Test Report

CGR1240

Cisco Connected Grid Router w/ 802.11N Access Points

FCC ID: LDKALTMT0556

IC: 2461B-ALTMT0556

2400-2483.5 MHz

Against the following Specifications:

CFR47 Part 15.247

RSS 210

Cisco Systems
EMC Laboratory
170 West Tasman Drive
San Jose, CA 95134

Testing - Certificate Number : 1178-01

Author: Jose Aguirre
Approved By: Shyam Pullela
Title: Manager

This report replaces any previously entered test report under EDCS - 1104807

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

Notes:

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

Section 2: Assessment Information

2.1 General

This report contains an assessment of an apparatus against Electromagnetic Compatibility Standards based upon tests carried out on the samples submitted. The testing was performed by and for the use of Cisco systems Inc:

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 and measurement tolerances.

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 60 Hz (+/-20%)

2.2 Date of testing

18-Oct-2011

2.3 Report Issue Date

Cisco 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)

CGR1240, 802.11n 2.4GHz WLAN Access Point

2.6 EUT Description

The Cisco CGR1240 802.11n Access Points support 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.

802.11B, One Antenna, 1 to 11 Mbps
802.11G, One Antenna, 6 to 54 Mbps
HT-20, One Antenna, M0 to M7

The following antennas are supported by this product series. The items in bold will be specifically tested and cover all others. The data included in this report represent the worst case data for all antennas.

Frequency	Part Number	Antenna Type	Antenna Gain (dBi)
2400MHz – 2483.5MHz	CPN 07-1156-01	dipole	4

Section 3: 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.

3.1 Sample Details(Photographs of the test samples, where appropriate can be found in appendix H)

Sample No.	Equipment Details	Part Number	Manufacturer	Hardware Rev.	Firmware Rev.	Software Rev.	Serial Number
S01	Altamont	CGR1240	Cisco Systems	TBD	TBD	TBD	TBD

3.2 System Details

System #	Description	Samples
1	Altamount WLAN FCC	S01

3.3 Mode of Operation Details

Mode#	Description	Comments
1	OFDM / CCK	802.11B, 802.11G & HT20
2	Receiver mode	802.11B, 802.11G & HT20

Appendix A: Emission Test Results

Target Maximum Channel Power

The following table details the maximum supported Total Channel Power for all operating modes.

	Maximum Channel Power (dBm)		
	Frequency (MHz)		
Operating Mode	2412	2437	2462
802.11B, 1 to 11 Mbps	11	11	11
802.11G, 6 to 54 Mbps	8	8	8
HT-20, M0 to M7	7	7	7

6dB Bandwidth

15.247: Systems using digital modulation techniques may operate in the 2400-2483.5MHz band. 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).

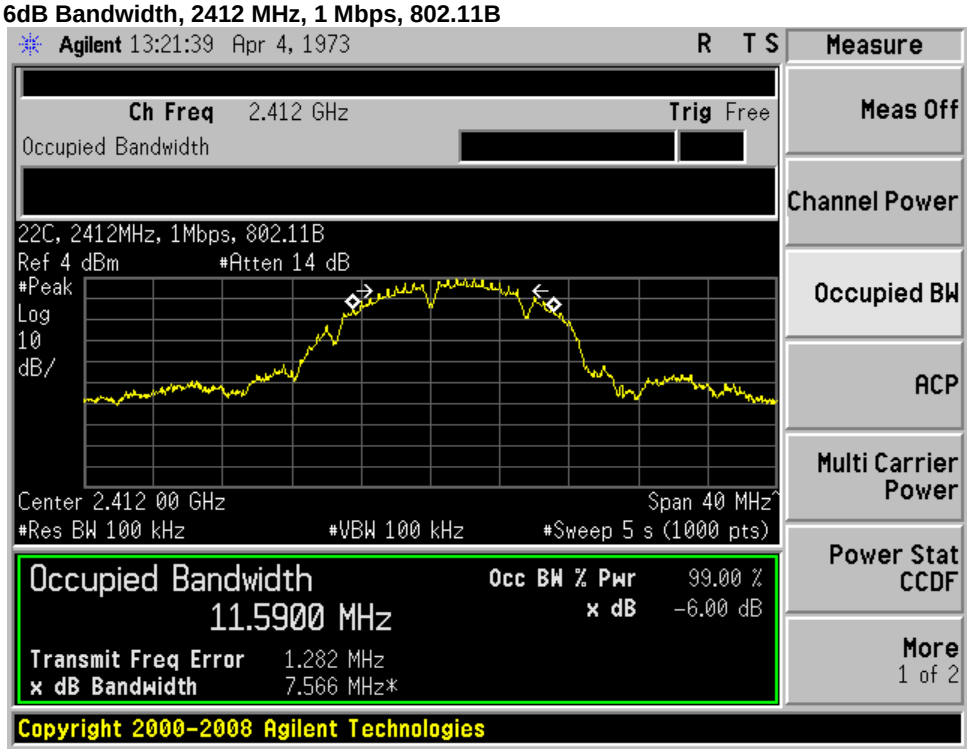
Center Frequency:	Frequency from table below
Span:	2 x Nominal Bandwidth (e.g. 40MHz for a 20MHz channel)
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	5 s
Resolution Bandwidth:	100 kHz
Video Bandwidth:	100 kHz
X dB Bandwidth:	6 dB
Detector:	Peak
Trace:	Single

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

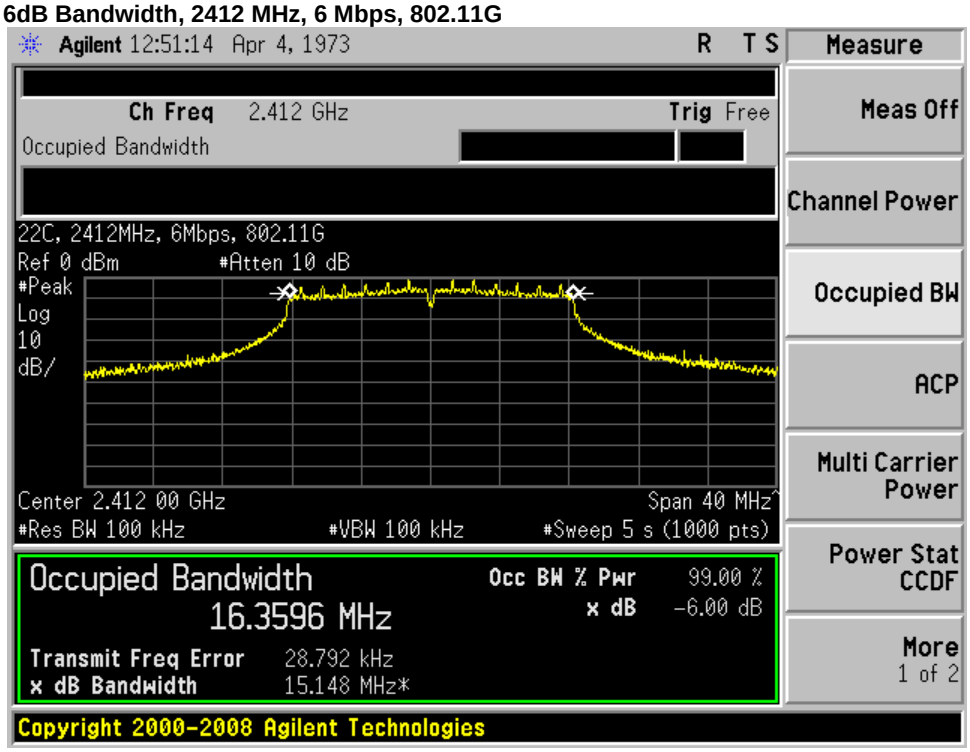
The worst case output is recorded.

Frequency (MHz)	Mode	Data Rate (Mbps)	6dB BW (MHz)	Limit (kHz)	Margin (MHz)
2412	802.11B, 1-11 Mbps	1	7.6	>500	7.1
	802.11G, 6- 54 Mbps	6	15.1	>500	14.6
	HT20, M0 – M7	M0	15.1	>500	14.6
2437	802.11B, 1-11 Mbps	1	7.5	>500	7.0
	802.11G, 6- 54 Mbps	6	15.2	>500	14.7
	HT20, M0 – M7	M0	15.2	>500	14.7
2462	802.11B, 1-11 Mbps	1	7.6	>500	7.1
	802.11G, 6- 54 Mbps	6	15.1	>500	14.6
	HT20, M0 – M7	M0	15.2	>500	14.7

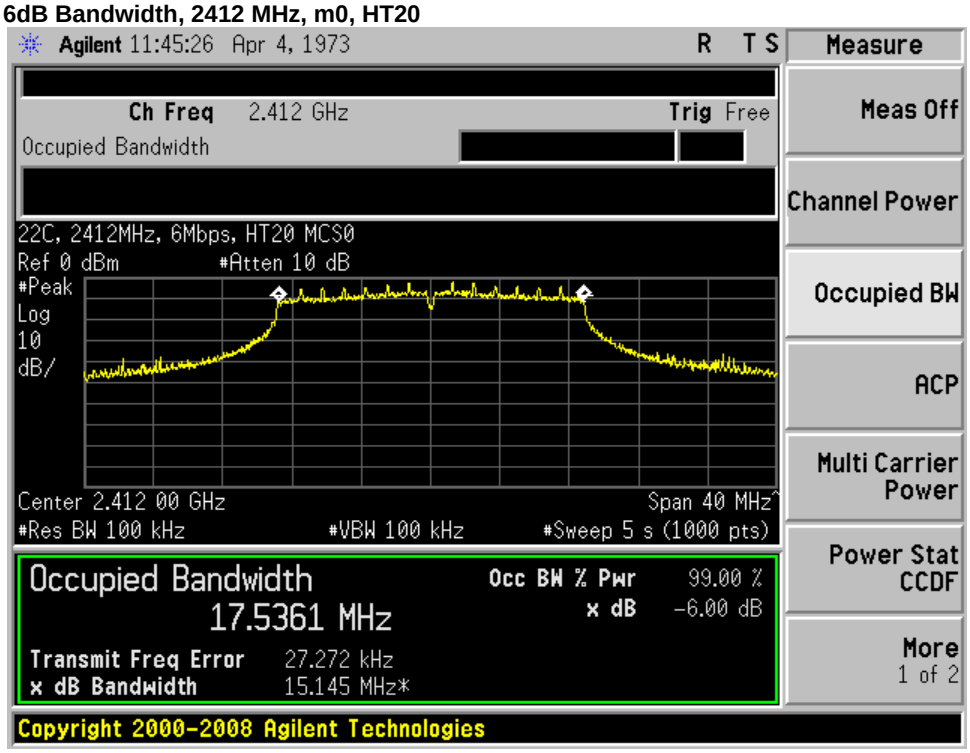
6dB Bandwidth, 2412 MHz, 1 Mbps, 802.11B



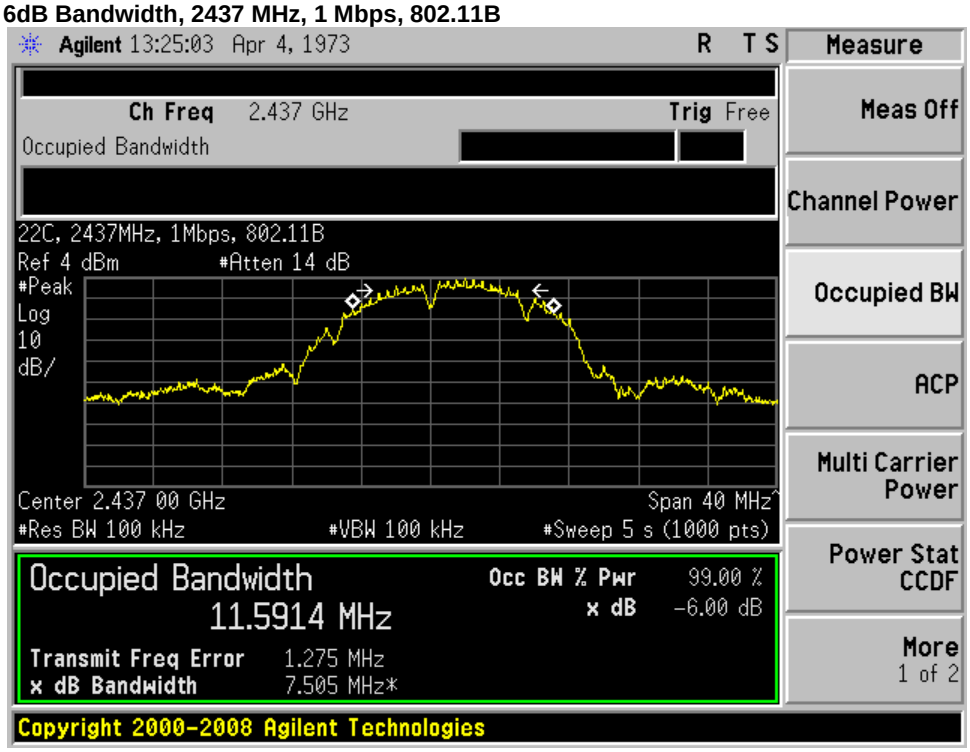
6dB Bandwidth, 2412 MHz, 6 Mbps, 802.11G



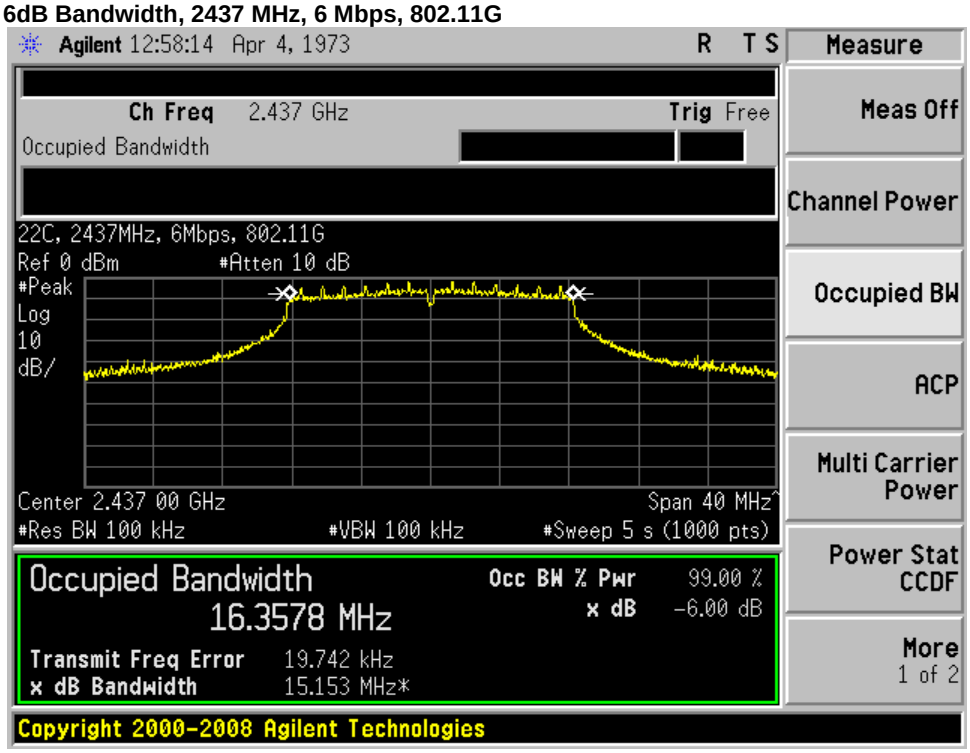
6dB Bandwidth, 2412 MHz, m0, HT20



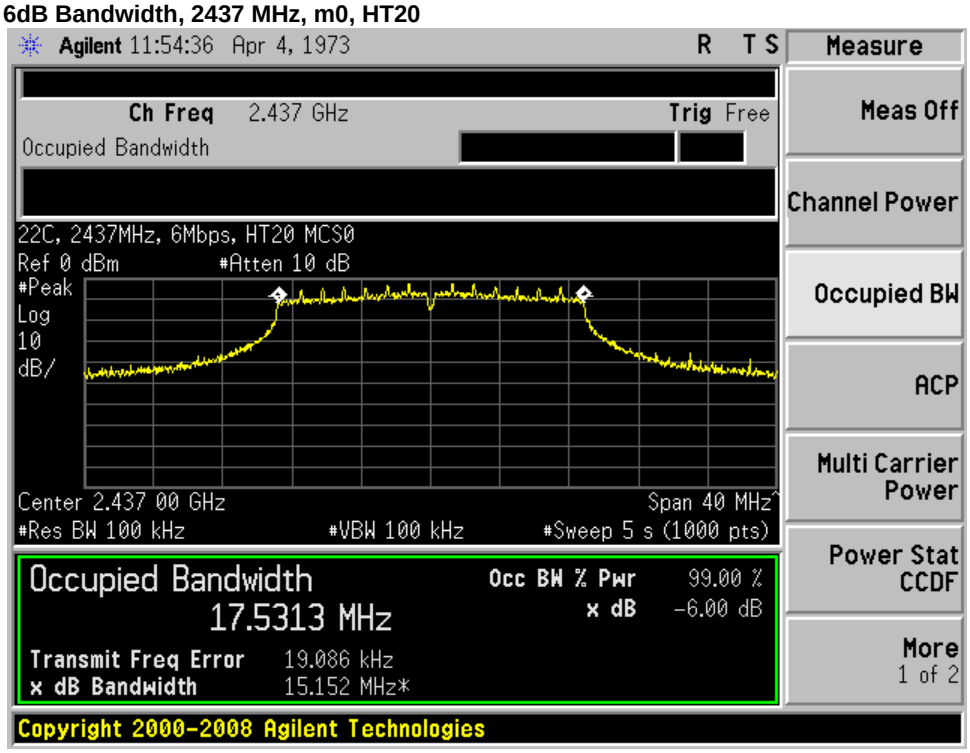
6dB Bandwidth, 2437 MHz, 1 Mbps, 802.11B



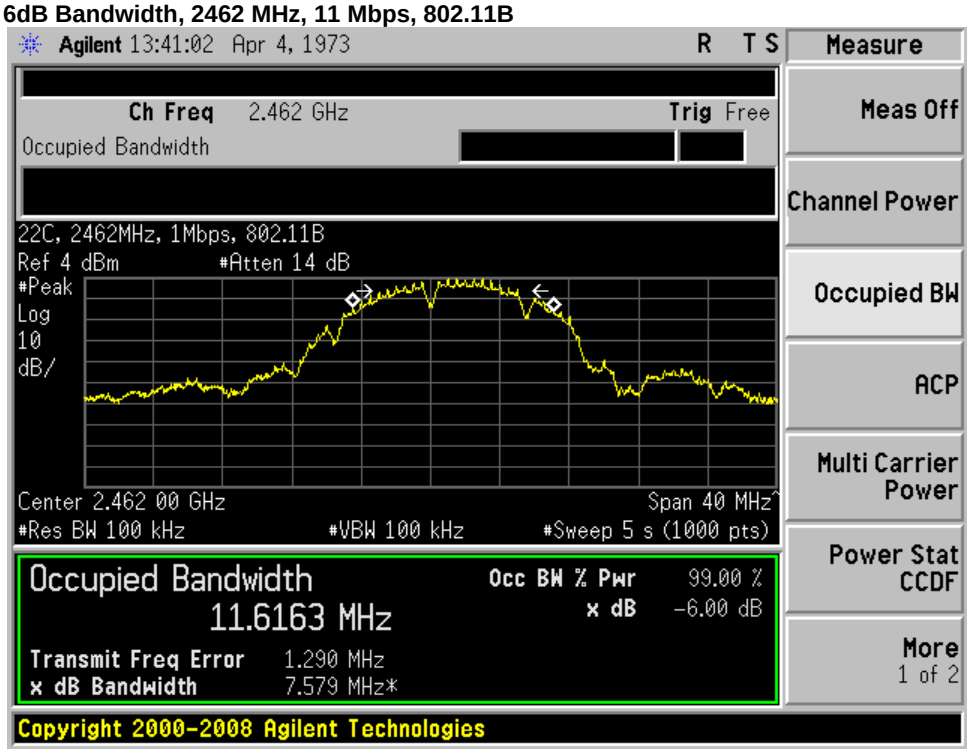
6dB Bandwidth, 2437 MHz, 6 Mbps, 802.11G



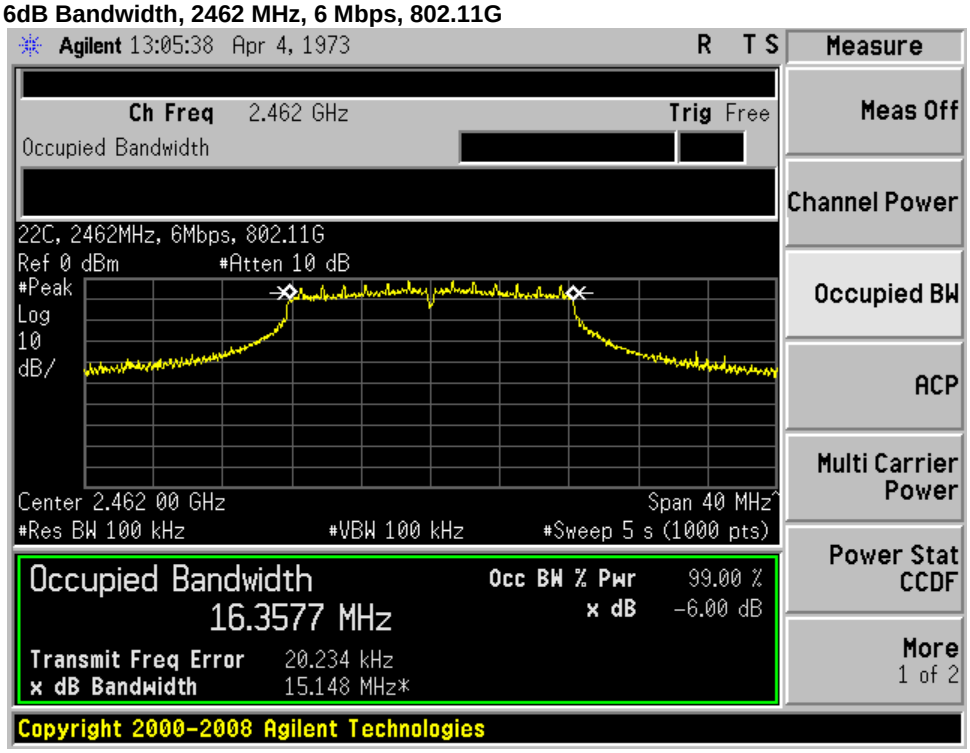
6dB Bandwidth, 2437 MHz, m0, HT20



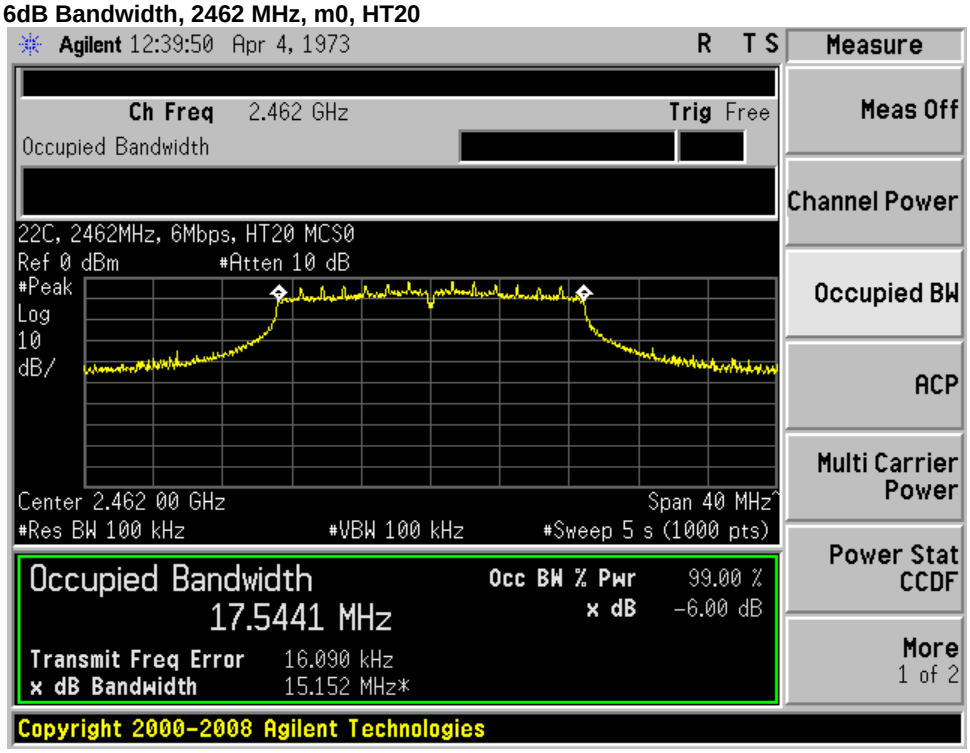
6dB Bandwidth, 2462 MHz, 11 Mbps, 802.11B



6dB Bandwidth, 2462 MHz, 6 Mbps, 802.11G



6dB Bandwidth, 2462 MHz, m0, HT20



99% and 26dB 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).

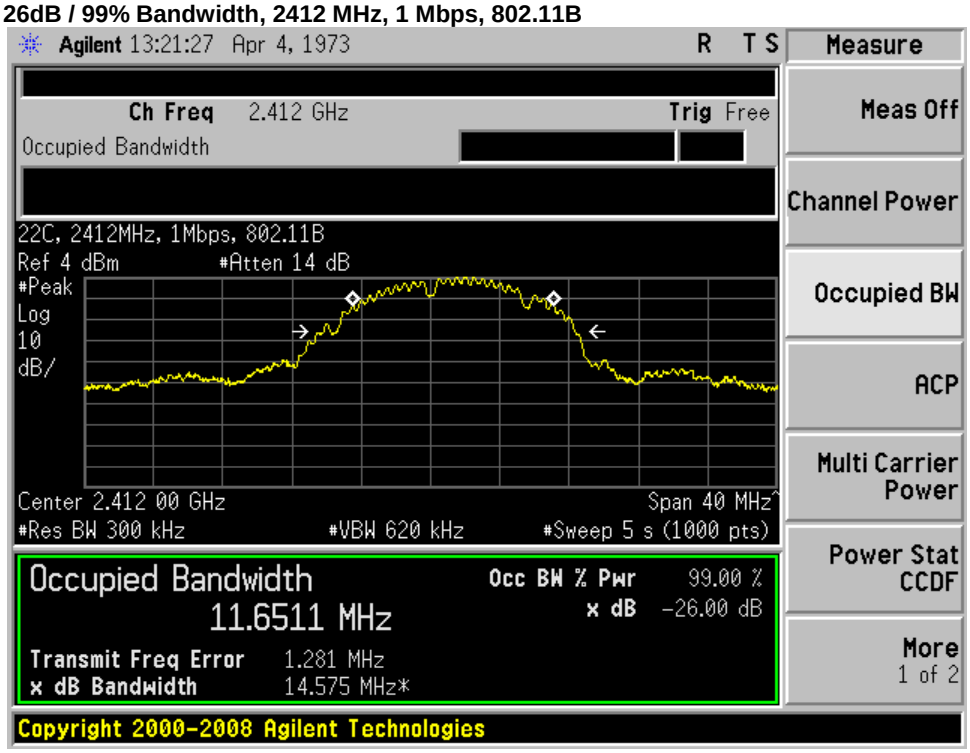
Center Frequency:	Frequency from table below
Span:	2 x Nominal Bandwidth (e.g. 40MHz for a 20MHz channel)
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	5 s
Resolution Bandwidth:	1%-3% of 26 dB Bandwidth
Video Bandwidth:	≥Resolution Bandwidth
X dB Bandwidth:	26 dB
Detector:	Peak
Trace:	Single

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

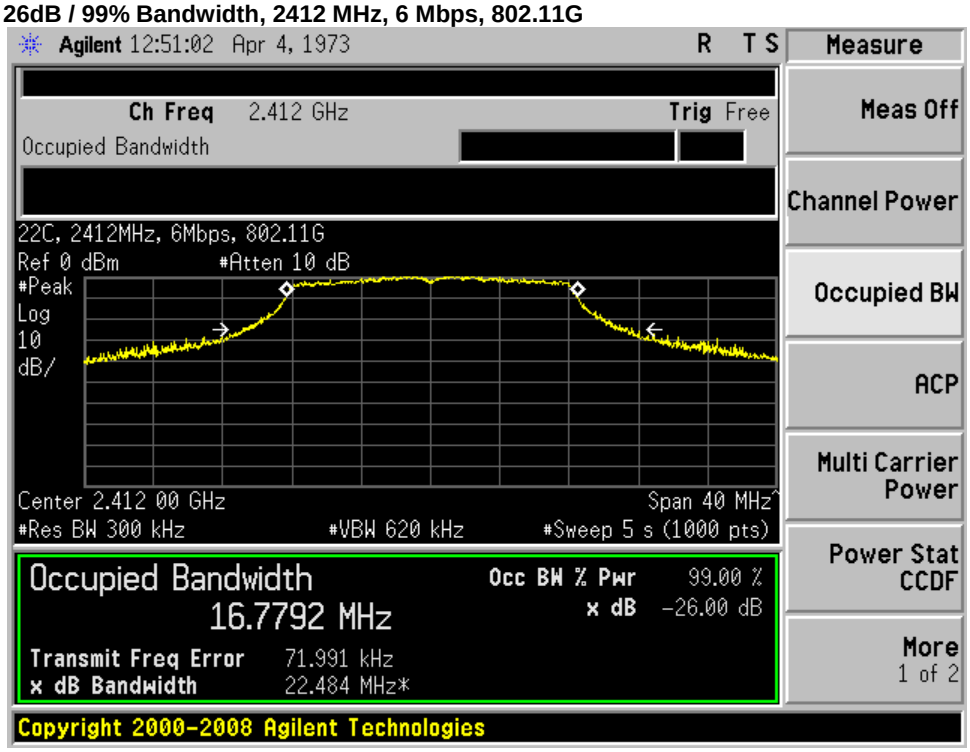
The worst case output is recorded.

Frequency (MHz)	Mode	Data Rate (Mbps)	26dB BW (MHz)	99% BW (MHz)
2412	802.11B, 1-11 Mbps	1	14.6	11.7
	802.11G, 6- 54 Mbps	6	22.5	16.8
	HT20, M0 – M7	M0	23.8	17.8
2437	802.11B, 1-11 Mbps	1	14.6	11.7
	802.11G, 6- 54 Mbps	6	22.7	16.8
	HT20, M0 – M7	M0	22.8	17.8
2462	802.11B, 1-11 Mbps	1	14.9	11.7
	802.11G, 6- 54 Mbps	6	22.2	16.8
	HT20, M0 – M7	M0	22.8	17.9

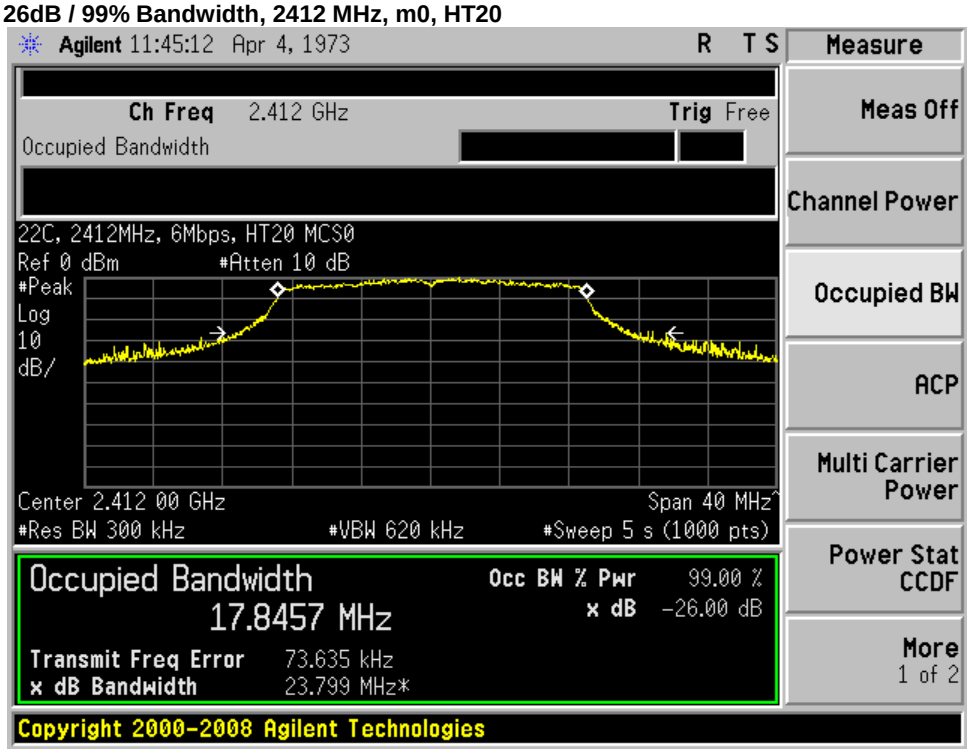
26dB / 99% Bandwidth, 2412 MHz, 1 Mbps, 802.11B



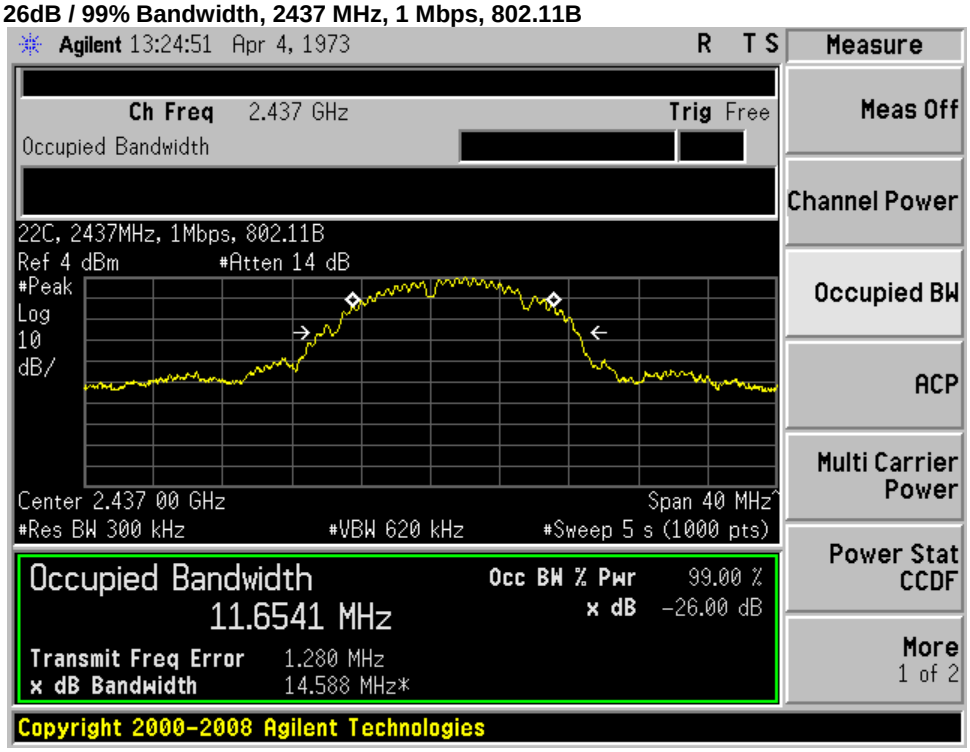
26dB / 99% Bandwidth, 2412 MHz, 6 Mbps, 802.11G



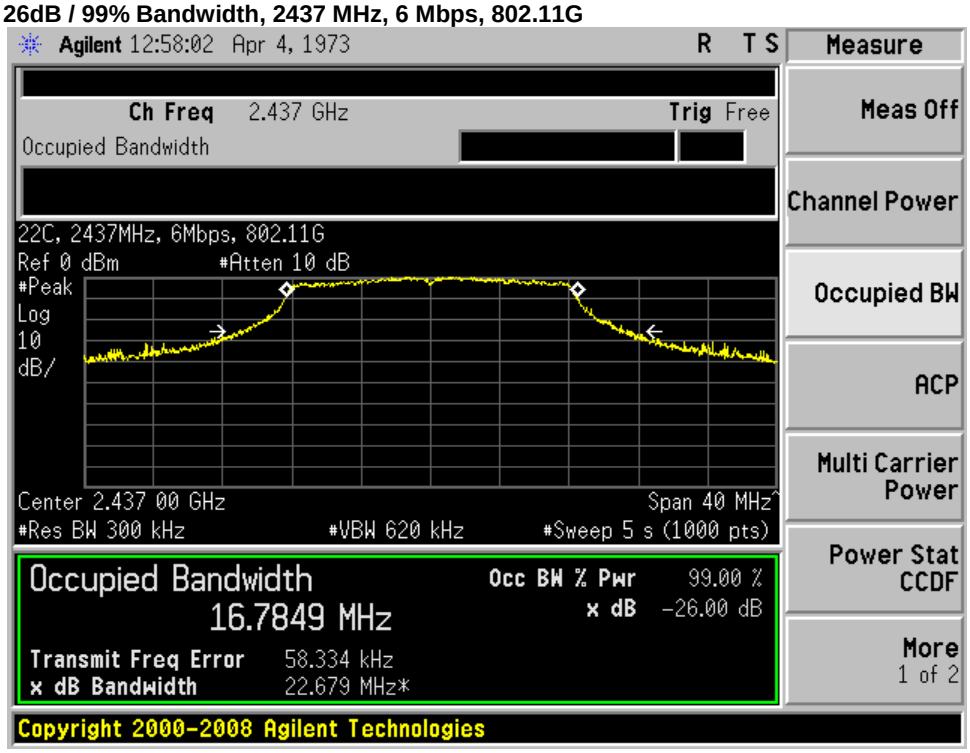
26dB / 99% Bandwidth, 2412 MHz, m0, HT20



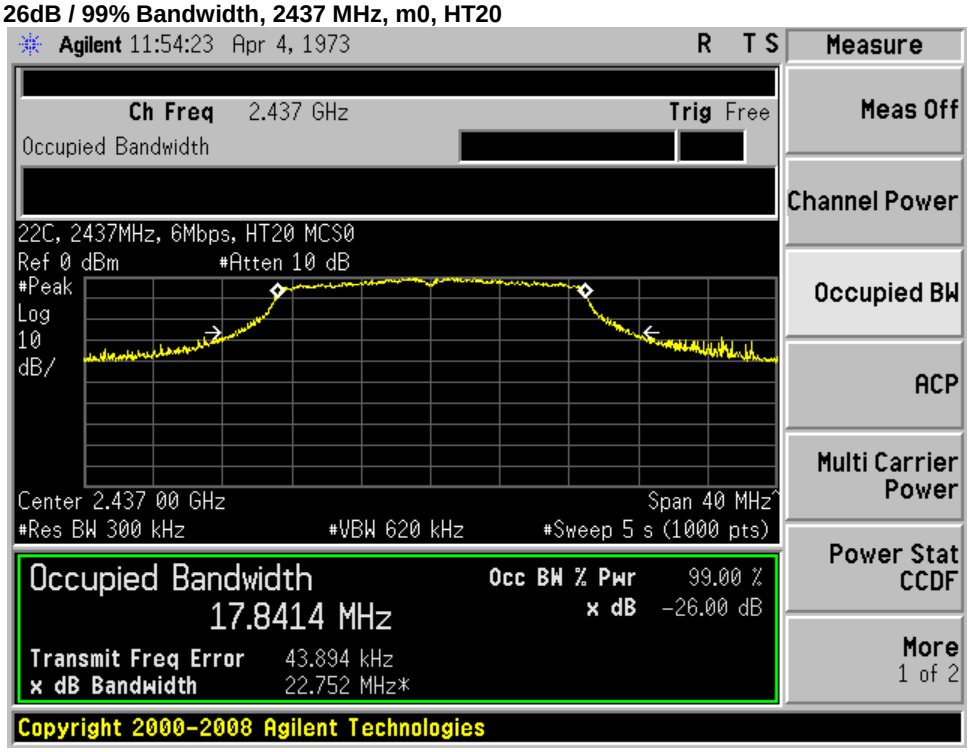
26dB / 99% Bandwidth, 2437 MHz, 1 Mbps, 802.11B



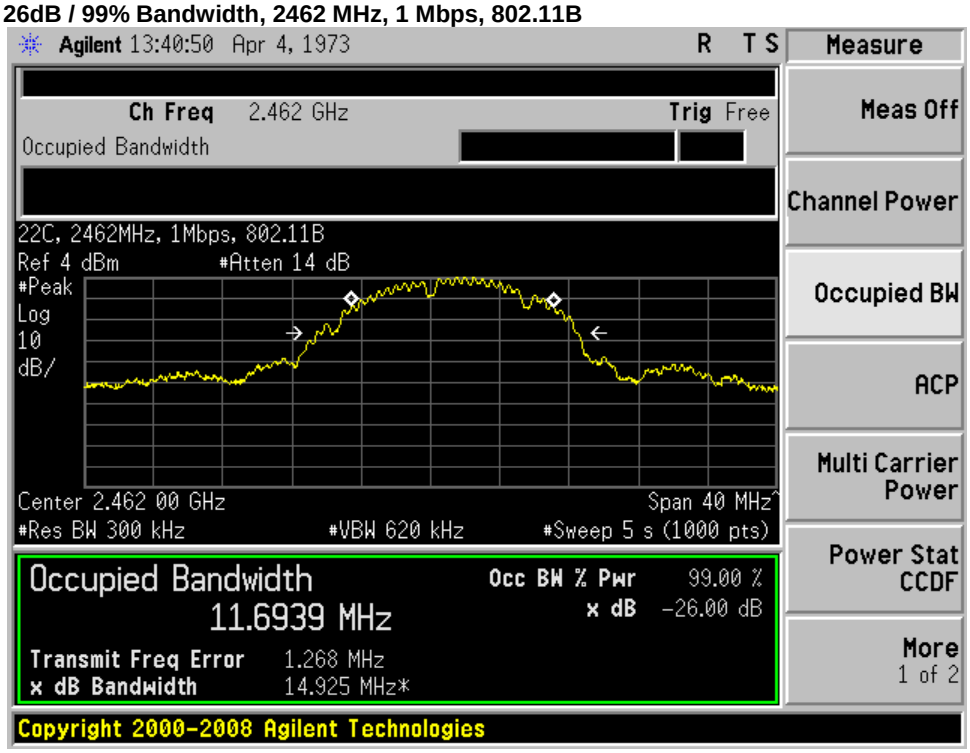
26dB / 99% Bandwidth, 2437 MHz, 6 Mbps, 802.11G



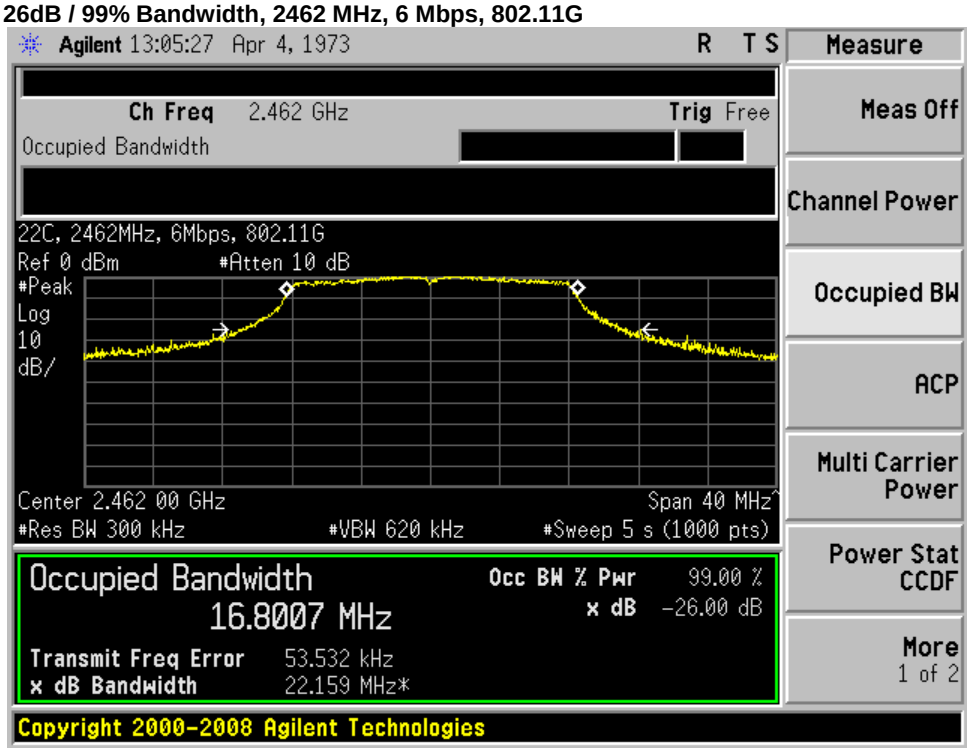
26dB / 99% Bandwidth, 2437 MHz, m0, HT20



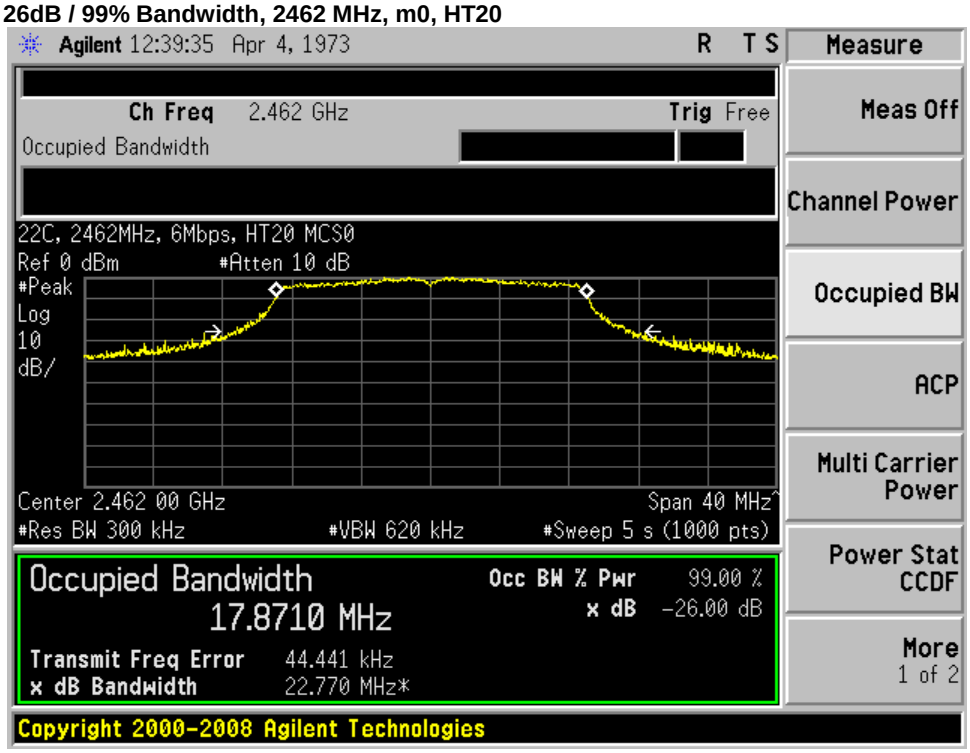
26dB / 99% Bandwidth, 2462 MHz, 1 Mbps, 802.11B



26dB / 99% Bandwidth, 2462 MHz, 6 Mbps, 802.11G



26dB / 99% Bandwidth, 2462 MHz, m0, HT20



Peak Output Power

15.247: The maximum conducted output power of the intentional radiator for systems using digital modulation in the 2400-2483.5 MHz 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 4dBi

Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode. Configure the spectrum analyzer as shown below.

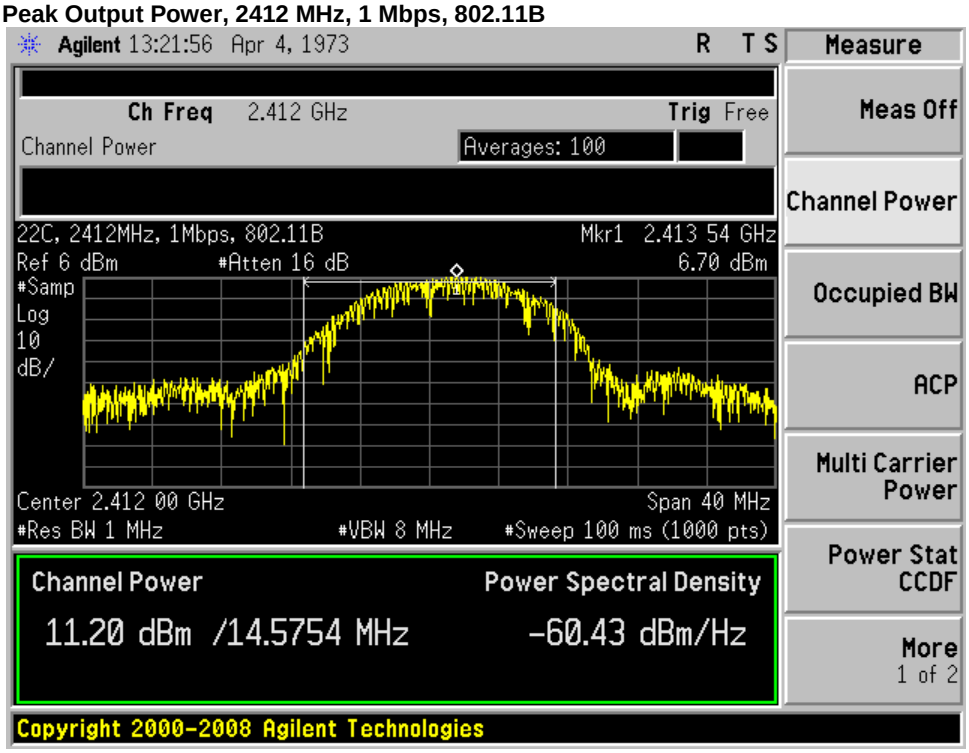
Enable "Channel Power" function of analyzer
Center Frequency: Frequency from table below
Span: 20 MHz (must be greater than 26dB bandwidth, adjust as necessary)
Ref Level Offset: Correct for attenuator and cable loss.
Reference Level: 20 dBm
Attenuation: 20 dB
Sweep Time: 100ms, Single sweep
Resolution 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

After averaging 100 traces of the transmitter waveform on the spectrum analyzer, record the spectrum analyzer Channel Power.

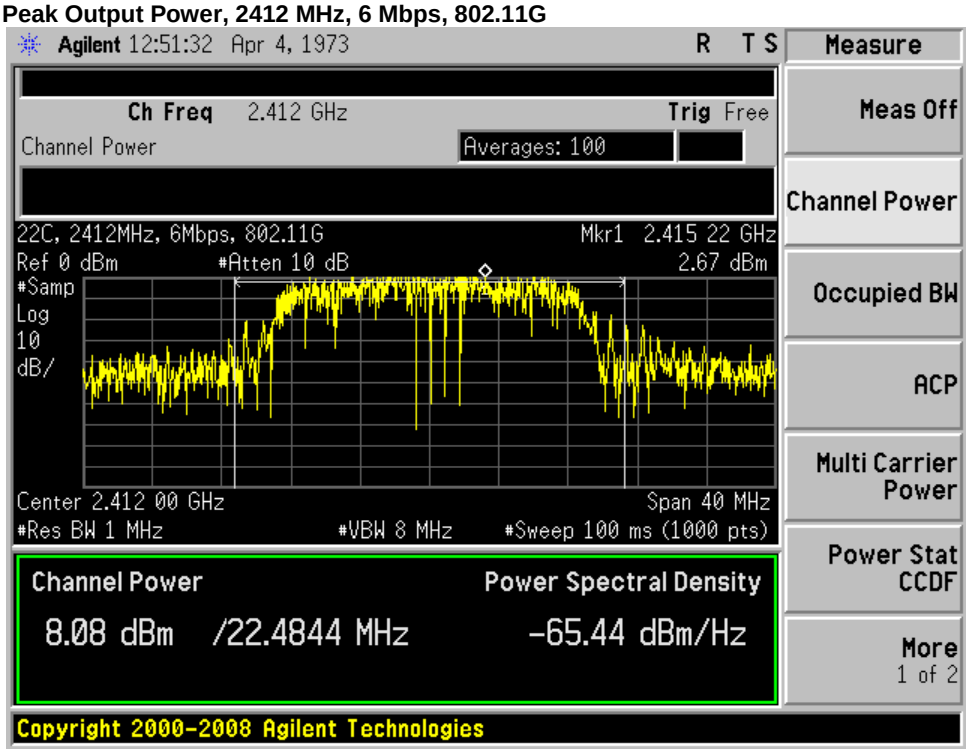
The worst case output is recorded.

Frequency (MHz)	Mode	Data Rate (Mbps)	Channel Power (dBm)	Limit (dBm)
2412	802.11B, 1-11 Mbps	1	11.2	30
	802.11G, 6- 54 Mbps	6	8.1	30
	HT20, M0 – M7	M0	7.0	30
2437	802.11B, 1-11 Mbps	1	10.7	30
	802.11G, 6- 54 Mbps	6	7.8	30
	HT20, M0 – M7	M0	6.9	30
2462	802.11B, 1-11 Mbps	1	11.3	30
	802.11G, 6- 54 Mbps	6	8.2	30
	HT20, M0 – M7	M0	7.5	30

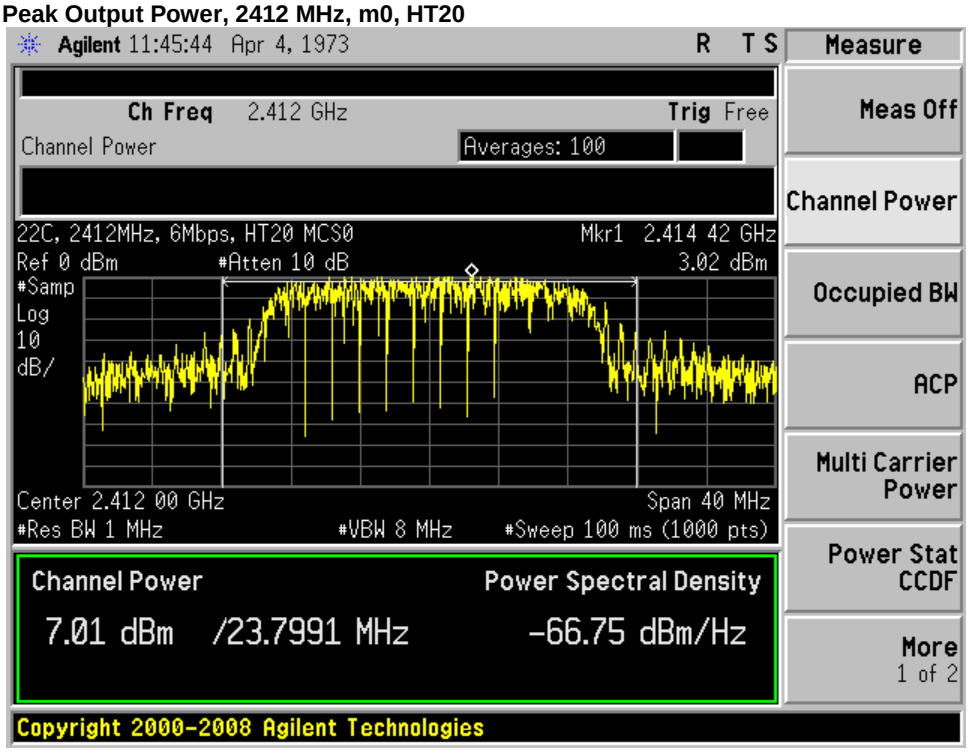
Peak Output Power, 2412 MHz, 1 Mbps, 802.11B



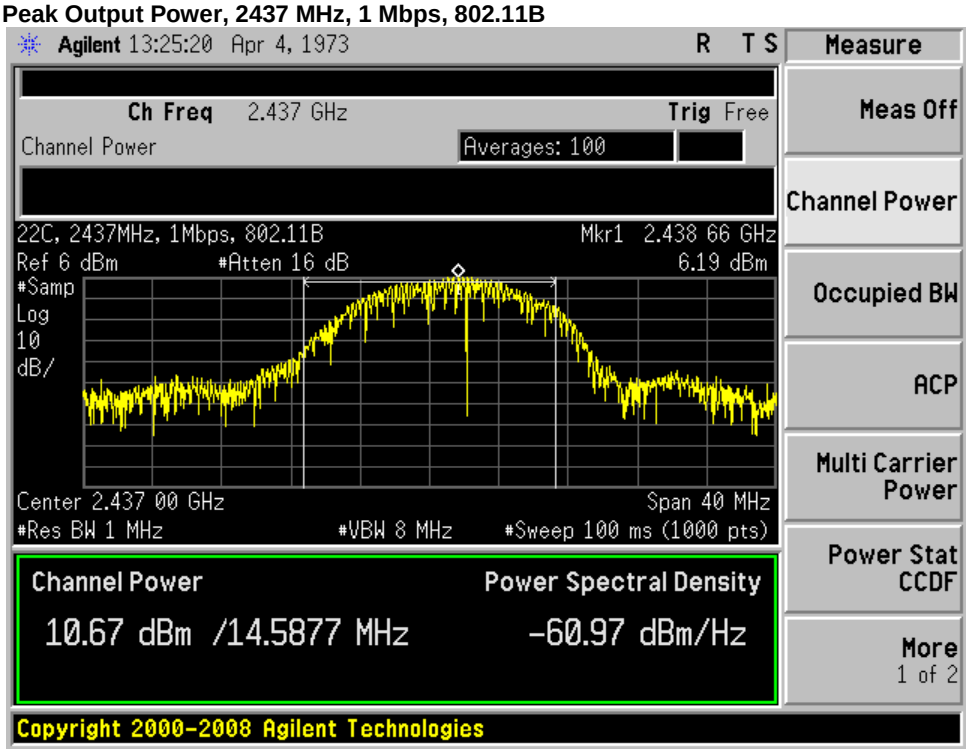
Peak Output Power, 2412 MHz, 6 Mbps, 802.11G



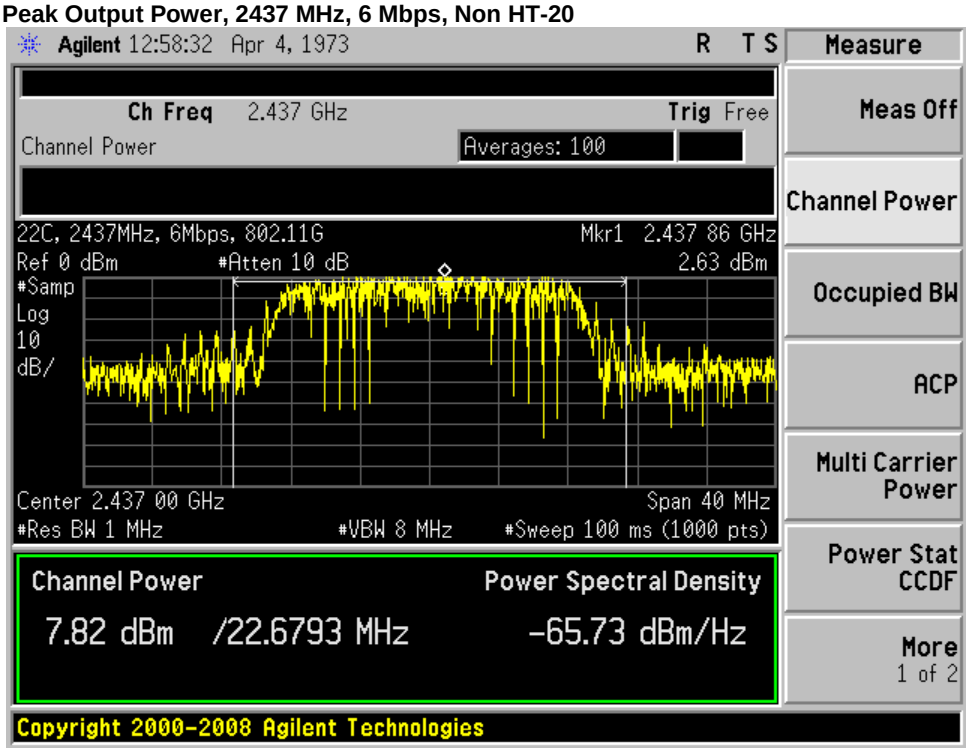
Peak Output Power, 2412 MHz, m0, HT20



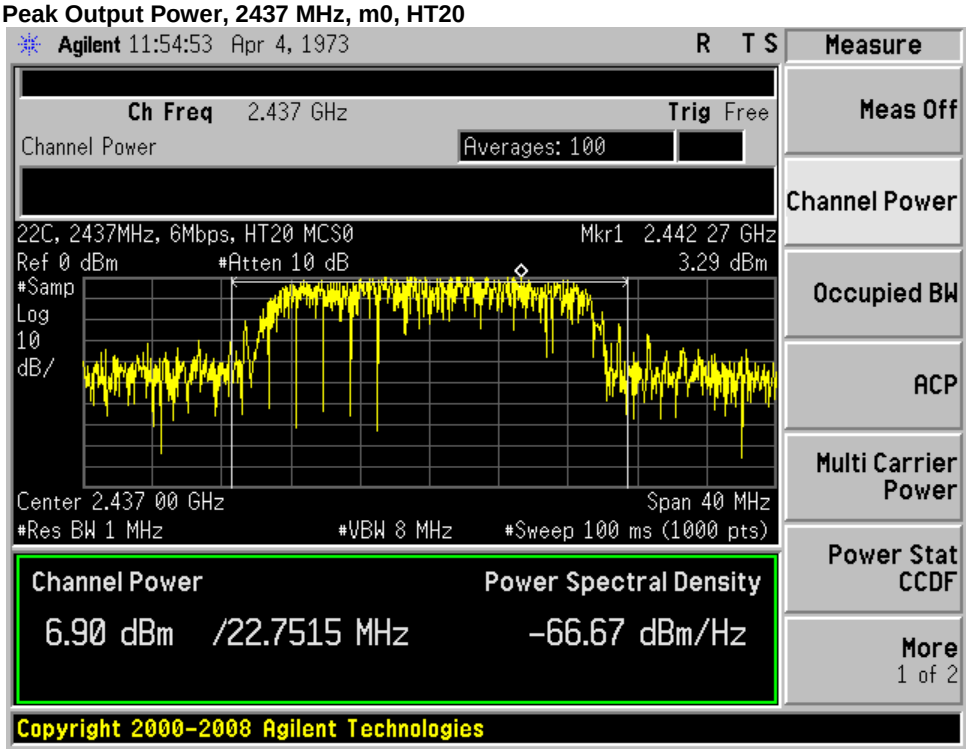
Peak Output Power, 2437 MHz, 1 Mbps, 802.11B



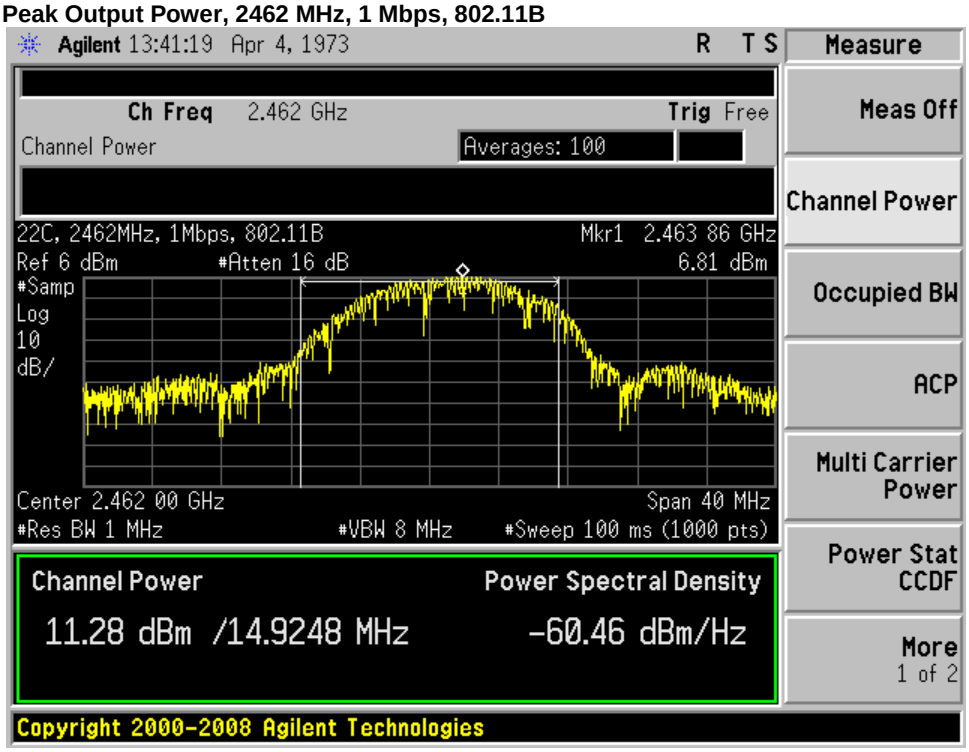
Peak Output Power, 2437 MHz, 6 Mbps, Non HT-20



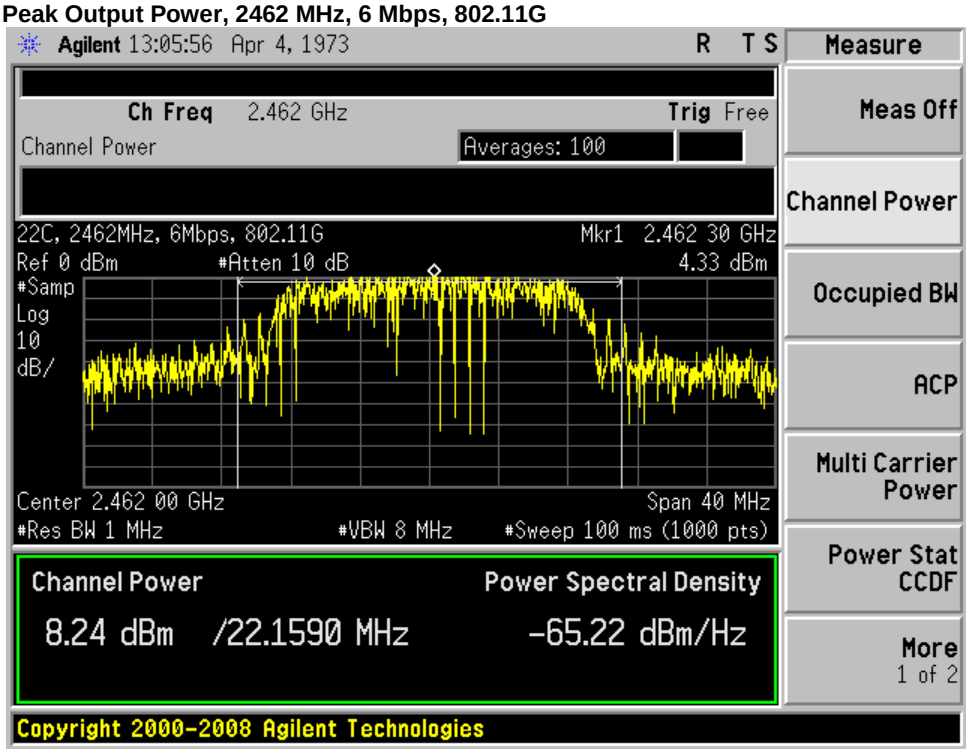
Peak Output Power, 2437 MHz, m0, HT20



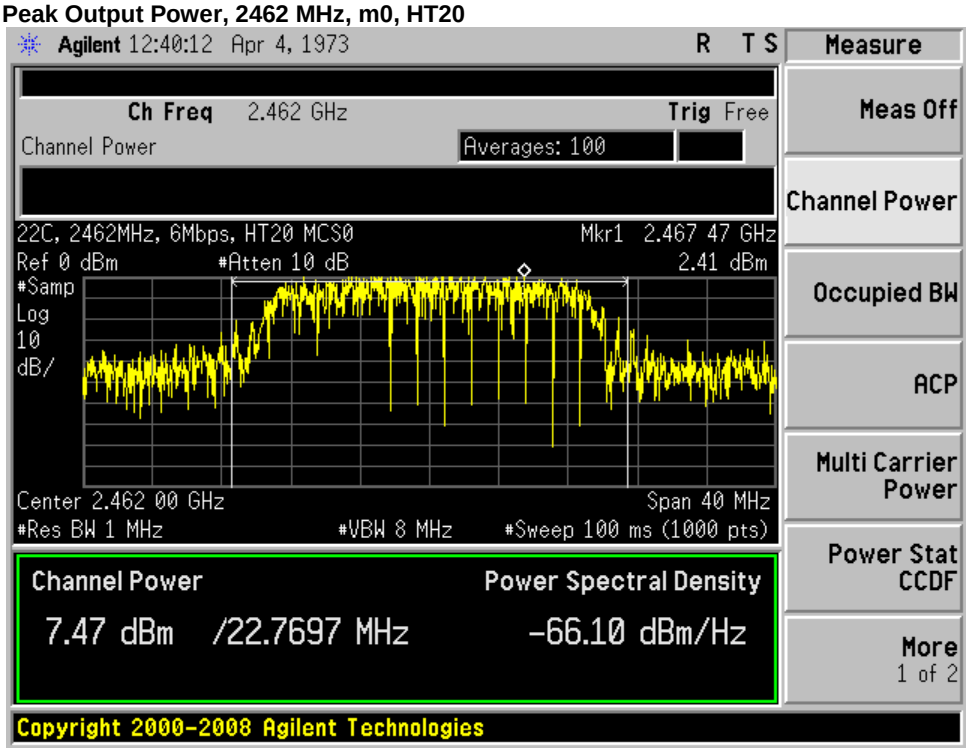
Peak Output Power, 2462 MHz, 1 Mbps, 802.11B



Peak Output Power, 2462 MHz, 6 Mbps, 802.11G



Peak Output Power, 2462 MHz, m0, HT20



Power Spectral Density

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

Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode. Configure the spectrum analyzer as shown below.

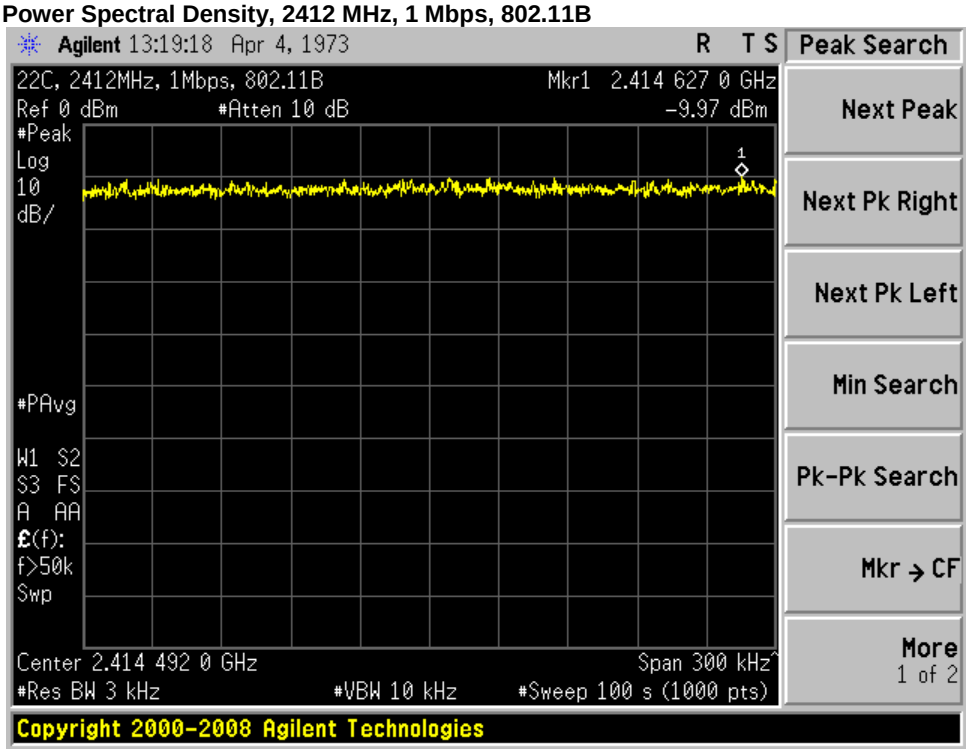
Center Frequency: Frequency from table below
Span: 20 MHz
Ref Level Offset: Correct for attenuator and cable loss.
Reference Level: 20 dBm
Attenuation: 20 dB
Sweep Time: 10s
Resolution Bandwidth: 3 kHz
Video Bandwidth: 10 kHz
Detector: Peak
Trace: Single
Marker: Peak Search

Record the Marker value.

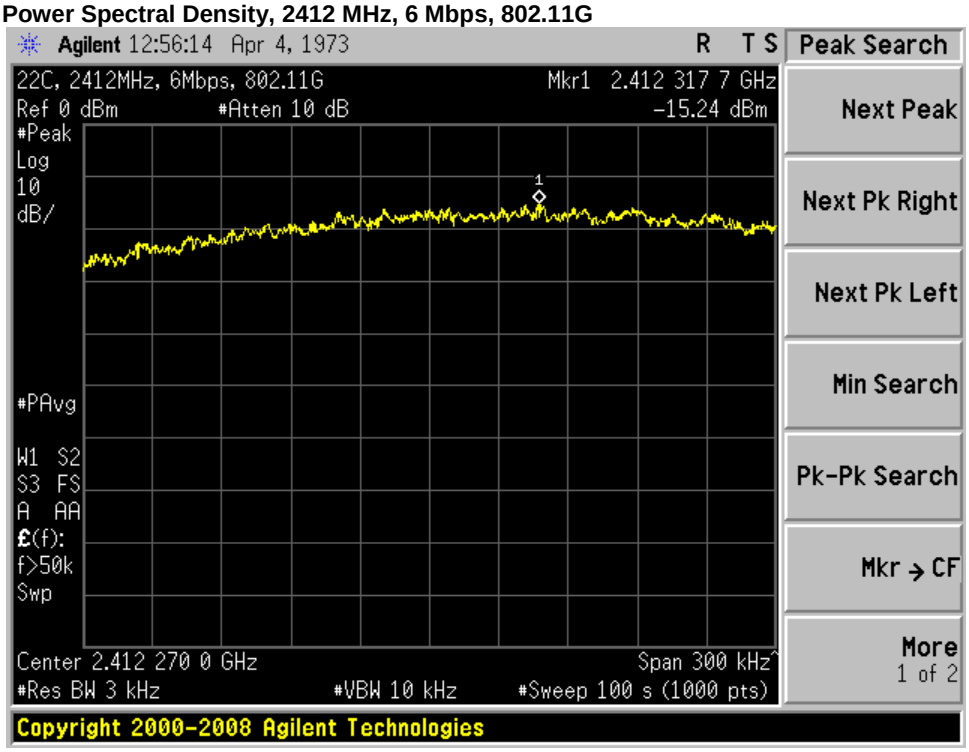
The worst case output is recorded.

Frequency (MHz)	Mode	Data Rate (Mbps)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)
2412	802.11B, 1-11 Mbps	1	-9.97	8
	802.11G, 6- 54 Mbps	6	-15.24	8
	HT20, M0 – M7	M0	-16.34	8
2437	802.11B, 1-11 Mbps	1	-8.72	8
	802.11G, 6- 54 Mbps	6	-15.81	8
	HT20, M0 – M7	M0	-16.55	8
2462	802.11B, 1-11 Mbps	1	-10.09	8
	802.11G, 6- 54 Mbps	6	-16.32	8
	HT20, M0 – M7	M0	-15.52	8

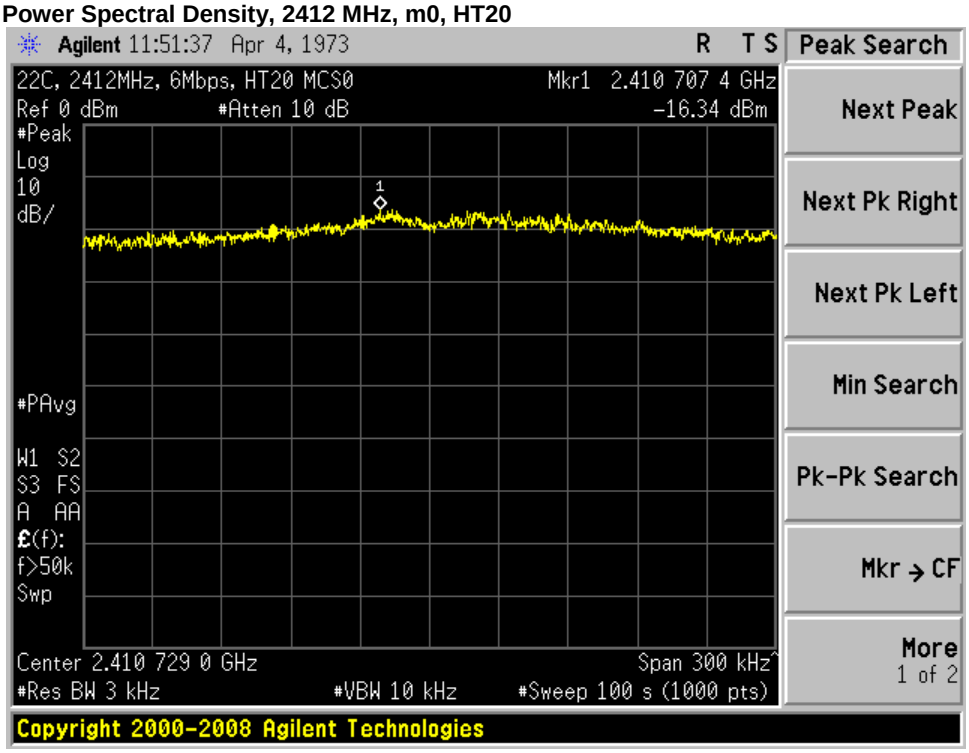
Power Spectral Density, 2412 MHz, 1 Mbps, 802.11B



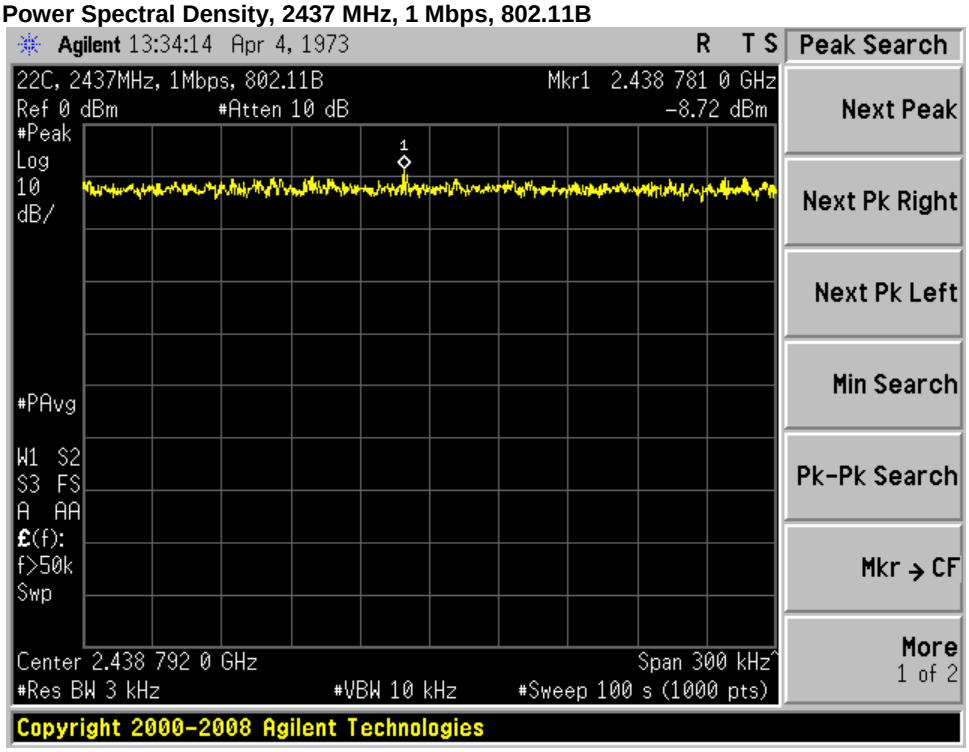
Power Spectral Density, 2412 MHz, 6 Mbps, 802.11G



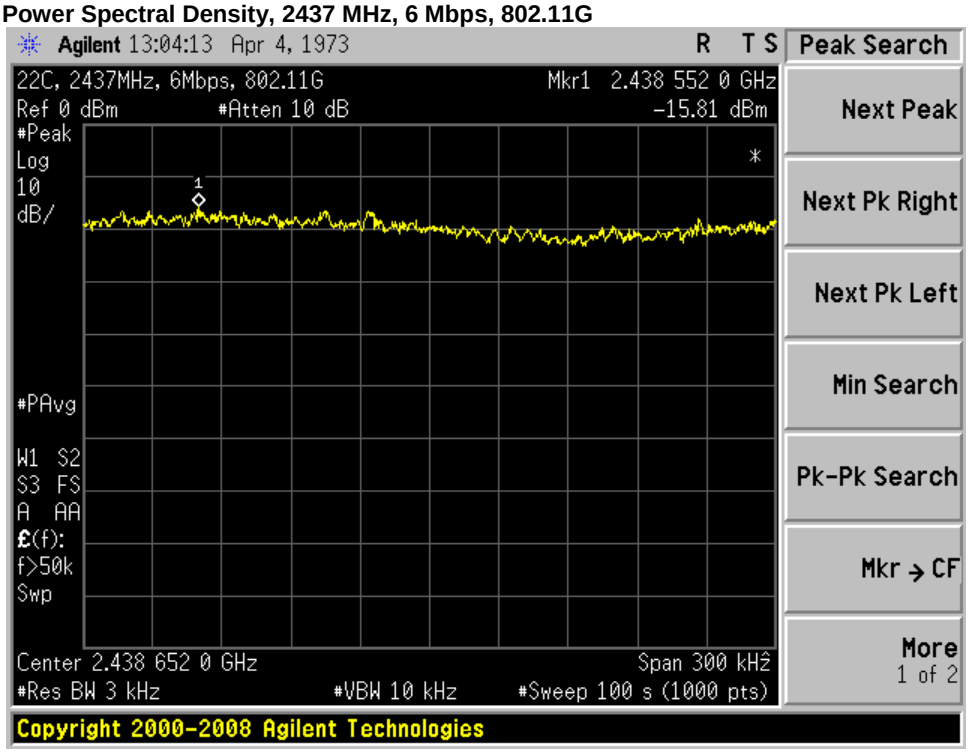
Power Spectral Density, 2412 MHz, m0, HT20



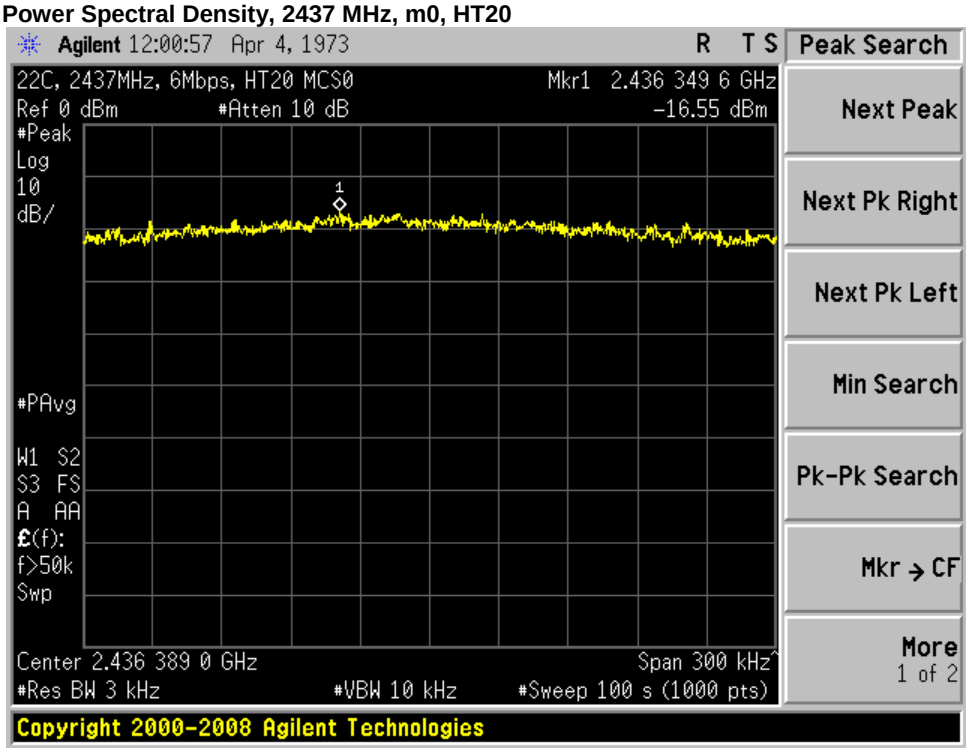
Power Spectral Density, 2437 MHz, 1 Mbps, 802.11B



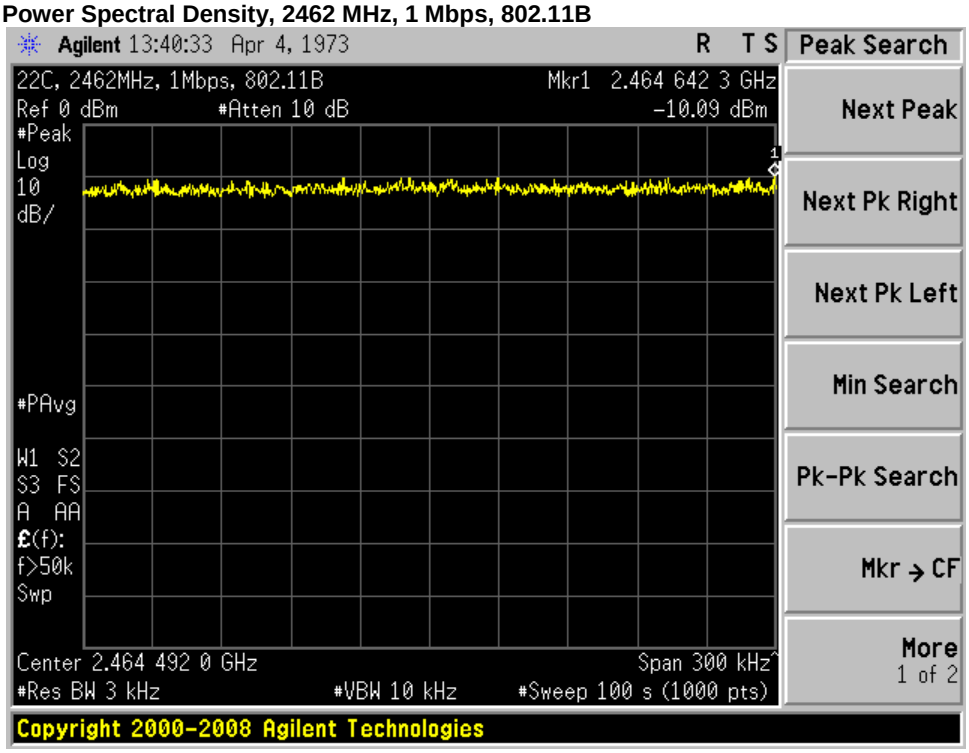
Power Spectral Density, 2437 MHz, 6 Mbps, 802.11G



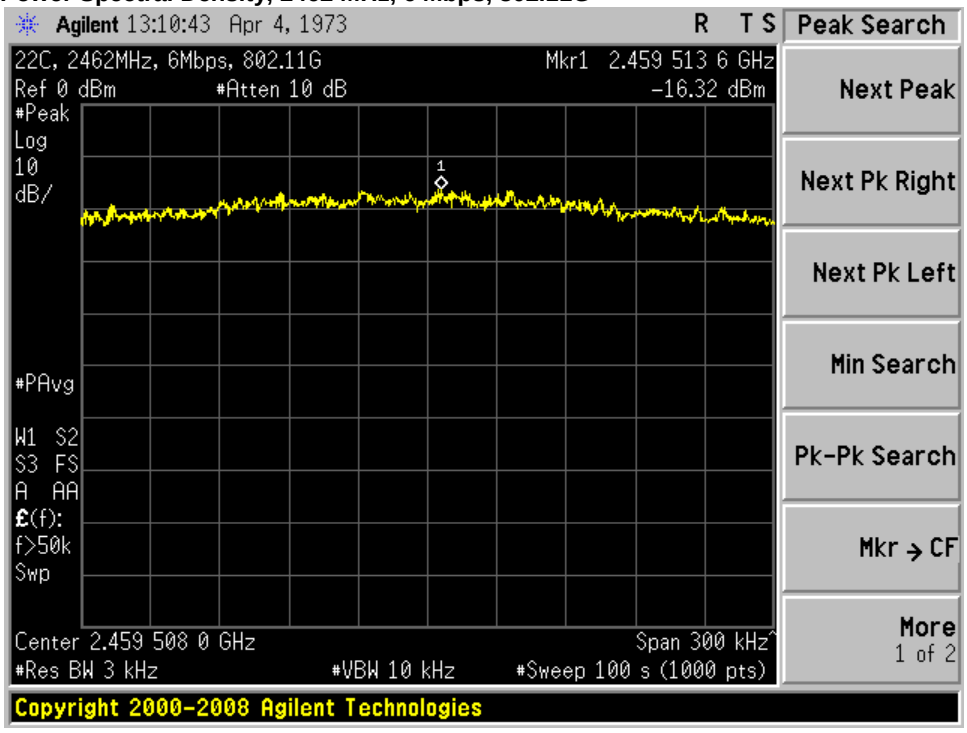
Power Spectral Density, 2437 MHz, m0, HT20



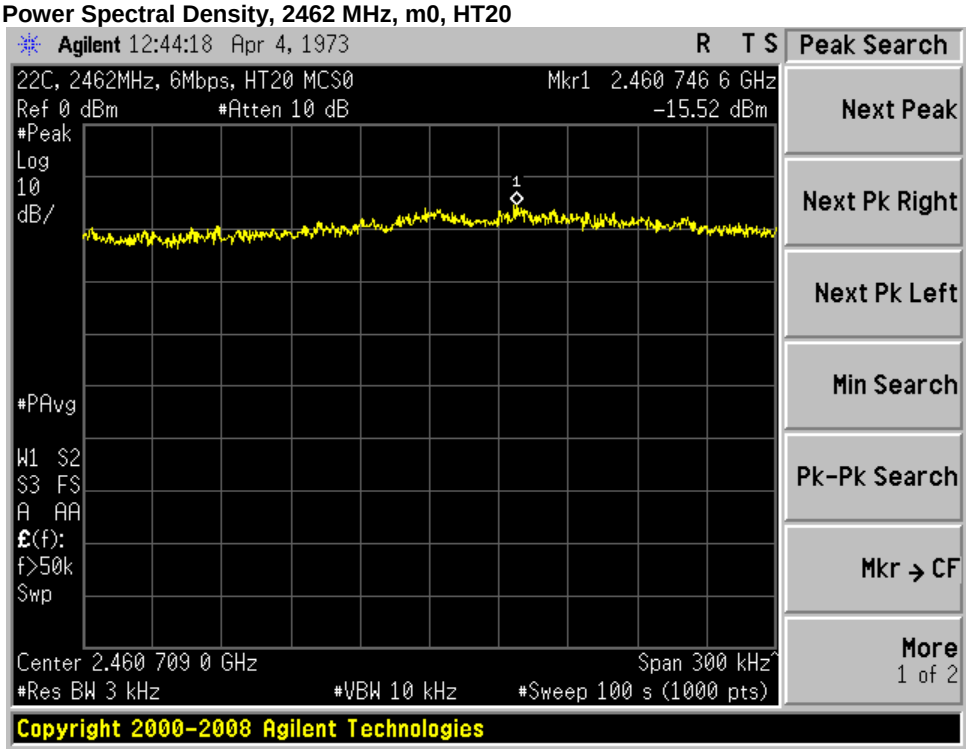
Power Spectral Density, 2462 MHz, 1 Mbps, 802.11B



Power Spectral Density, 2462 MHz, 6 Mbps, 802.11G



Power Spectral Density, 2462 MHz, m0, HT20



Conducted Spurious Emissions

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

Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode. Configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer).

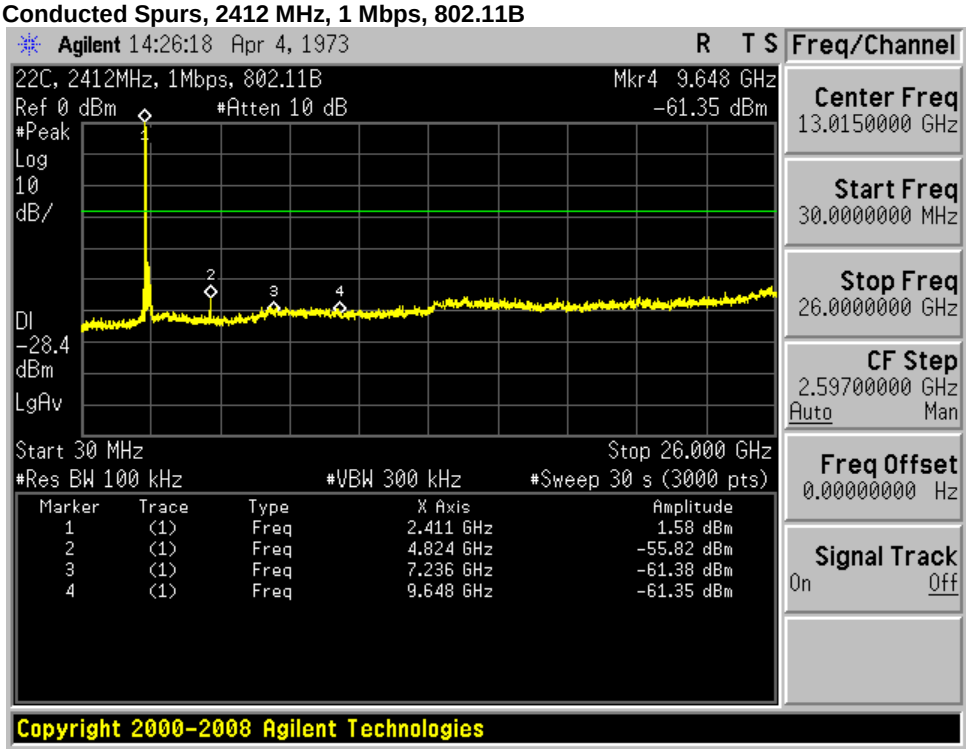
Span:	30 MHz-26 GHz
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	Auto
Resolution Bandwidth:	100 kHz
Video Bandwidth:	300 kHz
Detector:	Peak
Trace:	Single
Marker:	Peak

Record the marker waveform peak to spur difference

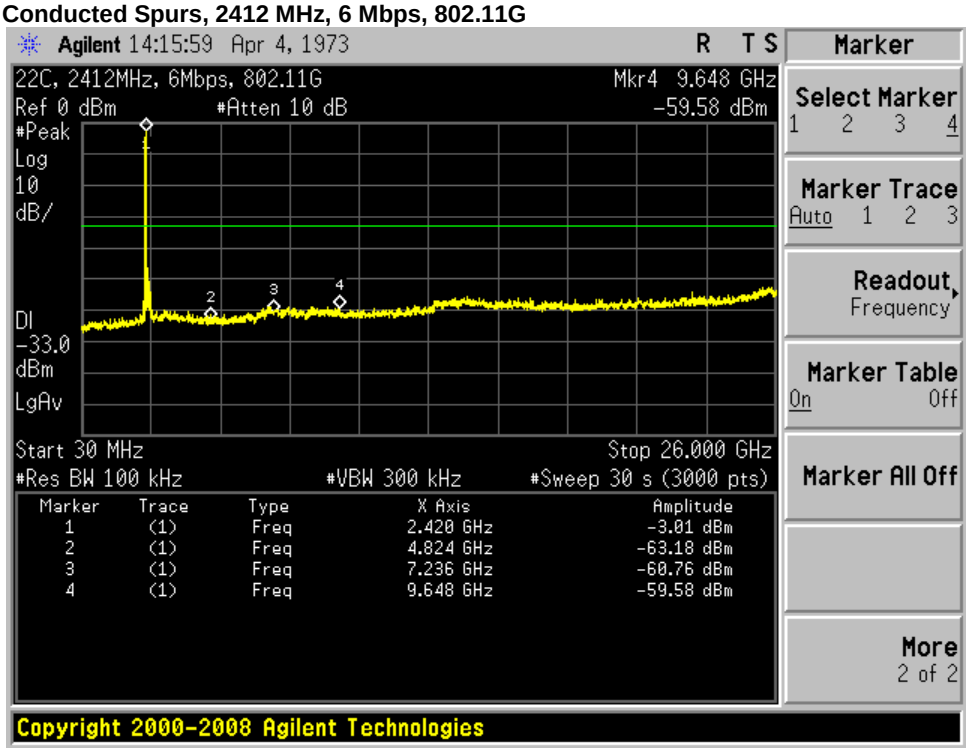
The worst case output is recorded.

Frequency (MHz)	Mode	Data Rate (Mbps)	Conducted Spur Delta (dBc)	Limit (dBc)	Margin (dB)
2412	802.11B, 1-11 Mbps	1	57.4	30	27.4
	802.11G, 6- 54 Mbps	6	56.6	30	26.6
	HT20, M0 – M7	M0	55.8	30	25.8
2437	802.11B, 1-11 Mbps	1	60.2	30	30.2
	802.11G, 6- 54 Mbps	6	56.8	30	26.8
	HT20, M0 – M7	M0	54.0	30	24
2462	802.11B, 1-11 Mbps	1	63.4	30	33.4
	802.11G, 6- 54 Mbps	6	56.5	30	26.5
	HT20, M0 – M7	M0	57.7	30	27.7

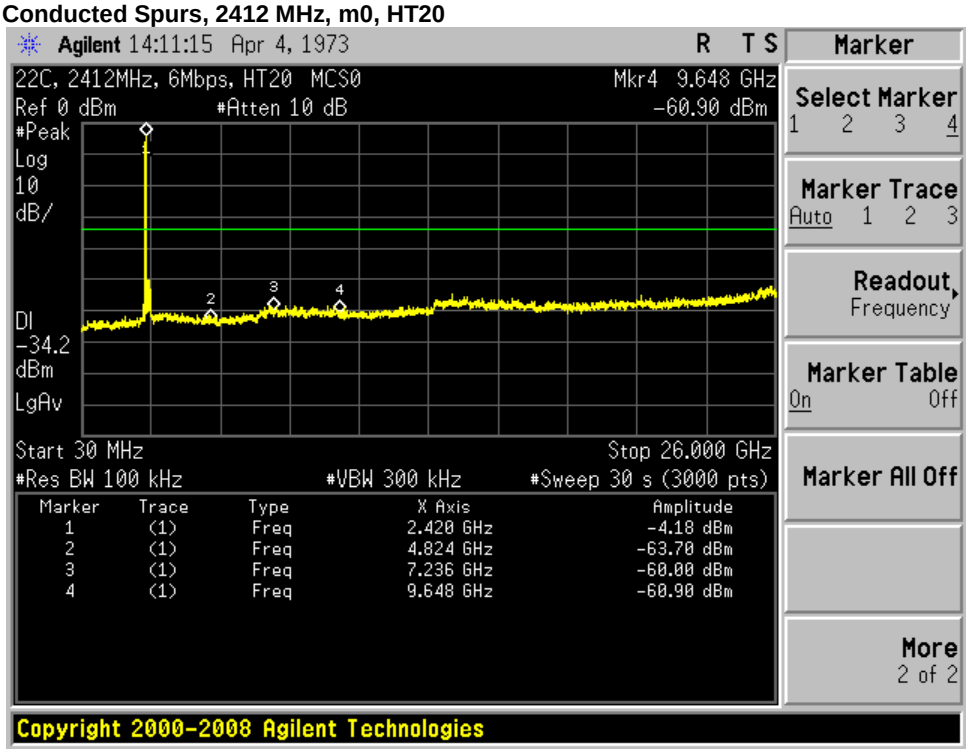
Conducted Spurs, 2412 MHz, 1 Mbps, 802.11B



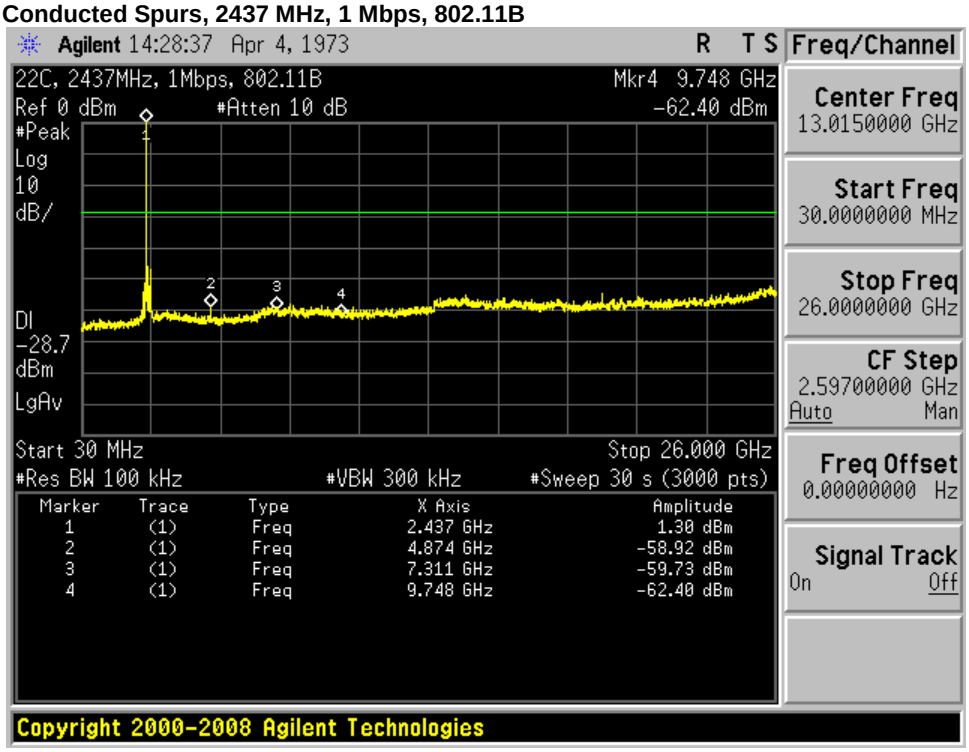
Conducted Spurs, 2412 MHz, 6 Mbps, 802.11G



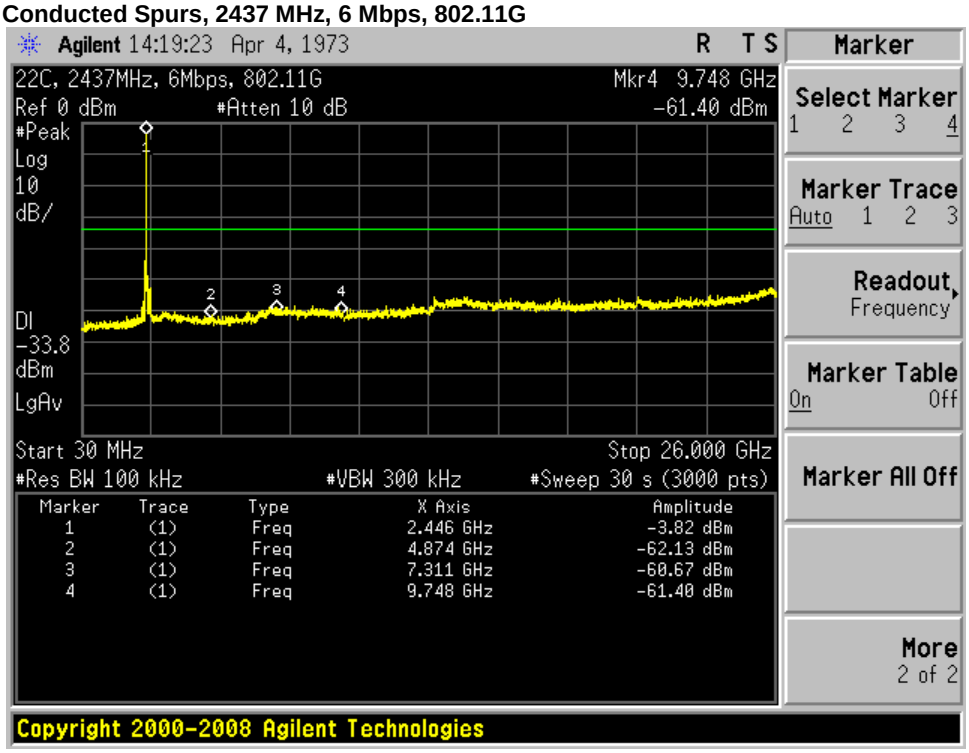
Conducted Spurs, 2412 MHz, m0, HT20



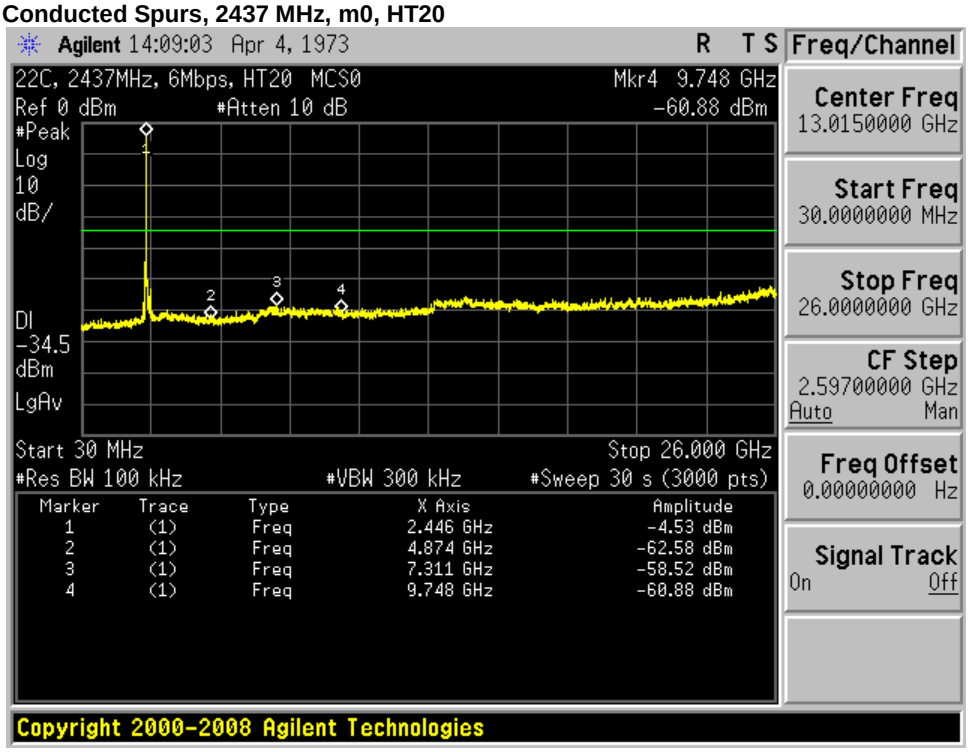
Conducted Spurs, 2437 MHz, 1 Mbps, 802.11B



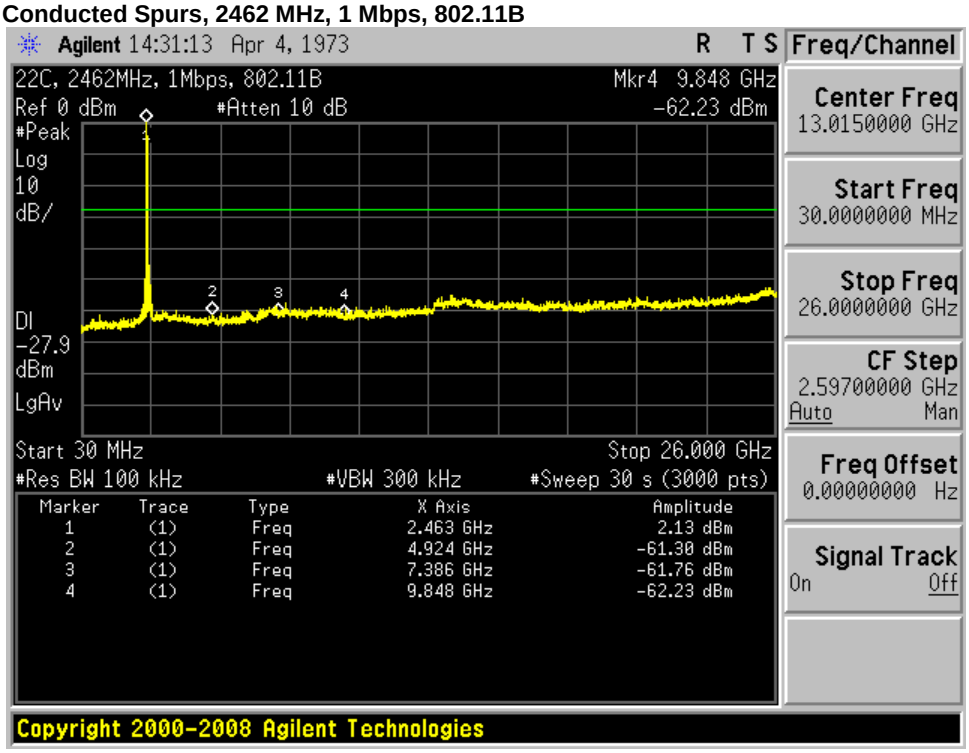
Conducted Spurs, 2437 MHz, 6 Mbps, 802.11G



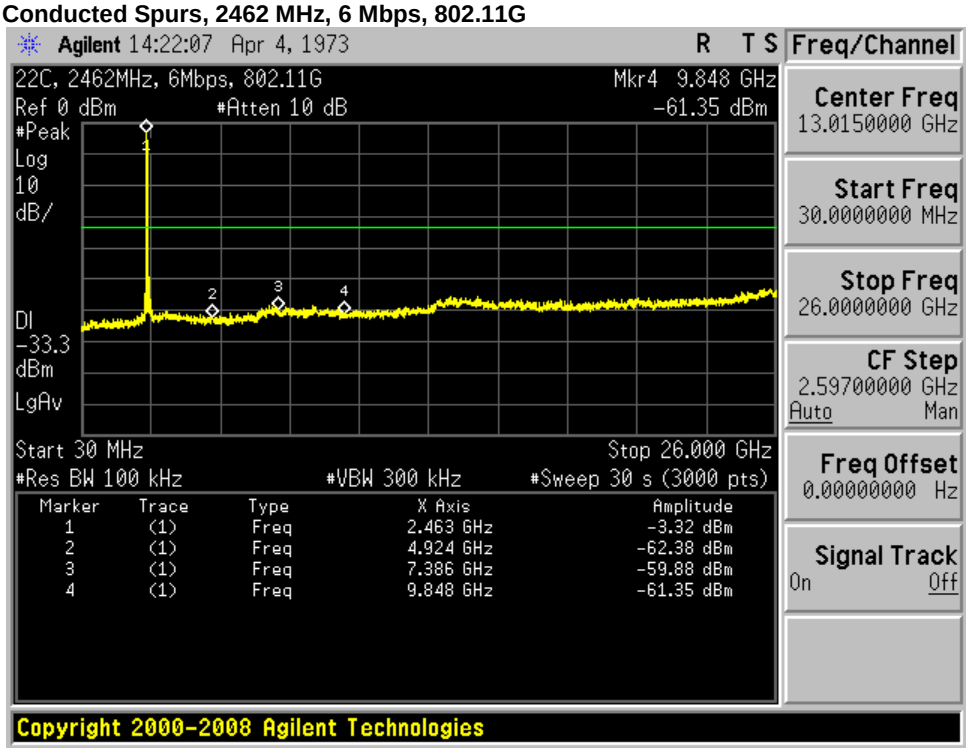
Conducted Spurs, 2437 MHz, m0, HT20



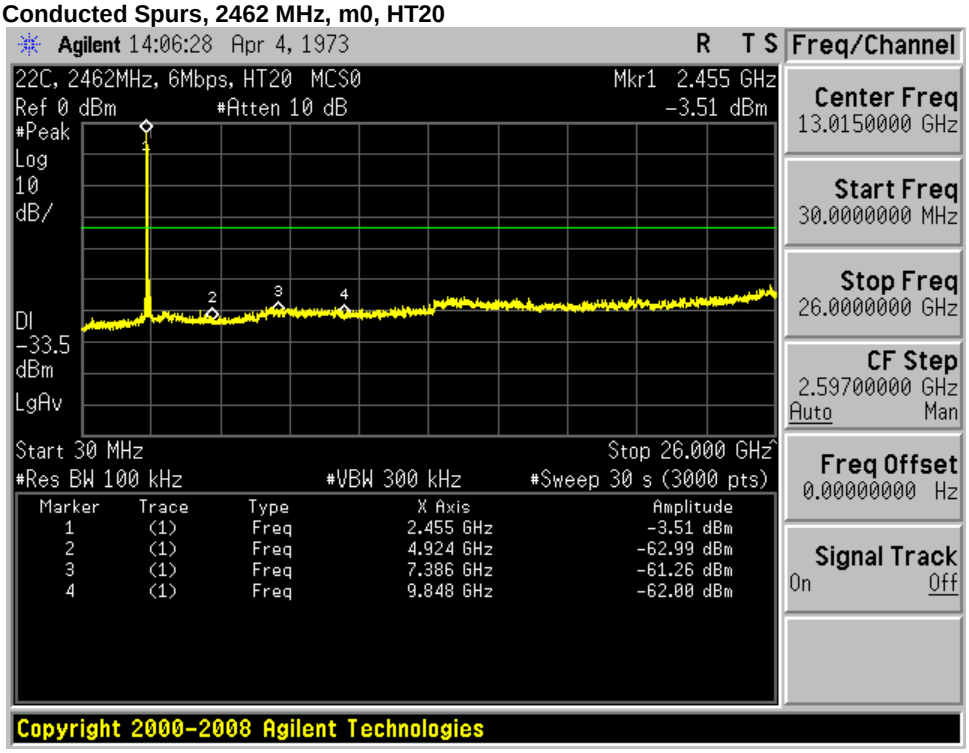
Conducted Spurs, 2462 MHz, 1 Mbps, 802.11B



Conducted Spurs, 2462 MHz, 6 Mbps, 802.11G



Conducted Spurs, 2462 MHz, m0, HT20



Test Setup Photos – Conducted

See Test setup photo exibit

Appendix B: Emission Test Results

Radiated Bandedge

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

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.

Reference Level: 110 dBuV
Attenuation: 20 dB
Sweep Time: Coupled
Resolution Bandwidth: 1MHz
Video Bandwidth: 1 MHz for peak, 10 Hz for average
Detector: Peak

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

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

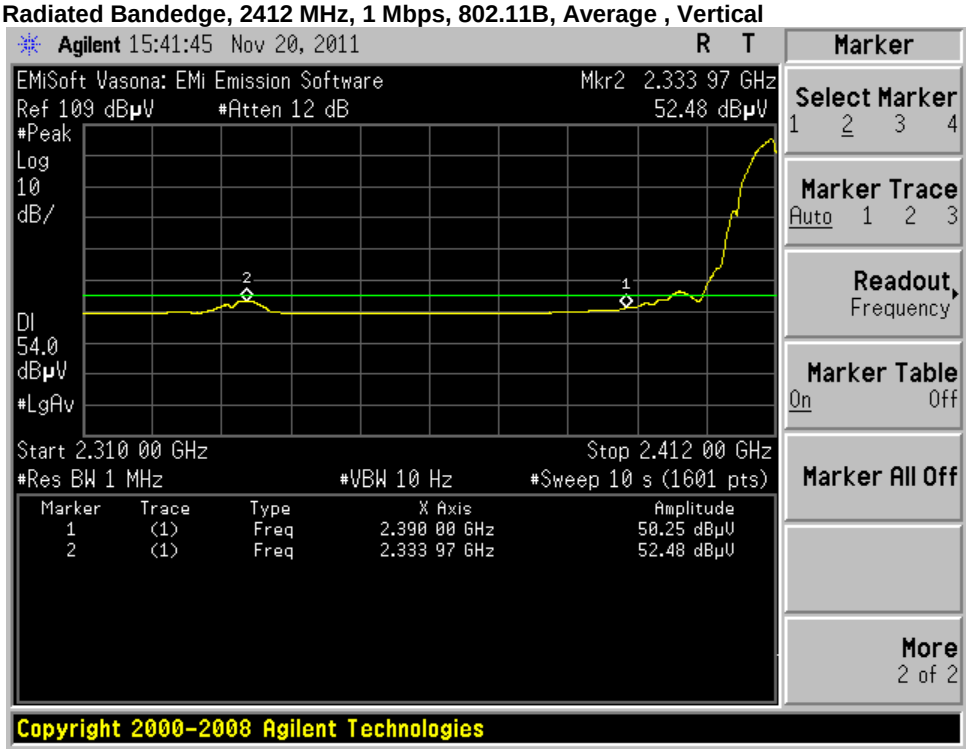
Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands.

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

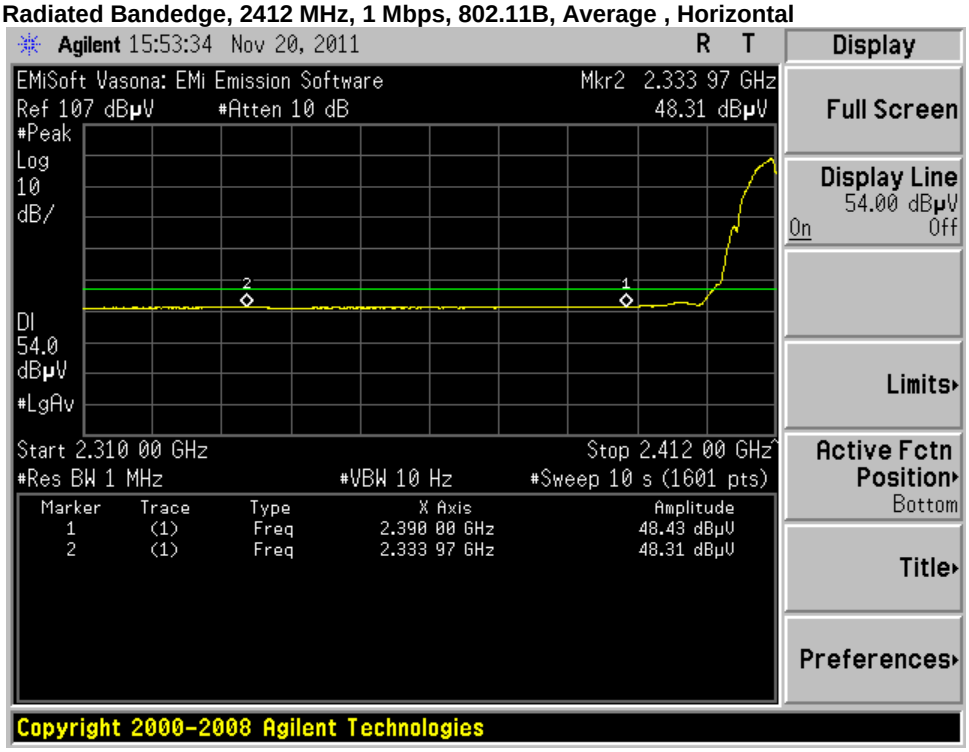
Frequency (MHz)	Mode	Data Rate (Mbps)	Radiated Bandedge Level (dBuV/m)	Average Limit (dBuV/m)
2412	802.11B, 1-11 Mbps	1	50.25	54
	802.11G, 6- 54 Mbps	6	52.88	54
	HT20, M0 – M7	M0	52.95	54
2462	802.11B, 1-11 Mbps	1	50.27	54
	802.11G, 6- 54 Mbps	6	53.45	54
	HT20, M0 – M7	M0	53.28	54

Frequency (MHz)	Mode	Data Rate (Mbps)	Radiated Bandedge Level (dBuV/m)	Peak Limit (dBuV/m)
2412	802.11B, 1-11 Mbps	1	61.89	74
	802.11G, 6- 54 Mbps	6	67.21	74
	HT20, M0 – M7	M0	70.62	74
2462	802.11B, 1-11 Mbps	1	61.67	74
	802.11G, 6- 54 Mbps	6	72.31	74
	HT20, M0 – M7	M0	71.60	74

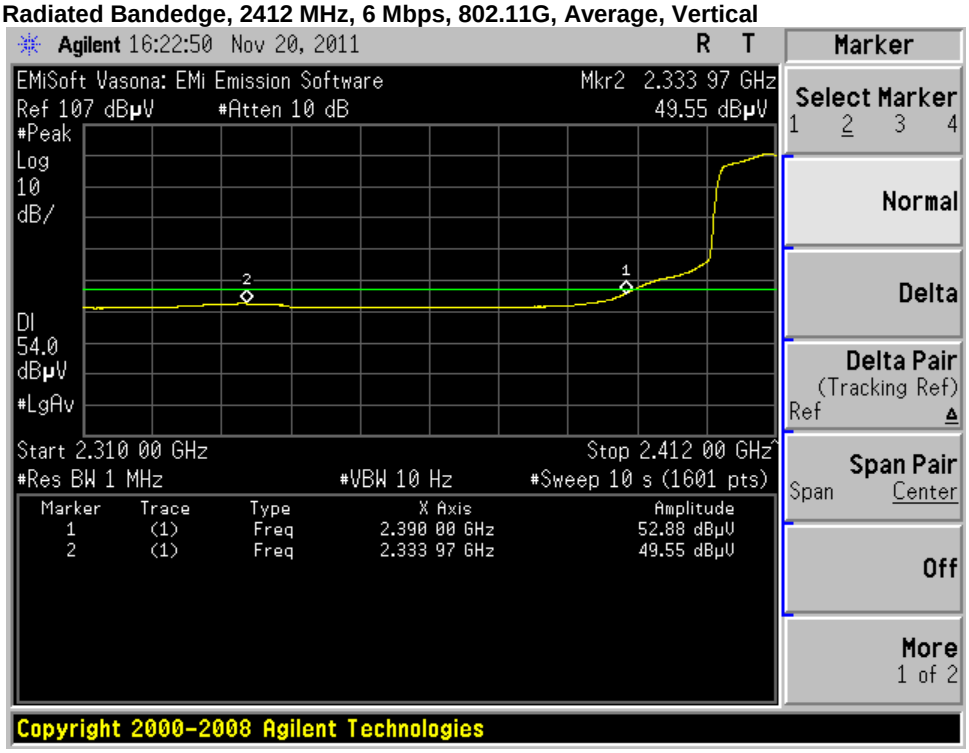
Radiated Bandedge, 2412 MHz, 1 Mbps, 802.11B, Average , Vertical



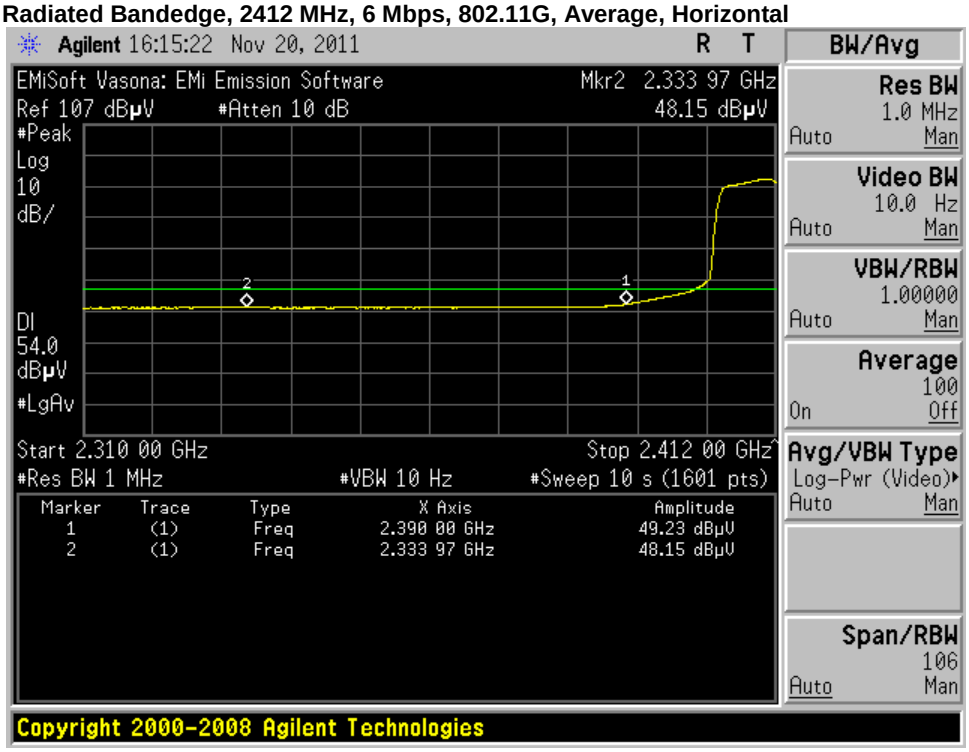
Radiated Bandedge, 2412 MHz, 1 Mbps, 802.11B, Average , Horizontal



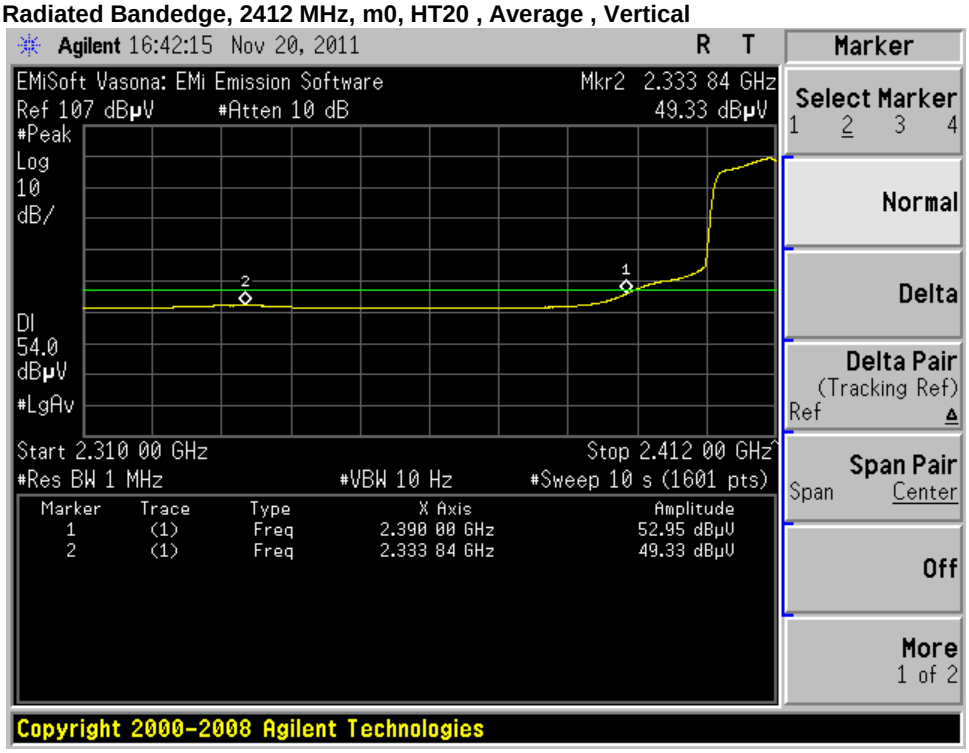
Radiated Bandedge, 2412 MHz, 6 Mbps, 802.11G, Average, Vertical



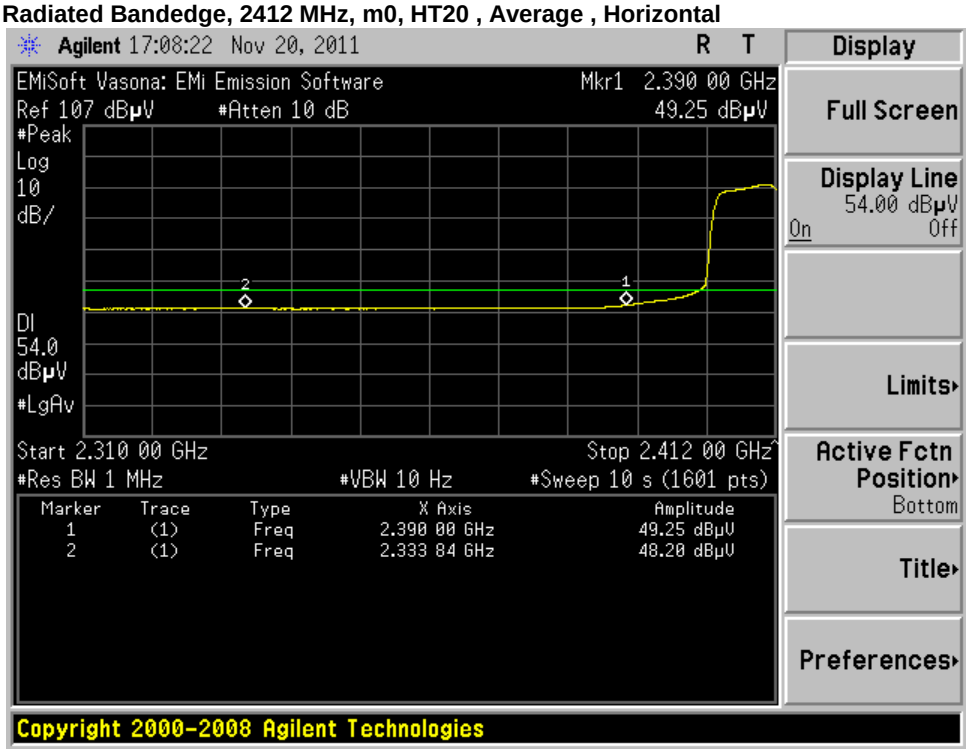
Radiated Bandedge, 2412 MHz, 6 Mbps, 802.11G, Average, Horizontal



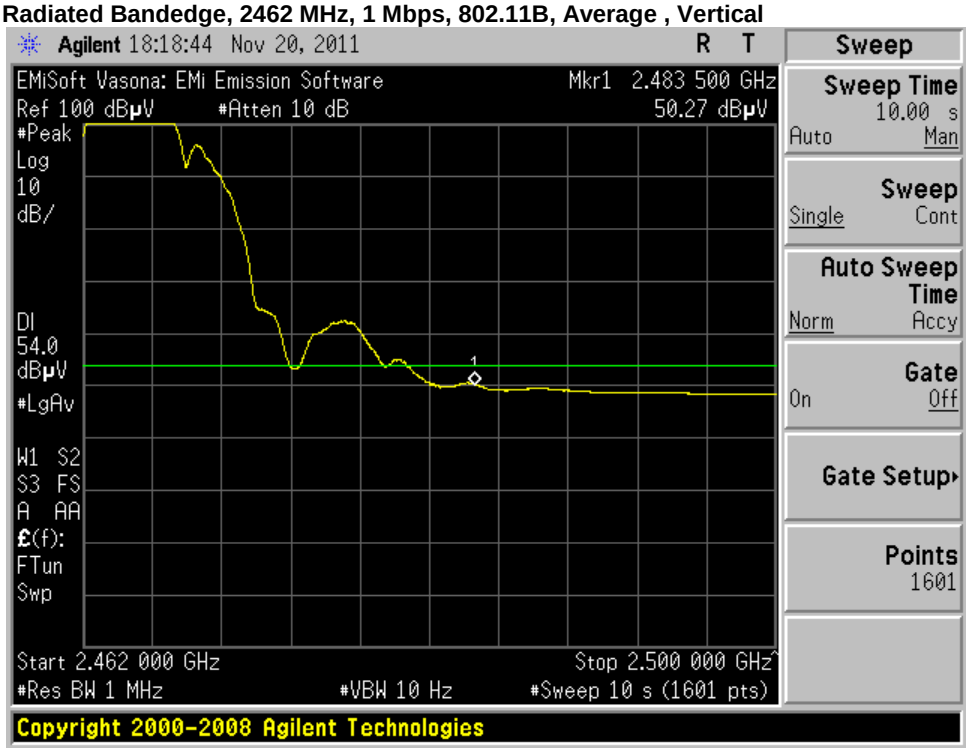
Radiated Bandedge, 2412 MHz, m0, HT20 , Average , Vertical



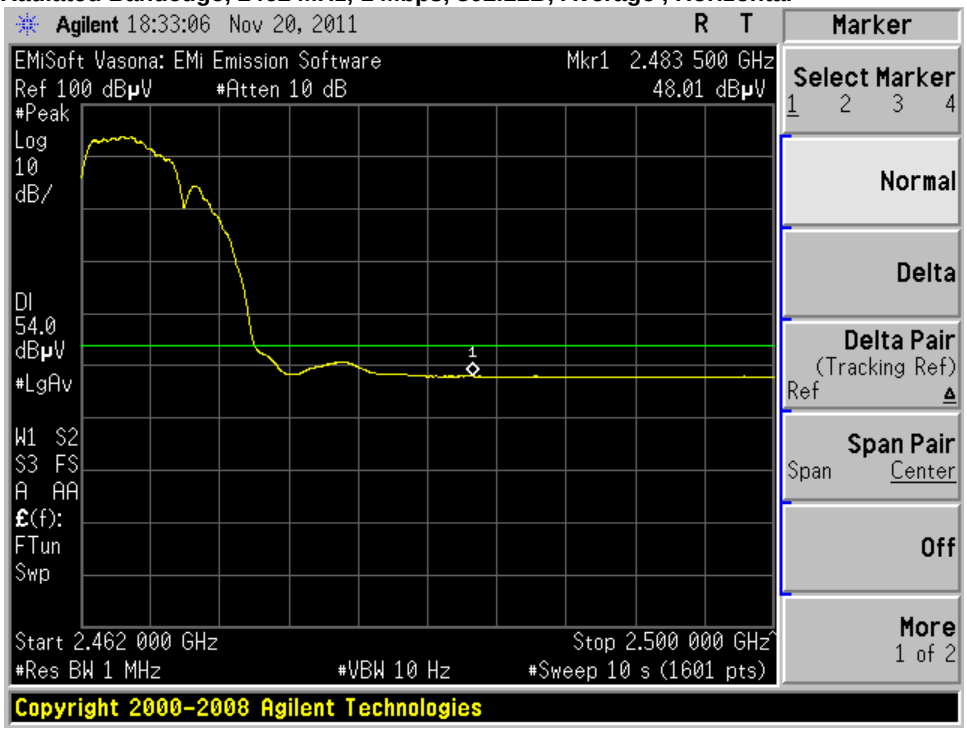
Radiated Bandedge, 2412 MHz, m0, HT20 , Average , Horizontal



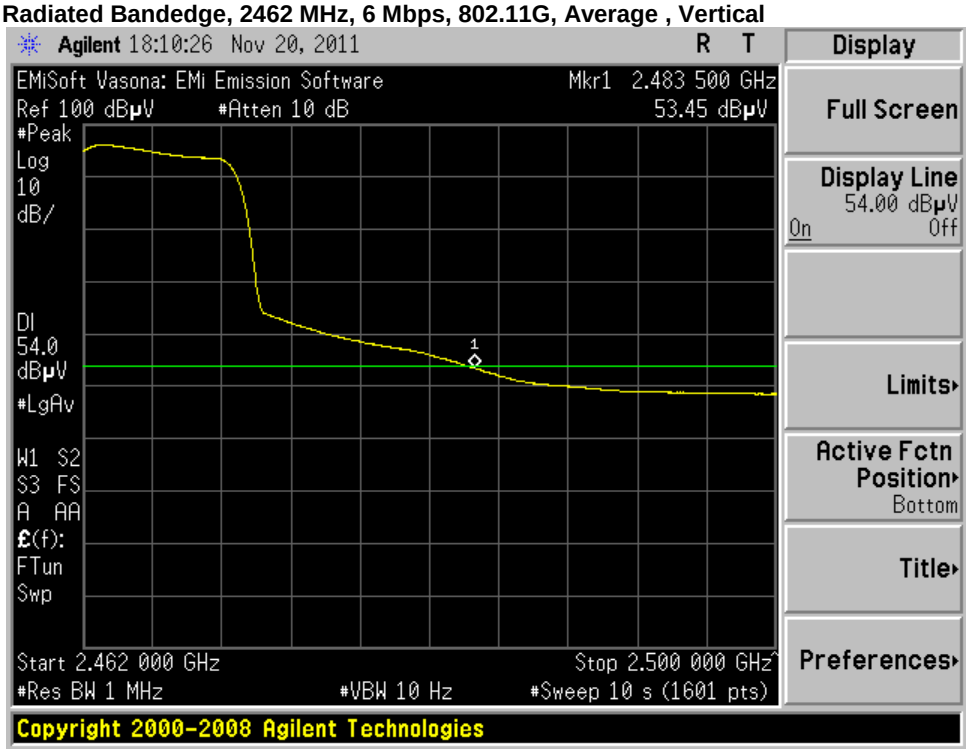
Radiated Bandedge, 2462 MHz, 1 Mbps, 802.11B, Average , Vertical



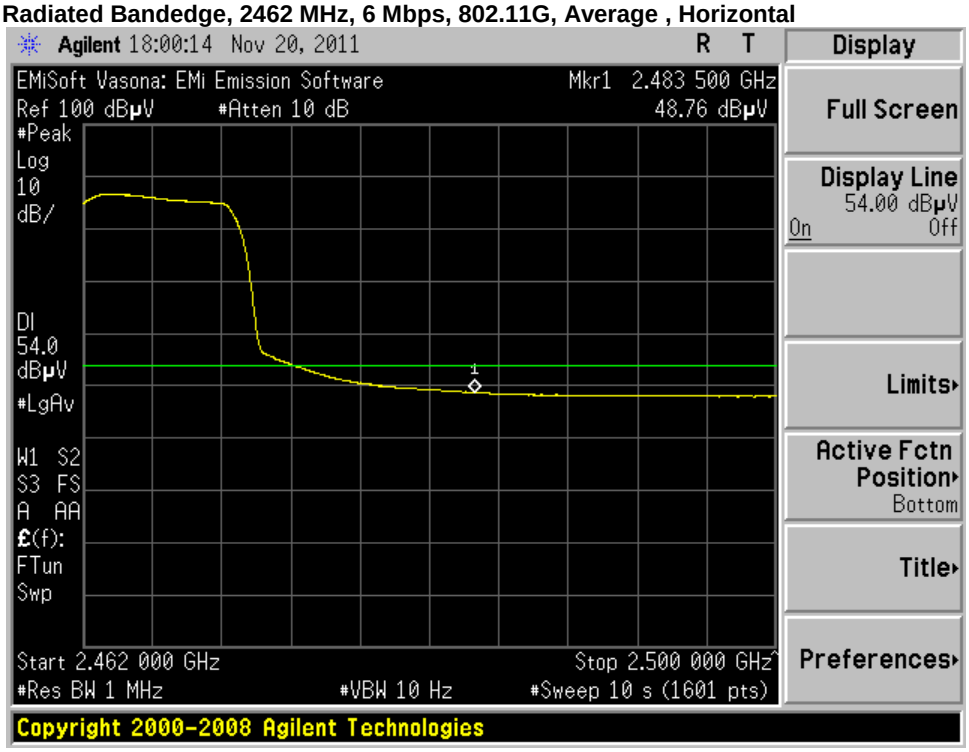
Radiated Bandedge, 2462 MHz, 1 Mbps, 802.11B, Average , Horizontal



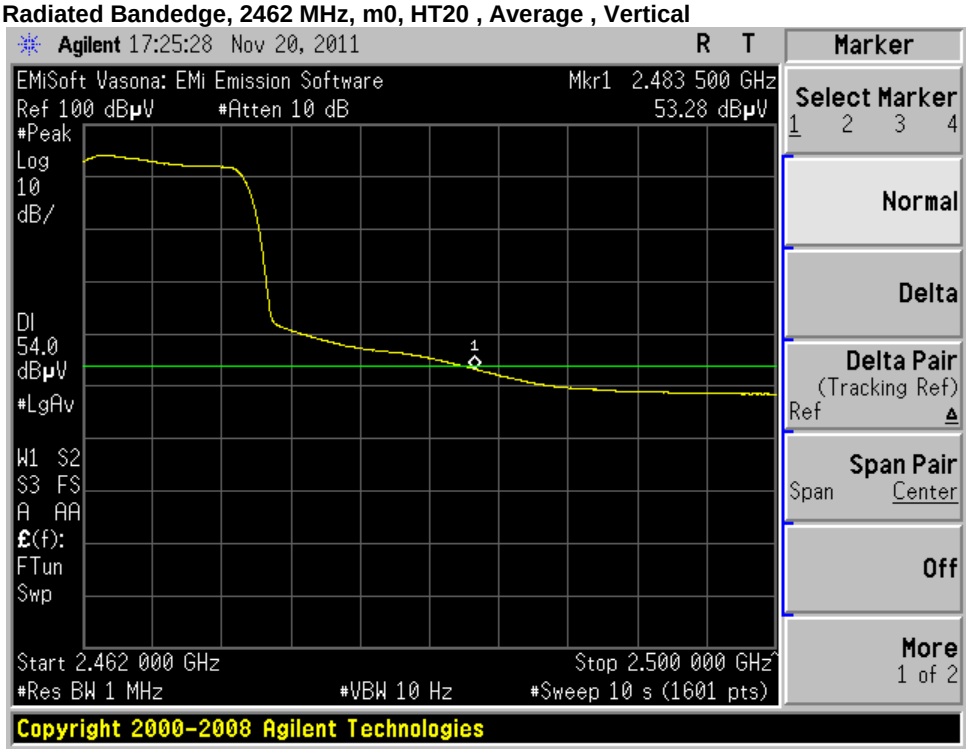
Radiated Bandedge, 2462 MHz, 6 Mbps, 802.11G, Average , Vertical



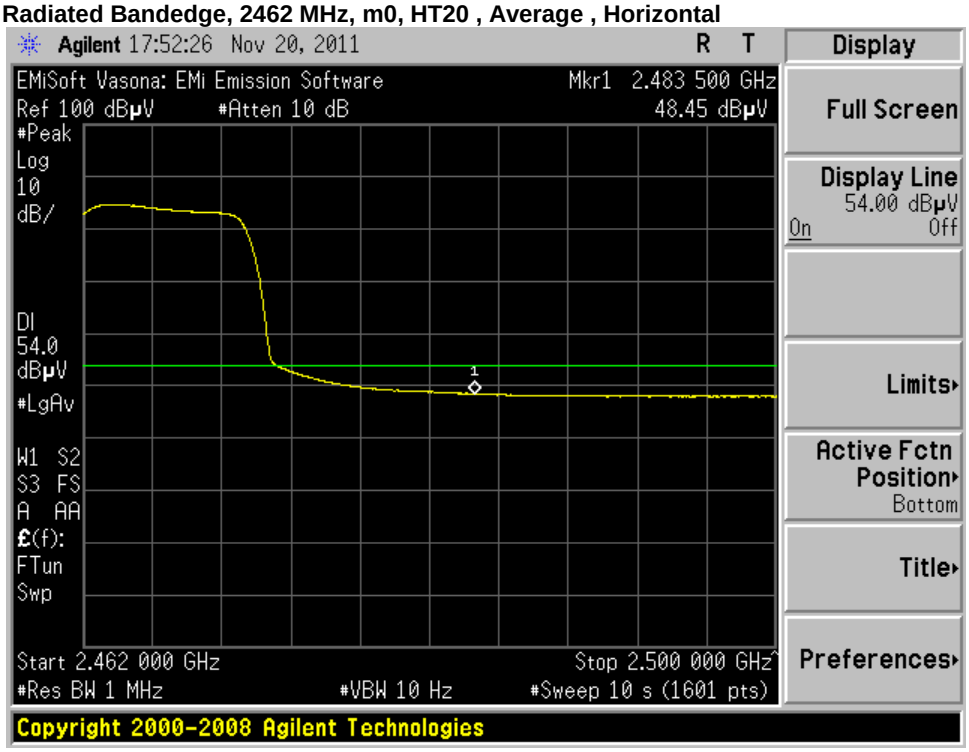
Radiated Bandedge, 2462 MHz, 6 Mbps, 802.11G, Average , Horizontal



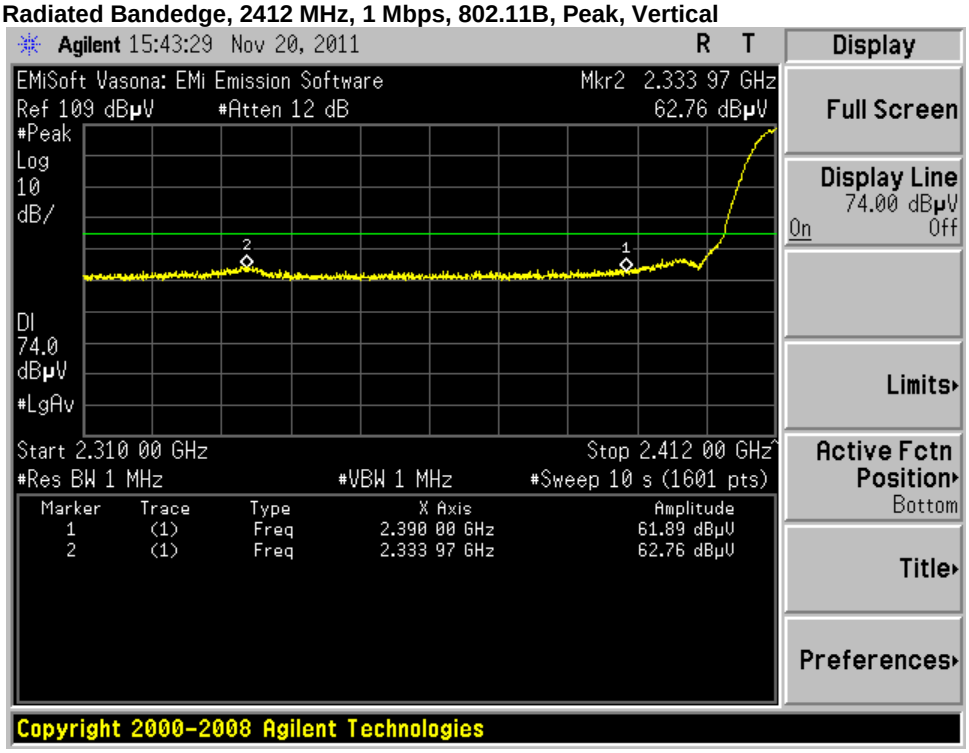
Radiated Bandedge, 2462 MHz, m0, HT20 , Average , Vertical



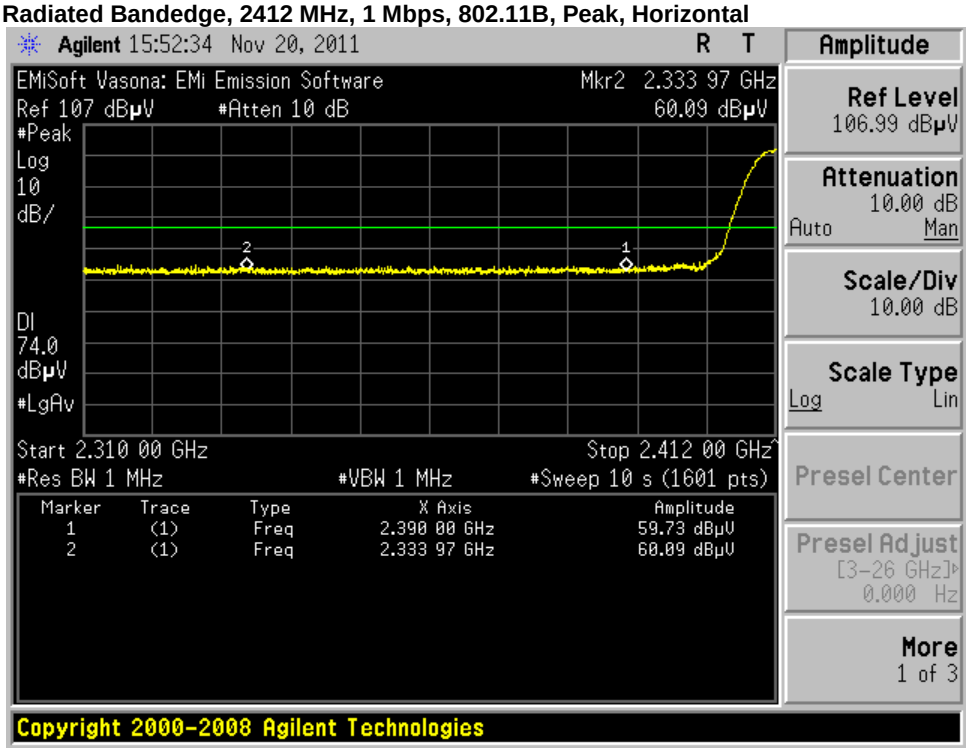
Radiated Bandedge, 2462 MHz, m0, HT20 , Average , Horizontal



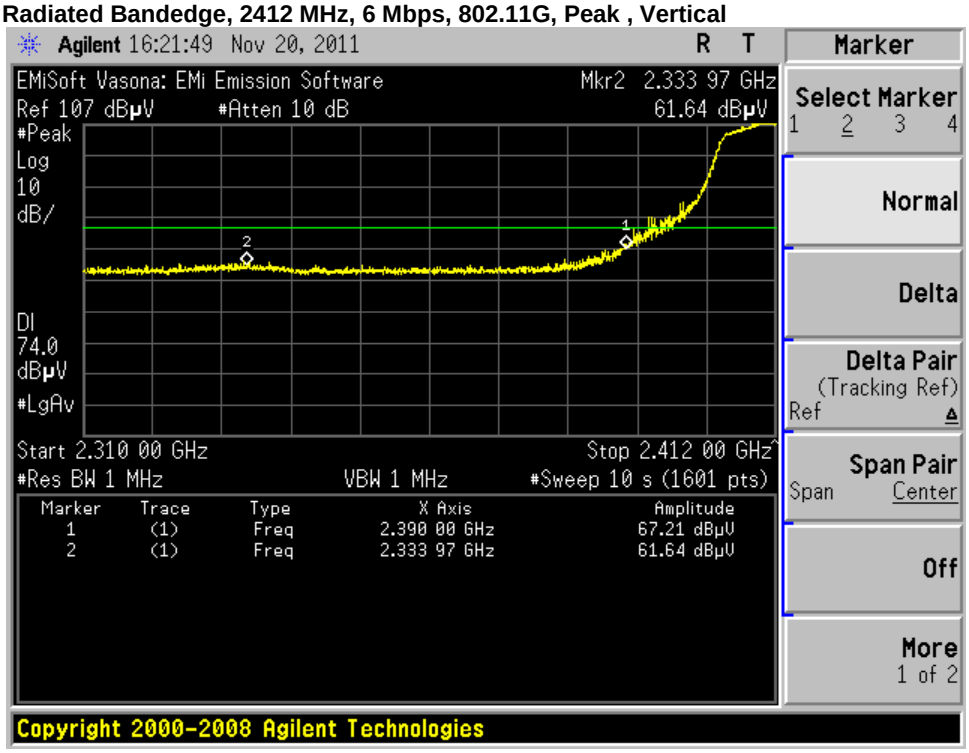
Radiated Bandedge, 2412 MHz, 1 Mbps, 802.11B, Peak, Vertical



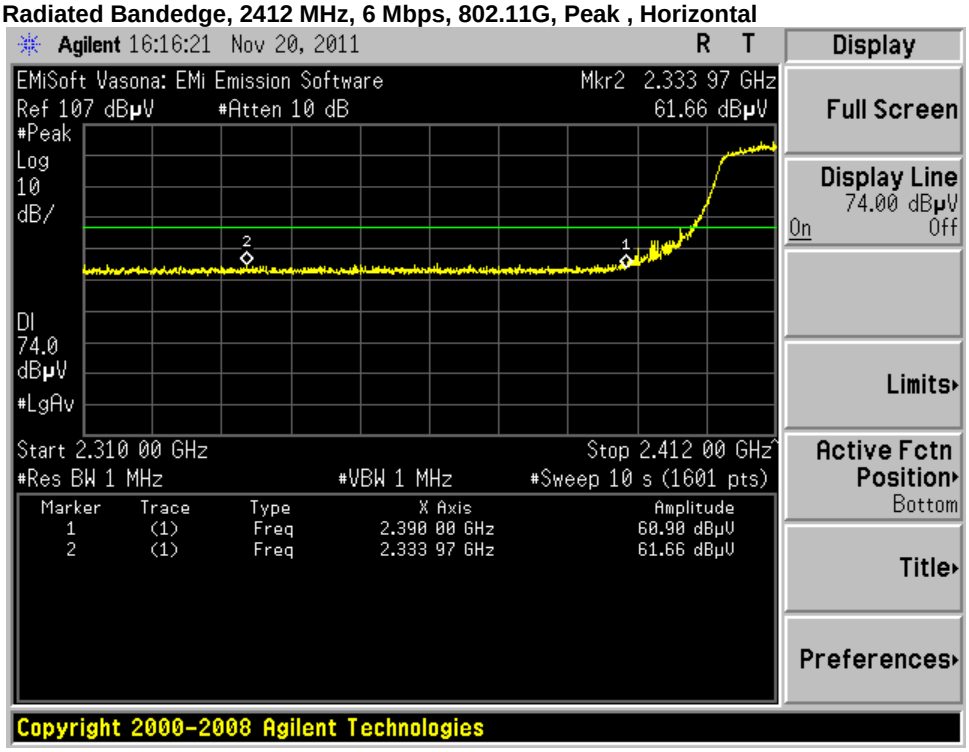
Radiated Bandedge, 2412 MHz, 1 Mbps, 802.11B, Peak, Horizontal



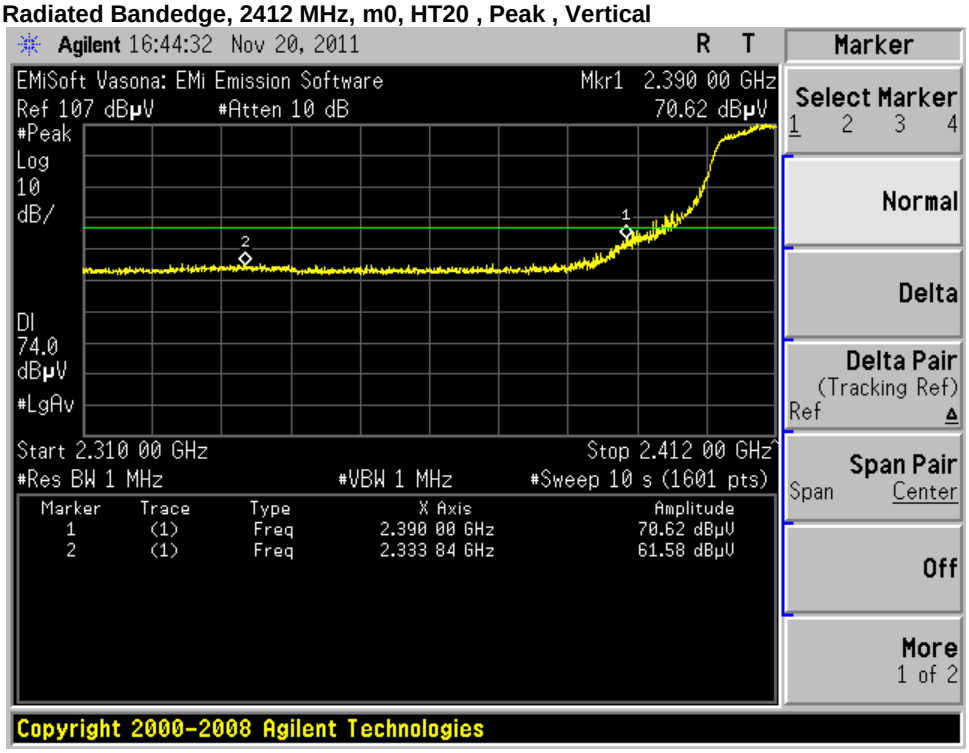
Radiated Bandedge, 2412 MHz, 6 Mbps, 802.11G, Peak , Vertical



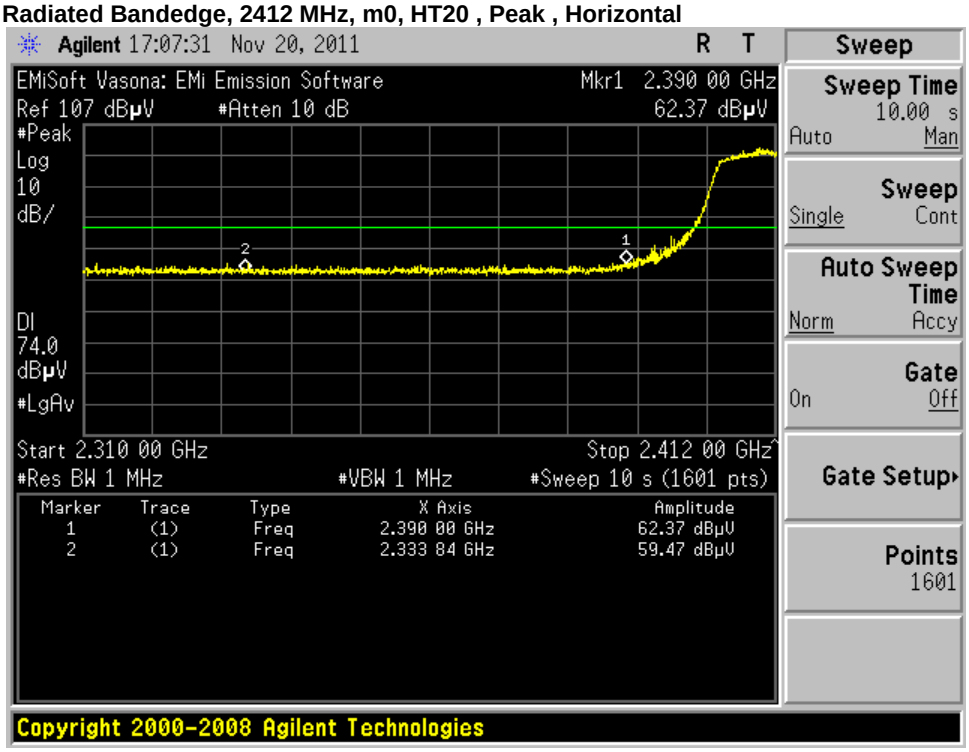
Radiated Bandedge, 2412 MHz, 6 Mbps, 802.11G, Peak , Horizontal



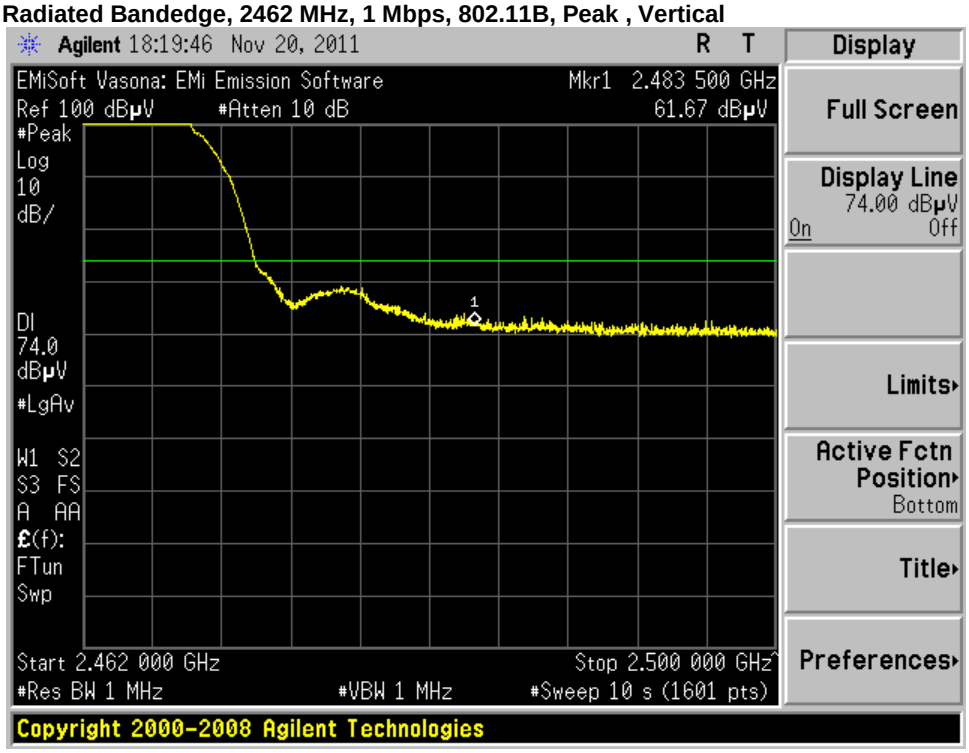
Radiated Bandedge, 2412 MHz, m0, HT20 , Peak , Vertical



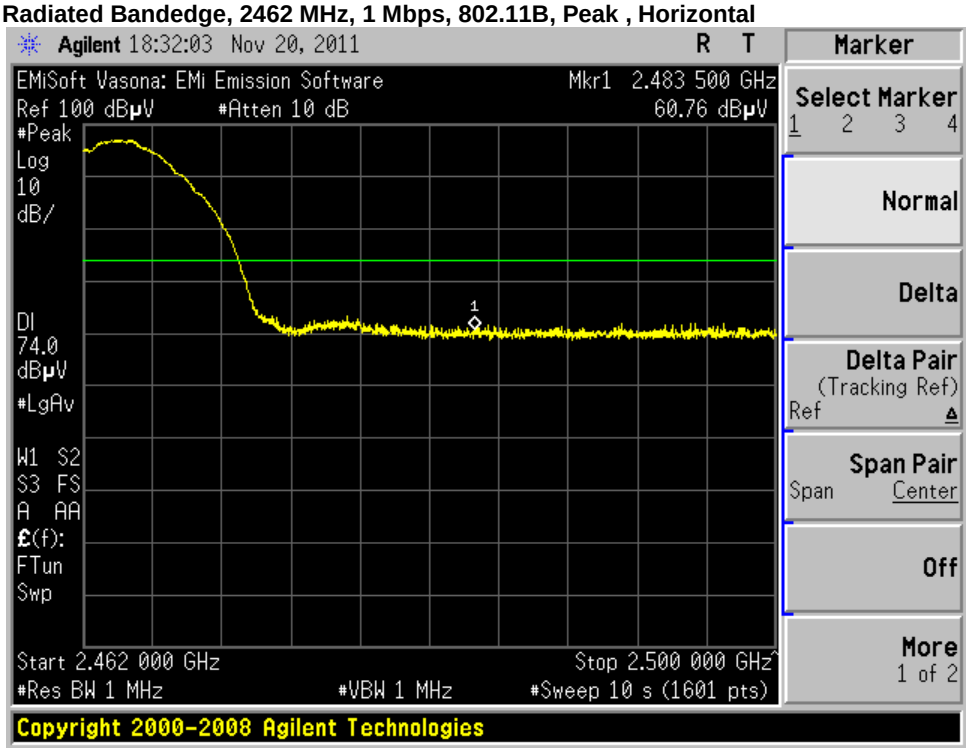
Radiated Bandedge, 2412 MHz, m0, HT20 , Peak , Horizontal



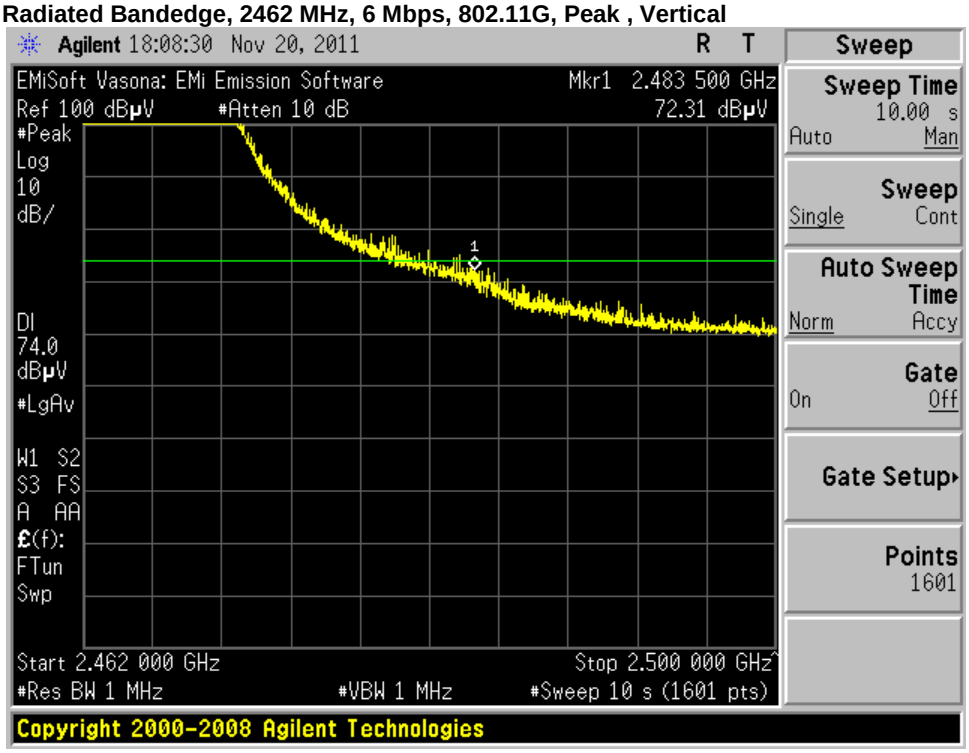
Radiated Bandedge, 2462 MHz, 1 Mbps, 802.11B, Peak , Vertical



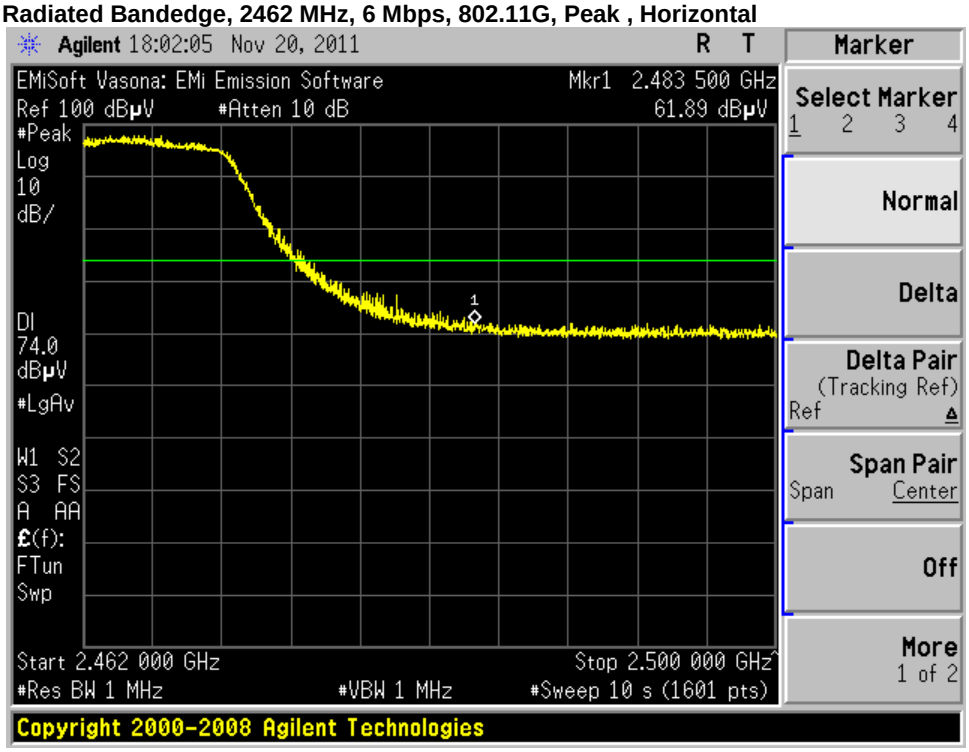
Radiated Bandedge, 2462 MHz, 1 Mbps, 802.11B, Peak , Horizontal



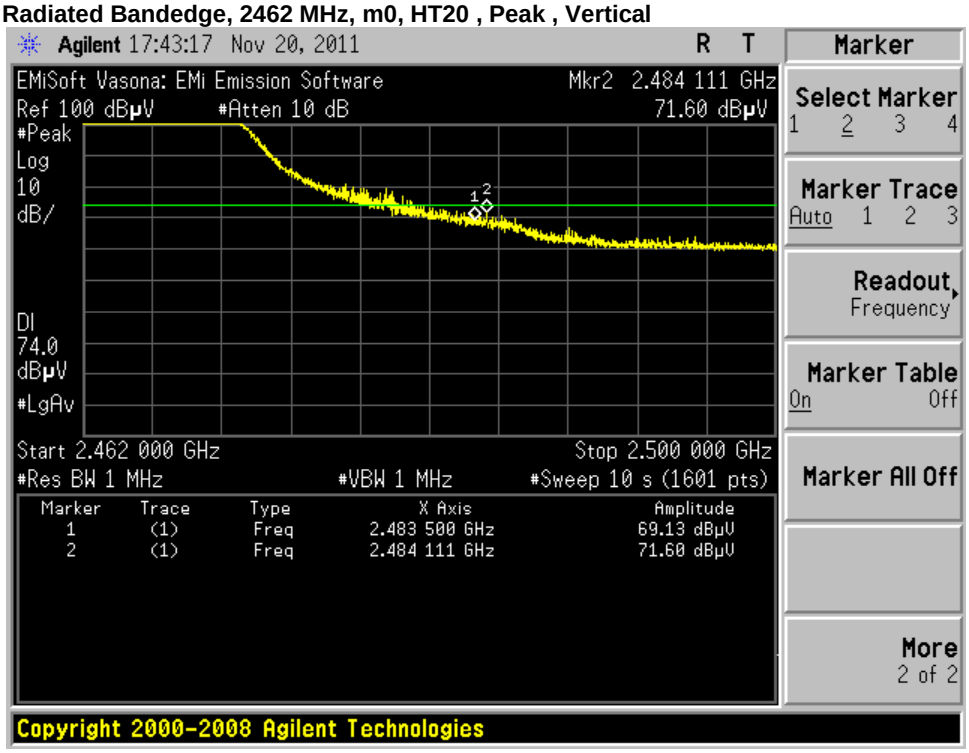
Radiated Bandedge, 2462 MHz, 6 Mbps, 802.11G, Peak , Vertical



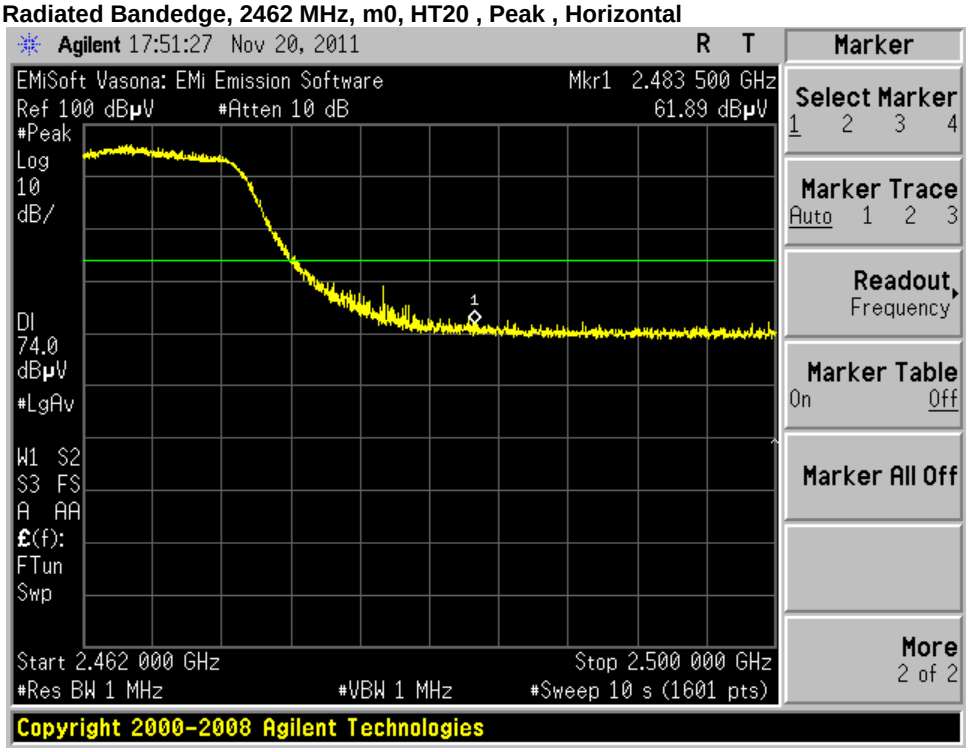
Radiated Bandedge, 2462 MHz, 6 Mbps, 802.11G, Peak , Horizontal



Radiated Bandedge, 2462 MHz, m0, HT20 , Peak , Vertical



Radiated Bandedge, 2462 MHz, m0, HT20 , Peak , Horizontal



Radiated Spurious Emissions

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

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, 10 Hz for average
Detector:	Peak

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

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

This report represents the worst case data for all supported operating modes.
There are no measurable emissions above 18 GHz.

Frequency (MHz)	Mode	Data Rate (Mbps)	Radiated Level (dBuV/m)	Average Limit (dBuV/m)
2412	802.11B, 1-11 Mbps	1	41.4	54
	802.11G, 6- 54 Mbps	6	38.0	54
	HT20, M0 – M7	M0	37.2	54
2437	802.11B, 1-11 Mbps	1	36.3	54
	802.11G, 6- 54 Mbps	6	35.5	54
	HT20, M0 – M7	M0	34.7	54
2462	802.11B, 1-11 Mbps	1	35.8	54
	802.11G, 6- 54 Mbps	6	35.9	54
	HT20, M0 – M7	M0	35.4	54

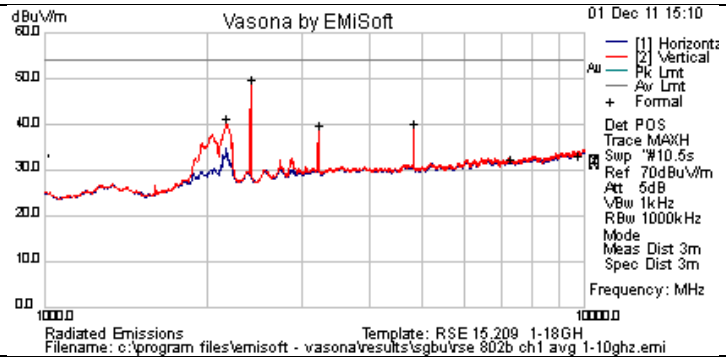
Radiated Spurious Emissions Average

Test Number: 71127 **Spec ID:** 647			
Basic Standard	**Applied to**	**Freq Range**	**Test Details / Comments**
15.109 15.247, RSS-210, LP0002 HKTA1039	Enclosure	30MHz - 26.5GHz	Radiated Spurious Emissions Average Measurements
Operating Mode	**Mode :** 1, OFDM / CCK		
Power Input	110, 60Hz (+/-20%)		
Overall Result	Pass		
Comments	No further comments		
Deviation	There were no deviations from the specification		

System Number	**Description**	**Samples**	**System under test**	**Support equipment**
1	Altamount WLAN FCC	S01	☑	☐

Subtest Number: 71127 - 1			
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Title	**802.11B ch1 Average 1-10GHz**		
Subtest Result	Pass		
Highest Frequency	10000.0		
Lowest Frequency	1000.0		
Environmental Conditions:			
Temperature: (59 to 95)F	68F		
Humidity: (10 to 75)%:	55%		
Equipment used:			
Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11B ch1 Average 1-10GHz

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
2170	**46.5**	**4.5**	**-9.6**	**41.4**	**Av**	**V**	**150**	**42**	**54**	**-12.6**	**Pass**	
2412.92	54.4	4.7	-9.2	49.9	Av	V	100	42	54	-4.1	Pass	Channel 1
3214	42.1	5.6	-7.7	40	Av	V	100	42	54	-14	Pass	
4824.001	39.3	7	-6.1	40.2	Av	V	200	42	54	-13.8	Pass	
7236.95	27.2	8.5	-3.4	32.4	Av	V	100	42	54	-21.6	Pass	
9648.221	24.9	10.6	-2.1	33.3	Av	V	100	42	54	-20.7	Pass	

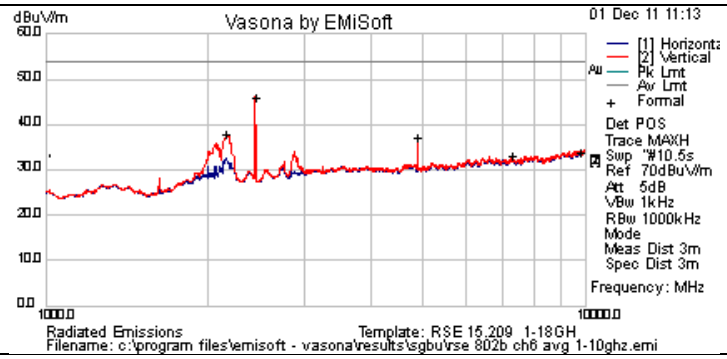
Subtest Number: 71127 - 3	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11B ch6 Average 1-10GHz**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0

Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11B ch6 Average 1-10GHz

Test Results Table

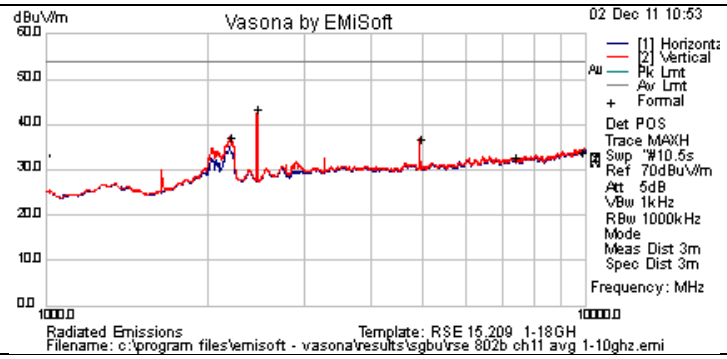
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2435.5	50.5	4.8	-9.2	46.1	Av	V	100	214	54	-7.9	Pass	Channel 6
2156.5	43.3	4.5	-9.8	38	Av	V	150	214	54	-16	Pass	
4874.5	36.5	7	-6.3	37.2	Av	V	150	214	54	-16.8	Pass	
7311.661	27.7	8.6	-3.2	33.1	Av	V	100	214	54	-20.9	Pass	
9748.331	24.9	10.6	-1.6	34	Av	V	100	214	54	-20	Pass	

Subtest Number: 71127 - 5	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11B ch11 Average 1-10GHz**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11B ch11 Average 1-10GHz

Test Results Table

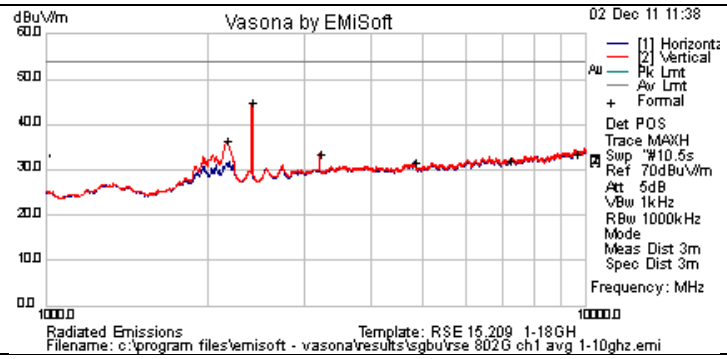
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2462.5	47.8	4.8	-9.1	43.5	Av	V	100	154	54	-10.5	Pass	Channel 11
2192.5	42.1	4.5	-9.5	37.2	Av	V	150	154	54	-16.8	Pass	
4924	36.2	7	-6.4	36.9	Av	V	150	154	54	-17.1	Pass	
7386.133	27.3	8.7	-3.4	32.6	Av	V	100	152	54	-21.4	Pass	
9848.032	24.8	10.7	-1.8	33.7	Av	V	100	152	54	-20.3	Pass	

Subtest Number: 71127 - 7	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11G ch1 Average 1-10GHz**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11G ch1 Average 1-10GHz

Test Results Table

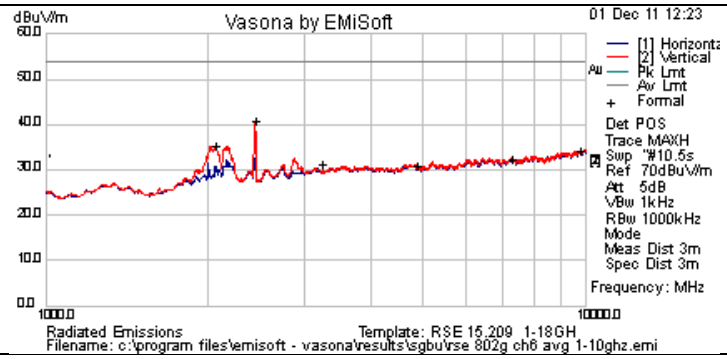
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2411.106	49.4	4.7	-9.2	44.9	Av	V	100	143	54	-9.1	Pass	Channel 1
2161	41.5	4.5	-9.7	36.3	Av	V	150	143	54	-17.7	Pass	
3214.397	35.5	5.6	-7.7	33.3	Av	V	100	143	54	-20.7	Pass	
4824.11	30.6	7	-6.1	31.5	Av	V	100	143	54	-22.5	Pass	
7236.981	26.9	8.5	-3.4	32.1	Av	V	100	143	54	-21.9	Pass	
9648.07	25	10.6	-2.1	33.4	Av	V	100	143	54	-20.6	Pass	

Subtest Number: 71127 - 9	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11G ch6 Average 1-10GHz**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11G ch6 Average 1-10GHz

Test Results Table

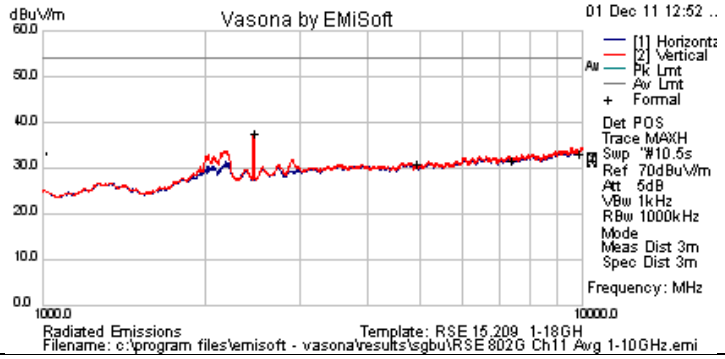
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2437.65	45	4.8	-9.2	40.6	Av	V	100	206	54	-13.4	Pass	Channel 6
2066.5	41.4	4.4	-10.3	35.5	Av	V	150	206	54	-18.5	Pass	
3249.942	33.7	5.6	-7.9	31.4	Av	V	100	206	54	-22.6	Pass	
4874.537	30.2	7	-6.3	30.9	Av	V	100	206	54	-23.1	Pass	
7311.391	26.8	8.6	-3.2	32.2	Av	V	100	206	54	-21.8	Pass	
9749.43	25.1	10.6	-1.6	34.1	Av	V	100	206	54	-19.9	Pass	

Subtest Number: 71127 - 11	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11G ch11 Average 1-10GHz**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



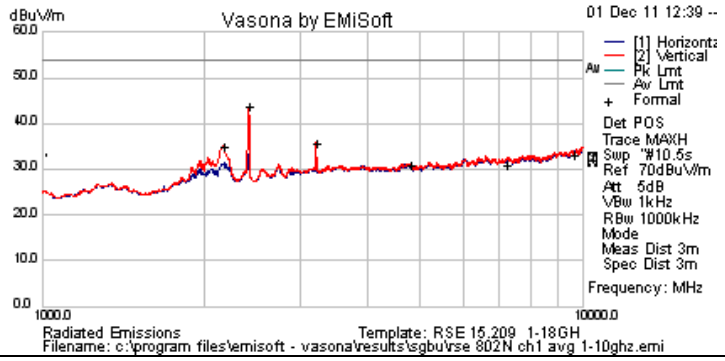
Title: 802.11G ch11 Average 1-10GHz

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
2461.256	41.9	4.8	-9.1	37.6	Av	V	100	141	54	-16.4	Pass	Channel 11
2086.3	40.6	4.4	-10.3	34.7	Av	V	150	206	54	-19.3	Pass	
4924.832	30.3	7	-6.4	30.9	Av	V	100	141	54	-23.1	Pass	
7386	26.4	8.7	-3.4	31.7	Av	V	100	141	54	-22.3	Pass	
9848	24.4	10.7	-1.8	33.3	Av	V	100	141	54	-20.7	Pass	

Subtest Number: 71127 - 13			
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Title	**HT20 ch1 Average 1-10GHz**		
Subtest Result	Pass		
Highest Frequency	10000.0		
Lowest Frequency	1000.0		
Environmental Conditions:			
Temperature: (59 to 95)F	68F		
Humidity: (10 to 75)%:	55%		
Equipment used:			
Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: HT20 ch1 Average 1-10GHz

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
2411.113	48	4.7	-9.2	43.6	Av	V	100	142	54	-10.4	Pass	Channel 1
3214	37.9	5.6	-7.7	35.8	Av	V	100	142	54	-18.2	Pass	
2161	40.4	4.5	-9.7	35.1	Av	V	150	142	54	-18.9	Pass	
4824	29.9	7	-6.1	30.8	Av	V	100	142	54	-23.2	Pass	

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
7236	25.9	8.5	-3.4	31	Av	V	100	142	54	-23	Pass	
9648	24.6	10.6	-2.1	33.1	Av	V	100	142	54	-20.9	Pass	

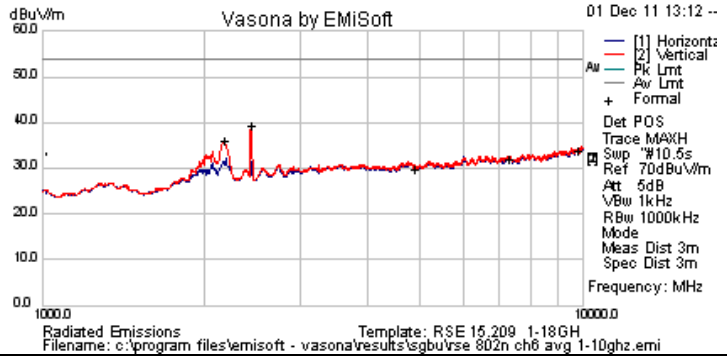
Subtest Number: 71127 - 15	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**HT20 ch6 Average 1-10GHz**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0

Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: HT20 ch6 Average 1-10GHz

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
2437.674	43.8	4.8	-9.2	39.4	AV	V	100	142	54	-14.6	Pass	Channel 6
2161	41.1	4.5	-9.7	35.9	AV	V	150	142	54	-18.1	Pass	

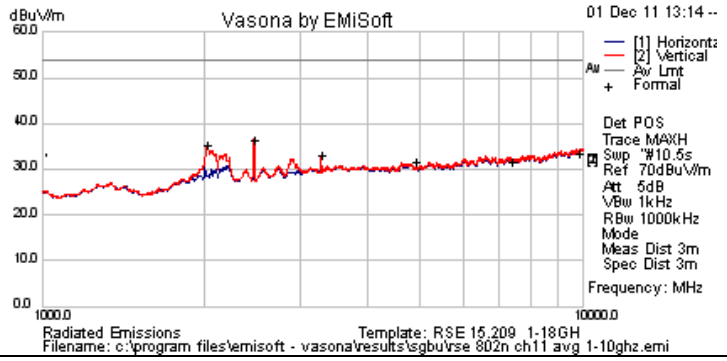
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4874	29.1	7	-6.3	29.8	AV	V	100	143	54	-24.2	Pass	
7311	26.5	8.6	-3.2	31.9	AV	V	100	143	54	-22.1	Pass	
9748	24.8	10.6	-1.6	33.8	AV	V	100	143	54	-20.2	Pass	

Subtest Number: 71127 - 17	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Results	
Subtest Title	**HT20 ch11 Average 1-10GHz**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



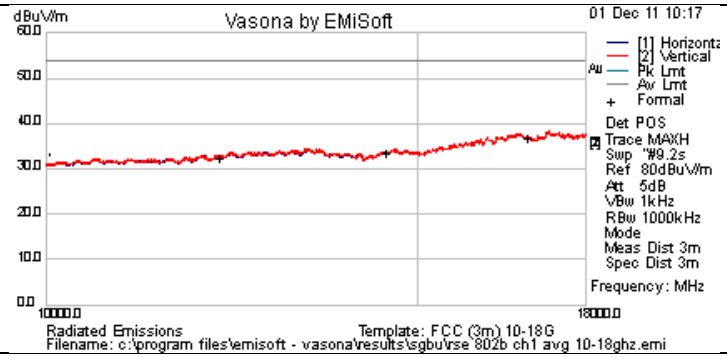
Title: HT20 ch11 Average 1-10GHz

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
2462.956	40.8	4.8	-9.1	36.5	AV	V	100	206	54	-17.5	Pass	Channel 11
2017	41.3	4.3	-10.3	35.4	AV	V	200	206	54	-18.6	Pass	
4924	30.9	7	-6.4	31.6	AV	V	100	206	54	-22.4	Pass	
9848	24.7	10.7	-1.8	33.6	AV	V	100	206	54	-20.4	Pass	
3281.592	35.2	5.6	-7.9	33	AV	V	100	206	54	-21	Pass	

Subtest Number: 71127 - 2			
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Title	**802.11B ch1 Average 10-18GHz**		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	10000.0		
Environmental Conditions:			
Temperature: (59 to 95)F	68F		
Humidity: (10 to 75)%:	55%		
Equipment used:			
Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11B ch1 Average 10-18GHz

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
16884	28.9	16.2	-8.4	36.7	Av	V	100	42	54	-17.3	Pass	
12060.001	29.4	12.2	-9.3	32.3	Av	V	100	42	54	-21.7	Pass	
14472	29.5	13.6	-9.7	33.4	Av	V	100	42	54	-20.6	Pass	

No emissions seen. The above readings are noise floor.

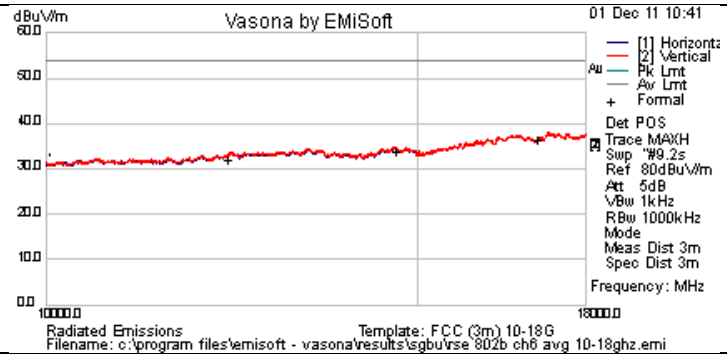
Subtest Number: 71127 - 4	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11B ch6 Average 10-18GHz**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0

Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11B ch6 Average 10-18GHz

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
12185.001	28.9	12.2	-9	32.1	Av	V	100	214	54	-21.9	Pass	
14622	29.5	13.7	-9.5	33.7	Av	V	100	214	54	-20.3	Pass	
17059	29	16.3	-9	36.3	Av	V	100	214	54	-17.7	Pass	

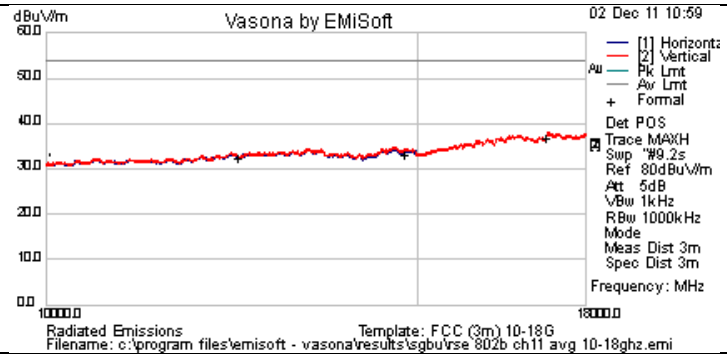
No emissions seen. The above readings are noise floor.

Subtest Number: 71127 - 6	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11B ch11 Average 10-18GHz**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11B ch11 Average 10-18GHz

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
12310.001	29.1	12.3	-9.2	32.2	Av	V	100	154	54	-21.8	Pass	
14772	28.9	13.9	-9.8	33	Av	V	100	154	54	-21	Pass	
17234	28.7	16.5	-8.4	36.7	Av	V	100	154	54	-17.3	Pass	

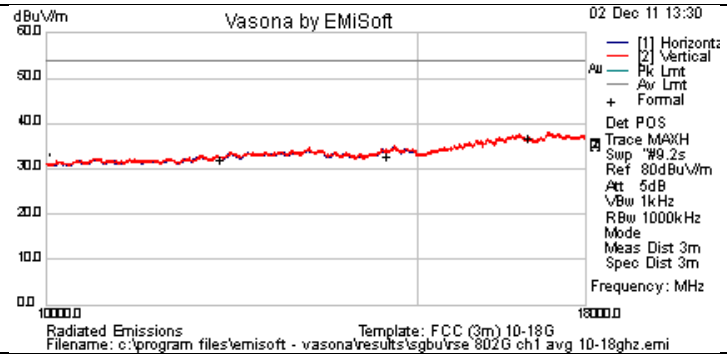
No emissions seen. The above readings are noise floor.

Subtest Number: 71127 - 8	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11G ch1 Average 10-18GHz**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11G ch1 Average 10-18GHz

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
12060.001	29.1	12.2	-9.3	32	Av	V	100	141	54	-22	Pass	
14472	28.9	13.6	-9.7	32.8	Av	V	100	141	54	-21.2	Pass	
16884	28.9	16.2	-8.4	36.7	Av	V	100	141	54	-17.3	Pass	

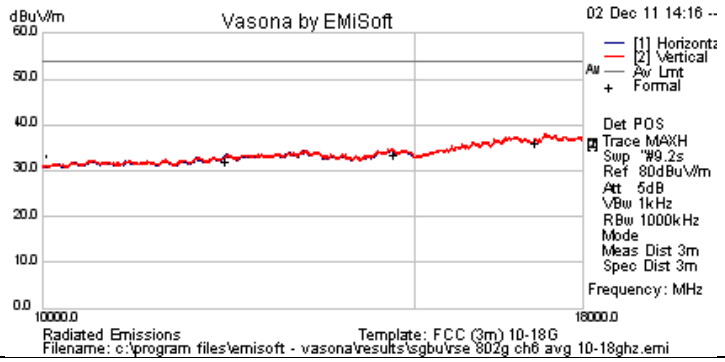
No emissions seen. The above readings are noise floor.

Subtest Number: 71127 - 10	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11G ch6 Average 10-18GHz**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11G ch6 Average 10-18GHz

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
12185.001	28.8	12.2	-9	32	Av	V	100	206	54	-22	Pass	Noise floor
14622	29.3	13.7	-9.5	33.5	Av	V	100	206	54	-20.5	Pass	Noise Floor
17059	28.8	16.3	-9	36.1	Av	V	100	206	54	-17.9	Pass	Noise floor

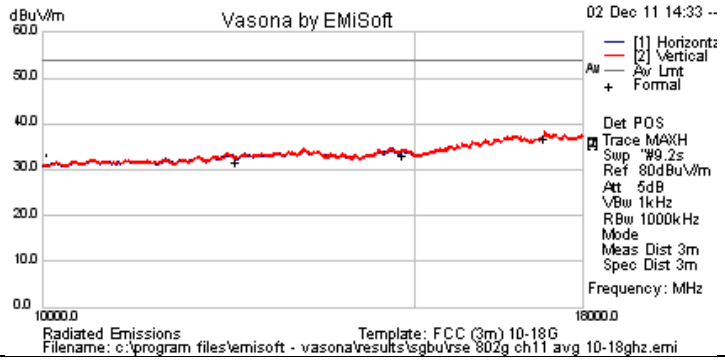
No emissions seen. The above readings are noise floor.

Subtest Number: 71127 - 12	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11G ch11 Average 10-18GHz**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11G ch11 Average 10-18GHz

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
12310.001	28.7	12.3	-9.2	31.8	Av	V	100	142	54	-22.2	Pass	Noise Floor
14772	28.9	13.9	-9.8	33	Av	V	100	142	54	-21	Pass	Noise Floor
17234	28.7	16.5	-8.4	36.8	Av	V	100	142	54	-17.2	Pass	Noise Floor

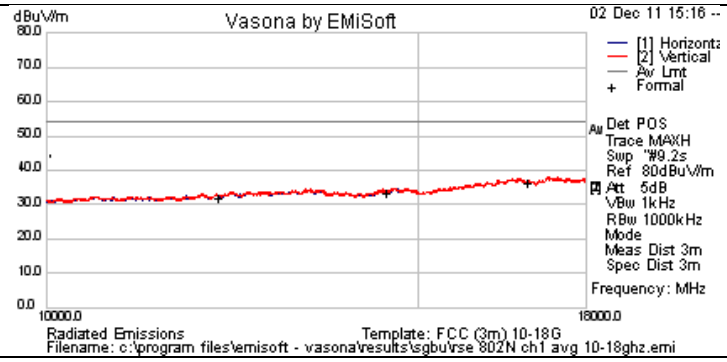
No emissions seen. The above readings are noise floor.

Subtest Number: 71127 - 14	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**HT20 ch1 Average 10-18GHz**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: HT20 ch1 Average 10-18GHz

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
12060.001	28.9	12.2	-9.3	31.8	Av	V	100	142	54	-22.2	Pass	Noise Floor
14472	29.3	13.6	-9.7	33.2	Av	V	100	142	54	-20.8	Pass	Noise Floor
16884	28.7	16.2	-8.4	36.5	Av	V	100	142	54	-17.5	Pass	Noise Floor

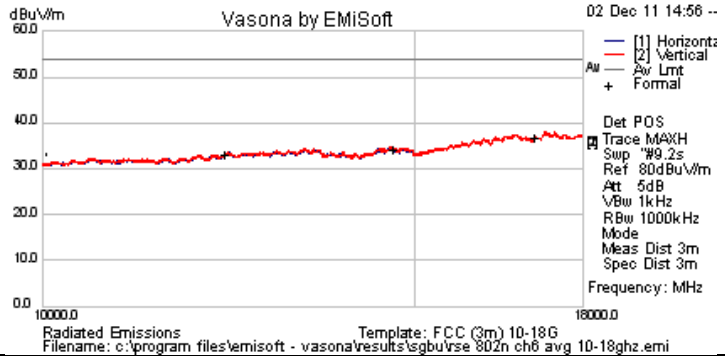
No emissions seen. The above readings are noise floor.

Subtest Number: 71127 - 16	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**HT20 ch6 Average 10-18GHz**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: HT20 ch6 Average 10-18GHz

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	29.9	12.2	-9	33.1	Av	V	100	142	54	-20.9	Pass	Noise Floor
14622	30.1	13.7	-9.5	34.3	Av	V	100	142	54	-19.7	Pass	Noise Floor
17059	29.6	16.3	-9	36.9	Av	V	100	142	54	-17.1	Pass	Noise Floor

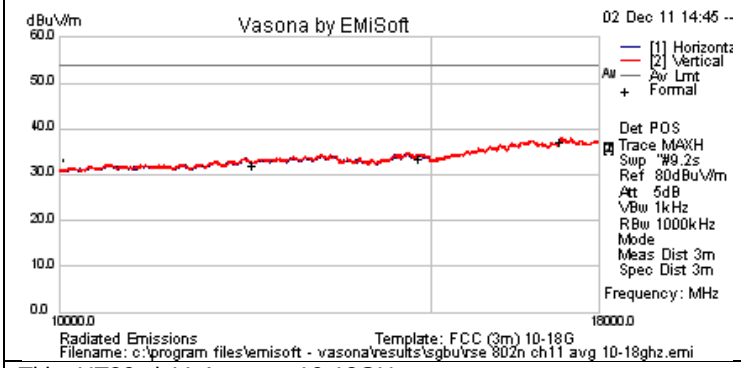
No Emissions seen. The readings above are Noise floor

Subtest Number: 71127 - 18	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**HT20 ch11 Average 10-18GHz**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: HT20 ch11 Average 10-18GHz

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
12310.001	28.9	12.3	-9.2	32	AV	V	100	206	54	-22	Pass	Noise Floor
14772	29.2	13.9	-9.8	33.3	AV	V	100	206	54	-20.7	Pass	Noise Floor
17234	29.2	16.5	-8.4	37.2	AV	V	100	206	54	-16.8	Pass	Noise Floor

No Emissions seen. The readings above are Noise floor

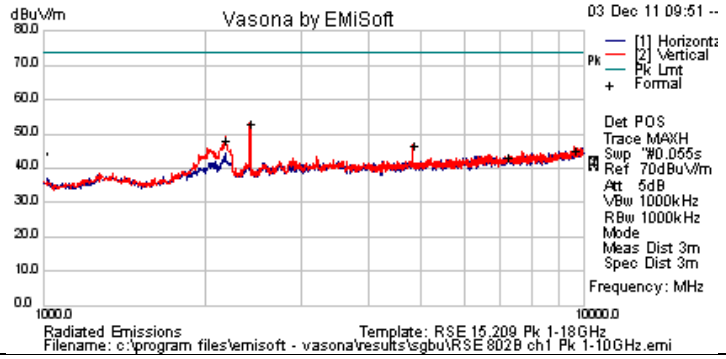
Radiated emissions Peak Measurements

Test Number: 71026 **Spec ID:** 647				
Basic Standard	**Applied to**	**Class**	**Freq Range**	**Test Details / Comments**
15.109 15.247, RSS-210, LP0002 HKTA1039	Enclosure	B	30MHz - 26.5GHz	Radiated emissions Peak Measurements
Operating Mode	**Mode :** 1, OFDM / CCK			
Power Input	110, 60Hz (+/-20%)			
Overall Result	Pass			
Comments	**Peak Measurements**			
Deviation	There were no deviations from the specification			

System Number	**Description**	**Samples**	**System under test**	**Support equipment**
1	Altamount WLAN FCC	S01	☑	☐

Subtest Number: 71026 - 1			
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Title	**802.11B channel 1(1-10GHz)**		
Subtest Result	Pass		
Highest Frequency	10000.0		
Lowest Frequency	1000.0		
Environmental Conditions:			
Temperature: (59 to 95)F	68F		
Humidity: (10 to 75)%:	55%		
Equipment used:			
Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11B channel 1(1-10GHz)

Test Results Table

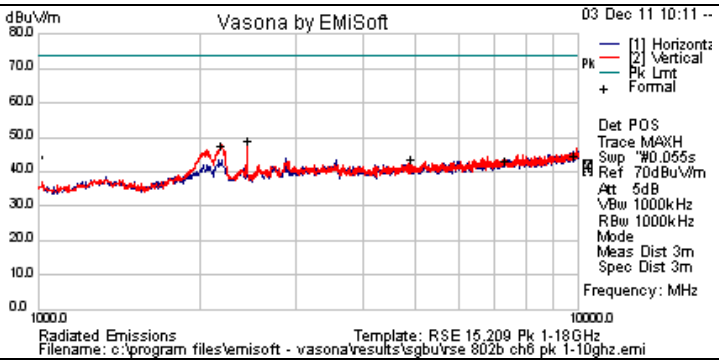
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2412.754	57.5	4.7	-9.2	53	Peak(Scan)	V	100	-1	74	-21	Pass	
4824.945	45.8	7	-6.1	46.7	Peak(Scan)	V	100	-1	74	-27.3	Pass	
7235.191	38.1	8.5	-3.4	43.3	Peak(Scan)	V	100	-1	74	-30.7	Pass	
9648.326	36.5	10.6	-2.1	45	Peak(Scan)	V	100	-1	74	-29	Pass	
2175.204	53.1	4.5	-9.5	48	Peak(Scan)	V	100	-1	74	-26	Pass	

Subtest Number: 71026 - 2	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11B channel 6(1-10GHz)**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11B channel 6(1-10GHz)

Test Results Table

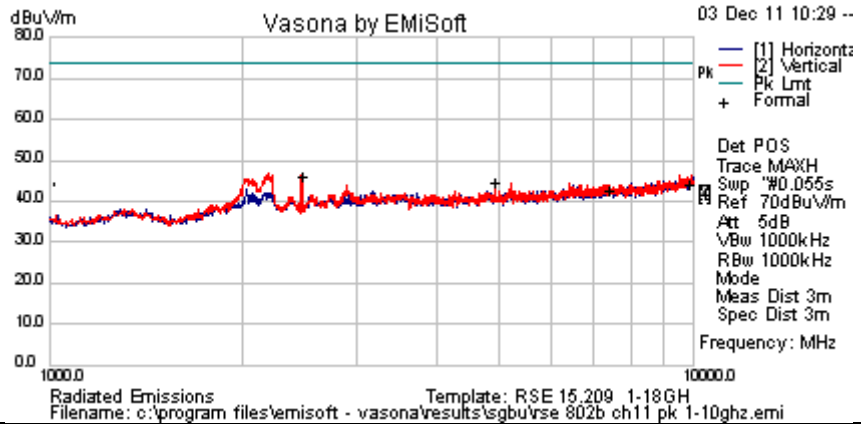
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2437.1	53.4	4.8	-9.2	49	Peak(Scan)	V	100	-2	74	-25	Pass	
4875.746	42.8	7	-6.3	43.5	Peak(Scan)	V	100	-2	74	-30.5	Pass	
7311.195	38	8.6	-3.2	43.4	Peak(Scan)	V	100	-2	74	-30.6	Pass	
9748.051	35.5	10.6	-1.6	44.6	Peak(Scan)	V	100	-2	74	-29.4	Pass	
2175.204	52.6	4.5	-9.5	47.5	Peak(Scan)	V	100	-2	74	-26.5	Pass	

Subtest Number: 71026 - 3	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11B channel 11 (1-10GHz)**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11B channel 11 (1-10GHz)

Test Results Table

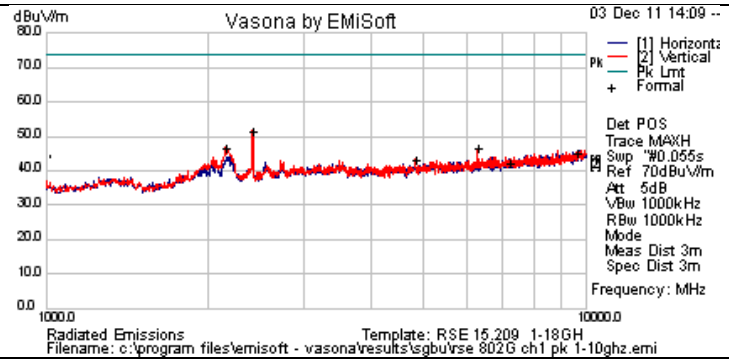
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2462.207	50.4	4.8	-9.1	46.1	Peak(Scan)	V	100	-1	74	-27.9	Pass	
4923.57	43.9	7	-6.4	44.6	Peak(Scan)	V	100	-1	74	-29.4	Pass	
7386.163	37.3	8.7	-3.4	42.6	Peak(Scan)	V	100	-1	74	-31.4	Pass	
9847.999	35.5	10.7	-1.8	44.4	Peak(Scan)	V	100	-1	74	-29.6	Pass	

Subtest Number: 71026 - 4	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11G channel 1 (1-10GHz)**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11G channel 1 (1-10GHz)

Test Results Table

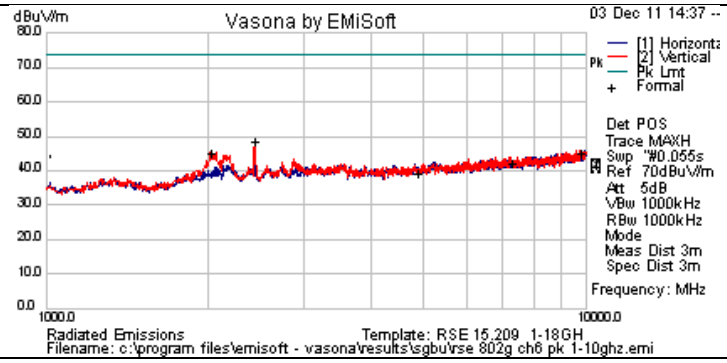
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2147.5	52.1	4.4	-9.8	46.7	Pk	V	150	153	74	-27.3	Pass	
2413	56.1	4.8	-9.2	51.7	Pk	V	100	153	74	-22.3	Pass	Channel 1
4827.867	42.4	7	-6.1	43.3	Pk	V	100	153	74	-30.7	Pass	
6301	42.4	7.9	-3.8	46.4	Pk	V	150	153	74	-27.6	Pass	
9648	36.5	10.6	-2.1	45	Pk	V	100	153	74	-29	Pass	

Subtest Number: 71026 - 5	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11G channel 6 (1-10GHz)**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11G channel 6 (1-10GHz)

Test Results Table

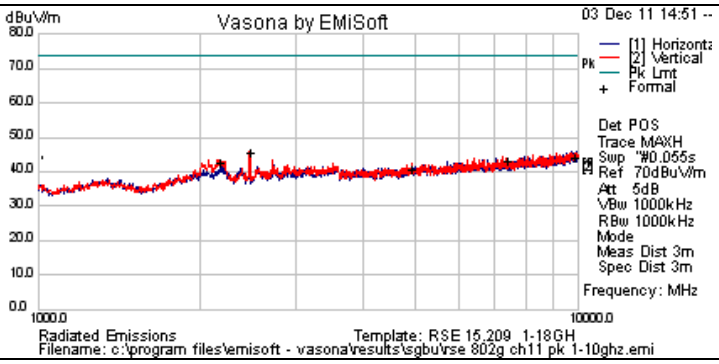
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2012.5	51.2	4.3	-10.3	45.2	Peak(Scan)	V	200	206	54	-8.8	Pass	
2437.663	52.8	4.8	-9.2	48.4	Peak(Scan)	V	100	206	54	-5.6	Pass	
4874	38.8	7	-6.3	39.5	Peak(Scan)	V	100	206	54	-14.5	Pass	
7311.391	36.5	8.6	-3.2	41.9	Peak(Scan)	V	100	206	54	-12.1	Pass	
9748.678	36	10.6	-1.6	45	Peak(Scan)	V	100	206	54	-9	Pass	

Subtest Number: 71026 - 6	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11G channel 11 (1-10GHz)**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: 802.11G channel 11 (1-10GHz)

Test Results Table

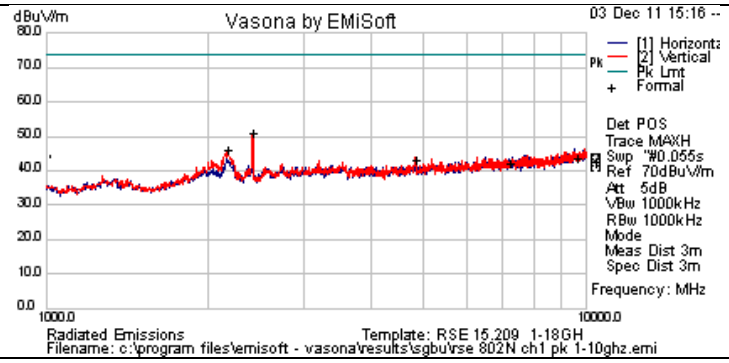
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2461.388	50.1	4.8	-9.1	45.8	Pk	V	100	141	74	-28.2	Pass	
2175.204	47.5	4.5	-9.5	42.4	Pk	V	100	141	74	-31.6	Pass	
4924.063	40	7	-6.4	40.7	Pk	V	100	141	74	-33.3	Pass	
7386.071	38.1	8.7	-3.4	43.3	Pk	V	100	141	74	-30.7	Pass	
9848.41	35	10.7	-1.8	43.9	Pk	V	100	141	74	-30.1	Pass	

Subtest Number: 71026 - 7	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**HT20 channel 1 (1-10GHz)**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: HT20 channel 1 (1-10GHz)

Test Results Table

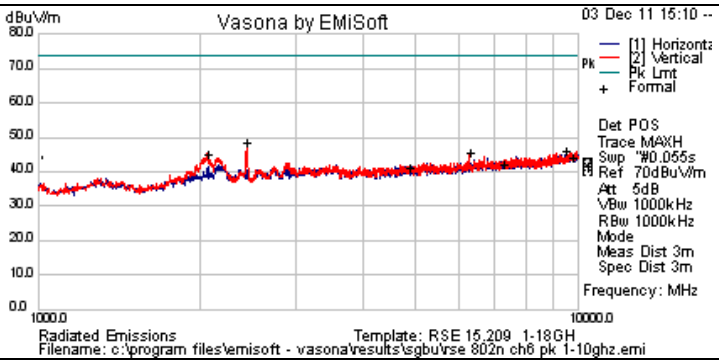
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2161	51.2	4.5	-9.7	45.9	Pk	V	150	153	74	-28.1	Pass	
2412.619	55.2	4.7	-9.2	50.8	Pk	V	100	153	74	-23.2	Pass	
4824.898	42.1	7	-6.1	43	Pk	V	100	153	74	-31	Pass	
7236.682	37	8.5	-3.4	42.2	Pk	V	100	153	74	-31.8	Pass	
9648.701	35.4	10.6	-2.1	43.8	Pk	V	100	153	74	-30.2	Pass	

Subtest Number: 71026 - 8	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**HT20 channel 6 (1-10GHz)**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: HT20 channel 6 (1-10GHz)

Test Results Table

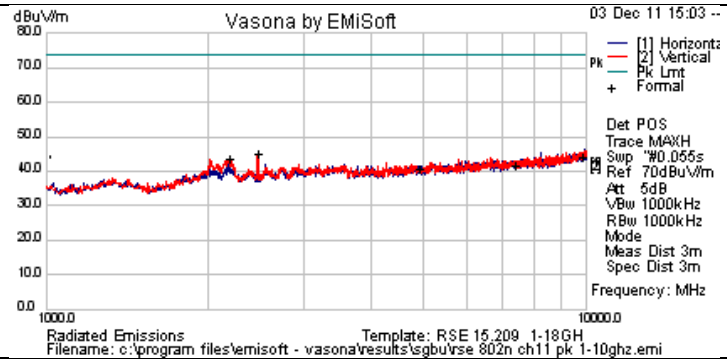
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2057.5	51.1	4.3	-10.3	45.2	Pk	V	150	206	74	-28.8	Pass	
2435.5	52.9	4.8	-9.2	48.5	Pk	V	100	206	74	-25.5	Pass	Channel 6
4874.942	40.6	7	-6.3	41.3	Pk	V	100	206	74	-32.7	Pass	
6301.038	41.3	7.9	-3.8	45.4	Pk	V	100	206	74	-28.6	Pass	
7311.391	36.6	8.6	-3.2	42	Pk	V	100	206	74	-32	Pass	
9748.253	35	10.6	-1.6	44.1	Pk	V	100	206	74	-29.9	Pass	

Subtest Number: 71026 - 9	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**HT20 channel 11 (1-10GHz)**
Subtest Result	Pass
Highest Frequency	10000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

Graphical Test Results



Title: HT20 channel 11 (1-10GHz)

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
2462.5	49.3	4.8	-9.1	45	Pk	V	100	141	74	-29	Pass	
2183.5	48.7	4.5	-9.5	43.7	Pk	V	150	141	74	-30.3	Pass	
4924.063	40.1	7	-6.4	40.8	Pk	V	100	141	74	-33.2	Pass	
7386.093	36.5	8.7	-3.4	41.8	Pk	V	100	141	74	-32.2	Pass	
9848.108	35.1	10.7	-1.8	44	Pk	V	100	141	74	-30	Pass	

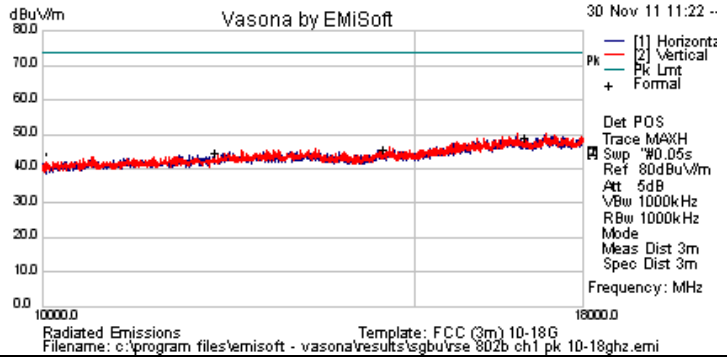
Subtest Number: 71026 - 10	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11B channel 1 (10-18GHz)**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

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 channel 1 (10-18GHz)

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
12060.001	41.8	12.2	-9.3	44.7	Pk	V	100	42	74	-29.3	Pass	Noise Floor
14472	41.6	13.6	-9.7	45.5	Pk	V	100	42	74	-28.5	Pass	Noise Floor
16884	41	16.2	-8.4	48.8	Pk	V	100	42	74	-25.2	Pass	Noise Floor

No emissions seen. Measurements take are of Noise floor

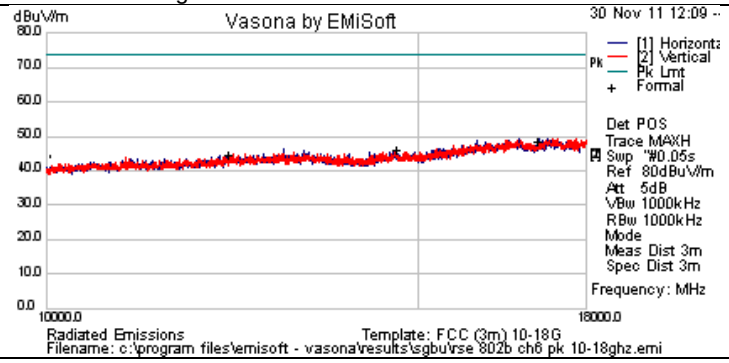
Subtest Number: 71026 - 11	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11B channel 6 (10-18GHz)**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

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 channel 6 (10-18GHz)

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
12185.001	41.6	12.2	-9	44.8	Pk	V	100	214	74	-29.2	Pass	Noise Floor
14622	42	13.7	-9.5	46.2	Pk	V	100	214	74	-27.8	Pass	Noise Floor
17059	41.2	16.3	-9	48.5	Pk	V	100	214	74	-25.5	Pass	Noise Floor

No emissions seen. Measurements take are of Noise floor

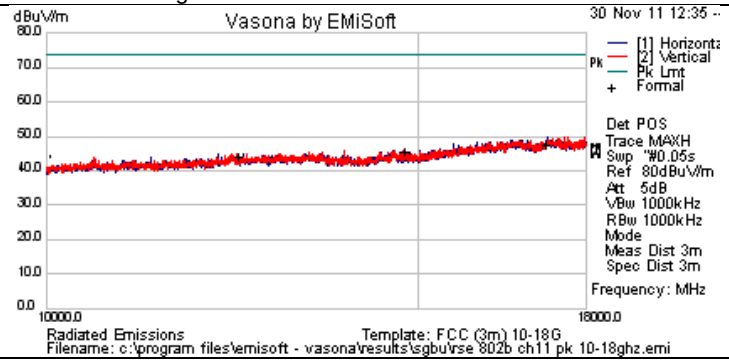
Subtest Number: 71026 - 12	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11B channel 11 (10-18GHz)**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	55%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034304	Micro-Tronics	BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

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 channel 11 (10-18GHz

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
12310.001	41.2	12.3	-9.2	44.3	Pk	V	100	154	74	-29.7	Pass	Noise Floor
14772	41.4	13.9	-9.8	45.5	Pk	V	100	154	74	-28.5	Pass	Noise Floor
17234	39.5	16.5	-8.4	47.6	Pk	V	100	154	74	-26.4	Pass	Noise Floor

No emissions seen. Measurements take are of Noise floor

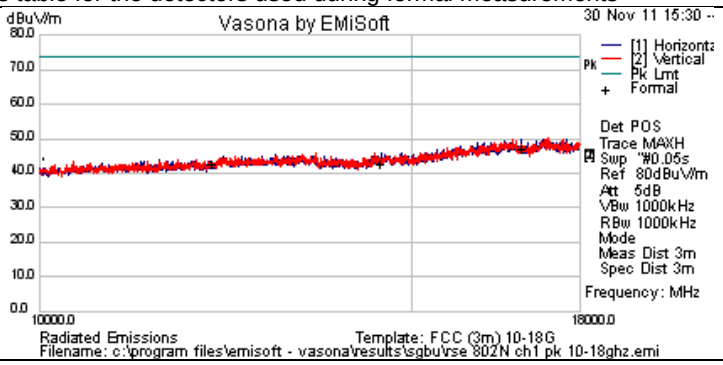
Subtest Number: 71026 - 13	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**HT20 channel 1 (10-18GHz)**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Comments on the above Test Results	HT20 channel 1 (10-18GHz)
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	54%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

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: HT20 channel 1 (10-18GHz)

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
12060.002	39.6	12.2	-9.3	42.5	Pk	V	100	142	74	-31.5	Pass	Noise Floor
14472	38.6	13.6	-9.7	42.5	Pk	V	100	142	74	-31.5	Pass	Noise Floor
16884	39.1	16.2	-8.4	46.9	Pk	V	100	142	74	-27.1	Pass	Noise Floor

No emissions seen. Measurements take are of Noise floor

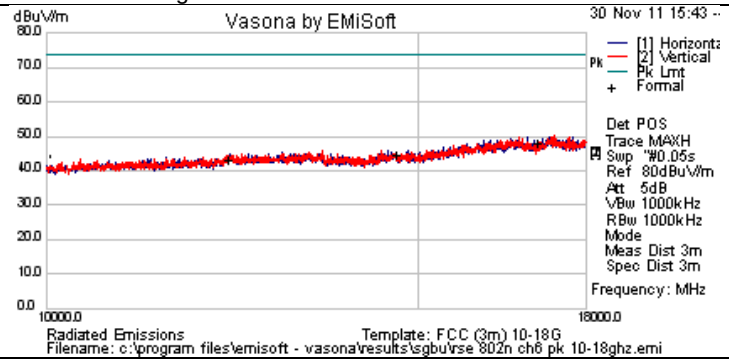
Subtest Number: 71026 - 14	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**HT20 channel 6 (10-18GHz)**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	54%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

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: HT20 channel 6 (10-18GHz)

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
12185.001	40	12.2	-9	43.2	Pk	V	100	142	74	-30.8	Pass	Noise Floor
14622	40.4	13.7	-9.5	44.6	Pk	V	100	142	74	-29.4	Pass	Noise Floor
17059	40.9	16.3	-9	48.2	Pk	V	100	142	74	-25.8	Pass	Noise Floor

No emissions seen. Measurements take are of Noise floor

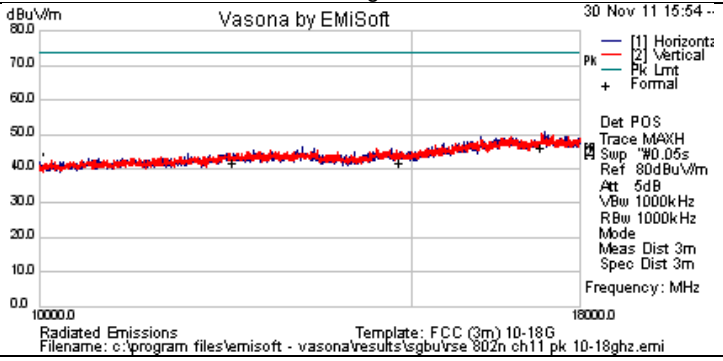
Subtest Number: 71026 - 15	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**HT20 channel 11 (10-18GHz)**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	54%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

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: HT20 channel 11 (10-18GHz)

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
12310.001	38.4	12.3	-9.2	41.5	Pk	V	100	206	74	-32.5	Pass	Noise Floor
14772	37.5	13.9	-9.8	41.7	Pk	V	100	206	74	-32.3	Pass	Noise Floor
17234	38.3	16.5	-8.4	46.3	Pk	V	100	206	74	-27.7	Pass	Noise Floor

No emissions seen. Measurements take are of Noise floor

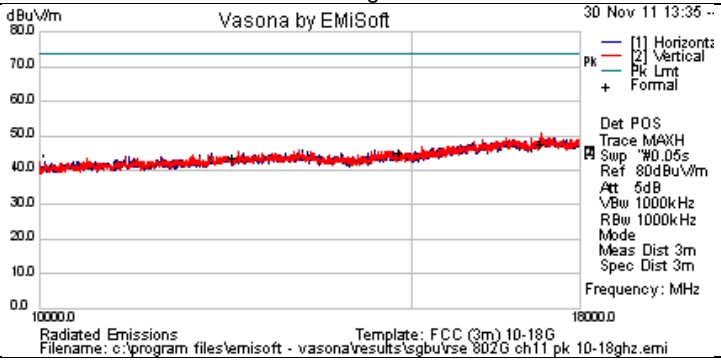
Subtest Number: 71026 - 16	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Results	
Subtest Title	**802G channel 11 (10-18GHz)**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	54%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

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: 802G channel 11 (10-18GHz)

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
12310.001	40.7	12.3	-9.2	43.8	Pk	V	100	141	74	-30.2	Pass	Noise Floor
14772	41.2	13.9	-9.8	45.3	Pk	V	100	141	74	-28.7	Pass	Noise Floor
17234	39.7	16.5	-8.4	47.8	Pk	V	100	141	74	-26.2	Pass	Noise Floor

No emissions seen. Measurements take are of Noise floor

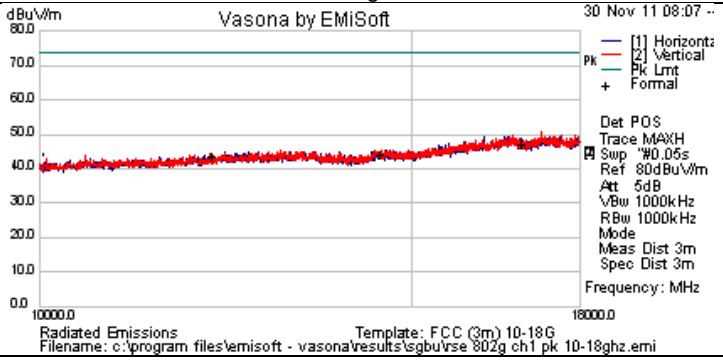
Subtest Number: 71026 - 17	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802G channel 1 (10-18GHz)**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	54%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

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: 802G channel 1 (10-18GHz)

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
12060.001	41.8	12.2	-9.3	44.7	Pk	V	100	42	74	-29.3	Pass	Noise Floor
14472	41.6	13.6	-9.7	45.5	Pk	V	100	42	74	-28.5	Pass	Noise Floor
16884	41	16.2	-8.4	48.8	Pk	V	100	42	74	-25.2	Pass	Noise Floor

No emissions seen. Measurements take are of Noise floor

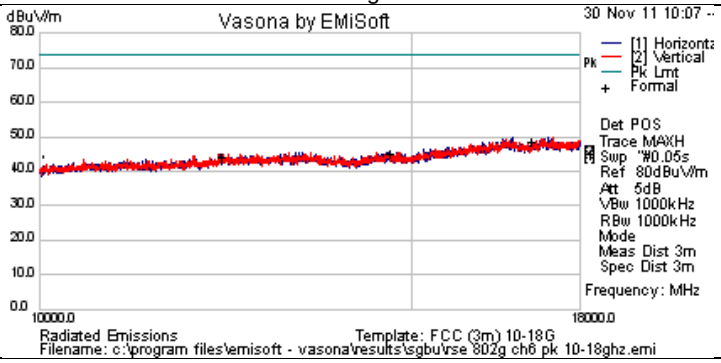
Subtest Number: 71026 - 18	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802G channel 6 (10-18GHz**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	10000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	54%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS034075	Schaffner	RSG 2000	Reference Spectrum Generator, 1-18GHz
CIS035618	Micro-Tronics	HPM50112-02	High pass Filter, 6.4-18GHz
CIS038371	Cisco	TH0118	Mast Mount Preamplifier Array, 1-18GHz
CIS042015	ETS-Lindgren	3117	Double Ridged Waveguide Horn Antenna
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

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: 802G channel 6 (10-18GHz

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
12185.001	40	12.2	-9	43.2	Pk	V	100	142	74	-30.8	Pass	Noise Floor
14622	40.4	13.7	-9.5	44.6	Pk	V	100	142	74	-29.4	Pass	Noise Floor
17059	40.9	16.3	-9	48.2	Pk	V	100	142	74	-25.8	Pass	Noise Floor

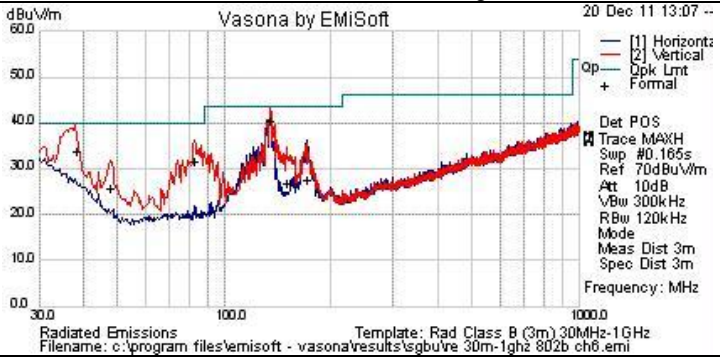
No emissions seen. Measurements take are of Noise floor

Radiated Emissions 30MHz to 1GHz

Subtest Number: 71026 - 21			
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Title	**802.11B channel 6 (30Mhz to 1GHz)**		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Environmental Conditions:			
Temperature: (59 to 95)F	71F		
Humidity: (10 to 75)%:	44%		
Equipment used:			
Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS027236	York	CNE V	Comparison Noise Emitter
CIS030654	Sunol Sciences	JB1	Combination Antenna, 30MHz-2GHz
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035248	Stanley	33-696	5 Meter Tape Measure
CIS040641	Rohde & Schwarz	ESU26	EMI Test Receiver
CIS041935	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable
CIS047316	Huber+Suhner	Sucoflex 106PA	N Type RF Atenna Cable 8.5m

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

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
133.944	25.6	1.1	13.6	40.3	Qp	V	101	281	43.5	-3.2	Pass	

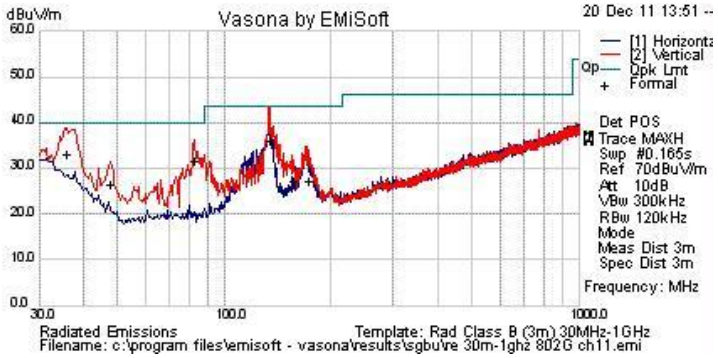
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
37.92	18.1	0.6	15	33.8	Qp	V	131	344	40	-6.2	Pass	
82.018	23.6	0.8	7.3	31.7	Qp	V	143	52	40	-8.3	Pass	
170.126	14.4	1.2	12	27.6	Qp	H	131	92	43.5	-15.9	Pass	
47.356	16.5	0.6	8.6	25.8	Qp	V	139	86	40	-14.2	Pass	
150.074	13.2	1.1	12.4	26.7	Qp	V	106	256	43.5	-16.8	Pass	

The above test results represent the worst case emissions for all 3 channels (ch1, ch6, ch11) for the 802.11B mode. Channel 6 measured the highest readings of the three channels. All emissions seen were broadband in nature and coming from the power supply cable.

Subtest Number: 71026 - 22			
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Title	**802.11G channel 11 (30Mhz to 1GHz)**		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Environmental Conditions:			
Temperature: (59 to 95)F	71F		
Humidity: (10 to 75)%:	44%		
Equipment used:			
Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS027236	York	CNE V	Comparison Noise Emitter
CIS030654	Sunol Sciences	JB1	Combination Antenna, 30MHz-2GHz
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035248	Stanley	33-696	5 Meter Tape Measure
CIS040641	Rohde & Schwarz	ESU26	EMI Test Receiver
CIS041935	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable
CIS047316	Huber+Suhner	Sucoflex 106PA	N Type RF Atenna Cable 8.5m

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 (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

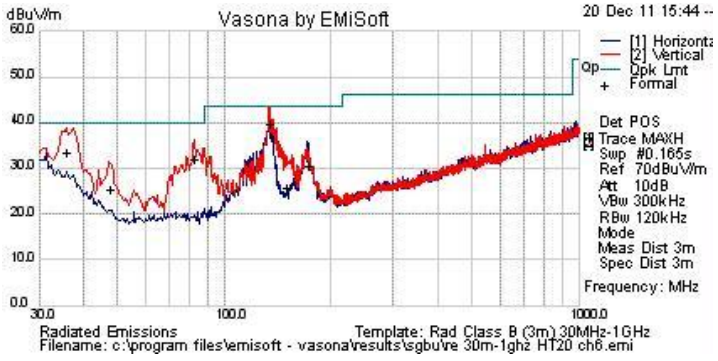
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
133.305	21.1	1.1	13.7	35.9	Qp	V	158	116	43.5	-7.6	Pass	
35.82	16	0.6	16.6	33.2	Qp	V	135	52	40	-6.8	Pass	
81.895	23.4	0.8	7.3	31.5	Qp	V	102	-6	40	-8.5	Pass	
47.46	17.3	0.6	8.5	26.5	Qp	V	113	175	40	-13.5	Pass	
171.62	14.2	1.2	11.9	27.3	Qp	V	170	222	43.5	-16.2	Pass	
155.615	13.7	1.1	12.3	27.1	Qp	V	108	141	43.5	-16.4	Pass	

The above test results represent the worst case emissions for all 3 channels (ch1, ch6, ch11) for the 802.11G mode. Channel 11 measured the highest readings of the three channels. All emissions seen were broadband in nature and coming from the power supply cable.

Subtest Number: 71026 - 26			
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Title	**HT20 channel 6 (30MHz to 1GHz)**		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Environmental Conditions:			
Temperature: (59 to 95)F	71F		
Humidity: (10 to 75)%:	44%		
Equipment used:			
Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS027236	York	CNE V	Comparison Noise Emitter
CIS030654	Sunol Sciences	JB1	Combination Antenna, 30MHz-2GHz
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS035248	Stanley	33-696	5 Meter Tape Measure
CIS040641	Rohde & Schwarz	ESU26	EMI Test Receiver
CIS041935	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable
CIS047316	Huber+Suhner	Sucoflex 106PA	N Type RF Atenna Cable 8.5m

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



HT20 channel 6 (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
133.596	24.8	1.1	13.7	39.6	Qp	V	100	300	43.5	-3.9	Pass	

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
35.656	16.2	0.6	16.7	33.4	Qp	V	125	137	40	-6.6	Pass	
82.044	23.8	0.8	7.3	31.9	Qp	V	153	-6	40	-8.1	Pass	
171.783	17.3	1.2	11.9	30.4	Qp	H	128	270	43.5	-13.1	Pass	
47.284	16.1	0.6	8.6	25.4	Qp	V	165	36	40	-14.6	Pass	
148.973	12.1	1.1	12.5	25.7	Qp	V	132	66	43.5	-17.8	Pass	

The above test results represent the worst case emissions for all 3 channels (ch1, ch6, ch11) for the HT20 mode. Channel 6 measured the highest readings of the three channels. All emissions seen were broadband in nature and coming from the power supply cable.

Receiver Spurious Emissions

Receiver spurious emissions which as defined in RSS GEN Section 4.10, must also comply with the radiated emission limits specified in Section section 6.10 table2.

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: 10 Hz for average
Detector: Average on formal, Peak on the prescan

Span: 30MHz - 1GHz
Reference Level: 70 dBuV
Attenuation: 10 dB
Sweep Time: Coupled
Resolution Bandwidth: 120kHz
Video Bandwidth: 300kHz
Detector: QP on the formal, Peak on the prescan

This report represents the worst case data for all supported operating modes.
There are no measurable emissions above 18 GHz.

Frequency (MHz)	Mode	Data Rate (Mbps)	Radiated Level (dBuV/m)	Average Limit (dBuV/m)
133.819	802.11B, 1-11 Mbps	1	39.4	43.5
133.727	802.11G, 6- 54 Mbps	6	38.0	43.5
133.548	HT20, M0 – M7	M0	39.4	43.5

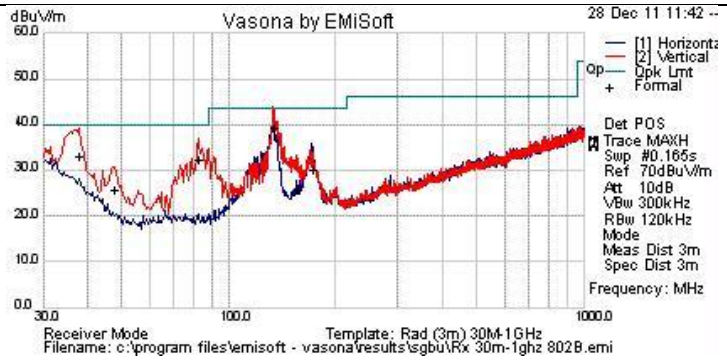
Test Number: 71251 **Spec ID:** 1552			
Basic Standard	**Applied to**	**Freq Range**	**Test Details / Comments**
RSS GEN RSS 210	Enclosure	30MHz - 26.5GHz	Receiver Spurious Emissions
Operating Mode	**Mode :** 2, Receiver mode		
Power Input	110, 60Hz (+/-20%)		
Overall Result	Pass		
Comments	**No observable emissions seen above 18GHz**		
Deviation	There were no deviations from the specification		

System Number	**Description**	**Samples**	**System under test**	**Support equipment**
1	Altamount WLAN FCC	S01	☑	☐

Subtest Number: 71251 - 12			
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Title	**802.11B Rx 30MHz to 1GHz**		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Environmental Conditions:			
Temperature: (59 to 95)F	68F		
Humidity: (10 to 75)%:	50%		
Equipment used:			
Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS027236	York	CNE V	Comparison Noise Emitter
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS038404	Sunol Sciences	JB1	Combination Antenna
CIS040641	Rohde & Schwarz	ESU26	EMI Test Receiver
CIS041935	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

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 Rx 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
133.819	24.7	1.1	13.6	39.4	Qp	V	111	277	43.5	-4.1	Pass	
37.72	17.5	0.6	15.2	33.2	Qp	V	127	11	40	-6.8	Pass	
81.616	24	0.8	7.3	32.2	Qp	V	128	60	40	-7.8	Pass	
47.465	16.7	0.7	8.5	25.9	Qp	V	166	88	40	-14.1	Pass	
172.298	17.2	1.2	11.9	30.3	Qp	H	115	291	43.5	-13.2	Pass	
155.945	12.4	1.1	12.3	25.8	Qp	V	127	182	43.5	-17.7	Pass	

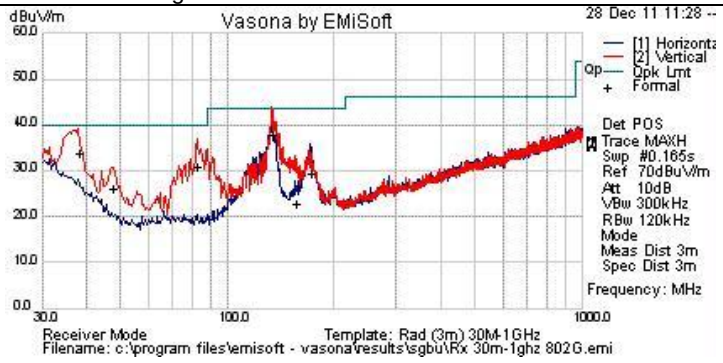
Subtest Number: 71251 - 11	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11G Rx 30MHz to 1GHz**
Subtest Result	Pass
Highest Frequency	1000.0
Lowest Frequency	30.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	50%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS038404	Sunol Sciences	JB1	Combination Antenna
CIS040641	Rohde & Schwarz	ESU26	EMI Test Receiver
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

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 Rx 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
133.727	23.3	1.1	13.6	38	Qp	V	154	261	43.5	-5.5	Pass	
37.952	18.2	0.6	15	33.8	Qp	V	105	328	40	-6.2	Pass	
81.987	22.9	0.8	7.3	31	Qp	V	131	75	40	-9	Pass	
172.03	16.2	1.2	11.9	29.3	Qp	H	100	296	43.5	-14.2	Pass	
47.546	17.1	0.6	8.5	26.2	Qp	V	155	80	40	-13.8	Pass	

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
155.948	9.2	1.1	12.3	22.7	Qp	V	131	191	43.5	-20.8	Pass	

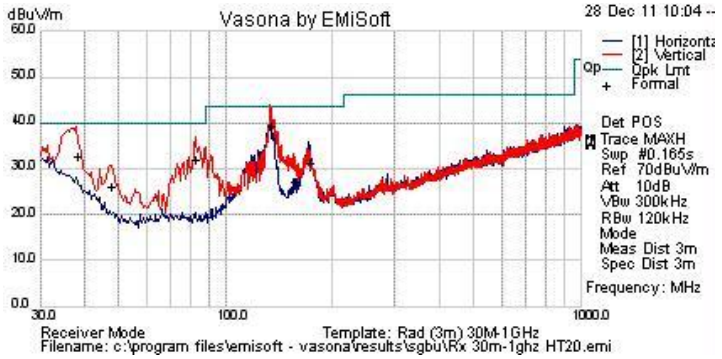
Subtest Number: 71251 - 10	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**HT20 Rx 30MHz to 1GHz**
Subtest Result	Pass
Highest Frequency	1000.0
Lowest Frequency	30.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	50%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS038404	Sunol Sciences	JB1	Combination Antenna
CIS040641	Rohde & Schwarz	ESU26	EMI Test Receiver
CIS047280	Huber + Suhner	Sucoflex 102E	40GHz Cable K Connector
CIS047314	Huber+Suhner	Sucoflex 106PAQ	N Type RF Antenna Cable

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: **HT20 Rx 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
133.548	24.6	1.1	13.7	39.4	Qp	V	115	109	43.5	-4.1	Pass	
37.917	17	0.6	15	32.6	Qp	V	114	201	40	-7.4	Pass	

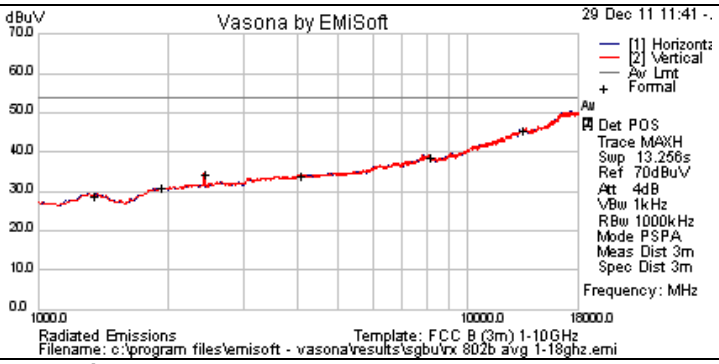
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
82.024	24	0.8	7.3	32.1	Qp	V	104	214	40	-7.9	Pass	
171.838	18	1.2	11.9	31.2	Qp	H	163	315	43.5	-12.3	Pass	
47.382	16.8	0.6	8.6	26	Qp	V	148	29	40	-14	Pass	
156.187	13.9	1.1	12.3	27.3	Qp	V	100	141	43.5	-16.2	Pass	

Subtest Number: 71251 - 15	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11B Rx 1-18GHz (Average)**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	49%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS042015	EMC Test Systems	3117	Double Ridged Guide Horn Antenna
CIS005568	HP	8449B	PreAmplifier (1-26.5GHz)
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-1344-520520	RF Coaxial Cable, to 18GHz, 134.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS040503	Agilent	E4440A	Precision Spectrum Analyzer
CIS041935	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable
CIS047316	Huber + Suhner	Sucoflex 106PA	Sucoflex N Type Black 7ft cable

Graphical Test Results



Title: **802.11B Rx 1-18GHz (Average)**

Test Results Table

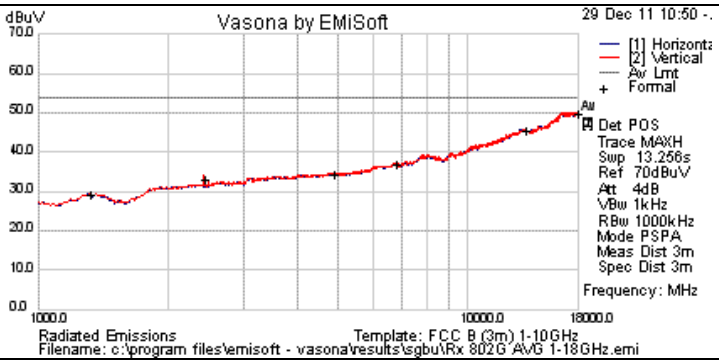
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2434.451	33.6	5.1	-4.2	34.4	Av	V	100	344	54	-19.6	Pass	
1350.667	32.2	3.7	-7.1	28.8	Av	H	100	0	54	-25.2	Pass	noise floor
1935.663	31.5	4.5	-5.1	30.9	Av	V	100	0	54	-23.1	Pass	noise floor
4086.182	29.9	6.7	-2.8	33.8	Av	V	100	0	54	-20.2	Pass	noise floor
8164.987	29.2	10	-0.6	38.5	Av	H	100	0	54	-15.5	Pass	noise floor
13404.00	26.9	13.3	5.2	45.4	Av	V	100	0	54	-8.6	Pass	noise floor

Subtest Number: 71251 - 14	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**802.11G Rx 1-18GHz Average**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	49%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS042015	EMC Test Systems	3117	Double Ridged Guide Horn Antenna
CIS005568	HP	8449B	PreAmplifier (1-26.5GHz)
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-1344-520520	RF Coaxial Cable, to 18GHz, 134.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS040503	Agilent	E4440A	Precision Spectrum Analyzer
CIS041935	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable
CIS047316	Huber + Suhner	Sucoflex 106PA	Sucoflex N Type Black 7ft cable

Graphical Test Results



Title: 802.11G Rx 1-18GHz Average

Test Results Table

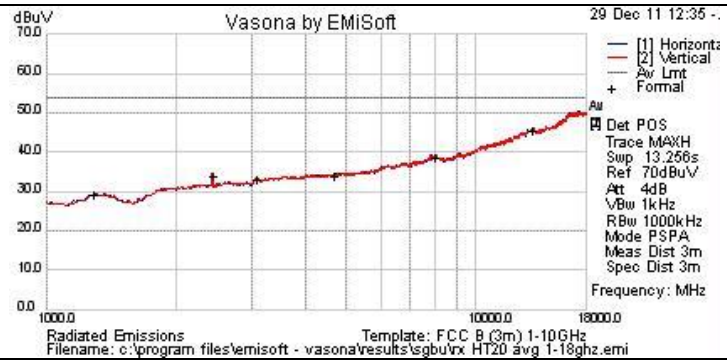
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2435.568	32.4	5	-4.2	33.2	Av	V	100	340	54	-20.8	Pass	
1325.528	32.6	3.7	-7.1	29.2	Av	V	100	0	54	-24.8	Pass	noise floor
6825.407	29	8.7	-0.7	37	Av	V	100	0	54	-17	Pass	noise floor
13658.22	27.4	13.3	4.8	45.4	Av	V	100	0	54	-8.6	Pass	noise floor
18000	27	16.3	6.4	49.6	Av	V	100	0	54	-4.4	Pass	noise floor
4859.166	28.9	7.4	-1.9	34.3	Av	V	100	0	54	-19.7	Pass	nosie floor

Subtest Number: 71251 - 13	
Engineer	Jose Aguirre
Lab Information	Building P, 5m Anechoic
Subtest Title	**HT20 Rx 1-18GHz Average**
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0
Environmental Conditions:	
Temperature: (59 to 95)F	68F
Humidity: (10 to 75)%:	49%

Equipment used:

Equipment No	Manufacturer	Model	Description
CIS042015	EMC Test Systems	3117	Double Ridged Guide Horn Antenna
CIS005568	HP	8449B	PreAmplifier (1-26.5GHz)
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber
CIS021117	Micro-Coax	UFB311A-0-1344-520520	RF Coaxial Cable, to 18GHz, 134.4 in
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS040503	Agilent	E4440A	Precision Spectrum Analyzer
CIS041935	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable
CIS047316	Huber + Suhner	Sucoflex 106PA	Sucoflex N Type Black 7ft cable

Graphical Test Results



Title: HT20 Rx 1-18GHz 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
2432.004	32.9	5	-4.2	33.8	Av	V	100	341	54	-20.2	Pass	
1289.627	32.4	3.6	-7	29	Av	H	100	0	54	-25	Pass	noise floor
3091.604	31.2	5.8	-3.8	33.2	Av	V	100	0	54	-20.8	Pass	noise floor
4667.951	29.1	7.2	-2.3	34	Av	V	100	0	54	-20	Pass	noise floor
8024.608	29.5	9.9	-0.7	38.7	Av	H	100	0	54	-15.3	Pass	noise floor
13520.74	27	13.4	5	45.4	Av	V	100	0	54	-8.6	Pass	noise floor

Radiated Setup Photos

See test setup photo exhibit

Conducted Emissions – AC Mains

Test Number: 71286 **Spec ID:** 484				
Basic Standard	**Applied to**	**Class**	**Freq Range**	**Test Details / Comments**
CFR47 Part 15.207 (RSS210)	AC Power Line	B	0.150MHz - 30MHz	Also complies with HKTA1039
Operating Mode	**Mode :** 1, OFDM / CCK			
Power Input	110, 60Hz (+/-20%)			
Overall Result	Pass			
Comments	No further comments			
Deviation	There were no deviations from the specification			

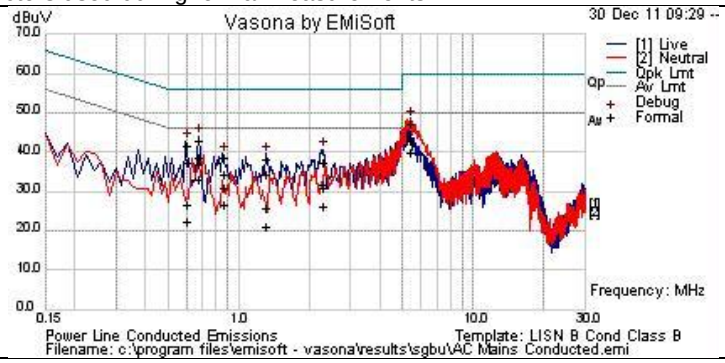
System Number	**Description**	**Samples**	**System under test**	**Support equipment**
1	Altamount WLAN FCC	S01	☑	☐

Subtest Number: 71286 - 2			
Engineer	Jose Aguirre		
Lab Information	Building P, 10m Anechoic		
Subtest Results			
Line Under Test	[B] AC power		
Transducer	LISN		
Subtest Result	Pass		
Highest Frequency	30.0		
Lowest Frequency	0.15		
Comments on the above Test Results	the test data is representative worst case for all modes tested		
Environmental Conditions:			
Temperature: (59 to 95)F	68F		
Humidity: (10 to 75)%:	50%		
Comments:			
Equipment used:			
Equipment No	Manufacturer	Model	Description
CIS001399	Fluke	77 II	Multimeter
CIS019206	TTE	H613-150K-50-21378	Hi Pass Filter - 150KHz cutoff
CIS008370	Andrew	F4A-PNMNM	49 ft Heliax Cable
CIS005707	Fischer Custom Communications	FCC-LISN-50-50	LISN
CIS008591	Fischer Custom Communications	FCC-RFM2F-520R	LISN AC Adaptor - Std 120V outlet
CIS030559	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in
CIS033648	Midwest Microwave	CSY-NMNM-14-010-FS	RF Coaxial Cable, RG-214, 10ft

CIS041929	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable
CIS040641	Rohde & Schwarz	ESU26	EMI Test Receiver

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: AC mains Conducted Emissions

Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
2.288	17	20.1	0.1	37.3	Qp	L	56	-18.7	Pass	
5.393	23.5	20.3	0.1	43.9	Qp	L	60	-16.1	Pass	
1.311	18.1	20.1	0.1	38.3	Qp	L	56	-17.7	Pass	
0.599573	21.4	20.1	0.1	41.6	Qp	L	56	-14.4	Pass	
0.861887	18.2	20.1	0.1	38.4	Qp	L	56	-17.6	Pass	
0.675234	22.6	20.1	0.1	42.8	Qp	L	56	-13.2	Pass	
5.392	26.7	20.3	0.1	47.1	Qp	N	60	-12.9	Pass	
0.601666	6.4	20.1	0.1	26.6	Qp	N	56	-29.4	Pass	
1.309	5.4	20.1	0.1	25.6	Qp	N	56	-30.4	Pass	
0.673478	16.7	20.1	0.1	36.9	Qp	N	56	-19.1	Pass	
2.282	10.8	20.1	0.1	31	Qp	N	56	-25	Pass	
0.860176	10.6	20.1	0.1	30.8	Qp	N	56	-25.2	Pass	
2.288	11.4	20.1	0.1	31.6	Av	L	46	-14.4	Pass	
5.393	19.3	20.3	0.1	39.7	Av	L	50	-10.3	Pass	
1.311	14	20.1	0.1	34.2	Av	L	46	-11.8	Pass	
0.599573	17.3	20.1	0.1	37.4	Av	L	46	-8.6	Pass	
0.861887	14.1	20.1	0.1	34.3	Av	L	46	-11.7	Pass	
0.675234	18.6	20.1	0.1	38.7	Av	L	46	-7.3	Pass	
5.392	22.6	20.3	0.1	43	Av	N	50	-7	Pass	
0.601666	2	20.1	0.1	22.1	Av	N	46	-23.9	Pass	
1.309	0.9	20.1	0.1	21.1	Av	N	46	-24.9	Pass	
0.673478	12.7	20.1	0.1	32.8	Av	N	46	-13.2	Pass	

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
2.282	5.8	20.1	0.1	26	Av	N	46	-20	Pass	
0.860176	6.4	20.1	0.1	26.6	Av	N	46	-19.4	Pass	

Physical Test arrangement Photograph:

See Test Setup photo exhibit

Maximum Permissible Exposure (MPE) Calculations

15.247: U-NII devices are subject to the radio frequency radiation exposure requirements specified in Sec. 1.1307(b), Sec. 2.1091 and Sec. 2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a ``general population/uncontrolled'' environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

Given

$E=\sqrt{(30*P*G)/d}$ and $S=E^{2/3770}$

where

E=Field Strength in Volts/meter
P=Power in Watts
G=Numeric Antenna Gain
d=Distance in meters
S=Power Density in mW/cm^2

Combine equations and rearrange the terms to express the distance as a function of the remaining variables:

$d=\sqrt{((30*P*G)/(3770*S))}$

Changing to units of power in mW and distance in cm, using:

$P(mW)=P(W)/1000$ $d(cm)=100*d(m)$

yields

$d=100*\sqrt{((30*(P/1000)*G)/(3770*S))}$
$d=0.282*\sqrt{(P*G/S)}$

where

d=Distance in cm
P=Power in mW
G=Numerica Antenna Gain
S=Power Density in mW/cm^2

Substituting the logarithmic form of power and gain using:

$P(mW)=10^{(P(dBm)/10)}$ $G(numeric)=10^{(G(dBi)/10)}$

yields

$d=0.282*10^{((P+G)/20)}/\sqrt{S}$ Equation (1)

and

$s=((0.282*10^{((P+G)/20)})/d)^2$ Equation (2)

where

d=MPE distance in cm
P=Power in dBm
G=Antenna Gain in dBi
S=Power Density in mW/cm^2

Equation (1) and the measured peak power are used to calculate the MPE distance. Note that for mobile or fixed location transmitters such as an access point, the minimum separation distance is 20 cm even if the calculations indicate that the MPE distance may be less.

S=1mW/cm^2 maximum. The highest supported antenna gain is 4 dBi. Using the peak power levels recorded in the test report along with Equation 1 above, the MPE distances are calculated as follows.

Frequency (MHz)	Bit Rate (Mbps)	Power Density (mW/cm^2)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)	Limit (cm)	Margin (cm)
2412	1	1	11.2	4	1.62	20	-18.38
2437	1	1	10.67	4	1.53	20	-18.47
2462	1	1	11.28	4	1.64	20	-18.36
2412	6	1	8.08	4	1.13	20	-18.87
2437	6	1	7.82	4	1.10	20	-18.90
2462	6	1	8.24	4	1.15	20	-18.85
2412	6.5	1	7.01	4	1.00	20	-19.00
2437	6.5	1	6.9	4	0.99	20	-19.01
2462	6.5	1	7.47	4	1.06	20	-18.94

MPE Calculations

To maintain compliance, installations will assure a separation distance of at least 20cm.

Using Equation 2, the MPE levels (s) at 20 cm are calculated as follows:

Frequency (MHz)	Bit Rate (Mbps)	MPE Distance (cm)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Margin (mW/cm^2)
2412	1	20	11.2	4	0.007	1	-0.993
2437	1	20	10.67	4	0.006	1	-0.994
2462	1	20	11.28	4	0.007	1	-0.993
2412	6	20	8.08	4	0.003	1	-0.997
2437	6	20	7.82	4	0.003	1	-0.997
2462	6	20	8.24	4	0.003	1	-0.997
2412	6.5	20	7.01	4	0.003	1	-0.997
2437	6.5	20	6.9	4	0.002	1	-0.998
2462	6.5	20	7.47	4	0.003	1	-0.997

Appendix C: Test Equipment/Software Used to perform the test

Equip#	Manufacturer/ Model	Description	Last Cal	Next Due
001399	Fluke/ 77 II	Multimeter	17-JUN-11	17-JUN-12
003003	HP/ 83731B	Synthesized Signal Generator	14-MAR-11	14-MAR-12
004882	EMC Test Systems/ 3115	Double Ridged Guide Horn Antenna	26-MAY-11	26-MAY-12
005568	HP/ 8449B	PreAmplifier (1-26.5GHz)	28-SEP-11	28-SEP-12
005707	Fischer Custom Communications/ FCC-LISN-50-50	LISN	06-APR-11	06-APR-12
006088	HP/ 8447D	PreAmplifier (.1-1GHz)	01-FEB-11	01-FEB-12
008195	TTE/ H613-150K-50-213 78	Hi Pass Filter - 150KHz cutoff	04-JAN-11	04-JAN-12
008370	Andrew/ F4A-PNMNM	49 ft Heliax Cable	16-APR-11	16-APR-12
008376	Andrew/ F4A-PNMNM	30 ft Heliax Cable	21-JUN-11	21-JUN-12
008447	Cisco/ NSA 10m Chamber	NSA 10m Chamber	18-OCT-11	18-OCT-12
008448	Cisco/ NSA 5m Chamber	NSA 5m Chamber	07-OCT-11	07-OCT-12
008591	Fischer Custom Communications/ FCC-RFM2F-520R	LISN AC Adaptor - Std 120V outlet	06-APR-11	06-APR-12
019206	TTE/ H785-150K-50-213 78	High Pas Filter,Fo=150kHz	20-SEP-11	20-SEP-12
020975	Micro-Coax/ UFB311A-0-1344-5 20520	RF Coaxial Cable, to 18GHz, 134.4 in	24-FEB-11	24-FEB-12
021117	Micro-Coax/ UFB311A-0-2484-5 20520	RF Coaxial Cable, to 18GHz, 248.4 in	24-AUG-11	24-AUG-12
027236	York/ CNE V	Comparison Noise Emitter	Cal Not Required	N/A
030559	Micro-Coax/ UFB311A-1-0950-5 04504	RF Coaxial Cable, to 18GHz, 95 in	24-FEB-11	24-FEB-12
030564	Micro-Coax/ UFB311A-1-0950-5 04504	RF Coaxial Cable, to 18GHz, 95 in	24-AUG-11	24-AUG-12
030654	Sunol Sciences/ JB1	Combination Antenna, 30MHz-2GHz	04-OCT-11	04-OCT-12
033648	Midwest Microwave/ CSY-NMNM-14-010 -FS	RF Coaxial Cable, RG-214, 10ft	16-APR-11	16-APR-12
033988	Agilent/ E4446A	PSA Spectrum Analyzer	18-NOV-201 1	18-NOV-201 2

034075	Schaffner/ RSG 2000	Reference Spectrum Generator, 1-18GHz	Cal Not Required	N/A
034304	Micro-Tronics/ BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz	07-JUL-11	07-JUL-12
034972	Midwest Microwave/ ATT-0640-20-29M-02	Attenuator, 20dB, DC-40GHz	16-MAY-11	16-MAY-12
035248	Stanley/ 33-696	5 Meter Tape Measure	12-MAY-11	12-MAY-12
035618	Micro-Tronics/ HPM50112-02	High pass Filter, 6.4-18GHz	07-JUL-11	07-JUL-12
037236	JFW/ 50CB-015	Control Box, GPIB	Cal Not Required	N/A
038371	Cisco/ TH0118	Mast Mount Preamplifier Array, 1-18GHz	17-NOV-11	17-NOV-12
038404	Sunol Sciences/ JB1	Combination Antenna	15-JUN-11	15-JUN-12
040503	Agilent/ E4440A	Precision Spectrum Analyzer	28-OCT-11	28-OCT-12
040603	Agilent/ E4440A	Spectrum Analyzer	05-AUG-11	05-AUG-12
040641	Rohde & Schwarz/ ESU26	EMI Test Receiver	02-JUN-11	02-JUN-12
041929	Newport/ iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	09-DEC-11	09-DEC-12
041935	Newport/ iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	04-MAR-11	04-MAR-12
041979	Cisco/ 1840	18-40GHz EMI Test Head/Verification Fixture	13-JUL-11	13-JUL-12
042015	ETS-Lindgren/ 3117	Double Ridged Waveguide Horn Antenna	03-FEB-11	03-FEB-12
043116	Huber + Suhner/ Sucoflex 104PE	N & SMA RF cable	14-DEC-11	14-DEC-12
044940	Rohde & Schwarz/ ESU40	EMI Test Receiver, 20Hz-40GHz	05-MAY-11	05-MAY-12
045050	Rohde & Schwarz/ ESCI	EMI Test Receiver	26-OCT-11	26-OCT-12
045084	American Reliance Inc./ SPS80-558-K022	Power Supply	Cal Not Required	N/A
045085	Rohde & Schwarz/ NRP	Power Meter	16-MAR-11	16-MAR-12
045086	Rohde & Schwarz/ NRP-Z21	Power Sensor	16-MAR-11	16-MAR-12
046379	Micro-Tronics/ BRC16306	Band Reject Filter	02-SEP-11	02-SEP-12
046385	Micro-Tronics/ HPM16310	Highpass Filter	11-JUL-11	11-JUL-12
047280	Huber + Suhner/ Sucoflex 102E	40GHz Cable K Connector	02-JUN-11	02-JUN-12
047314	Huber+Suhner/ Sucoflex 106PAQ	N Type RF Antenna Cable	18-AUG-11	18-AUG-12
047315	Huber+Suhner/ Sucoflex 106PA	N Type RF Antenna Cable	18-AUG-11	18-AUG-12
047316	Huber+Suhner/ Sucoflex 106PA	N Type RF Atenna Cable 8.5m	18-AUG-11	18-AUG-12

Software used in the tests

Vasona File Version	Used in Subtests
5.071	[71251 - 1, 71251 - 2, 71251 - 3]
5.073	[71026 - 1, 71026 - 2, 71026 - 3, 71026 - 4, 71026 - 5, 71026 - 6, 71026 - 7, 71026 - 8, 71026 - 9, 71026 - 10, 71026 - 11, 71026 - 12, 71026 - 13, 71026 - 14, 71026 - 15, 71026 - 16, 71026 - 17, 71026 - 18, 71127 - 1, 71127 - 2, 71127 - 3, 71127 - 4, 71127 - 5, 71127 - 6, 71127 - 7, 71127 - 8, 71127 - 9, 71127 - 10, 71127 - 11, 71127 - 12, 71127 - 13, 71127 - 14, 71127 - 15, 71127 - 16, 71127 - 17, 71127 - 18, 71286 - 1, 71251 - 4, 71251 - 5, 71251 - 6, 71251 - 7, 71251 - 8, 71251 - 9]