

# Welch Allyn Protocol, Inc.

## Welch Allyn 802.11a Wireless PC Card

### FCC 15.407 Test Report

Testing Conducted According to  
Test Plan: EMC, Lamarr Product Implementations  
Part No.: 830-1412-00 Rev A

August 27, 2007

Report No. PROT0295

Report Prepared By



[www.nwemc.com](http://www.nwemc.com)  
1-888-EMI-CERT

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EMC Test Report

**Certificate of Test**  
**Issue Date: August 27, 2007**  
**Welch Allyn Protocol, Inc.**  
**Model: Welch Allyn 802.11a Wireless PC Card**

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Spurious Radiated Emissions	FCC 15.407:2006	ANSI C63.4:2003 DA 02-2138:2002	Pass
AC Power line Conducted Emissions	FCC 15.407:2006	ANSI C63.4:2003 DA 02-2138:2002	Pass
Peak Transmit Power	FCC 15.407:2006	ANSI C63.4:2003 DA 02-2138:2002	Pass
Peak Power Spectral Density	FCC 15.407:2006	ANSI C63.4:2003 DA 02-2138:2002	Pass
Emission Bandwidth	FCC 15.407:2006	ANSI C63.4:2003 DA 02-2138:2002	Pass
Peak Excursion of the Modulation Envelope	FCC 15.407:2006	ANSI C63.4:2003 DA 02-2138:2002	Pass
Frequency Stability	FCC 15.407:2006	ANSI C63.4:2003 DA 02-2138:2002	Pass

**Modifications made to the product**

See the Modifications section of this report

**Test Facility**

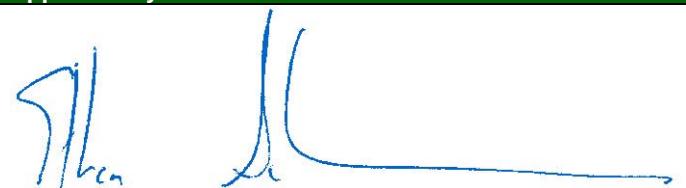
The measurement facility used to collect the data is located at:

Northwest EMC, Inc.  
22975 NW Evergreen Parkway, Suite 400  
Hillsboro, OR 97124

Phone: (503) 844-4066    Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada.

Approved By:



Ethan Schoonover, Sultan Lab Manager



NVLAP Lab Code: 200630-0

*This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.*

*Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.*

Revision Number	Description	Date	Page Number
00	None		

**FCC:** Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.



**NVLAP:** Northwest EMC, Inc. is accredited under the United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 2004/108/EC, and ANSI C63.4. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.



NVLAP LAB CODE 200629-0  
NVLAP LAB CODE 200630-0  
NVLAP LAB CODE 200676-0  
NVLAP LAB CODE 200761-0

**Industry Canada:** Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS 212, Issue 1 (Provisional) and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements.



**CAB:** Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.



**TÜV Product Service:** Included in TÜV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TÜV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TÜV's current Listing of CARAT Laboratories, available from TÜV. A certificate was issued to represent that this laboratory continues to meet TÜV's CARAT Program requirements. Certificate No. USA0604C.



**TÜV Rheinland:** Authorized to carryout EMC tests by order and under supervision of TÜV Rheinland. This authorization is based on "Conditions for EMC-Subcontractors" of November 1992.



**NEMKO:** Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).



**Australia/New Zealand:** The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).



**VCCI:** Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (Registration Numbers. - Hillsboro: C-1071, R-1025, C-2687, T-289, and R-2318, Irvine: R-1943, C-2766, and T-298, Sultan: R-871, C-1784, and T-294).



**BSMI:** Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement. License No.SL2-IN-E-1017.



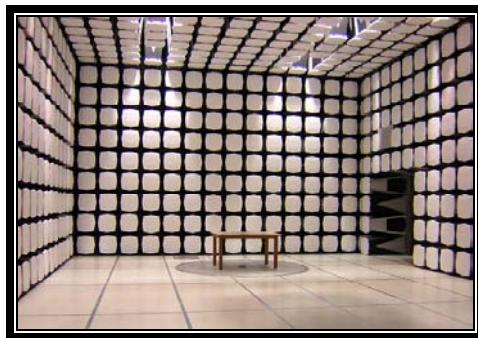
**GOST:** Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification



## SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/scope.asp>



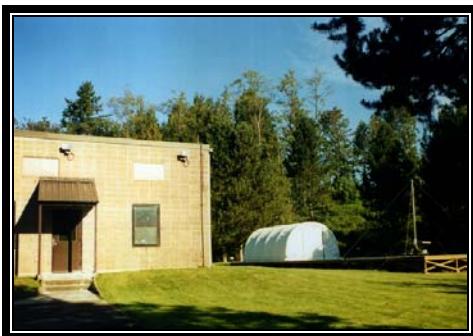
**California – Orange County Facility  
Labs OC01 – OC13**

41 Tesla Ave. Irvine, CA 92618  
(888) 364-2378 Fax: (503) 844-3826



**Oregon – Evergreen Facility  
Labs EV01 – EV11**

22975 NW Evergreen Pkwy. Suite 400 Hillsboro, OR 97124  
(503) 844-4066 Fax: (503) 844-3826



**Washington – Sultan Facility  
Labs SU01 – SU07**

14128 339<sup>th</sup> Ave. SE Sultan, WA 98294  
(888) 364-2378

## Party Requesting the Test

<b>Company Name:</b>	Welch Allyn Protocol, Inc.
<b>Address:</b>	8500 SW Creekside Place
<b>City, State, Zip:</b>	Beaverton, OR 97008-7107
<b>Test Requested By:</b>	Bob Jenkins
<b>Model:</b>	Welch Allyn 802.11a Wireless PC Card
<b>First Date of Test:</b>	August 13, 2007
<b>Last Date of Test:</b>	August 21, 2007
<b>Receipt Date of Samples:</b>	August 13, 2007
<b>Equipment Design Stage:</b>	Production
<b>Equipment Condition:</b>	No Damage

## Information Provided by the Party Requesting the Test

## Functional Description of the EUT (Equipment Under Test):

802.11a radio

## Testing Objective:

These tests were selected to satisfy the EMC requirements for FCC 15.407.

## EUT Photo



**CONFIGURATION 1 PROT0295**

Software/Firmware Running during test	
Description	Version
Prism Engineering Tool	2:5:14:0

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
EUT - 802.11a radio	Welch Allyn Protocol Inc.	Welch Allyn 802.11a Wireless PC Card	001AFA0000CE

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
TCC Test Fixture	Welch Allyn Protocol Inc.	851-0034-01 Rev. 02	20
AC Adapter 1	CUI Inc.	EPAS-101W-05	None

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter 2	IBM	08K8212	11S08K8212Z1Z7UB4172NK
Laptop	IBM	2366-83U	KP-ZMDVL

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Ethernet/Serial	No	1.2m	No	TCC Test Fixture	Laptop
DC	No	1.6m	No	TCC Test Fixture	AC Adapter 1
DC	No	1.3m	Yes	Laptop	AC Adapter 2
AC	No	1.8m	No	AC Adapter 2	AC Mains

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

**CONFIGURATION 2 PROT0295**

Software/Firmware Running during test	
Description	Version
Prism Engineering Tool	2:5:14:0

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
EUT - 802.11a radio	Welch Allyn Protocol Inc.	Welch Allyn 802.11a Wireless PC Card	001AFA0000CE

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
TCC Test Fixture	Welch Allyn Protocol Inc.	851-0034-01 Rev. 02	20
AC Adapter 1	CUI Inc.	EPAS-101W-05	None

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter 2	IBM	08K8212	11S08K8212Z1Z7UB4172NK
Laptop	IBM	2366-83U	KP-ZMDVL

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Ethernet/Serial	No	1.2m	No	TCC Test Fixture	Laptop
DC	No	1.6m	No	TCC Test Fixture	AC Adapter 1
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

## CONFIGURATION 3 PROT0295

Software/Firmware Running during test	
Description	Version
Prism Engineering Tool	2:5:14:0

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
EUT - 802.11a radio	Welch Allyn Protocol Inc.	Welch Allyn 802.11a Wireless PC Card	001AFA0000CE

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
TCC Test Fixture	Welch Allyn Protocol Inc.	851-0034-01 Rev. 02	20
Linear Power Supply	CUI Inc.	DTR050100-P1	None

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter 2	IBM	08K8212	11S08K8212Z1Z7UB4172NK
Laptop	IBM	2366-83U	KP-ZMDVL

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Ethernet/Serial	No	1.2m	No	TCC Test Fixture	Laptop
DC	No	1.6m	No	TCC Test Fixture	AC Adapter 1
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	8/13/2007	Emission Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	8/13/2007	Peak Excursion of the Modulation Envelope	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	8/13/2007	Peak Power Spectral Denisty	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	8/13/2007	Peak Transmit Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	8/15/2007	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	8/21/2007	Spurious Radiated Emissions	Modified from delivered configuration. Initial or No Modification	Copper tape was added in two pieces around the antenna cable end of the card covering the rubber end cap. Modification done by Steve Baker.	EUT remained at Northwest EMC following the test.
7	8/21/2007	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

#### **MODES OF OPERATION**

Transmitting 802.11(a), 6 Mbps, Channel 120

Transmitting 802.11(a), 6 Mbps, Channel 60

Transmitting 802.11(a), 6 Mbps, Channel 40

#### **POWER SETTINGS INVESTIGATED**

120VAC/60Hz

#### **SAMPLE CALCULATIONS**

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

#### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Receiver	Rohde & Schwartz	ESCI	ARG	12/7/2006	13
LISN	Solar	9252-50-R-24-BNC	LIR	11/20/2007	13
LISN	Solar	9252-50-R-24-BNC	LIP	12/20/2006	13
Attenuator	Tektronix	011-0059-02	ATC	12/27/2006	13
High Pass Filter	TTE	H97-100K-50-720B	HFX	8/22/2006	24
EV07 cable d			EVG	4/17/2007	13

#### **MEASUREMENT BANDWIDTHS**

	Frequency Range	Peak Data	Quasi-Peak Data	Average Data
	(MHz)	(kHz)	(kHz)	(kHz)
0.01 - 0.15	1.0	0.2	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0	120.0
Above 1000	1000.0	N/A	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

#### **MEASUREMENT UNCERTAINTY**

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

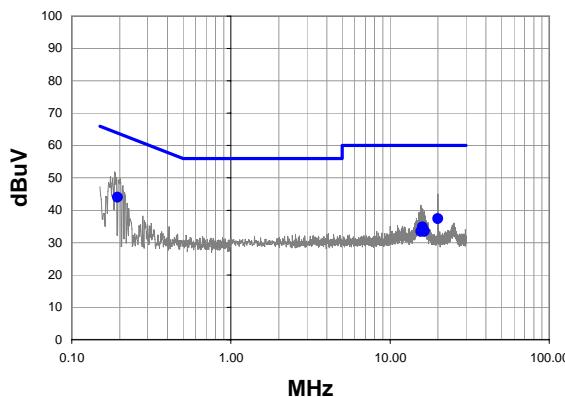
#### **TEST DESCRIPTION**

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50 Ω measuring port is terminated by a 50 Ω EMI meter or a 50 Ω resistive load. All 50 Ω measuring ports of the LISN are terminated by 50Ω.

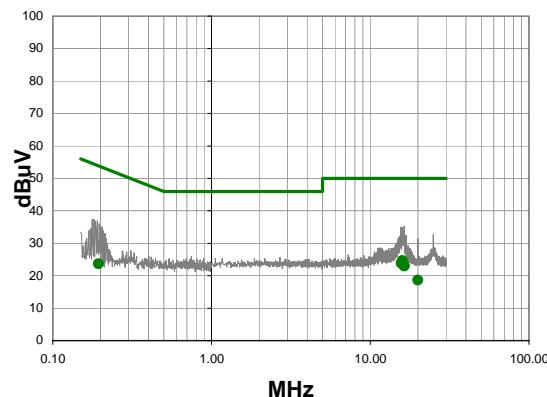
## EMC AC POWERLINE CONDUCTED EMISSIONS

Work Order:	PROT0295	Date:	08/21/07	<i>Rod Peloquin</i>
Project:	None	Temperature:	23	
Job Site:	EV07	Humidity:	46	
Serial Number:	001AFA0000CE	Barometric Pres.:	29.95	Tested by: Rod Peloquin
EUT:	Welch Allyn 802.11a Wireless PC Card			
Configuration:	3 - AC Powerline Conducted Emissions			
Customer:	Welch Allyn Protocol, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting 802.11(a), 6 Mbps, Channel 40			
Deviations:	No deviations.			
Comments:				
Test Specifications		Test Method		
FCC 15.407:2006		ANSI C63.4:2003 DA 02-2138:2002		
Run #	9	Line:	High Line	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.194	22.9	1.1	44.0	63.9	-19.8
20.000	16.9	0.5	37.4	60.0	-22.6
15.980	14.3	0.5	34.8	60.0	-25.2
16.390	13.1	0.5	33.6	60.0	-26.4
16.454	13.1	0.5	33.6	60.0	-26.4
15.654	13.0	0.5	33.5	60.0	-26.5

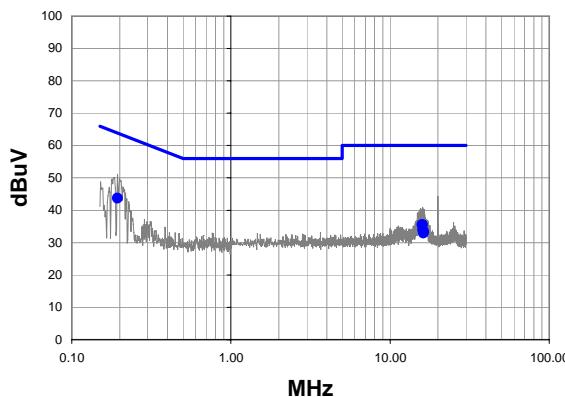
Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
15.980	4.2	0.5	24.7	50.0	-25.3
15.654	3.4	0.5	23.9	50.0	-26.1
16.390	2.6	0.5	23.1	50.0	-26.9
16.454	2.5	0.5	23.0	50.0	-27.0
0.194	1.1	1.1	23.6	53.9	-30.2
20.000	-1.8	0.5	18.7	50.0	-31.3

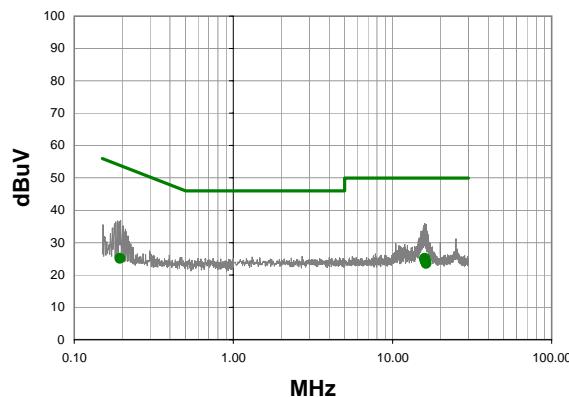
## EMC AC POWERLINE CONDUCTED EMISSIONS

Work Order:	PROT0295	Date:	08/21/07	<i>Rod Peloquin</i>
Project:	None	Temperature:	23	
Job Site:	EV07	Humidity:	46	
Serial Number:	001AFA0000CE	Barometric Pres.:	29.95	Tested by: Rod Peloquin
EUT:	Welch Allyn 802.11a Wireless PC Card			
Configuration:	3 - AC Powerline Conducted Emissions			
Customer:	Welch Allyn Protocol, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting 802.11(a), 6 Mbps, Channel 40			
Deviations:	No deviations.			
Comments:				
Test Specifications		Test Method		
FCC 15.407:2006		ANSI C63.4:2003 DA 02-2138:2002		
Run #	10	Line:	Neutral	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.194	22.6	1.1	43.7	63.9	-20.1
15.910	15.0	0.5	35.5	60.0	-24.5
15.978	15.0	0.5	35.5	60.0	-24.5
16.032	13.5	0.5	34.0	60.0	-26.0
16.318	12.9	0.5	33.4	60.0	-26.6
16.238	12.5	0.5	33.0	60.0	-27.0

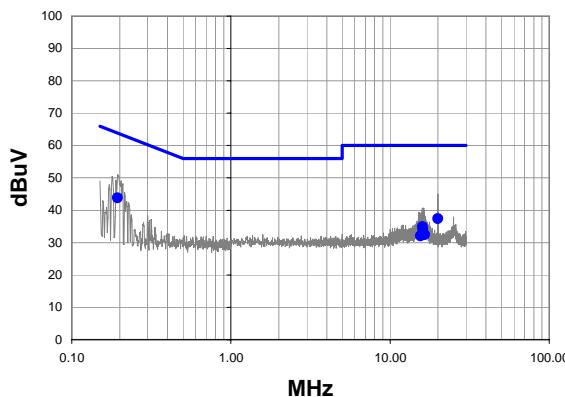
Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
15.978	4.7	0.5	25.2	50.0	-24.8
15.910	4.5	0.5	25.0	50.0	-25.0
16.032	3.9	0.5	24.4	50.0	-25.6
16.238	3.6	0.5	24.1	50.0	-25.9
16.318	3.1	0.5	23.6	50.0	-26.4
0.194	4.0	1.1	25.1	53.9	-28.7

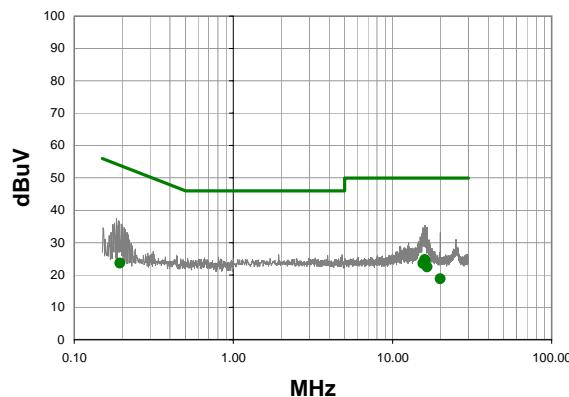
## EMC AC POWERLINE CONDUCTED EMISSIONS

Work Order:	PROT0295	Date:	08/21/07	<i>Rod Peloquin</i>
Project:	None	Temperature:	23	
Job Site:	EV07	Humidity:	46	
Serial Number:	001AFA0000CE	Barometric Pres.:	29.95	Tested by: Rod Peloquin
EUT:	Welch Allyn 802.11a Wireless PC Card			
Configuration:	3 - AC Powerline Conducted Emissions			
Customer:	Welch Allyn Protocol, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting 802.11(a), 6 Mbps, Channel 60			
Deviations:	No deviations.			
Comments:				
Test Specifications		Test Method		
FCC 15.407:2006		ANSI C63.4:2003 DA 02-2138:2002		
Run #	11	Line:	High Line	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.194	22.7	1.1	43.8	63.9	-20.0
20.000	16.9	0.5	37.4	60.0	-22.6
15.982	14.4	0.5	34.9	60.0	-25.1
16.046	13.8	0.5	34.3	60.0	-25.7
16.518	12.0	0.5	32.5	60.0	-27.5
15.570	11.6	0.5	32.1	60.0	-27.9

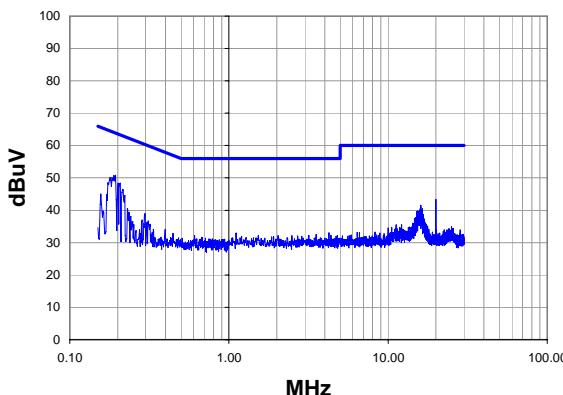
Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
15.982	4.3	0.5	24.8	50.0	-25.2
16.046	4.0	0.5	24.5	50.0	-25.5
15.570	3.1	0.5	23.6	50.0	-26.4
16.518	2.0	0.5	22.5	50.0	-27.5
0.194	2.5	1.1	23.6	53.9	-30.2
20.000	-1.7	0.5	18.8	50.0	-31.2

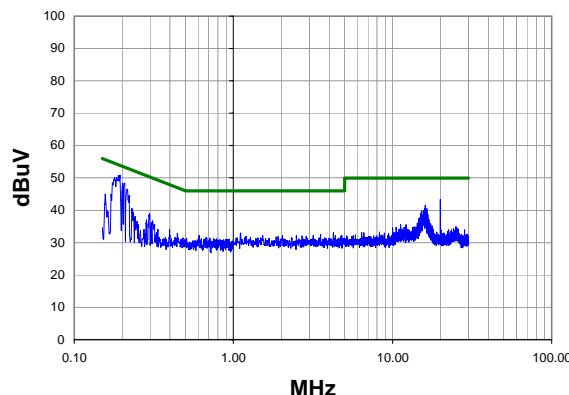
## EMC AC POWERLINE CONDUCTED EMISSIONS

Work Order:	PROT0295	Date:	08/21/07	<i>Rod Peloquin</i>
Project:	None	Temperature:	23	
Job Site:	EV07	Humidity:	46	
Serial Number:	001AFA0000CE	Barometric Pres.:	29.95	Tested by: Rod Peloquin
EUT:	Welch Allyn 802.11a Wireless PC Card			
Configuration:	3 - AC Powerline Conducted Emissions			
Customer:	Welch Allyn Protocol, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting 802.11(a), 6 Mbps, Channel 60			
Deviations:	No deviations.			
Comments:				
Test Specifications		Test Method		
FCC 15.407:2006		ANSI C63.4:2003 DA 02-2138:2002		
Run #	12	Line:	Neutral	Ext. Attenuation: 20
		Results: Pass		

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.194	29.7	1.1	50.8	63.9	-13.0
0.208	27.4	1.0	48.4	63.3	-14.9
0.201	27.4	1.0	48.4	63.6	-15.2
0.215	25.5	1.0	46.5	63.0	-16.5
20.000	22.9	0.5	43.4	60.0	-16.6
16.040	21.1	0.5	41.6	60.0	-18.4
15.990	20.1	0.5	40.6	60.0	-19.4
15.900	20.0	0.5	40.5	60.0	-19.5
16.460	20.0	0.5	40.5	60.0	-19.5
16.380	19.6	0.5	40.1	60.0	-19.9
15.720	19.4	0.5	39.9	60.0	-20.1
15.230	19.3	0.5	39.8	60.0	-20.2
15.650	19.2	0.5	39.7	60.0	-20.3
16.270	19.1	0.5	39.6	60.0	-20.4
0.157	23.1	1.9	45.0	65.6	-20.7
15.090	18.7	0.5	39.2	60.0	-20.8
16.530	18.2	0.5	38.7	60.0	-21.3
16.670	18.2	0.5	38.7	60.0	-21.3
0.296	18.0	0.9	38.9	60.3	-21.4
16.590	18.1	0.5	38.6	60.0	-21.4

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.194	29.7	1.1	50.8	53.9	-3.0
0.208	27.4	1.0	48.4	53.3	-4.9
0.201	27.4	1.0	48.4	53.6	-5.2
0.215	25.5	1.0	46.5	53.0	-6.5
20.000	22.9	0.5	43.4	50.0	-6.6
16.040	21.1	0.5	41.6	50.0	-8.4
15.990	20.1	0.5	40.6	50.0	-9.4
15.900	20.0	0.5	40.5	50.0	-9.5
16.460	20.0	0.5	40.5	50.0	-9.5
16.380	19.6	0.5	40.1	50.0	-9.9
15.720	19.4	0.5	39.9	50.0	-10.1
15.230	19.3	0.5	39.8	50.0	-10.2
15.650	19.2	0.5	39.7	50.0	-10.3
16.270	19.1	0.5	39.6	50.0	-10.4
0.157	23.1	1.9	45.0	55.6	-10.7
15.090	18.7	0.5	39.2	50.0	-10.8
16.530	18.2	0.5	38.7	50.0	-11.3
16.670	18.2	0.5	38.7	50.0	-11.3
0.296	18.0	0.9	38.9	50.3	-11.4
16.590	18.1	0.5	38.6	50.0	-11.4

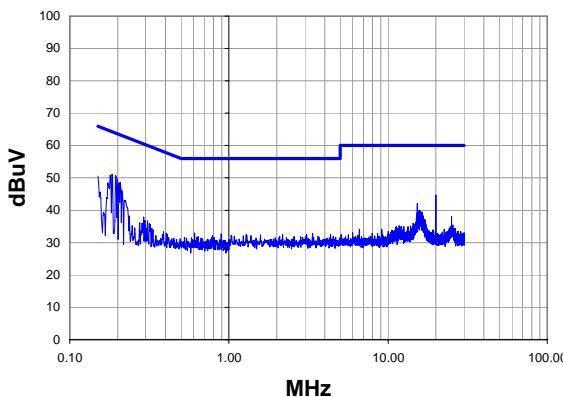
## EMC AC POWERLINE CONDUCTED EMISSIONS

Work Order:	PROT0295	Date:	08/21/07	<i>Rod Peloquin</i>
Project:	None	Temperature:	23	
Job Site:	EV07	Humidity:	46	
Serial Number:	001AFA0000CE	Barometric Pres.:	29.95	Tested by: Rod Peloquin
EUT:	Welch Allyn 802.11a Wireless PC Card			
Configuration:	3 - AC Powerline Conducted Emissions			
Customer:	Welch Allyn Protocol, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting 802.11(a), 6 Mbps, Channel 120			
Deviations:	No deviations.			
Comments:				

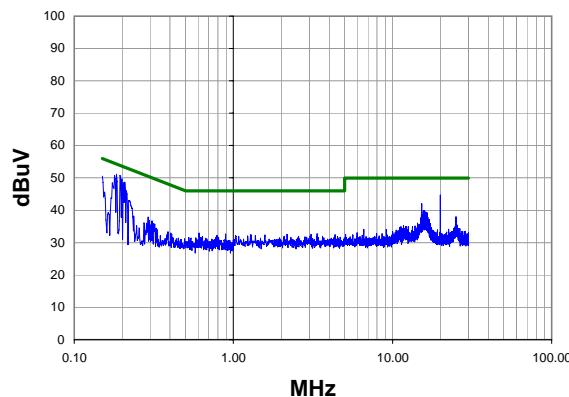
Test Specifications		Test Method	
FCC 15.407:2006		ANSI C63.4:2003 DA 02-2138:2002	

Run #	13	Line:	High Line	Ext. Attenuation:	20	Results	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.194	29.6	1.1	50.7	63.9	-13.1
0.184	29.8	1.3	51.1	64.3	-13.2
0.179	29.3	1.4	50.7	64.5	-13.8
0.199	28.6	1.0	49.6	63.6	-14.0
0.208	27.7	1.0	48.7	63.3	-14.6
0.204	27.5	1.0	48.5	63.4	-14.9
20.000	24.2	0.5	44.7	60.0	-15.3
0.150	28.5	2.0	50.5	66.0	-15.5
0.213	25.0	1.0	46.0	63.1	-17.1
15.230	21.6	0.5	42.1	60.0	-17.9
0.223	22.0	1.0	43.0	62.7	-19.7
15.850	19.5	0.5	40.0	60.0	-20.0
15.650	19.4	0.5	39.9	60.0	-20.1
15.800	19.4	0.5	39.9	60.0	-20.1
15.600	19.0	0.5	39.5	60.0	-20.5
16.160	19.0	0.5	39.5	60.0	-20.5
16.330	18.9	0.5	39.4	60.0	-20.6
16.040	18.8	0.5	39.3	60.0	-20.7
16.450	18.8	0.5	39.3	60.0	-20.7
16.400	18.6	0.5	39.1	60.0	-20.9

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.194	29.6	1.1	50.7	53.9	-3.1
0.184	29.8	1.3	51.1	54.3	-3.2
0.179	29.3	1.4	50.7	54.5	-3.8
0.199	28.6	1.0	49.6	53.6	-4.0
0.208	27.7	1.0	48.7	53.3	-4.6
0.204	27.5	1.0	48.5	53.4	-4.9
20.000	24.2	0.5	44.7	50.0	-5.3
0.150	28.5	2.0	50.5	56.0	-5.5
0.213	25.0	1.0	46.0	53.1	-7.1
15.230	21.6	0.5	42.1	50.0	-7.9
0.223	22.0	1.0	43.0	52.7	-9.7
15.850	19.5	0.5	40.0	50.0	-10.0
15.650	19.4	0.5	39.9	50.0	-10.1
15.800	19.4	0.5	39.9	50.0	-10.1
15.600	19.0	0.5	39.5	50.0	-10.5
16.160	19.0	0.5	39.5	50.0	-10.5
16.330	18.9	0.5	39.4	50.0	-10.6
16.040	18.8	0.5	39.3	50.0	-10.7
16.450	18.8	0.5	39.3	50.0	-10.7
16.400	18.6	0.5	39.1	50.0	-10.9

## EMC AC POWERLINE CONDUCTED EMISSIONS

Work Order:	PROT0295	Date:	08/21/07	<i>Rod Peloquin</i>
Project:	None	Temperature:	23	
Job Site:	EV07	Humidity:	46	
Serial Number:	001AFA0000CE	Barometric Pres.:	29.95	Tested by: Rod Peloquin
EUT:	Welch Allyn 802.11a Wireless PC Card			
Configuration:	3 - AC Powerline Conducted Emissions			
Customer:	Welch Allyn Protocol, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting 802.11(a), 6 Mbps, Channel 120			
Deviations:	No deviations.			
Comments:				

## Test Specifications

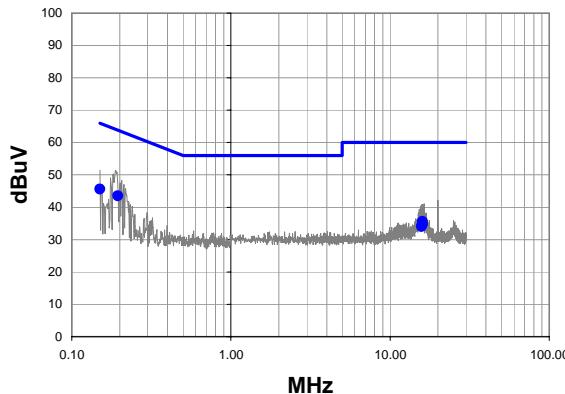
FCC 15.407:2006

## Test Method

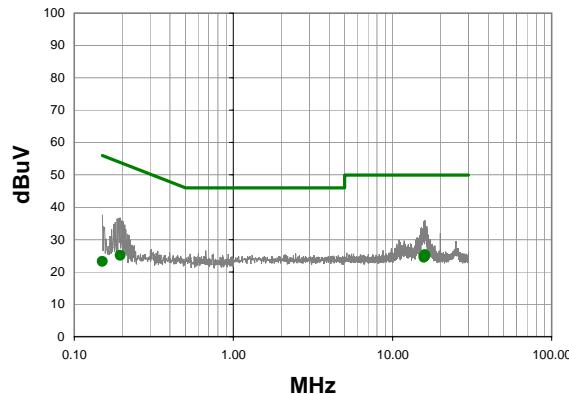
ANSI C63.4:2003 DA 02-2138:2002

Run #	14	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit

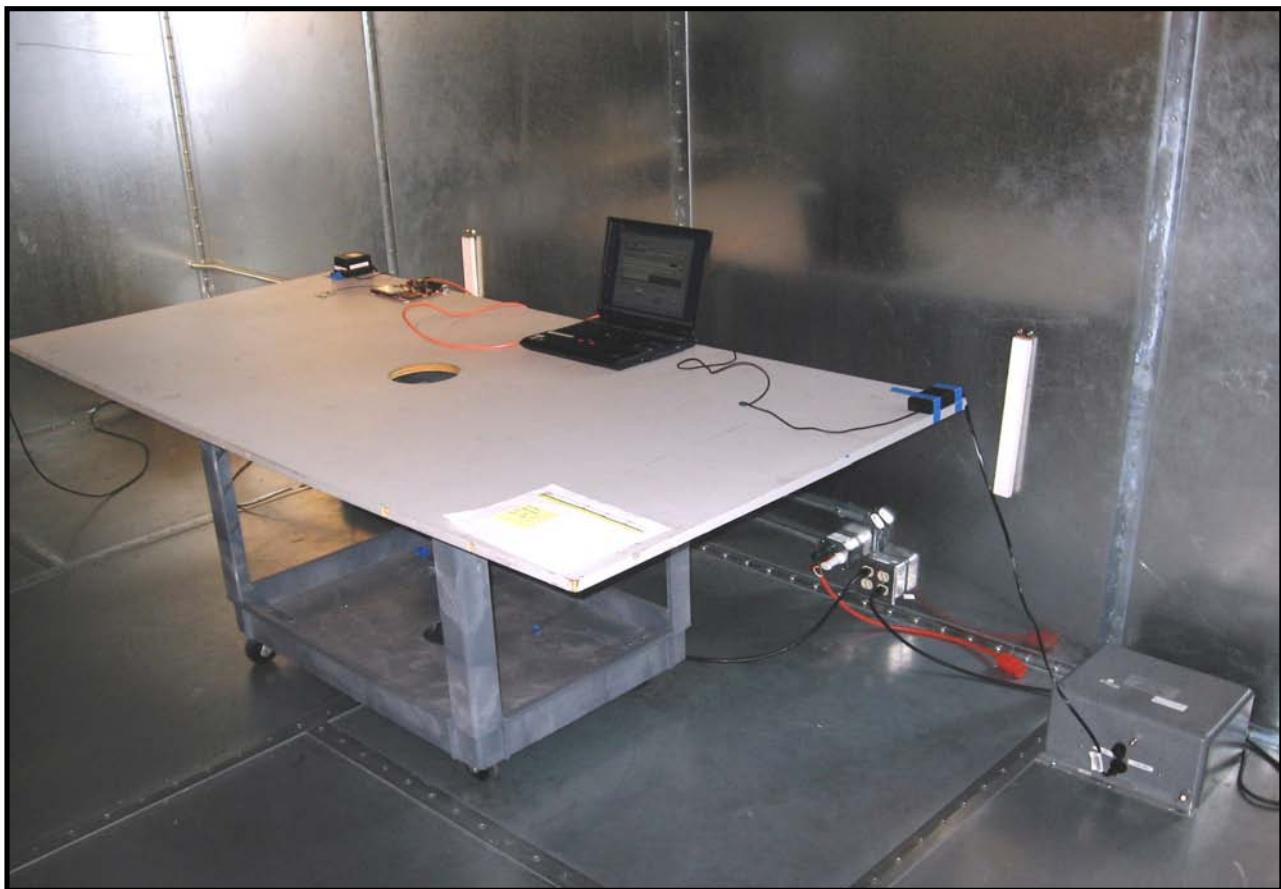


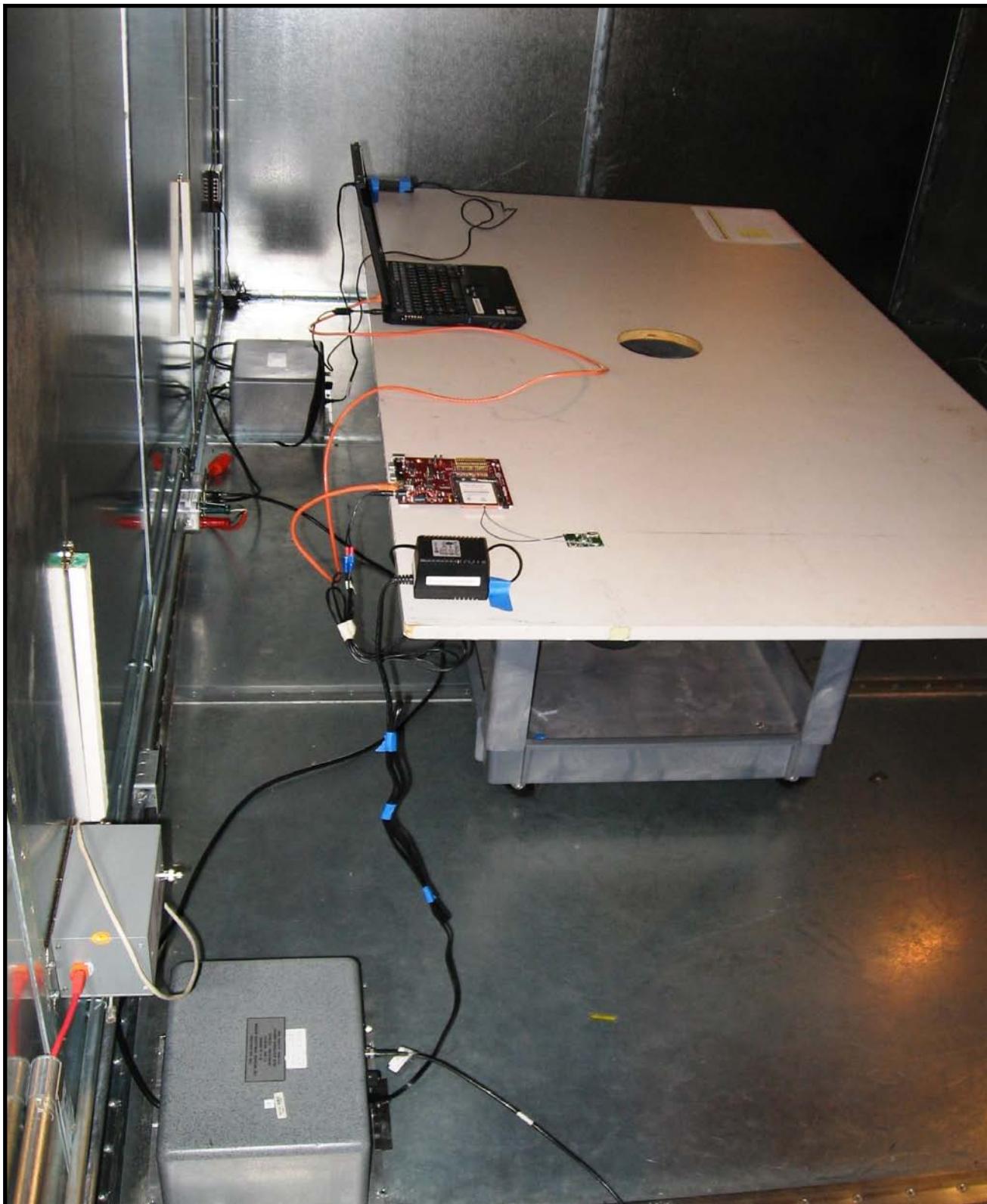
Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.195	22.4	1.1	43.5	63.8	-20.3
0.150	23.6	2.0	45.6	66.0	-20.4
15.978	15.1	0.5	35.6	60.0	-24.4
15.988	14.2	0.5	34.7	60.0	-25.3
15.918	14.0	0.5	34.5	60.0	-25.5
15.784	13.6	0.5	34.1	60.0	-25.9

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
15.978	4.8	0.5	25.3	50.0	-24.7
15.988	4.6	0.5	25.1	50.0	-24.9
15.918	4.4	0.5	24.9	50.0	-25.1
15.784	4.1	0.5	24.6	50.0	-25.4
0.195	4.0	1.1	25.1	53.8	-28.7
0.150	1.2	2.0	23.2	56.0	-32.8





Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4407B	AAU	12/8/2006	13

**MEASUREMENT UNCERTAINTY**

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

**TEST DESCRIPTION**

FCC Public Notice DA 02-2138 was followed. The transmit frequency was set to the lowest, a medium, and the highest channels in each band. The transmit power was set to its default maximum. The EUT's only data rate was measured. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

- Span = approximately 1.5 to 2 times the emission bandwidth, centered on the transmit channel.
- RBW = Approx. 1% of the emission bandwidth (B). This was an iterative process where an exact match of 1% may not be achieved. The largest value of RBW that came close to 1% of the emission bandwidth was used.
- A peak detector was used.
- The marker-delta function was then used to measure 26 dB emission bandwidth.

## EMC

## Emission Bandwidth

EUT: Welch Allyn 802.11a Wireless PC Card

Work Order: PROT0295

Serial Number: 001AFA0000CE

Date: 08/13/07

Customer: Welch Allyn Protocol, Inc.

Temperature: 24°C

Attendees: None

Humidity: 35%

Project: None

Barometric Pres.: 1020.4mb

Tested by: Holly Ashkannejhad

Power: 5VDC nominal

Job Site: EV06

## TEST SPECIFICATIONS

## Test Method

FCC 15.407:2006

ANSI C63.4:2003 DA 02-2138:2002

## COMMENTS

## DEVIATIONS FROM TEST STANDARD

Configuration #

1

Signature

*Holly Ashkannejhad*

802.11(a), 6Mbps

## 5150-5250MHz band

Low channel, 5180MHz	29.2931 MHz	N/A	N/A
Mid channel, 5200MHz	29.6766 MHz	N/A	N/A
High channel, 5240MHz	29.7099 MHz	N/A	N/A

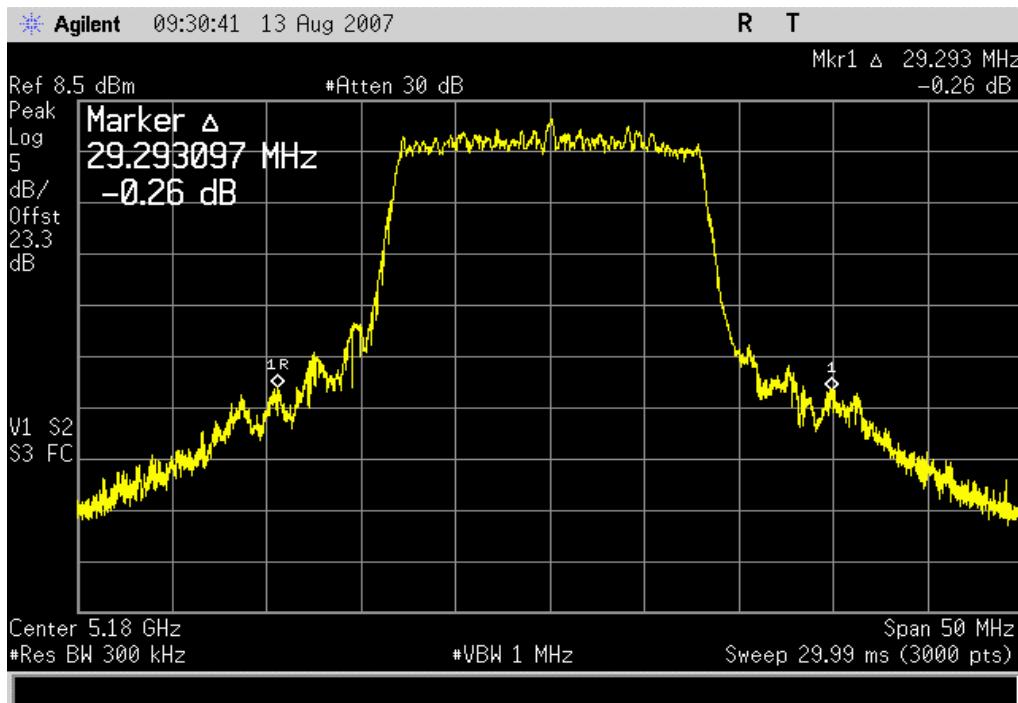
## 5250-5350MHz band

Low channel, 5260MHz	33.7279 MHz	N/A	N/A
Mid channel, 5300MHz	29.7266 MHz	N/A	N/A
High channel, 5320MHz	30.4268 MHz	N/A	N/A

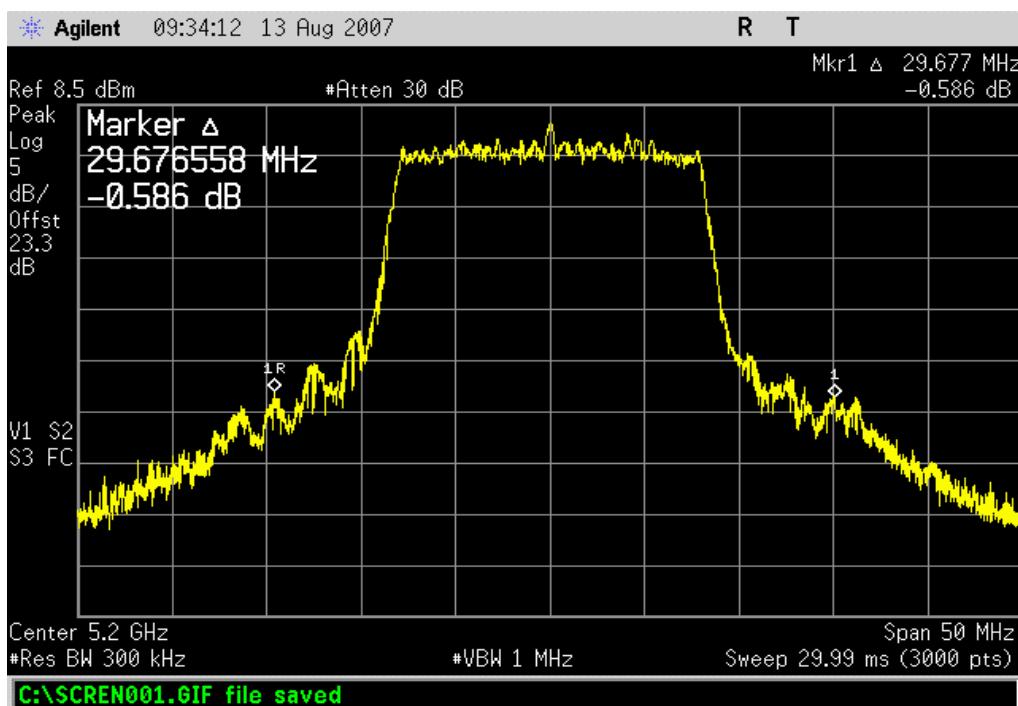
## 5470-5725MHz Band

Low channel, 5500MHz	32.9443 MHz	N/A	N/A
Mid channel, 5600MHz	34.3114 MHz	N/A	N/A
High channel, 5700MHz	38.3961 MHz	N/A	N/A

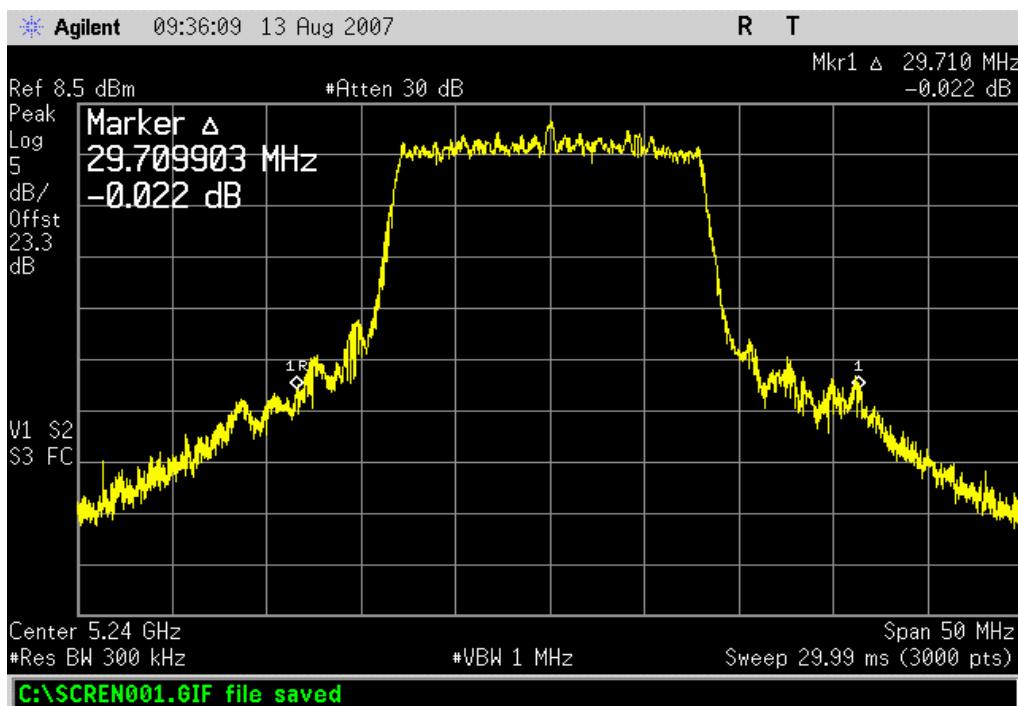
Result: N/A	802.11(a), 6Mbps, 5150-5250MHz band, Low channel, 5180MHz	Value: 29.2931 MHz	Limit: N/A
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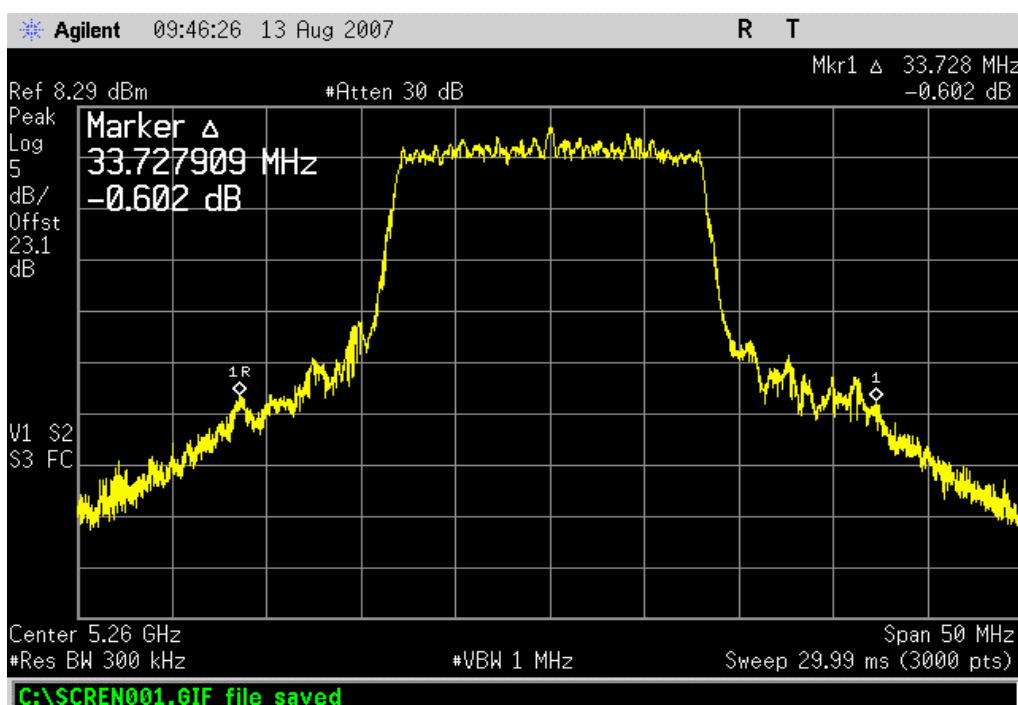
Result: N/A	802.11(a), 6Mbps, 5150-5250MHz band, Mid channel, 5200MHz	Value: 29.6766 MHz	Limit: N/A
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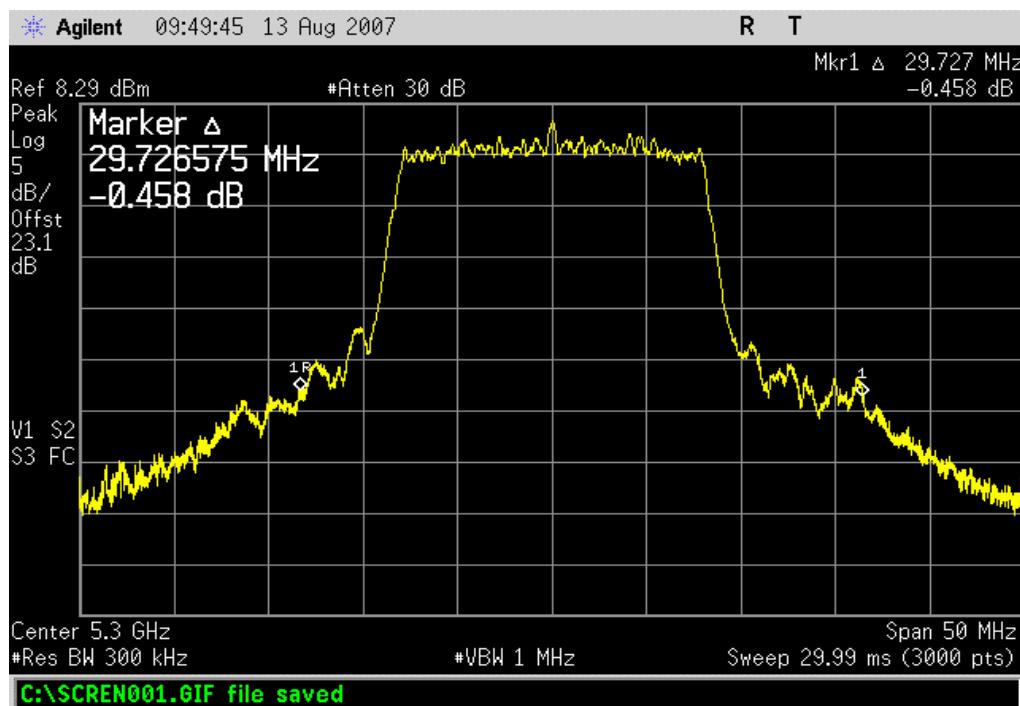
Result: N/A	Value: 29.7099 MHz	Limit: N/A
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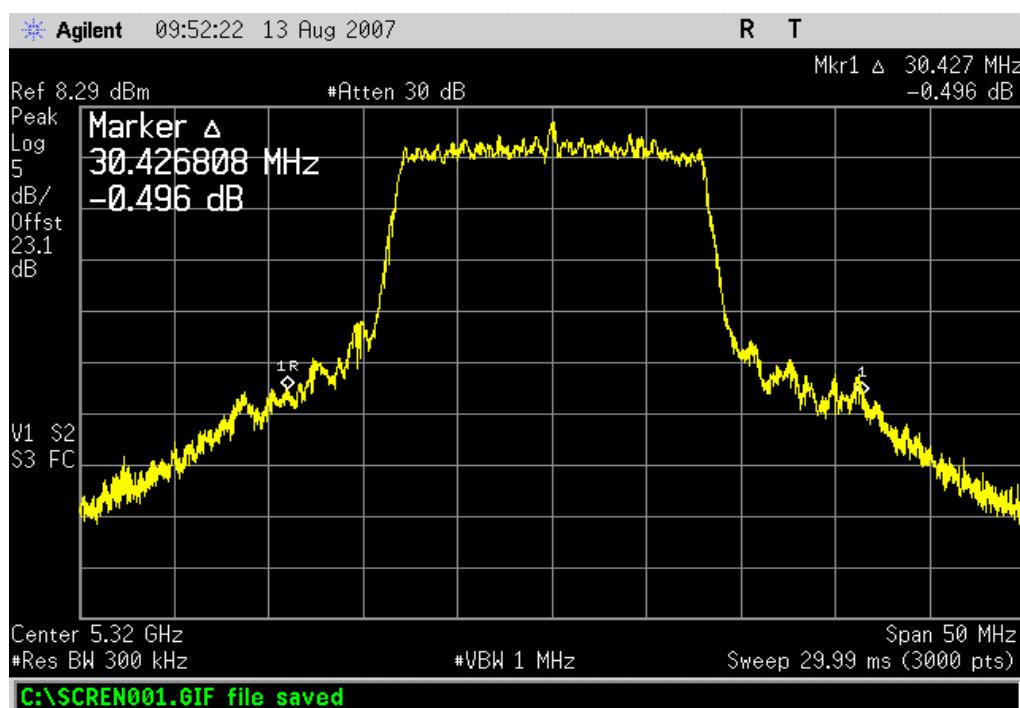
Result: N/A	Value: 33.7279 MHz	Limit: N/A
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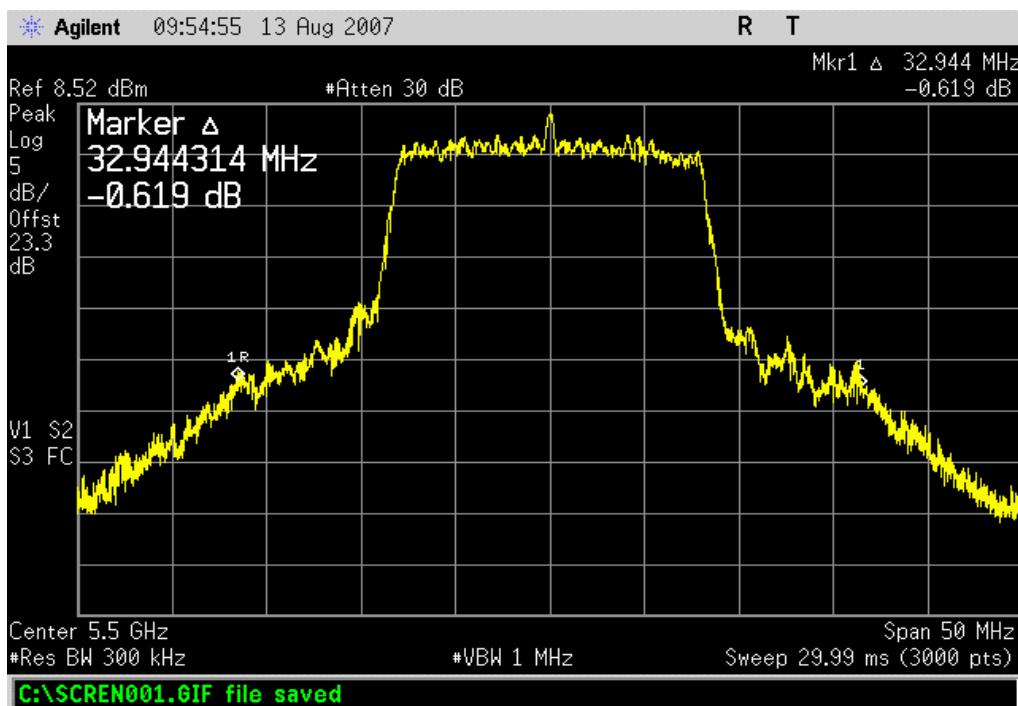
Result: N/A	Value: 29.7266 MHz	Limit: N/A
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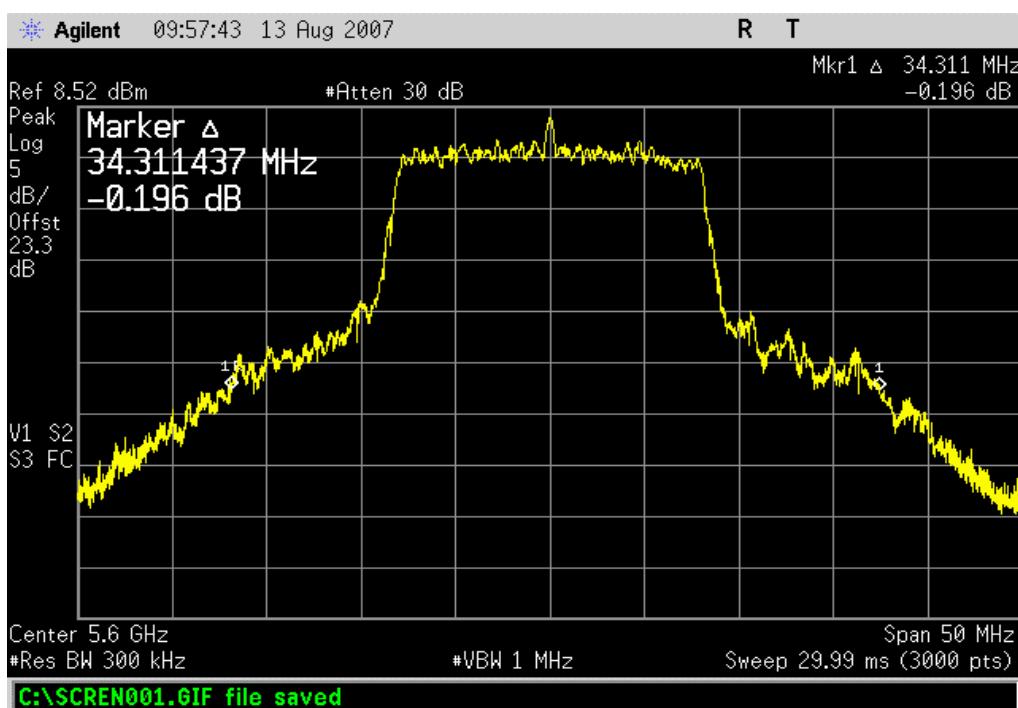
Result: N/A	Value: 30.4268 MHz	Limit: N/A
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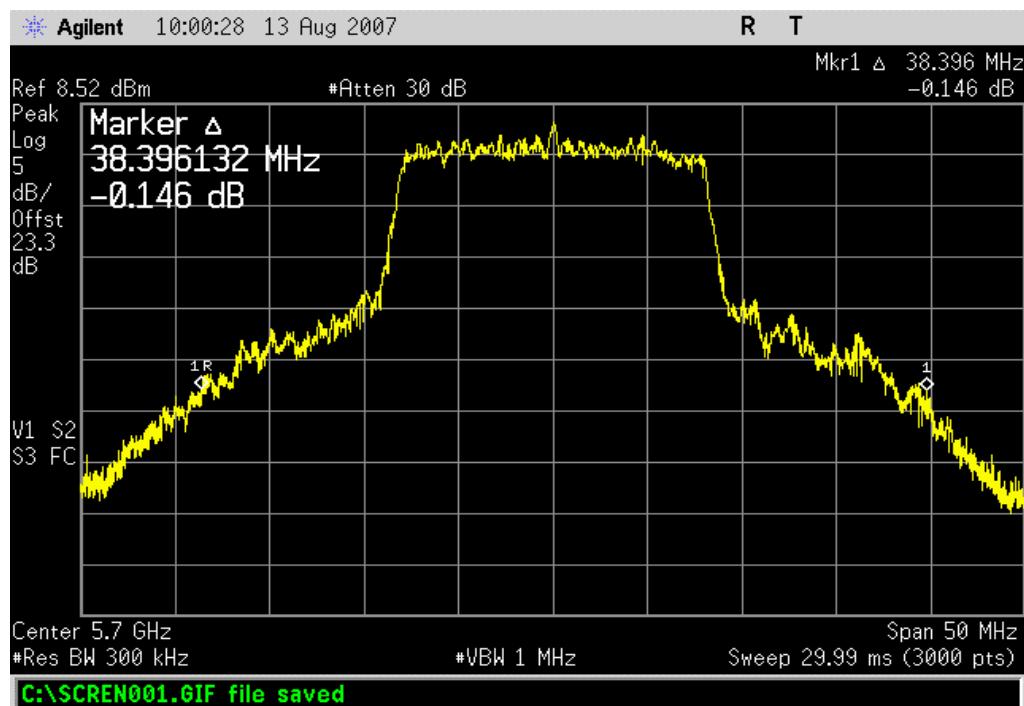
802.11(a), 6Mbps, 5470-5725MHz Band, Low channel, 5500MHz		
Result: N/A	Value: 32.9443 MHz	Limit: N/A

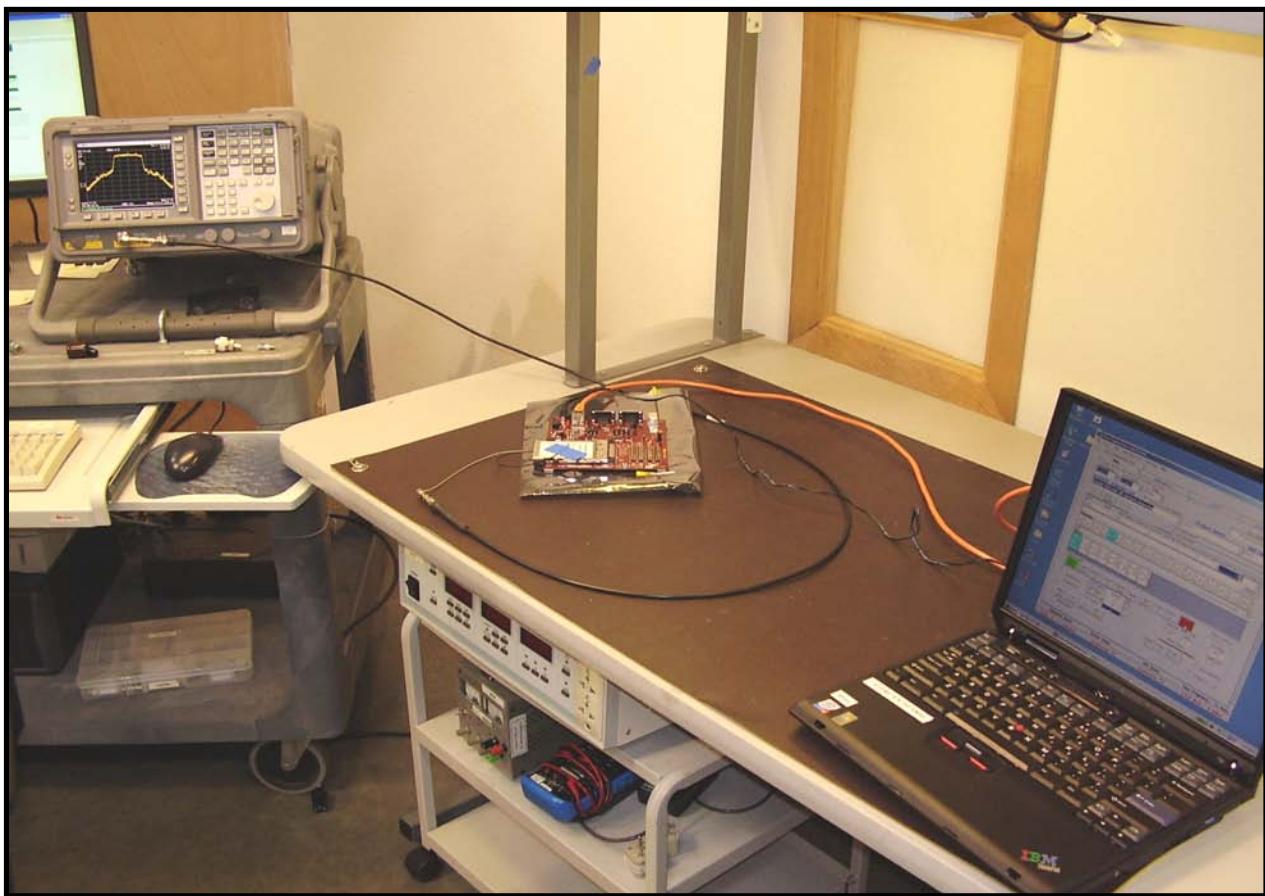


802.11(a), 6Mbps, 5470-5725MHz Band, Mid channel, 5600MHz		
Result: N/A	Value: 34.3114 MHz	Limit: N/A



802.11(a), 6Mbps, 5470-5725MHz Band, High channel, 5700MHz		
<b>Result:</b> N/A	<b>Value:</b> 38.3961 MHz	<b>Limit:</b> N/A





# Frequency Stability

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT						
Description	Manufacturer	Model	ID	Last Cal.	Interval	
Multimeter	Tektronix	DMM912	MMH	12/7/2006	13	
DC Power Supply	Topward	TPS-2000	TPD	NCR	0	
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	6/8/2007	13	
Chamber, Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZH-32-2-2-H/AC	TBA	7/7/2007	13	
Spectrum Analyzer	Agilent	E4407B	AAU	12/8/2006	13	

## MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

## TEST DESCRIPTION

### Variation of Supply Voltage

The primary supply voltage was varied over the range specified by the client. Per the client, the chip only works over this voltage range; it will shut off if the voltage is outside the specified range.

### Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30 ° to +50° C) and at 10°C intervals.

A direct connect measurement was made between the EUT's antenna cable and a spectrum analyzer. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT. Measurements were made at the mid channel of each band to determine frequency stability. If the frequency variation is less than 100 ppm, the EUT will meet the requirement of 15.407(g), that the emissions are maintained within the band of operation.

Frequency Stability						XMit 2007.06.13
EUT:	Welch Allyn 802.11a Wireless PC Card			Work Order:	PROT0295	
Serial Number:	001AF0000CE			Date:	08/15/07	
Customer:	Welch Allyn Protocol, Inc.			Temperature:	24°C	
Attendees:	None			Humidity:	35%	
Project:	None			Barometric Pres.:	1020.4mb	
Tested by:	Holly Ashkannejhad			Power:	5.0VDC nominal	
TEST SPECIFICATIONS				Test Method		
FCC 15.407-2006				ANSI C63.4:2003 DA 02-2138:2002		
COMMENTS						
DEVIATIONS FROM TEST STANDARD						
Configuration #	1	Signature <i>Holly Ashkannejhad</i>				

Normal Test Conditions

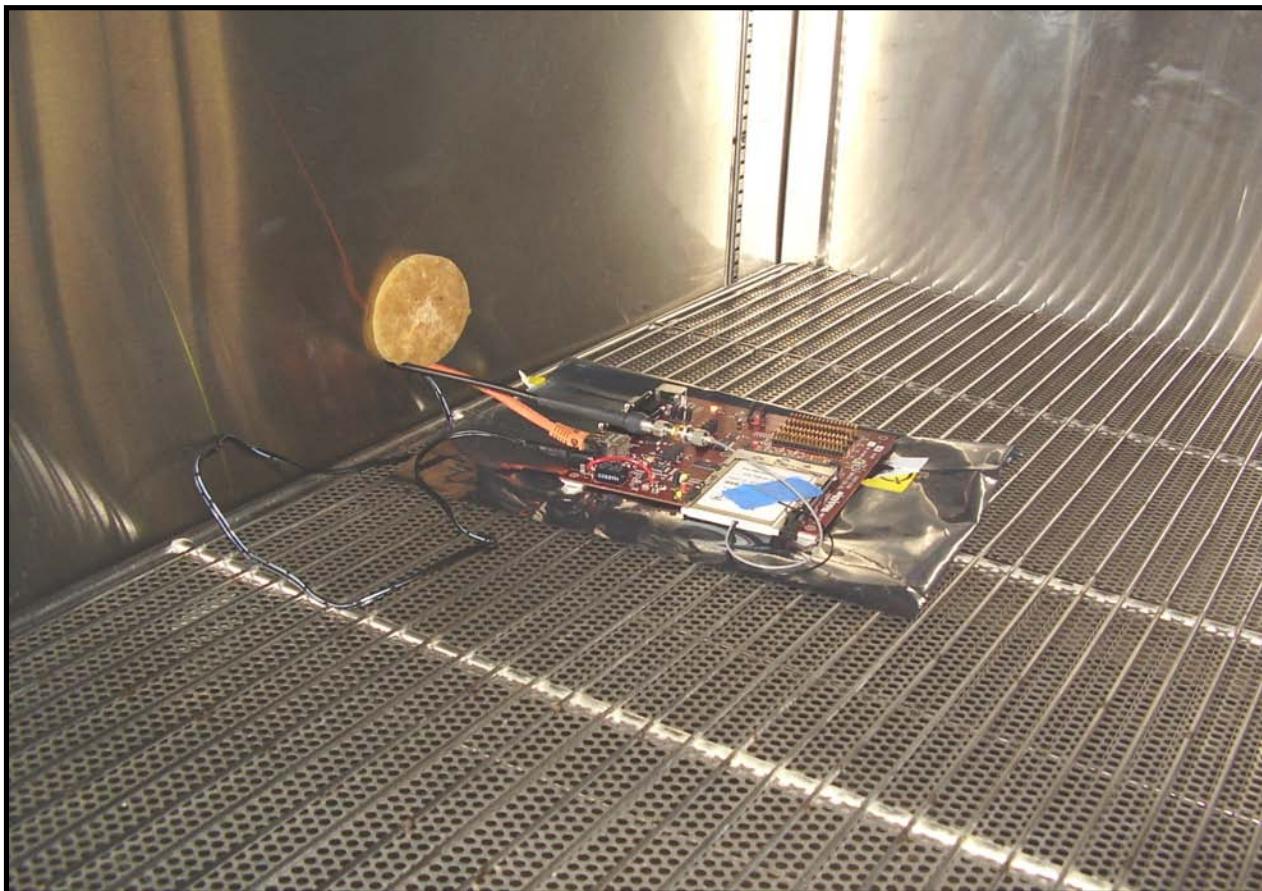
Temp (°C)	Power (Vdc)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
24	5.0	5200.000000	5199.971244	5.53	100
24	5.0	5300.000000	5299.970916	5.49	100
24	5.0	5600.000000	5599.969933	5.37	100

Extreme power source conditions

Power (Vdc)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
4.7	5200.000000	5199.972765	5.24	100
4.7	5300.000000	5299.971985	5.29	100
4.7	5600.000000	5599.970137	5.33	100
Power (Vdc)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
5.25	5200.000000	5199.975210	4.77	100
5.25	5300.000000	5299.975366	4.65	100
5.25	5600.000000	5599.975280	4.41	100

Extreme temperature conditions

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Limit (ppm)
-30	5200.000000	5200.017989	3.46	100
-30	5300.000000	5300.018308	3.45	100
-30	5600.000000	5600.019121	3.41	100
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Limit (ppm)
-20	5200.000000	5200.017969	3.46	100
-20	5300.000000	5300.018107	3.42	100
-20	5600.000000	5600.019023	3.40	100
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Limit (ppm)
-10	5200.000000	5200.013435	2.58	100
-10	5300.000000	5300.013645	2.57	100
-10	5600.000000	5600.014175	2.53	100
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Limit (ppm)
0	5200.000000	5200.002153	0.41	100
0	5300.000000	5300.002320	0.44	100
0	5600.000000	5600.002391	0.43	100
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Limit (ppm)
10	5200.000000	5199.987075	2.49	100
10	5300.000000	5299.986376	2.57	100
10	5600.000000	5599.986807	2.36	100
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Limit (ppm)
20	5200.000000	5199.975863	4.64	100
20	5300.000000	5299.975406	4.64	100
20	5600.000000	5599.973793	4.68	100
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Limit (ppm)
30	5200.000000	5199.962696	7.17	100
30	5300.000000	5299.962121	7.15	100
30	5600.000000	5599.959984	7.15	100
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Limit (ppm)
40	5200.000000	5199.958686	7.95	100
40	5300.000000	5299.957834	7.96	100
40	5600.000000	5599.955367	7.97	100
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Limit (ppm)
50	5200.000000	5199.957954	8.09	100
50	5300.000000	5299.957051	8.10	100
50	5600.000000	5599.954491	8.13	100



# Peak Transmit Power

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

## TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4407B	AAU	12/8/2006	13

## MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

## TEST DESCRIPTION

FCC Public Notice DA 02-2138 was followed. The transmit frequency was set to the lowest, a medium, and the highest channels in each band. The transmit power was set to its default maximum. The EUT's only data rate was measured. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input. The amplitude accuracy of the spectrum analyzer was further enhanced by calibrating the setup using the power meter and synthesized signal generator.

Prior to measuring peak transmit power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Peak Transmit Power. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report.

Method #1 found in FCC Public Notice DA02-2138 was used because the analyzer sweep time was less than or equal to T.

The spectrum analyzer settings were as follows:

- The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- The RBW = 1 MHz, VBW  $\geq$  3 MHz
- Sample detector mode because the bin width (span / number of spectral points)  $<$  0.5 RBW.
- Trace average 100 traces in power averaging mode (not video averaging).
- Power was integrated across "B", by using the channel power function of the analyzer.

## EMC

## Peak Transmit Power

EUT: Welch Allyn 802.11a Wireless PC Card

Work Order: PROT0295

Serial Number: 001AFA0000CE

Date: 08/13/07

Customer: Welch Allyn Protocol, Inc.

Temperature: 25°C

Attendees: None

Humidity: 34%

Project: None

Barometric Pres.: 1020.4mb

Tested by: Holly Ashkannejhad

Power: 5VDC nominal

Job Site: EV06

## TEST SPECIFICATIONS

## Test Method

FCC 15.407:2006

ANSI C63.4:2003 DA 02-2138:2002

## COMMENTS

## DEVIATIONS FROM TEST STANDARD

Configuration #

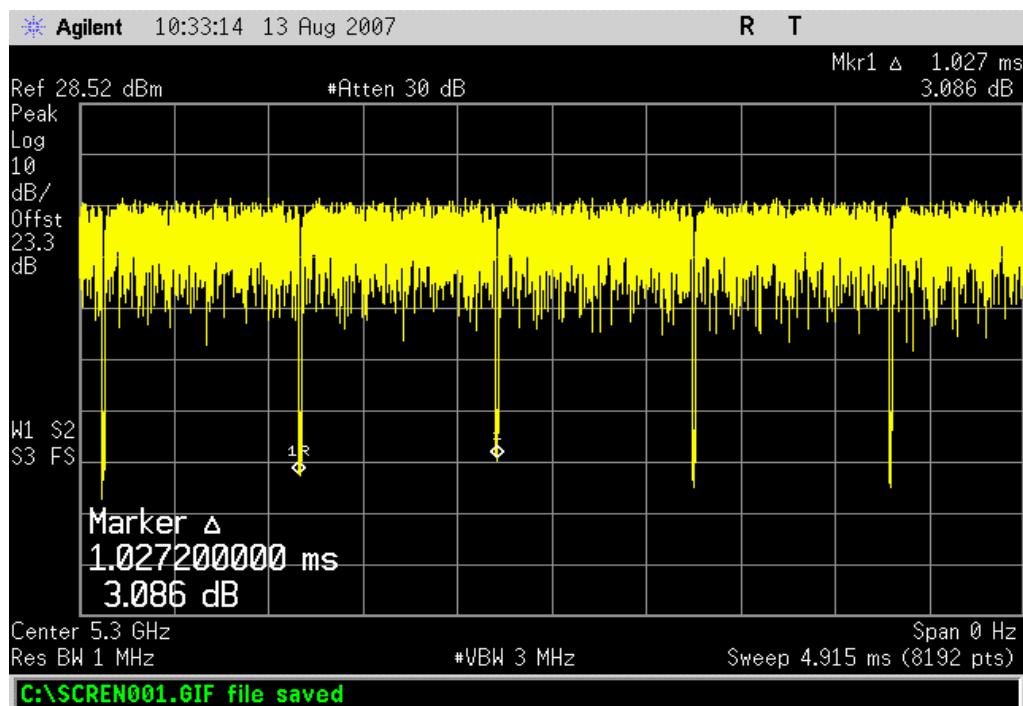
1

Signature

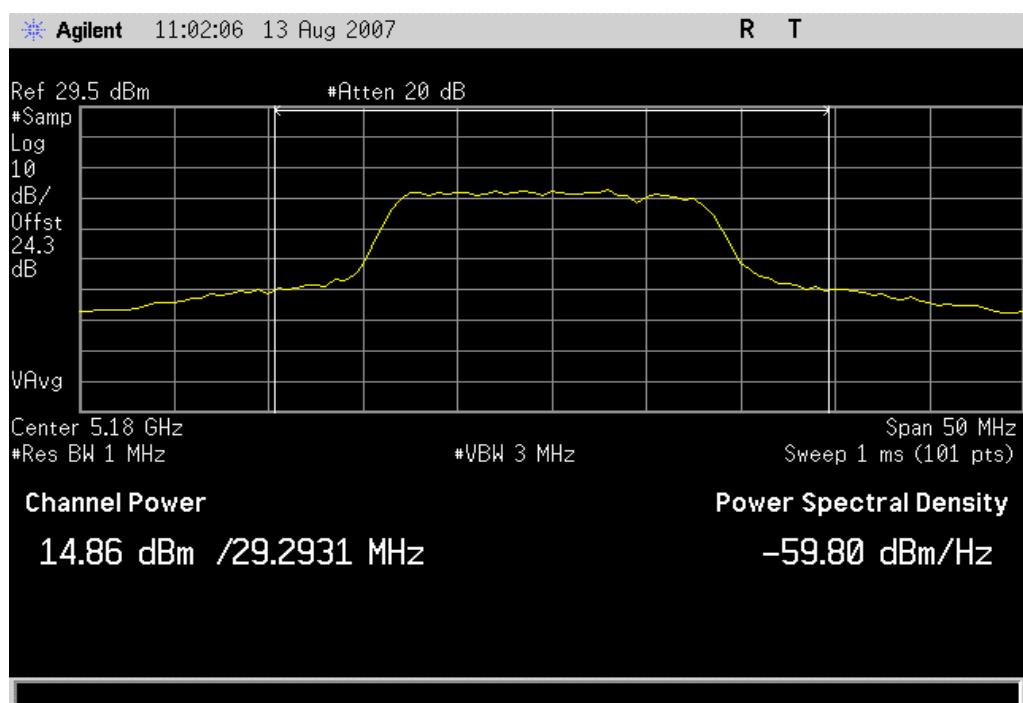
*Holly Ashkannejhad*

			Value	Limit	Results
Transmission Burst Duration					
802.11(a), 6Mbps	Transmission Burst Duration		1.0272 msec	N/A	N/A
5150 - 5250 MHz Band					
Low Channel, 5180 MHz			14.86 dBm	17 dBm	Pass
Mid channel, 5200 MHz			14.79 dBm	17 dBm	Pass
High channel, 5240 MHz			14.31 dBm	17 dBm	Pass
5250 - 5350 MHz Band					
Low channel, 5260 MHz			14.48 dBm	24 dBm	Pass
Mid channel, 5300 MHz			13.92 dBm	24 dBm	Pass
High channel, 5320 MHz			14.27 dBm	24 dBm	Pass
5470-5725 MHz Band					
Low channel, 5500 MHz			14.37 dBm	24 dBm	Pass
Mid channel, 5600 MHz			13.95 dBm	24 dBm	Pass
High channel, 5700 MHz			13.99 dBm	24 dBm	Pass

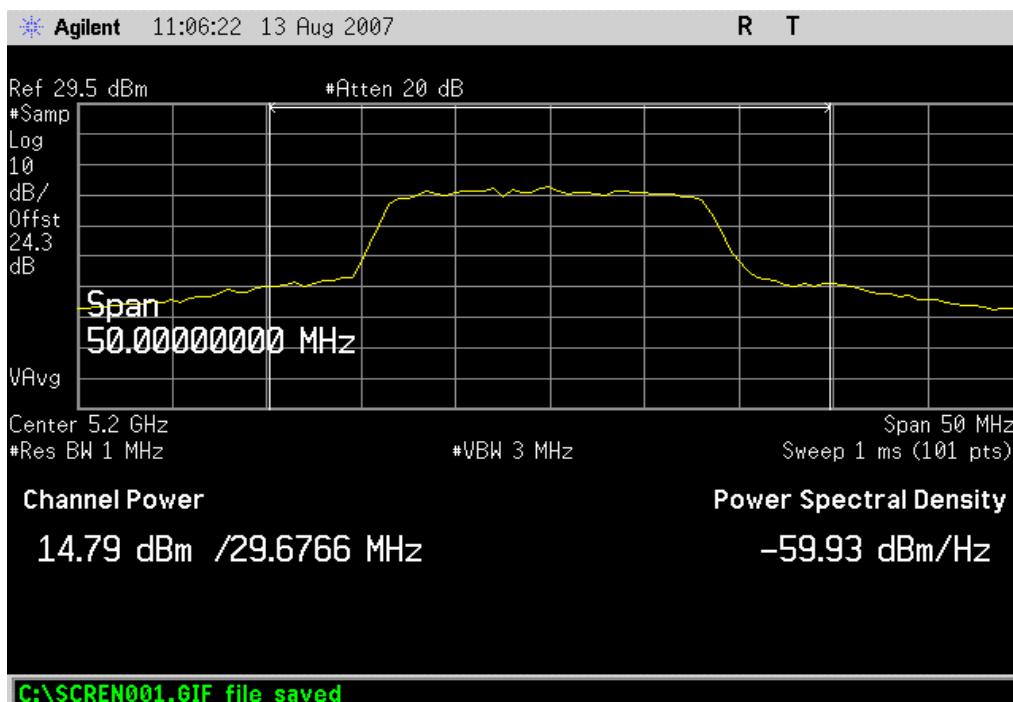
Transmission Burst Duration		
<b>Result:</b> N/A	<b>Value:</b> 1.0272 msec	<b>Limit:</b> N/A



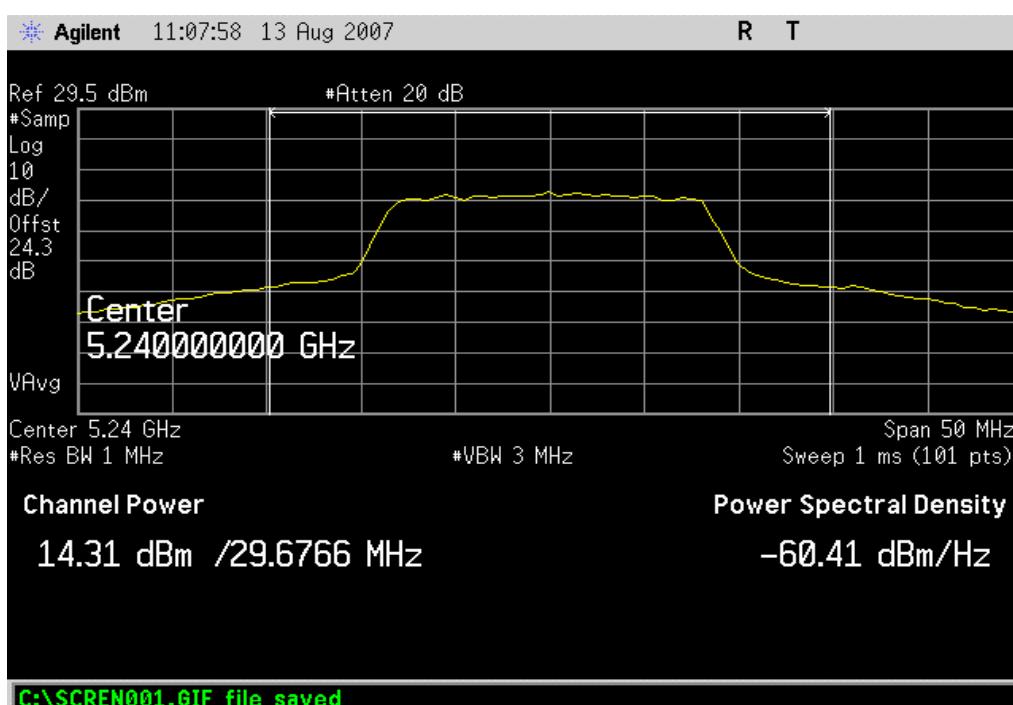
802.11(a), 6Mbps, 5150 - 5250 MHz Band, Low Channel, 5180 MHz		
<b>Result:</b> Pass	<b>Value:</b> 14.86 dBm	<b>Limit:</b> 17 dBm



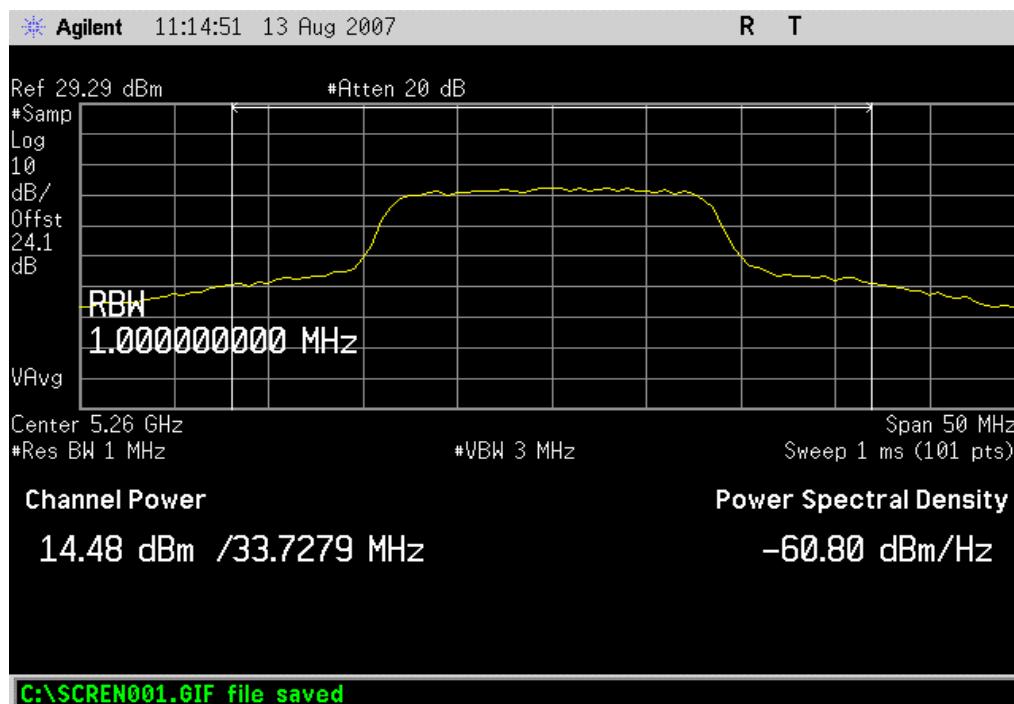
802.11(a), 6Mbps, 5150 - 5250 MHz Band, Mid channel, 5200 MHz		
Result: Pass	Value: 14.79 dBm	Limit: 17 dBm



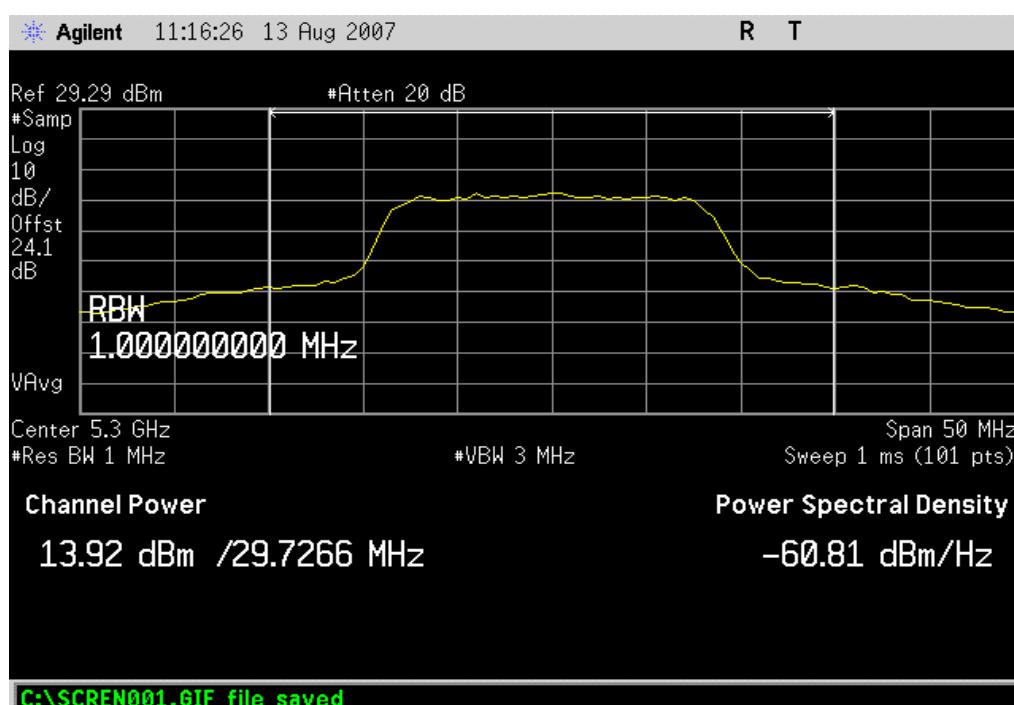
802.11(a), 6Mbps, 5150 - 5250 MHz Band, High channel, 5240 MHz		
Result: Pass	Value: 14.31 dBm	Limit: 17 dBm



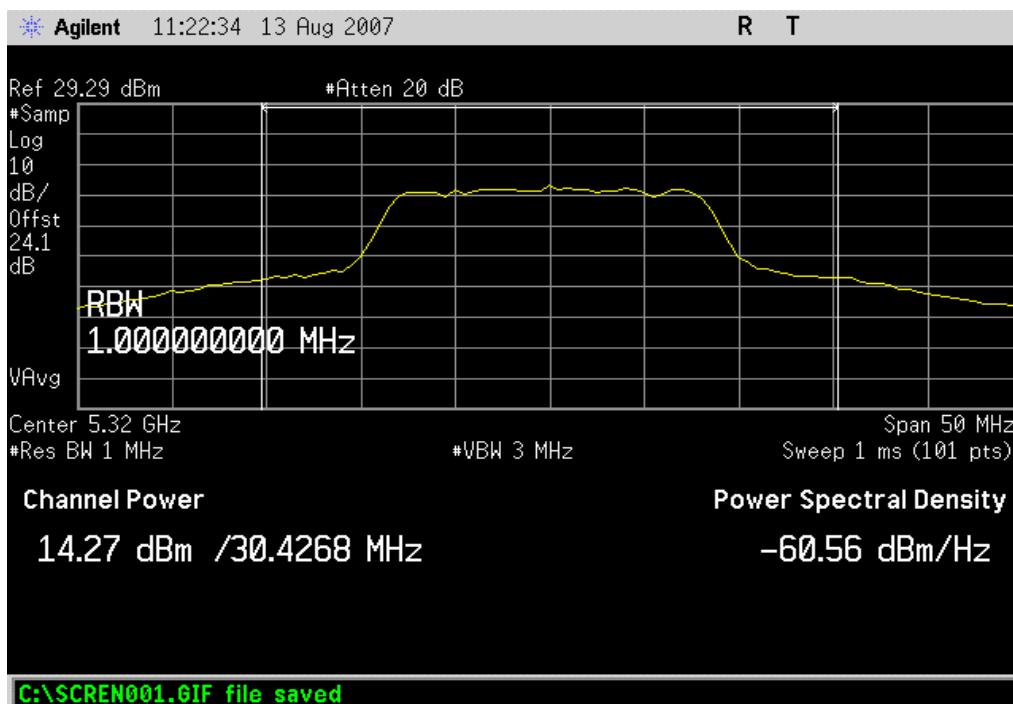
802.11(a), 6Mbps, 5250 - 5350 MHz Band, Low channel, 5260 MHz		
Result: Pass	Value: 14.48 dBm	Limit: 24 dBm



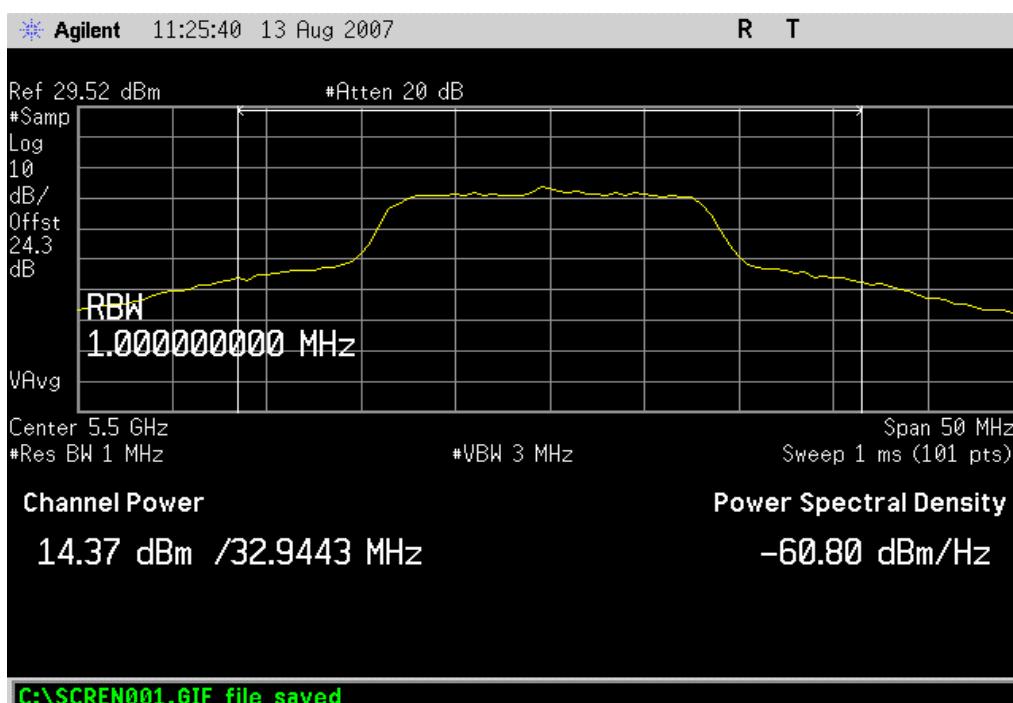
802.11(a), 6Mbps, 5250 - 5350 MHz Band, Mid channel, 5300 MHz		
Result: Pass	Value: 13.92 dBm	Limit: 24 dBm



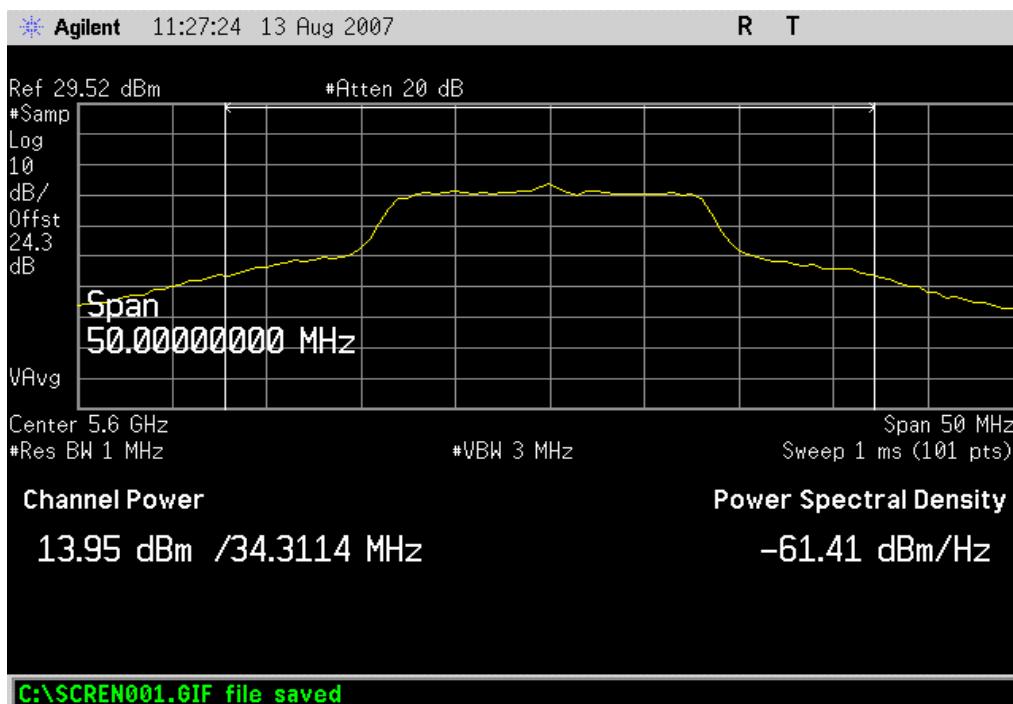
802.11(a), 6Mbps, 5250 - 5350 MHz Band, High channel, 5320 MHz		
Result: Pass	Value: 14.27 dBm	Limit: 24 dBm



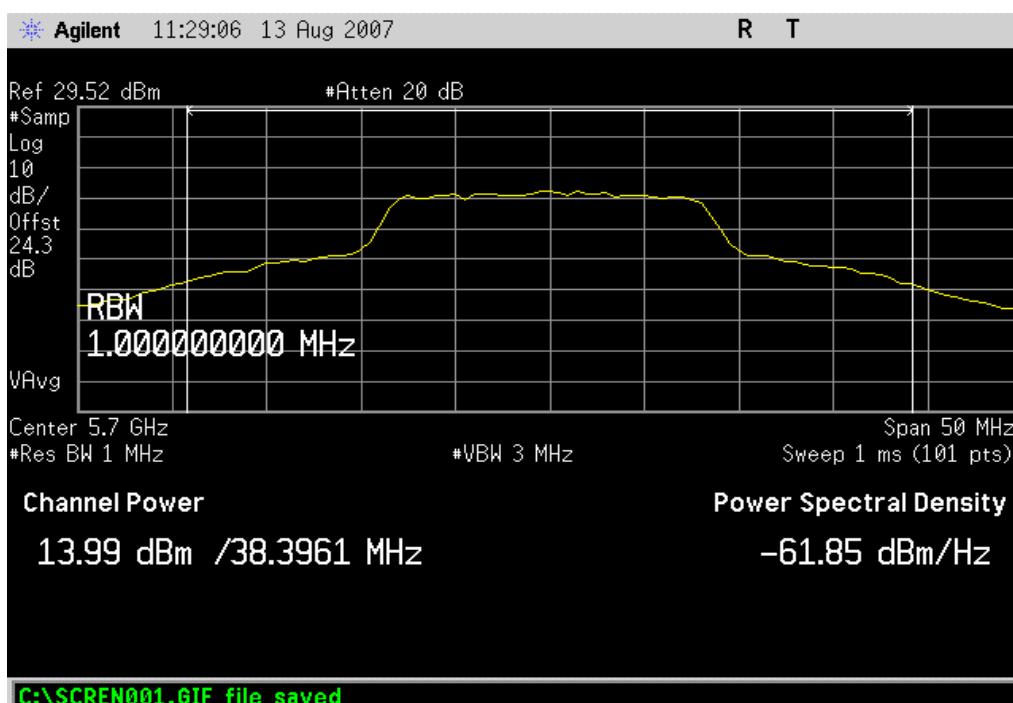
802.11(a), 6Mbps, 5470-5725 MHz Band, Low channel, 5500 MHz		
Result: Pass	Value: 14.37 dBm	Limit: 24 dBm

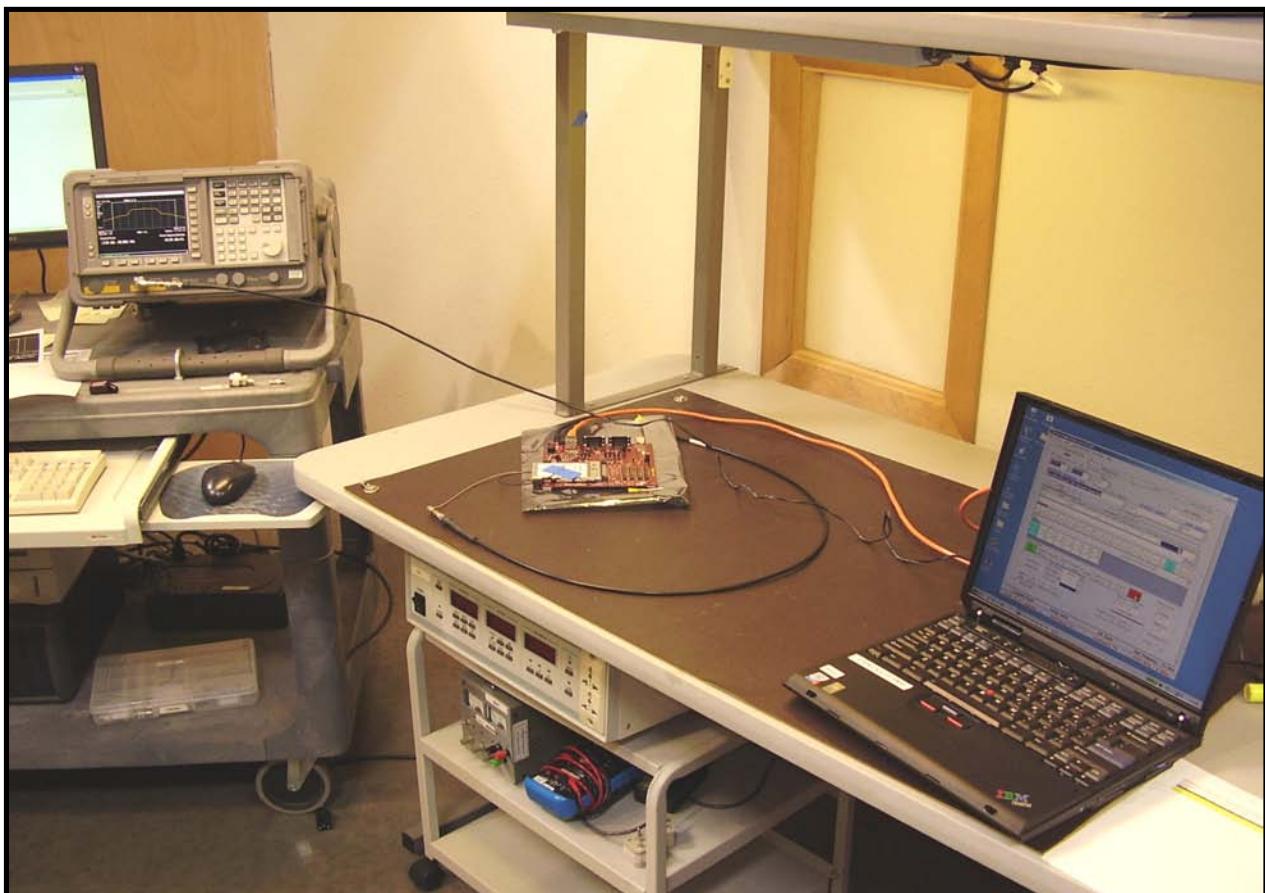


802.11(a), 6Mbps, 5470-5725 MHz Band, Mid channel, 5600 MHz		
Result: Pass	Value: 13.95 dBm	Limit: 24 dBm



802.11(a), 6Mbps, 5470-5725 MHz Band, High channel, 5700 MHz		
Result: Pass	Value: 13.99 dBm	Limit: 24 dBm





Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT					
Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4407B	AAU	12/8/2006	13

#### MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

#### TEST DESCRIPTION

FCC Public Notice DA 02-2138 was followed. The transmit frequency was set to the lowest, a medium, and the highest channels in each band. The transmit power was set to its default maximum. The EUT's only data rate was measured. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

- Span set to encompass the entire emission bandwidth (B), centered on the transmit channel.
- Using the marker delta function, the largest difference between the following two traces was measured:
  - 1st Trace: RBW = 1 MHz, VBW  $\geq$  3 MHz with peak detector and max-hold settings.
  - 2nd Trace: Use same settings as were used for peak conducted transmit power.

## Peak Excursion of the Modulation Envelope

EUT: Welch Allyn 802.11a Wireless PC Card	Work Order: PROT0295
Serial Number: 001AFA0000CE	Date: 08/13/07
Customer: Welch Allyn Protocol, Inc.	Temperature: 24°C
Attendees: None	Humidity: 35%
Project: None	Barometric Pres.: 1020.4mb
Tested by: Holly Ashkannejhad	Job Site: EV06

## TEST SPECIFICATIONS

FCC 15.407:2006	Test Method: ANSI C63.4:2003 DA 02-2138:2002

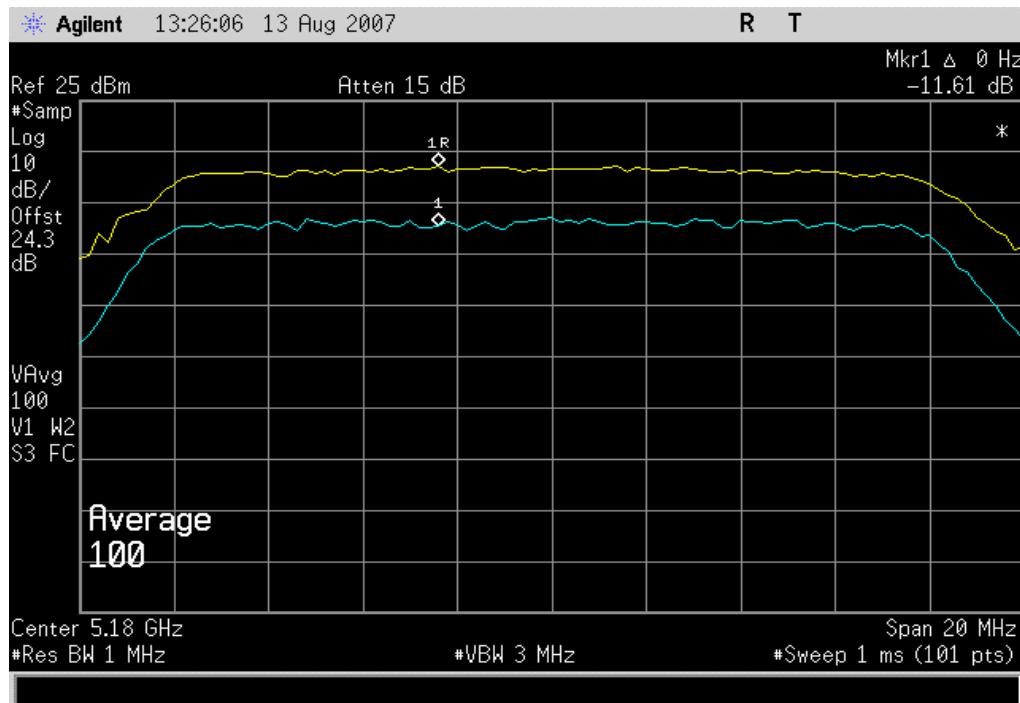
## COMMENTS

## DEVIATIONS FROM TEST STANDARD

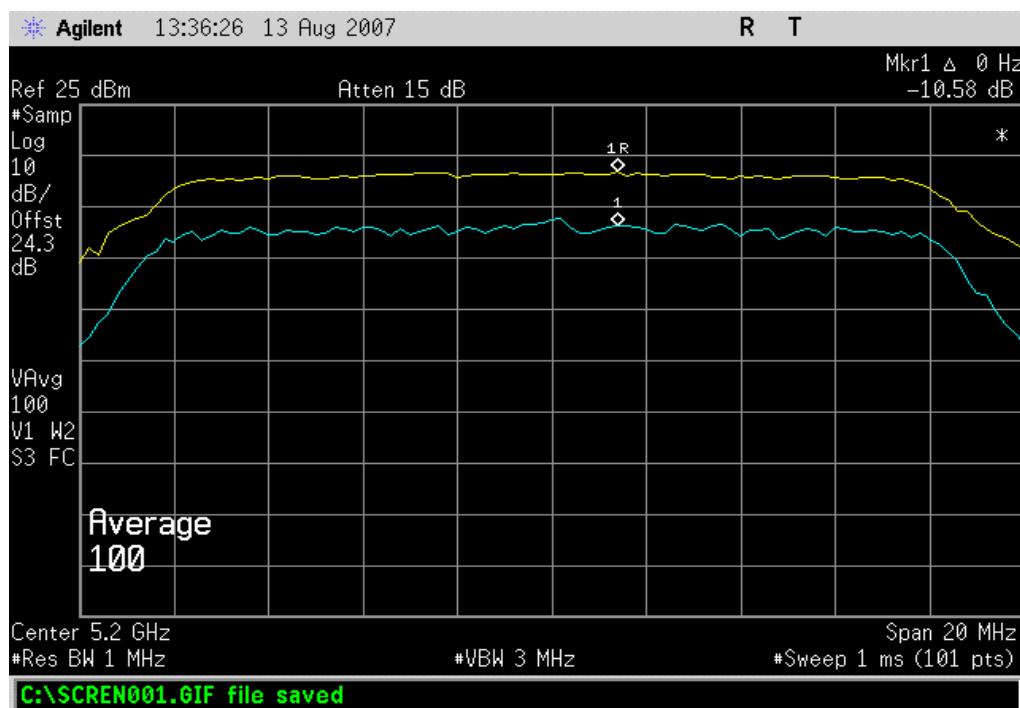
Configuration #	1	Signature	
		<i>Holly Ashkannejhad</i>	

		Value	Limit	Results
802.11(a), 6Mbps				
5150 - 5250 MHz band				
Low channel, 5180MHz	11.61 dB	≤ 13 dB	Pass	
Mid channel, 5200MHz	10.58 dB	≤ 13 dB	Pass	
High channel, 5240MHz	11.15 dB	≤ 13 dB	Pass	
5250 - 5350 MHz band				
Low channel, 5260MHz	11.3 dB	≤ 13 dB	Pass	
Mid channel, 5300MHz	11.25 dB	≤ 13 dB	Pass	
High channel 5320MHz	11.32 dB	≤ 13 dB	Pass	
5470 - 5725 MHz band				
Low channel, 5500MHz	9.052 dB	≤ 13 dB	Pass	
Mid channel, 5600MHz	9.287 dB	≤ 13 dB	Pass	
High channel, 5700MHz	8.99 dB	≤ 13 dB	Pass	

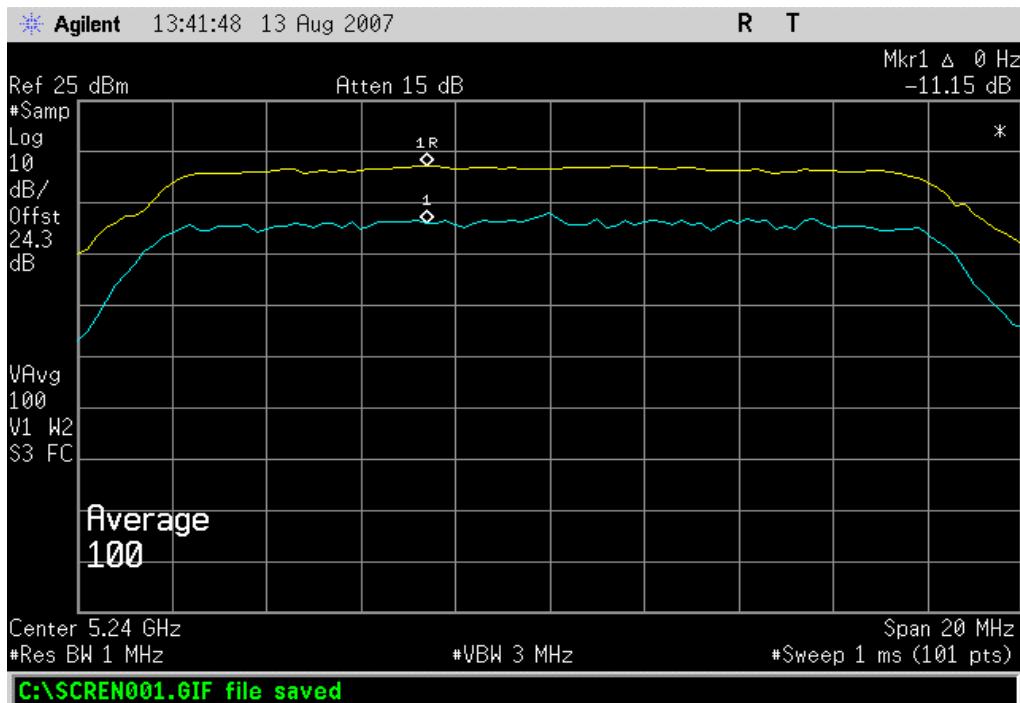
802.11(a), 6Mbps, 5150 - 5250 MHz band, Low channel, 5180MHz		
<b>Result:</b> Pass	<b>Value:</b> 11.61 dB	<b>Limit:</b> $\leq 13$ dB



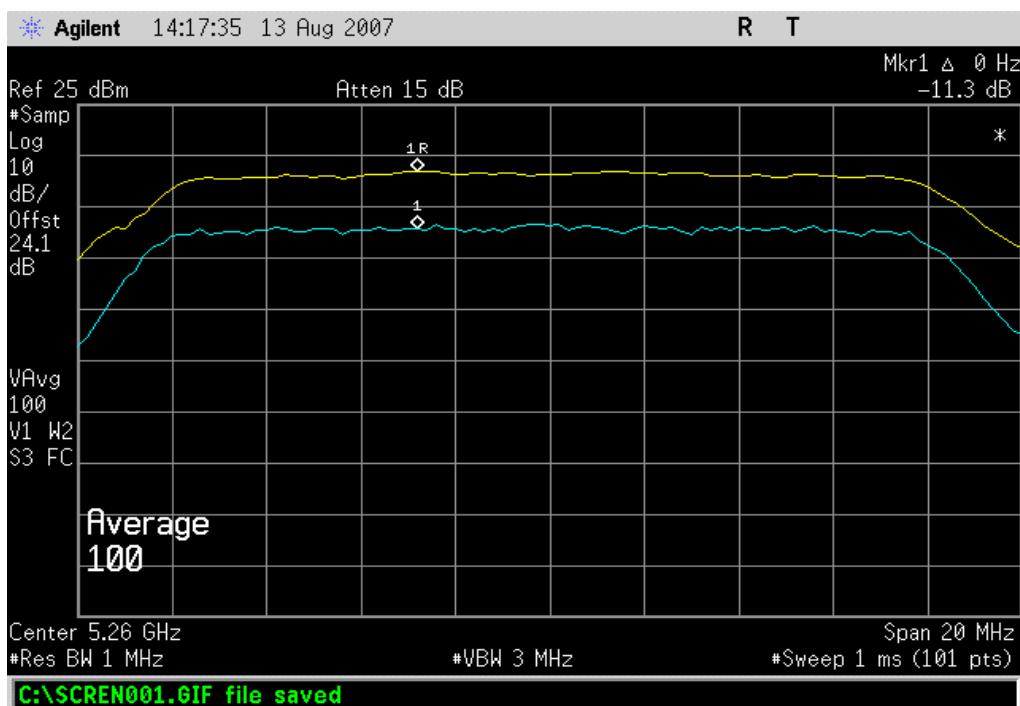
802.11(a), 6Mbps, 5150 - 5250 MHz band, Mid channel, 5200MHz		
<b>Result:</b> Pass	<b>Value:</b> 10.58 dB	<b>Limit:</b> $\leq 13$ dB



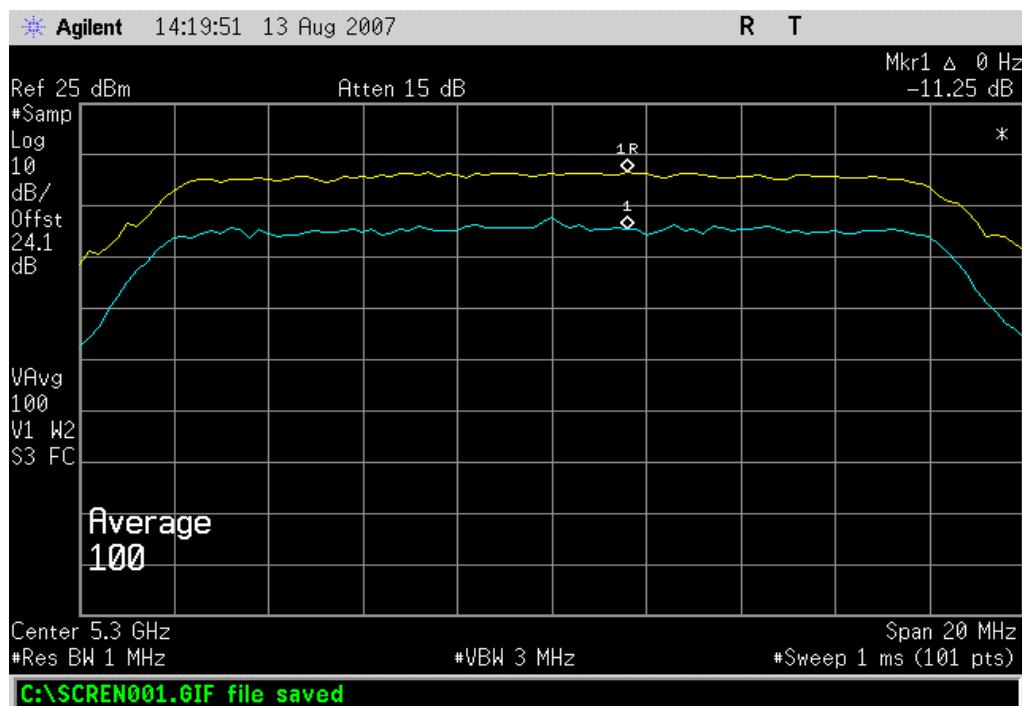
802.11(a), 6Mbps, 5150 - 5250 MHz band, High channel, 5240MHz		
<b>Result:</b> Pass	<b>Value:</b> 11.15 dB	<b>Limit:</b> $\leq 13$ dB



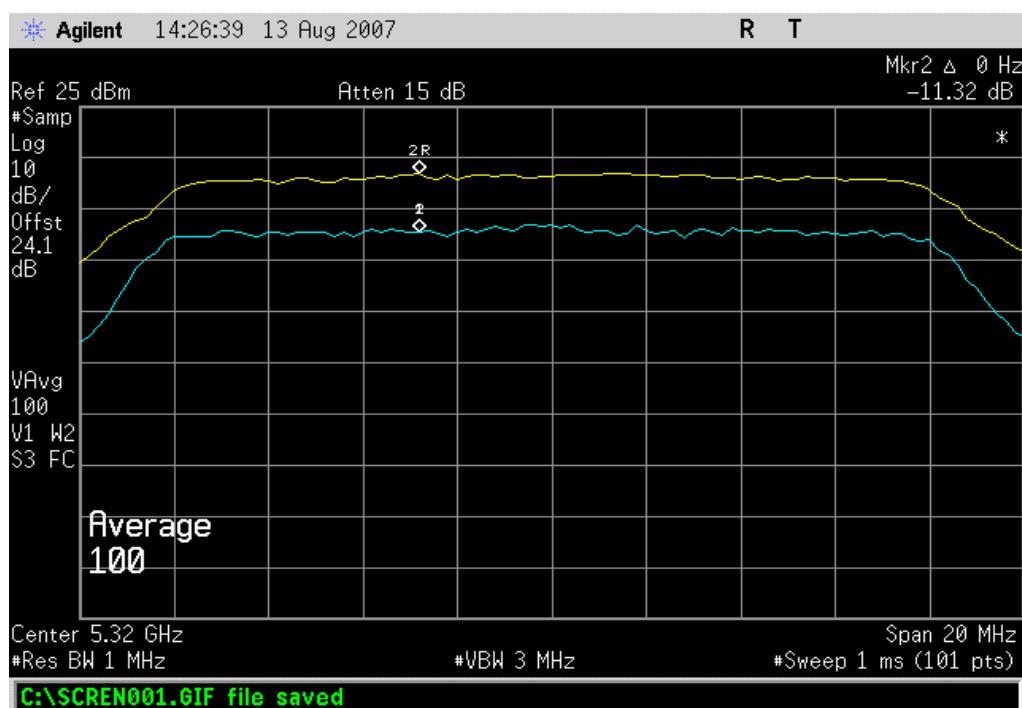
802.11(a), 6Mbps, 5250 - 5350 MHz band, Low channel, 5260MHz		
<b>Result:</b> Pass	<b>Value:</b> 11.3 dB	<b>Limit:</b> $\leq 13$ dB



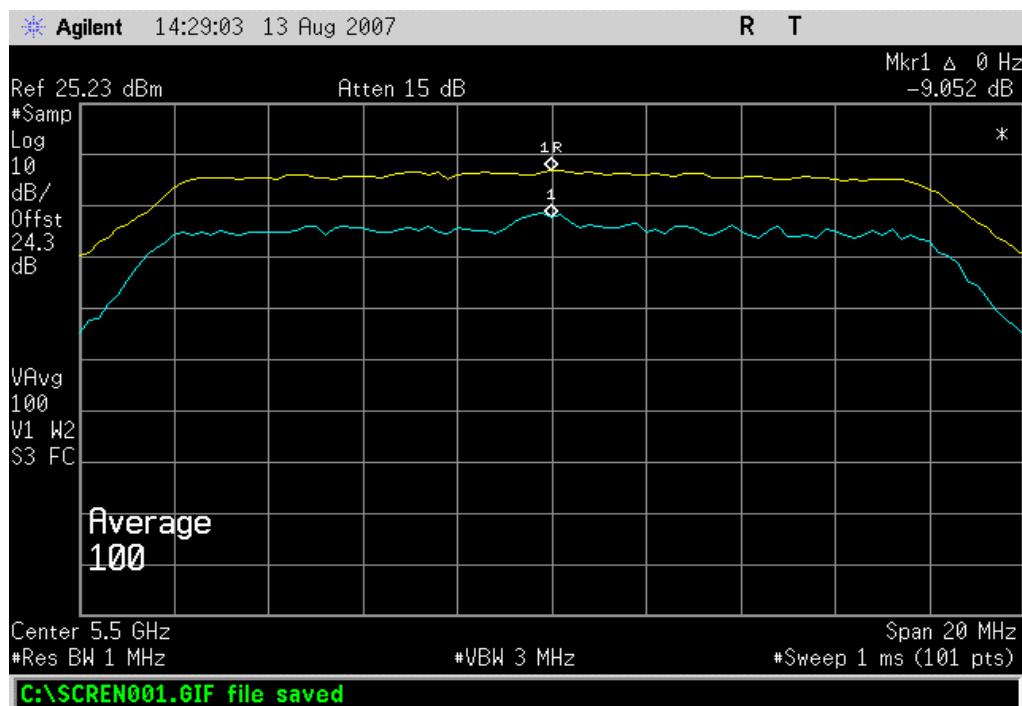
802.11(a), 6Mbps, 5250 - 5350 MHz band, Mid channel, 5300MHz		
<b>Result:</b> Pass	<b>Value:</b> 11.25 dB	<b>Limit:</b> $\leq 13$ dB



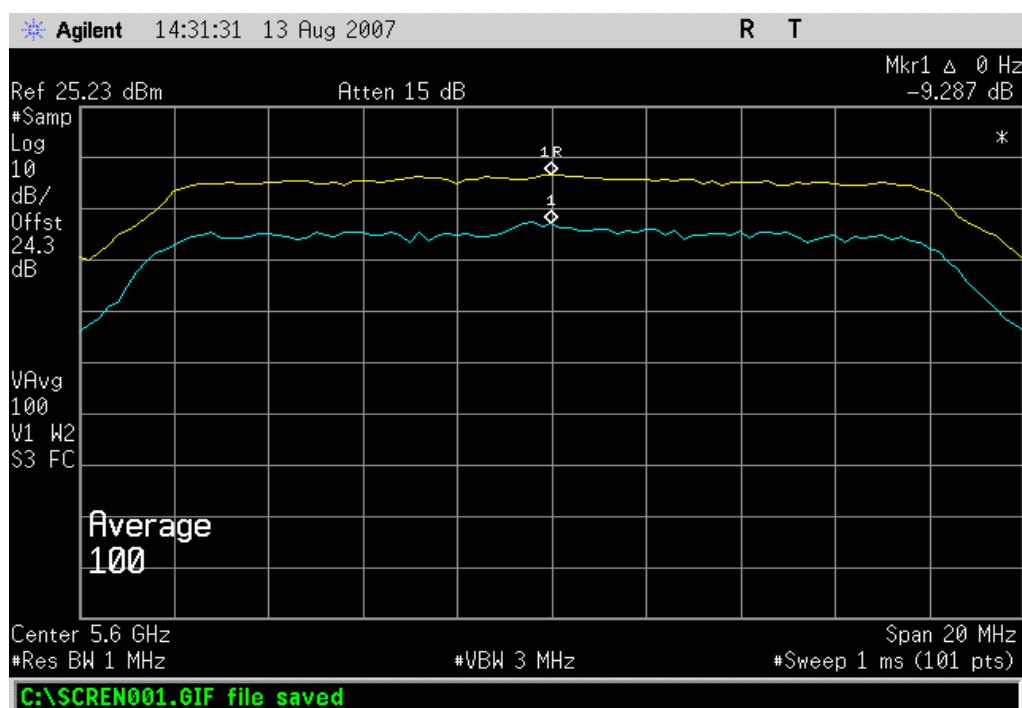
802.11(a), 6Mbps, 5250 - 5350 MHz band, High channel 5320MHz		
<b>Result:</b> Pass	<b>Value:</b> 11.32 dB	<b>Limit:</b> $\leq 13$ dB



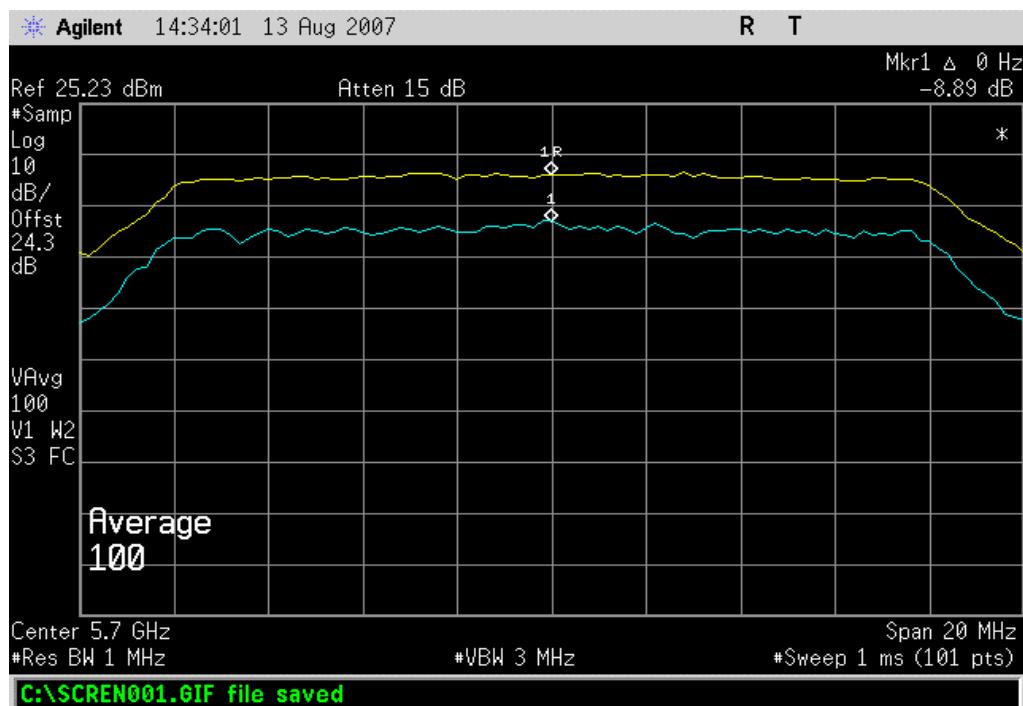
802.11(a), 6Mbps, 5470 - 5725 MHz band, Low channel, 5500MHz		
<b>Result:</b> Pass	<b>Value:</b> 9.052 dB	<b>Limit:</b> $\leq 13$ dB

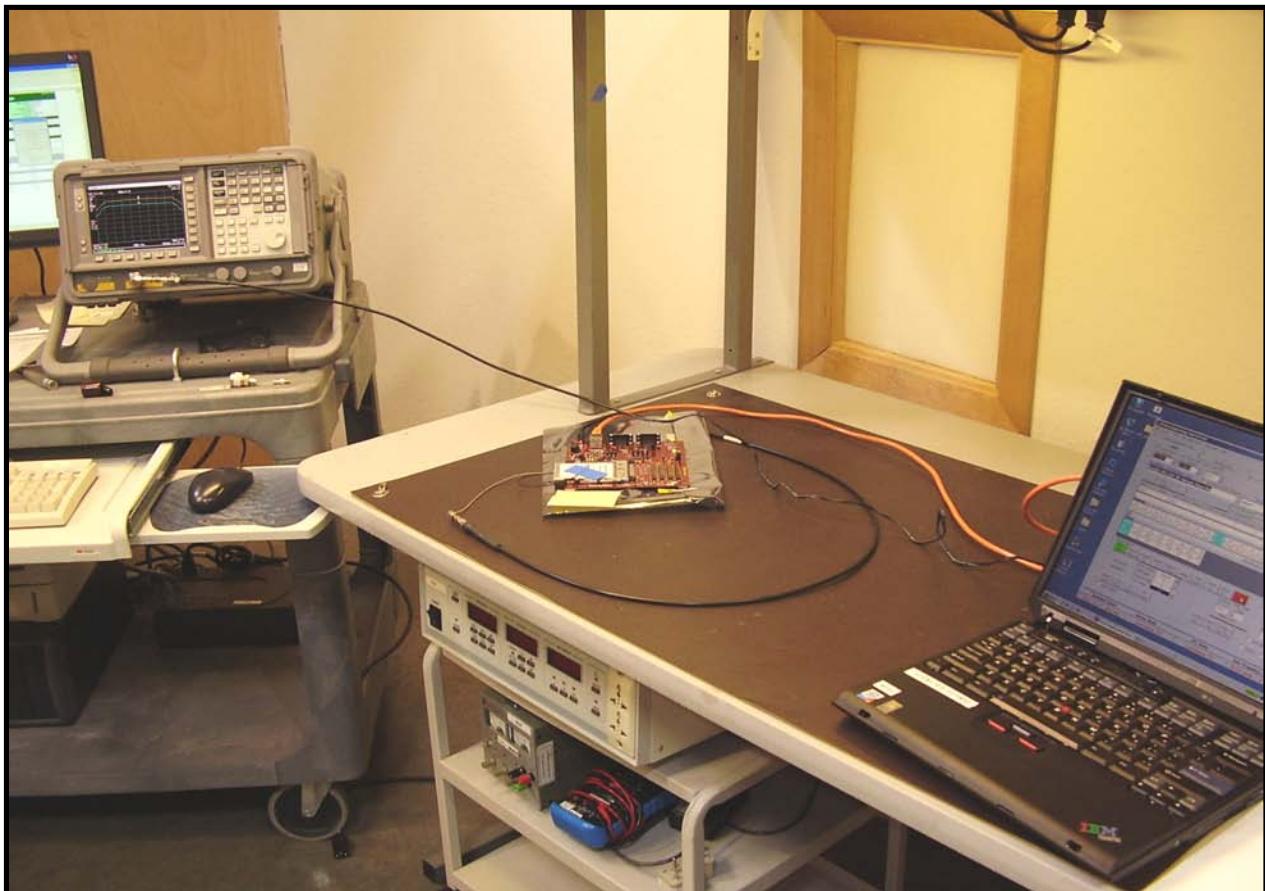


802.11(a), 6Mbps, 5470 - 5725 MHz band, Mid channel, 5600MHz		
<b>Result:</b> Pass	<b>Value:</b> 9.287 dB	<b>Limit:</b> $\leq 13$ dB



802.11(a), 6Mbps, 5470 - 5725 MHz band, High channel, 5700MHz		
<b>Result:</b> Pass	<b>Value:</b> 8.99 dB	<b>Limit:</b> $\leq$ 13 dB





Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4407B	AAU	12/8/2006	13

**MEASUREMENT UNCERTAINTY**

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

**TEST DESCRIPTION**

FCC Public Notice DA 02-2138 was followed. The transmit frequency was set to the lowest, a medium, and the highest channels in each band. The transmit power was set to its default maximum. The EUT's only data rate was measured. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input. The amplitude accuracy of the spectrum analyzer was further enhanced by calibrating the setup using the power meter and synthesized signal generator.

Prior to measuring peak power spectral density, the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring peak power spectral density. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report. The transmission pulse duration (T) was measured across a constant amplitude pulse using an RF detector diode and an oscilloscope. The scope photos are found with the peak power measurement data elsewhere in this report.

Method #2 found in FCC Public Notice DA02-2138 was used because the analyzer sweep time was less than or equal to T.

The spectrum analyzer settings were as follows:

- The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- RBW = 1 MHz, VBW  $\geq$  3 MHz because the emission bandwidth (B) is greater than 1 MHz
- Sample detector mode because the bin width (span / number of spectral points)  $<$  0.5 RBW.
- Trace average 100 traces in power averaging mode (not video averaging).

The peak power spectral density (PPSD) was determined to be the highest level found across the emission in any 1 MHz band after 100 sweeps of power averaging (not video averaging).

## Peak Power Spectral Density

EUT: Welch Allyn 802.11a Wireless PC Card	Work Order: PROT0295
Serial Number: 001AFA0000CE	Date: 08/13/07
Customer: Welch Allyn Protocol, Inc.	Temperature: 24°C
Attendees: None	Humidity: 35%
Project: None	Barometric Pres.: 1020.4mb
Tested by: Holly Ashkannejhad	Job Site: EV06

## TEST SPECIFICATIONS

FCC 15.407:2006	Test Method: ANSI C63.4:2003 DA 02-2138:2002

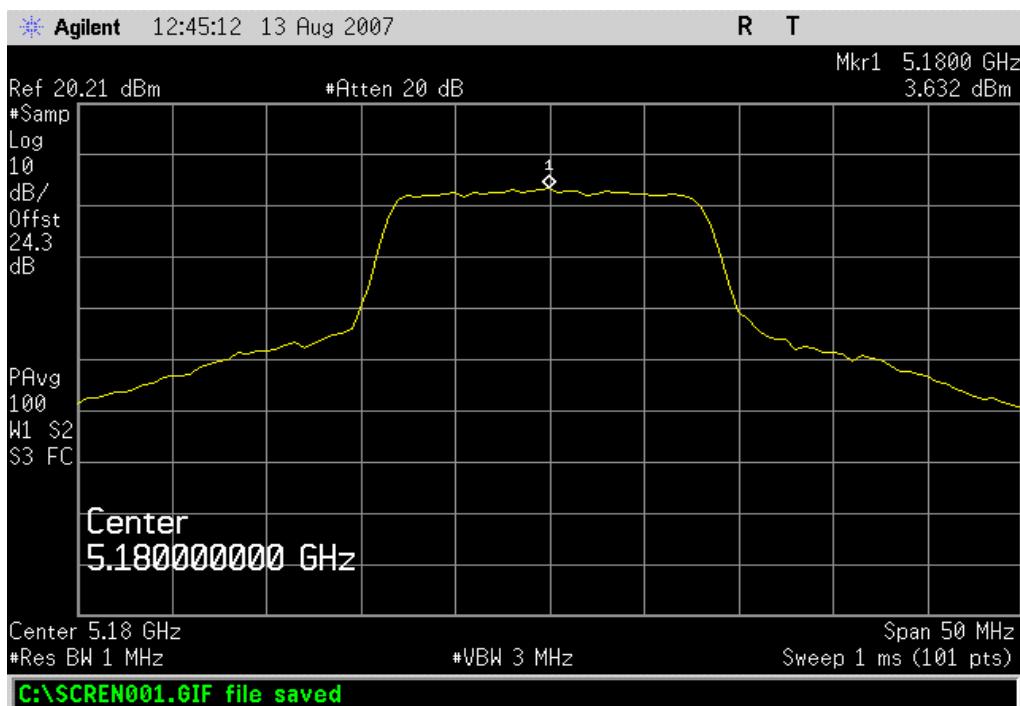
## COMMENTS

## DEVIATIONS FROM TEST STANDARD

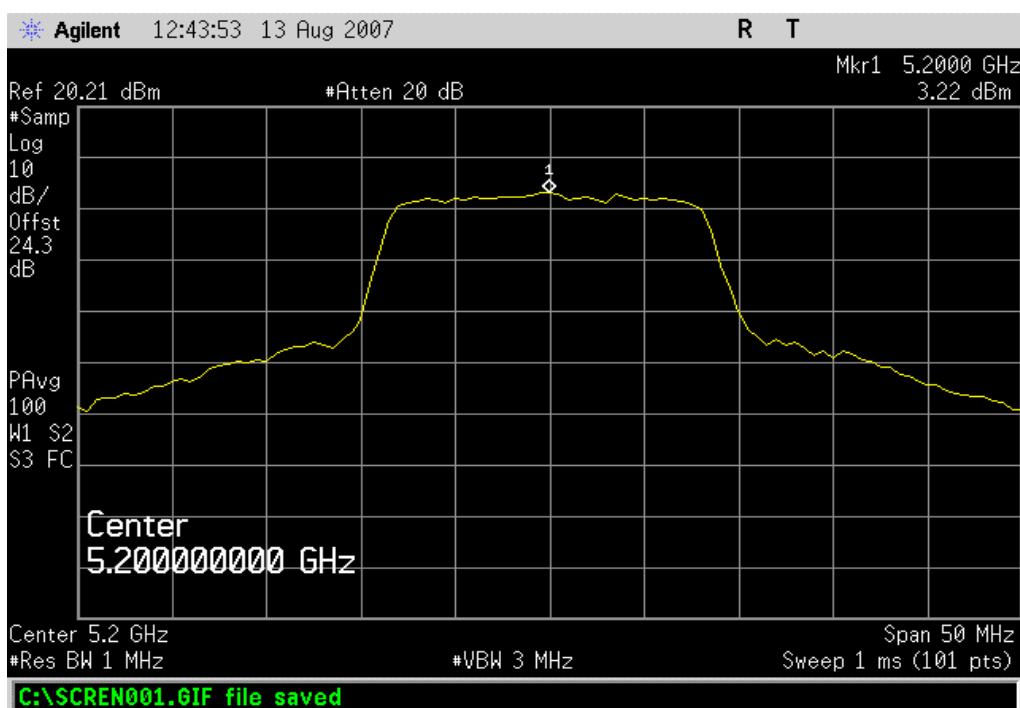
Configuration #	1	Signature			
802.11(a), 6Mbps					

		Value	Limit	Results
<b>802.11(a), 6Mbps</b>				
5150 - 5250 MHz Band				
Low channel, 5180 MHz		3.632 dBm	4 dBm	Pass
Mid channel, 5200 MHz		3.22 dBm	4 dBm	Pass
High channel, 5240 MHz		3.987 dBm	4 dBm	Pass
5250 - 5350 MHz Band				
Low channel, 5260 MHz		3.503 dBm	11 dBm	Pass
Mid channel, 5300 MHz		4.552 dBm	11 dBm	Pass
High channel, 5320 MHz		3.707 dBm	11 dBm	Pass
5470-5725 MHz Band				
Low channel, 5500 MHz		5.461 dBm	11 dBm	Pass
Mid channel, 5600 MHz		4.609 dBm	11 dBm	Pass
High channel, 5700 MHz		3.348 dBm	11 dBm	Pass

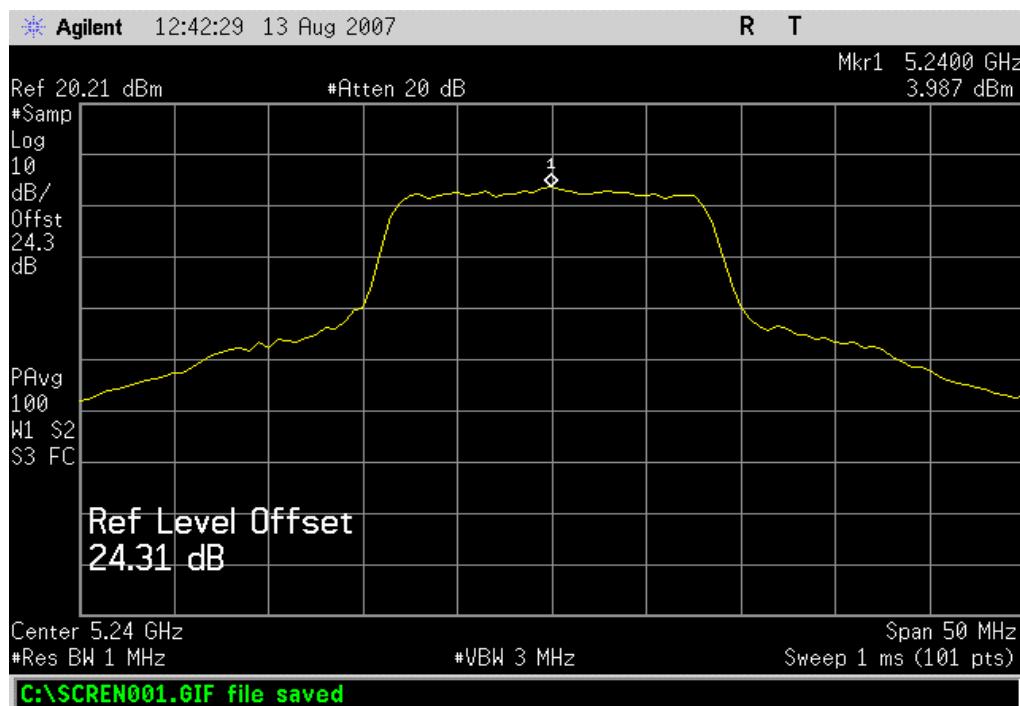
802.11(a), 6Mbps, 5150 - 5250 MHz Band, Low Channel, 5180 MHz		
Result: Pass	Value: 3.632 dBm	Limit: 4 dBm



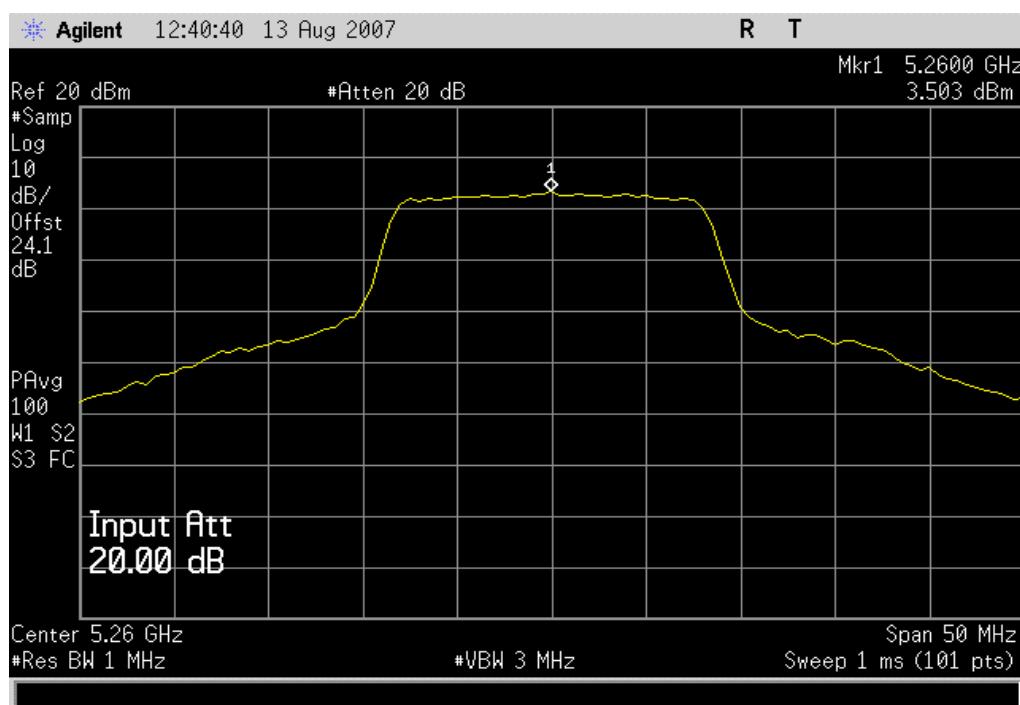
802.11(a), 6Mbps, 5150 - 5250 MHz Band, Mid channel, 5200 MHz		
Result: Pass	Value: 3.22 dBm	Limit: 4 dBm



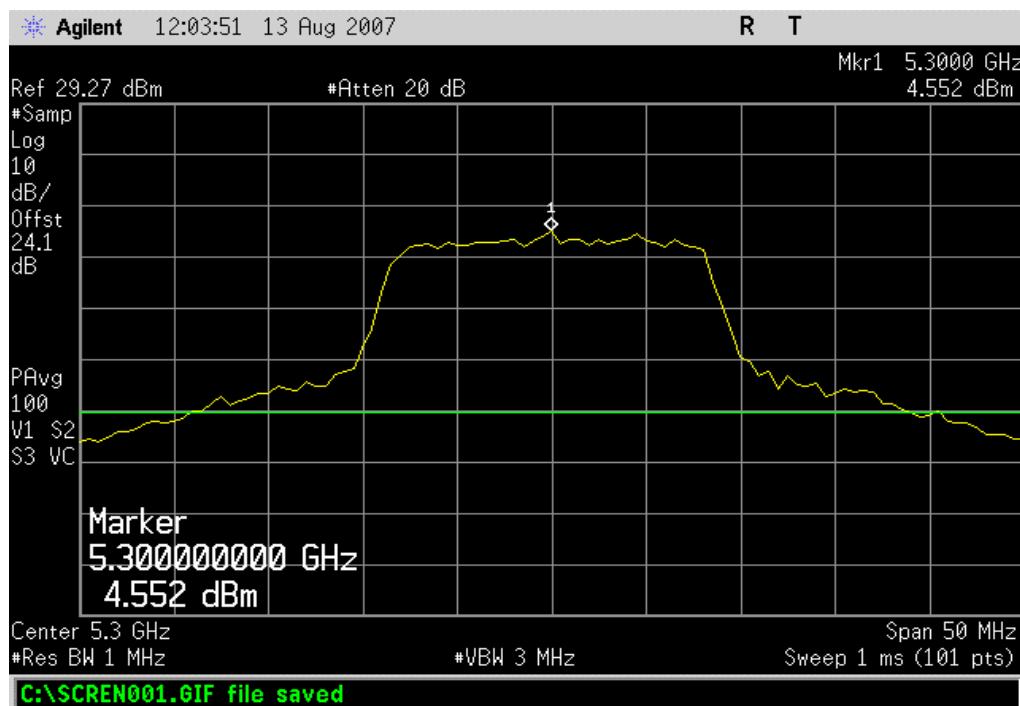
802.11(a), 6Mbps, 5150 - 5250 MHz Band, High channel, 5240 MHz		
Result: Pass	Value: 3.987 dBm	Limit: 4 dBm



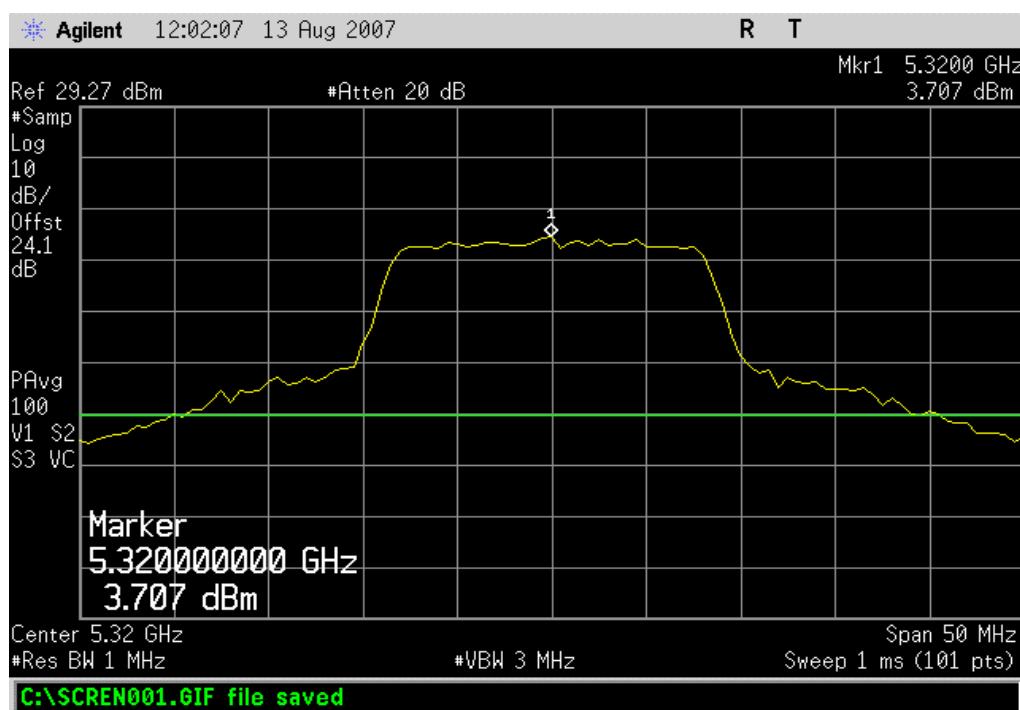
802.11(a), 6Mbps, 5250 - 5350 MHz Band, Low channel, 5260 MHz		
Result: Pass	Value: 3.503 dBm	Limit: 11 dBm



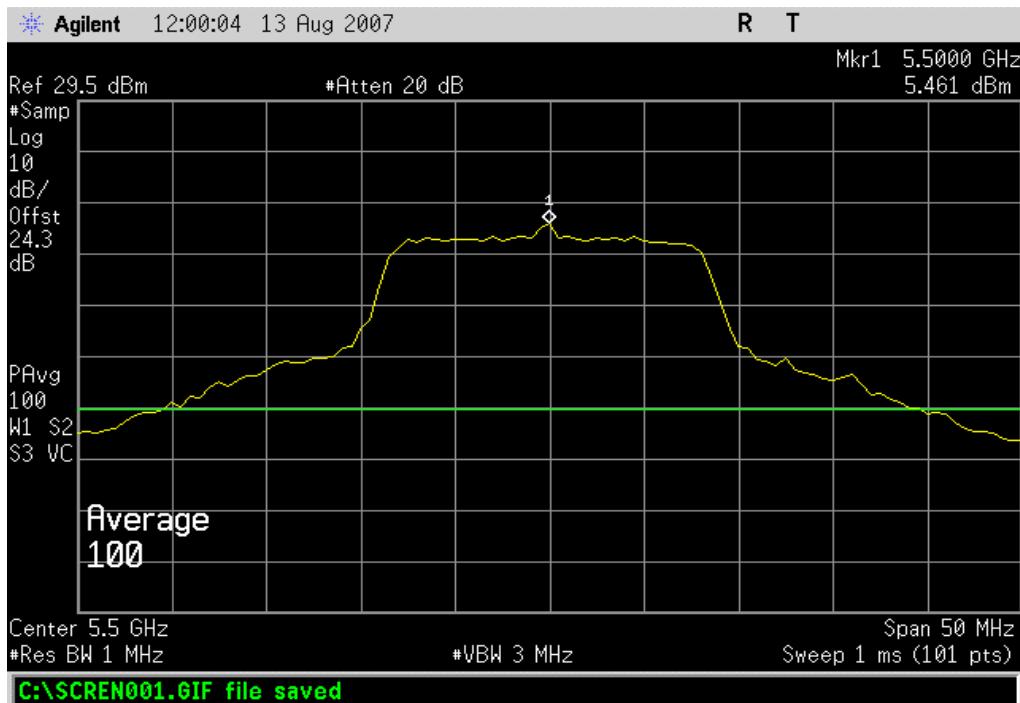
802.11(a), 6Mbps, 5250 - 5350 MHz Band, Mid channel, 5300 MHz		
Result: Pass	Value: 4.552 dBm	Limit: 11 dBm



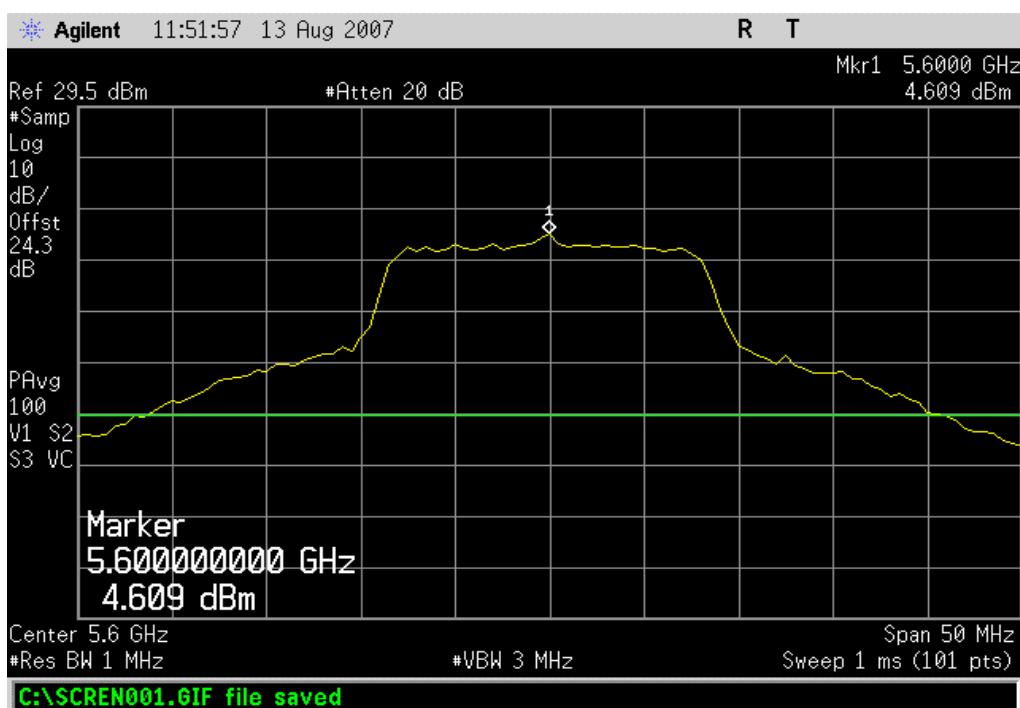
802.11(a), 6Mbps, 5250 - 5350 MHz Band, High channel, 5320 MHz		
Result: Pass	Value: 3.707 dBm	Limit: 11 dBm



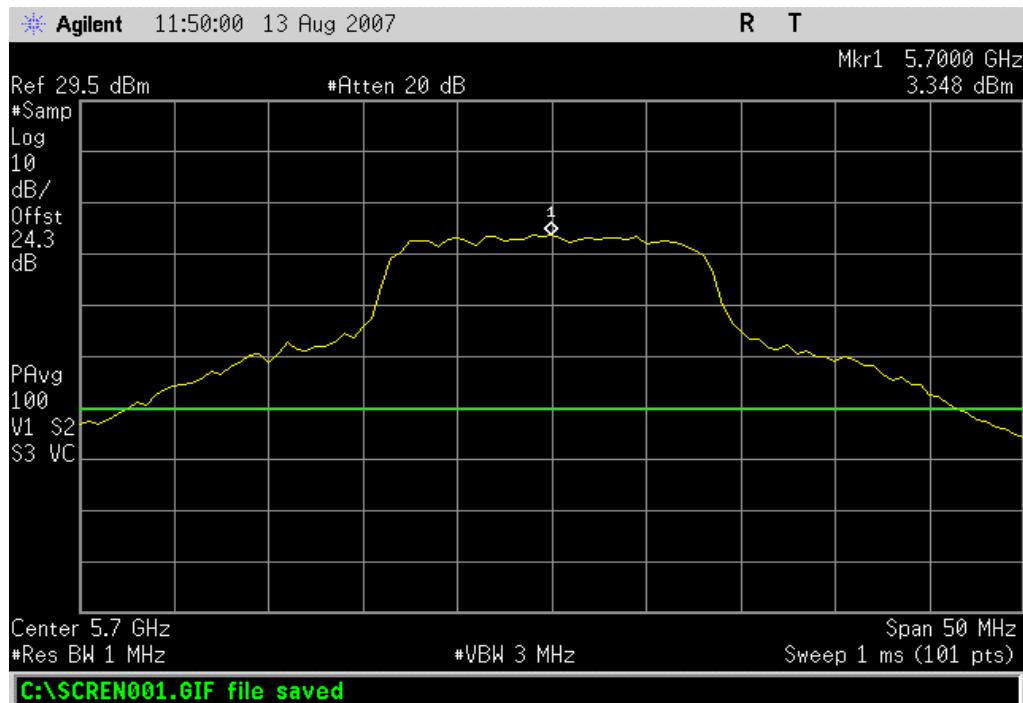
802.11(a), 6Mbps, 5470-5725 MHz Band, Low channel, 5500 MHz		
Result: Pass	Value: 5.461 dBm	Limit: 11 dBm

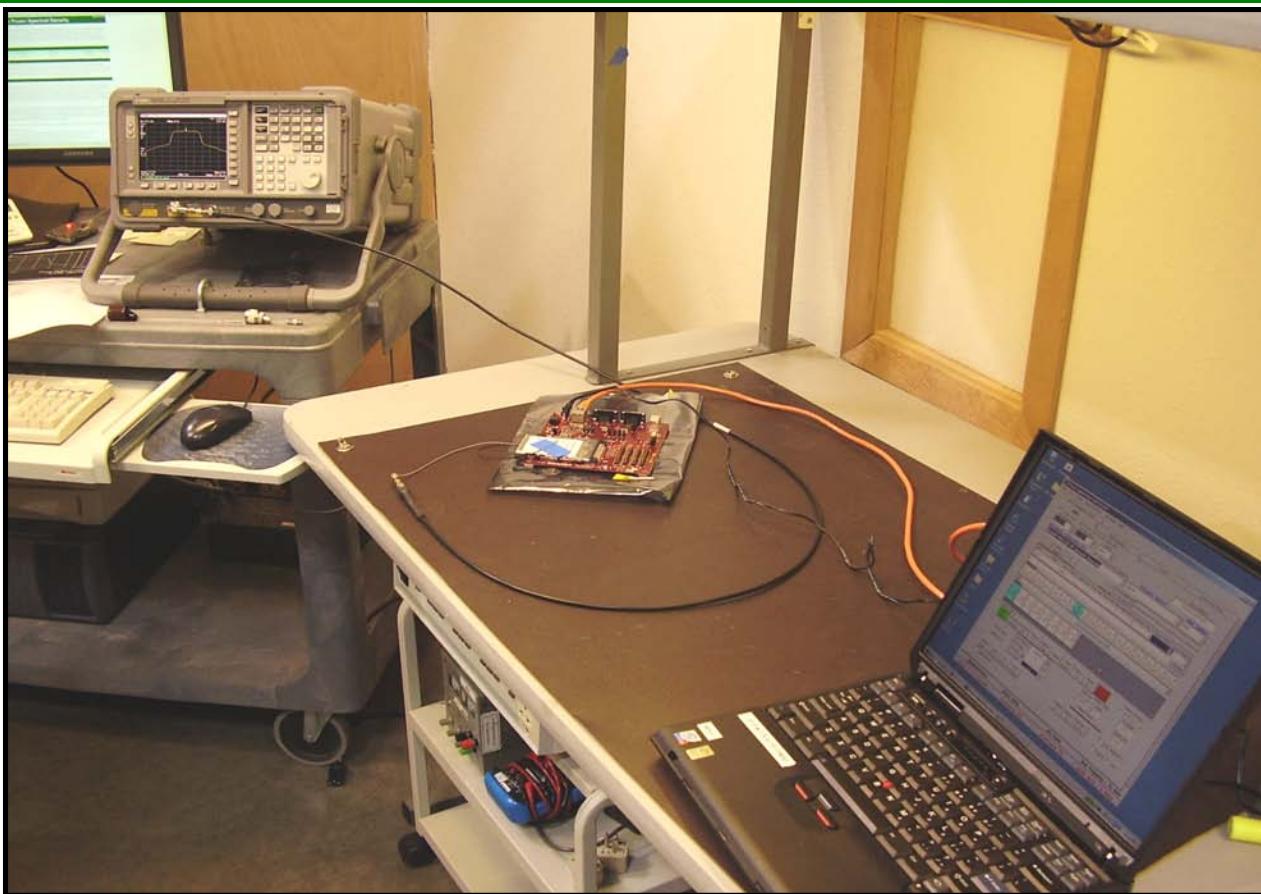


802.11(a), 6Mbps, 5470-5725 MHz Band, Mid channel, 5600 MHz		
Result: Pass	Value: 4.609 dBm	Limit: 11 dBm



802.11(a), 6Mbps, 5470-5725 MHz Band, High channel, 5700 MHz		
<b>Result:</b> Pass	<b>Value:</b> 3.348 dBm	<b>Limit:</b> 11 dBm





Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

#### MODES OF OPERATION

Transmitting 802.11(a), 6 Mbps

#### CHANNELS TESTED

Channel 36

Channel 48

Channel 52

Channel 64

Channel 100

Channel 120

Channel 140

#### POWER SETTINGS INVESTIGATED

120VAC/60Hz

#### FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	40 GHz
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#### CLOCKS AND OSCILLATORS

None Provided

#### SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

#### TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2006	13
Pre-Amplifier	Miteq	AM-1616-1000	AOL	12/29/2006	13
Antenna, Biconilog	EMCO	3141	AXE	12/28/2005	24
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	5/10/2007	13
Antenna, Horn	EMCO	3115	AHC	8/24/2006	24
EV01 cables g,h,j			EVB	5/10/2007	13
Antenna, Horn	ETS	3160-08	AHV	NCR	0
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	6/22/2007	13
Antenna, Horn	EMCO	3160-09	AHG	NCR	0
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	7/25/2007	13
EV01 cables g,h,l			EVF	5/10/2007	13
EV01 Cable D			EVD	7/25/2007	13
Antenna, Horn	ETS	3160-08	AHV	NCR	0
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	6/22/2007	13
Pre-Amplifier	Miteq	JS4-26004000-50-5A	AON	7/25/2007	13
Pre-Amplifier	Miteq	JS4-26004000-40-8P	APV	7/25/2007	13
Antenna, Horn	EMCO	3160-10	AHI	NCR	0
EV01 cable B			EVE	7/25/2007	13
Antenna, Horn	EMCO	3160-08	AHK	NCR	0
Pre-Amplifier	Hewlett-Packard	8447-F Option 10	APM	NCR	0
Pre-Amplifier	Hewlett-Packard	83017A	APL	10/24/2006	13
Signal Generator	Agilent	E8257D	TGX	1/25/2007	13
6.4 GHz High Pass Filter	Micro-Tronics	HPM50112	HGA		
5.8 GHz Notch Filter	Micro-Tronics	BRC50704	HGB		
5.8 GHz Notch Filter	Micro-Tronics	BRC50705	HFQ	1/12/2007	13
5.25 GHz Notch Filter	K&L Microwave	8N50-5250/X200-0/0	HFK	4/3/2006	24

#### MEASUREMENT BANDWIDTHS

	Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2	
0.15 - 30.0	10.0	9.0	9.0	
30.0 - 1000	100.0	120.0	120.0	
Above 1000	1000.0	N/A		1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

#### MEASUREMENT UNCERTAINTY

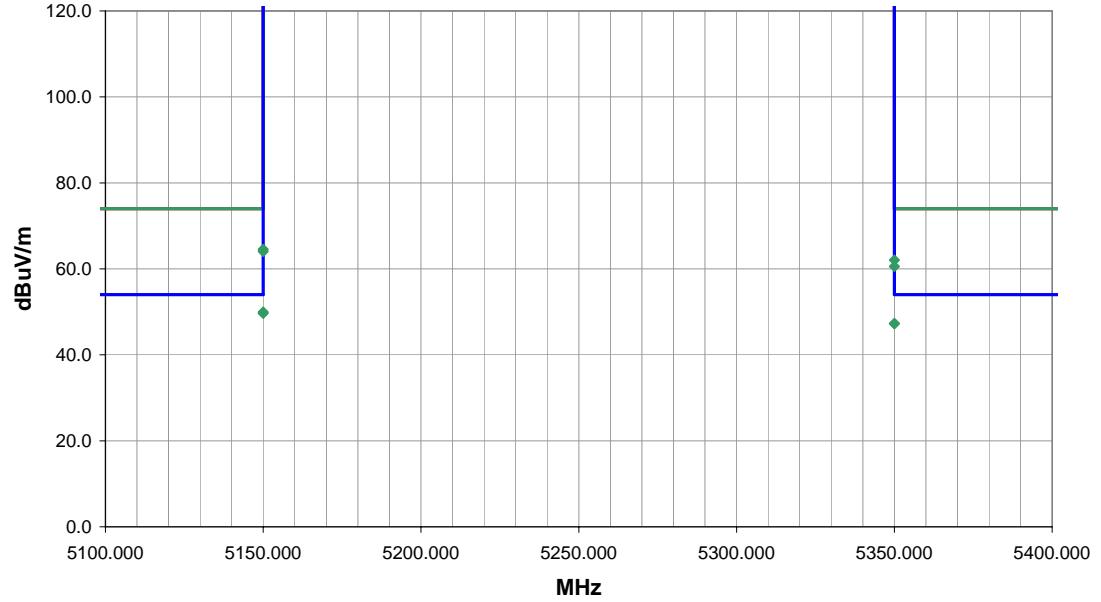
Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

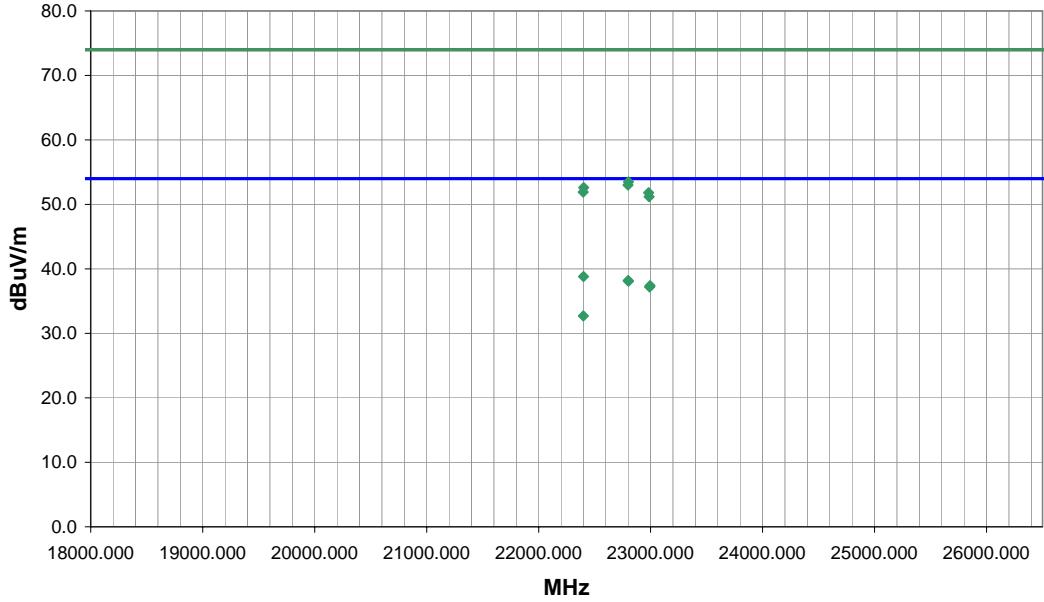
#### TEST DESCRIPTION

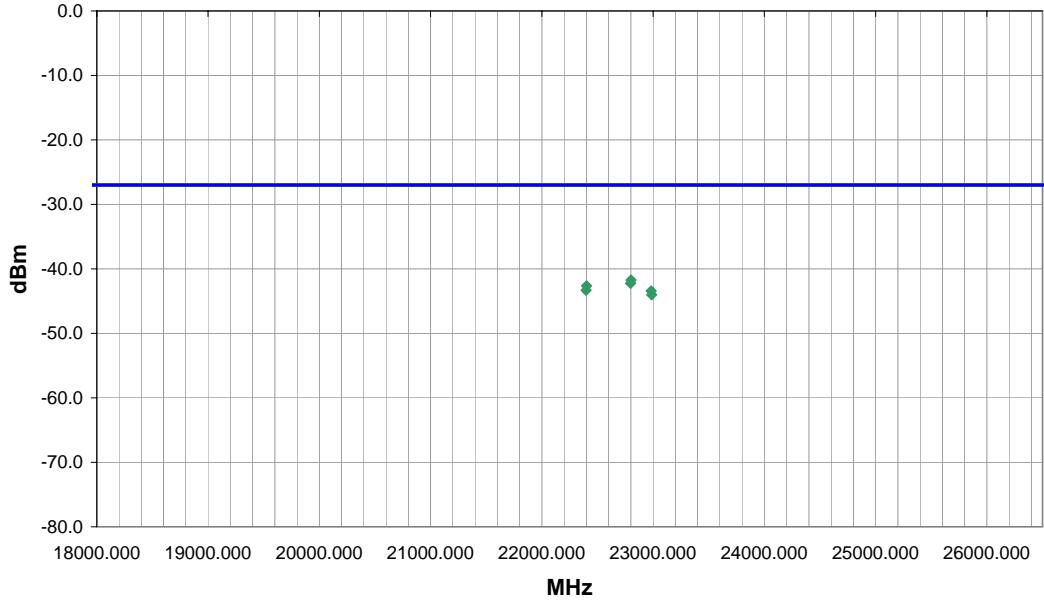
The only antenna to be used with the EUT was tested. The EUT was configured for the lowest, middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.4:2003). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

SPURIOUS RADIATED EMISSIONS												PSA 2007.05.07 EMI 2006.11.29	
EUT: Welch Allyn 802.11a Wireless PC Card						Work Order: PROT0295							
Serial Number: 001AFA0000CE						Date: 08/16/07							
Customer: Welch Allyn Protocol, Inc.						Temperature: 24							
Attendees: None						Humidity: 39%							
Project: None						Barometric Pres.: 29.95							
Tested by: Rod Peloquin			Power: 120VAC/60Hz			Job Site: EV01							
TEST SPECIFICATIONS												Test Method	
FCC 15.407:2006												ANSI C63.4:2003 DA 02-2138:2002	
TEST PARAMETERS													
Antenna Height(s) (m)			1 - 4			Test Distance (m)			3				
COMMENTS													
EUT OPERATING MODES													
Transmitting 802.11(a), 6 Mbps.													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
Run #	1										<i>Roddy Le Peloquin</i> Signature		
Configuration #	2												
Results	Pass												
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit (dB)	Compared to Spec. (dB)	Comments
15539.500	47.7	2.9	280.0	1.6	0.0	0.0	H-Horn	AV	0.0	50.6	54.0	-3.4	Ch. 36, EUT horizontal, antenna on side
15539.550	47.4	2.9	99.0	1.5	0.0	0.0	V-Horn	AV	0.0	50.3	54.0	-3.7	Ch. 36, EUT horizontal, antenna on side
15539.500	46.4	2.9	235.0	1.8	0.0	0.0	H-Horn	AV	0.0	49.3	54.0	-4.7	Ch. 36, EUT horizontal, antenna horizontal
15539.600	46.4	2.9	225.0	1.4	0.0	0.0	V-Horn	AV	0.0	49.3	54.0	-4.7	Ch. 36, EUT horizontal, antenna horizontal
15539.600	46.1	2.9	9.0	1.6	0.0	0.0	H-Horn	AV	0.0	49.0	54.0	-5.0	Ch. 36, EUT vertical, antenna vertical
15539.450	44.5	2.9	227.0	1.5	0.0	0.0	V-Horn	AV	0.0	47.4	54.0	-6.6	Ch. 36, EUT vertical, antenna vertical
15719.450	44.6	3.0	301.0	1.7	0.0	0.0	H-Horn	AV	0.0	47.6	54.0	-6.4	Ch. 48, EUT horizontal, antenna on side
15539.450	44.5	2.9	227.0	1.5	0.0	0.0	V-Horn	AV	0.0	47.4	54.0	-6.6	Ch. 36, EUT vertical, antenna vertical
15719.450	43.8	3.0	99.0	1.4	0.0	0.0	V-Horn	AV	0.0	46.8	54.0	-7.2	Ch. 48, EUT horizontal, antenna on side
15779.500	43.4	3.0	300.0	1.7	0.0	0.0	H-Horn	AV	0.0	46.4	54.0	-7.6	Ch. 52, EUT horizontal, antenna on side
15959.450	43.3	3.1	304.0	1.4	0.0	0.0	V-Horn	AV	0.0	46.4	54.0	-7.6	Ch. 64, EUT horizontal, antenna on side
15959.650	43.2	3.1	295.0	1.7	0.0	0.0	H-Horn	AV	0.0	46.3	54.0	-7.7	Ch. 64, EUT horizontal, antenna on side
15779.450	42.1	3.0	305.0	1.4	0.0	0.0	V-Horn	AV	0.0	45.1	54.0	-8.9	Ch. 52, EUT horizontal, antenna on side
15542.000	60.3	2.9	280.0	1.6	0.0	0.0	H-Horn	PK	0.0	63.2	74.0	-10.8	Ch. 36, EUT horizontal, antenna on side
15542.650	60.0	2.9	99.0	1.5	0.0	0.0	V-Horn	PK	0.0	62.9	74.0	-11.1	Ch. 36, EUT horizontal, antenna on side
15538.800	58.9	2.9	225.0	1.4	0.0	0.0	V-Horn	PK	0.0	61.8	74.0	-12.2	Ch. 36, EUT horizontal, antenna horizontal
15542.250	58.9	2.9	238.0	1.7	0.0	0.0	H-Horn	PK	0.0	61.8	74.0	-12.2	Ch. 36, EUT horizontal, antenna horizontal
15542.500	58.5	2.9	9.0	1.6	0.0	0.0	H-Horn	PK	0.0	61.4	74.0	-12.6	Ch. 36, EUT vertical, antenna vertical
15719.200	57.8	3.0	301.0	1.7	0.0	0.0	H-Horn	PK	0.0	60.8	74.0	-13.2	Ch. 48, EUT horizontal, antenna on side
15716.550	56.8	3.0	99.0	1.4	0.0	0.0	V-Horn	PK	0.0	59.8	74.0	-14.2	Ch. 48, EUT horizontal, antenna on side
15534.400	56.7	2.9	227.0	1.5	0.0	0.0	V-Horn	PK	0.0	59.6	74.0	-14.4	Ch. 36, EUT vertical, antenna vertical

NORTHWEST		SPURIOUS RADIATED EMISSIONS							PSA 2007.05.07				
EMC									EMI 2006.11.29				
EUT:	Welch Allyn 802.11a Wireless PC Card						Work Order:	PROT0295					
Serial Number:	001AFA0000CE						Date:	08/16/07					
Customer:	Welch Allyn Protocol, Inc.						Temperature:	24					
Attendees:	None						Humidity:	39%					
Project:	None						Barometric Pres.:	29.95					
Tested by:	Rod Peloquin			Power: 120VAC/60Hz			Job Site:	EV01					
TEST SPECIFICATIONS										Test Method			
FCC 15.407:2006										ANSI C63.4:2003 DA 02-2138:2002			
TEST PARAMETERS													
Antenna Height(s) (m)		1 - 4		Test Distance (m)		3							
COMMENTS													
EUT OPERATING MODES													
Transmitting 802.11(a), 6 Mbps.													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
Run #	1										<i>Roddy Le Peloquin</i> Signature		
Configuration #	2												
Results	Pass												
Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
15542.000			280.0	1.6			H-Horn	PK	6.27E-07	-32.0	-27.0	-5.0	Ch. 36, EUT horizontal, antenna on side
15542.650			99.0	1.5			V-Horn	PK	5.85E-07	-32.3	-27.0	-5.3	Ch. 36, EUT horizontal, antenna on side
15538.800			225.0	1.4			V-Horn	PK	4.54E-07	-33.4	-27.0	-6.4	Ch. 36, EUT horizontal, antenna horizontal
15542.250			238.0	1.7			H-Horn	PK	4.54E-07	-33.4	-27.0	-6.4	Ch. 36, EUT horizontal, antenna horizontal
15542.500			9.0	1.6			H-Horn	PK	4.14E-07	-33.8	-27.0	-6.8	Ch. 36, EUT vertical, antenna vertical
15719.200			301.0	1.7			H-Horn	PK	3.61E-07	-34.4	-27.0	-7.4	Ch. 48, EUT horizontal, antenna on side
15716.550			99.0	1.4			V-Horn	PK	2.86E-07	-35.4	-27.0	-8.4	Ch. 48, EUT horizontal, antenna on side
15534.400			227.0	1.5			V-Horn	PK	2.74E-07	-35.6	-27.0	-8.6	Ch. 36, EUT vertical, antenna vertical

NORTHWEST		SPURIOUS RADIATED EMISSIONS										PSA 2007.05.07			
EMC												EMI 2006.11.29			
EUT: Welch Allyn 802.11a Wireless PC Card							Work Order: PROT0295								
Serial Number: 001AFA0000CE							Date: 08/20/07								
Customer: Welch Allyn Protocol, Inc.							Temperature: 24								
Attendees: None							Humidity: 39%								
Project: None							Barometric Pres.: 29.95								
Tested by: Rod Peloquin		Power: 120VAC/60Hz					Job Site: EV01								
TEST SPECIFICATIONS		Test Method													
FCC 15.407:2006		ANSI C63.4:2003 DA 02-2138:2002													
TEST PARAMETERS															
Antenna Height(s) (m)		1 - 2		Test Distance (m)		1									
COMMENTS															
EUT OPERATING MODES															
Transmitting 802.11(a), 6 Mbps															
DEVIATIONS FROM TEST STANDARD															
No deviations.															
Run #	4														
Configuration #	2														
Results	Pass														
															
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments		
5150.000	23.2	36.3	218.0	1.1	1.0	0.0	H-Horn	AV	-9.5	50.0	54.0	-4.0	Channel 36		
5150.000	22.9	36.3	294.0	1.1	1.0	0.0	V-Horn	AV	-9.5	49.7	54.0	-4.3	Channel 36		
5350.000	19.9	36.9	4.0	1.0	1.0	0.0	V-Horn	AV	-9.5	47.3	54.0	-6.7	Channel 64		
5350.000	19.9	36.9	-1.0	1.0	1.0	0.0	H-Horn	AV	-9.5	47.3	54.0	-6.7	Channel 64		
5150.000	37.8	36.3	294.0	1.1	1.0	0.0	V-Horn	PK	-9.5	64.6	74.0	-9.4	Channel 36		
5150.000	37.3	36.3	218.0	1.1	1.0	0.0	H-Horn	PK	-9.5	64.1	74.0	-9.9	Channel 36		
5350.000	34.7	36.9	-1.0	1.0	1.0	0.0	H-Horn	PK	-9.5	62.1	74.0	-11.9	Channel 64		
5350.000	33.2	36.9	4.0	1.0	1.0	0.0	V-Horn	PK	-9.5	60.6	74.0	-13.4	Channel 64		

SPURIOUS RADIATED EMISSIONS													
EMC											PSA 2007.05.07 EMI 2006.11.29		
EUT: Welch Allyn 802.11a Wireless PC Card						Work Order: PROT0295							
Serial Number: 001AFA0000CE						Date: 08/20/07							
Customer: Welch Allyn Protocol, Inc.						Temperature: 24							
Attendee: None						Humidity: 39%							
Project: None						Barometric Pres.: 29.95							
Tested by: Rod Peloquin			Power: 120VAC/60Hz			Job Site: EV01			Test Method				
TEST SPECIFICATIONS													
FCC 15.407:2006						ANSI C63.4:2003 DA 02-2138:2002							
TEST PARAMETERS													
Antenna Height(s) (m)			1 - 2			Test Distance (m)			3				
COMMENTS													
EUT OPERATING MODES													
Transmitting 802.11(a), 6 Mbps													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
Run #	5												
Configuration #	2												
Results	Pass												
Signature													
													
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
22400.300	29.0	9.8	226.0	1.2	3.0	0.0	±-High Horr	AV	0.0	38.8	54.0	-15.2	Channel 120
22799.870	28.5	9.7	250.0	1.1	3.0	0.0	✓-High Horr	AV	0.0	38.2	54.0	-15.8	Channel 140
22801.870	28.4	9.7	238.0	1.4	3.0	0.0	±-High Horr	AV	0.0	38.1	54.0	-15.9	Channel 140
22994.470	27.7	9.7	-1.0	1.0	3.0	0.0	±-High Horr	AV	0.0	37.4	54.0	-16.6	Channel 149
22990.700	27.5	9.7	-1.0	1.0	3.0	0.0	✓-High Horr	AV	0.0	37.2	54.0	-16.8	Channel 149
22801.800	43.8	9.7	250.0	1.1	3.0	0.0	✓-High Horr	PK	0.0	53.5	74.0	-20.5	Channel 140
22797.500	43.3	9.7	238.0	1.4	3.0	0.0	±-High Horr	PK	0.0	53.0	74.0	-21.0	Channel 140
22399.500	22.9	9.8	211.0	1.1	3.0	0.0	✓-High Horr	AV	0.0	32.7	54.0	-21.3	Channel 120
22401.930	42.8	9.8	211.0	1.1	3.0	0.0	✓-High Horr	PK	0.0	52.6	74.0	-21.4	Channel 120
22397.270	42.1	9.8	226.0	1.2	3.0	0.0	±-High Horr	PK	0.0	51.9	74.0	-22.1	Channel 120
22982.230	42.1	9.7	-1.0	1.0	3.0	0.0	✓-High Horr	PK	0.0	51.8	74.0	-22.2	Channel 149
22986.430	41.5	9.7	-1.0	1.0	3.0	0.0	±-High Horr	PK	0.0	51.2	74.0	-22.8	Channel 149

NORTHWEST		SPURIOUS RADIATED EMISSIONS								PSA 2007.05.07			
EMC		EUT: Welch Allyn 802.11a Wireless PC Card				Work Order: PROT0295				EMI 2006.11.29			
Serial Number:	001AFA0000CE					Date: 08/20/07							
Customer:	Welch Allyn Protocol, Inc.				Temperature: 24								
Attendees:	None				Humidity: 39%								
Project:	None				Barometric Pres.: 29.95								
Tested by:	Rod Peloquin		Power: 120VAC/60Hz		Job Site: EV01								
TEST SPECIFICATIONS		Test Method											
FCC 15.407:2006		ANSI C63.4:2003 DA 02-2138:2002											
TEST PARAMETERS													
Antenna Height(s) (m)		1 - 2		Test Distance (m)		3							
COMMENTS													
EUT OPERATING MODES													
Transmitting 802.11(a), 6 Mbps													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
Run #	5												
Configuration #	2												
Results	Pass				Signature								
 <p>The plot shows dBm on the y-axis (ranging from -80.0 to 0.0) versus MHz on the x-axis (ranging from 18000.000 to 26000.000). A blue horizontal line represents the -41.7 dBm specification limit. Three green data points are plotted at approximately 22.986 GHz, showing values around -43.4 dBm, -43.3 dBm, and -44.0 dBm, which are all below the specification limit.</p>													
Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
22801.800			250.0	1.1			V-High Horr	PK	6.72E-08	-41.7	-27.0	-14.7	Channel 140
22797.500			238.0	1.4			H-High Horr	PK	5.99E-08	-42.2	-27.0	-15.2	Channel 140
22401.930			211.0	1.1			V-High Horr	PK	5.46E-08	-42.6	-27.0	-15.6	Channel 120
22397.270			226.0	1.2			H-High Horr	PK	4.65E-08	-43.3	-27.0	-16.3	Channel 120
22982.230			-1.0	1.0			V-High Horr	PK	4.54E-08	-43.4	-27.0	-16.4	Channel 149
22986.430			-1.0	1.0			H-High Horr	PK	3.95E-08	-44.0	-27.0	-17.0	Channel 149

SPURIOUS RADIATED EMISSIONS													
NORTHWEST											PSA 2007.05.07		
EMC											EMI 2006.11.29		
EUT: Welch Allyn 802.11a Wireless PC Card						Work Order: PROT0295							
Serial Number: 001AFA0000CE						Date: 08/20/07							
Customer: Welch Allyn Protocol, Inc.						Temperature: 23							
Attendees: Steve Baker						Humidity: 45%							
Project: None						Barometric Pres.: 29.99							
Tested by: Rod Peloquin			Power: 120VAC/60Hz			Job Site: EV01			Test Method				
TEST SPECIFICATIONS													
FCC 15.407:2006						ANSI C63.4:2003 DA 02-2138:2002							
TEST PARAMETERS													
Antenna Height(s) (m)			1 - 4			Test Distance (m)			3				
COMMENTS													
Copper tape over end of card													
EUT OPERATING MODES													
Transmitting 802.11(a), 6 Mbps													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
Run #	7						Signature		<i>Rodney L. Peloquin</i>				
Configuration #	2												
Results	Pass												
<p>dBm</p> <p>0.0</p> <p>-10.0</p> <p>-20.0</p> <p>-30.0</p> <p>-40.0</p> <p>-50.0</p> <p>-60.0</p> <p>-70.0</p> <p>-80.0</p> <p>12500.000 13500.000 14500.000 15500.000 16500.000 17500.000</p> <p>MHz</p>													
Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
16794.620			282.0	1.4			V-Horn	PK	3.52E-07	-34.5	-27.0	-7.5	Channel 120
16495.000			237.0	1.7			V-Horn	PK	2.28E-07	-36.4	-27.0	-9.4	Channel 100
16794.620			278.0	1.6			H-Horn	PK	1.77E-07	-37.5	-27.0	-10.5	Channel 120
16494.380			328.0	1.7			H-Horn	PK	1.34E-07	-38.7	-27.0	-11.7	Channel 100
17094.790			203.0	1.4			V-Horn	PK	1.14E-07	-39.4	-27.0	-12.4	Channel 140
17094.710			103.0	1.4			H-Horn	PK	5.33E-08	-42.7	-27.0	-15.7	Channel 140

SPURIOUS RADIATED EMISSIONS												PSA 2007.05.07 EMI 2006.11.29			
EUT:	Welch Allyn 802.11a Wireless PC Card						Work Order: PROT0295								
Serial Number:	001AFA0000CE						Date: 08/21/07								
Customer:	Welch Allyn Protocol, Inc.						Temperature: 23								
Attendees:	None						Humidity: 46%								
Project:	None						Barometric Pres: 29.95								
Tested by:	Rod Peloquin			Power: 120VAC/60Hz			Job Site: EV01								
TEST SPECIFICATIONS												Test Method			
FCC 15.407-2006												ANSI C63.4:2003 DA 02-2138.2002			
TEST PARAMETERS															
Antenna Height(s) (m)		1 - 4		Test Distance (m)		3									
COMMENTS															
EUT OPERATING MODES															
Transmitting 802.11(a), 6 Mbps															
DEVIATIONS FROM TEST STANDARD															
No deviations.															
Run #	8		<i>Roddy Le Peloquin</i> Signature												
Configuration #	2														
Results	Pass														
<p>The graph plots dBuV/m on the y-axis (0.0 to 120.0) against MHz on the x-axis (6000.000 to 12000.000). A horizontal blue line represents the 54.0 dBuV/m specification limit. Data points are plotted as green diamonds. Most points are clustered between 40.0 and 60.0 dBuV/m, with a few outliers above the limit line.</p>															
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments		
10480.000	32.4	16.1	296.0	1.6	3.0	0.0	H-Horn	AV	0.0	48.5	54.0	-5.5	Ch. 48		
10360.030	31.7	16.2	273.0	1.4	3.0	0.0	V-Horn	AV	0.0	47.9	54.0	-6.1	Ch. 36, EUT on side, antenna on vertical		
10639.970	31.3	16.5	260.0	1.1	3.0	0.0	V-Horn	AV	0.0	47.8	54.0	-6.2	Ch. 64, EUT on side, antenna on vertical		
10359.970	31.2	16.2	282.0	1.5	3.0	0.0	V-Horn	AV	0.0	47.4	54.0	-6.6	Ch. 36		
10480.000	30.8	16.1	306.0	1.3	3.0	0.0	V-Horn	AV	0.0	46.9	54.0	-7.1	Ch. 48		
10480.000	29.6	16.1	280.0	1.2	3.0	0.0	V-Horn	AV	0.0	45.7	54.0	-8.3	Ch. 48, EUT on side, antenna on vertical		
10520.030	29.4	16.2	78.0	1.3	3.0	0.0	H-Horn	AV	0.0	45.6	54.0	-8.4	Ch. 52		
10359.970	29.2	16.2	72.0	1.3	3.0	0.0	H-Horn	AV	0.0	45.4	54.0	-8.6	Ch. 36		
10640.000	28.8	16.5	84.0	1.2	3.0	0.0	H-Horn	AV	0.0	45.3	54.0	-8.7	Ch. 64, EUT horizontal, antenna on side		
10519.970	28.8	16.2	317.0	1.1	3.0	0.0	V-Horn	AV	0.0	45.0	54.0	-9.0	Ch. 52		
10639.970	28.4	16.5	284.0	1.2	3.0	0.0	V-Horn	AV	0.0	44.9	54.0	-9.1	Ch. 64, EUT horizontal, antenna on side		
10640.000	28.3	16.5	297.0	1.2	3.0	0.0	H-Horn	AV	0.0	44.8	54.0	-9.2	Ch. 64, EUT on side, antenna on vertical		
10997.630	27.0	17.6	4.0	1.7	3.0	0.0	H-Horn	AV	0.0	44.6	54.0	-9.4	Ch. 100, EUT on side, antenna on vertical		
10997.400	26.9	17.6	111.0	1.0	3.0	0.0	V-Horn	AV	0.0	44.5	54.0	-9.5	Ch. 100, EUT on side, antenna on vertical		
11197.200	26.5	17.0	33.0	1.6	3.0	0.0	H-Horn	AV	0.0	43.5	54.0	-10.5	Ch. 120, EUT on side, antenna on vertical		
11197.230	26.2	17.1	254.0	1.3	3.0	0.0	V-Horn	AV	0.0	43.3	54.0	-10.7	Ch. 120, EUT on side, antenna on vertical		
11396.800	26.2	16.4	303.0	1.1	3.0	0.0	V-Horn	AV	0.0	42.6	54.0	-11.4	Ch. 140, EUT on side, antenna on vertical		
10515.570	46.3	16.2	317.0	1.1	3.0	0.0	V-Horn	PK	0.0	62.5	74.0	-11.5	Ch. 52		
11399.930	25.7	16.4	29.0	1.4	3.0	0.0	H-Horn	AV	0.0	42.1	54.0	-11.9	Ch. 140, EUT on side, antenna on vertical		
10482.500	45.0	16.1	296.0	1.6	3.0	0.0	H-Horn	PK	0.0	61.1	74.0	-12.9	Ch. 48		

NORTHWEST  
EMC

## SPURIOUS RADIATED EMISSIONS

PSA 2007.05.07  
EMI 2006.11.29

EUT:	Welch Allyn 802.11a Wireless PC Card	Work Order:	PROT0295
Serial Number:	001AFA0000CE	Date:	08/21/07
Customer:	Welch Allyn Protocol, Inc.	Temperature:	23
Attendees:	None	Humidity:	46%
Project:	None	Barometric Pres.:	29.95
Tested by:	Rod Peloquin	Power:	120VAC/60Hz
			Job Site: EV01

## TEST SPECIFICATIONS

FCC 15.407-2006 ANSI C63.4:2003 DA 02-2138.2002

## TEST PARAMETERS

Antenna Height(s) (m) 1 - 4 Test Distance (m) 3

## COMMENTS

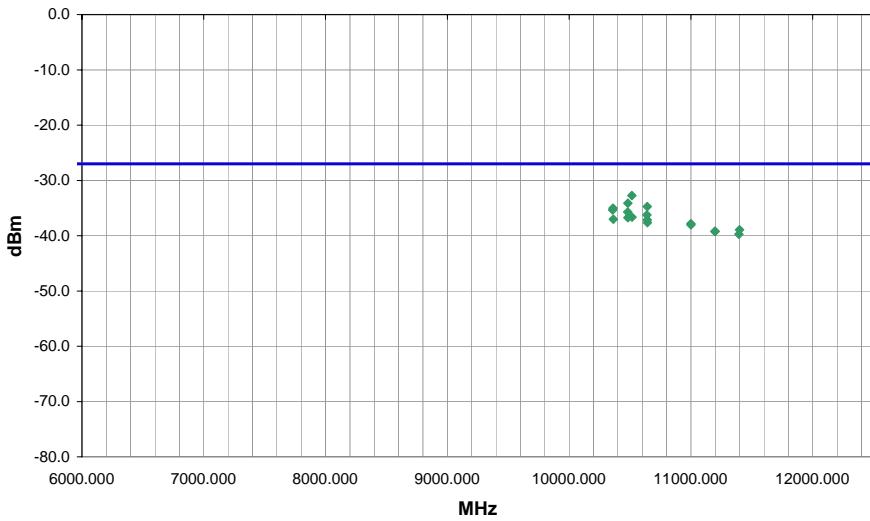
## EUT OPERATING MODES

Transmitting 802.11(a), 6 Mbps

## DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	8
Configuration #	2
Results	Pass

*Rod Peloquin*  
Signature

Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
10515.570			317.0	1.1			V-Horn	PK	5.33E-07	-32.7	-27.0	-5.7	Ch. 52
10482.500			296.0	1.6			H-Horn	PK	3.86E-07	-34.1	-27.0	-7.1	Ch. 48

