

Welch Allyn Protocol, Inc.

Welch Allyn 802.11a Wireless PC Card

FCC 15.247 Test Report

May 26, 2009

Report No. PROT0295.2 Rev 01

Report Prepared By



www.nwemc.com

1-888-EMI-CERT

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EMC Test Report



22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Issue Date: May 26, 2009

Welch Allyn Protocol, Inc.

Model: Welch Allyn 802.11a Wireless PC Card

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Spurious Radiated Emissions	FCC 15.247 (DTS):2007	ANSI C63.4:2003 KDB No. 558074	Pass
Spurious Conducted Emissions	FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074	Pass
AC Power line Conducted Emissions	FCC 15.207:2006	ANSI C63.4:2003	Pass
Band Edge Compliance	FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074	Pass
Occupied Bandwidth	FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074	Pass
Output Power	FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074	Pass
Power Spectral Density	FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074	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 (Site filing #2834D-1).

Approved By:

Donald Fecteau, IS 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
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01	Updated spec year on CoT for Spurious Radiated Emissions	6/8/09	2
01	Expanded Testing Objective and added additional EUT photo.	6/8/09	7
01	Updated Configurations page for Spurious Radiated Emissions testing	6/8/09	8
01	Replaced Spurious Radiated Emissions module with new module for unshielded configuration.	6/8/09	32-39

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.



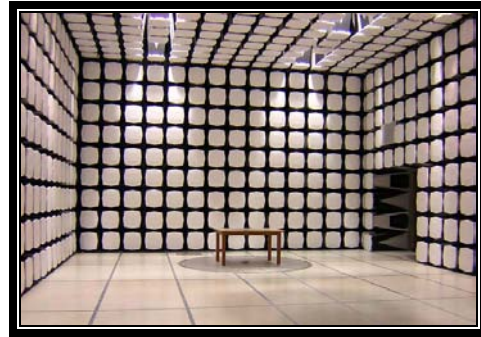
GOST: Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from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



SCOPE

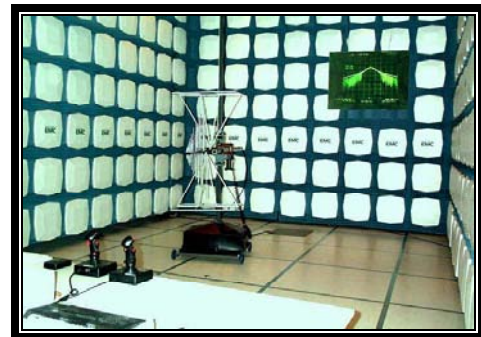
For details on the Scopes of our Accreditations, please visit:

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

Party Requesting the Test

Company Name:	Welch Allyn Protocol, Inc.
Address:	8500 SW Creekside Place
City, State, Zip:	Beaverton, OR 97008-7107
Test Requested By:	Bob Jenkins
Model:	Welch Allyn 802.11a Wireless PC Card
First Date of Test:	August 13, 2007
Last Date of Test:	May 26, 2009
Receipt Date of Samples:	August 13, 2007
Equipment Design Stage:	Production
Equipment Condition:	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 15.247. Spurious radiated emissions testing was performed with the external shield removed and antenna port direct connect data was taken with the external shield installed. Both radio configurations are otherwise identical.

EUT Photo



No External Shield



With External Shield

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.	Lamarr2	000B28004C5C

Peripherals in test setup boundary

Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter (TCC)	CUI Inc.	EPAS-101W-05	None

Remote Equipment Outside of Test Setup Boundary

Description	Manufacturer	Model/Part Number	Serial Number
TCC Test Fixture	Welch Allyn Protocol Inc.	851-0034-01 Rev. 02	Unknown
AC Adapter (WAN)	CUI Inc.	PSA18U-120	140500179A2
WAN Modem	Belkin	F5D5231-4	507B1400828
Laptop	IBM	T40	99-OXRAW 04/02

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Ethernet	No	1.8m	No	WAN Modem	Laptop
Ethernet	No	5.0m	No	TCC Test Fixture	WAN Modem
DC	No	1.6m	No	TCC Test Fixture	AC Adapter (TCC)

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	Occupied 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	8/14/2007	Output 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.
3	8/14/2007	Power Spectral Density	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	8/14/2007	Band Edge Compliance	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	8/21/2007	AC Powerline Conducted Emissions	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	8/22/2007	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Client removed EUT from Northwest EMC following the test.
7	5/26/2009	Spurious Radiated 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.

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

The occupied bandwidth was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate.

EMC

Occupied 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:	5.0VDC nominal
		Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074

COMMENTS

DEVIATIONS FROM TEST STANDARD

Configuration #	1	Signature <i>Holly Ashkannejhad</i>
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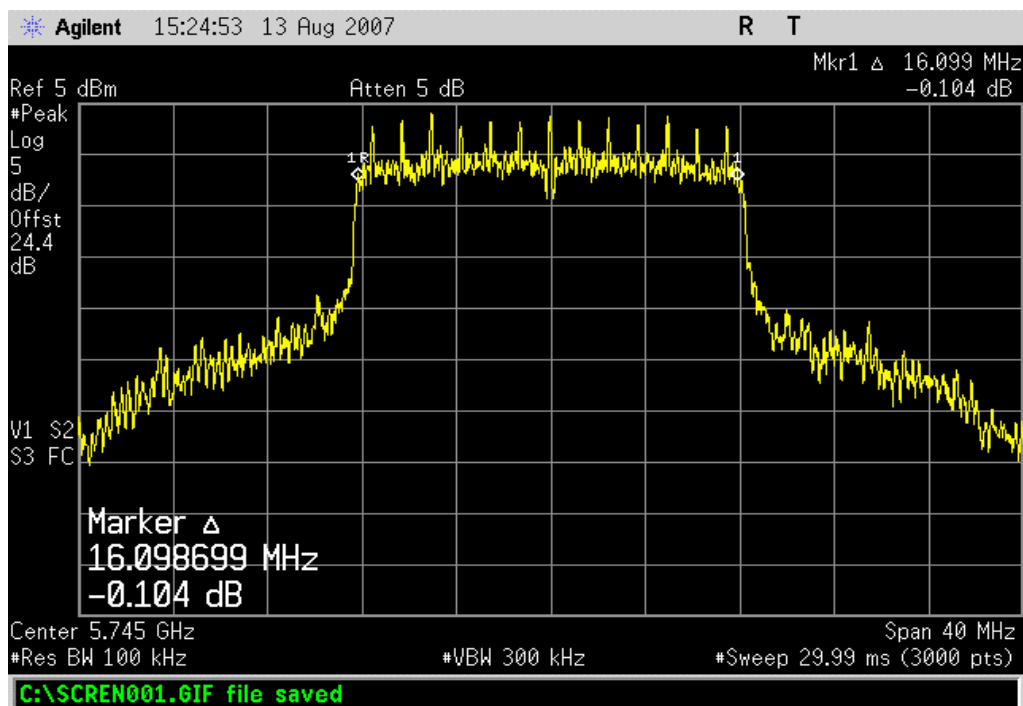
		Value	Limit	Results
802.11(a), 6Mbps	5725 - 5850 MHz band			
	Low channel, 5745 MHz	16.0987 MHz	≥ 500kHz	Pass
	Mid channel, 5785 MHz	15.8053 MHz	≥ 500kHz	Pass
	High channel, 5825 MHz	15.8586 MHz	≥ 500kHz	Pass

Occupied Bandwidth

802.11(a), 6Mbps, 5725 - 5850 MHz band, Low channel, 5745 MHz

Result: Pass

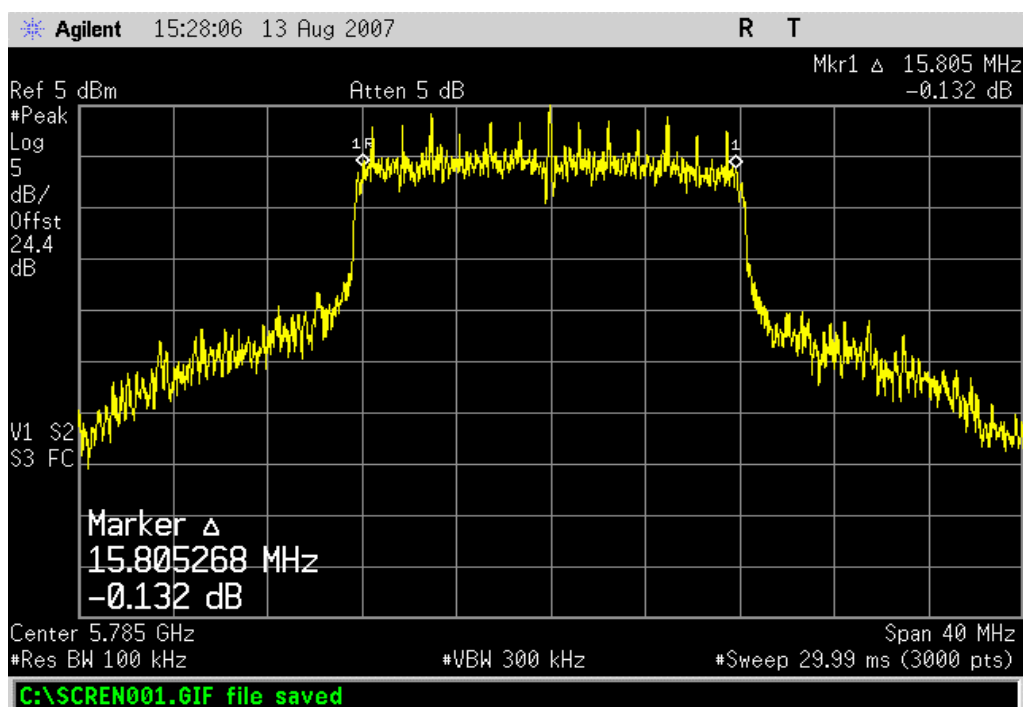
Value: 16.0987 MHz

Limit: $\geq 500\text{kHz}$ 

802.11(a), 6Mbps, 5725 - 5850 MHz band, Mid channel, 5785 MHz

Result: Pass

Value: 15.8053 MHz

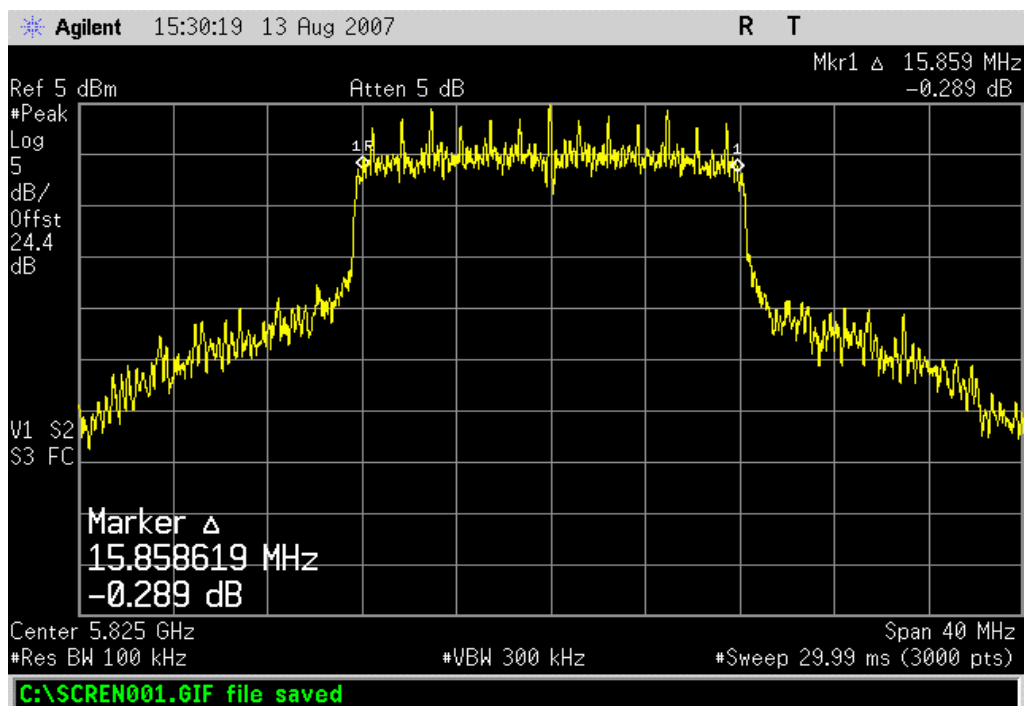
Limit: $\geq 500\text{kHz}$ 

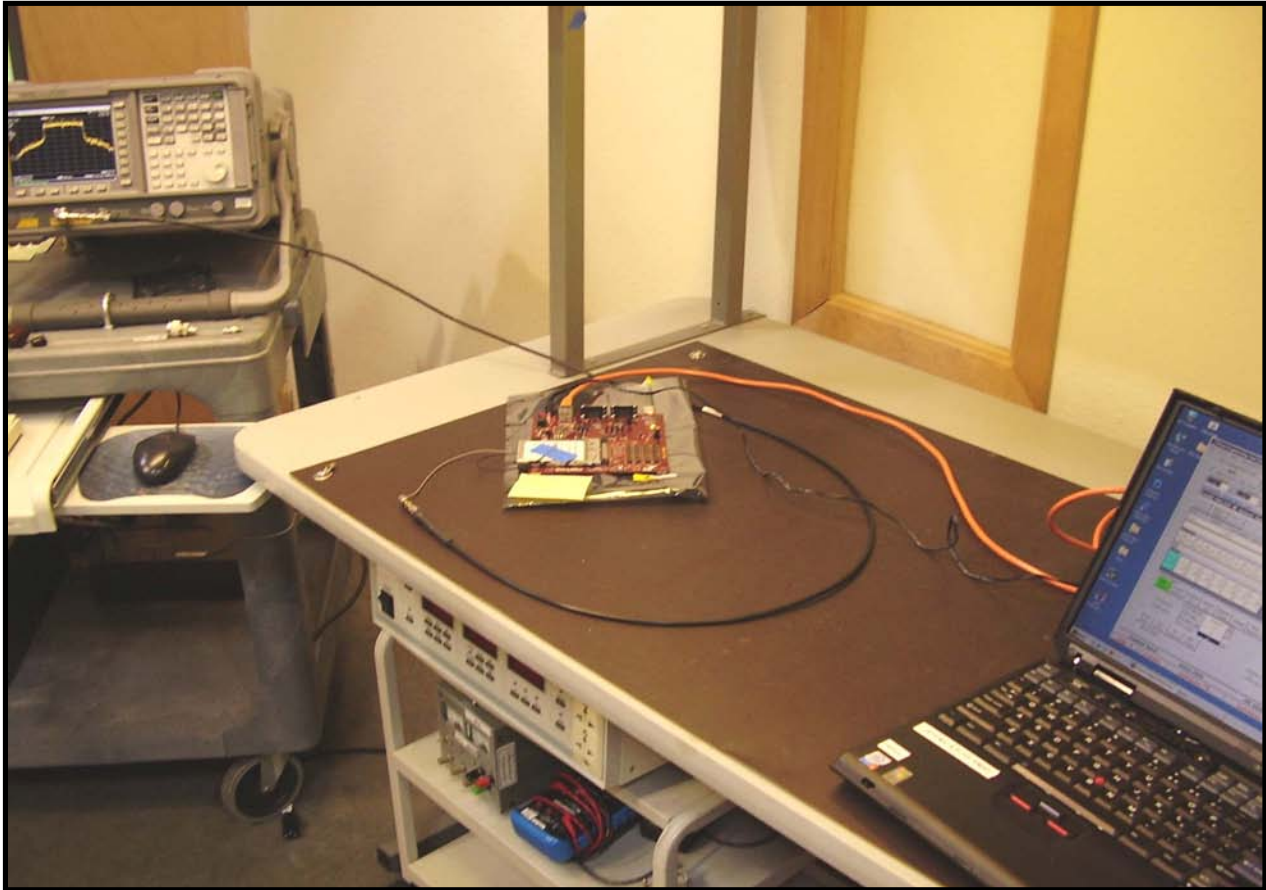
Occupied Bandwidth

802.11(a), 6Mbps, 5725 - 5850 MHz band, High channel, 5825 MHz

Result: Pass

Value: 15.8586 MHz

Limit: $\geq 500\text{kHz}$ 



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
Oscilloscope	Agilent	DS06052A	TOK	3/9/2007	13
Power Sensor	Gigatronics	80701A	SPL	9/19/2006	12
Power Meter	Gigatronics	8651A	SPM	9/19/2006	12
Signal Generator	Agilent	E8257D	TGX	1/25/2007	13
Attenuator		93459 3330A-6	AUF	1/22/2007	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	6/8/2007	13
RF Detector	RLC Electronics	CR-133-R	ZZA	NCR	0

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 peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The EUT was transmitting at its maximum output power. The data rate of the radio was varied to determine the level that produced the highest output power.

The measurement was made using a direct connection between the RF output of the EUT and a RF detector diode. The DC output of the diode was measured with the oscilloscope. The signal generator, tuned to the transmit frequency, was then substituted for the EUT. The CW output of the signal generator was adjusted until the DC output of the RF detector diode match the peak level produced when connected to the EUT. To further reduce measurement error, the power meter and sensor were then used to measure the output power level of the signal generator.

De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36dBm.

NORTHWEST

EMC

Output Power

XMIT 2007.06.13

EUT: Welch Allyn 802.11a Wireless PC Card		Work Order: PROTO295
Serial Number: 001AFA0000CE		Date: 08/14/07
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	Job Site: EV06

TEST SPECIFICATIONS

Test Method

FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074
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COMMENTS

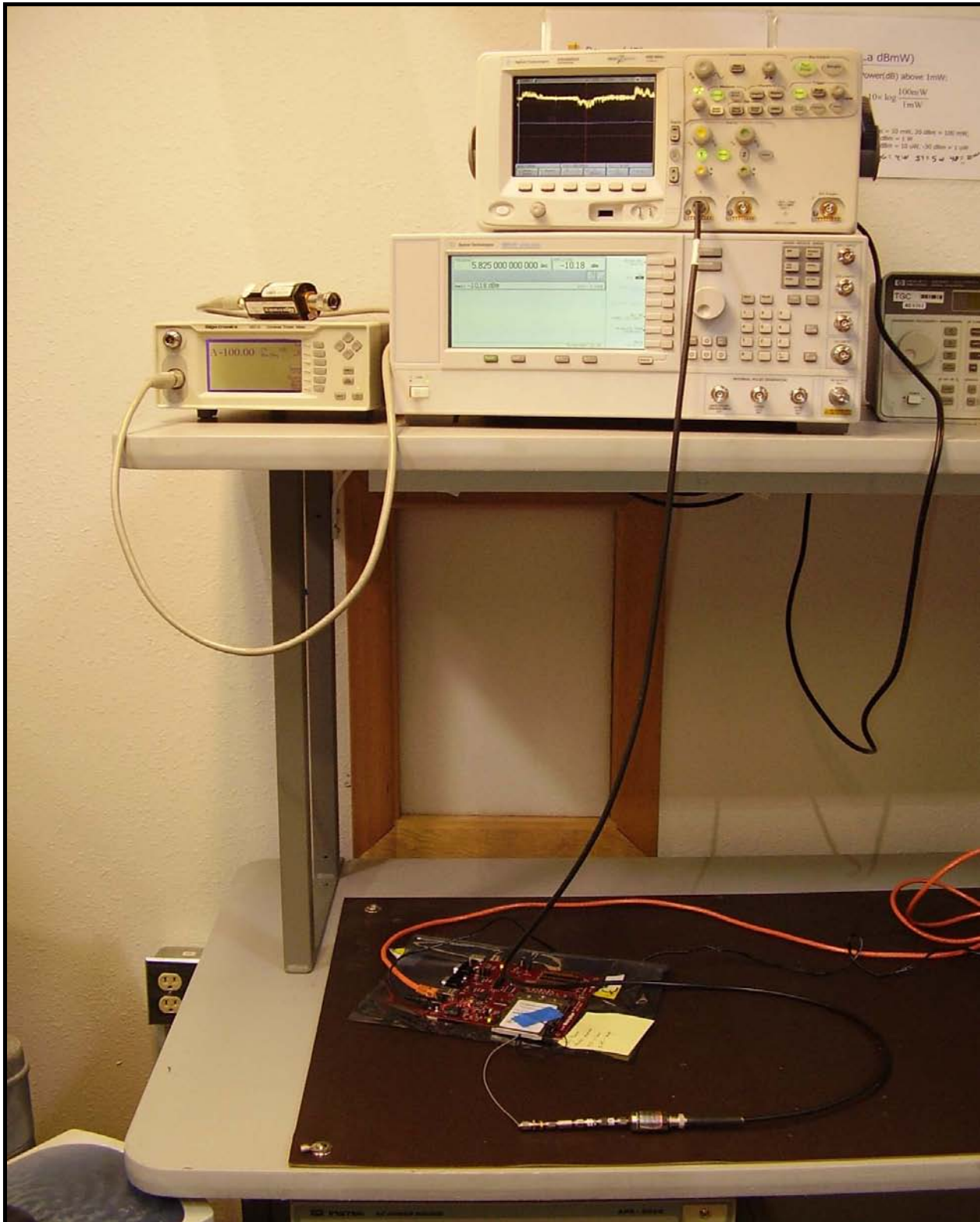
DEVIATIONS FROM TEST STANDARD

Configuration #	1	Signature <i>Holly Ashkannejhad</i>
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802.11(a), 6Mbps

5725-5850 MHz band

Xmit Frequency (MHz)	Channel	DC on Scope (mV)	Attenuator Specific Ref.Offset (dB)	Sig Gen Output (dBm)	Power Meter (dBm)	Value	Limit (mW)	
						Power Meter (mW)		
5745	149	-38.5	26.3	-10.35	15.89	38.82	1000	Pass
5785	157	-39.5	26.29	-10.18	16.04	40.18	1000	Pass
5825	165	-39.5	26.29	-10.18	16.04	40.18	1000	Pass



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

The requirements of FCC 15.247(d) for emissions at least 20dB below the carrier in any 100kHz bandwidth outside the allowable band was measured with the EUT set to low and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate using direct sequence modulation. The channels closest to the band edges were selected. The spectrum was scanned across each band edge from 10 MHz below the band edge to 10 MHz above the band edge.

EMC

Band Edge Compliance

EUT:	Welch Allyn 802.11a Wireless PC Card	Work Order:	PROT0295
Serial Number:	001AFA0000CE	Date:	08/14/07
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
		Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074

COMMENTS

DEVIATIONS FROM TEST STANDARD

None

Configuration #	1	Signature 
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	Value	Limit	Results
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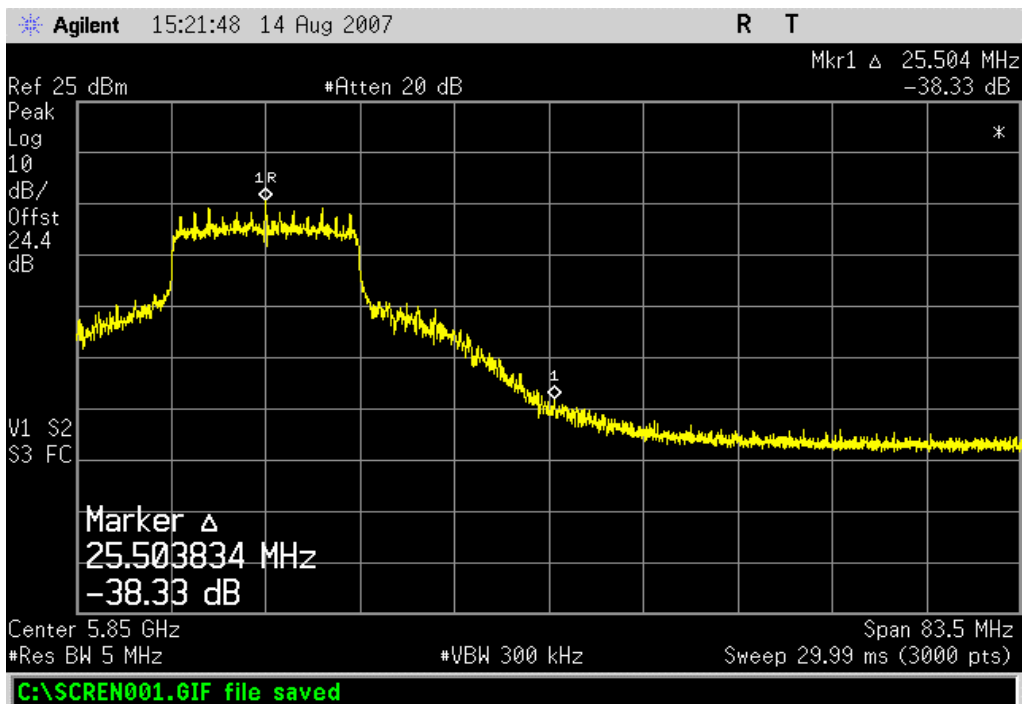
802.11(a), 6Mbps	5725 MHz - 5850 MHz		
	Low channel, 5745 MHz	-38.33 dBc	≤ -20 dBc
	High channel, 5825 MHz	-29.07 dBc	≤ -20 dBc
			Pass
			Pass

Band Edge Compliance

802.11(a), 6Mbps, 5725 MHz - 5850 MHz, Low channel, 5745 MHz

Result: Pass

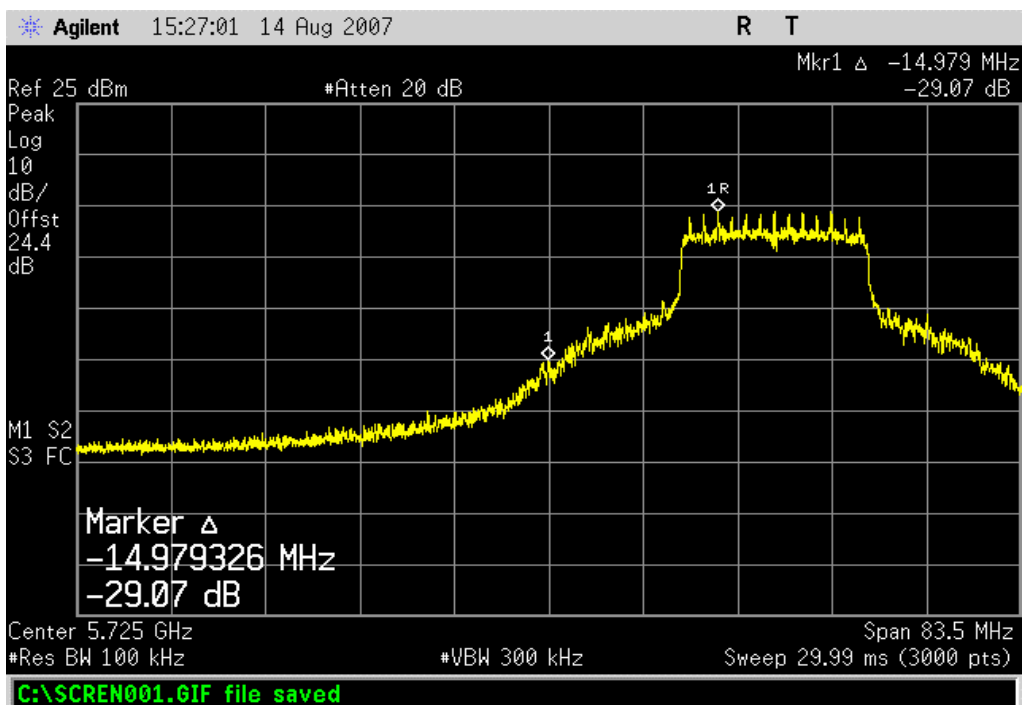
Value: -38.33 dBc

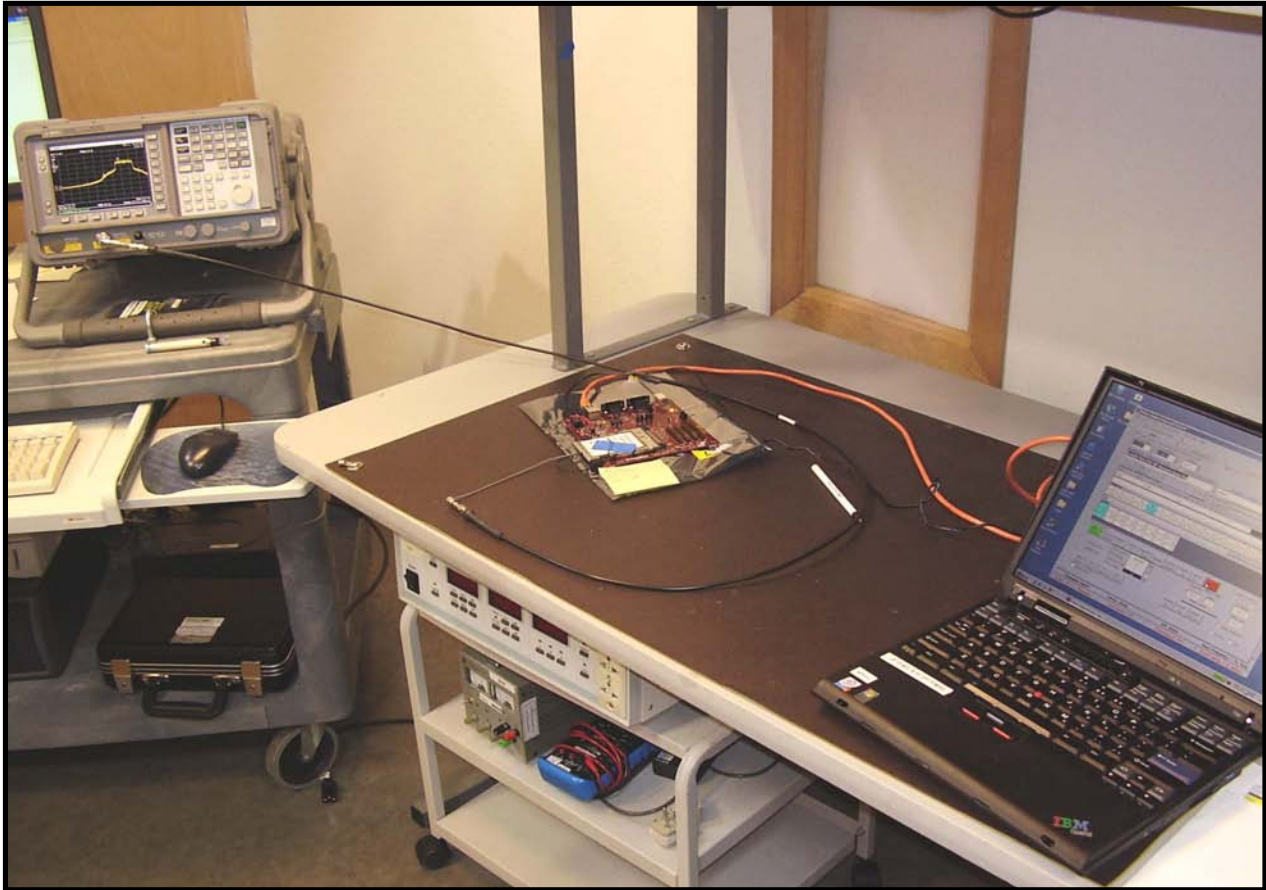
Limit: ≤ -20 dBc

802.11(a), 6Mbps, 5725 MHz - 5850 MHz, High channel, 5825 MHz

Result: Pass

Value: -29.07 dBc

Limit: ≤ -20 dBc



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	E4446A	AAT	12/7/2006	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

The spurious RF conducted emissions were measured with the EUT set to low, medium, and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate using direct sequence modulation. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

EMC

SPURIOUS CONDUCTED EMISSIONS

EUT:	Welch Allyn 802.11a Wireless PC Card	Work Order:	PROT0295
Serial Number:	001AFA0000CE	Date:	08/22/07
Customer:	Welch Allyn Protocol, Inc.	Temperature:	22°C
Attendees:	None	Humidity:	43%
Project:	None	Barometric Pres.:	30.05
Tested by:	Rod Peloquin	Power:	120VAC/60Hz
		Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074

COMMENTS

DEVIATIONS FROM TEST STANDARD

None

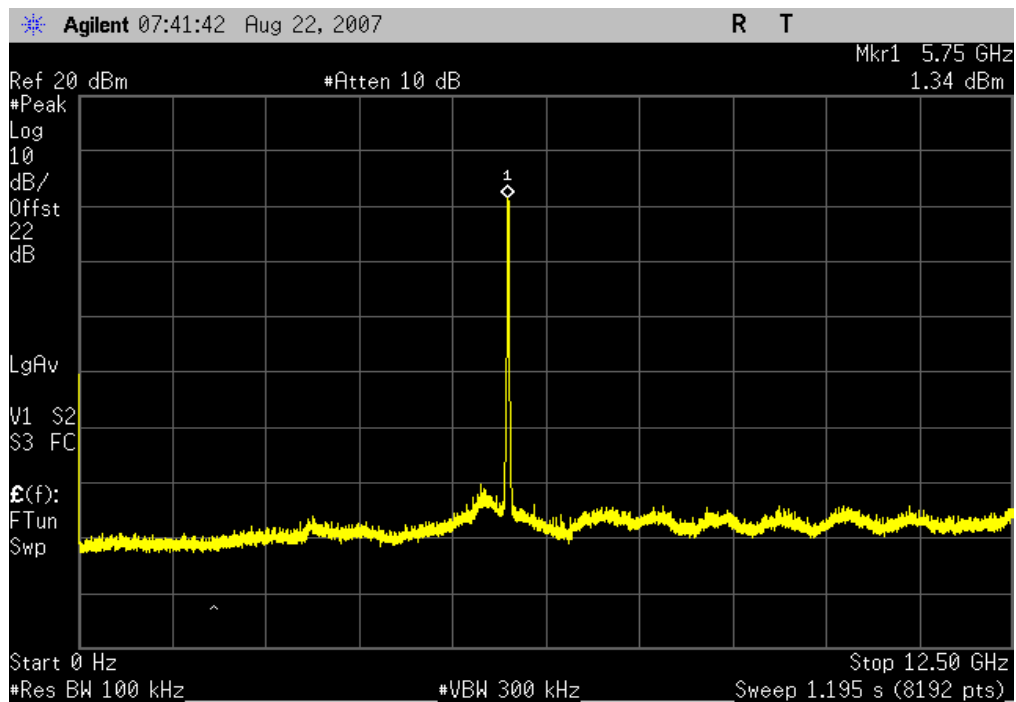
Configuration #	1	Signature 
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		Value	Limit	Results
Low Channel, 149				
	0MHz - 12.5GHz	< -40 dBc	≤ - 20 dBc	Pass
	12.4 GHz - 24 GHz	< -40 dBc	≤ - 20 dBc	Pass
	23.5 GHz - 31 GHz	< -40 dBc	≤ - 20 dBc	Pass
	30.5 GHz - 40 GHz	< -40 dBc	≤ - 20 dBc	Pass
Mid Channel, 157				
	0MHz - 12.5GHz	< -40 dBc	≤ - 20 dBc	Pass
	12.4 GHz - 24 GHz	< -40 dBc	≤ - 20 dBc	Pass
	23.5 GHz - 31 GHz	< -40 dBc	≤ - 20 dBc	Pass
	30.5 GHz - 40 GHz	< -40 dBc	≤ - 20 dBc	Pass
High Channel, 165				
	0MHz - 12.5GHz	< -40 dBc	≤ - 20 dBc	Pass
	12.4 GHz - 24 GHz	< -40 dBc	≤ - 20 dBc	Pass
	23.5 GHz - 31 GHz	< -40 dBc	≤ - 20 dBc	Pass
	30.5 GHz - 40 GHz	< -40 dBc	≤ - 20 dBc	Pass

Low Channel 149, 0MHz - 12.5 GHz

Result: Pass

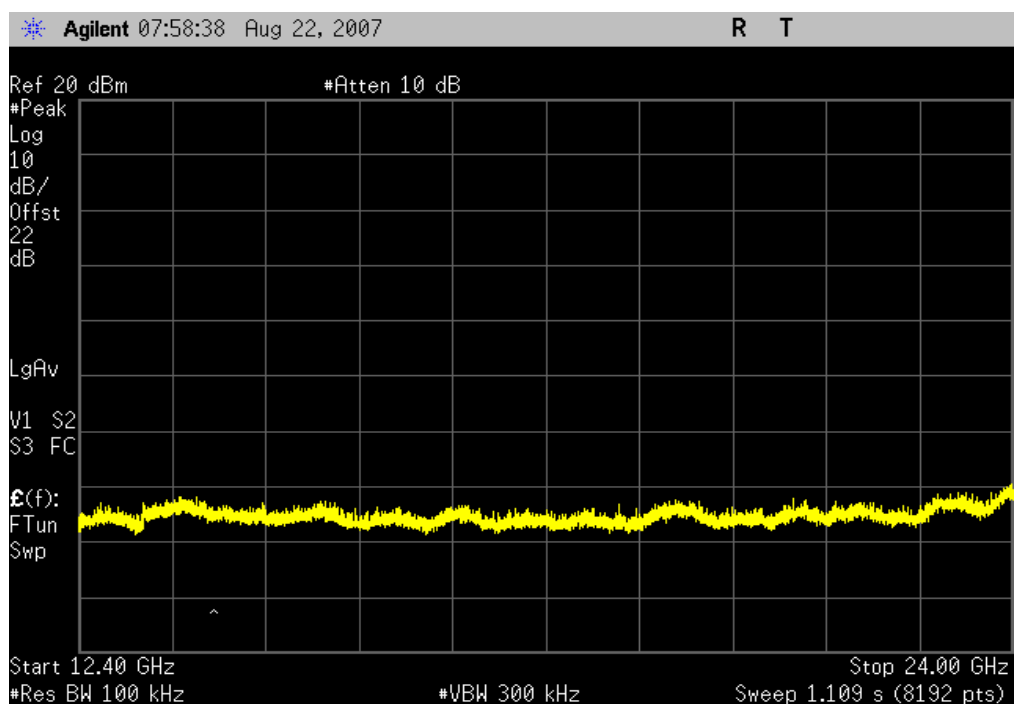
Value: < -40 dBc

Limit: ≤ -20 dBc

Low Channel 149, 12.4 GHz - 24 GHz

Result: Pass

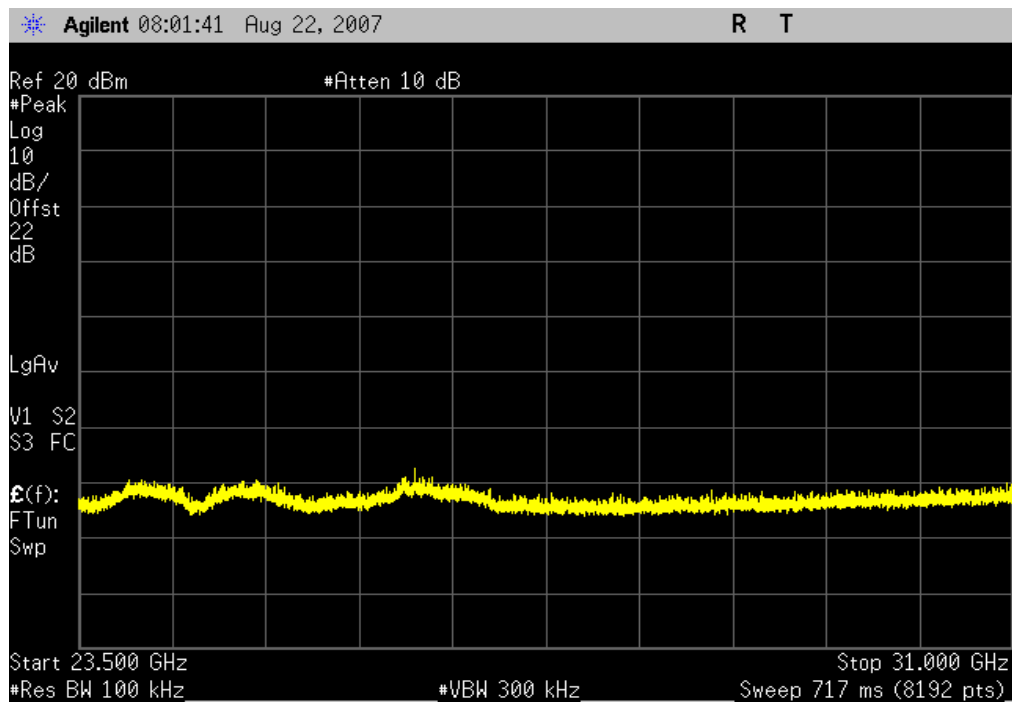
Value: < -40 dBc

Limit: ≤ -20 dBc

Low Channel 149, 23.5 GHz - 31 GHz

Result: Pass

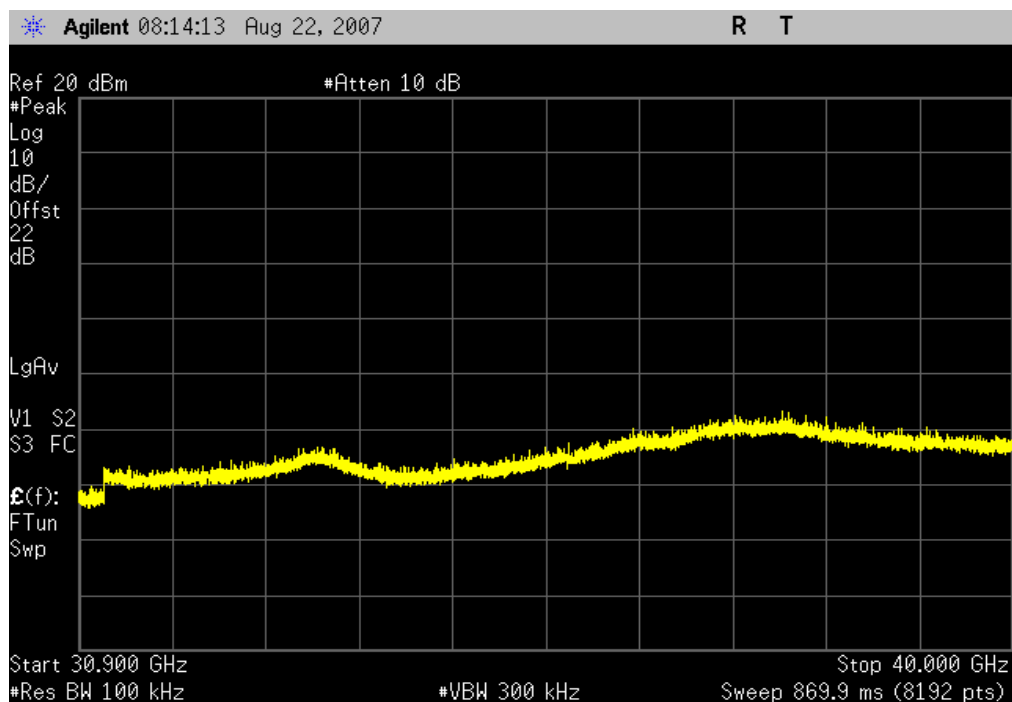
Value: < -40 dBc

Limit: ≤ -20 dBc

Low Channel 149, 30.5 GHz - 40 GHz

Result: Pass

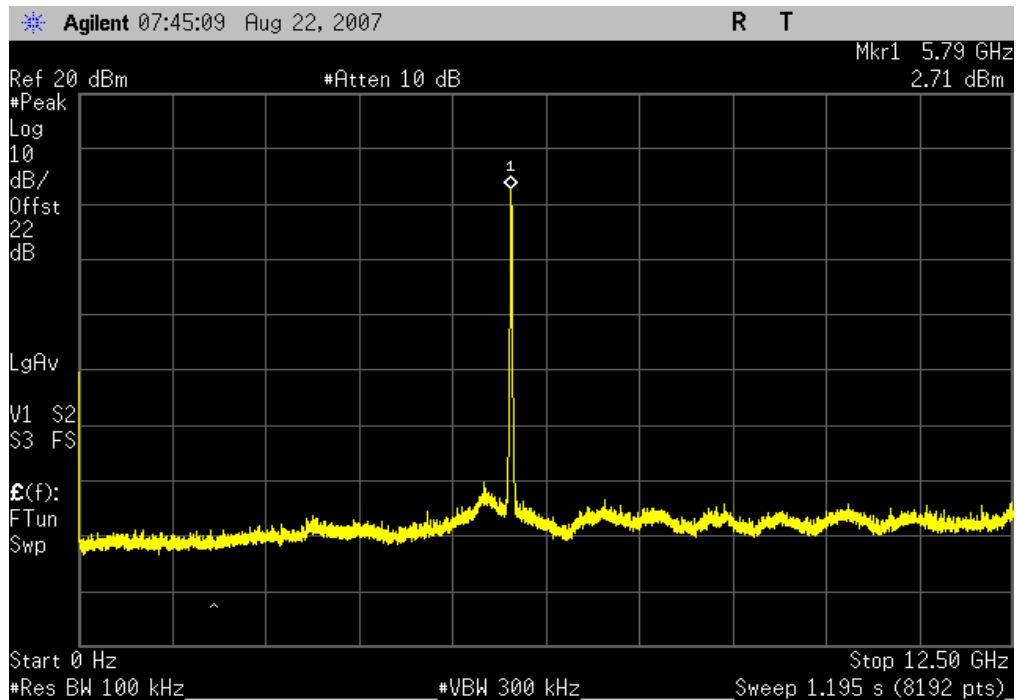
Value: < -40 dBc

Limit: ≤ -20 dBc

Mid Channel 157, 0MHz - 12.5GHz

Result: Pass

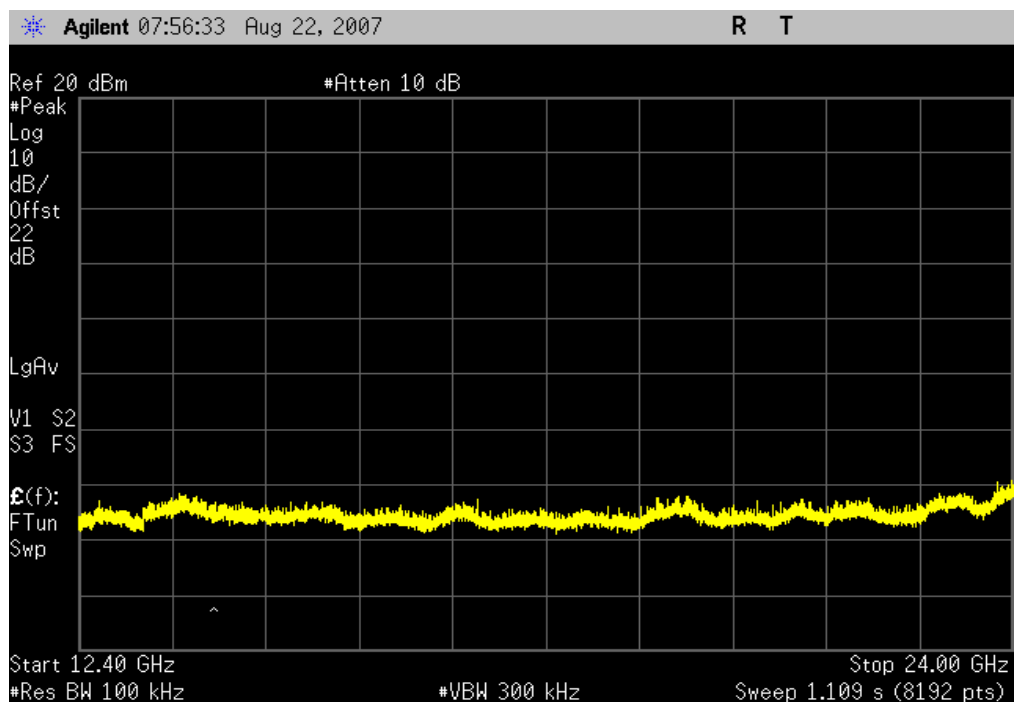
Value: < -40 dBc

Limit: ≤ -20 dBc

Mid Channel 157, 12.4 GHz - 24 GHz

Result: Pass

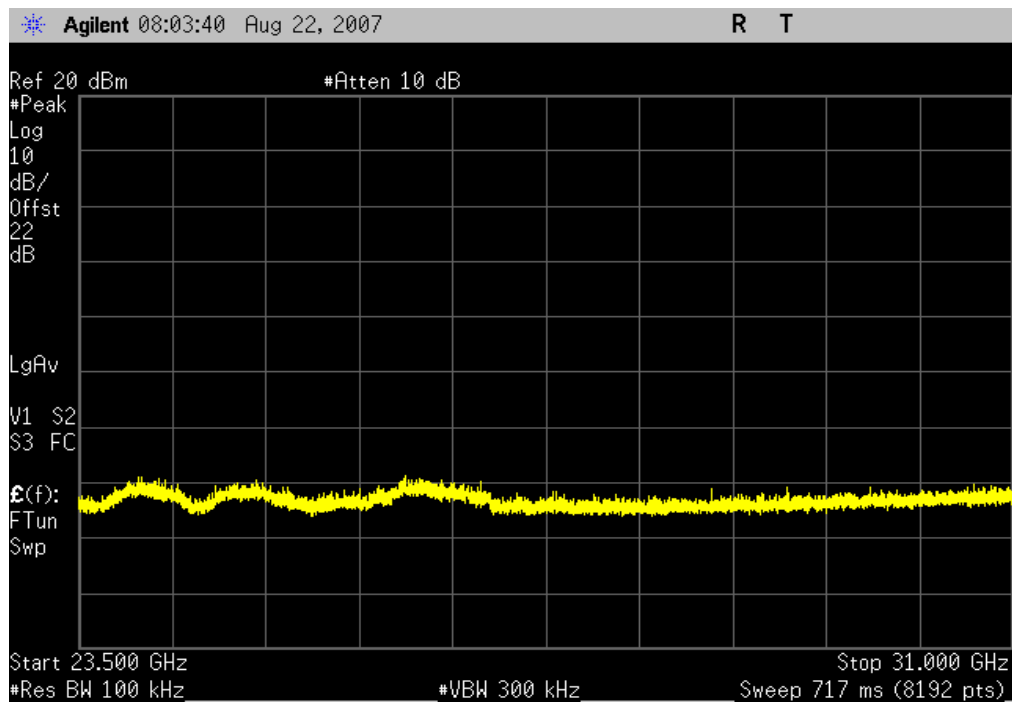
Value: < -40 dBc

Limit: ≤ -20 dBc

Mid Channel 157, 23.5 GHz - 31 GHz

Result: Pass

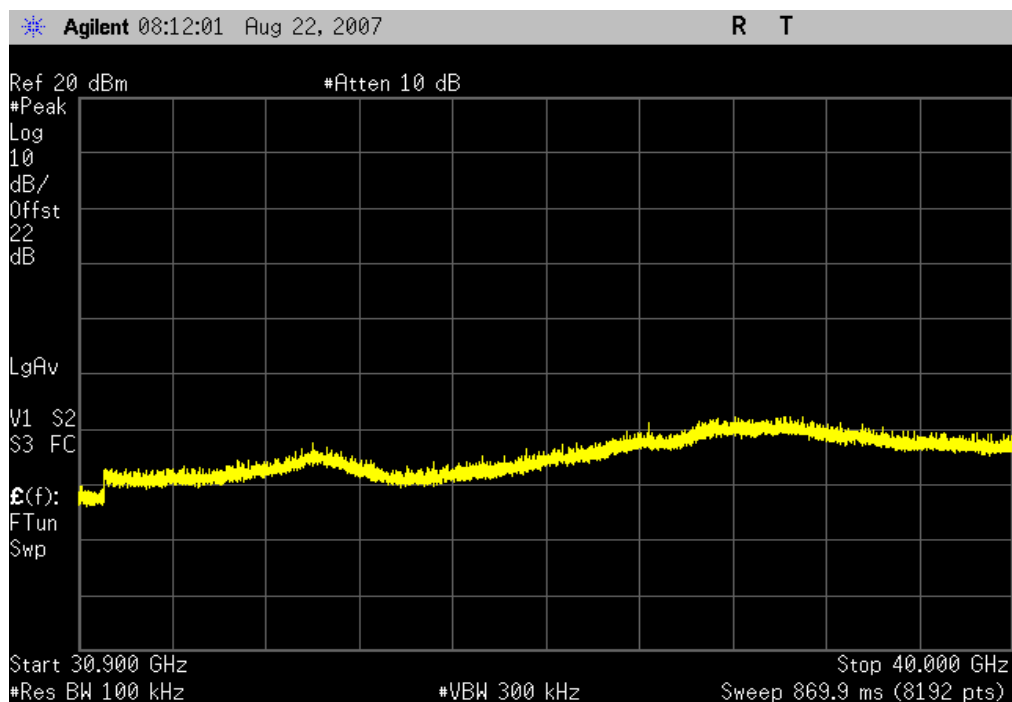
Value: < -40 dBc

Limit: ≤ -20 dBc

Mid Channel 157, 30.5 GHz - 40 GHz

Result: Pass

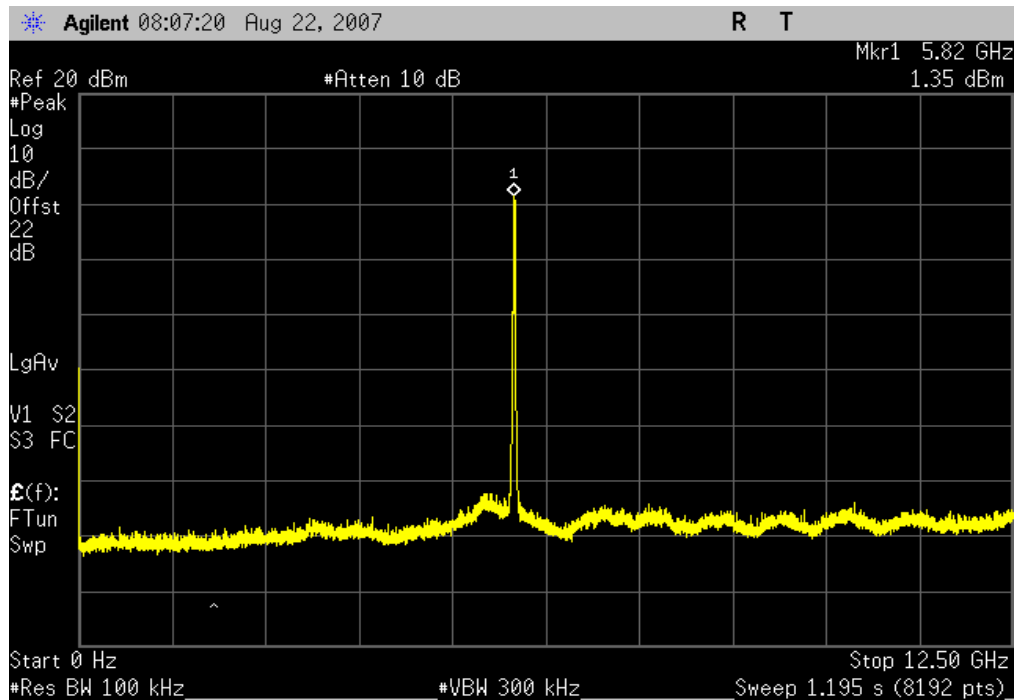
Value: < -40 dBc

Limit: ≤ -20 dBc

High Channel 165, 0MHz - 12.5GHz

Result: Pass

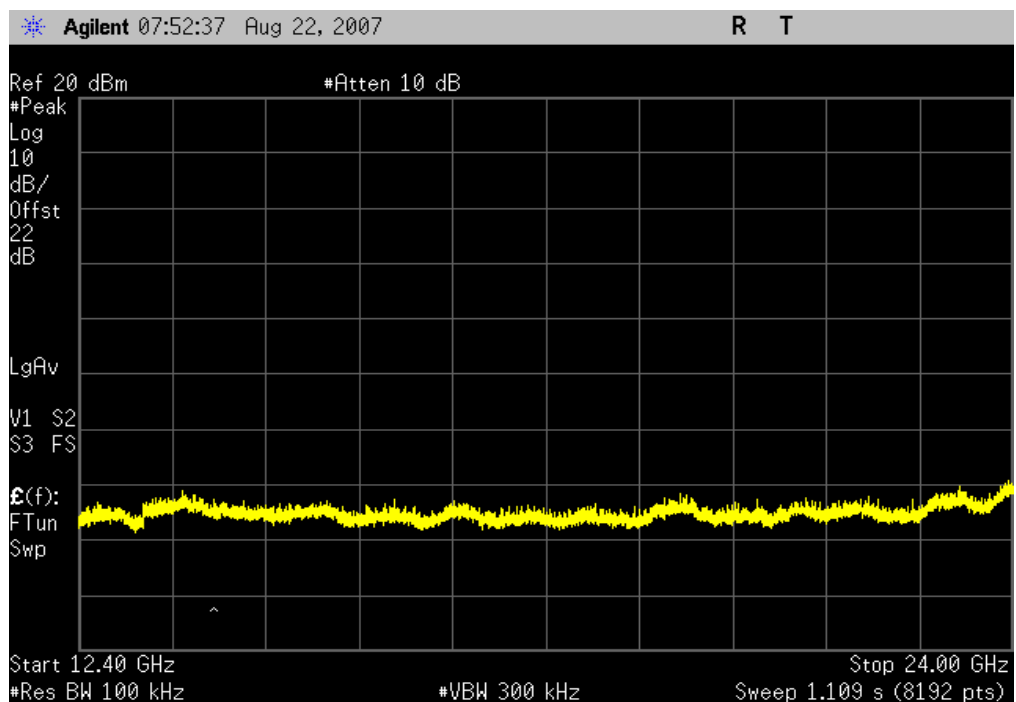
Value: < -40 dBc

Limit: ≤ -20 dBc

High Channel 165, 12.4 GHz - 24 GHz

Result: Pass

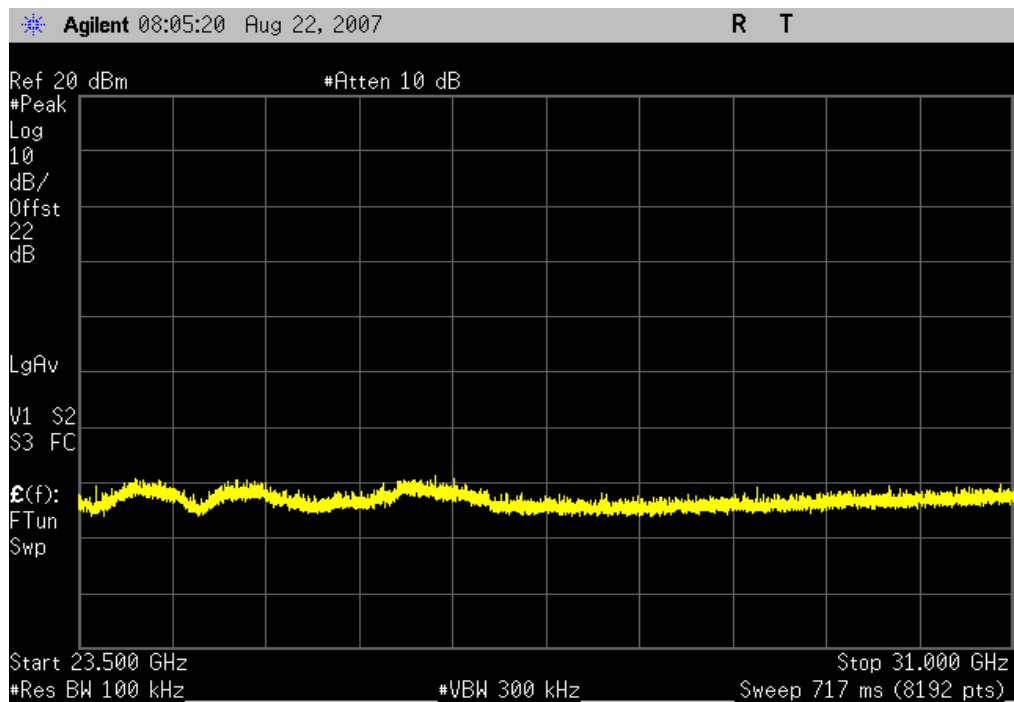
Value: < -40 dBc

Limit: ≤ -20 dBc

High Channel 165, 23.5 GHz - 31 GHz

Result: Pass

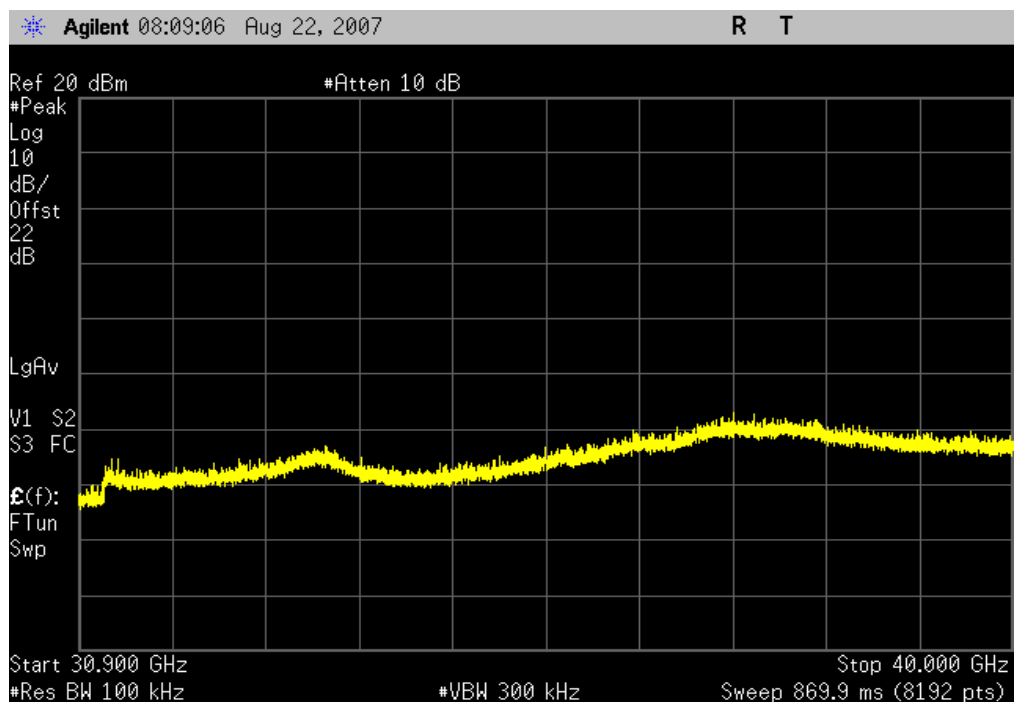
Value: < -40 dBc

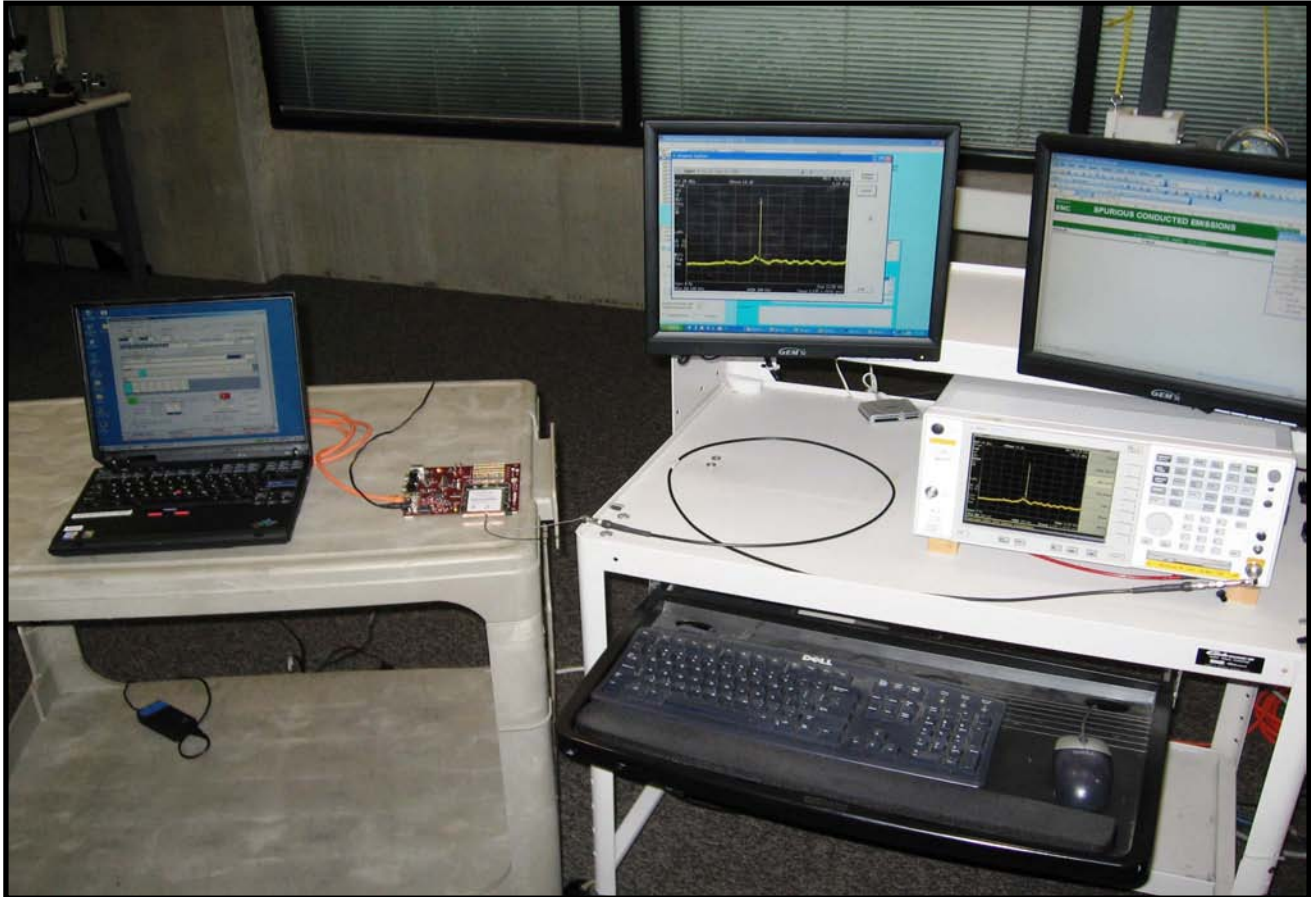
Limit: ≤ -20 dBc

High Channel 165, 30.5 GHz - 40 GHz

Result: Pass

Value: < -40 dBc

Limit: ≤ -20 dBc



Spurious Radiated Emissions

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 149

Channel 157

Channel 165

POWER SETTINGS INVESTIGATED

120VAC/60Hz

FREQUENCY RANGE INVESTIGATED

Start Frequency

30 MHz

Stop Frequency

40 GHz

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
5.25 GHz Notch Filter	K&L Microwave	8N50-5250/X200-0/0	HFK	4/3/2008	24
5.8 GHz Notch Filter	Micro-Tronics	BRC50705	HFQ	6/1/2009	13
Band Reject Filter	Micro-Tronics	BRC50704	HGB	9/19/2008	13
High Pass Filter	Micro-Tronics	HPM50112	HGA	6/27/2008	13
Pre-Amplifier	Miteq	JS4-26004000-40-8P	AON	7/14/2008	13
Pre-Amplifier	Miteq	JS4-26004000-40-8P	APV	7/14/2008	13
Antenna, Horn	EMCO	3160-10	AHI	NCR	0
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVI	5/14/2008	13
Antenna, Horn	ETS	3160-08	AIA	NCR	0
EV01 Cables		18-26GHz Standard Gain Horn Cable	EVD	12/2/2008	13
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	12/2/2008	13
Antenna, Horn	ETS	3160-09	AHG	NCR	0
EV12 Cables		Standard Gain Horn Cables	EVU	5/14/2008	13
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVH	5/14/2008	13
Antenna, Horn	ETS	3160.07	AHZ	10/14/2008	24
High Pass Filter	Micro-Tronics	50111	HGE	5/14/2008	13
Attenuator	Pasternack	PE7005-20	AUN	5/10/2008	13
Pre-Amplifier	Miteq	AMF-3D00100800-32-13P	AVF	6/17/2008	13
Antenna, Horn	ETS	3115	AIB	8/25/2008	24
Spectrum Analyzer	Agilent	E44440A	AFA	11/14/2008	12
EV12 Cables		Bilog Cables	EVS	6/17/2008	13
Pre-Amplifier	Miteq	AM-1616-1000	AVM	6/17/2008	13
Antenna, Biconilog	EMCO	3141	AXG	11/4/2008	13
High Pass Filter	Micro-Tronics	HPM50111	HFO	5/21/2008	13
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	5/19/2008	13
Antenna, Horn	EMCO	3115	AHC	8/12/2008	24
Spectrum Analyzer	Agilent	E4446A	AAV	12/11/2008	13
EV01 Cables		Double Ridge Horn Cables	EVB	5/19/2008	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
0.15 - 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.

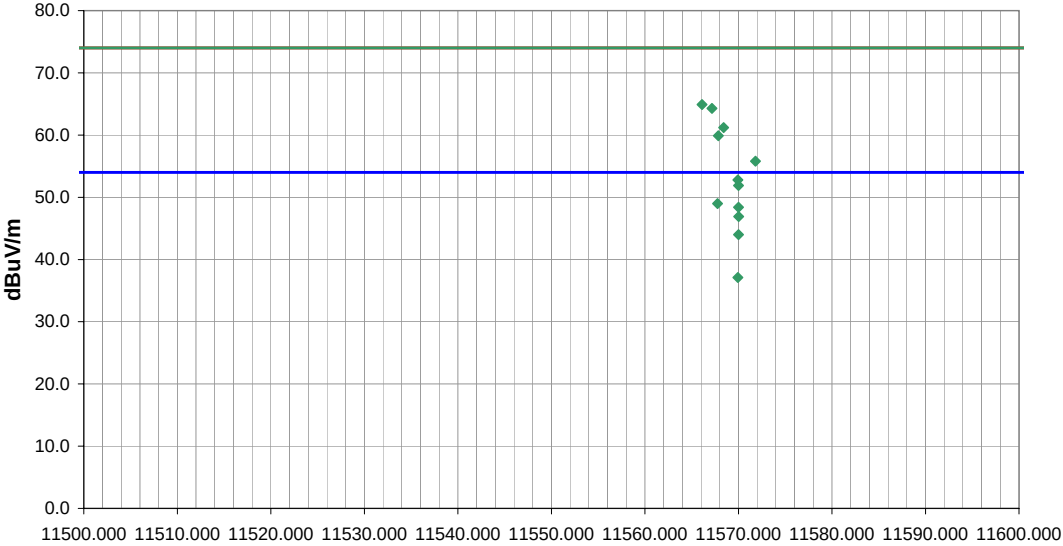
MEASUREMENT UNCERTAINTY

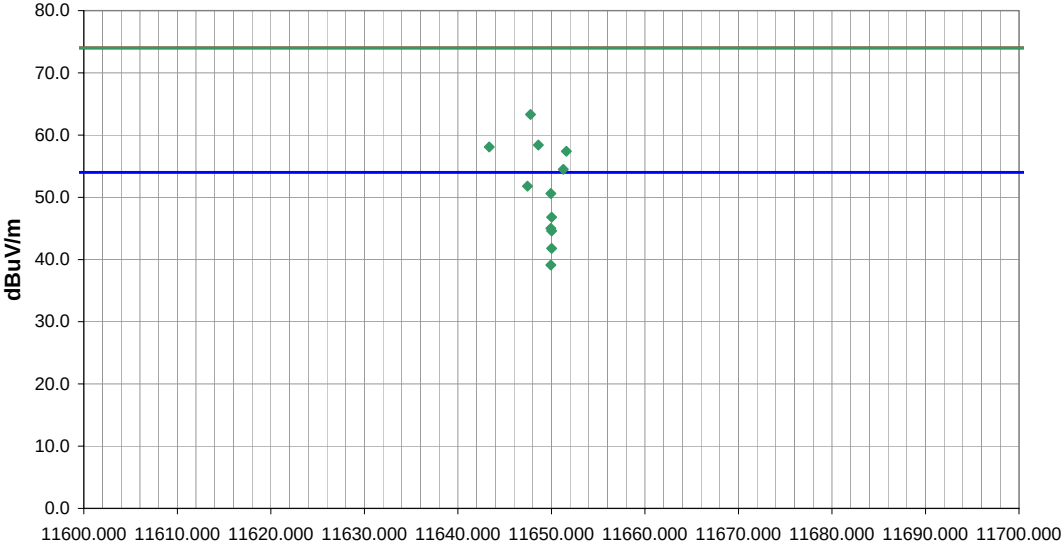
A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

TEST DESCRIPTION

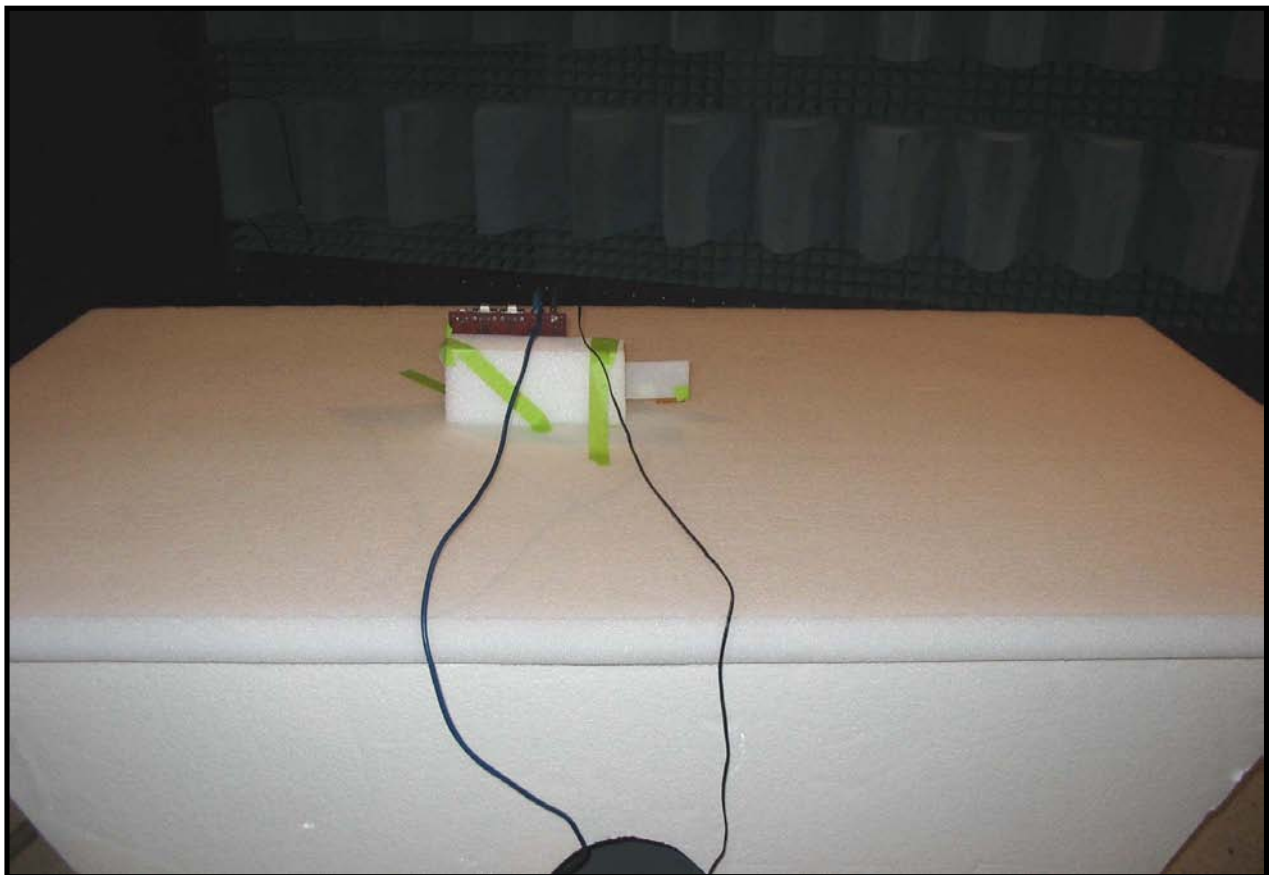
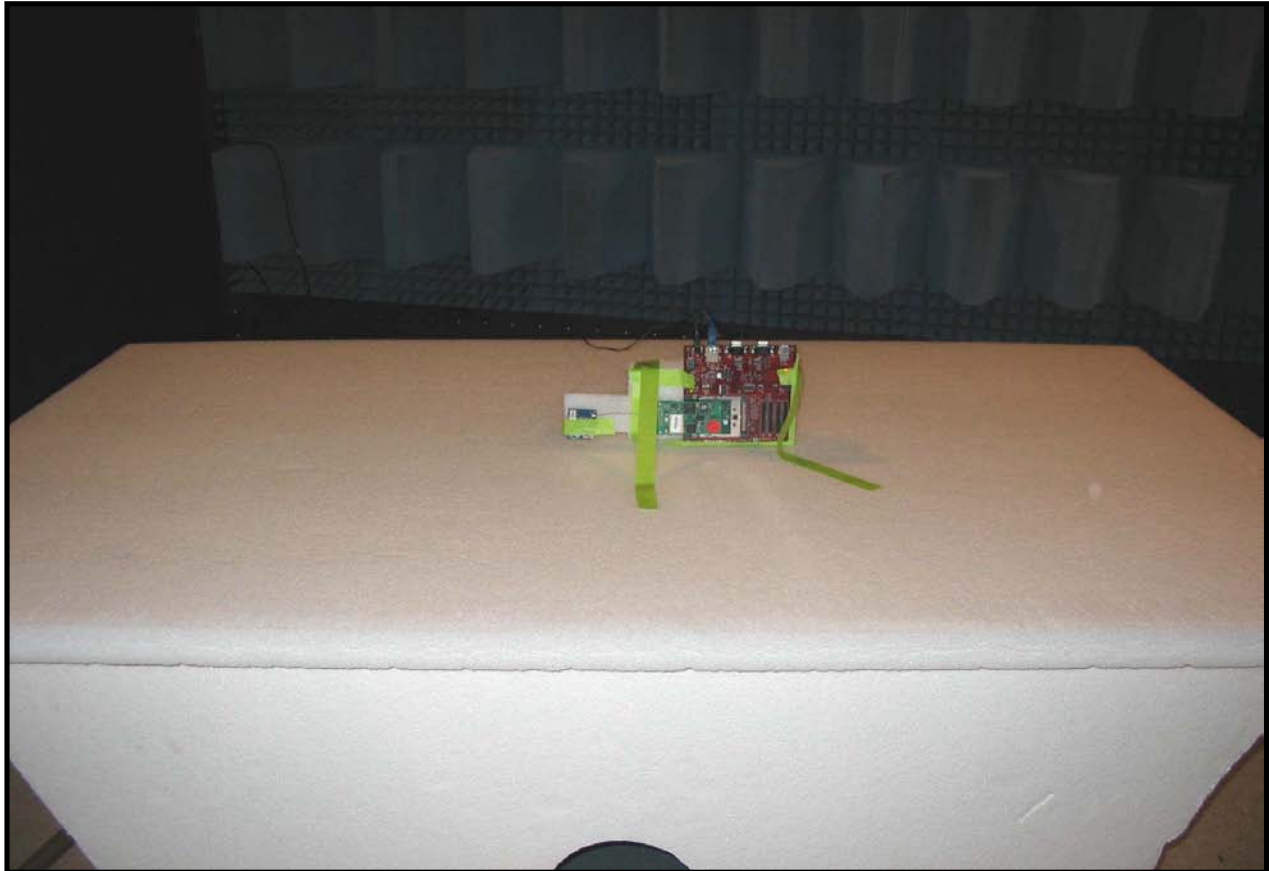
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axes, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

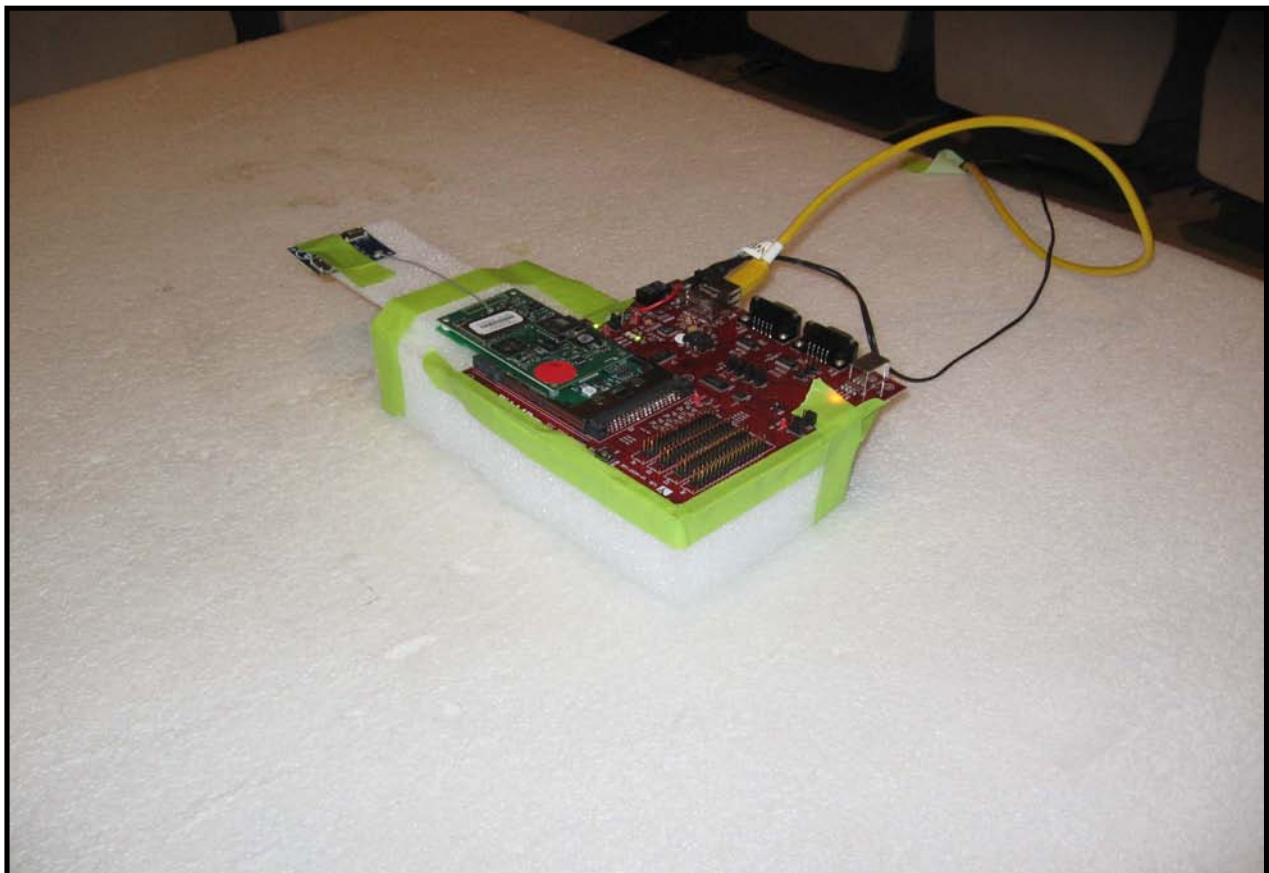
NORTHWEST EMC										Spurious Radiated Emissions				PSA 2008.07.21 EMI 2008.1.9	
EUT: Lamarr2		Work Order: PROT0311													
Serial Number: 000B28004C5C		Date: 05/26/09													
Customer: Welch Allyn Protocol, Inc.		Temperature: 22													
Attendees: Steve Baker		Humidity: 34%													
Project: None		Barometric Pres.: 30.27													
Tested by: Jennifer Herrett		Power: 120VAC/60Hz		Job Site: EV12											
TEST SPECIFICATIONS										Test Method					
FCC 15.247 (DTS):2007										ANSI C63.4:2003, KDB No. 558074					
TEST PARAMETERS															
Antenna Height(s) (m)		1 - 4		Test Distance (m)		3									
COMMENTS															
None															
EUT OPERATING MODES															
Transmitting 802.11(a), Ch 149, 6Mbps															
DEVIATIONS FROM TEST STANDARD															
No deviations.															
Run #		6													
Configuration #		2													
Results		Pass		Signature <i>Jennifer Herrett</i>											
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		
11490.040	65.1	-12.1	343.0	1.0	3.0	0.0	H-Horn	AV	0.0	53.0	54.0	-1.0	EUT vertical. 2. Det:60F1 & PCV:50600.		
11487.570	64.7	-12.1	352.0	1.0	3.0	0.0	V-Horn	AV	0.0	52.6	54.0	-1.4	EUT on side. 2. Det:60F1 & PCV:50600.		
11489.900	60.4	-12.1	305.0	1.0	3.0	0.0	V-Horn	AV	0.0	48.3	54.0	-5.7	EUT horizontal. 2. Det:60F1 & PCV:50600.		
11491.620	77.6	-12.1	343.0	1.0	3.0	0.0	H-Horn	PK	0.0	65.5	74.0	-8.5	EUT vertical. 2. Det:60F1 & PCV:50600.		
11489.490	76.4	-12.1	352.0	1.0	3.0	0.0	V-Horn	PK	0.0	64.3	74.0	-9.7	EUT on side. 2. Det:60F1 & PCV:50600.		
11489.870	56.2	-12.1	12.0	1.0	3.0	0.0	H-Horn	AV	0.0	44.1	54.0	-9.9	EUT on side. 2. Det:60F1 & PCV:50600.		
11489.900	56.2	-12.1	76.0	1.0	3.0	0.0	V-Horn	AV	0.0	44.1	54.0	-9.9	EUT vertical. 2. Det:60F1 & PCV:50600.		
11489.960	55.2	-12.1	174.0	1.0	3.0	0.0	H-Horn	AV	0.0	43.1	54.0	-10.9	EUT horizontal. 2. Det:60F1 & PCV:50600.		
11487.320	71.9	-12.1	305.0	1.0	3.0	0.0	V-Horn	PK	0.0	59.8	74.0	-14.2	EUT horizontal. 2. Det:60F1 & PCV:50600.		
11492.210	68.5	-12.1	12.0	1.0	3.0	0.0	H-Horn	PK	0.0	56.4	74.0	-17.6	EUT on side. 2. Det:60F1 & PCV:50600.		
11491.740	68.0	-12.1	76.0	1.0	3.0	0.0	V-Horn	PK	0.0	55.9	74.0	-18.1	EUT vertical. 2. Det:60F1 & PCV:50600.		
11485.870	67.7	-12.1	174.0	1.0	3.0	0.0	H-Horn	PK	0.0	55.6	74.0	-18.4	EUT horizontal. 2. Det:60F1 & PCV:50600.		

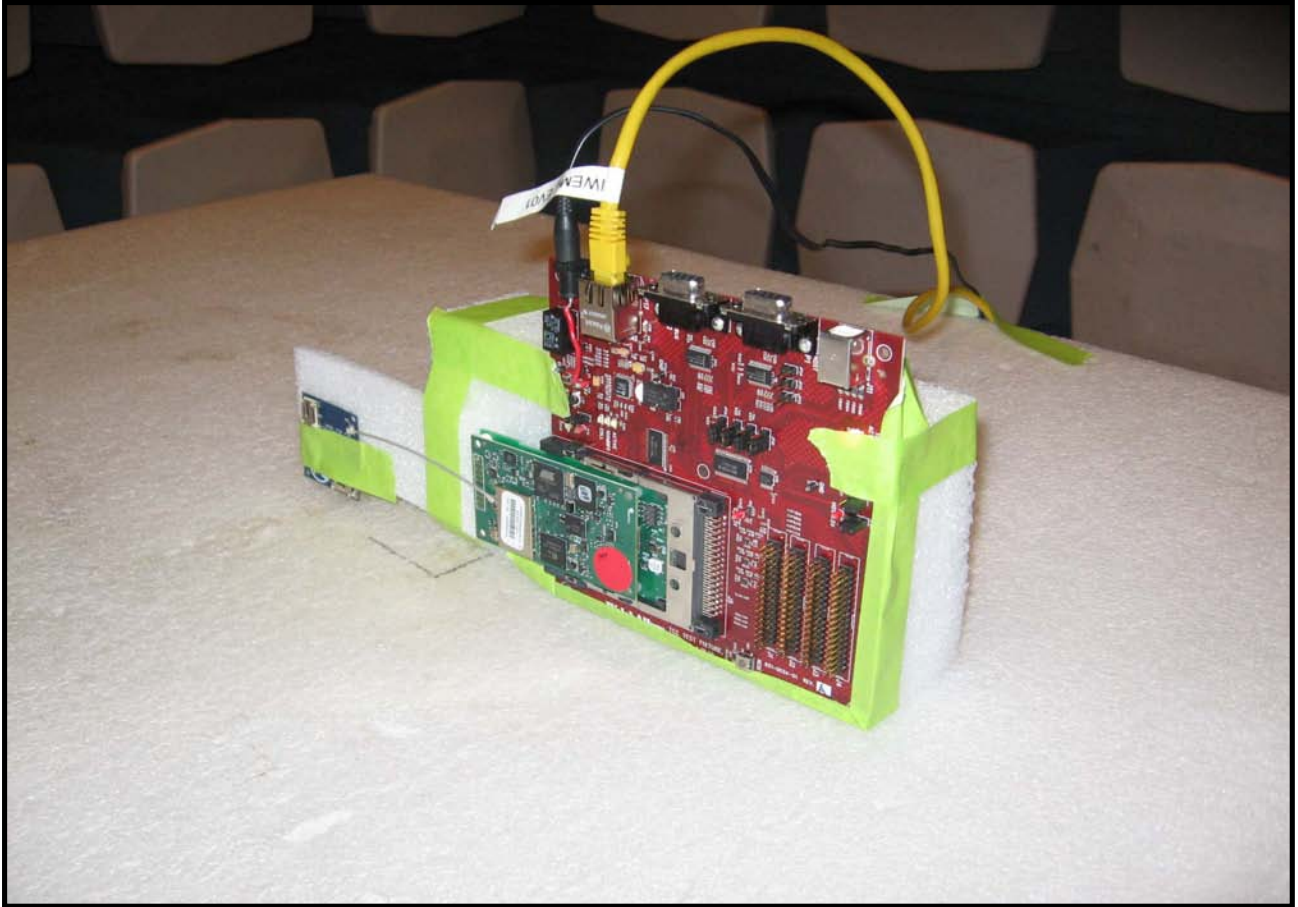
NORTHWEST EMC										Spurious Radiated Emissions					PSA 2008.07.21 EMI 2008.1.9				
EUT: Lamarr2										Work Order: PROT0311									
Serial Number: 000B28004C5C										Date: 05/26/09									
Customer: Welch Allyn Protocol, Inc.										Temperature: 22									
Attendees: Steve Baker										Humidity: 34%									
Project: None										Barometric Pres.: 30.27									
Tested by: Jennifer Herrett										Power: 120VAC/60Hz					Job Site: EV12				
TEST SPECIFICATIONS										Test Method									
FCC 15.247 (DTS):2007										ANSI C63.4:2003, KDB No. 558074									
TEST PARAMETERS																			
Antenna Height(s) (m)					1 - 4					Test Distance (m)					3				
COMMENTS																			
None																			
EUT OPERATING MODES																			
Transmitting 802.11(a), Ch 157, 6Mbps																			
DEVIATIONS FROM TEST STANDARD																			
No deviations.																			
Run #					7					 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 dBuV/m	Compared to Spec. (dB)	Comments						
11569.940	64.8	-12.0	360.0	1.0	3.0	0.0	H-Horn	AV	0.0	52.8	54.0	-1.2	EUT vertical.						
11570.000	63.9	-12.0	349.0	1.1	3.0	0.0	V-Horn	AV	0.0	51.9	54.0	-2.1	EUT on side.						
11570.000	60.4	-12.0	320.0	1.0	3.0	0.0	V-Horn	AV	0.0	48.4	54.0	-5.6	EUT horizontal.						
11570.020	58.9	-12.0	45.0	1.0	3.0	0.0	H-Horn	AV	0.0	46.9	54.0	-7.1	EUT on side.						
11566.100	76.9	-12.0	360.0	1.0	3.0	0.0	H-Horn	PK	0.0	64.9	74.0	-9.1	EUT vertical.						
11567.170	76.3	-12.0	349.0	1.1	3.0	0.0	V-Horn	PK	0.0	64.3	74.0	-9.7	EUT on side.						
11570.000	56.0	-12.0	100.0	1.0	3.0	0.0	V-Horn	AV	0.0	44.0	54.0	-10.0	EUT vertical.						
11568.420	73.2	-12.0	320.0	1.0	3.0	0.0	V-Horn	PK	0.0	61.2	74.0	-12.8	EUT horizontal.						
11567.850	71.9	-12.0	45.0	1.0	3.0	0.0	H-Horn	PK	0.0	59.9	74.0	-14.1	EUT on side.						
11569.940	49.1	-12.0	169.0	1.0	3.0	0.0	H-Horn	AV	0.0	37.1	54.0	-16.9	EUT horizontal.						
11571.830	67.8	-12.0	100.0	1.0	3.0	0.0	V-Horn	PK	0.0	55.8	74.0	-18.2	EUT vertical.						
11567.770	61.0	-12.0	169.0	1.0	3.0	0.0	H-Horn	PK	0.0	49.0	74.0	-25.0	EUT horizontal.						

NORTHWEST EMC										Spurious Radiated Emissions					PSA 2008.07.21 EMI 2008.1.9				
EUT: Lamarr2										Work Order: PROT0311									
Serial Number: 000B28004C5C										Date: 05/26/09									
Customer: Welch Allyn Protocol, Inc.										Temperature: 22									
Attendees: Steve Baker										Humidity: 34%									
Project: None										Barometric Pres.: 30.27									
Tested by: Jennifer Herrett										Power: 120VAC/60Hz					Job Site: EV12				
TEST SPECIFICATIONS										Test Method									
FCC 15.247 (DTS):2007										ANSI C63.4:2003, KDB No. 558074									
TEST PARAMETERS																			
Antenna Height(s) (m)					1 - 4					Test Distance (m)					3				
COMMENTS																			
None																			
EUT OPERATING MODES																			
Transmitting 802.11(a), Ch 165, 6Mbps																			
DEVIATIONS FROM TEST STANDARD																			
No deviations.																			
Run #					8					 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 dBuV/m	Compared to Spec. (dB)	Comments						
11649.940	62.5	-11.9	6.0	1.0	3.0	0.0	H-Horn	AV	0.0	50.6	54.0	-3.4	EUT vertical.						
11650.020	58.7	-11.9	302.0	1.1	3.0	0.0	V-Horn	AV	0.0	46.8	54.0	-7.2	EUT horizontal.						
11649.940	56.9	-11.9	0.0	1.1	3.0	0.0	V-Horn	AV	0.0	45.0	54.0	-9.0	EUT on side.						
11650.020	56.5	-11.9	44.0	1.0	3.0	0.0	H-Horn	AV	0.0	44.6	54.0	-9.4	EUT on side.						
11647.770	75.2	-11.9	6.0	1.0	3.0	0.0	H-Horn	PK	0.0	63.3	74.0	-10.7	EUT vertical.						
11650.020	53.7	-11.9	292.0	1.1	3.0	0.0	V-Horn	AV	0.0	41.8	54.0	-12.2	EUT vertical.						
11649.940	51.0	-11.9	183.0	1.0	3.0	0.0	H-Horn	AV	0.0	39.1	54.0	-14.9	EUT horizontal.						
11648.600	70.3	-11.9	302.0	1.1	3.0	0.0	V-Horn	PK	0.0	58.4	74.0	-15.6	EUT horizontal.						
11643.350	70.0	-11.9	0.0	1.1	3.0	0.0	V-Horn	PK	0.0	58.1	74.0	-15.9	EUT on side.						
11651.600	69.3	-11.9	44.0	1.0	3.0	0.0	H-Horn	PK	0.0	57.4	74.0	-16.6	EUT on side.						
11651.270	66.4	-11.9	292.0	1.1	3.0	0.0	V-Horn	PK	0.0	54.5	74.0	-19.5	EUT vertical.						
11647.440	63.7	-11.9	183.0	1.0	3.0	0.0	H-Horn	PK	0.0	51.8	74.0	-22.2	EUT horizontal.						









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

The peak power spectral density measurements were measured with the EUT set to low, mid, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate using direct sequence modulation. Per the procedure outlined in FCC 97-114, the spectrum analyzer was used as follows:

The emission peak(s) were located and zoom in on within the passband. The resolution bandwidth was set to 3 kHz, the video bandwidth was set to greater than or equal to the resolution bandwidth. The sweep speed was set equal to the span divided by 3 kHz (sweep = (SPAN/3 kHz)). For example, given a span of 1.5 MHz, the sweep should be $1.5 \times 10^6 \div 3 \times 10^3 = 500$ seconds. External attenuation was used and added to the reading. The following FCC procedure was used for modifying the power spectral density measurements:

"If the spectrum line spacing cannot be resolved on the available spectrum analyzer, the noise density function on most modern conventional spectrum analyzers will directly measure the noise power density normalized to a 1 Hz noise power bandwidth. Add 34.8 dB for correction to 3 kHz."

EMC

Power Spectral Density

EUT:	Welch Allyn 802.11a Wireless PC Card	Work Order:	PROT0295
Serial Number:	001AFA0000CE	Date:	08/14/07
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
		Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074

COMMENTS

DEVIATIONS FROM TEST STANDARD

Configuration #	1	Signature <i>Holly Ashkannejhad</i>
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		Value	Limit	Results
802.11(a), 6Mbps	5725MHz - 5850MHz			
	Low channel, 5745MHz	-5.1 dBm / 3 kHz	8 dBm / 3 kHz	Pass
	Mid channel, 5785MHz	-4.94 dBm / 3 kHz	8 dBm / 3 kHz	Pass
	High channel, 5825MHz	-5.39 dBm / 3 kHz	8 dBm / 3 kHz	Pass

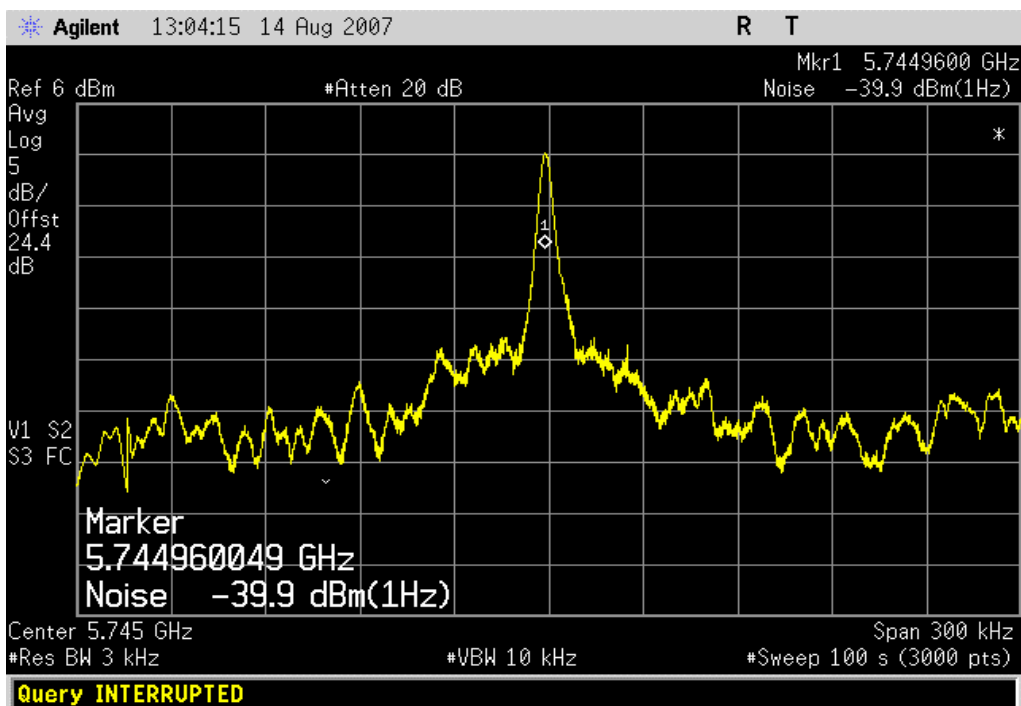
Power Spectral Density

802.11(a), 6Mbps, 5725MHz - 5850MHz, Low channel, 5745MHz

Result: Pass

Value: -5.1 dBm / 3 kHz

Limit: 8 dBm / 3 kHz

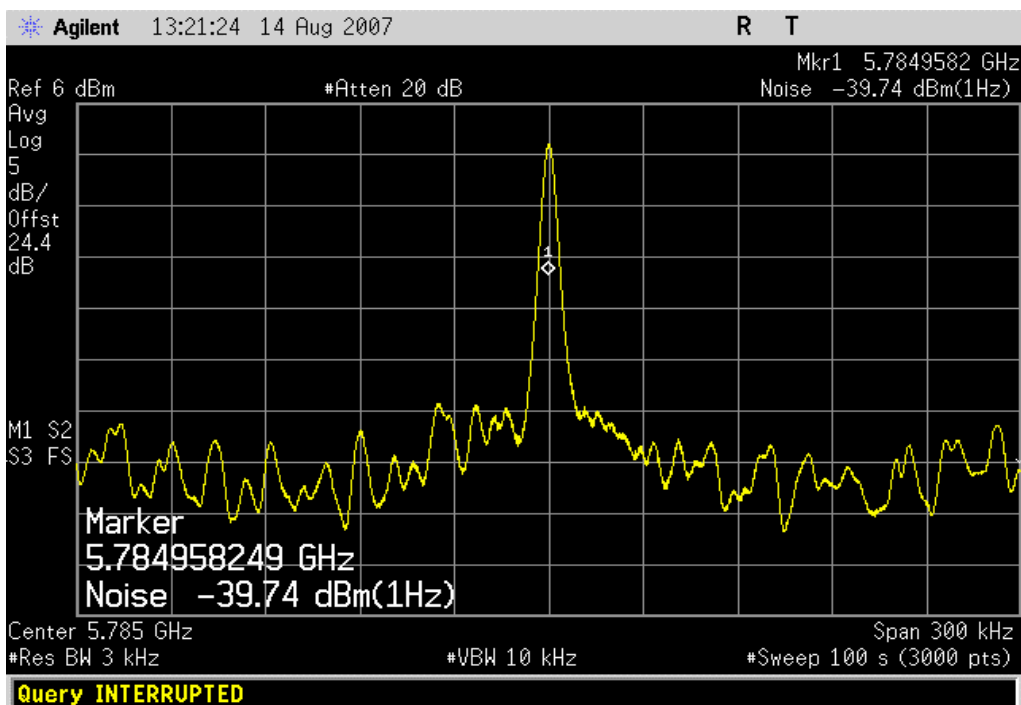


802.11(a), 6Mbps, 5725MHz - 5850MHz, Mid channel, 5785MHz

Result: Pass

Value: -4.94 dBm / 3 kHz

Limit: 8 dBm / 3 kHz



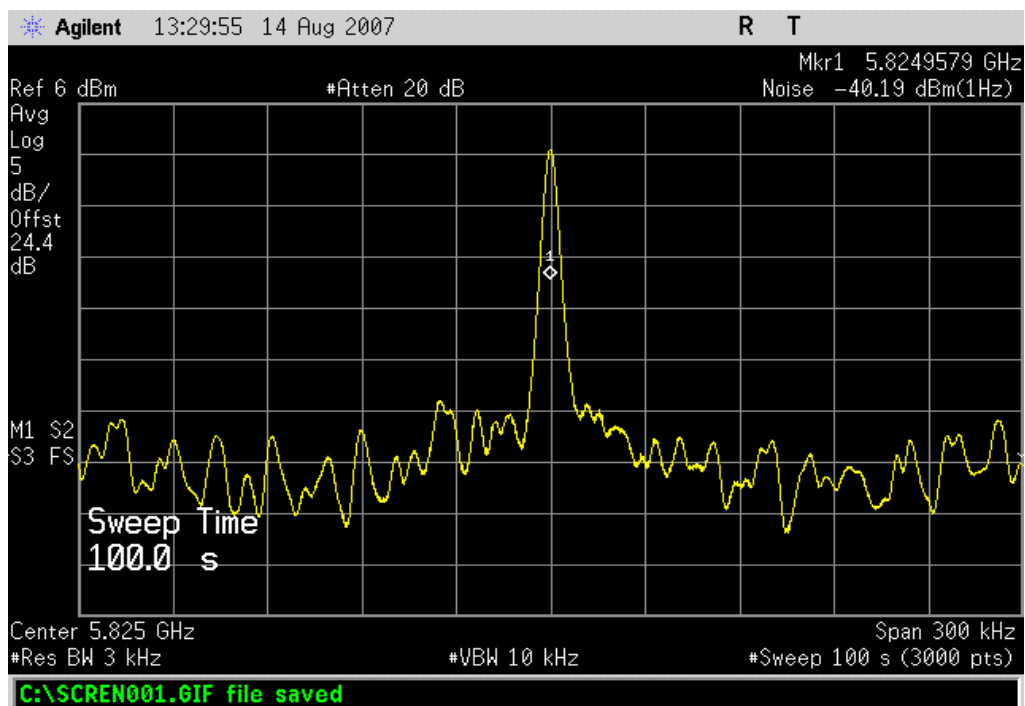
Power Spectral Density

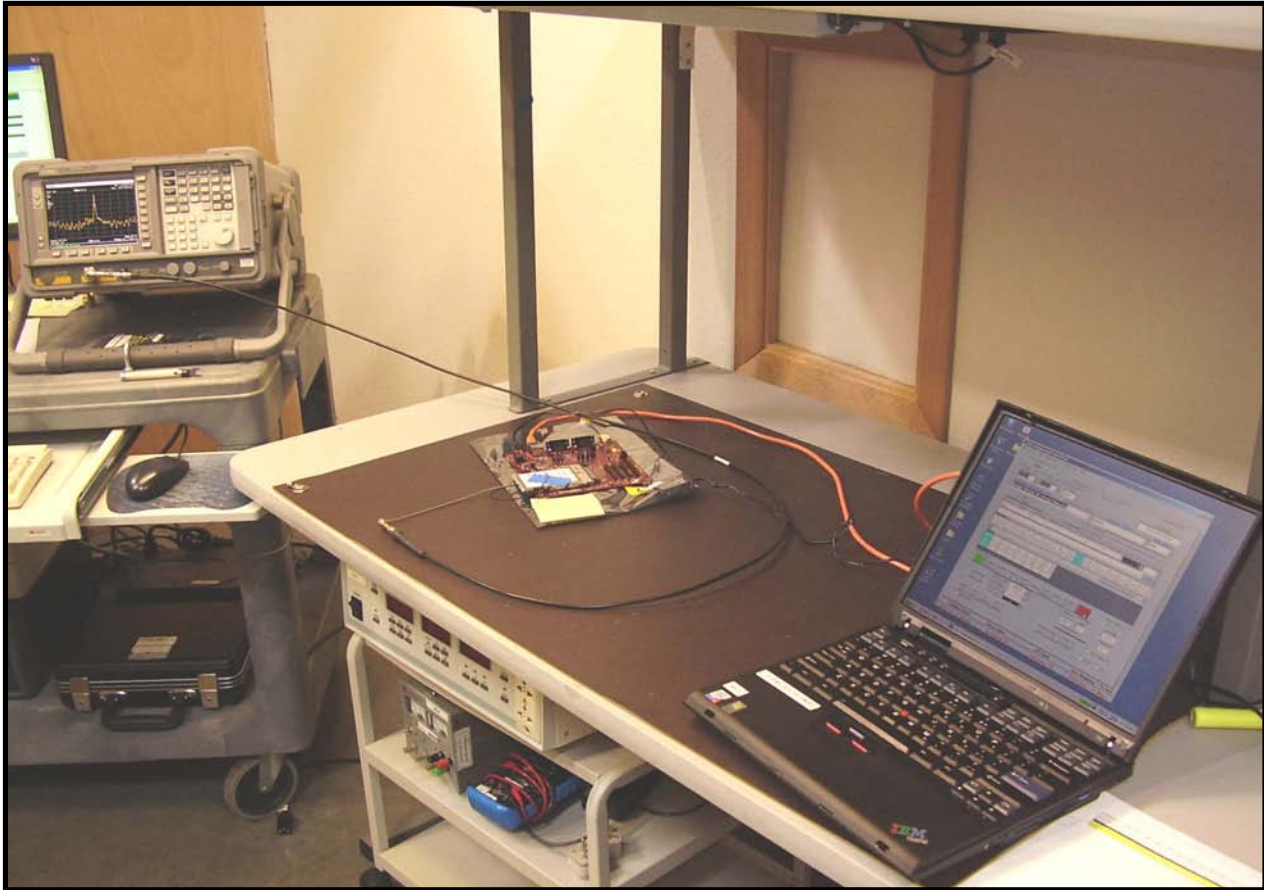
802.11(a), 6Mbps, 5725MHz - 5850MHz, High channel, 5825MHz

Result: Pass

Value: -5.39 dBm / 3 kHz

Limit: 8 dBm / 3 kHz





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 149

Transmitting 802.11(a), 6 Mbps, Channel 157

Transmitting 802.11(a), 6 Mbps, Channel 165

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
0.15 - 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

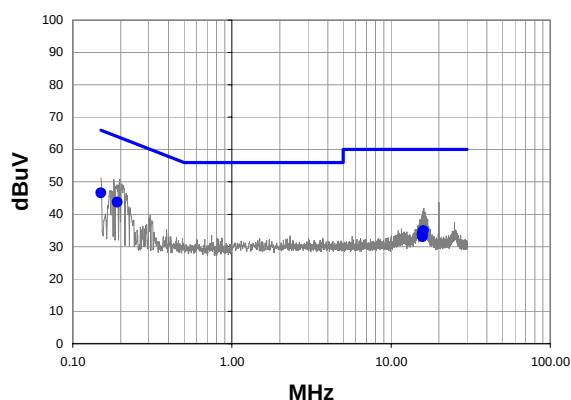
Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 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 50 Ω .

EMC

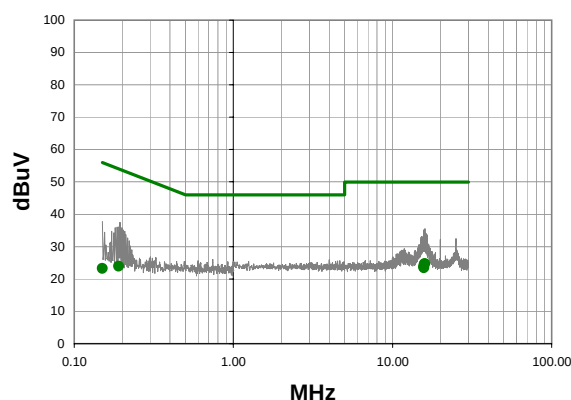
AC POWERLINE CONDUCTED EMISSIONS

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 157				
Deviations:	No deviations.				
Comments:					
Test Specifications FCC 15.207:2006			Test Method ANSI C63.4:2003		
Run #	15	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

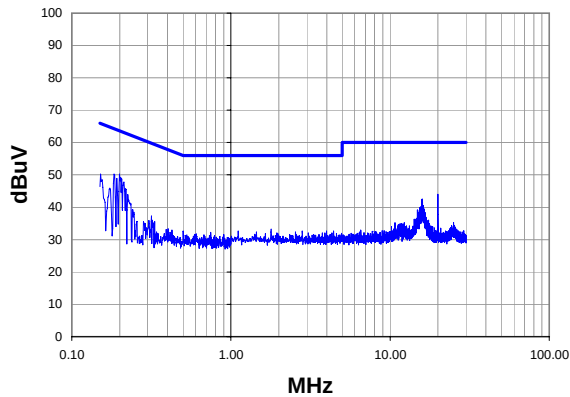
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.150	24.6	2.0	46.6	66.0	-19.4
0.190	22.5	1.2	43.7	64.0	-20.3
15.982	14.4	0.5	34.9	60.0	-25.1
15.844	14.1	0.5	34.6	60.0	-25.4
15.712	13.3	0.5	33.8	60.0	-26.2
15.772	12.6	0.5	33.1	60.0	-26.9

Average Data - vs - Average Limit

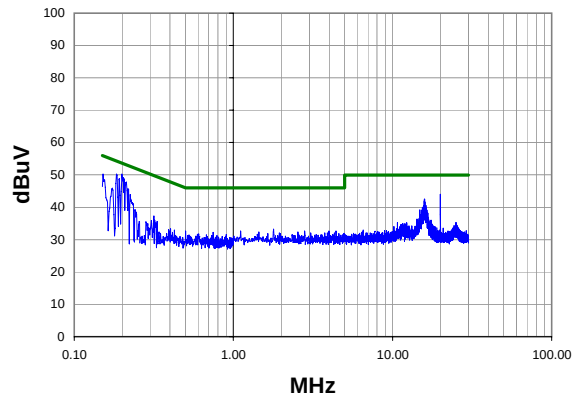
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
15.982	4.3	0.5	24.8	50.0	-25.2
15.844	4.1	0.5	24.6	50.0	-25.4
15.712	3.3	0.5	23.8	50.0	-26.2
15.772	3.0	0.5	23.5	50.0	-26.5
0.190	2.7	1.2	23.9	54.0	-30.1
0.150	1.2	2.0	23.2	56.0	-32.8

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 157						
Deviations:	No deviations.						
Comments:							
Test Specifications FCC 15.207:2006			Test Method ANSI C63.4:2003				
Run #	16	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)
0.199	29.2	1.0	50.2	63.6	-13.4
0.184	28.9	1.3	50.2	64.3	-14.1
0.206	27.8	1.0	48.8	63.4	-14.6
0.193	27.7	1.2	48.9	63.9	-15.1
0.213	26.8	1.0	47.8	63.1	-15.3
0.152	28.3	2.0	50.3	65.9	-15.6
20.000	23.6	0.5	44.1	60.0	-15.9
0.218	24.7	1.0	45.7	62.9	-17.2
15.920	22.1	0.5	42.6	60.0	-17.4
15.850	21.9	0.5	42.4	60.0	-17.6
15.870	21.4	0.5	41.9	60.0	-18.1
15.980	21.2	0.5	41.7	60.0	-18.3
0.225	22.9	1.0	43.9	62.6	-18.8
0.174	24.4	1.5	45.9	64.8	-18.9
15.790	20.1	0.5	40.6	60.0	-19.4
16.190	20.1	0.5	40.6	60.0	-19.4
15.650	19.7	0.5	40.2	60.0	-19.8
15.400	19.5	0.5	40.0	60.0	-20.0
16.150	19.5	0.5	40.0	60.0	-20.0
16.010	19.4	0.5	39.9	60.0	-20.1

Peak Data - vs - Average Limit

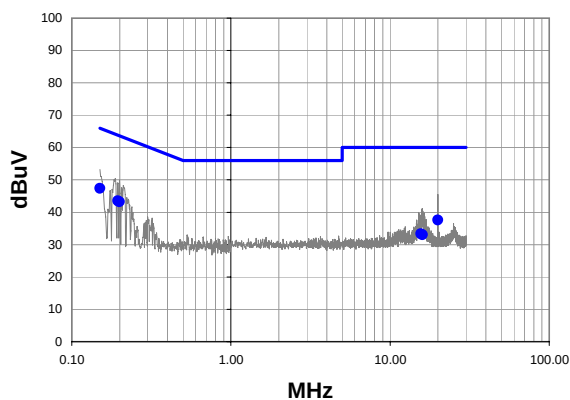
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.199	29.2	1.0	50.2	53.6	-3.4
0.184	28.9	1.3	50.2	54.3	-4.1
0.206	27.8	1.0	48.8	53.4	-4.6
0.193	27.7	1.2	48.9	53.9	-5.1
0.213	26.8	1.0	47.8	53.1	-5.3
0.152	28.3	2.0	50.3	55.9	-5.6
20.000	23.6	0.5	44.1	50.0	-5.9
0.218	24.7	1.0	45.7	52.9	-7.2
15.920	22.1	0.5	42.6	50.0	-7.4
15.850	21.9	0.5	42.4	50.0	-7.6
15.870	21.4	0.5	41.9	50.0	-8.1
15.980	21.2	0.5	41.7	50.0	-8.3
0.225	22.9	1.0	43.9	52.6	-8.8
0.174	24.4	1.5	45.9	54.8	-8.9
15.790	20.1	0.5	40.6	50.0	-9.4
16.190	20.1	0.5	40.6	50.0	-9.4
15.650	19.7	0.5	40.2	50.0	-9.8
15.400	19.5	0.5	40.0	50.0	-10.0
16.150	19.5	0.5	40.0	50.0	-10.0
16.010	19.4	0.5	39.9	50.0	-10.1

EMC

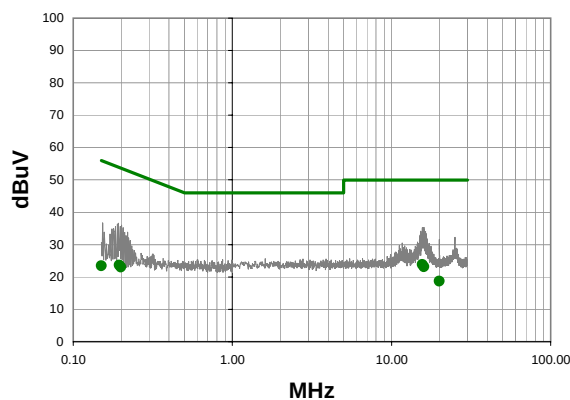
AC POWERLINE CONDUCTED EMISSIONS

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 165						
Deviations:	No deviations.						
Comments:							
Test Specifications FCC 15.207:2006			Test Method ANSI C63.4:2003				
Run #	17	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)
0.150	25.4	2.0	47.4	66.0	-18.6
0.195	22.4	1.1	43.5	63.8	-20.3
0.199	22.2	1.0	43.2	63.7	-20.4
20.000	17.1	0.5	37.6	60.0	-22.4
15.586	12.9	0.5	33.4	60.0	-26.6
15.962	12.6	0.5	33.1	60.0	-26.9

Average Data - vs - Average Limit

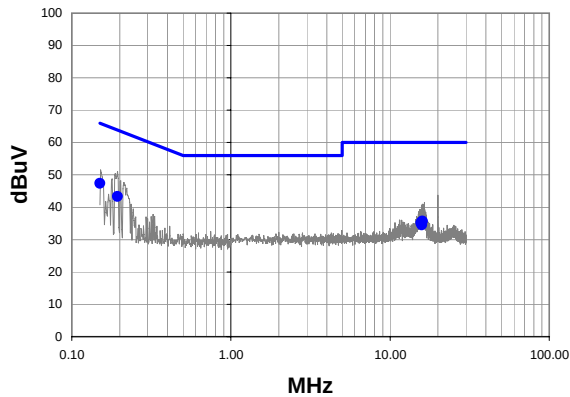
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
15.586	3.4	0.5	23.9	50.0	-26.1
15.962	2.7	0.5	23.2	50.0	-26.8
0.195	2.5	1.1	23.6	53.8	-30.2
0.199	2.0	1.0	23.0	53.7	-30.6
20.000	-1.8	0.5	18.7	50.0	-31.3
0.150	1.4	2.0	23.4	56.0	-32.6

EMC

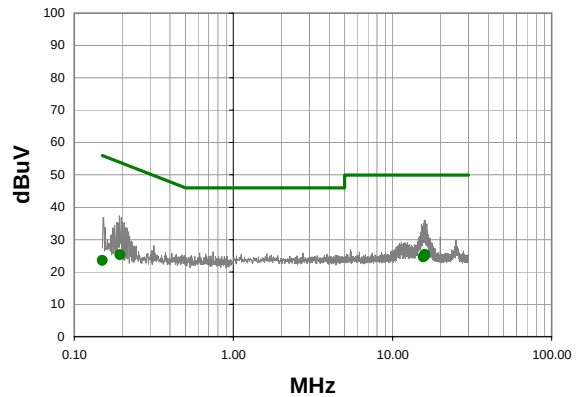
AC POWERLINE CONDUCTED EMISSIONS

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 165				
Deviations:	No deviations.				
Comments:					
Test Specifications FCC 15.207:2006			Test Method ANSI C63.4:2003		
Run #	18	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)
0.150	25.4	2.0	47.4	66.0	-18.6
0.194	22.2	1.1	43.3	63.9	-20.5
15.984	15.2	0.5	35.7	60.0	-24.3
15.912	15.0	0.5	35.5	60.0	-24.5
15.648	14.6	0.5	35.1	60.0	-24.9
15.848	14.0	0.5	34.5	60.0	-25.5

Average Data - vs - Average Limit

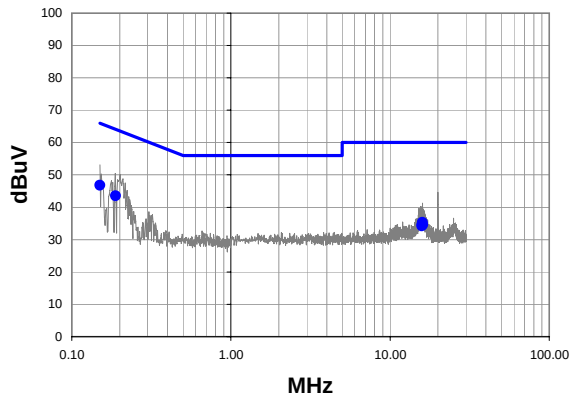
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
15.984	4.9	0.5	25.4	50.0	-24.6
15.912	4.6	0.5	25.1	50.0	-24.9
15.848	4.4	0.5	24.9	50.0	-25.1
15.648	4.2	0.5	24.7	50.0	-25.3
0.194	4.2	1.1	25.3	53.9	-28.5
0.150	1.5	2.0	23.5	56.0	-32.5

EMC

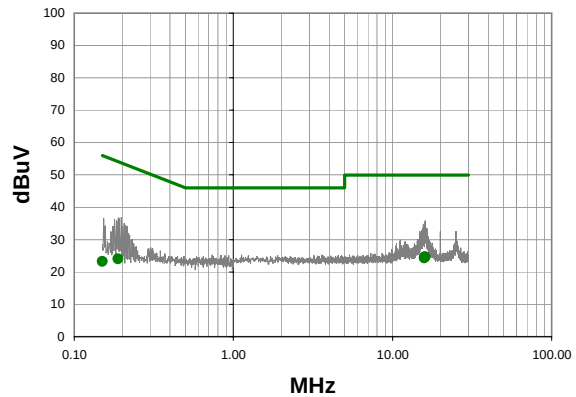
AC POWERLINE CONDUCTED EMISSIONS

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 149				
Deviations:	No deviations.				
Comments:					
Test Specifications FCC 15.207:2006			Test Method ANSI C63.4:2003		
Run #	19	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

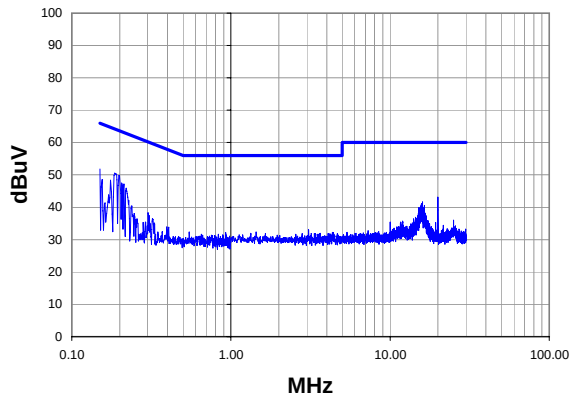
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.150	24.8	2.0	46.8	66.0	-19.2
0.189	22.3	1.2	43.5	64.1	-20.6
15.982	14.8	0.5	35.3	60.0	-24.7
15.914	14.2	0.5	34.7	60.0	-25.3
16.046	14.0	0.5	34.5	60.0	-25.5
15.852	13.8	0.5	34.3	60.0	-25.7

Average Data - vs - Average Limit

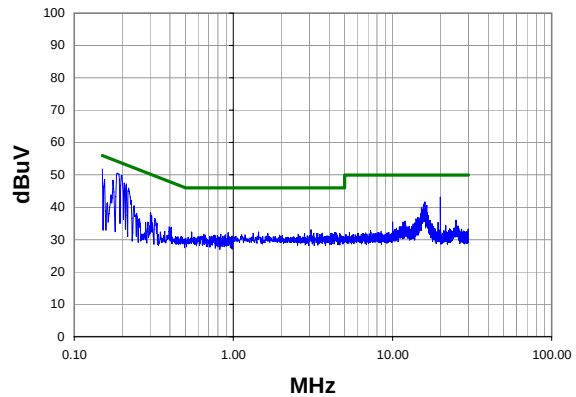
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
15.982	4.2	0.5	24.7	50.0	-25.3
16.046	4.2	0.5	24.7	50.0	-25.3
15.914	4.1	0.5	24.6	50.0	-25.4
15.852	3.9	0.5	24.4	50.0	-25.6
0.189	2.8	1.2	24.0	54.1	-30.1
0.150	1.2	2.0	23.2	56.0	-32.8

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 149						
Deviations:	No deviations.						
Comments:							
Test Specifications FCC 15.207:2006			Test Method ANSI C63.4:2003				
Run #	20	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)
0.186	29.3	1.3	50.6	64.2	-13.6
0.199	28.8	1.0	49.8	63.6	-13.8
0.150	29.8	2.0	51.8	66.0	-14.2
0.206	26.5	1.0	47.5	63.4	-15.9
0.213	26.2	1.0	47.2	63.1	-15.9
0.176	26.9	1.5	48.4	64.7	-16.3
20.000	22.7	0.5	43.2	60.0	-16.8
0.220	24.9	1.0	45.9	62.8	-16.9
0.155	26.7	1.9	48.6	65.7	-17.1
15.970	21.2	0.5	41.7	60.0	-18.3
15.820	20.7	0.5	41.2	60.0	-18.8
15.710	20.3	0.5	40.8	60.0	-19.2
16.400	20.1	0.5	40.6	60.0	-19.4
15.650	19.9	0.5	40.4	60.0	-19.6
15.170	19.5	0.5	40.0	60.0	-20.0
15.790	19.4	0.5	39.9	60.0	-20.1
16.040	19.3	0.5	39.8	60.0	-20.2
16.260	19.3	0.5	39.8	60.0	-20.2
16.100	19.2	0.5	39.7	60.0	-20.3
15.480	18.9	0.5	39.4	60.0	-20.6

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.186	29.3	1.3	50.6	54.2	-3.6
0.199	28.8	1.0	49.8	53.6	-3.8
0.150	29.8	2.0	51.8	56.0	-4.2
0.206	26.5	1.0	47.5	53.4	-5.9
0.213	26.2	1.0	47.2	53.1	-5.9
0.176	26.9	1.5	48.4	54.7	-6.3
20.000	22.7	0.5	43.2	50.0	-6.8
0.220	24.9	1.0	45.9	52.8	-6.9
0.155	26.7	1.9	48.6	55.7	-7.1
15.970	21.2	0.5	41.7	50.0	-8.3
15.820	20.7	0.5	41.2	50.0	-8.8
15.710	20.3	0.5	40.8	50.0	-9.2
16.400	20.1	0.5	40.6	50.0	-9.4
15.650	19.9	0.5	40.4	50.0	-9.6
15.170	19.5	0.5	40.0	50.0	-10.0
15.790	19.4	0.5	39.9	50.0	-10.1
16.040	19.3	0.5	39.8	50.0	-10.2
16.260	19.3	0.5	39.8	50.0	-10.2
16.100	19.2	0.5	39.7	50.0	-10.3
15.480	18.9	0.5	39.4	50.0	-10.6



