22431 ANTONIO PARKWAY B160-417
RANCHO SANTA MARGARITA, CA 92688
T (949)459-2754
F (949)459-2759
AegisLabsInc.com

Class II Permissive Change
Test Report
And Application for Grant of Equipment Authorization

TEST REPORT PERTAINING TO:

Equipment Under Test	Model Number(s)
Intel PRO/Wireless 3945ABG Network Connection	WM3945ABG

CONFIGURATION
802.11a / 802.11b / 802.11g with a set of Travis ATG Amphenol Antennas

MEASUREMENTS PERFORMED IN ACCORDANCE WITH THE FOLLOWING STANDARD (S)

Regulatory Standard(s)
47 CFR Part 15, Subpart C Section 15.247 Test Method: ANSI C63.4: 2003 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

ACCREDITED
Certificate Number: 1111.01

PREPARED FOR:
Dell Computer Corporation
One Dell Way
Round Rock, TX 78682
Contact(s): Mr. Jason Limoges

PREPARED BY:
Aegis Labs, Inc.
22431 Antonio Parkway B160-417
Rancho S. Margarita, CA 92688
Agent(s): Mr. Rick Candelas
Mr. Johnny Candelas

Test Report #: INTEL-061011F
Test Report Revision: NONE

	REPORT BODY	APPENDICES		TOTAL PAGES
		A	*B*	
PAGES	14	28	1	43

TABLE OF CONTENTS

1.0 REGULATORY COMPLIANCE GUIDELINES

Aegis Labs, Inc. operates as both a Nevada and California Corporation with no organizational or financial relationship with any company, institution, or private individual. Testing and engineering functions provided by Aegis Labs were furnished by RF technicians and engineers with accredited qualifications and training credentials to carry out their duties.

The object of this report was to publish verifiable test results of an EUT subjected to the tests outlined in the standard listed on the cover page of this report.

1.1 Guidelines For Testing To Emissions Standards

This standard for EMC emission requirements apply to electrical equipment for Information Technology Equipment (ITE). Compliance to these standards and in combination with the other standards listed in this test report can be used to demonstrate presumption of compliance with the protection requirements of the appropriate agency standard.

The purpose of this standard is to specify minimum requirements for emissions regarding electromagnetic compatibility (EMC) and protect the radio frequency spectrum 9 kHz. – 400 GHz. from unwanted interference generated from electrical/digital systems that intentionally or unintentionally generated RF energy. The emissions standards, normative documents and/or publications were used to conduct all tests performed on the equipment herein referred to as “Equipment Under Test”.

2.0 SUMMARY OF TEST RESULTS

802.11a Mode (5745-5825 MHz)

EMISSIONS STANDARD			
FCC Part 15 Section	**Description**	**Results**	**Comments**
15.247(a)(2)	The minimum 6dB bandwidth shall be at least 500 kHz.	PASSED	5745 MHz = 16.58 MHz 5785 MHz = 16.67 MHz 5825 MHz = 16.67 MHz *Per Original Filing*
15.247(b)(3)	The maximum peak output power of the intentional radiator shall not exceed 1 watt.	PASSED	5745 MHz = 19.60 dBm = 91.20 mW 5785 MHz = 19.70 dBm = 93.33 mW 5825 MHz = 19.80 dBm = 95.50 mW
15.247(b)(5)	The intentional radiator shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the FCC guidelines per Section 1.1307(b)(1).	PASSED	Refer to MPE Calculations Exhibit
15.247(c)	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.	PASSED	See Data Sheets
15.247(c)	Radiated emissions, which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a). All others must be < -20dBc.	PASSED	See Data Sheets
15.247(d)	The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.	PASSED	5745 MHz = -8.50 dB 5785 MHz = -9.50 dB 5825 MHz = -9.83 dB *Per Original Filing*
15.207	AC Conducted Emissions	PASSED	*See Original Filing*
15.209	Radiated Emissions (30-1000 MHz)	PASSED	*See Original Filing*

2.0 Summary of Test Results (Continued)

802.11b Mode (2400-2483.5 MHz)

EMISSIONS STANDARD			
FCC Part 15 Section	**Description**	**Results**	**Comments**
15.247(a)(2)	The minimum 6dB bandwidth shall be at least 500 kHz.	PASSED	2412 MHz = 8.33 MHz 2437 MHz = 8.83 MHz 2462 MHz = 9.17 MHz *Per Original Filing*
15.247(b)(3)	The maximum peak output power of the intentional radiator shall not exceed 1 watt.	PASSED	2412 MHz = 19.71 dBm = 93.54 mW 2437 MHz = 20.53 dBm = 112.98 mW 2462 MHz = 20.34 dBm = 108.14 mW
15.247(b)(5)	The intentional radiator shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the FCC guidelines per Section 1.1307(b)(1).	PASSED	Refer to MPE Calculations Exhibit
15.247(c)	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.	PASSED	See Data Sheets
15.247(c)	Radiated emissions, which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a). All others must be < -20dBc.	PASSED	See Data Sheets
15.247(d)	The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.	PASSED	2412 MHz = -10.33 dB 2437 MHz = -7.83 dB 2462 MHz = -8.83 dB *Per Original Filing*
15.207	AC Conducted Emissions	PASSED	*See Original Filing*
15.209	Radiated Emissions (30-1000 MHz)	PASSED	*See Original Filing*

2.0 Summary of Test Results (Continued)

802.11g Mode (2400-2483.5 MHz)

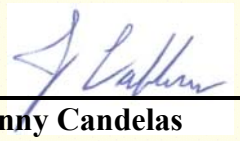
EMISSIONS STANDARD			
FCC Part 15 Section	**Description**	**Results**	**Comments**
15.247(a)(2)	The minimum 6dB bandwidth shall be at least 500 kHz.	PASSED	2412 MHz = 16.58 MHz 2437 MHz = 16.67 MHz 2462 MHz = 16.67 MHz *Per Original Filing*
15.247(b)(3)	The maximum peak output power of the intentional radiator shall not exceed 1 watt.	PASSED	2412 MHz = 24.21 dBm = 263.63 mW 2437 MHz = 24.71 dBm = 295.80 mW 2462 MHz = 24.28 dBm = 267.92 mW
15.247(b)(5)	The intentional radiator shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the FCC guidelines per Section 1.1307(b)(1).	PASSED	Refer to MPE Calculations Exhibit
15.247(c)	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.	PASSED	See Data Sheets
15.247(c)	Radiated emissions, which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a). All others must be < -20dBc.	PASSED	See Data Sheets
15.247(d)	The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.	PASSED	2412 MHz = -9.17 dB 2437 MHz = -8.17 dB 2462 MHz = -9.17 dB *Per Original Filing*
15.207	AC Conducted Emissions	PASSED	*See Original Filing*
15.209	Radiated Emissions (30-1000 MHz)	PASSED	*See Original Filing*

ANALYSIS AND CONCLUSIONS

Based upon the measurement results we find that this equipment is within the limits of the global standards listed on the cover page of this test report. All results are based on a test of one sample. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

Approval Signatories

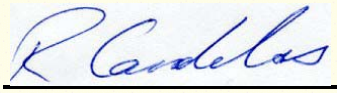
Test and Report Completed By:



10/20/06

Johnny Candelas **Date:**
Test Technician
Aegis Labs, Inc.

Report Approved By:



10/20/06

Rick Candelas **Date:**
Quality Assurance Manager
Aegis Labs, Inc.

3.0 ADMINISTRATIVE DATA AND TEST DESCRIPTION

DEVICE TESTED:	ITE Type: Intel PRO/Wireless 3945ABG Network Connection Model Number(s): WM3945ABG Serial Number: 00B11A295CVD26965002 FCC ID: E2KWM3945ABG
DATE EUT RECEIVED:	October 3rd, 2006
TEST DATE(S):	October 13th – 17th, 2006
ORIGIN OF TEST SAMPLE(S):	Production
EQUIPMENT CLASS:	EUT tested as CLASS B device
RESPONSIBLE PARTY:	Dell Computer Corporation One Dell Way Round Rock, TX 78682
CLIENT CONTACT:	Mr. Jason Limoges
MANUFACTURER:	Dell Computer Corporation
TEST LOCATION:	Aegis Labs, Inc. 32231 Trabuco Creek Road Trabuco Canyon, CA 92678 Open Area Test Site #2
ACCREDITATION CERTIFICATE(s):	A2LA Certificate Number: 1111.01, Valid through February 28, 2008
PURPOSE OF TEST:	To demonstrate compliance with the standards as described in Sections 1.0 & 2.0 of this report.
UNCERTAINTY BUDGET:	Proficiency Testing and Uncertainty Calculations for all tests indicated in this report have been conducted in accordance with ISO 17025: 2005 requirements Section 5.4.6, and 5.9. Uncertainty Budgets and Proficiency Test results available upon request.
STATEMENT OF CALIBRATION:	All accredited equipment calibrations were performed by Liberty Labs, Inc. and World Cal. with typical calibration uncertainty estimates derived from ISO Guide to the determination of uncertainties with a Coverage Factor of k=2 for 95% level of confidence.

4.0 DESCRIPTION OF EUT CONFIGURATION

4.1 EUT Description

Equipment Under Test (EUT)	
Trade Name:	Intel PRO/Wireless 3945ABG Network Connection
Model Number:	WM3945ABG
Frequency Range:	802.11a = 5745 – 5825 MHz 802.11b/g = 2412 – 2462MHz
Type of Transmission:	Direct Sequence Spread Spectrum
Transfer Rate:	1/5.5/11 Mbps for 802.11b mode 6/36/54 Mbps for 802.11g and 802.11a modes
Number of Channels:	802.11a mode (5725-5850 MHz) = 5 802.11b mode (2400-2483.5 MHz) = 11 802.11g mode (2400-2483.5 MHz)= 11
Modulation Type:	DBPSK, DQPSK, CCK, OFDM
Antenna Type:	Flex Inverted F Antenna (Main/Aux)
Antenna Gain (See Note 2):	1.98 dBi @ 5 GHz / 3.80 dBi @ 2.4 GHz
Transmit Output Power:	18-20 dBm (Typical) for 802.11a mode 20 dBm (Typical) for 802.11b mode 24-25 dBm (Typical) for 802.11g mode Please see Appendix A (Data Sheets) for actual output power.
Power Supply:	3.3VDC from computer MPCI slot.
Number of External Test Ports Exercised:	2 Antenna Ports (1 Main & 1 Auxiliary)

The Intel PRO/Wireless 3945ABG Network Connection is an embedded 802.11a/b/g network adapter operating in the 2.4 GHz and 5 GHz spectrum. The EUT is based on the Mini Card form factor designed to meet the space and size requirements for thin and light notebook PCs. It is capable of a data rate of up to 52 Mbps.

NOTE 1: For a more detailed description, please refer to the manufacture's specifications or User's Manual.

NOTE 2: The EUT was tested with a set of Travis ATG Amphenol Antennas. (Refer to the antenna specifications exhibits).

4.2 EUT Configuration

The EUT was tested installed in the Mini PCI-E slot of the host computer as a modular device using a PCI extender board to extend the EUT outside the computer chassis. The EUT was then connected to a set of antennas via its Main and Aux antenna ports. Data for a set of Travis ATG Amphenol Antennas can be found in Appendix A (Data Sheets)

The low, middle, and high channels were tested in 802.11a, b, & g modes. Also, the EUT was tested once transmitting from the Main antenna port and once transmitting from the Aux antenna port. The EUT was placed in either continuous transmit or continuous receive mode by a program provided by the manufacturer (GRTT *Version 1.1.1*).

4.3 List of EUT, Sub-Assemblies and Host Equipment

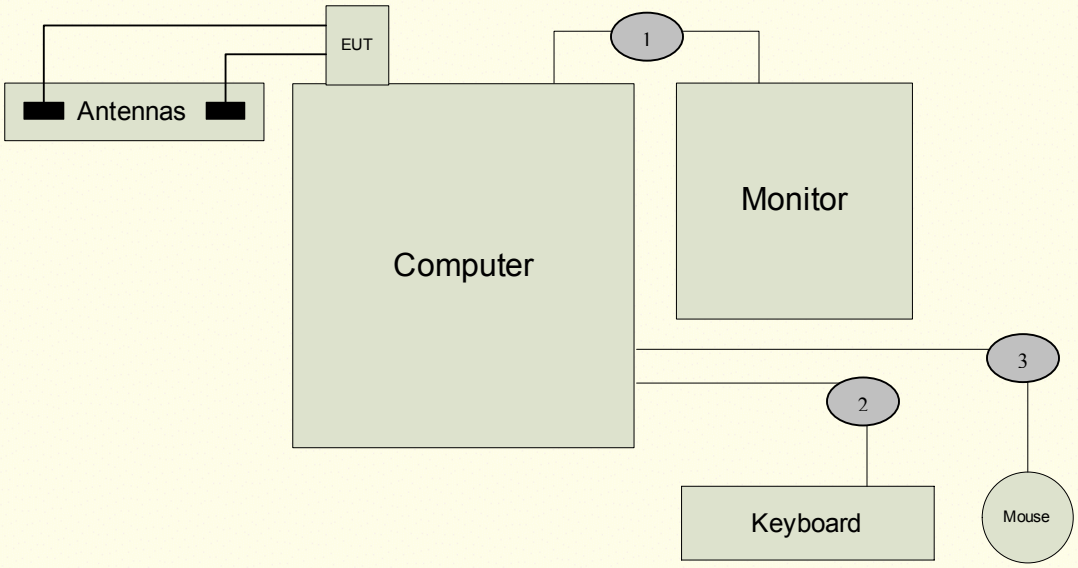
Equipment Under Test			
Manufacturer	**Equipment Name**	**Model or Part Number**	**Serial Number**
Intel Corporation	Intel PRO/Wireless 3945ABG Network Connection	WM3945ABG	00B11A295CVD26965002

EUT Sub Assemblies			
Manufacturer	**Equipment Name**	**Model or Part Number**	**Serial Number**
Amphenol	Main Multi Band Antenna	S03030 - FPCB	N/A
Amphenol	Auxiliary Multi Band Antenna	S03030 - FPCB	N/A

HOST EQUIPMENT LIST			
Manufacturer	**Equipment Name**	**Model or Part Number**	**Serial Number**
Computer	Intel	Generic	IZTGVV4312035
Monitor	Compaq	473A	545AF16AD243
Keyboard	Logitech	Y-BF37	MCTZ5200581
Mouse	Logitech	M-BJ58	LZE14759424

NOTE: All the power cords of the above support equipment are standard and non-shielded.

4.4 I/O Cabling Diagram and Description



Signal Line Cable Description							
Cable	**Length**	**Construction**	**Source Connector**	**Destination Connector**	**Bundled Length**	**Ferrite Attached**	**Note**
1	1.5m	Round, Braid & Foil Shielded	Host Computer: Metallic DB-15	Monitor: Hardwired	N/A	N/A	N/A
2	1.5m	Round, Braid & Foil Shielded	Host Computer: Metallic 8-pin Mini DIN	Keyboard: Hardwired	N/A	N/A	N/A
3	1.5m	Round, Braid & Foil Shielded	Host Computer: Metallic 8-pin Mini DIN	Mouse: Hardwired	N/A	N/A	N/A

4.5 EMC Test Hardware and Software Measurement Equipment

TEST EQUIPMENT LIST - Emissions					
Equipment Name	**Manufacturer**	**Model Number**	**Serial Number**	**Calibration Due Date**	**Maintenance Calibration Cycle**
Spectrum Analyzer	Agilent	8565EC	3946A00245	07/24/07	1 Year
Antenna – Horn	EMCO	3115	2230	05/15/07	1 Year
Preamp	Agilent	8449B	3008A01573	12/08/06	1 Year
18 Foot Coax	Semflex	X116BFSX10216	546	12/14/06	1 Year
2.4 GHz Notch Filter	Micro-Tronics	BRM50702-02	003	10/21/06	1.5 Years
5.725-5.850 GHz Notch Filter	Microwave Circuits	N0257881	3173-01	04/21/07	2 Years
Antenna - 18-26.5 GHz Pre-amplified Horn	Aegis Labs, Inc.	H042	SLK-35-3W	02/08/07	1 Year
Power Meter	Anritsu	ML2487A	6K00001785	05/30/07	1 Year
Wide Bandwidth Sensor	Anritsu	MA2491A	31193	05/30/07	1 Year
12dB Attenuator	Narda	4779-12	203	12/09/06	1.5 Year
Temperature/Humidity Monitor	Dickson	TH550	7255185	03/24/07	1 Year

5.0 CONDITIONS DURING EMISSIONS MEASUREMENTS

5.1 General

All measurements were made according to the procedures defined in or referred to by the standard listed on the cover page of this report. The measurements were made in the operating mode producing the largest emissions consistent with normal operation and connected to the minimum configuration of auxiliary devices.

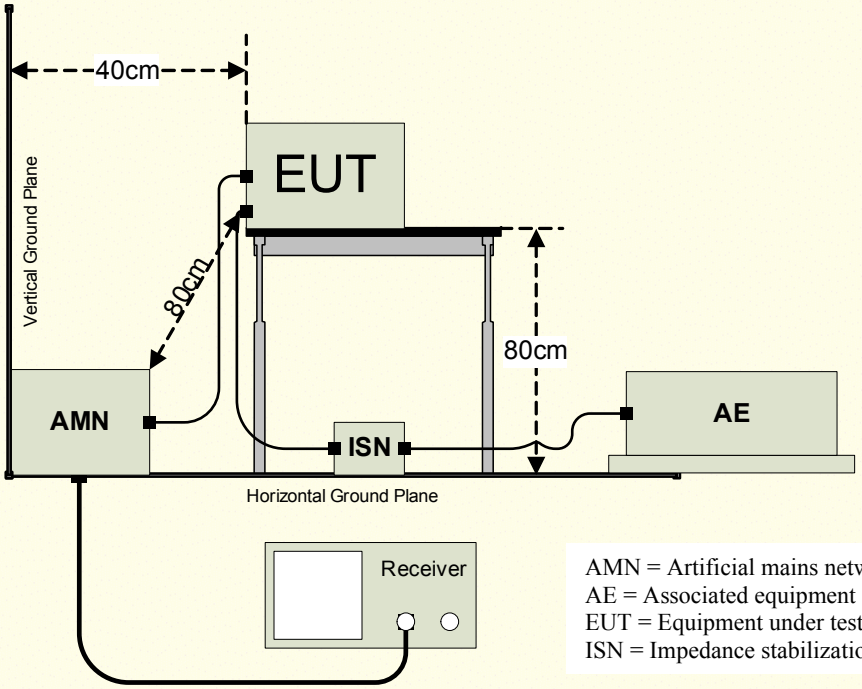
5.2 Conducted Emissions Test Setup

The following was the test configuration.

EUT signal cables that hung closer than 40 cm to the horizontal metal ground plane were folded back and forth forming a bundle 30 cm to 40 cm long. The power cord of the EUT was also bundled in the center and plugged into one of the artificial mains network (AMN). All peripheral equipment was powered from a second AMN via a multiple outlet strip placed at a distance on 10cm from each other. The AMN and ISN were positioned 80cm from the EUT. Signal cables that were not connected to an AE were terminated using the correct termination. If applicable, the current probe was placed at 0.1 m from the ISN.

Peak, quasi-peak and/or average detectors were used for testing performed between 150 kHz and 30 MHz. A swept frequency scan was performed for both Line 1 and Line 2. The six highest readings were compared against the limit and recorded in the data sheet along with a snapshot image of the sweep scan. The graphical scans in Appendix A only reflect peak readings while the tabulated data sheets reflect peak, average, and/or quasi-peak measurements.

Climatic Conditions:
The EUT was tested within its intended operating and climatic conditions.



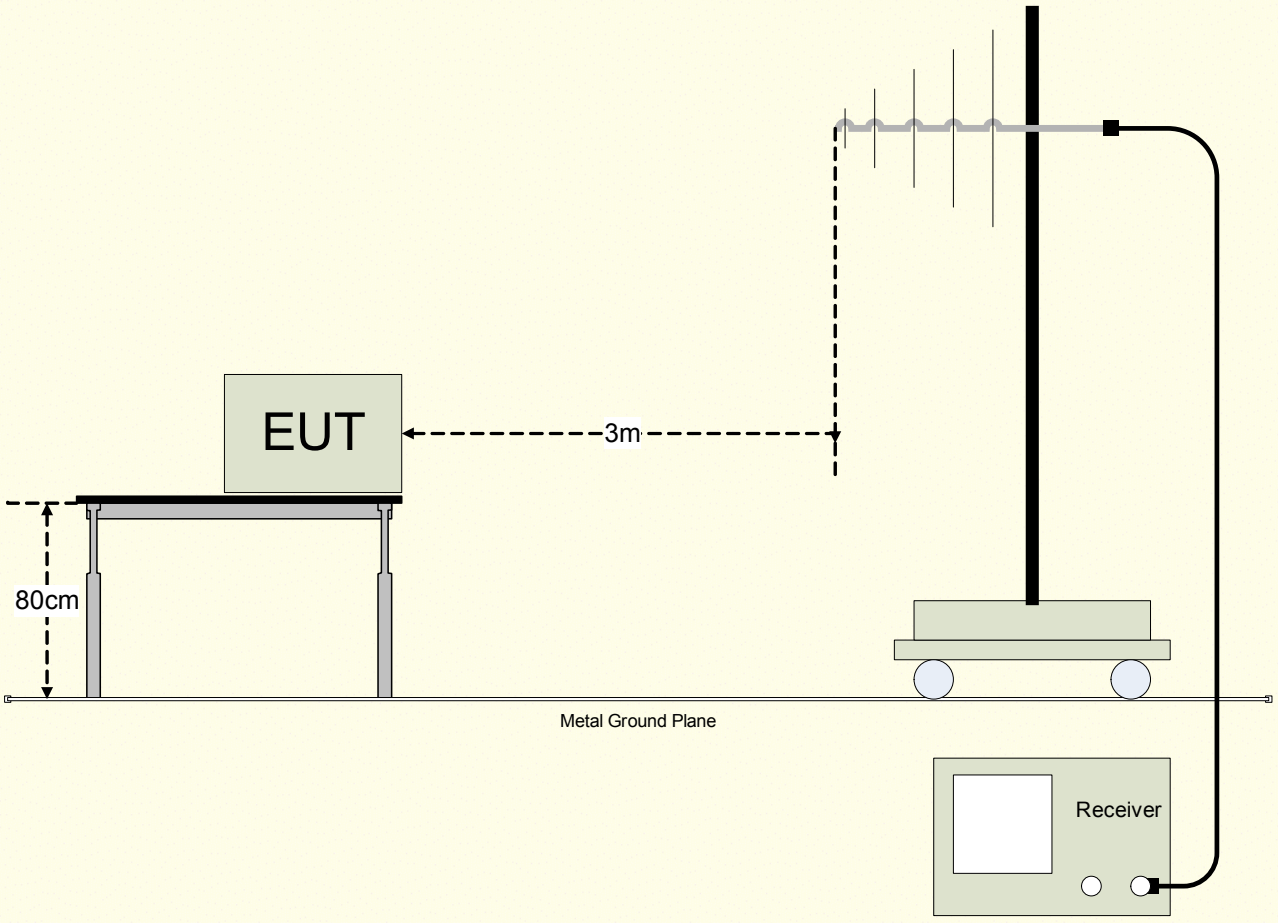
AMN = Artificial mains network
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

5.3 Radiated Emissions Test Setup

The Open Area Test Site (OATS) was used for radiated emission testing. The receiving (Rx) antenna(s) was placed 10m from the nearest side of the EUT facing the Rx antenna. The EUT (if floor-standing) was placed directly on the flush-mounted 360 degree rotating turntable. The EUT (if table-top) was placed directly on an 80cm high non-metallic table, and the table was placed on the rotating turntable. During the initial EMI scan, all the suspect frequencies, i.e.; harmonics, broadband signals were checked with the Rx broadband antennas in both vertical and horizontal polarities. The biconical Rx, log periodic Rx, and horn Rx antennas were used from 30MHz – 299.99MHz, 300MHz – 1000MHz, and 1GHz – 18GHz respectively.

Upon completion of all harmonic and broadband measurements, the balance of any remaining frequencies was checked between 30MHz – 18GHz. Any signals appearing within 20 dB of the classification limit was measured. Each signal was maximized by first rotating the turntable at least 360 degrees and recording the azimuth in the data sheet. Lastly, the Rx antenna was raised and/or lowered to maximize the signal elevation. If the measured signal was obtained using the peak detector and that signal appeared within 3 dB of the regulatory limit line, then the same signal was re-measured using the quasi-peak detector on the EMI receiver. Both meter readings if necessary were recorded on the data sheet.

Climatic Conditions:
The EUT was tested within its intended operating and climatic conditions.



APPENDIX A

TEST DATA

RADIATED EMISSIONS TEST RESULTS

CLIENT:	Dell Computer Corporation	**DATE:**	10/16/06
EUT:	Intel PRO/Wireless 3945ABG Network Connection	**PROJECT NUMBER:**	INTEL-061011
MODEL NUMBER:	WM3945ABG	**TEST ENGINEER:**	BM
SERIAL NUMBER:	00B11A295CVD26965002	**SITE #:**	2
CONFIGURATION:	Tested installed in the host computer's mini PCI slot in **802.11a (5745-5825 MHz) mode with Travis ATG Amphenol Antennas.**	**TEMPERATURE:**	15 deg. C
		HUMIDITY:	84% RH
		TIME:	8:30 PM

Description:	Radiated RF Emissions (1 GHz – 18 GHz)
Results:	**PASSED** Horizontal and Vertical Antenna Polarizations Class B Limits
Note:	Radiated Emissions Measurements were performed on the EUT with power supply set at the following voltage and frequency. • 120VAC / 60 Hz.

Unwanted Spurious Emissions Limits			
Frequency (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m) (Emissions in the restricted bands)**	**Field Strength (dBm/MHz) (Emissions outside the restricted bands)**
Above 960	500	54.00 (Average) 74.00 (Peak)	< -20 dBc

Radiated Emissions Sample Calculations

Corrected Meter Reading = Meter Reading + F +C - D

Where, F = Antenna Factor
C = Cable Factor
G = Amplifier Gain
D = Distance Factor (if applicable)

Therefore, the equation for determining the Corrected Meter Reading Limit (CML) is:

CML = Specification Limit - F - C + D

Radiated Emissions Test Results (Continued)

*Fundamental Measurements in **802.11a mode (5745-5825 MHz)***
Channels 149, 157, & 165
Continuous TX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-02

RADIATED EMISSIONS - Horizontal Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
5745.00	60.00	100	270			4.99	35.25	100.24			**Ch. 149**
5745.00				51.99	A	4.99	35.25	92.23			
5785.00	59.33	100	270			5.01	35.26	99.59			**Ch. 157**
5785.00				51.54	A	5.01	35.26	91.80			
5825.00	60.50	100	270			5.02	35.27	100.79			**Ch. 165**
5825.00				52.78	A	5.02	35.27	93.07			

RADIATED EMISSIONS – Vertical Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
5745.00	58.17	100	225			4.99	35.05	98.20			**Ch. 149**
5745.00				50.41	A	4.99	35.05	90.44			
5785.00	56.83	100	225			5.01	35.07	96.91			**Ch. 157**
5785.00				49.43	A	5.01	35.07	89.51			
5825.00	59.17	100	225			5.02	35.10	99.29			**Ch. 165**
5825.00				51.15	A	5.02	35.10	91.27			

NOTE: Fundamental signals measured to calculate the band edge field strengths using the “Marker Delta Method”.

Radiated Emissions Test Results (Continued)

*Band Edge Field Strength Measurements in **802.11a mode (5745-5825 MHz)***
Channels 149 & 165
Continuous TX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-02

RADIATED EMISSIONS - Horizontal Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
5725.00	32.33	100	270			4.98	35.25	72.55	80.24	-7.68	**Ch. 149**
5850.00	29.33	100	270			5.03	35.27	69.63	80.79	-11.15	**Ch. 165**

RADIATED EMISSIONS – Vertical Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
5725.00	30.67	100	225			4.98	35.04	70.68	78.20	-7.52	**Ch. 149**
5850.00	32.50	100	225			5.03	35.11	72.64	79.29	-6.64	**Ch. 165**

NOTE: The "Band Edge Field Strength" was calculated using the "Fundamental" and "Conducted Band Edge" measurements per the "Marker-Delta Method" with the following formula:

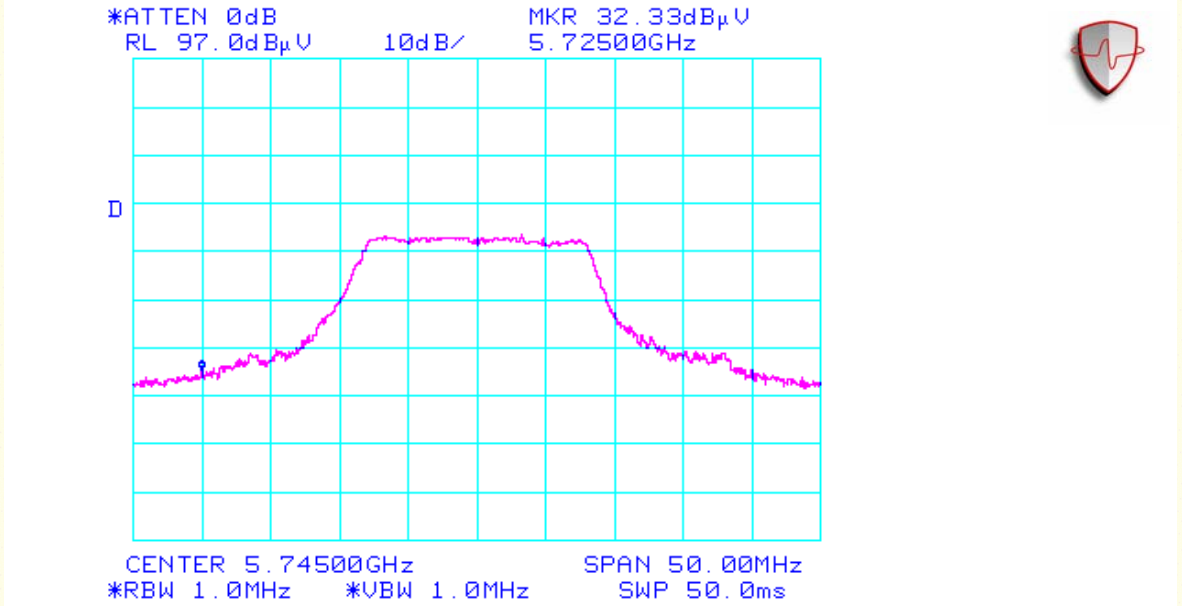
BE = Fm – Δm

Where
BE = Band Edge Field Strength
Fm = Measured Fundamental (Peak or Average)
Δm = Measured Conducted Band Edge Delta (Peak or Average)

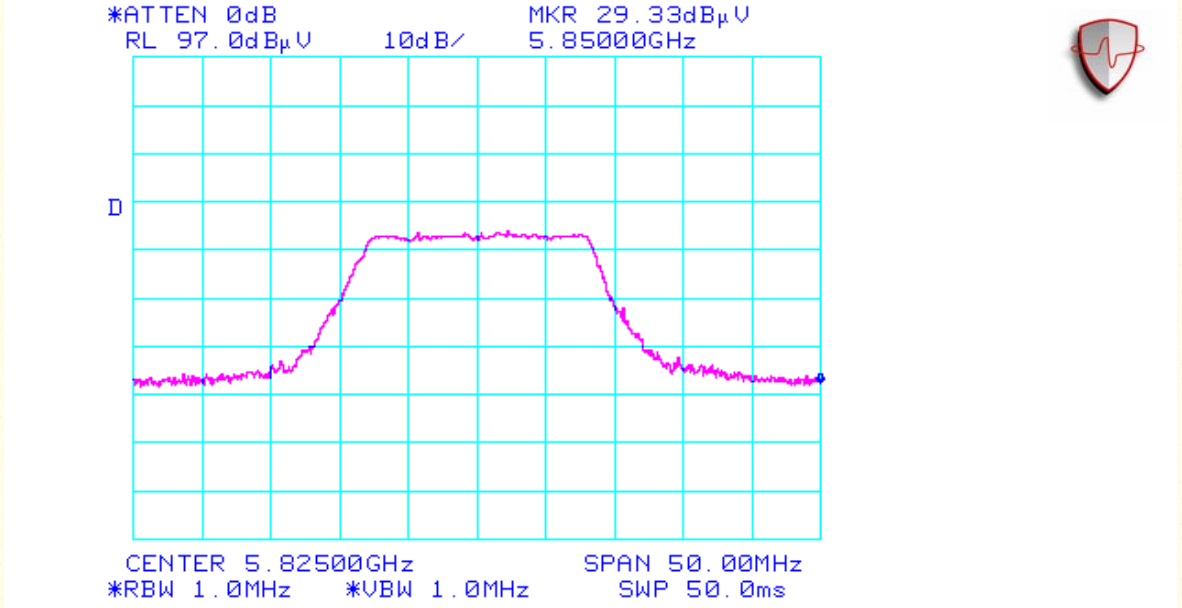
Radiated Emissions Test Results (Continued)

Plots Showing Out-Of-Band Emissions (Peak RBW=VBW=1MHz)

Test Date	*Data*	*Test Eng.*
10/16/06	5.745 GHz band edge **PEAK (Horizontal Antenna Polarity)** (INTEL-061011-02a01)	JC



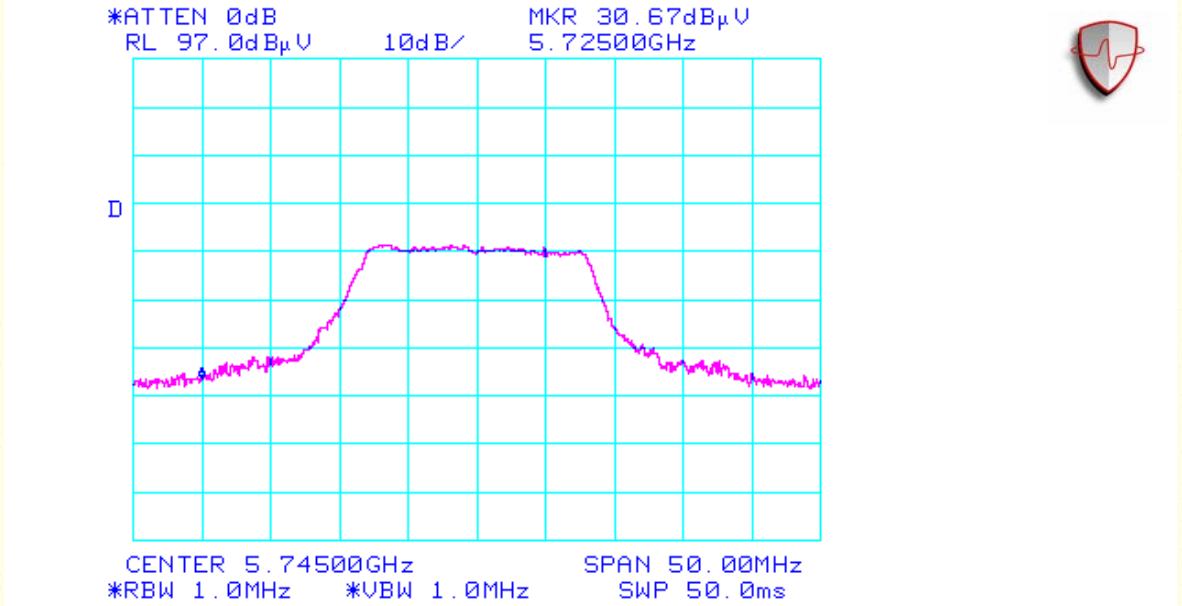
Test Date	*Data*	*Test Eng.*
10/16/06	5.825 GHz band edge **PEAK (Horizontal Antenna Polarity)** (INTEL-061011-02a02)	JC



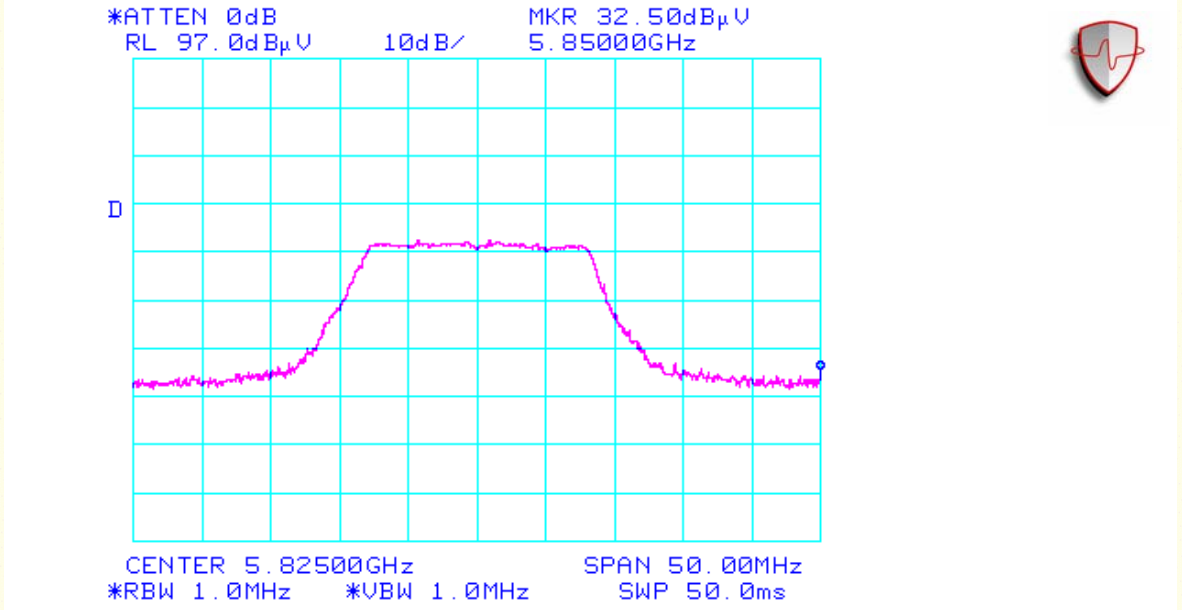
Radiated Emissions Test Results (Continued)

Plots Showing Out-Of-Band Emissions (Peak RBW=VBW=1MHz)

Test Date	*Data*	*Test Eng.*
10/16/06	5.745 GHz band edge **PEAK (Vertical Antenna Polarity)** (INTEL-061011-02a03)	JC



Test Date	*Data*	*Test Eng.*
10/16/06	5.825 GHz band edge **PEAK (Vertical Antenna Polarity)** (INTEL-061011-02a04)	JC



Radiated Emissions Test Results (Continued)

*Spurious Emissions Measurements in **802.11a mode (5745-5825 MHz)***
Channels 149, 157, & 165
Continuous TX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-04

RADIATED EMISSIONS - Horizontal Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Preamp Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
11489.70	62.50	125	180			50.53	7.41	39.19	58.58	74.00	-15.42	**Ch. 149**
11489.70				46.83	A	50.53	7.41	39.19	42.91	54.00	-11.09	
11569.68	64.83	100	180			50.58	7.42	39.23	60.89	74.00	-13.11	**Ch. 157**
11569.68				50.44	A	50.58	7.42	39.23	46.50	54.00	-7.50	
11650.36	65.50	100	180			50.64	7.42	39.26	61.54	74.00	-12.46	**Ch.165**
11650.36				53.21	A	50.64	7.42	39.26	49.25	54.00	-4.75	

RADIATED EMISSIONS - Vertical Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Preamp Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
11489.75	59.00	100	225			50.53	7.41	39.19	55.08	74.00	-18.92	**Ch.149**
11489.75				44.29	A	50.53	7.41	39.19	40.37	54.00	-13.63	
11570.38	65.50	100	135			50.58	7.42	39.23	61.56	74.00	-12.44	**Ch. 157**
11570.38				51.01	A	50.58	7.42	39.23	47.07	54.00	-6.93	
11650.20	67.00	100	135			50.64	7.42	39.26	63.04	74.00	-10.96	**Ch. 165**
11650.20				54.29	A	50.64	7.42	39.26	50.33	54.00	-3.67	

Spurious Radiated Emissions Test Results (Continued)

*Spurious Emissions Measurements in **802.11a mode (5745-5825 MHz)***
Channels 149, 157, & 165
Continuous TX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-05

RADIATED EMISSIONS - Horizontal Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Antenna/ Preamp Factor (dB)*	*Corrected Reading (dBuV/m)*	*Limits (dBuV/m)*	*Diff (dB) +=FAIL*	*Comments*
22980.00	47.17	100	225			10.62	-5.02	52.77	74.00	-21.23	**Ch. 149**
22980.00				34.04	A	10.62	-5.02	39.64	54.00	-14.36	
23139.81	46.17	100	225			10.66	-5.12	51.72	79.59	-27.87	**Ch. 157**
23299.75	52.50	100	225			10.71	-5.20	58.01	80.79	-22.78	**Ch. 165**

RADIATED EMISSIONS - Vertical Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Antenna/ Preamp Factor (dB)*	*Corrected Reading (dBuV/m)*	*Limits (dBuV/m)*	*Diff (dB) +=FAIL*	*Comments*
22980.00	46.00	100	225			10.62	-4.99	51.63	74.00	-22.38	**Ch. 149**
22980.00				32.59	A	10.62	-4.99	38.22	54.00	-15.79	
23139.87	43.33	100	225			10.66	-5.09	48.90	76.91	-28.01	**Ch. 157**
23299.74	47.83	100	225			10.71	-5.16	53.37	79.29	-25.92	**Ch. 165**

Radiated Emissions Test Results (Continued)

*Spurious Emissions Measurements in **802.11a mode (5745-5825 MHz)***
Channels 149, 157, & 165
Continuous RX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-04

RADIATED EMISSIONS - Horizontal Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Preamp Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
3829.95	56.17	100	180			50.78	4.05	33.13	42.57	74.00	-31.43	**Ch. 149**
3829.95				44.50	A	50.78	4.05	33.13	30.90	54.00	-23.10	
7659.92	56.83	125	180			50.15	5.81	37.40	49.89	74.00	-24.11	
7659.92				46.49	A	50.15	5.81	37.40	39.55	54.00	-14.45	
3856.71	56.00	100	180			50.78	4.07	33.18	42.47	74.00	-31.53	**Ch. 157**
3856.71				45.07	A	50.78	4.07	33.18	31.54	54.00	-22.46	
7713.10	57.33	100	180			50.14	5.83	37.43	50.45	74.00	-23.55	
7713.10				48.52	A	50.14	5.83	37.43	41.64	54.00	-12.36	
3883.55	56.50	100	225			50.78	4.08	33.24	43.05	74.00	-30.95	**Ch. 165**
3883.55				44.80	A	50.78	4.08	33.24	31.35	54.00	-22.65	
7766.79	57.83	100	180			50.13	5.85	37.46	51.01	74.00	-22.99	
7766.79				49.22	A	50.13	5.85	37.46	42.40	54.00	-11.60	

RADIATED EMISSIONS - Vertical Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Preamp Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
3829.63	55.83	100	135			50.78	4.05	33.13	42.23	74.00	-31.77	**Ch. 149**
3829.63				45.99	A	50.78	4.05	33.13	32.39	54.00	-21.61	
7659.54	55.00	100	135			50.15	5.81	37.40	48.06	74.00	-25.94	
7659.54				43.39	A	50.15	5.81	37.40	36.45	54.00	-17.55	
3856.53	56.17	100	135			50.78	4.07	32.83	42.29	74.00	-31.71	**Ch. 157**
3856.53				44.58	A	50.78	4.07	32.83	30.70	54.00	-23.30	
7713.31	55.33	100	135			50.14	5.83	37.29	48.30	74.00	-25.70	
7713.31				44.46	A	50.14	5.83	37.29	37.43	54.00	-16.57	
3883.04	56.17	100	180			50.78	4.08	32.90	42.37	74.00	-31.63	**Ch. 165**
3883.04				43.94	A	50.78	4.08	32.90	30.14	54.00	-23.86	
7766.63	56.00	100	135			50.13	5.85	37.31	49.03	74.00	-24.97	
7766.63				45.41	A	50.13	5.85	37.31	38.44	54.00	-15.56	

RADIATED EMISSIONS TEST RESULTS

CLIENT:	Dell Computer Corporation	**DATE:**	10/16/06
EUT:	Intel PRO/Wireless 3945ABG Network Connection	**PROJECT NUMBER:**	INTEL-061011
MODEL NUMBER:	WM3945ABG	**TEST ENGINEER:**	BM
SERIAL NUMBER:	00B11A295CVD26965002	**SITE #:**	2
CONFIGURATION:	Tested installed in the host computer's mini PCI slot in **802.11b (2400-2483.5 MHz) mode with Travis ATG Amphenol Antennas.**	**TEMPERATURE:**	15 deg. C
		HUMIDITY:	84% RH
		TIME:	8:30 PM

Description:	Radiated RF Emissions (1 GHz – 18 GHz)
Results:	**PASSED** Horizontal and Vertical Antenna Polarizations Class B Limits
Note:	Radiated Emissions Measurements were performed on the EUT with power supply set at the following voltage and frequency. • 120VAC / 60 Hz.

Unwanted Spurious Emissions Limits			
Frequency (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m) (Emissions in the restricted bands)**	**Field Strength (dBm/MHz) (Emissions outside the restricted bands)**
Above 960	500	54.00 (Average) 74.00 (Peak)	< -20 dBc

Radiated Emissions Sample Calculations

Corrected Meter Reading = Meter Reading + F +C - D

Where, F = Antenna Factor
C = Cable Factor
G = Amplifier Gain
D = Distance Factor (if applicable)

Therefore, the equation for determining the Corrected Meter Reading Limit (CML) is:

CML = Specification Limit - F - C + D

Radiated Emissions Test Results (Continued)

*Fundamental Measurements in **802.11b mode (2400-2483.5 MHz)***
Channels 1, 6, & 11
Continuous TX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-02

RADIATED EMISSIONS - Horizontal Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
2412.00	67.17	100	135			3.19	29.50	99.86			**Ch. 1**
2412.00				63.67	A	3.19	29.50	96.36			
2437.00	67.00	100	135			3.20	29.59	99.79			**Ch. 6**
2437.00				63.73	A	3.20	29.59	96.52			
2462.00	66.50	100	135			3.22	29.67	99.39			**Ch. 11**
2462.00				63.10	A	3.22	29.67	95.99			

RADIATED EMISSIONS – Vertical Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
2412.00	66.33	100	180			3.19	29.04	98.55			**Ch. 1**
2412.00				63.05	A	3.19	29.04	95.27			
2437.00	66.17	100	180			3.20	29.11	98.49			**Ch. 6**
2437.00				62.71	A	3.20	29.11	95.03			
2462.00	66.17	100	180			3.22	29.19	98.58			**Ch. 11**
2462.00				62.59	A	3.22	29.19	95.00			

NOTE: Fundamental signals measured to calculate the band edge field strengths using the “Marker Delta Method”.

Radiated Emissions Test Results (Continued)

*Band Edge Field Strength Measurements in **802.11b mode (2400-2483.5 MHz)***
Channels 1 & 11
Continuous TX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-02

RADIATED EMISSIONS - Horizontal Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
2390.00								45.53	74.00	-28.47	**Ch. 1**
2390.00					A			34.19	54.00	-19.81	
2400.00	33.17	100	135			3.18	29.46	65.81	79.86	-14.05	
2483.50								45.06	74.00	-28.94	**Ch. 11**
2483.50					A			34.49	54.00	-19.51	
2487.00								45.89	74.00	-28.11	
2487.00					A			34.65	54.00	-19.35	

RADIATED EMISSIONS – Vertical Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
2390.00								44.22	74.00	-29.78	**Ch. 1**
2390.00					A			33.10	54.00	-20.90	
2400.00	32.33	100	180			3.18	29.00	64.51	78.55	-14.04	
2483.50								44.25	74.00	-29.75	**Ch. 11**
2483.50					A			33.50	54.00	-20.50	
2487.00								45.08	74.00	-28.92	
2487.00					A			33.66	54.00	-20.34	

NOTE: The “Band Edge Field Strength” was calculated using the “Fundamental” and “Conducted Band Edge” measurements per the “Marker-Delta Method” with the following formula:

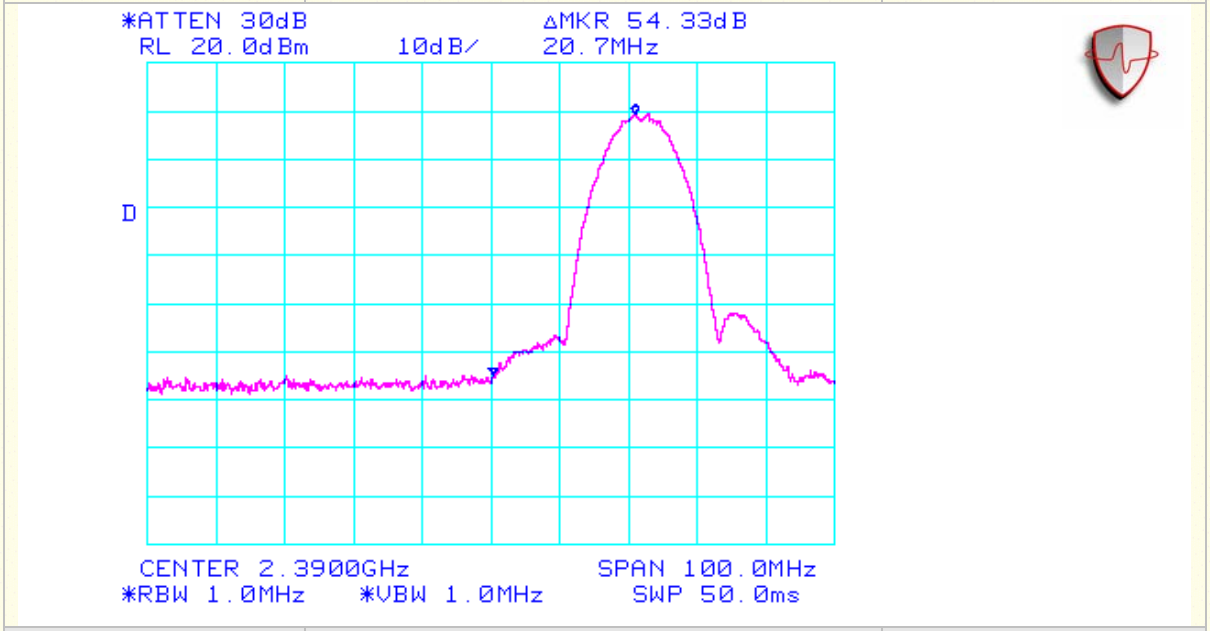
$BE = Fm - \Delta m$

Where
BE = Band Edge Field Strength
Fm = Measured Fundamental (Peak or Average)
Δm = Measured Conducted Band Edge Delta (Peak or Average)

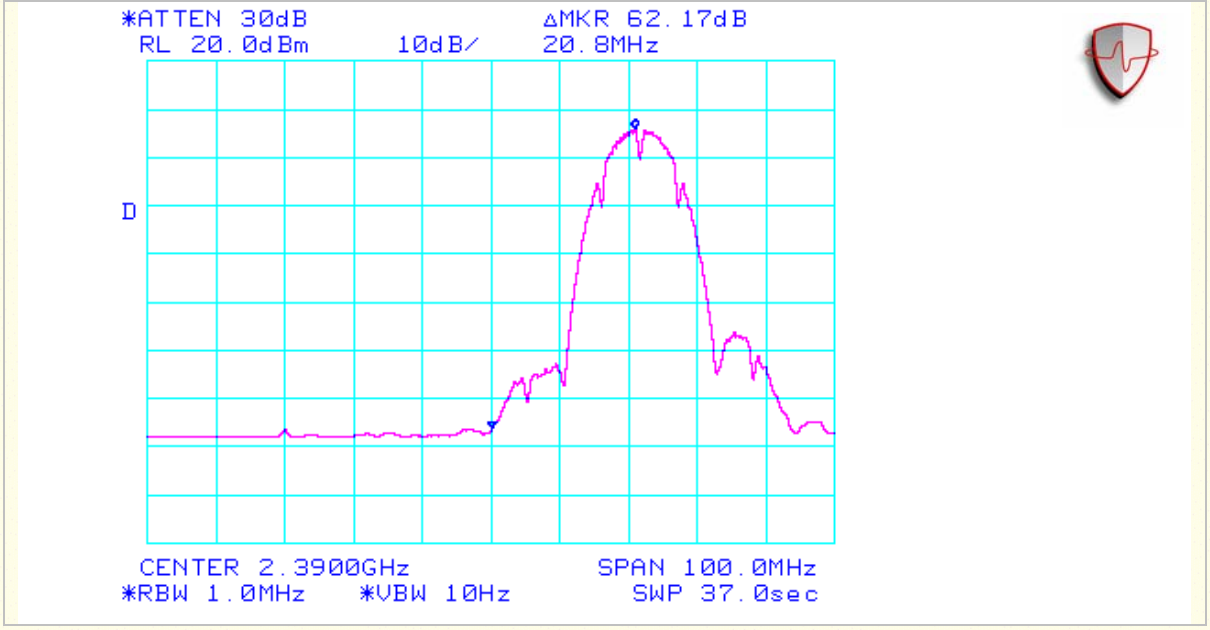
Radiated Emissions Test Results (Continued)

Plots Showing Out-Of-Band Emissions (Peak RBW=VBW=1MHz; Average RBW = 1MHz, VBW = 10Hz)

Test Date	*Data*	*Test Eng.*
07/26/05	2.412 GHz band edge **PEAK DELTA** (INTEL-050721-22a01)	JC



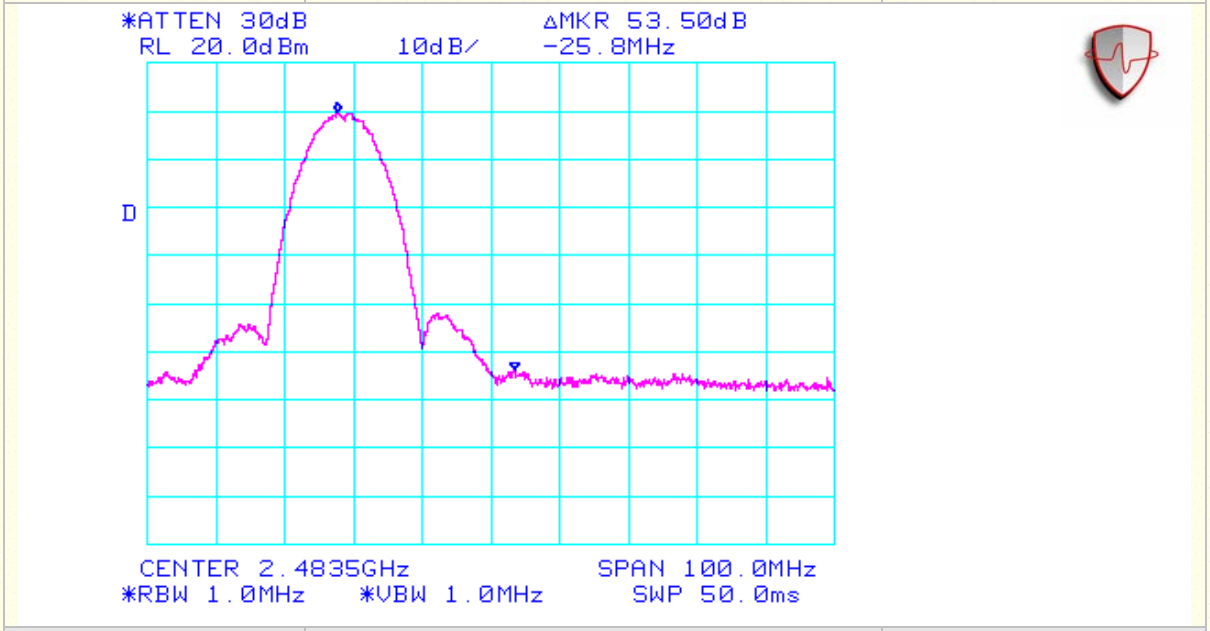
Test Date	*Data*	*Test Eng.*
07/26/05	2.412 GHz band edge **AVERAGE DELTA** (INTEL-050721-22a02)	JC



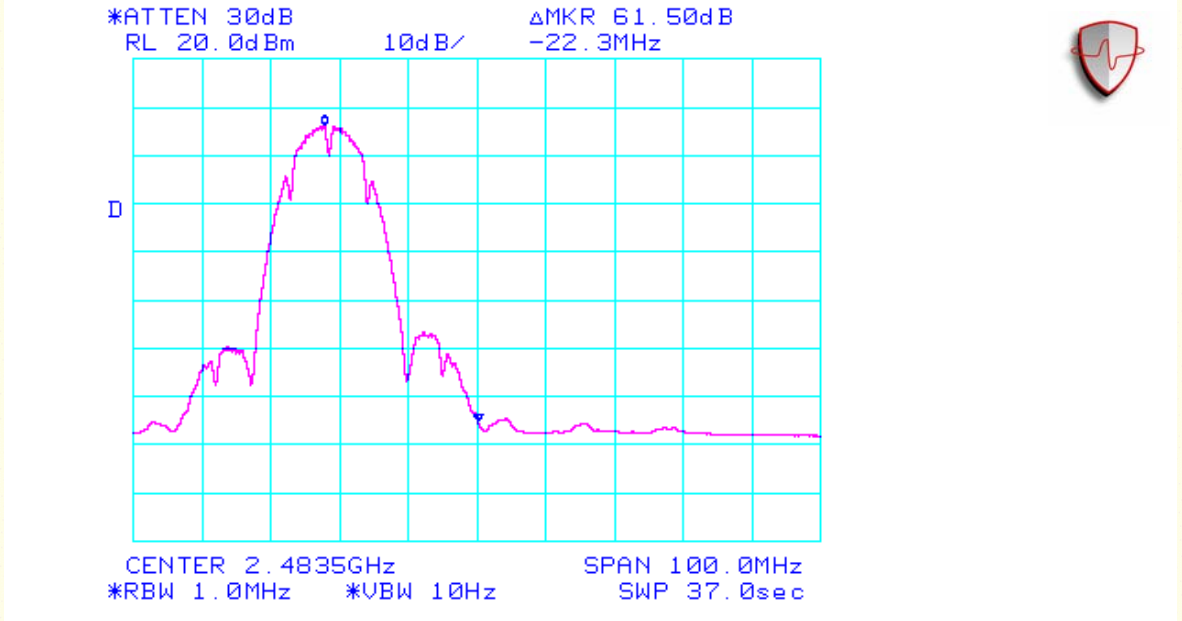
Radiated Emissions Test Results (Continued)

Plots Showing Out-Of-Band Emissions (Peak RBW=VBW=1MHz; Average RBW = 1MHz, VBW = 10Hz)

Test Date	*Data*	*Test Eng.*
07/26/05	2.462 GHz band edge **PEAK DELTA** (INTEL-050721-22a03)	JC



Test Date	*Data*	*Test Eng.*
07/26/05	2.462 GHz band edge **AVERAGE DELTA** (INTEL-050721-22a04)	JC



Spurious Radiated Emissions Test Results (Continued)

*Spurious Emissions Measurements in **802.11b mode (2400-2483.5 MHz)***
Channels 1, 6, & 11
Continuous TX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-03

RADIATED EMISSIONS - Horizontal Antenna Polarization

Freq. (MHz)	Meter Reading (dBuV)	Antenna Height (cm)	Azimuth (degrees)	Quasi pk or AVG (dBuV)		1 Meter Distance Factor (dB)	Cable Factor (dB)	Ant. Factor (dB)	Corrected Reading (dBuV)	Limits (dBuV)	Diff (dB) +=FAIL	Comments
2312.00	31.17	100	225			9.54	1.94	29.16	52.74	74.00	-21.26	**Ch. 1**
2312.00				16.15	A	9.54	1.94	29.16	37.72	54.00	-16.28	
2360.00	31.83	100	225			9.54	1.97	29.32	53.58	74.00	-20.42	
2360.00				16.25	A	9.54	1.97	29.32	38.00	54.00	-16.00	
2336.00	31.83	100	225			9.54	1.96	29.24	53.49	74.00	-20.51	**Ch. 6**
2336.00				16.69	A	9.54	1.96	29.24	38.35	54.00	-15.65	
2360.00	32.17	100	225			9.54	1.97	29.32	53.92	74.00	-20.08	
2360.00				16.35	A	9.54	1.97	29.32	38.10	54.00	-15.90	
2358.66	30.00	100	225			9.54	1.97	29.32	51.75	74.00	-22.25	**Ch.11**
2358.66				16.35	A	9.54	1.97	29.32	38.10	54.00	-15.90	
2360.00	32.17	100	225			9.54	1.97	29.32	53.92	74.00	-20.08	
2360.00				16.15	A	9.54	1.97	29.32	37.90	54.00	-16.10	

RADIATED EMISSIONS - Vertical Antenna Polarization

Freq. (MHz)	Meter Reading (dBuV)	Antenna Height (cm)	Azimuth (degrees)	Quasi pk or AVG (dBuV)		1 Meter Distance Factor (dB)	Cable Factor (dB)	Ant. Factor (dB)	Corrected Reading (dBuV)	Limits (dBuV)	Diff (dB) +=FAIL	Comments
2312.00	31.83	100	225			9.54	1.94	28.74	52.97	74.00	-21.03	**Ch. 1**
2312.00				15.99	A	9.54	1.94	28.74	37.13	54.00	-16.87	
2360.00	31.67	100	225			9.54	1.97	28.88	52.98	74.00	-21.02	
2360.00				16.20	A	9.54	1.97	28.88	37.51	54.00	-16.49	
2336.00	32.33	100	225			9.54	1.96	28.81	53.55	74.00	-20.45	**Ch. 6**
2336.00				16.10	A	9.54	1.96	28.81	37.32	54.00	-16.68	
2360.00	29.67	100	225			9.54	1.97	28.88	50.98	74.00	-23.02	
2360.00				16.15	A	9.54	1.97	28.88	37.46	54.00	-16.54	
2358.66	31.67	100	225			9.54	1.97	28.88	52.97	74.00	-21.03	**Ch.11**
2358.66				16.04	A	9.54	1.97	28.88	37.34	54.00	-16.66	
2360.00	32.00	100	225			9.54	1.97	28.88	53.31	74.00	-20.69	
2360.00				16.15	A	9.54	1.97	28.88	37.46	54.00	-16.54	

NOTE: These spurious emissions measurements were taken without a preamp at a distance on 1 meter to avoid saturating the preamp and analyzer because the signals were close to the fundamental frequency. The readings were extrapolated to 3 meters.

Radiated Emissions Test Results (Continued)

*Spurious Emissions Measurements in **802.11b mode (2400-2483.5 MHz)***
Channels 1, 6, & 11
Continuous TX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-04

RADIATED EMISSIONS - Horizontal Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Preamp Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
3216.29	56.17	100	180			50.88	3.71	31.72	40.72	79.86	-39.14	**Ch. 1**
4824.00	56.50	100	180			51.08	4.57	33.91	43.90	74.00	-30.10	
4824.00				45.79	A	51.08	4.57	33.91	33.19	54.00	-20.81	
7235.73	55.33	100	180			50.31	5.63	36.61	47.26	74.00	-26.74	
7235.73				43.43	A	50.31	5.63	36.61	35.36	54.00	-18.64	
9648.01	61.17	100	225			50.15	6.56	38.12	55.69	79.86	-24.17	
3249.32	56.17	100	180			50.87	3.72	31.80	40.83	79.79	-38.96	**Ch. 6**
4873.53	55.33	100	180			51.12	4.59	34.02	42.82	74.00	-31.18	
4873.53				43.96	A	51.12	4.59	34.02	31.45	54.00	-22.55	
7311.49	54.67	100	180			50.27	5.67	36.81	46.87	74.00	-27.13	
7311.49				42.61	A	50.27	5.67	36.81	34.81	54.00	-19.19	
9747.85	61.17	100	225			50.19	6.60	38.20	55.78	79.79	-24.01	
3282.81	54.83	100	180			50.85	3.74	31.88	39.60	79.39	-39.79	**Ch. 11**
4923.74	55.67	100	180			51.15	4.61	34.13	43.26	74.00	-30.74	
4923.74				46.20	A	51.15	4.61	34.13	33.79	54.00	-20.21	
7386.36	59.00	100	180			50.24	5.70	37.00	51.47	74.00	-22.53	
7386.36				48.71	A	50.24	5.70	37.00	41.18	54.00	-12.82	
9848.01	65.17	100	180			50.23	6.64	38.28	59.86	79.39	-19.53	

Radiated Emissions Test Results (Continued)

RADIATED EMISSIONS - Vertical Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Preamp Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
3216.00	56.83	100	180			50.88	3.71	31.28	40.93	78.55	-37.62	**Ch. 1**
4824.09	57.50	100	180			51.08	4.57	33.78	44.77	74.00	-29.23	
4824.09				48.44	A	51.08	4.57	33.78	35.71	54.00	-18.29	
7236.36	55.17	100	225			50.31	5.63	36.51	47.01	74.00	-26.99	
7236.36				43.41	A	50.31	5.63	36.51	35.25	54.00	-18.75	
9647.93	59.17	125	180			50.15	6.56	38.09	53.66	78.55	-24.89	
3249.50	57.00	125	180			50.87	3.72	31.35	41.21	78.49	-37.28	**Ch. 6**
4873.95	58.00	100	135			51.12	4.59	33.87	45.35	74.00	-28.65	
4873.95				49.36	A	51.12	4.59	33.87	36.71	54.00	-17.29	
7310.61	53.17	100	180			50.27	5.67	36.71	45.27	74.00	-28.73	
7310.61				40.68	A	50.27	5.67	36.71	32.78	54.00	-21.22	
9747.96	58.50	100	180			50.19	6.60	38.15	53.06	78.49	-25.43	
3282.78	56.50	125	135			50.85	3.74	31.42	40.81	78.58	-37.77	**Ch. 11**
4924.04	58.67	100	180			51.15	4.61	33.96	46.09	74.00	-27.91	
4924.04				50.32	A	51.15	4.61	33.96	37.74	54.00	-16.26	
7386.38	58.33	100	135			50.24	5.70	36.90	50.70	74.00	-23.30	
7386.38				46.83	A	50.24	5.70	36.90	39.20	54.00	-14.80	
9847.91	63.50	100	225			50.23	6.64	38.21	58.12	78.58	-20.46	

Radiated Emissions Test Results (Continued)

*Spurious Emissions Measurements in **802.11b mode (2400-2483.5 MHz)***
Channels 1, 6, & 11
Continuous RX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-04

RADIATED EMISSIONS - Horizontal Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Preamp Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
3215.80	56.67	100	180			50.88	3.71	31.72	41.21	74.00	-32.79	**Ch. 1**
3215.80				45.31	A	50.88	3.71	31.72	29.85	54.00	-24.15	
3249.30	56.17	125	225			50.87	3.72	31.80	40.83	74.00	-33.17	**Ch. 6**
3249.30				46.25	A	50.87	3.72	31.80	30.91	54.00	-23.09	
3282.71	56.83	100	180			50.85	3.74	31.88	41.60	74.00	-32.40	**Ch. 11**
3282.71				45.73	A	50.85	3.74	31.88	30.50	54.00	-23.50	

RADIATED EMISSIONS - Vertical Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Preamp Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
3216.00	56.00	100	180			50.88	3.71	31.28	40.10	74.00	-33.90	**Ch. 1**
3216.00				45.13	A	50.88	3.71	31.28	29.23	54.00	-24.77	
3249.39	57.33	125	225			50.87	3.72	31.35	41.54	74.00	-32.46	**Ch. 6**
3249.39				48.56	A	50.87	3.72	31.35	32.77	54.00	-21.23	
3282.73	57.67	125	180			50.85	3.74	31.42	41.98	74.00	-32.02	**Ch. 11**
3282.73				49.15	A	50.85	3.74	31.42	33.46	54.00	-20.54	

RADIATED EMISSIONS TEST RESULTS

CLIENT:	Dell Computer Corporation	**DATE:**	10/16/06
EUT:	Intel PRO/Wireless 3945ABG Network Connection	**PROJECT NUMBER:**	INTEL-061011
MODEL NUMBER:	WM3945ABG	**TEST ENGINEER:**	BM
SERIAL NUMBER:	00B11A295CVD26965002	**SITE #:**	2
CONFIGURATION:	Tested installed in the host computer's mini PCI slot in **802.11g (2400-2483.5 MHz) mode with Travis ATG Amphenol Antennas.**	**TEMPERATURE:**	15 deg. C
		HUMIDITY:	84% RH
		TIME:	8:30 PM

Description:	Radiated RF Emissions (1 GHz – 18 GHz)
Results:	**PASSED** Horizontal and Vertical Antenna Polarizations Class B Limits
Note:	Radiated Emissions Measurements were performed on the EUT with power supply set at the following voltage and frequency. • 120VAC / 60 Hz.

Unwanted Spurious Emissions Limits			
Frequency (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m) (Emissions in the restricted bands)**	**Field Strength (dBm/MHz) (Emissions outside the restricted bands)**
Above 960	500	54.00 (Average) 74.00 (Peak)	< -20 dBc

Radiated Emissions Sample Calculations

Corrected Meter Reading = Meter Reading + F +C - D

Where, F = Antenna Factor
C = Cable Factor
G = Amplifier Gain
D = Distance Factor (if applicable)

Therefore, the equation for determining the Corrected Meter Reading Limit (CML) is:

CML = Specification Limit - F - C + D

Radiated Emissions Test Results (Continued)

*Fundamental Measurements in **802.11g mode (2400-2483.5 MHz)***
Channels 1, 6, & 11
Continuous TX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-02

RADIATED EMISSIONS - Horizontal Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
2412.00	67.67	100	135			3.19	29.50	100.36			**Ch. 1**
2412.00				60.13	A	3.19	29.50	92.82			
2437.00	66.33	100	135			3.20	29.59	99.12			**Ch. 6**
2437.00				58.20	A	3.20	29.59	90.99			
2462.00	65.67	100	180			3.22	29.67	98.56			**Ch. 11**
2462.00				57.46	A	3.22	29.67	90.35			

RADIATED EMISSIONS – Vertical Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
2412.00	66.83	100	180			3.19	29.04	99.05			**Ch. 1**
2412.00				58.75	A	3.19	29.04	90.97			
2437.00	66.33	100	180			3.20	29.11	98.65			**Ch. 6**
2437.00				59.00	A	3.20	29.11	91.32			
2462.00	63.33	100	180			3.22	29.19	95.74			**Ch. 11**
2462.00				55.04	A	3.22	29.19	87.45			

NOTE: Fundamental signals measured to calculate the band edge field strengths using the “Marker Delta Method”.

Radiated Emissions Test Results (Continued)

*Band Edge Field Strength Measurements in **802.11g mode (2400-2483.5 MHz)***
Channels 1 & 11
Continuous TX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-02

RADIATED EMISSIONS - Horizontal Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
2390.00								63.53	74.00	-10.47	**Ch. 1**
2390.00					A			45.99	54.00	-8.01	
2400.00	46.67	100	135			3.18	29.46	79.31	80.36	-1.05	
2483.50								58.39	74.00	-15.61	**Ch. 11**
2483.50					A			40.85	54.00	-13.15	

RADIATED EMISSIONS – Vertical Antenna Polarization											
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
2390.00								62.22	74.00	-11.78	**Ch. 1**
2390.00					A			44.14	54.00	-9.86	
2400.00	45.50	100	180			3.18	29.00	77.68	79.05	-1.37	
2483.50								55.57	74.00	-18.43	**Ch. 11**
2483.50					A			37.95	54.00	-16.05	

NOTE: The "Band Edge Field Strength" was calculated using the "Fundamental" and "Conducted Band Edge" measurements per the "Marker-Delta Method" with the following formula:

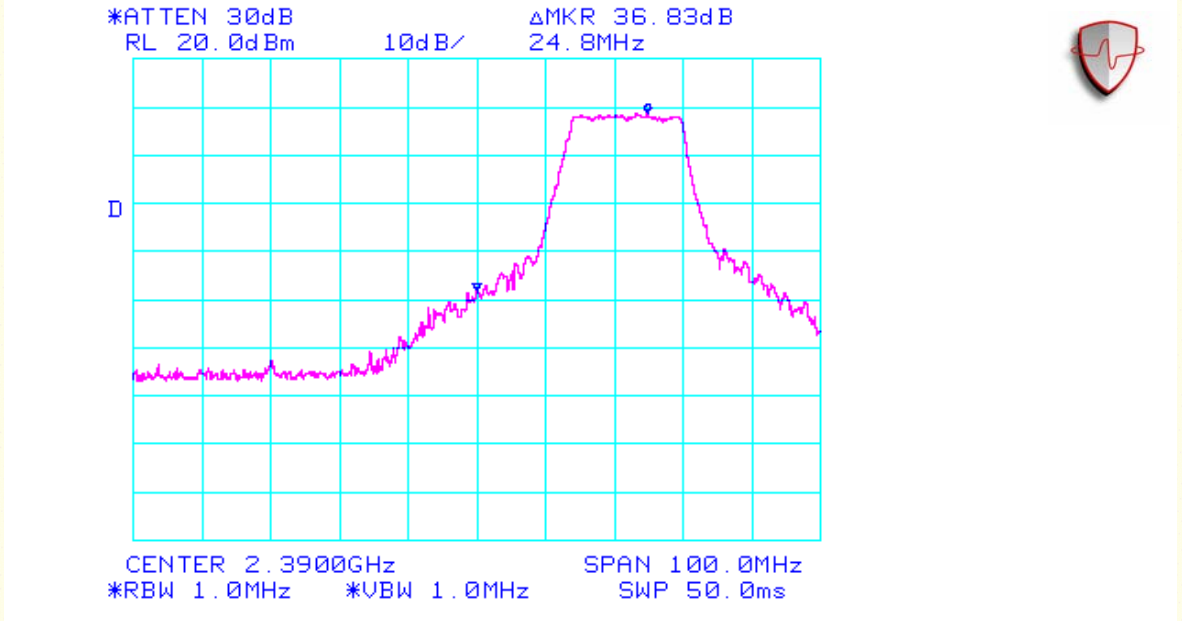
BE = Fm – Δm

Where
BE = Band Edge Field Strength
Fm = Measured Fundamental (Peak or Average)
Δm = Measured Conducted Band Edge Delta (Peak or Average)

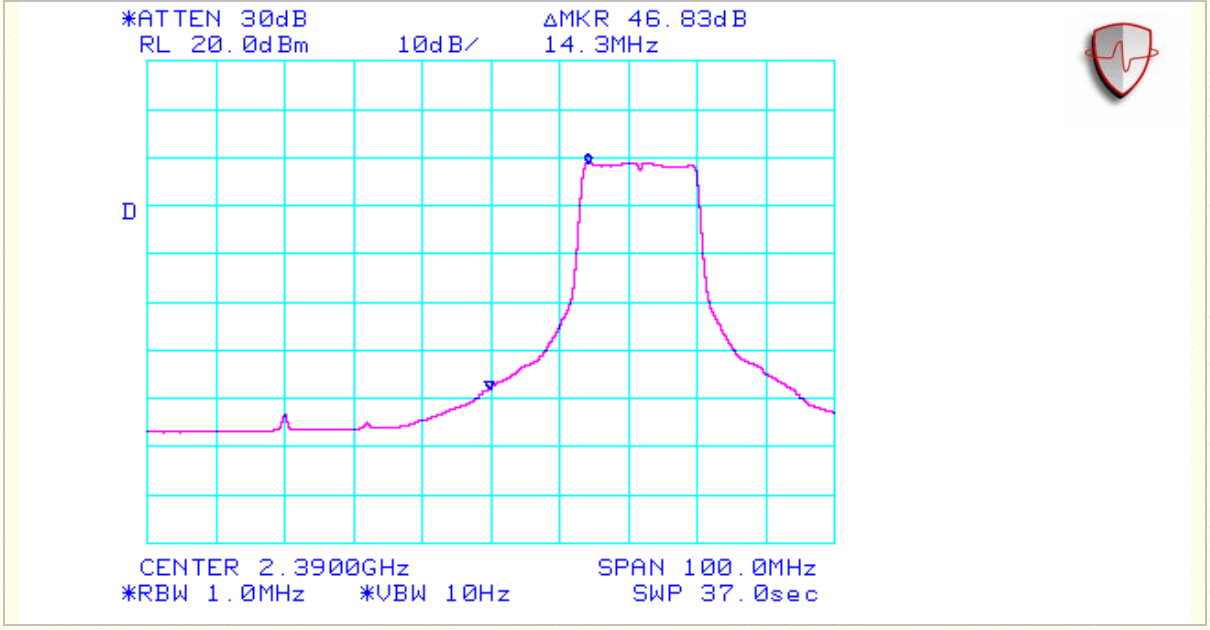
Radiated Emissions Test Results (Continued)

Plots Showing Out-Of-Band Emissions (Peak RBW=VBW=1MHz; Average RBW = 1MHz, VBW = 10Hz)

Test Date	*Data*	*Test Eng.*
07/26/05	2.412 GHz band edge **PEAK DELTA** (INTEL-050721-22b01)	JC



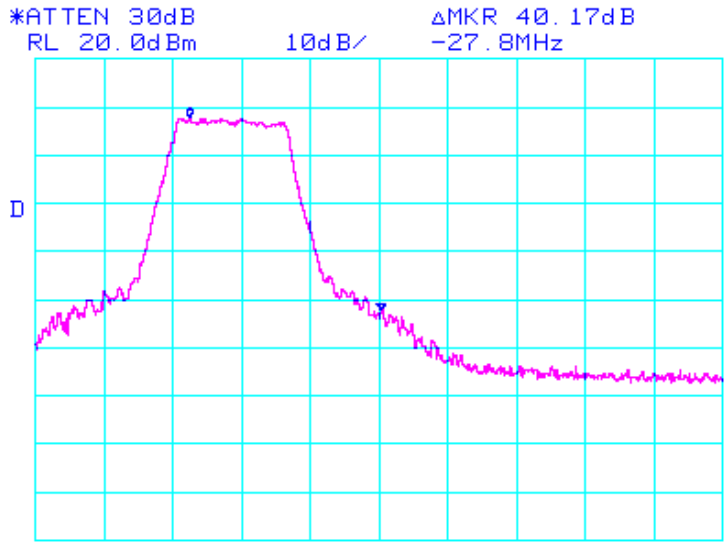
Test Date	*Data*	*Test Eng.*
07/26/05	2.412 GHz band edge **AVERAGE DELTA** (INTEL-050721-22b02)	JC



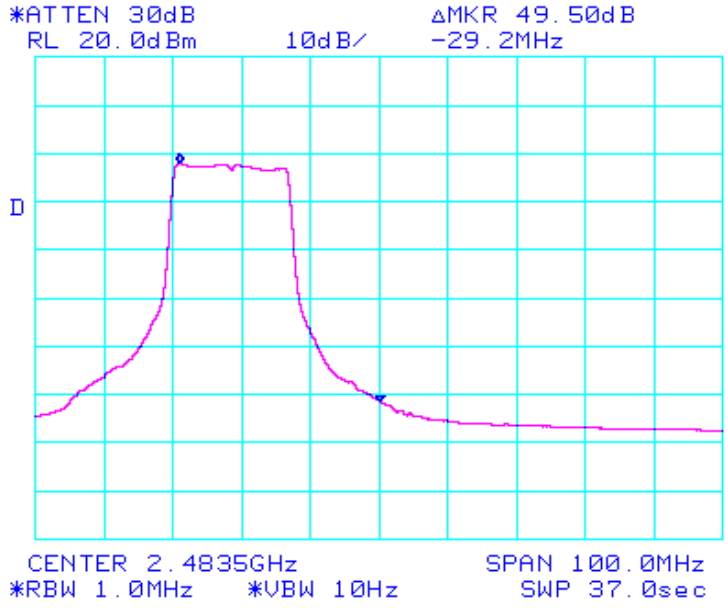
Radiated Emissions Test Results (Continued)

Plots Showing Out-Of-Band Emissions (Peak RBW=VBW=1MHz; Average RBW = 1MHz, VBW = 10Hz)

Test Date	*Data*	*Test Eng.*
07/26/05	2.462 GHz band edge **PEAK DELTA** (INTEL-050721-22b03)	JC



Test Date	*Data*	*Test Eng.*
07/26/05	2.462 GHz band edge **AVERAGE DELTA** (INTEL-050721-22b04)	JC



Spurious Radiated Emissions Test Results (Continued)

*Spurious Emissions Measurements in **802.11g mode (2400-2483.5 MHz)***
Channels 1, 6, & 11
Continuous TX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-03

RADIATED EMISSIONS - Horizontal Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*1 Meter Distance Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
2312.00	31.67	100	225			9.54	1.94	29.16	53.24	74.00	-20.76	**Ch. 1**
2312.00				16.10	A	9.54	1.94	29.16	37.67	54.00	-16.33	
2336.00	32.33	100	225			9.54	1.96	29.24	53.99	74.00	-20.01	**Ch. 6**
2336.00				17.19	A	9.54	1.96	29.24	38.85	54.00	-15.15	
2358.66	32.33	100	225			9.54	1.97	29.32	54.08	74.00	-19.92	**Ch. 11**
2358.66				18.52	A	9.54	1.97	29.32	40.27	54.00	-13.73	

RADIATED EMISSIONS - Vertical Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*1 Meter Distance Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
2312.00	31.67	100	225			9.54	1.94	28.74	52.81	74.00	-21.19	**Ch. 1**
2312.00				16.04	A	9.54	1.94	28.74	37.18	54.00	-16.82	
2336.00	33.33	100	225			9.54	1.96	28.81	54.55	74.00	-19.45	**Ch. 6**
2336.00				19.08	A	9.54	1.96	28.81	40.30	54.00	-13.70	
2358.66	32.83	100	225			9.54	1.97	28.88	54.13	74.00	-19.87	**Ch. 11**
2358.66				18.82	A	9.54	1.97	28.88	40.12	54.00	-13.88	

NOTE: These spurious emissions measurements were taken without a preamp at a distance on 1 meter to avoid saturating the preamp and analyzer because the signals were close to the fundamental frequency. The readings were extrapolated to 3 meters.

Radiated Emissions Test Results (Continued)

*Spurious Emissions Measurements in **802.11g mode (2400-2483.5 MHz)***
Channels 1, 6, & 11
Continuous TX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-04

RADIATED EMISSIONS - Horizontal Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Preamp Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
3216.00	55.50	100	180			50.88	3.71	31.72	40.04	80.36	-40.32	**Ch. 1**
9648.00	61.00	100	135			50.15	6.56	38.12	55.52	80.36	-24.84	
3249.32	56.00	100	180			50.87	3.72	31.80	40.66	79.12	-38.46	**Ch. 6**
9747.96	59.17	100	180			50.19	6.60	38.20	53.78	79.12	-25.34	
3282.56	58.33	100	180			50.85	3.74	31.88	43.10	78.56	-35.46	**Ch. 11**
9847.69	58.67	100	135			50.23	6.64	38.28	53.36	78.56	-25.20	

RADIATED EMISSIONS - Vertical Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Preamp Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
3216.00	56.83	125	180			50.88	3.71	31.28	40.93	79.05	-38.12	**Ch. 1**
9648.00	57.83	100	180			50.15	6.56	38.09	52.32	79.05	-26.73	
3249.32	57.83	125	180			50.87	3.72	31.35	42.04	78.65	-36.61	**Ch. 6**
9747.96	58.17	100	180			50.19	6.60	38.15	52.73	78.65	-25.92	
3282.33	58.50	125	180			50.85	3.74	31.42	42.81	75.74	-32.93	**Ch. 11**
9847.86	58.00	100	180			50.23	6.64	38.21	52.62	75.74	-23.12	

Radiated Emissions Test Results (Continued)

*Spurious Emissions Measurements in **802.11g mode (2400-2483.5 MHz)***
Channels 1, 6, & 11
Continuous RX** at MAIN Antenna port with **Travis ATG Amphenol Antennas
Aegis Labs, Inc. File #: INTEL-061011-04

RADIATED EMISSIONS - Horizontal Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Preamp Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
3215.80	55.67	125	225			50.88	3.71	31.72	40.21	74.00	-33.79	**Ch. 1**
3215.80				44.95	A	50.88	3.71	31.72	29.49	54.00	-24.51	
3249.32	56.83	125	225			50.87	3.72	31.80	41.49	74.00	-32.51	**Ch. 6**
3249.32				47.01	A	50.87	3.72	31.80	31.67	54.00	-22.33	
3282.66	56.33	100	225			50.85	3.74	31.88	41.10	74.00	-32.90	**Ch. 11**
3282.66				44.97	A	50.85	3.74	31.88	29.74	54.00	-24.26	

RADIATED EMISSIONS - Vertical Antenna Polarization												
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Preamp Factor (dB)*	*Cable Factor (dB)*	*Ant. Factor (dB)*	*Corrected Reading (dBuV)*	*Limits (dBuV)*	*Diff (dB) +=FAIL*	*Comments*
3216.00	55.67	100	180			50.88	3.71	31.28	39.77	74.00	-34.23	**Ch. 1**
3216.00				45.35	A	50.88	3.71	31.28	29.45	54.00	-24.55	
3249.43	57.67	100	180			50.87	3.72	31.35	41.88	74.00	-32.12	**Ch. 6**
3249.43				47.96	A	50.87	3.72	31.35	32.17	54.00	-21.83	
3282.67	57.33	100	180			50.85	3.74	31.42	41.64	74.00	-32.36	**Ch. 11**
3282.67				49.15	A	50.85	3.74	31.42	33.46	54.00	-20.54	

PEAK TRANSMIT POWER

CLIENT:	Dell Computer Corporation	**DATE:**	10/16/06
EUT:	Intel PRO/Wireless 3945ABG Network Connection	**PROJECT NUMBER:**	INTEL-061011
MODEL NUMBER:	WM3945ABG	**TEST ENGINEER:**	BM
SERIAL NUMBER:	00B11A295CVD26965002	**SITE #:**	2
CONFIGURATION:	Tested installed in the host computer's mini PCI slot.	**TEMPERATURE:**	15 deg. C
		HUMIDITY:	84% RH
		TIME:	8:30 PM

Description:	The maximum peak output power of the intentional radiator shall not exceed 1 watt.
Results:	See Data Sheet
Note:	Conducted Emissions Measurements were performed on the EUT with power supply set at the following voltage and frequency. • 120VAC / 60 Hz.

Peak Transmit Power Limits	
Frequency (MHz)	**Output Power (W)**
5745-5825	1
2412-2462	1

Peak Transmit Power (Continued)

Mode	Channel	Frequency (MHz)	Rate (Mbps)	Average Power (dBm)	Average Power (mW)	Peak Power (dBm)	Peak Power (mW)
802.11a	149	5745	6	16.82	48.08	19.60	91.20
802.11a	157	5785	6	17.05	50.70	19.70	93.33
802.11a	165	5825	6	17.13	51.64	19.80	95.50
802.11b	1	2412	1	17.13	51.64	19.71	93.54
802.11b	6	2437	1	17.96	62.52	20.53	112.98
802.11b	11	2462	1	17.86	61.09	20.34	108.14
802.11g	1	2412	6	16.18	41.50	24.21	263.63
802.11g	6	2437	6	16.82	48.08	24.71	295.80
802.11g	11	2462	6	15.33	34.12	24.28	267.92

NOTE: The output power measurement is conducted.

APPENDIX B

MODIFICATIONS AND RECOMMENDATIONS

1.0	NONE