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TEST REPORT PERTAINING TO:

Equipment Under Test	Model Number(s)
Intel Wireless WiFi Link 4965AGN	4965AG_

CONFIGURATION
802.11a / 802.11b / 802.11g with a set of Ethertronics Antennas

MEASUREMENTS PERFORMED IN ACCORDANCE WITH THE FOLLOWING STANDARD (S)

Regulatory Standard(s)
FCC CFR 47, PART 15 SUBPART B **CLASS B**

ACCREDITED

Certificate Number: 1111.01

PREPARED FOR:
Hewlett-Packard Company
20555 SH 249
Mail Stop 060607
Houston, TX 77070-2698

Contact(s): Mr. Walter Overcash

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-061210F

Test Report Revision: NONE

	REPORT BODY	APPENDICES				TOTAL PAGES
		A	***B***	***C***	***D***	
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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

These global standards 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 these standards 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

Emissions

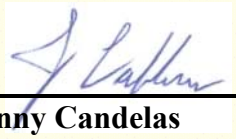
Index	Standard	Test Limits / Levels			Results
1	FCC PART 15	**A.C. Mains Port; Conducted Emissions; 0.150 MHz to 30 MHz**			PASSED
		Frequency	Q-P Limit	AVG Limit	
		0.150 – 0.5 MHz	66 dBuV	56 dBuV	
		0.5 – 5	56 dBuV	46 dBuV	
		5 – 30	60 dBuV	50 dBuV	
	FCC PART 15	**R.F. Electromagnetic Fields, 30 to 1000 MHz**			PASSED
		Frequency	Limit	Distance	
		30 – 230 MHz	30 dBuV/m	10m	
		230 – 1000 MHz	37 dBuV/m	10m	

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

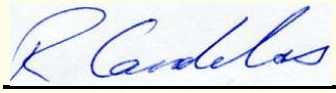
Test and Report Completed By:



12/11/06

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

Report Approved By:



12/11/06

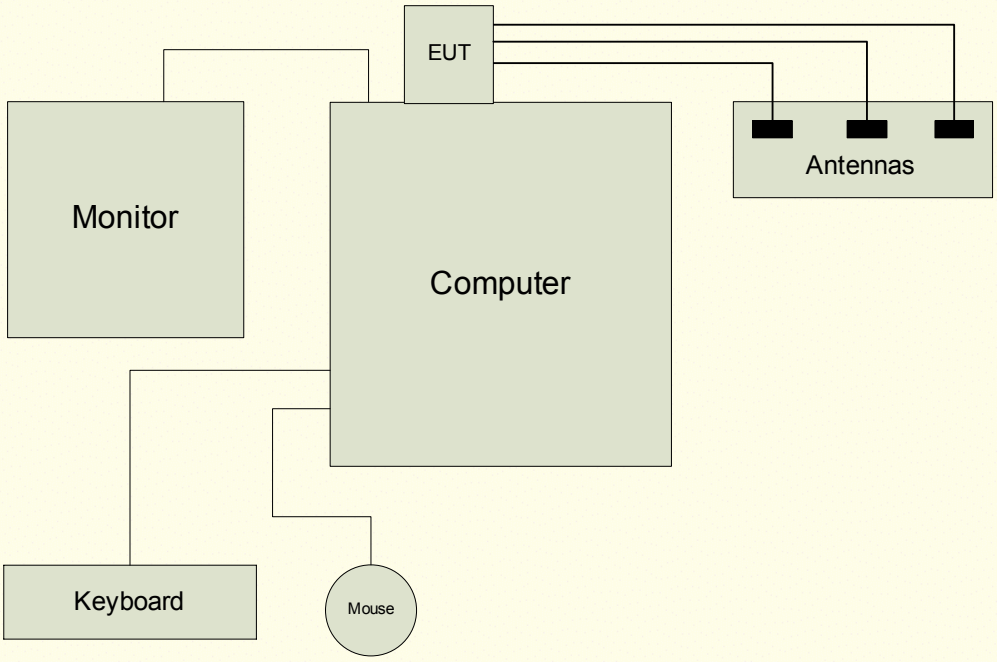
Rick Candelas **Date:**
Quality Assurance Manager
Aegis Labs, Inc.

3.0 ADMINISTRATIVE DATA AND TEST DESCRIPTION

DEVICE TESTED:	ITE Type: Intel Wireless WiFi Link 4965AGN Model Number(s): 4965AG_ Serial Number: 0013E804612B
DATE EUT RECEIVED:	August 25th, 2006
TEST DATE(S):	September 7th – 8th, 2006
ORIGIN OF TEST SAMPLE(S):	Production
EQUIPMENT CLASS:	EUT tested as CLASS B device
RESPONSIBLE PARTY:	Hewlett-Packard Company 20555 SH 249 Mail Stop 060607 Houston, TX 77070-2698
CLIENT CONTACT:	Mr. Walter Overcash
MANUFACTURER:	Hewlett-Packard Company
TEST LOCATION:	Aegis Labs, Inc. 32231 Trabuco Creek Road Trabuco Canyon, CA 92678 Open Area Test Site #1
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 Arrangement and Location of EUT and Host Equipment



4.2 EUT Description and Configuration

Equipment Under Test (EUT): Intel Wireless WiFi Link 4965AGN	
Test Routine Software Programs used during testing of EUT and Peripherals:	Intel Corporation Software (CRTU Ver. 4.1.14.0000)
Number of External Test Ports Exercised:	3 Antenna Ports
Power Supply Voltage applied to EUT during qualification measurements:	Conducted: 120VAC / 60Hz Radiated: 120 VAC / 60 Hz
Clocks and/or Crystal Oscillator(s):	N/A

4.2.1 Product Description

The Intel Wireless WiFi Link 4965AGN 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 54 Mbps.

4.2.2 EUT Configuration

The EUT was set-up according to the ANSI C63.4: 2003 guidelines for emissions testing. For emissions testing the EUT (Intel Wireless WiFi Link 4965AGN, Model Number(s): 4965AG_) had antennas connected to its antenna ports.

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 Chain 1, 2, & 3 antenna ports. Data for a set of Ethertronics antennas can be found in Appendix A (Data Sheets)

The low, middle, and high channels were tested in 802.11a, b, g, & n modes. Also, the EUT was tested once transmitting from Chain 1 antenna port and once transmitting from Chain 2 antenna port. The EUT was placed in either continuous transmit or continuous receive mode by a program provided by the manufacturer (*CRTU Version 4.1.14.0000*).

4.3 List of EUT, Sub-Assemblies and Host Equipment

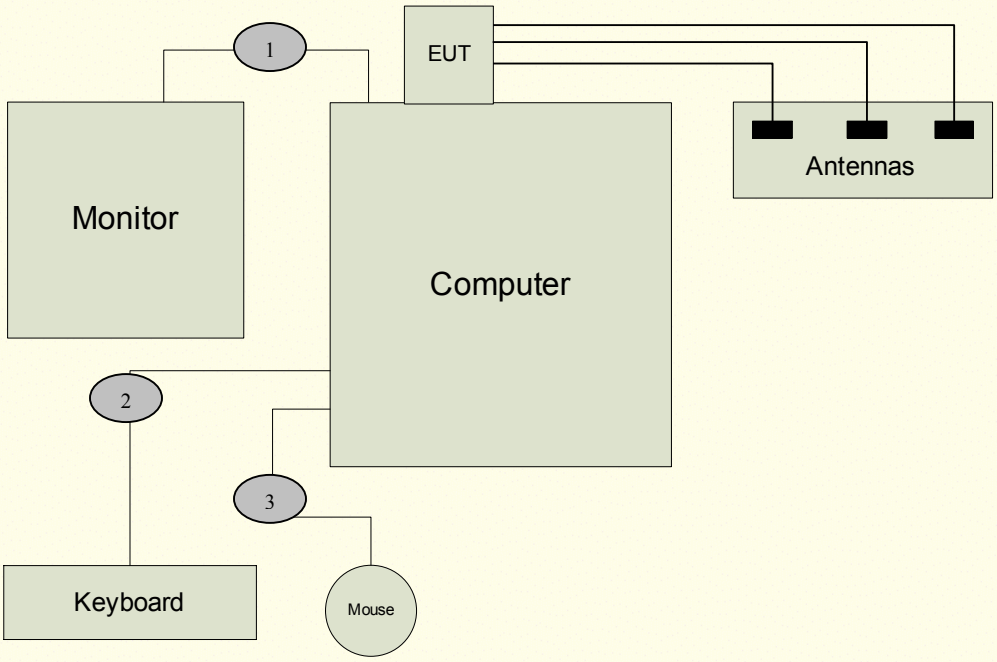
Equipment Under Test			
Manufacturer	**Equipment Name**	**Model or Part Number**	**Serial Number**
Intel Corporation	Intel Wireless WiFi Link 4965AGN	4965AG_	0013E804612B

EUT Sub-Assemblies			
Manufacturer	**Equipment Name**	**Model or Part Number**	**Serial Number**
Ethertronics	Chain A (Tx)Antenna	MPCI01001	N/A
Ethertronics	Chain B (Tx) Antenna	MPCI01001	N/A
Ethertronics	Rx Antenna	MPCI01001	N/A

Remotely Located Support Equipment			
Manufacturer	**Equipment Name**	**Model or Part Number**	**Serial Number**
GST	Host Computer	GST-8000	G0400295337-015
Sony	Monitor	CPD-200ES	0742818
Logitech	Keyboard	Y-BF37	MCT25200581
Logitech	Mouse	M-BJ58	LNA22802012

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

4.4 Signal Line Cable Description and Connection Location



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					
Equipment Name	**Manufacturer**	**Model Number**	**Serial Number**	**Calibration Due Date**	**Maintenance Calibration Cycle**
EMI Receiver - RF Section	Hewlett Packard	8546A	3325A00137	04/26/07	1 Year
EMI Receiver - RF Filter Section	Hewlett Packard	85460A	3325A00138	04/26/07	1 Year
10dB Attenuator	Radiall	R412710000	Lot 9624	06/30/07	2 Years
LISN (EUT)	Solar Electronics	9252-50-R-24-BNC	961025	03/30/08	2 Years
LISN (Access)	Solar Electronics	9252-50-R-24-BNC	961024	07/05/07	2 Years
Antenna - Biconical	EMCO	3110B	3383	04/06/07	1 Year
Antenna - Log Periodic	EMCO	3148	47943	06/22/07	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.

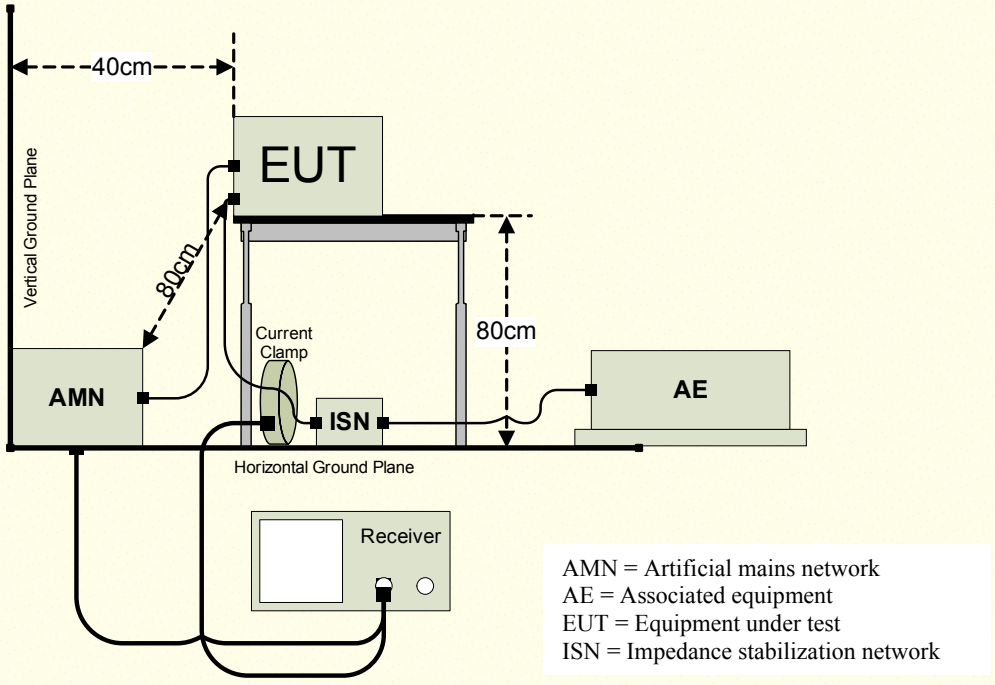
5.2 Conducted Emissions Test Setup

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.

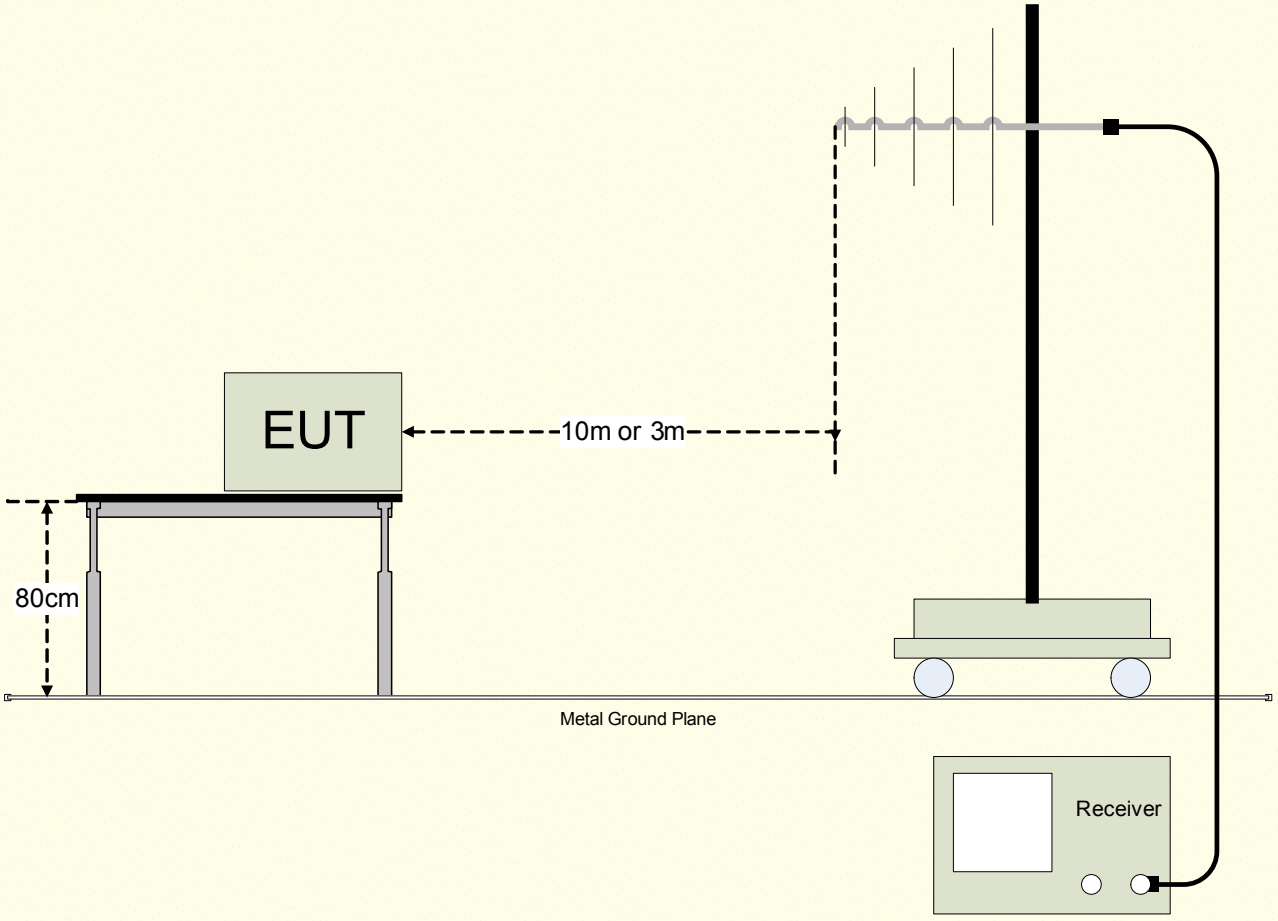


5.3 Radiated Emissions Test Setup

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 – 300MHz, 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

AC POWER PORT - CONDUCTED EMISSIONS TEST RESULTS

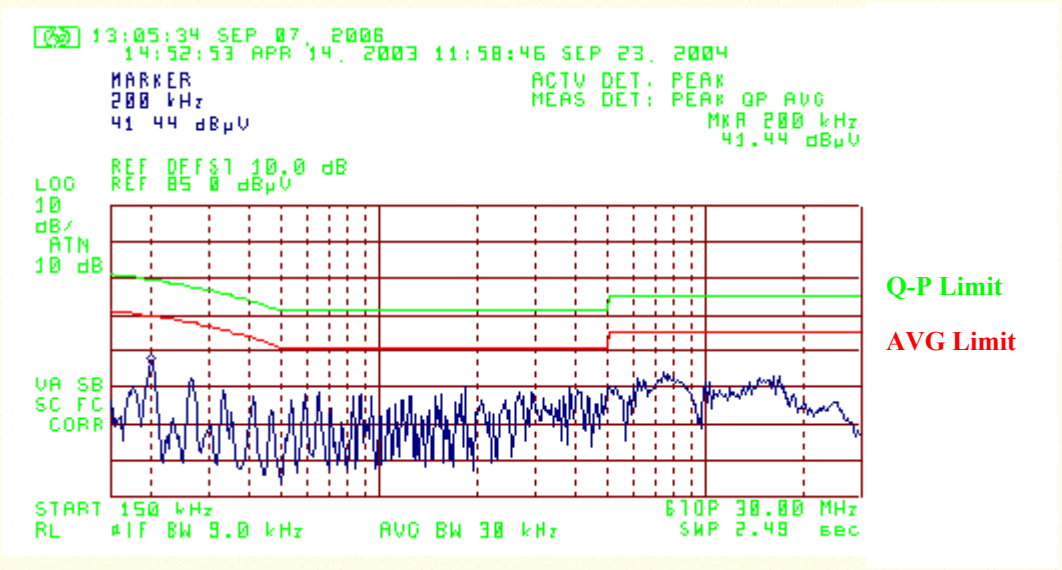
CLIENT:	Hewlett-Packard Company	**DATE:**	09/07/06
EUT:	Intel Wireless WiFi Link 4965AGN	**PROJECT NUMBER:**	INTEL-060907
MODEL NUMBER:	4965AG_	**TEST ENGINEER:**	JC
SERIAL NUMBER:	0013E804612B	**SITE #:**	1
CONFIGURATION:	Tested installed in the host computer's mini PCI slot.	**TEMPERATURE:**	22 deg. C
		HUMIDITY:	49%
		TIME:	2:15 PM

Description:	Conducted Power RF Emissions (150 kHz – 30 MHz)
Results:	**PASSED** LINE 1 and LINE 2 Limits
Note:	Conducted Emissions Measurements were performed on the EUT with the power supply set at the following voltage and frequency. • 120VAC / 60 Hz

AC Power Port – Conducted Emissions Test Results (Continued)

Continuously Transmitting @ 120VAC/60Hz (INTEL-060907-01)

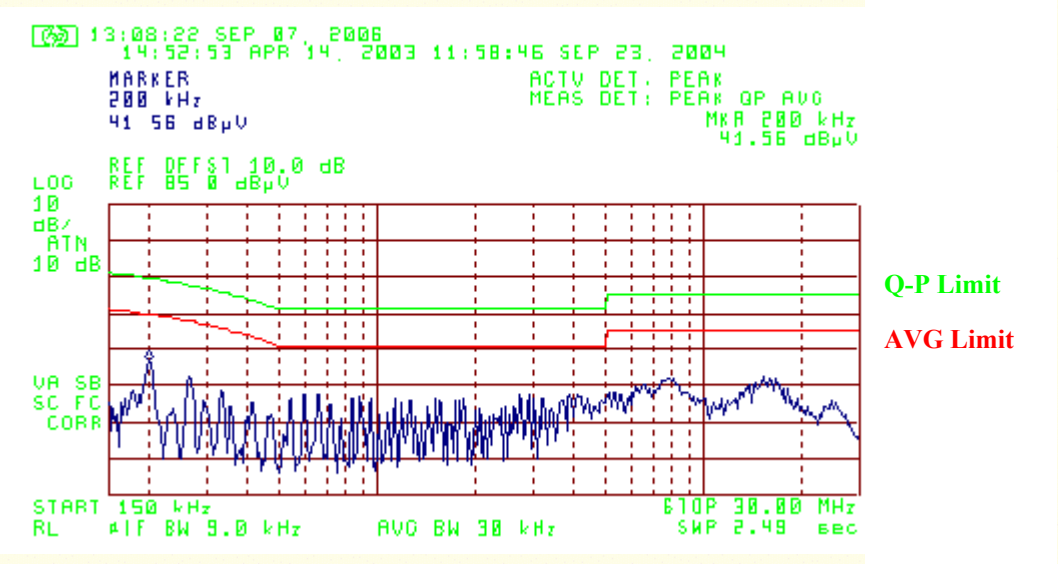
FCC CLASS B CONDUCTED EMISSIONS – LINE 1						
Freq. (MHz)	*Meter Reading (dBuV)*	*Detector (PK/QP/AV)*	*Average Limit (dBuV)*	*Average Delta(dB)*	*Quasi-Peak Limit (dBuV)*	*Quasi-Peak Delta(dB)*
0.2000	41.44	PK	54.57	-13.13	64.57	-23.13
0.2700	37.40	PK	52.57	-15.17	62.57	-25.17
1.8400	35.48	PK	46.00	-10.52	56.00	-20.52
7.3900	38.91	PK	50.00	-11.09	60.00	-21.09
10.0000	36.02	PK	50.00	-13.98	60.00	-23.98
16.1400	38.26	PK	50.00	-11.74	60.00	-21.74



AC Power Port – Conducted Emissions Test Results (Continued)

Continuously Transmitting @ 120VAC/60Hz (INTEL-060907-01)

FCC CLASS B CONDUCTED EMISSIONS - LINE 2						
Freq. (MHz)	*Meter Reading (dBuV)*	*Detector (PK/QP/AV)*	*Average Limit (dBuV)*	*Average Delta(dB)*	*Quasi-Peak Limit (dBuV)*	*Quasi-Peak Delta(dB)*
0.2000	41.56	PK	54.57	-13.01	64.57	-23.01
0.2700	37.40	PK	52.57	-15.17	62.57	-25.17
0.3300	33.69	PK	50.86	-17.17	60.86	-27.17
4.1300	32.63	PK	46.00	-13.37	56.00	-23.37
7.6800	36.91	PK	50.00	-13.09	60.00	-23.09
15.2200	37.46	PK	50.00	-12.54	60.00	-22.54



RADIATED EMISSIONS TEST RESULTS

CLIENT:	Hewlett-Packard Company	**DATE:**	09/07/06
EUT:	Intel Wireless WiFi Link 4965AGN	**PROJECT NUMBER:**	INTEL-060907
MODEL NUMBER:	4965AG_	**TEST ENGINEER:**	JC
SERIAL NUMBER:	0013E804612B	**SITE #:**	1
CONFIGURATION:	Tested installed in the host computer's mini PCI slot.	**TEMPERATURE:**	22 deg. C
		HUMIDITY:	49%
		TIME:	2:15 PM

Description:	Radiated RF Emissions (30 MHz – 1000 MHz)
Results:	**PASSED** Horizontal and Vertical Antenna Polarizations Class B Limits
Note:	Radiated Emissions Measurements were performed on the EUT with the power supply set at the following voltage and frequency. • 120VAC / 60 Hz.

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)

Continuously Transmitting @ 120VAC/60Hz (INTEL-060907-02)

Horizontal Open Field Maximized Data										
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Antenna Factor (dB)*	*Corrected Reading (dBuV/m)*	*Limits (dBuV/m)*	*Diff (dB) +=FAIL*
48.02	8.58	400	45			2.65	10.32	21.55	30.00	-8.45
120.00	14.23	400	90	11.03	Q	2.39	11.20	24.62	30.00	-5.38
250.01	10.96	350	90			2.91	17.40	31.27	37.00	-5.73
305.09	11.32	300	270			3.07	14.49	28.87	37.00	-8.13
375.00	10.53	250	45			3.35	15.10	28.98	37.00	-8.03
386.00	11.63	225	45			3.39	15.54	30.56	37.00	-6.44

Vertical Open Field Maximized Data										
Freq. (MHz)	*Meter Reading (dBuV)*	*Antenna Height (cm)*	*Azimuth (degrees)*	*Quasi pk or AVG (dBuV)*		*Cable Factor (dB)*	*Antenna Factor (dB)*	*Corrected Reading (dBuV/m)*	*Limits (dBuV/m)*	*Diff (dB) +=FAIL*
48.01	11.12	100	45			2.65	10.52	24.29	30.00	-5.71
119.98	18.40	100	90	14.65	Q	2.39	10.80	27.84	30.00	-2.16
250.03	8.51	100	45			2.91	18.30	29.72	37.00	-7.28
306.35	13.06	100	45			3.07	14.78	30.91	37.00	-6.09
358.01	7.94	100	0			3.27	15.44	26.65	37.00	-10.35
375.05	8.85	100	90			3.35	15.30	27.50	37.00	-9.50
386.01	15.71	100	180	13.62	Q	3.39	15.61	32.62	37.00	-4.38

APPENDIX B

PHOTOGRAPHS – (TEST SETUPS)

CONDUCTED EMISSIONS – FRONT VIEW

FOR

EUT: Intel Wireless WiFi Link 4965AGN
*MODEL NUMBER: 4965AG_*

CONDUCTED EMISSIONS – SIDE VIEW

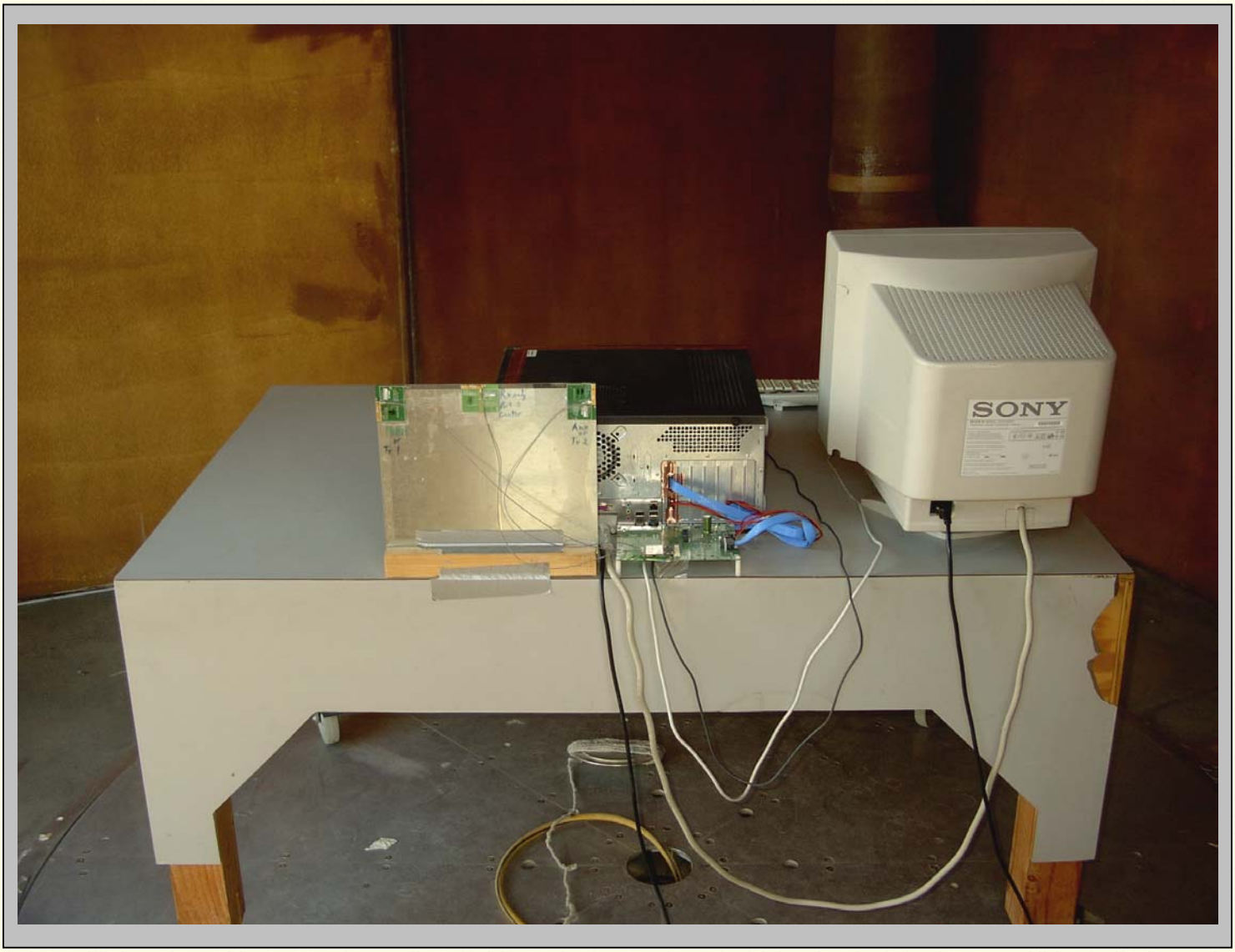
FOR

EUT: Intel Wireless WiFi Link 4965AGN
*MODEL NUMBER: 4965AG_*

RADIATED EMISSIONS – FRONT VIEW

FOR

EUT: Intel Wireless WiFi Link 4965AGN
*MODEL NUMBER: 4965AG_*



RADIATED EMISSIONS – REAR VIEW

FOR

EUT: Intel Wireless WiFi Link 4965AGN
*MODEL NUMBER: 4965AG_*

APPENDIX C

MODIFICATIONS REQUIRED

1.0	NONE

APPENDIX D

ACCREDITATION CERTIFICATE (S)

THE AMERICAN
ASSOCIATION
FOR LABORATORY
ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

AEGIS LABS, INC.
Trabuco Canyon, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 18 June 2005*).

Presented this 12th day of May 2006.

AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION
CORPORATE SEAL 1978 DISTRICT OF COLUMBIA
A2LA

President
For the Accreditation Council
Certificate Number 1111.01
Valid to February 28, 2008

For the tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

American Association for Laboratory Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

AEGIS LABS, INC.[1]
32231 Trabuco Creek Road
Trabuco Canyon, CA 92678
Rick Candelas Phone: 949-459-7886

ELECTRICAL (EMC)

Valid To: February 28, 2008 Certificate Number: 1111.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following electromagnetic compatibility tests:

Technology	Test Method(s)
Emissions	
Conducted Emissions Measurements 150 kHz. – 30 MHz.	CFR 47, FCC Part 15 (ANSI C63.4:2003); EN 55022:1998/A1:2000/A2:2003;
Radiated Emissions Measurements 30 MHz. - 40 GHz	EN 55011:1998; IEC CISPR 11:2003; CISPR 13; CISPR 22:1997; AS/NZS CISPR 22:2004; SS IEC CISPR 22; VCCI V-3/2005.04; CNS 13438 1997; ICES-003; RSS-210; ANSI/TIA/EIA 603A-2001; SANS 222:2005/CISPR 22:2005 (SABS CISPR 22:2005) AS/NSZ 4771:2000; EN 61000-6-3:2001; EN 61000-6-4:2001; SI 961-6-1:2002 KN 22 (RRL No. 2005-82, September 29, 2005)
Product Family Generic Standards	EN 50081-1: 1992; EN 50081-2:1993; EN 50082-1: 1997; EN 50130-4:1995/A1; EN 55020:1994/A11/A12/A13/A14; EN 55024:1998/A1:2001/A2:2003; EN 55103-1: 1996; EN 55103-2:1996; EN 61000-6-1:2001; EN 61000-6-2:1999/2001; EN 61000-4-3: 2001; EN 61000-6-4: 2001, EN 300 328-1: v1.2.2, 1.3.1; EN 300-328-2: v1.1.1, 1.2.1; EN 301 489-17; IEC 60601-1-2 (up to 1 GHz); EN 61326:1997/A1/A2; EN 50091-2:1995; EN 300 386:2003
Radiated Emissions Measurements (H-Field 30Hz-30 MHz)	CFR 47, FCC Part 18 (ANSI C63.4:2003)

Technology	Test Method(s)
Immunity	RRL No. 2005-130, December 27, 2005
Electrostatic Discharge Immunity[2]	IEC 61000-4-2 1995/A1:1998/A2:2000; KN 61000-4-2
Radiated Immunity[2] (Radiated E-field 10kHz to 1.0 GHz)	IEC 61000-4-3: A1:1998/A2:2000, 2002; KN 61000-4-3
Electrical Fast Transient/Burst Immunity[2]	IEC 61000-4-4:1995/A1:2000/A2:2001; KN 61000-4-4
Surge Immunity & Voltage Spikes[2]	IEC 61000-4-5: 1995 A1: 2000, 2001, ITU-T K.20; KN 61000-4-5
Conducted Immunity[2]	IEC 61000-4-6:1996/A1:2000, 2001, 2003; KN 61000-4-6
Power Frequency Magnetic Field Immunity[2]	IEC 61000-4-8:1993 A1: 2000, 2001; KN 61000-4-8
Voltage Dips, Short Interruptions[2]	IEC 61000-4-11:1994/A1:2000; KN 61000-4-11
Harmonic Current Emissions[2]	EN 61000-3-2: 2000
Voltage Fluctuations and Flicker[2]	EN 61000-3-3:1995/A1:2001

[1] This accreditation covers testing performed at the main laboratory listed above, and the satellite laboratory located at 23091 Antonio Parkway, Suite 310, Rancho Santa Margarita, CA 92688.
[2] Immunity (Susceptibility) testing is performed at the satellite laboratory located at 23091 Antonio Parkway, Suite 310, Rancho Santa Margarita, CA 92688.