

*FCC PART 15, SUBPART B and C
TEST REPORT*
for

 INTEL MINI PCI TYPE 802.11 ABG
 WIRELESS LAN ADAPTER
 FOR USE IN THE HP LAPTOP
 AGENCY SERIES NUMBER: SII

MODEL: WM3B2915ABG

Prepared for

 HEWLETT PACKARD COMPANY
 20555 SH 249
 HOUSTON, TEXAS 77070

Prepared by: _____

KYLE FUJIMOTO

Approved by: _____

MICHAEL CHRISTENSEN

 COMPATIBLE ELECTRONICS INC.
 114 OLINDA DRIVE
 BREA, CALIFORNIA 92823
 (714) 579-0500

DATE: SEPTEMBER 30,2004

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
PAGES	22	2	2	18	134	180	

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 Brea Division
 114 Olinda Drive
 Brea, CA 92823
 (714) 579-0500

 Agoura Division
 2337 Troutdale Drive
 Agoura, CA 91301
 (818) 597-0600

 Silverado Division
 19121 El Toro Road
 Silverado, CA 92676
 (949) 589-0700

 Lake Forest Division
 20621 Pascal Way
 Lake Forest, CA 92630
 (949) 587-0400

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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product endorsement by NVLAP, NIST, or any other agency of the U.S. Government.

Device Tested: Intel Mini PCI Type 802.11 ABG Wireless LAN Adapter
for use in the HP Laptop Agency Series Number: SII
Model: WM3B2915ABG
S/N: N/A

Product Description: The product is a wireless miniPCI card used for the Hewlett Packard Company Laptop Agency Series Number: SII.

Modifications: The EUT was not modified during the testing.

Manufacturer: Hewlett Packard Company
20555 SH 249
Houston, Texas 77070

Test Dates: July 23, 24, 25, 26, 27, and 28, 2004

Test Specifications: EMI requirements
Limits: **Class B** of CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247

Test Procedure: ANSI C63.4: 2001

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.207
2	Spurious Radiated RF Emissions, 30 MHz – 1000 MHz	Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.209
3	Spurious Radiated RF Emissions, 10 kHz – 30 MHz and 1000 MHz – 25000 MHz	Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.247(c)
4	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 10 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(c)
5	Emissions produced by the intentional radiator in restricted bands, 10 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209(a), and section 15.247 (c)
6	6 dB Bandwidth	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(a)(2)
7	Peak Power Output	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(b)(3)
8	RF Conducted Antenna Test	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(c)
9	Peak Power Spectral Density Conducted from the Intentional Radiator to the Antenna Port	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (d)

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Intel Mini PCI Type 802.11 ABG Wireless LAN Adapter (for use in the HP Laptop Agency Series Number: SII) Model: WM3B2915ABG. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2001. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the specification limits defined by the **Class B** limits of CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

Note: The 2400 MHz to 2485.3 MHz and the 5725 MHz to 5850 MHz bands are applicable to this report; the other bands of operation (5150 MHz to 5250 MHz and 5250 MHz to 5350 MHz) are documented in the Compatible Electronics, Inc. report number **B40804D8**.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests of the testing described herein were performed at the test facility of Compatible Electronics at the following location:

114 Olinda Drive, Brea, California 92823

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Hewlett Packard Company

David Wissel PSG Global Business Units – Mobile Computing

Compatible Electronics, Inc.

Benigno Chavez	Test Technician
Arnold Gaffud	Sr. Test Engineer
Kyle Fujimoto	Test Engineer
Michael Christensen	Lab Manager

2.4 Date Test Sample was Received

The test sample was received on June 16, 2004.

2.5 Disposition of the Test Sample

The sample has not been returned to Hewlett Packard Company as of September 30, 2004.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
ANSI C63.4 2001	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

The Intel Mini PCI Type 802.11BG Wireless LAN Adapter (for use in the HP Laptop Agency Series Number: SI1) Model: WM3B2915ABG was directly connected to the laptop's mini PCI port behind the display. The laptop was also connected to the AC Adapter via its power port. The EUT was continuously transmitting and receiving. The commands for the EUT were programmed using the special test software provided.

Note: For all tests, the main antenna port was tested, with the auxiliary antenna port being spot checked to insure the readings were not higher.

The final radiated as well as the conducted data was taken in the mode above. Please see Appendix E for the data sheets.

4.1.1 **Cable Construction and Termination**

Cable 1

This is a 1.1 meter unshielded cable connecting the laptop to the AC Adapter. It has a 5.5 mm power connector at the laptop end and is hard wired into the laptop. The cable was bundled to a length of 1.1 meters.



5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
Equipment Name				
Intel Mini PCI Type 802.11 ABG Wireless LAN Adapter (EUT)	INTEL CORPORATION	WM3B2915ABG	N/A	CNTWM3B2915ABG
EUT Sub-Assemblies				
Main Antenna	WISTRON NEWEB CORPORATION	P/N: 81EBC15COMM4	N/A	N/A
Auxiliary Antenna	WISTRON NEWEB CORPORATION	P/N: 81EBC15COMA4	N/A	N/A
Host Equipment List				
LAPTOP	HEWLETT PACKARD	SI1	N/A	DoC



5.2 EMI Test Equipment for Brea Facility – Part 1

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Radiated Emissions Manual Test – Radiated	Compatible Electronics	N/A	N/A	N/A	N/A
Conducted Emissions Test Program	Compatible Electronics	N/A	N/A	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08768	June 24, 2004	June 24, 2005
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	3701A22262	June 24, 2004	June 24, 2005
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01363	June 24, 2004	June 24, 2005
Preamplifier	Com Power	PA-102	1017	January 6, 2004	Jan. 6, 2005
Biconical Antenna	Com Power	AB-100	1548	October 8, 2003	Oct. 8, 2004
Log Periodic Antenna	Com Power	AL-100	16089	October 8, 2003	Oct. 8, 2004
Computer	Hewlett Packard	D5251A 888	US74458128	N/A	N/A
Monitor	Hewlett Packard	D5258A	DK74889705	N/A	N/A
LISN	Com Power	LI-215	12078	November 22,2003	Nov. 22, 2004
LISN	Com Power	LI-215	12082	November 22,2003	Nov. 22, 2004
RF Attenuator	Weinschel Corporation	2	BJ6396	August 7, 2003	Aug. 7, 2004

5.3 EMI Test Equipment for Brea Facility – Part 2

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
EMI Receiver	Rohde & Schwarz	ESIB40	100172	July 22, 2003	July 22, 2004
Loop Antenna	Com Power	AB-100	25310	June 4, 2003	June 4, 2005
Horn Antenna	Com Power	MWH-2640/B	1011	November 5, 2003	Nov. 5, 2004
Horn Antenna	Com Power	AH826	081006	December 22, 2003	Dec. 22, 2004
Horn Antenna	Com Power	AH-118	10085	January 8, 2004	Jan. 8, 2005
Microwave Preamplifier	Com Power	PA-122	25196	March 4, 2004	Mar. 4, 2005
Microwave Preamplifier	Com Power	PA-122	181917	April 20, 2004	Apr. 20, 2005
Microwave Preamplifier	Com Power	PA-840	711812	February 24, 2004	Feb. 24, 2005
RF Peak Power Meter / Analyzer	Boonton Electronics Corp.	4500A-01-30	1282	February 23, 2004	Feb. 23, 2005
Peak Power Sensor	Boonton Electronics Corp.	57318	3723	February 23, 2004	Feb. 23, 2005

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Antenna Gain

Please see page 3 of the Antenna Information *.PDF document.



8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

8.1 RF Emissions

8.1.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A 10 dB attenuation pad was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 2001. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Section 15.207 for conducted emissions.

8.1.2

Radiated Emissions (Spurious and Harmonics) Test

The EMI Receiver was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz, the Com-Power Microwave Preamplifier Model: PA-122 was used for frequencies from 1 GHz to 18 GHz, and the Com Power Microwave Preamplifier Model: PA-840 was used for frequencies from 18 GHz to 25 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the EMI Receiver records the highest measured reading over all the sweeps.

The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets.

The frequencies above 1 GHz were averaged using the EMI Receiver's average detector.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 25 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 2001. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT by the Radiated Emission Manual Test software. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

Radiated Emissions (Spurious and Harmonics) Test (con't)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance to obtain final data.

Note: For the Spurious Emissions that were 103 MHz away from the fundamental for the 802.11g mode, the readings were taken at 1 meter with the 1 to 3 meter extrapolation being used to change the spec limit

Spec limit at 3 meters = 74 dBuV (peak), 54 dBuV (average)

Spec limit at 1 meter = 74 dBuV (peak) + [20 log (spec test distance / actual test distance)] = 83.5 dBuV (peak)

Spec limit at 1 meter = 54 dBuV (average) + [20 log (spec test distance / actual test distance)] = 63.5 dBuV (average)

Note 2: the spec test distance is 3 meters and the actual test distance is 1 meter.

8.2 6 dB and 20 dB Bandwidth

The 6 dB and 20 dB bandwidths were measured using the EMI Receiver. The bandwidth was measured using a direct connection from the RF out on the EUT. The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz.

Test Results:

The EUT complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (a)(2).

8.3 Peak Output Power

The Peak Output Power was measured using the power meter and power sensor. The EUT was directly connected to the power sensor, which was directly connected to the power meter. The Peak Output Power was then measured

Test Results:

The EUT complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (b)(3).

8.4 RF Antenna Conducted Test

The RF antenna conducted test was performed using the EMI Receiver. The RF antenna conducted test was measured using a direct connection from the RF out on the EUT into the input of the analyzer. The resolution bandwidth was 100 kHz, and the video bandwidth 300 kHz. The spans were wide enough to include all the harmonics and emissions that were produced by the intentional radiator.

Test Results:

The EUT complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (c).

8.5 Spectral Density Output

The spectral density output was measured using the EMI Receiver. The spectral density output was measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The resolution bandwidth was 3 kHz, and the video bandwidth was 10 kHz. The highest 1.5 MHz of the signal was used as the frequency span with the sweep rate being 1 second for every 3 kHz of span.

Test Results:

The EUT complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (d).



8.6**RF Band Edges**

The RF band edges were measured at the start of the restricted bands (2390 MHz and 2483.5 MHz). The readings taken were also averaged by the EMI Receiver. Data sheets are included in Appendix E, which compares the reading from the EMI Receiver to the spec limit.

Readings that were taken using the Marker Delta Method were derived as follows:

1. Set the EUT to transmit on the highest operating frequency near the edge of the restricted band. Set the EMI Receiver sweep to the edge of the restricted band and set the span wide enough to encompass the fundamental signal and the edge of the restricted band.
2. Make a radiated emissions measurement of the fundamental at 3 meters on the OATS. Maximize the level of the emission. Using MAX HOLD and Peak Search, record the highest peak and average level. (Peak: RBW = VBW = 1 MHz; AVG: RBW = 1 MHz, VBW = 10 Hz)
3. Connect a coax cable to the antenna output of the EUT and measure directly to the EMI Receiver. Use the same center frequency and span settings that were used for steps #1 and #2. Reduce the RBW to 100 kHz (this has been specified for band edge 2.4 GHz 15.247, Note: this is about 1% and 1% would probably suffice for most measurements.) Set the VBW = 1 MHz for peak, 10 Hz for AVG (identical to previous readings). Using MAX HOLD, then "Peak Search" and "Marker Delta" determine the "delta dB" from the peak of the fundamental to the maximum level within the restricted band. This dBc level is the "Delta dB" reading.
4. If the maximum level within the restricted band is within two standard BW (where a "standard" bandwidth is the bandwidth specified by ANSI C63.4: 2001 for the frequency being measured, or 1 MHz for > 1GHz) of the edge of the restricted band, measure the amount that the level of the fundamental dropped when the RBW was changed from 1 MHz to the RBW used in step 2.
5. Calculate the PEAK and Average level within the restricted band in dBuV/m using the equations below:

For readings within two standard bandwidths of the band edge:

Restricted band level (Peak) = Peak reference level – delta dB – BW delta dB (step #4)

Restricted band level (AVG) = Average reference level – delta dB – BW delta dB (step #4)

For readings that are outside the two standard bandwidths of the band edge:

Restricted band level (Peak) = Peak reference level – delta dB

Restricted band level (AVG) = AVG reference level – delta dB

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (c). The RF power at the restricted bands closest to the band edges at 2390 MHz and 2483.5 MHz meet the limits of section 15.209. Please see the data sheets located in Appendix E.

9. CONCLUSIONS

The Intel Mini PCI Type 802.11 ABG Wireless LAN Adapter (for use in the HP Laptop Agency Series Number: SII) Model: WM3B2915ABG meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

Note: The 2400 MHz to 2485.3 MHz and the 5725 MHz to 5850 MHz bands are applicable to this report; the other bands of operation (5150 MHz to 5250 MHz and 5250 MHz to 5350 MHz) are documented in the Compatible Electronics, Inc. report number **B40804D8**.



APPENDIX A***LABORATORY RECOGNITIONS***

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

LABORATORY RECOGNITIONS

Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200528-0

Voluntary Control Council for Interference - Registration Numbers: R-983, C-1026, R-984 and C-1027

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

Compatible Electronics is recognized or on file with the following agencies:

Federal Communications Commission

Industry Canada

Radio-Frequency Technologies (Competent Body)

APPENDIX B***MODIFICATIONS TO THE EUT***

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

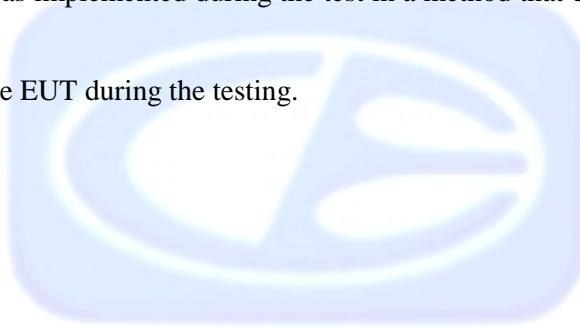
Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and Subpart C specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT during the testing.



APPENDIX C***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Intel Mini PCI Type 802.11 ABG Wireless LAN Adapter (for use in
the HP Laptop Agency Series Number: SII)
Model: WM3B2915ABG
S/N: N/A

There were no additional models covered under this report.



APPENDIX D***DIAGRAMS, CHARTS, AND PHOTOS***

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

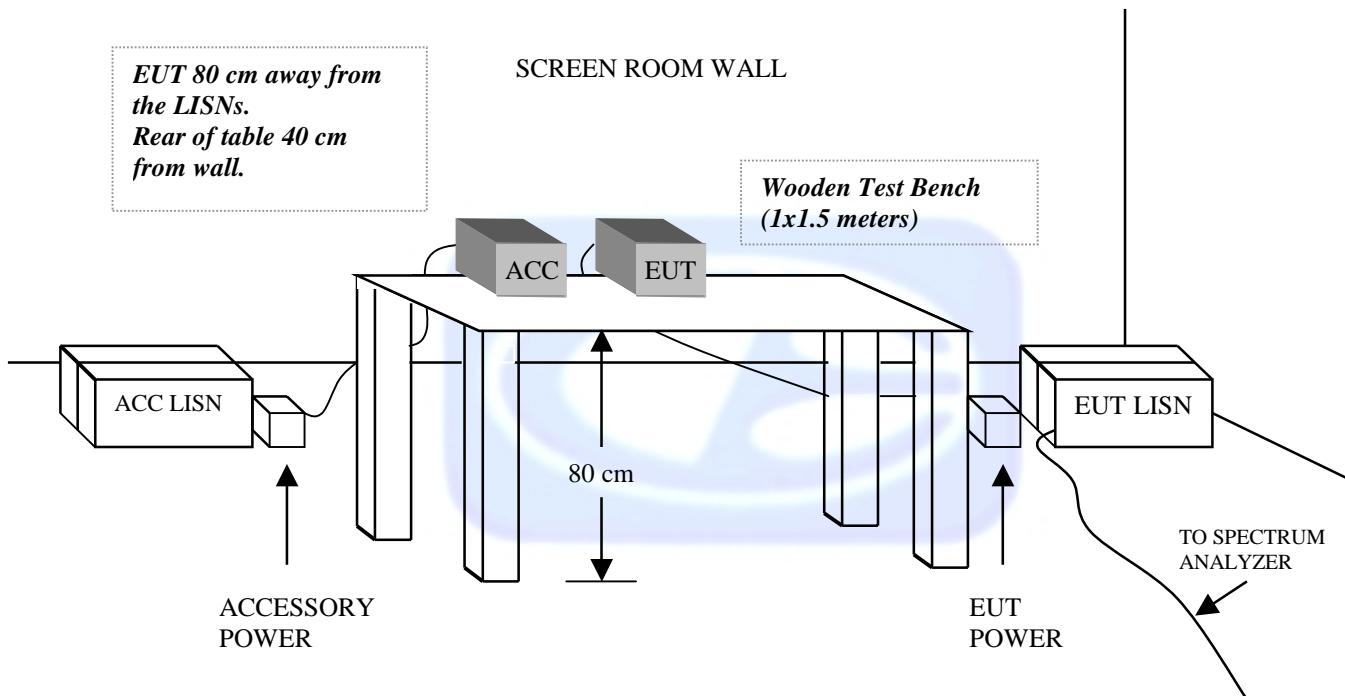
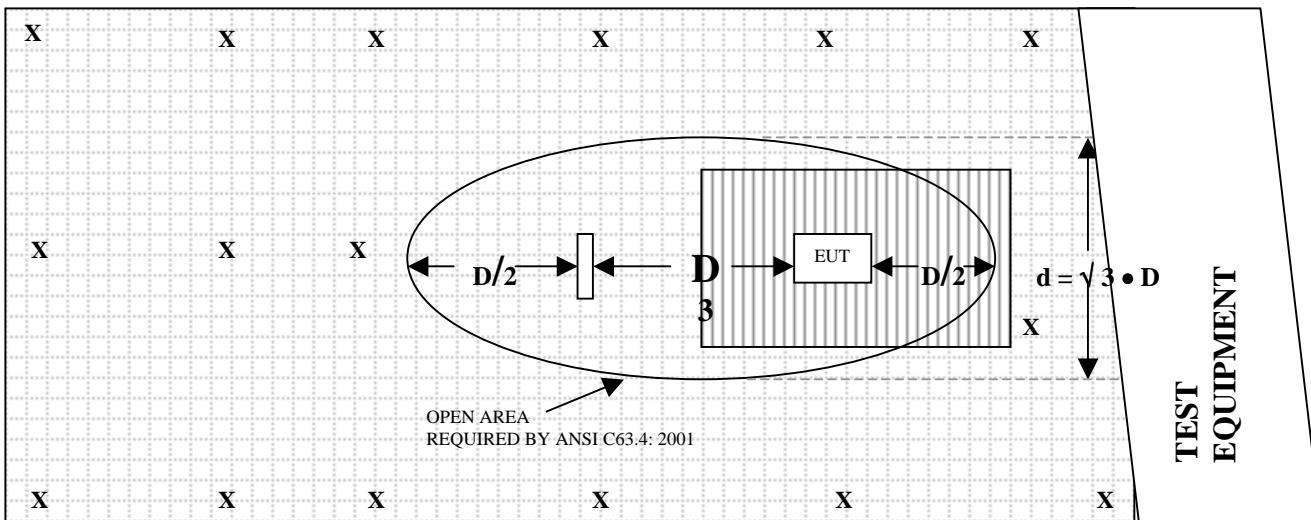


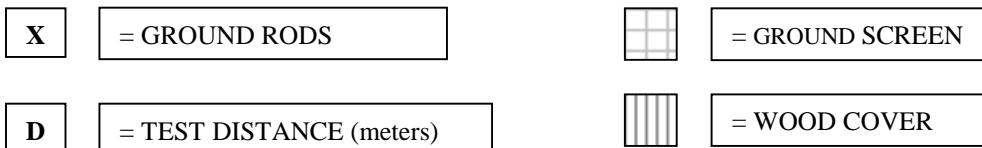
FIGURE 2: PLOT MAP AND LAYOUT OF 3 METER RADIATED SITE

OPEN LAND > 15 METERS

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS



COM-POWER AB-100

BICONICAL ANTENNA

S/N: 1548

CALIBRATION DATE: OCTOBER 8, 2003

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	13.1	120	9.9
35	12.9	125	11.4
40	14.6	140	12.0
45	12.8	150	13.0
50	12.9	160	13.9
60	9.3	175	14.2
70	8.2	180	14.3
80	8.0	200	14.9
90	8.1	250	16.6
100	8.8	300	19.7

COM-POWER AL-100**LOG PERIODIC ANTENNA****S/N: 16089****CALIBRATION DATE: OCTOBER 8, 2003**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	12.8	700	20.0
400	14.4	800	21.2
500	16.0	900	20.8
600	17.7	1000	21.7

COM-POWER PA-102

PREAMPLIFIER

S/N: 1017

CALIBRATION DATE: JANUARY 6, 2004

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	37.8	300	37.6
40	37.5	350	37.5
50	37.7	400	37.5
60	37.5	450	37.0
70	37.5	500	37.1
80	37.5	550	37.3
90	37.5	600	37.1
100	37.5	650	37.4
125	37.8	700	37.1
150	37.5	750	37.1
175	37.5	800	36.8
200	37.6	850	36.2
225	37.6	900	36.7
250	37.5	950	36.2
275	37.6	1000	35.3

COM-POWER PA-122

MICROWAVE PREAMPLIFIER

S/N: 25195

CALIBRATION DATE: AUGUST 19, 2003

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	30.8	6.0	33.3
1.1	30.9	6.5	32.7
1.2	30.9	7.0	31.8
1.3	30.4	7.5	31.6
1.4	30.7	8.0	30.3
1.5	31.0	8.5	29.0
1.6	31.2	9.0	29.0
1.7	30.3	9.5	29.5
1.8	28.9	10.0	30.9
1.9	31.2	11.0	30.2
2.0	30.9	12.0	28.7
2.5	30.4	13.0	30.3
3.0	31.7	14.0	28.7
3.5	32.6	15.0	29.5
4.0	32.6	16.0	31.1
4.5	32.2	17.0	30.1
5.0	31.1	18.0	28.6
5.5	30.6		

COM-POWER PA-840

MICROWAVE PREAMPLIFIER

S/N: 711013

CALIBRATION DATE: MARCH 12, 2004

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	26.7	29.5	27.1
18.5	26.0	30.0	27.2
19.0	25.5	30.5	28.1
19.5	25.1	31.0	27.2
20.0	24.5	31.5	29.1
20.5	24.3	32.0	27.1
21.0	23.9	32.5	26.9
21.5	23.7	33.0	27.1
22.0	23.8	33.5	26.8
22.5	24.0	34.0	26.5
23.0	24.1	34.5	26.4
23.5	24.8	35.0	25.8
24.0	25.2	35.5	24.7
24.5	25.7	36.0	24.6
25.0	26.2	36.5	25.6
25.5	26.5	37.0	25.5
26.0	27.0	37.5	26.1
26.5	27.0	38.0	25.9
27.0	26.8	38.5	23.9
27.5	24.3	39.0	22.8
28.0	26.7	39.5	21.3
28.5	27.2	40.0	23.4
29.0	27.3		

ANTENNA RESEARCH DRG-118/A

HORN ANTENNA

S/N: 1053

CALIBRATION DATE: JANUARY 16, 2004

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.4	10.0	38.7
1.5	25.2	10.5	39.0
2.0	28.2	11.0	38.9
2.5	28.5	11.5	41.3
3.0	30.1	12.0	40.5
3.5	31.0	12.5	40.0
4.0	31.2	13.0	40.2
4.5	31.9	13.5	40.5
5.0	33.2	14.0	41.6
5.5	33.7	14.5	44.8
6.0	34.3	15.0	41.4
6.5	35.0	15.5	39.2
7.0	36.7	16.0	39.4
7.5	37.3	16.5	40.9
8.0	37.1	17.0	42.6
8.5	37.3	17.5	45.1
9.0	37.7	18.0	41.7
9.5	38.6		

COM-POWER AL-130
LOOP ANTENNA
S/N: 25310
CALIBRATION DATE: JUNE 4, 2003

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-41.2	10.3
0.01	-41.3	10.2
0.02	-42.3	9.2
0.05	-42.5	9.0
0.07	-42.3	9.2
0.1	-42.5	9.0
0.2	-44.6	6.9
0.3	-42.1	9.4
0.5	-42.4	9.1
0.7	-42.1	9.4
1	-41.5	10.0
2	-41.0	10.5
3	-41.3	10.2
4	-41.3	10.2
5	-40.9	10.6
10	-41.6	9.9
15	-42.1	9.4
20	-42.2	9.3
25	-42.7	8.8
30	-44.3	7.2

COM-POWER AH826

HORN ANTENNA

S/N: 0071957

CALIBRATION DATE: NOVEMBER 05, 2003

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	33.3	22.5	32.9
18.5	32.9	23.0	33.0
19.0	32.7	23.5	33.6
19.5	32.6	24.0	33.6
20.0	32.7	24.5	33.5
20.5	33.0	25.0	33.5
21.0	33.0	25.5	33.7
21.5	33.2	26.0	34.1
22.0	32.9	26.5	34.5

COM-POWER MWH-2640/B

HORN ANTENNA

S/N: 1011

CALIBRATION DATE: NOVEMBER 05, 2003

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
26.5	36.0	33.5	36.0
27.0	36.0	34.0	36.8
27.5	35.6	34.5	37.3
28.0	35.9	35.0	37.7
28.5	35.8	35.5	37.8
29.0	36.0	36.0	38.2
29.5	35.9	36.5	38.3
30.0	36.4	37.0	38.2
30.5	36.4	37.5	38.6
31.0	36.8	38.0	38.6
31.5	36.5	38.5	39.1
32.0	36.5	39.0	38.8
32.5	36.2	39.5	39.0
33.0	36.4	40.0	39.5

**FRONT VIEW**

HEWLETT PACKARD COMPANY
INTEL MINI PCI TYPE 802.11 ABG WIRELESS LAN ADAPTER
FOR USE IN THE HP LAPTOP AGENCY SERIES NUMBER: SII
MODEL: WM3B2915ABG
FCC SUBPART B AND C – RADIATED EMISSIONS

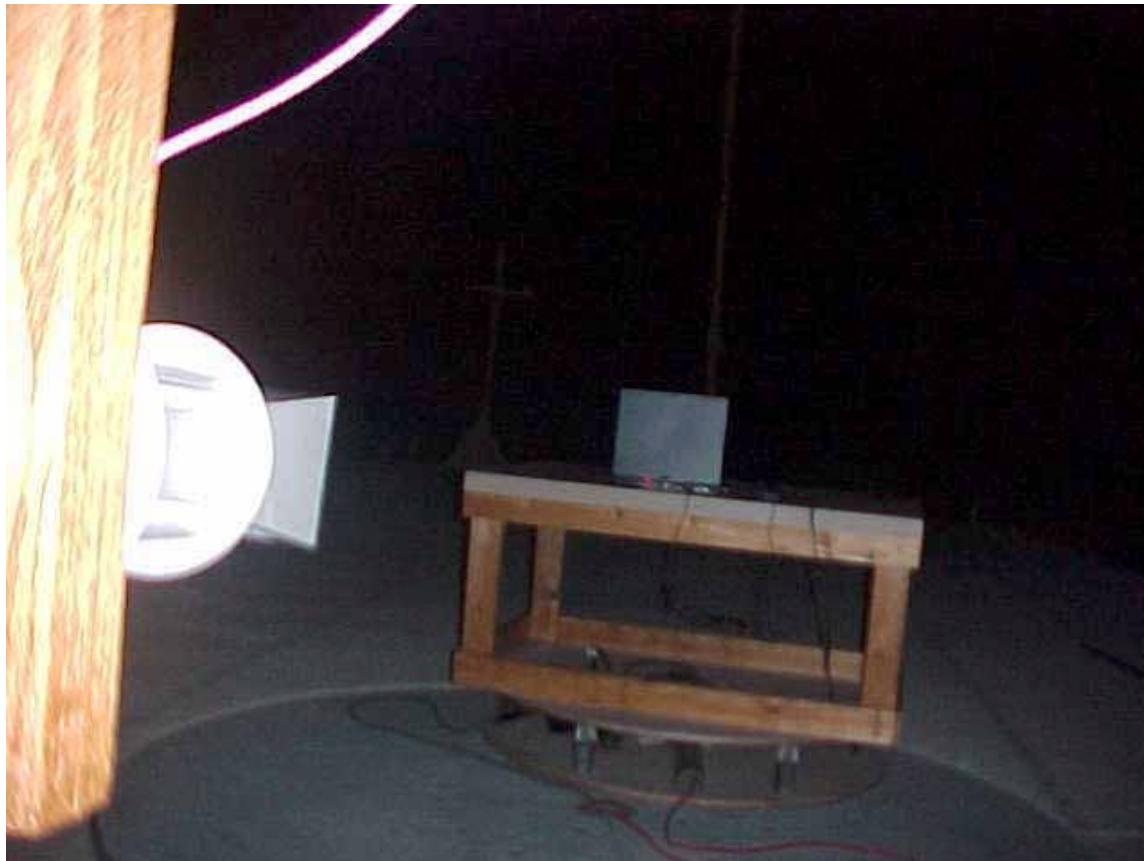
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

**REAR VIEW**

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FCC SUBPART B AND C – RADIATED EMISSIONS

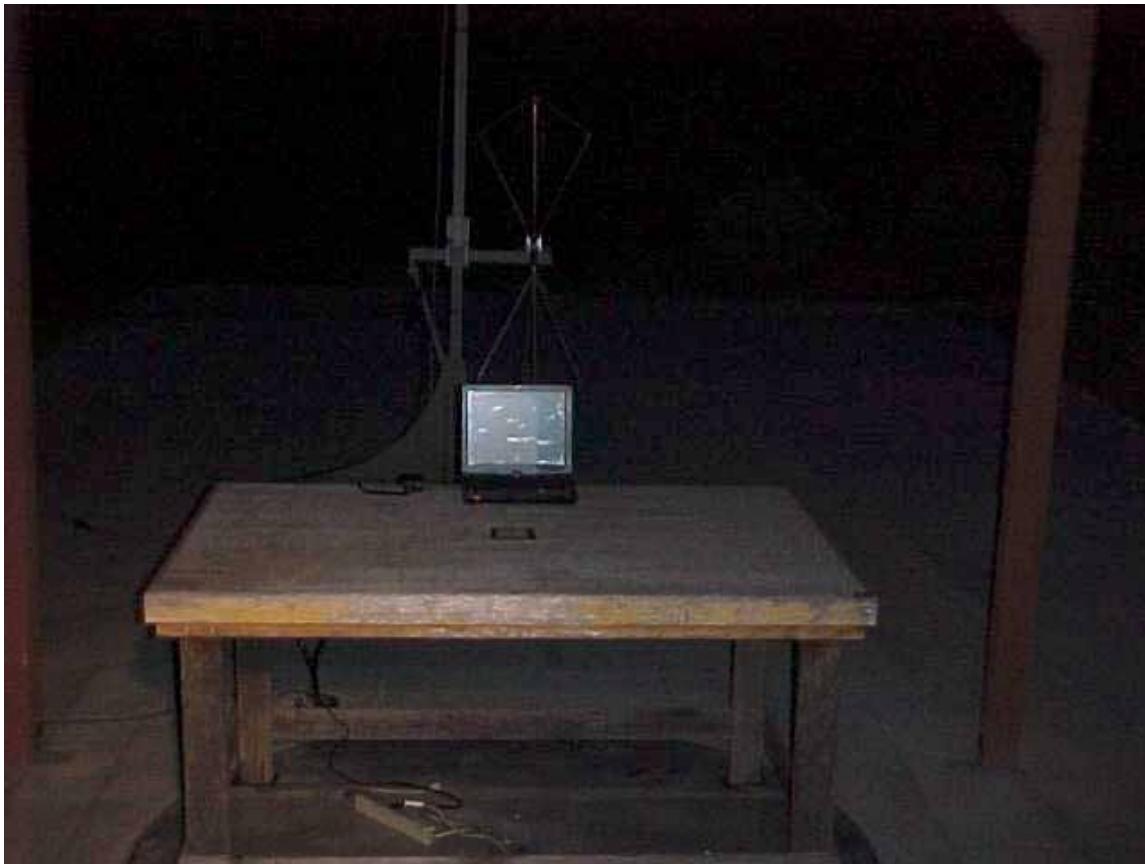
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FCC SUBPART B – RADIATED EMISSIONS

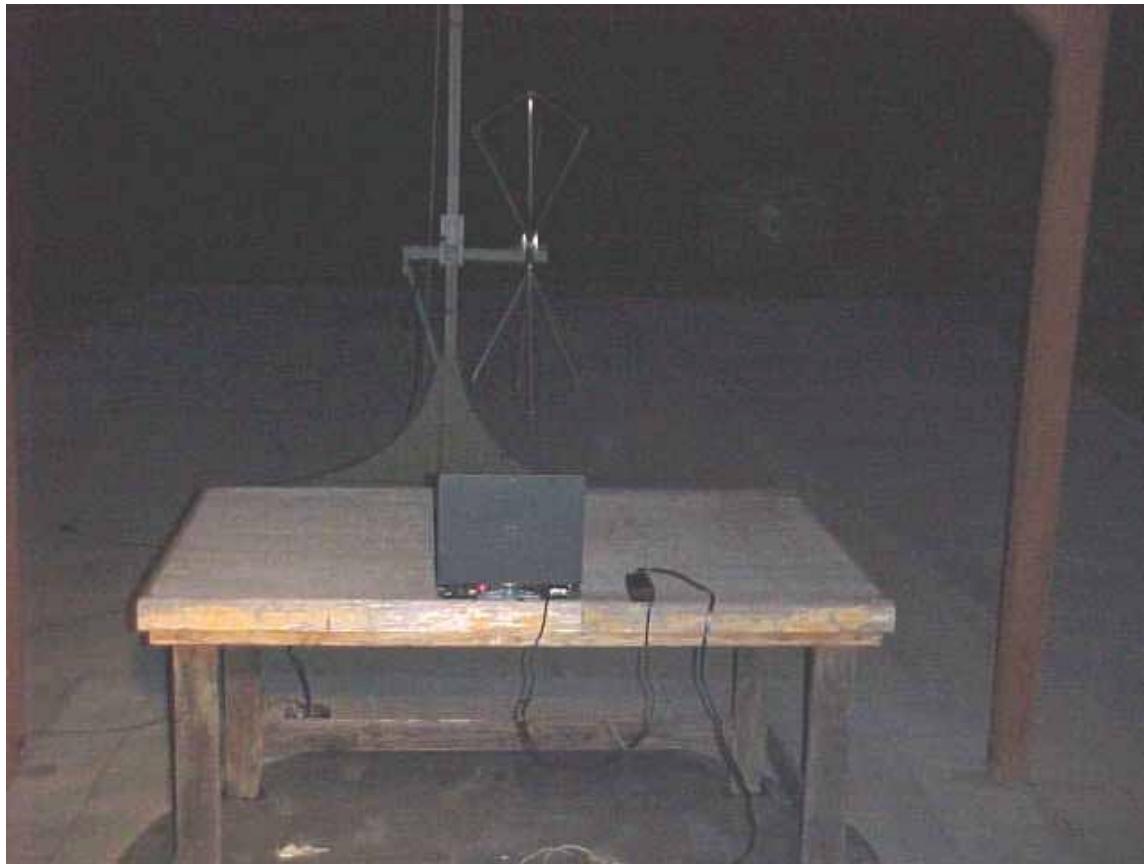
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FCC SUBPART B AND C – CONDUCTED EMISSIONS

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