FCC CFR47 PART 15 SUBPART B

TEST REPORT
FOR

802.11g / Draft 802.11 n WLAN PCI-E Mini Card

MODEL NUMBER: BCM943225HM

REPORT NUMBER: 09U12364-10

ISSUE DATE: MARCH 10, 2009

Prepared for

BROADCOM CORP.

190 MATHILDA PLACE

SUNNYVALE, CA 94086, U.S.A.

Prepared by

COMPLIANCE CERTIFICATION SERVICES
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	03/10/09	Initial Issue	T. Chan

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, USA

EUT DESCRIPTION: 802.11g / Draft 802.11n WLAN PCI-E Mini Card

MODEL: BCM943225HM

SERIAL NUMBER: 74

DATE TESTED: MARCH 10, 2009

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART B	Pass

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

THU CHAN
EMC MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

CHIN PANG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11g/Draft 802.11n Wireless LAN Transceiver module and manufactured by Broadcom. Model number is BCM943225HM.

5.2. PRELIMINARY TEST CONFIGURATIONS

The following configuration was investigated during testing:

EUT Configuration	Description
Typical Configuration	EUT connected to laptop via extended board with minimum configuration such as printer, USB mouse.

5.3. MODE(s) OF OPERATION

Mode	Description
Normal	EUT is running in Receiving mode

5.4. DETAILS OF TESTED SYSTEM

SUPPORT EQUIPMENT & PERIPHERALS

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Notebook PC	HP	Pavillion dv6000	CNF6511956	DoC
AC Adapter	Delta Electronics	ADP-65HB B	5BC5B0CYLTF5U	DoC
Printer	HP	7850	MY56K1304B	DoC
Mouse	Dell	0YH958	HC6450C2BP9	DoC

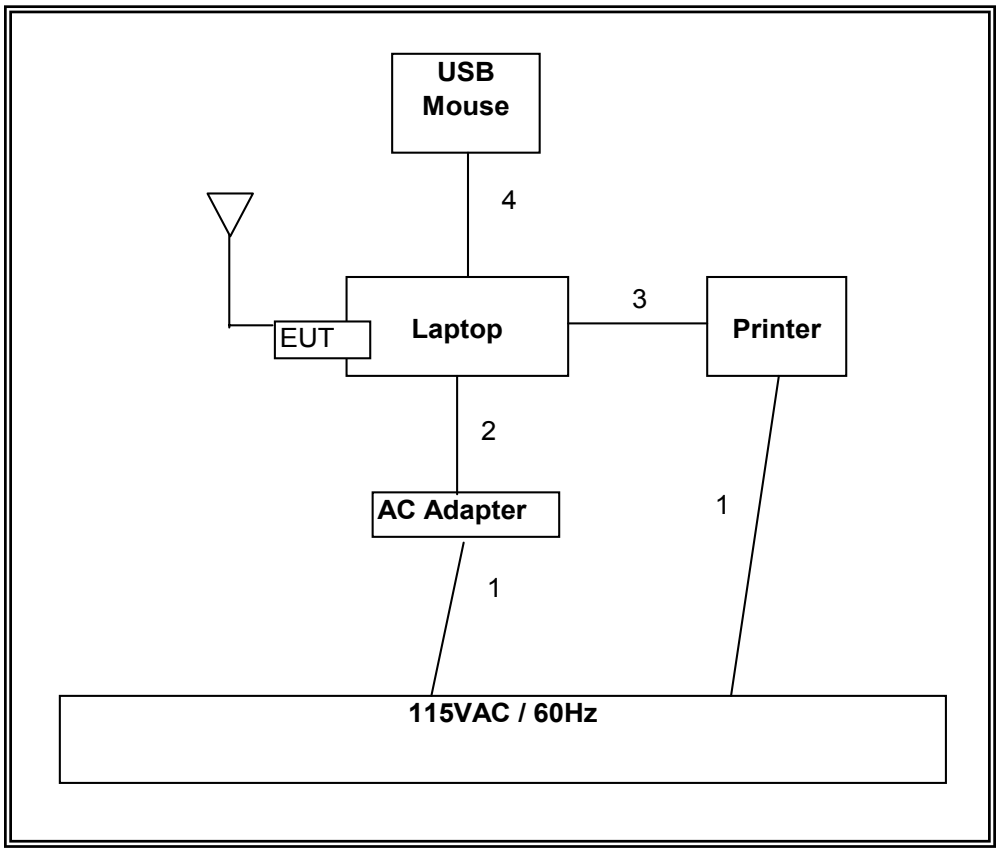
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identica Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	2	US 115V	Un-shielded	2m	NA
2	DC	1	DC	Un-shielded	2m	NA
3	USB	1	Printer	Un-shielded	2m	NA
4	USB	1	USB	Un-shielded	2m	NA

TEST SETUP

The EUT connected to a Laptop via extended board with a typical configuration.

TEST SETUP DIAGRAM



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Preamp, 1000MHz	Sonoma	310N	N02891	03/31/09
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	02/11/10
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	01/05/10
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/29/09
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/06/09
Antenna, Horn, 18 GHz	EMCO	3115	C00945	04/22/09
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	12/01/09

7. APPLICABLE LIMITS AND TEST RESULTS

7.1. RADIATED EMISSIONS

TEST PROCEDURE

ANSI C63.4

The highest clock frequency generated or used in the EUT is 20 MHz; therefore the frequency range was investigated from 30 MHz to 1 GHz.

LIMIT

§15.109 (a) except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Limits for radiated disturbance of Class B ITE at measuring distance of 3 m	
Frequency range (MHz)	Quasi-peak limits (dBµV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960 MHz	54
Note: The lower limit shall apply at the transition frequency.	

RESULTS

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

30-1000MHz Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr:Chin Pang
Date:3/10/2009
Project #: 09U12364
Company:Broadcom
EUT Description:EUT/Support Equipment
EUT M/N:
Test Target:FCC 15B
Mode Oper:Normal

f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filter dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Horizotal													
221.648	3.0	55.0	11.9	1.4	32.6	0.0	0.0	35.6	46.0	-10.4	H	P	
313.812	3.0	54.4	13.5	1.6	32.6	0.0	0.0	36.9	46.0	-9.1	H	P	
374.534	3.0	51.9	14.6	1.8	32.7	0.0	0.0	35.7	46.0	-10.3	H	P	
561.622	3.0	49.6	17.7	2.3	32.8	0.0	0.0	36.7	46.0	-9.3	H	P	
803.432	3.0	49.2	21.0	2.8	32.5	0.0	0.0	40.5	46.0	-5.5	H	P	

Rev. 1.27.09
Note: No other emissions were detected above the system noise floor.

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

30-1000MHz Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr:Chin Pang
Date:3/10/2009
Project #: 09U12364
Company:Broadcom
EUT Description:EUT/Support Equipment
EUT M/N:
Test Target:FCC 15B
Mode Oper:Normal

f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filter dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
vert													
49.681	3.0	59.9	8.2	0.6	32.7	0.0	0.0	36.0	40.0	-4.0	V	P	
136.084	3.0	50.5	13.4	1.0	32.6	0.0	0.0	32.3	43.5	-11.2	V	P	
221.528	3.0	51.5	11.9	1.4	32.6	0.0	0.0	32.2	46.0	-13.8	V	P	
314.412	3.0	52.5	13.5	1.6	32.6	0.0	0.0	35.1	46.0	-10.9	V	P	
443.057	3.0	48.6	15.8	2.0	32.7	0.0	0.0	33.7	46.0	-12.3	V	P	
839.553	3.0	46.6	21.2	2.9	32.3	0.0	0.0	38.5	46.0	-7.5	V	P	

Rev. 1.27.09
Note: No other emissions were detected above the system noise floor.

7.2. AC MAINS LINE CONDUCTED EMISSIONS

TEST PROCEDURE

ANSI C63.4

LIMIT

§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Notes: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

RESULTS

6 WORST EMISSIONS

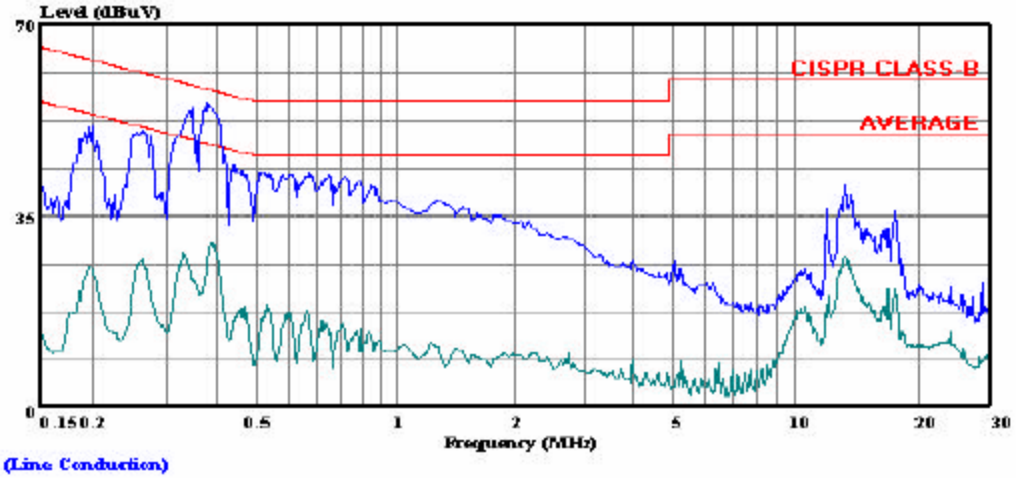
CONDUCTED EMISSIONS DATA (115VAC 60Hz)

Freq.	Reading			Closs	Limit	FCC_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.27	50.60	--	27.28	0.00	61.12	51.12	-10.52	-23.84	L1
0.35	54.86	--	23.55	0.00	58.96	48.96	-4.10	-25.41	L1
0.38	55.70	53.45	30.40	0.00	58.28	48.28	-4.83	-17.88	L1
0.27	50.54	--	25.31	0.00	61.12	51.12	-10.58	-25.81	L2
0.35	54.74	--	27.14	0.00	58.96	48.96	-4.22	-21.82	L2
0.37	55.10	52.66	28.14	0.00	58.50	48.50	-5.84	-20.36	L2
6 Worst Data									

LINE 1 RESULTS

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 7 File#: 09U12364_Digital LC.EMI
Date: 03-10-2009 Time: 09:21:31



(Line Conduction)

Trace: 5 Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Doug Anderson
Project #: : 09U12364
Company: : Broadcom
Configuration:: EUT w/Laptop and Minimum Peripherals
Mode: : Normal
Target: : FCC Class B
Voltage: : 115VAC / 60Hz
: L1: Peak (Blue), Average (Green)

LINE 2 RESULTS

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 14 File#: 09U12364_Digital LC.EMI
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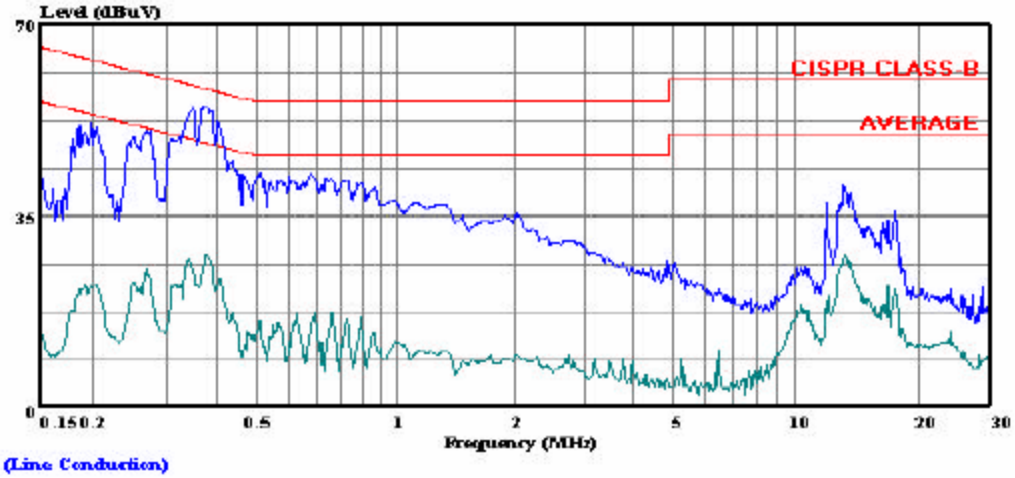
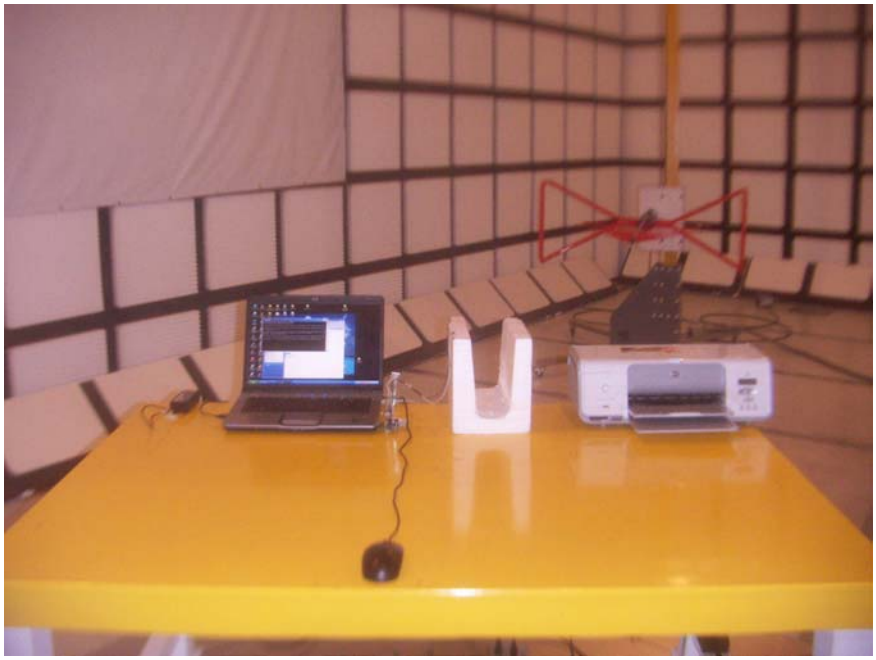


(Line Conduction)
Trace: 12 Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Doug Anderson
Project #: : 09U12364
Company: : Broadcom
Configuration:: EUT w/Laptop and Minimum Peripherals
Mode: : Normal
Target: : FCC Class B
Voltage: : 115VAC / 60Hz
: L2: Peak (Blue), Average (Green)

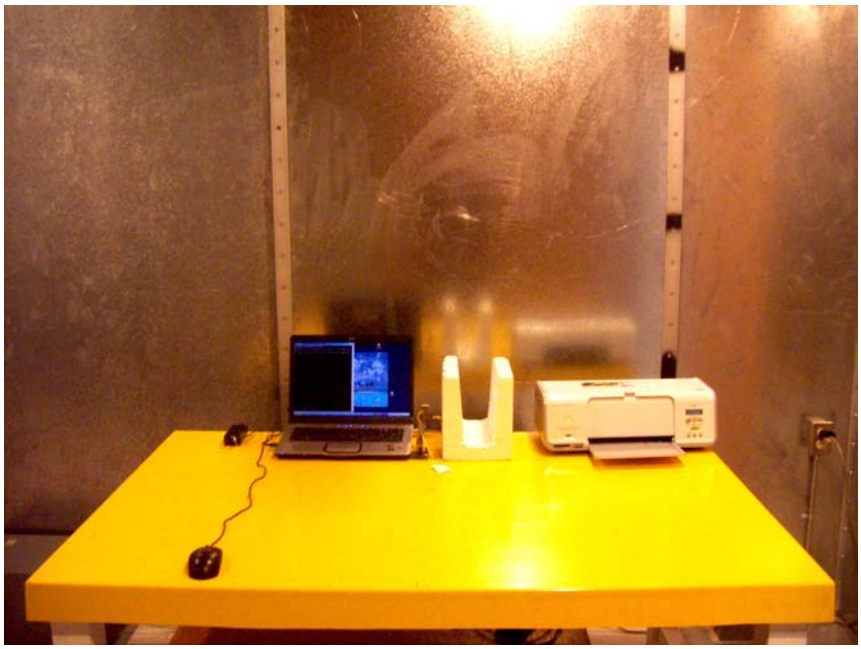
8. SETUP PHOTOS

RADIATED EMISSIONS (FRONT)

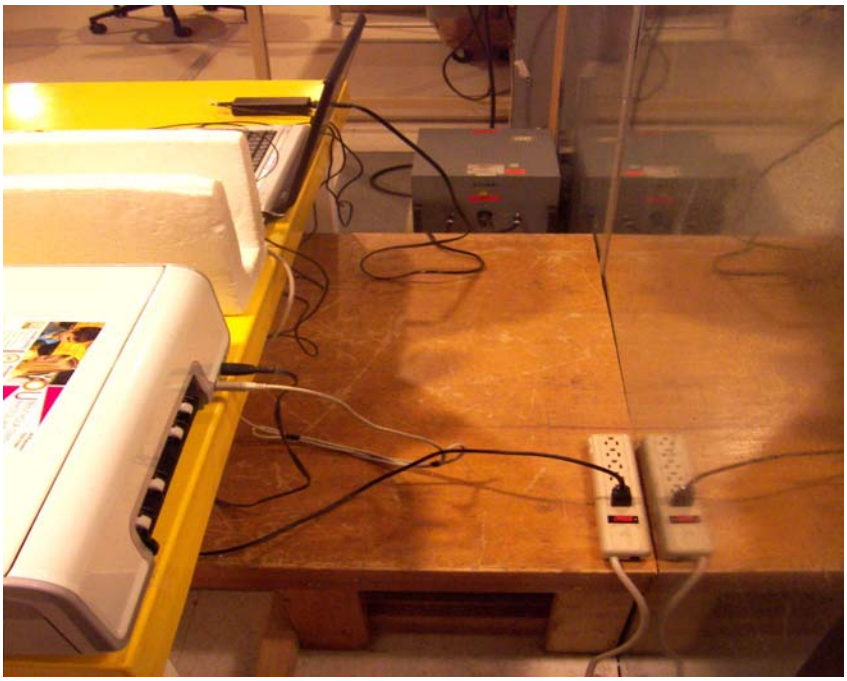


RADIATED EMISSIONS (BACK)

AC MAINS LINE CONDUCTED EMISSION (FRONT)



LINE CONDUCTED EMISSION (BACK)



END OF REPORT