FCC CFR47 PART 15 SUBPART B

TEST REPORT

FOR

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

MODEL NUMBER: BCM94322MC

FCC ID: QDS-BRCM1036

REPORT NUMBER: 07U11529-9

ISSUE DATE: JANUARY 27, 2008

Prepared for

BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, USA

Prepared by

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	1-27-08	Initial Issue	Hsin Fu Shih

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: 802.11ag / Draft 802n WLAN PCI-E MINI CARD

MODEL: BCM94322MC

SERIAL NUMBER: P208 _S/N 194 for 2.4 GHz

DATE TESTED: JANUARY 09 to 10, 2008

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART B	No Non-Compliance Noted

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. 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 Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services 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:

HSIN FU SHIH
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

THANH NGUYEN
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 802.11ag/Draft 802.11n Wireless LAN Transceiver module and manufactured by Broadcom. Model number is BCM94322MC.

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, modem, keyboard, USB mouse.

5.3. MODE(s) OF OPERATION

Mode	Description
EMCTest & TX	All I/O ports activate with H' patterns scrolling on the screen display with TX on.

5.4. SOFTWARE AND FIRMWARE

The test software used during the tests was EMCTest and epi_ttcp program.

5.5. MODIFICATIONS

No modifications were made during testing.

5.6. DETAILS OF TESTED SYSTEM

SUPPORT EQUIPMENT & PERIPHERALS

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Modem	Hayes	4714US	A02247143261	BFJUSA-31719-M5-E
Keyboard	Microsoft	KC-0405	7.6198E+12	Doc
Mouse	Microsoft	X802382	868042	DoC
Printer	HP	7850	MY56K1304B	DoC
Laptop	Dell	Inspiron 1526	CN-0SE2C2-70166	DoC
AC Adapter	Dell	HP-0Q065B83	CN-0N2765-7890-4	DoC

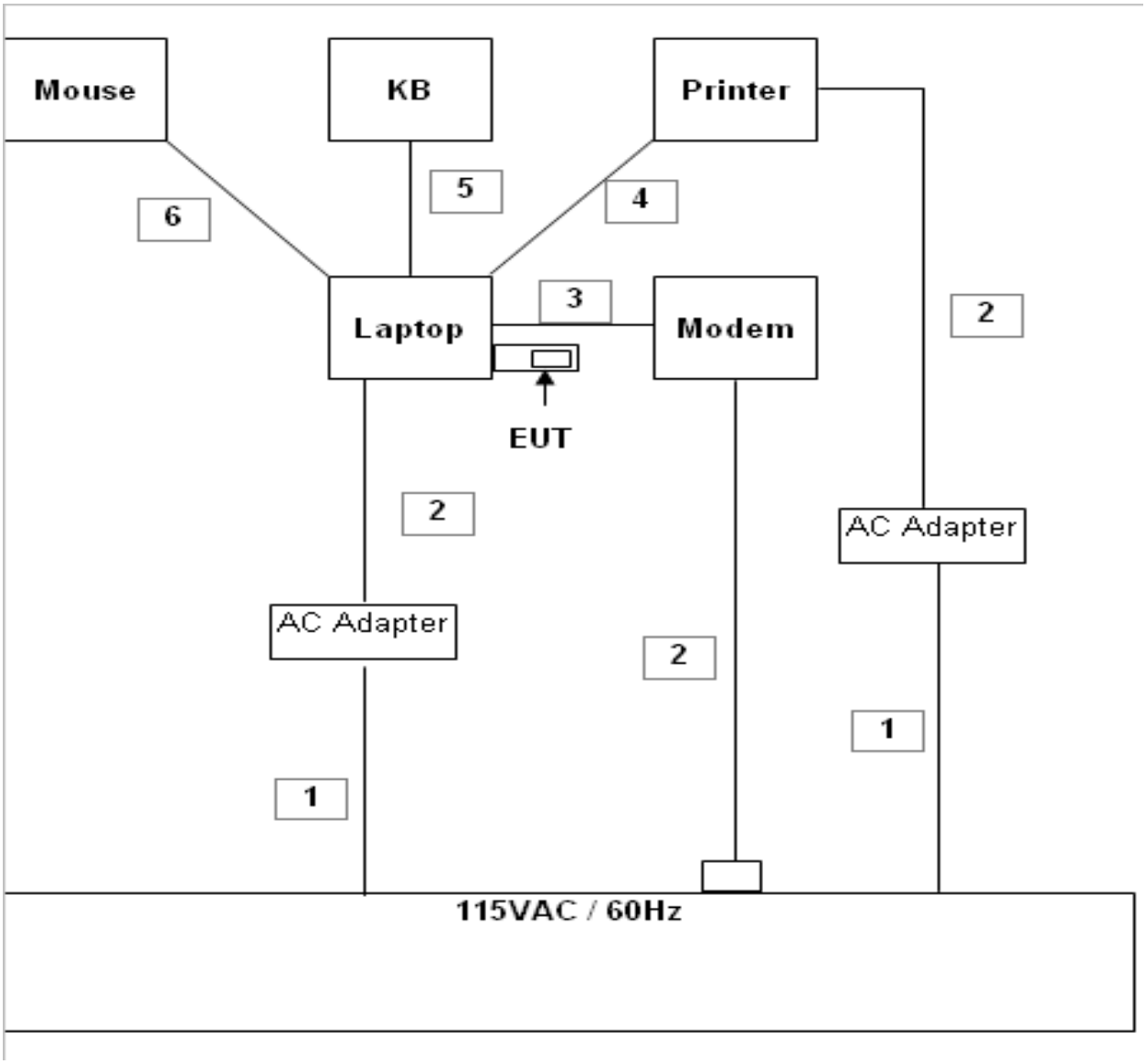
I/O CABLES

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	No
2	DC	3	DC Plug	Un-shielded	1.5m	No
3	Line	1	RJ11	Un-shielded	2m	Yes
4	USB	1	USB	Shielded	1m	Yes
5	USB	1	USB	Shielded	1m	No
6	USB	1	USB	Shielded	1m	No

TEST SETUP

The EUT connected to laptop via extended board with a typical configuration. Test software exercised the radio card and activated all I/O ports.

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 Date**	**Cal Due**
EMI Receiver, 2.9 GHz	Agilent / HP	8542E	C00957	2/6/2007	6/12/2008
RF Filter Section, 2.9 GHz	Agilent / HP	85420E	C00958	2/6/2007	6/12/2008
30MHz-2GHz Antenna	Sunol Sciences	JB1	C01011	9/28/2007	9/28/2008
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	5/9/2007	5/9/2008
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/25/2007	10/25/2008
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	N02481	10/25/2007	10/25/2008
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	10/16/2006	1/27/2008

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

No non-compliance noted:

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

HORIZONTAL DATA

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

Data#: 10 File#: 07U11529_EMI.EMI Date: 01-09-2008 Time: 15:15:29

Condition: FCC CLASS-B HORIZONTAL
Test Operator: Thanh Nguyen
Project # : 07U11529
Company : Broadcom
Config : EUT, Laptop w/ minimum config.
Mode : Digital EMI test SW
Target : FCC CLASS B

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	Freq	Read Level	Factor	Limit Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	148.340	50.08	-13.74	36.34	43.50	-7.16	Peak
2	293.840	51.77	-12.48	39.29	46.00	-6.71	Peak
3	521.790	45.06	-6.91	38.15	46.00	-7.85	Peak
4	606.180	45.45	-5.27	40.18	46.00	-5.82	Peak
5	727.430	42.42	-3.11	39.31	46.00	-6.69	Peak
6	806.000	42.31	-2.04	40.27	46.00	-5.73	Peak

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

VERTICAL DATA

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

Data#: 9 File#: 07U11529_EMI.EMI Date: 01-09-2008 Time: 15:12:55

Condition: FCC CLASS-B VERTICAL
Test Operator: Thanh Nguyen
Project # : 07U11529
Company : Broadcom
Config : EUT, Laptop w/ minimum config.
Mode : Digital EMI test SW
Target : FCC CLASS B

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	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	42.610	47.43	-14.27	33.16	40.00	-6.84	Peak
2	123.120	45.89	-13.11	32.79	43.50	-10.72	Peak
3	406.360	48.36	-9.73	38.63	46.00	-7.37	Peak
4	538.280	46.16	-6.64	39.52	46.00	-6.48	Peak
5	581.930	46.47	-5.72	40.75	46.00	-5.25	Peak
6	806.000	41.77	-2.04	39.73	46.00	-6.27	Peak

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

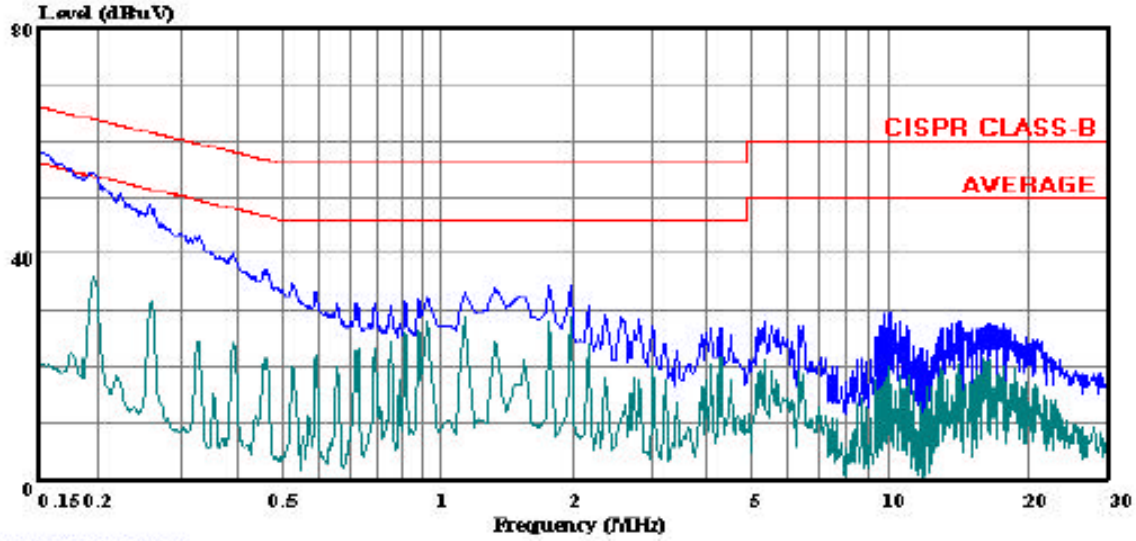
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.15	57.94	--	35.98	0.00	65.89	55.89	-7.95	-19.91	L1
1.43	33.43	--	--	0.00	56.00	46.00	-22.57	-12.57	L1
2.08	34.32	--	--	0.00	56.00	46.00	-21.68	-11.68	L1
0.16	59.06	--	34.84	0.00	65.52	55.52	-6.46	-20.68	L2
1.03	33.86	--	--	0.00	56.00	46.00	-22.14	-12.14	L2
1.87	34.72	--	--	0.00	56.00	46.00	-21.28	-11.28	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#: 21 File#: FCC15B.EMI Date: 01-09-2008 Time: 11:56:56



(Line Conduction)

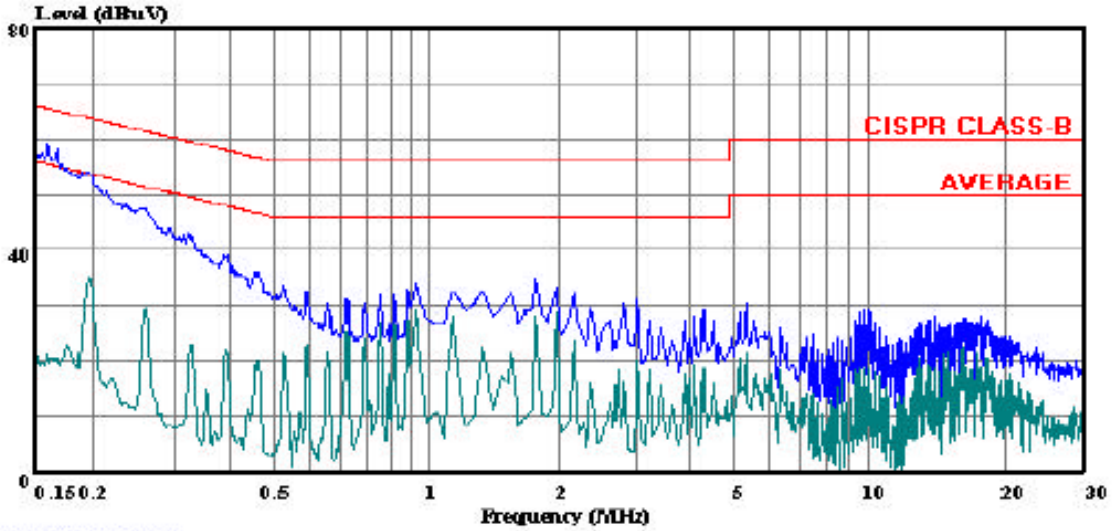
Trace: 19 Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Thanh Nguyen
Project #: : 07U11529
Company: : BroadCom
Configuration:: EUT, Laptop w/ mini. config.
Mode: : Digital
Target: : FCC Class B
Voltage: : 115VAC 60Hz
: Line 1: 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#: FCC15B.EMI Date: 01-09-2008 Time: 11:45:23



(Line Conduction)

Trace: 12 Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Thanh Nguyen
Project #: : 07U11529
Company: : BroadCom
Configuration:: EUT, Laptop w/ mini. config.
Mode: : Digital
Target: : FCC Class B
Voltage: : 115VAC 60Hz
: Line 2: Peak (blue), Average (Green)