FCC CFR47 PART 15 SUBPART B

TEST REPORT
FOR

802.11g/DRAFT 802.11n WIRELESS LAN + BLUETOOTH
PCI-E MINI CARD

MODEL NUMBER: BCM943225HMB

REPORT NUMBER: 09U12521-21A

FCC ID: QDS-BRCM1048

ISSUE DATE: MAY 13, 2009

Prepared for

BROADCOM CORP.

190 MATHILDA PLACE

SUNNYVALE, CA 94086, U.S.A.

Prepared by

COMPLIANCE CERTIFICATION SERVICES
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	05/08/09	Initial Issue	T. Chan
A	05/13/09	Added FCC ID to the report	A. Zaffar

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	BROADCOM CORP. 190 MATHILDA PLACE SUNNYVALE, CA 94086, U.S.A.
EUT DESCRIPTION	802.11g/Draft 802.11n Wireless LAN + Bluetooth PCI-E Mini Card
MODEL:	BCM943225HMB
SERIAL NUMBER:	6
DATE TESTED:	MAY 06 - 07, 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:

VIEN TRAN
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 + Bluetooth PCI-E Mini Card.

The radio module is manufactured by Broadcom.

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
EMC Test & TX	All I/O ports activate with H' patterns scrolling on the screen display with TX on.

5.4. DETAILS OF TESTED SYSTEM

SUPPORT EQUIPMENT & PERIPHERALS

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Dell	Inspiron 630m	814C40100252200122KS00	DoC
AC Adapter	Dell	LA65NS0-00	CN-ODF263-71615-6CG-F8C9	DoC
Printer	HP	7850	MY56K1304B	DoC
Mouse	Dell	0YH958	HC6450C2BP9	DoC

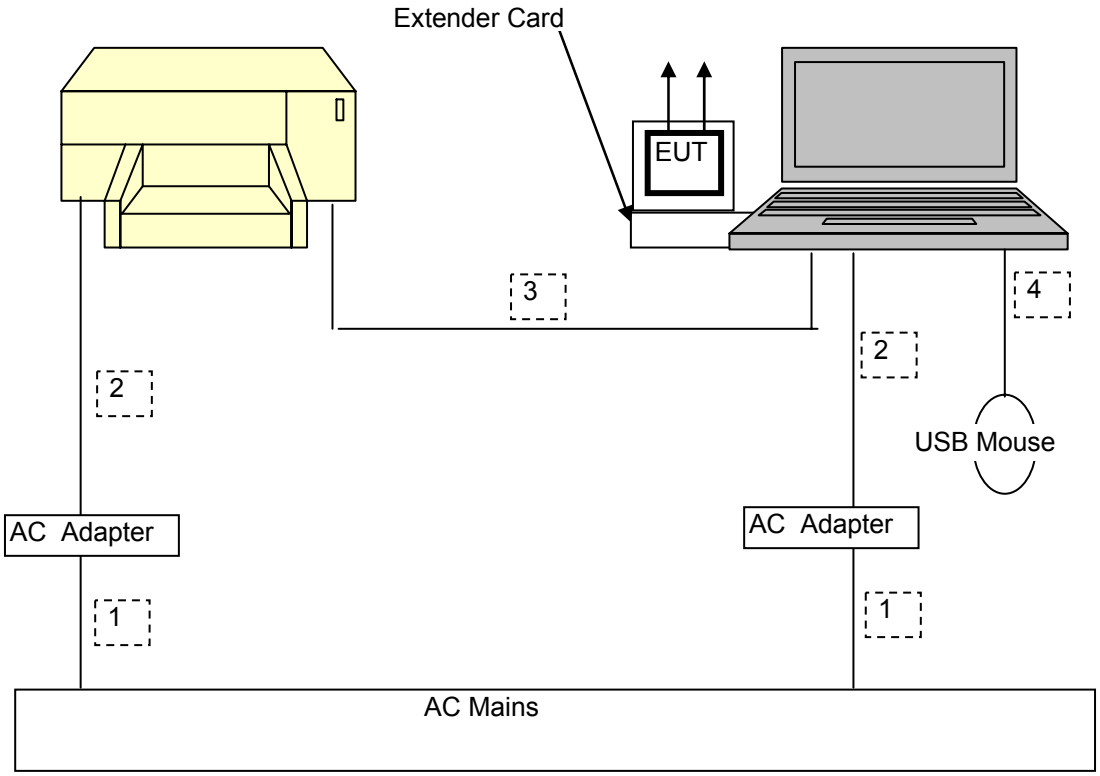
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identica Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	2	US 115V	Shielded	1.5m	NA
2	DC	2	DC	Un-shielded	1.5m	Ferrite at laptop's end
3	USB	1	Printer	Un-shielded	2.0m	Bundle
4	USB	1	USB	Un-shielded	2.0m	USB Mouse

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**
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01171	01/14/10
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01161	08/06/09
Preamp, 1000MHz	Agilent / HP	8447D	C00558	03/31/10
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/29/09
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	02/06/10

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& VERTICAL)

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

Test Engr: Vien Tran
Date: 05/06/09
Project #: 09U12521
Company: Broadcom
EUT Description: 802.11g/Draft 802.11n Wireless LAN + Bluetooth PCI-E Mini Card
EUT M/N: BCM943225HMB
Test Target: FCC Part 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
Horizontal													
78.482	3.0	48.8	7.7	0.8	29.6	0.0	0.0	27.7	40.0	-12.3	H	P	
202.927	3.0	54.1	12.0	1.3	28.9	0.0	0.0	38.5	43.5	-5.0	H	P	
799.592	3.0	43.8	21.0	2.8	29.2	0.0	0.0	38.4	46.0	-7.6	H	P	
Vertical													
40.200	3.0	46.4	13.9	0.6	29.6	0.0	0.0	31.2	40.0	-8.8	V	P	
202.927	3.0	51.3	12.0	1.3	28.9	0.0	0.0	35.7	43.5	-7.8	V	P	
398.055	3.0	46.8	15.0	1.9	29.3	0.0	0.0	34.4	46.0	-11.6	V	P	
929.917	3.0	43.1	21.8	3.1	28.5	0.0	0.0	39.5	46.0	-6.5	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

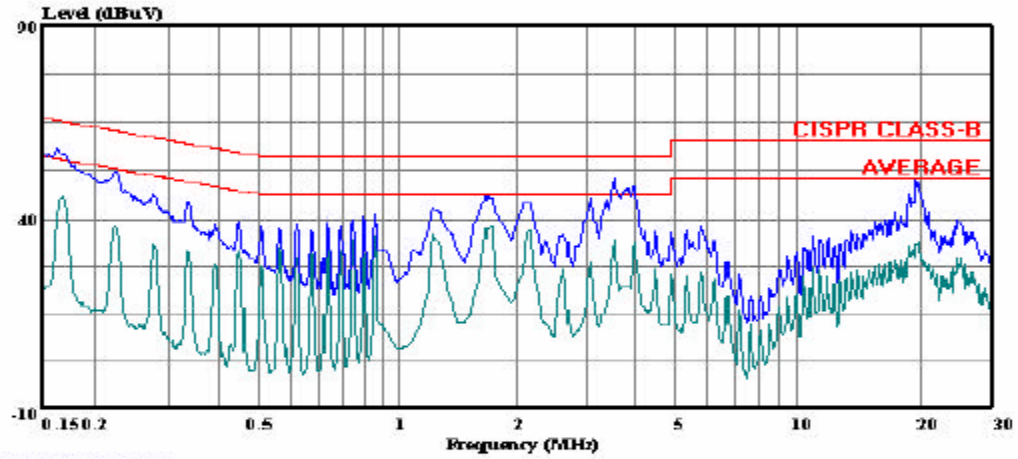
CONDUCTED EMISSIONS DATA (115VAC 60Hz)

Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.16	57.99	--	45.50	0.00	65.31	55.31	-7.32	-9.81	L1
3.80	50.37	--	34.48	0.00	56.00	46.00	-5.63	-11.52	L1
19.53	49.57	--	33.44	0.00	60.00	50.00	-10.43	-16.56	L1
0.16	56.49	--	44.93	0.00	65.31	55.31	-8.82	-10.38	L2
3.80	51.64	--	34.19	0.00	56.00	46.00	-4.36	-11.81	L2
19.53	48.75	--	29.33	0.00	60.00	50.00	-11.25	-20.67	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#: 09U12521_Digital.EMI
Date: 05-06-2009 Time: 13:53:02



(Line Conduction)

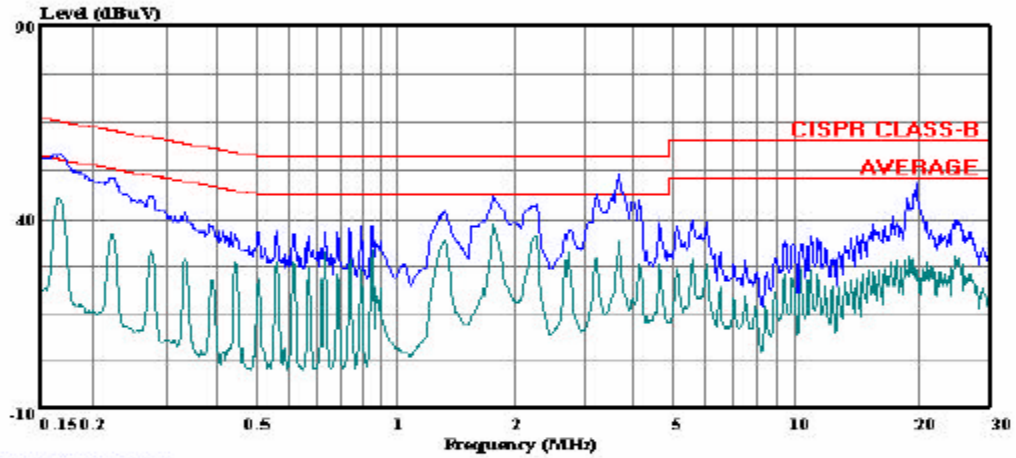
Trace: 5 Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Vien Tran
Project #: : 09U12521
Company: : Broadcom
Configuration:: EUT / Minimum Peripherals
Mode: : Normal Mode
Target: : Digital_FCC Class B
Voltage: : 115VAC/60 Hz
: Line 1:Blue (Peak); Green (Average)

LINE 2 RESULTS

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

Data#: 14 File#: 09U12521_Digital.EMI
Date: 05-06-2009 Time: 14:01:16



Trace: 12 Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Vien Tran
Project #: : 09U12521
Company: : Broadcom
Configuration:: EUT / Minimum Peripherals
Mode: : Normal Mode
Target: : Digital_FCC Class B
Voltage: : 115VAC/60 Hz
: Line 2:Blue (Peak); Green (Average)