

FCC CFR47 PART 15 SUBPART B

TEST REPORT FOR

802.11 b/g/n WLAN MODULE

MODEL NUMBER: SDGOB-0991 FCC ID: B94SDGOB0991

REPORT NUMBER: 09U12655-2, Revision B

ISSUE DATE: AUGUST 07, 2009

Prepared for

HEWLETT PACKARD COMPANY 3000 HANOVER STREET PALO ALTO, CA 94304, U.S.A.

Prepared by

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Revision History

DATE: AUGUST 07, 2009

MODEL: SDGOB-0991

Rev.	Issue Date	Revisions	Revised By
	07/31/09	Initial Issue	T. Chan
В	08/07/09	Added FCC ID to the report	A. Zaffar

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Hewlett Packard Company

3000 Hanover Street Palo Alto, CA 94304, U.S.A.

EUT DESCRIPTION: 802.11 b/g/n WLAN MODULE

MODEL: SDGOB-0991

SERIAL NUMBER: 002265E08299A

DATE TESTED: JULY 28-29, 2009

APPLICABLE STANDARDS

STANDARD

TEST RESULTS

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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:

Tested By:

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THU CHAN EMC MANAGER

COMPLIANCE CERTIFICATION SERVICES

CHIN PANG EMC ENGINEER

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COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

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

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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 802.11 b/g/n WLAN Module

The radio module is manufactured by HONG FU JIN Precision Industry (Shenzhen) Co., Ltd, Foxconn Network System Group

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5.2. PRELIMINARY TEST CONFIGURATIONS

The following configuration was investigated during testing:

EUT Configuration	Description
Typical Configuration	EUT connected to laptop via a USB cable 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								
Printer	HP	2225C	2930S52614	DSI6XU2225				
Mouse	HP	M-S34	LZB74708572	DZL211029				
Laptop	Dell	PP09S	27920070721	DoC				
AC Adapter	Dell	PA-1650-06D3	CNODF263716156CGF8C9	DoC				

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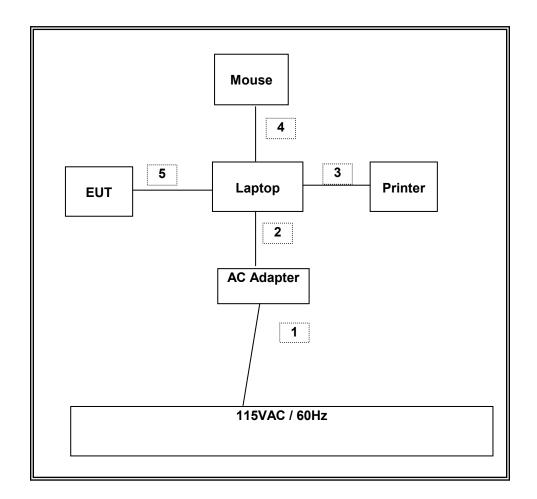
I/O CABLES

	I/O CABLE LIST											
Cable	Cable Port		Connector	Cable	Cable	Remarks						
No.		Identica	Туре	Туре	Length							
		Ports										
1	AC	1	US 115V	Un-shielded	2m	NA						
2	DC	1	DC	Un-shielded	2m	one ferrite at Laptop's end						
3	USB	1	Printer	Un-shielded	2m	NA						
4	USB	1	Mouse	Un-shielded	2m	NA						
5	USB	1	WLAN Module	Un-shielded	2m	NA						

TEST SETUP

The EUT connected to a Laptop via a USB Cable and 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.

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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	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**)

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MODEL: SDGOB-0991

30-1000MHz Frequency Measurement

Compliance Certification Services, Fremont 5m Chamber

Chin Pang Test Engr: Date: 07/28/09 09U12655 Project #: Company: Broadcom

EUT Description: 802.11 B/G/N Wlan Module

EUT M/N: SDGOB-0991 Test Target: FCC Class B Mode Oper: Normal

Margin Margin vs. Limit

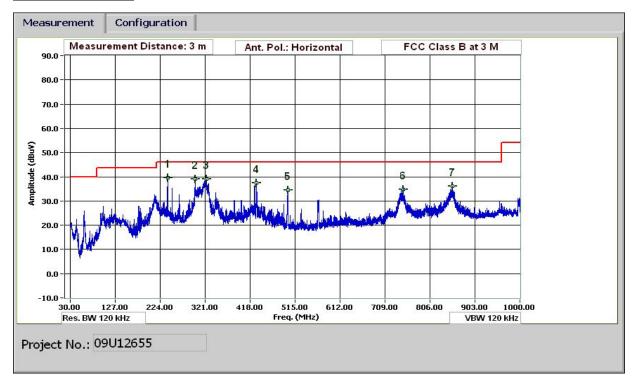
f Measurement Frequency Amp Preamp Gain
Dist Distance to Antenna D Corr Distance Correct to 3 meters
Read Analyzer Reading Filter Filter Insert Loss

Dist Distance to American
Read Analyzer Reading Filter Filter Insert Loss
AF Antenna Factor Corr. Calculated Field Strength
Limit Field Strength Limit

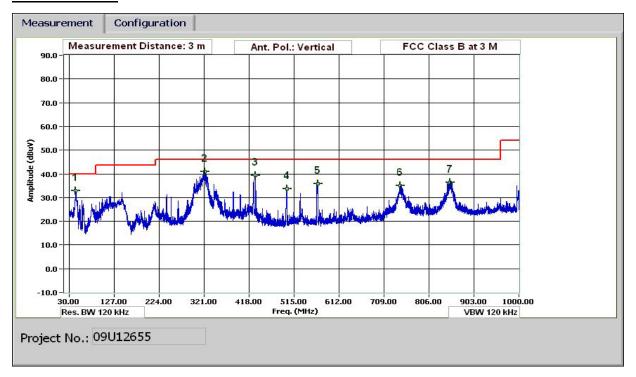
f	Dist	Read	AF	CL	-	D Corr			Limit		Ant Pol	:	Notes
MHz	(m)	dBuV	dB/m	dВ	dB	dB	dB	dBuV/m	dBuv/m	dB	V/H	P/A/QP	
Vert													
44.041	3.0	50.3	11.6	0.6	29.6	0.0	0.0	32.9	40.0	-7.1	V	EP	
322.692	3.0	54.5	13.7	1.7	28.9	0.0	0.0	41.0	46.0	-5.0	V	EP	
322.692	3.0	51.2	13.7	1.7	28.9	0.0	0.0	37.7	46.0	-8.3	V	QP	
432.017	3.0	51.2	15.6	2.0	29.4	0.0	0.0	39.3	46.0	-6.7	V	EP	
499.579	3.0	44.4	16.8	2.1	29.7	0.0	0.0	33.6	46.0	-12.4	V	EP	
566.182	3.0	45.5	17.8	2.3	29.7	0.0	0.0	35.9	46.0	-10.1	V	EP	
744.509	3.0	41.7	20.0	2.7	29.4	0.0	0.0	35.0	46.0	-11.0	V	EP	
851.794	3.0	41.0	21.3	2.9	28.9	0.0	0.0	36.4	46.0	-9.6	V	EP	
240.129	3.0	55.3	11.8	1.4	28.8	0.0	0.0	39.7	46.0	-6.3	Н	EP	
299.891	3.0	52.9	13.3	1.6	28.8	0.0	0.0	38.9	46.0	-7.1	H	EP	
324.132	3.0	52.5	13.7	1.7	28.9	0.0	0.0	39.0	46.0	-7.0	н	EP	
432.017	3.0	49.3	15.6	2.0	29.4	0.0	0.0	37.4	46.0	-8.6	Н	EP	
499.579	3.0	45.3	16.8	2.1	29.7	0.0	0.0	34.5	46.0	-11.5	н	EP	
749.070	3.0	41.4	20.1	2.7	29.4	0.0	0.0	34.8	46.0	-11.2	Н	EP	
854.554	3.0	40.7	21.3	2.9	28.8	0.0	0.0	36.1	46.0	-9.9	н	EP	
•••••										:			

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HOIZONTAL PLOT



VERTICAL PLOT



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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	Limits (dBµV)				
(MHz)	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.		Closs	Limit EN B		Mar	Remark					
(MHz)	PK (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2				
0.17	55.12		42.55	0.00	64.77	54.77	-9.65	-12.22	L1		
3.88	43.35		27.54	0.00	56.00	46.00	-12.65	-18.46	L1		
21.60	41.12		25.77	0.00	60.00	50.00	-18.88	-24.23	L1		
0.17	54.44		41.57	0.00	64.91	54.91	-10.47	-13.34	L2		
4.01	44.73		28.08	0.00	56.00	46.00	-11.27	-17.92	L2		
20.92	42.38		27.87	0.00	60.00	50.00	-17.62	-22.13	L2		
6 Worst Data											

LINE 1 RESULTS

COMPLIANCE

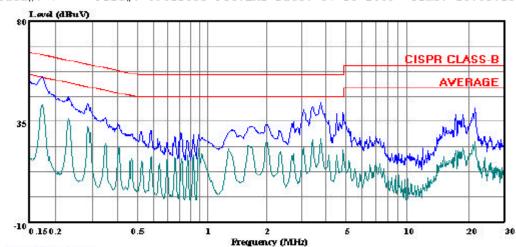
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Data#: 7 File#: 09U12655 FCC.EMI Date: 07-28-2009 Time: 18:05:15



(Line Conduction)

Trace: 5 Ref Trace:

Condition: CISPR CLASS-B Test Operator: : Chin Pang Project #: : 09U12655 Company: : Broadcom

EUT Description:: 802.11 bgn Wlan Module

Mode: : Normal

Target: : CISPR 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#: 09U12655 FCC.EMI Date: 07-28-2009 Time: 18:14:54 Love (dBuV) CISPR CLASS-B AVERAGE ·10 0.150.2 0.5 Frequency (MHz) (Line Conduction) Trace: 12 Ref Trace: Condition: CISPR CLASS-B Test Operator: : Chin Pang Project #: : 09U12655 Company: : Broadcom BUT Description:: 802.11 bgn Wlan Module Mode: : Normal Target: : CISPR Class B : 115VAC/60Hz Voltage: : L2 Peak (Blue) , Average (Green)