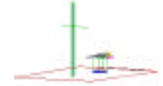




PCTEST ENGINEERING LABORATORY, INC.

6660-B Dobbin Road, Columbia, MD 21045 USA
Tel. 410.290.6652 / Fax 410.290.6654
<http://www.pctestlab.com>



MEASUREMENT REPORT FCC PART 15.247 / IC RSS-210 Bluetooth

Applicant Name:

Sony Corporation
1-7-1 Konan
Minato-ku
108-0075
Japan

Date of Testing:

April 8, 2011

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

0Y1104150764.AK8

FCC ID: AK8PCG41313L

IC CERTIFICATION NO.: 409B-PCG41313L

APPLICANT: Sony Corporation

Application Type:

Certification

Model(s):

PCG-41313L

EUT Type:

Laptop with Bluetooth and WLAN

Max. RF Output Power:

3.802 mW (5.8dBm) Conducted

Frequency Range:

2402 – 2480MHz (Bluetooth for US)

Type of Modulation:

GFSK, $\pi/4$ -QPSK, 8DPSK

FCC Classification:

FCC Part 15 Spread Spectrum Transmitter (DSS)

FCC Rule Part(s):

Part 15 Subpart C (15.247)

IC Specification(s):

RSS-210 Issue 8

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Grant Conditions: Power output listed is conducted.

PCTEST certifies that no party to this application has been subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.


Randy Ortanez
President



FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN		Page 1 of 17

TABLE OF CONTENTS

FCC PART 15.247 MEASUREMENT REPORT.....	3
1.0 INTRODUCTION	4
1.1 SCOPE.....	4
1.2 PCTEST TEST LOCATION	4
2.0 PRODUCT INFORMATION.....	5
2.1 EQUIPMENT DESCRIPTION	5
2.2 EMI SUPPRESSION DEVICE(S)/MODIFICATIONS	5
2.3 LABELING REQUIREMENTS.....	5
3.0 DESCRIPTION OF TEST.....	6
3.1 EVALUATION PROCEDURE.....	6
3.2 RADIATED EMISSIONS	7
4.0 ANTENNA REQUIREMENTS	8
5.0 TEST EQUIPMENT CALIBRATION DATA	9
6.0 TEST RESULTS	10
6.1 SUMMARY	10
6.2 OUTPUT POWER MEASUREMENT.....	11
6.3 TIME OF OCCUPANCY.....	11
6.4 RADIATED SPURIOUS EMISSION MEASUREMENTS.....	12
6.5 RADIATED RESTRICTED BAND EDGE MEASUREMENTS.....	16
7.0 CONCLUSION	17

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 2 of 17	



MEASUREMENT REPORT

FCC Part 15.247



§ 2.1033 General Information

APPLICANT: Sony Corporation
APPLICANT ADDRESS: 1-7-1 Konan
 Minato-ku, 108-0075
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S): Part 15 Subpart C (15.247)
IC SPECIFICATION(S): RSS-210 Issue 8
BASE MODEL : PCG-41313L
FCC ID: AK8PCG41313L
Test Device Serial No.: N/A ☐ Production ☒ Pre-Production ☐ Engineering
FCC CLASSIFICATION: FCC Part 15 Spread Spectrum Transmitter (DSS)
Method/System: Frequency Hopping Spread Spectrum (FHSS)
DATE(S) OF TEST: April 8, 2011
TEST REPORT S/N: 0Y1104150764.AK8

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21045, U.S.A.



- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451A-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451A-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

FCC ID: AK8PCG41313L	 FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		 Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 3 of 17

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2 PCTEST Test Location

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity are, the Baltimore-Washington Intern't'l (BWI) airport, the city of Baltimore and the Washington, DC area. (see Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003 on January 28, 2009.

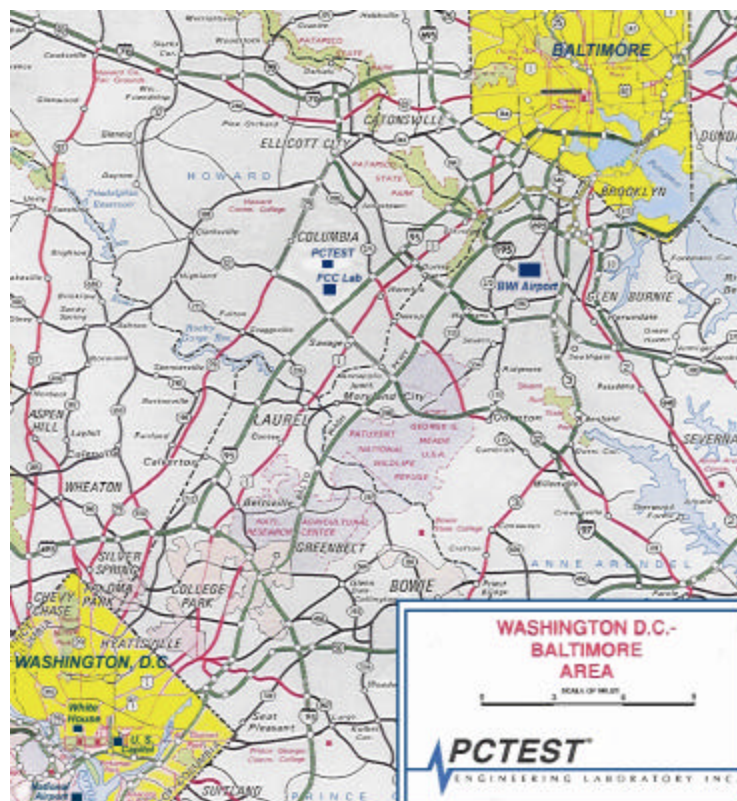


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

FCC ID: AK8PCG41313L	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)	VAIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN		Page 4 of 17

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Sony Laptop with Bluetooth and WLAN FCC ID: AK8PCG41313L**. The test data contained in this report pertains only to the emissions due to the EUT's Bluetooth transmitter.

- This Bluetooth module has been tested by a Bluetooth Qualification Lab, and we confirm the following:
 - A) The hopping sequence is pseudorandom
 - B) All channels are used equally on average
 - C) The receiver input bandwidth equals the transmit bandwidth
 - D) The receiver hops in sequence with the transmit signal
- 15.247(g): In accordance with the Bluetooth Industry Standard, the system is designed to comply with all of the regulations in Section 15.247 when the transmitter is presented with a continuous data (or information) system.
- 15.247(h): In accordance with the Bluetooth Industry Standard, the system does not coordinate its channels selection/ hopping sequence with other frequency hopping systems for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters.
- The EUT consisted of the following component(s):

Manufacturer / Base Model	FCC ID	Description
Sony / Model: PCG-41313L	AK8PCG41313L	Laptop with Bluetooth and WLAN

Table 2-1. EUT Equipment Description

2.2 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

2.3 Labeling Requirements

Per 15.19: Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(b)(2).

Please see attachment for FCC ID label and label location.

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 5 of 17	

3.0 DESCRIPTION OF TEST

3.1 Evaluation Procedure

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2003) and FCC Public Notice DA 00-705 dated March 30, 2000 entitled "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems" were used in the measurement of the **Sony Laptop with Bluetooth and WLAN FCC ID: AK8PCG41313L**.

Deviation from measurement procedure.....None

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 6 of 17	

3.2 Radiated Emissions

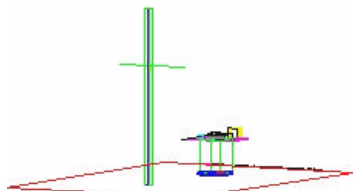


Figure 3-1. 3-Meter Test Site

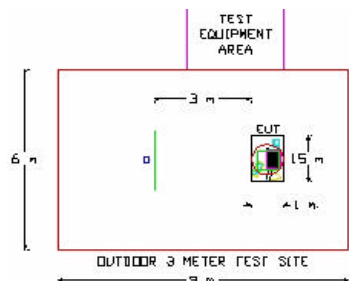


Figure 3-2. Dimensions of Outdoor Test Site

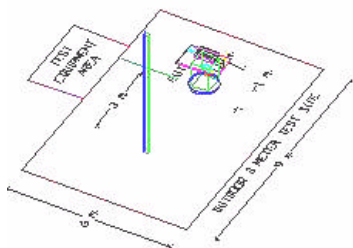


Figure 3-3. Turntable and System Setup

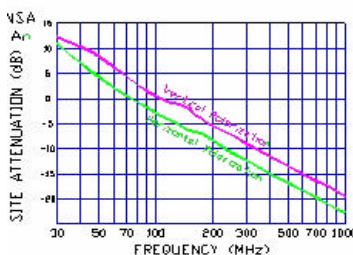


Figure 3-4. Normalized Site Attenuation Curves (H&V)

Preliminary measurements were made indoors at 1-meter using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, and turntable azimuth with respect to the antenna was noted for each frequency found. The spectrum was scanned from 30 to 200 MHz using a bi-conical antenna and from 200 to 1000 MHz using a log-spiral antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used.

Final measurements were made outdoors at 3-meter test range using Roberts™ Dipole antennas or horn antennas (see Figure 3-1). The test equipment was placed on a wooden and plastic bench situated on a 1.5m x 2m area adjacent to the measurement area (see Figure 3-2). Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The detector function was set to CISPR quasi-peak mode and the bandwidth of the spectrum analyzer was set to 100kHz for frequencies below 1GHz or 1MHz for frequencies above 1GHz. Above 1GHz the detector function was set to average mode (RBW = 1MHz, VBW = 10Hz).

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1 x 1.5 meter table (see Figure 3-3). The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in the test setup photographs. Each EME reported was calibrated using the Agilent E8257D (250kHz – 20GHz) PSG Signal Generator. The Theoretical Normalized Site Attenuation Curves for both horizontal and vertical polarization are shown in Figure 3-4.

FCC ID: AK8PCG41313L	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)	VAIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 7 of 17	

4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antennas of the Sony Laptop with Bluetooth and WLAN are **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The **Sony Laptop with Bluetooth and WLAN FCC ID: AK8PCG41313L** unit complies with the requirement of §15.203.

Ch.	Frequency (MHz)
00	2402
:	:
39	2441
:	:
78	2480

Table 4-1. Frequency/ Channel Operations

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)	 Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 8 of 17

5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	263-10dB	(DC-18GHz) 10 dB Attenuator	N/A		N/A	N/A
-	No.166	(1000-26500MHz) Microwave RF Cable	N/A		N/A	N/A
-	No.167	(100kHz - 100MHz) RG58 Coax Cable	N/A		N/A	N/A
Agilent	8447D	Broadband Amplifier	3/17/2011	Annual	3/17/2012	1937A03348
Agilent	8447D	Broadband Amplifier	3/17/2011	Annual	3/17/2012	2443A01900
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	2/8/2011	Annual	2/8/2012	3008A00985
Agilent	E4407B	ESA Spectrum Analyzer	4/6/2011	Annual	4/6/2012	US39210313
Agilent	E4448A	PSA (3Hz-50GHz) Spectrum Analyzer	11/30/2010	Annual	11/30/2011	US42510244
Agilent	N9020A	MXA Signal Analyzer	9/8/2010	Annual	9/8/2011	US46470561
Agilent	N4010A	Wireless Connectivity Test Set	9/27/2010	Annual	9/27/2011	GB46170464
Emco	3115	Horn Antenna (1-18GHz)	10/14/2009	Biennial	10/14/2011	9704-5182
Emco	3115	Horn Antenna (1-18GHz)	4/8/2010	Biennial	4/8/2012	9205-3874
Emco	3116	Horn Antenna (18 - 40GHz)	9/9/2008	Triennial	9/9/2011	9203-2178
Emco	3816/2	LISN	11/5/2010	Biennial	11/5/2012	9707-1077
Emco	3816/2	LISN	11/3/2010	Biennial	11/3/2012	9707-1079
MiniCircuits	VHF-3100+	High Pass Filter	N/A		N/A	30721
Pasternack	PE2209-10	Bidirectional Coupler	N/A		N/A	N/A
Pasternack	PE7000-6	6 dB Attenuator	N/A		N/A	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	11/11/2010	Annual	11/11/2011	836371/0079
Rohde & Schwarz	CMU200	Base Station Simulator	6/21/2010	Annual	6/21/2011	833855/0010
Sunol	DRH-118	Horn Antenna (1 - 18GHz)	5/14/2009	Biennial	5/14/2011	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/17/2009	Biennial	7/17/2011	A051107
Rohde & Schwarz	CMU200	Base Station Simulator	6/17/2010	Annual	6/17/2011	836536/0005
Rohde & Schwarz	FSQ 26	Spectrum Analyzer	8/28/2010	Annual	8/28/2011	200452
Anritsu	ML2495A	Power Meter	10/13/2010	Annual	10/13/2011	941001

Table 5-1. Annual Test Equipment Calibration Schedule

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 9 of 17	

6.0 TEST RESULTS

6.1 Summary

Company Name: Sony Corporation
 FCC ID: AK8PCG41313L
 Method/System: Frequency Hopping Spread Spectrum (FHSS)
 Number of Channels: 79

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (Tx)						
15.247(b)(1)	RSS-210 [A8.4(2)]	Peak Transmitter Output Power	< 1 Watt if ≥ 75 non-overlapping channels used	CONDUCTED	PASS	Section 6.2
15.247(a)(1)(iii)	RSS-210 [A8.1(4)]	Time of Occupancy	< 0.4 sec in 31.6 sec period		PASS	Section 6.3
15.247(a)(1)(iii)	RSS-210 [A8.1]	20dB Bandwidth	< 1 MHz only if using less than 15 non-overlapping channels		PASS	See Note Below
15.247(a)(1)	RSS-210 [A8.1(2)]	Channel Separation	> 2/3 of 20 dB BW for systems with Output Power < 125mW		PASS	
15.247(a)(1)(iii)	RSS-210 [A8.1(4)]	Number of Channels	> 15 Channels		PASS	
15.247(d)	RSS-210 [A8.5]	Band Edge / Out-of-Band Emissions	Conducted < 20dBc		PASS	
15.207	RSS-Gen [7.2.2]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits or < RSS-Gen table 2 limits	LINE CONDUCTED	PASS	
15.205 15.209	RSS-210 [A8.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-210 table 3 limits)	RADIATED	PASS	Section 6.4, Section 6.5
RECEIVER MODE (Rx) / DIGITAL DEVICE						
15.107	RSS-Gen [7.2.2]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.107 limits or < RSS-Gen table 2 limits	LINE CONDUCTED	PASS	Part 15B Test Report
15.109	RSS-Gen [7.2.3.2]	General Field Strength Limits (Restricted Bands and Radiated Emissions Limits)	< FCC 15.109 limits or < RSS-Gen limits [Section 6; Table1]	RADIATED (30MHz-1GHz) (1-25 GHz)	PASS	Part 15B Test Report

Table 6-1. Summary of Test Results

Note:

All modes of operation and data rates were investigated. Conducted test results can be found under the FCC Authorization database of granted applications for FCC Part 15C report for FCC ID: PD962230ANH and PD962230ANHU. The data from that grant represent the EUT under worse case test settings. The Sony Laptop FCC ID: AK8PCG41313L contains the identical module and so the data remains applicable in this test report.

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 10 of 17	

6.2 Output Power Measurement

§15.247 (b)(1); RSS-210 (A8.4 (2))

Measurement is made while the EUT is operating in non-hopping transmission mode. The powers shown below are peak powers measured using a Bluetooth signaling test set (Agilent Model: N4010A) and a spectrum analyzer set to peak detector with RBW = VBW = 3MHz. **The maximum permissible output power is 1 Watt.**

This unit was tested with all possible data rates and the highest power is 5.8 dBm (3.802mW) reported with the unit transmitting at 3Mbps as reported in FCC grant Intel Module FCC ID:PD962230ANHU in the DSS Report.

6.3 Time of Occupancy

§15.247 (a)(1)(iii); RSS-210 (A8.1 (4))

Measurement is made while EUT is operating in hopping mode with the spectrum analyzer set to zero span. **The maximum permissible time of occupancy is 400 ms within a period of 400ms multiplied by the number of hopping channels employed.**

Time of Occupancy for one pulse width = 2.99 ms as reported on FCC grant for Intel Module FCC ID: PD962230ANHU DSS Report.

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)	 Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 11 of 17

6.4 Radiated Spurious Emission Measurements

§15.205 & §15.209, §15.247 (d); RSS-210 (A8.5)

The EUT was tested from 9kHz and up to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average measurement was used, using RBW = 1MHz, VBW = 1/τ Hz, where τ is the Bluetooth pulse width in seconds, and linearly polarized horn antennas. All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 6-2 per Section 15.209. This unit was tested with all possible data rates and the highest power is 5.8 dBm (3.802mW) reported with the unit transmitting at 3Mbps as reported in FCC grant Intel Module FCC ID:PD962230ANHU in the DSS Report. No significant radiated emissions were found in the 2310 - 2390MHz restricted band.

Frequency	Field Strength [mV/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 6-2. Radiated Limits

Sample Calculation

o Field Strength Level [dBμV/m] = Analyzer Level [dBm] + 107 + AFCL [dB] + Duty Cycle Correction [dB]

Notes:

- o AFCL = Antenna Factor [dB] + Cable Loss [dB]
- o Duty Cycle Correction Factor Calculation:
 - o Time to cycle through all channels = Δt = τ [ms] x 79 channels = 236.21ms, where τ = pulse width
 - o 100ms / Δt [ms] = H → Round up to next highest integer, to account for worst case, H' = 1
 - o Worst Case Dwell Time = τ [ms] x H' = 2.99ms
 - o Duty Cycle Correction = 20log(Worst Case Dwell Time/100ms) [dB] = -30.487dB

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 12 of 17	

Radiated Spurious Emission Measurements (Cont'd)

§15.205 & §15.209, §15.247 (d); RSS-210 (A8.5)

Mode: Bluetooth

Measurement Distance: 3 Meters

Operating Frequency: 2402MHz

Channel: 0

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol [H/V]	AFCL [dB]	Duty Cycle Correction [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
4804.00	-110.49	Avg	H	41.90	-30.49	7.92	53.98	-46.06
4804.00	-98.39	Peak	H	41.90	0.00	50.51	73.98	-23.47
12010.00	-135.00	Avg	H	59.36	0.00	31.36	53.98	-22.62
12010.00	-125.00	Peak	H	59.36	0.00	41.36	73.98	-32.62

Table 6-3. Radiated Measurements

NOTES:

1. All emissions shown lie in the restricted bands specified in §15.205 and are below the limit shown in Table 6-2.
2. Average measurements > 1GHz using RBW = 1MHz and VBW = $1/\tau$ Hz, where τ = pulse width in seconds. Peak measurements > 1GHz using RBW = VBW = 1MHz.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
5. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
6. Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
7. Above 960MHz the limit is 500 μ V/m (54dB μ /m) at 3 meters radiated.

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 13 of 17	

Radiated Spurious Emission Measurements (Cont'd)

§15.205 & §15.209, §15.247 (d); RSS-210 (A8.5)

Mode: Bluetooth

Measurement Distance: 3 Meters

Operating Frequency: 2441MHz

Channel: 39

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol [H/V]	AFCL [dB]	Duty Cycle Correction [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
4882.00	-108.15	Avg	H	42.10	-30.49	10.46	53.98	-43.52
4882.00	-97.05	Peak	H	42.10	0.00	52.05	73.98	-21.93
7323.00	-135.00	Avg	H	48.42	0.00	20.42	53.98	-33.56
7323.00	-125.00	Peak	H	48.42	0.00	30.42	73.98	-43.56
12205.00	-135.00	Avg	H	59.88	0.00	31.88	53.98	-22.10
12205.00	-125.00	Peak	H	59.88	0.00	41.88	73.98	-32.10

Table 6-4. Radiated Measurements

NOTES:

1. All emissions shown lie in the restricted bands specified in §15.205 and are below the limit shown in Table 6-2.
2. Average measurements > 1GHz using RBW = 1MHz and VBW = $1/\tau$ Hz, where τ = pulse width in seconds. Peak measurements > 1GHz using RBW = VBW = 1MHz.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
5. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
6. Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
7. Above 960MHz the limit is 500 μ V/m (54dB μ /m) at 3 meters radiated.

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 14 of 17	

Radiated Spurious Emission Measurements (Cont'd)

§15.205 & §15.209, §15.247 (d); RSS-210 (A8.5)

Mode: Bluetooth

Measurement Distance: 3 Meters

Operating Frequency: 2480MHz

Channel: 78

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol [H/V]	AFCL [dB]	Duty Cycle Correction [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
4960.00	-108.31	Avg	H	42.30	-30.49	10.50	53.98	-43.48
4960.00	-98.91	Peak	H	42.30	0.00	50.39	73.98	-23.59
7440.00	-135.00	Avg	H	48.57	0.00	20.57	53.98	-33.41
7440.00	-125.00	Peak	H	48.57	0.00	30.57	73.98	-43.41
12400.00	-135.00	Avg	H	60.39	0.00	32.39	53.98	-21.59
12400.00	-125.00	Peak	H	60.39	0.00	42.39	73.98	-31.59

Table 6-5. Radiated Measurements

NOTES:

1. All emissions shown lie in the restricted bands specified in §15.205 and are below the limit shown in Table 6-2.
2. Average measurements > 1GHz using RBW = 1MHz and VBW = $1/\tau$ Hz, where τ = pulse width in seconds. Peak measurements > 1GHz using RBW = VBW = 1MHz.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
5. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
6. Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
7. Above 960MHz the limit is 500 μ V/m (54dB μ /m) at 3 meters radiated.

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 15 of 17	

6.5 Radiated Restricted Band Edge Measurements

§15.205 & §15.209, §15.247 (d); RSS-210 (A8.5)

Mode: Bluetooth

Measurement Distance: 3 Meters

Operating Frequency: 2480MHz

Channel: 78

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol [H/V]	AFCL [dB]	Duty Cycle Correction [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
2483.50	-81.57	Avg	H	35.93	-30.49	30.87	53.98	-23.11
2483.50	-78.37	Peak	H	35.93	0.00	64.56	73.98	-9.42
2484.60	-90.37	Avg	H	35.93	-30.49	22.07	53.98	-31.91
2484.60	-89.77	Peak	H	35.93	0.00	53.16	73.98	-20.82
2486.10	-101.28	Avg	H	35.94	-30.49	11.17	53.98	-42.81
2486.10	-96.38	Peak	H	35.94	0.00	46.56	73.98	-27.42

Table 6-6. Radiated Restricted Band Edge Measurements at 3-meters

NOTES:

1. All emissions shown lie in the restricted bands specified in §15.205 and are below the limit shown in Table 6-2.
2. Average measurements > 1GHz using RBW = 1MHz and VBW = $1/\tau$ Hz, where τ = pulse width in seconds. Peak measurements > 1GHz using RBW = VBW = 1MHz.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
5. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
6. Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
7. Above 960MHz the limit is 500 μ V/m (54dB μ /m) at 3 meters radiated.

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 16 of 17	

7.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Sony Laptop with Bluetooth and WLAN FCC ID: AK8PCG41313L** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules and RSS-210 of the Industry Canada Rules.

FCC ID: AK8PCG41313L		FCC Pt. 15.247 BLUETOOTH TEST REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104150764.AK8	Test Dates: April 8, 2011	EUT Type: Laptop with Bluetooth and WLAN	Page 17 of 17	