EMI TEST REPORT

Test Report No. : 23FE0013-HO-1

Applicant	:	**Sony Corporation**
Type of Equipment	:	**Notebook Personal Computer**
Model No.	:	**PCG-571L**
Test standard	:	**FCCPart15 Subpart C Section15.207, Section 15.247**
FCC ID	:	**AK8PCG57AL**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of A-Pex International Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.
5. This test report does not constitute an endorsement by NIST/NVLAP or U.S. Government.

Date of test : January 17, 20 and 21, 2003

Tested by : Y. Iwasa

Yoshiaki Iwasa
EMC Head Office Division

Approved by :

Hironobu Shimoji
Group Leader of EMC Head Office Division

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CONTENTS

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SECTION 1: Client information

Company name	:	Sony Corporation
Address	:	6-7-35 Kitashinagawa, Shinagawa-ku, Tokyo, 141-0001 Japan
Telephone Number	:	+81-3-5795-8033
Facsimile Number	:	+81-3-5795-8346
Contact Person	:	Kaoru Ichikawa

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Notebook Personal Computer
Model No.	:	PCG-571L
Serial No.	:	JAW-20, JAW-24
Rating	:	AC120V/60Hz
Country of Manufacture	:	Japan
Receipt Date of Sample	:	January 14, 2002
Condition of EUT	:	Engineering prototype

2.2 Product Description

Sony Corporation Model: PCG-571LM referred to as the EUT in this report is a Notebook Personal Computer with IEEE 802.11b RF module and antenna included.

The specification is as following;

Equipment Type	:	Transceiver
Clock frequency used in EUT	:	1.6GHz, 166.5 MHz, 100MHz, 48MHz, 33.3MHz, 65MHz, 27MHz, 25MH, 14.3MHz, 12.3MHz, 10MHz
Frequency characteristics	:	from 2400MHz to 2483.5MHz, 1MHz
Type of modulation	:	OBBSK (1M), DQBSK (2M), CCK (5.5M-11M)
Bandwidth & Channel spacing	:	2412MHz-2462MHz, 5 MHz
Channel number	:	11
Emission Designation (ITU Code)	:	22M0P7D
Antenna Type	:	λ/ 4 monopole chip antenna
Antenna Gain	:	-0.53dBi
Transmit power	:	16dBm
Operation temperature range	:	5.0 deg. C to 35.0 deg. C
Power & Signal Cable Length	:	≤ 3m
Mode of Operation	:	Half Duplex

*FCC Part 15.31 (e)
The host device PCG-571L provide the stable power supply (DC: 3.3V), and Notebook Personal Computer complies power supply regulation.

*FCC Part 15.203 Antenna requirement
Notebook Personal Computer and its antenna comply with this requirement since they are built in host device PCG-571L when they are put up for sale and they are used with a particular antenna connector.

SECTION 3: Test specification, procedures and results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted Emissions
Section 15.247 Operation within the Band 902-928MHz, 2400-2483.5MHz and 5725-5850MHz

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	ANSI C63.4:2001	Section 15.207	-	N/A	7.1dB 0.2631MHz,L	Complied
2	6dB Bandwidth	ANSI C63.4:2001	Section 15.247(a)(2)	Conducted	N/A	-	Complied
3	Maximum Peak Output Power	ANSI C63.4:2001	Section 15.247(b)(3)	Conducted	N/A	-	Complied
4	Out of Band Emission	ANSI C63.4:2001	Section 15.247 (c)	Radiated	N/A	5.5dB 24120MHz, Hor/Ver	Complied
5	Restricted Band Edges	ANSI C63.4:2001	Section 15.247 (c)	Radiated	N/A	11.7dB 2390MHz	Complied
6	Power Density	ANSI C63.4:2001	Section 15.247 (d)	Conducted	N/A	26.8dB 2437MHz	Complied

3.3 Additions to Standards

No addition, deviation or exclusion has been made from standards.

3.4 Confirmation

A-Pex International Co., Ltd. hereby confirms that E.U.T., in the configuration tested, complies with the specifications FCC Part 15 Subpart C Section 15.207 and 247.

3.5 Uncertainty

Conducted Emission Test
The measurement uncertainty (with a 95% confidence level) for this test was ±1.3dB.
□The data listed in this test report may exceed the test limit because it does not have enough margin.
■The data listed in this test report has enough margin, more than the site margin.

Maximum Peak Output power, Out of Band Emission and Restricted Band Edges(Radiated) Test
The measurement uncertainty (with a 95% confidence level) for this test using Loop antenna is ±1.9dB.
The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ±4.5dB.
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ±5.2dB.
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ±6.6dB.
■The data listed in this test report may exceed the test limit because it does not have enough margin.
□The data listed in this test report has enough margin.

6dB Bandwidth , Maximum Peak Output power, Out of Band Emission and Power Density (Conducted) Test
The measurement uncertainty (with a 95% confidence level) for this test was ±3.0dB.
□The data listed in this test report may exceed the test limit because it does not have enough margin.
■The data listed in this test report has enough margin.

3.6 Test Location

A-Pex International Co., Ltd. EMC Head Office Division.
No.2 semi anechoic chamber
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Telephone: +81 596 24 8116 Facsimile: +81 596 24 8124
No.2 semi anechoic chamber has been fully described in a report submitted to FCC office, and listed on June 05, 2002. (Registration number: No.2 :846015 Industry Canada: No.2 : IC-4247-2)
*NVLAP Lab. code: 200572-0

3.7 Test set up, Data of EMI and Test instruments

Refer to APPENDIX 1 to 3.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

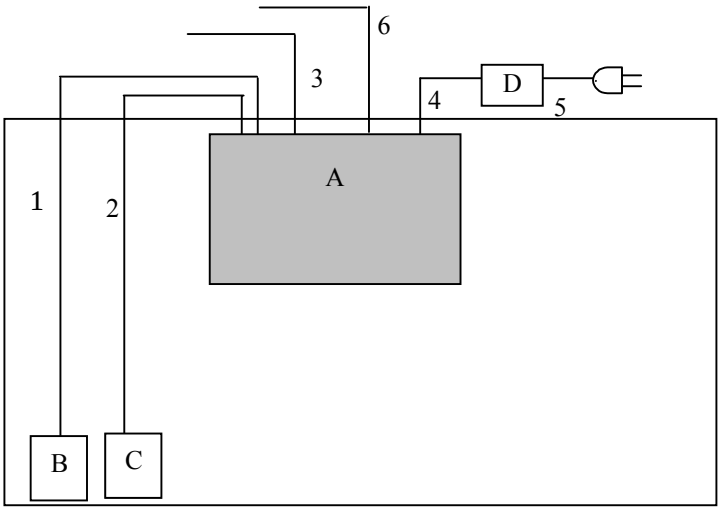
The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

The sequence is used : 1. Transmitting mode (2412MHz)
2. Transmitting mode (2437MHz)
3. Transmitting mode (2462MHz)

Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

*The EUT (S/N: JAW-20) is used for the test on Conducted Emission, Out of Band Emission, and Restricted Band Edges.
*The EUT (S/N: JAW-24) is used for the test on 6dB Bandwidth, Maximum Peak Output Power, and Power Density.

4.2 Configuration and peripherals



* Cabling was taken into consideration and test data was taken under worst case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID	Remark
A	Notebook Personal Computer	PCG-571L	JAW-20 JAW-24	Sony Corporation	AK8PCG57AL	EUT
B	Mouse	M-UB48	LZE02650788	Logitech	-	-
C	Microphone	-	-	FUJITSU	-	-
D	AC Adaptor	NJD-7707	C(1306)	NJRC	-	-

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	USB cable	0.8	N	Polyvinyl chloride
2	Microphone cable	1.6	N	Polyvinyl chloride
3	1394 cable	1.5	Y	Polyvinyl chloride
4	AC adaptor cable	1.8	N	Polyvinyl chloride
5	AC adaptor cable	0.8	N	Polyvinyl chloride
6	Head phone cable	3.2	N	Polyvinyl chloride

SECTION 5: Conducted Emission

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. I/O cables and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. All unused 50Ωconnectors of the LISN were resistively terminated in 50Ω when not connected to the measuring equipment.
The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT on a reference ground plane 4.0 x 4.0m in a No.2 semi Anechoic Chamber.
The EUT was connected to a Line Impedance Stabilization Network (LISN).
An overview sweep with peak detection has been performed.
The measurements have been performed with a CISPR quasi-peak detector (IF BW 9kHz).
Measurement range:0.15-30MHz

Test data : APPENDIX 3
Test result : Pass
Test instruments : MTR-02, MSA-02, MCC-13, MLS-02

SECTION 6: 6dB Bandwidth, Section 15.247(a)(2)

Test Procedure
The minimum 6dB bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass
Test instruments : MTR-01, MCC-04

SECTION 7: Maximum Peak Output Power, Section 15.247(b)(3)

[Conducted]
Test Procedure
The Maximum Peak Output Power was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass
Test instruments : MTR-01, MCC-04, MPM-01, MPSE-03

[Radiated]

Test Procedure
EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.
The Radiated Electric Field Strength intensity has been measured at No.2 semi anechoic chamber (7.5x5.8x5.2m) with a ground plane and at a distance of 3m.
The measuring antenna height was varied between 1 to 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization.

Test data : APPENDIX 3
Test result : Pass
Test instruments : MTR-01, MCC-04, MCC-06, MHA-05, MPA-01

SECTION 8: Out of Band Emission, Section 15.247 (c)

[Radiated]

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.
The Radiated Electric Field Strength intensity has been measured in No.2 semi anechoic chamber (7.5x5.8x5.2m) with a ground plane and at a distance of 3m.
The measuring antenna height was varied between 1 to 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization.
In any 100kHz bandwidth outside the frewuency band in which the spread spectrum intentional radiator is operating, the rafdio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

Test data : **APPENDIX 3**
Test result : **Pass**
Test instruments : **MTR-01, MCC-04, MCC-06,MHA-06, MPA-01 MBA-01, MLA-01, MPA-02, MAT-06, MBF-01, MHA-01**

SECTION9: Restricted Band Edge, Section 15.247(c)

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.
The Radiated Electric Field Strength intensity has been measured in No.2 semi anechoic chamber (7.5x5.8x5.2m) with a ground plane and at a distance of 3m.
The measuring antenna height was varied between 1 to 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization.
In any 100kHz bandwidth outside the frewuency band in which the spread spectrum intentional radiator is operating, the rafdio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

Test data : **APPENDIX 3**
Test result : **Pass**
Test instruments : **MTR-01, MCC-04, MCC-06,MHA-05**

SECTION10: Power Density, Section 15.247(d)

Test Procedure
The Power density was measured with a spectrum analyzer connected to the antenna port.
Test data : APPENDIX 3
Test result : Pass
Test instruments : MTR-01, MCC-04

SECTION 11: Spurious Emission, Section 15.247(c)

[Conducted]
Test Procedure
The Spurious Emission (Conducted) was measured with a spectrum analyzer connected to the antenna port.

Test data	**:**	**APPENDIX 3**
Test result	**:**	**Pass**
Test instruments	**:**	**MTR01, MCC-04**

[Radiated]
Test Procedure
EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.
The Radiated Electric Field Strength intensity has been measured in No.2 semi anechoic chamber (7.5x5.8x5.2m) with a ground plane and at a distance of 3m.
The measuring antenna height was varied between 1 to 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization.
The maximum output power of EUT was confirmed as the worst case condition in the photo of APPENDIX.

Test data	**:**	**APPENDIX 3**
Test result	**:**	**Pass**
Test instruments	**:**	**MTR-01, MCC-12, MCC-04, MCC-06,MHA-05, MPA-01** **MBA-03, MLA-03, MPA-04, MAT-07,** **MBF-01, MHA-01, MTR-02**

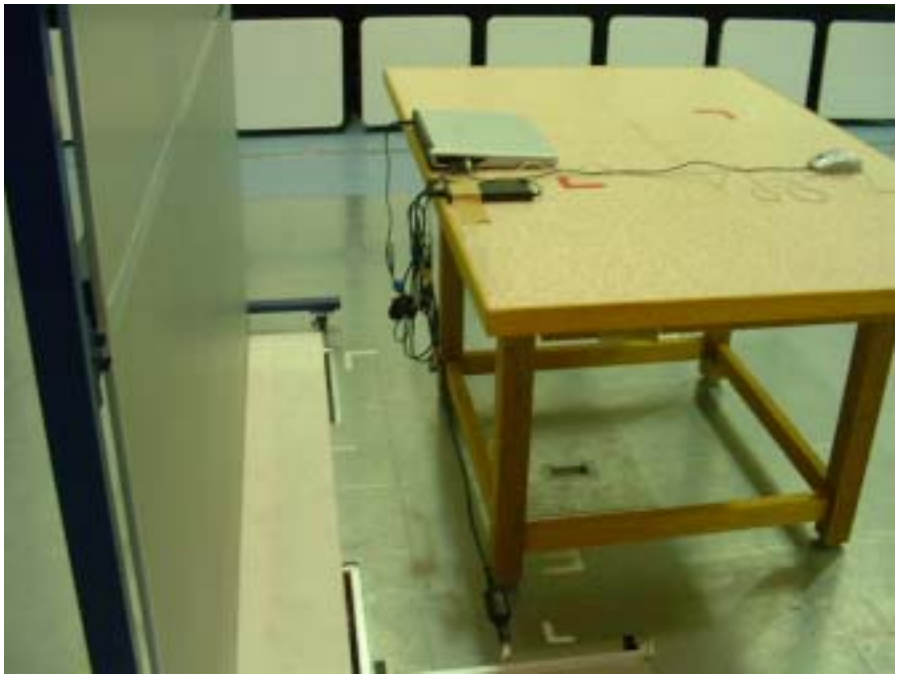
APPENDIX 1: Photographs of test setup

APPENDIX 2: Test instruments

APPENDIX 3: Data of EMI test

APPENDIX 1: Photographs of test setup

Conducted Emission



Spurious Emission (Radiated)

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