# RADIO TEST REPORT

## Test Report No. : 29EE0190-HO-01-C

| | | |
|---|---|---|
| **Applicant** | : | **Sony Computer Entertainment Inc.** |
| **Type of Equipment** | : | **PSP** |
| **Model No.** | : | **PSP-3001** |
| **FCC ID** | : | **AK8PSP3001B** |
| **Test regulation** | : | **FCC Part 15 Subpart C 2009 Section 15.207, Section 15.247** |
| **Test Result** | : | **Complied** |

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

**Date of test:** December 22, 2008 to January 27, 2009

**Tested by:**

| Takumi Shimada | Kazuya Yoshioka | Kenichi Adachi |
|---|---|---|
| EMC Services | EMC Services | EMC Services |

**Approved by :**

Mitsuru Fujimura
Assistant Manager of EMC Services

NVLAP LAB CODE: 200572-0

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# SECTION 1: Customer information

| | |
|---|---|
| Company Name | Sony Computer Entertainment Inc. |
| Brand name | Sony |
| Address | 2-6-21 Minami-Aoyama, Minato-ku,Tokyo,107-0062, Japan |
| Telephone Number | +81-3-6483-8023 |
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| Contact Person | Tatsuya Suzuki |

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

## 2.1 Identification of E.U.T.

| | |
|---|---|
| Type of Equipment | PSP |
| Model No. | PSP-3001 |
| Serial No. | 03-TSP1320H-0000430-PSPXXXX for Conducted Emission and Radiated emission tests<br>03-TSP1320H-0000467-PSPXXXX for Antenna Terminal Conducted tests |
| WLAN Module | Module 2 |
| Rating | DC 5V, AC Adaptor (AC 100V-240V) |
| Country of Manufacture | China |
| Condition of EUT | Production prototype<br>(Not for sale: This sample is equivalent to mass-produced items.) |
| Receipt Date of Sample | December 22, 2008 |

## 2.2 Product Description

Radio Specification

Wireless LAN Module (IEEE802.11b)

| | |
|---|---|
| Equipment Type | Transceiver |
| Frequency of Operation | 2412-2462 MHz |
| Clock Frequency | 40MHz |
| ITU Code | G1D |
| Type of Modulation | DSSS |
| Method of frequency generation | Crystal |
| Antenna model | HBS01-SO01 |
| Antenna type | Inverted F antenna |
| Antenna Gain | +3.5 dBi (Max.) |

# SECTION 3: Test specification, procedures & results

## 3.1 Test Specification

| | | |
|---|---|---|
| Test Specification | : | FCC Part15 Subpart C: 2009, final revised on February 17, 2009 |
| Title | : | FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators<br>Section 15.207 Conducted limits<br>Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz |

*The revision on February 17, 2009 does not influence the test specification applied to the EUT

The EUT complies with FCC Part 15 Subpart B. Refer to the test report 29EE0162-YW.

**FCC 15.31 (e)**
This EUT provides stable voltage (DC3.1V/1.9V) constantly to RF Part regardless of input voltage. (For details, refer to Block Diagram for the product.) Therefore, this EUT complies with the requirement.

**FCC Part 15.203 Antenna requirement**
It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

### 3.2 Procedures and results

**[DSSS and other forms of modulation ]**

| No. | Item | Test Procedure | Specification | Remarks | Deviation | Worst margin | Results |
|---|---|---|---|---|---|---|---|
| 1 | Conducted emission | **FCC:** ANSI C63.4:2003 7. AC powerline conducted emission measurements | **FCC:** Section 15.207 | Conducted | N/A | **[QP]** 20.6dB 0.19330MHz, L **[AV]** 19.9dB 0.19330MHz, L | Complied |
| | | **IC:** RSS-Gen 7.2.2 | **IC:** RSS-Gen 7.2.2 | | | | |
| 2 | 6dB Bandwidth | **FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" | **FCC:** Section 15.247(a)(2) | Conducted | N/A | See data. | Complied |
| | | **IC:** RSS-Gen 4.6.2 | **IC:** RSS-210 A8.2(a) | | | | |
| 3 | Maximum Peak Output Power | **FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" | **FCC:** Section 15.247(b)(3) | Conducted | N/A | | Complied |
| | | **IC:** RSS-Gen 4.8 | **IC:** RSS-210 A8.4(4) | | | | |
| 4 | Restricted Band Edges | **FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" | **FCC:** Section 15.247 (d) | Conducted/ Radiated | N/A | | Complied |
| | | **IC:** - | **IC:** RSS-210 A8.5 | | | | |
| 5 | Power Density | **FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" | **FCC:** Section 15.247 (e) | Conducted | N/A | | Complied |
| | | **IC:** - | **IC:** RSS-210 A8.2(b) | | | | |
| 6 | Spurious Emission | **FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" | **FCC:** Section15.247(d) | Conducted/ Radiated | N/A | **[Tx]** 6.6dB 4924.00MHz Vertical, AV **[Rx]** 7.6dB 77.187MHz Vertical, QP | Complied |
| | | **IC:** RSS-Gen 4.9 RSS-Gen 4.10 | **IC:** RSS-210 A8.5 RSS-Gen 7.2.1 and 7.2.3 | | | | |
| Note: UL Japan, Inc.'s EMI Work Procedures No.QPM05 and QPM15. | | | | | | | |

*These tests were performed without any deviations from test procedure except for addition or exclusion.
* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

### 3.3 Addition to standards

| No. | Item | Test Procedure | Specification | Remarks | Deviation | Worst margin | Results |
|---|---|---|---|---|---|---|---|
| 1 | 99% Occupied Bandwidth | **IC:** RSS-Gen 4.6.1 | **IC:** RSS-Gen 4.6.1 | Conducted | N/A | N/A | N/A |

### 3.4 Uncertainty

**EMI**
The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

| Test room | Conducted emission | Radiated emission (10m*) | | | Radiated emission (3m*) | | | Radiated emission (3m*) | |
|---|---|---|---|---|---|---|---|---|---|
| | 150kHz-30MHz | 9kHz-30MHz | 30MHz-300MHz | 300MHz-1GHz | 9kHz-30MHz | 30MHz-300MHz | 300MHz-1GHz | 1GHz-18GHz | 18GHz-40GHz |
| No.1 semi-anechoic chamber (±) | 3.7dB | 3.1dB | 4.4dB | 4.2dB | 3.2dB | 3.8dB | 3.9dB | 5.9dB | 6.1dB |
| No.2 semi-anechoic chamber (±) | 3.7dB | - | - | - | 3.2dB | 4.4dB | 4.0dB | 5.9dB | 6.1dB |
| No.3 semi-anechoic chamber (±) | 3.7dB | - | - | - | 3.2dB | 4.6dB | 4.0dB | 5.9dB | 6.1dB |
| No.4 semi-anechoic chamber (±) | 3.7dB | - | - | - | 3.2dB | 3.9dB | 3.9dB | 5.9dB | 6.1dB |

*10m/3m = Measurement distance

Conducted emission test
The data listed in this test report has enough margin, more than the site margin.

Radiated emission test(3m)
The data listed in this test report has enough margin, more than the site margin.

Other test except Conducted Emission and Spurious Emission (Radiated)
The measurement uncertainty for this test is 3.0dB.

### 3.5 Test Location

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| | FCC Registration Number | IC Registration Number | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Other rooms |
|---|---|---|---|---|---|
| No.1 semi-anechoic chamber | 313583 | 2973C-1 | 19.2 x 11.2 x 7.7m | 7.0 x 6.0m | No.1 Power source room |
| No.2 semi-anechoic chamber | 655103 | 2973C-2 | 7.5 x 5.8 x 5.2m | 4.0 x 4.0m | - |
| No.3 semi-anechoic chamber | 148738 | 2973C-3 | 12.0 x 8.5 x 5.9m | 6.8 x 5.75m | No.3 Preparation room |
| No.3 shielded room | - | - | 4.0 x 6.0 x 2.7m | N/A | - |
| No.4 semi-anechoic chamber | 134570 | 2973C-4 | 12.0 x 8.5 x 5.9m | 6.8 x 5.75m | No.4 Preparation room |
| No.4 shielded room | - | - | 4.0 x 6.0 x 2.7m | N/A | - |
| No.5 semi-anechoic chamber | - | - | 6.0 x 6.0 x 3.9m | 6.0 x 6.0m | - |
| No.6 shielded room | - | - | 4.0 x 4.5 x 2.7m | 4.75 x 5.4 m | - |
| No.6 measurement room | - | - | 4.75 x 5.4 x 3.0m | 4.75 x 4.15 m | - |
| No.7 shielded room | - | - | 4.7 x 7.5 x 2.7m | 4.7 x 7.5m | - |
| No.8 measurement room | - | - | 3.1 x 5.0 x 2.7m | N/A | - |
| No.9 measurement room | - | - | 8.0 x 4.5 x 2.8m | 2.0 x 2.0m | - |
| No.10 measurement room | - | - | 2.6 x 2.8 x 2.5m | 2.4 x 2.4m | - |
| No.11 measurement room | - | - | 3.1 x 3.4 x 3.0m | 2.4 x 3.4m | - |

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

### 3.6 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 Mode(s)

The mode used for test :

| Test | Mode | Tested frequency |
|---|---|---|
| Conducted Emission<br>Spurious Emission | WLAN 11b Transmitting (Tx), 11Mbps *1) | 2412MHz(L)<br>2437MHz(M)<br>2462MHz(H) |
| | WLAN 11b Receiving (Rx) | 2437MHz(M) |
| 6dB Bandwidth<br>Maximum Peak Output Power<br>Power Density<br>99% Occupied Bandwidth | WLAN 11b Transmitting (Tx), 11Mbps *1) | 2412MHz(L)<br>2437MHz(M)<br>2462MHz(H) |
| Restricted Band Edge | WLAN 11b Transmitting (Tx), 11Mbps *1) | 2412MHz(L)<br>2462MHz(H) |

*Transmitting duty was 100% on all tests.
*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum power.
*1) Continuous transmitting of the signal, which is spread with complimentary code (8bit) defined in the Chapter 18 of IEEE Std 802.11b.

## 4.2 Configuration and peripherals

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## SECTION 5: Conducted Emission

**Test Procedure and conditions**

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m 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. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)
I/O cable 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. All unused 50ohm connectors of the LISN(AMN) were resistivity terminated in 50ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber or a Measurement Room.
The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

**Detector : quasi-peak and average detector (IF BW 9 kHz)**
**Measurement range : 0.15-30MHz**
**Test data : APPENDIX 2**
**Test result : Pass**

## SECTION 6: Spurious Emission

**[Conducted]**
**Test Procedure**
The Out of Band Emission was measured with a spectrum analyzer connected to the antenna port.
It was measured based on "1. RF antenna conducted test" of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".
The following spectrum analyzer setting was used:

- RBW: 100kHz
- VBW: 300kHz
- Sweep: Auto
- Detector: Peak
- Trace: Max Hold

**Test data : APPENDIX 2**
**Test result : Pass**

**[Radiated]**
**Test Procedure**
It was measured based on "2. Radiated emission test" of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".
EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane.
The Radiated Electric Field Strength intensity has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m(Below 10GHz) and 1m(Upper 10GHz).
The height of the measuring varied between 1 and 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 with the Test Receiver, or the Spectrum Analyzer.
The radiated emission measurements were made with the following detector function of the test receiver and the Spectrum analyzer.
In any 100kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio 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.

**20dBc was applied to the frequency over the limit of FCC 15.209 / Table 2 of RSS-210 2.7 (IC) and outside the restricted band of FCC15.205 / Table 1 of RSS-210 2.7 (IC).**

| Frequency | Below 1GHz | Above 1GHz |
|---|---|---|
| Instrument used | Test Receiver / Spectrum Analyzer | Spectrum Analyzer *1) |
| Detector<br>IF Bandwidth | QP: BW 120kHz(T/R)<br>20dBc : RBW: 100kHz<br>VBW: 300kHz (S/A) | PK: RBW: 1MHz/VBW: 1MHz<br>AV *2): RBW: 1MHz/VBW: 10Hz<br>20dBc: RBW: 100kHz/VBW: 300kHz |

*1) The Spectrum Analyzer was used in 3dB resolution bandwidth.
*2) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

**Test data : APPENDIX 2**
**Test result : Pass**

# SECTION 7: Bandwidth

## 6dB Bandwidth

**Test Procedure**

The bandwidth was measured with a spectrum analyzer connected to the antenna port.
It was measured based on "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".
The following spectrum analyzer setting was used:

- Span: 50MHz
- RBW: 100kHz
- VBW: 300kHz
- Sweep: Auto
- Detector: Peak
- Trace: Max Hold

**Test data : APPENDIX 2**
**Test result : Pass**

## 99% Occupied Bandwidth

**Test Procedure**

The bandwidth was measured with a spectrum analyzer connected to the antenna port.
The following spectrum analyzer setting was used:

- Span: Enough width to display 20dB Bandwidth
- RBW: as close to 1% of the Span as is possible without being below 1%
- VBW: Three times of RBW
- Sweep: Auto
- Detector: Peak
- Trace: Max Hold

**Test data : APPENDIX 2**
**Test result : Pass**

## SECTION 8: Maximum Peak Output Power

**Test Procedure**

The Maximum Peak Output Power was measured with a power meter (tested bandwidth: 50MHz) connected to the antenna port.
It was measured based on "Power Output Option 1" of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".

**Test data : APPENDIX 2**
**Test result : Pass**

## SECTION 9: Peak Power Density

**[Conducted]**
**Test Procedure**
The Peak Power Density was measured with a spectrum analyzer connected to the antenna port.
It was measured based on "PSD Option 1" of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".

- Span: 9MHz
- RBW: 30kHz*)
- VBW: 100kHz
- Sweep: 300sec
- Detector: Peak
- Trace: Max Hold

*) The test was not performed at RBW: 3kHz that was stated in the Regulation.
However, the measurement value with RBW:3kHz is less than the value of RBW:30kHz and the test data met the limit with RBW:3kHz.

**Test data : APPENDIX 2**
**Test result : Pass**