



## RADIO TEST REPORT

Test Report No. : 29HE0053-HO-01-A-R2

Applicant : Sony Computer Entertainment Inc.  
Type of Equipment : Handheld Entertainment System  
Model No. : PSP-N1001  
FCC ID : AK8PN1001A1  
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.
6. Original test report number of this report is 29HE0053-HO-01-A.

Date of test: March 18 to May 25, 2009

Tested by:

Takayuki Shimada  
EMC Services

Approved by :

Mitsuru Fujimura  
Assistant Manager of EMC Services



NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.  
\*As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://uljapan.co.jp/emc/nvlap.html>

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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
Facsimile Number	+81-3-6483-8642
Contact Person	Akiko Tsukada

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

### **2.1 Identification of E.U.T.**

Type of Equipment	Handheld Entertainment System
Model No.	PSP-N1001
Serial No.	0000605: Used for Conducted Emission and Radiated emission tests 0000707: Used for Antenna Terminal Conducted tests
Rating	DC 5V, AC Adaptor (AC 100V-240V)
Country of Manufacture	China
Condition of EUT	Production prototype (Not for sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample	March 9, 2009

### **2.2 Product Description**

Model No: PSP-N1001 (referred to as the EUT in this report) is the Handheld Entertainment System.  
The clock frequency used in EUT: Maximum clock frequency: 480 MHz

#### **Bluetooth (Ver. 2.0+EDR)**

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Clock Frequency	26MHz
Type of Modulation	FHSS (GFSK, $\pi/4$ DQPSK, 8DPSK)
Bandwidth & Channel spacing	1MHz & 1MHz
Power Supply (inner)	DC 3.2V/DC 1.9V
Antenna Type	Inverted F Antenna
Antenna Connector Type	N/A
Antenna Gain	-1.9 dBi max

For Bluetooth (Ver. 2.0+EDR) part, please see the test report number 29HE0053-HO-01-B-R2.

#### **Wireless LAN Module (IEEE802.11b)**

Equipment Type	Transceiver
Frequency of Operation	2412-2462 MHz
Clock Frequency	40MHz
Type of Modulation	DSSS
Bandwidth & Channel spacing	20MHz & 5MHz
Power Supply (inner)	DC 3.1V/DC 1.9V
Antenna Type	Mono-pole antenna
Antenna Connector Type	N/A
Antenna Gain	+1.1 dBi max

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List of Model No.:

Handheld Entertainment System

Model No.	Items			Prototype No.
	Destination	Manufacture	Ver.	
PSP-N1001	UC2	1	-	CEM-N1001F

AC Adaptor

Model Name(SCE type names) & Distributions	P/S cord Spec. No. (see Info. Below)	Mfr. Name	Vendor Type Names	Rating
PSP-N100 UC2	2	Sony Corporation	ACC-161	input: 100-240V, 50/60Hz, 0.2A output: 5Vdc, 1500mA

Power Supply Cord

Spec.No.	Distributions	Parts Name	Company Name	Type No.	Rating/Specification
2	UC2	Plug	HIRAKAWA HEWTECH CORP.	Plug:VM0228A,	125V ac, 7A ac
		/Cord		Cord:NISPT-2	1.5m long
		/Connector		Connector:VM0296	
2	UC2	Plug	I-Sheng	Plug:SP-12N	125V ac, 7A ac
		/Cord		Cord:NISPT-2	1.5m long
		/Connector		Connector:IS-037A	

\*Above two power codes are equivalent. Therefore, these are not influenced to the result of EMC testing.

Factory:

1. Hongfujin Precision Electronics (Yantai) Co., Ltd.

B Sec Export Processing Zone, 50 Beijing Zhong RD, Yantai Economic & Technological Development Area, Yantai Shandong China

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### **SECTION 3: Test specification, procedures & results**

#### **3.1 Test Specification**

Test Specification : FCC Part15 Subpart C: 2009, final revised on February 27, 2009

Title : FCC 47CFR Part15 Radio Frequency Devices Subpart C Intentional Radiators  
Section 15.207 Conducted limits  
Section 15.247 Operation within the bands 902-928MHz,  
2400-2483.5MHz, and 5725-5850MHz

The EUT complies with FCC Part 15 Subpart B. Refer to the test report 29HE0064-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.

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### 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 IC: RSS-Gen 7.2.2	FCC: Section 15.207 IC: RSS-Gen 7.2.2	Conducted	N/A	[QP] 11.0dB, 0.20415MHz, L [AV] 19.0dB 0.20375MHz, N	Complied
2	6dB Bandwidth	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" IC: RSS-Gen 4.6.2	FCC: Section 15.247(a)(2) IC: RSS-210 A8.2(a)	Conducted	N/A	See data.	Complied
3	Maximum Peak Output Power	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" IC: RSS-Gen 4.8	FCC: Section 15.247(b)(3) IC: RSS-210 A8.4(4)	Conducted	N/A		Complied
4	Restricted Band Edges	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" IC: -	FCC: Section 15.247 (d) IC: RSS-210 A8.5	Conducted/ Radiated	N/A		Complied
5	Power Density	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" IC: -	FCC: Section 15.247 (e) IC: RSS-210 A8.2(b)	Conducted	N/A		Complied
6	Spurious Emission	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" IC: RSS-Gen 4.9 RSS-Gen 4.10	FCC: Section15.247(d) IC: RSS-210 A8.5 RSS-Gen 7.2.1 and 7.2.3	Conducted/ Radiated	N/A	[Tx] 10.0dB 9848.00MHz AV, Vertical [Rx] 9.4dB 9748.00MHz AV, Vertical	Complied*1)

Note: UL Japan, Inc.'s EMI Work Procedures No.QPM05 and QPM15.

\*1) Co-location & Co-operation are included in this test.

\* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

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### 3.3 Addition to standard

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-Gen 4.6.1	RSS-Gen 4.6.1	Radiated	N/A	N/A	N/A

Other than above, no addition, exclusion nor deviation has been made from the standard.

### 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.

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### 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	WLAN 11b Transmitting (Tx), 11Mbps *1)	2412MHz(L) 2437MHz(M) 2462MHz(H)
	WLAN 11b Receiving (Rx)	2437MHz(M)
6dB Bandwidth Maximum Peak Output Power Power Density 99% Occupied Bandwidth	WLAN 11b Transmitting (Tx), 11Mbps *1)	2412MHz(L) 2437MHz(M) 2462MHz(H)
Restricted Band Edge	WLAN 11b Transmitting (Tx), 11Mbps *1)	2412MHz(L) 2462MHz(H)
	WLAN 11b Transmitting (Tx), 11Mbps *1) BT 3DH5 Hopping On, PRBS9*2)	
Spurious Emission*3)	WLAN 11b Transmitting (Tx), 11Mbps *1)	2412MHz(L) 2437MHz(M) 2462MHz(H)
	WLAN 11b Transmitting (Tx), 11Mbps *1) BT 3DH5 Hopping On, PRBS9*2)	2437MHz(M)
	WLAN 11b Receiving (Rx)	2437MHz(M)

\*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 rated power.

\*1) Continuous transmitting of the signal, which is spread with complimentary code (8bit) defined in the Chapter 18 of IEEE Std 802.11b.

\*2) This mode is for Co-location & Co-operation.

\*3) The Spurious Emission test at Stand Alone was performed with the full-charged battery.

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## 4.2 Configuration and peripherals

**This page has been submitted for a separate exhibit.**

## **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. 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

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**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 Section 15.247".

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 Section 15.247".

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 FCC 15.205 / Table 1 of RSS-210 2.7 (IC).**

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

\*1) 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**

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## **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 Section 15.247".  
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: 15MHz
- RBW: 30kHz\*)
- VBW: 100kHz
- Sweep: 500sec(Span/RBW)
- Detector: Peak
- Trace: Max Clear Write

\*) 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

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