

# RADIO TEST REPORT

**Test Report No.: 27AE0069-HO-B**

**Applicant** : Sony Computer Entertainment Inc.  
**Type of Equipment** : PLAYSTATION®3  
**Model No.** : CECHA01  
**FCC ID** : AK8CBEH1000  
**Test standard** : FCC Part 15 Subpart C  
Section 15.207, Section 15.247: 2006  
**Test Result** : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.

**Date of test:**

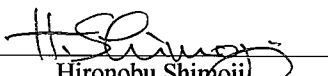
August 21 to 30, 2006

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NVLAP LAB CODE: 200572-0

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\*As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://ulapex.jp/emc/nvlap.htm>

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## **SECTION 1: Client information**

Company Name	Sony Computer Entertainment Inc.
Brand Name	SONY
Address	2-6-21 Minamiaoyama, Minato-ku, Tokyo, 107-0062, Japan
Telephone Number	+81-3-6438-8625
Facsimile Number	+81-3-6438-8607
Contact Person	Akiko Tsukada

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

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

Type of Equipment	PLAYSTATION®3
Model No	CECHA01
Serial No	G1D0184
Rating	AC 120V/60Hz
Country of Manufacture	JAPAN
Receipt Date of Sample	August 9, 2006
Condition of EUT	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	No modification by the test lab.

### **2.2 Product Description**

Model: CECHA01, referred to as the EUT in this report, is a PLAYSTATION®3.  
Clock Frequencies are CPU:3.2GHz(CPU), 66MHz(ATA), 133MHz(ATA), 33MHz(PCI), and 750MHz(SATA1).  
It contains Bluetooth (Ver. 2.0+EDR) module and IEEE802.11b/g WLAN module.  
Those modules do not transmit simultaneously.

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

Equipment Type	Transceiver	
Frequency of Operation	2402-2480MHz	
Type of Modulation	FHSS (GFSK, $\pi$ /4DQPSK, 8DPSK)	
Bandwidth & Channel spacing	1MHz & 1MHz	
Power Supply (inner)	DC3.3V	
Antenna Type	ANT1: Reverse F Antenna (manufacturer: SMK / AMP)	ANT2: Dipole Antenna
Antenna Gain	ANT1: 0.21dBi (max)	ANT2: 4.13 dBi (max)
Antenna Connector Type	ANT1: N/A	ANT2: N/A

\*For Bluetooth module test, please see UL Apex Test Report No. 27AE0069-HO-A.

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**IEEE802.11b/g WLAN**

Equipment Type	Transceiver	
Frequency of Operation	2412-2462MHz	
Type of Modulation	DSSS/OFDM	
Bandwidth & Channel spacing	20MHz & 5MHz	
Power Supply (inner)	DC 3.3V/DC1.3V	
Antenna Type	ANT0: Reverse F Antenna	ANT1: Reverse F Antenna
Antenna Gain	ANT0: 0.10dBi max	ANT1: 0.91dBi max
Antenna Connector Type	ANT0: U.FL	ANT1: N/A

**[Variant model]**

PLAYSTATION®3 (model: CECHA01) has variant models, Debugging Station (model: DECHA00A and DECHA00AS). The differences between the EUT and variants are the software program and logo on the enclosure. There is no difference in the hardware and the radio characteristics.

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

#### **3.1 Test Specification**

Test Specification : FCC Part15 Subpart C : 2006

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
Section 15.207 Conducted limits : 2006  
Section 15.247 Operation within the bands 902-928MHz,  
2400-2483.5MHz, and 5725-5850MHz: 2006

### 3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Mode*0)	Deviation	Worst margin*1)	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	-	1, 2, 3	N/A	4.5dB 0.22564MHz AV, N	Complied
2	6dB Bandwidth	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: RSS-Gen 4.4.2	FCC: Section 15.247(a)(2) IC: RSS-210 A8.2(1)	Conducted	1, 2	N/A	See data.	Complied
3	Maximum Peak Output Power	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: RSS-Gen 4.6	FCC: Section 15.247(b)(3) IC: RSS-210 A8.4(4)	Conducted	1, 2	N/A		Complied
4	Restricted Band Edges	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: -	FCC: Section 15.247 (d) IC: RSS-210 A8.5	Conducted/ Radiated	1, 2	N/A		Complied
5	Power Density	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: -	FCC: Section 15.247 (e) IC: RSS-210 A8.2(2)	Conducted	1, 2	N/A		Complied
6	Spurious Emission	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: RSS-Gen 4.7 RSS-Gen 4.8	FCC: Section 15.247(d) IC: RSS-210 A8.5 RSS-Gen 7.2.1 and 7.2.3	Conducted/ Radiated	1, 2, 3	N/A		<b>Tx</b> 4.6dB 68.193MHz (IEEE802.11b, 2437MHz) 68.192MHz (IEEE802.11b, 2462MHz) Horizontal, QP <b>Rx</b> 1.4dB 338.689MHz Horizontal, QP

Note: UL Apex's EMI Work Procedures No.QPM05 and QPM15.

\*0) Please refer to Section 4.1 for details of test mode.

\*1) The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

\*These tests were also referred to "Guidance on Measurement of Digital Transmission Systems Operating under Section 15.247".

\*These tests were performed without any deviations from test procedure except for additions or exclusions.

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### 3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Mode *0)	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-Gen 4.4.1	RSS-Gen 4.4.1	Conducted	1, 2	N/A	N/A	N/A

\*0) Please refer to Section 4.1 for details of test mode.

### 3.4 Uncertainty

#### Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is  $\pm 2.6$ dB.  
The data listed in this test report has enough margin, more than the site margin.

#### Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is  $\pm 4.59$ dB(3m)/  
 $\pm 4.58$ dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is  $\pm 4.62$ dB(3m)/  
 $\pm 4.60$ dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is  $\pm 5.27$ dB.  
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

#### Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is  $\pm 3.0$ dB.

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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	IC4247A	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	655103	IC4247A-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	IC4247A-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	IC4247A-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	-
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	N/A	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	2.0 x 2.0 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 5.4 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	-

\* 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.7 shielded room.

### 3.6 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.



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

### **4.1 Operating Modes**

The mode used for test :

1. Transmitting mode 11b (CCK 11Mbps (Worst), Packet type: Maximum, Payload: PN9)
  - Low Channel : 2412MHz (Ch1)
  - Mid Channel : 2437MHz (Ch6)
  - High Channel : 2462MHz (Ch11)
  
2. Transmitting mode 11g (OFDM 54Mbps, Packet type: Maximum, Payload: PN9)
  - Low Channel : 2412MHz(Ch1)
  - Mid Channel : 2437MHz(Ch6)
  - High Channel : 2462MHz(Ch11)
  
3. Receiving mode 11b/g (Receiving mode is common for 11g and 11g.)
  - Mid Channel : 2437MHz (Ch6)

\* Output power can be set at two levels for both 11b and 11g. Test was performed with the higher power level.

#### **Conditions:**

Date rate: 11b 1, 2, 5.5, 11 Mbps  
11g 6, 9, 12, 18, 24, 36, 48, 54 Mbps

After pre-check, the formal test was performed with the following data rate that has the maximum conducted output power.

- 11Mbps for 11b
- 54Mbps for 11g.

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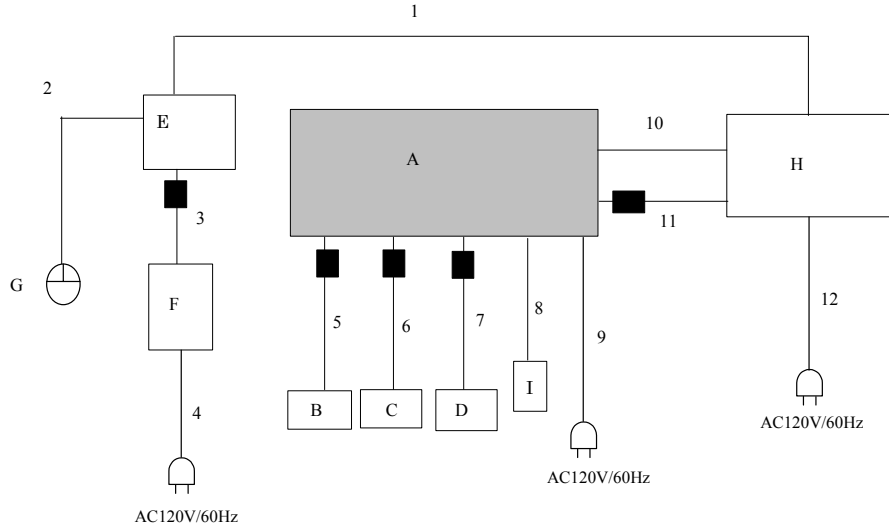
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4.2 Configuration and peripherals



■ : Standard Ferrite Core

\* Cabling and setup were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	PLAYSTATION®3	CECHA01	G1D0184	Sony Computer Entertainment Inc.	EUT
B	PLAYSTATION®3 Controller	CBEH-1010	KT44010225	Sony Computer Entertainment Inc.	-
C	PLAYSTATION®3 Controller	CBEH-1010	KT44010225	Sony Computer Entertainment Inc.	-
D	PLAYSTATION®3 Controller	CBEH-1010	KT44010225	Sony Computer Entertainment Inc.	-
E	Note PC	ThinkPad X40	KV-DNK71	IBM	-
F	AC Adaptor	02K6808	-	IBM	-
G	Mouse	M-UB48	LZE02601001	Logitech	-
H	LCD Monitor	L205GL	5Z001932GJ	MITSUBISHI	-
I	USB Memory	-	-	IO DATA	-

**List of cables used**

No.	Name	Length (m)	Cable Shielding	Connector Shielding	Remark
1	LAN Cable	2.8	Shielded	Shielded	-
2	USB Cable	0.8	Shielded	Shielded	-
3	DC Cable	1.8	Unshielded	Unshielded	One ferrite core (standard attachment)
4	AC Cable	1.0	Unshielded	Unshielded	-
5	USB Cable	1.4	Shielded	Shielded	One ferrite core (standard attachment)
6	USB Cable	1.4	Shielded	Shielded	One ferrite core (standard attachment)
7	USB Cable	1.4	Shielded	Shielded	One ferrite core (standard attachment)
8	USB extension Cable	1.0	Shielded	Shielded	-
9	AC Cable	2.5	Unshielded	Unshielded	-
10	HDMI Cable	1.0	Shielded	Shielded	-
11	AV Multi Cable	4.5	Unshielded	Unshielded	One ferrite core (standard attachment)
12	AC Cable	2.0	Unshielded	Unshielded	-

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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 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. 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.

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.

<b>Detector</b>	<b>: CISPR quasi-peak and average detector (IF BW 9 kHz)</b>
<b>Measurement range</b>	<b>: 0.15-30MHz</b>
<b>Test data</b>	<b>: APPENDIX 3</b>
<b>Test result</b>	<b>: Pass</b>

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## **SECTION 6: Bandwidth**

### **Test Procedure**

The bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3  
Test result : Pass

## **SECTION 7: Maximum Peak Output Power**

### **Test Procedure**

The Maximum Peak Output Power was measured with power meter connected to the antenna port.

Test data : APPENDIX 3  
Test result : Pass

## **SECTION 8: Peak Power Density**

[Conducted]

### **Test Procedure**

The Peak Power Density was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3  
Test result : Pass

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## **SECTION 9: Spurious Emission**

### **[Conducted]**

#### **Test Procedure**

The Out of Band Emission was measured with a spectrum analyzer connected to the antenna port.

**Test data : APPENDIX 3**

**Test result : Pass**

### **[Radiated]**

#### **Test Procedure**

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 80cm 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 (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

In any 100kHz bandwidth outside the frequency 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 FCC15.209 /Table 2 of RSS-210 2.7 (IC) and outside the restricted band of FCC15.205 / Table 1 of RSS-210 2.7 (IC).**

**(\*frequencies at which the margin is below the site uncertainty described in Section 3.4)**

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: RBW:1MHz/VBW:10Hz 20dBc : RBW:100kHz/VBW:300kHz

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

**Test data : APPENDIX 3**

**Test result : Pass**

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