



# RADIO TEST REPORT

Test Report No. : 27EE0056-HO-A

Applicant : Sony Corporation  
Type of Equipment : DVD Receiver  
Model No. : HCD-DH7BT  
FCC ID : AK8HCDDH7BT  
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:

December 9 to 16, 2006

Tested by:

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EMC Services

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Approved by :

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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://ulapex.jp/emc/nvlap.htm>

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## **SECTION 1: Client information**

Company Name : Sony EMCS Corporation Saitama TEC\*  
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Contact Person : Kikuo Murata

\* Sony EMCS Corporation Saitama TEC is on behalf of the applicant: Sony Corporation.

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

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

Type of Equipment : DVD Receiver  
Model No. : HCD-DH7BT  
Serial No. : 1  
Rating : AC120V/60Hz  
Country of Manufacture : China  
Receipt Date of Sample : December 8, 2006  
Condition of EUT : Engineering 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 No: HCD-DH7BT (referred to as the EUT in this report) is the DVD Receiver.

Clock frequency(ies) in the system : Microcomputer clock: 5MHz, Clock IC: 32.768kHz,  
Bluetooth DSP: 24MHz, AMP DSP: 49.152MHz,  
XM IC: 45.158MHz, DVD DSP: 27MHz  
Equipment Type : Transceiver  
Frequency of Operation : 2402-2480MHz  
Bandwidth & Channel spacing : 1MHz & 1MHz / CH  
Modulation : FHSS  
Power Supply (inner) : DC 3.3V  
Antenna Type : Pattern Antenna  
Antenna Gain : 1.0dBi

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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

#### **FCC 15.31 (e)**

This EUT provides stable voltage (DC3.3V) constantly to RF Module regardless of input voltage. 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

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin*0)	Results						
1	Conducted emission	FCC: ANSI C63.4:2003 7. AC powerline conducted emission measurements	FCC: Section 15.207	-	N/A	11.7dB 0.38440MHz AV, N	Complied						
		IC: RSS-Gen 7.2.2	IC: RSS-Gen 7.2.2										
2	Carrier Frequency Separation	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators	FCC: Section 15.247(a)(1)	Conducted	N/A	See data.	Complied						
		IC: -	IC: RSS-210 A8.1 (2)										
3	20dB Bandwidth	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators	FCC: Section 15.247(a)(1)	Conducted	N/A			See data.	Complied				
		IC: -	IC: RSS-210 A8.1 (1)										
4	Number of Hopping Frequency	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators	FCC: Section 15.247(a)(1)(iii)	Conducted	N/A					See data.	Complied		
		IC: -	IC: RSS-210 A8.1 (4)										
5	Dwell time	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators	FCC: Section 15.247(a)(1)(iii)	Conducted	N/A							See data.	Complied
		IC: -	IC: RSS-210 A8.1 (4)										
6	Maximum Peak Output Power	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators	FCC: Section 15.247(b)(1)	Conducted	N/A	See data.	Complied						
		IC: RSS-Gen 4.6	IC: RSS-210 A8.4 (2)										
7	Band Edge Compliance	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators	FCC: Section 15.247(d)	Conducted	N/A			See data.	Complied				
		IC: -	IC: RSS-210 A8.5										
8	Spurious Emission	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators	FCC: Section 15.247(d)	Conducted Radiated	N/A					See data.	Complied		
		IC: RSS-Gen 4.7 RSS-Gen 4.8	IC: RSS-210 A8.5 RSS-Gen 7.2.1 and 7.2.3										

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

\*0) 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 FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".

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

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### 3.3 Additions or deviations to standards

No addition, deviation, nor exclusion has been made from standards.

### 3.4 Uncertainty

#### Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is  $\pm 2.66$ 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).  
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is  $\pm 4.62$ dB(3m).  
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is  $\pm 5.27$ dB.  
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 (with a 95% confidence level) for this test is  $\pm 3.0$ dB.

### 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. 6 and No.7 shielded rooms.

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

Refer to APPENDIX 1 to 3.

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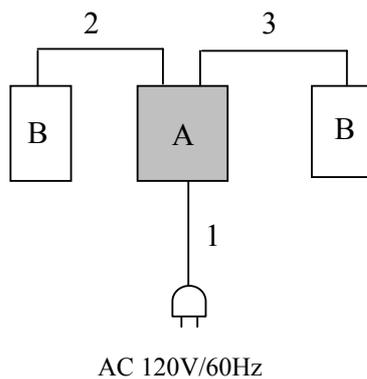
## SECTION 4: Operation of E.U.T. during testing

### 4.1 Operating Modes

The mode used for test : [FHSS:Bluetooth]  
Transmitting mode(Packet size DH5, Data packet: PRBS9)  
- Low Channel : 2402MHz  
- Mid Channel : 2441MHz  
- High Channel : 2480MHz  
Inquiry mode

Remarks: Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT. However, the limit level 125mWof AFH mode was used for the test.

### 4.2 Configuration and peripherals



\* 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	DVD Receiver	HCD-DH7BT	1	SONY	EUT
B	Speaker system	SS-CDH3	1	SONY	-

#### List of cables used

No.	Name	Length (m)	Shield	
			Cable	Connector
1	AC Power Cord	1.6	Unshielded	Unshielded
2	Speaker Cable	1.5	Unshielded	Unshielded
3	Speaker Cable	1.5	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 0.5m, 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. 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.

<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 2</b>
<b>Test result</b>	<b>: Pass</b>

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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.

**Test data : APPENDIX 2**

**Test result : Pass**

**[Radiated]**

**Test Procedure**

EUT was placed on a urethane platform of nominal size, 1.0m by 0.5m, 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 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
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 test was made on EUT at the normal use position.

**Test data : APPENDIX 2**

**Test result : Pass**

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## **SECTION 7: Bandwidth**

### **Test Procedure**

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

**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.

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

## **SECTION 9: Carrier Frequency Separation**

### **Test Procedure**

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

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

## **SECTION 10: Number of Hopping Frequency**

### **Test Procedure**

The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

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

## **SECTION 11: Dwell time**

### **Test Procedure**

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

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

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