



RADIO TEST REPORT

Test Report No. : 29GE0205-HO-01-A-R1

Applicant : Sand Dollar Enterprise, Inc.
Type of Equipment : Computer Entertainment System
Model No. : CECH-2001A
FCC ID : XCET12NA28K
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 29GE0205-HO-01-A.

Date of test: March 9 to April 1, 2009

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SECTION 1: Customer information

Company Name	Sand Dollar Enterprise, Inc.
Address	919 East Hillsdale Boulevard, Foster City, CA 94404
Telephone Number	1-650-655-8040
Contact Person	Riley Russell

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

2.1 Identification of E.U.T.

Type of Equipment	Computer Entertainment System
Model No	CECH-2001A
Serial No	1200162 (Power Supply: SONY) 1200168 (Power Supply: DELTA) 1200174: Used for Antenna Terminal Conducted tests
Rating	AC120V / 60Hz
Country of Manufacture	JAPAN/CHINA
Receipt Date of Sample	March 9, 2009
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.

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2.2 Product Description

Model: CECH-2001A, referred to as the EUT in this report, is a Computer Entertainment System.
The EUT contains Bluetooth (Ver. 2.0+EDR) module and IEEE802.11b/g WLAN module. Those modules do not transmit simultaneously.

List of Model No.:

Computer Entertainment System/PlayStation®3

Model No.	Items			Prototype No.
	Destination	Manufacture	Ver.	
CECH-2001A	UC2	1, 2, 3	Production, 120GB	CBEH-2001

Model No.	Items			Prototype No.
	Destination	Manufacture	Ver.	
CECH-2001B	UC2	1, 2, 3	Production, 250GB	CBEH-2001B

Computer Entertainment System/Debugging Station (for PlayStation®3)

Model No.	Items			Prototype No.
	Destination	Manufacture	Ver.	
DECH-2000A	SY5	1	Debugging Station, 120GB	DEH-H2500A
DECH-2000AS	SY5	1	Debugging Station, (For exhibition), 120GB	DEH-H2500AS

Factory:

1. Sony EMCS Corporation Kisarazu Tec
8-4 Shiomi Kisarazu-shi Chiba-ken, 202-0834 Japan

2. Maintek Computer (Suzhou) Co., Ltd.
Bldg. 2, 233 Jin Feng Rd Suzhou Jiangsu China

3. 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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The clock frequencies used in the EUT: Max clock frequency is 3.2GHz.

Bluetooth (Ver. 2.0+EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS (GFSK, $\pi/4$ -DQPSK, 8DPSK)
Bandwidth & Channel spacing	1MHz & 1MHz
Power Supply (inner)	DC5.0V
Antenna Type	PIFA
Antenna Gain	2.5 dBi (max)
Antenna Connector Type	U.FL

For Bluetooth part, please see UL Japan, Inc. Test Report Number: 29GE0205-HO-01-B-R1.

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)	DC5.0V	
Antenna Type	ANT 0: IFA	ANT 1: PIFA
Antenna Gain	ANT 0: 4.3 dBi (max)	ANT 1: 2.5 dBi (max)
Antenna Connector Type	ANT 0: N/A	ANT 1: U.FL

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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 29HE0065-YW.

FCC 15.31 (e)

This EUT provides stable voltage(DC5.0V) constantly to RF part 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

[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] 5.8dB 0.15185MHz, N, Tx, ANT 0 0.15522MHz, N, Rx, ANT 0 [AV] 1.0dB 3.15689MHz, N, Tx, ANT 0	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] 4.0dB 874.961MHz, Horizontal, QP, ANT 0 874.957MHz Horizontal, QP, ANT 0 [Rx] 4.4dB 874.975MHz Horizontal, QP, ANT 0	Complied

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

* 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 report meets the limits unless the uncertainty is taken into consideration.

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 : [IEEE 802.11b / IEEE 802.11g : DSSS / OFDM]

Test	Mode	Tested frequency	Tested antenna
Conducted Emission *1)	IEEE802.11b Transmitting (Tx), 11Mbps	2412MHz(L)	ANT 0
	IEEE802.11g Transmitting (Tx), 24Mbps	2437MHz(M) 2462MHz(H)	ANT 1
	IEEE802.11b/g Receiving (Rx)	2437MHz(M)	ANT 0 ANT 1
Spurious Emission (Radiated)	IEEE802.11b Transmitting (Tx), 11Mbps	2412MHz(L)	ANT 0
	IEEE802.11g Transmitting (Tx), 24Mbps	2437MHz(M)*2) 2462MHz(H)	ANT 1
	IEEE802.11b/g Receiving (Rx)	2437MHz(M)	ANT 0 ANT 1
6dB Bandwidth Power Density 99% Occupied Bandwidth	IEEE802.11b Transmitting (Tx), 11Mbps IEEE802.11g Transmitting (Tx), 24Mbps	2412MHz(L) 2437MHz(M) 2462MHz(H)	ANT 0
Maximum Peak Output Power	IEEE802.11b Transmitting (Tx), 11Mbps IEEE802.11g Transmitting (Tx), 24Mbps	2412MHz(L) 2437MHz(M) 2462MHz(H)	ANT 0 ANT 1
Spurious Emission (Conducted)	IEEE802.11b Transmitting (Tx), 11Mbps	2412MHz(L)	ANT 0
	IEEE802.11g Transmitting (Tx), 24Mbps	2437MHz(M) 2462MHz(H)	
	IEEE802.11b/g Receiving (Rx)	2437MHz(M)	ANT 0
Restricted Band Edge (Radiated)	IEEE802.11b Transmitting (Tx), 11Mbps IEEE802.11g Transmitting (Tx), 24Mbps	2412MHz(L) 2462MHz(H)	ANT 0 ANT 1
Restricted Band Edge (Conducted)	IEEE802.11b Transmitting (Tx), 11Mbps IEEE802.11g Transmitting (Tx), 24Mbps	2412MHz(L) 2462MHz(H)	ANT 0

*Transmitting duty was 100% on all tests.

*As a result of preliminary check for two antennas (ANT 0 and ANT 1), the formal test was performed as above-mentioned table. Also ANT 1 has two kinds of manufacture's antennas (TYCO and HITACHI), the test was performed with TYCO antenna according to the customer's request because they have identical antenna characteristics.

*The transmitting data shall be scrambled with the following scramblers and it was transmitted continuously.

[11b]

11Mbps: IEEE Std 802.11b(1999) Section 18.2.4

[11g]

24Mbps: IEEE Std 802.11a(1999) Section 17.3.5.4

*1) The test was performed for both of Power Supply: SONY and Power Supply: DELTA. Other tests besides Conducted Emission test were performed with Power Supply: SONY as a representative.

*2) The difference of between Power Supply: SONY and Power Supply: DELTA was confirmed by the IEEE802.11b Transmitting (Tx), 11Mbps mode.

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4.2 Configuration and peripherals

This page has been submitted for a separate exhibit.

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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. 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 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
Detector	QP: BW 120kHz(T/R)	PK: RBW: 1MHz/VBW: 1MHz
IF Bandwidth		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 and Y 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".

	[IEEE802.11b]	[IEEE802.11g]
- Span	: 15MHz	18MHz
- RBW	: 30kHz *)	30kHz *)
- VBW	: 100kHz	100kHz
- Sweep	: 500sec(Span/RBW)	600sec (Span/RBW)
- Detector	: Peak	Peak
- Trace	: Clear Write	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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