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FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: 04.03.0653EF
Page: 1 of 16
FCC ID: OJJRC73610

FCC TEST REPORT

Application No. : 04.03.0653E
Applicant: Radica Games Ltd.
FCC ID: OJJRC73610
Fundamental Carrier Frequency : 2.441 GHz

Equipment Under Test (EUT):

Name: PS2 Phoenix Wireless Pad
Model: RC73610

Standards: FCC PART 15, SUBPART C : 2002

Date of Receipt: 1 April 2004

Date of Test: 25 April 2004

Date of Issue: 26 April 2004

Test Result :	PASS *
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Kent Hsu
Laboratory Manager
SGS-CSTC Co., Ltd.

This report refers to the General Conditions for Inspection and Testing Services, printed overleaf
This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the SGS PRODUCT CERTIFICATION MARK.. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



2 Contents

	Page
1 COVER PAGE	1
2 CONTENTS.....	2
3 GENERAL INFORMATION	3
3.1 CLIENT INFORMATION	3
3.2 GENERAL DESCRIPTION OF E.U.T.	3
3.3 DESCRIPTION OF SUPPORT UNITS	3
3.4 STANDARDS APPLICABLE FOR TESTING	3
3.5 TEST LOCATION	3
3.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER	3
3.7 TEST FACILITY	4
4 TEST RESULTS	5
4.1 TEST INSTRUMENTS.....	5
4.2 E.U.T. OPERATION	5
4.3 TEST PROCEDURE & MEASUREMENT DATA	6
4.3.1 Radiated Emissions	6
4.3.2 Conducted Emissions Mains Terminals, 150kHz to 30MHz.....	10
4.3.3 Measurement Data	10
4.3.4 Occupied Bandwidth.....	11
5 PHOTOGRAPHS - RADIATED EMISSION TEST SETUP	12
6 PHOTOGRAPHS - EUT CONSTRUCTIONAL DETAILS.....	13~16

3 General Information

3.1 Client Information

Applicant Name: Radica Games Ltd.
Applicant Address: Suit V, 6/F, Valiant Ind. Centre., 2-12 Au Pui Wan Street. Fotan,
Shatin, N.T. Hong Kong

3.2 General Description of E.U.T.

Product Name: PS2 Phoenix Wireless Pad (2.4GHz)
Model: RC73610
Power Supply: 4.5V DC (3 x 'AA' Size Batteries) for Transmitter,
Receiver powered by host PS2.
Power Cord: N/A-

3.3 Description of Support Units

The EUT was tested as an PS2 (model: SCPH-30006 R of SONY) & TCL 17" TV monitor.

3.4 Standards Applicable for Testing

The customer requested FCC tests for a PS2 Phoenix Wireless Pad (Receiver)
The standard used was FCC PART 15, SUBPART C (2003) section 15.249.

3.5 Test Location

All tests were performed at:-

SGS-CSTC Standards Technical Services Ltd., Guangzhou Safety & EMC Laboratory, 1/F,
Building No. 1, Agriculture Machinery Materials Company Warehouse Ltd., Wushan Road
Shipai, Tianhe District, Guangzhou, China. P.C. 510630.

Tel: +86 20 3848 1001

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3.6 Other Information Requested by the Customer

None.

3.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP – Lab Code: 200611-0**
SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 2000611-0. Effective through February 2, 2003.
- **ACA**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.
- **VCCI**
The 3m Semi-anechoic chamber and Shielded Room (11.5m x 4m x 4m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1599 and C-1706 respectively.
Date of Registration: February 28, 2003. Valid until May 30, 2005
- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FINKO**
Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.
- **CNAL – LAB Code: L0141**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of Testing Laboratories.
- **FCC – Registration No.: 282399**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP, SGS-CSTC is an authorized test laboratory for the DoC process.

4 Test Results

4.1 Test Instruments

Test Equipment	Manufacturer	Model	Asset No.	Cal. Due Date
3m Semi- Anechoic Chamber	Frankonia	3m method	EMC0501	15-02-2005
EMI Test Receiver	Rohde & Schwarz	ESCS30	EMC0506	15-02-2005
Bilog Type Antenna	Schaffner Chase	CBL6143	EMC0519	17-01-2005
Coaxial cable	SGS-CSTC	10m	EMC0514	04-11-2004
Spectrum Analyzer	ROHDE & SCHWARZ	FSP 30	EMC0521	01-04-2004
Horn Antenna	ROHDE & SCHWARZ	HF906	EMC0517	01-04-2004
Temperature, Humidity & Barometer	Oregon Scientific	BA-888	EMC0003	24-07-2004
Peramplifier	Agilent	8449B	EMC0520	30-06-2004
Coaxial cable	SGS	N/A	EMC0514	01-06-2004
Shielding Room	Frankonia	12 x 4 x 4 m ³	EMC0103	N/A
LISN	Schaffner Chase	MNZ050D11	1421	04-11-2004
EMI Test Receiver	Rohde& Schwarz	ESCS30	100086	09-12-2004
Coaxial Cable	SGS	2m	EMC0107	01-06-2004

4.2 E.U.T. Operation

Input voltage: 120Vac / 60Hz (for PS2 supplied)

Operating Environment:

Temperature: 24.0 °C

Humidity: 50 % RH

Atmospheric Pressure: 1006 mbar

EUT Operation: Pre-test in transmitting mode with Digit & Analog signal mode.
Compliance test in transmitting mode Digital signal since no worse case be found. (Two mode are almost same)



4.3 Test Procedure & Measurement Data

4.3.1 Radiated Emissions

4.3.1.1 Test in transmitting mode

Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 C Section 15.249
Test Date: 25 April 2004
Measurement Distance: 3m (Semi-Anechoic Chamber)
Frequency range 30 MHz – 25GHz for transmitting mode.
Test instrumentation resolution bandwidth
120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 M – 25GHz)
Operation: Receive antenna scan height 1 - 4 m, polarization Vertical/
Horizontal

Requirements:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m @ 3m)	Field Strength of Harmonics and Spurious Emissions (dBuV/m @ 3m)
902 to 928	94.0	54.0
2400 to 2483.5	94.0	54.0
5725 to 5875	94.0	54.0
24000 to 24250	108.0	68.0

The fundamental frequency of the EUT is 2441MHz

The limit for average field strength dBuV/m for the fundamental frequency= 94.0 dBuV/m.

No fundamental is allowed in the restricted bands.

The limit for average field strength dBuV/m for the harmonics and spurious frequencies = 54.0 dBuV/m. Spurious in the restricted bands must be less than 54.0 dBuV/m or 15.209.

Test Procedure: The procedure used was ANSI Standard C63.4-2000. The receiver was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier .
The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Peramplifier Factor

The following test results were performed on the EUT on 12 October 2003:

1. Fundamental emission

Peak Measurement

Test Frequency (GHz)	Measuring Level (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
2.441	90.2	82.3	114.0	23.8	31.7
Average Measurement					
2.441	84.5	76.2	94.0	9.5	17.8

2. Harmonics & Spurious Emissions

Peak Measurement

Test Frequency (GHz)	Measuring Level (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
2) 4.882	60.1	67.8	74.0	13.9	6.2
3) 7.323	53.6	53.3	74.0	20.4	20.7
4) 9.764	52.6	53.4	74.0	21.4	20.6
5) 12.205	55.5	54.8	74.0	18.5	19.2
6) 14.646	N/A	N/A	74.0	N/A	N/A
7) 17.087	N/A	N/A	74.0	N/A	N/A
8) 19.528	N/A	N/A	74.0	N/A	N/A
9) 21.969	N/A	N/A	74.0	N/A	N/A
10) 24.410	N/A	N/A	74.0	N/A	N/A
Average Measurement					
2) 4.882	50.0	53.8	54.0	4.0	0.2
3) 7.323	45.3	44.5	54.0	8.7	9.5
4) 9.764	46.2	43.6	54.0	7.8	10.4
5) 12.205	50.0	50.4	54.0	4.0	3.6
6) 14.646	N/A	N/A	54.0	N/A	N/A
7) 17.087	N/A	N/A	54.0	N/A	N/A
8) 19.528	N/A	N/A	54.0	N/A	N/A
9) 21.969	N/A	N/A	54.0	N/A	N/A
10) 24.410	N/A	N/A	54.0	N/A	N/A

N/A: refer to remark 1).



Remark:

- 1). For this intentional radiator operates below 10 GHz, the spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. And above the fifth harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 7th harmonic.
- 2). According to 15.249 (d) As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

TEST RESULTS: The unit does meet the FCC requirements.

3. Other Spurious Emissions. (30MHz-1000MHz)

Test Requirement: FCC Part15 Section 15.209
 Test Method: Based on FCC Part15 B
 Measurement Distance: 3m
 Limit:
 40.0 dBμV/m between 30MHz & 88MHz
 43.5 dBμV/m between 88MHz & 216MHz
 46.0 dBμV/m between 216MHz & 960MHz
 54.0 dBμV/m above 960MHz
 Detector: Peak for pre-scan , 120kHz resolution bandwidth within 1GHz,
 1MHz resolution bandwidth above 1GHz
 Quasi-Peak if maximised peak within 6dB of limit

The following quasi-peak measurements were performed on the EUT:

Frequency (Hz)	Antenna Polarization	Emission Level (dBμV/m)	Limit dBμV/m)	Margin (dB)
200.000M	Vertical	15.0	43.5	18.5
800.000M	Vertical	27.0	46.0	19.0
2.904G	Vertical	50.2	54.0	3.8
3.414G	Vertical	42.7	54.0	11.3
5.352G	Vertical	53.0	54.0	1.0
5.862G	Vertical	43.3	54.0	10.7
50.000	Horizontal	15.0	40.0	25.0
2.904G	Horizontal	49.3	54.0	4.7
3.414G	Horizontal	46.6	54.0	7.4
3.890G	Horizontal	44.5	54.0	9.5
4.400G	Horizontal	52.3	54.0	1.7
5.352G	Horizontal	49.8	54.0	4.2

The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier .
 The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Peramlifer Factor

TEST RESULTS: The unit does meet the FCC requirements

4.3.2 Conducted Emissions Mains Terminals, 150kHz to 30MHz

Test Requirement: FCC Part15 Section 15.207
 Test Method: ANSI C63.4
 Test Date: 13 October 2003
 Frequency Range: 150KHz to 30MHz
 Class / Severity: Class B
 Detector: Peak for pre-scan (9kHz Resolution Bandwidth)
 Operating Environment:
 Temperature: 24.0°C Humidity: 52% RH Atmospheric Pressure: 1012 Mbar
 EUT Operation: Pre-test in transmitting mode with AV signal & transmitting mode with TV signal. Compliance test in transmitting mode AV signal since no worse case be found. (Two mode are almost same)
 As appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

4.3.3 Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

The following Quasi-Peak and Average measurements were performed on the EUT.:

Freq. MHz	Line	QP Level dBuV	Limit dBuV	Margin dB	AV Level dBuV	Limit dBuV	Margin dB
0.156	Live	50.8	65.7	14.9	44.1	55.7	11.6
0.175	Live	50.2	64.7	14.5	46.0	54.7	8.7
0.238	Live	43.6	62.2	18.6	42.4	52.2	9.8
0.298	Live	35.6	60.3	24.7	32.7	50.3	17.6
2.855	Live	29.3	56.0	26.7	28.7	46.0	17.3
15.700	Live	36.7	60.0	23.3	32.3	50.0	17.7
0.160	Neutral	51.2	65.5	14.3	44.4	55.5	11.1
0.198	Neutral	44.3	63.7	19.4	N/A	53.7	N/A
0.298	Neutral	37.6	60.3	22.7	N/A	50.3	N/A
0.822	Neutral	27.3	56.0	28.7	N/A	46.0	N/A
2.776	Neutral	31.2	56.0	24.8	N/A	46.0	N/A
15.700	Neutral	36.2	56.0	19.8	N/A	46.0	N/A

TEST RESULTS: The unit does meet the FCC requirements.

4.3.4 Occupied Bandwidth

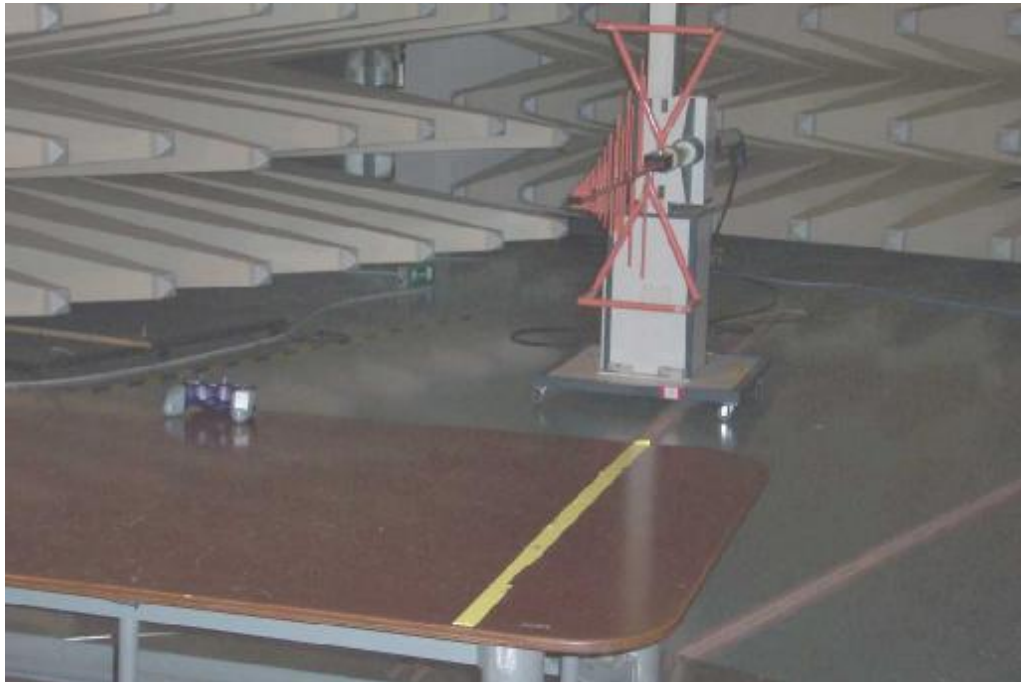
Test Requirement:	FCC Part 15 C
Test Method:	Based on FCC Part15 C Section 15.249: Operation within the band 26.96 – 27.28 MHz
Test Date:	25 April 2004
Requirements:	15.249 (c) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.
Method of measurement:	A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken. The vertical is set to 10dB per division. The horizontal scale is set to 100KHz per division.

The graph as below, represents the emissions take for this device.



The results: The unit does meet the FCC requirements.

5 Photographs - Radiated Emission Test Setup



6 Photographs - EUT Constructional Details

Rx



Tx



