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**FEDERAL COMMUNICATIONS COMMISSION**

Registration number: 282399

Report No.: GLEMO040801090RFI

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FCC ID: SH7GS250R

## **FCC TEST REPORT**

**Application No. :** GLEMO040801090RF (SGS SZ NO.:SZTYR040804548/TS)

**Applicant:** Prism Technology Limited

**FCC ID:** SH7GS250R

**Fundamental Carrier Frequency :** 2.441 GHz

**Equipment Under Test (EUT):**

Name: PS2 2.4G Wireless Gamepad

Model: GS250R

**Standards:** FCC PART 15, SUBPART C : 2002

**Date of Receipt:** 06 August 2004

**Date of Test:** 10 to 20 August 2004

**Date of Issue:** 12 September 2004

<b>Test Result :</b>	<b>PASS *</b>
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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.

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### **3 General Information**

#### **3.1 Client Information**

Applicant Name: Prism Technology Limited  
Applicant Address: Room 713, 7 Floor, Block A, Hoplite Industrial Centre, 3-5 Wang Tai Road, Kowloon Bay, Hong Kong

#### **3.2 General Description of E.U.T.**

Product Name: PS2 2.4G Wireless Gamepad (2.4G)  
Model: GS250R  
Power Supply: 4.8V DC (4 x 'AAA' Size Rechargeable Batteries) for Transmitter, Receiver powered by host PS2.  
Power Cord: N/A-

#### **3.3 Description of Support Units**

The EUT was tested as a PS2 (model: SCPH-30006 R of SONY) & TCL 14" TV monitor.

#### **3.4 Standards Applicable for Testing**

The customer requested FCC tests for a PS2 2.4G Wireless Gamepad  
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: 200611-0. Effective through December 31, 2004.
- **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-FIMKO**  
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's accreditation, SGS-CSTC is an authorised test laboratory for the DoC process.  
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.
- **Industry Canada (IC)**  
The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5169.

## 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	01-04-2005
Horn Antenna	ROHDE & SCHWARZ	HF906	EMC0517	01-04-2005
Temperature, Humidity & Barometer	Oregon Scientific	BA-888	EMC0003	24-07-2004
Peramplifier	Agilent	8449B	EMC0520	30-06-2005
Coaxial cable	SGS	N/A	EMC0514	01-06-2005
Shielding Room	Frankonia	12 x 4 x 4 m <sup>3</sup>	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	01-06-2005

### 4.2 E.U.T. Operation

Input voltage: 4.8V DC (4 x 'AAA' Size Rechargeable Batteries) for Transmitter.

Operating Environment:

Temperature: 24.0 °C

Humidity: 52 % RH

Atmospheric Pressure: 1012 mbar

EUT Operation: Pre-test in transmitting mode with different channels.  
The channels just only a coding changes, not frequency changes.

Compliace test in transmitting mode (the switch at 7 player mode (1,3 on) as the user manual shown) since no worse case be found.

## 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:	18 August 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 dB $\mu$ V/m for the fundamental frequency= 94.0 dB $\mu$ V/m.

No fundamental is allowed in the restricted bands.

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

**Test Procedure:** The procedure used was ANSI Standard C63.4-2000. The receive 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 18 August 2004:

### 1. Fundamental emission

#### Peak Measurement

Test Frequency (GHz)	Measuring Level (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
2.441	94.3	90.9	114.0	19.7	23.1
<b>Average Measurement</b>					
2.441	82.8	78.2	94.0	11.2	15.8

### 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	56.0	60.6	74.0	18.0	13.4
3) 7.323	53.0	55.2	74.0	21.0	18.8
4) 9.764	52.8	53.5	74.0	21.2	20.5
5) 12.205	54.3	54.2	74.0	19.7	19.8
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	48.0	50.8	54.0	6.0	3.2
3) 7.323	42.3	43.0	54.0	11.7	11.0
4) 9.764	46.8	45.6	54.0	7.2	8.4
5) 12.205	45.0	43.4	54.0	9.0	10.6
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 7<sup>th</sup> harmonic.
- 2). According to 15.249 (e) 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.**

Test Requirement: FCC Part15 Section 15.209  
Test Method: Based on FCC Part15 B  
Measurement Distance: 3m  
Limit:  
40.0 dB $\mu$ V/m between 30MHz & 88MHz  
43.5 dB $\mu$ V/m between 88MHz & 216MHz  
46.0 dB $\mu$ V/m between 216MHz & 960MHz  
54.0 dB $\mu$ V/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 (dB $\mu$ V/m)	Limit dB $\mu$ V/m)	Margin (dB)
166.000M	Vertical	27.2	43.5	16.3
261.000M	Vertical	30.1	46.0	15.9
364.500M	Vertical	29.5	46.0	16.5
391.500M	Vertical	31.0	46.0	15.0
456.750M	Vertical	28.9	46.0	17.1
497.125M	Vertical	31.2	46.0	14.8
2.134G	Vertical	48.9	54.0	5.1
3.421G	Vertical	46.9	54.0	7.1
166.000M	Horizontal	27.8	43.5	15.7
66.575M	Horizontal	28.9	40.0	11.1
99.470M	Horizontal	26.2	43.5	17.3
300.022M	Horizontal	27.2	46.0	18.8
364.687M	Horizontal	30.1	46.0	15.9
408.000M	Horizontal	29.2	46.0	16.8
2.134G	Horizontal	50.6	54.0	3.4
3.421G	Horizontal	42.0	54.0	12.0

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

**TEST RESULTS:** The unit does meet the FCC requirements

**4.3.1.2 Test in charging mode**

Test Requirement:	FCC Part15 Section 15.109
Test Method:	Based on FCC Part15 B
Measurement Distance:	3m
Limit:	40.0 dB $\mu$ V/m between 30MHz & 88MHz 43.5 dB $\mu$ V/m between 88MHz & 216MHz 46.0 dB $\mu$ V/m between 216MHz & 960MHz 54.0 dB $\mu$ V/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 (MHz)	Antenna Polarization	Emission Level (dB $\mu$ V/m)	Limit dB $\mu$ V/m)	Margin (dB)
59.145	Vertical	26.8	40.0	13.2
99.938	Vertical	25.6	43.5	17.9
139.063	Vertical	28.7	43.5	14.8
198.750	Vertical	27.8	43.5	15.7
243.000	Vertical	29.5	46.0	16.5
374.563	Vertical	30.9	46.0	15.1
138.000	Horizontal	22.9	43.5	20.6
163.250	Horizontal	20.1	43.5	23.4
182.250	Horizontal	23.0	43.5	20.5
240.048	Horizontal	27.0	46.0	19.0
250.020	Horizontal	26.7	46.0	19.3
364.000	Horizontal	26.2	46.0	19.8

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

TEST RESULTS: The unit does meet the FCC requirements

#### 4.3.2 Conducted Emissions, 150KHz to 30MHz

Test Requirement: FCC Part15 Section 15.107  
Test Method: ANSI C63.4  
Test Date: 18 August 2004  
Frequency Range: 150KHz to 30MHz  
Class / Severity: Class B  
Detector: Peak for pre-scan (9kHz Resolution Bandwidth)

##### 4.3.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.0 °C      Humidity: 52 % RH      Atmospheric Pressure: 1012 mBar  
EUT Operation: Test in charging mode.  
Quasi-Peak if maximised peak within 6dB of limit

##### 4.3.2.2 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
0.159	Live	10.6	65.5	54.9	-8.5	55.5	64.0
0.169	Live	10.4	65.0	54.6	-8.1	55.0	63.1
0.439	Live	14.6	57.1	42.5	-7.8	47.1	54.9
0.453	Live	16.9	56.8	39.9	-7.5	46.8	54.3
0.464	Live	15.4	56.6	41.2	-7.6	46.6	54.2
0.501	Live	11.5	56.0	44.5	-8.9	46.0	54.9
0.176	Neutral	10.4	64.7	54.3	-8.4	54.7	63.1
0.470	Neutral	15.5	56.5	41.0	-6.2	46.5	52.7
0.479	Neutral	13.4	56.4	43.0	-7.3	46.4	53.7
0.489	Neutral	11.2	56.2	45.0	-8.3	46.2	54.5
0.502	Neutral	8.6	56.0	47.4	-8.6	46.0	54.6
0.513	Neutral	9.6	56.0	46.4	-8.4	46.0	54.4

#### 4.3.3 Occupied Bandwidth

Test Requirement:

FCC Part 15 C

Test Method:

Based on FCC Part15 C Section 15.249:

Operation within the band 2400 – 2483.5 MHz

Test Date:

19 August 2004

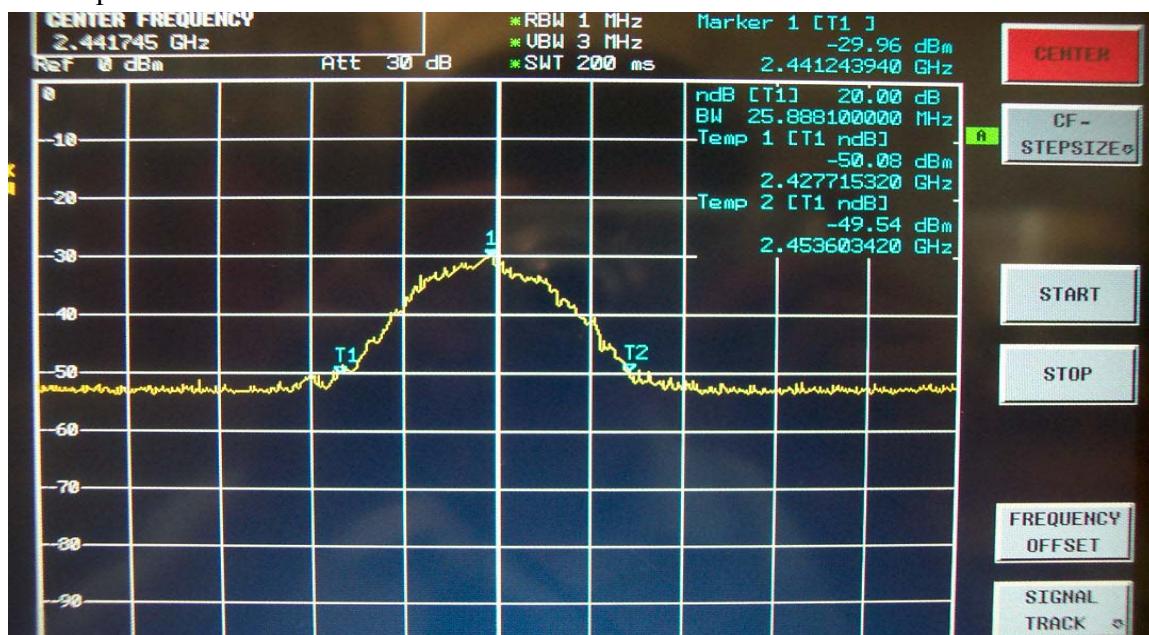
Requirements:

15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 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 occupied bandwidth as below:



The test result for the Emissions radiated outside of the specified frequency bands , please refer the section 4.3.1 of this report.

The worst case is 50.6dBuV/m at frequency 5.352GHz, it's below the limits in Section 15.209.

For the field strength of Lower Edges:2400MHz is 32.1dBuV/m.

For the field strength of Upper Edges:2483.5MHz is 31.8dBuV/m.

**The results: The unit does meet the FCC requirements.**