Saitek Electronics (Shenzhen) Limited

Application
For
Certification
(FCC ID: QIWPRX7-2)

Transmitter, Model : ART NO. H18

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [24-5-2001]

WO# 0214772
WN/at
November 8, 2002

- The test results reported in this report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
- This report shall not be reproduced except in full without prior authorization from Intertek Testing Services Hong Kong Limited.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

LIST OF EXHIBITS

MEASUREMENT/TECHNICAL REPORT

Saitek Electronics (Shenzhen) Limited - MODEL: ART NO. H18
FCC ID: QIWPRX7-2

November 8, 2002

This report concerns (check one:) Original Grant X Class II Change _____

Equipment Type: Low Power Transmitter (example: computer, printer, modem, etc.)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes ___ No X

If yes, defer until: _____ date

Company Name agrees to notify the Commission by: _____ date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes ___ No X

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [24-5-2001 Edition] provision.

Report prepared by: Wilbur Ng
Intertek Testing Services
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HONG KONG
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Fax: 852-2742-9149

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List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	Conducted Photos.pdf
Test Report	Conducted Emission Test Result	Conducted.pdf
Test Report	Bandwidth Plot	bw.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf

EXHIBIT 1

GENERAL DESCRIPTION

1.0 General Description

1.1 Product Description

The equipment under test (EUT) is a transceiver for a PS2 Controller operating at 907 MHz - 922 MHz which is controlled by VCO/PLL circuit within the RF. The EUT is powered by the Playstation 2 Controller Port. The EUT has a Scan Button which allows the EUT to align the Communication Channel with the controller. The EUT is used to transmit and receive signals from the Playstation 2 to the controller during game playing mode.

The EUT has a Scan button, press the scan button to change the communication to other game console.

When insert the EUT to the PS2, it can communicate with the Hub Unit, which connected to a corded game controller, and the user can play the video game on the TV.

The brief circuit description is saved with filename : descri.pdf

1.2 Related Submittal(s) Grants

This is a single application for certification of a transmitter. The receiver for this transmitter is authorized by 15V procedure.

1.3 Test Methodology

The radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section"** of this Application.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the emission data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

EXHIBIT 2

SYSTEM TEST CONFIGURATION

2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (1992.)

The EUT was powered by the Playstation 2 Controller Port during test.

The lowest, middle and highest emitted frequency bands are measured.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The unit was connected to Playstation 2 and placed in the rim of the turntable as shown in the radiated emission configuration photo.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on a turn table, which enabled the engineer to maximize emissions through its placement in normal operation.

For simplicity of testing, the unit was wired to transmit continuously.

2.2 EUT Exercising Software

There was no special software to exercise the device.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

2.4 Equipment Modification

Any modifications installed previous to testing by Saitek Electronics (Shenzhen) Limited will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services.

2.5 Support Equipment List and Description

Equipment List : - PS2 : Brand : SONY
Model: SCPH-15000
Serial No. : J3996857
- TV : Brand : HITACHI
Model: C15-F200Q
Serial No. : N2D001397
- Game Pad Controller : Brand : SONY
Model: SCPH-10010

All the items listed under section 2.0 of this report are

Confirmed by:

Wilbur Ng
Manager
Intertek Testing Services
Agent for Saitek Electronics (Shenzhen) Limited

Signature

November 8, 2002 Date

EXHIBIT 3

EMISSION RESULTS

3.0 Emission Results

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + AV

where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD + AV

3.1 Field Strength Calculation (cont'd)

Example

Assume a receiver reading of 62.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB

AV = -10 dB

FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 dBμV/m

Level in mV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission

3660.200 MHz

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos.pdf

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 5.5 dB

TEST PERSONNEL:

Signature

Anthony K. M. Chan, Compliance Engineer
Typed/Printed Name

November 8, 2002
Date

Company: Saitek Electronics (Shenzhen) Limited Date of Test: October 20, 2002
Model: ART NO. H18

Table 1

Radiated Emissions (Lowest Frequency Band)

Polarity	Frequency (MHz)	Reading (dBµV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
H	906.976	46.5	32.0	16	62.5	94	-31.5
V	1812.552	48.0	26.5	34	40.5	54	-13.5
V	2718.828	52.4	29.1	34	47.5	54	-6.5
V	3625.104	48.2	32.8	34	47.0	54	-7.0
V	4531.380	45.8	34.0	34	45.8	54	-8.2
V	5490.300	40.1	35.2	34	41.3	54	-12.7

Notes: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3 meter distance were measured at 0.3 meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3 meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna are used for the emission over 1000MHz.

*Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and peak detector data for frequencies over 1000 MHz.

Test Engineer: Anthony K. M. Chan

Company: Saitek Electronics (Shenzhen) Limited Date of Test: October 20, 2002
Model: ART NO. H18

Table 2

Radiated Emissions (Middle Frequency Band)

Polarity	Frequency (MHz)	Reading (dBµV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	915.050	48.2	33.0	16	65.2	94	-28.8
H	1830.100	52.1	26.5	34	44.6	54	-9.4
H	2745.150	43.8	29.1	34	38.9	54	-15.1
H	3660.200	49.7	32.8	34	48.5	54	-5.5
H	4575.250	44.1	34.0	34	44.1	54	-9.9
H	5490.300	39.0	35.2	34	40.2	54	-13.8

Notes: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3 meter distance were measured at 0.3 meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3 meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna are used for the emission over 1000MHz.

*Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and peak detector data for frequencies over 1000 MHz.

Test Engineer: Anthony K. M. Chan

Company: Saitek Electronics (Shenzhen) Limited Date of Test: October 20, 2002
Model: ART NO. H18

Table 3

Radiated Emissions (Highest Frequency Band)

Polarity	Frequency (MHz)	Reading (dBµV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
H	921.430	36.0	33.0	16	53.0	94	-41.0
V	1842.860	49.1	26.5	34	41.6	54	-12.4
V	2764.290	51.7	29.1	34	46.8	54	-7.2
V	3685.720	48.4	32.8	34	47.2	54	-6.8
V	4607.155	45.3	34.0	34	45.3	54	-8.7
V	5528.580	40.0	36.0	34	42.0	54	-12.0

Notes: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic emissions not\ detected at the 3 meter distance were measured at 0.3 meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3 meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna are used for the emission over 1000MHz.

*Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and peak detector data for frequencies over 1000 MHz.

Test Engineer: Anthony K. M. Chan

3.4 Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration
at
15.505 MHz

For electronic filing, the worst case line-conducted configuration photograph are saved with filename: conducted photos.pdf

3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission is saved with filename: conducted.pdf

Judgement: Passed by 15.8 dB

TEST PERSONNEL:

Signature

Anthony K. M. Chan, Compliance Engineer
Typed/Printed Name

November 8, 2002
Date

EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

4.0 Equipment Photographs

For electronic filing, the photographs are saved with filename:
external photos.pdf and internal photos.pdf

EXHIBIT 5

PRODUCT LABELLING

5.0 Product Labelling

For electronic filing, the FCC ID label artwork and the label location are saved with filename: label.pdf

EXHIBIT 6

TECHNICAL SPECIFICATIONS

6.0 Technical Specifications

For electronic filing, the block diagram and schematics are saved with filename: block.pdf and circuit.pdf

EXHIBIT 7

INSTRUCTION MANUAL

7.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf

EXHIBIT 8

MISCELLANEOUS INFORMATION

8.0 Miscellaneous Information

This miscellaneous information includes details of the measured bandwidth and the test procedure.

8.1 Measured Bandwidth

The plot on saved in bw.pdf shows the fundamental emission is confined in the specified band. It shows the emission within the band of 902 - 928 MHz. It meets requirement of Section 15.249(C).

Figure 8.1 Bandwidth

8.2 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 1992.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. The antenna of EUT was fully extended. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The antenna height and polarization are varied during the testing to search for maximum signal levels.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 450 kHz to 30 MHz.

8.2 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4 - 1992.

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.