

Saitek Limited

Application For Certification (FCC ID: QIWPP9W2-2)

Superheterodyne Receiver

Model : Art No. J64

WO# 0210086

WN/at

August 15, 2002

- The test results reported in this report shall refer 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.
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- The evaluation data of the report will be kept for 3 years from the date of issuance.

FCC ID : QIWPP9W2-2

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MEASUREMENT/TECHNICAL REPORT

**Saitek Limited - MODEL: Art No. J64
FCC ID: QIWPP9W2-2**

August 15, 2002

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

Equipment Type: Superheterodyne Receiver (example: computer, printer, modem, etc.)

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

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

If no, assumed Part 15, Subpart B for intentional radiator

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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 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

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EXHIBIT 1

GENERAL DESCRIPTION

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1.0 General Description

1.1 Product Description

The equipment under test (EUT) is a superheterodyne received for a PC Wireless Pad operating at 905.06 or 910.06 MHz. The EUT is powered by a PC given D.C. 5.0V via USB Port. The EUT has a slide switch to control the receiver operating at Channel A or B, or to perform charging mode.

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 receiver. The transmitter for this receiver is authorized by Certification procedure.

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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. 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.

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EXHIBIT 2

SYSTEM TEST CONFIGURATION

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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 D.C. 5.0V via USB Port of computer during test.

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 operated standalone and placed in the center of the turntable.

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 the three orthogonal axes.

2.2 EUT Exercising Software

Connect the EUT to the USB Port of the computer, and run the game controllers setup program in the control panel of Windows, then the game can be controlled by the EUT.

2.3 Special Accessories

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

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2.4 Equipment Modification

Any modifications installed previous to testing by Saitek 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

This product was tested with connected to the computer.

Support Equipment:

1. HP Computer, Model: DTPC-17, S/N: SG94482658
(Tested to comply with FCC standards)
2. HITACHI Monitor, Model: CM643ET, S/N: T9G000030
(Tested to comply with FCC standards)
3. HP Mouse, Model: M-S34, S/N: LZE937078518
(Tested to comply with FCC standards)
4. HP Printer, Model: C4224A, S/N: SGGJ085319
(Tested to comply with FCC standards)
5. HP Keyboard, Model: SK-2502C, S/N: M91112642
(Tested to comply with FCC standards)
6. Modem, Model: 6800CN, FCC ID: BEJ9D9070038
(Tested to comply with FCC standards)

Cables:

Three AC Power (2m, unshielded) computer,
printer and monitor
One serial port cable (1.5m, shielded, metal hook)
One COM port cable (1.5m, shielded)
One monitor cable (1m shielded, ferrite)
One telephone line (2m, unshielded)
One USB cable (1m unshielded)

All the items listed under section 2.0 of this report are

Confirmed by:

Wilbur Ng
Manager
Intertek Testing Services
Agent for Saitek Limited



Signature

August 15, 2002

Date

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EXHIBIT 3

EMISSION RESULTS

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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.

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3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

$$FS = RR + LF$$

where FS = Field Strength in dB μ V/m

RR = RA - AG in dB μ V

LF = CF + AF in dB

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 52.0 \text{ dB}\mu\text{V}/\text{m}$$

$$AF = 7.4 \text{ dB}$$

$$RR = 23.0 \text{ dB}\mu\text{V}$$

$$CF = 1.6 \text{ dB}$$

$$LF = 9.0 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$FS = RR + LF$$

$$FS = 23 + 9 = 32 \text{ dB}\mu\text{V}/\text{m}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm} [(32 \text{ dB}\mu\text{V}/\text{m})/20] = 39.8 \mu\text{V}/\text{m}$$

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3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission (Ch B)

899.348 MHz

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

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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 3.8 dB (Ch B)

TEST PERSONNEL:



Signature

Ivan Y. M. Wong, Compliance Engineer
Typed/Printed Name

August 15, 2002
Date

INTERTEK TESTING SERVICES

Company: Saitek Limited
Model: Art No. J64

Date of Test: July 23, 2002

Table 1 (Ch A)

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V / m)	Limit at 3m (dB μ V / m)	Margin (dB)
V	894.339	25.7	32.0	16	41.7	46	-4.3
V	1788.678	45.3	26.5	34	37.8	54	-16.2
V	2683.028	41.9	29.1	34	37.0	54	-17.0
V	3577.367	37.4	32.8	34	36.2	54	-17.8
V	4471.706	39.1	34.2	34	39.3	54	-14.7
V	5366.045	35.8	35.2	34	37.0	54	-17.0

Notes: 1. Negative sign in the column shows value below limit.
2. Peak Detector Data unless otherwise stated.
3. 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.

Test Engineer: Ivan Y. M. Wong

INTERTEK TESTING SERVICES

Company: Saitek Limited
Model: Art No. J64

Date of Test: July 23, 2002

Table 2 (Ch B)
Radiated Emissions

Polarity	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	899.348	26.2	32.0	16	42.2	46	-3.8
V	1798.696	45.2	26.5	34	37.7	54	-16.3
V	2698.044	42.6	29.1	34	37.7	54	-16.3
V	3597.392	37.4	32.8	34	36.2	54	-17.8
V	4496.740	39.4	34.2	34	39.6	54	-14.4
V	5396.088	35.8	35.2	34	37.0	54	-17.0

Notes: 1. Negative sign in the column shows value below limit.
2. Peak Detector Data unless otherwise stated.
3. 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.

Test Engineer: Ivan Y. M. Wong

INTERTEK TESTING SERVICES

Company: Saitek Limited

Date of Test: July 23, 2002

Model: Art No. J64

Worst-case operating mode: Operate Mode (Computer Peripheral)

Table 3

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	36.184	32.2	10	16	26.2	40.0	-13.8
V	54.281	33.1	11	16	28.1	40.0	-11.9
H	78.394	41.5	6	16	31.5	40.0	-8.5
H	84.434	43.4	8	16	35.4	40.0	-4.6
H	90.468	37.6	10	16	31.6	43.5	-11.9
H	96.499	36.4	11	16	31.4	43.5	-12.1
H	108.550	34.4	13	16	31.4	43.5	-12.1
H	114.584	32.9	13	16	29.9	43.5	-13.6
H	120.622	31.2	13	16	28.2	43.5	-15.3
H	126.651	31.7	13	16	28.7	43.5	-14.8
H	144.745	30.5	13	16	27.5	43.5	-16.0
H	150.341	36.6	13	16	33.6	43.5	-9.9
H	156.784	31.2	15	16	30.2	43.5	-13.3
H	160.129	33.0	16	16	33.0	43.5	-10.5
H	162.819	31.2	16	16	31.2	43.5	-12.3

Notes: 1. Negative sign in the column shows value below limit.

2. Peak Detector Data unless otherwise stated.
3. 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.

Test Engineer: Ivan Y. M. Wong

INTERTEK TESTING SERVICES

Company: Saitek Limited

Date of Test: July 23, 2002

Model: Art No. J64

Worst-case operating mode: Operate Mode (Computer Peripheral)

Table 3 (Cont'd)

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	171.818	29.4	18	16	31.4	43.5	-12.1
H	180.928	26.0	20	16	30.0	43.5	-13.5
H	192.994	33.3	16	16	33.3	43.5	-10.2
H	199.021	34.5	16	16	34.5	43.5	-9.0
H	205.054	30.5	17	16	31.5	43.5	-12.0
H	211.076	30.0	17	16	31.0	43.5	-12.5
H	235.209	29.0	19	16	32.0	46.0	-14.0
H	253.275	24.0	21	16	29.0	46.0	-17.0
H	271.394	23.5	22	16	29.5	46.0	-16.5
H	283.445	29.9	22	16	35.9	46.0	-10.1
H	295.531	28.6	22	16	34.6	46.0	-11.4
H	331.690	27.4	24	16	35.4	46.0	-10.6
H	343.780	28.8	24	16	36.8	46.0	-9.2
H	373.904	23.6	24	16	31.6	46.0	-14.4
H	434.230	25.6	25	16	34.6	46.0	-11.4

Notes: 1. Negative sign in the column shows value below limit.

2. Peak Detector Data unless otherwise stated.
3. 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.

Test Engineer: Ivan Y. M. Wong

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EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

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4.0 Equipment Photographs

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

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EXHIBIT 5

PRODUCT LABELLING

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5.0 Product Labelling

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

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EXHIBIT 6

TECHNICAL SPECIFICATIONS

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6.0 Technical Specifications

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

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EXHIBIT 7

INSTRUCTION MANUAL

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7.0 Instruction Manual

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

This manual will be provided to the end-user with each unit sold/leased in the United States.

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EXHIBIT 8

MISCELLANEOUS INFORMATION

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8.0 Miscellaneous Information

This miscellaneous information includes details of test procedure.

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8.1 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of superheterodyne receivers operating under the Part 15, Subpart B rules.

The equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the groundplane. 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 also varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

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.

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8.1 Emissions Test Procedures (cont)

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 were 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.

Measurements are normally conducted at a measurement distance of three meters. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

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