

**Joyce Park Industrial Ltd.**

Application  
For  
Certification  
**(FCC ID: QU7JPAR)**

Superheterodyne Receiver

0214479(S1)  
DL/Sandy  
May 18, 2004

- The test results reported in this test 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.
- For Terms And Conditions of the services, it can be provided upon request.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

# INTERTEK TESTING SERVICES

---

---

## LIST OF EXHIBITS

### *INTRODUCTION*

|                   |                           |
|-------------------|---------------------------|
| <i>EXHIBIT 1:</i> | General Description       |
| <i>EXHIBIT 2:</i> | System Test Configuration |
| <i>EXHIBIT 3:</i> | Emission Results          |
| <i>EXHIBIT 4:</i> | Equipment Photographs     |
| <i>EXHIBIT 5:</i> | Product Labelling         |
| <i>EXHIBIT 6:</i> | Technical Specifications  |
| <i>EXHIBIT 7:</i> | Instruction Manual        |
| <i>EXHIBIT 8:</i> | Miscellaneous Information |

# INTERTEK TESTING SERVICES

---

## MEASUREMENT/TECHNICAL REPORT

**Joyce Park Industrial Ltd. - MODEL: SE-8100**

**SE-7100**

**SE-6100**

**FCC ID: QU7JPAR**

**May 18, 2004**

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

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

If no, assumed Part 15, Subpart B for unintentional radiator - the new 47 CFR [12-08-03 Edition] provision.

---

Report prepared by:

Derek Leung  
Intertek Testing Services  
Hong Kong Ltd.  
2/F., Garment Centre,  
576, Castle Peak Road,  
Kowloon, Hong Kong.  
Phone: 852-2173-8504  
Fax: 852-2371-0521

# INTERTEK TESTING SERVICES

---

---

## Table of Contents

|  |    |
|--|----|
| <b>1.0 <u>General Description</u></b> .....          | 2  |
| 1.1 Product Description .....                        | 2  |
| 1.2 Related Submittal(s) Grants .....                | 2  |
| 1.3 Test Methodology .....                           | 3  |
| 1.4 Test Facility .....                              | 3  |
| <b>2.0 <u>System Test Configuration</u></b> .....    | 5  |
| 2.1 Justification .....                              | 5  |
| 2.2 EUT Exercising Software .....                    | 5  |
| 2.3 Special Accessories .....                        | 5  |
| 2.4 Equipment Modification .....                     | 6  |
| 2.5 Measurement Uncertainty .....                    | 6  |
| 2.6 Support Equipment List and Description .....     | 6  |
| <b>3.0 <u>Emission Results</u></b> .....             | 8  |
| 3.1 Field Strength Calculation .....                 | 9  |
| 3.2 Radiated Emission Configuration Photograph ..... | 10 |
| 3.3 Radiated Emission Data .....                     | 11 |
| <b>4.0 <u>Equipment Photographs</u></b> .....        | 14 |
| <b>5.0 <u>Product Labelling</u></b> .....            | 16 |
| <b>6.0 <u>Technical Specifications</u></b> .....     | 18 |
| <b>7.0 <u>Instruction Manual</u></b> .....           | 20 |
| <b>8.0 <u>Miscellaneous Information</u></b> .....    | 22 |
| 8.1 Discussion of Pulse Desensitization .....        | 23 |
| 8.2 Calculation of Average Factor .....              | 24 |
| 8.3 Emissions Test Procedures .....                  | 25 |

## INTERTEK TESTING SERVICES

---

---

### 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.doc |
| External Photo        | External Photo             | external photos.doc |
| Internal Photo        | Internal Photo             | internal photos.doc |
| 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          |

---

---

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 1**

**GENERAL DESCRIPTION**

## INTERTEK TESTING SERVICES

---

### 1.0 General Description

#### 1.1 Product Description

The Equipment Under Test (EUT) is a Receiver Part of a Parking Sensor operating at 915MHz. The EUT is powered by 12V d.c. It will install on the dashboard in the interior of a car. When the driver select reverse gear, the EUT will sound a beep. This indicates that the Parking Sensor is working and has been activated. It can receive the signal from the corresponding transmitter. It can receive the signal from up to four remote sensors. The EUT has LED light flash and beeper to assist driver get to know the existence is obstacle and its position.

The Model: SE-6100 and SE-7100 are the same as the Model: SE-8100 in hardware aspect except that SE-6100 has 2 sensors, SE-7100 has 3 sensors and SE-8100 has 4 sensors.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

#### 1.2 Related Submittal(s) Grants

This is an application for Certification of a receiver. The transmitter, associated with this receiver, has FCC ID: QU7JPAA and has been filed at the same time.

## INTERTEK TESTING SERVICES

---

---

### 1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (2001). All radiated measurements were performed in an Open Area Test Site. Preliminary scans were performed in the Open Area Test Site 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 radiated data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been placed on file with the FCC.

---

---

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 2**

**SYSTEM TEST CONFIGURATION**

## INTERTEK TESTING SERVICES

---

### 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 (2001).

The device was powered from 8 x new 1.5V "AA" alkaline batteries.

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. The 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 connected with a battery box and was mounted to a cardboard box, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

#### 2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it received continuously.

#### 2.3 Special Accessories

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

## INTERTEK TESTING SERVICES

---

### 2.4 Equipment Modification

Any modifications installed previous to testing by Joyce Park Industrial Ltd. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services.

### 2.5 Measurement Uncertainty

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

### 2.6 Support Equipment List and Description

This product was tested in a configuration with battery box connected.

All the items listed under section 2.0 of this report are

*Confirmed by:*

*Derek Leung  
Supervisor  
Intertek Testing Services Hong Kong Ltd.  
Agent for Joyce Park Industrial Ltd.*



\_\_\_\_\_  
Signature

May 18, 2004

\_\_\_\_\_  
Date

---

---

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 3**

**EMISSION RESULTS**

## INTERTEK TESTING SERVICES

---

---

### 3.0 Emission Results

Data is included of the 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.

## INTERTEK TESTING SERVICES

---

### 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  $\text{dB}\mu\text{V}/\text{m}$

RA = Receiver Amplitude (including preamplifier) in  $\text{dB}\mu\text{V}$

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  $\text{dB}\mu\text{V}/\text{m}$

RR = RA - AG in  $\text{dB}\mu\text{V}$

LF = CF + AF in dB

Assume a receiver reading of 52.0  $\text{dB}\mu\text{V}$  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  $\text{dB}\mu\text{V}/\text{m}$ . This value in  $\text{dB}\mu\text{V}/\text{m}$  was converted to its corresponding level in  $\mu\text{V}/\text{m}$ .

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

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

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

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

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

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

$$FS = RR + LF$$

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

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

## **INTERTEK TESTING SERVICES**

---

---

### **3.2 Radiated Emission Configuration Photograph**

**Worst Case Radiated Emission  
at  
1807.614 MHz**

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.doc.

## INTERTEK TESTING SERVICES

---

---

### 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 7.1 dB

### **TEST PERSONNEL:**



---

*Signature*

Ben W. K. Ho, Compliance Engineer  
Typed/Printed Name

---

May 18, 2004

Date

## INTERTEK TESTING SERVICES

---

Company: Joyce Park Industrial Ltd.  
Model: SE-8100

Date of Test: March 25, 2003

**Table 1**  
**FCC Class B Radiated Emissions**

| Polarization | Frequency<br>(MHz) | Reading<br>(dB $\mu$ V) | Antenna<br>Factor<br>(dB) | Pre-Amp<br>Gain<br>(dB) | Net<br>at 3m<br>(dB $\mu$ V/m) | Limit<br>at 3m<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------|--------------------|-------------------------|---------------------------|-------------------------|--------------------------------|----------------------------------|----------------|
| V            | 903.800            | 27.4                    | 22.6                      | 16                      | 34.0                           | 46                               | -12.0          |
| V            | 1807.614           | 54.4                    | 26.5                      | 34                      | 46.9                           | 54                               | -7.1           |
| V            | 2711.421           | 43.0                    | 29.1                      | 34                      | 38.1                           | 54                               | -15.9          |
| V            | 3615.228           | 37.6                    | 32.8                      | 34                      | 36.4                           | 54                               | -17.6          |
| V            | 4519.035           | 36.2                    | 34.0                      | 34                      | 36.2                           | 54                               | -17.8          |

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances 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 sign in the column shows value below limit.

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

Test Engineer: Ben W. K. Ho

---

---

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 4**

**EQUIPMENT PHOTOGRAPHS**

## INTERTEK TESTING SERVICES

---

---

### 4.0 Equipment Photographs

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

---

---

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 5**

**PRODUCT LABELLING**

## INTERTEK TESTING SERVICES

---

---

### 5.0 Product Labelling

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

---

---

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 6**

**TECHNICAL SPECIFICATIONS**

## INTERTEK TESTING SERVICES

---

---

### 6.0 Technical Specifications

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

---

---

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 7**

**INSTRUCTION MANUAL**

## INTERTEK TESTING SERVICES

---

---

### 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.

---

---

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 8**

**MISCELLANEOUS INFORMATION**

## INTERTEK TESTING SERVICES

---

---

### 8.0 Miscellaneous Information

This miscellaneous information includes the test procedure and calculation of factors such as pulse desensitization and averaging factor.

## INTERTEK TESTING SERVICES

---

### 8.1 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF*.

This device is a superheterodyne receiver. The stabilized signals are continuous, and no desensitization of the measurement equipment occurs.

## INTERTEK TESTING SERVICES

---

### 8.2 Calculation of Average Factor

The emission limits are specified using spectrum analyzers or receivers which incorporate quasi-peak detectors. Typical measurements are made using peak detectors, however, emissions which approach the respective emission limit are measured using a quasi-peak detector.

For measurements above 1 GHz, spectrum analyzers or receivers using average detectors are employed, or the appropriate average factor can be applied.

Measurements using spectrum analyzers with filters other than peak detectors are recorded in the data table section of this report.

This device is a superheterodyne receiver.

It is not necessary to apply average factor to the measurement results.

## INTERTEK TESTING SERVICES

---

### 8.3 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 test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2001. A typical or an unmodulated CW signal at the operating frequency of the EUT has been supplied to the EUT for all measurements. Such a signal is supplied by a signal generator and an antenna in close proximity to the EUT. The signal level is sufficient to stabilize the local oscillator of the EUT.

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 EUT is adjusted through all three orthogonal axis to obtain maximum emission levels. 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. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

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.

## INTERTEK TESTING SERVICES

---

### 8.3 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 were made as described in ANSI C63.4 - 2001.

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is 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. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.2). 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.