



August 17, 2008

***Fuzhou Emax Electronic Co., Ltd.  
Building #12-#16, Cangshan Industrial Area,  
Juyuanzhou, Jinshan District,  
Fuzhou, China***

***Dear Jianxin Shi,***

Enclosed you will find your file copy of a Part 15 Certification (FCC ID: WEC-1212).

For your reference, TCB review normally takes 1 week. Approval will then be granted when no query is sorted.

Please contact me if you have any questions regarding the enclosed material.

Sincerely,

A handwritten signature in black ink, appearing to read "Shawn Xing", with a stylized flourish extending to the right.

Shawn Xing  
Assistant Manager

Enclosure



**Fuzhou Emax Electronic Co., Ltd.**

Application  
For  
Certification  
**(FCC ID: WEC-1212)**

Superregenerative Receiver

Sample Description : Key Finder  
Model: STG-1213

*Billy Li*

**SZ08060042-2**

**Billy Li**

**August 17, 2008**

- 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 is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results referenced from this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
- 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.

TRF no.: FCC 15C\_RX-Sra  
FCC ID: WEC-1212

**Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch**

6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China  
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## INTERTEK TESTING SERVICES

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### 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

**Fuzhou Emax Electronic Co., Ltd. - MODEL: STG-1213**  
**FCC ID: WEC-1212**

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

Equipment Type: Superregenerative Receiver (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 B for unintentional radiator - the new 47 CFR  
[09-20-07 Edition] provision.

Report prepared by:

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Intertek Testing Services Shenzhen Ltd.  
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# INTERTEK TESTING SERVICES

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## Table of Contents

1.0	<b><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
2.0	<b><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
3.0	<b><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
4.0	<b><u>Equipment Photographs</u></b> .....	15
5.0	<b><u>Product Labelling</u></b> .....	17
6.0	<b><u>Technical Specifications</u></b> .....	19
7.0	<b><u>Instruction Manual</u></b> .....	21
8.0	<b><u>Miscellaneous Information</u></b> .....	23
8.1	Stabilization Waveform.....	24
8.2	Emissions Test Procedures .....	25

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## INTERTEK TESTING SERVICES

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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
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
Test Report	Stabilization Waveform	superreg.pdf
Cover Letter	Letter of Agency	agency.pdf

# **INTERTEK TESTING SERVICES**

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## **EXHIBIT 1**

### **GENERAL DESCRIPTION**

## INTERTEK TESTING SERVICES

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### 1.0 **General Description**

#### 1.1 Product Description

The equipment under test (EUT) is a receiver for a key finder operating at 433.920 MHz. The EUT is power by a 3.0V cell battery. The EUT will emit an audible beep when the user presses corresponding one of the four keys of the transmitter. The key ring receiver and the slim receiver have two difference appearances, have different PCB layout, but with the same circuit.

For electronic filing, 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, associated with this receiver, has FCC ID: WEC-1213 and has been filed at the same time.



## INTERTEK TESTING SERVICES

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### 1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). All radiated measurements were performed in a Semi-anechoic Chamber. Preliminary scans were performed in the Semi-anechoic Chamber 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 Semi-chamber facility used to collect the radiated data is **Interterk Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. 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 (2003).

The device was powered from a new 3.0V cell battery.

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 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

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### 2.4 Equipment Modification

Any modifications installed previous to testing by Fuzhou Emax Electronic Co., 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.

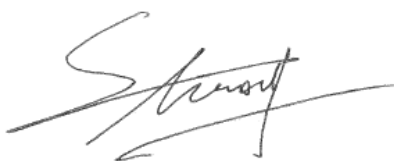
### 2.6 Support Equipment List and Description

This product was tested in standalone configuration.

All the items listed under section 2.0 of this report are

*Confirmed by:*

*Shawn Xing  
Assistant Manager  
Intertek Testing Services Shenzhen Ltd.  
Kejiyuan Branch  
Agent for Fuzhou Emax Electronic Co., Ltd.*



Signature

August 17, 2008

Date

## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 3**

### **EMISSION RESULTS**

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### 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.

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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 $\mu$ V/m  
               $RA$  = Receiver Amplitude (including preamplifier) in dB $\mu$ 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 $\mu$ V/m  
               $RR = RA - AG$  in dB $\mu$ V  
               $LF = CF + AF$  in dB

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

$RA = 52.0$ dB $\mu$ V/m	
$AF = 7.4$ dB	$RR = 23.0$ dB $\mu$ V
$CF = 1.6$ dB	$LF = 9.0$ dB
$AG = 29.0$ dB	
$FS = RR + LF$	
$FS = 23 + 9 = 32$ dB $\mu$ V/m	

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

## **INTERTEK TESTING SERVICES**

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

Worst Case Radiated Emission  
at  
882.627 MHz (key ring receiver)

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



## INTERTEK TESTING SERVICES

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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 8.5 dB (key ring receiver)

#### **TEST PERSONNEL:**



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*Signature*

Billy Li, Compliance Engineer  
*Typed/Printed Name*

August 17, 2008  
*Date*

## INTERTEK TESTING SERVICES

Applicant: Fuzhou Emax Electronic Co., Ltd.  
Model: STG-1213(key ring receiver)

Date of Test: July 31, 2008

Table 1

### FCC Class B Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	420.110	37.7	20.0	17.9	35.6	46.0	-10.4
H	422.750	37.3	20.0	18.0	35.3	46.0	-10.7
H	428.320	37.8	20.0	18.0	35.8	46.0	-10.2
H	431.160	38.2	20.0	18.0	36.2	46.0	-9.8
H	436.720	37.9	20.0	18.0	35.9	46.0	-10.1
H	454.340	37.4	20.0	18.1	35.5	46.0	-10.5
H	876.812	31.9	20.0	25.3	37.2	46.0	-8.8
H	882.627	32.0	20.0	25.5	37.5	46.0	-8.5
H	1301.250	34.3	20.0	26.1	40.4	54.0	-13.6
H	1735.400	34.6	20.0	28.5	43.1	54.0	-10.9

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. All emissions below 1000MHz are below the QP limit and all emissions above 1000MHz are below the AV limit.

5. Peak detector was used when the frequency above 1000MHz.

Test Engineer: Billy Li

TRF no.: FCC 15C\_RX-SRa  
FCC ID: WEC-1212

## INTERTEK TESTING SERVICES

Applicant: Fuzhou Emax Electronic Co., Ltd.  
Model: STG-1213(slim receiver)

Date of Test: July 31, 2008

**Table 2**

### FCC Class B Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	399.570	38.7	20.0	17.7	36.4	46.0	-9.6
H	424.790	37.5	20.0	17.8	35.3	46.0	-10.7
H	430.610	37.9	20.0	17.9	35.8	46.0	-10.2
H	436.980	38.2	20.0	18.0	36.2	46.0	-9.8
H	880.690	29.9	20.0	26.0	35.9	46.0	-10.1
H	903.970	29.4	20.0	26.1	35.5	46.0	-10.5
H	1297.570	31.2	20.0	26.0	37.2	54.0	-16.8
H	1731.500	29.0	20.0	28.5	37.5	54.0	-16.5

- 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. All emissions below 1000MHz are below the QP limit and all emissions above 1000MHz are below the AV limit.
5. Peak detector was used when the frequency above 1000MHz.

Test Engineer: Billy Li

## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 4**

### **EQUIPMENT PHOTOGRAPHS**

## INTERTEK TESTING SERVICES

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### 4.0 **Equipment Photographs**

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

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### **EXHIBIT 5**

### **PRODUCT LABELLING**

## INTERTEK TESTING SERVICES

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### 5.0 **Product Labelling**

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

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### **EXHIBIT 6**

### **TECHNICAL SPECIFICATIONS**



## INTERTEK TESTING SERVICES

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### 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**

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### **EXHIBIT 7**

### **INSTRUCTION MANUAL**

## INTERTEK TESTING SERVICES

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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.

## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 8**

### **MISCELLANEOUS INFORMATION**

## INTERTEK TESTING SERVICES

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### 8.0 **Miscellaneous Information**

This miscellaneous information includes details of the stabilizing process (including a plot of the stabilized waveform) and the test procedure.

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### 8.1 Stabilization Waveform

Previous to the testing, the superregenerative receiver was stabilized as outlined in the test procedure. For the electronic filing, the plot saved with filename: superreg.pdf shows the fundamental emission when a signal generator was used to stabilize the receiver. Please note that the antenna was placed as close as possible to the EUT for clear demonstration of the waveform and that accurate readings are not possible from this plot.

## INTERTEK TESTING SERVICES

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### 8.2 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch in the measurements of superregenerative 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 - 2003. Superregenerative receivers are stabilized prior to measurement by generating a signal well above the receiver threshold whose frequency is tuned until the emissions stabilize into a line spectrum. The signal is usually generated as CW with a Marconi 2022D signal generator and a short whip antenna and is at a level of several hundred to several thousand mV/m. Plots of the stabilized signal will be shown. If a modulated signal is used, it will be noted.

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.

The frequency range scanned is from 30MHz to 2000MHz. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

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### **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 were made as described in ANSI C63.4 - 2003.

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. 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.