



# **ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR SUPERHETRODYNE RECEIVER**

**Test report file number** : E047R-035

**Applicant** : SHINCHANG ELECTRICS CO., LTD.

**Address** : 734-2, Wonshi-Dong, Ansan-Si, Gyungki-Do, 425-090, Korea

**Manufacturer** : SHINCHANG ELECTRICS CO., LTD.

**Address** : 734-2, Wonshi-Dong, Ansan-Si, Gyungki-Do, 425-090, Korea

**Type of Equipment** : REMOTE KEYLESS ENTRY SYSTEM

**FCC ID** : NYOSEKS-07RX

**Model / Type No.** : SEKS-07RX

**Serial number** : N/A

**Total page of Report** : 9 pages (including this page)

**Date of Incoming** : July 03, 2004


**Date of issuing** : July 13, 2004

## **SUMMARY**


The equipment complies with the regulation; **FCC PART 15 SUBPART B §15.101**

This test report contains only the result of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

Prepared by:

  
G. W. Lee/ Chief Engineer  
EMC Div.  
ONETECH Corp.

Reviewed by:

  
Y. K. Kwon/ Director  
EMC Div.  
ONETECH Corp.



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**1. VERIFICATION OF COMPLIANCE**

APPLICANT : SHINCHANG ELECTRICS CO., LTD.  
ADDRESS : 734-2, Wonshi-Dong, Ansan-Si, Gyungki-Do, 425-090, Korea  
CONTACT PERSON : Seungchul, Choi / Research Engineer  
TELEPHONE NO : 82-41-901-0463  
FCC ID : NYOSEKS-07RX  
MODEL NO/NAME : SEKS-07RX  
SERIAL NUMBER : N/A  
DATE : July 13, 2004

DEVICE TYPE	UNINTENTIONAL RADIATOR
E.U.T. DESCRIPTION	REMOTE KEYLESS ENTRY SYSTEM -SUPERHETRODYNE RECEIVER
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/2001
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 §15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



## 2. GENERAL INFORMATION

### 2.1 Product Description

The SHINCHANG ELECTRICS CO., LTD., Model SEKS-06RX (referred to as the EUT in this report) is a receiver that is fixed inside the vehicle and receives the signal from the transmitter, Model: SEKS-07TX, FCC ID: NYOSEKS-07TX which was manufactured by Shingchang Electrics Co., Ltd and then decide locking and unlocking the door of the vehicle. The product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
RECEIVING FREQUENCY	433.92 MHz
SENSITIVITY	Min -98dBm
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	4.8970 MHz
RATED SUPPLY VOLTAGE	DC 12V
OPERATING VOLTAGE	DC 9 ~ 16V
NUMBER OF LAYERS	2 LAYERS

Model Differences:

-. No other model differences have been mentioned.

### 2.2 Related Submittal(s) / Grant(s)

Original submittal only.



## 2.3 Test System Details

The EUT was tested with the following all equipment used in the tested systems are:

Model	Manufacturer	FCC ID	Description	Connected to
SEKS-07RX	SHINCHANG ELECTRICS CO., LTD.	NYOSEKS-06RX	RECEIVER	BATTERY
N/A	N/A	N/A	BATTERY	EUT
N/A	N/A	N/A	Jig	EUT
8657A	HP	N/A	Signal Generator	N/A

## 2.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4/2001. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

## 2.5 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Commission on October 02, 2002. (Registration Number: 529838)

# 3. SYSTEM TEST CONFIGURATION

## 3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
MAIN BOARD	SHINCHANG ELECTRICS CO., LTD.	95400-1F300	N/A

## 3.2 EUT exercise Software

Set the signal generator to transmit at 433.92MHz and then the EUT receives the signal.

Used battery for the EUT was fully charged.

To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes.

## 3.3 Equipment Modifications

None



### 3.4 Configuration of Test System

#### Line Conducted Emission Test:

It is not need to test this requirement, because the power of the EUT supplies from a car battery.

#### Radiated Emission Test:

Preliminary radiated emissions tests were conducted using the procedure in ANSI C63.4/2001, 8.3.1.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meters open area test site.

#### Coherent Test:

During Radiated Emission Tests, H.P. signal generator model no: 8657A was used to radiate an unmodulated CW signal to EUT at 433.92 MHz in order to cohere the individual components of the characteristic broadband emissions from EUT.

#### Antenna Power Conduction Test:

This equipment was only with a permanently attached antenna, so the radiated emission measurement was performed with the antenna attached.

## 4. PRELIMINARY TEST

### 4.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
N/A	N/A
It is not need to test this requirement, because the power of the EUT is supplied from a car battery.	

### 4.2 Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
RX mode	X



## 5. FINAL RESULT OF MEASUREMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level.

### 5.1 Radiated Emission Test

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 47 % Temperature : 24 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B (Section: 15.109)  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)  
 Type of Test : Unintentional Radiator  
 Result : PASSED BY -12.47dB at 270.30 MHz

EUT : REMOTE KEYLESS ENTRY SYSTEM Date: July 08, 2004  
 Operating Condition : RX mode  
 Distance : 3 Meter

Radiated Emission		Ant	Correction Factors		Total	FCC LIMIT	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dB/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (Db)
129.90	11.00	H	13.85	1.67	26.52	43.52	-17.00
170.00	11.80	H	15.76	2.00	29.56	43.52	-13.96
182.10	12.14	H	16.26	2.00	30.40	43.52	-13.12
270.30	13.10	H	17.97	2.48	33.55	46.02	-12.47
Other frequencies are more than 30dB below the limit up to 2GHz.							

Radiated Emission Tabulated Data

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Tested by: Ki-Hong, Nam / Test Engineer



## 6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

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= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)



**7. LIST OF TEST EQUIPMENT**

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS 10	827864/005	NOV/03	12MONTH	■
2.	Test receiver	R/S	ESHS10	834467/007	APR/04	12MONTH	
3.	Spectrum analyzer	HP	8567A	3021A00773	JUL/04	12MONTH	■
4.	RF preselector	HP	85685A	3107A01268	JUL/04	12MONTH	■
5.	Quasi-Peak Adapter	HP	85650A	3107A01550	JUL/04	12MONTH	■
6.	Biconical antenna	EMCO	3104C	9109-4441 9109-4443 9109-4444	JUL/04	12MONTH	■
7.	Log Periodic antenna	EMCO	3146	9109-3213 9109-3214 9109-3217	JUL/04	12MONTH	■
8.	Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA9120D294	JUN/04	12MONTH	■
9.	LISN	EMCO	3825/2	9109-1867 9109-1869	AUG/03	12MONTH	
10.	RF Amplifier	HP	8347F	3307A01354	JUN/04	N/A	
11.	Spectrum Analyzer	HP	8564E	3650A00756	JUL/04	12MONTH	■
12.	Spectrum Analyzer	HP	8566B	3407A08547	AUG/03	12MONTH	
13.	Plotter	HP	7475A	30052 22986	N/A	N/A	
14.	Position Controller	HD	HD100	100/788	N/A	N/A	■
15.	Turn Table	HD	DS420S	N/A	N/A	N/A	■
16.	Antenna Master	HD	HD240	N/A	N/A	N/A	■
17.	Isolation Transformer	Digitek Power	DPT	DPF-22027	N/A	N/A	■
18.	Isolation Transformer	Digitek Power	DPT	DPF-22028	N/A	N/A	■
19.	Frequency Converter	Digitek Power	VFS/DEFC	N/A	N/A	N/A	■