

ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR SUPERHETRODYNE RECEIVER

Test Report No. : E123R-063

AGR No. : A123A-016R

Applicant : Shinchang Electrics Co., Ltd.

Address : 734-2, Wonshi-dong, Danwon-gu, Ansan-si, Kyungki-do, 425-090, Korea

Manufacturer : Shinchang Electrics Co., Ltd.

Address : 734-2, Wonshi-dong, Danwon-gu, Ansan-si, Kyungki-do, 425-090, Korea

Type of Equipment : Remote Keyless Entry System

FCC ID : NYOSEKS-SL13MYARX

IC Certification No. : 3109A- SL13MYARX

Model No. : SEKS-SL13MYARX

Serial number : N/A

Total page of Report : 12 pages (including this page)

Date of Incoming : March 12, 2012

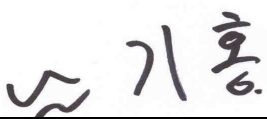
Date of issuing : March 26, 2012

SUMMARY

The equipment complies with the regulation; **FCC CFR 47 PART 15 SUBPART B, Section 15.101 and IC RSS-210 Issue 8, RSS-Gen Issue 3.**

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.

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1. VERIFICATION OF COMPLIANCE

APPLICANT : Shinchang Electrics Co., Ltd.
 ADDRESS : 734-2, Wonshi-dong, Danwon-gu, Ansan-si, Kyungki-do, 425-090, Korea
 CONTACT PERSON : Mr. Hak-Su, Khim / Quality Control Assistant Manager
 TELEPHONE NO : +82-41-901-0487
 FCC ID : NYOSEKS-SL13MYARX
 IC CERTIFICATION NO. : 3109A- SL13MYARX
 MODEL NAME : SEKS-SL13MYARX
 BRAND NAME : SL BCM / KIA
 SERIAL NUMBER : N/A
 DATE : March 26, 2012

EQUIPMENT CLASS	FCC: CYC - Communications Receiver used w/ Pt 15 Tx IC: Category I License-Exempt Receiver
E.U.T. DESCRIPTION	Remote Keyless Entry System - SUPERHETRODYNE RECEIVER
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.4: 2009
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 and RSS-210 Issue 8, RSS-Gen Issue 3
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	10 m, Semi Anechoic Chamber

The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC & IC 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-SL13MYARX (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-SL10ATX and FCC ID: NYOSEKS-SL10ATX, IC certification No.: 3109A-SEKSSL10ATX, which was manufactured by Shingchang Electrics Co., Ltd. and then decided 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	315.00 MHz
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>= 1 MHz)	4 MHz
ANTENNA TYPE	External Antenna
RATED SUPPLY VOLTAGE	DC 12 V
OPERATING VOLTAGE	DC 9 V ~ 16 V
NUMBER OF LAYERS	2 Layers

2.2 Model Differences:

-. None

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC part 15B, section 15.101 and IC, RSS-Gen Issue 3, section 6.

2.5 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.4: 2009 and RSS-210, Issue 8 & RSS-Gen Issue 3 at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 307-51, Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862, Korea. The Onetech Corp. has been accredited as a Conformity Assessment Body (CAB) with designation number KR0013 and was submitted to the Industry Canada on April 14, 2009. (Registration Number: IC 3736A-2).

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	N/A	SL11c NU BCM V4.0	N/A
RF Board	N/A	RFM_T _ V3.0	N/A

3.2 Peripheral equipment

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

Model	Manufacturer	FCC ID & IC certification No.	Description	Connected to
SEKS-SL13MYARX	Shinchang Electrics Co., Ltd.	NYOSEKS-SL13MYARX	Receiver (EUT)	Battery
		3109A- SL13MYARX		
N/A	N/A	N/A	Battery	EUT
N/A	N/A	N/A	Jig Box	EUT
SEKS-SL10ATX	Shinchang Electrics Co., Ltd.	NYOSEKS-SL10ATX	Transmitter	N/A
		3109A-SEKSSL10ATX		

3.3 Mode of operation during the test

-. The EUT was operated with receiving mode continuously during the test.

3.4 Equipment Modifications

-. None

3.5 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: 2003, 8.3.1.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 m semi anechoic chamber.

Coherent Test:

During Radiated Emission Tests, the EUT was operated with standby mode of receiving condition.

Antenna Power Conduction Test:

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

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)
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

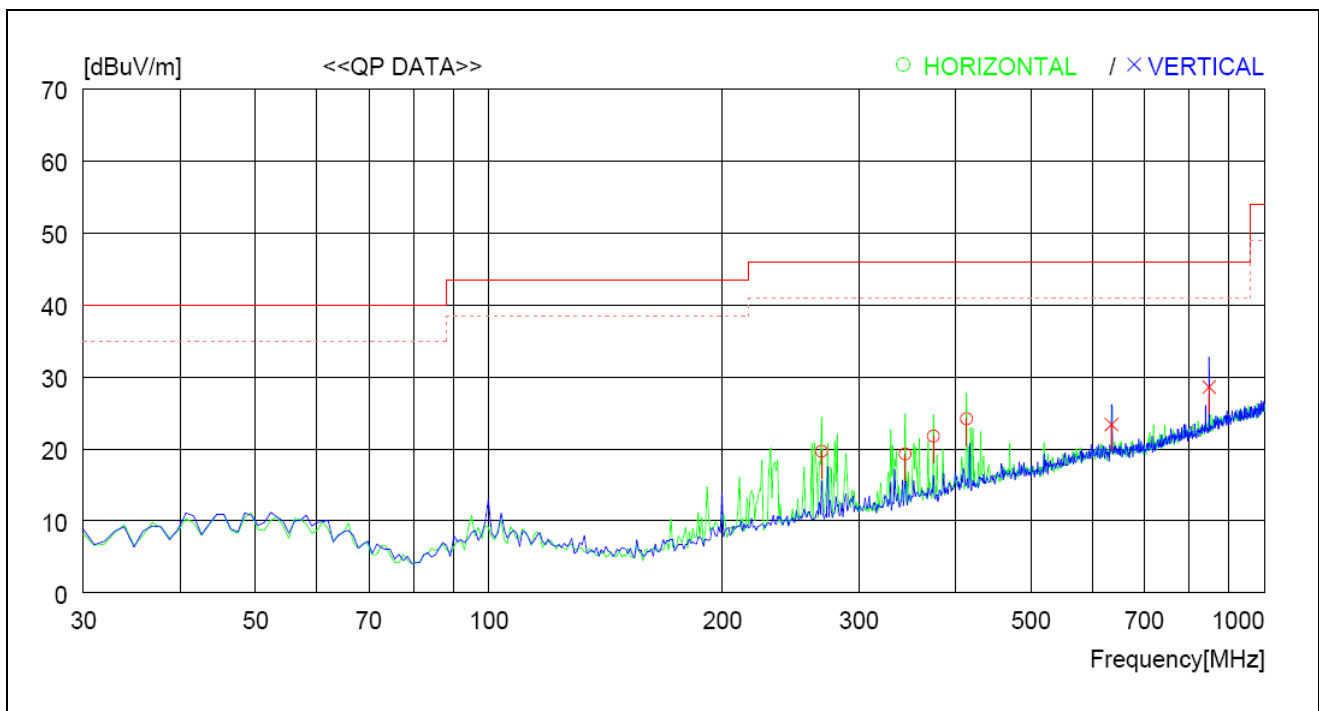
Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level.

5.1 Radiated Emission Test

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

Humidity Level	: <u>42.2 % R.H.</u>	Temperature: <u>20.9 °C</u>
Limits apply to	: <u>FCC CFR 47, Part 15, Subpart B (Section: 15.109) and RSS-Gen Issue 3 Section 6</u>	
Detector	: CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)	
Type of Test	: <u>Unintentional Radiator</u>	
Result	: <u>PASSED BY -17.40 dB at 848.670 MHz</u>	

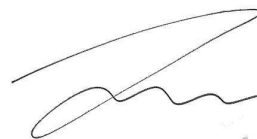
EUT	: Remote Keyless Entry System	Date: March 23, 2012
Operating Condition	: RX mode	
Distance	: 3 m	
Frequency Range	: 30 MHz ~ 1 000 MHz	



No.	FREQ	READING QP	ANT FACTOR	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	268.620	36.4	12.7	3.4	32.8	19.7	46.0	26.3	100	0
2	344.280	34.1	14.4	3.9	33.1	19.3	46.0	26.7	100	6
3	374.350	35.7	15.1	4.1	33.1	21.8	46.0	24.2	100	112
4	413.151	37.1	15.9	4.3	33.1	24.2	46.0	21.8	100	218
----- Vertical -----										
5	848.670	33.8	21.3	6.5	33.0	28.6	46.0	17.4	400	141
6	635.277	32.1	19.1	5.4	33.2	23.4	46.0	22.6	100	204

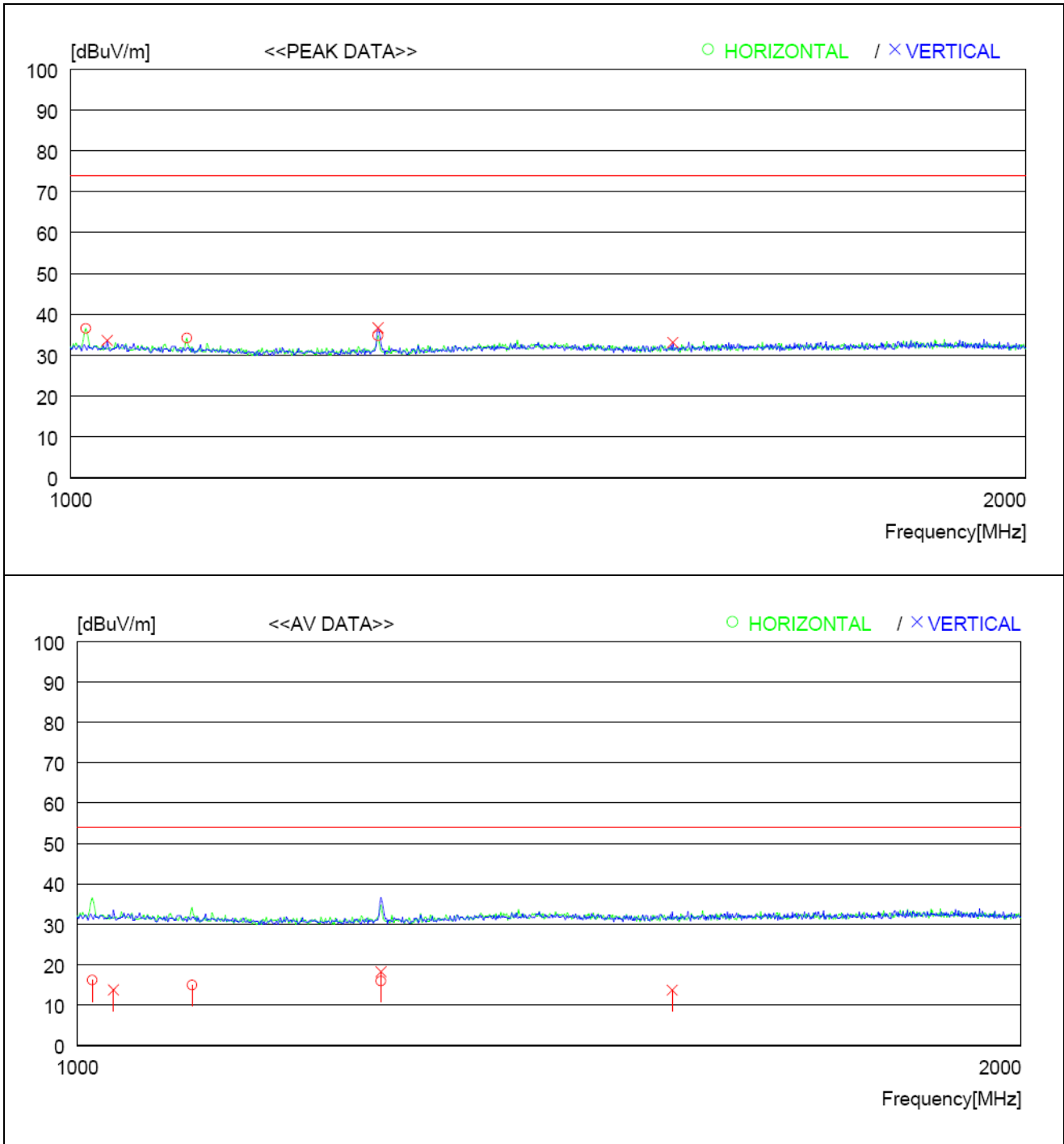
Remark: Margin (dB) = Limit – Result and Result = Reading Quasi-Peak + Antenna Factor + Loss - Gain

Loss and Gain in above table means Cable Loss and Pre-amplifier gain.



Tested by: Chang-Uk, Jun / Engineer

Frequency Range : 1 000 MHz ~ 2 000 MHz

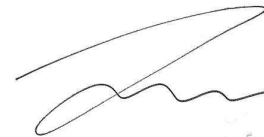


No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	1011.000	48.8	25.9	4.2	42.3	36.6	74.0	37.4	100	0
2	1088.000	46.0	25.9	4.6	42.3	34.2	74.0	39.8	100	47
3	1250.000	46.3	26.0	4.9	42.4	34.8	74.0	39.2	100	0
----- Vertical -----										
4	1027.000	45.6	25.9	4.4	42.3	33.6	74.0	40.4	100	354
5	1250.000	48.2	26.0	4.9	42.4	36.7	74.0	37.3	100	6
6	1548.000	44.1	26.1	5.5	42.6	33.1	74.0	40.9	100	359

No.	FREQ [MHz]	READING AV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	1011.000	28.4	25.9	4.2	42.3	16.2	54.0	37.8	100	0
2	1088.000	26.8	25.9	4.6	42.3	15.0	54.0	39.0	100	47
3	1250.000	27.5	26.0	4.9	42.4	16.0	54.0	38.0	100	0
----- Vertical -----										
4	1027.000	25.8	25.9	4.4	42.3	13.8	54.0	40.2	100	354
5	1250.000	29.8	26.0	4.9	42.4	18.3	54.0	35.7	100	6
6	1548.000	24.7	26.1	5.5	42.6	13.7	54.0	40.3	100	359

Remark: Margin (dB) = Limit – Result and Result = Reading Quasi-Peak + Antenna Factor + Loss - Gain

Loss and Gain in above table means Cable Loss and Pre-amplifier gain.



Tested by: Chang-Uk, Jun / Engineer

6. FIELD STRENGTH CALCULATION

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

+	Meter reading	(dB μ V)
+	Cable Loss	(dB)
+	Antenna Factor (Loss)	(dB/m)
=	Corrected Reading	(dB μ V/m)
-	Specification Limit	(dB μ V/m)
=	dB Relative to Spec	($\pm$ dB)

7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESCI	101012	FEB/12	12MONTH	■
2.	Test Receiver	R/S	ESU	100261	SEP/11	12MONTH	■
3.	Amplifier	Sonoma Instrument	310N	312544	OCT/11	12MONTH	■
4.	Amplifier	Sonoma Instrument	310N	312545	OCT/11	12MONTH	■
5.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163-202	OCT/10	24MONTH	■
6.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-419	FEB/12	24MONTH	■
7.	Controller	Innco System	CO2000	619/27030611/L	N/A	N/A	■
8.	Turn Table	Innco System	DT3000	930611	N/A	N/A	■
9.	Antenna Master	Innco System	MA4000-EP	3320611	N/A	N/A	■
10.	Antenna Master	Innco System	MA4000-EP	3350611	N/A	N/A	■