



# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR SINGLE SUPERHETERODYNE RECEIVER

**Test report file number** : E03DR-093

**Applicant** : OMRON AUTOMOTIVE ELECTRONICS KOREA CO., LTD.  
**Address** : 481-2, Kasan-Dong, Kumchun-Ku, Seoul, 153-023, Korea

**Manufacturer** : OMRON AUTOMOTIVE ELECTRONICS KOREA CO., LTD.  
**Address** : 481-2, Kasan-Dong, Kumchun-Ku, Seoul, 153-023, Korea

**Type of Equipment** : REMOTE CONTROL SECURITY RECEIVER

**FCC ID** : OSLOKA-110R

**Model Name** : OKA-110R

**Multiple Model Name** : N/A

**Serial number** : N/A

**Total page of Report** : 10 pages (including this page)

**Date of Incoming** : November 25, 2003

**Date of Issuing** : December 31, 2003

## SUMMARY

The equipment complies with the requirements of **FCC CFR 47 PART 15 SUBPART B, SECTION 15.101.**

This test report contains only the results 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  
G. W. Lee/ Chief Engineer  
EMC Div.  
ONETECH Corp.

Reviewed by: Y. K. Kwon  
Y. K. Kwon/ Director  
EMC Div.  
ONETECH Corp.



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## 1. VERIFICATION OF COMPLIANCE

- APPLICANT : OMRON AUTOMOTIVE ELECTRONICS KOREA CO., LTD.
- ADDRESS : 481-2, Kasan-Dong, Kumchun-Ku, Seoul, 153-023, Korea
- CONTACT PERSON : Mr. Youngje, Seo / Section Manager
- TELEPHONE NO : 82-2-850-5743
- FCC ID : OSLOKA-110R
- MODEL NO/NAME : OKA-110R
- SERIAL NUMBER : N/A
- DATE : December 31, 2003

DEVICE TYPE	UNINTENTIONAL RADIATOR
E.U.T. DESCRIPTION	REMOTE CONTROL SECURITY RECEIVER - SINGLE SUPERHETERODYNE 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, SECTION 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 OMRON AUTOMOTIVE ELECTRONICS KOREA CO., LTD., Model OKA-110R (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: OKA-110T, FCC ID: OSLOKA-110T, which was manufactured by above applicant and then decide locking and unlocking the. The product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE		Non-Metal
RECEIVING FREQUENCY		313.85 MHz
RF RECEIVER MODULE	TYPE	G8X-21RXIAM by OMRON IIDA
	LOCAL CLOCK FREQ.	313.85 MHz
	FREQUENCY GENERATION	Crystal Resonator
	MODULATION SCHEME	FM (Superheterodyne)
	CARRIER DETECT SENSITIVITY	11 dBuVemf
USED CPU		MB90F548GLSPF by Fujitsu
LIST OF EACH OSC. OR CRY. FREQ. (FREQ.>=1MHz)		4 MHz on Main Board
OPERATING VOLTAGE/CURRENT		DC12V, 50mA from vehicle battery
NUMBER OF LAYERS		2 Layers

**2.2 Model Differences:**

The difference(s) compared to the EUT is as follows: none

**2.3 Related Submittal(s) / Grant(s)**

Original submittal only



## 2.4 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
OKA-110R	OMRON AUTOMOTIVE ELECTRONICS KOREA CO., LTD.	OSLOKA-110R	RECEIVER	BATTERY
N/A	OMRON AUTOMOTIVE ELECTRONICS KOREA CO., LTD.	N/A	Door Unlock Check Unit with a battery	EUT
8657A	HP	N/A	Signal Generator	N/A

## 2.5 Test Methodology

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.

## 2.6 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 January 18, 2002. (Registration Number: 92819)



**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	OMRON AUTOMOTIVE ELECTRONICS KOREA CO., LTD.	JM-ETACS	N/A

**3.2 EUT exercise Software**

Set the signal generator to transmit at 313.85MHz and then the EUT receives the signal.

Used battery for the EUT was fully charged.

**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 frequency modulated signal to EUT at 313.85 MHz in order to cohere the individual components of the characteristic broadband emissions from EUT.

Antenna Power Conduction Test:

The antenna of this equipment was installed on the EUT, so the radiated emission measurement was performed with the antenna installed.



**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.

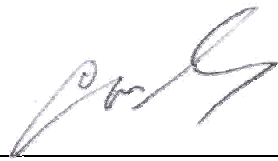
Humidity Level : 48 % Temperature : 16 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)  
 Type of Test : Unintentional Radiator  
 Result : PASSED BY -10.51 dB at 878.80 MHz

EUT : REMOTE CONTROL SECURITY RECEIVER Date: December 12, 2003  
 Operating Condition : RX mode  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)  
 Frequency Range : 30 MHz ~ 2 GHz  
 Distance : 3 Meter

Radiated Emission		Ant	Correction Factors		Total	FCC LIMIT	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
61.00	12.10	V	11.04	0.00	23.14	40.00	-16.86
602.30	4.70	V	19.32	2.24	26.26	46.02	-19.76
796.30	3.60	V	21.02	3.09	27.71	46.02	-18.31
878.80	9.90	H	21.93	3.68	35.51	46.02	-10.51
888.50	8.20	H	22.03	3.75	33.98	46.02	-12.04
907.90	5.00	V	22.21	3.84	31.05	46.02	-14.97

There was not observed any emission from 1 GHz to 2GHz..

Radiated Emission Tabulated Data



**Tested by: In-Sub, Youn / 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	DEC/03	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	APR/03	12MONTH	
3.	Spectrum analyzer	HP	8566B	3407A08547	AUG/03	12MONTH	■
4.	Spectrum analyzer	HP	8568B	3109A05456	MAY/03	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	MAY/03	12MONTH	■
6.	Quasi-Peak Adapter	HP	85650A	3107A01542	MAY/03	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	FEB/03	12MONTH	■
8.	Biconical antenna	EMCO	3104C	9109-4443	MAY/03	12MONTH	■
				9109-4444	JUL/03	12MONTH	
		Schwarzbeck	VHA9103	91031852	AUG/02	12MONTH	
9.	Log Periodic antenna	EMCO	3146	9109-3213	AUG/02	12MONTH	■
				9109-3214	JUL/03	12MONTH	
				9109-3217	MAY/03	12MONTH	
		Schwarzbeck	9108-A(494)	62281001	AUG/02	12MONTH	
10.	LISN	EMCO	3825/2	9109-1867	AUG/03	12MONTH	
				9109-1869	OCT/03	12MONTH	
11.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
12.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
13.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■