



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR SINGLE SUPERHETERODYNE RECEIVER

Test report file number : E033R-058

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 (Unintentional Radiator)

FCC ID : OSLOKA-610R

Model Name : OKA-610R

Multiple Model Name : N/A

Serial number : N/A

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

Date of Incoming : February 21, 2003

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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.

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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-610R
- MODEL NO/NAME : OKA-610R
- SERIAL NUMBER : N/A
- DATE : March 25, 2003

| | |
|--|---|
| DEVICE TYPE | UNINTENTIONAL RADIATOR |
| E.U.T. DESCRIPTION | REMOTE CONTROL SECURITY RECEIVER - SINGLE SUPERHETERODYNE RECEIVER |
| THIS REPORT CONCERNS | ORIGINAL GRANT |
| MEASUREMENT PROCEDURES | ANSI C63.4/1992 |
| 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-610R (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-610T, FCC ID: OSLOKA-610T, which was manufactured by above applicant and then decide locking and unlocking the door and alarm siren. The product specification described herein was obtained from product data sheet or user's manual.

| | | |
|--|----------------------------|---|
| CHASSIS TYPE | | Plastic |
| RECEIVING FREQUENCY | | 307.9 MHz |
| RF RECEIVER MODULE | TYPE | WMF-R13 by Mitsumi Elec. |
| | LOCAL CLOCK FREQ. | 318.6 MHz |
| | FREQUENCY GENERATION | Crystal Resonator |
| | MODULATION SCHEME | FM (Single Superheterodyne) |
| | CARRIER DETECT SENSITIVITY | 11 dBuVemf |
| USED CPU | | MB89636 by Fujitsu |
| LIST OF EACH OSC. OR CRY. FREQ. (FREQ.>=1MHz) | | 63.72 MHz on RF receiver module 10 MHz on Main Board |
| OPERATING VOLTAGE/CURRENT | | DC12V, 50mA from battery of vehicle |
| NUMBER OF LAYERS | | 2 Layers |

Model Differences:

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

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 |
|----------|---|-------------|--|--------------|
| OKA-610R | OMRON AUTOMOTIVE ELECTRONICS KOREA CO., LTD. | OSLOKA-610R | 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 |

2.4 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.4/1992. 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 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. | XD-ETACS | N/A |

3.2 EUT exercise Software

Set the signal generator to transmit at 307.9MHz 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 C63.4/1992, 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 307.9 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 : 48 % Temperature : 18 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)
 Type of Test : Unintentional Radiator
 Result : PASSED BY -7.39 dB at 318.80 MHz

EUT : REMOTE CONTROL SECURITY RECEIVER Date: March 07, 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) |
| 117.80 | 10.30 | V | 13.34 | 1.23 | 24.87 | 43.50 | -18.63 |
| 215.50 | 10.80 | H | 10.93 | 1.65 | 23.38 | 43.50 | -20.12 |
| 318.80 | 22.10 | H | 14.40 | 2.11 | 38.61 | 46.00 | -7.39 |
| 324.40 | 15.20 | H | 14.18 | 2.15 | 31.53 | 46.00 | -14.47 |
| 382.80 | 14.60 | H | 14.79 | 2.40 | 31.79 | 46.00 | -14.21 |
| 626.80 | 6.40 | H | 19.27 | 3.01 | 28.68 | 46.00 | -17.32 |
| 934.40 | 7.40 | H | 22.91 | 4.06 | 34.37 | 46.00 | -11.63 |

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

Radiated Emission Tabulated Data



Tested by: Young-Min, Choi / Project 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)

= 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 | APR/02 | 12MONTH | ■ |
| 2. | Test receiver | R/S | ESHS 10 | 834467/007 | NOV/02 | 12MONTH | |
| 3. | Spectrum analyzer | HP | 8566B | 3407A08547 | AUG/02 | 12MONTH | ■ |
| 4. | Spectrum analyzer | HP | 8568B | 3109A05456 | APR/02 | 12MONTH | ■ |
| 5. | RF preselector | HP | 85685A | 3107A01264 | APR/02 | 12MONTH | ■ |
| 6. | Quasi-Peak Adapter | HP | 85650A | 3107A01542 | APR/02 | 12MONTH | ■ |
| 7. | TRILOG Broadband Antenna | Schwarzbeck | VULB9163 | VULB9163 166 | FEB/03 | 12MONTH | ■ |
| 8. | Biconical antenna | EMCO | 3104C | 9109-4441 9109-4443 9109-4444 | APR/02 | 12MONTH | ■ |
| 9. | Log Periodic antenna | EMCO | 3146 | 9109-3213 9109-3214 9109-3217 | APR/02 | 12MONTH | ■ |
| 10. | LISN | EMCO | 3825/2 | 9109-1867 9109-1869 | AUG/02 | 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 | ■ |