# TEST REPORT

FCC RULES Part 15 Subpart C §15.231

# FCC ID : OSLOKA-674T

| | | |
|---|---|---|
| Equipment Under Test | : | RF Keyless Entry System(Transmitter) |
| Model No. | : | OKA-674T |
| Serial No. | : | N/A |
| Applicant | : | **Omron Automotive Electronics Korea Co., Ltd.** |
| Manufacturer | : | **Omron Automotive Electronics Korea Co., Ltd.** |
| Date of Test(s) | : | 2006-02-20 ~ 2006-03-07 |
| Date of Issue | : | 2006-03-09 |

In the configuration tested, the EUT complied with the standards specified above.

**Remarks:**

# VERIFICATION OF COMPLIANCE

| | |
|---|---|
| **Applicant :** | Omron Automotive Electronics Korea Co., Ltd. |
| **Kind of Product :** | RF Keyless Entry System(Transmitter) |
| **Brand Name :** | N/A |
| **Model Name :** | OKA-674T |
| **Model Difference :** | - |
| **Report File No. :** | STROR-06-023 |
| **Date of test :** | 2006-02-20 ~ 2006-03-07 |
| **Receiver EUT :** | - |

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULT** |
| Part 15 Subpart C§15.231 | Complied |

The above equipment was tested by SGS Testing Korea Co., Ltd. for compliance with the requirements set forth in the FCC RULES Part 15 Subpart C §15.231. The results of testing in this report apply to the product system that was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

***Tested By:***  ***Date*** **2006-03-09**

***Feel Jeong***

***Approved By***  ***Date*** **2006-03-09**

***Albert Lim***

# INDEX

## CONTENTS

| | Page |
|---|---|
| 1. General Description of EUT ---------- | 4 |
| 2. General Information of EUT ---------- | 4 |
| 3. Test Procedure ---------- | 5 |
| 4. Test Condition---------- | 6 |
| **Test Results** | |
| 5. Field Strength of the Carrier ---------- | 7 |
| 6. Spurious Emission ---- ---------- | 8 |
| 7. Bandwidth of Operation Frequency ---------- | 9 |
| 8. Transmission Time ---------- | 10 |
| 9. Attachment A – Photos of the Test Set up ---------- | 11 |
| 10.Attachment B – Photos of the EUT---------- | 12 |

# 1. General Description of EUT

**Remote Keyless Entry:**

**The RKE transmitter transmits at 315MHz for NA an FSK modulated data signal to the SRx. The RF system of SRx receives this encrypted RF signal. The SRx send the signal to corresponding the host Body Control Module through single wired K-line bus then the host module broadcasts the requested remote commands to the appropriate control modules in the vehicle through CAN-communication line. In general the following functions are provided:**

**-Lock the car**

**-Unlock the car**

**-Unlock the trunk of the car**

**-Panic**

# 2. General Information of EUT

## Transmitter

| | |
|---|---|
| Power Supply | DC3V(Lithium) |
| Operating Frequency | 315 MHz |
| Modulation | FSK |
| Operating Temperature | -20℃ ~ +60℃ |
| Frequency Generation | X-Tal |
| Communication method | One - Way |
| Size | 34 mm(W) x 62 mm(L) x 15 mm(H) |
| Antenna Type | Integrated PCB Pattern |

## Details of Modification

**N/A**

# 3. Test Procedure

The test procedures are performed following the test stands ANSI C.63.4-2003.

## 3.1 Conducted Emission

Testing was performed according ANSI C.63.4-2003 in a shielded room with peripherals placed on a table, 0.8 m high over a metal floor.

It was located more than required distance away from the shield room wall.

## 3.2 Radiated Emission

Testing was performed according ANSI C.63.4-2003 at open field test site. The EUT was placed in a 0.8 m high table along with the peripherals.

The turn-table was separated from the antenna distance 3 meters. Cables were placed in a position to produce maximum emissions as determined by experimentation and operation mode was selected for maximum.

The frequencies and amplitudes of maximum emission were measured at vary azimuths, antenna heights and antenna polarities.

Reported are maximized emission levels.

# 4. Test Condition

## 4.1 Test Configuration

The device was configured for testing in a typical fashion (as a customer would normally use it).

During the tests, the EUT and the supported equipments were installed to meet FCC requirement and operated in a manner, which tends to maximize its emission level in a typical application.

**Conducted Emission Test**

It needs not to test requirement, because the EUT supplies from a DC battery.

**Radiated Emission Test**

Preliminary radiated emission tests were conducted using the procedure in ANSI C.63.4-2003 clause 8.3.1.1. to determine the worst operating condition. Final radiated emission tests were measured at 3 meter open field test site. To complete the test configuration required by the FCC, the EUT was tested in all three orthogonal planes.

## 4.2 EUT Operation

EUT was tested according to the following operation modes provided by the specifications given by the manufacturer, and reported the worst emissions.

## 4.3 Peripherals / Support Equipment Used

Following peripheral devices and interface cables were connected during the measurement.

Type of Peripheral Equipment Used:

| Description | Model Name | Serial NO | Manufacturer |
|---|---|---|---|
| - | - | - | - |

# 5. Field Strength of the Carrier FCC Part 15, Subpart C, Section 15.231(b)

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

Humidity Level : 43 % Temperature: 21 ℃

| Radiated Emissions | | | Ant | Correction Factors | | Total | FCC Limit | |
|---|---|---|---|---|---|---|---|---|
| Carrier Freq. (MHz) | Amp. (dBuV/m) | Detect Mode | Pol. | Ant. (dB/m) | Cable (dB) | Amp. (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) |
| 315 | 47.9 | Peak | H | 15.93 | 1.85 | 65.68 | 75.62 | 9.94 |

* Remark: To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes.

Note :

1. A peak limit is 20dB above the average limit.

## Test Equipment Used

| EQUIPMENT | MANUFACTURER | MODEL | CAL DUE. |
|---|---|---|---|
| Spectrum Analyzer | Agilent | 8565E | 2006-12-08 |
| Test Receiver | R&S | ESVS10 | 2006-05-24 |
| Turn Table | DI-1500 | Daeil EMC | N/A |
| Antenna Master | 1050 | EMCO | N/A |
| Log-periodic antenna | Schwarzbeck | UHALP9107 | 2006-05-02 |

# 6. Spurious Emission FCC Part 15, Subpart C, Section 15.231(b)

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

Humidity Level : 43 % Temperature: 21 ℃

| Radiated Emissions | | | Ant | Correction Factors | | Total | FCC Limit | |
|---|---|---|---|---|---|---|---|---|
| Freq. (MHz) | Amp. (dBuV/m) | Detect Mode | Pol. | Ant. (dB/m) | Cable (dB) | Amp. (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) |
| 945 | 25.1 | Peak | H | 25.19 | 3.33 | 52.96 | 55.62 | 2.66 |
| 1260 | 12.67 | Peak | H | 24.44 | 4.72 | 41.83 | 55.62 | 13.79 |
| 2205 | 14.50 | Peak | H | 27.51 | 6.56 | 49.57 | 55.62 | 6.05 |

Remark: Other spurious frequencies were not found up to 4000MHz
To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes.

Notes :

1. H: Horizontal polarization, V: Vertical polarization
2. Emission Level =Reading +Antenna Factor + Cable Loss
3. A peak limit is 20dB above the average limit

## Test Equipment Used

| EQUIPMENT | MANUFACTURER | MODEL | CAL DUE. |
|---|---|---|---|
| Spectrum Analyzer | Agilent | 8565E | 2006-12-08 |
| Test Receiver | R&S | ESVS10 | 2006-05-24 |
| Turn Table | DI-1500 | Daeil EMC | N/A |
| Antenna Master | 1050 | EMCO | N/A |
| Horn antenna | Schwarzbeck | 9120D | 2006-07-23 |
| Log-periodic antenna | Schwarzbeck | UHALP9107 | 2006-05-02 |
| Biconical antenna | EMCO | 3110 | 2006-04-04 |

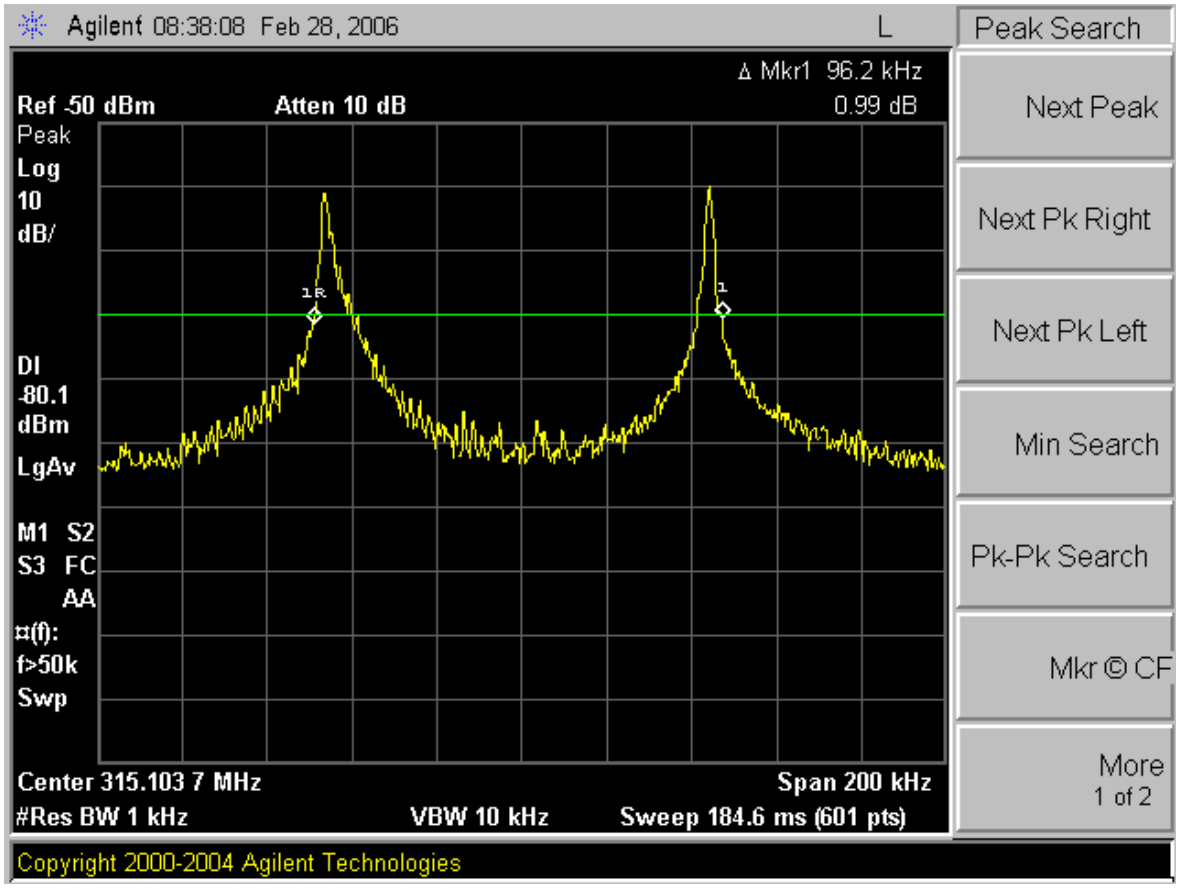
## 7. Bandwidth of Operation Frequency FCC Part 15, Subpart C, Section 15.231(c)

Humidity Level : 43 % Temperature: 21 ℃

Limit of 20dB Bandwidth : 315 MHz * 0.0025 = 787.5 kHz

| Carrier Freq. (MHz) | Bandwidth of the emission. (kHz) | Limit (kHz) | Remark |
|---|---|---|---|
| 315 | 96.2 | 787.5 | The point 20dB down from the modulated carrier |

The plot of test result is attached as below




### Test Equipment Used

| EQUIPMENT | MANUFACTURER | MODEL | CAL DUE. |
|---|---|---|---|
| Spectrum Analyzer | Agilent | E4440A | 2006-05-20 |

# 8. Transmission Time

**FCC Part 15, Subpart C, Section 15.231(a) (1)**

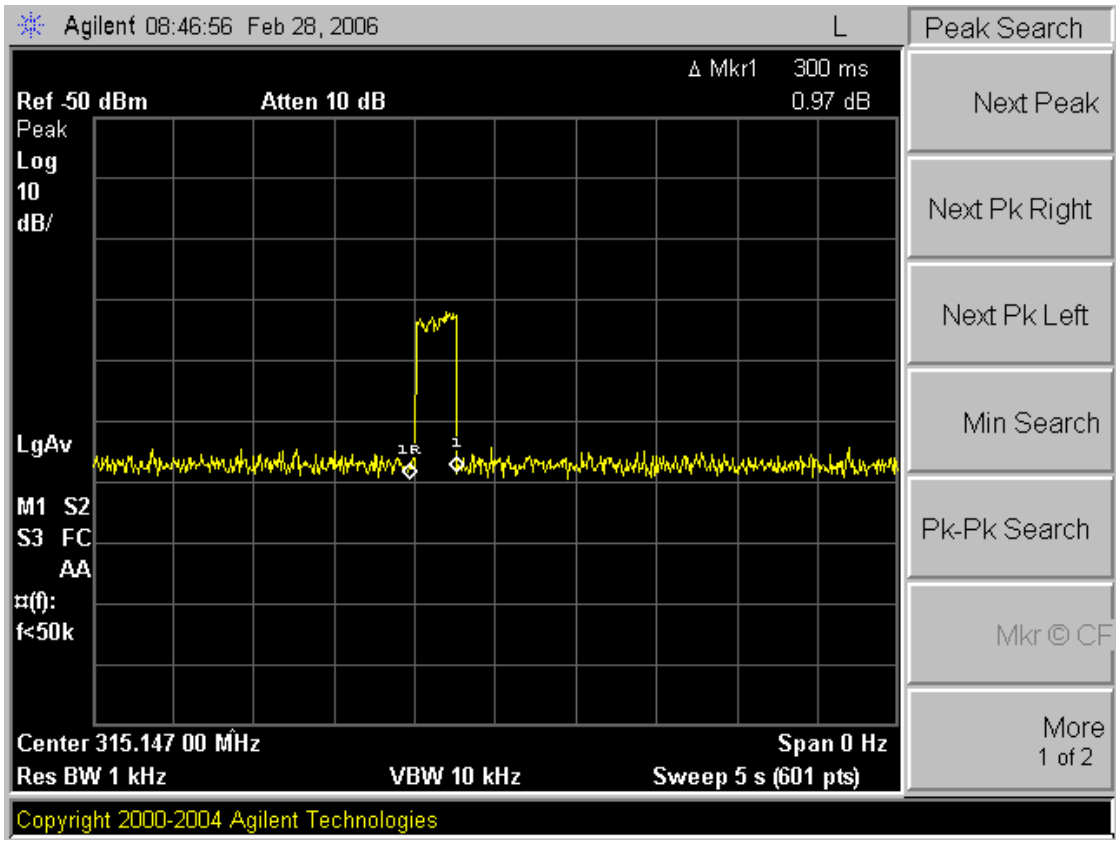
Humidity Level : 43 %

Temperature: 21 ℃

Limit of Transmission Time :A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

| Carrier Freq. (MHz) | Transmission Time (sec) | Limit (sec) | Pass/Fail |
|---|---|---|---|
| 315 | 0.3 | 5 | Pass |

The plot of test result is attached as below




Test Equipment Used

| EQUIPMENT | MANUFACTURER | MODEL | CAL DUE. |
|---|---|---|---|
| Spectrum Analyzer | Agilent | E4440A | 2006-05-20 |

## 9. Attachment A – Photo of the test set up