FCC TEST REPORT

Reference No. : **G-44-2012-01088**

Applicant : **Omron Automotive Electronics Korea Co., Ltd.**

Equipment Under Test (EUT) :

Product Name : RF Keyless Entry System (Receiver)

Model Name : OKA-870R

Applied Standards : **FCC Part 15 : 2010, Subpart B, Class B**

ANSI C63.4 : 2003

CISPR 22 : 2006

Date of Receipt : **April 17, 2012**

Date of Test : **April 18, 2012**

Date of Issue : **May 04, 2012**

Test Results : **Complied**

Tested by : ----------
Jerry Jeong

Reviewed by : ----------
Forest Lee

Contents

1. General Information

1.1 Client Information

Applicant : Omron Automotive Electronics Korea Co., Ltd.
Address of Applicant : 492, Gayul-Ri, Bogye-Myeon, Anseong-City, Kyonggi-Do, Korea
Manufacturer : Omron Automotive Electronics Korea Co., Ltd.
Address of Manufacturer : 492, Gayul-Ri, Bogye-Myeon, Anseong-City, Kyonggi-Do, Korea

1.2 Test Laboratory

Name and Address : SGS Korea Co., Ltd.
18-34, Sanbon-dong, Gunpo, Gyeonggi-do, Korea
435-040
Phone : + 82 31 428 5700
Fax : + 82 31 427 2370
e-mail : forest.lee@sgs.com

1.3 General Information of E.U.T.

Product Name	RF Keyless Entry System (Receiver)
Model Name	OKA-870R
Serial No.	-
EMI Classification	Class B
Operating Frequency	313.89 ㎒
Test Voltage	12 Vd.c.

1.4 Operating Modes and Conditions

Operating mode	Operating condition
RX Mode	RX Mode

1.5 Auxiliary Equipments

Description	Model	Serial No.	Manufacturer
Remote Keyless Entry	OKA-870T	-	Omron Automative Electronics Korea Co.,LTD
Code Checker	-	-	-

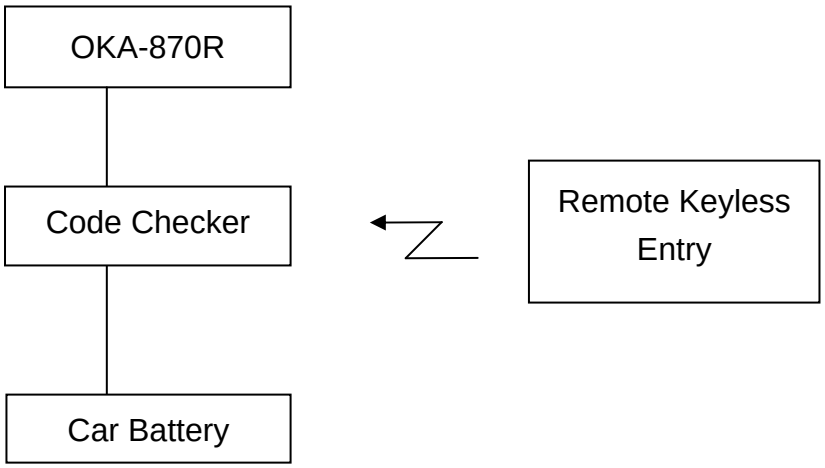
1.6 Cable List

Start		END		Cable Spec.	
Name	I/O Port	Name	I/O Port	Length	Shield
RF Keyless Entry System (Receiver	IO	Code Checker	-	0.1	Unshield
Code Checker	DC IN	Car Battery	-	0.5	Unshield

1.7 System Configurations

Description	Model	Serial No.	Manufacturer
Main Board	YD-BCM	95400A76305H CU9862002	-

1.8 Test System Layout



1.9 Modifications

There was no modified item during the test.

1.10 Applicable Standards for Testing

Standards	Status	Deviation
FCC Part 15 : 2010, Subpart B	Applicable	No Deviation

1.11 Summary of Test Results

Test Item	Basic Standards	Results
Conducted Emission	ANSI C63.4 : 2003	Complied
Radiated Emission	ANSI C63.4 : 2003	Complied

Note: Test methods of all test items are performed according to the basic standards in this table.

EMISSION

2.1 Test Results

Test Items	Basic Standards	Test Results
Conducted Emission	ANSI C63.4 : 2003	**N/A**
Radiated Emission	ANSI C63.4 : 2003	**Complied**

2.2 Test Method and Limits

2.2.1 Test Method

Test Items	Measuring Frequency Range	RBW	Measuring Distance
Conducted Emission	0.15 ㎒ ~ 30 ㎒	9 ㎑	N/A
Radiated Emission	30 ㎒ ~ 1 ㎓	120 ㎑	10 ㎙ & 3 ㎙
	Above 1 ㎓	1 ㎒	3 ㎙

Note : 10 m method of radiated emission measurement is only applied to Class A equipment over the frequency range of 30 ㎒ ~ 1 ㎓. Except this, 3 m method is applied to Class B equipment over the frequency range of 30 ㎒ ~ 1 ㎓ and Class A and Class B equipment above 1 ㎓.

2.2.2 Test Limits

-Conducted Emission Limits

Frequency Range	Limits(dB(μV))		Class
	Quasi-peak	Average	
0.15 ㎒ ~ 0.5 ㎒	79	66	**Class A**
0.5 ㎒ ~ 30 ㎒	73	60	
0.15 ㎒ ~ 0.5 ㎒	66 to 56	56 to 46	**Class B**
0.5 ㎒ ~ 5 ㎒	56	46	
5 ㎒ ~ 30 ㎒	60	50	

Note : The lower limit shall apply at the transition frequencies. The limit decreases linearly with the logarithm of the frequency in the range 0.15 ㎒ to 0.5 ㎒.

-Radiated Emission Limits below 1 ㎓

Frequency Range	Limits(dB(μV/m))	Class
	Quasi-peak	
30 ㎒ ~ 88 ㎒	39.1	**Class A**
88 ㎒ ~ 216 ㎒	43.5	
216 ㎒ ~ 960 ㎒	46.4	
960 ㎒ ~ 1 ㎓	49.5	
30 ㎒ ~ 88 ㎒	40	**Class B**
88 ㎒ ~ 216 ㎒	43.5	
216 ㎒ ~ 960 ㎒	46	
960 ㎒ ~ 1 ㎓	54	

-Radiated Emission Limits above 1 ㎓

Frequency Range	Limits(dB(μV/m))		Class
	Average	Peak	
Above 1 ㎓	59.5	79.5	**Class A**
Above 1 ㎓	54	74	**Class B**

Note : The limits of class A equipment is extrapolated using an extrapolation factor of 20 dB/decade because it was measured at 3m distance not 10m distance.

2.3 Radiated Emission

The initial preliminary exploratory scans were performed over the measuring frequency range(30 ㎒ to 2 ㎓) using a max hold mode incorporating a Peak detector and using the software of EP5RE(Version Ver3.10.20 from TOYO). The final test data was measured using a Quasi-Peak detector below 1 ㎓ and a Peak and Average detector above 1 ㎓. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency.

2.3.1 Test Equipments

Description	Model No.	Manufacturer	S/N	Last Cal. Date
Horn Antenna	HF906	R & S	100229	2011.05.04
Signal Conditioning Unit	SCU 18	R & S	10117	2012.01.12
Bilog Antenna	VULB9163	SCHWARZBECK MESS-ELEKTRONIK	396	2011.05.12
Test Receiver	ESU26	R & S	100109	2011.05.04
Amplifier	8447F	HP	2944A03909	2011.07.04

Note : Only the calibration period of Antennas is 2 years but the period of every equipment is 1 year.

2.3.2 Test Site

3 m Semi-Anechoic Chamber in Gunpo Laboratory

2.3.3 Environment Conditions

Below 1 GHz (3 m method)

Temperature : 23.4 °C
Humidity : 25.0 %R.H.
Atmospheric Pressure : 100.9 kPa

Test Date : April 18, 2012

Freq. (MHz)	Level (dBμV)	Pol. (H/V)	A (°)	H (m)	AF (dB)	CL (dB)	Amp. (dB)	F/S (dBμV/m)	Limit (dBμV/m)	Margin (dB)
35.25	26.10	H	121.5	1.01	12.61	0.61	27.17	12.15	40.00	27.85
275.65	40.30	H	174.5	1.01	12.63	1.72	26.55	28.10	46.00	17.90
292.79	26.50	V	134.8	1.97	12.63	1.78	26.51	14.40	46.00	31.60
301.72	29.40	V	134.8	1.97	12.65	1.81	26.51	17.35	46.00	28.65
551.38	24.00	V	47.7	1.97	16.80	2.49	27.90	15.39	46.00	30.61
941.48	24.50	V	234.9	1.01	22.58	3.13	27.28	22.93	46.00	23.07

Measurement Uncertainty (Horizontal) : ± 5.00 dB (The confidential level is about 95%, K=2)
Measurement Uncertainty (Vertical) : ± 5.36 dB (The confidential level is about 95%, K=2)

Note:
- AF = Antenna Factor
- CL = Cable Loss
- F/S = Field Strength
- Pol.(H) = Horizontal
- Pol.(V) = Vertical
- Amp. = Amplifier Gain
- Margin = Limit – F/S
- F/S = Level + AF + CL – Amp.
- A : Angle
- H : Height

Above 1 GHz (3 m method)

Temperature : 23.2 °C
Humidity : 26.0 %R.H.
Atmospheric Pressure : 100.9 kPa

Test Date : April 18, 2012

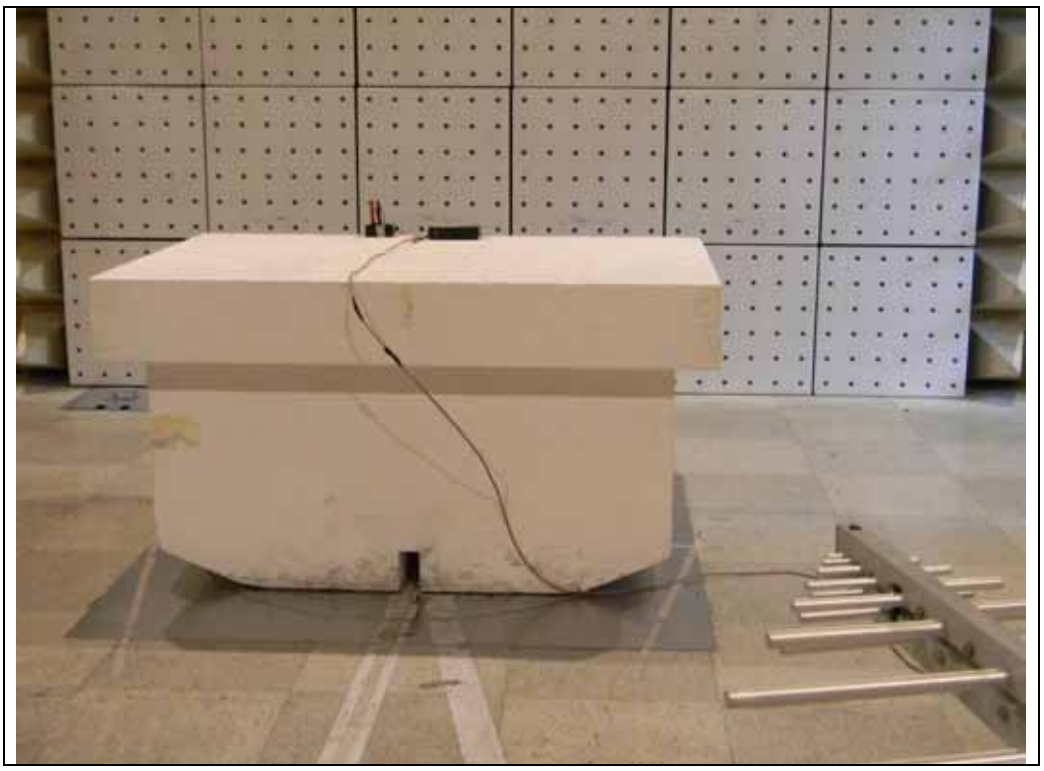
Freq. (MHz)	Level (dBμV)	Pol. (H/V)	A (°)	H (m)	AF (dB)	CL (dB)	Amp. (dB)	F/S (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Peak Detector										
1425.63	45.20	V	193.3	1.00	25.01	3.91	43.75	30.37	74.00	43.63
1765.21	46.20	H	74.4	1.00	27.02	4.38	43.88	33.72	74.00	40.28
Average Detector										
1425.63	31.10	V	193.3	1.00	25.01	3.91	43.75	16.27	54.00	37.73
1765.21	32.30	H	74.4	1.00	27.02	4.38	43.88	19.82	54.00	34.18

Measurement Uncertainty (Horizontal) : ± 4.89 dB (The confidential level is about 95%, K=2)
Measurement Uncertainty (Vertical) : ± 4.93 dB (The confidential level is about 95%, K=2)

Note:
- AF = Antenna Factor
- CL = Cable Loss
- F/S = Field Strength
- Pol.(H) = Horizontal
- Pol.(V) = Vertical
- Amp. = Amplifier Gain
- Margin = Limit – F/S
- F/S = Level + AF + CL – Amp.
- A : Angle
- H : Height

See Appendix A (Radiated Emission)

2.4 Photographs of Radiated Emission (3m method below 1 GHz)



2.5 Photographs of Radiated Emission (3m method above 1 GHz)

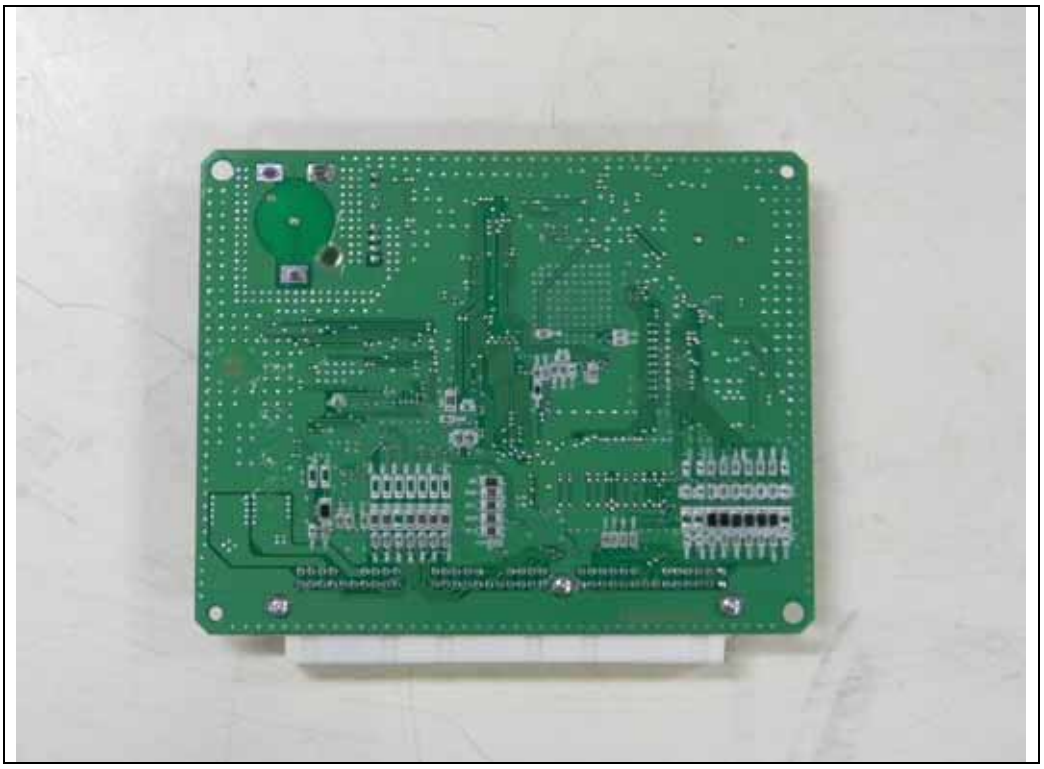
3. Photographs of EUT

- **Front View**

- **Rear View**

- **Top View of Main Board**

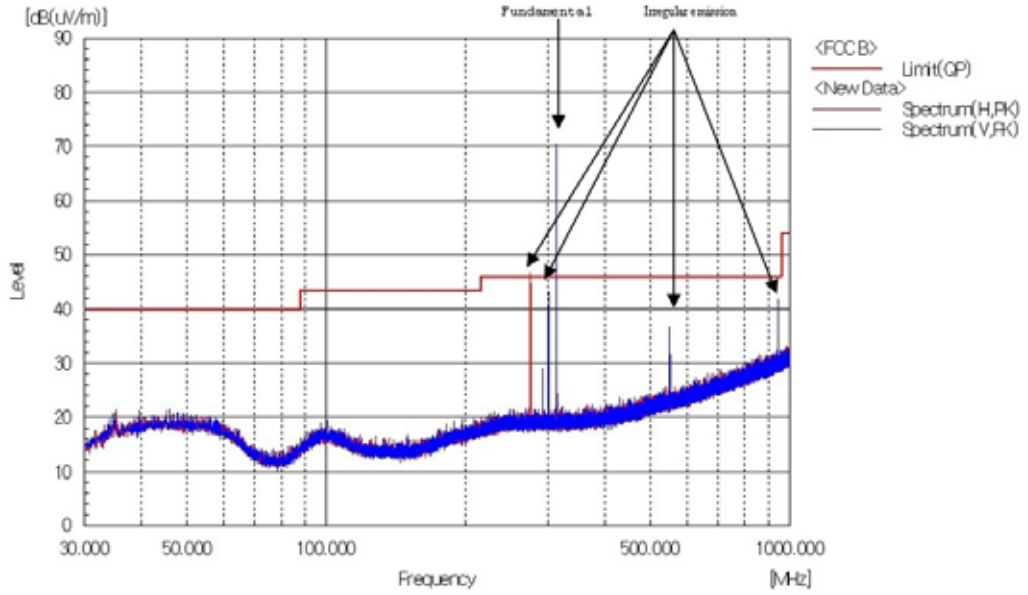
- **Bottom View of Main Board**



- **Inside**

Appendix A : Radiated Emission

Below 1 ㎓



Above 1 ㎓