FCC TEST REPORT

Reference No. : **G-44-2013-00494**

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

Equipment Under Test (EUT) :

Product Name : RF Keyless Entry System (Receiver)

Model Name : OKA-875R

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

ANSI C63.4 : 2009

Date of Receipt : **February 18, 2013**

Date of Test : **February 21, 2013**

Date of Issue : **February 26, 2013**

Test Results : **Complied**

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

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

Remarks :

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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. (Gunpo Laboratory)
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-875R
Serial No.	-
EMI Classification	Class B
FCC ID	OSLOKA-875R
Operating Frequency	433.92 ㎒
Test Voltage	12 Vd.c.

1.4 Operating Modes and Conditions

Operating mode	Operating condition
RX Mode	433.92 ㎒ RX Mode

1.5 Auxiliary Equipments

Description	Model	Serial No.	Manufacturer
Spectrum Analyzer	8593E	36241161407	HP
Test Zig	-	-	-
Car Battery	SY90R	1050787	Delkor
Remote Key	OKA-875T	-	Hyundai MOBIS

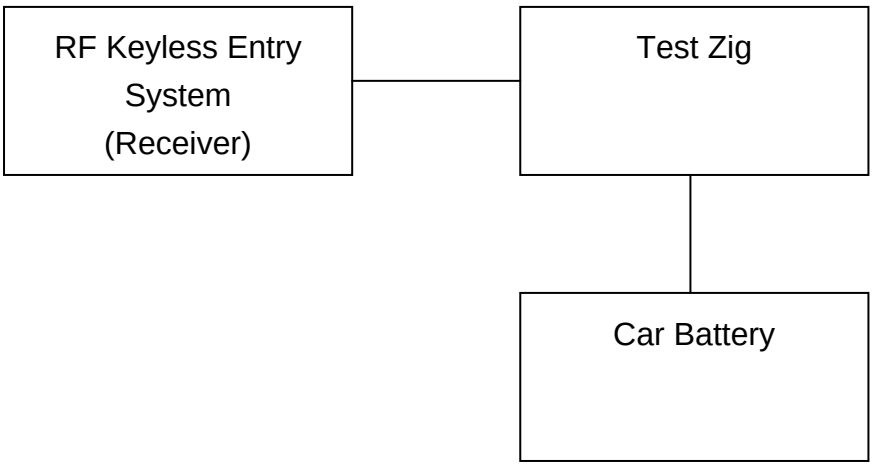
1.6 Cable List

Start		END		Cable Spec.	
Name	I/O Port	Name	I/O Port	Length	Shield
RF Keyless Entry System (Receiver	IO	Test Zig	-	0.2	Unshield
Test Zig	-	Car Battery	DC OUT	2.3	Unshield

1.7 System Configurations

Description	Model	Serial No.	Manufacturer
Main Board	PS BCM	-	-

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 : 2009	N/A
Radiated Emission	ANSI C63.4 : 2009	Complied

Note 1 : Test methods of all test items are performed according to the basic standards in this table.
Note 2 : This product is operated with DC 12V from a cat battery. So, the conducted emission is not performed.

EMISSION

2.1 Test Results

Test Items	Basic Standards	Test Results
Conducted Emission	ANSI C63.4 : 2009	**N/A**
Radiated Emission	ANSI C63.4 : 2009	**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 GHz

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

-Radiated Emission Limits above 1 GHz

Frequency Range	Limits(dB(μV/m))		Class
	Average	Peak	
Above 1 GHz	59.5	79.5	**Class A**
Above 1 GHz	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 at 3 ㎜ distance over the measuring frequency range(30 ㎒ to 2.2 ㎓) 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 ㎓ at 3 ㎜ distance and a Peak and Average detector above 1 ㎓ at 3 ㎜ distance. 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	100326	2011.11.23
Signal Conditioning Unit	SCU 18	R & S	10117	2013.01.14
Bilog Antenna	VULB9163	SCHWARZBECK MESS-ELEKTRONIK	396	2011.05.12
Test Receiver	ESCI 7	R & S	100911	2013.02.15
Amplifier	8447F	HP	2944A03909	2012.07.03

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 : 19.2 °C ~ 19.4 °C
Humidity : 20.0 %R.H. ~ 21.0 %R.H.
Atmospheric Pressure : 102.6 kPa ~ 102.7 kPa

Test Date : February 21, 2013

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)
97.29	36.50	H	53.6	3.00	12.58	1.36	27.51	22.93	43.50	20.57
101.90	38.70	H	62.4	3.00	12.45	1.40	27.50	25.05	43.50	18.45
107.72	46.30	H	247.1	3.00	11.43	1.43	27.48	31.68	43.50	11.82
127.97	39.10	H	204.5	2.00	8.98	1.56	27.44	22.20	43.50	21.30
240.01	38.20	H	45.5	1.20	13.01	2.14	27.06	26.29	46.00	19.71
443.10	39.70	H	83.1	1.10	17.42	2.91	27.96	32.07	46.00	13.93

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 : 16.5 ℃ ~ 18.4 ℃
Humidity : 19.0 %R.H. ~ 20.0 %R.H.
Atmospheric Pressure : 102.7 kPa

Test Date : February 21, 2013

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										
1975.67	42.10	H	195.7	2.00	27.77	6.47	43.74	32.61	74.00	41.39
1487.60	40.70	H	124.1	2.00	25.15	5.87	43.76	27.96	74.00	46.04
Average Detector										
1975.67	33.50	H	195.7	2.00	27.77	6.47	43.74	24.01	54.00	29.99
1487.60	34.20	H	124.1	2.00	25.15	5.87	43.76	21.46	54.00	32.54

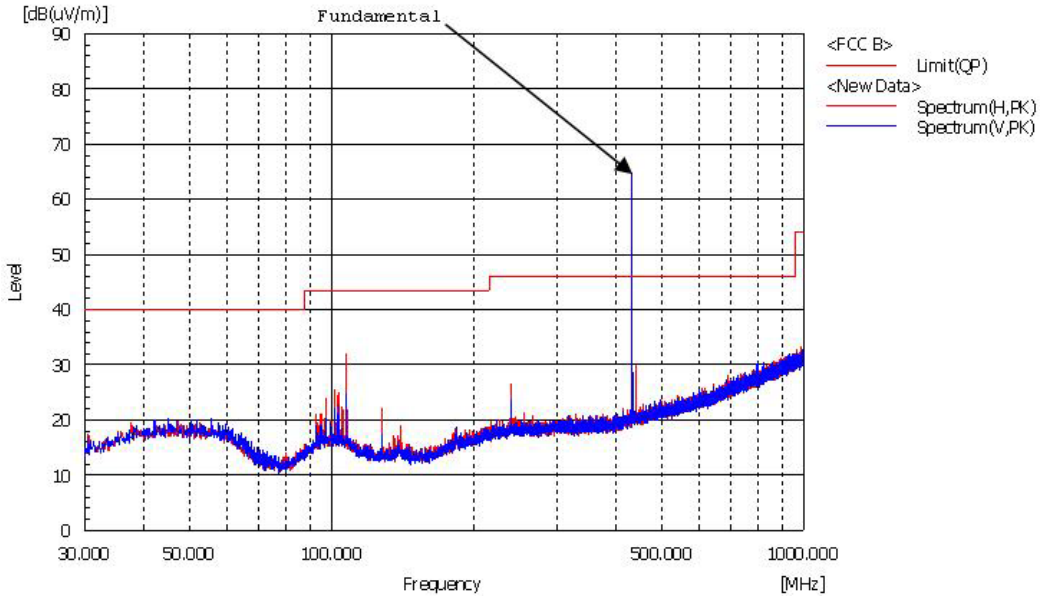
Measurement Uncertainty (Horizontal) : ± 4.89 dB (The confidential level is about 95%, K=2)
Measurement Uncertainty (Vertical) : ± 4.93 dB (The confidential level is about 95%, K=2)

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)

Appendix A : Radiated Emission

Below 1 GHz



Above 1 GHz