



# RADIO TEST REPORT

Test Report No. : 31CE0028-HO-01-A-R1

**Applicant** : Omron Corporation  
**Type of Equipment** : Transmitter, Keyless Entry System for vehicle  
**Model No.** : G8D-694H-A  
**Test regulation** : FCC Part 15 Subpart C: 2010  
**FCC ID** : OUCG8D-694H-A  
**Test Result** : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This report is a revised version of 31CE0028-HO-01-A. 31CE0028-HO-01-A is replaced with this report.

**Date of test:**

October 14 and November 25, 2010

**Representative  
test engineer:**

Motoya Imura  
Engineer of EMC Service

**Approved by:**

Shinya Watanabe  
Leader of EMC Service

NVLAP LAB CODE: 200572-0

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## **SECTION 1: Customer information**

Company Name : Omron Corporation  
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Contact Person : Masashi Matsuda

## **SECTION 2: Equipment under test (E.U.T.)**

### **2.1 Identification of E.U.T.**

Type of Equipment : Transmitter, Keyless Entry System for vehicle  
Model No. : G8D-694H-A  
Serial No. : Refer to Clause 4.2  
Rating : DC 3.0V (Lithium Battery (CR2025))  
Receipt Date of Sample : October 14, 2010  
Country of Mass-production : Japan  
Condition of EUT : Production prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)  
Modification of EUT : No Modification by the test lab

### **2.2 Product Description**

Keyless Entry System for vehicle controls locking and unlocking of doors and a trunk of the vehicle.  
This system consists of the transmitter and the receiver. The transmitter a device that transmits the radio signal when the button is pressed.  
The reciver is, installed into the vehicle, recieves the signal from the transmitter and controls locking and unlocking of doors and a trunk according received signal.

### **Radio Specification**

Radio Type : Transmitter  
Frequency of Operation : 313.85MHz  
Modulation : FSK  
Power Supply (radio part input) : DC 3.0V  
Antenna type : Internal Antenna

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## **SECTION 3: Test specification, procedures & results**

### **3.1 Test Specification**

Test Specification : FCC Part 15 Subpart C: 2010, final revised on October 13, 2010

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
Section 15.231 Periodic operation in the band 40.66 - 40.70MHz  
and above 70MHz

### **3.2 Procedures and results**

<b>Item</b>	<b>Test Procedure</b>	<b>Specification</b>	<b>Worst margin</b>	<b>Results</b>	<b>Remarks</b>
Conducted emission	FCC: ANSI C63.4:2003 7. AC powerline conducted emission measurements IC: RSS-Gen 7.2.2	FCC: Section 15.207 ----- IC: RSS-Gen 7.2.2	N/A	N/A*1)	-
Automatically Deactivate	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: -	FCC: Section 15.231(a)(1) ----- IC: RSS-210 A1.1.1	N/A	Complied	Radiated
Electric Field Strength of Fundamental Emission	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: RSS-Gen 4.8	FCC: Section 15.231(b) ----- IC: RSS-210 A1.1.2	5.2dB 313.850MHz Horizontal (PK with Duty factor)	Complied	Radiated
Electric Field Strength of Spurious Emission	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: RSS-Gen 4.9	FCC: Section 15.205 Section 15.209 Section 15.231(b) ----- IC: RSS-210 A1.1.2, 2.6, 2.7	1.1dB 2824.608MHz Vertical (PK with Duty factor)	Complied	Radiated
-20dB Bandwidth	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: -	FCC: Section 15.231(c) ----- IC: Reference data	N/A	Complied	Radiated
Note: UL Japan, Inc.'s EMI Work Procedures No.QPM05 and QPM15. *1) The test is not applicable since the EUT does not have AC Mains.					

#### **FCC 15.31 (e)**

This test was performed with the New Battery (DC 3.0V) and the constant voltage was supplied to the EUT during the tests. Therefore, the EUT complies with the requirement.

#### **FCC Part 15.203 Antenna requirement**

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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### 3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	IC: RSS-Gen 4.6.1	IC: RSS-Gen 4.6.1	N/A	Complied	Radiated

Other than above, no addition, exclusion nor deviation has been made from the standard.

### 3.4 Uncertainty

#### EMI

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(±dB)				(1m*)(±dB)		(0.5m*)(±dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	2.9dB	4.8dB	5.0dB	3.9dB	4.3dB	4.5dB	4.3dB
No.2	3.5dB	4.8dB	5.1dB	4.0dB	4.2dB	4.4dB	4.2dB
No.3	3.8dB	4.6dB	4.7dB	4.0dB	4.2dB	4.5dB	4.2dB
No.4	3.5dB	4.4dB	4.9dB	4.0dB	4.2dB	4.6dB	4.2dB

\*3m/1m/0.5m = Measurement distance

#### Radiated emission test(3m)

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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### 3.5 Test Location

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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

\* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

### 3.6 Test set up, Data of EMI, Test instruments.

Refer to APPENDIX.

## **SECTION 4: Operation of E.U.T. during testing**

### **4.1 Operating Modes**

<b>Test Item*</b>	<b>Mode</b>
Automatically Deactivate Duty Cycle	Normal use mode
Electric Field Strength of Fundamental Emission Electric Field Strength of Spurious Emission -20dB & 99% Occupied Bandwidth	Transmitting mode (Tx) *1)
* The system was configured in typical fashion (as a customer would normally use it) for testing. *1) The software of this mode is the same as one of normal product, except that EUT continues to transmit when transmitter button is being pressed (For Normal use mode, EUT stops when transmitter button is being pressed.) End users cannot change the settings of the output power of the product.	

### **4.2 Configuration and peripherals**

A:EUT

\* Test data was taken under worse case conditions.

#### **Description of EUT**

<b>No.</b>	<b>Item</b>	<b>Model number</b>	<b>Serial number</b>	<b>Manufacturer</b>	<b>Remarks</b>
A	Transmitter, Keyless Entry System for vehicle	G8D-694H-A	X 00053 *1) X 00049 *2)	Omron Corporation	EUT

\*1) Used for Normal use mode

\*2) Used for Transmitting mode

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**SECTION 5: Radiated emission (Electric Field Strength of Fundamental and Spurious Emission)**

**Test Procedure and conditions**

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane. The EUT was set on the center of the tabletop.  
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.  
Photographs of the set up are shown in Appendix 1.

**[Transmitting mode]**

The Radiated Electric Field Strength has been measured on Semi anechoic chamber with a ground plane and at a distance of 3m.  
The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.  
The measurements were performed for both vertical and horizontal antenna polarization.  
The radiated emission measurements were made with the following detector function of the test receiver/spectrum analyzer.

**Test Antennas are used as below;**

Frequency	Below 30MHz	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

	Below or equal to 1GHz *1)	Above 1GHz *2)
Detector Type	Peak and Peak with Duty factor	Peak and Peak with Duty factor
IF Bandwidth	120kHz	PK: S/A:RBW 1MHz, VBW:3MHz

- \*1) The test below 1GHz was performed with QP detect.  
Because it was generated at the repetition cycle of 20Hz or more the pulse emission.
- \*2) The Spectrum Analyzer was used in 3dB resolution bandwidth.

- The carrier level (or, noise levels) was (or were) measured at each position of all three axes X, Y and Z, and the position that has the maximum noise was determined.  
With the position, the noise levels of all the frequencies was measured.

\*The result is rounded off to the second decimal place, so some differences might be observed.

**Measurement range : 30MHz-3.2GHz**  
**Test data : APPENDIX**  
**Test result : Pass**



## **SECTION 6: Automatically deactivate**

### **Test Procedure**

The measurement was performed with Electric field strength using a spectrum analyzer.

Test data : APPENDIX  
Test result : Pass

## **SECTION 7: -20dB and 99% Occupied Bandwidth**

### **Test Procedure**

The measurement was performed in the antenna height to gain the maximum of Electric field strength.

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20dB Bandwidth	500kHz	5.1kHz	16kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	1 % of Span	Three times of RBW	Auto	Peak *1)	Max Hold *1)	Spectrum Analyzer

\*1) The measurement was performed with Peak detector, Max Hold since the duty cycle was not 100%.

Test data : APPENDIX  
Test result : Pass