

EMISSION TEST REPORT

Test Report No. : 19E0038-02-2

Applicant: OMRON Corporation

Type of Equipment: Keyless Entry System (Receiver)

Model No.: G8D-355H-B

Test standard: FCC Part 15 Subpart B Class B
IC RSS-210 (Issue No. 2)
*IC RSS-210 (Issue No. 2) is based upon FCC Part 15.

Test Result: Complies

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The results in this report apply only to the sample tested.

Date of test: May 20, 2000

Tested by: _____

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Approved by: _____

Kazutoyo Nakanishi

Group Leader of EMC section

Issued date: May 24, 2000

Testing Laboratory

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1 GENERAL INFORMATION

APPLICANT : OMRON Corporation

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REGULATION(S) : FCC Part 15 Subpart B

MODEL NUMBER : G8D-355H-B

SERIAL NUMBER : -

KIND OF EQUIPMENT : Keyless Entry System (Receiver)

TESTED DATE : May 20, 2000

RECEIPT DATE OF SAMPLE : May 16, 2000

REPORT FILE NUMBER : 19E0038-02-2

TEST SITE : A-PEX Yokowa NO.3 Open Test Site

1.1 Product Description

OMRON Corporation, Model G8D-355H-B (referred to as the EUT in this report) is a Keyless Entry System (Receiver).

The specification is as following :

Operation Frequency : 4.19999MHz
Local Clock Frequency : 324.55MHz
Modulation : Single Superheterodyne
Operation Voltage : DC 12V, 10mA

1.2 Tested System Details

The FCC IDs for all equipment, plus description of all cables used in the tested system are:

Model	FCC ID	Description	Cable description	Backshell Material
(1) OMRON M/N: G8D-355H-B S/N: 000002 (EUT)	OUCG8D-355H-B	Keyless Entry System (Receiver)	Unshielded I/F Cable	P.V.C.
(2) OMRON M/N: G8D-355H-A S/N: -	OUCG8D-355H-A	Keyless Entry System (Transmitter)	-	-
(3) OMRON M/N: - S/N: -	N/A	Simulator	Unshielded DC Power Cable	P.V.C.
(4) YUASA Corporation M/N: - S/N: -	N/A	Battery	-	-

1.3 Tested Methodology

Both conducted and radiated testing were performed according to the procedures in FCC/ANSI C63.4(1992). Radiated testing was performed at a distance of 3 meters from the antenna to EUT.

1.4 Test Facility

The open area site measurement facility used to collect the radiated data is located on 108, Yokowa-cho, Ise-shi, Mie-ken, 516-1106 Japan.

This site has been fully described in a report dated August 1, 1997 submitted to FCC office, and listed dated September 16, 1997 (31040/SIT 1300F2) and accepted Feb. 19, 1998 (IC2973-3) by Industry Canada.

2 SYSTEM TEST CONFIGURATION

2.1 Operation Environment

Radiation
Temperature : 20 Degree
Humidity : 69%
Power supply : DC 12V

2.2 Justification

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

2.3 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

The sequence is used:

Operation: Receiving mode

2.4 Test Procedure

2.4.1 Tabletop Equipment Radiated Emissions

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.

The rear of EUT, including peripherals was aligned and flush with rear of tabletop.

I/O cables that were connected to the peripherals were bundled in center.

They were folded back and forth forming a bundle 30cm to 40cm long and were hanged 40cm height to the ground plane.

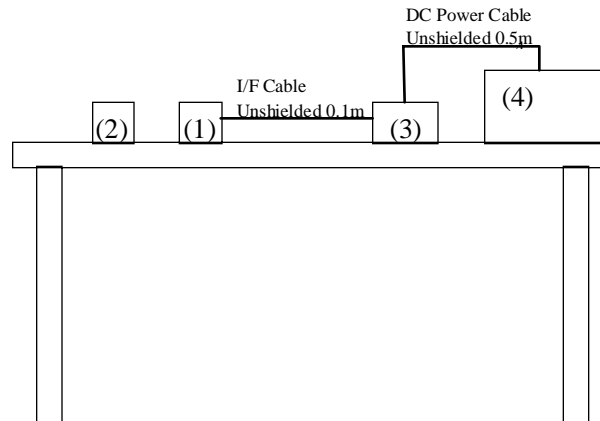
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.

The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

The measurement distance was 3m.

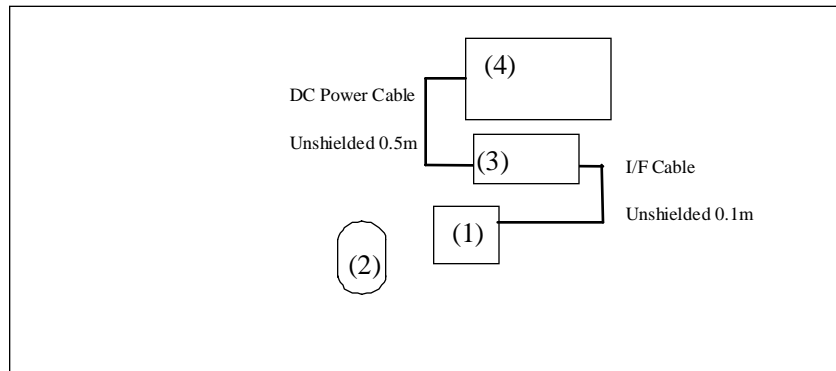
Figure2.1 Configuration of Tested System

Front View



* Cabling was taken into consideration and test data was taken under worse case conditions.

Top View



* Cabling was taken into consideration and test data was taken under worse case conditions.

3 RADIATED MEASUREMENT PHOTOS

Figure 3.1 Radiated Measurement Photos

3.1 Measurement Uncertainty

Radiated Emission Test

The measurement uncertainty (with a 95% confidence level) for this test was $\pm 3.3\text{dB}$.

The data listed in this test report has enough margin, more than 3.3dB.

4 RADIATED EMISSION DATA

The initial step in collecting radiated data was a spectrum analyzer peak scan of the measurement range(30MHz-1000MHz).
The final data was reported in the worst-case emissions.
The minimum margin to the limit is as follows :

Frequency (MHz)	Receiver Reading (dBuV)	Correction Factor (dBuV)	Field Strength (dBuV/m)	Limit (dBuV/m)	Margin (dBuV)
324.55	36.7	-0.7	36.0	46.0	10.0

* All readings are quasi-peak mode.

4.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, Cable Factor and Antenna Pad, and subtracting the Amplifier Gain from the measured reading. The sample calculation is as follows :

$$FS = RA + AF + CF + AT - AG$$

where FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Factor
AT = Antenna Pad
AG = Amplifier Gain

Assume a receiver reading of 36.7 dBuV is obtained. The antenna Factor of 14.6 dB, Cable Factor of 5.7 dB and Antenna Pad of 6.2 dB is added. The Amplifier Gain of 27.2 dB is subtracted, giving a field strength of 36 dBuV/m.

$$FS = 36.7 + 14.6 + 5.7 + 6.2 - 27.2 = 36.0$$

5 TEST EQUIPMENT USED

NAME	MANUFACTURER	MODEL	Control No.	Calibrated Until
Pre Amplifier	Hewlett Packard	8447D	AF1	November 16, 2000
Biconical Antenna	Schwarzbeck	BBA9106	BA3	April 29, 2001
Logperiodic Antenna	Schwarzbeck	UHALP9108-A	LA5	August 8, 2000
Spectrum Analyzer	Advantest	R3271	SA5	September 27, 2000
Test Receiver	Rohde & Schwarz	ESVS-30	TR2	July 4, 2000

indicates EMI Test Equipment used.

All measurement equipment is traceable to national standard

APPENDIX

A : Test Data

Radiated emissions : A1 to A2