

EMISSION TEST REPORT


Test Report No. : **21IE0027-YW-2**

Applicant: OMRON CORPORATION.
Type of Equipment: Keyless Entry System (Receiver)
Model No.: G8D-325A-B (3SW type)
FCC ID OUCG8D-325A-B
Test standard: FCC Part 15 Subpart B §15.109(a)
Test Result: Complies

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

Date of test: April 10, 2001

Tested by: 
Masafumi Inui

Approved by: 
Kazutoyo Nakanishi
Section Manager of EMC section

Issued date: April 19, 2001

Testing Laboratory

A-pex International Co., Ltd.

108 Yokowa-cho, Ise-shi Mie-ken 516-1106 JAPAN

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1 GENERAL INFORMATION

APPLICANT : OMRON CORPORATION

TRADE NAME : OMRON

ADDRESS : 6368 Nenjo-Zaka, Okusa, Komaki-City,
Aichi 485-0802 Japan
Tel: +81-568-78-6170
Fax: +81-568-78-6179

REGULATION(S) : FCC Part 15 Subpart B §15.109(a)

MODEL NUMBER : G8D-325A-B (3SW type)

FCC ID : OUCG8D-325A-B

SERIAL NUMBER : Sample No.1

KIND OF EQUIPMENT : Keyless Entry System (Receiver)

TESTED DATE : April 10, 2001

RECEIPT DATE OF SAMPLE : April 6, 2001

REPORT FILE NUMBER : 21IE0027-YW-2

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

Test report**Our reference** : 21IE0027-YW-2**Page** : 4 of 10**Issued date** : April 19, 2001**FCC ID** : OUCG8D-325A-B

1.1 Product Description

Model: G8D-325A-B (3SW type) (referred to as the EUT in this report) is a Keyless Entry System (Receiver).

G8D-325A-B (3SW type) is deemed to be equal about the level of EMC since they have few differences as remarked below, therefore, G8D-325A-B (3SW type) which is a top-level model was measured as their representative.

Model No	PWB	Parts on PWB	software(basic control)
G8D-325A-B (2SW type)	same as G8D-325A-B(3SW type)	TR4, TR5 and their support parts are not loaded.	same as G8D-325A-B(3SW type)
G8D-325A-B (3SW type)	Origin	Origin	Origin

The specification is as following :

Type of receiver : Super Heterodyne
 Receiving Frequency : 313.85MHz
 Local Oscillator Frequency : 324.55 MHz
 Intermediate Frequency : 10.7MHz
 Other Clock Frequency : 5.00MHz(CPU)
 Operation Voltage : DC 12V

1.2 Test Specification

Test Specification : FCC Part 15 Subpart B § 15.109 Radiated emission limits

Title : FCC 47CFR Part15 Radio Frequency Device

Subpart B Unintentional Radiators

1.3 Methods & Procedures

No.	Item	Test Procedure	Specification	Remarks
1	Conducted emission	FCC/ANSI C63.4:1992	§ 15.107	-
2	Radiated emission	FCC/ANSI C63.4:1992	§ 15.109(a)	3m

1.4 Exclusion from standards

No.	Item	Test Procedure	Specification	Remarks
1	Conducted emission	FCC/ANSI C63.4:1992	§ 15.107	-

* This test was not performed since EUT dose not have AC power port.

1.5 Test Location

A-PEX International Co.,Ltd. Yokowa No.3 test site

108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 Japan

Telephone number : +81-596-39-1485

Facsimile number : +81-596-39-0232

This site has been fully described in a report submitted to FCC office, and listed on September 12, 2000 (Registration number: 90412).

*NVLAP Lab. code : 200109-0

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2 SYSTEM TEST CONFIGURATION

2.1 Operation Environment

Temperature : 28
Humidity : 28%
Power supply : DC 12V (Car Battery)

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 testing was designed to exercise the various system components in a manner similar to typical use.

The sequence is used:

Operation Mode : Receiving

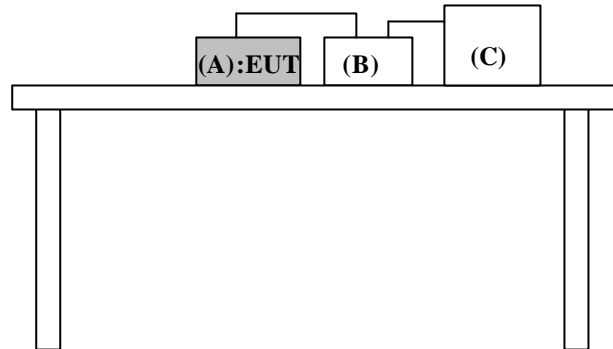
2.4 Test Procedure

Tabletop Equipment Radiated Emissions

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

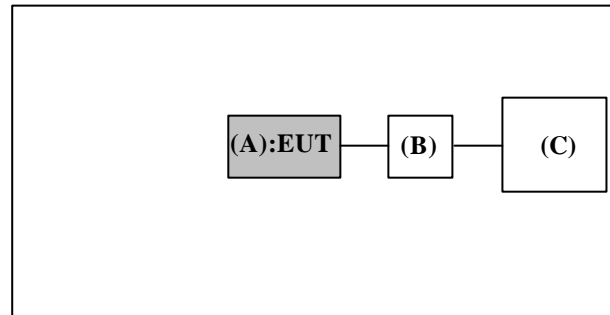
Figure2.1 Configuration of Tested System

Front View



* Test data was taken under worse case conditions.

Top View



*Test data was taken under worse case conditions.

Description of EUT and Support Equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	Keyless Entry System (Receiver)	G8D-325A-B (3SW type)	Sample No.1	OMRON	OUCG8D-325A-B
B	Checker Box	N/A	N/A	OMRON	-
C	Car Battery	50B24L	N/A	YUASA	-

List of cables used

No.	Item	Length (m)	Shield	Remark
	Signal & DC Power Cable	0.1	N	-
	DC Power Cable	0.4	N	-

3 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)	Ant Pol	Receiver Reading (dB μ V)	Correction Factor (dB)	Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
160.02	V	27.7	-7.2	20.5	43.5	23.0

* The test receiver settings for radiated emissions measurement were as follows.

Detector Type : Quasi-Peak (CISPR)
Bandwidth : 120kHz

3.1 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 27.7 dB μ V is obtained. The antenna Factor of 15.0 dB, Cable Factor of 2.5 dB and Antenna Pad of 3.1 dB is added. The Amplifier Gain of 27.8 dB is subtracted, giving a field strength of 20.5 dB μ V/m.

$$FS = 27.7 + 15.0 + 2.5 + 3.1 - 27.8 = 20.5 \text{ dB } \mu \text{ V/m}$$

3.2 Measurement Uncertainty

Radiated Emission Test

The measurement uncertainty (with a 95% confidence level) for this test was ± 3.3 dB.

The data listed in this test report may exceed the test limit because it does not have enough margin (more than 3.3dB).

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

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FCC ID : OUCG8D-325A-B

4 Test EQUIPMENT USED

Instrument	Mfr.	Model No.	Control No.	Calibration Until // Interval
Pre Amplifier	Hewlett Packard	8447D	AF-01	November 4, 2001 / 1 year
Attenuator	Anritsu	MP721B	AT-06	June 8, 2001 / 1 year
Biconical Antenna	Schwarzbeck	BBA9106	BA-03	April 28, 2001 / 1 year
Logperiodic Antenna	Schwarzbeck	UHALP9108-A	LA-06	April 29, 2001 / 1 year
Spectrum Analyzer	Hewlett Packard	8567A	SA-04	May 5, 2001 / 6 months
Test Receiver	Rohde & Schwarz	ESVS10	TR-06	August 9, 2001 / 1 year

*All measurement equipment is traceable to national standard.

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APPENDIX

A : Test Data

Radiated emissions

A1 – A2

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DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.
YOKOWA No.3 OPEN TEST SITE
Report No. : 211E0027-YW-2

Applicant : OMRON Corporation
 Kind of Equipment : Keyless Entry System(Receiver)
 Model No. : G8D-325A-B(3SW Type)
 Serial No. : sample No.1
 Power : DC12V
 Mode : Receiving
 Remarks : FCC ID : OUCG8D-325A-B
 Date : 4/10/2001
 Test Distance : 3 m
 Temperature : 27 °C
 Humidity : 31 %
 Regulation : FCC Part15B. 109(a)



 Engineer : Masafumi Inui

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	60.00	BB	24.4	26.9	8.3	28.1	1.4	3.1	9.1	11.6	40.0	30.9	28.4	
2.	120.01	BB	24.4	27.1	13.4	28.2	2.1	3.1	14.8	17.5	43.5	28.7	26.0	
3.	160.02	BB	22.6	27.7	15.0	27.8	2.5	3.1	15.4	20.5	43.5	28.1	23.0	
4.	199.99	BB	23.1	24.4	16.5	28.1	2.8	3.1	17.4	18.7	43.5	26.1	24.8	
5.	324.55	BB	21.8	21.6	14.6	27.6	3.7	3.1	15.6	15.4	46.0	30.4	30.6	
6.	649.08	BB	20.9	21.0	19.3	27.2	5.5	3.3	21.8	21.9	46.0	24.2	24.1	
7.	973.63	BB	19.9	20.0	23.0	27.2	7.4	2.9	26.0	26.1	54.0	28.0	27.9	

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

Except for the above table : adequate margin data below the limits.
 ANT. TYPE:30-300MHz Biconical, 300-1000MHz Logperiodic

DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.
YOKOWA No.3 OPEN TEST SITE
Report No. : 211E0027-YW-2

Applicant : OMRON Corporation
 Kind of Equipment : Keyless Entry System(Receiver)
 Model No. : G8D-325A-B(3SW Type)
 Serial No. : sample No.1
 Power : DC12V
 Mode : Receiving
 Remarks : FCC ID : OUCG8D-325A-B
 Date : 4/10/2001
 Test Distance : 3 m
 Temperature : 27 °C
 Humidity : 31 %
 Regulation : FCC Part15B. 109(a)



 Engineer : Masafumi Inui

