

# **EMISSION TEST REPORT**

**Test Report No. :** 21IE0027-YW-1

**Applicant:** OMRON CORPORATION.

**Type of Equipment:** Keyless Entry System (Transmitter)

**Model No.:** G8D-325A-A (3SW type)

**FCC ID** OUCG8D-325A-A


**Test standard:** FCC Part 15 Subpart C  
§ 15.205 and § 15.231


**Test Result:** Complies

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

**Date of test:** April 13, 2001

**Tested by:**   
Makoto Kosaka

**Approved by:**   
Kazutoyo Nakanishi  
Section Manager of EMC section

**Issued date:** April 19, 2001

Testing Laboratory

**A-pex International Co., Ltd.**

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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 C  
§ 15.205 and § 15.231

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

FCC ID : OUCG8D-325A-A

SERIAL NUMBER : Sample No.1

KIND OF EQUIPMENT : Keyless Entry System (Transmitter)

TESTED DATE : April 13, 2001

RECEIPT DATE OF SAMPLE : April 6, 2001

REPORT FILE NUMBER : 21IE0027-YW-1

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

**Test report****Our reference** : 21IE0027-YW-1**Page** : 4 of 10**Issued date** : April 19, 2001**FCC ID** : OUCG8D-325A-A**1.1 Product Description**

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

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

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

The specification is as following :

Carrier Frequency : 313.85 MHz  
 Operation Voltage : Lithium Battery DC 3.0V(CR2025)  
 Modulation : FSK

**1.2 Test Specification**

Test Specification : FCC Part 15 Subpart C

Title : FCC 47CFR Part15 Radio Frequency Device

Subpart C Intentional Radiators

§ 15.205 Restricted bands of operation

§ 15.231 Periodic operation in the band 40.66 – 40.70 MHz and above 70MHz

**1.3 Methods & Procedures**

No.	Item	Test Procedure	Specification	Remarks
1	Restricted bands of operation	FCC/ANSI C63.4:1992	§ 15.205	3m
2	Electric Field Strength of Fundamental Emission	FCC/ANSI C63.4:1992	§ 15.231(b)	3m
3	Electric Field Strength of Spurious Emission	FCC/ANSI C63.4:1992	§ 15.231(b)	3m
4	-20dB Bandwidth	FCC/ANSI C63.4:1992	§ 15.231(c)	-

**1.4 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%

### 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 : Transmitting

### 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.

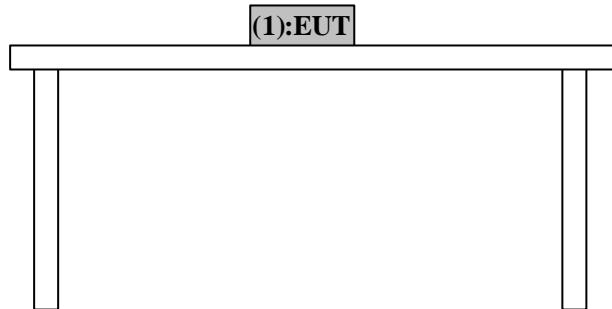
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.

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

The measurement distance was 3m.

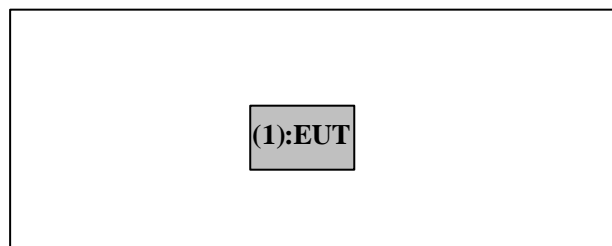
## Figure2.1 Configuration of Tested System

### Front View



\* Test data was taken under worse case conditions.

### Top View



\*Test data was taken under worse case conditions.

No.	Item	Model number	Serial number	Manufacturer	FCC ID
1	Keyless Entry System (Transmitter)	G8D-325A-A (3SW type)	Sample No.1	OMRON	OUCG8D-325A-A

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**Test report****Our reference : 21IE0027-YW-1****Page : 7 of 10****Issued date : April 19, 2001****FCC ID : OUCG8D-325A-A****3 RADIATED EMISSION DATA**

The initial step in collecting radiated data was a spectrum analyzer peak scan of the measurement range (30MHz-3200MHz).

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 $\mu$ V)	Correction Factor (dB)	Field Strength (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
313.87	H	76.0	-3.7	72.3	75.6	3.3

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

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

§ 15.231(c) -20dB Bandwidth

Bandwidth Limit: Fundamental Frequency 313.85MHz  $\times$  0.25% = 784.625kHz

Bandwidth Limit	measurement data (20dB down)	Result
Lower frequency Limit (313.4576875MHz:392.3125kHz)	313.644MHz(233kHz)	Pass
Upper frequency Limit (314.2423125MHz:392.3125kHz)	314.097MHz(220kHz)	Pass
-20dB Bandwidth (784.625kHz)	Lf + Uf = 453kHz	Pass

\* See Appendix 2 and 3

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### 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 76.0 dB  $\mu$  V is obtained. The antenna Factor of 14.5 dB, Cable Factor of 3.6 dB and Antenna Pad of 5.9 dB is added. The Amplifier Gain of 27.7 dB is subtracted, giving a field strength of 72.3 dB  $\mu$  V/m.

$$FS = 76.0 + 14.5 + 3.6 + 5.9 - 27.7 = 72.3 \text{ dB } \mu \text{ V/m}$$

### 3.2 Measurement Uncertainty

#### Radiated Emission Test

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



**Test report****Our reference : 21IE0027-YW-1****Page : 9 of 10****Issued date : April 19, 2001****FCC ID : OUCG8D-325A-A****4 Test EQUIPMENT USED**

<b>Instrument</b>	<b>Mfr.</b>	<b>Model No.</b>	<b>Control No.</b>	<b>Calibration Until // Interval</b>
Pre Amplifier	Hewlett Packard	8447D	AF-01	November 4, 2001 / 1 year
Pre Amplifier	Hewlett Packard	8449B	AF-04	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
Horn Antenna	A.H. Systems	SAS200/571	HA-01	January 31, 2003 / 3 year
Spectrum Analyzer	Hewlett Packard	8567A	SA-04	May 5, 2001 / 6 months
Spectrum Analyzer	Advantest	R3271	SA-05	January 31, 2002 / 1 year
Test Receiver	Rohde & Schwarz	ESVS10	TR-06	August 9, 2001 / 1 year
Test Receiver	Rohde & Schwarz	ESCS30	TR-07	August 7, 2001 / 1 year

\*All measurement equipment is traceable to national standard.

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Test report

Our reference : 21IE0027-YW-1

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FCC ID : OUCG8D-325A-A

## **APPENDIX**

### **A : Test Data**

Radiated emissions

A1 – A3

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# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.

YOKOWA NO.3 OPEN SITE

COMPANY : OMRON Corporation  
 TRADE NAME : OMRON  
 EQUIPMENT : keyless Entry System (Transmitter)  
 MODEL : G8D-325A-A (3SW type)  
 POWER : DC3.0V(CR2025)  
 Mode : Transmitting  
 Serial No. : sample No.1  
 Temperature : 28°C  
 Humidity : 28%

REPORT NO : 21IE0027-YW-1  
 REGULATION : FCC15.231(b) / 15.205  
 TEST DISTANCE : 3m  
 DATE : 2001/4/13  
 FCC ID : OUCG8D-325A-A

  
 ENGINEER : Makoto Kosaka

**Below 1GHz QP DETECT(Test Receiver: BW 120kHz)**

**Above 1GHz PK DETECT (Spectrum Analyzer : RBW 1MHz and VBW 1MHz)**

No.	FREQ [MHz]	ANT TYPE	READING		ANT Factor	ATTEN [dB]	CABLE LOSS [dB]	AMP GAIN [dB]	RESULT		LIMIT dB $\mu$ V/m	MARGIN	
			HOR [dB $\mu$ V]	VER [dB $\mu$ V]					HOR dB $\mu$ V/m	VER dB $\mu$ V/m		HOR [dB]	VER [dB]
1	313.87	BB	76.0	56.7	14.5	5.9	3.6	27.7	72.3	53.0	75.6	3.3	22.6
2	627.67	BB	40.8	32.4	18.8	6.1	5.4	27.3	43.8	35.4	55.6	11.8	20.2
3	941.40	BB	23.0	24.0	22.7	5.9	7.3	27.0	31.9	32.9	55.6	23.7	22.7
4	1255.28	BB	53.6	50.7	24.4	0.0	6.2	35.1	49.1	46.2	55.6	6.5	9.4
5	1569.24	BB	42.8	41.0	25.5	0.0	6.8	34.7	40.4	38.6	54.0	13.6	15.4
6	1883.08	BB	40.5	41.8	27.1	0.0	7.5	34.5	40.6	41.9	55.6	15.0	13.7

## REMARKS

ANTENNA TYPE: 30-300MHz Biconical / 300-1000MHz Logperiodic / 1-3.2GHz DRG Horn

CALCULATION(30MHz to 1000MHz) : READING + ANT Factor + ATTEN + Cable Loss - AMP Gain

CALCULATION(1.0GHz to 3.3GHz) : READING + ANT Factor + Cable Loss - AMP Gain

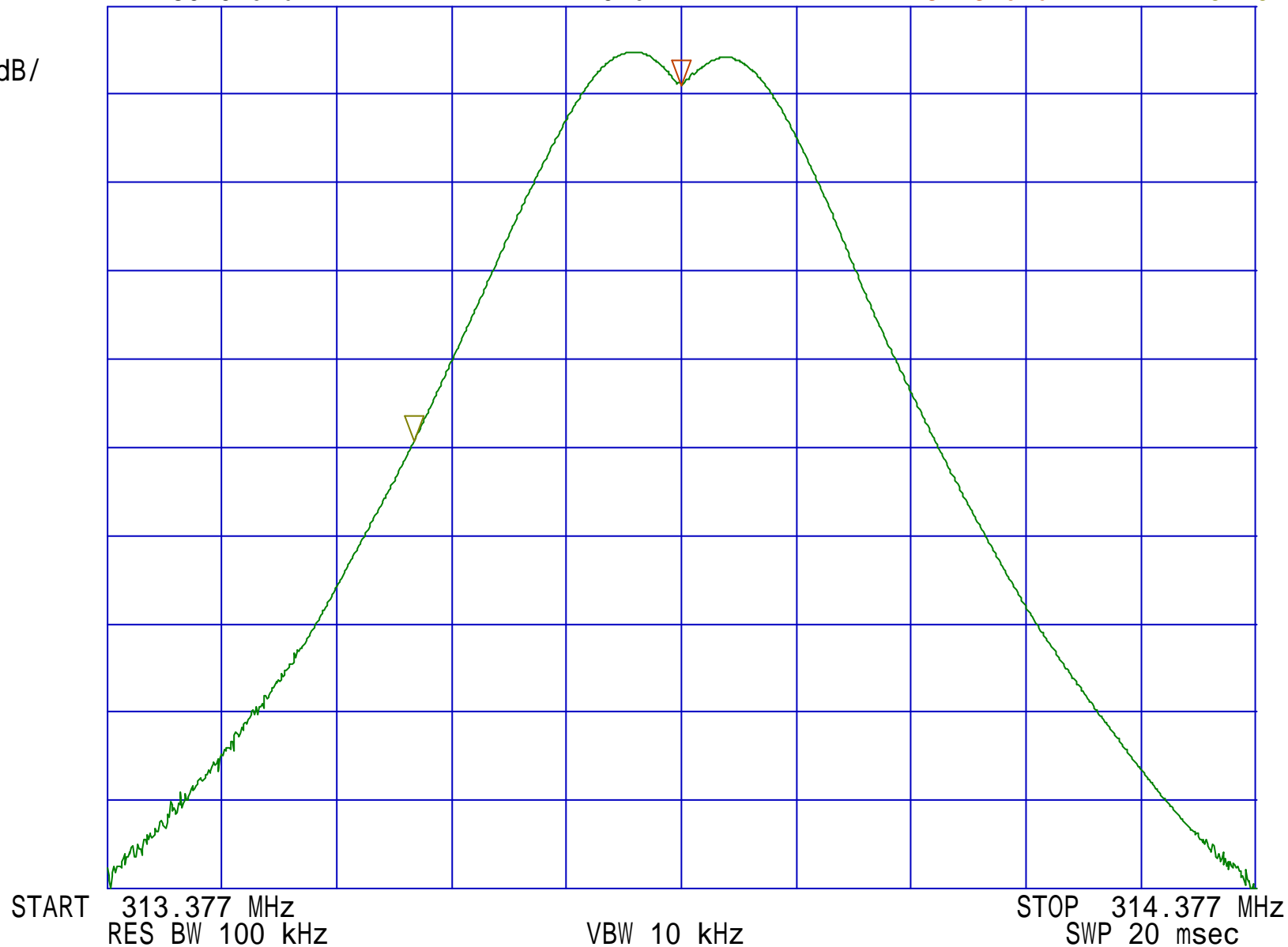
\*Except for the above table : adequate margin data below the limits.

OMRON (G8D-325A-A) / FCC ID: OUCG8D-325A-A  
Page A2 / -20dB Bandwidth(Hor) : Section 15.231(c)  
REF 80.0 dBuV ATTEN 10 dB

MAKER  
313.8770 MHz  
75.45 dBuV

MAKER  
-233.0000 kHz  
-20.10 dBuV

5 dB/



OMRON (G8D-325A-A) / FCC ID: OUCG8D-325A-A  
Page A3 / -20dB Bandwidth(Hor) : Section 15.231(c)  
REF 80.0 dBuV ATTEN 10 dB

MAKER  
313.8770 MHz  
75.45 dBuV

MAKER  
220.0000 kHz  
-20.05 dBuV

5 dB/

