

EMISSION TEST REPORT

Test Report No. : 18F0063-02-1

Applicant: OMRON Corporation

Type of Equipment: Keyless Entry System (Transmitter)

Model No.: G8D-443H-A

Test standard: FCC Part 15 Subpart C

Test Result: Complies

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

Date of test: July 7, 1999

Tested by:



Naoki Sakamoto

Approved by:



Kazutoyo Nakanishi

Group Leader of EMC section

Issued date: July 16, 1999

Testing Laboratory

A-pex International Co., Ltd.

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

Telephone: +81 596 39 1485

Facsimile: +81 596 39 0232

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Test report

FCC ID : E4EG8D-443H-A

Our reference : 18F0063-02-1

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1 GENERAL INFORMATION

APPLICANT : OMRON Corporation

ADDRESS : 1-501, Yashirogaoka, Meito-ku, Nagoya-city
Aichi, 465-0051 Japan
Tel: +81-52-704-2525
Fax: +81-52-704-2769

REGULATION(S) : FCC Part 15 Subpart C

MODEL NUMBER : G8D-443H-A

SERIAL NUMBER : -

KIND OF EQUIPMENT : Keyless Entry System (Transmitter)

TESTED DATE : July 7, 1999

RECEIPT DATE OF SAMPLE : June 26, 1999

REPORT FILE NUMBER : 18F0063-02-1

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

Testing Laboratory

A-pex International Co., Ltd.

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

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1.1 Tested Methodology

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 .

1.2 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 Aug. 1, 1997 submitted to FCC office, and listed dated Sep. 16, 1997 (31040/SIT 1300F2) and accepted Feb. 19, 1998 (IC2973-3) by Industry Canada.

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2 Product Description

OMRON Corporation, Model G8D-443H-A (referred to as the EUT in this report) is a Keyless Entry System (Transmitter).

The specification is as following :

Operation Frequency : 4.19MHz

Carrier Frequency : 307.9MHz

Operation Voltage : DC 3V, 20mA (Battery)

3 Tested Equipment Details

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

<u>Model</u>	<u>FCC ID</u>	<u>Description</u>	<u>Cable description</u>	<u>Backshell Material</u>
(1) OMRON M/N: G8D-443H-A S/N: - (EUT)	E4EG8D-443H-A	Keyless Entry System (Transmitter)	-	-

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4 SYSTEM TEST CONFIGURATION

4.1 Justification

The measurement was performed with the system configuration shown in Figure 4.2.
Running mode was taken for the EUT operation mode.

4.2 Test Procedure

Tabletop Equipment Radiated Emissions

EUT was placed on a platform of nominal size, 1m by 1.0m, 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.

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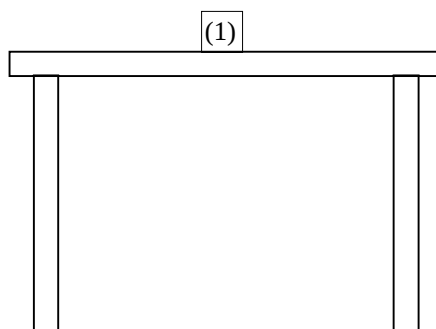
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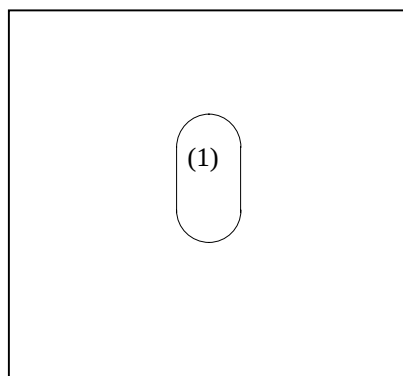
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Figure 4.2 Configuration of Tested System

Front View



Top View



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5 RADIATED MEASUREMENT PHOTOS

Figure 5.1 Radiated Measurement Photos



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

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5.1 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 may exceed the test limit because it does not have enough margin (more than 3.3dB).

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6 RADIATED EMISSION DATA

The initial step in collecting radiated data was a spectrum analyzer peak scan of the measurement range (30MHz-3100MHz).

The final data was reported in the worst-case emissions.

The minimum margin to the limit is as follows :

*** 30MHz - 1000MHz : QP Detect**

***1000MHz - 3100MHz : PK Detect**

Frequency (GHz)	Receiver Reading (dBuV)	Correction Factor (dBuV)	Field Strength (dBuV/m)	Limit (dBuV/m)	Margin (dBuV)
615.73	47.9	4.3	52.2	55.1	2.9

The Fundamental Frequency of this equipment is 307.9MHz. The peak of output level of fundamental frequency was confirmed at the 307.9MHz by performing the measurement.

It was corroborated that equipment was within of the tolerance which is prescribed in the FCC regulation Part 15 Subpart C sec. 15.231 (c).

Since the fundamental frequency is 307.9MHz, the upper limit could be 308.6 MHz and lower limit could be 307.2MHz.

The measurement result was 308.1MHz when the limit was 308.6MHz and also another measurement result was 307.6 MHz when the limit was 307.2MHz.

Any spurious emissions did not detect except fundamental frequency's spurious.

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6.1 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 Reading

AF = Antenna Factor

CF = Cable Factor

AT = Antenna Pad

AG = Amplifier Gain

Assume a receiver reading of 47.9 dBuV is obtained. The antenna Factor of 18.5 dB, Cable Factor of 7.1 dB is added. The Antenna Pad of 6.0 dB and Amplifier Gain of 27.3 dB is subtracted, giving a field strength of 52.2 dBuV/m.

$$FS = 47.9 + 18.5 + 7.1 + 6.0 - 27.3 = 52.2 \text{ dBuV/m}$$

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NAME	MANUFACTURER	MODEL	Control No.	Calibrated Until
Pre Amplifier	Hewlett Puckered	8447D	AF1	November 30, 1999
Pre Amplifier	Hewlett Packard	8449B	AF4	January 31, 2000
Biconical Antenna	Schwarzbeck	BBA9106	BA2	April 30, 2000
Logperiodic Antenna	Schwarzbeck	UHALP9108-A	LA6	February 14 , 2000
Horn Antenna	AH System, Inc	SAS-200/571	HA1	February 5 , 2000
Spectrum Analyzer	Hewlett Packard	8567A	SA4	November 30, 1999
Spectrum Analyzer	Advantest	R3271	SA5	November 30, 1999
Test Receiver	Rohde & Schwarz	ESVS-10	TR6	April 20, 2000
Microwave Cable Assembly	Suhner	Sucoflex104	CC-C1	April 30, 2000
Microwave Cable Assembly	Suhner	Sucoflex104	CC-C2	April 30, 2000

indicates EMI Test Equipment used.

All measurement equipment is traceable to national standard

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APPENDIX

Test Data

Radiated emissions

A 1 - A 3

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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
MODEL : G8D-443H-A(Transmitter)
POWER : DC3V
DESCRIPTION : Transmitting(f=307.9MHz)
REMARKS : 30-1000MHz QP Detect
: 1000-3100MHz PK Detect

REPORT NO : 18F0063-02-1
REGULATION : FCC Part 15 Subpart C(205/231)
TEST DISTANCE : 3m
ATTENUATOR : 6dB / 30-1000MHz Only
FCC ID : E4EG8D-443H-A
DATE : 07/07/1999

ENGINEER : Naoki.Sakamoto

No.	FREQ [MHz]	ANT TYPE	READING		ANT Factor	CABLE LOSS	AMP GAIN	RESULT		LIMIT	MARGIN	
			HOR [dB μ V]	VER [dB μ V]				HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1	307.86	LP	68.7	60.0	14.1	5.5	27.9	66.4	57.7	75.1	8.70	17.40
2	615.73	LP	47.9	40.1	18.5	7.1	27.3	52.2	44.4	55.1	2.90	10.70
3	923.59	LP	32.4	26.3	20.8	9.0	26.8	41.4	35.3	55.1	13.70	19.80
4	1231.60	HA	41.1	43.0	25.1	4.5	36.0	34.7	36.6	53.9	19.20	17.30
5	1539.50	HA	42.3	43.8	26.1	5.1	35.4	38.1	39.6	53.9	15.80	14.30
6	1847.40	HA	43.6	43.7	26.8	4.9	35.4	39.9	40.0	55.1	15.20	15.10
7	2155.30	HA	43.2	42.4	28.5	5.2	35.2	41.7	40.9	55.1	13.40	14.20
8	2463.20	HA	42.0	42.3	30.5	6.3	34.3	44.5	44.8	55.1	10.60	10.30
9	2771.10	HA	40.1	41.6	31.3	6.6	34.5	43.5	45.0	53.9	10.40	8.90
10	3079.00	HA	39.8	40.0	32.1	6.9	34.6	44.2	44.4	55.1	10.90	10.70

SAMPLE CALCLATION :

30-1000MHz : RESULT = READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.(6dB)

1000-3100MHz : RESULT = READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN

Expect for the above table : adequate margin data below the limits.

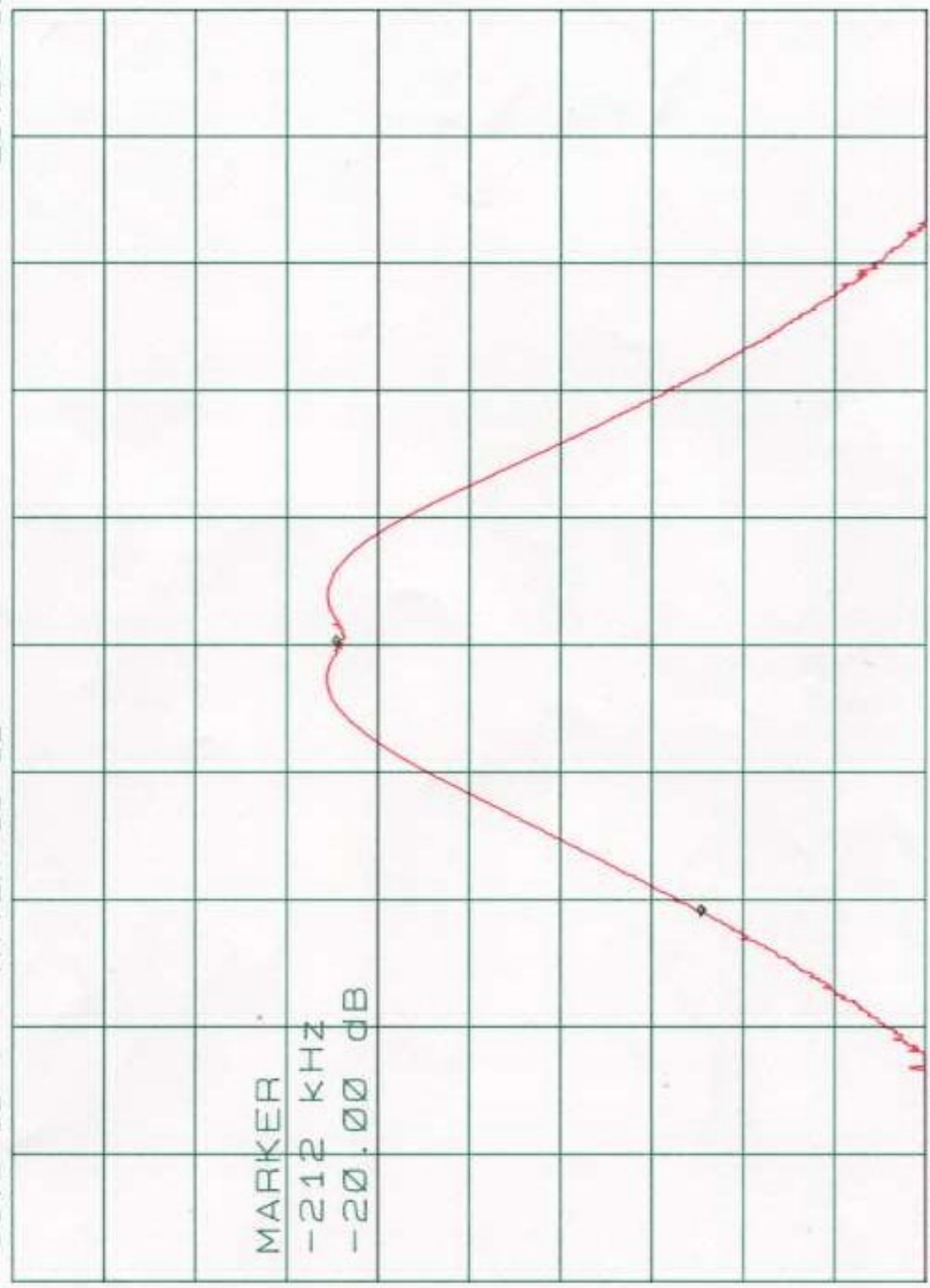
REF 85.0 dB V -212 KHZ
-20.00 dB

ATTEN 10 dB

5 dB/

MARKER
-212 KHZ
-20.00 dB

DL 65.0
dB V



CENTER 307.880 MHZ SPAN 1.000 MHZ
RES BW 100 KHZ VBW 100 KHZ SWP 20 msec

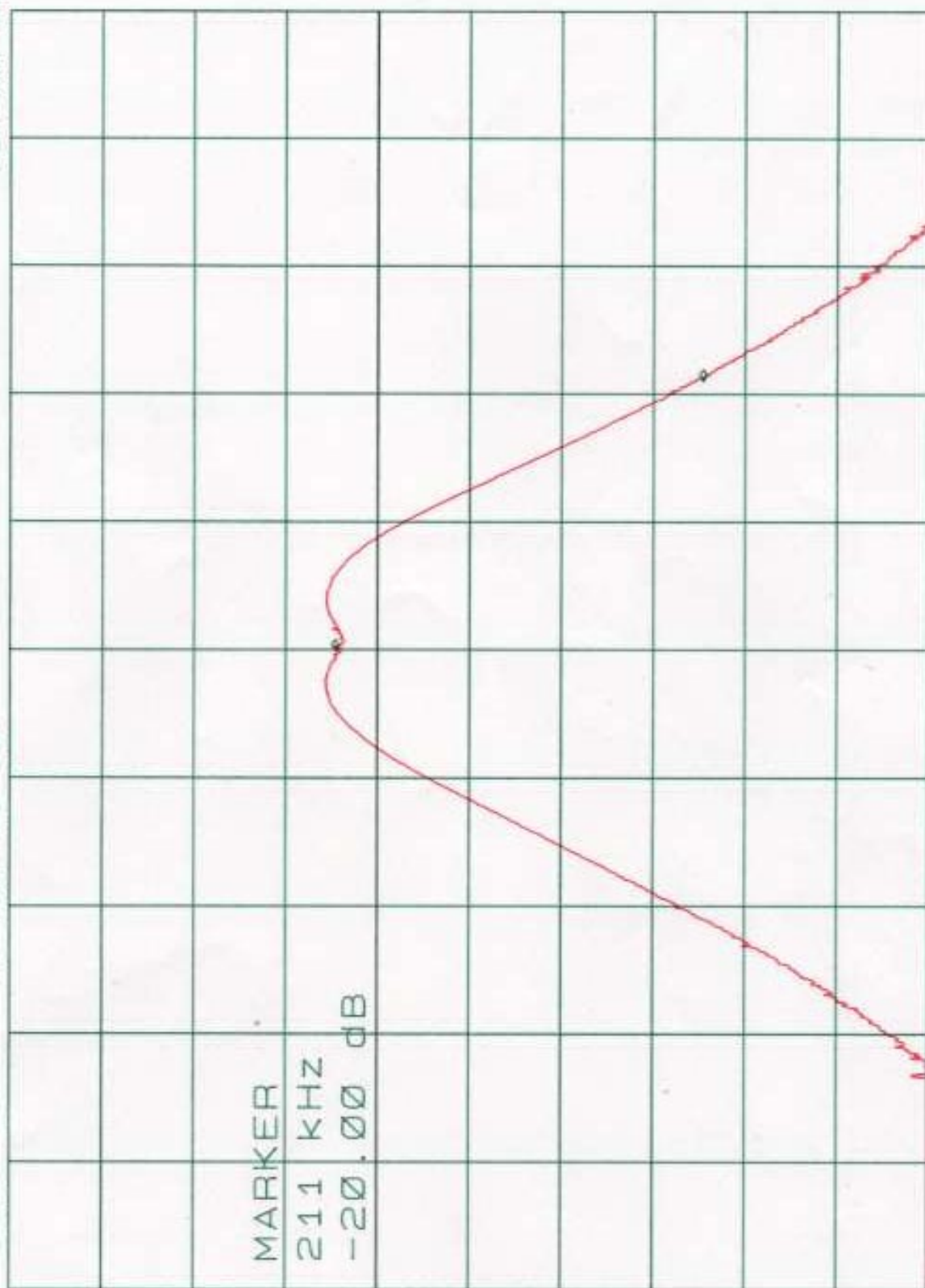
MKR 211 KHZ
-20.00 dB

REF 85.0 dB V ATTN 10 dB

5 dB/

MARKER
211 KHZ
-20.00 dB

DL 65.0
dB V



SPAN 1.000 MHZ
SWR 20 msec

VBW 100 KHZ

CENTER 307.880 MHZ
RES BW 100 KHZ