EMISSION TEST REPORT

Test Report No. : 17F0050-02-1

OMRON Corporation

Model: V700-HMC71/V700-HMC73/V700-HMD11

FCC Part 15 Subpart B/C

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2. This test report does not constitute an endorsement by NIST/NVLAP or U.S. Government.

3. This equipment is in compliance with above regulation. We hereby certify that the data are contain a true representation of the emission profile.

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

5. This test report clearly shows that EUT, V700-HMC71/V700-HMC73/V700-HMD11, RF-ID System is in compliance with FCC Part 15 Subpart B/C, specification.

Date of test: July 10, 1998 **Issued date:** July 23, 1998

Tested by: O. Watatani
Osamu Watatani
Engineer, EMC Dept.

Approved by:
Kazutoyo Nakanishi
Group Leader of EMC section

Form Version No. 1

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1 GENERAL INFORMATION

APPLICANT	: OMRON Corporation
REGULATION(S)	: FCC Part 15 Subpart B/C
MODEL NUMBER	: V700-HMC71/V700-HMC73 : V700-HMD11
SERIAL NUMBER	: 81
KIND OF EQUIPMENT	: RF-ID System
TESTED DATE	: July 10, 1998
REPORT FILE NUMBER	: 17F0050-02
TEST SITE	: A-PEX Yokowa NO.2 Open Test Site

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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 May. 27, 1997 submitted to FCC office, and accepted in a letter dated Aug. 18, 1997 (31040/SIT 1300F2).

2 Product Description

OMRON Corporation Model: V700-HMC71/V700-HMC73/ V700-HMD11 (referred to as the EUT in this report) is a Electromagnetic Inductive RF-ID System with a 125-kHz-band Carrier.

The specification is as following :

The clock used	:	125 kHz (Carrier frequency)
	:	8 MHz (CPU clock)
Input voltage	:	DC 5V , ±10% (V700-HMC71/V700-HMC73)
	:	DC 5V , ±5% (V700-HMD11)

3 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
(1) OMRON M/N: V700-HMC71 S/N: 81 (EUT)	-	Read/write module	Flat Cable/ Unshielded
(2) OMRON M/N: V700-HMC73 S/N: 81 (EUT)	-	Read/write module	Flat Cable/ Unshielded
(3) OMRON M/N: V700-HMD11 S/N: 81 (EUT)	-	Read/write module	Signal Cable/ Shielded
(4) Hewlett Packard M/N: HP 200LX S/N: S	-	Personal Computer	RS232C Cable/ Shielded
(5) OMRON Corp. M/N: S82S-0705 S/N: 25670K	-	Power Supply	FG Cable/ Shielded AC PS Cable/ Unshielded
(6) OMRON Corp. M/N: V600-A20 S/N: 971291D	-	AC Adapter 1	DC PS Cable/ Unshielded
(7) OMRON Corp. M/N: - S/N: 1	-	Level Converter	DC PS Cable/ Unshielded
(8) OMRON Corp. M/N: D21P31 S/N: 30	-	ID Tag	-
(9) Hewlett Packard M/N: HP F1011A S/N: TH734018067	-	AC Adapter 2	DC Power Cable/ Unshielded

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

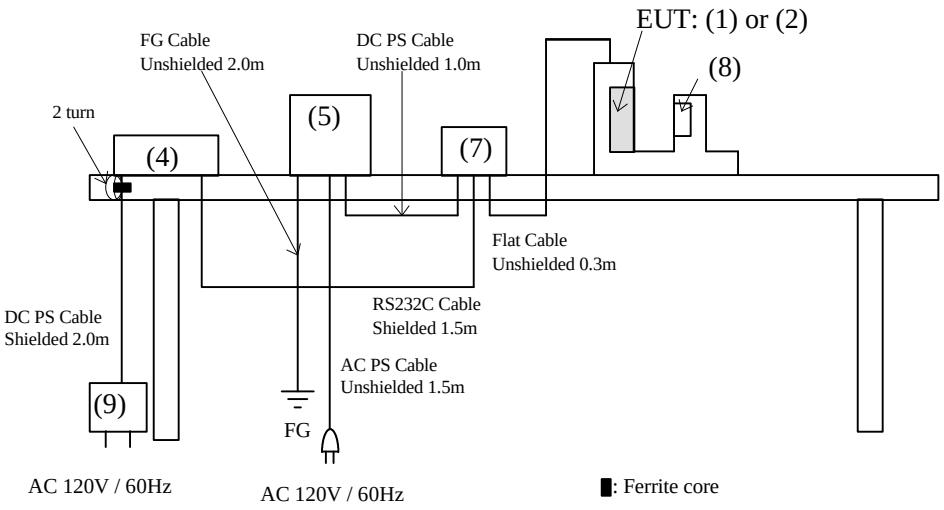
Tabletop Equipment Radiated Emissions

EUT was placed on a platform of nominal size, 1m by 1.5m, 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.

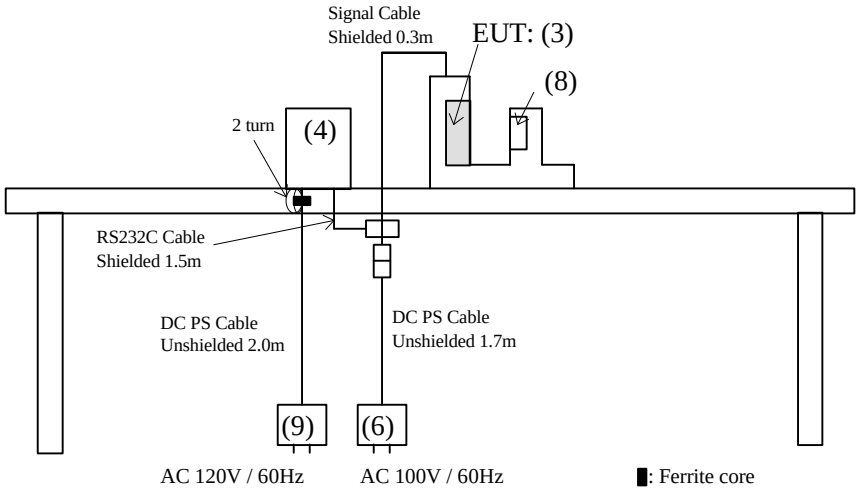
Figure 4.2 Configuration of Tested System

Front View

1.V700-HMC71, HMC73



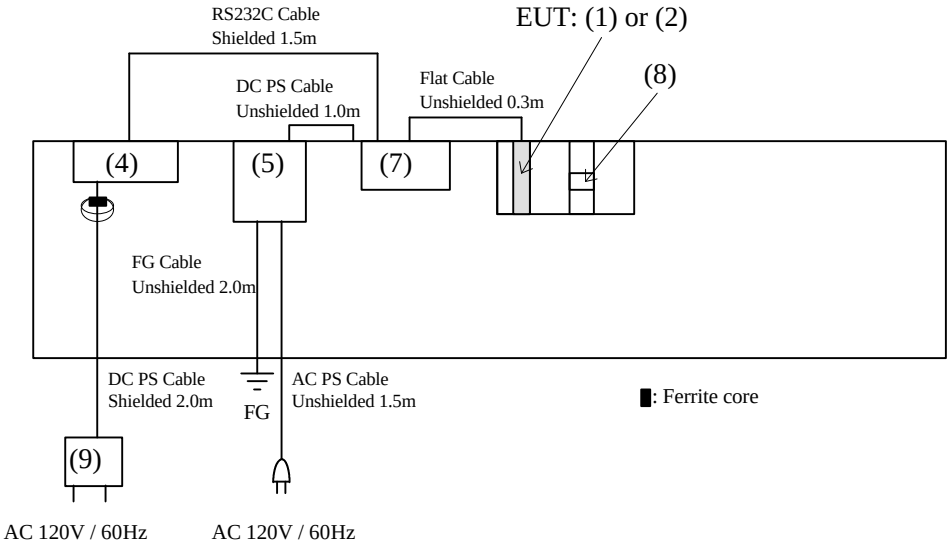
2.V700-HMD11



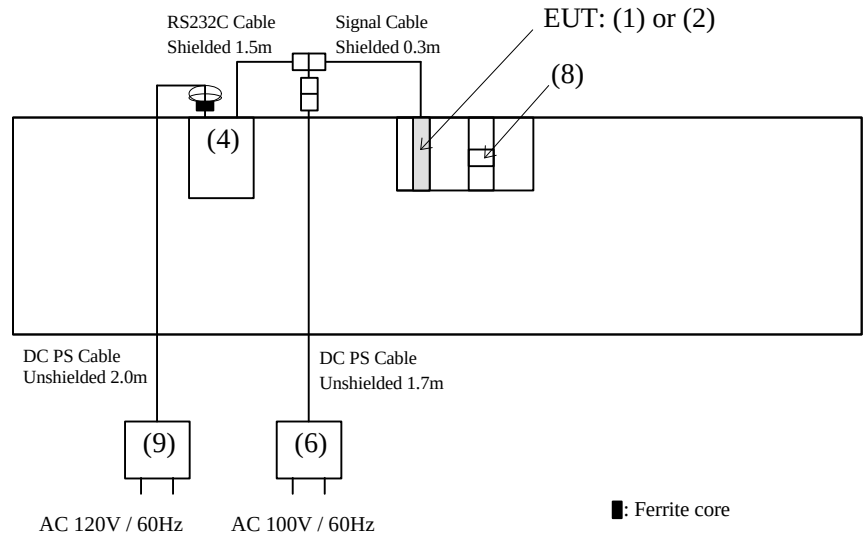
* Cabling was taken into consideration and test data was taken under worse case conditions.

Top View

1.V700-HMC71, HMC73



2.V700-HMD11



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5 RADIATED MEASUREMENT PHOTOS

Figure 5.1 Radiated Measurement Photos (V700-HMC71)

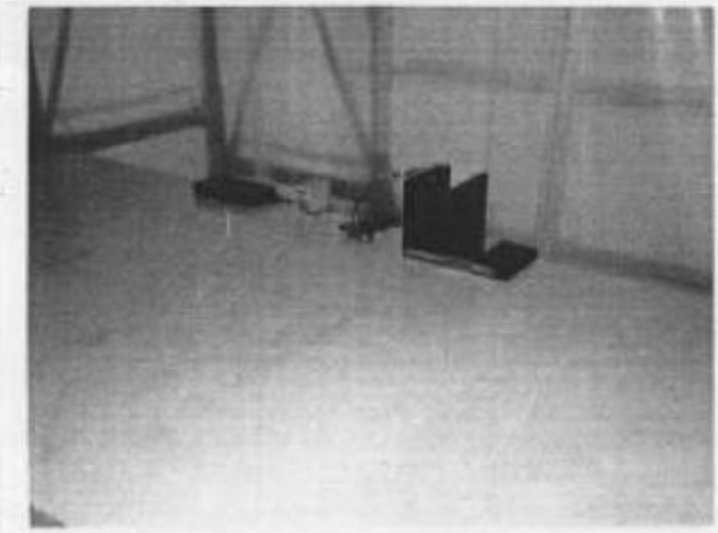

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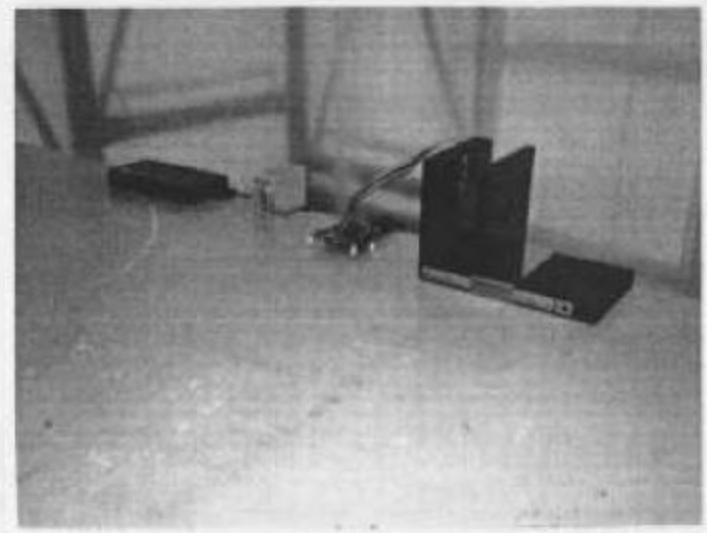
Figure 5.2 Radiated Measurement Photos (V700-HMC73)



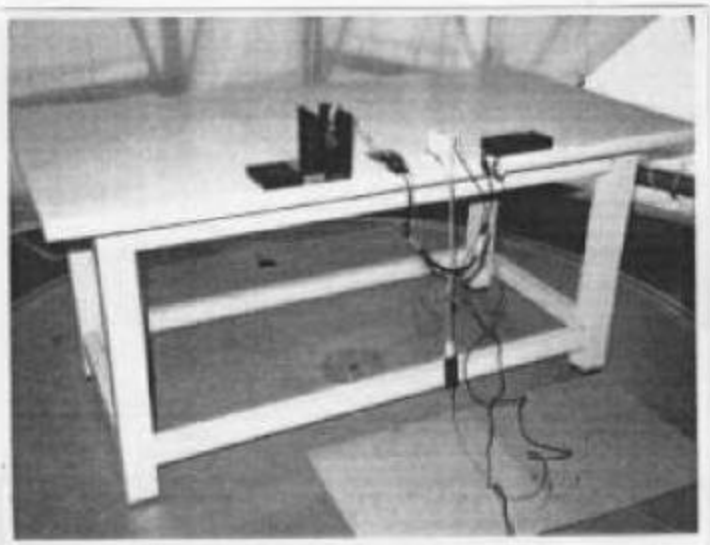
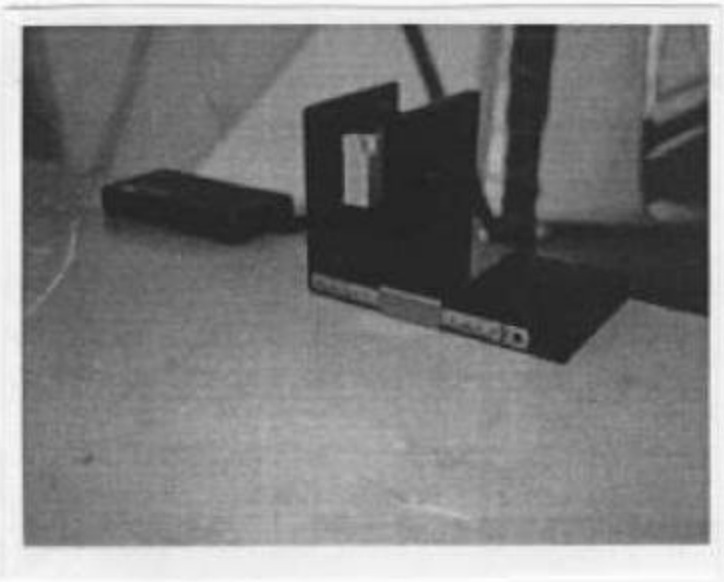


Figure 5.3 Radiated Measurement Photos (V700-HMD11)



5.1 Measurement Uncertainty

Radiated Emission Test

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

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

6 RADIATED EMISSION DATA

The initial step in collecting radiated data was a spectrum analyzer peak scan of the measurement range(10KHz-1,000MHz).
The final data was reported in the worst-case emissions.
The minimum margin to the limit is as follows :

1.10KHz - 30MHz

Frequency (MHz)	Receiver Reading (dBuV)	Correction Factor (dBuV)	Field Strength (dBuV/m)	Limit (dBuV/m)	Margin (dBuV)
V700-HMC71					
0.1259	91.0	-4.1	86.9	105.6	18.7
V700-HMC73					
1.0003	49.8	-4.1	45.7	67.6	21.9
V700-HMD11					
1.0001	48.4	-4.1	44.3	67.6	23.3

2. 30MHz - 1GHz

Frequency (MHz)	Receiver Reading (dBuV)	Correction Factor (dBuV)	Field Strength (dBuV/m)	Limit (dBuV/m)	Margin (dBuV)
V700-HMC71					
59.56	45.9	-13.0	32.9	40.0	7.1
V700-HMC73					
76.00	48.1	-15.0	33.1	40.0	6.9
V700-HMD11					
74.99	42.9	-15.3	27.6	40.0	12.4

* All readings are QP mode.

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 45.9 / 48.1 / 42.9 dBuV is obtained. The antenna Factor of 7.8 / 5.5 / 5.3 dB, Cable Factor of 2.8 / 3.1 / 3.0 dB and Antenna Pad of 6.0 dB is added. The Amplifier Gain of 29.6 dB is subtracted, giving a field strength of 32.9 / 33.1 / 27.6 dBuV/m.

V700-HMC71:
FS = 45.9 + 7.8 + 2.8 + 6.0 - 29.6 = 32.9 dBuV/m

V700-HMC73:
FS = 48.1 + 5.5 + 3.1 + 6.0 - 29.6 = 33.1 dBuV/m

V700-HMD11:
FS = 42.9 + 5.3 + 3.0 + 6.0 - 29.6 = 27.6 dBuV/m

7 TEST EQUIPMENT USED

NAME	MANUFACTURER	MODEL	Control No.	Calibrated Until
Pre Amplifier	Anritsu	MH648A	AP3	December 11, 1998
Biconical Antenna	Schwarzbeck	BBA9106	BA2	July 6, 1999
Logperiodic Antenna	Schwarzbeck	UHALP9108A	LA6	July 19, 1998
Loop Antenna	Rohde & Schwarz	HFH2-Z2	LP1	September 11, 1998
Spectrum Analyzer	Hewlett Packard	8567A	SA3	December 11, 1998
Test Receiver	Rohde & Schwarz	ESHS-30	TR3	July 27, 1998
Test Receiver	Rohde & Schwarz	ESVS-10	TR4	July 17, 1998

APPENDIX

Test Data

Magnetic Field emissions

V700-HMC71: A 1 - A 2
V700-HMC73: A 3 - A 4
V700-HMD11: A 5 - A 6

Radiated emissions

V700-HMC71: A 7 - A 8
V700-HMC73: A 9 - A 10
V700-HMD11: A 11 - A 12

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