



## EMISSION TEST REPORT

Test report file No. : **01-IST-073/FB** Date of issue : June 12, 2001.  
Model / Type No. : MW-700  
Kind of product : Web Monitor  
Applicant : Daewoo Electronics Co., Ltd  
Manufacturer : Daewoo Electronics Co., Ltd  
Address : 543, Dangjung-Dong, Kunpo-City, Kyunggi-Do, Korea

**Test result** according to the regulation(s)

Positive  Negative

at page 3.

This test report without appendix consists of 17 pages.

It is not allowed to copy this report even partly without the allowance of the Test Laboratory.

This equipment is complied with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992.

## DIRECTORY

<b>A) Documentation.</b>	Page
Directory	<u>2</u>
Test regulations	<u>3</u>
Environmental Conditions	<u>3</u>
Test Conditions	<u>4 ~ 5</u>
Equipment under Test	<u>6 ~ 7</u>
Test Result	<u>8</u>
Test-setup (Figures)	<u>9 ~ 10</u>
Summary	<u>17</u>

### **B) Test Data.**

Conducted emissions (Mains)	: 450 kHz - 30 MHz	<u>11 ~ 13</u>
Radiated emissions	: 30 MHz – 2 GHz	<u>14 ~ 16</u>

### **C) Appendix**

## **TEST REGULATIONS**

The tests were performed according to the following regulations ;

- - FCC Part 15, Subpart B (Unintentional Radiators, Class B)

## **INFORMATION OF TEST LABORATORY**

### **IST EMC Lab.**

San 21-8 Goan-Ri, Baekam-Myun, Yongin-Si, Kyunggi-Do, Korea

International - Tel : 82-31 - 333 - 4093. Fax : 82-31 - 333 - 4094.

Domestic - Tel : 031 - 333 - 4093. Fax : 031 - 333 - 4094.

## **ENVIRONMENTAL CONDITIONS**

Temperature	<u>26</u> °C
Humidity	<u>42</u> %
Atmospheric pressure	<u>1000</u> mbar

## TEST CONDITIONS

The **measurement of the conducted emissions (Interference voltage)** was performed in a shielded room.

### Test location :

- - Shielded room. No.1
- Compact chamber 2

### Used testing instruments :

<u>Name</u>	<u>Type</u>	<u>Manufacturer</u>	<u>Calibration. Date</u>	<u>Serial Number</u>
■ ESH 3	Test Receiver	Rohde & Schwarz	Oct. 08, 2000	861742/018
■ 3725/2	LISN	EMCO	Oct. 08, 2000	9102-1788
■ 3825/2	LISN	EMCO	Dec. 20, 2000	9103-1788
■ ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Jun. 16, 2001	357.8810.52

### Test - accessories :

<u>Type</u>	<u>Manufacturer</u>
■ Aneroid Barometer	Sato
■ Hygrometer	Sato

### Measurement Procedures :

Conducted emissions measurements were made in accordance with ANSI C-63.4-1992, "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50Ω/ 50uH LISN as the input transducer to an EMI/Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an IF bandwidth of 10kHz or for "quasi-peak" within a bandwidth of 9kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

### Test engineer :



B. K. Bae. / Research Engineer

The **measurement of the radiated emissions (Electric field)** in the frequency range from 30 MHz to 1GHz was performed in horizontal and vertical antenna polarization at a open-site which meet the site attenuation requirement of ANSI C63.4-1992 and a test distance of :

- - Open-site 1
- - 3 meters
- Compact chamber
- 10 meters

**Used testing instruments :**

<u>Name</u>	<u>Type</u>	<u>Manufacturer</u>	<u>Calibration. Date</u>	<u>Serial Number</u>
■ ESVP	Test Receiver	Rohde & Schwarz	July. 21, 2000	861744/004
■ VULB 9160	Antenna	Schwarzbeck	July. 11, 2000	3048
■ 3115	Horn Antenna	EMCO	Nov. 15, 2000	9012-3602
■ 8566B	Spectrum Analyzer	Hewlett Packard	July. 21, 2000	3026A01532
■ 85650A	Quasi-Peak Adaptor	Hewlett Packard	July. 21, 2000	3107A01532
■ 95685A	RF Preselector	Hewlett Packard	July. 21, 2000	362

**Test - accessories :**

Type	Manufacturer
■ Aneroid Barometer	Sato
■ Hygrometer	Sato

**Measurement procedures**

Radiated measurements were in accordance with ANSI C63.4-1992 "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurements were performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a EMI/Field Intensity Meter. The measurements were made with the detector set for "quasi-peak" within a bandwidth of 120kHz.

Above 1 GHz, peak detector function mode is used. The radiated measurements above 1 GHz were performed at a compact chamber which meet the site attenuation requirement of ANSI C63.4-1992.

All used test-instruments as well as the test-accessories are calibrated regularly.

**Test engineer :**



B. K, Bae. / Research Engineer

## EQUIPMENT UNDER TEST

### Equipment Description

The Equipment Under Test (EUT) is the **17 inch Web Monitor of Daewoo Electronics Co., Ltd.** It is composed of two parts. One is a internal PC (terminal part), the other is a monitor part which was certified as the model name 712B(FCC ID: C5F7NFCMC712B).

#### Terminal Part

CPU	NS Geode GX-1 233 MHz
Memory	8/16M flash memory 16/32M RAM
Video	Maximum resolution 1024 x 768, maximum 16 bit color
Audio	CD-level-sound-16 bit 44.1kHz stereo External speakers-1/8 inch mini-jack External microphone-1/8 inch mini-jack Built-in speakers – 8 ohm 1.75W
Keyboard	PS/2 type keyboard
Mouse	PS/2 type mouse
Network	10/100 Base T Ethernet, RJ-45 Connector
I/O Interface	2 PS/2 port 2 USB port (Type A) 1 RS-232C serial port (DB-9) 1 Printer port (DB-25)
Software	Microsoft Windows CE 2.12 (including Direct X) Microsoft RDP Client Citrix ICA Client Win CE MS Internet Explorer 4.01 Win CE MS Windows Media Player 6.4

#### Monitor Part

CDT Size	17 inch
Diagonal visible image area	16.2 inch
Dot Pitch	0.28 mm
Synchronization	Horizontal: 30-70 kHz Vertical: 50-160 Hz
Plug and Play	DDC1/2B/CI
Power Saving	EPA, VESA DPMS, Nutek Compliant
Power Source	100-240 Vac, 50/60Hz (free voltage)
Power Consumption	85W
Dimension (W x H x D)	420 x 440 x 440 mm
Weight-unpacked	37.0/16.8 lbs/kg
Operating Temperature	10-40 °C / 50-104 °F

**Operation - mode of the E.U.T. :**

The equipment under test was operated during the measurement under following conditions :  
Standby.

- Operational Condition : EUT was connected to Server PC (based on Windows 2000 server) by LAN cable, and operational program (to scroll 'H' characters) for test was running in Server. After connecting to Server PC, displayed 'H' characters on the screen of EUT during the measurement.

**Configuration of the equipment under test :**

Equipment	Type	Brand	Serial No.	FCC ID	Remark
Web Monitor	MW-700	Daewoo	-	Applied	
Keyboard	ACK-260A	Click.TV	008249682V2	L2BACEKEY260	PS/2 type
Mouse	AGM2320	Daewoo	912017627	DoC	PS/2 type
EUT system is composed of three part - Web Monitor, keyboard and mouse.					

Following peripheral devices and interface cables were connected during the measurement :

Equipment	Type	Brand	Serial No.	FCC ID	Remark
Server PC	AP200	Compaq	7014CTL10111	DoC	Server system
Keyboard	-	Compaq	269513-B31	DoC	
Mouse	M-S38	compaq	327716-001	DZL211107	
Monitor	719B	Daewoo	-	C5F7NFCMC719B	
Printer	A0302380	Northern Telecom	26633S60168	BS16XU2225C-L	Parrarel
Keyboard	SKR-3033S	Sejin	0FBB007598	DoC	USB type
Head Set	NM-V83	TOCO	-	-	
Mouse	M-M28	Logitech	LCA53305547	DZL210365	Serial
<ul style="list-style-type: none"> <li>■ Unshielded AC power cable : 1.8m</li> <li>■ Shielded monitor's signal cables(Analog) : 1.5m</li> <li>■ LAN cable : 15m</li> </ul>					

## TEST RESULT

### Conducted emissions : 450 kHz - 30 MHz

The requirements are.

■ KEPT NOT KEPT

Min. limit margin

3.3 dB at 16.003 MHz

Remarks : See test-graph to be attached at pages 11 ~ 13.

### Radiated emissions (magnetic field) : 10 kHz - 30 MHz

The requirements are

KEPT NOT KEPT

Max. limit margin.

\_\_\_\_\_ dB at \_\_\_\_\_ MHz

Remarks :

### Radiated emissions (electric field) 30 MHz - 2000 MHz

The requirements are

■ KEPT NOT KEPT

Min. limit margin

3.3 dB at 653.6 MHz

Remarks : See test-graph to be attached at pages 14 ~ 16.



### Test Set-Up ( Type : MW-700 )

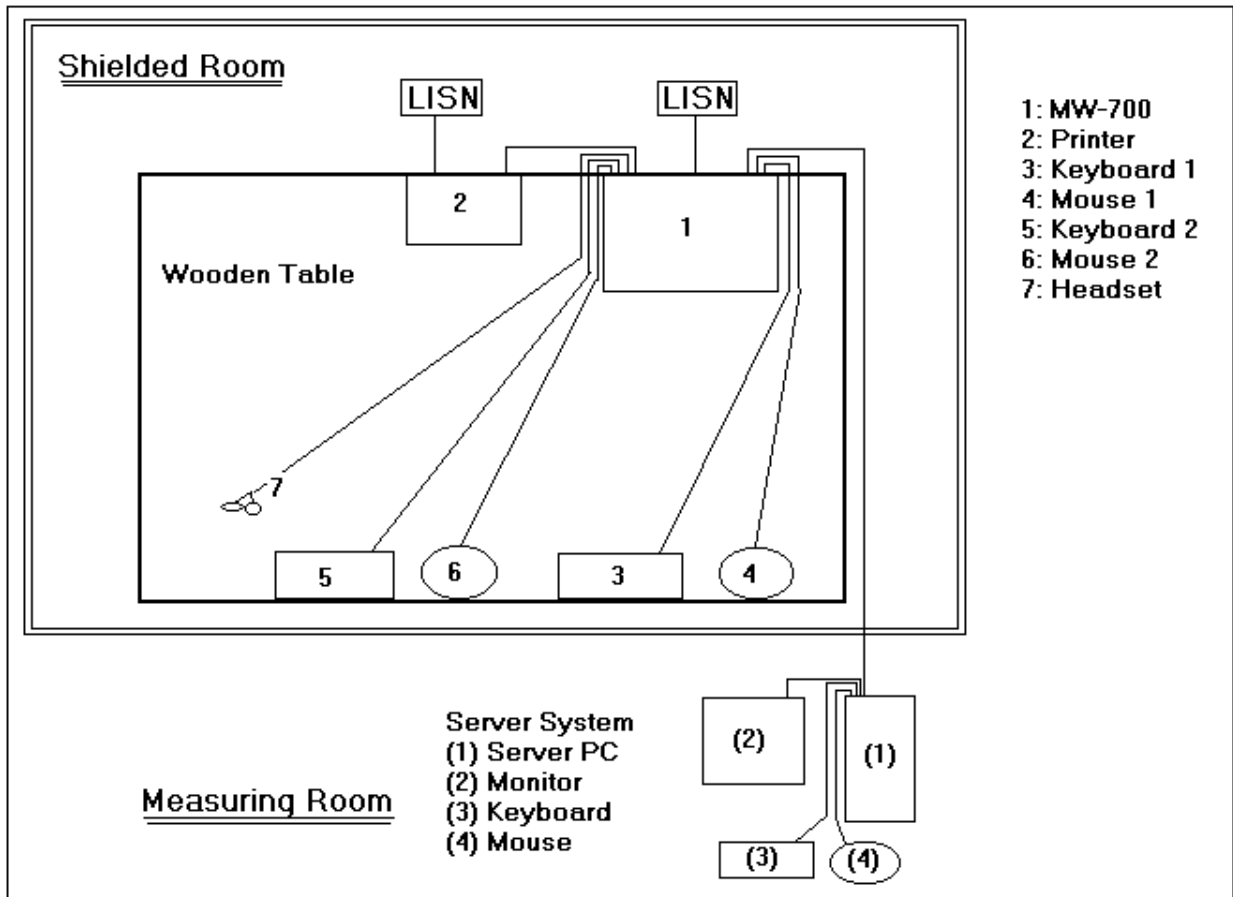
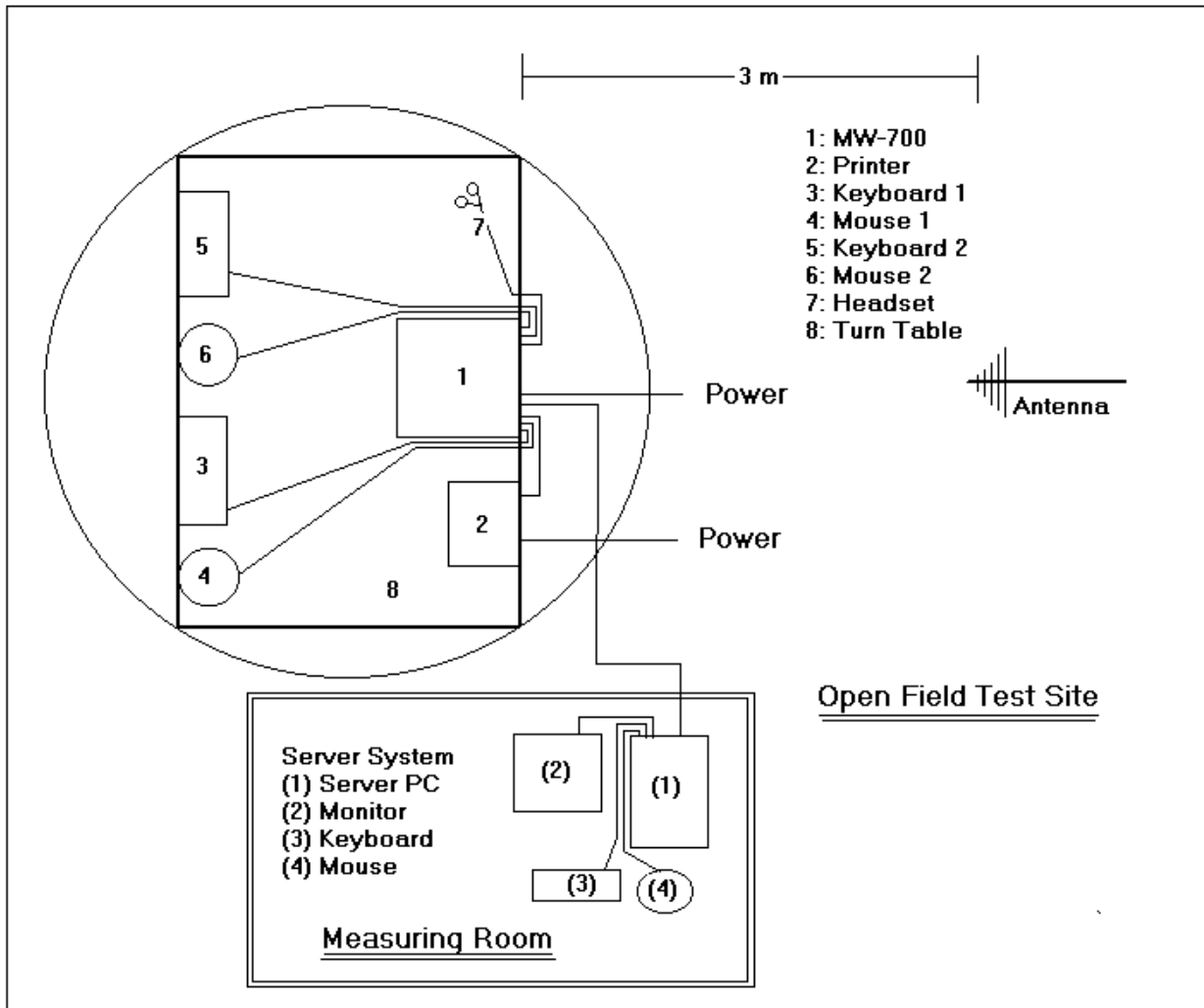


Figure 1 : Conducted emission 450kHz ~ 30MHz

**Test Set-Up  
( Type : MW-700 )**



**Figure 2 : Radiated emission 30MHz ~ 2GHz**

## Conducted Emission Test Data

Type : MW-700  
 Manufacturer : Daewoo Electronics Co., Ltd.  
 Operation mode : Scrolling "H" pattern display 1024 X 768, 60Hz  
 Date : June 04, 2001

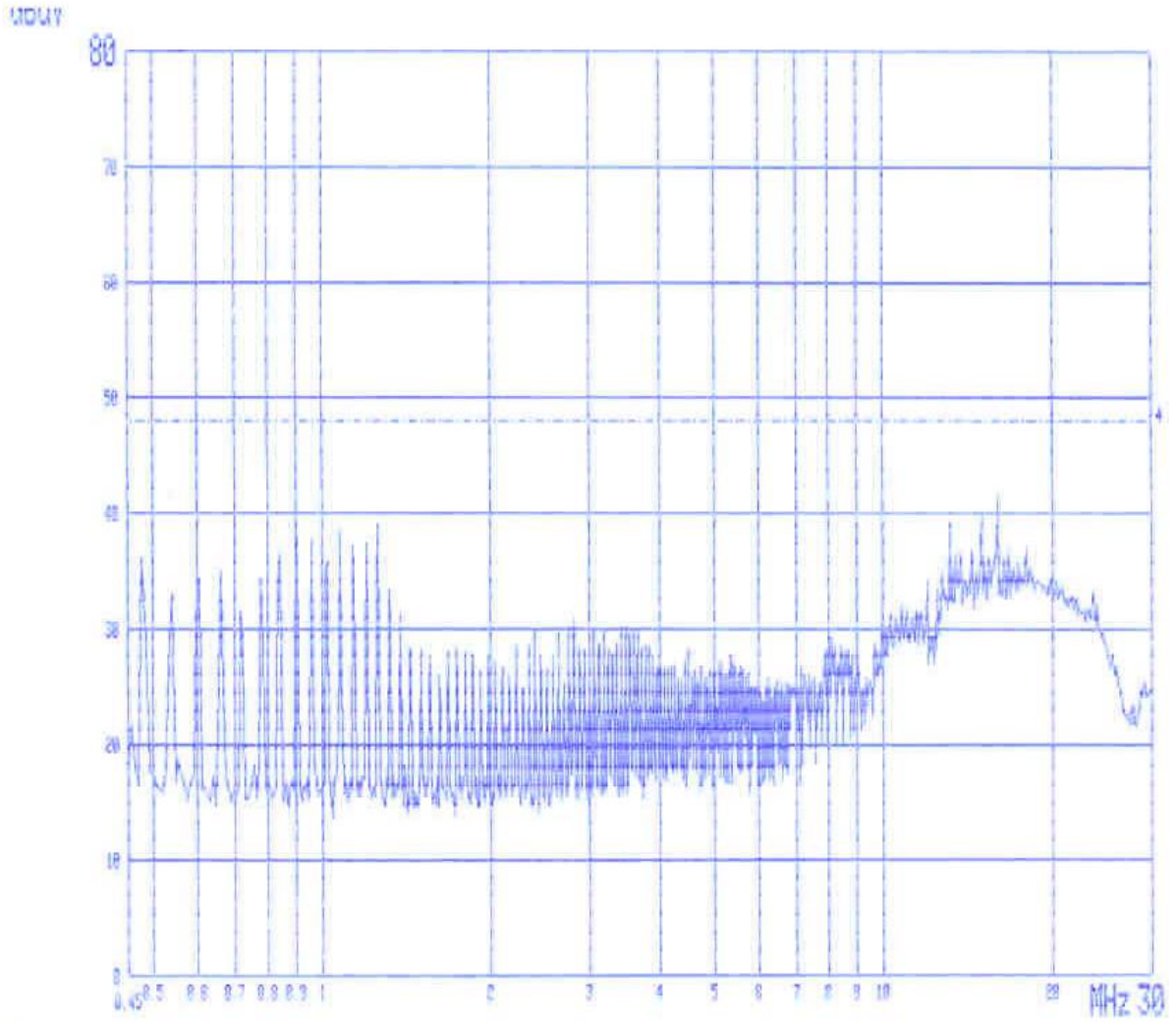
### Highest Emissions relative to the limit

Frequency [MHz]	Reading [dBuV]	Insertion Loss [dB]	Phase (L1/N)	Result [dBuV]	Limit [dBuV]	Margin [dB]
0.446	35.1	0.8	L1	35.9	48.0	12.1
0.660	32.4	0.8		33.2	48.0	14.8
1.080	36.2	0.8		37.0	48.0	11.0
1.261	39.5	0.8		40.3	48.0	7.7
2.821	26.8	0.8		27.6	48.0	20.4
16.003	39.8	0.8		40.6	48.0	7.4
0.658	32.1	0.8	N	32.9	48.0	15.1
1.081	36.4	0.8		37.2	48.0	10.8
1.260	39.6	0.8		40.4	48.0	7.6
2.941	30.0	0.8		30.8	48.0	17.2
13.157	41.9	0.8		42.7	48.0	5.3
16.003	43.9	0.8		44.7	48.0	3.3
<b>Cable loss are less than 0.1 dB</b>						

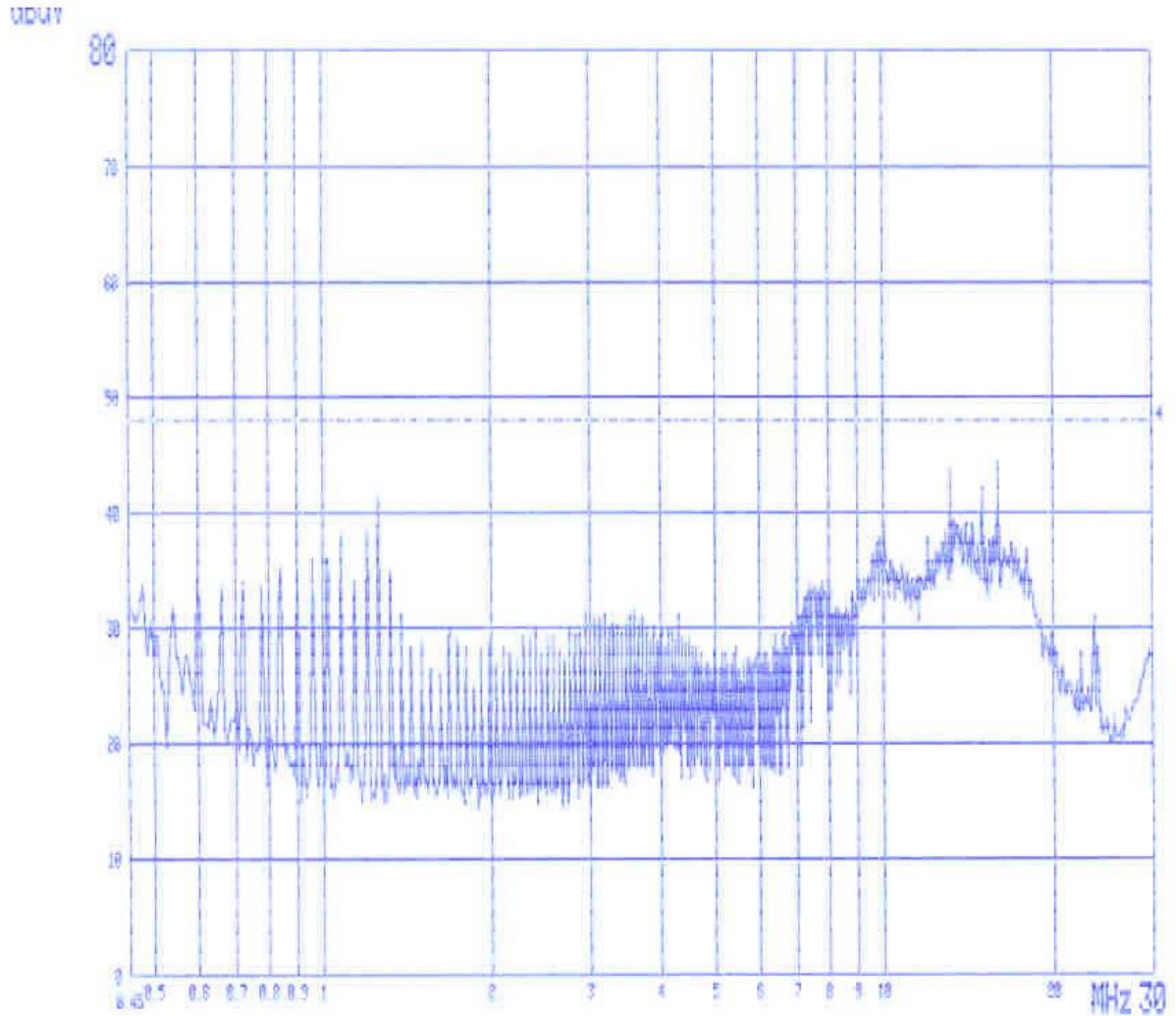
\*L1 : Live Line

\*\*N : Neutral Line

\*\*\* Please refer to data graphs at page 12 ~ 13



MODEL : MU-700  
120Vac 60Hz Phase : L1

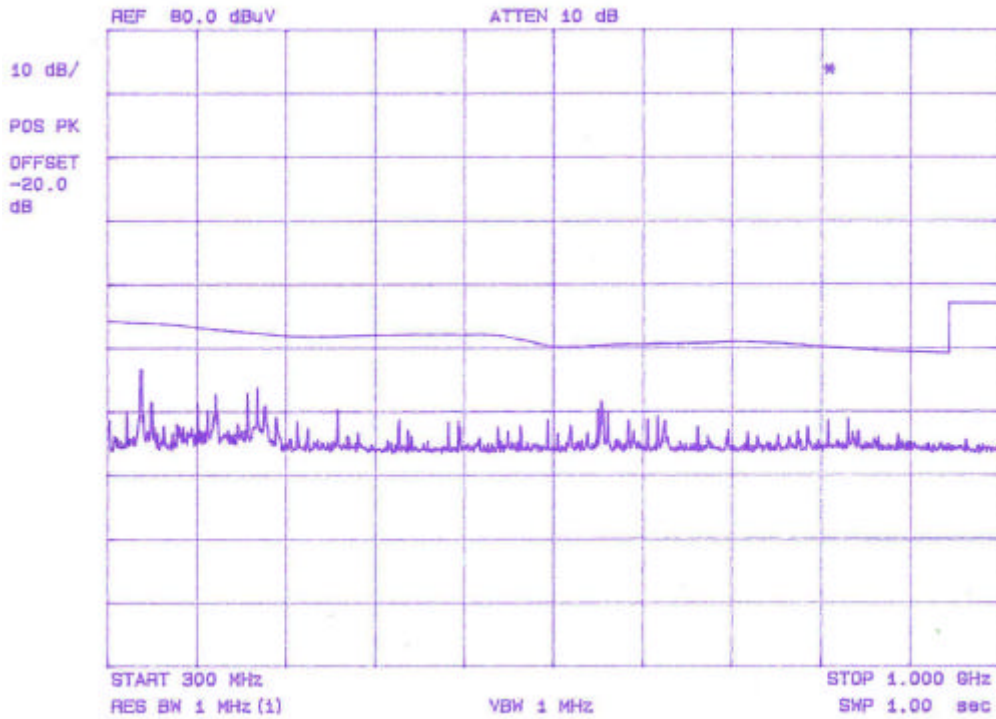
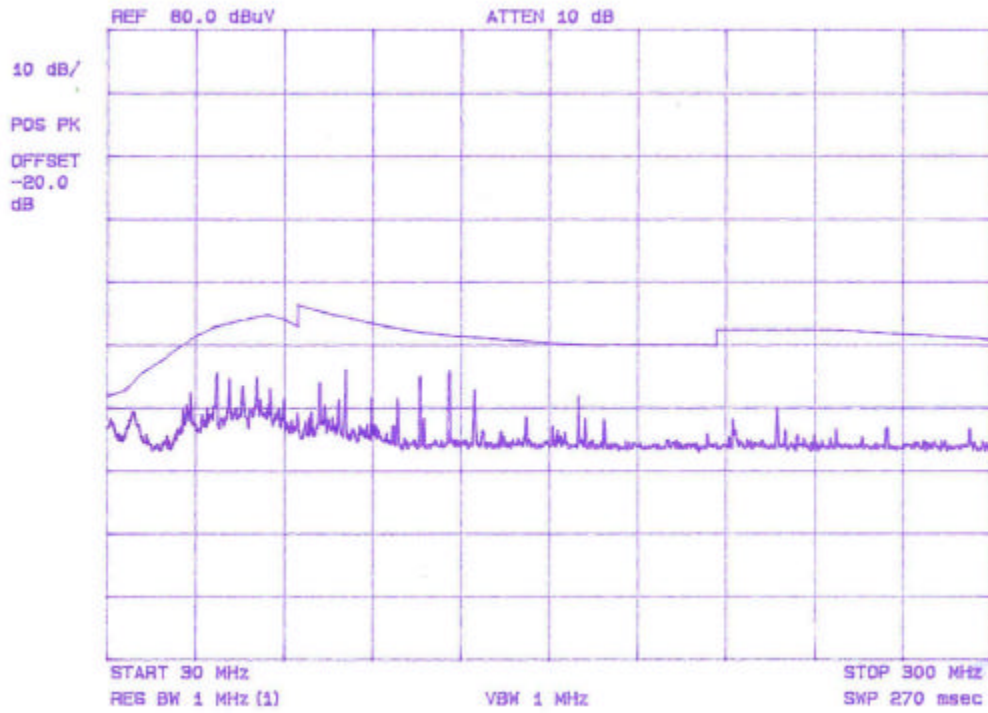


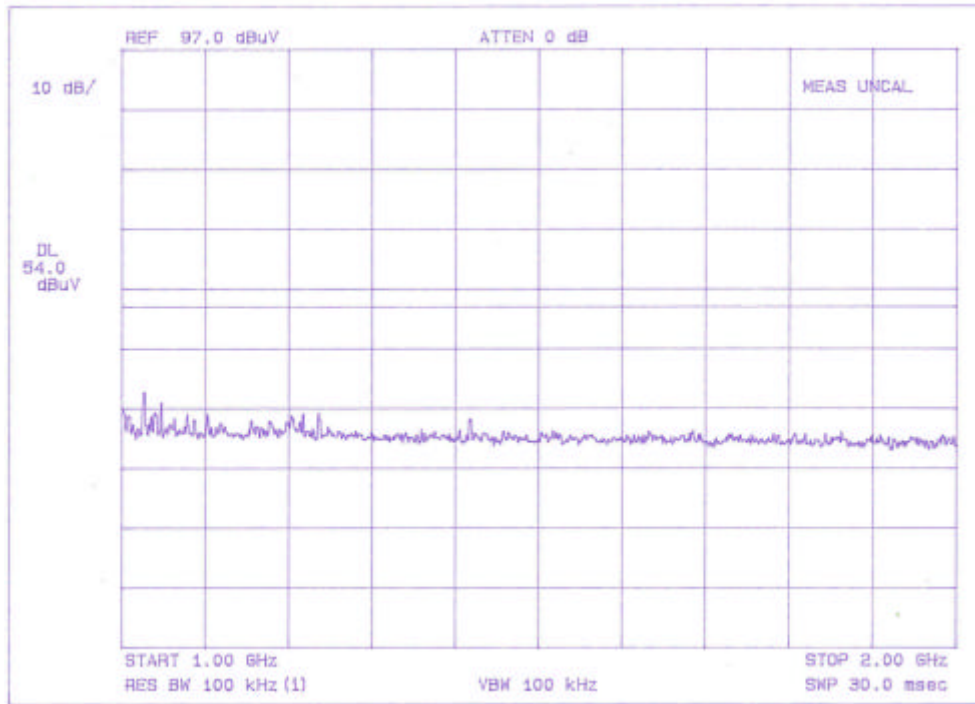
MODEL : MW-700  
120Vac 60Hz Phase : N

## Radiation Test Data

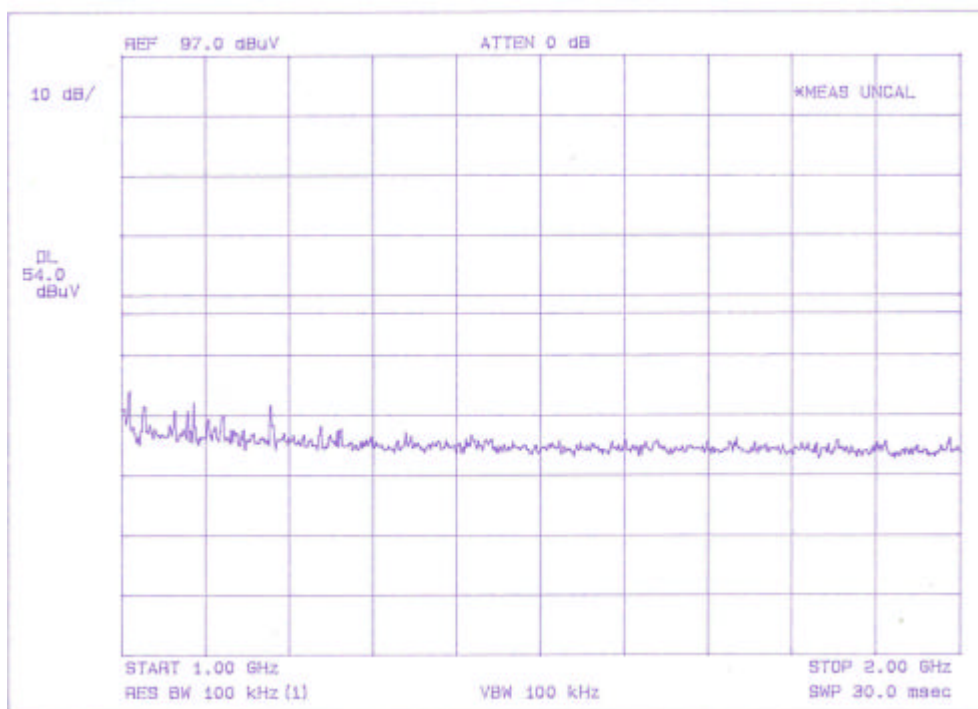
Type : MW-700  
 Manufacturer : Daewoo Electronics Co., Ltd.  
 Operation mode : Scrolling "H" pattern display 1024 X 768, 60Hz  
 Test distance : 3 m  
 Antenna : VULB9160  
 Date : June 05, 2001.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
55.1	18.6	10.9	1.4	32	100	V	30.9	40.0	9.1
63.0	18.0	10.9	1.5	33	100	V	30.4	40.0	9.6
94.5	24.3	7.5	1.7	211	100	V	33.5	43.5	10.0
141.8	21.9	11.7	2.2	220	100	V	35.8	43.5	7.7
181.1	17.1	10.5	2.4	208	100	V	30.0	43.5	13.5
233.9	26.4	9.8	2.8	30	125	H	39.0	46.0	7.0
267.3	21.7	11.5	3.0	31	126	H	36.2	46.0	9.8
325.8	21.1	11.7	3.4	12	100	V	36.2	46.0	9.8
334.1	22.3	11.7	3.5	15	120	H	37.5	46.0	8.5
378.0	20.5	12.5	3.8	200	100	V	36.8	46.0	9.2
384.3	24.3	12.5	3.8	201	120	H	40.6	46.0	5.4
409.5	22.6	13.3	4.3	202	100	V	40.2	46.0	5.8
417.4	20.5	13.5	4.4	200	100	V	38.4	46.0	7.6
448.9	18.5	13.9	4.5	11	244	H	36.9	46.0	9.1
653.6	20.7	17.1	4.9	13	256	H	42.7	46.0	3.3
685.1	19.4	18.1	5.0	15	250	H	42.5	46.0	3.5





**Radiated Emission Test 1GHz ~ 2GHz (Polar: Vertical)**



**Radiated Emission Test 1GHz ~ 2GHz (Polar: Horizontal)**



## SUMMARY

### GENERAL REMARKS :

The equipment is not modified anything, mechanical or circuit to improve EMI status during a measurement and complied the regulation “Part 15 subpart B Class B of CFR 47”

### FINAL JUDGMENT :

The requirements according to the technical regulations are

■ Kept   Not kept

The equipment under test does

- - Fulfill the general approval requirements mentioned on page 3.
- Not fulfill the general approval requirements mentioned on page 3.

Begin of testing                                 : June 01, 2001

End of testing                                   : June 10, 2001

**Reviewed by :**



**Joon H. Lee. EMC Manager  
IST EMC Lab.**

**Approved by :**



**G. Chung Chief of EMC Lab.**