



## EMISSION TEST REPORT

Test report file No. : **02-IST-026/FB** Date of issue : Feb. 27, 2001

Model / Type No. : L700CAV  Basic  Alternate

Kind of product : LCD Monitor

Brand name : Daewoo

Applicant : Daewoo Electronics Co., Ltd. Display Business Division

Manufacturer : Daewoo Electronics Co., Ltd. Display Business Division

License holder : Daewoo Electronics Co., Ltd. Display Business Division

Address : 543, Dangjung-Dong, Kunpo-City, Kyonggi-Do, Korea

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

Positive  Negative

at page 3.

This test report with appendix consists of 25 pages.

The test result only responds to the tested sample.

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.

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## 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.

### EQUIPMENT UNDER TEST

#### Equipment Description :

LCD Pannel :	17.0 inch TFT LCD Pixel Pinch 0.264 x 0.264 mm
Frequency Range :	Vertical 55 ~ 77 Hz, Horizontal 30 ~ 80 kHz
PC Input Signal :	H / V separated (TTL) 15 pin mini D-Sub (Analog RGB)
AV Input Signal :	Video - CVBS, S-VHS input Audio1 - Left,Right Stereo RCA Audio2 - mini jact for sound card
Speaker :	Maximum output 6 W (L-3W, R-3W) Input signal – 100 mV, 8 ohm Speaker Adapter Model No. L4D-120100 (UL Listed 23DJ E192841)
Power Supply Input :	100 ~ 240 Vac, 50/60 Hz
Power consumption :	45 W
Micom Type :	MTV312MV64 (MYSON) – clock 12 MHz
Dimensions (W x H x D) :	420 x 398 x 194 mm (with stand)

## EQUIPMENT UNDER TEST

### EUT Type :

- Table-Top.
- Floor-Standing.
- Table-Top and Floor-Standing(Combination).

### Operation – mode of the E.U.T. :

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

- Standby.
- Operational Condition :
  - 1) Scrolling “H” characters under MS Windows 98,  
Test mode : 1280 X 1024, 75 Hz
  - 2) Displaying color bar and sounding 1 kHz audio

### Configuration of the equipment under test :

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

Equipment	Type	Brand	Serial No.
PC	Brio BA600/550	HP	SG01902402
Keyboard	SK-2502C	HP	M0004102821
Mouse1	M-S48A	HP	LZE01251424
Printer	A0302384	Northern Telecom	26633S60168
Mouse2	M-MD14-2	Logitech	N/A
Pattern Generator	PM5418	Fluke	945205418003

#### Connecting Interface Cables :

- Unshielded AC power cable : 1.8 m
- Shielded monitor’s signal cable : 1.5 m
- Shielded printer’s signal cable : 1.5 m

## 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 :**

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESH 3	Test Receiver	Rohde & Schwarz	Jun. 16, 2001	861742/015
3725/2	LISN	EMCO	Jul. 30, 2001	9101-2068
KNW-407	LISN	Hyup-Rip	Jul. 26, 2001	8-883-10
ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Jul. 13, 2001	357.8810.52

**Test - accessories :**

Type	Manufacturer
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 :**



\_\_\_\_\_  
S. J. Oh / Research Engineer  
IST EMC Lab.

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 :

Location :             Open Site No. 1       Open Site No. 2       Open Site No. 3  
 Distance :            3 meters             10 meters

**Used testing instruments :**

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESVP	Test Receiver	Rohde & Schwarz	Jun. 12, 2001	861744/018
VULB 9160	Antenna	Schwarzbeck	Jun. 04, 2001	3048

**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.

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

**Test engineer :**



S. J. Oh / Research Engineer  
IST EMC Lab.

## TEST RESULT

**Test Condition : Scrolling 'H' characters under MS Windows 98**

**Conducted emissions : 450 kHz - 30 MHz**

The requirements are.  KEPT  NOT KEPT  
 Min. limit margin 7.2 dB at 20.196 MHz  
 Remarks : See test-graph to be attached at pages 11 ~ 14.

**Radiated emissions (electric field) 30 MHz - 1000 MHz**

The requirements are.  KEPT  NOT KEPT  
 Min. limit margin 3.3 dB at 269.2 MHz  
 Remarks : See test-data at page 15 ~ 16.

**Test Condition : Displaying color bar and sounding 1 kHz audio**

**Conducted emissions : 450 kHz - 30 MHz**

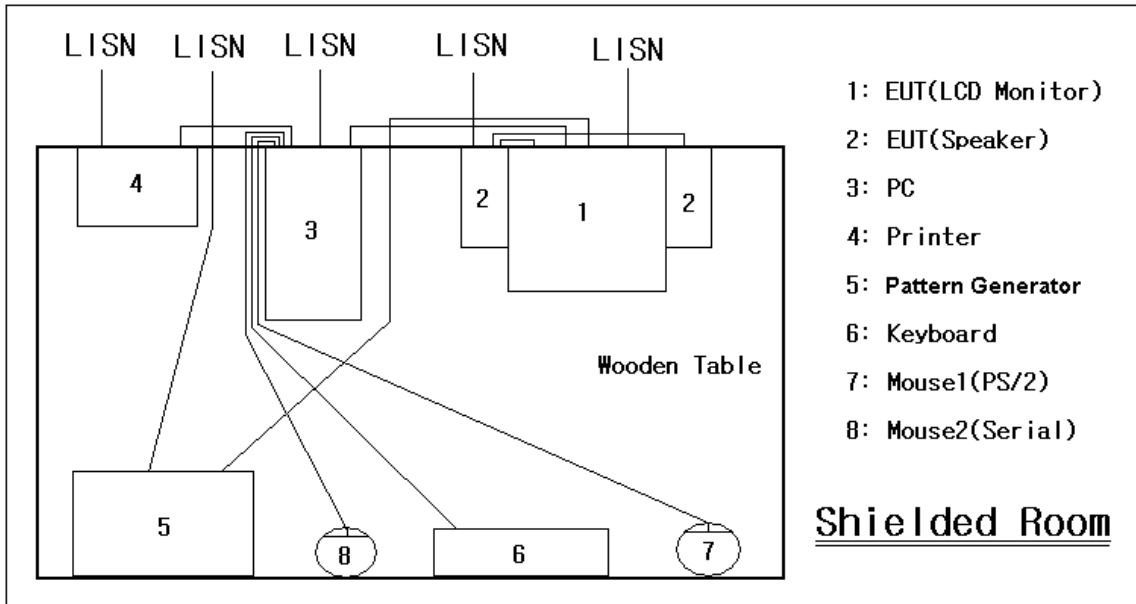
The requirements are.  KEPT  NOT KEPT  
 Min. limit margin 8.6 dB at 20.066 MHz  
 Remarks : See test-graph to be attached at pages 19 ~ 22.

**Radiated emissions (electric field) 30 MHz - 1000 MHz**

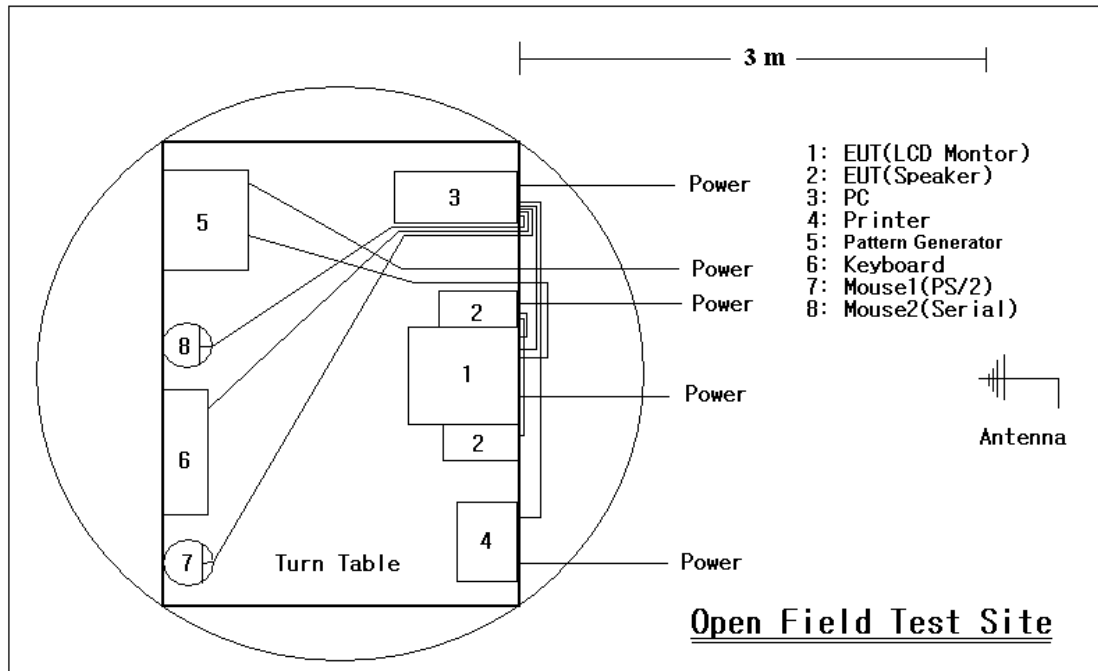
The requirements are.  KEPT  NOT KEPT  
 Min. limit margin 3.3 dB at 297.0 MHz  
 Remarks : See test-data at page 23 ~ 24.

## TEST SETUP (Drawings)

Type : L700CAV



Conducted Emissions 0.15 MHz - 30 MHz



Radiated Emissions 30 MHz - 1000 MHz



## **TEST SETUP (Photos)**

Test Condition : Scrolling 'H' characters under MS Windows 98

Type : L700CAV



Conducted Emissions 0.15 MHz - 30 MHz



## **TEST SETUP (Photos)**

Test Condition : Scrolling 'H' characters under MS Windows 98

Type : L700CAV



Radiated Emissions 30 MHz - 1000 MHz



## Conducted Emission Test Data

Type L700CAV  
 Manufacturer Daewoo Electronics Co., Ltd. Display Business Division  
 Operation mode Scrolling "H" pattern display 1280 x 1024, 75Hz  
 Environmental Conditon Temperature : 18 °C  
 Humidity : 40 %  
 Atmospheric pressure : 1000 mbar  
 Date Feb. 19, 2002

### Highest Emissions relative to the limit

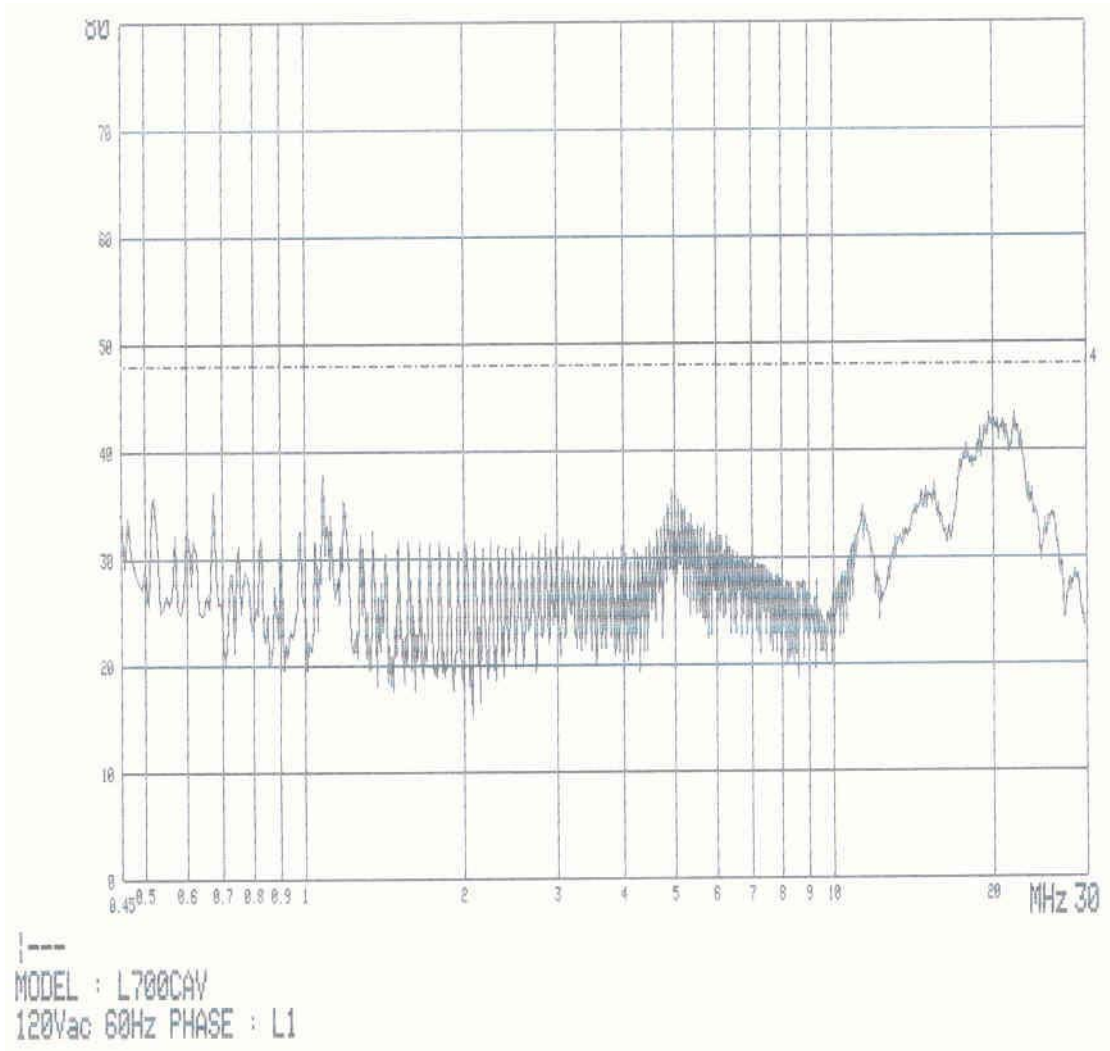
Frequency [MHz]	Reading [dB $\mu$ V]	Insertion loss [dB]	Phase (L1/N)	Result [dB $\mu$ V]	Limit [dB $\mu$ V]	Margin [dB]
0.671	34.5	0.8	L1	35.3	48.0	12.7
1.084	38.4	0.8		39.2	48.0	8.8
2.858	22.6	0.8		23.4	48.0	24.6
4.969	35.4	0.8		36.2	48.0	11.8
15.562	25.0	0.8		25.8	48.0	22.2
21.995	35.6	0.8		36.4	48.0	11.6
0.516	38.3	0.8	N	39.1	48.0	8.9
1.086	36.1	0.8		36.9	48.0	11.1
1.404	36.1	0.8		36.9	48.0	11.1
5.017	35.7	0.8		36.5	48.0	11.5
16.591	34.2	0.8		35.0	48.0	13.0
20.196	40.0	0.8		40.8	48.0	7.2

**Cable loss are less than 0.1 dB**

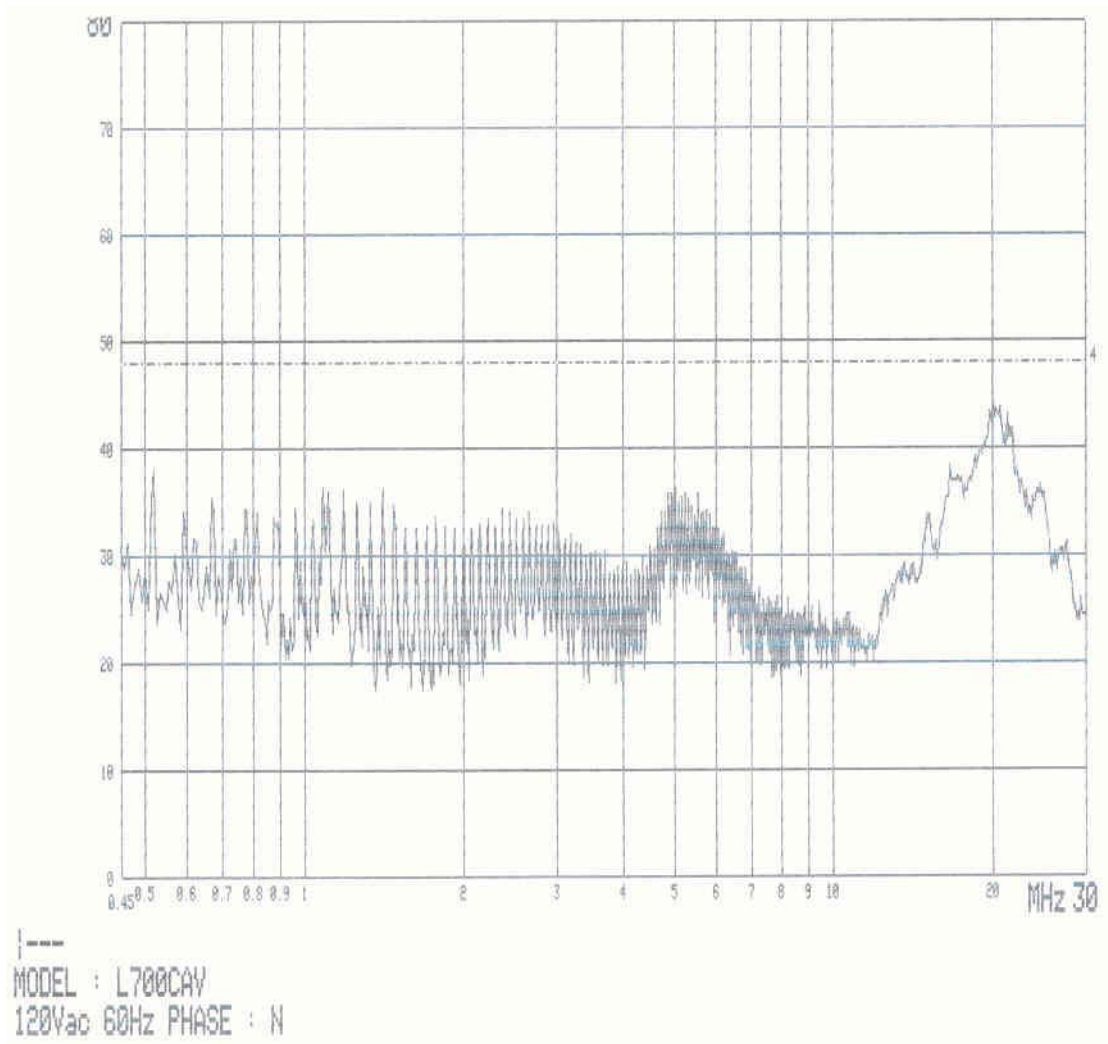
\*L1 : Live Line

\*\*N : Neutral Line

\*\*\* Please refer to data graphs at page 12 ~ 14.

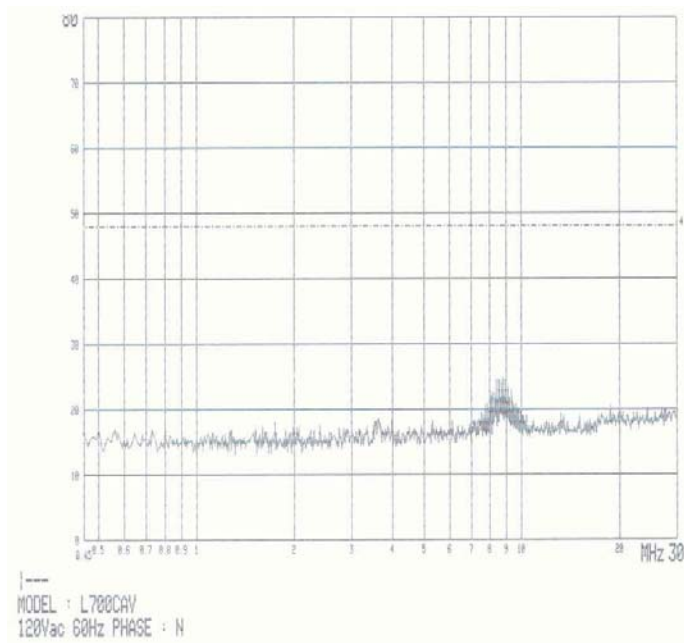
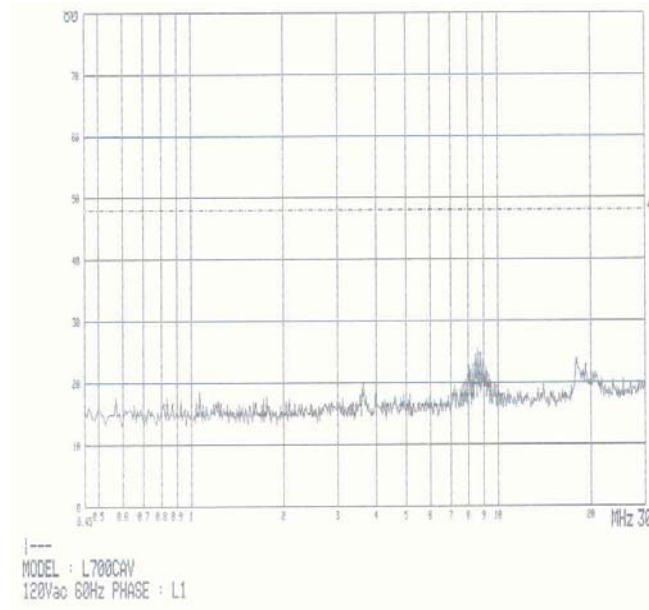






## Conducted Emission Test Data

Model L4D-120100 (Adapter for Speaker)  
Input 120 Vac, 60 Hz  
Output 12 Vdc / 1 A

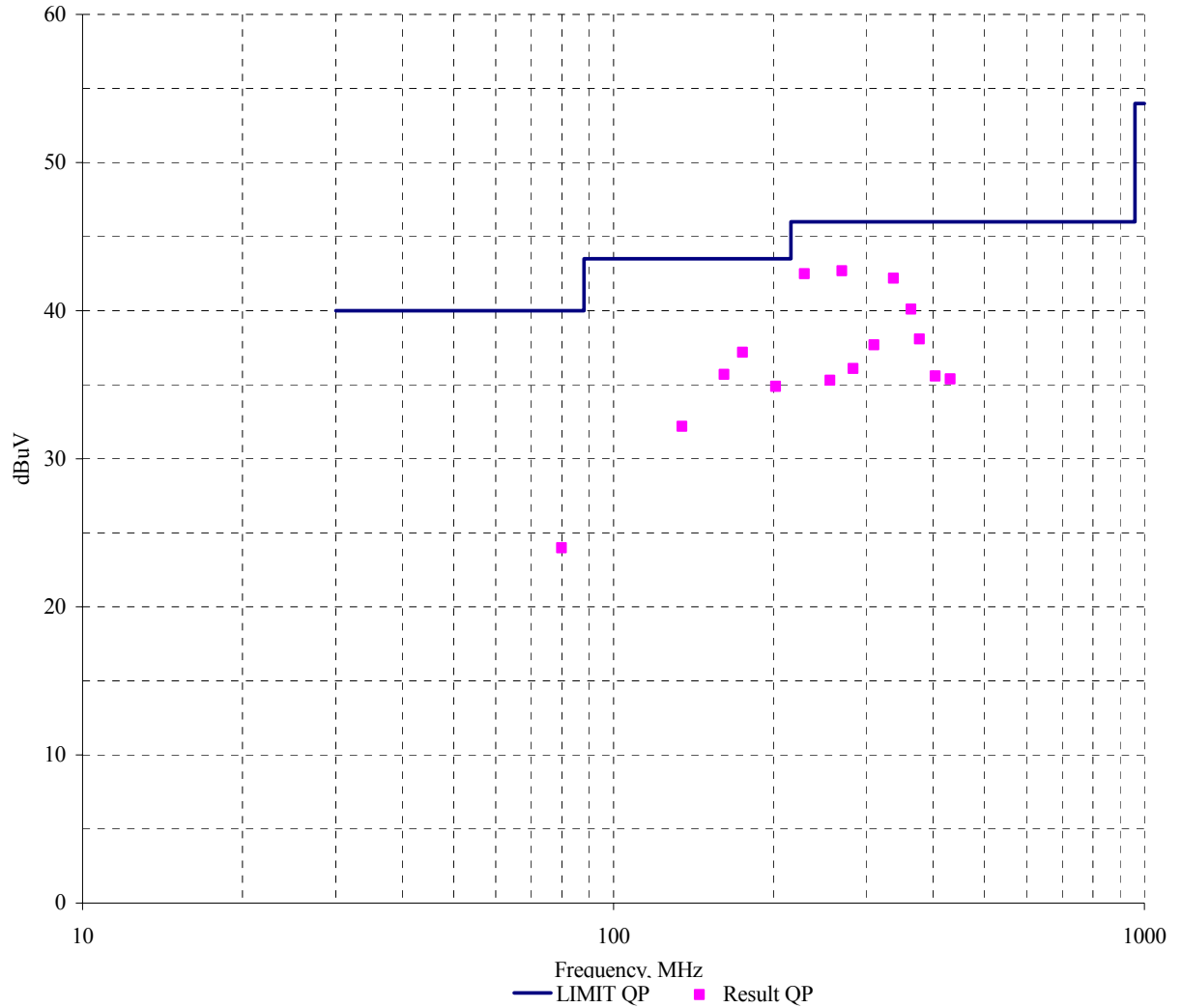


## Radiation Test Data

Type L700CAV  
 Manufacturer Daewoo Electronics Co., Ltd. Display Business Division  
 Operation mode Scrolling "H" pattern display 1280 x 1024, 75Hz  
 Environmental Condition Temperature : 17 °C  
 Humidity : 41 %  
 Atmospheric pressure : 1000 mbar  
 Test distance 3 m  
 Antenna VULB9160  
 Date Feb. 20, 2002

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
79.8	14.6	7.8	1.6	17	100	V	24.0	40.0	16.0
134.6	19.2	10.9	2.1	19	100	H	32.2	43.5	11.3
161.5	21.1	12.3	2.3	18	100	V	35.7	43.5	7.8
175.0	23.3	11.5	2.4	13	100	V	37.2	43.5	6.3
201.9	23.9	8.5	2.5	275	262	H	34.9	43.5	8.6
228.8	30.4	9.3	2.8	267	258	H	42.5	46.0	3.5
255.7	21.3	11.1	2.9	264	100	V	35.3	46.0	10.7
269.2	28.2	11.5	3.0	310	100	V	42.7	46.0	3.3
282.7	21.1	11.9	3.1	264	100	V	36.1	46.0	9.9
309.6	22.7	11.7	3.3	253	100	V	37.7	46.0	8.3
336.5	27.0	11.7	3.5	68	100	V	42.2	46.0	3.8
363.4	24.3	12.1	3.7	45	100	V	40.1	46.0	5.9
376.9	21.8	12.5	3.8	25	100	V	38.1	46.0	7.9
403.8	18.0	13.3	4.3	28	104	H	35.6	46.0	10.4
430.7	17.3	13.7	4.4	21	120	V	35.4	46.0	10.6

### MEASUREMENT OF DISTURBANCE RADIATION





## **TEST SETUP (Photos)**

Test Condition : Displaying color bar and sounding 1 kHz audio

Type : L700CAV



Conducted Emissions 0.15 MHz - 30 MHz



## **TEST SETUP (Photos)**

Test Condition : Displaying color bar and sounding 1 kHz audio

Type : L700CAV



Radiated Emissions 30 MHz - 1000 MHz



## Conducted Emission Test Data

Type L700CAV  
 Manufacturer Daewoo Electronics Co., Ltd. Display Business Division  
 Operation mode Displaying color bar and sounding 1 kHz audio  
 Environmental Conditon Temperature : 18 °C  
 Humidity : 41 %  
 Atmospheric pressure : 1000 mbar  
 Date Feb. 19, 2002

### Highest Emissions relative to the limit

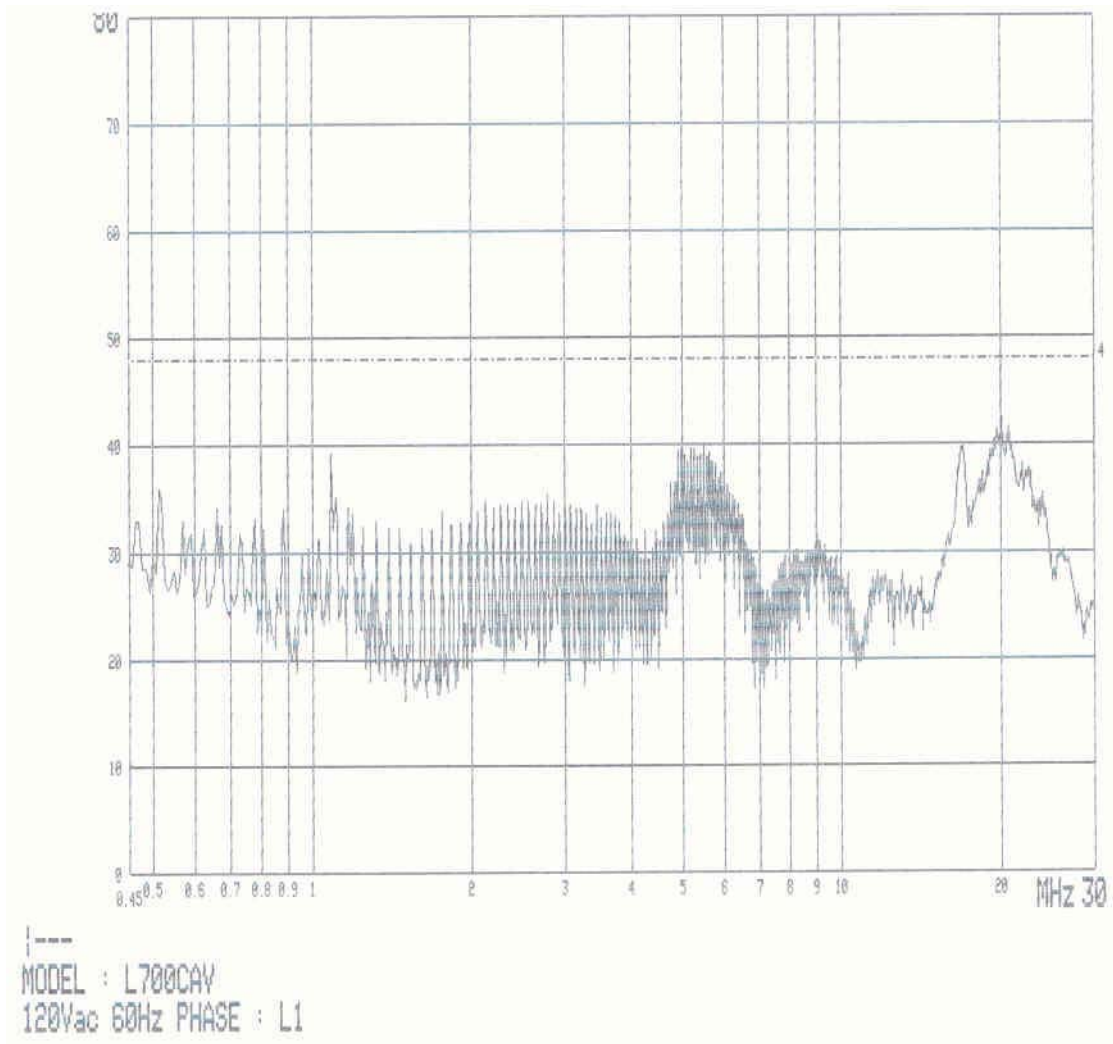
Frequency [MHz]	Reading [dB $\mu$ V]	Insertion loss [dB]	Phase (L1/N)	Result [dB $\mu$ V]	Limit [dB $\mu$ V]	Margin [dB]
0.517	35.8	0.8	L1	36.6	48.0	11.4
1.087	38.2	0.8		39.0	48.0	9.0
2.784	34.1	0.8		34.9	48.0	13.1
4.980	37.4	0.8		38.2	48.0	9.8
16.990	35.0	0.8		35.8	48.0	12.2
20.066	38.6	0.8		39.4	48.0	8.6
0.515	37.1	0.8	N	37.9	48.0	10.1
0.881	36.7	0.8		37.5	48.0	10.5
1.395	36.9	0.8		37.7	48.0	10.3
4.986	36.4	0.8		37.2	48.0	10.8
16.637	35.0	0.8		35.8	48.0	12.2
20.669	38.5	0.8		39.3	48.0	8.7

**Cable loss are less than 0.1 dB**

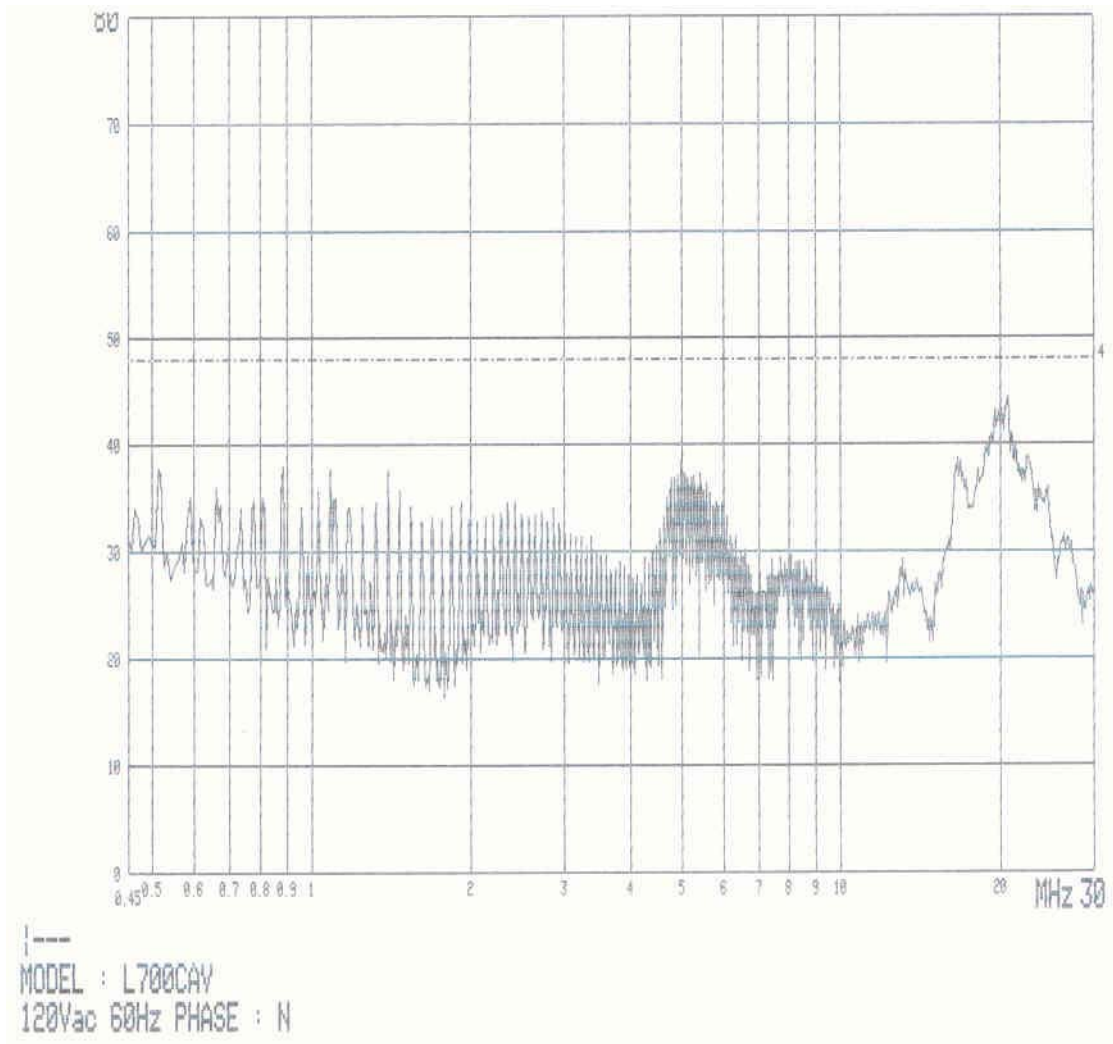
\*L1 : Live Line

\*\*N : Neutral Line

\*\*\* Please refer to data graphs at page 20 ~ 22.

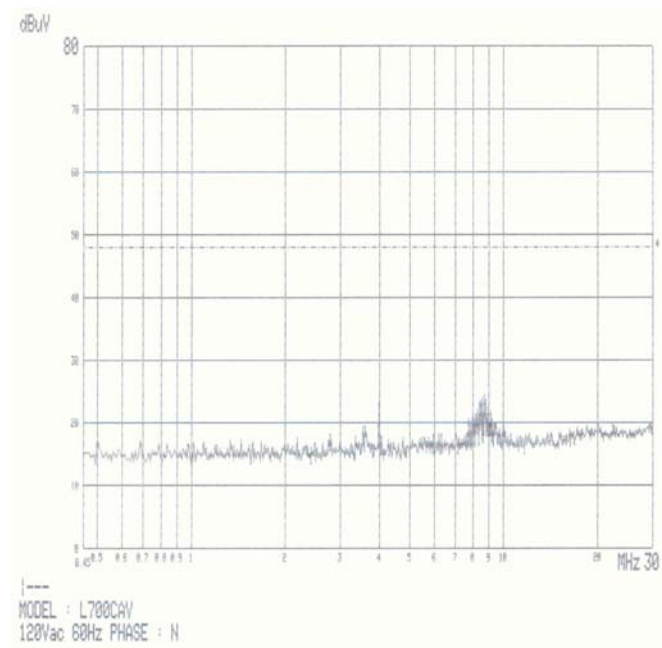
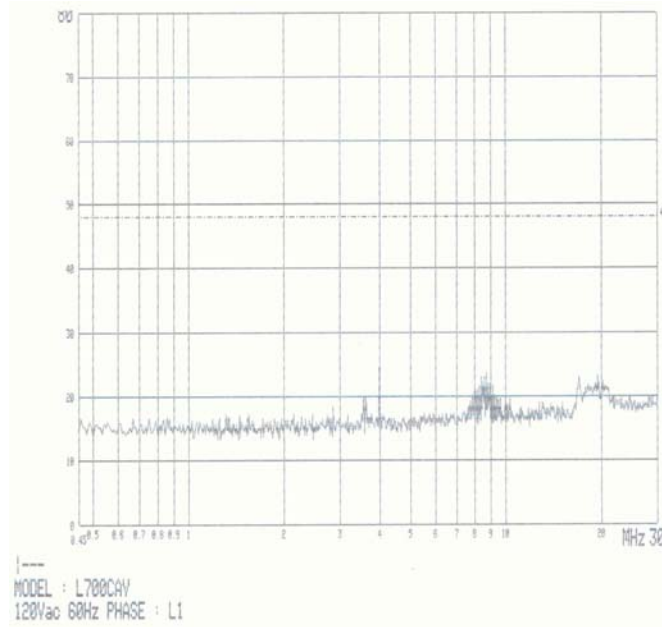






## Conducted Emission Test Data

Model	L4D-120100 (Adapter for Speaker)
Input	120 Vac, 60 Hz
Output	12 Vdc / 1 A

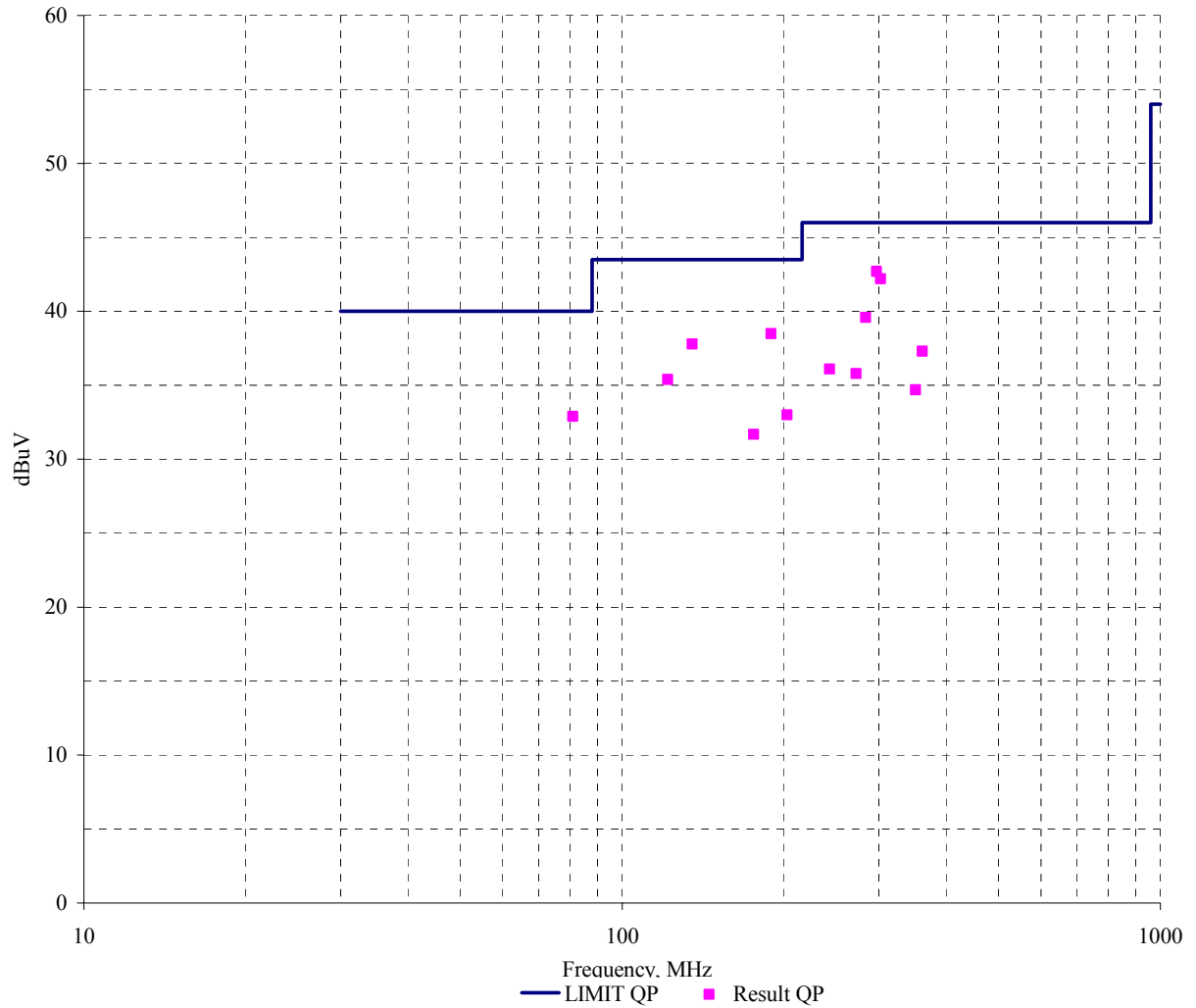


## Radiation Test Data

Type L700CAV  
 Manufacturer Daewoo Electronics Co., Ltd. Display Business Division  
 Operation mode Displaying color bar and sounding 1 kHz audio  
 Environmental Condition Temperature : 18 °C  
 Humidity : 42 %  
 Atmospheric pressure : 1000 mbar  
 Test distance 3 m  
 Antenna VULB9160  
 Date Feb. 21, 2002

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
81.0	23.6	7.7	1.6	318	100	V	32.9	40.0	7.1
121.5	23.4	10.0	2.0	62	100	H	35.4	43.5	8.1
135.0	24.8	10.9	2.1	48	100	V	37.8	43.5	5.7
175.5	17.9	11.4	2.4	33	100	V	31.7	43.5	11.8
189.0	26.7	9.3	2.5	359	163	V	38.5	43.5	5.0
202.5	22.0	8.5	2.5	111	100	V	33.0	43.5	10.5
243.0	22.8	10.4	2.9	359	156	H	36.1	46.0	9.9
272.0	21.2	11.6	3.0	270	170	H	35.8	46.0	10.2
283.5	24.6	11.9	3.1	273	158	V	39.6	46.0	6.4
297.0	27.8	11.7	3.2	276	100	V	42.7	46.0	3.3
302.1	27.2	11.7	3.3	283	100	V	42.2	46.0	3.8
351.0	19.4	11.7	3.6	359	100	V	34.7	46.0	11.3
361.0	22.0	11.7	3.6	327	110	V	37.3	46.0	8.7

### MEASUREMENT OF DISTURBANCE RADIATION





## 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                      : Feb. 18, 2002

End of testing                         : Feb. 23, 2002

Reviewed by :

Approved by :



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



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