



EMISSION TEST REPORT

Test report file No. : **03-IST-070/FA** Date of issue : Mar. 20, 2003.

Model / Type No. : DSP-4280GM ☐ Basic ☒ Alternate

Kind of product : PDP(Plasma Display Panel)

Brand name : DAEWOO

Applicant : Daewoo Electronics Corp.

Manufacturer : Daewoo Electronics Corp.

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 24 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

A) Documentation.

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B) Test Data.

Conducted emissions (Mains)	: 450 kHz - 30 MHz	<u>14~19</u>
Radiated emissions	: 30 MHz – 1 GHz	<u>20~23</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>12</u>
Humidity	<u>36</u> %
Atmospheric pressure	<u>1014</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 :**

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESH 3	Test Receiver	Rohde & Schwarz	Jul. 25, 2002	892108/018
3725/2	LISN	EMCO	Aug. 22, 2002	9101-2068
KNW-407	LISN	Hyup-Rip	Aug. 21, 2002	8-883-10
ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Jul. 25, 2002	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. H. Lee / Test 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	Aug. 16, 2002	861744/004
VULB 9160	Antenna	Schwarzbeck	Jul. 10, 2002	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. H. Lee / Test Engineer
IST EMC Lab.

EQUIPMENT UNDER TEST

Equipment Description

The Equipment Under Test (EUT) is the **PDP of Daewoo Electronics Corp.**

Outer dimensions	Without Stand : WxHxD=1,055 x 652 x 85 mm With Stand : WxHxD=1,055 x 730 x 85 mm
Weight	Without Stand - 41 Kg, With Stand - 47 Kg
Power requirements	100 ~ 240 Vac, 50/60Hz, 3.2 ~ 1.3A
Rated input power	320W
External port	PC IN(2), Component(2), Video IN(2), Speaker Out(2)
Product	PDP(Plasma Display Panel)

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 : - Test program under Windows 98 : Scrolling “H” pattern,
 1600 X 1200, 75Hz
 - Color bar and activating speaker

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	SG01901756
Keyboard	SK-2502C	HP	M004103042
Mouse(PS/2)	M-S48a	HP	LZE01252490
Mouse(Serial)	M-M28	Logitech	LCA53305547
Printer	A0302384	Northern Telecom	26633S60168

Connecting Interface Cables & Ports :

- Shielded monitor's signal cable : 2.8m
- S-Video Cable: 1.0m(75Ω, 620Ω Termination)
- RCA Cables: 75Ω(Video IN), 47kΩ(Audio IN) Termination
- Unshielded Speaker cable : 2.5m

Description of Difference

(Difference Between Original and Changed DSP-4280GM)

Difference between the original model and the changed model

Item	The original model		The changed model		Remark
	Manufacturer	Type	Manufacturer	Type	
Noise filter	DELTA Electronics Inc.	10DKDW3S	DELTA Electronics Inc.	10GEEW3Q	-
5V-SUB PCB	None	None	DAEWOO Electronics Corp.	PTSBMSG009	adding
POWER PCB	SM TECH	SP-3000	ORIGIN Electric Co.,Ltd.	PDD-421	-
VIDEO PCB	DAEWOO Electronics Corp.	PEVDMSD035	DAEWOO Electronics Corp.	PEVDMSD035	Changed to LVDS Interface
PDP Module	ORION PDP Co.,Ltd.	PW4210	NEC Corp.	NP42B2MF02	-

* NEC PDP Module include X-SUS PCB, Y-SUS PCB, CONNECTION PCB.

* LVDS : Low Voltage Differential Signal.

TEST RESULT

<Mode : Scrolling "H" Pattern>

Conducted emissions : 450 kHz - 30 MHz

The requirements are. ☒ KEPT ☐ NOT KEPT
Min. limit margin QP : 9.0, AV : 3.7 dB at 0.159 MHz
Remarks : See test-graph to be attached at pages 14~16.

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are. ☒ KEPT ☐ NOT KEPT
Min. limit margin 4.2 dB at 162.6 MHz
Remarks : See test-data at page 20~21.

<Mode : Color bar>

Conducted emissions : 450 kHz - 30 MHz

The requirements are. ☒ KEPT ☐ NOT KEPT
Min. limit margin QP : 8.5, AV : 3.5 dB at 0.159 MHz
Remarks : See test-graph to be attached at pages 17~19.

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are. ☒ KEPT ☐ NOT KEPT
Min. limit margin 5.6 dB at 200.4 MHz
Remarks : See test-data at page 22~23.

Test Set-Up
(Type : DSP-4280GM, Mode : Scrolling “H” Pattern)



Conducted emission : 450kHz ~ 30MHz



Test Set-Up
(Type : DSP-4280GM, Mode : Color bar)



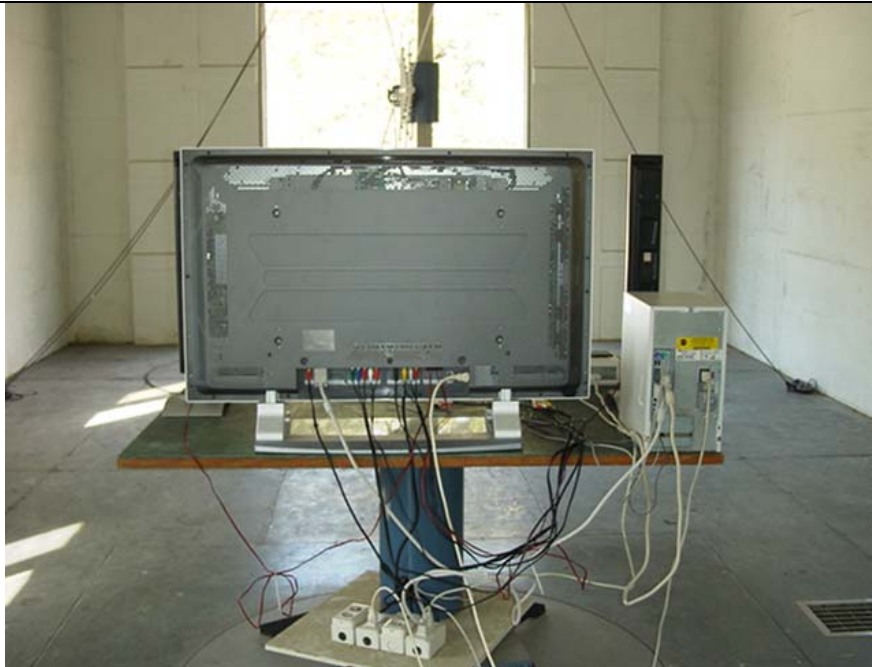
Conducted emission : 450kHz ~ 30MHz



Test Set-Up
(Type : DSP-4280GM, Mode : Scrolling “H” Pattern)



Radiated emission : 30MHz ~ 1000MHz

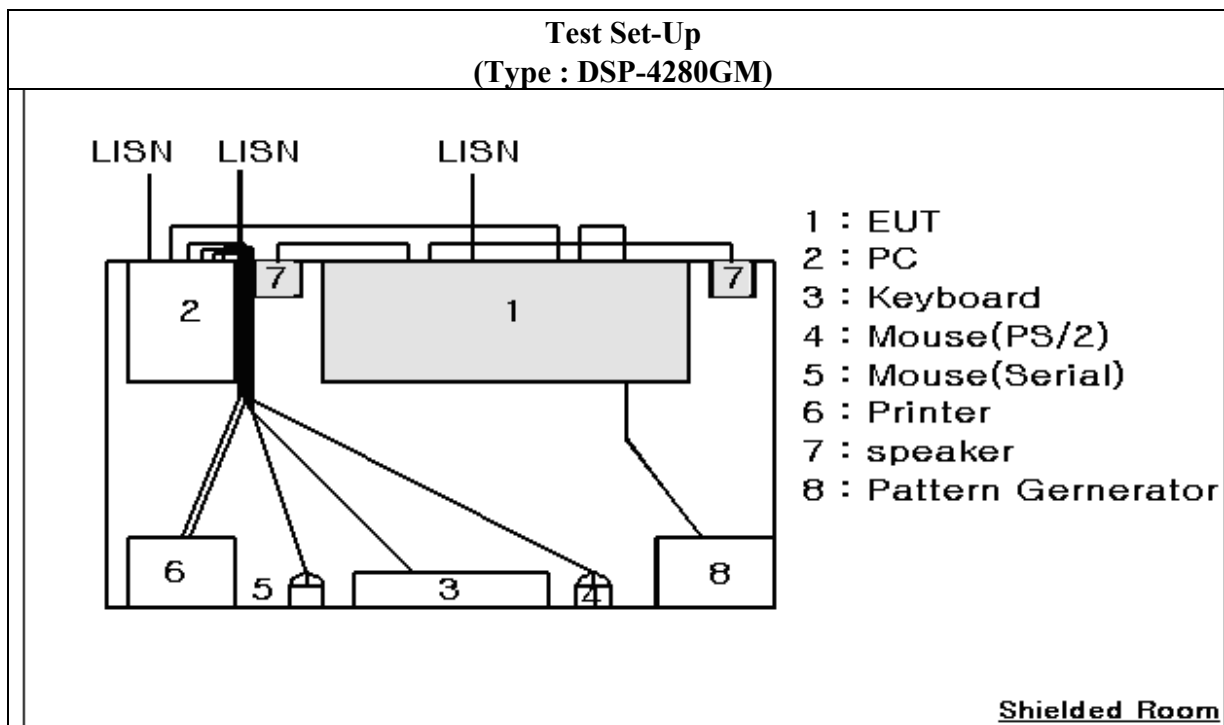


Test Set-Up
(Type : DSP-4280GM, Mode : Color bar)

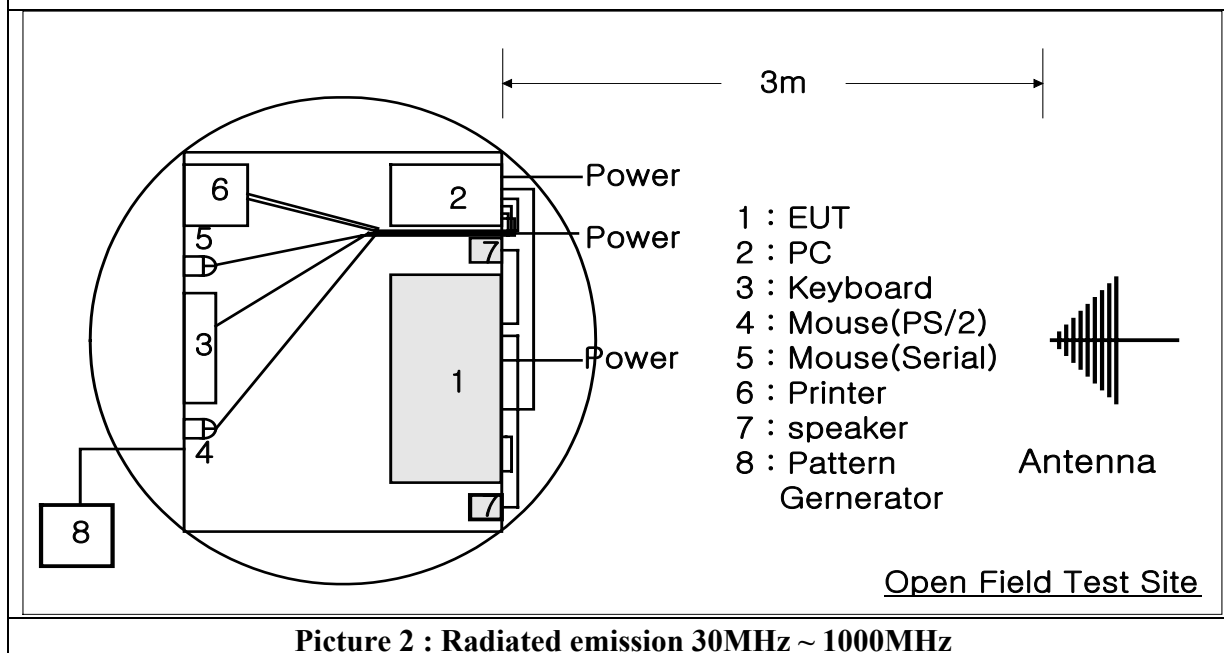


Radiated emission : 30MHz ~ 1000MHz





Picture 1 : Conducted emission 450kHz ~ 30MHz



Picture 2 : Radiated emission 30MHz ~ 1000MHz

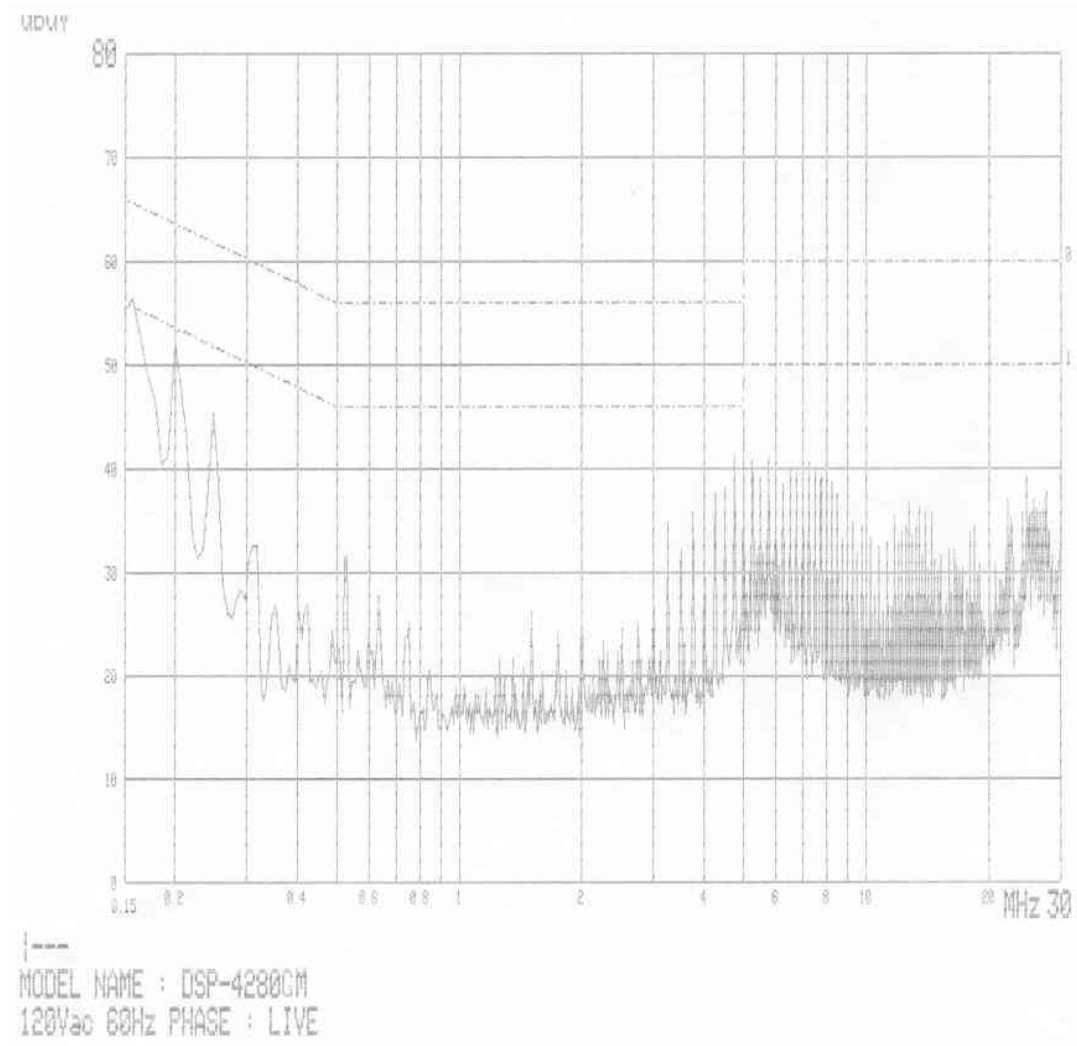
Conducted Emission Test Data

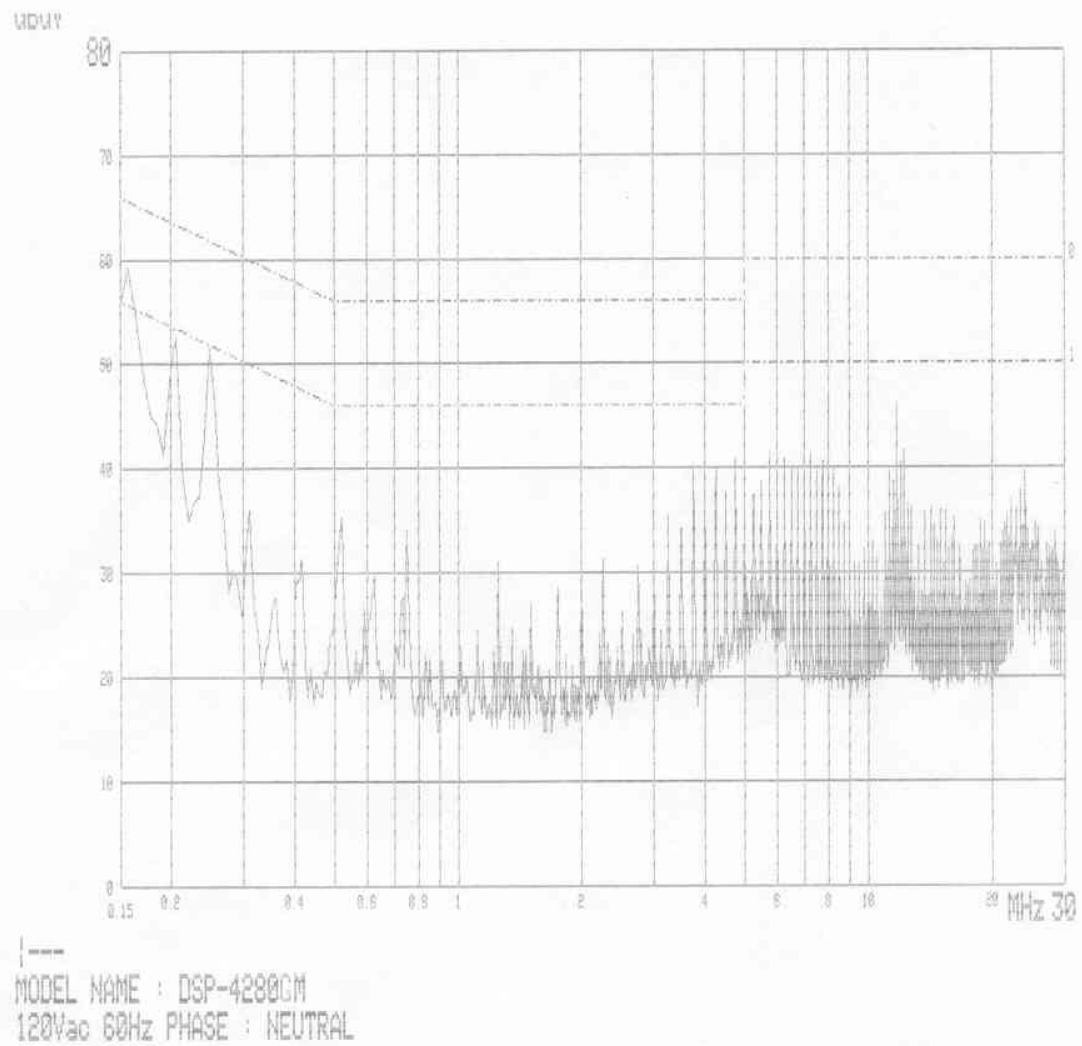
Type : DSP-4280GM
 Manufacturer : Daewoo Electronics Corp.
 Operation mode : Scrolling "H" pattern display 1600 X 1200, 75Hz
 Date : Mar. 10, 2003

Highest Emissions relative to the limit

Frequency [MHz]	Reading [dBμV]		Insertion Loss [dB]	Cable Loss [dBμV]	Phase (*L1/ **N)	Limit [dBμV]		Margin [dB]	
	Q-peak	AV				Q-peak	AV	Q-peak	AV
0.159	54.1	49.4	0.2	0.5	L1*	65.5	55.5	10.7	5.4
0.200	46.9	42.2	0.2	0.5		63.6	53.6	16.0	10.7
3.749	33.5	11.0	0.0	0.5		56.0	46.0	21.9	34.4
4.750	39.7	14.2	0.0	0.5		56.0	46.0	15.8	31.3
5.748	37.8	15.2	0.0	0.6		60.0	50.0	21.6	34.2
7.249	38.2	13.2	0.1	0.7		60.0	50.0	21.1	36.1
0.159	55.9	51.2	0.1	0.5	N**	65.5	55.5	9.0	3.7
0.251	47.7	21.7	0.1	0.5		61.7	51.7	13.4	29.4
3.748	36.4	13.6	0.0	0.5		56.0	46.0	19.0	31.8
4.751	31.1	13.7	0.0	0.5		56.0	46.0	24.3	31.7
5.750	35.1	13.3	0.1	0.6		60.0	50.0	24.3	36.1
11.751	32.2	10.9	0.2	0.6		60.0	50.0	27.0	38.3
*L1 : Live Line **N : Neutral Line									

*** Please refer to data graphs at page 15 ~ 16





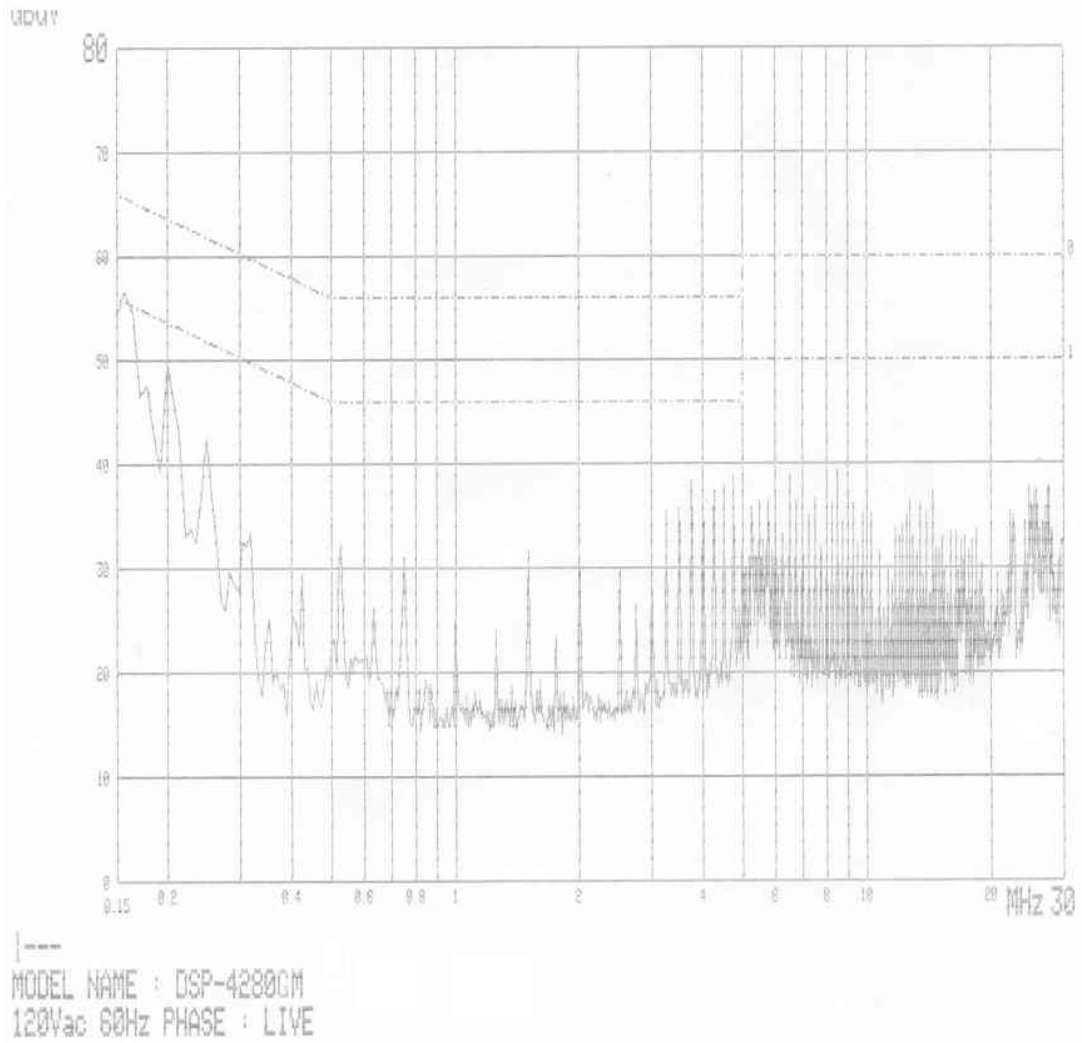
Conducted Emission Test Data

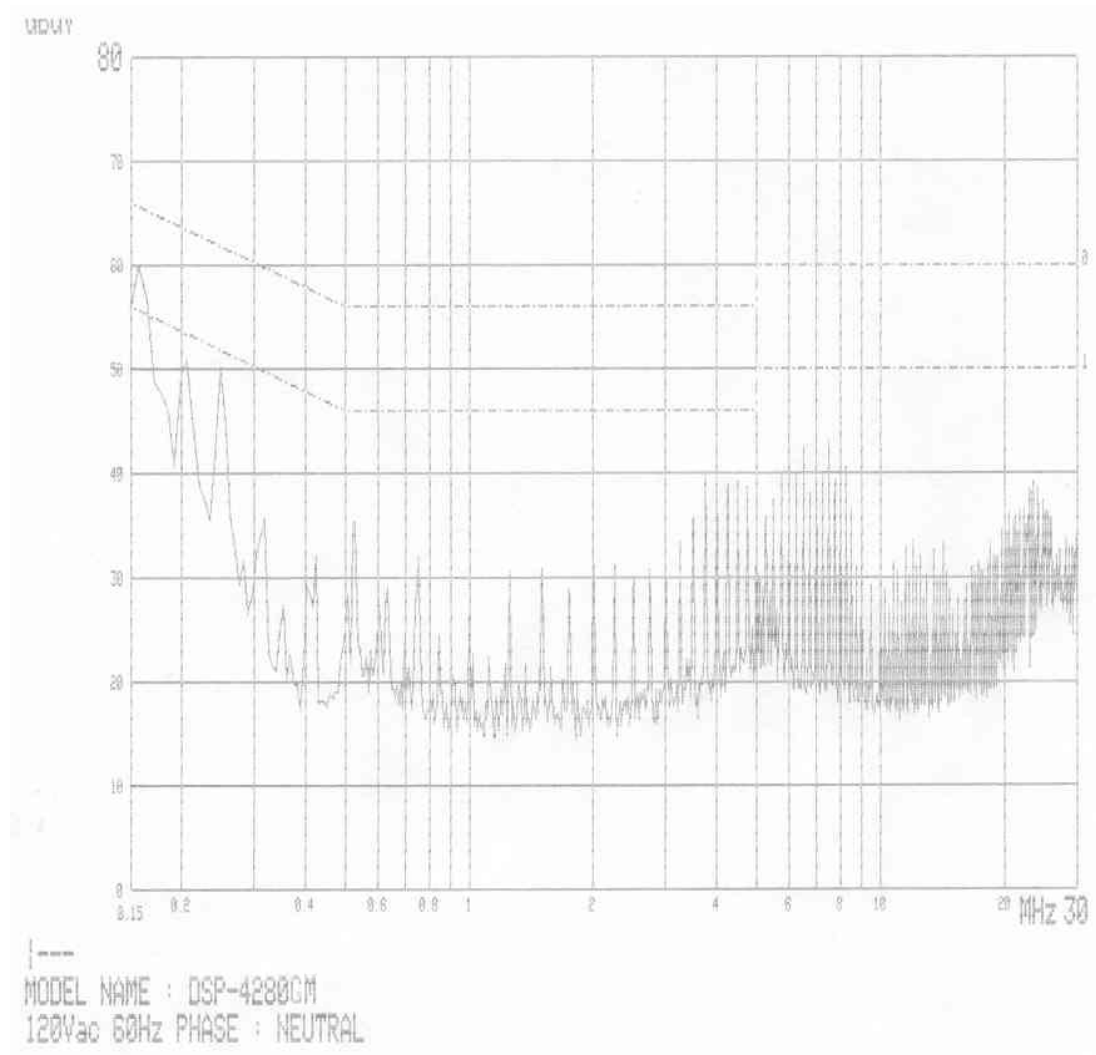
Type : DSP-4280GM
 Manufacturer : Daewoo Electronics Corp.
 Operation mode : Color bar
 Date : Mar. 10, 2003

Highest Emissions relative to the limit

Frequency [MHz]	Reading [dBμV]		Insertion Loss [dB]	Cable Loss [dBμV]	Phase (*L1/ **N)	Limit [dBμV]		Margin [dB]	
	Q-peak	AV				Q-peak	AV	Q-peak	AV
0.159	54.2	49.3	0.2	0.5	L1*	65.5	55.5	10.6	5.5
0.203	46.4	42.8	0.2	0.5		63.5	53.5	16.4	10.0
4.000	36.2	10.8	0.0	0.5		56.0	46.0	19.2	34.6
4.751	34.9	11.3	0.0	0.5		56.0	46.0	20.6	34.2
6.500	36.1	12.4	0.1	0.7		60.0	50.0	23.2	36.9
8.499	36.2	11.0	0.1	0.6		60.0	50.0	23.1	38.3
0.159	56.4	51.4	0.1	0.5	N**	65.5	55.5	8.5	3.5
0.250	47.7	21.1	0.1	0.5		61.8	51.8	13.5	30.1
3.751	35.4	11.2	0.0	0.5		56.0	46.0	20.0	34.2
3.997	35.9	11.8	0.0	0.5		56.0	46.0	19.5	33.6
6.500	38.5	10.8	0.1	0.7		60.0	50.0	20.8	38.5
7.501	39.2	12.3	0.1	0.7		60.0	50.0	20.0	36.9
*L1 : Live Line **N : Neutral Line									

*** Please refer to data graphs at page 18 ~ 19



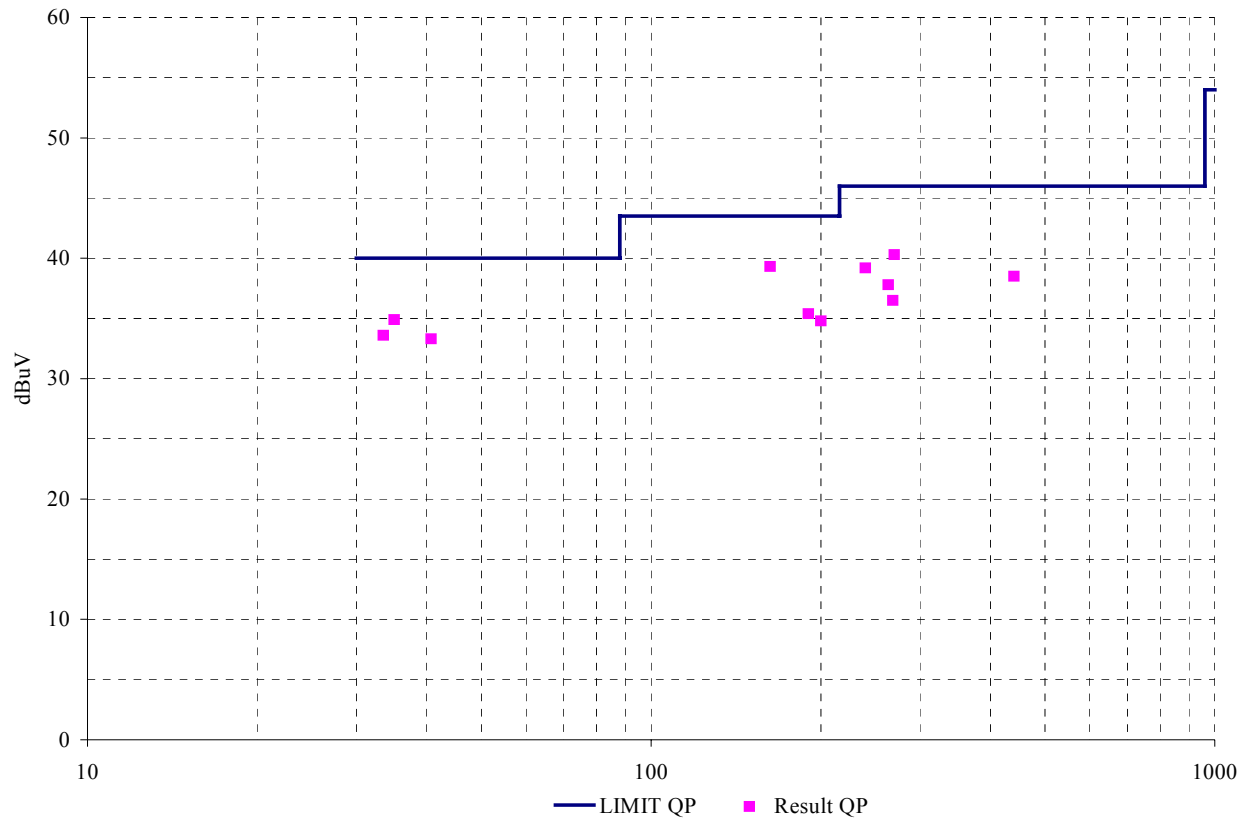


Radiation Test Data

Type : DSP-4280GM
 Manufacturer : Daewoo Electronics Corp.
 Operation mode : Scrolling "H" pattern display 1600 X 1200, 75Hz
 Test distance : 3 m
 Antenna : VULB9160
 Date : Mar. 12, 2003.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
33.5	19.2	13.4	1.0	265	100	V	33.6	40.0	6.4
35.0	20.5	13.4	1.0	195	100	V	34.9	40.0	5.1
40.7	18.5	13.6	1.2	310	100	V	33.3	40.0	6.7
162.6	24.6	12.3	2.3	316	286	H	39.3	43.5	4.2
190.1	23.8	9.1	2.5	286	276	H	35.4	43.5	8.1
200.0	23.7	8.6	2.5	112	312	H	34.8	43.5	8.7
240.0	26.0	10.3	2.9	246	333	H	39.2	46.0	6.8
263.4	23.5	11.4	2.9	260	297	H	37.8	46.0	8.2
268.5	22.0	11.5	3.0	260	368	H	36.5	46.0	9.5
270.0	25.7	11.6	3.0	188	300	H	40.3	46.0	5.7
440.0	20.2	13.8	4.5	160	100	V	38.5	46.0	7.5
720.0	13.5	19.0	5.1	128	100	V	37.5	46.0	8.5

MEASUREMENT OF DISTURBANCE RADIATION
(Test mode : Scrolling "H" pattern)

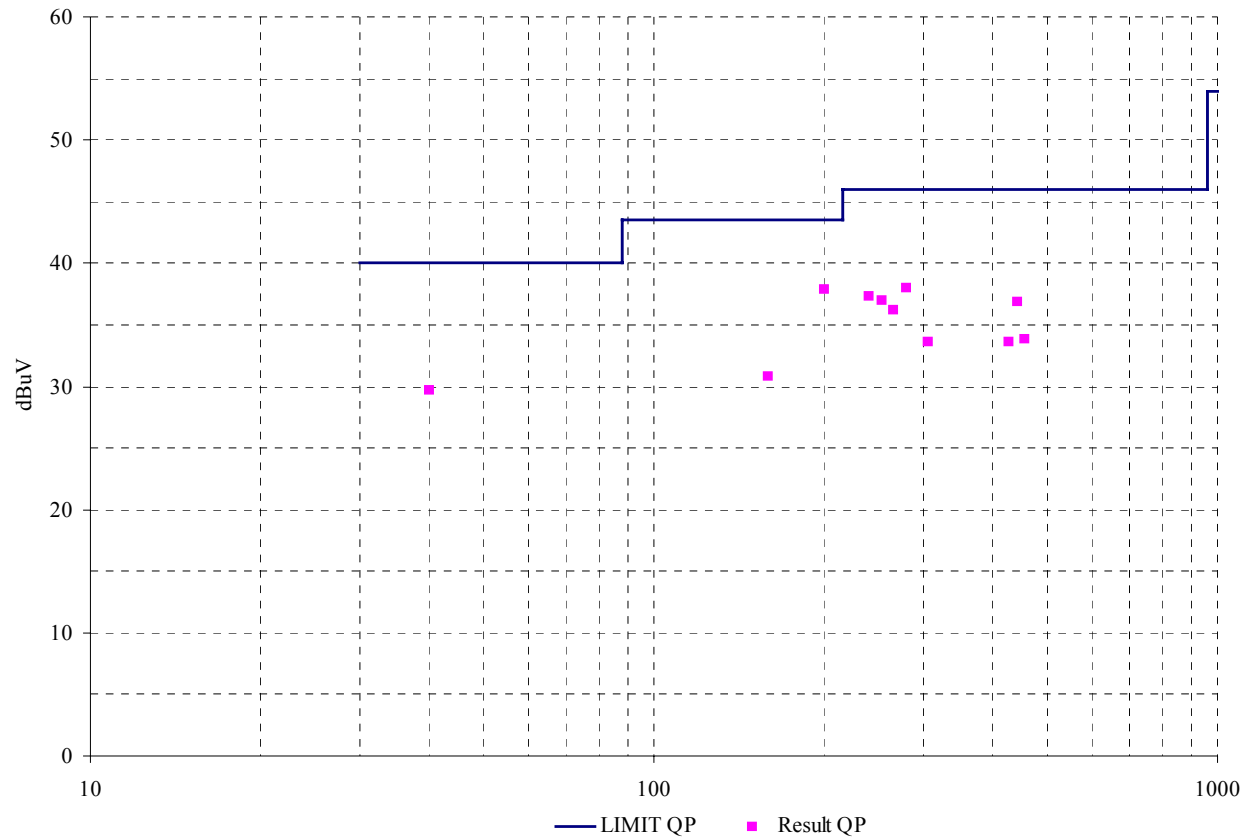


Radiation Test Data

Type : DSP-4280GM
 Manufacturer : Daewoo Electronics Corp.
 Operation mode : Color bar
 Test distance : 3 m
 Antenna : VULB9160
 Date : Mar. 13, 2003.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
40.0	14.9	13.6	1.2	286	100	V	29.7	40.0	10.3
159.6	16.2	12.3	2.3	276	100	V	30.8	43.5	12.7
200.4	26.9	8.5	2.5	163	269	H	37.9	43.5	5.6
240.0	24.2	10.3	2.9	312	315	H	37.4	46.0	8.6
253.4	23.2	10.9	2.8	333	388	H	37.0	46.0	9.0
266.5	21.8	11.5	3.0	270	360	H	36.2	46.0	9.8
280.0	23.0	11.9	3.1	132	278	H	38.0	46.0	8.0
306.5	18.6	11.7	3.3	215	265	H	33.6	46.0	12.4
426.6	15.5	13.7	4.4	246	100	V	33.6	46.0	12.5
440.0	18.6	13.8	4.5	277	100	V	36.9	46.0	9.1
453.1	15.4	14.0	4.5	319	100	V	33.9	46.0	12.1
480.0	14.5	14.6	4.8	206	100	V	33.9	46.0	12.2

MEASUREMENT OF DISTURBANCE RADIATION
(Test mode : Color bar)



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 : Mar. 10, 2003

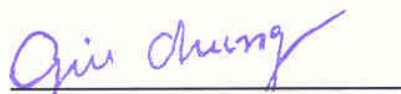
End of testing : Mar. 13, 2003

Reviewed by :



Joon H. Lee / EMC Manager
IST EMC Lab.

Approved by :



G. Chung / Chief of EMC Lab.