



IST EMC LAB.

EMISSION TEST REPORT

Test report file No. : **01-IST-108/FB** Date of issue : Aug. 17, 2001.
Model / Type No. : LV520H
Kind of product : 15" LCD Monitor
Applicant : Orion Electric Co.,Ltd.
Manufacturer : Orion Electric Co.,Ltd.
Address : 165 Gongdan-Dong, Gumi-City, Kyongbuk, Korea.

Test result according to the regulation(s)

☒ Positive ☐ Negative

at page 3.

This test report without appendix consists of 14 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

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A) Documentation.

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B) Test Data.

Conducted emissions (Mains)	: 450 kHz - 30 MHz	<u>9 ~ 11</u>
Radiated emissions	: 30 MHz – 1 GHz	<u>12 ~ 13</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>27</u>
Humidity	<u>47</u> %
Atmospheric pressure	<u>1001</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	Jul. 16, 2001	861742/015
■ EZM	Spectrum Monitor	Rohde & Schwarz	Jul. 13, 2001	863183/008
■ 3725/2	LISN	EMCO	Jul. 13, 2001	9102-1788
■ KNW-407	LISN	Hyup-Rip Ele.	Jul. 26, 2001	8-833-10
■ ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Jul. 13, 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 :



S. G. Kim. / 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 :

Test location :

☐ - Open-site 1 ☒ - Open-site 2 ☐ - Compact chamber

Test distance :

☒ - 3 meters ☐ - 10 meters ☐ - 30 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	Jun. 12, 2001	861744/018
☒ VULB 9160	Antenna	Schwarzbeck	Jun. 04, 2001	3047

Test - accessories :

<u>Type</u>	<u>Manufacturer</u>
☒ 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. G. Kim. / Research Engineer

IST EMC Lab.

EQUIPMENT UNDER TEST

Equipment Description

LCD Type	- 15.0" viewable
	- LTM150XH-T01 (Samsung Ele.)
Resolution	- 1024 X 768, 75Hz
Scanning Frequency	- Horizontal: 31~50 kHz, Vertical: 60 Hz
Input Signal	- Video : RGB Analog (0.7Vp-p, 75•) Sync : H/V Separate(TTL)
Weight	- Net 5.3 Kg, Gross 7.5 Kg
Active Display Area	- 304 mm X 228 mm
Dimension (WxDxH)	- 392 x 196 x 362 (mm)
Power Rating	- 100~240 Vac, 50/60Hz (input) - 12 Vdc, 3.3 A (output)
Adapter	- Model Name : SAD3912SE - Brand : Orion (S/N: AG2600005)

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

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

- ☐ Standby.
- ☒ Operation for Test : Scrolling "H" characters under MS Windows98,
Resolution : 1024 x 768, 75Hz

Configuration of the equipment under test :

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

Equipment	Type	Brand	Serial No	FCC ID
PC	Brio BA600/550	HP	SG01603782	DoC
Keyboard	SK-2502C	HP	M000456678	DoC
Printer	A0302384	Northern Telecom	26633S60168	BS16XU2225C-L
Mouse1	M-S48a	HP	LZE01000039	JNZ201213
Mouse2	M-M28	Logitech	LCA53305547	DZL210365

Connection Cables :

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- Unshielded AC power cable : 1.8 m
- Unshielded DC power cable (adapted) : 1.5m
- Shielded monitor's signal cables(Analog) : 1.5m
- Shielded printer's signal cables(Analog) : 1.5m

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

The requirements are.

☒ KEPT

☐ NOT KEPT

Min. limit margin

_____ 9.1 _____ dB at _____ 24.093 _____ MHz

Remarks : See test data and graphs to be attached at pages 9 ~ 11.

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are

☒ KEPT

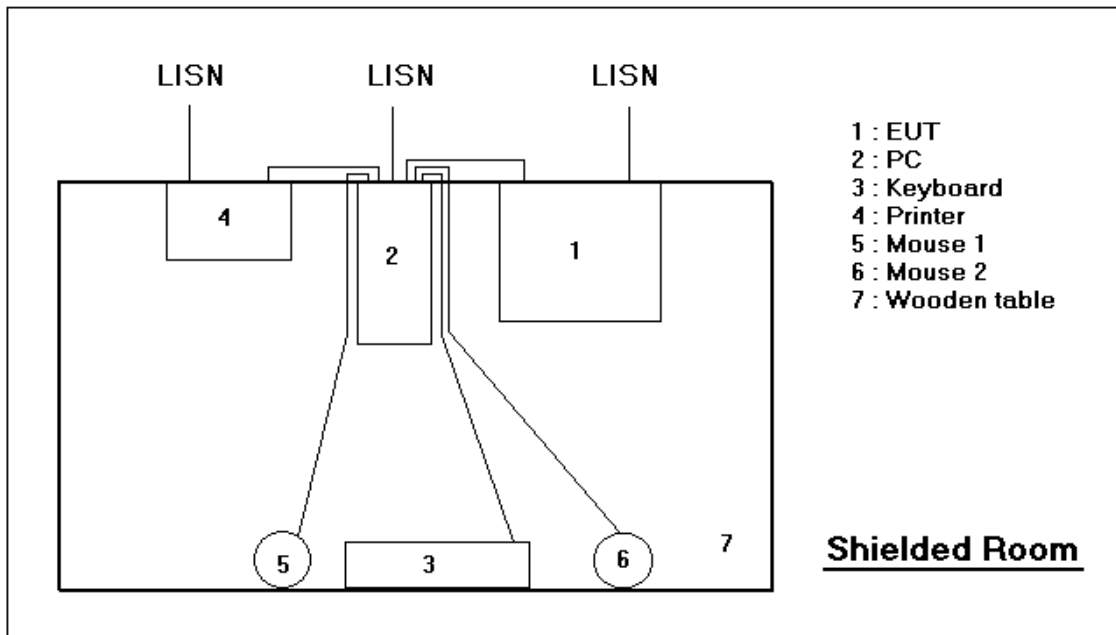
☐ NOT KEPT

Min. limit margin

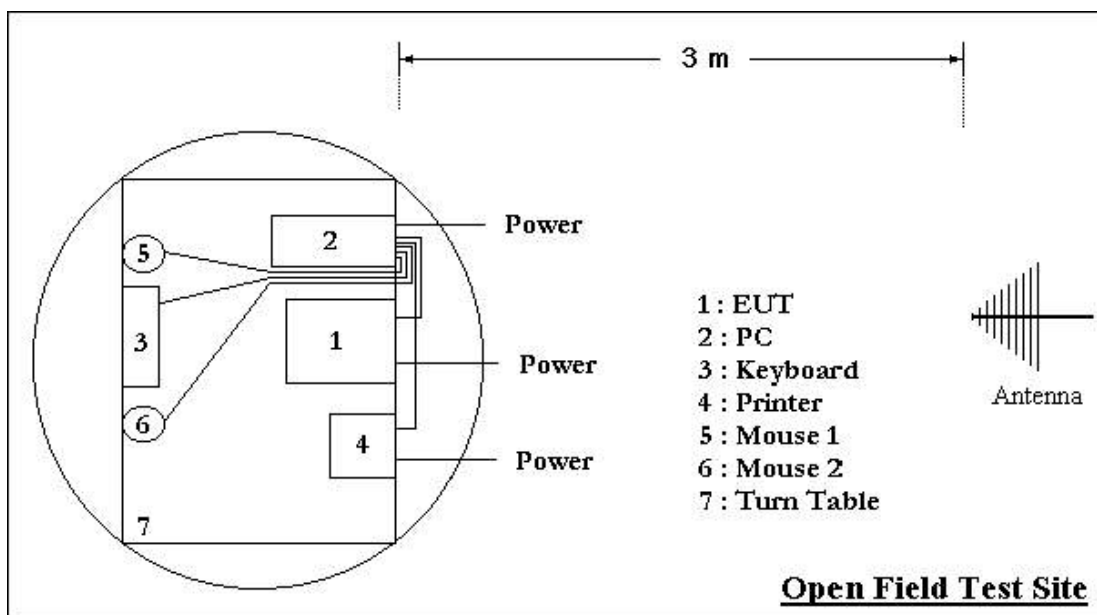
_____ 4.4 _____ dB at _____ 136.4 _____ MHz

Remarks : See test data and graphs to be attached at page 12 ~ 13.

**Test Set-Up
(Type : L510B1)**



Picture 1 : Conducted emission 450kHz ~ 30MHz



Picture 2 : Radiated emission 30MHz ~ 1000MHz

Conducted Emission Test Data

Type : LV520H
Manufacturer : Orion Electric Co., Ltd.
Operation mode : Scrolling "H" pattern display 1024 X 768, 75Hz
Date : Aug. 03, 2001

Highest Emissions relative to the limit

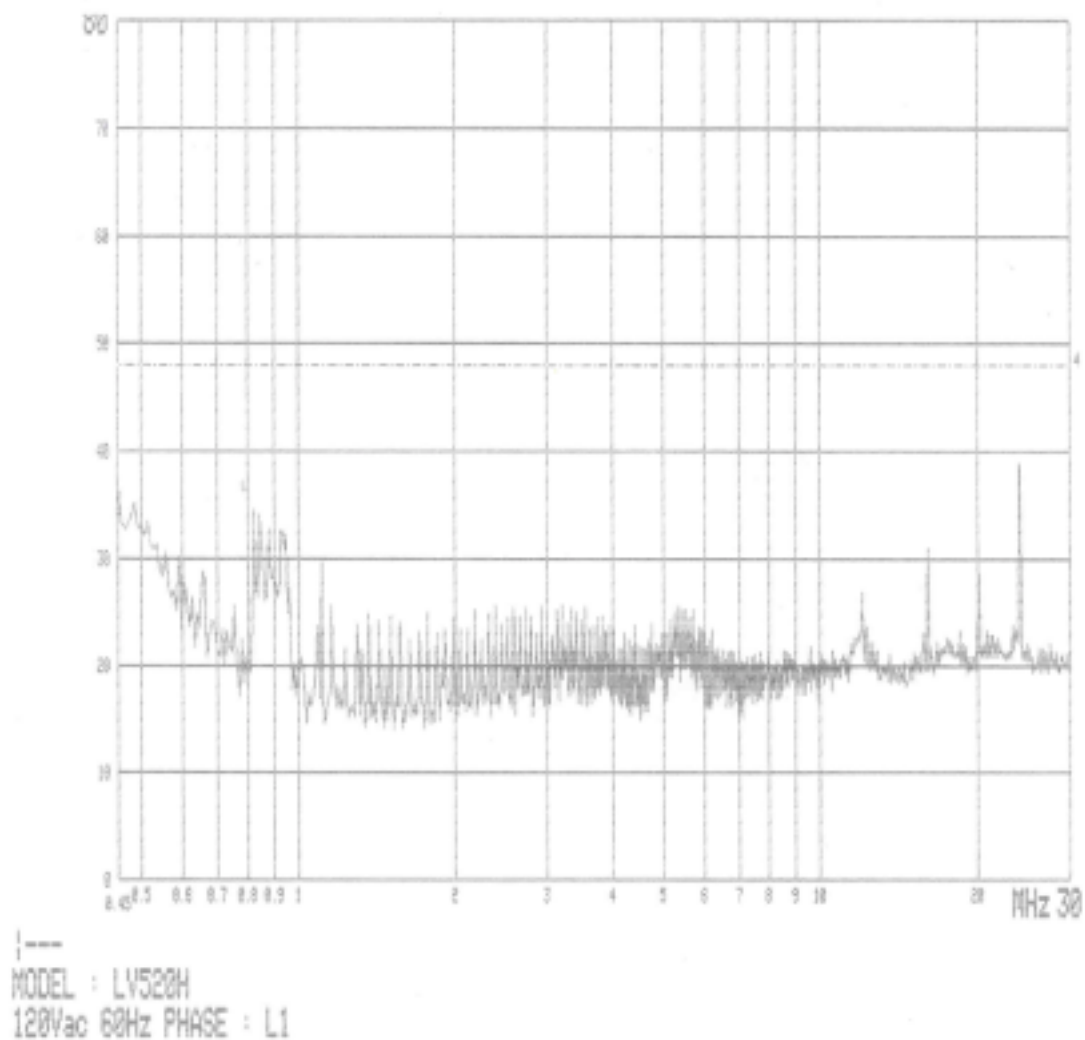
Frequency [MHz]	Reading [dBμV]	Insertion loss [dB]	Phase (L1* / N**)	Result [dBμV]	Limit [dBμV]	Margin [dB]
0.450	35.4	0.8	L1	36.2	48.0	11.8
0.884	24.7	0.8		25.5	48.0	22.5
12.045	24.3	0.8		25.1	48.0	22.9
16.058	27.3	0.8		28.1	48.0	19.9
20.077	24.1	0.8		24.9	48.0	23.1
24.095	35.2	0.8		36.0	48.0	12.0

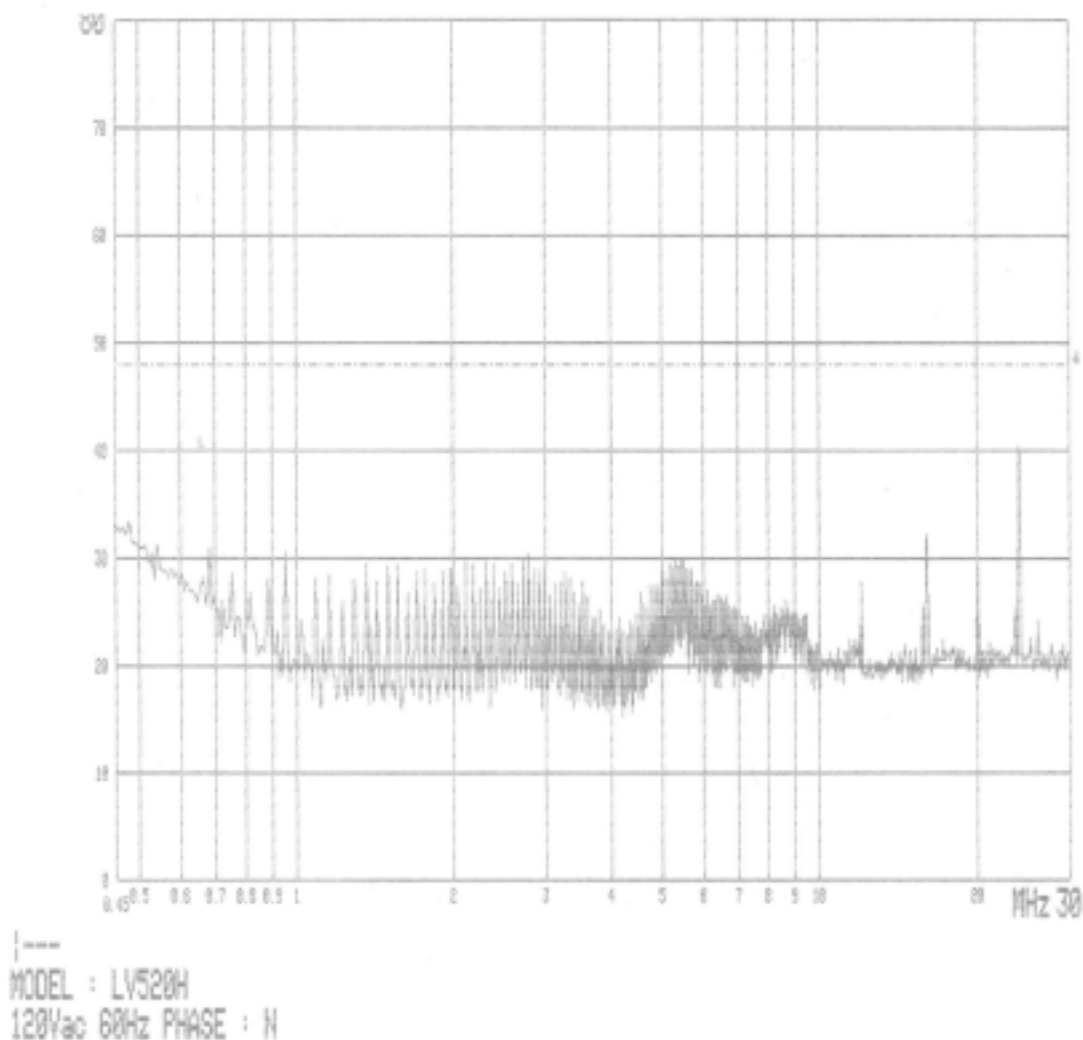
0.45	31.8	0.8	N	32.6	48.0	15.4
0.887	26.5	0.8		27.3	48.0	20.7
12.046	25.3	0.8		26.1	48.0	21.9
16.057	29.5	0.8		30.3	48.0	17.7
20.076	26.3	0.8		27.1	48.0	20.9
24.093	38.1	0.8		38.9	48.0	9.1
Cable loss are less than 0.1 dB						

*L1 : Live Line

**N : Neutral Line

*** Please refer to data graphs at page 10 ~ 11





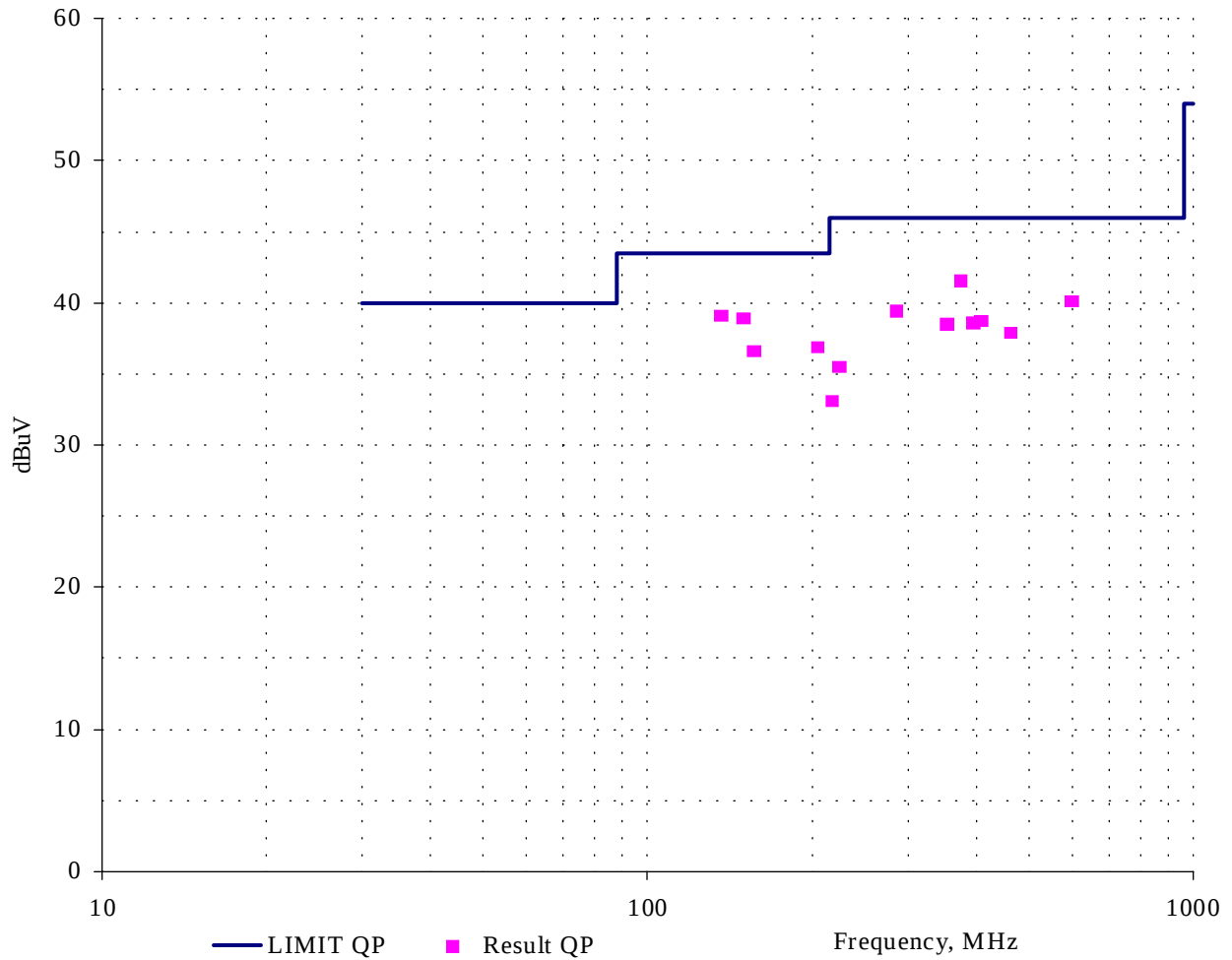
Radiation Test Data

Type : LV520H
Manufacturer : Orion Electric Co., Ltd.

Operation mode : Scrolling "H" pattern display 1024 X 768, 75Hz
 Test distance : 3 m
 Antenna : VULB9160
 Date : Aug. 8, 2001.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
136.4	24.1	12.2	2.8	358	100	V	39.1	43.5	4.4
150.0	23.2	12.8	2.9	158	100	V	38.9	43.5	4.6
156.8	20.8	12.9	2.9	81	100	V	36.6	43.5	6.9
204.6	24.3	9.3	3.3	267	100	V	36.9	43.5	6.6
218.2	20.0	9.5	3.6	313	100	V	33.1	46.0	12.9
225.0	21.9	9.9	3.7	161	100	V	35.5	46.0	10.5
286.4	23.1	12.1	4.2	124	100	H	39.4	46.0	6.6
354.6	20.1	13.6	4.8	242	100	H	38.5	46.0	7.5
375.0	22.2	14.2	5.1	213	196	H	41.5	46.0	4.5
395.5	18.7	14.7	5.2	212	169	V	38.6	46.0	7.4
409.1	18.4	15.0	5.3	357	241	V	38.7	46.0	7.3
463.7	15.9	16.2	5.8	269	130	H	37.9	46.0	8.1
600.0	14.8	18.6	6.7	240	100	V	40.1	46.0	5.9

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 : Aug. 01, 2001

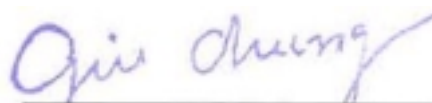
End of testing : Aug. 13, 2001

Reviewed by :

Approved by :



Joon H. Lee. EMC Manager
IST EMC Lab.



G. Chung Chief of EMC Lab.