



EMISSION TEST REPORT

Test report file No. : **01-IST-112/FB** Date of issue : Aug. 23, 2001

Model / Type No. : F9S936

Kind of product : 19" Color Display 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

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>48</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	Jun. 11, 2001	861742/018
■ 3725/2	LISN	EMCO	Jul. 13, 2001	9102-1788
■ 3825/2	LISN	EMCO	Jul. 13, 2001	9103-1788
■ 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 :

- - 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	Jun. 12, 2001	861744/004
■ 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. G, Kim. / Research Engineer

IST EMC Lab.

EQUIPMENT UNDER TEST

Equipment Description

CRT Type	- 19.0" Dynamic focus
	- Dot pitch : 0.26 mm
Resolution	- 1600 X 1200, 75 Hz
Scanning Frequency	- Horizontal: 30~96 kHz, Vertical: 50~160 Hz
Input Signal	- Video : RGB Analog (0.7Vp-p, 75Ω)
Weight	- Net 21.0 Kg, Gross 24.0 Kg
Active Display Area	- 366 mm X 275 mm
Dimension (WxDxH)	- 570 mm X 565 mm X 570 mm
Power Rating	- 100~240Vac, 50/60Hz (input)
	- Universal Power

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 : 1600 x 1200, 75 Hz

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 :

- Unshielded AC power cable : 1.8 m
- 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

23 dB at 23.963 MHz

Remarks : See test-graph to be attached at pages 9 ~ 11.

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are

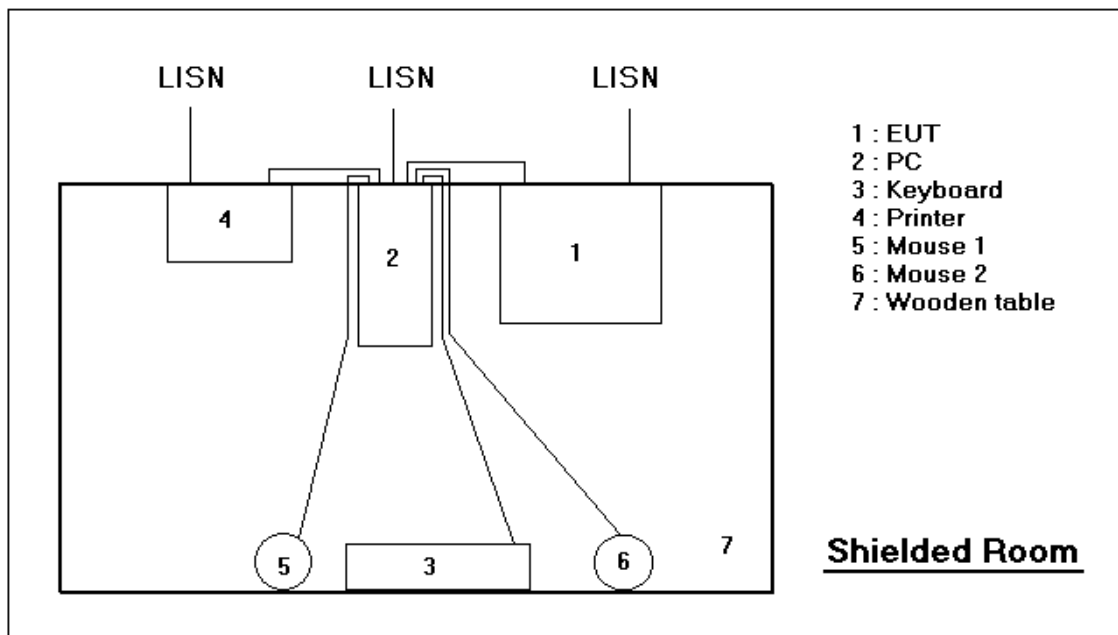
☒ KEPT ☐ NOT KEPT

Min. limit margin

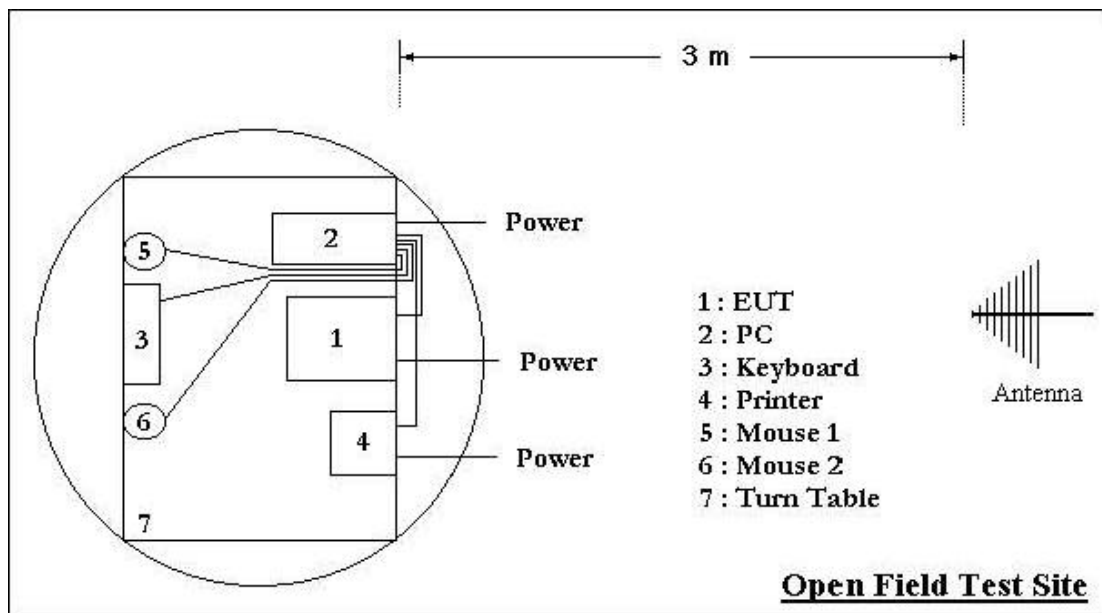
3.5 dB at 447.3 MHz

Remarks : See test-data at page 12 ~ 13.

**Test Set-Up
(Type : F9S936)**



Picture 1 : Conducted emission 450kHz ~ 30MHz



Picture 2 : Radiated emission 30MHz ~ 1000MHz

Conducted Emission Test Data

Type : F9S936
 Manufacturer : Orion Electric Co., Ltd.
 Operation mode : Scrolling "H" pattern display 1600 X 1200, 75 Hz
 Date : Aug. 14, 2001

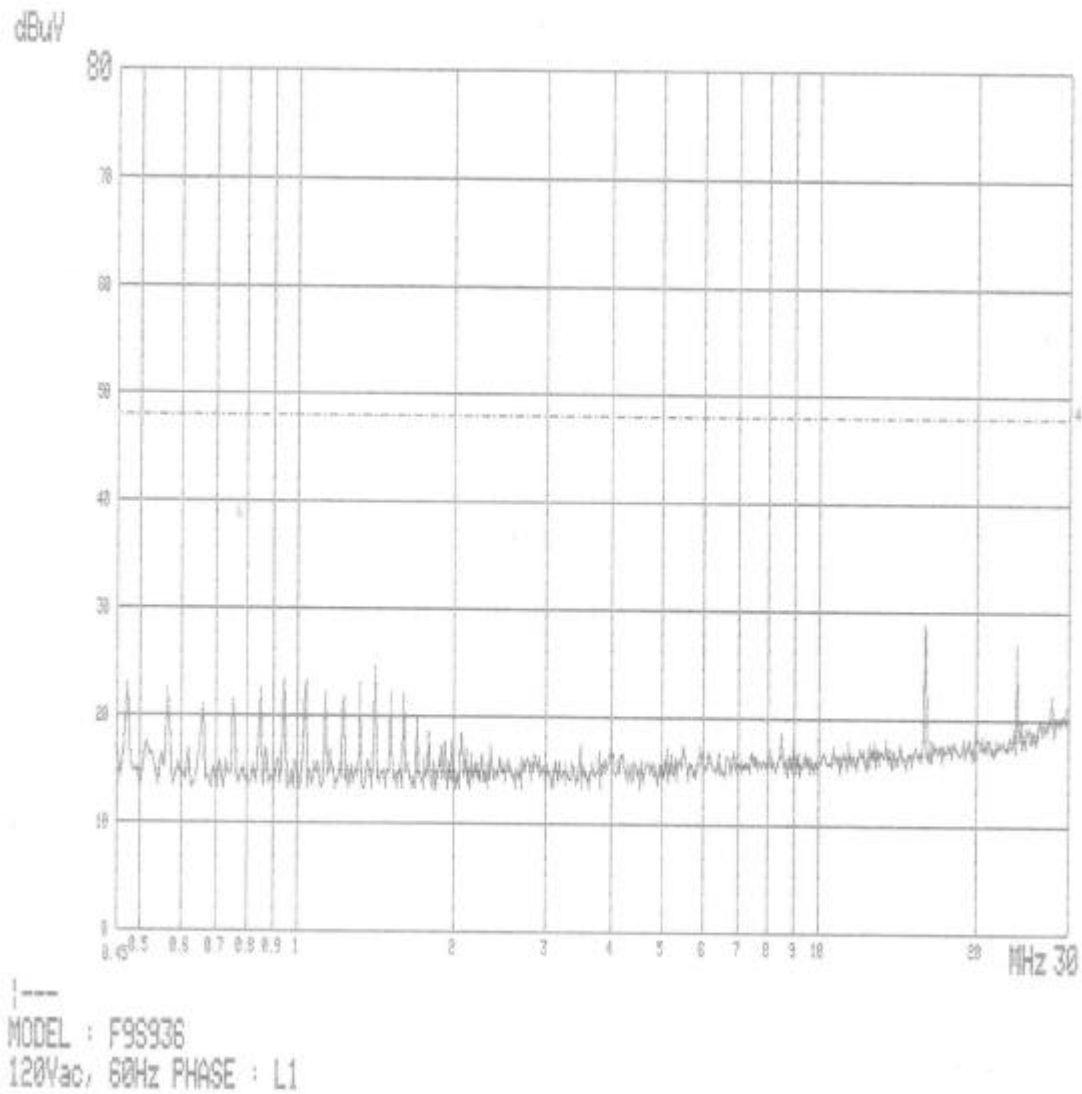
Highest Emissions relative to the limit

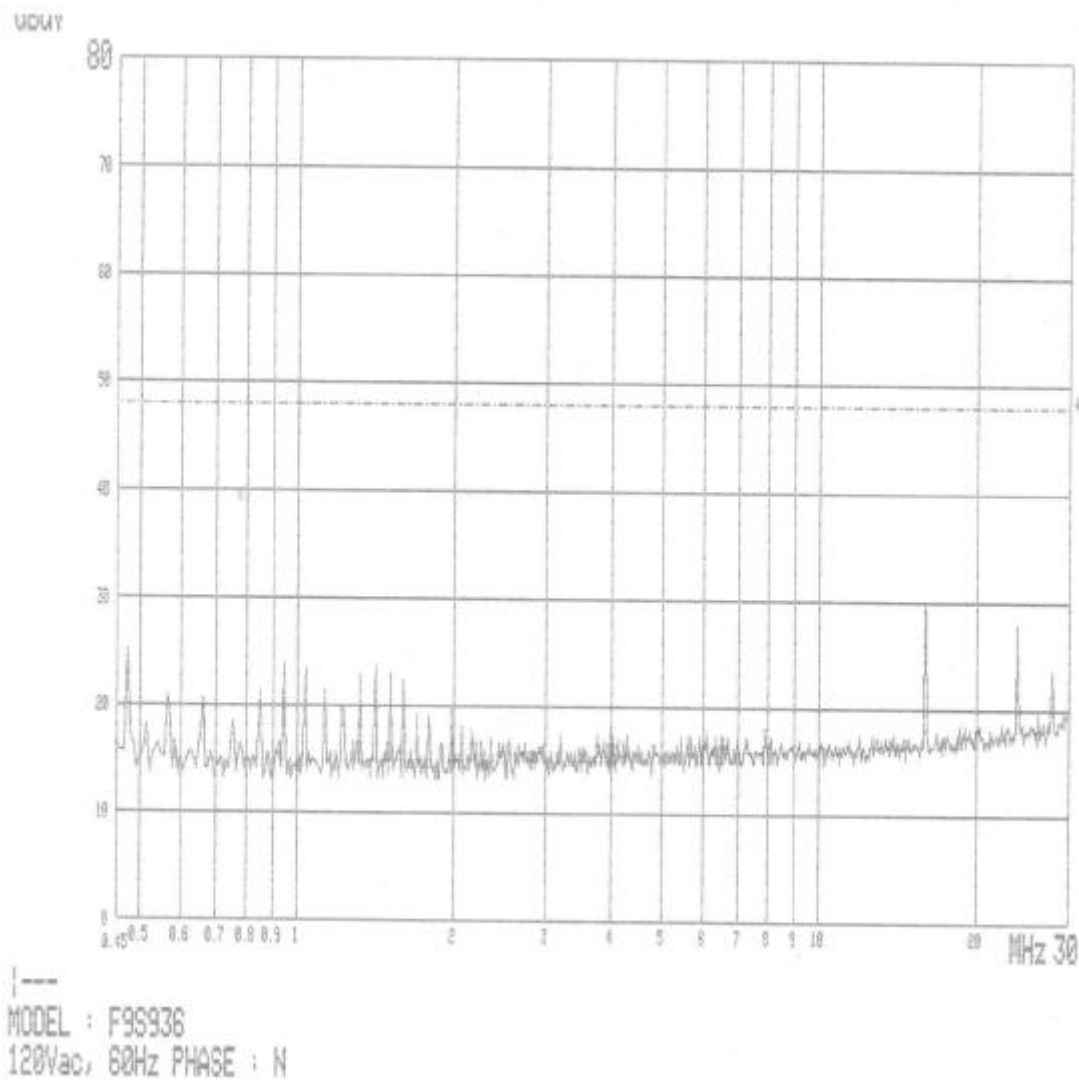
Frequency [MHz]	Reading [dBμV]	Insertion loss [dB]	Phase (L1/N)	Result [dBμV]	Limit [dBμV]	Margin [dB]
0.942	19.8	0.8	L1	20.6	48.0	27.4
1.414	21.4	0.8		22.2	48.0	25.8
15.969	26.8	0.8		27.6	48.0	20.4
23.956	22.9	0.8		23.7	48.0	24.3
0.473	21.9	0.8	N	22.7	48.0	25.3
1.413	21.8	0.8		22.6	48.0	25.4
15.966	26.8	0.8		27.6	48.0	20.4
23.960	24.2	0.8		25.0	48.0	23.0
Cable loss are less than 0.1 dB						

*L1 : Live Line

**N : Neutral Line

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

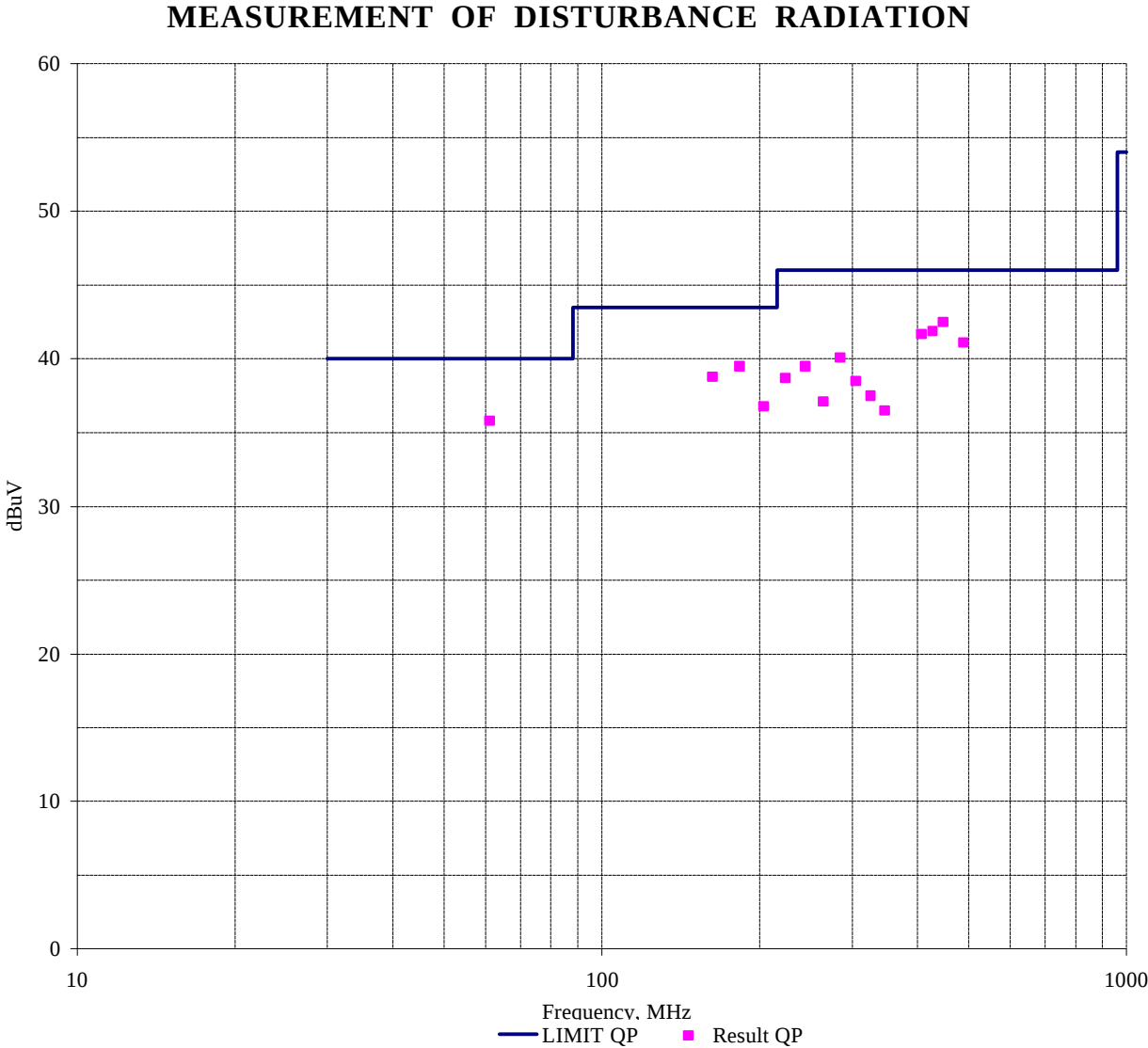




Radiation Test Data

Type : F9S936
 Manufacturer : Orion Electric Co., Ltd.
 Operation mode : Scrolling "H" pattern display 1600 X 1200, 75 Hz
 Test distance : 3 m
 Antenna : VULB9160
 Date : Aug. 16, 2001.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
61.0	23.1	11.3	1.4	188	110	V	35.8	40.0	4.2
162.6	24.1	12.3	2.3	348	151	V	38.7	43.5	4.8
183.0	26.9	10.1	2.4	344	132	V	39.4	43.5	4.1
203.3	25.8	8.5	2.5	354	125	V	36.8	43.5	6.7
223.6	27.1	8.8	2.8	315	122	V	38.7	46.0	7.3
244.0	26.2	10.4	2.9	178	228	V	39.5	46.0	6.5
264.3	22.8	11.4	2.9	177	348	V	37.1	46.0	8.9
284.7	25.1	11.9	3.1	186	241	H	40.1	46.0	5.9
304.9	23.5	11.7	3.3	182	301	H	38.5	46.0	7.5
325.3	22.4	11.7	3.4	13	114	V	37.5	46.0	8.5
345.7	21.2	11.7	3.6	345	121	V	36.5	46.0	9.5
406.6	24.1	13.3	4.3	324	122	V	41.7	46.0	4.3
427.0	23.8	13.7	4.4	350	115	V	41.9	46.0	4.1
447.3	24.1	13.9	4.5	17	132	V	42.5	46.0	3.5
488.0	21.5	14.8	4.8	324	248	H	41.1	46.0	4.9



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. 08, 2001

End of testing : Aug. 20, 2001

Reviewed by :



Joon H. Lee. EMC Manager
IST EMC Lab.

Approved by :



G. Chung Chief of EMC Lab.