

IST EMC LAB.

E M I S S I O N T E S T R E P O R T

Test report file No. : **00-IST-073/FB** Date of issue : Dec. 05, 2000.

Model / Type No. : 7A750

Kind of product : 17" Color Display Monitor.

Applicant : Orion Electric Co., Ltd

Manufacturer : Orion Electric Co., Ltd

Address : 165, Gongdan-Dong, Gumi-City, Kyung-Buk, Korea.

Test result according to the regulation(s)

☒ Positive ☐ Negative

at page 3.

This test report without appendix consists of 15 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.

	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</u>
Test Result	<u>7</u>
Test-setup (Pictures)	<u>8~9</u>
Test-setup (Figures)	<u>10</u>
Summary	<u>15</u>

B) Test Data.

Conducted emissions (Mains)	: 450 kHz - 30 MHz	<u>11 ~ 13</u>
Radiated emissions	: 30 MHz – 1 GHz	<u>14</u>

C) Appendix

Spec. Plate

Block & Schematic Diagram

User's Manual

EUT's Pictures

IST EMC LAB.

Component List

IST EMC LAB.

TEST REGULATIONS

The tests were performed according to the following regulations ;

- . EN 50081-1 / 2. 1991.
- . EN 55011 / 3. 1991. . Croup 1. . Croup 2.
- . . Class A. . Class B.
- . EN 55014 / 4. 1993. . Household appliances and similar
- . Portable tools
- . Semiconductor devices
- . - EN 55014 / A2:1990
- . - EN 55015 / A1:1990 . - EN 55015 / 2.1987 . - EN 55015 / 12.1993
- . - EN 55022 / 8.1994 . - Class A . - Class B

! - FCC Part 15, Subpart B (Unintentional Devices, Class B)

. - BS

. - VCCI

. - CISPR

All testing were conducted at IST EMC Laboratory.

ENVIRONMENTAL CONDITIONS

Temperature	<u>18</u>
Humidity	<u>45</u> %
Atmospheric pressure	<u>999</u> mbar

IST EMC LAB.

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 :

Type	Manufacturer	Calibration. Date	Serial Number
; ESH 3	Rohde & Schwarz	Oct. 08, 2000	861742/018
; - 3725/2	EMCO	Oct. 08, 2000	9102-1788
; - 3825/2	EMCO	Dec. 18, 1999	9103-1788
; KNW-407	EMCO	Oct. 08, 2000	8-833-11

Test - accessories :

Type	Manufacturer
; Aneroid Barometer	Sato
; Hygrometer	Sato

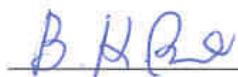
Measurement Procedures :

Conducted emissions measurements were made in accordance with ANSI C-63.4-1992, "FCC procedure for measuring RF Emissions from Computing Devices".

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

IST EMC LAB.

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 :

Type	Manufacturer	Calibration. Date	Serial Number
ESVP	Rohde & Schwarz	July. 21, 2000	861744/004
VULB 9160	Schwarzbeck	July. 11, 2000	3048

Test - accessories :

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

Measurement procedures

Radiated measurements were in accordance with ANSI C63.4-1992 "FCC Procedure for measuring RF Emissions from Computing Devices." 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 :

B. K. Bae. / Research Engineer
IST EMC Lab.

EQUIPMENT UNDER TEST

Equipment Description

The Equipment Under Test (EUT) is the **17-inch Color Display Monitor of Orion Electric Co., Ltd. (FCC ID: EWB7A750)**

- Maximum Resolution: 1280 x 1024 Non-interlaced, H-Sync: 64kHz / V-Sync: 60Hz
- Frequency Range: H-Sync: 30kHz - 70kHz , V-Sync: 50Hz - 150Hz
- Video Bandwidth: 110MHz Max
- CRT Picture Tube: 17-inch diagonal(ORION M41KXU110XX021)
- Dot Pitch: 0.27mm Pitch Black Matrix Screen
- Power Supply Input: 100-240 Vac, 50/60Hz
- Power Consumption: 100W(Max.)
- Power Cord: Unshielded
- Port(s)/Input Connector(s): 15-pin D-sub type signal connector
- Cable(s): Shielded D-sub (with ferrite on both ends)
- Dimension(WxHxD): 560 x 520 x 495mm
- Weight(net): 16.5kg

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

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

- . Standby.
- ; Test program (H – Pattern) : Scrolling “H” characters under MS Windows98,
- . Test program (customer specific)

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	SG01301176	N/A
Keyboard	SK-2502C	HP	M000375059	N/A
Printer	A0302384	Northern Telecom	26633S60168	BS16XU2225C-L
Mouse1	M-S48A	HP	LZA00850320	JNZ201213
Mouse2	M-M28	Logitech	LCA53305547	DZL210365

Cable Type :

- ; Unshielded AC power cable : 1.8m
- ; Shielded monitor's signal cable : 1.5m

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

The requirements are.

; KEPT . NOT KEPT

Min. limit margin

-4.0 dB at 0.45 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

-2.6 dB at 32.5 MHz

Remarks : See test-data at page 14.

**Test Sep-Up
(Type : 7A750)**

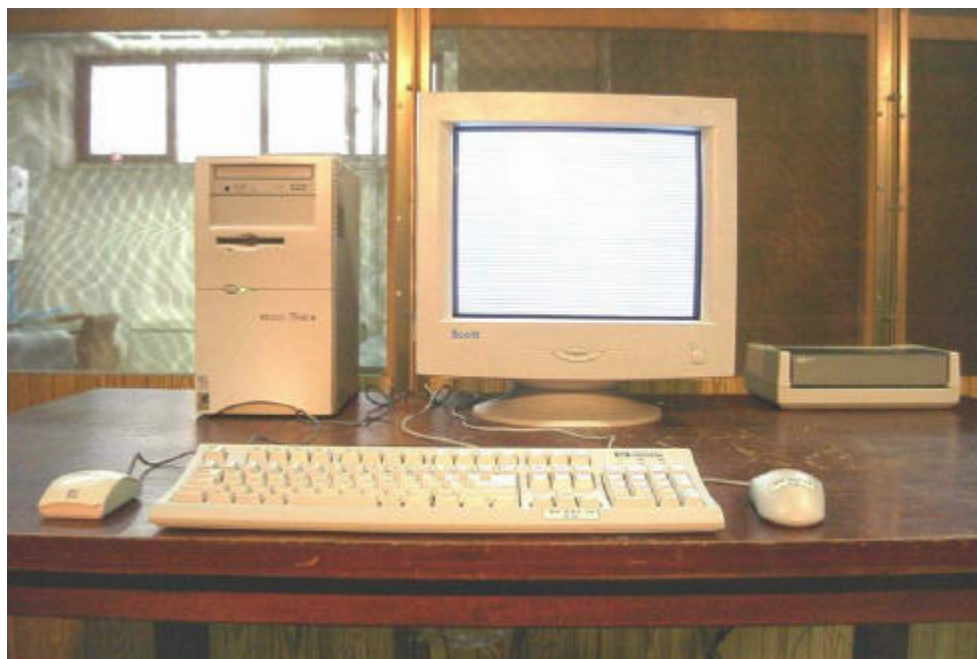
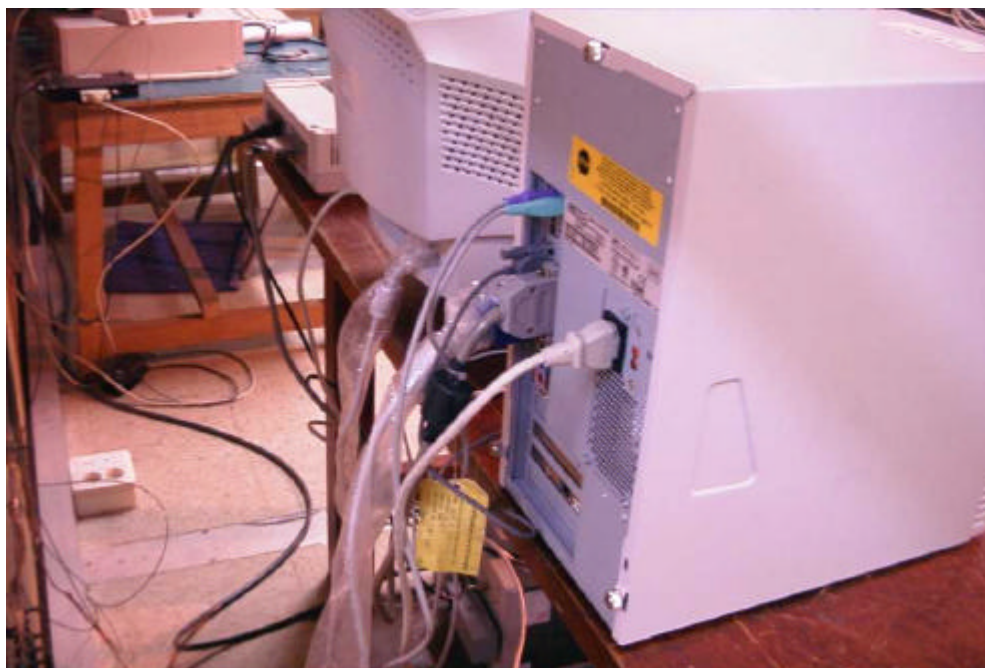


Figure 1(a) : Conducted emission 450kHz ~ 30MHz



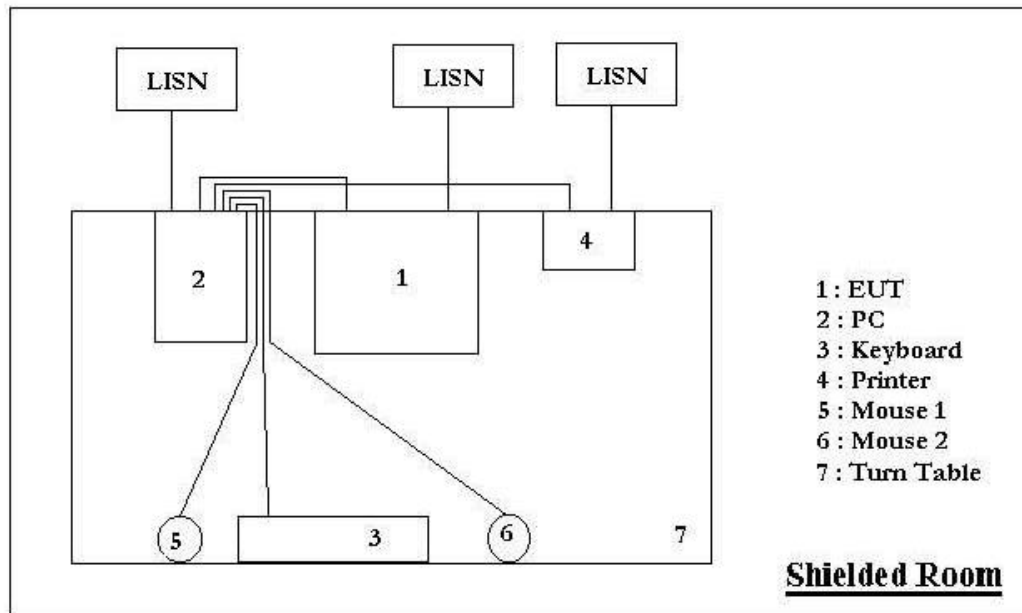
**Figure 1(b) : Conducted emission 450kHz ~ 30MHz
Test Sep-Up
(Type : 7A750)**



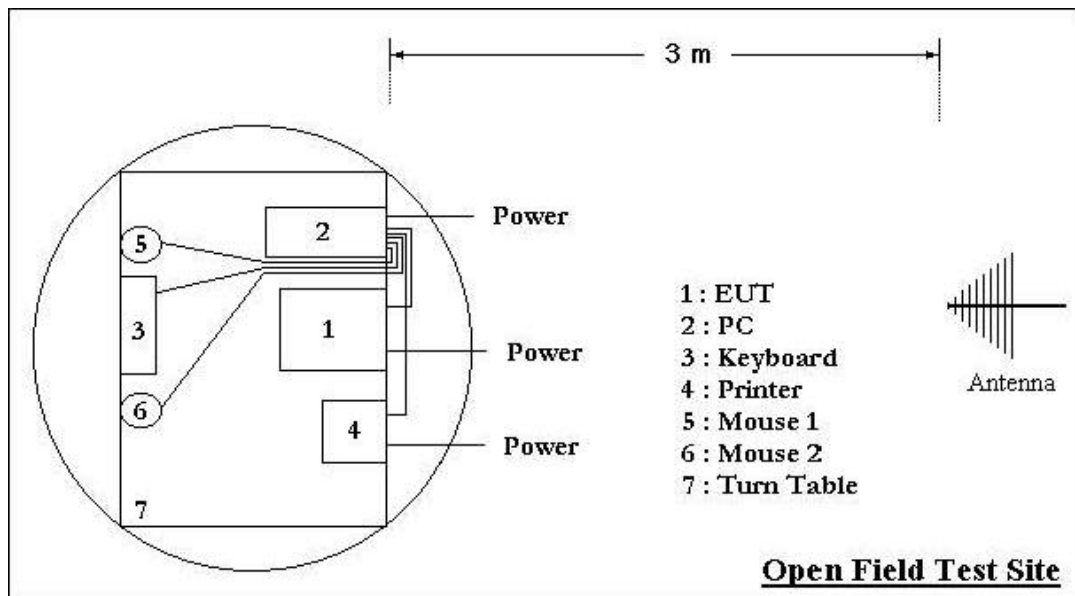
Figure 2(a) : Radiated Emission 30MHz ~ 1000MHz



**Figure 2(b) : Radiated Emission 30MHz ~ 1000MHz
Test Set-Up
(Type : 7A750)**



Picture 1 : Conducted emission 450kHz ~ 30MHz



**Picture 2 : Radiated emission 30MHz ~ 1000MHz
Conducted Emission Test Data**

Type : 7A750
 Manufacturer : Orion Electric Co., Ltd
 Operation mode : Scrolling "H" pattern display 1280 X 1024, 60Hz
 Date : Nov. 29, 2000

Frequency [MHz]	Reading [dBμV]	Insertion loss [dB]	Phase (*L1/**N)	Limit [dBμV]	Margin [dB]
0.45	44.0	0.8	L1	48.0	- 3.2
0.51	35.7	0.8	L1	48.0	- 11.5
23.84	35.5	0.8	L1	48.0	- 11.7
0.45	43.0	0.8	N	48.0	- 4.2
0.51	34.5	0.8	N	48.0	- 12.7
13.04	37.0	0.8	N	48.0	- 10.2

*L1 : Live Line

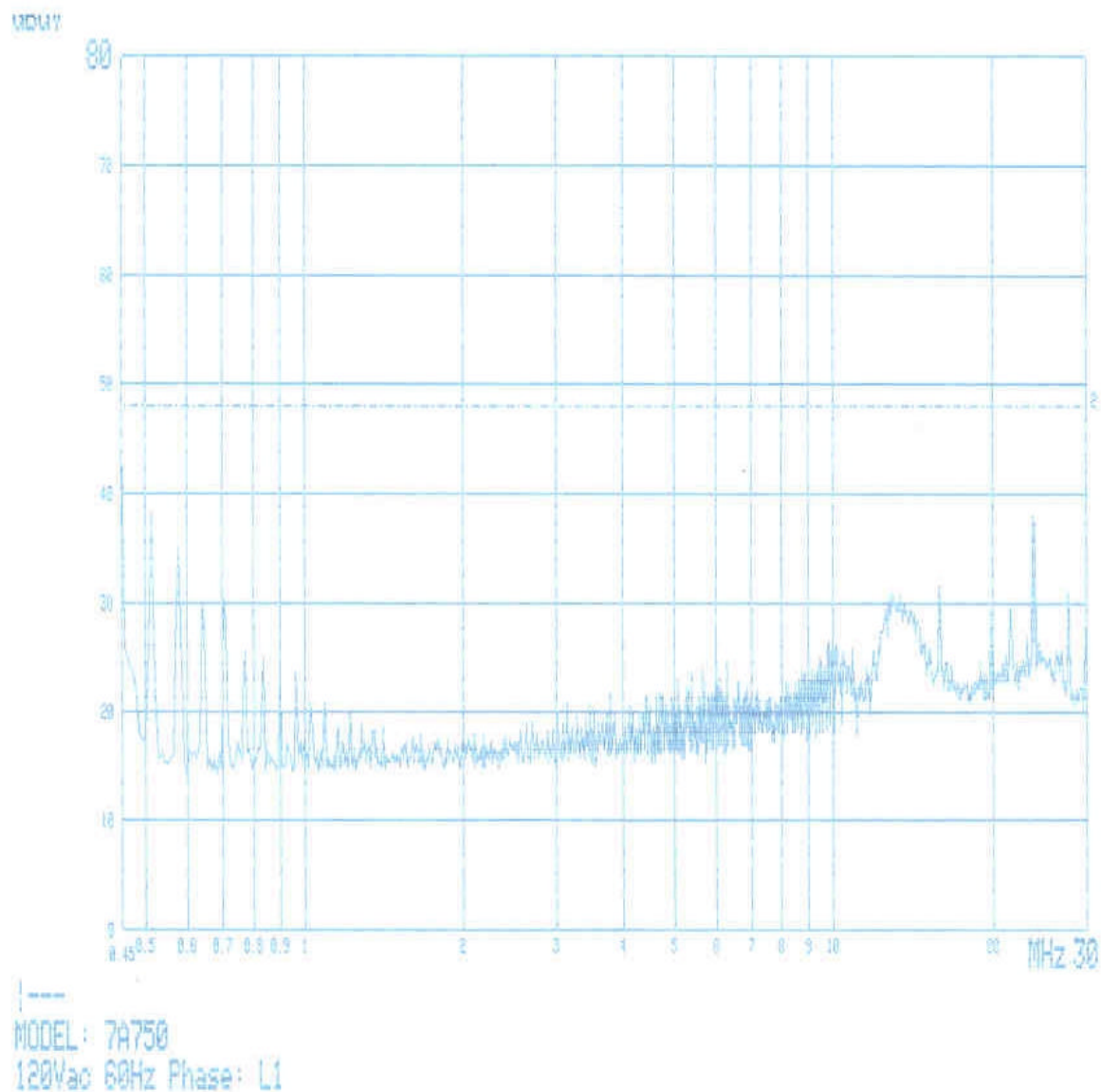
**N : Neutral Line

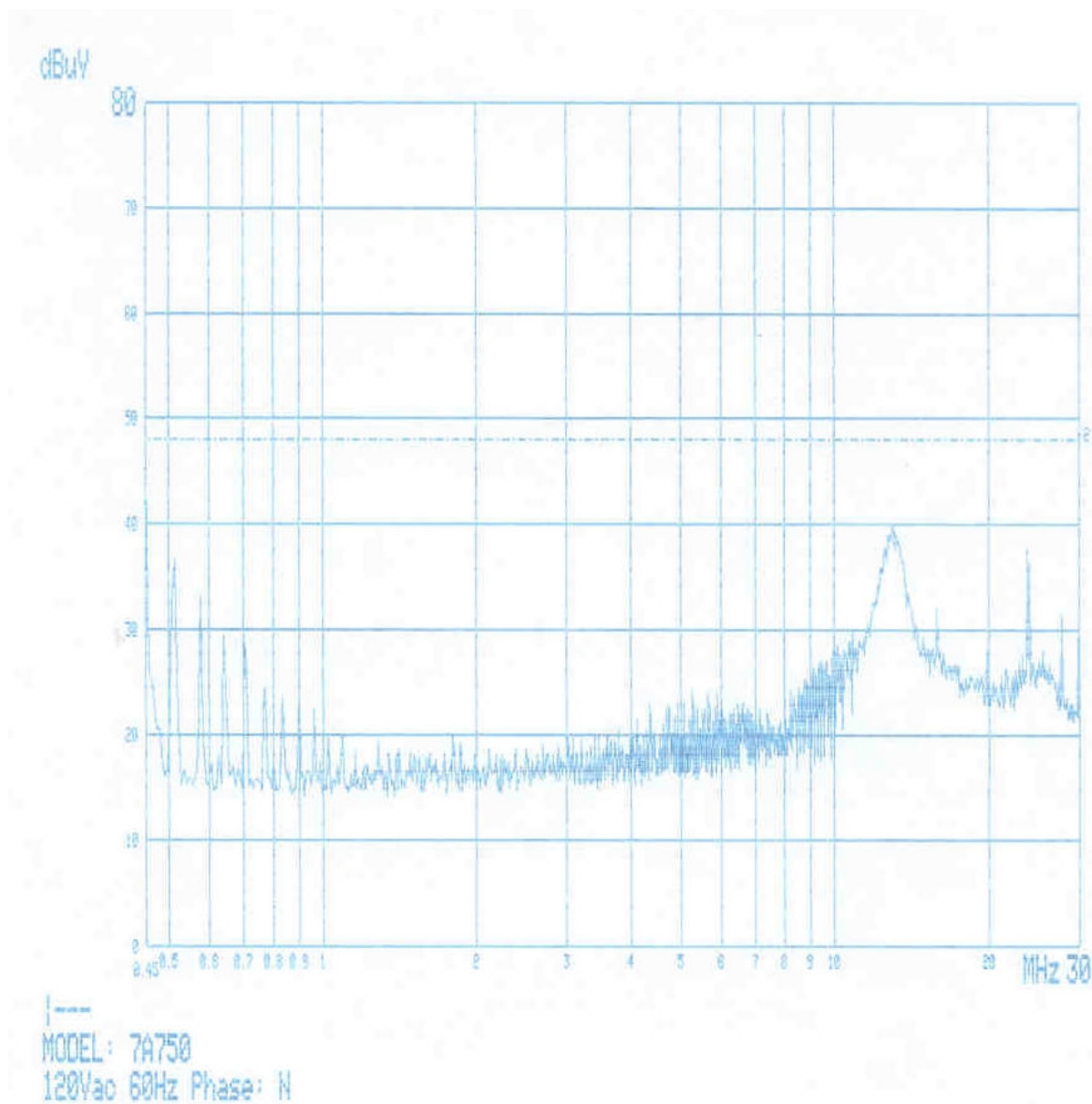
*** “—“ is means that the EuT has a margin

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

***** Cable loss are less than 0.1 dB

IST EMC LAB.





Radiation Test Data

Type : 7A750
 Manufacturer : Orion Electric Co., Ltd
 Operation mode : Scrolling "H" pattern display 1280 X 1024, 60Hz
 Test distance : 3 m
 Antenna : VULB9160
 Date : Nov. 27, 2000.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [m]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
32.5	23.0	13.4	1.0	26	1.00	V	37.4	40.0	-2.6
43.4	13.3	11.7	1.2	35	1.21	V	26.2	40.0	-13.8
54.2	19.0	10.9	1.3	354	1.00	V	31.2	40.0	-8.8
65.1	15.2	10.5	1.5	356	1.15	V	27.2	40.0	-12.8
75.9	18.5	8.7	1.6	348	1.25	V	28.8	40.0	-11.2
86.7	23.5	7.2	1.7	35	1.25	V	32.4	40.0	-7.6
108.4	18.5	9.1	1.9	344	1.23	V	29.5	43.5	-14.0
119.2	11.7	9.8	2.0	345	1.15	V	23.5	43.5	-20.0
130.1	17.2	10.5	2.1	15	3.85	H	29.8	43.5	-13.7
140.9	15.0	11.6	2.2	18	3.90	H	28.8	43.5	-14.7
151.8	16.0	12.2	2.3	32	3.95	H	30.5	43.5	-13.0
162.6	20.5	12.3	2.3	175	3.88	H	35.2	43.5	-8.3
173.4	17.0	11.9	2.4	184	3.95	H	31.3	43.5	-12.2
184.3	15.5	10.0	2.4	175	1.16	V	27.9	43.5	-15.6
195.1	17.0	8.8	2.5	166	3.89	H	28.3	43.5	-15.2
205.9	13.0	8.4	2.5	37	3.87	H	23.9	43.5	-19.6
216.8	14.5	8.4	2.7	33	3.77	H	25.6	46.0	-20.4
227.7	13.0	9.3	2.8	124	3.74	H	25.1	46.0	-20.9
238.5	20.5	10.1	2.9	355	3.75	H	33.5	46.0	-12.5
249.4	22.5	10.7	2.8	352	3.67	H	36.0	46.0	-10.0
260.2	17.2	11.3	2.9	122	1.23	V	31.4	46.0	-14.6
271.0	14.0	11.6	3.2	125	1.24	V	28.6	46.0	-17.4
281.9	13.7	11.9	3.1	351	2.89	H	28.7	46.0	-17.3
292.7	17.8	11.8	3.2	350	2.84	H	32.7	46.0	-13.3

IST EMC LAB.

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

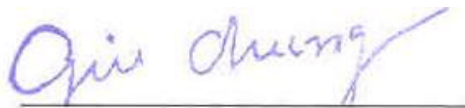
- Fulfill the general approval requirements mentioned on page 3.
- Not fulfill the general approval requirements mentioned on page 3.

Begin of testing : Nov. 27, 2000

End of testing : Nov. 29, 2000

Reviewed by :

Approved by :



Joon H. Lee. EMC Manager
IST EMC Lab.

G. Chung Chief of EMC Lab.