



EMISSION TEST REPORT

Test report file No. : **01-IST-072/FB** Date of issue : June 12, 2001.

Model / Type No. : LN710S

Kind of product : 17 inch 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 13 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</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.

Product Information

- Power rating : 100~240 Vac, 50/60 Hz / DC 12V, 4.5A
- Brand name : Orion
- Manufactured by : Orion Electric Co.,Ltd.
- Contact person : Charles Hur / Assistant Manager

ENVIRONMENTAL CONDITIONS

Temperature	<u>26</u>
Humidity	<u>42</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	Oct. 08, 2000	861742/018
■ 3725/2	LISN	EMCO	Oct. 08, 2000	9102-1788
■ 3825/2	LISN	EMCO	Dec. 20, 2000	9103-1788
■ ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Jun. 16, 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 :



B. K. Bae. / 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	July. 21, 2000	861744/004
■ VULB 9160	Antenna	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 “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 :

BKR

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

EQUIPMENT UNDER TEST

Equipment Description

The Equipment Under Test (EUT) is the **17 inch LCD Monitor of Orion Electric Co., Ltd.**

LCD Type	- 17.0" diagonal AM-TFT
	- Dot pitch : 0.264mm
Resolution	- 1280 X 1024, 60Hz
Frequency	- Horizontal: 31~70kHz, Vertical: 60~85Hz
Active Display Area	- 338mm X 270mm
Dimension	- 494mm X 240mm X 537mm
Power Rating	- 100~240Vac, 50/60Hz (input)
	- 12Vdc, 4.5A(output, using adaptor)
	- Adaptor Type: PSCV540103A (Samsung Electric)

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	SG01902402	DoC
Keyboard	SK-2502C	HP	M0004102821	DoC
Printer	A0302384	Northern Telecom	26633S60168	BS16XU2225C-L
Mouse1	M-S48a	HP	LZA10251257	JNZ201213
Mouse2	M-M28	Logitech	LCA53305547	DZL210365

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

TEST RESULT

Conducted emissions : 450 kHz - 30 MHz

The requirements are.

■ KEPT

NOT KEPT

Min. limit margin

12.1 dB at 15.945 MHz

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

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 - 1000 MHz

The requirements are

■ KEPT

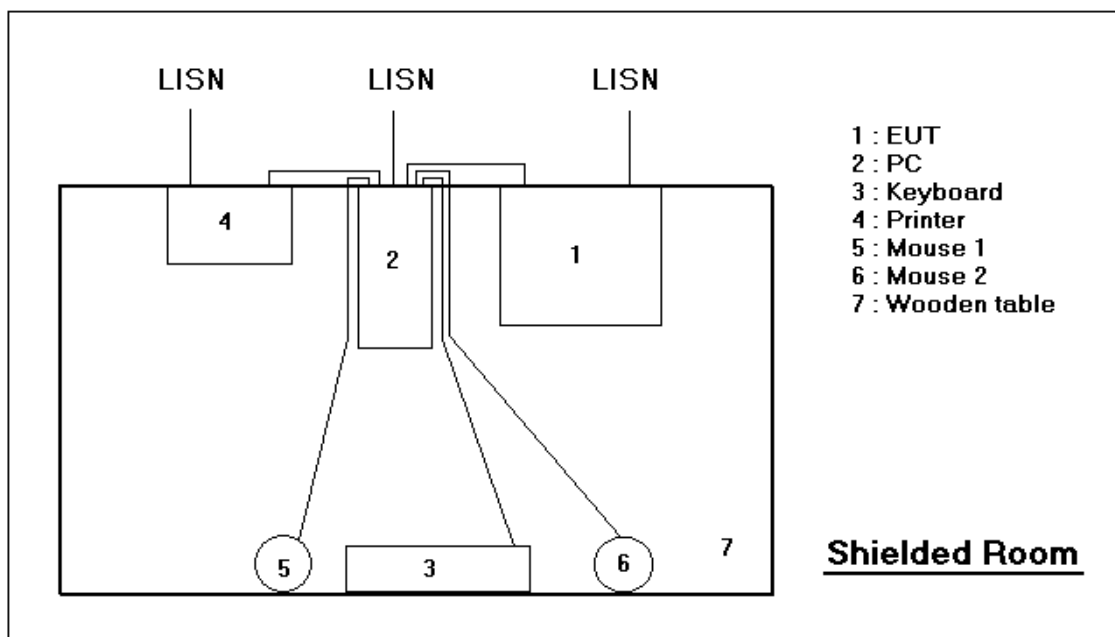
NOT KEPT

Min. limit margin

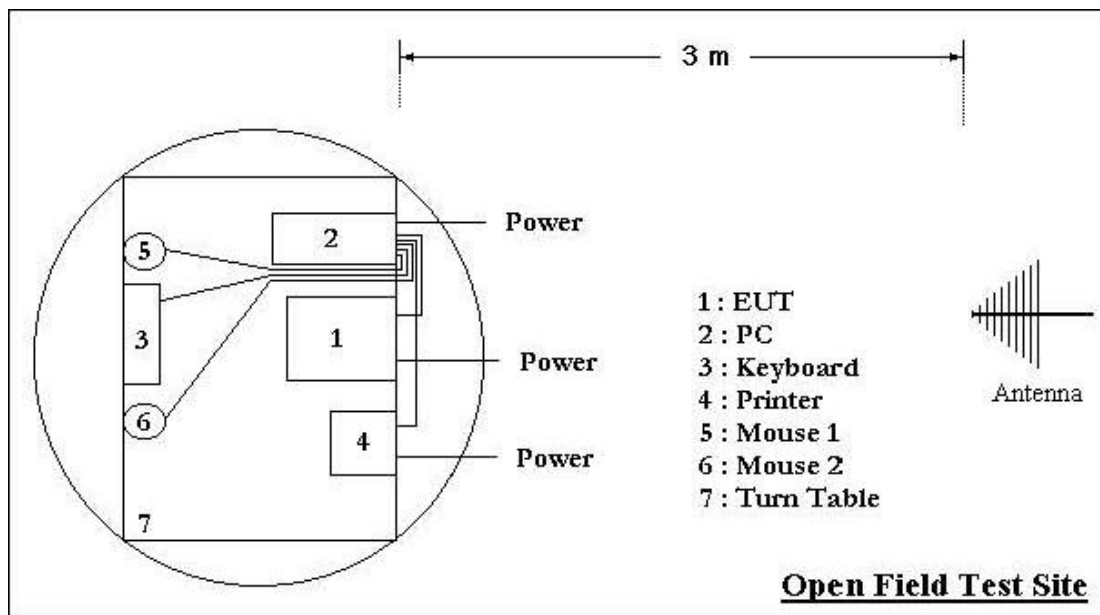
4.1 dB at 271.0 MHz

Remarks : See test-data at page 12.

Test Set-Up (Type : LN710S)



Picture 1 : Conducted emission 450kHz ~ 30MHz



Picture 2 : Radiated emission 30MHz ~ 1000MHz

Conducted Emission Test Data

Type : LN710S
 Manufacturer : Orion Electric Co., Ltd.
 Operation mode : Scrolling "H" pattern display 1280 X 1024, 60Hz
 Date : June 04, 2001

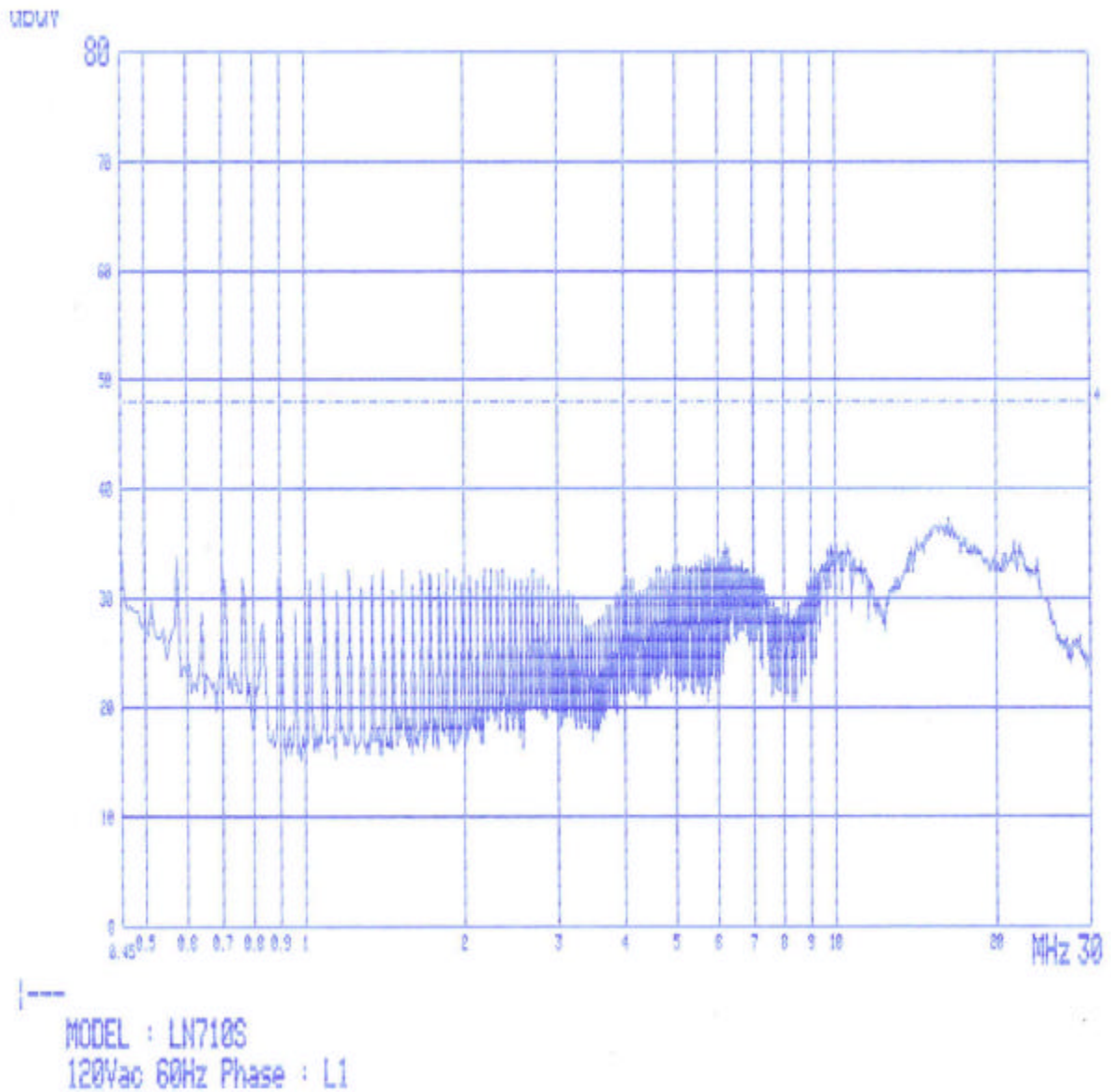
Highest Emissions relative to the limit

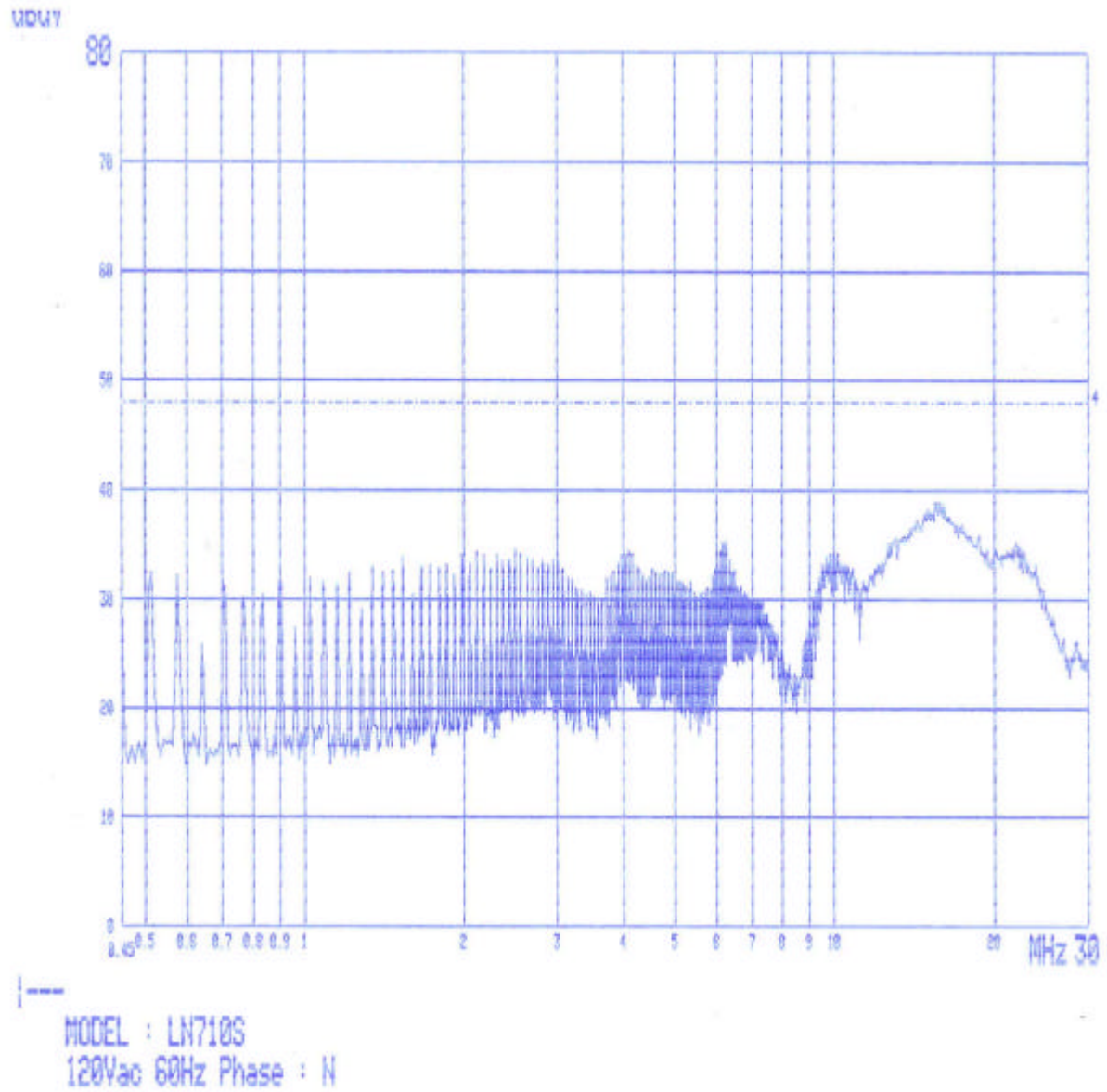
Frequency [MHz]	Reading [dBμV]	Insertion loss [dB]	Phase (L1/N)	Result [dBμV]	Limit [dBμV]	Margin [dB]
0.450	32.0	0.8	L1	32.8	48.0	15.2
2.304	31.3	0.8		32.1	48.0	15.9
6.208	33.5	0.8		34.3	48.0	13.7
10.495	31.5	0.8		32.3	48.0	15.7
16.318	33.8	0.8		34.6	48.0	13.4
22.395	30.7	0.8		31.5	48.0	16.5
0.450	29.6	0.8	N	30.4	48.0	17.6
0.513	30.8	0.8		31.6	48.0	16.4
0.897	31.4	0.8		32.2	48.0	15.8
2.498	33.1	0.8		33.9	48.0	14.1
6.212	34.2	0.8		35.0	48.0	13.0
15.945	35.1	0.8		35.9	48.0	12.1
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 : LN710S
 Manufacturer : Orion Electric Co., Ltd.
 Operation mode : Scrolling "H" pattern display 1280 X 1024, 60Hz
 Test distance : 3 m
 Antenna : VULB9160
 Date : June 05, 2001.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
32.5	9.8	13.4	1.0	358	100	V	24.2	40.0	15.8
67.5	17.8	10.1	1.6	158	100	V	29.5	40.0	10.5
75.8	20.7	8.7	1.6	81	100	V	31.0	40.0	9.0
86.7	20.6	7.2	1.7	267	100	V	29.5	40.0	10.5
135.0	19.6	11.0	2.1	313	100	H	32.7	43.5	10.8
153.0	22.3	12.2	2.3	161	100	V	36.8	43.5	6.7
198.0	22.7	8.7	2.5	124	100	V	33.9	43.5	9.6
249.3	21.2	10.7	2.8	242	100	H	34.7	46.0	11.3
271.0	27.3	11.6	3.0	213	196	V	41.9	46.0	4.1
351.0	21.4	11.7	3.6	212	169	V	36.7	46.0	9.3
359.9	21.3	11.7	3.6	357	241	H	36.6	46.0	9.2
379.4	24.0	12.5	3.8	269	130	H	40.3	46.0	5.7

