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EMC TEST REPORT For FCC

Test Report No.	:	CTK03-F083
Date of Issue	:	August 5, 2003
FCC ID	:	MSAD19BL-1
Model/Type No.	:	D19BL
Kind of Product	:	CRT Monitor
Applicant	:	Hansol LCD Inc.
Applicant Address	:	27-29, Hanchon-Ri, Ducksan-Myun, Jinchon-Gun, Chungbuk, 365-840, Korea
Manufacturer	:	Hansol Electronics (Thailand) Co., LTD.
Manufacturer Address	:	168 Moo 1 Tambon Banbung, Amphoe Banbung, Chonburi Province 20170 Thailand
Contact Person	:	Mr. Weon Seo, LEE
Telephone	:	+82-43-530-8554
Received Date	:	July 25, 2003
Test period	:	Start: July 26, 2003 End: July 26, 2003
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

The test results presented in this report relate only to the object tested.

CERTiTEK Standards Laboratory Co., Ltd. is accredited by Korea Laboratory Accreditation Scheme (KOLAS) which signed the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the above test item(s) and test method(s).

Tested by

Young Joon, Park
EMC Test Engineer
Date: August 5, 2003

Reviewed by

James Hong
EMC Technical Manager
Date: August 5, 2003

REPORT REVISION HISTORY

Date	Revision	Page No
August 5, 2003	Issued (CTK03-F083)	All

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1.0 General Product Description

1.0.1 Tested Equipment

☒ Unless otherwise indicated, all tests were conducted on Model D19BL.
☐ Tests performed on Model _____ were considered to be representative of Model(s) _____.

1.0.2 Equipment Size, Mobility and Identification

Dimensions:	440(W) by 454(D) by 447(H)	☒ mm	☐ in	
Mobility:	☐ Hand-Held	☒ Table-top	☐ Floor-standing	
Serial No.:	Not Applicable			

1.0.3 Electrical Ratings

Input:	AC 100-240V, 50/60Hz ± 3Hz
Output:	Not applicable

1.0.4 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage:	120VAC
Frequency:	60Hz

1.0.5 Clock & Other Frequencies Utilized

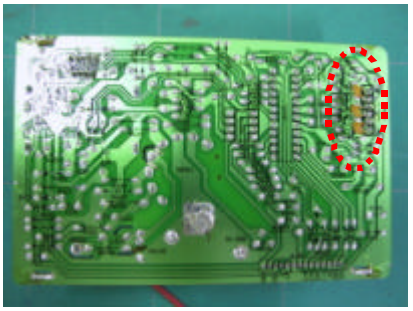
12MHz

1.1 Model Differences

Not applicable

1.2 Device Modifications

Three capacitors [47pF/C41, C42 and C43] will be added in VIDEO BOARD as below photo;



1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	DoC or TCB (ID)
PC	Hewlett-Packard Company	HP PD1059	n/a	DoC
KEYBOARD	SAMSUNG	SEM-DT35	33008109	DoC
MOUSE (PS/2 type)	SAMSUNG	OMS3CB	0303009871	DoC
MOUSE (USB type)	SAMSUNG	OMC3CB	0303009883	DoC
MOUSE (Serial type)	Microsoft	BASM1	4475951-20000	DoC

☒ Cable Description

#	Description	Ferrited	Length (m)	Other Details
1	AC Power, Unshielded	No	1.8	Connect to AC Power from EUT
2	AC Power, Unshielded	No	1.8	Connect to AC Power from PC
3	Monitor cable, Shielded	Yes	1.8	Connect to PC
4	Keyboard cable, Shielded	No	2.0	n/a
5	Mouse cable, Shielded	No	2.0	PS/2 Type
6	Mouse cable, Shielded	No	2.0	USB Type
7	Mouse cable, Shielded	No	2.0	Serial Type

n/a = not available

1.4 Test Software

☐ Pinging
☒ Name / Version / Type of Pattern : Display Test Patterns / 1.5 / Scrolling 'H'

1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

☒ Test program (Scrolling 'H')
☐ Standby
☐ Practice operation
☒ Resolution / Refresh Rate - 1600 x 1200 / 75Hz
☐ Test program (color bar)
☐ Test program (customer specific)

1.6 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.7 Test Facility

The measurement facility is located at 386-1, Ho-Dong, Yongin-City, Kyungki-Do, Korea 449-100. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.8 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested.
Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)
Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Open Area Test Site. Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

* Measurement procedures was In accordance with ANSI C63.4-1992 7.2.3, 7.2.4, 8.3.1.1, 8.3.1.2

1.9 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	**FCC**	3 and 10 meter Open Area Test Sites to perform FCC Part 15/18 measurements.	93250
JAPAN	**VCCI**	10 meter Open Area Test Site and one conducted site.	R-948, C-986
KOREA	**MIC**	10 meter Open Area Test Site and EMS (ESD, RS, EFT/Burst, Surge)	No. 51, KR0025
International	**KOLAS**	EMC	
Europe	**GLAS**	EMC EN 55011, EN 55022, EN 55024, EN 61326, EN 50130-4, EN 50081-1, EN 50081-2, EN 50082-1, EN 50082-2, EN 61000-6-2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11, EN 61000-3-2, EN 61000-3-3	No.13000796-02

2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

☐ EN 50081-1:1992

☐ EN 55011:1998 +A1:1999 ☐ Group 1 ☐ Group 2
☐ Class A ☐ Class B

☐ EN 55013:1990 +A12:1994 +A13:1996 +A14:1999
☐ EN 55013:2001

☐ EN 55014-1:1993 +A1:1997 +A2:1999 ☐ Household appliances and similar
☐ Portable tools
☐ Semiconductor devices

☐ EN 55014-1:2000
☐ EN 55014-2:1997

☐ EN 55015:1996 +A1:1997 +A2:1999
☐ EN 55015:2000

☐ EN 55020:1994 +A11:1996 +A13:1999 +A14:1999
☐ EN 55020:1994 +A11:1996 +A12:1999 +A13:1999 +A14:1999

☐ EN 55022:1994 +A1:1995 +A2:1997 ☐ Class A ☐ Class B
☐ EN 55022:1998 +A1:2000 ☐ Class A ☐ Class B

☐ EN 61000-3-2:1995 +A1:1998 +A2:1998
☐ EN 61000-3-2:1995 +A1:1998 +A2:1998 +A14:2000
☐ EN 61000-3-2:2000
☐ EN 61000-3-3:1995

☐ VCCI V-3/99.05 : 1999 ☐ Class A ☐ Class B

☒ FCC PART 15 Subpart B ☐ Class A ☒ Class B

☐ AS 3548 (1992) ☐ Class A ☐ Class B

2.1 Conducted Voltage Emissions

Test Date
July 26, 2003

Test Location
EMI-CE: Shielded Room

Test Instruments

☒ Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002

Test Accessories

☐ LISN	EMCO	3825/2	9206-1971
☒ LISN	EMCO	3825/2	9409-2246
☒ LISN	EMCO	3825/2	9607-2574
☒ Control PC	HP	Vectra 500	SG72000192

Frequency Range of Measurement
☐ 150 kHz to 30 MHz
☒ 450 kHz to 30 MHz

Instrument Settings
IF Band Width: 9 kHz

Test Results
The requirements are:

☒ MET	minimum margin is 13.8 dBuV at 0.45 MHz
☐ NOT MET	limit exceeded by maximum of ____ dBuV at _____ MHz
☐ NOT APPLICABLE	

Remarks
See Appendix A for test data.

2.2 Radiated Electric Field Emissions

Test Date
July 26, 2003

Test Location
☐ EMI-OATS: Testing was performed at a test distance of 10 m
☒ EMI-OATS: Testing was performed at a test distance of 3 m

Test Instruments

☒ Field Strength Meter	Rohde & Schwarz	ESVS30	826638/008

Test Accessories

☒ ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014
☐ Biconical Antenna	Schwarzbeck	BBA9106	41-00201
☐ Biconical Antenna	EMCO	3110B	9607-2564
☐ Log-periodic Antenna	EMCO	3146	9607-4567

Frequency Range of Measurement
30 MHz to 1 GHz

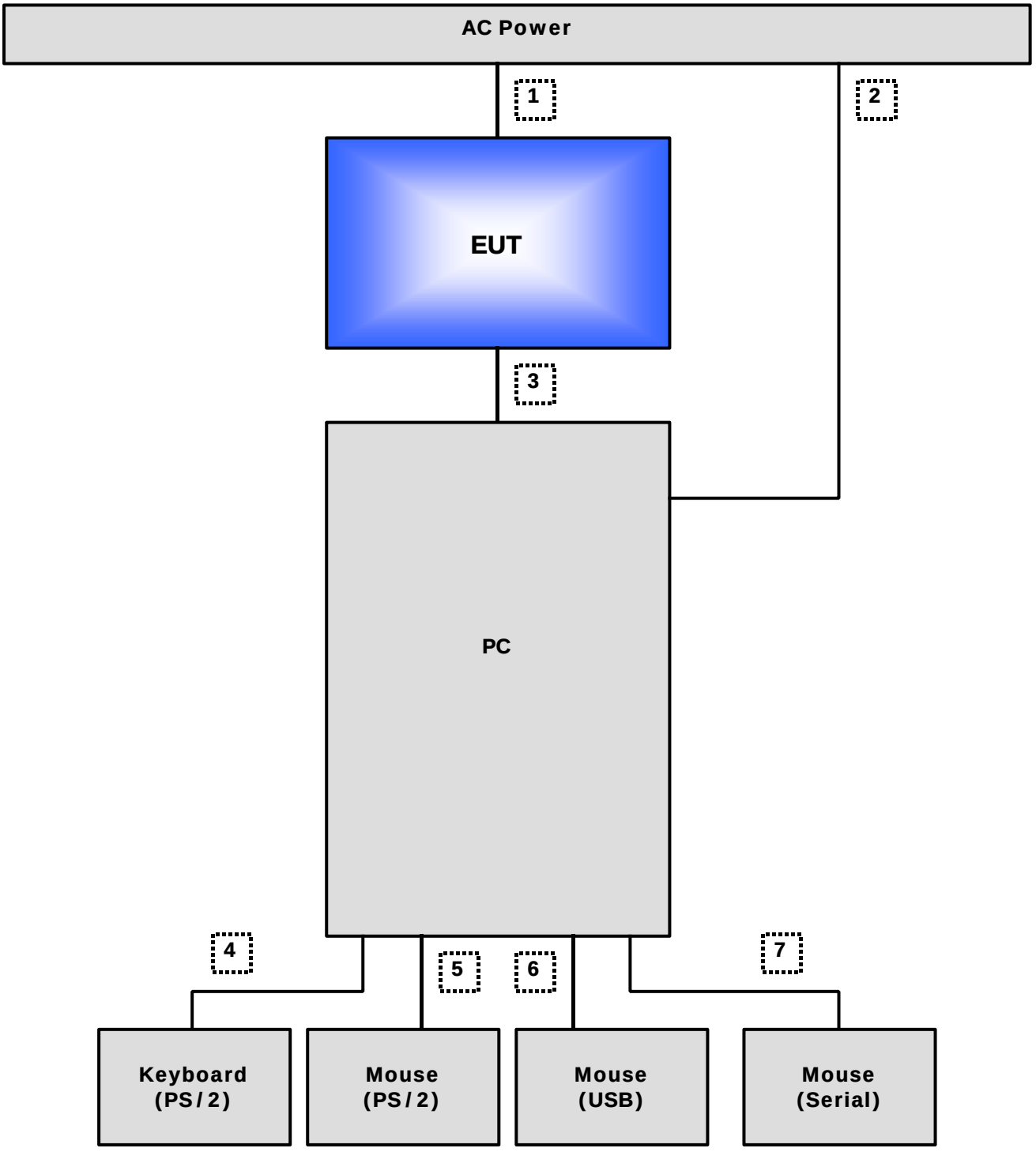
Instrument Settings
IF Band Width: 120 kHz

Test Results
The requirements are:

☒ MET minimum margin is 12.60 dBuV/m at 129.62 MHz
☐ NOT MET limit exceeded by maximum of ____ dBuV/m at _____ MHz
☐ NOT APPLICABLE

Remarks
See Appendix A for test data

Configuration

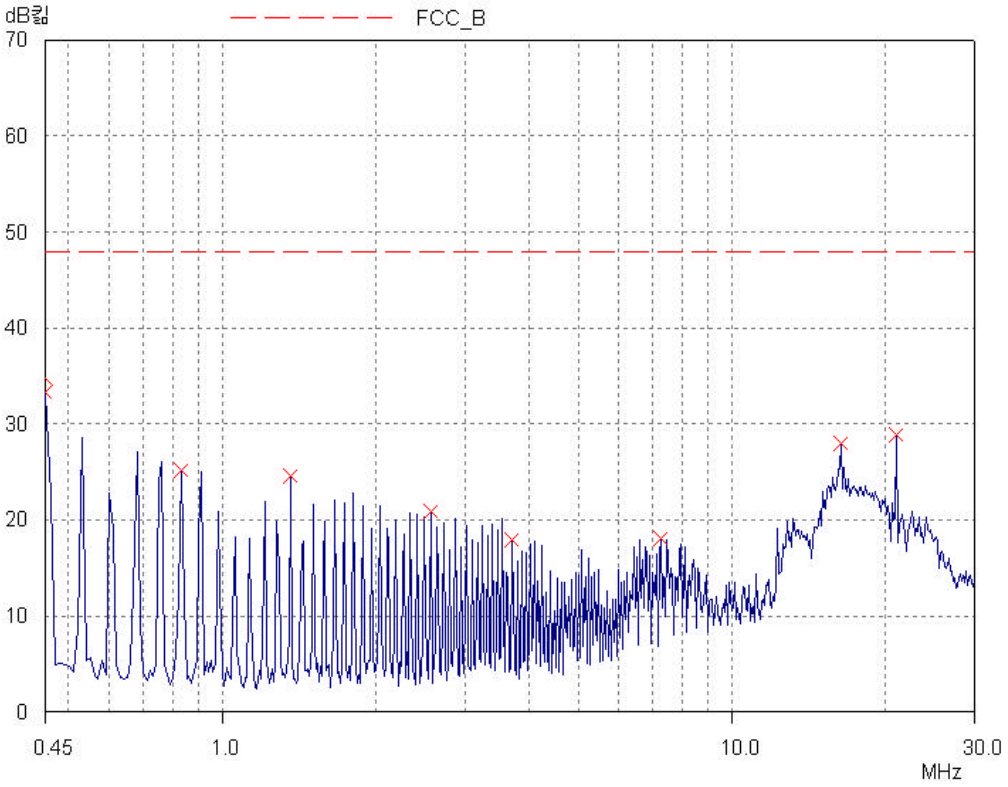


APPENDIX A – TEST DATA

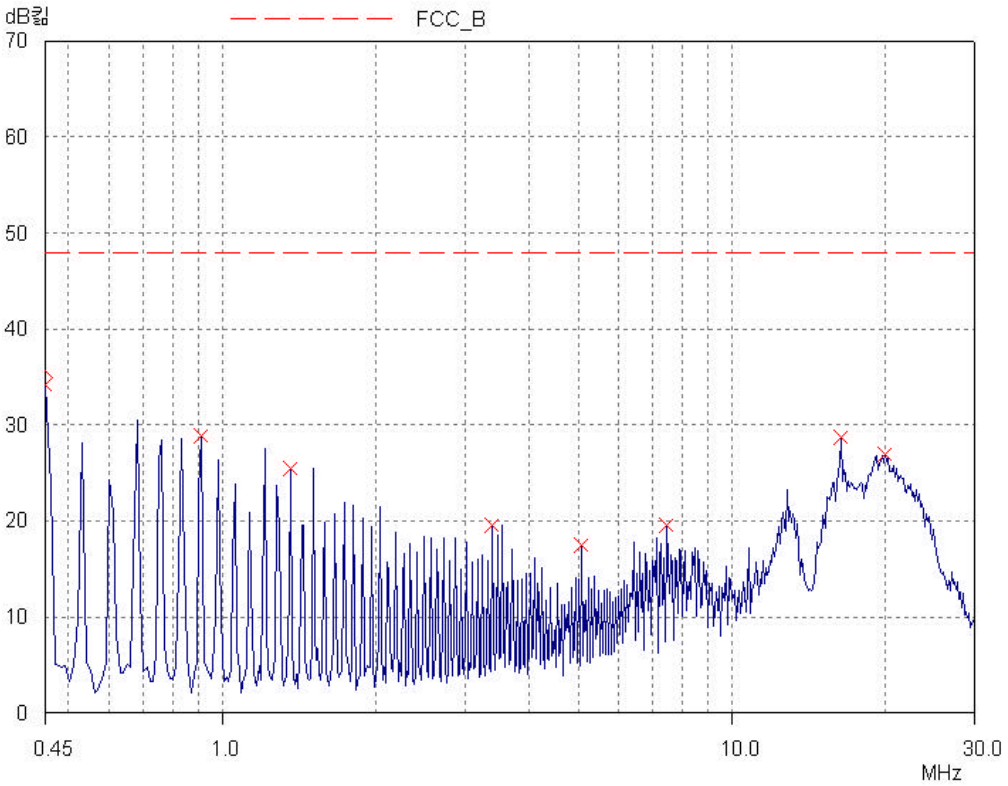
Conducted Voltage Emissions (Quasi-Peak reading)

Frequency	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
[MHz]	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.45	0.5	0.1	N	48.0	33.6	34.2	13.8				
0.83	0.3	0.1	L	48.0	24.8	25.2	22.8				
0.91	0.3	0.1	N	48.0	28.5	28.9	19.1				
1.36	0.3	0.1	N	48.0	25.1	25.5	22.6				
2.57	0.3	0.1	L	48.0	20.5	20.9	27.1				
3.40	0.3	0.1	N	48.0	19.2	19.6	28.4				
3.70	0.3	0.1	L	48.0	17.6	18.0	30.0				
5.06	0.3	0.1	N	48.0	17.0	17.4	30.6				
7.25	0.3	0.2	L	48.0	17.6	18.1	29.9				
7.40	0.3	0.2	N	48.0	19.0	19.5	28.5				
16.31	0.4	0.2	N	48.0	28.1	28.7	19.3				
21.01	0.7	0.4	L	48.0	27.8	28.9	19.1				

Line



Neutral



Radiated Electric Field Emissions (Quasi-Peak reading)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
113.42	18.6	H	2.6	9.55	1.10	43.5	29.25	14.25
129.62	20.8	V	1.0	8.80	1.30	43.5	30.90	12.60
194.43	21.1	H	1.2	7.00	1.70	43.5	29.80	13.70
210.63	14.7	V	1.0	7.70	1.80	43.5	24.20	19.30
469.86	14.0	V	1.0	15.00	3.30	46.0	32.30	13.70
506.51	10.9	H	3.2	15.70	3.50	46.0	30.12	15.88
525.87	13.1	V	1.0	16.00	3.50	46.0	32.60	13.40
567.07	10.5	V	1.0	16.60	3.50	46.0	30.60	15.40