

EMC TEST REPORT For FCC



Test Report No. : CTK01-F168
Date of Issue : November 8, 2001
Model/Type No: : E19BL
Kind of Product : CRT Monitor
Applicant : Hansol Electronics Inc.
Applicant Address : 27-29, Hanchon-Ri, Ducksan-Myun, Jinchon-Gun, Chungbuk,
365-840, Korea
Manufacturer : Hansol Electronics Inc.
Manufacturer Address : 27-29, Hanchon-Ri, Ducksan-Myun, Jinchon-Gun, Chungbuk,
365-840, Korea
Contact Person : S. P. Yang
Telephone : +82-43-530-8503
Received Date : October 29, 2001
Test period : Start: Oct. 22, 2001 End: Nov. 6, 2001
Test Results : ☒ In Compliance ☐ Not in Compliance

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

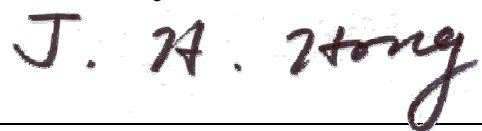
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Tested by



Michael Jang
EMC Test Engineer
Date: November 8, 2001

Reviewed by



James Hong
EMC Technical Manager
Date: November 8, 2001

REPORT REVISION HISTORY

Date	Revision	Page No
Nov. 8, 2001	(CTK01-F168) Issued	All

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1.0 General Product Description

The product is CRT Monitor.

1.0.1 Tested Equipment

- ☒ Unless otherwise indicated, all tests were conducted on Model E19BL.
- ☐ Tests performed on Model _____ were considered to be representative of Model(s) _____.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: 470 by 462 by 466 ☒ mm ☐ in
Mobility: ☐ Hand-Held ☒ Table-top ☐ Floor-standing
Serial No.: Not Applicable

1.0.3 Electrical Ratings

Input: 100-240 V ac, 50/60 Hz
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: 110 V ac
Frequency: 60 Hz

1.0.5 Clock & Other Frequencies Utilized

Micro Controller Unit: 7.993 MHz

1.1 Model Differences

Not applicable

1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

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.	FCC ID or DoC
Personal Computer	HP	DTPC-17	SG0150776	DoC
Printer	HP	C4530A	US7A91703J	DoC
Keyboard	SAN HAWK TECIING	-	M000351491	DoC
Game Pad	Microsoft	Side Winder	03421317	C3KMGP1
Head Set	-	Hi-Sonic	-	N/A
PS/2 Mouse	PANWEST	Cyber Bettie	PM1F154000055	DoC
Serial Mouse	Microsoft	BASM1	4475951-20000	DoC
USB Mouse	PANWEST	Cyber Bettie	PM1F184045737	DoC
USB Mouse	PANWEST	Cyber Bettie	PM1F144009945	DoC

☒ Cable Description

#	Description	Ferrited	Length (m)	Other Details
1	PC Power Cable, Unshielded	No	1.8	Connect to AC Power
2	EUT Power Cable, Unshielded	No	2.0	Connect to AC Power
3	Printer Power Cable, Unshielded	No	1.8	Connect to AC Power
4	Monitor Signal Cable, Shielded	Yes	1.6	Between PC and Monitor
5	Game Pad Cable, Shielded	No	1.8	Connect to PC
6	Head Set Cable, Unshielded	No	3.0	Connect to PC
7	Line In Cable, Unshielded	No	1.5	-
8	Keyboard Cable, Shielded	No	1.5	Connect to PC
9	USB Mouse Cable, Shielded	No	1.8	Connect to PC
10	USB Mouse Cable, Shielded	No	1.8	Connect to PC
11	Serial Mouse Cable, Shielded	No	1.8	Connect to PC
12	PS/2 Mouse Cable, Shielded	No	1.8	Connect to PC
13	Printer Signal Cable, Shielded	No	1.5	Between PC and Printer

n/a = not available

1.4 Test Software

- ☐ Pinging
☒ Compaq Computer (Version 1.0)

1.5 EUT Operating Mode(s)

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

- ☒ Test program (H-Pattern) under 1280 x 1024 and 75 Hz
☐ Test program (color bar)
☐ Standby
☐ Test program (customer specific)
☐ Practice operation

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	 NO. 119

2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

☐ EN 50081-1 /1992

☐ EN 55011 /1998

☐ Group 1

☐ Group 2

☐ Class A

☐ Class B

☐ EN 55013 /A12:1994

☐ EN 55014 /1987

☐ Household appliances and similar

☐ Portable tools

☐ Semiconductor devices

☐ EN 55014 /A2:1990

☐ EN 55014 /1993

☐ Household appliances and similar

☐ Portable tools

☐ Semiconductor devices

☐ EN 55015 /1987

☐ EN 55015 /A1:1990

☐ EN 55015 /1993

☐ EN 55022 /A1:1995

☐ Class A

☐ Class B

☐ EN 55022 /1998

☐ Class A

☐ Class B

☐ EN 61000-3-2 /1995 (EN 60555 Part 2 /4.87)

☐ EN 61000-3-3 /1995 (EN 60555 Part 3 /4.87)

☐ BS

☐ 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

☐ CISPR 11 (1990)

☐ Group 1

☐ Group 2

☐ Class A

☐ Class B

☐ CISPR 22 (1993)

☐ Class A

☐ Class B

2.1 Conducted Voltage Emissions

Test Date

November 6, 2001

Test Location

EMI-CE: Shielded Room

Test Instruments

<input checked="" type="checkbox"/> Field Strength Meter	Rohde Schwarz	ESHS30	828144/002
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Test Accessories

<input checked="" type="checkbox"/> LISN	EMCO	3825/2	9206-1971
<input checked="" type="checkbox"/> LISN	EMCO	3825/2	9409-2246
<input type="checkbox"/> LISN	EMCO	3825/2	9607-2574
<input checked="" type="checkbox"/> 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:

<input checked="" type="checkbox"/> MET	minimum margin is 9.5 dB μ V at 13.99 MHz
<input type="checkbox"/> NOT MET	limit exceeded by maximum of ____ dB μ V at ____ MHz
<input type="checkbox"/> NOT APPLICABLE	

Remarks

See Appendix A for test data.

2.2 Radiated Electric Field Emissions

Test Date

October 22, 2001

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

<input checked="" type="checkbox"/> ULTRA Broadband Antenna	R & S	HL562	361324/014
<input type="checkbox"/> Biconical Antenna	Schwarzbeck	BBA9106	41-00201
<input type="checkbox"/> Biconical Antenna	EMCO	3110B	9607-2564
<input type="checkbox"/> 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

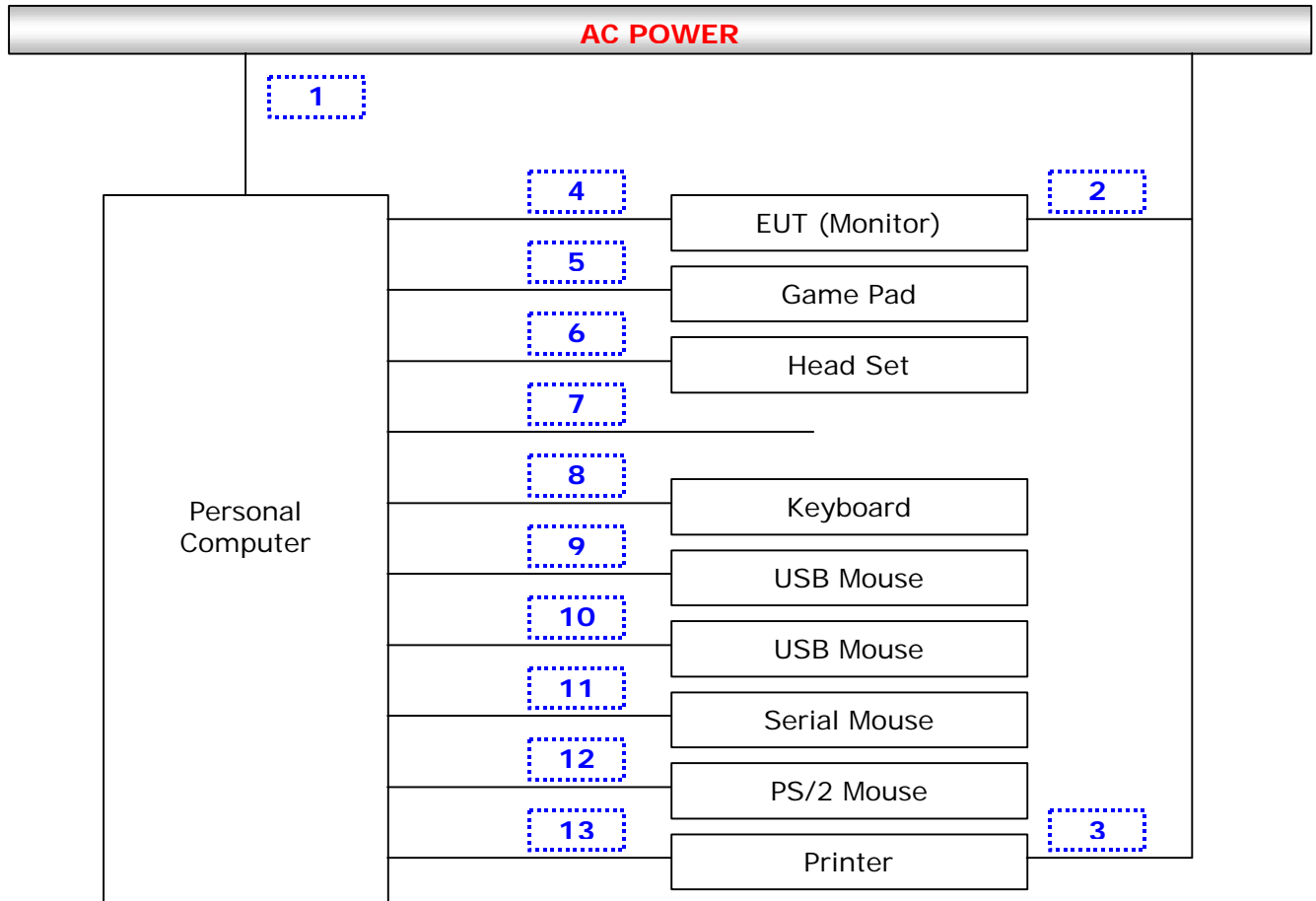
The requirements are:

- ☒ MET minimum margin is 5.37 dB ($\mu\text{V/m}$) at 599.3 MHz
☐ NOT MET limit exceeded by maximum of ____ dB($\mu\text{V/m}$) at ____ MHz
☐ NOT APPLICABLE

Remarks

See Appendix A for test data

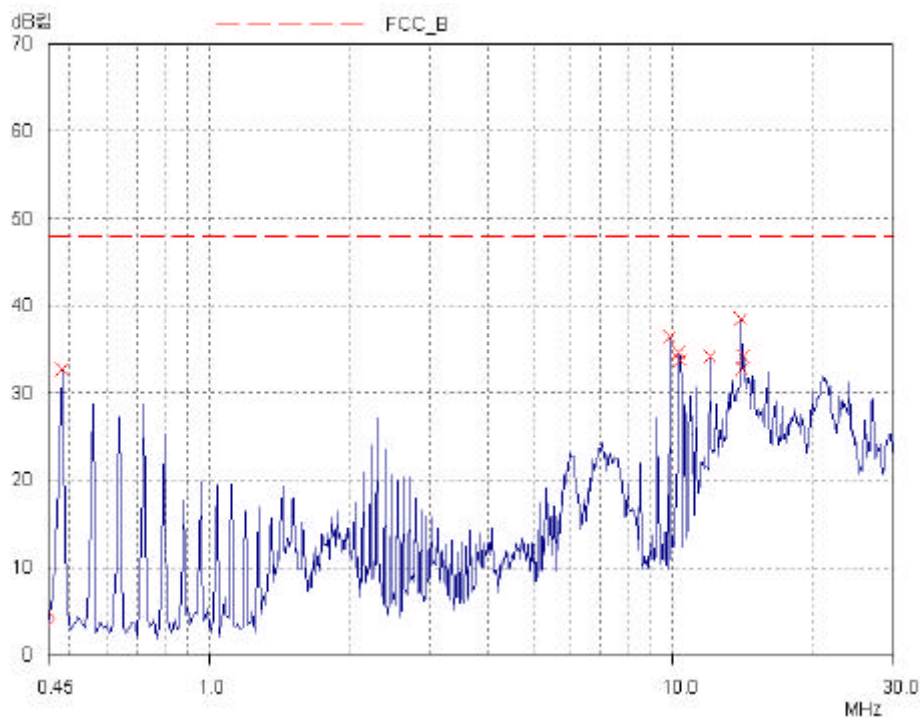
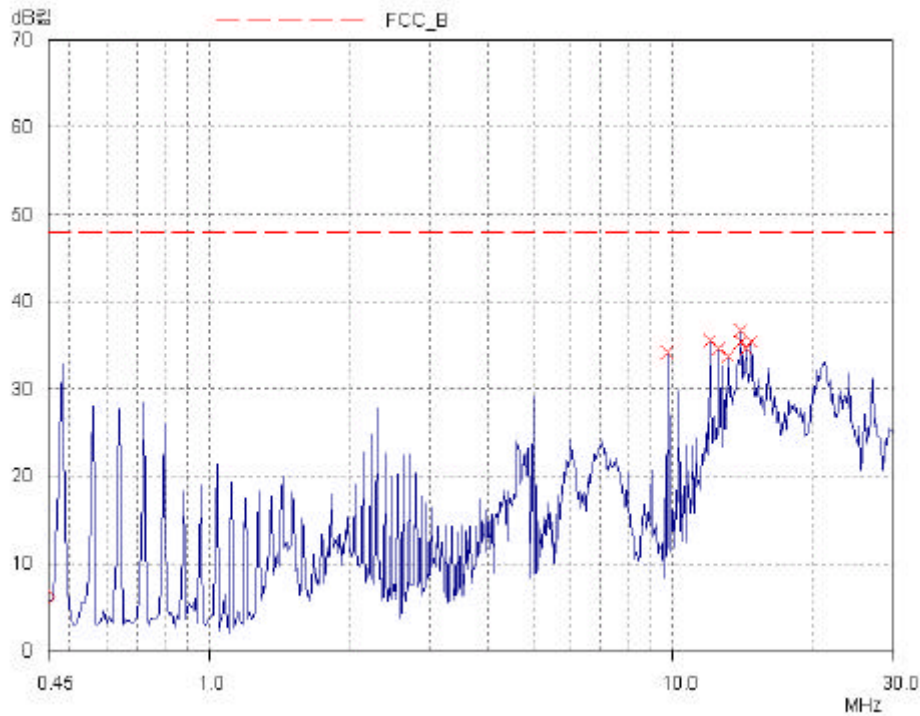
Configuration



APPENDIX A – TEST DATA

Conducted Voltage Emissions (Quasi-Peak reading)

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
	LISN	Cable		Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]	Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]
0.48	0.3	0.1	N	48.0	32.3	32.7	15.3				
9.87	0.3	0.2	N	48.0	35.9	36.4	11.7				
10.28	0.3	0.2	N	48.0	34.1	34.6	13.4				
10.39	0.3	0.2	N	48.0	33.2	33.7	14.3				
11.99	0.3	0.3	L	48.0	34.9	35.5	12.5				
12.54	0.2	0.2	L	48.0	34.2	34.6	13.4				
13.99	0.2	0.2	N	48.0	38.1	38.5	9.5				
14.05	0.2	0.2	L	48.0	34.9	35.3	12.7				
14.22	0.2	0.2	N	48.0	33.8	34.2	13.8				
14.38	0.2	0.2	L	48.0	34.2	34.6	13.4				
14.77	0.3	0.2	L	48.0	34.8	35.3	12.7				



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			
33.40	10.3	V	1.0	17.80	0.40	40.0	28.45	11.55
94.10	23.2	V	1.0	8.90	0.90	43.5	33.02	10.48
107.60	24.0	H	2.0	9.50	1.10	43.5	34.57	8.93
148.10	25.2	V	1.0	7.70	1.40	43.5	34.30	9.20
161.60	22.5	H	1.8	7.30	1.60	43.5	31.36	12.14
171.80	26.4	H	2.0	7.05	1.60	43.5	35.00	8.50
242.60	20.8	H	1.9	9.10	2.00	46.0	31.88	14.12
403.30	21.9	V	1.0	13.50	2.70	46.0	38.05	7.95
457.50	21.8	V	1.0	14.80	3.10	46.0	39.71	6.29
599.30	19.9	V	1.0	17.00	3.70	46.0	40.63	5.37
769.00	13.6	H	2.3	19.10	4.50	46.0	37.22	8.78
805.80	13.6	V	1.0	19.60	4.70	46.0	37.85	8.15