

EMC TEST REPORT For FCC

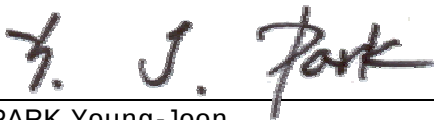


Test Report No. : CTK02-F148
Date of Issue : October 15, 2002
FCC ID : MSAB19CL-1
Model/Type No. : B19CL
Kind of Product : CRT Monitor
Applicant : Hansol Electronics Inc.
Applicant Address : 27-29, Hanchon-Ri, Ducksan-Myun, Jinchon-Gun, Chungbuk,
365-840, Korea
Manufacturer : Hansol Electronics Inc.
Manufacturer Address : 27-29, Hanchon-Ri, Ducksan-Myun, Jinchon-Gun, Chungbuk,
365-840, Korea
Contact Person : Mr. S. P. Yang
Telephone : +82-43-530-8503
Received Date : October 04, 2002
Test period : Start: October 08, 2002 End: October 09, 2002
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

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

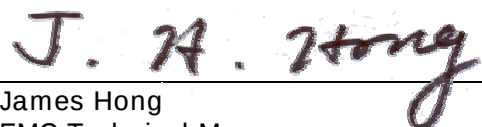
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Tested by



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Date: October 15, 2002

Reviewed by



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Date: October 15, 2002



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REPORT REVISION HISTORY

Date	Revision	Page No
October 14, 2002	(CTK02-F148) Issued	All

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1.0 General Product Description

1.0.1 Tested Equipment

- ☒ Unless otherwise indicated, all tests were conducted on Model B19CL.
- ☐ Tests performed on Model _____ were considered to be representative of Model(s) _____.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: 470(W) by 487(D) by 470(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, 2A
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

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.	DoC or TCB (ID)
PC	HP	HP Pavilion 8877	KR12207235	DoC
KEYBOARD	World Com Mart	KB120	-	DoC
MOUSE (PS/2 type)	PANWEST	Cyber Beetle	PM1F184045737	DoC
MOUSE (USB type)	PANWEST	Cyber Beetle	PM1F144009945	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	PS/2 Type
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') ☐ Test program (color bar)
☐ Standby ☐ Test program (customer specific)
☐ Practice operation
☒ Resolution / Refresh Rate - 1600 x 1200 / 75Hz

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
☐ Class A | ☐ Group 2
☐ 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

October 08, 2002

Test Location

EMI-CE: Shielded Room

Test Instruments

☒ Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002
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Test Accessories

☒ 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 11.1 dBuV at 20.25 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

October 09, 2002

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

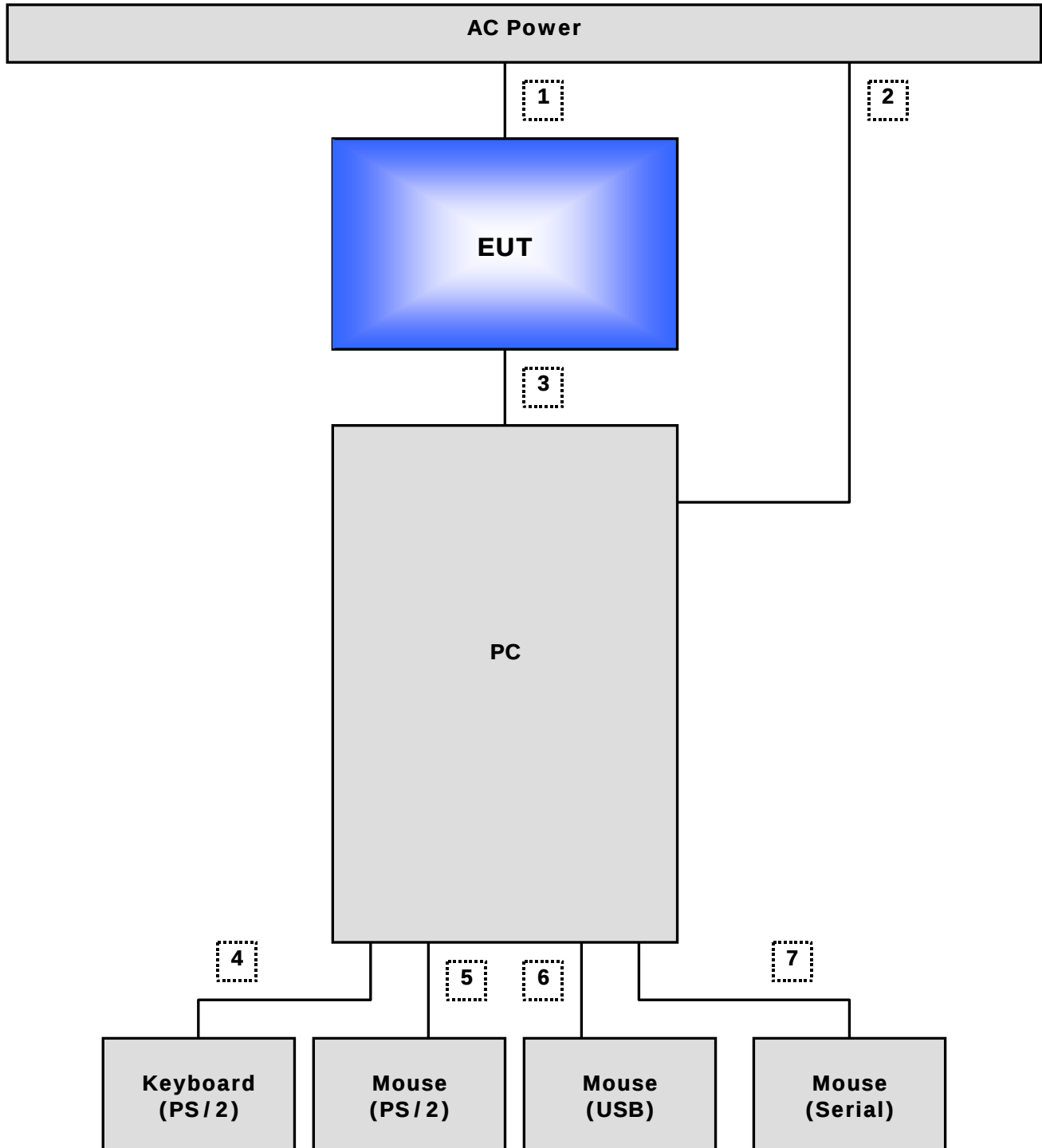
The requirements are:

- ☒ MET minimum margin is 4.00 dBuV/m at 573.01 MHz
☐ NOT MET limit exceeded by maximum of ____ dBuV/m at ____ MHz
☐ NOT APPLICABLE

Remarks

See Appendix A for test data

Configuration

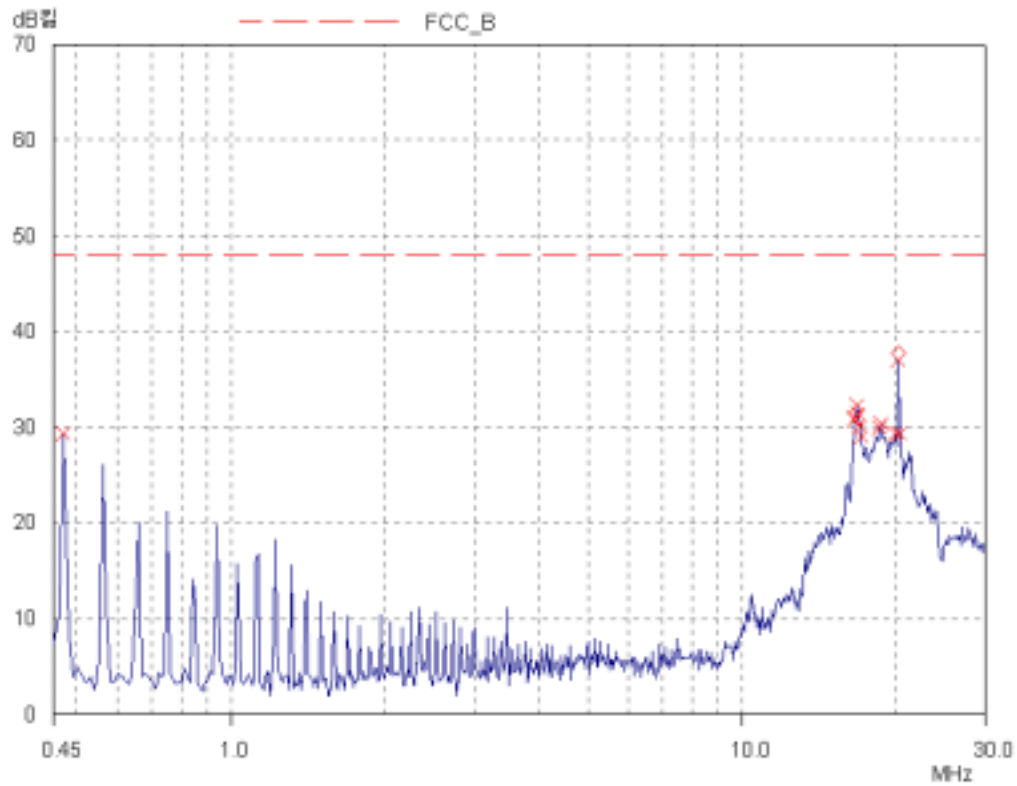


APPENDIX A – TEST DATA

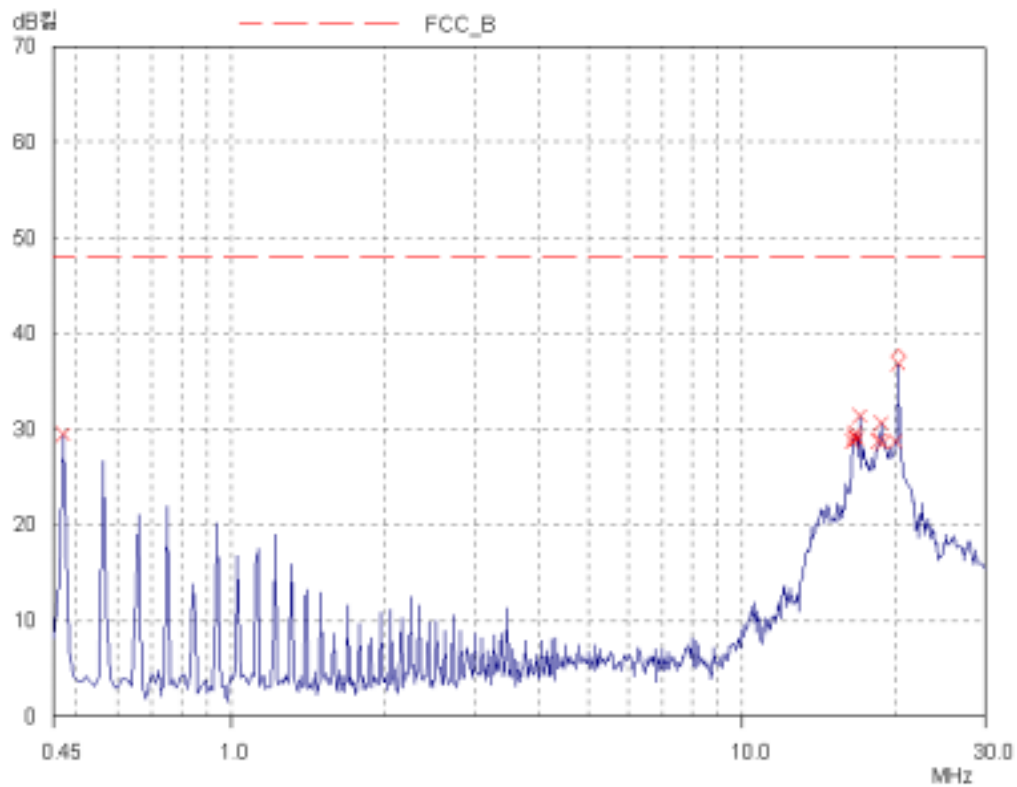
Conducted Voltage Emissions (Quasi-Peak reading)

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.47	0.5	0.1	N	48.0	28.8	29.4	18.6				
16.55	0.5	0.2	L	48.0	30.0	30.7	17.3				
16.64	0.5	0.2	L	48.0	30.2	30.9	17.1				
16.75	0.5	0.2	L	48.0	31.5	32.2	15.8				
16.85	0.5	0.2	L	48.0	30.6	31.3	16.7				
16.95	0.5	0.2	L	48.0	29.3	30.0	18.0				
17.05	0.5	0.2	L	48.0	28.3	29.0	19.0				
18.56	0.7	0.2	L	48.0	28.9	29.8	18.2				
18.66	0.7	0.2	N	48.0	29.7	30.6	17.4				
19.97	0.7	0.3	L	48.0	28.3	29.3	18.7				
20.25	0.7	0.3	L	48.0	35.9	36.9	11.1				
20.35	0.7	0.3	L	48.0	28.2	29.2	18.8				

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			
61.10	27.7	V	1.0	3.60	0.70	40.0	32.00	8.00
81.32	23.6	V	1.0	8.60	0.90	40.0	33.10	6.90
101.62	26.5	V	1.0	9.35	1.00	43.5	36.80	6.70
133.32	24.5	V	1.0	8.60	1.30	43.5	34.40	9.10
182.64	23.9	H	4.0	6.85	1.60	43.5	32.30	11.20
223.15	23.6	H	4.0	8.10	1.80	46.0	33.50	12.50
263.68	24.9	H	3.6	9.85	2.20	46.0	36.90	9.10
283.80	26.1	H	1.8	10.50	2.30	46.0	38.90	7.10
305.18	27.8	V	2.0	11.30	2.40	46.0	41.50	4.50
325.09	26.2	H	1.8	11.90	2.50	46.0	40.60	5.40
447.10	23.7	V	1.0	14.60	3.10	46.0	41.40	4.60
573.01	21.9	H	2.2	16.60	3.50	46.0	42.00	4.00