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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E01NR-016

Applicant : HAN GIL TELECOM CO., LTD.

Address : 222-1, Suwolam-Ri, Seotan-Myun, Pyungtaek-Si, Gyunggi-Do, Korea

Manufacturer : HAN GIL TELECOM CO., LTD.

Address : 222-1, Suwolam-Ri, Seotan-Myun, Pyungtaek-Si, Gyunggi-Do, Korea

Type of Equipment : 15.1" TFT LCD MONITOR (Peripheral Device for Class B Computing Device)

FCC ID : PXWHLM151X

Model / Type No. : HLM151X

Serial number : N/A

Total page of Report : 16 pages (including this page)

Date of Incoming : October 8, 2001

Date of issuing : November 7, 2001

SUMMARY

The equipment complies with the regulation; **FCC PART 15 CFR 47 SUBPART B, Class B.**

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production

Prepared by:


G. W. Lee/ Chief Engineer
EMC & Telecom Div.
ONETECH Corp.

Reviewed by:


Y. K. Kwon/ Manager
EMC & Telecom Div.
ONETECH Corp.



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1. VERIFICATION OF COMPLIANCE

APPLICANT : HAN GIL TELECOM CO., LTD.
 ADDRESS : 222-1, Suwolam-Ri, Seotan-Myun, Pyungtaek-Si, Gyunggi-Do, Korea
 CONTACT PERSON : Mr. Shin-Ku, Kang / General Manager
 TELEPHONE NO : 82-2-3016-0285
 FCC ID : PXWHLM151X
 MODEL NO/NAME : HLM151X
 SERIAL NUMBER : N/A
 DATE : November 7, 2001

DEVICE TYPE	Peripheral Device for Class B Computing Device - Unintentional Radiator
E.U.T. DESCRIPTION	15.1" TFT LCD MONITOR
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/1992
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15, SECTION 15.101 (Class B)
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



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2. GENERAL INFORMATION

2.1 Product Description

The HAN GIL TELECOM CO., LTD., Model HLM151X (referred to as the EUT in this report) is a 15.1" TFT LCD MONITOR has functions for DPMS (Display Power Management Signaling), Plug & Play, OSD (On Screen Display) Menu and Auto configuration as hot key. The applicant wants to use 2 LCD panels for the EUT. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE		Plastic
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)		14.318 MHz, 12.000MHz
POWER REQUIREMENT		90~265 Vac Less than 25W
MAX RESOLUTION		XGA 1024 x 768 @ 75Hz
FREQUENCY	HORIZONTAL	31 ~ 60 kHz
	VERTICAL	55 ~ 75 Hz
USED LCD	MODEL NO	LM151X2 and LM151X05
	MANUFACTURER	LG PHILIPS
NUMBER OF LAYERS		4 Layers (Main B'd), 1 Layer (OSD B'D and Inverter B'd)
EXTERNAL CONNECTOR		VGA Input (15pin D-SUB) and Power Input

Model Differences:

- . The following list consists of added model name and their differences: The basic and added models are identical except for following difference only.

Model No		Model Differences
Basic Model	HLM151X	
Added Model	LCD15/HG	BUYER NAME: DAEWOO TELECOM EUROPE

2.2 Related Submittal(s) / Grant(s)

Original submittal only



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2.3 Test System Details

The model numbers for all the equipments which were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
HLM151X	HAN GIL TELECOM CO., LTD.	PXWHLM151X	15.1" TFT LCD MONITOR (EUT)	PC
DESKPRO EXM	COMPAQ	DoC	PC	-
KB-9963	COMPAQ	DoC	KEYBOARD	PC
M-S48A	LOGITECH	JNZ201213	MOUSE	PC
2225C	HP	DSI6XU2225	PRINTER	PC
020-0470	CARDINAL	GDE0196	MODEM	PC

2.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.5 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Commission on January 12, 1999. (Registration Number: 92819)



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3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

The EUT has 2 LCD Panels, so tests were performed at each two panels and each test data for two panels were recorded in this report.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
MAIN B'D	HAN GIL TELECOM	HLM151M MAIN	N/A
DC/AC Inverter	DS PLUS INC	DS-1005NA-V2.0	N/A
LCD Panel #1	LG Philips Inc.	LM151X2	N/A
LCD panel #2	LG Philips Inc	LM151X05	N/A
POWER B'D	SUN KOREA	U07-1138	N/A
OSD BOARD	HAN GIL TELECOM	HLM151M FUNCTION	N/A

3.2 EUT exercise Software

The windows program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. This program was included into HOST. Once loaded, this program sequentially exercises each system component in turn. The sequence used is: (1) series of H characters are printed on the monitor until the screen is completely full, (2) copy series of H characters to mass storage device (if one is used), (3) print series of H characters to printer. The complete cycle is repeated continuously.

The test was performed about each resolution from minimum resolution to maximum resolution for getting maximum noise level and the worst investigated resolution mode of the EUT was 1024 x 768, 75Hz.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
15.1" TFT LCD MONITOR (EUT)	N	N	1.2(P), 1.5(D)
PC	N	-	1.5(P)
KEYBOARD	N/A	Y	1.2 (D)
MOUSE	N/A	Y	1.2(D)
MODEM	N	Y	1.5(P), 1.5(D)
PRINTER	N	Y	1.5(P), 1.5 (D)



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* The marked “(P)” means the Power Cable.



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3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
15.1" TFT LCD MONITOR (EUT)	Y	BOTH END	Y	BOTH END
PC	-	-	-	-
KEYBOARD	Y	PC END	Y	PC END
MOUSE	N	N/A	Y	PC END
MODEM	N	N/A	Y	BOTH END
PRINTER	N	N/A	Y	BOTH END

3.5 Equipment Modifications

To achieve compliance to CLASS B levels, the following change(s) was made by ONETECH Corp. during compliance testing:

“There was no Modified items during EMI test”

3.6 Configuration of Test System

Line Conducted Test: The EUT was connected to AC/DC adapter and the adapter was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emission test was conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.



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4. PRELIMINARY TEST

4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Resolution: 640 X 480	
Resolution: 800 X 600	
Resolution: 1024 X 768	X

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Resolution: 640 X 480	
Resolution: 800 X 600	
Resolution: 1024 X 768	X



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5. FINAL RESULT OF MEASUREMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

5.1 Conducted Emission Test

5.1.1 USED LCD PANEL : LM151X2

Humidity Level : 55 %

Temperature : 19°C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107

Type of Test : CLASS B

Result : PASSED BY -14.08 dB at 10.81 MHz

EUT : 15.1" TFT LCD MONITOR

Date: November 09, 2001

Operating Condition : Resolution 1024 x 768 mode

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Power Line Conducted Emission			FCC CLASS B	
Frequency (MHz)	Amplitude (dBuV)	Conductor	Limit (dBuV)	Margin (dB)
0.51	28.69	NEUTRAL	48.00	-19.31
0.58	28.79	HOT	48.00	-19.21
8.1	28.01	HOT	48.00	-19.99
10.81	33.92	HOT	48.00	-14.08
22.06	27.22	HOT	48.00	-20.78
27.29	27.51	HOT	48.00	-20.49

Line Conducted Emission Tabulated Data

Tested by: Young-Min, Choi/Project Engineer

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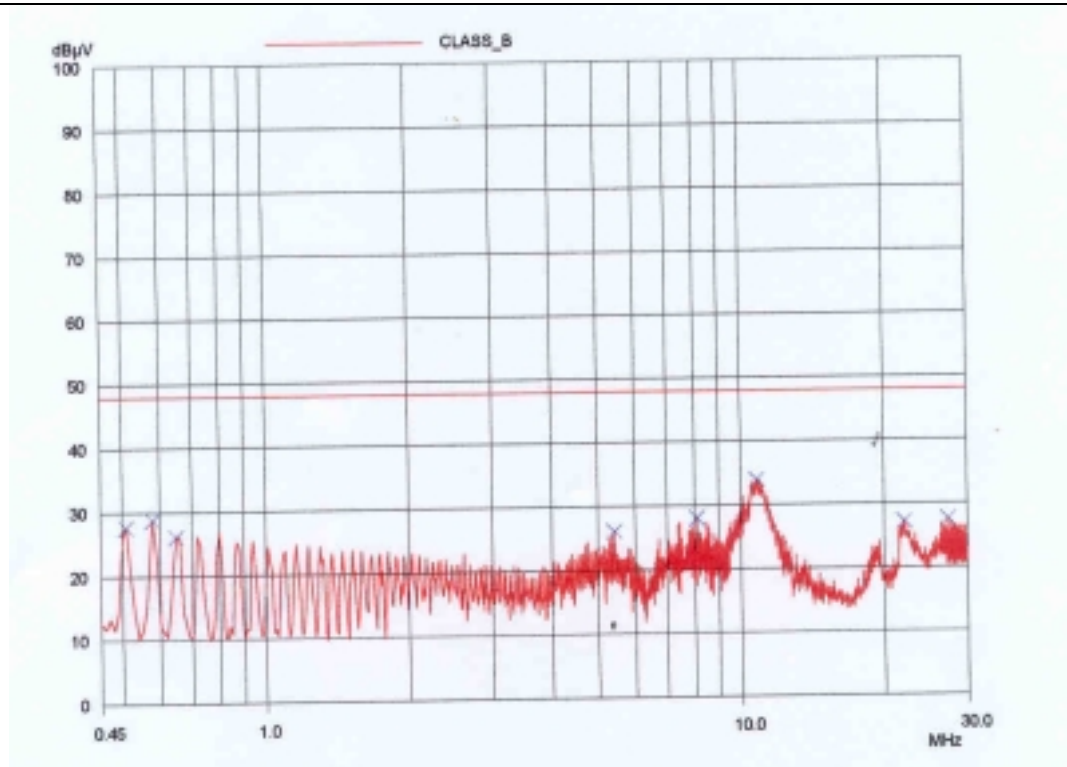
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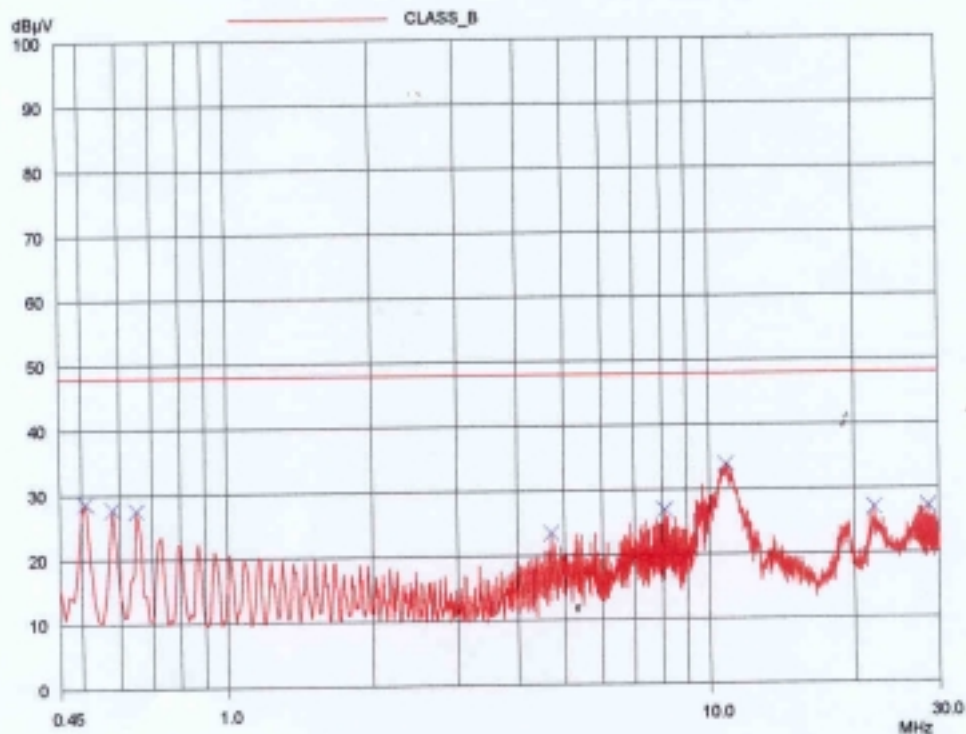
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HOT LINE





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NEUTRAL LINE



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5.1.2 USED LCD PANEL : LM151X05

Humidity Level : 55 %

Temperature : 19°C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107

Type of Test : CLASS B

Result : PASSED BY -16.50 dB at 10.77 MHz

EUT : 15.1" TFT LCD MONITOR

Date: November 09, 2001

Operating Condition : Resolution 1024 x 768 mode

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

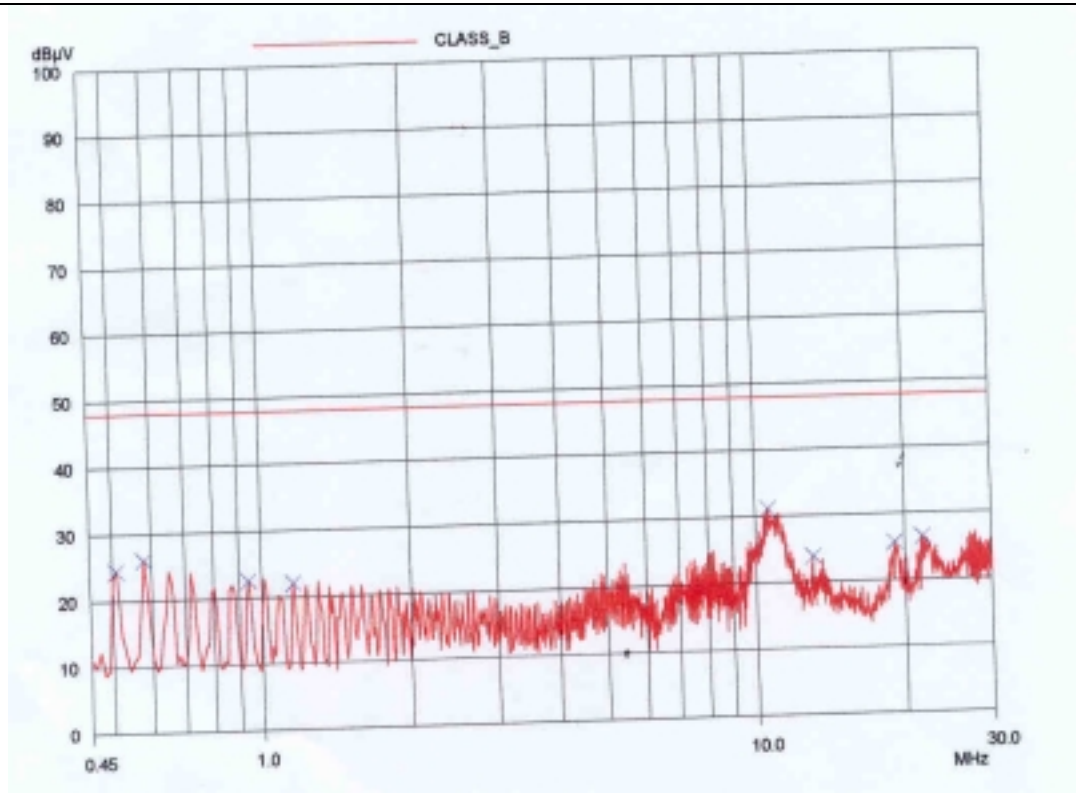
Power Line Conducted Emission			FCC CLASS B	
Frequency (MHz)	Amplitude (dBuV)	Conductor	Limit (dBuV)	Margin (dB)
0.58	26.04	HOT	48.00	-21.96
10.77	31.50	NEUTRAL	48.00	-16.50
19.53	28.54	NEUTRAL	48.00	-19.46
21.75	26.43	HOT	48.00	-21.57
22.15	26.64	NEUTRAL	48.00	-21.36
27.29	27.16	NEUTRAL	48.00	-20.84

Line Conducted Emission Tabulated Data

Tested by: Young-Min, Choi/Project Engineer



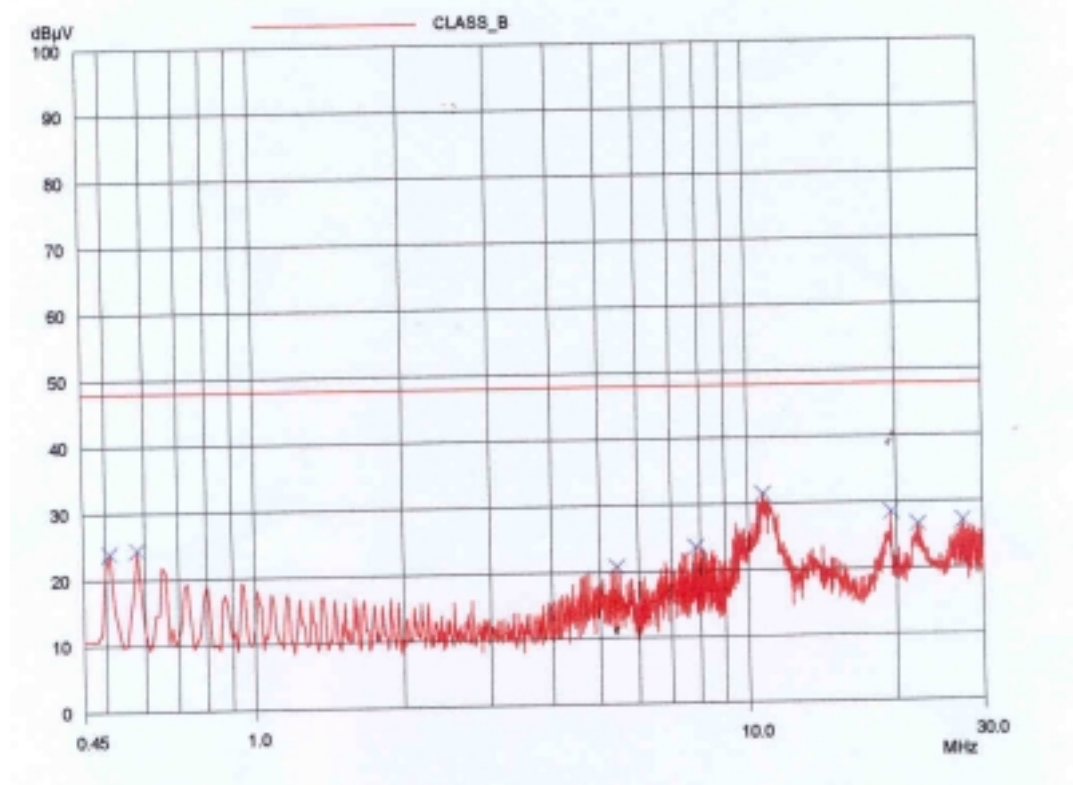
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HOT LINE



NEUTRAL LINE



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5.2 Radiated Emission Test

5.2.1 USED LCD PANEL : LM151X2

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 56 % Temperature : 15 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109
Type of Test : CLASS B
Result : PASSED BY -3.84 dB at 705.00 MHz

EUT : 15.1" TFT LCD MONITOR Date: November 05, 2001
Operating Condition : Resolution 1024 x 768 mode
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
Distance : 3 Meter

Radiated Emissions		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
67.09	20.30	H	8.33	1.00	29.63	40.00	-10.37
87.33	21.50	V	7.78	1.10	30.38	40.00	-9.62
168.00	14.10	H	15.54	1.42	31.06	43.50	-12.44
269.00	23.70	H	12.72	1.88	38.30	46.00	-7.70
370.20	20.50	V	14.76	2.37	37.63	46.00	-8.37
378.60	20.90	V	14.89	2.40	38.19	46.00	-7.81
394.40	23.20	V	15.30	2.42	40.92	46.00	-5.08
402.80	21.30	V	15.49	2.44	39.23	46.00	-6.77
488.80	20.00	V	17.39	2.64	40.03	46.00	-5.97
629.60	15.40	H	19.30	3.01	37.71	46.00	-8.29
705.00	18.00	V	20.82	3.34	42.16	46.00	-3.84
773.20	15.40	V	20.85	3.60	39.85	46.00	-6.15

Radiated Emissions Tabulated Data

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(TEL: 82-31-746-8500 FAX: 82-31-746-8700)

EMC Testing Dept : 426-1 Daeangryong-Ri Chong-Myun Kwangju-City, Kyunggi-Do 464-860 Korea (TEL: 82-31-765-8289 FAX: 82-31-766-2904)



Tested by: Young-Min, Choi/Project Engineer



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5.2.2 USED LCD PANEL : LM151X05

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 56 %

Temperature : 15 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109

Type of Test : CLASS B

Result : PASSED BY -5.39 dB at 472.80 MHz

EUT : 15.1" TFT LCD MONITOR

Date: November 06, 2001

Operating Condition : Resolution 1024 x 768 mode

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

Distance : 3 Meter

Radiated Emissions		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
67.09	19.10	H	8.33	1.00	28.43	40.00	-11.57
87.33	21.80	V	7.78	1.10	30.67	40.00	-9.33
100.78	24.20	V	11.91	1.15	37.26	43.50	-6.24
167.96	18.40	V	15.53	1.42	35.35	43.50	-8.15
214.40	18.70	H	10.94	1.64	31.28	43.50	-12.22
239.80	25.20	H	11.35	1.78	38.33	46.00	-7.67
394.40	17.70	V	15.30	2.42	35.42	46.00	-10.58
472.80	21.00	V	17.01	2.60	40.61	46.00	-5.39
503.80	19.40	V	17.65	2.69	39.74	46.00	-6.26
570.60	17.50	V	18.49	2.85	38.84	46.00	-7.16

Radiated Emissions Tabulated Data

Tested by: Young-Min, Choi/Project Engineer

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6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)



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7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS 10	827864/005	OCT/01	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	APR/01	12MONTH	■
3.	Spectrum analyzer	HP	8568B	3109A05456	APR/01	12MONTH	■
4.	RF preselector	HP	85685A	3107A01264	APR/01	12MONTH	■
5.	Quasi-Peak Adapter	HP	85650A	3107A01542	APR/01	12MONTH	■
6.	Biconical antenna	EMCO	3104C	9109-4441 9109-4443 9109-4444	APR/01	12MONTH	■
7.	Log Periodic antenna	EMCO	3146	9109-3213 9109-3214 9109-3217	APR/01	12MONTH	■
8.	LISN	EMCO	3825/2	9109-1867 9109-1869	JUL/01	12MONTH	■
9.	Computer System	HP	98581C	98543A	N/A	N/A	■
	Hard disk drive		9153C	CMC762Z9153	N/A	N/A	■
10.	Plotter	HP	7475A	30052 22986	N/A	N/A	■
11.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
12.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
13.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■