



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E03DR-006

Applicant : ATEC SYSTEM CO., LTD.

Address : #1451-78, Seocho-Dong, Seocho-Gu, Seoul, 137-866, Korea

Manufacturer : ATEC SYSTEM CO., LTD.

Address : #1451-78, Seocho-Dong, Seocho-Gu, Seoul, 137-866, Korea

Type of Equipment : 15" LCD MONITOR

FCC ID. : PDLAL150N

Model Name : AL150N

Serial number : N/A

Total page of Report : 13 pages (including this page)

Date of Incoming : October 27, 2003

Date of Issuing : December 02, 2003

SUMMARY

The equipment complies with the regulation; *PART 15 SUBPART B, Class B Computing Device Peripherals.*

This test report contains only the result 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.

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**1. VERIFICATION OF COMPLIANCE**

- APPLICANT : ATEC SYSTEM CO., LTD.
- ADDRESS : #1451-78, Seocho-Dong, Seocho-Gu, Seoul, 137-866, Korea
- CONTACT PERSON : Mr. Dong-Suk, Cha / Research Engineer
- TELEPHONE NO. : +82-2-2190-5152
- FCC ID : PDLAL150N
- MODEL NAME : AL150N
- SERIAL NUMBER : N/A
- DATE : December 02, 2003

DEVICE TYPE	Peripheral Device for Class B Personal Computing Device -UNINTENTIONAL RADIATOR
E.U.T. DESCRIPTION	15" LCD MONITOR
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4: 2001
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART (S)	PART 15 SUBPART B, SECTION 15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	N/A
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

- This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 affected by the 15.37(j) transition provisions.
- 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.



2. GENERAL INFORMATION

2.1 Product Description

The ATEC SYSTEM CO., LTD., Model AL150N (referred to as the EUT in this report) is a 15" LCD MONITOR that is connected a personal computer. The 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)	12.000 MHz and 24.576 MHz on the main board
LCD PANEL SPEC.	LM150X06 (A4) / LG Philips LCD
DISPLAY MODE	Normally White
DISPLAY RESOLUTION	Maximum: 1024 X 768, 75Hz
POWER REQUIREMENT	DC 12V, 3.33A, 40W(Max) from the AC/DC Adaptor
USED AC/DC ADAPTOR	LSE0107A1240 manufactured by LI SHIN
NUMBER OF LAYERS	Main Board: 4 Layers OSD Board & Inverter Board: 2 Layers
EXTERNAL CONNECTORS	Audio In/Out, DC In

2.2 Model Differences:

-. None

2.3 Related Submittal(s) / Grant(s)

-. Original submittal only



2.4 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
AL150N	ATEC SYSTEM CO., LTD.	PDLAL150N	15" LCD MONITOR(EUT)	Notebook PC
LSE0107A1240	LI SHIN	N/A	AC/DC ADAPTOR	EUT
S690	Samsung Elec.	DoC	NOTEBOOK PC	-
AD-6019 (V)	Samsung Elec.	N/A	AC/DC ADAPTER(Notebook PC)	Notebook PC
M-SAS51	Logitech	JNZ211167	MOUSE	Notebook PC
2225C	HP	DSI6XU2225	PRINTER	Notebook PC
020-0470	Cardinal	GDE0196	MODEM	Notebook PC
SMS-015N	Sungil Precision Co., Ltd.	N/A	SPEAKER	EUT

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2001.

Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Gwangju-Si, Gyeonggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (Registration Number: 92819)



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.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	N/A	N/A	N/A
OSD Board	N/A	AL170 OSD	N/A
Inverter Board	DS-PLUS INC.	DS-1005WK	N/A
LCD Panel	LG Philips LCD	LM150X06 (A4)	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 investigated maximum 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" LCD MONITOR (EUT)	N	Y	1.5(P), 1.5(D)
AC/DC ADAPTOR	N	N (DC OUT)	1.5(P), 1.2(D)
NOTEBOOK PC	N	-	1.5 (P), -
AC/DC ADAPTOR(Notebook PC)	N	N (DC OUT)	1.5(P), 1.2(D)
MOUSE	N/A	Y	1.2(D)
PRINTER	N	Y	1.8(P), 1.2(D)
SPEAKER	N/A	N	1.2(D)
MODEM	N	Y	1.8(P), 1.2(D)

* The marked "(D)" means the I/O Cable and "(P)" means the Power Cable.

3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
15" LCD MONITOR (EUT)	Y	BOTH END	Y	BOTH END
AC/DC ADAPTOR	Y	EUT END	Y	EUT END
NOTEBOOK PC	-	-	-	-
AC/DC ADAPTOR(Notebook PC)	Y	NOTEBOOK END	Y	NOTEBOOK END
MOUSE	N	N/A	Y	NOTEBOOK END
PRINTER	N	N/A	Y	BOTH END
SPEAKER	N	N/A	Y	BOTH END
MODEM	N	N/A	Y	BOTH END

3.5 Equipment Modifications

- . None



3.6 Configuration of Test System

Line Conducted Test: The power of the EUT was supplied by AC/DC adaptor and the adaptor was connected to LISN. All supporting equipments were connected to another LISN. Exploratory Power line Conducted Emission measurement was performed by using the procedure in ANSI C63.4: 2001, 7.2.3 to determine the worse operating conditions.

Radiated Emission Test: Exploratory radiated emission measurement was conducted using the procedure in ANSI C63.4: 2001, 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.

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



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

Humidity Level : 36% Temperature : 21°C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107(a)
 Type of Test : CLASS B
 Result : PASSED BY -8.36 dB at 0.19 MHz under Peak detector mode

EUT : 15" LCD MONITOR Date : October 29, 2003
 Operating Condition : Continuously displayed "H" characters on the screen of the EUT
 Detector : CISPR Quasi-Peak and Average(6 dB Bandwidth: 9 kHz)
 Resolution : 1024 X 768, 75Hz

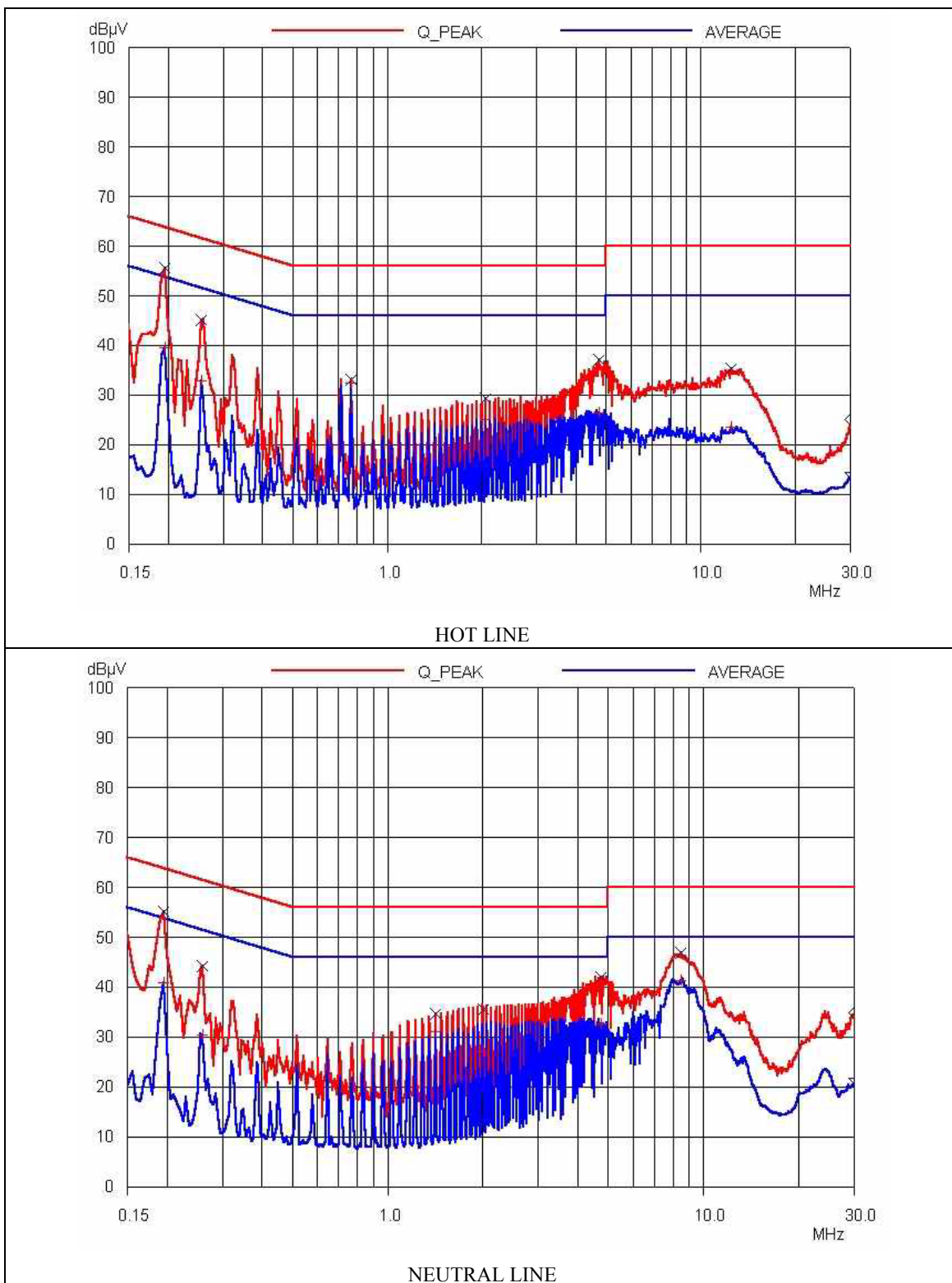
Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.19	H	55.46	63.82	-8.36
0.25	H	45.05	61.59	-16.54
1.42	N	34.56	56.00	-21.44
2.00	N	35.61	56.00	-20.39
4.71	N	42.05	56.00	-13.95
8.45	N	46.87	60.00	-13.13
Frequency (MHz)	Line	Average (dBuV)		Margin (Db)
		Emission level	Limits	
0.19	H	39.58	53.82	-14.24
1.42	N	30.99	46.00	-15.01
4.71	N	32.55	46.00	-13.45
8.45	N	41.23	50.00	-8.77

Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

See next page for an overview sweep performed with peak and average detector.

Tested by: Sue-Yong, Lee / Test Engineer





5.2 Radiated Emission Test for Digital mode

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

Humidity Level : 33 % Temperature : 23°C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109(a)
 Type of Test : CLASS B
 Result : PASSED BY -3.29 dB at 381.10 MHz

EUT : 15" LCD MONITOR Date : October 27, 2003
 Operating Condition : Continuously displayed "H" characters on the screen of the EUT
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
 Distance : 3 Meter
 Resolution : 1024 X 768, 75Hz

Radiated Emission		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)
78.50	11.10	V	6.58	0.61	18.29	40.00	-21.71
102.80	10.90	V	10.81	0.71	22.42	43.52	-21.10
109.50	12.10	V	11.67	0.50	24.27	43.52	-19.25
121.00	23.70	V	13.11	0.30	37.11	43.52	-6.41
134.80	17.40	V	14.13	0.49	32.02	43.52	-11.50
215.00	18.10	H	16.74	0.74	35.58	43.52	-7.94
269.60	23.80	H	17.89	0.44	42.13	46.02	-3.89
306.50	21.80	H	13.71	0.65	36.16	46.02	-9.86
338.50	25.50	H	14.28	0.85	40.63	46.02	-5.39
381.10	26.50	H	15.28	0.95	42.73	46.02	-3.29
473.30	24.30	H	17.05	1.07	42.42	46.02	-3.60
811.10	20.21	H	21.18	1.31	42.70	46.02	-3.32
885.50	12.23	H	22.27	1.41	35.91	46.02	-10.11

Radiated Emission Tabulated Data

Tested by: Sue-Yong, Lee / Test Engineer



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)



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	NOV/03	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	APR/03	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	MAY/03	12MONTH	
4.	Spectrum analyzer	HP	8568B	3109A05456	MAY/03	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	MAY/03	12MONTH	■
6.	Quasi-Peak Adapter	HP	85650A	3107A01542	MAY/03	12MONTH	■
7.	Matching Pad	TME	ZT-130	9F 954	N/A	N/A	
8.	Color Pattern Generator	LEADER	LT416	3347622	N/A	N/A	
9.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	FEB/03	12MONTH	
10.	Biconical antenna	EMCO	3104C	9109-4443	MAY/03	12MONTH	
				9109-4444	JUL/03	12MONTH	■
		Schwarzbeck	VHA9103	91031852	AUG/02	12MONTH	
11.	Log Periodic antenna	EMCO	3146	9109-3213	AUG/02	12MONTH	
				9109-3214	JUL/03	12MONTH	■
				9109-3217	MAY/03	12MONTH	
		Schwarzbeck	9108-A(494)	62281001	AUG/02	12MONTH	
12.	LISN	EMCO	3825/2	9109-1867	AUG/03	12MONTH	■
				9109-1869	OCT/03	12MONTH	■
13.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
14.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
15.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■

* Mark “■” means used equipment.