



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test Report No. : E048R-043

Applicant : ATEC CO., LTD.
Address : #1451-78, Seocho-Dong, Seocho-Gu, Seoul, 137-867, Korea

Manufacturer : ATEC CO., LTD.
Address : #1451-78, Seocho-Dong, Seocho-Gu, Seoul, 137-867, Korea

Type of Equipment : 19" LCD Monitor

FCC ID. : PDLAL190N

Model Name : AL190N

Serial Number : N/A

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

Date of Incoming : August 02, 2004

Date of Issuing : August 17, 2004

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.

Prepared by: 

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**1. VERIFICATION OF COMPLIANCE**

APPLICANT : ATEC CO., LTD.
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CONTACT PERSON : Mr. Dong-Suk, Cha / Research Engineer
TELEPHONE NO. : +82-2-2190-5152
FCC ID : PDLAL190N
MODEL NAME : AL190N
SERIAL NUMBER : N/A
DATE : August 17, 2004

DEVICE TYPE	Peripheral Device for Class B Personal Computing Device -UNINTENTIONAL RADIATOR
E.U.T. DESCRIPTION	19" 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	No
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 CO., LTD., Model AL190N (referred to as the EUT in this report) is a 19" 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, 24.576 MHz, 27.000 MHz and 6.000 MHz on the main board
LCD PANEL SPEC.	LM190E01 / LG Philips LCD
DISPLAY MODE	Normally White
DISPLAY RESOLUTION	Maximum: 1280 x 1024, 75Hz
POWER REQUIREMENT	DC 12V, 4.16A from the AC/DC Adaptor
USED AC/DC ADAPTERS	LSE9901B1250 manufactured by Li Shin International Enterprise Corp.
NUMBER OF LAYERS	2 Layers : Inverter Board and OSD Board 4 Layers : Main Board
EXTERNAL CONNECTORS	RGB, DVI, Audio In/Out, Composite, S-Video, 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	Description	FCC ID	Connected to
AL190N	ATEC CO., LTD.	19" LCD Monitor(EUT)	PDLAL190N	Notebook PC
LSE9901B1250	Li Shin International	AC/DC ADAPTER	N/A	EUT
PP01L	DELL	Notebook PC	DoC	-
SMS-015N	SUNGIL	SPEAKER	N/A	EUT
2225C	HP	PRINTER	DSI6XU2225	Notebook PC



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 the 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, Kwangju-City, Kyunggi-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	AL190C	N/A
OSD Board	N/A	AL190N OSD	N/A
Inverter Board	DS-Plus Inc	DS-1007WF	N/A
LCD Panel	LG Philips LCD	LM190E01	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 1280 x 1024, 75Hz.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
19" LCD Monitor (EUT)	N	Y	1.5(P), 1.5(D)
AC/DC ADAPTER	N	N/A	1.5(P)
NOTEBOOK PC	N	-	1.8(P)
PRINTER	N	Y	1.8(P), 1.5(D)
SPEAKER	N/A	N	1.5(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
19" LCD Monitor (EUT)	Y	BOTH END	Y	BOTH END
AC/DC ADAPTER	Y	EUT END	Y	EUT END
NOTEBOOK PC	-	-	-	-
PRINTER	N	N/A	Y	BOTH END
SPEAKER	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 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: 2001 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: 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: 800 x 600	-
Resolution: 1024 x 768	-
Resolution: 1280 x 1024	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: 800 x 600	-
Resolution: 1024 x 768	-
Resolution: 1280 x 1024	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 : 42%

Temperature :

24°C

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

Type of Test : CLASS B

Result : PASSED BY -12.75 dB at 23.88 MHz

EUT : 19" LCD Monitor

Date: August 11, 2004

Operating Condition : Continuously displayed "H" characters on the screen of the EUT

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

Resolution : 1280 x 1024, 75Hz

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.19	H	49.05	64.04	-14.99
0.63	N	41.04	56.00	-14.96
4.17	H	39.98	56.00	-16.02
15.81	N	44.55	60.00	-15.45
23.88	H	47.25	60.00	-12.75
28.02	H	45.13	60.00	-14.87
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
-				
-				

Line Conducted Emission Tabulated Data

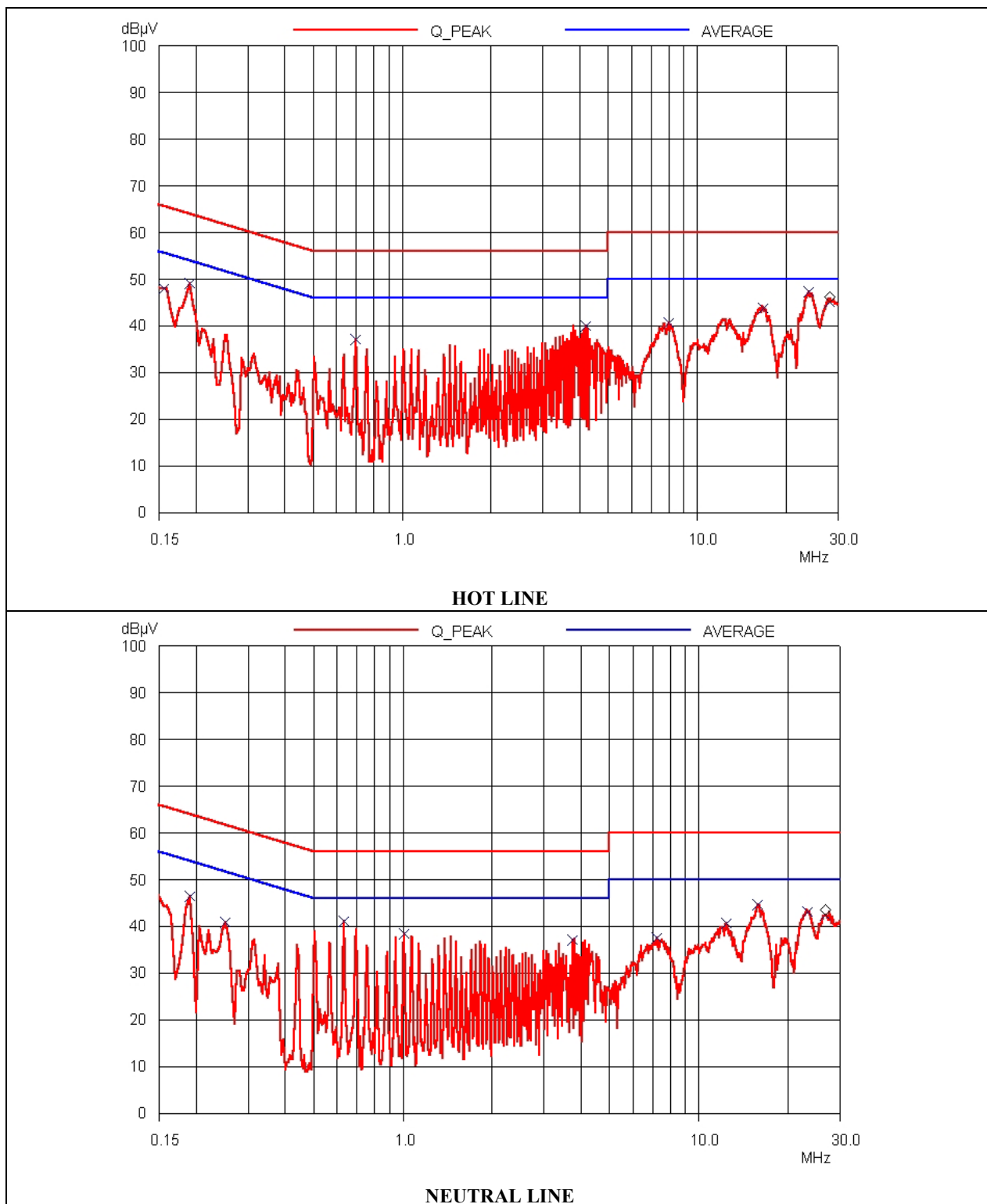
Remark : "H": Hot Line, "N": Neutral line

Average mode was not measured, because Peak values were under the average limit.

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



Tested by: S. Y. Lee / Project 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 : 39 % Temperature : 25°C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109(a)
 Type of Test : CLASS B
 Result : PASSED BY -2.12 dB at 752.89 MHz

EUT : 19" LCD Monitor Date: August 12, 2004
 Operating Condition : Continuously displayed "H" characters on the screen of EUT
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
 Frequency Range : 30 MHz – 1000 MHz
 Distance : 3 Meter
 Resolution : 1280 x 1024, 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)
71.70	28.40	V	5.18	1.53	35.11	40.00	-4.89
100.74	22.72	H	10.58	1.90	35.20	43.52	-8.32
225.74	15.40	H	16.98	2.50	34.88	46.02	-11.14
360.44	21.09	H	14.77	3.14	39.00	46.02	-7.02
405.98	19.25	V	15.96	3.49	38.70	46.02	-7.32
677.31	18.54	H	20.11	4.25	42.90	46.02	-3.12
752.89	17.35	H	22.14	4.41	43.90	46.02	-2.12
947.66	14.04	H	22.81	5.25	42.10	46.02	-3.92

Radiated Emission Tabulated Data

Tested by: S. Y. Lee / Project 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	DEC/03	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/04	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	JUL/04	12MONTH	
4.	Spectrum analyzer	HP	8568B	3109A05456	JUL/04	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	APR/04	12MONTH	■
6.	Quasi-Peak Adapter	HP	85650A	3107A01542	JUL/04	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	FEB/04	12MONTH	
8.	Biconical antenna	EMCO	3104C	9109-4443	MAY/04	12MONTH	
		Schwarzbeck	VHA9103	91031852	JAN/04		■
9.	Log Periodic antenna	EMCO	3146	9109-3213	FEB/04	12MONTH	
				9109-3217	MAY/04		
		Schwarzbeck	9108-A(494)	62281001	JAN/04		■
10.	LISN	EMCO	3825/2	9109-1867	JUL/04	12MONTH	■
				9109-1869	OCT/03		■
11.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
12.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
13.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■