ELECTROMAGNETIC EMISSION COMPLIANCE REPORT
FOR FCC CLASS B CERTIFICATION

Test report file number	**: E02DR-003**
Applicant	**: ATEC SYSTEM CO., LTD.**
Address	**: #1451-78, Seocho-Dong, Seocho-Gu, Seoul, 137-867, Korea**
Manufacturer	**: ATEC SYSTEM CO., LTD.**
Address	**: #1451-78, Seocho-Dong, Seocho-Gu, Seoul, 137-867, Korea**
Type of Equipment	**: 18.1" TFT LCD MONITOR (Class B Computing Device Peripheral)**
FCC ID	**: PDLAL181N**
Model Name	**: AL181N**
Multiple Model Name	**: N/A**
Serial number	**: N/A**
Total page of Report	**: 13 pages (including this page)**
Date of Incoming	**: September 10, 2002**
Date of Issuing	**: December 02, 2002**

SUMMARY

The equipment complies with the requirements of **FCC CFR 47 PART 15 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:
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EMC Div.
ONETECH Corp.

Reviewed by:
Y. K. Kwon/ Director
EMC Div.
ONETECH Corp.

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1. VERIFICATION OF COMPLIANCE

-. APPLICANT : ATEC SYSTEM CO., LTD.
-. ADDRESS : #1451-78, Seocho-Dong, Seocho-Gu, Seoul, 137-867, Korea
-. CONTACT PERSON : Mr. Jeong-Hee, Oh / Research Engineer
-. TELEPHONE NO : +82-2-2190-5155
-. FCC ID : PDLAL181N
-. MODEL NO/NAME : AL181N
-. SERIAL NUMBER : N/A
-. DATE : December 02, 2002

DEVICE TYPE	Class B Computing Device Peripheral - Unintentional Radiator
E.U.T. DESCRIPTION	18.1" 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
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 ATEC SYSTEM CO., LTD., Model AL181N (referred to as the EUT in this report) is 18.1" TFT LCD MONITOR that is adopted the 18.1" LCD(Liquid Crystal Display) Narrow Bezel panel which allows you efficient use in a small space due to the slim design with wild screen.. 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, 6 MHz, 24.576MHz on Main Board 12 MHz on USB Board
POWER REQUIREMENT	DC12V, 5A from AC/DC adapter
MAX RESOLUTION	SXGA 1280 x 1024 @ 75Hz
NUMBER OF LAYERS	4 Layers (MIB B'd), 2 Layers (Inverter B'D, USB B'd, OSD B'd, TV Tuner B'D)
EXTERNAL CONNECTOR	VGA INPUT (15pin D-SUB), DVI-D INPUT, VIDEO IN (RCA Type), VIDEO IN (S-Video Type), AUDIO IN/OUT, DC IN, USB Up, USB Down x 2EA

Model Differences:

The difference(s) compared to the EUT is as follows: none

2.2 Related Submittal(s) / Grant(s)

Original submittal only

2.3 Test System Details

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

Model	Manufacturer	FCC ID.	Description	Connected to
AL181N	ATEC SYSTEM CO., LTD.	PDLAL181N	18.1" TFT LCD MONITOR(EUT)	PC
LSE9901B1260	LI SHIN INTERNATIONAL	N/A	AC/DC Adapter	EUT
PCA-3100	Prochips	MY8PCA3100	USB Camera	EUT
SMU100A	Diography Inc.	DoC	Smart Card Reader (USB)	EUT
GHV-S9990	GoldStar	N/A	VTR	EUT
-	-	N/A	EARPHONE	EUT
DeskPro EXM	Compaq	DoC	PC	-
KB-9963	COMPAQ	DoC	KEYBOARD	PC
X06-08477	Microsoft Corp.	DoC	MOUSE	PC
2225C	HP	DSI6XU2225	PRINTER	PC
020-0470	CARDINAL	GDE0196	MODEM	PC

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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.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
MID Board	ATEC SYSTEM CO., LTD.	MID180	N/A
USB Board	ATEC SYSTEM CO., LTD.	AL180 USB	N/A
OSD Board	ATEC SYSTEM CO., LTD.	AL180 OSD	N/A
TV Tuner	LG	TAPC-H701F	N/A
Inverter Board	DS-Plus Inc.	DS-1008WC	N/A
LCD Panel	LG. PHILIPS LCD	LM181E06 (A4M1)	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 investigated resolution mode of the EUT was at 1280 x 1024 at 75Hz.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
18.1" TFT LCD MONITOR (EUT)	N	Y	1.5(P), -
AC/DC ADAPTER	N	N	1.5(P), 1.2(D)
USB Camera	N/A	Y	1.2(D)
Smart Card Reader (USB)	N/A	Y	1.2(D)
VTR	N	N	1.5(P), 1.2(D)
EARPHONE	N/A	N	1.2(D)
PC	N	-	1.5(P)
MOUSE	N/A	Y	1.2(D)
KEYBOARD	N/A	Y	1.2(D)
PRINTER	N	Y	1.5(P), 1.5(D)
MODEM	N	Y	1.5(P), 1.5(D)

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

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3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
18.1" TFT LCD MONITOR (EUT)	Y	BOTH END	Y	BOTH END
AC/DC ADAPTER	Y	EUT END	Y	EUT END
USB Camera	N	N/A	Y	EUT END
Smart Card Reader (USB)	N	N/A	Y	EUT END
EARPHONE	N	N/A	Y	EUT END
VTR	N	N/A	Y	BOTH END
PC	-	-	-	-
MOUSE	N	N/A	Y	PC END
KEYBOARD	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 were 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: 640x480	
Resolution: 800x600	
Resolution: 1024x768	
Resolution: 1280x1024	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: 640x480	
Resolution: 800x600	
Resolution: 1024x768	
Resolution: 1280x1024	X

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5. FINAL RESULT OF MEASURMENT

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 : 48 % Temperature: 19 °C

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

Type of Test : CLASS B

Result : PASSED BY –13.06 dB at 3.87 MHz

EUT : 18.1" TFT LCD MONITOR Date: November 02, 2001

Operating Condition : Resolution 1280x1024 mode

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

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.18	H	51.30	64.49	-13.19
0.30	H	40.72	60.24	-19.52
1.25	H	30.86	56.00	-25.14
3.87	H	42.94	56.00	-13.06
4.10	N	41.40	56.00	-14.60
13.39	N	37.03	60.00	-22.97
Frequency (MHz)	**Line**	**Average (dBuV)**		**Margin (dB)**
		Emission level	**Limits**	
-				
-				

Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line, "P": Peak detect

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

See Appendix I for an overview sweep performed with peak detector.

Tested by: Sue-Yong, Lee / Test Engineer

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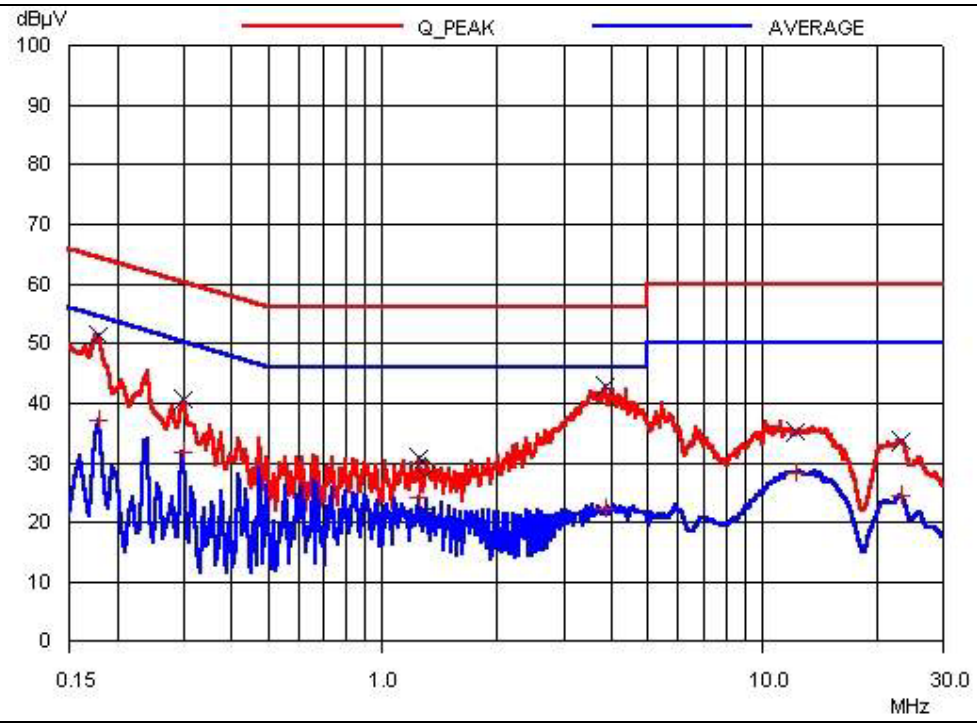
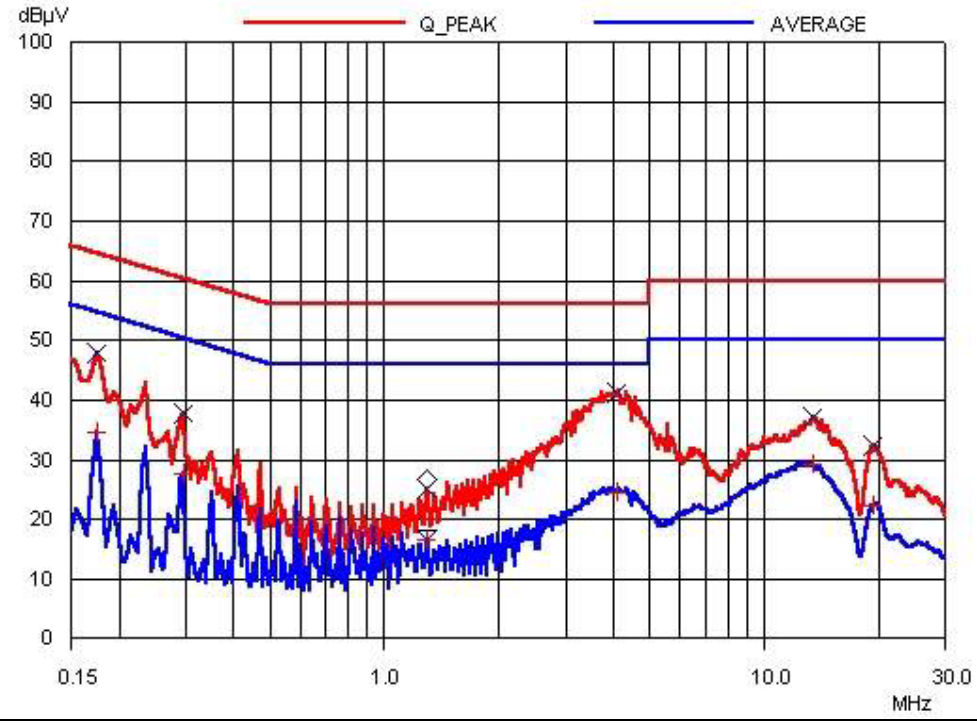


HOT LINE



NEUTRAL LINE

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5.2 Radiated Emission Test

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

Humidity Level : 51 % Temperature: 16 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)
Type of Test : CLASS B
Result : PASSED BY –3.60dB at 458.80MHz

EUT : 18.1" TFT LCD MONITOR Date: December 12, 2001
Operating Condition : Resolution 1280x1024 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)
45.25	24.00	V	10.81	0.88	35.69	40.00	-4.31
51.85	20.80	V	10.53	0.95	32.28	40.00	-7.72
64.75	20.80	V	8.56	1.00	30.36	40.00	-9.64
71.95	20.70	V	7.40	1.00	29.10	40.00	-10.90
78.15	19.90	V	6.73	1.00	27.63	40.00	-12.37
84.02	27.63	V	7.32	1.08	36.03	40.00	-3.97
103.88	20.86	V	12.50	1.17	34.53	43.50	-8.97
129.53	19.70	V	13.00	1.26	33.96	43.50	-9.54
155.30	17.30	H	14.63	1.37	33.30	43.50	-10.20
204.49	20.30	H	10.93	1.59	32.82	43.50	-10.68
243.40	19.80	H	11.78	1.80	33.38	46.00	-12.62
280.00	14.20	H	13.34	1.91	29.45	46.00	-16.55
359.40	16.70	H	14.51	2.32	33.53	46.00	-12.47
370.20	16.30	H	14.57	2.37	33.24	46.00	-12.76
383.20	14.20	H	14.80	2.40	31.40	46.00	-14.60
396.20	14.10	H	15.13	2.42	31.65	46.00	-14.35
404.60	16.50	V	15.31	2.44	34.25	46.00	-11.75
458.80	23.30	H	16.53	2.57	42.40	46.00	-3.60
504.02	22.10	V	17.52	2.69	42.31	46.00	-3.69
675.02	15.30	V	20.75	3.18	39.23	46.00	-6.77

Radiated Emissions Tabulated Data

Remark: “H”: Horizontal, “V”: Vertical

Tested by: Sue-Yong, Lee / Test 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/02	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	APR/02	12MONTH	■
3.	Spectrum analyzer	HP	8568B	3109A05456	APR/02	12MONTH	■
4.	RF preselector	HP	85685A	3107A01264	APR/02	12MONTH	■
5.	Quasi-Peak Adapter	HP	85650A	3107A01542	APR/02	12MONTH	■
6.	Biconical antenna	EMCO	3104C	9109-4441 9109-4443 9109-4444	APR/02	12MONTH	■
7.	Log Periodic antenna	EMCO	3146	9109-3213 9109-3214 9109-3217	APR/02	12MONTH	■
8.	LISN	EMCO	3825/2	9109-1867 9109-1869	AUG/02	12MONTH	■
9.	Computer System Hard disk drive	HP	98581C 9153C	98543A CMC762Z9153	N/A N/A	N/A N/A	■ ■
10.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
11.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
12.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■

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