



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E036R-090

Applicant : BTC Korea Co., Ltd.

Address : BTC B/D. 307, Yangjae-Dong, Seocho-Ku, Seoul, Korea.

Manufacturer : BTC Korea Co., Ltd.

Address : 439-1, Sanggi-li, Pongdam-eub, Hwasung-si, Kyungki-do, Korea

Type of Equipment : LCD Monitor

FCC ID. : LAK151P

Model Name : 151P

Serial Number : N/A

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

Date of Incoming : May 13, 2003

Date of Issuing : June 26, 2003

SUMMARY

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

This test report contains only the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

Prepared by:


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**1. VERIFICATION OF COMPLIANCE**

APPLICANT : BTC Korea Co., Ltd.
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CONTACT PERSON : Mr. Il-Jun, Choi / Manager
TELEPHONE NO. : +82-2-3461-6466
FCC ID : LAK151P
MODEL NAME : 151P
SERIAL NUMBER : N/A
DATE : June 26, 2003

DEVICE TYPE	Peripheral Device for Class B Computing Device -UNINTENTIONAL RADIATOR
E.U.T. DESCRIPTION	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	YES
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 and is not 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 BTC Korea Co., Ltd., Model 151P (referred to as the EUT in this report) is a 15" TFT-LCD Monitor with TV Tuner. The Verification report for the TV Tuner in the EUT shall be issued with other test report numbers. The Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic – Non coated
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	14.31818 MHz and 24.576MHz on the main board
LCD PANEL SPEC.	HSD150MX49 / HANNSTAR
INPUT VIDEO SIGNAL	VGA Compatible Analog RGB
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 ADAPTERS	LSE0107A1240 Manufactured by Li Shin International Enterprise Corp
NUMBER OF LAYERS	Main Board : 4 Layers, OSD Board, Inverter Board & Tuner Board: 2 Layers
EXTERNAL CONNECTORS	Power In Terminal, D-SUB Terminal, S-Video Input, Composite Video Input, Audio Output Left / Right, PC Audio Input, PC Audio Output.

Model Differences:

-. None

2.2 Related Submittal(s) / Grant(s)

-. Original submittal only



2.3 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
151P	BTC Korea Co., Ltd.	LCD Monitor (EUT)	LAK151T	PC
Deskpro EXM	Compaq	PERSONAL COMPUTER	DoC	-
5530M	BTC	KEYBOARD	DoC	PC
M-SAS51	Logitech	MOUSE	JNZ211167	PC
GHV-S9990	GOLDSTAR	VCR	N/A	EUT
KY-1050	J.R. Electronics Co., Ltd.	SPEAKER	N/A	EUT
2225C	HP	PRINTER	DSI6XU2225	PC
020-0470	CARDINAL	MODEM	GDE0196	PC
LSE0107A1240	Li Shin International Enterprise Corp	AC/DC ADAPTER	N/A	EUT

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-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	TEVI LOGIC	N/A	N/A
OSD Board	BTC KOREA CO., LTD.	1500MAEP	N/A
Inverter Board	Frontek Co., Ltd.	FIF1521-01C	N/A
TV Tuner	SAMSUNG	TCPN9082DA27D(T)	N/A
Tuner Connector Board	BTC Korea Co., Ltd.	FEM	N/A
LCD Panel	HANNSTAR	HSD150MX49	N/A
AC/DC Adaptor	LI SHIN	LSE0107A1240	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 worst 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)
LCD Monitor (EUT)	N	Y	1.5(P), 1.2(D)
PERSONAL COMPUTER	N	Y	1.8(P)
KEYBOARD	N/A	Y	1.5(D)
MOUSE	N/A	Y	1.5(D)
VCR	N	N	1.8(P), 1.5(D)
SPEAKER	N	N	1.2(D)
PRINTER	N	Y	1.8(P), 1.2(D)
MODEM	N	Y	1.8(P), 1.2(D)
AC/DC ADAPTER	N	N	1.5(P), 1.2(D)

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

3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
LCD Monitor (EUT)	Y	BOTH END	Y	BOTH END
PERSONAL COMPUTER	N	N/A	Y	BOTH END
KEYBOARD	N	N/A	Y	PC END
MOUSE	N	N/A	Y	PC END
VCR	N	N/A	Y	BOTH END
SPEAKER	N	N/A	Y	EUT END
PRINTER	N	N/A	Y	BOTH END
MODEM	N	N/A	Y	BOTH END
AC/DC ADAPTER	Y	EUT END	Y	EUT END

3.5 Equipment Modifications

- The ferrite core was added to video signal cable and shield was reinforced.
- The ferrite core was added to the cable that is connected between main board and tuner board.
- The ferrite core was added to the cable that is connected between main board and OSD board.
- The EMI gasket was added between the LCD panel and main chassis.
- The EMI gasket was added between the main board shield cover and main chassis.



3.6 Configuration of Test System

Line Conducted Test: AC/DC adapter supplied the power of the EUT 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.

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 TestHumidity Level : 38%Temperature : 21°CLimits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107Type of Test : CLASS BResult : PASSED BY -11.56 dB at 0.18 MHz when used Peak detector mode

EUT : LCD Monitor

Date : May

19, 2003

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

Resolution : 1024 x 768, 75Hz

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

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.18	N	52.70	64.26	-11.56
0.25	N	45.21	61.76	-16.55
0.31	N	40.07	59.97	-19.90
3.75	H	37.53	56.00	-18.47
5.10	N	40.98	60.00	-19.02
11.22	H	40.20	60.00	-19.80
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
0.18	N	39.77	54.26	-14.49
0.25	N	32.11	51.76	-19.65
1.93	N	32.14	46.00	-13.86
5.10	N	33.99	50.00	-16.01

Tabulated test data for Mains Terminal Continuous Disturbance Voltage

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

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



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Testing & Evaluation Lab.

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FCC ID. : LAK151P

File No. : E036R-090

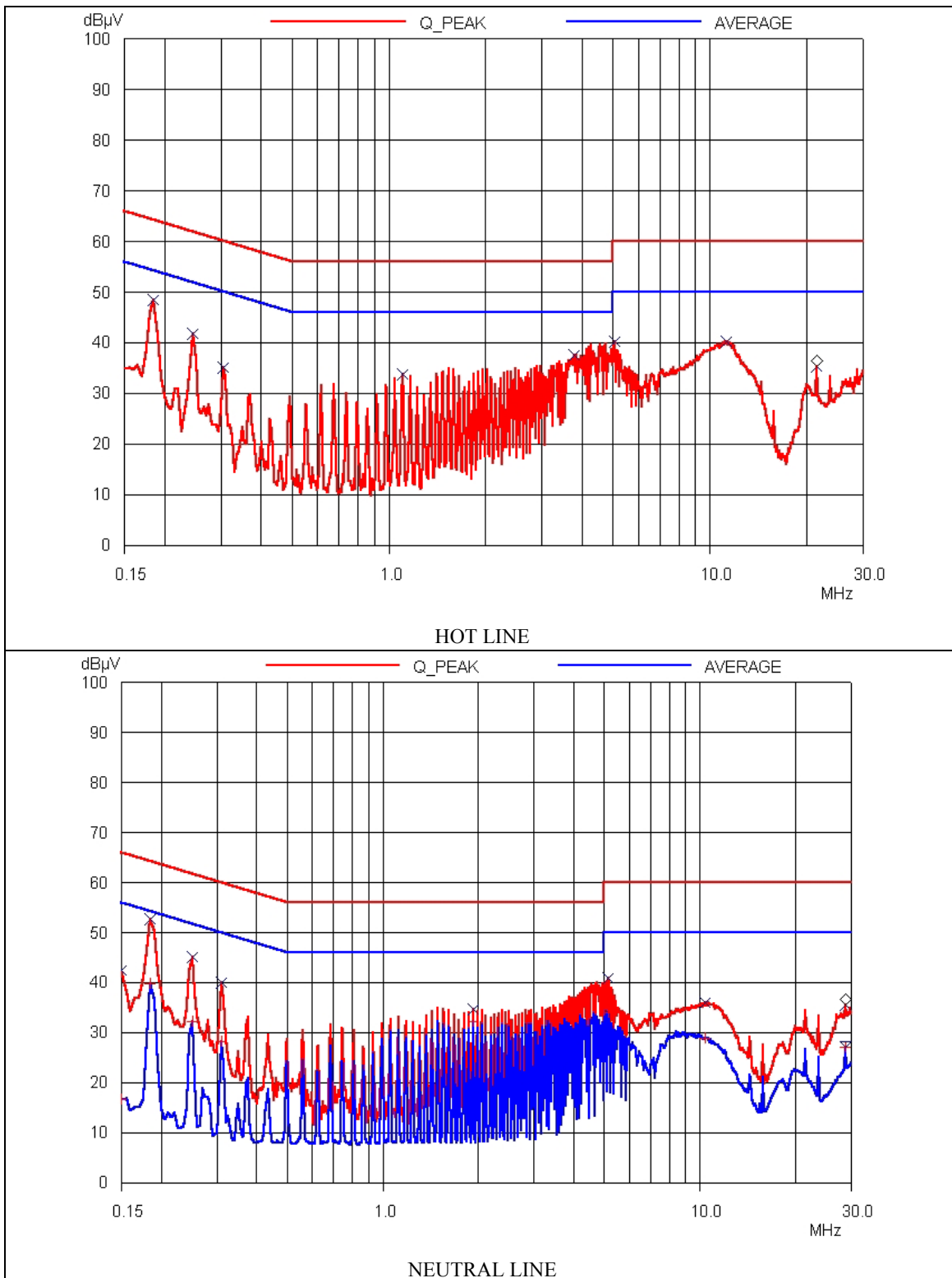
Tested by: Dan-Gi, Lee / Project Engineer

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FCC-004 (Rev.0)

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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 : 49 %

Temperature : 23°C

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

Type of Test : CLASS B

Result : PASSED BY -4.09 dB at 829.20 MHz

EUT : LCD Monitor

Date : May 14, 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)
56.70	18.30	V	9.87	0.98	29.15	40.00	-10.85
72.00	22.30	V	7.39	1.00	30.69	40.00	-9.31
162.60	18.60	V	15.68	1.40	35.68	43.50	-7.82
189.40	15.80	H	16.49	1.50	33.79	43.50	-9.71
199.80	17.40	V	16.88	1.57	35.85	43.50	-7.65
271.40	16.90	H	12.78	1.88	31.56	46.00	-14.44
314.40	14.60	H	14.56	2.09	31.25	46.00	-14.75
336.10	14.50	H	14.29	2.21	31.00	46.00	-15.00
343.30	17.30	H	14.38	2.25	33.93	46.00	-12.07
344.30	18.50	H	14.39	2.25	35.14	46.00	-10.86
372.80	17.10	H	14.59	2.38	34.07	46.00	-11.93
567.80	19.80	H	18.30	2.84	40.94	46.00	-5.06
829.20	16.20	H	21.94	3.77	41.91	46.00	-4.09

Radiated Emission Tabulated Data

Tested by: Dan-Gi, 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	ESVS10	827864/005	NOV/02	12MONTH	■
2.	Test receiver	R/S	ESHS10	834467/007	APR/03	12MONTH	
3.	Spectrum analyzer	HP	8568B	3109A05456	MAY/03	12MONTH	■
			8566B	3407A08547	AUG/02		
4.	RF preselector	HP	85685A	3107A01264	MAY/03	12MONTH	■
5.	Quasi-Peak Adapter	HP	85650A	3107A01542	MAY/03	12MONTH	■
6.	Dipole Antenna	EMCO	3121C	9107-745	APR/03	12MONTH	
7.	Biconical antenna	EMCO	3104C	9109-4443	MAY/03	12MONTH	■
				9109-4444	MAY/03		
		Schwarzbeck	VHA9103	91031852	JUL/02		
8.	Log Periodic antenna	EMCO	3146	9109-3214	JUL/02	12MONTH	■
				9109-3217	MAY/03		
		Schwarzbeck	9108-A(494)	62281001	AUG/02		
9.	Horn antenna	Schwarzbeck	BBHA9120D	BBHA9120D294	JUN/03	12MONTH	
10.	Trilog Broadband antenna	Schwarzbeck	VULB9163	VULB9163-166	FEB/03	12MONTH	■
11.	LISN	EMCO	3825/2	9109-1867	AUG/02	12MONTH	■
				9109-1869	OCT/02		
12.	RF Amplifier	HP	8447F	3113A04554	N/A	N/A	
13.	Portable Spectrum Analyzer	HP	8591A	3131A02312	N/A	N/A	
14.	Computer System Hard disk drive	HP	98581C	98543A	N/A	N/A	
			9153C	CMC762Z9153	N/A	N/A	
15.	Plotter	HP	7475A	30052 22986	N/A	N/A	
16.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
17.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
18.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■

* Mark "■" means used equipment.