LG Electronics Inc.
Quality & Reliability Center

36, Munlae-dong, 6-ga, Youngdungpo-gu, Seoul 150-096, Korea
Tel : + 82 2 2630 3077~9, Fax : +82 2 2635 5543

CERTIFICATION OF COMPLIANCE

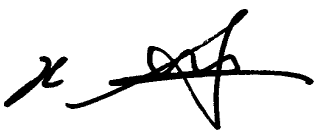
Date of Issue: July 15, 2002 **Test Report No: 00431-4521-F2193**

Applicant:	LG Electronics Inc.
Regulation:	FCC Part 15 Class B / Canada Standard ICES-003 Class B
Test procedure:	ANSI C63.4-1992 / Canada Standard ICES-003
Equipment Class:	Unintentional Radiators – Digital device
EUT Type:	15” LCD Monitor

Trade Name(s):	Model No.:
LG	***LB500K***

This device has been verified to comply with the applicable requirements in the FCC Part 15 / Canada Standard ICES-003 and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992 / Canada Standard ICES-003.

I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.



NVLAP Lab Code:200040-0

Kyeom-Soon Kim / General Manager
Quality and Reliability Center
LG Electronics Inc.

NVLAP Lab Code:200040-0

REPORT FOR A DIGITAL DEVICE

Scope - Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

U.S. Responsible Party:	LG Electronics USA Inc.
Address:	6133 North River Road,Suite 1100 (Riverway Plasza) Rosemont, IL 60018, USA
Contact Person:	P.H.Byun, General Manager
Telephone No.:	(847) 692-4630 EXT.329
Manufacturer:	LG Electronics Inc. DID Division
Address:	642 Jinpyoung-dong Kumi-City Kyoungsangbuk-do, 730-360, Korea
FCC ID No.:	BEJLB500K
EUT Class:	Unintentional Radiators - Digital device
EUT Type:	15" LCD Monitor
Trade Name:	LG
Model No.:	LB500K
Rule Part:	FCC Part 15 Class B / Canada Standard ICES-003 Class B
Test Procedure:	ANSI C63.4-1992 / Canada Standard ICES-003
Date of Test:	July 11 ~ 12, 2002
Date of Receipt of EUT:	July 11, 2002
Date of Issue:	July 15, 2002
Test Report No.:	00431-4521-F2193
Test Result:	**Positive**

The Quality and Reliability Center was accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200040-0.

Tested by:

S. H. Ji / Senior Research Engineer
Quality and Reliability Center
LG Electronics Inc.

Reviewed by :

D. H. Lee / Research Engineer
Quality and Reliability Center
LG Electronics Inc.

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LG Electronics Inc. Q & R Center, 36, Munlae-dong, 6-ga, Youngdungpo-gu, Seoul, Korea Tel:+82-2-2630-3077~9, Fax:+82-2-2635-5543

1. GENERAL INFORMATION

1.1 Descriptions of equipment under test (EUT)

1.1.1 Manufacturer: LG Electronics Inc. DID Division
642 Jinpyoung-dong Kumi-City Kyoungsangbuk-do, 730-360, Korea

1.1.2 EUT Type: 15" LCD Monitor

1.1.3 Model No.: LB500K

1.1.4 Serial No.: N/A

1.1.5 Trade Name: LG

1.1.6 FCC ID No.: BEJLB500K

1.1.7 System characteristic and descriptions

Max. Resolution:		1024 X 768 @ 75 Hz	
a)	Sync Input:	Horizontal Freq.	30 – 63 kHz
		Vertical Freq.	56 – 75 Hz
b)	Test Mode:	Display "H" pattern on the screen	
c)	Power Supply:	AC 100-240 V, 50/60 Hz, 0.6 A	
d)	Power Cord:	Unshielded AC power cord	
e)	Port/Input connector:	15 pin D-sub type connector	
f)	Cable:	1.8 m shielded D-sub with ferrite on both ends	
g)	Max. Video band width:	80 MHz	
h)	Used LCD panel:	LM150X0 (LG-Philips LCD)	
		M150XN03 (AU Optronics)	
i)	Maker of Power Board:	DELTA ELECTRONICS INC.	
		POWERNET	

** The EUT uses 2 different type of LCD panel and Power Board.*

1.2 Regulations applied to EUT

- FCC Part 15 Class B / Canada Standard ICES-003 Class B
  : The limit of CISPR 22 Class B apply in this test according to part 15.107.e) and 15.109.g).

1.3 Measurement procedure

ANSI C63.4-1992 / Canada Standard ICES-003

1.4 Measurement place

LG Electronics Inc. Quality and Reliability Center
36, Munlae-dong, 6-ga, Youngdungpo-gu, Seoul 150-096, Korea

2. GENERAL TEST CONDITIONS

The test data contained in this report ware obtained by use of the measurement method recommended in FCC Rules, 47 C.F.R. § 15.31(a)(6), with equipment and at the test site filed by the Federal Communications Commission (FCC). The technical standard for a computing device is set forth in the computing devices of Part 15 of FCC Rules. The measurement for radiated emissions and power-line conducted emissions were performed in accordance with the procedures described in ANSI C63.4-1992.

2.1 Operating conditions of EUT

According to the requirements in the computing devices of Part 15, the measurement was made at each function of the EUT being connected with appropriate cables and peripherals. All measurement was investigated under operating conditions of clause 11.1 of ANSI C63.4-1992.

2.2 Stabilization of EUT operating

The EUT was operated for sufficient minutes before testing to make it stabilized in a normal operating condition. The power supplied to the EUT was filtered to meet the requirements.

2.3 Temperature and humidity

The measurement data in this report was obtained at the temperature in the range of 10 to 30 C and humidity in the range of 30 to 80%.

3. TEST SITE

3.1 Semi-anechoic chamber

Measurement of radiated emissions from EUT was made at semi-anechoic chamber that has been in compliance with Federal Communications Commissions (FCC) requirements of clause 2.948 according to ANSI C63.4-1992 on Jan. 29, 2001.

3.2 A shielded enclosure

The measurement of was made power line conducted emissions in a shielded enclosure providing sufficient shielding effectiveness.

4. CALIBRATIONS OF MEASURING INSTRUMENTS

All measurements were made with instruments calibrated according to the recommendation by manufacturer. Measurement of radiated emissions and power line conducted emissions were made with instruments conforming to American National Standard Specification, ANSI C63.4-1992. The calibration of measuring instrument, including any accessories that may affect test results, were performed according to the recommendation by manufacturer.

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5. DESCRIPTION OF TEST CONDITION

5.1 Power line conducted emission measurements

5.1.1 Shielded enclosure

The measurement for power-line emissions from EUT was made in shielded enclosure that provides sufficient shielding effectiveness enough not to affect test results.

5.1.2 Detector function selection and bandwidth

During conducted emission measurement, a radio noise meter that has a CISPR quasi-peak detector with 10 kHz IF bandwidth of 6 dB was utilized.

5.1.3 Frequency range to be scanned

For conducted emissions measurement, frequency range of 150 kHz to 30 MHz included, was investigated.

5.1.4 Unit of measurement

Test results for conducted emissions are reported in micro-volts.

5.1.5 Line impedance stabilization network (LISN)

A LISN with characteristics that conform to the requirements of ANSI C63.4-1992 was used for the measurement of conducted power-line radio noise; (50 micro-henries / 50 ohms). Chassis and earth-points for grounding of the LISN were earth-grounded.

5.1.6 Test conditions and configuration of EUT

The EUT was configured and operated in all modes of operation so as to find the maximum enumeration of emissions from EUT.

The EUT has designed to use the public AC lines with rated AC voltage as specified in Owner's manual and Installation' manual of EUT and filtered to meet the requirement. AC power was supplied to the EUT through LISN with characteristics described in 5.1.5 of part I of this report.

The EUT was placed on a 1 m X 1.5 m X 80 cm high wooden table that is place on the earth-grounded conducting surface larger than 2 square meters. The vertical conducting surface was replaced with horizontal ground plane. Length of the power lead in excess of 80 cm horizontally separating the EUT from LISN was folded back-and-forth form at the center of the power cord not exceeding 40 cm in length.

Each type of accessory provided by manufacturer or typically used and support equipment were connected to the EUT during measurement to the typical usage and applicable as nearly as practicable.

5.1.7 Measurement uncertainty

Power line conducted emission measurements: $\pm$ 3 dB

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above mentioned way.

The measurement uncertainty was calculated in accordance with NAMAS NIS 81 : The treatment of uncertainty in EMC measurement."

The measurement uncertainty was given with a confidence of 95%.

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5.2 Radiated emissions measurements

5.2.1 Test site

Measurements were made in semi-anechoic chamber as described at 3.1 in this report.

5.2.2 Detector function selection and bandwidth

In radiated emissions measurement, a field strength meter that has a CISPR quasi-peak detector was used. The 6 dB bandwidth of the detector of instrument is 120 kHz over frequency range of 30 to 1000 MHz.

5.2.3 Unit of measurement

Test results of radiated emissions measurement are reported in micro-volts per meter at the specific distance. Using the unit of dBuV on the test instrument, the indication unit was converted to field strength unit of uV/m as following method;

$$F\ (uV/m) = 10^{\{(R+CL+AF)/20\}}\ (uV/m)$$

here,

F: Field Strength in uV/m, R: Meter Reading Level in dB(uV),
CL: Cable Loss from antenna to meter in dB,
AF: Antenna Factor of receiving antenna in dB(/m)

5.2.4 Antennas

Measurements were made using calibrated half-wave tuned dipole antenna for final measurements and biconical / log-periodic antenna in range of 30 to 1000 MHz for preliminary measurements to determine the emission characteristics of the EUT. Measurements were also made for both horizontal and vertical polarization.
The horizontal distance between the receiving antenna and the closest periphery of the EUT was 3 meters as described in 8.2.3 of ANSI C63.4-1992.

5.2.5 Frequency range to be scanned

For radiated emissions measurements, the spectrum in the range of 30 to 1000 MHz was investigated. (The highest frequency generated or used by the EUT is 80 MHz, as mentioned in 1.1.7 h).)

5.2.6 Test conditions and configuration of EUT

The EUT was configured and operated in all modes of operation so as to find the maximum enumeration of emissions from EUT. The EUT was placed on a 80 cm high non metallic 1 m X 1.5 m table. The turn table containing the system was rotated and the antenna height was varied 4 m to find the maximum enumeration of emissions from EUT. Each type of accessory provided by manufacturer or typically used and support equipment were connected to the EUT during measurement to the typical usage and applicable as nearly as practicable.

5.2.7 Measurement uncertainty

Radiated emissions measurements: $\pm$ 5 dB

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above mentioned way.

The measurement uncertainty was calculated in accordance with NAMAS NIS 81 : The treatment of uncertainty in EMC measurement."

The measurement uncertainty was given with a confidence of 95%.

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6. MEASURING INSTRUMENTS AND SET-UP

6.1 Power line conducted emissions

6.1.1 Test receiver

Rohde & Schwarz, Model ESH3 (9 kHz to 30 MHz)
Detector function: CISPR Quasi-Peak
IF Bandwidth: 10 kHz

6.1.2 Line Impedance Stabilization Network (LISN)

EUT: Rohde & Schwarz, Model ESH2-Z5
Peripheral: Schwarzbeck, Model NSLK8128
Impedance Characteristic : 50uH / 50Ω

6.2 Radiated emissions

6.2.1 Test receiver

Rohde & Schwarz, Model ESVP (20 to 1300 MHz)
Detector function: CISPR Quasi-Peak
IF Bandwidth: 120 kHz

6.2.2 Receiving Antennas.

a) Schwarzbeck, Model VHAP: Tuned dipole antenna (30 to 300 MHz)
b) Schwarzbeck, Model UHAP: Tuned dipole antenna (300 to 1000MHz)
c) Schwarzbeck, Model VHA 9103: Bi-conical Antenna (30 ~ 300 MHz)
d) Schwarzbeck, Model UHALP: Log-periodic antenna (300 ~ 1000 MHz)

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7. TEST DATA

7-1. Power line conducted emissions (§ 15.107)

Product: 15” LCD Monitor Model: LB500K
Test Date: July 12, 2002 Serial No.: N/A

Detector: Quasi-peak /Average
Test Limit: CISPR 22 Class B

a) LG Philips LCD & Powernet

Frequency (MHz)	Quasi-Peak (dBuV)			Average (dBuV)			Phase (L1/L2)
	Tested Level	Limit	Margin (dB)	Tested Level	Limit	Margin (dB)	
0.18	51.0	64.8	-13.8	37.2	54.8	-17.6	L2
0.23	41.1	62.5	-21.4	27.6	52.5	-24.9	L2
0.78	40.1	56.0	-15.9	39.4	46.0	-6.6	L1
0.84	35.7	56.0	-20.3	35.5	46.0	-10.5	L2
12.76	31.1	60.0	-28.9	24.7	50.0	-25.3	L1

b) LG Philips LCD & Delta

Frequency (MHz)	Quasi-Peak (dBuV)			Average (dBuV)			Phase (L1/L2)
	Tested Level	Limit	Margin (dB)	Tested Level	Limit	Margin (dB)	
0.20	44.0	63.7	-19.7	36.3	53.7	-17.4	L1
0.21	46.9	63.2	-16.3	45.7	53.2	-7.5	L1
0.42	44.0	57.7	-13.7	43.8	47.7	-3.9	L2
0.64	40.3	56.0	-15.7	40.2	46.0	-5.8	L2
8.45	34.1	60.0	-25.9	30.5	50.0	-19.5	L2

c) AU Optronics & Powernet

Frequency (MHz)	Quasi-Peak (dBuV)			Average (dBuV)			Phase (L1/L2)
	Tested Level	Limit	Margin (dB)	Tested Level	Limit	Margin (dB)	
0.17	51.3	65.0	-13.7	39.5	55.0	-15.5	L1
0.23	41.2	62.5	-21.3	28.4	52.5	-24.1	L1
0.79	35.7	56.0	-20.3	35.4	46.0	-10.6	L1
0.84	39.8	56.0	-16.2	39.7	46.0	-6.3	L1
12.66	37.2	60.0	-22.8	33.4	50.0	-16.6	L2

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d) AU Optronics & Delta

Frequency (MHz)	Quasi-Peak (dBuV)			Average (dBuV)			Phase (L1/L2)
	Tested Level	Limit	Margin (dB)	Tested Level	Limit	Margin (dB)	
0.19	51.6	64.0	-12.4	41.3	54.0	-12.7	L2
0.26	43.1	61.6	-18.5	35.2	51.6	-16.4	L2
0.42	40.0	57.7	-17.7	38.5	47.7	-9.2	L1
0.64	36.7	56.0	-19.3	36.1	46.0	-9.9	L1
4.57	33.6	56.0	-22.4	30.2	46.0	-15.8	L1
12.67	40.4	60.0	-19.6	36.1	50.0	-13.9	L1

Result: Positive

NOTES:

1. All modes of operation were investigated.
2. The limits of CISPR 22 Class B apply in this conducted emissions test according to § 15.107.e).
3. The EUT was tested under the condition that all of support device and accessories described in clause 9 in this test report was connected and normally operated during the testing.
4. All other emissions are non-significant.
5. Phase L1 = Hot Phase L2 = Neutral

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7-2. Radiated emissions (§ 15.109)

Product:	15” LCD Monitor	Model:	LB500K
Test Date:	July 11 ~ 12, 2002	Serial No.:	N/A

Detector: Quasi-peak *Test distance: 3m*
Test Limit: CISPR 22 Class B

a) LG Philips LCD & Powernet

Frequency(MHz)	Reading(dBuV)	AF(dB/m)	CL(dB)	Pol.	F/S(dBuV/m)	Limit(dBuV/m)	Margin(dB)
87.81	20.8	5.9	1.2	V	27.8	40.5	-12.7
131.83	16.8	11.7	1.5	V	30.0	40.5	-10.5
153.85	12.0	13.6	1.7	H	27.3	40.5	-13.2
413.47	13.8	16.3	2.9	V	33.0	47.5	-14.5
461.36	15.0	16.3	2.9	V	34.2	47.5	-13.3
798.70	14.5	20.2	3.8	V	38.5	47.5	-9.0

b) LG Philips LCD & Delta

Frequency(MHz)	Reading(dBuV)	AF(dB/m)	CL(dB)	Pol.	F/S(dBuV/m)	Limit(dBuV/m)	Margin(dB)
131.85	19.6	11.7	1.5	V	32.8	40.5	-7.7
450.38	14.1	16.3	2.9	V	33.3	47.5	-14.2
461.36	15.5	16.3	2.9	V	34.7	47.5	-12.8
527.27	9.7	17.3	3.2	V	30.2	47.5	-17.3
593.18	14.0	17.3	3.2	V	34.5	47.5	-13.0
798.70	11.0	20.2	3.8	H	35.0	47.5	-12.5

c) AU Optronics & Powernet

Frequency(MHz)	Reading(dBuV)	AF(dB/m)	CL(dB)	Pol.	F/S(dBuV/m)	Limit(dBuV/m)	Margin(dB)
132.99	21.4	11.7	1.5	V	34.6	40.5	-5.9
139.34	19.5	11.7	1.5	V	32.7	40.5	-7.8
177.33	13.3	14.5	1.8	H	29.6	40.5	-10.9
190.00	15.6	14.5	1.8	H	31.9	40.5	-8.6
430.64	11.1	16.3	2.9	V	30.3	47.5	-17.2
798.68	14.4	20.2	3.8	V	38.4	47.5	-9.1

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d) AU Optronics & Delta

Frequency(MHz)	Reading(dBuV)	AF(dB/m)	CL(dB)	Pol.	F/S(dBuV/m)	Limit(dBuV/m)	Margin(dB)
101.32	19.4	9.1	1.3	V	29.8	40.5	-10.7
126.67	17.3	11.7	1.5	V	30.5	40.5	-10.0
132.99	19.7	11.7	1.5	V	32.9	40.5	-7.6
139.34	16.1	11.7	1.5	H	29.3	40.5	-11.2
329.32	14.8	14.8	2.5	V	32.0	47.5	-15.5
443.32	12.4	16.3	2.9	V	31.6	47.5	-15.9
798.68	9.6	20.2	3.8	H	33.6	47.5	-13.9

Result: Positive

* Limit Calculation 30 - 230 MHz: 40.5 dBuV/m = 30 dBuV/m + 20 Log_{10}(10/3) [dB]
* Limit

30 - 230 MHz: 40.5 dBuV/m
230 - 1000 MHz: 47.5 dBuV/m

NOTES:

1. All modes of operation were investigated.
2. The limits of CISPR 22 Class B apply in this conducted emissions test according to § 15.109.g).
3. The EUT was tested under the condition that all of support device and accessories described in clause 9 in this test report was connected and normally operated during the testing.
4. All cables were maximized on the testing.
5. All other emissions are non-significant.
6. AF = Antenna factor CL = Cable loss F/S = Field Strength
7. The conversion factor for 10 m to 3 m was used as 20 X Log_{10}(10/3) [dB].

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8. LIST OF INSTRUMENTS USED

Type	Maker	Model	Cal. Date	N Date	Control No.
Test receiver	R&S	ESVP	12-Apr.-02	12-Apr.-03	F0033966AAZA
Test receiver	R&S	ESH3	11-Apr.-02	11-Apr.-03	F0000193AAZL
LISN	R&S	NSLK8128	10-Sep.-01	10-Sep.-02	F10000014025
LISN	R&S	ESH2-Z5	10-Sep.-01	10-Sep.-02	F0033973AAZA
Biconical antenna	S/B	VHA9103	07-Jan-02	07-Jan.-04	F0000477AAZB
Log-periodic antenna	S/B	UHALP9107	07-Jan-02	07-Jan.-04	F0000476AAZB
Tuned dipole antenna	S/B	VHAP	08-Aug.-01	08-Aug.-03	F0000405AAZB
Tuned dipole antenna	S/B	UHAP	08-Aug.-01	08-Aug.-03	F0000408AAZB

R&S: Rohde & Schwarz S/B: Schwarzbeck
Cal. Date: Calibration date N Date: Next calibration date

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9. SUPPORT DEVICE & ACCESSORIES USED

9-1. Support device

9-1-1. Desktop computer

Model:	VL800 DT
Maker:	H/P
S/N:	SG12504879
FCC ID:	DOC (CLASS B)

9-1-2. Keyboard

Model:	SK-2511A
Maker:	H/P
S/N:	M010208088
FCC ID:	GYUR73SK

9-1-3. Computer Mouse

Model:	M-BD58
Maker:	LOGITECH
S/N:	LZC11906724
FCC ID:	DOC (CLASS B)

9-1-4. Printer

Model:	C6427A
Maker:	H/P
S/N:	CN17C1C0FP
FCC ID:	DOC (CLASS B)

9-1-5. Modem

Model:	0701
Maker:	US ROBOTICS
S/N:	24LGG8DB0673
FCC ID:	DOC (CLASS B)

9-1-6. Graphic Card

Model:	Geforce 2 GTS
Maker:	NVIDIA
S/N:	5065-2543
FCC ID:	DOC (CLASS B)

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