

Application for FCC Certificate
On Behalf of
LG Electronics U.S.A Inc.

CRT Monitor

Model No.: T15QA-*

Serial No.: E06072701

FCC ID : BEJT15QA

Prepared For : LG Electronics U.S.A Inc.
2000 Millbrook Dr.Lincolnshire,
IL 60069 United States

Prepared By : Audix Technology (Shanghai) Co., Ltd.
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Report No. : ACI-F06034
Date of Test : Jul 28, 2006
Date of Report : Aug 07, 2006

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TEST REPORT FOR FCC CERTIFICATE

Applicant : LG Electronics U.S.A Inc.
Manufacturer : Nanjing LG-Tontru Color Display System Co., Ltd.
EUT Description : CRT Monitor
(A) Model No. : T15QA-
(B) Serial No. : E06072701
(C) Power Supply : 120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B FEBRUARY 2006
AND ANSI C63.4-2003*

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B (Class B) and ICES-003, Issue 4 February 2004 (CISPR 22:2002) limits both radiated and conducted emissions.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report shows that the EUT (M/N: T15QA-*; S/N: E06072701) which was tested in 3m anechoic chamber on Jul 28, 2006 is technically compliance with the FCC official limits also.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report contains data that are not covered by the NVLAP accreditation.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Jul 28, 2006

Prepared By: Sarah Liu 2006.08.10
SARAH LIU/ Assistant

Reviewer: Sammy Chen 2006.08.10
SAMMY CHEN / Deputy Assistant Manager



For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Approved Signatory: Ian Chen 2006.08.10
IAN CHEN / Assistant Manager

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Results	Meets Limit
EMISSION			
Conducted Disturbance At main terminal	FCC RULES AND REGULATIONS PART 15 SUBPART B FEBRUARY 2006 AND ANSI C63.4-2003	Pass	15.107 Class B
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B FEBRUARY 2006 AND ANSI C63.4-2003	Pass	15.109 Class B

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description : CRT Monitor

Type of EUT : ☒ Production ☐ Pre-product ☐ Pro-type

Model No. : T15QA-*

Serial No. : E06072701

Applicant : LG Electronics U.S.A Inc.
2000 Millbrook Dr.Lincolnshire,
IL 60069 United States

Manufacturer : Nanjing LG-Tontru Color Display System
Co., Ltd.
No.346, Yao Xin Road, Nanjing, China

D-Sub Cable : Shielded, Detachable, 1.4m, with one core

Power Cord : Unshielded, Detachable, 1.6m

Remark:

The EUT is a CRT Monitor which input/output ports as follows:

- (1) One Power Port
- (2) One D-Sub Input Port

2.2 Supported Simulators

2.2.1 PC

Manufacturer : HP

Model Number : dx6120MT

CPU : CNG53004J2

Power Cable : Unshielded, detachable ,1.8m

Certificate : FCC DoC, VCCI, CE/EMC
VCCI, C-Tick, CE/EMC
MIC, C-Tick(N119)

2.2.2 Keyboard

Manufacturer : HP

Model Number : M-S69

Serial Number : 334684-002

Data Cable : Unshielded ,undetachable, 1.85m

Certificate : FCC DoC, VCCI, CE/EMC, MIC, GS

2.2.3 Mouse

Manufacturer : HP
Model Number : KB-0316
Serial Number : 382641-AA1Sch
Data Cable : Unshielded ,undetachable, 1.85m
Certificate : FCC DoC, VCCI, CE/EMC, MIC, GS

2.2.4 Printer

Manufacturer : HP
Model Number : Pr-L Laser Jet 6L

2.2.5 Modem

Manufacturer : Aceex
Model Number : 1414
Serial Number : 980013576
Data Cable : Unshielded, Detachable, 1.8m
FCC ID : IFAXDM1414

2.3 Description of Test Facility

Site Description : Sept. 17, 1998 file on
August 15, 2003 Renewed
(Semi-Anechoic Chamber) Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046, USA
Name of Firm : Audix Technology (Shanghai) Co., Ltd.
Site Location : 3F 34Bldg 680 Guiping Rd,
Caohejing Hi-Tech Park,
Shanghai, China 200233.
FCC registration Number : 91789
Accredited by NVLAP, Lab Code : 200371-0

2.4 Measurement Uncertainty

Conducted Emission Expanded Uncertainty: U = 1.84dB
Radiated Emission Expanded Uncertainty : U = 2.96dB

3 CONDUCTED EMISSION TEST

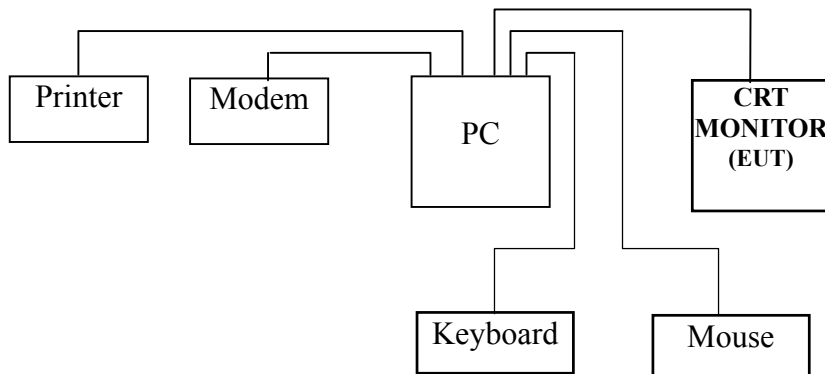
3.1 Test Equipment

The following test equipment are used during the conducted emission test in a shielded room:

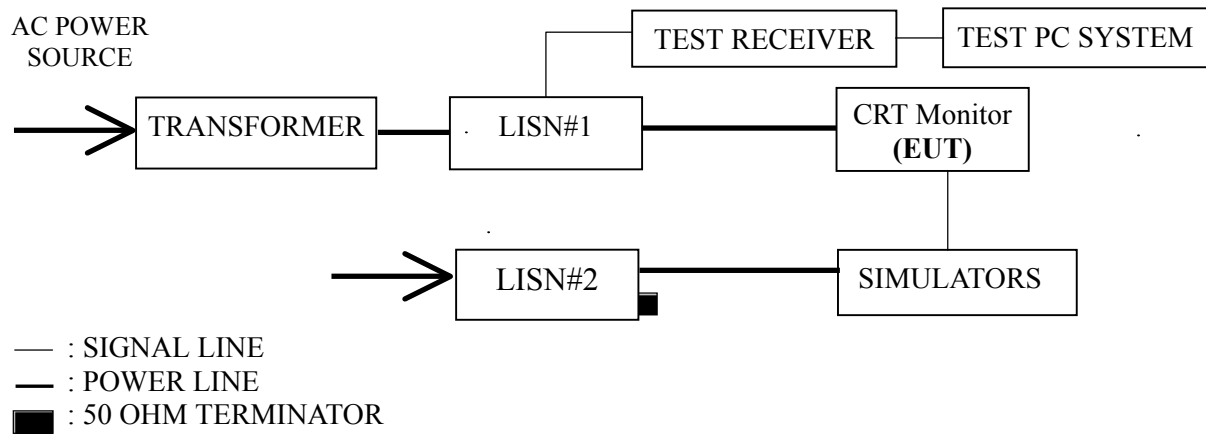
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESHS10	830223/007	Apr 08, 2006	Apr 08, 2007
2.	Line Impedance Stabilization Network (LISN#1)	Kyoritsu	KNW-407	8-1280-4	Apr 12, 2006	Apr 12, 2007
3.	Line Impedance Stabilization Network (LISN#2)	Kyoritsu	KNW-407	8-1280-5	Apr 13, 2006	Apr 13, 2007
4.	50Ω Coaxial Switch	ANRITSU	MP59B	6200426389	Mar 18, 2006	Sep 18, 2006
5.	50Ω Terminator	Anritsu	BNC	001	Apr 11, 2006	Apr 11, 2007
6.	Software	Audix	E3	SET00200 9804M592	--	--

3.2 Block Diagram of Test Setup

3.2.1 EUT & Supported Simulators



3.2.2 Conducted Disturbance Test Setup



3.3 Conducted Emission Limit

Frequency Range (MHz)	Limits dB (μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66~56	56~46
0.5 ~ 5	56	46
5 ~ 30	60	50
NOTE 1 – The lower limit shall apply at the transition frequencies. NOTE 2 – The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz~0.50 MHz NOTE 3 – If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.		

3.4 Test Configuration

The EUT (listed in Sec.2.1) and the simulators (listed in Sec 2.2) were installed as shown on Sec.3.2 to meet FCC requirement and operating in a manner that tends to maximize its emission level in a normal application.

3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT and simulators as shown in Sec. 3.2
- 3.5.2 Turn on the power of all equipment and the EUT.
- 3.5.3 Set the contrast control to maximum.
- 3.5.4 Set the brightness control to maximum or at raster extinction if raster extinction occurs at less than maximum brightness.
- 3.5.5 For color monitors, use white letters on a black background to represent all color.
- 3.5.6 Select the worse case of positive or negative video if both alternatives are available.
- 3.5.7 Set character size and number of characters per line so that typically the greatest number of characters per screen is displayed.
- 3.5.8 For monitors with graphics capabilities, a pattern consisting of all scrolling Hs should be displayed. For monitors with text only capability, a pattern consisting of random text shall be displayed. If neither of the above is applied, use a typical display.
- 3.5.9 Set the EUT on the test modes in turn, and then test it.
- 3.5.10 The test modes are as follows:

VGA	VGA	VGA
640*480@75Hz	800*600@85Hz	1024*768@60Hz

3.6 Test Procedures

The EUT was connected to the power mains through a Line Impedance Stabilization Network (LISN). This provided a 50 ohm coupling impedance for the measuring equipment.

Both sides of AC line (VA & VB) were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to ANSI C63.4:2003 during conducted emission test.

The bandwidth of Test Receiver ESHS10 was set at 10 kHz.

The frequency range from 150 kHz to 30 MHz was checked.

The test modes were done on conducted disturbance test and all the test results are listed in Sec. 3.7.

3.7 Test Results

< PASS >

The frequency and amplitude of the highest conducted emission relative to the limit is reported. All emissions not reported below are too low against the prescribed limits.

Test Mode	Data Page
VGA 640*480@75Hz	P11
VGA 800*600@85Hz	P12
VGA 1024*768@60Hz	P13

NOTE 1 - Factor = Cable Loss + LISN Factor.

NOTE 2 - Emission Level = Meter Reading + Factor.

NOTE 3 - "QP" means "Quasi-Peak" values, "AV" means "Average" values.

NOTE 4 - The worst case is for VGA 640*480@75Hz mode. The worst emission is detected at 0.15 MHz with corrected signal level of 50.98 (μV) (limit is 56.00 dB (μV)), when the VB (AV) of the EUT is connected to LISN.

EUT : CRT Monitor Temperature : 28°C

Model No. : T15QA-* Humidity : 60%

Serial No. : E06072701 Date of Test : Jul 28, 2006

Test Mode : VGA 640*480@75Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
VA	0.15	56.70	1.01	57.71	66.00	8.29	QP
	0.15	48.80	1.01	49.81	56.00	6.19	AV
	0.20	49.70	0.76	50.46	63.74	13.28	QP
	0.30	42.51	0.53	43.04	60.32	17.28	QP
	0.49	35.83	0.49	36.32	56.10	19.78	QP
	2.43	34.89	1.06	35.95	56.00	20.05	QP
	9.91	42.63	0.39	43.02	60.00	16.98	QP
VB	0.15	56.50	0.98	57.48	66.00	8.52	QP
	0.15	50.00	0.98	50.98	56.00	5.02	AV
	0.20	50.49	0.76	51.25	63.69	12.44	QP
	0.49	39.33	0.38	39.71	56.10	16.39	QP
	0.84	36.21	0.28	36.49	56.00	19.51	QP
	2.54	35.91	1.10	37.01	56.00	18.99	QP
	13.70	39.30	0.54	39.84	60.00	20.16	QP

TEST ENGINEER: Leo Xue
(LEO XUE)

EUT : CRT Monitor Temperature : 28°C

Model No. : T15QA-* Humidity : 60%

Serial No. : E06072701 Date of Test : Jul 28, 2006

Test Mode : VGA 800*600@85Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.19	50.99	0.82	51.81	64.26	12.45
	0.23	47.17	0.65	47.82	62.39	14.57
	0.47	36.77	0.49	37.26	56.54	19.28
	1.96	36.45	0.35	36.80	56.00	19.20
	9.35	41.83	0.40	42.23	60.00	17.77
	12.78	40.81	0.45	41.26	60.00	18.74
VB	0.19	51.00	0.81	51.81	64.26	12.45
	0.28	46.49	0.47	46.96	60.85	13.89
	0.52	39.16	0.37	39.53	56.00	16.47
	1.45	37.60	0.29	37.89	56.00	18.11
	2.35	35.81	0.89	36.70	56.00	19.30
	13.91	39.94	0.56	40.50	60.00	19.50

TEST ENGINEER: Leo Xue
(LEO XUE)

EUT : CRT Monitor Temperature : 28°C

Model No. : T15QA-* Humidity : 60%

Serial No. : E06072701 Date of Test : Jul 28, 2006

Test Mode : VGA 1024*768@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.15	48.70	1.01	49.71	66.00	16.29
	0.19	50.30	0.79	51.09	64.04	12.95
	0.48	36.30	0.49	36.79	56.36	19.57
	1.83	34.57	0.35	34.92	56.00	21.08
	3.51	35.55	0.75	36.30	56.00	19.70
	10.29	41.51	0.40	41.91	60.00	18.09
VB	0.15	48.60	0.98	49.58	66.00	16.42
	0.19	50.60	0.78	51.38	64.04	12.66
	0.53	38.66	0.37	39.03	56.00	16.97
	1.30	35.48	0.29	35.77	56.00	20.23
	2.46	35.79	1.06	36.85	56.00	19.15
	13.20	40.07	0.53	40.60	60.00	19.40

TEST ENGINEER: Leo Xue
(LEO XUE)

4 RADIATED EMISSION TEST

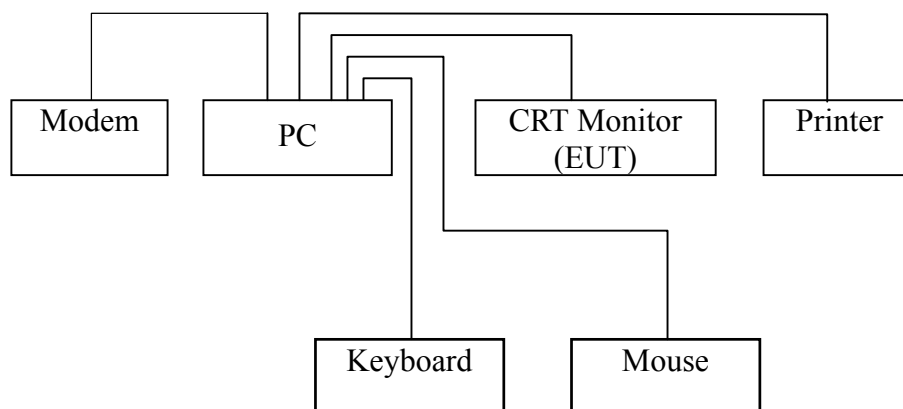
4.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

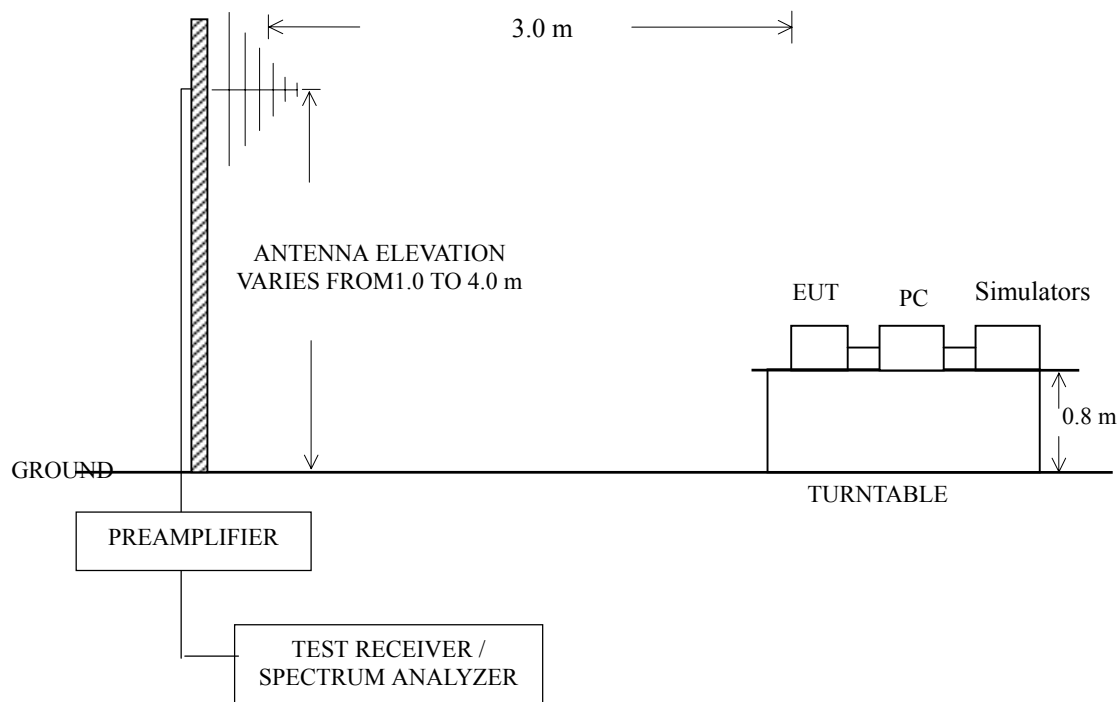
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3628A00167	Apr 18, 2006	Apr 18, 2007
2.	Bilog Antenna	Chase	CBL6111	1145	Mar 18, 2006	Sep 18, 2006
3.	Test Receiver	R&S	ESVS10	832699/004	Apr 08, 2006	Apr 08, 2007
4.	Preamplifier	HP	8447D	2944A10548	Mar 19, 2006	Sep 19, 2006
5.	Preamplifier	HP	8449B	3008A00864	Apr 18, 2006	Apr 18, 2007
6.	Horn Antenna	EMCO	3115	9607-4878	Apr 18, 2006	Apr 18, 2007
7.	50Ω Coaxial Switch	Anritsu	MP59B	6200426390	Mar 18, 2006	Sep 18, 2006
8.	Software	Audix	E3	SET00200 9912M295-2	--	--

4.2 Block Diagram of Test Setup

4.2.1 EUT and simulators



4.2.2 Radiated emission test setup



4.3 Radiated Emission Limit

Frequency (MHz)	Distance (m)	Field strength limits	
		($\mu\text{V/m}$)	dB ($\mu\text{V/m}$)
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

NOTE 1 - Emission Level dB ($\mu\text{V/m}$) = $20 \log$ Emission Level ($\mu\text{V/m}$)

NOTE 2 - The tighter limit applies at the band edges.

NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz.

4.4 Test Configuration

The configuration of the EUT and simulators are same as those used in conducted emission test.

Please refer to Sec.3.4.

4.5 Operating Condition of EUT

Same as conducted emission test which is listed in Sec.3.5, except the test setup replaced by Sec.4.2.

4.6 Test Procedures

The EUT and simulators were placed on a turntable that is 0.8 meter above ground. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.4:2003 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESVS10 was set at 120 kHz.

The frequency range from 30 MHz to 1000 MHz was checked for all the test modes.

The test modes were done on radiated disturbance test and all the test results are listed in Sec.4.7.

The test modes are as follows:

VGA 640*480@75Hz	VGA 800*600@85Hz	VGA 1024*768@60Hz
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4.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Test Mode	Data Page
VGA 640*480@75Hz	P18
VGA 800*600@85Hz	P19
VGA 1024*768@60Hz	P20

NOTE 1 - Emission Level = Meter Reading + Factor.

NOTE 2 - Factor = Antenna Factor + Cable Loss - Preamp Factor.

NOTE 3 - All readings are Quasi-Peak values.

NOTE 4 - 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 5 - The worst case is for VGA 1024*768@60Hz mode. The worst emission at horizontal polarization was detected at 298.69 MHz with corrected signal level of 40.50 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 1.32 m height and the turntable was at 321°. The worst emission at vertical polarization was detected at 478.14 MHz with corrected signal level of 38.67 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 1.21 m height and the turntable was at 134°.

EUT : CRT Monitor Temperature : 22°C

Model No. : T15QA-* Humidity : 60%

Serial No. : E06072701 Date of Test : Jul 28, 2006

Test Mode : VGA 640*480@75Hz

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	51.34	45.09	8.08	1.18	28.08	26.27	40.00	13.73
	70.74	43.84	7.69	1.54	28.02	25.05	40.00	14.95
	130.88	38.91	11.38	1.99	27.85	24.43	43.50	19.07
	193.93	44.35	12.16	2.45	27.54	31.42	43.50	12.08
	242.43	46.01	13.28	2.80	27.30	34.79	46.00	11.21
	489.78	38.16	19.81	4.09	28.63	33.43	46.00	12.57
Vertical	51.34	49.63	8.08	1.18	28.08	30.81	40.00	9.19
	70.74	45.77	7.69	1.54	28.02	26.98	40.00	13.02
	130.88	39.73	11.38	1.99	27.85	25.25	43.50	18.25
	193.93	43.55	12.16	2.45	27.54	30.62	43.50	12.88
	288.99	40.58	14.54	3.11	27.27	30.96	46.00	15.04
	489.78	41.38	19.81	4.09	28.63	36.65	46.00	9.35

TEST ENGINEER: Season Yang
(SEASON YANG)

EUT : CRT Monitor Temperature : 22°C

Model No. : T15QA-* Humidity : 60%

Serial No. : E06072701 Date of Test : Jul 28, 2006

Test Mode : VGA 800*600@85Hz

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	51.34	47.77	8.08	1.18	28.08	28.95	40.00	11.05
	179.38	44.86	11.68	2.35	27.62	31.27	43.50	12.23
	193.93	44.51	12.16	2.45	27.54	31.58	43.50	11.92
	240.49	45.89	13.24	2.79	27.31	34.61	46.00	11.39
	293.84	48.24	14.68	3.14	27.27	38.79	46.00	7.21
	470.38	38.09	19.39	4.02	28.52	32.98	46.00	13.02
Vertical	51.35	51.61	8.08	1.18	28.08	32.79	40.00	7.21
	130.88	40.91	11.38	1.99	27.85	26.43	43.50	17.07
	193.93	43.81	12.16	2.45	27.54	30.88	43.50	12.62
	293.84	41.56	14.68	3.14	27.27	32.11	46.00	13.89
	470.38	41.79	19.39	4.02	28.52	36.68	46.00	9.32
	764.29	33.30	22.68	5.28	28.47	32.79	46.00	13.21

TEST ENGINEER: Season Yang
(SEASON YANG)

EUT : CRT Monitor Temperature : 22°C

Model No. : T15QA-* Humidity : 60%

Serial No. : E06072701 Date of Test : Jul 28, 2006

Test Mode : VGA 1024*768@60Hz

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	101.78	42.57	10.15	1.74	27.99	26.47	43.50	17.03
	140.58	46.00	11.04	2.06	27.82	31.28	43.50	12.22
	179.38	46.46	11.68	2.35	27.62	32.87	43.50	10.63
	240.49	46.17	13.24	2.79	27.31	34.89	46.00	11.11
	298.69	49.80	14.79	3.18	27.27	40.50	46.00	5.50
	478.14	40.91	19.58	4.04	28.57	35.96	46.00	10.04
Vertical	43.58	43.59	11.06	1.11	28.13	27.63	40.00	12.37
	61.04	45.94	7.05	1.38	28.06	26.31	40.00	13.69
	140.58	44.34	11.04	2.06	27.82	29.62	43.50	13.88
	193.93	43.15	12.16	2.45	27.54	30.22	43.50	13.28
	298.69	43.89	14.79	3.18	27.27	34.59	46.00	11.41
	478.14	43.62	19.58	4.04	28.57	38.67	46.00	7.33

TEST ENGINEER: Season Yang
(SEASON YANG)

5 DEVIATION TO TEST SPECIFICATIONS

None

6 DEBUG DESCRIPTION

Name	M/N:	Specifications (mm)	Manufacturer	Location
Magnetic Core	125-074E	18.2*9.7* 12	Smart Ceramic Company Ltd.	See Appendix II Figure 7, 8, 9
Magnetic Core	125-124K	13.9* 6.9* 15.0	Weihai Feelux Electronic Co.,Ltd	See Appendix II Figure 10