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

Color Monitor

Model No.: C15LA-*

Serial No.: 43TAE27490149

FCC ID : BEJC15LA

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-F04016
Date of Test :Mar 16-23, 2004
Date of Report :Mar 29, 2004

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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	:	Color Monitor
		(A) Model No. : C15LA-*
		(B) Serial No. : 43TAE27490149
		(B) Power Supply : AC100-240V, 50-60Hz, 1.5A

Test Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B JULY 2003 AND ANSI C63.4-2001

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) 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. Also, this report shows that the EUT (M/N: C15LA-*; S/N: 43TAE27490149), which was tested in 3m anechoic chamber on Mar 16-23, 2004 to be technically compliant with the FCC official limits.

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 : Mar 16-23, 2004

Prepared by : Cathrin. Yin 2004.04.07 Test Engineer
CATHRIN YIN
(Assistant)

AUDIX®
Audix Technology (Shanghai) Co., Ltd.

Dream Cao 2004.04.07
For and on behalf of
DREAM CAO
(Engineer)

Reviewer : Sammy Chen 2004.04.07
SAMMY CHEN
(Engineer)

Approved Signatory : Byron Kwo 07 Apr 04
Authorized Signature(s)
BYRON KWO
(Assistant Manager)

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test

Description	:	Color Monitor
Type of EUT	:	☑ Production ☐ Pre-product ☐ Pro-type
Model No.	:	C15LA-*
Serial No.	:	43TAE27490149
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, YaoXin Road, Nanjing China

1.2 Supported Simulators

1.2.1 PC

Manufacturer	:	HP
Model Number	:	DL481P
Serial Number	:	CNG3470BD9
CPU	:	2.6GHz.
Power Cable	:	Unshielded, detachable ,1.8m..
Certificate	:	FCC DoC, MIC (E-A011-03-2204CB), VCCI, C-Tick, CE/EMC,

1.2.2 Keyboard (PS2)

Manufacturer	:	Logitech
Model Number	:	KB-0133
C/T	:	B69350MVBPFDI
Data Cable	:	Unshielded, undetachable, 1.9m
Certification	:	FCC DoC, VCCI, CE/EMC, MIC, C-Tick (N119)

1.2.3 Mouse (PS2)

Manufacturer	:	Logitech
Model Number	:	M-S69
C/T	:	F6AB70S5BPI1G6O
Data Cable	:	Unshielded ,undetachable, 1.85m
Certificate	:	FCC ID:JNZ21-1443, VCCI CE/EMC, MIC, C-Tick(N231).

1.2.4 Printer

Manufacturer	:	HP
Model Number	:	C3990A
Serial Number	:	JPZX020487
Data Cable	:	Unshielded, detachable, 1.5m
Certification	:	GS, CE/EMC, C-Tick, FCC DoC,

1.2.5 Modem

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

1.3 Description of Test Facility

Site Description (Semi-Anechoic Chamber)	:	Sept. 17, 1998 file on 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
NVLAP Lab Code	:	200371-0

1.4 Measurement Uncertainty

Conducted Emission Uncertainty	:	U=±2.66dB
Radiated Emission Uncertainty	:	U=±4.26dB

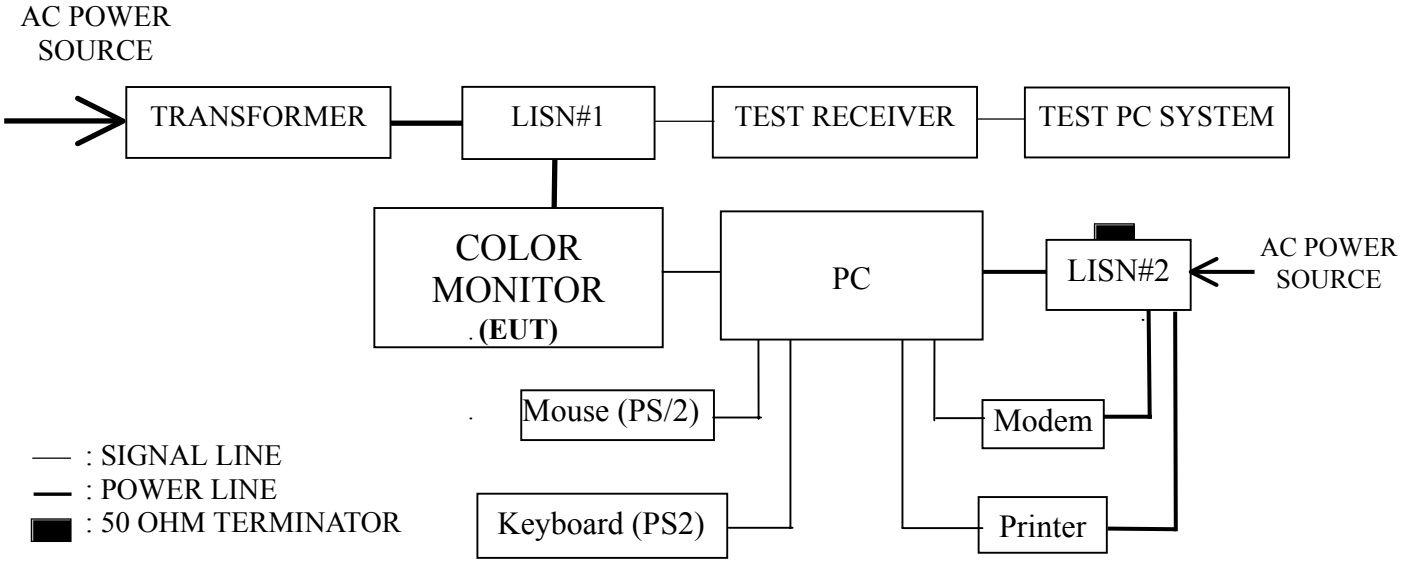
2 CONDUCTED EMISSION TEST

2.1 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.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS10	844077/020	Apr 21, 2003	1 Year
2.	Line Impedance Stabilization Network (LISN#1)	Kyoritsu	KNW-407	8-1280-4	Apr 23,2003	1 Year
3.	Line Impedance Stabilization Network (LISN#2)	Kyoritsu	KNW-407	8-1280-5	Apr 24,2003	1 Year
4.	50Ω Coaxial Switch	Anritsu	MP59B	M73389	Sep 24, 2003	1/2 Year
5.	50Ω Terminator	No.26 Factory	BNC	No.1	Oct 28, 2004	1/2 Year
6.	Software	Audix	E3	SET00200 9804M592	-	-

2.2 Block Diagram of Test Setup



2.3 Conducted Emission Limit

Frequency Range (MHz)	Limits dB(μV)	
	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.

2.4 Test Configuration

The EUT (listed in Sec.1.1) and the simulators (listed in Sec1.2) were installed as shown on Sec.2.2 to meet FCC requirement and operating in a manner which tends to maximize its emission level in a normal application.

2.5 Operating Condition of EUT

2.5.1 Setup the EUT and simulators as shown in Sec. 2.2

2.5.2 Turn on the power of all equipment and the EUT.

2.5.3 Set the contrast control to maximum.

2.5.4 Set the brightness control to maximum or at raster extinction if raster extinction occurs at less than maximum brightness.

2.5.5 For color monitors, use white letters on a black background to represent all color.

2.5.6 Select the worse case of positive or negative video if both alternatives are available.

2.5.7 Set character size and number of characters per line so that typically the greatest number of characters per screen is displayed.

2.5.8 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 apply, use a typical display.

2.5.9 Set the EUT on the test mode, and then test.

2.6 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 FCC Part 15 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 mode (640*480 75Hz, 800*600 85Hz, 1024*768 60Hz) was done on conducted disturbance test and all the test results are listed in Sec. 2.7.

2.7 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.

The worse case is for 800*600 85Hz mode. The worst emission is detected at 0.160 MHz with corrected signal level of 51.52 dB(μV) (limit is 55.46 dB(μV)), when the VA (AV) of the EUT is connected to LISN.

EUT :	Color Monitor	Temperature :	23℃
Model No. :	C15LA-*	Humidity :	56%
Serial No. :	43TAE27490149		
Test Mode :	640*480 75Hz	Date of Test :	Mar 16, 2004

Test Line		Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	QP	0.186	0.22	55.35	55.57	64.20	8.63
		0.235	0.20	51.14	51.34	62.29	10.95
		0.282	0.16	47.70	47.86	60.76	12.90
		0.328	0.15	42.02	42.17	59.50	17.33
		4.688	0.20	42.82	43.02	56.00	12.98
		18.656	0.84	42.13	42.97	60.00	17.03
	AV	**0.186**	**0.22**	**47.90**	**48.12**	**54.21**	**6.09**
VB		0.187	0.22	53.18	53.40	64.17	10.77
		0.233	0.20	49.66	49.86	62.35	12.49
		0.281	0.20	47.02	47.22	60.79	13.57
		0.328	0.20	42.74	42.94	59.49	16.55
		4.688	0.27	43.20	43.47	56.00	12.53
		21.189	0.74	35.12	35.86	60.00	24.14

NOTE 1 - Probe Factor means insertion loss of LISN.
NOTE 2 - Factor = Cable Loss + Probe Factor.
NOTE 3 - Emission Level = Meter Reading + Factor.
NOTE 4 - QP means Quasi-Peak Values, AV means Average Values.

TEST ENGINEER: Dream Cao
(DREAM CAO)

EUT :	Color Monitor	Temperature :	23℃
Model No. :	C15LA-*	Humidity :	56%
Serial No. :	43TAE27490149		
Test Mode :	800*600 85Hz	Date of Test :	Mar 16, 2004

Test Line		Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	QP	0.160	0.22	58.61	58.83	65.48	6.65
		0.215	0.21	51.44	51.65	63.00	11.35
		0.268	0.18	47.30	47.48	61.19	13.71
		0.322	0.15	44.14	44.29	59.65	15.36
		4.617	0.20	42.52	42.72	56.00	13.28
		19.212	0.88	43.73	44.61	60.00	15.39
	AV	**0.160**	**0.22**	**51.30**	**51.52**	**55.46**	**3.94**
VB	QP	0.161	0.24	57.78	58.02	65.40	7.38
		0.215	0.20	51.98	52.18	63.00	10.82
		0.268	0.20	48.80	49.00	61.19	12.19
		0.321	0.20	42.98	43.18	59.69	16.51
		4.563	0.27	42.58	42.85	56.00	13.15
		21.630	0.76	36.42	37.18	60.00	22.82
	AV	0.160	0.22	49.90	50.15	55.41	5.26

NOTE 1 - Probe Factor means insertion loss of LISN.
NOTE 2 - Factor = Cable Loss + Probe Factor.
NOTE 3 - Emission Level = Meter Reading + Factor.
NOTE 4 - QP means Quasi-Peak Values, AV means Average Values.

TEST ENGINEER: Dream Cao
(DREAM CAO)

EUT	:	Color Monitor	Temperature	:	23℃
Model No.	:	C15LA-*	Humidity	:	56%
Serial No.	:	43TAE27490149			
Test Mode	:	1024*768 60Hz	Date of Test	:	Mar 16, 2004

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	**0.194**	**0.22**	**53.30**	**53.52**	**63.88**	**10.36**
	0.242	0.19	49.18	49.37	62.04	12.67
	0.288	0.16	46.28	46.44	60.58	14.14
	0.338	0.15	40.43	40.58	59.25	18.67
	4.880	0.20	42.36	42.56	56.00	13.44
	19.515	0.90	41.78	42.68	60.00	17.32
VB	0.193	0.22	51.14	51.36	63.91	12.55
	0.242	0.19	47.78	47.97	62.04	14.07
	0.291	0.21	44.68	44.89	60.50	15.61
	0.338	0.20	41.04	41.24	59.25	18.01
	4.879	0.27	42.82	43.09	56.00	12.91
	22.173	0.78	34.30	35.08	60.00	24.92

NOTE 1 - Probe Factor means insertion loss of LISN.
NOTE 2 - Factor = Cable Loss + Probe Factor.
NOTE 3 - Emission Level = Meter Reading + Factor.
NOTE 4 - All reading are Quasi-Peak Values.

TEST ENGINEER: Dream Cao
(DREAM CAO)

3 RADIATED EMISSION TEST

3.1 Test Equipment

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

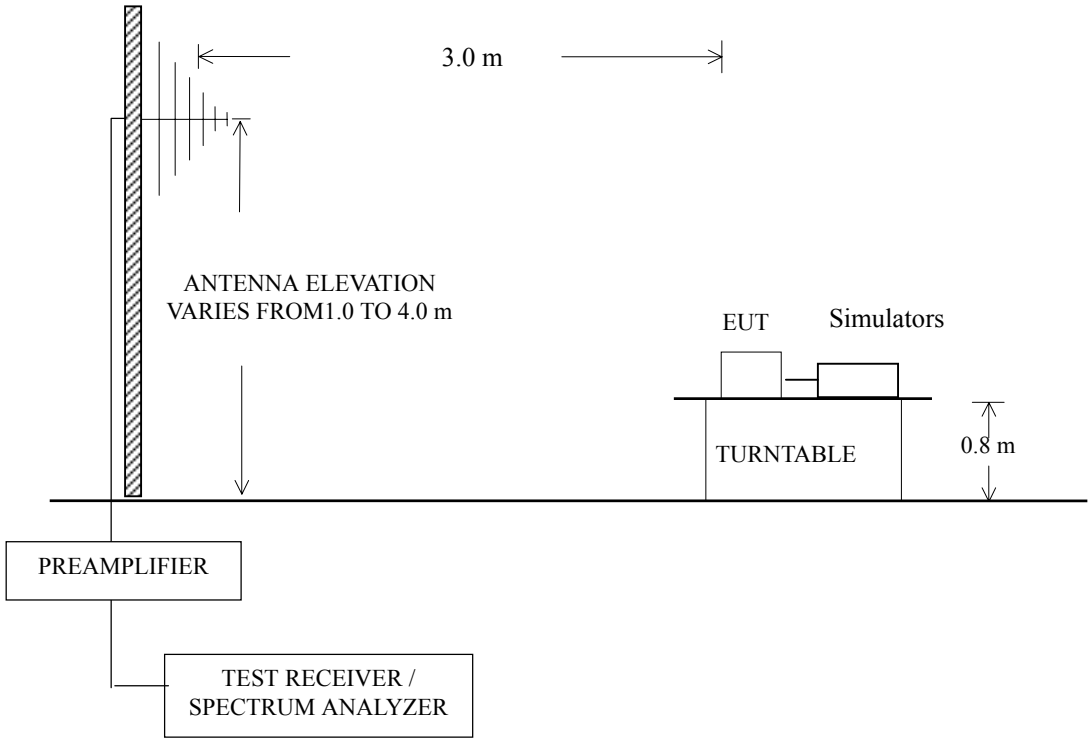
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	8593EM	3628A00167	Apr 26, 2003	1 Year
2.	Bilog Antenna	Chase	CBL6111	1145	Mar 20, 2004	1/2 Year
3.	Test Receiver	Rohde & Schwarz	ESVS10	832699/001	Apr 22, 2003	1 Year
4.	Preamplifier	HP	8447D	2944A06849	Mar 22, 2004	1/2 Year
5.	50Ω Coaxial Switch	Anritsu	MP59B	M74689	Oct 28, 2004	1/2 Year
6.	Software	Audix	E3	SET00200 9912M295-2	-	-

3.2 Block Diagram of Test Setup

EUT and simulators

Same as Sec.2.2.

Radiated emission test setup



3.3 Radiated Emission Limit

Frequency (MHz)	Distance (m)	Field strength limits (μV/m)	
		(μV/m)	dB(μV/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(μV/m) = 20 log Emission Level (μV/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.

3.4 Test Configuration

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

Please refer to Sec.2.4.

3.5 Operating Condition of EUT

Same as conducted emission test which is listed in Sec.2.5, except the test setup replaced by Sec.3.2.

3.6 Test Procedures

The EUT and simulators were placed on a turntable which 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 polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to FCC Part 15 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.

The test mode (640*480 75Hz, 800*600 85Hz, 1024*768 60Hz) was done on radiated 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 radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

The worse case is for 800*600 85Hz mode. The worst emission at horizontal polarization was detected at 310.330 MHz with corrected signal level of 37.38 dB(μV/m) (limit is 46.00 dB(μV/m)), when the antenna was 1.20m height and the turn table was at 305°.The worst emission at vertical polarization was detected at 31.940 MHz with corrected signal level of 36.71 dB(μV/m) (limit is 40.00 dB(μV/m)), when the antenna was 1.00m height and the turn table was at 105°.

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

EUT	:	Color Monitor	Temperature	:	20.7℃
Model No.	:	C15LA-*	Humidity	:	53%
Serial No.	:	43TAE27490149			
Test Mode	:	640*480 75Hz	Date of Test	:	Mar 23, 2004

Polarization	Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV/m)	Limits dB(μV/m)	Margin (dB)
Horizontal	96.930	6.72	1.38	28.29	44.43	24.24	43.50	19.26
	184.230	10.77	1.92	27.89	47.62	32.42	43.50	11.08
	250.190	13.53	2.25	27.53	46.11	34.36	46.00	11.64
	298.690	14.51	2.48	27.55	43.20	32.64	46.00	13.36
	322.940	**15.30**	**2.60**	**27.67**	**49.07**	**39.30**	**46.00**	**6.70**
	567.380	21.53	3.52	28.81	32.36	28.60	46.00	17.40
Vertical	**36.790**	**11.56**	**0.80**	**28.44**	**52.28**	**36.20**	**40.00**	**3.80**
	114.390	11.94	1.49	28.20	39.27	24.50	43.50	19.00
	184.230	10.77	1.92	27.89	45.26	30.06	43.50	13.44
	288.990	14.34	2.44	27.58	42.09	31.29	46.00	14.71
	378.230	16.88	2.83	28.09	38.92	30.54	46.00	15.46
	502.390	19.65	3.31	28.52	35.06	29.50	46.00	16.50

NOTE 1 - Probe Factor means antenna factor.
NOTE 2 - Emission Level = Meter Reading + Antenna Factor + Cable Loss – Preamp Factor
NOTE 3 - Factor = Probe Factor + Cable Loss - Preamp Factor
NOTE 4 - All reading are Quasi-Peak values.
NOTE 5 - At the frequency 36.790 MHz (vertical polarization), the measured results are below the specification limit by a margin less than the measurement uncertainty, it is not therefore possible to determine compliance at a level of confidence of 95%. However, the measured result indicates a higher probability that the product tested complies with the specification limit.

TEST ENGINEER: Dream Cao
(DREAM CAO)

EUT	:	Color Monitor	Temperature :	20.7℃	
Model No.	:	C15LA-*	Humidity :	53%	
Serial No.	:	43TAE27490149			
Test Mode	:	800*600 85Hz	Date of Test :	Mar 23, 2004	

Polarization	Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV/m)	Limits dB(μV/m)	Margin (dB)
Horizontal	96.930	6.72	1.38	28.29	42.80	22.61	43.50	20.89
	124.090	13.59	1.56	28.17	37.19	24.17	43.50	19.33
	193.930	10.47	2.04	27.85	49.57	34.23	43.50	9.27
	255.040	13.63	2.24	27.51	46.43	34.79	46.00	11.21
	310.330	**14.87**	**2.51**	**27.55**	**47.55**	**37.38**	**46.00**	**8.62**
	339.430	15.79	2.72	27.77	42.58	33.32	46.00	12.68
Vertical	**31.940**	**12.08**	**0.82**	**28.48**	**52.29**	**36.71**	**40.00**	**3.29**
	126.030	13.31	1.60	28.16	40.20	26.95	43.50	16.55
	182.290	10.83	1.88	27.89	46.60	31.42	43.50	12.08
	242.430	13.07	2.20	27.62	45.70	33.35	46.00	12.65
	293.840	14.44	2.48	27.58	40.79	30.13	46.00	15.87
	455.830	18.68	3.12	28.44	36.93	30.29	46.00	15.71

NOTE 1 - Probe Factor means antenna factor.
NOTE 2 - Emission Level = Meter Reading + Antenna Factor + Cable Loss – Preamp Factor
NOTE 3 - Factor = Probe Factor + Cable Loss - Preamp Factor
NOTE 4 - All reading are Quasi-Peak values.
NOTE 5 - At the frequency 31.940 MHz (vertical polarization), the measured results are below the specification limit by a margin less than the measurement uncertainty, it is not therefore possible to determine compliance at a level of confidence of 95%. However, the measured result indicates a higher probability that the product tested complies with the specification limit.

TEST ENGINEER: Dream Cao
(DREAM CAO)

EUT	:	Color Monitor	Temperature :	20.7℃	
Model No.	:	C15LA-*	Humidity :	53%	
Serial No.	:	43TAE27490149			
Test Mode	:	1024*768 60Hz	Date of Test :	Mar 23, 2004	

Polarization	Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV/m)	Limits dB(μV/m)	Margin (dB)
Horizontal	119.240	13.69	1.54	28.19	37.99	25.03	43.50	18.47
	182.290	**10.83**	**1.88**	**27.89**	**52.62**	**37.44**	**43.50**	**6.06**
	242.430	13.07	2.20	27.62	45.61	33.26	46.00	12.74
	261.830	13.78	2.27	27.51	45.17	33.71	46.00	12.29
	324.880	15.33	2.60	27.69	42.22	32.46	46.00	13.54
	358.830	16.36	2.73	27.90	36.84	28.03	46.00	17.97
Vertical	**36.790**	**11.56**	**0.80**	**28.44**	**51.94**	**35.86**	**40.00**	**4.14**
	119.240	13.69	1.54	28.19	41.73	28.77	43.50	14.73
	182.290	10.83	1.88	27.89	47.91	32.73	43.50	10.77
	242.430	13.07	2.20	27.62	44.74	32.39	46.00	13.61
	324.880	15.33	2.60	27.69	38.92	29.16	46.00	16.84
	434.490	18.21	3.03	28.48	35.14	27.90	46.00	18.10

NOTE 1 - Probe Factor means antenna factor.
NOTE 2 - Emission Level = Meter Reading + Antenna Factor + Cable Loss – Preamp Factor
NOTE 3 - Factor = Probe Factor + Cable Loss - Preamp Factor
NOTE 4 - All reading are Quasi-Peak values.
NOTE 5 - At the frequency 36.790 MHz (vertical polarization), the measured results are below the specification limit by a margin less than the measurement uncertainty, it is not therefore possible to determine compliance at a level of confidence of 95%. However, the measured result indicates a higher probability that the product tested complies with the specification limit.

TEST ENGINEER: Dream Cao
(DREAM CAO)

4 DEVIATION TO TEST SPECIFICATIONS

The following components are used during the countermeasure procedures:

Name	Model Number	Specifications (mm)			Manufacturer	Location
		Length	Internal diameter	External diameter		
Magnetic core	125-074E	12.0±0.7	9.6±0.3	18.4±0.4	BOAM Co., Ltd.	See Appendix II Figure 4, 5, 6
Magnetic core	70-1601708001	17.0±0.5	8.0±0.3	16.0±0.5	URITE&EQ Co., Ltd.	See Appendix II Figure 4
Note: The Manufacturer had to add the magnetic cores to the cables in the production of this EUT in order that complies with the limits.						