

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

LCD Monitor

Model No.: L1952SQ

Serial No.: E05122904

FCC ID : BEJL1952SQ

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-F06004
Date of Test : Jan 10-11, 2006
Date of Report : Jan 18, 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 : LCD Monitor
(A) Model No. : L1952SQ
(B) Serial No. : E05122904
(C) Power Supply : 120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B SEPTEMBER 2005
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) 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: L1952SQ; S/N: E05122904) which was tested in 3m anechoic chamber on Jan 10-11, 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 : Jan 10-11, 2006

Prepared By:

Sarah Liu 2006.01.20
SARAH LIU / Assistant

Reviewer:

Sarah Liu 2006.01.20
 For and on behalf of
JIAJIA CHEN / Supervisor
Audix Technology (Shanghai) Co., Ltd.

Approved Signatory:

Byron Kwo 20 Jan 06
BYRON KWON / Deputy 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 SEPTEMBER 2005 AND ANSI C63.4-2003	Pass	15.107 Class B
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B SEPTEMBER 2005 AND ANSI C63.4-2003	Pass	15.109 Class B

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description : LCD Monitor

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

Model No. : L1952SQ

Serial No. : E05122904

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 : Unshielded, Detachable, 1.8m with two cores

2.2 Supported Simulators

2.2.1 PC

Manufacturer : HP

Model Number : DL481P

CPU : CNG3470BD9

Power Cable : Unshielded, Detachable ,1.8m.

Certification : FCC DoC, MIC (E-A011-03-2204CB),
VCCI, C-Tick, CE/EMC

2.2.2 Keyboard

Manufacturer : Logitech

Model Number : KB-0133

Serial Number : 323686-AA1

Data Cable : Unshielded, Undetachable, 1.9m

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

2.2.3 Mouse

Manufacturer : Logitech
Model Number : M-S69
Serial Number : 323614-001
Data Cable : Unshielded ,Undetachable, 1.85m.
Certification : FCC ID:JNZ21-1443, VCCI, CE-EMC,
MIC, C-Tick(N231)

2.2.4 Printer

Manufacturer : HP
Model Number : C3990A
Serial Number : JPZX020487
Data Cable : Unshielded, Detachable, 1.5m
Power Cord : Unshielded, Detachable, 1.8m
Certification : GS, CE/EMC, C-Tick, FCC DoC

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

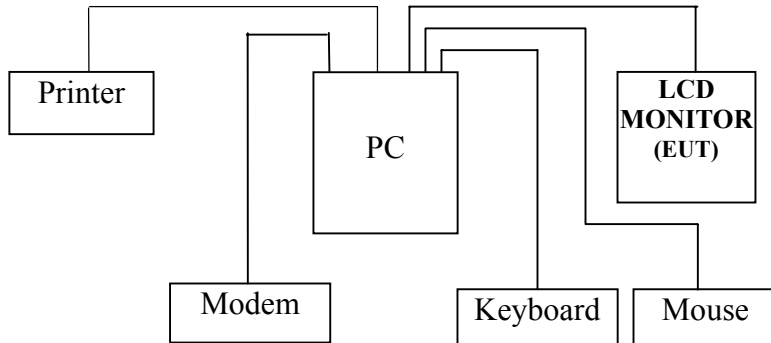
3.1 Test Equipment

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

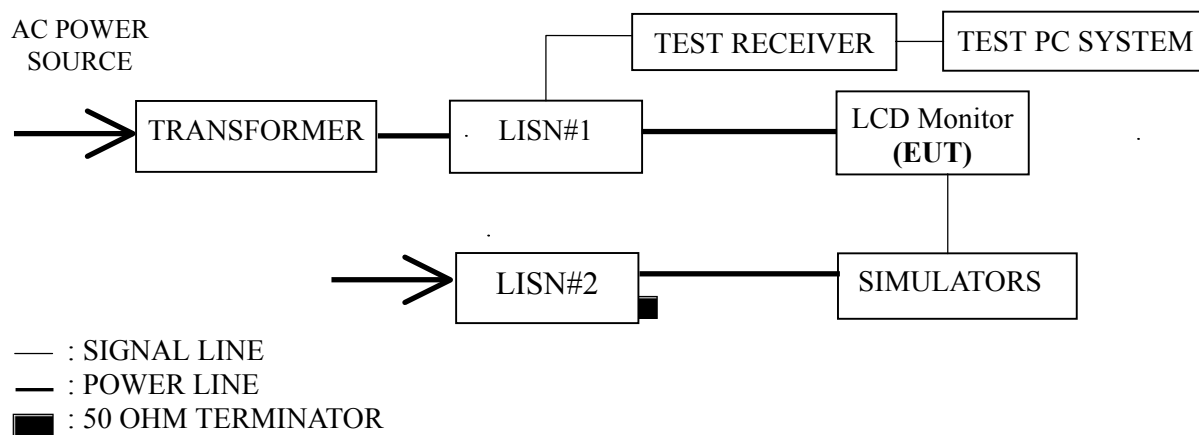
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESHS10	844077/020	Jan 28, 2005	Jan 28, 2006
2.	Line Impedance Stabilization Network (LISN#1)	Kyoritsu	KNW-407	8-1280-4	Apr 12, 2005	Apr 12, 2006
3.	Line Impedance Stabilization Network (LISN#2)	Kyoritsu	KNW-407	8-1280-5	Apr 13, 2005	Apr 13, 2006
4.	50Ω Coaxial Switch	ANRITSU	MP59B	6200426389	Oct 07, 2005	Apr 07, 2006
5.	50Ω Terminator	Anritsu	BNC	001	May 11, 2005	May 11, 2006
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 (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.		

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 (VGA 800*600@75Hz, VGA 1024*768@75Hz, VGA 1280*1024@60Hz) in turn, and then test it.

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 (VGA 800*600@75Hz, VGA 1024*768@75Hz, VGA 1280*1024@60Hz) 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.

The worst case is for VGA 1280*1024@60Hz mode. The worst emission is detected at 2.93 MHz with corrected signal level of 42.84 (μ V) (limit is 56.00 dB (μ V)), when the VA of the EUT is connected to LISN.

NOTE 1 - Factor = Cable Loss + LISN Factor.

NOTE 2 - Emission Level = Meter Reading + Factor.

NOTE 3 - All reading are Quasi-Peak values.

EUT : LCD Monitor Temperature : 22°C

Model No. : L1952SQ Humidity : 50%

Serial No. : E05122904

Test Mode : VGA 800*600@75Hz Date of Test : Jan 11, 2006

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.21	0.57	45.40	45.97	63.35	17.38
	0.53	0.46	37.38	37.84	56.00	18.16
	1.45	0.37	35.65	36.02	56.00	19.98
	2.90	0.34	41.40	41.74	56.00	14.26
	6.70	0.39	39.23	39.62	60.00	20.38
	10.96	0.43	43.06	43.49	60.00	16.51
VB	0.21	0.56	46.62	47.18	63.32	16.14
	0.58	0.33	35.94	36.27	56.00	19.73
	1.45	0.29	32.08	32.37	56.00	23.63
	2.90	0.31	39.44	39.75	56.00	16.25
	7.25	0.39	38.01	38.40	60.00	21.60
	10.96	0.49	40.49	40.98	60.00	19.02

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : LCD Monitor Temperature : 22°C

Model No. : L1952SQ Humidity : 50%

Serial No. : E05122904

Test Mode : VGA 1024*768@75Hz Date of Test : Jan 11, 2006

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.21	0.56	46.52	47.08	63.32	16.24
	0.53	0.46	37.12	37.58	56.00	18.42
	1.45	0.37	35.53	35.90	56.00	20.10
	2.90	0.34	42.33	42.67	56.00	13.33
	7.25	0.39	39.82	40.21	60.00	19.79
	11.62	0.44	42.62	43.06	60.00	16.94
VB	0.21	0.56	46.99	47.55	63.32	15.77
	0.58	0.33	35.37	35.70	56.00	20.30
	1.45	0.29	32.04	32.33	56.00	23.67
	2.90	0.31	39.38	39.69	56.00	16.31
	7.69	0.40	38.35	38.75	60.00	21.25
	11.62	0.51	40.39	40.90	60.00	19.10

TEST ENGINEER: D. Yang
(DIO YANG)

EUT : LCD Monitor Temperature : 22°C

Model No. : L1952SQ Humidity : 50%

Serial No. : E05122904

Test Mode : VGA 1280*1024@60Hz Date of Test : Jan 11, 2006

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.21	0.56	46.99	47.55	63.32	15.77
	0.53	0.46	37.10	37.56	56.00	18.44
	1.45	0.37	35.55	35.92	56.00	20.08
	2.90	0.34	42.39	42.73	56.00	13.27
	7.25	0.39	39.88	40.27	60.00	19.73
	11.62	0.44	42.84	43.28	60.00	16.72
VB	0.21	0.56	48.15	48.71	63.32	14.61
	0.28	0.50	37.74	38.24	60.90	22.66
	0.58	0.44	35.75	36.19	56.00	19.81
	2.90	0.34	39.40	39.74	56.00	16.26
	7.69	0.39	38.70	39.09	60.00	20.91
	11.62	0.44	41.72	42.16	60.00	17.84

TEST ENGINEER: Dio Yang
(DIO YANG)

4 RADIATED EMISSION TEST

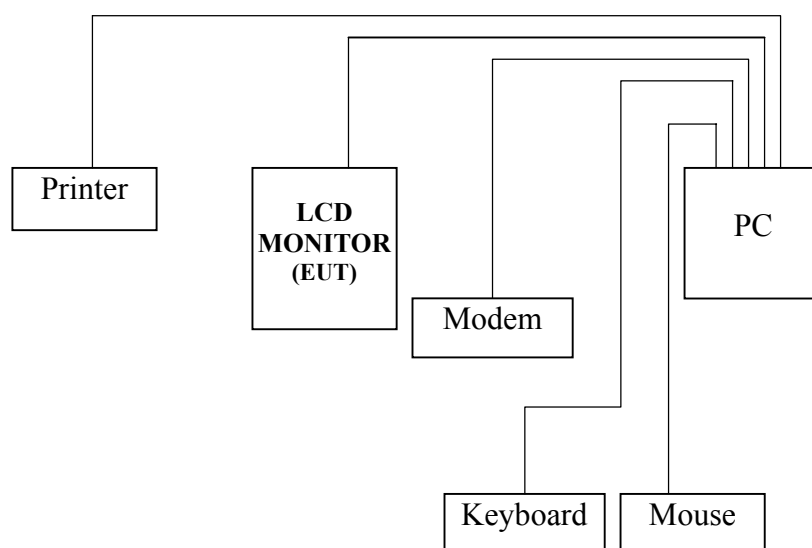
4.1 Test Equipment

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

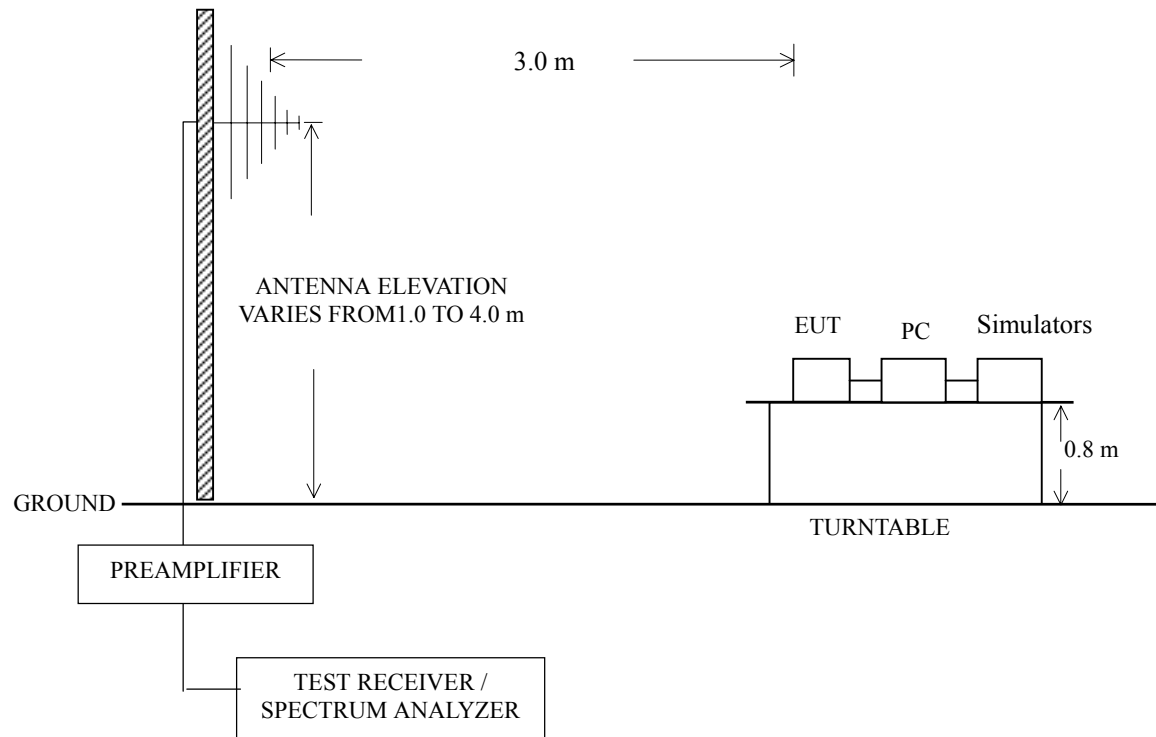
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3628A00167	Apr 18, 2005	Apr 18, 2006
2.	Bilog Antenna	Chase	CBL6111	1146	Sep 18, 2005	Mar 18, 2006
3.	Test Receiver	R&S	ESVS10	832699/004	Apr 08, 2005	Apr 08, 2006
4.	Preamplifier	HP	8447D	2944A06849	Sep 20, 2005	Mar 20, 2006
5.	50Ω Coaxial Switch	Anritsu	MP59B	6200426390	Oct 07, 2005	Apr 07, 2006
6.	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.

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.

The test modes (VGA 800*600@75Hz, VGA 1024*768@75Hz, VGA 1280*1024@60Hz) were done on radiated disturbance test and all the test results are listed in Sec.4.7.

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.

The worst case is for 1280*1024@60Hz mode. The worst emission at horizontal polarization was detected at 744.89 MHz with corrected signal level of 40.37 dB ($\mu\text{V/m}$) (limit is 46.00 dB ($\mu\text{V/m}$)), when the antenna was 1.20 m height and the turntable was at 140°. The worst emission at vertical polarization was detected at 373.38 MHz with corrected signal level of 41.15 dB ($\mu\text{V/m}$) (limit is 46.00 dB ($\mu\text{V/m}$)), when the antenna was 1.20 m height and the turntable was at 75°.

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

NOTE 1 - Emission Level = Meter Reading + Factor.

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

NOTE 3 - All reading are Quasi-Peak values.

EUT : LCD Monitor Temperature : 22.7°C

Model No. : L1952SQ Humidity : 53%

Serial No. : E05122904

Test Mode : VGA 800*600@60Hz Date of Test : Jan 10, 2006

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	203.63	45.24	10.53	2.05	27.88	29.94	43.50	13.56
	324.88	41.93	15.21	2.65	27.79	32.00	46.00	14.00
	468.44	40.80	18.01	3.20	28.66	33.35	46.00	12.65
	609.09	37.40	21.23	3.72	28.81	33.54	46.00	12.46
	676.99	40.54	21.83	3.96	28.88	37.45	46.00	8.55
	856.44	37.02	22.90	4.42	28.52	35.82	46.00	10.18
Vertical	126.03	49.20	12.10	1.65	28.27	34.68	43.50	8.82
	201.69	44.34	10.77	2.05	27.89	29.27	43.50	14.23
	335.55	45.82	15.68	2.69	27.87	36.32	46.00	9.68
	468.44	43.42	18.01	3.20	28.66	35.97	46.00	10.03
	599.39	39.11	20.65	3.69	28.80	34.65	46.00	11.35
	856.44	39.81	22.90	4.42	28.52	38.61	46.00	7.39

TEST ENGINEER: Green-Zou
(GREEN ZOU)

EUT : LCD Monitor Temperature : 22.7°C

Model No. : L1952SQ Humidity : 53%

Serial No. : E05122904

Test Mode : VGA 1024*768@75Hz Date of Test : Jan 10, 2006

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	203.63	42.99	10.53	2.05	27.88	27.69	43.50	15.81
	329.73	39.10	15.37	2.67	27.83	29.31	46.00	16.69
	400.54	37.60	17.50	2.94	28.30	29.74	46.00	16.26
	599.39	37.66	20.65	3.69	28.80	33.20	46.00	12.80
	674.08	36.56	21.70	3.93	28.88	33.31	46.00	12.69
	730.34	38.17	22.79	4.10	28.84	36.22	46.00	9.78
Vertical	85.29	47.51	7.20	1.38	28.55	27.54	40.00	12.46
	138.64	42.37	12.03	1.71	28.20	27.91	43.50	15.59
	337.49	43.73	15.76	2.71	27.88	34.32	46.00	11.68
	473.29	45.27	18.21	3.23	28.68	38.03	46.00	7.97
	730.34	36.09	22.79	4.10	28.84	34.14	46.00	11.86
	853.53	37.64	22.95	4.42	28.53	36.48	46.00	9.52

TEST ENGINEER: Green-Zou
(GREEN ZOU)

EUT : LCD Monitor Temperature : 22.7°C

Model No. : L1952SQ Humidity : 53%

Serial No. : E05122904

Test Mode : VGA 1280*1024@60Hz Date of Test : Jan 10, 2006

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	82.38	40.34	7.02	1.35	28.58	20.13	40.00	19.87
	135.73	38.11	12.11	1.68	28.22	23.68	43.50	19.82
	216.24	43.65	10.27	2.11	27.83	28.20	46.00	17.80
	373.38	42.93	16.44	2.85	28.13	34.09	46.00	11.91
	698.33	38.40	23.02	4.02	28.90	36.54	46.00	9.46
	744.89	42.38	22.67	4.13	28.81	40.37	46.00	5.63
Vertical	85.29	47.85	7.20	1.38	28.55	27.88	40.00	12.12
	135.73	44.14	12.11	1.68	28.22	29.71	43.50	13.79
	322.94	44.16	15.20	2.63	27.78	34.21	46.00	11.79
	373.38	49.99	16.44	2.85	28.13	41.15	46.00	4.85
	478.14	42.00	18.25	3.25	28.70	34.80	46.00	11.20
	856.44	38.23	22.90	4.42	28.52	37.03	46.00	8.97

TEST ENGINEER: Green-Zou
(GREEN ZOU)

5 DEVIATION TO TEST SPECIFICATIONS

None.

6 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	Specifications (mm)	Manufacturer	Location
Al-Tape	40*20	Fuzhou Huibang ELECTRONIC Corp.	See Appendix Figure 9
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.			