

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

LCD Monitor

Model No.: W2340TV

Serial No.: E2009120804

FCC ID : BEJW2340TV

Prepared For : LG Electronics U.S.A., Inc.
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Date of Test : Dec 29 – 30, 2009
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TEST REPORT FOR FCC CERTIFICATE

Applicant : LG Electronics U.S.A., Inc.
Manufacturer : LG Electronics Nanjing Display Co., Ltd.
EUT Description : LCD Monitor
(A) Model No. : W2340TV
(B) Serial No. : E2009120804
(C) Power Supply : 120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2008
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: Refer to Sec. 2.1; S/N: Refer to Sec. 2.1) which was tested in 3m anechoic chamber Dec 29 – 30, 2009 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 : Dec 29 – 30, 2009 Date of Report : Jan 04, 2010

Producer : Kathy Wang
KATHY WANG / Assistant

Review : Dio Yang
DIO YANG / Deputy Assistant Manager

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

Signatory : Sammy Chen
Authorized Signature EMSAMMY 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 of Test Item	Standard	Limits	Results
EMISSION			
Conducted Disturbance at the Mains Terminal	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2008 AND ANSI C63.4-2003	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2008 AND ANSI C63.4-2003	15.109(a) Class B	Pass

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description	:	LCD Monitor
Type of EUT	:	☒ Production ☐ Pre-product ☐ Pro-type
Model No.	:	W2340TV
Serial No.	:	E2009120804
Real Power	:	43.00W
Applicant	:	LG Electronics U.S.A., Inc. 1000 Sylvan Avenue, Englewood Cliffs, NJ 07632, United States
Manufacturer	:	LG Electronics Nanjing Display Co., Ltd. No.346, Yao Xin Road, Economic & Technical Development Zone, Nanjing, China
LCD Panel	:	Manufacturer : LG Display M/N : LM230WF1 (TL) (A7)
Max Resolution	:	1920*1080@60Hz
D-Sub Cable #1	:	Shielded, Detachable, 1.85m, with two cores on cable
D-Sub Cable #2	:	Shielded, Detachable, 1.85m, with two cores in connector
DVI Cable #1	:	Shielded, Detachable, 1.85m, with two cores on cable
DVI Cable #2	:	Shielded, Detachable, 1.85m, with two cores in connector
Power Cord	:	Unshielded, Detachable, 1.80m
Note	:	After evaluation, the D-Sub cable#1 and DVI cable#1 were used in the test for they will cause the maximum emission.

Remark:

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

- (1) One D-Sub Port : Connected with PC
- (2) One DVI Port : Connected with PC
- (3) One AC In Port : Connected with Power

2.2 Peripherals

2.2.1 PC

Manufacturer : HP
Model Number : dx7400MT
Serial Number : CNG8130K89
Power Cord : Unshielded, Detachable, 1.8m
Certificate : FCC DoC; CE/EMC; VCCI; C-Tick; UL
BSMI (R33001) 3C (A000111)
MIC (E-A011-04-2659(B))

2.2.2 Printer

Manufacturer : HP
Model Number : C3990A
Serial Number : JPZX020487
Data Cable : Shielded, Detachable, 1.5m
Certificate : GS, CE/EMC, C-Tick, FCC DoC

2.2.3 Keyboard

Manufacturer : Microsoft
Model Number : RT2300
Serial Number : 7668200662248
Data Cable : Shielded, Undetachable, 1.8m
Certificate : CE/EMC, FCC DoC, VCCI, MIC, C-Tick,
BSMI

2.2.4 Mouse

Manufacturer : Microsoft
Model Number : RT2300
Serial Number : 6965712071551
Data Cable : Shielded, Undetachable, 1.85m.
Certificate : FCC DoC, VCCI, CE/EMC, MIC, GS

2.2.5 Modem

Manufacturer : TP-LINK
Model Number : TM-EC5658V
Serial Number : 07123301053
Data Cable : Shielded, Detachable, 1.8m
Certificate : FCC DoC, CE/EMC, CCC

2.3 Description of Test Facility

Site Description (Semi-Anechoic Chamber)	:	Sept. 17, 1998 file on Apr 29, 2009 Renewed 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 200233, China
NVLAP Lab Code	:	200371-0

2.4 Measurement Uncertainty

Conducted Emission Expanded Uncertainty:	U = 1.26 dB
Radiated Emission Expanded Uncertainty :	U = 3.02 dB

3 CONDUCTED EMISSION TEST

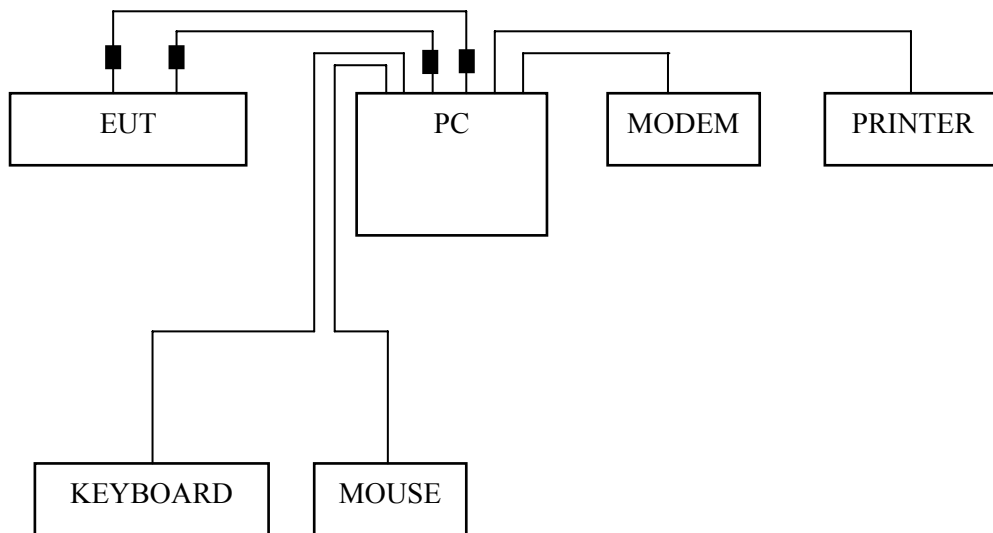
3.1.1 Test Equipment

The following test equipments 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	ESCI	100841	Nov 21, 2009	Nov 21, 2010
2.	Artificial Mains Network (AMN)	R&S	ESH2-Z5	843890/011	Apr 02, 2009	Apr 02, 2010
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Apr 02, 2009	Apr 02, 2010
4.	50 Ω Coaxial Switch	Anritsu	MP59B	6200426389	Sep 19, 2009	Mar 19, 2010
5.	50 Ω Terminator	Anritsu	BNC	001	Apr 02, 2009	Apr 02, 2010
6.	Software	Audix	E3	SET00200 9804M592	--	--

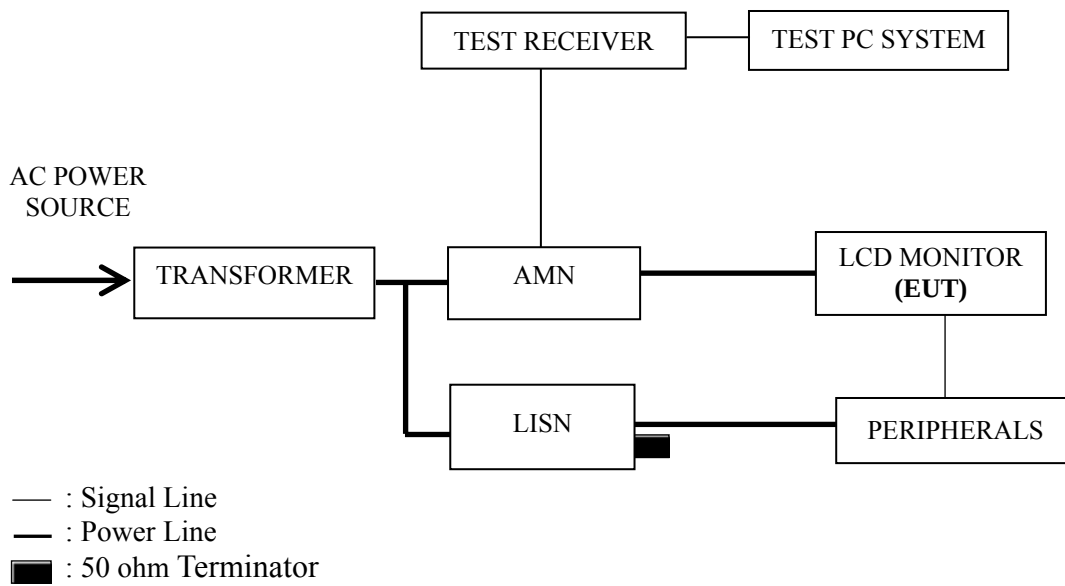
3.2 Block Diagram of Test Setup

3.2.1 EUT & Peripherals



■: Ferrite core

3.2.2 Conducted Disturbance Test Setup



3.3 Conducted Emission Limit [FCC Part 15 Subpart B 15.107(a)]

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		

3.4 Test Configuration

The EUT (listed in Sec.2.1) and the peripherals (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 peripherals as shown in Sec. 3.2.

3.5.2 Turn on the power of all equipments and the EUT.

3.5.3 Set the contrast & brightness of EUT to maximum.

3.5.4 PC system ran the self-test program “EMC Test” by windows XP and sent “H” characters to EUT through graphic card, the EUT’s screen displayed and filled with “H” pattern by its resolution (Via D-Sub/DVI Input).

3.5.5 Repeat above procedure from 3.5.3 to 3.5.4 for difference test mode.

3.5.6 The other peripherals devices were driven and operated during the test.

3.5.7 The test modes are as follows:

M/N	Test Mode
W2340TV	D-Sub 640*480@60Hz
	D-Sub 1024*768@60Hz
	D-Sub 1680*1050@60Hz
	D-Sub 1920*1080@60Hz
	DVI 640*480@60Hz
	DVI 1024*768@60Hz
	DVI 1680*1050@60Hz
	DVI 1920*1080@60Hz

3.6 Test Procedures

The EUT and peripherals were connected to the power mains through an Artificial Mains Network (AMN). This provided a 50 ohm coupling impedance for the measuring equipment.

Both sides of AC line (Line & Neutral) 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 R&S Test Receiver ESCI was set at 9 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.

M/N	Test Mode	Data Page
W2340TV	D-Sub 640*480@60Hz	P12
	D-Sub 1024*768@60Hz	P13
	D-Sub 1680*1050@60Hz	P14
	D-Sub 1920*1080@60Hz	P15
	DVI 640*480@60Hz	P16
	DVI 1024*768@60Hz	P17
	DVI 1680*1050@60Hz	P18
	DVI 1920*1080@60Hz	P19

NOTE 1 – The **bold test mode** listed above means the worst test mode.

NOTE 2 – Factor = Cable Loss + AMN Factor.

NOTE 3 – Emission Level = Meter Reading + Factor.

NOTE 4 – “QP” means “Quasi-Peak” values, “AV” means “Average” values.

NOTE 5 – The worst case is for D-Sub 640*480@60Hz test mode. The worst emission is detected at 0.182 MHz (Quasi-Peak Value) with corrected signal level of 54.88 dB (μV) (limit is 64.42 dB (μV)), when the Neutral the EUT is connected to AMN.

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 48%RH

Serial No. : E2009120804 Date of Test : Dec 29, 2009

Test Mode : D-Sub 640*480@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.182	54.00	0.22	54.22	64.42	10.20	QP
	0.307	40.11	0.25	40.36	60.06	19.70	
	0.552	31.03	0.28	31.31	56.00	24.69	
	4.269	33.44	0.43	33.87	56.00	22.13	
	7.175	39.03	0.47	39.50	60.00	20.50	
	25.591	43.82	0.81	44.63	60.00	15.37	
	0.182	40.73	0.22	40.95	54.42	13.47	AV
	0.307	24.04	0.25	24.29	50.06	25.77	
	0.552	25.40	0.28	25.68	46.00	20.32	
	4.269	18.02	0.43	18.45	46.00	27.55	
	7.175	25.32	0.47	25.79	50.00	24.21	
	25.591	36.59	0.81	37.40	50.00	12.60	
Neutral	0.182	54.68	0.20	54.88	64.42	9.54	QP
	0.303	40.81	0.23	41.04	60.15	19.11	
	0.751	31.17	0.28	31.45	56.00	24.55	
	4.224	34.73	0.43	35.16	56.00	20.84	
	5.653	33.37	0.46	33.83	60.00	26.17	
	25.591	35.14	0.74	35.88	60.00	24.12	
	0.182	37.19	0.20	37.39	54.42	17.03	AV
	0.303	26.55	0.23	26.78	50.15	23.37	
	0.751	30.59	0.28	30.87	46.00	15.13	
	4.224	16.85	0.43	17.28	46.00	28.72	
	5.653	22.84	0.46	23.30	50.00	26.70	
	25.591	28.63	0.74	29.37	50.00	20.63	

TEST ENGINEER: HUGH HUANG

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 48%RH

Serial No. : E2009120804 Date of Test : Dec 29, 2009

Test Mode : D-Sub 1024*768@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.182	53.38	0.22	53.60	64.42	10.82	QP
	0.307	39.67	0.25	39.92	60.06	20.14	
	0.552	30.92	0.28	31.20	56.00	24.80	
	4.202	27.96	0.43	28.39	56.00	27.61	
	7.687	37.23	0.48	37.71	60.00	22.29	
	25.591	43.02	0.81	43.83	60.00	16.17	
	0.182	29.47	0.22	29.69	54.42	24.73	AV
	0.307	18.56	0.25	18.81	50.06	31.25	
	0.552	26.06	0.28	26.34	46.00	19.66	
	4.202	12.71	0.43	13.14	46.00	32.86	
	7.687	29.74	0.48	30.22	50.00	19.78	
	25.591	34.94	0.81	35.75	50.00	14.25	
Neutral	0.183	52.78	0.20	52.98	64.33	11.35	QP
	0.310	38.92	0.23	39.15	59.97	20.82	
	0.552	29.99	0.26	30.25	56.00	25.75	
	4.158	36.25	0.43	36.68	56.00	19.32	
	7.852	30.34	0.49	30.83	60.00	29.17	
	24.790	34.48	0.74	35.22	60.00	24.78	
	0.183	31.79	0.20	31.99	54.33	22.34	AV
	0.310	20.08	0.23	20.31	49.97	29.66	
	0.552	27.34	0.26	27.60	46.00	18.40	
	4.158	23.68	0.43	24.11	46.00	21.89	
	7.852	20.61	0.49	21.10	50.00	28.90	
	24.790	27.20	0.74	27.94	50.00	22.06	

TEST ENGINEER: HUGH HUANG

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 48%RH

Serial No. : E2009120804 Date of Test : Dec 29, 2009

Test Mode : D-Sub 1680*1050@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.182	51.42	0.22	51.64	64.42	12.78	QP
	0.303	37.90	0.25	38.15	60.15	22.00	
	0.552	31.24	0.28	31.52	56.00	24.48	
	4.361	31.02	0.43	31.45	56.00	24.55	
	7.252	37.72	0.47	38.19	60.00	21.81	
	24.400	43.18	0.81	43.99	60.00	16.01	
	0.182	34.56	0.22	34.78	54.42	19.64	AV
	0.303	24.83	0.25	25.08	50.15	25.07	
	0.552	26.57	0.28	26.85	46.00	19.15	
	4.361	25.94	0.43	26.37	46.00	19.63	
	7.252	28.73	0.47	29.20	50.00	20.80	
	24.400	36.43	0.81	37.24	50.00	12.76	
Neutral	0.182	52.01	0.20	52.21	64.42	12.21	QP
	0.303	38.62	0.23	38.85	60.15	21.30	
	0.505	30.12	0.26	30.38	56.00	25.62	
	4.158	29.99	0.43	30.42	56.00	25.58	
	5.653	32.05	0.46	32.51	60.00	27.49	
	25.055	33.66	0.73	34.39	60.00	25.61	
	0.182	33.88	0.20	34.08	54.42	20.34	AV
	0.303	22.44	0.23	22.67	50.15	27.48	
	0.505	17.41	0.26	17.67	46.00	28.33	
	4.158	22.76	0.43	23.19	46.00	22.81	
	5.653	22.58	0.46	23.04	50.00	26.96	
	25.055	26.91	0.73	27.64	50.00	22.36	

TEST ENGINEER: HUGH HUANG

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 48%RH

Serial No. : E2009120804 Date of Test : Dec 29, 2009

Test Mode : D-Sub 1920*1080@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.183	51.19	0.22	51.41	64.33	12.92	QP
	0.307	37.80	0.25	38.05	60.06	22.01	
	0.552	30.90	0.28	31.18	56.00	24.82	
	4.269	34.98	0.43	35.41	56.00	20.59	
	7.175	38.29	0.47	38.76	60.00	21.24	
	23.888	43.44	0.82	44.26	60.00	15.74	
	0.183	31.76	0.22	31.98	54.33	22.35	AV
	0.307	13.52	0.25	13.77	50.06	36.29	
	0.552	26.40	0.28	26.68	46.00	19.32	
	4.269	13.79	0.43	14.22	46.00	31.78	
	7.175	22.53	0.47	23.00	50.00	27.00	
	23.888	36.40	0.82	37.22	50.00	12.78	
Neutral	0.182	50.77	0.20	50.97	64.42	13.45	QP
	0.300	36.01	0.23	36.24	60.24	24.00	
	0.499	31.13	0.26	31.39	56.01	24.62	
	3.041	33.73	0.41	34.14	56.00	21.86	
	8.822	31.19	0.50	31.69	60.00	28.31	
	24.400	32.31	0.75	33.06	60.00	26.94	
	0.182	38.00	0.20	38.20	54.42	16.22	AV
	0.300	18.54	0.23	18.77	50.24	31.47	
	0.499	18.42	0.26	18.68	46.01	27.33	
	3.041	18.85	0.41	19.26	46.00	26.74	
	8.822	25.35	0.50	25.85	50.00	24.15	
	24.400	25.32	0.75	26.07	50.00	23.93	

TEST ENGINEER: HUGH HUANG

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 48%RH

Serial No. : E2009120804 Date of Test : Dec 29, 2009

Test Mode : DVI 640*480@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.183	48.86	0.22	49.08	64.33	15.25	QP
	0.307	36.76	0.25	37.01	60.06	23.05	
	0.552	31.09	0.28	31.37	56.00	24.63	
	4.269	33.31	0.43	33.74	56.00	22.26	
	7.100	35.36	0.47	35.83	60.00	24.17	
	22.896	42.71	0.83	43.54	60.00	16.46	
	0.183	27.25	0.22	27.47	54.33	26.86	AV
	0.307	18.14	0.25	18.39	50.06	31.67	
	0.552	26.11	0.28	26.39	46.00	19.61	
	4.269	14.77	0.43	15.20	46.00	30.80	
	7.100	24.68	0.47	25.15	50.00	24.85	
	22.896	35.48	0.83	36.31	50.00	13.69	
Neutral	0.182	48.63	0.20	48.83	64.42	15.59	QP
	0.307	37.26	0.23	37.49	60.06	22.57	
	0.505	32.12	0.26	32.38	56.00	23.62	
	3.642	33.76	0.43	34.19	56.00	21.81	
	8.235	34.06	0.49	34.55	60.00	25.45	
	23.888	32.44	0.76	33.20	60.00	26.80	
	0.182	31.85	0.20	32.05	54.42	22.37	AV
	0.307	20.72	0.23	20.95	50.06	29.11	
	0.505	18.90	0.26	19.16	46.00	26.84	
	3.642	21.19	0.43	21.62	46.00	24.38	
	8.235	19.52	0.49	20.01	50.00	29.99	
	23.888	25.68	0.76	26.44	50.00	23.56	

TEST ENGINEER: HUGH HUANG

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 48%RH

Serial No. : E2009120804 Date of Test : Dec 29, 2009

Test Mode : DVI 1024*768@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.182	48.94	0.22	49.16	64.42	15.26	QP
	0.300	35.12	0.25	35.37	60.24	24.87	
	0.552	30.81	0.28	31.09	56.00	24.91	
	4.224	29.74	0.43	30.17	56.00	25.83	
	7.100	35.53	0.47	36.00	60.00	24.00	
	23.387	42.96	0.82	43.78	60.00	16.22	
	0.182	30.28	0.22	30.50	54.42	23.92	AV
	0.300	16.94	0.25	17.19	50.24	33.05	
	0.552	25.61	0.28	25.89	46.00	20.11	
	4.224	18.61	0.43	19.04	46.00	26.96	
	7.100	24.02	0.47	24.49	50.00	25.51	
	23.387	35.46	0.82	36.28	50.00	13.72	
Neutral	0.182	49.19	0.20	49.39	64.42	15.03	QP
	0.303	37.55	0.23	37.78	60.15	22.37	
	0.499	31.58	0.26	31.84	56.01	24.17	
	3.642	34.91	0.43	35.34	56.00	20.66	
	8.235	33.32	0.49	33.81	60.00	26.19	
	24.400	33.19	0.75	33.94	60.00	26.06	
	0.182	37.34	0.20	37.54	54.42	16.88	AV
	0.303	22.48	0.23	22.71	50.15	27.44	
	0.499	20.90	0.26	21.16	46.01	24.85	
	3.642	19.89	0.43	20.32	46.00	25.68	
	8.235	19.01	0.49	19.50	50.00	30.50	
	24.400	24.52	0.75	25.27	50.00	24.73	

TEST ENGINEER: HUGH HUANG

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 48%RH

Serial No. : E2009120804 Date of Test : Dec 29, 2009

Test Mode : DVI 1680*1050@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.182	49.53	0.22	49.75	64.42	14.67	QP
	0.300	39.24	0.25	39.49	60.24	20.75	
	0.654	29.38	0.27	29.65	56.00	26.35	
	4.224	34.56	0.43	34.99	56.00	21.01	
	7.368	37.36	0.47	37.83	60.00	22.17	
	24.142	42.74	0.82	43.56	60.00	16.44	
	0.182	31.95	0.22	32.17	54.42	22.25	AV
	0.300	18.21	0.25	18.46	50.24	31.78	
	0.654	26.76	0.27	27.03	46.00	18.97	
	4.224	18.04	0.43	18.47	46.00	27.53	
	7.368	27.40	0.47	27.87	50.00	22.13	
	24.142	34.71	0.82	35.53	50.00	14.47	
Neutral	0.182	49.39	0.20	49.59	64.42	14.83	QP
	0.303	37.62	0.23	37.85	60.15	22.30	
	0.505	31.71	0.26	31.97	56.00	24.03	
	4.027	35.11	0.43	35.54	56.00	20.46	
	8.822	31.51	0.50	32.01	60.00	27.99	
	24.142	31.58	0.76	32.34	60.00	27.66	
	0.182	31.64	0.20	31.84	54.42	22.58	AV
	0.303	22.31	0.23	22.54	50.15	27.61	
	0.505	17.77	0.26	18.03	46.00	27.97	
	4.027	18.07	0.43	18.50	46.00	27.50	
	8.822	25.86	0.50	26.36	50.00	23.64	
	24.142	23.78	0.76	24.54	50.00	25.46	

TEST ENGINEER: HUGH HUANG

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 48%RH

Serial No. : E2009120804 Date of Test : Dec 29, 2009

Test Mode : DVI 1920*1080@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.182	49.77	0.22	49.99	64.42	14.43	QP
	0.317	36.27	0.26	36.53	59.80	23.27	
	0.654	29.36	0.27	29.63	56.00	26.37	
	4.269	29.22	0.43	29.65	56.00	26.35	
	7.252	37.47	0.47	37.94	60.00	22.06	
	23.636	43.81	0.83	44.64	60.00	15.36	
	0.182	18.76	0.22	18.98	54.42	35.44	AV
	0.317	16.25	0.26	16.51	49.80	33.29	
	0.654	26.26	0.27	26.53	46.00	19.47	
	4.269	16.06	0.43	16.49	46.00	29.51	
	7.252	28.53	0.47	29.00	50.00	21.00	
	23.636	37.04	0.83	37.87	50.00	12.13	
Neutral	0.170	44.48	0.20	44.68	64.94	20.26	QP
	0.307	37.58	0.23	37.81	60.06	22.25	
	0.499	31.31	0.26	31.57	56.01	24.44	
	4.224	29.38	0.43	29.81	56.00	26.19	
	5.653	31.36	0.46	31.82	60.00	28.18	
	24.142	31.92	0.76	32.68	60.00	27.32	
	0.170	20.76	0.20	20.96	54.94	33.98	AV
	0.307	23.67	0.23	23.90	50.06	26.16	
	0.499	19.33	0.26	19.59	46.01	26.42	
	4.224	19.93	0.43	20.36	46.00	25.64	
	5.653	22.53	0.46	22.99	50.00	27.01	
	24.142	23.27	0.76	24.03	50.00	25.97	

TEST ENGINEER: HUGH HUANG

4 RADIATED EMISSION TEST

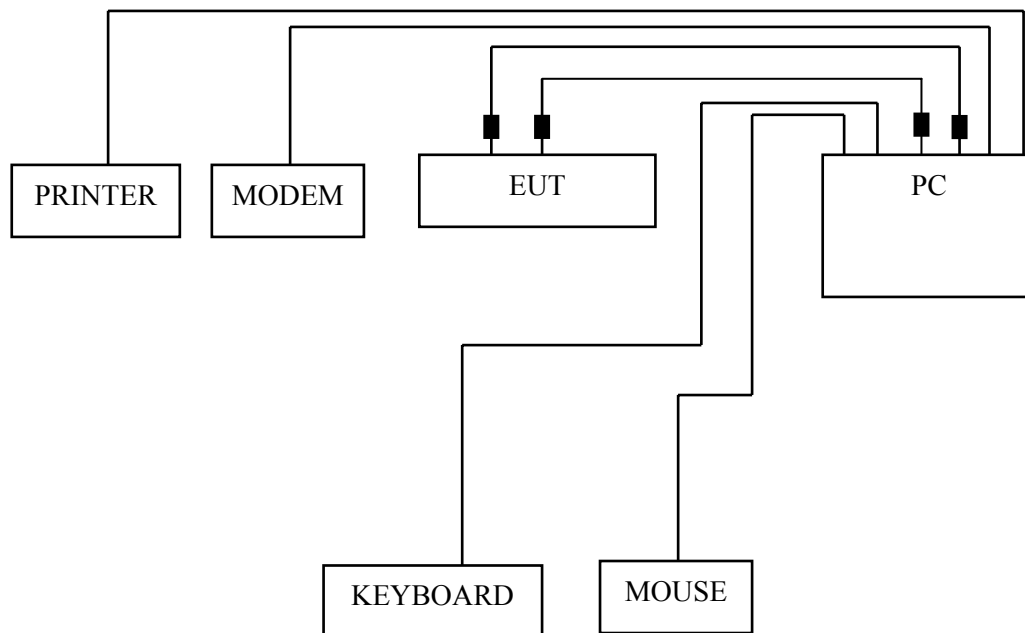
4.1 Test Equipment

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

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESVS10	844594/001	Mar 07, 2009	Mar 07, 2010
2.	Preamplifier	Agilent	8447D	2944A10548	Sep 19, 2009	Mar 19, 2010
3.	Preamplifier	HP	8449B	3008A00864	Apr 29, 2009	Apr 29, 2010
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 14, 2008	May 14, 2010
5.	Spectrum	Agilent	E7405A	MY45106600	May 19, 2009	May 19, 2010
6.	Software	Audix	E3	SET00200 9912M295-2	--	--

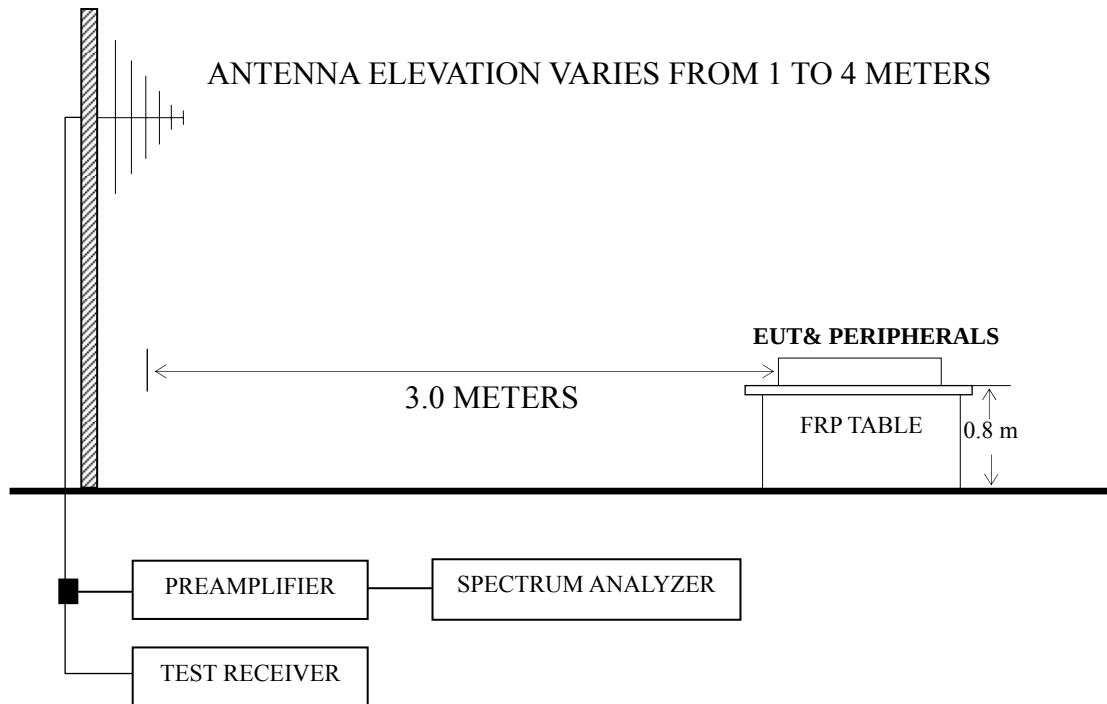
4.2 Block Diagram of Test Setup

4.2.1 EUT and Peripherals



■ : Ferrite core

4.2.2 Radiated emission test setup



■ : 50 ohm Coaxial Switch

4.3 Radiated Emission Limit [FCC Part 15 Subpart B 15.109(a)]

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 and Average value detector above 1GHz.

NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT.

4.4 Test Configuration

The configuration of the EUT and peripherals 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 for the test setup replaced by Sec.4.2.

4.6 Test Procedures

The EUT and peripherals were placed on a FRP turntable that is 0.8 meter above ground. The FRP 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. Broadband antenna (Calibrated Bilog Antenna) was used as receiving antenna. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. 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 1000MHz was checked for all test modes.

The frequency range from 1 GHz to 2 GHz was checked for D-Sub/DVI 1680*1050@60Hz and D-Sub/DVI 1920*1080@60Hz modes.

The test modes 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.

M/N	Test Mode	Data Page
W2340TV	D-Sub 640*480@60Hz	P24
	D-Sub 1024*768@60Hz	P25
	D-Sub 1680*1050@60Hz	P26
	D-Sub 1920*1080@60Hz	P27
	DVI 640*480@60Hz	P28
	DVI 1024*768@60Hz	P29
	DVI 1680*1050@60Hz	P30
	DVI 1920*1080@60Hz	P31

NOTE 1 – **The bold test mode** listed above means the worst test mode.

NOTE 2 – Emission Level = Antenna Factor + Cable Loss + Meter Reading. (< 1GHz)

NOTE 3 – Emission Level = Antenna Factor + Cable Loss – Preamp Factor + Meter Reading. (> 1GHz)

NOTE 4 – The emission levels that are 20dB below the official limit are not reported.

NOTE 5 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 6 – The worst case is for DVI 640*480@60Hz test mode. The worst emission at horizontal polarization was detected at 212.360 MHz with corrected signal level of 38.73 dB (μV/m) (limit is 43.50dB (μV/m)), when the antenna was 1.15 m height and the turntable was at 119°. The worst emission at vertical polarization was detected at 519.850 MHz with corrected signal level of 42.19 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 1.20 m height and the turntable was at 30°.

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 60%RH

Serial No. : E2009120804 Date of Test : Dec 30, 2009

Test Mode : D-Sub 640*480@60Hz

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	30.970	0.58	19.03	0.62	20.23	40.00	19.77
	73.650	15.85	6.98	0.91	23.74	40.00	16.26
	146.400	22.78	11.61	1.23	35.62	43.50	7.88
	405.390	18.15	16.57	2.04	36.76	46.00	9.24
	591.630	7.04	19.11	2.45	28.60	46.00	17.40
	983.510	11.20	22.30	3.19	36.69	54.00	17.31
Vertical	31.940	13.65	18.49	0.62	32.76	40.00	7.24
	75.590	21.97	7.24	0.91	30.12	40.00	9.88
	149.310	23.03	11.35	1.23	35.61	43.50	7.89
	408.300	22.09	16.62	2.07	40.78	46.00	5.22
	536.340	12.56	18.39	2.35	33.30	46.00	12.70
	930.160	14.90	21.93	3.10	39.93	46.00	6.07

TEST ENGINEER: RAVEN JIN

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 60%RH

Serial No. : E2009120804 Date of Test : Dec 30, 2009

Test Mode : D-Sub 1024*768@60Hz

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	30.000	-0.62	19.60	0.62	19.60	40.00	20.40
	87.230	11.75	8.96	0.99	21.70	40.00	18.30
	142.520	19.13	11.91	1.21	32.25	43.50	11.25
	369.500	17.95	15.84	1.97	35.76	46.00	10.24
	510.150	7.55	18.04	2.27	27.86	46.00	18.14
	948.590	13.29	22.05	3.13	38.47	46.00	7.53
Vertical	31.940	11.22	18.49	0.62	30.33	40.00	9.67
	71.710	16.95	6.69	0.90	24.54	40.00	15.46
	144.460	18.04	11.76	1.21	31.01	43.50	12.49
	371.440	21.52	15.88	1.96	39.36	46.00	6.64
	521.790	10.10	18.18	2.32	30.60	46.00	15.40
	966.050	14.86	22.19	3.16	40.21	54.00	13.79

TEST ENGINEER: RAVEN JIN

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 60%RH

Serial No. : E2009120804 Date of Test : Dec 30, 2009

Test Mode : D-Sub 1680*1050@60Hz

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)	Remark
Horizontal	30.970	0.30	19.03	0.62	--	19.95	40.00	20.05	QP
	70.740	17.12	6.58	0.89	--	24.59	40.00	15.41	
	147.370	22.54	11.51	1.24	--	35.29	43.50	8.21	
	372.410	15.37	15.92	1.95	--	33.24	46.00	12.76	
	515.970	7.71	18.09	2.31	--	28.11	46.00	17.89	
	954.410	11.95	22.11	3.14	--	37.20	46.00	8.80	
	1114.000	46.41	23.21	4.00	34.11	39.51	74.00	34.49	PK
	1268.000	46.07	24.23	4.34	34.13	40.51	74.00	33.49	
	1424.000	45.33	25.34	4.65	34.14	41.18	74.00	32.82	
	1500.000	45.38	25.80	4.80	34.15	41.83	74.00	32.17	
	1635.000	40.76	26.49	5.06	34.16	38.15	74.00	35.85	
	1856.000	44.43	27.21	5.46	34.19	42.91	74.00	31.09	
Vertical	31.940	12.10	18.49	0.62	--	31.21	40.00	8.79	QP
	71.710	21.10	6.69	0.90	--	28.69	40.00	11.31	
	147.370	17.67	11.51	1.24	--	30.42	43.50	13.08	
	367.560	22.87	15.81	1.95	--	40.63	46.00	5.37	
	514.030	16.23	18.06	2.31	--	36.60	46.00	9.40	
	936.950	14.75	21.96	3.10	--	39.81	46.00	6.19	
	1104.000	46.86	23.15	3.97	34.11	39.87	74.00	34.13	PK
	1211.000	45.62	23.82	4.22	34.12	39.54	74.00	34.46	
	1315.000	46.21	24.62	4.44	34.13	41.14	74.00	32.86	
	1494.000	43.65	25.80	4.79	34.15	40.09	74.00	33.91	
	1677.000	43.26	26.59	5.15	34.17	40.83	74.00	33.17	
	1857.000	43.48	27.21	5.46	34.19	41.96	74.00	32.04	

TEST ENGINEER: RAVEN JIN

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 60%RH

Serial No. : E2009120804 Date of Test : Dec 30, 2009

Test Mode : D-Sub 1920*1080@60Hz

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)	Remark
Horizontal	30.000	-0.45	19.60	0.62	--	19.77	40.00	20.23	QP
	98.870	10.92	11.27	1.04	--	23.23	43.50	20.27	
	150.280	20.99	11.25	1.23	--	33.47	43.50	10.03	
	365.620	16.88	15.73	1.96	--	34.57	46.00	11.43	
	515.970	10.38	18.09	2.31	--	30.78	46.00	15.22	
	937.920	13.74	21.99	3.11	--	38.84	46.00	7.16	
	1135.000	43.13	23.33	4.05	34.11	36.40	74.00	37.60	PK
	1273.000	45.28	24.27	4.35	34.13	39.77	74.00	34.23	
	1422.000	43.89	25.34	4.65	34.14	39.74	74.00	34.26	
	1561.000	44.54	26.19	4.92	34.16	41.49	74.00	32.51	
	1797.000	41.93	26.90	5.40	34.18	40.05	74.00	33.95	
	1856.000	44.43	27.21	5.46	34.19	42.91	74.00	31.09	
Vertical	31.940	12.79	18.49	0.62	--	31.90	40.00	8.10	QP
	83.350	19.27	8.30	0.98	--	28.55	40.00	11.45	
	146.400	17.36	11.61	1.23	--	30.20	43.50	13.30	
	412.180	22.38	16.67	2.07	--	41.12	46.00	4.88	
	512.090	21.23	18.06	2.30	--	41.59	46.00	4.41	
	957.320	14.18	22.13	3.14	--	39.45	46.00	6.55	
	1054.000	43.76	22.76	3.83	34.10	36.25	74.00	37.75	PK
	1313.000	43.18	24.62	4.43	34.13	38.10	74.00	35.90	
	1419.000	44.51	25.31	4.64	34.14	40.32	74.00	33.68	
	1564.000	42.43	26.19	4.93	34.16	39.39	74.00	34.61	
	1742.000	40.69	26.76	5.28	34.18	38.55	74.00	35.45	
	1963.000	42.12	27.91	5.56	34.20	41.39	74.00	32.61	

TEST ENGINEER: RAVEN JIN

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 60%RH

Serial No. : E2009120804 Date of Test : Dec 30, 2009

Test Mode : DVI 640*480@60Hz

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	30.000	-0.73	19.60	0.62	19.49	40.00	20.51
	85.290	11.33	8.66	0.98	20.97	40.00	19.03
	212.360	25.99	11.26	1.48	38.73	43.50	4.77
	324.880	20.84	14.58	1.85	37.27	46.00	8.73
	533.430	14.81	18.33	2.34	35.48	46.00	10.52
	985.450	13.88	22.30	3.22	39.40	54.00	14.60
Vertical	31.940	11.51	18.49	0.62	30.62	40.00	9.38
	97.900	11.37	11.11	1.02	23.50	43.50	20.00
	128.940	15.86	12.58	1.14	29.58	43.50	13.92
	406.360	23.49	16.59	2.05	42.13	46.00	3.87
	519.850	21.73	18.15	2.31	42.19	46.00	3.81
	990.300	20.20	22.35	3.21	45.76	54.00	8.24

TEST ENGINEER: RAVEN JIN

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 60%RH

Serial No. : E2009120804 Date of Test : Dec 30, 2009

Test Mode : DVI 1024*768@60Hz

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	30.000	-1.02	19.60	0.62	19.20	40.00	20.80
	90.140	12.07	9.40	1.01	22.48	43.50	21.02
	211.390	26.53	11.22	1.48	39.23	43.50	4.27
	367.560	18.37	15.81	1.95	36.13	46.00	9.87
	510.150	14.30	18.04	2.27	34.61	46.00	11.39
	947.620	16.31	22.05	3.12	41.48	46.00	4.52
Vertical	31.940	12.00	18.49	0.62	31.11	40.00	8.89
	95.960	13.70	10.70	1.01	25.41	43.50	18.09
	128.940	17.10	12.58	1.14	30.82	43.50	12.68
	408.300	21.74	16.62	2.07	40.43	46.00	5.57
	512.090	15.74	18.06	2.30	36.10	46.00	9.90
	969.930	16.64	22.22	3.16	42.02	54.00	11.98

TEST ENGINEER: RAVEN JIN

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 60%RH

Serial No. : E2009120804 Date of Test : Dec 30, 2009

Test Mode : DVI 1680*1050@60Hz

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)	Remark
Horizontal	30.970	-0.92	19.03	0.62	--	18.73	40.00	21.27	QP
	83.350	12.84	8.30	0.98	--	22.12	40.00	17.88	
	198.780	21.41	10.64	1.44	--	33.49	43.50	10.01	
	343.310	21.02	15.11	1.85	--	37.98	46.00	8.02	
	527.610	14.93	18.27	2.33	--	35.53	46.00	10.47	
	959.260	12.04	22.13	3.15	--	37.32	46.00	8.68	
	1027.000	44.13	22.57	3.76	34.10	36.36	74.00	37.64	PK
	1138.000	47.71	23.36	4.06	34.11	41.02	74.00	32.98	
	1199.000	42.30	23.70	4.20	34.12	36.08	74.00	37.92	
	1315.000	42.66	24.62	4.44	34.13	37.59	74.00	36.41	
	1461.000	42.33	25.56	4.73	34.14	38.48	74.00	35.52	
	1679.000	41.90	26.59	5.15	34.17	39.47	74.00	34.53	
Vertical	31.940	10.89	18.49	0.62	--	30.00	40.00	10.00	QP
	98.870	12.12	11.27	1.04	--	24.43	43.50	19.07	
	124.090	14.67	12.81	1.15	--	28.63	43.50	14.87	
	405.390	22.14	16.57	2.04	--	40.75	46.00	5.25	
	516.940	21.60	18.12	2.31	--	42.03	46.00	3.97	
	959.260	16.70	22.13	3.15	--	41.98	46.00	4.02	
	1025.000	49.08	22.57	3.76	34.10	41.31	74.00	32.69	PK
	1141.000	46.70	23.36	4.07	34.11	40.02	74.00	33.98	
	1257.000	46.16	24.14	4.31	34.12	40.49	74.00	33.51	
	1321.000	44.87	24.66	4.45	34.13	39.85	74.00	34.15	
	1543.000	43.29	26.07	4.88	34.16	40.08	74.00	33.92	
	1834.000	41.20	27.08	5.43	34.18	39.53	74.00	34.47	

TEST ENGINEER: RAVEN JIN

EUT : LCD Monitor Temperature : 22°C

Model No. : W2340TV Humidity : 60%RH

Serial No. : E2009120804 Date of Test : Dec 30, 2009

Test Mode : DVI 1920*1080@60Hz

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)	Remark
Horizontal	38.730	10.56	14.62	0.66	--	25.84	40.00	14.16	QP
	98.870	8.11	11.27	1.04	--	20.42	43.50	23.08	
	198.780	19.27	10.64	1.44	--	31.35	43.50	12.15	
	371.440	17.57	15.88	1.96	--	35.41	46.00	10.59	
	593.570	14.24	19.14	2.46	--	35.84	46.00	10.16	
	742.950	18.50	20.13	2.78	--	41.41	46.00	4.59	
	1255.000	49.16	24.14	4.31	34.12	43.49	74.00	30.51	PK
	1436.000	41.89	25.41	4.67	34.14	37.83	74.00	36.17	
	1543.000	44.57	26.07	4.88	34.16	41.36	74.00	32.64	
	1607.000	41.90	26.42	5.01	34.16	39.17	74.00	34.83	
	1699.000	41.94	26.65	5.19	34.17	39.61	74.00	34.39	
	1852.000	40.60	27.21	5.45	34.19	39.07	74.00	34.93	
Vertical	31.940	10.71	18.49	0.62	--	29.82	40.00	10.18	QP
	98.870	11.80	11.27	1.04	--	24.11	43.50	19.39	
	134.760	15.57	12.30	1.19	--	29.06	43.50	14.44	
	409.270	20.69	16.62	2.07	--	39.38	46.00	6.62	
	518.880	21.27	18.15	2.31	--	41.73	46.00	4.27	
	959.260	14.66	22.13	3.15	--	39.94	46.00	6.06	
	1065.000	46.75	22.85	3.86	34.11	39.35	74.00	34.65	PK
	1158.000	46.30	23.48	4.11	34.11	39.78	74.00	34.22	
	1287.000	44.81	24.40	4.38	34.13	39.46	74.00	34.54	
	1424.000	44.34	25.34	4.65	34.14	40.19	74.00	33.81	
	1614.000	41.34	26.43	5.03	34.16	38.64	74.00	35.36	
	1820.000	40.25	27.03	5.42	34.18	38.52	74.00	35.48	

TEST ENGINEER: RAVEN JIN

5 DEVIATION TO TEST SPECIFICATIONS

None.

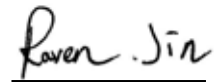
6 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Specifications (mm)	Manufacturer	Location
Gasket	T-308	50*30	DAEHUNG SUBSIDIARY MATERIALS.	See Internal Photo Figure 13

Note: We had required the applicant and manufacturer that all electrical and mechanical devices employed for spurious radiation suppression, including any modifications made during certification testing, must be incorporated in each unit marked

TEST ENGINEER:



(RAVEN JIN)