

Application for FCC Certificate
On Behalf of
Hisense Electric Co., Ltd.

LCD TV

Model No.	Serial No.	Brand
PHDN42M78US	E2010061704	Hisense
ELPCFT421	--	ELEMENT

FCC ID : W9HPDPX0001

Prepared For : Hisense Electric Co., Ltd.
No.218 Qianwangang Road, Economy & Technology
Development Zone, Qingdao, China

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Report No. : ACI-F10085
Date of Test : Jun 29 – Jul 05, 2010
Date of Report : Jul 14, 2010

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TEST REPORT FOR FCC CERTIFICATE

Applicant : Hisense Electric Co., Ltd.
 Manufacturer : Hisense Electric Co., Ltd.
 EUT Description : LCD TV

Model No.	Serial No.	Brand	Power Supply
PHDN42M78US	E2010061704	Hisense	120V/60Hz
ELPCFT421	--	ELEMENT	

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2009
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: Refer to Sec.2.1; S/N: Refer to Sec.2.1) which was tested in 3m anechoic chamber Jun 29 – Jul 05, 2010 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.


The test results for EUT's TV functions are contained in No.F10084, a Verification report.

Date of Test : Jun 29 – Jul 05, 2010 Date of Report : Jul 14, 2010

Producer : 
KATHY WANG / Assistant

Review : 
DIO YANG / Deputy Assistant Manager

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

Signatory : 
Authorized Signature EMC SAMMY 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 2009 AND ANSI C63.4-2003	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2009 AND ANSI C63.4-2003	15.109(a) Class B	Pass

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description : LCD TV

Type of EUT : Production Pre-product Pro-type

Model No.	Serial No.	Brand
PHDN42M78US	E2010061704	Hisense
ELPCFT421	--	ELEMENT

Note 1 : The above models are all the same except for the different model number and brand.

Note 2 : The PHDN42M78US was tested and recorded in this report.

Applicant : Hisense Electric Co., Ltd.
No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China

Manufacturer : Hisense Electric Co., Ltd.
No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China

LCD Panel : Manufacturer : SAMSUNG
M/N : S42AX-YB09

Max Resolution : 1024*768@60Hz

D-Sub Cable : Shielded, Detachable, 1.85m,
with two cores on cable

HDMI Cable : Shielded, Detachable, 1.85m,
without core on cable

Power Cord : Unshielded, Detachable, 1.80m

Remark:

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

Side View:

- (1) One HDMI1 Port : Connected with PC
- (2) One RF Port : Connected with ATSG SG
- (3) One VGA Port : Connected with PC
- (4) One VGA Audio Port : Connected with PC
- (5) One Earphone Port : Connected with earphone
- (6) One USB (Service) Port : Connected with U-Disk as Terminator

Back View:

- (7) One HDMI2 Port : Connected with DVD #1
- (8) One HDMI3 Port : Connected with DVD #2
- (9) One Digital Audio Port: : Connected with DVD #1
- (10) One component of YPbPr1 Port: : Connected with DVD #1
- (11) One component of YPbPr1 Audio Port: : Connected with DVD #1
- (12) One Component of AV Port: : Connected with DVD #1
- (13) One Audio Port: : Connected with Speaker

2.2 Peripherals

2.2.1 PC

Manufacturer : HP
 Model Number : dx7200MT
 Serial Number : CNG622017W
 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, 1.8m.
Certificate : CE/EMC, FCC DoC, VCCI, MIC, C-Tick,
BSMI

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

2.2.6 Earphone

Manufacturer : SONY
Model Number : MDR-E808
Serial Number : 1808030805305506

2.2.7 TV Signal Generator

Manufacturer : FLUKE
Model Number : 54200m01
Serial Number : 814008
Data Cable : Shielded, detachable, 2.0m
Power Cord : Unshielded, detachable, 2.0m
Certificate : CE/EMC, FCC DoC, CCC

2.2.8 ATSC Signal Generator

Manufacturer : SENCORE
Model Number : ATSC997
Serial Number : 6790071

2.2.9 DVD #1

Manufacturer : PHILIPS
Model Number : DVP3986K/93
Serial Number : KX1A0902120108
Certificate : FCC DoC, CE/EMC, CCC

2.2.10 DVD#2

Manufacturer : LG
Model Number : DF9921N
Serial Number : 3850R-M846W
Certificate : FCC DoC, CE/EMC, CCC

2.2.11 Speaker

Manufacturer : DIBA
Model Number : FS-04
Serial Number : 002

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

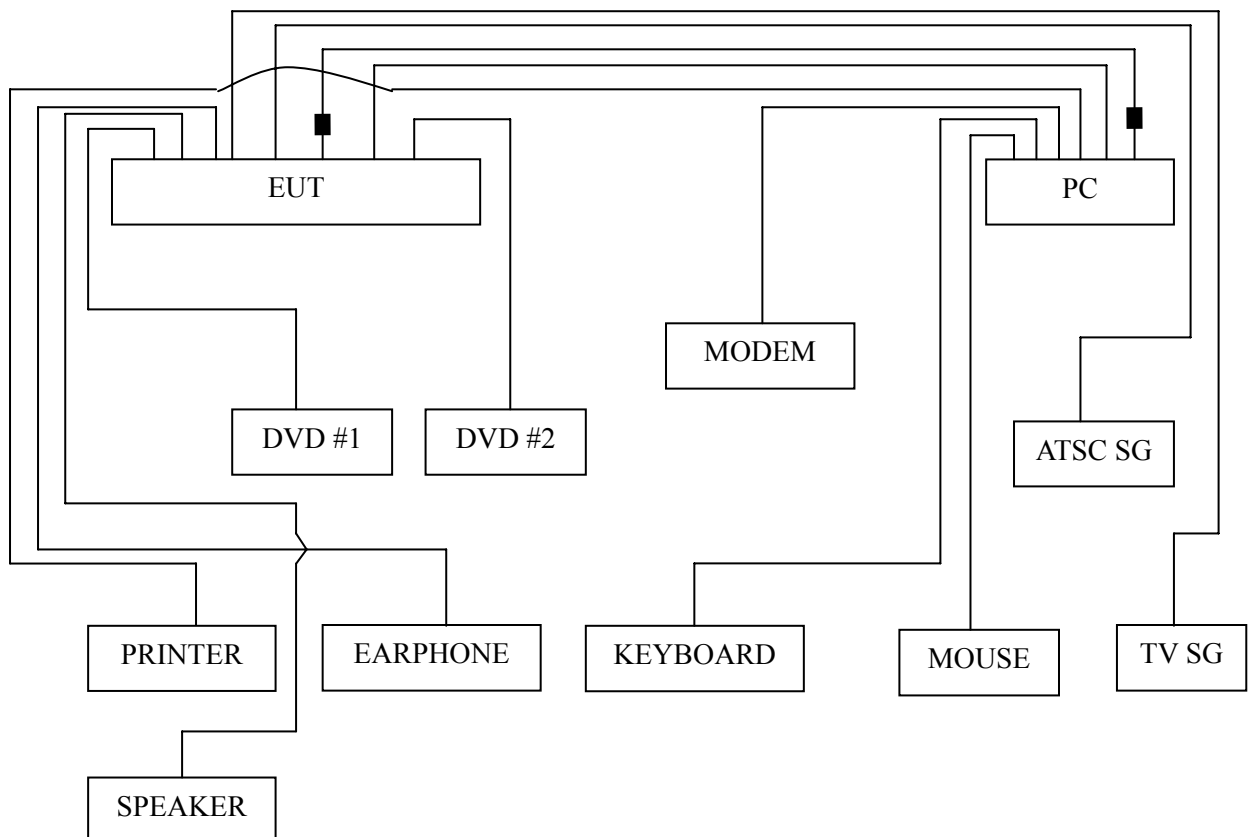
3.1 Test Equipment

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	Oct 15, 2009	Oct 15, 2010
2.	Artificial Mains Network (AMN)	R&S	ESH2-Z5	843890/011	Apr 02, 2010	Apr 02, 2011
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Apr 02, 2010	Apr 02, 2011
4.	50 Ω Coaxial Switch	Anritsu	MP59B	6200426389	Mar 19, 2010	Sep 19, 2010
5.	50 Ω Terminator	Anritsu	BNC	001	Apr 02, 2010	Apr 02, 2011
6.	Software	Audix	E3	SET00200 9804M592	--	--

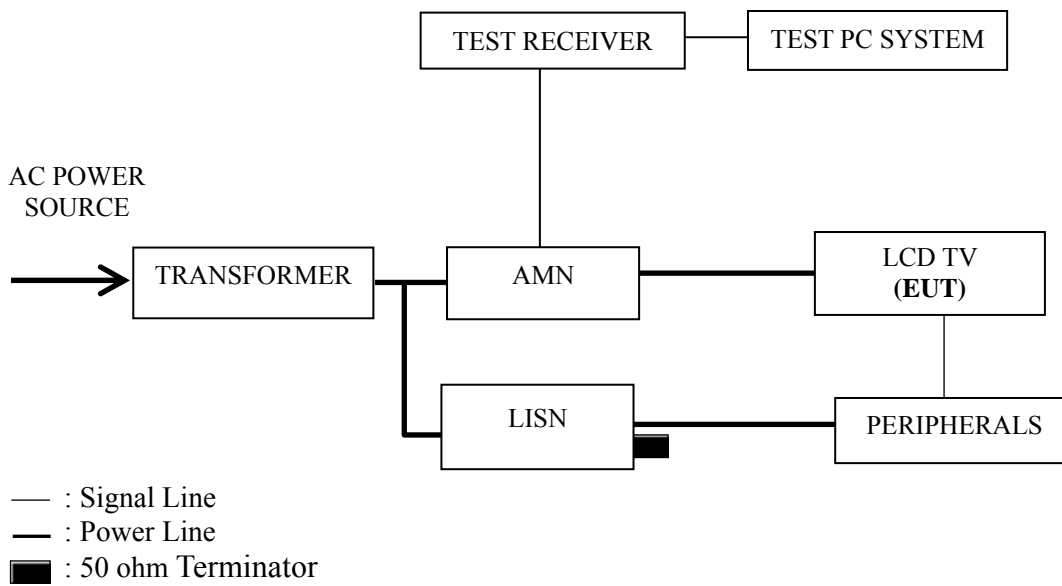
3.2 Block Diagram of Test Setup

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 & HDMI 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:

Test Mode
D-Sub 640*480@60Hz
D-Sub 800*600@60Hz
D-Sub 1024*768@60Hz
HDMI 640*480@60Hz
HDMI 800*600@60Hz
HDMI 1024*768@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.

Test Mode	Data Page
D-Sub 640*480@60Hz	P13
D-Sub 800*600@60Hz	P14
D-Sub 1024*768@60Hz	P15
HDMI 640*480@60Hz	P16
HDMI 800*600@60Hz	P17
HDMI 1024*768@60Hz	P18

NOTE 1 – Factor = Cable Loss + AMN 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 D-Sub 640*480@60Hz test mode. The worst emission is detected at 2.057 MHz (Quasi-Peak value) with corrected signal level of 52.21 dB (μ V) (limit is 56.00 dB (μ V)), when the Neutral of the EUT is connected to AMN.

EUT : LCD TV Temperature : 22°C

Model No. : PHDN42M78US Humidity : 48%RH

Serial No. : E2010061704 Date of Test : Jul 05, 2010

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

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.190	44.63	0.38	45.01	64.02	19.01	QP
	0.296	46.82	0.45	47.27	60.37	13.10	
	0.880	45.58	0.54	46.12	56.00	9.88	
	1.464	42.83	0.57	43.40	56.00	12.60	
	9.352	24.54	1.03	25.57	60.00	34.43	
	12.920	37.11	1.18	38.29	60.00	21.71	
	0.190	38.67	0.38	39.05	54.02	14.97	AV
	0.296	28.53	0.45	28.98	50.37	21.39	
	0.880	16.96	0.54	17.50	46.00	28.50	
	1.464	26.53	0.57	27.10	46.00	18.90	
	9.352	15.75	1.03	16.78	50.00	33.22	
	12.920	24.08	1.18	25.26	50.00	24.74	
Neutral	0.296	48.20	0.39	48.59	60.36	11.77	QP
	0.883	48.39	0.51	48.90	56.00	7.10	
	1.471	51.50	0.54	52.04	56.00	3.96	
	2.057	51.63	0.58	52.21	56.00	3.79	
	12.940	49.78	1.30	51.08	60.00	8.92	
	16.270	48.84	1.55	50.39	60.00	9.61	
	0.296	30.96	0.39	31.35	50.36	19.01	AV
	0.883	28.17	0.51	28.68	46.00	17.32	
	1.471	32.84	0.54	33.38	46.00	12.62	
	2.057	33.71	0.58	34.29	46.00	11.71	
	12.940	31.99	1.30	33.29	50.00	16.71	
	16.270	30.46	1.55	32.01	50.00	17.99	

TEST ENGINEER: TED ZHU

EUT : LCD TV Temperature : 22°C

Model No. : PHDN42M78US Humidity : 48%RH

Serial No. : E2010061704 Date of Test : Jul 05, 2010

Test Mode : D-Sub 800*600@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.190	52.29	0.38	52.67	64.02	11.35	QP
	0.296	47.77	0.45	48.22	60.36	12.14	
	0.881	46.72	0.54	47.26	56.00	8.74	
	1.470	46.24	0.57	46.81	56.00	9.19	
	2.045	33.74	0.61	34.35	56.00	21.65	
	12.920	34.39	1.18	35.57	60.00	24.43	
	0.190	45.69	0.38	46.07	54.02	7.95	AV
	0.296	27.11	0.45	27.56	50.36	22.80	
	0.881	25.43	0.54	25.97	46.00	20.03	
	1.470	25.52	0.57	26.09	46.00	19.91	
	2.045	22.40	0.61	23.01	46.00	22.99	
	12.920	23.61	1.18	24.79	50.00	25.21	
Neutral	0.193	44.87	0.31	45.18	63.93	18.75	QP
	0.295	45.26	0.39	45.65	60.37	14.72	
	0.881	44.36	0.51	44.87	56.00	11.13	
	1.471	42.27	0.54	42.81	56.00	13.19	
	2.055	34.90	0.58	35.48	56.00	20.52	
	13.000	35.82	1.30	37.12	60.00	22.88	
	0.193	39.24	0.31	39.55	53.93	14.38	AV
	0.295	24.46	0.39	24.85	50.37	25.52	
	0.881	23.03	0.51	23.54	46.00	22.46	
	1.471	17.10	0.54	17.64	46.00	28.36	
	2.055	23.06	0.58	23.64	46.00	22.36	
	13.000	23.17	1.30	24.47	50.00	25.53	

TEST ENGINEER: TED ZHU

EUT : LCD TV Temperature : 22°C

Model No. : PHDN42M78US Humidity : 48%RH

Serial No. : E2010061704 Date of Test : Jul 05, 2010

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

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark	
Line	0.192	52.62	0.38	53.00	63.93	10.93	QP	
	0.296	45.01	0.45	45.46	60.37	14.91		
	0.880	44.17	0.54	44.71	56.00	11.29		
	1.464	43.95	0.57	44.52	56.00	11.48		
	2.044	32.55	0.61	33.16	56.00	22.84		
	13.267	31.76	1.19	32.95	60.00	27.05		
	0.192	46.54	0.38	46.92	53.93	7.01	AV	
	0.296	23.51	0.45	23.96	50.37	26.41		
	0.880	14.38	0.54	14.92	46.00	31.08		
	1.464	27.09	0.57	27.66	46.00	18.34		
	2.044	22.46	0.61	23.07	46.00	22.93		
	13.267	21.81	1.19	23.00	50.00	27.00		
	Neutral	0.192	44.85	0.31	45.16	63.93	18.77	QP
		0.297	43.94	0.39	44.33	60.34	16.01	
0.880		43.02	0.51	43.53	56.00	12.47		
1.464		41.21	0.54	41.75	56.00	14.25		
2.044		34.11	0.58	34.69	56.00	21.31		
13.267		33.82	1.32	35.14	60.00	24.86		
0.192		39.47	0.31	39.78	53.93	14.15	AV	
0.297		20.44	0.39	20.83	50.34	29.51		
0.880		14.87	0.51	15.38	46.00	30.62		
1.464		18.59	0.54	19.13	46.00	26.87		
2.044		21.38	0.58	21.96	46.00	24.04		
13.267		26.26	1.32	27.58	50.00	22.42		

TEST ENGINEER: TED ZHU

EUT : LCD TV Temperature : 22°C

Model No. : PHDN42M78US Humidity : 48%RH

Serial No. : E2010061704 Date of Test : Jul 05, 2010

Test Mode : HDMI 640*480@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark	
Line	0.190	52.06	0.38	52.44	64.02	11.58	QP	
	0.296	44.83	0.45	45.28	60.37	15.09		
	0.880	44.24	0.54	44.78	56.00	11.22		
	1.464	43.98	0.57	44.55	56.00	11.45		
	2.044	32.59	0.61	33.20	56.00	22.80		
	13.267	31.68	1.19	32.87	60.00	27.13		
		0.190	46.42	0.38	46.80	54.02	7.22	AV
		0.296	26.03	0.45	26.48	50.37	23.89	
		0.880	15.60	0.54	16.14	46.00	29.86	
		1.464	26.37	0.57	26.94	46.00	19.06	
		2.044	22.20	0.61	22.81	46.00	23.19	
		13.267	23.23	1.19	24.42	50.00	25.58	
Neutral	0.193	45.10	0.31	45.41	63.92	18.51	QP	
	0.296	43.00	0.39	43.39	60.37	16.98		
	0.881	42.32	0.51	42.83	56.00	13.17		
	1.460	40.33	0.54	40.87	56.00	15.13		
	2.055	34.20	0.58	34.78	56.00	21.22		
	13.400	33.19	1.33	34.52	60.00	25.48		
		0.193	38.52	0.31	38.83	53.92	15.09	AV
		0.296	23.45	0.39	23.84	50.37	26.53	
		0.881	20.88	0.51	21.39	46.00	24.61	
		1.460	17.63	0.54	18.17	46.00	27.83	
		2.055	21.81	0.58	22.39	46.00	23.61	
		13.400	24.36	1.33	25.69	50.00	24.31	

TEST ENGINEER: TED ZHU

EUT : LCD TV Temperature : 22°C

Model No. : PHDN42M78US Humidity : 48%RH

Serial No. : E2010061704 Date of Test : Jul 05, 2010

Test Mode : HDMI 800*600@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.193	52.58	0.38	52.96	63.93	10.97	QP
	0.296	44.82	0.45	45.27	60.37	15.10	
	0.880	44.26	0.54	44.80	56.00	11.20	
	1.466	43.97	0.57	44.54	56.00	11.46	
	2.055	32.48	0.61	33.09	56.00	22.91	
	13.300	31.62	1.19	32.81	60.00	27.19	
	0.193	47.39	0.38	47.77	53.93	6.16	AV
	0.296	19.89	0.45	20.34	50.37	30.03	
	0.880	22.10	0.54	22.64	46.00	23.36	
	1.466	26.29	0.57	26.86	46.00	19.14	
	2.055	21.62	0.61	22.23	46.00	23.77	
	13.300	23.70	1.19	24.89	50.00	25.11	
Neutral	0.190	44.55	0.31	44.86	64.02	19.16	QP
	0.296	42.91	0.39	43.30	60.35	17.05	
	0.880	42.38	0.51	42.89	56.00	13.11	
	1.467	40.39	0.54	40.93	56.00	15.07	
	2.045	34.16	0.58	34.74	56.00	21.26	
	13.290	33.11	1.32	34.43	60.00	25.57	
	0.190	38.87	0.31	39.18	54.02	14.84	AV
	0.296	21.48	0.39	21.87	50.35	28.48	
	0.880	18.75	0.51	19.26	46.00	26.74	
	1.467	22.99	0.54	23.53	46.00	22.47	
	2.045	22.33	0.58	22.91	46.00	23.09	
	13.290	25.10	1.32	26.42	50.00	23.58	

TEST ENGINEER: TED ZHU

EUT : LCD TV Temperature : 22°C

Model No. : PHDN42M78US Humidity : 48%RH

Serial No. : E2010061704 Date of Test : Jul 05, 2010

Test Mode : HDMI 1024*768@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark	
Line	0.192	52.62	0.38	53.00	63.93	10.93	QP	
	0.296	45.01	0.45	45.46	60.37	14.91		
	0.880	44.17	0.54	44.71	56.00	11.29		
	1.464	43.95	0.57	44.52	56.00	11.48		
	2.044	32.55	0.61	33.16	56.00	22.84		
	13.267	31.76	1.19	32.95	60.00	27.05		
	0.192	46.54	0.38	46.92	53.93	7.01	AV	
	0.296	23.51	0.45	23.96	50.37	26.41		
	0.880	14.38	0.54	14.92	46.00	31.08		
	1.464	27.09	0.57	27.66	46.00	18.34		
	2.044	22.46	0.61	23.07	46.00	22.93		
	13.267	21.81	1.19	23.00	50.00	27.00		
	Neutral	0.192	44.85	0.31	45.16	63.93	18.77	QP
		0.297	43.94	0.39	44.33	60.34	16.01	
0.880		43.02	0.51	43.53	56.00	12.47		
1.464		41.21	0.54	41.75	56.00	14.25		
2.044		34.11	0.58	34.69	56.00	21.31		
13.267		33.82	1.32	35.14	60.00	24.86		
0.192		39.47	0.31	39.78	53.93	14.15	AV	
0.297		20.44	0.39	20.83	50.34	29.51		
0.880		14.87	0.51	15.38	46.00	30.62		
1.464		18.59	0.54	19.13	46.00	26.87		
2.044		21.38	0.58	21.96	46.00	24.04		
13.267		26.26	1.32	27.58	50.00	22.42		

TEST ENGINEER: TED ZHU

4 RADIATED EMISSION TEST

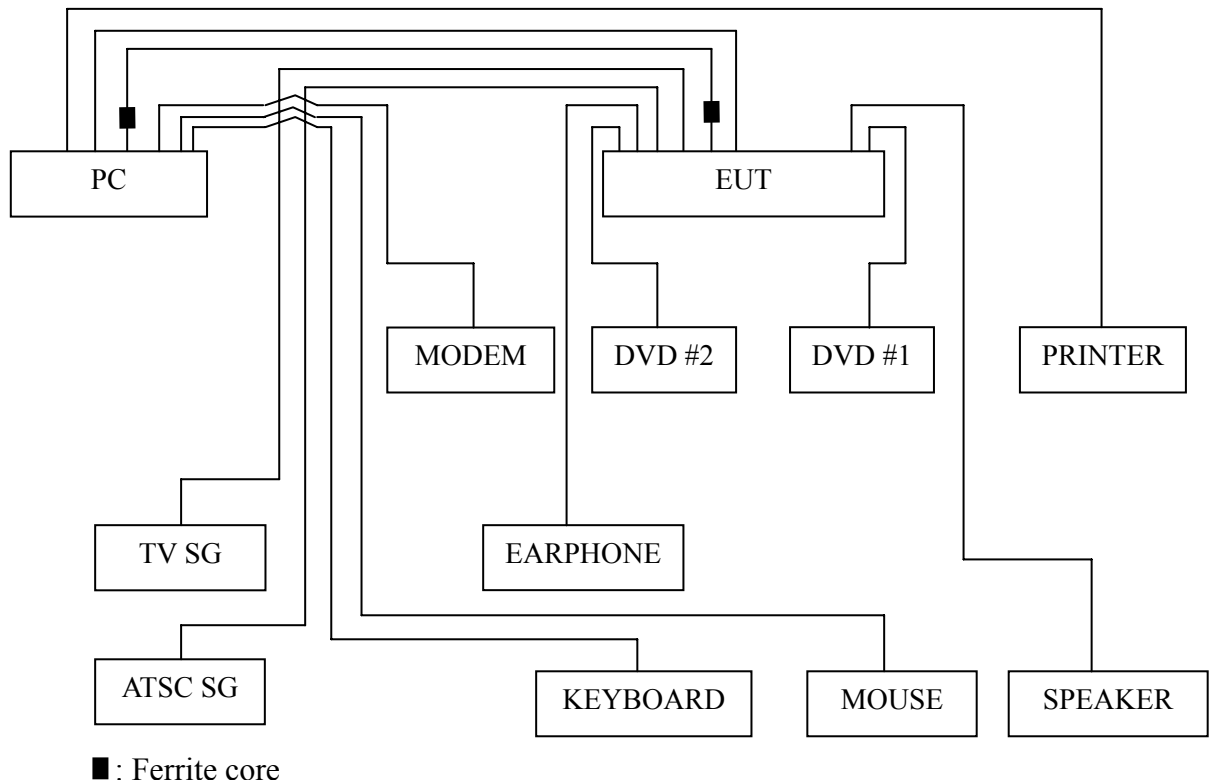
4.1 Test Equipment

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

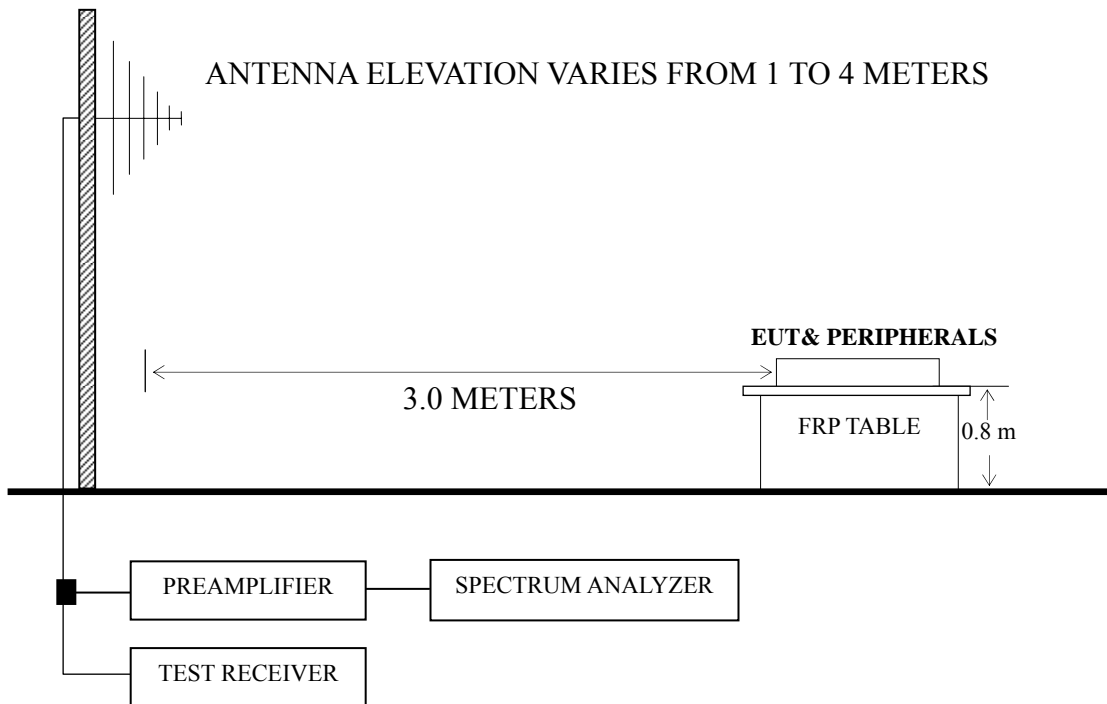
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESVS10	844594/001	Mar 07, 2010	Mar 07, 2011
2.	Preamplifier	Agilent	8447D	2944A10548	Mar 19, 2010	Sep 19, 2010
3.	Bi-log Antenna	TESEQ	CBL6112D	23192	Dec 01, 2009	Dec 01, 2010
4.	Spectrum Analyzer	Agilent	E7405A	MY45106600	May 19, 2009	May 19, 2010
5.	Software	Audix	E3	SET00200 9912M295-2	--	--

4.2 Block Diagram of Test Setup

4.2.1 EUT and Peripherals



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.

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 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.

Test Mode	Data Page
D-Sub 640*480@60Hz	P22
D-Sub 800*600@60Hz	P23
D-Sub 1024*768@60Hz	P24
HDMI 640*480@60Hz	P25
HDMI 800*600@60Hz	P26
HDMI 1024*768@60Hz	P27

NOTE 1 – Emission Level = Antenna Factor + Cable Loss + Meter Reading.

NOTE 2 – The emission levels that are 20dB below the official limit are not reported.

NOTE 3 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 4 – The worst case is for D-Sub 1024*768@60Hz test mode. The worst emission at horizontal polarization was detected at 87.230MHz with corrected signal level of 36.77dB ($\mu\text{V/m}$) (limit is 40.00dB ($\mu\text{V/m}$)), when the antenna was 1.20 m height and the turntable was at 340°. The worst emission at vertical polarization was detected at 30.000 MHz with corrected signal level of 36.23 dB ($\mu\text{V/m}$) (limit is 40.00 dB ($\mu\text{V/m}$)), when the antenna was 1.10 m height and the turntable was at 120°.

EUT : LCD TV Temperature : 22°C

Model No. : PHDN42M78US Humidity : 60%RH

Serial No. : E2010061704 Date of Test : Jun 30, 2010

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

Polarization	Frequency (MHz)	Meter Reading dB (μ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μ V/m)	Limits dB (μ V/m)	Margin (dB)
Horizontal	43.580	22.31	11.88	0.74	34.93	40.00	5.07
	58.130	28.26	6.96	0.83	36.05	40.00	3.95
	153.190	21.87	11.04	1.25	34.16	43.50	9.34
	371.440	22.76	15.88	1.99	40.63	46.00	5.37
	449.040	16.80	17.20	2.17	36.17	46.00	9.83
	633.340	16.00	19.37	2.52	37.89	46.00	8.11
Vertical	43.580	21.69	11.88	0.74	34.31	40.00	5.69
	58.130	26.96	6.96	0.83	34.75	40.00	5.25
	135.730	18.26	12.28	1.19	31.73	43.50	11.77
	223.030	21.21	11.80	1.52	34.53	46.00	11.47
	373.380	24.06	15.92	1.99	41.97	46.00	4.03
	633.340	16.64	19.37	2.52	38.53	46.00	7.47

TEST ENGINEER: RAVEN JIN

EUT : LCD TV Temperature : 22°C

Model No. : PHDN42M78US Humidity : 60%RH

Serial No. : E2010061704 Date of Test : Jun 30, 2010

Test Mode : D-Sub 800*600@60Hz

Polarization	Frequency (MHz)	Meter Reading dB (μ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μ V/m)	Limits dB (μ V/m)	Margin (dB)
Horizontal	43.580	22.31	11.88	0.74	34.93	40.00	5.07
	58.130	28.26	6.96	0.83	36.05	40.00	3.95
	153.190	21.87	11.04	1.25	34.16	43.50	9.34
	371.440	22.76	15.88	1.99	40.63	46.00	5.37
	449.040	16.80	17.20	2.17	36.17	46.00	9.83
	633.340	16.00	19.37	2.52	37.89	46.00	8.11
Vertical	36.790	18.19	15.80	0.69	34.68	40.00	5.32
	94.990	21.89	10.45	1.02	33.36	43.50	10.14
	221.090	23.92	11.71	1.52	37.15	46.00	8.85
	363.680	18.71	15.69	1.96	36.36	46.00	9.64
	449.040	19.12	17.20	2.17	38.49	46.00	7.51
	877.780	10.94	21.49	3.00	35.43	46.00	10.57

TEST ENGINEER: RAVEN JIN

EUT : LCD TV Temperature : 22°C

Model No. : PHDN42M78US Humidity : 60%RH

Serial No. : E2010061704 Date of Test : Jun 30, 2010

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	16.40	19.60	0.63	36.63	40.00	3.37
	59.000	28.55	6.80	0.83	36.18	40.00	3.82
	75.590	28.06	7.24	0.92	36.22	40.00	3.78
	87.230	26.83	8.96	0.98	36.77	40.00	3.23
	221.090	25.82	11.71	1.52	39.05	46.00	6.95
	371.440	21.39	15.88	1.99	39.26	46.00	6.74
Vertical	30.000	16.00	19.60	0.63	36.23	40.00	3.77
	39.880	21.00	13.99	0.72	35.71	40.00	4.29
	109.540	19.80	12.25	1.08	33.13	43.50	10.37
	221.090	18.97	11.71	1.52	32.20	46.00	13.80
	356.890	19.83	15.53	1.95	37.31	46.00	8.69
	449.040	19.56	17.20	2.17	38.93	46.00	7.07

TEST ENGINEER: RAVEN JIN

EUT : LCD TV Temperature : 22°C

Model No. : PHDN42M78US Humidity : 60%RH

Serial No. : E2010061704 Date of Test : Jun 30, 2010

Test Mode : HDMI 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	56.190	26.20	7.46	0.82	34.48	40.00	5.52
	67.830	27.61	6.52	0.88	35.01	40.00	4.99
	92.080	22.17	9.82	1.00	32.99	43.50	10.51
	223.030	20.79	11.80	1.52	34.11	46.00	11.89
	366.590	15.27	15.77	1.98	33.02	46.00	12.98
	633.340	13.17	19.37	2.52	35.06	46.00	10.94
Vertical	38.730	19.77	14.62	0.71	35.10	40.00	4.90
	119.240	15.48	12.97	1.12	29.57	43.50	13.93
	221.090	18.01	11.71	1.52	31.24	46.00	14.76
	363.680	19.63	15.69	1.96	37.28	46.00	8.72
	410.240	18.06	16.64	2.08	36.78	46.00	9.22
	446.130	18.38	17.17	2.16	37.71	46.00	8.29

TEST ENGINEER: RAVEN JIN

EUT : LCD TV Temperature : 22°C

Model No. : PHDN42M78US Humidity : 60%RH

Serial No. : E2010061704 Date of Test : Jun 30, 2010

Test Mode : HDMI 800*600@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	56.190	25.95	7.46	0.82	34.23	40.00	5.77
	67.830	27.31	6.52	0.88	34.71	40.00	5.29
	223.030	20.35	11.80	1.52	33.67	46.00	12.33
	363.680	17.26	15.69	1.96	34.91	46.00	11.09
	455.830	13.61	17.32	2.18	33.11	46.00	12.89
	633.340	12.67	19.37	2.52	34.56	46.00	11.44
Vertical	38.730	20.70	14.62	0.71	36.03	40.00	3.97
	49.400	22.57	9.16	0.78	32.51	40.00	7.49
	119.240	17.94	12.97	1.12	32.03	43.50	11.47
	223.030	19.11	11.80	1.52	32.43	46.00	13.57
	363.680	23.15	15.69	1.96	40.80	46.00	5.20
	446.130	22.65	17.17	2.16	41.98	46.00	4.02

TEST ENGINEER: RAVEN JIN

EUT : LCD TV Temperature : 22°C

Model No. : PHDN42M78US Humidity : 60%RH

Serial No. : E2010061704 Date of Test : Jun 30, 2010

Test Mode : HDMI 1024*768@60Hz

Polarization	Frequency (MHz)	Meter Reading dB (μ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μ V/m)	Limits dB (μ V/m)	Margin (dB)
Horizontal	58.130	27.38	6.96	0.83	35.17	40.00	4.83
	87.230	25.27	8.96	0.98	35.21	40.00	4.79
	133.790	20.12	12.35	1.18	33.65	43.50	9.85
	225.940	25.05	11.94	1.53	38.52	46.00	7.48
	449.040	18.69	17.20	2.17	38.06	46.00	7.94
	633.340	13.24	19.37	2.52	35.13	46.00	10.87
Vertical	36.790	19.26	15.80	0.69	35.75	40.00	4.25
	119.240	19.58	12.97	1.12	33.67	43.50	9.83
	225.940	19.35	11.94	1.53	32.82	46.00	13.18
	363.680	22.43	15.69	1.96	40.08	46.00	5.92
	446.130	20.31	17.17	2.16	39.64	46.00	6.36
	875.840	10.34	21.46	3.00	34.80	46.00	11.20

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	Manufacturer	Location
Gasket	DAA1001\ROH	TAT ELECTRONIC TECH CO., LTD.	See Internal Photo Figure 22, 23
		QDJOINSET S&T CO.,LTD	
Gasket	DAA1002\ROH	TAT ELECTRONIC TECH CO., LTD.	See Internal Photo Figure 25
		QDJOINSET S&T CO.,LTD	
Gasket	20X20X22T\ROH	QDJOINSET S&T CO.,LTD	See Internal Photo Figure 23, 25
Aluminum foil	DBA40X100\ROH	QDJOINSET S&T CO.,LTD	See Internal Photo Figure 22
Gasket	DAA13X30\ROH	QDJOINSET S&T CO.,LTD	See Internal Photo Figure 24
Ferrite core	ZCAT3035-1330\ROH	FEELUX	See Internal Photo Figure 25
		Rui Feng Electronic Co., Ltd.	
		Hai An Magnetic Material No.2 Factory	

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)