

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

PDP TV

Model No.	Serial No.	Brand
PHD50M85US	--	Hisense
ELPCFT501	E2010072901	ELEMENT

FCC ID : W9HPDPX0002

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

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Report No. : ACI-F10097
Date of Test : Aug 02-05, 2010
Date of Report : Aug 09, 2010

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TEST REPORT FOR FCC CERTIFICATE

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

Model No.	Serial No.	Brand	Power Supply
PHD50M85US	--	Hisense	120V/60Hz
ELPCFT501	E2010072901	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 Aug 02-05, 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.F10096, a Verification report.

Date of Test : Aug 02-05, 2010 Date of Report : Aug 09, 2010

Producer : 
CANDY XI / Assistant

Review : 
DIO YANG / Deputy Assistant Manager

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

Signatory : 
Authorized Signature EMC SAMMY CHEN / 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 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 : PDP TV

Type of EUT : Production Pre-product Pro-type

Model No.	Serial No.	Brand
PHD50M85US	--	Hisense
ELPCFT501	E2010072901	ELEMENT

Note1 : The above models are all the same except for the different model number and brand.

Note2 : The ELPCFT501 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

PDP Panel : Manufacturer : Panasonic
M/N : MC127H27D12

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 PDP TV which input/output ports as follows:

Back Port:

- (1) One Component of YPbPr Port : Connected with DVD #1
- (2) One Component of YPbPr Audio Port : Connected with DVD #1
- (3) One VGA Port : Connected with PC
- (4) One VGA Audio Port : Connected with PC
- (5) One Component of AV Port : Connected with DVD #1
- (6) One HDMI2 Port : Connected with DVD #1
- (7) One HDMI3 Port : Connected with DVD #2
- (8) One Audio Out Port: : Connected with Speaker

Side Port

- (9) One HDMI1 Port : Connected with PC
- (10) One ANT Port : Connected with ATSC SG/TV SG
- (11) One Headphone Port : Connected with Earphone
- (12) DIGITAL AUDIO Port : Connected with DVD#2
- (13) One Service Port : Do not open to customer

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, 1.8m.
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 (No.3 3m 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

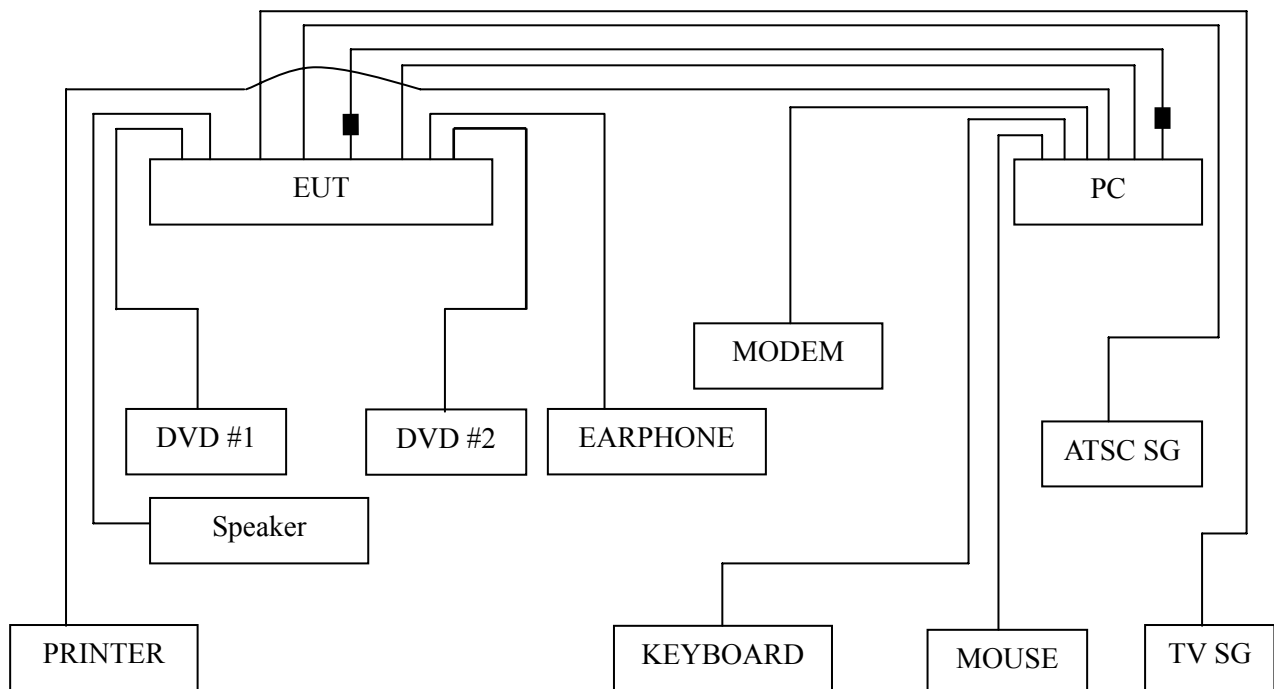
3.1 Test Equipment

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	--	--

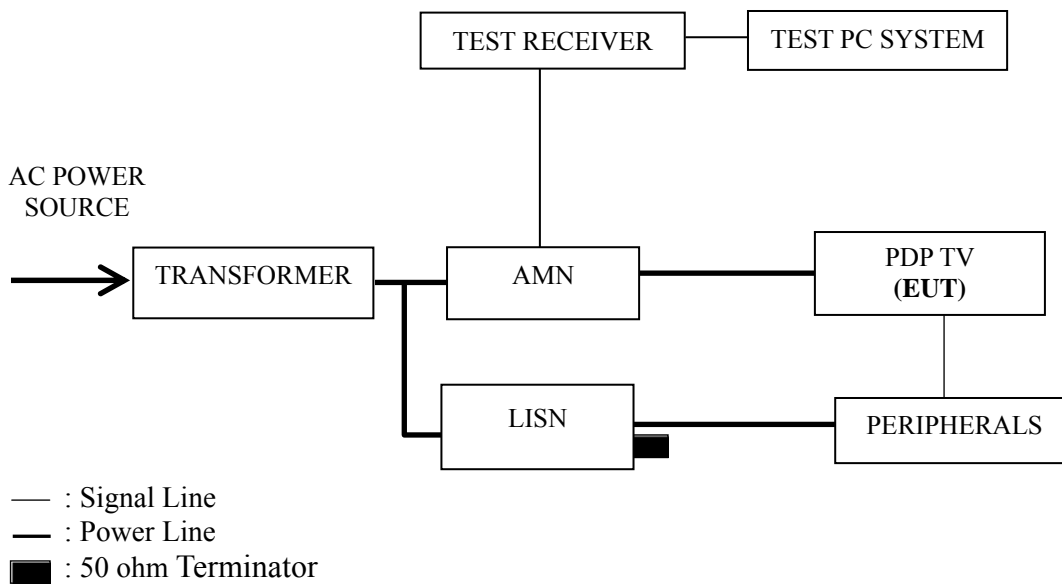
3.2 Block Diagram of Test Setup

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 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 0.161 MHz (Quasi-Peak value) with corrected signal level of 47.87 dB (μV) (limit is 65.43 dB (μV)), when the Line of the EUT is connected to AMN.

EUT : PDP TV Temperature : 22°C

Model No. : ELPCFT501 Humidity : 48%RH

Serial No. : E2010072901 Date of Test : Aug 02, 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	0.161	47.49	0.38	47.87	65.43	17.56	QP
	0.348	29.57	0.46	30.03	59.00	28.97	
	0.558	30.31	0.52	30.83	56.00	25.17	
	4.027	26.62	0.75	27.37	56.00	28.63	
	8.323	24.19	0.98	25.17	60.00	34.83	
	22.298	27.13	1.70	28.83	60.00	31.17	
	0.161	21.19	0.38	21.57	55.43	33.86	AV
	0.348	23.14	0.46	23.60	49.00	25.40	
	0.558	14.68	0.52	15.20	46.00	30.80	
	4.027	9.25	0.75	10.00	46.00	36.00	
	8.323	10.82	0.98	11.80	50.00	38.20	
	22.298	19.14	1.70	20.84	50.00	29.16	
Neutral	0.184	37.96	0.31	38.27	64.28	26.01	QP
	0.230	30.92	0.33	31.25	62.44	31.19	
	0.558	27.31	0.49	27.80	56.00	28.20	
	4.027	21.28	0.70	21.98	56.00	34.02	
	7.935	20.29	0.92	21.21	60.00	38.79	
	22.298	22.69	1.81	24.50	60.00	35.50	
	0.184	31.25	0.31	31.56	54.28	22.72	AV
	0.230	26.04	0.33	26.37	52.44	26.07	
	0.558	16.35	0.49	16.84	46.00	29.16	
	4.027	11.70	0.70	12.40	46.00	33.60	
	7.935	11.98	0.92	12.90	50.00	37.10	
	22.298	15.86	1.81	17.67	50.00	32.33	

TEST ENGINEER: TED ZHU

EUT : PDP TV Temperature : 22°C

Model No. : ELPCFT501 Humidity : 48%RH

Serial No. : E2010072901 Date of Test : Aug 02, 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	0.152	38.78	0.37	39.15	65.91	26.76	QP
	0.221	30.20	0.40	30.60	62.79	32.19	
	0.558	29.03	0.52	29.55	56.00	26.45	
	2.396	22.42	0.66	23.08	56.00	32.92	
	8.235	19.96	0.96	20.92	60.00	39.08	
	21.830	27.14	1.69	28.83	60.00	31.17	
	0.151	21.33	0.37	21.70	55.96	34.26	AV
	0.221	20.56	0.40	20.96	52.79	31.83	
	0.558	15.12	0.52	15.64	46.00	30.36	
	2.396	9.02	0.66	9.68	46.00	36.32	
	8.235	12.59	0.96	13.55	50.00	36.45	
	21.830	17.50	1.69	19.19	50.00	30.81	
Neutral	0.156	41.04	0.32	41.36	65.65	24.29	QP
	0.228	32.80	0.33	33.13	62.52	29.39	
	0.558	28.58	0.49	29.07	56.00	26.93	
	4.070	24.38	0.71	25.09	56.00	30.91	
	8.501	22.69	0.95	23.64	60.00	36.36	
	22.063	28.21	1.81	30.02	60.00	29.98	
	0.156	25.16	0.32	25.48	55.65	30.17	AV
	0.228	25.92	0.33	26.25	52.52	26.27	
	0.558	15.35	0.49	15.84	46.00	30.16	
	4.070	9.83	0.71	10.54	46.00	35.46	
	8.501	11.62	0.95	12.57	50.00	37.43	
	22.063	19.97	1.81	21.78	50.00	28.22	

TEST ENGINEER: TED ZHU

EUT : PDP TV Temperature : 22°C

Model No. : ELPCFT501 Humidity : 48%RH

Serial No. : E2010072901 Date of Test : Aug 02, 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	0.184	43.13	0.38	43.51	64.28	20.77	QP
	0.230	33.96	0.40	34.36	62.44	28.08	
	0.558	28.33	0.52	28.85	56.00	27.15	
	2.396	23.41	0.66	24.07	56.00	31.93	
	8.062	19.95	0.96	20.91	60.00	39.09	
	21.830	25.22	1.69	26.91	60.00	33.09	
	0.184	29.22	0.38	29.60	54.28	24.68	AV
	0.230	28.77	0.40	29.17	52.44	23.27	
	0.558	16.87	0.52	17.39	46.00	28.61	
	2.396	10.78	0.66	11.44	46.00	34.56	
	8.062	11.15	0.96	12.11	50.00	37.89	
	21.830	18.47	1.69	20.16	50.00	29.84	
Neutral	0.153	38.68	0.32	39.00	65.82	26.82	QP
	0.230	31.78	0.33	32.11	62.44	30.33	
	0.558	29.53	0.49	30.02	56.00	25.98	
	2.396	22.35	0.62	22.97	56.00	33.03	
	8.501	20.13	0.95	21.08	60.00	38.92	
	21.830	27.08	1.81	28.89	60.00	31.11	
	0.153	17.62	0.32	17.94	55.82	37.88	AV
	0.230	23.49	0.33	23.82	52.44	28.62	
	0.558	16.83	0.49	17.32	46.00	28.68	
	2.396	11.92	0.62	12.54	46.00	33.46	
	8.501	11.89	0.95	12.84	50.00	37.16	
	21.830	19.10	1.81	20.91	50.00	29.09	

TEST ENGINEER: TED ZHU

EUT : PDP TV Temperature : 22°C

Model No. : ELPCFT501 Humidity : 48%RH

Serial No. : E2010072901 Date of Test : Aug 02, 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	0.155	47.60	0.37	47.97	65.74	17.77	QP
	0.184	45.58	0.38	45.96	64.28	18.32	
	0.558	31.18	0.52	31.70	56.00	24.30	
	4.027	27.53	0.75	28.28	56.00	27.72	
	8.592	24.09	0.99	25.08	60.00	34.92	
	22.535	32.86	1.72	34.58	60.00	25.42	
	0.155	37.19	0.37	37.56	55.74	18.18	AV
	0.184	35.26	0.38	35.64	54.28	18.64	
	0.558	21.57	0.52	22.09	46.00	23.91	
	4.027	17.54	0.75	18.29	46.00	27.71	
	8.592	14.57	0.99	15.56	50.00	34.44	
	22.535	22.46	1.72	24.18	50.00	25.82	
Neutral	0.160	46.85	0.32	47.17	65.47	18.30	QP
	0.184	42.54	0.31	42.85	64.30	21.45	
	0.558	29.83	0.49	30.32	56.00	25.68	
	4.027	24.18	0.70	24.88	56.00	31.12	
	8.235	23.95	0.93	24.88	60.00	35.12	
	22.535	31.60	1.83	33.43	60.00	26.57	
	0.160	36.55	0.32	36.87	55.47	18.60	AV
	0.184	32.45	0.31	32.76	54.30	21.54	
	0.558	16.87	0.49	17.36	46.00	28.64	
	4.027	9.02	0.70	9.72	46.00	36.28	
	8.235	12.55	0.93	13.48	50.00	36.52	
	22.535	21.57	1.83	23.40	50.00	26.60	

TEST ENGINEER: TED ZHU

EUT : PDP TV Temperature : 22°C

Model No. : ELPCFT501 Humidity : 48%RH

Serial No. : E2010072901 Date of Test : Aug 02, 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	0.162	37.18	0.38	37.56	65.34	27.78	QP
	0.230	34.45	0.40	34.85	62.44	27.59	
	0.558	29.86	0.52	30.38	56.00	25.62	
	2.396	22.36	0.66	23.02	56.00	32.98	
	8.412	20.56	0.98	21.54	60.00	38.46	
	22.063	28.27	1.70	29.97	60.00	30.03	
	0.162	24.25	0.38	24.63	55.34	30.71	AV
	0.230	29.07	0.40	29.47	52.44	22.97	
	0.558	17.16	0.52	17.68	46.00	28.32	
	2.396	9.95	0.66	10.61	46.00	35.39	
	8.412	8.52	0.98	9.50	50.00	40.50	
	22.063	11.46	1.70	13.16	50.00	36.84	
Neutral	0.184	42.67	0.31	42.98	64.28	21.30	QP
	0.228	29.74	0.33	30.07	62.52	32.45	
	0.558	23.89	0.49	24.38	56.00	31.62	
	4.027	22.07	0.70	22.77	56.00	33.23	
	7.977	21.19	0.92	22.11	60.00	37.89	
	22.298	22.05	1.81	23.86	60.00	36.14	
	0.184	24.16	0.31	24.47	54.28	29.81	AV
	0.228	23.18	0.33	23.51	52.52	29.01	
	0.558	6.30	0.49	6.79	46.00	39.21	
	4.027	14.25	0.70	14.95	46.00	31.05	
	7.977	8.99	0.92	9.91	50.00	40.09	
	22.298	12.02	1.81	13.83	50.00	36.17	

TEST ENGINEER: TED ZHU

EUT : PDP TV Temperature : 22°C

Model No. : ELPCFT501 Humidity : 48%RH

Serial No. : E2010072901 Date of Test : Aug 02, 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	0.151	37.27	0.37	37.64	65.96	28.32	QP
	0.230	33.63	0.40	34.03	62.44	28.41	
	0.923	24.55	0.54	25.09	56.00	30.91	
	2.396	22.19	0.66	22.85	56.00	33.15	
	7.852	19.06	0.95	20.01	60.00	39.99	
	22.063	27.92	1.70	29.62	60.00	30.38	
	0.151	24.32	0.37	24.69	55.96	31.27	AV
	0.230	28.73	0.40	29.13	52.44	23.31	
	0.923	17.61	0.54	18.15	46.00	27.85	
	2.396	12.25	0.66	12.91	46.00	33.09	
	7.852	11.45	0.95	12.40	50.00	37.60	
	22.063	20.17	1.70	21.87	50.00	28.13	
Neutral	0.184	44.06	0.31	44.37	64.28	19.91	QP
	0.230	31.62	0.33	31.95	62.44	30.49	
	0.558	27.96	0.49	28.45	56.00	27.55	
	4.027	20.74	0.70	21.44	56.00	34.56	
	8.412	20.85	0.95	21.80	60.00	38.20	
	22.063	26.80	1.81	28.61	60.00	31.39	
	0.184	28.55	0.31	28.86	54.28	25.42	AV
	0.230	24.63	0.33	24.96	52.44	27.48	
	0.558	16.31	0.49	16.80	46.00	29.20	
	4.027	10.49	0.70	11.19	46.00	34.81	
	8.412	12.27	0.95	13.22	50.00	36.78	
	22.063	19.07	1.81	20.88	50.00	29.12	

TEST ENGINEER: TED ZHU

4 RADIATED EMISSION TEST

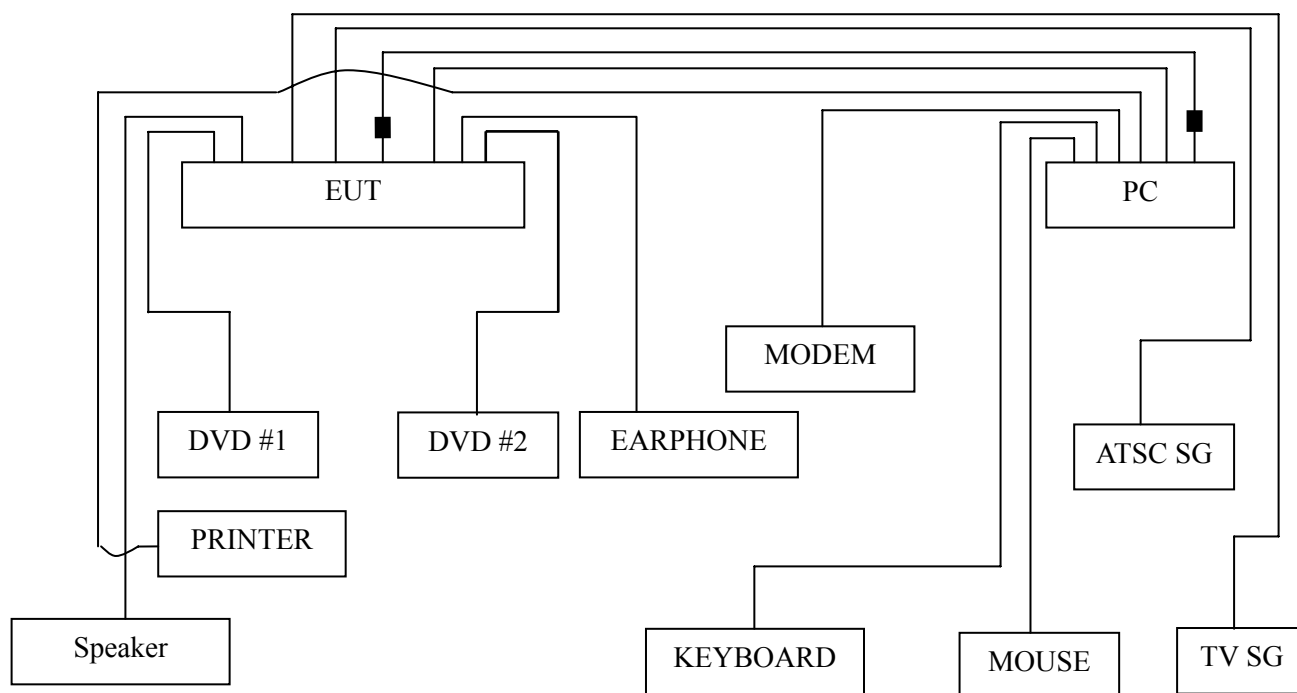
4.1 Test Equipment

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, 2010	May 19, 2011
5.	Software	Audix	E3	SET00200 9912M295-2	--	--

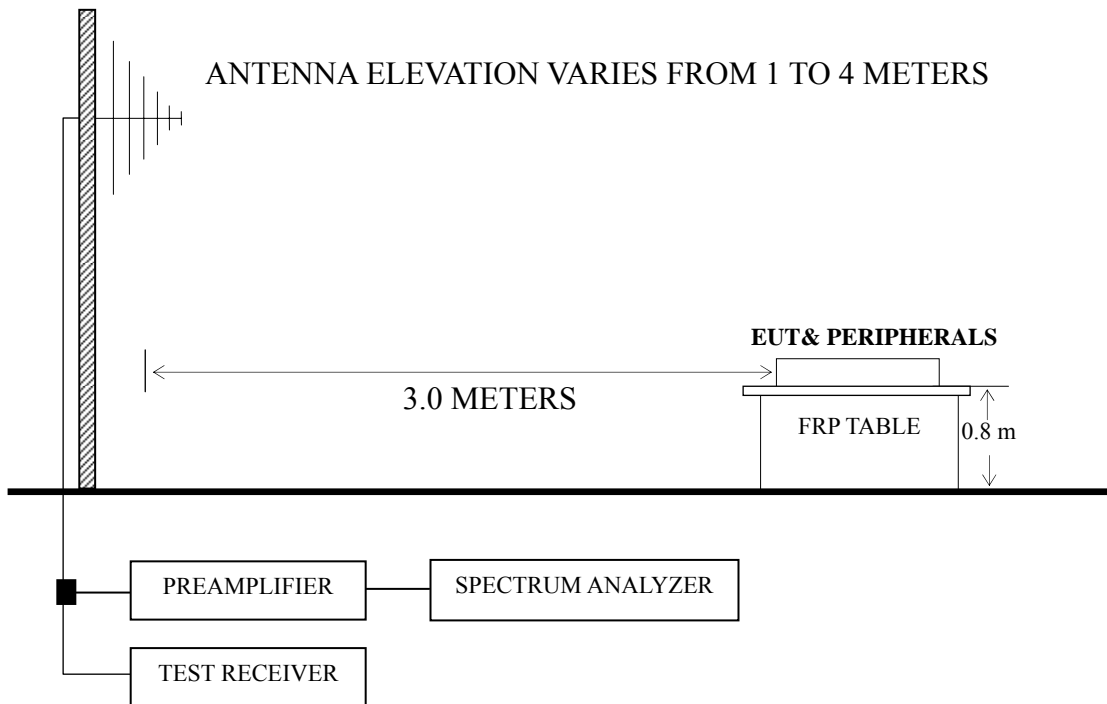
4.2 Block Diagram of Test Setup

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.

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 HDMI 800*600@60Hz test mode. The worst emission at horizontal polarization was detected at 510.15 MHz with corrected signal level of 42.06 dB ($\mu\text{V}/\text{m}$) (limit is 46.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.00 m height and the turntable was at 250°. The worst emission at vertical polarization was detected at 508.21 MHz with corrected signal level of 43.00 dB ($\mu\text{V}/\text{m}$) (limit is 46.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.00 m height and the turntable was at 290°.

EUT : PDP TV Temperature : 22°C

Model No. : ELPCFT501 Humidity : 60%RH

Serial No. : E2010072901 Date of Test : Aug 05, 2010

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	92.08	13.11	9.82	1.00	23.93	43.50	19.57
	108.57	14.52	12.17	1.08	27.77	43.50	15.73
	142.52	15.95	11.91	1.21	29.07	43.50	14.43
	192.96	16.66	10.40	1.42	28.48	43.50	15.02
	293.50	26.31	13.79	1.74	41.84	46.00	4.16
	515.00	20.74	18.09	2.29	41.12	46.00	4.88
Vertical	30.00	7.44	19.60	0.63	27.67	40.00	12.33
	59.10	21.27	6.80	0.83	28.90	40.00	11.10
	133.79	17.22	12.35	1.18	30.75	43.50	12.75
	184.23	17.42	10.05	1.39	28.86	43.50	14.64
	293.50	24.51	13.79	1.74	40.04	46.00	5.96
	517.91	22.26	18.12	2.29	42.67	46.00	3.33

TEST ENGINEER: RAVEN JIN

EUT : PDP TV Temperature : 22°C

Model No. : ELPCFT501 Humidity : 60%RH

Serial No. : E2010072901 Date of Test : Aug 05, 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	53.28	23.95	8.14	0.80	32.89	40.00	7.11
	66.86	23.20	6.53	0.88	30.61	40.00	9.39
	132.82	19.70	12.40	1.18	33.28	43.50	10.22
	187.14	19.69	10.17	1.40	31.26	43.50	12.24
	293.84	26.58	13.79	1.74	42.11	46.00	3.89
	512.09	21.98	18.06	2.29	42.33	46.00	3.67
Vertical	53.28	17.25	8.14	0.80	26.19	40.00	13.81
	106.63	15.94	12.02	1.07	29.03	43.50	14.47
	147.37	18.33	11.51	1.23	31.07	43.50	12.43
	187.14	19.98	10.17	1.40	31.55	43.50	11.95
	294.81	26.18	13.82	1.76	41.76	46.00	4.24
	512.09	20.97	18.06	2.29	41.32	46.00	4.68

TEST ENGINEER: RAVEN JIN

EUT : PDP TV Temperature : 22°C

Model No. : ELPCFT501 Humidity : 60%RH

Serial No. : E2010072901 Date of Test : Aug 05, 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	87.23	20.03	8.96	0.98	29.97	40.00	10.03
	107.60	21.15	12.10	1.07	34.32	43.50	9.18
	152.22	23.03	11.09	1.25	35.37	43.50	8.13
	237.58	21.49	12.44	1.57	35.50	46.00	10.50
	294.81	26.58	13.82	1.76	42.16	46.00	3.84
	506.27	22.18	17.98	2.27	42.43	46.00	3.57
Vertical	42.61	20.65	12.39	0.74	33.78	40.00	6.22
	87.23	23.99	8.96	0.98	33.93	40.00	6.07
	107.60	20.04	12.10	1.07	33.21	43.50	10.29
	152.22	23.90	11.09	1.25	36.24	43.50	7.26
	294.81	27.08	13.82	1.76	42.66	46.00	3.34
	498.51	21.53	17.88	2.26	41.67	46.00	4.33

TEST ENGINEER: RAVEN JIN

EUT : PDP TV Temperature : 22°C

Model No. : ELPCFT501 Humidity : 60%RH

Serial No. : E2010072901 Date of Test : Aug 05, 2010

Test Mode : HDMI 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	94.99	14.83	10.45	1.02	26.30	43.50	17.20
	117.30	14.37	12.84	1.12	28.33	43.50	15.17
	141.25	17.85	12.01	1.21	31.07	43.50	12.43
	192.96	18.66	10.40	1.42	30.48	43.50	13.02
	295.78	26.52	13.84	1.76	42.12	46.00	3.88
	500.45	21.13	17.90	2.26	41.29	46.00	4.71
Vertical	41.64	12.78	13.02	0.73	26.53	40.00	13.47
	70.74	16.31	6.58	0.90	23.79	40.00	16.21
	127.97	13.84	12.63	1.16	27.63	43.50	15.87
	201.69	18.90	10.78	1.45	31.13	43.50	12.37
	295.78	26.95	13.84	1.76	42.55	46.00	3.45
	510.15	21.37	18.04	2.27	41.68	46.00	4.32

TEST ENGINEER: RAVEN JIN

EUT : PDP TV Temperature : 22°C

Model No. : ELPCFT501 Humidity : 60%RH

Serial No. : E2010072901 Date of Test : Aug 05, 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	52.31	19.51	8.41	0.79	28.71	40.00	11.29
	105.66	19.47	11.95	1.07	32.49	43.50	11.01
	145.43	20.11	11.66	1.23	33.00	43.50	10.50
	197.81	17.31	10.60	1.44	29.35	43.50	14.15
	295.78	25.15	13.84	1.76	40.75	46.00	5.25
	510.15	21.75	18.04	2.27	42.06	46.00	3.94
Vertical	54.25	20.39	7.92	0.81	29.12	40.00	10.88
	94.99	19.91	10.45	1.02	31.38	43.50	12.12
	135.73	18.09	12.28	1.19	31.56	43.50	11.94
	222.06	14.01	11.75	1.52	27.28	46.00	18.72
	295.78	27.06	13.84	1.76	42.66	46.00	3.34
	508.21	22.72	18.01	2.27	43.00	46.00	3.00

TEST ENGINEER: RAVEN JIN

EUT : PDP TV Temperature : 22°C

Model No. : ELPCFT501 Humidity : 60%RH

Serial No. : E2010072901 Date of Test : Aug 05, 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	50.37	18.01	8.85	0.78	27.64	40.00	12.36
	77.53	22.60	7.49	0.94	31.03	40.00	8.97
	153.19	9.45	11.04	1.25	21.74	43.50	21.76
	236.61	27.99	12.40	1.56	41.95	46.00	4.05
	291.90	25.84	13.77	1.74	41.35	46.00	4.65
	501.42	20.83	17.93	2.26	41.02	46.00	4.98
Vertical	43.58	18.31	11.88	0.74	30.93	40.00	9.07
	89.17	23.50	9.24	0.99	33.73	43.50	9.77
	106.63	22.38	12.02	1.07	35.47	43.50	8.03
	151.25	22.60	11.19	1.25	35.04	43.50	8.46
	295.78	25.62	13.84	1.76	41.22	46.00	4.78
	503.36	21.68	17.95	2.26	41.89	46.00	4.11

TEST ENGINEER: RAVEN JIN

5 DEVIATION TO TEST SPECIFICATIONS

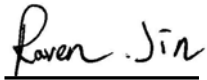
None.

6 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
Gasket	DAA1001\ROH	Qingdao Joinset S&T Co., Ltd.	See Internal Photos Figure 30
		SHENZHEN TONGANTAI ELECTRONIC TECHNOLOGY CO.,LTD.	
Ferrite core	ZCAT3035-1330\ROH	FEELUX	See Internal Photos Figure 30, 32
		Rui Feng Electronic Co., Ltd.	
		Hai An Magnetic Material No.2 Factory	
Ferrite core	ZCAT2132-1130\ROH	JIANGSU LETTALL ELECTRONICS CO., LTD.	See Internal Photos Figure 31
		FEELUX	
		Rui Feng Electronic Co., Ltd.	
Ferrite core	BNF-12\ZCAT1519-0830\ROH	Hai An Magnetic Material No.2 Factory	See Internal Photos Figure 32, 33, 34
		FEELUX	
		JIANGSU LETTALL ELECTRONICS CO., LTD.	

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)