

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

LED LCD TV

Model No.	Brand
55K610GWN	Hisense

FCC ID : W9HLCDF0030

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

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Report No. : ACI-F13175
Date of Test : Sep 11 – 18, 2013
Date of Report : Oct 09, 2013

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TEST REPORT FOR FCC CERTIFICATE

Applicant : Hisense Electric Co., Ltd.
 Manufacturer : Hisense Electric Co., Ltd.
 Factory #1 : Hisense Electric Co., Ltd.
 Factory #2 : Tatung Mexico S.A. de C.V.
 EUT Description : LED LCD TV

Model No.	Brand	Power Supply
55K610GWN	Hisense	120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2012
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) which was tested in 3m anechoic chamber Sep 11 – 18, 2013 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.F13174, a Verification report.

Date of Test : Sep 11 – 18, 2013 Date of Report : Oct 08, 2013

Producer : 
 KATHY WANG / Supervisor

Review : 
 DIO YANG / 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 2012 AND ANSI C63.4-2003	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2012 AND ANSI C63.4-2003	15.109(a) Class B	Pass

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description	:	LED LCD TV
Type of EUT	:	<input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type
Model No.	:	55K610GWN
Bread Name	:	Hisense
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
Factory #1	:	Hisense Electric Co., Ltd. No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China
Factory #2	:	Tatung Mexico S.A. de C..V. Miguel Catalán 420, Parque Industrial Rio Bravo, Cd. Juarez, Chih., CP 32557
LCD Panel	:	Manufacturer : Hisense M/N : HE550GF-B51(004)\PW1
Tuner	:	Manufacturer : XuGuang Tech.Co.,Ltd M/N : SDVT-10A/WF2\ROH
Max Resolution	:	1024*768@60Hz
D-Sub Cable	:	Shielded, Detachable, 1.85m, with two cores on cable
HDMI Cable	:	Shielded, Detachable, 1.00m
Power Cord	:	Unshielded, Detachable, 1.80m

Remark:

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

Bottom Port:

- (1) One DIGITAL AUDIO OUT Port
: Connected with DVD PLAYER #1
- (2) One LAN Port
: Connected with PC
- (3) One HDMI4/ARC Port
: Connected with DVD PLAYER #3

- (4) One HDMI3 Port : Connected with DVD PLAYER #2
- (5) One component of Audio/YPbPr Audio Port : Connected with DVD PLAYER #1
- (6) One component of Video/YPbPr Port : Connected with DVD PLAYER #1

Side Port:

- (1) One VGA Port : Connected with PC
- (2) One PC/DVI Audio In Port : Connected with PC
- (3) One ANT/CABLE IN Port : Connected with Antenna or ATSC SG / TV SG
- (4) One HDMI2/DVI Port : Connected with PC
- (5) One HDMI1 Port : Connected with DVD PLAYER #1
- (6) One USB1 Port : Connected with U-Disk#1
- (7) One USB2 Port : Connected with U-Disk#2
- (8) One USB3 Port : Connected with U-Disk#3
- (9) One AUDIO OUT Port : Connected with Earphone

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 : 1406
Serial Number : 0200702302609
Data Cable : Shielded, undetachable ,1.8m
Certificate : CE/EMC, FCC DoC, VCCI, MIC, C-Tick,
BSMI

2.2.4 Mouse

Manufacturer : Microsoft
Model Number : 1405
Serial Number : 0204603562213
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 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

2.2.7 ATSC Signal Generator

Manufacturer : SENCORE
Model Number : ATSC997
Serial Number : 6790071

2.2.8 DVD PLAYER #1

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

2.2.9 DVD PLAYER #2

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

2.2.10 DVD PLAYER #3

Manufacturer : DGT RONIK
Model Number : DV-A340
Serial Number : 10004184-C
Certificate : FCC DoC, CE/EMC, CCC

2.2.11 Earphone

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

2.2.12 U-DISK*3

Manufacturer : LG
Model Number : 1GB

2.3 Description of Test Facility

Site Description (No.3 3m Chamber) : Sept. 17, 1998 file on
Mar 16, 2012 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 = 3.42 dB
Radiated Emission Expanded Uncertainty (30-200MHz):
U = 4.14 dB (Horizontal)
U = 4.28 dB (Vertical)

Radiated Emission Expanded Uncertainty (200M-1GHz):
U = 4.18 dB (Horizontal)
U = 4.26 dB (Vertical)

3 CONDUCTED EMISSION TEST

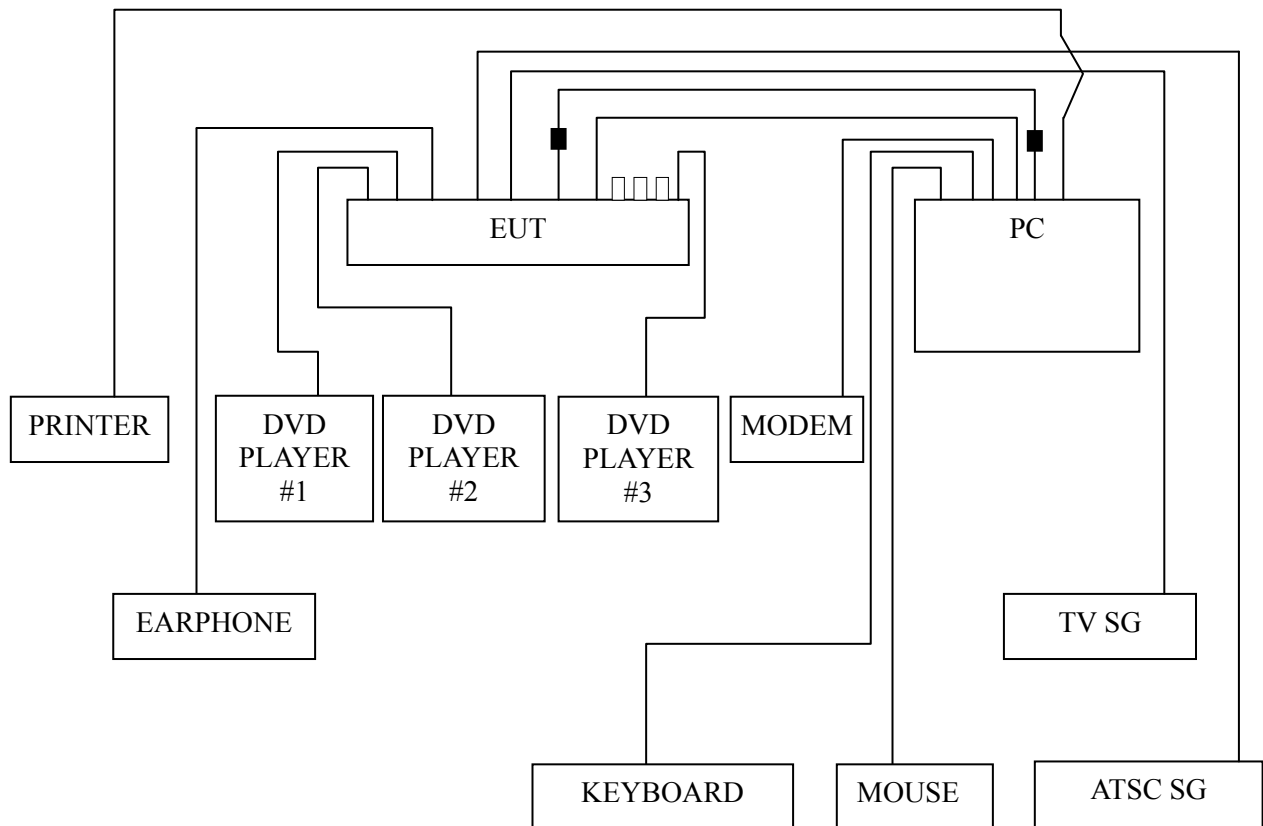
3.1 Test Equipment

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	Mar 20, 2013	Mar 19, 2014
2.	Artificial Mains Network (AMN)	R&S	ESH2-Z5	843890/011	Feb 25, 2013	Feb 24, 2014
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2013	Mar 19, 2014
4.	50Ω Coaxial Switch	Anritsu	MP59B	6200426389	Sep 18, 2013	Mar 17, 2014
5.	50Ω Terminator	Anritsu	BNC	001	Mar 20, 2013	Mar 19, 2014
6.	Software	Audix	E3	SET00200 9804M592	--	--

3.2 Block Diagram of Test Setup

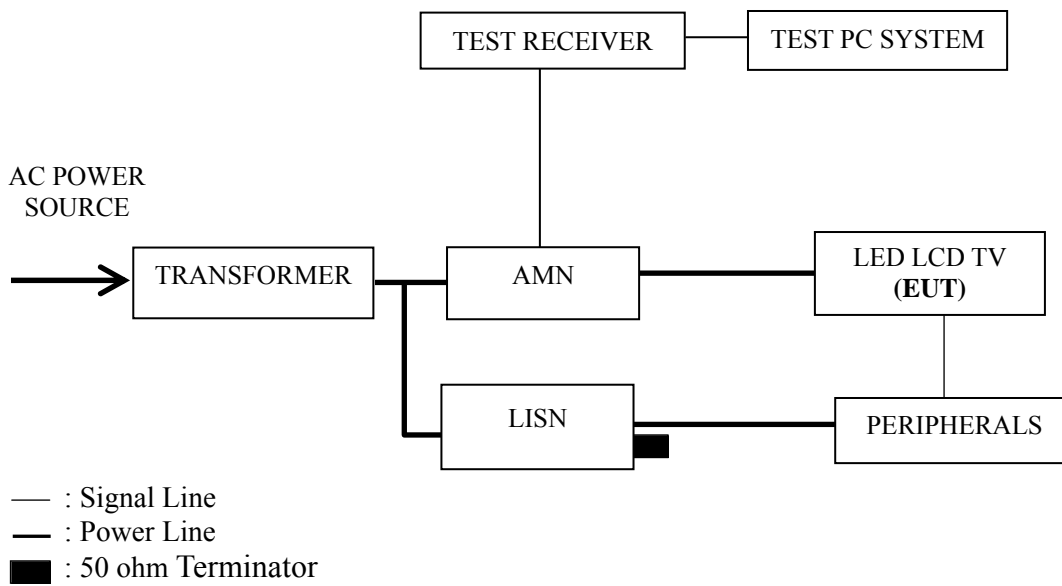
3.2.1 EUT & Peripherals



■ : Ferrite core

□ : U-Disk

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 In USB Play mode, set the EUT play digital media from U-Disk.
- 3.5.6 In LAN mode, set the EUT play digital media through LAN port.
- 3.5.7 The other peripherals devices were driven and operated during the test.
- 3.5.8 The test modes are as follows:

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

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 1024*768@60Hz	P13
HDMI 1024*768@60Hz	P14
D-Sub 800*600@60Hz	P15
D-Sub 640*480@60Hz	P16
USB Play	P17
LAN Play	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 HDMI 1080p mode was tested and recorded in a FCC Verification test report (No. F13174).

NOTE 5 – The worst case is for D-Sub 800*600@60Hz test mode. The worst emission is detected at 3.821 MHz (Quasi-Peak Value) with corrected signal level of 50.58 dB (μ V) (limit is 56.00 dB (μ V)), when the Line of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C
 Model No. : 55K610GWN Humidity : 48%RH
 Test Mode : D-Sub 1024*768@60Hz Date of Test : Sep 18, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.482	42.30	0.11	42.41	56.31	13.90	QP
	1.150	43.59	0.20	43.79	56.00	12.21	
	2.131	44.30	0.21	44.51	56.00	11.49	
	2.741	44.30	0.24	44.54	56.00	11.46	
	3.771	49.00	0.28	49.28	56.00	6.72	
	15.330	42.91	0.18	43.09	60.00	16.91	
	0.482	35.10	0.11	35.21	46.31	11.10	AV
	1.150	33.49	0.20	33.69	46.00	12.31	
	2.131	32.50	0.21	32.71	46.00	13.29	
	2.741	32.50	0.24	32.74	46.00	13.26	
3.771	36.30	0.28	36.58	46.00	9.42		
15.330	40.61	0.18	40.79	50.00	9.21		
Neutral	0.481	42.20	0.36	42.56	56.33	13.77	QP
	1.132	43.50	0.32	43.82	56.00	12.18	
	1.738	42.50	0.30	42.80	56.00	13.20	
	2.712	45.60	0.31	45.91	56.00	10.09	
	3.801	50.10	0.32	50.42	56.00	5.58	
	15.330	40.90	0.75	41.65	60.00	18.35	
	0.481	34.80	0.36	35.16	46.33	11.17	AV
	1.132	31.60	0.32	31.92	46.00	14.08	
	1.738	31.90	0.30	32.20	46.00	13.80	
	2.712	34.20	0.31	34.51	46.00	11.49	
3.801	36.80	0.32	37.12	46.00	8.88		
15.330	38.20	0.75	38.95	50.00	11.05		

TEST ENGINEER: Wency Yang

EUT : LED LCD TV Temperature : 22°C
 Model No. : 55K610GWN Humidity : 48%RH
 Test Mode : HDMI 1024*768@60Hz Date of Test : Sep 18, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.492	42.40	0.11	42.51	56.14	13.63	QP
	1.129	43.59	0.20	43.79	56.00	12.21	
	2.155	45.60	0.21	45.81	56.00	10.19	
	2.820	45.79	0.25	46.04	56.00	9.96	
	3.814	50.10	0.28	50.38	56.00	5.62	
	15.330	40.01	0.18	40.19	60.00	19.81	AV
	0.492	37.30	0.11	37.41	46.14	8.73	
	1.129	33.89	0.20	34.09	46.00	11.91	
	2.155	35.20	0.21	35.41	46.00	10.59	
	2.820	34.89	0.25	35.14	46.00	10.86	
3.814	37.90	0.28	38.18	46.00	7.82	AV	
15.330	38.11	0.18	38.29	50.00	11.71		
Neutral	0.485	41.80	0.37	42.17	56.25	14.08	QP
	1.163	44.39	0.32	44.71	56.00	11.29	
	1.816	43.30	0.30	43.60	56.00	12.40	
	2.481	45.90	0.30	46.20	56.00	9.80	
	3.733	47.30	0.32	47.62	56.00	8.38	
	15.330	40.80	0.75	41.55	60.00	18.45	AV
	0.485	35.10	0.37	35.47	46.25	10.78	
	1.163	34.19	0.32	34.51	46.00	11.49	
	1.816	31.60	0.30	31.90	46.00	14.10	
	2.481	33.50	0.30	33.80	46.00	12.20	
3.733	32.40	0.32	32.72	46.00	13.28	AV	
15.330	38.30	0.75	39.05	50.00	10.95		

TEST ENGINEER: Wency Yang

EUT : LED LCD TV Temperature : 22°C

Model No. : 55K610GWN Humidity : 48%RH

Test Mode : D-Sub 800*600@60Hz Date of Test : Sep 18, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.486	42.40	0.11	42.51	56.24	13.73	QP
	1.163	43.99	0.20	44.19	56.00	11.81	
	1.825	44.10	0.20	44.30	56.00	11.70	
	2.815	45.10	0.24	45.34	56.00	10.66	
	3.821	50.30	0.28	50.58	56.00	5.42	
	15.330	39.51	0.18	39.69	60.00	20.31	AV
	0.486	36.10	0.11	36.21	46.24	10.03	
	1.163	34.39	0.20	34.59	46.00	11.41	
	1.825	34.80	0.20	35.00	46.00	11.00	
	2.815	33.50	0.24	33.74	46.00	12.26	
Neutral	3.821	37.10	0.28	37.38	46.00	8.62	QP
	15.330	37.71	0.18	37.89	50.00	12.11	
	0.497	42.90	0.37	43.27	56.05	12.78	
	1.164	44.39	0.32	44.71	56.00	11.29	
	1.828	44.29	0.30	44.59	56.00	11.41	
	2.489	46.30	0.30	46.60	56.00	9.40	AV
	3.796	49.00	0.32	49.32	56.00	6.68	
	15.330	40.30	0.75	41.05	60.00	18.95	
	0.497	37.00	0.37	37.37	46.05	8.68	
	1.164	35.19	0.32	35.51	46.00	10.49	
	1.828	35.09	0.30	35.39	46.00	10.61	AV
	2.489	35.20	0.30	35.50	46.00	10.50	
	3.796	33.80	0.32	34.12	46.00	11.88	
	15.330	37.87	0.75	38.62	50.00	11.38	

TEST ENGINEER: Wency Yang

EUT : LED LCD TV Temperature : 22°C
 Model No. : 55K610GWN Humidity : 48%RH
 Test Mode : D-Sub 640*480@60Hz Date of Test : Sep 18, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.498	42.90	0.11	43.01	56.04	13.03	QP
	1.149	43.49	0.20	43.69	56.00	12.31	
	1.831	44.20	0.20	44.40	56.00	11.60	
	2.486	46.00	0.23	46.23	56.00	9.77	
	3.767	49.00	0.28	49.28	56.00	6.72	
	15.330	40.01	0.18	40.19	60.00	19.81	
	0.498	37.60	0.11	37.71	46.04	8.33	AV
	1.149	32.99	0.20	33.19	46.00	12.81	
	1.831	35.30	0.20	35.50	46.00	10.50	
	2.486	33.10	0.23	33.33	46.00	12.67	
3.767	33.80	0.28	34.08	46.00	11.92		
15.330	38.21	0.18	38.39	50.00	11.61		
Neutral	0.489	42.20	0.37	42.57	56.18	13.61	QP
	1.155	44.09	0.32	44.41	56.00	11.59	
	1.825	44.09	0.30	44.39	56.00	11.61	
	2.496	46.80	0.30	47.10	56.00	8.90	
	3.831	49.80	0.32	50.12	56.00	5.88	
	15.330	40.20	0.75	40.95	60.00	19.05	
	0.489	36.60	0.37	36.97	46.18	9.21	AV
	1.155	34.19	0.32	34.51	46.00	11.49	
	1.825	33.89	0.30	34.19	46.00	11.81	
	2.496	36.40	0.30	36.70	46.00	9.30	
3.831	36.30	0.32	36.62	46.00	9.38		
15.330	37.80	0.75	38.55	50.00	11.45		

TEST ENGINEER: Wency Yang

EUT : LED LCD TV Temperature : 22°C

Model No. : 55K610GWN Humidity : 48%RH

Test Mode : USB Play Date of Test : Sep 18, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.497	43.10	0.11	43.21	56.04	12.83	QP
	0.832	44.09	0.23	44.32	56.00	11.68	
	1.153	43.79	0.20	43.99	56.00	12.01	
	2.167	46.20	0.21	46.41	56.00	9.59	
	3.770	49.20	0.28	49.48	56.00	6.52	
	15.330	40.21	0.18	40.39	60.00	19.61	
	0.497	37.80	0.11	37.91	46.04	8.13	AV
	0.832	36.19	0.23	36.42	46.00	9.58	
	1.153	33.59	0.20	33.79	46.00	12.21	
	2.167	35.50	0.21	35.71	46.00	10.29	
	3.770	33.90	0.28	34.18	46.00	11.82	
	15.330	38.31	0.18	38.49	50.00	11.51	
Neutral	0.493	42.60	0.37	42.97	56.12	13.15	QP
	0.830	44.30	0.29	44.59	56.00	11.41	
	1.158	44.09	0.32	44.41	56.00	11.59	
	2.445	46.00	0.30	46.30	56.00	9.70	
	3.822	50.00	0.32	50.32	56.00	5.68	
	15.330	40.80	0.75	41.55	60.00	18.45	
	0.493	37.00	0.37	37.37	46.12	8.75	AV
	0.830	36.50	0.29	36.79	46.00	9.21	
	1.158	34.19	0.32	34.51	46.00	11.49	
	2.445	32.90	0.30	33.20	46.00	12.80	
	3.822	34.70	0.32	35.02	46.00	10.98	
	15.330	38.20	0.75	38.95	50.00	11.05	

TEST ENGINEER: Wency Yang

EUT : LED LCD TV Temperature : 22°C

Model No. : 55K610GWN Humidity : 48%RH

Test Mode : LAN Play Date of Test : Sep 18, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.498	43.10	0.11	43.21	56.03	12.82	QP
	0.811	43.90	0.23	44.13	56.00	11.87	
	1.153	43.89	0.20	44.09	56.00	11.91	
	2.497	46.30	0.23	46.53	56.00	9.47	
	3.771	49.30	0.28	49.58	56.00	6.42	
	15.330	39.81	0.18	39.99	60.00	20.01	
	0.498	37.70	0.11	37.81	46.03	8.22	AV
	0.811	33.80	0.23	34.03	46.00	11.97	
	1.153	33.39	0.20	33.59	46.00	12.41	
	2.497	35.20	0.23	35.43	46.00	10.57	
	3.771	34.10	0.28	34.38	46.00	11.62	
	15.330	37.81	0.18	37.99	50.00	12.01	
Neutral	0.499	43.20	0.37	43.57	56.01	12.44	QP
	0.813	43.90	0.29	44.19	56.00	11.81	
	1.168	44.89	0.32	45.21	56.00	10.79	
	2.460	45.80	0.30	46.10	56.00	9.90	
	3.793	49.30	0.32	49.62	56.00	6.38	
	15.330	40.80	0.75	41.55	60.00	18.45	
	0.499	37.20	0.37	37.57	46.01	8.44	AV
	0.813	35.40	0.29	35.69	46.00	10.31	
	1.168	35.19	0.32	35.51	46.00	10.49	
	2.460	31.90	0.30	32.20	46.00	13.80	
	3.793	34.00	0.32	34.32	46.00	11.68	
	15.330	38.40	0.75	39.15	50.00	10.85	

TEST ENGINEER: Wency Yang

4 RADIATED EMISSION TEST

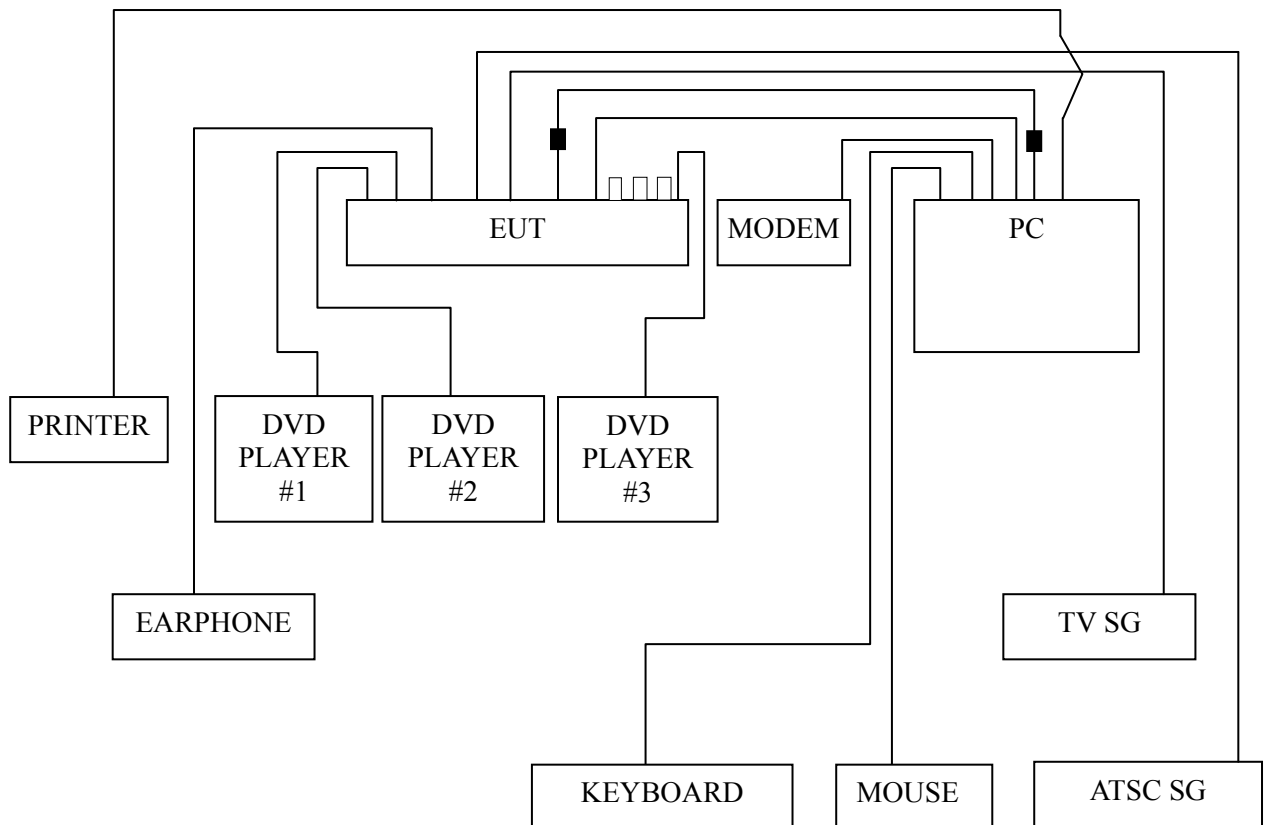
4.1 Test Equipment

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	ESCI	101302	Sep 03, 2013	Sep 02, 2014
2.	Preamplifier	Agilent	8447D	2944A10548	Mar 18, 2013	Sep 17, 2013
3.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 03, 2013	May 02, 2014
4.	Spectrum	Agilent	E7405A	MY45106600	Dec 17, 2012	Dec 16, 2013
5.	50Ω Coaxial Switch	Anritsu	MP59B	6200426390	Mar 18, 2013	Sep 17, 2013
6.	Software	Audix	E3	SET00200 9912M295-2	--	--

4.2 Block Diagram of Test Setup

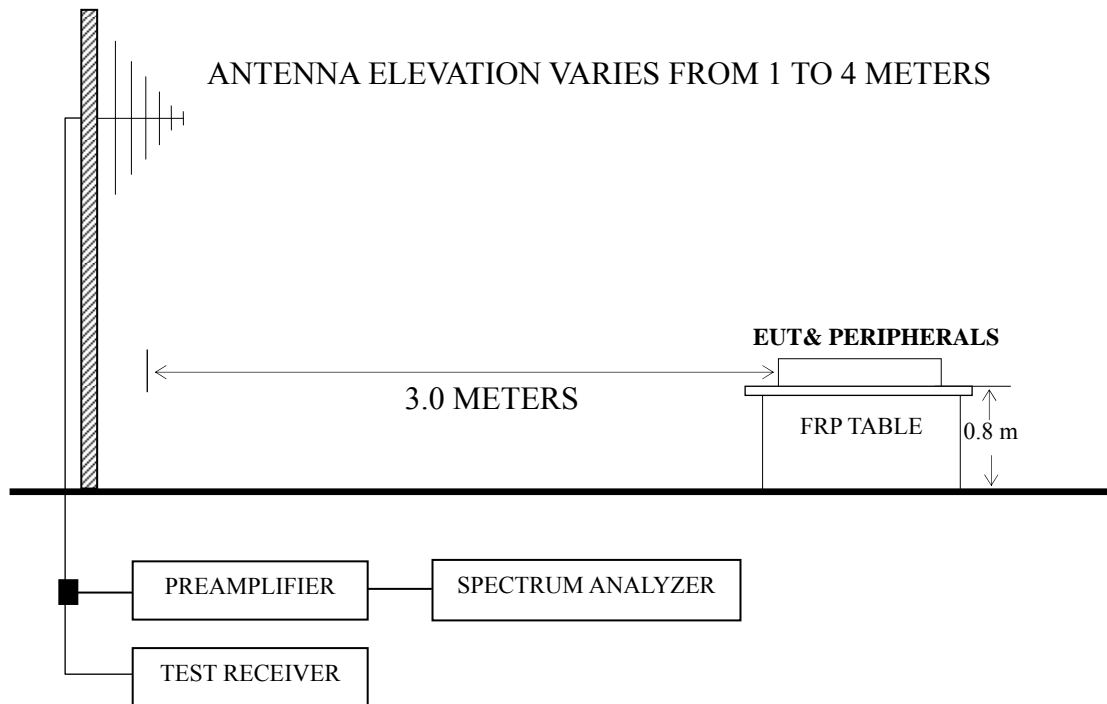
4.2.1 EUT and Peripherals



■ : Ferrite core

□ : U-Disk

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	
		($\mu\text{V}/\text{m}$)	dB ($\mu\text{V}/\text{m}$)
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 ($\mu\text{V}/\text{m}$) = 20 log Emission Level ($\mu\text{V}/\text{m}$)

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.

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 I.F. bandwidth of Test Receiver R&S ESCI 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 1024*768@60Hz	P22
HDMI 1024*768@60Hz	P23
HDMI 800*600@60Hz	P24
HDMI 640*480@60Hz	P25
USB Play	P26
LAN Play	P27

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

NOTE 2 – All readings are Quasi-Peak values.

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

NOTE 4 – The HDMI 1080p mode was tested and recorded in a FCC Verification test report (No. F13174).

NOTE 5 – The worst case is for HDMI 1024*768@60Hz test mode. The worst emission at horizontal polarization was detected at 159.980 MHz with corrected signal level of 40.91 dB ($\mu\text{V}/\text{m}$) (limit is 43.50 dB ($\mu\text{V}/\text{m}$)), when the antenna was 2.00 m height and the turntable was at 333°. The worst emission at vertical polarization was detected at 173.560 MHz with corrected signal level of 39.89 dB ($\mu\text{V}/\text{m}$) (limit is 43.50 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.80 m height and the turntable was at 152°.

EUT : LED LCD TV Temperature : 22°C

Model No. : 55K610GWN Humidity : 60%RH

Test Mode : D-Sub 1024*768@60Hz Date of Test : Sep 11, 2013

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	74.620	25.10	6.46	1.00	32.56	40.00	7.44
	168.710	27.26	8.40	1.76	37.42	43.50	6.08
	283.170	22.14	12.27	2.43	36.84	46.00	9.16
	396.660	18.34	15.93	2.68	36.95	46.00	9.05
	596.480	18.94	18.40	3.20	40.54	46.00	5.46
	704.150	19.26	20.13	3.55	42.94	46.00	3.06
Vertical	31.940	15.44	16.50	0.68	32.62	40.00	7.38
	74.620	25.36	6.46	1.00	32.82	40.00	7.18
	124.090	23.88	11.48	1.50	36.86	43.50	6.64
	174.530	26.67	8.31	1.80	36.78	43.50	6.72
	397.630	17.80	15.93	2.68	36.41	46.00	9.59
	702.210	18.82	20.13	3.54	42.49	46.00	3.51

TEST ENGINEER: Neal Wang

EUT : LED LCD TV Temperature : 22°C

Model No. : 55K610GWN Humidity : 60%RH

Test Mode : HDMI 1024*768@60Hz Date of Test : Sep 11, 2013

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	74.620	29.64	6.46	1.00	37.10	40.00	2.90
	149.310	28.03	10.12	1.64	39.79	43.50	3.71
	159.980	29.61	9.60	1.70	40.91	43.50	2.59
	373.380	12.55	14.90	2.66	30.11	46.00	15.89
	499.480	20.24	18.10	2.98	41.32	46.00	4.68
	704.150	18.64	20.13	3.55	42.32	46.00	3.68
Vertical	35.820	16.32	15.63	0.73	32.68	40.00	7.32
	75.590	28.03	6.54	1.01	35.58	40.00	4.42
	121.180	25.74	11.42	1.48	38.64	43.50	4.86
	173.560	29.77	8.32	1.80	39.89	43.50	3.61
	596.480	20.27	18.40	3.20	41.87	46.00	4.13
	702.210	18.55	20.13	3.54	42.22	46.00	3.78

TEST ENGINEER: Neal Wang

EUT : LED LCD TV Temperature : 22°C

Model No. : 55K610GWN Humidity : 60%RH

Test Mode : HDMI 800*600@60Hz Date of Test : Sep 11, 2013

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	74.620	28.55	6.46	1.00	36.01	40.00	3.99
	151.250	26.34	9.98	1.65	37.97	43.50	5.53
	180.350	29.59	8.20	1.84	39.63	43.50	3.87
	396.660	23.46	15.93	2.68	42.07	46.00	3.93
	598.420	15.77	18.30	3.20	37.27	46.00	8.73
	820.550	6.96	20.70	3.80	31.46	46.00	14.54
Vertical	33.880	16.39	16.12	0.70	33.21	40.00	6.79
	73.650	23.88	6.33	0.98	31.19	40.00	8.81
	120.210	24.37	11.41	1.48	37.26	43.50	6.24
	173.560	27.53	8.32	1.80	37.65	43.50	5.85
	434.490	17.96	17.50	2.78	38.24	46.00	7.76
	887.480	11.93	19.80	4.43	36.16	46.00	9.84

TEST ENGINEER: Neal Wang

EUT : LED LCD TV Temperature : 22°C

Model No. : 55K610GWN Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz Date of Test : Sep 11, 2013

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	73.650	27.22	6.33	0.98	34.53	40.00	5.47
	149.310	26.72	10.12	1.64	38.48	43.50	5.02
	203.630	25.90	7.93	1.97	35.80	43.50	7.70
	399.570	17.90	16.20	2.69	36.79	46.00	9.21
	594.540	18.15	18.50	3.20	39.85	46.00	6.15
	743.920	18.27	18.83	3.57	40.67	46.00	5.33
Vertical	32.910	12.65	16.30	0.69	29.64	40.00	10.36
	72.680	21.92	6.20	0.97	29.09	40.00	10.91
	121.180	22.27	11.42	1.48	35.17	43.50	8.33
	172.590	24.26	8.34	1.80	34.40	43.50	9.10
	370.470	18.40	14.85	2.65	35.90	46.00	10.10
		600.360	16.15	18.30	3.22	37.67	46.00

TEST ENGINEER: Neal Wang

EUT : LED LCD TV Temperature : 22°C

Model No. : 55K610GWN Humidity : 60%RH

Test Mode : USB Play Date of Test : Sep 11, 2013

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	76.560	21.85	6.59	1.03	29.47	40.00	10.53
	172.590	22.27	8.34	1.80	32.41	43.50	11.09
	231.760	19.54	9.80	2.11	31.45	46.00	14.55
	374.350	17.52	14.95	2.66	35.13	46.00	10.87
	598.420	16.93	18.30	3.20	38.43	46.00	7.57
	718.700	14.25	19.42	3.56	37.23	46.00	8.77
Vertical	34.850	14.59	15.85	0.71	31.15	40.00	8.85
	75.590	25.01	6.54	1.01	32.56	40.00	7.44
	126.030	20.87	11.60	1.51	33.98	43.50	9.52
	170.650	20.66	8.38	1.78	30.82	43.50	12.68
	394.720	14.97	15.80	2.68	33.45	46.00	12.55
	678.930	14.64	19.00	3.48	37.12	46.00	8.88

TEST ENGINEER: Neal Wang

EUT : LED LCD TV Temperature : 22°C

Model No. : 55K610GWN Humidity : 60%RH

Test Mode : LAN Play Date of Test : Sep 11, 2013

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	72.680	20.29	6.20	0.97	27.46	40.00	12.54
	161.920	27.11	9.20	1.72	38.03	43.50	5.47
	283.170	22.69	12.27	2.43	37.39	46.00	8.61
	397.630	19.81	15.93	2.68	38.42	46.00	7.58
	596.480	16.40	18.40	3.20	38.00	46.00	8.00
	748.770	7.92	18.80	3.58	30.30	46.00	15.70
Vertical	72.680	25.59	6.20	0.97	32.76	40.00	7.24
	129.910	23.34	11.90	1.53	36.77	43.50	6.73
	174.530	27.98	8.31	1.80	38.09	43.50	5.41
	256.980	26.12	12.30	2.25	40.67	46.00	5.33
	394.720	16.39	15.80	2.68	34.87	46.00	11.13
	590.660	13.04	18.60	3.18	34.82	46.00	11.18

TEST ENGINEER: Neal Wang

5 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
Al Tape	DBA40X50\ROH	Qingdao Joinset S&T Co., Ltd.	See Internal Photos Figure 18
Gasket	35X0.7X41mm\VGA	Qingdao Joinset S&T Co., Ltd.	See Internal Photos Figure 19

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: Neal Wang
(NEAL WANG)

6 DEVIATION TO TEST SPECIFICATIONS

None.