

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

LED LCD TV

Model No.	Brand
50H7EG, 50K390GW	Hisense

FCC ID : W9HLCDF0047

Prepared For : Hisense Electric Co., Ltd.
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Development Zone, Qingdao, China

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Report No. : ACI-F14118
Date of Test : Jul 10 – Aug 06, 2014
Date of Report : Aug 11, 2014

TABLE OF CONTENTS

	Page
1 SUMMARY OF STANDARDS AND RESULTS.....	4
1.1 Description of Standards and Results.....	4
2 GENERAL INFORMATION.....	5
2.1 Description of Equipment Under Test.....	5
2.2 Peripherals.....	6
2.3 Description of Test Facility	8
2.4 Measurement Uncertainty	8
3 CONDUCTED EMISSION TEST	9
3.1 Test Equipment.....	9
3.2 Block Diagram of Test Setup	9
3.3 Conducted Emission Limit [FCC Part 15 Subpart B 15.107(a)].....	10
3.4 Test Configuration.....	10
3.5 Operating Condition of EUT	11
3.6 Test Procedures	11
3.7 Test Results	12
4 RADIATED EMISSION TEST	19
4.1 Test Equipment.....	19
4.2 Block Diagram of Test Setup	19
4.3 Radiated Emission Limit [FCC Part 15 Subpart B 15.109(a)].....	20
4.4 Test Configuration.....	20
4.5 Operating Condition of EUT	20
4.6 Test Procedures	21
4.7 Test Results	21
5 DEBUG DESCRIPTION	30
6 DEVIATION TO TEST SPECIFICATIONS	31

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
50H7EG, 50K390GW	Hisense	120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2013
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 Sec2.1) which was tested in 3m anechoic chamber Jul 10 – Aug 06, 2014 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.

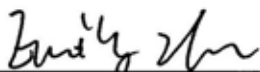
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This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

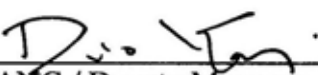

The test results for EUT's TV functions are contained in No.F14117, a Verification report.

Date of Test : Jul 10 – Aug 06, 2014 Date of Report : Aug 11, 2014

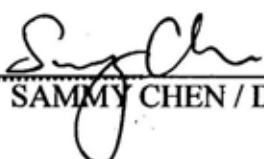
Producer :


EMILY ZHU / Assistant

Review :


DIO YANG / Deputy 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 2013 AND ANSI C63.4-2003	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2013 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 checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type
Model No.	:	50H7EG, 50K390GW
Note	:	The above models are all the same except for model name. 50H7EG model is tested and recorded in the report.
Brand 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 : HE500HF-B57\S0
Max Resolution	:	HDMI 1920*1080@60Hz D-Sub 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 HDMI2 Port : Connected with DVD PLAYER #3
- (2) One HDMI3 Port : Connected with DVD PLAYER #1
- (3) One HDMI4 Port : Connected with DVD PLAYER #2
- (4) One LAN Port : Connected with PC
- (5) One IR Blaster Port : Connected with Terminal
- (6) One DIGITAL Output(Optical) Port : Connected with DVD PLAYER #3
- (7) One PC/ AUDIO IN Port : Connected with PC
- (8) One VGA In Port : Connected with PC

Side Port:

- (9) One component of AV/YPbPr Port : Connected with DVD PLAYER #3
- (10) One HDMI1 Port : Connected with PC
- (11) One Earphone/Audio Out Port : Connected with Earphone
- (12) One ANT/CABLE IN Port : Connected with ATSC SG / TV SG
- (13) Three USB Ports : Connected with U-Disk

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;
BSMI, 3C, MIC

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 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 : PHILIPS
Model Number : DVP3986K/93
Serial Number : KX1A0902120082
Certificate : FCC DoC, CE/EMC, CCC

2.2.10 DVD PLAYER #3

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

2.2.11 Earphone #1

Manufacturer : audio-technica
Model Number : ATH-CKL200

2.2.12 Earphone #2

Manufacturer : Skullcandy
Model Number : FMJ

2.2.13 U-DISK*3

Manufacturer : LG
Model Number : 1GB

2.3 Description of Test Facility

Site Description : Sept. 17, 1998 file on
(No.3 3m Chamber) 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 = 2.77 dB

Radiated Emission Expanded Uncertainty (30-200MHz):
U = 4.17 dB (Horizontal)
U = 4.02 dB (Vertical)

Radiated Emission Expanded Uncertainty (200M-1GHz):
U = 3.38 dB (Horizontal)
U = 3.28 dB (Vertical)

Radiated Emission Expanded Uncertainty (Above 1GHz):
U = 4.68 dB (Horizontal)
U = 4.87 dB (Vertical)

3 CONDUCTED EMISSION TEST

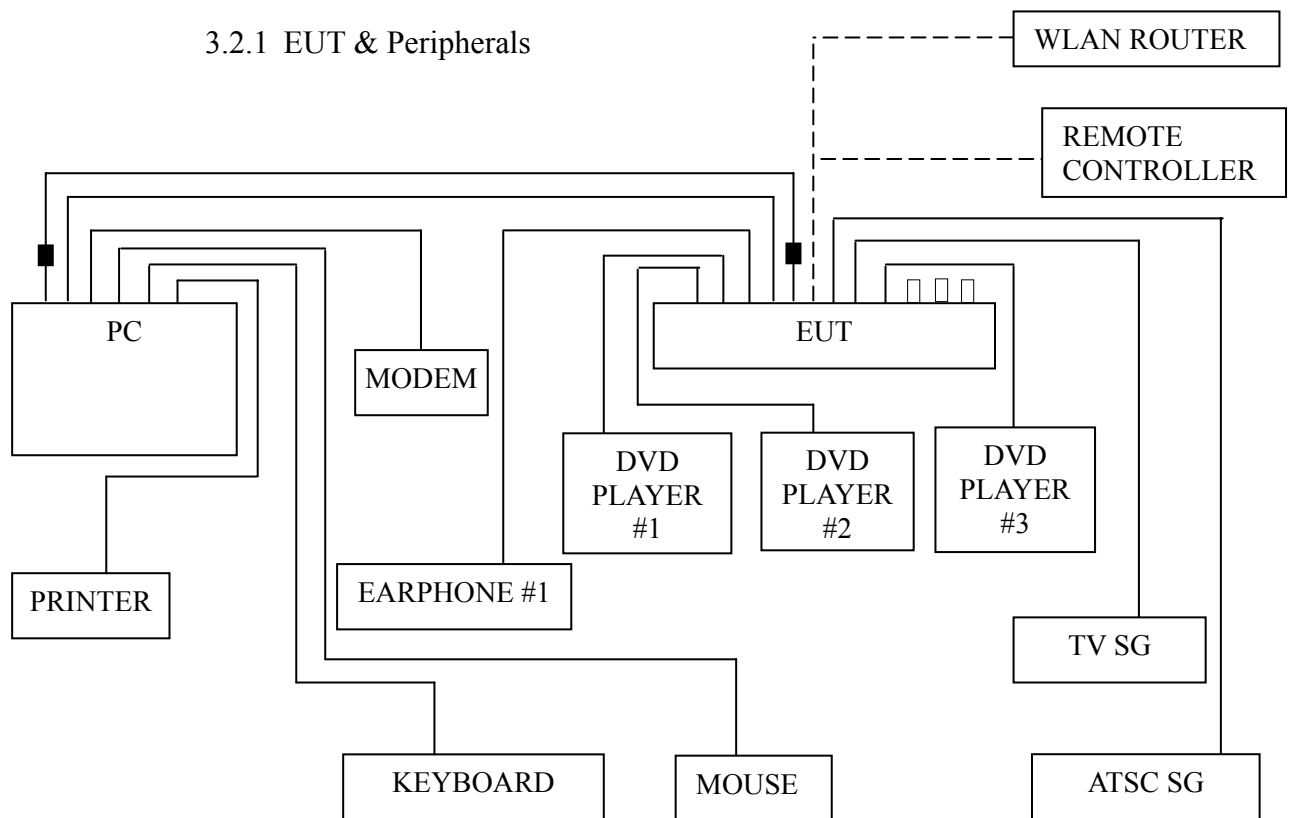
3.1 Test Equipment

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	101303	Sep 11, 2013	Sep 10, 2014
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2013	Jun 26, 2014
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2014	Mar 19, 2015
4.	50Ω Coaxial Switch	Anritsu	MP59B	6200426389	Mar 18, 2014	Sep 17, 2014
5.	50Ω Terminator	Anritsu	BNC	001	Mar 20, 2014	Mar 19, 2015
6.	Software	Audix	E3	6.111206	--	--

3.2 Block Diagram of Test Setup

3.2.1 EUT & Peripherals

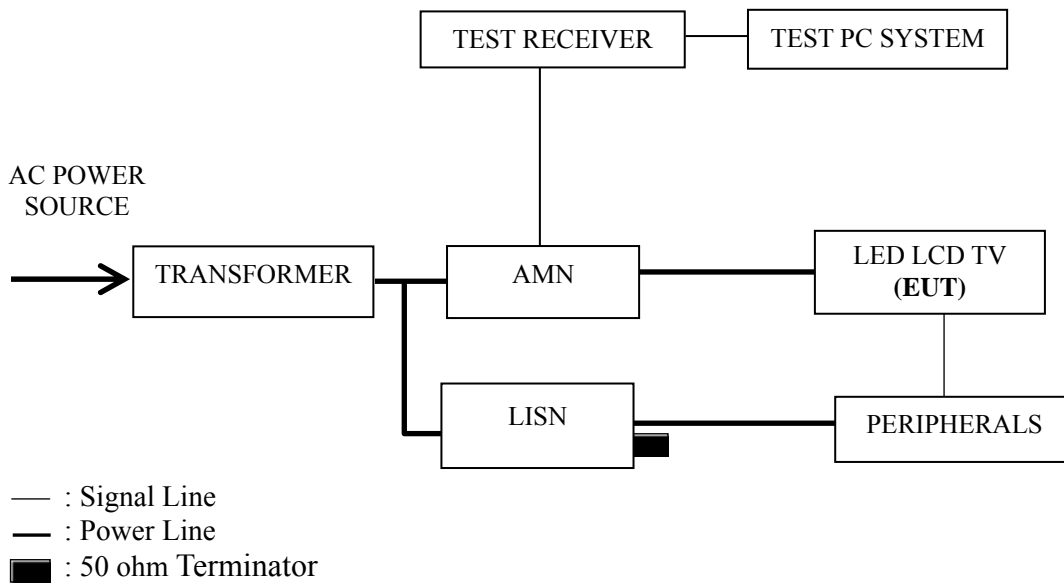


--- : WLAN/BT signal

■ : 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 (μV)	
	Quasi-peak	Average
0.15 ~ 0.5	66~56	56~46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE 1 – The lower limit shall apply at the transition frequencies.
 NOTE 2 – The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz~0.50 MHz

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 Play mode, set the EUT play digital media through LAN port.

3.5.7 The WLAN function is operating to communicate with WLAN router / the BT function is operating to communicate with the remote controller.

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

3.5.9 The test modes are as follows:

Test Mode
D-Sub 1024*768@60Hz
HDMI 1920*1080@60Hz
D-Sub 800*600@60Hz
D-Sub 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 1920*1080@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 worst case is for D-Sub 1024*768@60Hz test mode. The worst emission is detected at 3.700 MHz (Quasi-Peak Value) with corrected signal level of 42.97 dB (μV) (limit is 56.00 dB (μV)), when the Neutral of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22

Model No. : 50H7EG Humidity : 48%RH

Test Mode : D-Sub 1024*768@60Hz Date of Test : Aug 06, 2014

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.164	37.32	10.57	47.89	65.25	17.36	QP
	0.383	28.58	10.44	39.02	58.21	19.19	
	0.582	31.36	10.44	41.80	56.00	14.20	
	1.898	30.36	10.43	40.79	56.00	15.21	
	4.478	29.89	10.46	40.35	56.00	15.65	
	6.488	31.42	10.43	41.85	60.00	18.15	
	0.164	26.68	10.57	37.25	55.25	18.00	AV
	0.383	18.47	10.44	28.91	48.21	19.30	
	0.582	20.14	10.44	30.58	46.00	15.42	
	1.898	19.47	10.43	29.90	46.00	16.10	
	4.478	18.45	10.46	28.91	46.00	17.09	
	6.488	20.14	10.43	30.57	50.00	19.43	
Neutral	0.167	39.40	10.56	49.96	65.12	15.16	QP
	0.379	32.16	10.43	42.59	58.30	15.71	
	0.579	31.68	10.43	42.11	56.00	13.89	
	1.178	30.82	10.41	41.23	56.00	14.77	
	3.700	32.48	10.49	42.97	56.00	13.03	
	6.285	31.55	10.50	42.05	60.00	17.95	
	0.167	28.56	10.56	39.12	55.12	16.00	AV
	0.379	20.37	10.43	30.80	48.30	17.50	
	0.579	21.45	10.43	31.88	46.00	14.12	
	1.178	20.65	10.41	31.06	46.00	14.94	
	3.700	19.58	10.49	30.07	46.00	15.93	
	6.285	20.68	10.50	31.18	50.00	18.82	

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22

Model No. : 50H7EG Humidity : 48%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Jul 10, 2014

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.164	39.60	10.57	50.17	65.26	15.09	QP
	0.585	30.30	10.44	40.74	56.00	15.26	
	1.175	30.20	10.40	40.60	56.00	15.40	
	2.993	25.70	10.45	36.15	56.00	19.85	
	6.292	30.30	10.42	40.72	60.00	19.28	
	17.199	23.11	10.56	33.67	60.00	26.33	
	0.164	24.40	10.57	34.97	55.26	20.29	AV
	0.585	18.80	10.44	29.24	46.00	16.76	
	1.175	20.80	10.40	31.20	46.00	14.80	
	2.993	16.30	10.45	26.75	46.00	19.25	
	6.292	23.70	10.42	34.12	50.00	15.88	
	17.199	17.81	10.56	28.37	50.00	21.63	
Neutral	0.166	35.50	10.56	46.06	65.16	19.10	QP
	0.384	30.40	10.43	40.83	58.20	17.37	
	0.584	30.40	10.43	40.83	56.00	15.17	
	1.160	30.00	10.41	40.41	56.00	15.59	
	2.204	28.61	10.46	39.07	56.00	16.93	
	6.471	29.10	10.50	39.60	60.00	20.40	
	0.166	24.70	10.56	35.26	55.16	19.90	AV
	0.384	22.90	10.43	33.33	48.20	14.87	
	0.584	19.70	10.43	30.13	46.00	15.87	
	1.160	20.50	10.41	30.91	46.00	15.09	
	2.204	18.71	10.46	29.17	46.00	16.83	
	6.471	21.80	10.50	32.30	50.00	17.70	

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22

Model No. : 50H7EG Humidity : 48%RH

Test Mode : D-Sub 800*600@60Hz Date of Test : Aug 06, 2014

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.169	36.60	10.56	47.16	65.03	17.87	QP
	0.585	30.71	10.44	41.15	56.00	14.85	
	0.899	32.02	10.40	42.42	56.00	13.58	
	1.352	31.29	10.40	41.69	56.00	14.31	
	1.959	29.91	10.44	40.35	56.00	15.65	
	6.805	30.85	10.44	41.29	60.00	18.71	
	0.169	25.15	10.56	35.71	55.03	19.32	AV
	0.585	20.36	10.44	30.80	46.00	15.20	
	0.899	21.45	10.40	31.85	46.00	14.15	
	1.352	20.15	10.40	30.55	46.00	15.45	
	1.959	18.47	10.44	28.91	46.00	17.09	
	6.805	20.48	10.44	30.92	50.00	19.08	
Neutral	0.166	37.96	10.56	48.52	65.16	16.64	QP
	0.377	31.60	10.43	42.03	58.34	16.31	
	0.573	31.05	10.43	41.48	56.00	14.52	
	1.147	30.98	10.41	41.39	56.00	14.61	
	1.898	29.50	10.45	39.95	56.00	16.05	
	6.285	33.45	10.50	43.95	60.00	16.05	
	0.166	28.45	10.56	39.01	55.16	16.15	AV
	0.377	20.70	10.43	31.13	48.34	17.21	
	0.573	20.47	10.43	30.90	46.00	15.10	
	1.147	18.45	10.41	28.86	46.00	17.14	
	1.898	18.69	10.45	29.14	46.00	16.86	
	6.285	20.47	10.50	30.97	50.00	19.03	

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22

Model No. : 50H7EG Humidity : 48%RH

Test Mode : D-Sub 640*480@60Hz Date of Test : Jul 10, 2014

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.169	38.10	10.56	48.66	65.02	16.36	QP
	0.587	30.50	10.44	40.94	56.00	15.06	
	1.175	29.90	10.40	40.30	56.00	15.70	
	2.133	28.90	10.44	39.34	56.00	16.66	
	6.269	29.90	10.42	40.32	60.00	19.68	
	16.620	23.40	10.56	33.96	60.00	26.04	
	0.169	24.70	10.56	35.26	55.02	19.76	AV
	0.587	18.70	10.44	29.14	46.00	16.86	
	1.175	20.80	10.40	31.20	46.00	14.80	
	2.133	18.50	10.44	28.94	46.00	17.06	
	6.269	23.00	10.42	33.42	50.00	16.58	
	16.620	18.20	10.56	28.76	50.00	21.24	
Neutral	0.166	36.20	10.56	46.76	65.18	18.42	QP
	0.385	30.30	10.43	40.73	58.17	17.44	
	1.173	29.90	10.41	40.31	56.00	15.69	
	2.967	28.10	10.48	38.58	56.00	17.42	
	5.566	25.90	10.50	36.40	60.00	23.60	
	16.350	22.69	10.68	33.37	60.00	26.63	
	0.166	24.80	10.56	35.36	55.18	19.82	AV
	0.385	22.90	10.43	33.33	48.17	14.84	
	1.173	21.10	10.41	31.51	46.00	14.49	
	2.967	17.30	10.48	27.78	46.00	18.22	
	5.566	18.10	10.50	28.60	50.00	21.40	
	16.350	17.39	10.68	28.07	50.00	21.93	

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22

Model No. : 50H7EG Humidity : 48%RH

Test Mode : USB Play Date of Test : Jul 10, 2014

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.165	39.60	10.57	50.17	65.22	15.05	QP
	0.580	29.90	10.44	40.34	56.00	15.66	
	1.169	30.20	10.40	40.60	56.00	15.40	
	1.944	29.10	10.44	39.54	56.00	16.46	
	4.822	26.30	10.47	36.77	56.00	19.23	
	6.892	29.71	10.44	40.15	60.00	19.85	
	0.165	24.80	10.57	35.37	55.22	19.85	AV
	0.580	19.70	10.44	30.14	46.00	15.86	
	1.169	21.50	10.40	31.90	46.00	14.10	
	1.944	19.40	10.44	29.84	46.00	16.16	
	4.822	17.70	10.47	28.17	46.00	17.83	
	6.892	23.81	10.44	34.25	50.00	15.75	
Neutral	0.164	36.30	10.56	46.86	65.25	18.39	QP
	0.387	30.40	10.43	40.83	58.12	17.29	
	0.587	30.60	10.43	41.03	56.00	14.97	
	1.173	30.20	10.41	40.61	56.00	15.39	
	3.765	26.90	10.49	37.39	56.00	18.61	
	6.473	29.69	10.51	40.20	60.00	19.80	
	0.164	24.20	10.56	34.76	55.25	20.49	AV
	0.387	22.90	10.43	33.33	48.12	14.79	
	0.587	18.90	10.43	29.33	46.00	16.67	
	1.173	21.40	10.41	31.81	46.00	14.19	
	3.765	18.20	10.49	28.69	46.00	17.31	
	6.473	21.19	10.51	31.70	50.00	18.30	

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22

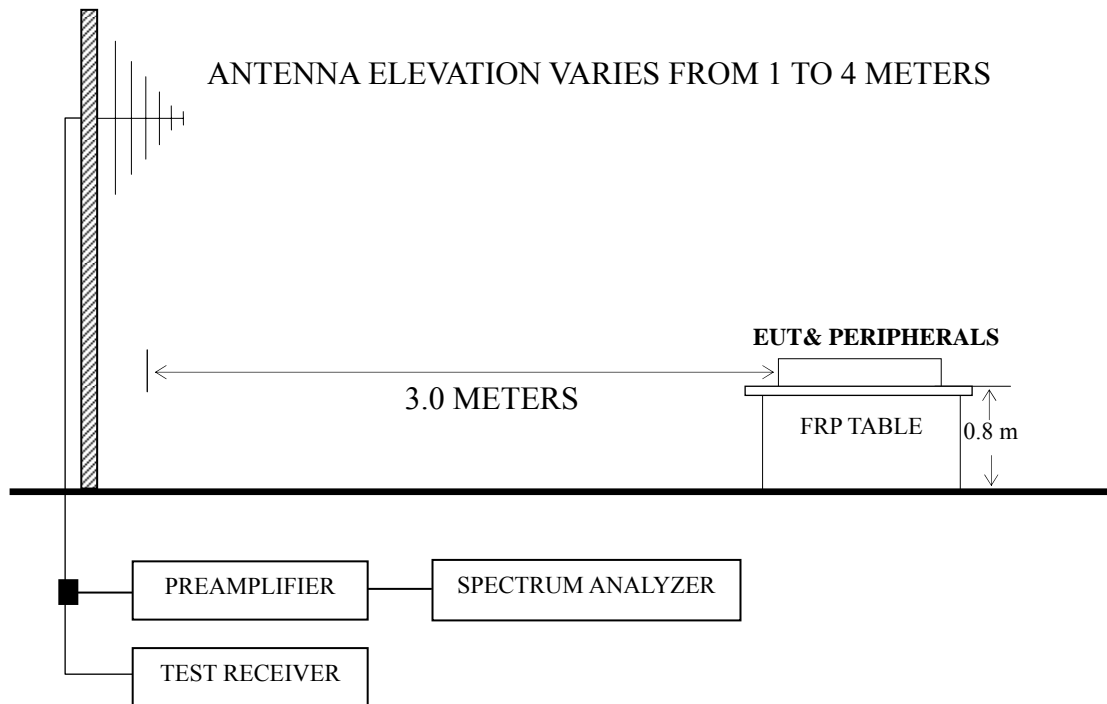
Model No. : 50H7EG Humidity : 48%RH

Test Mode : LAN Play Date of Test : Jul 10, 2014

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.166	38.80	10.57	49.37	65.16	15.79	QP
	0.580	29.90	10.44	40.34	56.00	15.66	
	1.170	30.30	10.40	40.70	56.00	15.30	
	2.211	29.10	10.44	39.54	56.00	16.46	
	3.767	27.10	10.44	37.54	56.00	18.46	
	6.707	29.60	10.44	40.04	60.00	19.96	
	0.166	24.90	10.57	35.47	55.16	19.69	AV
	0.580	19.70	10.44	30.14	46.00	15.86	
	1.170	21.40	10.40	31.80	46.00	14.20	
	2.211	18.50	10.44	28.94	46.00	17.06	
	3.767	18.30	10.44	28.74	46.00	17.26	
	6.707	22.70	10.44	33.14	50.00	16.86	
Neutral	0.166	35.50	10.56	46.06	65.16	19.10	QP
	0.382	29.60	10.43	40.03	58.24	18.21	
	0.574	29.20	10.43	39.63	56.00	16.37	
	1.428	28.60	10.42	39.02	56.00	16.98	
	2.211	29.21	10.46	39.67	56.00	16.33	
	6.135	26.49	10.49	36.98	60.00	23.02	
	0.166	24.70	10.56	35.26	55.16	19.90	AV
	0.382	21.30	10.43	31.73	48.24	16.51	
	0.574	18.80	10.43	29.23	46.00	16.77	
	1.428	19.30	10.42	29.72	46.00	16.28	
	2.211	18.51	10.46	28.97	46.00	17.03	
	6.135	20.79	10.49	31.28	50.00	18.72	

TEST ENGINEER: ERIC TANG

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.

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 frequency range from 1 GHz to 24 GHz (10th harmonic of the 2.4GHz RF function) was checked for the worst emission test mode.

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
HDMI 1920*1080@60Hz	P23 – P24
D-Sub 1024*768@60Hz	P25
HDMI 1280*1024@60Hz	P26
HDMI 640*480@60Hz	P27
USB Play	P28
LAN Play	P29

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

NOTE 2 – All readings are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.

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 1280*1024@60Hz test mode. The worst emission at horizontal polarization was detected at 701.240 MHz with corrected signal level of 41.65 dB ($\mu\text{V/m}$) (limit is 46.00 dB ($\mu\text{V/m}$)), when the antenna was 2.00 m height and the turntable was at 36°. The worst emission at vertical polarization was detected at 41.640 MHz with corrected signal level of 34.33 dB ($\mu\text{V/m}$) (limit is 40.00 dB ($\mu\text{V/m}$)), when the antenna was 1.00 m height and the turntable was at 264°.

EUT : LED LCD TV Temperature : 22

Model No. : 50H7EG Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Jul 22, 2014

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	39.700	9.01	12.16	0.75	--	21.92	40.00	18.08	QP
	83.350	22.59	7.55	1.08	--	31.22	40.00	8.78	
	133.790	21.97	11.27	1.44	--	34.68	43.50	8.82	
	185.200	25.03	8.10	1.74	--	34.87	43.50	8.63	
	301.600	22.04	12.45	2.50	--	36.99	46.00	9.01	
	703.180	16.83	19.97	3.50	--	40.30	46.00	5.70	
	1028.000	46.25	23.81	4.92	38.14	36.84	74.00	37.16	PK
	1154.690	48.57	24.32	5.07	37.85	40.11	74.00	33.89	
	1289.360	50.23	24.95	5.35	37.51	43.02	74.00	30.98	
	1456.000	50.70	25.49	5.62	37.03	44.78	74.00	29.22	
	1557.480	49.59	26.20	5.65	36.77	44.67	74.00	29.33	
	1947.000	47.58	30.59	6.19	36.16	48.20	74.00	25.80	
	1028.000	36.15	23.81	4.92	38.14	26.74	54.00	27.26	AV
	1154.690	36.85	24.32	5.07	37.85	28.39	54.00	25.61	
	1289.360	36.47	24.95	5.35	37.51	29.26	54.00	24.74	
	1456.000	38.48	25.49	5.62	37.03	32.56	54.00	21.44	
	1557.480	38.47	26.20	5.65	36.77	33.55	54.00	20.45	
	1947.000	39.47	30.59	6.19	36.16	40.09	54.00	13.91	

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22

Model No. : 50H7EG Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Jul 22, 2014

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Vertical	39.700	22.16	12.16	0.75	--	35.07	40.00	4.93	QP
	128.940	21.11	12.16	1.42	--	34.69	43.50	8.81	
	192.960	27.21	8.05	1.77	--	37.03	43.50	6.47	
	253.100	20.15	12.00	2.17	--	34.32	46.00	11.68	
	447.100	13.74	16.57	2.78	--	33.09	46.00	12.91	
	701.240	14.90	20.10	3.49	--	38.49	46.00	7.51	
	1046.350	46.26	23.88	4.94	38.10	36.98	74.00	37.02	PK
	1116.580	50.27	24.15	5.01	37.94	41.49	74.00	32.51	
	1289.000	47.57	24.95	5.35	37.51	40.36	74.00	33.64	
	1445.580	50.00	25.46	5.61	37.05	44.02	74.00	29.98	
	1678.000	50.66	27.61	5.89	36.54	47.62	74.00	26.38	
	1856.000	50.26	29.73	6.16	36.27	49.88	74.00	24.12	
	1046.350	36.47	23.88	4.94	38.10	27.19	54.00	26.81	AV
	1116.580	36.48	24.15	5.01	37.94	27.70	54.00	26.30	
	1289.000	36.57	24.95	5.35	37.51	29.36	54.00	24.64	
	1445.580	36.58	25.46	5.61	37.05	30.60	54.00	23.40	
	1678.000	36.47	27.61	5.89	36.54	33.43	54.00	20.57	
	1856.000	36.47	29.73	6.16	36.27	36.09	54.00	17.91	

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22

Model No. : 50H7EG Humidity : 60%RH

Test Mode : D-Sub 1024*768@60Hz Date of Test : Aug 06, 2014

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	40.260	10.26	11.89	0.76	22.91	40.00	17.09
	78.560	22.56	7.07	1.01	30.64	40.00	9.36
	126.580	21.46	12.29	1.40	35.15	43.50	8.35
	294.580	20.36	13.00	2.47	35.83	46.00	10.17
	480.250	15.12	17.90	2.86	35.88	46.00	10.12
	706.150	16.59	19.83	3.50	39.92	46.00	6.08
Vertical	40.000	20.36	11.90	0.76	33.02	40.00	6.98
	75.480	20.47	7.01	0.99	28.47	40.00	11.53
	130.540	21.47	11.99	1.42	34.88	43.50	8.62
	250.690	20.69	11.87	2.15	34.71	46.00	11.29
	420.580	12.69	17.33	2.73	32.75	46.00	13.25
	547.580	14.70	19.83	3.04	37.57	46.00	8.43

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22

Model No. : 50H7EG Humidity : 60%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Jul 22, 2014

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	31.940	4.59	17.10	0.65	22.34	40.00	17.66
	104.690	18.00	11.90	1.26	31.16	43.50	12.34
	179.380	23.54	7.98	1.70	33.22	43.50	10.28
	311.300	20.96	13.27	2.52	36.75	46.00	9.25
	701.240	18.06	20.10	3.49	41.65	46.00	4.35
	924.340	10.66	20.20	4.56	35.42	46.00	10.58
Vertical	41.640	21.74	11.82	0.77	34.33	40.00	5.67
	68.800	20.65	6.00	0.92	27.57	40.00	12.43
	143.490	19.85	10.40	1.49	31.74	43.50	11.76
	257.950	18.15	12.40	2.20	32.75	46.00	13.25
	528.580	10.95	18.10	3.00	32.05	46.00	13.95
	898.150	13.64	19.07	4.42	37.13	46.00	8.87

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22

Model No. : 50H7EG Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz Date of Test : Jul 22, 2014

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	39.700	8.47	12.16	0.75	21.38	40.00	18.62
	76.560	22.72	7.03	1.00	30.75	40.00	9.25
	122.150	20.79	12.16	1.38	34.33	43.50	9.17
	311.300	25.26	13.27	2.52	41.05	46.00	4.95
	388.900	23.26	15.52	2.67	41.45	46.00	4.55
	704.150	17.65	19.97	3.50	41.12	46.00	4.88
Vertical	35.820	15.12	15.35	0.71	31.18	40.00	8.82
	71.710	18.66	6.45	0.94	26.05	40.00	13.95
	183.260	24.99	8.07	1.72	34.78	43.50	8.72
	310.330	16.53	13.20	2.52	32.25	46.00	13.75
	699.300	11.60	20.10	3.49	35.19	46.00	10.81
	895.240	14.12	19.07	4.42	37.61	46.00	8.39

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22

Model No. : 50H7EG Humidity : 60%RH

Test Mode : USB Play Date of Test : Jul 22, 2014

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	37.760	3.12	13.92	0.73	17.77	40.00	22.23
	75.590	21.09	7.01	0.99	29.09	40.00	10.91
	135.730	20.90	10.96	1.45	33.31	43.50	10.19
	192.960	22.38	8.05	1.77	32.20	43.50	11.30
	410.240	12.18	16.70	2.70	31.58	46.00	14.42
	803.090	10.56	19.70	3.70	33.96	46.00	12.04
Vertical	34.850	14.84	15.65	0.69	31.18	40.00	8.82
	66.860	18.52	5.65	0.91	25.08	40.00	14.92
	138.640	21.56	10.79	1.47	33.82	43.50	9.68
	245.340	19.69	10.60	2.13	32.42	46.00	13.58
	534.400	8.92	18.90	3.02	30.84	46.00	15.16
	911.730	12.13	20.10	4.53	36.76	46.00	9.24

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22

Model No. : 50H7EG Humidity : 60%RH

Test Mode : LAN Play Date of Test : Jul 22, 2014

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	35.820	2.91	15.35	0.71	18.97	40.00	21.03
	77.530	21.10	7.05	1.01	29.16	40.00	10.84
	124.090	19.26	12.32	1.39	32.97	43.50	10.53
	190.050	23.80	7.90	1.75	33.45	43.50	10.05
	416.060	11.97	17.00	2.72	31.69	46.00	14.31
	921.430	8.89	20.30	4.56	33.75	46.00	12.25
Vertical	30.970	13.78	18.10	0.64	32.52	40.00	7.48
	80.440	16.40	7.15	1.04	24.59	40.00	15.41
	131.850	19.93	11.66	1.43	33.02	43.50	10.48
	236.610	20.28	9.95	2.05	32.28	46.00	13.72
	519.850	7.23	17.50	2.97	27.70	46.00	18.30
	914.640	11.63	20.20	4.56	36.39	46.00	9.61

TEST ENGINEER: NEAL WANG

5 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
Gasket	35X0.7X41mm\VGA\ROH	Qingdao Joinset S&T Co., Ltd.	See Internal Photo Appendix Figure 19
FFC	FFC-60-83-P\ROH	Foshan City Shunde District Hehui Electronic CO., Ltd	See Internal Photo Appendix Figure 20

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.