

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

LED LCD TV

Model No.	Brand
48K20DW, 48K21DW, 48K22DW, 48K23DW, 48K24DW, 48K25DW	Hisense
48H5, 48H5C, 48H5E, 48H5S, 48H5I	

FCC ID : W9HLCDE0015

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Development Zone, Qingdao, China

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Report No. : ACI-F14002
Date of Test : Dec 25 – 27, 2013
Date of Report : Jan 08, 2014

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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
Refer to Sec2.1	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 Dec 25 – 27, 2013 is technically compliance with the FCC official limits also.

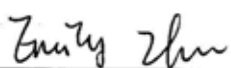
This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

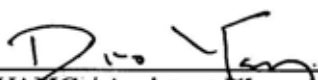

This report contains data that are not covered by the NVLAP accreditation.

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.F14003, a Verification report.

Date of Test : Dec 25 – 27, 2013 Date of Report : Jan 08, 2014

Producer : 
EMILY ZHU / Assistant

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 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 type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type
Model No.	:	48K20DW, 48K21DW, 48K22DW, 48K23DW, 48K24DW, 48K25DW, 48H5, 48H5C, 48H5E, 48H5S, 48H5I
Note	:	The above models are all the same except for model name. 48H5 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 : HD480DF-B37\S0.B2
Max Resolution	:	1920*1080@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#2
- (2) One HDMI3/ARC Port : Connected with DVD PLAYER#1
- (3) One DIGITAL AUDIO OUT Port : Connected with DVD PLAYER #2
- (4) One component of Audio/YPbPr Audio Port : Connected with DVD PLAYER#1
- (5) One component of Video/YPbPr Port : Connected with DVD PLAYER#1
- (6) One LAN Port : Connected with PC

Side Port:

- (1) Two USB Ports : Connected with U-Disk
- (2) One HDMI1/DVI Port : Connected with PC
- (3) One VGA Port : Connected with PC
- (4) One AUDIO IN Port : Connected with PC
- (5) One AUDIO OUT/Earphone Port : Connected with Earphone
- (6) One ANT/CABLE IN Port : Connected with Antenna or ATSC SG / TV SG

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 Earphone

Manufacturer : audio-technica
Model Number : ATH-CKL200

2.2.11 U-DISK *2

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 = 3.02 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

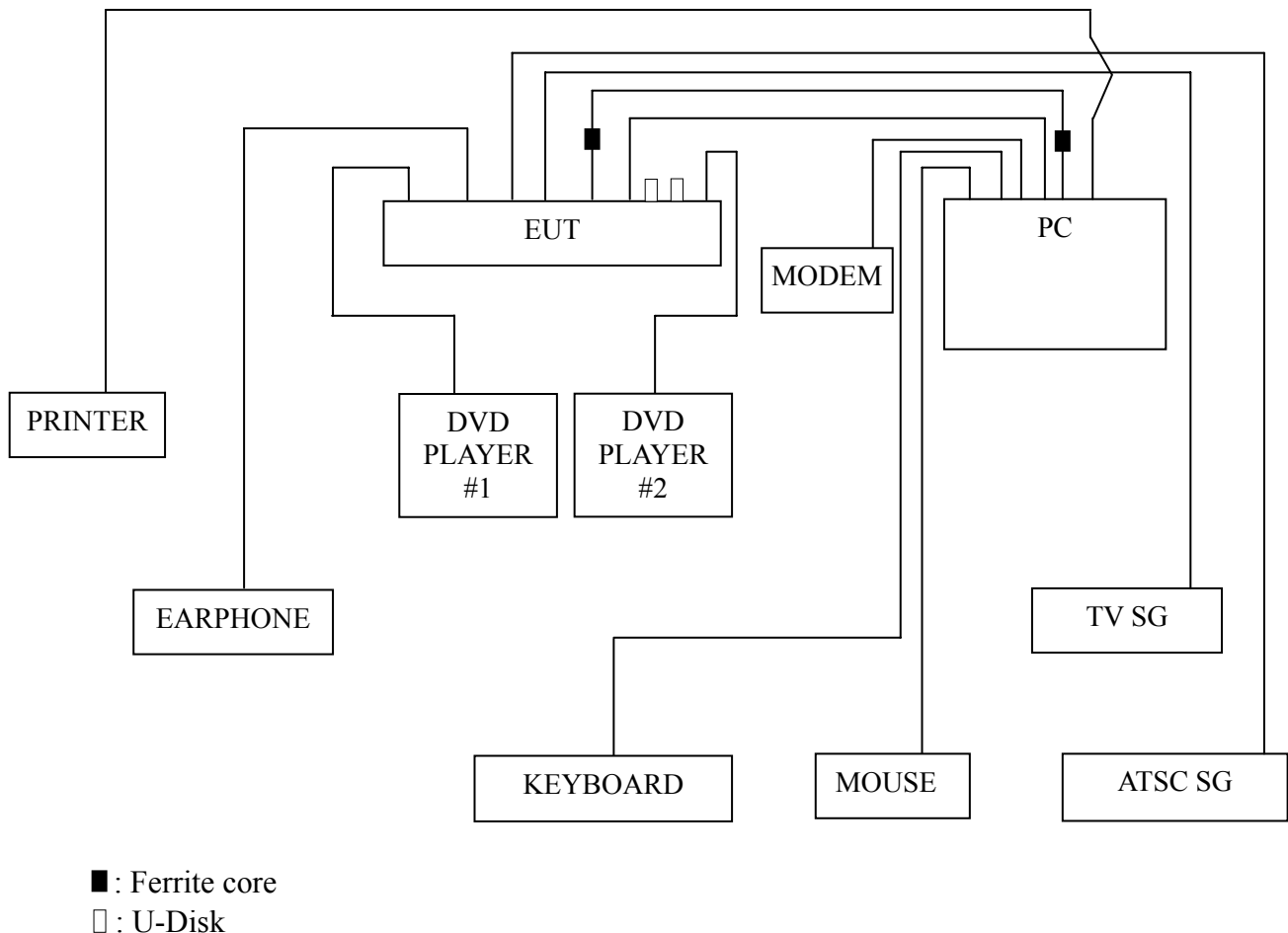
3.1 Test Equipment

The following test equipments are used during the conducted emission test in a shielded room:

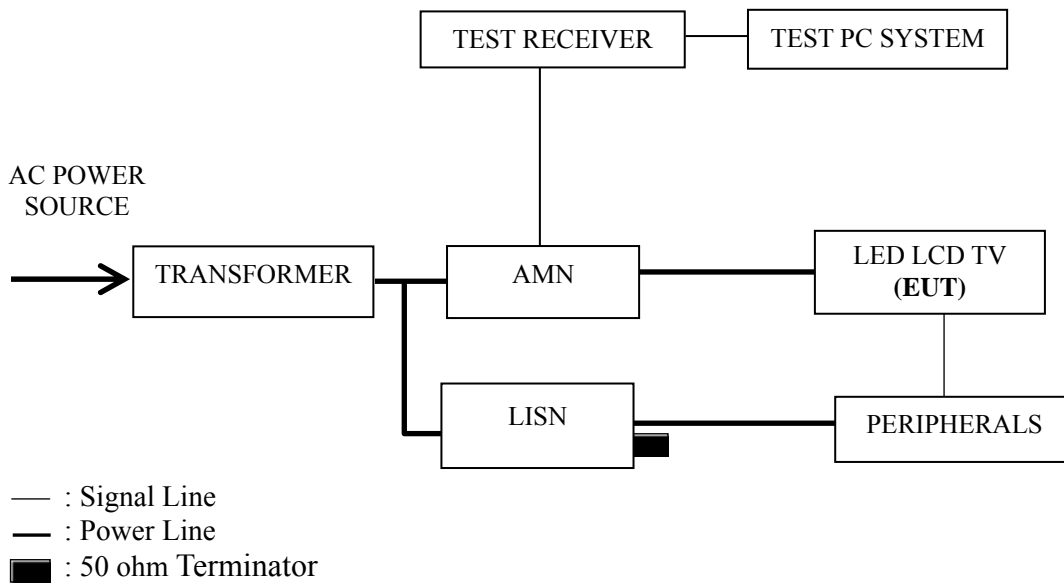
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	100841	Mar 20, 2013	Mar 19, 2014
2.	Artificial Mains Network (AMN)	R&S	ESH2-Z5	843890/011	Feb 25, 2013	Feb 24, 2014
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2013	Mar 19, 2014
4.	50 Ω Coaxial Switch	Anritsu	MP59B	6200426389	Sep 18, 2013	Mar 17, 2014
5.	50 Ω Terminator	Anritsu	BNC	001	Mar 20, 2013	Mar 19, 2014
6.	Software	Audix	E3	6.2009-1-15	--	--

3.2 Block Diagram of Test Setup

3.2.1 EUT & Peripherals



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 other peripherals devices were driven and operated during the test.

3.5.8 The test modes are as follows:

Test Mode
D-Sub 1920*1080@60Hz
HDMI 1920*1080@60Hz
D-Sub 1280*1024@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 1920*1080@60Hz	P13
HDMI 1920*1080@60Hz	P14
D-Sub 1280*1024@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 1920*1080@60Hz test mode. The worst emission is detected at 0.151 MHz (Quasi-Peak Value) with corrected signal level of 62.05 dB (μV) (limit is 65.94 dB (μV)), when the Neutral of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 48%RH

Test Mode : D-Sub 1920*1080@60Hz Date of Test : Dec 25, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	61.70	0.16	61.86	66.00	4.14	QP
	0.314	38.80	0.05	38.85	59.88	21.03	
	0.500	37.50	-0.05	37.45	56.01	18.56	
	0.797	33.50	0.08	33.58	56.00	22.42	
	3.274	45.61	0.13	45.74	56.00	10.26	
	8.861	34.20	0.26	34.46	60.00	25.54	
	0.150	46.00	0.16	46.16	56.00	9.84	AV
	0.314	26.40	0.05	26.45	49.88	23.43	
	0.500	25.00	-0.05	24.95	46.01	21.06	
	0.797	21.70	0.08	21.78	46.00	24.22	
	3.274	33.51	0.13	33.64	46.00	12.36	
	8.861	27.30	0.26	27.56	50.00	22.44	
Neutral	0.151	61.90	0.15	62.05	65.94	3.89	QP
	0.310	35.50	0.22	35.72	59.98	24.26	
	0.500	35.60	0.21	35.81	56.00	20.19	
	0.796	33.20	0.14	33.34	56.00	22.66	
	3.276	45.41	0.18	45.59	56.00	10.41	
	8.833	28.90	0.42	29.32	60.00	30.68	
	0.151	45.80	0.15	45.95	55.94	9.99	AV
	0.310	25.60	0.22	25.82	49.98	24.16	
	0.500	23.40	0.21	23.61	46.00	22.39	
	0.796	21.50	0.14	21.64	46.00	24.36	
	3.276	34.61	0.18	34.79	46.00	11.21	
	8.833	20.20	0.42	20.62	50.00	29.38	

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 48%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Dec 25, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	61.37	0.16	61.53	66.00	4.47	QP
	0.310	38.19	0.05	38.24	59.97	21.73	
	0.505	37.43	-0.05	37.38	56.00	18.62	
	0.796	34.22	0.08	34.30	56.00	21.70	
	3.276	45.06	0.13	45.19	56.00	10.81	
	8.412	30.75	0.26	31.01	60.00	28.99	
	0.150	44.49	0.16	44.65	56.00	11.35	AV
	0.310	29.70	0.05	29.75	49.97	20.22	
	0.505	25.10	-0.05	25.05	46.00	20.95	
	0.796	23.60	0.08	23.68	46.00	22.32	
	3.276	35.01	0.13	35.14	46.00	10.86	
	8.412	21.61	0.26	21.87	50.00	28.13	
Neutral	0.150	61.67	0.15	61.82	66.00	4.18	QP
	0.303	35.80	0.22	36.02	60.15	24.13	
	0.499	35.07	0.21	35.28	56.01	20.73	
	0.796	33.50	0.14	33.64	56.00	22.36	
	3.276	44.99	0.18	45.17	56.00	10.83	
	8.412	30.56	0.40	30.96	60.00	29.04	
	0.150	45.58	0.15	45.73	56.00	10.27	AV
	0.303	23.64	0.22	23.86	50.15	26.29	
	0.499	23.60	0.21	23.81	46.01	22.20	
	0.796	21.23	0.14	21.37	46.00	24.63	
	3.276	33.51	0.18	33.69	46.00	12.31	
	8.412	22.00	0.40	22.40	50.00	27.60	

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 48%RH

Test Mode : D-Sub 1280*1024@60Hz Date of Test : Dec 25, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.152	61.31	0.15	61.46	65.89	4.43	QP
	0.314	38.60	0.05	38.65	59.87	21.22	
	0.498	36.90	-0.05	36.85	56.04	19.19	
	0.674	37.01	0.08	37.09	56.00	18.91	
	3.271	45.61	0.13	45.74	56.00	10.26	
	8.758	31.40	0.26	31.66	60.00	28.34	
	0.152	45.81	0.15	45.96	55.89	9.93	AV
	0.314	25.90	0.05	25.95	49.87	23.92	
	0.498	24.80	-0.05	24.75	46.04	21.29	
	0.674	20.31	0.08	20.39	46.00	25.61	
	3.271	33.91	0.13	34.04	46.00	11.96	
	8.758	22.70	0.26	22.96	50.00	27.04	
Neutral	0.150	61.60	0.15	61.75	65.99	4.24	QP
	0.311	35.50	0.22	35.72	59.95	24.23	
	0.500	35.30	0.21	35.51	56.00	20.49	
	0.795	33.60	0.14	33.74	56.00	22.26	
	3.264	45.41	0.18	45.59	56.00	10.41	
	6.920	32.79	0.33	33.12	60.00	26.88	
	0.150	45.70	0.15	45.85	55.99	10.14	AV
	0.311	25.40	0.22	25.62	49.95	24.33	
	0.500	23.20	0.21	23.41	46.00	22.59	
	0.795	21.90	0.14	22.04	46.00	23.96	
	3.264	35.31	0.18	35.49	46.00	10.51	
	6.920	21.39	0.33	21.72	50.00	28.28	

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 48%RH

Test Mode : D-Sub 640*480@60Hz Date of Test : Dec 25, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	61.20	0.16	61.36	65.99	4.63	QP
	0.313	38.50	0.05	38.55	59.88	21.33	
	0.502	37.30	-0.05	37.25	56.00	18.75	
	0.797	33.80	0.08	33.88	56.00	22.12	
	3.265	44.91	0.13	45.04	56.00	10.96	
	8.917	27.80	0.26	28.06	60.00	31.94	
	0.150	45.58	0.16	45.74	55.99	10.25	AV
	0.313	25.90	0.05	25.95	49.88	23.93	
	0.502	24.60	-0.05	24.55	46.00	21.45	
	0.797	22.60	0.08	22.68	46.00	23.32	
	3.265	34.41	0.13	34.54	46.00	11.46	
	8.917	20.30	0.26	20.56	50.00	29.44	
Neutral	0.152	61.50	0.15	61.65	65.88	4.23	QP
	0.311	35.50	0.22	35.72	59.95	24.23	
	0.501	35.40	0.21	35.61	56.00	20.39	
	0.672	35.81	0.12	35.93	56.00	20.07	
	3.265	45.21	0.18	45.39	56.00	10.61	
	8.954	31.10	0.43	31.53	60.00	28.47	
	0.152	45.30	0.15	45.45	55.88	10.43	AV
	0.311	25.60	0.22	25.82	49.95	24.13	
	0.501	23.10	0.21	23.31	46.00	22.69	
	0.672	20.01	0.12	20.13	46.00	25.87	
	3.265	35.01	0.18	35.19	46.00	10.81	
	8.954	25.40	0.43	25.83	50.00	24.17	

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 48%RH

Test Mode : USB Play Date of Test : Dec 25, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	61.20	0.16	61.36	66.00	4.64	QP
	0.311	38.80	0.05	38.85	59.95	21.10	
	0.500	36.90	-0.05	36.85	56.01	19.16	
	0.672	36.61	0.08	36.69	56.00	19.31	
	3.258	45.31	0.13	45.44	56.00	10.56	
	8.271	28.80	0.26	29.06	60.00	30.94	
	0.150	45.70	0.16	45.86	56.00	10.14	AV
	0.311	29.60	0.05	29.65	49.95	20.30	
	0.500	24.70	-0.05	24.65	46.01	21.36	
	0.672	21.71	0.08	21.79	46.00	24.21	
	3.258	34.91	0.13	35.04	46.00	10.96	
	8.271	19.60	0.26	19.86	50.00	30.14	
Neutral	0.152	61.60	0.15	61.75	65.90	4.15	QP
	0.305	35.40	0.22	35.62	60.10	24.48	
	0.500	35.30	0.21	35.51	56.00	20.49	
	0.798	33.70	0.14	33.84	56.00	22.16	
	3.260	45.31	0.18	45.49	56.00	10.51	
	9.965	25.30	0.40	25.70	60.00	34.30	
	0.152	45.90	0.15	46.05	55.90	9.85	AV
	0.305	25.10	0.22	25.32	50.10	24.78	
	0.500	23.10	0.21	23.31	46.00	22.69	
	0.798	22.50	0.14	22.64	46.00	23.36	
	3.260	34.71	0.18	34.89	46.00	11.11	
	9.965	17.70	0.40	18.10	50.00	31.90	

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 48%RH

Test Mode : LAN Play Date of Test : Dec 25, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.151	61.30	0.15	61.45	65.94	4.49	QP
	0.314	38.50	0.05	38.55	59.86	21.31	
	0.502	37.30	-0.05	37.25	56.00	18.75	
	0.674	36.91	0.08	36.99	56.00	19.01	
	3.273	45.61	0.13	45.74	56.00	10.26	
	8.511	29.89	0.27	30.16	60.00	29.84	
	0.151	45.50	0.15	45.65	55.94	10.29	AV
	0.314	25.90	0.05	25.95	49.86	23.91	
	0.502	24.70	-0.05	24.65	46.00	21.35	
	0.674	21.31	0.08	21.39	46.00	24.61	
	3.273	33.41	0.13	33.54	46.00	12.46	
	8.511	21.19	0.27	21.46	50.00	28.54	
Neutral	0.150	61.60	0.15	61.75	65.99	4.24	QP
	0.310	35.30	0.22	35.52	59.97	24.45	
	0.499	35.20	0.21	35.41	56.01	20.60	
	0.788	33.60	0.14	33.74	56.00	22.26	
	3.262	44.81	0.18	44.99	56.00	11.01	
	6.721	30.71	0.31	31.02	60.00	28.98	
	0.150	45.40	0.15	45.55	55.99	10.44	AV
	0.310	25.80	0.22	26.02	49.97	23.95	
	0.499	23.10	0.21	23.31	46.01	22.70	
	0.788	20.90	0.14	21.04	46.00	24.96	
	3.262	33.31	0.18	33.49	46.00	12.51	
	6.721	18.51	0.31	18.82	50.00	31.18	

TEST ENGINEER: ERIC TANG

4 RADIATED EMISSION TEST

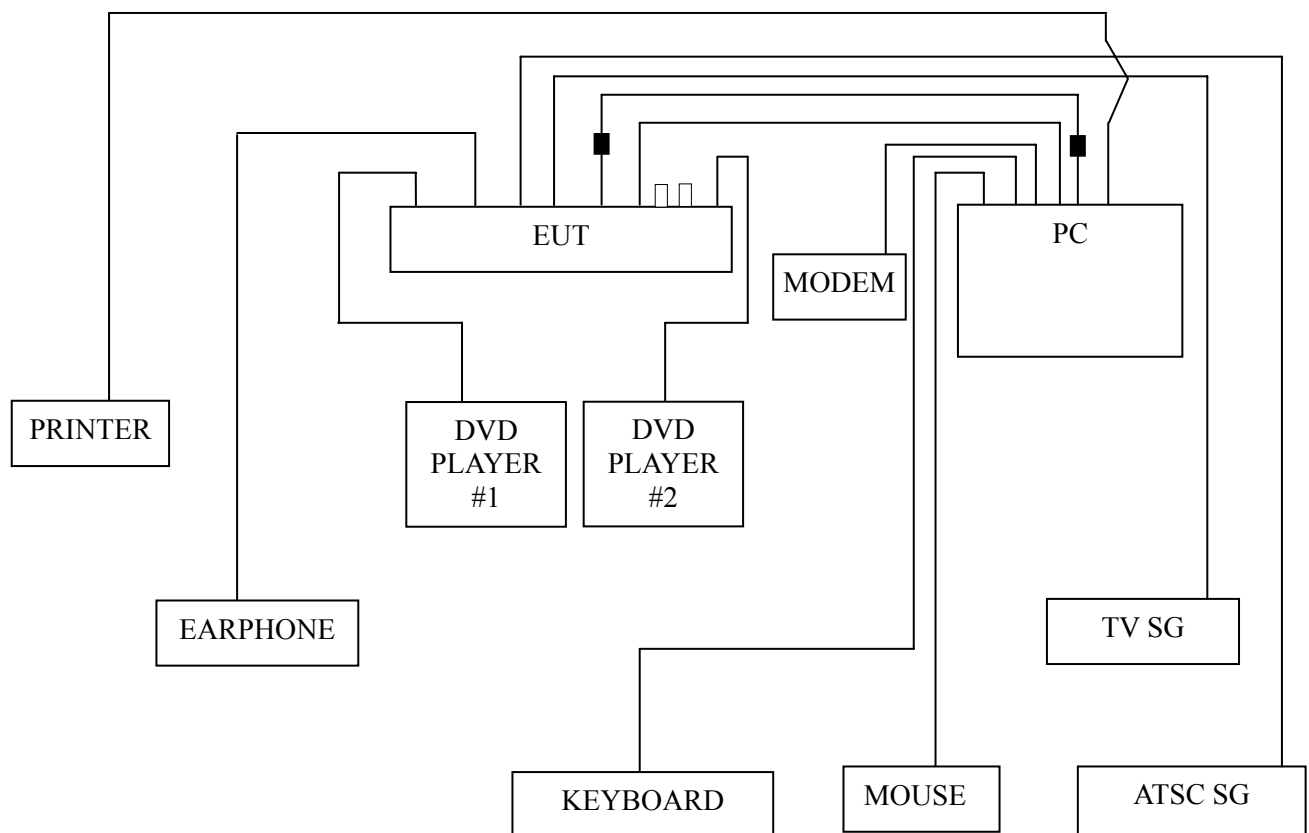
4.1 Test Equipment

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	Sep 18, 2013	Mar 17, 2014
3.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2013	Mar 19, 2014
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 03, 2013	May 02, 2014
5.	Horn Antenna	EMCO	3115	9607-4878	May 11, 2013	May 10, 2014
6.	Spectrum	Agilent	E7405A	MY45106600	Nov 11, 2013	Nov 10, 2014
7.	50 Coaxial Switch	Anritsu	MP59B	6200426390	Sep 18, 2013	Mar 17, 2014
8.	Software	Audix	E3	6.2007-9-10	--	--

4.2 Block Diagram of Test Setup

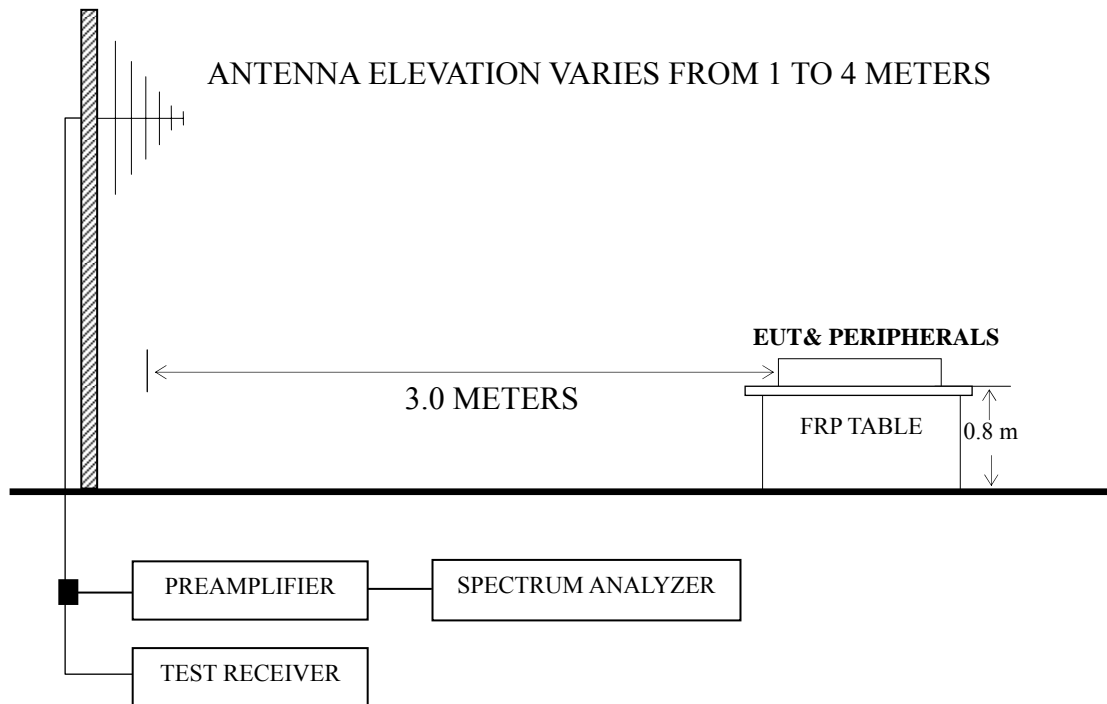
4.2.1 EUT & Peripherals



■ : 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	
		($\mu\text{V/m}$)	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 2 GHz was checked for the maximum resolution 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 1920*1080@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 1920*1080@60Hz test mode. The worst emission at horizontal polarization was detected at 926.280 MHz with corrected signal level of 44.08 dB ($\mu\text{V/m}$) (limit is 46.00 dB ($\mu\text{V/m}$)), when the antenna was 1.90 m height and the turntable was at 243°. The worst emission at vertical polarization was detected at 741.980 MHz with corrected signal level of 44.56 dB ($\mu\text{V/m}$) (limit is 46.00 dB ($\mu\text{V/m}$)), when the antenna was 1.80 m height and the turntable was at 68°.

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Dec 27, 2013

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	72.680	24.99	6.20	0.97	--	32.16	40.00	7.84	QP
	130.880	20.62	11.72	1.55	--	33.89	43.50	9.61	
	458.740	21.15	17.20	2.86	--	41.21	46.00	4.79	
	526.640	21.19	18.35	3.05	--	42.59	46.00	3.41	
	701.240	19.13	20.30	3.54	--	42.97	46.00	3.03	
	926.280	20.15	19.30	4.63	--	44.08	46.00	1.92	
	1011.000	48.38	23.74	4.91	38.18	38.85	74.00	35.15	PK
	1146.000	46.78	24.28	5.05	37.87	38.24	74.00	35.76	
	1289.000	45.93	24.95	5.35	37.51	38.72	74.00	35.28	
	1437.000	45.96	25.43	5.61	37.08	39.92	74.00	34.08	
	1641.000	47.80	27.14	5.81	36.60	44.15	74.00	29.85	
	1884.000	45.36	30.00	6.17	36.24	45.29	74.00	28.71	
	1011.000	34.76	23.74	4.91	38.18	25.23	54.00	28.77	AV
	1146.000	33.24	24.28	5.05	37.87	24.70	54.00	29.30	
	1289.000	32.01	24.95	5.35	37.51	24.80	54.00	29.20	
	1437.000	32.90	25.43	5.61	37.08	26.86	54.00	27.14	
	1641.000	34.54	27.14	5.81	36.60	30.89	54.00	23.11	
	1884.000	32.61	30.00	6.17	36.24	32.54	54.00	21.46	

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Dec 27, 2013

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	36.790	18.37	14.92	0.74	--	34.03	40.00	5.97	QP
	80.440	26.13	6.84	1.08	--	34.05	40.00	5.95	
	148.340	24.21	10.15	1.63	--	35.99	43.50	7.51	
	415.090	24.45	16.75	2.73	--	43.93	46.00	2.07	
	555.740	21.51	19.20	3.10	--	43.81	46.00	2.19	
	741.980	22.12	18.87	3.57	--	44.56	46.00	1.44	
	1117.000	46.10	24.15	5.01	37.94	37.32	74.00	36.68	PK
	1244.000	45.92	24.75	5.25	37.63	38.29	74.00	35.71	
	1347.000	44.79	25.16	5.47	37.35	38.07	74.00	35.93	
	1457.000	46.13	25.49	5.62	37.01	40.23	74.00	33.77	
	1553.000	45.40	26.16	5.65	36.78	40.43	74.00	33.57	
	1836.000	45.50	29.51	6.16	36.30	44.87	74.00	29.13	
	1117.000	33.30	24.15	5.01	37.94	24.52	54.00	29.48	AV
	1244.000	32.11	24.75	5.25	37.63	24.48	54.00	29.52	
	1347.000	31.29	25.16	5.47	37.35	24.57	54.00	29.43	
	1457.000	33.95	25.49	5.62	37.01	28.05	54.00	25.95	
	1553.000	32.84	26.16	5.65	36.78	27.87	54.00	26.13	
	1836.000	32.67	29.51	6.16	36.30	32.04	54.00	21.96	

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 60%RH

Test Mode : D-Sub 1920*1080@60Hz Date of Test : Dec 27, 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	80.440	25.07	6.84	1.08	32.99	40.00	7.01
	150.280	26.68	10.04	1.64	38.36	43.50	5.14
	412.180	21.43	16.45	2.73	40.61	46.00	5.39
	526.640	20.68	18.35	3.05	42.08	46.00	3.92
	701.240	18.38	20.30	3.54	42.22	46.00	3.78
	741.980	19.89	18.87	3.57	42.33	46.00	3.67
Vertical	80.440	26.15	6.84	1.08	34.07	40.00	5.93
	148.340	24.32	10.15	1.63	36.10	43.50	7.40
	409.270	23.28	16.28	2.71	42.27	46.00	3.73
	698.330	18.50	20.30	3.54	42.34	46.00	3.66
	741.980	20.41	18.87	3.57	42.85	46.00	3.15
	890.390	17.06	19.80	4.43	41.29	46.00	4.71

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 60%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Dec 27, 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	80.440	24.92	6.84	1.08	32.84	40.00	7.16
	130.880	23.01	11.72	1.55	36.28	43.50	7.22
	187.140	27.01	8.10	1.87	36.98	43.50	6.52
	463.590	20.05	17.45	2.88	40.38	46.00	5.62
	555.740	19.43	19.20	3.10	41.73	46.00	4.27
	698.330	17.96	20.30	3.54	41.80	46.00	4.20
Vertical	33.880	17.24	16.12	0.70	34.06	40.00	5.94
	148.340	25.53	10.15	1.63	37.31	43.50	6.19
	187.140	27.78	8.10	1.87	37.75	43.50	5.75
	405.390	22.73	16.25	2.71	41.69	46.00	4.31
	555.740	19.90	19.20	3.10	42.20	46.00	3.80
	887.480	18.45	19.80	4.43	42.68	46.00	3.32

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz Date of Test : Dec 27, 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	70.740	25.05	5.89	0.94	31.88	40.00	8.12
	145.430	24.64	10.28	1.62	36.54	43.50	6.96
	402.480	20.77	16.22	2.69	39.68	46.00	6.32
	444.190	21.35	17.15	2.82	41.32	46.00	4.68
	698.330	18.22	20.30	3.54	42.06	46.00	3.94
	887.480	18.45	19.80	4.43	42.68	46.00	3.32
Vertical	30.970	14.94	17.65	0.67	33.26	40.00	6.74
	80.440	25.87	6.84	1.08	33.79	40.00	6.21
	148.340	26.83	10.15	1.63	38.61	43.50	4.89
	400.540	23.29	16.20	2.69	42.18	46.00	3.82
	444.190	22.99	17.15	2.82	42.96	46.00	3.04
	887.480	18.03	19.80	4.43	42.26	46.00	3.74

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 60%RH

Test Mode : USB Play Date of Test : Dec 27, 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	77.530	25.22	6.65	1.05	32.92	40.00	7.08
	92.080	25.27	8.66	1.24	35.17	43.50	8.33
	145.430	25.54	10.28	1.62	37.44	43.50	6.06
	322.940	23.21	14.02	2.58	39.81	46.00	6.19
	371.440	22.08	14.85	2.66	39.59	46.00	6.41
	698.330	15.70	20.30	3.54	39.54	46.00	6.46
Vertical	46.490	23.69	8.80	0.83	33.32	40.00	6.68
	92.080	27.57	8.66	1.24	37.47	43.50	6.03
	148.340	24.80	10.15	1.63	36.58	43.50	6.92
	371.440	20.48	14.85	2.66	37.99	46.00	8.01
	698.330	15.98	20.30	3.54	39.82	46.00	6.18
	746.830	16.75	18.83	3.58	39.16	46.00	6.84

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22

Model No. : 48H5 Humidity : 60%RH

Test Mode : LAN Play Date of Test : Dec 27, 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	76.560	23.75	6.59	1.03	31.37	40.00	8.63
	140.580	19.11	10.30	1.60	31.01	43.50	12.49
	385.020	17.17	15.30	2.67	35.14	46.00	10.86
	411.210	20.64	16.30	2.73	39.67	46.00	6.33
	458.740	21.15	17.20	2.86	41.21	46.00	4.79
	723.550	16.89	19.27	3.56	39.72	46.00	6.28
Vertical	33.880	16.90	16.12	0.70	33.72	40.00	6.28
	55.220	18.93	6.08	0.87	25.88	40.00	14.12
	88.200	23.00	7.92	1.18	32.10	43.50	11.40
	325.850	22.16	14.15	2.58	38.89	46.00	7.11
	494.630	16.66	17.77	2.96	37.39	46.00	8.61
	777.870	17.49	18.13	3.60	39.22	46.00	6.78

TEST ENGINEER: NEAL WANG

5 DEVIATION TO TEST SPECIFICATIONS

None.