

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

LED LCD TV

Model No.	Brand
HU50K300FW	Hisense
LC-50N5000U, LC-50N5000C	Sharp

FCC ID : W9HLCDF0069

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

Prepared By : Audix Technology (Shanghai) Co., Ltd.
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Report No. : ACI-F15256
Date of Test : Nov 18-Dec 26, 2015
Date of Report : Dec 30, 2015

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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.
Factory #3 : HISENSE ELECTRONICA MEXICO, S.A. DE C.V.
EUT Description : LED LCD TV

Model No.	Brand	Power Supply
HU50K300FW	Hisense	120V/60Hz
LC-50N5000U, LC-50N5000C	Sharp	

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2014
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 Nov 18-Dec 26, 2015 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.F15257, a Verification report.

Date of Test : Nov 18-Dec 26, 2015 Date of Report : Dec 30, 2015

Producer : Huimin Yan
HUIMIN YAN / Assistant

Review : Sammy Chen
SAMMY CHEN / Manager

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

Signatory : Byron Kwo
Authorized Signature EMC BYRON KWO / Assistant General 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 2014 AND ANSI C63.4-2003	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2014 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 : ☒ Production ☐ Pre-product ☐ Pro-type

Model No	HU50K300FW	LC-50N5000U, LC-50N5000C
Brand	Hisense	Sharp

Note : The above models are all the same except for brand and model number. HU50K300FW model is tested and recorded in the report.

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

Manufacturer : Same as Applicant

Factory #1 : Same as Applicant

Factory #2 : Tatung Mexico S.A. de C.V.
Miguel Catalán 420, Parque Industrial Rio Bravo,
Cd. Juarez, Chih., CP 32557

Factory #3 : HISENSE ELECTRONICA MEXICO, S.A. DE C.V.
Blvd. Sharp #3510 Parque Industrial
Rosarito, C.P. 22710 Playas de Rosarito, B.C.

LCD Panel : Manufacturer : Hisense
M/N : HD500DF-B54 (020)

Tuner : Manufacturer : XuGuang Tech. Co., Ltd.
M/N : HFT-96S3\W11FJ4H\RoH

Max Resolution : 1920*1080@60Hz

HDMI Cable*3 : Shielded, Detachable, 1.50m, with two cores
(Lab provide)

Power Cord : Unshielded, Detachable, 1.80m, without core

AV Cable : Unshielded, Detachable, 1.80m, without core
(Lab provide)

Ypbpr Cable : Unshielded, Detachable, 2.00m, without core
(Lab provide)

Audio Cable : Unshielded, Detachable, 1.50m, without core
(Lab provide)

LAN Cable : Unshielded, Detachable, 1.50m, without core
(Lab provide)

Remark:

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

Side Port:

- (1) One HDMI2/ARC Port : Connected with DVD PLAYER#2
- (2) One HDMI1 Port : Connected with PC
- (3) One USB1 Port : Connected with Hard-Disk #1
- (4) One USB2 Port : Connected with Hard-Disk #2
- (5) One Audio out Port : Connected with Earphone
- (6) One ANT/CABLE IN Port : Connected with Antenna or ATSC SG / TV SG

Back Port:

- (7) One LAN Port : Connected with PC
- (8) One Digital Audio Out Port : Connected with DVD PLAYER#1
- (9) One HDMI3 Port : Connected with DVD PLAYER#1
- (10) One component of YPbPr + Audio Port : Connected with DVD PLAYER#1
- (11) One AV Port : Connected with DVD PLAYER #2

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;
BSMI, 3C, MIC

2.2.2 Printer

Manufacturer : HP
Model Number : P1007
Serial Number : VNFN713831
Data Cable : Shielded, detachable, 1.8m
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 : audio-technica
Model Number : ATH-CKL200

2.2.7 TV Signal Generator

Manufacturer : FLUKE
Model Number : 54200m01
Serial Number : 814008

2.2.8 ATSC Signal Generator

Manufacturer : SENCORE
Model Number : ATSC997
Serial Number : 6790071

2.2.9 DVD PLAYER #1

Manufacturer : PHILIPS
Model Number : DVP3986K/93
Serial Number : KX1A0902120108
Certificate : CCC

2.2.10 DVD PLAYER #2

Manufacturer : PHILIPS
Model Number : DVP3986K/93
Serial Number : KX1A0902120082
Certificate : CCC

2.2.11 Hard Disk #1

Manufacturer : Tetasy
Model Number : F12
Serial Number : A010022-4A60007
Data Cable : Shielded, Undetachable, 1.8m.
Certificate : CE, FCC DoC

2.2.12 Hard Disk #2

Manufacturer : Tetasy
Model Number : F12
Serial Number : A010022-40F0005
Data Cable : Shielded, Undetachable, 1.8m.
Certificate : CE, FCC DoC

2.3 Description of Test Facility

Site Description : Sept. 17, 1998 file on
(No.3 3m Chamber) Jan.15, 2015 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

FCC registration Number : 91789

NVLAP Lab Code : 200371-0

2.4 Measurement Uncertainty

Conducted Emission Expanded Uncertainty : U = 3.4dB

Radiated Emission Expanded Uncertainty (30-200MHz):
U = 4.6dB (Horizontal)
U = 4.3dB (Vertical)

Radiated Emission Expanded Uncertainty (200M-1GHz):
U = 4.5dB (Horizontal)
U = 5.4dB (Vertical)

Radiated Emission Expanded Uncertainty (1GHz-6GHz):
U = 5.1dB

3 CONDUCTED EMISSION TEST

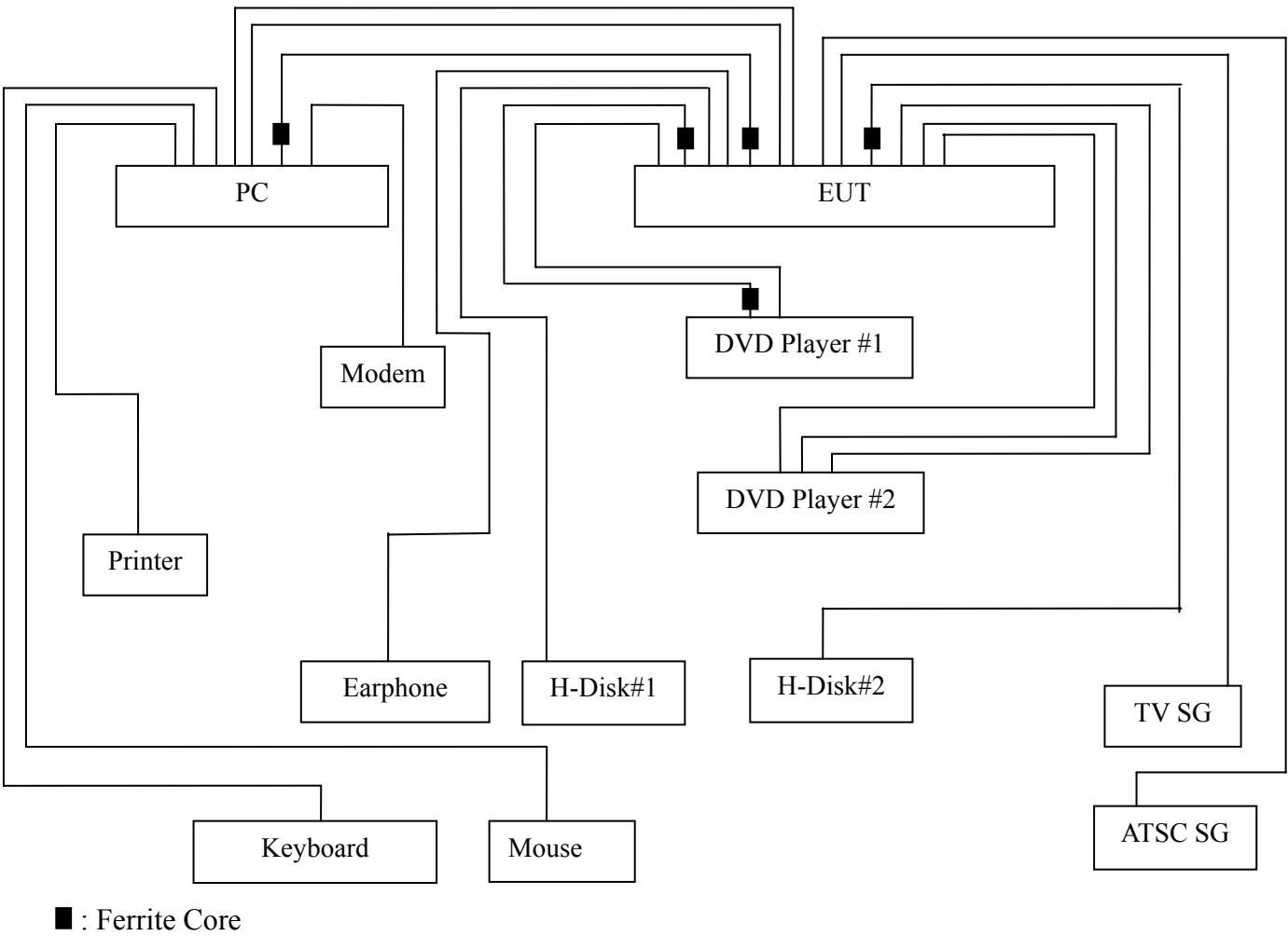
3.1 Test Equipment

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

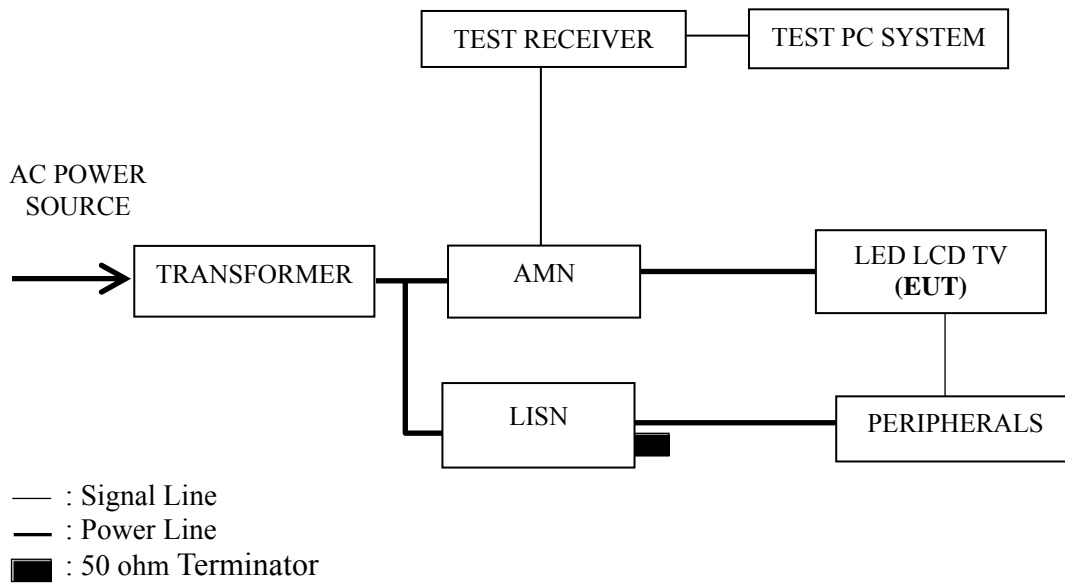
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Jul 03, 2015	Jul 02, 2016
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2015	Jun 26, 2016
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-5	Mar 20, 2015	Mar 19, 2016
4.	50Ω Terminator	Anritsu	BNC	001	Mar 20, 2015	Mar 19, 2016
5.	Software	Audix	E3	6.111206	--	--

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 HDMI Input).

3.5.5 PC system sent the 1kHz audio signal to EUT through audio port, the EUT speak out 1kHz audio signal.

3.5.6 In USB Play mode, set the EUT play digital media from H-Disk.

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

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
HDMI 1920*1080@60Hz & 1kHz playing
HDMI 1280*1024@60Hz & 1kHz playing
HDMI 640*480@60Hz & 1kHz playing
HDMI1080P
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
HDMI 1920*1080@60Hz & 1kHz playing	P13
HDMI 1280*1024@60Hz & 1kHz playing	P14
HDMI 640*480@60Hz & 1kHz playing	P15
HDMI1080P	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 HDMI 1280*1024@60Hz & 1kHz Playing test mode. The worst emission is detected at 0.514 MHz (QP Value) with corrected signal level of 35.59 dB (μV) (limit is 46.00 dB (μV)), when the Line of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 48%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Nov 18, 2015
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.228	36.70	10.50	47.20	62.52	15.32	QP
	0.515	34.10	10.39	44.49	56.00	11.51	
	0.773	33.40	10.38	43.78	56.00	12.22	
	1.544	30.30	10.40	40.70	56.00	15.30	
	2.717	25.89	10.44	36.33	56.00	19.67	
	6.880	27.60	10.46	38.06	60.00	21.94	
	0.228	23.30	10.50	33.80	52.52	18.72	AV
	0.515	25.20	10.39	35.59	46.00	10.41	
	0.773	24.70	10.38	35.08	46.00	10.92	
	1.544	19.60	10.40	30.00	46.00	16.00	
	2.717	14.99	10.44	25.43	46.00	20.57	
	6.880	18.90	10.46	29.36	50.00	20.64	
Neutral	0.237	30.61	10.47	41.08	62.21	21.13	QP
	0.515	32.50	10.37	42.87	56.00	13.13	
	0.679	29.61	10.35	39.96	56.00	16.04	
	1.270	28.89	10.39	39.28	56.00	16.72	
	1.539	29.61	10.39	40.00	56.00	16.00	
	7.010	28.90	10.51	39.41	60.00	20.59	
	0.237	16.31	10.47	26.78	52.21	25.43	AV
	0.515	23.40	10.37	33.77	46.00	12.23	
	0.679	17.81	10.35	28.16	46.00	17.84	
	1.270	15.29	10.39	25.68	46.00	20.32	
	1.539	18.71	10.39	29.10	46.00	16.90	
	7.010	19.70	10.51	30.21	50.00	19.79	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 48%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Nov 18, 2015
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.228	36.60	10.50	47.10	62.52	15.42	QP
	0.514	34.10	10.39	44.49	56.00	11.51	
	0.772	33.50	10.38	43.88	56.00	12.12	
	1.541	30.20	10.40	40.60	56.00	15.40	
	2.730	25.79	10.44	36.23	56.00	19.77	
	7.282	28.80	10.47	39.27	60.00	20.73	
	0.228	23.30	10.50	33.80	52.52	18.72	AV
	0.514	25.20	10.39	35.59	46.00	10.41	
	0.772	24.60	10.38	34.98	46.00	11.02	
	1.541	19.70	10.40	30.10	46.00	15.90	
	2.730	15.29	10.44	25.73	46.00	20.27	
	7.282	18.90	10.47	29.37	50.00	20.63	
Neutral	0.230	30.90	10.48	41.38	62.44	21.06	QP
	0.515	32.50	10.37	42.87	56.00	13.13	
	0.772	32.80	10.36	43.16	56.00	12.84	
	1.540	29.91	10.39	40.30	56.00	15.70	
	2.475	25.70	10.42	36.12	56.00	19.88	
	7.289	29.60	10.52	40.12	60.00	19.88	
	0.230	18.40	10.48	28.88	52.44	23.56	AV
	0.515	23.30	10.37	33.67	46.00	12.33	
	0.772	24.10	10.36	34.46	46.00	11.54	
	1.540	19.31	10.39	29.70	46.00	16.30	
	2.475	16.30	10.42	26.72	46.00	19.28	
	7.289	19.30	10.52	29.82	50.00	20.18	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 48%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Nov 18, 2015

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.231	36.20	10.50	46.70	62.43	15.73	QP
	0.507	32.90	10.39	43.29	56.00	12.71	
	0.772	33.50	10.38	43.88	56.00	12.12	
	1.541	30.30	10.40	40.70	56.00	15.30	
	2.520	26.20	10.43	36.63	56.00	19.37	
	7.027	29.10	10.46	39.56	60.00	20.44	
	0.231	22.70	10.50	33.20	52.43	19.23	AV
	0.507	18.00	10.39	28.39	46.00	17.61	
	0.772	24.30	10.38	34.68	46.00	11.32	
	1.541	19.90	10.40	30.30	46.00	15.70	
	2.520	17.30	10.43	27.73	46.00	18.27	
	7.027	19.80	10.46	30.26	50.00	19.74	
Neutral	0.237	30.61	10.47	41.08	62.19	21.11	QP
	0.502	31.30	10.37	41.67	56.00	14.33	
	1.360	29.70	10.39	40.09	56.00	15.91	
	1.538	29.90	10.39	40.29	56.00	15.71	
	2.714	25.30	10.43	35.73	56.00	20.27	
	7.340	29.90	10.52	40.42	60.00	19.58	
	0.237	16.21	10.47	26.68	52.19	25.51	AV
	0.502	14.50	10.37	24.87	46.00	21.13	
	1.360	16.80	10.39	27.19	46.00	18.81	
	1.538	19.20	10.39	29.59	46.00	16.41	
	2.714	15.20	10.43	25.63	46.00	20.37	
	7.340	18.50	10.52	29.02	50.00	20.98	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 48%RH

Test Mode : HDMI1080P Date of Test : Nov 18, 2015

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.228	36.50	10.50	47.00	62.53	15.53	QP
	0.512	33.60	10.39	43.99	56.00	12.01	
	0.772	33.30	10.38	43.68	56.00	12.32	
	1.541	30.60	10.40	41.00	56.00	15.00	
	2.307	25.90	10.42	36.32	56.00	19.68	
	7.346	30.60	10.47	41.07	60.00	18.93	
	0.228	23.30	10.50	33.80	52.53	18.73	AV
	0.512	24.70	10.39	35.09	46.00	10.91	
	0.772	24.50	10.38	34.88	46.00	11.12	
	1.541	19.90	10.40	30.30	46.00	15.70	
	2.307	17.80	10.42	28.22	46.00	17.78	
	7.346	19.70	10.47	30.17	50.00	19.83	
Neutral	0.234	30.60	10.48	41.08	62.32	21.24	QP
	0.515	32.40	10.37	42.77	56.00	13.23	
	0.680	29.31	10.35	39.66	56.00	16.34	
	1.539	30.21	10.39	40.60	56.00	15.40	
	2.658	25.50	10.43	35.93	56.00	20.07	
	7.323	31.90	10.52	42.42	60.00	17.58	
	0.234	17.10	10.48	27.58	52.32	24.74	AV
	0.515	23.30	10.37	33.67	46.00	12.33	
	0.680	17.61	10.35	27.96	46.00	18.04	
	1.539	19.41	10.39	29.80	46.00	16.20	
	2.658	15.40	10.43	25.83	46.00	20.17	
	7.323	19.70	10.52	30.22	50.00	19.78	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 48%RH

Test Mode : USB Play Date of Test : Nov 18, 2015

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.228	36.60	10.50	47.10	62.52	15.42	QP
	0.515	34.10	10.39	44.49	56.00	11.51	
	1.276	29.10	10.39	39.49	56.00	16.51	
	1.542	30.50	10.40	40.90	56.00	15.10	
	3.837	24.10	10.46	34.56	56.00	21.44	
	6.792	27.70	10.46	38.16	60.00	21.84	
	0.228	23.30	10.50	33.80	52.52	18.72	AV
	0.515	25.00	10.39	35.39	46.00	10.61	
	1.276	15.20	10.39	25.59	46.00	20.41	
	1.542	19.90	10.40	30.30	46.00	15.70	
	3.837	14.30	10.46	24.76	46.00	21.24	
	6.792	19.30	10.46	29.76	50.00	20.24	
Neutral	0.237	30.51	10.47	40.98	62.20	21.22	QP
	0.513	32.30	10.37	42.67	56.00	13.33	
	0.770	32.30	10.36	42.66	56.00	13.34	
	1.543	30.31	10.39	40.70	56.00	15.30	
	2.552	25.11	10.42	35.53	56.00	20.47	
	6.798	29.00	10.51	39.51	60.00	20.49	
	0.237	16.21	10.47	26.68	52.20	25.52	AV
	0.513	23.50	10.37	33.87	46.00	12.13	
	0.770	23.70	10.36	34.06	46.00	11.94	
	1.543	19.11	10.39	29.50	46.00	16.50	
	2.552	16.21	10.42	26.63	46.00	19.37	
	6.798	19.60	10.51	30.11	50.00	19.89	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 48%RH

Test Mode : LAN Play Date of Test : Nov 18, 2015

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.227	36.50	10.50	47.00	62.57	15.57	QP
	0.515	33.80	10.39	44.19	56.00	11.81	
	0.770	33.30	10.38	43.68	56.00	12.32	
	1.536	29.60	10.40	40.00	56.00	16.00	
	3.534	23.20	10.45	33.65	56.00	22.35	
	7.181	28.50	10.47	38.97	60.00	21.03	
	0.227	23.20	10.50	33.70	52.57	18.87	AV
	0.515	24.70	10.39	35.09	46.00	10.91	
	0.770	24.50	10.38	34.88	46.00	11.12	
	1.536	19.70	10.40	30.10	46.00	15.90	
	3.534	15.90	10.45	26.35	46.00	19.65	
	7.181	20.00	10.47	30.47	50.00	19.53	
Neutral	0.240	30.30	10.47	40.77	62.09	21.32	QP
	0.495	30.60	10.37	40.97	56.09	15.12	
	0.675	29.91	10.35	40.26	56.00	15.74	
	1.540	30.31	10.39	40.70	56.00	15.30	
	2.466	25.90	10.42	36.32	56.00	19.68	
	7.545	27.20	10.52	37.72	60.00	22.28	
	0.240	15.80	10.47	26.27	52.09	25.82	AV
	0.495	14.70	10.37	25.07	46.09	21.02	
	0.675	18.11	10.35	28.46	46.00	17.54	
	1.540	19.41	10.39	29.80	46.00	16.20	
	2.466	16.60	10.42	27.02	46.00	18.98	
	7.545	15.50	10.52	26.02	50.00	23.98	

TEST ENGINEER: WENCY YANG

4 RADIATED EMISSION TEST

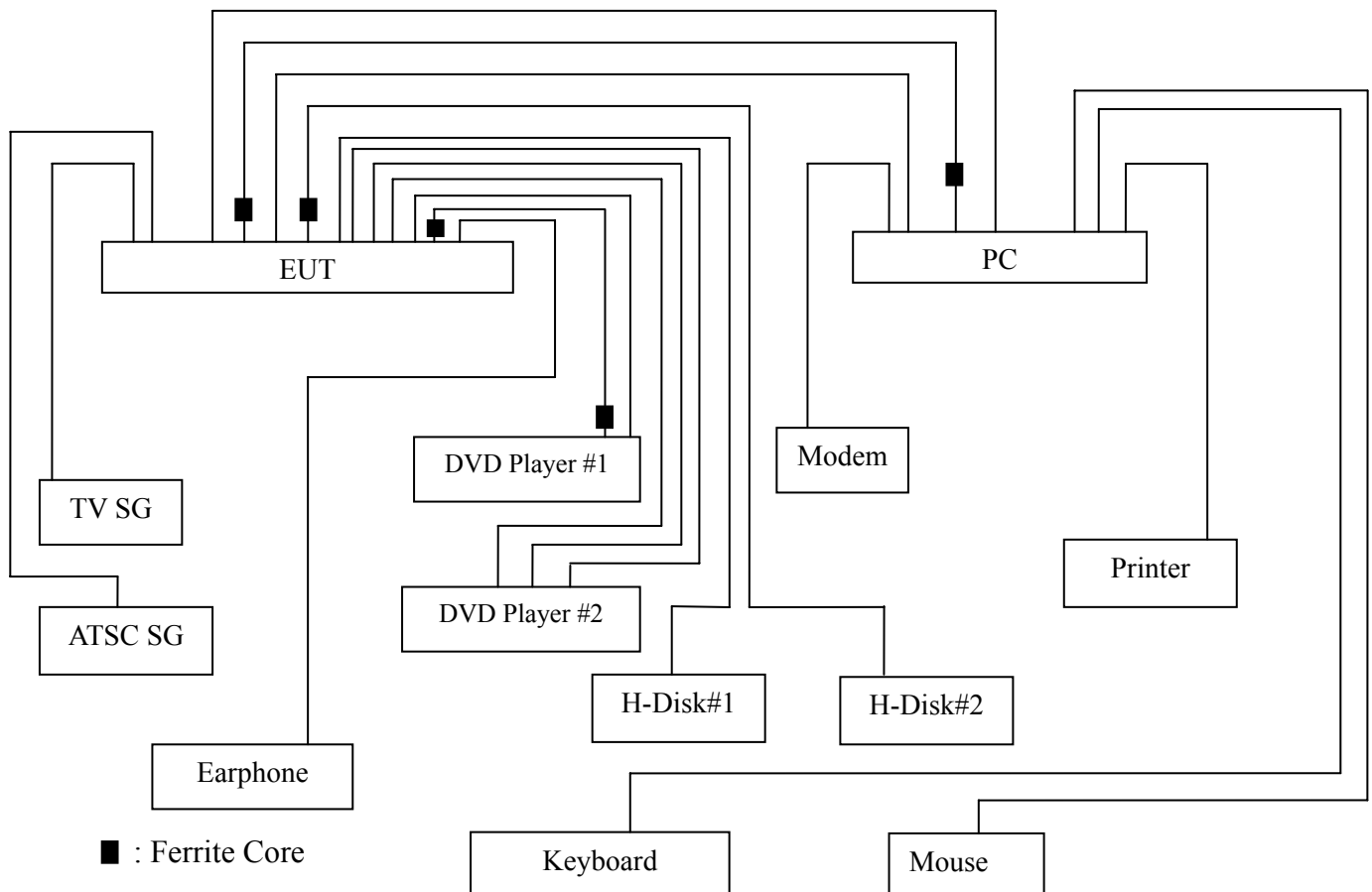
4.1 Test Equipment

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	101303	May 07, 2015	May 06, 2016
2.	Preamplifier	Agilent	8447D	2944A06664	Apr 27, 2015	Apr 26, 2016
3.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2015	Sep 19, 2016
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 15, 2015	May 14, 2016
5.	Horn Antenna	EMCO	3115	9607-4878	Jun 03, 2015	Jun 02, 2016
6.	Spectrum	Agilent	N9010A	MY52221182	Jun 12, 2015	Jun 11, 2016
7.	Spectrum	HP	8591EM	3628A00908	May 07, 2015	May 06, 2016
8.	50 Ω Coaxial Switch	Anritsu	MP59B	6200426390	Sep 18, 2015	Mar 17, 2016
9.	Software	Audix	E3	6.2007-9-10	--	--

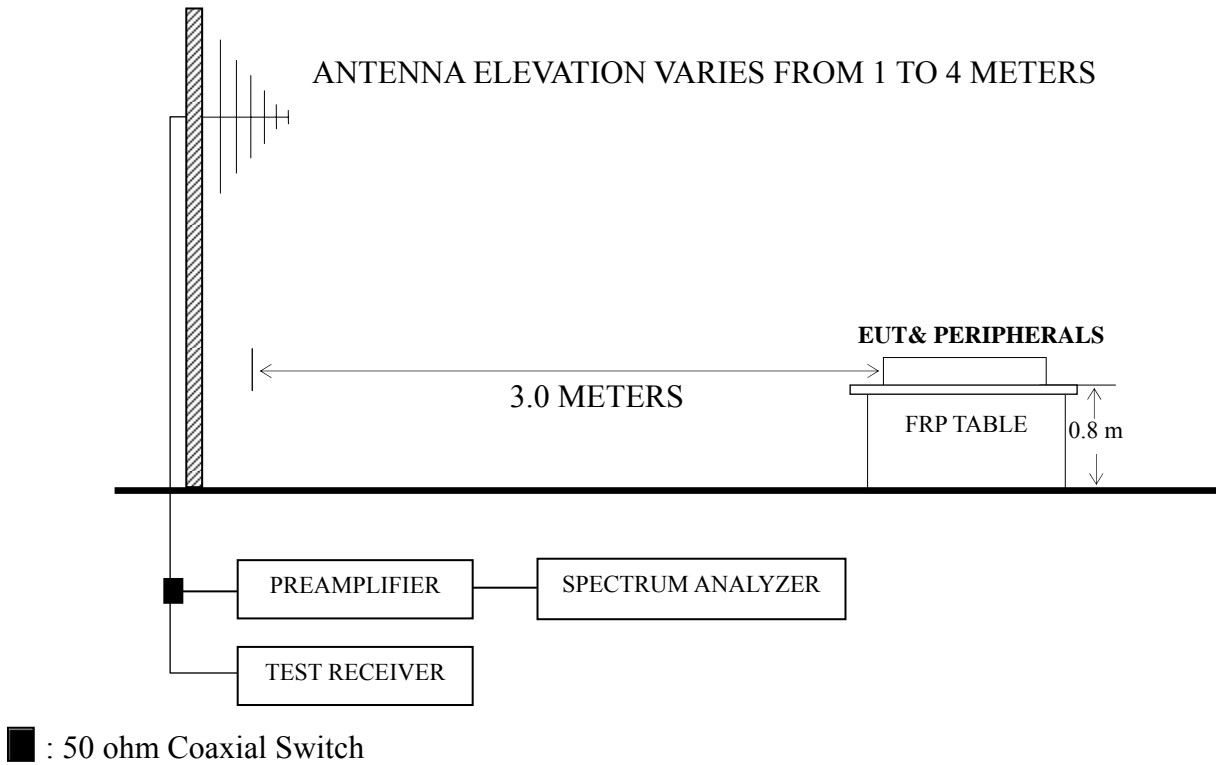
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals

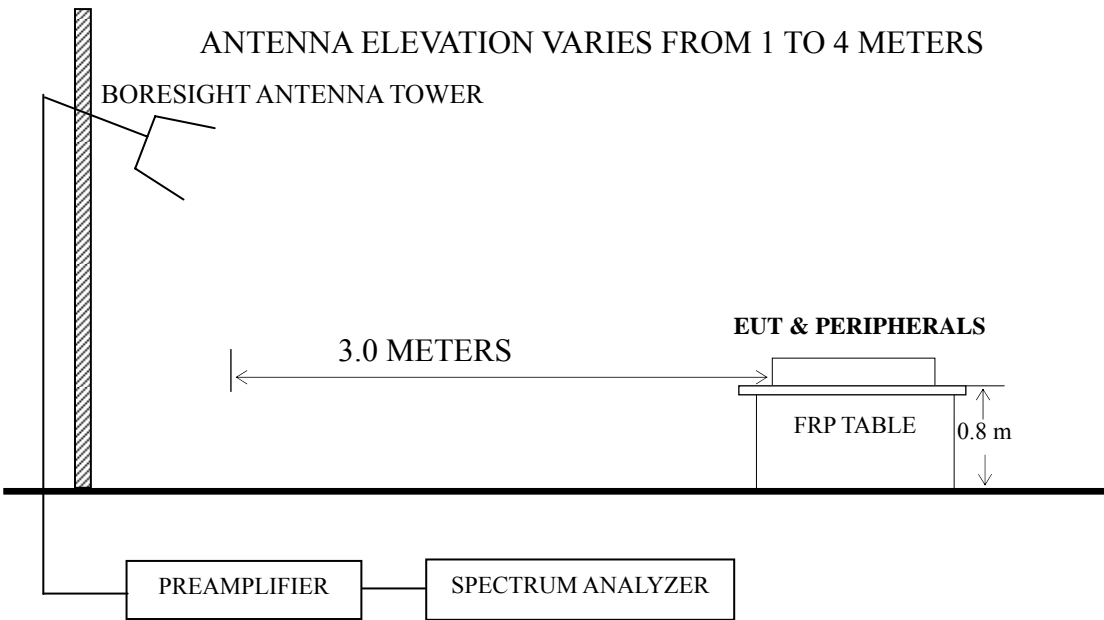


4.2.2 Radiated emission test setup

4.2.2.1 Below 1GHz



4.2.2.2 Above 1GHz



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 HDMI 1920*1080@60Hz & 1kHz playing and HDMI1080P 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 & 1kHz playing	P23-P24
HDMI 1280*1024@60Hz & 1kHz playing	P25
HDMI 640*480@60Hz & 1kHz playing	P26
HDMI1080P	P27-P28
USB Play	P29
LAN Play	P30

- 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 & 1kHz playing test mode. The worst emission at horizontal polarization was detected at 791.000 MHz with corrected signal level of 44.68 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 2.03 m height and the turntable was at 43°. The worst emission at vertical polarization was detected at 891.000 MHz with corrected signal level of 45.76 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 1.4m height and the turntable was at 332°.

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Dec 26, 2015

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	99.840	15.94	12.25	1.32	--	29.51	43.50	13.99	QP
	131.850	26.44	12.71	1.53	--	40.68	43.50	2.82	
	319.060	25.80	14.45	2.62	--	42.87	46.00	3.13	
	639.160	15.15	19.50	2.77	--	37.42	46.00	8.58	
	736.160	19.33	19.97	3.60	--	42.90	46.00	3.10	
	791.000	20.50	20.50	3.68	--	44.68	46.00	1.32	
	1194.350	65.63	24.42	3.52	36.14	57.43	74.00	16.57	PK
	1509.340	61.24	25.64	3.89	35.67	55.10	74.00	18.90	
	1576.340	53.72	25.92	3.98	35.58	48.04	74.00	25.96	
	1590.240	61.59	25.98	4.01	35.56	56.02	74.00	17.98	
	1903.450	62.93	27.18	4.31	35.21	59.21	74.00	14.79	
	1980.350	72.60	27.42	4.43	35.13	69.32	74.00	4.68	
	1194.350	37.67	24.42	3.52	36.14	29.47	54.00	24.53	AV
	1509.340	39.57	25.64	3.89	35.67	33.43	54.00	20.57	
	1576.340	36.57	25.92	3.98	35.58	30.89	54.00	23.11	
	1590.240	43.56	25.98	4.01	35.56	37.99	54.00	16.01	
	1903.450	37.80	27.18	4.31	35.21	34.08	54.00	19.92	
	1980.350	51.79	27.42	4.43	35.13	48.51	54.00	5.49	

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Dec 26, 2015

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Vertical	30.000	16.70	18.90	0.63	--	36.23	40.00	3.77	QP
	138.640	27.46	12.53	1.57	--	41.56	43.50	1.94	
	454.860	23.82	16.92	2.84	--	43.58	46.00	2.42	
	608.900	21.40	19.10	2.39	--	42.89	46.00	3.11	
	797.200	20.00	20.57	3.68	--	44.25	46.00	1.75	
	891.000	20.00	21.30	4.46	--	45.76	46.00	0.24	
	1001.800	60.09	23.51	4.89	36.49	52.00	74.00	22.00	PK
	1194.000	72.81	24.42	3.52	36.14	64.61	74.00	9.39	
	1228.040	60.83	24.57	3.56	36.08	52.88	74.00	21.12	
	1510.000	67.10	25.66	3.89	35.67	60.98	74.00	13.02	
	1587.040	67.04	25.98	4.01	35.57	61.46	74.00	12.54	
	1982.350	66.71	27.44	4.43	35.12	63.46	74.00	10.54	
	1001.800	36.78	23.51	4.89	36.49	28.69	54.00	25.31	AV
	1194.000	54.67	24.42	3.52	36.14	46.47	54.00	7.53	
	1228.040	34.25	24.57	3.56	36.08	26.30	54.00	27.70	
	1510.000	37.68	25.66	3.89	35.67	31.56	54.00	22.44	
	1587.040	47.56	25.98	4.01	35.57	41.98	54.00	12.02	
	1982.350	49.57	27.44	4.43	35.12	46.32	54.00	7.68	

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 60%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Dec 26, 2015
& 1kHz Playing

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	23.63	8.78	1.04	33.45	40.00	6.55
	138.640	20.12	12.53	1.57	34.22	43.50	9.28
	196.840	26.39	9.97	1.95	38.31	43.50	5.19
	329.000	24.60	14.76	2.63	41.99	46.00	4.01
	736.160	20.27	19.97	3.60	43.84	46.00	2.16
	796.300	17.28	20.57	3.68	41.53	46.00	4.47
Vertical	41.640	21.72	12.41	0.75	34.88	40.00	5.12
	57.160	30.52	6.24	0.86	37.62	40.00	2.38
	125.000	24.90	13.10	1.49	39.49	43.50	4.01
	177.440	25.59	10.61	1.83	38.03	43.50	5.47
	540.000	22.70	18.50	2.68	43.88	46.00	2.12
	914.640	15.79	21.50	4.61	41.90	46.00	4.10

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Dec 26, 2015

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	21.97	8.78	1.04	31.79	40.00	8.21
	138.640	21.28	12.53	1.57	35.38	43.50	8.12
	192.960	26.37	10.20	1.92	38.49	43.50	5.01
	333.310	25.79	14.89	2.64	43.32	46.00	2.68
	456.800	18.68	16.98	2.85	38.51	46.00	7.49
	757.500	16.70	20.25	3.63	40.58	46.00	5.42
Vertical	41.640	21.52	12.41	0.75	34.68	40.00	5.32
	57.160	29.52	6.24	0.86	36.62	40.00	3.38
	125.000	24.20	13.10	1.49	38.79	43.50	4.71
	192.960	27.73	10.20	1.92	39.85	43.50	3.65
	456.800	23.56	16.98	2.85	43.39	46.00	2.61
	603.070	18.50	19.10	2.26	39.86	46.00	6.14

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 60%RH

Test Mode : HDMI1080P Date of Test : Dec 26, 2015

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	80.440	26.12	9.43	1.09	--	36.64	40.00	3.36	QP
	136.700	24.22	12.57	1.56	--	38.35	43.50	5.15	
	248.250	20.30	12.42	2.15	--	34.87	46.00	11.13	
	296.750	25.89	13.70	2.56	--	42.15	46.00	3.85	
	311.300	26.61	14.15	2.60	--	43.36	46.00	2.64	
	796.300	18.61	20.57	3.68	--	42.86	46.00	3.14	
	1050.000	56.76	23.75	4.55	36.40	48.66	74.00	25.34	PK
	1188.040	65.15	24.40	3.52	36.15	56.92	74.00	17.08	
	1236.360	64.05	24.59	3.56	36.07	56.13	74.00	17.87	
	1587.350	67.16	25.98	4.01	35.57	61.58	74.00	12.42	
	1903.240	61.57	27.18	4.31	35.21	57.85	74.00	16.15	
	1981.250	73.03	27.44	4.43	35.12	69.78	74.00	4.22	
	1050.000	35.46	23.75	4.55	36.40	27.36	54.00	26.64	AV
	1188.040	41.57	24.40	3.52	36.15	33.34	54.00	20.66	
	1236.360	42.47	24.59	3.56	36.07	34.55	54.00	19.45	
	1587.350	43.26	25.98	4.01	35.57	37.68	54.00	16.32	
	1903.240	43.25	27.18	4.31	35.21	39.53	54.00	14.47	
	1981.250	51.63	27.44	4.43	35.12	48.38	54.00	5.62	

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 60%RH

Test Mode : HDMI1080P Date of Test : Dec 26, 2015

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Vertical	30.000	17.58	18.90	0.63	--	37.11	40.00	2.89	QP
	83.350	25.78	9.66	1.13	--	36.57	40.00	3.43	
	131.850	26.65	12.71	1.53	--	40.89	43.50	2.61	
	316.150	20.94	14.35	2.61	--	37.90	46.00	8.10	
	400.540	22.15	16.60	2.72	--	41.47	46.00	4.53	
	616.850	21.48	19.25	2.39	--	43.12	46.00	2.88	
	1030.230	58.78	23.65	4.66	36.44	50.65	74.00	23.35	PK
	1187.680	69.84	24.40	3.52	36.16	61.60	74.00	12.40	
	1229.070	62.32	24.57	3.56	36.08	54.37	74.00	19.63	
	1581.250	68.30	25.96	3.98	35.58	62.66	74.00	11.34	
	1823.430	59.89	26.89	4.19	35.29	55.68	74.00	18.32	
	1980.340	68.43	27.42	4.43	35.13	65.15	74.00	8.85	
	1030.230	35.46	23.65	4.66	36.44	27.33	54.00	26.67	AV
	1187.680	50.46	24.40	3.52	36.16	42.22	54.00	11.78	
	1229.070	45.66	24.57	3.56	36.08	37.71	54.00	16.29	
	1581.250	45.58	25.96	3.98	35.58	39.94	54.00	14.06	
	1823.430	43.46	26.89	4.19	35.29	39.25	54.00	14.75	
	1980.340	50.38	27.42	4.43	35.13	47.10	54.00	6.90	

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 60%RH

Test Mode : USB Play Date of Test : Dec 26, 2015

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	19.95	8.78	1.04	29.77	40.00	10.23
	127.000	21.97	12.97	1.51	36.45	43.50	7.05
	199.750	24.27	9.77	1.97	36.01	43.50	7.49
	328.760	26.32	14.76	2.63	43.71	46.00	2.29
	629.460	13.53	19.50	2.64	35.67	46.00	10.33
	791.520	20.80	20.50	3.68	44.98	46.00	1.02
Vertical	30.040	13.60	18.90	0.63	33.13	40.00	6.87
	54.250	29.76	6.66	0.84	37.26	40.00	2.74
	122.150	25.44	12.92	1.48	39.84	43.50	3.66
	199.750	29.06	9.77	1.97	40.80	43.50	2.70
	791.100	20.40	20.50	3.68	44.58	46.00	1.42
	891.000	16.20	21.30	4.46	41.96	46.00	4.04

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : HU50K300FW Humidity : 60%RH

Test Mode : LAN Play Date of Test : Dec 26, 2015

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	80.560	25.59	9.43	1.09	36.11	40.00	3.89
	133.280	24.98	12.67	1.54	39.19	43.50	4.31
	231.760	21.74	11.28	2.09	35.11	46.00	10.89
	306.450	24.33	13.99	2.60	40.92	46.00	5.08
	393.750	18.04	16.53	2.71	37.28	46.00	8.72
	797.760	18.80	20.57	3.68	43.05	46.00	2.95
Vertical	30.040	14.90	18.90	0.63	34.43	40.00	5.57
	83.350	25.16	9.66	1.13	35.95	40.00	4.05
	140.640	23.50	12.45	1.59	37.54	43.50	5.96
	398.600	20.07	16.58	2.71	39.36	46.00	6.64
	607.150	19.38	19.10	2.26	40.74	46.00	5.26
	891.000	18.50	21.30	4.46	44.26	46.00	1.74

TEST ENGINEER: MARK LI

5 DEVIATION TO TEST SPECIFICATIONS

None.

6 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
Conductive Tape	5*30MM\ROH	Joinset Co., Ltd.	See Appendix Figure 26, 27, 28
Master	SMR-TSL-4-3.5-5R	Joinset Co., Ltd.	See Appendix Figure 29

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:

Wency Yang
(WENCY YANG)