

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

LED LCD TV

Model No.: LC-50N3100U

Brand: Sharp

FCC ID : W9HLCDF0081

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-F16087
Date of Test : Mar 30 - Apr 01, 2016
Date of Report : Apr 11, 2016

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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. : LC-50N3100U
Brand : Sharp
Power Supply : 120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2015
AND ANSI C63.4-2014*

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 Mar 30 - Apr 01, 2016 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.F16088, a Verification report.

Date of Test : Mar 30 - Apr 01, 2016 Date of Report : Apr 11, 2016

Producer : 
ALAN HE / Assistant

Review : 
 **BYRON WU / Deputy Assistant Manager**
For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Signatory : 
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 2015 AND ANSI C63.4-2014	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2015 AND ANSI C63.4-2014	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	:	LC-50N3100U
Brand	:	Sharp
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 : SILICON LABS M/N : Si2158
Max Resolution	:	1920*1080@60Hz
HDMI Cable*2 (Lab provide)	:	Shielded, Detachable, 1.50m
Power Cord	:	Unshielded, Detachable, 1.80m, 2C
USB Cable*1 (Lab provide)	:	Shielded, Detachable, 1.00m

Remark:

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

Back Port:

(1) One USB Port

: Connected with H-Disk

(2) One Component In/AV In Port

: Connected with DVD PLAYER

(3) One HDMI1 (ARC) Port

: Connected with DVD PLAYER

Side Port:

(4) One HDMI2 Port

: Connected with PC

(5) One DVI Audio In Port

: Connected with PC

(6) One Audio Out Port

: Connected with Earphone #1

(7) One ANT Port

: Connected with ATSC SG / TV SG

(8) Digital Audio Out

: Connected with Audio Converter to Earphone #2

2.2 Peripherals

2.2.1 PC

Manufacturer : Lenovo
Model Number : E73s
Serial Number : PC0892JM
Power Cord : Unshielded, Detachable, 1.8m
Certificate : FCC DoC; CE/EMC; VCCI; C-Tick

2.2.2 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

2.2.3 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

2.2.4 Printer

Manufacturer : HP
Model Number : C8060A
Serial Number : CN3J19564X
Data Cable : Shielded, Detachable, 1.5m
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 : CCC

2.2.6 Earphone*2

Manufacturer : Edifier
Model Number : H210

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

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

2.2.10 Hard Disk

Manufacturer : Tetasys
Model Number : F12
Serial Number : A010022-4860010X
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

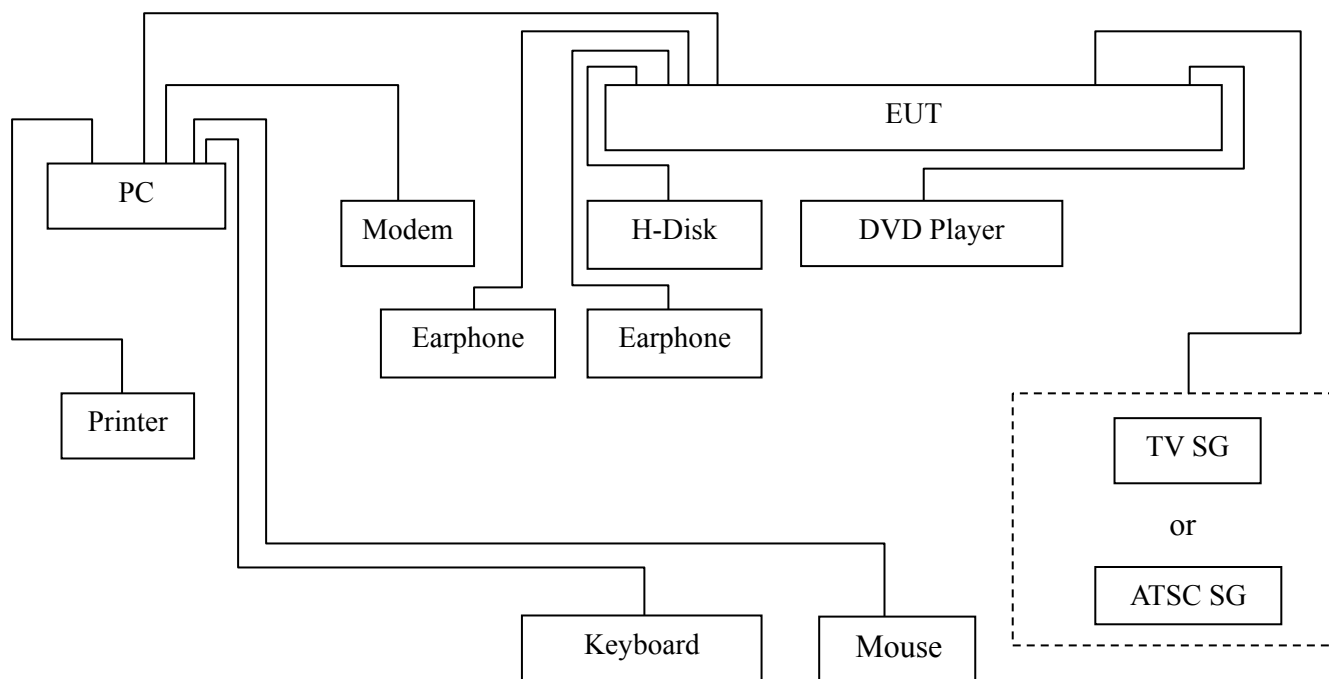
3.1 Test Equipment

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

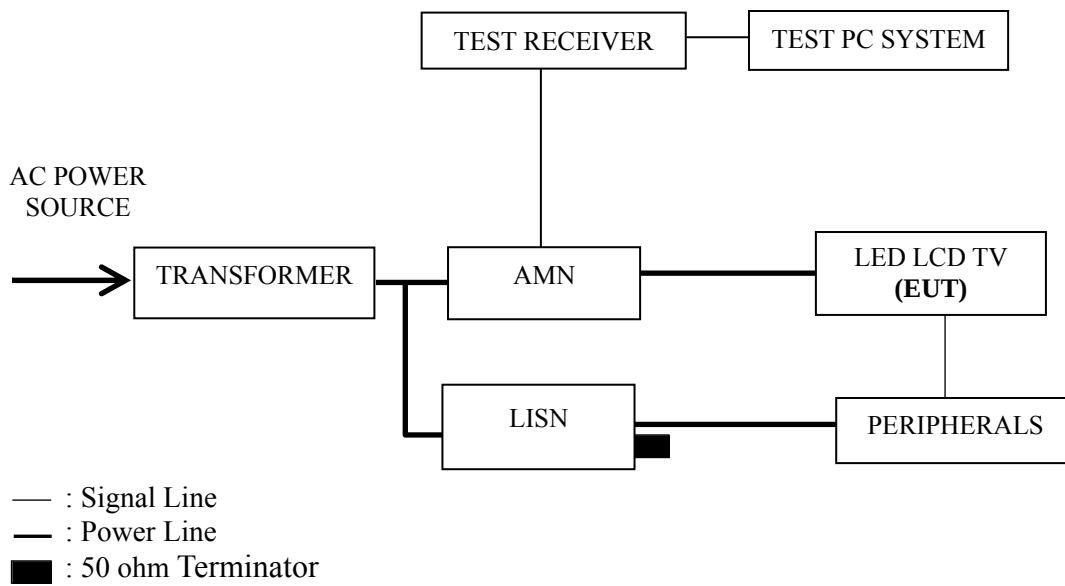
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Jul 03, 2015	Jul 02, 2016
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2015	Jun 26, 2016
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-5	Mar 20, 2016	Mar 19, 2017
4.	50Ω Terminator	Anritsu	BNC	001	Mar 20, 2016	Mar 19, 2017
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 (μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66~56	56~46
0.5 ~ 5	56	46
5 ~ 30	60	50

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

3.4 Test Configuration

The EUT (listed in Sec.2.1) and the peripherals (listed in Sec 2.2) were installed as shown on Sec.3.2 to meet FCC requirement and operating in a manner that tends to maximize its emission level in a normal application.

3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT and peripherals as shown in Sec. 3.2.
- 3.5.2 Turn on the power of all equipments and the EUT.
- 3.5.3 Set the contrast & brightness of EUT to maximum.
- 3.5.4 PC system ran the self-test program “EMC Test” by windows XP and sent “H” characters to EUT through graphic card, the EUT’s screen displayed and filled with “H” pattern by its resolution (Via 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 The other peripherals devices were driven and operated during the test.
- 3.5.8 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

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 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

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 HDMI1080P test mode. The worst emission is detected at 0.166 MHz (Average Value) with corrected signal level of 50.86 dB (μV) (limit is 55.17 dB (μV)), when the Line of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-50N3100U Humidity : 48%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Mar 30, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.163	49.00	10.57	59.57	65.29	5.72	QP
	0.388	31.90	10.43	42.33	58.12	15.79	
	0.585	32.30	10.38	42.68	56.00	13.32	
	0.768	29.60	10.38	39.98	56.00	16.02	
	1.769	26.19	10.41	36.60	56.00	19.40	
	6.297	31.70	10.47	42.17	60.00	17.83	
	0.163	40.40	10.57	50.97	55.29	4.32	AV
	0.388	23.50	10.43	33.93	48.12	14.19	
	0.585	22.70	10.38	33.08	46.00	12.92	
	0.768	18.70	10.38	29.08	46.00	16.92	
	1.769	16.29	10.41	26.70	46.00	19.30	
	6.297	22.60	10.47	33.07	50.00	16.93	
Neutral	0.165	48.90	10.56	59.46	65.22	5.76	QP
	0.383	29.20	10.41	39.61	58.21	18.60	
	0.579	31.50	10.36	41.86	56.00	14.14	
	1.538	27.70	10.39	38.09	56.00	17.91	
	2.906	25.70	10.43	36.13	56.00	19.87	
	6.072	31.21	10.49	41.70	60.00	18.30	
	0.165	40.20	10.56	50.76	55.22	4.46	AV
	0.383	20.50	10.41	30.91	48.21	17.30	
	0.579	22.30	10.36	32.66	46.00	13.34	
	1.538	17.60	10.39	27.99	46.00	18.01	
	2.906	16.90	10.43	27.33	46.00	18.67	
	6.072	23.61	10.49	34.10	50.00	15.90	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-50N3100U Humidity : 48%RH

Test Mode : HDMI 1280*1024@60Hz & 1kHz Playing Date of Test : Mar 30, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.163	48.90	10.57	59.47	65.30	5.83	QP
	0.385	31.30	10.43	41.73	58.18	16.45	
	0.586	33.50	10.38	43.88	56.00	12.12	
	1.365	27.20	10.39	37.59	56.00	18.41	
	3.997	26.99	10.47	37.46	56.00	18.54	
	6.124	31.00	10.47	41.47	60.00	18.53	
	0.163	39.50	10.57	50.07	55.30	5.23	AV
	0.385	23.50	10.43	33.93	48.18	14.25	
	0.586	23.10	10.38	33.48	46.00	12.52	
	1.365	17.30	10.39	27.69	46.00	18.31	
	3.997	18.69	10.47	29.16	46.00	16.84	
	6.124	23.50	10.47	33.97	50.00	16.03	
Neutral	0.165	48.90	10.56	59.46	65.20	5.74	QP
	0.388	29.30	10.41	39.71	58.10	18.39	
	0.587	32.70	10.36	43.06	56.00	12.94	
	1.531	28.00	10.39	38.39	56.00	17.61	
	4.077	26.50	10.46	36.96	56.00	19.04	
	6.319	31.00	10.50	41.50	60.00	18.50	
	0.165	40.10	10.56	50.66	55.20	4.54	AV
	0.388	21.40	10.41	31.81	48.10	16.29	
	0.587	22.80	10.36	33.16	46.00	12.84	
	1.531	17.80	10.39	28.19	46.00	17.81	
	4.077	18.20	10.46	28.66	46.00	17.34	
	6.319	22.20	10.50	32.70	50.00	17.30	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-50N3100U Humidity : 48%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Mar 30, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.166	48.39	10.57	58.96	65.18	6.22	QP
	0.389	31.80	10.43	42.23	58.08	15.85	
	0.589	33.40	10.38	43.78	56.00	12.22	
	1.564	28.50	10.40	38.90	56.00	17.10	
	4.705	25.60	10.48	36.08	56.00	19.92	
	6.332	30.90	10.47	41.37	60.00	18.63	
	0.166	40.29	10.57	50.86	55.18	4.32	AV
	0.389	23.30	10.43	33.73	48.08	14.35	
	0.589	22.90	10.38	33.28	46.00	12.72	
	1.564	18.80	10.40	29.20	46.00	16.80	
	4.705	19.90	10.48	30.38	46.00	15.62	
	6.332	22.50	10.47	32.97	50.00	17.03	
Neutral	0.165	48.80	10.56	59.36	65.20	5.84	QP
	0.382	29.00	10.41	39.41	58.23	18.82	
	0.584	33.80	10.36	44.16	56.00	11.84	
	1.568	28.61	10.39	39.00	56.00	17.00	
	3.988	26.70	10.46	37.16	56.00	18.84	
	6.331	31.10	10.50	41.60	60.00	18.40	
	0.165	40.00	10.56	50.56	55.20	4.64	AV
	0.382	19.40	10.41	29.81	48.23	18.42	
	0.584	24.00	10.36	34.36	46.00	11.64	
	1.568	19.11	10.39	29.50	46.00	16.50	
	3.988	18.80	10.46	29.26	46.00	16.74	
	6.331	23.00	10.50	33.50	50.00	16.50	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-50N3100U Humidity : 48%RH

Test Mode : HDMI 1080P Date of Test : Mar 30, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.166	48.89	10.57	59.46	65.17	5.71	QP
	0.384	31.20	10.43	41.63	58.20	16.57	
	0.584	33.90	10.38	44.28	56.00	11.72	
	1.640	29.20	10.40	39.60	56.00	16.40	
	3.913	26.70	10.46	37.16	56.00	18.84	
	6.078	30.30	10.47	40.77	60.00	19.23	
	0.166	40.29	10.57	50.86	55.17	4.31	AV
	0.384	22.70	10.43	33.13	48.20	15.07	
	0.584	24.50	10.38	34.88	46.00	11.12	
	1.640	19.70	10.40	30.10	46.00	15.90	
	3.913	19.40	10.46	29.86	46.00	16.14	
	6.078	23.50	10.47	33.97	50.00	16.03	
Neutral	0.163	48.60	10.56	59.16	65.30	6.14	QP
	0.387	29.30	10.41	39.71	58.13	18.42	
	0.587	33.40	10.36	43.76	56.00	12.24	
	1.571	28.81	10.39	39.20	56.00	16.80	
	3.901	26.39	10.46	36.85	56.00	19.15	
	6.077	29.91	10.49	40.40	60.00	19.60	
	0.163	39.20	10.56	49.76	55.30	5.54	AV
	0.387	21.20	10.41	31.61	48.13	16.52	
	0.587	23.00	10.36	33.36	46.00	12.64	
	1.571	18.91	10.39	29.30	46.00	16.70	
	3.901	18.79	10.46	29.25	46.00	16.75	
	6.077	23.21	10.49	33.70	50.00	16.30	

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-50N3100U Humidity : 48%RH

Test Mode : USB Play Date of Test : Mar 30, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.164	49.00	10.57	59.57	65.25	5.68	QP
	0.383	31.20	10.43	41.63	58.22	16.59	
	0.578	32.70	10.38	43.08	56.00	12.92	
	1.784	28.79	10.41	39.20	56.00	16.80	
	4.841	26.00	10.48	36.48	56.00	19.52	
	6.507	29.20	10.47	39.67	60.00	20.33	
	0.164	40.20	10.57	50.77	55.25	4.48	AV
	0.383	23.30	10.43	33.73	48.22	14.49	
	0.578	23.90	10.38	34.28	46.00	11.72	
	1.784	18.89	10.41	29.30	46.00	16.70	
	4.841	19.80	10.48	30.28	46.00	15.72	
	6.507	20.70	10.47	31.17	50.00	18.83	
Neutral	0.166	47.90	10.56	58.46	65.15	6.69	QP
	0.388	29.30	10.41	39.71	58.11	18.40	
	0.578	32.90	10.36	43.26	56.00	12.74	
	1.361	27.80	10.39	38.19	56.00	17.81	
	3.917	26.89	10.46	37.35	56.00	18.65	
	6.056	29.50	10.49	39.99	60.00	20.01	
	0.166	39.80	10.56	50.36	55.15	4.79	AV
	0.388	21.10	10.41	31.51	48.11	16.60	
	0.578	23.30	10.36	33.66	46.00	12.34	
	1.361	18.30	10.39	28.69	46.00	17.31	
	3.917	19.69	10.46	30.15	46.00	15.85	
	6.056	23.60	10.49	34.09	50.00	15.91	

TEST ENGINEER: WENCY YANG

4 RADIATED EMISSION TEST

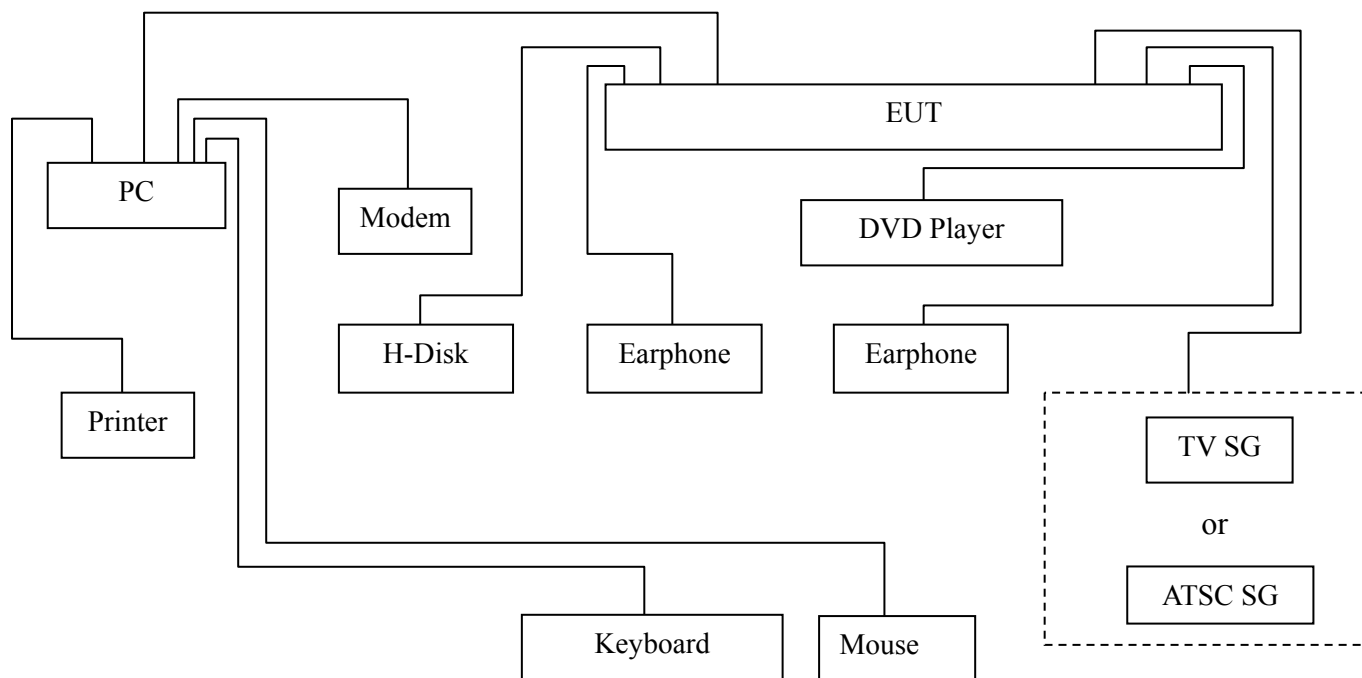
4.1 Test Equipment

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.	Software	Audix	e3	6.2007-9-10	--	--

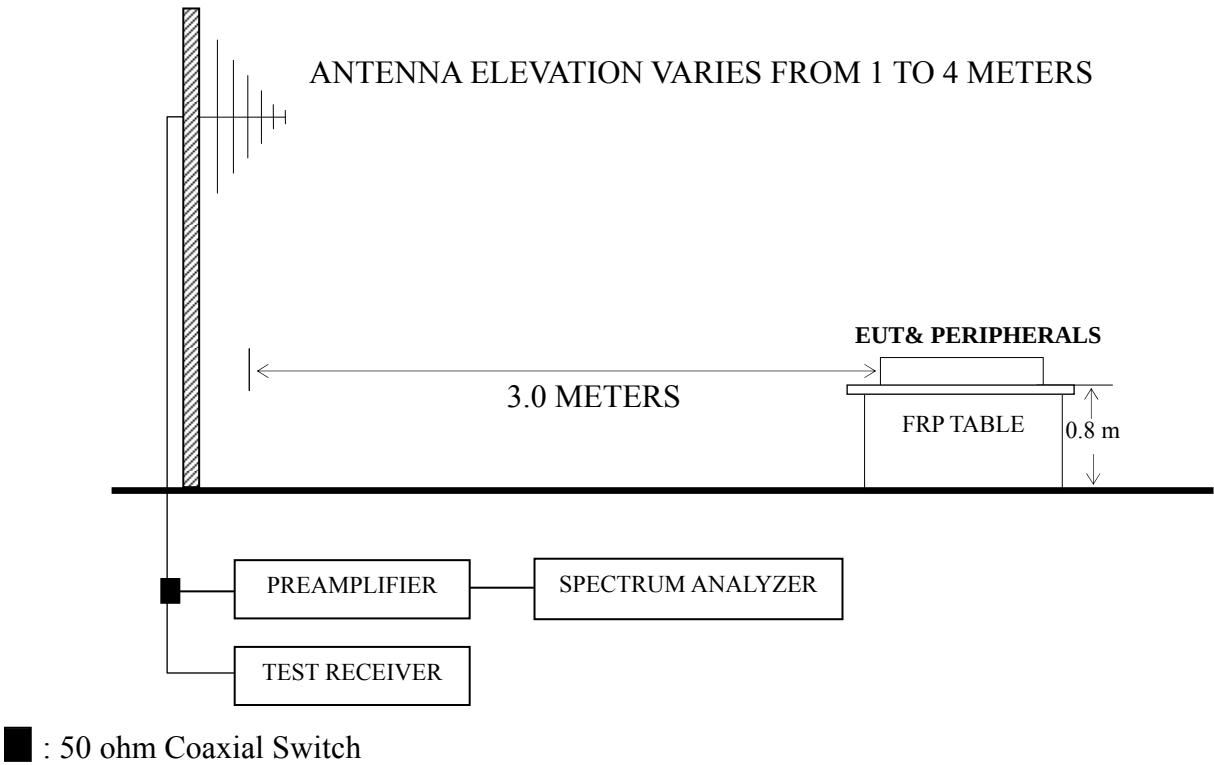
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals

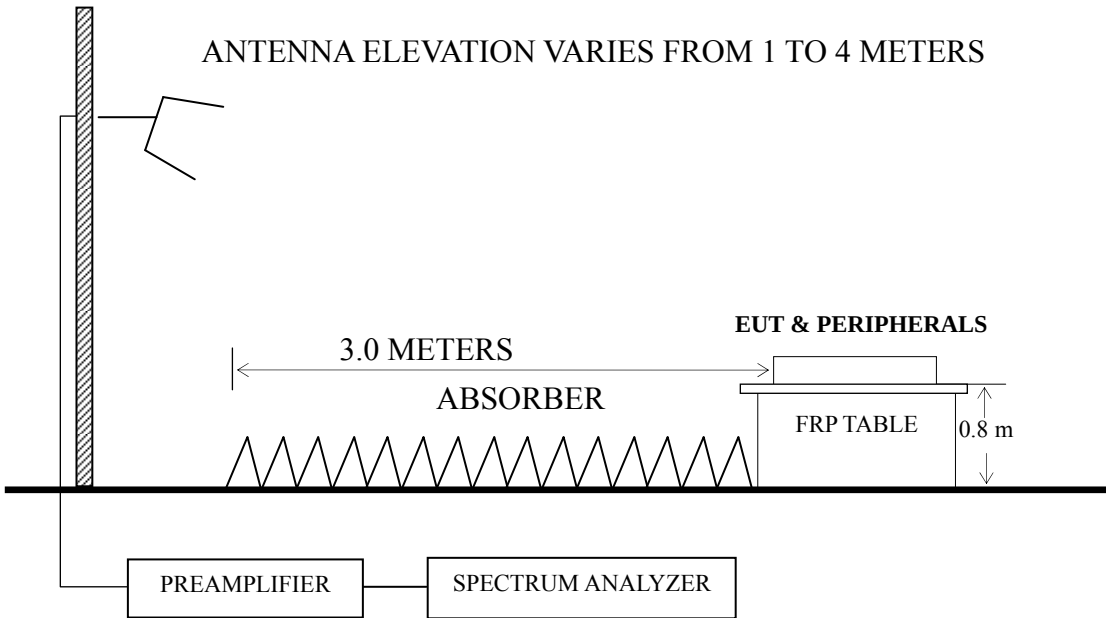


4.2.2 Radiated emission test setup

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 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 & 1kHz playing	P22-P23
HDMI 1280*1024@60Hz & 1kHz playing	P24
HDMI 640*480@60Hz & 1kHz playing	P25
HDMI1080P	P26
USB Play	P27

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 & 1 kHz playing test mode. The worst emission at horizontal polarization was detected at 311.087 MHz with corrected signal level of 41.79 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 1.90 m height and the turntable was at 245°. The worst emission at vertical polarization was detected at 30.853 MHz with corrected signal level of 36.74 dB (μV/m) (limit is 40.00 dB (μV/m)), when the antenna was 1.50 m height and the turntable was at 320°.

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-50N3100U Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Apr 01, 2016

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	86.503	22.58	10.00	1.16	--	33.74	40.00	6.26	QP
	130.837	21.57	12.76	1.53	--	35.86	43.50	7.64	
	148.963	23.36	11.57	1.63	--	36.56	43.50	6.94	
	311.087	25.04	14.15	2.60	--	41.79	46.00	4.21	
	593.050	17.71	18.85	2.31	--	38.87	46.00	7.13	
	742.259	13.49	19.97	3.60	--	37.06	46.00	8.94	
	1057.116	51.11	23.78	4.43	36.39	42.93	74.00	31.07	PK
	1213.502	55.21	24.51	3.54	36.11	47.15	74.00	26.85	
	1266.823	53.31	24.73	3.61	36.02	45.63	74.00	28.37	
	1483.178	54.35	25.54	3.86	35.71	48.04	74.00	25.96	
	1696.503	57.00	26.42	4.07	35.44	52.05	74.00	21.95	
	1902.639	52.87	27.18	4.31	35.21	49.15	74.00	24.85	
	1057.116	36.50	23.78	4.43	36.39	28.32	54.00	25.68	AV
	1213.502	40.73	24.51	3.54	36.11	32.67	54.00	21.33	
	1266.823	39.20	24.73	3.61	36.02	31.52	54.00	22.48	
	1483.178	37.47	25.54	3.86	35.71	31.16	54.00	22.84	
	1696.503	43.84	26.42	4.07	35.44	38.89	54.00	15.11	
	1902.639	36.29	27.18	4.31	35.21	32.57	54.00	21.43	

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-50N3100U Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Apr 01, 2016

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	30.853	17.85	18.25	0.64	--	36.74	40.00	3.26	QP
	61.680	28.80	6.31	0.89	--	36.00	40.00	4.00	
	148.963	24.45	11.57	1.63	--	37.65	43.50	5.85	
	314.377	23.89	14.25	2.61	--	40.75	46.00	5.25	
	599.321	18.16	19.10	2.31	--	39.57	46.00	6.43	
	890.728	15.17	21.30	4.46	--	40.93	46.00	5.07	
	1034.630	56.36	23.68	4.66	36.43	48.27	74.00	25.73	PK
	1209.161	67.44	24.49	3.54	36.12	59.35	74.00	14.65	
	1273.651	56.44	24.76	3.61	36.01	48.80	74.00	25.20	
	1496.525	56.13	25.59	3.89	35.69	49.92	74.00	24.08	
	1687.408	56.96	26.38	4.07	35.44	51.97	74.00	22.03	
	1783.786	53.73	26.74	4.15	35.33	49.29	74.00	24.71	
	1034.630	41.49	23.68	4.66	36.43	33.40	54.00	20.60	AV
	1209.161	50.37	24.49	3.54	36.12	42.28	54.00	11.72	
	1273.651	40.11	24.76	3.61	36.01	32.47	54.00	21.53	
	1496.525	41.48	25.59	3.89	35.69	35.27	54.00	18.73	
	1687.408	40.78	26.38	4.07	35.44	35.79	54.00	18.21	
	1783.786	38.46	26.74	4.15	35.33	34.02	54.00	19.98	

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-50N3100U Humidity : 60%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Apr 01, 2016
& 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	62.871	23.42	6.37	0.89	30.68	40.00	9.32
	86.503	23.79	10.00	1.16	34.95	40.00	5.05
	135.982	21.37	12.58	1.55	35.50	43.50	8.00
	305.680	24.83	13.99	2.60	41.42	46.00	4.58
	432.546	20.68	16.82	2.79	40.29	46.00	5.71
	539.478	19.73	18.50	2.68	40.91	46.00	5.09
Vertical	30.962	16.19	18.15	0.64	34.98	40.00	5.02
	61.778	28.10	6.31	0.89	35.30	40.00	4.70
	126.772	21.17	13.00	1.50	35.67	43.50	7.83
	207.850	24.50	9.92	2.01	36.43	43.50	7.07
	308.913	21.59	14.06	2.60	38.25	46.00	7.75
	599.321	19.12	19.10	2.31	40.53	46.00	5.47

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-50N3100U Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Apr 01, 2016

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	63.092	23.38	6.39	0.89	30.66	40.00	9.34
	86.503	23.39	10.00	1.16	34.55	40.00	5.45
	136.460	21.78	12.57	1.56	35.91	43.50	7.59
	215.268	20.15	10.20	2.03	32.38	43.50	11.12
	312.179	24.97	14.20	2.61	41.78	46.00	4.22
	586.844	12.83	18.58	2.36	33.77	46.00	12.23
Vertical	31.843	17.68	17.59	0.65	35.92	40.00	4.08
	63.983	28.48	6.44	0.90	35.82	40.00	4.18
	85.898	22.51	9.90	1.16	33.57	40.00	6.43
	312.179	21.65	14.20	2.61	38.46	46.00	7.54
	601.427	18.38	19.10	2.26	39.74	46.00	6.26
	903.309	9.27	21.40	4.56	35.23	46.00	10.77

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-50N3100U Humidity : 60%RH

Test Mode : HDMI1080P Date of Test : Apr 01, 2016

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	83.230	20.90	9.66	1.12	31.68	40.00	8.32
	135.032	18.86	12.60	1.55	33.01	43.50	10.49
	222.950	23.81	10.70	2.05	36.56	46.00	9.44
	300.367	24.11	13.84	2.59	40.54	46.00	5.46
	373.311	20.29	16.36	2.69	39.34	46.00	6.66
	459.114	20.75	17.10	2.85	40.70	46.00	5.30
Vertical	71.330	25.85	7.60	0.96	34.41	40.00	5.59
	128.113	20.67	12.90	1.51	35.08	43.50	8.42
	203.523	23.42	9.77	1.98	35.17	43.50	8.33
	296.184	19.76	13.65	2.56	35.97	46.00	10.03
	382.588	22.16	16.50	2.70	41.36	46.00	4.64
	612.064	18.11	19.15	2.39	39.65	46.00	6.35

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-50N3100U Humidity : 60%RH

Test Mode : USB Play Date of Test : Apr 01, 2016

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	67.675	21.69	6.94	0.92	29.55	40.00	10.45
	143.830	21.09	12.20	1.60	34.89	43.50	8.61
	222.950	23.45	10.70	2.05	36.20	46.00	9.80
	311.087	24.95	14.15	2.60	41.70	46.00	4.30
	386.634	16.85	16.50	2.70	36.05	46.00	9.95
	449.556	15.10	16.80	2.84	34.74	46.00	11.26
Vertical	30.962	16.60	18.15	0.64	35.39	40.00	4.61
	67.675	27.86	6.94	0.92	35.72	40.00	4.28
	122.404	18.66	12.95	1.48	33.09	43.50	10.41
	207.850	23.94	9.92	2.01	35.87	43.50	7.63
	315.481	21.11	14.30	2.61	38.02	46.00	7.98
	599.321	17.90	19.10	2.31	39.31	46.00	6.69

TEST ENGINEER: MARK LI

5 DEVIATION TO TEST SPECIFICATIONS

None.