

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

LED LCD TV

Model No.	Brand
LC-32N4000U	Sharp
32H4C, 32H4C+, 32H4CA	Hisense

FCC ID : W9HLCDC0037

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

Prepared By : Audix Technology (Shanghai) Co., Ltd.
3F and 4F, 34Bldg 680 Guiping Rd,
Caohejing Hi-Tech Park,
Shanghai 200233, China

Tel: +86-21-64955500

Fax: +86-21-64955491

Report No. : ACI-F16120
Date of Test : May 06-11, 2016
Date of Report : May 18, 2016

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	18
4.1 Test Equipment.....	18
4.2 Block Diagram of Test Setup.....	18
4.3 Radiated Emission Limit [FCC Part 15 Subpart B 15.109(a)].....	19
4.4 Test Configuration.....	19
4.5 Operating Condition of EUT.....	20
4.6 Test Procedures.....	20
4.7 Test Results.....	21
5 DEVIATION TO TEST SPECIFICATIONS	28

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
LC-32N4000U	Sharp	120V/60Hz
32H4C, 32H4C+, 32H4CA	Hisense	

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 May 06-11, 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.

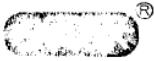
This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

The test results for EUT's TV functions are contained in No.F16121, a Verification report.

Date of Test : May 06-11, 2016 Date of Report : May 18, 2016

Producer : Huimin Yan
HUI MIN YAN / Assistant

Review : Byron Wu
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-32N4000U	32H4C, 32H4C+, 32H4CA
Brand	Sharp	Hisense

Note #1 : The above models are all the same except for brand and model number.LC-32N4000U model is tested and recorded in the report

Note #2 : “+”represents any of the Arabic numeral.

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 : HD315DH-B12(010)

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

Max Resolution : 1920*1080@60Hz

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

Power Cord : Unshielded, Detachable, 1.80m, 2C

USB Cable (Lab provide) : Shielded, Detachable, 1.00m

Remark:

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

Side Port:

- (1) One AUDIO OUT Port : Connected with Earphone #1
- (2) One ANT Port : Connected with Antenna or ATSC SG
- (3) One HDMI1 Port : Connected with DVD PLAYER #1
- (4) One HDMI 2 Port : Connected with PC
- (5) One HDMI 3/ARC Port : Connected with DVD PLAYER #2

Bottom Port:

- (6) One Digital Audio Out Port : Connected with Audio Converter to Earphone #2
- (7) One AV IN Port : Connected with DVD PLAYER #1
- (8) One USB Port : Connected with Hard-Disk

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

2.2.2 Printer

Manufacturer : HP
Model Number : P1007
Serial Number : VNFN713831
Power Cord : Unshielded, Detachable, 1.8m
Certificate : GS, FCC DoC; CE/EMC; C-Tick

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, 1.5m
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 #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

Manufacturer : Tetasys
Model Number : F12
Serial Number : A010022-486006
Data Cable : Shielded, Undetachable, 1.8m.
Certificate : CE, FCC DoC

2.3 Description of Test Facility

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

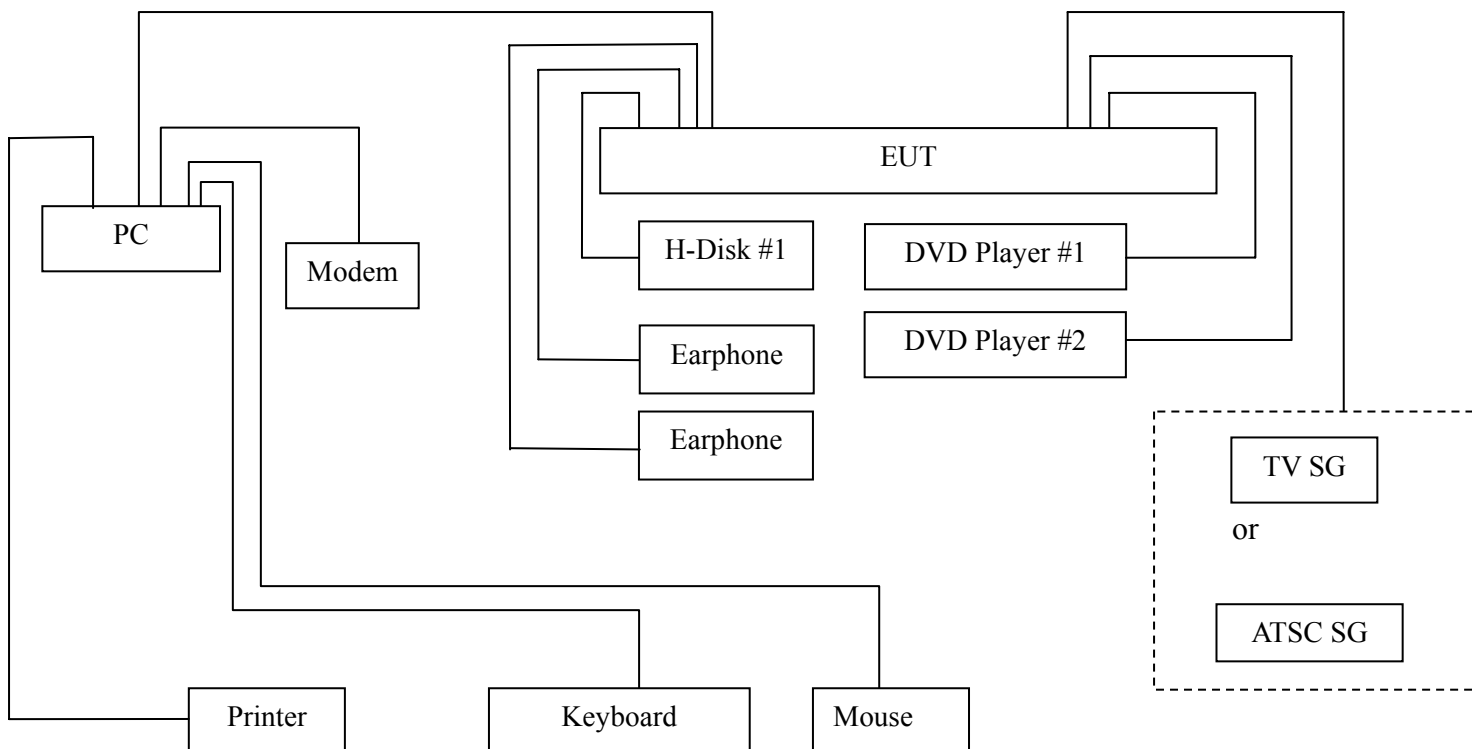
3.1 Test Equipment

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

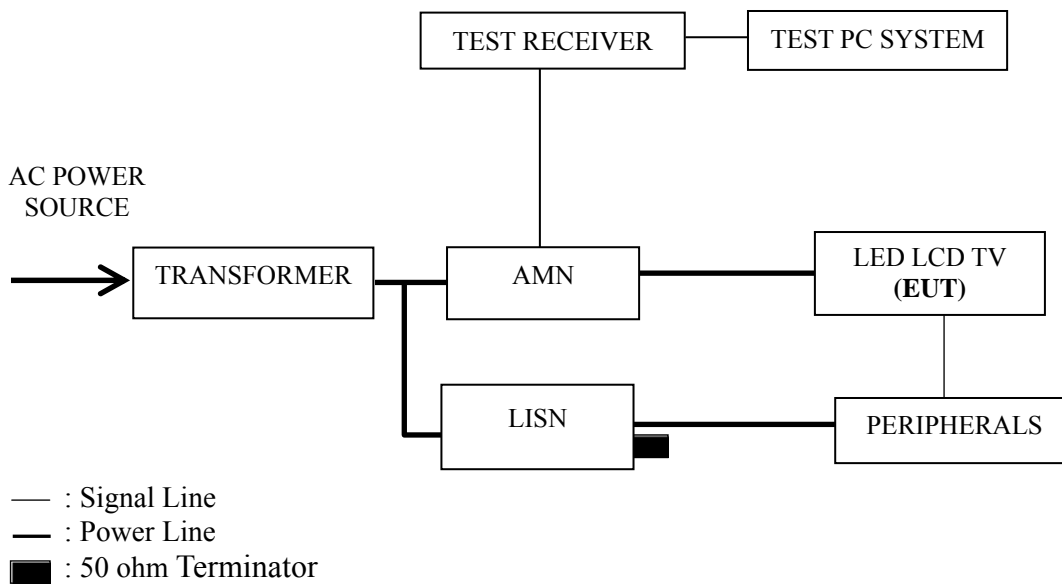
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Jul 03, 2015	Jul 02, 2016
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2015	Jun 26, 2016
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2016	Mar 19, 2017
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 C63.4:2014 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 HDMI 1920*1080@60Hz & 1kHz Playing test mode. The worst emission is detected at 7.716MHz (Quasi-Peak Value) with corrected signal level of 32.77 dB (μ V) (limit is 50.00 dB (μ V)), when the Line of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 23°C

Model No. : LC-32N4000U Humidity : 52%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : May 06, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.190	35.50	10.53	46.03	64.02	17.99	QP
	0.458	23.00	10.40	33.40	56.72	23.32	
	1.055	21.60	10.38	31.98	56.00	24.02	
	3.139	20.60	10.44	31.04	56.00	24.96	
	4.757	26.20	10.48	36.68	56.00	19.32	
	7.716	28.40	10.47	38.87	60.00	21.13	
	0.190	22.80	10.53	33.33	54.02	20.69	AV
	0.458	8.80	10.40	19.20	46.72	27.52	
	1.055	9.80	10.38	20.18	46.00	25.82	
	3.139	11.50	10.44	21.94	46.00	24.06	
	4.757	18.00	10.48	28.48	46.00	17.52	
	7.716	22.30	10.47	32.77	50.00	17.23	
Neutral	0.160	32.80	10.57	43.37	65.46	22.09	QP
	0.420	21.39	10.40	31.79	57.45	25.66	
	0.761	14.80	10.36	25.16	56.00	30.84	
	1.933	15.30	10.41	25.71	56.00	30.29	
	4.875	22.90	10.47	33.37	56.00	22.63	
	7.958	26.40	10.53	36.93	60.00	23.07	
	0.160	13.30	10.57	23.87	55.46	31.59	AV
	0.420	10.59	10.40	20.99	47.45	26.46	
	0.761	1.90	10.36	12.26	46.00	33.74	
	1.933	3.70	10.41	14.11	46.00	31.89	
	4.875	13.10	10.47	23.57	46.00	22.43	
	7.958	20.30	10.53	30.83	50.00	19.17	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32N4000U Humidity : 48%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : May 06, 2016
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.186	35.10	10.54	45.64	64.21	18.57	QP
	0.354	26.30	10.44	36.74	58.87	22.13	
	0.567	23.40	10.38	33.78	56.00	22.22	
	1.172	19.81	10.38	30.19	56.00	25.81	
	4.690	26.59	10.48	37.07	56.00	18.93	
	7.717	27.70	10.47	38.17	60.00	21.83	
	0.186	23.50	10.54	34.04	54.21	20.17	AV
	0.354	11.50	10.44	21.94	48.87	26.93	
	0.567	10.60	10.38	20.98	46.00	25.02	
	1.172	10.91	10.38	21.29	46.00	24.71	
	4.690	17.99	10.48	28.47	46.00	17.53	
	7.717	21.80	10.47	32.27	50.00	17.73	
Neutral	0.160	33.00	10.57	43.57	65.47	21.90	QP
	0.386	19.50	10.41	29.91	58.14	28.23	
	0.751	15.00	10.36	25.36	56.00	30.64	
	1.618	14.11	10.39	24.50	56.00	31.50	
	4.871	22.10	10.47	32.57	56.00	23.43	
	7.607	27.00	10.52	37.52	60.00	22.48	
	0.160	13.20	10.57	23.77	55.47	31.70	AV
	0.386	11.70	10.41	22.11	48.14	26.03	
	0.751	1.10	10.36	11.46	46.00	34.54	
	1.618	2.31	10.39	12.70	46.00	33.30	
	4.871	12.20	10.47	22.67	46.00	23.33	
	7.607	19.30	10.52	29.82	50.00	20.18	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32N4000U Humidity : 48%RH

Test Mode : HDMI 640*480@60Hz & 1kHz playing Date of Test : May 06, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.182	35.40	10.54	45.94	64.40	18.46	QP
	0.447	24.00	10.41	34.41	56.93	22.52	
	1.161	18.91	10.38	29.29	56.00	26.71	
	2.230	19.20	10.42	29.62	56.00	26.38	
	4.512	24.50	10.47	34.97	56.00	21.03	
	7.483	28.50	10.47	38.97	60.00	21.03	
	0.182	22.30	10.54	32.84	54.40	21.56	AV
	0.447	10.40	10.41	20.81	46.93	26.12	
	1.161	9.11	10.38	19.49	46.00	26.51	
	2.230	10.10	10.42	20.52	46.00	25.48	
	4.512	16.60	10.47	27.07	46.00	18.93	
	7.483	21.30	10.47	31.77	50.00	18.23	
Neutral	0.185	21.50	10.52	32.02	54.25	22.23	QP
	0.413	9.20	10.40	19.60	47.59	27.99	
	0.763	2.50	10.36	12.86	46.00	33.14	
	1.931	3.40	10.41	13.81	46.00	32.19	
	4.646	11.90	10.47	22.37	46.00	23.63	
	7.997	20.20	10.53	30.73	50.00	19.27	
	0.185	34.30	10.52	44.82	64.25	19.43	AV
	0.413	20.90	10.40	31.30	57.59	26.29	
	0.763	15.00	10.36	25.36	56.00	30.64	
	1.931	16.20	10.41	26.61	56.00	29.39	
	4.646	22.30	10.47	32.77	56.00	23.23	
	7.997	26.60	10.53	37.13	60.00	22.87	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22°C
 Model No. : LC-32N4000U Humidity : 48%RH
 Test Mode : HDMI 1080P Date of Test : May 06, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.187	34.90	10.54	45.44	64.18	18.74	QP
	0.385	22.00	10.43	32.43	58.16	25.73	
	0.567	23.40	10.38	33.78	56.00	22.22	
	1.581	20.30	10.40	30.70	56.00	25.30	
	4.880	27.20	10.48	37.68	56.00	18.32	
	7.702	27.30	10.47	37.77	60.00	22.23	
	AV	0.187	23.20	10.54	33.74	54.18	20.44
		0.385	15.70	10.43	26.13	48.16	22.03
		0.567	10.80	10.38	21.18	46.00	24.82
		1.581	10.40	10.40	20.80	46.00	25.20
		4.880	17.90	10.48	28.38	46.00	17.62
		7.702	21.00	10.47	31.47	50.00	18.53
Neutral	0.158	33.60	10.57	44.17	65.58	21.41	QP
	0.436	18.80	10.39	29.19	57.13	27.94	
	0.760	15.10	10.36	25.46	56.00	30.54	
	1.919	14.40	10.41	24.81	56.00	31.19	
	4.641	21.50	10.47	31.97	56.00	24.03	
	7.874	26.70	10.53	37.23	60.00	22.77	
	AV	0.158	14.40	10.57	24.97	55.58	30.61
		0.436	6.90	10.39	17.29	47.13	29.84
		0.760	1.40	10.36	11.76	46.00	34.24
		1.919	3.90	10.41	14.31	46.00	31.69
		4.641	12.10	10.47	22.57	46.00	23.43
		7.874	20.40	10.53	30.93	50.00	19.07

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32N4000U Humidity : 48%RH

Test Mode : USB Play Date of Test : May 06, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.188	34.80	10.53	45.33	64.12	18.79	QP
	0.341	26.29	10.45	36.74	59.18	22.44	
	0.566	23.50	10.38	33.88	56.00	22.12	
	1.522	17.80	10.40	28.20	56.00	27.80	
	4.640	25.79	10.48	36.27	56.00	19.73	
	7.473	27.40	10.47	37.87	60.00	22.13	
	0.188	23.30	10.53	33.83	54.12	20.29	AV
	0.341	11.29	10.45	21.74	49.18	27.44	
	0.566	10.90	10.38	21.28	46.00	24.72	
	1.522	9.40	10.40	19.80	46.00	26.20	
	4.640	17.49	10.48	27.97	46.00	18.03	
	7.473	20.90	10.47	31.37	50.00	18.63	
Neutral	0.183	34.20	10.53	44.73	64.36	19.63	QP
	0.424	21.69	10.40	32.09	57.37	25.28	
	0.967	16.00	10.37	26.37	56.00	29.63	
	2.556	12.91	10.42	23.33	56.00	32.67	
	4.815	22.30	10.47	32.77	56.00	23.23	
	7.534	26.40	10.52	36.92	60.00	23.08	
	0.183	20.80	10.53	31.33	54.36	23.03	AV
	0.424	11.99	10.40	22.39	47.37	24.98	
	0.967	3.10	10.37	13.47	46.00	32.53	
	2.556	3.81	10.42	14.23	46.00	31.77	
	4.815	12.70	10.47	23.17	46.00	22.83	
	7.534	19.50	10.52	30.02	50.00	19.98	

TEST ENGINEER: SENVEN LU

4 RADIATED EMISSION TEST

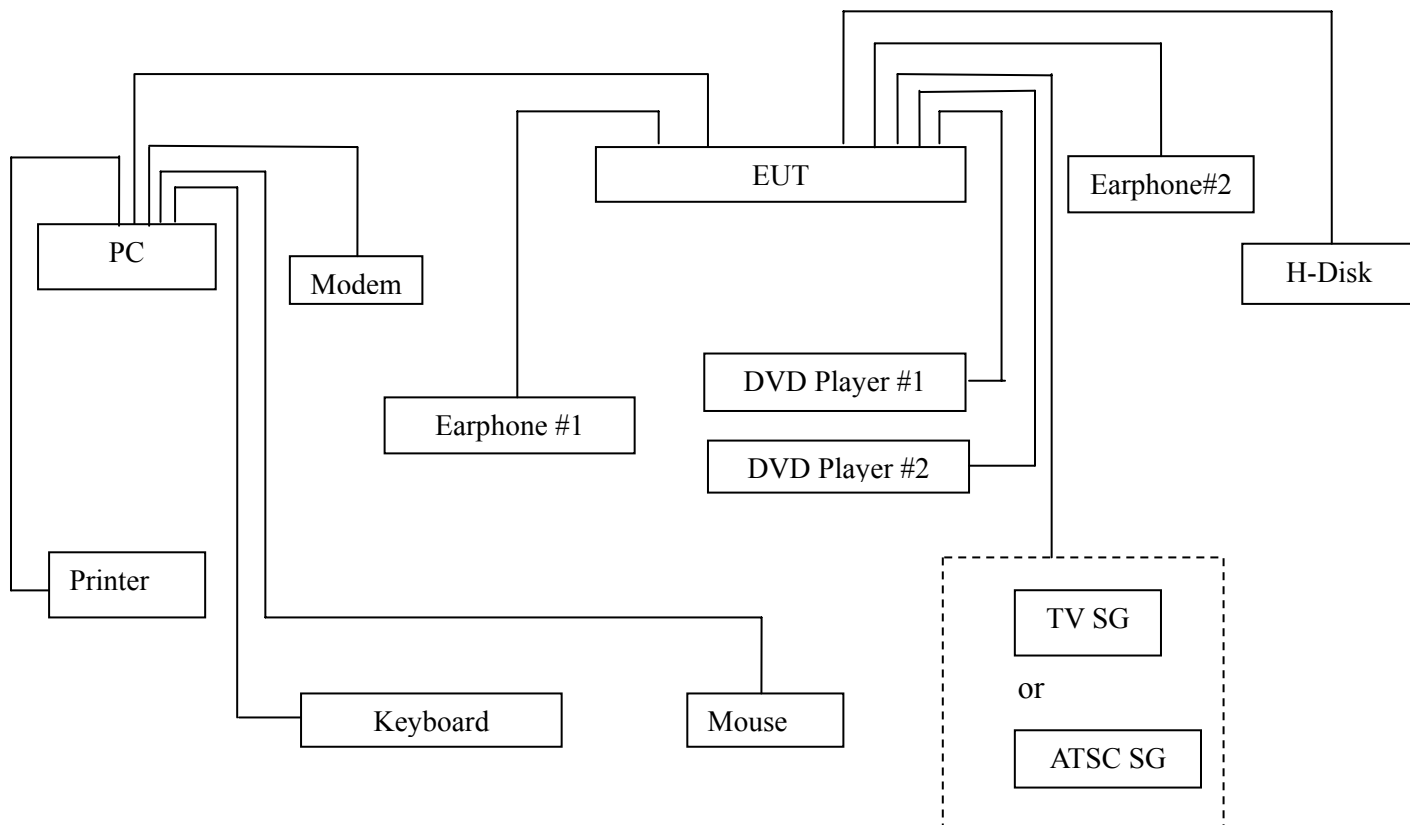
4.1 Test Equipment

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, 2016	May 06, 2017
2.	Preamplifier	Agilent	8447D	2944A06664	Apr 27, 2016	Apr 26, 2017
3.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2016	Sep 19, 2016
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 15, 2016	May 14, 2017
5.	Horn Antenna	EMCO	3115	9607-4878	Jun 03, 2016	Jun 02, 2017
6.	Spectrum	Agilent	E7405A	MY45106600	Jun 12, 2016	Jun 11, 2017
7.	Spectrum	HP	8591EM	3628A00908	May 07, 2016	May 06, 2017
8.	Software	Audix	e3	6.2007-9-10	--	--

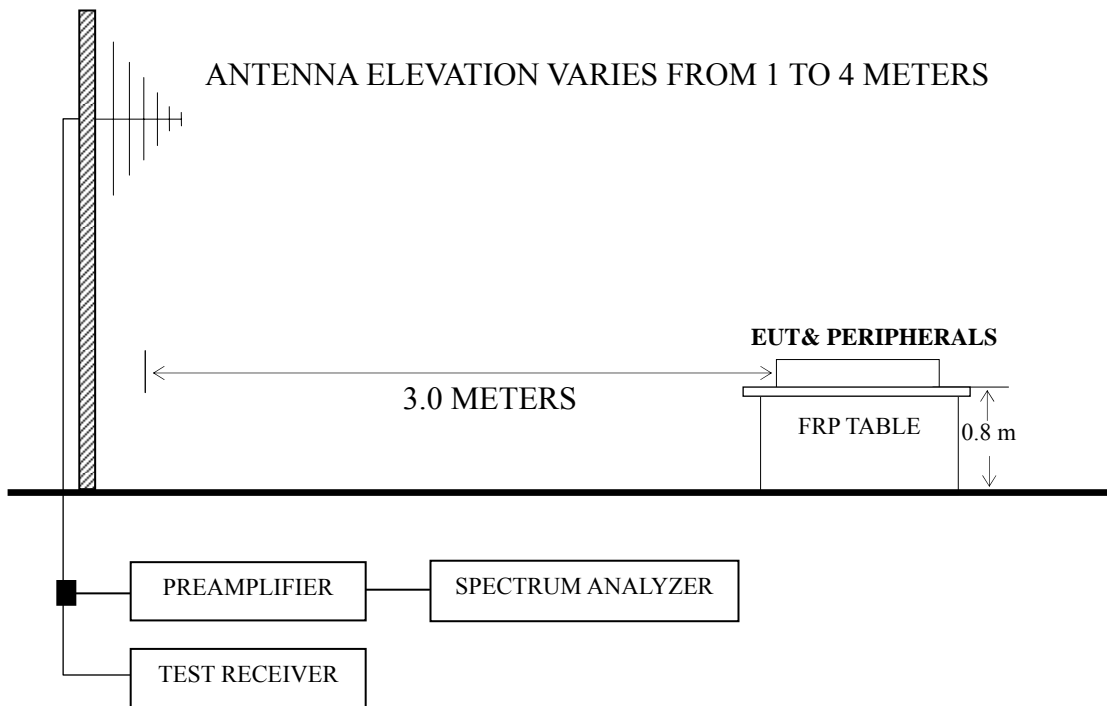
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals



4.2.2 Radiated emission test setup

4.2.2.1 Below 1GHz



■ : 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 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
HDMI 1280*1024@60Hz & 1kHz Playing	P23
HDMI 640*480@60Hz & 1kHz Playing	P24
HDMI1080P	P25
USB Play	P26

- NOTE 1 – Emission Level = Antenna Factor + Cable Loss + 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 377.259 MHz with corrected signal level of 42.56 dB ($\mu\text{V}/\text{m}$) (limit is 46.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.60 m height and the turntable was at 45°. The worst emission at vertical polarization was detected at 148.963 MHz with corrected signal level of 40.49 dB ($\mu\text{V}/\text{m}$) (limit is 43.50 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.00 m height and the turntable was at 330°.

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32N4000U Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : May 11, 2016

Polarization	Frequency (MHz)	Meter Reading dB (μ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μ V/m)	Limits dB (μ V/m)	Margin (dB)	Remark
Horizontal	78.413	24.77	9.12	1.05	--	34.94	40.00	5.06	QP
	158.112	24.42	11.14	1.70	--	37.26	43.50	6.24	
	311.087	24.58	14.15	2.60	--	41.33	46.00	4.67	
	377.259	23.43	16.44	2.69	--	42.56	46.00	3.44	
	480.000	20.00	17.50	2.90	--	40.40	46.00	5.60	
	896.997	15.88	21.30	4.46	--	41.64	46.00	4.36	
	1051.449	62.90	23.75	4.55	36.40	54.80	74.00	19.20	PK
	1579.169	59.83	25.94	3.98	35.58	54.17	74.00	19.83	
	1755.252	64.08	26.65	4.13	35.36	59.50	74.00	14.50	
	1051.449	45.89	23.75	4.55	36.40	37.79	54.00	16.21	AV
	1579.169	43.49	25.94	3.98	35.58	37.83	54.00	16.17	
	1755.252	46.48	26.65	4.13	35.36	41.90	54.00	12.10	
1051.449	45.89	23.75	4.55	36.40	37.79	54.00	16.21		

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32N4000U Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : May 11, 2016
& 1kHz Playing

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	32.979	15.54	16.91	0.67	--	33.12	40.00	6.88	QP
	80.362	24.67	9.43	1.09	--	35.19	40.00	4.81	
	148.963	27.29	11.57	1.63	--	40.49	43.50	3.01	
	480.528	19.84	17.50	2.90	--	40.24	46.00	5.76	
	636.134	17.32	19.50	2.77	--	39.59	46.00	6.41	
	896.997	12.47	21.30	4.46	--	38.23	46.00	7.77	
	1047.688	67.05	23.74	4.55	36.41	58.93	74.00	15.07	PK
	1213.502	63.00	24.51	3.54	36.11	54.94	74.00	19.06	
	1739.597	60.67	26.59	4.11	35.38	55.99	74.00	18.01	AV
	1047.688	49.20	23.74	4.55	36.41	41.08	54.00	12.92	
	1213.502	45.30	24.51	3.54	36.11	37.24	54.00	16.76	
1739.597	43.21	26.59	4.11	35.38	38.53	54.00	15.47		

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32N4000U Humidity : 60%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : May 11, 2016
& 1kHz Playing

Polarization	Frequency (MHz)	Meter Reading dB (μ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μ V/m)	Limits dB (μ V/m)	Margin (dB)
Horizontal	80.081	19.89	9.40	1.09	30.38	40.00	9.62
	160.346	21.20	11.10	1.72	34.02	43.50	9.48
	324.456	24.70	14.63	2.62	41.95	46.00	4.05
	379.914	22.68	16.50	2.69	41.87	46.00	4.13
	480.000	21.10	17.50	2.90	41.50	46.00	4.50
	896.997	15.50	21.30	4.46	41.26	46.00	4.74
Vertical	32.179	14.20	17.35	0.66	32.21	40.00	7.79
	80.362	22.48	9.43	1.09	33.00	40.00	7.00
	324.456	23.98	14.63	2.62	41.23	46.00	4.77
	480.528	19.02	17.50	2.90	39.42	46.00	6.58
	636.134	13.90	19.50	2.77	36.17	46.00	9.83
	925.756	12.50	21.63	4.61	38.74	46.00	7.26

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32N4000U Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Apr 12, 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	79.243	23.41	9.23	1.07	33.71	40.00	6.29
	135.032	22.38	12.60	1.55	36.53	43.50	6.97
	160.346	25.39	11.10	1.72	38.21	43.50	5.29
	315.481	21.10	14.30	2.61	38.01	46.00	7.99
	378.584	21.35	16.47	2.69	40.51	46.00	5.49
	480.528	21.32	17.50	2.90	41.72	46.00	4.28
Vertical	32.179	13.70	17.35	0.66	31.71	40.00	8.29
	80.081	24.22	9.40	1.09	34.71	40.00	5.29
	135.032	23.37	12.60	1.55	37.52	43.50	5.98
	480.528	19.36	17.50	2.90	39.76	46.00	6.24
	636.134	16.85	19.50	2.77	39.12	46.00	6.88
	896.997	15.29	21.30	4.46	41.05	46.00	4.95

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32N4000U Humidity : 60%RH

Test Mode : HDMI1080P Date of Test : Apr 12, 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	89.170	23.41	10.35	1.20	34.96	43.50	8.54
	130.880	21.52	12.76	1.53	35.81	43.50	7.69
	237.580	23.25	11.64	2.11	37.00	46.00	9.00
	412.180	17.89	16.64	2.75	37.28	46.00	8.72
	622.670	13.63	19.35	2.52	35.50	46.00	10.50
	808.910	14.15	20.60	3.78	38.53	46.00	7.47
Vertical	33.880	16.17	16.47	0.67	33.31	40.00	6.69
	81.410	24.28	9.51	1.10	34.89	40.00	5.11
	136.700	22.35	12.57	1.56	36.48	43.50	7.02
	235.640	24.50	11.48	2.10	38.08	46.00	7.92
	413.150	19.74	16.64	2.75	39.13	46.00	6.87
	544.100	19.82	18.62	2.63	41.07	46.00	4.93

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32N4000U Humidity : 60%RH

Test Mode : USB Play Date of Test : Apr 12, 2016

Polarization	Frequency (MHz)	Meter Reading dB (μ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μ V/m)	Limits dB (μ V/m)	Margin (dB)
Horizontal	77.530	22.31	8.95	1.05	32.31	40.00	7.69
	121.180	19.61	12.86	1.46	33.93	43.50	9.57
	216.240	22.92	10.26	2.03	35.21	46.00	10.79
	330.700	18.64	14.80	2.64	36.08	46.00	9.92
	520.820	15.20	18.14	2.78	36.12	46.00	9.88
	773.990	12.79	20.50	3.65	36.94	46.00	9.06
Vertical	88.200	26.53	10.25	1.18	37.96	43.50	5.54
	150.280	25.06	11.46	1.63	38.15	43.50	5.35
	208.480	21.87	9.96	2.01	33.84	43.50	9.66
	304.510	20.81	13.95	2.60	37.36	46.00	8.64
	526.640	12.90	18.22	2.73	33.85	46.00	12.15
	832.190	13.58	20.70	3.97	38.25	46.00	7.75

TEST ENGINEER: BILL WU

5 DEVIATION TO TEST SPECIFICATIONS

None.