

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

LED LCD TV

Model No.	Brand
LC-40N3000U	Sharp

FCC ID : W9HLCDD0057

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-F16140
Date of Test : Jun 06 – 08, 2016
Date of Report : Jun 17, 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.
Factory #4 : Guangdong Hisense Electronics Co., Ltd.
EUT Description : LED LCD TV

Model No.	Brand	Power Supply
LC-40N3000U	Sharp	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 Jun 06 – 08, 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.

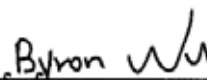

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

The test results for EUT's TV functions are contained in No.F16041, a Verification report.

Date of Test : Jun 06 – 08, 2016 Date of Report : Jun 17, 2016

Producer :


TINA LIANG / Assistant

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

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	:	<input checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type
Model No	:	LC-40N3000U
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.
Factory #4	:	Guangdong Hisense ELECTRONICS Co., Ltd Zone B, No.8 Hisense ROAD, Advanced , Manufacturing Jiangsha Demonstration Park, Jiangmen City, Guangdong Province 529000, China
LCD Panel	:	Manufacturer : Hisense M/N : JHD400DF-E31
Tuner	:	Manufacturer : SILICON LABS M/N : Si2151-A10
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 USB Port

: Connected with H-Disk

(2) Digital Audio Out

: Connected with Audio Converter to Earphone

(3) ANT Port

: Connected with ATSC SG

(4) One HDMI2 Port

: Connected with PC

(5) One HDMI3 Port

: Connected with DVD PLAYER #2

Back Port:

(6) One HDMI1 Port

: Connected with DVD PLAYER #1

(7) One AUDIO OUT Port

: Connected with Earphone

(1) One COMPONENT / AV IN Port

: Connected with DVD PLAYER #1

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, Detachable, 1.5m
Certificate : CE/EMC, FCC DoC, VCCI, MIC, C-Tick, BSMI

2.2.3 Printer

Manufacturer : HP
Model Number : P1007
Serial Number : VNFN713831
Data Cable : Shielded, Detachable, 1.5m
Certificate : GS, CE/EMC, FCC DoC, C-Tick

2.2.4 Mouse

Manufacturer : Microsoft
Model Number : RT2300
Serial Number : 6965712071551
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, 1.5m
Certificate : CCC

2.2.6 Earphone *2

Manufacturer : EDIFIER
Model Number : H210

2.2.7 DVD PLAYER #1

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

2.2.8 DVD PLAYER #2

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

2.2.9 Hard Disk

Manufacturer : Tetasy
Model Number : F12
Serial Number : A010022-486006
Data Cable : Shielded, Detachable, 1.5m.
Certificate : CE, FCC DoC

2.2.10 ATSC Signal Generator

Manufacturer : SENCORE
Model Number : ATSC997
Serial Number : 6790071

2.2.11 TV Signal Generator

Manufacturer : FLUKE
Model Number : 54200M01
Serial Number : 814008

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

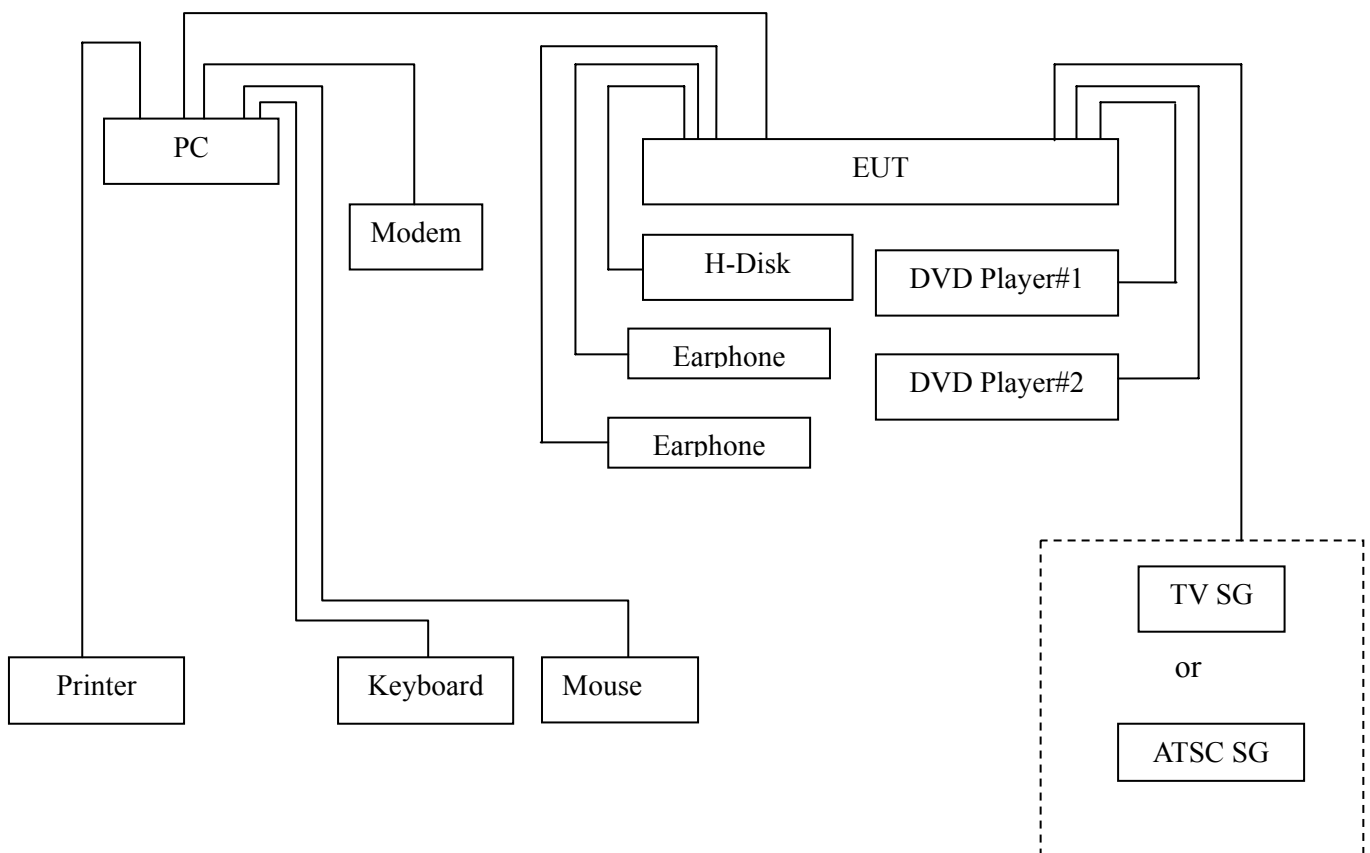
3.1 Test Equipment

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

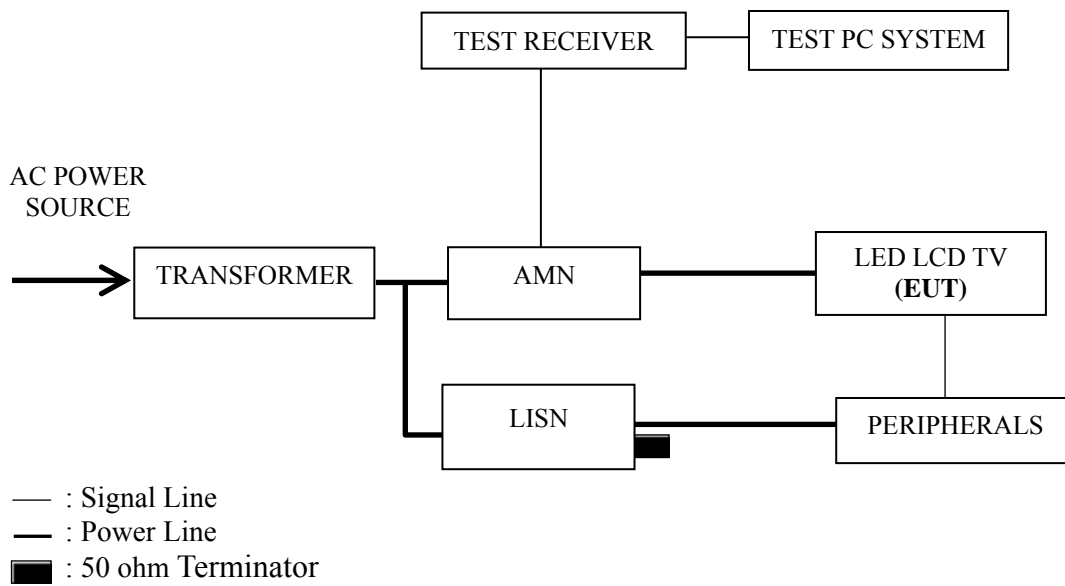
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Jul 03, 2015	Jul 02, 2016
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2015	Jun 26, 2016
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2016	Mar 19, 2017
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 HDMI 800*600@60Hz & 1kHz playing for test mode.

The worst emission is detected at 0.307MHz (Quasi-Peak Value) with corrected signal level of 46.77dB (μV) (limit is 50.04 dB (μV)), when the Line of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 23

Model No. : LC-40N3000U Humidity : 52%RH

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

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.183	38.10	10.55	48.65	64.37	15.72	QP
	0.307	38.01	10.46	48.47	60.05	11.58	
	0.406	34.40	10.43	44.83	57.73	12.90	
	0.917	26.60	10.39	36.99	56.00	19.01	
	2.670	22.69	10.45	33.14	56.00	22.86	
	7.949	32.50	10.48	42.98	60.00	17.02	
	0.183	24.20	10.55	34.75	54.37	19.62	AV
	0.307	36.11	10.46	46.57	50.05	3.48	
	0.406	29.00	10.43	39.43	47.73	8.30	
	0.917	17.40	10.39	27.79	46.00	18.21	
	2.670	12.09	10.45	22.54	46.00	23.46	
	7.949	24.30	10.48	34.78	50.00	15.22	
Neutral	0.183	40.30	10.54	50.84	64.37	13.53	QP
	0.308	38.51	10.44	48.95	60.04	11.09	
	0.409	33.00	10.41	43.41	57.67	14.26	
	1.479	30.60	10.40	41.00	56.00	15.00	
	4.786	34.90	10.48	45.38	56.00	10.62	
	8.439	32.61	10.54	43.15	60.00	16.85	
	0.183	27.60	10.54	38.14	54.37	16.23	AV
	0.308	35.21	10.44	45.65	50.04	4.39	
	0.409	27.30	10.41	37.71	47.67	9.96	
	1.479	17.90	10.40	28.30	46.00	17.70	
	4.786	25.00	10.48	35.48	46.00	10.52	
	8.439	25.21	10.54	35.75	50.00	14.25	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 23

Model No. : LC-40N3000U Humidity : 52%RH

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

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.186	37.59	10.55	48.14	64.20	16.06	QP
	0.307	38.01	10.46	48.47	60.04	11.57	
	0.407	34.30	10.43	44.73	57.72	12.99	
	0.916	26.60	10.39	36.99	56.00	19.01	
	2.633	25.19	10.45	35.64	56.00	20.36	
	7.953	33.60	10.48	44.08	60.00	15.92	
	0.186	24.89	10.55	35.44	54.20	18.76	AV
	0.307	36.31	10.46	46.77	50.04	3.27	
	0.407	29.10	10.43	39.53	47.72	8.19	
	0.916	13.90	10.39	24.29	46.00	21.71	
	2.633	13.89	10.45	24.34	46.00	21.66	
	7.953	24.50	10.48	34.98	50.00	15.02	
Neutral	0.181	40.70	10.54	51.24	64.45	13.21	QP
	0.307	38.41	10.44	48.85	60.05	11.20	
	0.409	33.30	10.41	43.71	57.67	13.96	
	1.475	30.10	10.40	40.50	56.00	15.50	
	4.789	34.30	10.48	44.78	56.00	11.22	
	6.210	35.11	10.50	45.61	60.00	14.39	
	0.181	27.60	10.54	38.14	54.45	16.31	AV
	0.307	35.21	10.44	45.65	50.05	4.40	
	0.409	27.40	10.41	37.81	47.67	9.86	
	1.475	18.80	10.40	29.20	46.00	16.80	
	4.789	24.50	10.48	34.98	46.00	11.02	
	6.210	25.41	10.50	35.91	50.00	14.09	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 23

Model No. : LC-40N3000U Humidity : 52%RH

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

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.186	37.70	10.55	48.25	64.22	15.97	QP
	0.307	38.01	10.46	48.47	60.05	11.58	
	0.409	34.20	10.43	44.63	57.68	13.05	
	0.917	26.60	10.39	36.99	56.00	19.01	
	2.662	24.39	10.45	34.84	56.00	21.16	
	7.929	32.60	10.48	43.08	60.00	16.92	
	0.186	25.00	10.55	35.55	54.22	18.67	AV
	0.307	36.11	10.46	46.57	50.05	3.48	
	0.409	28.80	10.43	39.23	47.68	8.45	
	0.917	17.50	10.39	27.89	46.00	18.11	
	2.662	13.49	10.45	23.94	46.00	22.06	
	7.929	24.40	10.48	34.88	50.00	15.12	
Neutral	0.183	40.40	10.54	50.94	64.36	13.42	QP
	0.308	38.41	10.44	48.85	60.02	11.17	
	0.410	33.00	10.41	43.41	57.65	14.24	
	1.476	30.10	10.40	40.50	56.00	15.50	
	4.789	34.00	10.48	44.48	56.00	11.52	
	8.237	34.50	10.54	45.04	60.00	14.96	
	0.183	27.70	10.54	38.24	54.36	16.12	AV
	0.308	35.11	10.44	45.55	50.02	4.47	
	0.410	27.40	10.41	37.81	47.65	9.84	
	1.476	18.70	10.40	29.10	46.00	16.90	
	4.789	24.30	10.48	34.78	46.00	11.22	
	8.237	26.40	10.54	36.94	50.00	13.06	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 23

Model No. : LC-40N3000U Humidity : 52%RH

Test Mode : HDMI 1080P Date of Test : Jun 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	38.50	10.55	49.05	64.39	15.34	QP
	0.308	38.01	10.46	48.47	60.02	11.55	
	0.407	34.20	10.43	44.63	57.71	13.08	
	0.922	27.60	10.39	37.99	56.00	18.01	
	2.641	22.69	10.45	33.14	56.00	22.86	
	7.936	32.50	10.48	42.98	60.00	17.02	
	0.182	24.80	10.55	35.35	54.39	19.04	AV
	0.308	36.11	10.46	46.57	50.02	3.45	
	0.407	29.10	10.43	39.53	47.71	8.18	
	0.922	23.80	10.39	34.19	46.00	11.81	
	2.641	11.59	10.45	22.04	46.00	23.96	
	7.936	24.60	10.48	35.08	50.00	14.92	
Neutral	0.182	40.50	10.54	51.04	64.38	13.34	QP
	0.308	38.61	10.44	49.05	60.02	10.97	
	0.408	33.30	10.41	43.71	57.69	13.98	
	0.924	29.50	10.38	39.88	56.00	16.12	
	4.647	34.20	10.48	44.68	56.00	11.32	
	7.954	33.20	10.54	43.74	60.00	16.26	
	0.182	27.40	10.54	37.94	54.38	16.44	AV
	0.308	35.21	10.44	45.65	50.02	4.37	
	0.408	28.00	10.41	38.41	47.69	9.28	
	0.924	24.40	10.38	34.78	46.00	11.22	
	4.647	22.60	10.48	33.08	46.00	12.92	
	7.954	25.10	10.54	35.64	50.00	14.36	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 23

Model No. : LC-40N3000U Humidity : 52%RH

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

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.183	38.30	10.55	48.85	64.36	15.51	QP
	0.309	37.91	10.46	48.37	60.01	11.64	
	0.408	34.30	10.43	44.73	57.69	12.96	
	0.922	27.50	10.39	37.89	56.00	18.11	
	2.636	24.79	10.45	35.24	56.00	20.76	
	7.951	33.80	10.48	44.28	60.00	15.72	
	0.183	24.70	10.55	35.25	54.36	19.11	AV
	0.309	36.01	10.46	46.47	50.01	3.54	
	0.408	28.90	10.43	39.33	47.69	8.36	
	0.922	23.80	10.39	34.19	46.00	11.81	
	2.636	13.59	10.45	24.04	46.00	21.96	
	7.951	24.50	10.48	34.98	50.00	15.02	
Neutral	0.183	40.29	10.54	50.83	64.35	13.52	QP
	0.308	38.51	10.44	48.95	60.01	11.06	
	0.562	32.81	10.37	43.18	56.00	12.82	
	1.477	30.60	10.40	41.00	56.00	15.00	
	4.788	34.30	10.48	44.78	56.00	11.22	
	7.951	33.40	10.54	43.94	60.00	16.06	
	0.183	27.39	10.54	37.93	54.35	16.42	AV
	0.308	35.11	10.44	45.55	50.01	4.46	
	0.562	18.91	10.37	29.28	46.00	16.72	
	1.477	18.40	10.40	28.80	46.00	17.20	
	4.788	24.20	10.48	34.68	46.00	11.32	
	7.951	25.60	10.54	36.14	50.00	13.86	

TEST ENGINEER: SEVEN LU

4 RADIATED EMISSION TEST

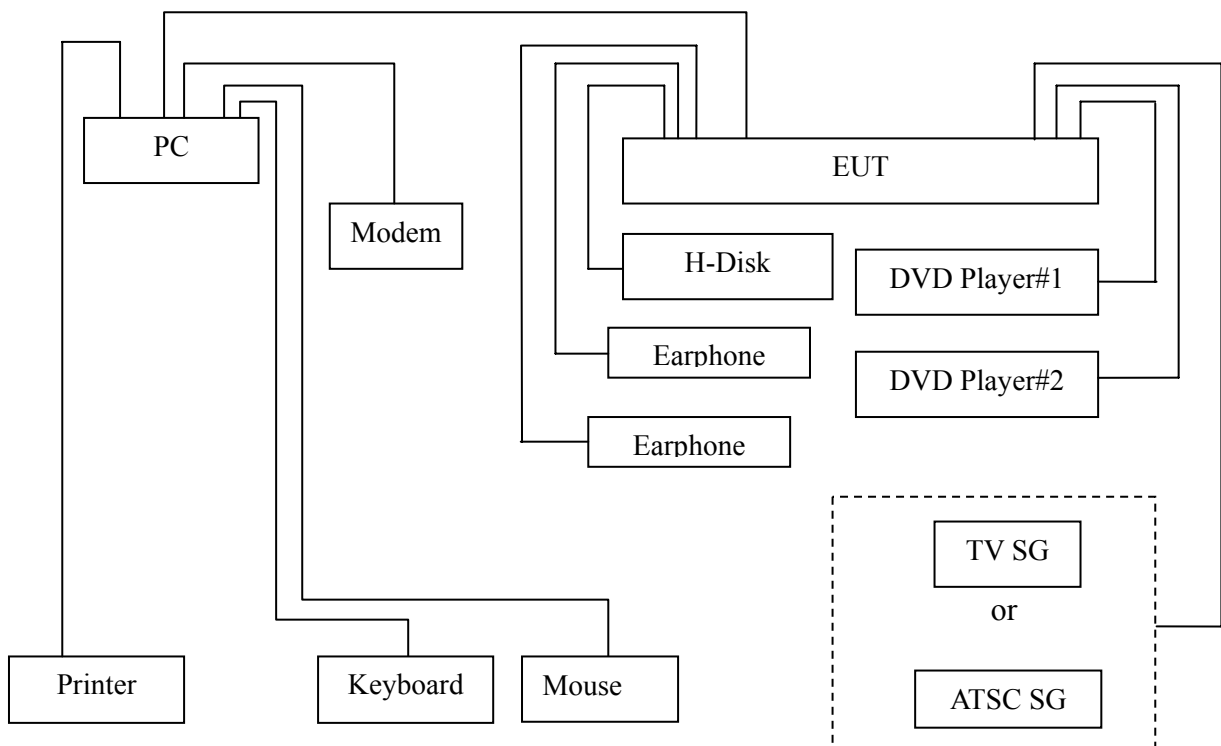
4.1 Test Equipment

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	Mar 19, 2017
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 10, 2016	May 09, 2017
5.	Horn Antenna	EMCO	3115	9607-4878	Jun 03, 2016	Jun 02, 2017
6.	Spectrum	Agilent	E7405A	MY45106600	Jun 12, 2015	Jun 11, 2016
7.	Spectrum	HP	8591EM	3628A00908	May 07, 2016	May 06, 2017
8.	Software	Audix	e3	6.2007-9-10	--	--

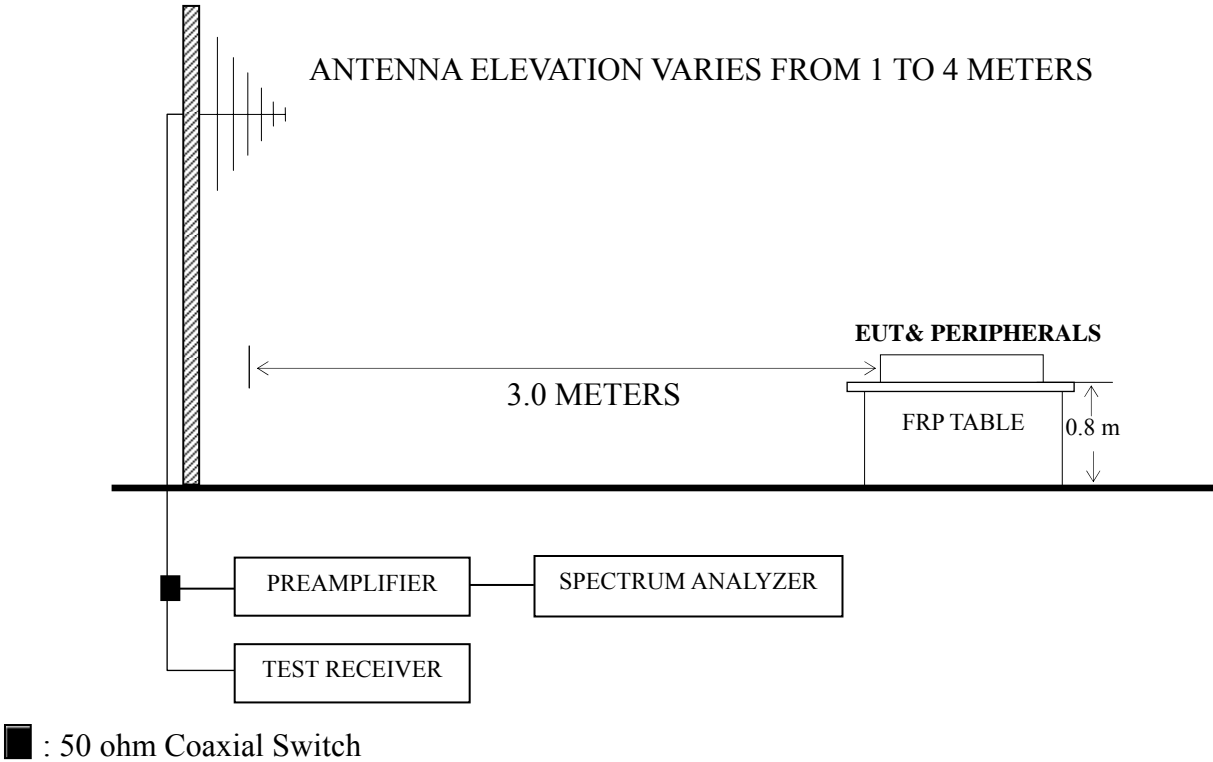
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals

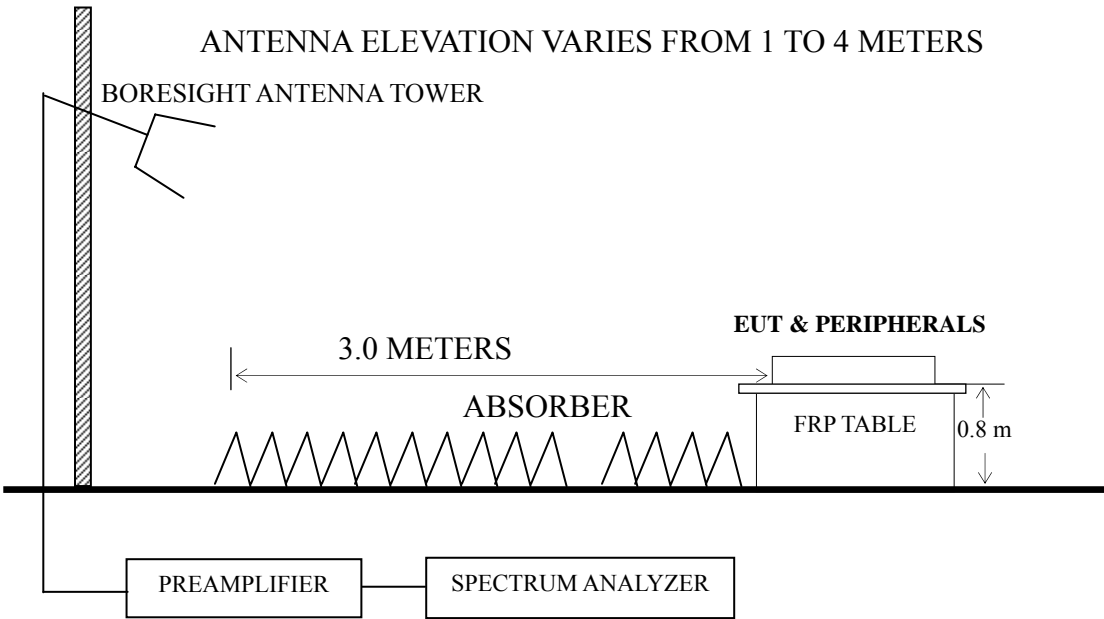


4.2.2 Radiated emission test setup

4.2.2.1 Below 1GHz



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 C63.4:2014 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.

Frequency	Test Mode	Data Page
Below 1GHz	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
Above 1GHz	HDMI 1920*1080@60Hz & 1kHz Playing	P22-P23

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 890.728MHz with corrected signal level of 42.90 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 1.50 m height and the turntable was at 75°. The worst emission at vertical polarization was detected at 818.834 MHz with corrected signal level of 41.76dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 1.40 m height and the turntable was at 250°.

EUT : LED LCD TV Temperature : 22

Model No. : LC-40N3000U Humidity : 54%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Jun 08, 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	92.139	22.17	11.13	1.23	--	34.53	43.50	8.97	QP
	148.441	22.03	12.23	1.62	--	35.88	43.50	7.62	
	185.788	24.56	10.17	1.88	--	36.61	43.50	6.89	
	325.596	17.67	14.33	2.62	--	34.62	46.00	11.38	
	651.942	16.63	19.27	2.90	--	38.80	46.00	7.20	
	890.728	17.34	21.10	4.46	--	42.90	46.00	3.10	
	1242.099	51.75	24.62	3.59	36.06	43.90	74.00	30.10	PK
	1501.898	55.32	25.62	3.89	35.68	49.15	74.00	24.85	
	1684.388	60.17	26.36	4.07	35.45	55.15	74.00	18.85	
	1242.099	28.18	24.62	3.59	36.06	20.33	54.00	33.67	AV
	1501.898	33.29	25.62	3.89	35.68	27.12	54.00	26.88	
	1684.388	37.20	26.36	4.07	35.45	32.18	54.00	21.82	

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-40N3000U Humidity : 54%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Jun 08, 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	69.114	24.39	7.32	0.93	--	32.64	40.00	7.36	QP
	126.329	20.63	12.43	1.50	--	34.56	43.50	8.94	
	182.559	25.24	10.25	1.87	--	37.36	43.50	6.14	
	228.490	24.26	11.42	2.08	--	37.76	46.00	8.24	
	562.662	17.13	18.12	2.52	--	37.77	46.00	8.23	
	818.834	17.58	20.30	3.88	--	41.76	46.00	4.24	PK
	1246.558	53.05	24.64	3.59	36.06	45.22	74.00	28.78	
	1491.172	56.79	25.57	3.86	35.69	50.53	74.00	23.47	
	1767.877	57.08	26.68	4.13	35.35	52.54	74.00	21.46	AV
	1246.558	30.52	24.64	3.59	36.06	22.69	54.00	31.31	
	1491.172	33.63	25.57	3.86	35.69	27.37	54.00	26.63	
	1767.877	35.53	26.68	4.13	35.35	30.99	54.00	23.01	

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-40N3000U Humidity : 54%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Jun 08, 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	88.033	20.04	10.50	1.18	31.72	43.50	11.78
	150.538	23.87	12.03	1.63	37.53	43.50	5.97
	252.948	18.90	12.90	2.18	33.98	46.00	12.02
	482.216	14.75	17.22	2.91	34.88	46.00	11.12
	696.857	13.59	19.17	3.54	36.30	46.00	9.70
	869.130	15.03	20.90	4.27	40.20	46.00	5.80
Vertical	32.067	15.59	17.05	0.66	33.30	40.00	6.70
	107.888	19.97	12.17	1.38	33.52	43.50	9.98
	161.474	20.09	11.24	1.72	33.05	43.50	10.45
	230.907	20.56	11.56	2.09	34.21	46.00	11.79
	638.369	14.42	19.18	2.77	36.37	46.00	9.63
	813.112	15.00	20.30	3.88	39.18	46.00	6.82

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-40N3000U Humidity : 54%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Jun 08, 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	147.404	22.63	12.35	1.27	36.25	43.50	7.25
	183.201	24.64	10.23	1.42	36.29	43.50	7.21
	226.099	20.96	11.34	1.56	33.86	46.00	12.14
	422.058	11.47	16.33	2.09	29.89	46.00	16.11
	656.530	8.22	19.23	2.63	30.08	46.00	15.92
	818.834	6.44	20.30	2.94	29.68	46.00	16.32
Vertical	45.535	20.12	9.90	0.68	30.70	40.00	9.30
	146.374	22.53	12.48	1.26	36.27	43.50	7.23
	189.260	27.20	10.03	1.44	38.67	43.50	4.83
	226.894	23.45	11.38	1.57	36.40	46.00	9.60
	658.836	10.83	19.20	2.63	32.66	46.00	13.34
	801.786	8.58	20.40	2.91	31.89	46.00	14.11

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-40N3000U Humidity : 54%RH

Test Mode : HDMI1080P Date of Test : Jun 08, 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	147.921	24.47	12.29	1.27	38.03	43.50	5.47
	185.138	27.82	10.20	1.43	39.45	43.50	4.05
	222.95	22.81	11.20	1.55	35.56	46.00	10.44
	272.278	15.97	13.26	1.69	30.92	46.00	15.08
	420.58	12.40	16.32	2.09	30.81	46.00	15.19
	845.088	14.14	20.40	2.98	37.52	46.00	8.48
Vertical	32.864	14.21	16.73	0.58	31.52	40.00	8.48
	45.855	22.43	9.70	0.68	32.81	40.00	7.19
	148.441	23.11	12.23	1.27	36.61	43.50	6.89
	191.67	27.40	9.97	1.45	38.82	43.50	4.68
	222.95	22.20	11.20	1.55	34.95	46.00	11.05
	845.088	14.79	20.40	2.98	38.17	46.00	7.83

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-40N3000U Humidity : 54%RH

Test Mode : USB Play Date of Test : Jun 08, 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	92.462	23.80	11.20	0.96	35.96	43.50	7.54
	127.218	21.90	12.57	1.17	35.64	43.50	7.86
	210.786	19.90	10.65	1.51	32.06	43.50	11.44
	348.027	14.23	15.06	1.90	31.19	46.00	14.81
	495.934	11.41	17.42	2.25	31.08	46.00	14.92
	779.607	8.08	20.10	2.87	31.05	46.00	14.95
Vertical	46.995	22.81	9.45	0.68	32.94	40.00	7.06
	108.647	20.55	12.15	1.06	33.76	43.50	9.74
	173.205	24.14	10.73	1.38	36.25	43.50	7.25
	210.048	19.07	10.60	1.51	31.18	43.50	12.32
	349.250	14.22	15.06	1.90	31.18	46.00	14.82
	785.093	9.07	20.17	2.87	32.11	46.00	13.89

TEST ENGINEER: BILL WU

5 DEVIATION TO TEST SPECIFICATIONS

None