

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

LED LCD TV

Model No.	Brand
LC-55N5300U	Sharp
HU55K3120FW	Hisense

FCC ID : W9HLCDF0084

Prepared For : Hisense Electric Co., Ltd.
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Report No. : ACI-F16132
Date of Test : May 16-23, 2016
Date of Report : Jun 02, 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.	Brand	Power Supply
LC-55N5300U	Sharp	120V/60Hz
HU55K3120FW	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 16-23, 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.F16131, a Verification report.

Date of Test : May 16-23, 2016 Date of Report : Jun 02, 2016

Producer : Huimin Yan
 HUIMIN YAN / Assistant

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

Signatory : Sammy Chen
 Authorized Signature EMC SAMMY CHEN / 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-55N5300U	HU55K3120FW
Brand	Sharp	Hisense

Note : The above models are all the same except for brand and model number.LC-55N5300U 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 : HD550DF-F51

Tuner : Manufacturer : XuGuang Tech. Co., Ltd
M/N : MxL661

Max Resolution : 1024*768@60Hz

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

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

USB Cable*2 (Lab provide) : Shielded, Detachable, 1.00m

LAN Cable : Shielded, Detachable, 1.50m

Remark:

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

Side Port:

- (1) One ANT Port : Connected with Antenna or ATSC SG
- (2) One HDMI1 Port : Connected with PC
- (3) One HDMI 2 Port : Connected with DVD PLAYER #1
- (4) One USB1 Port : Connected with H-Disk #1
- (5) One USB2 Port : Connected with H-Disk #2
- (6) One AUDIO OUT Port : Connected with Earphone

Back Port:

- (7) One COMPONENT IN/AV IN Out Port : Connected with DVD PLAYER #1
- (8) One LAN Port : Connected with PC
- (9) DIGITAL AUDIO OUT : Connected with Earphone
- (10) One HDMI3 Port : Connected with DVD PLAYER #2

2.2 Peripherals

2.2.1 PC

Manufacturer : HP
 Model Number : Pro3340
 Serial Number : 6CR2512VFD
 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 Modem

Manufacturer : TP-LINK
Model Number : TM-EC5658V
Serial Number : 07123301053
Data Cable : Shielded, Detachable, 1.5m
Certificate : CCC

2.2.5 Earphone *2

Manufacturer : EDIFIER
Model Number : H210

2.2.6 TV Signal Generator

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

2.2.7 ATSC Signal Generator

Manufacturer : SENCORE
Model Number : ATSC997
Serial Number : 6790071

2.2.8 DVD PLAYER #1

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

2.2.9 DVD PLAYER #2

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

2.2.10 Hard Disk #1

Manufacturer : Tetasys
Model Number : F12
Serial Number : A010022-4860010X
Data Cable : UnShielded, Detachable, 1.8m.
Certificate : CE, FCC DoC

2.2.11 Hard Disk #2

Manufacturer : Tetasys
Model Number : F12
Serial Number : A010022-4A60007
Data Cable : UnShielded, Detachable, 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

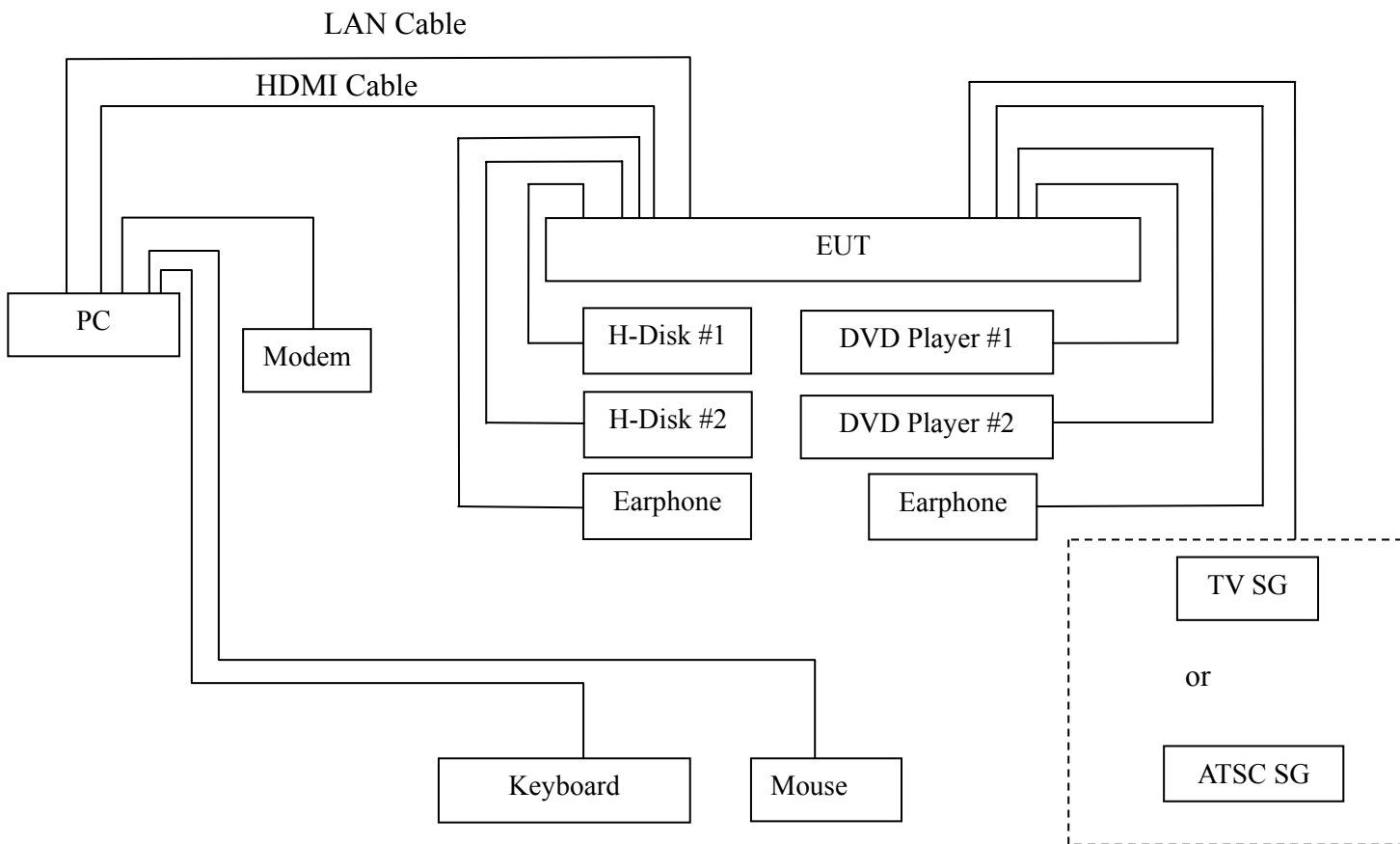
3.1 Test Equipment

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

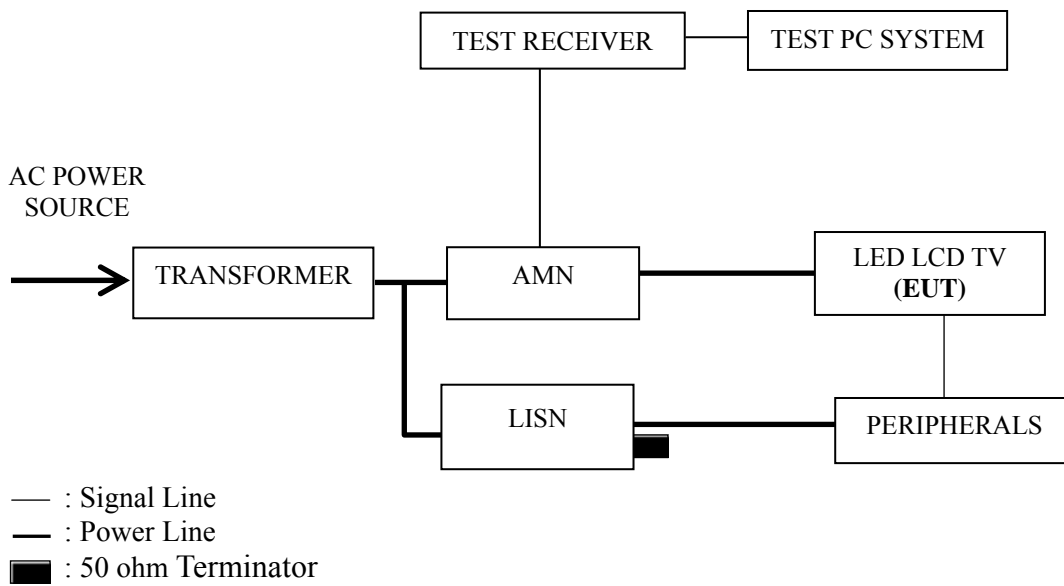
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Jul 03, 2015	Jul 02, 2016
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2015	Jun 26, 2016
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2016	Mar 19, 2017
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 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 1024*768@60Hz & 1kHz Playing
HDMI 800*600@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 C63.4:2014 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 1024*768@60Hz & 1kHz Playing	P13
HDMI 800*600@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 800*600@60Hz & 1kHz Playing test mode.
The worst emission is detected at 0.184MHz (Quasi-Peak Value) with corrected signal level of 59.05 dB (μ V) (limit is 64.31 dB (μ V)), when the Line of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 23

Model No. : LC-55N5300U Humidity : 52%RH

Test Mode : HDMI 1024*768@60Hz Date of Test : May 16, 2016
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.184	48.40	10.55	58.95	64.29	5.34	QP
	0.419	33.99	10.43	44.42	57.47	13.05	
	0.554	32.71	10.39	43.10	56.00	12.90	
	1.104	30.10	10.39	40.49	56.00	15.51	
	2.097	26.90	10.42	37.32	56.00	18.68	
	17.870	29.19	10.59	39.78	60.00	20.22	
	0.184	35.50	10.55	46.05	54.29	8.24	AV
	0.419	22.69	10.43	33.12	47.47	14.35	
	0.554	20.81	10.39	31.20	46.00	14.80	
	1.104	18.20	10.39	28.59	46.00	17.41	
	2.097	16.00	10.42	26.42	46.00	19.58	
	17.870	23.69	10.59	34.28	50.00	15.72	
Neutral	0.185	48.30	10.53	58.83	64.28	5.45	QP
	0.421	30.79	10.41	41.20	57.42	16.22	
	0.548	32.21	10.37	42.58	56.00	13.42	
	1.263	27.49	10.40	37.89	56.00	18.11	
	3.347	23.89	10.46	34.35	56.00	21.65	
	18.160	28.90	10.70	39.60	60.00	20.40	
	0.185	35.20	10.53	45.73	54.28	8.55	AV
	0.421	20.69	10.41	31.10	47.42	16.32	
	0.548	19.81	10.37	30.18	46.00	15.82	
	1.263	15.59	10.40	25.99	46.00	20.01	
	3.347	13.99	10.46	24.45	46.00	21.55	
	18.160	22.70	10.70	33.40	50.00	16.60	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N5300U Humidity : 48%RH

Test Mode : HDMI 800*600@60Hz & 1kHz Playing Date of Test : May 16, 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	0.184	48.50	10.55	59.05	64.31	5.26	QP
	0.420	34.09	10.43	44.52	57.45	12.93	
	0.632	32.19	10.40	42.59	56.00	13.41	
	1.117	30.30	10.39	40.69	56.00	15.31	
	2.592	25.70	10.44	36.14	56.00	19.86	
	17.860	28.29	10.59	38.88	60.00	21.12	
	0.184	35.70	10.55	46.25	54.31	8.06	AV
	0.420	22.49	10.43	32.92	47.45	14.53	
	0.632	19.99	10.40	30.39	46.00	15.61	
	1.117	19.50	10.39	29.89	46.00	16.11	
	2.592	14.50	10.44	24.94	46.00	21.06	
	17.860	22.09	10.59	32.68	50.00	17.32	
Neutral	0.185	48.00	10.53	58.53	64.28	5.75	QP
	0.419	30.49	10.41	40.90	57.48	16.58	
	0.547	32.01	10.37	42.38	56.00	13.62	
	1.604	27.31	10.40	37.71	56.00	18.29	
	3.551	24.80	10.46	35.26	56.00	20.74	
	18.010	29.10	10.70	39.80	60.00	20.20	
	0.185	35.20	10.53	45.73	54.28	8.55	AV
	0.419	20.19	10.41	30.60	47.48	16.88	
	0.547	19.51	10.37	29.88	46.00	16.12	
	1.604	15.21	10.40	25.61	46.00	20.39	
	3.551	14.10	10.46	24.56	46.00	21.44	
	18.010	23.30	10.70	34.00	50.00	16.00	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N5300U Humidity : 48%RH

Test Mode : HDMI 640*480@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	0.185	48.00	10.55	58.55	64.25	5.70	QP
	0.414	33.40	10.43	43.83	57.57	13.74	
	0.634	32.29	10.40	42.69	56.00	13.31	
	1.271	27.90	10.40	38.30	56.00	17.70	
	2.105	27.70	10.42	38.12	56.00	17.88	
	18.240	28.10	10.59	38.69	60.00	21.31	
	0.185	35.70	10.55	46.25	54.25	8.00	AV
	0.414	21.60	10.43	32.03	47.57	15.54	
	0.634	20.09	10.40	30.49	46.00	15.51	
	1.271	16.40	10.40	26.80	46.00	19.20	
	2.105	17.20	10.42	27.62	46.00	18.38	
	18.240	21.90	10.59	32.49	50.00	17.51	
Neutral	0.183	48.39	10.54	58.93	64.33	5.40	QP
	0.418	30.39	10.41	40.80	57.48	16.68	
	0.623	31.30	10.37	41.67	56.00	14.33	
	1.110	29.91	10.38	40.29	56.00	15.71	
	2.115	28.80	10.42	39.22	56.00	16.78	
	17.910	28.00	10.70	38.70	60.00	21.30	
	0.183	34.89	10.54	45.43	54.33	8.90	AV
	0.418	19.69	10.41	30.10	47.48	17.38	
	0.623	21.50	10.37	31.87	46.00	14.13	
	1.110	19.21	10.38	29.59	46.00	16.41	
	2.115	17.20	10.42	27.62	46.00	18.38	
	17.910	21.80	10.70	32.50	50.00	17.50	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N5300U Humidity : 48%RH

Test Mode : HDMI 1080P Date of Test : May 16, 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	0.184	48.40	10.55	58.95	64.31	5.36	QP
	0.418	33.80	10.43	44.23	57.49	13.26	
	0.616	31.50	10.39	41.89	56.00	14.11	
	1.261	28.80	10.40	39.20	56.00	16.80	
	2.114	28.40	10.42	38.82	56.00	17.18	
	17.990	28.40	10.59	38.99	60.00	21.01	
	0.184	35.70	10.55	46.25	54.31	8.06	AV
	0.418	22.00	10.43	32.43	47.49	15.06	
	0.616	21.60	10.39	31.99	46.00	14.01	
	1.261	16.00	10.40	26.40	46.00	19.60	
	2.114	17.50	10.42	27.92	46.00	18.08	
	17.990	22.80	10.59	33.39	50.00	16.61	
Neutral	0.184	48.29	10.54	58.83	64.31	5.48	QP
	0.372	29.09	10.43	39.52	58.46	18.94	
	0.549	33.21	10.37	43.58	56.00	12.42	
	1.105	29.01	10.38	39.39	56.00	16.61	
	2.340	28.50	10.43	38.93	56.00	17.07	
	18.030	28.10	10.70	38.80	60.00	21.20	
	0.184	35.09	10.54	45.63	54.31	8.68	AV
	0.372	19.89	10.43	30.32	48.46	18.14	
	0.549	21.01	10.37	31.38	46.00	14.62	
	1.105	18.61	10.38	28.99	46.00	17.01	
	2.340	15.70	10.43	26.13	46.00	19.87	
	18.030	21.90	10.70	32.60	50.00	17.40	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N5300U 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	0.183	48.50	10.55	59.05	64.35	5.30	QP
	0.420	33.79	10.43	44.22	57.44	13.22	
	0.555	32.81	10.39	43.20	56.00	12.80	
	1.115	30.10	10.39	40.49	56.00	15.51	
	2.364	28.30	10.43	38.73	56.00	17.27	
	17.790	28.09	10.59	38.68	60.00	21.32	
	AV	0.183	34.80	10.55	45.35	54.35	9.00
		0.420	22.49	10.43	32.92	47.44	14.52
		0.555	21.31	10.39	31.70	46.00	14.30
		1.115	19.40	10.39	29.79	46.00	16.21
		2.364	15.80	10.43	26.23	46.00	19.77
		17.790	22.49	10.59	33.08	50.00	16.92
Neutral	0.185	47.90	10.53	58.43	64.27	5.84	QP
	0.421	30.69	10.41	41.10	57.43	16.33	
	0.548	33.11	10.37	43.48	56.00	12.52	
	1.122	29.31	10.38	39.69	56.00	16.31	
	1.865	28.00	10.42	38.42	56.00	17.58	
	18.110	28.10	10.70	38.80	60.00	21.20	
	AV	0.185	35.40	10.53	45.93	54.27	8.34
		0.421	20.19	10.41	30.60	47.43	16.83
		0.548	20.51	10.37	30.88	46.00	15.12
		1.122	18.21	10.38	28.59	46.00	17.41
		1.865	16.10	10.42	26.52	46.00	19.48
		18.110	22.50	10.70	33.20	50.00	16.80

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N5300U Humidity : 48%RH

Test Mode : LAN 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	0.185	48.40	10.55	58.95	64.24	5.29	QP
	0.419	33.69	10.43	44.12	57.48	13.36	
	0.548	33.01	10.39	43.40	56.00	12.60	
	1.110	30.90	10.39	41.29	56.00	14.71	
	2.598	26.10	10.44	36.54	56.00	19.46	
	17.700	27.29	10.59	37.88	60.00	22.12	
	AV	0.185	35.70	10.55	46.25	54.24	7.99
		0.419	22.29	10.43	32.72	47.48	14.76
		0.548	21.21	10.39	31.60	46.00	14.40
		1.110	19.50	10.39	29.89	46.00	16.11
		2.598	14.40	10.44	24.84	46.00	21.16
		17.700	21.39	10.59	31.98	50.00	18.02
Neutral	0.185	48.30	10.53	58.83	64.27	5.44	QP
	0.405	29.30	10.41	39.71	57.76	18.05	
	0.560	32.41	10.37	42.78	56.00	13.22	
	1.120	30.01	10.38	40.39	56.00	15.61	
	2.613	26.61	10.43	37.04	56.00	18.96	
	18.080	28.00	10.70	38.70	60.00	21.30	
	AV	0.185	35.40	10.53	45.93	54.27	8.34
		0.405	16.50	10.41	26.91	47.76	20.85
		0.560	19.61	10.37	29.98	46.00	16.02
		1.120	19.21	10.38	29.59	46.00	16.41
		2.613	14.51	10.43	24.94	46.00	21.06
		18.080	22.40	10.70	33.10	50.00	16.90

4 RADIATED EMISSION TEST

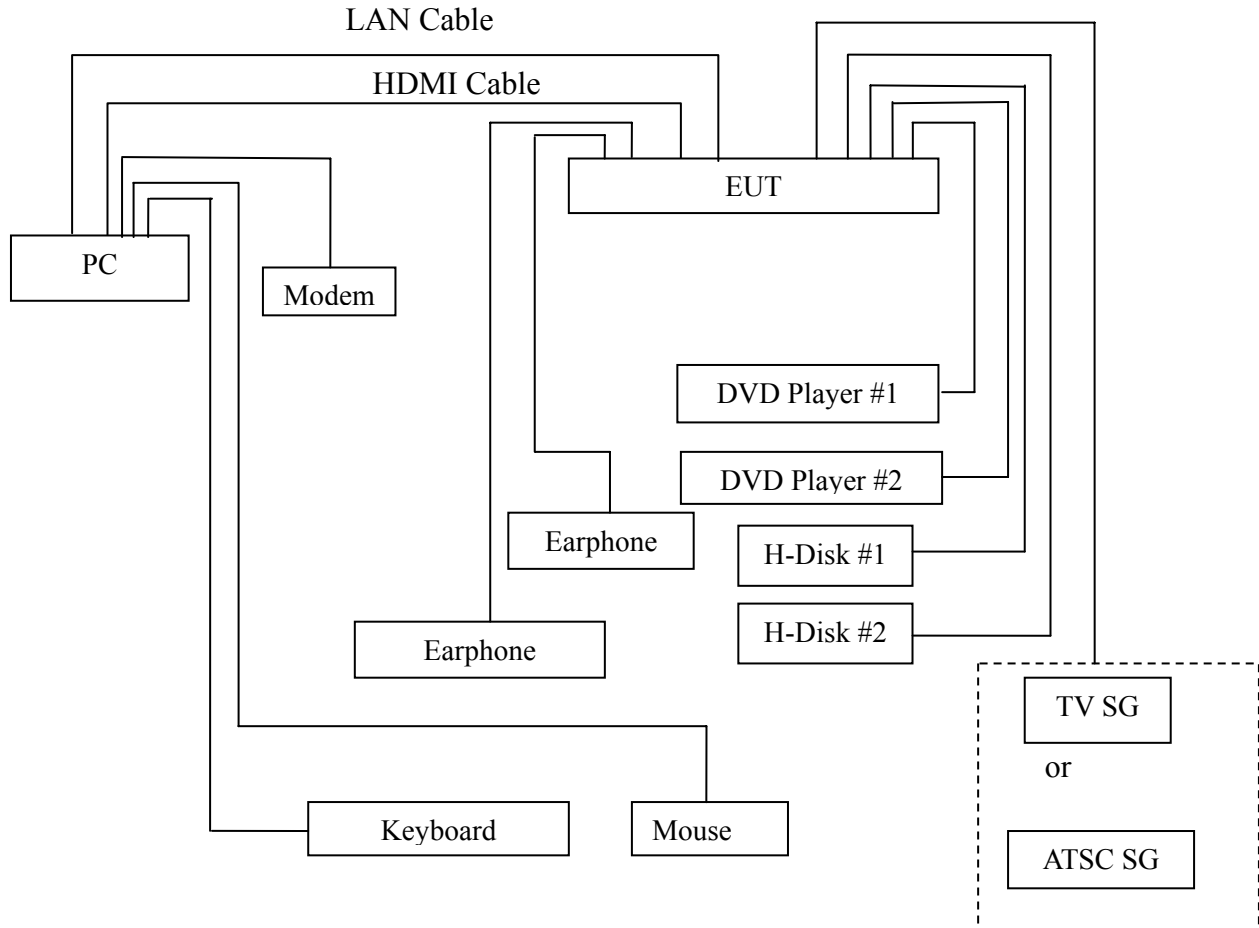
4.1 Test Equipment

The following test equipments are used during the radiated emission test in a semi-anechoic chamber:

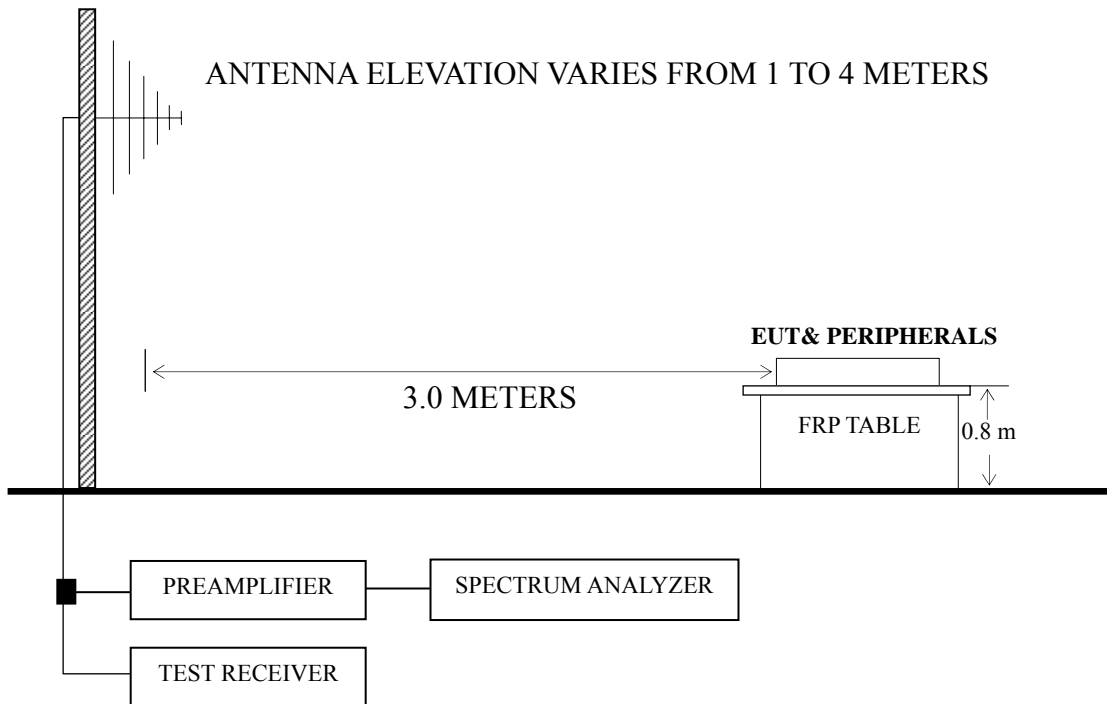
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101303	May 07, 2016	May 06, 2017
2.	Preamplifier	Agilent	8447D	2944A06664	Apr 27, 2016	Apr 26, 2017
3.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2016	Sep 19, 2016
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 15, 2016	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



■ : 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 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 1024*768@60Hz & 1kHz Playing	P23
HDMI 800*600@60Hz & 1kHz Playing	P24
HDMI 640*480@60Hz & 1kHz playing	P25
HDMI1080P	P26
USB Play	P27
LAN Play	P28

NOTE 1 – Emission Level = Antenna Factor + Cable Loss + Meter Reading. (< 1GHz);

NOTE 2 – All readings are Quasi-Peak values.

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 1024*768@60Hz & 1kHz Playing Playing test mode. The worst emission at horizontal polarization was detected at 796.183 MHz with corrected signal level of 41.64 dB ($\mu\text{V}/\text{m}$) (limit is 46.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.80 m height and the turntable was at 110°. The worst emission at vertical polarization was detected at 54.643 MHz with corrected signal level of 35.45 dB ($\mu\text{V}/\text{m}$) (limit is 40.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.80 m height and the turntable was at 200°.

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N5300U Humidity : 60%RH

Test Mode : HDMI 1024*768@60Hz & 1kHz Playing Date of Test : May 23, 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	55.203	23.10	6.48	0.85	30.43	40.00	9.57
	77.323	23.02	8.89	1.04	32.95	40.00	7.05
	150.393	23.82	11.46	1.63	36.91	43.50	6.59
	297.111	25.36	13.70	2.56	41.62	46.00	4.38
	434.920	20.21	16.86	2.79	39.86	46.00	6.14
	799.332	17.03	20.60	3.68	41.31	46.00	4.69
Vertical	54.298	28.00	6.66	0.84	35.50	40.00	4.50
	77.289	25.62	8.89	1.04	35.55	40.00	4.45
	150.204	21.93	11.46	1.63	35.02	43.50	8.48
	297.019	24.62	13.70	2.56	40.88	46.00	5.12
	401.293	18.12	16.60	2.72	37.44	46.00	8.56
	791.294	14.29	20.50	3.68	38.47	46.00	7.53

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N5300U Humidity : 60%RH

Test Mode : HDMI 800*600@60Hz & 1kHz Playing Date of Test : May 23, 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	77.203	22.50	8.89	1.04	32.43	40.00	7.57
	149.284	24.78	11.57	1.63	37.98	43.50	5.52
	222.103	24.51	10.65	2.05	37.21	46.00	8.79
	297.222	23.98	13.70	2.56	40.24	46.00	5.76
	433.019	18.12	16.84	2.79	37.75	46.00	8.25
	796.111	16.72	20.57	3.68	40.97	46.00	5.03
Vertical	32.928	16.00	16.99	0.67	33.66	40.00	6.34
	55.398	26.44	6.43	0.85	33.72	40.00	6.28
	150.485	24.13	11.46	1.63	37.22	43.50	6.28
	298.328	23.43	13.75	2.56	39.74	46.00	6.26
	505.493	15.70	17.90	2.89	36.49	46.00	9.51
	790.393	15.40	20.50	3.68	39.58	46.00	6.42

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N5300U Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : May 23, 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	35.820	17.03	15.20	0.69	32.92	40.00	7.08
	86.260	22.86	9.95	1.16	33.97	40.00	6.03
	124.090	21.12	13.04	1.49	35.65	43.50	7.85
	186.170	22.25	10.44	1.88	34.57	43.50	8.93
	321.970	19.55	14.54	2.62	36.71	46.00	9.29
	686.690	15.79	19.80	3.41	39.00	46.00	7.00
Vertical	81.410	21.56	9.51	1.10	32.17	40.00	7.83
	183.260	22.71	10.50	1.87	35.08	43.50	8.42
	289.960	23.17	13.60	2.49	39.26	46.00	6.74
	423.820	17.66	16.80	2.78	37.24	46.00	8.76
	636.250	15.96	19.50	2.77	38.23	46.00	7.77
	972.840	11.15	22.40	4.80	38.35	54.00	15.65

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N5300U Humidity : 60%RH

Test Mode : HDMI 1080P Date of Test : May 23, 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	105.272	23.20	12.51	1.36	37.07	43.50	6.43
	141.330	24.02	12.40	1.59	38.01	43.50	5.49
	229.293	21.48	11.12	2.08	34.68	46.00	11.32
	307.831	19.95	14.03	2.60	36.58	46.00	9.42
	467.235	18.40	17.26	2.87	38.53	46.00	7.47
	830.400	15.65	20.70	3.97	40.32	46.00	5.68
Vertical	33.445	14.71	16.69	0.67	32.07	40.00	7.93
	69.357	23.95	7.21	0.93	32.09	40.00	7.91
	138.874	24.18	12.52	1.57	38.27	43.50	5.23
	209.313	23.36	10.00	2.01	35.37	43.50	8.13
	416.179	16.31	16.72	2.75	35.78	46.00	10.22
	658.836	14.96	19.60	3.03	37.59	46.00	8.41

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N5300U Humidity : 60%RH

Test Mode : USB Play Date of Test : May 23, 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	116.132	20.71	12.72	1.43	34.86	43.50	8.64
	168.414	22.87	11.01	1.77	35.65	43.50	7.85
	265.676	20.84	13.20	2.29	36.33	46.00	9.67
	390.723	18.16	16.50	2.71	37.37	46.00	8.63
	597.223	14.87	18.98	2.31	36.16	46.00	9.84
	851.035	12.90	20.73	4.17	37.80	46.00	8.20
Vertical	32.406	15.40	17.28	0.66	33.34	40.00	6.66
	57.999	24.43	6.20	0.87	31.50	40.00	8.50
	120.277	21.58	12.83	1.46	35.87	43.50	7.63
	189.739	20.83	10.33	1.90	33.06	43.50	10.44
	351.708	20.81	15.64	2.66	39.11	46.00	6.89
	562.662	14.75	18.75	2.52	36.02	46.00	9.98

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N5300U Humidity : 60%RH

Test Mode : LAN Play Date of Test : May 23, 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	112.131	21.94	12.65	1.41	36.00	43.50	7.50
	147.921	20.72	11.73	1.62	34.07	43.50	9.43
	301.422	16.82	13.84	2.59	33.25	46.00	12.75
	404.667	19.38	16.60	2.72	38.70	46.00	7.30
	687.151	11.57	19.75	3.41	34.73	46.00	11.27
	836.244	13.85	20.75	3.97	38.57	46.00	7.43
Vertical	32.067	14.33	17.43	0.66	32.42	40.00	7.58
	58.819	25.81	6.20	0.87	32.88	40.00	7.12
	113.714	20.71	12.67	1.42	34.80	43.50	8.70
	150.011	24.10	11.50	1.63	37.23	43.50	6.27
	336.035	19.33	14.97	2.64	36.94	46.00	9.06
	675.208	15.23	19.70	3.28	38.21	46.00	7.79

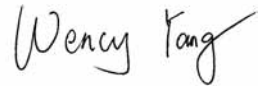
5 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
Conductive cotton bubble	SMR-TSL-4-3.5-5R	QINGDAO JOINSET CO.,LTD	See Internal Photos Figure18

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)

6 DEVIATION TO TEST SPECIFICATIONS

None.