

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

LED LCD TV

Model No.	Brand
LC-55N7000U LC-55N7000C	Sharp

FCC ID : W9HLCDF0085

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-F16152
Date of Test : Jun 17-24, 2016
Date of Report : Jul 04, 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-55N7000U	Sharp	120V/60Hz
LC-55N7000C		

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 17-24, 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.

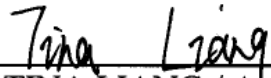
This report contains data that are not covered by the NVLAP accreditation.

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.


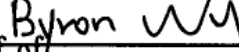
The test results for EUT's TV functions are contained in No.F16153, a Verification report.

Date of Test : Jun 17-24, 2016 Date of Report : Jul 04, 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 KWOK / 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-55N7000U, LC-55N7000C
Brand	:	Sharp
Note	:	The above models are all the same except for model number. LC-55N7000U 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 : HE550IU-B51(110)
Tuner	:	Manufacturer : XuGuang Tech. Co., Ltd M/N : HFT-96S3/W11FJ2H\ROH
Max Resolution	:	3840*2160@60Hz
HDMI Cable*4 (Lab provide)	:	Shielded, Detachable, 1.50m
Power Cord	:	Unshielded, Detachable, 1.80m, 2C
USB Cable*3 (Lab provide)	:	Shielded, Detachable, 1.00m
LAN Cable	:	Shielded, Detachable, 1.50m
MHL to HDMI Adaptor: with RCP (Lab provide)	:	Manufacture: CE-Link M/N: 3002

Remark:

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

Side Port:

- (1) One HDMI 2 Port : Connected with PC
- (2) One HDMI1 / MHL Port : Connected with Mobile Photo
- (3) One USB Port #1 : Connected with H-Disk #1
- (4) One USB Port #2 : Connected with H-Disk #2
- (5) One USB Port #3 : Connected with H-Disk #3
- (6) One ANT Port : Connected with ATSC SG
- (7) One AUDIO OUT Port : Connected with Earphone

Back Port:

- (8) One COMPONENT IN/AV IN Out Port : Connected with DVD PLAYER #1
- (9) One LAN Port : Connected with PC
- (10) DIGITAL AUDIO OUT : Connected with Audio Converter to Earphone
- (11) One HDMI3 Port : Connected with DVD PLAYER #1
- (12) One HDMI4 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, Detachable, 1.5m
 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, Detachable, 1.5m.
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 : Shielded, 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

2.2.12 Hard Disk #3

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

2.2.13 Mobile Phone

Manufacturer : SAMSUNG
Model Number : GT-I9100G
Serial Number : 6935152011519
Data Cable : Shielded, Detachable, 1.5m.
Certificate : CE, EMC

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

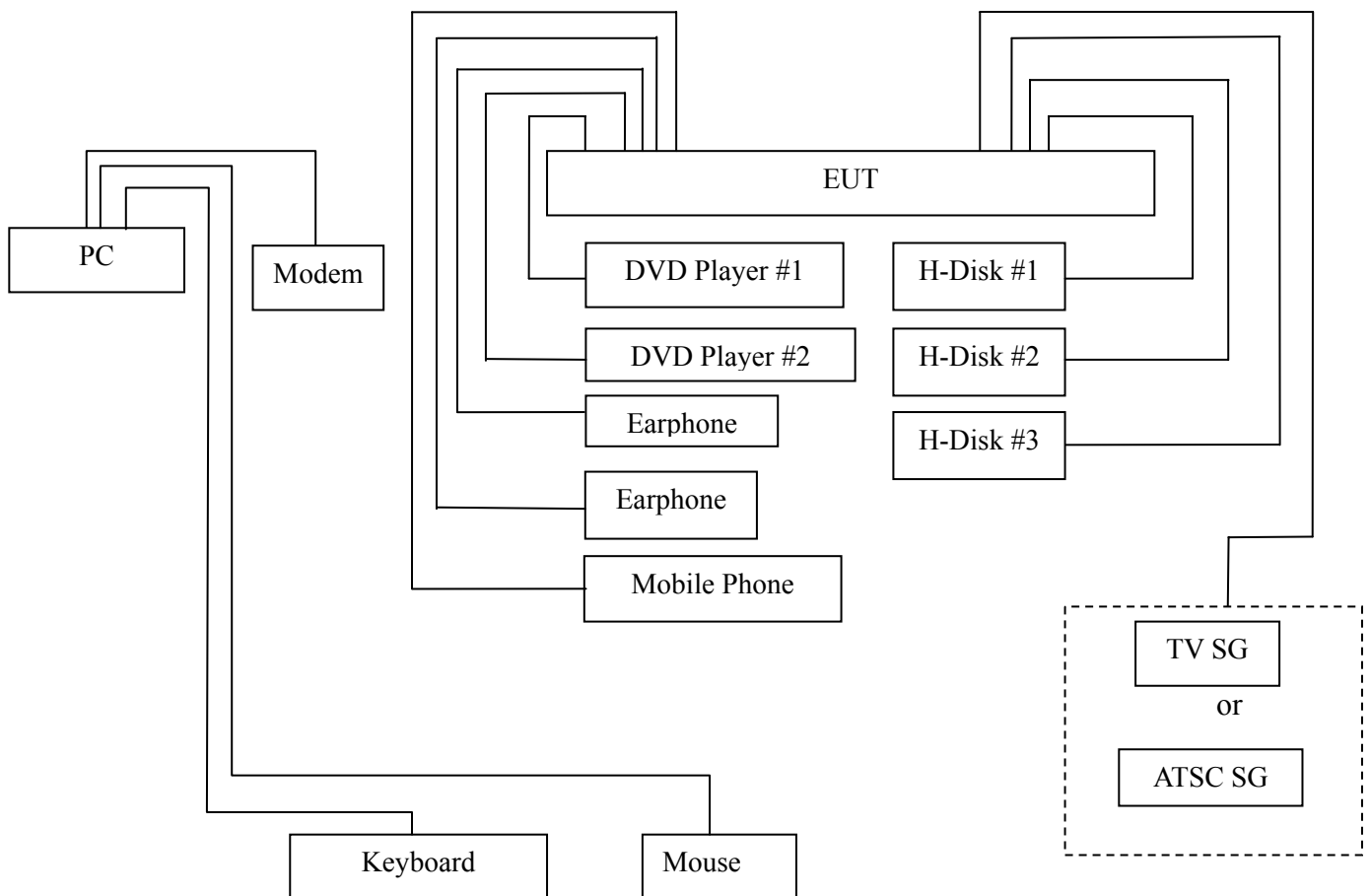
3.1 Test Equipment

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

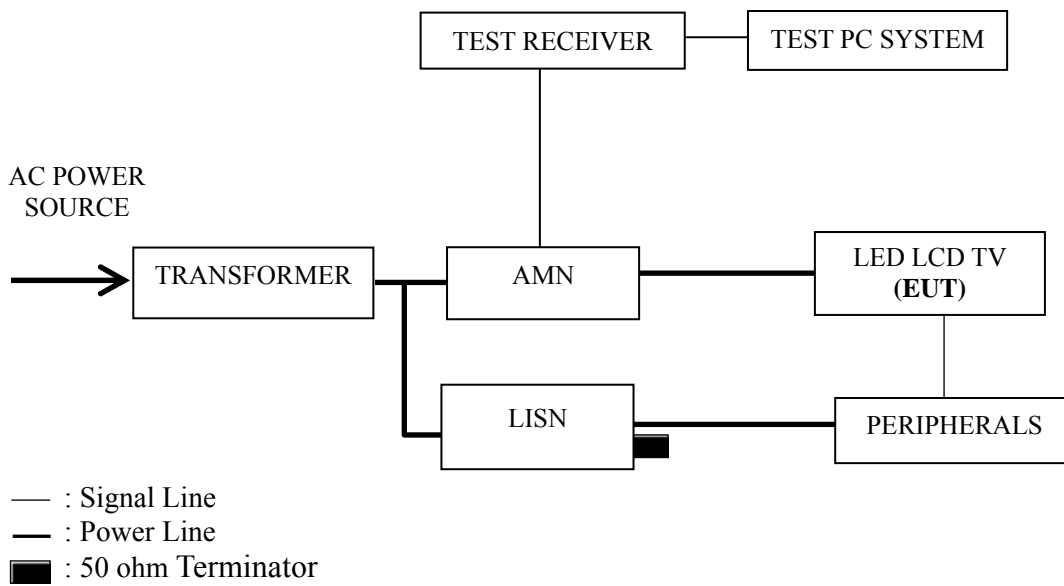
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Jul 03, 2015	Jul 02, 2016
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2015	Jun 26, 2016
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2016	Mar 19, 2017
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 In MHL mode, set the EUT play digital media from mobile phone.
- 3.5.9 The other peripherals devices were driven and operated during the test.
- 3.5.10 The test modes are as follows:

Test Mode
HDMI 3840*2160@60Hz & 1kHz playing
HDMI 1920*1080@60Hz & 1kHz playing
HDMI 1280*1024@60Hz & 1kHz playing
HDMI 640*480@60Hz & 1kHz playing
HDMI 1080P
USB Play
LAN Play
MHL

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 3840*2160@60Hz & 1kHz playing	P14
HDMI 1920*1080@60Hz & 1kHz playing	P15
HDMI 1280*1024@60Hz & 1kHz playing	P16
HDMI 640*480@60Hz & 1kHz playing	P17
HDMI 1080P	P18
USB Play	P19
LAN Play	P20
MHL	P21

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 USB Play test mode. The worst emission is detected at 0.176MHz (Quasi-Peak Value) with corrected signal level of 59.66 dB (μ V) (limit is 64.70 dB (μ V)), when the Line of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 23

Model No. : LC-55N7000U Humidity : 52%RH

Test Mode : HDMI 3840*2160@60Hz Date of Test : Jun 17, 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	0.175	48.90	10.56	59.46	64.72	5.26	QP
	0.405	33.80	10.43	44.23	57.75	13.52	
	0.609	32.40	10.39	42.79	56.00	13.21	
	1.059	28.80	10.39	39.19	56.00	16.81	
	2.443	27.91	10.43	38.34	56.00	17.66	
	21.850	32.69	10.67	43.36	60.00	16.64	
	AV	0.175	36.20	10.56	46.76	54.72	7.96
		0.405	21.90	10.43	32.33	47.75	15.42
		0.609	19.30	10.39	29.69	46.00	16.31
		1.059	16.50	10.39	26.89	46.00	19.11
		2.443	17.21	10.43	27.64	46.00	18.36
		21.850	27.29	10.67	37.96	50.00	12.04
Neutral	0.177	48.19	10.55	58.74	64.65	7.30	QP
	0.397	29.50	10.41	39.91	57.92	18.01	
	0.546	30.21	10.37	40.58	56.00	15.42	
	1.202	26.69	10.40	37.09	56.00	18.91	
	2.451	26.60	10.43	37.03	56.00	18.97	
	21.290	32.90	10.75	43.65	60.00	16.35	
	AV	0.177	36.89	10.55	47.44	54.65	7.21
		0.397	17.10	10.41	27.51	47.92	20.41
		0.546	17.61	10.37	27.98	46.00	18.02
		1.202	14.19	10.40	24.59	46.00	21.41
		2.451	16.10	10.43	26.53	46.00	19.47
		21.290	27.30	10.75	38.05	50.00	11.95

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 48%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Jun 17, 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	0.175	49.10	10.56	59.66	64.72	5.06	QP
	0.405	34.00	10.43	44.43	57.76	13.33	
	0.967	28.50	10.39	38.89	56.00	17.11	
	2.426	27.90	10.43	38.33	56.00	17.67	
	4.774	25.70	10.49	36.19	56.00	19.81	
	21.840	32.89	10.67	43.56	60.00	16.44	
	0.175	36.60	10.56	47.16	54.72	7.56	AV
	0.405	22.10	10.43	32.53	47.76	15.23	
	0.967	16.10	10.39	26.49	46.00	19.51	
	2.426	17.00	10.43	27.43	46.00	18.57	
	4.774	16.60	10.49	27.09	46.00	18.91	
	21.840	27.09	10.67	37.76	50.00	12.24	
Neutral	0.175	48.60	10.55	59.15	64.73	5.58	QP
	0.404	29.80	10.41	40.21	57.78	17.57	
	0.531	28.90	10.38	39.28	56.00	16.72	
	1.062	28.50	10.38	38.88	56.00	17.12	
	2.422	27.30	10.43	37.73	56.00	18.27	
	21.510	32.20	10.76	42.96	60.00	17.04	
	0.175	36.10	10.55	46.65	54.73	8.08	AV
	0.404	18.50	10.41	28.91	47.78	18.87	
	0.531	15.00	10.38	25.38	46.00	20.62	
	1.062	16.60	10.38	26.98	46.00	19.02	
	2.422	17.10	10.43	27.53	46.00	18.47	
	21.510	26.70	10.76	37.46	50.00	12.54	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 48%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Jun 17, 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	0.174	48.90	10.56	59.46	64.75	5.29	QP
	0.390	33.10	10.44	43.54	58.07	14.53	
	0.611	32.70	10.39	43.09	56.00	12.91	
	1.211	28.80	10.40	39.20	56.00	16.80	
	2.469	27.21	10.43	37.64	56.00	18.36	
	22.420	30.10	10.68	40.78	60.00	19.22	
	0.174	36.30	10.56	46.86	54.75	7.89	AV
	0.390	20.60	10.44	31.04	48.07	17.03	
	0.611	18.40	10.39	28.79	46.00	17.21	
	1.211	16.20	10.40	26.60	46.00	19.40	
	2.469	16.31	10.43	26.74	46.00	19.26	
	22.420	24.70	10.68	35.38	50.00	14.62	
Neutral	0.175	48.60	10.55	59.15	64.73	5.58	QP
	0.399	29.80	10.41	40.21	57.88	17.67	
	0.991	28.60	10.38	38.98	56.00	17.02	
	1.675	27.51	10.40	37.91	56.00	18.09	
	4.600	25.59	10.48	36.07	56.00	19.93	
	21.550	31.00	10.76	41.76	60.00	18.24	
	0.175	36.50	10.55	47.05	54.73	7.68	AV
	0.399	17.60	10.41	28.01	47.88	19.87	
	0.991	17.80	10.38	28.18	46.00	17.82	
	1.675	15.91	10.40	26.31	46.00	19.69	
	4.600	15.79	10.48	26.27	46.00	19.73	
	21.550	25.20	10.76	35.96	50.00	14.04	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 48%RH

Test Mode : HDMI 640*480@60Hz & 1kHz playing Date of Test : Jun 17, 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	0.173	48.90	10.56	59.46	64.82	5.36	QP
	0.399	33.70	10.43	44.13	57.87	13.74	
	0.527	30.00	10.40	40.40	56.00	15.60	
	1.051	29.80	10.39	40.19	56.00	15.81	
	2.970	25.00	10.45	35.45	56.00	20.55	
	21.660	30.20	10.66	40.86	60.00	19.14	
	0.173	35.80	10.56	46.36	54.82	8.46	AV
	0.399	20.90	10.43	31.33	47.87	16.54	
	0.527	17.90	10.40	28.30	46.00	17.70	
	1.051	18.30	10.39	28.69	46.00	17.31	
	2.970	16.60	10.45	27.05	46.00	18.95	
	21.660	24.60	10.66	35.26	50.00	14.74	
Neutral	0.175	48.60	10.55	59.15	64.72	5.57	QP
	0.526	29.30	10.38	39.68	56.00	16.32	
	1.128	29.01	10.38	39.39	56.00	16.61	
	2.488	28.60	10.43	39.03	56.00	16.97	
	4.688	28.50	10.48	38.98	56.00	17.02	
	22.450	30.60	10.78	41.38	60.00	18.62	
	0.175	36.80	10.55	47.35	54.72	7.37	AV
	0.526	15.90	10.38	26.28	46.00	19.72	
	1.128	16.51	10.38	26.89	46.00	19.11	
	2.488	15.70	10.43	26.13	46.00	19.87	
	4.688	16.40	10.48	26.88	46.00	19.12	
	22.450	25.10	10.78	35.88	50.00	14.12	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 48%RH

Test Mode : HDMI 1080P Date of Test : Jun 17, 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	0.174	49.00	10.56	59.56	64.76	5.20	QP
	0.383	32.30	10.44	42.74	58.22	15.48	
	0.591	29.60	10.39	39.99	56.00	16.01	
	1.051	29.60	10.39	39.99	56.00	16.01	
	4.586	25.89	10.49	36.38	56.00	19.62	
	21.940	30.10	10.67	40.77	60.00	19.23	
	0.174	36.50	10.56	47.06	54.76	7.70	AV
	0.383	18.50	10.44	28.94	48.22	19.28	
	0.591	14.80	10.39	25.19	46.00	20.81	
	1.051	18.30	10.39	28.69	46.00	17.31	
	4.586	16.39	10.49	26.88	46.00	19.12	
	21.940	25.00	10.67	35.67	50.00	14.33	
Neutral	0.175	48.60	10.55	59.15	64.72	5.57	QP
	0.399	29.90	10.41	40.31	57.88	17.57	
	0.554	31.31	10.37	41.68	56.00	14.32	
	1.059	29.50	10.38	39.88	56.00	16.12	
	2.439	27.10	10.43	37.53	56.00	18.47	
	22.180	30.30	10.78	41.08	60.00	18.92	
	0.175	36.70	10.55	47.25	54.72	7.47	AV
	0.399	18.20	10.41	28.61	47.88	19.27	
	0.554	18.91	10.37	29.28	46.00	16.72	
	1.059	18.20	10.38	28.58	46.00	17.42	
	2.439	16.70	10.43	27.13	46.00	18.87	
	22.180	25.00	10.78	35.78	50.00	14.22	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 48%RH

Test Mode : USB Play Date of Test : Jun 17, 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	0.176	49.10	10.56	59.66	64.70	5.04	QP
	0.399	33.60	10.43	44.03	57.88	13.85	
	0.952	28.50	10.39	38.89	56.00	17.11	
	1.747	28.49	10.42	38.91	56.00	17.09	
	4.727	26.40	10.49	36.89	56.00	19.11	
	22.410	31.10	10.68	41.78	60.00	18.22	
	0.176	37.30	10.56	47.86	54.70	6.84	AV
	0.399	21.00	10.43	31.43	47.88	16.45	
	0.952	14.90	10.39	25.29	46.00	20.71	
	1.747	17.39	10.42	27.81	46.00	18.19	
	4.727	17.50	10.49	27.99	46.00	18.01	
	22.410	25.40	10.68	36.08	50.00	13.92	
Neutral	0.175	48.60	10.55	59.15	64.73	5.58	QP
	0.399	29.70	10.41	40.11	57.87	17.76	
	0.542	31.10	10.38	41.48	56.00	14.52	
	1.057	29.50	10.38	39.88	56.00	16.12	
	2.398	27.90	10.43	38.33	56.00	17.67	
	22.370	33.20	10.78	43.98	60.00	16.02	
	0.175	36.50	10.55	47.05	54.73	7.68	AV
	0.399	18.80	10.41	29.21	47.87	18.66	
	0.542	18.80	10.38	29.18	46.00	16.82	
	1.057	18.30	10.38	28.68	46.00	17.32	
	2.398	17.40	10.43	27.83	46.00	18.17	
	22.370	27.40	10.78	38.18	50.00	11.82	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 48%RH

Test Mode : LAN Play Date of Test : Jun 17, 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	0.175	49.00	10.56	59.56	64.70	5.14	QP
	0.405	34.00	10.43	44.43	57.75	13.32	
	0.599	29.50	10.39	39.89	56.00	16.11	
	0.985	29.60	10.39	39.99	56.00	16.01	
	2.437	27.40	10.43	37.83	56.00	18.17	
	22.280	32.10	10.68	42.78	60.00	17.22	
	0.175	37.30	10.56	47.86	54.70	6.84	AV
	0.405	22.40	10.43	32.83	47.75	14.92	
	0.599	15.30	10.39	25.69	46.00	20.31	
	0.985	19.00	10.39	29.39	46.00	16.61	
	2.437	17.30	10.43	27.73	46.00	18.27	
	22.280	26.80	10.68	37.48	50.00	12.52	
Neutral	0.173	48.49	10.56	59.05	64.81	5.76	QP
	0.403	30.40	10.41	40.81	57.79	16.98	
	0.541	31.20	10.38	41.58	56.00	14.42	
	1.193	28.69	10.40	39.09	56.00	16.91	
	2.297	26.80	10.43	37.23	56.00	18.77	
	22.530	31.10	10.78	41.88	60.00	18.12	
	0.173	35.79	10.56	46.35	54.81	8.46	AV
	0.403	19.80	10.41	30.21	47.79	17.58	
	0.541	18.80	10.38	29.18	46.00	16.82	
	1.193	16.99	10.40	27.39	46.00	18.61	
	2.297	16.60	10.43	27.03	46.00	18.97	
	22.530	25.50	10.78	36.28	50.00	13.72	

TEST ENGINEER: SENVEN LU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 48%RH

Test Mode : MHL Date of Test : Jun 17, 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	0.175	49.10	10.56	59.66	64.72	5.06	QP
	0.405	33.90	10.43	44.33	57.75	13.42	
	0.547	31.61	10.39	42.00	56.00	14.00	
	1.203	29.30	10.40	39.70	56.00	16.30	
	3.159	26.30	10.45	36.75	56.00	19.25	
	22.298	31.60	10.68	42.28	60.00	17.72	
	0.175	37.40	10.56	47.96	54.72	6.76	AV
	0.405	22.70	10.43	33.13	47.75	14.62	
	0.547	19.51	10.39	29.90	46.00	16.10	
	1.203	17.40	10.40	27.80	46.00	18.20	
	3.159	13.70	10.45	24.15	46.00	21.85	
	22.298	26.20	10.68	36.88	50.00	13.12	
Neutral	0.174	48.60	10.55	59.15	64.77	5.62	QP
	0.403	29.90	10.41	40.31	57.79	17.48	
	0.566	31.81	10.37	42.18	56.00	13.82	
	1.053	29.70	10.38	40.08	56.00	15.92	
	2.541	27.81	10.43	38.24	56.00	17.76	
	21.770	31.50	10.76	42.26	60.00	17.74	
	0.174	36.30	10.55	46.85	54.77	7.92	AV
	0.403	19.00	10.41	29.41	47.79	18.38	
	0.566	19.31	10.37	29.68	46.00	16.32	
	1.053	18.40	10.38	28.78	46.00	17.22	
	2.541	14.91	10.43	25.34	46.00	20.66	
	21.770	26.20	10.76	36.96	50.00	13.04	

TEST ENGINEER: SENVEN LU

4 RADIATED EMISSION TEST

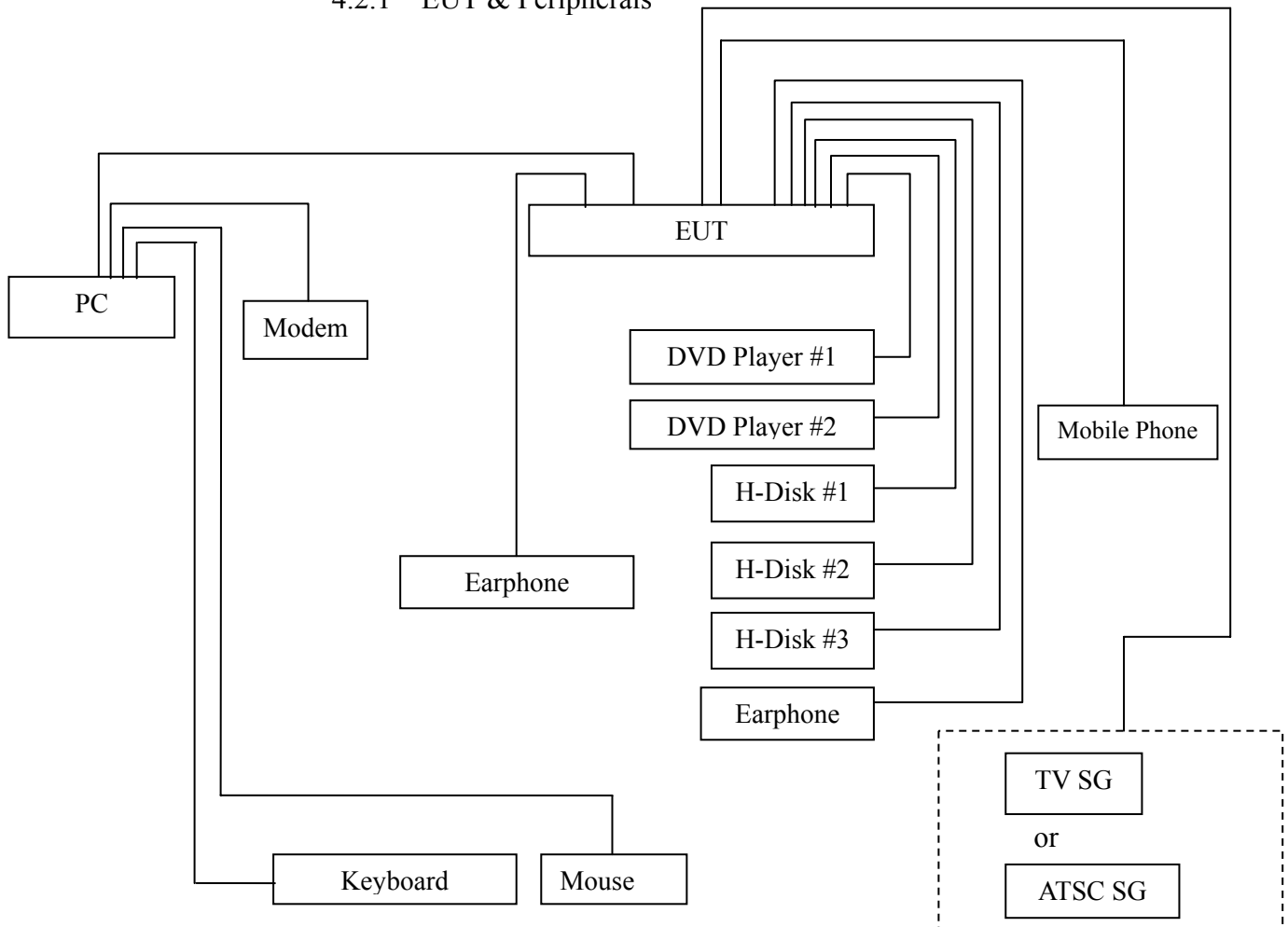
4.1 Test Equipment

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

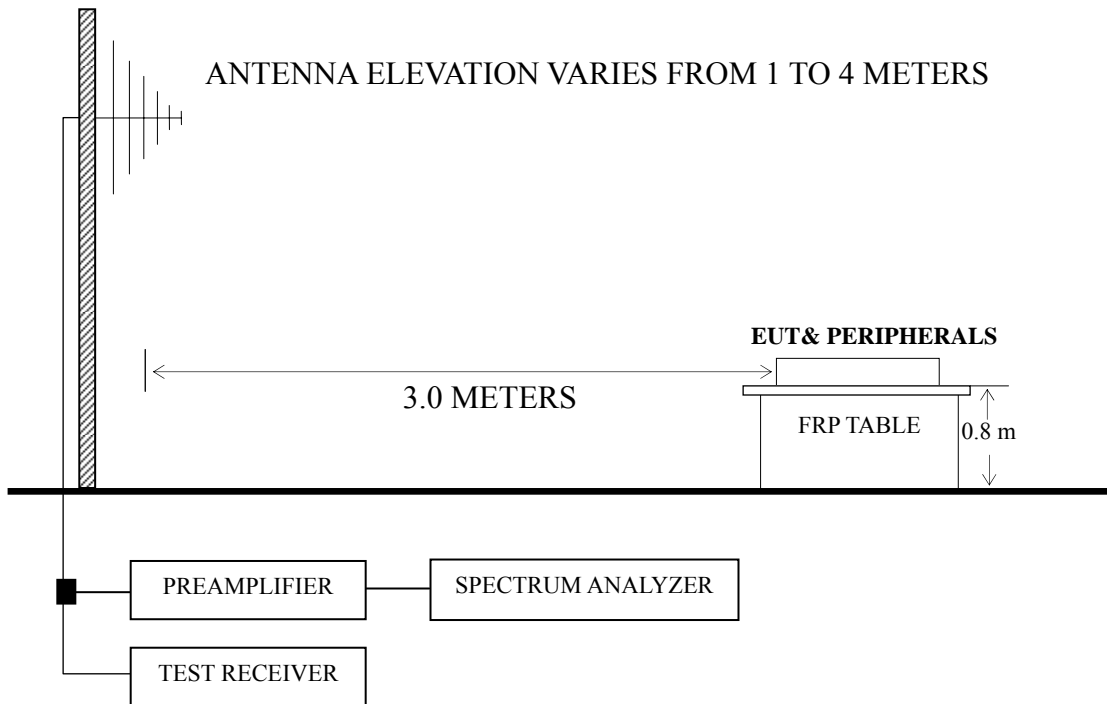
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101303	May 07, 2016	May 06, 2017
2.	Preamplifier	Agilent	8447D	2944A06664	Apr 27, 2016	Apr 26, 2017
3.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2016	Sep 19, 2016
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 15, 2016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



■ : 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 6 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 3840*2160@60Hz & 1kHz playing	P26 - P27
	HDMI 1920*1080@60Hz & 1kHz playing	P28
	HDMI 1280*1024@60Hz & 1kHz playing	P29
	HDMI 640*480@60Hz & 1kHz playing	P30
	HDMI1080P	P31
	MHL	P32
	USB Play	P33
	LAN Play	P34
Above 1GHz	HDMI 3840*2160@60Hz & 1kHz playing	P26 - P27

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 3840*2160@60Hz & 1kHz playing test mode. The worst emission at horizontal polarization was detected at 893.300 MHz with corrected signal level of 42.94 dB ($\mu\text{V}/\text{m}$) (limit is 46.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.90 m height and the turntable was at 260°. The worst emission at vertical polarization was detected at 893.300 MHz with corrected signal level of 42.95 dB ($\mu\text{V}/\text{m}$) (limit is 46.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.85 m height and the turntable was at 300°.

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 60%RH

Test Mode : HDMI 3840*2160@60Hz & 1kHz playing Date of Test : Jun 24, 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	77.530	24.40	8.95	1.05	--	34.40	40.00	5.60	QP
	88.200	23.33	10.25	1.18	--	34.76	43.50	8.74	
	184.230	24.56	10.50	1.87	--	36.93	43.50	6.57	
	238.550	28.38	11.72	2.11	--	42.21	46.00	3.79	
	704.150	19.47	19.80	3.56	--	42.83	46.00	3.17	
	893.300	17.18	21.30	4.46	--	42.94	46.00	3.06	
	2103.453	69.71	27.70	4.55	35.11	66.85	74.00	7.15	PK
	3170.512	64.91	30.86	5.93	35.03	66.67	74.00	7.33	
	3492.606	62.11	31.50	6.17	34.72	65.06	74.00	8.94	
	2103.453	48.23	27.70	4.55	35.11	45.37	54.00	8.63	AV
	3170.512	41.48	30.86	5.93	35.03	43.24	54.00	10.76	
3492.606	39.65	31.50	6.17	34.72	42.60	54.00	11.40		

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 60%RH

Test Mode : HDMI 3840*2160@60Hz & 1kHz playing Date of Test : Jun 24, 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
Vertical	34.850	19.38	15.80	0.68	--	35.86	40.00	4.14	QP
	93.050	24.94	11.30	1.24	--	37.48	43.50	6.02	
	157.070	23.14	11.16	1.68	--	35.98	43.50	7.52	
	449.040	22.47	16.82	2.84	--	42.13	46.00	3.87	
	704.150	19.40	19.80	3.56	--	42.76	46.00	3.24	
	893.300	17.19	21.30	4.46	--	42.95	46.00	3.05	PK
	1745.842	70.77	26.61	4.11	35.38	66.11	74.00	7.89	
	2449.490	65.07	28.32	4.86	35.15	63.10	74.00	10.90	
	3159.171	65.31	30.84	5.93	35.04	67.04	74.00	6.96	
	1745.842	48.38	26.61	4.11	35.38	43.72	54.00	10.28	
AV	2449.490	42.77	28.32	4.86	35.15	40.80	54.00	13.20	
	3159.171	41.35	30.84	5.93	35.04	43.08	54.00	10.92	

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Jun 24, 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	81.410	22.26	9.51	1.10	32.87	40.00	7.13
	111.480	21.55	12.64	1.41	35.60	43.50	7.90
	187.140	25.01	10.41	1.88	37.30	43.50	6.20
	248.250	26.52	12.42	2.15	41.09	46.00	4.91
	702.210	18.28	19.80	3.54	41.62	46.00	4.38
	893.300	14.80	21.30	4.46	40.56	46.00	5.44
Vertical	41.640	19.89	12.41	0.75	33.05	40.00	6.95
	94.020	23.22	11.50	1.26	35.98	43.50	7.52
	170.650	24.92	10.87	1.78	37.57	43.50	5.93
	235.640	27.75	11.48	2.10	41.33	46.00	4.67
	450.010	22.12	16.80	2.84	41.76	46.00	4.24
	892.330	16.07	21.30	4.46	41.83	46.00	4.17

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 60%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Jun 24, 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	81.410	22.26	9.51	1.10	32.87	40.00	7.13
	111.480	21.55	12.64	1.41	35.60	43.50	7.90
	187.140	25.01	10.41	1.88	37.30	43.50	6.20
	248.250	26.52	12.42	2.15	41.09	46.00	4.91
	702.210	18.28	19.80	3.54	41.62	46.00	4.38
	893.300	14.80	21.30	4.46	40.56	46.00	5.44
Vertical	41.640	19.89	12.41	0.75	33.05	40.00	6.95
	94.020	23.22	11.50	1.26	35.98	43.50	7.52
	170.650	24.92	10.87	1.78	37.57	43.50	5.93
	235.640	27.75	11.48	2.10	41.33	46.00	4.67
	450.010	22.12	16.80	2.84	41.76	46.00	4.24
	892.330	16.07	21.30	4.46	41.83	46.00	4.17

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz & 1kHz playing Date of Test : Jun 24, 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	87.230	23.04	10.10	1.18	34.32	40.00	5.68
	128.940	21.03	12.87	1.52	35.42	43.50	8.08
	224.000	23.70	10.75	2.07	36.52	46.00	9.48
	361.740	18.98	15.97	2.67	37.62	46.00	8.38
	560.590	13.43	18.90	2.52	34.85	46.00	11.15
	733.250	16.11	20.03	3.59	39.73	46.00	6.27
Vertical	75.590	22.68	8.61	1.02	32.31	40.00	7.69
	108.570	20.66	12.57	1.39	34.62	43.50	8.88
	166.770	25.39	11.19	1.75	38.33	43.50	5.17
	244.370	24.91	12.20	2.14	39.25	46.00	6.75
	418.970	20.69	16.80	2.76	40.25	46.00	5.75
	627.520	17.58	19.45	2.64	39.67	46.00	6.33

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 60%RH

Test Mode : HDMI 1080P Date of Test : Jun 24, 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	94.020	23.08	11.50	1.26	35.84	43.50	7.66
	150.280	25.38	11.46	1.63	38.47	43.50	5.03
	202.660	21.26	9.75	1.98	32.99	43.50	10.51
	271.530	23.70	13.26	2.35	39.31	46.00	6.69
	385.990	22.69	16.50	2.70	41.89	46.00	4.11
	757.500	17.58	20.25	3.63	41.46	46.00	4.54
Vertical	35.820	16.23	15.20	0.69	32.12	40.00	7.88
	74.620	23.62	8.43	1.01	33.06	40.00	6.94
	111.480	20.46	12.64	1.41	34.51	43.50	8.99
	150.280	24.44	11.46	1.63	37.53	43.50	5.97
	271.530	25.59	13.26	2.35	41.20	46.00	4.80
	482.990	21.52	17.54	2.91	41.97	46.00	4.03

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 60%RH

Test Mode : MHL Date of Test : Jun 24, 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	95.093	21.54	11.75	1.27	34.56	43.50	8.94
	132.221	23.85	12.71	1.53	38.09	43.50	5.41
	189.074	20.41	10.36	1.90	32.67	43.50	10.83
	283.979	21.70	13.43	2.45	37.58	46.00	8.42
	373.311	16.57	16.36	2.69	35.62	46.00	10.38
	570.610	11.88	18.30	2.47	32.65	46.00	13.35
Vertical	36.127	17.03	14.95	0.70	32.68	40.00	7.32
	66.733	27.12	6.77	0.91	34.80	40.00	5.20
	114.917	20.99	12.70	1.43	35.12	43.50	8.38
	151.067	23.89	11.43	1.65	36.97	43.50	6.53
	243.377	19.88	12.10	2.13	34.11	46.00	11.89
	682.348	13.18	19.85	3.28	36.31	46.00	9.69

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 60%RH

Test Mode : USB Play Date of Test : Jun 24, 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	102.360	20.65	12.39	1.34	34.38	43.50	9.12
	151.597	22.85	11.39	1.65	35.89	43.50	7.61
	275.157	21.09	13.20	2.39	36.68	46.00	9.32
	393.472	14.98	16.53	2.71	34.22	46.00	11.78
	588.905	13.11	18.60	2.36	34.07	46.00	11.93
	848.056	10.46	20.70	4.07	35.23	46.00	10.77
Vertical	34.760	16.67	15.90	0.68	33.25	40.00	6.75
	96.775	21.43	11.93	1.29	34.65	43.50	8.85
	167.824	23.88	11.07	1.77	36.72	43.50	6.78
	253.837	21.26	12.62	2.18	36.06	46.00	9.94
	419.108	15.38	16.80	2.76	34.94	46.00	11.06
	638.369	12.11	19.50	2.77	34.38	46.00	11.62

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22

Model No. : LC-55N7000U Humidity : 60%RH

Test Mode : LAN Play Date of Test : Jun 24, 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	104.903	20.71	12.50	1.35	34.56	43.50	8.94
	163.755	24.20	11.24	1.73	37.17	43.50	6.33
	233.349	20.23	11.32	2.09	33.64	46.00	12.36
	350.477	19.29	15.60	2.66	37.55	46.00	8.45
	586.844	15.84	18.58	2.36	36.78	46.00	9.22
	827.493	12.26	20.70	3.97	36.93	46.00	9.07
Vertical	54.452	27.36	6.61	0.84	34.81	40.00	5.19
	94.428	22.54	11.60	1.26	35.40	43.50	8.10
	140.342	25.01	12.50	1.57	39.08	43.50	4.42
	245.090	23.92	12.30	2.14	38.36	46.00	7.64
	343.180	21.00	15.24	2.65	38.89	46.00	7.11
	627.274	11.82	19.45	2.64	33.91	46.00	12.09

TEST ENGINEER: CAESAR WU

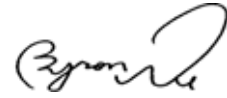
5 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
Conductive foam	SMR-TSL-4-3.5-5R\RO H	ZhuoYun club Co., Ltd.	See Internal Photos Figure 23

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:



(BYRON WU)

6 DEVIATION TO TEST SPECIFICATIONS

None.