

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

LED LCD TV

Model No.: LC-65N7000U

Brand: Sharp

FCC ID : W9HLCDF0064

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-F15228A1
Date of Test : Apr 15-21, 2016
Date of Report : May 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. : LC-65N7000U
Brand : Sharp
Power Supply : 120V/60Hz

Test Procedure Used:

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

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. To determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B (Class B) limits both radiated and conducted emissions.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report shows that the EUT (M/N: Refer to Sec2.1) which was tested in 3m anechoic chamber Apr 15-21, 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.

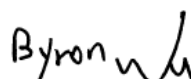
This report contains data that are not covered by the NVLAP accreditation.


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.F15227A1, a Verification report.

Date of Test : Apr 15-21, 2016 Date of Report : May 04, 2016

Producer : 
ALAN HE / Assistant

Review : 
BYRON WU / Deputy Assistant Manager

 For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Signatory : 
Authorized Signature EMC BYRON KWO / Assistant General Manager

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description of Test Item	Standard	Limits	Results
EMISSION			
Conducted Disturbance at the Mains Terminal	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2015 AND ANSI C63.4-2014	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2015 AND ANSI C63.4-2014	15.109(a) Class B	Pass

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description : LED LCD TV

Type of EUT : ☒ Production ☐ Pre-product ☐ Pro-type

Model No : LC-65N7000U

Brand : Sharp

Note : The modified histories of report are as follows:

Report No.	Model No.	Rev. Summary	Edition No.	Data of Rev.
ACI-F15228	LTDN65K550GUWUS, LC-65N7000U, LC-65N7000C	Original Report	0	Nov 30, 2015
ACI-F15228A1	LC-65N7000U	1.To change panel	Rev. A1	May 04, 2016

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 : HE650HU-B51

Tuner : Manufacturer : XuGuang Tech. Co., Ltd.
M/N : HFT-96S3/W11FJ2H\RoH

Max Resolution : 3840*2160@60Hz

HDMI Cable*4 : Shielded, Detachable, 1.50m, with two cores
(Lab provide)

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

LAN Cable : Shielded, Detachable, 1.50m

USB Cable*3 : Shielded, Detachable, 1.00m, without core
(Lab provide)

MHL to HDMI Adaptor: Manufacture: CE-Link
with RCP (Lab provide)M/N: 3002

Remark:

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

Side Port:

- (1) One USB3 Port : Connected with Hard-Disk #1
- (2) One HDMI2/ARC Port : Connected with DVD PLAYER #2
- (3) One HDMI1/MHL Port : Connected with Smart Mobile Phone
- (4) One Audio out Port : Connected with Earphone
- (5) One Service Port : Do not open to customer
- (6) One USB1 Port : Connected with Hard-Disk #2
- (7) One USB2 Port : Connected with Hard-Disk #3
- (8) One ANT/CABLE IN Port : Connected with Antenna or ATSC SG / TV SG

Back Port:

- (9) One LAN Port : Connected with PC
- (10) One HDMI3 Port : Connected with DVD PLAYER #1
- (11) One HDMI4 Port : Connected with PC
- (12) One Digital Audio Out Port : Connected with DVD PLAYER #1
- (13) One component of YPbPr +Video Port : Connected with DVD PLAYER #2
- (14) One AV Port : Connected with DVD PLAYER #1

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 DVD PLAYER #1

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

2.2.7 DVD PLAYER #2

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

2.2.8 Hard Disk #1

Manufacturer : Tetasy
Model Number : F12
Serial Number : A010022-4860010X
Data Cable : Shielded, Undetachable, 1.8m.
Certificate : CE, FCC DoC

2.2.9 Hard Disk #2

Manufacturer : Tetasy
Model Number : F12
Serial Number : A010022-4A60007
Data Cable : Shielded, Undetachable, 1.8m.
Certificate : CE, FCC DoC

2.2.10 Hard Disk #3

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

2.2.11 Smart Mobile Phone

Manufacturer : SAMSUNG
Model Number : GT-I9100G
Serial Number : 6935152011519
Certificate : CE/EMC

2.2.12 ATSC Signal Generator

Manufacturer : SENCORE
Model Number : ATSC997
Serial Number : 6790071

2.2.13 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

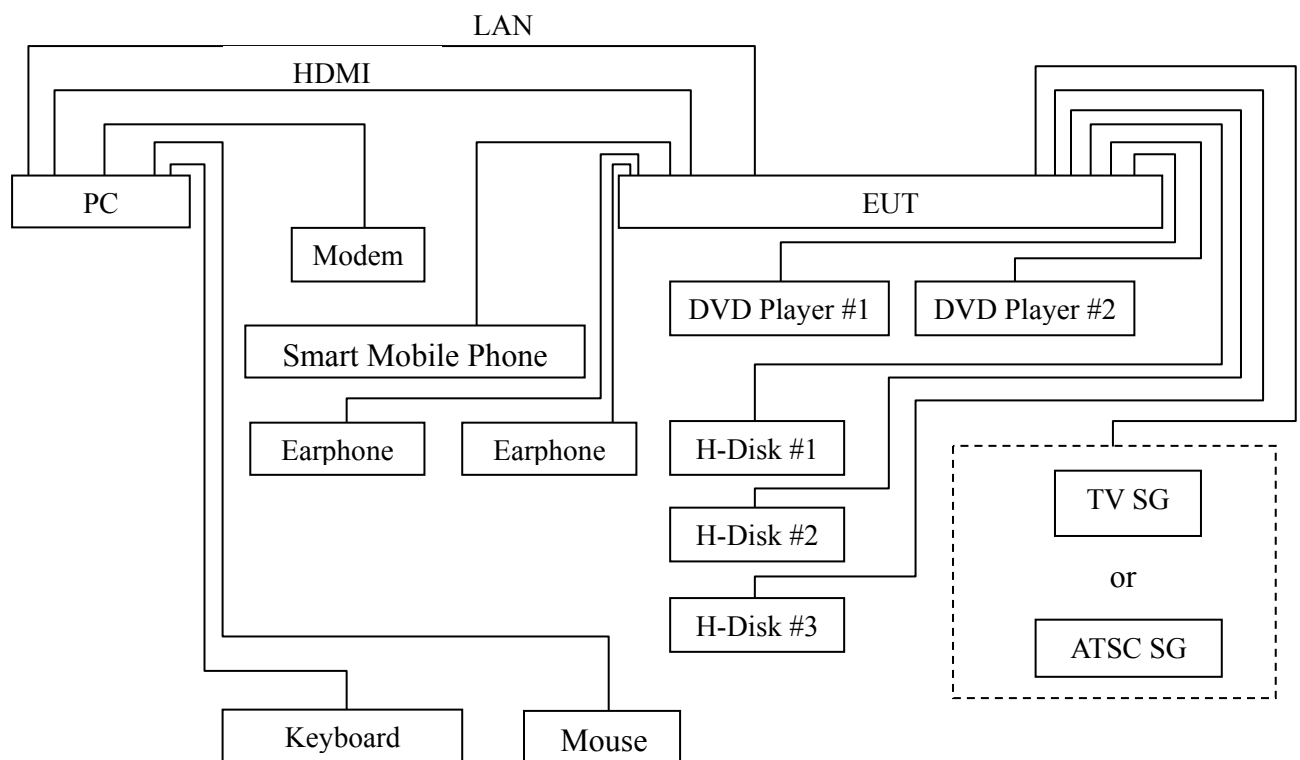
3.1 Test Equipment

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

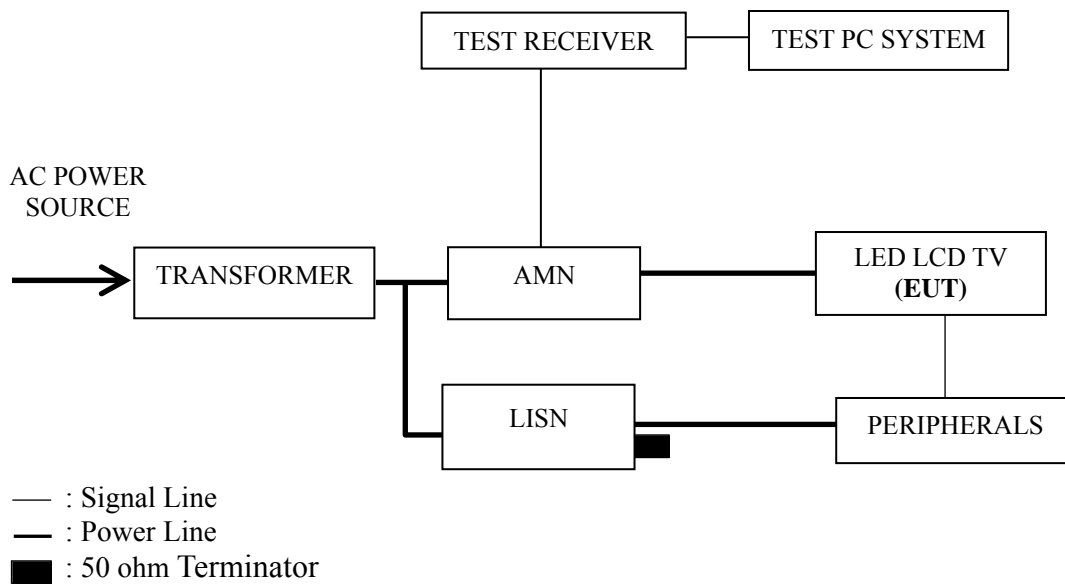
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Jul 03, 2015	Jul 02, 2016
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2015	Jun 26, 2016
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-5	Mar 20, 2016	Mar 19, 2017
4.	50Ω Terminator	Anritsu	BNC	001	Mar 20, 2016	Mar 19, 2017
5.	Software	Audix	e3	6.111206	--	--

3.2 Block Diagram of Test Setup

3.2.1 EUT & Peripherals



3.2.2 Conducted Disturbance Test Setup



3.3 Conducted Emission Limit [FCC Part 15 Subpart B 15.107(a)]

Frequency Range (MHz)	Limits dB (μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66~56	56~46
0.5 ~ 5	56	46
5 ~ 30	60	50

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

3.4 Test Configuration

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

3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT and peripherals as shown in Sec. 3.2.
- 3.5.2 Turn on the power of all equipments and the EUT.
- 3.5.3 Set the contrast & brightness of EUT to maximum.
- 3.5.4 PC system ran the self-test program “EMC Test” by windows XP and sent “H” characters to EUT through graphic card, the EUT’s screen displayed and filled with “H” pattern by its resolution (Via HDMI Input).
- 3.5.5 PC system sent the 1kHz audio signal to EUT through audio port, the EUT speak out 1kHz audio signal.
- 3.5.6 In USB Play mode, set the EUT play digital media from Hard 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
HDMI1080P
MHL
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 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
HDMI1080P	P18
MHL	P19
USB Play	P20
LAN Play	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 MHL test mode. The worst emission is detected at 0.162 MHz (Quasi-Peak Value) with corrected signal level of 58.56 dB (μV) (limit is 65.39 dB (μV)), when the Neutral of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 48%RH

Test Mode : HDMI 3840*2160@60Hz & 1kHz Playing Date of Test : Apr 15, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.161	47.20	10.57	57.77	65.43	7.66	QP
	0.183	41.50	10.54	52.04	64.36	12.32	
	0.392	29.69	10.43	40.12	58.03	17.91	
	0.641	26.70	10.38	37.08	56.00	18.92	
	1.990	17.10	10.41	27.51	56.00	28.49	
	6.722	20.41	10.46	30.87	60.00	29.13	
	0.161	35.90	10.57	46.47	55.43	8.96	AV
	0.183	29.00	10.54	39.54	54.36	14.82	
	0.392	19.19	10.43	29.62	48.03	18.41	
	0.641	15.00	10.38	25.38	46.00	20.62	
	1.990	4.30	10.41	14.71	46.00	31.29	
	6.722	12.51	10.46	22.97	50.00	27.03	
Neutral	0.164	45.80	10.56	56.36	65.25	8.89	QP
	0.269	31.61	10.45	42.06	61.14	19.08	
	0.398	29.50	10.40	39.90	57.89	17.99	
	0.651	23.31	10.35	33.66	56.00	22.34	
	1.962	17.50	10.41	27.91	56.00	28.09	
	6.483	21.99	10.51	32.50	60.00	27.50	
	0.164	35.50	10.56	46.06	55.25	9.19	AV
	0.269	19.81	10.45	30.26	51.14	20.88	
	0.398	19.10	10.40	29.50	47.89	18.39	
	0.651	9.71	10.35	20.06	46.00	25.94	
	1.962	3.60	10.41	14.01	46.00	31.99	
	6.483	17.19	10.51	27.70	50.00	22.30	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 48%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Apr 15, 2016
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.161	47.10	10.57	57.67	65.42	7.75	QP
	0.192	42.00	10.53	52.53	63.95	11.42	
	0.405	28.70	10.42	39.12	57.76	18.64	
	0.664	24.11	10.37	34.48	56.00	21.52	
	1.720	17.59	10.41	28.00	56.00	28.00	
	6.294	26.10	10.47	36.57	60.00	23.43	
	0.161	35.80	10.57	46.37	55.42	9.05	AV
	0.192	29.20	10.53	39.73	53.95	14.22	
	0.405	16.60	10.42	27.02	47.76	20.74	
	0.664	12.81	10.37	23.18	46.00	22.82	
	1.720	4.19	10.41	14.60	46.00	31.40	
	6.294	10.60	10.47	21.07	50.00	28.93	
Neutral	0.161	46.89	10.57	57.46	65.39	7.93	QP
	0.180	42.10	10.53	52.63	64.47	11.84	
	0.396	29.39	10.41	39.80	57.94	18.14	
	0.662	24.21	10.35	34.56	56.00	21.44	
	1.969	16.00	10.41	26.41	56.00	29.59	
	6.589	21.90	10.51	32.41	60.00	27.59	
	0.161	36.09	10.57	46.66	55.39	8.73	AV
	0.180	29.40	10.53	39.93	54.47	14.54	
	0.396	19.29	10.41	29.70	47.94	18.24	
	0.662	12.91	10.35	23.26	46.00	22.74	
	1.969	2.90	10.41	13.31	46.00	32.69	
	6.589	10.70	10.51	21.21	50.00	28.79	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 48%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Apr 15, 2016
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.160	47.60	10.57	58.17	65.45	7.28	QP
	0.272	31.91	10.47	42.38	61.07	18.69	
	0.405	28.40	10.42	38.82	57.75	18.93	
	0.663	23.91	10.37	34.28	56.00	21.72	
	2.236	16.30	10.42	26.72	56.00	29.28	
	6.076	22.30	10.47	32.77	60.00	27.23	
	0.160	36.10	10.57	46.67	55.45	8.78	AV
	0.272	20.31	10.47	30.78	51.07	20.29	
	0.405	16.50	10.42	26.92	47.75	20.83	
	0.663	12.71	10.37	23.08	46.00	22.92	
	2.236	0.50	10.42	10.92	46.00	35.08	
	6.076	19.40	10.47	29.87	50.00	20.13	
Neutral	0.168	46.49	10.56	57.05	65.07	8.02	QP
	0.195	42.30	10.51	52.81	63.84	11.03	
	0.399	29.60	10.40	40.00	57.88	17.88	
	0.658	23.41	10.35	33.76	56.00	22.24	
	2.237	16.50	10.42	26.92	56.00	29.08	
	6.596	25.00	10.51	35.51	60.00	24.49	
	0.168	34.69	10.56	45.25	55.07	9.82	AV
	0.195	30.10	10.51	40.61	53.84	13.23	
	0.399	19.20	10.40	29.60	47.88	18.28	
	0.658	11.11	10.35	21.46	46.00	24.54	
	2.237	0.40	10.42	10.82	46.00	35.18	
	6.596	10.10	10.51	20.61	50.00	29.39	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 48%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Apr 15, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.165	46.49	10.57	57.06	65.19	8.13	QP
	0.195	42.10	10.53	52.63	63.84	11.21	
	0.403	29.30	10.42	39.72	57.79	18.07	
	0.668	23.41	10.37	33.78	56.00	22.22	
	2.015	17.80	10.41	28.21	56.00	27.79	
	6.580	22.10	10.47	32.57	60.00	27.43	
	0.165	35.59	10.57	46.16	55.19	9.03	AV
	0.195	29.90	10.53	40.43	53.84	13.41	
	0.403	18.10	10.42	28.52	47.79	19.27	
	0.668	12.51	10.37	22.88	46.00	23.12	
	2.015	3.90	10.41	14.31	46.00	31.69	
	6.580	8.50	10.47	18.97	50.00	31.03	
Neutral	0.161	47.10	10.57	57.67	65.42	7.75	QP
	0.263	32.30	10.46	42.76	61.33	18.57	
	0.409	27.50	10.40	37.90	57.68	19.78	
	0.663	24.31	10.35	34.66	56.00	21.34	
	2.007	18.70	10.41	29.11	56.00	26.89	
	6.614	21.70	10.51	32.21	60.00	27.79	
	0.161	36.30	10.57	46.87	55.42	8.55	AV
	0.263	19.90	10.46	30.36	51.33	20.97	
	0.409	14.80	10.40	25.20	47.68	22.48	
	0.663	12.61	10.35	22.96	46.00	23.04	
	2.007	4.80	10.41	15.21	46.00	30.79	
	6.614	12.40	10.51	22.91	50.00	27.09	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 48%RH

Test Mode : HDMI1080P Date of Test : Apr 15, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.166	46.09	10.57	56.66	65.17	8.51	QP
	0.191	42.90	10.53	53.43	63.99	10.56	
	0.398	29.50	10.42	39.92	57.90	17.98	
	0.663	23.41	10.37	33.78	56.00	22.22	
	1.756	16.09	10.41	26.50	56.00	29.50	
	6.581	22.10	10.47	32.57	60.00	27.43	
	0.166	35.79	10.57	46.36	55.17	8.81	AV
	0.191	29.70	10.53	40.23	53.99	13.76	
	0.398	18.80	10.42	29.22	47.90	18.68	
	0.663	11.91	10.37	22.28	46.00	23.72	
	1.756	4.39	10.41	14.80	46.00	31.20	
	6.581	9.00	10.47	19.47	50.00	30.53	
Neutral	0.158	46.80	10.57	57.37	65.56	8.19	QP
	0.193	42.60	10.51	53.11	63.93	10.82	
	0.399	29.60	10.40	40.00	57.87	17.87	
	0.665	24.01	10.35	34.36	56.00	21.64	
	1.732	15.49	10.41	25.90	56.00	30.10	
	6.509	22.30	10.51	32.81	60.00	27.19	
	0.158	33.70	10.57	44.27	55.56	11.29	AV
	0.193	30.10	10.51	40.61	53.93	13.32	
	0.399	19.00	10.40	29.40	47.87	18.47	
	0.665	12.71	10.35	23.06	46.00	22.94	
	1.732	2.39	10.41	12.80	46.00	33.20	
	6.509	15.00	10.51	25.51	50.00	24.49	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 48%RH

Test Mode : MHL Date of Test : Apr 15, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.163	47.10	10.57	57.67	65.34	7.67	QP
	0.182	43.40	10.54	53.94	64.42	10.48	
	0.420	25.69	10.42	36.11	57.45	21.34	
	0.674	23.31	10.37	33.68	56.00	22.32	
	1.745	15.99	10.41	26.40	56.00	29.60	
	6.095	21.30	10.47	31.77	60.00	28.23	
	0.163	36.30	10.57	46.87	55.34	8.47	AV
	0.182	30.60	10.54	41.14	54.42	13.28	
	0.420	15.89	10.42	26.31	47.45	21.14	
	0.674	12.41	10.37	22.78	46.00	23.22	
	1.745	2.29	10.41	12.70	46.00	33.30	
	6.095	10.40	10.47	20.87	50.00	29.13	
Neutral	0.162	47.99	10.57	58.56	65.39	6.83	QP
	0.181	43.50	10.53	54.03	64.45	10.42	
	0.407	29.10	10.40	39.50	57.71	18.21	
	0.666	23.61	10.35	33.96	56.00	22.04	
	2.027	17.10	10.41	27.51	56.00	28.49	
	6.609	26.50	10.51	37.01	60.00	22.99	
	0.162	36.49	10.57	47.06	55.39	8.33	AV
	0.181	30.70	10.53	41.23	54.45	13.22	
	0.407	17.70	10.40	28.10	47.71	19.61	
	0.666	11.71	10.35	22.06	46.00	23.94	
	2.027	3.60	10.41	14.01	46.00	31.99	
	6.609	12.10	10.51	22.61	50.00	27.39	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 48%RH

Test Mode : USB Play Date of Test : Apr 15, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.158	46.38	10.58	56.96	65.58	8.62	QP
	0.182	43.50	10.54	54.04	64.41	10.37	
	0.399	29.50	10.42	39.92	57.87	17.95	
	0.664	23.91	10.37	34.28	56.00	21.72	
	2.021	16.90	10.41	27.31	56.00	28.69	
	6.411	21.60	10.47	32.07	60.00	27.93	
	0.158	34.49	10.58	45.07	55.58	10.51	AV
	0.182	30.10	10.54	40.64	54.41	13.77	
	0.399	18.80	10.42	29.22	47.87	18.65	
	0.664	12.41	10.37	22.78	46.00	23.22	
	2.021	3.80	10.41	14.21	46.00	31.79	
	6.411	9.50	10.47	19.97	50.00	30.03	
Neutral	0.161	47.20	10.57	57.77	65.43	7.66	QP
	0.183	43.50	10.53	54.03	64.33	10.30	
	0.400	29.20	10.40	39.60	57.85	18.25	
	0.665	23.71	10.35	34.06	56.00	21.94	
	2.024	16.80	10.41	27.21	56.00	28.79	
	6.646	22.60	10.51	33.11	60.00	26.89	
	0.161	36.00	10.57	46.57	55.43	8.86	AV
	0.183	30.10	10.53	40.63	54.33	13.70	
	0.400	18.90	10.40	29.30	47.85	18.55	
	0.665	12.41	10.35	22.76	46.00	23.24	
	2.024	4.10	10.41	14.51	46.00	31.49	
	6.646	14.00	10.51	24.51	50.00	25.49	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 48%RH

Test Mode : LAN Play Date of Test : Apr 15, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.161	47.70	10.57	58.27	65.41	7.14	QP
	0.198	41.30	10.52	51.82	63.71	11.89	
	0.399	28.90	10.42	39.32	57.87	18.55	
	0.671	22.91	10.37	33.28	56.00	22.72	
	1.758	16.19	10.41	26.60	56.00	29.40	
	6.265	24.60	10.47	35.07	60.00	24.93	
	0.161	36.20	10.57	46.77	55.41	8.64	AV
	0.198	30.20	10.52	40.72	53.71	12.99	
	0.399	18.80	10.42	29.22	47.87	18.65	
	0.671	11.81	10.37	22.18	46.00	23.82	
	1.758	4.09	10.41	14.50	46.00	31.50	
	6.265	10.50	10.47	20.97	50.00	29.03	
Neutral	0.163	47.19	10.57	57.76	65.32	7.56	QP
	0.195	43.10	10.51	53.61	63.80	10.19	
	0.399	29.40	10.40	39.80	57.87	18.07	
	0.672	24.01	10.35	34.36	56.00	21.64	
	1.978	14.90	10.41	25.31	56.00	30.69	
	6.644	22.10	10.51	32.61	60.00	27.39	
	0.163	36.39	10.57	46.96	55.32	8.36	AV
	0.195	30.60	10.51	41.11	53.80	12.69	
	0.399	18.60	10.40	29.00	47.87	18.87	
	0.672	12.91	10.35	23.26	46.00	22.74	
	1.978	1.60	10.41	12.01	46.00	33.99	
	6.644	13.90	10.51	24.41	50.00	25.59	

TEST ENGINEER: SEVEN LU

4 RADIATED EMISSION TEST

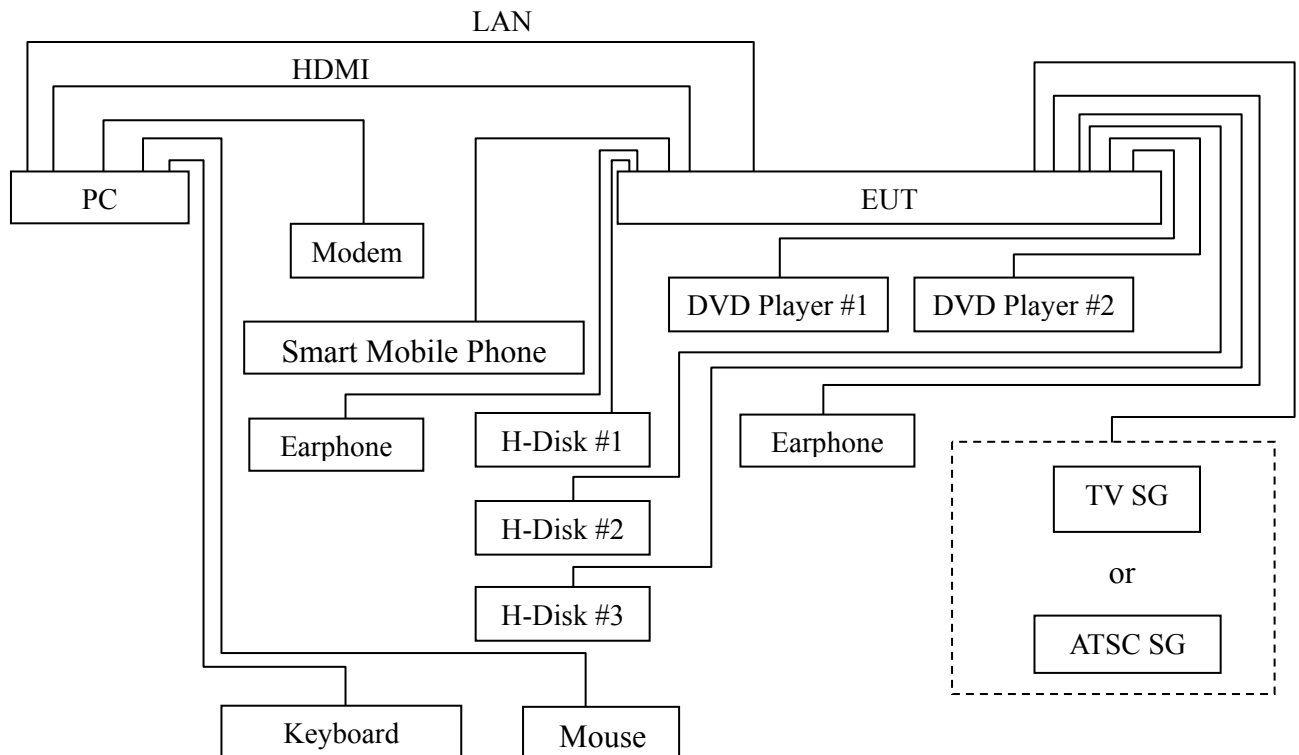
4.1 Test Equipment

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, 2015	May 06, 2016
2.	Preamplifier	Agilent	8447D	2944A06664	Apr 27, 2015	Apr 26, 2016
3.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2015	Sep 19, 2016
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 15, 2015	May 14, 2016
5.	Horn Antenna	EMCO	3115	9607-4878	Jun 03, 2015	Jun 02, 2016
6.	Spectrum	Agilent	E7405A	MY45106600	Apr 26, 2015	Apr 25, 2016
7.	Spectrum	HP	8591EM	3628A00908	May 07, 2015	May 06, 2016
8.	Software	Audix	e3	6.2007-9-10	--	--

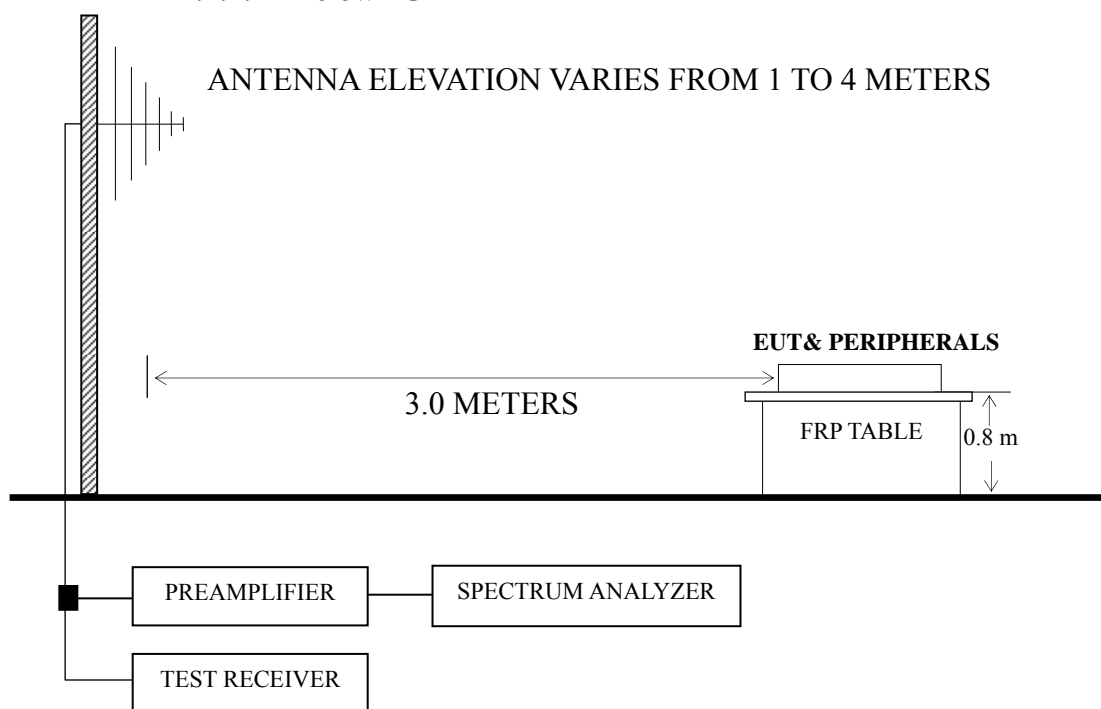
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals



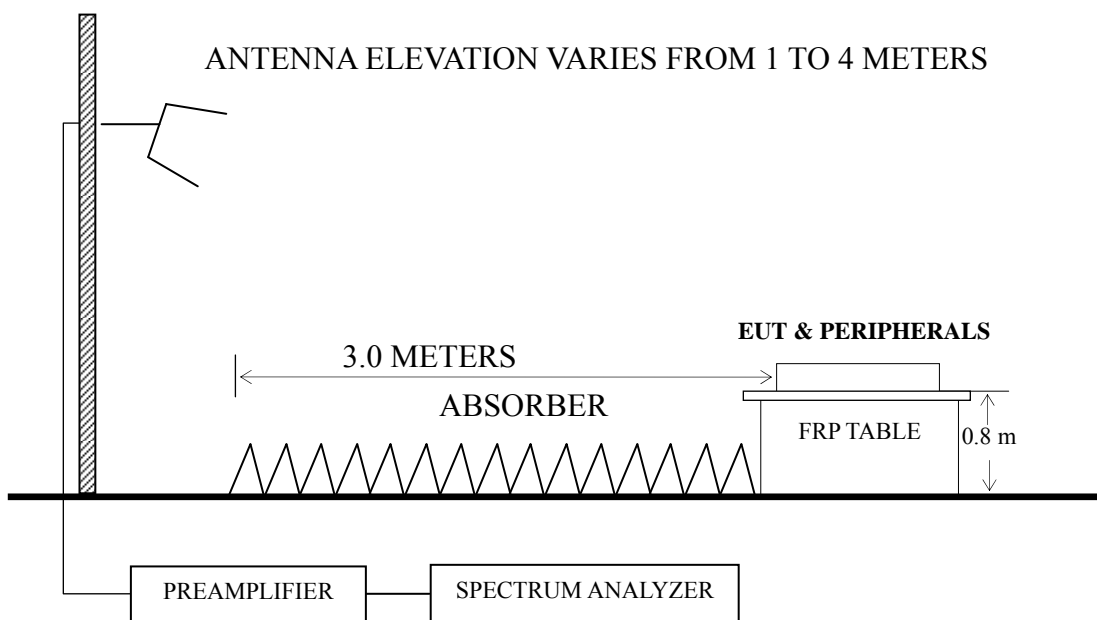
4.2.2 Radiated emission test setup

4.2.2.1 Below 1GHz



■ : 50 ohm Coaxial Switch

4.2.2.2 Above 1GHz



4.3 Radiated Emission Limit [FCC Part 15 Subpart B 15.109(a)]

Frequency (MHz)	Distance (m)	Field strength limits	
		($\mu\text{V/m}$)	dB ($\mu\text{V/m}$)
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
NOTE 1 - Emission Level dB ($\mu\text{V/m}$) = 20 log Emission Level ($\mu\text{V/m}$) NOTE 2 - The tighter limit applies at the band edges. NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system. NOTE 4 - The limits shown are based on Quasi-peak value detector. NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT.			

4.4 Test Configuration

The configuration of the EUT and peripherals are same as those used in conducted emission test.

Please refer to Sec.3.4.

4.5 Operating Condition of EUT

Same as conducted emission test which is listed in Sec.3.5, except for the test setup replaced by Sec.4.2.

4.6 Test Procedures

The EUT and peripherals were placed on a FRP turntable that is 0.8 meter above ground. The FRP turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Broadband antenna (Calibrated Bilog Antenna) was used as receiving antenna. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.4 requirements during radiated emission test.

The I.F. bandwidth of Test Receiver R&S ESCI was set at 120 kHz.

The frequency range from 30 MHz to 1000MHz was checked for all test modes.

The frequency range from 1 GHz to 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.

Test Mode	Data Page
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

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 3840*2160@60Hz & 1kHz playing test mode. The worst emission at horizontal polarization was detected at 890.728 MHz with corrected signal level of 42.05 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 1.90 m height and the turntable was at 110°. The worst emission at vertical polarization was detected at 890.728 MHz with corrected signal level of 42.64 dB (μV/m) (limit is 40.00 dB (μV/m)), when the antenna was 1.80 m height and the turntable was at 65°.

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 60%RH

Test Mode : HDMI 3840*2160@60Hz & 1kHz Playing Date of Test : Apr 21, 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	89.905	24.22	10.45	1.21	--	35.88	43.50	7.62	QP
	104.903	19.35	12.50	1.35	--	33.20	43.50	10.30	
	147.404	19.30	11.80	1.62	--	32.72	43.50	10.78	
	297.224	20.29	13.70	2.56	--	36.55	46.00	9.45	
	590.974	18.06	18.73	2.31	--	39.10	46.00	6.90	
	890.728	16.29	21.30	4.46	--	42.05	46.00	3.95	
	1477.873	58.78	25.52	3.86	35.71	52.45	74.00	21.55	PK
	1705.647	61.99	26.45	4.09	35.42	57.11	74.00	16.89	
	2122.382	59.91	27.73	4.58	35.11	57.11	74.00	16.89	
	2538.859	60.70	28.57	4.96	35.16	59.07	74.00	14.93	
	2983.131	61.51	30.43	5.76	35.20	62.50	74.00	11.50	
	3369.664	58.15	31.25	6.10	34.83	60.67	74.00	13.33	
	1477.873	42.78	25.52	3.86	35.71	36.45	54.00	17.55	AV
	1705.647	45.22	26.45	4.09	35.42	40.34	54.00	13.66	
	2122.382	43.29	27.73	4.58	35.11	40.49	54.00	13.51	
	2538.859	44.39	28.57	4.96	35.16	42.76	54.00	11.24	
	2983.131	44.02	30.43	5.76	35.20	45.01	54.00	8.99	
	3369.664	40.20	31.25	6.10	34.83	42.72	54.00	11.28	

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 60%RH

Test Mode : HDMI 3840*2160@60Hz & 1kHz Playing Date of Test : Apr 21, 2016

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Vertical	59.025	28.96	6.20	0.87	--	36.03	40.00	3.97	QP
	145.861	19.90	11.95	1.61	--	33.46	43.50	10.04	
	297.224	16.16	13.70	2.56	--	32.42	46.00	13.58	
	590.974	21.27	18.73	2.31	--	42.31	46.00	3.69	
	670.489	14.17	19.60	3.16	--	36.93	46.00	9.07	
	890.728	16.88	21.30	4.46	--	42.64	46.00	3.36	
	1204.835	59.44	24.46	3.54	36.12	51.32	74.00	22.68	PK
	1480.523	58.47	25.54	3.86	35.71	52.16	74.00	21.84	
	1771.048	60.49	26.70	4.13	35.35	55.97	74.00	18.03	
	2107.225	57.55	27.71	4.55	35.11	54.70	74.00	19.30	
	2561.707	55.30	28.67	5.03	35.16	53.84	74.00	20.16	
	3393.901	55.27	31.31	6.10	34.81	57.87	74.00	16.13	
	1204.835	44.29	24.46	3.54	36.12	36.17	54.00	17.83	AV
	1480.523	43.11	25.54	3.86	35.71	36.80	54.00	17.20	
	1771.048	44.93	26.70	4.13	35.35	40.41	54.00	13.59	
	2107.225	41.89	27.71	4.55	35.11	39.04	54.00	14.96	
	2561.707	40.03	28.67	5.03	35.16	38.57	54.00	15.43	
	3393.901	40.00	31.31	6.10	34.81	42.60	54.00	11.40	

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Apr 21, 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	96.099	21.47	11.84	1.27	34.58	43.50	8.92
	145.861	19.65	11.95	1.61	33.21	43.50	10.29
	297.224	16.14	13.70	2.56	32.40	46.00	13.60
	593.050	18.22	18.85	2.31	39.38	46.00	6.62
	709.182	14.85	19.80	3.56	38.21	46.00	7.79
	890.728	15.95	21.30	4.46	41.71	46.00	4.29
Vertical	59.232	27.57	6.20	0.87	34.64	40.00	5.36
	93.440	20.25	11.40	1.24	32.89	43.50	10.61
	148.441	21.20	11.65	1.62	34.47	43.50	9.03
	425.028	14.73	16.80	2.78	34.31	46.00	11.69
	605.659	20.07	19.10	2.26	41.43	46.00	4.57
	890.728	15.96	21.30	4.46	41.72	46.00	4.28

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 60%RH

Test Mode : HDMI 1280*1024@60Hz & 1kHz Playing Date of Test : Apr 21, 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	91.175	17.80	10.80	1.23	29.83	43.50	13.67
	147.404	18.09	11.80	1.62	31.51	43.50	11.99
	446.414	19.25	16.83	2.82	38.90	46.00	7.10
	593.050	15.58	18.85	2.31	36.74	46.00	9.26
	742.259	15.43	19.97	3.60	39.00	46.00	7.00
	851.035	13.47	20.73	4.17	38.37	46.00	7.63
Vertical	62.651	25.53	6.36	0.89	32.78	40.00	7.22
	148.963	20.51	11.57	1.63	33.71	43.50	9.79
	446.414	17.02	16.83	2.82	36.67	46.00	9.33
	593.050	15.59	18.85	2.31	36.75	46.00	9.25
	742.259	18.55	19.97	3.60	42.12	46.00	3.88
	842.130	11.74	20.77	4.07	36.58	46.00	9.42

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Apr 21, 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	57.160	23.73	6.24	0.86	30.83	40.00	9.17
	81.410	24.33	9.51	1.10	34.94	40.00	5.06
	145.430	24.41	12.03	1.61	38.05	43.50	5.45
	230.790	23.29	11.24	2.09	36.62	46.00	9.38
	402.480	15.55	16.60	2.72	34.87	46.00	11.13
	580.960	16.87	18.52	2.42	37.81	46.00	8.19
Vertical	46.490	21.87	9.46	0.78	32.11	40.00	7.89
	59.100	27.48	6.20	0.87	34.55	40.00	5.45
	95.960	22.28	11.84	1.27	35.39	43.50	8.11
	153.190	20.35	11.31	1.65	33.31	43.50	10.19
	210.420	25.67	10.03	2.01	37.71	43.50	5.79
	313.240	22.96	14.25	2.61	39.82	46.00	6.18

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 60%RH

Test Mode : HDMI1080P Date of Test : Apr 21, 2016

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	67.830	23.88	6.94	0.92	31.74	40.00	8.26
	85.290	21.90	9.85	1.15	32.90	40.00	7.10
	136.700	20.62	12.57	1.56	34.75	43.50	8.75
	253.100	20.98	12.62	2.18	35.78	46.00	10.22
	425.760	15.61	16.80	2.78	35.19	46.00	10.81
	691.540	13.08	19.70	3.41	36.19	46.00	9.81
Vertical	62.010	26.09	6.33	0.89	33.31	40.00	6.69
	82.380	21.30	9.60	1.12	32.02	40.00	7.98
	167.740	20.30	11.07	1.77	33.14	43.50	10.36
	298.690	20.22	13.75	2.56	36.53	46.00	9.47
	579.020	12.36	18.50	2.42	33.28	46.00	12.72
	941.800	10.86	21.83	4.70	37.39	46.00	8.61

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 60%RH

Test Mode : MHL Date of Test : Apr 21, 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	57.160	23.73	6.24	0.86	30.83	40.00	9.17
	90.140	23.14	10.50	1.21	34.85	43.50	8.65
	169.680	21.19	10.90	1.78	33.87	43.50	9.63
	311.300	23.75	14.15	2.60	40.50	46.00	5.50
	478.140	13.96	17.46	2.90	34.32	46.00	11.68
	817.640	11.42	20.67	3.88	35.97	46.00	10.03
Vertical	53.280	23.97	6.83	0.84	31.64	40.00	8.36
	90.140	21.84	10.50	1.21	33.55	43.50	9.95
	189.080	23.29	10.36	1.90	35.55	43.50	7.95
	315.180	18.95	14.30	2.61	35.86	46.00	10.14
	667.290	16.27	19.60	3.16	39.03	46.00	6.97
	895.240	12.07	21.30	4.46	37.83	46.00	8.17

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 60%RH

Test Mode : USB Play Date of Test : Apr 21, 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	94.020	19.09	11.50	1.26	31.85	43.50	11.65
	189.080	24.30	10.36	1.90	36.56	43.50	6.94
	311.300	23.09	14.15	2.60	39.84	46.00	6.16
	482.990	13.11	17.54	2.91	33.56	46.00	12.44
	722.580	9.63	19.97	3.57	33.17	46.00	12.83
	875.840	7.87	20.97	4.36	33.20	46.00	12.80
Vertical	36.790	14.83	14.22	0.70	29.75	40.00	10.25
	65.890	26.14	6.63	0.91	33.68	40.00	6.32
	143.490	23.65	12.20	1.60	37.45	43.50	6.05
	275.410	16.93	13.20	2.39	32.52	46.00	13.48
	449.040	15.37	16.82	2.84	35.03	46.00	10.97
	722.580	14.59	19.97	3.57	38.13	46.00	7.87

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-65N7000U Humidity : 60%RH

Test Mode : LAN Play Date of Test : Apr 21, 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	68.800	22.45	7.12	0.92	30.49	40.00	9.51
	144.460	17.15	12.15	1.60	30.90	43.50	12.60
	238.550	21.29	11.72	2.11	35.12	46.00	10.88
	396.660	17.60	16.57	2.71	36.88	46.00	9.12
	542.160	13.00	18.56	2.63	34.19	46.00	11.81
	844.800	10.62	20.73	4.07	35.42	46.00	10.58
Vertical	46.490	21.83	9.46	0.78	32.07	40.00	7.93
	93.050	22.15	11.30	1.24	34.69	43.50	8.81
	172.590	19.39	10.79	1.80	31.98	43.50	11.52
	246.310	17.91	12.34	2.14	32.39	46.00	13.61
	596.480	12.72	18.98	2.31	34.01	46.00	11.99
	728.400	15.26	20.03	3.59	38.88	46.00	7.12

TEST ENGINEER: BILL WU

5 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
Gasket	SMR-TSL-4-3.5-5R	Qingdao Joinset Co., Ltd	See Internal Photos Figure 22

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.