

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

LED LCD TV

Model No.	Brand
HU70M9700UWG	Hisense
LC-70N9100U	Sharp

FCC ID : W9HLCDF0092

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-F16241
Date of Test : Sep 12-23, 2016
Date of Report : Sep 29, 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
HU70M9700UWG	Hisense	120V/60Hz
LC-70N9100U	Sharp	

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 Sep 12-23, 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.F16240, a Verification report.

Date of Test : Sep 12-23, 2016 Date of Report : Sep 29, 2016

Producer :

Tina Liang
TINA LIANG / Assistant

Reviewed :

Audix Technology (Shanghai) Co., Ltd.

Byron Wu
BYRON WU / Deputy Assistant Manager

Signatory :

Byron Wu
Authorized Signature EMC BYRON KWU / 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	HU70M9700UWG	LC-70N9100U
Brand	Hisense	Sharp

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

Manufacturer : Same as Applicant

Factory #1 : Same as Applicant

Factory #2 : Tatung Mexico S.A. de C.V.
Miguel Catalán 420, Parque Industrial Rio Bravo,
Cd. Juarez, Chih., CP 32557

Factory #3 : HISENSE ELECTRONICA MEXICO,S.A. DE C.V.
Blvd. Sharp #3510 Parque Industrial
Rosarito, C.P. 22710 Playas de Rosarito, B.C.

LCD Panel : Manufacturer : Hisense
M/N : HD700IU-B41(210)

Tuner : Manufacturer : SILICON LABS
M/N : Si2151-A10

Max Resolution : 3840*2160@60Hz

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

Power Cord : Unshielded, Detachable, 1.80m, 3C

USB Cable*3 : Shielded, Detachable, 1.00m
(Lab provide)

LAN Cable : Unshielded, 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 ANT Port

: Connected with ATSC SG/TV SG

(2) One USB #1 Port

: Connected with Hard-Disk #1

(3) One USB #2 Port

: Connected with Hard-Disk #2

(4) One Service Port

: Do not open to the customers

(5) One AUDIO OUT Port

: Connected with Earphone #1

(6) One HDMI1 /MHL Port

: Connected with Smart Mobile Phone

(7) One HDMI2 Port

: Connected with PC

(8) One USB #3 Port

: Connected with Hard-Disk #3

Bottom Port:

(9) One COMPONENT IN / AV IN Port

: Connected with DVD PLAYER #1

(10) One LAN Port

: Connected with PC

(11) One DIGITAL AUDIO OUT Port

: Connected with Audio Converter to Earphone

(12) One HDMI3 Port

: Connected with DVD PLAYER #1

(13) 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, 1.5m.
Certificate : CE, FCC DoC

2.2.11 Hard Disk #2

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

2.2.12 Hard Disk #3

Manufacturer : Tetasys
Model Number : F12
Serial Number : A010022-4A60007
Data Cable : Shielded, Detachable, 1.5m.
Certificate : CE, FCC DoC

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

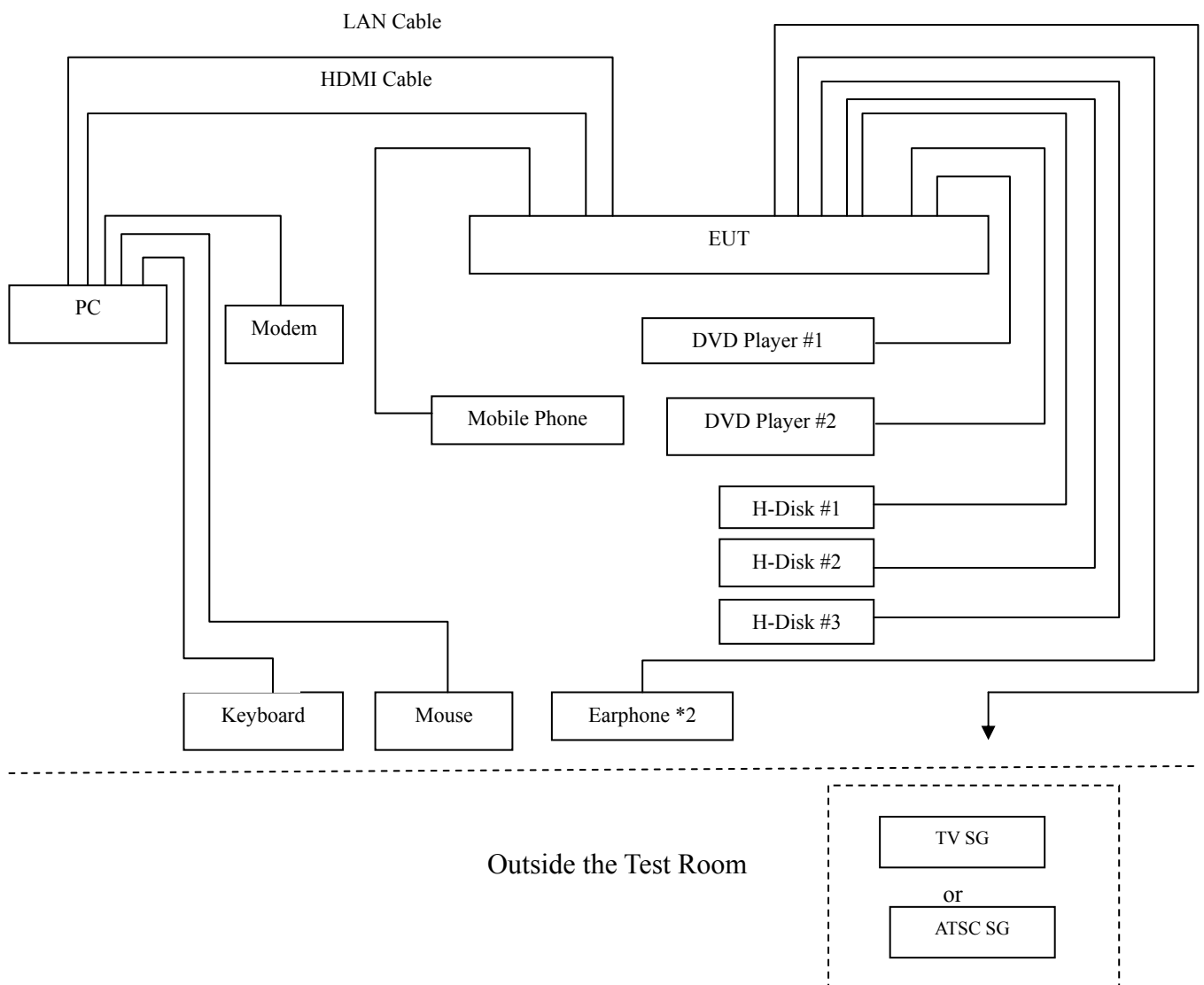
3.1 Test Equipment

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

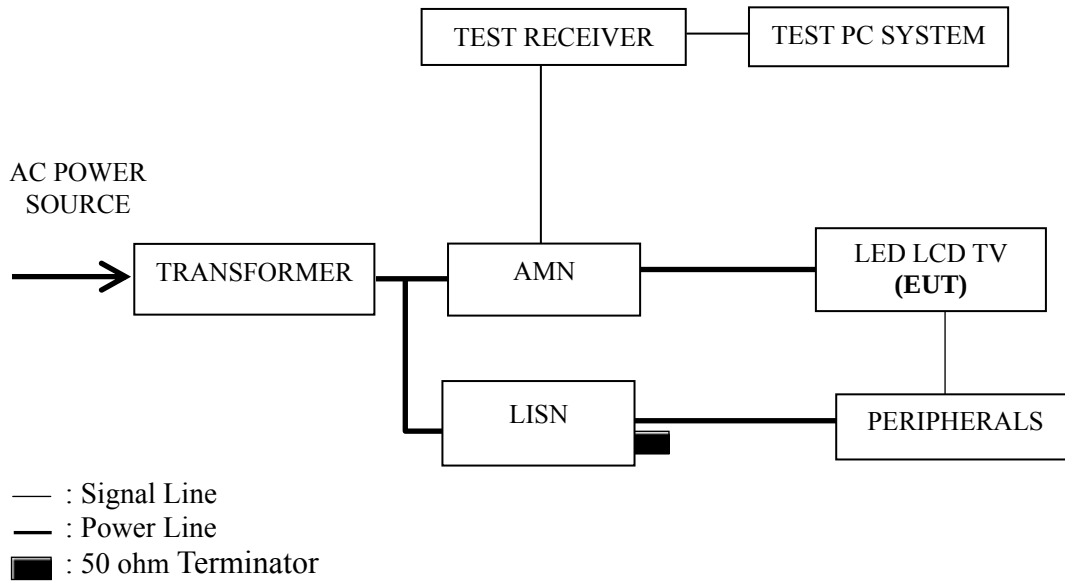
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Apr 27, 2016	Apr 26, 2017
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 25, 2016	Jun 24, 2017
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2016	Mar 19, 2017
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
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 C63.4:2014 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	P13
HDMI 1920*1080@60Hz & 1kHz Playing	P14
HDMI 1280*1024@60Hz & 1kHz playing	P15
HDMI 640*480@60Hz & 1kHz playing	P16
HDMI1080P	P17
MHL	P18
USB Play	P19
LAN Play	P20

NOTE 1 – Factor = Cable Loss + AMN Factor.

NOTE 2 – Emission Level = Meter Reading + Factor.

NOTE 3 – “QP” means “Quasi-Peak” values, “AV” means “Average” values.

NOTE 4 – The worst case is for HDMI 1920*1080@60Hz & 1kHz Playing test mode.
The worst emission is detected at 0.748MHz (Quasi-Peak Value) with corrected signal level of 41.10 dB (μV) (limit is 46.00 dB (μV)), when the Line of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 48%RH

Test Mode : HDMI 3840*2160@60Hz & 1kHz Playing Date of Test : Sep 12, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	34.70	10.59	45.29	65.98	20.69	QP
	0.325	36.69	10.47	47.16	59.57	12.41	
	0.585	34.60	10.40	45.00	56.00	11.00	
	1.224	35.09	10.41	45.50	56.00	10.50	
	2.878	36.70	10.43	47.13	56.00	8.87	
	5.522	26.00	10.46	36.46	60.00	23.54	
	0.150	13.90	10.59	24.49	55.98	31.49	AV
	0.325	30.39	10.47	40.86	49.57	8.71	
	0.585	19.80	10.40	30.20	46.00	15.80	
	1.224	19.99	10.41	30.40	46.00	15.60	
	2.878	22.70	10.43	33.13	46.00	12.87	
	5.522	14.00	10.46	24.46	50.00	25.54	
Neutral	0.152	36.50	10.58	47.08	65.92	18.84	QP
	0.316	35.99	10.46	46.45	59.80	13.35	
	0.650	35.60	10.39	45.99	56.00	10.01	
	1.409	36.60	10.41	47.01	56.00	8.99	
	2.909	36.50	10.46	46.96	56.00	9.04	
	22.830	30.01	10.78	40.79	60.00	19.21	
	0.152	14.50	10.58	25.08	55.92	30.84	AV
	0.316	23.89	10.46	34.35	49.80	15.45	
	0.650	17.70	10.39	28.09	46.00	17.91	
	1.409	25.10	10.41	35.51	46.00	10.49	
	2.909	22.30	10.46	32.76	46.00	13.24	
	22.830	18.91	10.78	29.69	50.00	20.31	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 48%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Sep 12, 2016
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	34.70	10.59	45.29	65.98	20.69	QP
	0.327	36.40	10.46	46.86	59.53	12.67	
	0.748	37.20	10.40	47.60	56.00	8.40	
	1.399	35.59	10.41	46.00	56.00	10.00	
	2.864	36.00	10.43	46.43	56.00	9.57	
	7.372	25.40	10.47	35.87	60.00	24.13	
	0.150	14.00	10.59	24.59	55.98	31.39	AV
	0.327	30.00	10.46	40.46	49.53	9.07	
	0.748	30.70	10.40	41.10	46.00	4.90	
	1.399	23.79	10.41	34.20	46.00	11.80	
	2.864	19.10	10.43	29.53	46.00	16.47	
	7.372	17.40	10.47	27.87	50.00	22.13	
Neutral	0.150	36.50	10.58	47.08	65.99	18.91	QP
	0.303	36.80	10.46	47.26	60.15	12.89	
	0.557	34.90	10.39	45.29	56.00	10.71	
	0.963	36.60	10.40	47.00	56.00	9.00	
	2.895	37.30	10.46	47.76	56.00	8.24	
	21.990	30.99	10.77	41.76	60.00	18.24	
	0.150	14.70	10.58	25.28	55.99	30.71	AV
	0.303	22.20	10.46	32.66	50.15	17.49	
	0.557	23.70	10.39	34.09	46.00	11.91	
	0.963	24.70	10.40	35.10	46.00	10.90	
	2.895	22.10	10.46	32.56	46.00	13.44	
	21.990	19.59	10.77	30.36	50.00	19.64	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 48%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Sep 12, 2016
& 1kHz playing

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	36.70	10.59	47.29	65.98	18.69	QP
	0.339	35.19	10.46	45.65	59.23	13.58	
	0.564	36.10	10.40	46.50	56.00	9.50	
	1.049	33.60	10.40	44.00	56.00	12.00	
	2.863	35.60	10.43	46.03	56.00	9.97	
	5.727	26.20	10.46	36.66	60.00	23.34	
	0.150	14.00	10.59	24.59	55.98	31.39	AV
	0.339	20.89	10.46	31.35	49.23	17.88	
	0.564	25.60	10.40	36.00	46.00	10.00	
	1.049	17.80	10.40	28.20	46.00	17.80	
	2.863	18.30	10.43	28.73	46.00	17.27	
	5.727	13.50	10.46	23.96	50.00	26.04	
Neutral	0.150	36.60	10.58	47.18	65.98	18.80	QP
	0.304	36.80	10.46	47.26	60.14	12.88	
	0.563	35.90	10.39	46.29	56.00	9.71	
	1.200	37.20	10.41	47.61	56.00	8.39	
	2.878	36.50	10.46	46.96	56.00	9.04	
	23.480	31.20	10.80	42.00	60.00	18.00	
	0.150	14.70	10.58	25.28	55.98	30.70	AV
	0.304	22.50	10.46	32.96	50.14	17.18	
	0.563	23.70	10.39	34.09	46.00	11.91	
	1.200	25.30	10.41	35.71	46.00	10.29	
	2.878	18.00	10.46	28.46	46.00	17.54	
	23.480	18.80	10.80	29.60	50.00	20.40	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 48%RH

Test Mode : HDMI 640*480@60Hz & 1kHz playing Date of Test : Sep 12, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	34.70	10.59	45.29	65.98	20.69	QP
	0.326	36.69	10.47	47.16	59.56	12.40	
	0.558	35.80	10.40	46.20	56.00	9.80	
	1.223	35.69	10.41	46.10	56.00	9.90	
	2.895	36.50	10.43	46.93	56.00	9.07	
	5.490	27.90	10.46	38.36	60.00	21.64	
	0.150	14.00	10.59	24.59	55.98	31.39	AV
	0.326	30.29	10.47	40.76	49.56	8.80	
	0.558	26.00	10.40	36.40	46.00	9.60	
	1.223	20.89	10.41	31.30	46.00	14.70	
	2.895	23.10	10.43	33.53	46.00	12.47	
	5.490	13.90	10.46	24.36	50.00	25.64	
Neutral	0.150	36.60	10.58	47.18	65.98	18.80	QP
	0.325	37.09	10.46	47.55	59.59	12.04	
	0.565	34.00	10.39	44.39	56.00	11.61	
	1.162	35.61	10.40	46.01	56.00	9.99	
	2.880	35.60	10.46	46.06	56.00	9.94	
	22.640	30.40	10.78	41.18	60.00	18.82	
	0.150	14.70	10.58	25.28	55.98	30.70	AV
	0.325	30.49	10.46	40.95	49.59	8.64	
	0.565	22.20	10.39	32.59	46.00	13.41	
	1.162	17.41	10.40	27.81	46.00	18.19	
	2.880	17.90	10.46	28.36	46.00	17.64	
	22.640	18.90	10.78	29.68	50.00	20.32	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 48%RH

Test Mode : HDMI1080P Date of Test : Sep 12, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.152	34.70	10.59	45.29	65.88	20.59	QP
	0.331	36.00	10.46	46.46	59.43	12.97	
	0.560	36.40	10.40	46.80	56.00	9.20	
	1.408	36.29	10.41	46.70	56.00	9.30	
	2.934	37.00	10.43	47.43	56.00	8.57	
	5.889	26.30	10.46	36.76	60.00	23.24	
	0.152	14.00	10.59	24.59	55.88	31.29	AV
	0.331	29.40	10.46	39.86	49.43	9.57	
	0.560	26.40	10.40	36.80	46.00	9.20	
	1.408	24.69	10.41	35.10	46.00	10.90	
	2.934	25.90	10.43	36.33	46.00	9.67	
	5.889	15.10	10.46	25.56	50.00	24.44	
Neutral	0.152	36.50	10.58	47.08	65.87	18.79	QP
	0.302	37.00	10.46	47.46	60.18	12.72	
	0.758	37.10	10.39	47.49	56.00	8.51	
	1.403	36.20	10.41	46.61	56.00	9.39	
	2.891	36.30	10.46	46.76	56.00	9.24	
	22.490	29.80	10.78	40.58	60.00	19.42	
	0.152	14.70	10.58	25.28	55.87	30.59	AV
	0.302	21.30	10.46	31.76	50.18	18.42	
	0.758	26.30	10.39	36.69	46.00	9.31	
	1.403	25.30	10.41	35.71	46.00	10.29	
	2.891	21.90	10.46	32.36	46.00	13.64	
	22.490	18.90	10.78	29.68	50.00	20.32	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 48%RH

Test Mode : MHL Date of Test : Sep 12, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.152	34.70	10.59	45.29	65.88	20.59	QP
	0.302	36.90	10.47	47.37	60.19	12.82	
	0.570	34.40	10.40	44.80	56.00	11.20	
	1.133	31.00	10.40	41.40	56.00	14.60	
	2.904	37.00	10.43	47.43	56.00	8.57	
	29.540	25.90	10.98	36.88	60.00	23.12	
	0.152	14.00	10.59	24.59	55.88	31.29	AV
	0.302	20.20	10.47	30.67	50.19	19.52	
	0.570	22.40	10.40	32.80	46.00	13.20	
	1.133	18.20	10.40	28.60	46.00	17.40	
	2.904	23.90	10.43	34.33	46.00	11.67	
	29.540	16.60	10.98	27.58	50.00	22.42	
Neutral	0.153	36.61	10.57	47.18	65.84	18.66	QP
	0.306	36.10	10.46	46.56	60.08	13.52	
	0.561	34.10	10.39	44.49	56.00	11.51	
	1.029	33.40	10.40	43.80	56.00	12.20	
	2.905	35.40	10.46	45.86	56.00	10.14	
	23.510	30.60	10.80	41.40	60.00	18.60	
	0.153	14.71	10.57	25.28	55.84	30.56	AV
	0.306	22.50	10.46	32.96	50.08	17.12	
	0.561	23.30	10.39	33.69	46.00	12.31	
	1.029	16.50	10.40	26.90	46.00	19.10	
	2.905	22.00	10.46	32.46	46.00	13.54	
	23.510	18.50	10.80	29.30	50.00	20.70	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 48%RH

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

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.153	34.70	10.59	45.29	65.86	20.57	QP
	0.304	36.60	10.47	47.07	60.14	13.07	
	0.566	35.40	10.40	45.80	56.00	10.20	
	1.180	36.30	10.40	46.70	56.00	9.30	
	2.939	35.80	10.43	46.23	56.00	9.77	
	12.810	24.00	10.53	34.53	60.00	25.47	
	0.153	14.00	10.59	24.59	55.86	31.27	AV
	0.304	21.90	10.47	32.37	50.14	17.77	
	0.566	24.70	10.40	35.10	46.00	10.90	
	1.180	22.70	10.40	33.10	46.00	12.90	
	2.939	22.00	10.43	32.43	46.00	13.57	
	12.810	17.40	10.53	27.93	50.00	22.07	
Neutral	0.152	36.60	10.58	47.18	65.87	18.69	QP
	0.327	36.80	10.45	47.25	59.52	12.27	
	0.744	36.20	10.39	46.59	56.00	9.41	
	1.192	37.10	10.41	47.51	56.00	8.49	
	2.930	34.90	10.46	45.36	56.00	10.64	
	22.640	31.70	10.78	42.48	60.00	17.52	
	0.152	14.60	10.58	25.18	55.87	30.69	AV
	0.327	29.90	10.45	40.35	49.52	9.17	
	0.744	23.40	10.39	33.79	46.00	12.21	
	1.192	24.30	10.41	34.71	46.00	11.29	
	2.930	20.80	10.46	31.26	46.00	14.74	
	22.640	19.20	10.78	29.98	50.00	20.02	

TEST ENGINEER: SEVEN LU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 48%RH

Test Mode : LAN Play Date of Test : Sep 12, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.153	34.80	10.59	45.39	65.86	20.47	QP
	0.328	36.40	10.46	46.86	59.51	12.65	
	0.749	37.20	10.40	47.60	56.00	8.40	
	1.193	36.89	10.41	47.30	56.00	8.70	
	2.911	36.70	10.43	47.13	56.00	8.87	
	12.730	25.30	10.53	35.83	60.00	24.17	
	0.153	14.00	10.59	24.59	55.86	31.27	AV
	0.328	30.10	10.46	40.56	49.51	8.95	
	0.749	27.90	10.40	38.30	46.00	7.70	
	1.193	23.39	10.41	33.80	46.00	12.20	
	2.911	23.30	10.43	33.73	46.00	12.27	
	12.730	16.90	10.53	27.43	50.00	22.57	
Neutral	0.152	36.60	10.58	47.18	65.89	18.71	QP
	0.306	36.50	10.46	46.96	60.08	13.12	
	0.832	34.00	10.39	44.39	56.00	11.61	
	1.439	35.80	10.42	46.22	56.00	9.78	
	2.883	36.90	10.46	47.36	56.00	8.64	
	23.230	29.71	10.79	40.50	60.00	19.50	
	0.152	14.60	10.58	25.18	55.89	30.71	AV
	0.306	23.10	10.46	33.56	50.08	16.52	
	0.832	12.40	10.39	22.79	46.00	23.21	
	1.439	20.70	10.42	31.12	46.00	14.88	
	2.883	19.80	10.46	30.26	46.00	15.74	
	23.230	18.41	10.79	29.20	50.00	20.80	

TEST ENGINEER: SEVEN LU

4 RADIATED EMISSION TEST

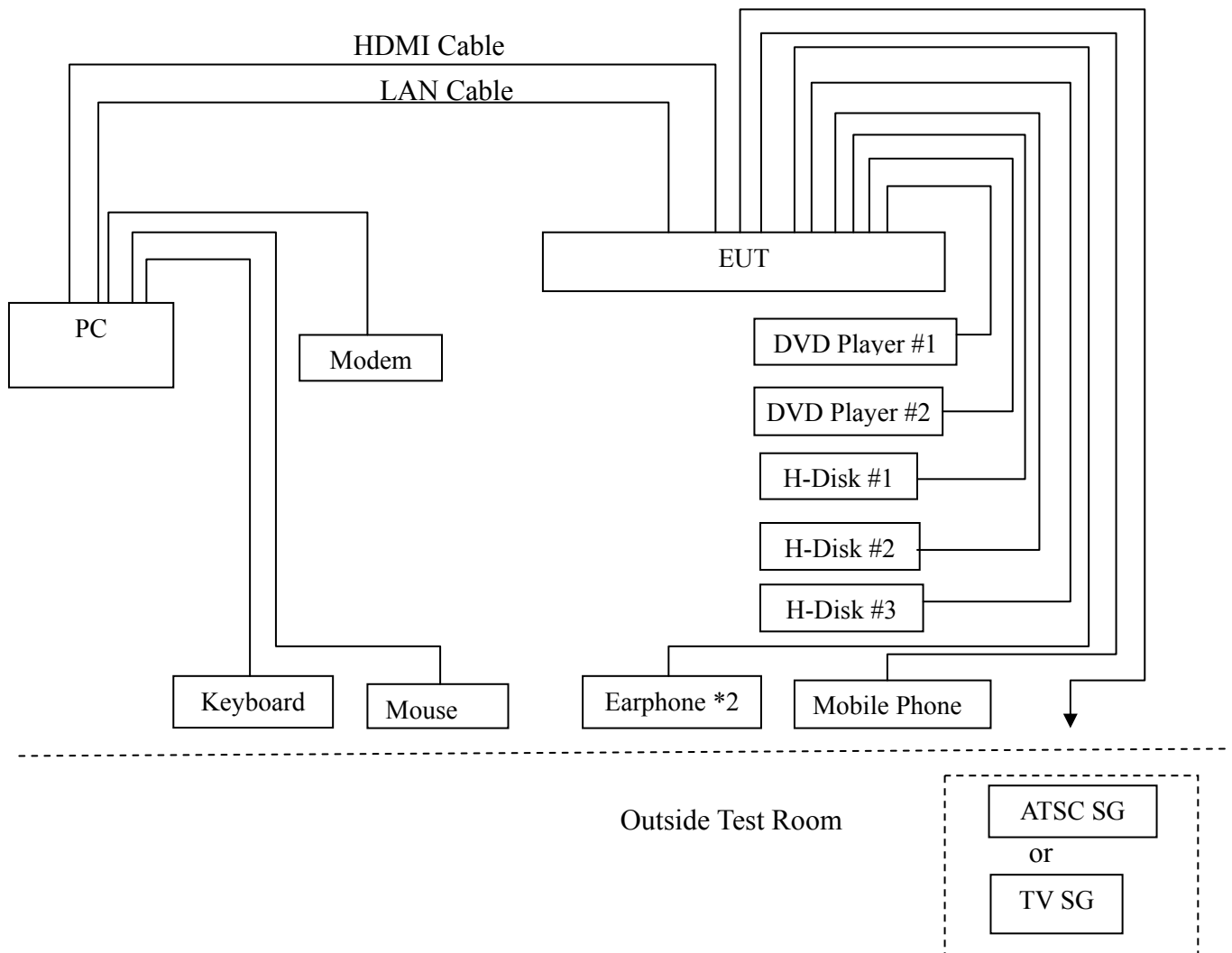
4.1 Test Equipment

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

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101303	May 07, 2016	May 06, 2017
2.	Preamplifier	Agilent	8447D	2944A06664	Apr 27, 2016	Apr 26, 2017
3.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2016	Sep 19, 2017
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 10, 2016	May 09, 2017
5.	Horn Antenna	EMCO	3115	9607-4878	May 31, 2016	May 30, 2017
6.	Spectrum	Agilent	E7405A	MY45106600	Feb 26, 2016	Feb 25, 2017
7.	Software	Audix	e3	6.2007-9-10	--	--

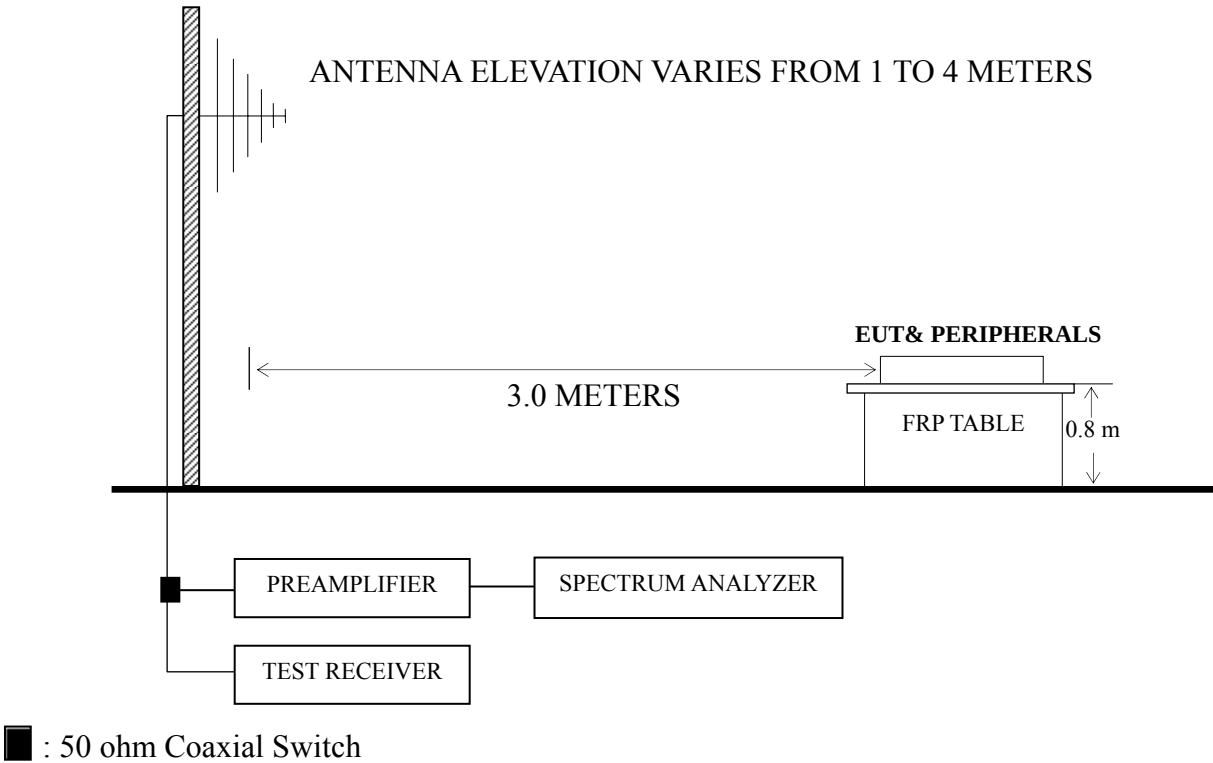
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals



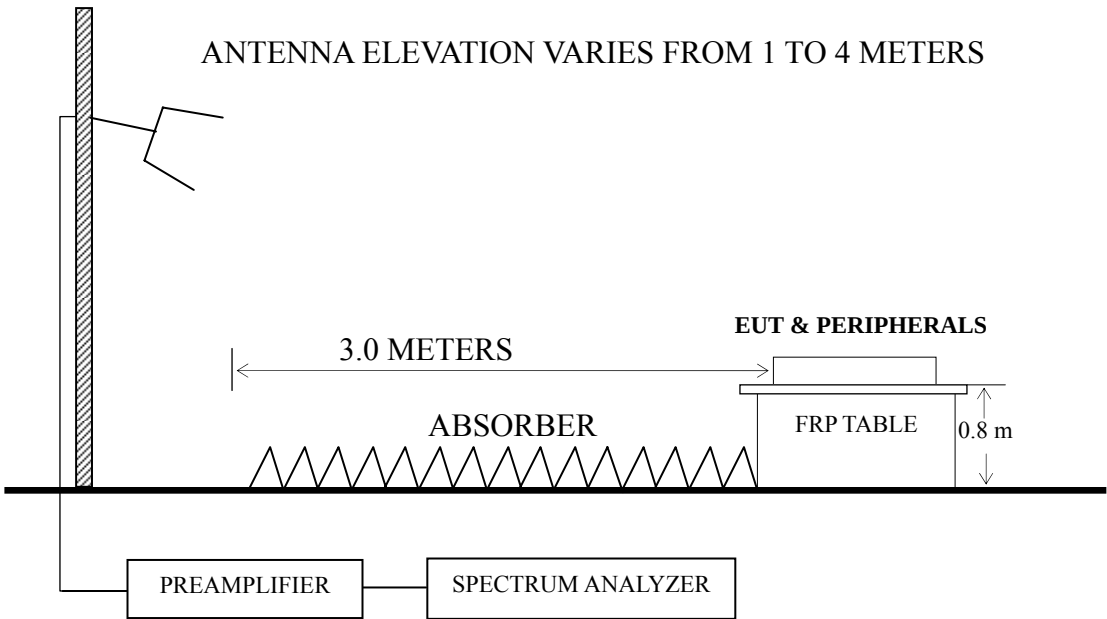
4.2.2 Radiated emission test setup

4.2.2.1 Below 1GHz



4.2.2.2 Above 1GHz

BORE-SIGHT ANTENNA TOWER



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	P25-P26
	HDMI 1920*1080@60Hz & 1kHz Playing	P27
	HDMI 1280*1024@60Hz & 1kHz playing	P28
	HDMI 640*480@60Hz & 1kHz playing	P29
	HDMI1080P	P30
	MHL	P31
	USB Play	P32
	LAN Play	P33
Above 1GHz	HDMI 3840*2160@60Hz & 1kHz Playing	P25-P26

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

NOTE 2 – All readings are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.

NOTE 3 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 4 – The worst case is for HDMI 3840*2160@60Hz & 1kHz Playing test mode. The worst emission at horizontal polarization was detected at 916.069MHz with corrected signal level of 43.53 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 2.00 m height and the turntable was at 250°. The worst emission at vertical polarization was detected at 796.183 MHz with corrected signal level of 42.15 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 2.00m height and the turntable was at 50°.

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 60%RH

Test Mode : HDMI 3840*2160@60Hz & 1kHz Playing Date of Test : Jul 11, 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	84.999	26.42	0.92	10.10	--	37.44	40.00	2.56	QP
	89.905	27.87	0.95	10.75	--	39.57	43.50	3.93	
	143.830	20.90	1.25	12.75	--	34.90	43.50	8.60	
	480.528	21.62	2.22	17.20	--	41.04	46.00	4.96	
	804.603	18.80	2.91	20.37	--	42.08	46.00	3.92	
	916.069	18.98	3.12	21.43	--	43.53	46.00	2.47	
	1480.523	58.72	25.54	3.86	35.71	52.41	74.00	21.59	PK
	2122.382	59.91	27.73	4.58	35.11	57.11	74.00	16.89	
	2547.974	60.94	28.63	4.96	35.16	59.37	74.00	14.63	
	1480.523	38.48	25.54	3.86	35.71	32.17	54.00	21.83	AV
	2122.382	39.01	27.73	4.58	35.11	36.21	54.00	17.79	
	2547.974	40.23	28.63	4.96	35.16	38.66	54.00	15.34	

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 60%RH

Test Mode : HDMI 3840*2160@60Hz & 1kHz Playing Date of Test : Jul 11, 2016

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Vertical	95.093	25.47	0.98	11.66	--	38.11	43.50	5.39	QP
	116.132	24.41	1.10	12.34	--	37.85	43.50	5.65	
	140.342	23.10	1.23	13.20	--	37.53	43.50	5.97	
	315.481	19.63	1.80	14.00	--	35.43	46.00	10.57	
	796.183	18.89	2.89	20.37	--	42.15	46.00	3.85	
	925.756	16.68	3.12	21.43	--	41.23	46.00	4.77	
	1809.539	58.83	26.84	4.19	35.30	54.56	74.00	19.44	PK
	2664.703	57.37	29.13	5.18	35.17	56.51	74.00	17.49	
	3381.760	55.16	31.29	6.10	34.82	57.73	74.00	16.27	
	1809.539	37.28	26.84	4.19	35.30	33.01	54.00	20.99	AV
	2664.703	37.67	29.13	5.18	35.17	36.81	54.00	17.19	
	3381.760	34.83	31.29	6.10	34.82	37.40	54.00	16.60	

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : RLED4350-UHD-B-SM Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Jul 11, 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	85.898	25.56	0.93	10.20	36.69	40.00	3.31
	110.957	25.24	1.07	12.15	38.46	43.50	5.04
	262.896	19.84	1.67	13.22	34.73	46.00	11.27
	417.641	20.17	2.09	16.28	38.54	46.00	7.46
	711.674	14.94	2.73	19.23	36.90	46.00	9.10
	878.322	17.01	3.05	20.97	41.03	46.00	4.97
Vertical	86.807	25.32	0.93	10.35	36.60	40.00	3.40
	89.590	26.91	0.95	10.75	38.61	43.50	4.89
	141.330	23.68	1.24	13.05	37.97	43.50	5.53
	305.680	20.25	1.77	13.79	35.81	46.00	10.19
	494.199	19.57	2.25	17.38	39.20	46.00	6.80
	801.786	18.32	2.91	20.40	41.63	46.00	4.37

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 60%RH

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

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	77.865	25.85	0.88	8.64	35.37	40.00	4.63
	145.351	22.82	1.26	12.54	36.62	43.50	6.88
	226.099	22.80	1.56	11.34	35.70	46.00	10.30
	334.859	19.99	1.86	14.63	36.48	46.00	9.52
	580.703	20.39	2.46	18.25	41.10	46.00	4.90
	785.093	16.80	2.87	20.17	39.84	46.00	6.16
Vertical	78.689	24.75	0.88	8.75	34.38	40.00	5.62
	100.229	25.07	1.00	12.40	38.47	43.50	5.03
	151.597	23.64	1.29	11.88	36.81	43.50	6.69
	305.680	21.76	1.77	13.79	37.32	46.00	8.68
	627.274	18.36	2.58	19.02	39.96	46.00	6.04
	798.980	17.19	2.89	20.40	40.48	46.00	5.52

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Jul 11, 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	80.644	24.49	0.89	8.99	34.37	40.00	5.63
	135.506	20.09	1.21	12.84	34.14	43.50	9.36
	219.845	26.63	1.54	11.00	39.17	46.00	6.83
	351.708	19.21	1.92	15.14	36.27	46.00	9.73
	568.613	13.75	2.44	18.20	34.39	46.00	11.61
	851.035	17.05	3.00	20.57	40.62	46.00	5.38
Vertical	46.995	23.81	0.68	9.45	33.94	40.00	6.06
	75.182	26.41	0.86	8.34	35.61	40.00	4.39
	94.428	24.20	0.97	11.53	36.70	43.50	6.80
	173.814	23.17	1.38	10.69	35.24	43.50	8.26
	257.422	22.02	1.65	13.25	36.92	46.00	9.08
	468.876	19.26	2.20	17.10	38.56	46.00	7.44

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 60%RH

Test Mode : HDMI1080P Date of Test : Jul 11, 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	71.330	27.29	0.84	7.62	35.75	40.00	4.25
	97.798	25.19	0.99	12.03	38.21	43.50	5.29
	149.486	23.00	1.28	12.16	36.44	43.50	7.06
	233.349	24.92	1.58	11.68	38.18	46.00	7.82
	333.687	19.38	1.86	14.63	35.87	46.00	10.13
	582.743	21.10	2.48	18.25	41.83	46.00	4.17
Vertical	69.600	27.15	0.83	7.34	35.32	40.00	4.68
	139.851	22.78	1.23	13.20	37.21	43.50	6.29
	220.617	25.34	1.55	11.05	37.94	46.00	8.06
	370.702	20.93	1.96	15.63	38.52	46.00	7.48
	495.934	21.15	2.25	17.42	40.82	46.00	5.18
	734.491	20.70	2.79	19.47	42.96	46.00	3.04

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 60%RH

Test Mode : MHL Date of Test : Jul 11, 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	90.537	25.08	0.95	10.87	36.90	43.50	6.60
	153.739	19.85	1.30	11.65	32.80	43.50	10.70
	286.982	20.70	1.73	13.45	35.88	46.00	10.12
	513.633	16.30	2.30	17.58	36.18	46.00	9.82
	663.473	11.71	2.65	19.25	33.61	46.00	12.39
	763.376	12.47	2.83	19.77	35.07	46.00	10.93
Vertical	62.431	26.87	0.79	6.76	34.42	40.00	5.58
	143.326	22.27	1.25	12.82	36.34	43.50	7.16
	248.552	23.22	1.63	12.52	37.37	46.00	8.63
	333.687	17.68	1.86	14.63	34.17	46.00	11.83
	549.020	14.29	2.38	17.84	34.51	46.00	11.49
	744.866	15.54	2.79	19.53	37.86	46.00	8.14

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 60%RH

Test Mode : USB Play Date of Test : Jul 11, 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	84.702	24.45	0.92	10.01	35.38	40.00	4.62
	101.289	24.87	1.01	12.37	38.25	43.50	5.25
	178.758	22.83	1.40	10.39	34.62	43.50	8.88
	322.189	18.67	1.83	14.16	34.66	46.00	11.34
	568.613	15.17	2.44	18.20	35.81	46.00	10.19
	839.182	12.25	2.98	20.20	35.43	46.00	10.57
Vertical	93.440	25.69	0.96	11.40	38.05	43.50	5.45
	110.957	23.62	1.07	12.15	36.84	43.50	6.66
	162.611	22.78	1.34	11.21	35.33	43.50	8.17
	311.087	21.33	1.79	13.92	37.04	46.00	8.96
	431.032	14.24	2.12	16.44	32.80	46.00	13.20
	787.851	13.58	2.87	20.23	36.68	46.00	9.32

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-70N9100U Humidity : 60%RH

Test Mode : LAN Play Date of Test : Jul 11, 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	81.783	24.44	0.90	9.33	34.67	40.00	5.33
	121.549	23.91	1.14	12.16	37.21	43.50	6.29
	204.238	23.81	1.49	10.27	35.57	43.50	7.93
	338.400	18.71	1.87	14.76	35.34	46.00	10.66
	502.940	15.79	2.26	17.52	35.57	46.00	10.43
	665.804	16.07	2.65	19.30	38.02	46.00	7.98
Vertical	87.112	23.49	0.93	10.40	34.82	40.00	5.18
	102.719	25.02	1.02	12.35	38.39	43.50	5.11
	182.559	22.59	1.42	10.25	34.26	43.50	9.24
	325.596	20.55	1.83	14.33	36.71	46.00	9.29
	549.020	12.56	2.38	17.84	32.78	46.00	13.22
	719.200	13.51	2.75	19.27	35.53	46.00	10.47

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	Qingdao jei club technology 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:



(BYRON WU)

6 DEVIATION TO TEST SPECIFICATIONS

None

