

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

LED LCD TV

Model No.:

Model No.	Brand
LC-32P3000U, LC-32P3000U+, LC-32P30+0U, LC-32P30+0U1, LC-32P30+0U2, LC-32P3+0U, LC-32P3+0U1,LC-32P3+0U2	Sharp

FCC ID : W9HLCDC0043

Prepared For : Hisense Electric Co., Ltd.
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Development Zone, Qingdao, China

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Report No. : ACI-F17242
Date of Test : Jun 30-Jul 03, 2017
Date of Report : Jul 07, 2017

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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. : Refer to Sec.2.1
 Brand : Sharp
 Power Supply : 120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B
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 30-Jul 03, 2017 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 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.F17241, a Verification report.

Date of Test : Jun 30-Jul 03, 2017 Date of Report : Jul 07, 2017

Producer : HUI MIN YAN
 HUI MIN YAN / Assistant

Review : Byron Wu
 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 AND ANSI C63.4-2014	15.107(a) Class B	Pass
		Minimum passing margin is 16.33dB at 0.151MHz	
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B AND ANSI C63.4-2014	15.109(a) Class B	Pass
		Minimum passing margin is 4.92dB at 906.482MHz (Horizontal, 1.8m/100°)	

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-32P3000U, LC-32P3000U+, LC-32P30+0U, LC-32P30+0U1, LC-32P30+0U2, LC-32P3+0U, LC-32P3+0U1,LC-32P3+0U2
Note #1	:	The above models are all the same except for model number. LC-32P3000U model is tested and recorded in the report.
Note #2	:	“+” represents any of the Arabic numeral.
Note #3	:	The tuner port comply with the 15.111 requirement.
Brand	:	Sharp
Applicant	:	Hisense Electric Co., Ltd. No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China
Manufacturer	:	Same as Applicant
Factory #1	:	Same as Applicant
Factory #2	:	Tatung Mexico S.A. de C.V. Miguel Catalán 420, Parque Industrial Rio Bravo, Cd. Juarez, Chih., CP 32557
Factory #3	:	HISENSE ELECTRONICA MEXICO,S.A. DE C.V. Blvd. Hisense #3510 Parque Industrial Rosarito, C.P. 22710 Playas de Rosarito, B.C.
LCD Panel	:	Manufacturer : Hisense M/N : HD315K2H81-B1QL
Tuner	:	Manufacturer : SILICON LABS M/N : Si2159-A10
Max Resolution	:	1920*1080@60Hz
HDMI Cable*3 (Lab provide)	:	Shielded, Detachable, 1.80m
Power Cord	:	Unshielded, Detachable, 1.80m, 2C

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

Remark:

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

Side View:

- (1) One DIGITALAUDIO OUT Port : Connected with Audio Converter to Earphone
- (2) One USB1 Ports : Connected with Hard-Disk

Back View:

- (3) One AV IN Port : Connected with DVD Player
- (4) One ANT Port : Connected with Antenna or ATSC SG/TV SG
- (5) One HDMI3 Port : Connected with PC
- (6) One HDMI1 Port : Connected with PC
- (7) One HDMI2 Port : Connected with DVD Player
- (8) One AUDIO OUT Port : Connected with Earphone

2.2 Peripherals

2.2.1 PC

Manufacturer : HP
Model Number : Pro3340
Serial Number : 6CR2512VFD
Power Cord : Unshielded, Detachable, 1.8m
Certificate : FCC DoC; CE/EMC; VCCI; C-Tick;

2.2.2 Keyboard

Manufacturer : Microsoft
Model Number : RT2300
Serial Number : 7668200662248
Data Cable : Shielded, undetachable, 1.8m
Certificate : CE/EMC, FCC DoC, VCCI, MIC,
C-Tick, BSMI

2.2.3 Mouse

Manufacturer : Microsoft
Model Number : RT2300
Serial Number : 6965712071551
Data Cable : Shielded, Undetachable, 1.8m.
Certificate : CE/EMC, FCC DoC, VCCI, MIC,
C-Tick, BSMI

2.2.4 Modem

Manufacturer : TP-LINK
Model Number : TM-EC5658V
Serial Number : 07123301053
Data Cable : Shielded, Detachable, 1.8m
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

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

2.2.9 Hard Disk

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

2.3 Description of Test Facility

Site Description (No.3 3m Chamber) : Sept. 17, 1998 file on
Jan.15, 2015 Renewed
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046, USA

Name of Firm : Audix Technology (Shanghai) Co., Ltd.

Site Location : 3F 34Bldg 680 Guiping Rd,
Caohejing Hi-Tech Park,
Shanghai 200233, China

FCC registration Number : 91789

NVLAP Lab Code : 200371-0

2.4 Measurement Uncertainty

Conducted Emission Expanded Uncertainty : U = 3.4dB

Radiated Emission Expanded Uncertainty (30-200MHz):
U = 4.3dB(Horizontal)
U = 4.6dB (Vertical)

Radiated Emission Expanded Uncertainty (200M-1GHz):
U = 4.3dB (Horizontal)
U = 5.5dB (Vertical)

Radiated Emission Expanded Uncertainty (1GHz-6GHz):
U = 5.1 dB

3 CONDUCTED EMISSION TEST

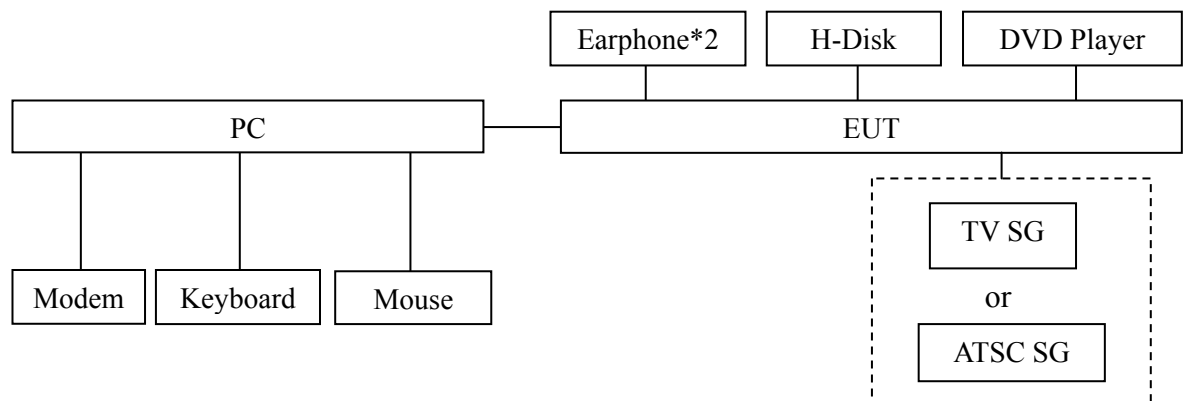
3.1 Test Equipment

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

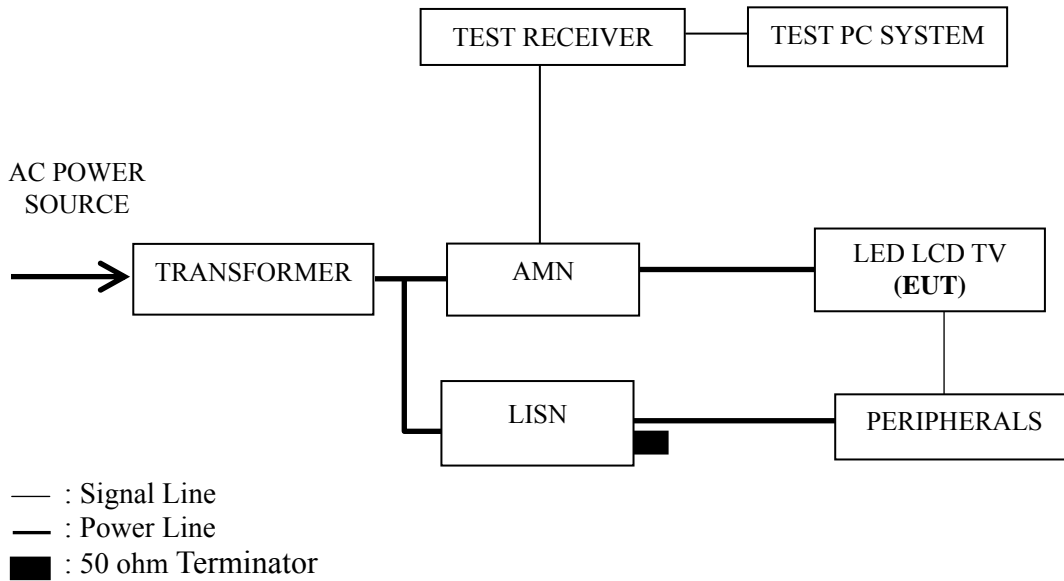
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Apr 27, 2017	Apr 26, 2018
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 25, 2017	Jun 24, 2018
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 17, 2017	Mar 16, 2018
4.	50Ω Terminator	Anritsu	BNC	001	Mar 20, 2017	Sep 19, 2017
5.	Software	Audix	E3	6.111206	--	--

3.2 Block Diagram of Test Setup

3.2.1 EUT & Peripherals



3.2.2 Conducted Disturbance Test Setup



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

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

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

3.4 Test Configuration

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

3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT and peripherals as shown in Sec. 3.2.
- 3.5.2 Turn on the power of all equipments and the EUT.
- 3.5.3 Set the contrast & brightness of EUT to maximum.
- 3.5.4 PC system ran the self-test program “EMC Test” by windows XP and sent “H” characters to EUT through graphic card, the EUT’s screen displayed and filled with “H” pattern by its resolution (Via HDMI Input).
- 3.5.5 PC system sent the 1kHz audio signal to EUT through audio port, the EUT speak out 1kHz audio signal.
- 3.5.6 In USB Play mode, set the EUT play digital media from H-Disk.
- 3.5.7 The other peripherals devices were driven and operated during the test.
- 3.5.8 The test modes are as follows:

Test Mode
HDMI1 1920*1080@60Hz & 1kHz playing
HDMI1 1280*1024@60Hz & 1kHz playing
HDMI1 640*480@60Hz & 1kHz playing
HDMI2 1920*1080@60Hz & 1kHz playing
HDMI3 1920*1080@60Hz & 1kHz playing
HDMI1080P
USB Play

3.6 Test Procedures

The EUT and peripherals were connected to the power mains through an Artificial Mains Network (AMN). This provided a 50 ohm coupling impedance for the measuring equipment.

Both sides of AC line (Line & Neutral) were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to ANSI C63.4 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
HDMI1 1920*1080@60Hz & 1kHz playing	P13
HDMI1 1280*1024@60Hz & 1kHz playing	P14
HDMI1 640*480@60Hz & 1kHz playing	P15
HDMI2 1920*1080@60Hz & 1kHz playing	P16
HDMI3 1920*1080@60Hz & 1kHz playing	P17
HDMI1080P	P18
USB Play	P19

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.

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 48%RH

Test Mode : HDMI1 Date of Test : Jun 30, 2017
1920*1080@60Hz &
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	0.150	38.30	10.60	48.90	65.98	17.08	QP
	0.180	36.35	10.56	46.91	64.50	17.59	
	0.431	22.61	10.40	33.01	57.24	24.23	
	0.672	15.24	10.38	25.62	56.00	30.38	
	3.140	11.73	10.43	22.16	56.00	33.84	
	7.977	14.99	10.49	25.48	60.00	34.52	
	0.150	14.40	10.60	25.00	55.98	30.98	AV
	0.180	22.20	10.56	32.76	54.50	21.74	
	0.431	11.70	10.40	22.10	47.24	25.14	
	0.672	4.31	10.38	14.69	46.00	31.31	
	3.140	4.30	10.43	14.73	46.00	31.27	
	7.977	10.30	10.49	20.79	50.00	29.21	
Neutral	0.183	36.11	10.49	46.60	64.33	17.73	QP
	0.239	26.91	10.46	37.37	62.13	24.76	
	0.484	16.61	10.38	26.99	56.27	29.28	
	3.399	11.70	10.45	22.15	56.00	33.85	
	7.175	6.81	10.50	17.31	60.00	42.69	
	12.124	11.41	10.50	21.91	60.00	38.09	
	0.183	24.61	10.49	35.10	54.33	19.23	AV
	0.239	12.70	10.46	23.16	52.13	28.97	
	0.484	6.70	10.38	17.08	46.27	29.19	
	3.399	4.20	10.45	14.65	46.00	31.35	
	7.175	1.80	10.50	12.30	50.00	37.70	
	12.124	5.80	10.50	16.30	50.00	33.70	

TEST ENGINEER: KALSI CHEN

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 48%RH

Test Mode : HDMI1 Date of Test : Jun 30, 2017
1280*1024@60Hz &
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	36.22	10.60	46.82	65.98	19.16	QP
	0.199	36.56	10.54	47.10	63.67	16.57	
	0.242	24.23	10.49	34.72	62.04	27.32	
	0.421	16.67	10.41	27.08	57.42	30.34	
	3.107	11.82	10.43	22.25	56.00	33.75	
	7.175	14.79	10.49	25.28	60.00	34.72	
	0.150	14.60	10.60	25.20	55.98	30.78	AV
	0.199	23.56	10.54	34.10	53.67	19.57	
	0.242	14.23	10.49	24.72	52.04	27.32	
	0.421	6.67	10.41	17.08	47.42	30.34	
	3.107	4.82	10.43	15.25	46.00	30.75	
	7.175	11.79	10.49	22.28	50.00	27.72	
Neutral	0.178	36.33	10.50	46.83	64.59	17.76	QP
	0.244	27.15	10.46	37.61	61.95	24.34	
	0.489	16.40	10.38	26.78	56.19	29.41	
	3.399	10.89	10.45	21.34	56.00	34.66	
	7.175	8.80	10.50	19.30	60.00	40.70	
	12.253	10.98	10.51	21.49	60.00	38.51	
	0.178	25.33	10.50	35.83	54.59	18.76	AV
	0.244	13.15	10.46	23.61	51.95	28.34	
	0.489	5.40	10.38	15.78	46.19	30.41	
	3.399	4.89	10.45	15.34	46.00	30.66	
	7.175	3.80	10.50	14.30	50.00	35.70	
	12.253	5.98	10.51	16.49	50.00	33.51	

TEST ENGINEER: KALSI CHEN

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 48%RH

Test Mode : HDMI1 640*480@60Hz Date of Test : Jun 30, 2017
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.151	39.03	10.60	49.63	65.96	16.33	QP
	0.183	35.20	10.55	45.75	64.33	18.58	
	0.239	23.34	10.50	33.84	62.13	28.29	
	0.421	16.95	10.41	27.36	57.42	30.06	
	3.276	10.34	10.44	20.78	56.00	35.22	
	9.757	14.92	10.49	25.41	60.00	34.59	AV
	0.151	16.03	10.60	26.63	55.96	29.33	
	0.183	19.20	10.55	29.75	54.33	24.58	
	0.239	13.34	10.50	23.84	52.13	28.29	
	0.421	5.95	10.41	16.36	47.42	31.06	
3.276	3.34	10.44	13.78	46.00	32.22	Neutral	
9.757	9.92	10.49	20.41	50.00	29.59		
0.178	36.92	10.50	47.42	64.59	17.17		QP
0.244	27.27	10.46	37.73	61.95	24.22		
0.307	17.60	10.42	28.02	60.06	32.04		
0.484	12.90	10.38	23.28	56.27	32.99		
3.472	10.78	10.45	21.23	56.00	34.77		
7.175	12.52	10.50	23.02	60.00	36.98		AV
0.178	23.92	10.50	34.42	54.59	20.17		
0.244	13.27	10.46	23.73	51.95	28.22		
0.307	7.60	10.42	18.02	50.06	32.04		
0.484	4.90	10.38	15.28	46.27	30.99		
3.472	6.78	10.45	17.23	46.00	28.77	AV	
7.175	7.52	10.50	18.02	50.00	31.98		

TEST ENGINEER: KALSI CHEN

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 48%RH

Test Mode : HDMI2 Date of Test : Jun 30, 2017
1920*1080@60Hz &
1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.182	35.39	10.56	45.95	64.42	18.47	QP
	0.244	27.24	10.49	37.73	61.95	24.22	
	0.426	20.96	10.41	31.37	57.33	25.96	
	0.521	16.18	10.39	26.57	56.00	29.43	
	3.547	12.08	10.44	22.52	56.00	33.48	
	9.757	15.20	10.49	25.69	60.00	34.31	
	0.182	16.39	10.56	26.95	54.42	27.47	AV
	0.244	18.24	10.49	28.73	51.95	23.22	
	0.426	10.96	10.41	21.37	47.33	25.96	
	0.521	5.18	10.39	15.57	46.00	30.43	
	3.547	6.08	10.44	16.52	46.00	29.48	
	9.757	11.20	10.49	21.69	50.00	28.31	
Neutral	0.150	33.08	10.52	43.60	65.99	22.39	QP
	0.184	29.70	10.49	40.19	64.28	24.09	
	0.440	17.01	10.39	27.40	57.07	29.67	
	3.509	12.72	10.45	23.17	56.00	32.83	
	7.175	8.75	10.50	19.25	60.00	40.75	
	12.384	10.80	10.51	21.31	60.00	38.69	
	0.150	13.10	10.52	23.62	55.99	32.37	AV
	0.184	14.70	10.49	25.19	54.28	29.09	
	0.440	7.01	10.39	17.40	47.07	29.67	
	3.509	4.72	10.45	15.17	46.00	30.83	
	7.175	3.75	10.50	14.25	50.00	35.75	
	12.384	5.80	10.51	16.31	50.00	33.69	

TEST ENGINEER: KALSI CHEN

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 48%RH

Test Mode : HDMI3 Date of Test : Jun 30, 2017
1920*1080@60Hz &
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	0.150	36.36	10.60	46.96	65.98	19.02	QP	
	0.180	36.02	10.56	46.58	64.50	17.92		
	0.249	22.06	10.49	32.55	61.78	29.23		
	0.417	15.67	10.41	26.08	57.51	31.43		
	2.931	11.91	10.43	22.34	56.00	33.66		
	8.148	15.02	10.49	25.51	60.00	34.49		
	0.150	14.20	10.60	24.80	55.98	31.18	AV	
	0.180	22.02	10.56	32.58	54.50	21.92		
	0.249	12.06	10.49	22.55	51.78	29.23		
	0.417	5.67	10.41	16.08	47.51	31.43		
	2.931	4.91	10.43	15.34	46.00	30.66		
	8.148	9.02	10.49	19.51	50.00	30.49		
	Neutral	0.152	36.45	10.52	46.97	65.91	18.94	QP
		0.183	27.82	10.49	38.31	64.33	26.02	
0.444		16.57	10.39	26.96	56.98	30.02		
3.472		12.39	10.45	22.84	56.00	33.16		
7.175		7.35	10.50	17.85	60.00	42.15		
11.933		12.89	10.50	23.39	60.00	36.61		
0.152		25.45	10.52	35.97	55.91	19.94	AV	
0.183		14.82	10.49	25.31	54.33	29.02		
0.444		7.57	10.39	17.96	46.98	29.02		
3.472		5.39	10.45	15.84	46.00	30.16		
7.175		2.35	10.50	12.85	50.00	37.15		
11.933		6.89	10.50	17.39	50.00	32.61		

TEST ENGINEER: KALSI CHEN

EUT : LED LCD TV Temperature : 22°C
 Model No. : LC-32P3000U Humidity : 48%RH
 Test Mode : HDMI 1080P Date of Test : Jun 30, 2017

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.150	38.78	10.60	49.38	66.00	16.62	QP
	0.178	37.25	10.56	47.81	64.59	16.78	
	0.244	25.99	10.49	36.48	61.95	25.47	
	0.421	20.94	10.41	31.35	57.42	26.07	
	3.207	12.20	10.44	22.64	56.00	33.36	
	7.175	15.06	10.49	25.55	60.00	34.45	
	0.150	15.10	10.60	25.70	56.00	30.30	AV
	0.178	22.25	10.56	32.81	54.59	21.78	
	0.244	14.99	10.49	25.48	51.95	26.47	
	0.421	10.94	10.41	21.35	47.42	26.07	
	3.207	3.20	10.44	13.64	46.00	32.36	
	7.175	11.06	10.49	21.55	50.00	28.45	
Neutral	0.152	37.47	10.52	47.99	65.91	17.92	QP
	0.180	28.27	10.50	38.77	64.50	25.73	
	0.489	17.79	10.38	28.17	56.19	28.02	
	3.436	11.78	10.45	22.23	56.00	33.77	
	7.175	7.79	10.50	18.29	60.00	41.71	
	12.124	10.79	10.50	21.29	60.00	38.71	
	0.152	25.47	10.52	35.99	55.91	19.92	AV
	0.180	15.27	10.50	25.77	54.50	28.73	
	0.489	7.79	10.38	18.17	46.19	28.02	
	3.436	4.78	10.45	15.23	46.00	30.77	
	7.175	3.79	10.50	14.29	50.00	35.71	
	12.124	4.79	10.50	15.29	50.00	34.71	

TEST ENGINEER: KALSI CHEN

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 48%RH

Test Mode : USB Play Date of Test : Jun 30, 2017

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.152	37.25	10.60	47.85	65.91	18.06	QP
	0.183	36.24	10.55	46.79	64.33	17.54	
	0.242	21.07	10.49	31.56	62.04	30.48	
	0.417	17.84	10.41	28.25	57.51	29.26	
	3.140	12.55	10.43	22.98	56.00	33.02	
	7.175	15.87	10.49	26.36	60.00	33.64	
	0.152	14.25	10.60	24.85	55.91	31.06	AV
	0.183	23.24	10.55	33.79	54.33	20.54	
	0.242	13.07	10.49	23.56	52.04	28.48	
	0.417	5.84	10.41	16.25	47.51	31.26	
	3.140	6.55	10.43	16.98	46.00	29.02	
	7.175	11.87	10.49	22.36	50.00	27.64	
Neutral	0.152	37.39	10.52	47.91	65.91	18.00	QP
	0.194	28.39	10.49	38.88	63.84	24.96	
	0.440	17.52	10.39	27.91	57.07	29.16	
	3.436	12.81	10.45	23.26	56.00	32.74	
	8.148	10.93	10.50	21.43	60.00	38.57	
	12.124	12.92	10.50	23.42	60.00	36.58	
	0.152	25.39	10.52	35.91	55.91	20.00	AV
	0.194	13.39	10.49	23.88	53.84	29.96	
	0.440	7.52	10.39	17.91	47.07	29.16	
	3.436	5.81	10.45	16.26	46.00	29.74	
	8.148	4.93	10.50	15.43	50.00	34.57	
	12.124	7.92	10.50	18.42	50.00	31.58	

TEST ENGINEER: KALSI CHEN

4 RADIATED EMISSION TEST

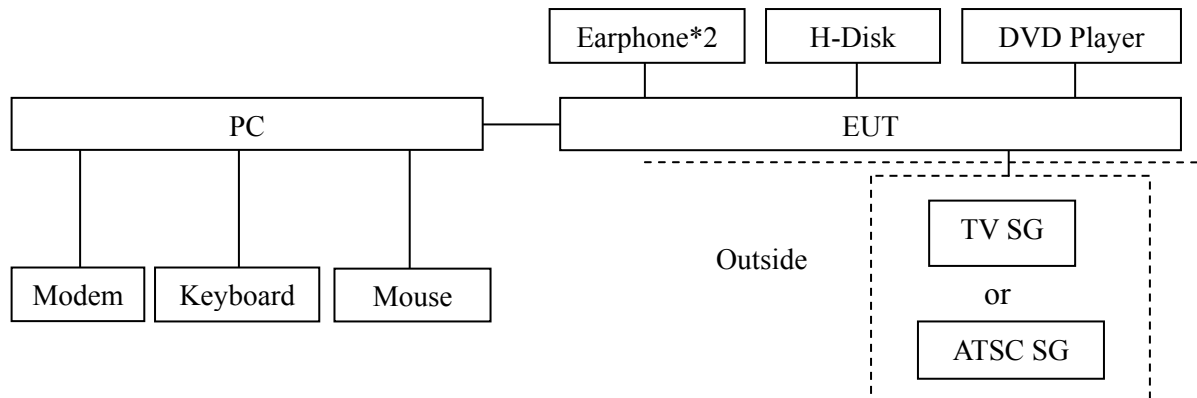
4.1 Test Equipment

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, 2017	May 06, 2018
2.	Preamplifier	Agilent	8447D	2944A06664	Apr 27, 2017	Apr 26, 2018
3.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2017	Mar 19, 2018
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 15, 2017	May 14, 2018
5.	Horn Antenna	EMCO	3115	9607-4878	Jun 03, 2017	Jun 02, 2018
6.	Spectrum	Agilent	E7405A	MY45106600	Apr 26, 2017	Apr 25, 2018
7.	Software	Audix	e3	6.2007-9-10	--	--

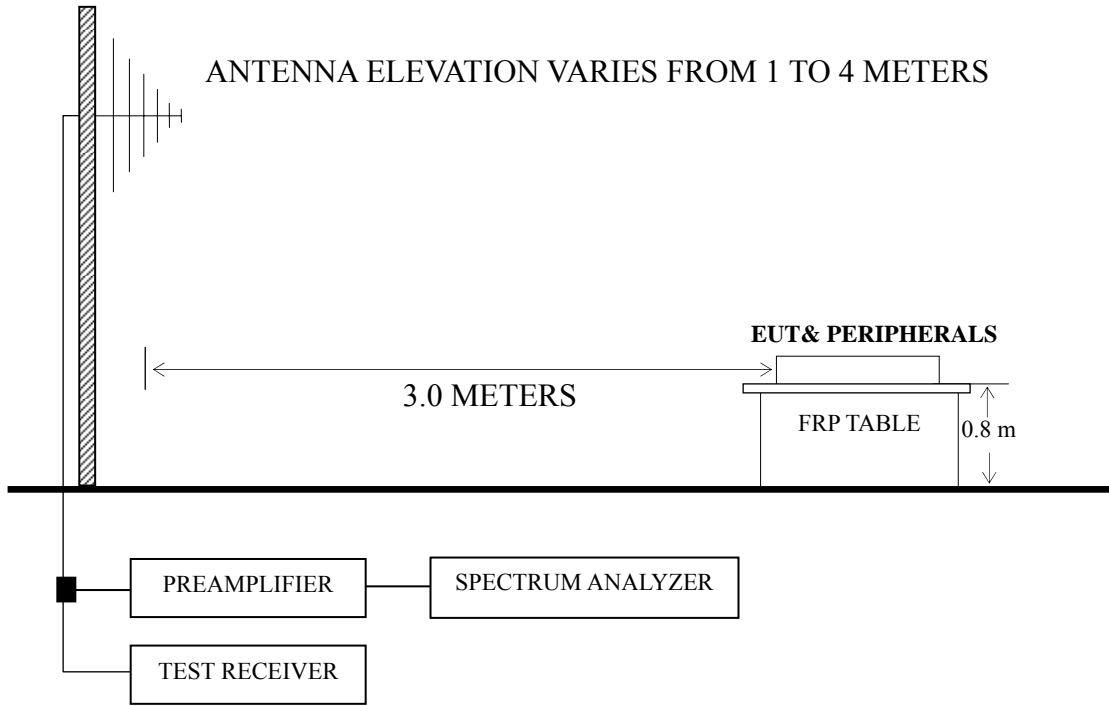
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals



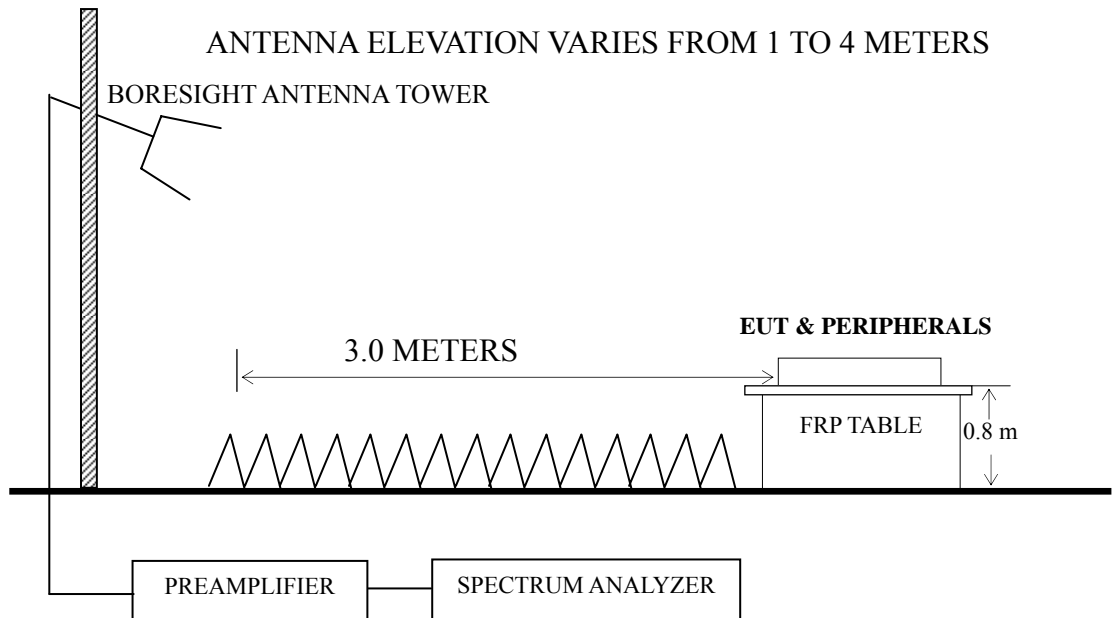
4.2.2 Radiated emission test setup

4.2.2.1 Below 1GHz



■ : 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 5 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
HDMI1 1920*1080@60Hz & 1kHz playing	P24
HDMI2 1920*1080@60Hz & 1kHz playing	P25-P26
HDMI2 1280*1024@60Hz & 1kHz playing	P27
HDMI2 640*480@60Hz & 1kHz playing	P28
HDMI3 1920*1080@60Hz & 1kHz playing	P29
HDMI1080P	P30
USB Play	P31

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.

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 60%RH

Test Mode : HDMI1 1920*1080@60Hz Date of Test : Jul 03, 2017
& 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	104.903	13.39	12.90	1.03	27.32	43.50	16.18
	159.784	21.51	10.61	1.32	33.44	43.50	10.06
	302.481	21.67	14.05	1.77	37.49	46.00	8.51
	597.223	14.19	19.50	2.50	36.19	46.00	9.81
	742.259	15.48	20.57	2.76	38.81	46.00	7.19
	890.728	11.29	21.00	3.03	35.32	46.00	10.68
Vertical	31.399	14.28	17.99	0.56	32.83	40.00	7.17
	150.011	19.16	11.60	1.28	32.04	43.50	11.46
	229.293	21.29	11.26	1.58	34.13	46.00	11.87
	597.223	13.32	19.50	2.50	35.32	46.00	10.68
	742.259	12.80	20.57	2.76	36.13	46.00	9.87
	890.728	13.68	21.00	3.03	37.71	46.00	8.29

TEST ENGINEER: LEON YUN

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 60%RH

Test Mode : HDMI2 1920*1080@60Hz & 1kHz playing Date of Test : Jul 03, 2017

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	82.071	14.04	9.79	0.87	0.00	24.70	40.00	15.30	QP
	104.170	13.85	12.88	1.03	0.00	27.76	43.50	15.74	
	158.112	20.77	10.84	1.32	0.00	32.93	43.50	10.57	
	303.544	21.19	14.07	1.78	0.00	37.04	46.00	8.96	
	513.633	14.44	18.50	2.33	0.00	35.27	46.00	10.73	
	603.539	14.14	19.55	2.52	0.00	36.21	46.00	9.79	
	1317.757	56.37	3.67	24.92	35.98	48.98	74.00	25.02	PK
	1441.262	48.27	3.81	25.39	35.81	41.66	74.00	32.34	
	1764.712	54.94	4.13	26.68	35.44	50.31	74.00	23.69	
	1317.757	40.34	3.67	24.92	35.98	32.95	54.00	21.05	AV
	1441.262	33.88	3.81	25.39	35.81	27.27	54.00	26.73	
	1764.712	40.74	4.13	26.68	35.44	36.11	54.00	17.89	

TEST ENGINEER: LEON YUN

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 60%RH

Test Mode : HDMI2 1920*1080@60Hz Date of Test : Jul 03, 2017
& 1kHz playing

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	31.955	16.65	17.70	0.57	0.00	34.92	40.00	5.08	QP
	150.011	20.62	11.60	1.28	0.00	33.50	43.50	10.00	
	225.308	22.29	11.10	1.57	0.00	34.96	46.00	11.04	
	411.824	14.29	16.94	2.10	0.00	33.33	46.00	12.67	
	595.133	14.18	19.50	2.50	0.00	36.18	46.00	9.82	
	906.482	16.93	21.10	3.05	0.00	41.08	46.00	4.92	
	1181.321	51.30	3.63	24.37	36.19	43.11	74.00	30.89	PK
	1472.586	49.39	3.84	25.51	35.78	42.96	74.00	31.04	
	1742.717	52.56	4.11	26.59	35.46	47.80	74.00	26.20	
	1181.321	35.67	3.63	24.37	36.19	27.48	54.00	26.52	AV
	1472.586	34.83	3.84	25.51	35.78	28.40	54.00	25.60	
	1742.717	38.92	4.11	26.59	35.46	34.16	54.00	19.84	

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 60%RH

Test Mode : HDMI2 1280*1024@60Hz Date of Test : Jul 03, 2017
& 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	148.963	21.42	11.64	1.28	34.34	43.50	9.16
	303.544	22.32	14.07	1.78	38.17	46.00	7.83
	446.414	13.41	17.53	2.17	33.11	46.00	12.89
	607.787	14.50	19.58	2.52	36.60	46.00	9.40
	742.259	12.39	20.57	2.76	35.72	46.00	10.28
	906.482	16.11	21.10	3.05	40.26	46.00	5.74
Vertical	31.510	14.92	17.92	0.56	33.40	40.00	6.60
	148.963	24.97	11.64	1.28	37.89	43.50	5.61
	229.293	21.92	11.26	1.58	34.76	46.00	11.24
	286.982	16.69	13.75	1.74	32.18	46.00	13.82
	599.321	14.31	19.50	2.50	36.31	46.00	9.69
	742.259	10.12	20.57	2.76	33.45	46.00	12.55

TEST ENGINEER: LEON YUN

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 60%RH

Test Mode : HDMI2 640*480@60Hz & 1kHz Playing Date of Test : Jul 03, 2017

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	160.909	21.98	10.47	1.33	33.78	43.50	9.72
	308.913	22.64	14.18	1.80	38.62	46.00	7.38
	497.677	11.31	18.36	2.29	31.96	46.00	14.04
	522.718	12.96	18.50	2.34	33.80	46.00	12.20
	607.787	13.79	19.58	2.52	35.89	46.00	10.11
	972.337	4.51	21.70	3.16	29.37	54.00	24.63
Vertical	31.180	14.92	18.14	0.56	33.62	40.00	6.38
	143.830	17.20	12.05	1.25	30.50	43.50	13.00
	216.783	18.92	10.92	1.54	31.38	46.00	14.62
	286.982	16.28	13.75	1.74	31.77	46.00	14.23
	413.271	13.17	16.98	2.10	32.25	46.00	13.75
	603.539	12.83	19.55	2.52	34.90	46.00	11.10

TEST ENGINEER: LEON YUN

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 60%RH

Test Mode : HDMI3 1920*1080@60Hz & 1kHz Playing Date of Test : Jul 03, 2017

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	104.903	13.71	12.90	1.03	27.64	43.50	15.86
	159.225	21.08	10.73	1.32	33.13	43.50	10.37
	305.680	22.22	14.12	1.78	38.12	46.00	7.88
	504.706	12.83	18.44	2.31	33.58	46.00	12.42
	601.427	13.84	19.52	2.52	35.88	46.00	10.12
	909.667	7.83	21.10	3.05	31.98	46.00	14.02
Vertical	31.071	15.18	18.21	0.56	33.95	40.00	6.05
	67.913	23.13	7.35	0.81	31.29	40.00	8.71
	151.067	21.47	11.55	1.29	34.31	43.50	9.19
	229.293	19.78	11.26	1.58	32.62	46.00	13.38
	407.515	15.66	16.70	2.08	34.44	46.00	11.56
	593.050	13.82	19.50	2.50	35.82	46.00	10.18

TEST ENGINEER: LEON YUN

EUT : LED LCD TV Temperature : 22°C
 Model No. : LC-32P3000U Humidity : 60%RH
 Test Mode : HDMI1080P Date of Test : Jul 03, 2017

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	21.46	11.97	0.97	34.40	43.50	9.10
	157.007	23.78	11.06	1.31	36.15	43.50	7.35
	301.422	21.26	14.02	1.77	37.05	46.00	8.95
	520.888	11.84	18.50	2.34	32.68	46.00	13.32
	603.539	14.62	19.55	2.52	36.69	46.00	9.31
	906.482	14.31	21.10	3.05	38.46	46.00	7.54
Vertical	31.289	16.27	18.07	0.56	34.90	40.00	5.10
	64.433	20.96	6.78	0.80	28.54	40.00	11.46
	148.441	18.33	11.68	1.27	31.28	43.50	12.22
	416.179	11.79	17.02	2.10	30.91	46.00	15.09
	570.610	10.74	18.90	2.45	32.09	46.00	13.91
	742.259	8.38	20.57	2.76	31.71	46.00	14.29

TEST ENGINEER: LEON YUN

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-32P3000U Humidity : 60%RH

Test Mode : USB Play Date of Test : Jul 03, 2017

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	101.644	17.60	12.84	1.01	31.45	43.50	12.05
	164.330	22.56	10.33	1.34	34.23	43.50	9.27
	282.985	15.87	13.65	1.73	31.25	46.00	14.75
	444.851	12.28	17.50	2.17	31.95	46.00	14.05
	568.613	10.76	18.90	2.45	32.11	46.00	13.89
	798.980	9.15	20.80	2.85	32.80	46.00	13.20
Vertical	31.843	15.15	17.77	0.57	33.49	40.00	6.51
	79.521	18.57	9.27	0.86	28.70	40.00	11.30
	162.041	18.43	10.41	1.33	30.17	43.50	13.33
	216.024	19.65	10.96	1.54	32.15	46.00	13.85
	554.825	11.84	18.70	2.41	32.95	46.00	13.05
	755.387	9.80	20.70	2.78	33.28	46.00	12.72

TEST ENGINEER: LEON YUN

5 DEVIATION TO TEST SPECIFICATIONS

None.