

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

LED LCD TV

Model No.	Brand
LC-43N4000U	Sharp
LC-43N4000C	

FCC ID : W9HLCDD0052

Prepared For : Hisense Electric Co., Ltd.  
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Report No. : ACI-F16058  
Date of Test : Feb 27 – Mar 11, 2016  
Date of Report : Mar 17, 2016

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## TEST REPORT FOR FCC CERTIFICATE

Applicant : Hisense Electric Co., Ltd.  
 Manufacturer : Hisense Electric Co., Ltd.  
 Factory #1 : Hisense Electric Co., Ltd.  
 Factory #2 : Tatung Mexico S.A. de C.V.  
 Factory #3 : HISENSE ELECTRONICA MEXICO, S.A. DE C.V.  
 EUT Description : LED LCD TV

Model No.	Brand	Power Supply
LC-43N4000U	Sharp	120V/60Hz
LC-43N4000C		

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 Feb 27 – Mar 11, 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.F16057, a Verification report.***

Date of Test : Feb 27 – Mar 11, 2016 Date of Report : Mar 17, 2016

Producer : Huimin Yan  
 HUI MIN YAN / Assistant

Review : Byron Wu  
 BYRON WU / Deputy Assistant Manager

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

Signatory : [Signature]  
 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
<b>EMISSION</b>			
Conducted Disturbance at the Mains Terminal	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2015 AND ANSI C63.4-2014	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2015 AND ANSI C63.4-2014	15.109(a) Class B	Pass

## 2 GENERAL INFORMATION

### 2.1 Description of Equipment Under Test

Description	:	LED LCD TV
Type of EUT	:	<input checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type
Model No	:	LC-43N4000U, LC-43N4000C
Note	:	The above models are all the same except for model number.LC-43N4000U model is tested and recorded in the report.
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. Sharp #3510 Parque Industrial Rosarito, C.P. 22710 Playas de Rosarito, B.C.
LCD Panel	:	Manufacturer : Hisense M/N : HD426DF-B51(010)
Tuner	:	Manufacturer : XuGuang Tech. Co. Ltd. M/N : HFT-96S3/W11FJ4H\ROH
Max Resolution	:	1920*1080@60Hz
HDMI Cable*3 (Lab provide)	:	Shielded, Detachable, 1.50m
Power Cord	:	Unshielded, Detachable, 1.80m, 3C
USB Cable*1 (Lab provide)	:	Shielded, Detachable, 1.00m

**Remark:**

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

## Side Port:

- (1) One USB Port : Connected with H-Disk
- (2) ANT Port : Connected with ATSC SG
- (3) AUDIO OUT Port : Connected with Earphone #2
- (4) One HDMI1 Port : Connected with PC
- (5) One HDMI2 Port : Connected with DVD PLAYER #1

## Back Port:

- (6) One HDMI3 Port : Connected with DVD PLAYER #2
- (7) Digital Audio Out : Connected with Audio Converter to Earphone #2
- (1) One AV in Port : Connected with DVD PLAYER #1

## 2.2 Peripherals

### 2.2.1 PC

- Manufacturer : HP
- Model Number : dx7400MT
- Serial Number : CNG8130K89
- 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 Printer

- Manufacturer : HP
- Model Number : C8060A
- Serial Number : CN3J19564X
- Data Cable : Shielded, Detachable, 1.5m
- Certificate : GS, CE/EMC, FCC DoC, C-Tick

## 2.2.4 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

## 2.2.5 Modem

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

## 2.2.6 Earphone \*2

Manufacturer : EDIFIER  
Model Number : H210

## 2.2.7 DVD PLAYER #1

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

## 2.2.8 DVD PLAYER #2

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

## 2.2.9 Hard Disk

Manufacturer : Tetasys  
Model Number : F12  
Serial Number : A010022-4860010X  
Data Cable : Shielded, Detachable, 1.5m.  
Certificate : CE, FCC DoC

## 2.2.10 ATSC Signal Generator

Manufacturer : SENCORE  
Model Number : ATSC997  
Serial Number : 6790071

## 2.2.11 TV Signal Generator

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

## 2.3 Description of Test Facility

Site Description (No.3 3m Chamber)	:	Sept. 17, 1998 file on Jan.15, 2015 Renewed Federal Communications Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, USA
Name of Firm	:	Audix Technology (Shanghai) Co., Ltd.
Site Location	:	3F 34Bldg 680 Guiping Rd, Caohejing Hi-Tech Park, Shanghai 200233, China
FCC registration Number	:	91789
NVLAP Lab Code	:	200371-0

## 2.4 Measurement Uncertainty

Conducted Emission Expanded Uncertainty :	U = 3.4dB
Radiated Emission Expanded Uncertainty (30-200MHz):	U = 4.6dB(Horizontal) U = 4.3dB (Vertical)
Radiated Emission Expanded Uncertainty (200M-1GHz):	U = 4.5dB (Horizontal) U = 5.4dB (Vertical)
Radiated Emission Expanded Uncertainty (1GHz-6GHz):	U = 5.1dB



### 3 CONDUCTED EMISSION TEST

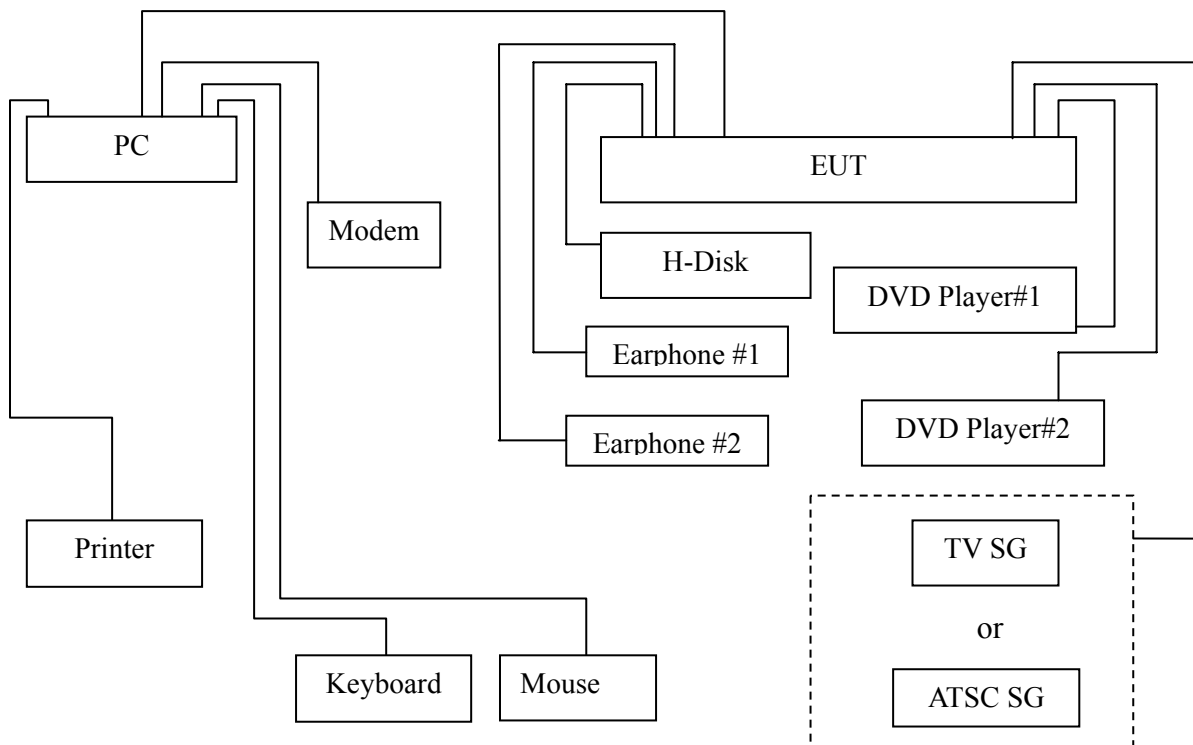
#### 3.1 Test Equipment

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

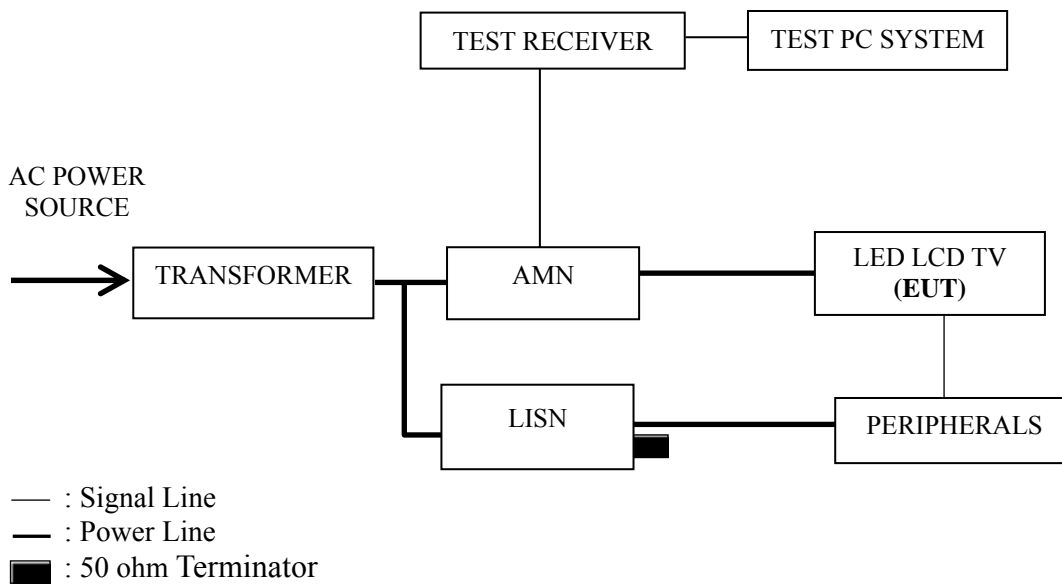
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Jul 03, 2015	Jul 02, 2016
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2015	Jun 26, 2016
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-5	Mar 20, 2015	Mar 19, 2016
4.	50Ω Terminator	Anritsu	BNC	001	Mar 20, 2015	Mar 19, 2016
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 ( $\mu$ 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
HDMI 1920*1080@60Hz & 1kHz playing
HDMI 1280*1024@60Hz & 1kHz playing
HDMI 640*480@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 C63.4:2014 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 1920*1080@60Hz & 1kHz playing	P13
HDMI 1280*1024@60Hz & 1kHz playing	P14
HDMI 640*480@60Hz & 1kHz playing	P15
HDMI1080P	P16
USB Play	P17

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 USB Play for test mode. The worst emission is detected at 0.453MHz (QP Value) with corrected signal level of 32.08dB ( $\mu$ V) (limit is 46.82 dB ( $\mu$ V)), when the Neutral of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 23

Model No. : LC-43N4000U Humidity : 52%RH

Test Mode : HDMI 1920\*1080@60Hz Date of Test : Feb 27, 2016  
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB( $\mu$ V)	Factor (dB)	Emission Level dB( $\mu$ V)	Limits dB( $\mu$ V)	Margin (dB)	Remark
Line	<b>0.195</b>	<b>37.50</b>	<b>10.53</b>	<b>48.03</b>	<b>63.83</b>	<b>15.80</b>	QP
	0.446	28.80	10.41	39.21	56.94	17.73	
	0.681	29.61	10.37	39.98	56.00	16.02	
	1.569	24.80	10.40	35.20	56.00	20.80	
	2.492	22.51	10.42	32.93	56.00	23.07	
	7.959	24.20	10.47	34.67	60.00	25.33	
	0.195	24.70	10.53	35.23	53.83	18.60	AV
	0.446	17.20	10.41	27.61	46.94	19.33	
	0.681	17.21	10.37	27.58	46.00	18.42	
	1.569	12.90	10.40	23.30	46.00	22.70	
	2.492	11.81	10.42	22.23	46.00	23.77	
	7.959	13.70	10.47	24.17	50.00	25.83	
Neutral	0.197	37.20	10.50	47.70	63.73	16.03	QP
	0.445	30.70	10.39	41.09	56.97	15.88	
	<b>0.674</b>	<b>30.51</b>	<b>10.35</b>	<b>40.86</b>	<b>56.00</b>	<b>15.14</b>	
	1.350	26.90	10.39	37.29	56.00	18.71	
	2.723	22.90	10.43	33.33	56.00	22.67	
	7.959	24.80	10.53	35.33	60.00	24.67	
	0.197	24.90	10.50	35.40	53.73	18.33	AV
	0.445	18.50	10.39	28.89	46.97	18.08	
	0.674	19.91	10.35	30.26	46.00	15.74	
	1.350	13.00	10.39	23.39	46.00	22.61	
	2.723	10.80	10.43	21.23	46.00	24.77	
	7.959	13.50	10.53	24.03	50.00	25.97	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 23

Model No. : LC-43N4000U Humidity : 52%RH

Test Mode : HDMI 1280\*1024@60Hz Date of Test : Feb 27, 2016  
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB( $\mu$ V)	Factor (dB)	Emission Level dB( $\mu$ V)	Limits dB( $\mu$ V)	Margin (dB)	Remark
Line	<b>0.196</b>	<b>37.40</b>	<b>10.52</b>	<b>47.92</b>	<b>63.77</b>	<b>15.85</b>	QP
	0.449	29.09	10.41	39.50	56.90	17.40	
	0.838	26.70	10.38	37.08	56.00	18.92	
	1.351	26.40	10.39	36.79	56.00	19.21	
	2.336	23.20	10.42	33.62	56.00	22.38	
	8.322	23.60	10.48	34.08	60.00	25.92	
	0.196	25.00	10.52	35.52	53.77	18.25	AV
	0.449	18.49	10.41	28.90	46.90	18.00	
	0.838	8.20	10.38	18.58	46.00	27.42	
	1.351	13.30	10.39	23.69	46.00	22.31	
	2.336	10.50	10.42	20.92	46.00	25.08	
	8.322	14.50	10.48	24.98	50.00	25.02	
Neutral	0.197	37.30	10.50	47.80	63.72	15.92	QP
	0.445	30.60	10.39	40.99	56.97	15.98	
	<b>0.681</b>	<b>30.81</b>	<b>10.35</b>	<b>41.16</b>	<b>56.00</b>	<b>14.84</b>	
	1.354	27.10	10.39	37.49	56.00	18.51	
	4.470	22.30	10.46	32.76	56.00	23.24	
	7.968	25.60	10.53	36.13	60.00	23.87	
	0.197	25.00	10.50	35.50	53.72	18.22	AV
	0.445	17.50	10.39	27.89	46.97	19.08	
	0.681	19.91	10.35	30.26	46.00	15.74	
	1.354	12.80	10.39	23.19	46.00	22.81	
	4.470	11.50	10.46	21.96	46.00	24.04	
	7.968	13.40	10.53	23.93	50.00	26.07	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 23

Model No. : LC-43N4000U Humidity : 52%RH

Test Mode : HDMI 640\*480@60Hz & 1kHz Playing Date of Test : Feb 27, 2016

Test Line	Frequency (MHz)	Meter Reading dB( $\mu$ V)	Factor (dB)	Emission Level dB( $\mu$ V)	Limits dB( $\mu$ V)	Margin (dB)	Remark
Line	<b>0.195</b>	<b>37.30</b>	<b>10.53</b>	<b>47.83</b>	<b>63.83</b>	<b>16.00</b>	QP
	0.419	26.69	10.42	37.11	57.47	20.36	
	0.677	29.31	10.37	39.68	56.00	16.32	
	1.590	27.30	10.40	37.70	56.00	18.30	
	3.887	21.80	10.46	32.26	56.00	23.74	
	8.169	23.59	10.48	34.07	60.00	25.93	
	0.195	24.20	10.53	34.73	53.83	19.10	AV
	0.419	13.79	10.42	24.21	47.47	23.26	
	0.677	19.51	10.37	29.88	46.00	16.12	
	1.590	13.80	10.40	24.20	46.00	21.80	
	3.887	9.60	10.46	20.06	46.00	25.94	
	8.169	15.70	10.48	26.18	50.00	23.82	
Neutral	0.196	37.49	10.51	48.00	63.77	15.77	QP
	<b>0.455</b>	<b>31.50</b>	<b>10.38</b>	<b>41.88</b>	<b>56.78</b>	<b>14.90</b>	
	0.676	30.71	10.35	41.06	56.00	14.94	
	1.340	26.70	10.39	37.09	56.00	18.91	
	4.330	20.10	10.46	30.56	56.00	25.44	
	7.921	21.40	10.53	31.93	60.00	28.07	
	0.196	24.89	10.51	35.40	53.77	18.37	AV
	0.455	19.40	10.38	29.78	46.78	17.00	
	0.676	20.51	10.35	30.86	46.00	15.14	
	1.340	12.90	10.39	23.29	46.00	22.71	
	4.330	10.20	10.46	20.66	46.00	25.34	
	7.921	12.80	10.53	23.33	50.00	26.67	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 23

Model No. : LC-43N4000U Humidity : 52%RH

Test Mode : HDMI 1080P Date of Test : Feb 27, 2016

Test Line	Frequency (MHz)	Meter Reading dB( $\mu$ V)	Factor (dB)	Emission Level dB( $\mu$ V)	Limits dB( $\mu$ V)	Margin (dB)	Remark
Line	<b>0.197</b>	<b>37.20</b>	<b>10.52</b>	<b>47.72</b>	<b>63.73</b>	<b>16.01</b>	QP
	0.449	28.89	10.41	39.30	56.90	17.60	
	0.597	26.50	10.38	36.88	56.00	19.12	
	1.189	27.01	10.38	37.39	56.00	18.61	
	2.748	21.09	10.44	31.53	56.00	24.47	
	7.789	22.90	10.47	33.37	60.00	26.63	
	0.197	25.20	10.52	35.72	53.73	18.01	AV
	0.449	17.99	10.41	28.40	46.90	18.50	
	0.597	14.10	10.38	24.48	46.00	21.52	
	1.189	10.11	10.38	20.49	46.00	25.51	
	2.748	8.79	10.44	19.23	46.00	26.77	
	7.789	12.60	10.47	23.07	50.00	26.93	
Neutral	0.196	37.70	10.51	48.21	63.78	15.57	QP
	0.451	31.29	10.39	41.68	56.86	15.18	
	0.593	27.50	10.36	37.86	56.00	18.14	
	1.353	26.90	10.39	37.29	56.00	18.71	
	2.505	23.10	10.42	33.52	56.00	22.48	
	7.210	22.60	10.52	33.12	60.00	26.88	
	0.196	24.90	10.51	35.41	53.78	18.37	AV
	<b>0.451</b>	<b>21.69</b>	<b>10.39</b>	<b>32.08</b>	<b>46.86</b>	<b>14.78</b>	
	0.593	15.00	10.36	25.36	46.00	20.64	
	1.353	13.30	10.39	23.69	46.00	22.31	
	2.505	11.50	10.42	21.92	46.00	24.08	
	7.210	11.70	10.52	22.22	50.00	27.78	



EUT : LED LCD TV Temperature : 23

Model No. : LC-43N4000U Humidity : 52%RH

Test Mode : USB Play Date of Test : Feb 27, 2016

Test Line	Frequency (MHz)	Meter Reading dB( $\mu$ V)	Factor (dB)	Emission Level dB( $\mu$ V)	Limits dB( $\mu$ V)	Margin (dB)	Remark	
Line	<b>0.196</b>	<b>37.20</b>	<b>10.52</b>	<b>47.72</b>	<b>63.77</b>	<b>16.05</b>	QP	
	0.419	26.59	10.42	37.01	57.48	20.47		
	0.824	27.10	10.38	37.48	56.00	18.52		
	1.588	26.90	10.40	37.30	56.00	18.70		
	3.323	20.20	10.45	30.65	56.00	25.35		
	7.806	22.20	10.47	32.67	60.00	27.33		
	0.196	24.90	10.52	35.42	53.77	18.35	AV	
	0.419	14.19	10.42	24.61	47.48	22.87		
	0.824	8.20	10.38	18.58	46.00	27.42		
	1.588	13.80	10.40	24.20	46.00	21.80		
	3.323	8.80	10.45	19.25	46.00	26.75		
	7.806	13.30	10.47	23.77	50.00	26.23		
	Neutral	0.196	37.50	10.51	48.01	63.80	15.79	QP
		0.453	31.40	10.38	41.78	56.82	15.04	
0.681		30.71	10.35	41.06	56.00	14.94		
1.590		27.61	10.39	38.00	56.00	18.00		
3.894		22.29	10.46	32.75	56.00	23.25		
7.969		24.90	10.53	35.43	60.00	24.57		
0.196		24.90	10.51	35.41	53.80	18.39	AV	
<b>0.453</b>		<b>21.70</b>	<b>10.38</b>	<b>32.08</b>	<b>46.82</b>	<b>14.74</b>		
0.681		20.31	10.35	30.66	46.00	15.34		
1.590		14.11	10.39	24.50	46.00	21.50		
3.894		9.49	10.46	19.95	46.00	26.05		
7.969		13.80	10.53	24.33	50.00	25.67		

TEST ENGINEER: WENCY YANG

## 4 RADIATED EMISSION TEST

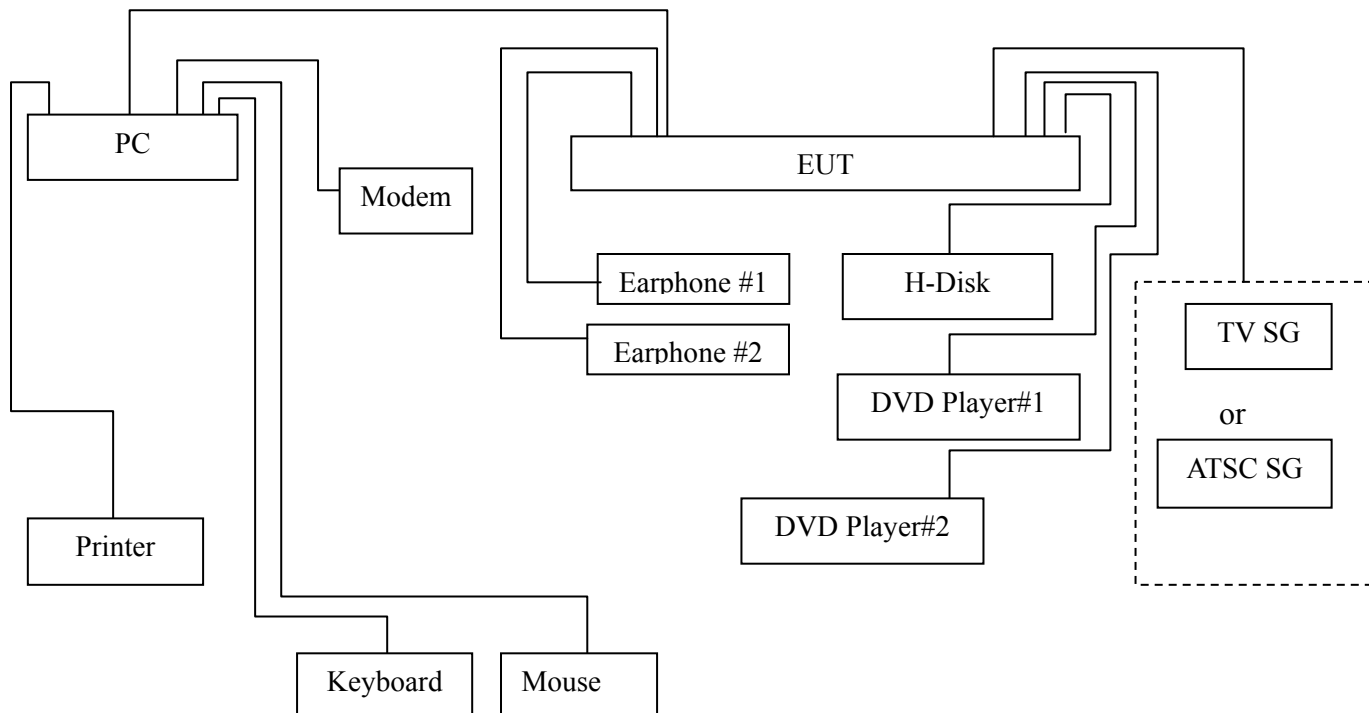
### 4.1 Test Equipment

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	N9010A	MY52221182	Jun 12, 2015	Jun 11, 2016
7.	Spectrum	HP	8591EM	3628A00908	May 07, 2015	May 06, 2016
8.	Software	Audix	e3	6.2007-9-10	--	--

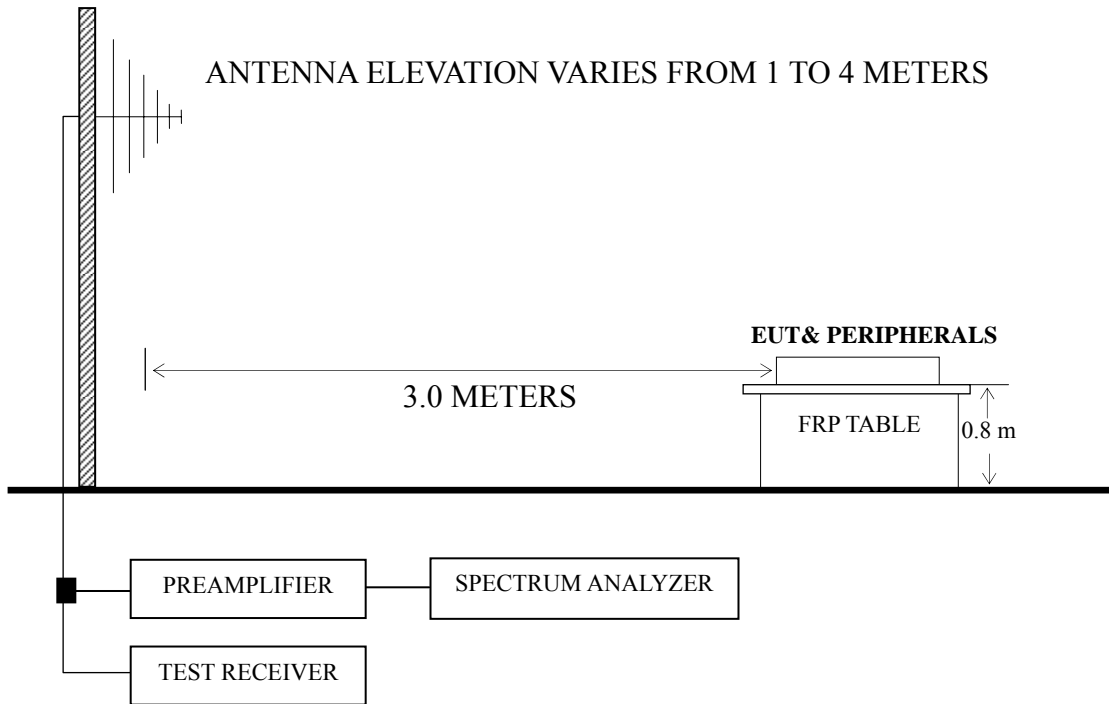
### 4.2 Block Diagram of Test Setup

#### 4.2.1 EUT & Peripherals



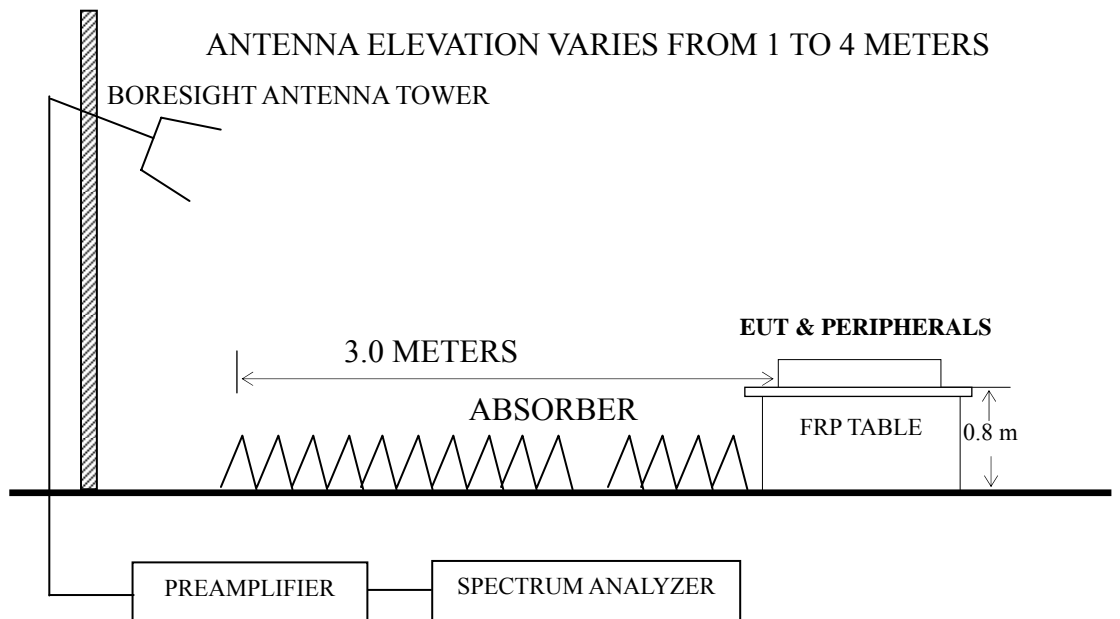
### 4.2.2 Radiated emission test setup

#### 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 C63.4:2014 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 2 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 1920*1080@60Hz & 1kHz playing	P22-P23
HDMI 1280*1024@60Hz & 1kHz playing	P24
HDMI 640*480@60Hz & 1kHz playing	P25
HDMI1080P	P26
USB Play	P27

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 1920\*1080@60Hz & 1 kHz playing test mode. The worst emission at horizontal polarization was detected at 916.069MHz with corrected signal level of 41.83 dB ( $\mu\text{V}/\text{m}$ ) (limit is 46.00 dB ( $\mu\text{V}/\text{m}$ )), when the antenna was 1.90 m height and the turntable was at 120°. The worst emission at vertical polarization was detected at 31.230 MHz with corrected signal level of 36.61dB ( $\mu\text{V}/\text{m}$ ) (limit is 40.00 dB ( $\mu\text{V}/\text{m}$ )), when the antenna was 1.00 m height and the turntable was at 75°.

EUT : LED LCD TV Temperature : 22

Model No. : LC-43N4000U Humidity : 54%RH

Test Mode : HDMI 1920\*1080@60Hz & 1kHz Playing Date of Test : Mar 11, 2016

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	74.135	25.94	8.27	0.99	--	35.20	40.00	4.80	QP
	140.835	21.34	12.45	1.59	--	35.38	43.50	8.12	
	480.528	20.21	17.50	2.90	--	40.61	46.00	5.39	
	593.050	19.89	18.85	2.31	--	41.05	46.00	4.95	
	903.309	15.64	21.40	4.56	--	41.60	46.00	4.40	
	<b>916.069</b>	<b>15.72</b>	<b>21.50</b>	<b>4.61</b>	--	<b>41.83</b>	<b>46.00</b>	<b>4.17</b>	
	1078.158	48.07	23.89	4.32	36.35	39.93	74.00	34.07	PK
	1217.858	54.06	24.52	3.54	36.10	46.02	74.00	27.98	
	1273.651	54.26	24.76	3.61	36.01	46.62	74.00	27.38	
	1493.846	52.65	25.59	3.86	35.69	46.41	74.00	27.59	
	1687.408	50.35	26.38	4.07	35.44	45.36	74.00	28.64	
	1957.973	49.22	27.35	4.39	35.15	45.81	74.00	28.19	
	1078.158	33.73	23.89	4.32	36.35	25.59	54.00	28.41	AV
	1217.858	39.68	24.52	3.54	36.10	31.64	54.00	22.36	
	1273.651	38.67	24.76	3.61	36.01	31.03	54.00	22.97	
	1493.846	38.72	25.59	3.86	35.69	32.48	54.00	21.52	
1687.408	36.11	26.38	4.07	35.44	31.12	54.00	22.88		
1957.973	33.68	27.35	4.39	35.15	30.27	54.00	23.73		

EUT : LED LCD TV Temperature : 22

Model No. : LC-43N4000U Humidity : 54%RH

Test Mode : HDMI 1920\*1080@60Hz & 1kHz Playing Date of Test : Mar 11, 2016

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Vertical	<b>31.230</b>	<b>17.99</b>	<b>17.97</b>	<b>0.65</b>	--	<b>36.61</b>	<b>40.00</b>	<b>3.39</b>	QP
	74.919	26.77	8.50	1.01	--	36.28	40.00	3.72	
	148.963	25.29	11.57	1.63	--	38.49	43.50	5.01	
	446.414	22.73	16.83	2.82	--	42.38	46.00	3.62	
	593.050	20.85	18.85	2.31	--	42.01	46.00	3.99	
	821.710	17.17	20.70	3.88	--	41.75	46.00	4.25	
	1012.621	54.04	23.56	4.78	36.47	45.91	74.00	28.09	PK
	1215.678	59.12	24.52	3.54	36.10	51.08	74.00	22.92	
	1499.209	58.15	25.60	3.89	35.68	51.96	74.00	22.04	
	1696.503	54.04	26.42	4.07	35.44	49.09	74.00	24.91	
	1872.203	52.92	27.06	4.27	35.24	49.01	74.00	24.99	
	1947.477	52.10	27.33	4.39	35.16	48.66	74.00	25.34	AV
	1012.621	39.65	23.56	4.78	36.47	31.52	54.00	22.48	
	1215.678	43.28	24.52	3.54	36.10	35.24	54.00	18.76	
	1499.209	42.66	25.60	3.89	35.68	36.47	54.00	17.53	
1696.503	39.76	26.42	4.07	35.44	34.81	54.00	19.19		
1872.203	38.28	27.06	4.27	35.24	34.37	54.00	19.63		
1947.477	42.17	27.33	4.39	35.16	38.73	54.00	15.27		

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22

Model No. : LC-43N4000U Humidity : 54%RH

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

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)
Horizontal	75.182	24.32	8.56	1.01	33.89	40.00	6.11
	159.784	20.55	11.11	1.70	33.36	43.50	10.14
	299.316	19.74	13.80	2.59	36.13	46.00	9.87
	480.528	17.30	17.50	2.90	37.70	46.00	8.30
	<b>813.112</b>	<b>15.78</b>	<b>20.63</b>	<b>3.88</b>	<b>40.29</b>	<b>46.00</b>	<b>5.71</b>
	955.438	9.61	22.05	4.75	36.41	46.00	9.59
Vertical	30.745	14.70	18.34	0.64	33.68	40.00	6.32
	75.977	24.35	8.67	1.02	34.04	40.00	5.96
	302.481	17.52	13.88	2.59	33.99	46.00	12.01
	<b>477.169</b>	<b>20.01</b>	<b>17.46</b>	<b>2.90</b>	<b>40.37</b>	<b>46.00</b>	<b>5.63</b>
	593.050	16.19	18.85	2.31	37.35	46.00	8.65
	821.710	14.77	20.70	3.88	39.35	46.00	6.65

TEST ENGINEER: MARK LI



EUT : LED LCD TV Temperature : 22

Model No. : LC-43N4000U Humidity : 54%RH

Test Mode : HDMI 640\*480@60Hz & 1kHz Playing Date of Test : Mar 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	<b>74.657</b>	<b>24.67</b>	<b>8.43</b>	<b>1.01</b>	<b>34.11</b>	<b>40.00</b>	<b>5.89</b>
	159.784	22.74	11.11	1.70	35.55	43.50	7.95
	299.316	19.75	13.80	2.59	36.14	46.00	9.86
	480.528	18.17	17.50	2.90	38.57	46.00	7.43
	595.133	13.53	18.85	2.31	34.69	46.00	11.31
	821.710	14.27	20.70	3.88	38.85	46.00	7.15
Vertical	<b>73.876</b>	<b>24.25</b>	<b>8.27</b>	<b>0.99</b>	<b>33.51</b>	<b>40.00</b>	<b>6.49</b>
	159.784	24.18	11.11	1.70	36.99	43.50	6.51
	299.316	18.43	13.80	2.59	34.82	46.00	11.18
	480.528	15.81	17.50	2.90	36.21	46.00	9.79
	586.844	15.75	18.58	2.36	36.69	46.00	9.31
	896.997	12.07	21.30	4.46	37.83	46.00	8.17

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22

Model No. : LC-43N4000U Humidity : 54%RH

Test Mode : HDMI1080P Date of Test : Mar 11, 2016

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)
Horizontal	<b>74.396</b>	<b>25.36</b>	<b>8.35</b>	<b>1.01</b>	<b>34.72</b>	<b>40.00</b>	<b>5.28</b>
	148.963	22.90	11.57	1.63	36.10	43.50	7.40
	301.422	22.07	13.84	2.59	38.50	46.00	7.50
	446.414	20.92	16.83	2.82	40.57	46.00	5.43
	593.050	18.36	18.85	2.31	39.52	46.00	6.48
	906.482	13.54	21.50	4.56	39.60	46.00	6.40
Vertical	30.962	16.04	18.15	0.64	34.83	40.00	5.17
	<b>74.919</b>	<b>25.91</b>	<b>8.50</b>	<b>1.01</b>	<b>35.42</b>	<b>40.00</b>	<b>4.58</b>
	148.963	23.44	11.57	1.63	36.64	43.50	6.86
	480.528	19.03	17.50	2.90	39.43	46.00	6.57
	593.050	18.94	18.85	2.31	40.10	46.00	5.90
	821.710	16.28	20.70	3.88	40.86	46.00	5.14

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22

Model No. : LC-43N4000U Humidity : 54%RH

Test Mode : USB Play Date of Test : Mar 11, 2016

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)
Horizontal	<b>72.084</b>	<b>23.67</b>	<b>7.83</b>	<b>0.98</b>	<b>32.48</b>	<b>40.00</b>	<b>7.52</b>
	138.387	21.10	12.53	1.56	35.19	43.50	8.31
	185.788	21.74	10.47	1.88	34.09	43.50	9.41
	313.276	16.52	14.25	2.61	33.38	46.00	12.62
	787.851	9.70	20.50	3.66	33.86	46.00	12.14
	869.130	10.61	20.90	4.27	35.78	46.00	10.22
Vertical	<b>73.617</b>	<b>23.99</b>	<b>8.20</b>	<b>0.99</b>	<b>33.18</b>	<b>40.00</b>	<b>6.82</b>
	100.229	19.75	12.30	1.32	33.37	43.50	10.13
	152.664	22.01	11.35	1.65	35.01	43.50	8.49
	360.448	15.57	15.90	2.67	34.14	46.00	11.86
	475.499	18.51	17.42	2.90	38.83	46.00	7.17
	863.056	10.95	20.83	4.27	36.05	46.00	9.95

TEST ENGINEER: MARK LI

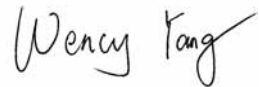
## 5 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
FERRITE CORE	BNF1730GR	Brigitte Liu Si (Shandong) photoelectric co., LTD	See Internal Photos Figure 23

Note: We had required the applicant and manufacturer that all electrical and mechanical devices employed for spurious radiation suppression, including any modifications made during certification testing, must be incorporated in each unit marked

TEST ENGINEER:



(WENCY YANG)

## **6 DEVIATION TO TEST SPECIFICATIONS**

None.