

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

LED LCD TV

Model No.	Brand
LTDN32K220WUS	Hisense
32H5FC, 32H5FC+	

FCC ID : W9HLCDC0034

Prepared For : Hisense Electric Co., Ltd.
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Date of Test : Dec07-23, 2015
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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
LTDN32K220WUS	Hisense	120V/60Hz
32H5FC, 32H5FC+		

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2014
AND ANSI C63.4-2003*

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 Dec 07-23, 2015 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.F15258, a Verification report.

Date of Test : Dec 07-23, 2015 Date of Report : Dec 31, 2015

Producer : Huimin Yan
HUIMIN YAN / Assistant

Review : Sammy Chen
SAMMY CHEN / Manager

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

Signatory : Byron Kwo
Authorized Signature EMC BYRON KWO / Assistant General Manager

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

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

Description of Test Item	Standard	Limits	Results
EMISSION			
Conducted Disturbance at the Mains Terminal	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2014 AND ANSI C63.4-2003	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2014 AND ANSI C63.4-2003	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	:	LTDN32K220WUS, 32H5FC, 32H5FC+
Note#1	:	The above models are all the same except for model number.LTDN32K220WUS model is tested and recorded in the report.
Note#2	:	“+ ” represents any numerals, for different sales area.
Brand	:	Hisense
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.Bld. Sharp #3510 Parque Industrial Rosarito, C.P. 22710 Playas de Rosarito, B.C.
LCD Panel	:	Manufacturer : Hisense M/N : HD315DF-B71
Tuner	:	Manufacturer : Riteng Electronic Co. Ltd. M/N : RF-LW-07Z\Reflow\ROH
Max Resolution	:	1920*1080@60Hz
HDMI Cable*2 (Lab provide)	:	Shielded, Detachable, 1.50m, with two cores
Power Cord	:	Unshielded, Detachable, 1.80m
LAN Cable	:	Shielded, Detachable, 1.50m
USB Cable (Lab provide)	:	Shielded, Detachable, 1.00m, without core

Remark:

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

Side Port:

- (1) One ANT/CABLE IN Port
: Connected with Antenna or ATSC SG / TV SG
- (2) One HDMI2/ARC Port
: Connected with DVD PLAYER
- (3) One HDMI1/DVI Port
: Connected with PC
- (4) One DVI Audio in Port
: Connected with PC
- (5) One LAN Port
: Connected with PC
- (6) One Digital Audio Out Port
: Connected with DVD PLAYER

Back Port:

- (7)One USB Port
: Connected with Hard-Disk
- (8)One Audio Out Port
: Connected with Earphone
- (9)One component in\AV in Port
: Connected with DVD PLAYER

2.2 Peripherals

2.2.1 PC

Manufacturer : HP
Model Number : dx7400MT
Serial Number : CNG8130K89
Power Cord : Shielded, 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

Manufacturer : audio-technica
Model Number : ATH-CKL200

2.2.6 DVD PLAYER

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

2.2.7 Hard Disk

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

2.2.8 ATSC Signal Generator

Manufacturer : SENCORE
Model Number : ATSC997
Serial Number : 6790071

2.2.9 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

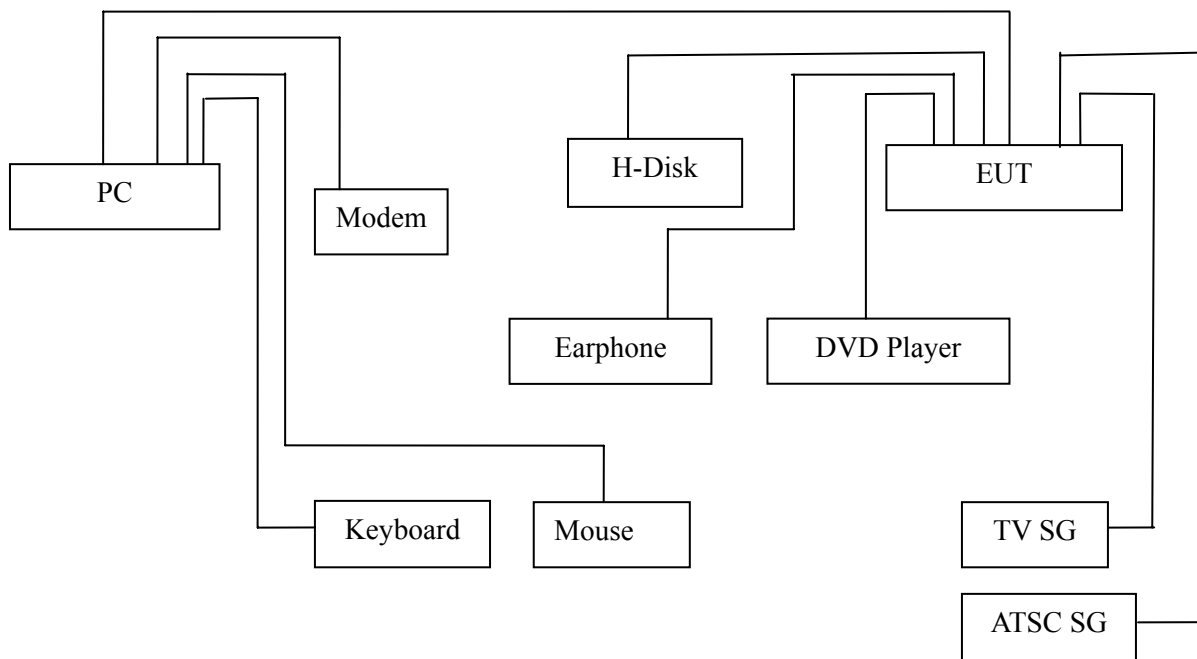
3.1 Test Equipment

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

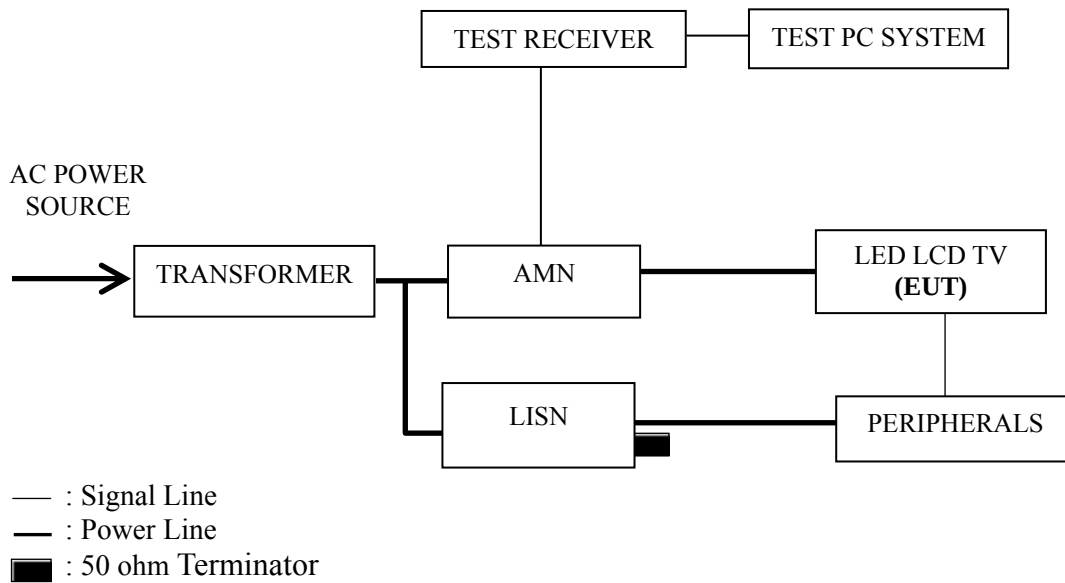
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Jul 03, 2015	Jul 02, 2016
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2015	Jun 26, 2016
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-5	Mar 20, 2015	Mar 19, 2016
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 (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 The other peripherals devices were driven and operated during the test.

3.5.9 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
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 C63.4:2003 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
LAN Play	P18

NOTE 1 – Factor = Cable Loss + AMN Factor.

NOTE 2 – Emission Level = Meter Reading + Factor.

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

NOTE 4 – The worst case is for USB Play test mode. The worst emission is detected at 0.316 MHz (QP Value) with corrected signal level of 45.73dB (μV) (limit is 49.81 dB (μV)), when the Neutral of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 48%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Dec 07, 2015
& 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	34.20	10.59	44.79	65.98	21.19	QP
	0.316	35.60	10.45	46.05	59.81	13.76	
	0.765	27.50	10.38	37.88	56.00	18.12	
	0.946	25.00	10.38	35.38	56.00	20.62	
	3.922	21.80	10.46	32.26	56.00	23.74	
	6.458	33.90	10.47	44.37	60.00	15.63	
	0.150	18.10	10.59	28.69	55.98	27.29	AV
	0.316	34.70	10.45	45.15	49.81	4.66	
	0.765	27.30	10.38	37.68	46.00	8.32	
	0.946	24.80	10.38	35.18	46.00	10.82	
	3.922	14.20	10.46	24.66	46.00	21.34	
	6.458	27.10	10.47	37.57	50.00	12.43	
Neutral	0.154	28.60	10.58	39.18	65.80	26.62	QP
	0.316	35.50	10.43	45.93	59.80	13.87	
	0.765	25.80	10.36	36.16	56.00	19.84	
	0.948	26.60	10.37	36.97	56.00	19.03	
	4.683	27.20	10.47	37.67	56.00	18.33	
	6.452	33.49	10.51	44.00	60.00	16.00	
	0.154	10.30	10.58	20.88	55.80	34.92	AV
	0.316	35.00	10.43	45.43	49.80	4.37	
	0.765	24.50	10.36	34.86	46.00	11.14	
	0.948	25.80	10.37	36.17	46.00	9.83	
	4.683	18.40	10.47	28.87	46.00	17.13	
	6.452	24.79	10.51	35.30	50.00	14.70	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 48%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Dec 07, 2015
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.152	30.69	10.59	41.28	65.91	24.63	QP
	0.316	34.50	10.45	44.95	59.81	14.86	
	0.764	26.60	10.38	36.98	56.00	19.02	
	0.946	24.80	10.38	35.18	56.00	20.82	
	4.724	24.40	10.48	34.88	56.00	21.12	
	6.597	33.50	10.47	43.97	60.00	16.03	
	0.152	13.89	10.59	24.48	55.91	31.43	AV
	0.316	34.40	10.45	44.85	49.81	4.96	
	0.764	26.20	10.38	36.58	46.00	9.42	
	0.946	24.60	10.38	34.98	46.00	11.02	
	4.724	15.90	10.48	26.38	46.00	19.62	
	6.597	26.60	10.47	37.07	50.00	12.93	
Neutral	0.151	33.19	10.59	43.78	65.97	22.19	QP
	0.316	35.51	10.43	45.94	59.82	13.88	
	0.764	25.00	10.36	35.36	56.00	20.64	
	0.947	27.20	10.37	37.57	56.00	18.43	
	4.672	26.10	10.47	36.57	56.00	19.43	
	6.571	31.60	10.51	42.11	60.00	17.89	
	0.151	16.89	10.59	27.48	55.97	28.49	AV
	0.316	35.01	10.43	45.44	49.82	4.38	
	0.764	24.30	10.36	34.66	46.00	11.34	
	0.947	26.40	10.37	36.77	46.00	9.23	
	4.672	17.90	10.47	28.37	46.00	17.63	
	6.571	21.00	10.51	31.51	50.00	18.49	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 48%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Dec 07, 2015

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.152	30.79	10.59	41.38	65.91	24.53	QP
	0.315	34.51	10.45	44.96	59.85	14.89	
	0.764	26.90	10.38	37.28	56.00	18.72	
	0.948	25.10	10.38	35.48	56.00	20.52	
	3.925	20.50	10.46	30.96	56.00	25.04	
	6.868	34.10	10.46	44.56	60.00	15.44	
	0.152	13.89	10.59	24.48	55.91	31.43	AV
	0.315	34.31	10.45	44.76	49.85	5.09	
	0.764	26.50	10.38	36.88	46.00	9.12	
	0.948	24.80	10.38	35.18	46.00	10.82	
	3.925	12.40	10.46	22.86	46.00	23.14	
	6.868	26.80	10.46	37.26	50.00	12.74	
Neutral	0.151	34.09	10.59	44.68	65.96	21.28	QP
	0.315	36.01	10.43	46.44	59.83	13.39	
	0.764	25.00	10.36	35.36	56.00	20.64	
	0.947	27.00	10.37	37.37	56.00	18.63	
	4.688	26.50	10.47	36.97	56.00	19.03	
	6.830	30.80	10.51	41.31	60.00	18.69	
	0.151	17.69	10.59	28.28	55.96	27.68	AV
	0.315	35.01	10.43	45.44	49.83	4.39	
	0.764	24.00	10.36	34.36	46.00	11.64	
	0.947	26.00	10.37	36.37	46.00	9.63	
	4.688	17.70	10.47	28.17	46.00	17.83	
	6.830	22.10	10.51	32.61	50.00	17.39	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 48%RH

Test Mode : HDMI1080P Date of Test : Dec 07, 2015

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.152	30.49	10.59	41.08	65.87	24.79	QP
	0.317	35.00	10.45	45.45	59.80	14.35	
	0.764	27.00	10.38	37.38	56.00	18.62	
	0.948	25.00	10.38	35.38	56.00	20.62	
	3.927	19.30	10.46	29.76	56.00	26.24	
	6.559	31.80	10.47	42.27	60.00	17.73	
	0.152	13.59	10.59	24.18	55.87	31.69	AV
	0.317	34.50	10.45	44.95	49.80	4.85	
	0.764	26.80	10.38	37.18	46.00	8.82	
	0.948	24.90	10.38	35.28	46.00	10.72	
	3.927	11.40	10.46	21.86	46.00	24.14	
	6.559	21.10	10.47	31.57	50.00	18.43	
Neutral	0.151	34.09	10.59	44.68	65.96	21.28	QP
	0.316	35.51	10.43	45.94	59.82	13.88	
	0.946	26.00	10.37	36.37	56.00	19.63	
	3.472	20.90	10.45	31.35	56.00	24.65	
	4.645	26.80	10.47	37.27	56.00	18.73	
	6.558	31.50	10.51	42.01	60.00	17.99	
	0.151	17.69	10.59	28.28	55.96	27.68	AV
	0.316	35.01	10.43	45.44	49.82	4.38	
	0.946	25.80	10.37	36.17	46.00	9.83	
	3.472	14.80	10.45	25.25	46.00	20.75	
	4.645	18.00	10.47	28.47	46.00	17.53	
	6.558	21.20	10.51	31.71	50.00	18.29	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 48%RH

Test Mode : USB Play Date of Test : Dec 07, 2015

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.151	33.49	10.59	44.08	65.94	21.86	QP
	0.317	34.60	10.45	45.05	59.80	14.75	
	0.764	26.80	10.38	37.18	56.00	18.82	
	0.947	25.50	10.38	35.88	56.00	20.12	
	4.739	25.20	10.48	35.68	56.00	20.32	
	6.910	31.50	10.46	41.96	60.00	18.04	
	0.151	17.39	10.59	27.98	55.94	27.96	AV
	0.317	34.40	10.45	44.85	49.80	4.95	
	0.764	26.50	10.38	36.88	46.00	9.12	
	0.947	25.00	10.38	35.38	46.00	10.62	
	4.739	16.30	10.48	26.78	46.00	19.22	
	6.910	22.80	10.46	33.26	50.00	16.74	
Neutral	0.151	33.89	10.59	44.48	65.93	21.45	QP
	0.316	35.50	10.43	45.93	59.81	13.88	
	0.764	25.80	10.36	36.16	56.00	19.84	
	0.946	26.90	10.37	37.27	56.00	18.73	
	3.922	24.29	10.46	34.75	56.00	21.25	
	6.533	32.80	10.51	43.31	60.00	16.69	
	0.151	17.69	10.59	28.28	55.93	27.65	AV
	0.316	35.30	10.43	45.73	49.81	4.08	
	0.764	24.30	10.36	34.66	46.00	11.34	
	0.946	26.00	10.37	36.37	46.00	9.63	
	3.922	16.19	10.46	26.65	46.00	19.35	
	6.533	25.50	10.51	36.01	50.00	13.99	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 48%RH

Test Mode : LAN Play Date of Test : Dec 07, 2015

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.151	33.49	10.59	44.08	65.95	21.87	QP
	0.151	17.39	10.59	27.98	55.95	27.97	
	0.315	34.61	10.45	45.06	59.84	14.78	
	0.315	34.51	10.45	44.96	49.84	4.88	
	0.763	27.50	10.38	37.88	56.00	18.12	
	0.763	27.00	10.38	37.38	46.00	8.62	
	0.947	25.20	10.38	35.58	56.00	20.42	AV
	0.947	25.00	10.38	35.38	46.00	10.62	
	4.729	24.50	10.48	34.98	56.00	21.02	
	4.729	15.60	10.48	26.08	46.00	19.92	
	6.402	31.20	10.47	41.67	60.00	18.33	
	6.402	23.50	10.47	33.97	50.00	16.03	
Neutral	0.151	34.09	10.59	44.68	65.97	21.29	QP
	0.151	17.89	10.59	28.48	55.97	27.49	
	0.317	35.40	10.43	45.83	59.80	13.97	
	0.317	35.20	10.43	45.63	49.80	4.17	
	0.763	25.00	10.36	35.36	56.00	20.64	
	0.763	23.80	10.36	34.16	46.00	11.84	
	0.948	26.90	10.37	37.27	56.00	18.73	AV
	0.948	26.20	10.37	36.57	46.00	9.43	
	4.427	24.80	10.46	35.26	56.00	20.74	
	4.427	16.20	10.46	26.66	46.00	19.34	
	6.599	33.00	10.51	43.51	60.00	16.49	
	6.599	25.80	10.51	36.31	50.00	13.69	

TEST ENGINEER: WENCY YANG

4 RADIATED EMISSION TEST

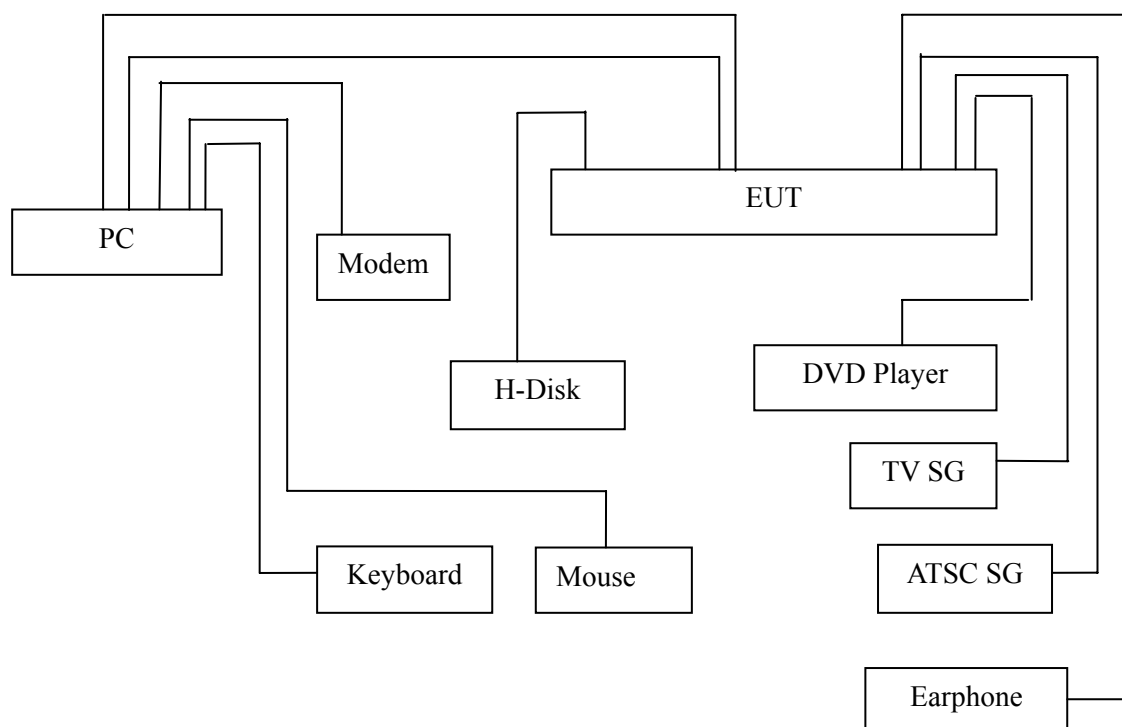
4.1 Test Equipment

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	--	--

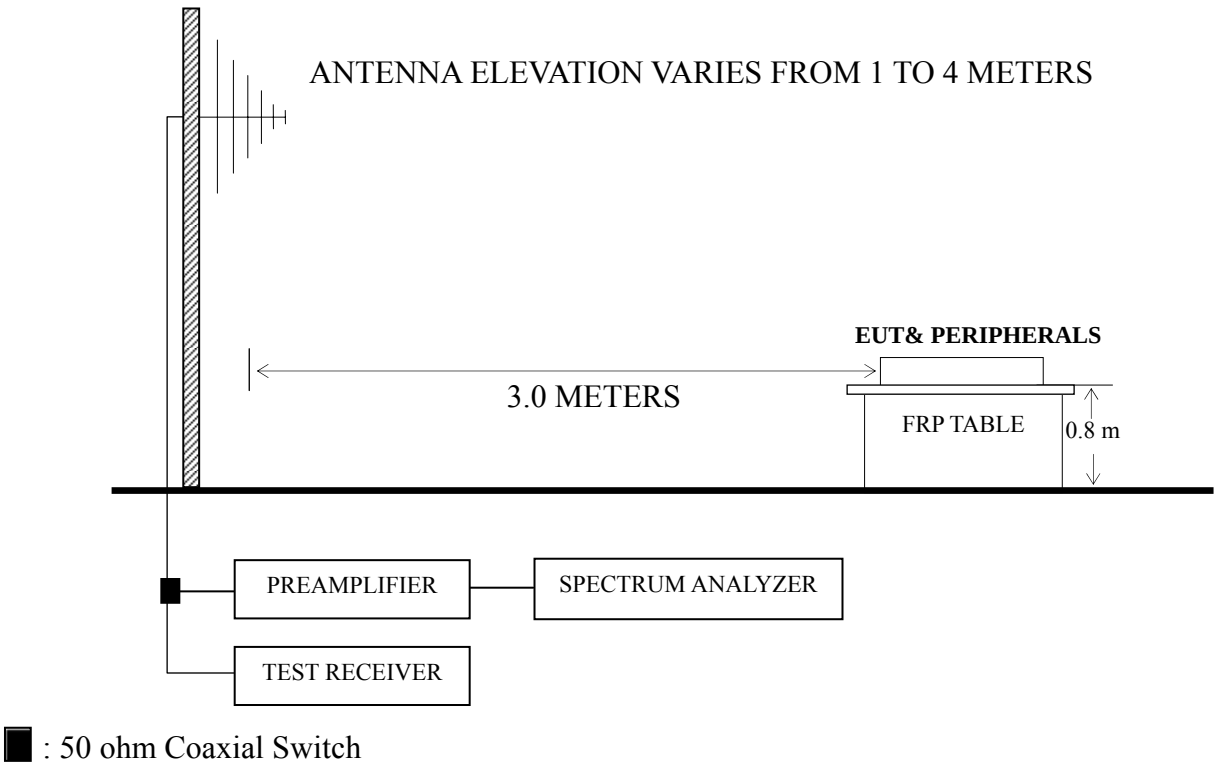
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals

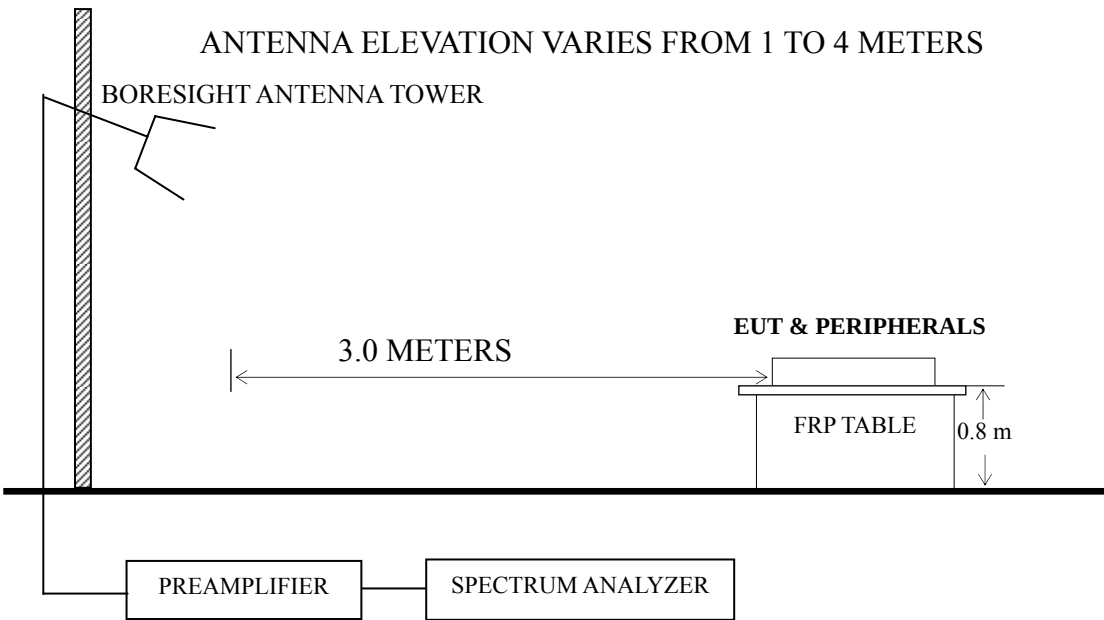


4.2.2 Radiated emission test setup

4.2.2.1 Below 1GHz



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 C63.4:2003 requirements during radiated emission test.

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

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

The frequency range from 1 GHz to 6 GHz was checked for the maximum resolution test mode.

The test modes were done on radiated disturbance test and all the test results are listed in Sec.4.7.

4.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Test Mode	Data Page
HDMI 1920*1080@60Hz & 1kHz playing	P23-P24
HDMI 1280*1024@60Hz & 1kHz playing	P25
HDMI 640*480@60Hz & 1kHz playing	P26
HDMI1080P	P27
USB Play	P28
LAN Play	P29

- 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 742.440 MHz with corrected signal level of 44.07 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 2.00 m height and the turntable was at 100°. The worst emission at vertical polarization was detected at 31.120 MHz with corrected signal level of 36.91 dB (μV/m) (limit is 40.00 dB (μV/m)), when the antenna was 1.00m height and the turntable was at 300°.

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Dec 23, 2015

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	151.250	23.89	11.43	1.65	--	36.97	43.50	6.53	QP
	189.080	23.40	10.36	1.90	--	35.66	43.50	7.84	
	248.250	27.42	12.42	2.15	--	41.99	46.00	4.01	
	295.780	27.28	13.65	2.56	--	43.49	46.00	2.51	
	704.640	19.90	19.80	3.56	--	43.26	46.00	2.74	
	742.440	20.50	19.97	3.60	--	44.07	46.00	1.93	
	1576.342	58.91	25.92	3.98	35.58	53.23	74.00	20.77	PK
	1752.110	63.60	26.63	4.11	35.37	58.97	74.00	15.03	
	2111.004	69.24	27.72	4.55	35.11	66.40	74.00	7.60	
	3153.515	64.33	30.82	5.93	35.05	66.03	74.00	7.97	
	3511.430	62.60	31.56	6.17	34.71	65.62	74.00	8.38	
	4553.192	54.19	33.65	6.70	34.06	60.48	74.00	13.52	
	1576.342	41.00	25.92	3.98	35.58	35.32	54.00	18.68	AV
	1752.110	45.49	26.63	4.11	35.37	40.86	54.00	13.14	
	2111.004	46.40	27.72	4.55	35.11	43.56	54.00	10.44	
	3153.515	43.21	30.82	5.93	35.05	44.91	54.00	9.09	
	3511.430	41.34	31.56	6.17	34.71	44.36	54.00	9.64	
	4553.192	36.38	33.65	6.7	34.06	42.67	54	11.33	

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Dec 23, 2015

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Vertical	31.120	18.20	18.06	0.65	--	36.91	40.00	3.09	QP
	93.050	26.26	11.30	1.24	--	38.80	43.50	4.70	
	141.550	25.97	12.40	1.59	--	39.96	43.50	3.54	
	250.190	26.84	12.50	2.15	--	41.49	46.00	4.51	
	297.720	24.35	13.70	2.56	--	40.61	46.00	5.39	
	707.060	18.02	19.80	3.56	--	41.38	46.00	4.62	
	1057.116	66.45	23.78	4.43	36.39	58.27	74.00	15.73	PK
	1748.973	69.54	26.61	4.11	35.37	64.89	74.00	9.11	
	2111.004	62.24	27.72	4.55	35.11	59.40	74.00	14.60	
	2458.283	63.94	28.33	4.86	35.15	61.98	74.00	12.02	
	3158.200	64.61	30.84	5.93	35.04	66.34	74.00	7.66	
	3505.144	60.01	31.53	6.17	34.71	63.00	74.00	11.00	
	1057.116	48.24	23.78	4.43	36.39	40.06	54.00	13.94	AV
	1748.973	47.30	26.61	4.11	35.37	42.65	54.00	11.35	
	2111.004	43.11	27.72	4.55	35.11	40.27	54.00	13.73	
	2458.283	44.20	28.33	4.86	35.15	42.24	54.00	11.76	
	3158.200	41.40	30.84	5.93	35.04	43.13	54.00	10.87	
	3505.144	41.22	31.53	6.17	34.71	44.21	54.00	9.79	

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 60%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Dec 23, 2015
& 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	144.460	23.69	12.15	1.60	37.44	43.50	6.06
	174.530	23.29	10.73	1.80	35.82	43.50	7.68
	245.340	26.79	12.30	2.14	41.23	46.00	4.77
	296.750	24.99	13.70	2.56	41.25	46.00	4.75
	380.170	18.49	16.50	2.69	37.68	46.00	8.32
	704.150	18.33	19.80	3.56	41.69	46.00	4.31
Vertical	31.940	16.90	17.50	0.65	35.05	40.00	4.95
	94.020	23.66	11.50	1.26	36.42	43.50	7.08
	138.640	24.18	12.53	1.57	38.28	43.50	5.22
	249.220	26.01	12.46	2.15	40.62	46.00	5.38
	704.150	16.78	19.80	3.56	40.14	46.00	5.86
	878.750	12.90	21.03	4.36	38.29	46.00	7.71

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Dec 23, 2015

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	145.430	21.36	12.03	1.61	35.00	43.50	8.50
	248.250	26.42	12.42	2.15	40.99	46.00	5.01
	297.720	24.80	13.70	2.56	41.06	46.00	4.94
	374.350	21.38	16.39	2.69	40.46	46.00	5.54
	704.640	17.90	19.80	3.56	41.26	46.00	4.74
	742.440	16.50	19.97	3.60	40.07	46.00	5.93
Vertical	93.050	23.58	11.30	1.24	36.12	43.50	7.38
	138.640	24.18	12.53	1.57	38.28	43.50	5.22
	246.310	25.04	12.34	2.14	39.52	46.00	6.48
	302.570	21.99	13.88	2.59	38.46	46.00	7.54
	702.210	17.97	19.80	3.54	41.31	46.00	4.69
	882.630	12.58	21.10	4.36	38.04	46.00	7.96

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 60%RH

Test Mode : HDMI1080P Date of Test : Dec 23, 2015

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	80.000	23.00	9.40	1.09	33.49	40.00	6.51
	142.520	24.82	12.30	1.59	38.71	43.50	4.79
	193.930	26.50	10.17	1.94	38.61	43.50	4.89
	297.720	20.78	13.70	2.56	37.04	46.00	8.96
	587.750	17.91	18.58	2.36	38.85	46.00	7.15
	797.270	16.99	20.57	3.68	41.24	46.00	4.76
Vertical	30.970	15.83	18.15	0.64	34.62	40.00	5.38
	82.380	23.05	9.60	1.12	33.77	40.00	6.23
	140.580	24.67	12.45	1.59	38.71	43.50	4.79
	191.990	26.01	10.23	1.92	38.16	43.50	5.34
	445.000	21.40	16.85	2.82	41.07	46.00	4.93
	613.940	19.56	19.20	2.39	41.15	46.00	4.85

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 60%RH

Test Mode : USB Play Date of Test : Dec 23, 2015

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	245.340	24.58	12.30	2.14	39.02	46.00	6.98
	286.080	23.85	13.52	2.49	39.86	46.00	6.14
	301.600	23.23	13.88	2.59	39.70	46.00	6.30
	702.210	16.28	19.80	3.54	39.62	46.00	6.38
	820.550	14.99	20.70	3.88	39.57	46.00	6.43
	914.640	12.56	21.50	4.61	38.67	46.00	7.33
Vertical	89.170	25.60	10.35	1.20	37.15	43.50	6.35
	147.370	21.47	11.80	1.62	34.89	43.50	8.61
	251.160	24.62	12.54	2.18	39.34	46.00	6.66
	449.040	20.55	16.82	2.84	40.21	46.00	5.79
	702.210	16.51	19.80	3.54	39.85	46.00	6.15
	878.750	13.56	21.03	4.36	38.95	46.00	7.05

TEST ENGINEER: MARK LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN32K220WUS Humidity : 60%RH

Test Mode : LAN Play Date of Test : Dec 23, 2015

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	90.140	23.65	10.50	1.21	35.36	43.50	8.14
	148.340	20.87	11.65	1.62	34.14	43.50	9.36
	241.500	27.00	12.00	2.13	41.13	46.00	4.87
	449.040	20.30	16.82	2.84	39.96	46.00	6.04
	705.100	16.60	19.80	3.56	39.96	46.00	6.04
	836.070	15.24	20.75	3.97	39.96	46.00	6.04
Vertical	88.200	25.35	10.25	1.18	36.78	43.50	6.72
	163.860	23.42	11.24	1.73	36.39	43.50	7.11
	241.500	26.00	12.00	2.13	40.13	46.00	5.87
	447.100	19.64	16.83	2.82	39.29	46.00	6.71
	702.210	16.74	19.80	3.54	40.08	46.00	5.92
	836.070	15.53	20.75	3.97	40.25	46.00	5.75

TEST ENGINEER: MARK LI

5 DEVIATION TO TEST SPECIFICATIONS

None.

6 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
Conductive Tape	DCF40\ROH	Qingdao Joinset S&T Co., Ltd.	See Internal Photos Figure 19

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
(WENCY YANG)