

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

LED LCD TV

Model No.	Brand
50K2203W	Hisense
50H6B	
50H5C	
50H5C+	

FCC ID : W9HLCDF0075

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

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Report No. : ACI-F16031
Date of Test : Jan 06- 15, 2016
Date of Report : Jan 25, 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
Refer to Sec.2.1	Hisense	120V/60Hz

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 Jan 06- 15, 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.

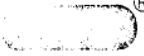
This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

The test results for EUT's TV functions are contained in No.F16030, a Verification report.

Date of Test : Jan 06- 15, 2016 Date of Report : Jan 25, 2016

Producer : Huimin Yan
 HUIMIN YAN / Assistant

Review : Sammy Chen
 SAMMY CHEN / Manager

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

Signatory : Sammy Chen for
 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	:	<input checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type
Model No	:	50K2203W, 50H6B, 50H5C, 50H5C+
Note	:	The above models are all the same except for model number.50K2203W model is tested and recorded in the report.
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. Blvd. Sharp #3510 Parque Industrial Rosarito, C.P. 22710 Playas de Rosarito, B.C.
LCD Panel	:	Manufacturer : Hisense M/N : HD500DF-B54 (020)
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, 2C
LAN Cable	:	Shielded, Detachable, 1.50m
USB Cable*2 (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 Audio out Port : Connected with Earphone
- (2) One USB 2 Port : Connected with Hard-Disk #2
- (3) One DEBUG Port : This port does not open to user
- (4) One USB 1 Port : Connected with Hard-Disk #1
- (5) One HDMI 2 Port : Connected with PC
- (6) One HDMI 1 Port : Connected with DVD PLAYER #1
- (7) One ANT/CABLE IN Port : Connected with Antenna or ATSC SG / TV SG

Back Port:

- (8) One LAN Port : Connected with PC
- (9) One HDMI3 Port : Connected with DVD PLAYER #2
- (10) One Digital Audio Out Port : Connected with DVD PLAYER #2
- (11) One COMPONENT IN/AV IN Port : Connected with DVD PLAYER #2

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, 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

Manufacturer : audio-technica
Model Number : ATH-CKL200

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

2.2.11 Hard Disk #2

Manufacturer : Tetasy
 Model Number : F12
 Serial Number : A010022-4A60007
 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

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

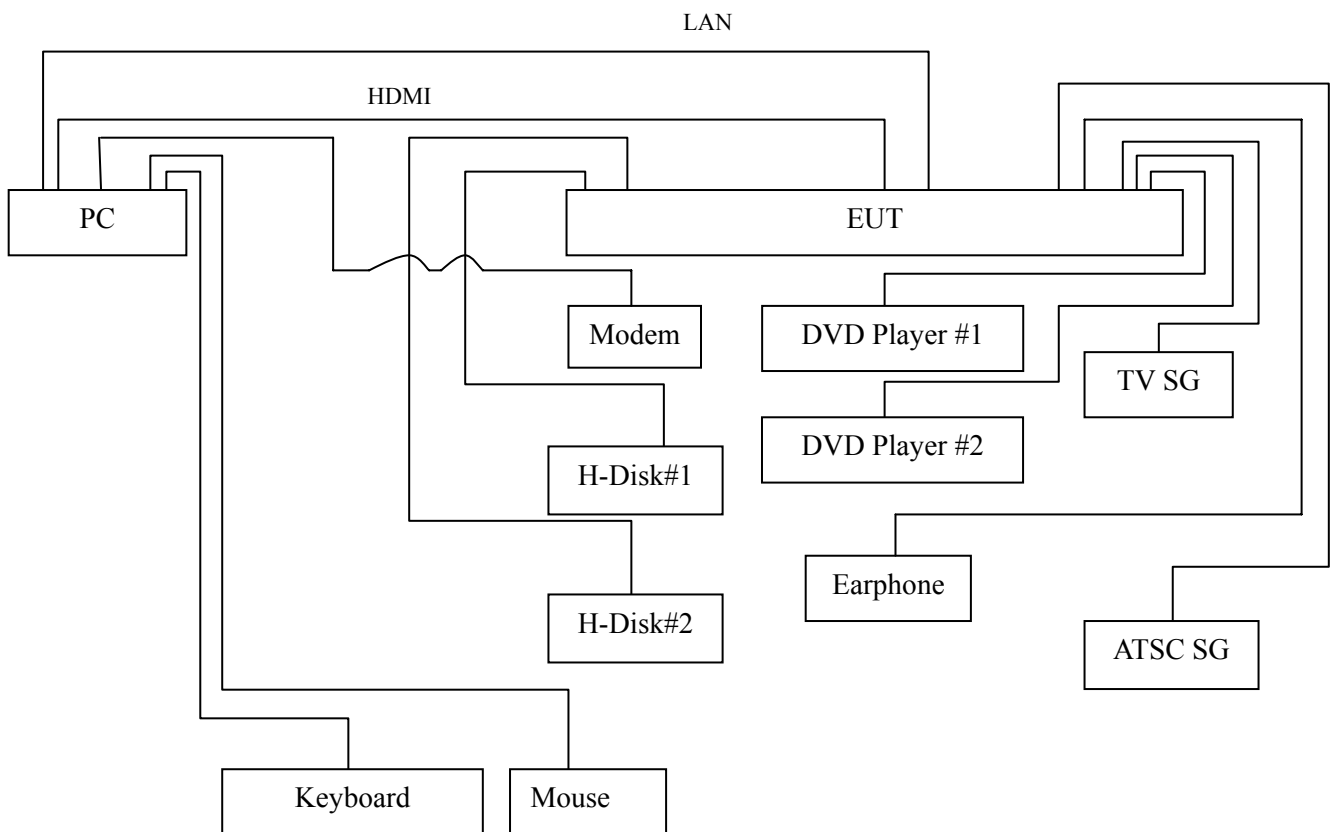
3.1 Test Equipment

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

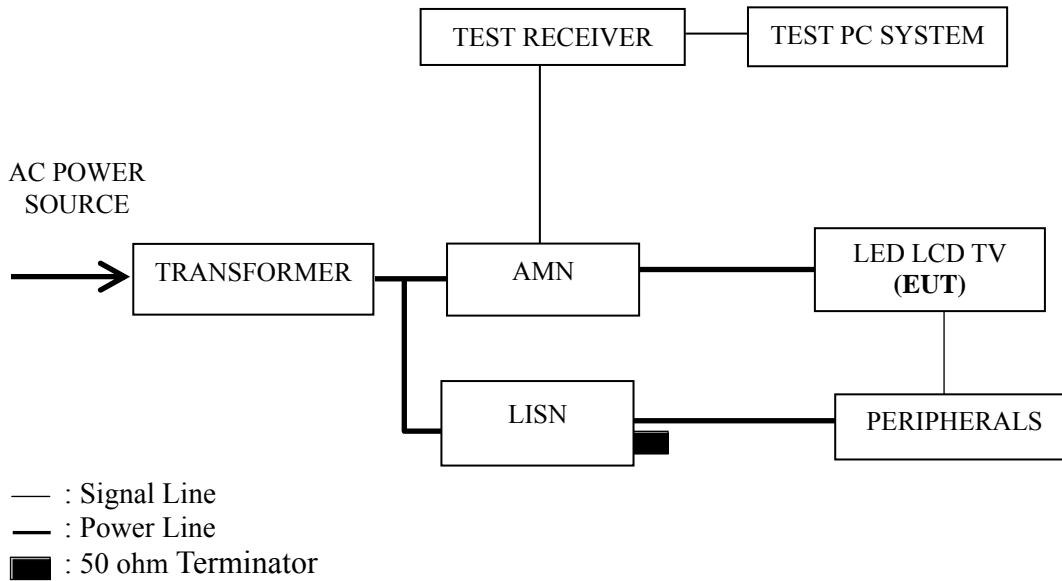
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Jul 03, 2015	Jul 02, 2016
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2015	Jun 26, 2016
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-5	Mar 20, 2015	Mar 19, 2016
4.	50Ω Terminator	Anritsu	BNC	001	Mar 18, 2015	Sep 17, 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 Hard 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 HDMI 1920*1080@60Hz & 1kHz playing test mode. The worst emission is detected at 0.227MHz (Average Value) with corrected signal level of 50.98 dB (μV) (limit is 62.55 dB (μV)), when the Neutral of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K2203W Humidity : 48%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Jan 06, 2016
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark	
Line	0.228	38.20	10.50	48.70	62.53	13.83	QP	
	0.517	30.80	10.39	41.19	56.00	14.81		
	0.780	30.50	10.38	40.88	56.00	15.12		
	1.278	26.90	10.39	37.29	56.00	18.71		
	1.560	27.70	10.40	38.10	56.00	17.90		
	6.200	34.00	10.47	44.47	60.00	15.53		
	0.228	24.00	10.50	34.50	52.53	18.03	AV	
	0.517	21.70	10.39	32.09	46.00	13.91		
	0.780	19.90	10.38	30.28	46.00	15.72		
	1.278	14.30	10.39	24.69	46.00	21.31		
	1.560	14.90	10.40	25.30	46.00	20.70		
	6.200	20.50	10.47	30.97	50.00	19.03		
	Neutral	0.227	40.50	10.48	50.98	62.55	11.57	QP
		0.522	32.80	10.37	43.17	56.00	12.83	
0.780		31.60	10.36	41.96	56.00	14.04		
1.393		26.60	10.39	36.99	56.00	19.01		
2.273		24.80	10.42	35.22	56.00	20.78		
6.212		33.90	10.50	44.40	60.00	15.60		
0.227		24.10	10.48	34.58	52.55	17.97	AV	
0.522		22.90	10.37	33.27	46.00	12.73		
0.780		20.50	10.36	30.86	46.00	15.14		
1.393		15.80	10.39	26.19	46.00	19.81		
2.273		15.70	10.42	26.12	46.00	19.88		
6.212		20.10	10.50	30.60	50.00	19.40		

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K2203W Humidity : 48%RH

Test Mode : HDMI 1280*1024@60Hz & 1kHz Playing Date of Test : Jan 06, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.226	38.30	10.50	48.80	62.60	13.80	QP
	0.523	31.00	10.39	41.39	56.00	14.61	
	0.680	28.71	10.37	39.08	56.00	16.92	
	1.294	27.20	10.39	37.59	56.00	18.41	
	4.750	23.30	10.48	33.78	56.00	22.22	
	6.206	33.50	10.47	43.97	60.00	16.03	
	AV	0.226	22.90	10.50	33.40	52.60	19.20
		0.523	20.20	10.39	30.59	46.00	15.41
		0.680	16.61	10.37	26.98	46.00	19.02
		1.294	16.80	10.39	27.19	46.00	18.81
		4.750	14.70	10.48	25.18	46.00	20.82
		6.206	19.60	10.47	30.07	50.00	19.93
Neutral	0.227	40.50	10.48	50.98	62.57	11.59	QP
	0.521	32.80	10.37	43.17	56.00	12.83	
	0.781	31.60	10.36	41.96	56.00	14.04	
	1.306	27.50	10.39	37.89	56.00	18.11	
	3.178	24.79	10.45	35.24	56.00	20.76	
	6.208	34.70	10.50	45.20	60.00	14.80	
	AV	0.227	23.70	10.48	34.18	52.57	18.39
		0.521	22.90	10.37	33.27	46.00	12.73
		0.781	20.50	10.36	30.86	46.00	15.14
		1.306	14.60	10.39	24.99	46.00	21.01
		3.178	13.99	10.45	24.44	46.00	21.56
		6.208	20.50	10.50	31.00	50.00	19.00

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K2203W Humidity : 48%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Jan 06, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.229	38.20	10.50	48.70	62.50	13.80	QP
	0.522	31.30	10.39	41.69	56.00	14.31	
	0.935	27.50	10.38	37.88	56.00	18.12	
	1.568	27.90	10.40	38.30	56.00	17.70	
	4.271	25.80	10.47	36.27	56.00	19.73	
	6.211	34.80	10.47	45.27	60.00	14.73	
	0.229	24.30	10.50	34.80	52.50	17.70	AV
	0.522	21.10	10.39	31.49	46.00	14.51	
	0.935	13.20	10.38	23.58	46.00	22.42	
	1.568	15.80	10.40	26.20	46.00	19.80	
	4.271	16.70	10.47	27.17	46.00	18.83	
	6.211	20.40	10.47	30.87	50.00	19.13	
Neutral	0.228	40.10	10.48	50.58	62.52	11.94	QP
	0.522	32.80	10.37	43.17	56.00	12.83	
	0.680	29.31	10.35	39.66	56.00	16.34	
	1.292	27.89	10.39	38.28	56.00	17.72	
	2.271	25.60	10.42	36.02	56.00	19.98	
	5.954	32.30	10.49	42.79	60.00	17.21	
	0.228	24.40	10.48	34.88	52.52	17.64	AV
	0.522	23.30	10.37	33.67	46.00	12.33	
	0.680	16.91	10.35	27.26	46.00	18.74	
	1.292	17.19	10.39	27.58	46.00	18.42	
	2.271	16.90	10.42	27.32	46.00	18.68	
	5.954	19.50	10.49	29.99	50.00	20.01	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C
 Model No. : 50K2203W Humidity : 48%RH
 Test Mode : HDMI1080P Date of Test : Jan 06, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark	
Line	0.227	38.50	10.50	49.00	62.56	13.56	QP	
	0.523	31.30	10.39	41.69	56.00	14.31		
	0.923	27.10	10.38	37.48	56.00	18.52		
	1.570	27.10	10.40	37.50	56.00	18.50		
	3.626	23.41	10.45	33.86	56.00	22.14		
	5.959	33.10	10.47	43.57	60.00	16.43		
	0.227	23.70	10.50	34.20	52.56	18.36	AV	
	0.523	21.80	10.39	32.19	46.00	13.81		
	0.923	11.50	10.38	21.88	46.00	24.12		
	1.570	16.30	10.40	26.70	46.00	19.30		
	3.626	14.31	10.45	24.76	46.00	21.24		
	5.959	20.90	10.47	31.37	50.00	18.63		
	Neutral	0.226	40.20	10.48	50.68	62.61	11.93	QP
		0.520	32.70	10.37	43.07	56.00	12.93	
0.778		31.60	10.36	41.96	56.00	14.04		
1.462		27.70	10.39	38.09	56.00	17.91		
3.179		24.79	10.45	35.24	56.00	20.76		
5.912		33.80	10.49	44.29	60.00	15.71		
0.226		23.50	10.48	33.98	52.61	18.63	AV	
0.520		23.80	10.37	34.17	46.00	11.83		
0.778		20.80	10.36	31.16	46.00	14.84		
1.462		18.60	10.39	28.99	46.00	17.01		
3.179		14.59	10.45	25.04	46.00	20.96		
5.912		18.20	10.49	28.69	50.00	21.31		

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K2203W Humidity : 48%RH

Test Mode : USB Play Date of Test : Jan 06, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.227	38.30	10.50	48.80	62.54	13.74	QP
	0.521	31.40	10.39	41.79	56.00	14.21	
	0.680	28.61	10.37	38.98	56.00	17.02	
	1.368	27.30	10.39	37.69	56.00	18.31	
	2.319	24.80	10.42	35.22	56.00	20.78	
	6.253	33.50	10.47	43.97	60.00	16.03	
	AV	0.227	23.90	10.50	34.40	52.54	18.14
		0.521	22.00	10.39	32.39	46.00	13.61
		0.680	16.71	10.37	27.08	46.00	18.92
		1.368	15.60	10.39	25.99	46.00	20.01
		2.319	15.60	10.42	26.02	46.00	19.98
		6.253	20.60	10.47	31.07	50.00	18.93
Neutral	0.227	40.50	10.48	50.98	62.57	11.59	QP
	0.520	32.80	10.37	43.17	56.00	12.83	
	0.935	26.80	10.37	37.17	56.00	18.83	
	1.732	25.59	10.41	36.00	56.00	20.00	
	4.329	25.60	10.46	36.06	56.00	19.94	
	5.945	34.10	10.49	44.59	60.00	15.41	
	AV	0.227	23.80	10.48	34.28	52.57	18.29
		0.520	23.90	10.37	34.27	46.00	11.73
		0.935	14.10	10.37	24.47	46.00	21.53
		1.732	15.19	10.41	25.60	46.00	20.40
		4.329	16.70	10.46	27.16	46.00	18.84
		5.945	18.80	10.49	29.29	50.00	20.71

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K2203W Humidity : 48%RH

Test Mode : LAN Play Date of Test : Jan 06, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.226	38.30	10.50	48.80	62.58	13.78	QP
	0.522	31.50	10.39	41.89	56.00	14.11	
	0.680	28.81	10.37	39.18	56.00	16.82	
	1.264	26.50	10.39	36.89	56.00	19.11	
	2.464	24.51	10.42	34.93	56.00	21.07	
	5.982	34.60	10.47	45.07	60.00	14.93	
	0.226	23.10	10.50	33.60	52.58	18.98	AV
	0.522	21.90	10.39	32.29	46.00	13.71	
	0.680	16.91	10.37	27.28	46.00	18.72	
	1.264	15.30	10.39	25.69	46.00	20.31	
	2.464	13.71	10.42	24.13	46.00	21.87	
	5.982	22.00	10.47	32.47	50.00	17.53	
Neutral	0.227	40.30	10.48	50.78	62.57	11.79	QP
	0.520	32.80	10.37	43.17	56.00	12.83	
	0.780	31.50	10.36	41.86	56.00	14.14	
	1.288	27.59	10.39	37.98	56.00	18.02	
	2.275	25.80	10.42	36.22	56.00	19.78	
	5.938	33.80	10.49	44.29	60.00	15.71	
	0.227	23.90	10.48	34.38	52.57	18.19	AV
	0.520	23.90	10.37	34.27	46.00	11.73	
	0.780	20.70	10.36	31.06	46.00	14.94	
	1.288	16.19	10.39	26.58	46.00	19.42	
	2.275	16.90	10.42	27.32	46.00	18.68	
	5.938	18.50	10.49	28.99	50.00	21.01	

TEST ENGINEER: WENCY YANG

4 RADIATED EMISSION TEST

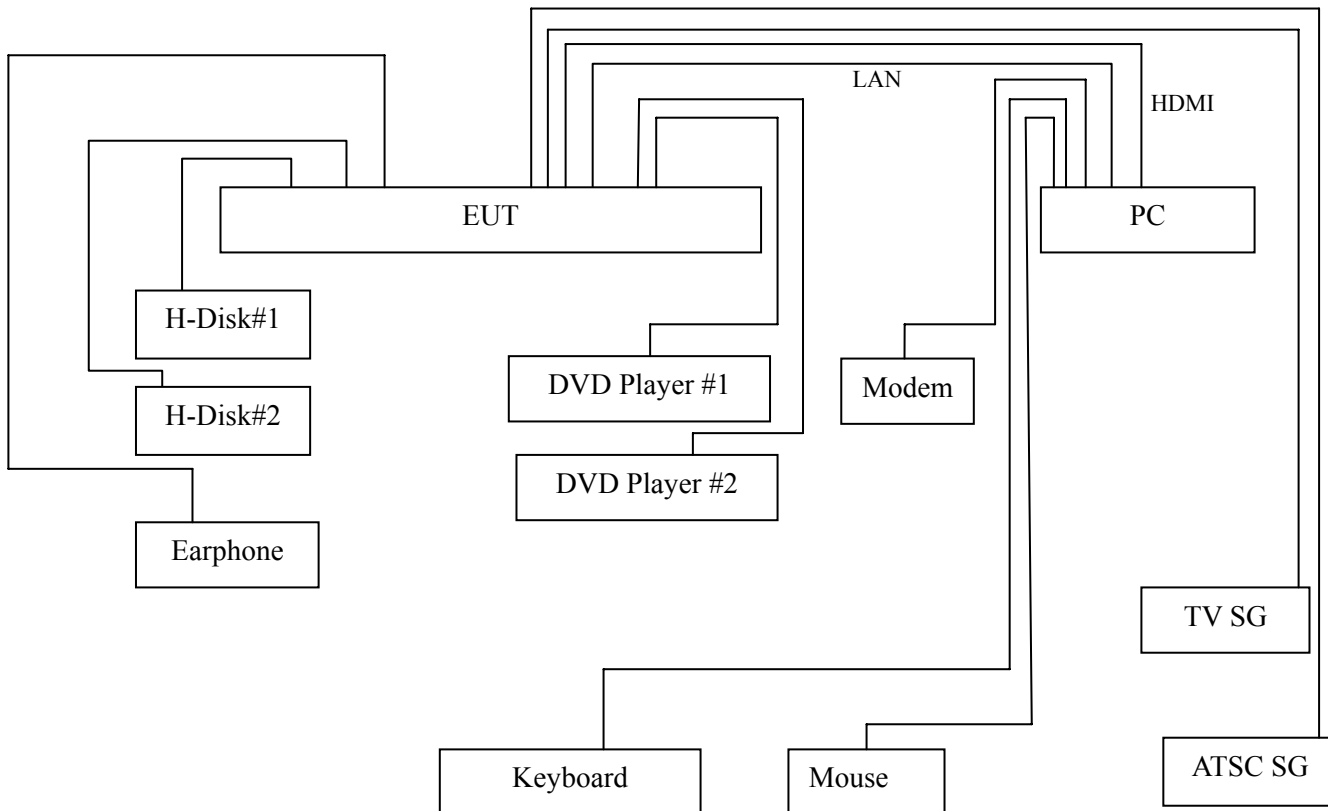
4.1 Test Equipment

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.	50Ω Coaxial Switch	Anritsu	MP59B	6200426390	Sep 18, 2015	Mar 17, 2016
9.	Software	Audix	E3	6.2007-9-10	--	--

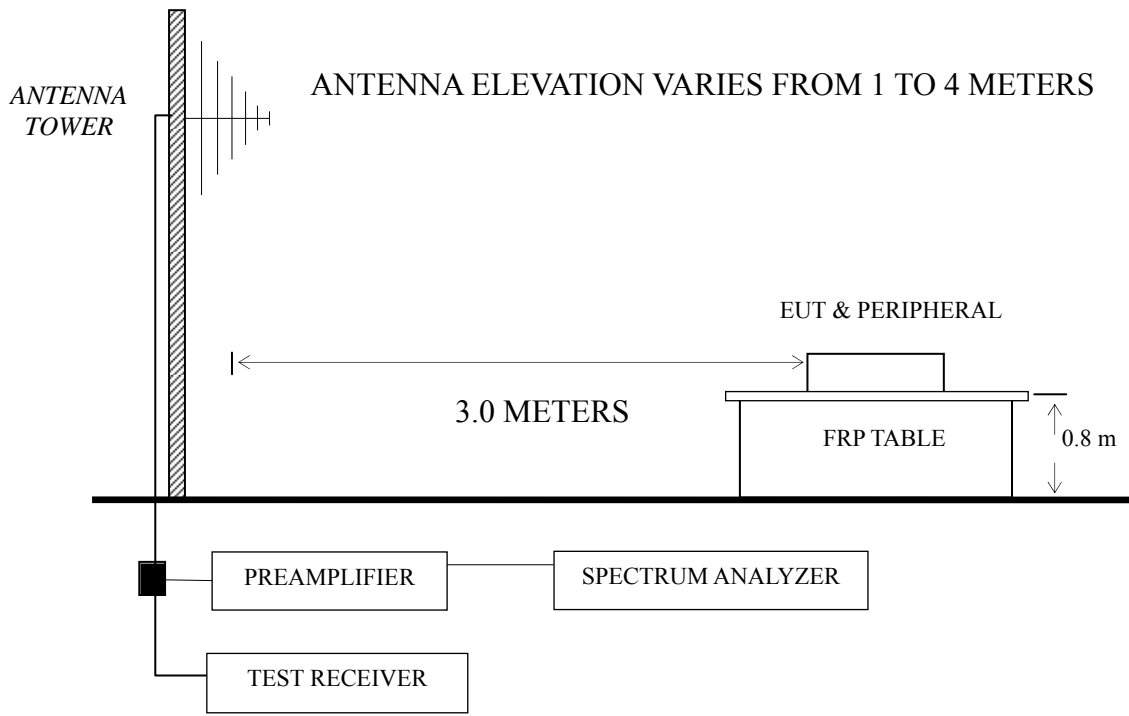
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals



4.2.2 Test Setup

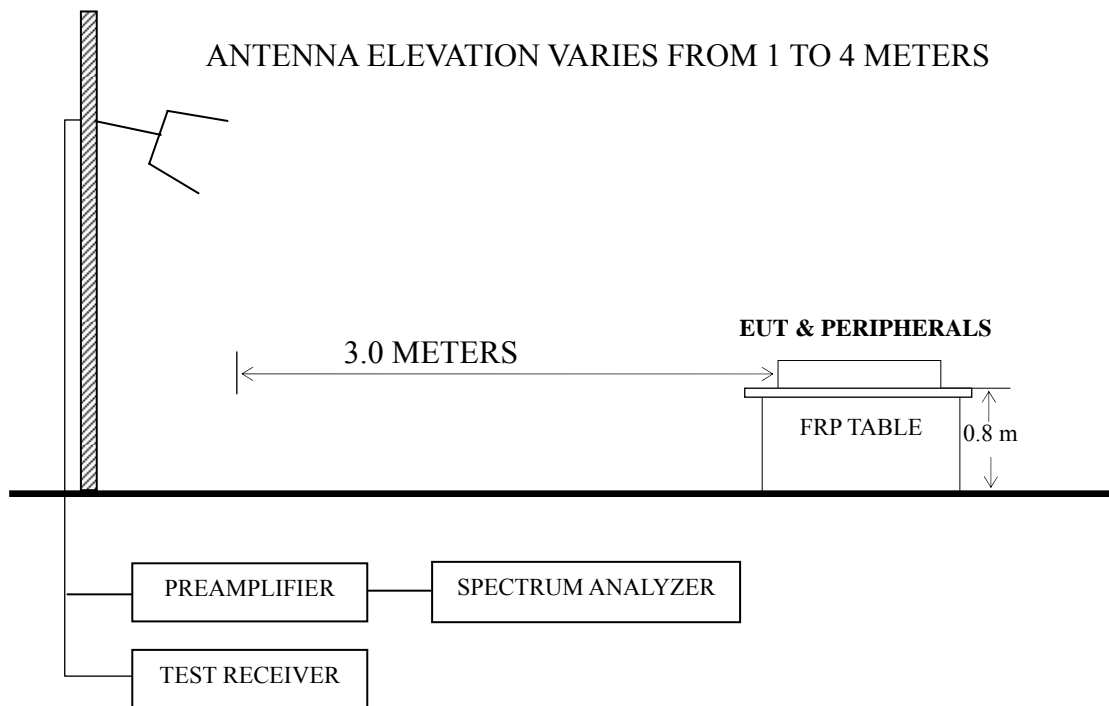
4.2.2.1 Below 1GHz



■ : 50 ohm Coaxial Switch

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 C63.4:2003 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	P24 - P25
HDMI 1280*1024@60Hz & 1kHz playing	P26
HDMI 640*480@60Hz & 1kHz playing	P27
HDMI1080P	P28
USB Play	P29
LAN Play	P30

NOTE 1 – Emission Level = Antenna Factor + Cable Loss + Meter Reading.
($< 1\text{GHz}$);

Emission Level = Antenna Factor + Cable Loss – Preamp Factor
+ Meter Reading. ($> 1\text{GHz}$)

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 & 1kHz playing test mode. The worst emission at horizontal polarization was detected at 483.960 MHz with corrected signal level of 44.02 dB ($\mu\text{V}/\text{m}$) (limit is 46.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.9 m height and the turntable was at 35° . The worst emission at vertical polarization was detected at 479.240 MHz with corrected signal level of 44.26 dB ($\mu\text{V}/\text{m}$) (limit is 46.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.3m height and the turntable was at 355° .

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K2203W Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Jan 15, 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	73.650	24.42	8.20	0.99	--	33.61	40.00	6.39	QP
	132.820	24.28	12.69	1.54	--	38.51	43.50	4.99	
	151.250	27.19	11.43	1.65	--	40.27	43.50	3.23	
	483.960	23.57	17.54	2.91	--	44.02	46.00	1.98	
	742.950	12.95	19.97	3.60	--	36.52	46.00	9.48	
	890.390	15.37	21.30	4.46	--	41.13	46.00	4.87	
	1211.329	57.91	24.49	3.54	36.11	49.83	74.00	24.17	PK
	2557.121	62.22	28.67	4.96	35.16	60.69	74.00	13.31	
	2951.232	65.02	30.30	5.69	35.20	65.81	74.00	8.19	
	3399.987	55.96	31.31	6.10	34.81	58.56	74.00	15.44	
	4253.498	52.11	33.22	6.43	34.19	57.57	74.00	16.43	
	5935.842	47.02	35.07	8.45	34.09	56.45	74.00	17.55	AV
	1211.329	38.28	24.49	3.54	36.11	30.20	54.00	23.80	
	2557.121	42.14	28.67	4.96	35.16	40.61	54.00	13.39	
2951.232	46.20	30.30	5.69	35.20	46.99	54.00	7.01		
3399.987	36.99	31.31	6.10	34.81	39.59	54.00	14.41		
4253.498	33.10	33.22	6.43	34.19	38.56	54.00	15.44		
5935.842	30.87	35.07	8.45	34.09	40.30	54.00	13.70		

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K2203W Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Jan 15, 2016
& 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	42.610	20.21	12.12	0.75	--	33.08	40.00	6.92	QP
	77.530	23.47	8.95	1.05	--	33.47	40.00	6.53	
	151.250	28.03	11.43	1.65	--	41.11	43.50	2.39	
	398.300	24.71	16.58	2.71	--	44.00	46.00	2.00	
	479.240	23.86	17.50	2.90	--	44.26	46.00	1.74	
	742.500	20.40	19.97	3.60	--	43.97	46.00	2.03	
	1206.996	57.09	24.48	3.54	36.12	48.99	74.00	25.01	PK
	2066.100	55.86	27.63	4.53	35.11	52.91	74.00	21.09	
	2259.742	56.88	27.99	4.69	35.13	54.43	74.00	19.57	
	2552.543	65.60	28.63	4.96	35.16	64.03	74.00	9.97	
	2951.232	65.96	30.30	5.69	35.20	66.75	74.00	7.25	
	3393.901	54.92	31.31	6.10	34.81	57.52	74.00	16.48	AV
	1206.996	38.66	24.48	3.54	36.12	30.56	54.00	23.44	
	2066.100	36.23	27.63	4.53	35.11	33.28	54.00	20.72	
	2259.742	38.45	27.99	4.69	35.13	36.00	54.00	18.00	
2552.543	46.66	28.63	4.96	35.16	45.09	54.00	8.91		
2951.232	45.31	30.30	5.69	35.20	46.10	54.00	7.90		
3393.901	34.01	31.31	6.10	34.81	36.61	54.00	17.39		

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K2203W Humidity : 60%RH

Test Mode : HDMI 1280*1024@60Hz & 1kHz Playing Date of Test : Jan 15, 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	145.430	19.83	12.03	1.61	33.47	43.50	10.03
	194.900	22.98	10.10	1.94	35.02	43.50	8.48
	287.050	24.50	13.55	2.49	40.54	46.00	5.46
	369.500	16.10	16.30	2.68	35.08	46.00	10.92
	609.090	21.11	19.10	2.39	42.60	46.00	3.40
	776.900	19.11	20.50	3.65	43.26	46.00	2.74
Vertical	83.350	23.46	9.66	1.13	34.25	40.00	5.75
	135.730	24.07	12.59	1.55	38.21	43.50	5.29
	436.430	20.43	16.88	2.81	40.12	46.00	5.88
	532.460	16.60	18.35	2.73	37.68	46.00	8.32
	844.800	17.20	20.73	4.07	42.00	46.00	4.00
	963.140	12.92	22.27	4.75	39.94	54.00	14.06

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K2203W Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Jan 15, 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	120.210	21.31	12.83	1.46	35.60	43.50	7.90
	189.080	21.99	10.36	1.90	34.25	43.50	9.25
	332.640	20.60	14.89	2.64	38.13	46.00	7.87
	376.290	22.17	16.41	2.69	41.27	46.00	4.73
	719.670	18.02	19.90	3.57	41.49	46.00	4.51
	832.190	17.41	20.70	3.97	42.08	46.00	3.92
Vertical	95.960	22.53	11.84	1.27	35.64	43.50	7.86
	164.830	24.89	11.30	1.75	37.94	43.50	5.56
	236.610	24.25	11.56	2.10	37.91	46.00	8.09
	383.080	19.00	16.50	2.70	38.20	46.00	7.80
	691.540	17.80	19.70	3.41	40.91	46.00	5.09
	932.100	14.67	21.70	4.65	41.02	46.00	4.98

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C
 Model No. : 50K2203W Humidity : 60%RH
 Test Mode : HDMI1080P Date of Test : Jan 15, 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	92.080	23.52	11.00	1.23	35.75	43.50	7.75
	174.530	27.04	10.73	1.80	39.57	43.50	3.93
	322.940	19.45	14.59	2.62	36.66	46.00	9.34
	486.870	17.71	17.58	2.91	38.20	46.00	7.80
	709.970	19.36	19.80	3.56	42.72	46.00	3.28
	955.380	12.13	22.05	4.75	38.93	46.00	7.07
Vertical	34.850	15.09	15.80	0.68	31.57	40.00	8.43
	87.230	22.31	10.10	1.18	33.59	40.00	6.41
	130.880	21.82	12.76	1.53	36.11	43.50	7.39
	244.370	18.83	12.20	2.14	33.17	46.00	12.83
	374.350	19.38	16.39	2.69	38.46	46.00	7.54
	863.230	16.14	20.83	4.27	41.24	46.00	4.76

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K2203W Humidity : 60%RH

Test Mode : USB Play Date of Test : Jan 15, 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	69.770	23.65	7.26	0.93	31.84	40.00	8.16
	138.640	19.17	12.53	1.57	33.27	43.50	10.23
	249.220	23.96	12.46	2.15	38.57	46.00	7.43
	439.340	15.75	16.90	2.81	35.46	46.00	10.54
	636.250	13.96	19.50	2.77	36.23	46.00	9.77
	904.940	12.50	21.40	4.56	38.46	46.00	7.54
Vertical	79.470	22.43	9.29	1.07	32.79	40.00	7.21
	145.430	21.58	12.03	1.61	35.22	43.50	8.28
	250.190	24.76	12.50	2.15	39.41	46.00	6.59
	482.990	17.48	17.54	2.91	37.93	46.00	8.07
	622.670	13.51	19.35	2.52	35.38	46.00	10.62
	853.530	12.28	20.73	4.17	37.18	46.00	8.82

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K2203W Humidity : 60%RH

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

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	83.350	21.77	9.66	1.13	32.56	40.00	7.44
	145.430	20.14	12.03	1.61	33.78	43.50	9.72
	281.230	22.87	13.27	2.42	38.56	46.00	7.44
	447.100	14.32	16.83	2.82	33.97	46.00	12.03
	667.290	12.14	19.60	3.16	34.90	46.00	11.10
	945.680	11.48	21.87	4.70	38.05	46.00	7.95
Vertical	32.910	16.16	16.99	0.66	33.81	40.00	6.19
	65.890	24.02	6.63	0.91	31.56	40.00	8.44
	98.870	22.04	12.16	1.30	35.50	43.50	8.00
	296.750	19.88	13.70	2.56	36.14	46.00	9.86
	500.450	14.32	17.90	2.94	35.16	46.00	10.84
	763.320	11.75	20.37	3.63	35.75	46.00	10.25


TEST ENGINEER: BILL 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\ROH	Qingdao Joinset Co., Ltd	See Appendix Figure 27

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.

