

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

LED LCD TV

Model No.	Brand
40K20DW, 40K21DW, 40K22DW, 40K23DW, 40K24DW, 40K25DW	Hisense
40H5, 40H5C, 40H5E, 40H5S, 40H5I	

FCC ID : W9HLCDD0039

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

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Report No. : ACI-F14004A1
Date of Test : Jul 31 – Aug 10, 2014
Date of Report : Aug 19, 2014

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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.
 EUT Description : LED LCD TV

Model No.	Brand	Power Supply
Refer to Sec2.1	Hisense	120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2013
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 Jul 31 – Aug 10, 2014 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.F14005A1, a Verification report.


Date of Test : Jul 31 – Aug 10, 2014 Date of Report : Aug 19, 2014

Producer : 
 EMILY ZHU / Assistant

Review : 
 DIO YANG / Deputy Manager



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

Signatory : 
 Authorized Signature EMC SAMMY CHEN / Deputy 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 2013 AND ANSI C63.4-2003	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2013 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. : 40K20DW, 40K21DW, 40K22DW, 40K23DW, 40K24DW, 40K25DW, 40H5, 40H5C, 40H5E, 40H5S, 40H5I

Note #1 : The modified histories of report are as follows:

Report No.	Model No.	Rev. Summary	Edition No.	Data of Rev.
ACI-F14004	40K20DW, 40K21DW, 40K22DW, 40K23DW, 40K24DW, 40K25DW 40H5, 40H5C, 40H5E, 40H5S, 40H5I	Original Report	0	Jan 09, 2014
ACI-F14004A1	40K20DW, 40K21DW, 40K22DW, 40K23DW, 40K24DW, 40K25DW 40H5, 40H5C, 40H5E, 40H5S, 40H5I	To modify the panel.	Rev. A1	Aug 19, 2014

Note #2 : The above models are all the same except for model name.
40K20DW model is tested and recorded in the report.

Brand Name : Hisense

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

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

Factory #1 : Hisense Electric Co., Ltd.
No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China

Factory #2	:	Tatung Mexico S.A. de C.V. Miguel Catalán 420, Parque Industrial Rio Bravo, Cd. Juarez, Chih., CP 32557
LCD Panel	:	Manufacturer : Hisense M/N : HD400DF-E37(020)\S1
Max Resolution	:	1920*1080@60Hz
D-Sub Cable	:	Shielded, Detachable, 1.85m, with two cores on cable
HDMI Cable	:	Shielded, Detachable, 1.00m
Power Cord	:	Unshielded, Detachable, 1.80m

Remark:

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

Bottom Port:

- (1) One HDMI2 Port : Connected with DVD PLAYER#2
- (2) One HDMI3/ARC Port : Connected with DVD PLAYER#1
- (3) One DIGITAL AUDIO OUT Port : Connected with DVD PLAYER #2
- (4) One component of Audio/YPbPr Audio Port : Connected with DVD PLAYER#1
- (5) One component of Video/YPbPr Port : Connected with DVD PLAYER#1
- (6) One LAN Port : Connected with PC

Side Port:

- (1) Two USB Ports : Connected with U-Disk
- (2) One HDMI1/DVI Port : Connected with PC
- (3) One VGA Port : Connected with PC
- (4) One AUDIO IN Port : Connected with PC
- (5) One AUDIO OUT/Earphone Port : Connected with Earphone
- (6) One ANT/CABLE IN Port : Connected with Antenna or ATSC SG / TV SG

2.2 Peripherals

2.2.1 PC

Manufacturer : HP
Model Number : dx7200MT
Serial Number : CNG622017W
Power Cord : Unshielded, Detachable, 1.8m
Certificate : FCC DoC; CE/EMC; VCCI; C-Tick;
BSMI, 3C, MIC

2.2.2 Printer

Manufacturer : HP
Model Number : C3990A
Serial Number : JPZX020487
Data Cable : Shielded, detachable, 1.5m
Certificate : GS, CE/EMC, C-Tick, FCC DoC

2.2.3 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

2.2.4 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

2.2.5 Modem

Manufacturer : TP-LINK
Model Number : TM-EC5658V
Serial Number : 07123301053
Data Cable : Shielded, Detachable, 1.8m
Certificate : FCC DoC, CE/EMC, CCC

2.2.6 TV Signal Generator

Manufacturer : FLUKE
Model Number : 54200m01
Serial Number : 814008
Data Cable : Shielded, detachable, 2.0m
Power Cord : Unshielded, detachable, 2.0m
Certificate : CE/EMC, FCC DoC, CCC

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 : FCC DoC, CE/EMC, CCC

2.2.9 DVD PLAYER#2

Manufacturer : PHILIPS
Model Number : DVP3986K/93
Serial Number : KX1A0902120082
Certificate : FCC DoC, CE/EMC, CCC

2.2.10 Earphone

Manufacturer : Skullcandy
Model Number : FMJ

2.2.11 U-DISK *2

Manufacturer : LG
Model Number : 1GB

2.3 Description of Test Facility

Site Description (No.3 3m Chamber) : Sept. 17, 1998 file on
Mar 16, 2012 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 = 2.77 dB
Radiated Emission Expanded Uncertainty (30-200MHz):	U = 4.17 dB (Horizontal)
	U = 4.02 dB (Vertical)
Radiated Emission Expanded Uncertainty (200M-1GHz):	U = 3.38 dB (Horizontal)
	U = 3.28 dB (Vertical)
Radiated Emission Expanded Uncertainty (Above 1GHz):	U = 4.68 dB (Horizontal)
	U = 4.87 dB (Vertical)

3 CONDUCTED EMISSION TEST

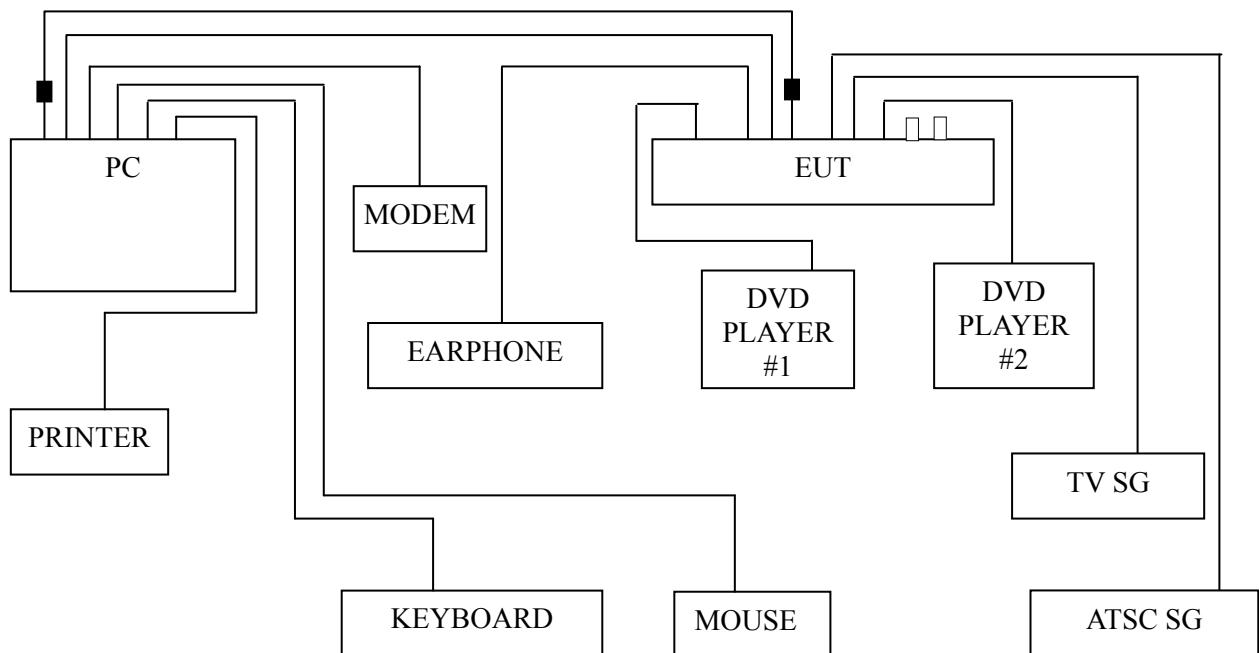
3.1 Test Equipment

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	101303	Sep 11, 2013	Sep 10, 2014
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2014	Jun 26, 2015
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2014	Mar 19, 2015
4.	50Ω Coaxial Switch	Anritsu	MP59B	6200426389	Mar 18, 2014	Sep 17, 2014
5.	50Ω Terminator	Anritsu	BNC	001	Mar 20, 2014	Mar 19, 2015
6.	Software	Audix	E3	6.111206	--	--

3.2 Block Diagram of Test Setup

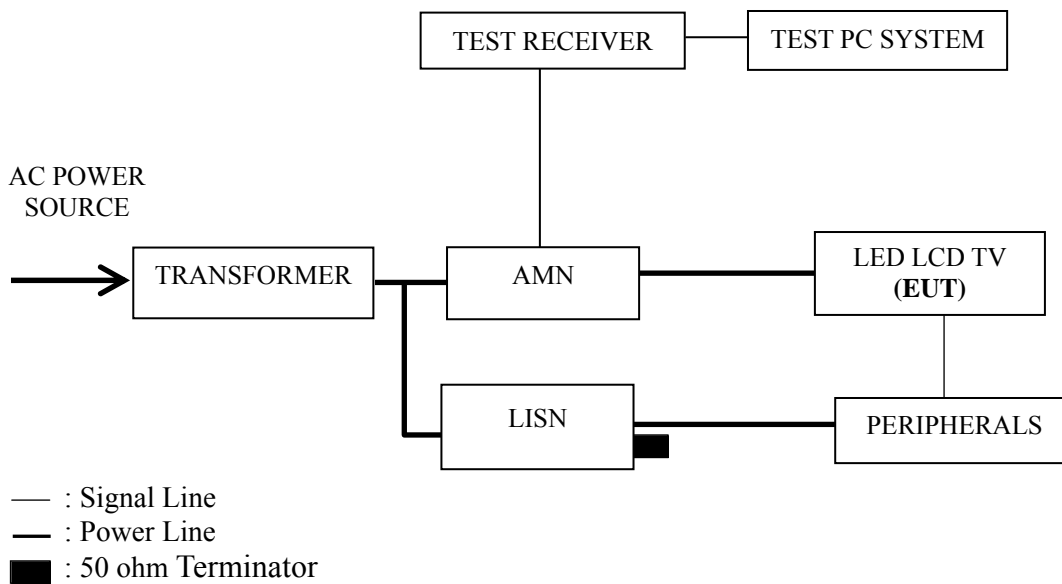
3.2.1 EUT & Peripherals



■ : Ferrite core

□ : U-Disk

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 D-Sub & HDMI Input).

3.5.5 In USB Play mode, set the EUT play digital media from U-Disk.

3.5.6 In LAN Play mode, set the EUT play digital media through LAN port.

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
D-Sub 1024*768@60Hz & 1kHz Playing
D-Sub 800*600@60Hz & 1kHz Playing
D-Sub 640*480@60Hz & 1kHz Playing
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	P14
D-Sub 1024*768@60Hz & 1kHz Playing	P15
D-Sub 800*600@60Hz & 1kHz Playing	P16
D-Sub 640*480@60Hz & 1kHz Playing	P17
USB Play	P18
LAN 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.

NOTE 4 – The worst case is for LAN Play test mode. The worst emission is detected at 18.540 MHz (Average Value) with corrected signal level of 45.08 dB (μ V) (limit is 50.00 dB (μ V)), when the Line of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : 40K20DW Humidity : 48%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Jul 31, 2014

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.543	32.10	10.44	42.54	56.00	13.46	QP
	0.663	31.60	10.43	42.03	56.00	13.97	
	2.272	27.80	10.44	38.24	56.00	17.76	
	5.960	34.41	10.40	44.81	60.00	15.19	
	7.837	36.50	10.47	46.97	60.00	13.03	
	18.780	38.31	10.58	48.89	60.00	11.11	
	0.543	18.50	10.44	28.94	46.00	17.06	AV
	0.663	16.60	10.43	27.03	46.00	18.97	
	2.272	16.40	10.44	26.84	46.00	19.16	
	5.960	26.91	10.40	37.31	50.00	12.69	
	7.837	29.00	10.47	39.47	50.00	10.53	
18.780	34.31	10.58	44.89	50.00	5.11		
Neutral	0.547	29.70	10.43	40.13	56.00	15.87	QP
	0.658	28.70	10.42	39.12	56.00	16.88	
	2.491	25.29	10.48	35.77	56.00	20.23	
	5.958	32.40	10.48	42.88	60.00	17.12	
	7.957	35.00	10.55	45.55	60.00	14.45	
	18.540	37.31	10.69	48.00	60.00	12.00	
	0.547	15.50	10.43	25.93	46.00	20.07	AV
	0.658	13.70	10.42	24.12	46.00	21.88	
	2.491	14.39	10.48	24.87	46.00	21.13	
	5.958	24.40	10.48	34.88	50.00	15.12	
	7.957	29.30	10.55	39.85	50.00	10.15	
18.540	34.01	10.69	44.70	50.00	5.30		

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 40K20DW Humidity : 48%RH

Test Mode : D-Sub 1024*768@60Hz Date of Test : Jul 31, 2014
& 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	0.552	31.80	10.44	42.24	56.00	13.76	QP
	0.665	31.50	10.43	41.93	56.00	14.07	
	2.473	27.19	10.45	37.64	56.00	18.36	
	5.929	36.71	10.40	47.11	60.00	12.89	
	7.847	35.40	10.47	45.87	60.00	14.13	
	18.230	39.30	10.58	49.88	60.00	10.12	
	AV	0.552	16.60	10.44	27.04	46.00	18.96
		0.665	16.30	10.43	26.73	46.00	19.27
		2.473	15.89	10.45	26.34	46.00	19.66
		5.929	24.61	10.40	35.01	50.00	14.99
		7.847	29.20	10.47	39.67	50.00	10.33
		18.230	34.40	10.58	44.98	50.00	5.02
Neutral	0.535	29.80	10.43	40.23	56.00	15.77	QP
	0.647	28.80	10.42	39.22	56.00	16.78	
	2.265	24.81	10.46	35.27	56.00	20.73	
	5.921	35.40	10.48	45.88	60.00	14.12	
	7.851	35.30	10.55	45.85	60.00	14.15	
	18.840	39.10	10.70	49.80	60.00	10.20	
	AV	0.535	16.20	10.43	26.63	46.00	19.37
		0.647	13.50	10.42	23.92	46.00	22.08
		2.265	14.11	10.46	24.57	46.00	21.43
		5.921	27.30	10.48	37.78	50.00	12.22
		7.851	29.60	10.55	40.15	50.00	9.85
		18.840	34.20	10.70	44.90	50.00	5.10

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 40K20DW Humidity : 48%RH

Test Mode : D-Sub 800*600@60Hz & 1kHz Playing Date of Test : Jul 31, 2014

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.561	31.80	10.44	42.24	56.00	13.76	QP
	0.657	31.40	10.43	41.83	56.00	14.17	
	2.260	26.50	10.44	36.94	56.00	19.06	
	5.929	34.81	10.40	45.21	60.00	14.79	
	7.728	34.70	10.46	45.16	60.00	14.84	
	18.320	38.80	10.58	49.38	60.00	10.62	
	0.561	17.30	10.44	27.74	46.00	18.26	AV
	0.657	16.70	10.43	27.13	46.00	18.87	
	2.260	15.60	10.44	26.04	46.00	19.96	
	5.929	26.41	10.40	36.81	50.00	13.19	
	7.728	28.50	10.46	38.96	50.00	11.04	
	18.320	34.20	10.58	44.78	50.00	5.22	
Neutral	0.541	29.60	10.43	40.03	56.00	15.97	QP
	0.657	28.70	10.42	39.12	56.00	16.88	
	2.473	24.69	10.48	35.17	56.00	20.83	
	5.929	33.80	10.48	44.28	60.00	15.72	
	7.851	35.90	10.55	46.45	60.00	13.55	
	18.420	38.61	10.69	49.30	60.00	10.70	
	0.541	15.50	10.43	25.93	46.00	20.07	AV
	0.657	13.30	10.42	23.72	46.00	22.28	
	2.473	13.89	10.48	24.37	46.00	21.63	
	5.929	25.90	10.48	36.38	50.00	13.62	
	7.851	29.30	10.55	39.85	50.00	10.15	
	18.420	34.31	10.69	45.00	50.00	5.00	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 40K20DW Humidity : 48%RH

Test Mode : D-Sub 640*480@60Hz & 1kHz Playing Date of Test : Jul 31, 2014

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.541	31.50	10.44	41.94	56.00	14.06	QP
	0.672	31.50	10.43	41.93	56.00	14.07	
	2.258	27.40	10.44	37.84	56.00	18.16	
	5.925	35.11	10.40	45.51	60.00	14.49	
	7.851	35.40	10.47	45.87	60.00	14.13	
	18.840	38.71	10.58	49.29	60.00	10.71	
	0.541	17.80	10.44	28.24	46.00	17.76	AV
	0.672	16.30	10.43	26.73	46.00	19.27	
	2.258	16.30	10.44	26.74	46.00	19.26	
	5.925	27.51	10.40	37.91	50.00	12.09	
	7.851	28.40	10.47	38.87	50.00	11.13	
	18.840	34.41	10.58	44.99	50.00	5.01	
Neutral	0.546	29.60	10.43	40.03	56.00	15.97	QP
	0.651	28.70	10.42	39.12	56.00	16.88	
	2.266	25.21	10.46	35.67	56.00	20.33	
	5.929	35.40	10.48	45.88	60.00	14.12	
	7.856	35.60	10.55	46.15	60.00	13.85	
	18.820	38.20	10.70	48.90	60.00	11.10	
	0.546	14.90	10.43	25.33	46.00	20.67	AV
	0.651	14.10	10.42	24.52	46.00	21.48	
	2.266	14.41	10.46	24.87	46.00	21.13	
	5.929	27.80	10.48	38.28	50.00	11.72	
	7.856	28.90	10.55	39.45	50.00	10.55	
	18.820	34.10	10.70	44.80	50.00	5.20	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 40K20DW Humidity : 48%RH

Test Mode : USB Play Date of Test : Jul 31, 2014

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.552	31.90	10.44	42.34	56.00	13.66	QP
	0.552	17.60	10.44	28.04	46.00	17.96	
	0.661	31.50	10.43	41.93	56.00	14.07	
	0.661	16.90	10.43	27.33	46.00	18.67	
	2.260	27.30	10.44	37.74	56.00	18.26	
	2.260	16.20	10.44	26.64	46.00	19.36	
	AV	5.931	34.91	10.40	45.31	60.00	14.69
		5.931	25.11	10.40	35.51	50.00	14.49
		7.935	34.10	10.47	44.57	60.00	15.43
		7.935	28.70	10.47	39.17	50.00	10.83
		18.840	38.41	10.58	48.99	60.00	11.01
		18.840	34.31	10.58	44.89	50.00	5.11
Neutral	0.546	29.80	10.43	40.23	56.00	15.77	QP
	0.546	15.50	10.43	25.93	46.00	20.07	
	0.647	29.10	10.42	39.52	56.00	16.48	
	0.647	14.30	10.42	24.72	46.00	21.28	
	2.260	25.01	10.46	35.47	56.00	20.53	
	2.260	13.61	10.46	24.07	46.00	21.93	
	AV	6.120	32.08	10.49	42.57	60.00	17.43
		6.120	24.49	10.49	34.98	50.00	15.02
		7.935	35.50	10.55	46.05	60.00	13.95
		7.935	27.80	10.55	38.35	50.00	11.65
		18.630	38.30	10.70	49.00	60.00	11.00
		18.630	34.20	10.70	44.90	50.00	5.10

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C
 Model No. : 40K20DW Humidity : 48%RH
 Test Mode : LAN Play Date of Test : Jul 31, 2014

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.546	31.60	10.44	42.04	56.00	13.96	QP
	0.546	18.20	10.44	28.64	46.00	17.36	
	0.654	31.60	10.43	42.03	56.00	13.97	
	0.654	16.20	10.43	26.63	46.00	19.37	
	2.473	27.39	10.45	37.84	56.00	18.16	
	2.473	16.29	10.45	26.74	46.00	19.26	
	AV	5.929	35.71	10.40	46.11	60.00	13.89
		5.929	27.51	10.40	37.91	50.00	12.09
		7.851	35.00	10.47	45.47	60.00	14.53
		7.851	29.30	10.47	39.77	50.00	10.23
		18.540	38.50	10.58	49.08	60.00	10.92
		18.540	34.50	10.58	45.08	50.00	4.92
Neutral	0.558	29.90	10.43	40.33	56.00	15.67	QP
	0.558	15.30	10.43	25.73	46.00	20.27	
	0.647	29.10	10.42	39.52	56.00	16.48	
	0.647	10.50	10.42	20.92	46.00	25.08	
	2.473	25.29	10.48	35.77	56.00	20.23	
	2.473	14.19	10.48	24.67	46.00	21.33	
	AV	5.928	32.70	10.48	43.18	60.00	16.82
		5.928	24.60	10.48	35.08	50.00	14.92
		7.935	34.20	10.55	44.75	60.00	15.25
		7.935	28.50	10.55	39.05	50.00	10.95
		18.810	38.00	10.70	48.70	60.00	11.30
		18.810	34.10	10.70	44.80	50.00	5.20

TEST ENGINEER: WENCY YANG

4 RADIATED EMISSION TEST

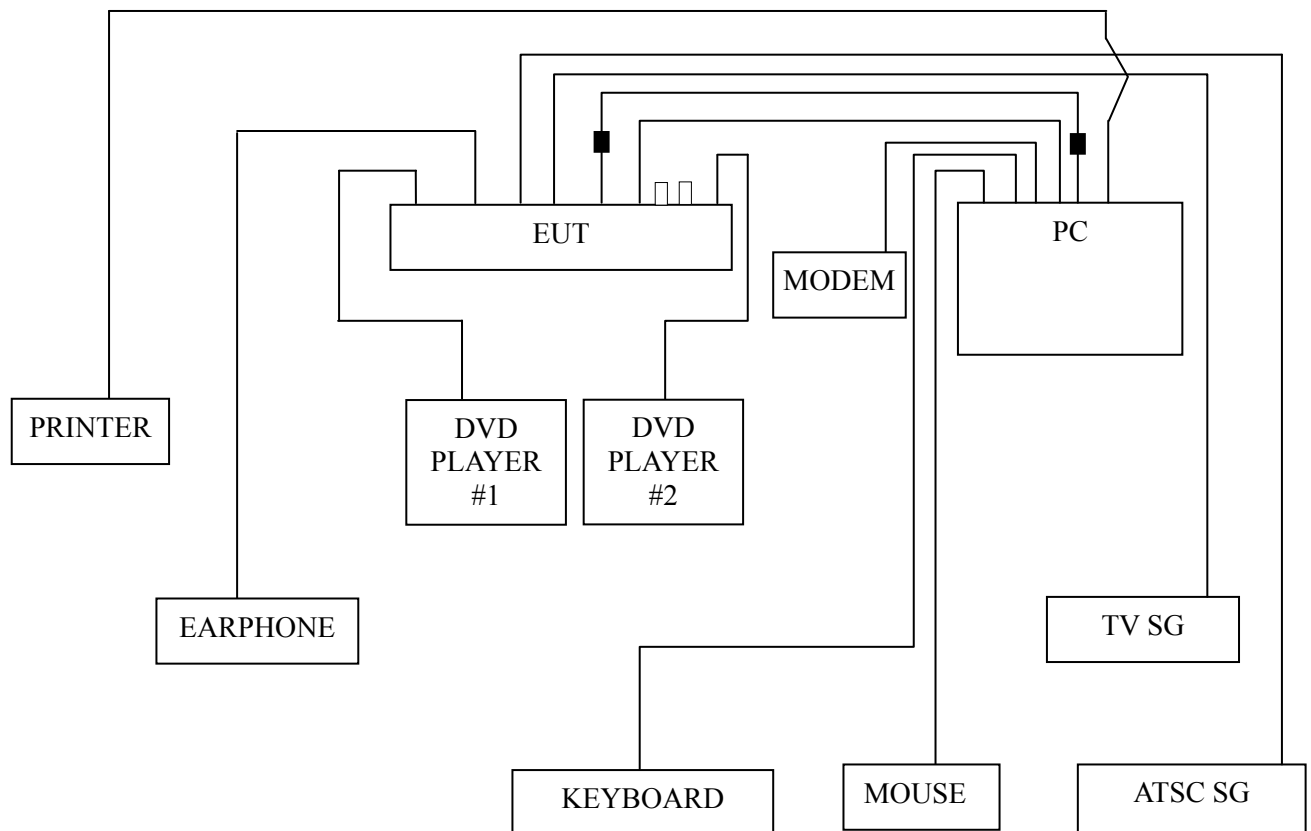
4.1 Test Equipment

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	101302	Sep 03, 2013	Sep 02, 2014
2.	Preamplifier	Agilent	8447D	2944A10548	Sep 18, 2014	Mar 17, 2015
3.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2014	Mar 19, 2015
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 03, 2014	May 02, 2015
5.	Horn Antenna	EMCO	3115	9607-4878	May 11, 2014	May 10, 2015
6.	Spectrum	Agilent	E7405A	MY45106600	Nov 11, 2013	Nov 10, 2014
7.	50Ω Coaxial Switch	Anritsu	MP59B	6200426390	Mar 18, 2014	Sep 17, 2014
8.	Software	Audix	E3	6.2007-9-10	--	--

4.2 Block Diagram of Test Setup

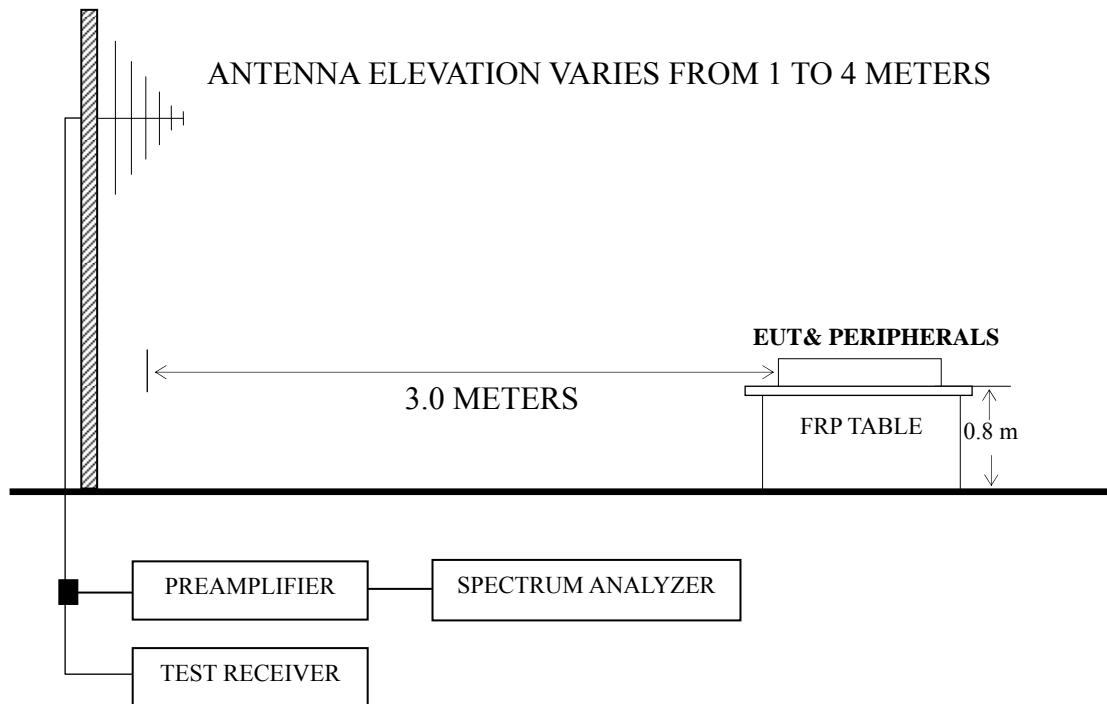
4.2.1 EUT & Peripherals



■ : Ferrite core

□ : U-Disk

4.2.2 Radiated emission test setup



■ : 50 ohm Coaxial Switch

4.3 Radiated Emission Limit [FCC Part 15 Subpart B 15.109(a)]

Frequency (MHz)	Distance (m)	Field strength limits	
		($\mu\text{V}/\text{m}$)	dB ($\mu\text{V}/\text{m}$)
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 ($\mu\text{V}/\text{m}$) = 20 log Emission Level ($\mu\text{V}/\text{m}$)

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 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	P24 – P25
HDMI 1280*1024@60Hz & 1kHz Playing	P26
HDMI 640*480@60Hz & 1kHz Playing	P27
D-Sub 1024*768@60Hz & 1kHz Playing	P28
USB Play	P29
LAN Play	P30

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 USB Play test mode. The worst emission at horizontal polarization was detected at 227.880 MHz with corrected signal level of 36.92 dB ($\mu\text{V}/\text{m}$) (limit is 46.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.40 m height and the turntable was at 114°. The worst emission at vertical polarization was detected at 32.910 MHz with corrected signal level of 37.81dB ($\mu\text{V}/\text{m}$) (limit is 40.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.00 m height and the turntable was at 226°.

EUT : LED LCD TV Temperature : 22°C

Model No. : 40K20DW Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Aug 10, 2014
& 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
Horizontal	32.910	17.21	16.91	0.67	--	34.79	40.00	5.21	QP
	71.710	21.73	6.23	0.94	--	28.90	40.00	11.10	
	136.700	23.83	11.03	1.46	--	36.32	43.50	7.18	
	239.520	22.70	10.00	2.08	--	34.78	46.00	11.22	
	579.020	17.46	19.70	3.16	--	40.32	46.00	5.68	
	829.280	6.93	21.13	3.88	--	31.94	46.00	14.06	
	1066.000	46.75	23.53	4.96	36.60	38.64	74.00	35.36	PK
	1269.000	45.76	24.72	5.30	36.28	39.50	74.00	34.50	
	1511.000	44.82	25.74	5.64	35.82	40.38	74.00	33.62	
	1653.000	49.17	26.24	5.81	35.63	45.59	74.00	28.41	
	1850.000	47.45	26.98	6.16	35.42	45.17	74.00	28.83	
	1953.000	47.87	27.29	6.19	35.34	46.01	74.00	27.99	AV
	1066.000	37.68	23.53	4.96	36.60	29.57	54.00	24.43	
	1269.000	38.21	24.72	5.30	36.28	31.95	54.00	22.05	
	1511.000	36.24	25.74	5.64	35.82	31.80	54.00	22.20	
	1653.000	40.10	26.24	5.81	35.63	36.52	54.00	17.48	
1850.000	38.60	26.98	6.16	35.42	36.32	54.00	17.68		
1953.000	38.87	27.29	6.19	35.34	37.01	54.00	16.99		

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 40K20DW Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Aug 10, 2014

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	31.940	18.58	17.10	0.65	--	36.33	40.00	3.67	QP
	72.680	23.80	6.66	0.95	--	31.41	40.00	8.59	
	145.430	22.61	10.44	1.50	--	34.55	43.50	8.95	
	226.910	23.46	8.68	2.01	--	34.15	46.00	11.85	
	383.080	14.87	14.75	2.66	--	32.28	46.00	13.72	
	636.250	8.82	18.60	3.34	--	30.76	46.00	15.24	
	1057.000	46.32	23.48	4.96	36.62	38.14	74.00	35.86	PK
	1174.000	45.64	24.14	5.08	36.44	38.42	74.00	35.58	
	1252.000	46.86	24.63	5.25	36.30	40.44	74.00	33.56	
	1364.000	45.03	25.19	5.51	36.10	39.63	74.00	34.37	
	1589.000	49.56	26.00	5.66	35.71	45.51	74.00	28.49	
	1822.000	51.92	26.90	6.16	35.45	49.53	74.00	24.47	AV
	1057.000	38.69	23.48	4.96	36.62	30.51	54.00	23.49	
	1174.000	36.50	24.14	5.08	36.44	29.28	54.00	24.72	
	1252.000	37.25	24.63	5.25	36.30	30.83	54.00	23.17	
1364.000	35.59	25.19	5.51	36.10	30.19	54.00	23.81		
1589.000	38.71	26.00	5.66	35.71	34.66	54.00	19.34		
1822.000	38.96	26.90	6.16	35.45	36.57	54.00	17.43		

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 40K20DW Humidity : 60%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Aug 10, 2014
& 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	72.680	23.83	6.66	0.95	31.44	40.00	8.56
	138.640	22.10	10.87	1.47	34.44	43.50	9.06
	224.970	24.29	8.20	1.98	34.47	46.00	11.53
	292.870	15.77	12.50	2.44	30.71	46.00	15.29
	389.870	14.07	15.00	2.67	31.74	46.00	14.26
	627.520	5.37	18.80	3.31	27.48	46.00	18.52
Vertical	32.910	20.21	16.91	0.67	37.79	40.00	2.21
	74.620	22.66	7.29	0.98	30.93	40.00	9.07
	149.310	18.91	10.66	1.52	31.09	43.50	12.41
	224.000	26.03	8.18	1.98	36.19	46.00	9.81
	339.430	9.99	14.50	2.58	27.07	46.00	18.93
	575.140	5.77	19.90	3.16	28.83	46.00	17.17

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 40K20DW Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Aug 10, 2014

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	31.940	8.76	17.10	0.65	26.51	40.00	13.49
	76.560	21.93	7.15	1.00	30.08	40.00	9.92
	153.190	23.00	9.70	1.53	34.23	43.50	9.27
	275.410	16.20	12.70	2.33	31.23	46.00	14.77
	402.480	16.97	15.80	2.69	35.46	46.00	10.54
	736.160	10.90	18.33	3.55	32.78	46.00	13.22
Vertical	36.790	15.57	15.74	0.72	32.03	40.00	7.97
	73.650	25.50	6.97	0.97	33.44	40.00	6.56
	165.800	16.28	9.03	1.62	26.93	43.50	16.57
	280.260	17.53	11.90	2.35	31.78	46.00	14.22
	425.760	11.33	17.50	2.74	31.57	46.00	14.43
	733.250	8.40	18.67	3.53	30.60	46.00	15.40

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 40K20DW Humidity : 60%RH

Test Mode : D-Sub 1024*768@60Hz & 1kHz Playing Date of Test : Aug 10, 2014

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	31.520	16.40	17.60	0.65	34.65	40.00	5.35
	76.280	20.14	7.20	0.99	28.33	40.00	11.67
	141.260	24.93	10.62	1.48	37.03	43.50	6.47
	251.690	20.59	11.66	2.17	34.42	46.00	11.58
	625.310	17.20	18.80	3.29	39.29	46.00	6.71
	802.640	7.79	20.67	3.70	32.16	46.00	13.84
Vertical	32.060	17.60	17.07	0.66	35.33	40.00	4.67
	71.520	24.61	6.23	0.94	31.78	40.00	8.22
	140.620	24.50	10.66	1.48	36.64	43.50	6.86
	226.910	23.46	8.68	2.01	34.15	46.00	11.85
	383.080	14.87	14.75	2.66	32.28	46.00	13.72
	650.130	10.12	17.90	3.37	31.39	46.00	14.61

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 40K20DW Humidity : 60%RH

Test Mode : USB Play Date of Test : Aug 10, 2014

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	31.940	9.59	17.10	0.65	27.34	40.00	12.66
	78.500	21.30	6.85	1.01	29.16	40.00	10.84
	144.460	22.05	10.44	1.49	33.98	43.50	9.52
	227.880	25.99	8.92	2.01	36.92	46.00	9.08
	311.300	18.81	13.21	2.52	34.54	46.00	11.46
	602.300	5.76	19.30	3.24	28.30	46.00	17.70
Vertical	32.910	20.23	16.91	0.67	37.81	40.00	2.19
	68.800	21.56	5.59	0.92	28.07	40.00	11.93
	141.550	21.21	10.62	1.48	33.31	43.50	10.19
	225.940	28.35	8.44	1.98	38.77	46.00	7.23
	404.420	14.29	16.00	2.69	32.98	46.00	13.02
	714.820	6.40	19.55	3.52	29.47	46.00	16.53

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 40K20DW Humidity : 60%RH

Test Mode : LAN Play Date of Test : Aug 10, 2014

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	68.819	27.88	5.59	0.92	34.39	40.00	5.61
	129.928	19.73	12.60	1.42	33.75	43.50	9.75
	215.286	21.97	8.00	1.91	31.88	43.50	11.62
	303.554	17.94	12.62	2.51	33.07	46.00	12.93
	520.830	17.51	18.20	2.97	38.68	46.00	7.32
	669.237	19.08	19.25	3.42	41.75	46.00	4.25
Vertical	35.840	17.05	16.24	0.71	34.00	40.00	6.00
	156.117	17.39	9.10	1.56	28.05	43.50	15.45
	272.515	19.87	12.46	2.30	34.63	46.00	11.37
	447.111	14.66	16.90	2.78	34.34	46.00	11.66
	612.008	15.04	18.95	3.26	37.25	46.00	8.75
	814.734	15.04	20.60	3.79	39.43	46.00	6.57

TEST ENGINEER: NEAL WANG

5 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
Gasket	35X0.7X41mm\VGA\ROH	Qingdao Joinset S&T Co., Ltd.	See Internal Photos Figure 21
Tape	5X30MM\ROH	Qingdao Joinset S&T Co., Ltd.	See Internal Photos Figure 22
Tape	RSAG8.600.0902\ROH	Qingdao Hengyiyuan Technology 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:

Neal Wang

(NEAL WANG)

6 DEVIATION TO TEST SPECIFICATIONS

None.