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

LED LCD TV

Model No.:
50H4D, 50H4D+, 50H4+0D, 50H4+0D1, 50H4+0D2,
50H40+0D, 50H40+0D1, 50H40+0D2, 50H4DM, 50H4307

Brand: Hisense

FCC ID : W9HLCDF0103

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

Prepared By : Audix Technology (Shanghai) Co., Ltd.
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Report No. : ACI-F17132
Date of Test : Mar 13-22, 2017
Date of Report : Apr 05, 2017

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TEST REPORT FOR FCC CERTIFICATE

Applicant	:	Hisense Electric Co., Ltd.
Manufacturer	:	Hisense Electric Co., Ltd.
Factory #1	:	Hisense Electric Co., Ltd.
Factory #2	:	Tatung Mexico S.A. de C.V.
Factory #3	:	HISENSE ELECTRONICA MEXICO, S.A. DE C.V.
EUT Description	:	LED LCD TV
		Model No. : Refer to Sec.2.1
		Brand : Hisense
		Power Supply : 120V/60Hz

Test Procedure Used:

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

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. To determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B (Class B) limits both radiated and conducted emissions.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report shows that the EUT (M/N: Refer to Sec2.1) which was tested in 3m anechoic chamber Mar 13-22, 2017 is technically compliance with the FCC official limits also.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

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

The test results for EUT's TV functions are contained in No.F17133, a Verification report.

Date of Test : Mar 13-22, 2017 Date of Report : Apr 05, 2017

Producer : Alan He
ALAN HE / Assistant

Review : Byron Wu
BYRON WU / Deputy Assistant Manager

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

Signatory :
Authorized Signature(s) BYRON KWO/Assistant General Manager

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

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

Description of Test Item	Standard	Limits	Results
EMISSION			
Conducted Disturbance at the Mains Terminal	FCC RULES AND REGULATIONS PART 15 SUBPART B AND ANSI C63.4-2014	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B 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	:	☑ Production ☐ Pre-product ☐ Pro-type
Model No	:	50H4D, 50H4D+, 50H4+0D, 50H4+0D1, 50H4+0D2, 50H40+0D, 50H40+0D1, 50H40+0D2, 50H4DM, 50H4307
Note #1	:	The above models are all the same except for model number. 50H4D model is tested and recorded in the report.
Note #2	:	"+"represents any of the Arabic numeral.
Note #3	:	The tuner port comply with the 15.111 requirement.
Brand	:	Hisense
RF module FCC ID	:	TC2-N1002
Applicant	:	Hisense Electric Co., Ltd. No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China
Manufacturer	:	Same as Applicant
Factory #1	:	Same as Applicant
Factory #2	:	Tatung Mexico S.A. de C.V. Miguel Catalán 420, Parque Industrial Rio Bravo, Cd. Juarez, Chih., CP 32557
Factory #3	:	HISENSE ELECTRONICA MEXICO,S.A. DE C.V. Blvd. Hisense #3510 Parque Industrial Rosarito, C.P. 22710 Playas de Rosarito, B.C.
LCD Panel	:	Manufacturer : Hisense M/N : HD500DF-B54(020)
Tuner	:	Manufacturer : XUGUANG M/N : HFT-96S3/W11FJ4H
Max Resolution	:	1920*1080@60Hz
HDMI Cable*3 (Lab provide)	:	Shielded, Detachable, 1.80m

Power Cord	:	Unshielded, Detachable, 1.80m, 2C
USB Cable (Lab provide)	:	Shielded, Detachable, 1.00m

Remark:

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

Bottom Port:

(1) One AV IN Port
: Connected with DVD Player

(2) One DIGITALAUDIO OUT Port
: Connected with Audio Converter to Earphone

(3) One HDMI3 Port
: Connected with DVD Player

Side Port:

(4) One ANT Port
: Connected with ATSC SG/TV SG

(5) One USB Port
: Connected with Hard-Disk

(6) One AUDIO OUT Port
: Connected with Earphone

(7) One HDMI1 Port
: Connected with PC

(8) One HDMI2 Port
: Connected with PC

2.1.1 PC

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

2.1.2 Keyboard

Manufacture r	:	Microsoft
Model Number	:	RT2300
Serial Number	:	7668200662248
Data Cable	:	Shielded, Detachable, 1.5m
Certificate	:	CE/EMC, FCC DoC, VCCI, MIC, C-Tick, BSMI

2.1.3 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

2.1.4 Modem

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

2.1.5 Earphone *2

Manufacturer	:	EDIFIER
Model Number	:	H210

2.1.6 DVD Player

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

2.1.7 Hard Disk

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

2.1.8 ATSC Signal Generator

Manufacturer	:	SENCORE
Model Number	:	ATSC997
Serial Number	:	6790071

2.1.9 TV Signal Generator

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

2.2 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

2.3 Measurement Uncertainty

Conducted Emission Expanded Uncertainty : U = 3.4dB
Radiated Emission Expanded Uncertainty (30-200MHz):
U = 4.3dB(Horizontal)
U = 4.6dB (Vertical)
Radiated Emission Expanded Uncertainty (200M-1GHz):
U = 4.3dB (Horizontal)
U = 5.5dB (Vertical)
Radiated Emission Expanded Uncertainty (1GHz-6GHz):
U = 5.1 dB

3 CONDUCTED EMISSION TEST

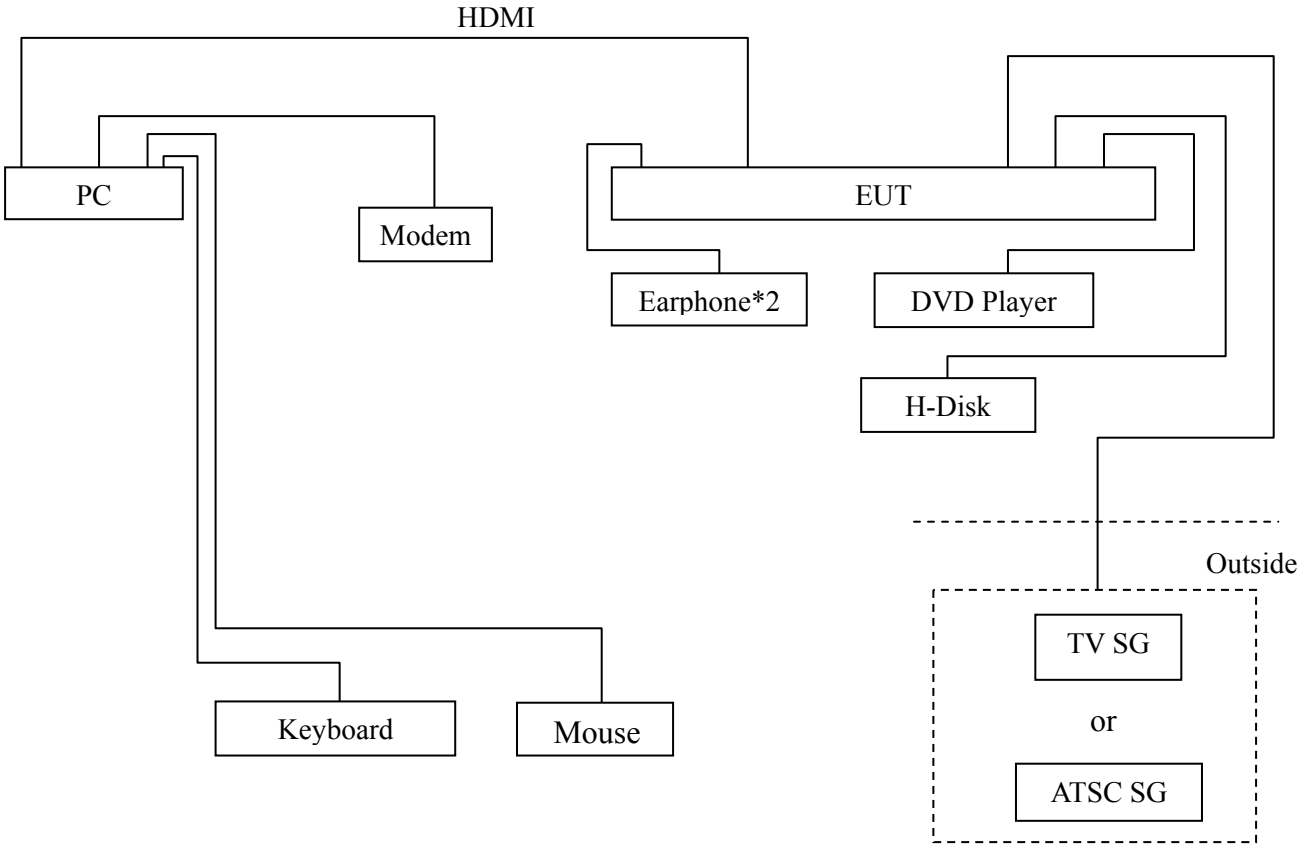
3.1 Test Equipment

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

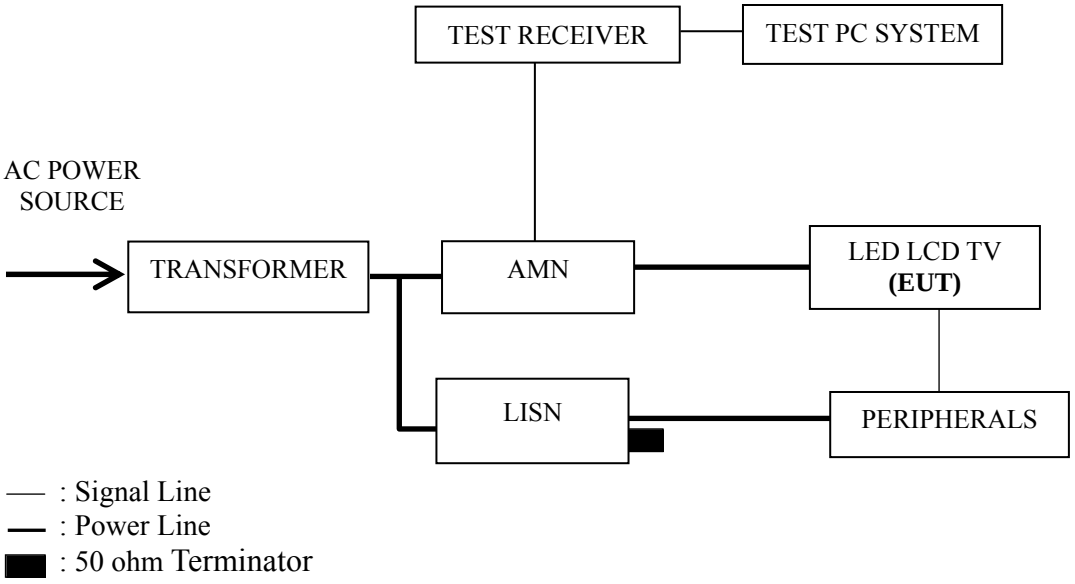
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Apr 27, 2016	Apr 26, 2017
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2016	Jun 26, 2017
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	May 15, 2016	May 14, 2017
4.	50Ω Terminator	Anritsu	BNC	001	Sep 18, 2016	Mar 17, 2017
5.	Software	Audix	E3	6.111206	--	--

3.2 Block Diagram of Test Setup

3.2.1 EUT & Peripherals



3.2.2 Conducted Disturbance Test Setup



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

Frequency Range (MHz)	Limits Db (μV)	
	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 WIFI mode, set the EUT play digital media through WIFI.

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

3.6 Test Procedures

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

Both sides of AC line (Line & Neutral) were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to ANSI C63.4 during conducted emission test.

The bandwidth of R&S Test Receiver ESCI was set at 9 kHz.

The frequency range from 150 kHz to 30 MHz was checked.

The test modes were done on conducted disturbance test and all the test results are listed in Sec. 3.7.

3.7 Test Results

< PASS >

The frequency and amplitude of the highest conducted emission relative to the limit is reported. All emissions not reported below are too low against the prescribed limits.

Test Mode	Data Page
HDMI2 1920*1080@60Hz & 1kHz playing	P13
HDMI2 1280*1024@60Hz & 1kHz playing	P14
HDMI2 640*480@60Hz & 1kHz playing	P15
HDMI1 1920*1080@60Hz & 1kHz playing	P16
HDMI3 1920*1080@60Hz & 1kHz playing	P17
HDMI1080P	P18
USB Play	P19
WIFI	P20

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 0.598 MHz (Average Value) with corrected signal level of 33.35dB (μV) (limit is 46.00 dB (μV)), when the Line of the EUT is connected to AMN.

EUT	:	LED LCD TV	Temperature :	22℃	
Model No.	:	50H4D	Humidity :	48%RH	
Test Mode	:	HDMI2 1920*1080@60Hz & 1kHz Playing	Date of Test :	Mar 13, 2017	

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.153	34.37	10.58	44.95	65.82	20.87	QP
	0.598	**31.17**	**10.39**	**41.56**	**56.00**	**14.44**	
	0.804	27.25	10.40	37.65	56.00	18.35	
	1.388	29.59	10.41	40.00	56.00	16.00	
	2.707	24.93	10.43	35.36	56.00	20.64	
	6.878	27.29	10.47	37.76	60.00	22.24	
	0.153	23.37	10.58	33.95	55.82	21.87	AV
	0.598	20.17	10.39	30.56	46.00	15.44	
	0.804	17.25	10.40	27.65	46.00	18.35	
	1.388	20.59	10.41	31.00	46.00	15.00	
	2.707	17.93	10.43	28.36	46.00	17.64	
	6.878	22.29	10.47	32.76	50.00	17.24	
Neutral	0.343	28.41	10.45	38.86	59.13	20.27	QP
	0.604	**31.81**	**10.38**	**42.19**	**56.00**	**13.81**	
	1.568	25.98	10.42	36.40	56.00	19.60	
	2.622	26.84	10.45	37.29	56.00	18.71	
	6.186	27.14	10.52	37.66	60.00	22.34	
	17.849	27.47	10.69	38.16	60.00	21.84	
	0.343	16.41	10.45	26.86	49.13	22.27	AV
	0.604	20.81	10.38	31.19	46.00	14.81	
	1.568	14.98	10.42	25.40	46.00	20.60	
	2.622	16.84	10.45	27.29	46.00	18.71	
	6.186	20.14	10.52	30.66	50.00	19.34	
	17.849	22.47	10.69	33.16	50.00	16.84	

TEST ENGINEER: BYRON WU

EUT	:	LED LCD TV	Temperature :	22℃	
Model No.	:	50H4D	Humidity :	48%RH	
Test Mode	:	HDMI2 1280*1024@60Hz & 1kHz Playing	Date of Test :	Mar 13, 2017	

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.343	26.03	10.46	36.49	59.13	22.64	QP
	0.614	31.40	10.39	41.79	56.00	14.21	
	0.804	25.05	10.40	35.45	56.00	20.55	
	1.568	26.51	10.40	36.91	56.00	19.09	
	2.285	24.60	10.42	35.02	56.00	20.98	
	6.252	30.22	10.46	40.68	60.00	19.32	
	0.343	17.03	10.46	27.49	49.13	21.64	AV
	0.614	**22.40**	**10.39**	**32.79**	**46.00**	**13.21**	
	0.804	13.05	10.40	23.45	46.00	22.55	
	1.568	17.51	10.40	27.91	46.00	18.09	
	2.285	15.60	10.42	26.02	46.00	19.98	
	6.252	21.22	10.46	31.68	50.00	18.32	
Neutral	0.346	28.89	10.45	39.34	59.05	19.71	QP
	0.611	**31.59**	**10.38**	**41.97**	**56.00**	**14.03**	
	1.602	27.91	10.42	38.33	56.00	17.67	
	2.554	25.59	10.45	36.04	56.00	19.96	
	3.881	24.75	10.48	35.23	56.00	20.77	
	6.420	30.83	10.53	41.36	60.00	18.64	
	0.346	18.89	10.45	29.34	49.05	19.71	AV
	0.611	22.59	10.38	32.97	46.00	13.03	
	1.602	16.91	10.42	27.33	46.00	18.67	
	2.554	16.59	10.45	27.04	46.00	18.96	
	3.881	15.75	10.48	26.23	46.00	19.77	
	6.420	21.83	10.53	32.36	50.00	17.64	

TEST ENGINEER: BYRON WU

EUT	:	LED LCD TV	Temperature :	22℃	
Model No.	:	50H4D	Humidity :	48%RH	
Test Mode	:	HDMI2 640*480@60Hz & 1kHz Playing	Date of Test :	Mar 13, 2017	

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.343	28.33	10.46	38.79	59.13	20.34	QP
	0.604	31.61	10.39	42.00	56.00	14.00	
	0.830	26.16	10.40	36.56	56.00	19.44	
	1.388	29.56	10.41	39.97	56.00	16.03	
	2.707	25.53	10.43	35.96	56.00	20.04	
	3.881	25.38	10.44	35.82	56.00	20.18	
	0.343	19.33	10.46	29.79	49.13	19.34	AV
	0.604	20.61	10.39	31.00	46.00	15.00	
	0.830	17.16	10.40	27.56	46.00	18.44	
	1.388	20.56	10.41	30.97	46.00	15.03	
	2.707	16.53	10.43	26.96	46.00	19.04	
	3.881	**22.38**	**10.44**	**32.82**	**46.00**	**13.18**	
Neutral	0.346	26.21	10.45	36.66	59.05	22.39	QP
	0.592	29.12	10.39	39.51	56.00	16.49	
	1.388	26.96	10.41	37.37	56.00	18.63	
	1.568	25.83	10.42	36.25	56.00	19.75	
	2.474	26.71	10.44	37.15	56.00	18.85	
	6.352	29.85	10.53	40.38	60.00	19.62	
	0.346	19.21	10.45	29.66	49.05	19.39	AV
	0.592	17.12	10.39	27.51	46.00	18.49	
	1.388	15.96	10.41	26.37	46.00	19.63	
	1.568	17.83	10.42	28.25	46.00	17.75	
	2.474	**21.71**	**10.44**	**32.15**	**46.00**	**13.85**	
	6.352	21.85	10.53	32.38	50.00	17.62	

TEST ENGINEER: BYRON WU

EUT	:	LED LCD TV	Temperature :	22℃	
Model No.	:	50H4D	Humidity :	48%RH	
Test Mode	:	HDMI1 1920*1080@60Hz & 1kHz playing	Date of Test :	Mar 13, 2017	

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.343	29.15	10.46	39.61	59.13	19.52	QP
	0.598	**31.54**	**10.39**	**41.93**	**56.00**	**14.07**	
	1.374	27.98	10.41	38.39	56.00	17.61	
	2.334	24.34	10.42	34.76	56.00	21.24	
	6.420	29.09	10.47	39.56	60.00	20.44	
	17.849	27.22	10.58	37.80	60.00	22.20	
	0.343	17.15	10.46	27.61	49.13	21.52	AV
	0.598	19.54	10.39	29.93	46.00	16.07	
	1.374	16.98	10.41	27.39	46.00	18.61	
	2.334	15.34	10.42	25.76	46.00	20.24	
	6.420	20.09	10.47	30.56	50.00	19.44	
	17.849	22.22	10.58	32.80	50.00	17.20	
Neutral	0.339	29.41	10.45	39.86	59.22	19.36	QP
	0.614	**31.11**	**10.38**	**41.49**	**56.00**	**14.51**	
	0.830	25.18	10.39	35.57	56.00	20.43	
	1.568	27.36	10.42	37.78	56.00	18.22	
	6.557	27.19	10.53	37.72	60.00	22.28	
	17.849	27.16	10.69	37.85	60.00	22.15	
	0.339	16.41	10.45	26.86	49.22	22.36	AV
	0.614	20.11	10.38	30.49	46.00	15.51	
	0.830	14.18	10.39	24.57	46.00	21.43	
	1.568	16.36	10.42	26.78	46.00	19.22	
	6.557	20.19	10.53	30.72	50.00	19.28	
	17.849	22.16	10.69	32.85	50.00	17.15	

TEST ENGINEER: BYRON WU

EUT	:	LED LCD TV	Temperature :	22℃	
Model No.	:	50H4D	Humidity :	48%RH	
Test Mode	:	HDMI3 1920*1080@60Hz & 1kHz playing	Date of Test :	Mar 13, 2017	

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.346	25.08	10.46	35.54	59.05	23.51	QP
	0.614	31.28	10.39	41.67	56.00	14.33	
	0.830	26.42	10.40	36.82	56.00	19.18	
	1.374	28.45	10.41	38.86	56.00	17.14	
	2.422	27.13	10.42	37.55	56.00	18.45	
	6.627	30.66	10.47	41.13	60.00	18.87	
	0.346	16.08	10.46	26.54	49.05	22.51	AV
	0.614	**22.28**	**10.39**	**32.67**	**46.00**	**13.33**	
	0.830	18.42	10.40	28.82	46.00	17.18	
	1.374	16.45	10.41	26.86	46.00	19.14	
	2.422	19.13	10.42	29.55	46.00	16.45	
	6.627	22.66	10.47	33.13	50.00	16.87	
Neutral	0.346	27.17	10.45	37.62	59.05	21.43	QP
	0.598	**31.20**	**10.38**	**41.58**	**56.00**	**14.42**	
	0.694	28.23	10.39	38.62	56.00	17.38	
	1.487	27.17	10.42	37.59	56.00	18.41	
	2.422	25.72	10.44	36.16	56.00	19.84	
	6.285	29.10	10.52	39.62	60.00	20.38	
	0.346	18.17	10.45	28.62	49.05	20.43	AV
	0.598	20.20	10.38	30.58	46.00	15.42	
	0.694	19.23	10.39	29.62	46.00	16.38	
	1.487	16.17	10.42	26.59	46.00	19.41	
	2.422	16.72	10.44	27.16	46.00	18.84	
	6.285	21.10	10.52	31.62	50.00	18.38	

TEST ENGINEER: BYRON WU

EUT	:	LED LCD TV	Temperature :	22℃	
Model No.	:	50H4D	Humidity	:	48%RH
Test Mode	:	HDMI 1080P	Date of Test	:	Mar 13, 2017

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.343	28.27	10.46	38.73	59.13	20.40	QP
	0.621	**31.88**	**10.39**	**42.27**	**56.00**	**13.73**	
	0.830	27.25	10.40	37.65	56.00	18.35	
	1.568	27.88	10.40	38.28	56.00	17.72	
	2.422	26.04	10.42	36.46	56.00	19.54	
	6.352	28.46	10.47	38.93	60.00	21.07	
	0.343	16.27	10.46	26.73	49.13	22.40	AV
	0.621	20.88	10.39	31.27	46.00	14.73	
	0.830	14.25	10.40	24.65	46.00	21.35	
	1.568	18.88	10.40	29.28	46.00	16.72	
	2.422	18.04	10.42	28.46	46.00	17.54	
	6.352	21.46	10.47	31.93	50.00	18.07	
Neutral	0.346	28.01	10.45	38.46	59.05	20.59	QP
	0.614	31.29	10.38	41.67	56.00	14.33	
	0.830	26.91	10.39	37.30	56.00	18.70	
	1.568	27.16	10.42	37.58	56.00	18.42	
	2.384	25.82	10.44	36.26	56.00	19.74	
	6.420	30.03	10.53	40.56	60.00	19.44	
	0.346	20.01	10.45	30.46	49.05	18.59	AV
	0.614	**22.29**	**10.38**	**32.67**	**46.00**	**13.33**	
	0.830	14.91	10.39	25.30	46.00	20.70	
	1.568	18.16	10.42	28.58	46.00	17.42	
	2.384	17.82	10.44	28.26	46.00	17.74	
	6.420	21.03	10.53	31.56	50.00	18.44	

TEST ENGINEER: BYRON WU

EUT	:	LED LCD TV	Temperature :	22℃	
Model No.	:	50H4D	Humidity	:	48%RH
Test Mode	:	USB Play	Date of Test	:	Mar 13, 2017

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.346	28.38	10.46	38.84	59.05	20.21	QP
	0.598	31.96	10.39	42.35	56.00	13.65	
	0.830	26.53	10.40	36.93	56.00	19.07	
	1.568	27.22	10.40	37.62	56.00	18.38	
	2.422	27.08	10.42	37.50	56.00	18.50	
	4.454	24.05	10.44	34.49	56.00	21.51	
	0.346	17.38	10.46	27.84	49.05	21.21	AV
	0.598	**22.96**	**10.39**	**33.35**	**46.00**	**12.65**	
	0.830	14.53	10.40	24.93	46.00	21.07	
	1.568	16.22	10.40	26.62	46.00	19.38	
	2.422	18.08	10.42	28.50	46.00	17.50	
	4.454	19.05	10.44	29.49	46.00	16.51	
Neutral	0.346	28.81	10.45	39.26	59.05	19.79	QP
	0.621	**31.02**	**10.38**	**41.40**	**56.00**	**14.60**	
	0.822	24.85	10.39	35.24	56.00	20.76	
	1.568	27.91	10.42	38.33	56.00	17.67	
	2.422	27.46	10.44	37.90	56.00	18.10	
	3.565	24.54	10.47	35.01	56.00	20.99	
	0.346	17.81	10.45	28.26	49.05	20.79	AV
	0.621	20.02	10.38	30.40	46.00	15.60	
	0.822	15.85	10.39	26.24	46.00	19.76	
	1.568	16.91	10.42	27.33	46.00	18.67	
	2.422	16.46	10.44	26.90	46.00	19.10	
	3.565	17.54	10.47	28.01	46.00	17.99	

TEST ENGINEER: BYRON WU

EUT	:	LED LCD TV	Temperature :	22℃	
Model No.	:	50H4D	Humidity	:	48%RH
Test Mode	:	WIFI	Date of Test	:	Mar 13, 2017

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.176	29.14	10.56	39.70	64.68	24.98	QP
	0.621	**32.01**	**10.39**	**42.40**	**56.00**	**13.60**	
	1.367	27.46	10.41	37.87	56.00	18.13	
	2.474	26.51	10.42	36.93	56.00	19.07	
	3.943	25.11	10.44	35.55	56.00	20.45	
	6.285	26.26	10.46	36.72	60.00	23.28	
	0.176	20.14	10.56	30.70	54.68	23.98	AV
	0.621	21.01	10.39	31.40	46.00	14.60	
	1.367	18.46	10.41	28.87	46.00	17.13	
	2.474	18.51	10.42	28.93	46.00	17.07	
	3.943	17.11	10.44	27.55	46.00	18.45	
	6.285	20.26	10.46	30.72	50.00	19.28	
Neutral	0.178	30.60	10.55	41.15	64.59	23.44	QP
	0.604	**32.26**	**10.38**	**42.64**	**56.00**	**13.36**	
	0.830	26.94	10.39	37.33	56.00	18.67	
	1.210	26.39	10.41	36.80	56.00	19.20	
	1.480	27.85	10.42	38.27	56.00	17.73	
	6.420	26.25	10.53	36.78	60.00	23.22	
	0.178	21.60	10.55	32.15	54.59	22.44	AV
	0.604	20.26	10.38	30.64	46.00	15.36	
	0.830	15.94	10.39	26.33	46.00	19.67	
	1.210	17.39	10.41	27.80	46.00	18.20	
	1.480	18.85	10.42	29.27	46.00	16.73	
	6.420	20.25	10.53	30.78	50.00	19.22	

TEST ENGINEER: BYRON WU

4 RADIATED EMISSION TEST

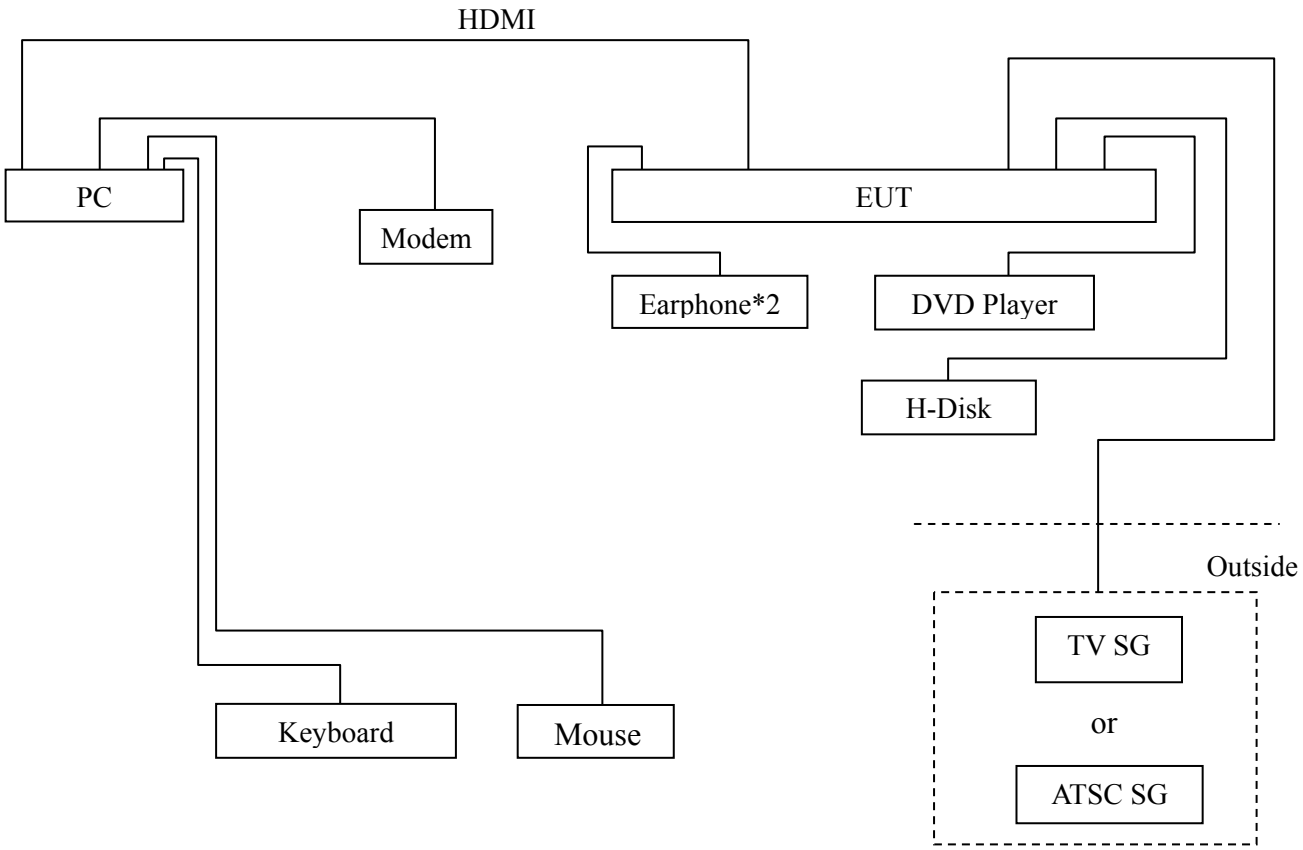
4.1 Test Equipment

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, 2016	May 06, 2017
2.	Preamplifier	Agilent	8447D	2944A06664	Apr 27, 2016	Apr 26, 2017
3.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2017	Mar 19, 2018
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 15, 2016	May 14, 2017
5.	Horn Antenna	EMCO	3115	9607-4878	Jun 03, 2016	Jun 02, 2017
6.	Spectrum	Agilent	E7405A	MY45106600	Apr 26, 2016	Apr 25, 2017
7.	Software	Audix	e3	6.2007-9-10	--	--

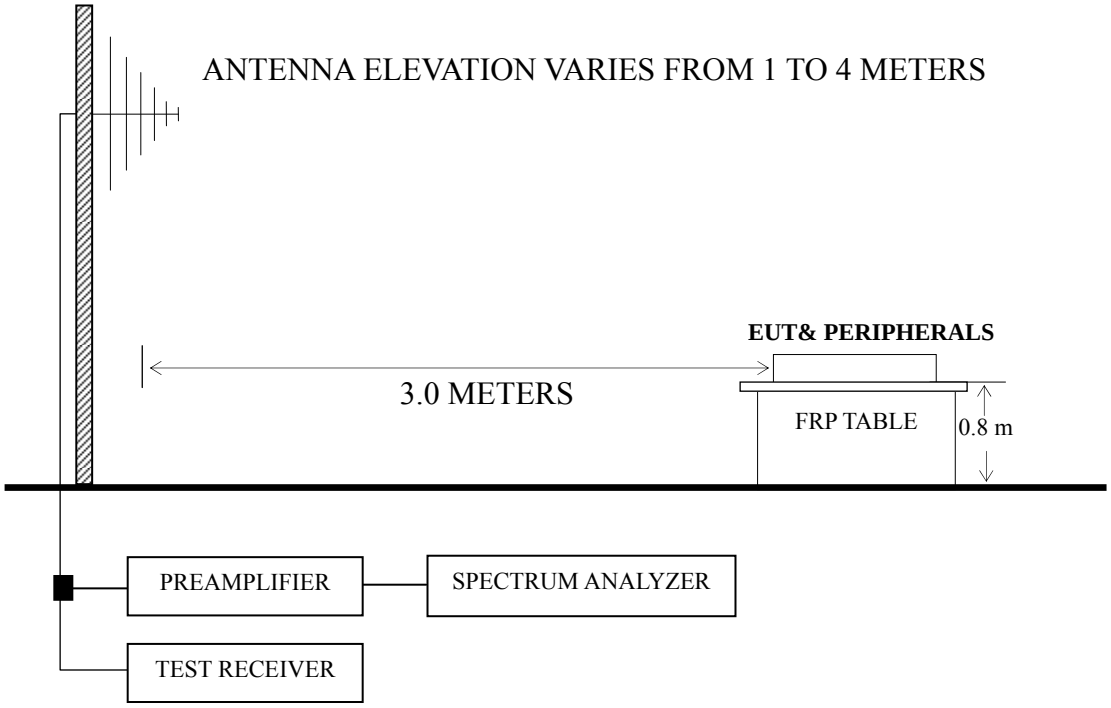
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals



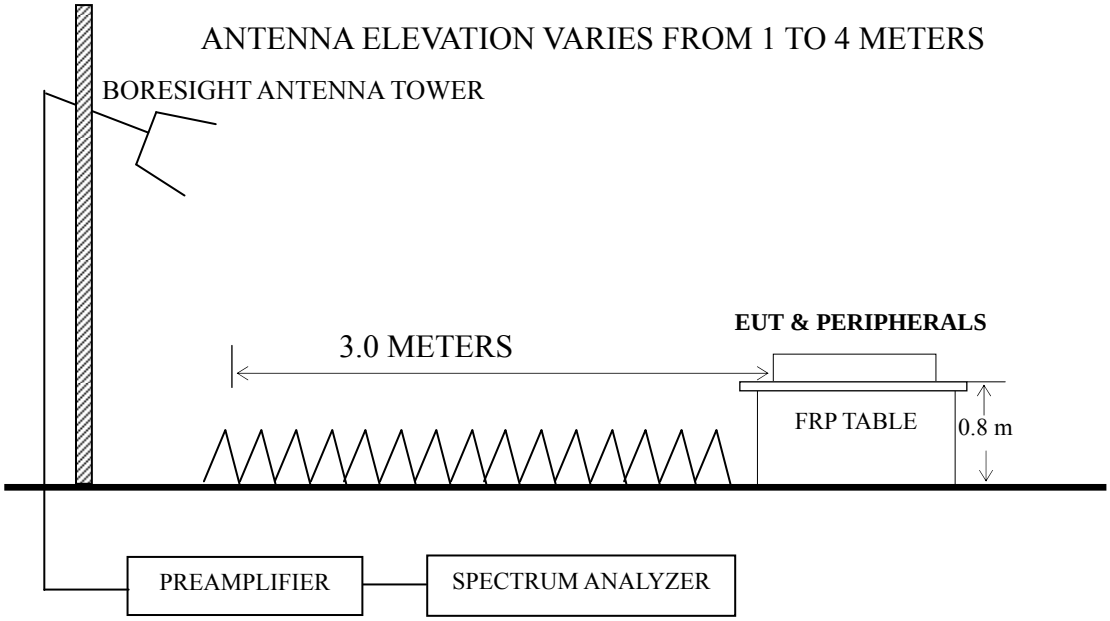
4.2.2 Radiated emission test setup

4.2.2.1 Below 1GHz



■ : 50 ohm Coaxial Switch

4.2.2.2 Above 1GHz



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

Frequency (MHz)	Distance (m)	Field strength limits	
		(μV/m)	dB (μV/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 (μV/m) = 20 log Emission Level (μV/m)
NOTE 2 - The tighter limit applies at the band edges.
NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
NOTE 4 - The limits shown are based on Quasi-peak value detector.
NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT.

4.4 Test Configuration

The configuration of the EUT and peripherals are same as those used in conducted emission test.

Please refer to Sec.3.4.

4.5 Operating Condition of EUT

Same as conducted emission test which is listed in Sec.3.5, except for the test setup replaced by Sec.4.2.

4.6 Test Procedures

The EUT and peripherals were placed on a FRP turntable that is 0.8 meter above ground. The FRP turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Broadband antenna (Calibrated Bilog Antenna) was used as receiving antenna. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.4 requirements during radiated emission test.

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

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

The frequency range from 1 GHz to 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
HDMI1 1920*1080@60Hz & 1kHz playing	P25-P26
HDMI1 1280*1024@60Hz & 1kHz playing	P27
HDMI1 640*480@60Hz & 1kHz playing	P28
HDMI2 1920*1080@60Hz & 1kHz playing	P29
HDMI3 1920*1080@60Hz & 1kHz playing	P30
HDMI1080P	P31
USB Play	P32
WIFI	P33

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 HDMI1 1920*1080@60Hz & 1kHz playing test mode. The worst emission at horizontal polarization was detected at 129.923 MHz with corrected signal level of 40.43 dB (μV/m) (limit is 43.50 dB (μV/m)), when the antenna was 2.30 m height and the turntable was at 120°. The worst emission at vertical polarization was detected at 127.218 MHz with corrected signal level of 40.25 dB (μV/m) (limit is 43.50 dB (μV/m)), when the antenna was 1.10 m height and the turntable was at 265°.

EUT	:	LED LCD TV	Temperature :	22℃
Model No.	:	50H4D	Humidity :	60%RH
Test Mode	:	HDMI1 1920*1080@60Hz & 1kHz Playing	Date of Test :	Mar 22, 2017

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	85.898	23.27	10.20	0.93	--	34.40	40.00	5.60	QP
	129.923	**26.35**	**12.90**	**1.18**	**--**	**40.43**	**43.50**	**3.07**	
	311.087	23.44	13.92	1.79	--	39.15	46.00	6.85	
	446.414	19.28	16.73	2.15	--	38.16	46.00	7.84	
	742.259	19.17	19.57	2.79	--	41.53	46.00	4.47	
	962.162	14.42	21.80	3.18	--	39.40	54.00	14.60	
	1313.043	56.35	24.91	3.82	35.99	49.09	74.00	24.91	PK
	1475.227	52.24	25.52	4.05	35.77	46.04	74.00	27.96	
	1733.375	47.94	26.55	4.38	35.47	43.40	74.00	30.60	
	1313.043	39.92	24.91	3.82	35.99	32.66	54.00	21.34	AV
	1475.227	37.00	25.52	4.05	35.77	30.80	54.00	23.20	
	1733.375	30.49	26.55	4.38	35.47	25.95	54.00	28.05	

TEST ENGINEER: CAESAR WU

EUT	:	LED LCD TV	Temperature :	22℃
Model No.	:	50H4D	Humidity	: 60%RH
Test Mode	:	HDMI1 1920*1080@60Hz & 1kHz Playing	Date of Test	: Mar 22, 2017

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Vertical	31.071	16.11	17.71	0.57	--	34.39	40.00	5.61	QP
	54.071	25.33	7.80	0.73	--	33.86	40.00	6.14	
	84.999	23.03	10.10	0.92	--	34.05	40.00	5.95	
	127.218	**26.51**	**12.57**	**1.17**	--	**40.25**	**43.50**	**3.25**	
	622.890	13.65	18.88	2.56	--	35.09	46.00	10.91	
	815.968	16.22	20.30	2.94	--	39.46	46.00	6.54	
	1147.936	50.27	24.22	3.52	36.24	41.77	74.00	32.23	PK
	1360.949	55.72	25.10	3.88	35.92	48.78	74.00	25.22	
	1567.891	44.59	25.90	4.17	35.66	39.00	74.00	35.00	
	1147.936	31.34	24.22	3.52	36.24	22.84	54.00	31.16	AV
	1360.949	37.20	25.10	3.88	35.92	30.26	54.00	23.74	
	1567.891	27.01	25.90	4.17	35.66	21.42	54.00	32.58	

TEST ENGINEER: CAESAR WU

EUT	:	LED LCD TV	Temperature :	22℃
Model No.	:	50H4D	Humidity :	60%RH
Test Mode	:	HDMI1 1280*1024@60Hz & 1kHz Playing	Date of Test :	Mar 22, 2017

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	85.898	23.66	10.20	0.93	34.79	40.00	5.21
	132.221	**25.62**	**12.86**	**1.19**	**39.67**	**43.50**	**3.83**
	307.831	23.45	13.82	1.79	39.06	46.00	6.94
	446.414	20.29	16.73	2.15	39.17	46.00	6.83
	668.142	17.99	19.35	2.65	39.99	46.00	6.01
	815.968	16.63	20.30	2.94	39.87	46.00	6.13
Vertical	31.731	16.26	17.27	0.58	34.11	40.00	5.89
	52.945	25.59	7.97	0.72	34.28	40.00	5.72
	84.999	23.85	10.10	0.92	34.87	40.00	5.13
	129.923	**25.52**	**12.90**	**1.18**	**39.60**	**43.50**	**3.90**
	744.866	16.98	19.53	2.79	39.30	46.00	6.70
	818.834	16.55	20.30	2.94	39.79	46.00	6.21

TEST ENGINEER: CAESAR WU

EUT	:	LED LCD TV	Temperature :	22℃
Model No.	:	50H4D	Humidity :	60%RH
Test Mode	:	HDMI1 640*480@60Hz & 1kHz Playing	Date of Test :	Mar 22, 2017

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	90.537	25.36	10.87	0.95	37.18	43.50	6.32
	132.221	**25.47**	**12.86**	**1.19**	**39.52**	**43.50**	**3.98**
	222.170	24.63	11.15	1.55	37.33	46.00	8.67
	595.133	16.93	18.25	2.50	37.68	46.00	8.32
	739.661	17.18	19.60	2.79	39.57	46.00	6.43
	818.834	16.02	20.30	2.94	39.26	46.00	6.74
Vertical	31.071	15.86	17.71	0.57	34.14	40.00	5.86
	60.069	26.70	6.60	0.77	34.07	40.00	5.93
	82.071	22.98	9.41	0.90	33.29	40.00	6.71
	129.923	**24.93**	**12.90**	**1.18**	**39.01**	**43.50**	**4.49**
	618.537	14.68	18.80	2.56	36.04	46.00	9.96
	739.661	14.53	19.60	2.79	36.92	46.00	9.08

TEST ENGINEER: CAESAR WU

EUT	:	LED LCD TV	Temperature :	22℃
Model No.	:	50H4D	Humidity :	60%RH
Test Mode	:	HDMI2 1920*1080@60Hz & 1kHz playing	Date of Test :	Mar 22, 2017

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	83.816	22.95	9.84	0.91	33.70	40.00	6.30
	133.619	**25.46**	**12.82**	**1.20**	**39.48**	**43.50**	**4.02**
	223.733	23.49	11.20	1.56	36.25	46.00	9.75
	305.680	18.89	13.79	1.77	34.45	46.00	11.55
	739.661	15.16	19.60	2.79	37.55	46.00	8.45
	887.610	11.87	21.10	3.07	36.04	46.00	9.96
Vertical	31.289	15.95	17.53	0.57	34.05	40.00	5.95
	60.069	26.78	6.60	0.77	34.15	40.00	5.85
	126.329	**25.24**	**12.43**	**1.16**	**38.83**	**43.50**	**4.67**
	211.527	19.69	10.70	1.52	31.91	43.50	11.59
	609.922	12.12	18.60	2.54	33.26	46.00	12.74
	813.112	11.40	20.30	2.94	34.64	46.00	11.36

TEST ENGINEER: CAESAR WU

EUT	:	LED LCD TV	Temperature	:	22℃
Model No.	:	50H4D	Humidity	:	60%RH
Test Mode	:	HDMI1 1920*1080@60Hz & 1kHz playing	Date of Test	:	Mar 22, 2017

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	85.898	23.27	10.20	0.93	34.40	40.00	5.60
	129.923	**26.35**	**12.90**	**1.18**	**40.43**	**43.50**	**3.07**
	311.087	23.44	13.92	1.79	39.15	46.00	6.85
	446.414	19.28	16.73	2.15	38.16	46.00	7.84
	742.259	19.17	19.57	2.79	41.53	46.00	4.47
	962.162	14.42	21.80	3.18	39.40	54.00	14.60
Vertical	31.071	16.11	17.71	0.57	34.39	40.00	5.61
	54.071	25.33	7.80	0.73	33.86	40.00	6.14
	84.999	23.03	10.10	0.92	34.05	40.00	5.95
	127.218	**26.51**	**12.57**	**1.17**	**40.25**	**43.50**	**3.25**
	622.890	13.65	18.88	2.56	35.09	46.00	10.91
	815.968	16.22	20.30	2.94	39.46	46.00	6.54

TEST ENGINEER: CAESAR WU

EUT	:	LED LCD TV	Temperature :	22℃
Model No.	:	50H4D	Humidity :	60%RH
Test Mode	:	HDMI1080P	Date of Test :	Mar 22, 2017

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	84.405	22.87	9.93	0.91	33.71	40.00	6.29
	134.088	**24.40**	**12.81**	**1.20**	**38.41**	**43.50**	**5.09**
	224.519	22.19	11.25	1.56	35.00	46.00	11.00
	362.985	17.69	15.47	1.95	35.11	46.00	10.89
	739.661	14.32	19.60	2.79	36.71	46.00	9.29
	869.130	12.92	20.90	3.03	36.85	46.00	9.15
Vertical	30.853	15.74	17.79	0.57	34.10	40.00	5.90
	59.649	25.60	6.66	0.77	33.03	40.00	6.97
	83.522	22.99	9.76	0.91	33.66	40.00	6.34
	132.221	**23.79**	**12.86**	**1.19**	**37.84**	**43.50**	**5.66**
	609.922	15.12	18.60	2.54	36.26	46.00	9.74
	884.503	12.67	21.05	3.05	36.77	46.00	9.23

TEST ENGINEER: CAESAR WU

EUT	:	LED LCD TV	Temperature :	22℃
Model No.	:	50H4D	Humidity :	60%RH
Test Mode	:	USB Play	Date of Test :	Mar 22, 2017

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	84.702	22.87	10.01	0.92	33.80	40.00	6.20
	128.113	**25.12**	**12.70**	**1.17**	**38.99**	**43.50**	**4.51**
	220.617	23.44	11.05	1.55	36.04	46.00	9.96
	297.224	21.16	13.60	1.75	36.51	46.00	9.49
	369.405	18.87	15.60	1.96	36.43	46.00	9.57
	734.491	14.58	19.47	2.79	36.84	46.00	9.16
Vertical	32.293	17.99	16.94	0.58	35.51	40.00	4.49
	80.081	22.66	8.90	0.89	32.45	40.00	7.55
	133.151	**25.19**	**12.83**	**1.20**	**39.22**	**43.50**	**4.28**
	605.659	12.86	18.55	2.52	33.93	46.00	12.07
	737.071	11.89	19.53	2.79	34.21	46.00	11.79
	906.482	10.45	21.30	3.09	34.84	46.00	11.16

TEST ENGINEER: CAESAR WU

EUT	:	LED LCD TV	Temperature :	22℃
Model No.	:	50H4D	Humidity :	60%RH
Test Mode	:	WIFI	Date of Test :	Mar 22, 2017

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	83.816	22.39	9.84	0.91	33.14	40.00	6.86
	129.015	**24.78**	**12.77**	**1.18**	**38.73**	**43.50**	**4.77**
	219.075	21.50	10.98	1.54	34.02	46.00	11.98
	303.544	20.40	13.71	1.77	35.88	46.00	10.12
	739.661	17.18	19.60	2.79	39.57	46.00	6.43
	860.035	11.11	20.70	3.00	34.81	46.00	11.19
Vertical	32.293	16.05	16.94	0.58	33.57	40.00	6.43
	58.819	26.96	6.91	0.76	34.63	40.00	5.37
	135.506	**24.71**	**12.84**	**1.21**	**38.76**	**43.50**	**4.74**
	304.610	18.34	13.75	1.77	33.86	46.00	12.14
	616.372	13.72	18.75	2.54	35.01	46.00	10.99
	906.482	12.54	21.30	3.09	36.93	46.00	9.07

TEST ENGINEER: CAESAR WU

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	60×40\ROH	Qingdao Joinset Co., Ltd	See Internal Photos Figure 20

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: Byron Wu

(BYRON WU)