

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

LED LCD TV

Model No.	Brand
40H4D, 40H4D +	Hisense
40H4+0D, 40H4+0D1, 40H4+0D2	
40H40+0D, 40H40+0D1, 40H40+0D2	
40H4DM, 40H4207	

FCC ID : W9HLCDD0070

Prepared For : Hisense Electric Co., Ltd.
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Development Zone, Qingdao, China

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Report No. : ACI-F17129
Date of Test : Mar 11- 20, 2017
Date of Report : Mar 30, 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.	Brand	Power Supply
Refer to Sec.2.1	Hisense	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 11- 20, 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.

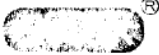
This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

The test results for EUT's TV functions are contained in No.F17128, a Verification report.

Date of Test : Mar 11- 20, 2017 Date of Report : Mar 30, 2017

Producer : Huimin Yan
 HUI MIN YAN / Assistant

Review : Byron Wu
 BYRON WU / Deputy Assistant Manager

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

Signatory : 
 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 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	:	<input checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type
Model No	:	40H4D, 40H4D +, 40H4+0D, 40H4+0D1, 40H4+0D2, 40H40+0D, 40H40+0D1, 40H40+0D2, 40H4DM, 40H4207
Brand	:	Hisense
Note#1	:	The above models are all the same except for the model number. The 40H4D was tested and reported in the report.
Note#2	:	“+”represents any of the Arabic numeral.
Note#3	:	The tuner port comply with the 15.111 requirement.
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.
Max Resolution	:	1920*1080@60Hz
LCD Panel	:	Manufacturer : Hisense M/N : HD396DF-E01(010)
Tuner	:	Manufacturer : XuGuang Tech. Co., Ltd. M/N : HFT-96S3/W11FJ6H/ROH
WIFI Modular	:	FCC ID: TC2-N1002
HDMI Cable*3 (Lab provide)	:	Shielded, Detachable, 1.80m

Power Cord : Unshielded, Detachable, 1.80m, 2C

USB Cable : Shielded, Detachable, 1.00m
(Lab provide)

Remark:

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

Side Port:

- (1) One USB Port : Connected with Hard-Disk
- (2) One HDMI1 Port : Connected with PC
- (3) One HDMI2 Port : Connected with PC
- (4) One Audio out Port : Connected with Earphone
- (5) One AV IN Port : Connected with DVD Player
- (6) One ANT/CABLE IN Port : Connected with ATSC SG / TV SG

Back Port:

- (7) One DIGITAL AUDIO OUT Port : Connected with Audio Converter to Earphone
- (8) One HDMI3 Port : Connected with DVD Player

2.2 Peripherals

2.2.1 PC

Manufacturer : HP
 Model Number : Pro3340
 Serial Number : 6CR2512VFD
 Power Cord : Unshielded, Detachable, 1.8m
 Certificate : CE/EMC, FCC DoC, VCCI, UL, CCC

2.2.2 Keyboard

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

2.2.3 Mouse

Manufacturer : Microsoft
 Model Number : RT2300
 Serial Number : 6965712071551
 Data Cable : Shielded, Detachable, 1.5m.
 Certificate : CE/EMC, FCC DoC, VCCI, MIC, C-Tick, BSMI

2.2.4 Modem

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

2.2.5 Earphone *2

Manufacturer : EDIFIER
Model Number : H210

2.2.6 DVD PLAYER

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

2.2.7 Hard Disk

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

2.2.8 ATSC Signal Generator

Manufacturer : SENCORE
Model Number : ATSC997
Serial Number : 6790071

2.2.9 TV Signal Generator

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

2.2.10 Router

Manufacturer : TP-LINK
Model Number : TL-WR800N
Serial Number : 13806805316

2.3 Description of Test Facility

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

2.4 Measurement Uncertainty

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

3 CONDUCTED EMISSION TEST

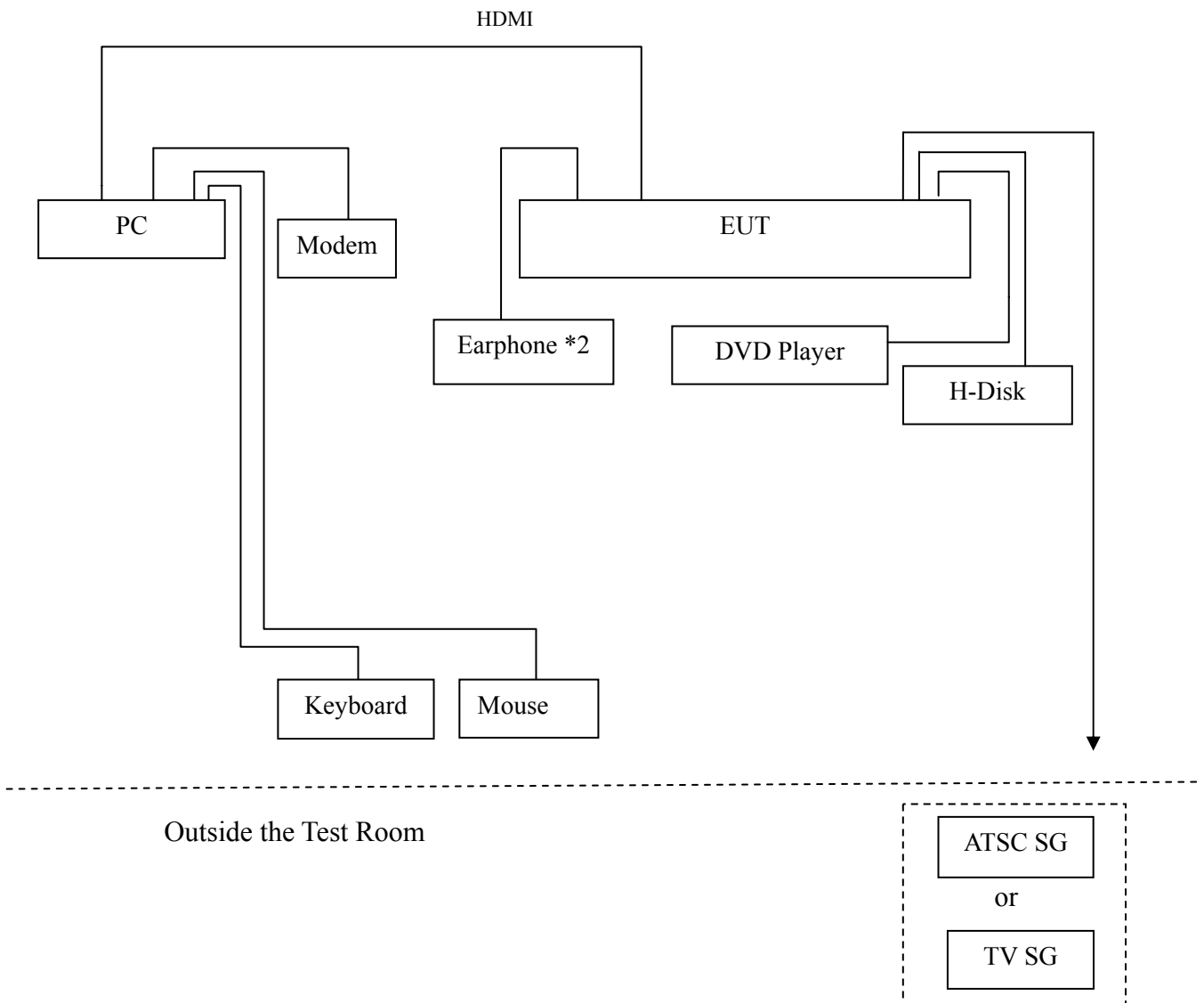
3.1 Test Equipment

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

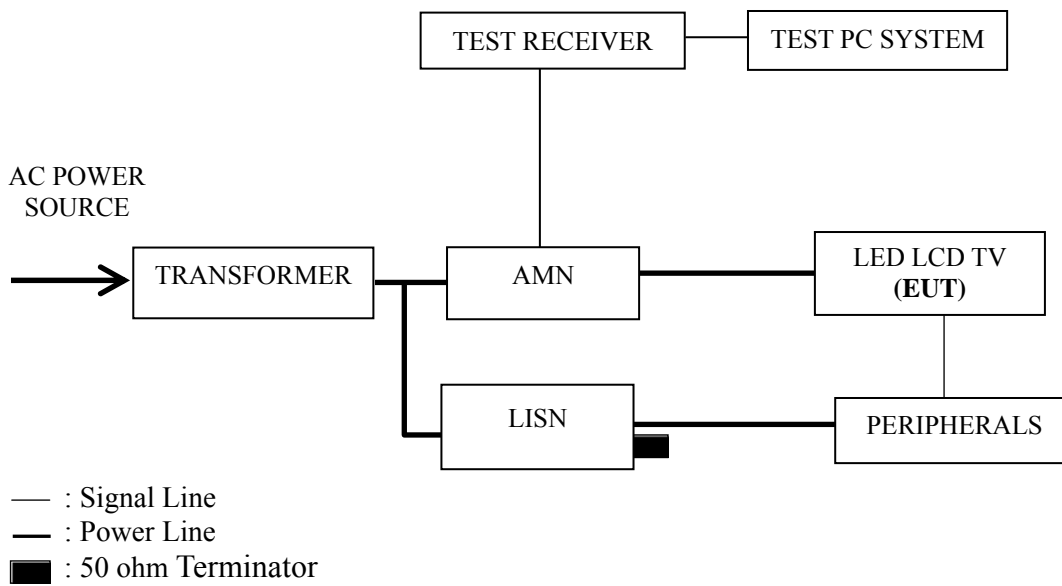
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Apr 27, 2016	Apr 26, 2017
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 25, 2016	Jun 24, 2017
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2016	Mar 19, 2017
4.	50Ω Terminator	Anritsu	BNC	001	Mar 20, 2016	Mar 19, 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 (μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66~56	56~46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE 1 – The lower limit shall apply at the transition frequencies.
 NOTE 2 – The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz~0.50 MHz

3.4 Test Configuration

The EUT (listed in Sec.2.1) and the peripherals (listed in Sec 2.2) were installed as shown on Sec.3.2 to meet FCC requirement and operating in a manner that tends to maximize its emission level in a normal application.

3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT and peripherals as shown in Sec. 3.2.
- 3.5.2 Turn on the power of all equipments and the EUT.
- 3.5.3 Set the contrast & brightness of EUT to maximum.
- 3.5.4 PC system ran the self-test program “EMC Test” by windows XP and sent “H” characters to EUT through graphic card, the EUT’s screen displayed and filled with “H” pattern by its resolution (Via HDMI Input).
- 3.5.5 PC system sent the 1kHz audio signal to EUT through audio port, the EUT speak out 1kHz audio signal.
- 3.5.6 In USB Play mode, set the EUT play digital media from H-Disk.
- 3.5.7 In 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
HDMI1 1920*1080@60Hz & 1kHz Playing
HDMI2 1920*1080@60Hz & 1kHz Playing
HDMI3 1920*1080@60Hz & 1kHz Playing
HDMI1 1280*1024@60Hz & 1kHz playing
HDMI1 640*480@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 C63.4:2014 during conducted emission test.

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

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

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

3.7 Test Results

< PASS >

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

Test Mode	Data Page
HDMI1 1920*1080@60Hz & 1kHz Playing	P13
HDMI2 1920*1080@60Hz & 1kHz Playing	P14
HDMI3 1920*1080@60Hz & 1kHz Playing	P15
HDMI1 1280*1024@60Hz & 1kHz playing	P16
HDMI1 640*480@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 HDMI1080P test mode. The worst emission is detected at 12.516MHz (Quasi-Peak Value) with corrected signal level of 42.42 dB (μ V) (limit is 50.00 dB (μ V)), when the Neutral of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 48%RH

Test Mode : HDMI1 1920*1080@60Hz Date of Test : Mar 11, 2017
& 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	0.184	35.02	10.55	45.57	64.28	18.71	QP
	0.367	30.64	10.45	41.09	58.56	17.47	
	0.592	28.79	10.40	39.19	56.00	16.81	
	1.403	23.46	10.41	33.87	56.00	22.13	
	5.535	29.02	10.46	39.48	60.00	20.52	
	12.384	36.77	10.53	47.30	60.00	12.70	
	0.184	22.02	10.55	32.57	54.28	21.71	AV
	0.367	17.64	10.45	28.09	48.56	20.47	
	0.592	14.79	10.40	25.19	46.00	20.81	
	1.403	16.46	10.41	26.87	46.00	19.13	
	5.535	21.02	10.46	31.48	50.00	18.52	
	12.384	29.77	10.53	40.30	50.00	9.70	
Neutral	0.178	34.43	10.55	44.98	64.59	19.61	QP
	0.529	30.55	10.39	40.94	56.00	15.06	
	0.775	30.82	10.39	41.21	56.00	14.79	
	1.480	30.12	10.42	40.54	56.00	15.46	
	5.476	31.88	10.51	42.39	60.00	17.61	
	12.384	37.79	10.62	48.41	60.00	11.59	
	0.178	21.43	10.55	31.98	54.59	22.61	AV
	0.529	16.55	10.39	26.94	46.00	19.06	
	0.775	18.82	10.39	29.21	46.00	16.79	
	1.480	21.12	10.42	31.54	46.00	14.46	
	5.476	25.88	10.51	36.39	50.00	13.61	
	12.384	30.79	10.62	41.41	50.00	8.59	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 48%RH

Test Mode : HDMI2 1920*1080@60Hz Date of Test : Mar 11, 2017
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.182	36.51	10.55	47.06	64.42	17.36	QP
	0.371	31.85	10.45	42.30	58.47	16.17	
	0.598	27.96	10.39	38.35	56.00	17.65	
	3.364	24.30	10.43	34.73	56.00	21.27	
	5.277	31.94	10.45	42.39	60.00	17.61	
	12.384	36.60	10.53	47.13	60.00	12.87	AV
	0.182	23.51	10.55	34.06	54.42	20.36	
	0.371	16.85	10.45	27.30	48.47	21.17	
	0.598	16.96	10.39	27.35	46.00	18.65	
	3.364	17.30	10.43	27.73	46.00	18.27	
5.277	25.94	10.45	36.39	50.00	13.61		
	12.384	30.60	10.53	41.13	50.00	8.87	
Neutral	0.178	35.73	10.55	46.28	64.59	18.31	QP
	0.521	29.36	10.39	39.75	56.00	16.25	
	0.775	29.85	10.39	40.24	56.00	15.76	
	2.178	26.97	10.43	37.40	56.00	18.60	
	5.535	32.60	10.51	43.11	60.00	16.89	
	12.253	35.85	10.62	46.47	60.00	13.53	AV
	0.178	22.73	10.55	33.28	54.59	21.31	
	0.521	15.36	10.39	25.75	46.00	20.25	
	0.775	18.85	10.39	29.24	46.00	16.76	
	2.178	18.97	10.43	29.40	46.00	16.60	
	5.535	25.60	10.51	36.11	50.00	13.89	
	12.253	28.85	10.62	39.47	50.00	10.53	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 48%RH

Test Mode : HDMI3 1920*1080@60Hz Date of Test : Mar 11, 2017
& 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	0.182	36.17	10.55	46.72	64.42	17.70	QP
	0.466	26.39	10.41	36.80	56.58	19.78	
	0.598	27.89	10.39	38.28	56.00	17.72	
	2.594	26.29	10.42	36.71	56.00	19.29	
	5.362	29.00	10.45	39.45	60.00	20.55	
	12.384	37.04	10.53	47.57	60.00	12.43	
	0.182	24.17	10.55	34.72	54.42	19.70	AV
	0.466	15.39	10.41	25.80	46.58	20.78	
	0.598	16.89	10.39	27.28	46.00	18.72	
	2.594	19.29	10.42	29.71	46.00	16.29	
	5.362	24.00	10.45	34.45	50.00	15.55	
	12.384	30.04	10.53	40.57	50.00	9.43	
Neutral	0.183	36.37	10.54	46.91	64.33	17.42	QP
	0.524	29.07	10.39	39.46	56.00	16.54	
	0.775	30.60	10.39	40.99	56.00	15.01	
	1.970	29.88	10.43	40.31	56.00	15.69	
	5.221	30.93	10.50	41.43	60.00	18.57	
	12.516	38.80	10.62	49.42	60.00	10.58	
	0.183	24.37	10.54	34.91	54.33	19.42	AV
	0.524	17.07	10.39	27.46	46.00	18.54	
	0.775	18.60	10.39	28.99	46.00	17.01	
	1.970	21.88	10.43	32.31	46.00	13.69	
	5.221	24.93	10.50	35.43	50.00	14.57	
	12.516	31.80	10.62	42.42	50.00	7.58	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 48%RH

Test Mode : HDMI1 1280*1024@60Hz Date of Test : Mar 11, 2017
& 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	0.182	36.69	10.55	47.24	64.42	17.18	QP
	0.385	28.72	10.44	39.16	58.17	19.01	
	0.598	27.02	10.39	37.41	56.00	18.59	
	2.594	26.71	10.42	37.13	56.00	18.87	
	5.362	30.33	10.45	40.78	60.00	19.22	
	12.384	37.19	10.53	47.72	60.00	12.28	
	0.182	23.69	10.55	34.24	54.42	20.18	AV
	0.385	15.72	10.44	26.16	48.17	22.01	
	0.598	15.02	10.39	25.41	46.00	20.59	
	2.594	18.71	10.42	29.13	46.00	16.87	
	5.362	24.33	10.45	34.78	50.00	15.22	
	12.384	30.19	10.53	40.72	50.00	9.28	
Neutral	0.178	34.03	10.55	44.58	64.59	20.01	QP
	0.564	30.28	10.39	40.67	56.00	15.33	
	0.775	30.74	10.39	41.13	56.00	14.87	
	1.480	29.01	10.42	39.43	56.00	16.57	
	5.277	33.31	10.50	43.81	60.00	16.19	
	12.516	38.53	10.62	49.15	60.00	10.85	
	0.178	21.03	10.55	31.58	54.59	23.01	AV
	0.564	17.28	10.39	27.67	46.00	18.33	
	0.775	19.74	10.39	30.13	46.00	15.87	
	1.480	20.01	10.42	30.43	46.00	15.57	
	5.277	25.31	10.50	35.81	50.00	14.19	
	12.516	31.53	10.62	42.15	50.00	7.85	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 48%RH

Test Mode : HDMI1 640*480@60Hz Date of Test : Mar 11, 2017
& 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	0.184	36.47	10.55	47.02	64.28	17.26	QP
	0.377	28.46	10.44	38.90	58.34	19.44	
	0.592	26.96	10.40	37.36	56.00	18.64	
	3.025	27.22	10.43	37.65	56.00	18.35	
	5.419	32.81	10.46	43.27	60.00	16.73	
	12.384	37.63	10.53	48.16	60.00	11.84	
	AV	0.184	25.47	10.55	36.02	54.28	18.26
		0.377	17.46	10.44	27.90	48.34	20.44
		0.592	14.96	10.40	25.36	46.00	20.64
		3.025	19.22	10.43	29.65	46.00	16.35
		5.419	25.81	10.46	36.27	50.00	13.73
		12.384	30.63	10.53	41.16	50.00	8.84
Neutral	0.182	34.36	10.54	44.90	64.42	19.52	QP
	0.313	31.50	10.45	41.95	59.88	17.93	
	0.529	28.87	10.39	39.26	56.00	16.74	
	3.799	29.68	10.47	40.15	56.00	15.85	
	5.277	32.09	10.50	42.59	60.00	17.41	
	12.384	36.79	10.62	47.41	60.00	12.59	
	AV	0.182	25.36	10.54	35.90	54.42	18.52
		0.313	22.50	10.45	32.95	49.88	16.93
		0.529	16.87	10.39	27.26	46.00	18.74
		3.799	21.68	10.47	32.15	46.00	13.85
		5.277	25.09	10.50	35.59	50.00	14.41
		12.384	30.79	10.62	41.41	50.00	8.59

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 48%RH

Test Mode : HDMI1080P Date of Test : Mar 11, 2017

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.186	35.34	10.55	45.89	64.20	18.31	QP
	0.381	28.50	10.44	38.94	58.25	19.31	
	0.598	27.12	10.39	37.51	56.00	18.49	
	3.720	26.42	10.43	36.85	56.00	19.15	
	5.419	32.44	10.46	42.90	60.00	17.10	
	12.384	37.45	10.53	47.98	60.00	12.02	
	0.186	24.34	10.55	34.89	54.20	19.31	AV
	0.381	17.50	10.44	27.94	48.25	20.31	
	0.598	16.12	10.39	26.51	46.00	19.49	
	3.720	20.42	10.43	30.85	46.00	15.15	
	5.419	25.44	10.46	35.90	50.00	14.10	
	12.384	30.45	10.53	40.98	50.00	9.02	
Neutral	0.184	34.72	10.54	45.26	64.28	19.02	QP
	0.300	30.81	10.46	41.27	60.24	18.97	
	0.564	30.98	10.39	41.37	56.00	14.63	
	0.775	30.69	10.39	41.08	56.00	14.92	
	5.277	32.17	10.50	42.67	60.00	17.33	
	12.516	37.80	10.62	48.42	60.00	11.58	
	0.184	23.72	10.54	34.26	54.28	20.02	AV
	0.300	17.81	10.46	28.27	50.24	21.97	
	0.564	18.98	10.39	29.37	46.00	16.63	
	0.775	18.69	10.39	29.08	46.00	16.92	
	5.277	23.17	10.50	33.67	50.00	16.33	
	12.516	31.80	10.62	42.42	50.00	7.58	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 48%RH

Test Mode : USB Play Date of Test : Mar 11, 2017

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.188	34.91	10.54	45.45	64.11	18.66	QP
	0.371	28.70	10.45	39.15	58.47	19.32	
	0.604	26.06	10.39	36.45	56.00	19.55	
	2.594	26.64	10.42	37.06	56.00	18.94	
	5.713	30.75	10.46	41.21	60.00	18.79	
	12.384	37.33	10.53	47.86	60.00	12.14	
	0.188	23.91	10.54	34.45	54.11	19.66	AV
	0.371	16.70	10.45	27.15	48.47	21.32	
	0.604	15.06	10.39	25.45	46.00	20.55	
	2.594	17.64	10.42	28.06	46.00	17.94	
	5.713	24.75	10.46	35.21	50.00	14.79	
	12.384	30.33	10.53	40.86	50.00	9.14	
Neutral	0.186	34.83	10.54	45.37	64.20	18.83	QP
	0.303	31.39	10.46	41.85	60.15	18.30	
	0.546	30.91	10.39	41.30	56.00	14.70	
	0.775	30.77	10.39	41.16	56.00	14.84	
	5.419	33.44	10.51	43.95	60.00	16.05	
	12.384	37.94	10.62	48.56	60.00	11.44	
	0.186	25.83	10.54	36.37	54.20	17.83	AV
	0.303	20.39	10.46	30.85	50.15	19.30	
	0.546	19.91	10.39	30.30	46.00	15.70	
	0.775	17.77	10.39	28.16	46.00	17.84	
	5.419	25.44	10.51	35.95	50.00	14.05	
	12.384	30.94	10.62	41.56	50.00	8.44	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C
 Model No. : 40H4D Humidity : 48%RH
 Test Mode : Wifi Date of Test : Mar 11, 2017

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.184	35.43	10.55	45.98	64.28	18.30	QP
	0.385	28.37	10.44	38.81	58.17	19.36	
	0.546	27.91	10.40	38.31	56.00	17.69	
	3.293	26.52	10.43	36.95	56.00	19.05	
	5.277	30.70	10.45	41.15	60.00	18.85	
	12.384	37.64	10.53	48.17	60.00	11.83	
	0.184	24.43	10.55	34.98	54.28	19.30	AV
	0.385	18.37	10.44	28.81	48.17	19.36	
	0.546	15.91	10.40	26.31	46.00	19.69	
	3.293	15.52	10.43	25.95	46.00	20.05	
	5.277	24.70	10.45	35.15	50.00	14.85	
	12.384	29.64	10.53	40.17	50.00	9.83	
Neutral	0.183	36.28	10.54	46.82	64.33	17.51	QP
	0.303	31.32	10.46	41.78	60.15	18.37	
	0.529	30.85	10.39	41.24	56.00	14.76	
	2.178	26.81	10.43	37.24	56.00	18.76	
	4.926	33.64	10.50	44.14	56.00	11.86	
	12.384	37.53	10.62	48.15	60.00	11.85	
	0.183	25.28	10.54	35.82	54.33	18.51	AV
	0.303	20.32	10.46	30.78	50.15	19.37	
	0.529	17.85	10.39	28.24	46.00	17.76	
	2.178	19.81	10.43	30.24	46.00	15.76	
	4.926	25.64	10.50	36.14	46.00	9.86	
	12.384	29.53	10.62	40.15	50.00	9.85	

TEST ENGINEER: BYRON WU

4 RADIATED EMISSION TEST

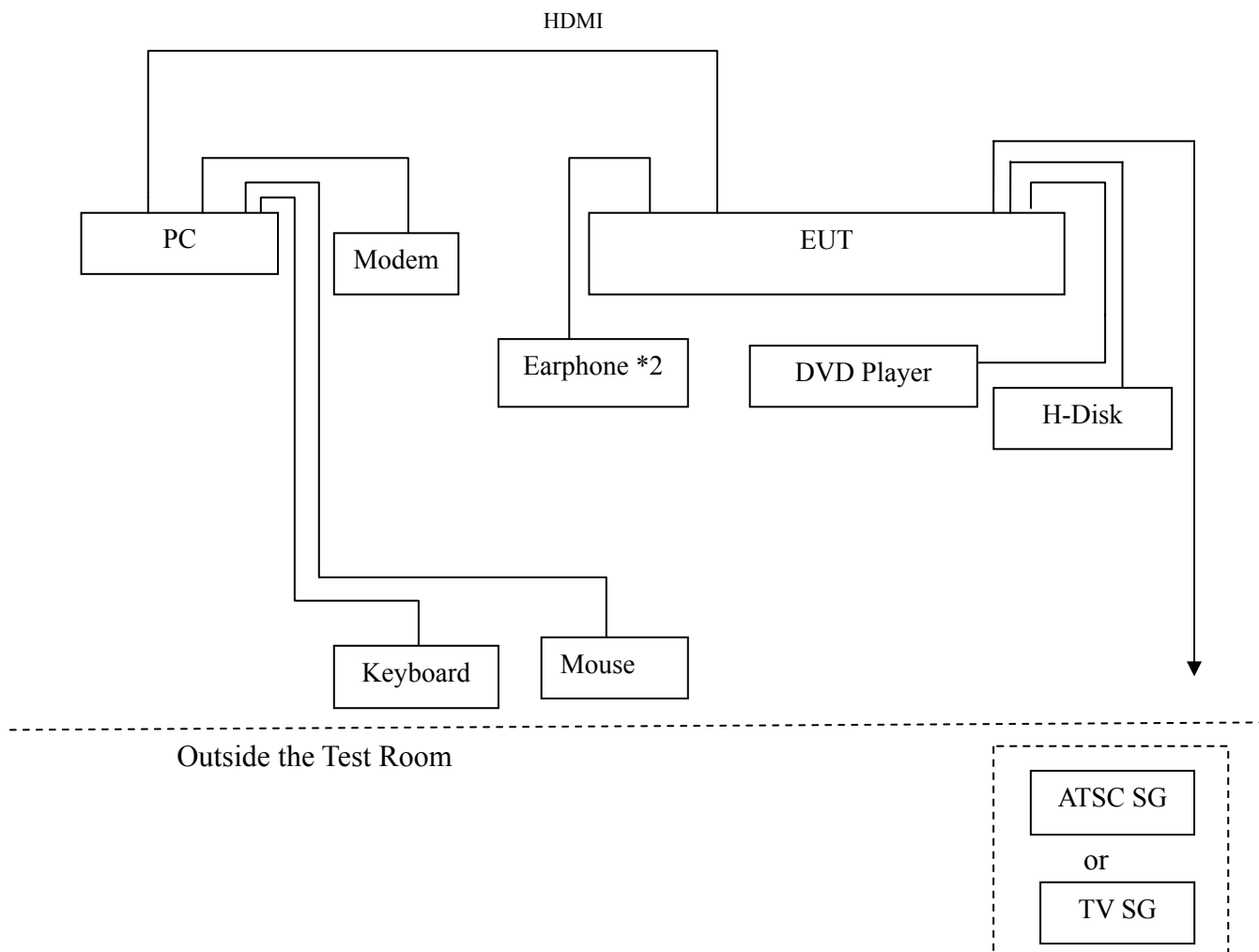
4.1 Test Equipment

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	--	--

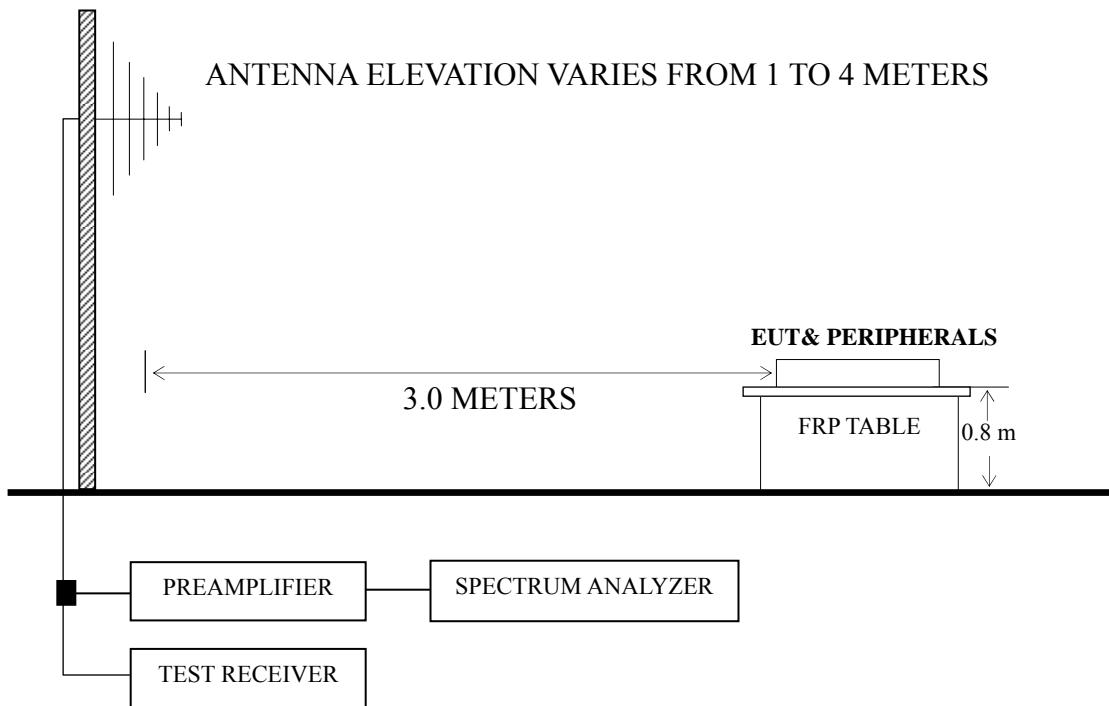
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals



4.2.2 Radiated emission test setup

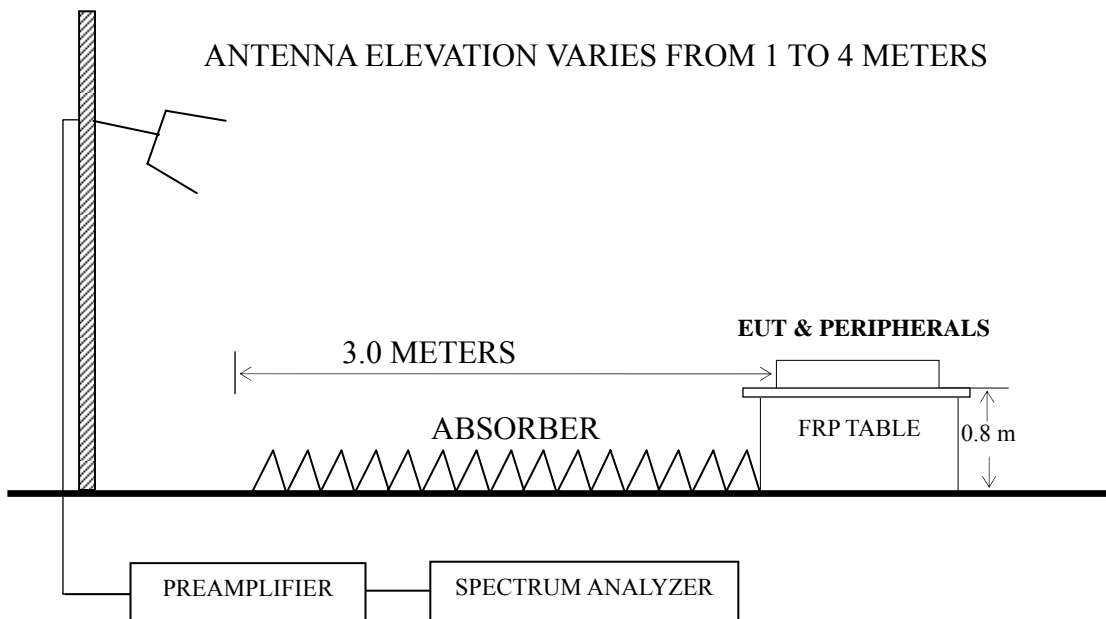
4.2.2.1 Below 1GHz



■ : 50 ohm Coaxial Switch

4.2.2.2 Above 1GHz

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 requirements during radiated emission test.

The I.F. bandwidth of Test Receiver R&S ESCI was set at 120 kHz and The Spectrum AgilentE7405A was set at 1MHz above 1GHz.

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
HDMI2 1920*1080@60Hz & 1kHz Playing	P27
HDMI3 1920*1080@60Hz & 1kHz Playing	P28
HDMI1 1280*1024@60Hz & 1kHz playing	P29
HDMI1 640*480@60Hz & 1kHz playing	P30
HDMI 1080P	P31
USB Play	P32
Wifi	P33

- NOTE 1 – Emission Level = Antenna Factor + Cable Loss + 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 90.855 MHz with corrected signal level of 37.56dB ($\mu\text{V}/\text{m}$) (limit is 43.50 dB ($\mu\text{V}/\text{m}$)), when the antenna was 2.0 m height and the turntable was at 250°. The worst emission at vertical polarization was detected at 30.680 MHz with corrected signal level of 36.83dB ($\mu\text{V}/\text{m}$) (limit is 40.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.0m height and the turntable was at 80°.

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 60%RH

Test Mode : HDMI1 1920*1080@60Hz & 1kHz Playing Date of Test : Mar 20, 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	30.962	15.75	17.71	0.57	0.00	34.03	40.00	5.97	QP
	90.855	25.68	10.93	0.95	0.00	37.56	43.50	5.94	
	132.221	22.95	12.86	1.19	0.00	37.00	43.50	6.50	
	297.224	20.50	13.60	1.75	0.00	35.85	46.00	10.15	
	446.414	19.28	16.73	2.15	0.00	38.16	46.00	7.84	
	890.728	12.67	21.10	3.07	0.00	36.84	46.00	9.16	PK
	1341.581	55.72	25.03	3.85	35.95	48.65	74.00	25.35	
	1467.318	51.85	25.50	4.02	35.78	45.59	74.00	28.41	
	1774.224	48.13	26.70	4.41	35.43	43.81	74.00	30.19	AV
	1341.581	38.84	25.03	3.85	35.95	31.77	54.00	22.23	
	1467.318	33.22	25.50	4.02	35.78	26.96	54.00	27.04	
1774.224	30.11	26.70	4.41	35.43	25.79	54.00	28.21		

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 60%RH

Test Mode : HDMI1 1920*1080@60Hz & 1kHz Playing Date of Test : Mar 20, 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	30.680	18.29	17.97	0.57	0.00	36.83	40.00	3.17	QP
	47.994	25.21	9.30	0.69	0.00	35.20	40.00	4.80	
	89.905	25.38	10.75	0.95	0.00	37.08	43.50	6.42	
	148.963	22.56	12.16	1.28	0.00	36.00	43.50	7.50	
	443.294	15.03	16.67	2.15	0.00	33.85	46.00	12.15	
	890.728	11.20	21.10	3.07	0.00	35.37	46.00	10.63	
	1187.688	54.28	24.40	3.61	36.18	46.11	74.00	27.89	PK
	1467.318	48.69	25.50	4.02	35.78	42.43	74.00	31.57	
	1666.376	49.44	26.30	4.29	35.54	44.49	74.00	29.51	
	1187.688	34.46	24.40	3.61	36.18	26.29	54.00	27.71	AV
	1467.318	31.52	25.50	4.02	35.78	25.26	54.00	28.74	
	1666.376	34.21	26.30	4.29	35.54	29.26	54.00	24.74	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 60%RH

Test Mode : HDMI2 1920*1080@60Hz & 1kHz Playing Date of Test : Mar 20, 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	30.211	14.31	18.23	0.56	33.10	40.00	6.90
	88.652	24.87	10.60	0.94	36.41	43.50	7.09
	133.619	21.10	12.82	1.20	35.12	43.50	8.38
	323.320	16.59	14.21	1.83	32.63	46.00	13.37
	382.588	15.84	15.85	2.00	33.69	46.00	12.31
	716.682	11.80	19.27	2.75	33.82	46.00	12.18
Vertical	32.067	17.51	17.05	0.58	35.14	40.00	4.86
	51.843	25.70	8.16	0.72	34.58	40.00	5.42
	86.807	24.43	10.35	0.93	35.71	40.00	4.29
	167.824	23.33	10.99	1.36	35.68	43.50	7.82
	463.970	15.88	16.98	2.19	35.05	46.00	10.95
	766.057	11.83	19.77	2.83	34.43	46.00	11.57

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 60%RH

Test Mode : HDMI3 1920*1080@60Hz & 1kHz Playing Date of Test : Mar 20, 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	30.962	14.95	17.71	0.57	33.23	40.00	6.77
	85.898	24.34	10.20	0.93	35.47	40.00	4.53
	90.855	26.09	10.93	0.95	37.97	43.50	5.53
	132.221	23.47	12.86	1.19	37.52	43.50	5.98
	297.224	19.30	13.60	1.75	34.65	46.00	11.35
	742.259	12.94	19.57	2.79	35.30	46.00	10.70
Vertical	31.160	17.80	17.62	0.57	35.99	40.00	4.01
	47.994	25.70	9.30	0.69	35.69	40.00	4.31
	84.999	24.61	10.10	0.92	35.63	40.00	4.37
	145.861	22.80	12.48	1.26	36.54	43.50	6.96
	297.224	17.93	13.60	1.75	33.28	46.00	12.72
	742.259	13.27	19.57	2.79	35.63	46.00	10.37

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 60%RH

Test Mode : HDMI1 1280*1024@60Hz Date of Test : Mar 20, 2017
& 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	30.962	13.58	17.71	0.57	31.86	40.00	8.14
	90.855	26.58	10.93	0.95	38.46	43.50	5.04
	132.221	23.79	12.86	1.19	37.84	43.50	5.66
	324.456	17.73	14.27	1.83	33.83	46.00	12.17
	517.248	13.82	17.52	2.30	33.64	46.00	12.36
	742.259	13.18	19.57	2.79	35.54	46.00	10.46
Vertical	30.962	16.80	17.71	0.57	35.08	40.00	4.92
	46.995	24.14	9.45	0.68	34.27	40.00	5.73
	89.905	24.58	10.75	0.95	36.28	43.50	7.22
	130.837	19.78	12.88	1.19	33.85	43.50	9.65
	297.224	17.79	13.60	1.75	33.14	46.00	12.86
	776.878	11.36	20.03	2.85	34.24	46.00	11.76

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 60%RH

Test Mode : HDMI1 640*480@60Hz & 1kHz Playing Date of Test : Mar 20, 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	31.289	14.83	17.53	0.57	32.93	40.00	7.07
	85.898	24.56	10.20	0.93	35.69	40.00	4.31
	133.151	22.45	12.83	1.20	36.48	43.50	7.02
	187.753	23.03	10.09	1.43	34.55	43.50	8.95
	392.095	16.13	16.13	2.02	34.28	46.00	11.72
	522.718	14.59	17.56	2.32	34.47	46.00	11.53
Vertical	30.962	16.88	17.71	0.57	35.16	40.00	4.84
	47.994	25.92	9.30	0.69	35.91	40.00	4.09
	85.898	24.32	10.20	0.93	35.45	40.00	4.55
	143.830	23.16	12.75	1.25	37.16	43.50	6.34
	590.974	14.21	18.17	2.50	34.88	46.00	11.12
	776.878	10.94	20.03	2.85	33.82	46.00	12.18

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 60%RH

Test Mode : HDMI 1080P Date of Test : Mar 20, 2017

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	30.745	14.06	17.88	0.57	32.51	40.00	7.49
	86.807	24.22	10.35	0.93	35.50	40.00	4.50
	134.559	22.32	12.81	1.21	36.34	43.50	7.16
	243.377	20.87	12.28	1.61	34.76	46.00	11.24
	422.058	15.27	16.33	2.09	33.69	46.00	12.31
	863.056	10.93	20.77	3.03	34.73	46.00	11.27
Vertical	30.531	16.80	18.05	0.56	35.41	40.00	4.59
	50.764	26.03	8.43	0.71	35.17	40.00	4.83
	88.342	23.99	10.55	0.94	35.48	43.50	8.02
	204.955	22.41	10.30	1.50	34.21	43.50	9.29
	389.355	15.52	16.05	2.02	33.59	46.00	12.41
	593.050	13.51	18.25	2.50	34.26	46.00	11.74

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H4D Humidity : 60%RH

Test Mode : USB Play Date of Test : Mar 20, 2017

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	32.293	15.15	16.94	0.58	32.67	40.00	7.33
	90.220	25.92	10.80	0.95	37.67	43.50	5.83
	147.404	20.25	12.35	1.27	33.87	43.50	9.63
	393.472	14.12	16.17	2.02	32.31	46.00	13.69
	636.134	11.02	19.15	2.59	32.76	46.00	13.24
	875.247	10.15	20.93	3.05	34.13	46.00	11.87
Vertical	31.955	17.55	17.10	0.58	35.23	40.00	4.77
	51.301	25.64	8.27	0.71	34.62	40.00	5.38
	93.440	23.67	11.40	0.96	36.03	43.50	7.47
	148.963	22.04	12.16	1.28	35.48	43.50	8.02
	383.932	16.23	15.90	2.00	34.13	46.00	11.87
	857.025	11.03	20.63	3.00	34.66	46.00	11.34

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C
 Model No. : 40H4D Humidity : 60%RH
 Test Mode : Wifi Date of Test : Mar 20, 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	31.620	14.43	17.27	0.58	32.28	40.00	7.72
	92.139	23.64	11.13	0.96	35.73	43.50	7.77
	151.597	19.73	11.88	1.29	32.90	43.50	10.60
	253.837	20.04	12.90	1.64	34.58	46.00	11.42
	372.005	15.89	15.63	1.97	33.49	46.00	12.51
	580.703	13.34	18.25	2.46	34.05	46.00	11.95
Vertical	32.749	17.99	16.78	0.58	35.35	40.00	4.65
	51.843	25.70	8.16	0.72	34.58	40.00	5.42
	63.983	26.16	6.84	0.80	33.80	40.00	6.20
	145.861	22.61	12.48	1.26	36.35	43.50	7.15
	226.099	20.96	11.34	1.56	33.86	46.00	12.14
	432.546	16.17	16.44	2.12	34.73	46.00	11.27

TEST ENGINEER: BYRON WU

5 DEVIATION TO TEST SPECIFICATIONS

None

