

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

LED LCD TV

Model No.	Brand
40H5C, 40H5D+ 40H5050, 40H5B, 40H5D	Hisense

FCC ID : W9HLCDD0067

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

Prepared By : Audix Technology (Shanghai) Co., Ltd.
3F and 4F, 34Bldg 680 Guiping Rd,
Caohejing Hi-Tech Park,
Shanghai 200233, China

Tel: +86-21-64955500
Fax: +86-21-64955491

Report No. : ACI-F16300
Date of Test : Dec 09-12, 2016
Date of Report : Dec 23, 2016

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TEST REPORT FOR FCC CERTIFICATE

Applicant : Hisense Electric Co., Ltd.
Manufacturer : Hisense Electric Co., Ltd.
Factory #1 : Hisense Electric Co., Ltd.
Factory #2 : Tatung Mexico S.A. de C.V.
Factory #3 : HISENSE ELECTRONICA MEXICO, S.A. DE C.V.
EUT Description : LED LCD TV

Model No.	Brand	Power Supply
40H5C, 40H5D+ 40H5050, 40H5B, 40H5D	Hisense	120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2015
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 Dec 09-12, 2016 is technically compliance with the FCC official limits also.

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

This report 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.F16302, a Verification report.

Date of Test : Dec 09-12, 2016 Date of Report : Dec 23, 2016

Producer : Tina Liang
TINA LIANG / Assistant

Review : Byron Wu
AUDIX For and on behalf of
Audix Technology (Shanghai) Co., Ltd. BYRON WU / Deputy Assistant Manager

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

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

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

Description of Test Item	Standard	Limits	Results
EMISSION			
Conducted Disturbance at the Mains Terminal	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2015 AND ANSI C63.4-2014	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2015 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.	Brand
40H5C, 40H5D+ 40H5050, 40H5B, 40H5D	Hisense

Note #1 : The above models are all the same except for model number. 40H5C model is tested and recorded in the report.

Note#2 : “+” represents any of the Arabic numeral, or spaces

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

Manufacturer : Same as Applicant

Factory #1 : Same as Applicant

Factory #2 : Tatung Mexico S.A. de C.V.
Miguel Catalán 420, Parque Industrial Rio Bravo,
Cd. Juarez, Chih., CP 32557

Factory #3 : HISENSE ELECTRONICA MEXICO,S.A. DE C.V.
Blvd. Sharp #3510 Parque Industrial
Rosarito, C.P. 22710 Playas de Rosarito, B.C.

LCD Panel : Manufacturer : Hisense
M/N : HD396DF-E01(010)

Tuner : Manufacturer : MAXLINEAR
M/N : MXL661

HDMI Cable*2 : Shielded, Detachable, 1.80m
(Lab provide)

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

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

LAN Cable : Unshielded, Detachable, 1.50m

Remark:

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

Side Port:

- (1) One ANT Port : Connected with ATSC SG/TV SG
- (2) One AUDIO OUT Port : Connected with Earphone#1
- (3) One HDMI1 Port : Connected with PC
- (4) One HDMI2 Port : Connected with DVD Player#1
- (5) One COMPONENT IN/AV IN Port : Connected with DVD PLAYER #2

Back Port:

- (6) One LAN Port : Connected with PC
- (7) One DIGITAL AUDIO Port : Connected with Audio Converter to Earphone#2
- (8) One USB Port : Connected with Hard-Disk
- (9) One Service Port : Do not open to customer
- (10) One AC Port : Connected with AC

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 Modem

Manufacturer : TP-LINK
Model Number : TM-EC5658V
Serial Number : 07123301053
Data Cable : Unshielded, Detachable, 1.5m
Certificate : CE/EMC, FCC DoC, VCCI, UL, CCC

2.2.3 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

2.2.4 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

2.2.5 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, Detachable, 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

2.3 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

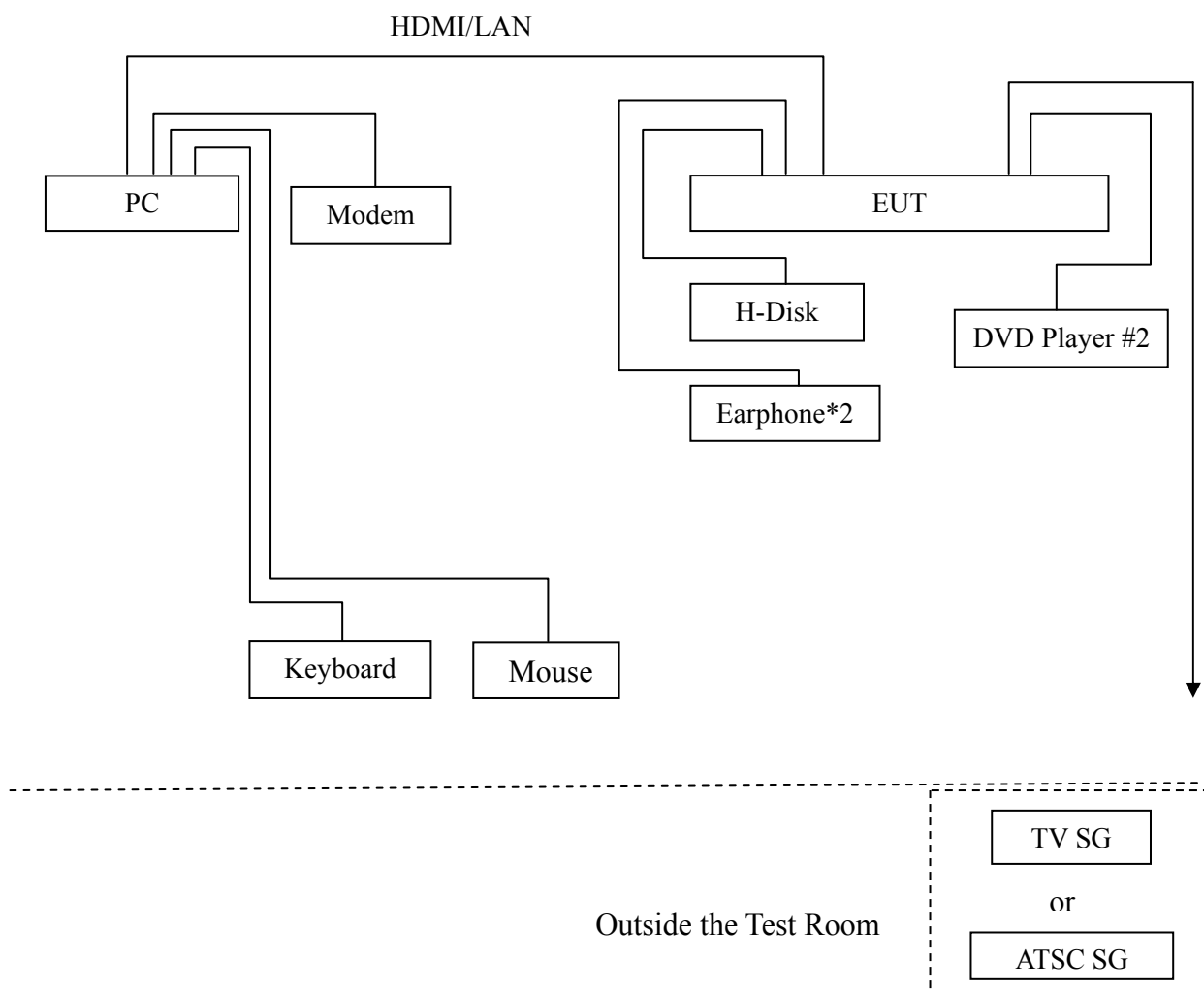
3.1 Test Equipment

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

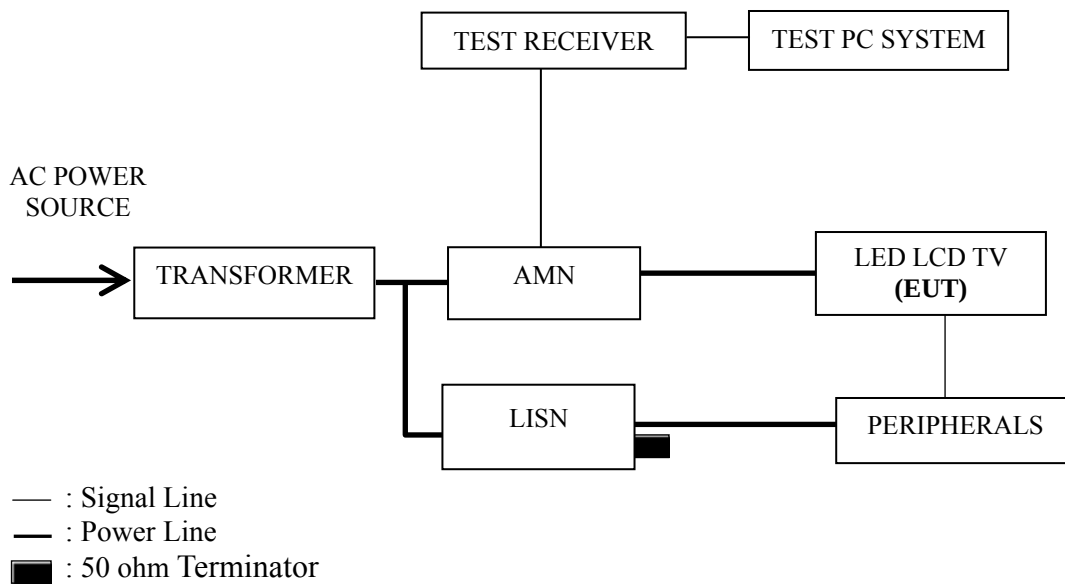
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Apr 27, 2016	Apr 26, 2017
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 25, 2016	Jun 24, 2017
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2016	Mar 19, 2017
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 (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/D-Sub Input).
- 3.5.5 PC system sent the 1kHz audio signal to EUT through audio port, the EUT speak out 1kHz audio signal.
- 3.5.6 In USB Play mode, set the EUT play digital media from H-Disk.
- 3.5.7 In LAN Play mode, set the EUT play digital media through LAN port.
- 3.5.8 The other peripherals devices were driven and operated during the test.
- 3.5.9 The test modes are as follows:

Test Mode
HDMI 1920*1080@60Hz & 1kHz Playing
HDMI 1280*1024@60Hz & 1kHz playing
HDMI 640*480@60Hz & 1kHz playing
HDMI1080P
USB Play
LAN Play

3.6 Test Procedures

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

Both sides of AC line (Line & Neutral) were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to ANSI C63.4:2014 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
HDMI 1920*1080@60Hz & 1kHz Playing	P13
HDMI 1280*1024@60Hz & 1kHz playing	P14
HDMI 640*480@60Hz & 1kHz playing	P15
HDMI1080P	P16
USB Play	P17
LAN Play	P18

NOTE 1 – Factor = Cable Loss + AMN Factor.

NOTE 2 – Emission Level = Meter Reading + Factor.

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

NOTE 4 – The worst case is for HDMI 1920*1080@60Hz & 1kHz Playing test mode.
The worst emission is detected at 0.661MHz (Quasi-Peak Value) with corrected signal level of 39.39 dB (μV) (limit is 46.00 dB (μV)), when the Neutral of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H5C Humidity : 48%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Dec 09, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	36.00	10.59	46.59	66.00	19.41	QP
	0.494	34.00	10.40	44.40	56.10	11.70	
	0.661	28.00	10.40	38.40	56.00	17.60	
	3.720	20.01	10.43	30.44	56.00	25.56	
	6.769	26.00	10.47	36.47	60.00	23.53	
	22.896	26.00	10.69	36.69	60.00	23.31	
	0.150	18.00	10.59	28.59	56.00	27.41	AV
	0.494	22.00	10.40	32.40	46.10	13.70	
	0.661	25.00	10.40	35.40	46.00	10.60	
	3.720	13.01	10.43	23.44	46.00	22.56	
	6.769	16.00	10.47	26.47	50.00	23.53	
	22.896	20.00	10.69	30.69	50.00	19.31	
Neutral	0.150	36.00	10.58	46.58	66.00	19.42	QP
	0.461	33.00	10.40	43.40	56.67	13.27	
	0.661	31.00	10.39	41.39	56.00	14.61	
	2.261	24.20	10.44	34.64	56.00	21.36	
	4.454	25.10	10.49	35.59	56.00	20.41	
	6.951	27.00	10.53	37.53	60.00	22.47	
	0.150	18.00	10.58	28.58	56.00	27.42	AV
	0.461	22.00	10.40	32.40	46.67	14.27	
	0.661	29.00	10.39	39.39	46.00	6.61	
	2.261	17.20	10.44	27.64	46.00	18.36	
	4.454	18.00	10.49	28.49	46.00	17.51	
	6.951	18.30	10.53	28.83	50.00	21.17	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H5C Humidity : 48%RH

Test Mode : HDMI 1280*1024@60Hz & 1kHz playing Date of Test : Dec 09, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	35.20	10.59	45.79	66.00	20.21	QP
	0.494	33.10	10.40	43.50	56.10	12.60	
	1.094	22.00	10.40	32.40	56.00	23.60	
	3.799	20.01	10.43	30.44	56.00	25.56	
	6.878	25.00	10.47	35.47	60.00	24.53	
	22.298	26.00	10.67	36.67	60.00	23.33	
	0.150	18.00	10.59	28.59	56.00	27.41	AV
	0.494	22.00	10.40	32.40	46.10	13.70	
	1.094	13.00	10.40	23.40	46.00	22.60	
	3.799	12.01	10.43	22.44	46.00	23.56	
	6.878	15.00	10.47	25.47	50.00	24.53	
	22.298	20.00	10.67	30.67	50.00	19.33	
Neutral	0.153	35.01	10.57	45.58	65.82	20.24	QP
	0.456	33.00	10.40	43.40	56.76	13.36	
	1.094	27.00	10.40	37.40	56.00	18.60	
	3.642	24.01	10.47	34.48	56.00	21.52	
	6.805	26.00	10.53	36.53	60.00	23.47	
	22.896	25.00	10.79	35.79	60.00	24.21	
	0.153	16.01	10.57	26.58	55.82	29.24	AV
	0.456	22.00	10.40	32.40	46.76	14.36	
	1.094	17.00	10.40	27.40	46.00	18.60	
	3.642	17.01	10.47	27.48	46.00	18.52	
	6.805	18.00	10.53	28.53	50.00	21.47	
	22.896	19.00	10.79	29.79	50.00	20.21	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H5C Humidity : 48%RH

Test Mode : HDMI 640*480@60Hz & 1kHz playing Date of Test : Jun 16, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	35.00	10.59	45.59	66.00	20.41	QP
	0.461	32.00	10.41	42.41	56.67	14.26	
	0.661	27.00	10.40	37.40	56.00	18.60	
	3.720	20.01	10.43	30.44	56.00	25.56	
	6.805	23.00	10.47	33.47	60.00	26.53	
	22.063	26.00	10.67	36.67	60.00	23.33	
	0.150	17.00	10.59	27.59	56.00	28.41	AV
	0.461	22.00	10.41	32.41	46.67	14.26	
	0.661	25.00	10.40	35.40	46.00	10.60	
	3.720	12.01	10.43	22.44	46.00	23.56	
	6.805	14.00	10.47	24.47	50.00	25.53	
	22.063	20.00	10.67	30.67	50.00	19.33	
Neutral	0.155	34.00	10.57	44.57	65.74	21.17	QP
	0.461	33.00	10.40	43.40	56.67	13.27	
	1.970	24.00	10.43	34.43	56.00	21.57	
	3.509	26.00	10.47	36.47	56.00	19.53	
	7.025	27.00	10.53	37.53	60.00	22.47	
	15.146	24.00	10.65	34.65	60.00	25.35	
	0.155	15.00	10.57	25.57	55.74	30.17	AV
	0.461	22.00	10.40	32.40	46.67	14.27	
	1.970	17.00	10.43	27.43	46.00	18.57	
	3.509	17.00	10.47	27.47	46.00	18.53	
	7.025	19.00	10.53	29.53	50.00	20.47	
	15.146	18.00	10.65	28.65	50.00	21.35	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H5C Humidity : 48%RH

Test Mode : HDMI1080P Date of Test : Dec 09, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	35.20	10.59	45.79	66.00	20.21	QP
	0.494	33.00	10.40	43.40	56.10	12.70	
	1.184	24.00	10.40	34.40	56.00	21.60	
	3.799	19.71	10.43	30.14	56.00	25.86	
	6.805	23.00	10.47	33.47	60.00	26.53	
	21.600	24.99	10.66	35.65	60.00	24.35	
	0.150	17.00	10.59	27.59	56.00	28.41	AV
	0.494	22.00	10.40	32.40	46.10	13.70	
	1.184	19.00	10.40	29.40	46.00	16.60	
	3.799	12.01	10.43	22.44	46.00	23.56	
	6.805	14.00	10.47	24.47	50.00	25.53	
	21.600	17.99	10.66	28.65	50.00	21.35	
Neutral	0.150	35.00	10.58	45.58	66.00	20.42	QP
	0.456	33.00	10.40	43.40	56.76	13.36	
	0.661	31.00	10.39	41.39	56.00	14.61	
	2.261	25.00	10.44	35.44	56.00	20.56	
	6.878	27.00	10.53	37.53	60.00	22.47	
	22.655	25.00	10.78	35.78	60.00	24.22	
	0.150	17.00	10.58	27.58	56.00	28.42	AV
	0.456	22.00	10.40	32.40	46.76	14.36	
	0.661	28.00	10.39	38.39	46.00	7.61	
	2.261	17.00	10.44	27.44	46.00	18.56	
	6.878	18.00	10.53	28.53	50.00	21.47	
	22.655	19.00	10.78	29.78	50.00	20.22	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H5C Humidity : 48%RH

Test Mode : USB Play Date of Test : Aug 16, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.161	33.01	10.57	43.58	65.43	21.85	QP
	0.494	33.10	10.40	43.50	56.10	12.60	
	1.184	24.00	10.40	34.40	56.00	21.60	
	3.509	22.00	10.43	32.43	56.00	23.57	
	6.769	25.00	10.47	35.47	60.00	24.53	
	21.830	25.00	10.66	35.66	60.00	24.34	
	0.161	14.01	10.57	24.58	55.43	30.85	AV
	0.494	22.00	10.40	32.40	46.10	13.70	
	1.184	19.00	10.40	29.40	46.00	16.60	
	3.509	13.00	10.43	23.43	46.00	22.57	
	6.769	15.00	10.47	25.47	50.00	24.53	
	21.830	19.00	10.66	29.66	50.00	20.34	
Neutral	0.153	34.01	10.57	44.58	65.82	21.24	QP
	0.447	33.00	10.41	43.41	56.93	13.52	
	1.094	26.00	10.40	36.40	56.00	19.60	
	2.261	24.40	10.44	34.84	56.00	21.16	
	4.952	25.00	10.50	35.50	56.00	20.50	
	6.698	26.00	10.53	36.53	60.00	23.47	
	0.153	16.01	10.57	26.58	55.82	29.24	AV
	0.447	21.00	10.41	31.41	46.93	15.52	
	1.094	17.00	10.40	27.40	46.00	18.60	
	2.261	17.00	10.44	27.44	46.00	18.56	
	4.952	19.00	10.50	29.50	46.00	16.50	
	6.698	18.00	10.53	28.53	50.00	21.47	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H5C Humidity : 48%RH

Test Mode : LAN Play Date of Test : Jun 16, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.152	35.00	10.59	45.59	65.91	20.32	QP
	0.484	32.00	10.40	42.40	56.27	13.87	
	0.661	27.00	10.40	37.40	56.00	18.60	
	3.799	20.01	10.43	30.44	56.00	25.56	
	6.769	25.00	10.47	35.47	60.00	24.53	
	21.830	25.00	10.66	35.66	60.00	24.34	
	0.152	16.00	10.59	26.59	55.91	29.32	AV
	0.484	22.00	10.40	32.40	46.27	13.87	
	0.661	15.00	10.40	25.40	46.00	20.60	
	3.799	12.01	10.43	22.44	46.00	23.56	
	6.769	15.00	10.47	25.47	50.00	24.53	
	21.830	19.00	10.66	29.66	50.00	20.34	
Neutral	0.150	35.00	10.58	45.58	66.00	20.42	QP
	0.456	33.00	10.40	43.40	56.76	13.36	
	0.788	26.50	10.39	36.89	56.00	19.11	
	2.261	25.00	10.44	35.44	56.00	20.56	
	4.952	25.00	10.50	35.50	56.00	20.50	
	7.100	26.00	10.53	36.53	60.00	23.47	
	0.150	17.00	10.58	27.58	56.00	28.42	AV
	0.456	22.00	10.40	32.40	46.76	14.36	
	0.788	16.50	10.39	26.89	46.00	19.11	
	2.261	17.00	10.44	27.44	46.00	18.56	
	4.952	19.00	10.50	29.50	46.00	16.50	
	7.100	18.00	10.53	28.53	50.00	21.47	

TEST ENGINEER: BYRON WU

4 RADIATED EMISSION TEST

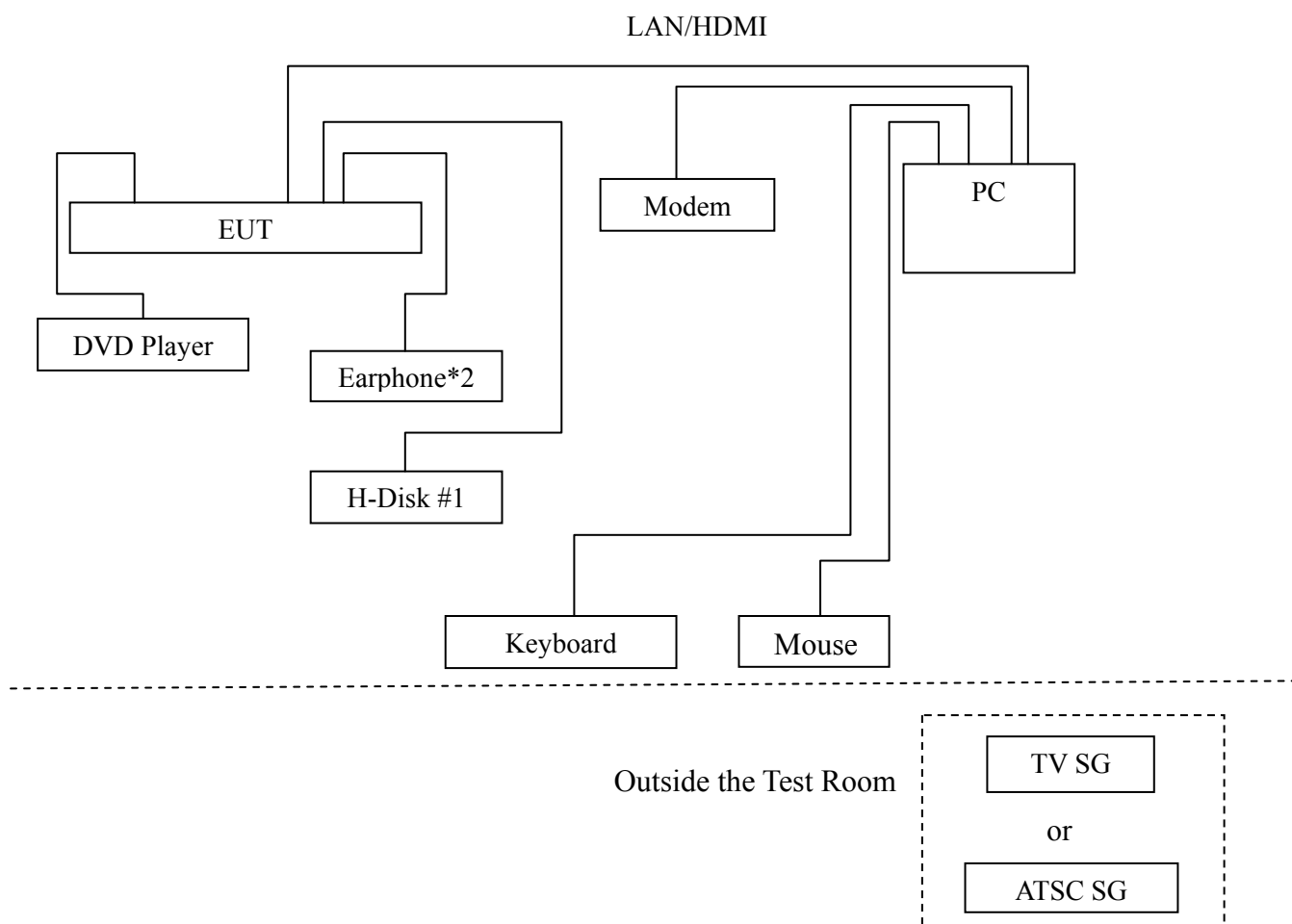
4.1 Test Equipment

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, 2016	Mar 19, 2017
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	--	--

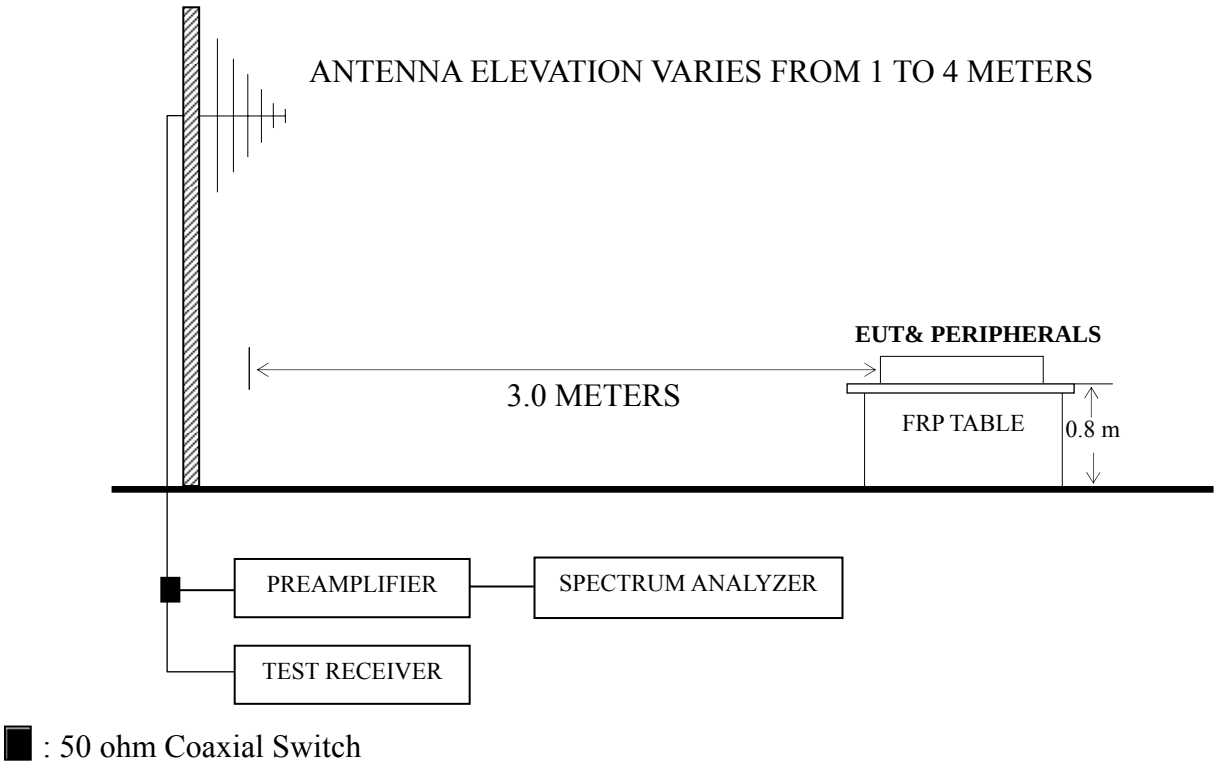
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals



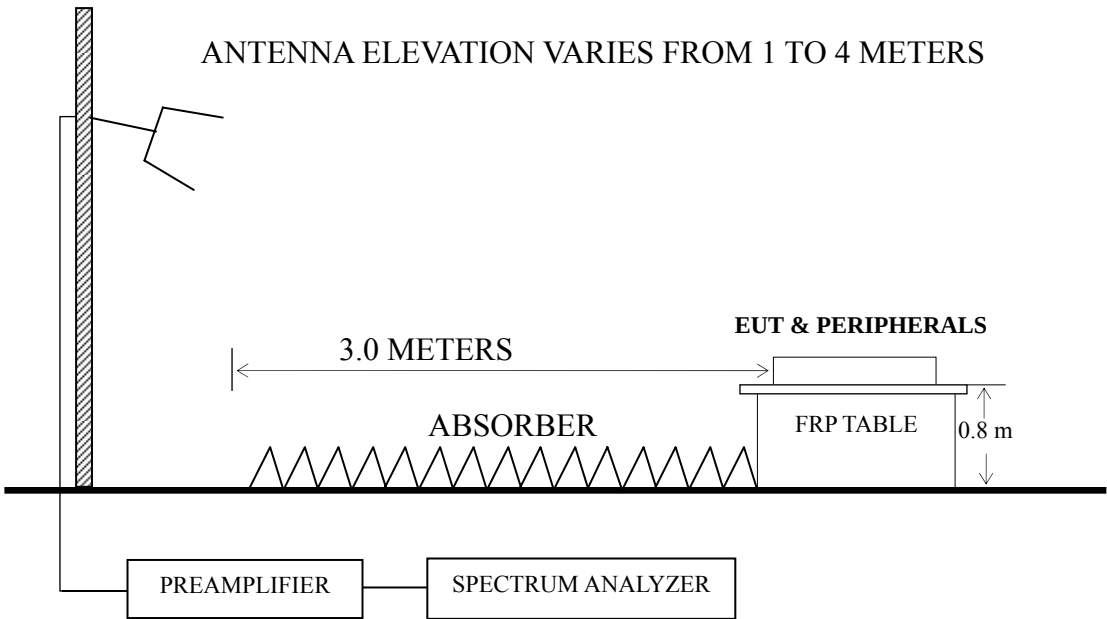
4.2.2 Radiated emission test setup

4.2.2.1 Below 1GHz



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.

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.

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

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 HDMI 1920*1080@60Hz & 1kHz Playing test mode. The worst emission at horizontal polarization was detected at 446.414 MHz with corrected signal level of 41.75dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 2.00 m height and the turntable was at 145°. The worst emission at vertical polarization was detected at 890.728 MHz with corrected signal level of 41.91dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 1 m height and the turntable was at 240°.

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H5C Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz Date of Test : Dec 12, 2016
& 1kHz Playing

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	107.888	23.31	12.17	1.05	--	36.53	43.50	6.97	QP
	153.200	24.52	11.73	1.29	--	37.54	43.50	5.96	
	237.910	27.70	11.98	1.60	--	41.28	46.00	4.72	
	446.414	22.87	16.73	2.15	--	41.75	46.00	4.25	
	742.259	19.45	19.57	2.79	--	41.81	46.00	4.19	
	890.728	17.83	21.10	3.07	--	42.00	46.00	4.00	
	1049.567	63.30	23.75	4.55	36.40	55.20	74.00	18.80	PK
	1570.703	59.16	25.90	3.98	35.59	53.45	74.00	20.55	
	1748.973	61.11	26.61	4.11	35.37	56.46	74.00	17.54	
	1049.567	44.31	23.75	4.55	36.40	36.21	54.00	17.79	AV
	1570.703	40.44	25.90	3.98	35.59	34.73	54.00	19.27	
	1748.973	41.77	26.61	4.11	35.37	37.12	54.00	16.88	

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : LC-75U Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Dec 12, 2016

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Vertical	30.000	16.50	18.40	0.56	--	35.46	40.00	4.54	QP
	157.007	25.51	11.43	1.31	--	38.25	43.50	5.25	
	236.645	24.93	11.92	1.59	--	38.44	46.00	7.56	
	446.414	22.28	16.73	2.15	--	41.16	46.00	4.84	
	742.259	19.08	19.57	2.79	--	41.44	46.00	4.56	
	890.728	17.74	21.10	3.07	--	41.91	46.00	4.09	PK
	1055.224	62.92	23.78	4.55	36.39	54.86	74.00	19.14	
	1231.021	63.54	24.58	3.56	36.08	55.60	74.00	18.40	
	1584.838	59.28	25.96	4.01	35.57	53.68	74.00	20.32	AV
	1055.224	42.34	23.78	4.55	36.39	34.28	54.00	19.72	
	1231.021	43.29	24.58	3.56	36.08	35.35	54.00	18.65	
	1584.838	38.11	25.96	4.01	35.57	32.51	54.00	21.49	

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H5C Humidity : 60%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Dec 12, 2016
& 1kHz Playing

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	107.888	23.80	12.17	1.05	37.02	43.50	6.48
	153.200	24.73	11.73	1.29	37.75	43.50	5.75
	239.320	26.46	12.04	1.60	40.10	46.00	5.90
	324.456	24.43	14.27	1.83	40.53	46.00	5.47
	647.386	18.33	19.27	2.61	40.21	46.00	5.79
	755.387	18.97	19.60	2.81	41.38	46.00	4.62
Vertical	30.000	15.50	18.40	0.56	34.46	40.00	5.54
	82.938	24.34	9.59	0.90	34.83	40.00	5.17
	107.888	23.91	12.17	1.05	37.13	43.50	6.37
	153.200	24.61	11.73	1.29	37.63	43.50	5.87
	324.456	25.47	14.27	1.83	41.57	46.00	4.43
	539.478	20.98	17.60	2.36	40.94	46.00	5.06

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H5C Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Dec 12, 2016

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	108.267	23.50	12.15	1.06	36.71	43.50	6.79
	158.112	24.54	11.38	1.32	37.24	43.50	6.26
	239.240	26.46	12.04	1.60	40.10	46.00	5.90
	373.311	16.28	15.66	1.97	33.91	46.00	12.09
	790.619	16.36	20.30	2.89	39.55	46.00	6.45
	952.094	14.10	21.70	3.16	38.96	46.00	7.04
Vertical	30.000	16.57	18.40	0.56	35.53	40.00	4.47
	33.917	17.52	16.35	0.60	34.47	40.00	5.53
	82.648	23.38	9.50	0.90	33.78	40.00	6.22
	108.647	24.66	12.15	1.06	37.87	43.50	5.63
	152.664	25.16	11.80	1.29	38.25	43.50	5.25
	239.147	26.18	12.04	1.60	39.82	46.00	6.18

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H5C Humidity : 60%RH

Test Mode : HDMI1080P Date of Test : Dec 12, 2016

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	85.898	22.84	10.20	0.93	33.97	40.00	6.03
	154.821	25.45	11.50	1.30	38.25	43.50	5.25
	223.733	25.76	11.20	1.56	38.52	46.00	7.48
	420.580	22.62	16.32	2.09	41.03	46.00	4.97
	494.199	20.25	17.38	2.25	39.88	46.00	6.12
	833.317	17.43	20.30	2.96	40.69	46.00	5.31
Vertical	34.639	18.54	15.93	0.60	35.07	40.00	4.93
	44.901	21.90	10.20	0.67	32.77	40.00	7.23
	91.816	24.14	11.07	0.96	36.17	43.50	7.33
	147.921	22.96	12.29	1.27	36.52	43.50	6.98
	238.310	26.83	11.98	1.60	40.41	46.00	5.59
	457.507	21.50	16.88	2.17	40.55	46.00	5.45

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H5C Humidity : 60%RH

Test Mode : USB Play Date of Test : Dec 12, 2016

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	34.156	16.06	16.21	0.60	32.87	40.00	7.13
	87.418	22.08	10.45	0.93	33.46	40.00	6.54
	207.850	23.63	10.48	1.51	35.62	43.50	7.88
	284.977	20.65	13.40	1.72	35.77	46.00	10.23
	616.372	16.47	18.75	2.54	37.76	46.00	8.24
	729.358	14.92	19.40	2.77	37.09	46.00	8.91
Vertical	34.396	17.71	16.02	0.60	34.33	40.00	5.67
	51.843	24.75	8.16	0.72	33.63	40.00	6.37
	190.405	23.25	10.00	1.44	34.69	43.50	8.81
	365.539	18.89	15.50	1.95	36.34	46.00	9.66
	443.294	19.11	16.67	2.15	37.93	46.00	8.07
	719.200	15.32	19.27	2.75	37.34	46.00	8.66

TEST ENGINEER: CAESAR WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 40H5C Humidity : 60%RH

Test Mode : LAN Play Date of Test : Dec 12, 2016

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	76.781	24.82	8.52	0.87	34.21	40.00	5.79
	100.581	20.51	12.39	1.00	33.90	43.50	9.60
	127.218	20.85	12.57	1.17	34.59	43.50	8.91
	162.041	24.20	11.21	1.33	36.74	43.50	6.76
	284.977	22.13	13.40	1.72	37.25	46.00	8.75
	506.479	16.03	17.56	2.28	35.87	46.00	10.13
Vertical	41.567	20.39	12.37	0.65	33.41	40.00	6.59
	66.034	23.78	7.01	0.81	31.60	40.00	8.40
	90.855	21.94	10.93	0.95	33.82	43.50	9.68
	144.335	22.95	12.68	1.25	36.88	43.50	6.62
	351.708	19.68	15.14	1.92	36.74	46.00	9.26
	656.530	15.69	19.23	2.63	37.55	46.00	8.45

TEST ENGINEER: CAESAR WU

5 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
SMcontact	SMR-TSL-4-3.5-5R	Qingdao Joinset Co., Ltd	See Internal Photos 13

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)

6 DEVIATION TO TEST SPECIFICATIONS

None

