

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

LED LCD TV

Model No.	Brand
HU65M5010UW, LC-65P8000U, LC-65N8002U	Sharp

FCC ID : W9HLCDF0098

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

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Report No. : ACI-F17029
Date of Test : Dec 28, 2016 –Jan 07, 2017
Date of Report : Jan 13, 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
HU65M5010UW, LC-65P8000U, LC-65N8002U	Sharp	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 28, 2016 –Jan 07, 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.F17028, a Verification report.

Date of Test : Dec 28, 2016 –Jan 07, 2017 Date of Report : Jan 13, 2016

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 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	:	<input checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type
Model No	:	HU65M5010UW, LC-65P8000U, LC-65N8002U
Brand	:	Sharp
Note	:	The above models are all the same except for the model number. The HU65M5010UW was tested and reported in the report.
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 : HD650M5U01
Tuner	:	Manufacturer : SILICON LABS M/N : Si2151-A10
HDMI Cable*4 (Lab provide)	:	Shielded, Detachable, 1.80m
Power Cord	:	Unshielded, Detachable, 1.80m, 2C
USB Cable*3 (Lab provide)	:	Shielded, Detachable, 1.00m
LAN Cable	:	Unshielded, Detachable, 1.50m
MHL to HDMI Adaptor: with RCP (Lab provide)	:	Manufacture: CE-Link M/N: 3002

Remark:

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

Side Port:

- (1) One USB3 Port : Connected with Hard-Disk
- (2) One HDMI2 Port : Connected with PC
- (3) One HDMI1/MHL Port : Connected with Smart Mobile Phone
- (4) One Audio out Port : Connected with Earphone
- (5) One Service Port : This port does not open to customer
- (6) One USB1 Port : Connected with Hard-Disk
- (7) One USB2 Port : Connected with Hard-Disk
- (8) One ANT/CABLE IN Port : Connected with ATSC SG / TV SG

Back Port:

- (9) One COMPONENT IN/AV IN Port : Connected with DVD Player
- (10) One LAN Port : Connected with PC
- (11) One DIGITAL AUDIO OUT Port : Connected with Audio Converter to Earphone
- (12) One HDMI3 Port : Connected with PC
- (13) One HDMI4 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 #1

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

2.2.8 Hard Disk #2

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

2.2.9 Hard Disk #3

Manufacturer : Tetasys
Model Number : F12
Serial Number : A010022-4A60007
Data Cable : Shielded, Detachable, 1.5m.
Certificate : CE, FCC DoC

2.2.10 ATSC Signal Generator

Manufacturer : SENCORE
Model Number : ATSC997
Serial Number : 6790071

2.2.11 TV Signal Generator

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

2.2.12 Smart Mobile Phone

Manufacturer : SAMSUNG
Model Number : GT-I9100G
Serial Number : 6935152011519
Certificate : CE/EMC

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

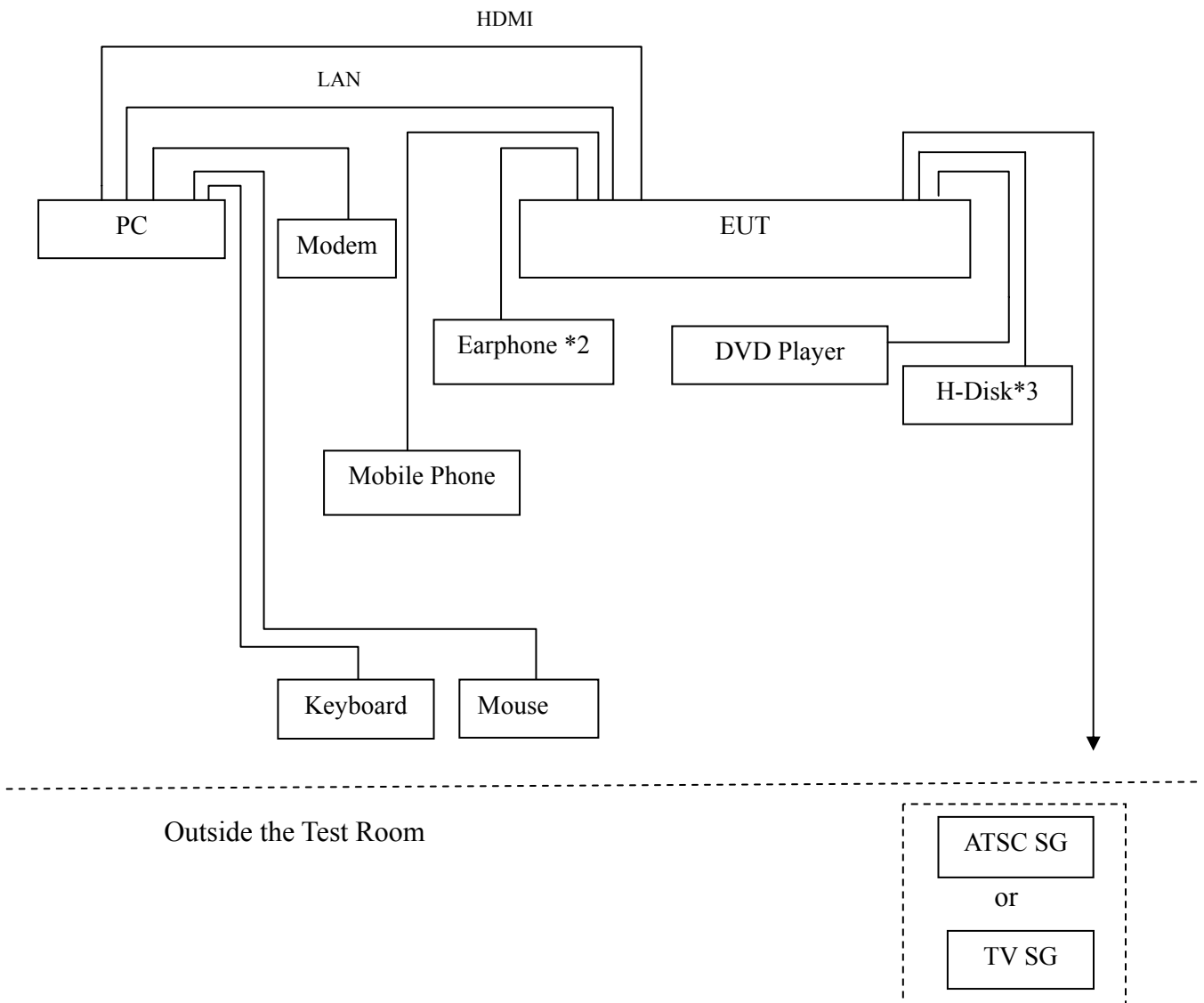
3.1 Test Equipment

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

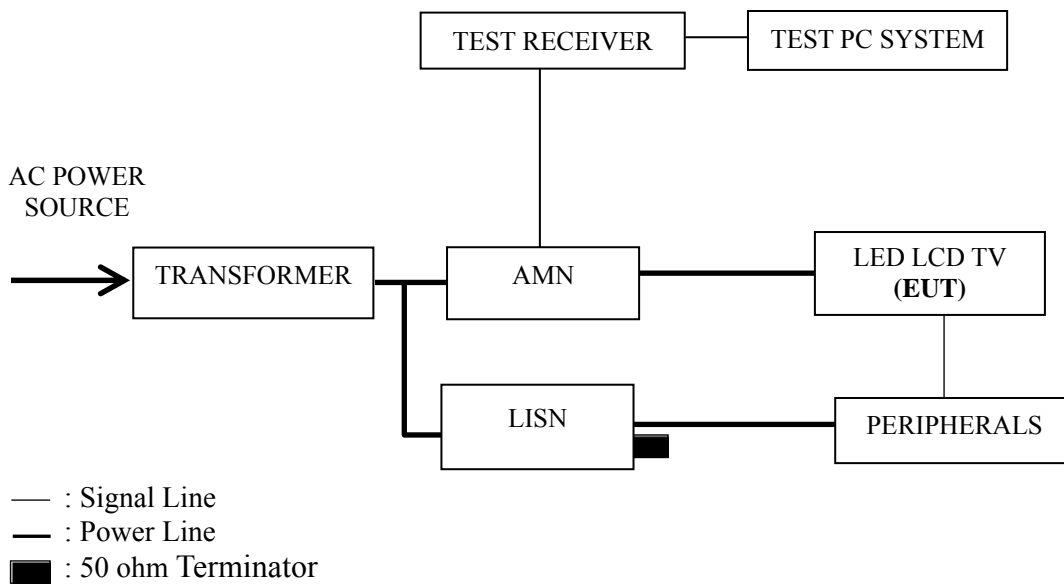
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Apr 27, 2016	Apr 26, 2017
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 25, 2016	Jun 24, 2017
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2016	Mar 19, 2017
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 In MHL mode, set the EUT play digital media from mobile phone.
- 3.5.9 The other peripherals devices were driven and operated during the test.
- 3.5.10 The test modes are as follows:

Test Mode
HDMI 3840*2160@60Hz & 1kHz Playing
HDMI 1920*1080@60Hz & 1kHz Playing
HDMI 1280*1024@60Hz & 1kHz playing
HDMI 640*480@60Hz & 1kHz playing
HDMI1080P
USB Play
LAN Play
MHL

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 3840*2160@60Hz & 1kHz Playing	P13
HDMI 1920*1080@60Hz & 1kHz Playing	P14
HDMI 1280*1024@60Hz & 1kHz playing	P15
HDMI 640*480@60Hz & 1kHz playing	P16
HDMI1080P	P17
USB Play	P18
LAN Play	P19
MHL	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 HDMI 3840*2160@60Hz & 1kHz Playing test mode.
The worst emission is detected at 0.166MHz (Quasi-Peak Value) with corrected signal level of 59.17 dB (μV) (limit is 65.16 dB (μV)), when the Line of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 48%RH

Test Mode : HDMI 3840*2160@60Hz Date of Test : Dec 28, 2016
& 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	0.166	48.60	10.57	59.17	65.16	5.99	QP
	0.426	30.80	10.42	41.22	57.33	16.11	
	0.694	29.10	10.40	39.50	56.00	16.50	
	1.858	25.40	10.41	35.81	56.00	20.19	
	4.822	20.20	10.45	30.65	56.00	25.35	
	16.398	21.50	10.57	32.07	60.00	27.93	
	0.166	36.10	10.57	46.67	55.16	8.49	AV
	0.426	21.80	10.42	32.22	47.33	15.11	
	0.694	15.10	10.40	25.50	46.00	20.50	
	1.858	14.00	10.41	24.41	46.00	21.59	
	4.822	13.50	10.45	23.95	46.00	22.05	
	16.398	15.90	10.57	26.47	50.00	23.53	
Neutral	0.166	48.50	10.56	59.06	65.16	6.10	QP
	0.398	29.50	10.42	39.92	57.90	17.98	
	0.641	32.60	10.39	42.99	56.00	13.01	
	1.236	24.00	10.41	34.41	56.00	21.59	
	4.622	23.09	10.50	33.59	56.00	22.41	
	17.755	21.50	10.69	32.19	60.00	27.81	
	0.166	35.90	10.56	46.46	55.16	8.70	AV
	0.398	15.20	10.42	25.62	47.90	22.28	
	0.641	20.50	10.39	30.89	46.00	15.11	
	1.236	15.30	10.41	25.71	46.00	20.29	
	4.622	15.29	10.50	25.79	46.00	20.21	
	17.755	15.40	10.69	26.09	50.00	23.91	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 48%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Dec 28, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.164	48.40	10.57	58.97	65.25	6.28	QP
	0.343	30.89	10.46	41.35	59.13	17.78	
	0.634	32.60	10.40	43.00	56.00	13.00	
	1.249	24.29	10.41	34.70	56.00	21.30	
	4.622	23.50	10.45	33.95	56.00	22.05	
	12.516	19.99	10.53	30.52	60.00	29.48	
	0.164	35.10	10.57	45.67	55.25	9.58	AV
	0.343	23.09	10.46	33.55	49.13	15.58	
	0.634	20.20	10.40	30.60	46.00	15.40	
	1.249	15.19	10.41	25.60	46.00	20.40	
	4.622	15.60	10.45	26.05	46.00	19.95	
	12.516	13.69	10.53	24.22	50.00	25.78	
Neutral	0.166	48.40	10.56	58.96	65.16	6.20	QP
	0.336	30.20	10.45	40.65	59.31	18.66	
	0.634	32.80	10.39	43.19	56.00	12.81	
	1.249	25.00	10.41	35.41	56.00	20.59	
	3.173	25.20	10.47	35.67	56.00	20.33	
	5.362	26.01	10.50	36.51	60.00	23.49	
	0.166	35.90	10.56	46.46	55.16	8.70	AV
	0.336	21.50	10.45	31.95	49.31	17.36	
	0.634	20.90	10.39	31.29	46.00	14.71	
	1.249	15.30	10.41	25.71	46.00	20.29	
	3.173	14.30	10.47	24.77	46.00	21.23	
	5.362	15.41	10.50	25.91	50.00	24.09	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 48%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Dec 28, 2016
& 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	0.164	48.60	10.57	59.17	65.25	6.08	QP
	0.421	31.59	10.43	42.02	57.42	15.40	
	0.641	33.10	10.40	43.50	56.00	12.50	
	1.878	22.90	10.41	33.31	56.00	22.69	
	4.822	25.00	10.45	35.45	56.00	20.55	
	17.018	23.20	10.57	33.77	60.00	26.23	
	0.164	34.80	10.57	45.37	55.25	9.88	AV
	0.421	21.49	10.43	31.92	47.42	15.50	
	0.641	21.00	10.40	31.40	46.00	14.60	
	1.878	13.30	10.41	23.71	46.00	22.29	
	4.822	14.80	10.45	25.25	46.00	20.75	
	17.018	17.60	10.57	28.17	50.00	21.83	
Neutral	0.166	48.50	10.56	59.06	65.16	6.10	QP
	0.417	31.60	10.42	42.02	57.51	15.49	
	0.641	33.50	10.39	43.89	56.00	12.11	
	1.662	23.50	10.42	33.92	56.00	22.08	
	3.293	23.70	10.47	34.17	56.00	21.83	
	5.362	24.41	10.50	34.91	60.00	25.09	
	0.166	36.00	10.56	46.56	55.16	8.60	AV
	0.417	20.10	10.42	30.52	47.51	16.99	
	0.641	22.10	10.39	32.49	46.00	13.51	
	1.662	13.80	10.42	24.22	46.00	21.78	
	3.293	12.10	10.47	22.57	46.00	23.43	
	5.362	16.81	10.50	27.31	50.00	22.69	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 48%RH

Test Mode : HDMI 640*480@60Hz & 1kHz playing Date of Test : Dec 28, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.166	48.60	10.57	59.17	65.16	5.99	QP
	0.426	31.50	10.42	41.92	57.33	15.41	
	0.641	32.40	10.40	42.80	56.00	13.20	
	1.839	25.60	10.41	36.01	56.00	19.99	
	4.822	22.40	10.45	32.85	56.00	23.15	
	16.055	21.80	10.56	32.36	60.00	27.64	
	0.166	35.90	10.57	46.47	55.16	8.69	AV
	0.426	21.80	10.42	32.22	47.33	15.11	
	0.641	19.70	10.40	30.10	46.00	15.90	
	1.839	14.50	10.41	24.91	46.00	21.09	
	4.822	14.40	10.45	24.85	46.00	21.15	
	16.055	16.40	10.56	26.96	50.00	23.04	
Neutral	0.166	48.50	10.56	59.06	65.16	6.10	QP
	0.421	31.29	10.42	41.71	57.42	15.71	
	0.641	32.80	10.39	43.19	56.00	12.81	
	1.858	25.40	10.43	35.83	56.00	20.17	
	4.772	23.30	10.50	33.80	56.00	22.20	
	14.986	21.20	10.65	31.85	60.00	28.15	
	0.166	35.90	10.56	46.46	55.16	8.70	AV
	0.421	21.99	10.42	32.41	47.42	15.01	
	0.641	21.10	10.39	31.49	46.00	14.51	
	1.858	13.50	10.43	23.93	46.00	22.07	
	4.772	14.60	10.50	25.10	46.00	20.90	
	14.986	15.60	10.65	26.25	50.00	23.75	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 48%RH

Test Mode : HDMI1080P Date of Test : Dec 28, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.164	48.20	10.57	58.77	65.25	6.48	QP
	0.421	31.59	10.43	42.02	57.42	15.40	
	0.634	32.30	10.40	42.70	56.00	13.30	
	1.249	24.99	10.41	35.40	56.00	20.60	
	4.672	22.60	10.45	33.05	56.00	22.95	
	15.388	21.60	10.55	32.15	60.00	27.85	
	0.164	34.10	10.57	44.67	55.25	10.58	AV
	0.421	21.79	10.43	32.22	47.42	15.20	
	0.634	19.60	10.40	30.00	46.00	16.00	
	1.249	14.99	10.41	25.40	46.00	20.60	
	4.672	14.70	10.45	25.15	46.00	20.85	
	15.388	15.90	10.55	26.45	50.00	23.55	
Neutral	0.166	48.40	10.56	58.96	65.16	6.20	QP
	0.421	31.69	10.42	42.11	57.42	15.31	
	0.621	31.71	10.38	42.09	56.00	13.91	
	1.645	24.20	10.42	34.62	56.00	21.38	
	4.622	23.99	10.50	34.49	56.00	21.51	
	15.226	21.30	10.65	31.95	60.00	28.05	
	0.166	35.70	10.56	46.26	55.16	8.90	AV
	0.421	21.69	10.42	32.11	47.42	15.31	
	0.621	18.51	10.38	28.89	46.00	17.11	
	1.645	13.20	10.42	23.62	46.00	22.38	
	4.622	15.29	10.50	25.79	46.00	20.21	
	15.226	15.90	10.65	26.55	50.00	23.45	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 48%RH

Test Mode : USB Play Date of Test : Dec 28, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark	
Line	0.166	48.60	10.57	59.17	65.16	5.99	QP	
	0.426	31.50	10.42	41.92	57.33	15.41		
	0.634	32.20	10.40	42.60	56.00	13.40		
	1.716	23.20	10.41	33.61	56.00	22.39		
	4.622	23.30	10.45	33.75	56.00	22.25		
	14.986	21.30	10.55	31.85	60.00	28.15		
	0.166	36.00	10.57	46.57	55.16	8.59	AV	
	0.426	22.00	10.42	32.42	47.33	14.91		
	0.634	20.40	10.40	30.80	46.00	15.20		
	1.716	12.90	10.41	23.31	46.00	22.69		
	4.622	15.40	10.45	25.85	46.00	20.15		
	14.986	15.80	10.55	26.35	50.00	23.65		
	Neutral	0.166	48.40	10.56	58.96	65.16	6.20	QP
		0.343	31.89	10.45	42.34	59.13	16.79	
0.679		30.20	10.39	40.59	56.00	15.41		
1.744		26.29	10.43	36.72	56.00	19.28		
3.985		22.39	10.49	32.88	56.00	23.12		
14.672		21.70	10.65	32.35	60.00	27.65		
0.166		35.70	10.56	46.26	55.16	8.90	AV	
0.343		25.29	10.45	35.74	49.13	13.39		
0.679		17.30	10.39	27.69	46.00	18.31		
1.744		14.99	10.43	25.42	46.00	20.58		
3.985		12.49	10.49	22.98	46.00	23.02		
14.672		15.80	10.65	26.45	50.00	23.55		

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 48%RH

Test Mode : LAN Play Date of Test : Dec 28, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.164	48.30	10.57	58.87	65.25	6.38	QP
	0.426	31.60	10.42	42.02	57.33	15.31	
	0.641	32.10	10.40	42.50	56.00	13.50	
	1.698	25.60	10.41	36.01	56.00	19.99	
	4.672	23.50	10.45	33.95	56.00	22.05	
	14.828	21.50	10.55	32.05	60.00	27.95	
	0.164	34.40	10.57	44.97	55.25	10.28	AV
	0.426	21.50	10.42	31.92	47.33	15.41	
	0.641	19.00	10.40	29.40	46.00	16.60	
	1.698	15.50	10.41	25.91	46.00	20.09	
	4.672	15.00	10.45	25.45	46.00	20.55	
	14.828	16.00	10.55	26.55	50.00	23.45	
Neutral	0.166	48.40	10.56	58.96	65.16	6.20	QP
	0.339	31.49	10.45	41.94	59.22	17.28	
	0.661	30.10	10.39	40.49	56.00	15.51	
	1.698	26.59	10.43	37.02	56.00	18.98	
	4.574	22.79	10.50	33.29	56.00	22.71	
	16.055	21.49	10.67	32.16	60.00	27.84	
	0.166	35.80	10.56	46.36	55.16	8.80	AV
	0.339	24.79	10.45	35.24	49.22	13.98	
	0.661	16.90	10.39	27.29	46.00	18.71	
	1.698	15.99	10.43	26.42	46.00	19.58	
	4.574	14.99	10.50	25.49	46.00	20.51	
	16.055	16.19	10.67	26.86	50.00	23.14	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C
 Model No. : HU65M5010UW Humidity : 48%RH
 Test Mode : MHL Date of Test : Dec 28, 2016

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.164	48.30	10.57	58.87	65.25	6.38	QP
	0.421	31.49	10.43	41.92	57.42	15.50	
	0.679	30.40	10.40	40.80	56.00	15.20	
	1.819	25.40	10.41	35.81	56.00	20.19	
	4.622	23.00	10.45	33.45	56.00	22.55	
	16.486	21.60	10.57	32.17	60.00	27.83	
	0.164	34.40	10.57	44.97	55.25	10.28	AV
	0.421	22.19	10.43	32.62	47.42	14.80	
	0.679	16.30	10.40	26.70	46.00	19.30	
	1.819	14.50	10.41	24.91	46.00	21.09	
	4.622	15.00	10.45	25.45	46.00	20.55	
	16.486	16.30	10.57	26.87	50.00	23.13	
Neutral	0.166	48.50	10.56	59.06	65.16	6.10	QP
	0.417	31.20	10.42	41.62	57.51	15.89	
	0.627	32.11	10.38	42.49	56.00	13.51	
	1.680	25.30	10.42	35.72	56.00	20.28	
	4.574	23.29	10.50	33.79	56.00	22.21	
	14.517	20.59	10.65	31.24	60.00	28.76	
	0.166	35.80	10.56	46.36	55.16	8.80	AV
	0.417	21.40	10.42	31.82	47.51	15.69	
	0.627	19.81	10.38	30.19	46.00	15.81	
	1.680	14.70	10.42	25.12	46.00	20.88	
	4.574	15.29	10.50	25.79	46.00	20.21	
	14.517	15.69	10.65	26.34	50.00	23.66	

TEST ENGINEER: BYRON WU

4 RADIATED EMISSION TEST

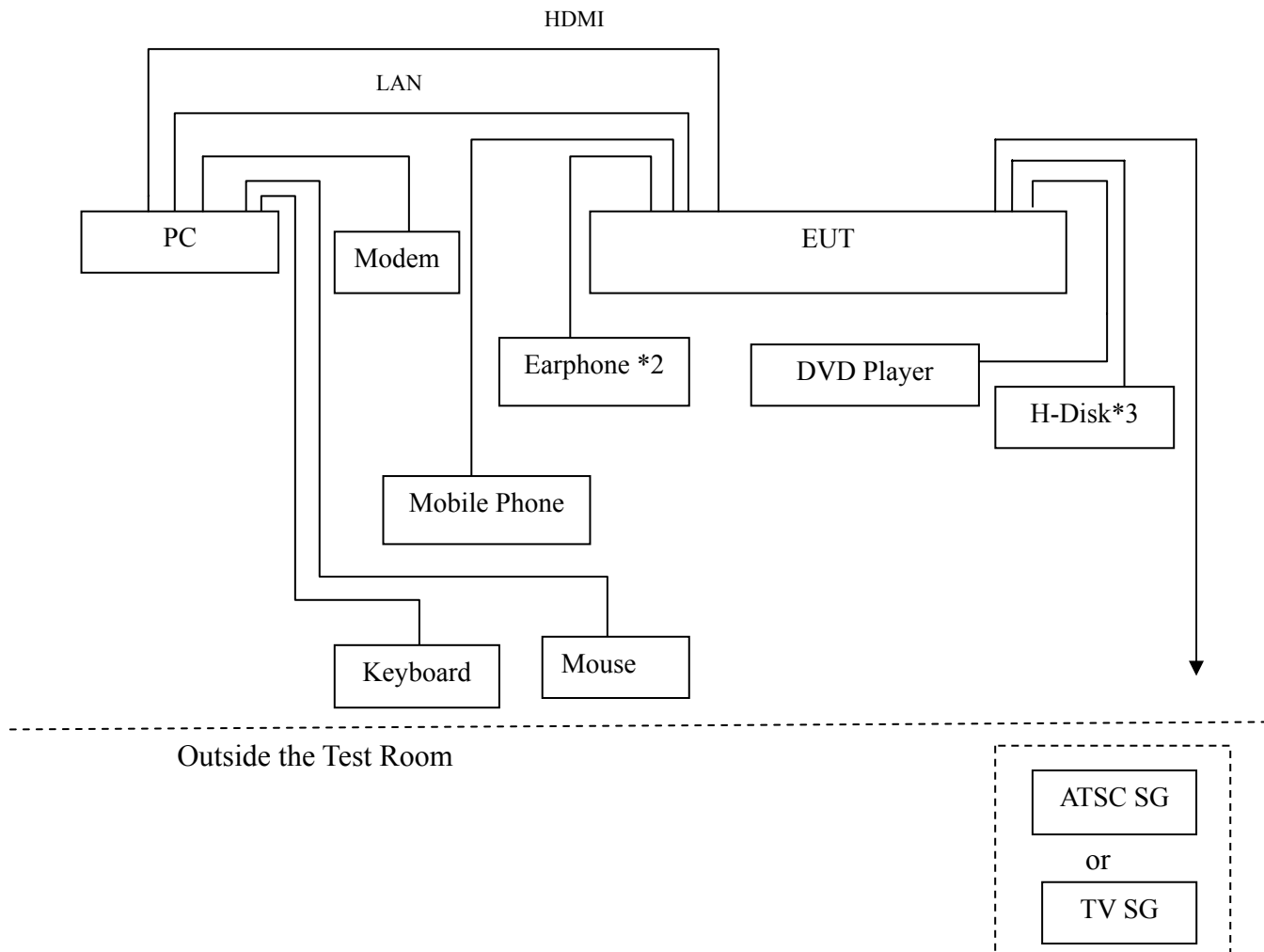
4.1 Test Equipment

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	--	--

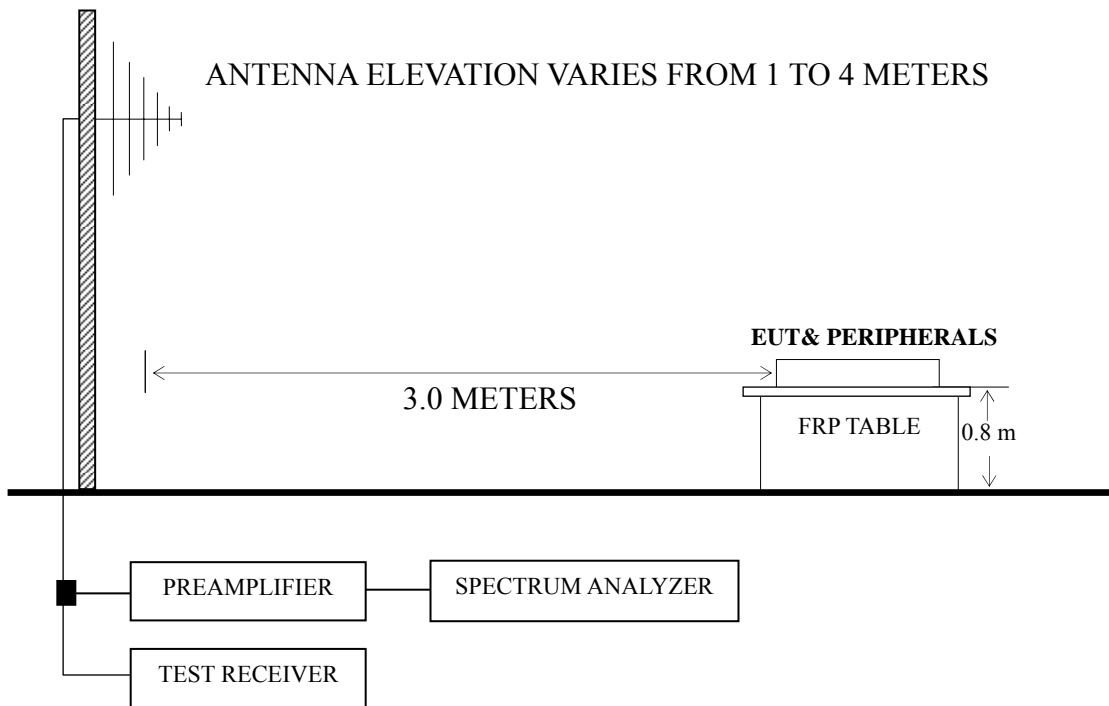
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals



4.2.2 Radiated emission test setup

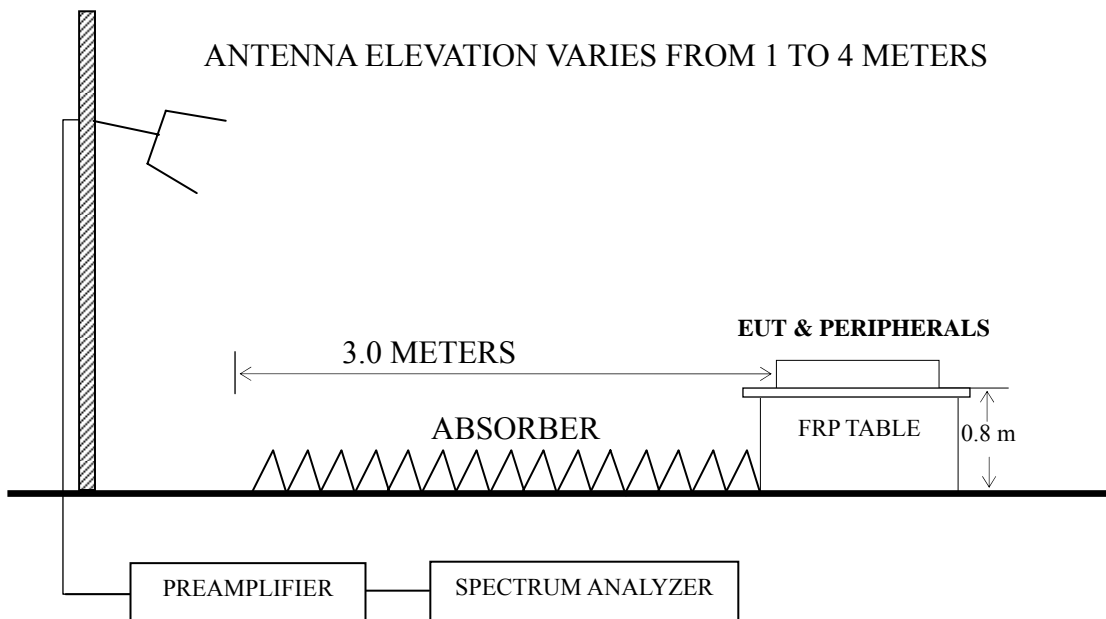
4.2.2.1 Below 1GHz



■ : 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	
		($\mu\text{V}/\text{m}$)	dB ($\mu\text{V}/\text{m}$)
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

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

4.4 Test Configuration

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

Please refer to Sec.3.4.

4.5 Operating Condition of EUT

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

4.6 Test Procedures

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

Frequency	Test Mode	Data Page
Below 1GHz	HDMI 3840*2160@60Hz & 1kHz Playing	P25-P26
	HDMI 1920*1080@60Hz & 1kHz Playing	P27
	HDMI 1280*1024@60Hz & 1kHz playing	P28
	HDMI 640*480@60Hz & 1kHz playing	P29
	HDMI1080P	P30
	USB Play	P31
	LAN Play	P32
	MHL	P33
Above 1GHz	HDMI 3840*2160@60Hz & 1kHz Playing	P25-P26

- 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 3840*2160@60Hz & 1kHz Playing test mode. The worst emission at horizontal polarization was detected at 480.528 MHz with corrected signal level of 41.71dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 2.0 m height and the turntable was at 250°. The worst emission at vertical polarization was detected at 31.955 MHz with corrected signal level of 35.80dB (μV/m) (limit is 40.00 dB (μV/m)), when the antenna was 1.2 m height and the turntable was at 55°.

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 60%RH

Test Mode : HDMI 3840*2160@60Hz & 1kHz Playing Date of Test : Jan 07, 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	80.081	21.67	8.90	0.89	0.00	31.46	40.00	8.54	QP
	154.821	23.34	11.50	1.30	0.00	36.14	43.50	7.36	
	167.824	25.85	10.99	1.36	0.00	38.20	43.50	5.30	
	330.195	18.06	14.50	1.85	0.00	34.41	46.00	11.59	
	480.528	22.29	17.20	2.22	0.00	41.71	46.00	4.29	
	890.728	14.87	21.10	3.07	0.00	39.04	46.00	6.96	PK
	1317.757	59.14	24.92	3.82	35.98	51.90	74.00	22.10	
	2659.932	55.11	29.10	5.48	35.20	54.49	74.00	19.51	
	2951.232	58.71	30.30	5.78	35.20	59.59	74.00	14.41	AV
	1317.757	41.55	24.92	3.82	35.98	34.31	54.00	19.69	
	2659.932	38.66	29.10	5.48	35.20	38.04	54.00	15.96	
2951.232	40.77	30.30	5.78	35.20	41.65	54.00	12.35		

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 60%RH

Test Mode : HDMI 3840*2160@60Hz & 1kHz Playing Date of Test : Jan 07, 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	31.955	18.12	17.10	0.58	0.00	35.80	40.00	4.20	QP
	56.001	24.37	7.40	0.75	0.00	32.52	40.00	7.48	
	167.824	23.31	10.99	1.36	0.00	35.66	43.50	7.84	
	297.224	19.59	13.60	1.75	0.00	34.94	46.00	11.06	
	480.528	21.62	17.20	2.22	0.00	41.04	46.00	4.96	
	890.728	15.96	21.10	3.07	0.00	40.13	46.00	5.87	
	1767.877	56.74	26.68	4.41	35.43	52.40	74.00	21.60	PK
	2655.171	58.44	29.10	5.48	35.20	57.82	74.00	16.18	
	2945.949	58.98	30.30	5.78	35.20	59.86	74.00	14.14	
	1767.877	40.79	26.68	4.41	35.43	36.45	54.00	17.55	AV
	2655.171	41.55	29.10	5.48	35.20	40.93	54.00	13.07	
	2945.949	42.52	30.30	5.78	35.20	43.40	54.00	10.60	

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 60%RH

Test Mode : HDMI 1920*1080@60Hz & 1kHz Playing Date of Test : Jan 07, 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	78.965	21.24	8.75	0.88	30.87	40.00	9.13
	154.821	23.77	11.50	1.30	36.57	43.50	6.93
	167.824	26.25	10.99	1.36	38.60	43.50	4.90
	410.383	22.00	16.20	2.06	40.26	46.00	5.74
	480.528	21.34	17.20	2.22	40.76	46.00	5.24
	742.259	16.59	19.57	2.79	38.95	46.00	7.05
Vertical	31.955	15.63	17.10	0.58	33.31	40.00	6.69
	55.027	23.85	7.62	0.74	32.21	40.00	7.79
	167.824	21.39	10.99	1.36	33.74	43.50	9.76
	446.414	21.57	16.73	2.15	40.45	46.00	5.55
	480.528	21.41	17.20	2.22	40.83	46.00	5.17
	593.050	13.83	18.25	2.50	34.58	46.00	11.42

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 60%RH

Test Mode : HDMI 1280*1024@60Hz Date of Test : Jan 07, 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	80.081	20.92	8.90	0.89	30.71	40.00	9.29
	167.824	26.05	10.99	1.36	38.40	43.50	5.10
	324.456	22.97	14.27	1.83	39.07	46.00	6.93
	480.528	21.19	17.20	2.22	40.61	46.00	5.39
	647.386	12.02	19.27	2.61	33.90	46.00	12.10
	900.147	14.43	21.20	3.09	38.72	46.00	7.28
Vertical	31.955	15.48	17.10	0.58	33.16	40.00	6.84
	56.001	23.87	7.40	0.75	32.02	40.00	7.98
	102.001	18.15	12.36	1.01	31.52	43.50	11.98
	167.824	20.36	10.99	1.36	32.71	43.50	10.79
	480.528	20.81	17.20	2.22	40.23	46.00	5.77
	955.438	10.10	21.75	3.18	35.03	46.00	10.97

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 60%RH

Test Mode : HDMI 640*480@60Hz & 1kHz Playing Date of Test : Jan 07, 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	77.865	20.40	8.64	0.88	29.92	40.00	10.08
	154.821	24.50	11.50	1.30	37.30	43.50	6.20
	167.824	25.13	10.99	1.36	37.48	43.50	6.02
	410.383	22.79	16.20	2.06	41.05	46.00	4.95
	477.169	21.76	17.18	2.22	41.16	46.00	4.84
	890.728	14.71	21.10	3.07	38.88	46.00	7.12
Vertical	34.037	15.91	16.30	0.60	32.81	40.00	7.19
	56.001	24.57	7.40	0.75	32.72	40.00	7.28
	102.001	16.31	12.36	1.01	29.68	43.50	13.82
	167.824	21.07	10.99	1.36	33.42	43.50	10.08
	477.169	20.73	17.18	2.22	40.13	46.00	5.87
	958.794	10.29	21.80	3.18	35.27	46.00	10.73

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 60%RH

Test Mode : HDMI1080P Date of Test : Jan 07, 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	78.965	22.65	8.75	0.88	32.28	40.00	7.72
	167.824	26.05	10.99	1.36	38.40	43.50	5.10
	297.224	18.54	13.60	1.75	33.89	46.00	12.11
	422.058	15.45	16.33	2.09	33.87	46.00	12.13
	479.930	21.00	17.20	2.22	40.42	46.00	5.58
	900.147	16.15	21.20	3.09	40.44	46.00	5.56
Vertical	31.180	14.13	17.62	0.57	32.32	40.00	7.68
	56.001	24.00	7.40	0.75	32.15	40.00	7.85
	167.824	23.87	10.99	1.36	36.22	43.50	7.28
	426.521	18.63	16.37	2.10	37.10	46.00	8.90
	479.770	15.80	17.20	2.22	35.22	46.00	10.78
	890.728	16.12	21.10	3.07	40.29	46.00	5.71

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 60%RH

Test Mode : USB Play Date of Test : Jan 07, 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	65.803	25.16	6.98	0.81	32.95	40.00	7.05
	88.342	19.54	10.55	0.94	31.03	43.50	12.47
	121.123	22.25	12.14	1.13	35.52	43.50	7.98
	202.810	20.02	10.20	1.49	31.71	43.50	11.79
	295.147	18.82	13.60	1.75	34.17	46.00	11.83
	665.804	11.36	19.30	2.65	33.31	46.00	12.69
Vertical	59.649	25.18	6.66	0.77	32.61	40.00	7.39
	104.903	18.44	12.30	1.03	31.77	43.50	11.73
	176.888	21.01	10.51	1.39	32.91	43.50	10.59
	282.985	17.92	13.45	1.72	33.09	46.00	12.91
	482.216	19.54	17.22	2.23	38.99	46.00	7.01
	701.761	12.85	19.13	2.71	34.69	46.00	11.31

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 60%RH

Test Mode : LAN Play Date of Test : Jan 07, 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	64.659	22.80	6.88	0.80	30.48	40.00	9.52
	79.243	22.00	8.79	0.88	31.67	40.00	8.33
	156.458	21.91	11.45	1.31	34.67	43.50	8.83
	419.108	15.04	16.30	2.09	33.43	46.00	12.57
	744.866	9.41	19.53	2.79	31.73	46.00	14.27
	839.182	11.62	20.20	2.98	34.80	46.00	11.20
Vertical	32.520	15.28	16.89	0.58	32.75	40.00	7.25
	82.938	19.91	9.59	0.90	30.40	40.00	9.60
	144.335	19.06	12.68	1.25	32.99	43.50	10.51
	230.907	19.29	11.56	1.58	32.43	46.00	13.57
	562.662	11.88	18.12	2.42	32.42	46.00	13.58
	848.056	12.28	20.50	2.98	35.76	46.00	10.24

TEST ENGINEER: BYRON WU

EUT : LED LCD TV Temperature : 22°C

Model No. : HU65M5010UW Humidity : 60%RH

Test Mode : MHL Date of Test : Jan 07, 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	87.725	20.53	10.45	0.93	31.91	40.00	8.09
	152.664	21.94	11.80	1.29	35.03	43.50	8.47
	297.224	18.34	13.60	1.75	33.69	46.00	12.31
	429.523	18.62	16.40	2.12	37.14	46.00	8.86
	620.710	12.13	18.80	2.56	33.49	46.00	12.51
	903.309	12.92	21.25	3.09	37.26	46.00	8.74
Vertical	31.731	14.77	17.27	0.58	32.62	40.00	7.38
	47.326	21.30	9.39	0.69	31.38	40.00	8.62
	78.689	21.78	8.75	0.88	31.41	40.00	8.59
	217.544	19.79	10.96	1.54	32.29	46.00	13.71
	522.718	14.61	17.56	2.32	34.49	46.00	11.51
	818.834	13.36	20.30	2.94	36.60	46.00	9.40

TEST ENGINEER: BYRON WU

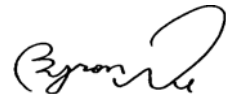
5 DEBUG DESCRIPTION

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 Appendix Figure 19

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