

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

LED LCD TV

Model No.	Brand
LTDN50K220GWUS	Hisense
50H5GB	

FCC ID : W9HLCDF0052

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

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Report No. : ACI-F15003  
Date of Test : Dec 16 – 17, 2014  
Date of Report : Jan 04, 2015

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## TEST REPORT FOR FCC CERTIFICATE

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

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

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2013  
AND ANSI C63.4-2003*

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

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report shows that the EUT (M/N: Refer to Sec2.1) which was tested in 3m anechoic chamber Dec 16 – 17, 2014 is technically compliance with the FCC official limits also.

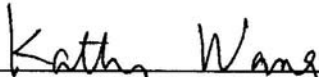
This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report contains data that are not covered by the NVLAP accreditation.


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

***The test results for EUT's TV functions are contained in No.F15004, a Verification report.***

Date of Test : Dec 16 – 17, 2014      Date of Report : Jan 04, 2015

Producer :   
 KATHY WANG / Supervisor

Review :   
 SAMMY CHEN / Deputy 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:

<b>Description of Test Item</b>	<b>Standard</b>	<b>Limits</b>	<b>Results</b>
<b>EMISSION</b>			
Conducted Disturbance at the Mains Terminal	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2013 AND ANSI C63.4-2003	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2013 AND ANSI C63.4-2003	15.109(a) Class B	Pass

## 2 GENERAL INFORMATION

### 2.1 Description of Equipment Under Test

Description	:	LED LCD TV
Type of EUT	:	<input checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type
Model No.	:	LTDN50K220GWUS, 50H5GB
Note	:	The above models are all the same except for model name. 50H5GB model is tested and Recorded in the report.
Brand Name	:	Hisense
Applicant	:	Hisense Electric Co., Ltd. No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China
Manufacturer	:	Hisense Electric Co., Ltd. No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China
Factory #1	:	Hisense Electric Co., Ltd. No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China
Factory #2	:	Tatung Mexico S.A. de C.V. Miguel Catalán 420, Parque Industrial Rio Bravo, Cd. Juarez, Chih., CP 32557
LCD Panel	:	Manufacturer : Hisense M/N : HD500DF-B53\S1\ROH
Max Resolution	:	1920*1080@60Hz
HDMI Cable	:	Shielded, Detachable, 1.00m
Power Cord	:	Unshielded, Detachable, 1.80m

**Remark:**

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

## Bottom Port:

- (1) One HDMI3/ARC Port : Connected with DVD PLAYER#1
- (2) One HDMI2 Port : Connected with DVD PLAYER#2
- (3) One DVI AUDIO IN Port : Connected with PC
- (4) One LAN Port : Connected with PC
- (5) One DIGITAL AUDIO OUT Port : Connected with DVD PLAYER #2
- (6) One HDMI1/DVI Port : Connected with PC

## Side Port:

- (1) Two USB Ports : Connected with U-Disk
- (2) One ANT/CABLE IN Port : Connected with Antenna or ATSC SG / TV SG
- (3) One component of Audio/YPbPr Audio Port : Connected with DVD PLAYER#1
- (4) One component of Video/YPbPr Port : Connected with DVD PLAYER#1
- (5) One AUDIO OUT Port : Connected with Earphone

## 2.2 Peripherals

### 2.2.1 PC

Manufacturer : HP  
 Model Number : dx7400MT  
 Serial Number : CNG8130K89  
 Power Cord : Unshielded, Detachable, 1.8m  
 Certificate : FCC DoC; CE/EMC; VCCI; C-Tick; BSMI, 3C, MIC

### 2.2.2 Printer

Manufacturer : HP  
 Model Number : P1007  
 Serial Number : VNFN713831  
 Data Cable : Shielded, detachable, 1.8m  
 Certificate : GS, CE/EMC, C-Tick, FCC DoC

## 2.2.3 Keyboard #1

Manufacturer : HP  
Model Number : CS105  
Serial Number : 9GTRNB1300120632  
Data Cable : Shielded, undetachable, 1.8m  
Certificate : CE/EMC, FCC DoC, VCCI, MIC, C-Tick, BSMI

## 2.2.4 Keyboard #2

Manufacturer : Microsoft  
Model Number : RT2300  
Serial Number : 7668200662248  
Data Cable : Shielded, undetachable, 1.8m  
Certificate : CE/EMC, FCC DoC, VCCI, MIC, C-Tick, BSMI

## 2.2.5 Mouse

Manufacturer : HP  
Model Number : CS105  
Serial Number : 9GTRNB1300120632  
Data Cable : Shielded, Undetachable, 1.8m.  
Certificate : CE/EMC, FCC DoC, VCCI, MIC, C-Tick, BSMI

## 2.2.6 Modem

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

## 2.2.7 Earphone

Manufacturer : audio-technica  
Model Number : ATH-CKL200

## 2.2.8 TV Signal Generator

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

## 2.2.9 ATSC Signal Generator

Manufacturer : SENCORE  
Model Number : ATSC997  
Serial Number : 6790071

#### 2.2.10 DVD PLAYER #1

Manufacturer : PHILIPS  
Model Number : DVP3986K/93  
Serial Number : KX1A0902120108  
Certificate : FCC DoC, CE/EMC, CCC

#### 2.2.11 DVD PLAYER #2

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

#### 2.2.12 U-DISK #1

Manufacturer : Kingmax  
Model Number : 8GB

#### 2.2.13 U-DISK #2

Manufacturer : Transcend  
Model Number : 8GB

### 2.3 Description of Test Facility

Site Description (No.3 3m Chamber) : Sept. 17, 1998 file on  
Mar 16, 2012 Renewed  
Federal Communications Commission  
FCC Engineering Laboratory  
7435 Oakland Mills Road  
Columbia, MD 21046, USA

Name of Firm : Audix Technology (Shanghai) Co., Ltd.

Site Location : 3F 34Bldg 680 Guiping Rd,  
Caohejing Hi-Tech Park,  
Shanghai 200233, China

NVLAP Lab Code : 200371-0

### 2.4 Measurement Uncertainty

Conducted Emission Expanded Uncertainty : U = 2.77dB  
Radiated Emission Expanded Uncertainty (30-200MHz):  
U = 4.40dB (Horizontal)  
U = 4.40dB (Vertical)

Radiated Emission Expanded Uncertainty (200M-1GHz):  
U = 4.40dB (Horizontal)  
U = 5.40dB (Vertical)

Radiated Emission Expanded Uncertainty (1GHz-6GHz):  
U = 5.08 dB



### 3 CONDUCTED EMISSION TEST

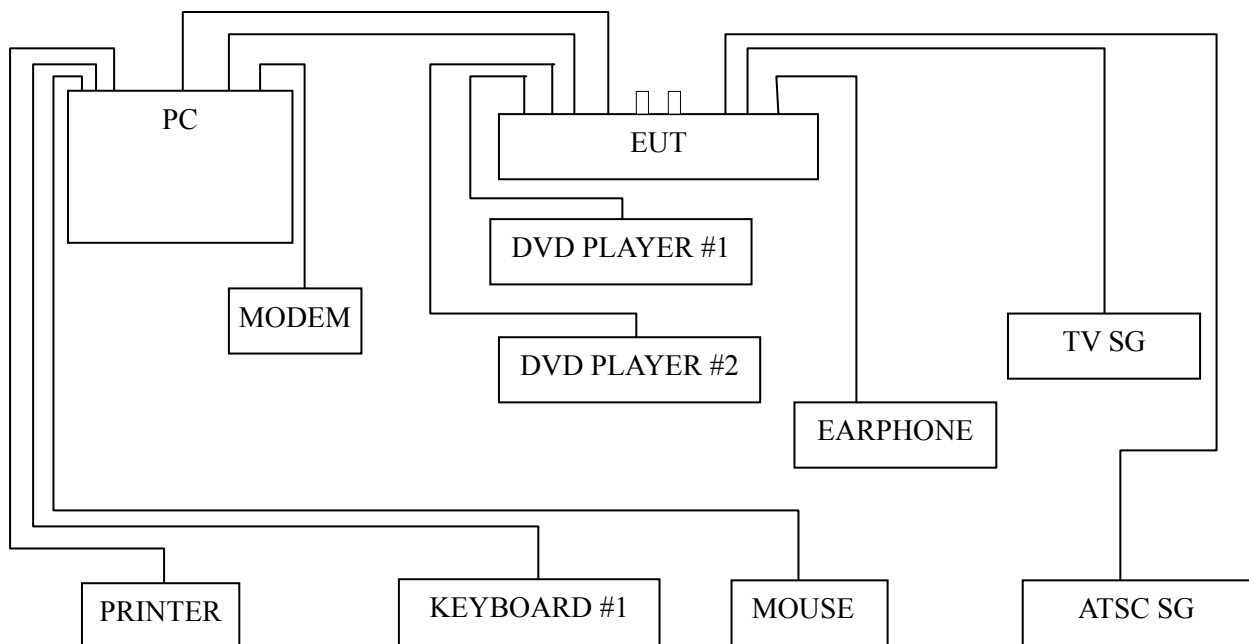
#### 3.1 Test Equipment

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

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101303	Sep 11, 2014	Sep 10, 2015
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 27, 2014	Jun 26, 2015
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2014	Mar 19, 2015
4.	50Ω Coaxial Switch	Anritsu	MP59B	6200426389	Sep 18, 2014	Mar 17, 2015
5.	50Ω Terminator	Anritsu	BNC	001	Mar 20, 2014	Mar 19, 2015
6.	Software	Audix	E3	6.111206	--	--

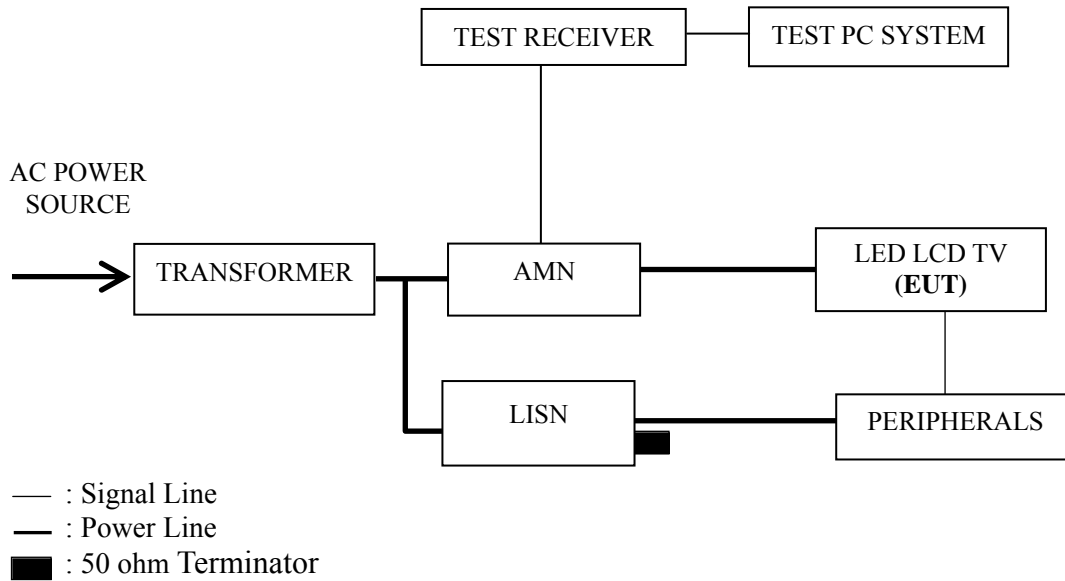
#### 3.2 Block Diagram of Test Setup

##### 3.2.1 EUT & Peripherals



□ : U-Disk

### 3.2.2 Conducted Disturbance Test Setup



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

Frequency Range (MHz)	Limits dB ( $\mu$ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66~56	56~46
0.5 ~ 5	56	46
5 ~ 30	60	50

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

### 3.4 Test Configuration

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

### 3.5 Operating Condition of EUT

3.5.1 Setup the EUT and peripherals as shown in Sec. 3.2.

3.5.2 Turn on the power of all equipments and the EUT.

3.5.3 Set the contrast & brightness of EUT to maximum.

3.5.4 PC system ran the self-test program “EMC Test” by windows XP and sent “H” characters to EUT through graphic card, the EUT’s screen displayed and filled with “H” pattern by its resolution (Via D-Sub & HDMI Input).

3.5.5 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 U-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@75Hz & 1kHz playing
HDMI 640*480@60Hz & 1kHz playing
USB Play
LAN Play

### 3.6 Test Procedures

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

Both sides of AC line (Line & Neutral) were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to ANSI C63.4:2003 during conducted emission test.

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

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

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

### 3.7 Test Results

< **PASS** >

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

Test Mode	Data Page
HDMI 1920*1080@60Hz & 1kHz playing	P13
HDMI 1280*1024@75Hz & 1kHz playing	P14
HDMI 640*480@60Hz & 1kHz playing	P15
USB Play	P16
LAN Play	P17

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 0.160 MHz (QP Value) with corrected signal level of 62.97 dB ( $\mu$ V) (limit is 65.45 dB ( $\mu$ V)), when the Neutral of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : 50H5GB Humidity : 48%RH

Test Mode : HDMI 1920\*1080@60Hz Date of Test : Dec 16, 2014  
& 1kHz Playing

Test Line	Frequency (MHz)	Meter Reading dB( $\mu$ V)	Factor (dB)	Emission Level dB( $\mu$ V)	Limits dB( $\mu$ V)	Margin (dB)	Remark
Line	0.160	52.30	10.57	62.87	65.47	2.60	QP
	0.377	28.81	10.44	39.25	58.34	19.09	
	0.564	26.80	10.44	37.24	56.00	18.76	
	1.121	26.10	10.40	36.50	56.00	19.50	
	1.879	24.30	10.43	34.73	56.00	21.27	
	7.203	33.20	10.45	43.65	60.00	16.35	
	0.160	39.20	10.57	49.77	55.47	5.70	AV
	0.377	19.61	10.44	30.05	48.34	18.29	
	0.564	16.30	10.44	26.74	46.00	19.26	
	1.121	16.40	10.40	26.80	46.00	19.20	
	1.879	16.40	10.43	26.83	46.00	19.17	
	7.203	20.10	10.45	30.55	50.00	19.45	
Neutral	<b>0.160</b>	<b>52.40</b>	<b>10.57</b>	<b>62.97</b>	<b>65.45</b>	<b>2.48</b>	QP
	0.373	27.21	10.43	37.64	58.44	20.80	
	0.570	28.50	10.43	38.93	56.00	17.07	
	1.182	25.60	10.41	36.01	56.00	19.99	
	2.089	25.80	10.46	36.26	56.00	19.74	
	7.193	32.30	10.53	42.83	60.00	17.17	
	0.160	40.50	10.57	51.07	55.45	4.38	AV
	0.373	16.31	10.43	26.74	48.44	21.70	
	0.570	16.30	10.43	26.73	46.00	19.27	
	1.182	15.10	10.41	25.51	46.00	20.49	
	2.089	16.70	10.46	27.16	46.00	18.84	
	7.193	24.20	10.53	34.73	50.00	15.27	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50H5GB Humidity : 48%RH

Test Mode : HDMI 1280\*1024@75Hz & 1kHz Playing Date of Test : Dec 16, 2014

Test Line	Frequency (MHz)	Meter Reading dB( $\mu$ V)	Factor (dB)	Emission Level dB( $\mu$ V)	Limits dB( $\mu$ V)	Margin (dB)	Remark
Line	<b>0.160</b>	<b>52.20</b>	<b>10.57</b>	<b>62.77</b>	<b>65.45</b>	<b>2.68</b>	QP
	0.377	27.83	10.44	38.27	58.34	20.07	
	0.567	27.58	10.44	38.02	56.00	17.98	
	1.324	27.56	10.40	37.96	56.00	18.04	
	4.407	23.06	10.46	33.52	56.00	22.48	
	7.175	31.72	10.45	42.17	60.00	17.83	
	0.160	39.60	10.57	50.17	55.45	5.28	AV
	0.377	18.51	10.44	28.95	48.34	19.39	
	0.567	17.90	10.44	28.34	46.00	17.66	
	1.324	18.30	10.40	28.70	46.00	17.30	
	4.407	15.10	10.46	25.56	46.00	20.44	
	7.175	24.50	10.45	34.95	50.00	15.05	
Neutral	0.163	51.50	10.57	62.07	65.34	3.27	QP
	0.375	27.75	10.43	38.18	58.39	20.21	
	0.567	26.17	10.43	36.60	56.00	19.40	
	1.223	26.28	10.41	36.69	56.00	19.31	
	2.088	24.55	10.46	35.01	56.00	20.99	
	6.878	31.71	10.52	42.23	60.00	17.77	
	0.163	40.70	10.57	51.27	55.34	4.07	AV
	0.375	15.31	10.43	25.74	48.39	22.65	
	0.567	17.20	10.43	27.63	46.00	18.37	
	1.223	16.50	10.41	26.91	46.00	19.09	
	2.088	15.60	10.46	26.06	46.00	19.94	
	6.878	24.20	10.52	34.72	50.00	15.28	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50H5GB Humidity : 48%RH

Test Mode : HDMI 640\*480@60Hz & 1kHz Playing Date of Test : Dec 16, 2014

Test Line	Frequency (MHz)	Meter Reading dB( $\mu$ V)	Factor (dB)	Emission Level dB( $\mu$ V)	Limits dB( $\mu$ V)	Margin (dB)	Remark
Line	0.160	52.20	10.57	62.77	65.46	2.69	QP
	0.381	27.42	10.44	37.86	58.25	20.39	
	0.558	28.03	10.44	38.47	56.00	17.53	
	1.223	25.77	10.40	36.17	56.00	19.83	
	2.088	24.87	10.44	35.31	56.00	20.69	
	7.446	31.89	10.46	42.35	60.00	17.65	
	0.160	39.80	10.57	50.37	55.46	5.09	AV
	0.381	16.80	10.44	27.24	48.25	21.01	
	0.558	17.60	10.44	28.04	46.00	17.96	
	1.223	16.60	10.40	27.00	46.00	19.00	
	2.088	15.50	10.44	25.94	46.00	20.06	
	7.446	25.30	10.46	35.76	50.00	14.24	
Neutral	<b>0.160</b>	<b>52.40</b>	<b>10.57</b>	<b>62.97</b>	<b>65.46</b>	<b>2.49</b>	QP
	0.371	26.51	10.45	36.96	58.47	21.51	
	0.567	26.93	10.43	37.36	56.00	18.64	
	1.324	27.75	10.41	38.16	56.00	17.84	
	3.681	23.33	10.49	33.82	56.00	22.18	
	7.175	31.81	10.53	42.34	60.00	17.66	
	0.160	40.20	10.57	50.77	55.46	4.69	AV
	0.371	17.49	10.45	27.94	48.47	20.53	
	0.567	17.30	10.43	27.73	46.00	18.27	
	1.324	18.60	10.41	29.01	46.00	16.99	
	3.681	14.20	10.49	24.69	46.00	21.31	
	7.175	24.90	10.53	35.43	50.00	14.57	

TEST ENGINEER: WENCY YANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50H5GB Humidity : 48%RH

Test Mode : USB Play Date of Test : Dec 16, 2014

Test Line	Frequency (MHz)	Meter Reading dB( $\mu$ V)	Factor (dB)	Emission Level dB( $\mu$ V)	Limits dB( $\mu$ V)	Margin (dB)	Remark
Line	0.160	51.20	10.57	61.77	65.46	3.69	QP
	0.377	28.24	10.44	38.68	58.34	19.66	
	0.567	27.19	10.44	37.63	56.00	18.37	
	1.129	27.16	10.40	37.56	56.00	18.44	
	2.839	25.43	10.45	35.88	56.00	20.12	
	6.878	31.80	10.44	42.24	60.00	17.76	
	0.160	39.90	10.57	50.47	55.46	4.99	AV
	0.377	17.61	10.44	28.05	48.34	20.29	
	0.567	17.10	10.44	27.54	46.00	18.46	
	1.129	18.20	10.40	28.60	46.00	17.40	
	2.839	16.59	10.45	27.04	46.00	18.96	
	6.878	25.51	10.44	35.95	50.00	14.05	
Neutral	<b>0.161</b>	<b>52.30</b>	<b>10.57</b>	<b>62.87</b>	<b>65.42</b>	<b>2.55</b>	QP
	0.367	26.20	10.45	36.65	58.56	21.91	
	0.641	26.68	10.42	37.10	56.00	18.90	
	1.269	26.04	10.41	36.45	56.00	19.55	
	2.088	25.23	10.46	35.69	56.00	20.31	
	6.878	31.89	10.52	42.41	60.00	17.59	
	0.161	40.20	10.57	50.77	55.42	4.65	AV
	0.367	17.49	10.45	27.94	48.56	20.62	
	0.641	16.40	10.42	26.82	46.00	19.18	
	1.269	15.80	10.41	26.21	46.00	19.79	
	2.088	15.40	10.46	25.86	46.00	20.14	
	6.878	24.70	10.52	35.22	50.00	14.78	

TEST ENGINEER: WENCY YANG



EUT : LED LCD TV Temperature : 22°C

Model No. : 50H5GB Humidity : 48%RH

Test Mode : LAN Play Date of Test : Dec 16, 2014

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark	
Line	0.160	51.40	10.57	61.97	65.45	3.48	QP	
	0.375	28.27	10.44	38.71	58.39	19.68		
	0.654	26.47	10.43	36.90	56.00	19.10		
	1.106	26.05	10.40	36.45	56.00	19.55		
	1.928	24.85	10.43	35.28	56.00	20.72		
	7.175	30.94	10.45	41.39	60.00	18.61		
	0.160	40.10	10.57	50.67	55.45	4.78	AV	
	0.375	19.21	10.44	29.65	48.39	18.74		
	0.654	16.90	10.43	27.33	46.00	18.67		
	1.106	16.40	10.40	26.80	46.00	19.20		
	1.928	15.20	10.43	25.63	46.00	20.37		
	7.175	23.80	10.45	34.25	50.00	15.75		
	Neutral	<b>0.160</b>	<b>52.40</b>	<b>10.57</b>	<b>62.97</b>	<b>65.45</b>	<b>2.48</b>	QP
		0.375	26.46	10.43	36.89	58.39	21.50	
0.558		27.87	10.43	38.30	56.00	17.70		
1.184		27.08	10.41	37.49	56.00	18.51		
2.839		23.16	10.48	33.64	56.00	22.36		
7.175		30.91	10.53	41.44	60.00	18.56		
0.160		39.60	10.57	50.17	55.45	5.28	AV	
0.375		17.81	10.43	28.24	48.39	20.15		
0.558		18.20	10.43	28.63	46.00	17.37		
1.184		17.60	10.41	28.01	46.00	17.99		
2.839		14.80	10.48	25.28	46.00	20.72		
7.175		24.50	10.53	35.03	50.00	14.97		

TEST ENGINEER: WENCY YANG

## 4 RADIATED EMISSION TEST

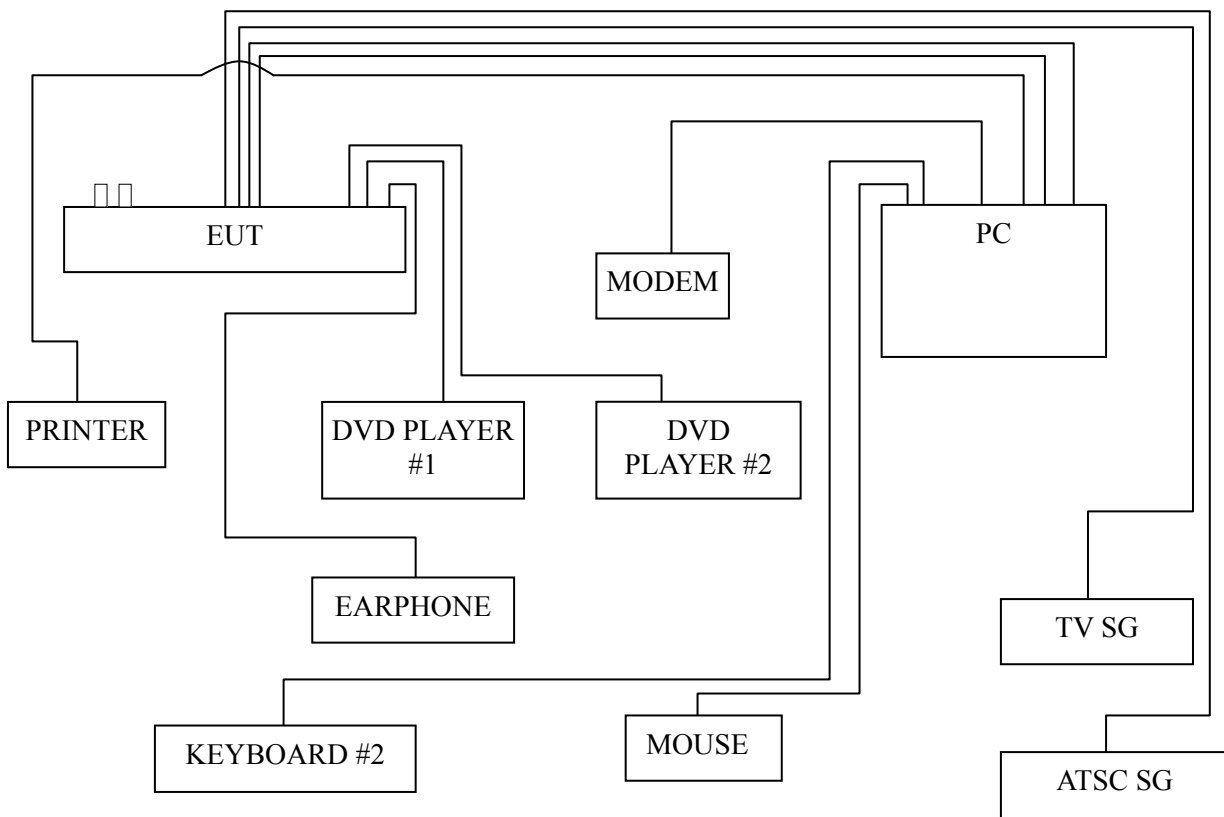
### 4.1 Test Equipment

The following test equipments are used during the radiated emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Sep 18, 2014	Mar 17, 2015
2.	Preamplifier	Agilent	8447D	2944A10548	Mar 20, 2014	Mar 19, 2015
3.	Preamplifier	HP	8449B	3008A00864	May 03, 2014	May 02, 2015
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 11, 2014	May 10, 2015
5.	Horn Antenna	EMCO	3115	9607-4878	Nov 11, 2014	Nov 10, 2015
6.	Spectrum	Agilent	E7405A	MY45106600	Sep 18, 2014	Mar 17, 2015
7.	50Ω Coaxial Switch	Anritsu	MP59B	6200426390	Sep 18, 2014	Mar 17, 2015
8.	Software	Audix	E3	6.2007-9-10	--	--

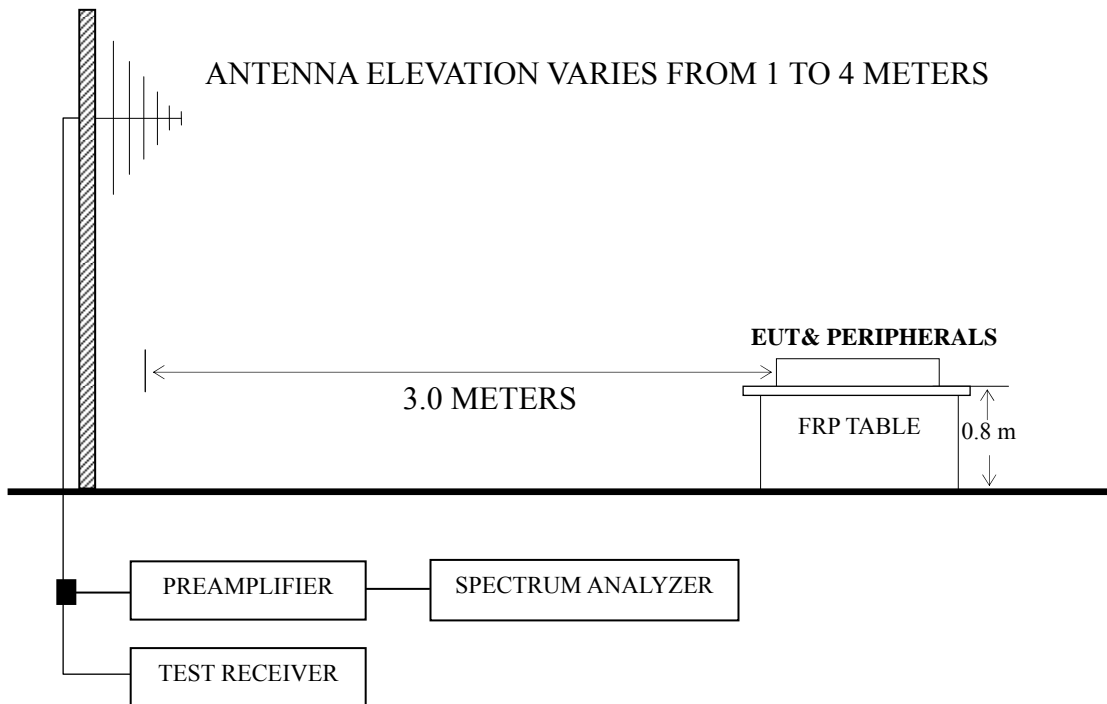
### 4.2 Block Diagram of Test Setup

#### 4.2.1 EUT & Peripherals



□ : U-Disk

### 4.2.2 Radiated emission test setup



■ : 50 ohm Coaxial Switch

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

Frequency (MHz)	Distance (m)	Field strength limits	
		( $\mu\text{V/m}$ )	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 C63.4:2003 requirements during radiated emission test.

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

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

The frequency range from 1 GHz to 2 GHz was checked for the maximum resolution test mode.

The test modes were done on radiated disturbance test and all the test results are listed in Sec.4.7.

## 4.7 Test Results

**<PASS>**

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Test Mode	Data Page
HDMI 1920*1080@60Hz & 1kHz playing	P22 – P23
HDMI 1280*1024@75Hz & 1kHz playing	P24
HDMI 640*480@60Hz & 1kHz playing	P25
USB Play	P26
LAN Play	P27

NOTE 1 – Emission Level = Antenna Factor + Cable Loss + Meter Reading. (< 1GHz);

Emission Level = Antenna Factor + Cable Loss – Preamp Factor + Meter Reading. (> 1GHz)

NOTE 2 – All readings are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.

NOTE 3 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 4 – The worst case is for HDMI 1920\*1080@60Hz & 1kHz playing test mode. The worst emission at horizontal polarization was detected at 700.19 MHz with corrected signal level of 45.00 dB ( $\mu\text{V/m}$ ) (limit is 46.00 dB ( $\mu\text{V/m}$ )), when the antenna was 2.10 m height and the turntable was at 321°. The worst emission at vertical polarization was detected at 39.02 MHz with corrected signal level of 37.47 dB ( $\mu\text{V/m}$ ) (limit is 40.00 dB ( $\mu\text{V/m}$ )), when the antenna was 1.50 m height and the turntable was at 114°.

EUT : LED LCD TV Temperature : 22°C

Model No. : 50H5GB Humidity : 60%RH

Test Mode : HDMI 1920\*1080@60Hz & 1kHz Playing Date of Test : Dec 17, 2014

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	73.103	27.44	6.76	0.85	--	35.05	40.00	4.95	QP
	129.000	23.44	12.47	1.15	--	37.06	43.50	6.44	
	207.560	25.43	8.14	1.44	--	35.01	43.50	8.49	
	308.913	27.00	12.93	1.81	--	41.74	46.00	4.26	
	381.249	19.11	14.70	2.00	--	35.81	46.00	10.19	
	<b>700.190</b>	<b>22.10</b>	<b>20.20</b>	<b>2.70</b>	--	<b>45.00</b>	<b>46.00</b>	<b>1.00</b>	
	1166.391	49.59	24.08	3.47	36.45	40.69	74.00	33.31	PK
	1276.560	50.07	24.76	3.67	36.26	42.24	74.00	31.76	
	1397.765	50.96	25.34	3.84	36.04	44.10	74.00	29.90	
	1439.372	49.48	25.50	3.89	35.95	42.92	74.00	31.08	
	1582.450	51.82	25.98	4.06	35.72	46.14	74.00	27.86	
	1715.581	51.71	26.49	4.24	35.55	46.89	74.00	27.11	AV
	1166.391	35.67	24.08	3.47	36.45	26.77	54.00	27.23	
	1276.560	34.78	24.76	3.67	36.26	26.95	54.00	27.05	
	1397.765	35.28	25.34	3.84	36.04	28.42	54.00	25.58	
	1439.372	34.68	25.50	3.89	35.95	28.12	54.00	25.88	
1582.450	36.49	25.98	4.06	35.72	30.81	54.00	23.19		
1715.581	34.48	26.49	4.24	35.55	29.66	54.00	24.34		

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 50H5GB Humidity : 60%RH

Test Mode : HDMI 1920\*1080@60Hz & 1kHz Playing Date of Test : Dec 17, 2014

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Vertical	<b>30.962</b>	<b>18.62</b>	<b>18.27</b>	<b>0.54</b>	--	<b>37.43</b>	<b>40.00</b>	<b>2.57</b>	QP
	39.024	22.90	13.96	0.61	--	37.47	40.00	2.53	
	50.764	26.12	7.73	0.69	--	34.54	40.00	5.46	
	130.000	26.34	12.60	1.15	--	40.09	43.50	3.41	
	291.036	24.68	12.50	1.76	--	38.94	46.00	7.06	
	308.000	25.43	12.93	1.81	--	40.17	46.00	5.83	
	1222.813	49.36	24.45	3.58	36.36	41.03	74.00	32.97	PK
	1354.591	49.57	25.16	3.78	36.12	42.39	74.00	31.61	
	1393.112	50.77	25.33	3.84	36.05	43.89	74.00	30.11	
	1446.858	50.13	25.53	3.89	35.93	43.62	74.00	30.38	
	1659.180	51.45	26.26	4.18	35.61	46.28	74.00	27.72	
	1793.019	50.07	26.79	4.32	35.47	45.71	74.00	28.29	
	1222.813	35.34	24.45	3.58	36.36	27.01	74.00	46.99	AV
	1354.591	35.23	25.16	3.78	36.12	28.05	74.00	45.95	
	1393.112	32.53	25.33	3.84	36.05	25.65	74.00	48.35	
	1446.858	36.57	25.53	3.89	35.93	30.06	74.00	43.94	
	1659.180	34.38	26.26	4.18	35.61	29.21	74.00	44.79	
	1793.019	34.26	26.79	4.32	35.47	29.90	74.00	44.10	

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 50H5GB Humidity : 60%RH

Test Mode : HDMI 1280\*1024@75Hz & 1kHz Playing Date of Test : Dec 17, 2014

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	73.876	21.74	7.08	0.85	29.67	40.00	10.33
	130.837	19.21	12.29	1.16	32.66	43.50	10.84
	209.313	27.24	8.10	1.45	36.79	43.50	6.71
	319.937	23.40	14.70	1.84	39.94	46.00	6.06
	385.281	21.43	14.85	2.02	38.30	46.00	7.70
	<b>700.450</b>	<b>21.15</b>	<b>20.20</b>	<b>2.70</b>	<b>44.05</b>	<b>46.00</b>	<b>1.95</b>
Vertical	30.962	16.66	18.27	0.54	35.47	40.00	4.53
	39.299	20.89	13.78	0.61	35.28	40.00	4.72
	50.057	24.96	8.30	0.68	33.94	40.00	6.06
	<b>130.837</b>	<b>26.09</b>	<b>12.29</b>	<b>1.16</b>	<b>39.54</b>	<b>43.50</b>	<b>3.96</b>
	207.640	26.54	8.14	1.44	36.12	43.50	7.38
	308.780	24.35	12.93	1.81	39.09	46.00	6.91

TEST ENGINEER: BILL WU



EUT : LED LCD TV Temperature : 22°C

Model No. : 50H5GB Humidity : 60%RH

Test Mode : HDMI 640\*480@60Hz & 1kHz Playing Date of Test : Dec 17, 2014

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	78.965	21.61	6.80	0.89	29.30	40.00	10.70
	130.837	22.05	12.29	1.16	35.50	43.50	8.00
	293.084	26.82	12.50	1.76	41.08	46.00	4.92
	307.831	28.77	12.85	1.81	43.43	46.00	2.57
	438.655	18.65	17.90	2.14	38.69	46.00	7.31
	<b>704.226</b>	<b>21.58</b>	<b>20.13</b>	<b>2.72</b>	<b>44.43</b>	<b>46.00</b>	<b>1.57</b>
Vertical	30.531	15.77	18.93	0.54	35.24	40.00	4.76
	39.024	22.13	13.96	0.61	36.70	40.00	3.30
	<b>130.000</b>	<b>26.48</b>	<b>12.60</b>	<b>1.15</b>	<b>40.23</b>	<b>43.50</b>	<b>3.27</b>
	207.850	25.07	8.14	1.45	34.66	43.50	8.84
	292.058	24.50	12.50	1.76	38.76	46.00	7.24
	307.831	25.64	12.85	1.81	40.30	46.00	5.70

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 50H5GB Humidity : 60%RH

Test Mode : USB Play Date of Test : Dec 17, 2014

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)
Horizontal	50.764	19.63	7.73	0.69	28.05	40.00	11.95
	74.135	25.96	7.08	0.85	33.89	40.00	6.11
	128.563	21.68	12.47	1.14	35.29	43.50	8.21
	210.786	26.34	8.08	1.45	35.87	43.50	7.63
	312.179	24.98	13.43	1.83	40.24	46.00	5.76
	<b>700.000</b>	<b>20.87</b>	<b>20.20</b>	<b>2.70</b>	<b>43.77</b>	<b>46.00</b>	<b>2.23</b>
Vertical	<b>31.399</b>	<b>19.16</b>	<b>17.77</b>	<b>0.55</b>	<b>37.48</b>	<b>40.00</b>	<b>2.52</b>
	39.854	23.57	13.08	0.62	37.27	40.00	2.73
	49.187	25.83	8.38	0.68	34.89	40.00	5.11
	75.182	25.88	7.35	0.86	34.09	40.00	5.91
	132.221	26.72	11.98	1.16	39.86	43.50	3.64
	306.754	25.54	12.85	1.80	40.19	46.00	5.81

TEST ENGINEER: BILL WU

EUT : LED LCD TV Temperature : 22°C

Model No. : 50H5GB Humidity : 60%RH

Test Mode : LAN Play Date of Test : Dec 17, 2014

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)
Horizontal	72.847	24.05	6.66	0.85	31.56	40.00	8.44
	130.379	21.67	12.44	1.15	35.26	43.50	8.24
	211.527	26.09	8.07	1.46	35.62	43.50	7.88
	317.701	24.56	14.27	1.84	40.67	46.00	5.33
	379.914	20.05	14.70	2.00	36.75	46.00	9.25
	<b>700.340</b>	<b>21.34</b>	<b>20.20</b>	<b>2.70</b>	<b>44.24</b>	<b>46.00</b>	<b>1.76</b>
Vertical	<b>31.399</b>	<b>19.38</b>	<b>17.77</b>	<b>0.55</b>	<b>37.70</b>	<b>40.00</b>	<b>2.30</b>
	40.276	23.81	12.82	0.62	37.25	40.00	2.75
	49.881	26.82	8.32	0.68	35.82	40.00	4.18
	73.617	26.80	6.97	0.85	34.62	40.00	5.38
	128.113	27.06	12.40	1.14	40.60	43.50	2.90
	293.084	23.82	12.50	1.76	38.08	46.00	7.92

TEST ENGINEER: BILL WU

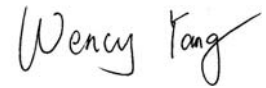
## 5 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
Gasket	JCT-RF-13-0.12-35\ROH	JOINSET	See Internal Photos Figure 21, 22, 23
Gasket	RSAG8.038.4346\ROH	Hui Jin	See Internal Photos Figure 24
	RSAG8.038.4347\ROH		
Gasket	JCT-19.5-11-120-CR\ROH	JOINSET	See Internal Photos Figure 25

e: 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:



**(WENCY YANG)**

## **6 DEVIATION TO TEST SPECIFICATIONS**

None.