

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

LCD TV

Model No.	Serial No.	Brand
LCD19W57ACA	--	Hisense
LHD19V68US	--	
ELCHS192	E2009082007	Element

FCC ID : W9HLCDA0001

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

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

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

Report No. : ACI-F09066A1  
Date of Test : Aug 25, 2009  
Date of Report : Oct 29, 2009

## TABLE OF CONTENTS

	Page
<b>1 SUMMARY OF STANDARDS AND RESULTS.....</b>	<b>4</b>
1.1 Description of Standards and Results.....	4
<b>2 GENERAL INFORMATION.....</b>	<b>5</b>
2.1 Description of Equipment Under Test.....	5
2.2 Peripherals.....	7
2.3 Description of Test Facility.....	8
2.4 Measurement Uncertainty.....	8
<b>3 CONDUCTED EMISSION TEST.....</b>	<b>9</b>
3.2 Block Diagram of Test Setup.....	9
3.3 Conducted Emission Limit [FCC Part 15 Subpart B 15.107(a)].....	10
3.4 Test Configuration.....	10
3.5 Operating Condition of EUT.....	11
3.6 Test Procedures.....	11
3.7 Test Results.....	12
<b>4 RADIATED EMISSION TEST.....</b>	<b>19</b>
4.1 Test Equipment.....	19
4.2 Block Diagram of Test Setup.....	19
4.3 Radiated Emission Limit [FCC Part 15 Subpart B 15.109(a)].....	20
4.4 Test Configuration.....	20
4.5 Operating Condition of EUT.....	20
4.6 Test Procedures.....	21
4.7 Test Results.....	21
<b>5 DEVIATION TO TEST SPECIFICATIONS.....</b>	<b>28</b>
<b>6 DEBUG DESCRIPTION.....</b>	<b>29</b>

## TEST REPORT FOR FCC CERTIFICATE

Applicant : Hisense Electric Co., Ltd.

Manufacturer : Hisense Electric Co., Ltd.

EUT Description : LCD TV

Model No.	Serial No.	Brand	Power Supply
LCD19W57ACA	--	Hisense	120V/60Hz
LHD19V68US	--		
ELCHS192	E2009082007	Element	

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2008  
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 Sec.2.1; S/N: Refer to Sec.2.1) which was tested in 3m anechoic chamber Aug 25, 2009 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.F09065A1, a Verification report.***

Date of Test : Aug 25, 2009 Date of Report : Oct 29, 2009Producer : Zeno Gu  
ZENO GU / AssistantReview : Dio Yang  
DIO YANG / Deputy Assistant ManagerFor and on behalf of  
Audix Technology (Shanghai) Co., Ltd.Signatory : Sammy Chen  
Authorized Signature EMC SAMMY CHEN / Assistant Managerx

# 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
<b>EMISSION</b>			
Conducted Disturbance at the Mains Terminal	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2008 AND ANSI C63.4-2003	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2008 AND ANSI C63.4-2003	15.109(a) Class B	Pass

## 2 GENERAL INFORMATION

### 2.1 Description of Equipment Under Test

Description : LCD TV

Type of EUT : ☒ Production ☐ Pre-product ☐ Pro-type

Model No.	Serial No.	Brand
LCD19W57ACA	--	Hisense
LHD19V68US	--	
ELCHS192	E2009082007	Element

Note 1 : The difference list for all models are as follows:

Report No.	Model No.	Rev. Summary	Edition No.	Data of Rev.
ACI-F09066	LCD19W57ACA, LCDN19V68CA, LHD19V68US, ELCHS192	Original Report.	0	Jul 24, 2009
ACI-F09066A1	LCD19W57ACA, LHD19V68US, ELCHS192	(1) To Change LCD panel, main board and power.	Rev. A1	Oct 29, 2009

Note 2 : The above models are all the same except for the different model number and brand.

Note 3 : The ELCHS192 was tested and recorded in this report.

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

LCD Panel : Manufacturer : CHI MEI OPTOELECTRONICS  
M/N : V185B1-L01

Tuner : Manufacturer : XuGuang Tech. Co., Ltd.  
M/N : DVT-8ADC1/W41F2\ROH

Max Resolution : 1360\*768@60Hz

D-Sub Cable : Shielded, Detachable, 1.85m,  
with two cores on cable

HDMI Cable : Shielded, Detachable, 1.85m,  
without core on cable

Power Cord : Unshielded, Detachable, 1.80m

**Remark:**

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

Rear View:

- |     |                                   |                                     |
|-----|-----------------------------------|-------------------------------------|
| (1) | One component of YPbPr Port       | Connected with DVD                  |
| (2) | One component of YPbPr Audio Port | Connected with DVD                  |
| (3) | One HDMI Port                     | Connected with DVD                  |
| (4) | One VGA Port                      | Connected with PC                   |
| (5) | One VGA Audio Port                | Connected with PC                   |
| (6) | One component of AV Port          | Connected with DVD                  |
| (7) | One RF Port                       | Connected with ATSC SG              |
| (8) | One S-Video Port                  | Connected with DVD                  |
| (9) | One USB (Service) Port            | Connected with U-Disk as Terminator |

Side Port:

- |      |                   |                         |
|------|-------------------|-------------------------|
| (10) | One COAXIAL Port  | Connected with DVD      |
| (11) | One Earphone Port | Connected with Earphone |

## 2.2 Peripherals

### 2.2.1 PC

Manufacturer : HP  
Model Number : dx7200MT  
Serial Number : CNG622017W  
Power Cord : Unshielded, Detachable, 1.8m  
Certificate : FCC DoC; CE/EMC; VCCI; C-Tick; UL  
BSMI (R33001) 3C (A000111)  
MIC (E-A011-04-2659(B))

### 2.2.2 Printer

Manufacturer : HP  
Model Number : C3990A  
Serial Number : JPZX020487  
Data Cable : Shielded, detachable, 1.5m  
Certificate : GS, CE/EMC, C-Tick, FCC DoC

### 2.2.3 Keyboard

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

### 2.2.4 Mouse

Manufacturer : Microsoft  
Model Number : RT2300  
Serial Number : 6965712071551  
Data Cable : Shielded, undetachable, 1.8m.  
Certificate : CE/EMC, FCC DoC, VCCI, MIC, C-Tick,  
BSMI

### 2.2.5 Modem

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

### 2.2.6 Earphone

Manufacturer : SONY  
Model Number : MDR-E808  
Serial Number : 1808030805305506

### 2.2.7 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

### 2.2.8 ATSC Signal Generator

Manufacturer : SENCORE  
Model Number : ATSC997  
Serial Number : 6790071

### 2.2.9 DVD

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

## 2.3 Description of Test Facility

Site Description (Semi-Anechoic Chamber) : Sept. 17, 1998 file on  
Apr 29, 2009 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 = 1.26 dB  
Radiated Emission Expanded Uncertainty : U = 3.02 dB



### 3 CONDUCTED EMISSION TEST

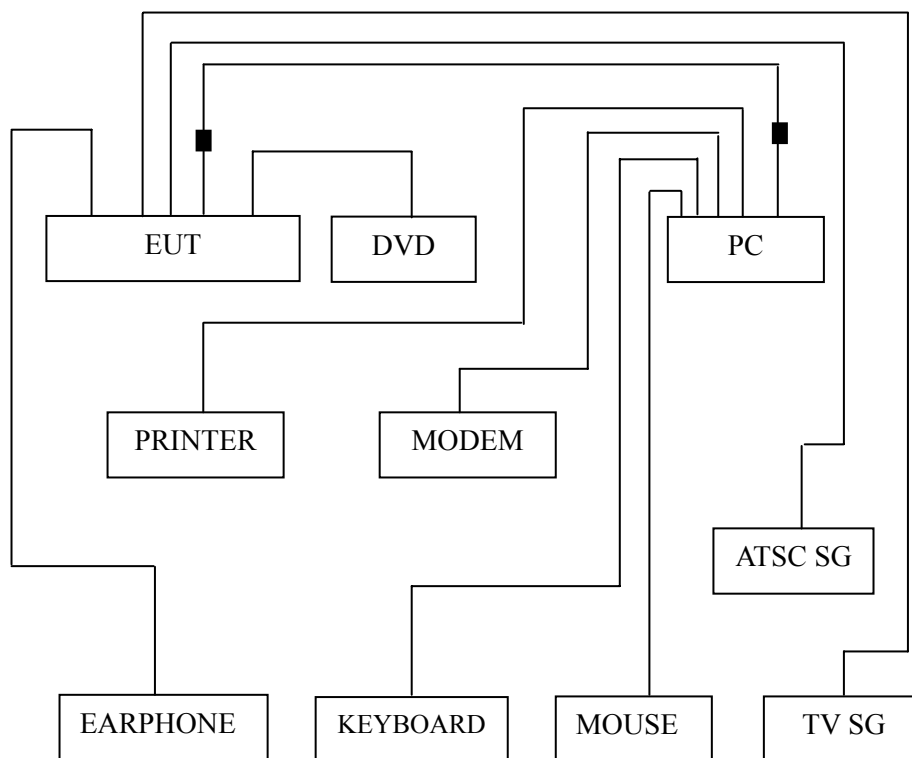
#### 3.1.1 Test Equipment

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	100841	Nov 21, 2008	Nov 21, 2009
2.	Artificial Mains Network (AMN)	R&S	ESH2-Z5	843890/011	Apr 02, 2009	Apr 02, 2010
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Apr 02, 2009	Apr 02, 2010
4.	50 $\Omega$ Coaxial Switch	Anritsu	MP59B	6200426389	Mar 19, 2009	Sep 19, 2009
5.	50 $\Omega$ Terminator	Anritsu	BNC	001	Apr 02, 2009	Apr 02, 2010
6.	Software	Audix	E3	SET00200 9804M592	--	--

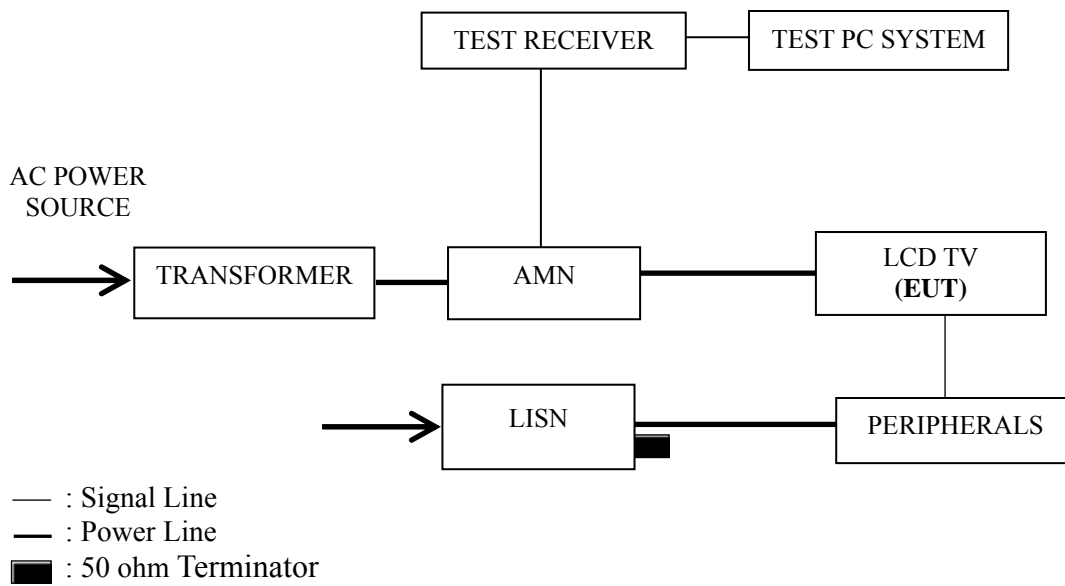
#### 3.2 Block Diagram of Test Setup

##### 3.2.1 EUT & Peripherals



■ : Ferrite core

### 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 Repeat above procedure from 3.5.3 to 3.5.4 for difference test mode.

3.5.6 The other peripherals devices were driven and operated during the test.

3.5.7 The test modes are as follows:

Test Mode
D-Sub 640*480@60Hz
D-Sub 1024*768@60Hz
D-Sub 1360*768@60Hz
HDMI 640*480@60Hz
HDMI 1024*768@60Hz
HDMI 1360*768@60Hz

### 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
D-Sub 640*480@60Hz	P13
D-Sub 1024*768@60Hz	P14
D-Sub 1360*768@60Hz	P15
HDMI 640*480@60Hz	P16
HDMI 1024*768@60Hz	P17
HDMI 1360*768@60Hz	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 D-Sub 1360\*768@60Hz test mode. The worst emission is detected at 0.197 MHz (Average) with corrected signal level of 38.33 dB (μV) (limit is 53.76 dB (μV)), when the Neutral of the EUT is connected to AMN.

EUT : LCD TV Temperature : 22°C

Model No. : ELCHS192 Humidity : 48%RH

Serial No. : E2009082007 Date of Test : Aug 25, 2009

Test Mode : D-Sub 640\*480@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.152	46.95	0.23	47.18	65.91	18.73	QP
	0.262	39.72	0.24	39.96	61.38	21.42	
	0.444	33.93	0.28	34.21	56.98	22.77	
	6.056	35.38	0.45	35.83	60.00	24.17	
	12.516	35.34	0.61	35.95	60.00	24.05	
	19.326	34.43	0.87	35.30	60.00	24.70	
	0.152	36.59	0.23	36.82	55.91	19.09	AV
	0.262	28.94	0.24	29.18	51.38	22.20	
	0.444	23.65	0.28	23.93	46.98	23.05	
	6.056	25.64	0.45	26.09	50.00	23.91	
	12.516	25.36	0.61	25.97	50.00	24.03	
	19.326	24.67	0.87	25.54	50.00	24.46	
Neutral	<b>0.150</b>	<b>49.68</b>	<b>0.20</b>	<b>49.88</b>	<b>66.00</b>	<b>16.12</b>	QP
	0.192	45.85	0.20	46.05	63.93	17.88	
	0.320	40.95	0.23	41.18	59.71	18.53	
	0.541	33.83	0.26	34.09	56.00	21.91	
	6.056	35.08	0.46	35.54	60.00	24.46	
	21.600	29.47	0.82	30.29	60.00	29.71	
	0.150	38.29	0.20	38.49	56.00	17.51	AV
	0.192	35.68	0.20	35.88	53.93	18.05	
	0.320	30.36	0.23	30.59	49.71	19.12	
	0.541	23.65	0.26	23.91	46.00	22.09	
	6.056	25.68	0.46	26.14	50.00	23.86	
	21.600	19.85	0.82	20.67	50.00	29.33	

TEST ENGINEER: HUGH HUANG

EUT : LCD TV Temperature : 22°C

Model No. : ELCHS192 Humidity : 48%RH

Serial No. : E2009082007 Date of Test : Aug 25, 2009

Test Mode : D-Sub 1024\*768@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	49.96	0.23	50.19	66.00	15.81	QP
	0.190	47.17	0.22	47.39	64.02	16.63	
	0.325	38.12	0.26	38.38	59.57	21.19	
	6.056	35.34	0.45	35.79	60.00	24.21	
	12.384	34.38	0.60	34.98	60.00	25.02	
	19.532	36.12	0.88	37.00	60.00	23.00	
	0.150	38.69	0.23	38.92	56.00	17.08	AV
	<b>0.190</b>	<b>38.04</b>	<b>0.22</b>	<b>38.26</b>	<b>54.02</b>	<b>15.76</b>	
	0.325	29.06	0.26	29.32	49.57	20.25	
	6.056	25.68	0.45	26.13	50.00	23.87	
	12.384	24.68	0.60	25.28	50.00	24.72	
	19.532	26.59	0.88	27.47	50.00	22.53	
Neutral	0.150	46.31	0.20	46.51	66.00	19.49	QP
	0.199	45.96	0.20	46.16	63.67	17.51	
	0.564	35.57	0.26	35.83	56.00	20.17	
	3.881	30.96	0.43	31.39	56.00	24.61	
	6.056	36.25	0.46	36.71	60.00	23.29	
	19.224	29.30	0.84	30.14	60.00	29.86	
	0.150	36.59	0.20	36.79	56.00	19.21	AV
	0.199	35.50	0.20	35.70	53.67	17.97	
	0.564	25.85	0.26	26.11	46.00	19.89	
	3.881	20.37	0.43	20.80	46.00	25.20	
	6.056	26.62	0.46	27.08	50.00	22.92	
	19.224	19.68	0.84	20.52	50.00	29.48	

TEST ENGINEER: HUGH HUANG

EUT : LCD TV Temperature : 22°C

Model No. : ELCHS192 Humidity : 48%RH

Serial No. : E2009082007 Date of Test : Aug 25, 2009

Test Mode : D-Sub 1360\*768@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	46.37	0.23	46.60	66.00	19.40	QP
	0.192	45.79	0.22	46.01	63.93	17.92	
	0.313	37.91	0.25	38.16	59.88	21.72	
	6.056	35.54	0.45	35.99	60.00	24.01	
	12.649	35.57	0.62	36.19	60.00	23.81	
	19.950	35.63	0.89	36.52	60.00	23.48	
	0.150	35.62	0.23	35.85	56.00	20.15	AV
	0.192	35.70	0.22	35.92	53.93	18.01	
	0.313	28.27	0.25	28.52	49.88	21.36	
	6.056	26.32	0.45	26.77	50.00	23.23	
	12.649	25.64	0.62	26.26	50.00	23.74	
	19.950	25.64	0.89	26.53	50.00	23.47	
Neutral	0.152	47.14	0.20	47.34	65.91	18.57	QP
	0.197	47.05	0.20	47.25	63.76	16.51	
	0.524	35.29	0.26	35.55	56.00	20.45	
	3.881	31.78	0.43	32.21	56.00	23.79	
	6.056	35.04	0.46	35.50	60.00	24.50	
	19.532	31.20	0.85	32.05	60.00	27.95	
	0.152	37.49	0.20	37.69	55.91	18.22	AV
	<b>0.197</b>	<b>38.13</b>	<b>0.20</b>	<b>38.33</b>	<b>53.76</b>	<b>15.43</b>	
	0.524	25.68	0.26	25.94	46.00	20.06	
	3.881	21.44	0.43	21.87	46.00	24.13	
	6.056	25.64	0.46	26.10	50.00	23.90	
	19.532	21.46	0.85	22.31	50.00	27.69	

TEST ENGINEER: HUGH HUANG

EUT : LCD TV Temperature : 22°C

Model No. : ELCHS192 Humidity : 48%RH

Serial No. : E2009082007 Date of Test : Aug 25, 2009

Test Mode : HDMI 640\*480@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	48.24	0.23	48.47	66.00	17.53	QP
	0.343	37.50	0.26	37.76	59.13	21.37	
	0.686	29.33	0.27	29.60	56.00	26.40	
	6.056	36.79	0.45	37.24	60.00	22.76	
	12.124	35.48	0.59	36.07	60.00	23.93	
	19.326	32.95	0.87	33.82	60.00	26.18	
	0.150	38.64	0.23	38.87	56.00	17.13	AV
	0.343	28.23	0.26	28.49	49.13	20.64	
	0.686	19.69	0.27	19.96	46.00	26.04	
	6.056	26.59	0.45	27.04	50.00	22.96	
	12.124	25.84	0.59	26.43	50.00	23.57	
	19.326	22.35	0.87	23.22	50.00	26.78	
Neutral	<b>0.153</b>	<b>48.83</b>	<b>0.20</b>	<b>49.03</b>	<b>65.82</b>	<b>16.79</b>	QP
	0.320	39.69	0.23	39.92	59.71	19.79	
	0.541	33.75	0.26	34.01	56.00	21.99	
	1.503	30.74	0.34	31.08	56.00	24.92	
	6.056	36.94	0.46	37.40	60.00	22.60	
	19.950	30.10	0.86	30.96	60.00	29.04	
	0.153	38.69	0.20	38.89	55.82	16.93	AV
	0.320	29.68	0.23	29.91	49.71	19.80	
	0.541	23.65	0.26	23.91	46.00	22.09	
	1.503	20.36	0.34	20.70	46.00	25.30	
	6.056	26.35	0.46	26.81	50.00	23.19	
	19.950	20.34	0.86	21.20	50.00	28.80	

TEST ENGINEER: HUGH HUANG



EUT : LCD TV Temperature : 22°C

Model No. : ELCHS192 Humidity : 48%RH

Serial No. : E2009082007 Date of Test : Aug 25, 2009

Test Mode : HDMI 1024\*768@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	49.07	0.23	49.30	66.00	16.70	QP
	0.192	45.05	0.22	45.27	63.93	18.66	
	0.320	38.31	0.26	38.57	59.71	21.14	
	6.056	36.90	0.45	37.35	60.00	22.65	
	12.253	35.33	0.60	35.93	60.00	24.07	
	19.740	33.87	0.88	34.75	60.00	25.25	
	<b>0.150</b>	<b>39.85</b>	<b>0.23</b>	<b>40.08</b>	<b>56.00</b>	<b>15.92</b>	AV
	0.192	35.64	0.22	35.86	53.93	18.07	
	0.320	28.67	0.26	28.93	49.71	20.78	
	6.056	26.59	0.45	27.04	50.00	22.96	
	12.253	25.67	0.60	26.27	50.00	23.73	
	19.740	23.64	0.88	24.52	50.00	25.48	
Neutral	0.150	47.92	0.20	48.12	66.00	17.88	QP
	0.317	41.96	0.23	42.19	59.80	17.61	
	0.541	34.65	0.26	34.91	56.00	21.09	
	1.585	30.75	0.34	31.09	56.00	24.91	
	6.056	36.84	0.46	37.30	60.00	22.70	
	19.740	30.22	0.85	31.07	60.00	28.93	
	0.150	37.49	0.20	37.69	56.00	18.31	AV
	0.317	31.26	0.23	31.49	49.80	18.31	
	0.541	25.13	0.26	25.39	46.00	20.61	
	1.585	20.34	0.34	20.68	46.00	25.32	
	6.056	26.59	0.46	27.05	50.00	22.95	
	19.740	20.46	0.85	21.31	50.00	28.69	

TEST ENGINEER: HUGH HUANG

EUT : LCD TV Temperature : 22°C

Model No. : ELCHS192 Humidity : 48%RH

Serial No. : E2009082007 Date of Test : Aug 25, 2009

Test Mode : HDMI 1360\*768@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	46.53	0.23	46.76	66.00	19.24	QP
	0.317	38.80	0.26	39.06	59.80	20.74	
	0.466	33.43	0.29	33.72	56.58	22.86	
	2.358	30.08	0.37	30.45	56.00	25.55	
	6.056	36.11	0.45	36.56	60.00	23.44	
	12.124	36.64	0.59	37.23	60.00	22.77	
	0.150	36.59	0.23	36.82	56.00	19.18	AV
	0.317	28.68	0.26	28.94	49.80	20.86	
	0.466	23.68	0.29	23.97	46.58	22.61	
	2.358	20.35	0.37	20.72	46.00	25.28	
	6.056	26.38	0.45	26.83	50.00	23.17	
	12.124	26.32	0.59	26.91	50.00	23.09	
Neutral	<b>0.150</b>	<b>49.76</b>	<b>0.20</b>	<b>49.96</b>	<b>66.00</b>	<b>16.04</b>	QP
	0.325	39.21	0.23	39.44	59.57	20.13	
	1.585	31.02	0.34	31.36	56.00	24.64	
	4.070	31.01	0.43	31.44	56.00	24.56	
	6.056	36.35	0.46	36.81	60.00	23.19	
	20.814	30.17	0.83	31.00	60.00	29.00	
	0.150	39.58	0.20	39.78	56.00	16.22	AV
	0.325	29.65	0.23	29.88	49.57	19.69	
	1.585	21.35	0.34	21.69	46.00	24.31	
	4.070	21.35	0.43	21.78	46.00	24.22	
	6.056	26.66	0.46	27.12	50.00	22.88	
	20.814	20.35	0.83	21.18	50.00	28.82	

TEST ENGINEER: HUGH HUANG

## 4 RADIATED EMISSION TEST

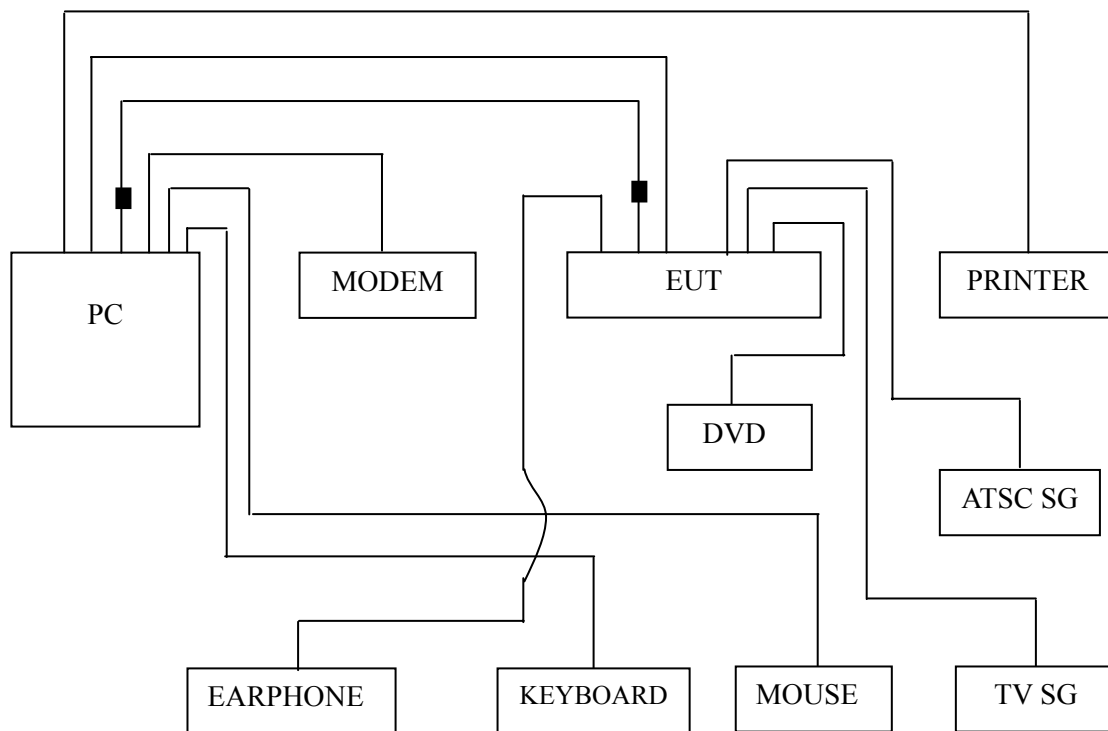
### 4.1 Test Equipment

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	ESVS10	844594/001	Mar 07, 2009	Mar 07, 2010
2.	Preamplifier	Agilent	8447D	2944A10548	Mar 19, 2009	Sep 19, 2009
3.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 14, 2008	May 14, 2010
4.	Spectrum	Agilent	E7405A	MY45106600	May 19, 2009	May 19, 2010
5.	Software	Audix	E3	SET00200 9912M295-2	--	--

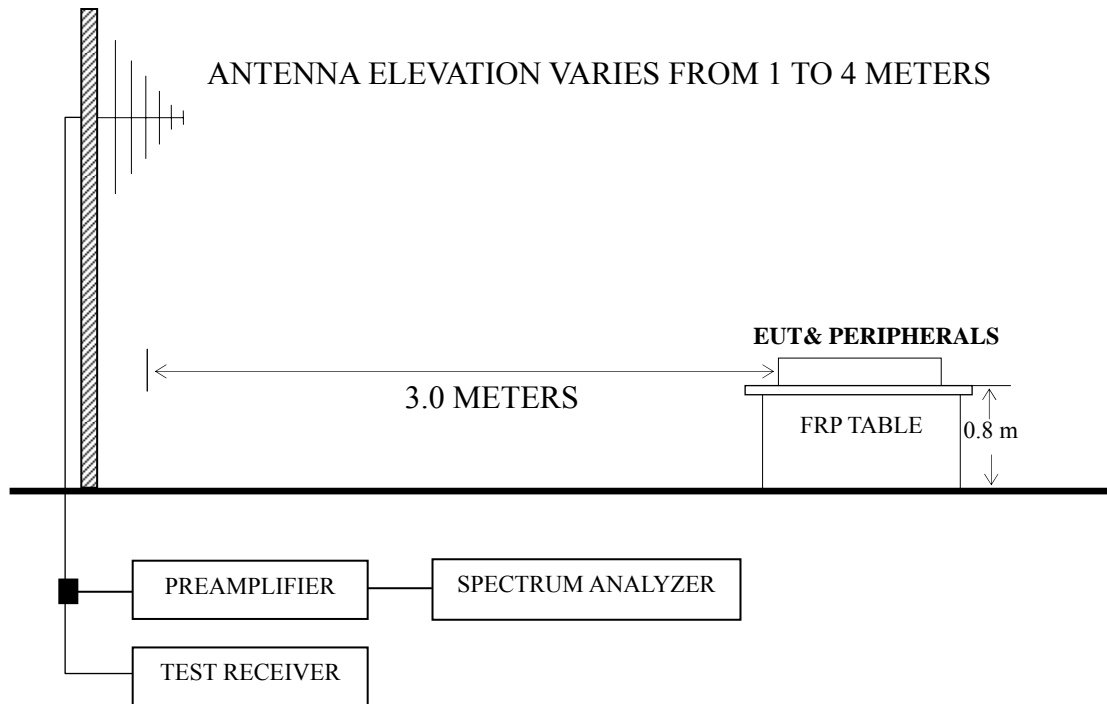
### 4.2 Block Diagram of Test Setup

#### 4.2.1 EUT and Peripherals



■ : Ferrite core

#### 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.

#### 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 bandwidth of Test Receiver R&S ESVS10 was set at 120 kHz.

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

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
D-Sub 640*480@60Hz	P22
D-Sub 1024*768@60Hz	P23
D-Sub 1360*768@60Hz	P24
HDMI 640*480@60Hz	P25
HDMI 1024*768@60Hz	P26
HDMI 1360*768@60Hz	P27

NOTE 1 – Emission Level = Antenna Factor + Cable Loss + Meter Reading.

NOTE 2 – The emission levels that are 20dB below the official limit are not reported.

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 D-Sub 640\*480@60Hz test mode. The worst emission at horizontal polarization was detected at 293.840 MHz with corrected signal level of 42.95 dB (μV/m) (limit is 46.00dB (μV/m)), when the antenna was 1.00 m height and the turntable was at 30°. The worst emission at vertical polarization was detected at 304.510 MHz with corrected signal level of 42.46dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 1.00 m height and the turntable was at 350°.

EUT : LCD TV Temperature : 22°C

Model No. : ELCHS192 Humidity : 60%RH

Serial No. : E2009082007 Date of Test : Aug 25, 2009

Test Mode : D-Sub 640\*480@60Hz

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	64.920	16.35	6.55	0.82	23.72	40.00	16.28
	100.810	14.78	11.57	1.08	27.43	43.50	16.07
	202.510	22.40	10.81	1.55	34.76	43.50	8.74
	<b>293.840</b>	<b>27.31</b>	<b>13.79</b>	<b>1.85</b>	<b>42.95</b>	<b>46.00</b>	<b>3.05</b>
	523.730	21.93	18.21	2.51	42.65	46.00	3.35
	607.150	12.38	19.24	2.76	34.38	46.00	11.62
Vertical	30.970	15.48	19.03	0.63	35.14	40.00	4.86
	<b>304.510</b>	<b>26.54</b>	<b>14.03</b>	<b>1.89</b>	<b>42.46</b>	<b>46.00</b>	<b>3.54</b>
	383.080	22.03	16.13	2.15	40.31	46.00	5.69
	515.000	21.32	18.09	2.49	41.90	46.00	4.10
	840.920	15.02	21.12	3.29	39.43	46.00	6.57
	996.120	17.07	22.37	3.62	43.06	54.00	10.94

TEST ENGINEER: RAVEN JIN

EUT : LCD TV Temperature : 22°C

Model No. : ELCHS192 Humidity : 60%RH

Serial No. : E2009082007 Date of Test : Aug 25, 2009

Test Mode : D-Sub1024\*768@60Hz

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	129.910	20.49	12.52	1.17	34.18	43.50	9.32
	202.660	24.16	10.81	1.55	36.52	43.50	6.98
	<b>296.750</b>	<b>25.55</b>	<b>13.86</b>	<b>1.86</b>	<b>41.27</b>	<b>46.00</b>	<b>4.73</b>
	519.850	20.14	18.15	2.49	40.78	46.00	5.22
	608.120	15.47	19.25	2.76	37.48	46.00	8.52
	996.120	16.75	22.37	3.62	42.74	54.00	11.26
Vertical	30.970	16.07	19.03	0.63	35.73	40.00	4.27
	43.580	18.91	11.88	0.68	31.47	40.00	8.53
	296.750	23.27	13.86	1.86	38.99	46.00	7.01
	389.870	20.94	16.30	2.18	39.42	46.00	6.58
	<b>518.880</b>	<b>21.37</b>	<b>18.15</b>	<b>2.49</b>	<b>42.01</b>	<b>46.00</b>	<b>3.99</b>
	996.120	16.69	22.37	3.62	42.68	54.00	11.32

TEST ENGINEER: RAVEN JIN

EUT : LCD TV Temperature : 22°C

Model No. : ELCHS192 Humidity : 60%RH

Serial No. : E2009082007 Date of Test : Aug 25, 2009

Test Mode : D-Sub1360\*768@60Hz

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	142.520	18.11	11.91	1.20	31.22	43.50	12.28
	202.660	23.56	10.81	1.55	35.92	43.50	7.58
	227.880	19.32	12.02	1.63	32.97	46.00	13.03
	297.720	25.66	13.86	1.88	41.40	46.00	4.60
	<b>518.880</b>	<b>21.58</b>	<b>18.15</b>	<b>2.49</b>	<b>42.22</b>	<b>46.00</b>	<b>3.78</b>
	996.120	14.45	22.37	3.62	40.44	54.00	13.56
Vertical	30.970	15.02	19.03	0.63	34.68	40.00	5.32
	202.660	21.57	10.81	1.55	33.93	43.50	9.57
	297.720	23.61	13.86	1.88	39.35	46.00	6.65
	427.700	19.45	16.89	2.27	38.61	46.00	7.39
	<b>518.880</b>	<b>21.14</b>	<b>18.15</b>	<b>2.49</b>	<b>41.78</b>	<b>46.00</b>	<b>4.22</b>
	996.120	15.67	22.37	3.62	41.66	54.00	12.34

TEST ENGINEER: RAVEN JIN



EUT : LCD TV Temperature : 22°C

Model No. : ELCHS192 Humidity : 60%RH

Serial No. : E2009082007 Date of Test : Aug 25, 2009

Test Mode : HDMI 640\*480@60Hz

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	30.000	8.12	19.60	0.63	28.35	40.00	11.65
	77.530	17.23	7.49	0.92	25.64	40.00	14.36
	202.660	22.10	10.81	1.55	34.46	43.50	9.04
	<b>293.840</b>	<b>25.31</b>	<b>13.79</b>	<b>1.85</b>	<b>40.95</b>	<b>46.00</b>	<b>5.05</b>
	523.730	17.93	18.21	2.51	38.65	46.00	7.35
	996.120	12.85	22.37	3.62	38.84	54.00	15.16
Vertical	<b>30.970</b>	<b>16.48</b>	<b>19.03</b>	<b>0.63</b>	<b>36.14</b>	<b>40.00</b>	<b>3.86</b>
	77.530	17.43	7.49	0.92	25.84	40.00	14.16
	293.840	25.58	13.79	1.85	41.22	46.00	4.78
	383.080	22.03	16.13	2.15	40.31	46.00	5.69
	515.000	17.32	18.09	2.49	37.90	46.00	8.10
	840.920	15.02	21.12	3.29	39.43	46.00	6.57

TEST ENGINEER: RAVEN JIN

EUT : LCD TV Temperature : 22°C

Model No. : ELCHS192 Humidity : 60%RH

Serial No. : E2009082007 Date of Test : Aug 25, 2009

Test Mode : HDMI 1024\*768@60Hz

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	30.970	8.03	19.03	0.63	27.69	40.00	12.31
	77.530	21.49	7.49	0.92	29.90	40.00	10.10
	202.660	20.16	10.81	1.55	32.52	43.50	10.98
	<b>296.750</b>	<b>25.55</b>	<b>13.86</b>	<b>1.86</b>	<b>41.27</b>	<b>46.00</b>	<b>4.73</b>
	519.850	16.14	18.15	2.49	36.78	46.00	9.22
	996.120	15.75	22.37	3.62	41.74	54.00	12.26
Vertical	<b>30.970</b>	<b>16.07</b>	<b>19.03</b>	<b>0.63</b>	<b>35.73</b>	<b>40.00</b>	<b>4.27</b>
	87.230	21.14	8.96	1.00	31.10	40.00	8.90
	296.750	23.27	13.86	1.86	38.99	46.00	7.01
	389.870	20.94	16.30	2.18	39.42	46.00	6.58
	518.880	17.37	18.15	2.49	38.01	46.00	7.99
	996.120	15.69	22.37	3.62	41.68	54.00	12.32

TEST ENGINEER: RAVEN JIN

EUT : LCD TV Temperature : 22°C

Model No. : ELCHS192 Humidity : 60%RH

Serial No. : E2009082007 Date of Test : Aug 25, 2009

Test Mode : HDMI 1360\*768@60Hz

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	30.000	7.30	19.60	0.63	27.53	40.00	12.47
	82.380	19.14	8.19	0.96	28.29	40.00	11.71
	142.520	20.11	11.91	1.20	33.22	43.50	10.28
	<b>297.720</b>	<b>25.66</b>	<b>13.86</b>	<b>1.88</b>	<b>41.40</b>	<b>46.00</b>	<b>4.60</b>
	608.120	17.06	19.25	2.76	39.07	46.00	6.93
	996.120	16.45	22.37	3.62	42.44	54.00	11.56
Vertical	<b>30.970</b>	<b>15.02</b>	<b>19.03</b>	<b>0.63</b>	<b>34.68</b>	<b>40.00</b>	<b>5.32</b>
	77.530	21.08	7.49	0.92	29.49	40.00	10.51
	297.720	23.61	13.86	1.88	39.35	46.00	6.65
	427.700	19.45	16.89	2.27	38.61	46.00	7.39
	518.880	17.14	18.15	2.49	37.78	46.00	8.22
	996.120	15.67	22.37	3.62	41.66	54.00	12.34

TEST ENGINEER: RAVEN JIN

## **5 DEVIATION TO TEST SPECIFICATIONS**

None.

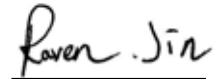
## 6 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Specifications (mm)	Manufacturer	Location
Ferrite Core	BNF-12\ZCAT1 519-0830	15*19*8	FEELUX	See Internal Photo Figure 17
Aluminum foil	--	8*3	ROH	See Internal Photo Figure 17
Ferrite Core	ZCAT3035-1330	30*35*13	ROH	See Internal Photo Figure 18
Aluminum foil	DBA40X100	--	FEELUX	See Internal Photo 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:



(RAVEN JIN)