

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

LED LCD TV

Model No.	Serial No.	Brand
LTDN46K316XWUS3D	E1206796-01/01	Hisense
46K316DW	--	

FCC ID : W9HLCDE0007

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

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Report No. : ACI-F12070A1
Date of Test : Jun 28 – Jul 09, 2012
Date of Report : Jul 13, 2012

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TEST REPORT FOR FCC CERTIFICATE

Applicant : Hisense Electric Co., Ltd.

Manufacturer : Hisense Electric Co., Ltd.

EUT Description : LED LCD TV

Model No.	Serial No.	Brand	Power Supply
LTDN46K316XWUS3D	E1206796-01/01	Hisense	120V/60Hz
46K316DW	--		

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2011
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; S/N: Refer to Sec2.1) which was tested in 3m anechoic chamber Jun 28 – Jul 09, 2012 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.

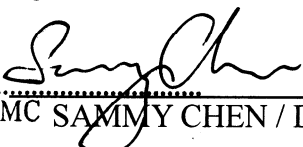
The test results for EUT's TV functions are contained in No.F12071A1, a Verification report.

Date of Test : Jun 28 – Jul 09, 2012 Date of Report : Jul 13, 2012

Producer : 
KATHY WANG / Assistant

Review : 
DIO YANG / Assistant Manager

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

.....
Signatory : 
Authorized Signature EMC SAMMY CHEN / Deputy 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 2011 AND ANSI C63.4-2003	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2011 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 : Production Pre-product Pro-type

Model No.	Serial No.	Brand
LTDN46K316XWUS3D	E1206796-01/01	Hisense
46K316DW	--	

Brand : Hisense

Note #1 : The above models are all the same except for the different model name.
The LTDN46K316XWUS3D was tested and recorded in the report.

Note #2 : The different list for all the models are as follows:

Report No.	Model No.	Rev. Summary	Edition No.	Data of Rev.
ACI-F12070	LTDN46K316XWUS3D, 46K316DW	Original Report.	0	Apr 26, 2012
ACI-F12070A1	LTDN46K316XWUS3D, 46K316DW	To add a new panel and a power board	Rev. A1	Jul 13, 2012

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 : Hisense
M/N : HE460FFD-B31\PW1

Max Resolution : 1024*768@60Hz

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

HDMI Cable : Shielded, Detachable, 1.00m,

Power Cord : Unshielded, Detachable, 1.80m

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

Side Port:

- (1) One HDMI2 Port : Connected with DVD #1
- (2) One HDMI1 Port : Connected with PC
- (3) One Headphone Port : Connected with Earphone
- (4) One ANT Port : Connected with ATSC SG / TV SG
- (5) One component of YPbPr Port : Connected with DVD #1
- (6) One component of YPbPr Audio Port : Connected with DVD #1
- (7) One component of AV Port : Connected with DVD #1
- (8) One DIGITAL AUDIO OUT Port : Connected with DVD #2

Bottom Port:

- (9) One LAN Port : Connected with PC
- (10) One USB2 Port : Connected with U-Disk
- (11) One USB1 Port : Connected with U-Disk
- (12) One VGA Port : Connected with PC
- (13) One PC/DVI Audio In Port : Connected with PC
- (14) One HDMI4 Port : Connected with DVD #3
- (15) One HDMI3 Port : Connected with DVD #2

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 PLAYER #1

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

2.2.10 DVD PLAYER #2

Manufacturer : LG
Model Number : DF9921N
Serial Number : 3850R-M846W
Certificate : FCC DoC, CE/EMC, CCC

2.2.11 DVD PLAYER #3

Manufacturer : DGT RONIK
Model Number : DV-A340
Serial Number : 10004184-C
Certificate : FCC DoC, CE/EMC, CCC

2.2.12 U-DISK

Manufacturer : LG
Model Number : 1GB

2.3 Description of Test Facility

Site Description (No.3 3m 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 = 3.43 dB
Radiated Emission Expanded Uncertainty (30-200MHz):
U = 4.67 dB (Horizontal)
U = 4.72 dB (Vertical)

Radiated Emission Expanded Uncertainty (200M-1GHz):
U = 4.81 dB (Horizontal)
U = 4.69 dB (Vertical)

3 CONDUCTED EMISSION TEST

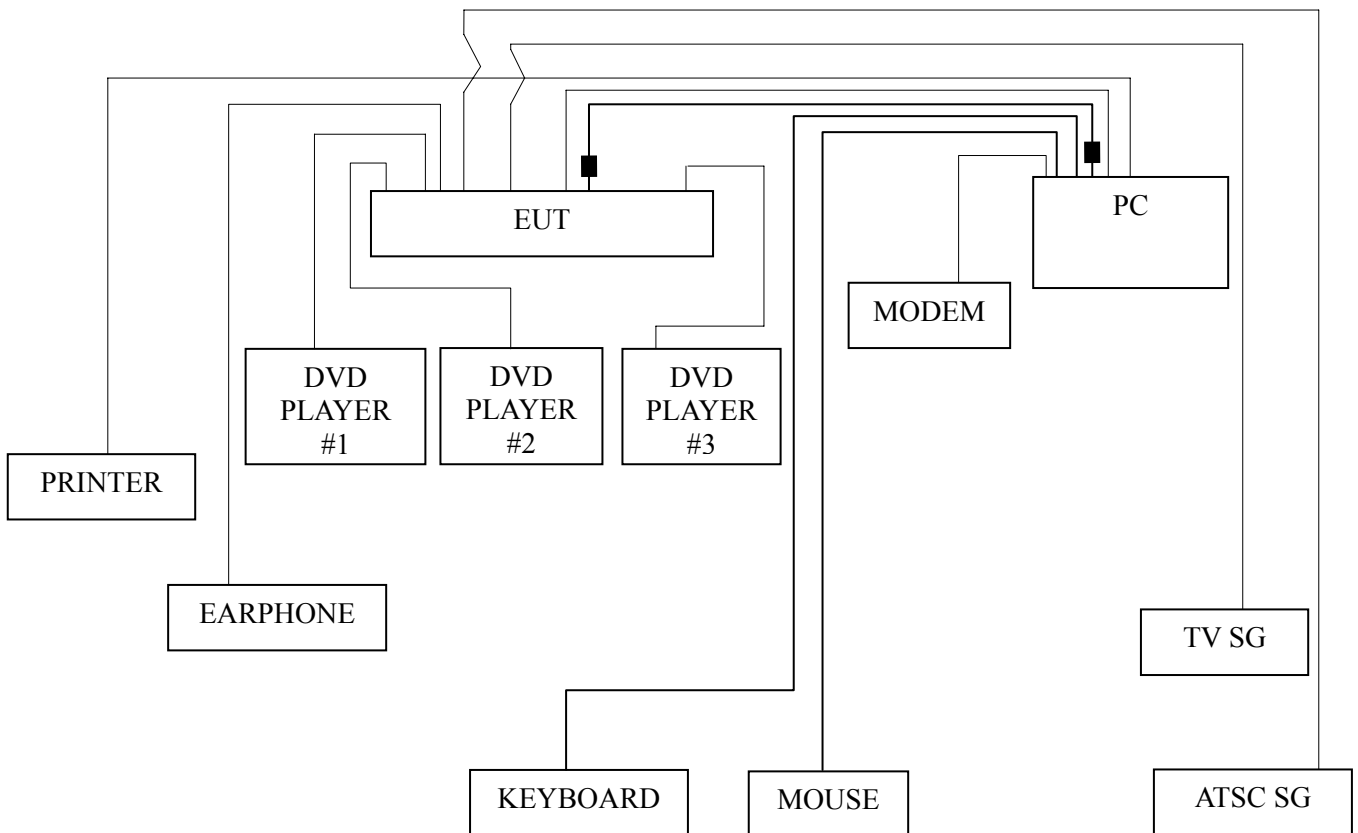
3.1 Test Equipment

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	100841	Mar 22, 2012	Mar 22, 2013
2.	Artificial Mains Network (AMN #1)	R&S	ESH2-Z5	843890/011	Feb 13, 2012	Feb 13, 2013
3.	Artificial Mains Network (AMN #2)	R&S	ENV4200	100125	Mar 22, 2012	Mar 22, 2013
4.	50 Ω Coaxial Switch	Anritsu	MP59B	6200426389	Mar 18, 2012	Sep 18, 2012
5.	50 Ω Terminator	Anritsu	BNC	001	Mar 22, 2012	Mar 22, 2013
6.	Software	Audix	E3	SET00200 9804M592	--	--

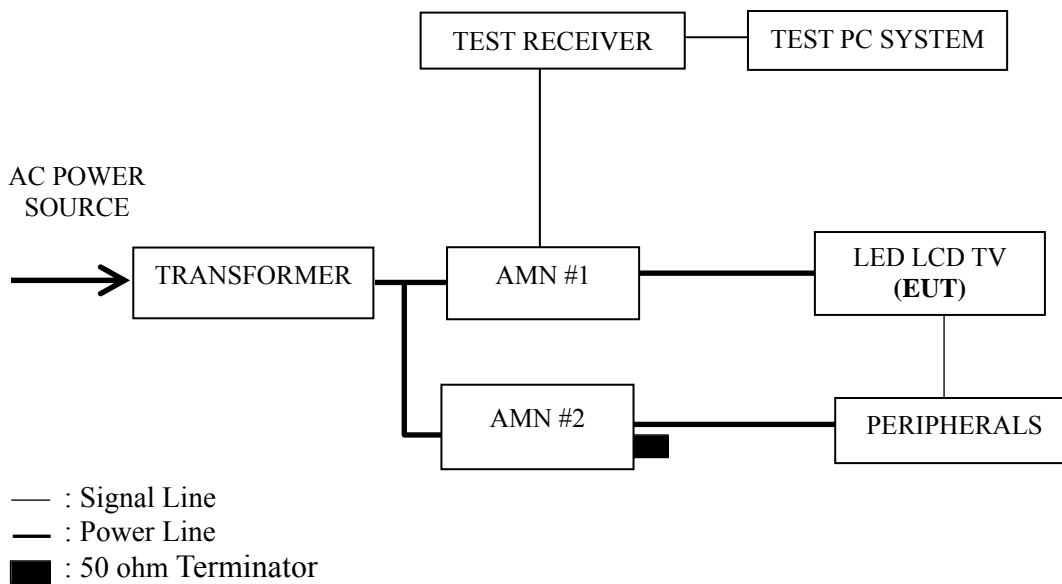
3.2 Block Diagram of Test Setup

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 (μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66~56	56~46
0.5 ~ 5	56	46
5 ~ 30	60	50

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

3.4 Test Configuration

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

3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT and peripherals as shown in Sec. 3.2.
- 3.5.2 Turn on the power of all equipments and the EUT.
- 3.5.3 Set the contrast & brightness of EUT to maximum.
- 3.5.4 PC system ran the self-test program “EMC Test” by windows XP and sent “H” characters to EUT through graphic card, the EUT’s screen displayed and filled with “H” pattern by its resolution (Via D-Sub & HDMI Input).
- 3.5.5 In USB Play mode, set the EUT play digital media from U-Disk.
- 3.5.6 In LAN mode, set the EUT play digital media through LAN port.
- 3.5.7 Repeat above procedure 3.5.6 for difference test mode.
- 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
D-Sub 1024*768@60Hz
HDMI 1024*768@60Hz
D-Sub 800*600@60Hz
D-Sub 640*480@60Hz
USB Play
LAN

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 1024*768@60Hz	P13
HDMI 1024*768@60Hz	P14
D-Sub 800*600@60Hz	P15
D-Sub 640*480@60Hz	P16
USB Play	P17
LAN	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 800*600@60Hz test mode. The worst emission is detected at 14.364 MHz (Quasi-Peak Value) with corrected signal level of 37.93 dB (μV) (limit is 60.00 dB (μV)), when the Line of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN46K316XWUS3D Humidity : 48%RH

Serial No. : E1206796-01/01 Date of Test : Jun 28, 2012

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

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.172	25.12	0.24	25.36	64.86	39.50	QP
	0.289	26.16	0.26	26.42	60.54	34.12	
	1.054	30.03	0.32	30.35	56.00	25.65	
	2.581	22.59	0.40	22.99	56.00	33.01	
	7.606	24.34	0.68	25.02	60.00	34.98	
	14.364	36.71	0.84	37.55	60.00	22.45	
	0.172	14.60	0.24	14.84	54.86	40.02	AV
	0.289	15.60	0.26	15.86	50.54	34.68	
	1.054	19.50	0.32	19.82	46.00	26.18	
	2.581	12.10	0.40	12.50	46.00	33.50	
	7.606	13.79	0.68	14.47	50.00	35.53	
	14.364	25.79	0.84	26.63	50.00	23.37	
Neutral	0.172	25.60	0.12	25.72	64.86	39.14	QP
	0.280	26.08	0.12	26.20	60.81	34.61	
	1.065	29.83	0.22	30.05	56.00	25.95	
	2.023	23.51	0.17	23.68	56.00	32.32	
	7.175	23.81	0.59	24.40	60.00	35.60	
	14.364	34.88	0.72	35.60	60.00	24.40	
	0.172	15.30	0.12	15.42	54.86	39.44	AV
	0.280	15.58	0.12	15.70	50.81	35.11	
	1.065	18.60	0.22	18.82	46.00	27.18	
	2.023	13.40	0.17	13.57	46.00	32.43	
	7.175	13.20	0.59	13.79	50.00	36.21	
	14.364	24.30	0.72	25.02	50.00	24.98	

TEST ENGINEER: SAWEN LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN46K316XWUS3D Humidity : 48%RH

Serial No. : E1206796-01/01 Date of Test : Jun 28, 2012

Test Mode : HDMI 1024*768@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark	
Line	0.170	24.88	0.24	25.12	64.94	39.82	QP	
	0.289	26.09	0.26	26.35	60.54	34.19		
	1.054	29.79	0.32	30.11	56.00	25.89		
	2.581	23.00	0.40	23.40	56.00	32.60		
	7.526	24.76	0.67	25.43	60.00	34.57		
	14.364	33.47	0.84	34.31	60.00	25.69		
	0.170	14.60	0.24	14.84	54.94	40.10	AV	
	0.289	15.60	0.26	15.86	50.54	34.68		
	1.054	19.40	0.32	19.72	46.00	26.28		
	2.581	12.60	0.40	13.00	46.00	33.00		
	7.526	14.30	0.67	14.97	50.00	35.03		
	14.364	23.09	0.84	23.93	50.00	26.07		
	Neutral	0.168	25.50	0.13	25.63	65.08	39.45	QP
		0.300	26.21	0.12	26.33	60.24	33.91	
1.071		30.17	0.22	30.39	56.00	25.61		
2.178		23.46	0.17	23.63	56.00	32.37		
6.805		24.69	0.58	25.27	60.00	34.73		
14.364		35.06	0.72	35.78	60.00	24.22		
0.168		14.31	0.13	14.44	55.08	40.64	AV	
0.300		15.60	0.12	15.72	50.24	34.52		
1.071		19.50	0.22	19.72	46.00	26.28		
2.178		13.21	0.17	13.38	46.00	32.62		
6.805		14.20	0.58	14.78	50.00	35.22		
14.364		24.50	0.72	25.22	50.00	24.78		

TEST ENGINEER: SAWEN LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN46K316XWUS3D Humidity : 48%RH

Serial No. : E1206796-01/01 Date of Test : Jun 28, 2012

Test Mode : D-Sub 800*600@60Hz

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.172	24.65	0.24	24.89	64.86	39.97	QP
	0.283	26.09	0.26	26.35	60.72	34.37	
	1.054	29.52	0.32	29.84	56.00	26.16	
	2.554	23.14	0.40	23.54	56.00	32.46	
	7.606	24.67	0.68	25.35	60.00	34.65	
	14.364	37.09	0.84	37.93	60.00	22.07	
	0.172	14.30	0.24	14.54	54.86	40.32	AV
	0.283	15.20	0.26	15.46	50.72	35.26	
	1.054	18.40	0.32	18.72	46.00	27.28	
	2.554	12.60	0.40	13.00	46.00	33.00	
	7.606	14.19	0.68	14.87	50.00	35.13	
	14.364	26.49	0.84	27.33	50.00	22.67	
Neutral	0.172	25.14	0.12	25.26	64.86	39.60	QP
	0.280	26.16	0.12	26.28	60.81	34.53	
	1.065	30.29	0.22	30.51	56.00	25.49	
	2.033	23.65	0.17	23.82	56.00	32.18	
	7.175	24.40	0.59	24.99	60.00	35.01	
	14.364	33.91	0.72	34.63	60.00	25.37	
	0.172	14.10	0.12	14.22	54.86	40.64	AV
	0.280	15.60	0.12	15.72	50.81	35.09	
	1.065	19.50	0.22	19.72	46.00	26.28	
	2.033	13.40	0.17	13.57	46.00	32.43	
	7.175	14.10	0.59	14.69	50.00	35.31	
	14.364	23.40	0.72	24.12	50.00	25.88	

TEST ENGINEER: SAWEN LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN46K316XWUS3D Humidity : 48%RH

Serial No. : E1206796-01/01 Date of Test : Jun 28, 2012

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

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark	
Line	0.170	24.78	0.24	25.02	64.94	39.92	QP	
	0.289	26.22	0.26	26.48	60.54	34.06		
	1.065	28.99	0.32	29.31	56.00	26.69		
	2.396	23.58	0.40	23.98	56.00	32.02		
	7.100	24.54	0.66	25.20	60.00	34.80		
	14.364	34.55	0.84	35.39	60.00	24.61		
	0.170	14.30	0.24	14.54	54.94	40.40	AV	
	0.289	15.60	0.26	15.86	50.54	34.68		
	1.065	18.60	0.32	18.92	46.00	27.08		
	2.396	13.50	0.40	13.90	46.00	32.10		
	7.100	14.30	0.66	14.96	50.00	35.04		
	14.364	24.29	0.84	25.13	50.00	24.87		
	Neutral	0.174	25.01	0.12	25.13	64.77	39.64	QP
		0.289	26.26	0.12	26.38	60.54	34.16	
1.065		29.93	0.22	30.15	56.00	25.85		
2.396		23.94	0.19	24.13	56.00	31.87		
7.100		24.30	0.59	24.89	60.00	35.11		
14.364		35.86	0.72	36.58	60.00	23.42		
0.174		14.50	0.12	14.62	54.77	40.15	AV	
0.289		15.10	0.12	15.22	50.54	35.32		
1.065		19.50	0.22	19.72	46.00	26.28		
2.396		13.50	0.19	13.69	46.00	32.31		
7.100		13.50	0.59	14.09	50.00	35.91		
14.364		25.60	0.72	26.32	50.00	23.68		

TEST ENGINEER: SAWEN LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN46K316XWUS3D Humidity : 48%RH

Serial No. : E1206796-01/01 Date of Test : Jun 28, 2012

Test Mode : USB Play

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark	
Line	0.168	24.62	0.24	24.86	65.08	40.22	QP	
	0.289	26.18	0.26	26.44	60.54	34.10		
	1.054	29.93	0.32	30.25	56.00	25.75		
	2.554	22.73	0.40	23.13	56.00	32.87		
	7.368	25.53	0.66	26.19	60.00	33.81		
	14.213	33.53	0.84	34.37	60.00	25.63		
	0.168	14.60	0.24	14.84	55.08	40.24	AV	
	0.289	15.90	0.26	16.16	50.54	34.38		
	1.054	18.60	0.32	18.92	46.00	27.08		
	2.554	12.30	0.40	12.70	46.00	33.30		
	7.368	15.11	0.66	15.77	50.00	34.23		
	14.213	23.39	0.84	24.23	50.00	25.77		
	Neutral	0.170	24.95	0.12	25.07	64.94	39.87	QP
		0.283	25.91	0.12	26.03	60.72	34.69	
1.065		30.02	0.22	30.24	56.00	25.76		
2.396		24.08	0.19	24.27	56.00	31.73		
6.805		25.01	0.58	25.59	60.00	34.41		
14.364		32.81	0.72	33.53	60.00	26.47		
0.170		14.60	0.12	14.72	54.94	40.22	AV	
0.283		15.60	0.12	15.72	50.72	35.00		
1.065		19.60	0.22	19.82	46.00	26.18		
2.396		13.60	0.19	13.79	46.00	32.21		
6.805		14.30	0.58	14.88	50.00	35.12		
14.364		22.60	0.72	23.32	50.00	26.68		

TEST ENGINEER: SAWEN LI

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN46K316XWUS3D Humidity : 48%RH

Serial No. : E1206796-01/01 Date of Test : Jun 28, 2012S

Test Mode : LAN

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.170	24.76	0.24	25.00	64.94	39.94	QP
	0.289	25.97	0.26	26.23	60.54	34.31	
	1.054	29.58	0.32	29.90	56.00	26.10	
	3.881	23.36	0.48	23.84	56.00	32.16	
	6.805	24.11	0.65	24.76	60.00	35.24	
	14.364	36.24	0.84	37.08	60.00	22.92	
	0.170	14.30	0.24	14.54	54.94	40.40	AV
	0.289	15.60	0.26	15.86	50.54	34.68	
	1.054	18.60	0.32	18.92	46.00	27.08	
	3.881	13.00	0.48	13.48	46.00	32.52	
	6.805	14.00	0.65	14.65	50.00	35.35	
	14.364	25.89	0.84	26.73	50.00	23.27	
Neutral	0.170	25.70	0.12	25.82	64.94	39.12	QP
	0.297	26.01	0.12	26.13	60.32	34.19	
	1.065	30.55	0.22	30.77	56.00	25.23	
	2.396	24.05	0.19	24.24	56.00	31.76	
	7.252	23.69	0.59	24.28	60.00	35.72	
	14.364	33.22	0.72	33.94	60.00	26.06	
	0.170	15.30	0.12	15.42	54.94	39.52	AV
	0.297	15.60	0.12	15.72	50.32	34.60	
	1.065	20.10	0.22	20.32	46.00	25.68	
	2.396	13.60	0.19	13.79	46.00	32.21	
	7.252	13.30	0.59	13.89	50.00	36.11	
	14.364	23.00	0.72	23.72	50.00	26.28	

TEST ENGINEER: SAWEN LI

4 RADIATED EMISSION TEST

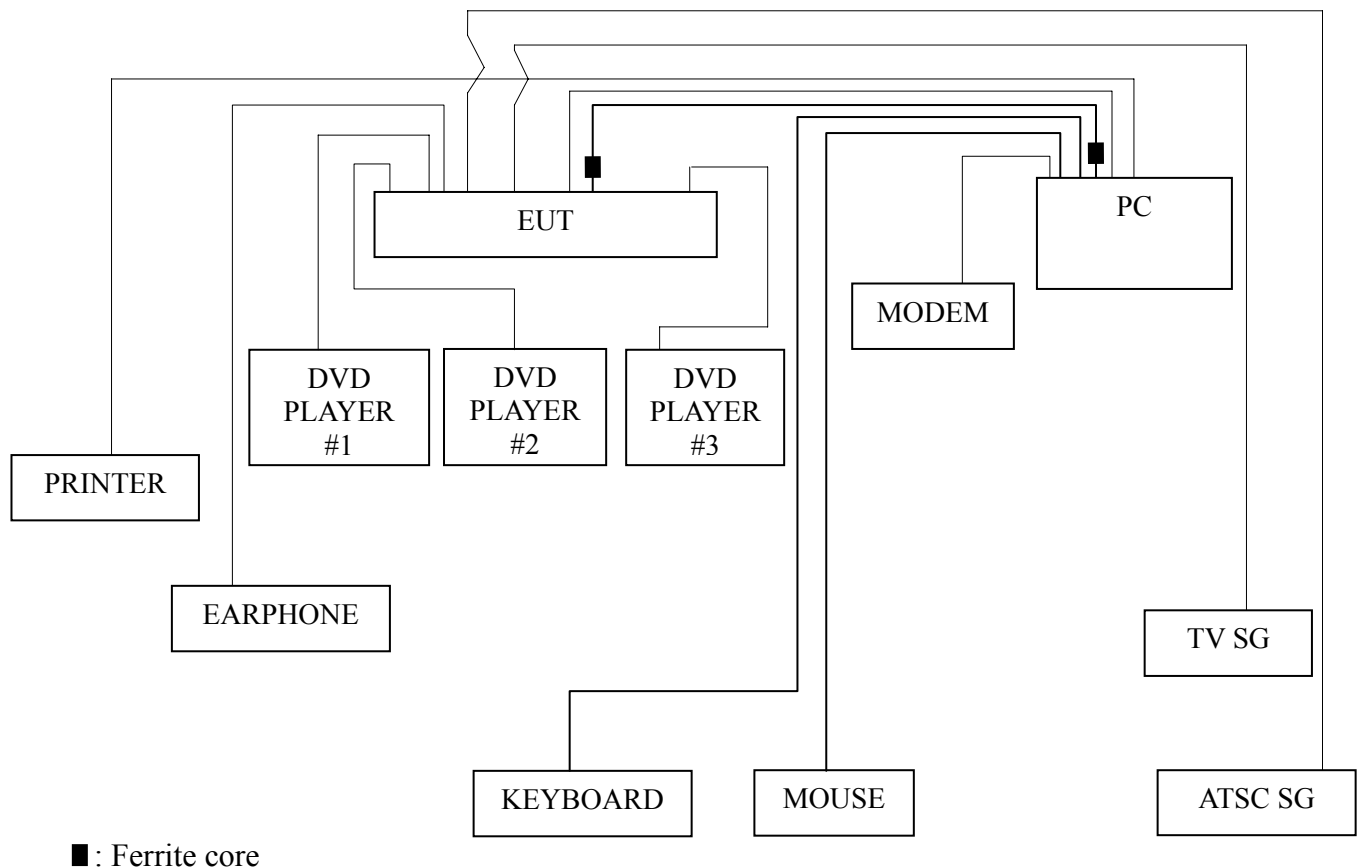
4.1 Test Equipment

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

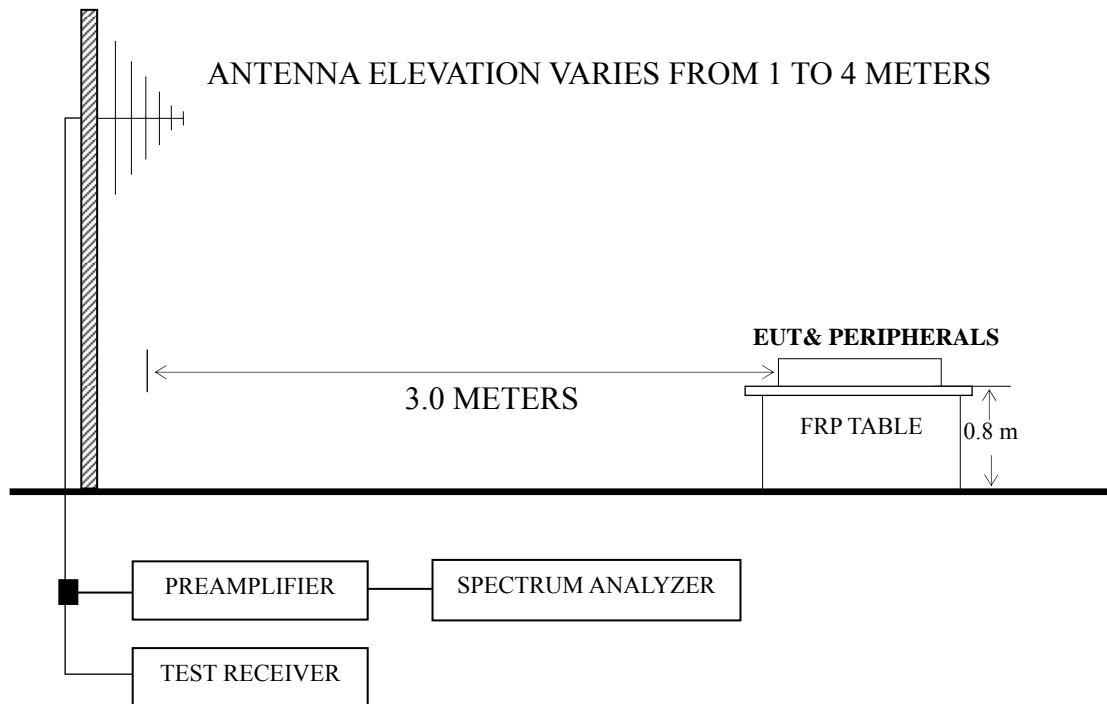
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESVS10	844594/001	Mar 22, 2012	Mar 22, 2013
2.	Preamplifier	Agilent	8447D	2944A10548	Mar 18, 2012	Sep 18, 2012
3.	Bi-log Antenna	TESEQ	CBL6112D	23192	Dec 01, 2011	Dec 01, 2012
4.	Spectrum	Agilent	E7405A	MY45106600	Mar 22, 2012	Mar 22, 2013
5.	50Ω Coaxial Switch	Anritsu	MP59B	6200426390	Mar 18, 2012	Sep 18, 2012
6.	Software	Audix	E3	SET00200 9912M295-2	--	--

4.2 Block Diagram of Test Setup

4.2.1 EUT and Peripherals



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 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 1024*768@60Hz	P22
HDMI 1024*768@60Hz	P23
D-Sub 800*600@60Hz	P24
D-Sub 640*480@60Hz	P25
USB Play	P26
LAN	P27

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

NOTE 2 – All readings are Quasi-Peak values.

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 740.800 MHz with corrected signal level of 43.76 dB ($\mu\text{V}/\text{m}$) (limit is 46.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.80 m height and the turntable was at 240°. The worst emission at vertical polarization was detected at 85.290 MHz with corrected signal level of 35.73 dB ($\mu\text{V}/\text{m}$) (limit is 40.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.80 m height and the turntable was at 110°.

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN46K316XWUS3D Humidity : 60%RH

Serial No. : E1206796-01/01 Date of Test : Jul 09, 2012

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

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	34.850	19.81	15.70	0.84	36.35	40.00	3.65
	94.020	22.52	11.15	1.78	35.45	43.50	8.05
	184.230	23.19	9.95	2.37	35.51	43.50	7.99
	233.700	20.18	11.23	2.56	33.97	46.00	12.03
	462.620	14.87	17.14	3.17	35.18	46.00	10.82
	774.960	14.52	20.34	3.84	38.70	46.00	7.30
Vertical	152.220	26.12	10.37	2.24	38.73	43.50	4.77
	211.390	24.33	10.26	2.47	37.06	43.50	6.44
	339.430	13.73	14.83	2.85	31.41	46.00	14.59
	466.500	16.81	17.19	3.17	37.17	46.00	8.83
	620.730	13.54	18.46	3.51	35.51	46.00	10.49
	774.960	16.01	20.34	3.84	40.19	46.00	5.81

TEST ENGINEER: RAVEN JIN

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN46K316XWUS3D Humidity : 60%RH

Serial No. : E1206796-01/01 Date of Test : Jul 09, 2012

Test Mode : HDMI 1024*768@60Hz

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	35.820	20.10	15.19	0.84	36.13	40.00	3.87
	72.680	19.48	10.08	1.47	31.03	40.00	8.97
	91.110	21.18	11.05	1.75	33.98	43.50	9.52
	154.160	15.53	10.34	2.25	28.12	43.50	15.38
	231.760	19.20	11.14	2.55	32.89	46.00	13.11
Vertical	497.540	14.44	17.58	3.27	35.29	46.00	10.71
	93.050	18.09	11.12	1.77	30.98	43.50	12.52
	140.580	22.42	10.60	2.18	35.20	43.50	8.30
	153.190	26.01	10.36	2.24	38.61	43.50	4.89
	186.170	20.86	9.93	2.38	33.17	43.50	10.33
	467.470	17.37	17.22	3.17	37.76	46.00	8.24
	774.960	16.01	20.34	3.84	40.19	46.00	5.81

TEST ENGINEER: RAVEN JIN

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN46K316XWUS3D Humidity : 60%RH

Serial No. : E1206796-01/01 Date of Test : Jul 09, 2012

Test Mode : D-Sub 800*600@60Hz

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	34.850	20.55	15.70	0.84	37.09	40.00	2.91
	90.140	20.49	11.00	1.73	33.22	43.50	10.28
	182.290	24.44	9.97	2.36	36.77	43.50	6.73
	226.910	21.50	10.93	2.53	34.96	46.00	11.04
	468.000	22.00	17.22	3.17	42.39	46.00	3.61
	773.020	13.67	20.34	3.84	37.85	46.00	8.15
Vertical	137.670	22.05	10.66	2.15	34.86	43.50	8.64
	184.230	20.59	9.95	2.37	32.91	43.50	10.59
	276.380	23.87	13.02	2.68	39.57	46.00	6.43
	468.000	23.00	17.22	3.17	43.39	46.00	2.61
	622.670	14.19	18.49	3.51	36.19	46.00	9.81
	780.780	11.58	20.40	3.86	35.84	46.00	10.16

TEST ENGINEER: RAVEN JIN

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN46K316XWUS3 Humidity : 60%RH
D

Serial No. : E1206796-01/01 Date of Test : Jul 09, 2012

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

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	35.820	19.10	15.19	0.84	35.13	40.00	4.87
	67.830	20.93	9.70	1.36	31.99	40.00	8.01
	88.200	24.68	10.93	1.70	37.31	43.50	6.19
	223.030	19.59	10.76	2.51	32.86	46.00	13.14
	462.620	13.04	17.14	3.17	33.35	46.00	12.65
	740.800	20.00	19.98	3.78	43.76	46.00	2.24
Vertical	85.290	23.27	10.80	1.66	35.73	40.00	4.27
	148.340	26.14	10.44	2.22	38.80	43.50	4.70
	185.200	21.12	9.94	2.38	33.44	43.50	10.06
	234.670	19.00	11.28	2.56	32.84	46.00	13.16
	343.310	14.65	14.91	2.86	32.42	46.00	13.58
	464.560	16.39	17.17	3.17	36.73	46.00	9.27

TEST ENGINEER: RAVEN JIN

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN46K316XWUS3D Humidity : 60%RH

Serial No. : E1206796-01/01 Date of Test : Jul 09, 2012

Test Mode : USB Play

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	33.880	18.33	16.26	0.83	35.42	40.00	4.58
	90.140	20.49	11.00	1.73	33.22	43.50	10.28
	181.320	19.83	9.98	2.36	32.17	43.50	11.33
	224.000	20.94	10.80	2.52	34.26	46.00	11.74
	468.000	22.00	17.22	3.17	42.39	46.00	3.61
	499.480	19.45	17.60	3.27	40.32	46.00	5.68
Vertical	90.140	14.34	11.00	1.73	27.07	43.50	16.43
	146.400	24.48	10.49	2.20	37.17	43.50	6.33
	183.260	22.50	9.96	2.37	34.83	43.50	8.67
	226.910	19.42	10.93	2.53	32.88	46.00	13.12
	399.570	13.99	16.30	2.99	33.28	46.00	12.72
	468.000	23.00	17.22	3.17	43.39	46.00	2.61

TEST ENGINEER: RAVEN JIN

EUT : LED LCD TV Temperature : 22°C

Model No. : LTDN46K316XWUS3D Humidity : 60%RH

Serial No. : E1206796-01/01 Date of Test : Jul 09, 2012

Test Mode : LAN

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	55.220	27.76	7.69	0.81	36.26	40.00	3.74
	127.000	23.07	12.66	1.16	36.89	43.50	6.61
	235.640	24.84	12.36	1.56	38.76	46.00	7.24
	287.050	24.29	13.68	1.73	39.70	46.00	6.30
	608.120	17.87	19.25	2.48	39.60	46.00	6.40
	704.150	16.90	19.73	2.70	39.33	46.00	6.67
Vertical	59.100	27.00	6.80	0.83	34.63	40.00	5.37
	211.390	27.47	11.22	1.49	40.18	43.50	3.32
	362.710	22.36	15.65	1.96	39.97	46.00	6.03
	573.200	16.27	18.88	2.39	37.54	46.00	8.46
	704.150	15.62	19.73	2.70	38.05	46.00	7.95
	910.760	15.18	21.78	3.04	40.00	46.00	6.00

TEST ENGINEER: RAVEN JIN

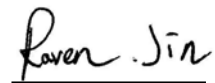
5 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
Gasket	DAA25X20X150\ROH	Qingdao Joinset S&T Co., Ltd.	See Internal Photos Figure 18, 19
		TAT ELECTRONIC TECH CO.,LTD.	
Gasket	DAA1002\ROH	Qingdao Joinset S&T Co., Ltd.	See Internal Photos Figure 18
		TAT ELECTRONIC TECH CO.,LTD.	
EMI Tape	35X0.7X56mm\VGA\ROH	Qingdao Joinset S&T Co., Ltd.	See Internal Photos Figure 20

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)

6 DEVIATION TO TEST SPECIFICATIONS

None.