

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

LED LCD TV

Model No.	Brand
55K610GWN	Hisense

FCC ID : W9HLCDF0019

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

Prepared By : Audix Technology (Shanghai) Co., Ltd.
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Report No. : ACI-F13065
Date of Test : May 09 – 13, 2013
Date of Report : May 15, 2013

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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
55K610GWN	Hisense	120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2012
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) which was tested in 3m anechoic chamber May 09 – 13, 2013 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.

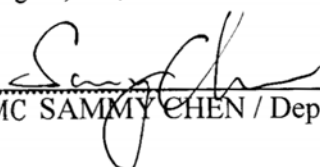
The test results for EUT's TV functions are contained in No.F13066, a Verification report.

Date of Test : May 09 – 13, 2013 Date of Report : May 15, 2013

Producer : 
 YENNY YU / Assistant

Review : 
 WENCY YANG / Supervisor

 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 2012 AND ANSI C63.4-2003	15.107(a) Class B	Pass
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART B OCTOBER 2012 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 type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type
Model No.	:	55K610GWN
Bread 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 : HE550GF-B51(1000)\PW1
Tuner	:	Manufacturer : XuGuang Tech.Co.,Ltd M/N : SDVT-10A/WF2\ROH
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

Remark:

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

Bottom Port:

- (1) One DIGITAL AUDIO OUT Port
: Connected with DVD PLAYER #1
- (2) One LAN Port
: Connected with PC

- (3) One HDMI4/ARC Port : Connected with DVD PLAYER #3
- (4) One HDMI3 Port : Connected with DVD PLAYER #2
- (5) One component of Audio/YPbPr Audio Port : Connected with DVD PLAYER #1
- (6) One component of Video/YPbPr Port : Connected with DVD PLAYER #1

Side Port:

- (1) One VGA Port : Connected with PC
- (2) One PC/DVI Audio In Port : Connected with PC
- (3) One ANT/CABLE IN Port : Connected with ATSC SG / TV SG
- (4) One HDMI2/DVI Port : Connected with PC
- (5) One HDMI1 Port : Connected with DVD PLAYER #1
- (6) One USB1 Port : Connected with U-Disk#1
- (7) One USB2 Port : Connected with U-Disk#2
- (8) One USB3 Port : Connected with U-Disk#3
- (9) One AUDIO OUT 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 : 1406
Serial Number : 0200702302609
Data Cable : Shielded, undetachable ,1.8m
Certificate : CE/EMC, FCC DoC, VCCI, MIC, C-Tick,
BSMI

2.2.4 Mouse

Manufacturer : Microsoft
Model Number : 1405
Serial Number : 0204603562213
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 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

2.2.7 ATSC Signal Generator

Manufacturer : SENCORE
Model Number : ATSC997
Serial Number : 6790071

2.2.8 DVD PLAYER #1

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

2.2.9 DVD PLAYER #2

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

2.2.10 DVD PLAYER #3

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

2.2.11 Earphone

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

2.2.12 U-DISK*3

Manufacturer : LG
Model Number : 1GB

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 = 3.42 dB

Radiated Emission Expanded Uncertainty (30-200MHz):
U = 4.14 dB (Horizontal)
U = 4.28 dB (Vertical)

Radiated Emission Expanded Uncertainty (200M-1GHz):
U = 4.18 dB (Horizontal)
U = 4.26 dB (Vertical)

3 CONDUCTED EMISSION TEST

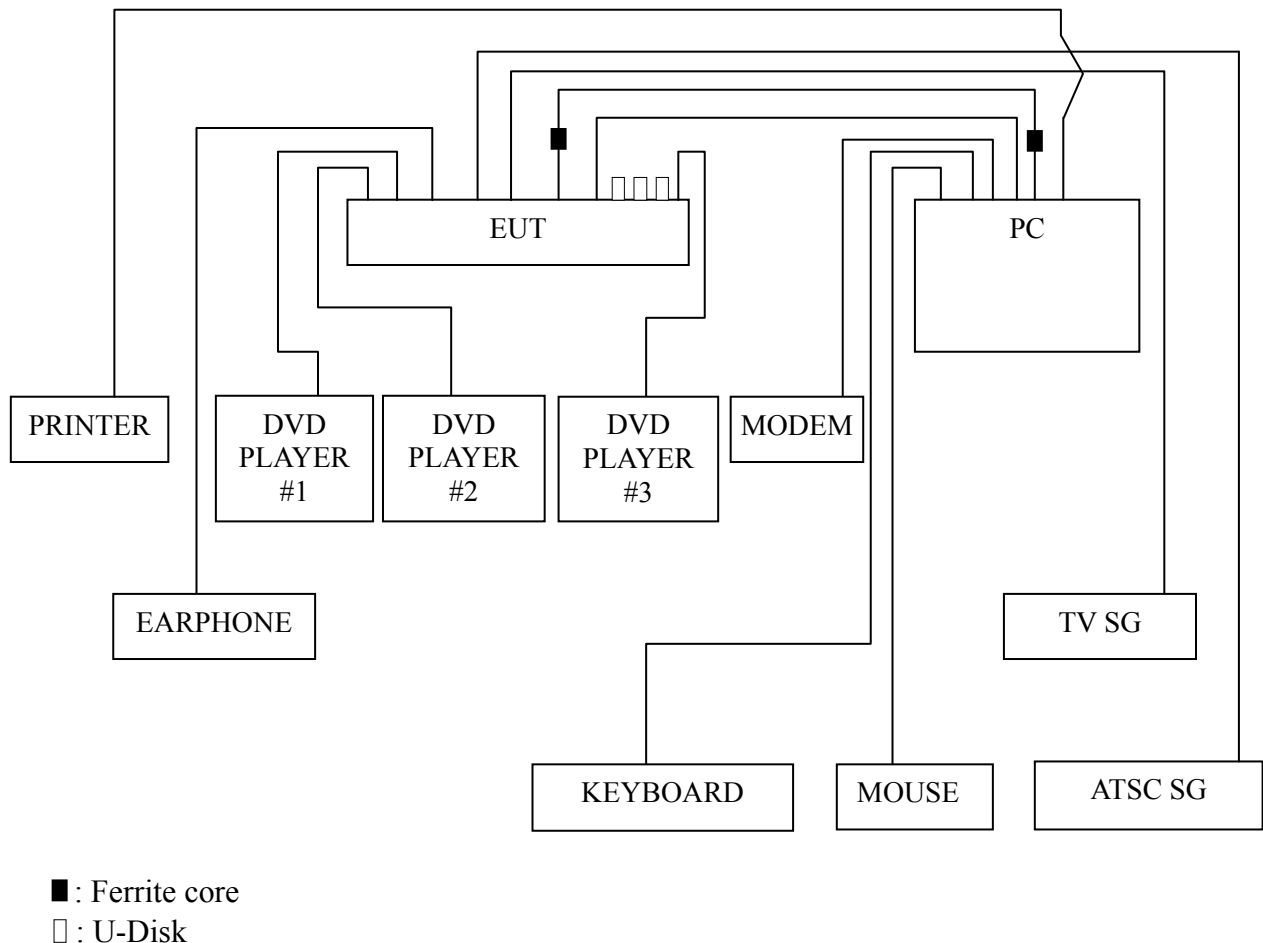
3.1 Test Equipment

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

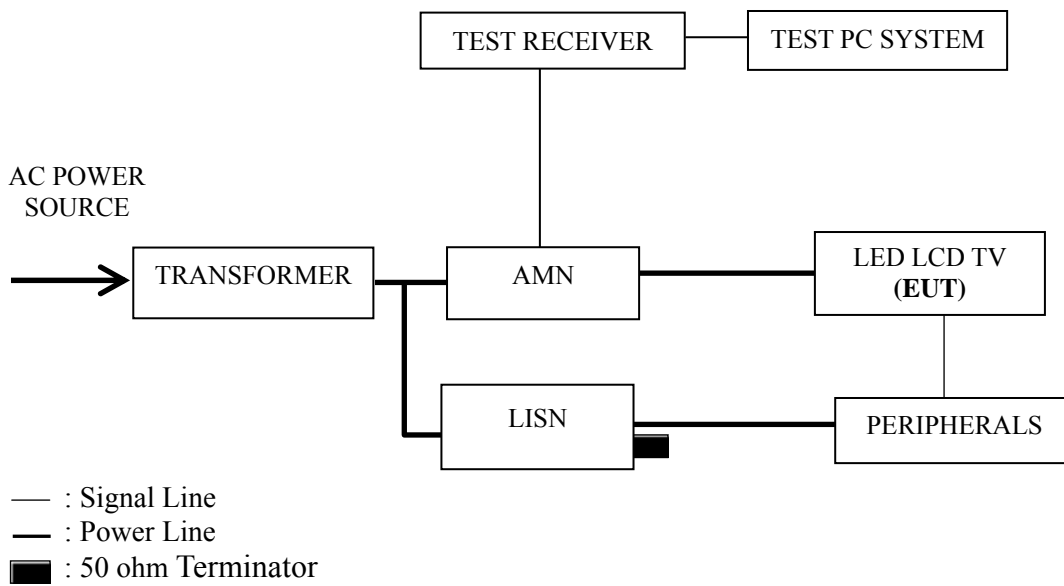
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	100841	Mar 20, 2013	Mar 20, 2014
2.	Artificial Mains Network (AMN)	R&S	ESH2-Z5	843890/011	Feb 25, 2013	Feb 25, 2014
3.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-4	Mar 20, 2013	Mar 20, 2014
4.	50 Ω Coaxial Switch	Anritsu	MP59B	6200426389	Mar 18, 2013	Sep 18, 2013
5.	50 Ω Terminator	Anritsu	BNC	001	Mar 20, 2013	Mar 20, 2014
6.	Software	Audix	E3	SET00200 9804M592	--	--

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 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 The other peripherals devices were driven and operated during the test.
- 3.5.8 The test modes are as follows:

Test Mode
D-Sub 1024*768@60Hz
HDMI 1024*768@60Hz
HDMI 800*600@60Hz
HDMI 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
HDMI 800*600@60Hz	P15
HDMI 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 HDMI 1080p mode was tested and recorded in a FCC Verification test report (No. F13066).

NOTE 5 – The worst case is for LAN test mode. The worst emission is detected at 2.794 MHz (Quasi-Peak Value) with corrected signal level of 48.80 dB (μ V) (limit is 56.00 dB (μ V)), when the Line of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22

Model No. : 55K610GWN Humidity : 48%RH

Test Mode : D-Sub 1024*768@60Hz Date of Test : May 13, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.444	36.87	0.35	37.22	56.98	19.76	QP
	0.720	39.74	0.20	39.94	56.00	16.06	
	1.032	40.00	0.32	40.32	56.00	15.68	
	1.878	40.33	0.39	40.72	56.00	15.28	
	2.809	47.07	0.40	47.47	56.00	8.53	
	8.592	35.76	0.71	36.47	60.00	23.53	
	0.444	24.19	0.35	24.54	46.98	22.44	AV
	0.720	24.55	0.20	24.75	46.00	21.25	
	1.032	28.20	0.32	28.52	46.00	17.48	
	1.878	27.55	0.39	27.94	46.00	18.06	
	2.809	33.26	0.40	33.66	46.00	12.34	
	8.592	21.20	0.71	21.91	50.00	28.09	
Neutral	0.444	38.46	0.17	38.63	56.98	18.35	QP
	0.735	39.51	0.21	39.72	56.00	16.28	
	1.032	40.69	0.22	40.91	56.00	15.09	
	1.310	40.98	0.22	41.20	56.00	14.80	
	2.794	45.60	0.21	45.81	56.00	10.19	
	8.592	35.90	0.52	36.42	60.00	23.58	
	0.444	25.60	0.17	25.77	46.98	21.21	AV
	0.735	26.55	0.21	26.76	46.00	19.24	
	1.032	28.50	0.22	28.72	46.00	17.28	
	1.310	28.49	0.22	28.71	46.00	17.29	
	2.794	34.22	0.21	34.43	46.00	11.57	
	8.592	23.22	0.52	23.74	50.00	26.26	

TEST ENGINEER: BEN TIAN

EUT : LED LCD TV Temperature : 22

Model No. : 55K610GWN Humidity : 48%RH

Test Mode : HDMI 1024*768@60Hz Date of Test : May 13, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.440	37.34	0.35	37.69	57.07	19.38	QP
	0.727	39.80	0.20	40.00	56.00	16.00	
	1.043	40.84	0.32	41.16	56.00	14.84	
	1.310	41.30	0.34	41.64	56.00	14.36	
	2.794	47.10	0.40	47.50	56.00	8.50	
	8.323	37.51	0.69	38.20	60.00	21.80	AV
	0.440	24.40	0.35	24.75	47.07	22.32	
	0.727	27.55	0.20	27.75	46.00	18.25	
	1.043	28.14	0.32	28.46	46.00	17.54	
	1.310	29.12	0.34	29.46	46.00	16.54	
2.794	35.24	0.40	35.64	46.00	10.36	AV	
8.323	25.59	0.69	26.28	50.00	23.72		
Neutral	0.447	38.12	0.17	38.29	56.93	18.64	QP
	0.735	39.62	0.21	39.83	56.00	16.17	
	1.043	42.06	0.22	42.28	56.00	13.72	
	1.928	40.73	0.17	40.90	56.00	15.10	
	2.794	47.28	0.21	47.49	56.00	8.51	
	8.323	38.21	0.55	38.76	60.00	21.24	AV
	0.447	26.23	0.17	26.40	46.93	20.53	
	0.735	26.75	0.21	26.96	46.00	19.04	
	1.043	30.23	0.22	30.45	46.00	15.55	
	1.928	28.66	0.17	28.83	46.00	17.17	
	2.794	34.90	0.21	35.11	46.00	10.89	
	8.323	25.90	0.55	26.45	50.00	23.55	

TEST ENGINEER: BEN TIAN

EUT : LED LCD TV Temperature : 22

Model No. : 55K610GWN Humidity : 48%RH

Test Mode : HDMI 800*600@60Hz Date of Test : May 13, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.435	37.19	0.35	37.54	57.15	19.61	QP
	0.727	40.50	0.20	40.70	56.00	15.30	
	1.043	40.56	0.32	40.88	56.00	15.12	
	1.338	40.83	0.34	41.17	56.00	14.83	
	2.794	46.96	0.40	47.36	56.00	8.64	
	8.323	39.00	0.69	39.69	60.00	20.31	AV
	0.435	24.21	0.35	24.56	47.15	22.59	
	0.727	28.55	0.20	28.75	46.00	17.25	
	1.043	28.22	0.32	28.54	46.00	17.46	
	1.338	27.25	0.34	27.59	46.00	18.41	
2.794	34.23	0.40	34.63	46.00	11.37	QP	
8.323	26.40	0.69	27.09	50.00	22.91		
0.447	37.10	0.17	37.27	56.93	19.66		
0.743	39.59	0.21	39.80	56.00	16.20		
1.032	41.00	0.22	41.22	56.00	14.78		
1.928	40.93	0.17	41.10	56.00	14.90	QP	
2.527	46.72	0.20	46.92	56.00	9.08		
9.011	37.59	0.50	38.09	60.00	21.91		
0.447	23.60	0.17	23.77	46.93	23.16		AV
0.743	27.80	0.21	28.01	46.00	17.99		
1.032	29.14	0.22	29.36	46.00	16.64		
1.928	29.63	0.17	29.80	46.00	16.20		
2.527	34.21	0.20	34.41	46.00	11.59		
9.011	25.41	0.50	25.91	50.00	24.09	AV	

TEST ENGINEER: BEN TIAN

EUT : LED LCD TV Temperature : 22

Model No. : 55K610GWN Humidity : 48%RH

Test Mode : HDMI 640*480@60Hz Date of Test : May 13, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.444	37.25	0.35	37.60	56.98	19.38	QP
	0.743	39.39	0.21	39.60	56.00	16.40	
	1.010	39.79	0.32	40.11	56.00	15.89	
	1.888	41.03	0.39	41.42	56.00	14.58	
	2.765	48.30	0.40	48.70	56.00	7.30	
	8.501	34.49	0.71	35.20	60.00	24.80	AV
	0.444	25.49	0.35	25.84	46.98	21.14	
	0.743	26.35	0.21	26.56	46.00	19.44	
	1.010	27.11	0.32	27.43	46.00	18.57	
	1.888	30.30	0.39	30.69	46.00	15.31	
	2.765	36.36	0.40	36.76	46.00	9.24	
	8.501	21.41	0.71	22.12	50.00	27.88	
Neutral	0.444	37.33	0.17	37.50	56.98	19.48	QP
	0.743	39.10	0.21	39.31	56.00	16.69	
	1.010	40.66	0.22	40.88	56.00	15.12	
	1.928	41.74	0.17	41.91	56.00	14.09	
	2.809	48.45	0.21	48.66	56.00	7.34	
	8.637	35.48	0.52	36.00	60.00	24.00	AV
	0.444	25.22	0.17	25.39	46.98	21.59	
	0.743	26.33	0.21	26.54	46.00	19.46	
	1.010	28.54	0.22	28.76	46.00	17.24	
	1.928	28.90	0.17	29.07	46.00	16.93	
	2.809	36.56	0.21	36.77	46.00	9.23	
	8.637	23.52	0.52	24.04	50.00	25.96	

TEST ENGINEER: BEN TIAN

EUT : LED LCD TV Temperature : 22

Model No. : 55K610GWN Humidity : 48%RH

Test Mode : USB Play Date of Test : May 13, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.447	37.66	0.35	38.01	56.93	18.92	QP
	0.735	39.39	0.21	39.60	56.00	16.40	
	1.043	40.80	0.32	41.12	56.00	14.88	
	1.324	40.93	0.34	41.27	56.00	14.73	
	2.765	48.01	0.40	48.41	56.00	7.59	
	5.221	37.10	0.50	37.60	60.00	22.40	
	0.447	25.19	0.35	25.54	46.93	21.39	AV
	0.735	24.60	0.21	24.81	46.00	21.19	
	1.043	28.70	0.32	29.02	46.00	16.98	
	1.324	28.50	0.34	28.84	46.00	17.16	
	2.765	36.51	0.40	36.91	46.00	9.09	
	5.221	25.45	0.50	25.95	50.00	24.05	
Neutral	0.447	38.15	0.17	38.32	56.93	18.61	QP
	0.735	39.76	0.21	39.97	56.00	16.03	
	1.043	41.13	0.22	41.35	56.00	14.65	
	1.928	41.68	0.17	41.85	56.00	14.15	
	2.527	47.22	0.20	47.42	56.00	8.58	
	8.323	36.69	0.55	37.24	60.00	22.76	
	0.447	24.69	0.17	24.86	46.93	22.07	AV
	0.735	27.02	0.21	27.23	46.00	18.77	
	1.043	29.07	0.22	29.29	46.00	16.71	
	1.928	29.16	0.17	29.33	46.00	16.67	
	2.527	34.99	0.20	35.19	46.00	10.81	
	8.323	23.14	0.55	23.69	50.00	26.31	

TEST ENGINEER: BEN TIAN

EUT : LED LCD TV Temperature : 22

Model No. : 55K610GWN Humidity : 48%RH

Test Mode : LAN Date of Test : May 13, 2013

Test Line	Frequency (MHz)	Meter Reading dB(μ V)	Factor (dB)	Emission Level dB(μ V)	Limits dB(μ V)	Margin (dB)	Remark
Line	0.444	37.11	0.35	37.46	56.98	19.52	QP
	0.743	40.56	0.21	40.77	56.00	15.23	
	1.043	41.27	0.32	41.59	56.00	14.41	
	1.324	41.68	0.34	42.02	56.00	13.98	
	2.794	48.40	0.40	48.80	56.00	7.20	
	8.916	35.08	0.72	35.80	60.00	24.20	
	0.444	24.89	0.35	25.24	46.98	21.74	AV
	0.743	27.96	0.21	28.17	46.00	17.83	
	1.043	28.36	0.32	28.68	46.00	17.32	
	1.324	27.63	0.34	27.97	46.00	18.03	
	2.794	36.24	0.40	36.64	46.00	9.36	
	8.916	21.63	0.72	22.35	50.00	27.65	
Neutral	0.444	37.60	0.17	37.77	56.98	19.21	QP
	0.743	39.49	0.21	39.70	56.00	16.30	
	1.043	41.24	0.22	41.46	56.00	14.54	
	1.324	41.77	0.21	41.98	56.00	14.02	
	2.500	46.62	0.20	46.82	56.00	9.18	
	9.011	34.96	0.50	35.46	60.00	24.54	
	0.444	24.56	0.17	24.73	46.98	22.25	AV
	0.743	26.42	0.21	26.63	46.00	19.37	
	1.043	28.35	0.22	28.57	46.00	17.43	
	1.324	28.16	0.21	28.37	46.00	17.63	
	2.500	32.33	0.20	32.53	46.00	13.47	
	9.011	21.12	0.50	21.62	50.00	28.38	

TEST ENGINEER: BEN TIAN

4 RADIATED EMISSION TEST

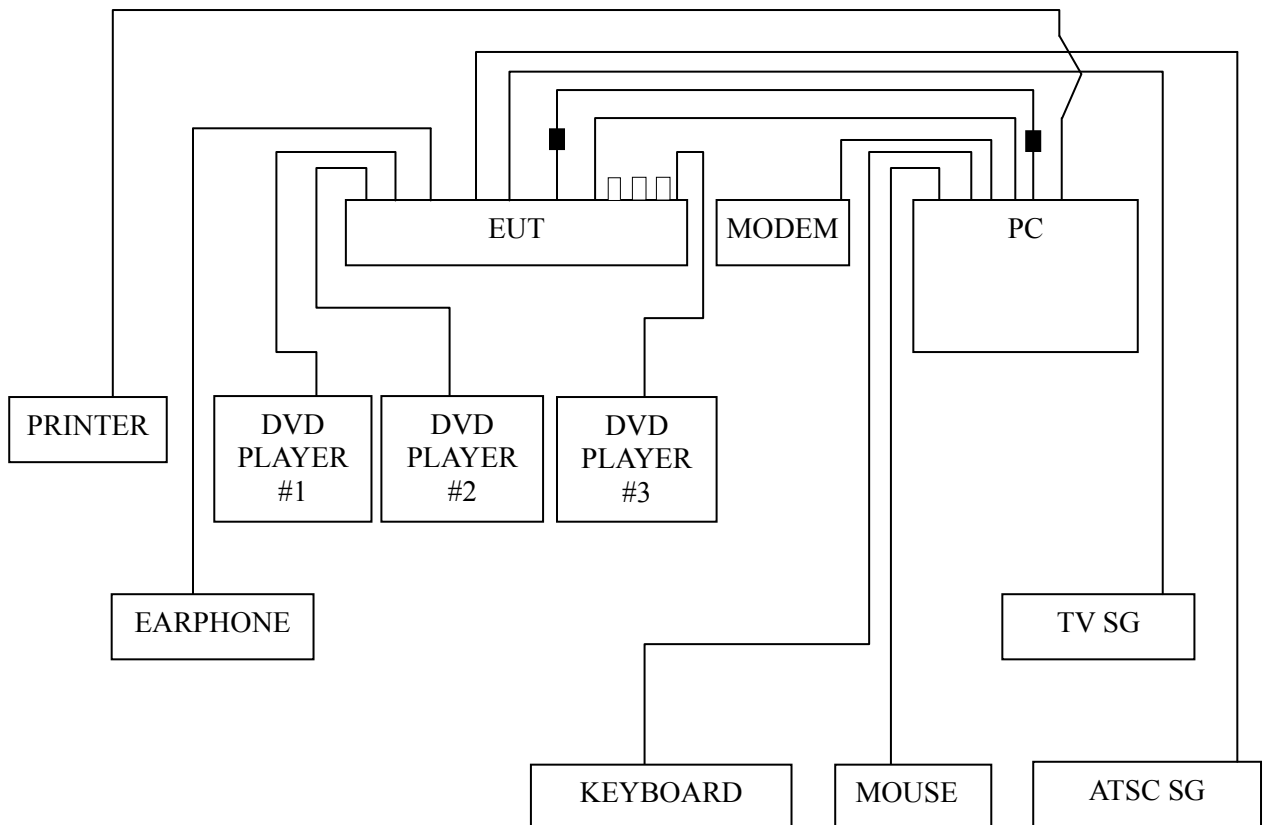
4.1 Test Equipment

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 11, 2012	Sep 11, 2013
2.	Preamplifier	Agilent	8447D	2944A10548	Mar 18, 2013	Sep 18, 2013
3.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 03, 2013	May 03, 2014
4.	Spectrum	Agilent	E7405A	MY45106600	Dec 17, 2012	Dec 17, 2013
5.	50 Coaxial Switch	Anritsu	MP59B	6200426390	Mar 18, 2013	Sep 18, 2013
6.	Software	Audix	E3	SET00200 9912M295-2	--	--

4.2 Block Diagram of Test Setup

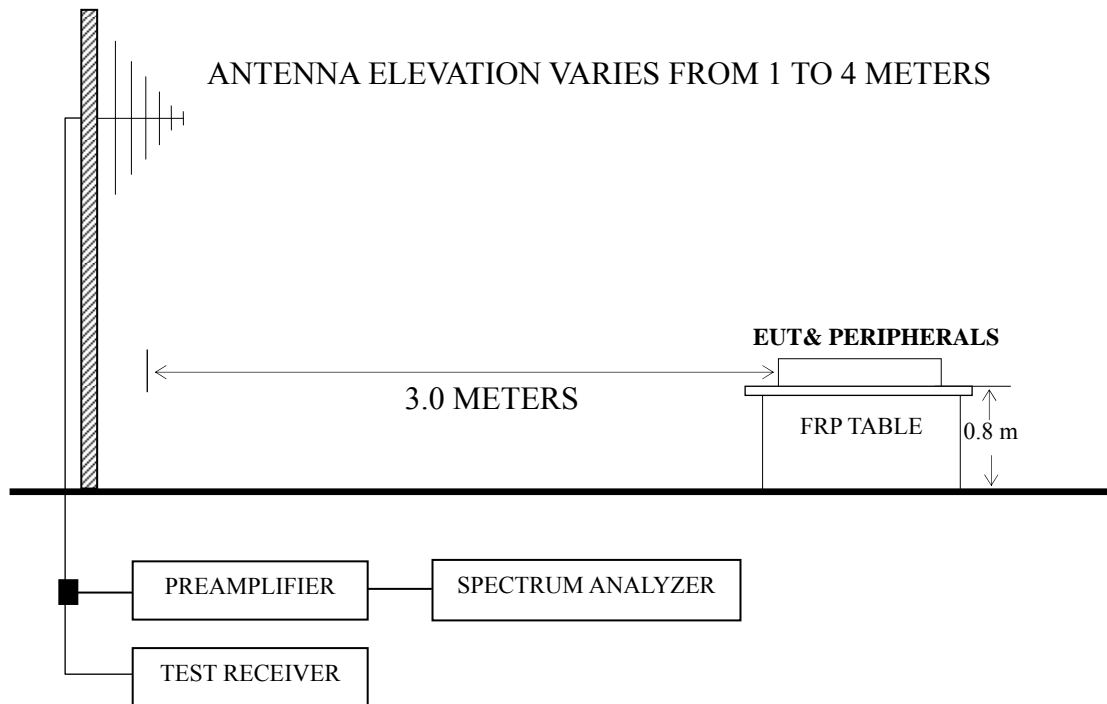
4.2.1 EUT and Peripherals



■ : Ferrite core

□ : 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	
		($\mu\text{V}/\text{m}$)	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 C63.4:2003 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 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 HDMI 1080p mode was tested and recorded in a FCC Verification test report (No. F13061).

NOTE 5 – The worst case is for D-Sub 640*480@60Hz test mode. The worst emission at horizontal polarization was detected at 700.120 MHz with corrected signal level of 43.64 dB ($\mu\text{V}/\text{m}$) (limit is 46.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.90 m height and the turntable was at 250°. The worst emission at vertical polarization was detected at 816.670 MHz with corrected signal level of 40.28 dB ($\mu\text{V}/\text{m}$) (limit is 46.00 dB ($\mu\text{V}/\text{m}$)), when the antenna was 1.90 m height and the turntable was at 123°.

EUT : LED LCD TV Temperature : 22

Model No. : 55K610GWN Humidity : 60%RH

Test Mode : D-Sub 1024*768@60Hz Date of Test : May 09, 2013

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	79.470	27.79	6.95	1.06	35.80	40.00	4.20
	144.460	21.42	10.54	1.61	33.57	43.50	9.93
	233.700	20.85	10.25	2.13	33.23	46.00	12.77
	397.630	18.98	15.80	2.68	37.46	46.00	8.54
	592.600	18.54	18.90	3.20	40.64	46.00	5.36
	698.700	19.80	19.90	3.54	43.24	46.00	2.76
Vertical	45.520	22.03	9.82	0.82	32.67	40.00	7.33
	79.470	28.38	6.95	1.06	36.39	40.00	3.61
	144.460	24.29	10.54	1.61	36.44	43.50	7.06
	191.990	25.38	7.93	1.91	35.22	43.50	8.28
	395.690	18.47	15.70	2.68	36.85	46.00	9.15
	700.260	18.50	19.90	3.54	41.94	46.00	4.06

TEST ENGINEER: RAVEN JIN

EUT : LED LCD TV Temperature : 22

Model No. : 55K610GWN Humidity : 60%RH

Test Mode : HDMI 1024*768@60Hz Date of Test : May 09, 2013

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	79.470	23.79	6.95	1.06	31.80	40.00	8.20
	122.150	15.99	11.94	1.49	29.42	43.50	14.08
	144.460	17.42	10.54	1.61	29.57	43.50	13.93
	233.700	16.85	10.25	2.13	29.23	46.00	16.77
	397.630	14.98	15.80	2.68	33.46	46.00	12.54
Vertical	592.600	14.54	18.90	3.20	36.64	46.00	9.36
	79.470	24.38	6.95	1.06	32.39	40.00	7.61
	123.120	23.86	11.96	1.49	37.31	43.50	6.19
	191.990	21.38	7.93	1.91	31.22	43.50	12.28
	395.690	14.47	15.70	2.68	32.85	46.00	13.15
	591.630	16.94	18.90	3.20	39.04	46.00	6.96
	701.240	17.77	19.90	3.54	41.21	46.00	4.79

TEST ENGINEER: RAVEN JIN

EUT : LED LCD TV Temperature : 22

Model No. : 55K610GWN Humidity : 60%RH

Test Mode : D-Sub 800*600@60Hz Date of Test : May 09, 2013

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	45.520	22.15	9.82	0.82	32.79	40.00	7.21
	144.460	23.59	10.54	1.61	35.74	43.50	7.76
	191.990	22.42	7.93	1.91	32.26	43.50	11.24
	233.700	19.39	10.25	2.13	31.77	46.00	14.23
	397.630	18.03	15.80	2.68	36.51	46.00	9.49
	894.270	17.13	19.93	4.43	41.49	46.00	4.51
Vertical	45.520	14.78	9.82	0.82	25.42	40.00	14.58
	148.340	23.30	10.80	1.63	35.73	43.50	7.77
	193.930	22.57	7.97	1.92	32.46	43.50	11.04
	233.700	19.55	10.25	2.13	31.93	46.00	14.07
	398.600	18.80	15.90	2.68	37.38	46.00	8.62
	444.190	17.61	17.15	2.82	37.58	46.00	8.42

TEST ENGINEER: RAVEN JIN

EUT : LED LCD TV Temperature : 22

Model No. : 55K610GWN Humidity : 60%RH

Test Mode : D-Sub 640*480@60Hz Date of Test : May 09, 2013

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	144.460	20.89	10.54	1.61	33.04	43.50	10.46
	193.930	23.55	7.97	1.92	33.44	43.50	10.06
	233.700	20.41	10.25	2.13	32.79	46.00	13.21
	396.660	20.61	15.80	2.68	39.09	46.00	6.91
	432.550	17.32	17.78	2.78	37.88	46.00	8.12
	700.120	20.20	19.90	3.54	43.64	46.00	2.36
Vertical	45.520	21.83	9.82	0.82	32.47	40.00	7.53
	233.700	19.56	10.25	2.13	31.94	46.00	14.06
	356.890	16.71	15.13	2.63	34.47	46.00	11.53
	397.630	20.38	15.80	2.68	38.86	46.00	7.14
	498.510	17.21	17.43	2.98	37.62	46.00	8.38
	816.670	15.65	20.83	3.80	40.28	46.00	5.72

TEST ENGINEER: RAVEN JIN

EUT : LED LCD TV Temperature : 22

Model No. : 55K610GWN Humidity : 60%RH

Test Mode : USB Play Date of Test : May 09, 2013

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	79.470	23.79	6.95	1.06	31.80	40.00	8.20
	122.150	15.99	11.94	1.49	29.42	43.50	14.08
	144.460	17.42	10.54	1.61	29.57	43.50	13.93
	233.700	16.85	10.25	2.13	29.23	46.00	16.77
	397.630	14.98	15.80	2.68	33.46	46.00	12.54
	592.600	14.54	18.90	3.20	36.64	46.00	9.36
Vertical	36.790	10.27	15.20	0.74	26.21	40.00	13.79
	45.520	17.03	9.82	0.82	27.67	40.00	12.33
	79.470	23.38	6.95	1.06	31.39	40.00	8.61
	191.990	20.38	7.93	1.91	30.22	43.50	13.28
	233.700	14.69	10.25	2.13	27.07	46.00	18.93
	395.690	13.47	15.70	2.68	31.85	46.00	14.15

TEST ENGINEER: RAVEN JIN

EUT : LED LCD TV Temperature : 22

Model No. : 55K610GWN Humidity : 60%RH

Test Mode : LAN Date of Test : May 09, 2013

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	124.090	24.41	11.98	1.50	37.89	43.50	5.61
	397.630	14.03	15.80	2.68	32.51	46.00	13.49
	591.630	16.40	18.90	3.20	38.50	46.00	7.50
	702.210	16.91	19.83	3.54	40.28	46.00	5.72
	744.890	15.30	18.53	3.57	37.40	46.00	8.60
	894.270	13.13	19.93	4.43	37.49	46.00	8.51
Vertical	79.470	22.04	6.95	1.06	30.05	40.00	9.95
	148.340	16.30	10.80	1.63	28.73	43.50	14.77
	191.990	15.94	7.93	1.91	25.78	43.50	17.72
	233.700	12.55	10.25	2.13	24.93	46.00	21.07
	395.690	11.46	15.70	2.68	29.84	46.00	16.16
	591.630	10.91	18.90	3.20	33.01	46.00	12.99

TEST ENGINEER: RAVEN JIN

5 DEBUG DESCRIPTION

The following components are used during the countermeasure procedures:

Name	M/N	Manufacturer	Location
Al Tape	DBA40X50\ROH	Qingdao Joinset S&T Co., Ltd.	See Internal Photo Figure 20
Gasket	35X0.7X41mm\VGA	Qingdao Joinset S&T Co., Ltd.	See Internal Photo Figure 21
		Shenzhen TAT Electronic Technology Co., Ltd.	

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.