



NVLAP LAB CODE 200707-0



## FCC PART 15B

### MEASUREMENT AND TEST REPORT

For

**Zhejiang Belson Technology Co., Ltd.**

Yuedong Road, Paojiang Industrial Zone,  
Shaoxing, Zhejiang, China

**FCC ID: XQSL2301A**

<b>Report Type:</b> Original Report	<b>Product Type:</b> LCD TV
<b>Test Engineer:</b> <u>Terry Chen</u> <i>Terry. chen</i>	
<b>Report Number:</b> <u>RSH09090451</u>	
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**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP\*, NIST, or any agency of the Federal Government.

\* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk “\*” (Rev.2)

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## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

The *Zhejiang Belson Technology Co.,Ltd* 's product, model number: *L2301A (FCC ID: XQSL2301A)* or the "EUT" as referred to in this report is a *LCD TV*, which measures approximately: 58 cm L x 44 cm W x 21 cm H, input voltage: AC 120V/60Hz.

\*Note: The serial product model *L2301A, L23XXY (XX=00-99, Y=A-Z), TD2420B, TD2420BU, TD2420R TD2420S, TD2420W*, we select *L2301A* to test, and their difference are only the model names, TV cabinet and colour, which was explained in the attached declaration letter.

\* All measurement and test data in this report was gathered from production sample serial number: 0909002 (Assigned by BACL, Shenzhen). The EUT was received on 2009-09-04.

### Objective

This Type approval report is prepared on behalf of *Zhejiang Belson Technology Co., Ltd.* in accordance with Part 2, Subpart J, Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine compliance with FCC Part 15, Class B.

### Related Submittal(s)/Grant(s)

N/A.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

### Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 21, 2007. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

## SYSTEM TEST CONFIGURATION

### Justification

The system was configured for testing in a manufacturer testing fashion.

### EUT Exercise Software

HWin Software Testing for VGA Mode.

### Equipment Modifications

No modification was made to the unit tested.

### Host System Configuration List and Details

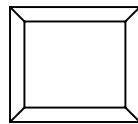
Manufacturer	Description	Model No.	Serial No.	FCC ID
Intel	Motherboard	D865GKD	11S19R1949ZJ1WCB46J1J4	DoC
IBM	Power	HIPRO-A2307F3T	11S49P2191ZJ1TAR47D1PG	DoC
IBM	Hard Disk	IC35L090AW207-0	VNVC32G3GGS52T	DoC
ALPS	3.5' Floppy	06P5226	11S06P5226ZJ1W25328053	DoC
Hitachi-LG	DVD-Rom	LTN-489S	B4F511412	DoC
ProMOS	Memory	V826616J24SATG-C0	BD070964H	N/A
Intel	CPU	Pentium4 2800MHz	N/A	N/A
Intel	Ethernet	PRO 10/100 VE	N/A	DoC

### Local Support Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	FCC ID
IBM	PC	ThinkCentre A50	99Y5681	DoC
Logitech	Keyboard	Y-SM48	SY513U68933	DoC
Logitech	Mouse	M-SAW83A	HCA31707689	DoC
IBM	CRT Monitor	6737-66W	23-P3242	BEJT17HD

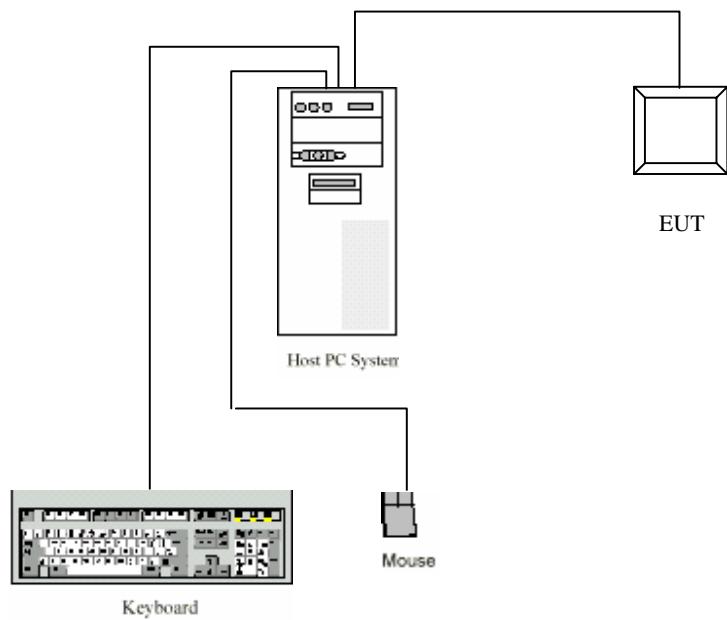
## Configuration of Test Setup

### For DVD mode:



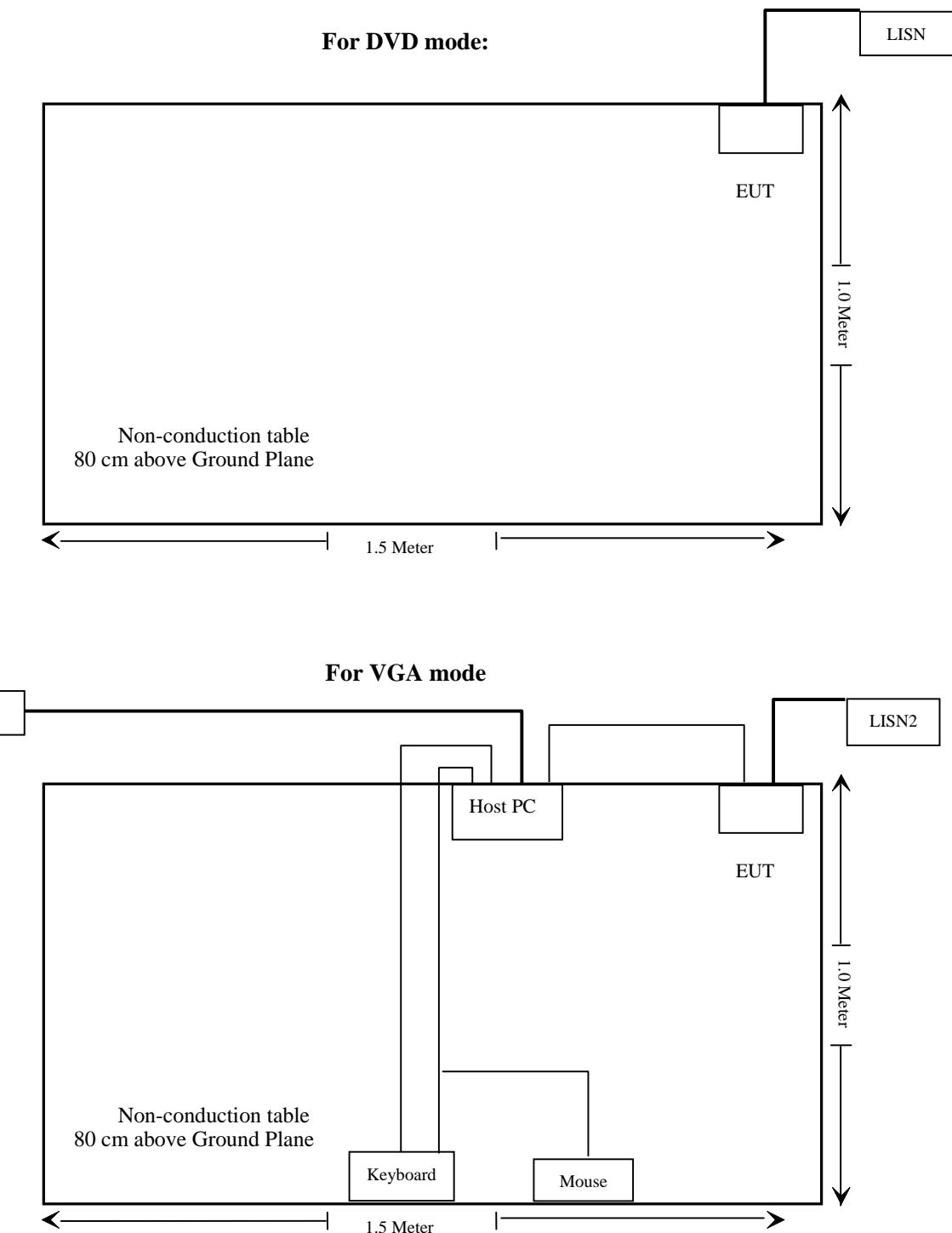
EUT

### For VGA mode:



#### Note:

According to ANSI C63.4-2003 §11.1.3, the maximum resolution with running H pattern mode was set for EUT.

**Block Diagram of Test Setup**

## **SUMMARY OF TEST RESULTS**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Results</b>
§15.107	Conducted Emissions	Compliant
§15.109	Radiated Emissions	Compliant

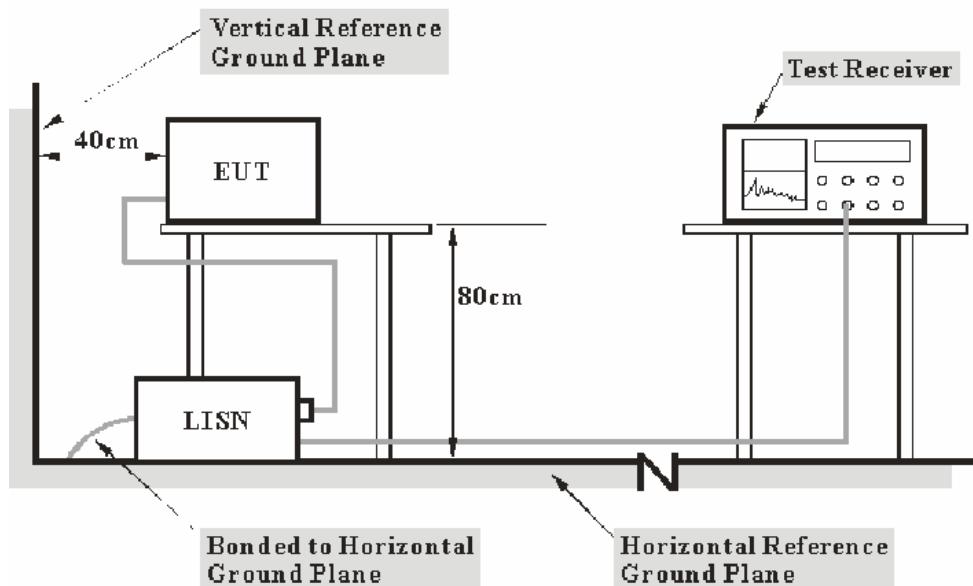
## FCC §15.107 - CONDUCTED EMISSIONS

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is  $\pm 2.4$  dB.

### EUT Setup



**Note:**

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.107 limits.

The spacing between the peripherals was 10 cm.

The EUT was connected to a 120 VAC/60 Hz power source.

## EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

<b>Frequency Range</b>	<b>IF B/W</b>
150 kHz – 30 MHz	9 kHz

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2009-04-28	2010-04-27
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2009-04-28	2010-04-27

\* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## Test Procedure

### For DVD mode:

During the conducted emission test, the EUT was connected to the LISN.

### For VGA mode:

During the conducted emission test, the EUT was connected to the LISN 2, the host PC was connected to the LISN 1.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.107, with the worst margin reading of:

### For DVD mode:

**5.40 dB at 3.470 MHz** in the **Line** conductor mode

### For VGA mode:

**2.90 dB at 3.470 MHz** in the **Neutral** conductor mode

## Test Data

### Environmental Conditions

<b>Temperature:</b>	25 ° C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0 kPa

\* The testing was performed by Terry Chen on 2009-09-21.

Test Mode: DVD playing

Line Conducted Emissions				FCC Part 15.107	
Frequency (MHz)	Amplitude (dB $\mu$ V)	Detector (QP/AV)	Conductor (Line/Neutral)	Limit (dB $\mu$ V)	Margin (dB)
3.470	50.60	QP	Line	56.00	5.40
3.470	49.20	QP	Neutral	56.00	6.80
3.480	38.90	AV	Line	46.00	7.10
3.475	37.60	AV	Neutral	46.00	8.40
2.135	45.10	QP	Line	56.00	10.90
28.550	38.90	AV	Line	50.00	11.10
29.990	38.70	AV	Neutral	50.00	11.30
2.125	43.60	QP	Neutral	56.00	12.40
0.255	37.20	AV	Line	51.60	14.40
2.130	31.60	AV	Line	46.00	14.40
0.255	36.70	AV	Neutral	51.60	14.90
0.255	46.60	QP	Neutral	61.60	15.00
0.190	48.80	QP	Neutral	64.00	15.20
29.990	44.40	QP	Neutral	60.00	15.60
2.123	30.40	AV	Neutral	46.00	15.60
0.255	45.90	QP	Line	61.60	15.70
28.680	44.30	QP	Line	60.00	15.70
5.945	43.60	QP	Line	60.00	16.40
5.945	33.30	AV	Line	50.00	16.70
0.190	47.20	QP	Line	64.00	16.80
6.005	43.10	QP	Neutral	60.00	16.90
6.010	32.60	AV	Neutral	50.00	17.40
0.190	34.60	AV	Neutral	54.00	19.40
0.190	32.20	AV	Line	54.00	21.80

### Environmental Conditions

<b>Temperature:</b>	25 ° C
<b>Relative Humidity:</b>	50 %
<b>ATM Pressure:</b>	100.0 kPa

\* The testing was performed by Terry Chen on 2009-09-25.

Test Mode: Running H pattern with VGA (1920×1080/60Hz) -worst case

Line Conducted Emissions				FCC Part 15.107	
Frequency (MHz)	Amplitude (dB $\mu$ V)	Detector (QP/AV)	Conductor (Line/Neutral)	Limit (dB $\mu$ V)	Margin (dB)
3.470	53.1	QP	Neutral	56.00	2.90
26.175	56.2	QP	Line	60.00	3.80
3.600	52.1	QP	Line	56.00	3.90
3.480	38.0	AV	Neutral	46.00	8.00
15.670	51.3	QP	Line	60.00	8.70
2.110	47.2	QP	Neutral	56.00	8.80
3.600	36.9	AV	Line	46.00	9.10
1.975	46.7	QP	Line	56.00	9.30
5.520	50.5	QP	Neutral	60.00	9.50
0.185	54.3	QP	Neutral	64.30	10.00
26.595	39.6	AV	Line	50.00	10.40
0.185	53.5	QP	Line	64.30	10.80
15.605	48.8	QP	Neutral	60.00	11.20
0.260	48.8	QP	Line	61.40	12.60
1.980	32.5	AV	Line	46.00	13.50
2.100	32.2	AV	Neutral	46.00	13.80
0.255	47.6	QP	Neutral	61.60	14.00
0.260	35.4	AV	Line	51.40	16.00
0.255	32.7	AV	Neutral	51.60	18.90
15.670	30.6	AV	Line	50.00	19.40
0.185	34.4	AV	Line	54.30	19.90
0.185	33.5	AV	Neutral	54.30	20.80
5.520	27.1	AV	Neutral	50.00	22.90
15.490	25.4	AV	Neutral	50.00	24.60

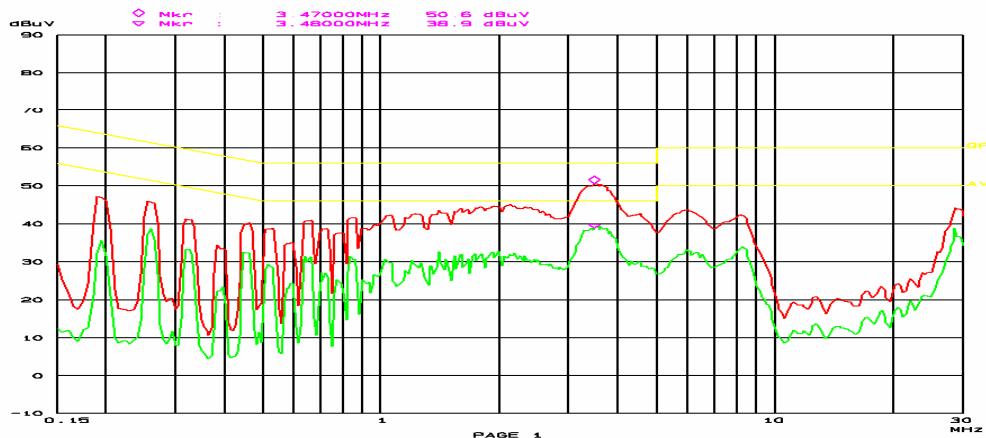
### Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

**For DVD mode:****Line:****Conducted Emissions  
FCC PART 15**

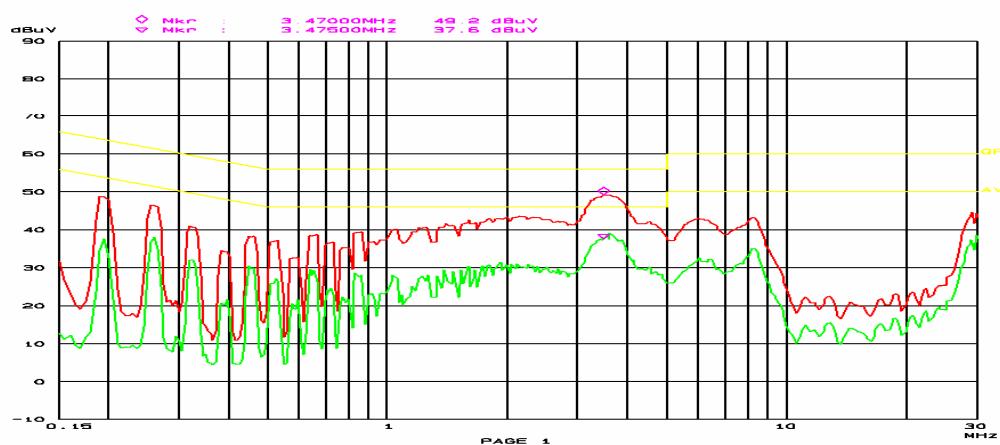
21. Sep 09 18:40

EUT: LCD TV (MODEL: L2301A)  
Manuf: Zhejiang Belsen Technology Co.,Ltd  
Op. Cond: Running (DVD)  
Op. Envir: Terry  
Test Spec: AC 120V/60Hz L  
Comment: Temp: 25 Hum: 56%  
BACL

**Neutral:****Conducted Emissions  
FCC PART 15**

21. Sep 09 17:34

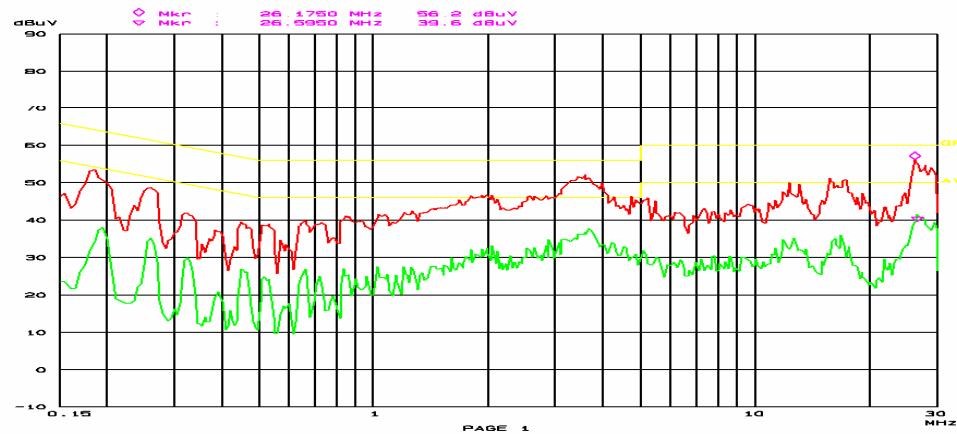
EUT: LCD TV (MODEL: L2301A)  
Manuf: Zhejiang Belsen Technology Co.,Ltd  
Op. Cond: Running (DVD)  
Op. Envir: Terry  
Test Spec: AC 120V/60Hz N  
Comment: Temp: 25 Hum: 56%  
BACL



**For VGA mode:****Line:****Conducted Emission  
FCC PART 15**

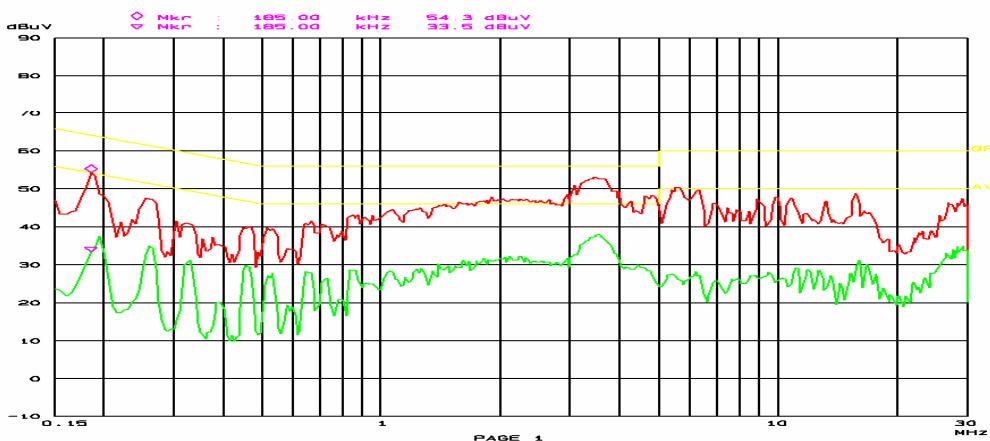
25. Sep 09 20:15

EUT: LCD TV (M/N L2301A)  
Manuf: Zhejiang Belsen Technology Co.,Ltd  
Op. Cond: Running (VGA)  
Op. Envir: Temp: 25  
Test Spec: AC 120V/60Hz L  
Comment: Temp: 25 Hum: 50%  
BACL

**Neutral:****Conducted Emission  
FCC PART 15**

25. Sep 09 20:31

EUT: LCD TV (M/N L2301A)  
Manuf: Zhejiang Belsen Technology Co.,Ltd  
Op. Cond: Running (VGA)  
Op. Envir: Temp: 25  
Test Spec: AC 120V/60Hz N  
Comment: Temp: 25 Hum: 50%  
BACL



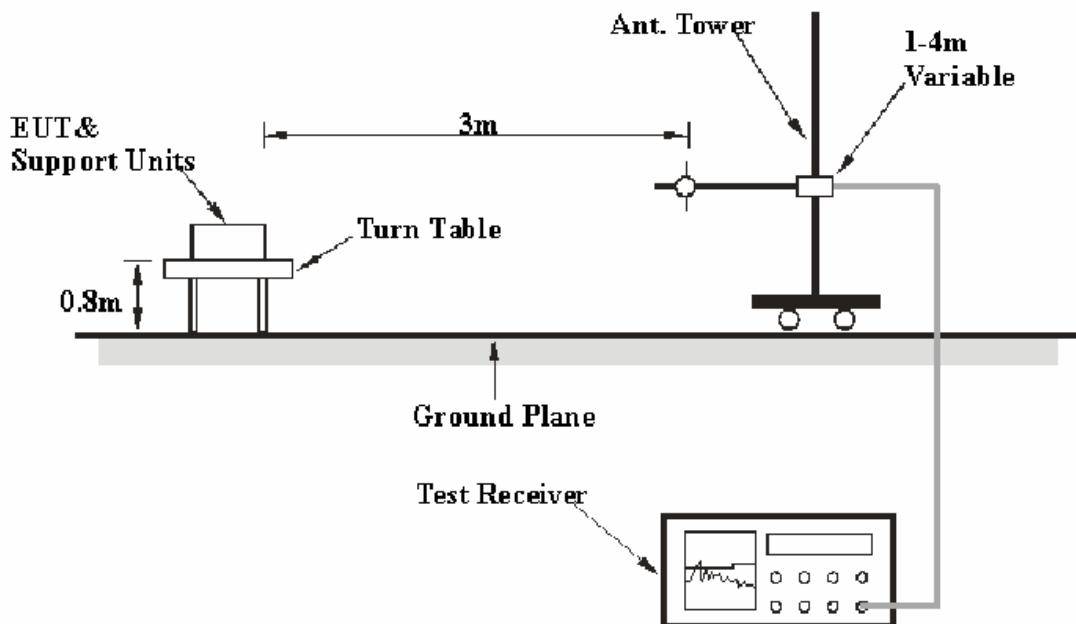
## FCC §15.109 - RADIATED EMISSIONS

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is  $\pm 4.0$  dB.

### EUT Setup



The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part 15.109 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The EUT was connected to a 120 VAC/60 Hz power source.

## EMI Test Receiver Setup

The system was investigated from 30 MHz to 1000 MHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

<b>Frequency</b>	<b>RB/W</b>	<b>VB/W</b>	<b>IF B/W</b>
30 MHz-1 GHz	100 kHz	300 kHz	120 kHz
above 1GHz			

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447E	1937A01046	2008-11-15	2009-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2009-03-11	2010-03-11
HP	Amplifier	8449B	3008A00277	2009-09-12	2010-09-11
Sunol Sciences	Horn Antenna	DRH-118	A052604	2009-09-25	2010-09-25
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-07-08	2010-07-08

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## Test Procedure

### For DVD mode:

During the radiated emissions test, the EUT was connected to the AC floor outlet.

### For VGA mode:

During the radiated emissions test, the EUT and host PC were connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode.

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the data in the following table, the EUT complied with the [FCC Part 15.109](#), with the worst margin reading of:

### For DVD mode:

**5.0 dB at 306.652000 MHz** in the **Horizontal** polarization

### For VGA mode:

**5.9 dB at 42.120500 MHz** in the **Vertical** polarization

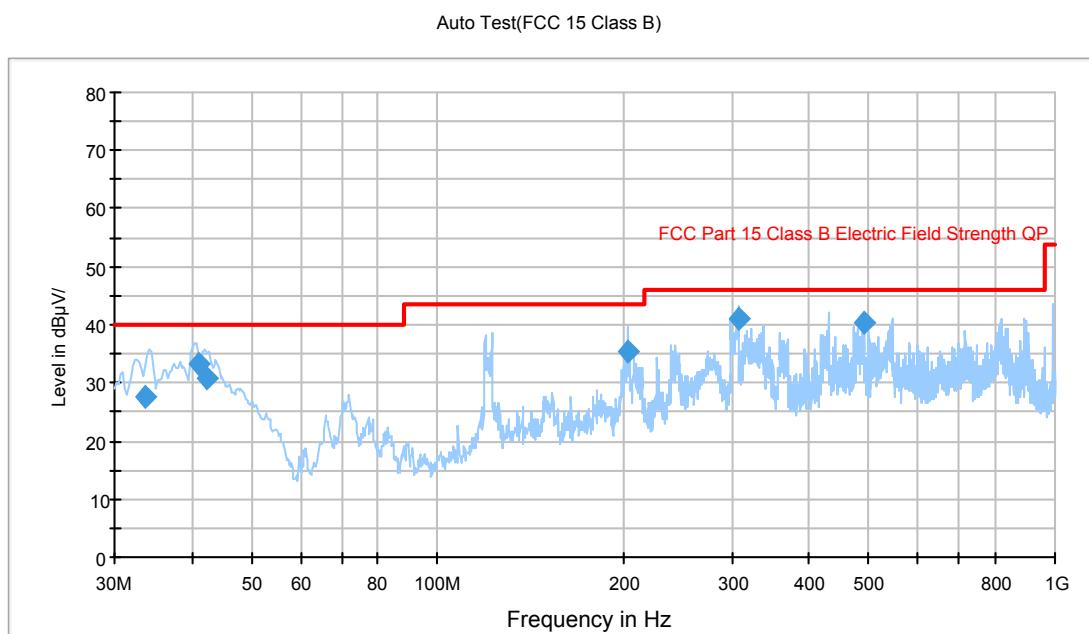
## Test Data

### Environmental Conditions

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0kPa

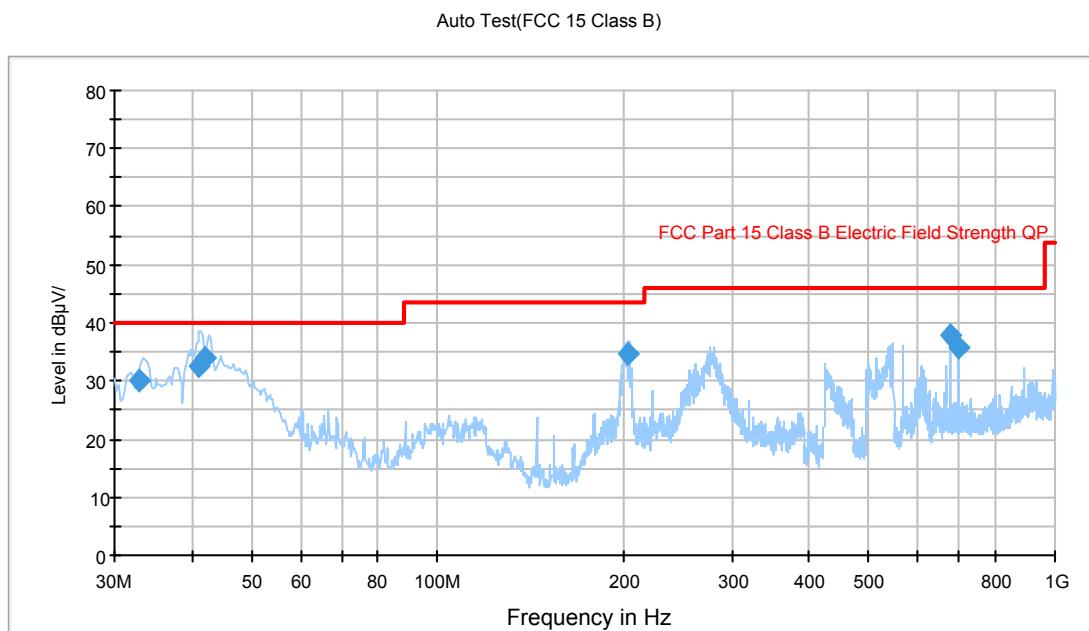
*The testing was performed by Terry Chen on 2009-09-22.*

Test Mode: DVD playing



Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Position (deg)	Correction Factor (dB)	Limit (dB $\mu$ V/m)	Margin (dB)
		Height (cm)	Polarity (H/V)				
306.652000	41.0	100.0	H	307.0	-14.1	46.0	5.0
490.773750	40.4	100.0	V	191.0	-10.6	46.0	5.6
40.914250	33.3	100.0	V	157.0	-15.9	40.0	6.7
203.586000	35.4	147.0	H	206.0	-17.0	43.5	8.1
42.458500	30.8	100.0	V	342.0	-16.8	40.0	9.2
33.731250	27.6	100.0	V	113.0	-11.1	40.0	12.4

Test Mode: Running H pattern VGA (1920×1080/60Hz)-worst case



Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Position (deg)	Correction Factor (dB)	Limit (dB $\mu$ V/m)	Margin (dB)
		Height (cm)	Polarity (H/V)				
42.120500	34.1	100.0	V	30.0	-16.6	40.0	5.9
40.975750	32.4	113.0	V	117.0	-16.0	40.0	7.6
674.732500	37.8	208.0	H	3.0	-7.3	46.0	8.2
203.512250	34.6	118.0	H	143.0	-17.0	43.5	8.9
32.997500	30.1	140.0	V	3.0	-10.6	40.0	9.9
698.626000	35.9	192.0	H	3.0	-6.9	46.0	10.1

\*\*\*\*\* END OF REPORT \*\*\*\*\*