



Hisense Electric Co., Ltd.

Application
For
Certification
FCC ID: W9HLCDC0032

LED LCD TV

Model: LHD32D50US
Additional Model: 32D50, 32H3B*

Computer Peripheral

Report No.: 150213021SZN-001

Prepared and Checked by:

Approved by:

Sign on file

Jenner Liu
Assistant Engineer

Andy Yan
Senior Project Engineer
Date: March 10, 2015

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
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TRF No.: FCC 15C_PC_b

INTERTEK TESTING SERVICES

LIST OF EXHIBITS

INTRODUCTION

<i>EXHIBIT 1:</i>	General Description
<i>EXHIBIT 2:</i>	System Test Configuration
<i>EXHIBIT 3:</i>	Emission Results
<i>EXHIBIT 4:</i>	Equipment Photographs
<i>EXHIBIT 5:</i>	Product Labeling
<i>EXHIBIT 6:</i>	Technical Specifications
<i>EXHIBIT 7:</i>	Instruction Manual
<i>EXHIBIT 8:</i>	Miscellaneous Information
<i>EXHIBIT 9:</i>	Test Equipment List

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MEASUREMENT / TECHNICAL REPORT

**Hisense Electric Co., Ltd.
MODEL: LHD32D50US
Additional Model: 32D50, 32H3B***

FCC ID: W9HLCDC0032

This report concerns (check one:) Original Grant Class II Change

Equipment Type: JBP-Class B Computing Device Peripheral

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes No

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes No

If no, assumed Part 15, Subpart B for unintentional radiator – the new 47 CFR [10-01-13 Edition] provision.

Report prepared by:

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Table of Contents

1.0	<u>General Description</u>	2
1.1	Product Description.....	2
1.2	Related Submittal(s) Grants.....	2
1.3	Test Methodology.....	3
1.4	Test Facility.....	3
2.0	<u>System Test Configuration</u>	5
2.1	Justification.....	5
2.2	EUT Exercising Software.....	5
2.3	Special Accessories.....	5
2.4	Equipment Modification.....	5
2.5	Measurement Uncertainty.....	6
2.6	Support Equipment List and Description.....	6
3.0	<u>Emission Results</u>	8
3.1	Field Strength Calculation.....	9
3.2	Radiated Emission Configuration Photograph.....	11
3.3	Radiated Emission Data.....	12
3.4	Conducted Emission at Mains Terminal.....	15
3.5	Conducted Emission Configuration Photograph.....	15
3.6	Conducted Emission.....	16
4.0	<u>Equipment Photographs</u>	22
5.0	<u>Product Labelling</u>	24
6.0	<u>Technical Specifications</u>	26
7.0	<u>Instruction Manual</u>	28
8.0	<u>Miscellaneous Information</u>	30
9.0	<u>Test Equipment List</u>	34

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List of attached file

Exhibit Type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated photos	radiated photos.pdf
Test Setup Photo	Conducted photos	conducted photos.pdf
External Photo	External Photos	external photos.pdf
Internal Photo	Internal Photos	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
ID Label / Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidential Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf

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EXHIBIT 1

GENERAL DESCRIPTION

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1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a LED LCD TV. The device can be used to connect PC by HDMI and VGA port. The EUT is powered by 120V/60Hz.

The Models: 32D50, 32H3B* are the same as the Model: LHD32D50US in hardware aspect. The difference in model number serves as marketing strategy.

1.2 Related Submittal(s) Grants

This is an application for certification of a computer peripheral. Other digital functions were reported in the verification report: 150213020SZN-001.

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1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). Radiated emission measurement was performed in Semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The Semi-anechoic chamber and shielding room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 242492).

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EXHIBIT 2
SYSTEM TEST CONFIGURATION

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2.0 **System Test Configuration**

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2009).

The device was powered by AC 120V/60Hz during the test. The worst case data was reported in this report.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. The step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

The frequency range from 30MHz to 2GHz was searched for spurious emissions from the device. Only those emissions reported were detected. All other emissions were at least 20 dB below the applicable limits.

2.2 EUT Exercising Software

N/A

2.3 Special Accessories

N/A

2.4 Equipment Modification

Any modifications installed previous to testing by Hisense Electric Co., Ltd. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch.

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2.5 Measurement Uncertainty

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

2.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
Laptop	Lenovo	X1
Laptop	Lenovo	T420
Hard Disk	Smart.drive	HD-003
USB Memory	TOSHIBA	UHYBS-004G-BL
1394 Cable	Smart.drive	Unshielded, Length 180cm
USB Cable	Smart.drive	Unshielded, Length 155cm
Dummy Load	N/A	N/A
VGA Cable	HP	Unshielded, Length 150cm
PC Audio Cable	N/A	Unshielded, Length 180cm
HDMI Cable*3	N/A	UnShielded, Length 180cm
AV Cable	N/A	Unshielded, Length 120cm
YPbPr Cable	N/A	Unshielded, Length 120cm
Digital Audio Out Cable	N/A	Unshielded, Length 120cm
Tuner Resister	N/A	75ohm
Headphone	N/A	Unshielded, Length 110cm
Remote controller	Hisense	N/A

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EXHIBIT 3
EMISSION RESULTS

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3.0 Emission Results

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

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3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG$$

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB/m

AG = Amplifier Gain in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG$$

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3.1 Field Strength Calculation (cont'd)

Example

Assume a receiver reading of 62.0dB μ V is obtained. The antenna factor of 7.4dB/m and cable factor of 1.6dB is added. The amplifier gain of 29dB is subtracted. The net field strength for comparison to the appropriate emission limit is 42dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 62.0\text{dB}\mu\text{V}$$

$$AF = 7.4\text{dB/m}$$

$$CF = 1.6\text{dB}$$

$$AG = 29.0\text{dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 = 42\text{dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm} [(42\text{dB}\mu\text{V/m})/20] = 125.9\mu\text{V/m}$$

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3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
At
341.419MHz (HDMI In Mode)

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos.pdf.

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3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 3.9dB margin (HDMI In Mode)

TEST PERSONNEL:

Sign on file

Jenner Liu Assistant Engineer
Typed/Printed Name

March 10, 2015
Date

INTERTEK TESTING SERVICES

Company: Hisense Electric Co., Ltd.

Date of Test: March 10, 2015

Model: LHD32D50US

Operating Mode: HDMI In

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	92.565	40.6	20.0	9.5	30.1	43.5	-13.4
Horizontal	191.990	45.1	20.0	11.4	36.5	43.5	-7.0
Horizontal	341.419	45.0	20.0	17.1	42.1	46.0	-3.9
Horizontal	1364.000	26.2	20.0	24.9	31.1	54.0	-22.9
Horizontal	1598.000	27.1	20.0	26.1	33.2	54.0	-20.8
Horizontal	1962.000	23.8	20.0	29.8	33.6	54.0	-20.4
Vertical	41.155	37.9	20.0	11.2	29.1	40.0	-10.9
Vertical	93.535	44.6	20.0	9.5	34.1	43.5	-9.4
Vertical	426.730	35.1	20.0	19.0	34.1	46.0	-11.9
Vertical	1196.000	29.1	20.0	23.8	32.9	54.0	-21.1
Vertical	1280.000	29.1	20.0	24.3	33.4	54.0	-20.6
Vertical	1596.000	33.1	20.0	25.8	38.9	54.0	-15.1

NOTES:

1. Quasi-Peak detector is used for frequency up to 1GHz and Peak detector is used for frequency from 1-2GHz.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. All emissions up to 1GHz are below the QP limit and all emissions between 1-2GHz are below the AV limit.

Test Engineer: Jenner Liu

INTERTEK TESTING SERVICES

Company: Hisense Electric Co., Ltd.

Date of Test: March 10, 2015

Model: LHD32D50US

Operating Mode: VGA

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	61.525	39.7	20.0	7.5	27.2	40.0	-12.8
Horizontal	152.220	38.4	20.0	10.9	29.3	43.5	-14.2
Horizontal	273.470	37.5	20.0	14.8	32.3	46.0	-13.7
Horizontal	1080.000	24.3	20.0	23.4	27.7	54.0	-26.3
Horizontal	1898.000	22.0	20.0	29.0	31.0	54.0	-23.0
Horizontal	1963.000	21.4	20.0	29.5	30.9	54.0	-23.1
Vertical	59.585	41.9	20.0	7.4	29.3	40.0	-10.7
Vertical	77.530	40.9	20.0	8.6	29.5	40.0	-10.5
Vertical	191.990	39.3	20.0	11.4	30.7	43.5	-12.8
Vertical	1328.000	25.7	20.0	24.3	30.0	54.0	-24.0
Vertical	1865.000	24.2	20.0	28.2	32.4	54.0	-21.6
Vertical	1963.000	22.4	20.0	28.9	31.3	54.0	-22.7

NOTES:

1. Quasi-Peak detector is used for frequency up to 1GHz and Peak detector is used for frequency from 1-2GHz.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. All emissions up to 1GHz are below the QP limit and all emissions between 1-2GHz are below the AV limit.

Test Engineer: Jenner Liu

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- 3.4 Conducted Emission at Mains Terminal
- 3.5 Conducted Emission Configuration Photograph

Worst Case Conducted Configuration
at
0.318 MHz(VGA Mode)

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

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3.6 Conducted Emission Data

Judgement: Passed by 7.2 dB margin (VGA Mode)

TEST PERSONNEL:

Sign on file

Jenner Liu Assistant Engineer
Typed/Printed Name

March 10, 2015
Date

INTERTEK TESTING SERVICES

Company: Hisense Electric Co., Ltd.

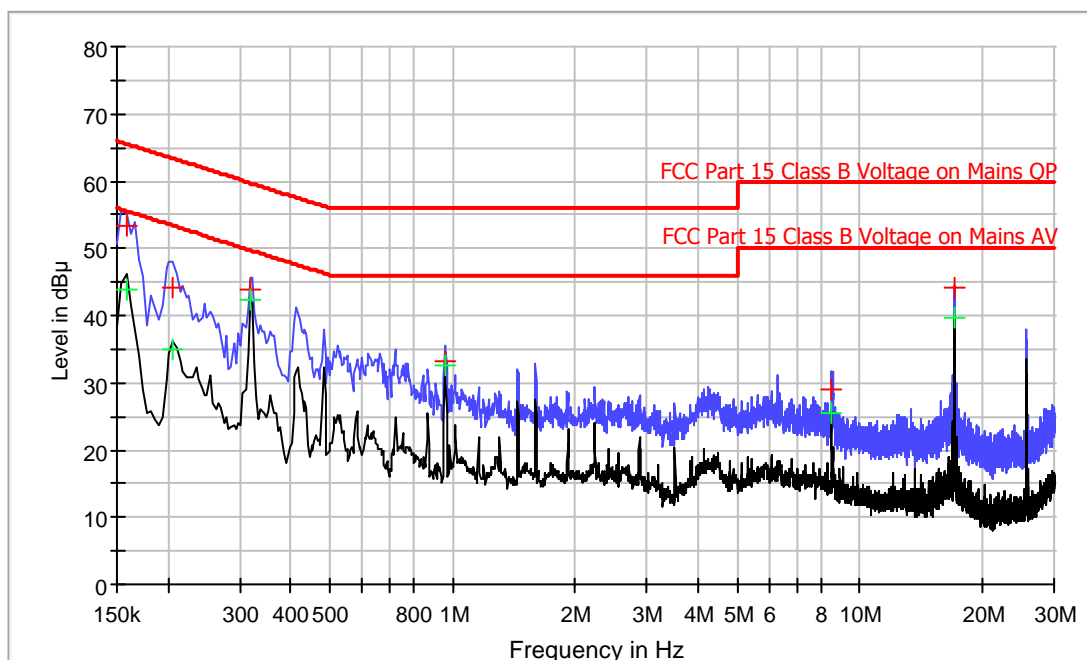
Date of Test: March 10, 2015

Model: LHD32D50US

Operating Mode: VGA

Phase: Live

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.158	53.2	L1	9.8	12.4	65.6
0.206	44.1	L1	9.8	19.3	63.4
0.318	43.9	L1	9.8	15.9	59.8
0.958	33.1	L1	9.9	22.9	56.0
8.542	28.9	L1	10.1	31.1	60.0
17.082	44.2	L1	10.3	15.8	60.0

Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.158	43.9	L1	9.8	11.7	55.6
0.206	34.9	L1	9.8	18.5	53.4
0.318	42.3	L1	9.8	7.5	49.8
0.958	32.7	L1	9.9	13.3	46.0
8.542	25.4	L1	10.1	24.6	50.0
17.082	39.6	L1	10.3	10.4	50.0

Test Engineer: Jenner Liu

TRF No.: FCC 15C_PC_b

FCC ID: W9HLCDC0032

INTERTEK TESTING SERVICES

Company: Hisense Electric Co., Ltd.

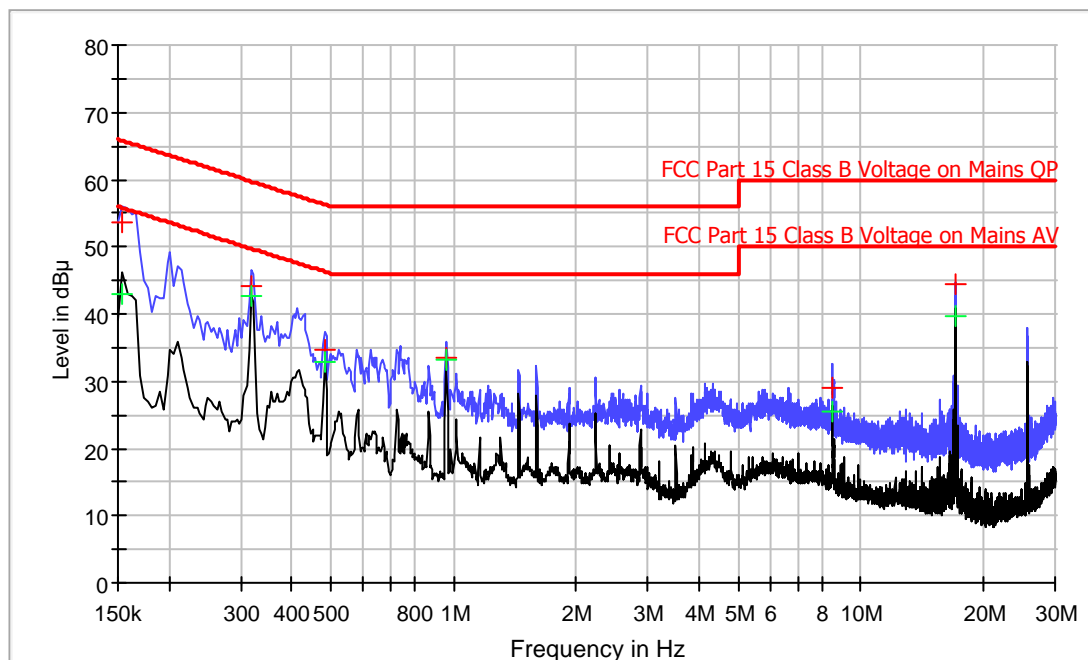
Date of Test: March 10, 2015

Model: LHD32D50US

Operating Mode: VGA

Phase: Neutral

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.154	53.5	N	10.0	12.3	65.8
0.318	44.2	N	10.1	15.6	59.8
0.482	34.6	N	10.1	21.7	56.3
0.958	33.6	N	10.2	22.4	56.0
8.542	29.1	N	10.4	30.9	60.0
17.082	44.3	N	10.5	15.7	60.0

Result Table AV

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.154	43.1	N	10.0	12.7	55.8
0.318	42.6	N	10.1	7.2	49.8
0.482	33.0	N	10.1	13.3	46.3
0.958	33.1	N	10.2	12.9	46.0
8.542	25.6	N	10.4	24.4	50.0
17.082	39.8	N	10.5	10.2	50.0

Test Engineer: Jenner Liu

TRF No.: FCC 15C_PC_b

FCC ID: W9HLCDC0032

INTERTEK TESTING SERVICES

Company: Hisense Electric Co., Ltd.

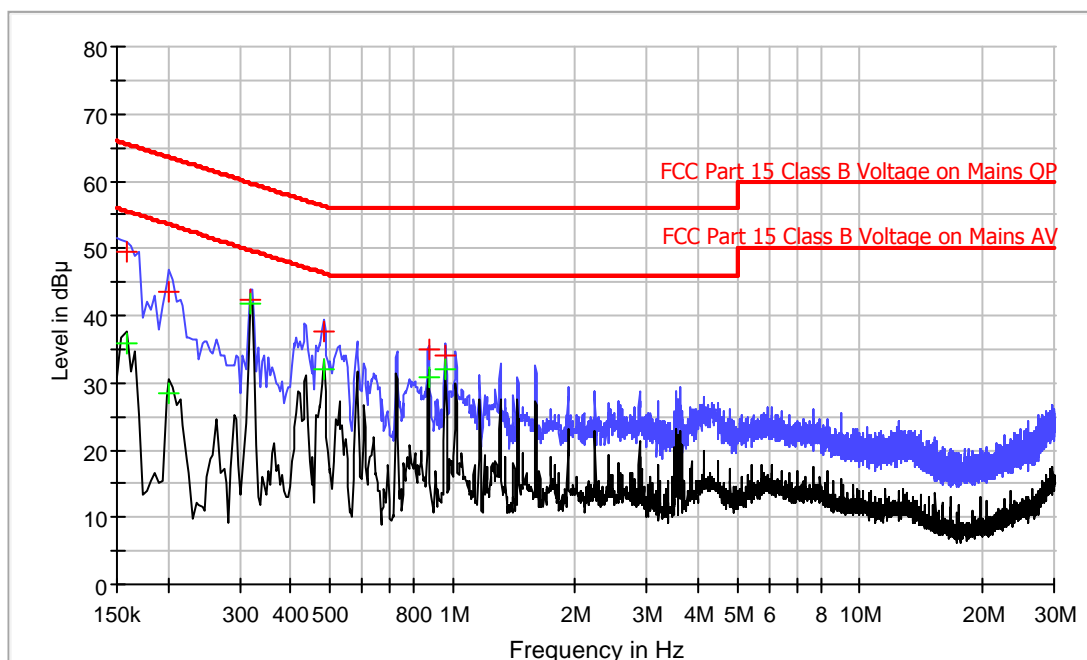
Date of Test: March 10, 2015

Model: LHD32D50US

Operating Mode: HDMI In

Phase: Live

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.158	49.6	L1	9.8	16.0	65.6
0.202	43.6	L1	9.8	19.9	63.5
0.318	42.3	L1	9.8	17.5	59.8
0.482	37.7	L1	9.8	18.6	56.3
0.874	35.0	L1	9.9	21.0	56.0
0.958	34.2	L1	9.9	21.8	56.0

Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.158	35.8	L1	9.8	19.8	55.6
0.202	28.3	L1	9.8	25.2	53.5
0.318	41.7	L1	9.8	8.1	49.8
0.482	32.1	L1	9.8	14.2	46.3
0.874	30.7	L1	9.9	15.3	46.0
0.958	32.1	L1	9.9	13.9	46.0

Test Engineer: Jenner Liu

TRF No.: FCC 15C_PC_b

FCC ID: W9HLCDC0032

INTERTEK TESTING SERVICES

Company: Hisense Electric Co., Ltd.

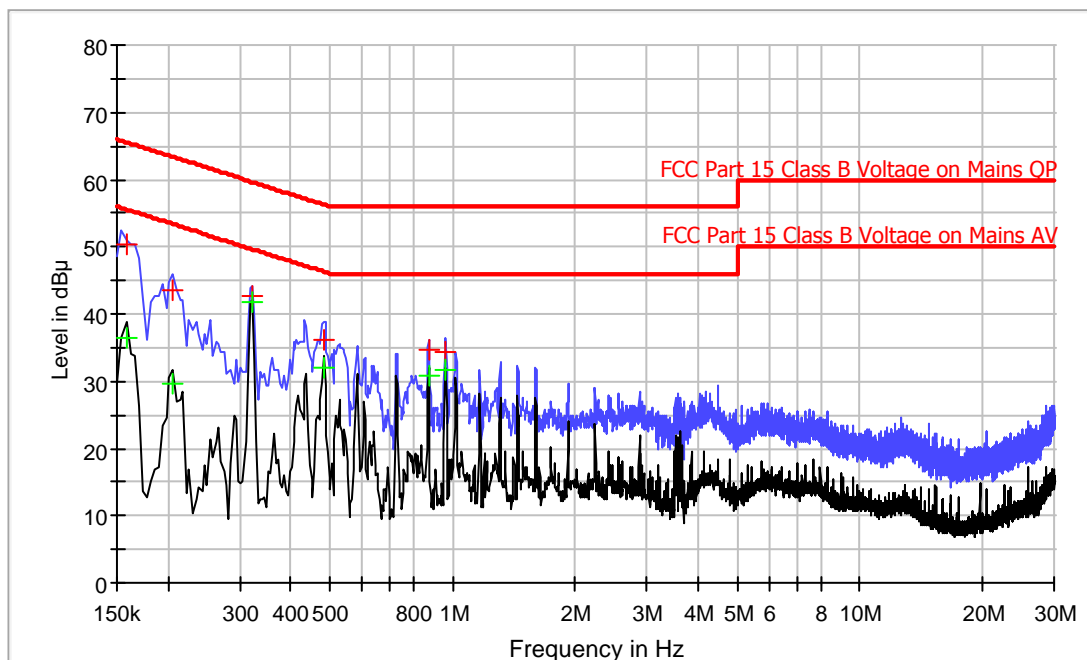
Date of Test: March 10, 2015

Model: LHD32D50US

Operating Mode: HDMI In

Phase: Neutral

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.158	50.3	N	10.0	15.3	65.6
0.206	43.5	N	10.1	19.9	63.4
0.322	42.6	N	10.1	17.1	59.7
0.482	36.1	N	10.1	20.2	56.3
0.874	34.6	N	10.2	21.4	56.0
0.962	34.3	N	10.2	21.7	56.0

Result Table AV

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.158	36.4	N	10.0	19.2	55.6
0.206	29.6	N	10.1	23.8	53.4
0.322	41.8	N	10.1	7.9	49.7
0.482	31.9	N	10.1	14.4	46.3
0.874	30.9	N	10.2	15.1	46.0
0.962	31.8	N	10.2	14.2	46.0

Test Engineer: Jenner Liu

TRF No.: FCC 15C_PC_b

FCC ID: W9HLCDC0032

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EXHIBIT 4
EQUIPMENT PHOTOGRAPHS

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4.0 Equipment Photographs

For electronic filing, photographs of the tested EUT are saved with filename: external photos.pdf and internal photos.pdf.

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EXHIBIT 5
PRODUCT LABELLING

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5.0 **Product Labelling**

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

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EXHIBIT 6
TECHNICAL SPECIFICATIONS

INTERTEK TESTING SERVICES

6.0 Technical Specifications

For electronic filing, the block diagram of the tested EUT is saved with filename: block.pdf.

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EXHIBIT 7
INSTRUCTION MANUAL

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7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold / leased in the United States.

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EXHIBIT 8

MISCELLANEOUS INFORMATION

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8.0 Miscellaneous Information

This miscellaneous information includes emission measuring procedure.

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8.1 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of computer peripheral operating under Part 15, Subpart B rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 – 2009.

The computer peripheral equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The antenna height and polarization are varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions are in QP mode from the frequency band 30MHz to 1GHz with RBW setting 120kHz and in PK & AV mode from frequency band 1GHz to 2GHz with RBW setting 1MHz. Detector function for conducted emissions are in QP & AV mode and IFBW setting is 9kHz from the frequency band 150kHz to 30MHz.

For radiated emission, the frequency range scanned is 30MHz to 2GHz. For line-conducted emissions, the range scanned is 150kHz to 30MHz.

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8.1 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

Conducted measurements are made as described in ANSI C63.4 – 2009.

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EXHIBIT 9

TEST EQUIPMENT LIST

INTERTEK TESTING SERVICES

9.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	Biconilog Antenna	ETS	3142C	00066460	28-Jun-2014	28-Jun-2015
SZ061-08	Horn Antenna	ETS	3115	00092346	19-Oct-2014	19-Oct-2015
EM031-03	EXA Spectrum Analyzer	R&S	FSV40	101506	09-Jun-2014	09-Jun-2015
SZ185-01	EMI Receiver	R & S	ESCI	100547	07-Feb-2015	07-Feb-2016
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	19-Apr-2014	19-Apr-2015
SZ062-04	RF Cable	RADIALL	RG 213U	--	04-Jan-2015	04-Jul-2015
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	01-Nov-2014	01-Nov-2015
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	01-Nov-2014	01-Nov-2015
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	16-Jun-2014	16-Jun-2015
SZ188-03	Shielding Room	ETS	RFD-100	4100	23-Aug-2014	23-Aug-2015