

Hisense Electric Co., Ltd

Application
For
Certification
FCC ID: W9HLCDC0025

LED TV

Model: LHD32D33US
Additional Model: LHD32D31US, LHD32D30US, 32D33, 32D31,
32D30

Computer Peripheral

Report No.: 130826033SZN-002

Prepared and Checked by:

Approved by:

Sign on file

Jenner Liu
Testing Engineer

Robert Li
Project Engineer
Date: September 09, 2013

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TRF No.: FCC 15C_PC_b

INTERTEK TESTING SERVICES

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MEASUREMENT / TECHNICAL REPORT

Hisense Electric Co., Ltd

MODEL: LHD32D33US

Additional Model: LHD32D31US, LHD32D30US, 32D33, 32D31, 32D30

FCC ID: W9HLCDC0025

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 [10-01-12 Edition] provision.

Report prepared by:

Jenner Liu
Intertek Testing Services Shenzhen Ltd.
Kejiyuan Branch
6F, D Block, Huahan Building, Langshan Road
Nanshan District, Shenzhen, P. R. China
Phone: (86 755) 8614 0639
Fax: (86 755) 8601 6751

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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 TV. The device can be used to connect PC by HDMI and VGA port. The EUT is powered by 120V/60Hz.

The Models: LHD32D31US, LHD32D30US, 32D33, 32D31, 32D30 are the same as the Model: LHD32D33US in hardware aspect. The difference in decoration, 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: 130826033SZN-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 5GHz 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 | T420 |
| Laptop | Lenovo | X1 |
| Hard Disk | Smart.drive | HD-003 |
| USB Memory | SanDisk | SDCZ36-002G-P36 |
| 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 180cm |
| HDMI Cable*3 | N/A | Shielded, Length 110cm |
| PC Audio Cable | N/A | Unshielded, Length 150cm |
| 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.

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

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

PD = Pulse Desensitization in dB

AV = Average Factor 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:

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

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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 pulse desensitization factor of the spectrum analyzer was 0dB, and the resultant average factor was -10dB. The net field strength for comparison to the appropriate emission limit is 32dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

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

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

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

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

$$PD = 0\text{dB}$$

$$AV = -10\text{dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32\text{dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32\text{dB}\mu\text{V/m})/20] = 39.8\mu\text{V/m}$$

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3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
At
519.785MHz (HDMI In Mode)

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

INTERTEK TESTING SERVICES

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 4.0dB margin (HDMI In Mode)

TEST PERSONNEL:

Sign on file

Jenner Liu Testing Engineer
Typed/Printed Name

September 09, 2013
Date

INTERTEK TESTING SERVICES

Company: Hisense Electric Co., Ltd
Date of Test: September 09, 2013
Model: LHD32D33US
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 | 519.763 | 43.5 | 20.0 | 16.3 | 39.8 | 46.0 | -6.2 |
| Horizontal | 668.500 | 38.7 | 20.0 | 19.9 | 38.6 | 46.0 | -7.4 |
| Horizontal | 965.565 | 35.6 | 20.0 | 23.9 | 39.5 | 54.0 | -14.5 |
| Horizontal | 1113.000 | 38.8 | 20.0 | 26.2 | 45.0 | 54.0 | -9.0 |
| Vertical | 371.440 | 41.9 | 20.0 | 15.6 | 37.5 | 46.0 | -8.5 |
| Vertical | 519.785 | 45.7 | 20.0 | 16.3 | 42.0 | 46.0 | -4.0 |
| Vertical | 668.260 | 38.7 | 20.0 | 19.9 | 38.6 | 46.0 | -7.4 |
| Vertical | 1113.000 | 37.8 | 20.0 | 26.2 | 44.0 | 54.0 | -10.0 |

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. Harmonic emissions not detected at the 3 meter distances were measured at 0.3- meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
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: September 09, 2013
Model: LHD32D33US
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 | 85.290 | 42.4 | 20.0 | 7.5 | 29.9 | 40.0 | -10.1 |
| Horizontal | 162.890 | 41.5 | 20.0 | 9.3 | 30.8 | 43.5 | -12.7 |
| Horizontal | 318.575 | 39.5 | 20.0 | 13.3 | 32.8 | 46.0 | -13.2 |
| Horizontal | 1379.000 | 22.2 | 20.0 | 29.9 | 41.0 | 54.0 | -13.0 |
| Vertical | 31.940 | 36.3 | 20.0 | 16.1 | 32.1 | 40.0 | -7.9 |
| Vertical | 88.000 | 45.9 | 20.0 | 7.2 | 32.4 | 40.0 | -7.6 |
| Vertical | 254.070 | 46.8 | 20.0 | 13.2 | 33.1 | 46.0 | -12.9 |
| Vertical | 1386.000 | 30.3 | 20.0 | 29.7 | 40.0 | 54.0 | -14.0 |

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. Harmonic emissions not detected at the 3 meter distances were measured at 0.3- meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
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

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

Worst Case Conducted Configuration
at
0.314 MHz(HDMI In 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 7.6 dB margin (HDMI In Mode)

TEST PERSONNEL:

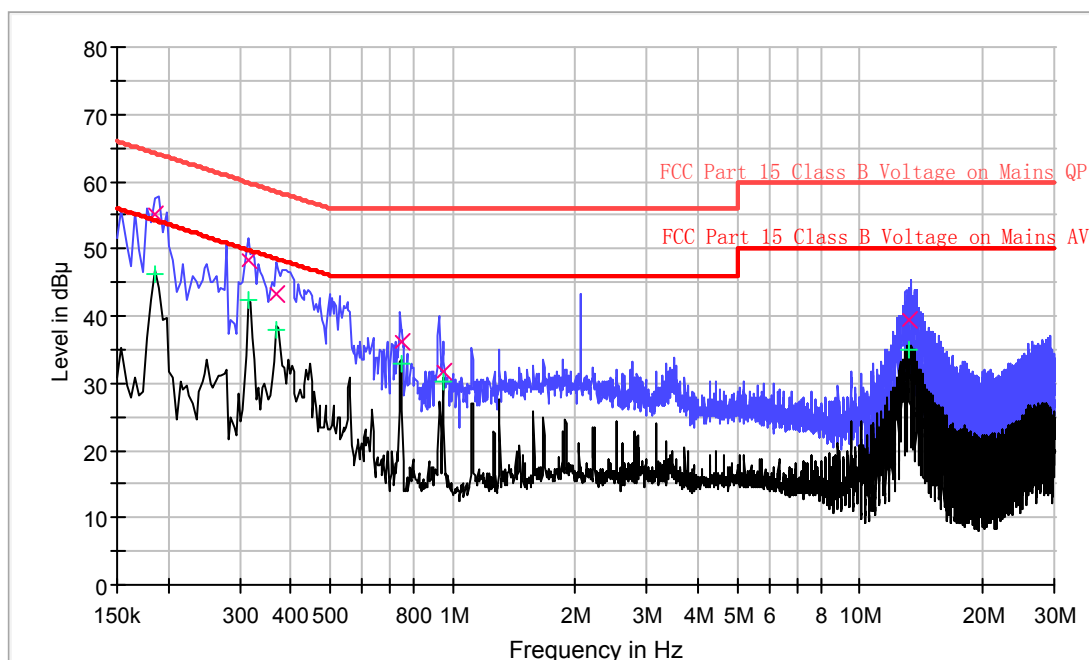
Sign on file

Jenner Liu Testing Engineer
Typed/Printed Name

September 09, 2013
Date

INTERTEK TESTING SERVICES

Company: Hisense Electric Co., Ltd
 Date of Test: September 09, 2013
 Model: LHD32D33US
 Operating Mode: HDMI In
 Phase: Live
Conducted Emission Test - FCC



Result Table QP

| Frequency (MHz) | QuasiPeak (dB µV) | Line | Corr. (dB) | Margin (dB) | Limit (dB µV) |
|-----------------|-------------------|------|------------|-------------|---------------|
| 0.186 | 55.2 | L1 | 9.7 | 9.0 | 64.2 |
| 0.314 | 48.3 | L1 | 9.7 | 11.6 | 59.9 |
| 0.370 | 43.2 | L1 | 9.7 | 15.3 | 58.5 |
| 0.746 | 36.2 | L1 | 9.7 | 19.8 | 56.0 |
| 0.950 | 31.8 | L1 | 9.8 | 24.2 | 56.0 |
| 13.158 | 39.3 | L1 | 10.1 | 20.7 | 60.0 |

Result Table AV

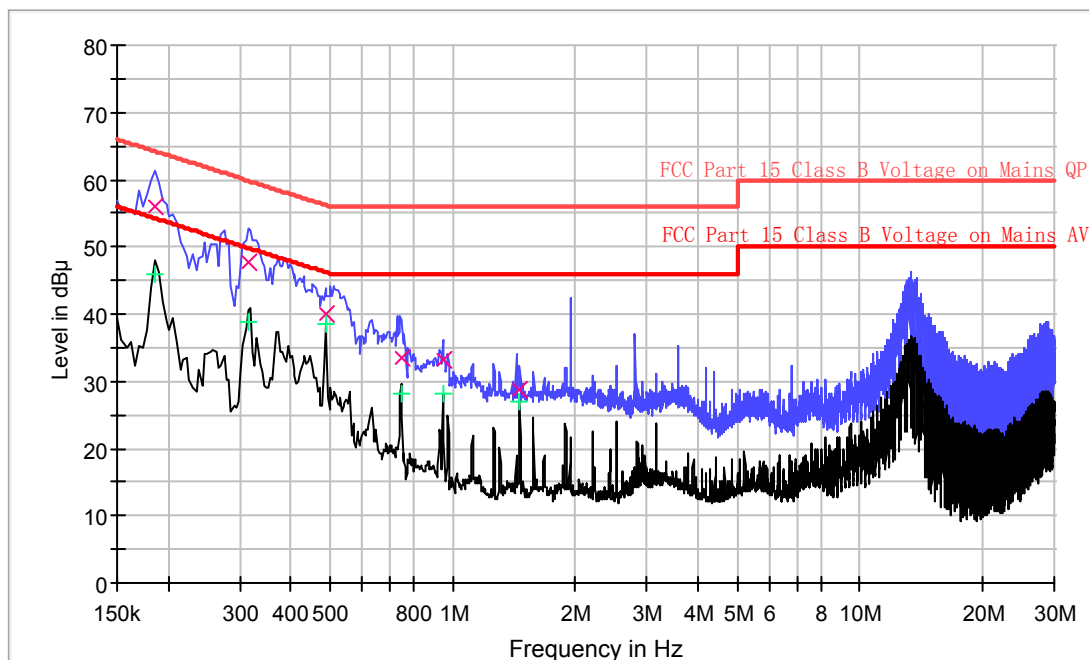
| Frequency (MHz) | Average (dB µV) | Line | Corr. (dB) | Margin (dB) | Limit (dB µV) |
|-----------------|-----------------|------|------------|-------------|---------------|
| 0.186 | 46.3 | L1 | 9.7 | 7.9 | 54.2 |
| 0.314 | 42.3 | L1 | 9.7 | 7.6 | 49.9 |
| 0.370 | 37.9 | L1 | 9.7 | 10.6 | 48.5 |
| 0.746 | 32.9 | L1 | 9.7 | 13.1 | 46.0 |
| 0.950 | 30.3 | L1 | 9.8 | 15.7 | 46.0 |
| 13.158 | 35.0 | L1 | 10.1 | 15.0 | 50.0 |

Test Engineer: Jenner Liu

TRF No.: FCC 15C_PC_b
 FCC ID: W9HLCDC0025

INTERTEK TESTING SERVICES

Company: Hisense Electric Co., Ltd
 Date of Test: September 09, 2013
 Model: LHD32D33US
 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) |
|-----------------|--------------------|------|------------|-------------|----------------|
| 0.186 | 55.9 | N | 10.2 | 8.3 | 64.2 |
| 0.314 | 47.6 | N | 10.2 | 12.3 | 59.9 |
| 0.486 | 39.9 | N | 10.2 | 16.3 | 56.2 |
| 0.746 | 33.4 | N | 10.3 | 22.6 | 56.0 |
| 0.946 | 33.3 | N | 10.3 | 22.7 | 56.0 |
| 1.462 | 28.8 | N | 10.3 | 27.2 | 56.0 |

Result Table AV

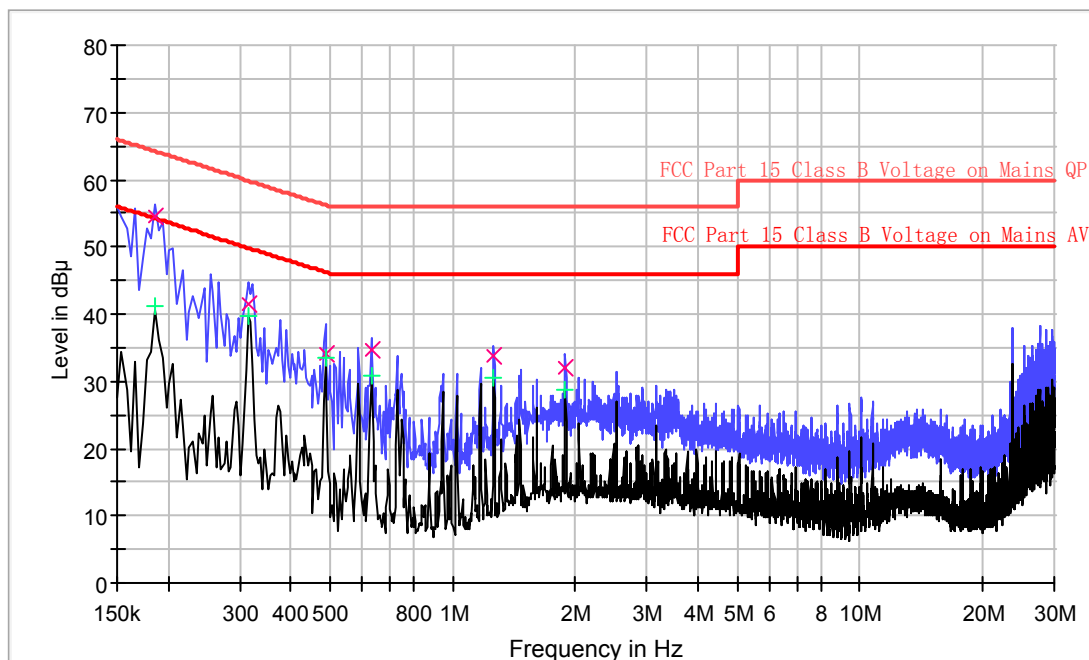
| Frequency (MHz) | Average (dB µ V) | Line | Corr. (dB) | Margin (dB) | Limit (dB µ V) |
|-----------------|------------------|------|------------|-------------|----------------|
| 0.186 | 45.8 | N | 10.2 | 8.4 | 54.2 |
| 0.314 | 38.9 | N | 10.2 | 11.0 | 49.9 |
| 0.486 | 38.6 | N | 10.2 | 7.6 | 46.2 |
| 0.746 | 28.1 | N | 10.3 | 17.9 | 46.0 |
| 0.946 | 28.1 | N | 10.3 | 17.9 | 46.0 |
| 1.462 | 26.9 | N | 10.3 | 19.1 | 46.0 |

Test Engineer: Jenner Liu

TRF No.: FCC 15C_PC_b
 FCC ID: W9HLCDC0025

INTERTEK TESTING SERVICES

Company: Hisense Electric Co., Ltd
 Date of Test: September 09, 2013
 Model: LHD32D33US
 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) |
|-----------------|------------------------|------|------------|-------------|--------------------|
| 0.186 | 54.5 | L1 | 9.7 | 9.7 | 64.2 |
| 0.314 | 41.6 | L1 | 9.7 | 18.3 | 59.9 |
| 0.486 | 34.0 | L1 | 9.7 | 22.2 | 56.2 |
| 0.630 | 34.6 | L1 | 9.7 | 21.4 | 56.0 |
| 1.262 | 33.8 | L1 | 9.8 | 22.2 | 56.0 |
| 1.894 | 32.0 | L1 | 9.8 | 24.0 | 56.0 |

Result Table AV

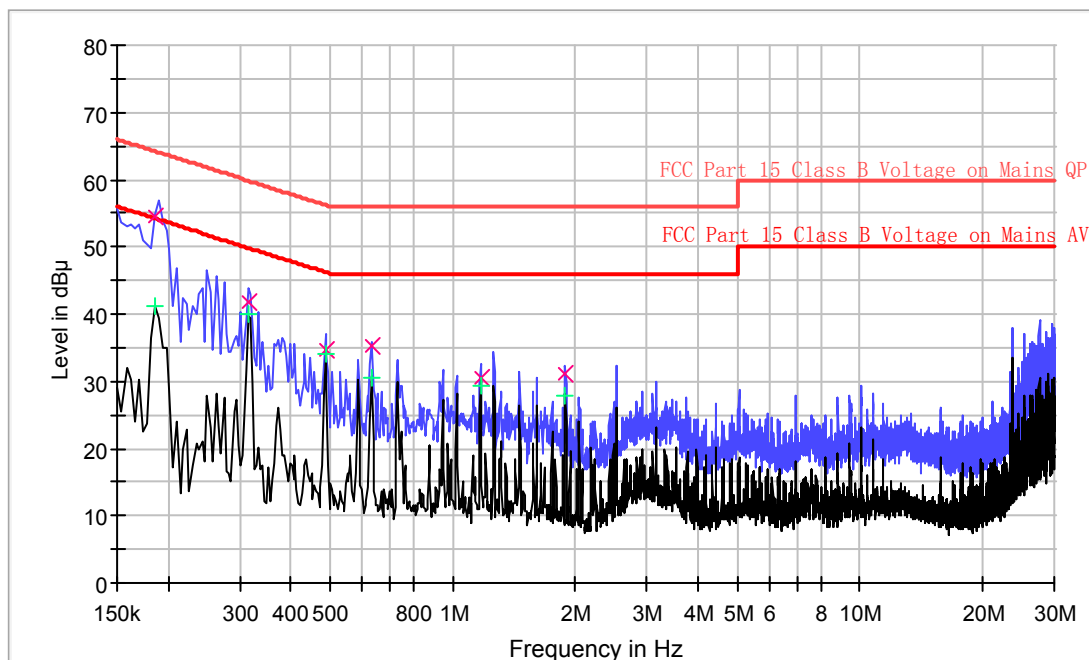
| Frequency (MHz) | Average (dB μ V) | Line | Corr. (dB) | Margin (dB) | Limit (dB μ V) |
|-----------------|----------------------|------|------------|-------------|--------------------|
| 0.186 | 41.1 | L1 | 9.7 | 13.1 | 54.2 |
| 0.314 | 39.7 | L1 | 9.7 | 10.2 | 49.9 |
| 0.486 | 33.6 | L1 | 9.7 | 12.6 | 46.2 |
| 0.630 | 30.9 | L1 | 9.7 | 15.1 | 46.0 |
| 1.262 | 30.5 | L1 | 9.8 | 15.5 | 46.0 |
| 1.894 | 28.9 | L1 | 9.8 | 17.1 | 46.0 |

Test Engineer: Jenner Liu

TRF No.: FCC 15C_PC_b
 FCC ID: W9HLCDC0025

INTERTEK TESTING SERVICES

Company: Hisense Electric Co., Ltd
 Date of Test: September 09, 2013
 Model: LHD32D33US
 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) |
|-----------------|------------------------|------|------------|-------------|--------------------|
| 0.186 | 54.4 | N | 10.2 | 9.8 | 64.2 |
| 0.314 | 41.9 | N | 10.2 | 18.0 | 59.9 |
| 0.486 | 34.6 | N | 10.2 | 21.6 | 56.2 |
| 0.630 | 35.3 | N | 10.2 | 20.7 | 56.0 |
| 1.170 | 30.5 | N | 10.3 | 25.5 | 56.0 |
| 1.894 | 31.0 | N | 10.3 | 25.0 | 56.0 |

Result Table AV

| Frequency (MHz) | Average (dB μ V) | Line | Corr. (dB) | Margin (dB) | Limit (dB μ V) |
|-----------------|----------------------|------|------------|-------------|--------------------|
| 0.186 | 41.2 | N | 10.2 | 13.0 | 54.2 |
| 0.314 | 40.1 | N | 10.2 | 9.8 | 49.9 |
| 0.486 | 34.1 | N | 10.2 | 12.1 | 46.2 |
| 0.630 | 30.6 | N | 10.2 | 15.4 | 46.0 |
| 1.170 | 29.4 | N | 10.3 | 16.6 | 46.0 |
| 1.894 | 27.9 | N | 10.3 | 18.1 | 46.0 |

Test Engineer: Jenner Liu

TRF No.: FCC 15C_PC_b
 FCC ID: W9HLCDC0025

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EXHIBIT 4
EQUIPMENT PHOTOGRAPHS

INTERTEK TESTING SERVICES

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

INTERTEK TESTING SERVICES

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

INTERTEK TESTING SERVICES

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

INTERTEK TESTING SERVICES

8.0 Miscellaneous Information

This miscellaneous information includes emission measuring procedure.

INTERTEK TESTING SERVICES

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 6GHz 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 6GHz. 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 | 29-Jun-13 | 29-Jun-2014 |
| SZ185-01 | EMI Receiver | R & S | ESCI | 100547 | 12-Mar-2013 | 12-Mar-2014 |
| SZ188-01 | Anechoic Chamber | ETS | RFD-F/A-100 | 02 Mar 2013 | 02-Mar-2013 | 02-Mar-2014 |
| SZ062-04 | RF Cable | RADIALL | RG 213U | -- | 20-Jul-2013 | 20-Jan-2014 |
| SZ185-02 | EMI Test Receiver | R&S | ESCI | 100692 | 05-Nov-2012 | 05-Nov-2013 |
| SZ187-01 | Two-Line V-Network | R&S | ENV216 | 100072 | 05-Nov-2012 | 05-Nov-2013 |
| SZ187-02 | Two-Line V-Network | R&S | ENV216 | 100073 | 05-Nov-2012 | 05-Nov-2013 |
| SZ188-03 | Shielding Room | ETS | RFD-100 | 4100 | 23-Aug-2013 | 23-Aug-2014 |