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<http://www.digitalemc.com>

# FCC Test Report

for

## LCD TV

**Applicant** : LG Electronics Inc.

**Model Number** : 47LD650H-UA

**Manufacturer** : LG Electronics Inc.

ANSI C 63.4:2003

**Test Standard** : FCC Part 15 Subpart B

(Type of Device : Class B Computing Device Peripheral (JBP))

**Date of Tests** : August 26 ~ September 08, 2010

**Date of Issue** : September 10, 2010

Tested by : D.H.EUN/Assistant Manager

Reviewed by : Y.K.SHIN/Manager

A handwritten signature in blue ink, appearing to read 'D.H.EUN', written over a horizontal line.

A handwritten signature in blue ink, appearing to read 'Y.K.SHIN', written over a horizontal line.

**This test result only responds to the tested sample.**

**It is not allowed to copy this report even partly without the allowance of the test laboratory.**

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## 1. General Remarks

This Report describes the emission characteristics of the tested product.

If the product will be used with additional equipment other than those mentioned in this report or if the tested product will be used against the manufacture's specifications, the compliance with the relevant standards for the system has to be ensured.

## 2. Test Laboratory

Digital EMC Co., Ltd. has been accredited / filed / authorized by the agencies listed in the following table;

| Certificate   | Nation  | Agency | Code                               | Mark                          |
|---------------|---------|--------|------------------------------------|-------------------------------|
| Accreditation | Korea   | KOLAS  | 393                                | ISO/IEC 17025                 |
| Site Filing   | USA     | FCC    | 101842                             | Test Facility list & NSA Data |
|               | Japan   | VCCI   | C-1427<br>R-1364, R-3385<br>T-1442 | Test Facility list & NSA Data |
| Certification | Korea   | KCC    | KR0034                             | Test Facility list & NSA Data |
|               | Germany | TUV    | ROK0826C                           | ISO/IEC 17025                 |

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competents of calibration and testing laboratory".

### DIGITAL EMC CO., LTD.

Address: 683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080

<http://www.digitalemcc.com>

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### 3. General Information of EUT

#### 3.1 Product Information

|                           |                                                                                                                    |
|---------------------------|--------------------------------------------------------------------------------------------------------------------|
| Equipment under Test      | LCD TV                                                                                                             |
| Model No.                 | 47LD650H-UA                                                                                                        |
| Serial No                 | NONE                                                                                                               |
| Type of Sample Tested     | Pre-Production                                                                                                     |
| Rating Power Supply       | AC100-240V, 50/60Hz                                                                                                |
| High Frequency            | 667MHz,1920*1080(HDMI,D sub max resolution)                                                                        |
| Supplied Power for Test   | AC120V, 60Hz                                                                                                       |
| Applicant                 | LG Electronics Inc.<br>19-1, Cheongho-ri, Jinwi-myeon, Pyeongtaek-si,<br>Gyeonggi-do, Korea                        |
| Manufacturer              | LG Electronics Inc.<br>19-1, Cheongho-ri, Jinwi-myeon, Pyeongtaek-si,<br>Gyeonggi-do, Korea                        |
| Factory                   | LG Electronics Reynosa, Inc.<br>LG Electronics USA, Inc_Reynosa 9801 South Cage Blvd.<br>Suite 3F Pharr, TX. 78577 |
| Date of Receipt of Sample | 2010-08-26                                                                                                         |

#### < Product Specifications >

##### RGB-PC

| Resolution | Horizontal Frequency(KHz) | Vertical Frequency(Hz) |
|------------|---------------------------|------------------------|
| 720x400    | 31.469                    | 70.08                  |
| 640x480    | 31.469<br>37.861          | 59.94<br>72.80         |
| 800x600    | 37.879<br>48.077          | 60.31<br>72.18         |
| 1024x768   | 48.363<br>56.476          | 60.00<br>70.06         |
| 1280x768   | 47.776<br>60.289          | 59.870<br>74.893       |
| 1360x768   | 47.712                    | 60.015                 |
| 1280x1024  | 63.981<br>79.976          | 60.020<br>75.025       |
| 1920x1080  | 66.587                    | 59.934                 |

Depending on models

##### HDMI-PC

| Resolution | Horizontal Frequency(KHz) | Vertical Frequency(Hz) |
|------------|---------------------------|------------------------|
| 720x400    | 31.469                    | 70.08                  |
| 640x480    | 31.469                    | 59.94                  |
| 800x600    | 35.156<br>37.879          | 56.25<br>60.31         |
| 1024x768   | 48.363                    | 60.00                  |
| 1280x768   | 47.776                    | 59.87                  |
| 1360x768   | 47.712                    | 60.015                 |
| 1280x1024  | 63.981                    | 60.02                  |
| 1920x1080  | 67.50                     | 60.00                  |

Depending on models

## 4. Test Summary

### 4.1 Summary of tests

The applied standards to evaluate the compliance of requirements is 47CFR Part 15, Subpart B and the measurement procedures specified in ANSI C63.4 are performed.

| Test Items                                                             | Applied Standards     | Status |
|------------------------------------------------------------------------|-----------------------|--------|
| <b>Emission</b>                                                        |                       |        |
| Conducted Emission                                                     | FCC Part 15 Subpart B | C      |
| Radiated Emission                                                      | FCC Part 15 Subpart B | C      |
| Note 1: C=Conform   NC=Not Conform   NT=Not Tested   NA=Not Applicable |                       |        |

## 5. Test Set-up and operation mode

### 5.1 Principle of Configuration Selection

**Emission** : The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

### 5.2 Test Operation Mode

- DSUB mode : Resolution 1920\*1080 MAX, "H" character scroll
- HDMI mode : Resolution 1920\*1080 MAX, "H" character scroll
- USB mode : USB file play

EUT is the following operational conditions apply:

- a) Set the contrast control to maximum.
- b) Set the brightness control to maximum or at raster extinction if raster extinction occurs at less than maximum brightness.
- c) For color monitors, use white letters on a black background to represent all colors.
- d) Select the worse case of positive or negative video if both alternatives are available.
- e) Set character size and number of characters per line so that the typical maximum number of characters per screen is displayed.
- f) For a monitor that has no graphics capabilities, regardless of the video card used, a pattern consisting of random text shall be displayed. For a monitor with graphics capability, even though another videocard may be needed to accomplish a graphic display, a screen pattern consisting of lines of scrolling H's should be displayed. For a monitor that has no text capabilities, use a typical display. That pattern should be used for the remainder of the tests.

### 5.3 Support Equipment Used

| Unit       | Model No. | Serial No.    | Manufacturer | CABLE        |            |                      | Backshell          | FCC ID |
|------------|-----------|---------------|--------------|--------------|------------|----------------------|--------------------|--------|
|            |           |               |              | Connect type | Length (m) | shield               |                    |        |
| Notebook   | LGT28     | 003QTAF063488 | LG           | DSUB<br>HDMI | 1.8<br>1.8 | Non-shield<br>Shield | Plastic<br>Plastic | DOC    |
| USB Memory | U1        | N/A           | AXXEN        | USB          | -          | Non-shield           | Plastic            | DOC    |

#### NOTE

- See "APPENDIX 1 Photographs" for actual system test setup

## 6. Test Results : Emission

### 6.1 Conducted Emission

#### **RESULT : COMPLY**

#### 6.1.1 Measurement Procedure

In the range of 0.15MHz to 30MHz, the conducted emission was measured and set-up was made accordance with **ANSI C63.4:2003**.

If the EUT is table top equipment, it was placed on a wooden table with a height of 0.8m above the reference ground plane and 0.4m from the conducting wall of the shielded room.

Also if the EUT is floor-standing equipment, it was placed on a non-conducted support with a height up to 0.15m above the reference ground plane.

Connect the EUT's power source lines to the appropriate power mains / peripherals through the LISN. All the other peripherals are connected to the 2<sup>nd</sup> LISN, if any.

Unused measuring port of the LISN was resistively terminated by 50 ohm terminator.

The measuring port of the LISN for EUT was connected to spectrum analyzer.

Using TOYO conducted emission test software, the emissions were scanned from 150KHz to 30MHz with peak detector mode.

After scanning over the frequency range, suspected emissions were selected to perform final measurement. When performing final measurement, the receiver was used which has Quasi-Peak detector and Average detector.

By varying the configuration of the test sample and the cable routing it was attempted to maximize the emission.

For further description of the configuration refer to the picture of the test set-up.

#### 6.1.2 List of Test and Measurement Instruments

| Name of Instrument | Model No. | Serial No.  | Manufacturer | Cal. Date  | Next Cal. Date |
|--------------------|-----------|-------------|--------------|------------|----------------|
| EMI Test Receiver  | ESCI      | 100364      | R&S          | 2010.05.12 | 2011.05.12     |
| Spectrum Analyzer  | 8594E     | 39911A05752 | AGILENT      | 2009.10.06 | 2010.10.06     |
| LISN               | LISN1600  | 197204      | TTI          | 2010.07.02 | 2011.07.02     |
| LISN(EUT)          | ESH2-Z5   | 828739/006  | R&S          | 2009.10.01 | 2010.10.01     |
| 50 ohm Terminator  | CT-01     | N/A         | TME          | 2010.01.12 | 2011.01.12     |

### 6.1.3 Limit for Conducted Emission

#### (1) Conducted Emission at mains ports of class A

| Frequency range<br>(MHz)                                        | Limits dB( $\mu$ V) |         |
|-----------------------------------------------------------------|---------------------|---------|
|                                                                 | Quasi-peak          | Average |
| 0.15 to 0.50                                                    | 79                  | 66      |
| 0.50 to 30                                                      | 73                  | 60      |
| Note The lower limit shall apply at the transition frequencies. |                     |         |

#### (2) Conducted Emission at mains ports of class B

| Frequency range<br>(MHz)                                                                                | Limits dB( $\mu$ V) |          |
|---------------------------------------------------------------------------------------------------------|---------------------|----------|
|                                                                                                         | Quasi-peak          | Average  |
| 0.15 to 0.50                                                                                            | 66 to 56            | 56 to 46 |
| 0.50 to 5                                                                                               | 56                  | 46       |
| 5 to 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 0.15MHz to 0.5MHz. |                     |          |

### 6.1.4 Test Result

|                     |                 |
|---------------------|-----------------|
| Test date           | August 26, 2010 |
| Ambient Temperature | 25              |
| Relative Humidity   | 58 % R.H.       |

Result : For the measurement data, see next page.

Note) 1. Emission Level = Reading Value + Correction Factor.

2. Correction Factor = Cable Loss + Insertion Loss of LISN

3. Margin = Limit - Emission level

# Test Result

< DSUB MODE >



## Results of Conducted Emission

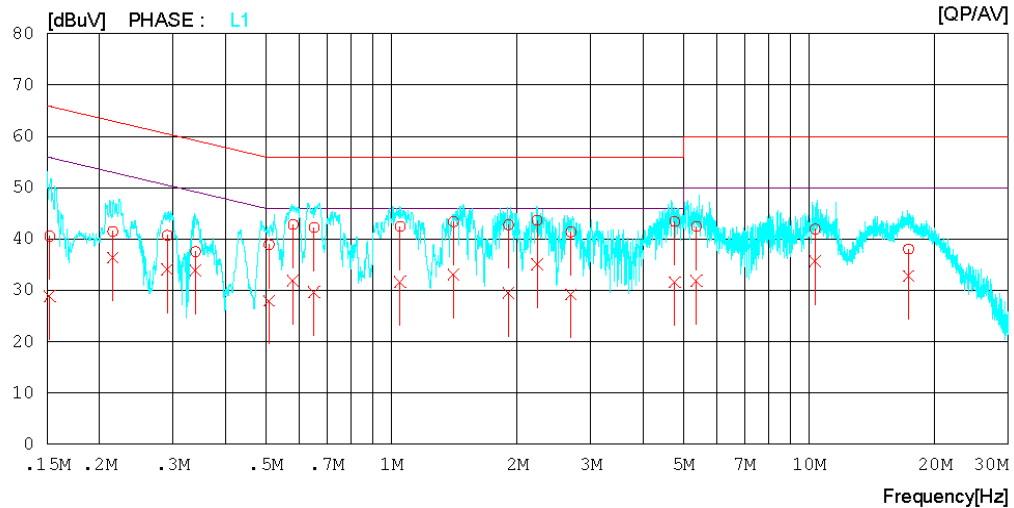
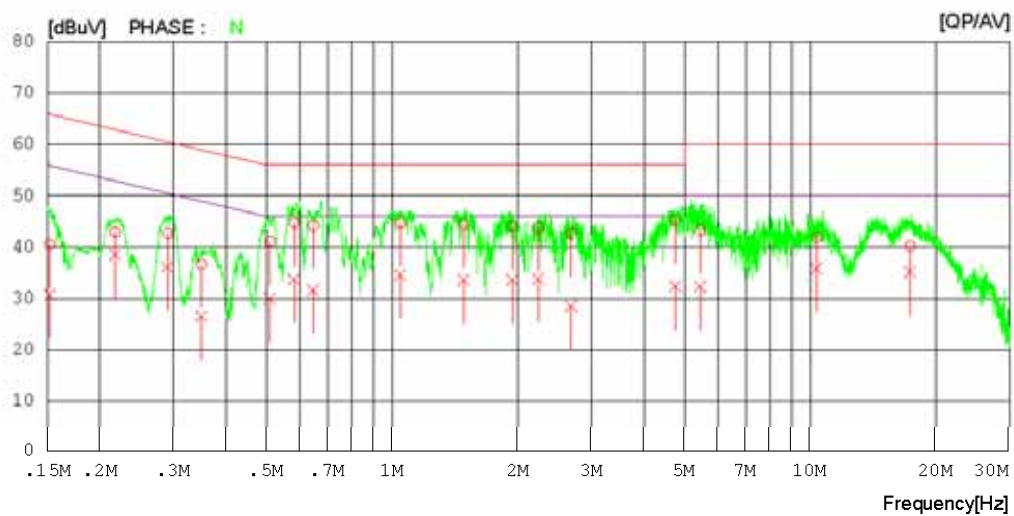
Digital EMC  
Date : 2010/08/26

Model No. : 47LD650H-UA  
Type :  
Serial No. :  
Test Condition : DSUB

Reference No. :  
Power Supply : 120V 60Hz  
Temp/Humi. : 25 °C 58 % R.H.  
Operator :

Memo :

LIMIT : CISPR22\_B QP  
CISPR22\_B AV





## Results of Conducted Emission

Digital EMC  
Date : 2010/08/26

Model No. : 47LD650H-UA  
Type :  
Serial No. :  
Test Condition : DSUB

Reference No. :  
Power Supply : 120V 60Hz  
Temp/Humi. : 25 °C 58 % R.H.  
Operator :

Memo :

LIMIT : CISPR22\_B QP  
CISPR22\_B AV

| NO | FREQ<br>[MHz] | READING      |              | C.FACTOR<br>[dB] | RESULT       |              | LIMIT        |              | MARGIN       |              | PHASE |
|----|---------------|--------------|--------------|------------------|--------------|--------------|--------------|--------------|--------------|--------------|-------|
|    |               | QP<br>[dBuV] | AV<br>[dBuV] |                  | QP<br>[dBuV] | AV<br>[dBuV] | QP<br>[dBuV] | AV<br>[dBuV] | QP<br>[dBuV] | AV<br>[dBuV] |       |
| 1  | 0.15174       | 40.3         | 30.5         | 0.2              | 40.5         | 30.7         | 65.9         | 55.9         | 25.4         | 25.2         | N     |
| 2  | 0.21746       | 42.7         | 38.3         | 0.2              | 42.9         | 38.5         | 62.9         | 52.9         | 20.0         | 14.4         | N     |
| 3  | 0.29065       | 42.5         | 35.9         | 0.2              | 42.7         | 36.1         | 60.5         | 50.5         | 17.8         | 14.4         | N     |
| 4  | 0.34976       | 36.4         | 26.3         | 0.3              | 36.7         | 26.6         | 59.0         | 49.0         | 22.3         | 22.4         | N     |
| 5  | 0.50970       | 40.8         | 29.7         | 0.3              | 41.1         | 30.0         | 56.0         | 46.0         | 14.9         | 16.0         | N     |
| 6  | 0.56283       | 44.5         | 33.5         | 0.2              | 44.7         | 33.7         | 56.0         | 46.0         | 22.3         | 12.3         | N     |
| 7  | 0.64773       | 44.0         | 31.4         | 0.2              | 44.2         | 31.6         | 56.0         | 46.0         | 11.8         | 14.4         | N     |
| 8  | 1.04600       | 44.4         | 34.2         | 0.3              | 44.7         | 34.5         | 56.0         | 46.0         | 11.3         | 11.5         | N     |
| 9  | 1.48050       | 44.1         | 33.3         | 0.3              | 44.4         | 33.6         | 56.0         | 46.0         | 11.6         | 12.4         | N     |
| 10 | 1.94000       | 43.8         | 33.3         | 0.3              | 44.1         | 33.6         | 56.0         | 46.0         | 11.9         | 12.4         | N     |
| 11 | 2.23550       | 43.5         | 33.6         | 0.3              | 43.8         | 33.9         | 56.0         | 46.0         | 12.2         | 12.1         | N     |
| 12 | 2.67650       | 42.4         | 28.2         | 0.3              | 42.7         | 28.5         | 56.0         | 46.0         | 13.3         | 17.5         | N     |
| 13 | 4.74700       | 44.9         | 31.9         | 0.5              | 45.4         | 32.4         | 56.0         | 46.0         | 10.6         | 13.6         | N     |
| 14 | 5.44150       | 42.8         | 31.8         | 0.5              | 43.3         | 32.3         | 60.0         | 50.0         | 16.7         | 17.7         | N     |
| 15 | 10.33000      | 41.3         | 35.3         | 0.6              | 41.9         | 35.9         | 60.0         | 50.0         | 18.1         | 14.1         | N     |
| 16 | 17.30350      | 39.3         | 34.2         | 0.9              | 40.2         | 35.1         | 60.0         | 50.0         | 19.8         | 14.9         | N     |
| 17 | 0.15196       | 40.4         | 28.7         | 0.2              | 40.6         | 28.9         | 65.9         | 55.9         | 25.3         | 27.0         | L1    |
| 18 | 0.21514       | 41.3         | 36.2         | 0.2              | 41.5         | 36.4         | 63.0         | 53.0         | 21.5         | 16.6         | L1    |
| 19 | 0.29048       | 40.5         | 33.9         | 0.2              | 40.7         | 34.1         | 60.5         | 50.5         | 19.8         | 16.4         | L1    |
| 20 | 0.33970       | 37.3         | 33.6         | 0.3              | 37.6         | 33.9         | 59.2         | 49.2         | 21.6         | 15.3         | L1    |
| 21 | 0.50918       | 38.6         | 27.7         | 0.3              | 38.9         | 28.0         | 56.0         | 46.0         | 17.1         | 18.0         | L1    |
| 22 | 0.58160       | 42.6         | 31.7         | 0.2              | 42.8         | 31.9         | 56.0         | 46.0         | 13.2         | 14.1         | L1    |
| 23 | 0.65220       | 42.0         | 29.5         | 0.2              | 42.2         | 29.7         | 56.0         | 46.0         | 13.8         | 16.3         | L1    |
| 24 | 1.04800       | 42.2         | 31.4         | 0.3              | 42.5         | 31.7         | 56.0         | 46.0         | 13.5         | 14.3         | L1    |
| 25 | 1.40750       | 43.1         | 32.8         | 0.3              | 43.4         | 33.1         | 56.0         | 46.0         | 12.6         | 12.9         | L1    |
| 26 | 1.90650       | 42.5         | 29.2         | 0.3              | 42.8         | 29.5         | 56.0         | 46.0         | 13.2         | 16.5         | L1    |
| 27 | 2.23300       | 43.4         | 34.8         | 0.3              | 43.7         | 35.1         | 56.0         | 46.0         | 12.3         | 10.9         | L1    |
| 28 | 2.68850       | 41.1         | 28.9         | 0.3              | 41.4         | 29.2         | 56.0         | 46.0         | 14.6         | 16.8         | L1    |
| 29 | 4.76200       | 42.9         | 31.1         | 0.5              | 43.4         | 31.6         | 56.0         | 46.0         | 12.6         | 14.4         | L1    |
| 30 | 5.36800       | 42.0         | 31.4         | 0.5              | 42.5         | 31.9         | 60.0         | 50.0         | 17.5         | 18.1         | L1    |
| 31 | 10.33350      | 41.3         | 35.1         | 0.6              | 41.9         | 35.7         | 60.0         | 50.0         | 18.1         | 14.3         | L1    |
| 32 | 17.29300      | 37.2         | 31.9         | 0.9              | 38.1         | 32.8         | 60.0         | 50.0         | 21.9         | 17.2         | L1    |

< HDMI MODE >



# Results of Conducted Emission

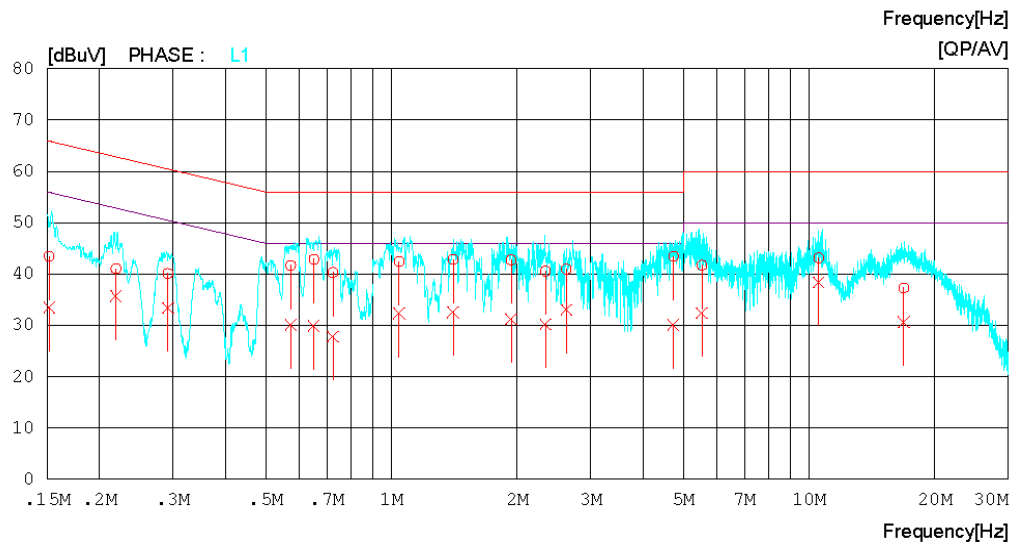
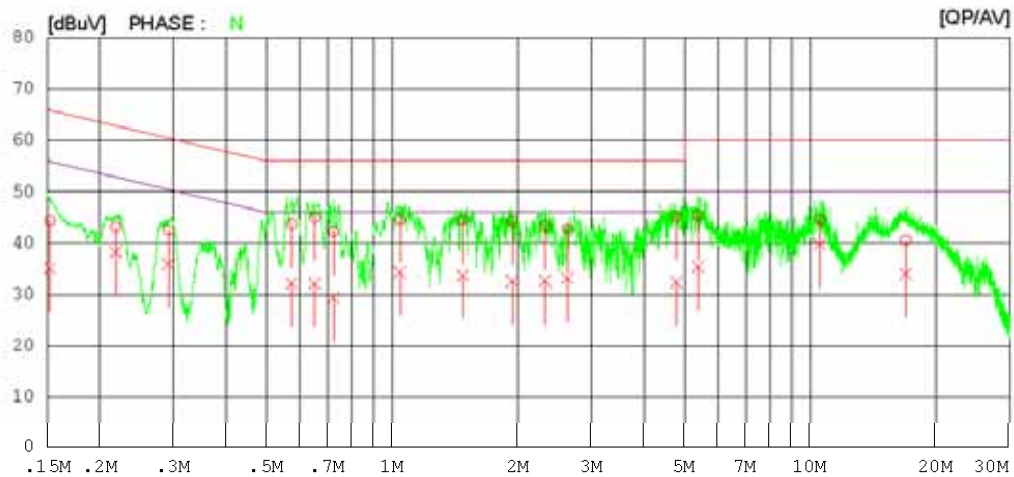
Digital EMC  
Date : 2010/08/26

Model No. : 47LD650H-UA  
Type :  
Serial No. :  
Test Condition : HDMI

Reference No. :  
Power Supply : 120V 60Hz  
Temp/Humi. : 25 °C 58 % R.H.  
Operator :

Memo :

LIMIT : CISPR22\_B QP  
CISPR22\_B AV





## Results of Conducted Emission

Digital EMC  
Date : 2010/08/26

Model No. : 47LD650H-UA  
Type :  
Serial No. :  
Test Condition : HDMI

Reference No. :  
Power Supply : 120V 60Hz  
Temp/Humi. : 25 °C 58 % R.H.  
Operator :

Memo :

LIMIT : CISPR22\_B QP  
CISPR22\_B AV

| NO | FREQ<br>[MHz] | READING      |              | C.FACTOR<br>[dB] | RESULT       |              | LIMIT        |              | MARGIN       |              | PHASE |
|----|---------------|--------------|--------------|------------------|--------------|--------------|--------------|--------------|--------------|--------------|-------|
|    |               | QP<br>[dBuV] | AV<br>[dBuV] |                  | QP<br>[dBuV] | AV<br>[dBuV] | QP<br>[dBuV] | AV<br>[dBuV] | QP<br>[dBuV] | AV<br>[dBuV] |       |
| 1  | 0.15185       | 44.2         | 34.9         | 0.2              | 44.4         | 35.1         | 65.9         | 55.9         | 21.5         | 20.8         | N     |
| 2  | 0.21856       | 43.0         | 38.1         | 0.2              | 43.2         | 38.3         | 62.9         | 52.9         | 19.7         | 14.6         | N     |
| 3  | 0.29199       | 42.4         | 35.7         | 0.2              | 42.6         | 35.9         | 60.5         | 50.5         | 17.9         | 14.6         | N     |
| 4  | 0.57414       | 43.5         | 31.9         | 0.2              | 43.7         | 32.1         | 56.0         | 46.0         | 12.3         | 13.9         | N     |
| 5  | 0.65244       | 44.8         | 31.9         | 0.2              | 45.0         | 32.1         | 56.0         | 46.0         | 11.0         | 13.9         | N     |
| 6  | 0.72350       | 42.0         | 29.1         | 0.3              | 42.3         | 29.4         | 56.0         | 46.0         | 13.7         | 16.6         | N     |
| 7  | 1.04350       | 44.4         | 34.0         | 0.3              | 44.7         | 34.3         | 56.0         | 46.0         | 11.3         | 11.7         | N     |
| 8  | 1.47500       | 44.2         | 33.4         | 0.3              | 44.5         | 33.7         | 56.0         | 46.0         | 11.5         | 12.3         | N     |
| 9  | 1.93550       | 44.0         | 32.3         | 0.3              | 44.3         | 32.6         | 56.0         | 46.0         | 11.7         | 13.4         | N     |
| 10 | 2.31900       | 43.0         | 32.3         | 0.3              | 43.3         | 32.6         | 56.0         | 46.0         | 12.7         | 13.4         | N     |
| 11 | 2.62450       | 42.4         | 32.9         | 0.3              | 42.7         | 33.2         | 56.0         | 46.0         | 13.3         | 12.8         | N     |
| 12 | 4.77500       | 44.7         | 31.9         | 0.5              | 45.2         | 32.4         | 56.0         | 46.0         | 10.8         | 13.6         | N     |
| 13 | 5.38650       | 44.9         | 34.9         | 0.5              | 45.4         | 35.4         | 60.0         | 50.0         | 14.6         | 14.6         | N     |
| 14 | 10.52900      | 44.0         | 39.1         | 0.6              | 44.6         | 39.7         | 60.0         | 50.0         | 15.4         | 10.3         | N     |
| 15 | 16.88800      | 39.7         | 33.1         | 0.9              | 40.6         | 34.0         | 60.0         | 50.0         | 19.4         | 16.0         | N     |
| 16 | 0.15150       | 43.2         | 33.3         | 0.2              | 43.4         | 33.5         | 65.9         | 55.9         | 22.5         | 22.4         | L1    |
| 17 | 0.21896       | 40.8         | 35.5         | 0.2              | 41.0         | 35.7         | 62.9         | 52.9         | 21.9         | 17.2         | L1    |
| 18 | 0.29141       | 39.9         | 33.2         | 0.2              | 40.1         | 33.4         | 60.5         | 50.5         | 20.4         | 17.1         | L1    |
| 19 | 0.57350       | 41.5         | 29.9         | 0.2              | 41.7         | 30.1         | 56.0         | 46.0         | 14.3         | 15.9         | L1    |
| 20 | 0.65186       | 42.7         | 29.7         | 0.2              | 42.9         | 29.9         | 56.0         | 46.0         | 13.1         | 16.1         | L1    |
| 21 | 0.72344       | 40.0         | 27.6         | 0.3              | 40.3         | 27.9         | 56.0         | 46.0         | 15.7         | 18.1         | L1    |
| 22 | 1.04250       | 42.1         | 32.0         | 0.3              | 42.4         | 32.3         | 56.0         | 46.0         | 13.6         | 13.7         | L1    |
| 23 | 1.40450       | 42.5         | 32.3         | 0.3              | 42.8         | 32.6         | 56.0         | 46.0         | 13.2         | 13.4         | L1    |
| 24 | 1.93400       | 42.5         | 30.9         | 0.3              | 42.8         | 31.2         | 56.0         | 46.0         | 13.2         | 14.8         | L1    |
| 25 | 2.33700       | 40.3         | 29.9         | 0.3              | 40.6         | 30.2         | 56.0         | 46.0         | 15.4         | 15.8         | L1    |
| 26 | 2.62200       | 40.7         | 32.7         | 0.3              | 41.0         | 33.0         | 56.0         | 46.0         | 15.0         | 13.0         | L1    |
| 27 | 4.73350       | 43.0         | 29.6         | 0.5              | 43.5         | 30.1         | 56.0         | 46.0         | 12.5         | 15.9         | L1    |
| 28 | 5.53300       | 41.2         | 31.9         | 0.5              | 41.7         | 32.4         | 60.0         | 50.0         | 18.3         | 17.6         | L1    |
| 29 | 10.53100      | 42.6         | 37.8         | 0.6              | 43.2         | 38.4         | 60.0         | 50.0         | 16.8         | 11.6         | L1    |
| 30 | 16.84500      | 36.4         | 29.8         | 0.9              | 37.3         | 30.7         | 60.0         | 50.0         | 22.7         | 19.3         | L1    |

< USB MODE >



# Results of Conducted Emission

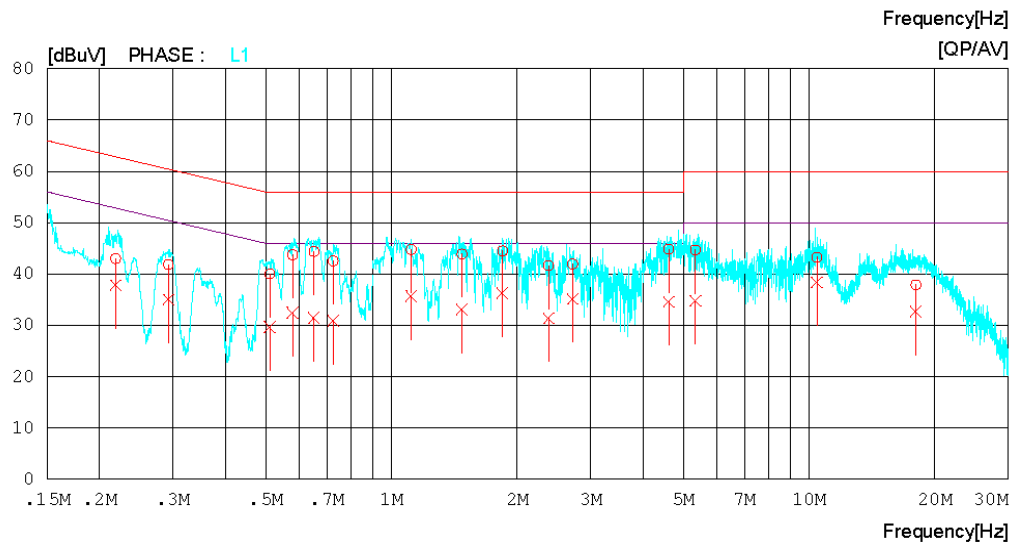
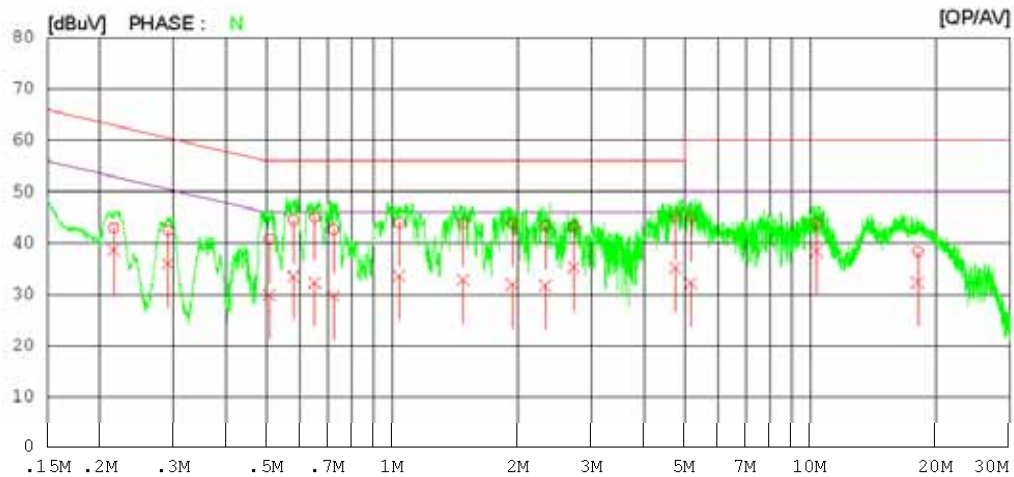
Digital EMC  
Date : 2010/08/26

Model No. : 47LD650H-UA  
Type :  
Serial No. :  
Test Condition : USB

Reference No. :  
Power Supply : 120V 60Hz  
Temp/Humi. : 25 °C 58 % R.H.  
Operator :

Memo :

LIMIT : CISPR22\_B QP  
CISPR22\_B AV





## Results of Conducted Emission

Digital EMC  
Date : 2010/08/26

Model No. : 47LD650H-UA  
Type :  
Serial No. :  
Test Condition : USB

Reference No. :  
Power Supply : 120V 60Hz  
Temp/Humi. : 25 °C 58 % R.H.  
Operator :

Memo :

LIMIT : CISPR22\_B QP  
CISPR22\_B AV

| NO | FREQ<br>[MHz] | READING      |              | C.FACTOR<br>[dB] | RESULT       |              | LIMIT        |              | MARGIN       |              | PHASE |
|----|---------------|--------------|--------------|------------------|--------------|--------------|--------------|--------------|--------------|--------------|-------|
|    |               | QP<br>[dBuV] | AV<br>[dBuV] |                  | QP<br>[dBuV] | AV<br>[dBuV] | QP<br>[dBuV] | AV<br>[dBuV] | QP<br>[dBuV] | AV<br>[dBuV] |       |
| 1  | 0.21589       | 42.8         | 38.4         | 0.2              | 43.0         | 38.6         | 63.0         | 53.0         | 20.0         | 14.4         | N     |
| 2  | 0.29080       | 42.3         | 35.7         | 0.2              | 42.5         | 35.9         | 60.5         | 50.5         | 18.0         | 14.6         | N     |
| 3  | 0.50808       | 40.4         | 29.6         | 0.3              | 40.7         | 29.9         | 56.0         | 46.0         | 15.3         | 16.1         | N     |
| 4  | 0.58058       | 44.3         | 33.3         | 0.2              | 44.5         | 33.5         | 56.0         | 46.0         | 11.5         | 12.5         | N     |
| 5  | 0.65274       | 44.8         | 32.1         | 0.2              | 45.0         | 32.3         | 56.0         | 46.0         | 11.0         | 13.7         | N     |
| 6  | 0.72366       | 42.3         | 29.3         | 0.3              | 42.6         | 29.6         | 56.0         | 46.0         | 13.4         | 16.4         | N     |
| 7  | 1.04000       | 43.7         | 33.2         | 0.3              | 44.0         | 33.5         | 56.0         | 46.0         | 12.0         | 12.5         | N     |
| 8  | 1.47700       | 43.7         | 32.5         | 0.3              | 44.0         | 32.8         | 56.0         | 46.0         | 12.0         | 13.2         | N     |
| 9  | 1.93550       | 43.7         | 31.7         | 0.3              | 44.0         | 32.0         | 56.0         | 46.0         | 12.0         | 14.0         | N     |
| 10 | 2.32150       | 43.0         | 31.4         | 0.3              | 43.3         | 31.7         | 56.0         | 46.0         | 12.7         | 14.3         | N     |
| 11 | 2.71900       | 42.9         | 35.0         | 0.3              | 43.2         | 35.3         | 56.0         | 46.0         | 12.8         | 10.7         | N     |
| 12 | 4.75200       | 44.7         | 34.6         | 0.5              | 45.2         | 35.1         | 56.0         | 46.0         | 10.8         | 10.9         | N     |
| 13 | 5.17600       | 44.4         | 31.7         | 0.5              | 44.9         | 32.2         | 60.0         | 50.0         | 15.1         | 17.8         | N     |
| 14 | 10.33350      | 43.4         | 37.8         | 0.6              | 44.0         | 38.4         | 60.0         | 50.0         | 16.0         | 11.6         | N     |
| 15 | 18.05400      | 37.4         | 31.4         | 1.0              | 38.4         | 32.4         | 60.0         | 50.0         | 21.6         | 17.6         | N     |
| 16 | 0.21850       | 42.8         | 37.6         | 0.2              | 43.0         | 37.8         | 62.9         | 52.9         | 19.9         | 15.1         | L1    |
| 17 | 0.29236       | 41.7         | 34.8         | 0.2              | 41.9         | 35.0         | 60.5         | 50.5         | 18.6         | 15.5         | L1    |
| 18 | 0.51128       | 39.7         | 29.4         | 0.3              | 40.0         | 29.7         | 56.0         | 46.0         | 16.0         | 16.3         | L1    |
| 19 | 0.57946       | 43.5         | 32.3         | 0.2              | 43.7         | 32.5         | 56.0         | 46.0         | 12.3         | 13.5         | L1    |
| 20 | 0.65193       | 44.2         | 31.3         | 0.2              | 44.4         | 31.5         | 56.0         | 46.0         | 11.6         | 14.5         | L1    |
| 21 | 0.72500       | 42.3         | 30.6         | 0.3              | 42.6         | 30.9         | 56.0         | 46.0         | 13.4         | 15.1         | L1    |
| 22 | 1.11550       | 44.5         | 35.4         | 0.3              | 44.8         | 35.7         | 56.0         | 46.0         | 11.2         | 10.3         | L1    |
| 23 | 1.47500       | 43.6         | 32.8         | 0.3              | 43.9         | 33.1         | 56.0         | 46.0         | 12.1         | 12.9         | L1    |
| 24 | 1.84400       | 44.2         | 36.0         | 0.3              | 44.5         | 36.3         | 56.0         | 46.0         | 11.5         | 9.7          | L1    |
| 25 | 2.37800       | 41.4         | 31.1         | 0.3              | 41.7         | 31.4         | 56.0         | 46.0         | 14.3         | 14.6         | L1    |
| 26 | 2.71550       | 41.7         | 34.9         | 0.3              | 42.0         | 35.2         | 56.0         | 46.0         | 14.0         | 10.8         | L1    |
| 27 | 4.61200       | 44.3         | 34.0         | 0.5              | 44.8         | 34.5         | 56.0         | 46.0         | 11.2         | 11.5         | L1    |
| 28 | 5.33700       | 44.2         | 34.3         | 0.5              | 44.7         | 34.8         | 60.0         | 50.0         | 15.3         | 15.2         | L1    |
| 29 | 10.43300      | 42.7         | 37.8         | 0.6              | 43.3         | 38.4         | 60.0         | 50.0         | 16.7         | 11.6         | L1    |
| 30 | 18.00250      | 36.9         | 31.7         | 1.0              | 37.9         | 32.7         | 60.0         | 50.0         | 22.1         | 17.3         | L1    |

## 6.2 Radiated Emission

### **RESULT : COMPLY**

#### 6.2.1 Measurement Procedure

The radiated emission was measured and set-up was made accordance with **ANSI C63.4:2003**.

If the EUT is tabletop equipment, it was placed on a wooden table with a height of 0.8m above the reference ground plane and 3m away from the interference receiving antenna **10m semi-anechoic chamber**.

Also if the EUT is floor-standing equipment, it was placed on a non-conducted support with a height up to 0.15m above the reference ground plane.

Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 to 4m above the reference ground plane continuously to determine associated with higher emission levels and record them.

The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

For below 1GHz frequency range, Quasi-Peak detector with 120kHz RBW was used.

Also Peak and Average detector with 1MHz RBW were used for above 1GHz frequency range.

For further description of the configuration refer to the picture of the test set-up.

#### 6.2.2 List of Test and Measurement Instruments

| Radiated Emission (10m Chamber) |                  |            |              |            |                |
|---------------------------------|------------------|------------|--------------|------------|----------------|
| Name of Instrument              | Model No.        | Serial No. | Manufacturer | Cal. Date  | Next Cal. Date |
| EMI Test Receiver               | ESU              | 100014     | R&S          | 2010.01.29 | 2011.01.29     |
| Bilog Antenna                   | CBL6112D         | 22609      | SCHAFFNER    | 2010.10.28 | 2011.10.28     |
| Horn Antenna                    | 3115             | 21097      | ETS          | 2009.09.23 | 2010.09.23     |
| Amplifier(22dB)                 | 8447E            | 2945A02865 | H/P          | 2010.01.29 | 2011.01.29     |
| Low Noise Preamplifier          | MLA-00108-B02-36 | 1518831    | TSJ          | 2010.02.08 | 2011.02.08     |
| Controller                      | 5905A            | N/A        | TOKIN        | -          | -              |
| ANT.master                      | N/A              | N/A        | TOKIN        | -          | -              |

#### 6.2.3 Limit of Radiated Emission

- The test frequency range of Radiated Emission measurements are listed below.

| Highest frequency generated or used in the device or on which the device operates or tunes (MHz) | Upper frequency of measurement range (MHz)                                     |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Below 108                                                                                        | 1000                                                                           |
| 108 – 500                                                                                        | 2000                                                                           |
| 500 – 1000                                                                                       | 5000                                                                           |
| Above 1000                                                                                       | 5 <sup>th</sup> harmonic of the highest frequency or 40GHz, whichever is lower |

## (1) Limit for Radiated Emission below 1000MHz

| Frequency range<br>(MHz)                                                                                                                                                                                                                                                                                                                          | Class A Equipment<br>(10m distance) | Class B Equipment<br>(3m distance)  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                   | Quasi-peak limits<br>(dB $\mu$ V/m) | Quasi-peak limits<br>(dB $\mu$ V/m) |
| 30 to 88                                                                                                                                                                                                                                                                                                                                          | 39.1                                | 40                                  |
| 88 to 216                                                                                                                                                                                                                                                                                                                                         | 43.5                                | 43.5                                |
| 216 to 960                                                                                                                                                                                                                                                                                                                                        | 46.4                                | 46                                  |
| 960 to 1000                                                                                                                                                                                                                                                                                                                                       | 49.5                                | 54                                  |
| Note 1 The lower limit shall apply at the transition frequency.<br>Note 2 Additional provisions may be required for cases where interference occurs.<br>Note 3 According to 15.109(g), as an alternative to the radiated emission limit shown above,<br>digital devices may be shown to comply with the standards(CISPR), Pub. 22 shown as below. |                                     |                                     |
| 30 to 230                                                                                                                                                                                                                                                                                                                                         | 40                                  | 30                                  |
| 230 to 1000                                                                                                                                                                                                                                                                                                                                       | 47                                  | 37                                  |

## (2) Limits for Radiated Emission in the frequency range 1000 - 2000MHz at a measuring distance of 10m

| Frequency<br>(GHz) | Class A Equipment      |                        | Class B Equipment      |                           |
|--------------------|------------------------|------------------------|------------------------|---------------------------|
|                    | peak<br>(dB $\mu$ V/m) | peak<br>(dB $\mu$ V/m) | peak<br>(dB $\mu$ V/m) | Average<br>(dB $\mu$ V/m) |
| 1 to 2             | 69.5                   | 49.5                   | 63.5                   | 43.5                      |

## (3) Limits for Radiated Emission above 1000MHz at a measuring distance of 3m

| Frequency<br>(GHz) | Class A Equipment      |                        | Class B Equipment      |                           |
|--------------------|------------------------|------------------------|------------------------|---------------------------|
|                    | peak<br>(dB $\mu$ V/m) | peak<br>(dB $\mu$ V/m) | peak<br>(dB $\mu$ V/m) | Average<br>(dB $\mu$ V/m) |
| 1 to 40            | 80                     | 60                     | 74                     | 54                        |

## 6.2.4 Test Result

|                     |                 |                    |
|---------------------|-----------------|--------------------|
| Test date           | August 31, 2010 | September 08, 2010 |
| Ambient Temperature | 23              | 24                 |
| Relative Humidity   | 47 % R.H.       | 41 % R.H.          |

Result : For the measurement data, see next page

Note) 1. Emission Level = Reading Value + Correction Factor.

2. Correction Factor = Cable loss - Amp gain + Antenna Factor

3. Margin = Limit - Emission level

**Test Result**

&lt; DSUB MODE &gt;

- 30MHz-1GHz

**RADIATED EMISSION**

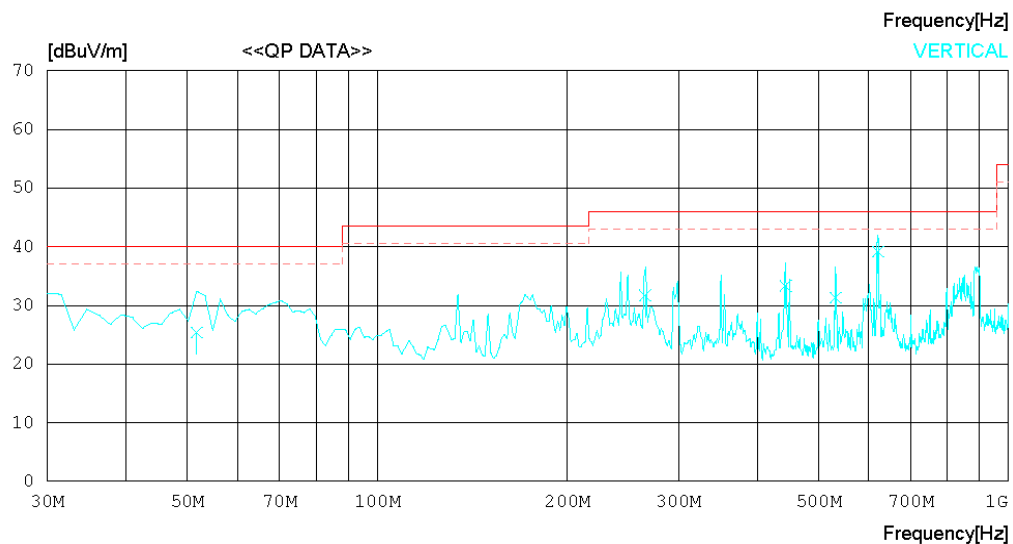
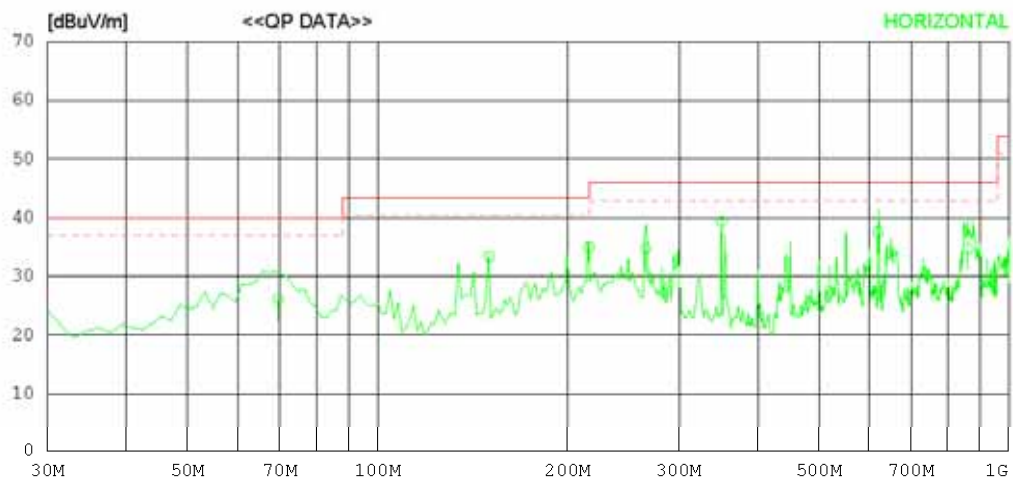
Date : 2010-08-31

Model Name : 47LD650H-UA  
Model No. :  
Serial No. :  
Test Condition : DSUB

Reference No. :  
Power Supply : 120V 60Hz  
Temp/Humi : 23°C 47 % R.H.  
Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)  
MARGIN: 3 dB



**RADIATED EMISSION**

Date : 2010-08-31

|                |               |               |                   |
|----------------|---------------|---------------|-------------------|
| Model Name     | : 47LD650H-UA | Reference No. | :                 |
| Model No.      | :             | Power Supply  | : 120V 60Hz       |
| Serial No.     | :             | Temp/Humi     | : 23 °C 47 % R.H. |
| Test Condition | : DSUB        | Operator      | :                 |

Memo :

LIMIT : FCC Part15 Subpart B Class B (3m)  
MARGIN: 3 dB

| No.                    | FREQ<br>[MHz] | READING<br>QP<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|-------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- Horizontal ----- |               |                         |                       |              |              |                    |                   |                |                 |                |
| 1                      | 69.600        | 41.5                    | 6.4                   | 1.0          | 22.7         | 26.2               | 40.0              | 13.8           | 278             | 88             |
| 2                      | 150.000       | 44.7                    | 10.3                  | 1.4          | 23.0         | 33.4               | 43.5              | 10.1           | 100             | 1              |
| 3                      | 215.995       | 45.1                    | 11.6                  | 1.7          | 23.4         | 35.0               | 43.5              | 8.5            | 100             | 206            |
| 4                      | 265.585       | 43.0                    | 13.5                  | 1.9          | 23.6         | 34.8               | 46.0              | 11.2           | 100             | 324            |
| 5                      | 350.224       | 46.1                    | 15.0                  | 2.2          | 24.0         | 39.3               | 46.0              | 6.7            | 177             | 0              |
| 6                      | 619.750       | 40.0                    | 18.8                  | 3.0          | 24.3         | 37.5               | 46.0              | 8.5            | 142             | 0              |
| 7                      | 860.100       | 34.5                    | 20.1                  | 3.5          | 23.4         | 34.7               | 46.0              | 11.3           | 201             | 0              |
| ----- Vertical -----   |               |                         |                       |              |              |                    |                   |                |                 |                |
| 8                      | 51.763        | 39.4                    | 7.8                   | 0.9          | 22.7         | 25.4               | 40.0              | 14.6           | 100             | 143            |
| 9                      | 265.823       | 39.9                    | 13.5                  | 1.9          | 23.6         | 31.7               | 46.0              | 14.3           | 199             | 1              |
| 10                     | 443.770       | 38.5                    | 16.7                  | 2.5          | 24.4         | 33.3               | 46.0              | 12.7           | 100             | 260            |
| 11                     | 532.098       | 35.1                    | 18.0                  | 2.7          | 24.5         | 31.3               | 46.0              | 14.7           | 100             | 0              |
| 12                     | 621.185       | 41.7                    | 18.8                  | 3.0          | 24.3         | 39.2               | 46.0              | 6.8            | 100             | 344            |

- 1GHz-6GHz



RADIATED EMISSION

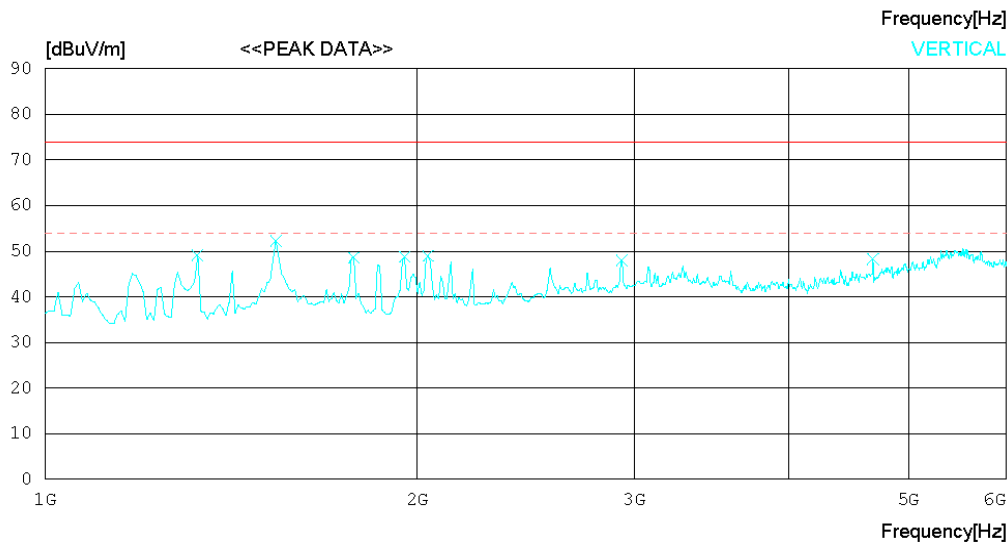
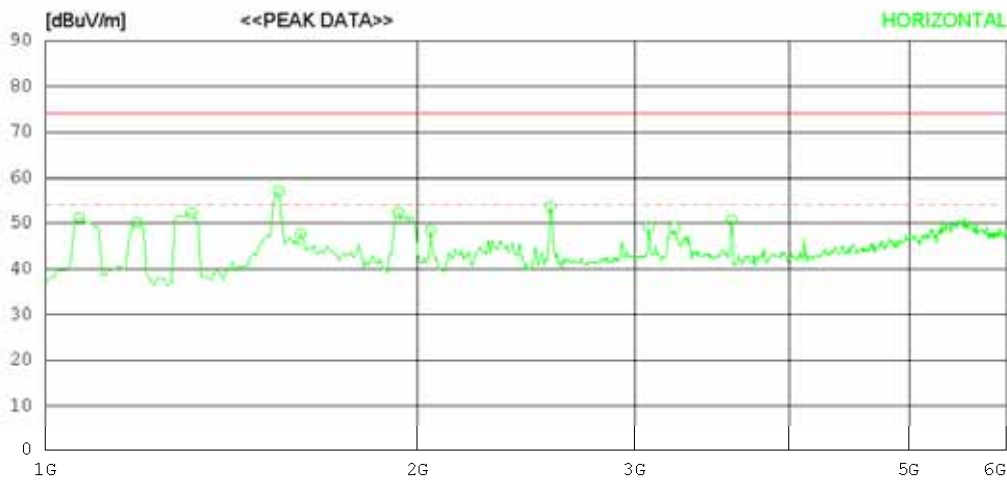
Date : 2010-09-08

Model Name : 47LD650H-UA  
Model No. :  
Serial No. :  
Test Condition : DSUB

Reference No. :  
Power Supply : 120V 60Hz  
Temp/Humi : 24 °C 41 % R.H.  
Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 8G(Peak)  
FCC Part15 Subpart.B Class B (3m) - 8G(Avg)



**RADIATED EMISSION**

Date : 2010-09-08

Model Name : 47LD650H-UA  
 Model No. :  
 Serial No. :  
 Test Condition : DSUB

Reference No. :  
 Power Supply : 120V 60Hz  
 Temp/Humi : 24°C 41 % R.H.  
 Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 8G(Peak)  
 FCC Part15 Subpart.B Class B (3m) - 8G(Avg)

| No.                    | FREQ<br>[MHz] | READING<br>PEAK<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|---------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- Horizontal ----- |               |                           |                       |              |              |                    |                   |                |                 |                |
| 1                      | 1064.103      | 64.3                      | 23.8                  | 5.0          | 41.9         | 51.2               | 74.0              | 22.8           | 100             | 227            |
| 2                      | 1184.295      | 62.7                      | 24.2                  | 5.2          | 41.9         | 50.2               | 74.0              | 23.8           | 100             | 123            |
| 3                      | 1312.500      | 64.1                      | 24.6                  | 5.5          | 41.9         | 52.3               | 74.0              | 21.7           | 100             | 358            |
| 4                      | 1544.872      | 67.8                      | 25.1                  | 6.0          | 41.9         | 57.0               | 74.0              | 17             | 100             | 211            |
| 5                      | 1608.974      | 58.2                      | 25.2                  | 6.2          | 41.9         | 47.7               | 74.0              | 26.3           | 100             | 358            |
| 6                      | 1929.487      | 62.2                      | 25.2                  | 6.9          | 41.9         | 52.4               | 74.0              | 21.6           | 100             | 187            |
| 7                      | 2049.679      | 57.9                      | 25.4                  | 7.1          | 41.9         | 48.5               | 74.0              | 25.5           | 100             | 358            |
| 8                      | 2562.507      | 59.9                      | 27.5                  | 7.9          | 41.6         | 53.7               | 74.0              | 20.3           | 100             | 189            |
| 9                      | 3075.335      | 52.6                      | 28.9                  | 8.9          | 41.3         | 49.1               | 74.0              | 24.9           | 100             | 159            |
| 10                     | 3227.581      | 52.0                      | 29.0                  | 9.1          | 41.2         | 48.9               | 74.0              | 25.1           | 100             | 358            |
| 11                     | 3588.164      | 52.9                      | 29.3                  | 9.5          | 40.9         | 50.8               | 74.0              | 23.2           | 100             | 223            |
| ----- Vertical -----   |               |                           |                       |              |              |                    |                   |                |                 |                |
| 12                     | 1328.526      | 60.8                      | 24.6                  | 5.6          | 41.9         | 49.1               | 74.0              | 24.9           | 100             | 318            |
| 13                     | 1536.859      | 63.1                      | 25.1                  | 6.0          | 41.9         | 52.3               | 74.0              | 21.7           | 100             | 174            |
| 14                     | 1777.243      | 58.8                      | 25.2                  | 6.5          | 41.9         | 48.6               | 74.0              | 25.4           | 100             | 21             |
| 15                     | 1953.525      | 58.6                      | 25.2                  | 6.9          | 41.9         | 48.8               | 74.0              | 25.2           | 100             | 318            |
| 16                     | 2041.666      | 58.4                      | 25.4                  | 7.1          | 41.9         | 49.0               | 74.0              | 25             | 100             | 316            |
| 17                     | 2931.103      | 52.1                      | 28.6                  | 8.6          | 41.3         | 48.0               | 74.0              | 26             | 100             | 188            |
| 18                     | 4677.906      | 46.4                      | 31.5                  | 10.8         | 40.4         | 48.3               | 74.0              | 25.7           | 100             | 240            |



RADIATED EMISSION

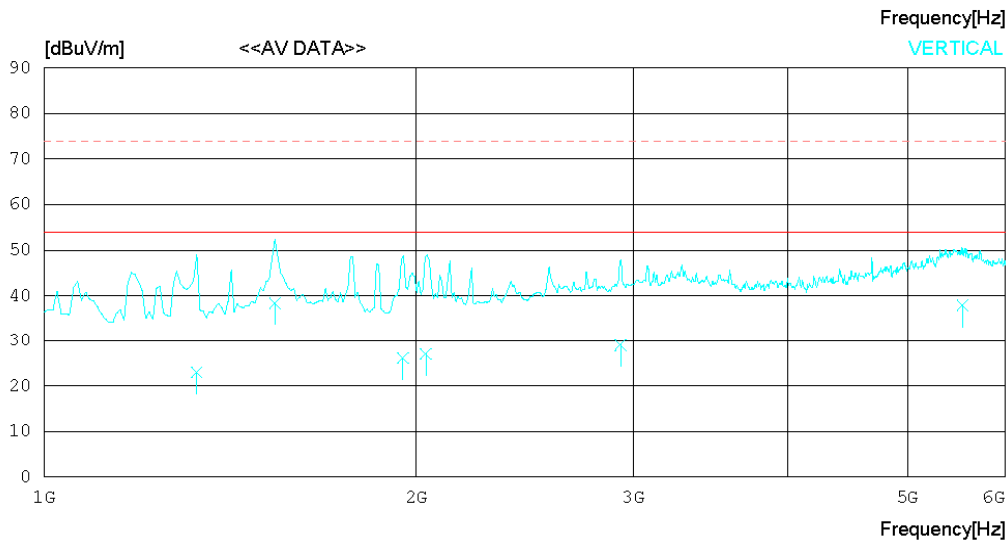
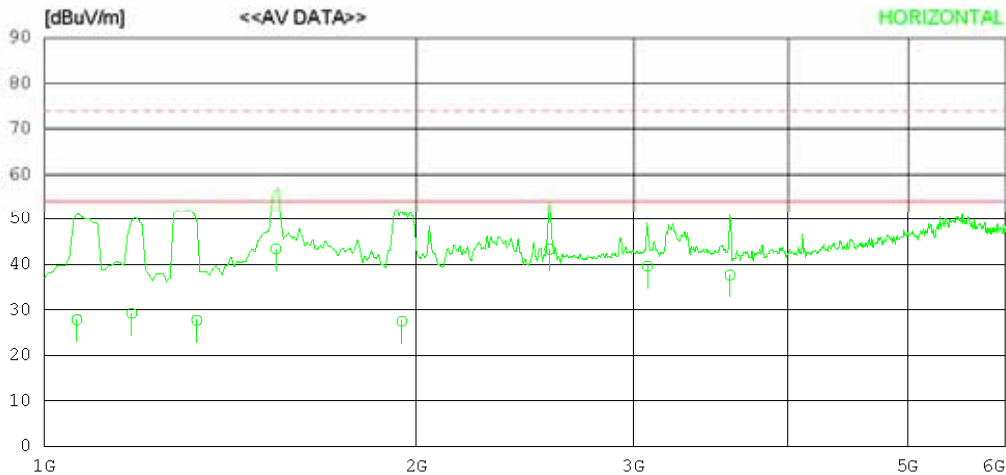
Date : 2010-09-08

Model Name : 47LD650H-UA  
Model No. :  
Serial No. :  
Test Condition : DSUB

Reference No. :  
Power Supply : 120V 60Hz  
Temp/Humi : 24 °C 41 % R.H.  
Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 8G(Avg)  
FCC Part15 Subpart.B Class B (3m) - 8G(Peak)



**RADIATED EMISSION**

Date : 2010-09-08

|                |               |               |                   |
|----------------|---------------|---------------|-------------------|
| Model Name     | : 47LD650H-UA | Reference No. | :                 |
| Model No.      | :             | Power Supply  | : 120V 60Hz       |
| Serial No.     | :             | Temp/Humi     | : 24 °C 41 % R.H. |
| Test Condition | : DSUB        | Operator      | :                 |

Memo :

LIMIT : FCC Part15 Subpart B Class B (3m) - 8G(Avg)  
 FCC Part15 Subpart B Class B (3m) - 8G(Peak)

| No.                    | FREQ<br>[MHz] | READING<br>AV<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|-------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- Horizontal ----- |               |                         |                       |              |              |                    |                   |                |                 |                |
| 1                      | 1062.201      | 40.9                    | 23.8                  | 5.0          | 41.9         | 27.8               | 54.0              | 26.2           | 100             | 227            |
| 2                      | 1176.904      | 41.7                    | 24.2                  | 5.2          | 41.9         | 29.2               | 54.0              | 24.8           | 100             | 123            |
| 3                      | 1328.224      | 39.4                    | 24.6                  | 5.6          | 41.9         | 27.7               | 54.0              | 26.3           | 100             | 358            |
| 4                      | 1539.035      | 54.2                    | 25.1                  | 6.0          | 41.9         | 43.4               | 54.0              | 10.6           | 100             | 211            |
| 5                      | 1947.248      | 37.3                    | 25.2                  | 6.9          | 41.9         | 27.5               | 54.0              | 26.5           | 100             | 187            |
| 6                      | 2564.836      | 49.5                    | 27.5                  | 7.9          | 41.6         | 43.3               | 54.0              | 10.7           | 100             | 189            |
| 7                      | 3078.025      | 43.1                    | 28.9                  | 8.9          | 41.3         | 39.6               | 54.0              | 14.4           | 100             | 159            |
| 8                      | 3591.048      | 39.7                    | 29.3                  | 9.5          | 40.9         | 37.6               | 54.0              | 16.4           | 100             | 223            |
| ----- Vertical -----   |               |                         |                       |              |              |                    |                   |                |                 |                |
| 9                      | 1328.224      | 34.7                    | 24.6                  | 5.6          | 41.9         | 23.0               | 54.0              | 31.0           | 100             | 318            |
| 10                     | 1536.859      | 49.2                    | 25.1                  | 6.0          | 41.9         | 38.4               | 54.0              | 15.6           | 100             | 174            |
| 11                     | 1951.189      | 35.9                    | 25.2                  | 6.9          | 41.9         | 26.1               | 54.0              | 27.9           | 100             | 318            |
| 12                     | 2036.307      | 36.4                    | 25.4                  | 7.1          | 41.9         | 27.0               | 54.0              | 27.0           | 100             | 316            |
| 13                     | 2927.827      | 33.1                    | 28.6                  | 8.6          | 41.3         | 29.0               | 54.0              | 25.0           | 100             | 188            |
| 14                     | 5540.810      | 31.1                    | 34.9                  | 11.9         | 40.0         | 37.9               | 54.0              | 16.1           | 100             | 240            |

&lt; HDMI MODE &gt;

- 30MHz-1GHz



## RADIATED EMISSION

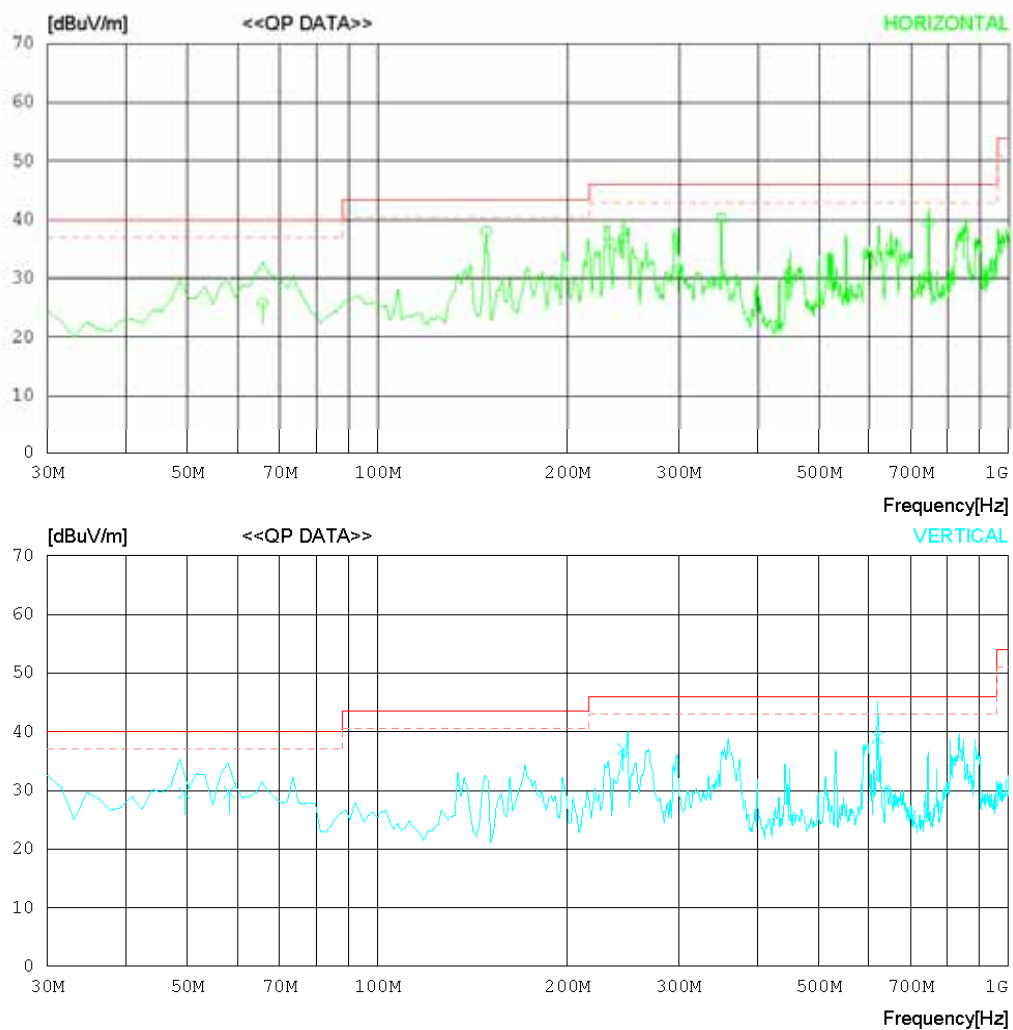
Date : 2010-08-31

Model Name : 47LD650H-UA  
Model No. :  
Serial No. :  
Test Condition : HDMI

Reference No. :  
Power Supply : 120V 60Hz  
Temp/Humi : 23°C 47 % R.H.  
Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)  
MARGIN: 3 dB



**RADIATED EMISSION**

Date : 2010-08-31

|                |   |             |               |   |                 |
|----------------|---|-------------|---------------|---|-----------------|
| Model Name     | : | 47LD650H-UA | Reference No. | : |                 |
| Model No.      | : |             | Power Supply  | : | 120V 60Hz       |
| Serial No.     | : |             | Temp/Humi     | : | 23 °C 47 % R.H. |
| Test Condition | : | HDMI        | Operator      | : |                 |

Memo :

LIMIT : FCC Part15 Subpart B Class B (3m)  
MARGIN: 3 dB

| No.                    | FREQ    | READING      | ANT            | LOSS | GAIN | RESULT   | LIMIT    | MARGIN | ANTENNA | TABLE |
|------------------------|---------|--------------|----------------|------|------|----------|----------|--------|---------|-------|
|                        | [MHz]   | QP<br>[dBuV] | FACTOR<br>[dB] | [dB] | [dB] | [dBuV/m] | [dBuV/m] | [dB]   | [cm]    | [DEG] |
| ----- Horizontal ----- |         |              |                |      |      |          |          |        |         |       |
| 1                      | 65.753  | 41.3         | 6.2            | 1.0  | 22.7 | 25.8     | 40.0     | 14.2   | 300     | 238   |
| 2                      | 148.798 | 49.3         | 10.3           | 1.4  | 23.0 | 38.0     | 43.5     | 5.5    | 200     | 234   |
| 3                      | 233.173 | 45.3         | 12.4           | 1.8  | 23.5 | 36.0     | 46.0     | 10.0   | 104     | 358   |
| 4                      | 245.173 | 45.5         | 13.1           | 1.8  | 23.5 | 36.9     | 46.0     | 9.1    | 100     | 44    |
| 5                      | 299.786 | 39.3         | 13.9           | 2.0  | 23.7 | 31.5     | 46.0     | 14.5   | 200     | 148   |
| 6                      | 350.000 | 47.0         | 15.0           | 2.2  | 24.0 | 40.2     | 46.0     | 5.8    | 200     | 1     |
| 7                      | 744.000 | 40.8         | 19.2           | 3.4  | 24.0 | 39.4     | 46.0     | 6.6    | 100     | 358   |
| 8                      | 846.314 | 37.1         | 20.0           | 3.5  | 23.5 | 37.1     | 46.0     | 8.9    | 100     | 212   |
| ----- Vertical -----   |         |              |                |      |      |          |          |        |         |       |
| 9                      | 49.506  | 43.0         | 8.4            | 0.9  | 22.7 | 29.6     | 40.0     | 10.4   | 100     | 1     |
| 10                     | 58.233  | 45.2         | 6.3            | 0.9  | 22.7 | 29.7     | 40.0     | 10.3   | 100     | 357   |
| 11                     | 245.189 | 45.7         | 13.1           | 1.8  | 23.5 | 37.1     | 46.0     | 8.9    | 300     | 69    |
| 12                     | 621.596 | 41.5         | 18.8           | 3.0  | 24.3 | 39.0     | 46.0     | 7.0    | 100     | 1     |

- 1GHz-6GHz



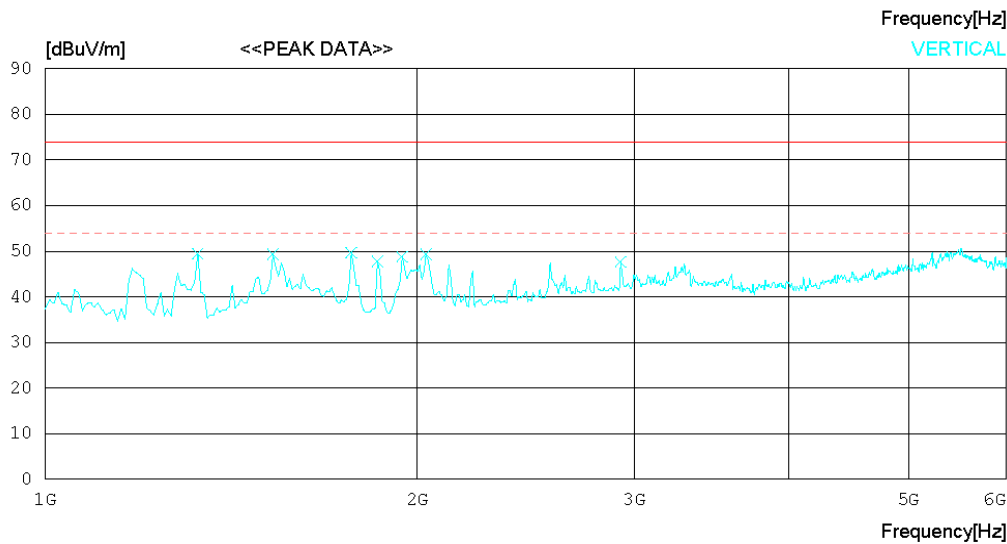
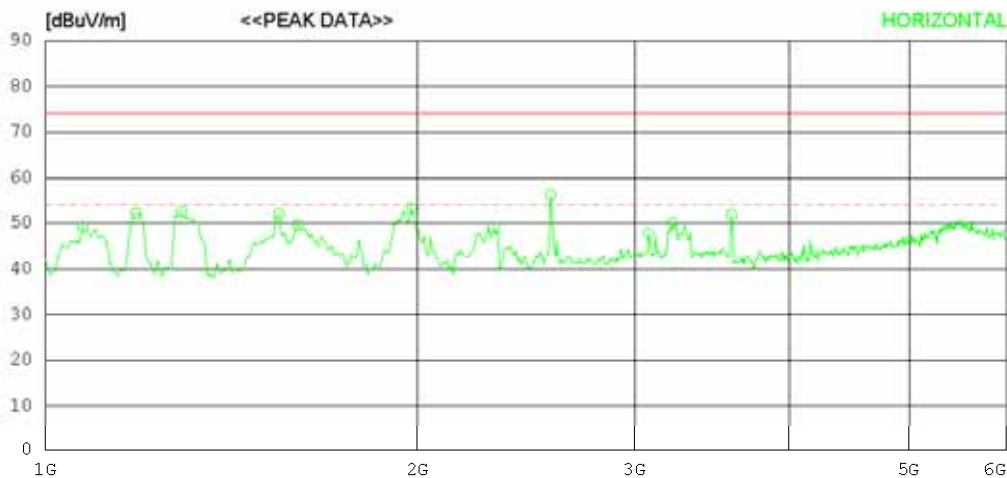
RADIATED EMISSION

Date : 2010-09-08

|                |               |               |   |                 |
|----------------|---------------|---------------|---|-----------------|
| Model Name     | : 47LD650H-UA | Reference No. | : |                 |
| Model No.      | :             | Power Supply  | : | 120V 60Hz       |
| Serial No.     | :             | Temp/Humi     | : | 24 °C 41 % R.H. |
| Test Condition | : HDMI        | Operator      | : |                 |

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 8G(Peak)  
FCC Part15 Subpart.B Class B (3m) - 8G(Avg)



**RADIATED EMISSION**

Date : 2010-09-08

|                |               |               |   |       |           |
|----------------|---------------|---------------|---|-------|-----------|
| Model Name     | : 47LD650H-UA | Reference No. | : |       |           |
| Model No.      | :             | Power Supply  | : | 120V  | 60Hz      |
| Serial No.     | :             | Temp/Humi     | : | 24 °C | 41 % R.H. |
| Test Condition | : HDMI        | Operator      | : |       |           |

Memo :

LIMIT : FCC Part15 Subpart B Class B (3m) - 8G(Peak)  
 FCC Part15 Subpart B Class B (3m) - 8G(Avg)

| No.                    | FREQ<br>[MHz] | READING<br>PEAK<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|---------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- Horizontal ----- |               |                           |                       |              |              |                    |                   |                |                 |                |
| 1                      | 1072.115      | 62.2                      | 23.8                  | 5.0          | 41.9         | 49.1               | 74.0              | 24.9           | 100             | 179            |
| 2                      | 1184.295      | 64.7                      | 24.2                  | 5.2          | 41.9         | 52.2               | 74.0              | 21.8           | 100             | 147            |
| 3                      | 1288.461      | 64.4                      | 24.5                  | 5.5          | 41.9         | 52.5               | 74.0              | 21.5           | 100             | 203            |
| 4                      | 1544.872      | 62.8                      | 25.1                  | 6.0          | 41.9         | 52.0               | 74.0              | 22             | 100             | 203            |
| 5                      | 1600.961      | 60.1                      | 25.2                  | 6.2          | 41.9         | 49.6               | 74.0              | 24.4           | 100             | 358            |
| 6                      | 1977.564      | 63.0                      | 25.2                  | 7.0          | 41.9         | 53.3               | 74.0              | 20.7           | 100             | 358            |
| 7                      | 2306.093      | 56.8                      | 26.5                  | 7.5          | 41.7         | 49.1               | 74.0              | 24.9           | 100             | 197            |
| 8                      | 2562.507      | 62.4                      | 27.5                  | 7.9          | 41.6         | 56.2               | 74.0              | 17.8           | 100             | 358            |
| 9                      | 3075.335      | 51.3                      | 28.9                  | 8.9          | 41.3         | 47.8               | 74.0              | 26.2           | 100             | 358            |
| 10                     | 3219.568      | 53.2                      | 29.0                  | 9.1          | 41.2         | 50.1               | 74.0              | 23.9           | 100             | 358            |
| 11                     | 3588.164      | 54.0                      | 29.3                  | 9.5          | 40.9         | 51.9               | 74.0              | 22.1           | 100             | 358            |
| ----- Vertical -----   |               |                           |                       |              |              |                    |                   |                |                 |                |
| 12                     | 1328.526      | 61.2                      | 24.6                  | 5.6          | 41.9         | 49.5               | 74.0              | 24.5           | 100             | 310            |
| 13                     | 1528.846      | 60.1                      | 25.1                  | 6.0          | 41.9         | 49.3               | 74.0              | 24.7           | 100             | 1              |
| 14                     | 1769.230      | 59.9                      | 25.2                  | 6.5          | 41.9         | 49.7               | 74.0              | 24.3           | 100             | 22             |
| 15                     | 1857.371      | 57.8                      | 25.2                  | 6.7          | 41.9         | 47.8               | 74.0              | 26.2           | 100             | 1              |
| 16                     | 1945.512      | 58.6                      | 25.2                  | 6.9          | 41.9         | 48.8               | 74.0              | 25.2           | 100             | 1              |
| 17                     | 2033.653      | 58.8                      | 25.3                  | 7.1          | 41.9         | 49.3               | 74.0              | 24.7           | 100             | 204            |
| 18                     | 2923.090      | 51.8                      | 28.6                  | 8.6          | 41.3         | 47.7               | 74.0              | 26.3           | 100             | 324            |

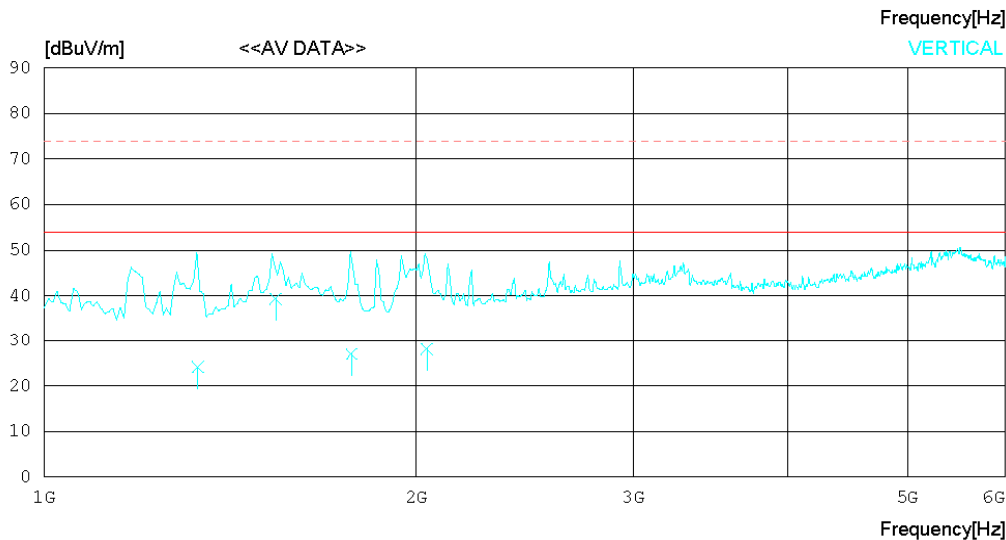
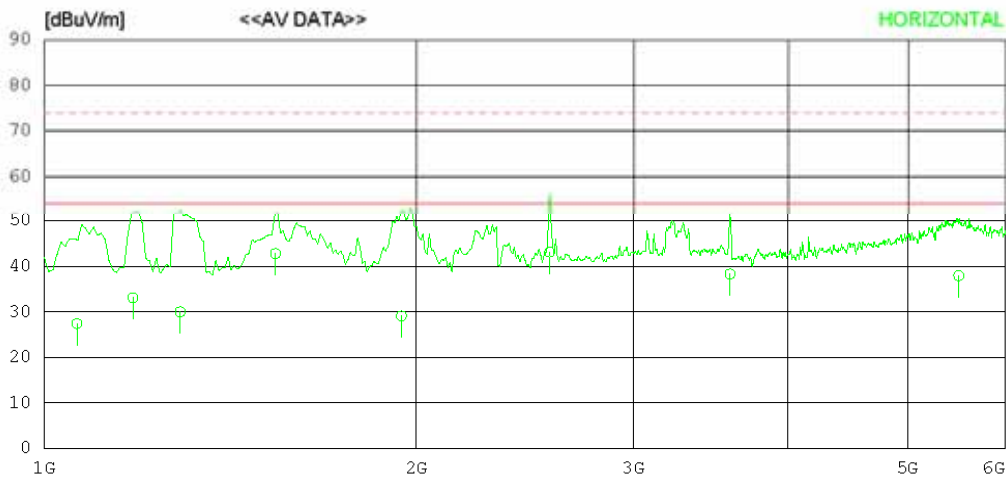


RADIATED EMISSION

Date : 2010-09-08

|                |               |               |   |                 |
|----------------|---------------|---------------|---|-----------------|
| Model Name     | : 47LD650H-UA | Reference No. | : |                 |
| Model No.      | :             | Power Supply  | : | 120V 60Hz       |
| Serial No.     | :             | Temp/Humi     | : | 24 °C 41 % R.H. |
| Test Condition | : HDMI        | Operator      | : |                 |
| Memo           | :             |               |   |                 |

LIMIT : FCC Part15 Subpart.B Class B (3m) - 8G(Avg)  
FCC Part15 Subpart.B Class B (3m) - 8G(Peak)



**RADIATED EMISSION**

Date : 2010-09-08

|                |   |             |               |   |                 |
|----------------|---|-------------|---------------|---|-----------------|
| Model Name     | : | 47LD650H-UA | Reference No. | : |                 |
| Model No.      | : |             | Power Supply  | : | 120V 60Hz       |
| Serial No.     | : |             | Temp/Humi     | : | 24 °C 41 % R.H. |
| Test Condition | : | HDMI        | Operator      | : |                 |

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 8G(Avg)  
 FCC Part15 Subpart.B Class B (3m) - 8G(Peak)

| No.                    | FREQ<br>[MHz] | READING<br>AV<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|-------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- Horizontal ----- |               |                         |                       |              |              |                    |                   |                |                 |                |
| 1                      | 1062.544      | 40.5                    | 23.8                  | 5.0          | 41.9         | 27.4               | 54.0              | 26.6           | 100             | 179            |
| 2                      | 1179.763      | 45.6                    | 24.2                  | 5.2          | 41.9         | 33.1               | 54.0              | 20.9           | 100             | 147            |
| 3                      | 1288.461      | 41.9                    | 24.5                  | 5.5          | 41.9         | 30.0               | 54.0              | 24.0           | 100             | 203            |
| 4                      | 1538.951      | 53.6                    | 25.1                  | 6.0          | 41.9         | 42.8               | 54.0              | 11.2           | 100             | 203            |
| 5                      | 1945.786      | 38.9                    | 25.2                  | 6.9          | 41.9         | 29.1               | 54.0              | 24.9           | 100             | 358            |
| 6                      | 2565.044      | 49.3                    | 27.5                  | 7.9          | 41.6         | 43.1               | 54.0              | 10.9           | 100             | 358            |
| 7                      | 3590.856      | 40.4                    | 29.3                  | 9.5          | 40.9         | 38.3               | 54.0              | 15.7           | 100             | 358            |
| 8                      | 5499.164      | 31.1                    | 35.1                  | 11.8         | 40.1         | 37.9               | 54.0              | 16.1           | 100             | 358            |
| ----- Vertical -----   |               |                         |                       |              |              |                    |                   |                |                 |                |
| 9                      | 1331.442      | 35.9                    | 24.6                  | 5.6          | 41.9         | 24.2               | 54.0              | 29.8           | 100             | 310            |
| 10                     | 1539.079      | 50.1                    | 25.1                  | 6.0          | 41.9         | 39.3               | 54.0              | 14.7           | 100             | 1              |
| 11                     | 1773.125      | 37.2                    | 25.2                  | 6.5          | 41.9         | 27.0               | 54.0              | 27.0           | 100             | 22             |
| 12                     | 2040.544      | 37.5                    | 25.4                  | 7.1          | 41.9         | 28.1               | 54.0              | 25.9           | 100             | 204            |

< USB MODE >

- 30MHz-1GHz



## RADIATED EMISSION

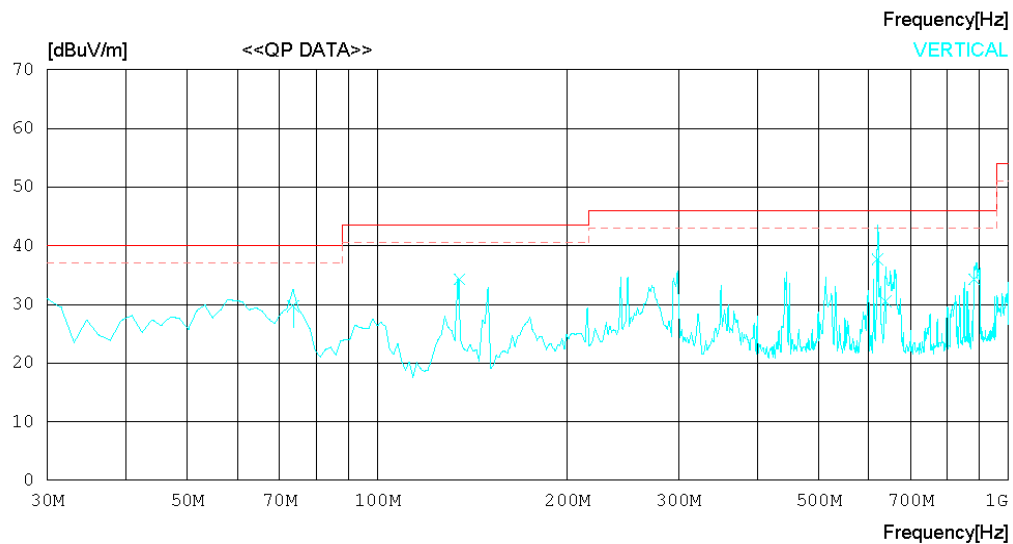
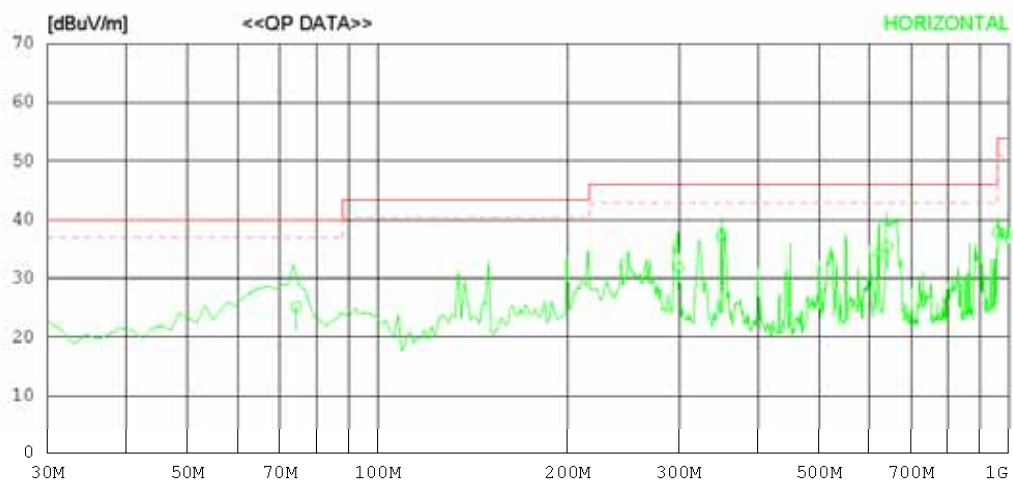
Date : 2010-09-08

Model Name : 47LD650H-UA  
Model No. :  
Serial No. :  
Test Condition : USB

Reference No. :  
Power Supply : 120V 60Hz  
Temp/Humi : 24 °C 41 % R.H.  
Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)  
MARGIN: 3 dB



**RADIATED EMISSION**

Date : 2010-09-08

|                |   |             |               |   |                 |
|----------------|---|-------------|---------------|---|-----------------|
| Model Name     | : | 47LD650H-UA | Reference No. | : |                 |
| Model No.      | : |             | Power Supply  | : | 120V 60Hz       |
| Serial No.     | : |             | Temp/Humi     | : | 24 °C 41 % R.H. |
| Test Condition | : | USB         | Operator      | : |                 |

Memo :

LIMIT : FCC Part15 Subpart B Class B (3m)  
MARGIN: 3 dB

| No.                    | FREQ    | READING | ANT    | LOSS | GAIN | RESULT   | LIMIT    | MARGIN | ANTENNA | TABLE |
|------------------------|---------|---------|--------|------|------|----------|----------|--------|---------|-------|
|                        | [MHz]   | QP      | FACTOR |      |      |          |          |        |         |       |
|                        |         | [dBuV]  | [dB]   | [dB] | [dB] | [dBuV/m] | [dBuV/m] | [dB]   | [cm]    | [DEG] |
| ----- Horizontal ----- |         |         |        |      |      |          |          |        |         |       |
| 1                      | 74.300  | 40.2    | 6.7    | 1.0  | 22.7 | 25.2     | 40.0     | 14.8   | 199     | 313   |
| 2                      | 299.800 | 39.6    | 13.9   | 2.0  | 23.7 | 31.8     | 46.0     | 14.2   | 199     | 315   |
| 3                      | 350.224 | 44.1    | 15.0   | 2.2  | 24.0 | 37.3     | 46.0     | 8.7    | 199     | 358   |
| 4                      | 620.288 | 36.5    | 18.8   | 3.0  | 24.3 | 34.0     | 46.0     | 12.0   | 100     | 45    |
| 5                      | 640.967 | 38.0    | 18.8   | 3.0  | 24.3 | 35.5     | 46.0     | 10.5   | 100     | 138   |
| 6                      | 958.606 | 36.0    | 21.2   | 3.7  | 23.0 | 37.9     | 46.0     | 8.1    | 100     | 230   |
| ----- Vertical -----   |         |         |        |      |      |          |          |        |         |       |
| 7                      | 73.546  | 44.8    | 6.6    | 1.0  | 22.7 | 29.7     | 40.0     | 10.3   | 100     | 358   |
| 8                      | 135.000 | 44.9    | 11.0   | 1.3  | 22.9 | 34.3     | 43.5     | 9.2    | 100     | 358   |
| 9                      | 620.704 | 40.2    | 18.8   | 3.0  | 24.3 | 37.7     | 46.0     | 8.3    | 100     | 358   |
| 10                     | 639.359 | 33.0    | 18.8   | 3.0  | 24.3 | 30.5     | 46.0     | 15.5   | 201     | 182   |
| 11                     | 882.404 | 33.7    | 20.3   | 3.6  | 23.3 | 34.3     | 46.0     | 11.7   | 300     | 1     |

- 1GHz-6GHz



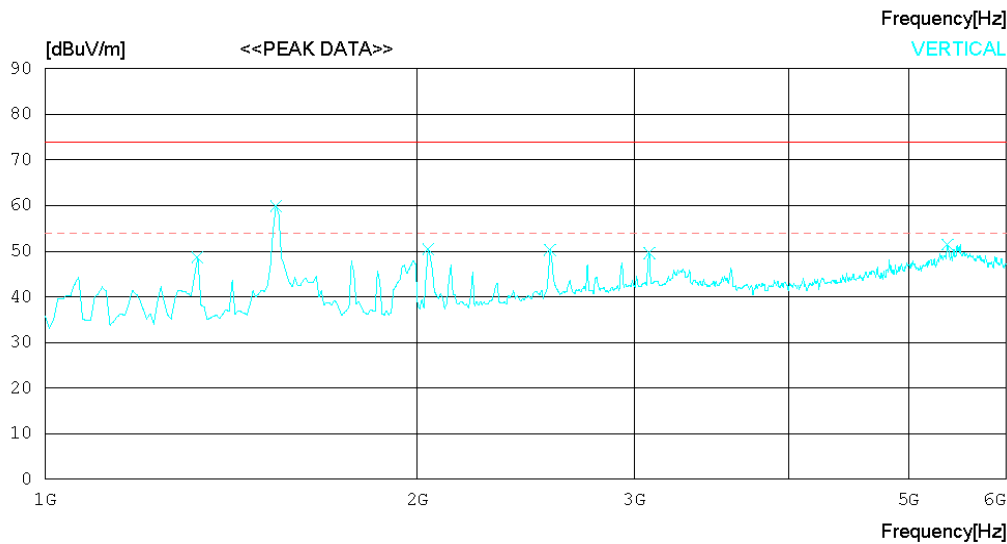
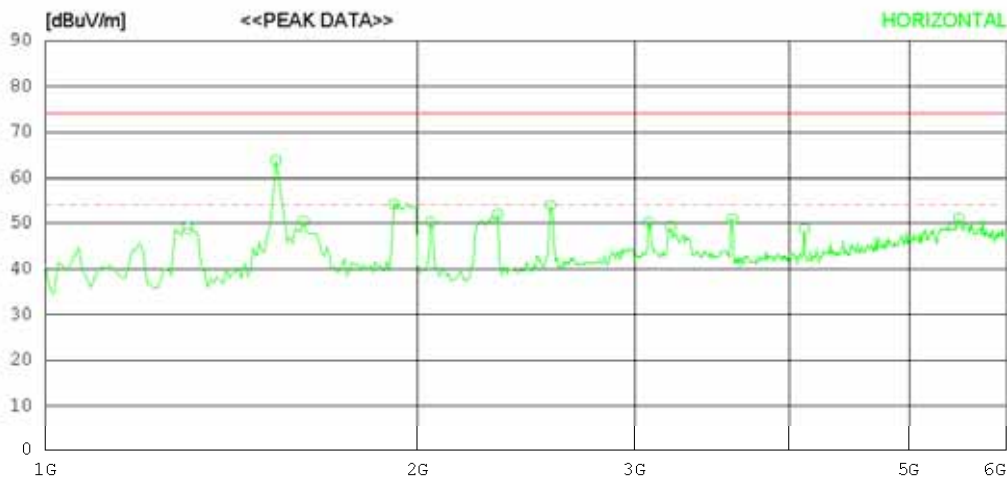
RADIATED EMISSION

Date : 2010-09-08

|                |               |               |   |                 |
|----------------|---------------|---------------|---|-----------------|
| Model Name     | : 47LD650H-UA | Reference No. | : |                 |
| Model No.      | :             | Power Supply  | : | 120V 60Hz       |
| Serial No.     | :             | Temp/Humi     | : | 24 °C 41 % R.H. |
| Test Condition | : USB         | Operator      | : |                 |

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 8G(Peak)  
FCC Part15 Subpart.B Class B (3m) - 8G(Avg)



**RADIATED EMISSION**

Date : 2010-09-08

Model Name : 47LD650H-UA  
 Model No. :  
 Serial No. :  
 Test Condition : USB

Reference No. :  
 Power Supply : 120V 60Hz  
 Temp/Humi : 24°C 41 % R.H.  
 Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 8G(Peak)  
 FCC Part15 Subpart.B Class B (3m) - 8G(Avg)

| No.                    | FREQ<br>[MHz] | READING<br>PEAK<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|---------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- Horizontal ----- |               |                           |                       |              |              |                    |                   |                |                 |                |
| 1                      | 1304.487      | 60.8                      | 24.5                  | 5.5          | 41.9         | 48.9               | 74.0              | 25.1           | 100             | 204            |
| 2                      | 1536.859      | 74.5                      | 25.1                  | 6.0          | 41.9         | 63.7               | 74.0              | 10.3           | 100             | 211            |
| 3                      | 1616.987      | 61.0                      | 25.2                  | 6.2          | 41.9         | 50.5               | 74.0              | 23.5           | 100             | 139            |
| 4                      | 1913.461      | 64.1                      | 25.2                  | 6.8          | 41.9         | 54.2               | 74.0              | 19.8           | 100             | 358            |
| 5                      | 2049.679      | 59.7                      | 25.4                  | 7.1          | 41.9         | 50.3               | 74.0              | 23.7           | 100             | 229            |
| 6                      | 2322.119      | 59.5                      | 26.6                  | 7.5          | 41.7         | 51.9               | 74.0              | 22.1           | 100             | 213            |
| 7                      | 2562.507      | 60.1                      | 27.5                  | 7.9          | 41.6         | 53.9               | 74.0              | 20.1           | 100             | 358            |
| 8                      | 3075.335      | 53.7                      | 28.9                  | 8.9          | 41.3         | 50.2               | 74.0              | 23.8           | 100             | 167            |
| 9                      | 3203.542      | 52.5                      | 28.9                  | 9.0          | 41.2         | 49.2               | 74.0              | 24.8           | 100             | 358            |
| 10                     | 3596.177      | 53.1                      | 29.3                  | 9.5          | 40.9         | 51.0               | 74.0              | 23             | 100             | 358            |
| 11                     | 4109.004      | 48.9                      | 30.3                  | 10.1         | 40.6         | 48.7               | 74.0              | 25.3           | 100             | 225            |
| 12                     | 5479.175      | 44.4                      | 35.0                  | 11.8         | 40.1         | 51.1               | 74.0              | 22.9           | 100             | 358            |
| ----- Vertical -----   |               |                           |                       |              |              |                    |                   |                |                 |                |
| 13                     | 1328.526      | 60.4                      | 24.6                  | 5.6          | 41.9         | 48.7               | 74.0              | 25.3           | 100             | 318            |
| 14                     | 1536.859      | 70.7                      | 25.1                  | 6.0          | 41.9         | 59.9               | 74.0              | 14.1           | 100             | 174            |
| 15                     | 2041.666      | 59.9                      | 25.4                  | 7.1          | 41.9         | 50.5               | 74.0              | 23.5           | 100             | 1              |
| 16                     | 2562.507      | 56.5                      | 27.5                  | 7.9          | 41.6         | 50.3               | 74.0              | 23.7           | 100             | 1              |
| 17                     | 3083.348      | 53.0                      | 28.9                  | 8.9          | 41.2         | 49.6               | 74.0              | 24.4           | 100             | 1              |
| 18                     | 5375.010      | 45.4                      | 34.5                  | 11.7         | 40.1         | 51.5               | 74.0              | 22.5           | 100             | 1              |

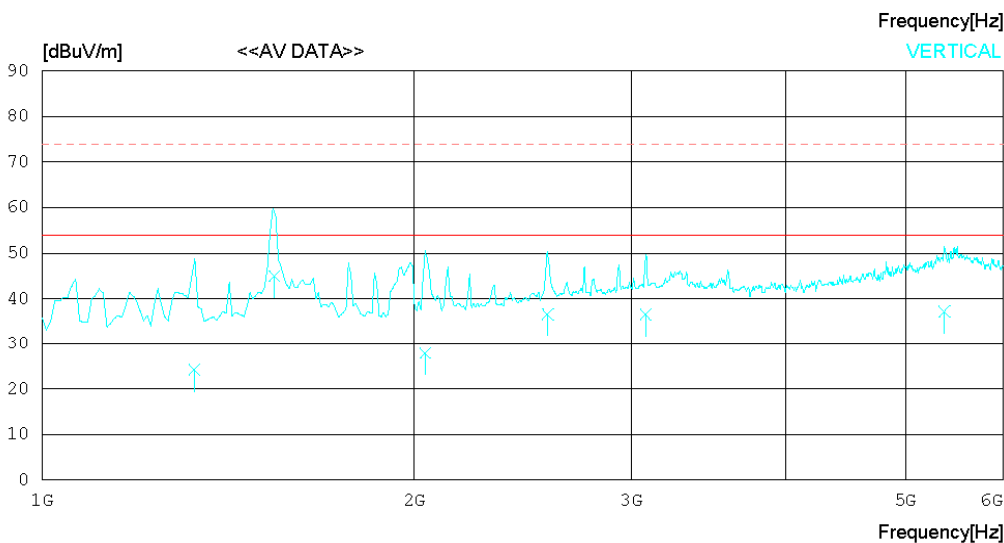
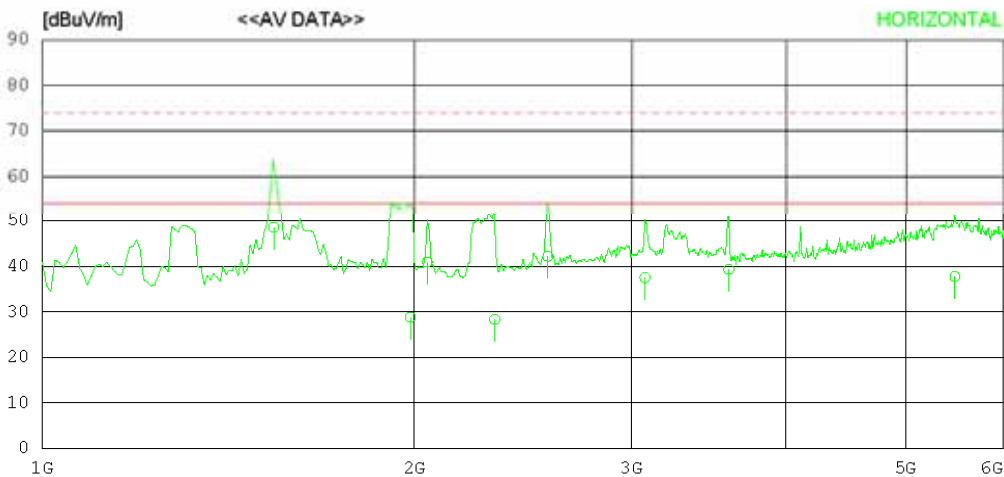


RADIATED EMISSION

Date : 2010-09-08

Model Name : 47LD650H-UA  
Model No. :  
Serial No. :  
Test Condition : USB

Reference No. :  
Power Supply : 120V 60Hz  
Temp/Humi : 24 °C 41 % R.H.  
Operator :  
  
Memo :  
  
LIMIT : FCC Part15 Subpart.B Class B (3m) - 8G(Avg)  
FCC Part15 Subpart.B Class B (3m) - 8G(Peak)



**RADIATED EMISSION**

Date : 2010-09-08

|                |   |             |               |   |                 |
|----------------|---|-------------|---------------|---|-----------------|
| Model Name     | : | 47LD650H-UA | Reference No. | : |                 |
| Model No.      | : |             | Power Supply  | : | 120V 60Hz       |
| Serial No.     | : |             | Temp/Humi     | : | 24 °C 41 % R.H. |
| Test Condition | : | USB         | Operator      | : |                 |

Memo :

LIMIT : FCC Part15 Subpart B Class B (3m) - 8G(Avg)  
 FCC Part15 Subpart B Class B (3m) - 8G(Peak)

| No.                    | FREQ<br>[MHz] | READING<br>AV<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|-------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- Horizontal ----- |               |                         |                       |              |              |                    |                   |                |                 |                |
| 1                      | 1539.044      | 59.3                    | 25.1                  | 6.0          | 41.9         | 48.5               | 54.0              | 5.5            | 100             | 211            |
| 2                      | 1985.935      | 38.5                    | 25.2                  | 7.0          | 41.9         | 28.8               | 54.0              | 25.2           | 100             | 358            |
| 3                      | 2049.679      | 50.3                    | 25.4                  | 7.1          | 41.9         | 40.9               | 54.0              | 13.1           | 100             | 229            |
| 4                      | 2323.946      | 35.9                    | 26.6                  | 7.5          | 41.7         | 28.3               | 54.0              | 25.7           | 100             | 213            |
| 5                      | 2565.500      | 48.4                    | 27.5                  | 7.9          | 41.6         | 42.2               | 54.0              | 11.8           | 100             | 358            |
| 6                      | 3075.335      | 41.0                    | 28.9                  | 8.9          | 41.3         | 37.5               | 54.0              | 16.5           | 100             | 167            |
| 7                      | 3596.177      | 41.4                    | 29.3                  | 9.5          | 40.9         | 39.3               | 54.0              | 14.7           | 100             | 358            |
| 8                      | 5479.175      | 31.0                    | 35.0                  | 11.8         | 40.1         | 37.7               | 54.0              | 16.3           | 100             | 358            |
| ----- Vertical -----   |               |                         |                       |              |              |                    |                   |                |                 |                |
| 9                      | 1328.526      | 35.9                    | 24.6                  | 5.6          | 41.9         | 24.2               | 54.0              | 29.8           | 100             | 318            |
| 10                     | 1541.256      | 55.8                    | 25.1                  | 6.0          | 41.9         | 45.0               | 54.0              | 9.0            | 100             | 174            |
| 11                     | 2041.666      | 37.3                    | 25.4                  | 7.1          | 41.9         | 27.9               | 54.0              | 26.1           | 100             | 1              |
| 12                     | 2566.000      | 42.8                    | 27.5                  | 7.9          | 41.6         | 36.6               | 54.0              | 17.4           | 100             | 171            |
| 13                     | 3079.826      | 40.0                    | 28.9                  | 8.9          | 41.3         | 36.5               | 54.0              | 17.5           | 100             | 1              |
| 14                     | 5375.010      | 31.1                    | 34.5                  | 11.7         | 40.1         | 37.2               | 54.0              | 16.8           | 100             | 1              |