LS221 Series LCD Monitor

User Guide

E3828

First Edition
April 2008

Copyright © 2008 ASUSTeK COMPUTER INC. All Rights Reserved.

No part of this manual, including the products and software described in it, may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form or by any means, except documentation kept by the purchaser for backup purposes, without the express written permission of ASUSTeK COMPUTER INC. ("ASUS").

Product warranty or service will not be extended if: (1) the product is repaired, modified or altered, unless such repair, modification of alteration is authorized in writing by ASUS; or (2) the serial number of the product is defaced or missing.

ASUS PROVIDES THIS MANUAL "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL ASUS, ITS DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES FOR LOSS OF PROFITS, LOSS OF BUSINESS, LOSS OF USE OR DATA, INTERRUPTION OF BUSINESS AND THE LIKE), EVEN IF ASUS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES ARISING FROM ANY DEFECT OR ERROR IN THIS MANUAL OR PRODUCT.

SPECIFICATIONS AND INFORMATION CONTAINED IN THIS MANUAL ARE FURNISHED FOR INFORMATIONAL USE ONLY, AND ARE SUBJECT TO CHANGE AT ANY TIME WITHOUT NOTICE, AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY ASUS. ASUS ASSUMES NO RESPONSIBILITY OR LIABILITY FOR ANY ERRORS OR INACCURACIES THAT MAY APPEAR IN THIS MANUAL, INCLUDING THE PRODUCTS AND SOFTWARE DESCRIBED IN IT.

Products and corporate names appearing in this manual may or may not be registered trademarks or copyrights of their respective companies, and are used only for identification or explanation and to the owners' benefit, without intent to infringe.

Contents

Contents iii
Notices iv
Safety information v
Care & Cleaning vi

Chapter 1: Product introduction
1.1 Welcome! 1-1
1.2 Package contents 1-1
1.3 Monitor introduction 1-2
1.3.1 Front view 1-2
1.3.2 Back view 1-3

Chapter 2: Setup
2.1 Unfolding the monitor 2-1
2.2 Connecting the cables 2-1
2.3 Turning the monitor on 2-1
2.4 Adjusting the monitor 2-2
2.5 Installing the monitor to a VESA wall mount adapter 2-2

Chapter 3: General instruction
3.1 OSD (On-Screen Display) menu 3-1
3.1.1 How to reconfigure 3-1
3.1.2 OSD Function Introduction 3-1
3.2 Specifications summary 3-4
3.3 Troubleshooting (FAQ) 3-6
3.4 Supported operating modes 3-7

Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

As an Energy Star® Partner, our company has determined that this product meets the Energy Star® guidelines for energy efficiency.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

Safety information

- Before setting up the monitor, carefully read all the documentation that came with the package.
- To prevent fire or shock hazard, never expose the monitor to rain or moisture.
- Never try to open the monitor cabinet. The dangerous high voltages inside the monitor may result in serious physical injury.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- Slots and openings on the back or top of the cabinet are provided for ventilation. Do not block these slots. Never place this product near or over a radiator or heat source unless proper ventilation is provided.
- The monitor should be operated only from the type of power source indicated on the label. If you are not sure of the type of power supply to your home, consult your dealer or local power company.
- Use the appropriate power plug which complies with your local power standard.
- Do not overload power strips and extention cords. Overloading can result in fire or electric shock.
- Avoid dust, humidity, and temperature extremes. Do not place the monitor in any area where it may become wet. Place the monitor on a stable surface.
- Unplug the unit during a lightning storm or if it will not be used for a long period of time. This will protect the monitor from damage due to power surges.
- Never push objects or spill liquid of any kind into the slots on the monitor cabinet.
- To ensure satisfactory operation, use the monitor only with UL listed computers which have appropriate configured receptacles marked between 100-240V AC.
- If you encounter technical problems with the monitor, contact a qualified service technician or your retailer.

This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste.
Please check local regulations for disposal of electronic products.

Care & Cleaning

- Before you lift or reposition your monitor, it is better to disconnect the cables and power cord. Follow the correct lifting techniques when positioning the monitor. When lifting or carrying the monitor, grasp the edges of the monitor. Do not lift the display by the stand or the cord.
- Cleaning. Turn your monitor off and unplug the power cord. Clean the monitor surface with a lint-free, non-abrasive cloth. Stubborn stains may be removed with a cloth dampened with mild cleaner.
- Avoid using a cleaner containing alcohol or acetone. Use a cleaner intended for use with the LCD. Never spray cleaner directly on the screen, as it may drip inside the monitor and cause an electric shock.

The following symptoms are normal with the monitor:

- The screen may flicker during the initial use due to the nature of the fluorescent light. Turn off the Power Switch and turn it on again to make sure that the flicker disappears.
- You may find slightly uneven brightness on the screen depending on the desktop pattern you use.
- When the same image is displayed for hours, an afterimage of the previous screen may remain after switching the image. The screen will recover slowly or you can turn off the Power Switch for hours.
- When the screen becomes black or flashes, or cannot work anymore, contact your dealer or service center to fix it. Do not repair the screen by yourself!

Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS websites**

   The ASUS websites worldwide provide updated information on ASUS hardware and software products. Refer to http://www.asus.com

2. **Optional documentation**

   Your product package may include optional documentation that may have been added by your dealer. These documents are not part of the standard package.

1.1 Welcome!

Thank you for purchasing the ASUS® LS221 Series LCD monitor!

The latest LCD monitor from ASUS provides a crisper, broader, and brighter display, plus a host of features that enhance your viewing experience.

With these features, you can enjoy the convenience and delightful visual experience that the LS221 Series brings you!

1.2 Package contents

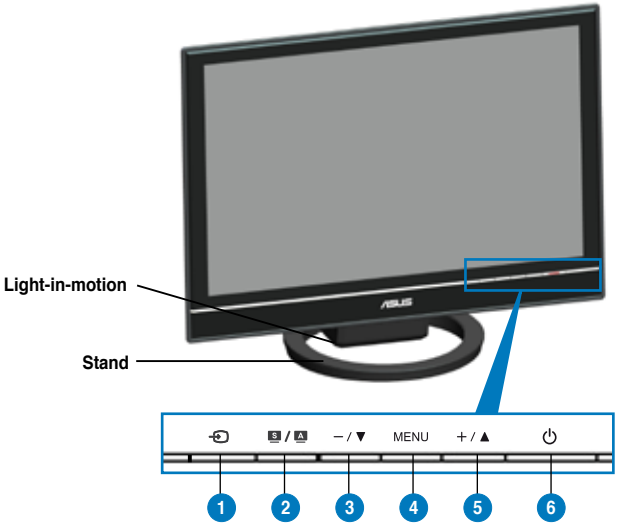
Check your LS221 Series LCD package for the following items:

- LCD monitor
- Quick start guide
- 1 x Power cord
- 1 x Power adapter
- 1 x VGA cable
- 1 x HDMI-DVI cable (LS221H only)
- 1 x Support CD
- 1 x Cleaning cloth (For some models)

If any of the above items is damaged or missing, contact your retailer immediately.

1.3 Monitor introduction

1.3.1 Front view



1. Button:
   - Use this hotkey to switch between the two input sources: VGA and HDMI (LS221H only).
2. S / A button:
   - Use this hotkey to switch from five video preset modes (Game Mode, Night View Mode, Scenery Mode, Standard Mode, Theater Mode) with SPLENDID™ Video Enhancement Technology.
   - Exit the OSD menu or go back to the previous menu as the OSD menu is active.
   - Automatically adjust the image to its optimized position, clock, and phase by long pressing this button for 2-4 seconds (for VGA mode only).
3. —/▼ button:
   - Press this button to decrease the value of the function selected or move left/up to the previous function.
4. MENU sensor:
   - Press this button to enter/select the icon (function) highlighted while the OSD is activated.
5. +/▲ button:
   - Press this button to increase the value of the function selected or move right/down to the next fuction.
   - This is also a hotkey for Brightness adjustment.

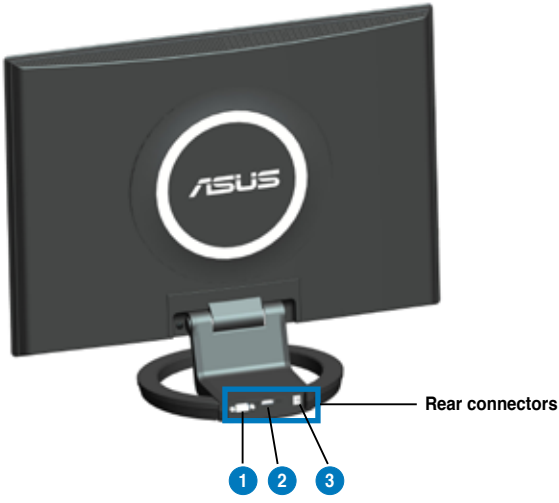
6. ⏻ Power button / power indicator
   - Press this button to turn the monitor on/off
   - The color definition of the power indicator is as the below table.

Status	Description
Blue	ON
Amber	Standby mode
OFF	OFF

7. Light-in-motion function

   The function indicates the status of the monitor. The color definition of the light is as the above table. You can turn on/off this function through the OSD menu.

1.3.2 Back view

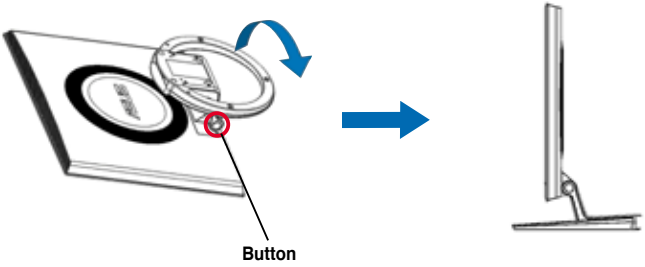


Rear connectors (from left to right)

1. **VGA port**. This 15-pin port is for PC VGA connection.
2. **HDMI port (LS221H only)**. For High-Definition Multimedia Interface (HDMI) signal connection.
3. **DC-IN port**. This port connects the power connector from the bundled power adapter.

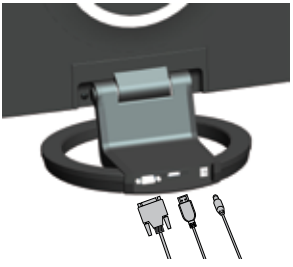
2.1 Unfolding the monitor

The monitor is folded in the package. To unfold the monitor, hold the back cover and press the Button with one hand, and carefully tilt the monitor forward with the other hand until the Button rebounds with a click.



2.2 Connecting the cables

Connect the cables as the following instructions:



- To connect the power adapter: first, connect the adapter cord securely to the monitor's DC-in port. Then, connect the power plug to the adapter port with the other end to a power outlet.
- To connect the VGA / HDMI cable:
  a. Plug the VGA / HDMI connector to the LCD monitor's VGA / HDMI port. (HDMI: LS221H only)
  b. Connect the other end of the VGA / HDMI cable to your computer's VGA / HDMI port.
  c. Tighten the two screws to secure the VGA / HDMI connector.

2.3 Turning the monitor on

Gently press the power button ⏻ . See page 1-2 for the location of the power buton. The power indicator ⏻ lights up in blue to show that the monitor is ON.

2.4 Adjusting the monitor

- For optimal viewing, we recommend that you look at the full face of the monitor, then adjust the monitor to the angle that is most comfortable for you.
- Hold the stand to prevent the monitor from falling when you change its angle.
- You can adjust the monitor's angle from -3º to 20º.

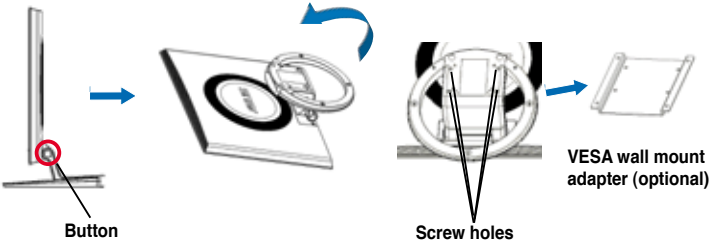
It is normal that the monitor slightly shakes while you adjust the the viewing angle.

2.5 Installing the monitor to a VESA wall mount adapter

The foldable stand of the LS221 LCD monitor is specially designed for a VESA wall mount adapter.

To install the monitor to a VESA wall mount adapter:

1. Have the front of the monitor face down on a table.
2. Press down the button on the arm and fold the stand toward the back of the monitor until the button rebounds with a click.
3. Fix the monitor on the VESA wall mount adapter using a screw driver to fasten four screws into the four screw holes on the monitor stand.

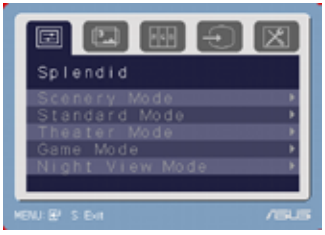


We recommend that you cover the table surface with soft cloth to prevent damage to the monitor.

The VESA wall mount kit (100 mm x 100 mm) is purchased separately.

3.1 OSD (On-Screen Display) menu

3.1.1 How to reconfigure



1. Press the MENU button to activate the OSD menu.
2. Press −/▼ and +/▲ to navigate through the functions. Highlight and activate the desired function by pressing the MENU button. If the selected function has a sub-menu, press −/▼ and +/▲ again to navigate through the sub-menu functions. Highlight and activate the desired sub-menu function by pressing the MENU button.
3. Press −/▼ and +/▲ to change the settings of the selected function.
4. To exit the OSD menu, press the S / A button. Repeat step 2 and step 3 to adjust any other function.

3.1.2 OSD Function Introduction

1. Spendid

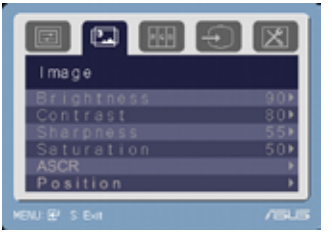
This function contains five sub-functions you can select for your preference. Each mode has the Reset selection, allowing you to maintain your setting or return to the preset mode.

- **Scenery Mode**: best choice for scenery photo display with SPLENDID™ Video Enhancement.
- **Standard Mode**: best choice for document editing with SPLENDID™ Video Enhancement.
- **Theater Mode**: best choice for movie with SPLENDID™ Video Enhancement.
- **Game Mode**: best choice for game playing with SPLENDID™ Video Enhancement.
- **Night View Mode**: best choice for dark-scene game or movie with SPLENDID™ Video Enhancement.

- In the Standard Mode, the Satuation and Sharpness functions are not user-configurable.
- In the other modes, the sRGB function is not user-configurable.

2. Image

You can adjust brightness, contrast, sharpness, saturation, position (VGA only), ASCR, and focus (VGA only) from this main function.

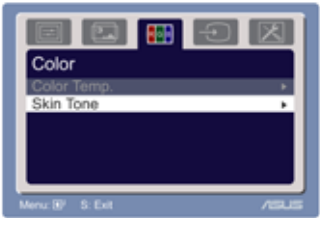


- **Brightness**: the adjusting range is from 0 to 100. +/▲ is a hotkey to activate this function.
- **Contrast**: the adjusting range is from 0 to 100.
- **Sharpness**: the adjusting range is from 0 to 100.
- **Saturation**: the adjusting range is from 0 to 100.
- **Position**: adjusts the horizontal postition (H-Position) and the vertical position (V-Position) of the image. The adjusting range is from 0 to 100.
- **ASCR**: turns on/off the ASCR(ASUS Smart Contrast Ratio) function.
- **Focus**: reduces Horizonal-line noise and Vertical-line noise of the image by adjusting (Phase) and (Clock) separately. The adjusting range is from 0 to 100.

- Phase adjusts the phase of the pixel clock signal. With a wrong phase adjustment, the screen shows horizontal disturbances.
- Clock (pixel frequency) controls the number of pixels scanned by one horizontal sweep. If the frequency is not correct, the screen shows vertical stripes and the image is not proportional.

3. Color

Select the desired image color from this function.

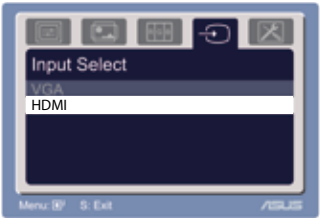


- **Color Temp.**: contains five color modes including Cool, Normal, Warm, sRGB, and User mode.
- **Skin Tone**: contains three color modes including Reddish, Natural, and Yellowish.

In the User mode, colors of R (Red), G (Green), and B (Bluee) are user-configurable; the adjusting range is from 0-100.

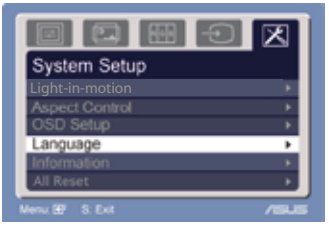
4. Input Select

In this function, you can select either VGA or HDMI input source. (Only for some models)



5. System Setup

Allow you to adjust the system.



- **Light-in-motion**: turns on/off this special function.
- **Aspect Control**: adjusts the aspect ratio to “Full” or “4:3”.
- **OSD Setup**:

  * Adjusts the horizontal postition (H-Position)/ the vertical position (V-Position) of the OSD from 0 to 100.

  * Adjusts the OSD timeout from 10 to 120.

  * Enables or disables the DDC/CI function.
- **Language**: there are several languages for your selection, including English, French, German, Spanish, Italian, Dutch, Russian, Traditional Chinese, Simplified Chinese, and Japanese.
- **Information**: shows the monitor information.
- **All Reset**: “Yes” allows you to restore the default setting.

3.2 Specifications summary

Product Series		LS221H
Display	Panel Size	22.0" Wide Screen
	Color Saturation(NTSC)	72%
	True Resolution	WSXGA+ 1680x1050
	Pixel Pitch	0.282mm
	Brightness (Max.)	300cd/m^2
	Contrast Ratio (Max.)	1000:1
	ASUS Smart C. R.(ASCR)	4000:1
	Viewing Angle (CR>10)	170°(H) / 160°(V)
	Display Colors	16.7M
	Response Time	2ms (Gray to Gray)
	LCD ZBD Warranty	Yes
	Protection Glass	Yes (Anti-reflection (<2%), 9H hardness)
Video Features	Trace Free Technology	Yes
	SPLENDID™ Video Intelligence Tech.	Yes
	SPLENDID™ Video Preset Mode	5 modes
	Skin-Tone Selection	3 modes
	Color Temperature Selection	5 modes
	HDCP	Yes
Convenient Hotkeys	SPLENDID™ Video Preset Mode Select.	Yes (5 modes)
	Auto. Adjustment	Yes
	Brightness Adjustment	Yes
	Input Selection	Yes
Input/ Output	PC Input	D-Sub
	Video Input	HDMI1.2
Signal Frequency	Analog Signal Frequency	31~81KHz(H) / 56~75 Hz(V)
	Digital Signal Frequency	31~81KHz(H) / 56~75 Hz(V)
Power Consumption	Power ON	<46W
	Power Saving Mode	<2W

Mechanical Design	Chassis Colors	Black
	Tilt	+20° ~ -3°
	VESA Wall Mounting	100 x 100mm
Security	Kensington lock	Yes
Dimension	Phys. Dimension (WxHxD)	531 x 436 x 248mm
	Box Dimension (WxHxD)	589 x 535 x 210mm
Weight	Net Weight (Esti.)	7 kg
	Gross Weight (Esti.)	10.1kg
Accessories		HDMI-DVI cable, VGA cable, Power cord, CD user guide, Warranty card, Quick start guide, Cleaning cloth
Regulation Approvals		Energy Star®, UL/cUL, CB, CE, FCC, CCC, BSMI, MIC, PSE, PSB, Gost-R, C-Tick, VCCI, RoHS, WEEE, Windows Vista WHQL

***Specifications are subject to change without notice.**

3.3 Troubleshooting (FAQ)

Problem	Possible Solution
Power LED is not ON	• Press the ⏻ button to check if the monitor is in the ON mode. • Check if the power cord is properly connected to the monitor and the power outlet.
The power LED lights amber and there is no screen image	• Check if the monitor and the computer are in the ON mode. • Make sure the signal cable is properly connected the monitor and the computer. • Inspect the signal cable and make sure none of the pins are bent. • Connect the computer with another available monitor to check if the computer is properly working.
Screen image is too light or dark	• Adjust the Contrast and Brightness settings via OSD.
Screen image is not centered or sized properly	• Press the S / A button for two seconds to automatically adjust the image. • Adjust the H-Position or V-Position settings via OSD.
Screen image bounces or a wave pattern is present in the image	• Make sure the signal cable is properly connected to the monitor and the computer. • Move electrical devices that may cause electrical interference.
Screen image has color defects (white does not look white)	• Inspect the signal cable and make sure that none of the pins are bent. • Perform Reset via OSD. • Adjust the R/G/B color settings or select the Color Temperature via OSD.
Screen image is blurry or fuzzy	• Press the S / A button for two seconds to automatically adjust the image (for VGA mode only). • Adjust the Phase and Clock settings via OSD.
No sound or sound is low	• Ensure that the audio cable is properly connected to the monitor and the computer • Adjust the volume settings of both your monitor and computer. • Ensure that the computer sound card driver is properly installed and activated.

3.4 Supported operating modes

Standard	Resolution Frequency	Vertical Frequency	Horizontal Frequency	Pixel
DOS	720 x 400	70Hz	31.47KHz	28.32MHz
VGA	640 x 480	60Hz	31.47KHz	25.18MHz
	640 x 480	72Hz	37.90KHz	31.50MHz
	640 x 480	75Hz	37.50KHz	31.50MHz
SVGA	800 x 600	56Hz	35.16KHz	36.00MHz
	800 x 600	60Hz	37.90KHz	40.00MHz
	800 x 600	75Hz	46.90KHz	49.50MHz
WVGA	848 x 480	60Hz	31.02KHz	33.75MHz
XGA	1024 x 768	60Hz	48.40KHz	65.00MHz
	1024 x 768	70Hz	56.50KHz	75.00MHz
	1024 x 768	75Hz	60.02KHz	78.75MHz
XGA+	1152 x 864	75Hz	67.50KHz	108.00MHz
WXGA	1280 x 800	60Hz	49.62KHz	83.375MHz
	1280 x 720	60Hz	44.69KHz	74.375MHz
	1280 x 768	60Hz	47.78KHz	79.50MHz
	1280 x 768	75Hz	60.29KHz	102.25MHz
QVGA	1280 x 960	60Hz	60.00KHz	108.00MHz
SXGA	1280 x 1024	60Hz	64.00KHz	108.00MHz
	1280 x 1024	75Hz	80.00KHz	135.00MHz
WXGA	1360 x 768	60Hz	47.71KHz	85.50MHz
WXGA+	1440 x 900	60Hz	55.94KHz	106.00MHz
	1440 x 900	75Hz	70.64KHz	136.75MHz
WSXGA+ (Primary)	1680 x 1050	60Hz	65.29KHz	146.25MHz

*** Modes not listed in the table may not be supported. For optimal resolution, we recommend that you choose a mode listed in the table above.**