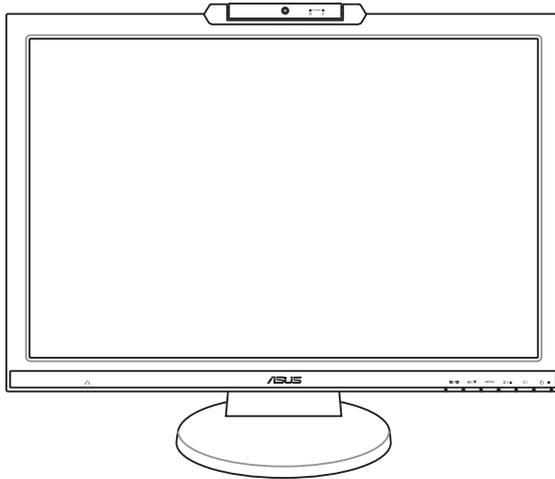




MK221 Series LCD Monitor

User's manual



E3647

First Edition V1

February 2008

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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 extension 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, electronic equipment, and mercury-containing button cell battery) 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



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: Information that you **MUST** follow to complete a task.



NOTE: Tips and additional information to aid in completing 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® MK221 Series LCD monitor!

The latest widescreen LCD monitor from ASUS provides a crisper, broader, and brighter display, plus a host of features that enhance your viewing experience. Besides, the built-in 1.3 mega-pixel webcam with Mic Array support enhances image quality and voice clarity. No need for installing additional communication devices while having a video conference or chatting with friends online!

With these features, you can enjoy the convenience and delightful audio-visual experience that the MK221 Series brings you!

1.2 Package contents

Check your MK221 Series LCD monitor package for the following items:

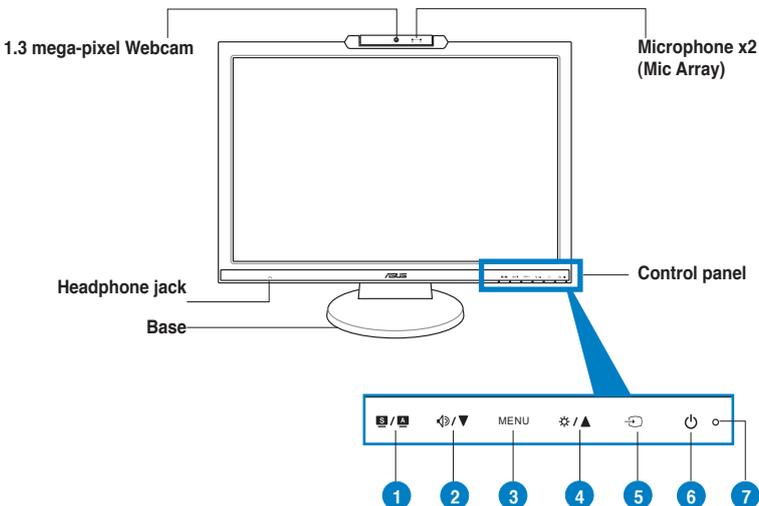
- LCD monitor
- Support CD
- Quick start guide
- Power cord x1
- VGA cable x1
- DVI cable x1
- USB 2.0 cable x1
- Audio cable x1



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

1.3 Monitor introduction

1.3.1 Front view



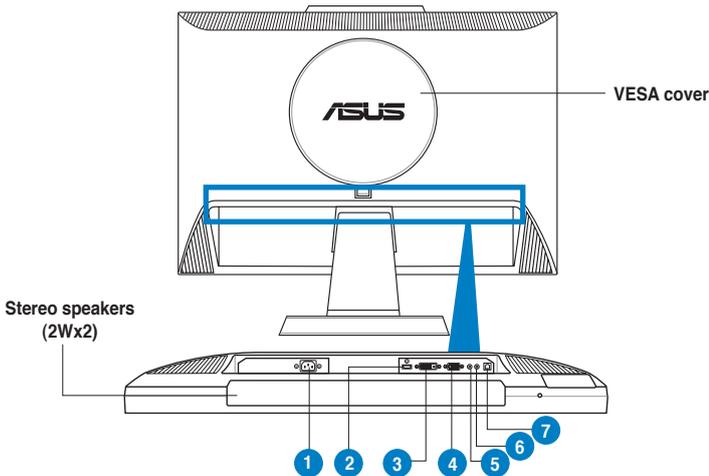
Control panel

1. **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 pressing this button for 2–3 seconds (MK221H VGA input only).
2. **Speaker / Volume Down** button:
 - Press this button to decrease the value of the function selected or move left/down to the previous function.
 - This is also a hotkey for Volume adjustment.
3. **MENU** button:
 - Press this button to enter/select the icon (function) highlighted while the OSD is activated.
4. **Star / Brightness Up** button:
 - Press this button to increase the value of the function selected or move right/up to the next function.
 - This is also a hotkey for Brightness adjustment.

5.  button
 - Use this hotkey to switch among the three input sources: VGA, DVI, HDMI. (MK221H only)
 - Automatically adjust the image to its optimized position, clock, and phase. (MK221S VGA input only).
6.  button
 - Press this button to turn the monitor on/off.
7. Power indicator
 - The color definition of the power indicator is as the table at the right side.

Status	Description
Blue	ON
Amber	Standby mode
OFF	OFF

1.3.2 Back view



Rear connectors

1. **AC-IN port.** Connects the power cord.
2. **HDMI port** (MK221H only). For high-definition multimedia interface (HDMI) signal connection.
3. **DVI port** (MK221H only). For DVI-D digital signal connection.
4. **VGA port.** For VGA analog signal connection.
5. **Audio out port.** Connects to external speakers.
6. **Audio in port.** Connects to PC audio source.
7. **USB 2.0 port.** For activating the built-in webcam and microphones.



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

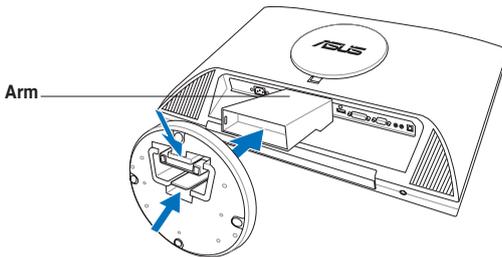
2.1 Assembling the monitor base

To assemble the monitor base:

1. Have the front of the monitor face down on a table.
2. Connect the base with the arm according to the below drawing. A click shows that the base has been connected successfully.

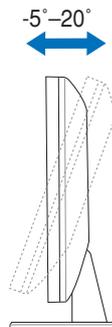


We recommend that you cover the table surface with soft cloth to prevent damage to the monitor.



2.2 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 -5° – 20° .



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

2.3 Detaching the arm/base (for VESA wall mount)

The detachable arm/base of the MK221 Series LCD monitor is specially designed for VESA wall mount.

To detach the arm/base:

1. Push up the cable cover to remove it from the arm (Figure 1).
2. Have the front of the monitor face down on a table.
3. Release the VESA cover.
4. Use a screwdriver to remove the four screws on the arm, then slide out the arm/base to detach it from the monitor (Figure 2).

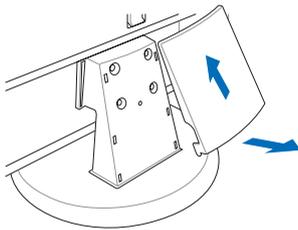


Figure 1

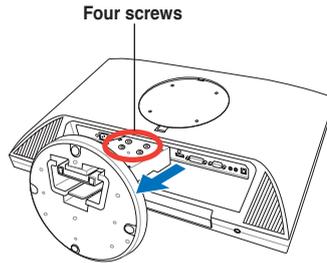


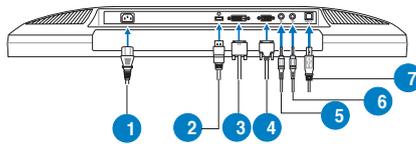
Figure 2



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

2.4 Connecting the cables

Connect the cables as shown:



- | |
|------------------------------------|
| 1. Power cord |
| 2. HDMI signal cable (MK221H only) |
| 3. DVI signal cable (MK221H only) |
| 4. VGA signal cable |
| 5. Audio-out cable |
| 6. Audio-in cable |
| 7. USB 2.0 cable |



The HDMI cable and audio-out cable are purchased separately.

- **To connect the power cord:** connect one end of the power cord securely to the monitor's AC input port, the other end to a power outlet.



Before you connect the cables, ensure that your PC is switched off or the power cord is unplugged from the wall socket.

- **To connect the signal cables:** connect one end of the signal cable(s) to the monitor, the other end to your computer or any other video device.



When the HDMI, DVI, and VGA cables are connected simultaneously, you can switch the input source from the **Input Select** item of the OSD functions, or by using the hotkey  on the front panel (MK221H only).

- **To connect the audio cable:** connect the audio cable from the monitor's audio-in port to the computer's audio-out port.
- **To connect to external speakers:** Connect an audio-out cable from the audio-out port of the LCD monitor to the audio-in port of external speakers.

2.5 Turning on the monitor

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

2.6 Built-in webcam with Mic Array support

The built-in 1.3 megapixel webcam with array microphones (Mic Array support) allows you to take pictures, have a video conference, or record audio-video clips. While chatting with friends via Internet-based communication tools, you can directly show your vivid image and clear voice with this device.

System requirements

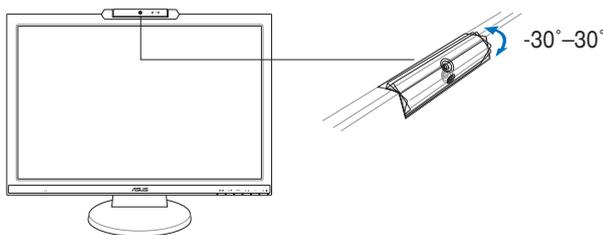
- A personal computer with Pentium® III 800 MHz or higher processor
- Microsoft® Windows® Vista / XP Service Pack 2 operating systems
- Minimum 200 MB free hard disk space to run the program
- 128 MB of RAM or above
- A display card supporting 16-bit high color mode



- Make sure that the bundled USB 2.0 cable is connected to both the LCD monitor and your PC. Otherwise, the webcam will not be activated.
- Make sure that you have installed the Windows® Vista / XP Service Pack 2 or later versions before using the device.

Using the device

- The device transmits images and sound to your PC through the USB 2.0 port. Therefore, make sure that the bundled USB 2.0 cable is connected to both the LCD monitor and your PC before you use the device.
- The webcam is adjustable upward and downward as shown.



Do not turn the webcam upward or downward over 30°; doing so might damage the webcam.

2.7 LifeFrame 2 software

ASUS MK221 provides the easy-to-use LifeFrame 2 software that can work with the webcam, allowing users to create their own photos or video clips.



- LifeFrame 2 only supports Microsoft® Windows® Vista/XP Service Pack 2 operating systems.
- The LifeFrame 2 software is bundled in the support CD.

Installation instructions

1. Close all other applications.
2. Insert the support CD into the optical drive and run the LifeFrame 2 program.
3. Follow the on-screen instructions to complete the installation

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 function selected 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** button. Repeat step 2 and step 3 to adjust any other function.



3.1.2 OSD Function Introduction

1. Splendid

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 Intelligence Technology.
- **Standard Mode:** best choice for document editing with SPLENDID™ Video Intelligence Technology.
- **Theater Mode:** best choice for movie with SPLENDID™ Video Intelligence Technology.
- **Game Mode:** best choice for game playing with SPLENDID™ Video Intelligence Technology.
- **Night View Mode:** best choice for dark-scene game or movie with SPLENDID™ Video Intelligence Technology.



- In the Standard Mode, the **ASCR, Satuation, Sharpness, and Skin Tone** functions are not user-configurable.
- Except in the Standard Mode, the **sRGB** function is not user-configurable.

2. Image

You can adjust brightness, contrast, ASCR, Trace Free, sharpness, saturation, position (VGA input only), and focus (VGA input 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.
- **ASCR:** turns on/off the ASCR (ASUS Smart Contrast Ratio) function.
- **Trace Free:** turns on/off the Trace Free function.
- **Sharpness:** the adjusting range is from 0 to 100.
- **Saturation:** the adjusting range is from 0 to 100.
- **Position:** adjusts the horizontal position (H-Position) and the vertical position (V-Position) of the image. The adjusting range is from 0 to 100.
- **Focus:** reduces Horizontal-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 image color you like 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 (Blue) are user-configurable; the adjusting range is from 0-100.

4. Input Select

Select from VGA, DVI, and HDMI input sources (MK221H only)



5. System Setup

Allow you to adjust the system.



- **Volume:** the adjusting range is from 0 to 100. **F5** is a hotkey to activate this function.
- **Aspect Control:** adjusts the aspect ratio to "Full" or "4:3".
- **OSD Setup:**
 - * Adjusts the horizontal position (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

Panel Type	TFT LCD (72% NTSC)
Panel size	22" wide screen
True Resolution	WSXGA+ 1680 x 1050
Pixel pitch	0.282mm
Brightness	300cd/m ² (Typical)
Contrast Ratio	1000:1 (ASCR Off) / 5000:1 (ASCR ON)
Viewing angle(H/V) CR>10	170°/160°
Display colors	16.7M
Response time	2ms (Gray to Gray)
Built-in webcam	1.3 mega pixels (rotatable)
Built-in microphone	MIC x2 (Mic Array with echo cancellation)
SPLENDID™ Video Intelligence Technology	Yes
SPLENDID™ selection	5 video preset modes (by hotkey)
Auto adjustment	Yes (by hotkey)
Color temperature selection	5 color temperatures
Skin-Tone selection	3 skin-tones
HDMI input	19-pin HDMI, supports 1080p (MK221H only)
Digital input	DVI-D with HDCP (MK221H only)
Analog input	D-Sub
Audio-in port	3.5 mm Mini-jack
Audio-out port	3.5 mm Mini-jack
Headphone port	3.5 mm Mini-jack
Colors	Black
Speaker (Built-in)	2W x 2 Stereo, RMS
Power LED	Blue (On)/ Amber (Standby)
VESA wall mount	100 x 100mm
Tilt	-5°~20°
Kensington lock	Yes
Voltage rating	AC: 100~240V
Power consumption	Power On : < 58W, Standby: < 2W, Power Off: <1W
Dimension (W x H x D)	521 mm x 418 mm x 224 mm (machine) 585 mm x 470 mm x 150 mm (package)
Net Weight	5.3 kg (approx.)
Temperature (Operating)	0°C~40°C
Temperature (Non-operating)	-20°C~60°C
Humidity (Operating)	10%~90%
Humidity (Non-operating)	10%~90%

(continued on the next page)

Specifications summary

Accessories	VGA cable, DVI cable (MK221H only), audio cable, USB cable, power cord, support CD, quick start guide, warranty card
Regulation approvals	Energy Star®, CB, CE, Gost-R, CCC, UL/cUL, FCC, C-Tick, BSMI, VCCI, RoHS, WEEE, PSB, J-moss, HDMI Full HD compliance (MK221H), Microsoft Windows Vista Premium compliance

*Specifications are subject to change without notice.

3.3 Troubleshooting (FAQ)

Problem	Possible Solution
Power LED is not ON	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Check if the monitor and the computer are in the ON mode. • Make sure the signal cable is properly connected to 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	<ul style="list-style-type: none"> • Adjust the Contrast and Brightness settings via OSD.
Screen image is not centered or sized properly	<ul style="list-style-type: none"> • Press the  button for 2–3 seconds to automatically adjust the image (VGA input only). • Adjust the H-Position or V-Position settings via OSD (VGA input only).
Screen image bounces or a wave pattern is present in the image	<ul style="list-style-type: none"> • Make sure the signal cable is properly connected to the monitor and the computer. • Move away electrical devices that may cause electrical interference.
Screen image has color defects (white does not look white)	<ul style="list-style-type: none"> • Inspect the signal cable and make sure that none of the pins are bent. • Perform All Reset via OSD. • Adjust the R/G/B color settings or select the Color Temperature via OSD.
Screen image is blurry or fuzzy	<ul style="list-style-type: none"> • Press the  button for 2–3 seconds to automatically adjust the image (VGA input only). • Adjust the Phase and Clock settings via OSD (VGA input only).
No sound or sound is low	<ul style="list-style-type: none"> • 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.
Webcam or array microphone is not working	<ul style="list-style-type: none"> • Make sure that you have connected the USB 2.0 cable securely to both the LCD monitor and your computer. • Make sure that you use the Microsoft® Windows® Vista / XP Service Pack 2 operating systems.

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.

* This monitor supports full HD (480i/p, 576i/p, 720p, 1080i/p) video contents from game consoles, DVD players and other consumer video devices.

