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VGA is a trademark of International Business Machines Corporation.
Pentium® is a registered trademark of Intel® Corporation.
Windows® is a registered trademark of Microsoft® Corporation.

CAUTION!!
Do not force the GPU cooler against the fragile GPU to avoid damage to the GPU.

WARNING!!
DO NOT touch the cooling system since it may produce a certain heat while processing tasks.

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life.

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Installing MSI Live Update

MSI Live Update offers you with brand-new update service experience, which can significantly save your time while searching files. MSI Live Update is capable to automatically analyze and list drivers, BIOS, and utilities you need. With the easy-to-use updating approaches, you can increase the performance of your system easily and quickly. Follow the instructions below, with a few mouse clicks, you can acquire the related files for the system updating.

Installing from the Disk

1. Insert the supplied disk into the CD-ROM drive, and start the **Setup** program.

2. Click the **Utility** tab on the setup screen.

3. Click the **MSI Live Update.** Follow the on-screen instructions to complete the installation.

Installing from the MSI Web Site

1. Link to MSI's website at http://www.msi.com.tw

2. Find and click **Live Update Online** on the left side of the web page to enter MSI Download Center.

3. Click **Start to Check** to download the Live Update application.

4. Click **Install** the continue.

5. Follow the on-screen instructions to complete the installation.

6. Launch MSI Live Update and to enter the main page of this utility as shown here.

Using MSI Live VGA Driver Update

This service enables you to update the latest VGA driver for your VGA card.

1. To update the MSI™ Live VGA Driver™, click Live VGA Driver™ item on the left column of the main page.

2. This utility will start checking your platform and the information on the VGA card, and display the information in a list.

3. Click the graph button on the bottom to connect MSI Live Update Series Server. Then, it will automatically connect the Internet and compare the version of the driver in the database.

4. It may take several minutes to detect the required drivers. Please wait while proceeding detection.

5. Click the **InstallShield Wizard** button on the right side of the table to download and update the driver. All actions will proceed automatically.

6. Follow the on-screen instructions to complete the updating procedure.

Using MSI Live VGA BIOS Update

This service enables you to update the latest VGA BIOS for your VGA card.
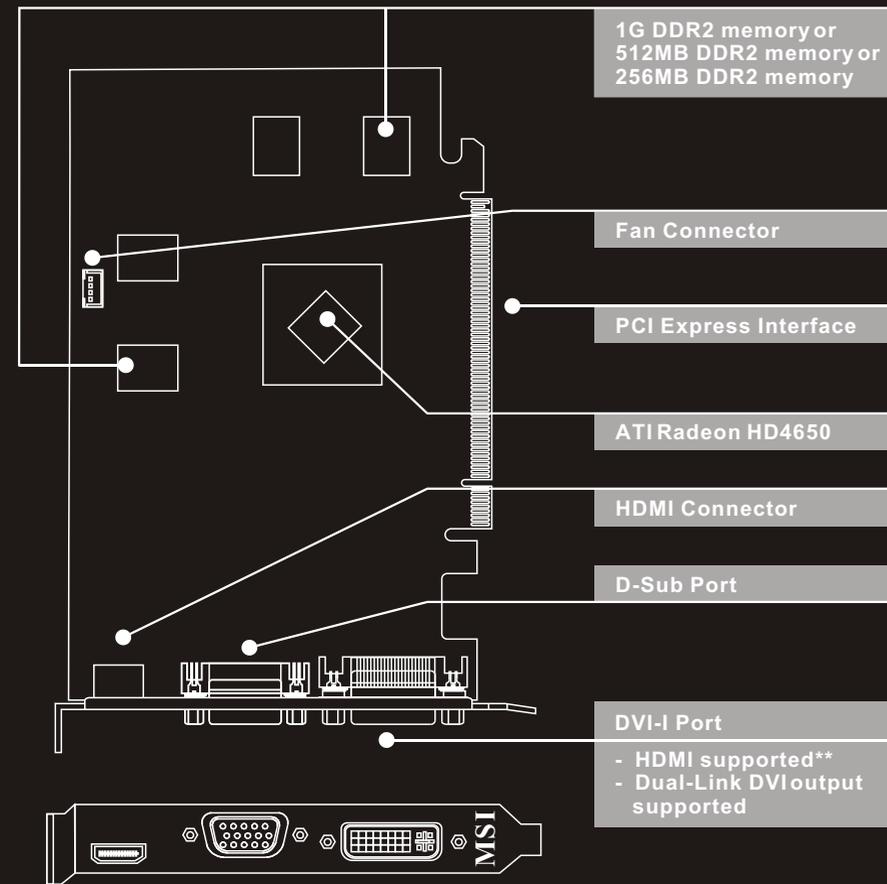
1. To update your VGA BIOS, click Live VGA BIOS™ item on the left column of the main page.

2. If your VGA card does not support the Live VGA BIOS™ function, you will receive a warning message on the screen.

3. If your VGA card do support the Live VGA BIOS™ function, please pay attention to the message shown on the screen telling you that in what circumstance flashing BIOS may fail to reboot.

4. Click Yes if you would like to try it at your own risk or No to return to the main page with everything unchanged.

5. If you click Yes to continue, it will check the information and BIOS version of your VGA card, and list them in a table.

6. Click the graph button at the bottom to connect the MSI™ Live Update 3™ Server.

7. The MSI™ Live VGA BIOS™ will automatically connect the Internet and search the supported BIOS in the database of MSI™.

8. If it has found one (or several) supported BIOS for your VGA card, click the InstallShield Wizard button on the right side of the table to have the new BIOS downloaded and updated automatically.

9. Follow the on-screen instructions to complete the updating procedure.

Note that the SDK of OD5 or OD5+ is not available for BIOS live updating currently. The latest news and Live Update function will be released on MSI web site.

Quick User's Guide

R4650 series

1G DDR2 memory or
512MB DDR2 memory or
256MB DDR2 memory

Fan Connector

PCI Express Interface

ATI Radeon HD4650

HDMI Connector

D-Sub Port

DVI-I Port

- HDMI supported**
- Dual-Link DVI output
  supported

**
Refer to the section of Enabling HDMI Output to enable the HDMI function.

Note: The VGA card shown here may vary from the actual card.
For further information, please visit MSI website at www.msi.com.tw

Unpacking

Please check out the following items to make sure that you get the complete product:
● VGA card
● Disk: Drivers, documentation, and applications
▷ Consult your dealer immediately if anything is missing or damaged.

System Requirements

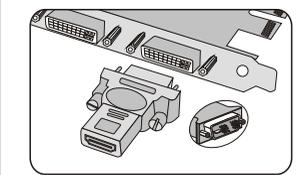To install the VGA card, your computer system needs to meet the following requirements:
● PCI Express® based PC is required with one X16 lane graphics slot available on the motherboard
● 1G of system memory
● Installation software requires CD-ROM drive
● DVD / Blu-rayX™ / HD DVD playback requires DVD / Blu-ray / HD DVD drive
● For DVI-HDMI adapter, please visit **http://ati.amd.com/** to get the compatible mainboard information.
● Visiting MSI website for further information of operating system support

Card Features   For reference only

Acceleration Features
● Fully DirectX 10.1 compliant, including full speed 32-bit floating point per component operations
● Shader Model 4.1 geometry and pixel support in a unified shader architecture
● 32- and 64-bit floating point processing per component.
● High performance dynamic branching and flow control.
● High dynamic range rendering with floating point blending, texture filtering and anti-aliasing support.
● 16- and 32-bit floating point components for high dynamic range computations.
● Full anti-aliasing on render surfaces up to and including 128-bit floating point formats.
● Support for OpenGL 2.1
● Anti-Aliasing Filtering
● Temporal anti-aliasing.
● 2x/4x/8x/16x modes
● Up to 128-tap texture filtering.
● Works with any single- or two-channel data format.
● New vertex cache and vertex fetch design, to increase vertex throughput from previous generations.
● Up to 8k x 8k textures, including 128-b/pixel texture are supported.
● High efficiency memory controller

Display Features
● Dual independent display controllers that support true 30-bpp throughout the display pipe.
● Full feature symmetry in both controllers.

● Support for display resolutions up to 3840x2400 per display output, which does not oversubscribe available memory bandwidth.
● Adaptive per-pixel de-interlacing and frame rate conversion (temporal filtering).
● Enhanced dithering algorithm for LCD panels.
● Full RMX for sources up to 2560 pixels/line.

Integrated HD Audio Controller (Azalia) and Codec
● Integrated HD Audio codec supports linear PCM and Dolby☐ Digital (7.1) audio formats for HDMI output. (Note: Player applications may limit the audio output capabilities.)
● Separate logical chip function.
● Can encrypt data onto one associated HDMI output.
● Compatible Microsoft UAA driver support for basic audio.
  - For advanced functionality, a 3rd party driver is required.
● Internally connected to the integrated HDMI interface, hence no external cable required.
● Support for up to 8 channels.
● HDCP content protection support for software audio stack.
● True audio plug-and-play capability for enhanced audio modes.

DVO Interface
● Configurable 12-bit DDR, 24-bit SDR/DDR digital outputs.
● Drives most popular TMDS and HDMI transmitters up to 220-MHz frequency.
● Also supports external SCART encoders.
● DVO capable of driving a 64-bpp digital output.

Motion Video Acceleration Features
● Motion Video Decode Acceleration technology
● Dedicated hardware (UVD - Unified Video Decoder) hardware for H.264, VC-1, and MPEG2 decode
● H.264 implementation is based on the ISO/IEC 14496-10 specification.
● VC-1 implementation is based on the SMPTE 421M specification.
● Motion Video Processing Acceleration
● Motion Adaptive and Vector based de-interlacing filter eliminates video artifacts caused by displaying interlaced video on non-interlaced displays, and by analyzing image and using optimal de-interlacing function on a per-pixel basis.

Bus Support Features
● Fully compliant with PCI Express Base Specification Rev. 2.0. Native x16 PCIe bus interface.
● Supports x1, x2, x4, x8, and x16 lane widths.
● Supports x1, x2, x4, x8, and x16 polarity inversion.

Other Features
● Support for serial ROM video BIOS.
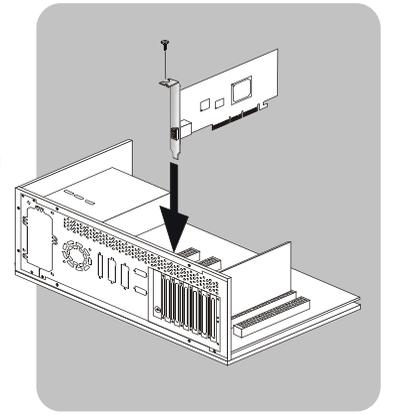● Support for 32 and 64-bit operating systems based on Intel, AMD and PowerPC CPUs.

Enabling HDMI Output

Follow the steps below to enable HDMI Output function:
1. Find the DVI-to-HDMI adapter that comes with the package, if provided. Consult your dealer to purchase the adapter if it is not provided.
2. Attach the DVI-to-HDMI adapter to the DVI connector.
3. Ensure that the adapter is firmly installed.

Hardware

Follow the steps below to install the VGA card:
1. Remove the computer case.
2. Locate the expansion slot on your mainboard. Warning: Inserting the VGA card into a wrong slot may damage your card (refer to your mainboard manual for more Information).
3. Put the card directly over the expansion slot and press one end of the card into the slot first. Gently but firmly press the other end until the card is fully seated in the slot.
4. Secure the card with a bracket screw.
5. Install all other cards and devices and connect all the cables, and then install the case.
6. Connect the monitor. Now, you are ready to install the software on your computer.

Software

To install the driver of the VGA card to your computer, please follow the steps below:
1. Turn on the computer.
2. Insert the CD into the CD-ROM drive. The Autorun program will start the Setup program, and show the setup screen as follows:

Tip : If, on your computer, the Autorun program does not execute automatically, please 1) enable the CD-ROM drive Auto-detect function from Control Panel; or 2) find and run the setup.exe file manually from the CD.

3. Click **ATI VGA Drivers**. Follow the on-screen instructions to complete the installation.
4. After finishing the installation, restart the computer as instructed.