



TESLA™ C2050 COMPUTING SYSTEM

INSTALLATION GUIDE



nvidia.

NVIDIA Tesla C2050

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01 INTRODUCTION

The NVIDIA® Tesla™ C2050 Computing Processor transforms your workstation to a personal supercomputer by offering unprecedented computing capabilities at 1/10th the cost of a conventional CPU-only workstation. The NVIDIA Tesla C2050 Computing Processor supports “must have” features for technical and enterprise computing, including C++ support, ECC memory for uncompromised accuracy and scalability, and 7X the double precision performance compared to Tesla 10-series GPU computing products.

About This Guide

This installation guide discusses the installation and configuration of the Tesla C2050 Computing Processor.

Minimum System Requirements

Prior to unpacking your new Tesla C2050, confirm that your system meets all the system requirements for a smooth installation.

> Operating System

- Microsoft Windows XP, Vista, Windows 7 (32-bit or 64-bit)
- Linux 32-bit and 64-bit on:
- Redhat Enterprise Linux 3.x, 4.x, 5.x
- SUSE Linux Enterprise Desktop 11 and 10
- OpenSUSE 11.1, 11.0, 10.3, 10.2, 10.1
- Fedora 10, 9, 8, 7
- Ubuntu 9.04, 8.10, 8.04, 7.10, 7.04

> Processor

- Intel Pentium 4 or Xeon processor or higher
- AMD Athlon processor or higher

> RAM

- 1 GB minimum, 4 GB recommended per Tesla C2050

> Graphics

- Single DVI-I Dual Link

> PCI Express Slot

- PCI Express x16 slot, Gen2 recommended but not required

> Power Consumption

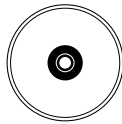
- 225 W maximum power consumption
- Power supply in the workstation must have either one 8-pin power connector or two 6-pin power connectors

02 UNPACKING

Be sure to inspect each piece of equipment. If anything is missing or damaged, contact your supplier.

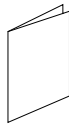
Equipment

The following equipment is included in the Tesla C2050 box.



Installation CD

Contains this file (installation guide) and all the necessary drivers to enable the Tesla C2050. To keep your drivers current, visit www.nvidia.com to download the latest drivers.



Quick Start Guide

Contains basic hardware and software installation instructions. Read carefully, and refer to the Installation Guide on the CD for full installation instructions and troubleshooting.



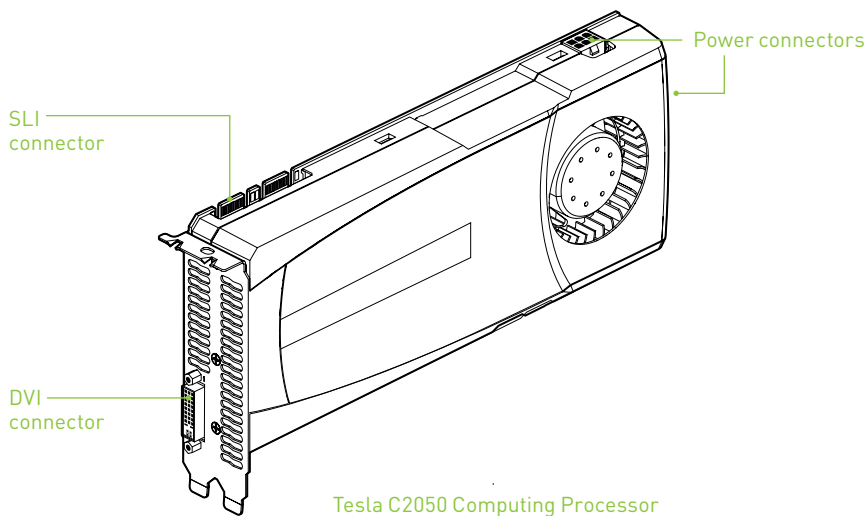
Registration Card

Register to gain priority access to online and phone support. Take time to follow the instructions on this card to register your product to take advantage of customer support and warranty.

02

Tesla C2050 GPU Computing Processor

Installs into the PCI Express x16 slot in your computer.



03

HARDWARE INSTALLATIONS

Installing the Tesla C2050 hardware involves opening up your computer.



Note: All hardware must be installed prior to installation of the drivers.

Before You Begin

If you have an NVIDIA graphics solution, either as a discrete card or as on-board graphics on your motherboard, you will need to uninstall the NVIDIA graphics software driver before installing your Tesla card.



Note: This does not apply to Linux based systems. It only applies to Windows based systems.

Tesla C2050 Installation

A computer system with an available PCI Express ×16 slot is required for the Tesla C2050. For the best system bandwidth between the host processor and the Tesla C2050, it is recommended (but not required) that the Tesla C2050 be installed in a PCI Express ×16 Gen2 slot.

Because there are so many different computer systems on the market, the installation procedure for the Tesla C2050 can vary from system to system. Use the following instructions as a guideline and consult the documentation for clarification of computer specific procedures.

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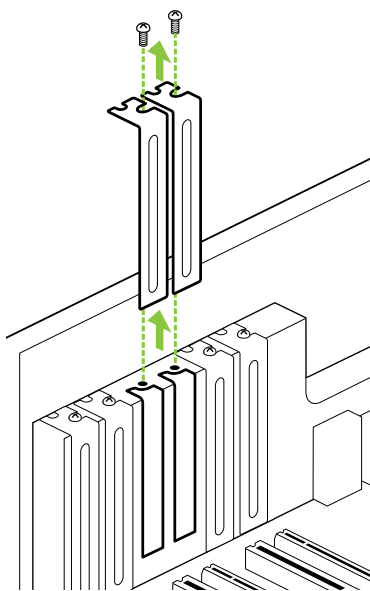


Note: It is important that all power to the computer be removed (unplugged) before you install the computing board. You must also discharge your body's static electricity before handling sensitive components. Simply touch a grounded surface before beginning.



Note: To simplify reconnections, label cables as they are disconnected.

- 1 Turn off your computer and monitor and disconnect the power cord at the outlet or at the back of your system (depending on the system).
- 2 Open your computer chassis (refer to your system documentation for details).
- 3 Remove the slot bracket for the two adjacent slots, if they are still covered. The Tesla C2050 computing board is a dual-slot board and will take up two (2) slots. Save any hardware (such as screws) to use to anchor the Tesla C2050 computing board after it is seated properly.

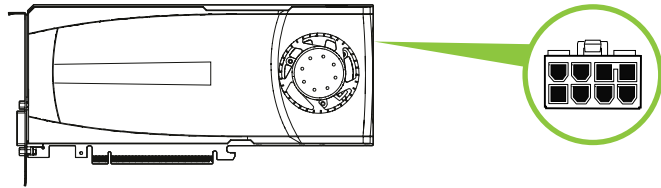


The Tesla C2050 requires two PCI Express x16 slots.

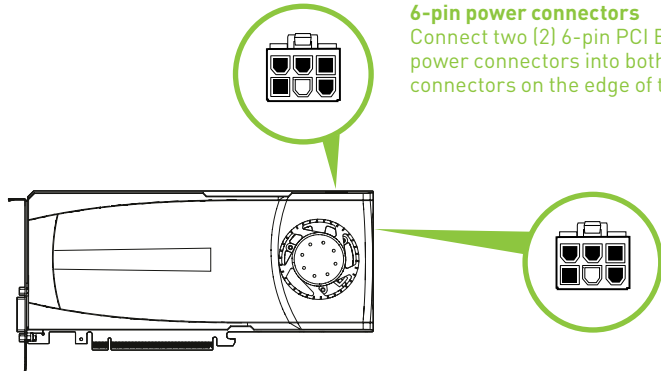
- 4 Connect either one 8-pin PCI Express auxiliary power connector coming from the computer power supply to the 8-pin power connector on the top edge of the board, or connect two 6-pin PCI Express power connectors from the power supply to the 8-pin and 6-pin power connectors on the board. The 8-pin power connector on the board is keyed so that the 6-pin power cable will fit in only one configuration.

8-pin power connector

Connect one (1) 8-pin PCI Express power connector on the edge of the board

**6-pin power connectors**

Connect two (2) 6-pin PCI Express power connectors into both power connectors on the edge of the board



- 5 Reinstall the computer cover and any cables that were removed earlier.



Note: If you are using two 6-pin power connectors, you must ensure that the power supply can drive enough power through the 6-pins to the power connector.

04 DRIVER INSTALLATION

This section contains the instructions to install the software drivers within a Windows environment or within a Linux environment.

Windows Installation

The required software for the Tesla C2050 includes the CUDA drivers, which should also serve as the driver for the NVIDIA discrete or on-board graphics processor. It is recommended that driver installation be carried out either using the installation CD that comes with the Tesla C2050 or by downloading the most recent drivers available at www.nvidia.com.



Note: Use only drivers that are designated to support Tesla C2050. Not all NVIDIA graphics drivers support the Tesla C2050.

1 Power up your computer

If the LEDs on the Tesla C2050 board turn red, then you have likely failed to connect the auxiliary PCI Express power connectors properly. Go back to the hardware installation steps and re-check the connectors for proper installation. Reconnect if necessary and power up again.

The following table is a list of different possible scenarios as well as the resulting behaviors.

8-Pin Power Connector	6-Pin Power Connector	Result
Connected (8-pin or 6-pin)	Connected	Full Power – LED light on the bracket is GREEN by default, or AMBER if NVIDIA HybridPower mode is enabled.
8-pin connected	Not connected	Full Power – LED light on the bracket is GREEN by default, or AMBER if NVIDIA HybridPower mode is enabled.
6-pin connected	Not connected	LED light is RED – board will not boot to OS.
Not connected	Connected	LED light is RED – board will not boot to OS.
Not connected	Not connected	LED light is RED – board will not boot.

- 2 Click **Cancel** each time the **Windows Found New Hardware Wizard** window displays. It will display one or more times.

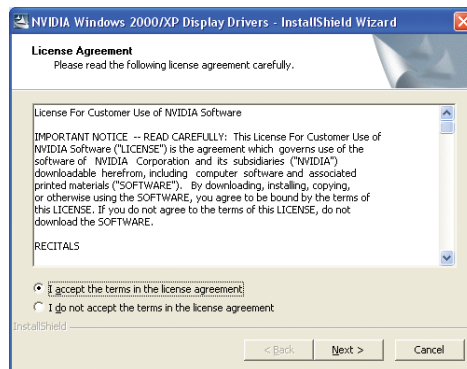


- 3 Insert the installation CD for the drivers included in the Tesla C2050 package. Follow instructions in the installer package.

- 4 Right-click on the CD driver and select **AutoPlay** or explore the files on the CD and double click **Launch.exe** if it does not begin to auto play.
- 5 Click **Install Driver** from the **Tesla Software Installation** screen.

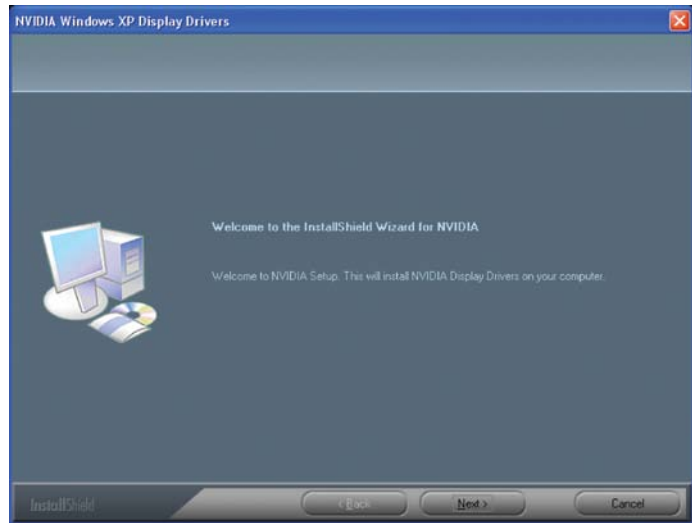


- 6 Select **I accept the terms of the license agreement**.
- 7 Click **Next**.



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- 8 Click **Next** when the **Welcome to the InstallShield Wizard** window displays.

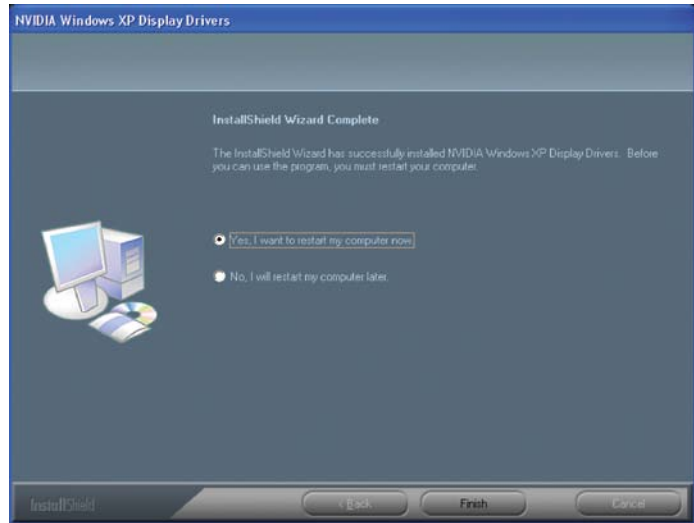


- 9 Click **Continue Anyway** when the Hardware Installation warning window displays.



This warning tells you that the drivers you are about to install have not passed the Windows Logo testing (WHQL). WHQL is a Microsoft testing procedure that is required before Microsoft approves the software. Clicking Continue Anyway will not harm your system.

- 10 Select **Yes, I want to restart my computer now.**
- 11 Click **Finish** to complete the installation and restart your system.



Note: If you are a software developer using CUDA, after rebooting, return to the **CD Software Installation** window and run **Install Toolkit** and then **Install Samples**.

Control Panel Setup

- 1 Select **Standard** or **Advanced** views depending on your preference for the **Control Panel** view selection. The **Advanced** view allows the user to select and modify application profiles through the control panel.



- 2 Select **Do not enable SLI technology** Configuration settings are application-dependent so you will need to configure SLI after the Tesla C2050 software has been installed and you have verified proper operation. Visit www.nvidia.com for application configuration information.



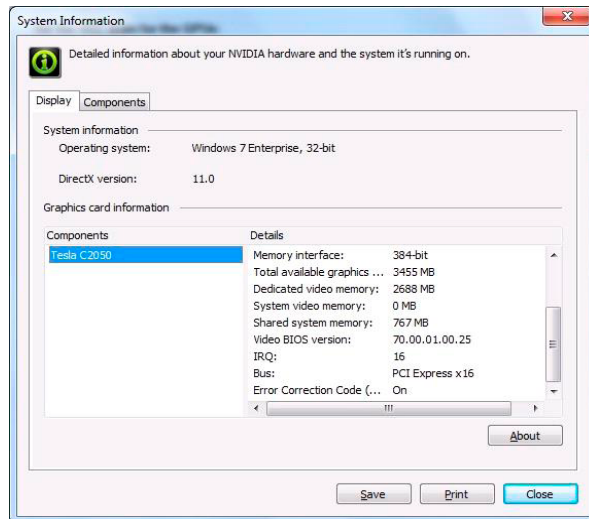
Once you have the computing board installed and verify it is functioning, you can customize setting for your particular application. Visit www.nvidia.com for information particular to your application.

Verifying Windows Installation

It is recommended that you verify your installation by going to the NVIDIA Control Panel and verifying that the boards have been installed correctly and are recognized by the drivers.

Use the following procedure to verify the installation of the boards:

- 1 Go to **Start > Control Panel**.
- 2 Select **NVIDIA Control Panel**.
- 3 Go to **Help > System Info** in the menu bar
- 4 Select **Display** tab.
- 5 Highlight the **Tesla C2050** in the list of componenets.



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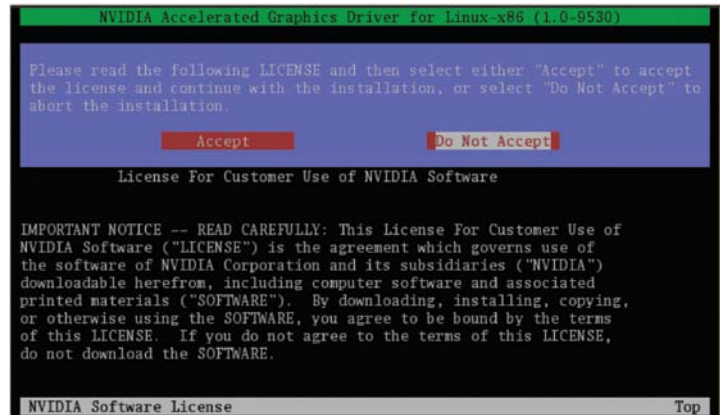
Linux Installation

We recommend using either the NVIDIA drivers located on the installation CD included with the Tesla C2050 or the latest drivers that can be downloaded from the NVIDIA Web site at www.nvidia.com

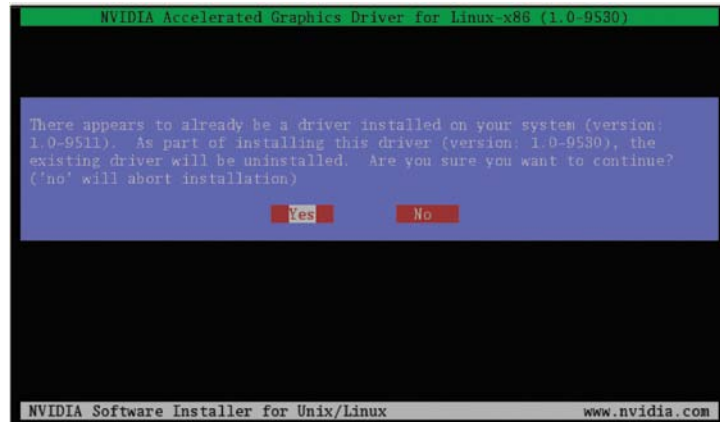
Before you begin the installation, you should exit the X server and close all OpenGL applications (it is possible that some OpenGL applications persist even after the X server has stopped). You should also set the default run level on your system such that it will boot to a VGA console and not directly to X. Doing so will make it easier to recover if there is a problem during the installation process.

- 1 Download the 32-bit or 64-bit Linux driver (the driver will have a similar naming convention as **NVIDIA-Linux-x86-100.14.11-pkg1.run** or **NVIDIA-Linux-x86_64-100.14.11-pkg2.run**).
- 2 Change to the directory containing the downloaded file.
- 3 Run as root the NVIDIA-Linux*.run file downloaded in Step 1. As the root user you can run the following executables:
cd download_directory
NVIDIA-Linux-x86-xxx-xx-xx.run or **NVIDIA-Linux-x86_64-xxx-xx-xx.run**
The **NVIDIA-Linux*.run** file is a self-extracting archive. When executed, it extracts the content of the archive and runs the contained **nvidia-installer** utility, which provides an interactive interface to walk you through the installation.
nvidia-installer will also install itself to **/usr/bin/nvidia-installer** which may be used at some later time to uninstall drivers, auto download updated drivers, etc.

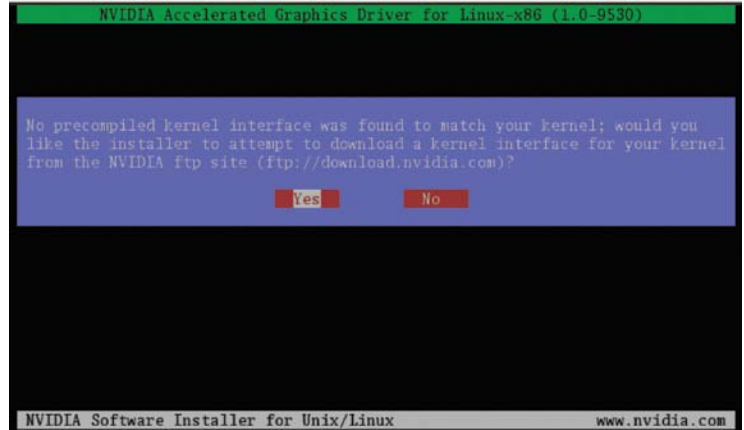
- 4 Select **Accept** to accept the License Agreement.



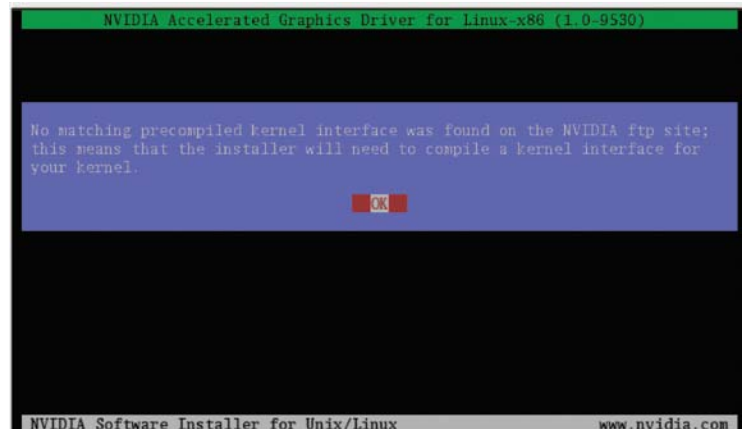
- 5 Select **Yes** if a warning window displays indicating that there are drivers already installed. Selecting **Yes** tells the installation process to overwrite the previously installed drivers.



- 6 Select **Yes** when the Kernel Interface window displays. When the installer is run, it will determine if it has a precompiled kernel interface for the kernel you are running. If it does not have one, it will check if there is one on the NVIDIA FTP site and download it.



- 7 Select **OK** to compile a kernel interface. If a kernel interface cannot be downloaded, either because the FTP site cannot be reached or because one is not provided, the installer will check your system for the required kernel sources and compile the interface for you. You must have the source code for your kernel installed for compilation to work. On most systems this means that you will need to locate and install the correct kernel source, kernel headers or kernel development package.



Linking of the kernel interface (in the case that the interface downloaded or compiled at installation) required you to have a linker installed on your system. The linker, usually `/usr/bin/ld`, is part of the `binutils` package. If a precompiled kernel interface is not found, you must install a linker prior to installing the NVIDIA driver.

- 8 Run **nvidia-xconfig** utility.
nvidia-xconfig will find the X configuration file and modify it to use the NVIDIA X driver. In most cases, you can answer **Yes** when the installer asks if it should run it. If you need to reconfigure your X server later, you can run **nvidia-xconfig** again from a terminal. **nvidia-xconfig** will make a backup copy of your configuration file before modifying it.
- 9 Installation is complete.



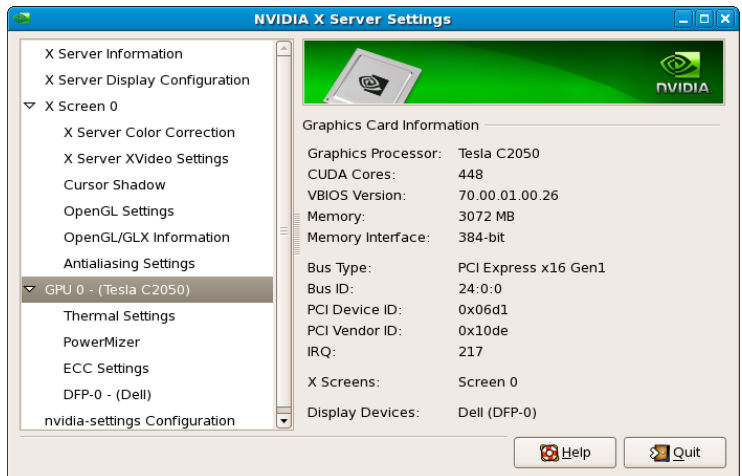
Note: The X server must be restarted for any changes to its configuration file to take effect.

More information about **nvidia-xconfig** can be found in the **nvidia-xconfig** manual page by running:

% man nvidia-xconfig

Verifying Linux Installation

- 1 Run **nvidia-settings** to displays the Server Settings window.
- 2 Verify here that the installation is correct and working.



REFERENCES AND RESOURCES

Getting Driver Updates

During NVIDIA software installation, the installation wizard provides an option to check for updated software online. You can also download software updates by visiting: www.nvidia.com.

REGISTRATION, WARRANTY, AND SUPPORT

Registering Your Tesla C2050 Computing Board

Registering your Tesla C2050 computing board, gives you priority access to the NVIDIA Customer Care support center. Once you have completed registration, you will be given a user ID and password for online customer care. You can also elect to receive automatic notification of special promotions and software updates through email to ensure that your Tesla C2050 computing board continues to operate optimally.

Warranty and Support

The Tesla C2050 is covered by a 36 month warranty.

For support, visit the Customer Care Center at www.nvidia.com/support. The Web site offers access to a broad range of product information.



COMPLIANCE AND CERTIFICATIONS

- > Bureau of Standards, Metrology, and Inspection (BSMI)
- > C-Tick
- > China Compulsory Certification (CCC)
- > Conformité Européenne (CE) 
- > Federal Communications Commission (FCC) - Class B 
- > Interference-Causing Equipment Standard (ICES)
- > Ministry of Information and Communication (MIC)
- > Underwriters Laboratories (UL, CUL) 
- > Voluntary Control Council for Interference (VCCI)

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