



ZOTAC[®]

Motherboard

GEFORCE 9400-ITX
GEFORCE 9300-ITX

User's Manual





Electronic Emission Notices

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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 instructions contained in this manual, may cause harmful interference to radio and television 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 THE RECEIVER
- CONNECT THE EQUIPMENT INTO AN OUTLET ON A CIRCUIT DIFFERENT FROM THAT OF THE RECEIVER
- CONSULT THE DEALER OR AN EXPERIENCED AUDIO/TELEVISION TECHNICIAN

NOTE:

Connecting this device to peripheral devices that do not comply with Class B requirements, or using an unshielded peripheral data cable, could also result in harmful interference to radio or television reception.

The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables.

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Motherboard Specifications

☐ **Chipset**

- ❖ NVIDIA MCP7A Series

☐ **Size**

- ❖ mini ITX form factor of 6.7 inch x 6.7 inch

☐ **Microprocessor support**

- ❖ Intel LGA 775 Celeron®, Pentium® 4, Pentium® D, Core™ 2 Series
- ❖ Support for 400MT/s to 1333MT/s (100MHz to 333MHz FSB)

☐ **Operating systems:**

- ❖ Supports Windows XP 32bit/64bit and Windows Vista 32bit/64bit

☐ **System Memory support**

- ❖ Supports DDRII667/800. Supports up to 8GBs DDRII memory.
- ❖ Supports dual Channel DDR2 128-Bit Memory Interface

☐ **USB 2.0 Ports**

- ❖ Supports hot plug and play
- ❖ Twelve USB 2.0 ports (six rear panel ports, six from onboard USB headers)
- ❖ Supports USB 2.0 protocol up to 480 Mbps transmission rate
- ❖ Support USB wake up from S3 (PCB Ver:03,04)

☐ **Onboard Serial ATA II**

- ❖ Two SATA II ports / three SATA II ports(PCB Ver:03,04).
- ❖ Independent DMA operation.
- ❖ Data transfer rates of 3Gb/s.

☐ **On board RTL8211CL Gigabit LAN(Optional)**

- ❖ Supports 10/100/1000M bps operation

☐ **On board RTL8201EL Fast Ethernet(Optional)**

- ❖ Supports 10/100Mbps operation
- ❖ Supports half/full duplex operation

☐ **Onboard Audio(Optional)**

- ❖ Azalia High-Definition audio
- ❖ Supports 6-channel
- ❖ Supports Jack-Sensing function

☐ **Green Function**

- ❖ Supports ACPI (Advanced Configuration and Power Interface)
- ❖ RTC timer to power-on the system
- ❖ AC power failure recovery

☐ **Onboard Graphics support**

- ❖ Integrated 300MHz DAC for analog displays with resolutions up to 1920x1440 at 75Hz.

- ❖ Support Hybrid SLI to increase graphics performance with GeForce® Boost
- ❖ Integrated GeForce 9xxx Series GPU, Supports DX10
- ❖ VGA / DVI-D / HDMI output support(optional)
- ❑ **PCI Express Interface**
 - ❖ PCI Express Generation 2.0 compatible
 - ❖ 5 GHz support, for a total bandwidth of 5 Gbps per direction per lane
 - ❖ Wake up function is supported
 - ❖ Clock spread spectrum capability.
- ❑ **Integrated HDMI Interface with HDCP**
 - ❖ Support Dual link DVI, resolutions up to 2560x1600 (PCB Ver:03,04)
 - ❖ Support Single link DVI, resolutions up to 1920x1440 (PCB Ver:00,01 only)
 - ❖ Supports DVI or HDMI 1.3 interfaces
 - ❖ Secure digital audio merged from integrated HDA codec with no external audio signals required
 - ❖ Support for HDCP 1.3 using soft or hard HDCP keys
 - ❖ HDCP encryption support when configured as DVI or HDMI link without the need for external HDCP key crypto ROM
- ❑ **Dual Head Display Controller**
 - ❖ Full NVIDIA nView™ multi-display technology capability, with independent display controllers for the CRT, TMDS, DisplayPort, and HDMI interface
 - ❖ Each controller can drive same or different display contents to different resolutions and refresh rates
- ❑ **Expansion Slots**
 - ❖ One PCI Express x16 slot.

Motherboard Layout

Figure 1 shows the motherboard and Figure 2 shows the back panel connectors.

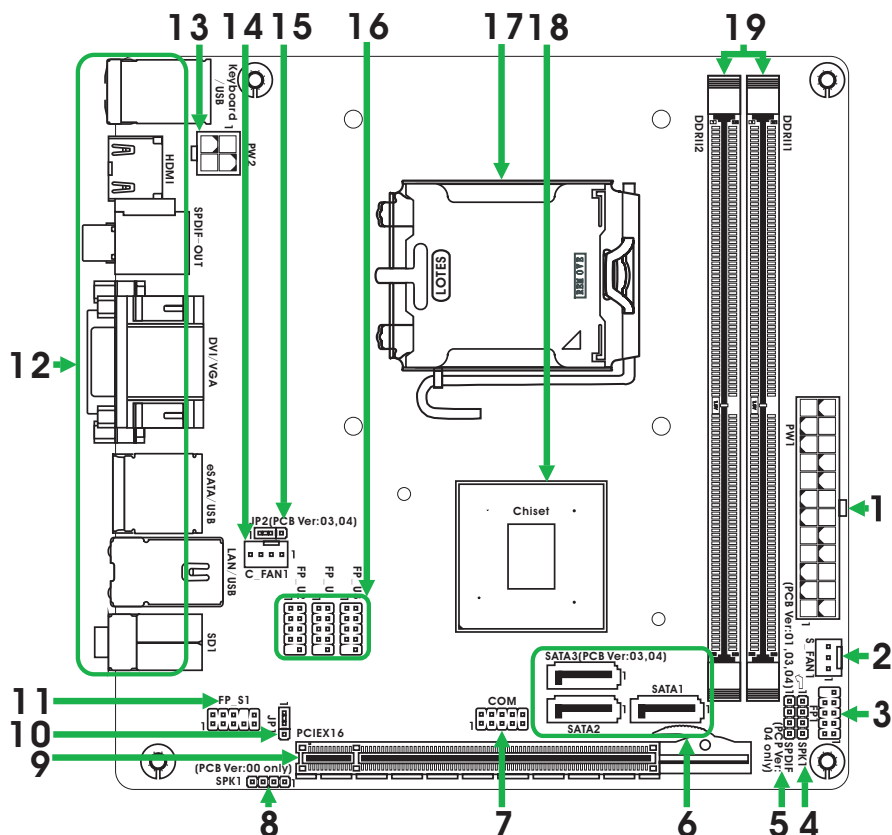
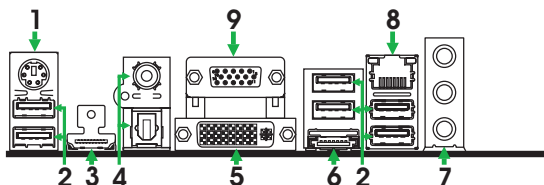


Figure 1. Board Layout

1. 24-pin ATX Power Connector
2. System Fan Connector
3. Front Panel Header
4. Speaker Header(PCB Ver:01,03,04)*
5. SPDIF-out(PCB Ver:04)*
6. Serial-ATA (SATA) Connectors(SATA3 for PCB ver:03,04)*
7. COM Header
8. Speaker Header(PCB Ver:00 only)*
9. PCI Express x16 Slot
- 10.Clear CMOS Jumper
- 11.Front Audio Header
- 12.Backpanel Connectors
- 13.4-pin ATX_12V Power Connector
- 14.CPU Fan Connector
- 15.USB Power Select Jumper(PCB Ver:03,04)*
- 16.USB / WiFi Headers
- 17.CPU Socket
- 18.Chipset
- 19.DDRII DIMM Sockets

Figure 2: Backpanel connectors



1. PS/2 keyboard connector

2. USB Connectors

3. HDMI Port

4. SPDIF Out(Coaxial / Optical)

5. DVI Connector(Support DVI-D)

6. eSATA Connector(For Motherboard PCB Ver00:AHCI mode only)*

7. Port	2-Channel	4-Channel	6-Channel
Blue	Line-In	Rear Speaker Out	Rear Speaker Out
Green	Line-Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Center/Subwoofer

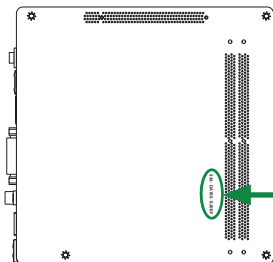
8. LAN Connector

Lan Port with LEDs to indicate status.

- Yellow/Light Up/Blink = 10 Mbps/Link/Activity
- Yellow and Orange/Light Up/Blink = 100 Mbps/link/Activity
- Yellow and Orange/Light Up/Blink = 1000 Mbps/link/Activity

9. VGA Port

* How to identify PCB Version



The bottom side of motherboard PCB shows "236-DA105-xx00F"

Motherboard PCB Version:00

The bottom side of motherboard PCB shows "236-DA105-xx10F"

Motherboard PCB Version:01

The bottom side of motherboard PCB shows "236-DA105-xx30F"

Motherboard PCB Version:03

The bottom side of motherboard PCB shows "236-DA105-xx40F"

Motherboard PCB Version:04

Note:

* Different motherboard PCB version could carry slightly different features and components placement . Please refer to the following diagram to identify PCB version:

Hardware Installation

This section will guide you through the installation of the motherboard. The topics covered in this section are:

- ❑ Preparing the motherboard
 - ❖ Installing the CPU
 - ❖ Installing the CPU fan
 - ❖ Installing the memory
- ❑ Installing the motherboard
- ❑ Connecting cables and setting switches

Safety Instructions

To reduce the risk of fire, electric shock, and injury, always follow basic safety precautions.

Remember to remove power from your computer by disconnecting the AC main source before removing or installing any equipment from/to the computer chassis.

Preparing the Motherboard

The motherboard shipped in the box does not contain a CPU and memory. You need to purchase these to complete this installation.

Installing the CPU

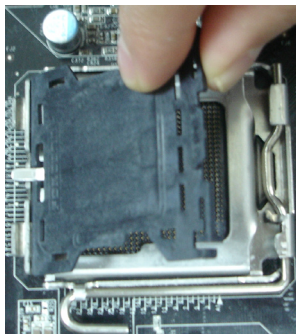
Be very careful when handling the CPU. Make sure not to bend or break any pins on the back. Hold the processor only by the edges and do not touch the bottom of the processor.

Use the following procedure to install the CPU onto the motherboard.

1. Unhook the socket lever by pushing down and away from the socket.
2. Lift the load plate. There is a protective socket cover on the load plate to protect the socket when there is no CPU installed.
3. Remove the protective socket cover from the load plate.
4. Remove the processor from its protective cover, making sure you hold it only by the edges. It is a good idea to save the cover so that whenever you remove the CPU, you have a safe place to store it.
5. Align the notches in the processor with the notches on the socket.
6. Lower the processor straight down into the socket with out tilting or sliding it into the socket.

Note: *Make sure the CPU is fully seated and level in the socket.*

7. Close the load plate over the CPU and press down while you close and engage the socket lever.



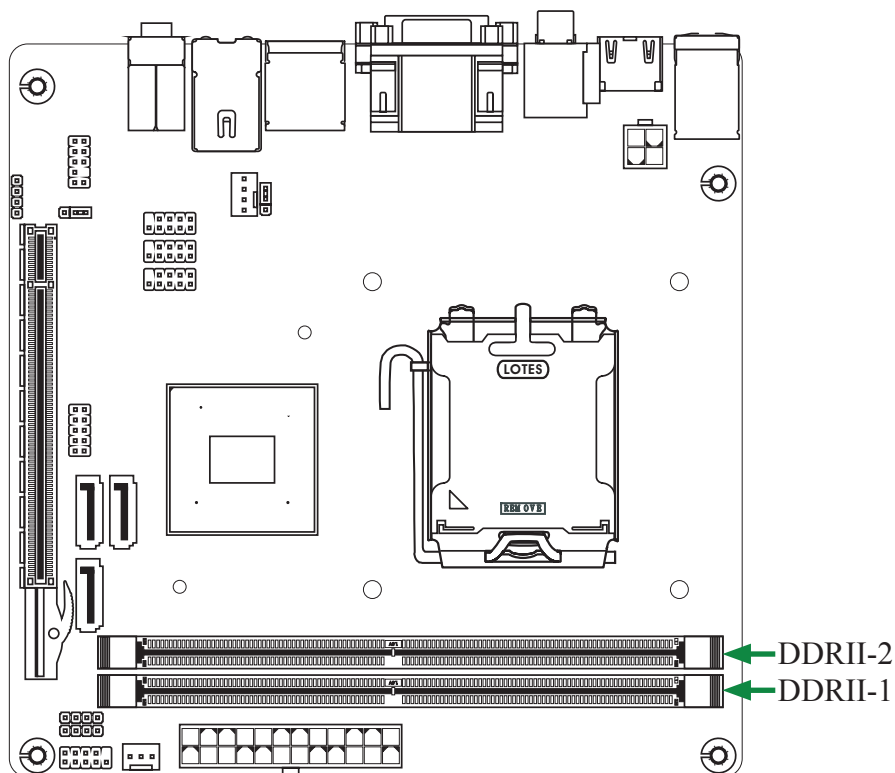
Installing the CPU Fan

There are many different fan types that can be used with this motherboard. Follow the instruction that came with your fan assembly. Be sure that the fan orientation is correct for your chassis type and your fan assembly.

Installing Memory DIMMs

Your new motherboard has two 1.8V 240-pin slots for DDR2 memory. These slots support 256 MB, 512 Mb, 1GB / 2GB / 4GB DDR2 technologies. There must be at least one memory bank populated to ensure normal operation. Use the following the recommendations for installing memory. (See Figure 1 for the location of the memory slots.)

- ☐ **One DIMM:** You can install the DIMM into any slot.
- ☐ **Two DIMMs:** Install into slots 1 and 2. The idea is to run on dual channel mode.



Use the following procedure to install memory DIMMs into the slots on the motherboard. Note that there is only one gap near the center of the DIMM slot. This slot matches the slot on the memory DIMM to ensure the component is installed properly.

1. Unlock a DIMM slot by pressing the module clips outward.
2. Align the memory module to the DIMM slot, and insert the module vertically into the DIMM slot. The plastic clips at both sides of the DIMM slot automatically lock the DIMM into the connector.

Installing the Motherboard

The sequence of installing the motherboard into the chassis depends on the chassis you are using and if you are replacing an existing motherboard or working with an empty chassis. Determine if it would be easier to make all the connections prior to this step or to secure the motherboard and then make all the connections. It is normally easier to secure the motherboard first.

Use the following procedure to install the I/O shield and secure the motherboard into the chassis.

Note: *Be sure that the CPU fan assembly has enough clearance for the chassis covers to lock into place and for the expansion cards. Also make sure the CPU Fan assembly is aligned with the vents on the covers.*

Installing the I/O Shield

The motherboard kit comes with an I/O shield that is used to block radio frequency transmissions, protects internal components from dust and foreign objects, and promotes correct airflow within the chassis.

Before installing the motherboard, install the I/O shield from the **inside** of the chassis. Press the I/O shield into place and make sure it fits securely. If the I/O shield does not fit into the chassis, you would need to obtain the proper size from the chassis supplier.

Connecting Cables and Setting Switches

This section takes you through all the connections and switch settings necessary on the motherboard. This will include:

- ☐ Power Connections
 - ❖ 24-pin ATX power (**PW1**)
 - ❖ 4-pin ATX 12V power (**PW2**)

- ☐ Internal Headers
 - ❖ SPK Header*
 - ❖ Serial Port Header - COM
 - ❖ USB Headers
 - ❖ Front panel header
 - ❖ F_Audio Header
 - ❖ SPDIF-Out Header*

- ☐ Chassis Fans

- ☐ Expansion slots

- ☐ Jumper settings*

See Figure 1 to locate the connectors and jumpers referenced in the following procedure.

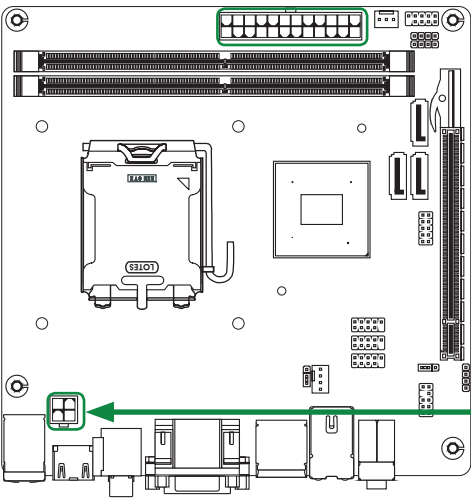
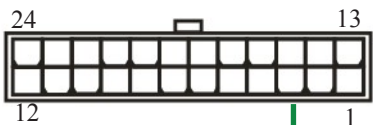
Connecting Internal Headers

24-pin ATX Power (PW1)

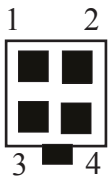
PW1 is the main power supply connector located along the edge of the board next to the DIMM slots. Make sure that the power supply cable and pins are properly aligned with the connector on the motherboard. Firmly plug the power supply cable into the connector and make sure it is secure.

Table 1. PW1 Pin Assignments

Connector



Pin	Signal	Pin	Signal
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWROK	20	-5V
9	+5V_AUX	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND



4-pin ATX 12V Power (PW2)

PW2, the 4-pin ATX 12V power connection, is used to provide power to the CPU. Align the pins to the connector and press firmly until seated.

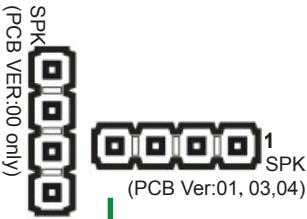
PW2 - Pin Definition

PIN	Assignment
1	GND
2	GND
3	+12V
4	+12V

SPK Header*

SPK - Pin Definition

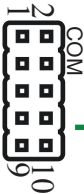
PIN	Assignment
1	VCC
2	NC
3	NC
4	SPK-



Serial Port Header - COM

COM - Pin Definition

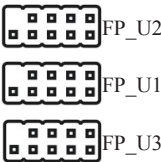
PIN	Assignment
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI
10	NC



USB Headers

This motherboard contains six USB 2.0 ports that are exposed on the rear panel of the chassis(Figure 2). The motherboard also contains six 10-pin internal header connectors onboard.

1. Secure the bracket to either the front or rear panel of your chassis (not all chassis are equipped with the front panel option).



USB Pin Definition

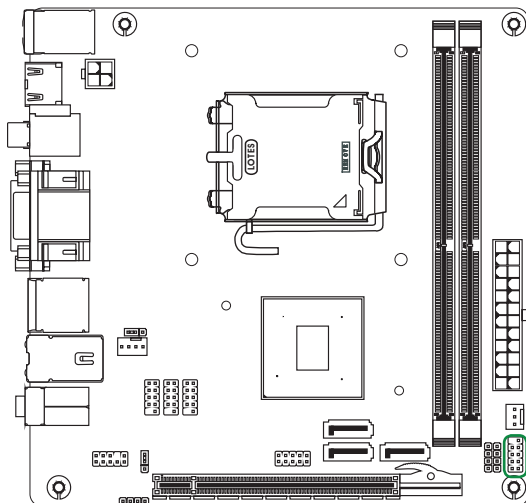
PIN	Assignment
1	VCC
2	VCC
3	USBP0-
4	USBP1-
5	USBP0+
6	USBP1+
7	GND
8	GND
9	KEY
10	OC#

Front panel header

The front panel header on this motherboard is one connector used to connect the following four cables.

❑ PWRLED

Attach the front panel power LED cable to these two pins of the connector. The Power LED indicates the system's status.



Front Panel Header Pin Definition
FP1

KEY	10		9	NC
GND	8		7	RESET
PWR_SW	6		5	GND
PW_LED-	4		3	HDD_LED-
PW_LED+	2		1	HDD_LED+



Note: Some chassis do not have all four cables. Be sure to match the name on the connectors to the corresponding pins.

❑ PWR SW

Attach the power button cable from the case to these two pins. Pressing the power button on the front panel turns the system on and off rather than using the power supply button.

❑ HDD LED

Attach the hard disk drive indicator **LED** cable to these two pins. The HDD indicator **LED** indicates the activity status of the hard disks.

❑ RST SW

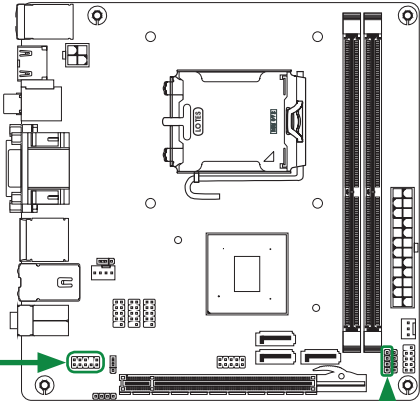
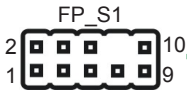
Attach the Reset switch cable from the front panel of the case to these two pins. The system restarts when the **RESET** switch is pressed.

F_Audio Header

The audio connector supports HD audio standard and provides two kinds of audio output choices: the Front Audio, the Rear Audio. The front Audio supports re-tasking function.

F_Audio Pin Definition

PIN	Assignment
1	MIC2(L)
2	GND
3	MIC(R)
4	-ACZ-DET
5	Front Audio(R)
6	Reserved
7	FAVDIO - JD
8	Key (No pin)
9	Front Audio(L)
10	Reserved



Note:

In order to utilize the front audio header, your chassis must have front audio connector. Also please make sure the pin assignment on the cable is the same as the pin assignment on the mainboard header. To find out if the chassis you are buying supports a front audio connector, please contract your dealer.

SPDIF-Out Header*

This header provides a SPDIF-Out (Sony/Philips Digital Interface) to digital multimedia device through coaxial connector.

SPDIF - Pin Definition

PIN	Assignment
1	SPDIF-out
2	VCC3
3	NC
4	GND



Connecting Serial ATA II Cables*

The Serial ATA II connector is used to connect the Serial ATA II device to the motherboard. These connectors support the thin Serial ATA II cables for primary storage devices. The current Serial ATA II interface allows up to 3Gb/s data transfer rate.

There are two or three serial ATA II connectors on the motherboard that support AHCI and RAID configurations. SATA II 3 support motherboard version:03,04.

SATA II Pin Definition

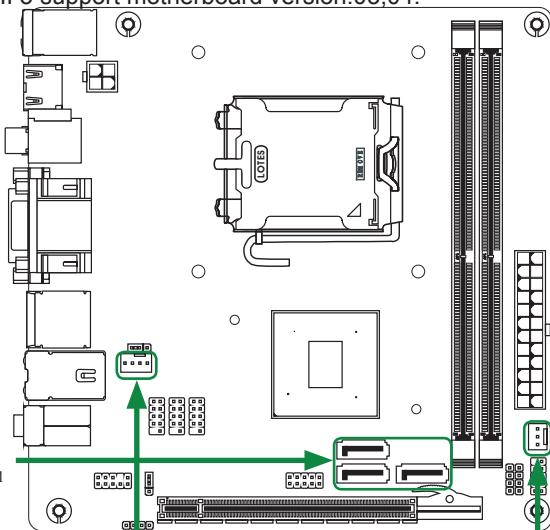
PIN	SIGNAL
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

SATA II-3
(PCB Ver:03,04)



SATA II-2

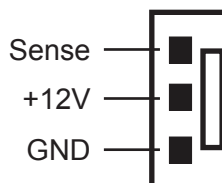
SATA II-1



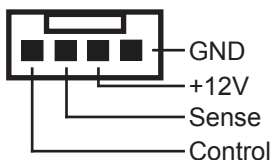
Fan Connections

There are two fan connections on the motherboard. The fan speed can be detected and viewed in the PC Health Status section of the CMOS Setup.

SYS FAN Connector

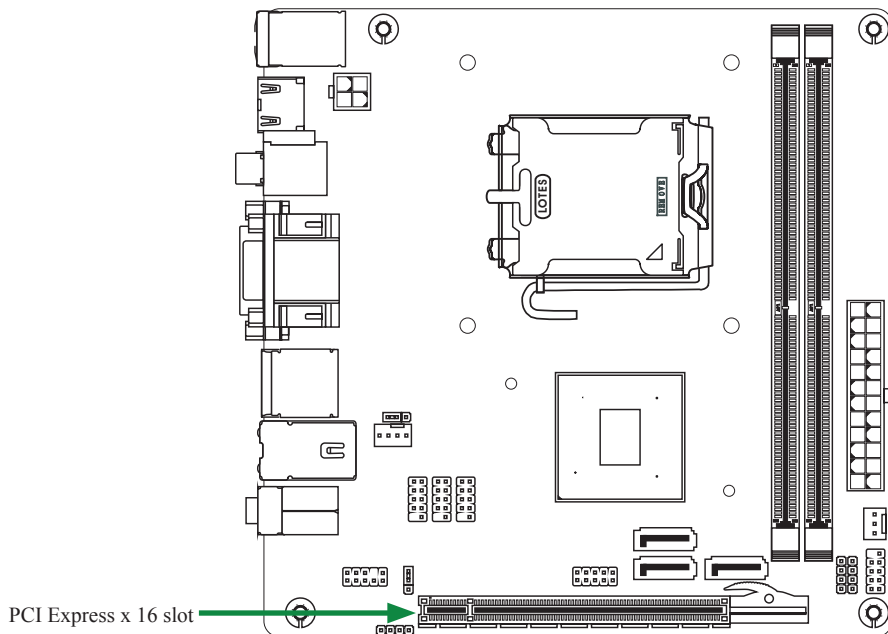


CPU FAN Connector



Expansion Slots

The NVIDIA MCP7a motherboard contains one expansion slot, PCI Express x16 graphics card supported by this motherboard.





PCI Express x16 Slots

There are one PCI Express x16 slot reserved for graphics or video cards. The bandwidth of the x16 slot is up to 8GB/sec complying with PCIE 2.0 specification.

Jumper Settings*



This chapter explains how to configure the motherboard's hardware. Before using your computer, make sure all jumpers and DRAM modules are set correctly. Refer to this chapter whenever in doubt.

JP1-CMOS Clear Jumper

JP1	Selection
1  1-2*	Normal*
1  2-3	CMOS Clear

If you want to clear the system configuration, use the JP1 (Clear CMOS Jumper) to clear data.

JP2-USB Power select(PCB VER:03,04)*

JP2	Selection
1  1-2*	5VSB*
1  2-3	5V

If you want to USB wake up, Please select power to 5VSB, it is for PCB Ver:03,04.

 Close  Open * = Default setting.

Notice:

1. Be sure to save the CMOS setting when exit the CMOS.
2. If the CPU is frequency multiplier locked, no CPU speed change will be seen even if the frequency multiplier setting in CMOS setup is changed.

Configuring the BIOS

This section discusses how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

This section includes the following information:

- ☐ Enter BIOS Setup
- ☐ Main Menu
- ☐ Standard CMOS Features
- ☐ Advanced BIOS Features
- ☐ Advanced Chipset Features
- ☐ Integrated Peripherals
- ☐ Power Management Setup
- ☐ PnP/PCI Configurations
- ☐ Pc health status
- ☐ Frequency/Voltage Control

Enter BIOS Setup

The BIOS is the communication bridge between hardware and software. Correctly setting the BIOS parameters is critical to maintain optimal system performance.

Use the following procedure to verify/change BIOS settings.

1. Power on the computer.,
2. Press the **Del** key when the following message briefly displays at the bottom of the screen during the Power On Self Test (POST).

Press F1 to continue, DEL to enter Setup.

Pressing **Del** takes you to the Phoenix-Award BIOS CMOS Setup Utility.

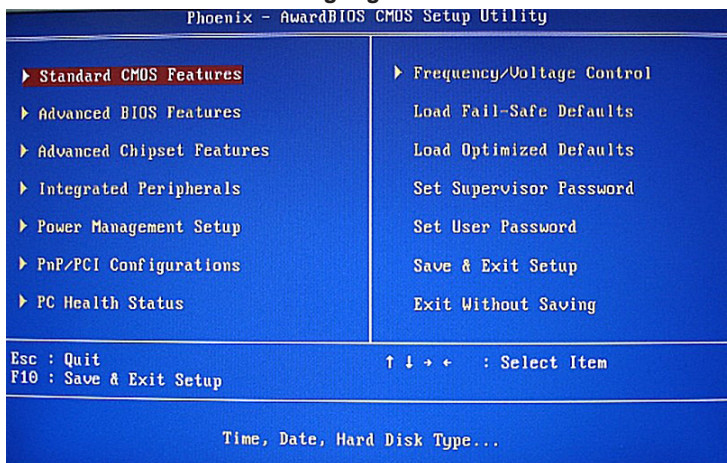
Note: It is strongly recommended that you do not change the default BIOS settings. Changing some settings could damage your computer.

If you do not find the setting you want in the Main Menu or a submenu, Press <Ctrl>+<F1> to access more advanced options.

Main Menu

The main menu allows you to select from the list of setup functions and two exit choices. Use the **Page Up** and **Page Down** keys to scroll through the options or press **Enter** to display the associated submenu. Use the **↑ ↓** arrow keys to position the selector in the option you choose. To go back to the previous menu, press **Esc**.

Note: *that on the BIOS screens all data in white is for information only, data in yellow is changeable, data in blue is non-changeable, and data in a red box is highlighted for selection.*



- ☐ **Standard CMOS Features**
Use this menu to set up the basic system configuration.
- ☐ **Advanced BIOS Features**
Use this menu to set up the advanced system features and boot sequence.
- ☐ **Advanced Chipset Features**
Use this menu to optimize system performance.
- ☐ **Integrated Peripherals**
Use this menu to set up onboard peripherals such as IDE, RAID, USB and LAN control.
- ☐ **Power Management Setup**
Use this menu to configure power management, power on, and sleep features.
- ☐ **PnP/PCI Configurations**
Use this menu to modify the system's Plug-and-Play and PCI configurations.
- ☐ **Pc health status**
Use this menu to monitor the real-time system status of your PC.

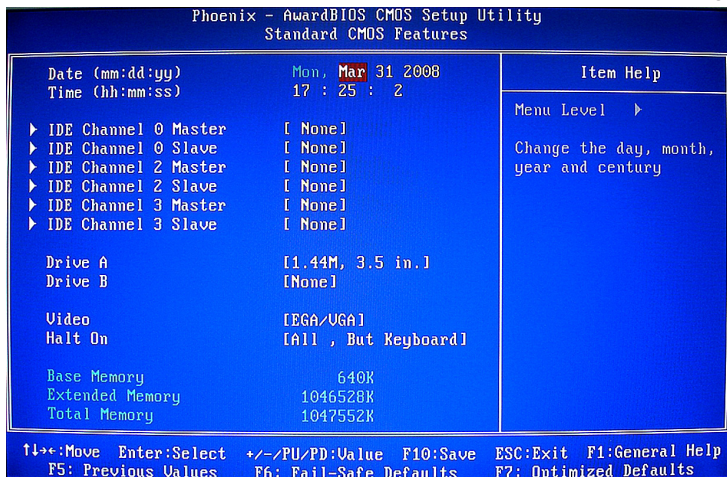
The following items on the CMOS Setup Utility main menu are commands rather than submenus:

- ☐ **Load Optimized Defaults**
Load default system settings.
- ☐ **Set Supervisor and User Password**
Use this command to set, change, and disable the password used to access the system and the BIOS menu.
- ☐ **Save & Exit Setup**
Use this command to save settings to CMOS and exit setup.
- ☐ **Exit Without Saving**
Use this command to abandon all setting changes and exit setup.

Standard CMOS Features Menu

The Standard CMOS Features menu is used to configure the standard CMOS information, such as the date, time, HDD model, and so on. Use the **Page Up** and **Page Down** keys to scroll through the options or press **Enter** to display the sub-menu. Use the **↑ ↓** arrow keys to position the selector in the option you choose. To go back to the previous menu, press **Esc**.

The information shown in **Item Help** corresponds to the option highlighted.



Note: Note that all data in white is for information only, data in yellow is changeable, data in blue is non-changeable, and data in a red box is highlighted for selection.

Date and Time

Using the arrow keys, position the cursor over the month, day, and year. Use the Page Up and Page Down keys to scroll through dates and times. Note that the weekday (Sun through Sat) cannot be changed. This field changes to correspond to the date you enter. Note that the hour value is shown in a 24-hour clock format. Time is represented as **hour : minute : second**.

IDE Channel

Use these functions to detect and configure the individual IDE channels. Select a channel and press Enter to display the IDE sub-menu.

Press **Enter** to auto-detect IDE channels in the system. Once the channel is detected, the values for Capacity, Cylinder, Head, Precomp, Landing Zone, and Sector are automatically filled in.

☐ **None**

There is no HDD installed or set.

☐ **Auto**

The system can auto-detect the hard disk when booting up.

☐ **Manual**

When you set the channel to **[Manual]** and change **Access Mode** to **[CHS]**, you can then enter the number of cylinders, heads, Precomp, landing zone, and sector.

Video

Use this option to choose the mode of Video, as EGA/VGA, CGA 40, CGA 80, MONO.

Drive A

The **Drive A** option allows you to select the kind of FDD to install.

Halt On

Halt On determines whether or not the computer stops if an error is detected during power on. Use the **Page Up** and **Page Down** keys to scroll through the options or press **Enter** to display the **Halt On** sub-menu. Use the **↑ ↓** arrow keys to position the selector in the option you choose. Press **Enter** to accept the changes and return to the Standard CMOS Features menu.

☐ **All Errors**

Whenever the BIOS detects a nonfatal error, the system stops and prompts you.

☐ **No Errors**

System boot does not stop for any detected errors.

☐ **All, But Keyboard**

System boot does not stop for keyboard errors, but does stop for all other errors.

☐ **All, But Diskette**

The system boot does not stop for a diskette error but will stop for all other errors.

☐ All, But Disk/Key

These field are read-only and are determined by the BIOS POST.

Memory

These settings are **display-only values** that are determined by the BIOS POST (Power-On Self Test).

☐ Base Memory

BIOS POST determines the amount of base (or conventional) memory installed in the system.

☐ Extended Memory

BIOS determines how much extended memory is present during the POST.

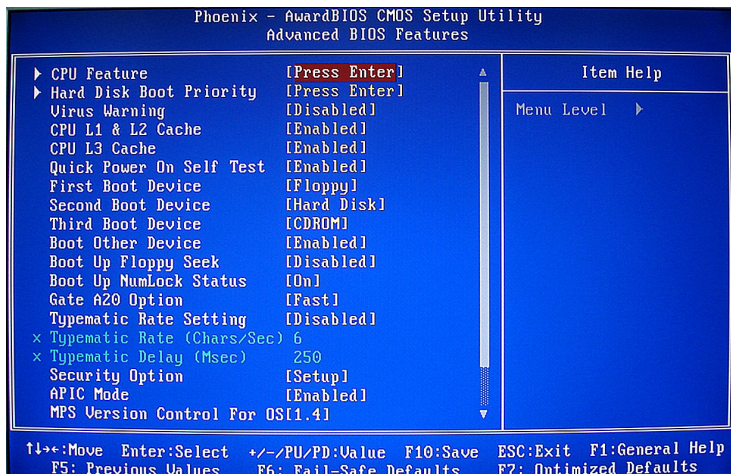
☐ Total Memory

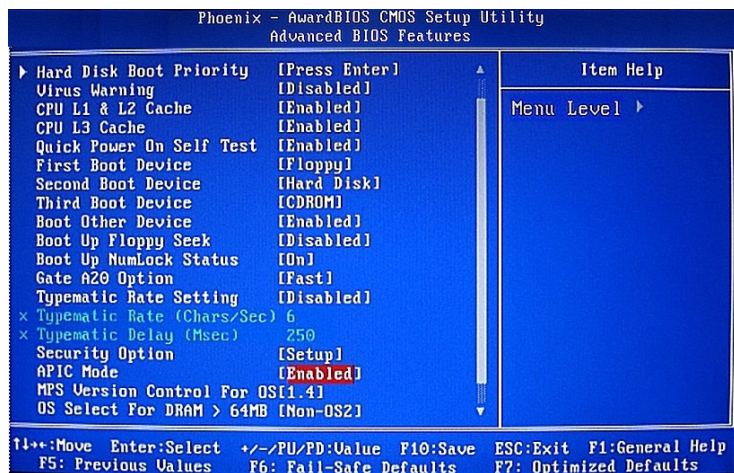
This value represents the total memory of the system.

Advanced BIOS Features

Access the Advanced BIOS Features menu from the CMOS Utility Setup screen. Use the **Page Up** and **Page Down** keys to scroll through the options or press **Enter** to display the sub-menu. Use the **↑ ↓** arrow keys to position the selector in the option you choose. To go back to the previous menu, press **Esc**.

Note: The options that have associated sub-menus are designated by a ►, which precedes the option. Press **Enter** to display the sub-menus.

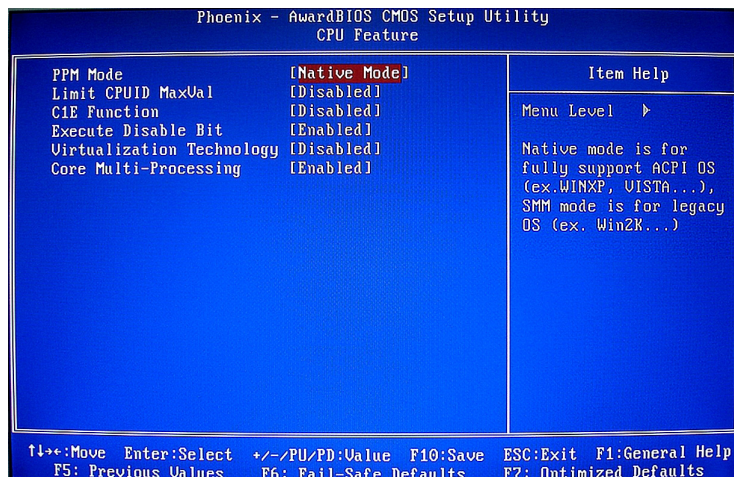




Note: Note that all data in white is for information only, data in yellow is changeable, data in blue is non-changeable, and data in a red box is highlighted for selection.

CPU Feature

Press Enter to display the CPU Feature menu.



☐ **PPM Mode**

Use this option to choose the mode of PPM.

☐ **Limit CPUID MaxVal**

Use this option to enable or disable the function of Limiting CPUID MaxVal

☐ **C1E Function**

Select CPU C1E function.

☐ **Execute Disable Bit**

When disabled forces the XD feature flag to always return 0, defaults choose Enable.

☐ **Virtualization Technology**

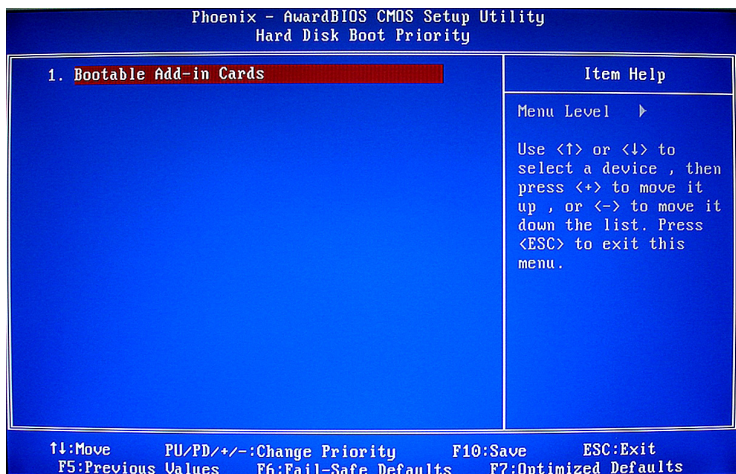
Use this option to enable or disable Virtualization Technology.

☐ **Core Multi-Processing**

Use this option to enable or disable Core Multi-Processing.

Hard Disk Boot Priority

Press Enter to display the Hard Disk Boot Priority.

☐ **Bootable Add-in Cards**

Use this option to bootable add-in cards.

☐ **Virus Warning**

Allow you to choose the Virus Warning feature for IDE Hard Disk boot sector protection.

☐ **CPU L1&L2 Cache/CPU L3 Cache**

Use these options to disable or enable L1/L2/L3 cache.

☐ **Quick Power On Self Test**

Enabling this option allows the system to skip certain test while booting, which reduces the time needed to boot the system.

☐ **First/Second/Third Boot Device**

Use this option to set the priority sequence of the devices booted at power on. Use the **Page Up** and **Page Down** keys to scroll through the options or press **Enter** to display the sub-menu. Use the **↑ ↓** arrow keys to position the selector in the option you choose.

☐ **Boot Other Device**

With the option set to **Enable**, the system boots from some other device if the first/second/third boot devices fail.

☐ **Boot Up Floppy Seek**

Enabled tests floppy drives to determine whether they have 40 or 80 tracks.

☐ **Boot Up NumLock Status**

This option allows you to select the power-on state of **NumLock**. Select **On** to activate the keyboard **NumLock** when the system is started. Select **Off** to disable the **NumLock** key.

☐ **Gate A20 Option**

Use this option to choose Gate A20 menu.

☐ **Typematic Rate Setting**

Use this option to set keystrokes repeat. if Enabled, display options as follows:

❖ Typematic Rate

❖ Typematic delay

☐ **Security Option**

The Security Options allows you to require a password every time the system boots or only when you enter setup. Select **Setup** to require a password to gain access to the CMOS Setup screen. Select **System** to require a password to access the CMOS Setup screen and when the system boots.

☐ **APIC Mode**

Use this function to enable or disable the Advanced Programmable Interrupt Controller (APIC). If you disable this option, you also disable the MPS Version Control for OS option.

☐ **MPS Version Control For OS**

Use this function to select the Multi-Processor Specification (MPS) version that BIOS passes to the operating system. Use the **Page Up** and **Page Down** keys to scroll through the options.

☐ **Full Screen LOGO Show**

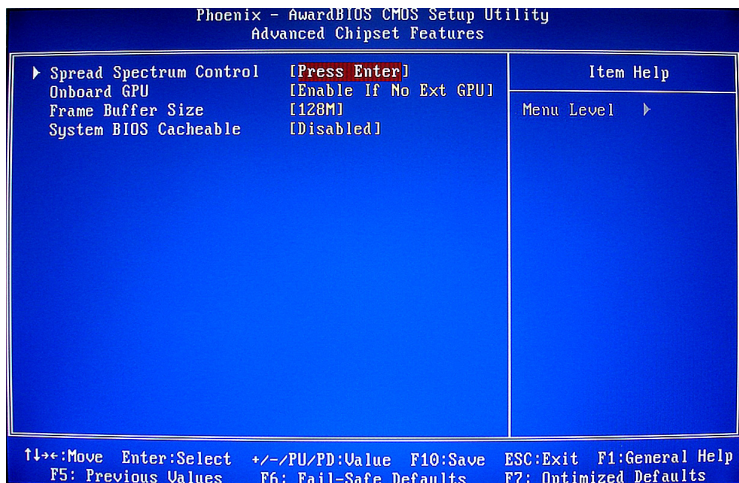
This option allows you to enable or disable the display of the full-screen logo when the system boots. Use the **Page Up** and **Page Down** keys to toggle between **Enable** and **Disable**.

☐ **Small LoGo (EPA) Show**

This option allows you to enable or disable the display of the Small LoGo when the system boots.

Advanced Chipset Features

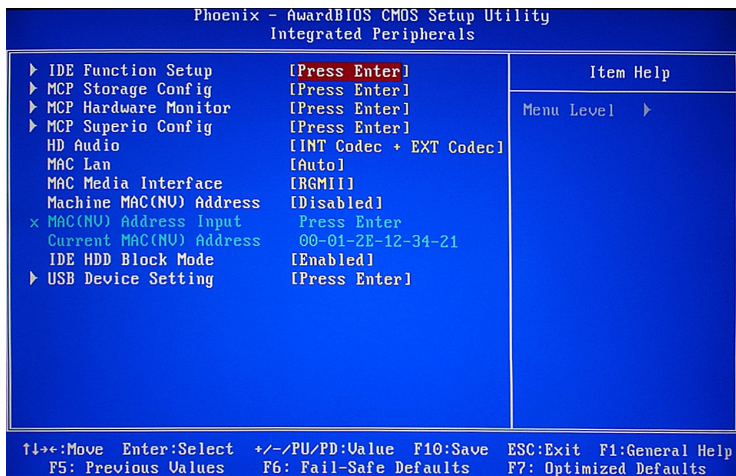
Select Advanced Chipset Features from the CMOS Setup Utility menu and press Enter to display the functions of the Advanced Chipset Functions menu.



- ☐ **Spread Spectrum Control**
Use this option to set Spread Spectrum
- ☐ **Onboard GPU**
Use this option to set Onboard GPU
- ☐ **Frame Buffer Size**
Use this option to change Buffer Size
- ☐ **System BIOS Cacheable**
Use this option to enable or disable the System BIOS Cacheable

Integrated Peripherals Menu

Select **Integrated Peripherals** from the CMOS Setup Utility menu and press **Enter** to display the Integrated Peripherals menu.



☐ IDE Function Setup

Use this option to set IDE function

☐ MCP Storage Config

Use this option to set MCP Storage

☐ MCP Hardware Monitor

Use this option to set MCP Hardware

☐ MCP Super io Config

Use this option to set MCP Super io

☐ HD Audio

Use this option to set HD Audio

☐ MAC Lan

Use this option to set MAC Lan

☐ MAC Media Interface

Use this option to set MAC Media

☐ Machine MAC(NV) Address

When set this option to "Enable", you can set a new address for current MAC(NV)

☐ USB Device Setting

Use this option to set USB device.

Power Management Setup Menu

Select **Power Management Setup** from the CMOS Setup Utility menu and press Enter to display the Power Management Setup menu.

Phoenix - AwardBIOS CMOS Setup Utility		
Power Management Setup		
ACPI function	[Enabled]	Item Help
ACPI Suspend Type	[S1(POS)]	
Power Management	[User Define]	Menu Level →
Video Off Method	[DPMS Support]	
HDD Power Down	[Disabled]	
HDD Down In Suspend	[Disabled]	
Soft-Off by PBTN	[Instant-Off]	
PowerOn After Pwr-Fail	[Off]	
WOL(PME#) From Soft-Off	[Disabled]	
WOL(RI#) From Soft-Off	[Disabled]	
MAC Resume from Soft-Off	[Enabled]	
USB Resume from Soft-Off	[Disabled]	
Power-On by Alarm	[Disabled]	
× Day of Month Alarm	0	
× Time (hh:mm:ss) Alarm	0 : 0 : 0	
POWER ON Function	[BUTTON ONLY]	
× KB Power ON Password	Enter	
× Hot Key Power ON	Ctrl-F1	
HPET Support	[Enabled]	
F1: Move Enter: Select +/-: PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

☐ ACPI Function

This function on the Power Management Setup menu allows you to enable or disable the ACPI function.

☐ Power Management

Use this option to set the mode for Power Management

☐ Video Off Method

Use this option to set a Method for Video off.

☐ HDD Power Down

Use this option to enable or disable a mode of HDD Power down.

☐ Soft-Off by PBTN

This function on the Power Management Setup menu allows you to set Soft-Off by PBTN to **[Instant-Off]** or **[Delay 4 Sec]**.

☐ PowerOn after PWR-fail

Use this option to change its setting

☐ Power-On by Alarm

Determines whether to power on the system at a desired time. If enable set the date and time as following:

- ❖ **Date(of Month) Alarm:** Turn on the system at a specific time on each day or on a specific day in a month.
- ❖ **Time(hh:mm:ss) Alarm:** Set the time at which the system will be Powered on automatically.

☐ PowerOn Function

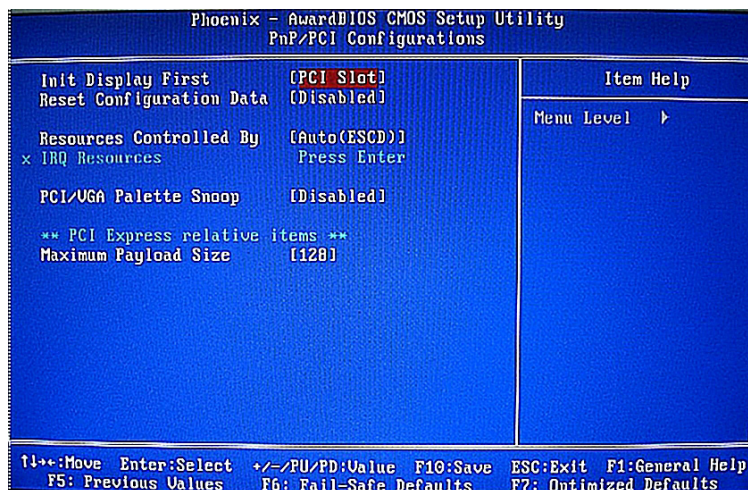
Use this option to Power On Mode (by button only, keyboard 98, mouse left/right, hot key, password or any key.)

☐ HPET Support

Use this option to enable or disable HPET Support; if enable, HPET Mode display. We can select.

PnP/PCI Configurations

Select **PnP/PCI Configuration** from the CMOS Setup Utility menu and press **Enter** to display the PnP/PCI Configuration menu.



☐ Init Display First

This function on the PnP/PCI Configuration menu allows you to define if the initial display is in the PCI slot, onboard or PCI Express slot. Options are **[PCI Slot]**, **[Onboard]** and **[PCIEx]**.

☐ Reset Configuration Data

This function on the PnP/PCI Configuration menu allows you to enable or disable the resetting of Extended System Configuration Data (ESCD) when you exit Setup. Set this to **[Enabled]** if you have installed a new add-on and the system reconfiguration has caused a serious conflict that prevents the OS from booting. The default setting is **[Disabled]**.

☐ **Resources Controlled By**

This function on the PnP/PCI Configuration menu allows you to define if the BIOS can automatically configure all the boot and plug-and-play compatible devices or if you can manually select IRQ, DMA, and memory base address fields. Select **[Auto(ESCD)]** if you want the BIOS to automatically populate these fields. If you select **[Manual]** so you can assign the resources, **IRQ Resources** is enabled for input.

☐ **IRQ Resources**

To enable this field for input, set **Resources Controlled By to [Manual]**. With this field enabled, press **Enter** to see options.

Use Legacy ISA for devices compliant with the original PC AT Bus specification.

Use PCI/ISA PnP for devices compliant with the plug-and-play standard, whether designed for PCI or ISA Bus architecture.

☐ **PCI/VGA Palette Snoop**

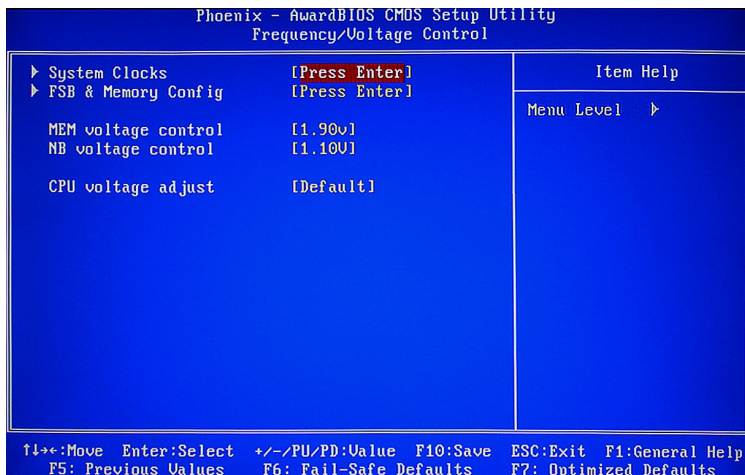
This function on the PnP/PCI Configuration menu allows you to enable or disable the Palette Snoop function.

☐ **Maximum Payload Size**

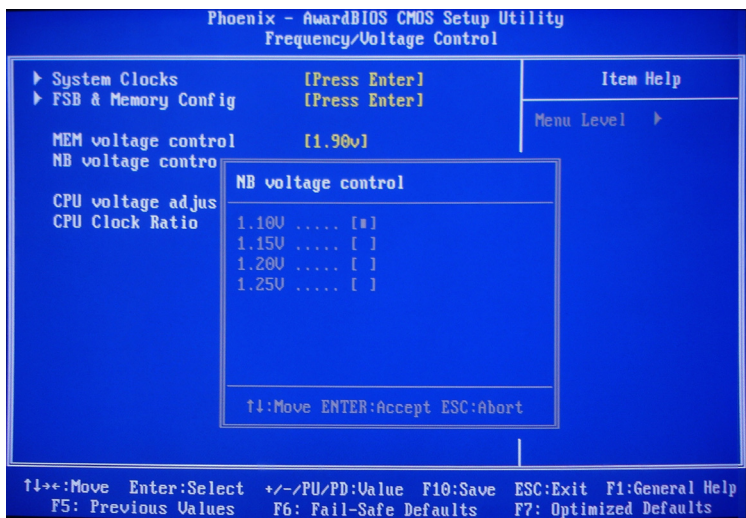
This function on the PnP/PCI Configuration menu allows you to set the maximum TLP payload size (in bytes) for the PCI Express devices. Use the **Page Up** and **Page Down** keys to scroll through sizes or enter the number using the keyboard numbers or use the + and – keys to go up and down the list of sizes.

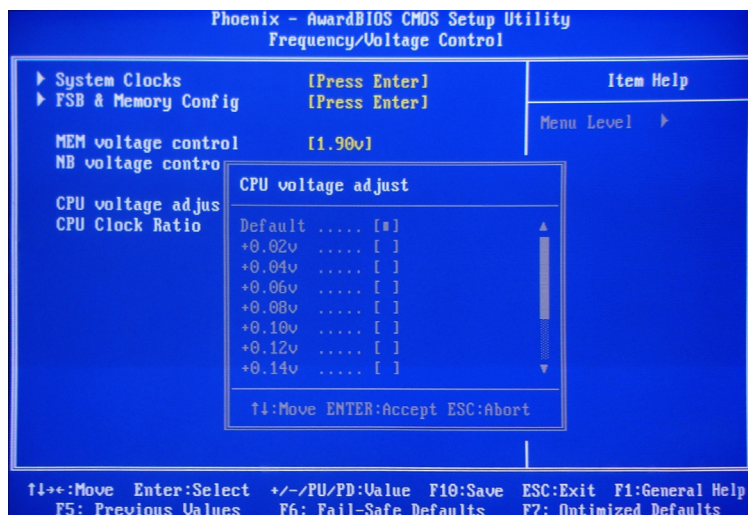
Frequency/Voltage Control

Select Frequency/Voltage Control from the CMOS Setup Utility menu and press Enter to display the system Monitor menu.



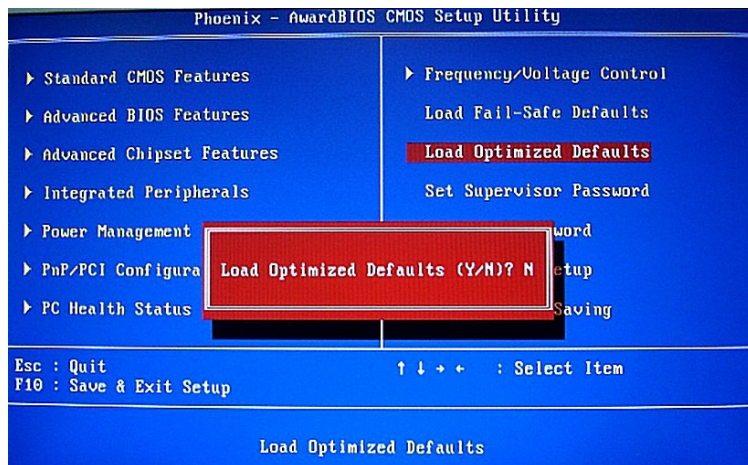
- ☐ **System Clock**
Press "Enter" to display System Clock status
- ☐ **FSB&Memory config**
Use this option to change FSB&Memory setting
- ☐ **MEM Voltage control**
Use this option to set Memory Voltage
- ☐ **NB Voltage control**
Use this option to set NB Voltage
- ☐ **CPU Voltage adjust**
Use this option to set CPU Voltage





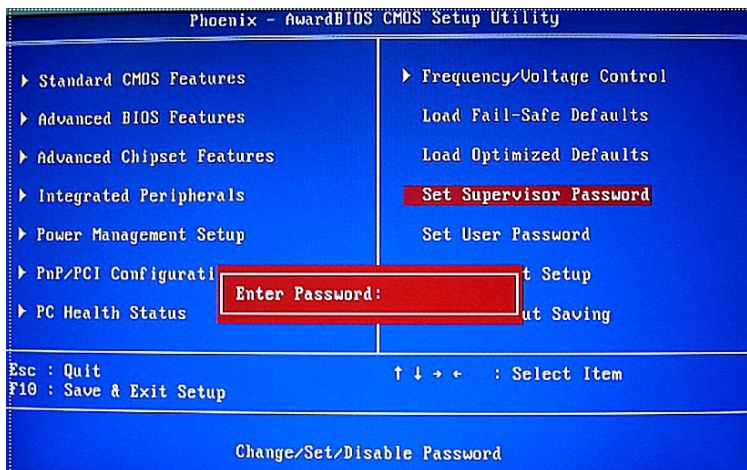
Load Optimized Defaults

Press <Enter> on this item and then press the <Y> key to load the optimal BIOS default settings. The BIOS default settings helps the system to operate in optimum state. Always load the Optimized defaults after updating the BIOS or after clearing the CMOS values.



Set Supervisor/User Password

Press <Enter> on this item and type the password with up to 8 characters and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>.



The BIOS Setup program allows you to specify two separate passwords:

❖ Supervisor Password

When a system password is set and the **Password Check** item in **Advanced BIOS Features** is set to **Setup**, you must enter the supervisor password for entering BIOS Setup and making BIOS changes.

When the **Password Check** item is set to **System**, you must enter the supervisor password (or user password) at system startup and when entering BIOS Setup.

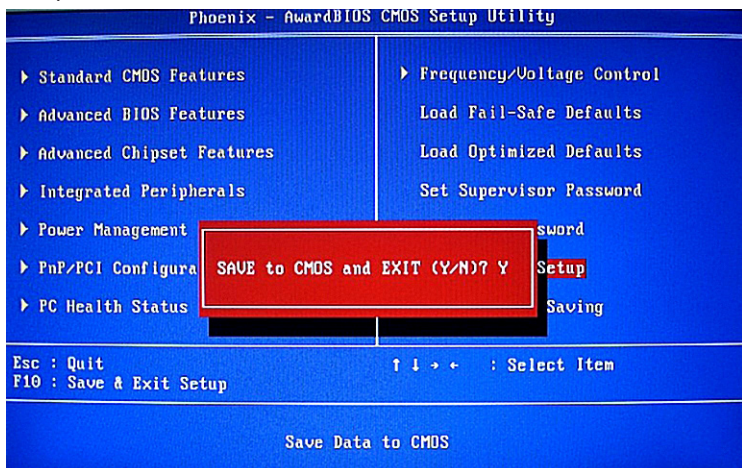
❖ User Password

When the **Password Check** item is set to **System**, you must enter the supervisor password (or user password) at system startup to continue system boot. In BIOS Setup, you must enter the supervisor password if you wish to make changes to BIOS settings. The user password only allows you to view the BIOS settings but not to make changes.

To clear the password, press <Enter> on the password item and when requested for the password, press <Enter> again. The message "PASSWORD DISABLED" will appear, indicating the password has been cancelled.

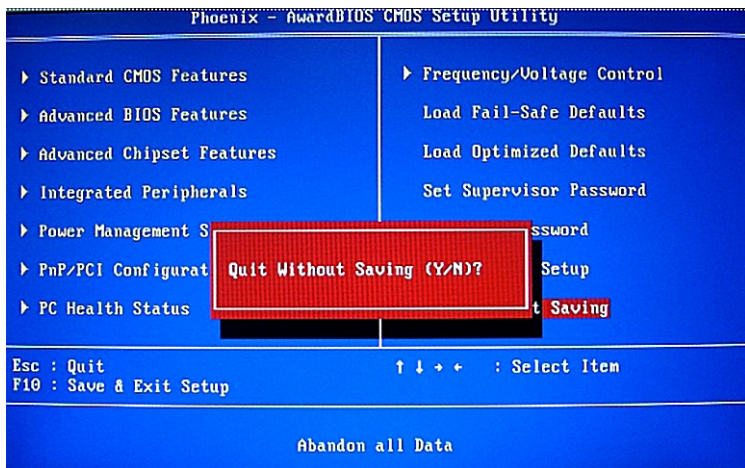
Save & Exit Setup

Press <Enter> on this item and press the <Y> key. This saves the changes to the CMOS and exits the BIOS Setup program. Press <N> or <Esc> to return to the BIOS Setup Main Menu.



Exit Without Saving

Press <Enter> on this item and press the <Y> key. This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS. Press <N> or <Esc> to return to the BIOS Setup Main Menu.



FLASH Update Procedure

The program AWDFLASH.EXE is included on the driver CD (D:\Utility\AWDFLASH.EXE). Please follow the recommended procedure to update the flash BIOS, as listed below.

1. Create a DOS-bootable floppy diskette. Copy the new BIOS file (just obtained or downloaded) and the utility program AWDFLASH.EXE to the diskette.
2. Allow the PC system to boot from the DOS diskette.
3. At the DOS prompt, type

AWDFLASH<ENTER>

4. Enter the file name of the new BIOS.
5. The question: "Do you want to save BIOS (Y/N)?" is displayed.

**Press "N" if there is no need to save the existing BIOS.
Press "Y" if a backup copy of the existing BIOS is needed.
(A file name has to be assigned to the existing BIOS binary file.)**

6. The message : "Press "Y" to program or "N" to exit" is displayed. Type

"Y"<ENTER>

7. Wait until the flash-update is completed.
8. Restart the PC.

<p>Warning : - Do not turn off or RESET the computer during the flash process.</p> <p>- If you are not sure how to upgrade the BIOS, please take your computer to an Authorized Service Center and have a trained technician do the work for you.</p>
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Installing Drivers and Software

Note: It is important to remember that before installing the driver CD that is shipped in the kit, you need to load your operating system. The motherboard supports Windows XP 32bit and 64bit and is Vista-capable.

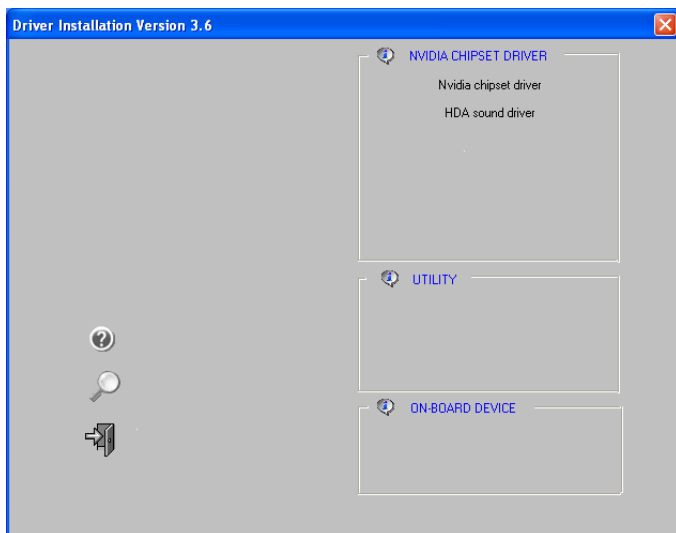
The kit comes with a CD that contains utility drivers and additional software.

The CD that has been shipped with your NVIDIA MCP7A motherboard contains the following software and drivers:

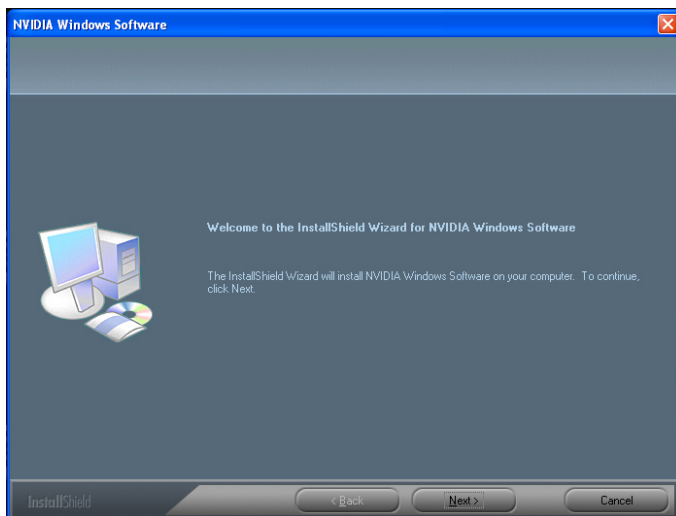
- ☐ **Nvidia chipset driver**
- ☐ **HDA Sound driver**

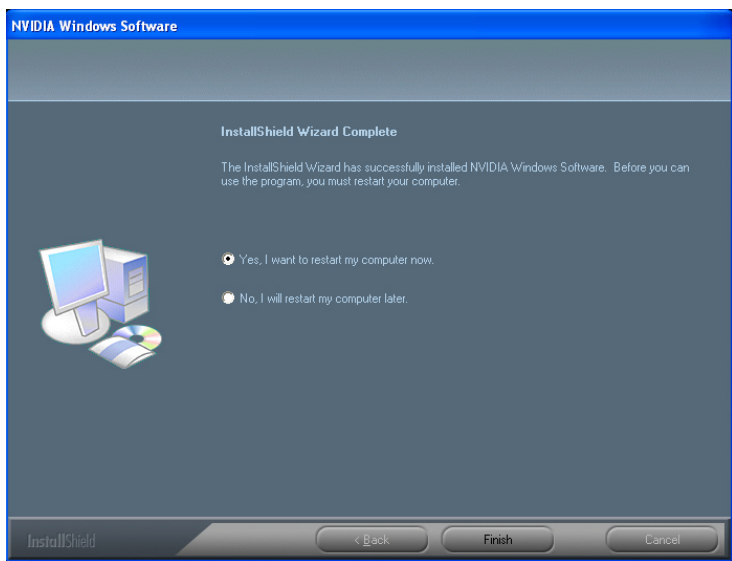
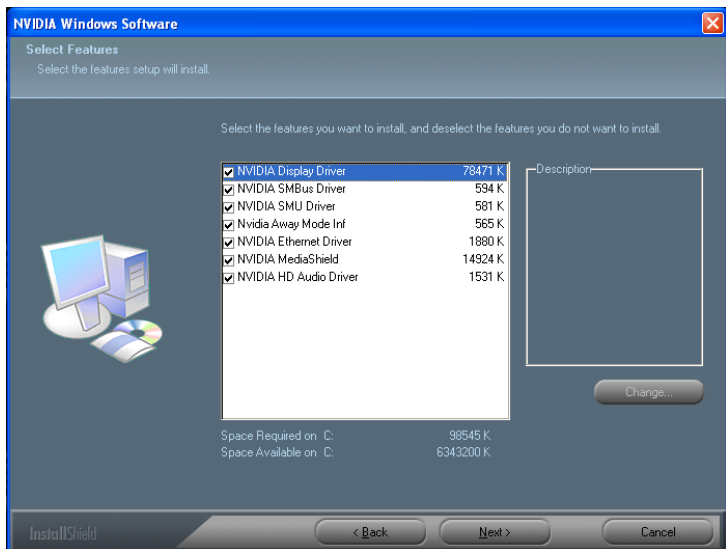
Drivers Installation

1. Insert the driver CD after loading your operating system. Waiting for one minute you can see below interface.

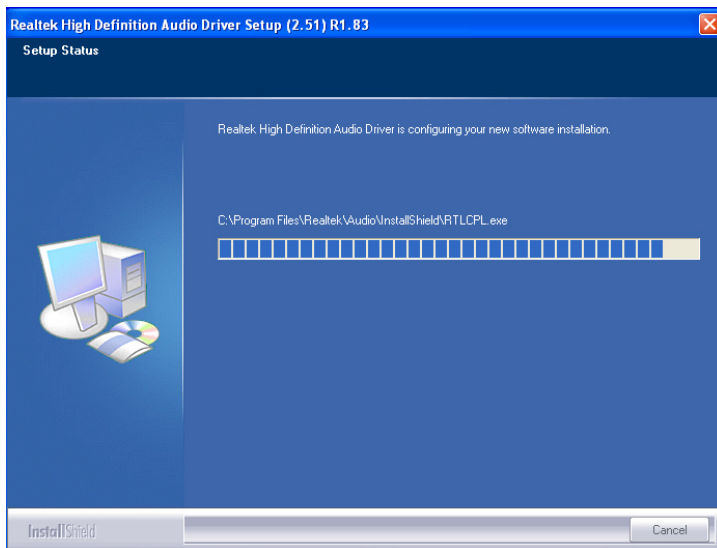
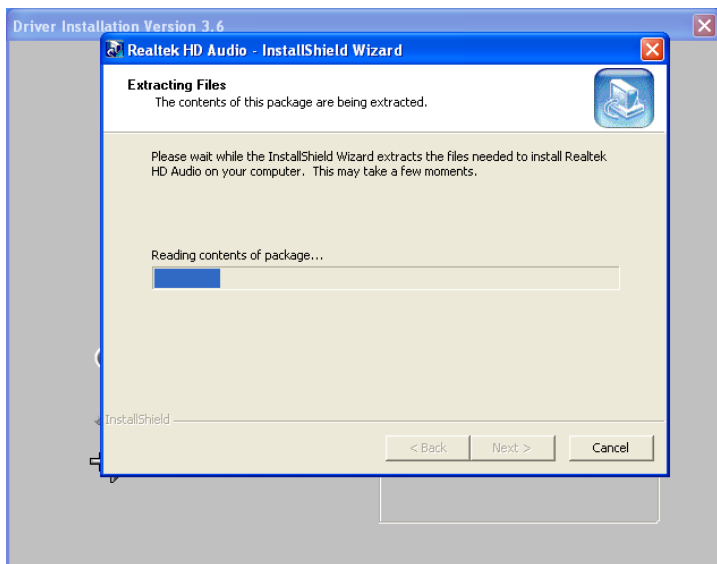


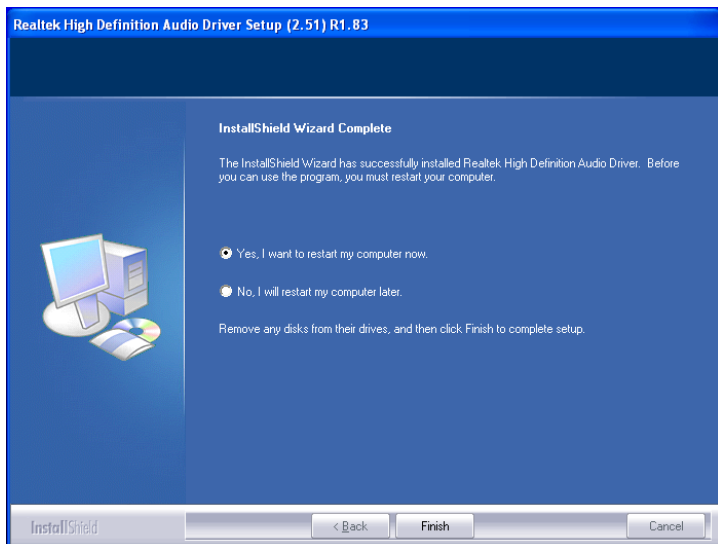
2. Follow the below steps to install Nvidia shipset driver.



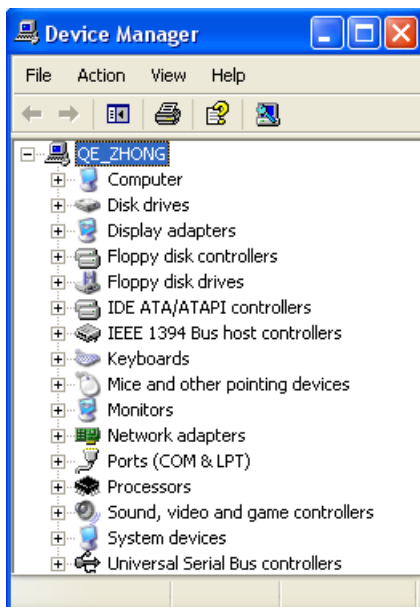


3. Follow the below for HDA sound driver installing.



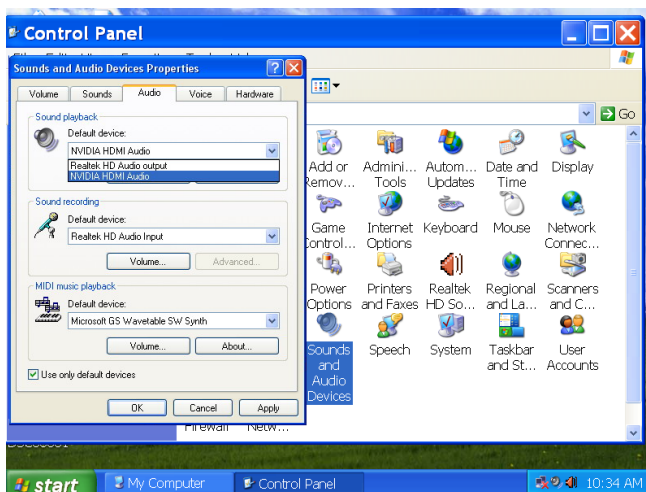
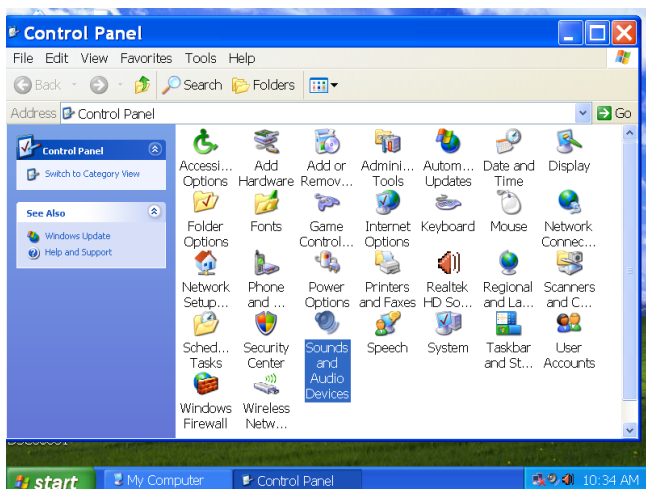


At last, you can open below page that provides information about the hardware devices on this motherboard, and check whether finish your installation.



HDMI SETUP

1. You can connect HDMI device to the HDMI port directly, or connect to DVI port by a DVI - HDMI dongle.
2. Enter Control Panel, double click “Sounds and Audio Devices”, select “NVIDIA HDMI Audio” as default play back device, then click ok.



Realtek HD Audio Driver Setup

Getting Started

After Realtek HD Audio Driver being installed (insert the driverCD and follow the on-screen instructions), “Realtek HD Audio Manager” icon will show in System tray as below. Double click the icon and the control panel will appear:



Sound Effect

After clicking on the “Sound Effect” tab, 3 sections “Environment”, “Equalizer” and “Karaoke” are available for selection.



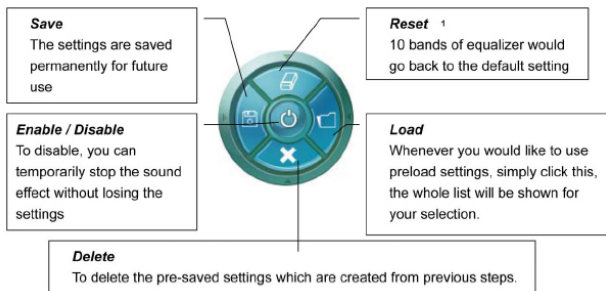
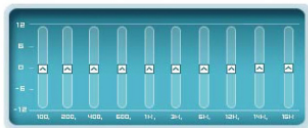
Environment Simulation

You will be able to enjoy different sound experience by pulling down the arrow, totally 23 kinds of sound effect will be shown for selection. Realtek HD Audio Sound Manager also provides five popular settings “Stone Corridor”, “Bathroom”, “Sewer pipe”, “Arena” and “Audio Corridor” for quick enjoyment.

Equalizer Selection

The Equalizer section allows you to create your own preferred settings by utilizing this tool.

In standard 10 bands of equalizer, ranging from 100Hz to 16KHz are available:



Frequently Used Equalizer Setting

Realtek recognizes the needs that you might have. By leveraging our long experience at audio field, Realtek HD Audio Sound Manager provides you certain optimized equalizer settings that are frequently used for your quick enjoyment.

How to Use

Other than the buttons “Pop” “Live” “Club” & “Rock” shown on the page, to pull down the arrow in “Others” , you will find more optimized settings available to you.

Karaoke Mode

Karaoke mode brings Karaoke fun back home by simply using the music you usually play, Karaoke mode can help you eliminate the vocal of the song or adjust the key to accommodate your range.

Vocal Cancellation: Single click on “Voice Cancellation”, the vocals of the songs will be erased, while the background music is still playing which lets you take over the vocal part.

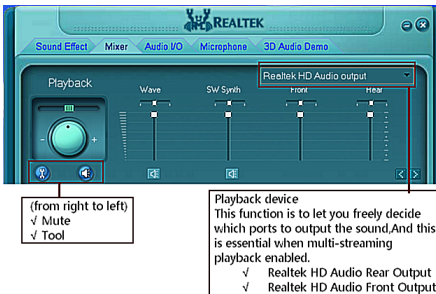
Key Adjustment: Using “Up / Down Arrow” to find a key which better fits your vocal range.

Mixer

Realtek HD Audio Sound Manager integrates Microsoft's "Volume Control" functions into the Mixer page. This gives you the advantage to you to create your favorite sound effect in one single tool.



Playback control



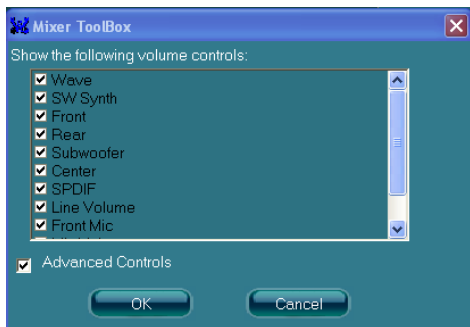
Mute

You may choose to mute single or multiple volume controls or to completely mute sound output.

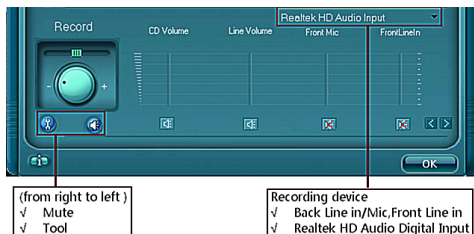
Tool

- ✓ **Show the following volume control**
This is to let you freely decide which volume control items to be displayed, total 13 items to be chosen.
- ✓ **Advanced controls**
- ✓ **Enable playback multi-streaming**

With this function, you will be able to have an audio chat with your friends via headphone (stream 1 from front panel) while still have music (stream 2 from back panel) playing. At any given period, you can have maximum 2 streams operating simultaneously.



Recording control



Mute

You may choose to mute single or multiple volume controls or to completely mute sound input.

Tool

✓ Show the following volume controls

This is to let you freely decide which volume control items to be displayed.

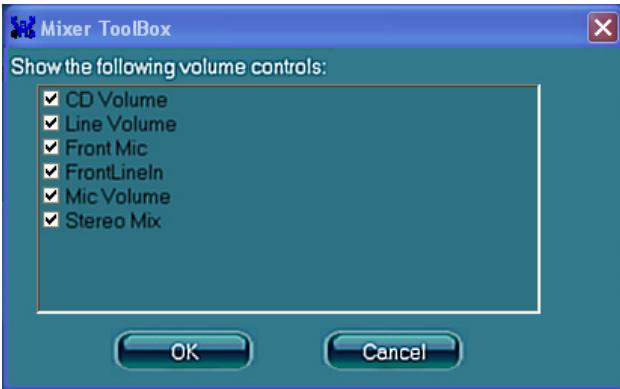
✓ Advanced controls.

Advanced control is a "Microphone Boost" icon.

Once this item is checked, you will find "advanced" icon beside "Front Pink In" & "Mic Volume". With this, the input signal into "Front Pink In" & "Mic Volume" will be strengthen.

✓ Enable recording multi-streaming

At any given period, you can have maximum 2 streams operating simultaneously.



Audio I/O

Realtek HD Audio Manager frees you from default speaker settings. Different from before, for each jack, they are not limited to perform certain functions. Instead, now each jack is able to be chosen to perform either output (i.e. playback) function or input (i.e. Recording) function, we call this “Retasking”.

Audio I/O aims to help you setting jacks as you wish. Moreover, other than blue to blue, pink to pink, the way that you used to do, Audio I/O would guide you to other right jacks that can also serve as microphone / speaker / headphone.



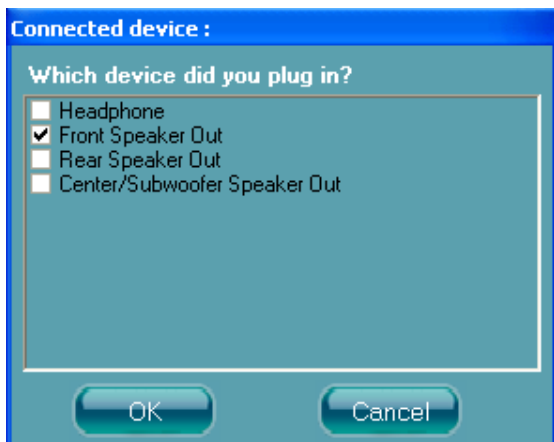
Speaker Configuration

Step 1: Plug in the device in any available jack.


Step 2: Dialogue "connected device" will pop up for your selection. Please select the device you are trying to plug in.

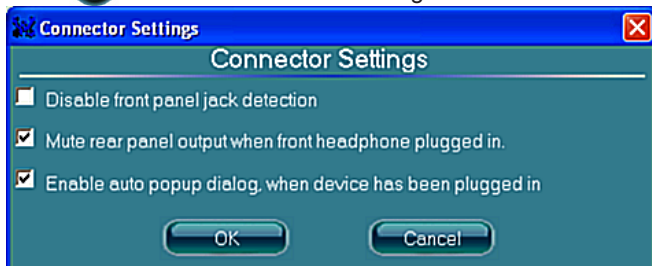
* If the device is being plugged into the correct jack, you will be able to find the icon beside the jack changed to the one that is same as your device.

* If not correct, Realtek HD Audio Manager will guide you to plug the device into the correct jack.



Connector Settings

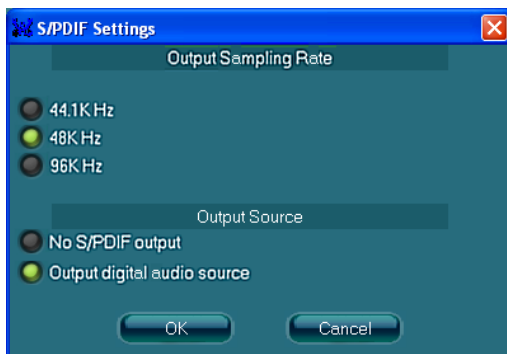
Click  to access connector settings



- ✓ **Mute rear panel when front headphone plugged in**
Once this option is checked, whenever front headphone is plugged, the music that is playing from the back panel, will be stopped.
- ✓ **Disable front panel jack detection (option)**
Did not find any function on front panel jacks?
Please check if front jacks on your system are so-called AC'97 jacks. If so, please check this item to disable front panel jack detection.
- ✓ **Enable auto popup dialogue, when device has been plugged in.**
Once this item checked, the dialog "Connected device", would not automatically pop up when device plugged in.

S/PDIF

Short for **S**ony/**P**hilips **D**igital **I**nterface, a standard audio file transfer format. S/PDIF allows the transfer of digital audio signals from one device to another without having to be converted first to an analog format. Maintaining the viability of a digital signal prevents the quality of the signal from degrading when it is converted to analog.



✓ **Output Sampling Rate**

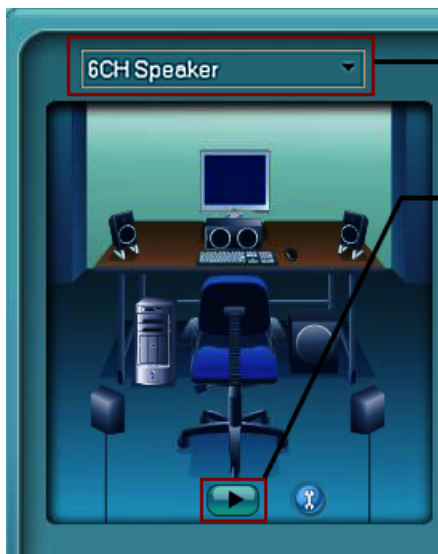
- 44.1KHz: This is recommended while playing CD
- 48KHz: This is recommended while playing DVD or Dolby.
- 96KHz: This is recommended while playing DVD-Audio.

✓ **Output Source**

- Output digital audio source: The digital audio format (such as .wav, .mp3, .midi etc) will come out through S/PDIF-Out.

Speaker Calibration

After you have successfully plugged in speakers and assigned to the right jacks, you are only one more step to go to enjoy the intended sound. We provide "Speaker Calibration" to help you check if the speakers are located in the correct position.



Step1

Select the channel output(headphone / 2 / 4 / 6 / 8 channel)

Step2

Click "play" icon

Step3

Look at the scene;while the speaker appears flushing,you should be able to hear the sound exactly from that direction.

Microphone

This page is designed to provide you better microphone / recording quality.

Below picture indicates both “Noise Suppression” & “Acoustic Echo Cancellation” are both enabled.



Noise Suppression

If you feel that the background noise, especially the sound generated from the fan inside PC, is too loud? Try “Noise Suppression”, which allows you to cut off and suppress disturbing noise.

Beam Forming

Also known as “directional recording”, this option lets you do the following: Once beam forming is enabled; only the sound from certain direction will be recorded. You will get the best quality if you chose 90° position, which we recommend you to use, this effectively means that you speak right into the microphone.

Note: A Stereo Microphone is required when using Beam Forming function.

Acoustic Echo Cancellation

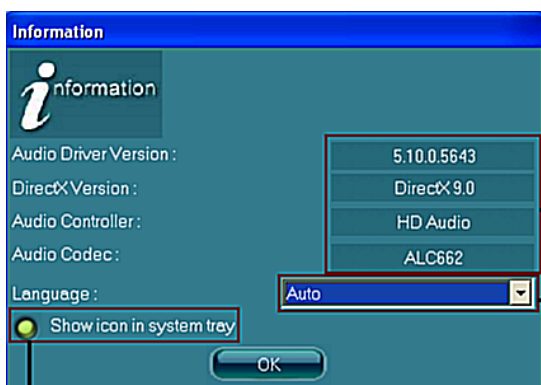
This function prevents playback sound from being recorded by microphone together with your sound. For example, you might have chance to use VOIP function through Internet with your friends. The voice of your friend will come out from speakers (play-back). However, the voice of your friend might also be recorded into your microphone then go back to your friend through Internet. In that case, your friend will hear his/her own voice again. With AEC (Acoustic Echo Cancellation) enabled at your side, your friend can enjoy the benefit with less echo.

Audio Demo

The section “3D Audio Demo” grants you another possibility to enjoy your sound. The Audio Demo allows you to listen to sound in an extraordinary way.



Information



Hardware / Software
information of your audio
system

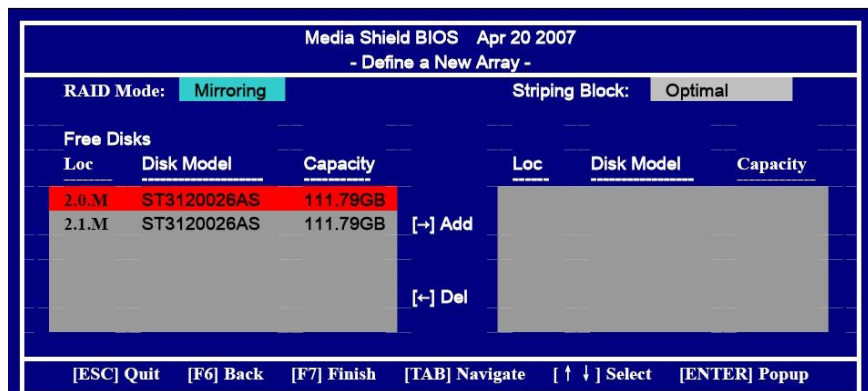
Language setting
When "Auto" is chosen, this
language setting would
accommodate to OS
language on your systems

Quick launch button at system tray

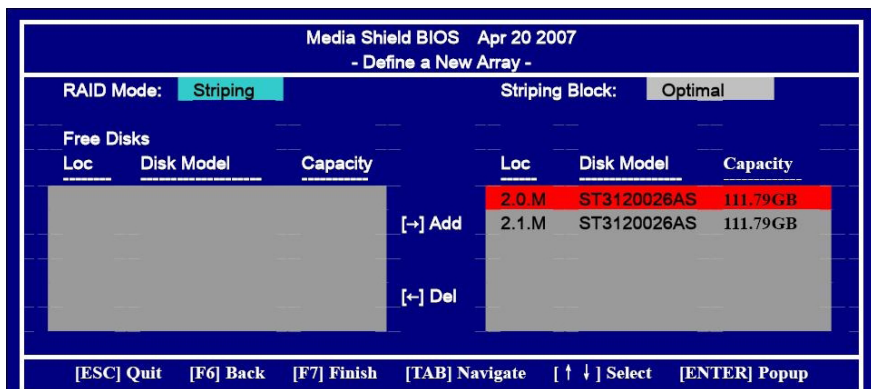
This section provides information about your current system audio device.

Entering the RAID BIOS Setup

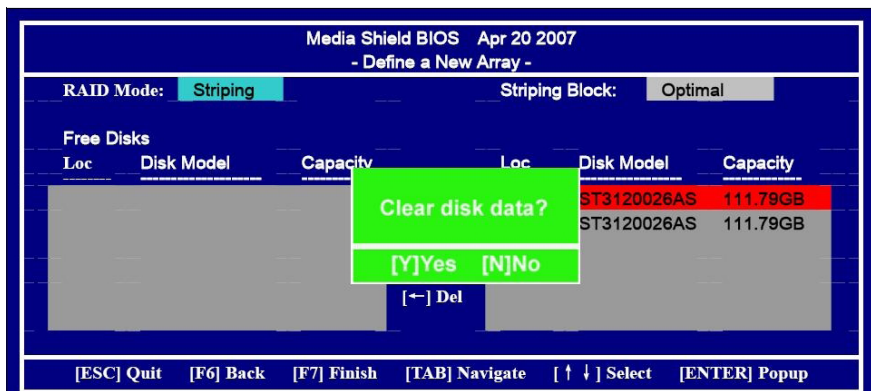
1. After rebooting your computer, wait until you see the RAID software promptint you to press F10.
2. The NVIDIA RAID Utility –Define a New Array window appears



3. In the RAID Mode field, use the UP or Down ARROW key to select a RAID Mode. The supported RAID modes include Mirroring (RAID 1), Striping (RAID 0) and Stripe Mirroring (RAID 0+1), Spanning(JBOD) and RAID 5. The following is an example of RAID 0 array creation.
4. If RAID 0(Striping) is selected, you can manually set the striping block size. in the Striping Block field, use the UP or DOWN ARROW ey to set the Striping Block size. The KB is standard unit of Striping Block size. We recommend you leaving it to the default setting-Optimal(64k). The size range is from 4k to 128k.
5. Select the hard drivers which you wish to be included in the disk array. The Free Disks section displays the information about the currently installed SATA hard drives. Press the TAB key to move to the Free Disks section. Select the target hard drives using the UP or DOWN ARROW key and use the RIGHT ARROW key to add the hard drives to the Array Disks section.



- Press F7 after selecting the target hard disks. A message which says "Clear disk data?" will appear. If you are sure to clear the data in the selected hard drives, press Y. (If the hard drives contain previously created RAID array, you need to press Y to clear the data from the hard drives.)



- After that, then Array List screen displaying the RAID array you created will appear. If you want to set the disk array as boot device, use the UP or DOWN ARROW key to select the array and press B. The Boot section will show Yes.

Media Shield BIOS Apr 20 2007				
- Array List -				
Boot	Id	Status	Vendor	Array Model Name
No	2	Healthy	NVIDIA	STRIPE 223.57G
[Ctrl-X] Exit [↑ ↓] Select [B] Set Boot [N] New Array [ENTER] Detail				

8. To read more information about the RAID array, press ENTER to enter the Array Detail screen, where you should see detailed information about RAID mode, disk block size, disk model name, and disk capacity, etc.

Media Shield BIOS Apr 20 2007					
- Array Detail -					
RAID Mode: Striping					
Striping Width : 1			Striping Block:64K		
<u>Adapt</u>	<u>Channel</u>	<u>M/S</u>	<u>Idex</u>	<u>Disk Model</u>	<u>Capacity</u>
1	0	Master	0	ST3120026AS	111.79GB
1	1	Master	1	ST3120026AS	111.79GB

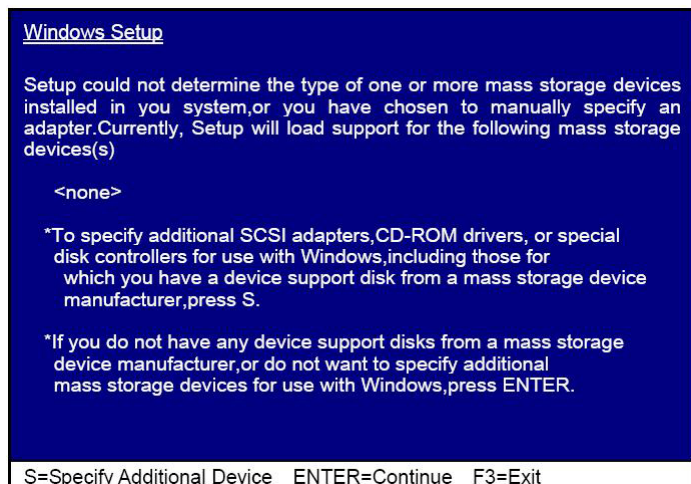
9. To delete the array, press D in the Array Detail screen. When the “Delete this array?” message appears, press Y to confirm or N to cancel. Press ENTER to return to the Array List screen. To exit the Nvidia RAID utility, press ESC in the main menu or Ctrl+X in the Array List screen. Now, you can proceed to install the SATA controller driver and operating system.

Installing the RAID Drivers

1. After you complete the RAID BIOS setup, boot from the windowsXP CD. The Windows Setup program starts.



2. Press F6 and wait a few moments for the Windows Setup screen to appear.



3. Specify the NVIDIA drivers.

- (1). Insert the floppy that has the RAID driver, press S, then press Enter.

Windows Setup

You have chosen to configure a SCSI Adapter for use with Windows,
Using a device support disk provided by an adapter manufacturer.

Select the SCSI Adapter you want from the following list, or press ESC
To return to the previous screen.

NVIDIA RAID CLASS DRIVER
NVIDIA Nforce Storage Controller

ENTER=Select F3=Exit

- (2). Select "NVIDIA RAID CLASS DRIVER" and then press Enter.

Windows Setup

Setup will load support for the following mass storage device(s);

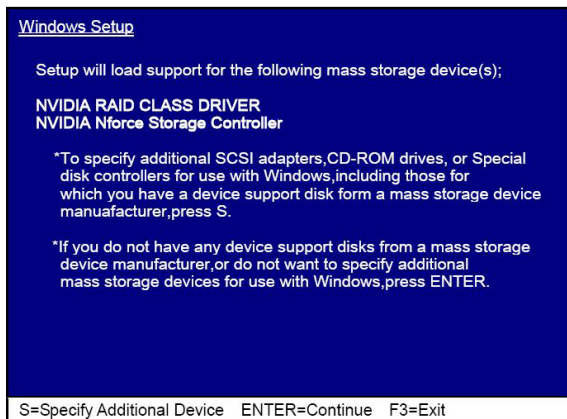
NVIDIA RAID CLASS DRIVER

*To specify additional SCSI adapters, CD-ROM drives, or Special
disk controllers for use with Windows, including those for
which you have a device support disk from a mass storage device
manufacturer, press S.

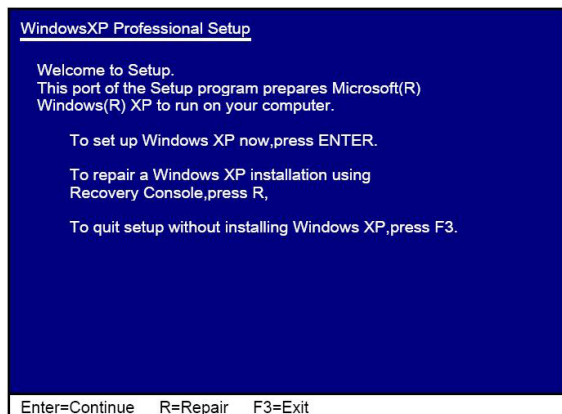
*If you do not have any device support disks from a mass storage
device manufacturer, or do not want to specify additional
mass storage devices for use with Windows, press ENTER.

S=Specify Additional Device ENTER=Continue F3=Exit

- (3). Press S again at the Specify Devices screen, then press Enter.
- (4). Select "NVIDIA Nforce Storage Controller" and then press Enter.



4. Press Enter to continue with Windows XP Installation.
Be sure to leave the floppy disk inserted in the floppy drive until the blue screen portion of Windows XP installation is completed, then take out the floppy.
5. Follow the instructions on how to install Windows XP.
During the GUI portion of the install you might be prompted to click Yes to install the RAID driver. Click Yes as many times as needed in order to finish the installation. This will not be an issue with a signed driver.



Reference Information

Hybrid SLI Technology

Built upon NVIDIA SLI[®] technology, Hybrid SLI[®] enables NVIDIA[®] discrete GPUs and NVIDIA motherboard GPUs to work together to deliver multi-GPU benefits. Hybrid SLI provides significant performance scaling through GeForce[®] Boost and compelling power and noise reduction benefits through HybridPower[™].

Hybrid SLI

SLI technology enables two discrete GPUs to work together and provide increased graphics performance. Hybrid SLI technology is similar to SLI technology in that it enables a motherboard GPU (mGPU) to work with a discrete GPU (dGPU) to provide two key benefits to the user.

☐ **GeForce Boost**

The GeForce Boost feature enables the motherboard GPU to work collaboratively with the discrete GPU to increase the performance of the discrete GPU. When GeForce Boost is enabled, the mGPU and dGPU share the rendering load by rendering different frames of an image. Thus the graphics processing power of the mGPU is harnessed to enhance the processing power of the dGPU.

☐ **HybridPower**

The HybridPower feature enables the user to switch off the dGPU when the maximum performance of the dGPU is not required and use the mGPU for non-intensive graphics applications, such as high definition DVD playback, Web surfing, and office productivity applications. Switching off the dGPU not only lowers the total system power consumption but also lowers total system noise and heat.

Hybrid SLI Requirements

- ☐ Hybrid SLI-enabled motherboard and discrete GPUs (go to www.nvidia.com/hybridSLI for a full list.)
- ☐ HybridPower-enabled power supply (go to www.nvidia.com/hybridSLI for a full list.)
- ☐ Windows Vista operating system
- ☐ At least 2GB of system memory
- ☐ Latest NVIDIA Graphics Driver from www.nvidia.com
- ☐ Systems BIOS programmed to enable Hybrid SLI (see next page)

Supported dGPUs

GeForce Boost

The GeForce Boost feature of Hybrid SLI works only with specific dGPUs whose performance is comparable with the mGPU. The list of dGPUs supported by the GeForce Boost feature can be found at www.nvidia.com/hybridSLI.

Note:

For best GeForce Boost performance, an AMD Phenom CPU that supports HT3 protocol is recommended.

HybridPower

The HybridPower feature is supported by specific dGPUs that are able to power down or enter into a low power state when the system enters Save Power mode, or stay on in Boost Performance mode. The list of the dGPUs supported by the HybridPower feature can be found at www.nvidia.com/hybridSLI.

Multi-GPU SLI Support in Hybrid SLI Systems

Certain Hybrid SLI-enabled motherboards also support multi-GPU SLI set ups. In this case, SLI works as it normally does—with two or more GPUs connected to power one display. Connecting the display to the mGPU enables HybridPower and allows the user to enter **Save Power** mode. Note that when more than one dGPU is plugged into a Hybrid SLI system, the GeForce Boost feature is not available.

Enabling Hybrid SLI

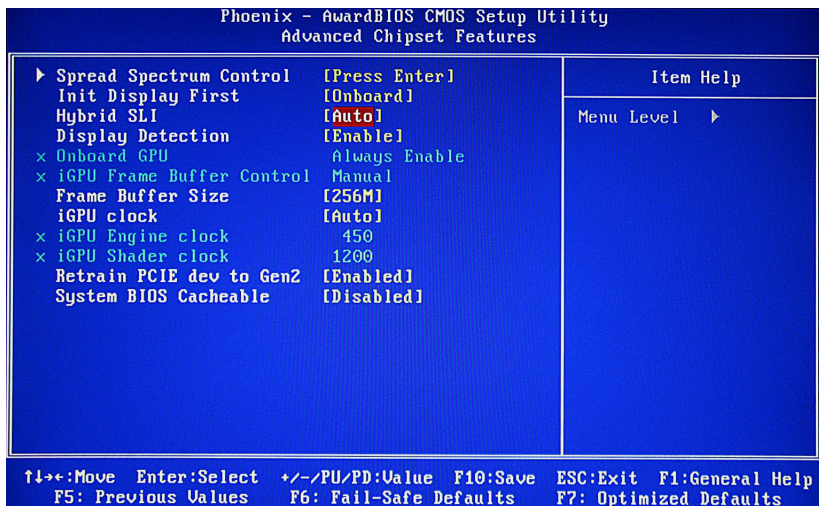
Enabling HybridPower

To enable HybridPower, the switches that control Hybrid SLI must be set to the appropriate values in the **System BIOS settings**. Go into the system BIOS and go to **Advanced→Chipset** to ensure that the following settings are set to the values given:

- ☐ **Hybrid Support:Enabled**
This enables hybrid functionality in the BIOS.
- ☐ **Onboard or mGPU Enable:.....Enabled**
When Hybrid is enabled, the Onboard GPU is automatically enabled.
- ☐ **Preferred or Primary Boot GPU:...mGPU**
This sets the primary display adapter. For HybridPower, this must be set to mGPU.
- ☐ **mGPU Frame Buffer Control:.....Manual**
- ☐ **mGPU Frame Buffer Size:.....256 MB**
The Frame Buffer size must be set to a minimum of 256MB for Hybrid SLI.

Note:

There may be differences in these menu items depending upon the manufacturer of your motherboard.



Enabling GeForce Boost

To enable GeForce Boost, the switches that control Hybrid SLI must be set to the appropriate values in the System BIOS settings. Go into the system BIOS and go to **Advanced→Chipset** to ensure that the following settings are set to the values given:

- ☐ **Hybrid Enable:****Enabled**
This enables hybrid functionality in the BIOS.
- ☐ **Onboard or mGPU Enable:** **Enabled**
When Hybrid is enabled, the Onboard GPU is automatically enabled.
- ☐ **Preferred or Primary Boot GPU:..mGPU**
This sets the primary display adapter. For GeForce Boost, this can be set to either the mGPU or the dGPU.
- ☐ **mGPU Frame Buffer Control:****Manual**
- ☐ **mGPU Frame Buffer Size:****256 MB**
The Frame Buffer size must be set to a minimum of 256MB for Hybrid SLI.

Note:

There may be differences in these menu items depending upon the manufacturer of your motherboard.

When the System BIOS is setup correctly and the Hybrid SLI drivers are installed on a hybrid-enabled system, the Hybrid UI icon displays in the Windows Vista system tray.



Click the icon to display the Hybrid UI

Disabling Hybrid SLI

Traditional dGPU Mode

The Hybrid SLI feature can be disabled if desired by settings the appropriate Hybrid SLI switches in the System BIOS settings. The system can be put into the traditional operating mode where the discrete GPU performs all the graphics processing and drives the display. The motherboard GPU will be disabled in this mode. To disable Hybrid SLI and put the system in the traditional dGPU based operating mode, the following switches in the System BIOS settings must be set to the corresponding values given below. Go into the system BIOS and go to **Advanced→Chipset** to ensure that the following settings are set to the values given:

- ☐ **Hybrid Enable:Disabled**
This disables hybrid functionality in the BIOS.
- ☐ **Onboard or mGPU Enable:.....Disabled**
When Hybrid is disabled, the Onboard GPU is automatically disabled.
- ☐ **Preferred or Primary Boot GPU:...dGPU**
This sets the primary display adapter. This is automatically set to dGPU when Hybrid is disabled.
- ☐ **mGPU Frame Buffer Control:.....Manual**
- ☐ **mGPU Frame Buffer Size:.....0 MB**
The Frame Buffer size must be set to the lowest possible value when the Onboard/ mGPU is disabled.

Note:

There may be differences in these menu items depending upon the manufacturer of your motherboard.

Multi-adapter Mode

When Hybrid SLI is disabled, the system can be programmed to be in multi-adapter mode by enabling both the dGPU and mGPU. This will allow the user to connect displays to both the mGPU and the dGPU. The system can be put into multi-adapter mode by setting the appropriate Hybrid SLI switches in the System BIOS settings. Go into the system BIOS and go to **Advanced→Chipset** to ensure that the following settings are set to the values given:

- ☐ **Hybrid Enable:.....Disabled**
This disables hybrid functionality in the BIOS.
- ☐ **Onboard or mGPU Enable:Enabled**
When Hybrid is disabled, the Onboard GPU is automatically disabled. The user must manually enable the mGPU to enable multi adapter mode.
- ☐ **Preferred or Primary Boot GPU:...dGPU**
This sets the primary display adapter. This is automatically set to dGPU when Hybrid is disabled.
- ☐ **mGPU Frame Buffer Control:.....Auto**
- ☐ **mGPU Frame Buffer Size:.....128MB**

Note:

There may be differences in the menu items above depending upon the manufacturer of your motherboard.

Multi-adapter mode is also supported when Hybrid SLI is enabled. The system can be put in Multi-adapter mode through the Hybrid SLI User Interface. The Hybrid SLI User Interface chapter describes how the system can be put into Multi-adapter mode when Hybrid SLI is enabled.

Hybrid SLI User Interface

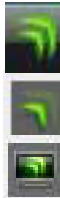
The Hybrid SLI icon is placed in the system tray when Hybrid SLI is enabled in the system BIOS (Figure 1).



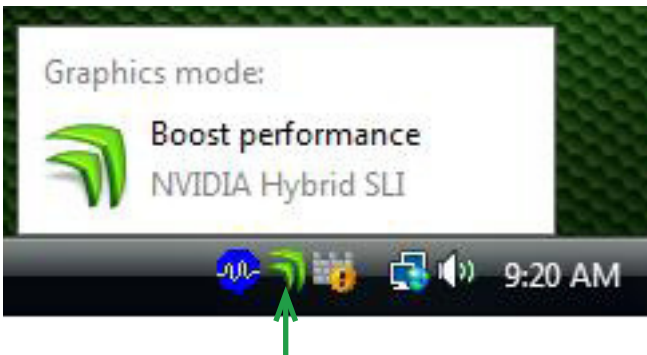
Figure 1. Hybrid SLI UI in System Tray

Viewing the icon tells you which mode the system is currently in.

- ☐ **Performance mode**
The entire icon is green
- ☐ **Save Power mode**
Half the icon is lit (one arc is lit).
- ☐ **Additional Displays mode**
Hybrid SLI is disabled




Another way to see what mode you are running in is to pause the mouse over the icon until the **Graphics mode** window displays.



Pause your mouse over the icon to display the Graphics mode window

Selecting a Hybrid Mode

Another way to see the current Hybrid mode of the system, and to change that mode, is to click on the Hybrid SLI icon  to display the **Select a Hybrid SLI mode** window.



The options available on this window are:

- ☐ **Save Power mode**
This is the Hybrid SLI mode where the dGPU completely shuts off and the mGPU renders and drives the display
- ☐ **Boost Performance mode**
This is the Hybrid SLI mode where the dGPU and mGPU are simultaneously active and working collaboratively to provide higher performance.
- ☐ **Additional Displays mode**
Hybrid SLI is disabled in this mode. The dGPU and mGPU operate independently to support **Multi-Adapter** mode.

Note:

The Hybrid SLI control panel indicates when a hybrid mode change cannot be made due to open applications (see Figure 2). The Hybrid SLI control panel also indicates when the user-selected Hybrid State is not in sync with the Windows Vista Power Profile of the system

HybridPower Settings

Blocking Applications

- ❑ Transitioning from **Boost Performance** mode to **Save Power** mode and vice versa is allowed only when there are no open 3D applications. The Hybrid SLI control panel prevents the transition when there are open 3D applications.
- ❑ The Hybrid SLI control panel provides a list of applications that are blocking the Hybrid SLI transition and asks the user to close those applications to complete the transition (Figure 2).

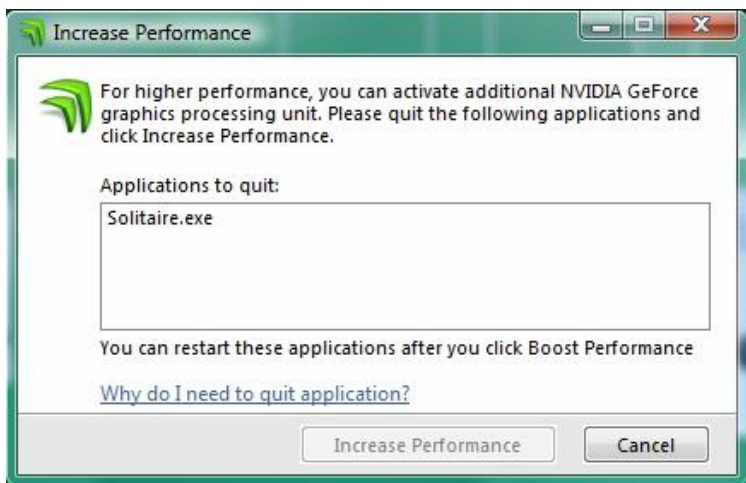


Figure 2. Open 3D Applications Block Hybrid SLI Transition

Settings to Enable Automatic Save Power Mode

On a Hybrid SLI system that is capable of supporting **HybridPower** mode, the user can program the Hybrid API to automatically put the system into **Save Power** mode after four minutes of system idle. This is done through the Windows Vista Power Plan settings (Figure 3).



Figure 3. Desktop Settings in Windows Vista Power Plan

Once the settings have been done in the Windows Vista Power Plan options, the NVIDIA driver automatically changes the system mode to **Save Power** after four minutes of WinIdle detection and saves the current Hybrid SLI mode. When WinIdle state is exited, the system automatically reverts back to the saved Hybrid SLI mode.

Connecting Displays to Hybrid SLI Systems

There are three use case examples in this section of Hybrid SLI technology.

Case 1: All Displays Connected to mGPU

Connecting one or two displays to your mGPU (Figure 4) is the ideal way to experience Hybrid SLI in most situations. Not only do you get the added performance boost from GeForce Boost (only on certain discrete GPUs), you also have the flexibility to switch between **Save Power** and **Performance** modes with the HybridPower feature (only on certain discrete GPUs). Table 1 lists the benefits of the Hybrid SLI modes.

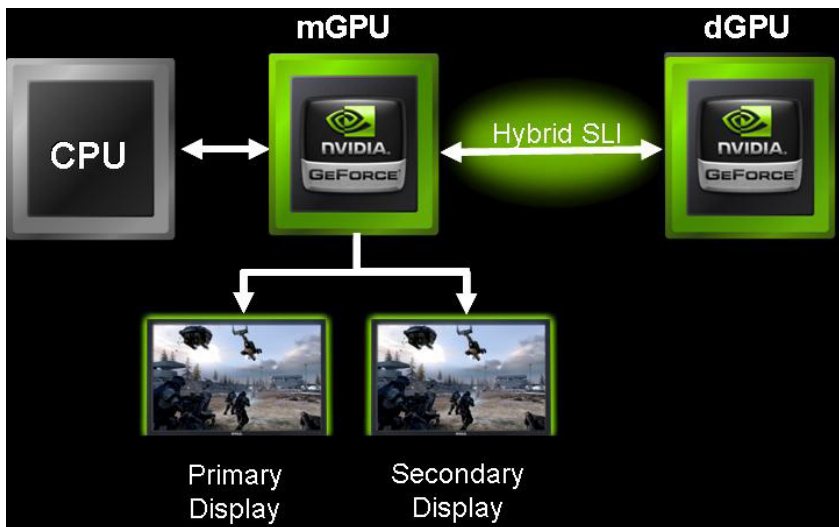


Figure 4. Displays Connected to mGPU

Table 1. HSLI Mode Benefits for Case 1

HSLI Mode	Enabled	Benefit
Performance	Yes	Additive GPU performance (Only on supported dGPUs. Refer to www.nvidia.com/hybridSLI)
Save Power	Yes	Power Savings and lower noise due to dGPU shutdown (only on supported dGPUs. Refer to www.nvidia.com/hybridSLI)

Case 2: All Displays Connected to dGPU

Connecting displays to the dGPU (Figure 5) disables **Save Power** mode but **Performance** mode will still be available (only with supported dGPUs). Table 2 lists the benefits of the Hybrid SLI modes in this usage case

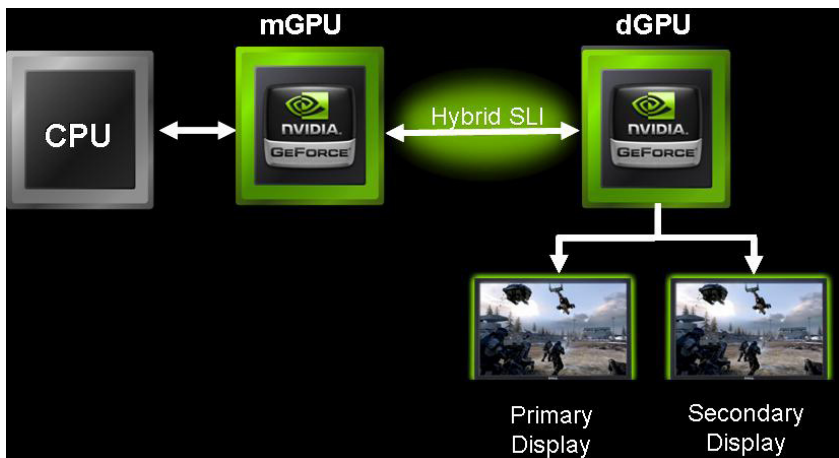


Figure 5. All Displays Connected to dGPU

Table 2. HSLI Mode Benefits for Case 2

HSLI Mode	Enabled	Benefit
Performance	Yes	Additive GPU performance (Only on supported dGPUs. Refer to www.nvidia.com/hybridSLI)
Save Power	No	Not supported because dGPU must be turned on to drive display.

If you connect displays to both the mGPU and dGPU and enable multi-adapter mode through the Hybrid User Interface then the **Performance** mode is disabled. The **Performance** feature is only available when the system is not in multi-adapter mode.

Case 3: Displays Connected to Both the mGPU and the dGPU

Multi-adapter mode allows you to activate displays connected to both the mGPU (up to two displays) and the dGPU (up to two displays). Multi-adapter mode can be enabled either through the System BIOS or through the Hybrid User Interface. You can enable Multi-adapter mode through the Hybrid User Interface by selecting the **Additional Displays** option. You can enable Multi-adapter mode through the System BIOS by setting the SBIOS switches to the values described in 'Disabling Hybrid SLI' on page 5. Enabling Multi-adapter mode through the System BIOS disables the Hybrid SLI features and does not allow you to take advantage of the **GeForce Boost** or **Hybrid-Power** features. This type of connection scenario is ideal only if you would like to always drive displays connected to the mGPU and the dGPU

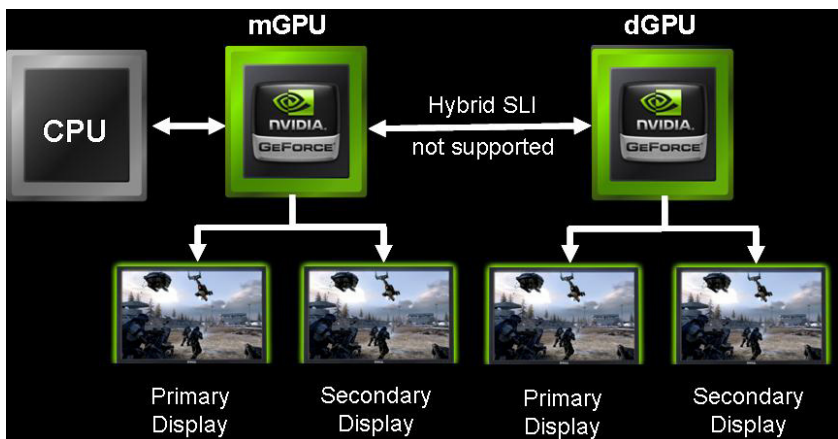


Figure 6. Displays Connected to Both mGPU and dGPU

Table 3. HSLI Mode Benefits for Case 3

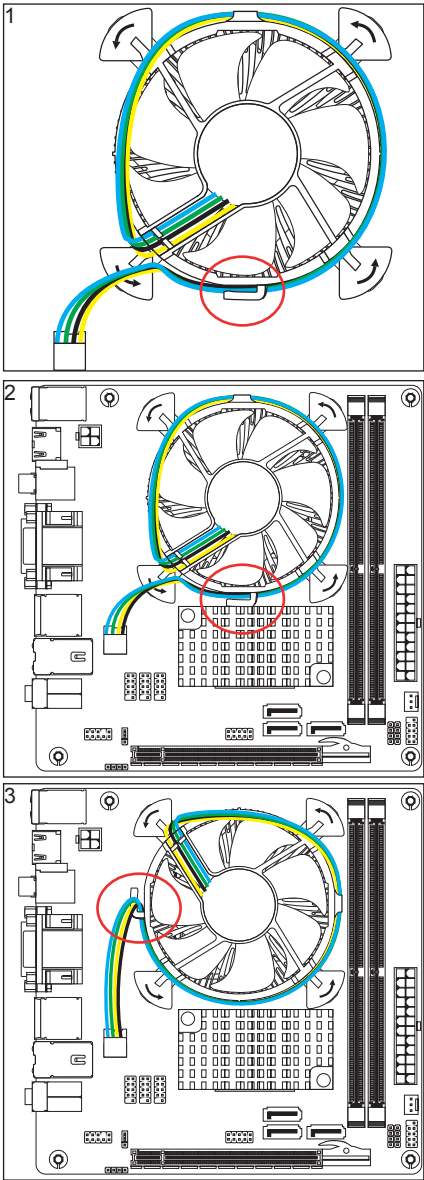
HSLI Mode	Enabled	Benefit
Performance	No	Not supported. Each GPU functions as independent adapter
Save Power	No	Not supported. Each GPU functions as independent adapter and dGPU must be turned on for it to drive its displays.

Precaution :
Intel CPU Cooling Fan Installation

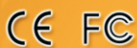
Intel Core2Duo CPU may be bundled with Low Profile Cooling Fan which carries plastic hooks at the edges of the Cooling Fan. The plastic hooks help to arrange the connection wires in a tidy way

If the CPU Cooling Fan is installed in a orientation in which one of the plastic hooks come into direct contact with the motherboard's Chipset Heatsink, then the plastic hook may press against the Chipset Heatsink. This could result in the Chipset Heatsink to be raised at one side, forming a small angle to the original horizontal position. Most of the thermal contact area will be lost, and the Chipset temperature will rise to unexpected high figures. System would fail due to overheating at the Chipset.

A practical workaround is to re-arrange the orientation of the CPU Cooling Fan, rotate the CPU Cooling Fan by 90 degree, such that the plastic hooks do not come into direct contact with the Chipset Heatsink.



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