P8Z68
Deluxe

Motherboard

E6614

First Edition (V1)
May 2011

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Notices

Federal Communications Commission Statement

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

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

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

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

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

Canadian Department of Communications Statement

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

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

REACH

Complying with the REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) regulatory framework, we published the chemical substances in our products at ASUS REACH website at http://csr.asus.com/english/REACH.htm.

> **DO NOT** throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

> **DO NOT** throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Ensure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, ensure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product introduction**

    This chapter describes the features of the motherboard and the new technology it supports.

- **Chapter 2: Hardware information**

    This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.

- **Chapter 3: BIOS setup**

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

- **Chapter 4: Software support**

    This chapter describes the contents of the support DVD that comes with the motherboard package and the software.

- **Chapter 5: Multiple GPU technology support**

    This chapter describes how to install and configure multiple ATI® CrossFireX™ and NVIDIA® SLI™ graphics cards.

Where to find more information

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

1. **ASUS websites**

    The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. **Optional documentation**

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

Conventions used in this guide

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

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

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

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

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

Typography

Bold text	Indicates a menu or an item to select.
Italics	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.
	Example: <Enter> means that you must press the Enter or Return key.
<Key1> + <Key2> + <Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).
	Example: <Ctrl> + <Alt> + <Del>

P8Z68 Deluxe specifications summary

CPU	LGA1155 socket for Intel® 2nd Generation Core™ i7 / Core™ i5 / Core™ i3 Processors Supports 32nm CPU Supports Intel® Turbo Boost Technology 2.0 * The Intel® Turbo Boost Technology 2.0 support depends on the CPU types. ** Refer to www.asus.com for Intel CPU support list
Chipset	Intel® Z68 Express Chipset
Memory	4 x DIMM, max. 32GB, DDR3 2200(O.C.)* / 2133(O.C.) / 1866(O.C.) / 1600 / 1333 / 1066 MHz, non-ECC, un-buffered memory Dual channel memory architecture Supports Intel® Extreme Memory Profile (XMP) * Due to CPU behavior, DDR3 2200/2000/1800 MHz memory module will run at DDR3 2133/1866/1600 MHz frequency as default. ** Hyper DIMM support is subject to the physical characteristics of individual CPUs. Some hyper DIMMs only support one DIMM per channel. Please refer to Memory QVL for details. *** Refer to www.asus.com or this user manual for the Memory QVL (Qualified Vendors Lists)
Expansion slots	2 x PCI Express 2.0 x16 slots (single at x16 or dual at x8/x8 mode) 1 x PCI Express 2.0 x16 slot [black] (at x4 mode, compatible with PCIe x1 and x4 devices) 2 x PCI Express 2.0 x1 slots 2 x PCI slots
Multi-GPU support	Supports NVIDIA® Quad-GPU SLI™ Technology Supports ATI® Quad-GPU CrossFireX™ Technology
Storage	**Intel® Z68 Express Chipset** - 2 x SATA 6.0 Gb/s ports (gray) - 4 x SATA 3.0 Gb/s ports (blue) - Intel® Rapid Storage Technology supports RAID 0, 1, 5, and 10 - Support Intel® Smart Response Technology **Marvell® PCIe 9128 SATA 6.0 Gb/s controller with HyperDuo function*** - 2 x SATA 6.0 Gb/s ports (navy blue) **JMicron® JMB362 SATA controller*** - 2 x eSATA 3.0 Gb/s ports (1 x Power eSATA) * These SATA ports are for data hard drives only. ATAPI devices are not supported.
LAN	Dual Gigabit LAN controllers—802.3az Energy Efficient Ethernet (EEE) appliance Intel® 82579 Gigabit LAN controller—Dual interconnect between the Integrated LAN controller and Physical Layer (PHY) Realtek® 8111E Gigabit LAN controller
Bluetooth	Bluetooth v2.1 + EDR ASUS BT GO! Utility

P8Z68 Deluxe specifications summary

Audio	Realtek® ALC889 8-channel High Definition Audio CODEC - Absolute Pitch 192khz/24bit True BD Lossless Sound - BD Audio Layer Content Protection - DTS Surround Sensation UltraPC - Supports Jack-Detection, Multi-Streaming and Front Panel Jack-Retasking - Coaxial / Optical S/PDIF Out ports at back I/O
IEEE 1394	VIA® 6315N controller supports 2 x IEEE 1394a ports (one at midboard, one at back panel)
USB	**2 x NEC® USB 3.0 controllers** - 2 x USB 3.0 ports at midboard for front panel support - 2 x USB 3.0 ports at back panel (blue) **Intel® Z68 Express Chipset** - 12 x USB 2.0 ports (4 ports at midboard; 8 ports at back panel)

ASUS unique features	**ASUS Dual Intelligent Processors 2 with DIGI+ VRM:**
	
	  ASUS DIGI+ VRM
	  - Industry leading Digital 16 Phase* Power Design
	  - ASUS DIGI+ VRM Utility
	* 12-phase for CPU, 4-phase for iGPU
	
	  ASUS EPU
	  - EPU, EPU switch
	
	  ASUS TPU
	  - Auto Tuning, TurboV, TPU switch
	
	ASUS BT GO! (Bluetooth):
	- Folder Sync, BT Transfer, Shot & Send, BT to Net, Music Player, Personal Manager
	
	ASUS BT Turbo Remote:
	- Exclusive Smartphone Interface supporting iPhone, Android, Windows Mobile, and Symbian systems
	
	ASUS Exclusive Features:
	- MemOK!
	- AI Suite II
	- AI Charger
	- Anti Surge
	- Disk Unlocker
	- ASUS EFI BIOS EZ Mode featuring friendly graphics user interface
	
	ASUS Quiet Thermal Solution:
	- ASUS Fanless Design: Heat-pipe solution
	- ASUS Fan Xpert
	
	ASUS EZ DIY:
	- ASUS Q-Shield
	- ASUS Q-Connector
	- ASUS O.C. Tuner
	- ASUS CrashFree BIOS 3
	- ASUS EZ Flash 2

ASUS Q-Design	ASUS Q-Code ASUS Q-LED (CPU, DRAM, VGA, Boot Device LED) ASUS Q-Slot ASUS Q-DIMM

P8Z68 Deluxe specifications summary

ASUS exclusive overclocking features	**Precision Tweaker 2:** - vCore: Adjustable CPU voltage at 0.005V increment - vCCIO: Adjustable I/O voltage at 0.00625V increment - vCCSA: 144-step system agent voltage control - vDRAM Bus: 160-step Memory voltage control - vPCH: 90-step Chipset voltage control - vCPU PLL: 160-step CPU & PCH PLL voltage control **SFS (Stepless Frequency Selection):** - BCLK/PCIE frequency tuning from 80MHz up to 300MHz at 0.1MHz increment **Overclocking Protection:** - ASUS C.P.R.(CPU Parameter Recall)
Back panel I/O ports	1 x PS/2 keyboard/mouse combo port 1 x Coaxial S/PDIF Out port 1 x Optical S/PDIF Out port 1 x Bluetooth module 2 x eSATA ports (1 x Power eSATA) 1 x IEEE 1394a port 2 x LAN (RJ-45) ports (1 x Intel® LAN) 2 x USB 3.0/2.0 ports (blue) 8 x USB 2.0/1.1 ports 1 x Clear CMOS switch 8-channel Audio I/O ports
Internal I/O connectors	1 x USB 3.0/2.0 connector supports additional 2 USB ports (19-pin) 2 x USB 2.0/1.1 connectors support additional 4 USB ports 4 x SATA 6.0 Gb/s connectors (2 x gray; 2 x navy blue) 4 x SATA 3.0 Gb/s connectors (blue) 1 x CPU Fan connector (4-pin) 2 x Chassis Fan connectors (1 x 4-pin, 1 x 3-pin) 2 x Power Fan connectors (2 x 3-pin) 1 x IEEE1394a connector Front panel audio connector 1 x S/PDIF Out header 24-pin EATX Power connector 8-pin EATX 12V Power connector System Panel (Q-Connector) 1 x MemOK! button 1 x EPU switch 1 x TPU switch 1 x Power-on switch 1 x Reset switch
BIOS features	64 Mb Flash ROM, EFI AMI BIOS, PnP, DMI 2.0, WfM 2.0, SM BIOS 2.5, ACPI 2.0a, Multi-language BIOS, ASUS EZ Flash 2, ASUS CrashFree BIOS 3, F12 PrintScreen Function
Manageability	WfM 2.0, DMI 2.0, WOL by PME, WOR by PME, PXE
Support DVD contents	Drivers ASUS Utilities ASUS Update Anti-virus software (OEM version)
Form factor	ATX form factor: 12 in. x 9.6 in. (30.5 cm x 24.4 cm)

*Specifications are subject to change without notice.

Chapter 1

1.1   Welcome!
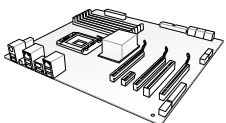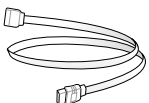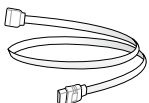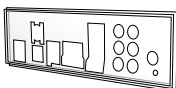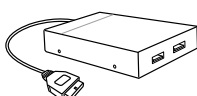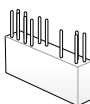
Thank you for buying an ASUS® P8Z68 Deluxe motherboard!

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of ASUS quality motherboards!

Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below.

1.2   Package contents

Check your motherboard package for the following items.

ASUS P8Z68 Deluxe motherboard	User guide	Support DVD
4 x Serial ATA 6.0 Gb/s cables	2 x Serial ATA 3.0 Gb/s cables	1 x ASUS SLI™ bridge connector
1 x ASUS Q-Shield	1 x ASUS front panel USB 3.0 box	1 x 2-in-1 ASUS Q-Connector kit

> • If any of the above items is damaged or missing, contact your retailer.
> • The illustrated items above are for reference only. Actual product specifications may vary with different models.

1.3 Special features

1.3.1 Product highlights

LGA1155 socket for Intel® Second Generation Core™ i7 / Core™ i5 / Core™ i3 Processors

This motherboard supports the Intel® second generation Core™ i7 / Core™ i5 / Core™ i3 processors in LGA1155 package with memory and PCI Express controllers integrated to support 2-channel (4 DIMMs) DDR3 memory and 16 PCI Express 2.0 lanes. This provides great graphics performance. Intel® **second generation Core™ i7 / Core™ i5 / Core™ i3** processors are among the most powerful and energy efficient CPUs in the world.

Intel® Z68 Express Chipset

The Intel® Z68 Express Chipset is the latest single-chipset design to support the new 1155 socket Intel® Core™ i7 / Core™ i5 / Core™ i3 second generation processors. It uses serial point-to-point links, which allows increased bandwidth and stability, and provides an improved performance. It also provides two SATA 6.0 Gb/s and four SATA 3.0 Gb/s ports for faster data retrieval at double the bandwidth of current bus systems. Moreover, Intel® Z68 Express Chipset also supports iGPU function, letting users enjoy the latest Intel integrated graphic performance.

Intel® Smart Response Technology

Intel® Smart Response Technology boosts overall system performance. It uses an installed fast SSD (min 18.6GB available capacity required) as a cache for frequently accessed data. Key benefits include reduced load and wait times, and lower power consumption through the elimination of unnecessary hard drive spin. This technology combines SSD performance with hard drive capacity, operating up to 4X faster than a hard drive-only system, and an important part of Green ASUS eco-friendly computing.

Quad-GPU SLI™ and Quad-GPU CrossFireX™ Support

The motherboard's powerful Intel® Z68 platform optimizes PCIe allocation in multiple-GPU configurations of either SLI™ or CrossFireX™. This allows you to enjoy a never before-experienced brand new gaming style.

Dual-Channel DDR3 2200(O.C.) / 2133(O.C.) / 1866(O.C.) / 1600 / 1333 / 1066 Support

The motherboard supports DDR3 memory that features data transfer rates of 2200(O.C.) / 2133(O.C.) / 1866(O.C.) / 1600 / 1333 / 1066 MHz to meet the higher bandwidth requirements of the latest 3D graphics, multimedia, and Internet applications. The dual-channel DDR3 architecture enlarges the bandwidth of your system memory to boost system performance.

* Due to CPU behavior, DDR3 2200/2000/1800 MHz memory module will run at DDR3 2133/1866/1600 MHz frequency as default.

Complete USB 3.0 Integration

ASUS facilitates strategic USB 3.0 accessibility for both the front and rear panel – 4 USB 3.0 ports in total. Experience the latest plug & play connectivity at speeds up to 10 times faster than USB 2.0. The P8Z68 Deluxe affords greater convenience to high speed connectivity.

Extra SATA 6.0 Gb/s Support

The Intel® Z68 Express Chipset natively supports the next-generation Serial ATA (SATA) interface, delivering up to 6.0 Gb/s data transfer. ASUS provides extra SATA 6.0 Gb/s ports with enhanced scalability, faster data retrieval, and double the bandwidth of current bus systems.

ASUS Front Panel USB 3.0 Box

ASUS feature-proofs your PC with full USB 3.0 implementation for better computing through super-fast data transfers. The provided standard-sized USB 3.0 front panel box is compatible with most PC cases, letting you enjoy the faster throughput of USB 3.0 without relegating cables and devices to the hard-to-reach rear I/O or having to purchase a new case.

1.3.2   Dual Intelligent Processors 2 with DIGI+ VRM

The world's first Dual Intelligent Processors from ASUS pioneered the use of two onboard chips—EPU (Energy Processing Unit) and TPU (TurboV Processing Unit). New generation Dual Intelligent Processors 2 with DIGI+ VRM digital power design launch control into a new era, empowering users with superior flexibility and perfect precision to ensure optimized performance, extreme system stability and greater power efficiency.

DIGI+ VRM

New ASUS DIGI+ VRM upgrades motherboard power delivery to a digital standard. The 16 digital architecture delivers twice the precision power. With iGPU on P8Z68 Deluxe motherboards, DIGI+ VRM intelligently adjust Vcore PWM, integrated graphics voltages and frequency modulation to minimize power loss through BIOS tuning and the exclusive user interface. It increases overclocking range while performance reaches its full potential, adjusting frequencies dynamically and cutting EM interference by half to enhance system stability through enabled spread spectrum. The DIGI+ VRM digital power design empowers users with superior flexibility and perfect precision to ensure optimized performance. extreme system stability, and greater power efficiency.

2X Precise Power Control

ASUS DIGI+ VRM delivers twice the precision power, intelligently adjusting PWM voltage and frequency modulation to minimize power loss while performance reaches its full potential.

2X Less Radiation

ASUS DIGI+ VRM adjusts frequencies dynamically, cutting radiation by half to enhance system stability through enabling spread spectrum.

TPU

Unleash your performance with ASUS' simple onboard switch or AI Suite II utility. The TPU chip offers precise voltage control and advanced monitoring through Auto Tuning and TurboV functions. Auto tuning offers a user friendly way to automatically optimize the system for fast, yet stable clock speeds, while TurboV enables unlimited freedom to adjust CPU frequencies and ratios for optimized performance in diverse situations.

EPU

Tap into the world's first real-time PC power saving chip through a simple onboard switch or AI Suite II utility. Get total system-wide energy optimization by automatically detecting current PC loadings and intelligently moderating power consumption. This also reduces fan noise and extends component longevity.

1.3.3   ASUS Exclusive Features

BT GO! (Bluetooth)

Onboard Bluetooth wireless design enables smart connectivity to Bluetooth devices with no additional adapter. ASUS BT GO! comes with 7 special functions that offer significant breakthrough in Bluetooth evolution, including Folder Sync, BT Transfer, BT Turbo Remote, BT-to-Net, Music Player, Shot and Send, and Personal Manager. All are accessible through the exclusive, user-friendly ASUS interface.

MemOK!

MemOK! quickly ensures memory boot compatibility. This remarkable memory rescue tool requires a mere push of a button to patch memory issues. MemOK! determines failsafe settings and dramatically improves your system boot success.

AI Suite II

With its user-friendly interface, ASUS AI Suite II consolidates all the exclusive ASUS features into one simple to use software package. It allows you to supervise overclocking, energy management, fan speed control, voltage and sensor readings, and even interact with mobile devices via Bluetooth. This all-in-one software offers diverse and ease to use functions, with no need to switch back and forth between different utilities.

1.3.4   ASUS Quiet Thermal Solution

ASUS Fanless Design—Heat-pipe solution

The ASUS heat-pipe features 0-dB thermal solution that offers you a noiseless PC environment. Its beautiful shape upgrades the visual enjoyment and the heat-pipe design lowers the temperature of the chipset and power phase area through high efficient heat-exchange. Combined with usability and aesthetics, the ASUS heat-pipe gives you an extremely silent and cooling experience with its elegant appearance.

> DO NOT uninstall the heat-pipe by yourself. Doing so may bend the tubing and affect the heat dissipation performance.

ASUS Fan Xpert

ASUS Fan Xpert intelligently allows you to adjust both the CPU and chassis fan speeds according to different ambient temperatures caused by different climate conditions in different geographic regions and your PC's loading. The built-in variety of useful profiles offer flexible controls of fan speed to achieve a quiet and cool environment.

1.3.5   ASUS EZ DIY

ASUS UEFI BIOS (EZ Mode)

ASUS UEFI BIOS offers a user-friendly interface that goes beyond traditional keyboard-only BIOS controls to enable more flexible and convenient mouse input. Users can easily navigate the UEFI BIOS with the smoothness of their operating system. Quick and simple overclocking and setup sharing is facilitated by the F12 hotkey BIOS snapshot feature. The exclusive EZ Mode displays frequently-accessed setup info, while the Advanced Mode is for experienced performance enthusiasts that demand far more intricate system control, including detailed DRAM information.

Supports hard drives over 2.2TB

ASUS UEFI BIOS natively supports hard drives larger than 2.2TB in 64-bit, with full storage space utilization helping deliver far more exciting computing than traditional BIOS versions.

ASUS Q-Design

ASUS Q-Design enhances your DIY experience. All of Q-LED, Q-Slot, Q-Code and Q-DIMM design speed up and simplify the DIY process!

ASUS Q-Shield

The specially designed ASUS Q-Shield does without the usual "fingers" - making it convenient and easy to install. With better electric conductivity, it ideally protects your motherboard against static electricity and shields it against Electronic Magnetic Interference (EMI).

ASUS Q-Connector

ASUS Q-Connector allows you to easily connect or disconnect the chassis front panel cables to the motherboard. This unique module eliminates the trouble of connecting the system panel cables one at a time and avoiding wrong cable connections.

ASUS EZ-Flash 2

ASUS EZ Flash 2 is a user-friendly utility that allows you to update the BIOS without using a bootable floppy disk or an OS-based utility.

1.3.6   Other special features

LucidLogix® Virtu

LucidLogix® Virtu is designed for the Intel® Sandy Bridge platform's powerful integrated graphics. Its GPU virtualization dynamically assigns tasks to the best available graphics resources based on power, performance and system load on Windows® 7 based PCs. It allows users to fully utilize the unique capabilities of advanced Sandy Bridge multimedia features alongside the high end 3D rendering performance provided by installed graphics cards. When no discrete graphics are needed, the graphics card is put in idle mode to lower utilization, heat, fan speed and power draw down to near zero, making the system more environmentally-friendly. For users with diverse needs, LucidLogix® Virtu GPU virtualization provides great flexibility and efficiency.

Power eSATA on the Go

The Power eSATA solution combines the eSATA connector and power source together, allowing you to use external SATA devices without the need of additional power source*. Easily backup photos, videos and other entertainment contents on external devices.

* Power eSATA requires a specially designed signal cable to provide 5V power for the external SATA device. The cable is purchased separately.

DTS Surround Sensation UltraPC

DTS Surround Sensation UltraPC delivers exceptional 5.1 surround experience through the most common PC audio setups—your existing stereo speakers or headphones. In addition to virtual surround, "Bass enhancement" provides stronger low frequency bass sound, and "Voice clarification" provides clear human dialogue even with loud background sound. With these technologies, you may experience a better home-theater audio with ease.

ErP Ready

The motherboard is European Union's Energy-related Products (ErP) ready, and ErP requires products to meet certain energy efficiency requirement in regards to energy consumptions. This is in line with ASUS vision of creating environment-friendly and energy-efficient products through product design and innovation to reduce carbon footprint of the product and thus mitigate environmental impacts.

Chapter 2

2.1   Before you proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.

- •   Unplug the power cord from the wall socket before touching any component.

- •   Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.

- •   Hold components by the edges to avoid touching the ICs on them.

- •   Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.

- •   Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.

2.2 Motherboard overview

2.2.1 Motherboard layout
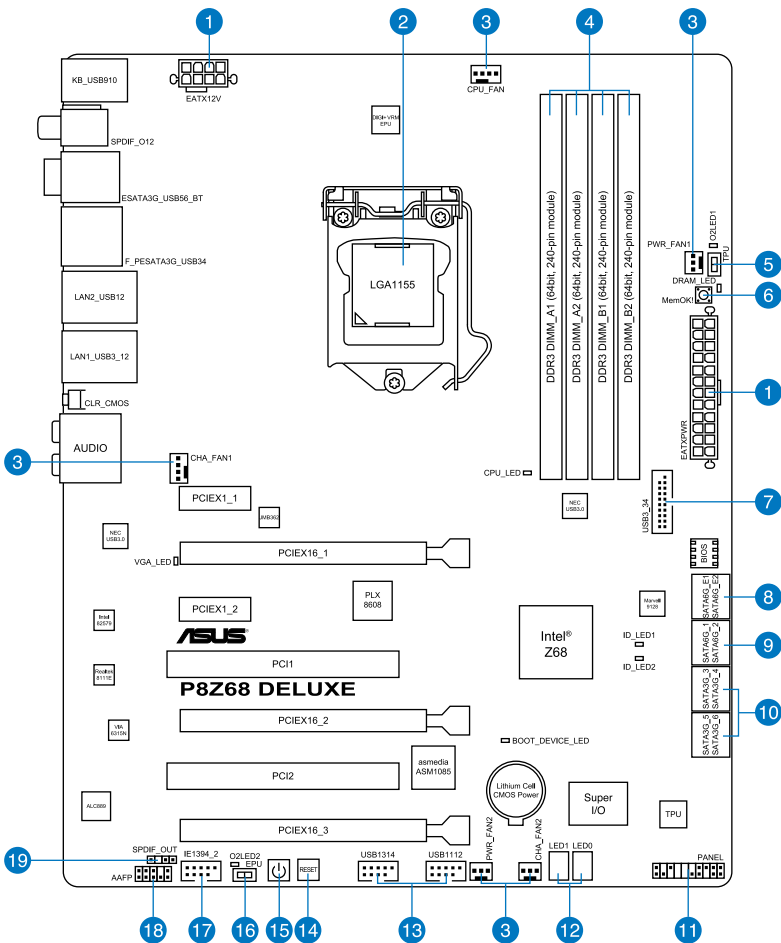
Refer to **2.2.7 Internal connectors** and **2.3.10 Rear panel connection** for more information about rear panel connectors and internal connectors.

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Chapter 2

2.2.2 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA1155 socket designed for the Intel®
2nd Generation Core™ i7 / Core™ i5 / Core™ i3 Processors.
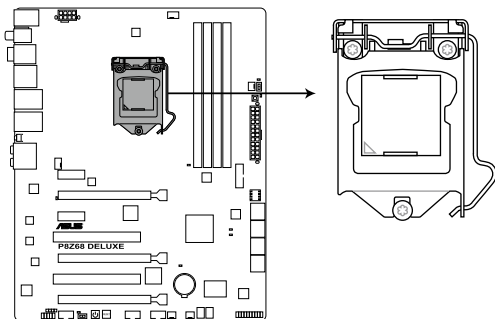
P8Z68 DELUXE CPU LGA1155

Ensure that all power cables are unplugged before installing the CPU.

• The LGA1156 CPU is incompatible with the LGA1155 socket. DO NOT install a LGA1156 CPU on the LGA1155 socket.

• Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.

• Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA1155 socket.

• The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

2.2.3   System memory

The motherboard comes with four Double Data Rate 3 (DDR3) Dual Inline Memory Modules (DIMM) slots.

> A DDR3 module is notched differently from a DDR or DDR2 module. DO NOT install a DDR or DDR2 memory module to the DDR3 slot.
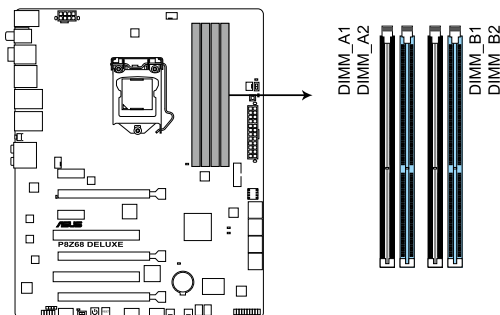
P8Z68 DELUXE 240-pin DDR3 DIMM socket

Recommended memory configurations
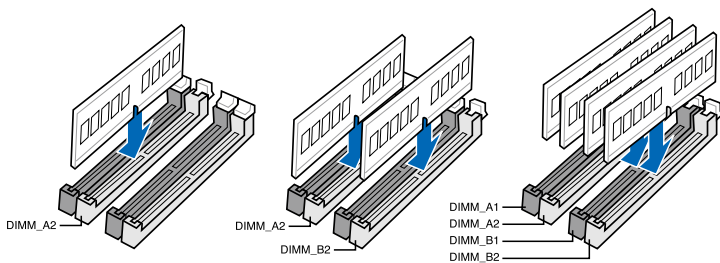
Memory configurations

You may install 1GB, 2GB and 4GB unbuffered and non-ECC DDR3 DIMMs into the DIMM sockets.

- • You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.

- • Due to CPU behavior, DDR3 2200/2000/1800 MHz memory module will run at DDR3 2133/1866/1600 MHz frequency as default.

- • According to Intel CPU spec, DIMM voltage below 1.65V is recommended to protect the CPU.

- • Always install DIMMs with the same CAS latency. For optimum compatibility, we recommend that you obtain memory modules from the same vendor.

- • Due to the memory address limitation on 32-bit Windows OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you do any of the following:
  - Use a maximum of 3GB system memory if you are using a 32-bit Windows OS.
  - Install a 64-bit Windows OS when you want to install 4GB or more on the motherboard.
    For more details, refer to the Microsoft® support site at
    http://support.microsoft.com/kb/929605/en-us.

- • This motherboard does not support DIMMs made up of 512Mb (64MB) chips or less (Memory chip capacity counts in Megabit, 8 Megabit/Mb = 1 Megabyte/MB).

- • The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value. To operate at the vendor-marked or at a higher frequency, refer to section **3.4 Ai Tweaker menu** for manual memory frequency adjustment.

- • For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs) or overclocking condition.

P8Z68 Deluxe Motherboard Qualified Vendors Lists (QVL)
DDR3 2200(O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
G.SKILL	F3-17600CL7D-4GBFLS(XMP)	4GB (2 x 2GB)	DS	-	-	7-10-10-28	1.65	•	•	•
G.SKILL	F3-17600CL8D-4GBPS(XMP)	4GB (2 x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	
G.SKILL	F3-17600CL9D-4GBTDS(XMP)	4GB (2 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	
KINGMAX	FLKE85F-B8KHA(XMP)	4GB (2 x 2GB)	DS	-	-	-	1.5~1.7	•	•	
KINGMAX	FLKE85F-B8KJAA-FEIS(XMP)	4GB (2 x 2GB)	DS	Kingmax	N/A	-	-	•	•	

* The memory modules in 2200MHz and above are supported by this motherboard; however, the actual frequency support varies depending on the O.C. margin of the installed CPU.

P8Z68 Deluxe Motherboard Qualified Vendors Lists (QVL)
DDR3 2133(O.C.) MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
G.SKILL	F3-17600CL9D-4GBTDS(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	

* The above QVL is for the DDR3 2200 MHz memory module. Due to CPU behavior, DDR3 2200 MHz
  memory module will run at DDR3 2133 MHz frequency.

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
G.SKILL	F3-17066CL9D-4GBTDS(XMP)	4GB (2x 2GB)	DS	-	-	-	1.65	•	•	•
G.SKILL	F3-17066CL8D-4GBPS(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	
G.SKILL	F3-17066CL9D-4GBTD(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	
G.SKILL	F3-17066CL9T-6GB-T	6GB(3 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	
GEIL	GE34GB2133C9DC(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-28	1.65	•	•	
GEIL	GU34GB2133C9DC(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-28	1.65	•	•	
KINGSTON	KHX2133C9D3T1K2/4GX(XMP)	4GB(2 x 2GB)	DS	-	-	9	1.65	•	•	•
Patriot	PVV34G2133C9K(XMP)	4GB (2x 2GB)	DS	-	-	9-11-9-27	1.66	•	•	•

P8Z68 Deluxe Motherboard Qualified Vendors Lists (QVL)
DDR3 1866(O.C.) MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
Apacer	78.AAGD5.9KD(XMP)	6GB(3 x 2GB)	DS	-	-	9-9-9-27	-	•	•	•
CORSAIR	CMT6GX3M3A2000C8(XMP)	6GB (3x 2GB)	DS	-	-	8-9-8-24	1.65	•	•	•
Crucial	BL12864BE2009.8SFB3(EPP)	1GB	SS	-	-	9-9-9-28	2	•	•	
G.SKILL	F3-16000CL6Q-8GBPIS(XMP)	8GB (4x 2GB)	SS	-	-	6-9-6-24	1.65	•	•	
G.SKILL	F3-16000CL9D-4GBRH(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	•
G.SKILL	F3-16000CL9D-4GBTD(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	
G.SKILL	F3-16000CL7T-6GBPS(XMP)	6GB(3 x 2GB)	DS	-	-	7-8-7-20	1.65	•	•	
G.SKILL	F3-16000CL9T-6GBPS(XMP)	6GB(3 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	
G.SKILL	F3-16000CL9T-6GBTD(XMP)	6GB(3 x 2GB)	DS	-	-	9-9-9-24	1.6	•	•	•
G.SKILL	F3-16000CL7Q-8GBFLS(XMP)	8GB(4 x 2GB)	DS	-	-	7-9-7-24	1.65	•	•	
GEIL	GU34GB2000C9DC(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-28	2	•	•	
GEIL	GE38GB2000C9QC(XMP)	8GB(4 x 2GB)	DS	-	-	9-9-9-28	1.65	•	•	
KINGSTON	KHX2000C9D3T1K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	-	1.65	•	•	•
Transcend	N/A(XMP)	6GB (3x 2GB)	DS	-	-	-	-	•	•	
Gingle	9CAASS37AZZ01D1	2GB	DS	-	-	9-9-9-24	-	•	•	
Patriot	PVT36G2000LLK(XMP)	6GB(3 x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	
Slicon Power	SP002GBLYU200S02(XMP)	2GB	DS	-	-	-	-	•	•	
Team	TXD32048M2000C9(XMP)	2GB	DS	Team	T3D1288RT-20	9-9-9-24	1.5	•	•	
Team	TXD32048M2000C9-L(XMP)	2GB	DS	Team	T3D1288LT-20	9-9-9-24	1.5	•	•	
Team	TXD32048M2000C9-L(XMP)	2GB	DS	Team	T3D1288RT-20	9-9-9-24	1.6	•	•	•

* The above QVL is for the DDR3 2000 MHz memory module. Due to CPU behavior, DDR3 2000 MHz
  memory module will run at DDR3 1866 MHz frequency.

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
CORSAIR	CMT6GX3M3A1866C9(XMP)	6GB (3x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	•
CORSAIR	TR3X6G1866C9DVer4.1(XMP)	6GB(3 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	
G.SKILL	F3-15000CL9D-4GBRH (XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	•
G.SKILL	F3-15000CL9D-4GBTD(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	•
OCZ	OCZ3P1866LV4GK	4GB(2 x 2GB)	DS	-	-	9-9-9	1.65	•	•	
OCZ	OCZ3P1866C9LV6GK	6GB(3 x 2GB)	DS	-	-	9-9-9	1.65	•	•	
OCZ	OCZ3RPR1866C9LV6GK	6GB(3 x 2GB)	DS	-	-	9-9-9	1.65	•	•	•

P8Z68 Deluxe Motherboard Qualified Vendors Lists (QVL)
DDR3 1600 MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
G.SKILL	F3-14400CL6D-4GBFLS(XMP)	4GB(2 x 2GB)	DS	-	-	6-8-6-24	1.65	•	•	
G.SKILL	F3-14400CL9D-4GBRL(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.6	•	•	•
KINGSTON	KHX1800C9D3T1K3/6GX(XMP)	6GB(3 x 2GB)	DS	-	-	-	1.65	•	•	

* The above QVL is for the DDR3 1800 MHz memory module. Due to CPU behavior, DDR3 1800 MHz memory module will run at DDR3 1600 MHz frequency.

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
A-DATA	AX3U1600GC4G9-2G	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.55~1.75	•	•	•
CORSAIR	TR3X3G1600C8DVer2.1(XMP)	3GB(3 x 1GB)	SS	-	-	8-8-8-24	1.65	•	•	
CORSAIR	CMG4GX3M2A1600C6	4GB (2x 2GB)	DS	-	-	6-6-6-18	1.65	•	•	
CORSAIR	CMD4GX3M2B1600C8	4GB(2x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	•
CORSAIR	CMG4GX3M2A1600C6	4GB(2x 2GB)	DS	-	-	6-6-6-18	1.65	•	•	
CORSAIR	CMX4GX3M2A1600C8(XMP)	4GB(2x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	•
CORSAIR	CMD4GX3M2A1600C8(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	•
CORSAIR	CMG4GX3M2A1600C7(XMP)	4GB(2 x 2GB)	DS	-	-	7-7-7-20	1.65	•	•	
CORSAIR	CMX4GX3M2A1600C9(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	•
CORSAIR	TR3X6G1600C8D	6GB(3 x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	
CORSAIR	CMX8GX3M4A1600C9(XMP)	8GB(4 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	
Crucial	BL12864BN1608.8FF(XMP)	2GB(2x 1GB)	SS	-	-	8-8-8-24	1.65	•	•	
Crucial	BL25664BN1608.16FF(XMP)	2GB	DS	-	-	8-8-8-24	1.65	•	•	
G.SKILL	F3-12800CL9D-4GBNG	4GB(2x 2GB)	SS	-	-	-	1.6	•	•	•
G.SKILL	F3-12800CL9D-4GBRL	4GB(2 x 2GB)	SS	-	-	-	1.6	•	•	•
G.SKILL	F3-12800CL7D-4GBRH(XMP)	4GB(2 x 2GB)	DS	-	-	7-7-7-24	1.65	•	•	•
G.SKILL	F3-12800CL8D-4GBRM(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8-24	1.6	•	•	•
G.SKILL	F3-12800CL9D-4GBECO(XMP)	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.35	•	•	•
G.SKILL	F3-12800CL8T-6GBPI(XMP)	6GB(3 x 2GB)	DS	-	-	8-8-8-21	1.6~1.65	•		
G.SKILL	F3-12800CL9T-6GBNQ	6GB(3 x 2GB)	DS	-	-	9-9-9-24	1.5-1.6	•	•	
GEIL	GV34GB1600C8DC(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8-28	1.6	•	•	
KINGMAX	FLGD45F-B8MF7(XMP)	1GB	SS	-	-	-	-	•	•	
KINGSTON	KHX1600C8D3K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	8	1.65	•	•	
OCZ	OCZ3P1600EB1G	1GB	SS	-	-	7-6-6-24	-	•	•	
OCZ	OCZ3G1600LV3GK	3GB(3 x 1GB)	SS	-	-	8-8-8	1.65	•	•	
OCZ	OCZ3P1600LV3GK	3GB(3 x 1GB)	SS	-	-	7-7-7	1.65	•	•	
OCZ	OCZ3BE1600C8LV4GK	4GB(2x 2GB)	DS	-	-	8-8-8	1.65	•	•	
OCZ	OCZ3BE1600C8LV4GK	4GB(2x 2GB)	DS	-	-	8-8-8	1.65	•	•	
OCZ	OCZ3P1600LV4GK	4GB(2 x 2GB)	DS	-	-	7-7-7	1.65	•	•	
OCZ	OCZ3X1600LV4GK(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8	1.65	•	•	•
OCZ	OCZ3FXE1600C7LV6GK	6GB (3x 2GB)	DS	-	-	7-7-7	1.65	•	•	
OCZ	OCZ3FXE1600C7LV6GK	6GB(3 x 2GB)	DS	-	-	7-7-7	1.65	•	•	
OCZ	OCZ3G1600LV6GK	6GB(3 x 2GB)	DS	-	-	8-8-8	1.65	•	•	
OCZ	OCZ3X1600LV6GK(XMP)	6GB(3 x 2GB)	DS	-	-	8-8-8	1.65	•	•	
OCZ	OCZ3X1600LV6GK(XMP)	6GB(3 x 2GB)	DS	-	-	8-8-8	1.65	•	•	
Super Talent	WP160UX4G9(XMP)	4GB(2 x 2GB)	DS	-	-	9	-	•	•	
Super Talent	WB160UX6G8(XMP)	6GB(3 x 2GB)	DS	-	-	-	-	•	•	

P8Z68 Deluxe Motherboard Qualified Vendors Lists (QVL)
DDR3 1600 MHz capability (continued)

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
Super Talent	WB160UX6G8(XMP)	6GB(3 x 2GB)	DS	-	-	8	-	•	•	•
EK Memory	EKM324L28BP8-I16(XMP)	4GB(2x 2GB)	DS	-	-	9	-	•	•	•
EK Memory	EKM324L28BP8-I16(XMP)	4GB(2x 2GB)	DS	-	-	9	-	•	•	•
GoodRam	GR1600D364L9/2G	2GB	DS	GoodRam	GF1008KC-JN	-	-	•	•	•
KINGTIGER	KTG2G1600PG3(XMP)	2GB	DS	-	-	-	-	•	•	•
Mushkin	996805(XMP)	4GB (2x 2GB)	DS	-	-	6-8-6-24	1.65	•	•	
Mushkin	996657	4GB(2x 2GB)	DS	-	-	7-7-7-20	-	•	•	
Mushkin	998805(XMP)	6GB (3x 2GB)	DS	-	-	6-8-6-24	1.65	•	•	
Patriot	PVT33G1600ELK	3GB(3 x 1GB)	SS	-	-	9-9-9-24	1.65	•	•	
Patriot	PGS34G1600LLKA2	4GB (2x 2GB)	DS	-	-	8-8-8-24	1.7	•	•	•
Patriot	PGS34G1600LLKA	4GB(2x 2GB)	DS	-	-	7-7-7-20	1.7	•	•	
PATRIOT	PGS34G1600LLKA	4GB(2x 2GB)	DS	-	-	7-7-7-20	1.7	•	•	•
Patriot	PVS34G1600ELK	4GB(2x 2GB)	DS	-	-	9-9-9-24	1.8	•	•	
Patriot	PVS34G1600LLK(XMP)	4GB(2x 2GB)	DS	-	-	7-7-7-20	1.9	•	•	
Patriot	PVS34G1600LLKN	4GB(2x 2GB)	DS	-	-	7-7-7-20	2.0	•	•	
Patriot	PVT36G1600ELK	6GB(3x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	•
Patriot	PVT36G1600ELK	6GB(3x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	•
Patriot	PVT36G1600LLK(XMP)	6GB(3 x 2GB)	DS	-	-	8-8-8-24	1.65	•	•	

P8Z68 Deluxe Motherboard Qualified Vendors Lists (QVL)
DDR3 1333 MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
A-DATA	SU3U1333W8G9-B	8GB	DS	Elpida	J4208BASE-DJ-F	9	-	•	•	•
A-DATA	SU3U1333B1G9-B	1GB	SS	Hynix	H5TQ1G83TFR	-	-	•	•	•
A-DATA	SU3U1333B2G9-B	2GB	SS	Hynix	H5TQ1G83TFR	-	-	•	•	•
A-DATA	SU3U1333C4G9-B	4GB	DS	Hynix	H5TQ2G83AFR	-	-	•	•	•
Apacer	78.01GC6.9L0	1GB	SS	Apacer	AM5D5808DEJSBG	9	-	•	•	•
CORSAIR	TR3X3G1333C9 (Ver2.1)	3GB(3 x 1GB)	SS	-	-	9-9-9-24	1.5	•	•	•
CORSAIR	CM3X1024-1333C9DHX	1GB	DS	-	-	-	1.1	•	•	•
CORSAIR	CMX3GX3M4A1333C9	8GB(4 x 2GB)	DS	-	-	9-9-9-24	1.5	•	•	•
Crucial	CT12864BA1339.8FF	1GB	SS	MICRON	D9KPT	9	-	•	•	•
Crucial	CT12864BA1339.8SFD	1GB	SS	MICRON	MT8JF12864AY-1G4D1	-	-	•	•	•
Crucial	CT12872BA1339.9FF	1GB	SS	MICRON	D9KPT(ECC)	9	-	•	•	•
Crucial	BL25664BN1337.16FF(XMP)	2GB	DS	-	-	7-7-7-24	1.65	•	•	•
Crucial	CT25664BA1339.16FF	2GB	DS	MICRON	D9KPT	9	-	•	•	•
Crucial	CT25664BA1339.16SFD	2GB	DS	MICRON	D9JNM	-	-	•	•	•
Crucial	CT25672BA1339.18FF	2GB	DS	MICRON	D9KPT(ECC)	9	-	•	•	•
ELPIDA	EBJ10UE8BDF0-DJ-F	1GB	SS	ELPIDA	J1108BDSE-DJ-F	-	-	•	•	•
ELPIDA	EBJ10UE8EDF0-DJ-F	1GB	SS	ELPIDA	J1108EDSE-DJ-F	-	-	•	•	•
ELPIDA	EBJ21UE8BAW0-DJ-E	2GB	DS	ELPIDA	J1108BABG-DJ-E	9	-	•	•	•
ELPIDA	EBJ21UE8BDF0-DJ-F	2GB	DS	ELPIDA	J1108BDSE-DJ-F	-	-	•	•	•
G.SKILL	F3-10600CL8D-2GBHK	2GB(2 x 1GB)	SS	-	-	-	1.65	•	•	•
G.SKILL	F3-10666CL7D-4GBPI(XMP)	4GB(2 x 2GB)	DS	-	-	7-7-7-21	1.5	•	•	
G.SKILL	F3-10666CL7D-4GBRH(XMP)	4GB(2 x 2GB)	DS	-	-	7-7-7-21	1.5	•	•	•
G.SKILL	F3-10666CL8D-4GBECO(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8-24	1.35	•	•	•
G.SKILL	F3-10666CL8D-4GBHK(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8-21	1.5-1.6	•	•	•
G.SKILL	F3-10666CL8D-4GBRM(XMP)	4GB(2 x 2GB)	DS	-	-	8-8-8-21	1.5-1.6	•	•	•

P8Z68 Deluxe Motherboard Qualified Vendors Lists (QVL)
DDR3 1333 MHz capability (continued)

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
G.SKILL	F3-10666CL9D-8GBRL	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.5	•	•	•
GEIL	GG34GB1333C9DC	4GB (2x 2GB)	DS	GEIL	GL1L128M88BA115FW	9-9-9-24	1.3	•	•	•
GEIL	GB34GB1333C7DC	4GB(2 x 2GB)	DS	GEIL	GL1L128M88BA15FW	7-7-7-24	1.5	•	•	•
GEIL	GG34GB1333C9DC	4GB(2 x 2GB)	DS	GEIL	GL1L128M88BA12N	9-9-9-24	1.3	•	•	•
GEIL	GV34GB1333C7DC	4GB(2 x 2GB)	DS	-	-	7-7-7-24	1.5	•	•	•
Hynix	HMT112U6BFR8C-H9	1GB	SS	Hynix	H5TQ1G83BFR	9	-	•	•	•
Hynix	HMT112U6TFR8A-H9	1GB	SS	Hynix	H5TC1G83TFR	-	-	•	•	•
Hynix	HMT125U6BFR8C-H9	2GB	DS	Hynix	H5TQ1G83BFRH9C	9	-	•	•	•
Hynix	HMT125U6TFR8A-H9	2GB	DS	Hynix	H5TC1G83TFR	-	-	•	•	•
KINGMAX	FLFE85F-B8KL9	2GB	DS	KINGMAX	KFB8FNLXL-BNF-15A	-	-	•	•	•
Kingston	KVR1333D3N9/1G	1GB	SS	Elpida	J1108BDSE-DJ-F	9	1.5	•	•	•
Kingston	KVR1333D3N9/2G	2GB	DS	Kingston	D1288JPNDPLD9U	9	1.5	•	•	•
Kingston	KHX1333C9D3UK2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	9	1.25	•	•	•
MICRON	MT8JTF12864AZ-1G4F1	1GB	SS	MICRON	9FF22 D9KPT	9	-	•	•	•
MICRON	MT8JTF12864AZ-1G4F1	1GB	SS	MICRON	D9KPT	9	-	•	•	•
MICRON	MT9JSF12872AZ-1G4F1	1GB	SS	MICRON	D9KPT(ECC)	9	-	•	•	•
MICRON	MT16JF25664AZ-1G4F1	2GB	DS	MICRON	D9KPT	9	-	•	•	•
MICRON	MT16JTF25664AZ-1G4F1	2GB	DS	MICRON	9FF22 D9KPT	9	-	•	•	•
MICRON	MT18JSF25672AZ-1G4F1	2GB	DS	MICRON	D9KPT(ECC)	9	-	•	•	•
OCZ	OCZ3RPX1333EB2GK	1GB	SS	-	-	-	-	•	•	
OCZ	OCZ3G1333LV3GK	3GB(3 x 1GB)	SS	-	-	9-9-9	1.65	•	•	•
OCZ	OCZ3P1333LV3GK	3GB(3 x 1GB)	SS	-	-	7-7-7	1.65	•	•	•
OCZ	OCZ3P13332GK	1GB	DS	-	-	7-7-7-20	-	•	•	
OCZ	OCZ3G1333ULV4GK	4GB (2x 2GB)	DS	-	-	8-8-8	1.35	•	•	
OCZ	OCZ3P1333LV4GK	4GB (2x 2GB)	DS	-	-	-	1.65	•	•	
OCZ	OCZ3G1333ULV4GK	4GB(2 x 2GB)	DS	-	-	8-8-8	1.65	•	•	
OCZ	OCZ3P13334GK	4GB(2 x 2GB)	DS	-	-	7	1.8	•	•	•
OCZ	OCZ3P1333LV4GK	4GB(2 x 2GB)	DS	-	-	7-7-7	1.65	•	•	•
OCZ	OCZ3RPX1333EB4GK	4GB(2 x 2GB)	DS	-	-	-	1.85	•	•	
OCZ	OCZ3G1333LV6GK	6GB(3 x 2GB)	DS	-	-	9-9-9	1.65	•	•	
OCZ	OCZ3P1333LV6GK	6GB(3 x 2GB)	DS	-	-	7-7-7	1.65	•	•	
OCZ	OCZX1333LV6GK(XMP)	6GB(3 x 2GB)	DS	NA	-	8-8-8	1.6	•	•	
PSC	AL8F8G73D-DG1	2GB	DS	PSC	A3P1GF3DGF	-	-	•	•	•
SAMSUNG	M378B1G73AH0-CH9	8GB	DS	SAMSUNG	K4B4G0846A-HCH9	-	-	•	•	•
SAMSUNG	M378B2873DZ1-CH9	1GB	SS	SAMSUNG	K4B1G0846D	9	-	•	•	•
SAMSUNG	M378B2873EH1-CH9	1GB	SS	SAMSUNG	K4B1G0846E	-	-	•	•	•
SAMSUNG	M378B2873FHS-CH9	1GB	SS	SAMSUNG	K4B1G0846F	-	-	•	•	•
SAMSUNG	M391B2873DZ1-CH9	1GB	SS	SAMSUNG	K4B1G0846D(ECC)	9	-	•	•	•
SAMSUNG	M378B5673DZ1-CH9	2GB	DS	SAMSUNG	K4B1G0846D	9	-	•	•	•
SAMSUNG	M378B5673FH0-CH9	2GB	DS	SAMSUNG	K4B1G0846F	-	-	•	•	•
SAMSUNG	M391B5673DZ1-CH9	2GB	DS	SAMSUNG	K4B1G0846D(ECC)	9	-	•	•	•
SAMSUNG	M378B5273BH1-CH9	4GB	DS	SAMSUNG	K4B2G0846B-HCH9	9	-	•	•	•
SAMSUNG	M378B5273CH0-CH9	4GB	DS	SAMSUNG	K4B2G0846C	K4B2G0846C	-	•	•	•
Transcend	N/A	2GB	DS	Elpida	J1108BDBG-DJ-F	-	-	•	•	•
ASUS	N/A	1GB	DS	-	-	-	-	•	•	•
ATP	AQ28M64A8BJH9S	1GB	SS	SAMSUNG	K4B1G0846E	-	-	•	•	•
ATP	AQ28M72D8BJH9S	1GB	SS	SAMSUNG	K4B1G0846D(ECC)	-	-	•	•	•
ATP	AQ56M64B8BJH9S	2GB	DS	SAMSUNG	K4B1G0846D	-	-	•	•	•

P8Z68 Deluxe Motherboard Qualified Vendors Lists (QVL)
DDR3 1333 MHz capability (continued)

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
ATP	AQ12M72E8BKH9S	4GB	DS	SAMSUNG	K4B2G0846B-HCH9 (ECC)	-	-	•	•	•
BUFFALO	FSX1333D3G-1G	1GB	SS	-	-	-	-	•	•	•
BUFFALO	FSH1333D3G-T3G(XMP)	3GB(3 x 1GB)	SS	-	-	7-7-7-20	-	•	•	•
BUFFALO	FSX1333D3G-2G	2GB	DS	-	-	-	-	•	•	•
EK Memory	EKM324L28BP8-I13	4GB(2 x 2GB)	DS	-	-	9	-	•	•	•
Elixir	M2F2G64CB88B7N-CG	2GB	SS	Elixir	N2CB2G808N-CG	-	-	•	•	•
Elixir	M2Y2G64CB8HA9N-CG	2GB	DS	-	-	-	-	•	•	•
Elixir	M2Y2G64CB8HC9N-CG	2GB	DS	-	-	-	-	•	•	•
Elixir	M2F4G64CB8HB5N-CG	4GB	DS	Elixir	N2CB2G808N-CG	-	-	•	•	•
GoodRam	GR1333D364L9/2G	2GB	DS	Qimonda	IDSH1G-03A1F1C-13H	-	-	•	•	•
KINGTIGER	F10DA2T1680	2GB	DS	KINGTIGER	KTG1333PS1208NST-C9	-	-	•	•	•
KINGTIGER	KTG2G1333PG3	2GB	DS	-	-	-	-	•	•	•
Patriot	PDC32G1333LLK	1GB	SS	PATRIOT	-	7	1.7	•	•	
Patriot	PVT33G1333ELK	3GB(3 x 1GB)	SS	-	-	9-9-9-24	1.65	•	•	•
Patriot	PGS34G1333LLKA	4GB(2 x 2GB)	DS	-	-	7-7-7-20	1.7	•	•	
Patriot	PVS34G1333ELK	4GB(2 x 2GB)	DS	-	-	9-9-9-24	1.5	•	•	
Patriot	PVS34G1333LLK	4GB(2 x 2GB)	DS	-	-	7-7-7-20	1.7	•	•	
Patriot	PVT36G1333ELK	6GB(3 x 2GB)	DS	-	-	9-9-9-24	1.65	•	•	•
Silicon Power	SP001GBLTU1333S01	1GB	SS	NANYA	NT5CB128M8AN-CG	-	-	•	•	•
Silicon Power	SP001GBLTU133S02	1GB	SS	S-POWER	I0YT3E0	9	-	•	•	•
Silicon Power	SP002GBLTU133S02	2GB	DS	S-POWER	I0YT3E0	9	-	•	•	•
Slicon Power	SP001GBLTE133S01	1GB	SS	NANYA	NT5CB128M8AN-CG	-	-	•	•	•
Slicon Power	SP002GBLTE133S01	2GB	DS	NANYA	NT5CB128M8AN-CG	-	-	•	•	•

Chapter 2

P8Z68 Deluxe Motherboard Qualified Vendors Lists (QVL)
DDR3 1066 MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								1 DIMM	2 DIMM	4 DIMM
Crucial	CT12864BA1067.8FF	1GB	SS	MICRON	D9KPT	7	-	•	•	•
Crucial	CT12864BA1067.8SFD	1GB	SS	MICRON	D9JNL	7	-	•	•	•
Crucial	CT12872BA1067.9FF	1GB	SS	MICRON	D9KPT(ECC)	7	-	•	•	•
Crucial	CT25664BA1067.16FF	2GB	DS	MICRON	D9KPT	7	-	•	•	•
Crucial	CT25664BA1067.16SFD	2GB	DS	MICRON	D9JNL	7	-	•	•	•
Crucial	CT25672BA1067.18FF	2GB	DS	MICRON	D9KPT(ECC)	7	-	•	•	•
ELPIDA	EBJ10UE8BAW0-AE-E	1GB	SS	ELPIDA	J1108BABG-DJ-E	7	-	•	•	•
ELPIDA	EBJ10UE8EDF0-AE-F	1GB	SS	ELPIDA	J1108EDSE-DJ-F	-	-	•	•	•
ELPIDA	EBJ11UD8BAFA-AG-E	1GB	DS	ELPIDA	J5308BASE-AC-E	8	-	•	•	
ELPIDA	EBJ21UE8BAW0-AE-E	2GB	DS	ELPIDA	J1108BABG-DJ-E	7	-	•	•	•
ELPIDA	EBJ21UE8EDF0-AE-F	2GB	DS	ELPIDA	J1108EDSE-DJ-F	-	-	•	•	
GEIL	GG34GB1066C8DC	4GB (2x 2GB)	DS	GEIL	GL1L128M88BA115FW	8-8-8-20	1.3	•	•	•
Hynix	HMT112U6AFP8C-G7N0	1GB	SS	HYNIX	H5TQ1G83AFPG7C	7	-	•	•	•
Hynix	HYMT112U64ZNF8-G7	1GB	SS	HYNIX	HY5TQ1G831ZNFP-G7	7	-	•	•	•
Hynix	HMT125U6AFP8C-G7N0	2GB	DS	HYNIX	H5TQ1G83AFPG7C	7	-	•	•	•
Hynix	HYMT125U64ZNF8-G7	2GB	DS	HYNIX	HY5TQ1G831ZNFP-G7	7	-	•	•	•
Kingston	KVR1066D3N7/1G	1GB	SS	Kingston	D1288JPNDPLD9U	7	1.5	•	•	•
Kingston	KVR1066D3N7/2G	2GB	DS	Elpida	J1108BDSE-DJ-F	7	1.5	•	•	•
MICRON	MT8JTF12864AZ-1G1F1	1GB	SS	MICRON	8ZF22 D9KPV	7	-	•	•	•
MICRON	MT8JTF12864AZ-1G1F1	1GB	SS	MICRON	D9KPT	7	-	•	•	•
MICRON	MT9JSF12872AZ-1G1F1	1GB	SS	MICRON	D9KPT(ECC)	7	-	•	•	•
MICRON	MT16JTF25664AZ-1G1F1	2GB	DS	MICRON	8ZF22 D9KPV	7	-	•	•	•
MICRON	MT16JTF25664AZ-1G1F1	2GB	DS	MICRON	D9KPT	7	-	•	•	•
MICRON	MT18JSF25672AZ-1G1F1	2GB	DS	MICRON	D9KPT(ECC)	7	-	•	•	•
SAMSUNG	M378B5273BH1-CF8	4GB	DS	SAMSUNG	K4B2G0846B-HCF8	8	1.5	•	•	•
Elixir	M2Y2G64CB8HA9N-BE	2GB	DS	-	-	-	-	•	•	•
Elixir	M2Y2G64CB8HC5N-BE	2GB	DS	Elixir	N2CB1G80CN-BE	-	-	•	•	•
Elixir	M2Y2G64CB8HC9N-BE	2GB	DS	-	-	-	-	•	•	•
WINTEC	3DU3191A-10	1GB	DS	Qimonda	IDSH51-03A1F1C-10F	7	-	•	•	

Side(s): SS - Single-sided   DS - Double-sided
DIMM support:

- **1 DIMM:** Supports one (1) module inserted into any slot as Single-channel memory configuration. **We suggest that you install the module into A2 slot.**
- **2 DIMMs:** Supports two (2) modules inserted into either the blue slots or the black slots as one pair of Dual-channel memory configuration. **We suggest that you install the modules into slots A2 and B2 for better compatibility.**
- **4 DIMMs:** Supports four (4) modules inserted into both the blue and black slots as two pairs of Dual-channel memory configuration.

- ASUS exclusively provides hyper DIMM support function.
- Hyper DIMM support is subject to the physical characteristics of individual CPUs. Load the X.M.P. or D.O.C.P. settings in the BIOS for the hyper DIMM support.
- Visit the ASUS website for the latest QVL.

2.2.4 Expansion slots

Ensure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.
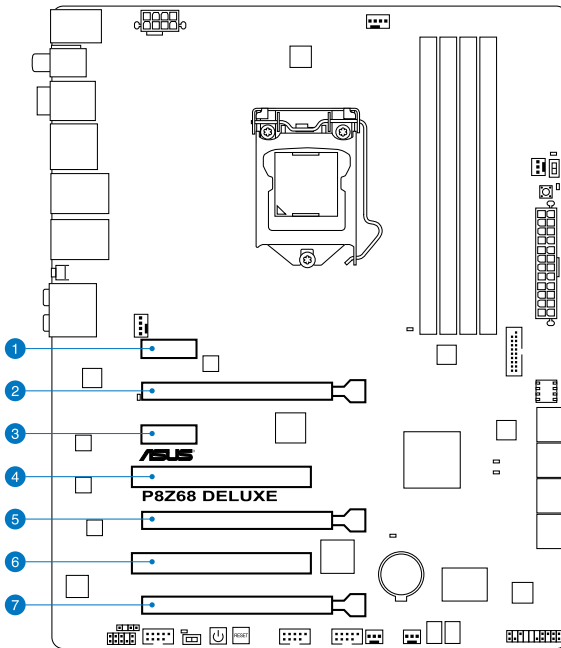
Slot No.	Slot Description
1	PCIe 2.0 x1_1 slot
2	PCIe 2.0 x16_1 slot (single at x16 or dual at x8/x8 mode)
3	PCIe 2.0 x1_2 slot
4	PCI slot 1
5	PCIe 2.0 x16_2 slot (at x8 mode)
6	PCI slot 2
7	PCIe 2.0 x16_3 slot [black] (at x4 mode, compatible with PCIe x1 and x4 devices)

VGA configuration	PCI Express operating mode	
	PCIe 2.0 x16_1	PCIe 2.0 x16_2
Single VGA/PCIe card	x16 (Recommend for single VGA)	N/A
Dual VGA/PCIe card	x8	x8

- In single VGA card mode, use the PCIe 2.0 x16_1 slot (navy blue) for a PCI Express x16 graphics card to get better performance.

- In CrossFireX™ or SLI™ mode, use the PCIe 2.0 x16_1 and PCIe 2.0 x16_2 slots for PCI Express x16 graphics cards to get better performance.

- We recommend that you provide sufficient power when running CrossFireX™ or SLI™ mode. Refer to page 2-31 for details.

- Connect a chassis fan to the motherboard connector labeled CHA_FAN1/2 when using multiple graphics cards for better thermal environment. See page 2-30 for details.

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
Intel PCH SATA Controller #0	–	–	shared	–	–	–	–	–
Intel PCH SATA Controller #1	–	–	–	shared	–	–	–	–
SMBUS Controller		–	shared	–	–	–	–	–
Thermal Controller		–	shared	–	–	–	–	–
EHCI #0	–	–	–	–	–	–	–	shared
EHCI #1	–	–	–	–	–	–	–	shared
PCIE x16_1	shared	–	–	–	–	–	–	–
PCIE x16_2		shared	–	–	–	–	–	–
PCIE x4	shared	–	–	–	–	–	–	–
Renesas Electronics USB 3.0 #1	shared	–	–	–	–	–	–	–
Renesas Electronics USB 3.0 #2	–	–	shared	–	–	–	–	–
Intel 82579 LAN	–	shared	–	–	–	–	–	–
PLX PCIE Bridge		–	–	shared	–	–	–	–
LAN_2		–	–	shared	–	–	–	–
VIA 6315N	shared	–	–	–	–	–	–	–
RealTek 8111E	–	–	–	shared	–	–	–	–
JMicron 362 IDE Controller	shared	–	–	–	–	–	–	–
Marvell 9128 Hardware RAID Controller	–	shared	–	–	–	–	–	–
PCIE x1_1	–	–	shared	–	–	–	–	–
PCIE x1_2	shared	–	–	–	–	–	–	–
PCI slot 1	–	–	–	shared	–	–	–	–
PCI slot 2	shared	–	–	–	–	–	–	–

2.2.5   Onboard switches

Onboard switches allow you to fine-tune performance when working on a bare or open-case system. This is ideal for overclockers and gamers who continually change settings to enhance system performance.

1.   Power-on switch

The motherboard comes with a power-on switch that allows you to power up or wake up the system. The switch also lights up when the system is plugged to a power source indicating that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard power-on switch.
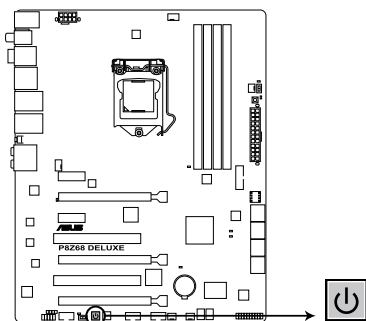
P8Z68 DELUXE Power on switch

2.   Reset switch

Press the reset switch to reboot the system.
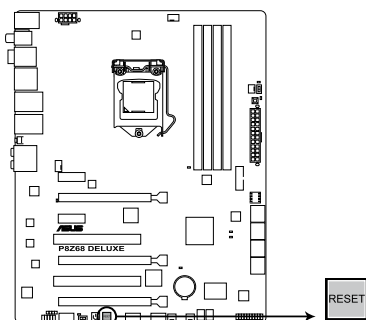
P8Z68 DELUXE Reset switch

3. MemOK! switch

Installing DIMMs that are incompatible with the motherboard may cause system boot failure, and the DRAM_LED near the MemOK! switch lights continuously. Press and hold the MemOK! switch until the DRAM_LED starts blinking to begin automatic memory compatibility tuning for successful boot.


P8Z68 DELUXE MemOK! switch
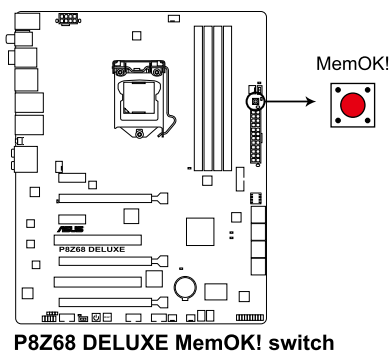
- Refer to section **2.2.6 Onboard LEDs** for the exact location of the DRAM_LED.

- The DRAM_LED also lights when the DIMM is not properly installed. Turn off the system and reinstall the DIMM before using the MemOK! function.

- The MemOK! switch does not function under Windows™ OS environment.

- During the tuning process, the system loads and tests failsafe memory settings. It takes about 30 seconds for the system to test one set of failsafe settings. If the test fails, the system reboots and test the next set of failsafe settings. The blinking speed of the DRAM_LED increases, indicating different test processes.

- Due to memory tuning requirement, the system automatically reboots when each timing set is tested. If the installed DIMMs still fail to boot after the whole tuning process, the DRAM_LED lights continuously. Replace the DIMMs with ones recommended in the Memory QVL (Qualified Vendors Lists) in this user manual or on the ASUS website at www.asus.com.

- If you turn off the computer and replace DIMMs during the tuning process, the system continues memory tuning after turning on the computer. To stop memory tuning, turn off the computer and unplug the power cord for about 5–10 seconds.

- If your system fail to boot due to BIOS overclocking, press the MemOK! switch to boot and load BIOS default settings. A messgae will appear during POST reminding you that the BIOS has been restored to its default settings.

- We recommend that you download and update to the latest BIOS version from the ASUS website at www.asus.com after using the MemOK! function.

4. **TPU switch**

Turning this switch to **Enable** will automatically optimize the system for fast, yet stable clock speeds.

> For ensuring the system performance, turn the switch setting to **Enable** when the system is powered off.
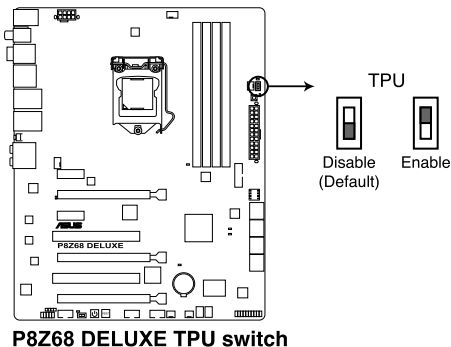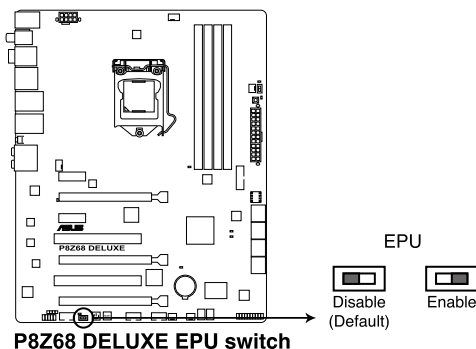

P8Z68 DELUXE TPU switch

> • The TPU LED (O2LED1) near the TPU switch lights when the switch setting is turned to **Enable**. Refer to section **2.2.6 Onboard LEDs** for the exact location of the TPU LED.
>
> • If you change the switch setting to **Enable** under the OS environment, the TPU function will be activated after the next system bootup.
>
> • You may use the TurboV and Auto Tuning feature in the TurboV EVO application, adjust the BIOS setup program, or enable the TPU switch at the same time. However, the system will use the last setting you have made.

5. EPU switch

Turning this switch to **Enable** will automatically detect the current PC loadings and intelligently moderate the power consumption.

> For ensuring the system performance, turn the switch setting to **Enable** when the system is powered off.
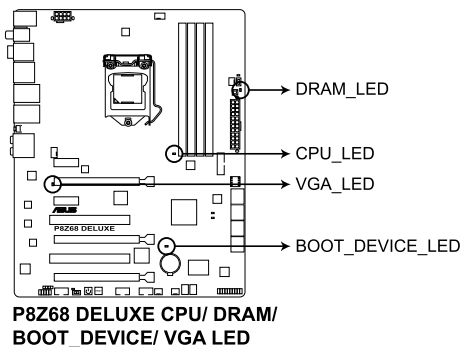

P8Z68 DELUXE EPU switch

> • The EPU LED (O2LED2) near the EPU switch lights when the switch setting is turned to **Enable**. Refer to section **2.2.6 Onboard LEDs** for the exact location of the EPU LED.
>
> • If you change the switch setting to **Enable** under the OS environment, the EPU function will be activated after the next system bootup.
>
> • You may change the EPU settings in the software application or BIOS setup program, and enable the EPU function at the same time. However, the system will use the last setting you have made.
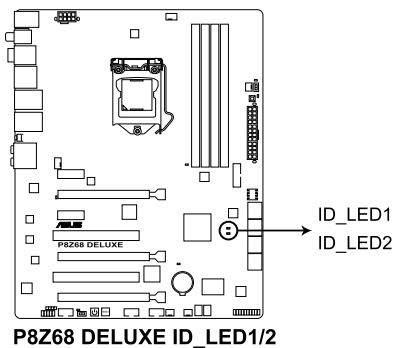
2.2.6   Onboard LEDs

1.   POST State LEDs

The POST State LEDs of CPU, DRAM, VGA card, and HDD indicate key components status during POST (Power-on Self Test). If an error is found , the LED next to the error device will continue lighting until the problem is solved. This user-friendly design provides an intuitional way to locate the root problem within a second.
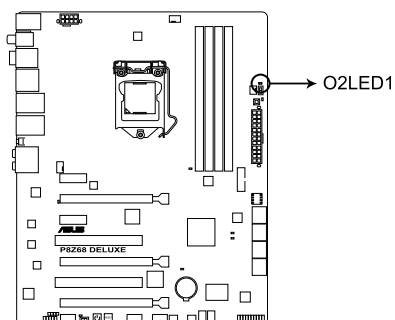
DRAM_LED

CPU_LED

VGA_LED

BOOT_DEVICE_LED

**P8Z68 DELUXE CPU/ DRAM/
BOOT_DEVICE/ VGA LED**

2.   ID LEDs

The ID LEDs provide an elegant embellishment to the motherboard design.

ID_LED1

ID_LED2

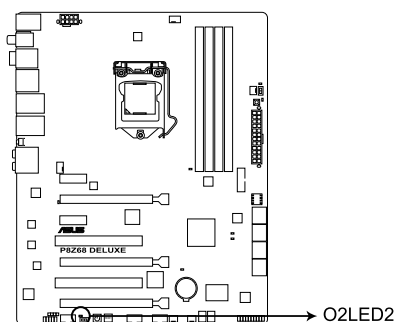**P8Z68 DELUXE ID_LED1/2**

3. TPU LED

The TPU LED lights when the TPU switch is turned to **Enable**.

→ O2LED1

P8Z68 DELUXE TPU LED

4. EPU LED

The EPU LED lights when the EPU switch is turned to **Enable**.

→ O2LED2

P8Z68 DELUXE EPU LED

Chapter 2

5. **Q-Code LEDs**

The Q-Code LED design provides you the 2-digit display, allowing you to know the system status. Refer to the Q-Code table below for details.

P8Z68 DELUXE Q-Code LED

LED1   LED0
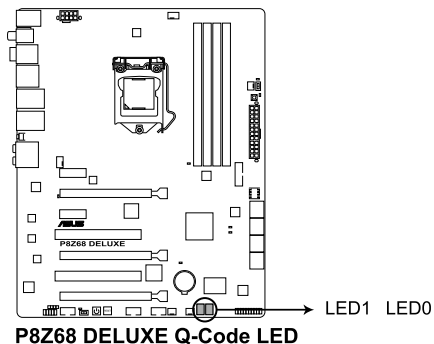
Q-Code table

Code	Description
00	Not used
01	Power on. Reset type detection (soft/hard).
02	AP initialization before microcode loading
03	System Agent initialization before microcode loading
04	PCH initialization before microcode loading
05	OEM initialization before microcode loading
06	Microcode loading
07	AP initialization after microcode loading
08	System Agent initialization after microcode loading
09	PCH initialization after microcode loading
0A	OEM initialization after microcode loading
0B	Cache initialization
0C – 0D	Reserved for future AMI SEC error codes
0E	Microcode not found
0F	Microcode not loaded
10	PEI Core is started
11 – 14	Pre-memory CPU initialization is started
15 – 18	Pre-memory System Agent initialization is started
19 – 1C	Pre-memory PCH initialization is started
1D – 2A	OEM pre-memory initialization codes
2B – 2F	Memory initialization
30	Reserved for ASL (see ASL Status Codes section below)

Q-Code table (continued)

Code	Description
31	Memory Installed
32 – 36	CPU post-memory initialization
37 – 3A	Post-Memory System Agent initialization is started
3B – 3E	Post-Memory PCH initialization is started
3F – 4E	OEM post memory initialization codes
4F	DXE IPL is started
50 – 53	Memory initialization error. Invalid memory type or incompatible memory speed
54	Unspecified memory initialization error
55	Memory not installed
56	Invalid CPU type or Speed
57	CPU mismatch
58	CPU self test failed or possible CPU cache error
59	CPU micro-code is not found or micro-code update is failed
5A	Internal CPU error
5B	Reset PPI is not available
5C – 5F	Reserved for future AMI error codes
E0	S3 Resume is stared (S3 Resume PPI is called by the DXE IPL)
E1	S3 Boot Script execution
E2	Video repost
E3	OS S3 wake vector call
E4 – E7	Reserved for future AMI progress codes
E8	S3 Resume Failed
E9	S3 Resume PPI not Found
EA	S3 Resume Boot Script Error
EB	S3 OS Wake Error
EC – EF	Reserved for future AMI error codes
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5 – F7	Reserved for future AMI progress codes
F8	Recovery PPI is not available
F9	Recovery capsule is not found
FA	Invalid recovery capsule
FB – FF	Reserved for future AMI error codes
60	DXE Core is started
61	NVRAM initialization
62	Installation of the PCH Runtime Services

Q-Code table (continued)

Code	Description
63 – 67	CPU DXE initialization is started
68	PCI host bridge initialization
69	System Agent DXE initialization is started
6A	System Agent DXE SMM initialization is started
6B – 6F	System Agent DXE initialization (System Agent module specific)
70	PCH DXE initialization is started
71	PCH DXE SMM initialization is started
72	PCH devices initialization
73 – 77	PCH DXE Initialization (PCH module specific)
78	ACPI module initialization
79	CSM initialization
7A – 7F	Reserved for future AMI DXE codes
80 – 8F	OEM DXE initialization codes
90	Boot Device Selection (BDS) phase is started
91	Driver connecting is started
92	PCI Bus initialization is started
93	PCI Bus Hot Plug Controller Initialization
94	PCI Bus Enumeration
95	PCI Bus Request Resources
96	PCI Bus Assign Resources
97	Console Output devices connect
98	Console input devices connect
99	Super IO Initialization
9A	USB initialization is started
9B	USB Reset
9C	USB Detect
9D	USB Enable
9E – 9F	Reserved for future AMI codes
A0	IDE initialization is started
A1	IDE Reset
A2	IDE Detect
A3	IDE Enable
A4	SCSI initialization is started
A5	SCSI Reset
A6	SCSI Detect
A7	SCSI Enable
A8	Setup Verifying Password
A9	Start of Setup
AA	Reserved for ASL (see ASL Status Codes section below)
AB	Setup Input Wait

Chapter 2

Q-Code table (continued)

Code	Description
AC	Reserved for ASL (see ASL Status Codes section below)
AD	Ready To Boot event
AE	Legacy Boot event
AF	Exit Boot Services event
B0	Runtime Set Virtual Address MAP Begin
B1	Runtime Set Virtual Address MAP End
B2	Legacy Option ROM Initialization
B3	System Reset
B4	USB hot plug
B5	PCI bus hot plug
B6	Clean-up of NVRAM
B7	Configuration Reset (reset of NVRAM settings)
B8– BF	Reserved for future AMI codes
C0– CF	OEM BDS initialization codes
D0	CPU initialization error
D1	System Agent initialization error
D2	PCH initialization error
D3	Some of the Architectural Protocols are not available
D4	PCI resource allocation error. Out of Resources
D5	No Space for Legacy Option ROM
D6	No Console Output Devices are found
D7	No Console Input Devices are found
D8	Invalid password
D9	Error loading Boot Option (LoadImage returned error)
DA	Boot Option is failed (StartImage returned error)
DB	Flash update is failed
DC	Reset protocol is not available

ACPI/ASL Checkpoints

Code	Description
0x01	System is entering S1 sleep state
0x02	System is entering S2 sleep state
0x03	System is entering S3 sleep state
0x04	System is entering S4 sleep state
0x05	System is entering S5 sleep state
0x10	System is waking up from the S1 sleep state
0x20	System is waking up from the S2 sleep state
0x30	System is waking up from the S3 sleep state
0x40	System is waking up from the S4 sleep state
0xAC	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

## 2.2.7 Internal connectors

1. Intel® Z68 Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_1/2 [gray])

These connectors connect to Serial ATA 6.0 Gb/s hard disk drives via Serial ATA 6.0 Gb/s signal cables.

If you installed Serial ATA hard disk drives, you can create a RAID 0, 1, 5, and 10 configuration with the Intel® Rapid Storage Technology through the onboard Intel® Z68 chipset.
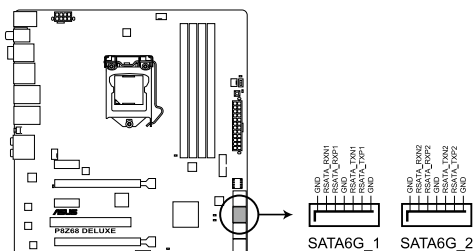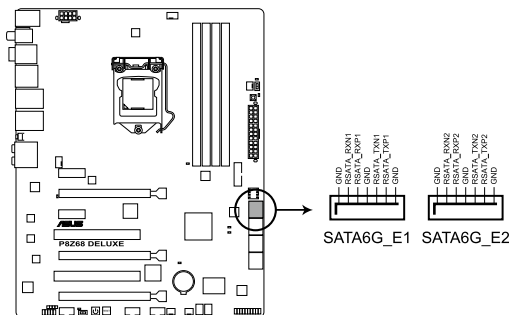

P8Z68 DELUXE Intel® SATA 6.0 Gb/s connectors
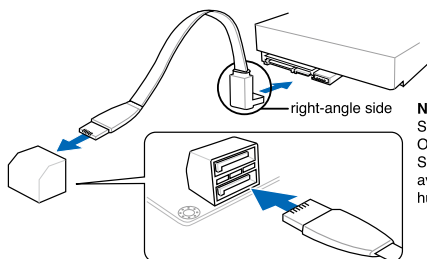
right-angle side

NOTE: Connect the right-angle side of SATA signal cable to SATA device. Or you may connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.

• These connectors are set to [AHCI Mode] by default. If you intend to create a Serial ATA RAID set using these connectors, set the **SATA Mode** item in the BIOS to [RAID Mode]. Refer to section **3.5.4 SATA Configuration** for details.

• Before creating a RAID set, refer to section **4.4 RAID configurations** or the manual bundled in the motherboard support DVD.

• When using NCQ, set the **SATA Mode** in the BIOS to [AHCI Mode]. Refer to section **3.5.4 SATA Configuration** for details.

• You must install Windows® XP Service Pack 3 or later versions before using Serial ATA hard disk drives. The Serial ATA RAID feature is available only if you are using Windows® XP SP3 or later versions.

2.   **Intel® Z68 Serial ATA 3.0 Gb/s connectors (7-pin SATA3G_3–6 [blue])**

These connectors connect to Serial ATA 3.0 Gb/s hard disk drives and optical disc drives via Serial ATA 3.0 Gb/s signal cables.

If you installed Serial ATA hard disk drives, you can create a RAID 0, 1, 5, and 10 configuration with the Intel® Rapid Storage Technology through the onboard Intel® Z68 chipset.
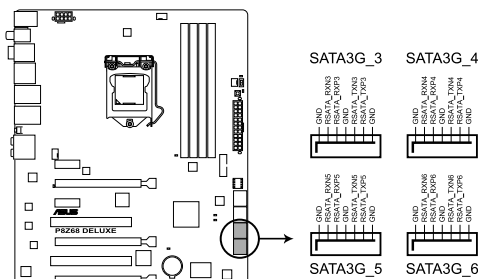
P8Z68 DELUXE Intel® SATA 3.0 Gb/s connectors

Chapter 2

3.   **Marvell® Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_E1/E2 [navy blue])**

These connectors connect to Serial ATA 6.0 Gb/s hard disk drives via Serial ATA 6.0 Gb/s signal cables.
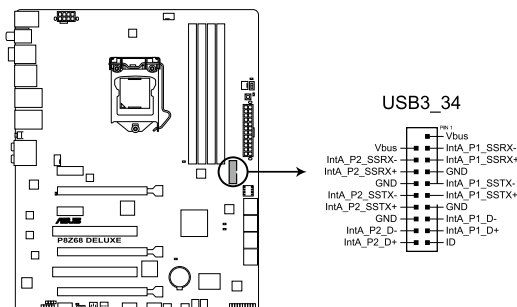

P8Z68 DELUXE Marvell® SATA 6.0 Gb/s connectors

•   The SATA6G_E1/E2 (navy blue) connectors are for data drives only. ATAPI device is not supported.

•   You must install Windows® XP Service Pack 3 or later versions before using Serial ATA hard disk drives.

•   When using NCQ, set the **Marvell Storage Controller** item in the BIOS to [Enabled]. Refer to section **3.5.6 Onboard Devices Configuration** for details.

•   Press <Ctrl> + <M> during POST to enter the Marvell RAID utility to create or delete a RAID configuration.

•   If you want to install a Windows operating system to a RAID configuration created using the Marvell SATA controller, you have to create a RAID driver disk using the motherboard support DVD and load the driver during OS installation. For 32/64bit Windows XP OS, load first the **Marvell shared library** driver, and then load **Marvell 91xx SATA Controller Driver**. For Windows Vista / Windows 7 OS, load only the **Marvell 91xx SATA Controller Driver**.

4.   USB 3.0 connector (20-1 pin USB3_34)

This connector is for the additional USB 3.0 ports, and complies with the USB 3.0 specificaton that supports up to 480 MBps connection speed. If the USB 3.0 front panel cable is available from your system chassis, with this USB 3.0 connector, you can have a front panel USB 3.0 solution.


USB3_34

PIN 1

	Vbus
Vbus	IntA_P1_SSRX-
IntA_P2_SSRX-	IntA_P1_SSRX+
IntA_P2_SSRX+	GND
GND	IntA_P1_SSTX-
IntA_P2_SSTX-	IntA_P1_SSTX+
IntA_P2_SSTX+	GND
GND	IntA_P1_D-
IntA_P2_D-	IntA_P1_D+
IntA_P2_D+	ID

P8Z68 DELUXE USB3.0 connector

You can connect the ASUS front panel USB 3.0 box to this connector to obtain the front panel USB 3.0 solution.

5.   USB 2.0 connectors (10-1 pin USB1112; USB1314)

These connectors are for USB 2.0 ports. Connect the USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 48 MBps connection speed.

USB1314   USB1112
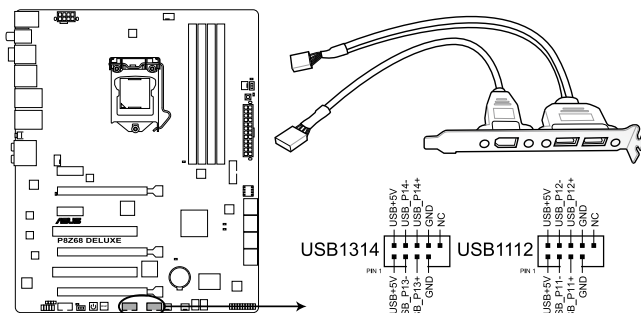
P8Z68 DELUXE USB2.0 connectors

Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

You can connect the front panel USB cable to the ASUS Q-Connector (USB, blue) first, and then install the Q-Connector (USB) to the USB connector onboard if your chassis supports front panel USB ports.

The USB 2.0 module is purchased separately.

6. IEEE 1394a port connector (10-1 pin IE1394_2)

This connector is for an IEEE 1394a port. Connect the IEEE 1394a module cable to this connector, then install the module to a slot opening at the back of the system chassis.


P8Z68 DELUXE IEEE 1394 connector
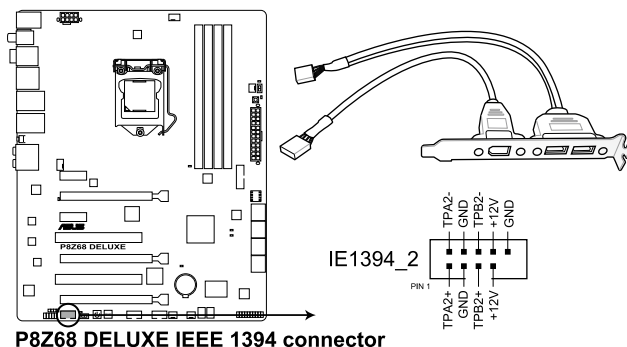
Never connect a USB cable to the IEEE 1394a connector. Doing so will damage the motherboard!

The IEEE 1394 bracket is purchased separately.

### 7. Digital audio connector (4-1 pin SPDIF_OUT)

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s). Connect the S/PDIF Out module cable to this connector, then install the module to a slot opening at the back of the system chassis.

P8Z68 DELUXE Digital audio connector
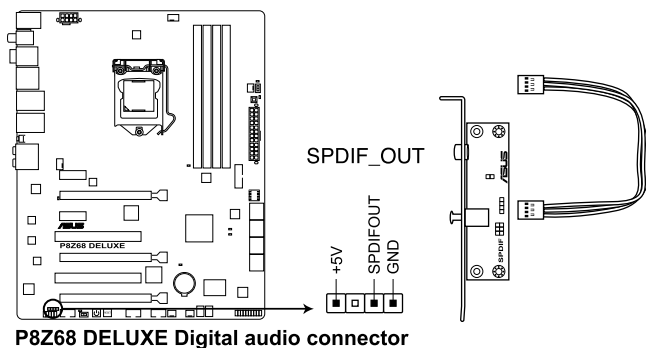
The S/PDIF module is purchased separately.

8.   **CPU, chassis, and power fan connectors**
      (4-pin CPU_FAN; 4-pin CHA_FAN1; 3-pin CHA_FAN2; 3-pin PWR_FAN1/2)

Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.


P8Z68 DELUXE Fan connectors
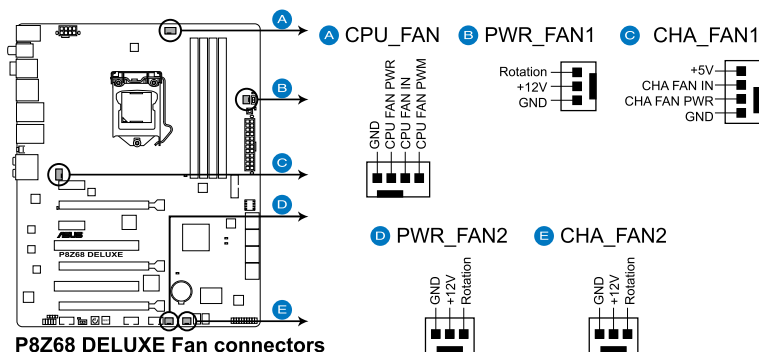
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!

- The CPU_FAN connector supports the CPU fan of maximum 1A (12 W) fan power.

- Only the CPU_FAN, CHA_FAN 1 and CHA_FAN 2 connectors support the ASUS FAN Xpert feature.

- If you install two VGA cards, we recommend that you plug the rear chassis fan cable to the motherboard connector labeled CHA_FAN1 or CHA_FAN2 for better thermal environment.

**9. Front panel audio connector (10-1 pin AAFP)**

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC`97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.

P8Z68 DELUXE Analog front panel connector
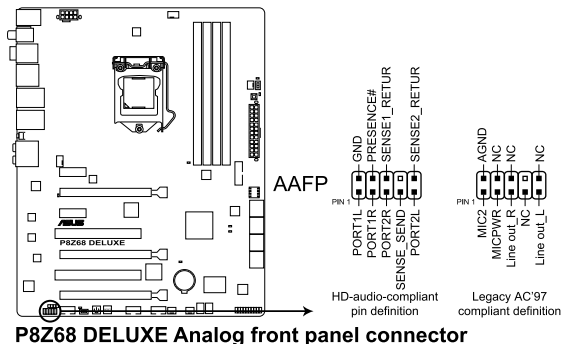
> • We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.
>
> • **If you want to connect a high-definition front panel audio module to this connector, set** the **Front Panel Type** item in the BIOS setup to **[HD];** if you want to connect an AC'97 front panel audio module to this connector, set the item to **[AC97]**. By default, this connector is set to **[HD]**.

10. ATX power connectors (24-pin EATXPWR; 8-pin EATX12V)

These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

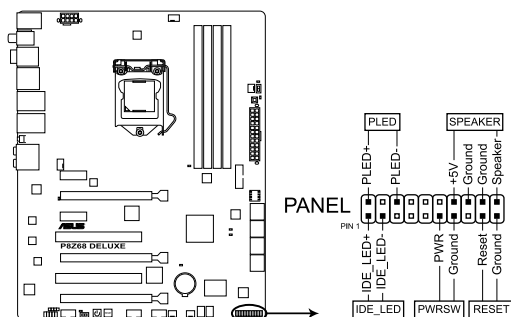**P8Z68 DELUXE ATX power connectors**
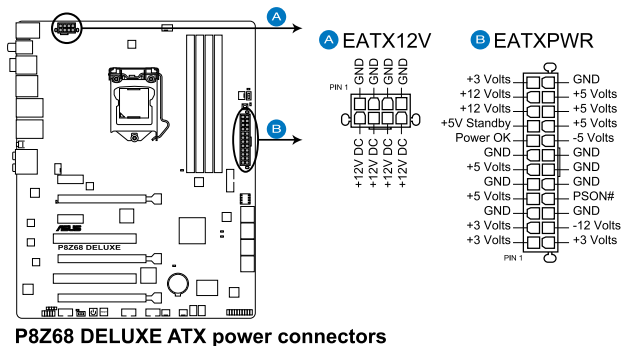
- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 350 W.

- Do not forget to connect the 4-pin/8-pin EATX12 V power plug; otherwise, the system will not boot.

- Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

- If you want to use two or more high-end PCI Express x16 cards, use a PSU with 1000W power or above to ensure the system stability.

- If you are uncertain about the minimum power supply requirement for your system, refer to the Recommended Power Supply Wattage Calculator at **http://support.asus. com/PowerSupplyCalculator/PSCalculator.aspx?SLanguage=en-us** for details.

PSU Suggested List

AcBel PC7030	Gigabyte P610A-C1
AcBel API5PC36	GoldenField ATX-S398
AcBel PC6018	GoldenField ATX-S550
AMA AA1200U-C	GreatWall BTX-600SE
AMA AA1000U-C	HECHUAN ST-ATX330
Antec SG-850	Huntkey R85
Antec EA-380	Huntkey 磐石500
ASUS P-50GA	I-cute AP-600S
ASUS P-55GA	In-Win COMMANDER-IRP-COM1500
ASUS U-65GA	OCZ 1000PXS
ASUS U-75HA	OCZ 780MXS
Be quiet BN073	SAMA YUHUI-350P
Be quiet BN077	Seasonic SS-500GB
Be quiet P6-PRO-850W	Seasonic SS-850EM
Bubalus PE600WJD	Seasonic SS-900HP
CoolerMaster RS-650	Seventeam ST-420BKP
CoolerMaster RS-750	Seventeam ST-522HLP
CoolerMaster RS-850EMBA	Seventeam ST550EAJ-05F
CoolerMaster RS-A00-ESBA	SHARKOON SHA-R600M
CoolerMaster RS-C50-EMBA-D2	Silverstone SST-ST50EF
Coolive AP-350F	Silverstone SST-ST85F
Corsair CMPSU-550VX	Silverstone ST1000
Corsair CMPSU-620HX	Snake PSH500V
Corsair CMPSU-750TX	Snake PSH850V
CWT PSH650V-D	Snake PMW-350WL
CWT PSH750V-D	Tagan TG1100-U33
Delta GPS-550AB	Tagan BZII1200
EnerMAX EPG600AWT	Thermaltake W0133RU
EnerMAX EGX1000EWL	Thermaltake W0133RE
EnerMAX EIN720AWT	TOPower TOP-500P5
FSP ATX-300PNR	Zalman ZM600-HP
Gigabyte M550A-D1	Zippy HP2-6500PE (G1)

11. **System panel connector (20-8 pin PANEL)**

This connector supports several chassis-mounted functions.

PANEL

P8Z68 DELUXE System panel connector

- **System power LED (2-pin PLED)**

  This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED (2-pin IDE_LED)**

  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

- **System warning speaker (4-pin SPEAKER)**

  This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.
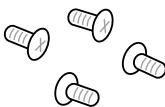
- **ATX power button/soft-off button (2-pin PWRSW)**
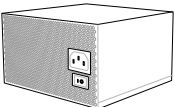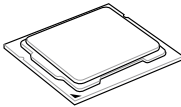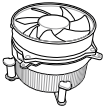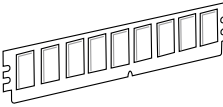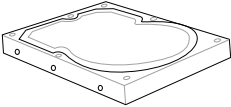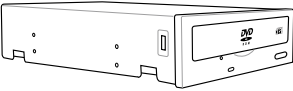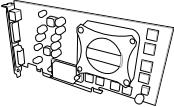
  This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **Reset button (2-pin RESET)**

  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

2.3 Building your computer system

2.3.1 Additional tools and components to build a PC system

1 bag of screws	**Philips (cross) screwdriver**
PC chassis	**Power supply unit**
Intel LGA 1155 CPU	**Intel LGA 1155 compatible CPU Fan**
DIMM	**SATA hard disk drive**
SATA optical disc drive (optional)	**Graphics card (optional)**

The tools and components in the table above are not included in the motherboard package.

2.3.2 CPU installation

> ⚠ The LGA1156 CPU is incompatible with the LGA1155 socket. DO NOT install a LGA1156 CPU on the LGA1155 socket.
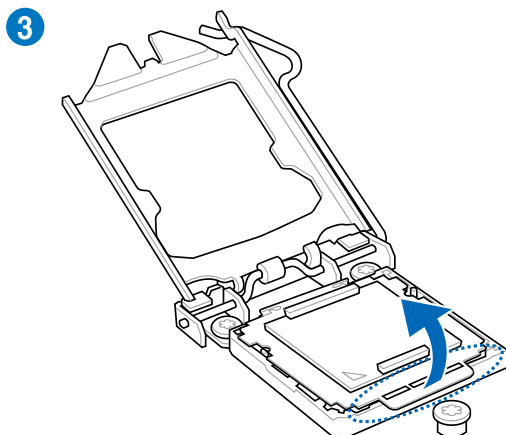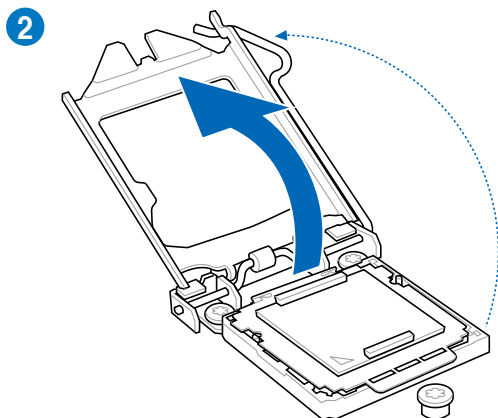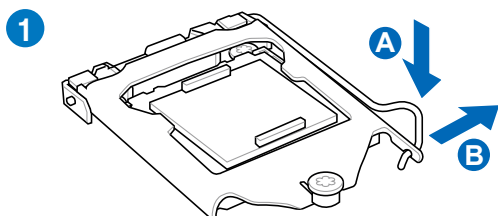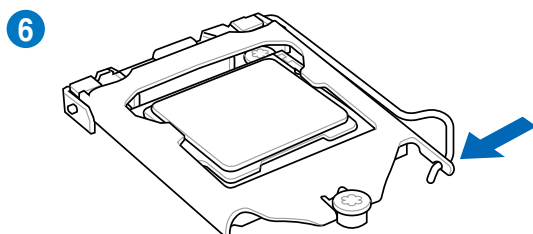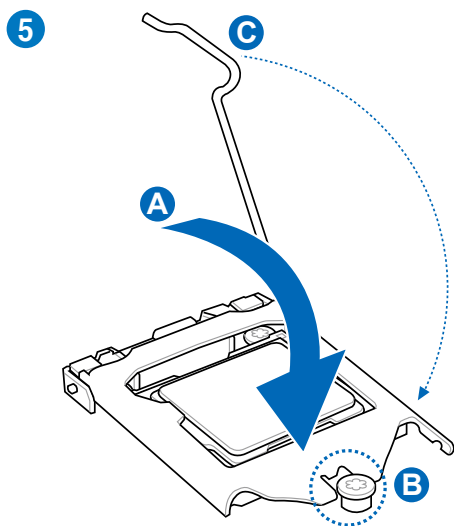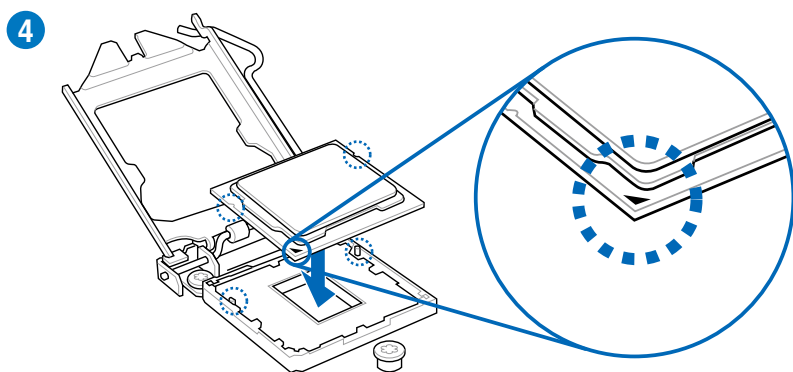
2.3.3   CPU heatsink and fan assembly installation
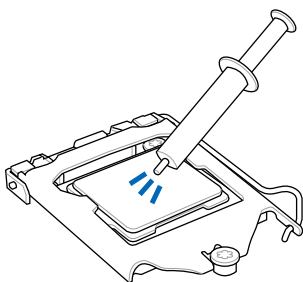
Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.

To install the CPU heatsink and fan assembly
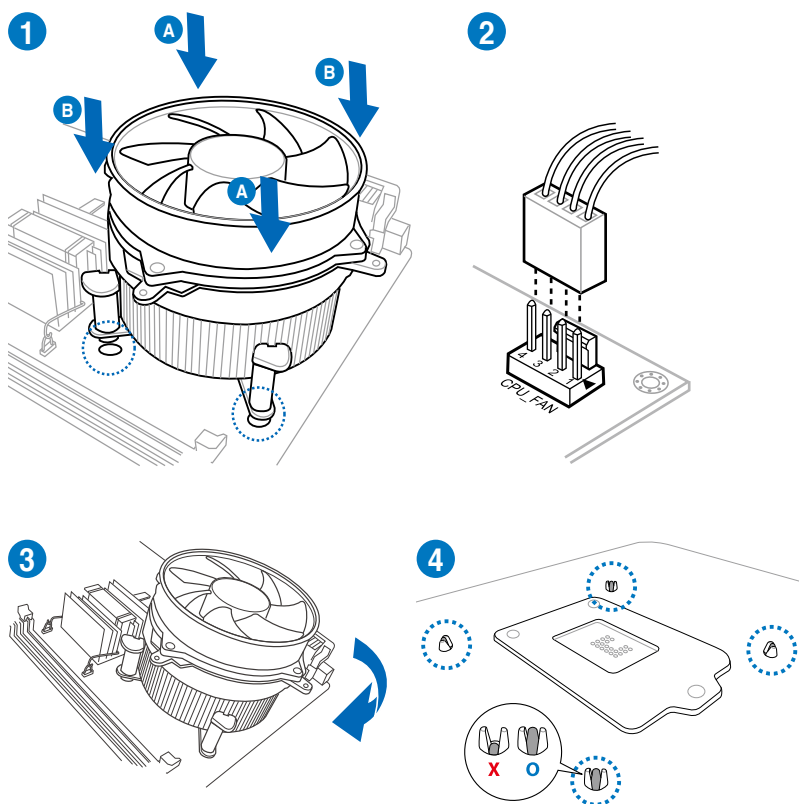
To uninstall the CPU heatsink and fan assembly
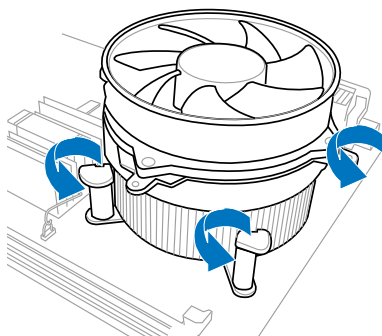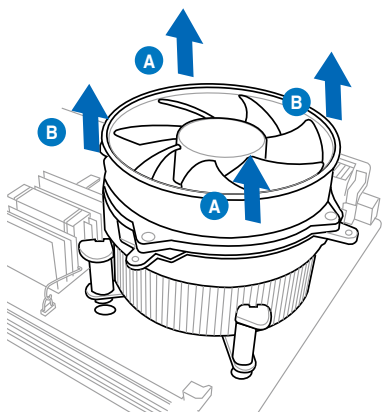
2.3.4   DIMM installation
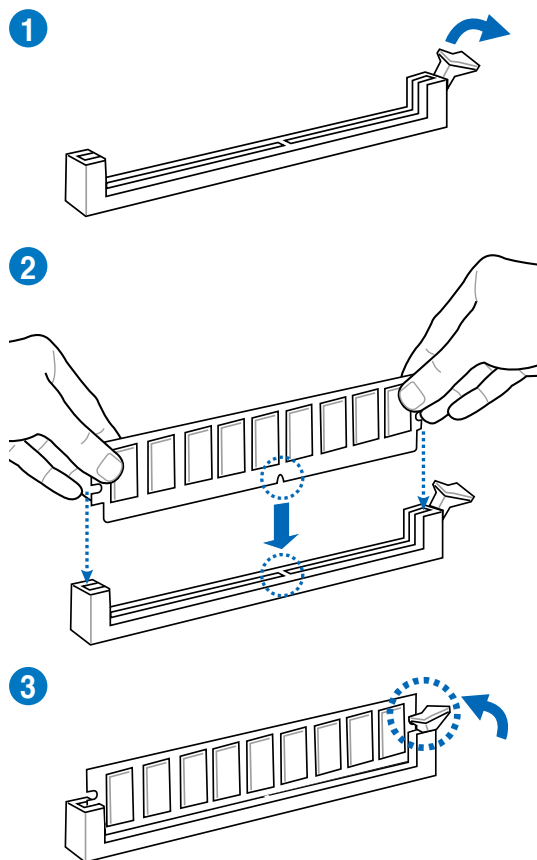
To remove a DIMM
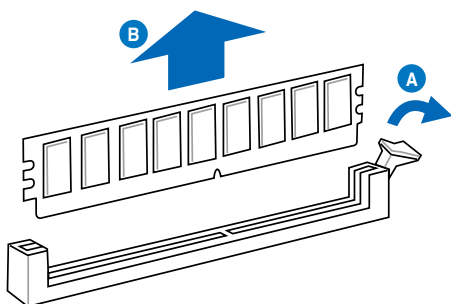
2.3.5　Motherboard installation

The diagrams in this section are for reference only. The motherboard layout may vary with models, but the installation steps remain the same.
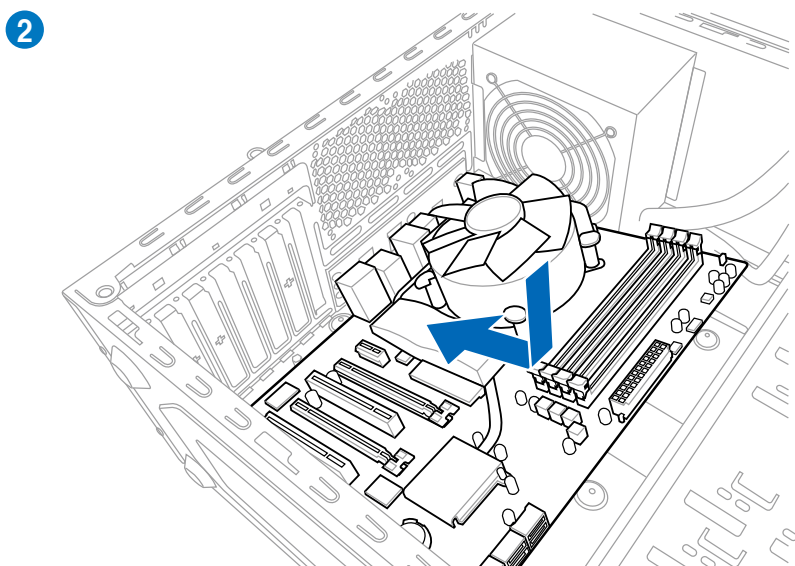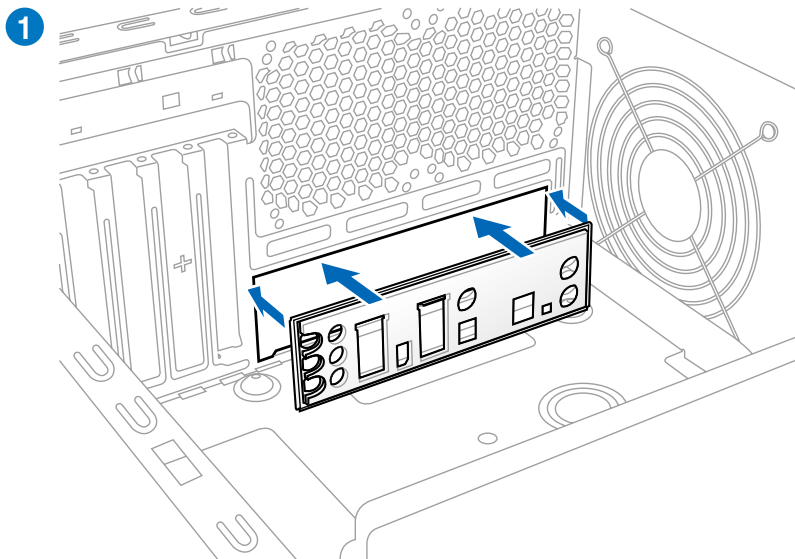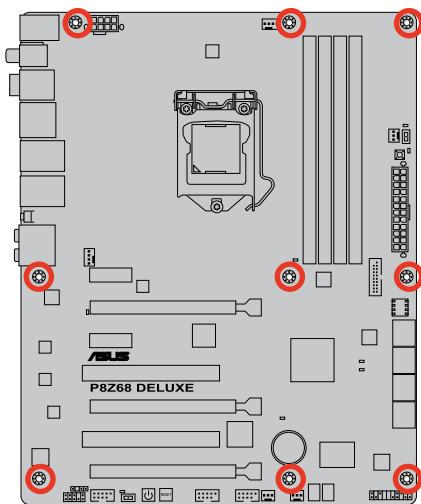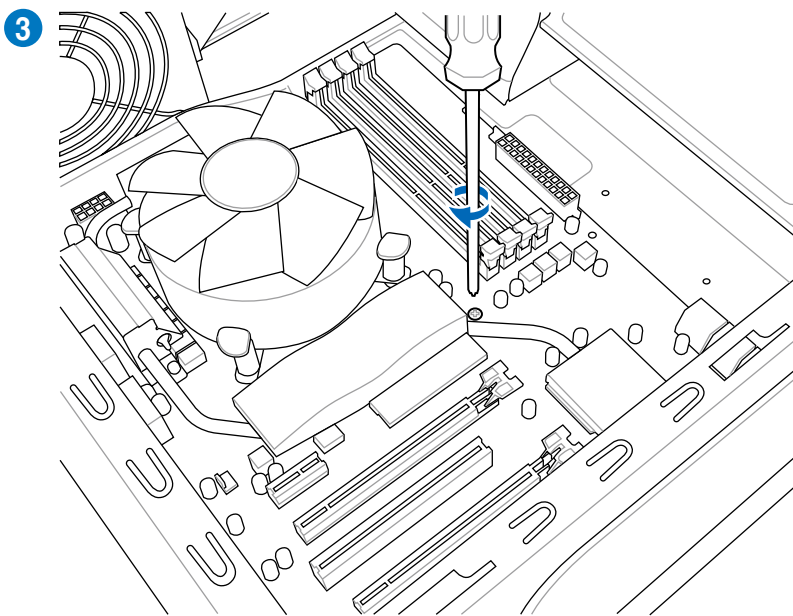
DO NOT overtighten the screws! Doing so can damage the motherboard.

2.3.6   ATX Power connection
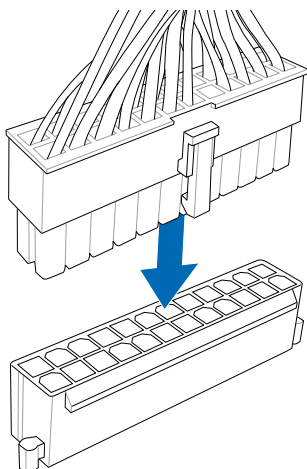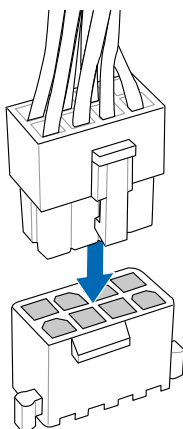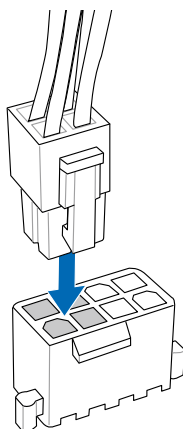
OR   **OR**
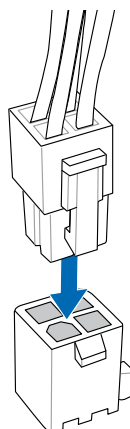
2.3.7 SATA device connection

OR

OR
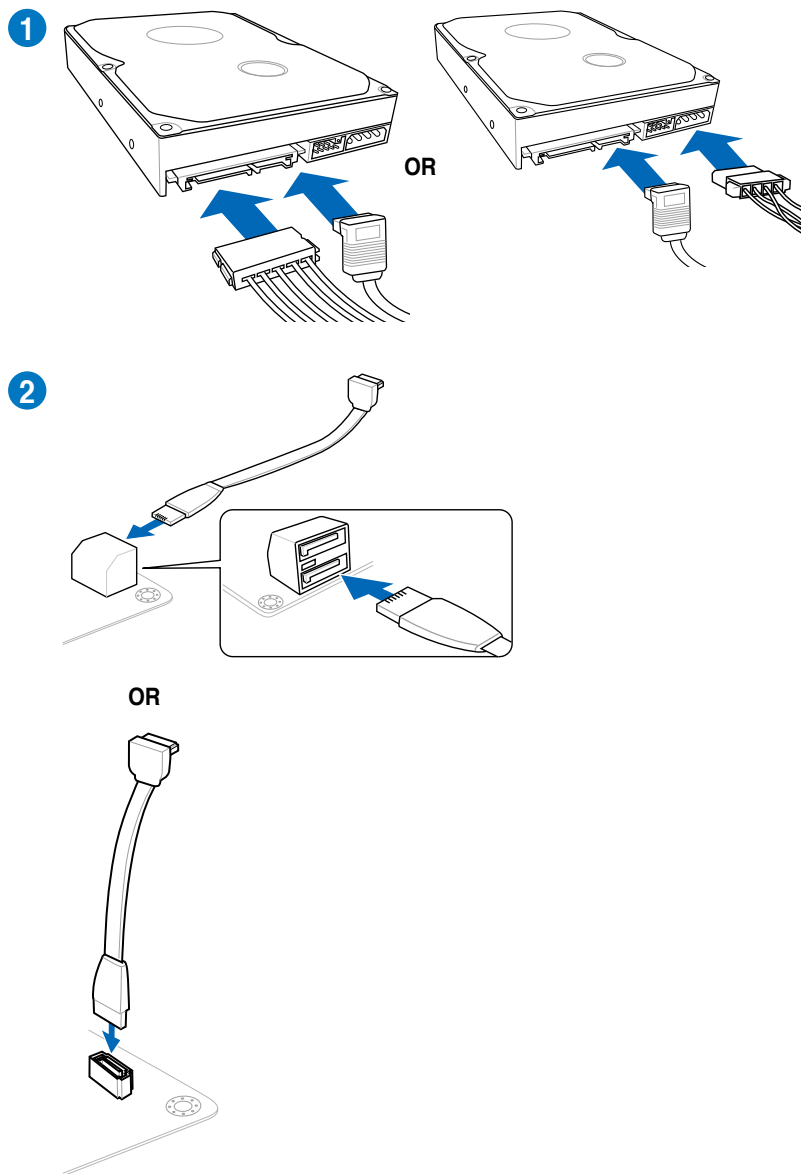
2.3.8 Front I/O Connector

To install ASUS Q-Connector
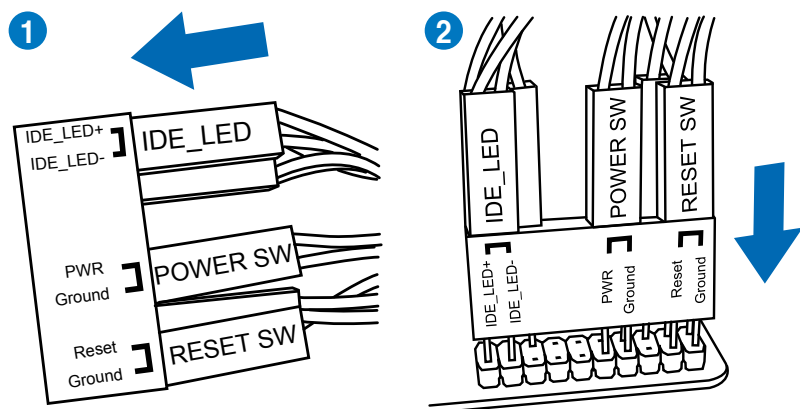
To install USB 2.0 Connector

USB 2.0
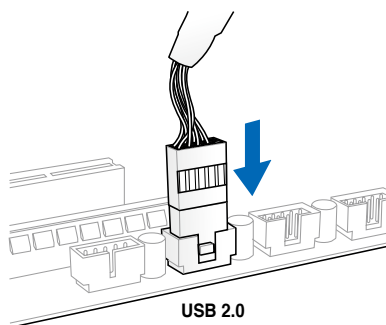
To install front panel audio connector

AAFP
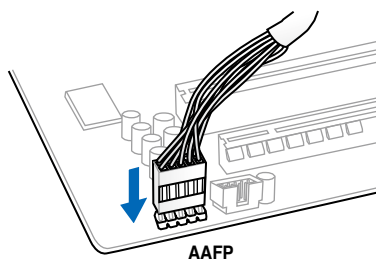
To install USB 3.0 Connector

USB 3.0
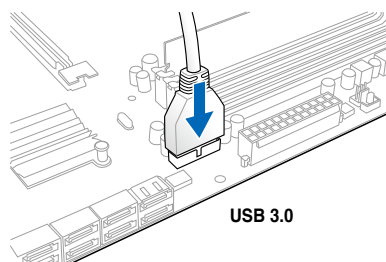
2.3.9   Expension Card installation

To install PCIe x16 cards
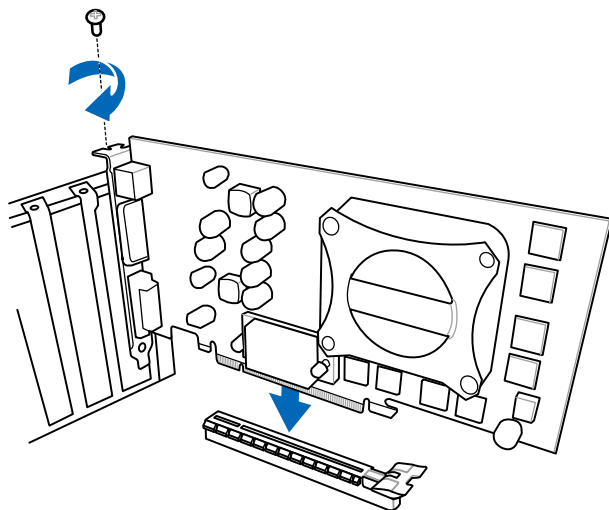
To install PCIe x1 cards
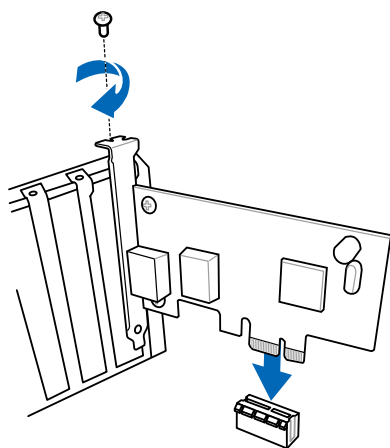
To install PCI cards
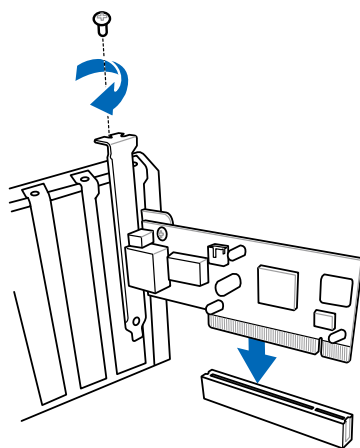
2.3.10 Rear panel connection
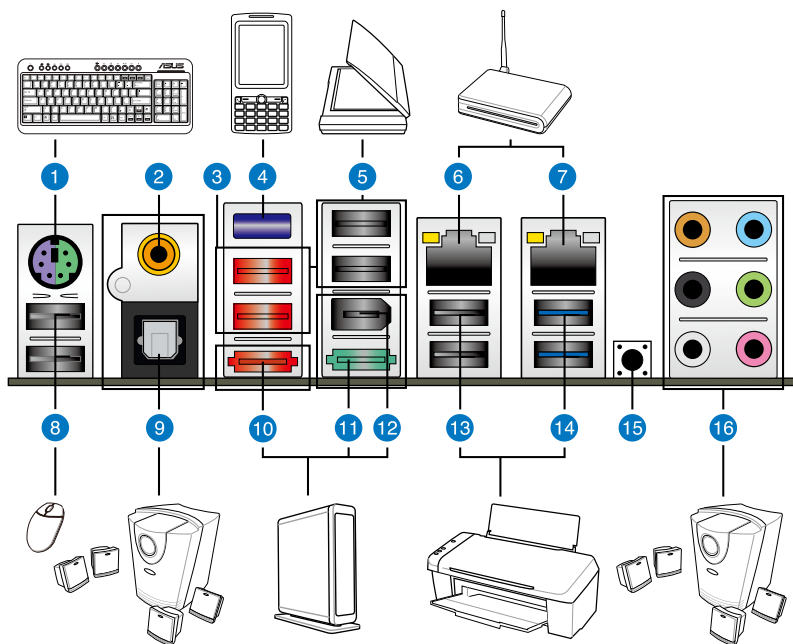
Rear panel connectors	
1. PS/2 keyboard/mouse combo port	9. Optical S/PDIF Out port
2. Coaxial S/PDIF Out port	10. External SATA port
3. USB 2.0 ports 5 and 6	11. Power External SATA port
4. Bluetooth module*	12. IEEE 1394a port
5. USB 2.0 ports 3 and 4	13. USB 2.0 ports 1 and 2
6. Realtek® LAN (RJ-45) port**	14. USB 3.0 ports 1 and 2
7. Intel® LAN (RJ-45) port** (Recommended for single LAN usage)	15. Clear CMOS switch
8. USB 2.0 ports 9 and 10	16. Audio I/O ports***

*, ** and ***: Refer to the tables on the next page for bluetooth module LED, LAN port LED, and audio port definitions.

- Press the Clear CMOS switch to clear BIOS setup information only when the system hangs due to overclocking.

- DO NOT insert a different connector to the external SATA port.

- Due to USB 3.0 controller limitation, USB 3.0 devices can only be used under Windows® OS environment and after the USB 3.0 driver installation.

- USB 3.0 devices can only be used as data storage only.

- We strongly recommend that you connect USB 3.0 devices to USB 3.0 ports for faster and better performance for your USB 3.0 devices.

- If you want to use the hot-plug function of the external SATA ports, you have to set the **JMB Storage Controller** item in the BIOS setting to [Enabled] and install the **JMicron JMB36X Controller Driver** from the motherboard support DVD. Refer to section **3.5.6 Onboard Devices Configuration** for details.

* Bluetooth module LED indications

Status	Description
Off	No link
Blue	Linked
Blinking	Data activity

** LAN ports LED indications

Activity Link LED		Speed LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
ORANGE	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection

ACT/LINK SPEED
LED   LED

LAN port
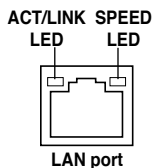
*** Audio 2, 4, 6, or 8-channel configuration

Port	Headset 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Line In
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In	Mic In
Orange	–	–	Center/Subwoofer	Center/Subwoofer
Black	–	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Gray	–	–	–	Side Speaker Out

2.3.11 Audio I/O connections

Audio I/O ports

orange	light blue
black	lime
gray	pink
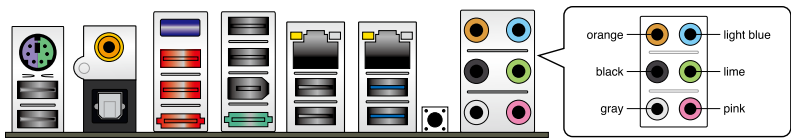
Connect to Headphone and Mic
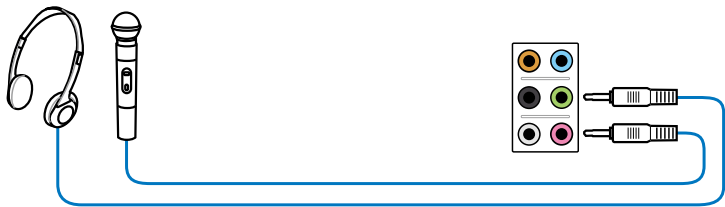
Connect to Stereo Speakers

AUDIO INPUTS
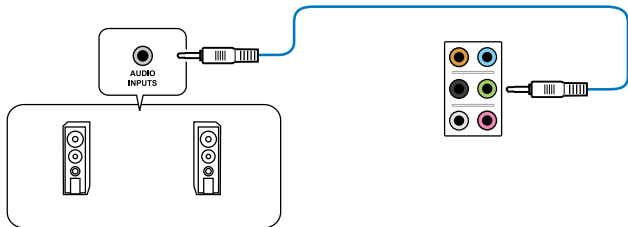
Connect to 2.1 channel Speakers

AUDIO INPUTS
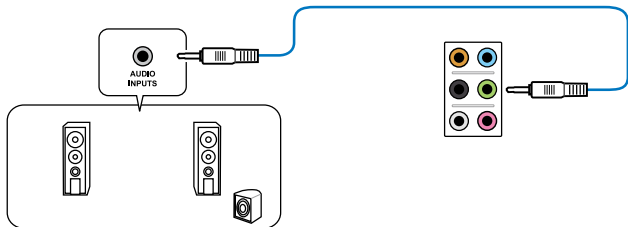
Connect to 4.1 channel Speakers
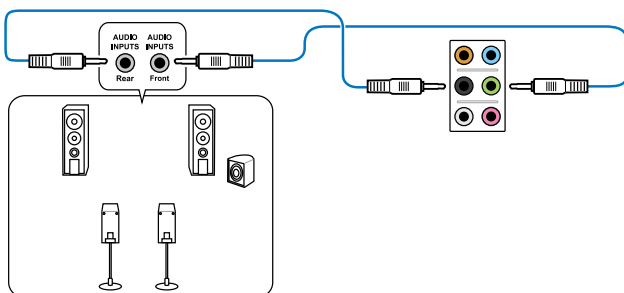
Connect to 5.1 channel Speakers
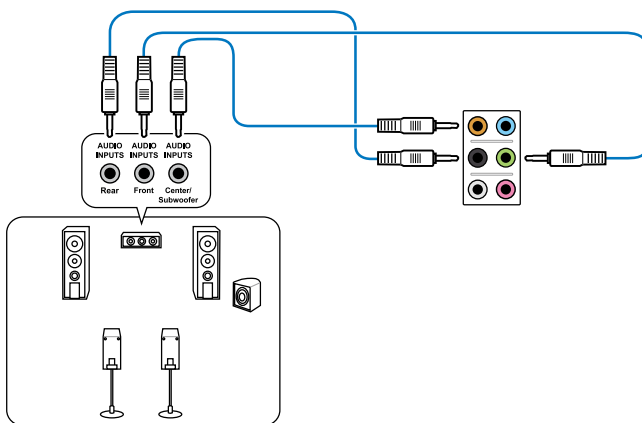
Connect to 7.1 channel Speakers
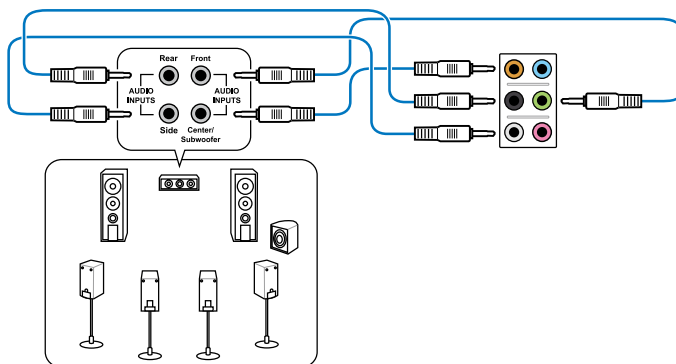
When the DTS Surround Sensation UltraPC function is enabled, ensure to connect the rear speaker to the gray port.

2.4   Starting up for the first time

1.   After making all the connections, replace the system case cover.

2.   Be sure that all switches are off.

3.   Connect the power cord to the power connector at the back of the system chassis.

4.   Connect the power cord to a power outlet that is equipped with a surge protector.

5.   Turn on the devices in the following order:

     a.   Monitor

     b.   External SCSI devices (starting with the last device on the chain)

     c.   System power

6.   After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with the "green" standards or if it has a "power standby" feature, the monitor LED may light up or change from orange to green after the system LED turns on.

     The system then runs the power-on self tests or POST. While the tests are running, the BIOS beeps (refer to the BIOS beep codes table below) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

BIOS Beep	Description
One short beep	VGA detected Quick boot set to disabled No keyboard detected
One continuous beep followed by two short beeps then a pause (repeated)	No memory detected
One continuous beep followed by three short beeps	No VGA detected
One continuous beep followed by four short beeps	Hardware component failure

7.   At power on, hold down the <Delete> key to enter the BIOS Setup. Follow the instructions in Chapter 3.

2.5   Turning off the computer

While the system is ON, pressing the power switch for less than four seconds puts the system on sleep mode or soft-off mode, depending on the BIOS setting. Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting.

Chapter 3

3.1   Knowing BIOS

The ASUS UEFI BIOS offers a user-friendly interface that goes beyond traditional keyboard-only BIOS controls to enable more flexible and convenient mouse input. Users can easily navigate the UEFI BIOS with the same smoothness as their operating system. The term "BIOS" in this user manual refers to "UEFI BIOS" unless otherwise specified.

BIOS (Basic Input and Output System) stores system hardware settings such as storage device configuration, overclocking settings, advanced power management, and boot device configuration that are needed for system startup in the motherboard CMOS. In normal circumstances, the default BIOS settings apply to most conditions to ensure optimum performance. **We recommend that you not change the default BIOS settings** except in the following circumstances:

•   An error message appears on the screen during the system bootup and requests you to run the BIOS Setup.

•   You have installed a new system component that requires further BIOS settings or update.

Inappropriate settings of the BIOS may result to instability or failure to boot. **We strongly recommend that you change the BIOS settings only with the help of a trained service personnel**.

3.2   BIOS setup program

A BIOS setup program is provided for BIOS item modification. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On Self-Test (POST) to enter the Setup utility. Otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, press <Ctrl> + <Alt> + <Delete>, or press the reset button on the system chassis to restart the system. You can also turn the system off and then turn it back on to restart the system. Do this last option only if the first two failed.

•   The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

•   Ensure that a USB mouse is connected to your motherboard if you want to use the mouse to control the BIOS setup program.

•   If the system becomes unstable after changing any BIOS setting, load the default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the **Exit** menu. See section **3.9 Exit Menu** for details.

•   If the system fails to boot after changing any BIOS setting, try to clear the CMOS and reset the motherboard to the default value. See section **2.2.8 Jumper** for information on how to erase the RTC RAM.

•   The BIOS setup program does not support the bluetooth devices.

The BIOS setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various submenus and select from the available options using a keyboard or a USB mouse.

The BIOS setup program can be used under two modes: **EZ Mode** and **Advanced Mode**. You can change modes from the **Exit** menu or from the **Exit/Advanced Mode** button in the **EZ Mode**/**Advanced Mode** screen.

3.2.1   EZ Mode

By default, the EZ Mode screen appears when you enter the BIOS setup program. The EZ Mode provides you an overview of the basic system information, and allows you to select the display language, system performance mode and boot device priority. To access the Advanced Mode, click **Exit/Advanced Mode**, then select **Advanced Mode**.

> The default screen for entering the BIOS setup program can be changed. Refer to the **Setup Mode** item in **section 3.7 Boot memu** for details.

Selects the display language of the BIOS setup program

Clicks to display all fan speeds if available

Displays the CPU/motherboard temperature, CPU/5V/3.3V/12V voltage output, CPU/chassis/power fan speed

Exits the BIOS setup program without saving the changes, saves the changes and resets the system, or enters the Advanced Mode

/ISUS EFI BIOS Utility - EZ Mode

Exit/Advanced Mode

P8Z68 Deluxe

BIOS Version : 0209   Build Date : 03/04/2011

CPU Type : Genuine Intel(R) CPU 0 @ 3.10GHz   Speed : 3531 MHz

Monday [9/13/2010]   Total Memory : 512 MB (DDR3 1066MHz)

English ▼

Temperature

CPU   +113.0ºF/+45.0ºC
MB   +75.2ºF/+40.0ºC

Voltage

CPU   1.248V   5V   5.160V
3.3V   3.344V   12V   12.248V

Fan Speed

CPU_FAN   3325RPM   PWR_FAN1   N/A
CHA_FAN1   N/A   CHA_FAN2   N/A

System Performance

Quiet
Performance   Energy Saving

Normal

Boot Priority

Use the mouse to drag or keyboard to navigate to decide the boot priority.

Boot Menu(F8)   Default(F5)

Selects the boot device priority

Power Saving mode

Loads optimized default

Displays the system properties of the selected mode on the right hand side

Normal mode

ASUS Optimal mode

Selects the boot device priority

> • The boot device options vary depending on the devices you installed to the system.
>
> • The **Boot Menu(F8)** button is available only when the boot device is installed to the system.

Chapter 3

3.2.2 Advanced Mode

The Advanced Mode provides advanced options for experienced end-users to configure the BIOS settings. The figure below shows an example of the Advanced Mode. Refer to the following sections for the detailed configurations.

> To access the Advanced Mode, click **Exit**, then select **Advanced Mode**.

Back button   Menu items   Menu bar   Configuration fields   General help

Submenu item   Pop-up window   Scroll bar   Navigation keys
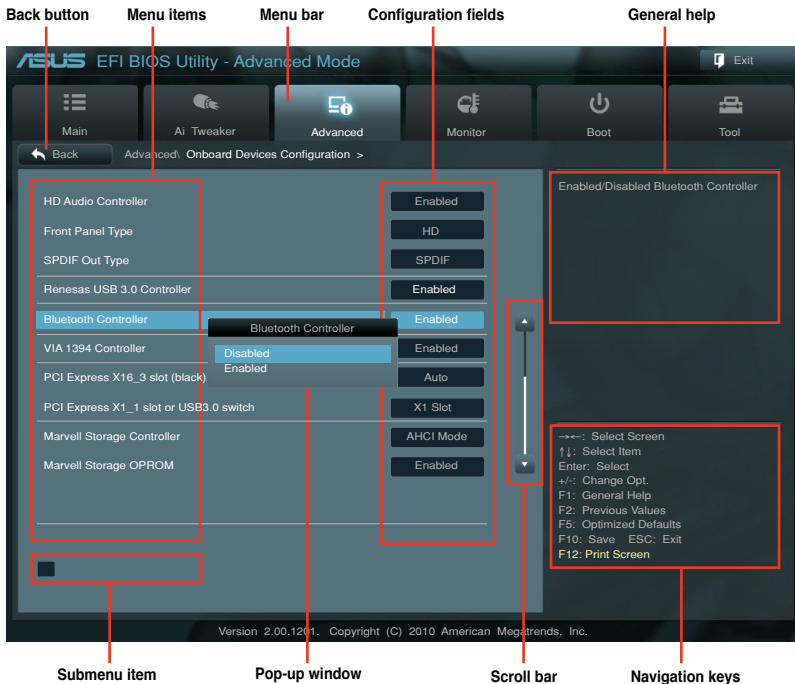
Menu bar

The menu bar on top of the screen has the following main items:

Main	For changing the basic system configuration
Ai Tweaker	For changing the overclocking settings
Advanced	For changing the advanced system settings
Monitor	For displaying the system temperature, power status, and changing the fan settings.
Boot	For changing the system boot configuration
Tool	For configuring options for special functions
Exit	For selecting the exit options and loading default settings

Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (Ai Tweaker, Advanced, Monitor, Boot, Tool, and Exit) on the menu bar have their respective menu items.

Back button

This button appears when entering a submenu. Press <Esc> or use the USB mouse to click this button to return to the previous menu screen.

Submenu items

A greater than sign (>) before each item on any menu screen means that the item has a submenu. To display the submenu, select the item and press <Enter>.

Pop-up window

Select a menu item and press <Enter> to display a pop-up window with the configuration options for that item.

Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen.

Navigation keys

At the bottom right corner of the menu screen are the navigation keys for the BIOS setup program. Use the navigation keys to select items in the menu and change the settings.

General help

At the top right corner of the menu screen is a brief description of the selected item. Use <F12> key to capture the BIOS screen and save it to the removable storage device.

Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is highlighted when selected. To change the value of a field, select it and press <Enter> to display a list of options.

3.3 Main menu

The Main menu screen appears when you enter the Advanced Mode of the BIOS Setup program. The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, language, and security settings.
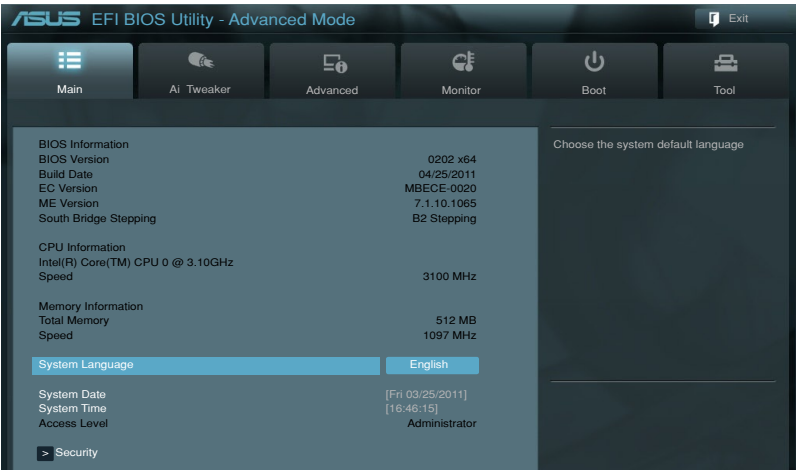
Security

The Security menu items allow you to change the system security settings.
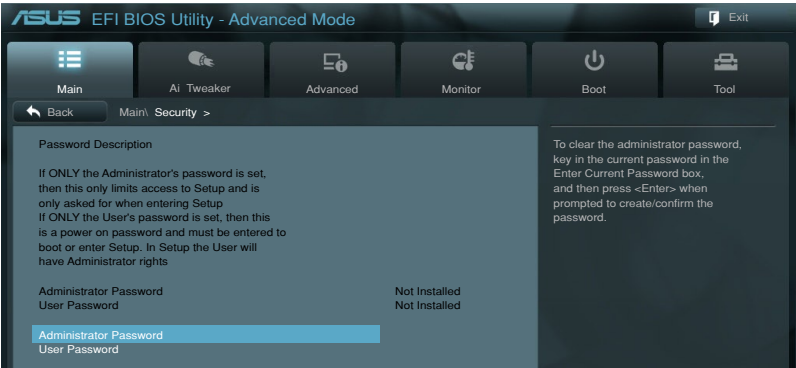
• If you have forgotten your BIOS password, erase the CMOS Real Time Clock (RTC) RAM to clear the BIOS password. See section **2.3.7 Jumper** for information on how to erase the RTC RAM.

• The **Administrator** or **User Password** items on top of the screen show the default **Not Installed**. After you set a password, these items show **Installed**.

Administrator Password

If you have set an administrator password, we recommend that you enter the administrator password for accessing the system. Otherwise, you might be able to see or change only selected fields in the BIOS setup program.

To set an administrator password:

1.   Select the **Administrator Password** item and press <Enter>.

2.   From the **Create New Password** box, key in a password, then press <Enter>.

3.   Confirm the password when prompted.

To change an administrator password:

1.   Select the **Administrator Password** item and press <Enter>.

2.   From the **Enter Current Password** box, key in the current password, then press <Enter>.

3.   From the **Create New Password** box, key in a new password, then press <Enter>.

4.   Confirm the password when prompted.

To clear the administrator password, follow the same steps as in changing an administrator password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the **Administrator Password** item on top of the screen shows **Not Installed**.

User Password

If you have set a user password, you must enter the user password for accessing the system. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a user password:

1.   Select the **User Password** item and press <Enter>.

2.   From the **Create New Password** box, key in a password, then press <Enter>.

3.   Confirm the password when prompted.

To change a user password:

1.   Select the **User Password** item and press <Enter>.

2.   From the **Enter Current Password** box, key in the current password, then press <Enter>.

3.   From the **Create New Password** box, key in a new password, then press <Enter>.

4.   Confirm the password when prompted.

To clear the user password, follow the same steps as in changing a user password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the **User Password** item on top of the screen shows **Not Installed**.

3.4   Ai Tweaker menu

The Ai Tweaker menu items allow you to configure overclocking-related items.

![warning icon] Be cautious when changing the settings of the Ai Tweaker menu items. Incorrect field values can cause the system to malfunction.

![note icon] The configuration options for this section vary depending on the CPU and DIMM model you installed on the motherboard.

EFI BIOS Utility - Advanced Mode   Exit

| Main | Ai Tweaker | Advanced | Monitor | Boot | Tool |

Target CPU Turbo-Mode Speed : 4429MHz

Target DRAM Speed : 1097MHz

Ai Overclock Tuner	Auto
BCLK/PCIE Frequency	103.0
Turbo Ratio	Auto
By All Cores (Can Adjust in OS)	43
Internal PLL Overvoltage	Auto
Memory Frequency	Auto
iGPU Max. Frequency	Auto
EPU Power Saving Mode	Disabled
> OC Tuner	
> DRAM Timing Control	
> CPU Power Management	

[X.M.P.] When XMP is enabled BLCK frequency, CPU ratio and memory parameters will be auto optimized.

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F5: Optimized Defaults
F10: Save   ESC: Exit
F12: Print Screen

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Scroll down to display the following items:

CPU Voltage	1.176V	Offset Mode
Offset Mode Sign		+
CPU Offset Voltage		Auto
iGPU Offset Mode Sign		+
iGPU Offset Voltage		Auto
DRAM Voltage	1.515V	Auto
VCCIO Voltage	1.062V	Auto
CPU PLL Voltage	1.800V	Auto
PCH Voltage	1.062V	Auto
DRAM DATA REF Voltage on CHA		Auto
DRAM CTRL REF Voltage on CHA		Auto
DRAM DATA REF Voltage on CHB		Auto
DRAM CTRL REF Voltage on CHB		Auto
CPU Spread Spectrum		Auto

Version 2.00.1201. Copyright (C) 2010 American Megatrends, Inc.

Ai Overclock Tuner [Auto]

Allows you to select the CPU overclocking options to achieve the desired CPU internal frequency. Select any of these preset overclocking configuration options:

[Auto]   Loads the optimal settings for the system.

[Manual]   Allows you to individually set overclocking parameters.

[X.M.P.]   If you install memory modules supporting the eXtreme Memory Profile (X.M.P.) Technology, choose this item to set the profiles supported by your memory modules for optimizing the system performance.

BCLK/PCIE Frequency [XXX]

Allows you to adjust the CPU and VGA frequency to enhance the system performance. Use the <+> and <-> keys to adjust the value. You can also key in the desired value using the numeric keypad. The values range from 80.0MHz to 300.0MHz.

eXtreme Memory Profile [High Performance]

This item appears only when you set the **Ai Overclock Tuner** item to [X.M.P.] and allows you to select the X.M.P. mode supported by your memory module.
Configuration options: [Disabled] [Profile #1] [Profile #2]

Turbo Ratio [By All Cores]

Allows you to manually adjust the Trubo CPU ratio.

[Auto]	All Turbo ratio are set by Intel CPU default settings.
[By ALL Cores (Can Adjust in OS)]	All numbers of active cores will be set to one single Turbo ratio in OS.
[By Per Core (Cannot Adjust in OS)]	All numbers of active cores can be set to an individual Turbo ratio in BIOS.

By ALL Cores (Can Adjust in OS) [XX]

This item appears only when you set the **Turbo Ratio** item to [By ALL Cores (Can Adjust in OS)]. Use the <+> and <-> keys to adjust the value.

1-/2-/3-/4-Core Ratio Limit [XX]

This item appears only when you set the **Turbo Ratio** item to [By Per Core (Cannot Adjust in OS)]. Use the <+> and <-> keys to adjust the value.

Internal PLL Overvoltage [Auto]

Allows you to set the Internal PLL Overvoltage.
Configuration options: [Auto] [Enabled] [Disabled]

Memory Frequency [Auto]

Allows you to set the memory operating frequency. The configuration options vary with the **BCLK/PCIE Frequency** item settings.

Selecting a very high memory frequency may cause the system to become unstable! If this happens, revert to the default setting.

The following items appears only when you set the **Initiate iGPU** items to [Enabled].

iGPU Max. Frequency [XXXX]

Use the <+> and <-> keys to adjust the value. The values range from 1100MHz to 3000MHz with a 50MHz interval.

EPU Power Saving MODE [Disabled]

Allows you to enable or disable the EPU power saving function.
Configuration options: [Disabled] [Enabled]

EPU Setting [Auto]

This item appears only when you set the **EPU Power Saving MODE** item to [Enabled.] and allows you to select the EPU power saving mode.
Configuration options: [Auto] [Light Power Saving Mode] [Medium Power Saving Mode] [Max Power Saving Mode]

OC Tuner

OC Tuner automatically overclocks the frequency and voltage of CPU and DRAM for enhancing the system performance. Configuration options: [OK] [Cancel]

DRAM Timing Control

The sub-items in this menu allow you to set the DRAM timing control features. Use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key.

Changing the values in this menu may cause the system to become unstable! If this happens, revert to the default settings.

CPU Power Management

The sub-items in this menu allow you to set the CPU ratio and features.

CPU Ratio [Auto]

Allows you to manually adjust the maximum non-turbo CPU ratio. Use <+> and <-> keys to adjust the value. The valid value ranges vary according to your CPU model.

Enhanced Intel SpeedStep Technology [Enabled]

Allows you to enable or disable the Enhanced Intel® SpeedStep Technology (EIST).

[Disabled]   Disables this function.

[Enabled]   The operating system dynamically adjusts the processor voltage and core frequency which may result in decreased average consumption and decreased average heat production.

<u>Turbo Mode [Enabled]</u>

This item appears only when you set the **EIST** item to [Enabled].

[Enabled]   Allows processor cores to run faster than marked frequency in specific condition.

[Disabled]   Disables this function.

The following five items appear only when you set the **EIST** and **Turbo Mode** items to [Enabled].

<u>Long Duration Power Limit [Auto]</u>

Use the <+> and <-> keys to adjust the value.

<u>Long Duration Maintained [Auto]</u>

Use the <+> and <-> keys to adjust the value.

<u>Short Duration Power Limit [Auto]</u>

Use the <+> and <-> keys to adjust the value.

<u>Additional Turbo Voltage [Auto]</u>

Use the <+> and <-> keys to adjust the value.

<u>Primary Plane Current Limit [Auto]</u>

Maximum instaneous current allowed at any given time for CPU cores.
Use <+> and <-> key to adjust the value at 0.125A increment.

DIGI+ VRM

Load-Line Calibration [Auto]

Load-line is defined by Intel VRM spec and affects CPU voltage. The CPU working voltage will decrease proportionally to CPU loading. Higher load-line calibration would get higher voltage and better overclocking performance, but increase the CPU and VRM thermal. This item allows you to adjust the voltage range from the following percentages to boost the system performance: 0% (Regular), 25% (Medium), 50% (High), 75% (Ultra High) and 100% (Extreme).
Configuration options: [Auto] [Regular] [Medium] [High] [Ultra High] [Extreme]

The actual performance boost may vary depending on your CPU specifiation.

VRM Frequency [Auto]

Switching frequency will affect the VRM transient response and component thermal. Setting a higher frequency gets faster transient response.

[Auto]   Allows you to enable or disable the Spread Spectrum item.

[Manual]   Allows you to manually set the frequency with a 10k Hz interval.

VRM Spread Spectrum [Disabled]

This item appears only when you set the **Frequency** item to [Auto] and allows you to enable the spread spectrum to enhance system stability.

VRM Fixed Frequency Mode [XXX]

This item appears only when you set the **VRM Frequency** item to [Manual] and allows you to set a fixed VRM frequency. Use the <+> and <-> keys to adjust the value. The values range from 300k Hz to 500k Hz with a 10k Hz interval.

Phase Control [Extreme]

Phase number is the number of woorking VRM phase. Increasing phase number under heavy system loading to get more transient and better thermal performance. Reducing phase number under light system loading to increase VRM efficiency

[Standard]   Proceeds phase control depending on the CPU loading.

[Optimized]   Loads the ASUS optimized phase tuning profile.

[Extreme]   Proceeds the full phase mode.

[Manual Adjustment]   Allows manual adjustment.

Manual Adjustment [Medium]

This item appears only when you set the **Phase Control** item to [Manual Adjustment]. Configuration options: [Ultra Fast] [Fast] [Medium] [Regular]

Duty Control [T.Probe]

[T.Probe]   Maintains the VRM thermal balance.

[Extreme]   Maintains the VRM current balance.

CPU Current Capability [100%]

This item provides wider total power range for overclocking. A higher value brings a wider total power range and extends the overclocking frequency range simultaneously. Configuration options: [100%] [110%] [120%] [130%] [140%]

> The following items appears only when you set the **Initiate iGPU** items to [Enabled].

iGPU Load-line Calibration [Auto]

Allows you to set the iGPU Load-line Calibration. Configuration options: [Auto] [Regular] [High] [Extreme]

iGPU Current Capability [100%]

Allows you to set the iGPU Current Capability. Configuration options: [100%] [140%]

> Do not remove the thermal module while changing the DIGI+ VRM related parrameters . The thermal conditions should be monitored.

> Some of the following items are adjusted by typing the desired values using the numeric keypad and press the <Enter> key. You can also use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key.

CPU Voltage [Offset Mode]

[Manual Mode]   Allows you to set a fixed CPU voltage.

[Offset Mode]   Allows you to set the Offset voltage.

Offset Mode Sign [+]

This item appears only when you set the **CPU Voltage** item to [Offset Mode].

[+]   To offset the voltage by a positive value.

[−]   To offset the voltage by a negative value.

CPU Offset Voltage [Auto]

This item appears only when you set the **CPU Voltage** item to [Offset Mode] and allows you to set the Offset voltage. The values range from 0.005V to 0.635V with a 0.005V interval.

CPU Manual Voltage [Auto]

This item appears only when you set the **CPU Voltage** item to [Manual Mode] and allows you to set a fixed CPU voltage. The values range from 0.800V to 1.990V with a 0.005V interval.

> Refer to the CPU documentation before setting the CPU voltage. Setting a high voltage may damage the CPU permanently, and setting a low voltage may make the system unstable.

> The following items appears only when you set the **Initiate iGPU** items to [Enabled].

iGPU Offset Mode Sign [+]

[+]   To offset the voltage by a positive value.

[−]   To offset the voltage by a negative value.

iGPU Offset Voltage [Auto]

Allows you to set the iGPU Offset voltage. The values range from 0.005V to 0.635V with a 0.005V interval.

DRAM Voltage [Auto]

Allows you to set the DRAM voltage. The values range from 1.20V to 2.20V with a 0.00625V interval.

> According to Intel CPU spec, DIMMs with voltage requirement over 1.65V may damage the CPU permanently. We recommend you install the DIMMs with the voltage requirement below 1.65V.

VCCIO Voltage [Auto]

Allows you to set the VCCIO voltage. The values range from 0.80V to 1.70V with a 0.00625V interval.

CPU PLL Voltage [Auto]

Allows you to set the CPU and PCH PLL voltage. The values range from 1.20V to 2.20V with a 0.00625V interval.

PCH Voltage [Auto]

Allows you to set the Platform Controller Hub volage. The values range from 0.80V to 1.70V with a 0.01V interval.

⚠ • The values of the CPU Manual Voltage, CPU Offset Voltage, DRAM Voltage, VCCIO Voltage, and PCH Voltage items are labeled in different color, indicating the risk levels of high voltage settings.

• The system may need better cooling system to work stably under high voltage settings.

	Black	Yellow	Pink	Red
CPU Manual Voltage	0.8V–1.22V	1.225V–1.280V	1.285V–1.335V	1.340V–1.990V
CPU Offset Voltage	0.005V–0.060V	0.065V–0.120V	0.125V–0.175V	0.180V–0.635V
iGPU Offset Voltage	0.005V–0.035V	0.04V–0.065V	0.07V–0.1V	0.105V–0.635V
DRAM Voltage	1.20000V–1.57500V	1.58125V–1.65000V	1.65625V–1.72500V	1.73125V–2.20000V
VCCIO Voltage	0.80000V–1.10000V	1.10625V–1.15000V	1.15625V–1.20625V	1.21250V–1.70000V
CPU PLL Voltage	1.20000V–1.88750V	1.89375V–1.97500V	1.98125V–2.06875V	2.07500V–2.20000V
PCH Voltage	0.80000V–1.10000V	1.11000V–1.15000V	1.16000V–1.20000V	1.21000V–1.70000V

DRAM DATA REF Voltage on CHA/B [Auto]

Allows you to set the DRAM DATA Reference Voltage on Channel A/B. The values range from 0.395x to 0.630x with a 0.005x interval. Different ratio might enhance DRAM overclocking ability.

DRAM CTRL REF Voltage on CHA/B [Auto]

Allows you to set the DRAM Control Reference Voltage on Channel A/B. The values range from 0.395x to 0.630x with a 0.005x interval. Different ratio might enhance DRAM overclocking ability.

CPU Spread Spectrum [Auto]

[Auto]   Automatic configuration.

[Disabled]   Enhances the BCLK overclocking ability.

[Enabled]   Sets to [Enabled] for EMI control.

Chapter 3

3.5 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.

⚠️ Be cautious when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.
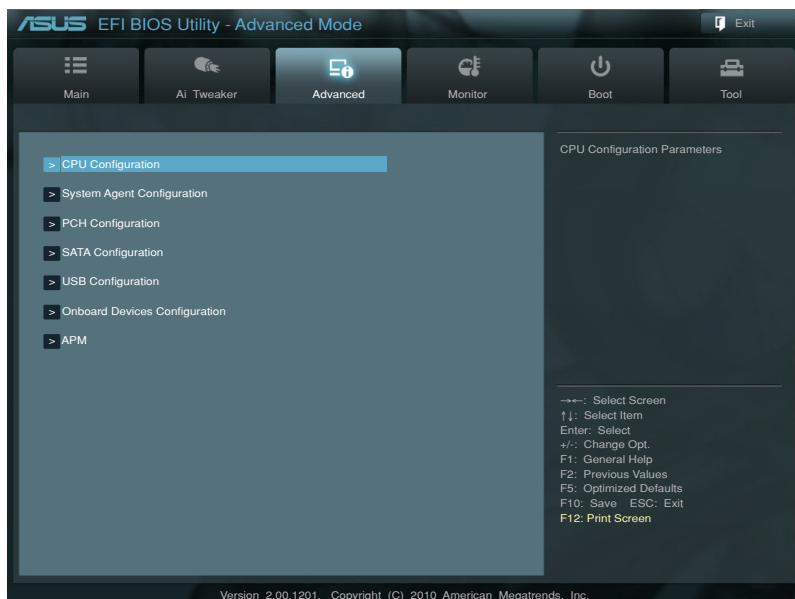
3.5.1 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.

The items shown in this screen may be different due to the CPU you installed.

Scroll down to display the following items:

CPU Ratio [Auto]

Allows you to set the ratio between the CPU Core Clock and the BCLK Frequency. Use <+> and <-> keys to adjust the ratio. The valid value ranges vary according to your CPU model.

Intel Adaptive Thermal Monitor [Enabled]

[Enabled]   Enables the overheated CPU to throttle its clock speed to cool down.

[Disabled]   Disables the CPU thermal monitor function.

Hyper-threading [Enabled]

The Intel Hyper-Threading Technology allows a hyper-threading processor to appear as two logical processors to the operating system, allowing the operating system to schedule two threads or processes simultaneously.

[Enabled]   Two threads per activated core are enabled.

[Disabled]   Only one thread per activated core is enabled.

Active Processor Cores [All]

Allows you to choose the number of CPU cores to activate in each processor package. Configuration options: [All] [1] [2] [3]

Limit CPUID Maximum [Disabled]

[Enabled]   Allows legacy operating systems to boot even without support for CPUs with extended CPUID functions.

[Disabled]   Disables this function.

Execute Disable Bit [Enabled]

[Enabled]   Enables the No-Execution Page Protection Technology.

[Disabled]   Forces the XD feature flag to always return to zero (0).

Intel(R) Virtualization Tech [Disabled]

[Enabled]   Allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

[Disabled]   Disables this function.

Enhanced Intel SpeedStep Technology [Enabled]

Allows you to enable or disable the Enhanced Intel® SpeedStep Technology (EIST).

[Disabled]   The CPU runs at its default speed.

[Enabled]   The operating system controls the CPU speed.

Turbo Mode [Enabled]

This item appears only when you set the **EIST** item to [Enabled] and allows you to enable or disable the Intel® Turbo Mode Technology.

[Enabled]   Allows processor cores to run faster than marked frequency in specific condition.

[Disabled]   Disables this function.

CPU C1E [Auto]

[Enabled]   Enables the C1E support function. This item should be enabled in order to enable the Enhanced Halt State.

[Disabled]   Disables this function.

CPU C3 Report [Auto]

Allows you to disable or enable the CPU C3 report to OS.

CPU C6 Report [Auto]

Allows you to disable or enable the CPU C6 report to OS.

3.5.2 System Agent Configuration
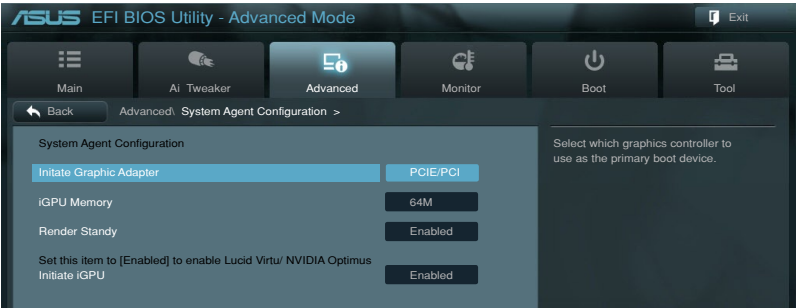
Initiate Graphic Adapter [PCIE/PCI]

Allows you to decide which graphics controller to use as the primary boot device.
Configuration options: [PCI/PCIE] [PCIE/PCI]

Render Standy [Enabled]

Allows you to set the Render Standy. Configuration options: [Disabled] [Enabled]

Initiate iGPU [Enabled]

Allows you to set the Initiate iGPU. Configuration options: [Disabled] [Enabled]

3.5.3 PCH Configuration
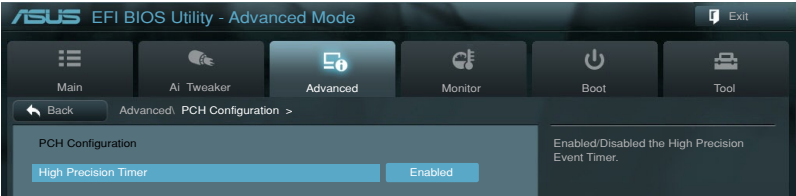
High Precision Timer [Enabled]

Allows you to enable or disable the High Precision Event Timer.
Configuration options: [Enabled] [Disabled]

3.5.4 SATA Configuration

While entering Setup, the BIOS automatically detects the presence of SATA devices. The SATA Port items show **Not Present** if no SATA device is installed to the corresponding SATA port.
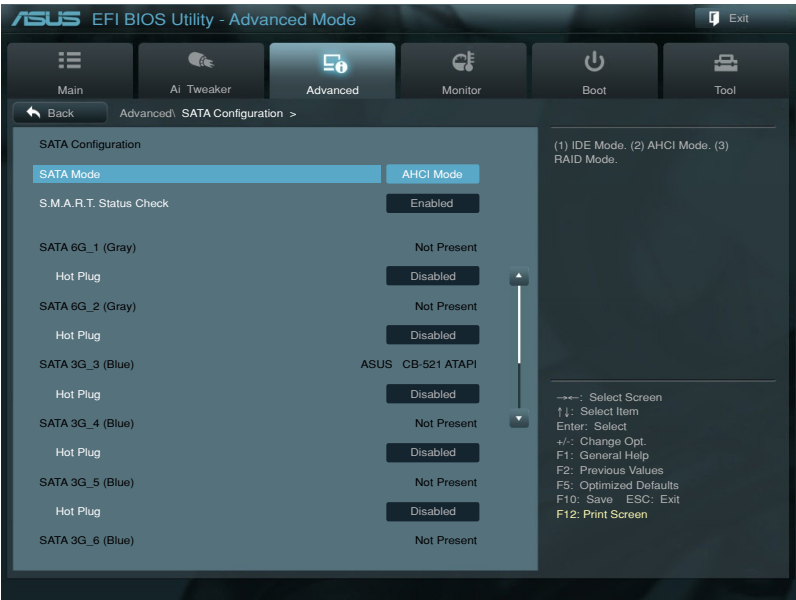
Scroll down to display the following items:
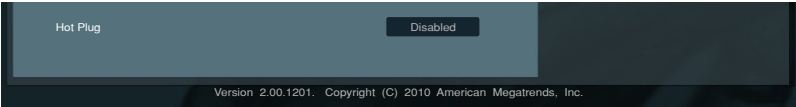
SATA Mode [AHCI Mode]

Allows you to set the SATA configuration.

[Disabled]   Disables the SATA function.

[IDE Mode]   Set to [IDE Mode] when you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices.

[AHCI Mode]   Set to [AHCI Mode] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.

[RAID Mode]   Set to [RAID Mode] when you want to create a RAID configuration from the SATA hard disk drives.

Serial-ATA Controller 0 [Enhanced]

This item appear only when you set the previous item to [IDE Mode]

[Disabled]   Disables the SATA function.

[Enhanced]   Set to [Enhanced] to support two SATA 6.0 Gb/s and two SATA 3.0 Gb/s devices.

[Compatible]   Set to [Compatible] when using Windows 98/NT/2000/MS-DOS. Up to four SATA devices are supported under these operating systems.

Serial-ATA Controller 1 [Enhanced]

[Disabled]   Disables the SATA function.

[Enhanced]   Set to [Enhanced] to support 2 SATA 3Gb/s devices.

S.M.A.R.T. Status Check [Enabled]

S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) is a monitor system. When read/write of your hard disk errors occur, this feature allows the hard disk to report warning messages during the POST.
Configuration options: [Enabled] [Disabled]

Chapter 3

3.5.5 USB Configuration

The items in this menu allow you to change the USB-related features.
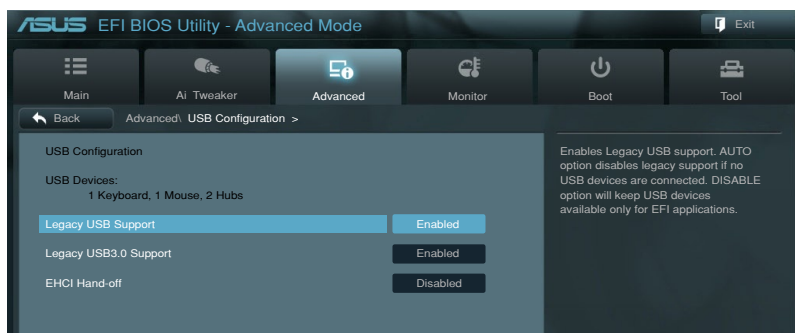
The **USB Devices** item shows the auto-detected values. If no USB device is detected, the item shows **None**.

Legacy USB Support [Enabled]

[Enabled]   Enables the support for USB devices on legacy operating systems (OS).

[Disabled]   The USB devices can be used only for the BIOS setup program.

[Auto]   Allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

Legacy USB3.0 Support [Enabled]

[Enabled]   Enables the support for USB 3.0 devices on legacy operating systems (OS).

[Disabled]   Disables the function.

EHCI Hand-off [Disabled]

[Enabled]   Enables the support for operating systems without an EHCI hand-off feature.

[Disabled]   Disables the function.

3.5.6 Onboard Devices Configuration
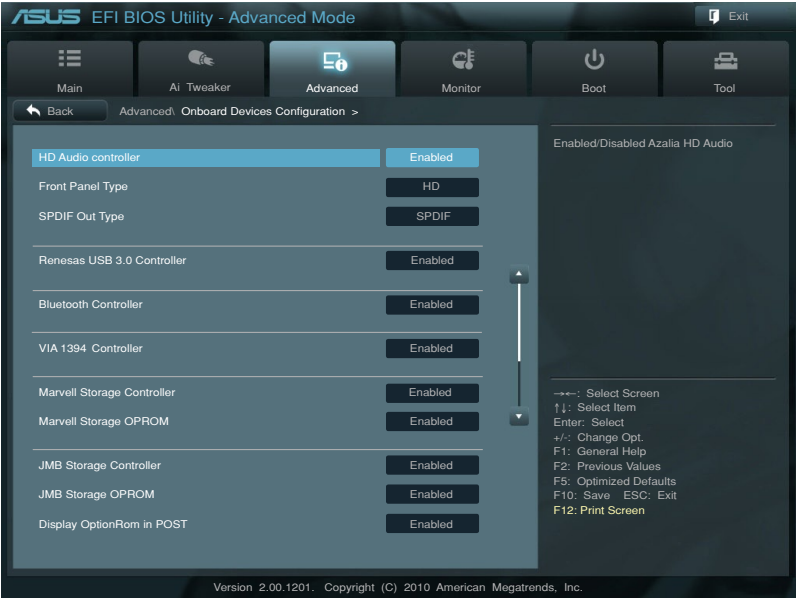
Scroll down to display the following items:
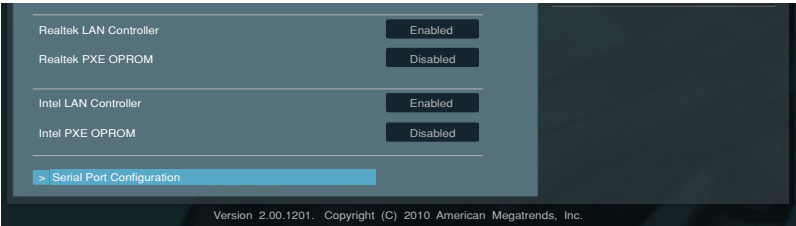
HD Audio Controller [Enabled]

[Enabled]	Enables the High Definition Audio Controller.
[Disabled]	Disables the controller.

The following two items appear only when you set the **Azalia HD Audio** item to [Enabled].

Front Panel Type [HD]

Allows you to set the front panel audio connector (AAFP) mode to legacy AC'97 or high-definition audio depending on the audio standard that the front panel audio module supports.

[HD]	Sets the front panel audio connector (AAFP) mode to high definition audio.
[AC97]	Sets the front panel audio connector (AAFP) mode to legacy AC'97

SPDIF Out Type [SPDIF]

[SPDIF]   Sets to [SPDIF] for SPDIF audio output.

[HDMI]   Sets to [HDMI] for HDMI audio output.

Renesas USB 3.0 Controller [Enabled]

[Enabled]   Enables the USB 3.0 controller.

[Disabled]   Disables the controller.

Bluetooth Controller [Enabled]

[Enabled]   Enables the onboard bluetooth controller.

[Disabled]   Disables the controller.

VIA 1394 Controller [Enabled]

[Enabled]   Enables the onboard IEEE 1394a controller.

[Disabled]   Disables the controller.

Marvell Storage Controller [AHCI Mode]

Allows you to select the Marvell storage controller operating mode.

[Disabled]   Disables the controller.

[IDE Mode]   Set to [IDE Mode] when you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices.

[AHCI Mode]   Set to [AHCI Mode] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.

Marvell Storage OPROM [Enabled]

This item appears only when you set the previous item to [Enabled] and allows you to enable or disable the OptionRom of the Marvell storage controller.
Configuration options: [Enabled] [Disabled]

JMB Storage Controller [Enabled]

Allows you to enable or disable the JMB storage controller.
Configuration options: [Disabled] [Enabled]

> If you want to use the full functin of the JMB storage contorller (ex. AHCI), we recommend that you set this item to [Enabled] and install the **JMicron JMB36X Controller Driver** from the motherboard support DVD.

JMB Storage OPROM [Enabled]

This item appears only when you set the previous item to [Enabled] and allows you to enable or disable the OptionRom of the JMB storage controller.
Configuration options: [Enabled] [Disabled]

Display OptionRom in POST [Enabled]

This item appears only when you set the **JMB Storage OPROM** item to [Enabled] and allows you to display or hide the OptionRom of the JMB storage controller during POST. Configuration options: [Enabled] [Disabled]

Intel LAN Controller [Enabled]

[Enabled]   Enables the Intel LAN controller.

[Disabled]   Disables the controller.

Intel PXE OPROM [Disabled]

This item appears only when you set the previous item to [Enabled] and allows you to enable or disable the PXE OptionRom of the Intel LAN controller. Configuration options: [Enabled] [Disabled]

Serial Port Configuration

The sub-items in this menu allow you to set the serial port configuration.

This item functions only if there is a serial port (COM1) connector on the motherboard.

Serial Port [Enabled]

Allows you to enable or disable the serial port (COM). Configuration options: [Enabled] [Disabled]

Change Settings [IO=3F8h; IRQ=4]

Allows you to select the Serial Port base address. Configuration options: [IO=3F8h; IRQ=4] [IO=2F8h; IRQ=3] **[IO=3E8h; IRQ=4]** [IO=2E8h; IRQ=3]

3.5.7 APM
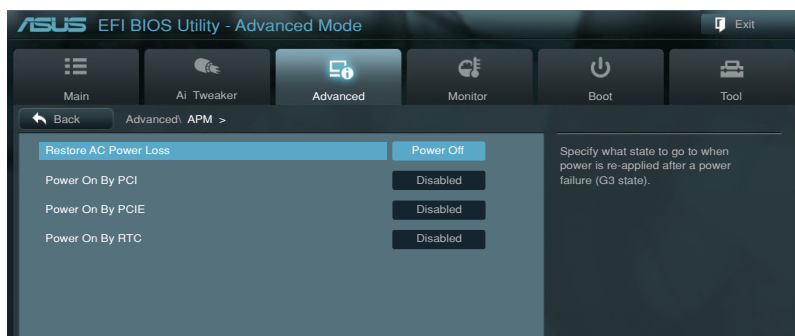
Restore AC Power Loss [Power Off]

[Power On]   The system goes into on state after an AC power loss.

[Power Off]   The system goes into off state after an AC power loss.

[Last State]   The system goes into either off or on state, whatever the system state was
               before the AC power loss.

Power On By PCI [Disabled]

[Disabled]   Disables the PME to wake up from S5 by PCI devices.

[Enabled]   Allows you to turn on the system through a PCI LAN or modem card. This
               feature requires an ATX power supply that provides at least 1A on the
               +5VSB lead.

Power On By PCIE [Disabled]

[Disabled]   Disables the PCIE devices to generate a wake event.

[Enabled]   Enables the PCIE devices to generate a wake event.

Power On By RTC [Disabled]

[Disabled]   Disables RTC to generate a wake event.

[Enabled]   When set to [Enabled], the items **RTC Alarm Date (Days)** and **Hour/
               Minute/Second** will become user-configurable with set values.

3.6 Monitor menu

The Monitor menu displays the system temperature/power status, and allows you to change the fan settings.

Scroll down to display the following items:
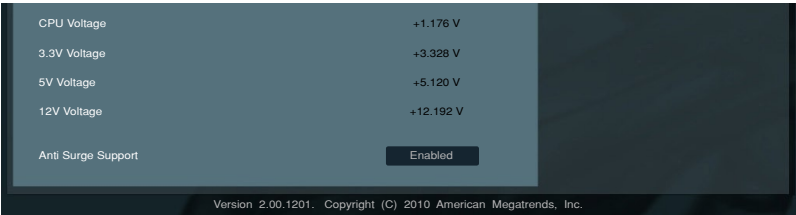
CPU Temperature / MB Temperature [xxxºC/xxxºF]

The onboard hardware monitor automatically detects and displays the CPU and motherboard temperatures. Select **Ignore** if you do not wish to display the detected temperatures.

CPU Fan Speed [xxxx RPM] or [Ignore] / [N/A]
CPU Fan OPT Speed [xxxx RPM] or [Ignore] / [N/A]
Chassis Fan 1/2 Speed [xxxx RPM] or [Ignore] / [N/A]
Power Fan 1 Speed [xxxx RPM] or [Ignore] / [N/A]

The onboard hardware monitor automatically detects and displays the CPU, chassis, and power fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows **N/A**. Select **Ignore** if you do not wish to display the detected speed.

CPU Q-Fan Control [Enabled]

[Disabled]   Disables the CPU Q-Fan control feature.

[Enabled]   Enables the CPU Q-Fan control feature.

CPU Fan Speed Low Limit [600 RPM]

This item appears only when you enable the **CPU Q-Fan Control** feature and allows you to disable or set the CPU fan warning speed.
Configuration options: [Ignore] [200 RPM] [300 RPM] [400 RPM] [500 RPM] [600 RPM]

CPU Fan Profile [Standard]

This item appears only when you enable the **CPU Q-Fan Control** feature and allows you to set the appropriate performance level of the CPU fan.

[Standard] Sets to [Standard] to make the CPU fan automatically adjust depending on the CPU temperature.

[Silent]   Sets to [Silent] to minimize the fan speed for quiet CPU fan operation.

[Turbo]   Sets to [Turbo] to achieve maximum CPU fan speed.

[Manual] Sets to [Manual] to assign detailed fan speed control parameters.

> The following four items appear only when you set **CPU Fan Profile** to [Manual].

CPU Upper Temperature [70]

Use the <+> and <-> keys to adjust the upper limit of the CPU temperature. The values range from 40ºC to 90ºC.

CPU Fan Max. Duty Cycle(%) [100]

Use the <+> and <-> keys to adjust the maximum CPU fan duty cycle. The values range from 20% to 100%. When the CPU temperature reaches the upper limit, the CPU fan will operate at the maximum duty cycle.

CPU Lower Temperature [20]

Displays the lower limit of the CPU temperature.

CPU Fan Min. Duty Cycle(%) [20]

Use the <+> and <-> keys to adjust the minimum CPU fan duty cycle. The values range from 0% to 100%. When the CPU temperature is under 40ºC, the CPU fan will operate at the minimum duty cycle.

Chassis Q-Fan Control [Enabled]

[Disabled]   Disables the Chassis Q-Fan control feature.

[Enabled]   Enables the Chassis Q-Fan control feature.

Chassis Fan Speed Low Limit [600 RPM]

This item appears only when you enable the **Chassis Q-Fan Control** feature and allows you to disable or set the chassis fan warning speed.
Configuration options: [Ignore] [200 RPM] [300 RPM] [400 RPM] [500 RPM] [600 RPM]

Chassis Fan Profile [Standard]

This item appears only when you enable the **Chassis Q-Fan Control** feature and allows you to set the appropriate performance level of the chassis fan.

[Standard] Sets to [Standard] to make the chassis fan automatically adjust depending on the chassis temperature.

[Silent] Sets to [Silent] to minimize the fan speed for quiet chassis fan operation.

[Turbo] Sets to [Turbo] to achieve maximum chassis fan speed.

[Manual] Sets to [Manual] to assign detailed fan speed control parameters.

The following four items appear only when you set **Chassis Fan Profile** to [Manual].

Chassis Upper Temperature [70]

Use the <+> and <-> keys to adjust the upper limit of the CPU temperature. The values range from 40ºC to 90ºC.

Chassis Fan Max. Duty Cycle(%) [100]

Use the <+> and <-> keys to adjust the maximum chassis fan duty cycle. The values range from 20% to 100%. When the chassis temperature reaches the upper limit, the chassis fan will operate at the maximum duty cycle.

Chassis Lower Temperature [40]

Displays the lower limit of the chassis temperature.

CPU Fan Min. Duty Cycle(%) [60]

Use the <+> and <-> keys to adjust the minimum chassis fan duty cycle. The values range from 0% to 100%. When the chassis temperature is under 40ºC, the chassis fan will operate at the minimum duty cycle.

CPU Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators. Select **Ignore** if you do not want to detect this item.

Anti Surge Support [Enabled]

This item allows you to enable or disable the Anti Surge function.
Configuration options: [Disabled] [Enabled]

Chapter 3

3.7 Boot menu

The Boot menu items allow you to change the system boot options.
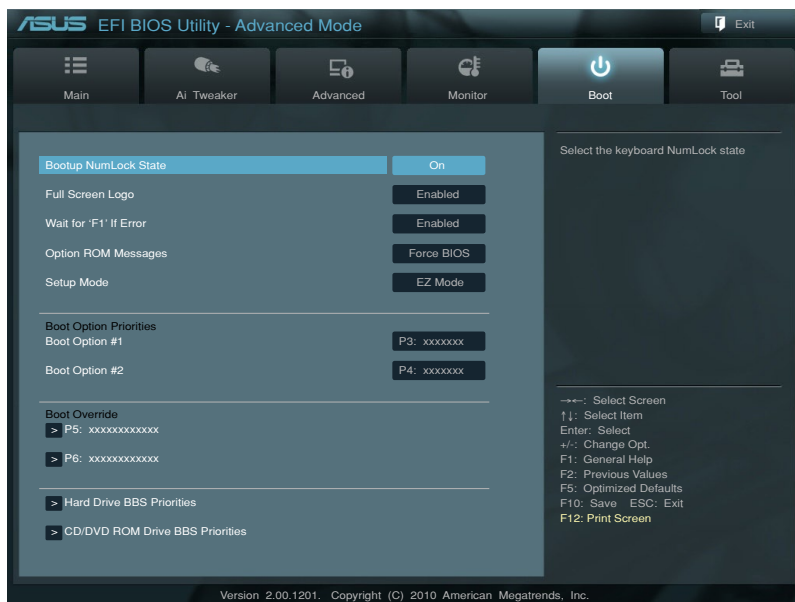
Bootup NumLock State [On]

| [On] | Sets the power-on state of the NumLock to [On]. |
| [Off] | Sets the power-on state of the NumLock to [Off]. |

Full Screen Logo [Enabled]

| [Enabled] | Enables the full screen logo display feature. |
| [Disabled] | Disables the full screen logo display feature. |

Set this item to [Enabled] to use the ASUS MyLogo 2™ feature.

Wait For 'F1' If Error [Enabled]

| [Disabled] | Disables this function. |
| [Enabled] | The system waits for the <F1> key to be pressed when error occurs. |

Option ROM Messages [Force BIOS]

| [Force BIOS] | The third-party ROM messages will be forced to display during the boot sequence. |
| [Keep Current] | The third-party ROM messages will be displayed only if the third-party manufacturer had set the add-on device to do so. |

Setup Mode [EZ Mode]

[Advanced Mode] Sets Advanced Mode as the default screen for entering the BIOS setup program.

[EZ Mode] Sets EZ Mode as the default screen for entering the BIOS setup program.

Boot Option Priorities

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

> • To select the boot device during system startup, press <F8> when ASUS Logo appears.
> • To access Windows OS in Safe Mode, do any of the following:
>   - Press <F5> when ASUS Logo appears.
>   - Press <F8> after POST.

Boot Override

These items displays the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system. Click an item to start booting from the selected device.

3.8 Tools menu

The Tools menu items allow you to configure options for special functions. Select an item then press <Enter> to display the submenu.
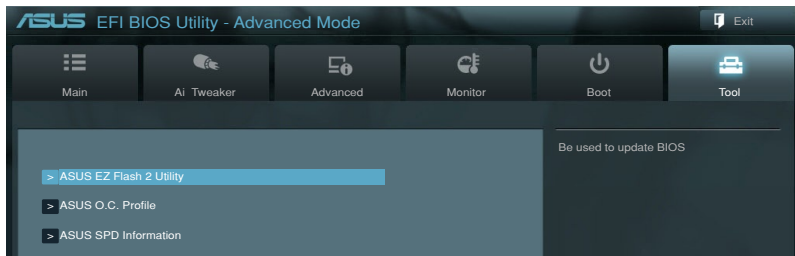
3.8.1 ASUS EZ Flash 2 Utility

Allows you to run ASUS EZ Flash 2. When you press <Enter>, a confirmation message appears. Use the left/right arrow key to select between [Yes] or [No], then press <Enter> to confirm your choice.

> For more details, refer to **section 3.10.2 ASUS EZ Flash 2 utility**.

3.8.2.   ASUS O.C. Profile

This item allows you to store or load multiple BIOS settings.
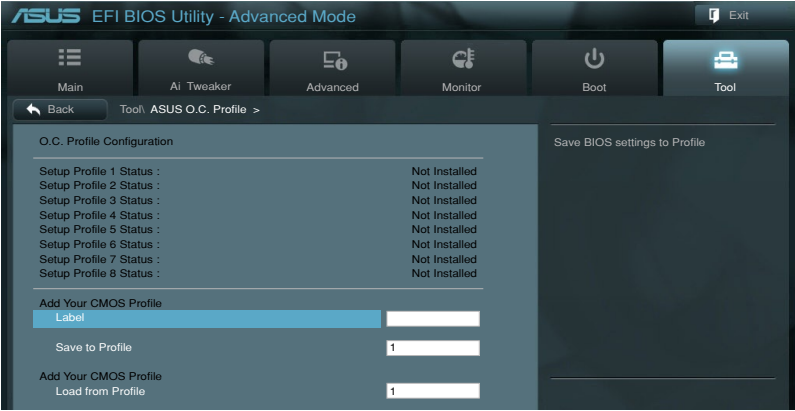
> *ℓ*   The **Setup Profile Status** items show **Not Installed** if no profile is created.

Save to Profile

Allows you to save the current BIOS settings to the BIOS Flash, and create a profile. Key in a profile number from one to eight, press <Enter>, and then select **Yes**.

Load from Profile

Allows you to load the previous BIOS settings saved in the BIOS Flash. Key in the profile number that saved your BIOS settings, press <Enter>, and then select **Yes**.

> *ℓ*   • DO NOT shut down or reset the system while updating the BIOS to prevent the system boot failure!
>
> • We recommend that you update the BIOS file only coming from the same memory/CPU configuration and BIOS version.

3.9   Exit menu

The Exit menu items allow you to load the optimal default values for the BIOS items, and save or discard your changes to the BIOS items. You can access the **EZ Mode** from the Exit menu.

```
                              Exit

                     Load Optimized Defaults

                     Save Changes & Reset

                     Discard Changes & Exit


                        ASUS EZ Mode

               Launch EFI Shell from filesystem device
```
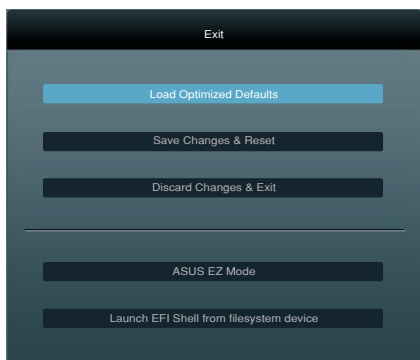
Load Optimized Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select **Yes** to load the default values.

Save Changes & Reset

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved. When you select this option or if you press <F10>, a confirmation window appears. Select **Yes** to save changes and exit.

Discard Changes & Exit

This option allows you to exit the Setup program without saving your changes. When you select this option or if you press <Esc>, a confirmation window appears. Select **Yes** to discard changes and exit.

ASUS EZ Mode

This option allows you to enter the EZ Mode screen.

Launch EFI Shell from filesystem device

This option allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available filesystem devices.

3.10 Updating BIOS

The ASUS website publishes the latest BIOS versions to provide enhancements on system stability, compatibility, or performance. However, BIOS updating is potentially risky. If there is no problem using the current version of BIOS, **DO NOT manually update the BIOS**. Inappropriate BIOS updating may result in the system's failure to boot. Carefully follow the instructions of this chapter to update your BIOS if necessary.

Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.

The following utilities allow you to manage and update the motherboard BIOS setup program.

1. **ASUS Update:** Updates the BIOS in Windows® environment.
2. **ASUS EZ Flash 2:** Updates the BIOS using a USB flash drive.
3. **ASUS CrashFree BIOS 3:** Restores the BIOS using the motherboard support DVD or a USB flash drive when the BIOS file fails or gets corrupted.
4. **ASUS BIOS Updater:** Updates and backups the BIOS in DOS environment using the motherboard support DVD and a USB flash disk drive.

Refer to the corresponding sections for details on these utilities.

Save a copy of the original motherboard BIOS file to a USB flash disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the **ASUS Update** or **BIOS Updater** utilities.

3.10.1 ASUS Update utility

The ASUS Update is a utility that allows you to manage, save, and update the motherboard BIOS in Windows® environment. The ASUS Update utility allows you to:

*   Update the BIOS directly from the Internet
*   Download the latest BIOS file from the Internet
*   Update the BIOS from an updated BIOS file
*   Save the current BIOS file
*   View the BIOS version information

This utility is available in the support DVD that comes with the motherboard package.

ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).

Launching ASUS Update

After installing AI Suite II from the motherboard support DVD, launch ASUS Update by clicking **Update > ASUS Update** on the AI Suite II main menu bar.

Quit all Windows® applications before you update the BIOS using this utility.

Updating the BIOS through the Internet

To update the BIOS through the Internet:

1. From the ASUS Update screen, select **Update BIOS from Internet**, and then click **Next**.
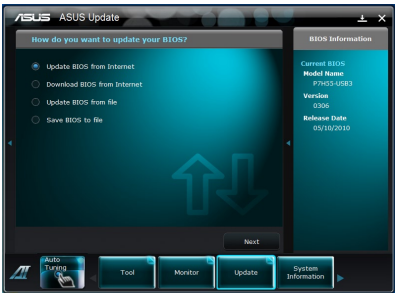
2. Select the ASUS FTP site nearest you to avoid network traffic.

   If you want to enable the BIOS downgradable function and auto BIOS backup function, check the checkboxs before the two items on the screen.
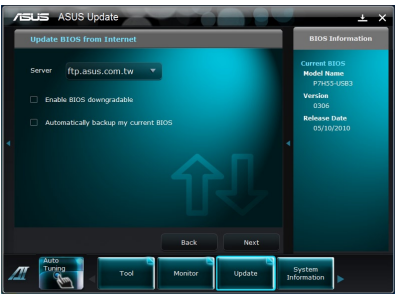
3. Select the BIOS version that you want to download. Click **Next**.

4. You can decide whether to change the BIOS boot logo, which is the image appearing on screen during the Power-On Self-Tests (POST). Click **Yes** if you want to change the boot logo or **No** to continue.

5. Follow the onscreen instructions to complete the update process.
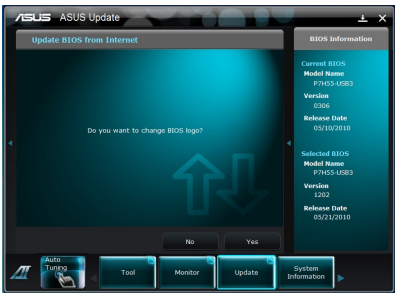
Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

1. From the ASUS Update screen, select **Update BIOS from file**, and then click **Next**.
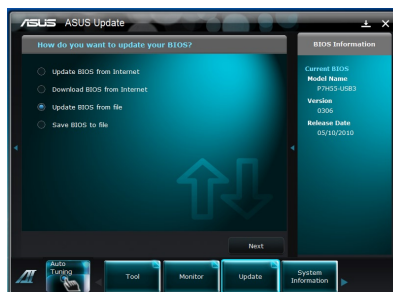
2. Locate the BIOS file from the Open window, click **Open**, and click **Next**.
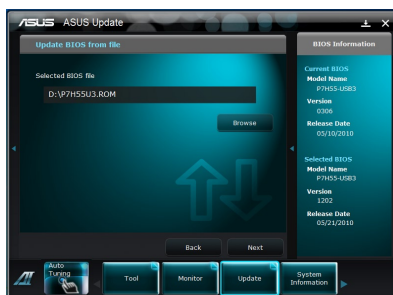
3. You can decide whether to change the BIOS boot logo. Click **Yes** if you want to change the boot logo or **No** to continue.

4. Follow the onscreen instructions to complete the update process.
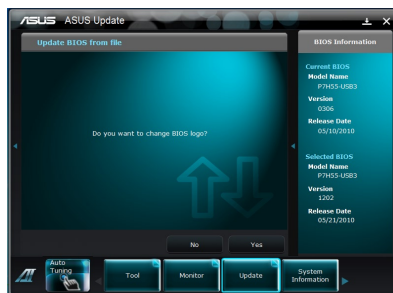
•   The screenshots in this section are for reference only. The actual BIOS information vary by models.

•   Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

3.10.2 ASUS EZ Flash 2 utility

The ASUS EZ Flash 2 feature allows you to update the BIOS without having to use a bootable floppy disk or an OS-based utility.

> Before you start using this utility, download the latest BIOS from the ASUS website at www.asus.com.

To update the BIOS using EZ Flash 2:

1. Insert the USB flash disk that contains the latest BIOS file to the USB port.

2. **Enter the Advanced Mode of the BIOS setup program. Go to the Tool** menu to select **ASUS EZ Flash Utility** and press <Enter> to enable it.
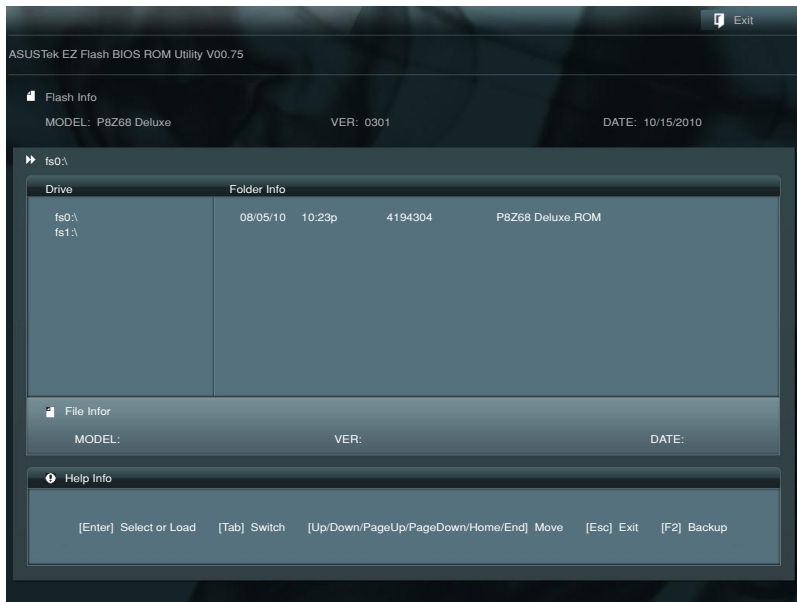
3. Press <Tab> to switch to the Drive field.

4. Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, and then press <Enter>.

5. Press <Tab> to switch to the Folder Info field.

6. Press the Up/Down arrow keys to find the BIOS file, and then press <Enter> to perform the BIOS update process. Reboot the system when the update process is done.

- • This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.
- • DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the **Exit** menu. See section **3.9 Exit Menu** for details.

3.10.3   ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 utility is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can restore a corrupted BIOS file using the motherboard support DVD or a USB flash drive that contains the BIOS file.

The BIOS file in the motherboard support DVD may be older than the BIOS file published on the ASUS official website. If you want to use the newer BIOS file, download the file at support.asus.com and save it to a USB flash drive.

Recovering the BIOS

To recover the BIOS:

1. Turn on the system.
2. Insert the motherboard support DVD to the optical drive, or the USB flash drive containing the BIOS file to the USB port.
3. The utility automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and enters ASUS EZ Flash 2 utility automatically.
4. The system requires you to enter BIOS Setup to recover BIOS setting. To ensure system compatibility and stability, we recommend that you press <F5> to load default BIOS values.

DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

3.10.4 ASUS BIOS Updater

The ASUS BIOS Updater allows you to update BIOS in DOS environment. This utility also allows you to copy the current BIOS file that you can use as a backup when the BIOS fails or gets corrupted during the updating process.

> The succeeding utility screens are for reference only. The actual utility screen displays may not be same as shown.

Before updating BIOS

1. Prepare the motherboard support DVD and a USB flash drive in FAT32/16 format and single partition.

2. Download the latest BIOS file and BIOS Updater from the ASUS website at http://support.asus.com and save them on the USB flash drive.

> • NTFS is not supported under DOS environment. Do not save the BIOS file and BIOS Updater to a hard disk drive or USB flash drive in NTFS format.
>
> • Do not save the BIOS file to a floppy disk due to low disk capacity.

3. Turn off the computer and disconnect all SATA hard disk drives (optional).

Booting the system in DOS environment

1. Insert the USB flash drive with the latest BIOS file and BIOS Updater to the USB port.

2. Boot your computer. When the ASUS Logo appears, press <F8> to show the **BIOS Boot Device Select Menu**. Insert the support DVD into the optical drive and select the optical drive as the boot device.

```
          Please select boot device:

   SATA:  XXXXXXXXXXXXXXX
   USB  XXXXXXXXXXXXXXX
   UEFI:  XXXXXXXXXXXXXXX
   Enter Setup

        ↑ and ↓ to move selection
      ENTER to select boot device
       ESC to boot using defaults
```
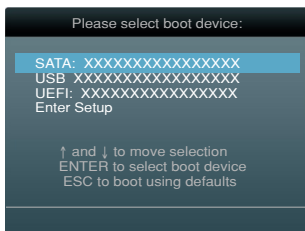
3. When the **Make Disk** menu appears, select the **FreeDOS command prompt** item by pressing the item number.

4. At the FreeDOS prompt, type **d:** and press <Enter> to switch the disk from Drive C (optical drive) to Drive D (USB flash drive).

```
Welcome to FreeDOS (http://www.freedos.org)!
C:\>d:
D:\>
```

Backing up the current BIOS

To backup the current BIOS file using the BIOS Updater

Ensure that the USB flash drive is not write-protected and has enough free space to save the file.

1.   At the FreeDOS prompt, type **bupdater /o[filename]** and press <Enter>.

```
D:\>bupdater /oOLDBIOS1.rom
```

          Filename Extension

The [filename] is any user-assigned filename with no more than eight alphanumeric characters for the filename and three alphanumeric characters for the extension.

2.   The BIOS Updater backup screen appears indicating the BIOS backup process. When BIOS backup is done, press any key to return to the DOS prompt.

```
        ASUSTek BIOS Updater for DOS V1.18 [2010/04/29]

          Current ROM                      Update ROM
     BOARD: P8Z68 Deluxe             BOARD: Unknown
     VER: 0204                       VER: Unknown
     DATE: 08/05/2010                DATE: Unknown
  PATH: A:\


            BIOS backup is done! Press any key to continue.



      Note
  Saving BIOS:

```
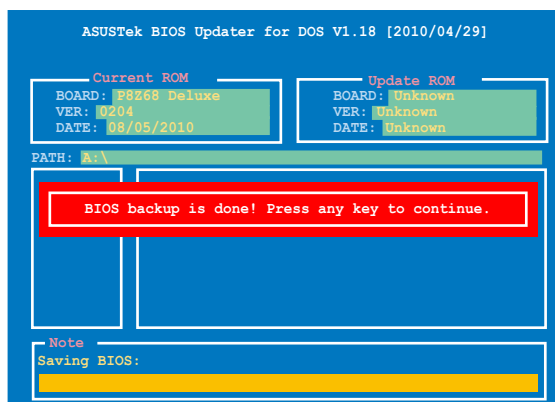
Updating the BIOS file

To update the BIOS file using BIOS Updater

1.   At the FreeDOS prompt, type **bupdater /pc /g** and press <Enter>.

```
D:\>bupdater /pc /g
```

2.   The BIOS Updater screen appears as below.

```
ASUSTek BIOS Updater for DOS V1.18 [2010/04/29]

        Current ROM                      Update ROM
   BOARD: P8Z68 Deluxe              BOARD: Unknown
   VER:   0204                      VER:   Unknown
   DATE:  08/05/2010                DATE:  Unknown
PATH: A:\

   A:          P8Z68 Deluxe.ROM        4194304 2010-08-05
               17:30:48




   Note
   [Enter] Select or Load    [Tab] Switch    [V] Drive Info
   [Up/Down/Home/End] Move   [B] Backup      [Esc] Exit
```

3.   Press <Tab> to switch between screen fields and use the <Up/Down/Home/End> keys
      to select the BIOS file and press <Enter>. BIOS Updater checks the selected BIOS file
      and prompts you to confirm BIOS update.

```
              Are you sure to update BIOS?
                     Yes     No
```

4.   Select **Yes** and press <Enter>. When BIOS update is done, press <ESC> to exit BIOS
      Updater. Restart your computer.

⚠ DO NOT shut down or reset the system while updating the BIOS to prevent system boot
   failure!

✎ •   For BIOS Updater version 1.04 or later, the utility automatically exits to the DOS
        prompt after updating BIOS.

   •   Ensure to load the BIOS default settings to ensure system compatibility and stability.
        Select the **Load Optimized Defaults** item under the **Exit** BIOS menu. See Chaper 3
        of your motherboard user manual for details.

   •   Ensure to connect all SATA hard disk drives after updating the BIOS file if you have
        disconnected them.

4.1 Installing an operating system

This motherboard supports Windows® XP/ 64-bit XP/ Vista / **64-bit Vista / 7 / 64-bit 7** operating systems (OS). Always install the latest OS version and corresponding updates to maximize the features of your hardware.

> • Motherboard settings and hardware options vary. Use the setup procedures presented in this chapter for reference only. Refer to your OS documentation for detailed information.
>
> • Ensure that you install the Windows® XP Service Pack 3 or later versions before installing the drivers for better compatibility and system stability.

4.2 Support DVD information

The support DVD that comes with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.

> The contents of the support DVD are subject to change at any time without notice. Visit the ASUS website at www.asus.com for updates.

4.2.1 Running the support DVD

Place the support DVD into the optical drive. The DVD automatically displays the Drivers menu if Autorun is enabled in your computer. Click each menu tab and select the items you want to install.

The Drivers menu shows the available device drivers if the system detects installed devices. Install the necessary drivers to use the devices.

The Make Disk menu contains items to create the RAID/AHCI driver disk.

The Manual menu contains the list of supplementary user manuals. Click an item to open the folder of the user manual.

The Utilities menu shows the applications and other software that the motherboard supports.

Click the Contact tab to display the ASUS contact information.

Click an icon to display DVD/ motherboard information

Click an item to install

- Drivers
- Utilities
- Make Disk
- Manual
- Contact

ASUS InstAll

- Norton Internet Security 2010
- Intel Chipset Driver
- Intel Rapid Storage Technology Driver S...
- Realtek Audio Driver
- Management Engine Interface
- JMicron JMB36X Controller Driver
- Marvell SATA 6G Driver
- Intel LAN Driver
- Realtek LAN Driver
- ASUS Bluetooth Driver

Please select items to install.

> If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the DVD.

4.2.2   Obtaining the software manuals

The software manuals are included in the support DVD. Follow the instructions below to get the necessary software manuals.

The software manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader from the Utilities menu before opening the files.

1.   Click the **Manual** tab. Click **ASUS Motherboard Utility Guide** from the manual list on the left.

2.   The **Manual** folder of the support DVD appears. Double-click the folder of your selected software.
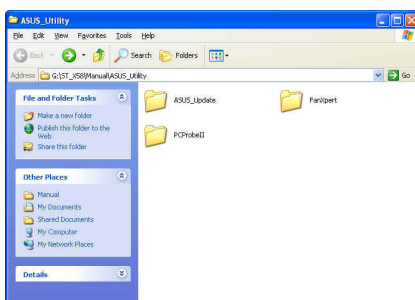
3.   Some software manuals are provided in different languages. Double-click the language to show the software manual.
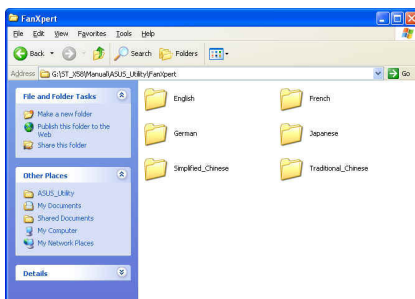
The screenshots in this section are for reference only. The actual software manuals containing in the support DVD vary by models.

4.3 Software information

Most of the applications in the support DVD have wizards that will conveniently guide you through the installation. View the online help or readme file that came with the software application for more information.

4.3.1 AI Suite II

AI Suite II is an all-in-one interface that integrates several ASUS utilities and allows users to launch and operate these utilities simultaneously.

Installing AI Suite II

To install AI Suite II on your computer

1. Place the support DVD to the optical drive. The Drivers installation tab appears if your computer has enabled the Autorun feature.

2. Click the Utilities tab, then click **AI Suite II**.

3. Follow the onscreen instructions to complete installation.

Using AI Suite II

AI Suite II automatically starts when you enter the Windows® operating system (OS). The AI Suite II icon appears in the Windows® notification area. Click the icon to open the AI Suite II main menu bar.

Click each button to select and launch a utility, to monitor the system, to update the motherboard BIOS, to display the system information, and to customize the settings of AI Suite II.

Click to customize the interface settings

Click to show the system information

Click to update the motherboard BIOS

Click to monitor sensors or CPU frequency

Click to select a utility

Shortcut to the Auto Tuning Mode under TurboV EVO
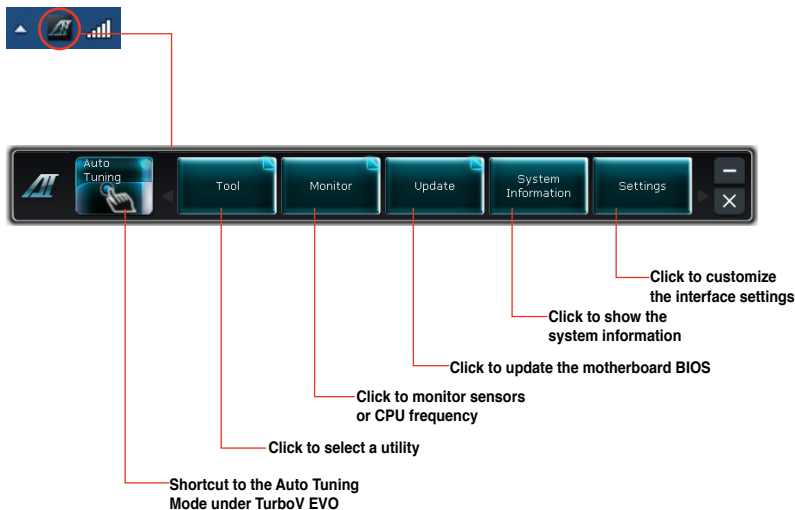
> • The **Auto Tuning** button appears only on models with the TurboV EVO function.
> • The applications in the Tool menu vary with models.
> • The screenshots of AI Suite II in this user manual are for reference only. The actual screenshots vary with models.
> • Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.2 DIGI+ VRM

ASUS DIGI+ VRM allows you to adjust VRM voltage and frequency modulation to enhance reliability and stability. It also provides the highest power efficiency, generating less heat to longer component lifespan and minimize power loss.

After installing AI Suite II from the motherboard support DVD, launch DIGI+ VRM by clicking **Tool > DIGI+ VRM** on the AI Suite II main menu bar.

Application helps

Apply all changes immediately

Undo all changes without applying
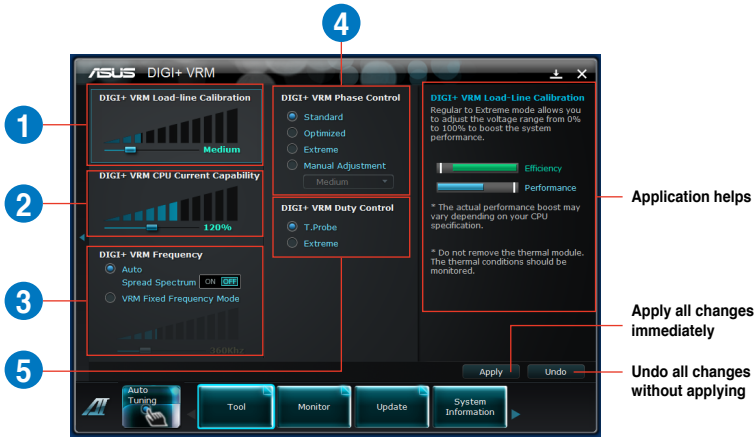
Function no.	Function description
1	**DIGI+ VRM Load-line Calibration** Higher load-line calibration could get higher voltage and good overclocking performance but increase the CPU and VRM thermal.
2	**DIGI+ VRM CPU Current Capability** DIGI+ VRM CPU Current Capability provides wider total power range for overclocking. A higher value setting gets higher VRM power consumption delivery.
3	**DIGI+ VRM Frequency** Switching frequency will affect the VRM transient response and component thermal. Higher frequency gets quicker transient response.
4	**DIGI+ VRM Phase Control** Increase phase number under heavy system loading to get more transient and better thermal performance. Reduce phase number under light system loading to increase VRM efficiency.
5	**DIGI+ VRM Duty Control** DIGI+ VRM Duty Control adjusts the current of every VRM phase and the thermal of every phase component.

- • The actual performance boost may vary depending on your CPU specification.
- • Do not remove the thermal module. The thermal conditions should be monitored.

Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.3 BT GO!

BT GO! connects a bluetooth (BT) device with the motherboard through Bluetooth connection for file transferring, file synchronization, music playback, personal manager, and multiple remote functions.

Launching BT GO!

After installing AI Suite II from the motherboard support DVD, launch **BT GO!** by clicking **Tool > BT GO!** on the AI Suite II main menu bar.

Using BT GO!

- Device list
- Function list
- Lights when the function is enabled
- Click to show the corresponding setting pane on the right side
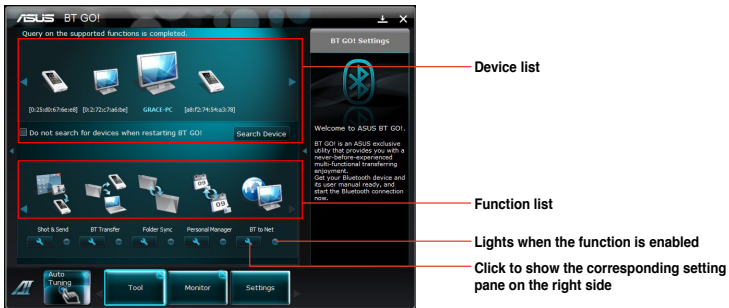
- Click ◄ and ► to scroll the device list and the function list.

- Click any of the device icons to select the device as the connected BT device and **BT GO!** will automatically search for the supported functions for the selected device.

- Click any of the device / function icons to connect the selected device and enable / disable the selected function.

Function introduction

Shot & Send: allows you to snap and transfer the screenshot to the connected BT device.

BT Transfer: allows you to share the files stored in the host BT device to another connected BT devices.

Folder Sync: allows you to sync or back up the selected folder between the selected BT devices and the computer.

Personal Manager: allows you to synchronize the personal contacts and calendar information between the BT device and the system.

BT to Net: allows the system to access the Internet via the network shared by the Bluetooth device.

Music Player: allows you to play the selected music files in the BT device through the computer's speakers.

BT Turbo Remote: provides a user-friendly interface that allows you to use your smartphone as the remote controller via the bluetooth connection for the **BT Turbo Key**, **Pocket Media**, and **Reset/Off** functions.

- Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

- The Bluetooth word mark and logos are owned by the Bluetooth SIG, Inc. and any use of such marks by ASUSTek Computer Inc. is under license. Other trademarks and trade names are those of their respective owners.

Chapter 4

4.3.4 TurboV EVO

ASUS TurboV EVO introduces **TurboV** that allows you to manually adjust the CPU frequency and related voltages as well as **Auto Tuning** function that offers automatic and easy overclocking and system level up. After installing AI Suite II from the motherboard support DVD, launch TurboV EVO by clicking **Tool > TurboV EVO** on the AI Suite II main menu bar.

> Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

TurboV

TurboV allows you to overclock the BCLK frequency, CPU voltage, IMC voltage, and DRAM Bus voltage in WIndows® environment and takes effect in real-time without exiting and rebooting the OS.

> Refer to the CPU documentation before adjusting CPU voltage settings. Setting a high voltage may damage the CPU permanently, and setting a low voltage may make the system unstable.

> For system stability, all changes made in **TurboV** will not be saved to BIOS settings and will not be kept on the next system boot. Use the **Save Profile** function to save your customized overclocking settings and manually load the profile after Windows starts.

Auto Tuning Mode

TurboV

Load profile

Target values

Current values

Click to show / hide more settings

Click to restore all start-up settings

Save the current settings as a new profile

Voltage Adjustment bars

Undoes all changes without applying

Applies all changes immediately

> For advanced overclock ability, adjust first the BIOS items, and then proceed more detailed adjustments in **More Settings**.

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Using Advanced Mode

Click **More Settings**, and then click the **Advanced Mode** tab to adjust the advanced voltage settings.

Advanced mode
Target values

Current values

Click to restore all start-up settings

Voltage Adjustment bars

Undoes all changes without applying

Applies all changes immediately

CPU Ratio

Allows you to manually adjust the CPU ratio.

The first time you use **CPU Ratio**, go to **AI Tweaker > CPU Power Management** in BIOS and set the **Turbo Ratio** item to **[Maximum Turbo Ratio setting in OS]**, or activate CPU Ratio by clicking the ON button on the CPU Ratio function screen.

1.   Click **More Settings**, and then click the **CPU Ratio** tab.

2.   Click the ON button to activate CPU Ratio.

3.   You will requested to restart the system. Click **Yes** to make the change take effect.

CPU Ratio

Click to restore all start-up settings

Click to activate the CPU Ratio

Applies all changes immediately

Undoes all changes without applying

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4. Drag the adjustment bar upwards or downwards to the desired value.

Adjustment bar
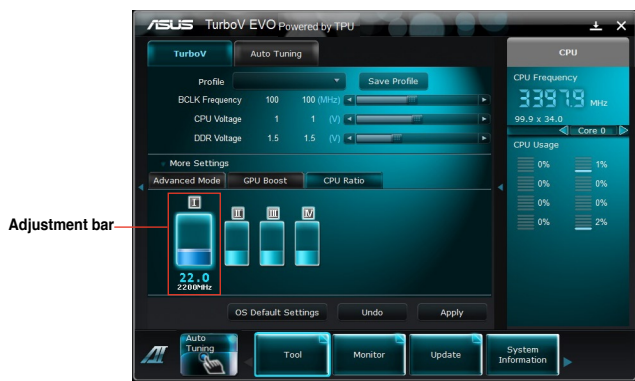
⌂ • Set the **CPU Ratio Setting** item in BIOS to [Auto] before using the CPU Ratio function in TurboV. Refer to Chapter 3 of your motherboard user manual for details.

• The CPU Ratio bars show the status of the CPU cores, which vary with your CPU model.

Auto Tuning

ASUS TurboV EVO includes two auto tuning modes, providing the most flexible auto-tuning options.

⌂ • The overclocking result varies with the CPU model and the system configuration.

• To prevent overheating from damaging the motherboard, a better thermal environment is strongly recommended.

• **Fast Tuning**: fast CPU overclocking
• **Extreme Tuning**: extreme overclocking for CPU and memory

Using Fast Tuning

1. Click the **Auto Tuning** tab and then click **Fast**.

2. Read through the warning messages and click **OK** to start auto-overclocking.

3.   TurboV automatically overclocks
     the CPU, saves BIOS settings
     and restarts the system. After
     re-entering Windows, a message
     appears indicating auto tuning
     success. Click **OK** to exit.

Using Extreme Tuning

1.   Click the **Auto Tuning** tab and then
     click **Extreme**.

2.   Read through the warning
     messages and click **OK** to start
     auto-overclocking.

3.   TurboV automatically overclocks
     the CPU and memory and restarts
     the system. After re-entering
     Windows, a message appears
     indicating the current overclocking
     result. To keep the result, click
     Stop.
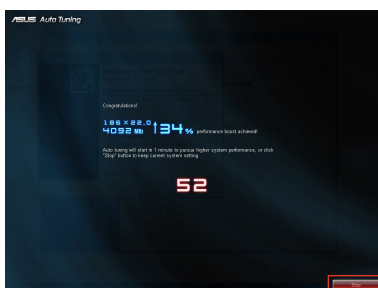
4.   If you did not click **Stop** in
     the previous step, TurboV
     automatically starts further system
     overclocking and stability test.
     An animation appears indicating
     the overclocking process. Click
     Stop if you want to cancel the
     Overclocking process.

5.   TurboV automatically adjusts and
     saves BIOS settings and restarts
     the system. After re-entering
     Windows, a message appears
     indicating auto tuning success.
     Click **OK** to exit.

Chapter 4

4.3.5 EPU

EPU is an energy-efficient tool that satisfies different computing needs. This utility provides several modes that you can select to save system power. Selecting Auto mode will have the system shift modes automatically according to current system status. You can also customize each mode by configuring settings like CPU frequency, GPU frequency, vCore Voltage, and Fan Control.

Launching EPU

After installing AI Suite II from the motherboard support DVD, launch EPU by clicking **Tool > EPU** on the AI Suite II main menu bar.

Displays the following message if no VGA power saving engine is detected.

Displays current mode

The items lighting up means power saving engine is activated

Displays the amount of CO2 reduced

*Shifts between the display of Total and Current CO2 reduced

Displays the current CPU power

Advanced settings for each mode

Displays the system properties of each mode

Multiple system operating modes

---

*• Select **From EPU Installation** to show the CO2 that has been reduced since you installed EPU.

*• Select **From the Last Reset** to show the total CO2 that has been reduced since you click the Clear button [Clear].

• Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.6 FAN Xpert

Fan Xpert intelligently allows you to adjust both the CPU and chassis fan speeds according to different ambient temperatures caused by different climate conditions in different geographic regions and your PC's system loading. The built-in variety of useful profiles offer flexible controls of fan speed to achieve a quiet and cool environment.

Launching FAN Xpert

After installing AI Suite II from the motherboard support DVD, launch FAN Xpert by clicking **Tool > Fan Xpert** on the AI Suite II main menu bar.

Using FAN Xpert

Click **Fan Name** to select a fan and then click **Setting** to select a preset mode for your selected fan.
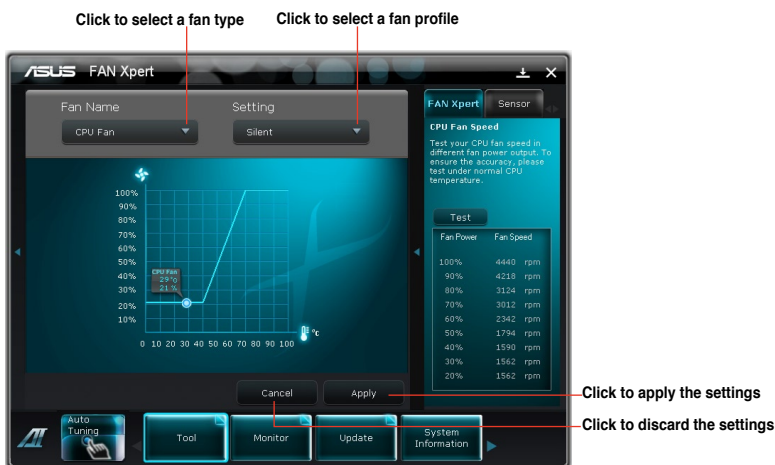
Fan setting

- **Disable:** disables the **Fan Xpert** function.
- **Standard:** adjusts fan speed in a moderate pattern.
- **Silent:** minimizes fan speed for quiet fan operation.
- **Turbo:** maximizes the fan speed for the best cooling effect.
- **Intelligent:** automatically adjusts the CPU fan speed according to the ambient temperature.
- **Stable:** fixes the CPU fan speed to avoid noise caused by the unsteady fan rotation. However, the fan will speed up when the temperature exceeds 70°C.
- **User:** Allows you to configure the CPU fan profile under certain limitations.

Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.7 Probe II

Probe II is a utility that monitors the computer's vital components, and detects and alerts you of any problem with these components. Probe II senses fan rotations, CPU temperature, and system voltages, among others. With this utility, you are assured that your computer is always at a healthy operating condition.

Launching Probe II

After installing AI Suite II from the motherboard support DVD, launch Probe II by clicking **Tool > Probe II** on the AI Suite II main menu bar.

Configuring Probe II

Click the **Voltage/Temperature/Fan Speed** tabs to activate the sensors or to adjust the sensor threshold values. The **Preference** tab allows you to customize the time interval of sensor alerts, or change the temperature unit.

Saves your configuration

Loads your saved configuration

Loads the default threshold values for each sensor

Applies your changes

Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.8 Audio configurations

The Realtek® audio CODEC provides 8-channel audio capability to deliver the ultimate audio experience on your computer. The software provides Jack-Detection function, S/PDIF Out support, and interrupt capability. The CODEC also includes the Realtek® proprietary UAJ® (Universal Audio Jack) technology for all audio ports, eliminating cable connection errors and giving users plug and play convenience.

Follow the installation wizard to install the Realtek® Audio Driver from the support DVD that came with the motherboard package.

If the Realtek audio software is correctly installed, you will find the **Realtek HD Audio Manager** icon on the taskbar. Double-click on the icon to display the Realtek HD Audio Manager.

Realtek HD Audio Manager

A. Realtek HD Audio Manager for Windows® Vista™
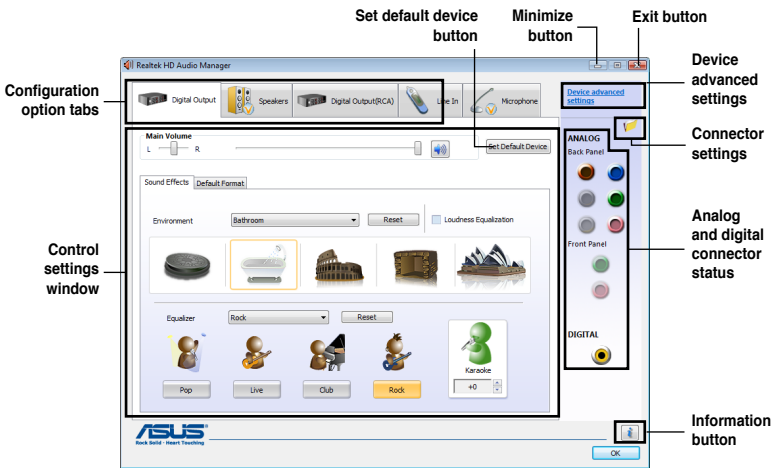
B. Realtek HD Audio Manager for Windows XP

Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.4   RAID configurations

The motherboard supports the following SATA RAID solutions:

*   **Intel® Rapid Storage Technology** with RAID 0, RAID 1, RAID 10 and RAID 5 support.
*   **Mavell® RAID utility** with RAID 0 and RAID 1 support.

---

*   You must install Windows® XP Service Pack 3 or later versions before using Serial ATA hard disk drives. The Serial ATA RAID feature is available only if you are using Windows® XP SP3 or later versions.

*   Due to Windows® XP / Vista limitation, a RAID array with the total capacity over 2TB cannot be set as a boot disk. A RAID array over 2TB can only be set as a data disk only.

*   If you want to install a Windows® operating system to a hard disk drive included in a RAID set, you have to create a RAID driver disk and load the RAID driver during OS installation. Refer to section **4.5 Creating a RAID driver disk** for details.

4.4.1   RAID definitions

RAID 0 (Data striping) optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

RAID 1 (Data mirroring) copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

RAID 5 stripes both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.

RAID 10 is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 10 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

4.4.2 Installing Serial ATA hard disks

The motherboard supports Serial ATA hard disk drives. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SATA hard disks for a RAID configuration:

1. Install the SATA hard disks into the drive bays.
2. Connect the SATA signal cables.
3. Connect a SATA power cable to the power connector on each drive.

4.4.3 Setting the RAID item in BIOS

You must enable the RAID function in the BIOS Setup before creating RAID set(s) using SATA HDDs. To do this:

1. Enter the BIOS Setup during POST.
2. Go to the **Advanced** menu > **SATA Configuration**, and then press <Enter>.
3. Set the **SATA Mode** item to [RAID Mode].
4. Save your changes, and then exit the BIOS Setup.

> Refer to Chapter 3 for details on entering and navigating through the BIOS Setup.

> Due to chipset limitation, when set any of SATA ports to RAID mode, all SATA ports run at RAID mode together.

4.4.4 Intel® Rapid Storage Technology Option ROM utility

To enter the Intel® Rapid Storage Technology Option ROM utility:

1. Turn on the system.
2. During POST, press <Ctrl> + <I> to display the utility main menu.

```
      Intel(R) Rapid Storage Technology - Option ROM - v10.0.0.1032
      Copyright(C) 2003-10 Intel Corporation.  All Rights Reserved.

 ===================================[ MAIN MENU ]===============================
      1. Create RAID Volume             4. Recovery Volume Options
      2. Delete RAID Volume             5. Acceleration Options
      3. Reset Disks to Non-RAID        6. Exit

 ============================[ DISK/VOLUME INFORMATION ]========================
   RAID Volumes:
   None defined.

   Physical Devices:
   Port Device Model    Serial #                 Size  Type/Status(Vol ID)
   0    ST3160812AS     9LS0HJA4              149.0GB  Non-RAID Disk
   1    ST3160812AS     9LS0F4HL              149.0GB  Non-RAID Disk
   2    ST3160812AS     3LS0JYL8              149.0GB  Non-RAID Disk
   3    ST3160812AS     9LS0BJ5H              149.0GB  Non-RAID Disk



      [↑↓]-Select           [ESC]-Exit          [ENTER]-Select Menu
```

Chapter 4

The navigation keys at the bottom of the screen allow you to move through the menus and select the menu options.

> The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.

> The utility supports maximum four hard disk drives for RAID configuration.

Creating a RAID set

To create a RAID set:

1. From the utility main menu, select **1. Create RAID Volume** and press <Enter>. The following screen appears:

```
        Intel(R) Rapid Storage Technology - Option ROM - v10.0.0.1032
        Copyright(C) 2003-10 Intel Corporation.  All Rights Reserved.

        ==================[ CREATE VOLUME MENU ]==================
                          Name:   Volume0
                    RAID Level:   RAID0(Stripe)
                         Disks:   Select Disks
                    Strip Size:    128KB
                      Capacity:   0.0   GB
                          Sync:   N/A
                                  Create Volume

        ========================[ HELP ]========================



             Enter a unique volume name that has no special characters and is
                            16 characters or less.




            [↑↓]Change      [TAB]-Next     [ESC]-Previous Menu     [ENTER]-Select
```

2. Enter a name for the RAID set and press <Enter>.

3. When the **RAID Level** item is selected, press the up/down arrow key to select a RAID level to create, and then press <Enter>.

4. When the **Disks** item is selected, press <Enter> to select the hard disk drives you want to include in the RAID set. The **SELECT DISKS** screen appears:

```
        ====================[ SELECT DISKS ]====================
        Port Drive Model      Serial #          Size   Status
        0    ST3160812AS      9LS0HJA4          149.0GB  Non-RAID Disk
        1    ST3160812AS      9LS0F4HL          149.0GB  Non-RAID Disk
        2    ST3160812AS      3LS0JYL8          149.0GB  Non-RAID Disk
        3    ST3160812AS      9LS0BJ5H          149.0GB  Non-RAID Disk


             Select 2 to 6 disks to use in creating the volume.


        [↑↓]-Prev/Next [SPACE]-SelectDisk [ENTER]-Done
```

5.   Use the up/down arrow key to select a drive, and then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection.

6.   Use the up/down arrow key to select the stripe size for the RAID array (for RAID 0, 10 and 5 only),and then press <Enter>. The available stripe size values range from 4KB to 128KB. The following are typical values:
RAID 0: 128KB
RAID 10: 64KB
RAID 5: 64KB

We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

---

7.   When the **Capacity** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.

8.   When the **Create Volume** item is selected, press <Enter>. The following warning message appears:

```
        WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.

    Are you sure you want to create this volume? (Y/N):
```

9.   Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the **CREATE VOLUME** menu.

Chapter 4

Deleting a RAID set

⚠️ Take caution when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

1. From the utility main menu, select **2. Delete RAID Volume** and press <Enter>. The following screen appears:

```
        Intel(R) Rapid Storage Technology - Option ROM - v10.0.0.1032
        Copyright(C) 2003-10 Intel Corporation.  All Rights Reserved.
    ============================[ DELETE VOLUME MENU ]============================
     Name         Level          Drives     Capacity      Status      Bootable
     Volume0      RAID0(Stripe)      2        298.0GB       Normal        Yes




    ==================================[ HELP ]==================================

            Deleting a volume will reset the disks to non-RAID.

                      WARNING: ALL DISK DATA WILL BE DELETED.
                     (This does not apply to Recovery volumes)






      [↑↓]-Select          [ESC]-Previous Menu       [DEL]-Delete Volume
```
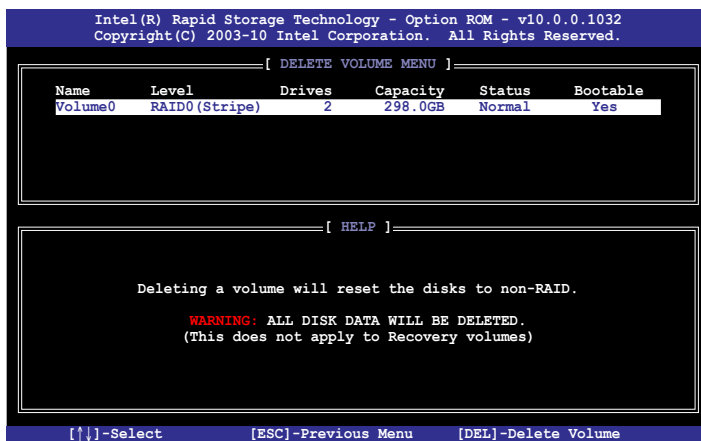
2. Use the up/down arrow key to select the RAID set you want to delete, and then press <Del>. The following warning message appears:

```
    ==================[ DELETE VOLUME VERIFICATION ]==================

                  ALL DATA IN THE VOLUME WILL BE LOST!
                 (This does not apply to Recovery volumes)

         Are you sure you want to delete volume "Volume0"? (Y/N):
```

3. Press <Y> to delete the RAID set and return to the utility main menu, or press <N> to return to the **DELETE VOLUME** menu.

Exiting the Intel® Rapid Storage Technology Option ROM utility

To exit the utility:

1. From the utility main menu, select **5. Exit**, and then press <Enter>. The following warning message appears:

```
                      ==========[ CONFIRM EXIT ]==========

                     Are you sure you want to exit? (Y/N):
```
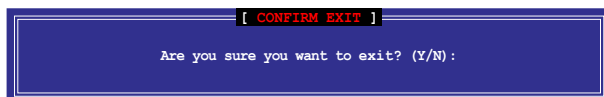
2. Press <Y> to exit or press <N> to return to the utility main menu.

4.4.5 Marvell RAID utility

The onboard Marvell SATA 6.0 Gb/s controller allows you to create a RAID 0 or RAID 1 array using two SATA hard disk drives. Refer to Chapter 2 of your motherboard user manual for the exact location of the Marvell SATA 6.0 Gb/s connector.

To enter the Marvell utility, press **<Ctrl>** + **<M>** during POST.

> ⚠ All exisiting data on the hard disk drives will be erased when creating or deleting a RAID array. Ensure that you have back up all your data in your hard disk drives before making any change to the drive status.

```
═══Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.═══
─Topology─────────────────    ─Information───────────────────
HBA 0: Marvell 0               Vendor ID         :   1B4B
├ Virtual Disks                Device ID         :   9130
└ Free Physical Disks          Revision ID       :   B1
  ├ PD 0: ST3160812AS          BIOS Version      :   1.0.0.1028
  └ PD 8: ST3160812AS          Firmware Version:     2.2.0.1105
                               PCIe Speed Rate   :   5.0Gbps
                               Configure SATA as:    AHCI Mode



                         ►                                  ►
  ─Help─────────────────────────────────────────────────────
 Marvell RAID on chip controller.
 ENTER: Operation   F10: Exit/Save   ESC: Return
```
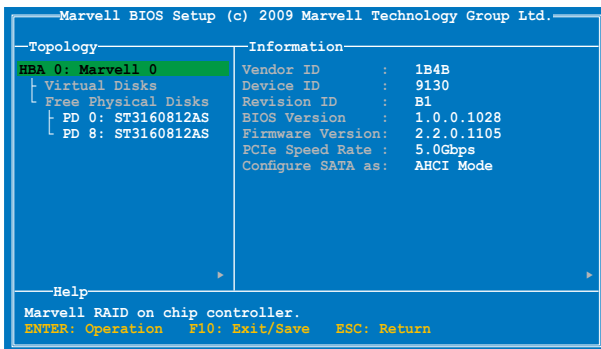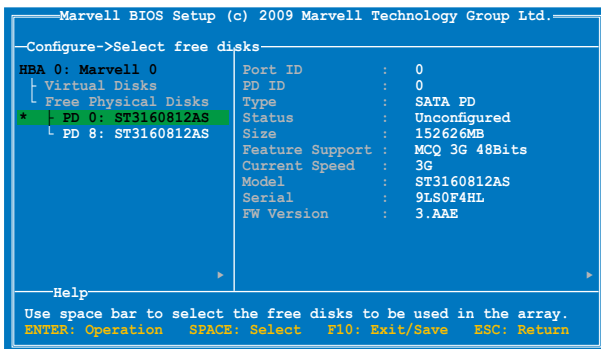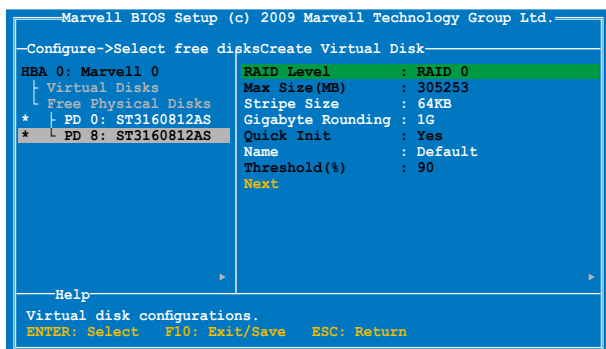
Create a RAID Array

1. Move the selection bar to **HBA 0: Marvell 0** and press <Enter>.

2. Select **Configuration Wizard** and press <Enter>.

```
═══Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.═══
─Configure->Select free disks───────────────────────────────
HBA 0: Marvell 0               Port ID           :   0
├ Virtual Disks                PD ID             :   0
└ Free Physical Disks          Type              :   SATA PD
 * ├ PD 0: ST3160812AS         Status            :   Unconfigured
   └ PD 8: ST3160812AS         Size              :   152626MB
                               Feature Support :     MCQ 3G 48Bits
                               Current Speed     :   3G
                               Model             :   ST3160812AS
                               Serial            :   9LS0F4HL
                               FW Version        :   3.AAE


                         ►                                  ►
  ─Help─────────────────────────────────────────────────────
 Use space bar to select the free disks to be used in the array.
 ENTER: Operation   SPACE: Select   F10: Exit/Save   ESC: Return
```

3. Press <Space> to select the hard drives to be included in the RAID array. An asterisk (*) appears in front of the selected hard drive. After selecting all the drives needed for the RAID array, press <Enter> to continue.

```
┌─────Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.─────┐
│                                                                    │
│ ─Configure->Select free disksCreate Virtual Disk─                  │
│  HBA 0: Marvell 0            RAID Level        : RAID 0             │
│   ├ Virtual Disks            Max Size(MB)      : 305253             │
│   └ Free Physical Disks      Stripe Size       : 64KB              │
│  *   ├ PD 0: ST3160812AS     Gigabyte Rounding : 1G                │
│  *   └ PD 8: ST3160812AS     Quick Init        : Yes               │
│                              Name              : Default            │
│                              Threshold(%)      : 90                 │
│                              Next                                   │
│                                                                    │
│                                                                    │
│                                                                    │
│                          ▶                                    ▶     │
│   ─Help─                                                           │
│  Virtual disk configurations.                                      │
│  ENTER: Select   F10: Exit/Save   ESC: Return                      │
└────────────────────────────────────────────────────────────────────┘
```

4. Use the up or down arrow key to move the selection bar and press <Enter> to configure further RAID settings.

    RAID Level: Select a RAID Level. Configuration options: [RAID 0] [RAID 1]

    Stripe Size: Specifies the size of single data block on the virtual disk. In general, a larger stripe size is recommended for applications requiring large data transfers such as audio, video, and graphics. A smaller stripe size is better for applications with content in much smaller size, such as e-mails and documents.
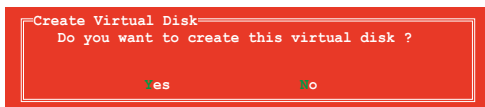   Configuration options: [32K] [64K]

    Gigabyte Rounding: In the event of a single physical disk failure in a RAID 1 virtual disk, Gigabyte Rounding allows the replacement physical disk to be of a size slightly smaller than the existing physical disk. The capacity of the rebuilt virtual disk equals to the size of the smaller physical disk included in the RAID 1 array. The configuration options represent the tolerance value of drive capacity difference.
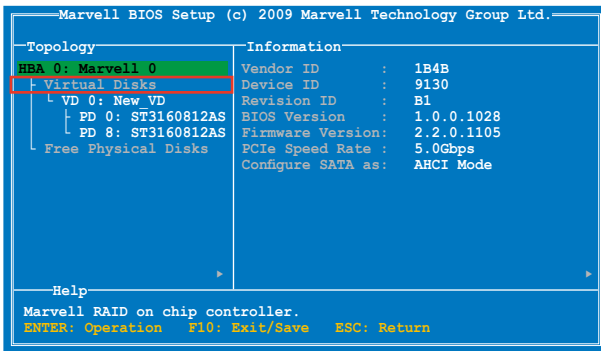   Configuration options: [None] [1G] [10G]

    Name: Enter a name with 1–10 letters (no special characters) for the RAID array.

5. Move the selection bar to **Next** and press <Enter>. The following warning message appears:

```
┌─Create Virtual Disk─────────────────────────────────┐
│   Do you want to create this virtual disk ?          │
│                                                      │
│              Yes               No                    │
└──────────────────────────────────────────────────────┘
```

Press <Y> to create the RAID array, or press <N> to cancel. The new RAID array appears under Virtual Disks, as shown in the image below.
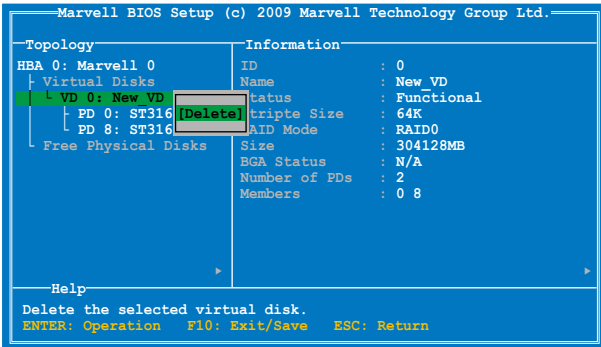
```
┌─Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.─┐
 ┌Topology─────────────┐ ┌Information──────────────────────┐
  HBA 0: Marvell 0        Vendor ID       :   1B4B
  ├ Virtual Disks         Device ID       :   9130
    └ VD 0: New_VD        Revision ID     :   B1
      ├ PD 0: ST3160812AS BIOS Version    :   1.0.0.1028
      ├ PD 8: ST3160812AS Firmware Version:   2.2.0.1105
  └ Free Physical Disks   PCIe Speed Rate :   5.0Gbps
                          Configure SATA as:  AHCI Mode



                   ►                                      ►
 ┌Help────────────────────────────────────────────────────┐
  Marvell RAID on chip controller.
  ENTER: Operation   F10: Exit/Save    ESC: Return
└──────────────────────────────────────────────────────────┘
```

6.   Press <F10>. The following warning message appears:

```
┌Exit──────────────────────────────────────────────┐
    Do you want to exit from Marvell BIOS Setup?


               Yes                 No
└──────────────────────────────────────────────────┘
```

Press <Y> to save the RAID setting and exit the Marvell RAID utility.

Delete an existing RAID Array

1.   Select the RAID array to delete and press <Enter>. Select **Delete** and press <Enter>.

```
┌─Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.─┐
 ┌Topology─────────────┐ ┌Information──────────────────────┐
  HBA 0: Marvell 0        ID              :   0
  ├ Virtual Disks         Name            :   New_VD
    └ VD 0: New_VD        Status          :   Functional
      ├ PD 0: ST316[Delete]Stripe Size    :   64K
      ├ PD 8: ST316        RAID Mode       :   RAID0
  └ Free Physical Disks   Size            :   304128MB
                          BGA Status      :   N/A
                          Number of PDs   :   2
                          Members         :   0 8



                   ►                                      ►
 ┌Help────────────────────────────────────────────────────┐
  Delete the selected virtual disk.
  ENTER: Operation   F10: Exit/Save    ESC: Return
└──────────────────────────────────────────────────────────┘
```

2. The following warning message appears:

```
┌─Delete Virtual Disk──────────────┐
│ Do you want to delete this virtual disk ? │
│                                   │
│           Yes           No        │
└───────────────────────────────────┘
```

Press <Y> to delete the selected RAID array. The following warning message appears:

```
┌─Delete MBR─────────────────────────────────┐
│ Do you want to delete MBR from this virtual disk ? │
│           Yes           No                  │
└─────────────────────────────────────────────┘
```

Press <Y> to delete the Master Boot Record (MBR) from the selected RAID array.

3. Press <F10>. The following warning message appears:

```
┌─Exit───────────────────────────────────┐
│    Do you want to exit from Marvell BIOS Setup? │
│                                         │
│           Yes           No              │
└─────────────────────────────────────────┘
```

Press <Y> to save the RAID setting and exit the Marvell RAID utility.

Chapter 4

Intel® Smart Response Technology

Intel® Smart Response Technology boosts overall system performance. It uses an installed fast SSD (min 18.6GB available capacity required) as a cache for frequently accessed data. Key benefits include reduced load and wait times, and lower power consumption through the elimination of unnecessary hard drive spin. This technology combines SSD performance with hard drive capacity, operating up to 4X faster than a hard drive-only system.

To install Intel® Smart Response Technology:

1.   Place the support DVD to the optical drive. The Drivers installation tab appears if your computer has enabled the Autorun feature.

2.   Click the Drivers tab, then click Intel Rapid Storage Technology Driver software.

3.   Follow the onscreen instructions to complete installation.

To use Smart Response Technology:

1.   Click **Acclerate** to launch Smart Response Technology settings.
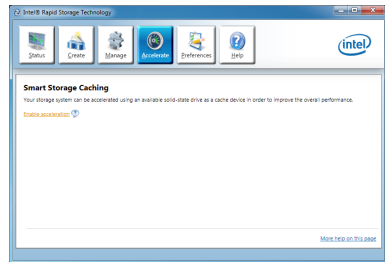
2.   a. Select the SSD you want to use to accelerate your storage system.

      b. Select the size allocated for SSD caching.

      c. Select which HDD for caching.

      d. **Enhanced mode**:WRITE THROUGH, write to SSD and HDD at the same time.

         Maximized mode:WRITE BACK, write to SSD and write back to HDD in a later time.
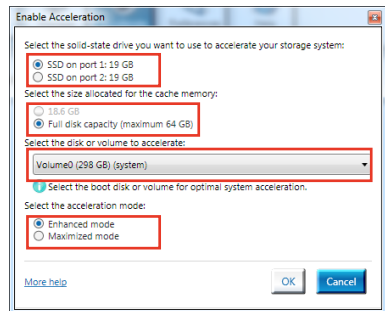
3. Select **Disable Acceleration** to disabled this function and Select **Change Mode** to switch accleration mode to Enhanced/ Maximus.
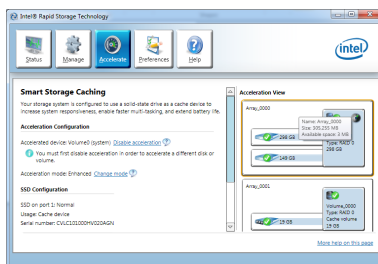
- Only Intel internal SATA ports (gray and blue) support Intel® Smart Response Technology.

- To enable Intel® Smart Response Technology, you need an SSD (>18.6GB) and a HDD.

- If you want to restore the OS, select **Disable Acceleration** to disabled this function or select **Acceleration Options** in BIOS Option ROM utility to disable this fuction.

- The performance of Intel® Smart Response Technology varies by installed SSD.

4.5 Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing a Windows® operating system on a hard disk drive that is included in a RAID set.

✎
- **The motherboard does not provide a floppy drive connector.** You have to use a USB floppy disk drive when creating a **SATA** RAID driver disk.
- Windows® XP may not recognize the USB floppy disk drive due to Windows® XP limitation. To work around this OS limitation, refer to section **4.5.4 Using a USB floppy disk drive**.

4.5.1 Creating a RAID driver disk without entering the OS

To create a RAID driver disk without entering the OS:

1. Boot your computer.
2. Press <Del> during POST to enter the BIOS setup utility.
3. Set the optical drive as the primary boot device.
4. Insert the support DVD into the optical drive.
5. Save changes and exit BIOS.
6. When the **Make Disk** menu appears, press <1> to create a RAID driver disk.
7. Insert a formatted floppy disk into the USB floppy disk drive, then press <Enter>.
8. Follow the succeeding screen instructions to complete the process.

4.5.2 Creating a RAID driver disk in Windows®

To create a RAID driver disk in Windows®:

1. Start Windows®.
2. Plug the USB floppy disk drive and insert a floppy disk.
3. Place the motherboard support DVD into the optical drive.
4. Go to the **Make Disk** menu, and then click **Intel AHCI/RAID Driver Disk** to create a RAID driver disk.
5. Select USB floppy disk drive as the destination disk.
6. Follow the succeeding screen instructions to complete the process.

✎ Write-protect the floppy disk to avoid a computer virus infection.

Chapter 4

4.5.3 Installing the RAID driver during Windows® OS installation

To install the RAID driver in Windows® XP:

1. During the OS installation, the system prompts you to press the F6 key to install third-party SCSI or RAID driver.

2. Press <F6>, and then insert the floppy disk with RAID driver into the USB floppy disk drive.

3. When prompted to select the SCSI adapter to install, select the RAID driver for the corresponding OS version.

4. Follow the succeeding screen instructions to complete the installation.

To install the RAID driver for Windows® Vista or later OS:

1. During the OS installation, click **Load Driver** to allow you to select the installation media containing the RAID driver.

2. Insert the USB flash drive with RAID driver into the USB port or the support DVD into the optical drive, and then click **Browse**.

3. Click the name of the device you've inserted, go to **Drivers** > **RAID**, and then select the RAID driver for the corresponding OS version. Click **OK**.

4. Follow the succeeding screen instructions to complete the installation.

Before loading the RAID driver from a USB flash drive, you have to use another computer to copy the RAID driver from the support DVD to the USB flash drive.

4.5.4 Using a USB floppy disk drive

Due to OS limitation, Windows® XP may not recognize the USB floppy disk drive when you install the RAID driver from a floppy disk during the OS installation.

To solve this issue, add the USB floppy disk drive's Vendor ID (VID) and Product ID (PID) to the floppy disk containing the RAID driver. Refer to the steps below:

1. Using another computer, plug the USB floppy disk drive, and insert the floppy disk containing the RAID driver.

2. Right-click **My Computer** on the Windows® desktop or **start** menu, and then select **Manage** from the pop-up window.
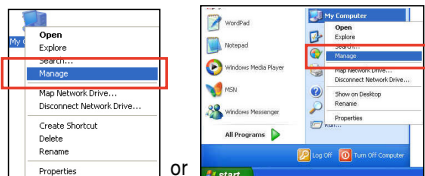
3. Select **Device Manager**. From the **Universal Serial Bus controllers**, right-click **xxxxxx USB Floppy**, and then select **Properties** from the pop-up window.

    The name of the USB floppy disk drive varies with different vendors.
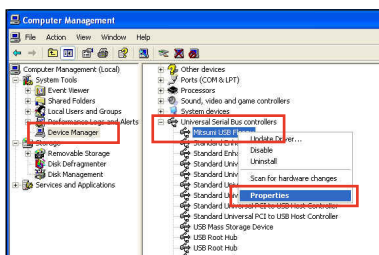
4. Click **Details** tab. The Vendor ID (VID) and Product ID (PID) are displayed.
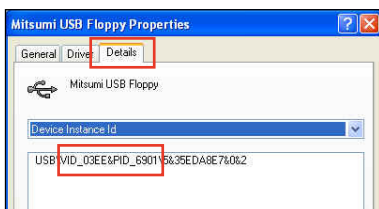
5. Browse the contents of the RAID driver disk to locate the file **txtsetup.oem**.

6. Double-click the file. A window appears, allowing you to select the program for opening the oem file.
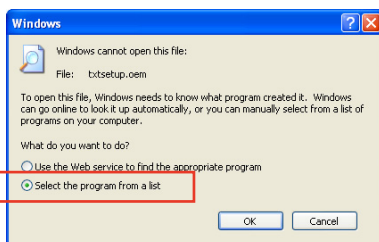
7.   Use Notepad to open the file.
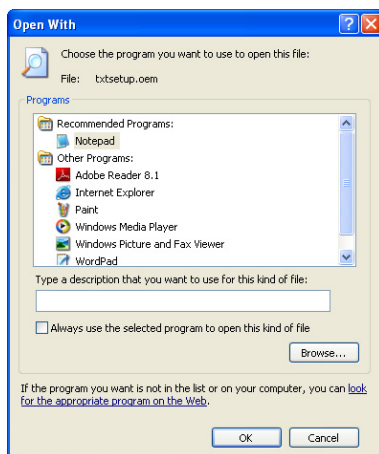
8.   Find the **[HardwareIds.scsi.iaAHCI_DesktopWorkstationServer]** and **[HardwareIds.scsi.iaStor_DesktopWorkstationServer]** sections in the **txtsetup.oem** file.

9.   Type the following line to the bottom of the two sections:
       id = "USB\VID_xxxx&PID_xxxx", "usbstor"

```
[HardwareIds.scsi.iaAHCI_DesktopWorkstationServer]
id= "PCI\VEN_8086&DEV_1C02&CC_0106","iaStor"
id= "USB\VID_03EE&PID_6901", "usbstor"


[HardwareIds.scsi.iaStor_DesktopWorkstationServer]
id= "PCI\VEN_8086&DEV_2822&CC_0104","iaStor"
id= "USB\VID_03EE&PID_6901", "usbstor"
```

Add the same line to both sections.

The VID and PID vary with different vendors.

10.   Save and exit the file.

Chapter 4

Chapter 5

5.1 ATI® CrossFireX™ technology

The motherboard supports the ATI® CrossFireX™ technology that allows you to install multi-graphics processing units (GPU) graphics cards. Follow the installation procedures in this section.

5.1.1 Requirements

- In Dual CrossFireX mode, you should have two identical CrossFireX-ready graphics cards or one CrossFireX-ready dual-GPU graphics card that are ATI® certified.
- Ensure that your graphics card driver supports the ATI CrossFireX technology. Download the latest driver from the AMD website (www.amd.com).
- Ensure that your power supply unit (PSU) can provide at least the minimum power required by your system. See Chapter 2 for details.

> - We recommend that you install additional chassis fans for better thermal environment.
> - Visit the ATI Game website (http://game.amd.com) for the latest certified graphics card and the supported 3D application list.

5.1.2 Before you begin

For ATI CrossFireX to work properly, you have to uninstall all existing graphics card drivers before installing ATI CrossFireX graphics cards to your system.

To uninstall existing graphics card drivers:

1. Close all current applications.
2. For Windows XP, go to **Control Panel > Add/Remove Programs**.
   For Windows Vista, go to **Control Panel > Programs and Features**.
3. Select your current graphics card driver/s.
4. For Windows XP, select **Add/Remove**.
   For Windows Vista, select **Uninstall**.
5. Turn off your computer.

5.1.3   Installing two CrossFireX™ graphics cards

The following pictures are for reference only. The graphics cards and the motherboard layout may vary with models, but the installation steps remain the same.

1. Prepare two CrossFireX-ready graphics cards.

2. Insert the two graphics card into the PCIEX16 slots. If your motherboard has more than two PCIEX16 slots, refer to Chapter 2 in this user manual for the locations of the PCIEX16 slots recommended for multi-graphics card installation.

3. Ensure that the cards are properly seated on the slots.

4. Align and firmly insert the CrossFireX bridge connector to the goldfingers on each graphics card. Ensure that the connector is firmly in place.
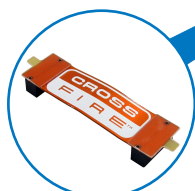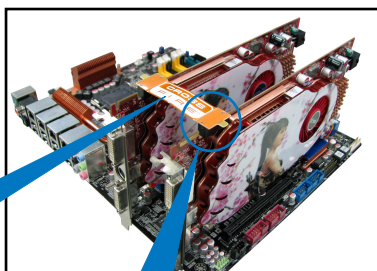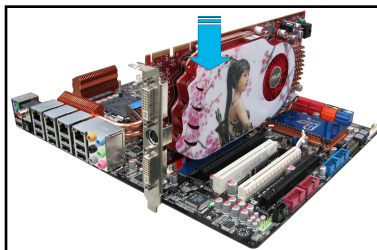
CrossFireX bridge (bundled with graphics cards)
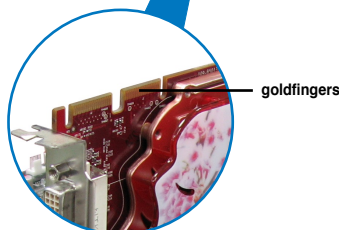
goldfingers

5. Connect two independent auxiliary power sources from the power supply to the two graphics cards separately.

6. Connect a VGA or a DVI cable to the graphics card.
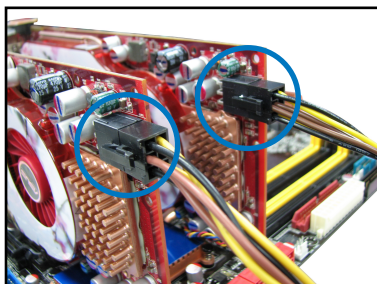
5.1.4   Installing the device drivers

Refer to the documentation that came with your graphics card package to install the device drivers.

Ensure that your PCI Express graphics card driver supports the ATI® CrossFireX™ technology. Download the latest driver from the AMD website (www.amd.com).

5.1.5   Enabling the ATI® CrossFireX™ technology

After installing your graphics cards and the device drivers, enable the CrossFireX™ feature through the ATI Catalyst™ Control Center in Windows environment.

Launching the ATI Catalyst Control Center

To launch the ATI Catalyst Control Center:

1.   Right-click on the Windows® desktop and select **Catalyst(TM) Control Center**. You can also right-click the ATI icon in the Windows notification area and select **Cayalist Control Center**.
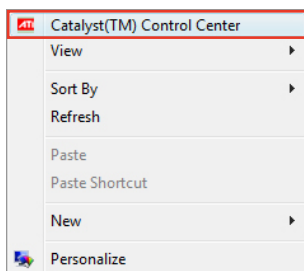
2.   The **Catalyst Control Center Setup Assistant** appears when the system detects the existance of multi-graphics cards. Click **Go** to continue to the **Catalyst Control Center Advanced View** window.
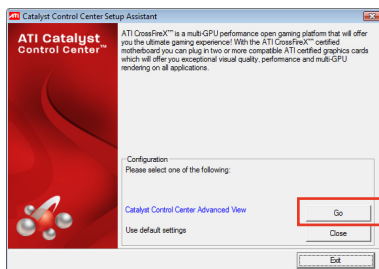
Enabling Dual CrossFireX technology

1.   In the Catalyst Control Center window, click **Graphics Settings > CrossFireX > Configure**.

2.   From the Graphics Adapter list, select the graphics card to act as the display GPU.

3.   Select **Enable CrossFireX**.

4.   Click **Apply**, and then click **OK** to exit the window.

5.2 NVIDIA® SLI™ technology

The motherboard supports the NVIDIA® SLI™ (Scalable Link Interface) technology that allows you to install multi-graphics processing units (GPU) graphics cards. Follow the installation procedures in this section.

5.2.1 Requirements

- In SLI mode, you should have two identical SLI-ready graphics cards that are NVIDIA® certified.

- Ensure that your graphics card driver supports the NVIDIA SLI technology. Download the latest driver from the NVIDIA website (www.nvidia.com).

- Ensure that your power supply unit (PSU) can provide at least the minimum power required by your system. See Chapter 2 for details.

> - We recommend that you install additional chassis fans for better thermal environment.
> - Visit the NVIDIA zone website (http://www.nzone.com) for the latest certified graphics card and supported 3D application list.

5.2.2 Installing two SLI-ready graphics cards

> The following pictures are for reference only. The graphics cards and the motherboard layout may vary with models, but the installation steps remain the same.

1. Prepare two SLI-ready graphics cards.

2. Insert the two graphics card into the PCIEX16 slots. If your motherboard has more than two PCIEX16 slots, refer to Chapter 2 in this user manual for the locations of the PCIEX16 slots recommended for multi-graphics card installation.

3. Ensure that the cards are properly seated on the slots.
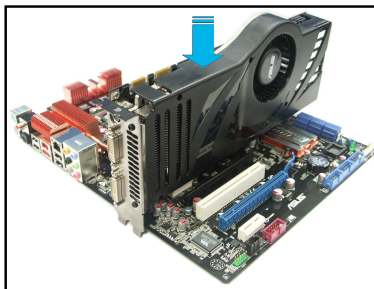
4.   Align and firmly insert the SLI bridge connector to the goldfingers on each graphics card. Ensure that the connector is firmly in place.

5.   Connect two independent auxiliary power sources from the power supply to the two graphics cards separately.

6.   Connect a VGA or a DVI cable to the graphics card.

SLI bridge

Goldfingers
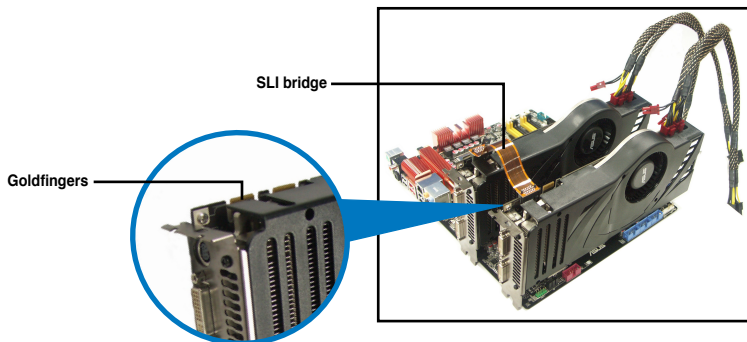
5.2.3   Installing the device drivers

Refer to the documentation that came with your graphics card package to install the device drivers.

Ensure that your PCI Express graphics card driver supports the NVIDIA® SLI™ technology. Download the latest driver from the NVIDIA website (www.nvidia.com).

5.2.4   Enabling the NVIDIA® SLI™ technology

After installing your graphics cards and the device drivers, enable the SLI feature in NVIDIA® Control Panel under the Windows® Vista™ operating system.

Launching the NVIDIA Control Panel

You can launch the NVIDIA Control Panel by the following two methods.

A.   Right click on the empty space of the Windows® desktop and select **NVIDIA Control Panel**.

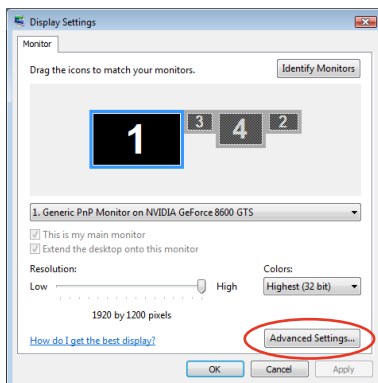The NVIDIA Control Panel window appears (See Step B5).
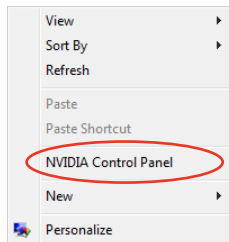
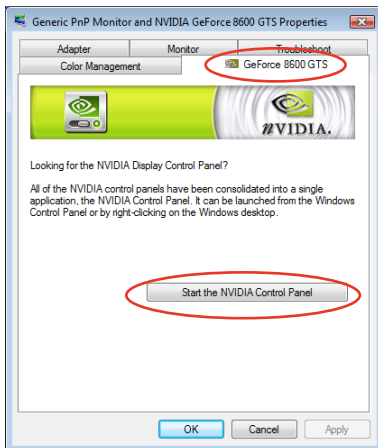B1. If you cannot see the NVIDIA Control Panel item in step (A), select **Personalize**.
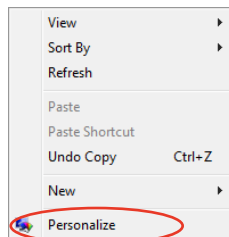
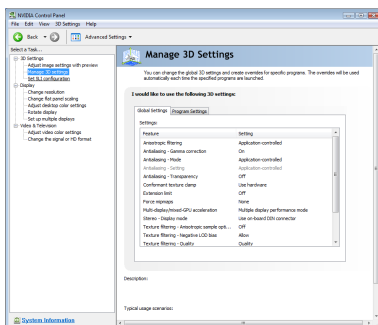B2. From the **Personalization** window, select **Display Settings**.
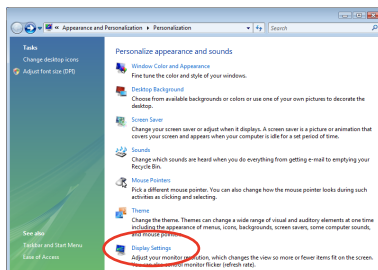
B3. From the Display Settings dialog box, click **Advanced Settings**.

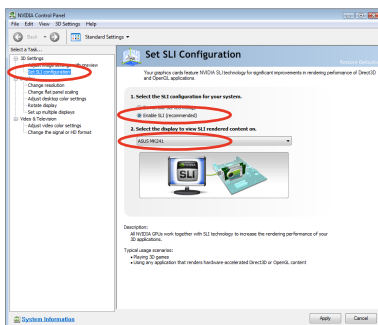B4. Select the NVIDIA GeForce tab, and then click **Start the NVIDIA Control Panel**.

B5. The NVIDIA Control Panel window appears.

Enabling SLI settings

From the NVIDIA Control Panel window, select **Set SLI Configuration**. Click **Enable SLI** and set the display for viewing SLI rendered content. When done, click **Apply**.

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Online support   support.asus.com

* EUR 0.14/minute from a German fixed landline; EUR 0.42/minute from a mobile phone.

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2. 1077(a)

Responsible Party Name: **Asus Computer International**

Address: **800 Corporate Way, Fremont, CA 94539.**

Phone/Fax No: **(510)739-3777/(510)608-4555**

hereby declares that the product

Product Name : Mother board

Model Number : P8Z68 DELUXE

Conforms to the following specifications:

☒ FCC Part 15, Subpart B, Unintentional Radiators
☐ FCC Part 15, Subpart C, Intentional Radiators
☐ FCC Part 15, Subpart E, Intentional Radiators

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Representative Person`s Name : __Steve Chang / President__

Signature : _____

Date : __May 11, 2011__

EC Declaration of Conformity

We, the undersigned,

Manufacturer:	ASUSTek COMPUTER INC.
Address, City:	No. 150, LI-TE RD., PEITOU, TAIPEI 112, TAIWAN R.O.C.
Country:	TAIWAN
Authorized representative in Europe:	ASUS COMPUTER GmbH
Address, City:	HARKORT STR. 21-23, 40880 RATINGEN
Country:	GERMANY

declare the following apparatus:

Product name :	**Mother board**
Model name :	**P8Z68 DELUXE**

conform with the essential requirements of the following directives:

☒2004/108/EC-EMC Directive

☒ EN 55022:2006+A1:2007	☒ EN 55024:1998+A1:2001+A2:2003
☒ EN 61000-3-2:2006	☒ EN 61000-3-3:2008
☐ EN 55013:2001+A1:2003+A2:2006	☒ EN 55020:2007

☐1999/5/EC-R &TTE Directive

☐ EN 300 328 V1.7.1(2006-05)	☐ EN 301 489-1 V1.8.1(2008-04)
☐ EN 300 440-1 V1.4.1(2008-05)	☐ EN 301 489-3 V1.4.1(2002-08)
☐ EN 300 440-2 V1.2.1(2008-03)	☐ EN 301 489-4 V1.3.1(2002-08)
☐ EN 301 511 V9.0.2(2003-03)	☐ EN 301 489-7 V1.3.1(2005-11)
☐ EN 301 908-1 V3.2.1(2007-05)	☐ EN 301 489-9 V1.4.1(2007-11)
☐ EN 301 908-2 V3.2.1(2007-05)	☐ EN 301 489-17 V2.1.1(2009-05)
☐ EN 301 893 V1.4.1(2005-03)	☐ EN 301 489-24 V1.4.1(2007-09)
☐ EN 302 544-2 V1.1.1(2009-01)	☐ EN 302 326-2 V1.2.2(2007-06)
☐ EN 50360:2001	☐ EN 302 326-3 V1.3.1(2007-09)
☐ EN 50371:2002	☐ EN 301 357-2 V1.3.1(2006-05)
☐ EN 50385:2002	☐ EN 302 623 V1.1.1(2009-01)

☒2006/95/EC-LVD Directive

☐ EN 60950-1:2006	☐ EN 60065:2002+A1:2006+A11:2008
☒ EN 60950-1:2006+A11:2009	

☐2009/125/EC-ErP Directive

Regulation (EC) No. 1275/2008	Regulation (EC) No. 278/2009
☐ EN 62301:2005	☐ EN 62301:2005
Regulation (EC) No. 642/2009	
☐ EN 62301:2005	Ver. 110101

☒CE marking

(EC conformity marking)

☐ (EC conformity marking)

Declaration Date: May 11, 2011
Year to begin affixing CE marking:2011

Position : **CEO**

Name : __Jerry Shen__

Signature : _____