MAXIMUS V GENE

Motherboard

E7318

Revised Edition V2
March 2012

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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>

MAXIMUS V GENE specifications summary

CPU	LGA1155 socket for 3rd/ 2nd Generation Intel® Core™ i7/ Core™ i5/Core™ i3/Pentium/Celeron Processors Supports 22nm/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® Z77 Express Chipset
Memory	Dual channel memory architecture 4 x DIMM, max. 32GB, DDR3 2666 (O.C.) / 2600 (O.C.) / 2400 (O.C.) / 2200(O.C.) / 2133(O.C.) 1866(O.C.) / 1600 / 1333 / 1066 MHz, non-ECC, un-buffered memory Supports Intel® Extreme Memory Profile (XMP) * Hyper DIMM support is subject to the physical characteristics of individual CPUs. Please refer to Memory QVL (Qualified Vendors List) for details.
Expansion Slots	2 x PCI Express 3.0/2.0 x16 slots [red] (single at x16, or dual at x8 / x8 mode) 1 x PCI Express 2.0 x4 slot [black] 1 x mini-PCI Express 2.0 x1 slot on mPCIe Combo™ expansion card * PCIe 3.0 speed is supported by Intel® 3rd generation Core™ processors.
VGA	**Integrated Intel® HD Graphics Processor** Multi-VGA output support: DisplayPort/ HDMI port Supports DisplayPort 1.1a with max. resolution 2560 x 1600@60Hz Supports HDMI 1.4a with max. resolution 1920 x 1200@60Hz Supports Intel®InTru™ 3D/Quick Sync Video/Clear Video HD Technology/Insider™
Multi-GPU Technology	Support NVIDIA® SLI™ / AMD CrossFireX™ **Technology** Supports Lucidlogix Virtu MVP Technology* *LucidLogix Virtu MVP supports Windows® 7 operating systems.

(continued on the next page)

MAXIMUS V GENE specifications summary

Storage	**Intel® Z77 Express Chipset**
	- 2 x SATA 6Gb/s ports [red]
	- 2 x SATA 3Gb/s ports [black]
	- 1 x eSATA 3Gb/s port
	- 1 x mSATA 3Gb/s slot on mPCIe Combo™ expansion card
	- Intel® Rapid Storage Technology supports RAID 0, 1, 5 and 10
	- Supports Intel® Smart Response Technology, Intel® Rapid Start Technology, Intel® Smart Connect Technology*
	ASMedia® SATA 6Gb/s controller
	- 2 x SATA 6Gb/s ports [red]**
	    * Supports on Intel® Core™ processor family with Windows® 7 operating systems.
	    ** These SATA ports are for data hard drives only.

LAN	Intel® Gigabit LAN Controller x 1

Audio	**SupremeFX III, built-in 8-Channel High Definition Audio CODEC**
	SupremeFX Shielding™ Technology
	1500 uF Audio Power Capacitor
	Gold-plated jacks
	- Output Signal-to-Noise Ratio (A-Weighted): 110 dB
	- Output THD+N at 1kHz: 95 dB
	Audio Feature:
	  - X-Fi® Xtreme Fidelity™
	  - EAX® Advanced™ HD 5.0
	  - THX® TruStudio PRO™
	  - Creative® ALchemy
	  - Supports: Jack-detection, Multi-streaming, Front Panel Jack-retasking
	- Blu-ray audio layer Content Protection
	- Optical S/PDIF out port at back panel

USB	**Intel® Z77 Express Chipset** - 4 x USB 3.0 ports; 2 ports at back panel [blue], 2 ports at mid-board [red] - 8 x USB 2.0 ports; 4 ports at back panel, 1 for ROG Connect [white]; 4 ports at mid-board **ASMedia® USB3.0 controller** - 2 x USB 3.0 ports; 2 ports at back panel [blue] * UASP standard only supports Windows 8.

(continued on the next page)

MAXIMUS V GENE specifications summary

ROG Exclusive Features	mPCIe Combo™ (mPCIe/mSATA combo card) ROG Connect - RC Diagram - RC Remote - RC Poster - GPU TweakIt ROG Extreme Engine Digi+ II - 8 phase CPU power - 4 phase iGPU power - 2 phase DRAM power UEFI BIOS features - ROG BIOS Print - GPU.DIMM Post CPU Level Up GameFirst ProbeIt iROG Extreme Tweaker USB BIOS Flashback Loadline Calibration ROG O.C. Profile
Special Features	ASUS EPU Engine ASUS Exclusive Features - AI Suite II - TurboV EVO - USB 3.0 Boost - Fan Xpert 2 - AI Charger+ - Disk Unlocker ASUS EZ DIY - ASUS CrashFree BIOS 3 - ASUS EZ Flash 2 - ASUS C.P.R.(CPU Parameter Recall) ASUS Q-Design - ASUS Q-Connector - ASUS Q-LED (CPU, DRAM, VGA, Boot Device LED) - ASUS Q-Slot - ASUS Q-DIMM

MAXIMUS V GENE specifications summary

Back I/O Ports	1 x Clear CMOS button 1 x ROG Connect On/Off switch 4 x USB 2.0 (1 port can be switched to ROG Connect) 1 x eSATA 3Gb/s 4 x USB 3.0 [blue] 1 x Optical S/PDIF out 1 x HDMI port 1 x DisplayPort 1 x LAN (RJ45) port 6 x Audio jacks
Internal I/O Ports	1 x USB 3.0 connector supports additional 2 USB 3.0 ports 2 x USB 2.0 connectors support additional 4 USB 2.0 ports 4 x SATA 6Gb/s connectors 2 x SATA 3Gb/s connectors 2 x CPU Fan connectors 3 x Chassis Fan connectors 1 x 24-pin EATX Power connector 1 x 8-pin EATX 12V Power connector 8 x ProbeIt Measurement Points 1 x Power-on button 1 x Reset button 1 x Go Button 1 x S/PDIF out header 1 x Front panel audio connector (AAFP) 1 x System panel connector 1 x mPCIe Combo header
Manageability	WfM2.0, DMI2.0, WOL by PME, PXE
BIOS Features	64Mb UEFI AMI BIOS, PnP, DMI2.0, WfM2.0, SM BIOS 2.5, ACPI2.0a Multi-Language BIOS
Software	Drivers Sound Blaster® X-Fi 2 Utility Kaspersky® Anti-Virus DAEMON Tools Pro Standard ROG CPU-Z ASUS AI Suite II ASUS WebStorage ASUS Utilities
Form Factor	mATX Form Factor, 9.6"x 9.6" (24.4cm x 24.4cm)

*Specifications are subject to change without notice.

Chapter 1

1.1   Welcome!

Thank you for buying an ROG MAXIMUS V GENE 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.

Motherboard	ROG MAXIMUS V GENE
Cables	**1 x ROG Connect cable** 2 x 2-in-1 SATA 6Gb/s signal cables 1 x 2-in-1 SATA 3Gb/s signal cables 1 x SLI bridge
Accessories	**I/O Shield** mPCIe Combo expansion card 1 x ROG Door Hanger 1 x 12 in 1 ROG Cable Label 1 x 2-in-1 ASUS Q-Connector Kit
Application DVD	ROG motherboard support DVD
Documentation	User guide

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

1.3   Special features

1.3.1   Product highlights

Republic of Gamers

The Republic of Gamers consists only the best of the best. We offer the best hardware engineering, the fastest performance, the most innovating ideas, and we welcome the best gamers to join in. In the Republic of Gamers, mercy rules are only for the weak, and bragging rights means everything. We believe in making statements and we excel in competitions. If your character matches our trait, then join the elite club, make your presence felt, in the Republic of Gamers.

LGA1155 socket for 3rd/ 2nd Generation Core™ i7/Core™ i5/Core™ i3/Pentium/Celeron Processors

This motherboard supports Intel® 3rd/2nd generation Core™ i7/i5/i3/Pentium®/ Celeron® processors in the LGA1155 package, with iGPU, memory and PCI Express controllers integrated to support onboard graphics output with dedicated chipsets, 2-channel (4 DIMM) DDR3 memory and 16 PCI Express 3.0/2.0 lanes. This provides great graphics performance. Intel® 3rd/2nd generation Core™ i7/i5/i3/Pentium®/Celeron® processors are among the most powerful and energy efficient CPUs in the world.

Intel® Z77 Express Chipset

The Intel® Z77 Express Chipset is a single-chipset design to support socket 1155 Intel® 3rd/2nd generation Core™ i7/i5/i3/Pentium®/Celeron® processors. It provides improved performance by utilizing serial point-to-point links, allowing increased bandwidth and stability. Additionally, Z77 chipset provides 4 USB 3.0 ports for 10 times faster data retrieval speed. Moreover, Intel® Z77 Express Chipset can also enable iGPU function, letting users enjoy the latest Intel® integrated graphic performance.

PCIe 3.0

PCI Express® 3.0 (PCIe 3.0) is the latest PCI Express bus standard with improved encoding schemes that provide twice the performance of current PCIe 2.0. Total bandwidth for a x16 link reaches a maximum of 32GB/s, double the 16GB/s of PCIe 2.0 (in x16 mode). As such, PCIe 3.0 provides users unprecedented data speeds, combined with the convenience and seamless transition offered by complete backward compatibility with PCIe 1.0 and PCIe 2.0 devices. PCIe 3.0 will become a must-have feature for users who wish to improve and optimize graphic performance, as well as have the latest technology available to them.

* PCIe 3.0 speed is supported by Intel® 3rd generation Core™ processors.

SLI/CrossFire On-Demand

Why choose when you can have both?

SLI or CrossFireX? Fret no longer because with the ROG Maximus V GENE, you'll be able to run both multi-GPU setups. The board features SLI/CrossFire on Demand technology, supporting up to Quad-GPU SLI or Quad-GPU CrossFireX configuration. Whichever path you take, you can be assured of jaw-dropping graphics at a level previously unseen.

LucidLogix® Virtu™ MVP

Up to 60% Hybrid Graphics Boost

LucidLogix Virtu MVP boosts your discrete graphics card up to 60% beyond its original performance. With the newly designed Virtual Vsync™, users can enjoy a smoother gaming experience by eliminating tearing artifacts. Its GPU virtualization dynamically assigns tasks to the best available graphics resource, fully utilizing 3X faster video conversion with Intel® Quick Sync Video 2.0 Technology while retaining 3D and gaming performance.

1.3.2 ROG unique gaming features

SupremeFX III

Supreme Sound

The SupremeFX III™ onboard audio solution is an 8-channel HD audio equipped with a carefully selected 1500uF capacitor which provides clean, ripple-free audio power and – perfect for enveloping gaming environments. With a metallic EMI cover and special layout design on the PCB, advanced SupremeFX Shielding™ technology isolates analog audio signals from digital sources for exceptional clarity and high fidelity, while a gold-plated jack ensures rich notes reach your ears with minimal distortion.
A bounty of industry standards are supported, including EAX® 5.0 Advanced HD, Creative® ALchemy and THX® TruStudio™ PRO, so the same great audio experiences found in live performances, films and recording studios are reproduced faithfully right on the PC. When bundled with the Sound Blaster® X-Fi MB2 suite, the SupremeFX III™ is the perfect choice to provide an exceptional gaming experience with realistic sound effects.

GameFirst

The speed you need to pwn

Low Internet latency allows you to frag more, and get fragged less. That's why ROG has introduced GameFirst, a feature that manages the flow of traffic according to your needs so that you can still listen to online music, download and upload files ,and engage in Internet chats without sacrificing the low ping times you need to pwn your opponents.

1.3.3 ROG Intelligent Performance & Overclocking features

mPCIe Combo

Give your board the mini upsize

Hook up immediate extra connectivity to your mATX board and say so long to physical limitations. The special adapter comes with one mini PCI Express 2.0/USB 2.0 combo port, and one mini SATA port. This way, you can connect extra devices without taking up valuable space inside the case, and get the best of both worlds: a compact PC with bigger expandability. Various devices can now connect instantly with no physical hassles.

ROG Connect

Plug and Overclock - Tweak it the hardcore way!

Monitor the status of your desktop PC and tweak its parameters in real-time via a notebook—just like a race car engineer—with ROG Connect. ROG Connect links your main system to a notebook through a USB cable, allowing you to view real-time POST code and hardware status readouts on your notebook, as well as make on-the-fly parameter adjustments at a purely hardware level.

Extreme Engine Digi+ II

Optimum power efficiency with premium components and intelligent digital design

The Extreme Engine Digi+ II has been upgraded and equipped with the finest Japan-made 10K Black Metallic capacitors, while the digital VRM design allows you to achieve ultimate performance with adjustable CPU and memory power management frequencies. Precise adjustments create greater efficiency, stability, double lifespan and performance for total system control.

USB BIOS FlashBack

Refresh the BIOS can never be that easy

USB BIOS Flashback must be the most convenient way to flash BIOS ever! It allows overclockers to try their BIOS with the simplist way one can imagine. No need to enter the BIOS or the operating system, just plug the thumb drive into the ROG Connect port & push the ROG Connect button for 3 seconds, BIOS would be automatically flashed under standby power. It's no doubt that USB BIOS Flashback gives overclockers the ultimate convenience!

iROG

Intelligent multiple control at hand

The iROG is a special IC which enables several ROG highlighted functions that gives users full disposal of the motherboard at any stage! This design allows advanced user control and management to be processed purely at a hardware level. iROG greatly increases fun during overclocking for PC enthusiasts and it offers system maintenance and management with more control and efficiency.

CPU Level Up

A simple click for instant upgrade!

Ever wish that you could have a more expansive CPU? Upgrade your CPU at no additional cost with ROG's CPU Level Up! Simply pick the processor you wanted to OC to, and the motherboard will do the rest! See the new CPU speed and enjoy that performance instantly. Overclocking is never as easy as this.

GPU.DIMM Post

Easily check the status of your graphics cards and memory in the BIOS!

Notice potential problems even before your enter the OS! Overclockers can save valuable minutes in detecting component failure under extreme conditions. With GPU.DIMM Post, quickly and easily check your graphics cards and memory DIMMs status in the BIOS, potentially keeping that record-breaking overclock!

BIOS Print

One click, easily share your BIOS settings

ROG offers a whole new UEFI BIOS feature to handle the demands of an overclocking experience. MAXIMUS V GENE features ROG BIOS Print which allows users to easily share their BIOS settings to others with the press of a button. The days of using a camera to take BIOS screenshot are over.

ProbeIt

Get all hands-on with hardware-based overclocking

ProbeIt takes the guesswork out of locating the motherboard's measurement points, identifying them clearly in the form of 7 sets of detection points so you'll know exactly where to get quick yet accurate readings using a multitester.

Extreme Tweaker

One stop performance tuning shop

Extreme Tweakers is the one stop shop to fine-tune your system to optimal performance. No matter if you're looking for frequency adjustment, over-voltage options, or memory timing settings, they're all here!

Loadline Calibration

Optimal power boost for extreme CPU overclocking!

Maintaining ample voltage support for the CPU is critical during overclocking. The Loadline Calibration ensures stable and optimal CPU voltage under heavy loading. It helps overclockers enjoy the motherboard's ultimate OC capabilities and benchmark scores.

1.3.4   ASUS special features

Intel Gigabit LAN

Experience the fast network connectivity!

The LAN solution from Intel has been long known to have a better throughput, lower CPU utilization as well as better stability. With the Intel Gigabit LAN solutions onboard, the ultimate network experience can therefore be delivered to its users like never before.

USB 3.0 Boost

Faster USB 3.0 Transmission with UASP

New ASUS USB 3.0 Boost technology supports UASP (USB Attached SCSI Protocol), the latest USB 3.0 standard. Witht USB 3.0 Boost technology, a USB device's transmission speed is significantly increased up to 170%, adding to an already impressive fast USB 3.0 transfer speed. ASUS software automatically accelerates data speeds for compatible USB 3.0 peripherals without the need for any user interaction.

1.3.5   ROG rich software bundled

Kaspersky® Anti-Virus

The best protection from viruses and spyware

Kaspersky® Anti-Virus Personal offers premium antivirus protection for individual users and home offices. It is based on advanced antivirus technologies. The product incorporates the Kaspersky® Anti-Virus engine, which is renowned for malicious program detection rates that are among the industry's highest.

DAEMON Tools Pro Standard

The real tool for optical and virtual discs

DAEMON Tools Pro offers essential functionality to backup CD, DVD and Blu-ray discs. It converts optical media into virtual discs and emulates devices to work with the virtual copies. DAEMON Tools Pro organizes data, music, video and photo collections on a PC, notebook or netbook.

ROG CPU-Z

Whole new design of CPU-Z

ROG CPU-Z is a customized ROG version authorized by CPUID. It has the same functionality and credibility as the original version, with a unique design. Use the whole new look of ROG CPU-Z to truly report your CPU related information and your uniqueness.

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
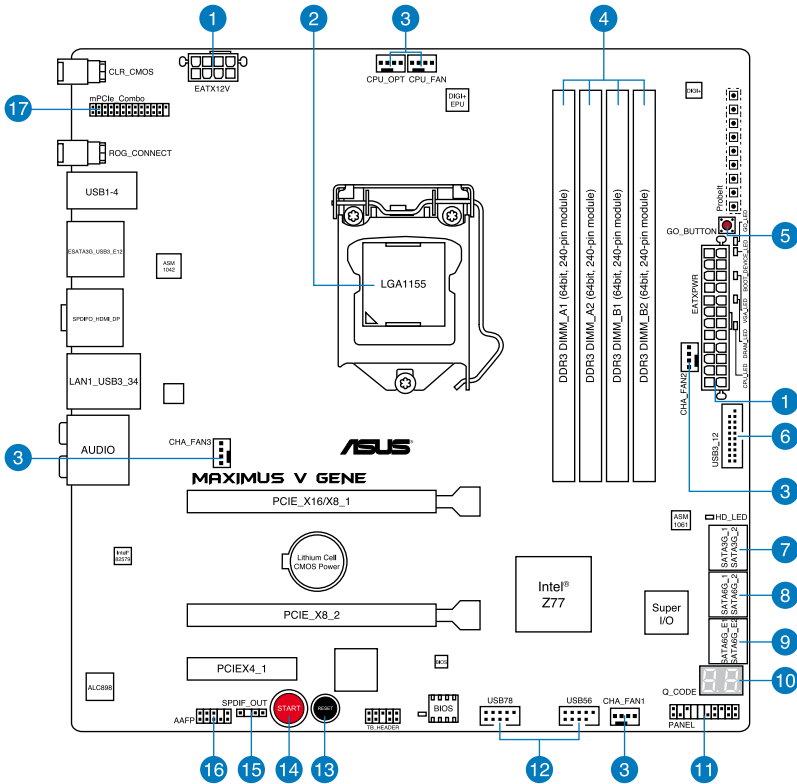
Refer to **2.2.8 Connectors** and **2.3.11 Rear panel connection** for more information about rear panel connectors and internal connectors.

2.2.2 Layout contents

Connectors/Jumpers/Switches/Slots		Page
1.	Power connectors (24-pin EATXPWR, 8-pin EATX12V)	2-34
2.	LGA1155 CPU Socket	2-4
3.	CPU, and chassis fan connectors (4-pin CPU_FAN, 4-pin CPU_OPT, 4-pin CHA_FAN1-3)	2-32
4.	DDR3 DIMM slots	2-5
5.	GO button	2-19
6.	USB 3.0 connector (USB3_12)	2-31
7.	Intel® Z77 Serial ATA 3.0 Gb/s connectors (7-pin SATA3G_1/2 [black])	2-28
8.	Intel® Z77 Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_1/2 [red])	2-27
9.	Asmedia® Z77 Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_E1/E2 [red])	2-29
10.	Debug LEDs	2-22
11.	System panel connector (20-8 pin PANEL)	2-35
12.	USB 2.0 connectors (10-1 pin USB56; USB78)	2-30
13.	Reset Switch	2-18
14.	Start Switch	2-18
15.	Digital audio connector (4-1 pin SPDIF_OUT)	2-31
16.	Front panel audio connector (10-1 pin AAFP)	2-33
17.	mPCIe Combo header (26-1 pin mPCIe_Combo)	2-31

Chapter 2

2.2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA1155 socket designed for the Intel® 3rd/2nd Generation Core™ i7 / Core™ i5 / Core™ i3 / Pentium / Celeron Processors.
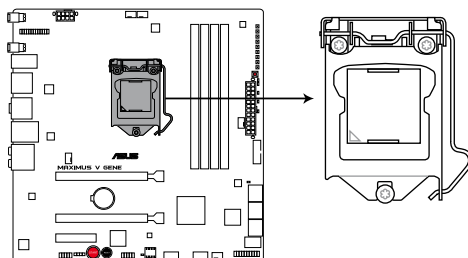
MAXIMUS V GENE CPU LGA1155

⚡ 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.

2.2.4 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.

MAXIMUS V GENE 240-pin DDR3 DIMM sockets
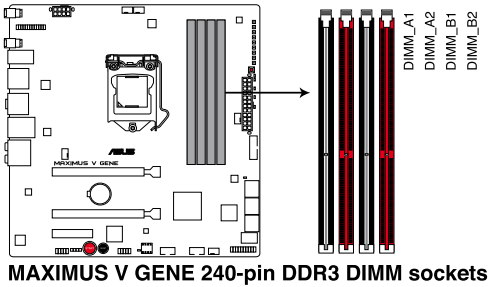
Recommended memory configurations
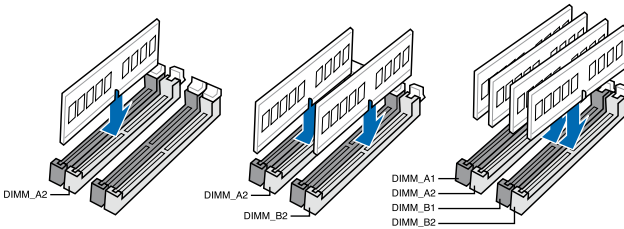
> Install one memory module in slot A2 first as a single-channel operation.

Memory configurations

You may install 1GB, 2GB, 4GB and 8GB 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 Intel® 2nd generation processor's behavior, DDR3 2200/2000/1800 and above 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 **3.3 Extreme 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.

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 2666(O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMM	4 DIMM
G.SKILL	F3-2666CL10Q-16GBZHD(XMP)	4GB(4 x 4GB)	DS	-	-	10-12-12-31	1.65	•	•

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 2600(O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMM	4 DIMM
G.SKILL	PC3-20800-8GB*8(XMP)	8GB*8	DS	-	-	C11-13-13-35	1.65	•	•

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 2400(O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMM	4 DIMM
A-DATA	AX3U2400GC4G10(XMP)	4GB	DS	-	-	10-11-11-30	1.65	•	•
CORSAIR	CMGTX8(XMP)	8GB (4x 2GB)	SS	-	-	10-12-10-30	1.65	•	•
CORSAIR	CMGTX3(XMP)	2GB	DS	-	-	9-11-9-27	1.65	•	
G.SKILL	F3-19200CL11Q-16GBZHD(XMP)	16GB (4x 4GB)	DS	-	-	11-11-11-31	1.65	•	•
G.SKILL	F3-19200CL11Q-16GBZHD(XMP)	16GB (4x 4GB)	DS	-	-	11-11-11-31	1.65	•	•
G.SKILL	F3-19200CL9Q-16GBZMD(XMP)	16GB (4x 4GB)	DS	-	-	9-11-11-31	1.65	•	•
G.SKILL	F3-19200CL10Q-32GBZHD(XMP)	32GB (4x 8GB)	DS	-	-	10-12-12-31	1.65	•	•
G.SKILL	F3-19200CL9D-4GBPIS(XMP)	4G (2x 2G)	DS	-	-	9-11-9-28	1.65	•	
GEIL	GOC316GB2400C10QC(XMP)	16GB (4x 4GB)	DS	-	-	10-11-11-30	1.65	•	•
GEIL	GOC316GB2400C11QC(XMP)	16GB (4x 4GB)	DS	-	-	11-11-11-30	1.65	•	•
Kingston	KHX2400C11D3K4/8GX(XMP)	8GB (4x 2GB)	SS	-	-	11-13-11-30	1.65	•	•
Transcend	TX2400KLU-4GK (381850)(XMP)	2GB	DS	-	-	-	1.65	•	•
Transcend	TX2400KLU-4GK(374243)(XMP)	2GB	DS	-	-	-	1.65	•	•
Patriot	PVV34G2400C9K(XMP)	4GB (2x 2GB)	DS	-	-	9-11-9-27	1.66	•	•

MAXIMUS V GENE 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)	
								2 DIMM	4 DIMM
G.SKILL	F3-17600CL7D-4GBFLS(XMP)	4G (2x 2G)	DS	-	-	7-10-10-28	1.65	•	
GEIL	GET34GB2200C9DC(XMP)	4GB (2x 2GB)	DS	-	-	9-10-9-28	1.65	•	•
GEIL	GET38GB2200C9ADC(XMP)	8GB (2x 4GB)	DS	-	-	9-11-9-28		•	•
KINGMAX	FLKE85F-B8KJAA-FEIS(XMP)	4GB (2x 2GB)	DS	Kingmax	N/A	-	1.65	•	

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 2133(O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional) 2 DIMM	DIMM socket support (Optional) 4 DIMM
A-DATA	8154A 1044(XMP)	2GB	SS	-	-	9-9-9-24	1.55-1.75	•	•
A-DATA	AX3U2133C2G9B(XMP)	2GB	SS	-	-	9-11-9-27	1.55~1.75	•	•
A-DATA	AX3U2133GC2G9B(XMP)	2GB	SS	-	-	9-9-9-24	1.55-1.75	•	
A-DATA	AX3U2133GC4G9B(XMP)	16GB (4x 4GB)	DS	-	-	9-11-9-27	1.65	•	•
Apacer	78.BAGE4.AFD0C(XMP)	8GB (2x 4GB)	DS	-	-	9-9-9-24	-	•	•
CORSAIR	CMT4GX3M2A2133C9(XMP)	4GB (2x 2GB)	DS	-	-	9-10-9-24	1.65	•	•
CORSAIR	CMT4GX3M2B2133C9(Ver7.1)(XMP)	4GB (2x 2GB)	DS	-	-	9-9-9-24	1.5	•	•
CORSAIR	CMT4GX3M2B2133C9(XMP)	4GB (2x 2GB)	DS	-	-	9-10-9-27	1.5	•	•
G.SKILL	F3-17000CL9Q-16GBXLD(XMP)	16GB (4x 4GB)	DS	-	-	9-11-9-28	1.65	•	•
G.SKILL	F3-17000CL9Q-16GBZH(XMP)	16GB (4x 4GB)	DS	-	-	9-11-10-28	1.65	•	•
G.SKILL	F3-17066CL9Q-16GBTDD(XMP)	16GB (4x 4GB)	DS	-	-	9-9-9-24	1.65	•	•
G.SKILL	F3-17000CL11Q2-64GBZLD(XMP)	64GB (8x 8GB)	DS	-	-	11-11-11-30	1.5	•	•
G.SKILL	F3-17066CL9D-8GBPID(XMP)	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.65	•	•
KINGSTON	KHX2133C11D3K4/16GX(XMP)	16GB (4x 4GB)	DS	-	-	11-12-11-30	1.65	•	•
KINGSTON	KHX2133C9AD3T1K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	-	1.65	•	•
KINGSTON	KHX2133C9AD3T1K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	9	1.65	•	•
KINGSTON	KHX2133C9AD3W1K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	9	1.65	•	•
KINGSTON	KHX2133C9AD3X2K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	9	1.65	•	•
KINGSTON	KHX2133C9AD3X2K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	9-9-9-24	1.65	•	•
KINGSTON	KHX2133C9AD3T1FK4/8GX(XMP)	8GB (4x 2GB)	DS	-	-	9	1.65	•	•
OCZ	OCZ3XTEP2133C9LV4GK	2GB	DS	-	-	7-7-7-20	1.65	•	
Patriot	PVV34G2133C9K(XMP)	4GB (2x 2GB)	DS	-	-	9-11-9-27	1.66	•	•

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 2000(O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional) 2	4
A-DATA	AX3U2000GB2G9B(XMP)	2GB	DS	-	-	9-11-9-27	1.55~1.75	•	•
A-DATA	AX3U2000GC4G9B(XMP)	4GB	DS	-	-	9-11-9-27	1.55~1.75	•	•
Apacer	78.AAGD5.9KD(XMP)	6GB(3 x 2GB)	DS	-	-	9-9-9-27	-	•	•
CORSAIR	CMT6GX3M3A2000C8(XMP)	6GB (3x 2GB)	DS	-	-	8-8-9-24	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	•	•
GEIL	GUP34GB2000C9DC(XMP)	4GB (2x 2GB)	DS	-	-	9-9-9-28	1.65	•	•
KINGSTON	KHX2000C9AD3T1K3/6GX(XMP)	6GB (3x 2GB)	DS	-	-	9	1.65	•	•
Transcend	TX2000KLN-8GK (388375)(XMP)	4GB	DS	-	-	-	1.6	•	•
AEXEA	AXA3ES2G2000LG28V(XMP)	2GB	DS	-	-	-	1.65	•	
AEXEA	AXA3ES4GK2000LG28V(XMP)	4GB (2x 2GB)	DS	-	-	-	1.65	•	•
Asint	SLA302G08-ML2HB(XMP)	4GB	DS	Hynix	H5TQ2G83BFRH9C	9-9-9-27	-	•	•
Gingle	FA3URSS673A801A	2GB	DS	-	-	9-9-9-24	-	•	•
Patriot	PX7312G2000ELK(XMP)	12GB (3x 4GB)	DS	-	-	9-11-9-27	1.65	•	•
Patriot	PV736G2000ELK(XMP)	6GB (3x 2GB)	DS	-	-	7-7-7-20	1.65	•	•
Patriot	PVT36G2000LLK(XMP)	6GB(3 x 2GB)	DS	-	-	8-8-8-24	1.65	•	
Silicon 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	•	•

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 1866(O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2	4
A-DATA	AX3U1866GC2G9B(XMP)	2GB	SS	-	-	9-11-9-27	1.55~1.75	•	
A-DATA	AX3U1866GC4G9B(XMP)	4GB	DS	-	-	9-11-9-27	1.55~1.75	•	•
CORSAIR	CMT32GX3M4X1866C9(Ver1.50)(XMP)	32GB (4x 8GB)	DS	-	-	9-10-9-27	1.5	•	•
CORSAIR	CMT32GX3M4X1866C9(Ver3.23)(XMP)	32GB (4x 8GB)	DS	-	-	10-10-10-27	1.5	•	•
CORSAIR	CMT32GX3M4X1866C9(Ver3.23)(XMP)	32GB (4x 8GB)	DS	-	-	10-10-10-27	1.5	•	•
CORSAIR	CMZ8GX3M2A1866C9(XMP)	8GB (2x 4GB)	DS	-	-	9-10-9-27	1.5	•	•
Crucial	BLE4G3D1869DE1XT0.16FMD(XMP)	4GB	DS	-	-	9-9-9-27	1.5	•	•
G.SKILL	F3-14900CL9Q-16GBXL(XMP)	16GB (4x 4GB)	DS	-	-	9-10-9-28	1.5	•	•
G.SKILL	F3-14900CL9Q-16GBZL(XMP)	16GB (4x 4GB)	DS	-	-	9-10-9-28	1.5	•	•
G.SKILL	F3-14900CL10Q2-64GBZLD(XMP)	64GB (8x 8GB)	DS	-	-	10-11-10-30	1.5	•	•
G.SKILL	F3-14900CL9D-8GBSR(XMP)	8GB (2x 4GB)	DS	-	-	9-10-9-28	1.5	•	•
G.SKILL	F3-14900CL9Q-8GBFLD(XMP)	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.6	•	•
Patriot	PXD34G1866ELK(XMP)	4GB (2x 2GB)	SS	-	-	9-9-9-24	1.65	•	•
Patriot	PXD38G1866ELK(XMP)	8GB (2x 4GB)	DS	-	-	9-11-9-27	1.65	•	•
Team	TXD34096M1866HC9K-L(XMP)	4GB	DS	Hynix	H5TC2G83BFRH9A	9-11-9-27	1.65	•	•

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 1800 MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMM	4 DIMM
G.SKIL	F3-14400CL9D-4GBRL(XMP)	4GB (2x 2GB)	DS	-	-	9-9-9-24	1.6	•	•

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 1600 MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMM	4 DIMM
A-DATA	AM2U16BC2P1	2GB	SS	A-DATA	3CCD-1509A	-	-	•	•
A-DATA	AM2U16BC4P2	4GB	DS	A-DATA	3CCD-1509A	-	-	•	•
A-DATA	AX3U1600GC4G9(XMP)	4GB	DS	-	-	-	1.55~1.75	•	•
A-DATA	AX3U1600PC4G8(XMP)	4GB	DS	-	-	8-8-8-24	1.55~1.75	•	•
A-DATA	AX3U1600XC4G79(XMP)	4GB	DS	-	-	7-9-7-21	1.65	•	•

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 1600 MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional) 2	4
CORSAIR	CMZ8GX3M4X1600C9(Ver 2.12)(XMP)	8GB (4x 2GB)	SS	-	-	9-9-9-24	1.5	•	•
CORSAIR	HX3X12G1600C9(XMP)	12GB (6x 2GB)	DS	-	-	9-9-9-24	1.6	•	•
CORSAIR	CML16GX3M4X1600C8(Ver 2.12)(XMP)	16GB (4x 4GB)	DS	-	-	Heat-Sink Package	1.5	•	•
CORSAIR	CMZ16GX3M4A1600C9(XMP)	16GB (4x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
CORSAIR	CMZ32GX3M4X1600C10 (Ver2.2)(XMP)	32GB (4x 8GB)	DS	-	-	10-10-10-27	1.5	•	•
CORSAIR	CMG4GX3M2A1600C6	4GB (2x 2GB)	DS	-	-	6-6-6-18	1.65	•	•
CORSAIR	CMP6GX3M3A1600C8(XMP)	6GB (3x 2GB)	DS	-	-	8-8-8-24	1.65	•	•
CORSAIR	CMP6GX3M3A1600C8(XMP)	6GB (3x 2GB)	DS	-	-	8-8-8-24	1.65	•	•
CORSAIR	CMX6GX3M3A1600C9(XMP)	6GB (3x 2GB)	DS	-	-	9-9-9-24	1.65	•	•
CORSAIR	CMX6GX3M3C1600C7(XMP)	6GB (3x 2GB)	DS	-	-	7-8-7-20	1.65	•	•
CORSAIR	CMZ8GX3M2A1600C8(XMP)	8GB (2x 4GB)	DS	-	-	8-8-8-24	1.5	•	•
CORSAIR	CMZ8GX3M2A1600C9(XMP)	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
Crucial	BL12864BN1608.8FF(XMP)	2GB(2x 1GB)	SS	-	-	8-8-8-24	1.65	•	•
Crucial	BL25664BN1608.16FF(XMP)	4GB(2x 2GB)	DS	-	-	8-8-8-24	1.65	•	•
Crucial	BLT4G3D1608DT1TX0.16FM(XMP)	4GB	DS	-	-	8-8-8-24	1.5	•	•
G.SKILL	F3-12800CL7Q-16GBXH(XMP)	16GB (4x 4GB)	DS	-	-	7-8-7-24	1.6	•	•
G.SKILL	F3-12800CL9Q-16GBXL(XMP)	16GB (4x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
G.Skill	F3-12800CL9Q-16GBZL(XMP)	16GB (4x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
G.SKILL	F3-12800CL9D-4GBNQ(XMP)	4GB (2x 2GB)	DS	-	-	9-9-9-24	1.5	•	•
G.SKILL	F3-12800CL7D-8GBRH(XMP)	8GB (2x 4GB)	DS	-	-	7-8-7-24	1.6	•	•
G.SKILL	F3-12800CL7D-8GBXH(XMP)	8GB (2x 4GB)	DS	-	-	7-8-7-24	1.6	•	•
G.SKILL	F3-12800CL9D-8GBRL(XMP)	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
G.SKILL	F3-12800CL9D-8GBSR2(XMP)	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.25	•	
G.SKILL	F3-12800CL8D-8GBECO(XMP)	8GB (2x4GB)	DS	-	-	8-8-8-24	1.35	•	•
GEIL	GET316GB1600C9QC(XMP)	16GB (4x 4GB)	DS	-	-	9-9-9-28	1.6	•	•
GEIL	GUP34GB1600C7DC(XMP)	4GB (2x 2GB)	DS	-	-	7-7-7-24	1.6	•	•
GEIL	GVP38GB1600C8QC(XMP)	8GB (4x 2GB)	DS	-	-	8-8-8-28	1.6	•	•
KINGMAX	FLGE85F-C8KL9A(XMP)	2GB	SS	KINGMAX	N/A	9-9-9-28	-	•	•
KINGMAX	FLGF65F-C8KL9A(XMP)	4GB	DS	KINGMAX	N/A	9-9-9-28	-	•	•
KINGSTON	KHX1600C9D3K3/12GX(XMP)	12GB (3x 4GB)	DS	-	-	9	1.65	•	•
KINGSTON	KHX1600C9D3T1BK3/12GX(XMP)	12GB (3x 4GB)	DS	-	-	9	1.65	•	
KINGSTON	KHX1600C9D3K3/12GX(XMP)	12GB(3x 4GB)	DS	-	-	-	1.65	•	•
KINGSTON	KHX1600C9D3K6/24GX(XMP)	24GB (6x 4GB)	DS	-	-	9	1.65	•	•
Kingston	KHX1600C9D3K8/32GX(XMP)	32GB (8x 4GB)	DS	-	-	9-9-9-27	1.65	•	•
KINGSTON	KHX1600C8D3K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	8	1.65	•	•
KINGSTON	KHX1600C8D3T1K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	8	1.65	•	•
KINGSTON	KHX1600C9D3K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	-	1.65	•	•

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 1600 MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional) 2	4
KINGSTON	KHX1600C9D3LK2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	-	1.65	•	•
KINGSTON	KHX1600C9D3X2K2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	9	1.65	•	•
KINGSTON	KHX1600C9D3K3/6GX(XMP)	6GB (3x 2GB)	DS	-	-	9	1.65	•	•
KINGSTON	KHX1600C9D3K3/6GX(XMP)	6GB (3x 2GB)	DS	-	-	9	1.65	•	•
KINGSTON	KHX1600C9D3K3/6GX(XMP)	6GB (3x 2GB)	DS	-	-	9	1.65	•	•
KINGSTON	KHX1600C9D3T1K3/6GX(XMP)	6GB (3x 2GB)	DS	-	-	9	1.65	•	•
KINGSTON	KHX1600C9D3P1K2/8G	8GB (2x 4GB)	DS	-	-	9	1.5	•	•
OCZ	OCZ3BE1600C8LV4GK	4GB(2x 2GB)	DS	-	-	8-8-8	1.65	•	
OCZ	OCZ3OB1600LV4GK	4GB(2x 2GB)	DS	-	-	9-9-9	1.65	•	
Transcend	TS256MLK64V6N	2GB	SS	Transcend	K4B2G0846C	-	-	•	•
Transcend	TS512MLK64V6N	4GB	DS	Transcend	K4B2G0846C	-	-	•	•
Transcend	JM1600KLN-8GK	8GB (2x 4GB)	DS	Transcend	TK483PCW3	-	-	•	•
Asint	SLZ3128M8-EGJ1D(XMP)	2GB	DS	Asint	3128M8-GJ1D	-	-	•	•
Asint	SLA302G08-EGG1C(XMP)	4GB	DS	Asint	302G08-GG1C	9-9-9-27	-	•	•
Asint	SLA302G08-EGJ1C(XMP)	4GB	DS	Asint	302G08-GJ1C	9-9-9-27	-	•	•
ATP	AQ12M64B8BKK0S	4GB	DS	SAMSUNG	K4B2G08460	-	NO	•	•
EK Memory	EKM324L28BP8-I16(XMP)	4GB(2x 2GB)	DS	-	-	9	-	•	•
EK Memory	EKM324L28BP8-I16(XMP)	4GB(2 x 2GB)	DS	-	-	9	-	•	•
Elixir	M2X2F64CB88G7N-DG(XMP)	2GB	SS	Elixir	N2CB2G80GN-DG	9-9-9-28	-	•	•
Elixir	M2X4G64CB8HG5N-DG(XMP)	4GB	DS	Elixir	N2CB2G80GN-DG	9-9-9-28	-	•	•
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	998805(XMP)	6GB (3x 2GB)	DS	-	-	6-8-6-24	1.65	•	•
Patriot	AE32G1609U1-U	2GB	SS	AMD	23EY4587MB6H	-	1.5	•	•
Patriot	PX7312G1600LLK(XMP)	12GB (3x 4GB)	DS	-	-	8-9-8-24	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	AE34G1609U2-U	4GB	DS	AMD	23EY4587MB6H	-	1.5	•	•
Patriot	PVV38G1600LLK(XMP)	8GB (2x 4GB)	DS	-	-	8-9-8-24	1.65	•	•
SanMax	SMD-4G68NG-16KK	4GB	DS	ELPIDA	J2108BDBG-GN-F	-	-	•	•
Team	TXD31024M1600C8-D(XMP)	1GB	SS	Team	T3D1288RT-16	8-8-8-24	1.65	•	•
Team	TXD32048M1600C7-L(XMP)	2GB	DS	Team	T3D1288LT-16	7-7-7-24	1.65	•	•
Team	TXD32048M1600HC8-D(XMP)	2GB	DS	Team	T3D1288RT-16	8-8-8-24	1.65	•	•
Team	TED34096M1600HC11	4GB	DS	Team	T3D2568ET-16	-	-	•	•
Team	TXD34096M1600HC9-D(XMP)	4GB	DS	Hynix	H5TC2G83BFRH9A	9-9-9-24	1.5	•	•

Chapter 2

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 1333 MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional) 2	4
A-DATA	AD63I1B0823EV	2GB	SS	A-DATA	3CCA-1509A	-	-	•	•
A-DATA	AM2U139C2P1	2GB	SS	A-DATA	3CCD-1509A	-	-	•	
A-DATA	AXDU1333GC2G9(XMP)	2GB	SS	-	-	9-9-9-24	1.25~1.35	•	•
A-DATA	AD63I1C1624EV	4GB	DS	A-DATA	3CCA-1509A	-	-	•	•
A-DATA	AM2U139C4P2	4GB	DS	A-DATA	3CCD-1509A	-	-	•	
A-DATA	SU3U1333W8G9(XMP)	8GB	DS	ELPIDA	J4208BASE-DJ-F	-	-	•	•
Apacer	78.A1GC6.9L1	2GB	DS	Apacer	AM5D5808FEQSBG	9	-	•	•
Apacer	78.B1GDE.9L10C	4GB	DS	Apacer	AM5D5908CEHSBG	9	-	•	•
CORSAIR	TW3X4G1333C9A	4GB (2x 2GB)	DS	-	-	9-9-9-24	1.5	•	•
CORSAIR	CMX8GX3M2A1333C9(XMP)	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
G.SKILL	F3-10600CL9D-4GBNT	4GB (2x 2GB)	DS	G.SKILL	D3 128M8CE9 2GB	9-9-9-24	1.5	•	•
G.SKILL	F3-10666CL8D-4GBHK(XMP)	4GB (2x 2GB)	DS	-	-	8-8-8-21	1.5	•	•
G.SKILL	F3-10666CL7D-8GBRH(XMP)	8GB (2x 4GB)	DS	-	-	7-7-7-21	1.5	•	•
G.SKILL	F3-10666CL9D-8GBRL	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
G.SKILL	F3-10666CL9D-8GBRL	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
G.SKILL	F3-10666CL9D-8GBXL	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
GEIL	GET316GB1333C9QC	16GB (4x 4GB)	DS	-	-	9-9-9-24	1.5	•	
GEIL	GG34GB1333C9DC	4GB (2x 2GB)	DS	GEIL	GL1L128M88BA115FW	9-9-9-24	1.3	•	
GEIL	GG34GB1333C9DC	4GB (2x 2GB)	DS	GEIL	GL1L128M88BA15B	9-9-9-24	1.3	•	
GEIL	GVP34GB1333C9DC	4GB (2x 2GB)	DS	-	-	9-9-9-24	1.5	•	
GEIL	GB34GB1333C7DC	4GB(2 x 2GB)	DS	GEIL	GL1L128M88BA15FW	7-7-7-24	1.5	•	•
GEIL	GVP38GB1333C9DC	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
GEIL	GVP38GB1333C7QC	8GB (4x 2GB)	DS	-	-	7-7-7-24	1.5	•	•
Hynix	HMT125U6TFR8A-H9	2GB	DS	Hynix	H5TC1G83TFR	-	-	-	
KINGMAX	FLFD45F-B8KL9	1GB	SS	KINGMAX	KFB8FNLXF-BNF-15A	-	-	•	
KINGMAX	FLFE85F-C8KL9	2GB	SS	KINGMAX	KFC8FNLBF-GXX-12A	-	-	•	•
KINGMAX	FLFE85F-C8KL9	2GB	SS	KINGMAX	KFC8FNLXF-DXX-15A	-	-	•	•
KINGMAX	FLFE85F-C8KM9	2GB	SS	Kingmax	KFC8FNMXF-BXX-15A	-	-	•	•
KINGMAX	FLFE85F-B8KL9	2GB	DS	KINGMAX	KFB8FNLXL-BNF-15A	-	-	•	•
KINGMAX	FLFF65F-C8KL9	4GB	DS	KINGMAX	KFC8FNLBF-GXX-12A	-	-	•	•
KINGMAX	FLFF65F-C8KL9	4GB	DS	KINGMAX	KFC8FNLXF-DXX-15A	-	-	•	•
KINGMAX	FLFF65F-C8KM9	4GB	DS	Kingmax	KFC8FNMXF-BXX-15A	-	-	•	•
KINGSTON	KVR1333D3S8N9/2G	2GB	SS	Micron	IFD77 D9LGK	-	1.5	•	•
KINGSTON	KVR1333D3N9/2G	2GB	DS	Elpida	J1108BDBG-DJ-F	-	1.5	•	•
KINGSTON	KVR1333D3N9/2G	2GB	DS	Kingston	D1288JPNDPLD9U	9	1.5	•	•
KINGSTON	KHX1333C9D3UK2/4GX(XMP)	4GB (2x 2GB)	DS	-	-	9	1.25	•	
KINGSTON	KVR1333D3N9K2/4G	4GB (2x 2GB)	DS	KINGSTON	D1288JEMFPGD9U	-	1.5	•	•
KINGSTON	KVR1333D3E9S/4G	4GB	DS	Elpida	J2108ECSE-DJ-F	9	1.5	•	•

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 1333 MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2	4
MICRON	MT4JTF12864AZ-1G4D1	1GB	SS	Micron	D9LGQ	-	-	•	
MICRON	MT8JTF25664AZ-1G4D1	2GB	SS	Micron	D9LGK	-	-	•	•
MICRON	MT8JTF25664AZ-1G4D1	2GB	SS	Micron	D9LGK	-	-	•	•
MICRON	MT8JTF25664AZ-1G4M1	2GB	SS	MICRON	D9PFJ	-	-	•	•
MICRON	MT16JTF51264AZ-1G4D1	4GB	DS	Micron	D9LGK	-	-	•	•
MICRON	MT16JTF51264AZ-1G4M1	4GB	DS	Micron	IGM22 D9PFJ	-	-	•	•
OCZ	OCZ3G1333LV4GK	4GB (2x 2GB)	DS	-	-	9-9-9	1.65	•	
OCZ	OCZ3G1333LV8GK	8GB (2x 4GB)	DS	-	-	9-9-9	1.65	•	
OCZ	OCZ3G1333LV8GK	8GB (2x 4GB)	DS	-	-	9-9-9	1.65	•	
OCZ	OCZ3RPR1333C9LV8GK	8GB (2x 4GB)	DS	-	-	9-9-9	1.65	•	
PSC	PC310600U-9-10-A0	1GB	SS	PSC	A3P1GF3FGF	-	-	•	•
PSC	PC310600U-9-10-B0	2GB	DS	PSC	A3P1GF3FGF	-	-	•	•
SAMSUNG	M378B5673FH0-CH9	2GB	DS	SAMSUNG	K4B1G0846F	-	-	•	•
SAMSUNG	M378B5273CH0-CH9	4GB	DS	SAMSUNG	K4B2G0846C	K4B2G0846C	-	•	•
SAMSUNG	M378B1G73AH0-CH9	8GB	DS	SAMSUNG	K4B4G0846A-HCH9	-	-	•	•
Transcend	JM1333KLN-2G (582670)	2GB	SS	Micron	ICD77 C9LGK	-	-	•	•
Transcend	JM1333KLN-2G	2GB	SS	Transcend	TK483PCW3	-	-	•	•
Transcend	TS256MLK64V3N (585541)	2GB	SS	Micron	ICD77 D9LGK	9	-	•	•
Transcend	TS256MLK64V3N (566577)	2GB	SS	Hynix	H5TQ2G83BFR	9	-	•	•
Transcend	TS256MLK64V3N (574206)	2GB	SS	Micron	D9LGK	9	-	•	•
Transcend	JM1333KLN-4G (583782)	4GB	DS	Transcend	TK483PCW3	9	-	•	
Transcend	JM1333KLN-4G	4GB	DS	Transcend	TK483PCW3	-	-	•	•
Transcend	TS512MLK64V3N (585538)	4GB	DS	Micron	IED27 D9LGK	9	-	•	•
Transcend	TS512MLK64V3N (574831)	4GB	DS	Micron	D9LGK	9	-	•	•
Transcend	TS1GLK64V3H	8GB	DS	MICRON	D9PBC	-	-	•	•
ACTICA	ACT1GHU64B8F1333S	1GB	SS	SAMSUNG	K4B1G0846F	-	-	•	•
ACTICA	ACT1GHU72C8G1333S	1GB	SS	SAMSUNG	K4B1G0846F(ECC)	-	-	•	•
ACTICA	ACT2GHU64B8G1333M	2GB	DS	Micron	D9KPT	-	-	•	•
ACTICA	ACT2GHU64B8G1333S	2GB	DS	SAMSUNG	K4B1G0846F	-	-	•	•
ACTICA	ACT2GHU72D8G1333M	2GB	DS	Micron	D9KPT(ECC)	-	-	•	•
ACTICA	ACT2GHU72D8G1333S	2GB	DS	SAMSUNG	K4B1G0846F(ECC)	-	-	•	•
ACTICA	ACT4GHU64B8H1333H	4GB	DS	Hynix	H5TQ2G83AFR	-	-	•	•
ACTICA	ACT4GHU72D8H1333H	4GB	DS	Hynix	H5TQ2G83AFR(ECC)	-	-	•	•
ATP	AQ56M72E8BJH9S	2GB	DS	SAMSUNG	K4B1G0846F(ECC)	-	-	•	•
ATP	AQ12M72E8BKH9S	4GB	DS	SAMSUNG	K4B2G0846C(ECC)	-	-	•	•
BUFFALO	D3U1333-1G	1GB	SS	Elpida	J1108BFBG-DJ-F	-	-	•	•
BUFFALO	D3U1333-2G	2GB	DS	Elpida	J1108BFBG-DJ-F	-	-	•	•
BUFFALO	D3U1333-4G	4GB	DS	NANYA	NT5CB256M8BN-CG	-	-	•	•

Chapter 2

MAXIMUS V GENE Motherboard Qualified Vendors Lists (QVL)
DDR3 1333 MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional) 2	4
EK Memory	EKM324L28BP8-I13	4GB(2 x 2GB)	DS	-	-	9	-	•	•
Elixir	M2F2G64CB88B7N-CG	2GB	SS	Elixir	N2CB2G808N-CG	-	-	•	•
Elixir	M2F2G64CB88D7N-CG	2GB	SS	Elixir	M2CB2G8BDN-CG	-	-	•	•
Elixir	M2F2G64CB88G7N-CG	2GB	SS	Elxir	N2CB2G80GN-CG	-	-	•	•
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	-	-	-	-	•	•
Mach Xtreme	MXD3V13332GS	2GB	SS	Mach Xtreme	C2S46D30-D313	-	-	•	•
Mach Xtreme	MXD3U133316GQ	16GB (4x 4GB)	DS	-	-	-	-	•	•
Patriot	AE32G1339U1-U	2GB	SS	AMD	23EY4587MB3H	-	1.5	•	•
Patriot	PGD316G1333ELK(XMP)	16GB (2x 8GB)	DS	-	-	9-9-9-24	1.5	•	•
Patriot	PSD32G13332	2GB	DS	Prtriot	PM128M8D3BU-15	9	-	•	•
Patriot	PGS34G1333LLKA	4GB(2 x 2GB)	DS	-	-	7-7-7-20	1.7	•	
Patriot	AE34G1339U2-U	4GB	DS	AMD	23EY4587MB3H	-	1.5	•	•
Patriot	PG38G1333EL(XMP)	8GB	DS	-	-	-	1.5	•	•
RiDATA	C304627CB1AG22Fe	2GB	DS	RiDATA	C304627CB1AG22Fe	9	-	•	•
RiDATA	E304459CB1AG32Cf	4GB	DS	RiDATA	E304459CB1AG32Cf	9	-	•	•
Silicon Power	SP001GBLTE133S01	1GB	SS	NANYA	NT5CB128M8AN-CG	-	-	•	•
Silicon Power	SP001GBLTU133S02	1GB	SS	S-POWER	10YT3E5	9	-	•	•
Silicon Power	SP002GBLTE133S01	2GB	DS	NANYA	NT5CB128M8AN-CG	-	-	•	•
Team	TXD31024M1333C7(XMP)	1GB	SS	Team	T3D1288LT-13	7-7-7-21	1.75	•	•
Team	TXD31048M1333C7-D(XMP)	1GB	SS	Team	T3D1288LT-13	7-7-7-21	1.75	•	
Team	TXD32048M1333C7-D(XMP)	2GB	DS	Team	T3D1288LT-13	7-7-7-21	1.5-1.6	•	•
Team	TED34096M1333HC9	4GB	DS	Team	T3D2568LT-13	-	-	•	•

• **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 red 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 red 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.

2.2.5 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.
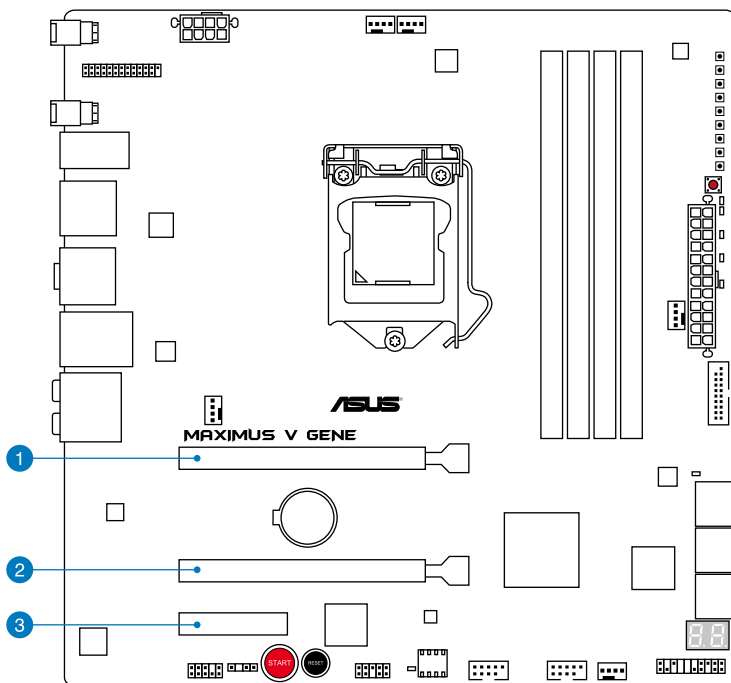
Slot No.	Slot Description
1	PCIe 3.0/2.0 x16/x8_1 slot
2	PCIe 3.0/2.0 x8_2 slot
3	PCIe 2.0 x4_1 slot

VGA configuration	PCI Express operating mode	
	PCIE_x16/x8_1	PCIE_x8_2
Single VGA/PCIe card	x16 (Recommend for single VGA)	N/A
Dual VGA/PCIe card	x8	x8

- PCIe 3.0 support depends on CPU type and requires PCIe 3.0 device.
- Connect a chassis fan to the motherboard connector labeled CHA_FAN1/2/3 when using multiple graphics cards for better thermal environment.

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCIE_x16/x8_1	shared	–	–	–	–	–	–	–
PCIE_x8_2	–	shared	–	–	–	–	–	–
PCIE_x4_1	shared	–	–	–	–	–	–	–
MINI_PCIE	–	–	shared	–	–	–	–	–
I.G.F.X	shared	–	–	–	–	–	–	–
Intel LAN Controller	–	shared	–	–	–	–	–	–
SATA #0	–	–	–	shared	–	–	–	–
SATA #1	–	–	–	shared	–	–	–	–
High Definition Audio	–	–	–	–	–	–	shared	–
EHCI #0 (USB2.0)	–	–	–	–	–	–	–	shared
EHCI #1 (USB2.0)	shared	–	–	–	–	–	–	–
XHCI (USB3.0)	shared	–	–	–	–	–	–	–
Asmedia USB3.0 Controller	shared	–	–	–	–	–	–	–
ASM1061 Storage Controller	–	–	–	shared	–	–	–	–

2.2.6   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

Press the power-on switch to wake/power up the system.

MAXIMUS V GENE Power on switch
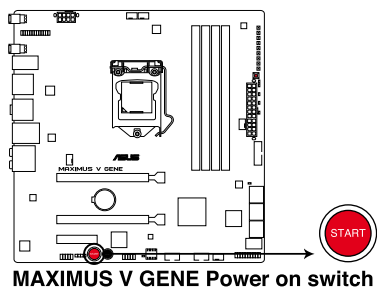
2.   Reset switch

Press the reset switch to reboot the system.

MAXIMUS V GENE Reset switch
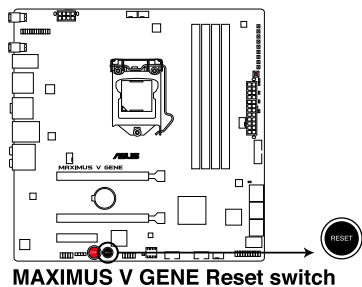
3. **GO button**

Press the GO button before POST to enable MemOK! or press it to quickly load the preset profile (GO_Button file) for temporary overclocking when in OS.

GO_BUTTON

MAXIMUS V GENE GO_BUTTON
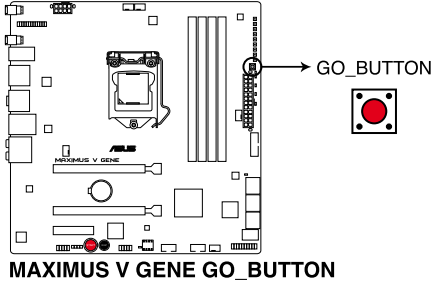
2.2.7 Onboard LEDs

1. Hard Disk LED

The hard disk LED is designed to indicate the hard disk activity. It blinks when data is being written into or read from the hard disk drive. The LED does not light up when there is no hard disk drive connected to the motherboard or when the hard disk drive does not function.
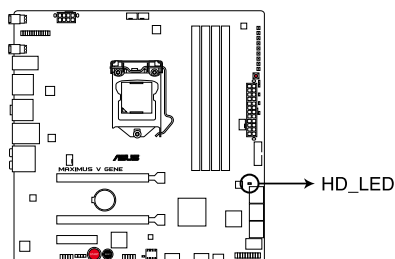
MAXIMUS V GENE Hard Disk LED

2. GO LED

Blinking: Indicates that MemOK! is enabled before POST.

Lighting: Indicates that the system loads the preset profile (GO_Button file) for temporary overclocking when in OS.
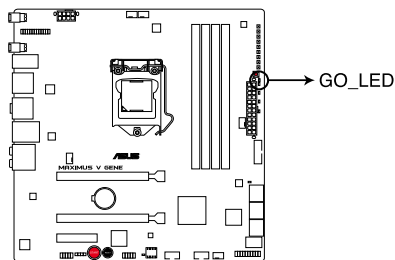
MAXIMUS V GENE GO_LED

3. **Q LED**

    Q LEDs check key components (CPU, DRAM, VGA card, and booting devices) in sequence during motherboard booting process. If an error is found , the corresponding LED will continue lighting until the problem is solved. This user-friendly design provides an intuitional way to locate the root problem within a second.

BOOT_DEVICE_LED
VGA_LED
DRAM_LED
CPU_LED

MAXIMUS V GENE CPU/ DRAM/ VGA/ BOOT_DEVICE LED
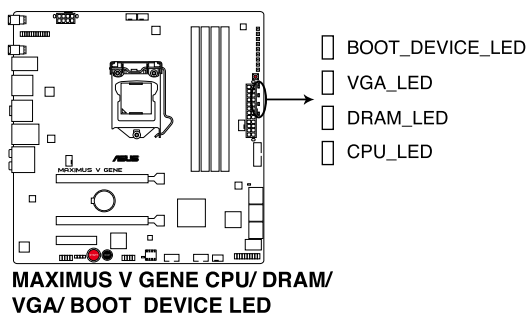
4. **Power LED**

    The motherboard comes with a power-on switch that lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder 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.

START

MAXIMUS V GENE Power on switch
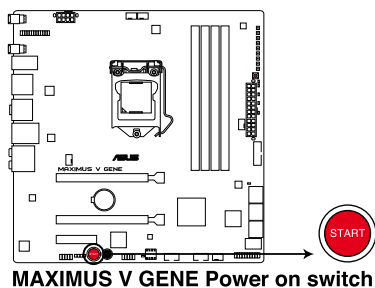
5. Q-Code LEDs

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.

Q-CODE

MAXIMUS V GENE Q-Code LED
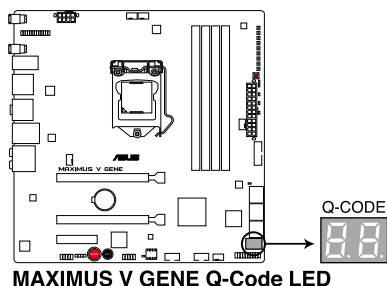
Q-Code table

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
06	Microcode loading
07	AP initialization after microcode loading
08	System Agent initialization after microcode loading
09	PCH 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
2B – 2F	Memory initialization
30	Reserved for ASL (see ASL Status Codes section below)
31	Memory Installed
32 – 36	CPU post-memory initialization
37 – 3A	Post-Memory System Agent initialization is started

Q-Code table (continued)

Code	Description
3B – 3E	Post-Memory PCH initialization is started
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
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

Q-Code table (continued)

Code	Description
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
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
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

Q-Code table (continued)

Code	Description
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
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.

2.2.8   Internal connectors

1.   Intel® Z77 Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_1/2 [red])

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® Z77 chipset.

MAXIMUS V GENE Intel® SATA 6.0 Gb/s connectors
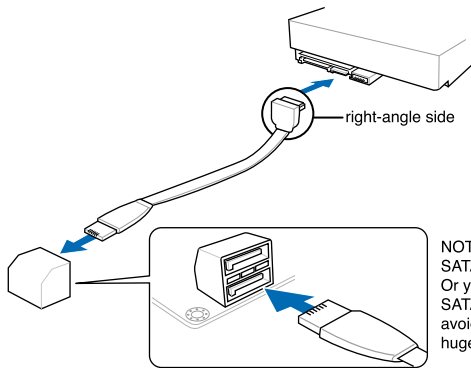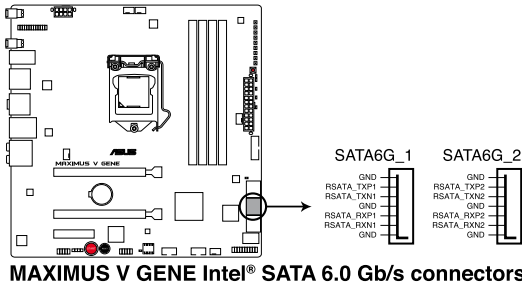
right-angle side

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 **3.5.3 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 **3.5.3 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® Z77 Serial ATA 3.0 Gb/s connectors (7-pin SATA3G_1-2 [black])

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® Z77 chipset.
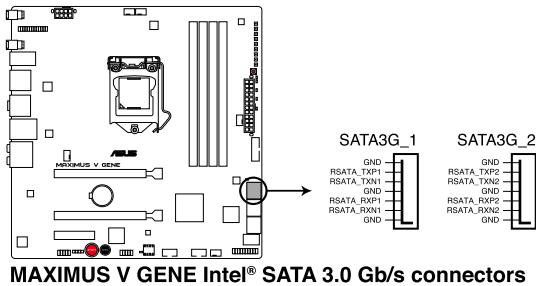
MAXIMUS V GENE Intel® SATA 3.0 Gb/s connectors

- 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 **3.5.3 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 **3.5.3 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.

Chapter 2

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

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

SATA6G_E1

GND
RSATA_TXP1
RSATA_TXN1
GND
RSATA_RXP1
RSATA_RXN1
GND

SATA6G_E2

GND
RSATA_TXP2
RSATA_TXN2
GND
RSATA_RXP2
RSATA_RXN2
GND
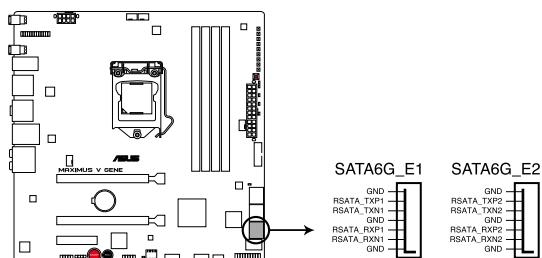
MAXIMUS V GENE Marvell® SATA 6.0 Gb/s connectors

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

•   When using NCQ, set the **ASM1061 Storage Controller** item in the BIOS to [Enabled]. Refer to section **3.5.6 Onboard Devices Configuration** for details.

4. USB 2.0 connectors (10-1 pin USB56 USB78)

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 480 Mbps connection speed.

MAXIMUS V GENE USB2.0 connectors
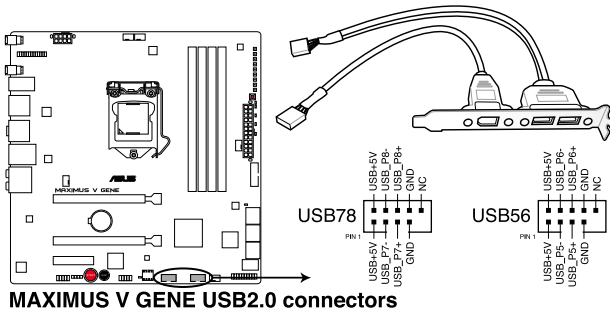
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

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 1394 + USB 2.0 cable is purchased separately.

Chapter 2

5. **USB 3.0 connector (20-1 pin USB3_12)**

   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_12

	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
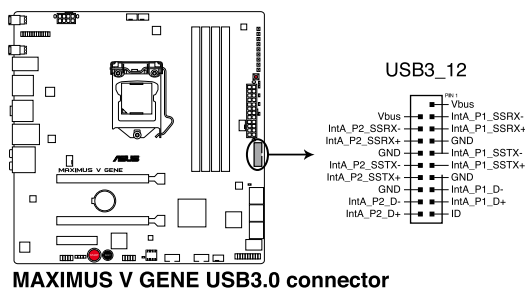
MAXIMUS V GENE USB3.0 connector

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

6. **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.

+5V   SPDIFOUT   GND

SPDIF_OUT
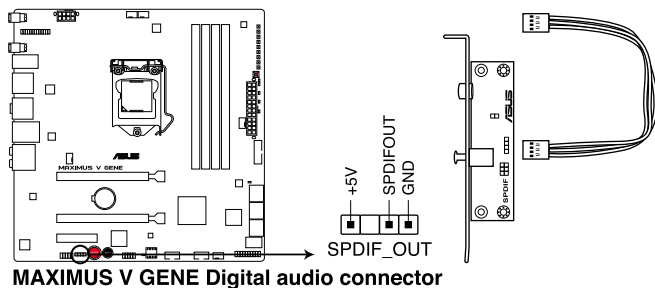
MAXIMUS V GENE Digital audio connector

> The S/PDIF module is purchased separately.

7. **CPU, and chassis fan connectors (4-pin CPU_FAN; 4-pin CPU_OPT; 4-pin CHA_FAN1/2/3)**

    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.

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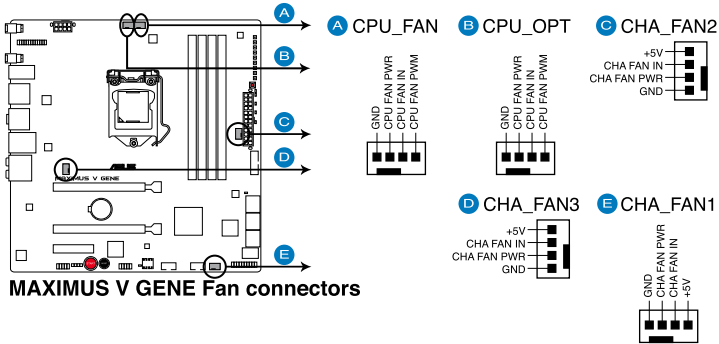
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!

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

•   If you install two VGA cards, we recommend that you plug the rear chassis fan cable to the motherboard connector labeled CHA_FAN1, CHA_FAN2, CHA_FAN3 for better thermal environment.

8. **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.
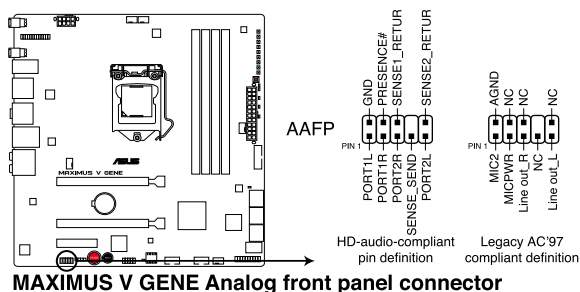
MAXIMUS V GENE Analog front panel connector

- • 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].

9. 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.

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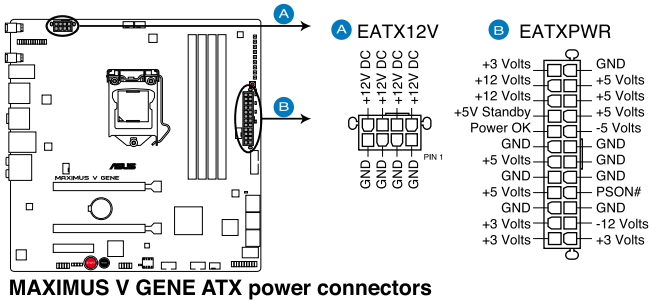
- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 350 W.

- Do not forget to connect the 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 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.

- 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.

10. System panel connector (20-8 pin PANEL)

This connector supports several chassis-mounted functions.
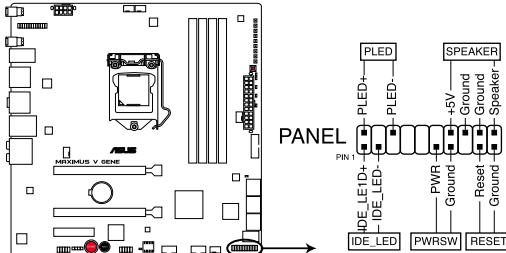
MAXIMUS V GENE System panel connector

- **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)**
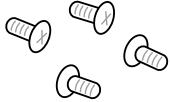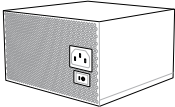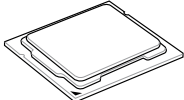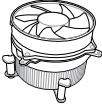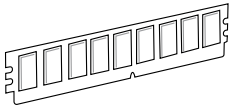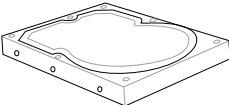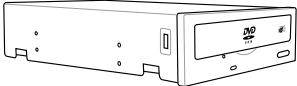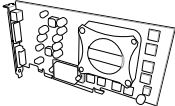
  This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **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.

Chapter 2

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.
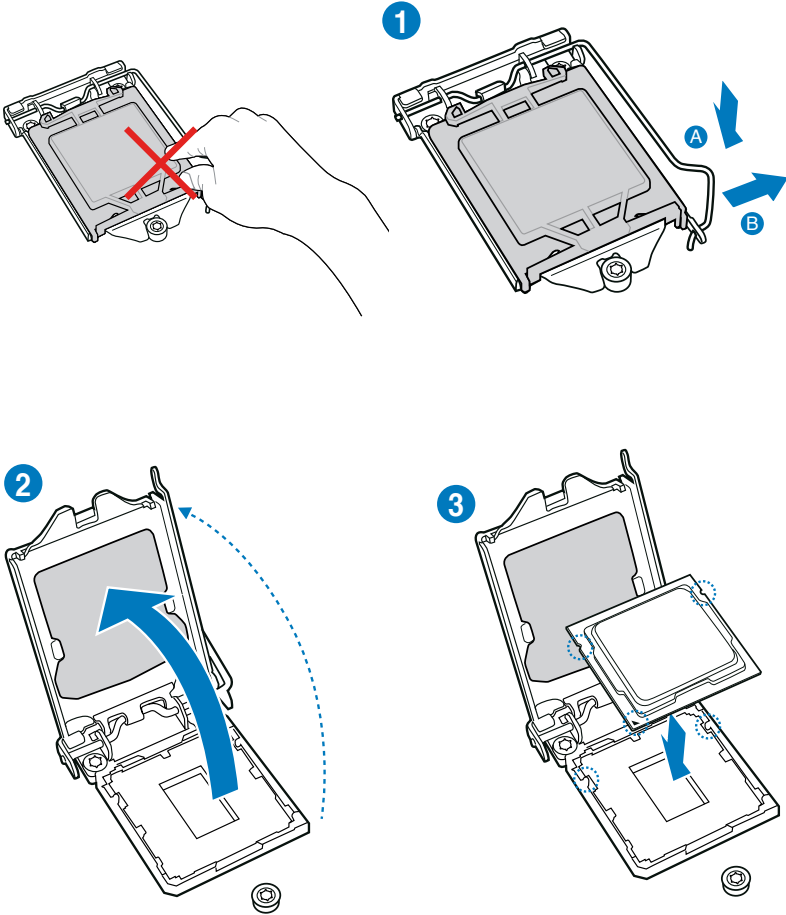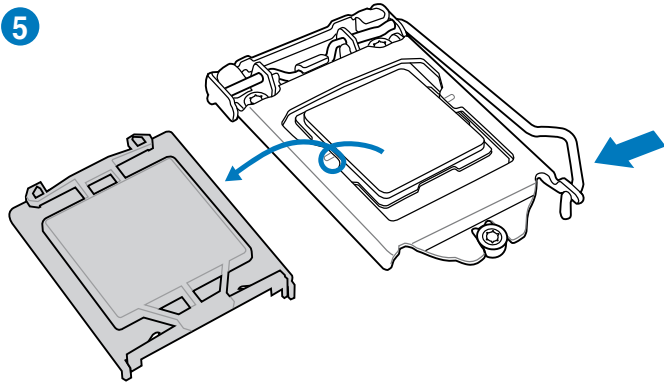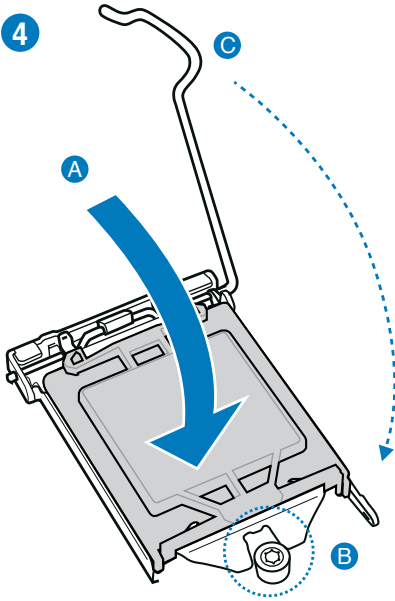
2.3.3 CPU heatsink and fan assembly installation
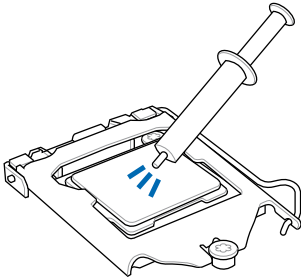
> ⚠ Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.

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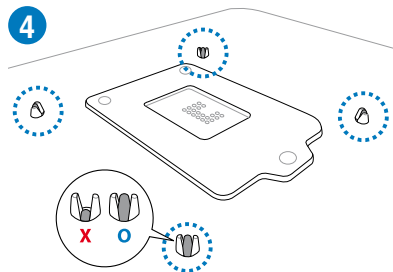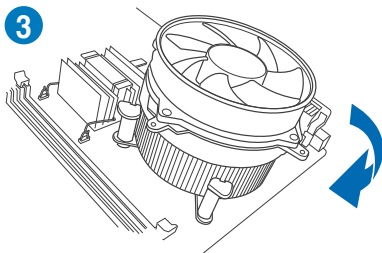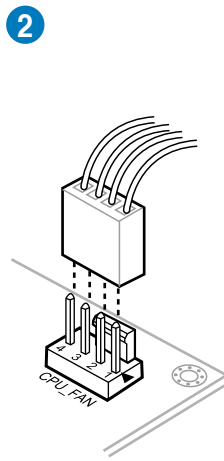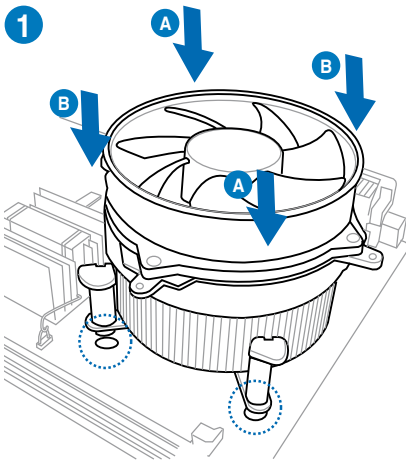
To uninstall the CPU heatsink and fan assembly
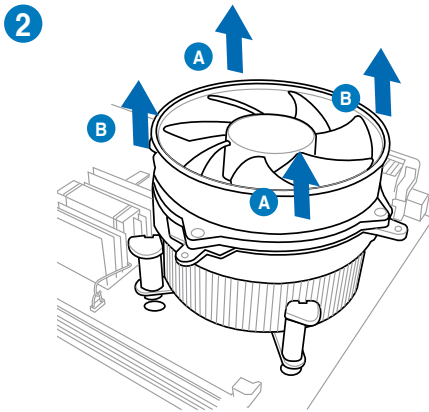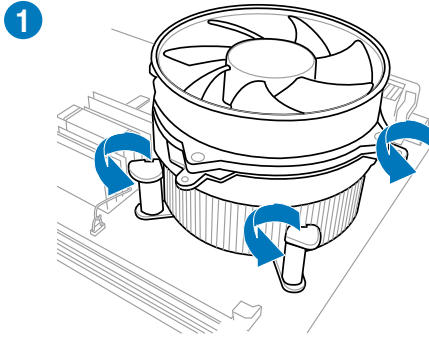
2.3.4   DIMM installation
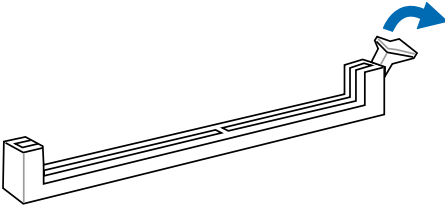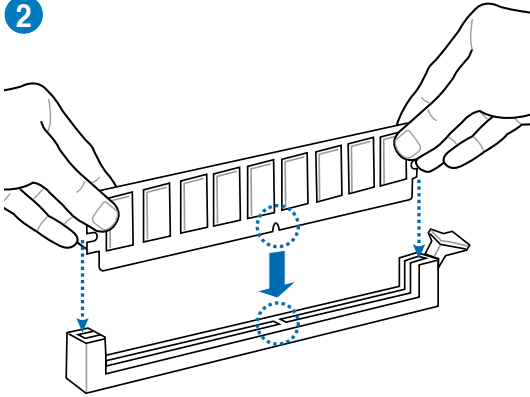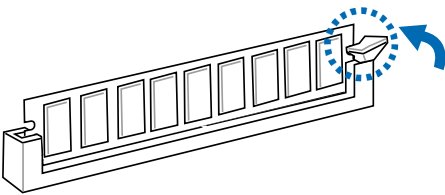
To remove a DIMM
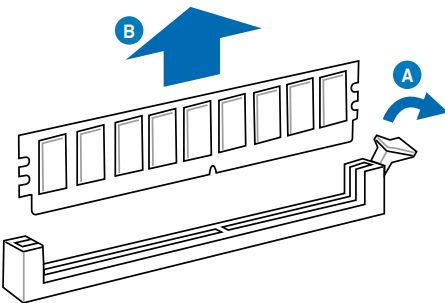
2.3.5 Motherboard installation

✎
- The diagrams in this section are for reference only. The motherboard layout may vary with models, but the installation steps remain the same.

- If you are installing an mPCIe Combo card, refer to **2.3.10 mPCIe Combo installation** before installing the motherboard.

1

2
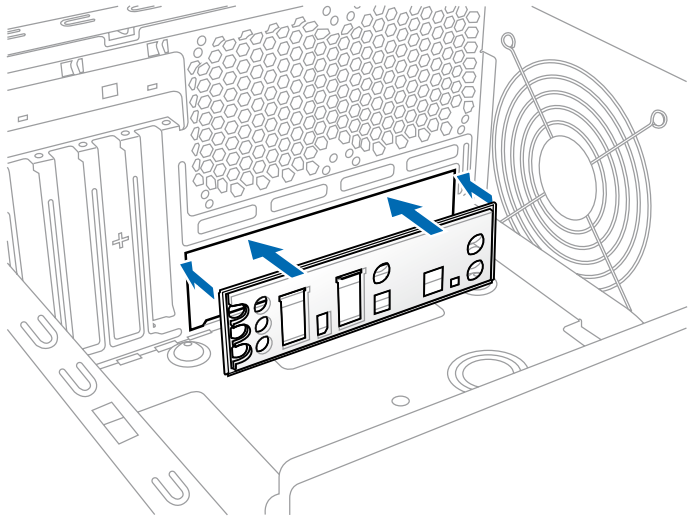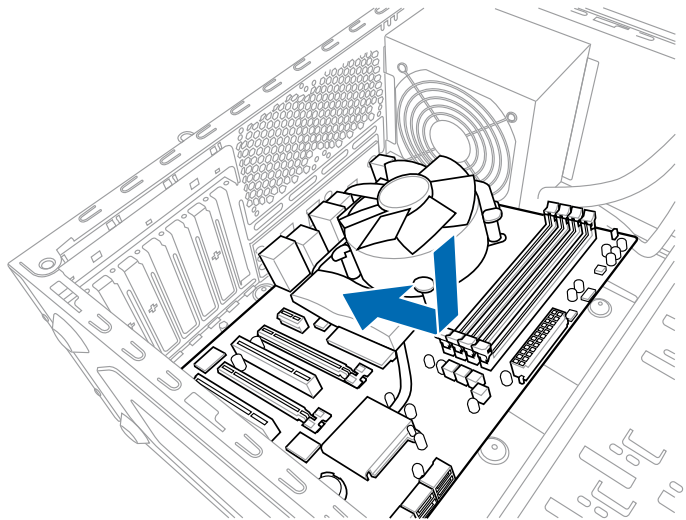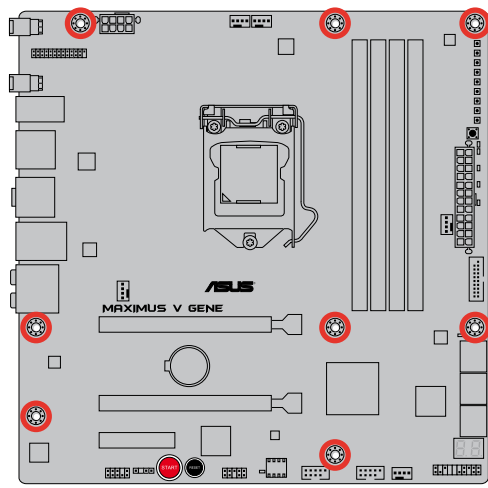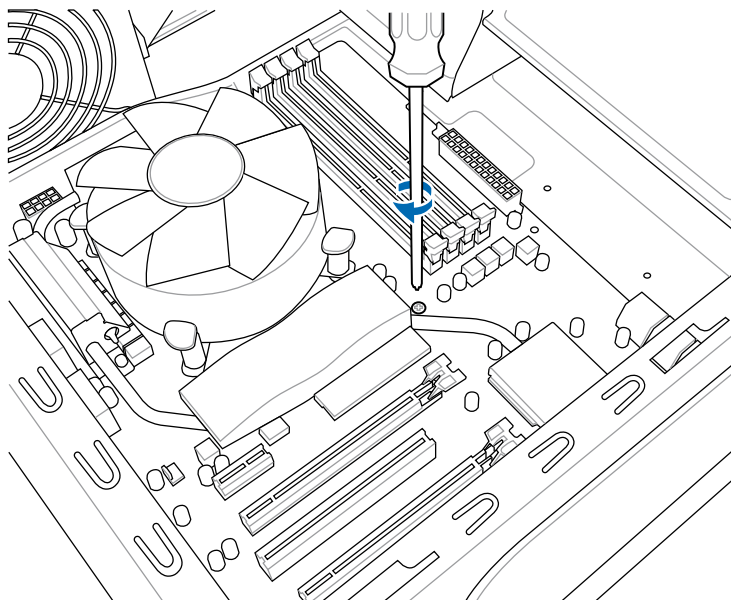
DO NOT overtighten the screws! Doing so can damage the motherboard.
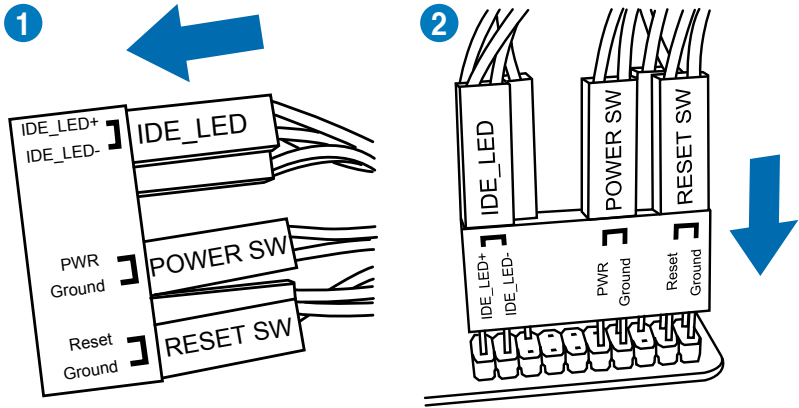
2.3.6   ATX Power connection

OR   OR
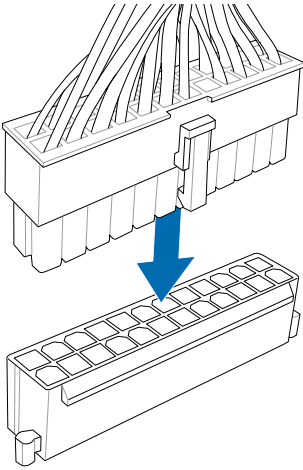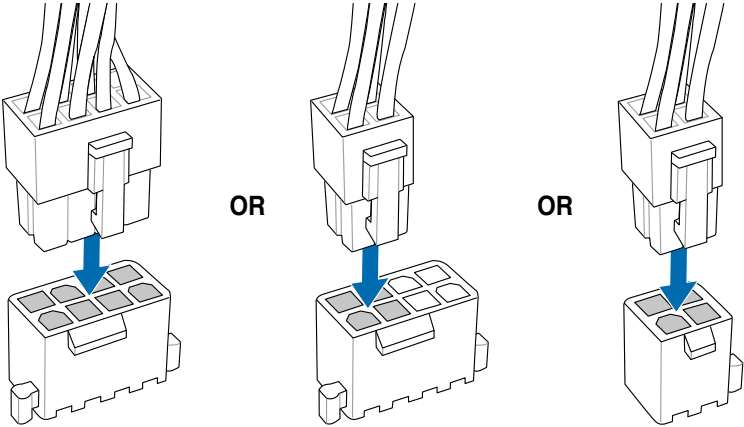
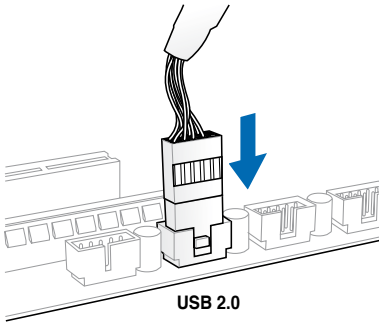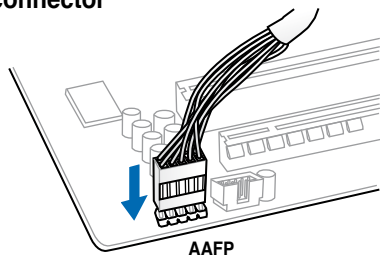### 2.3.7   SATA device connection
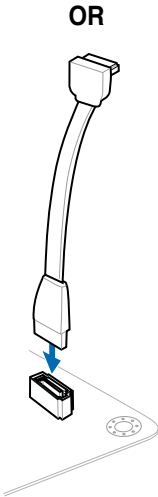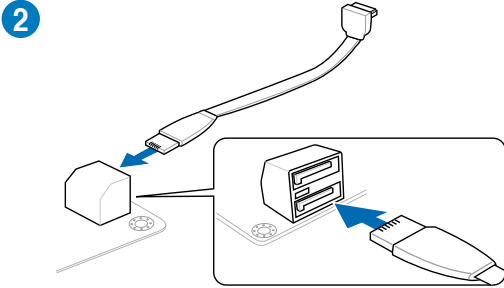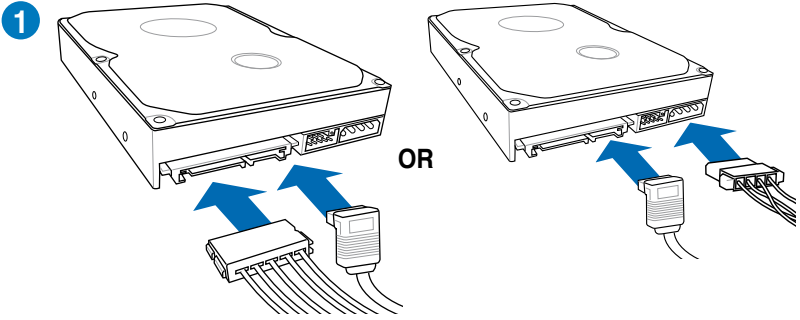
2.3.8 Front I/O Connector

To install ASUS Q-Connector

To install USB 2.0 Connector

USB 2.0

To install front panel audio connector
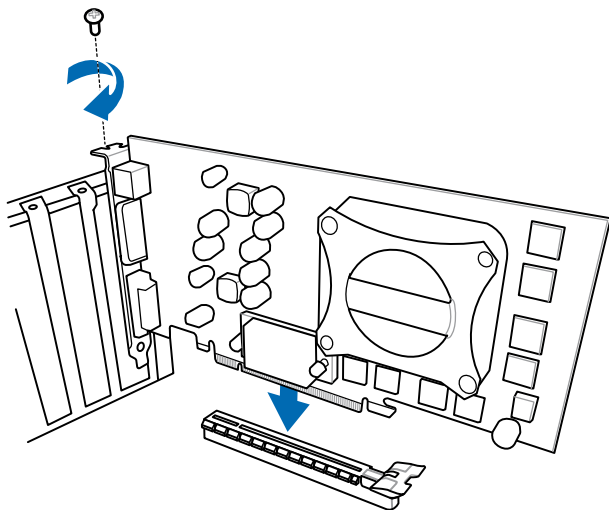

AAFP

To install USB 3.0 Connector
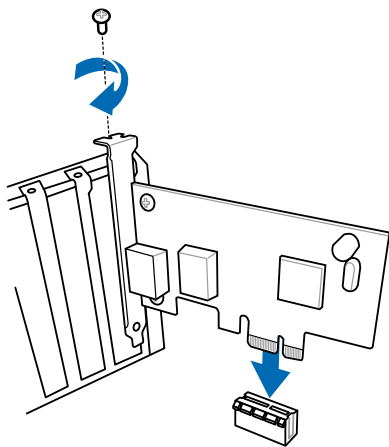

USB 3.0
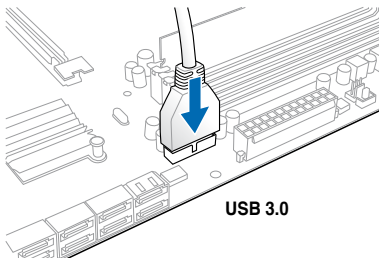
2.3.9   Expansion Card installation

To install PCIe x16 cards

To install PCIe x1 cards

2.3.10 mPCIe Combo installation

The mPCIe Combo is a mini card that allows you to add a mPCIe module and an mSATA module into your motherboard.

> •   This mPCIe Combo supports half-sized mPCIe modules (26.8mm x 30 mm) only.
>
> •   The mPCIe Combo supports both full-sized and half-sized mSATA modules. The suggested sizes are from 50.8mm x 30 mm to 26.8mm x 30mm.
>
> •   The mPCIe and mSATA modules are purchased separately.

Installing the mPCIe Wi-Fi module

To install the mPCIe Wi-Fi module:

1.   Remove both screws on the side of the MINI_PCIE slot, as indicated below. Keep screws for reassembly.
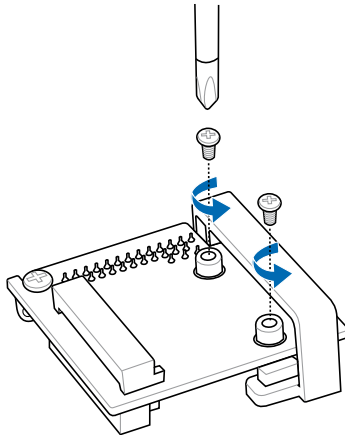
2.   Insert the mPCIe Wi-Fi module.

> The mPCIe Wi-Fi module fits in one orientation only. If it doesn't fit, try reversing it.
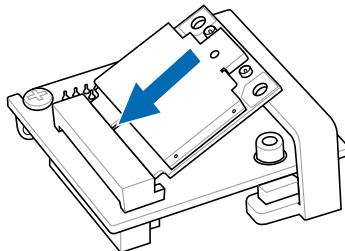
3. Press down the Wi-Fi module then secure in place using the screws removed earlier.

Do not overtighten the screws to prevent damage to the mPCIe Wi-Fi module or mPCIe Combo.
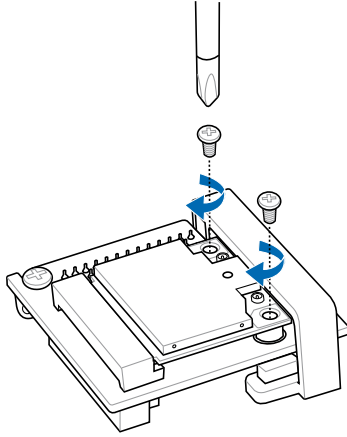
4. Remove the screw beside the 26-pin connector.
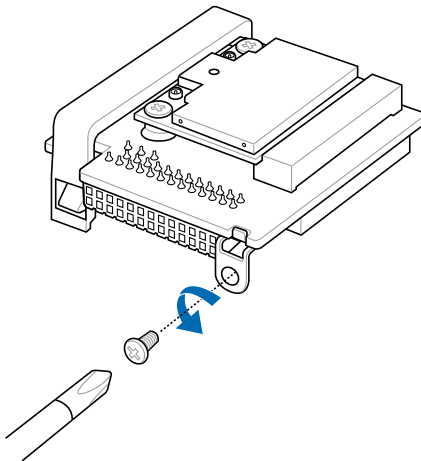
5. Locate the mPCIe_Combo connector on the motherboard. Align and insert the mPCIe Combo on the connector.
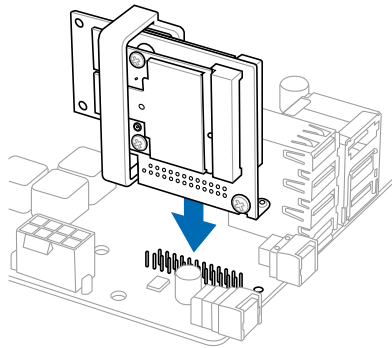
- The mPCIe Combo fits in one orientation only.
- Insert the mPCIe Combo with caution to prevent damage to the module, or the mPCIe_Combo connector pins, or the motherboard.

6. Secure the mPCIe Combo in place with the screw removed in step 4.
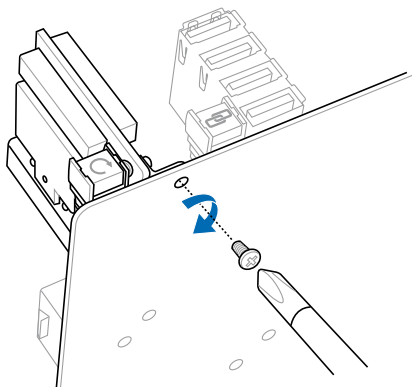
7. Remove the bolt from the Wi-Fi antenna connector. Leave the washer on the connector.

8. Insert the connector into the I/O shield's Wi-Fi port hole.

Ensure that the washer is placed between the connector and the back of the I/O Shield.

The Wi-Fi antenna and its cables are purchased separately.

9. Reattach the bolt on the connector.

antenna connector

washer

Clr CMOS

ROG CONNECT ON/OFF

CONNECT

I/O Shield

bolt
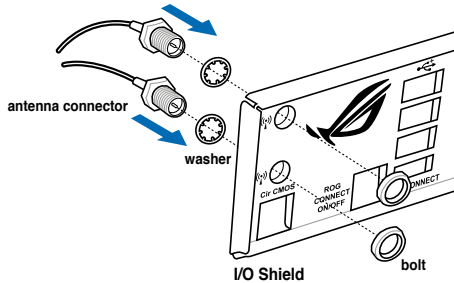
10. Connect the opposite end of the Wi-Fi antenna connector to the pins located on the mPCIe Wi-Fi card.
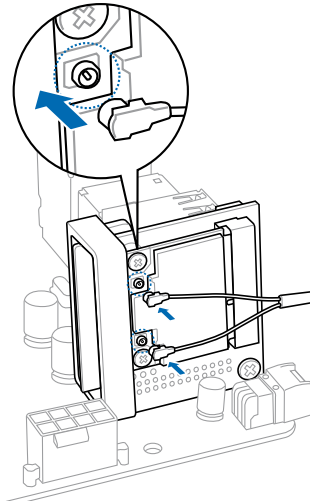
Installing the mSATA module

To install the mSATA module:

1.   Unlock the mSATA clip.
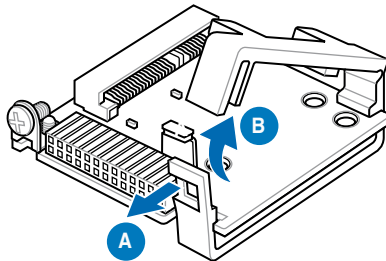
2.   Insert the mSATA card into the MSATA slot.

> The mSATA card fits in one orientation only. If it doesn't fit, try reversing it.

3.   Lock the mSATA clip.
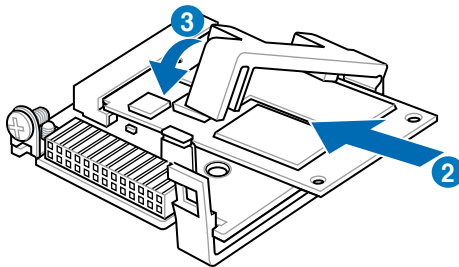
4. Remove the screw beside the 26-pin connector.
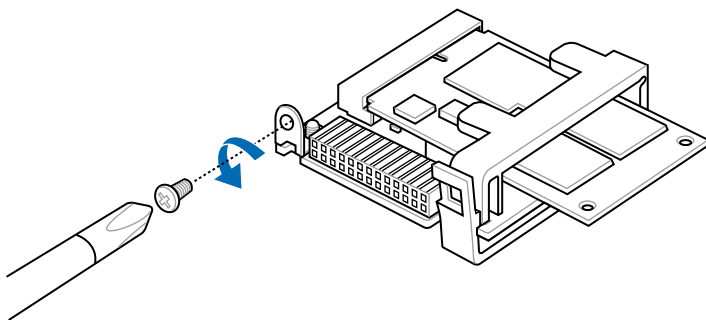
5. Locate the mPCIe_Combo connector on the motherboard. Align and insert the mPCIe Combo on the connector.
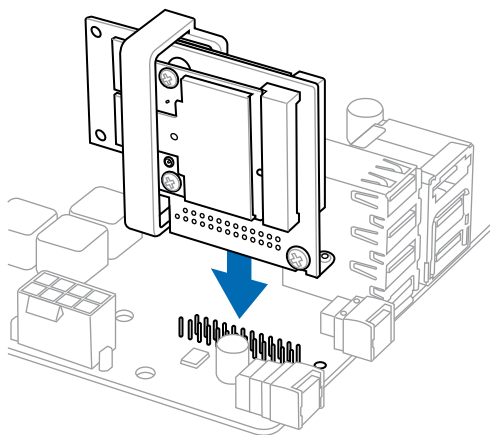
• The mPCIe Combo fits in one orientation only.

• Insert the mPCIe Combo with caution to prevent damage to the module, or the mPCIe_Combo connector pins, or the motherboard.

6.	Secure the mPCIe Combo in place with the screw removed in step 4
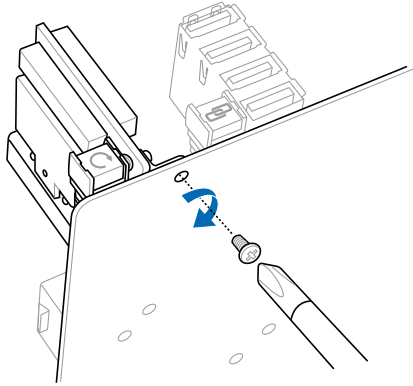
2.3.11 Rear panel connection
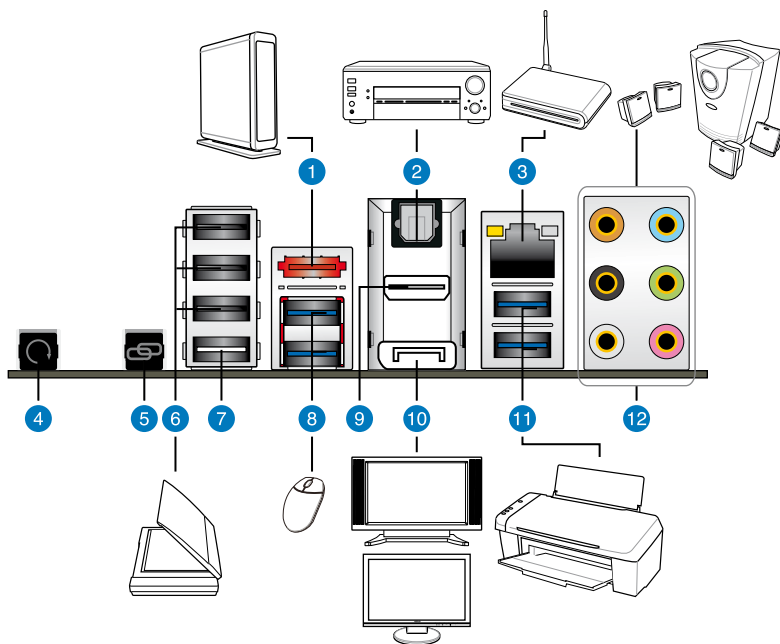
Rear panel connectors
1. External SATA ports
2. Optical S/PDIF Out port
3. LAN (RJ-45) port*
4. Clear CMOS switch
5. ROG Connect switch
6. USB 2.0 ports
7. USB 2.0 port, also ROG Connect port
8. ASMedia USB 3.0 ports, support ASUS USB 3.0 Boost UASP Mode
9. HDMI port
10. DisplayPort
11. Intel USB 3.0 ports, support ASUS USB 3.0 Boost Turbo Mode.
12.   Audio I/O ports**

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

- 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.

- Due to XCHI controller structure, please manually install your USB3.0 driver twice when installing the operating system from the USB3.0 optical drive.

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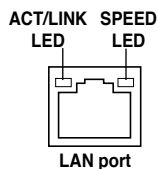
**Audio 2, 4, 6, or 8-channel configuration

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

2.3.12   Audio I/O connections

Audio I/O ports

orange
black
gray
light blue
lime
pink
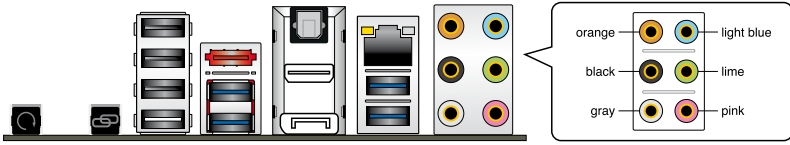
Connect to Headphone and Mic
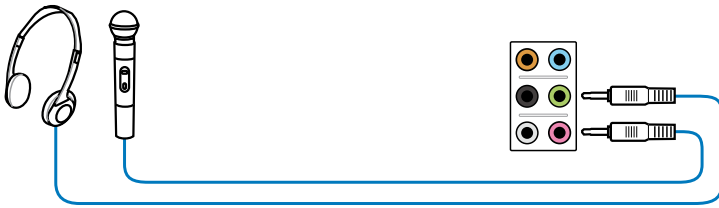
Connect to Stereo Speakers
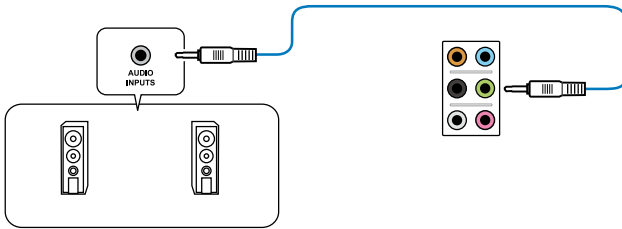
Connect to 2.1 channel Speakers

Chapter 2
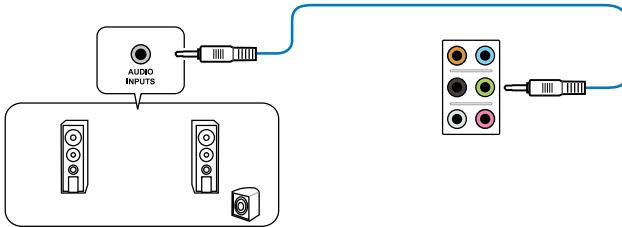
Connect to 4.1 channel Speakers
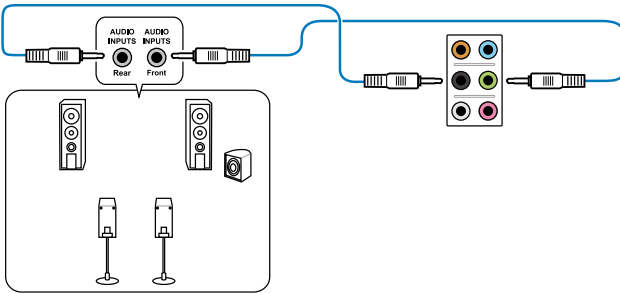
Connect to 5.1 channel Speakers
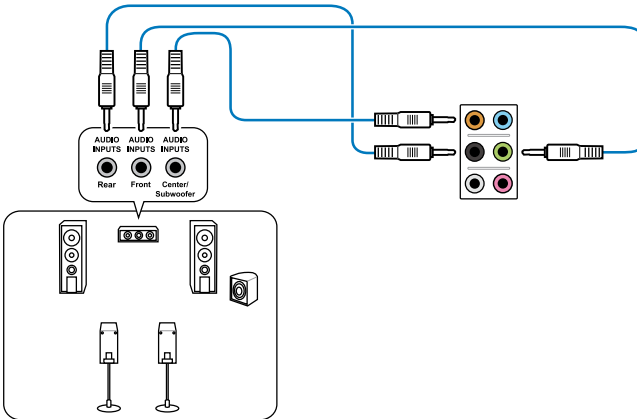
Connect to 7.1 channel Speakers
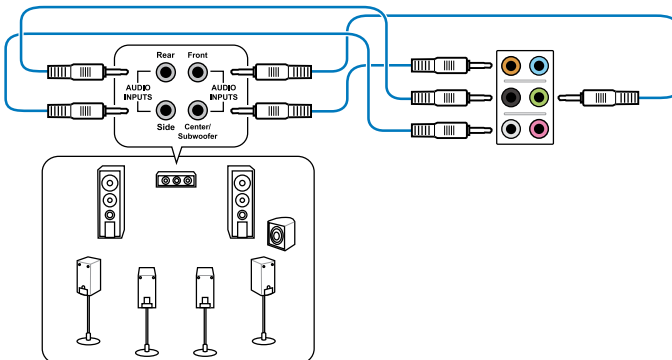
2.4   Starting up for the first time

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 new ASUS UEFI BIOS is a Unified Extensible Interface that complies with UEFI architecture, offering a user-friendly interface that goes beyond the traditional keyboard-only BIOS controls to enable a more flexible and convenient mouse input. Users can easily navigate the new 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 **2.3.11 Rear panel connectors** for information on how to erase the RTC RAM.

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 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 EZ Mode, click **Exit**, then select **ASUS EZ Mode**.

Menu items   **Menu bar**   **Pop-up window**   **General help**

Submenu item   **Configuration fields**   **Scroll bar**   **Navigation keys**

Menu bar

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

Extreme Tweaker	For changing the overclocking settings
Main	For changing the basic system configuration
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 (Extreme 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. Use <F12> key to capture the BIOS screen and save it to the removable storage device.

General help

At the top right corner of the menu screen is a brief description of the selected item.

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.

Chapter 3

3.2.2 EZ Mode

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

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

• 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.

3.3 Extreme Tweaker menu

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

> Be cautious when changing the settings of the Extreme Tweaker menu items. Incorrect field values can cause the system to malfunction.

> The configuration options for this section vary depending on the CPU and DIMM model you installed on the motherboard.

Scroll down to display the following items:

Scroll down to display the following items:

Load Gamers' OC Profile

Press <Enter> and select Yes to load the Gamers' OC profile to suit extreme overclocking.

CPU Level Up [Disabled]

Allows you to select a CPU level, and the related parameters will be automatically adjusted according to the selected CPU level.
Configuration options: [Disabled] [Auto] [X.XXXG]

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.

> The [X.M.P.] configuration option appears only when you install memory modules supporting the eXtreme Memory Profile(X.M.P.) Technology.

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

BCLK/PEG 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.

Turbo Ratio [Auto]

Allows you to set the CPU ratio automatically or manually.
[Auto]   Sets all Turbo Ratio to Intel® CPU default settings automatically.
[Manual]   Sets the Turbo Ratio for every core-activation condition of a full unlocked CPU manually.

> When the Turbo Ratio is set to [Manual], the following item appears:

Ratio Synchronizing Control [Enabled]
[Enabled]   Allows you to set an individual Turbo Ratio for every core-activation condition
[Disabled] Allows you to set one single Turbo Ratio for all core-activation conditions.

1-Core Ratio Limit [Auto]
Allows you to set the 1-Core Ratio Limit
[Auto]   Select to apply the CPU default Turbo Ratio setting
[Manual]   Select to to manually assign a 1-Core Ration Limit value that is higher than or equal to the 2-Core Ratio Limit.

2-Core Ratio Limit [Auto]
Allows you to set the 2-Core Ratio Limit
[Auto]   Select to apply the CPU default Turbo Ratio setting
[Manual]   Select to to manually assign a 2-Core Ratio Limit value that is higher than or equal to the 3-Core Ratio Limit. 1-Core Limit must not be set to [Auto]

3-Core Ratio Limit [Auto]
Allows you to set the 3-Core Ratio Limit
[Auto]   Select to apply the CPU default Turbo Ratio setting
[Manual]   Select to to manually assign a 3-Core Ratio Limit value that is higher than or equal to the 4-Core Ratio Limit. 1-Core/2-Core Ratio Limit must not be set to [Auto]

4-Core Ratio Limit [Auto]
Allows you to set the 4 Core Ratio Limit
[Auto]   Select to apply the CPU default Turbo Ratio setting
[Manual]   Select to to manually assign a 4-Core Ratio Limit value that is higher than or equal to the 3-Core Ratio Limit. 1-Core/2-Core/ 3-Core Limit must not be set to [Auto]

Chapter 3

Internal PLL Overvoltage [Auto]

Allows you to set the internal PLL voltage.
Configuration options: [Auto] [Enabled] [Disabled]

CPU bus speed : DRAM speed ratio mode [Auto]

Allows you to set the CPU bus speed to DRAM speed ratio mode.
[Auto]   DRAM speed is set to the optimized settings.
[100:133]   The CPU bus speed to DRAM speed ratio is set to 100:133.
[100:100}   The CPU bus speed to DRAM speed ratio is set to 100:100.

Memory Frequency [Auto]

Allows you to set the memory operating frequency.
Configuration options: [Auto] [DDR3-800MHz] [DDR3-1066MHz] [DDR3-1333MHz]
[DDR3-1600MHz] [DDR3-1866MHz] [DDR3-2133MHz] [DDR3-2400MHz]
[DDR3-2600MHz] [DDR3-2666MHz] [DDR3-2800MHz]

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

Xtreme Tweaking [Disabled]

This item may help improve some benchmarks performance.
Configuration options: [Disabled] [Enabled]

EPU Power Saving Mode [Disabled]

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

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.

Maximus Tweak [Auto]

Configuration options: [Auto] [Mode1] [Mode2]

Primary Timings

DRAM CAS# Latency [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

DRAM RAS# to CAS# Delay [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

DRAM RAS# PRE Time [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

DRAM RAS# ACT Time [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [255 DRAM Clock]

DRAM COMMAND Mode [Auto]
Configuration options: [Auto] [1 DRAM Clock] [2 DRAM Clock] [3 DRAM Clock]

Secondary Timings

DRAM RAS# to RAS# Delay [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

DRAM REF Cycle Time [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [511 DRAM Clock]

DRAM Refresh Interval [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [65535 DRAM Clock]

DRAM WRITE Recovery Time [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [31 DRAM Clock]

DRAM READ to PRE Time [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

DRAM FOUR ACT WIN Time [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [63 DRAM Clock]

DRAM WRITE to READ Delay [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

DRAM CKE Minimum pulse width [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]
DRAM CAS# Write Latency [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

DRAM RTL (CHA) [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [63 DRAM Clock]

DRAM RTL (CHB) [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [63 DRAM Clock]

DRAM IO-L (CHA) [Auto]
Configuration options: [Auto] [Delay 1 Clock] – [Delay 15 Clock]

DRAM IO-L (CHB) [Auto]
Configuration options: [Auto] [Delay 1 Clock] – [Delay 15 Clock]

Third Timings

tWRDR (DD) [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [8 DRAM Clock]

tRWDR (DD) [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [8 DRAM Clock]

tRWSR [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [8 DRAM Clock]

tRR (DD) [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [8 DRAM Clock]

tRR (DR) [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [8 DRAM Clock]

tRRSR [Auto]
Configuration options: [Auto] [4 DRAM Clock] – [7 DRAM Clock]

tWW (DD) [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [8 DRAM Clock]

tWW (DR) [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [8 DRAM Clock]

tWWSR [Auto]
Configuration options: [Auto] [4 DRAM Clock] – [7 DRAM Clock]

MISC

MRC Fast Boot [Enabled]
Configuration options: [Enabled] [Disabled]

DRAM CLK Period [Auto]
Configuration options: [Auto] [1] – [14]

Transmitter Slew (CHA) [Auto]
Configuration options: [Auto] [1] – [7]

Transmitter Slew (CHB) [Auto]
Configuration options: [Auto] [1] – [7]

Receiver Slew (CHA) [Auto]
Configuration options: [Auto] [1] – [7]

Receiver Slew (CHB) [Auto]
Configuration options: [Auto] [1] – [7]

MCH Duty Sense (CHA) [Auto]
Configuration options: [Auto] [1] – [31]

MCH Duty Sense (CHB) [Auto]
Configuration options: [Auto] [1] – [31]

Channel A DIMM Control [Enable Both DIMMS]
Configuration options: [Enable Both DIMMS] [Disable DIMM0] [Disable
DIMM1] [Disable Both DIMMS]

Channel B DIMM Control [Enable Both DIMMS]
Configuration options: [Enable Both DIMMS] [Disable DIMM0] [Disable
DIMM1] [Disable Both DIMMS]

DRAM Read Additional Swizzle [Auto]
Configuration options: [Auto] [Enabled] [Disabled]

DRAM Write Additional Swizzle [Auto]
Configuration options: [Auto] [Enabled] [Disabled]

GPU.DIMM Post

The sub-items in this menu display the status of the installed VGA cards and
memory. The field shows N/A if there's no device installed on that slot.

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.

Turbo Mode [Enabled]
Allows you to enable your core processor's speed to run faster than the
marked frequency in a specific condition.
Configuration options: [Disabled] [Enabled]

The following items appears only when you set the Turbo Mode to **[Enabled]**.

Long Duration Power Limit [Auto]
Allows you to limit the turbo ratio's long duration power.
Use the <+> and <-> keys to adjust the value.

Long Duration Maintained [Auto]
Allows you to maintain the turbo ratio's long duration power.
Use the <+> and <-> keys to adjust the value.

Short Duration Power Limit [Auto]
Allows you to limit the turbo ratio's long duration power.
Use the <+> and <-> keys to adjust the value.

Primary Plane Current Limit [Auto]
Maximum instantaneous current allowed at any given time for CPU cores
Use <+> and <-> key to adjust the value at 0.125A increment. .

Secondary Plane Current Limit [Auto]
Maximum instantaneous current allowed at any given time for Internal Graphics
cores.
Use <+> and <-> key to adjust the value at 0.125A increment.

Power Limit Control [Auto]

This item appears only when you set the **CPU Ratio** item to [Auto] and the
Turbo Mode item to [Enabled]. Leave this item at [Auto] for best overclocking
or set to [Enabled] to customize settings. Configuration options: [Auto]
[Enabled]

> The following items appear only when you set the **Turbo Mode** items to
> [Enabled] and **Power Limit Control** item to [Enabled].

Long Duration Power Limit [Auto]
Allows you to limit the turbo ratio's long duration power.
Use the <+> and <-> keys to adjust the value.

Long Duration Maintained [Auto]
Allows you to maintain the turbo ratio's long duration power.
Use the <+> and <-> keys to adjust the value.

Short Duration Power Limit [Auto]
Allows you to limit the turbo ratio's long duration power.
Use the <+> and <-> keys to adjust the value.

Primary Plane Current Limit [Auto]
Maximum instantaneous current allowed at any given time for CPU cores
Use <+> and <-> key to adjust the value at 0.125A increment. .

Secondary Plane Current Limit [Auto]
Maximum instantaneous current allowed at any given time for Internal Graphics
cores.
Use <+> and <-> key to adjust the value at 0.125A increment.

DIGI+ Power Control

⚠️ Do not remove the thermal module while changing the DIGI+ Power Control related parameters . 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 Load-Line Calibration [Auto]
CPU 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 specification.

CPU Voltage Frequency [Auto]
Switching frequency will affect the transient response and component thermal. Higher frequency gets quicker transient response.
Configuration options: [Auto] [Manual]

CPU Fixed Frequency [XXX]
The values range from 300kHz to 500kHz with a 10kHz interval.

CPU Power Phase Control [Auto]
Phase number is the number of working 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

[Auto]	The default power control phase mode
[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.

CPU Power Duty Control [T.Probe]

[T.Probe]   Maintains the VRM thermal balance.

[Extreme] Maintains the VRM current balance.

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CPU Current Capability [Auto]
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%] [150%] [OCP Disable]

VRM VRHOT Control [Default]
This item allows you to enable the VRM over temperature protection.
Configuration options: [Default] [Disable]

CPU Power Thermal Control [130]
A higher temperature brings a wider CPU power thermal range and extends the overclocking tolerance to enlarge the O.C. potential. Use the <+> and <-> keys to adjust the value. The values range from 130 to 151.

DO NOT remove the thermal module. The thermal conditions should be monitored.

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%] [110%] [120%] [130%] [140%]

DO NOT remove the thermal module while changing the DIGI+ VRM related parrameters . The thermal conditions should be monitored.

DRAM Current Capability [100%]
Setting a higher value brings a wider total power range and extends the overclocking frequency range simultaneously.
Configuration options: [100%] [110%] [120%] [130%]

DRAM Voltage Frequency [Auto]
This item allows you to adjust the DRAM switching frequency. Assign a fixed high DRAM frequency to increase O.C range or a lower DRAM frequency for better system stability. Configuration options: [Auto] [manual]

DRAM Power Phase control [Auto]
[Auto]   Allows you to set the default DRAM power phase control settings.
[Optimized]   Allows you to set ASUS optimized phase tuning profile.
[Extreme] Allows you to set the Full phase mode.

DRAM Power Thermal Control [110]
A higher temperature brings a wider DRAM power thermal range, and extends the overclocking tolerance to enlarge the O.C. potential. Use the <+> and <-> keys to adjust the value. The values range from 110 to 131.

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⚠ DO NOT remove the thermal module. The thermal conditions must be monitored.

VCCIO

The sub-items in this menu allow you to set the VCCIO settings.

VCCIO Switching Freq [Auto]
Allows you to switch the VCCIO frequency
Configuration options: [Auto] [1X] [1.65X]

VCCIO Full Phase Control [Enabled]
Allows you to enable or disable the VCCIO Full Phase Control.
Configuration options: [Auto] [Disabled] [Enabled]

VCCIO Over-Current Protection [Enabled]
Allows you to enable or disable the VCCIO Over-Current Protection.
Configuration options: [Disabled] [Enabled]

Extreme OV [Disable]

This item is set to [Disabled] by default to protect the CPU from being overheated. Set this item to [Enabled] to choose a higher voltage to overclock, but doing so might decrease CPU life. Configuration options: [Disabled] [Enabled]

CPU Voltage [Offset Mode]

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

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

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 2.155V with a 0.005V interval. The 2.155V voltage is available only when the **Extreme OV** item is set to [Enabled].

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.

DRAM Voltage [Auto]

Allows you to set the DRAM voltage. The values range from 1.20V to 1.92V with a 0.005V interval. The 1.92V voltage is available only when the Extreme OV item is set to [Enabled].

⚠ 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.

VCCSA Voltage [Auto]

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

VCCIO Voltage [Auto]

Allows you to set the VCCIO voltage. The values range from 0.80V to 1.55V with a 0.00625V interval.

CPU PLL Voltage [Auto]

Allows you to set the CPU PLL voltage. The values range from 1.25V to 2.50V with a 0.00625V interval.

Skew Driving Voltage [Auto]

Allows you to set the Skew Driving Voltage. The values range from 0.4V0 to 1.60V with a 0.00625V interval.

2nd VCCIO Voltage [Auto]

Allows you to set the second VCCIO voltage. The values range from 0.40V to 1.70V with a 0.00625V interval.

PCH Voltage [Auto]

Allows you to set the Platform Controller Hub voltage. The values range from 0.8000V to 1.6000V with a 0.00625V interval.

🖉 • The values of the **CPU Manual Voltage**, **iGPU Offset Voltage**, **DRAM Voltage**, **VCCSA/IO Voltage**, **CPU PLL Voltage**, and **PCH Voltage** items are labelled in different colors, indicating the risk levels of high voltage settings.

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

VTTDDR Voltage [Auto]

Allows you to set the VTTDDR voltage for DRAM channel. The values range from 0.6250V to 1.1000V with a 0.00625V interval.

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.

BCLK Skew [Auto]

Reduce to increase BCLK and increase to reduce BCLK.
Configuration options: [Auto] [-12]—[+12]

CPU I/O Skew [Auto]

Adjust this setting may allows you to increase the overclocking capability.
Configuration options: [Auto] [-4]—[+4]

DMI Skew [Auto]

Adjust this setting may allows you to increase the overclocking capability.
Configuration options: [Auto] [-4]—[+4]

PLL Skew [Auto]

Adjust this setting may allows you to increase the overclocking capability.
Configuration options: [Auto] [-12]—[+12]

PCH CLK Driving [Auto]

Adjust this setting may allows you to increase the overclocking capability.
Configuration options: [Auto] [-8]—[+8]

CPU Spread Spectrum [Auto]

[Auto]   Automatic configuration.

[Disabled]   Enhances the BCLK overclocking ability.

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

BCLK Recovery [Enabled]

Enable this option to recovery default BCLK setting automatically when the system fails on overclocking.
Configuration options: [Disabled] [Enabled]

3.4 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.

3.4.1 System Language [English]

Allows you to choose the BIOS language version from the options. Configuration options: [English] [Español] [Русский] [Français] [Deutsch] [简体中文] [繁體中文] [日本語]

3.4.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

3.4.3 System Time [xx:xx:xx]

Allows you to set the system time.

3.4.4 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 **2.3.11 Rear panel connectors** 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**.

3.5   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:

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]

This item appears only when a CPU supporting Hyper-Threading Technology is installed. 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]

[Disabled]   Disables this function.

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

Execute Disable Bit [Enabled]

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

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

Intel Virtualization Technology [Disabled]

[Disabled]   Disables this function.

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

Hardware Prefetcher [Enabled]

[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.

Adjacent Cache Line Prefetch [Enabled]

[Enabled]   Allows a hardware platform to perform adjacent cache line prefetching.

[Disabled]   Disables this function.

CPU Power Management Configuration

This item allows you to manage and configure the CPU's power.

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.

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

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Turbo Mode [Enabled]

[Disabled] Disables this function.

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

[Disabled] The CPU runs at its default speed.

[Enabled] The operating system controls the CPU speed.

CPU C1E [Auto]
[Disabled] Disables this function.

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

CPU C3 Report [Auto]
Allows you to disable or enable the CPU C3 report to OS.
Configuration options: [Auto] [Disabled] [Enabled]

CPU C6 Report [Auto]
Allows you to disable or enable the CPU C6 report to OS.
Configuration options: [Auto] [Disabled] **[Enabled]**

3.5.2 PCH Configuration

High Precision Timer [Enabled]

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

Intel(R) Rapid Start Technology [Disbled]

Allows you to enable or disable Intel(R) Rapid Start Technology.
Configuration options: [Enabled] [Disabled]

The following items appears only when you set the Intel(R) Rapid Start Technology to **[Enabled]**.

Entry on S3 RTC Wake [Enabled]
Allows you to enable or disable Entry on S3 RTC Wake.
Configuration options: [Enabled] [Disabled]

Entry After [Immediately]
Enable RTC wake timer at S3 enrty.
Configuration options: [Immediately] [1 minute] [2 minutes] [5 minutes] [10 minutes]
[15 minutes] [30 minutes] [1 hour] [2 hours]

Active Page Threshold Support [Enabled]
Allows you to enable or disable Active Page Threshold Support.
Configuration options: [Enabled] [Disabled]

Active Memory Threshold [0]
Try to support RST when partition size>Active Page Threshold size in MB. When setting to Zero, it will be in AUTO mode and check if partition size is enough at S3 entry.

Intel(R) Smart Connect Technology

Allow you to enable or disable Intel Smart Connect Technology.
Configuration options: [Enabled] [Disabled]

ISCT Configuration [Disabled]
Allows you to enable or disable ISCT Configuration.
Configuration options: [Enabled] [Disabled]

3.5.3 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.

SATA Mode Selection [AHCI]

Allows you to set the SATA configuration.

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

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

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]

Hot Plug [Enabled]

Allows you to enable or disable the hot plug support of the SATA ports.
Configuration options: [Disabled] [Enabled]

External SATA [Enabled]

Allows you to enable or disable the support of the External SATA.
Configuration options: [Disabled] [Enabled]

3.5.4   System Agent Configuration

Memory Remap Feature [Enabled]

Allows you to enable remapping the memory above 4GB.

[Enabled]   Enables the function.

[Disabled]   Disables this function.

Graphics Configuration [Auto]

Allows you to select a primary display from iGPU, and PCIe graphical devices.

Primary Display [Auto]
Allows you to select which of the iGPU/PCIE Graphics device should be the Primary Display.
Configuration options: [Auto] [IGPU] [PCIE]

iGPU Memory [64M]
Allows you to select the amount of system memory allocated to DVMT 5.0 used by the iGPU.

Render Standby [Enabled]
Allows you to enable the Intel Graphics Render Standby support to reduce the iGPU power use when idle.
Configuration options: [Disabled] [Enabled]

iGPU Multi-Monitor [Disabled]
Allows you to enable the iGPU Multi-Monitor. For Lucid Virtu MVP function supports, set this item to [Enabled] to empower both integrated and discrete graphics. iGPU shared system memory size is fixed in 64MB.
Configuration options: [Disabled] [Enabled]

NB PCIe Configuration

Allows you to configure the NB PCI Express settings.

PCIEX16_1 Link Speed [Auto]
Allows you to configure the PCIEX16_1 speed.
Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

PCIEX16_2 Link Speed [Auto]
Allows you to configure PCIEX16_2 speed.
Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

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.

Intel xHCI Mode [Smart Auto]

[Smart Auto] Enables optimized xHCI.

[Auto] Allows the system to set the xHCI.

[Enabled] Enables the operation of xHCI controller.

[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

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.

ASM1061 Storage Controller (Rear) [Enabled]

Allows you to select the ASM1061 storage controller operating mode.

[Disabled]   Disables the controller.

[Enabled]   Enables the controller.

ASM1061 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 ASM1061storage controller.
Configuration options: [Enabled] [Disabled]

ASmedia USB 3.0 Controller (USB3_E12) [Enabled]

[Enabled]   Enables the USB 3.0 controller.

[Disabled]   Disables the controller.

ASmedia USB 3.0 Battery Charging Support [Disabled]

[Enabled]   Enables Asmedia USB 3.0 fast battery charging support for USB
                  3.0 devices complying with the BC 1.1 regulation.

[Disabled]   Disables battery charging support.

Intel LAN [Enabled]

[Enabled]   Enables the GbE 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 82579LAN controller.
Configuration options: [Enabled] [Disabled]

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3.5.7 APM

ErP Ready [Disabled]

This item allows user to switch off some power at S5 to get the system ready for ErP requirement. When set enabled to Enabled, all other PME options will be switched off. Configuration options: [Disabled] [Enabled]

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 PCIE/PCI [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.

3.5.8 Network Stack
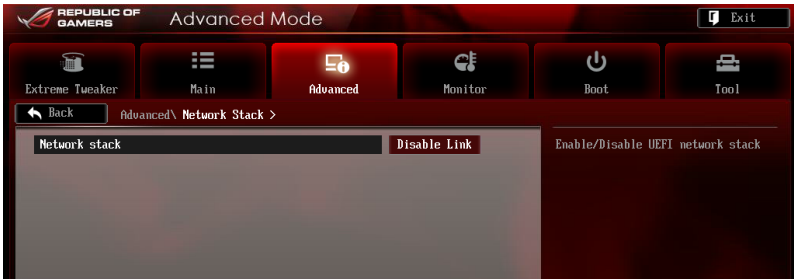
Network Stack [Disable Link]

This item allows user to disable or enable the UEFI network stack.
Configuration options: [Disable Link] [Enabled]

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

Ipv4 PXE Support [Enable]

This item allows user to disable or enable the Ipv4 PXE Support.
Configuration options: [Disable Link] [Enabled]

Ipv6 PXE Support [Enable]

This item allows user to disable or enable the Ipv6 PXE Support.
Configuration options: [Disable Link] [Enabled]

3.6 Monitor menu

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

Anti Surge Support [Enabled]

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

Voltage Monitor

*CPU Voltage; 3.3V Voltage; 5V Voltage; 12V Voltage; DRAM Voltage;
PCH Voltage; CPU PLL Voltage; VCCIO Voltage; VCCSA Voltage*
The onboard hardware monitor automatically detects the voltage output
through the onboard voltage regulators.

Temperature Monitor

CPU Temperature; MB Temperature [xxxºC/xxxºF]
The onboard hardware monitor automatically detects and displays the CPU,
and motherboard. Select [Ignored] if you do not wish to display the detected
temperatures.

Fan Speed Monitor

CPU FAN; CPU FAN OPT Speed; Chassis FAN1/2/3 Speed [xxxxRPM] or
[Ignored] / [N/A]
The onboard hardware monitor automatically detects and displays the CPU
fan, chassis fan, and optional fan speed in rotations per minute (RPM). If any
of the fans is not connected to the motherboard, the field shows [N/A]. These
items are not user-configurable.

Fan Speed Control

CPU Q-Fan Control [Disabled]
Allows you to enable or disable the CPU fan controller.

[Disabled]   Disables the CPU Q-fan controller.

[Enabled]   Enables the CPU Q-fan controller.

> The following three items appear when you enable the CPU Fan Control
> feature.

CPU Fan Speed Low Limit [600 RPM]
Allows you to set the low speed limit of the CPU fan and the system sends
warning message when the fan speed drops below the set value.
Configuration options: [Ignored] [200 RPM] [300 RPM] [400 RPM] [500 RPM]
[600 RPM]

CPU Fan Profile [Standard]
Allows you to set the appropriate performance level of the CPU fan.

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

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

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

[Manual]   Sets to [Manual] to display more items for you to manually
                  adjust the CPU upper/lower temperature, and CPU fan upper/
                  lower duty cycle.

> 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 20ºC to 75ºC.

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 20% to 100%. When the CPU temperature is under 40ºC, the CPU fan
will operate at the minimum duty cycle.

Chassis Q-Fan Control 1/3 [Disabled]

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

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

Chassis Fan Speed Low Limit 1/3 [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 75ºC.

Chassis Fan Max. Duty Cycle(%) [100]
Use the <+> and <-> keys to adjust the maximum chassis fan duty cycle. The values
range from 60% 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.
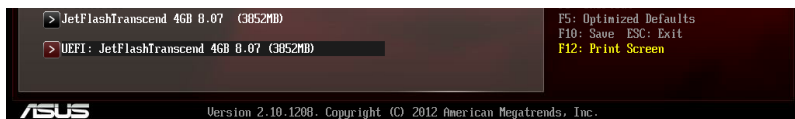
Chassis Fan Min. Duty Cycle(%) [60]
Use the <+> and <-> keys to adjust the minimum chassis fan duty cycle. The values range from 0% to 100%. When the chassis temperature is under 40ºC, the chassis fan will operate at the minimum duty cycle.

3.7 Boot menu

The Boot menu items allow you to change the system boot options.

Scroll down to display the following items:

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]

When set to [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 [Advanced 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.

UEFI/Legacy Boot [Enable both UEFI and Legacy]

[Enable both UEFI and Legacy]   Enables both UEFI and Legacy boot.

[Disable UEFI]   Enables the Legacy boot, and disables the UEFI boot.

[Disable Legacy]   Enables the UEFI booth, and disables the Legacy boot.

PCI ROM Priority [Legacy ROM]

[Legacy ROM]   Launch Legacy ROM

[EFI Compatibe ROM]   Launch UEFI Compatible ROM

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.

Chapter 3

3.8   Tool menu

The Tool 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 Utility. When you press <Enter> to start the application.

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.

> The **O.C. Profile Configuration** items show **Not Installed** if no profile is created.

Label

Allows you to input the label of the setup profiles.

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**.

> • 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.

3.8.3 Asus SPD Information

This item displays the SPD information.

3.8.4 GO Button File

This menu allows you to set the GO Button files, and load the desired GO Button file.

Scroll down to display the following items:

**BCLK/PCIE Frequency; CPU Voltage; DRAM Voltage;
VCCSA/IO Voltage; CPU PLL Voltage; PCH Voltage; 2nd VCCIO
Voltage; VTTDDR Voltage; IGPU Voltage; CPU Ratio;**

Allows you to use the <+> and <-> keys to adjust the values for each item. Refer to **3.3 Extreme Tweaker** Menu for details.

Load Default

Allows you to load default settings.

Save Above Settings

Allows you to save the adjusted values for specific items as a GO Button file.

Load from EEPROM setting

Allows you to load from EEPROM setting.

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
```
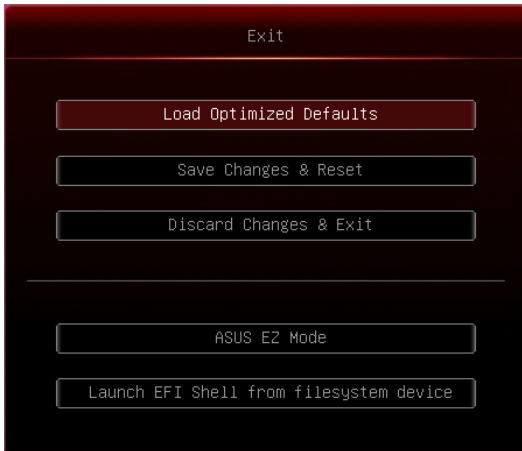
Load Optimized Defaults

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.
5.   **USB BIOS Flashback:** Updates the BIOS under standby power using a USB flash disk drive without entering BIOS or OS.

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**.
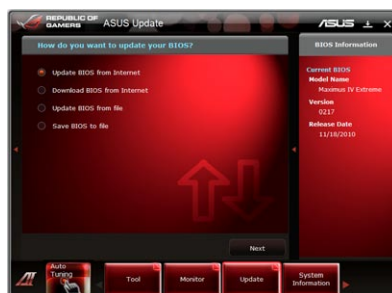
2.   Select the ASUS FTP site nearest you to avoid network traffic.

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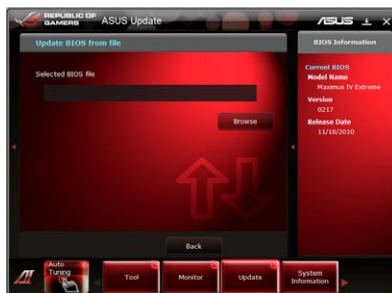
3.	Select the BIOS version that you want to download. Click **Next**.

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.
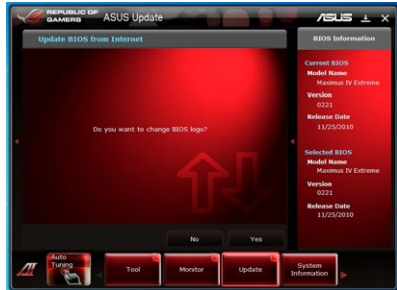
5.	Click Browse to locate your desired picture file.

6.	Adjust the picture resolution if needed and click **Next** to continue.

7.	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 Utility 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 Utility:

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.
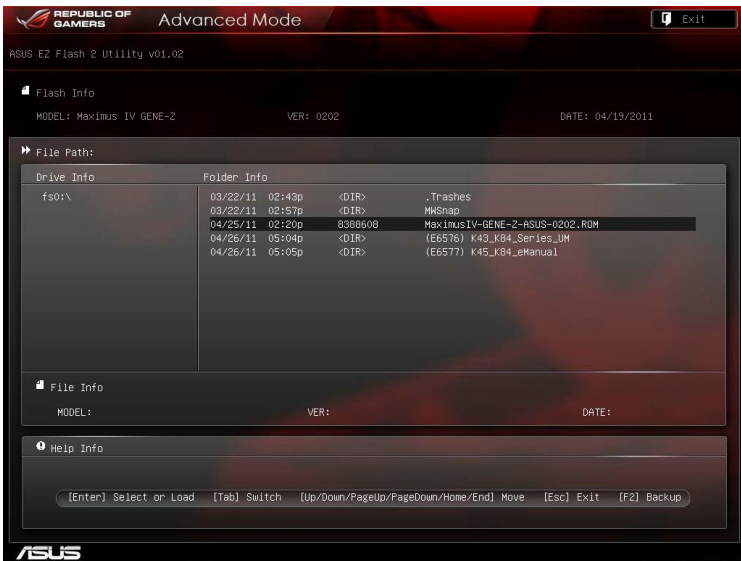
3. Press <Tab> to switch to the **Drive** field.
4. Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, and then press <Enter>.
5. Press <Tab> to switch to the **Folder Info** field.
6. Press the Up/Down arrow keys to find the BIOS file, and then press <Enter> to perform 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 **3.10 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:  XXXXXXXXXXXXXXXX
      USB  XXXXXXXXXXXXXXXX
      UEFI:  XXXXXXXXXXXXXXXX
      Enter Setup

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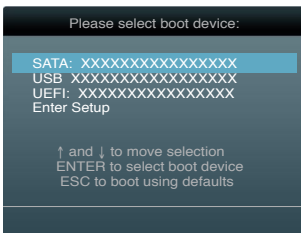
3. When the **Make Disk** menu appears, select the **FreeDOS command prompt** item by pressing the item number.

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:\>
```
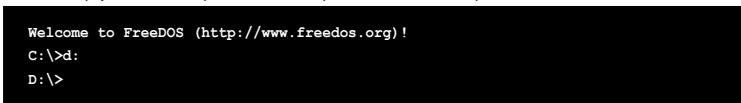
Backing up the current BIOS

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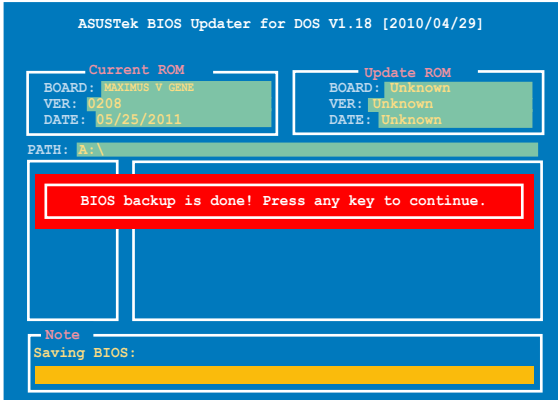
1.   At the FreeDOS prompt, type **bupdater /o[filename]** and press <Enter>.

```
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: MAXIMUS V GENE              BOARD: Unknown
  VER: 0208                         VER: Unknown
  DATE: 05/25/2011                  DATE: Unknown
 PATH: A:\


        BIOS backup is done! Press any key to continue.



   Note
 Saving BIOS:

```

Chapter 3

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: MAXIMUS V GENE          BOARD: Unknown
  VER: 0208                      VER: Unknown
  DATE: 05/25/2011               DATE: Unknown
  PATH: A:\

  A:          P8P67D.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
```
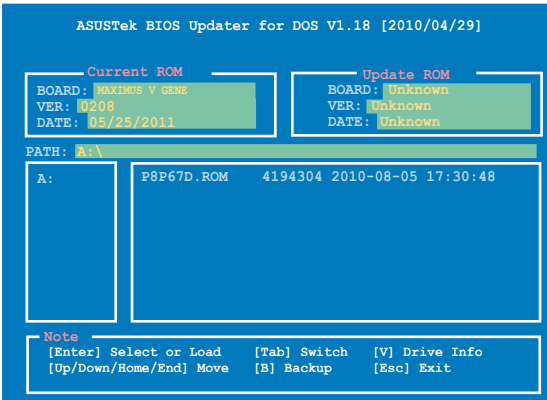
3.   Press <Tab> to switch between screen fields and use the <Up/Down/Home/
      End> keys to select the BIOS file and press <Enter>. BIOS Updater checks
      the selected BIOS file and prompts you to confirm BIOS update.

```
        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.

3.10.5 USB BIOS Flashback

The USB BIOS Flashback allows user to update the BIOS without entering the BIOS or the operating system by using a USB flash disk drive under standby power.

1. Download the latest BIOS file from the ASUS website

2. Extract and rename the BIOS image file to **"M5G.CAP"**

3. Copy **"M5G.CAP"** to the root directory of the USB flash disk drive

4. Turn off the system and connect the USB flash drive to the **ROG Connect port** (the white USB 2.0 port) at the rear panel of the motherboard

5. Hold the **ROG Connect button** until the LED begins to blink, then release

6. Wait until the LED stops to blink, then the BIOS flash will be completed.
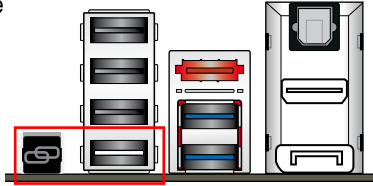
- This function can support devices such as a USB flash disk with NTFS/ FAT 32/ FAT 16 format and single partition only.

- DO NOT unplug the power of the system while updating the BIOS to prevent system boot failure!

Chapter 4

4.1   Installing an operating system

This motherboard supports Windows® XP/ 64-bit XP/ 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 an item to install

Click the Contact tab to display the ASUS contact information.

Click an icon to display DVD/ motherboard information

ASUS MAXIMUS V GENE motherboard support CD for Windows 7 64 Bit

Drivers   Utilities   Manual   Video   Contact   Specials

ASUS InstAll

MB

Please select items to install.

Intel Chipset Driver
Management Engine Interface
Realtek Audio Driver
Sound Blaster X-Fi MB 2
Asmedia SATA Controller Driver
Intel USB 3.0 Driver
Asmedia USB 3.0 Driver
Intel LAN Driver
Intel Rapid Storage Technology Driver s...

> 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.
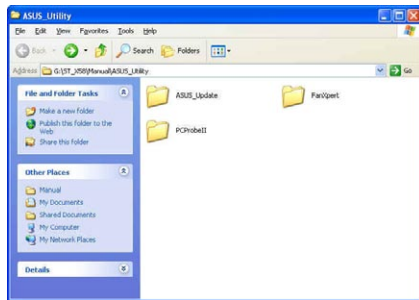
The software manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader from the Utilities menu before opening the files.
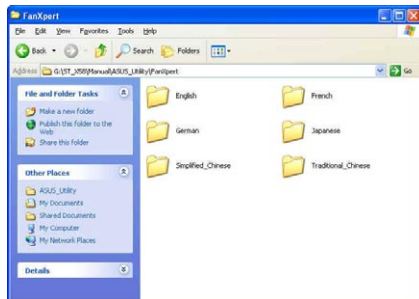
1.   Click the **Manual** tab. Click **ASUS Motherboard Utility Guide** from the manual list on the left.

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 CPU Level Up Mode under TurboV EVO
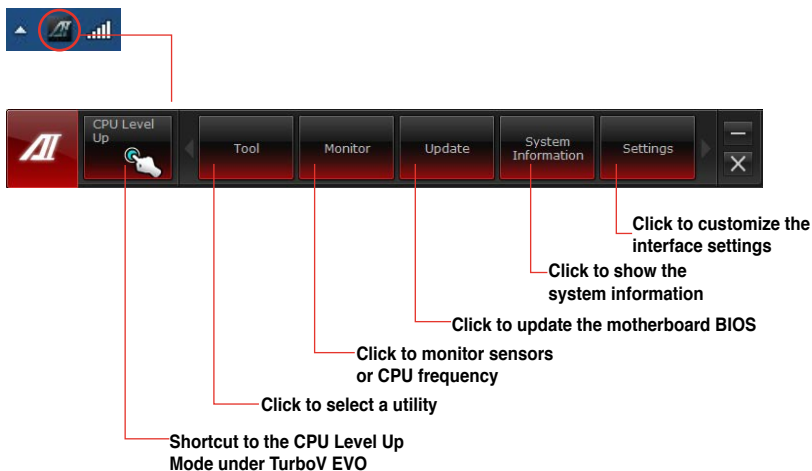
- The applications in the Tool menu vary with models.
- The screenshots of AI Suite II in this user manual are for reference only. The actual screenshots vary with models.
- Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.2 TurboV EVO

ASUS TurboV EVO introduces **TurboV** that allows you to manually adjust the CPU frequency and related voltages as well as **CPU Level Up** 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.

Click to select mode

Load profile Target values

Current values

Click to show settings

Save the current settings as a new profile

Voltage Adjustment bars

Undoes all changes without applying

Applies all changes immediately

Click to restore all start-up settings

Using Advanced Mode

Click on 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 **Extreme Tweaker > CPU Power Management** in BIOS and set the **Turbo Ratio** item to **[Maximum Turbo Ratio setting in OS]**.

1. Click on the **CPU Ratio** tab.
2. Drag the adjustment bar upwards or downwards to the desired value.
3. Click on **Apply** to make the change take effect.

CPU Ratio

Adjustment bar

Click to restore all start-up settings

Undoes all changes without applying
Applies all changes immediately

> • 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.

Chapter 4

CPU Strap

Allows you to manually adjust CPU Strap.

1. Click on the **CPU Strap** tab.
2. Click on the adjustment bar to the desired value. The graph on the right will change value accordingly.
3. Click on **Apply** to make the change take effect.

CPU Strap

Adjustment bar

Click to restore all start-up settings

Undoes all changes without applying

Applies all changes immediately

Every CPU Strap support is subject to the physical characteristics of individual CPUs.

CPU Level Up

ASUS TurboV EVO includes three CPU Level Up 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
- The CPU Level Up modes depend upon the CPU installed in your system.

Using CPU Level Up

1. Click the **CPU Level Up** tab, choose the mode, and click **Start**.

2. Read through the warning messages and click **OK** to start auto-overclocking.
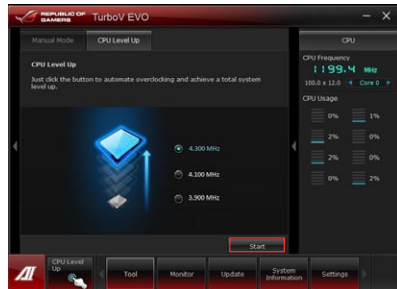
3. TurboV automatically overclocks the CPU, saves BIOS settings, and restarts the system. After re-entering Windows, a message appears indicating successful overclocking. Click **OK** to exit.

4.3.3 DIGI+ Power Control

New DIGI+ PowerControl 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+ Power Control by clicking **Tool > DIGI+ Power Control** on the AI Suite II main menu bar.

Select **CPU Power** or **DRAM Power** to adjust the power control settings.

CPU Power

Function no.	Function description
1	**CPU Load-line Calibration** It allows you to adjust the voltage settings and control the system temperature. Higher load-line calibration could get higher voltage and good overclocking performance but increases the CPU and VRM thermal.
2	**CPU Current Capability** CPU Current Capability provides wider total power range for overclocking. A higher value setting gets higher VRM power consumption delivery.
3	**CPU Voltage Frequency** Switching frequency will affect the VRM transient response and component thermal. Higher frequency gets quicker transient response.
4	**iGPU Load-line Calibration** Load-line is defined by Intel VRM specifications, and affects the iGPU voltage. The iGPU working voltage decreases proportionally to integrated graphics loading. A higher value can get a higher iGPU voltage, and a good performance, but decreases the CPU and VRM thermal conditions.
5	**iGPU Current Capability** A higher value brings wider total iGPU power range, and extends the overclocking frequency range simultaneously to enhance the iGPU performance.
6	**CPU Power 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.

Application aids

Apply all changes immediately

Undo all changes without applying

Function no.	Function description
7	**CPU Power Thermal Control** A higher temperature brings a wider CPU power thermal range, and extends the overclocking tolerance to enlarge overclocking potential.
8	**CPU Power Duty Control** CPU Power Duty Control adjusts the current of every VRM phase and the thermal of every phase component.

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DRAM Power

Application aids

Apply all changes immediately

Undo all changes without applying
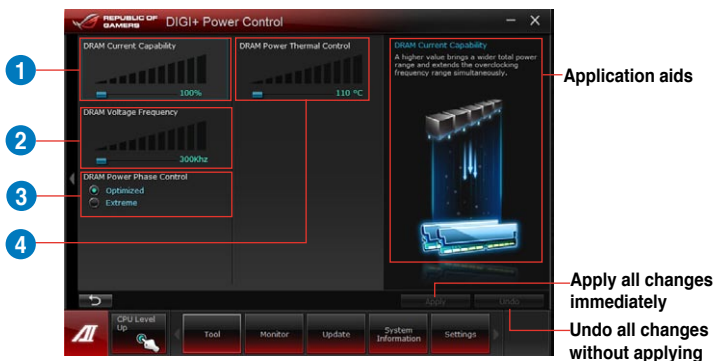
Function no.	Function description
1	**DRAM Current Capability** A higher value brings a wider total power range and extends the overclocking frequency range simultaneously.
2	**DRAM Voltage Frequency** Allows you to adjust the DRAM switching frequency for system stability or to increase OC Range.
3	**DRAM Power Phase Control** Select **Extreme** for full phase mode to increase system performance or select **Optimized** for ASUS optimized phase tuning profile to increase DRAM power efficiency.
4	**DRAM Power Thermal Control** A higher temperature brings a wider DRAM power thermal range, and extends the overclocking tolerance to enlarge overclocking potential.

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

Chapter 4

4.3.4 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.

Multiple system operating modes

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

---

*• 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.
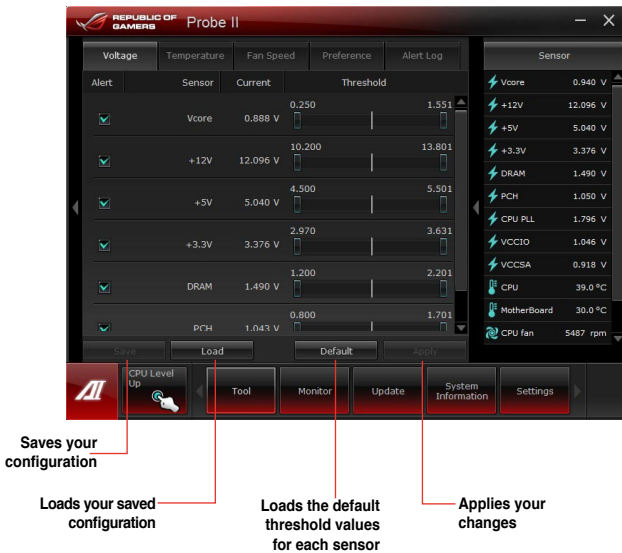
Chapter 4

4.3.5 Probe II

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

Voltage

The Voltage tab displays the system voltages sensors, including the current and threshold values. When a system voltage is less or more than the threshold percentage, the sensor sends an alert to the user through the monitor panels, or a pop-up message.
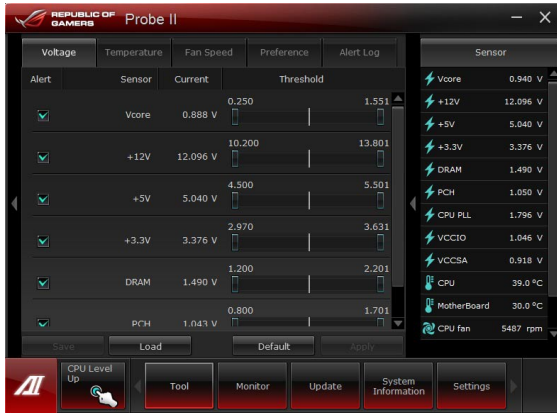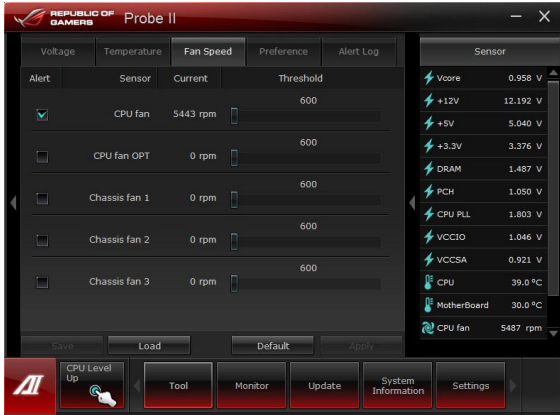

Temperature

The Temperature tab displays the CPU and motherboard temperature sensors, including the current and threshold values. When the CPU/MB temperature exceeds the threshold temperature, the sensor sends an alert to the user through the monitor panels or a pop-up message.
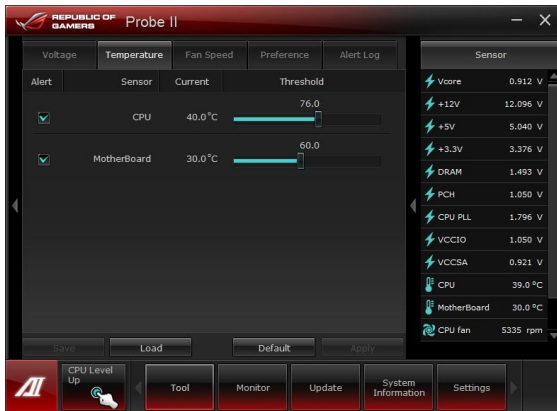
Fan Speed

The Fan Speed tab displays the current and threshold rotations (per minute) of the CPU, chassis, and power fans. When a fan rotation is less than the threshold rotation, the sensor sends an alert to the user through the monitor panels or a pop-up message.
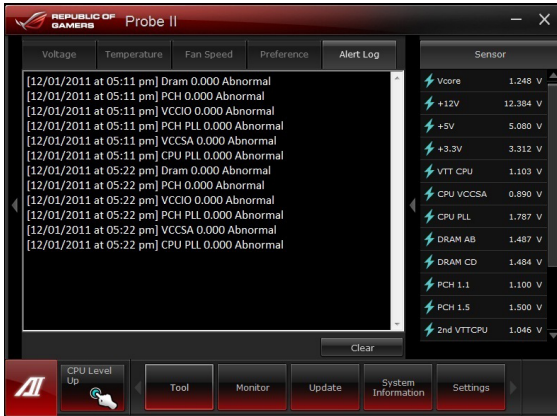

Preference

The Preference tab allows you to enable the pop-up window, set the cycle detection interval, and select the temperature scale.
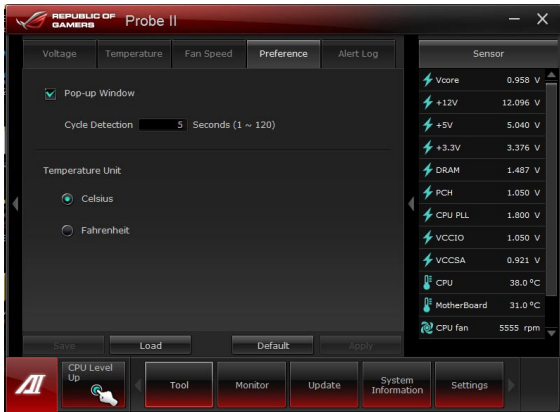
Alert Log
The Alert Log tab displays all normal and critical events detected by the sensors, including the sensor value at the time of the event. Click **Clear** to clear the log.

4.3.6 Sensor Recorder

Sensor Recorder monitors the changes in the system voltage, temperature, and fan speed on a timeline. The History Record function allows you to designate specific time spans on record to keep track of the three system statuses for certain purposes.

Launching Sensor Recorder

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

Using Sensor Recorder

Click on **Voltage/ Temperature/ Fan Speed** tabs for the status you want to monitor. Colored lines will automatically appear on the diagram to indicate the immediate changes in the system status.
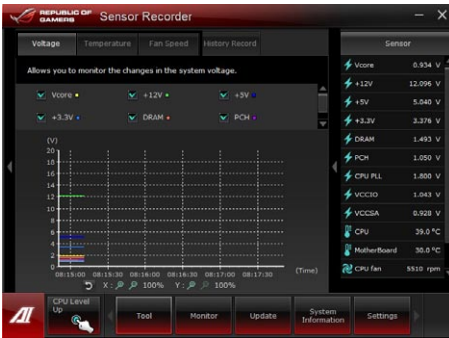
Using History Record

1. Click on the **History Record** tab and adjust the settings on the left for **Record Interval** and **Record Duration** according to need.
2. Click on **Recording** to start measurement and recording of each sensor.
3. To stop recording, click on **Recording** again.
4. To track the recorded contents, set **Type/ Date/ Select display items** to display the history details.
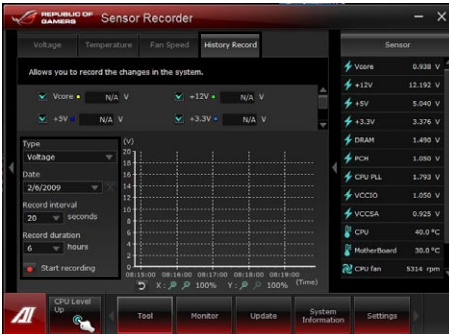
Click on **Monitor > Sensor** on the AI Suite II main menu bar and a highlight of the system statuses will appear on the right panel.

4.3.7 Ai Charger+

Battery Charging Version 1.1 (BC 1.1), a USB Implementers Forum (USB-IF) certified USB charging function, is designed to make USB charging faster than the standard USB devices. If your USB device supports the BC 1.1 function*, when you connect your USB device to your system, the system automatically detects your USB device and starts a fast USB charging. The charging speed may get 3 times faster than that of the standard USB devices**.

> • * Check your USB device manufacturer if it fully supports the BC 1.1 function.
>
> • ** The actual charging speed may vary with your USB device's conditions.
>
> • Ensure to remove and reconnect your USB device after enabling or disabling Ai Charger+ to ensure normal charging function.

4.3.8 USB 3.0 Boost

The ASUS exclusive USB 3.0 Boost provides speed boost for USB 3.0 devices and the up-to-date support of USB Attached SCSI Protocol (UASP). With USB 3.0 Boost, you can accelerate the transfer speed of your USB 3.0 devices with ease.

Launching USB 3.0 Boost

After installing AI Suite II from the motherboard support DVD, launch USB 3.0 Boost by clicking **Tool > USB 3.0 Boost** on the AI Suite II main menu bar.

Configuring USB 3.0 Boost

1. Connect a USB 3.0 device to the USB 3.0 port.

2. USB 3.0 Boost automatically detects the property of the connected device and switches to **Turbo** mode or **UASP** mode (if UASP is supported by the connected device).

3. You can manually switch the USB 3.0 mode back to **Normal** mode at any time.

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

4.3.9   Monitor

This section includes the Sensor and CPU Frequency functions.

Sensor

The sensor panel displays the current value of a system sensor such as fan rotation, CPU temperature, and voltages. Click **Monitor > Sensor** on the AI Suite II main menu bar to launch the Sensor panel.
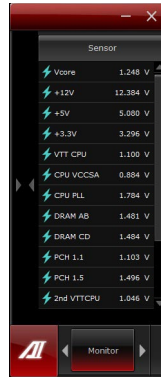
CPU Frequency

The CPU Frequency panel displays the current CPU frequency and CPU usage. Click **Monitor > CPU Frequency** on the AI Suite II main menu bar to open the CPU Frequency panel.
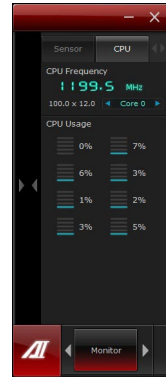
Resident in the right pane (system information area)   **Sensor panel**   **CPU Frequency panel**

4.3.10 ASUS Update

ASUS Update lays out the options for updating BIOS on your system. Update BIOS utility on your system or simply save the utility for later use just by following the directions on this convenient updating feature.

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.

Using ASUS Update

Select the way you would like to do with the BIOS utility. Click on **Next** and follow the instructions to complete your request.
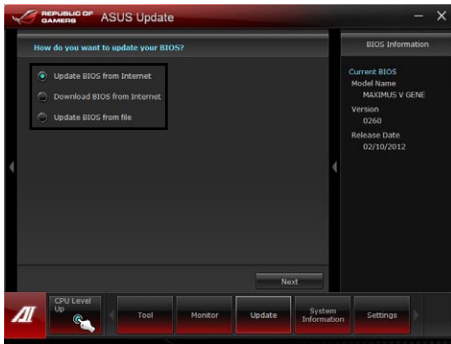
- **Update BIOS from Internet**
  Download the latest BIOS utility from the ASUS service website (www.asus.com) and follow the suggested procedures to update the BIOS version on your system.

- **Download BIOS from Internet**
  Download the latest BIOS utility from the ASUS service website (www.asus.com) and save for later use.

- **Update BIOS from file**
  Use the BIOS utility demanded from a source file to update the BIOS version on your system.

> There may be risks of system crash when updating BIOS. Backing up the original BIOS utility is recommended before updating.

4.3.11 MyLogo2

This MyLogo utility lets you customize the boot logo. The boot logo is the image that appears on screen during the Power-On-Self-Tests (POST). Personalize your computer from the very beginning!

Launching ASUS Update

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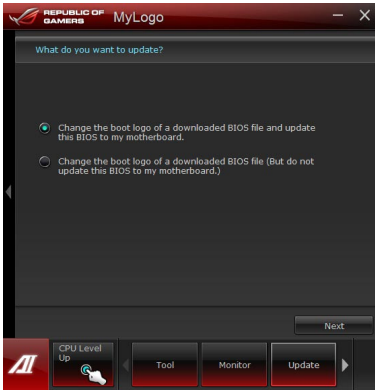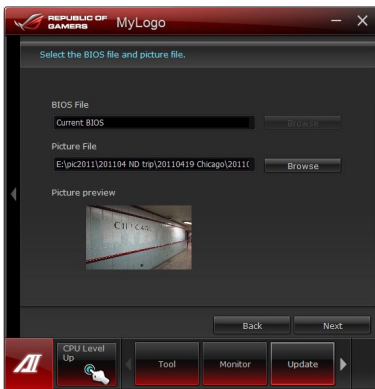

Using MyLogo

Select the way you would like to do update your boot logo. Then click Next and follow the given instructions.

Change the BIOS boot logo of my motherboard

1.   Under Current BIOS, click **Browse** and choose the desired image for your boot logo. Then click on Next.

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2. Click on **Auto Tune** to adjust image size compatibility or adjust the resolution bar.

3. You can click on Booting Preview to preview the boot image. Then click Next.

4. Click on **Flash** to start updating the image to the boot logo.

5. Click on Yes to reboot or you can also see the new logo next time you restart your computer.
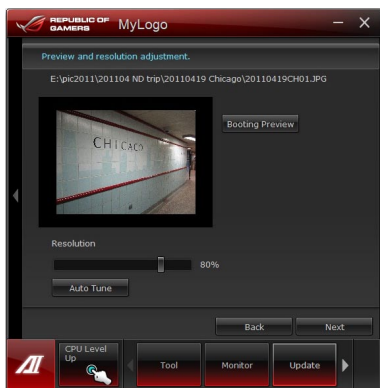
Change the boot logo of a downloaded BIOS file and update (or do not update) this BIOS to the motherboard

1. At BIOS File, **Browse** to download the requested BIOS file to your system. This utility will help you detect the compatibility of the BIOS version.

2. Then at Picture File, Browse to select the desired image for boot logo. Click Next.

3. Follow steps 2-5 in **Change the BIOS boot logo of my motherboard** to complete logo update.
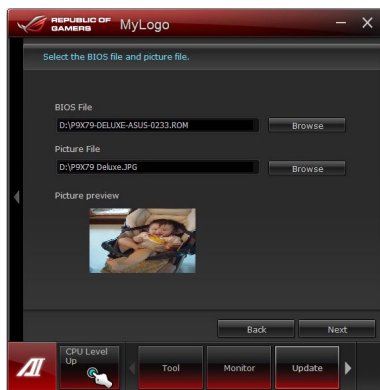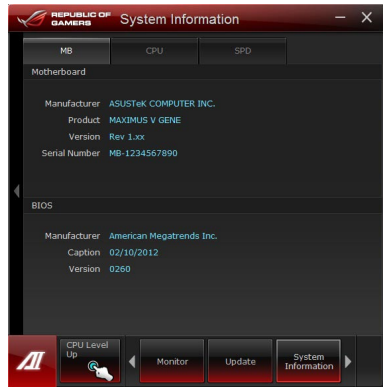

The fullscreen logo application in BIOS utility must be enabled for MyLogo to take effect.

4.3.12 System Information

The System Information section displays the information about the motherboard, CPU, and memory slots.
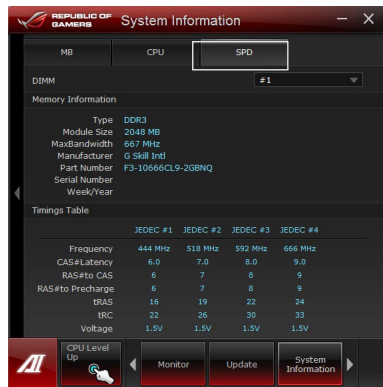
- Click the **MB** tab to see the details on the motherboard manufacturer, product name, version, and BIOS.

- Click the **CPU** tab to see the details on the processor, and the cache.
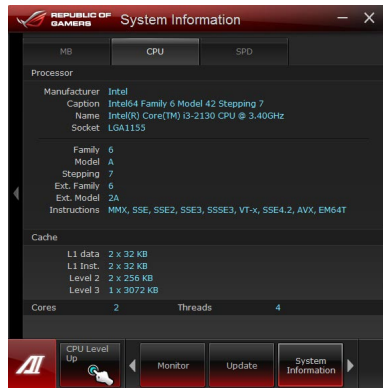
- Click the **SPD** tab, and select the memory slot to view the details on the memory module installed on the corresponding slot.

4.3.13 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® 7™

Configuration option tabs (vary with the audio devices connected)

Device advanced settings

Information button

Control settings

Exit button

Minimize button

Set default device buttons

Connector settings

Analog and digital connector status

B. Realtek HD Audio Manager for Windows XP

Configuration options

Control settings window

Information button

Exit button

Minimize button

• Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.
• Due to Intel® Z77 platform does not support Windows® Vista™, Realtek HD Audio driver is only supported by Windows® 7™/Windows® XP™.
• To play Blu-Ray disc, make sure to use an HDCP compliant monitor.

4.3.14 ROG Connect

ROG Connect allows you to monitor and adjust the local PC through your remote PC.

## Setting up USB connection between your local and remote PC

> • Install **ROG Connect** on the remote PC from the provided Support DVD before using ROG Connect.
>
> • **ROG Connect** must work with **ROG Connect Plus** to avail full function. Ensure that you install **ROG Connect Plus** on your local PC from the provided Support DVD before using **ROG Connect**.

1. Connect the provided ROG Connect cable to the local PC and the remote PC.

2. Press the ROG Connect Button and it will light up into a stable glow.

3. Double-click the **RC TweakIt** shortcut on the remote PC to activate the function
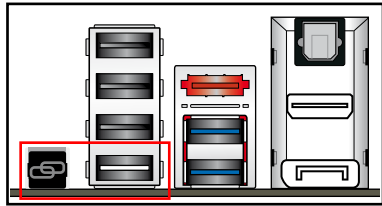
Using RC TweakIt

Use the sliders and buttons to monitor or adjust your local PC.

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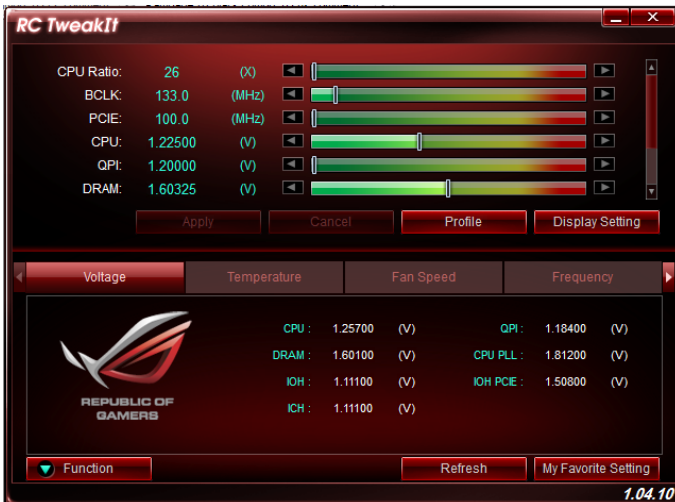
Click **Function** to display more options.

| RC Poster | RC Remote | RC Diagram | GPU TweakIt |

1.04.10
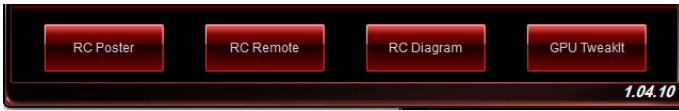
RC Poster

RC Poster shows the status of the local system during the POST. You can switch the display mode between **String** and **Code**.

RC Remote

RC Remote allows you to operate your local system through the ROG Connect cable.

RC Diagram

RC Diagram allows you to monitor and record your local system status.

GPU TweakIt

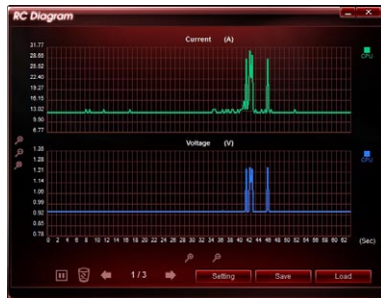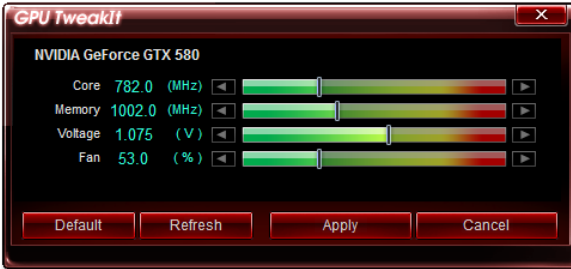GPU TweakIt allows you to control and monitor the installed GPU on the local system. Use the sliders to adjust the values and click **Apply** to save your customized settings.

4.3.15 Sound Blaster X-Fi MB 2

This application is available only under Windows Vista and Windows 7 operating system.

This installation requires that you have the latest version of the Windows Media Player installed on your system. Ensure to download and install the latest Windows Media Player before installing Sound Blaster X-Fi MB 2.

The onboard 8-channel HD audio (High Definition Audio, previously code-named Azalia) CODEC enables high-quality 192KHz/24-bit audio output, jack-sensing feature, retasking functions and multi-streaming technology that simultaneously sends different audio streams to different destinations.

Activating Sound Blaster X-Fi MB 2

After installing Sound Blaster X-Fi MB 2 successfully, you need to activate this utility online before first use.

1.   Double-click Activate on the desktop.

Ensure that you have successfully installed the LAN driver and have connected to the Internet.

2.   Click Activate to start activation.

Using Sound Blaster X-Fi MB 2

Speaker and Headphone
EAX
Equalizer
Mixer

THX
Adjusting Volume

Restoring to the Default

Mute
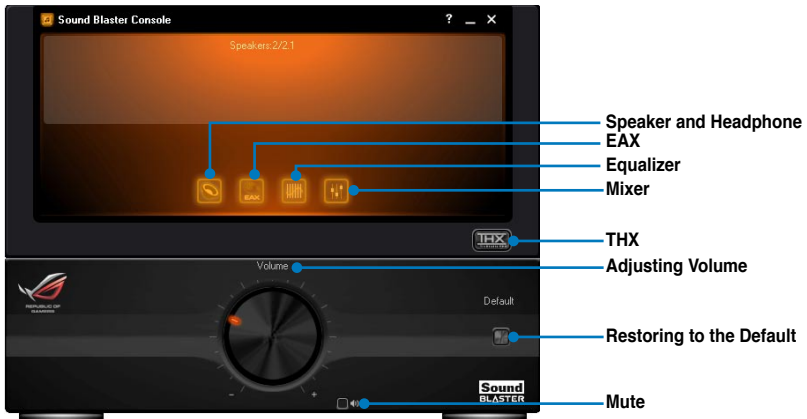
Speaker and Headphone
You can adjust the speaker-related or the headphone-related configurations.
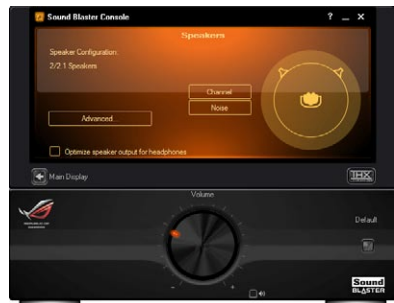
Environment audio extensions (EAX)
After enabling the EAX effects, you are allowed to select and add your desired environment sounds into the music.

Equalizer
You can manually adjust the audio
frequency with the equalizer and
customize your presets for later use.

Mixer
You can manually adjust the audio
volumes, including Line In, Stereo Mix
and Microphone, when recording or
during the playback.

THX
THX is a high-fidelity sound
technology that allows you to adjust
the surround sound effect, sub-woofer
volume, etc..

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.

- 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 - v10.5.1.1070
        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
```

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 - v10.5.1.1070
        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.
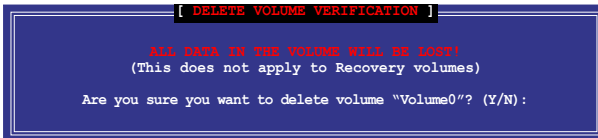
Deleting a RAID set

⚠ 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 - v10.5.1.1070
         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
```
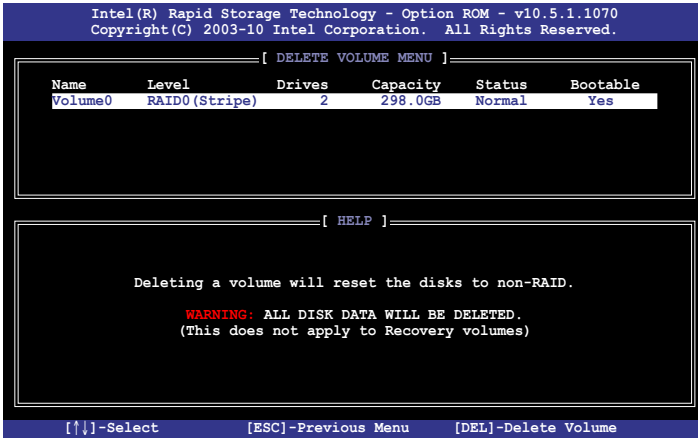
2.   Use the up/down arrow key to select the RAID set you want to delete, and then press <Del>. The following warning message appears:

```
    ════════════════[ 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):
```
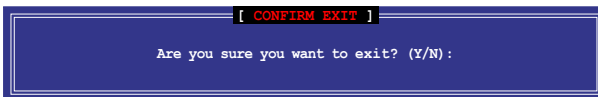
2.   Press <Y> to exit or press <N> to return to the utility main menu.

4.4.5 Introduction to Intel® 2012 Desktop responsiveness technologies

This document details the overview of the installation and configuration procedures of the Intel® 2012 Desktop responsiveness technologies.

Intel® 2012 Desktop responsiveness technologies feature the three technologies:

• Intel® Smart Response Technology

• Intel® Rapid Start Technology

• Intel® Smart Connect Technology

System Requirements for Intel® 2012 Desktop responsiveness technologies

In order for the system to run smoothly for the Intel® 2012 Desktop responsiveness, you must meet the following requirements:

1. CPU: Intel® 3rd/2nd generation Core Processor family

2. OS: Windows® 7 operating systems

3. SSD: One dedicated SSD (Solid State Disk) to support Intel® Smart Response and Intel ® Rapid Start Technology is necessary.

> Refer to the **SSD Capacity Requirements** table for the information of SSD size, partition capacity, and system memory requirements.

4. HDD: At least one HDD (Hard Disk Drive) for the system OS drive.

5. DRAM: To enable Intel® Rapid Start Technology, DRAM size smaller than 8GB is required.

> **Ensure to enable the acceleration of Intel® Smart Response Technology** before creating the partition for the Intel® Rapid Start Technology.

SSD Capacity Requirements

SSD Partition Capacity Requirements		System DRAM		
		2GB	**4GB**	**8GB**
Intel® storage combinations	**Intel® Rapid Start**	2GB	4GB	8GB
	Intel® Smart Response	20GB	20GB	20GB
	Intel® Smart Response and Intel® Rapid Start	Separate 20GB and 2GB partition (SSD size > 22GB)	Separate 20GB and 4GB partition (SSD size > 24GB)	Separate 20GB and 8GB partition (SSD size > 28GB)
	Intel® Smart Response, Intel® Rapid Start, and Intel® Smart Connect	Separate 20GB and 2GB partition (SSD size > 22GB)	Separate 20GB and 4GB partition (SSD size > 24GB)	Separate 20GB and 8GB partition (SSD size > 28GB)

- The SSD used for Intel® Rapid Start and Intel® Smart Response is not allowed for creating RAID.

- Due to OS behavior, Intel® Rapid Start Technology works inefficiently with over 4G system memory under Windows® 7 32-bit operating system.

- Only Intel® internal SATA ports (gray and blue) support Intel® 2012 Desktop responsiveness technologies.

- The performance of Intel® Smart Response Technology and Intel® Rapid Storage Technology vary by the installed SSD.

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Intel® Smart Response Technology

Intel® Smart Response Technology boosts overall system performance. It uses an installed fast SSD (min. 20GB available) as a cache for frequently accessed operations, speeding up hard drive/main memory interaction. Key benefits are expedited hard drive speeds, reduced load and wait times, and maximized storage utilization. Power consumption also goes down by reducing unnecessary hard drive spin.

> Before applying Intel® Smart Response Technology, setting the SATA Mode BIOS item to [RAID mode] in BIOS setup is necessary. Refer to section **3.5.3 SATA Configuration** for details

Installing 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 the installation.

Using the Intel® Smart Response Technology

1. Click **Accelerate** 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.
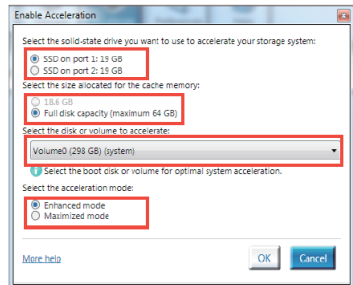
3. Select **Disable Acceleration** to disable this function, and select **Change Mode** to switch acceleration mode to Enhanced/ Maximized.
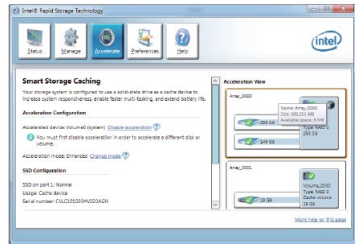
- • To enable Intel® Smart Response Technology, you need at least one SSD (≧20GB) and a HDD, and only one SSD can be assigned for caching.

- • If you want to restore the OS, go to **BIOS Option ROM > Acceleration Options** and remove the **Disks/Volume Acceleration** to disable Intel® Smart Response Technology.

- • The maximum caching size on the SSD is 64GB. If it exceeds, the storage capacity left out for caching can still be identified by the system for normal storage.

Intel® Rapid Start Technology

Intel® Rapid Start Technology allows you to quickly resume your computer from sleeping mode. Saving your computer's system memory to the configured SSD provides a faster wake-up response time, but keeps the energy in a low profile.

- • Before applying Intel® Rapid Start Technology, go to **Advanced Mode > Advanced > PCH Configuration** in BIOS item, and enable Intel® Rapid Start Technology.

- • Ensure to follow the procedure **Creating a partition** precisely to enable the Intel Rapid Start function. Error message appears if you install the Intel® Rapid Start Utility before creating a partition.

Creating a partition

- • Ensure to backup your data before using the Microsoft partition tool. Incorrect partitioning process will result to data loss.

- • Adjusting the DRAM to a high frequency will result to unstable system performance.

1. Go to Start, right-click **Computer > Manage > Disk Management**.
2. Select the SSD that you want to create the partition.

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3.	Right click the **New Volume** that you want to shrink from, and select **Shrink Volume**.
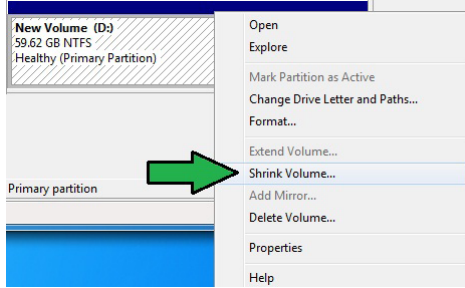
4.	If your SSD is not initialized and unformatted:

	a.	Right click the disk that you want to create the partition, and select **Initialize**.

	b.	Right click the unallocated volume, select **New Simple Volume**, and follow the remaining steps.
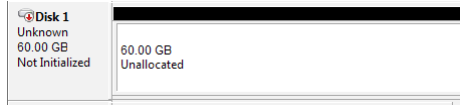
> ⚠️ If your SSD is smaller than 64GB, and is set to **Full disk capacity** caching option for Intel® Smart Response, you can not see any volume in the Disk Management. Ensure to set your cache memory value of **18.6GB** in Intel® Smart Response to allow enough capacity for the Intel® Rapid Start partition.

5.	Key in the required partition size, and must be equal to the system DRAM memory (1GB = 1024MB). Click **Shrink**.
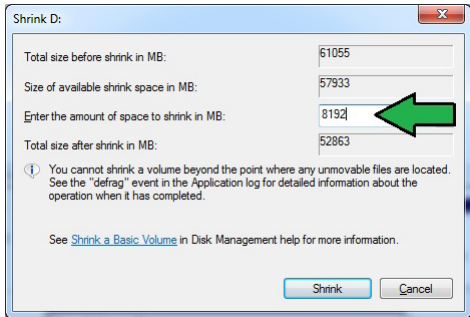
	Go to **Start > Control Panel > System and Security > System**, and check the DRAM size information.

	The unallocated volume is allocated to the selected disk.
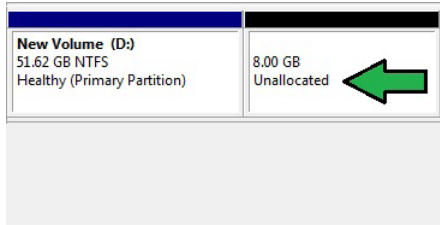
6.	To launch the disk partitioning tool, click **Start > Programs > Accessories > Command Prompt** tool.

7.	Type `diskpart` and press **Enter**.

8.	In the diskpart prompt, type `list disk` after DISKPART, and press **Enter**. Select the disk with the unallocated volume by typing `select disk x` (x = disk number), and press **Enter**

```
DISKPART> list disk

  Disk ###  Status         Size     Free     Dyn  Gpt
  --------  -------------  -------  -------  ---  ---
  Disk 0    Online         2794 GB  1024 KB        *
  Disk 1    Online           59 GB     8 GB

DISKPART> select disk 1

Disk 1 is now the selected disk.
```

✎	•	The value "**x**" refers to a disk number where you created the unallocated partition.

	•	Refer to step 5 for details about the unallocated disk space in the SSD.

9.	Type `create partition primary`, and press **Enter.**

```
DISKPART> create partition primary

DiskPart succeeded in creating the specified partition.

DISKPART>
```

10.	After creating a primary partition, type `detail disk`, and press **Enter** to view the details of the partitioned disk.

```
DISKPART> detail disk

M4-CT064M4SSD2
Disk ID: 316EF874
Type   : ATA
Status : Online
Path   : 0
Target : 1
LUN ID : 0
Location Path : PCIROOT(0)#ATA(C00T01L00)
Current Read-only State : No
Read-only  : No
Boot Disk  : No
Pagefile Disk : No
Hibernation File Disk  : No
Crashdump Disk  : No
Clustered Disk  : No

  Volume ###  Ltr  Label       Fs     Type       Size     Status    Info
  ----------  ---  ----------  -----  ---------  -------  --------  --------
  Volume 2    D    New Volume  NTFS   Partition   51 GB   Healthy
* Volume 3                     RAW    Partition    8 GB   Healthy
```

11.	Select the RAW volume which has the same size as the shrinked volume, type `select volume x` (x = number), and press **Enter** to store the Intel® Rapid Start partition.

```
DISKPART> select volume 3

Volume 3 is the selected volume.

DISKPART>
```

✎	•	The value "**x**" refers to a disk number where you want to create the store partition.

12. Type `set id=84 override`, press **Enter**, and wait for the "shrinking process" until the Disk Management utility identifies a new partition called **Hibernation Partition**.
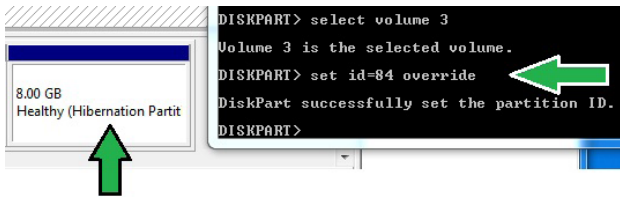
> The **Hibernation Partition** does not appear when you choose "GPT (GUID Partition Table store type". Ensure the "Unallocated" disappears from the volume, and a new partition is identified.

13. Reboot the system after creating the partition.

> The partition for Intel® Rapid Start Technology is incomplete if the computer is not rebooted, and this results to function failure of Intel® Rapid Start Technology.

Enabling and disabling the Intel® Rapid Start Technology under the OS

> Install the Intel® Rapid Start Technology first from your support DVD in order to launch the Intel® Rapid Start Manager.

After creating the partition, launch the Intel® Rapid Start Manager to enable or disable the Intel® Rapid Start Technology.

1. Click the **Show hidden icons** arrow from the right side of the task bar, and click **Intel® Rapid Start Technology Manager** icon.
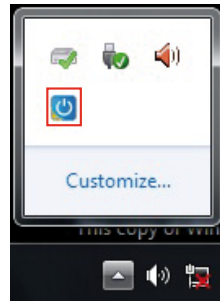
2. Tick **On** in the Status field to enable the function, and click **Save.**

Select and click to enable or disable the function
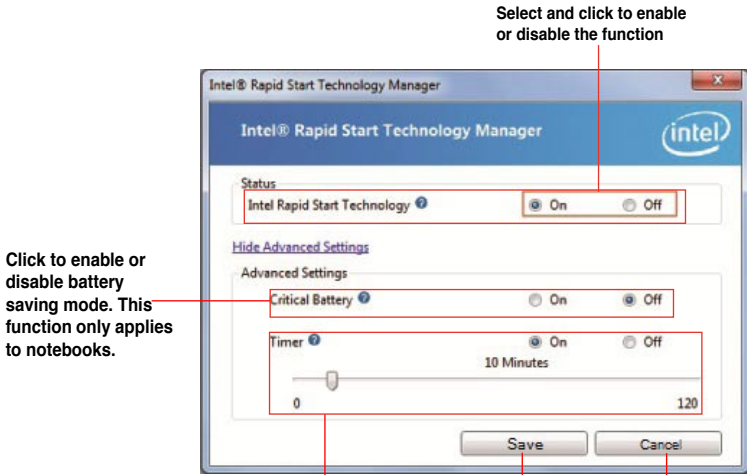
Click to enable or disable battery saving mode. This function only applies to notebooks.

Click to enable or disable the timer. When enabled, move the scroll bar to the desired time. When the system is idle for more than the time period you set, the system automatically goes into the Intel® Rapid Start mode. Default time is 10 minutes.

Click to save the settings made.

Click to cancel the settings made.

Recovering the partition

This procedure allows you to delete the Intel® Rapid Start Technology from your system, and recover the partition you made for the Intel Rapid® Start Technology installation.

1. Run the **Command Prompt** tool.

2. Type **diskpart** and press **Enter**.

3. At the diskpart prompt, type **list disk** after DISKPART, and press **Enter.**

4. Select the disk (SSD) where the Intel® Rapid Start Technology is installed for volume recovery, type **select disk x** (x = number), and press **Enter**.

The value "**x**" refers to a disk number where you want to delete the store partition.

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5. Type **list partition**, press **Enter,** and select the partition where the Intel® Rapid Start Technology is installed by typing **select partition x** (x = number), and press **Enter**.


> The value "**x**" refers to a disk number where you want to delete the store partition.

6. Type **delete partition override**, and press **Enter**. The diskpart utility deletes the selected partition.
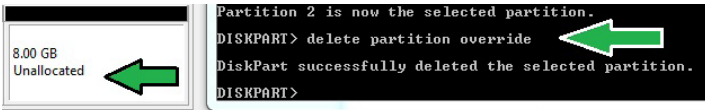
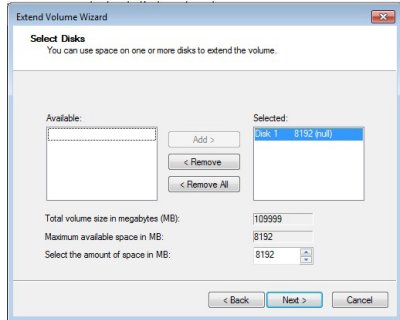7. In the desktop, click **Start**, right-click **Computer**, and click **Manage.**

8. In the Computer Management window, click **Disk Management**, right click the shrinked new volume, and select **Extend Volume**.
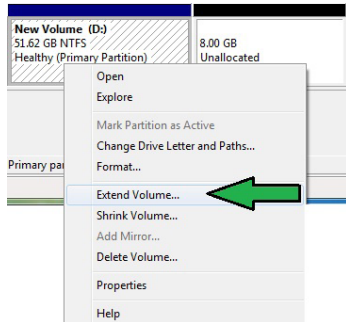
9. As the Extend Volume Wizard appears, click **Next**.

10. Click **Next** after selecting the default selected disk.

11. Extend volume setup is completed. Click **Finish** to recover the Intel® Rapid Start Technology partition.

12. Reboot the system after deleting the partition.

13. Go to **Start > Control Panel > Programs > Programs and Features >** to remove the Intel® Rapid Start Manager for the complete deletion of Intel® Rapid Start Technology.

Intel® Smart Connect Technology

The Intel® Smart Connect Technology is a feature that provides the latest content updates and energy efficiency to your computer's platform.

Once installed and activated, the Intel® Smart Connect Technology periodically wakes up the system from sleeping mode, performs user state gathering, and initiates re-entry to sleeping mode to wake-up after a set time interval.
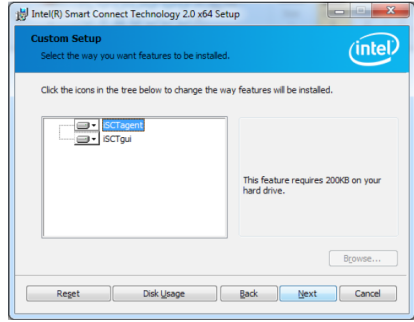
> • Intel® Smart Connect Technology supports Windows® Live Mail, Microsoft Outlook, and Seesmic applications.
>
> • It is necessary to enable the items of the PCH Configuration in the BIOS before applying the Intel® Smart Connect Technology. Go to **Advanced Mode > Advanced > PCH Configuration**, and enable the Intel® Smart Connect Technology.

Installing the Intel® Smart Connect Technology

1. Place the support DVD to the optical drive.

2. Go to **Utilities**, and click **Intel® Smart Connect Technology**.

3. As the setup wizard appears, click **Next** to begin the setup.

4. Tick **I accept the terms in the License Agreement**, and click **Next**.

5.   Select all and click **Next** for **Custom Setup**.

6.   Click **Install** to proceed the installation.
7.   Click **Yes** to restart your system, and for the newly installed Intel® Smart Connect Technology to take effect.

Using the Intel® Smart Connect Technology

•   Before the system goes to sleep mode, ensure to keep your applications on the desktop, and enter the applications, passwords.
•   Ensure that the internet is in connection when enabling the Intel® Smart Connect Technology.

1.   Click **Start > All Programs > Intel > Intel® Smart Connect Technology**.
2.   In the **Basic** tab, click **Enable Updating**. When enabled, the **Advanced** tab is available for advanced function settings.

The Advanced tab is activated when updating is enabled

Click to view version information and help topics

Click to configure the basic settings

Click to enable or disable the function

When the scroll bar is activated, adjust the waking up time period for Internet data update.

When updating is enabled, click to reset all settings to default.

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3. To disable the updating function, click **Disable Updating**. Clicking this button automatically disables the configuration in the **Advanced** tab. To reset to defaults, click **Reset All to Defaults**.
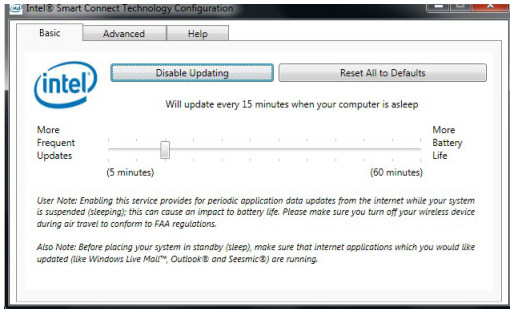
4. In the **Advanced** tab, set up the schedule during low power usage time period for power saving. This setting only applies to the assigned time period.
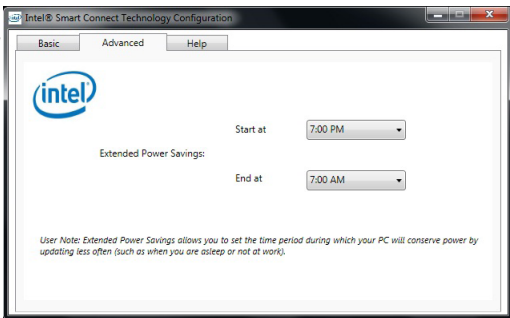
5. In the **Help** tab, click **About** to view the feature's version. Click **Topics** to learn more about the Intel® Smart Connect Technology and its configuration.

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.

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.
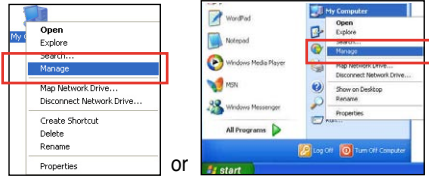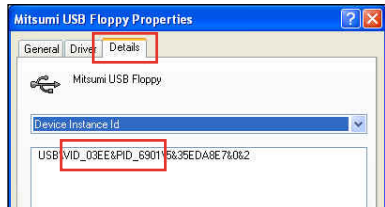
3.   Select **Device Manager**. From the **Universal Serial Bus controllers**, right-click **xxxxxx USB Floppy**, and then select **Properties** from the pop-up window.
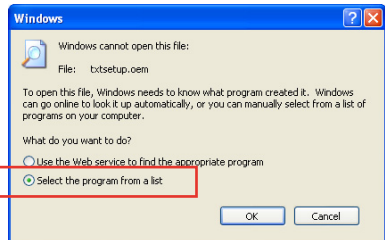
> The name of the USB floppy disk drive varies with different vendors.
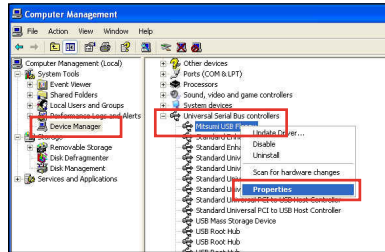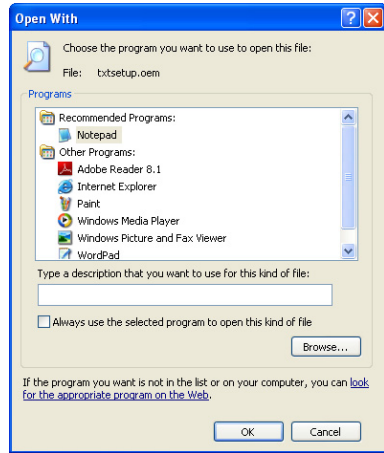
4.   Click **Details** tab. The Vendor ID (VID) and Product ID (PID) are displayed.

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.

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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.

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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.
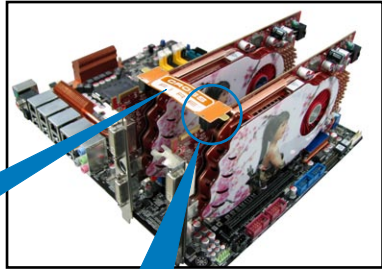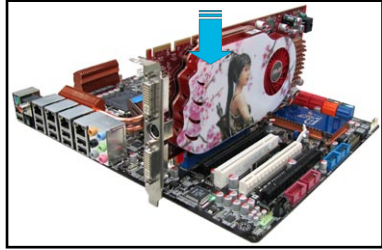
CrossFireX bridge (bundled with graphics cards)
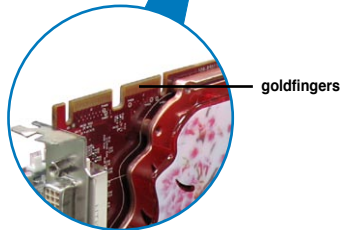
goldfingers

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.
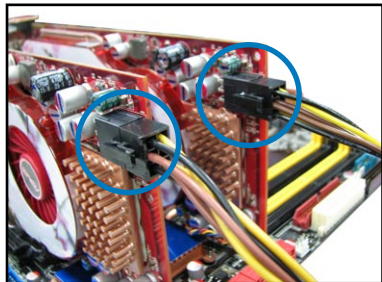
5.1.4 Installing the device drivers

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).
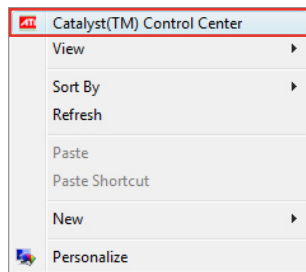
5.1.5 Enabling the ATI® CrossFireX™ technology

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.
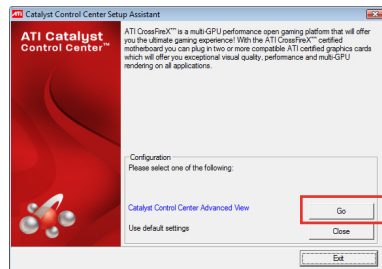
Enabling Dual CrossFireX technology

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.
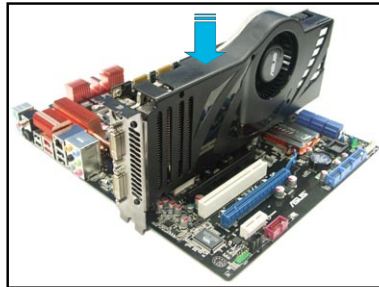
4. Align and firmly insert the SLI bridge connector to the goldfingers on each graphics card. Ensure that the connector is firmly in place.

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
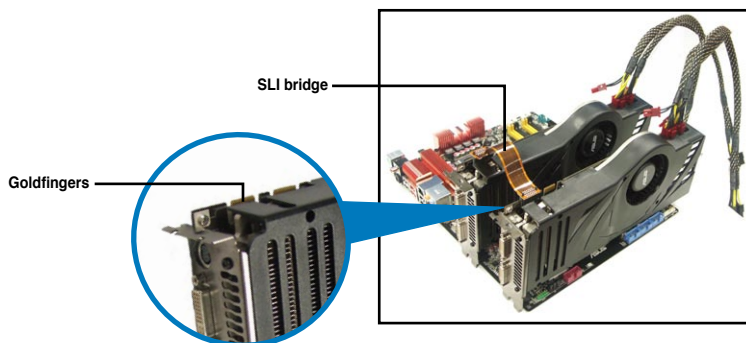
5.2.3   Installing the device drivers

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).

View	▶
Sort By	▶
Refresh	
Paste	
Paste Shortcut	
NVIDIA Control Panel	
New	▶
Personalize	
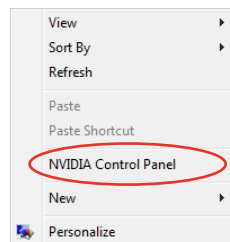
B1.   If you cannot see the NVIDIA Control Panel item in step
       (A), select **Personalize**.
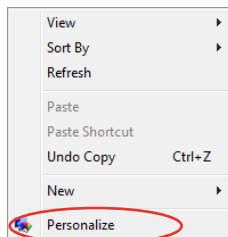
B2.   From the **Personalization** window,
       select **Display Settings**.
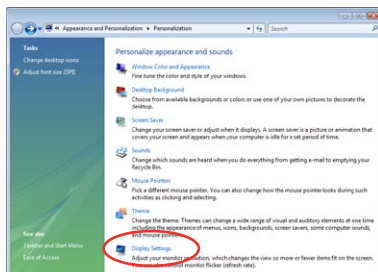
B3.   From the Display Settings dialog box,
       click **Advanced Settings**.
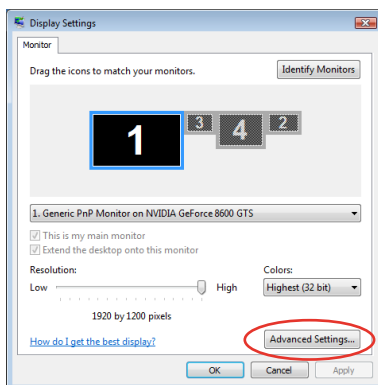
B4. Select the NVIDIA GeForce tab, and then click **Start the NVIDIA Control Panel**.
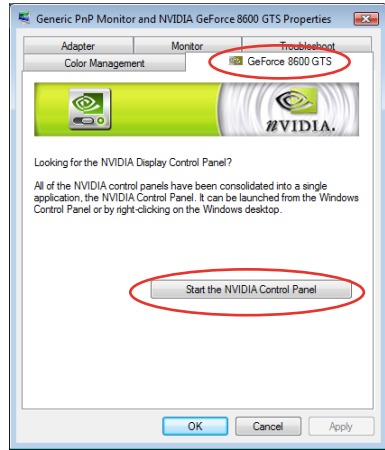
B5. The NVIDIA Control Panel window appears.
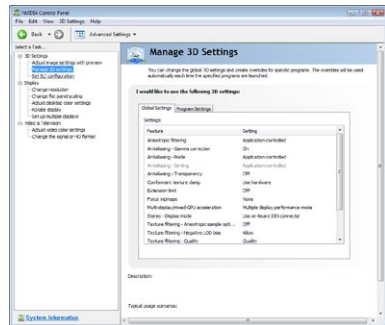
Enabling SLI settings

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**.

5.3 LucidLogix Virtu MVP

LucidLogix Virtu MVP allows your computer's VGA output and discrete graphic cards to perform better, respond faster and process media files smoother within a low power environment. Its GPU virtualization assigns tasks to the best available graphic source while the newly-designed Virtual Vsync gives you a smoother gaming experience.

> • LucidLogix Virtu MVP supports Windows 7® operating systems.
>
> • Intel® Quick Sync Video feature is supported by the 3rd/2nd generation Intel® Core™ processor family.
>
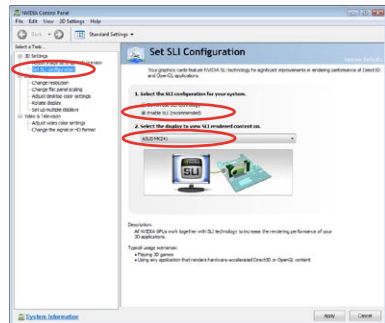> • iGPU Multi-Monitor support option must be enabled in BIOS and install both Intel® Graphics Accelerator, and graphics card driver before installing LucidLogix Virtu MVP from ASUS support DVD. Refer to **3.5.4 System Configuration** for details.
>
> • Hyperformance® and Virtual Sync are enabled when using more than one discrete GPU at the same time.
>
> • Supports NVIDIA® GF4xx/5xx series and AMD® HD5xxx/6xxx series graphic cards.
>
> • We do not recommended to use LucidLogix Virtu MVP under RAID mode.

5.3.1 Installing LucidLogix Virtu MVP

To install LucidLogix Virtu MVP:

1. Insert the support DVD in the optical drive. The **ASUS Support Wizard** appears if your computer has enabled the Autorun feature.

2. Click the **Utilites** tab, then click **LucidLogix Virtu MVP Software**.

3. Follow the succeeding onscreen instructions to complete the installation.

> After you successfully installed the LucidLogix Virtu MVP, the LucidLogix Virtu MVP icon appears in the notification area.

5.3.2 Setting up your display

LucidLogix Virtu MVP solution comes with two distinct modes that allows you to enjoy better graphics either from your built-in video output (i-Mode) or from a discrete graphics card (d-Mode).

i-Mode

To use LucidLogix Virtu MVP in i-Mode, the display must be connected to the onboard video output.

Ensure to set the Primary Display to iGPU in BIOS to activate i-Mode support.

d-Mode

To use LucidLogix Virtu MVP in d-Mode, the display must be connected to the installed graphics card.

•   Ensure to set the Primary Display to PCIE or PCIE/PCI in BIOS to enable d-Mode support.

•   d-Mode is recommended for an enhanced 3D gaming performance.

i-Mode (VGA output from motherboard)

d-Mode (VGA output from discrete graphics card)
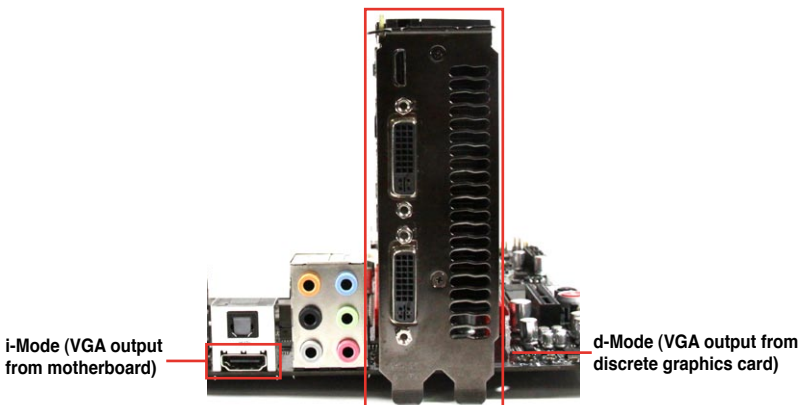
The motherboard's IO ports and discrete graphic card is for reference only and may vary in different models.

5.3.3 Configuring LucidLogix Virtu MVP

Launch the Virtu MVP Control Panel to allow you to configure the main features, adjust the performance settings and select applications for graphical virtualization.

To open the control panel, right-click LucidLogix Virtu MVP icon in the notification area and select **Open Virtu MVP Control Panel**.
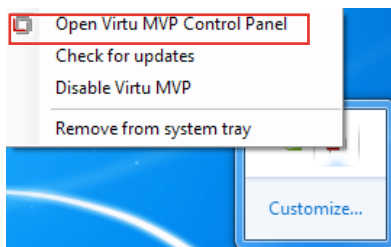
LucidLogix Virtu MVP is automatically activated when your system is powered on. Select **Remove from system tray** if you want to remove LucidLogix Virtu MVP icon from the notification area.

Main

Allows you to turn ON/OFF the GPU virtualization. Also from the Main tab, you can set to show or hide the In-Game icon.

Click to turn ON/OFF the LucidLogix Virtu MVP

Click to restore to default settings

Tick to show icon in system tray

Select display option for In-Game icon

Performance

Allows you to turn ON/OFF the Hyperformance® or Virtual Vsync function.

Click to turn Hyperformance® ON or OFF

Click to turn Virtual Vsync ON or OFF
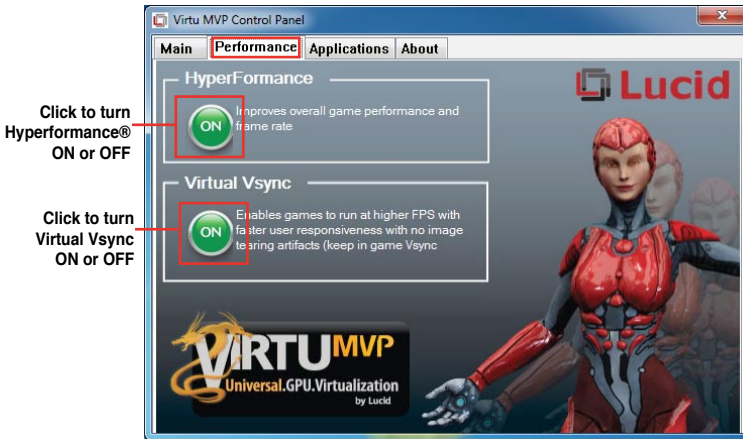
Applications

Allows you to select applications for graphic virtualization.

Click to select a program to run by discrete card, iGPU, or Hyperformance®

Click to add, edit, or remove programs
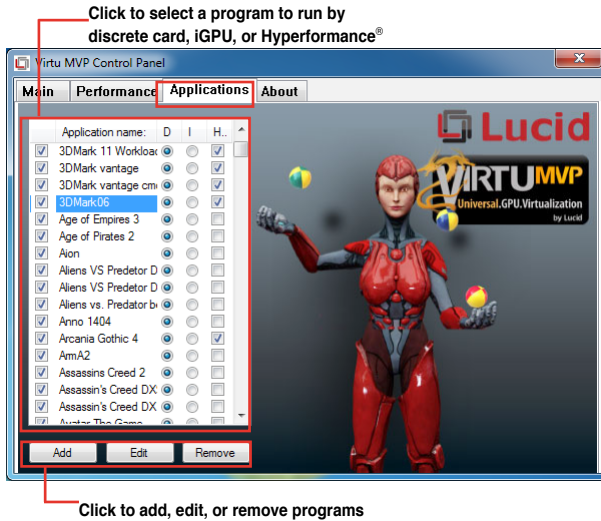
See the descriptions of these columns below:

- **D** column allows you to run applications with the discrete graphic card. Select **D** to enable 3D graphical performance for that application.

- **I** column allows to run applications with iGPU. Select **I** for applications with media extensive performance.

- **H** column allows you to run applications with Hyperformance®. Tick **H** to enhance graphical performance for that application.

> Actual graphical performance varies with the application used and graphics card installed.

Appendices

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.
- 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.

IC: Canadian Compliance Statement

Complies with the Canadian ICES-003 Class B specifications. This device complies with RSS 210 of Industry Canada. This Class B device meets all the requirements of the Canadian interference-causing equipment regulations.

This device complies with Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cut appareil numérique de la Classe B est conforme à la norme NMB-003 du Canada. Cet appareil numérique de la Classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Cet appareil est conforme aux normes CNR exemptes de licence d'Industrie Canada. Le fonctionnement est soumis aux deux conditions suivantes :

(1) cet appareil ne doit pas provoquer d'interférences et

(2) cet appareil doit accepter toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité de l'appareil.

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.

VCCI: Japan Compliance Statement

VCCI Class B Statement

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。
ＶＣＣＩ－Ｂ

KC: Korea Warning Statement

B급 기기 (가정용 방송통신기자재)
이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로
하며, 모든 지역에서 사용할 수 있습니다.

*당해 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없습
니다.

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.

ASUS Recycling/Takeback Services

ASUS recycling and takeback programs come from our commitment to the highest standards for protecting our environment. We believe in providing solutions for you to be able to responsibly recycle our products, batteries, other components as well as the packaging materials. Please go to http://csr.asus.com/english/Takeback.htm for detailed recycling information in different regions.

Appendices

RF Equipment Notices

CE: European Community Compliance Statement

The equipment complies with the RF Exposure Requirement 1999/519/EC, Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0–300 GHz). This wireless device complies with the R&TTE Directive.

Wireless Radio Use

This device is restricted to indoor use when operating in the 5.15 to 5.25 GHz frequency band.

Exposure to Radio Frequency Energy

The radiated output power of the Wi-Fi technology is below the FCC radio frequency exposure limits. Nevertheless, it is advised to use the wireless equipment in such a manner that the potential for human contact during normal operation is minimized.

FCC Bluetooth Wireless Compliance

The antenna used with this transmitter must not be colocated or operated in conjunction with any other antenna or transmitter subject to the conditions of the FCC Grant.

Bluetooth Industry Canada Statement

This Class B device meets all requirements of the Canadian interference-causing equipment regulations.

Cet appareil numérique de la Class B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

BSMI: Taiwan Wireless Statement

無線設備的警告聲明
經型式認證合格之低功率射頻電機,非經許可,公司、商號或使用者均不得擅自變更射頻、加
大功率或變更原設計之特性及功能。低功率射頻電機之使用不得影響飛航安全及干擾合法通信;
經發現有干擾現象時,應立即停用,並改善至無干擾時方得繼續使用。前項合法通信指依電信
法規定作業之無線通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電
機設備之干擾。

於 5.25GHz 至 5.35GHz 區域內操作之
無線設備的警告聲明
工作頻率 5.250 ～ 5.350GHz 該頻段限於室內使用。

Japan RF Equipment Statement

この製品は、周波数帯域5.15～5.35GＨzで動作しているときは、屋内においてのみ使用可能です。

KC (RF Equipment)

대한민국 규정 및 준수
방통위고시에 따른 고지사항
해당 무선설비는 운용 중 전파혼신 가능성이 있음,
이 기기는 인명안전과 관련된 서비스에 사용할 수 없습니다.

RF exposure warning

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Declaration of Conformity (R&TTE directive 1999/5/EC)

The following items were completed and are considered relevant and sufficient:

- Essential requirements as in [Article 3]
- Protection requirements for health and safety as in [Article 3.1a]
- Testing for electric safety according to [EN 60950]
- Protection requirements for electromagnetic compatibility in [Article 3.1b]
- Testing for electromagnetic compatibility in [EN 301 489-1] & [EN 301 489-17]
- Effective use of the radio spectrum as in [Article 3.2]
- Radio test suites according to [EN 300 328-2]

CE Marking

C E

CE marking for devices without wireless LAN/Bluetooth

The shipped version of this device complies with the requirements of the EEC directives 2004/108/EC "Electromagnetic compatibility" and 2006/95/EC "Low voltage directive".

C E ①

CE marking for devices with wireless LAN/ Bluetooth

This equipment complies with the requirements of Directive 1999/5/EC of the European Parliament and Commission from 9 March, 1999 governing Radio and Telecommunications Equipment and mutual recognition of conformity.

Appendices

Wireless Operation Channel for Different Domains

N. America	2.412-2.462 GHz	Ch01 through CH11
Japan	2.412-2.484 GHz	Ch01 through Ch14
Europe ETSI	2.412-2.472 GHz	Ch01 through Ch13

France Restricted Wireless Frequency Bands

Some areas of France have a restricted frequency band. The worst case maximum authorized power indoors are:

- 10mW for the entire 2.4 GHz band (2400 MHz–2483.5 MHz)
- 100mW for frequencies between 2446.5 MHz and 2483.5 MHz

> Channels 10 through 13 inclusive operate in the band 2446.6 MHz to 2483.5 MHz.

There are few possibilities for outdoor use: On private property or on the private property of public persons, use is subject to a preliminary authorization procedure by the Ministry of Defense, with maximum authorized power of 100mW in the 2446.5–2483.5 MHz band. Use outdoors on public property is not permitted.

In the departments listed below, for the entire 2.4 GHz band:

- Maximum authorized power indoors is 100mW
- Maximum authorized power outdoors is 10mW

Departments in which the use of the 2400–2483.5 MHz band is permitted with an EIRP of less than 100mW indoors and less than 10mW outdoors:

01 Ain	02 Aisne	03 Allier	05 Hautes Alpes
08 Ardennes	09 Ariège	11 Aude	12 Aveyron
16 Charente	24 Dordogne	25 Doubs	26 Drôme
32 Gers	36 Indre	37 Indre et Loire	41 Loir et Cher
45 Loiret	50 Manche	55 Meuse	58 Nièvre
59 Nord	60 Oise	61 Orne	63 Puy du Dôme
64 Pyrénées Atlantique		66 Pyrénées Orientales	
67 Bas Rhin	68 Haut Rhin	70 Haute Saône	71 Saône et Loire
75 Paris	82 Tarn et Garonne	84 Vaucluse	
88 Vosges	89 Yonne	90 Territoire de Belfort	
94 Val de Marne			

This requirement is likely to change over time, allowing you to use your wireless LAN card in more areas within France. Please check with ART for the latest information (www.arcep.fr)

> Your WLAN Card transmits less than 100mW, but more than 10mW.

IC Radiation Exposure Statement for Canada

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. To maintain compliance with IC RF exposure compliance requirements, please avoid direct contact to the transmitting antenna during transmitting. End users must follow the specific operating instructions for satisfying RF exposure compliance.

Operation is subject to the following two conditions:

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

To prevent radio interference to the licensed service (i.e. co-channel Mobile Satellite systems) this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

> The user is cautioned that this device should be used only as specified within this manual to meet RF exposure requirements. Use of this device in a manner inconsistent with this manual could lead to excessive RF exposure conditions.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Country Code selection feature to be disabled for products marketed to the US/CANADA.

ASUS contact information

ASUSTeK COMPUTER INC.

Address	15 Li-Te Road, Peitou, Taipei, Taiwan 11259
Telephone	+886-2-2894-3447
Fax	+886-2-2890-7798
E-mail	info@asus.com.tw
Web site	www.asus.com.tw

Technical Support

Telephone	+86-21-38429911
Online support	support.asus.com

ASUS COMPUTER INTERNATIONAL (America)

Address	800 Corporate Way, Fremont, CA 94539, USA
Telephone	+1-812-282-3777
Fax	+1-510-608-4555
Web site	usa.asus.com

Technical Support

Telephone	+1-812-282-2787
Support fax	+1-812-284-0883
Online support	support.asus.com

ASUS COMPUTER GmbH (Germany and Austria)

Address	Harkort Str. 21-23, D-40880 Ratingen, Germany
Fax	+49-2102-959911
Web site	www.asus.de
Online contact	www.asus.de/sales

Technical Support

Telephone	+49-1805-010923*
Support Fax	+49-2102-9599-11
Online support	support.asus.com

* EUR 0.14/minute from a German fixed landline; EUR 0.42/minute from a mobile phone.

Appendices

附件二

符合性聲明書
Declaration of Conformity

報驗義務人代碼 Code of the applicant	編　　號 Number
D33005	

本符合性聲明書應依商品檢驗法規定備齊相關技術文件後始得簽具
Please check all the related technical documents in accordance with the Commodity Inspection Act before signing the form.

報驗義務人：華碩電腦股份有限公司
Obligatory Applicant

地址：台北市北投區立德路 150 號 4 樓
Address

電話：02-2894-3447 # 2521
Telephone

商品中（英）文名稱：主機板 (Motherboard)
Commodity Name

商品型式（或型號）：Maximus V GENE
Commodity Type　（Model）

符合之檢驗標準及版次：CNS 13438：95 年完整版 (乙類) (Class B)
Standard(s) and version

試驗報告編號：121329R-ITTWP01V04
Test Report Number

試驗室名稱及代號：快特電波股份有限公司(SL2-IN-E-0043)
Testing laboratory name and designation number

符合性聲明檢驗標識及識別號碼：　　　　　　　　　　或
The form of the DoC marking appears like this　　　　　　　　　　or

D33005

D33005

茲聲明上述商品符合商品檢驗法符合性聲明之規定，若因違反本聲明書所聲明之內容，願意擔負相關法律責任。

I hereby declare that the listed commodity conforms to Declaration of Conformity requirements stipulated in the Commodity

Inspection Act. I agree to take any legal obligations should violations against the Declaration of Conformity occur.

報驗義務人：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿　（簽章）
Obligatory Applicant　　　　　　　　　　　　　　　　　　　（Signature）

中　華　民　國　一百零一　年　二　月　十三　日
　　DATE　　　　　　　　（year）　　（month）　　（day）

Appendices

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 :	Motherboard
Model name :	Maximus V GENE

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+A2: 2009	☒ 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(2006-10)	☐ 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 / A11:2009	☐ EN 60065:2002+A1:2006+A11:2008
☐ EN 60950-1 / A12:2011	☐ EN 60065:2002 / A12:2011

☐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. 111121

☒CE marking

C E

(EC conformity marking)

Position : **CEO**

Name : **Jerry Shen**

Declaration Date: Feb. 17, 2012
Year to begin affixing CE marking:2012

Signature : _____

Appendices

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 : Motherboard

Model Number : Maximus V GENE

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 : ___**Feb. 17, 2012**___

Ver. 110101