MS-9298

2U Rackmount Server

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Revision History

Revision	Revision History	Date
V1.0	First release	November 2009

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: http://www.msi.com/index.php?func=service
- Contact our technical staff at: http://ocss.msi.com

Safety Instructions

- Always read the safety instructions carefully.
- Keep this User's Manual for future reference.
- Keep this equipment away from humidity.
- Lay this equipment on a reliable flat surface before setting it up.
- The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
- Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
- Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
- Always Unplug the Power Cord before inserting any add-on card or module.
- All cautions and warnings on the equipment should be noted.
- Never pour any liquid into the opening that could damage or cause electrical shock.
- If any of the following situations arises, get the equipment checked by service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment does not work well or you can not get it work according to User's Manual.
  - The equipment has dropped and damaged.
  - The equipment has obvious sign of breakage.
- DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60°C (140°F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

警告使用者:

這是甲類資訊產品，在居住的環境中使用時，可能會造成無線電干擾，在這種情況下，使用者會被要求採取某些適當的對策。

廢電池請回收

For better environmental protection, waste batteries should be collected separately for recycling special disposal.

Precautions

1) Access can only be gained by service persons or by users who have been trained on the restrictions and the precautions for this specific site.
2) Access is by means of at least one of the following, special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.
3) Rack Mount Installation Instructions:

   - Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
   - Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
   - Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
   - Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
   - Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

FCC-A Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

CE N1996

Notice 1

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

Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

FC Micro-Star International
MS-9298

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.

WEEE Statement

ENGLISH

To protect the global environment and as an environmentalist, MSI must remind you that...

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life. MSI will comply with the product take back requirements at the end of life of MSI-branded products that are sold into the EU. You can return these products to local collection points.

DEUTSCH

Hinweis von MSI zur Erhaltung und Schutz unserer Umwelt

Gemäß der Richtlinie 2002/96/EG über Elektro- und Elektronik-Altgeräte dürfen Elektro- und Elektronik-Altgeräte nicht mehr als kommunale Abfälle entsorgt werden. MSI hat europaweit verschiedene Sammel- und Recyclingunternehmen beauftragt, die in die Europäische Union in Verkehr gebrachten Produkte, am Ende seines Lebenszyklus zurückzunehmen. Bitte entsorgen Sie dieses Produkt zum gegebenen Zeitpunkt ausschliesslich an einer lokalen Altgerätesammelstelle in Ihrer Nähe.

FRANÇAIS

En tant qu'écologiste et afin de protéger l'environnement, MSI tient à rappeler ceci...

Au sujet de la directive européenne (EU) relative aux déchets des équipement électriques et électroniques, directive 2002/96/EC, prenant effet le 13 août 2005, que les produits électriques et électroniques ne peuvent être déposés dans les décharges ou tout simplement mis à la poubelle. Les fabricants de ces équipements seront obligés de récupérer certains produits en fin de vie. MSI prendra en compte cette exigence relative au retour des produits en fin de vie au sein de la communauté européenne. Par conséquent vous pouvez retourner localement ces matériels dans les points de collecte.

РУССКИЙ

Компания MSI предпринимает активные действия по защите окружающей среды, поэтому напоминаем вам, что....

В соответствии с директивой Европейского Союза (ЕС) по предотвращению загрязнения окружающей среды использованным электрическим и электронным оборудованием (директива WEEE 2002/96/EC), вступающей в силу 13 августа 2005 года, изделия, относящиеся к электрическому и электронному оборудованию, не могут рассматриваться как бытовой мусор, поэтому производители вышеперечисленного электронного оборудования обязаны принимать его для переработки по окончании срока службы. MSI обязуется соблюдать требования по приему продукции, проданной под маркой MSI на территории ЕС, в переработку по окончании срока службы. Вы можете вернуть эти изделия в специализированные пункты приема.

ESPAÑOL

MSI como empresa comprometida con la protección del medio ambiente, recomienda:

Bajo la directiva 2002/96/EC de la Unión Europea en materia de desechos y/o equipos electrónicos, con fecha de rigor desde el 13 de agosto de 2005, los productos clasificados como “eléctricos y equipos electrónicos” no pueden ser depositados en los contenedores habituales de su municipio, los fabricantes de equipos electrónicos, están obligados a hacerse cargo de dichos productos al termino de su período de vida. MSI estará comprometido con los términos de recogida de sus productos vendidos en la Unión Europea al final de su periodo de vida. Usted debe depositar estos productos en el punto limpio establecido por el ayuntamiento de su localidad o entregar a una empresa autorizada para la recogida de estos residuos.

NEDERLANDS

Om het milieu te beschermen, wil MSI u eraan herinneren dat….

De richtlijn van de Europese Unie (EU) met betrekking tot Vervuiling van Electrische en Electronische producten (2002/96/EC), die op 13 Augustus 2005 in zal gaan kunnen niet meer beschouwd worden als vervuiling. Fabrikanten van dit soort producten worden verplicht om producten retour te nemen aan het eind van hun levenscyclus. MSI zal overeenkomstig de richtlijn handelen voor de producten die de merknaam MSI dragen en verkocht zijn in de EU. Deze goederen kunnen geretourneerd worden op lokale inzamelingspunten.

SRPSKI

Da bi zaštitili prirodnu sredinu, i kao preduzeće koje vodi računa o okolini i prirodnoj sredini, MSI mora da vas podesti da…

Po Direktivi Evropske unije (“EU”) o odbačenoj ekektronskoj i električnoj opremi, Direktiva 2002/96/EC, koja stupa na snagu od 13. Avgusta 2005, proizvodi koji spadaju pod “elektronsku i električnu opremu” ne mogu više biti odbačeni kao običan otpad i proizvođači ove opreme biće prinuđeni da uzmu natrag ove proizvode na kraju njihovog uobičajenog veka trajanja. MSI će poštovati zahtev o preuzimanju ovakvih proizvoda kojima je istekao vek trajanja, koji imaju MSI oznaku i koji su prodati u EU. Ove proizvode možete vratiti na lokalnim mestima za prikupljanje.

POLSKI

Aby chronić nasze środowisko naturalne oraz jako firma dbająca o ekologię, MSI przypomina, że...

Zgodnie z Dyrektywą Unii Europejskiej (“UE”) dotyczącą odpadów produktów elektrycznych i elektronicznych (Dyrektywa 2002/96/EC), która wchodzi w życie 13 sierpnia 2005, tzw. “produkty oraz wyposażenie elektryczne i elektroniczne “ nie mogą być traktowane jako śmieci komunalne, tak więc producenci tych produktów będą zobowiązani do odbierania ich w momencie gdy produkt jest wycofywany z użycia. MSI wypełni wymagania UE, przyjmując produkty (sprzedawane na terenie Unii Europejskiej) wycofywane z użycia. Produkty MSI będzie można zwracać w wyznaczonych punktach zbiorczych.

TÜRKÇE

Çevreci özelliğiyle bilinen MSI dünyada çevreyi korumak için hatırlatır:

Avrupa Birliği (AB) Kararnamesi Elektrik ve Elektronik Malzeme Atığı, 2002/96/EC Kararnamesi altında 13 Ağustos 2005 tarihinden itibaren geçerli olmak üzere, elektrikli ve elektronik malzemeler diğer atıklar gibi çöpe atılamayacak ve bu elektonik cihazların üreticileri, cihazların kullanım süreleri bittikten sonra ürünleri geri toplamakla yükümlü olacaktır. Avrupa Birliği'ne satılan MSI markalı ürünlerin kullanım süreleri bittiğinde MSI ürünlerin geri alınması isteği ile işbirliği içerisinde olacaktır. Ürünlerinizi yerel toplama noktalarına bırakabilirsiniz.

ČESKY

Záleží nám na ochraně životního prostředí - společnost MSI upozorňuje...

Podle směrnice Evropské unie ("EU") o likvidaci elektrických a elektronických výrobků 2002/96/EC platné od 13. srpna 2005 je zakázáno likvidovat "elektrické a elektronické výrobky" v běžném komunálním odpadu a výrobci elektronických výrobků, na které se tato směrnice vztahuje, budou povinni odebírat takové výrobky zpět po skončení jejich životnosti. Společnost MSI splní požadavky na odebírání výrobků značky MSI, prodávaných v zemích EU, po skončení jejich životnosti. Tyto výrobky můžete odevzdat v místních sběrnách.

MAGYAR

Annak érdekében, hogy környezetünket megvédjük, illetve környezetvédőként fellépve az MSI emlékezteti Önt, hogy ...

Az Európai Unió („EU") 2005. augusztus 13-án hatályba lépő, az elektromos és elektronikus berendezések hulladékairól szóló 2002/96/EK irányelve szerint az elektromos és elektronikus berendezések többé nem kezelhetőek lakossági hulladékként, és az ilyen elektronikus berendezések gyártói kötelessé válnak az ilyen termékek visszavételére azok hasznos élettartama végén. Az MSI betartja a termékvisszavétellel kapcsolatos követelményeket az MSI márkanév alatt az EU-n belül értékesített termékek esetében, azok élettartamának végén. Az ilyen termékeket a legközelebbi gyűjtőhelyre viheti.

ITALIANO

Per proteggere l'ambiente, MSI, da sempre amica della natura, ti ricorda che….

In base alla Direttiva dell'Unione Europea (EU) sullo Smaltimento dei Materiali Elettrici ed Elettronici, Direttiva 2002/96/EC in vigore dal 13 Agosto 2005, prodotti appartenenti alla categoria dei Materiali Elettrici ed Elettronici non possono più essere eliminati come rifiuti municipali: i produttori di detti materiali saranno obbligati a ritirare ogni prodotto alla fine del suo ciclo di vita. MSI si adeguerà a tale Direttiva ritirando tutti i prodotti marchiati MSI che sono stati venduti all'interno dell'Unione Europea alla fine del loro ciclo di vita. È possibile portare i prodotti nel più vicino punto di raccolta.

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Chapter 1
Overview

Thank you for choosing the MS-9298, a high-performance rackmount servers from MSI.

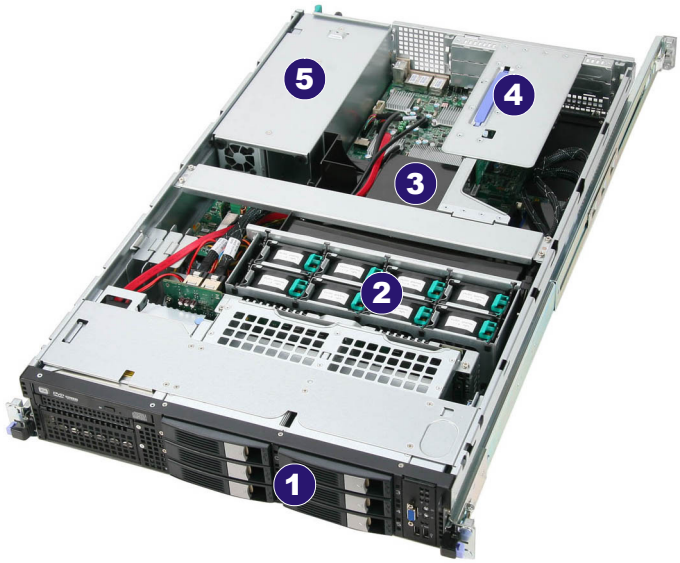
Based on the innovative Intel® 5520 & ICH10R chipsets for optimal system efficiency, the MS-9298 accommodates the latest Intel® Xeon 5500 Series processor and supports up to 12 DDR3 800/1066/1333 DIMM slots.

In the advanced-level and mid-range market segment, the MS-9298 can provide a high-performance solution for today's front-end and general purpose server, as well as in the future.

System Overview

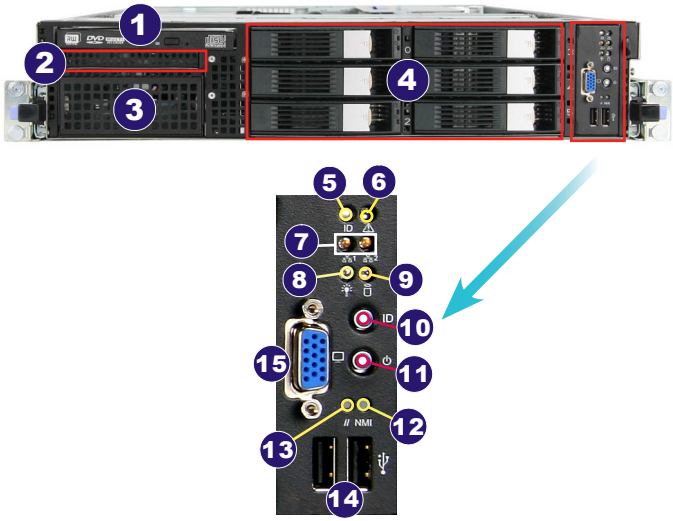
▣ Top View

NOTE: Before removing the rear cover, make sure that you remove the ODD front bezel first to avoid collision and damage.



1. **HDD Bay**
2. **Axial Fan Module (redundant)**
3. **Fan Duct**
4. **PCI Riser Card Bracket**
5. **SSI EPS 2U Power Supply**

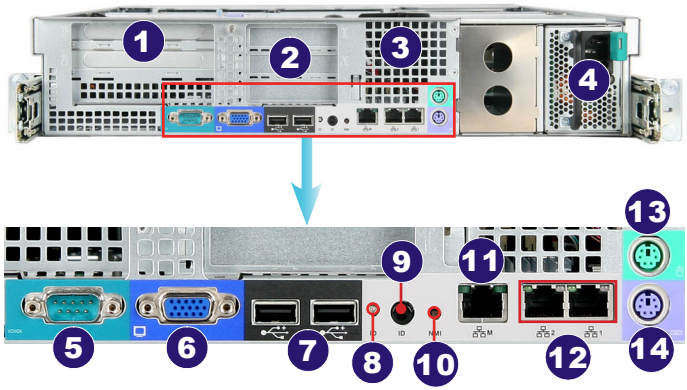
▣ Front View



1. Slim DVD Drive
2. Floppy Disk Drive
3. Tape Module Tray
4. Swappable Hard Disk Drive Bay
5. System ID LED
6. System Fault LED
7. LAN LED
8. Power LED
9. HDD LED
10. System ID Switch
11. Power Switch
12. NMI Switch
13. Reset Switch
14. USB Port
15. D-sub VGA Port

Front Bezel LEDs			
LED	**Color**	**State**	**Description**
Power/Sleep	Green	On	Legacy power on/ ACPI S0 state
		Blink	Sleep/ ACPI S1 state
	Off	Off	Power off/ ACPI S4, S5 state
HDD Activity	Green	Blink	HDD access activity
	Off	Off	No disk activity
LAN1/LAN2 Activity	Green	On	LAN link
	Green	Blink	LAN access activity
System Fault	Green	On	Running/ normal operation
	Amber	On	Critical or non-recoverable condition
	Amber	Blink	Non-critical condition
	Off	Off	POST/ system stop
System ID	Blue	On	Identify active via command or button
	Off	Off	No identification
Swappable HDD Status w/SAF-TE	Green	Blink	HDD access
	Amber	On	Failure or rebuild stopped
	Amber	Blink	Rebuild

▣ Rear View



1. Full Height Slot
2. Low Profile Slot
3. Ventilation Hole
4. SSI EPS 2U Power Supply
5. Serial Port
6. D-sub VGA Port
7. USB Port
8. System ID LED
9. System ID Switch
10. NMI Switch
11. Serial Console Port (for BMC)
12. Gigabit LAN Jack
13. PS/2 Mouse Port
14. PS/2 Keyboard Port

Important

When PS/2 devices are plugged into the PS/2 ports, the operating system will detect these devices as USB devices since the PS/2 ports adopt USB interface.

Rear Bezel LEDs			
LED	**Color**	**State**	**Description**
LAN Linkage	Green	On	LAN linked
	Green	Blink	LAN accessing
	Off	Off	No LAN linked
LAN Speed	Yellow	On	Gigabit mode
	Green	On	100M mode
	Off	Off	10M mode
System ID	Blue	On/Blink	Identified as active via command or button
	Off	Off	No identification

System Specifications

Processor

- Intel Xeon 5500 Series processor in LGA1366 package

Supported QPI

- Up to 6.4 GT/s

Chipset

- North Bridge: Intel 5520 chipset
- South Bridge: Intel ICH10R chipset

Memory

- 12 DDR3 800/1066/1333 DIMM slots (240pin / 1.5V)
- Supports the maximum of 192GB Registered DIMM or 96GB Unbuffered DIMM

Storage

- Supports up to 6 hot-swap SAS/ SATA HDDs (supported by SAS/ SATA RAID card)

LAN

- Gigabit Fast Ethernet by Intel 82576EB

System Management

- ServerEngines Pilot2 baseboard management controller (IPMI 2.0 compliant)

Graphics

- ServerEngines Pilot2 controller
- Onboard 32MB Video SDRAM

Input/Output Port, Switch, LED

- Front Panel
  - 1 system ID LED
  - 1 system fault LED
  - 2 LAN LEDs
  - 1 power LED
  - 1 HDD LED
  - 1 system ID switch
  - 1 power switch
  - 1 NMI switch
  - 1 reset switch
  - 2 USB ports
  - 1 D-sub VGA port
- Rear Panel
  - 1 PS/2 mouse port
  - 1 PS/2 keyboard port
  - 2 Gigabit LAN jacks
  - 1 serial console port (RJ-45 type, for BMC)

- 1 NMI switch
- 1 system ID switch
- 1 system ID LED
- 2 USB ports
- 1 D-sub VGA port
- 1 serial port

Chassis

- Form factor: 2U
- Dimension: 483mm (W) x 711mm (D) x 88 mm (H)
- Externally swappable 3.5-inch SATA HDD bay x 6
- 3.5-inch tape bay x 1
- Slim DVD bay x 1
- FDD bay x 1
- Full height slot x 2
- Low profile slot x 3

Power Supply

- 750 Watt Redundant_PSU
  - PFC Function: Yes
  - Form Factor: SSI EPS 2U
  - Redundancy Support: 1 + 1 Redundant
  - Safety Mark: UL, cUL, CE-mark, CCC and BSMI

Chapter 2
System Assembly

This chapter provides you with the information on system assembly procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.

Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

Getting Started

▣ Necessary Tools

	A Phillips (crosshead) screwdriver and a flathead screwdriver, can be used to do most of the installation. Choose one with a magnetic head would be better.
	Pliers, can be used as an auxiliary tool to connect some connectors or cables.
	Forceps, can be used to pick up tiny screws or set up the jumpers.
	Rubber gloves, can prevent yourself from being incised and suffering the static charge.

▣ Safety Precautions

The following precautions should be observed while handling the system:

- Place the system on a flat and stable surface.
- Do not place the system in environments subject to mist, smoke, vibration, excessive dust, salty or greasy air, or other corrosive gases and fumes.
- Do not drop or jolt the system.
- Disconnect the power supply before performing any installation procedures on the system.
- Do not perform any maintenance with wet hands.
- Prevent foreign substances, such as water, other liquids or chemicals, from entering the system while performing installation procedures on the system.
- Use a grounded wrist strap before handling system components such as CPU, Memory, HDD, PCI-E card, etc.
- Place system components on a grounded antistatic pad or on the bed that came with the components whenever the components are separated from the system.

System Assembly

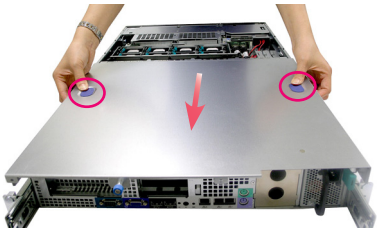
▣ System Cover

Step 1. Loosen the thumbscrew on the rear bezel of the system.

Step 2. Press the release buttons and slide the front chassis cover forwards.

Step 3. Lift the front chassis cover up to remove it from the chassis.

Step 4. Press the release buttons and slide the rear chassis cover backwards to remove it from the chassis.

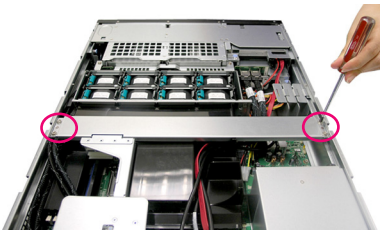


Important

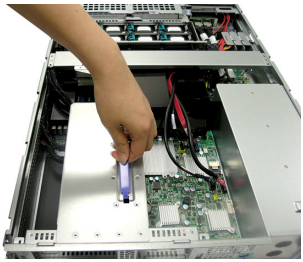
Before you remove or install any components, make sure the system is not turned on or connected to the AC power.

▣ CPU

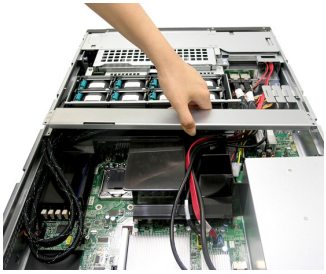
Step 1. On top of the CPU socket is a fan duct designed to enhance heat dissipation of the CPU. To remove the fan duct, first unscrew the metal bracket on its top.



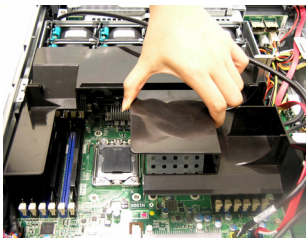
Step 2. Locate the riser card bracket and lift it up from the chassis.



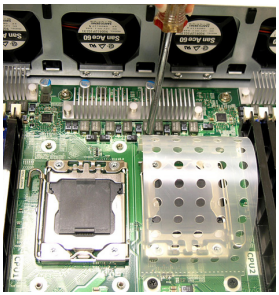
Step 3. Remove the metal bracket to uncover the fan duct.



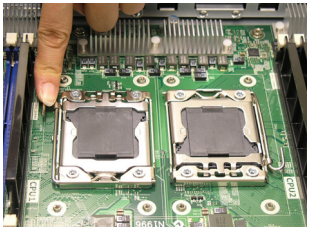
Step 4. Remove the fan duct and keep it aside for later use.

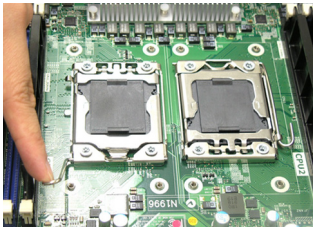


Step 5. Remove the dummy heat sink on the CPU2 socket.

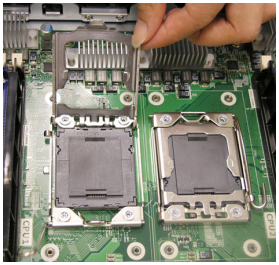


Step 6. Locate the CPU1 socket. Open the load lever and lift it up to its fullest extent.

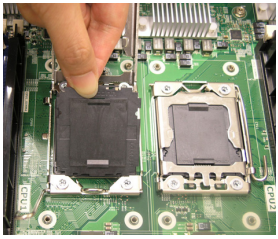




Step 7. Open the load plate.

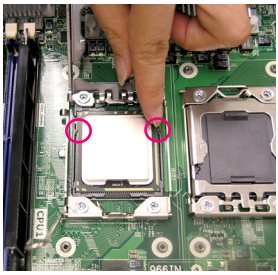


Step 8. The CPU socket has a plastic cap on it to protect the contact from damage. Before you install the CPU, always cover it to protect the socket pin. Remove the cap from the lever hinge side.

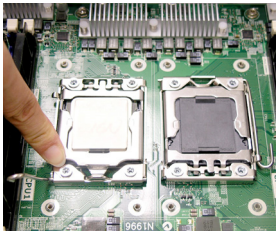


Step 9. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Be sure to grasp on the edge of the CPU base. Note that the alignment keys are matched.

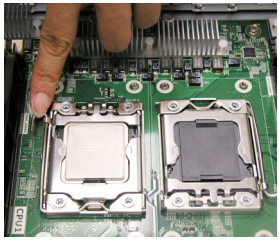
Visually inspect if the CPU is seated well into the socket. If not, take out the CPU with pure vertical motion and reinstall.



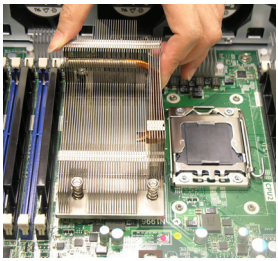
Step 10. Cover the load plate onto the package.

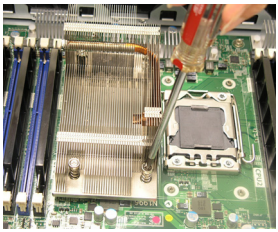


Step 11. Press down the load lever lightly onto the load plate, and then secure the lever with the hook under the retention tab.

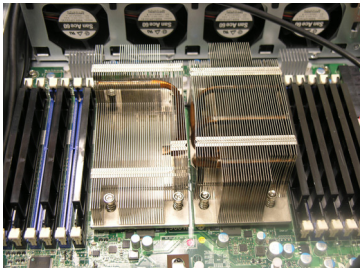


Step 12. Place the heat sink on top of CPU1 and secure the screws on both sides.



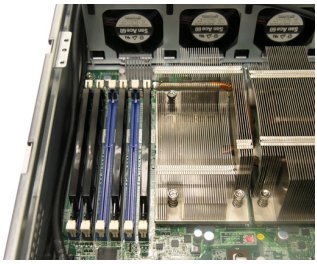


Step 13. Follow the same procedures to install the second CPU & heat sink.

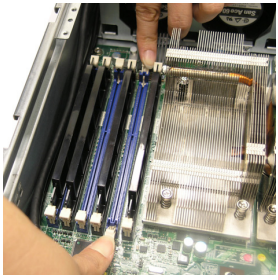


▣ Memory

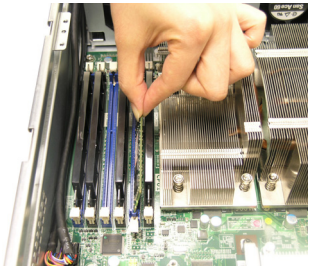
Step 1. Locate the DIMM1 slot.



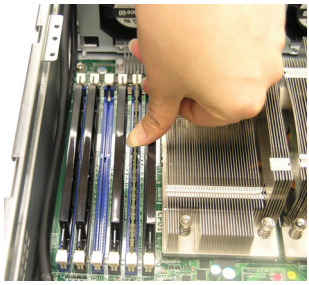
Step 2. Flip the slot clips outwards.



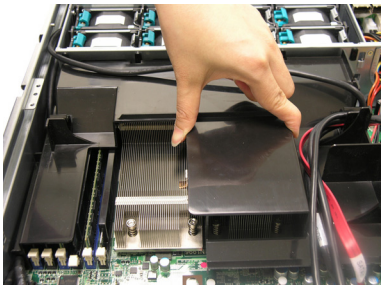
Step 3. Align the notch on the DIMM with the key on the slot and insert the DIMM vertically into the DIMM slot.



Step 4. Then push the DIMM in until its golden finger is deeply inserted in the DIMM slot. The slot clips at each side of the DIMM slot will automatically close when the DIMM is properly seated.



Step 5. Replace the fan duct on top of the CPU and DIMM.



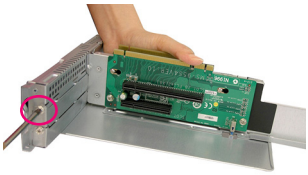
Important

- *In Multi-Channel mode, make sure that you install memory modules of the* ***same type and density*** *in different channel DIMM slots.*
- *To enable successful system boot-up, always insert the memory modules into the* ***DIMM1 first****.*
- *You can barely see the golden finger if the memory module is properly inserted in the DIMM slot.*

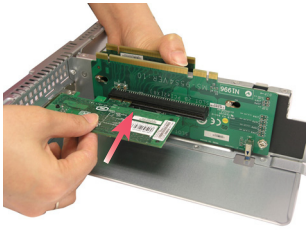
	Memory Population Rules
1 DIMM	CPU1_DIMM1 (Channel A0)
2 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0)
3 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1)
4 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1)
5 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0)
6 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0)
7 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0) + CPU1_DIMM5 (Channel B1)
8 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0) + CPU1_DIMM5 (Channel B1) + CPU2_DIMM5 (Channel B1)
9 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0) + CPU1_DIMM5 (Channel B1) + CPU2_DIMM5 (Channel B1) + CPU1_DIMM3 (Channel C0)
10 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0) + CPU1_DIMM5 (Channel B1) + CPU2_DIMM5 (Channel B1) + CPU1_DIMM3 (Channel C0) + CPU2_DIMM3 (Channel C0)
11 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0) + CPU1_DIMM5 (Channel B1) + CPU2_DIMM5 (Channel B1) + CPU1_DIMM3 (Channel C0) + CPU2_DIMM3 (Channel C0) + CPU1_DIMM6 (Channel C1)
12 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0) + CPU1_DIMM5 (Channel B1) + CPU2_DIMM5 (Channel B1) + CPU1_DIMM3 (Channel C0) + CPU2_DIMM3 (Channel C0) + CPU1_DIMM6 (Channel C1) + CPU2_DIMM6 (Channel C1)

▣ PCI Expansion Card

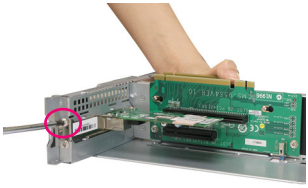
Step 1. The riser card bracket supports low-profile and full-length expansion cards. Unscrew the cover plates and put them aside for later use.



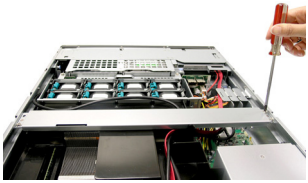
Step 2. Insert your expansion card into an appropriate PCI-E slot on the riser card.



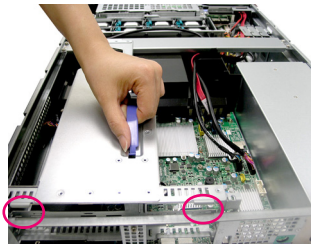
Step 3. Screw to secure the expansion card to the bracket.



Step 4. Put the metal bracket back and fasten it with screws.

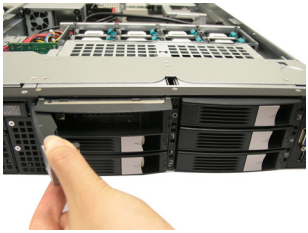


Step 5. Align the riser card golden fingers with the PCI-E slots on the mainboard. Push the riser card bracket carefully downwards until its wedgelocks engage to the chassis sidewall.



▣ Hard Disk Drive

Step 1. To release the hot-swapping HDD tray, flip open its lever and pull the tray out of the bay.



Step 2. Unscrew the HDD tray.

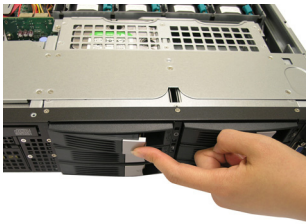
Step 3. Remove the tray and keep it aside for later use.

Step 4. Fit the HDD into the tray with screw holes aligned.

Step 5. Fasten the HDD with screws.

Step 6. Insert the HDD set into the bay.

Step 7. Press the lever back in place.



System Mounting

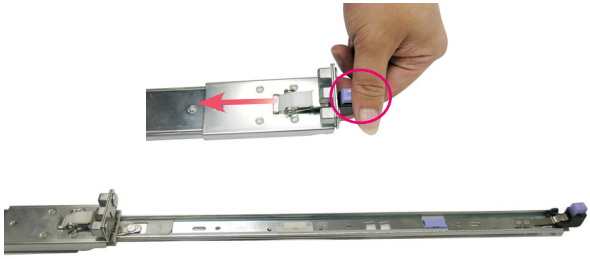
▣ Rack Rails

Important

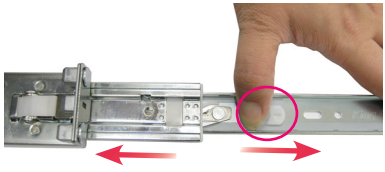
- *Only the service personnel can slide out the rack rails.*
- *The chassis rails are designed with locking tabs which can (1) hold the system firmly to the rack, and (2) lock the system halfway without directly sliding out of the rack when dismounting.*

Step 1. The chassis rails and rack rails have been assembled together beforehand. The first thing to do with the rail set is to take the chassis rails off the rack rails.

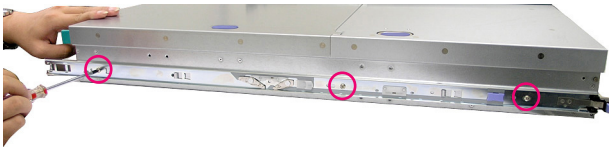
Step 2. Press the locking switch and pull the chassis rail gently out until the locking tab locks the rail.



Step 3. Simultaneously pull forward the locking tab and pull out the chassis rail. The chassis rail should slide easily off the rack rail.



Step 4. Attach the chassis rail to the chassis with 3 screws.
Step 5. Follow the same procedures to install the second chassis rail.



▣ Rack Mounting

Step 1. Adjust the rack rail length to fit your rack.

Step 2. Position the rack rail at the desired location in the rack. Make sure the sliding guide is facing inwards.

Step 3. Secure the rack rail to the rack with the cage nuts on the front and rear brackets.

Step 4. Follow the above procedures to install the second rack rail.

Step 5. Align the chassis rails with the rack rails. Slide the system into the rack with even force on both sides

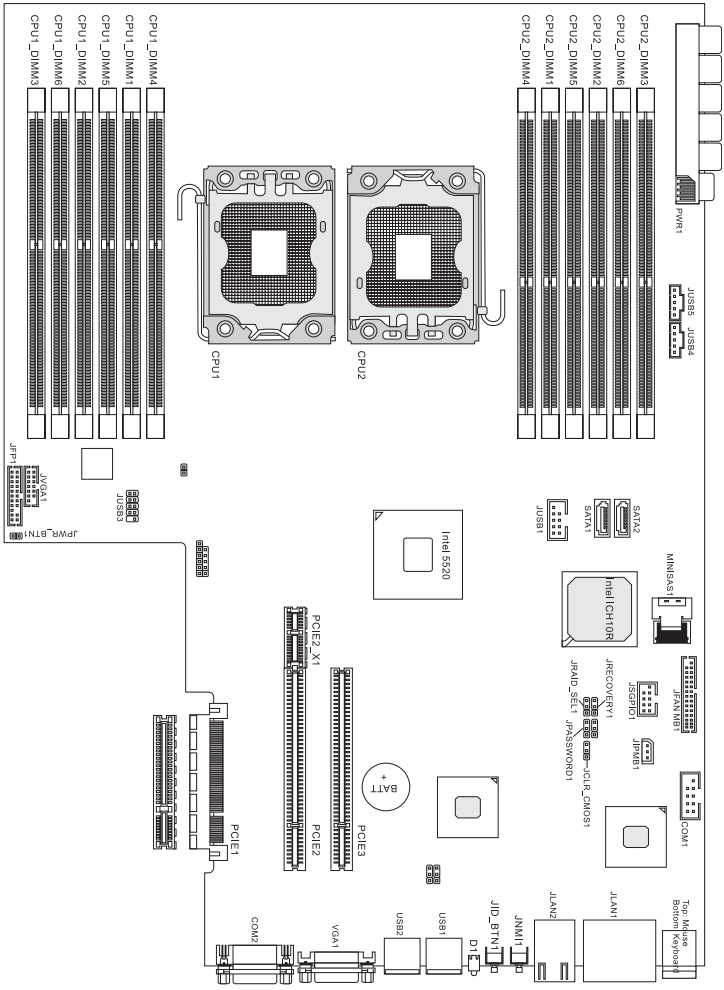
Step 6. When the system is locked halfway, depress the locking tabs to enable smooth mounting.

Step 7. The locking tabs should click when the system has been pushed completely into the rack.

Chapter 3
Mainboard Setup

This chapter provides you with the information on mainboard hardware configurations. Incorrect setting of jumpers and connectors may damage your mainboard. Please pay special attention not to connect these headers in wrong direction. DO NOT adjust any jumper while the mainboard is powered on.

Quick Components Guide



CPU (Central Processing Unit)

When you are installing the CPU, make sure that you install the cooler to prevent overheating. If you do not have the CPU cooler, consult your dealer before turning on the computer.

Important

Overheating

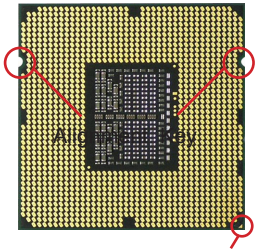
Overheating will seriously damage the CPU and system. Always make sure the cooling fan can work properly to protect the CPU from overheating. Make sure that you apply an even layer of thermal paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.

Replacing the CPU

While replacing the CPU, always turn off the power supply or unplug the power supply's power cord from the grounded outlet first to ensure the safety of CPU.

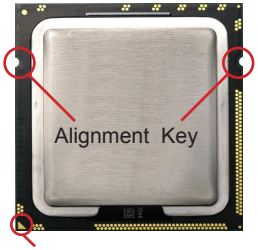
Introduction to LGA 1366 CPU

The pin-pad side of LGA 1366 CPU.



Yellow triangle is the Pin 1 indicator

The surface of LGA 1366 CPU. Remember to apply some thermal paste on it for better heat dispersion.



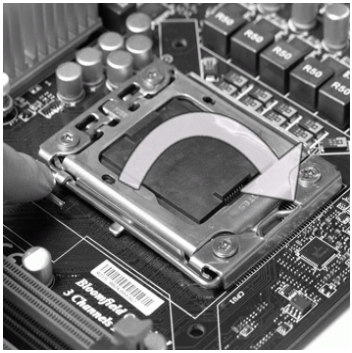
Yellow triangle is the Pin 1 indicator

CPU Installation

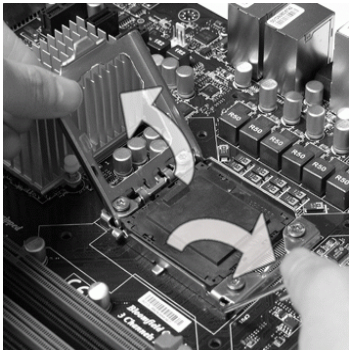
When you are installing the CPU, **make sure the CPU has a cooler attached on the top to prevent overheating**. Meanwhile, do not forget to apply some thermal paste on CPU before installing the heat sink/cooler fan for better heat dispersion.

Follow the steps below to install the CPU correctly. Wrong installation will cause the damage of your CPU & mainboard.

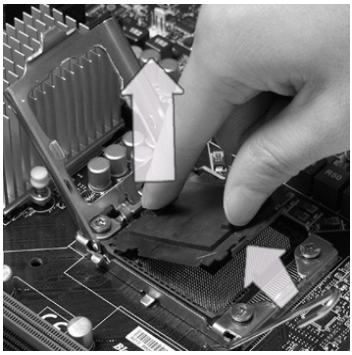
1. Open the load lever.



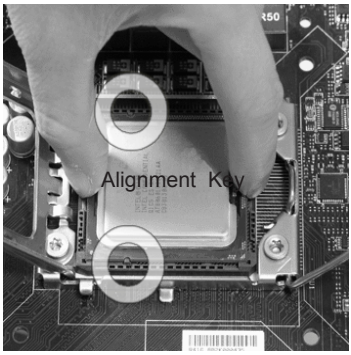
2. Lift the load lever up and open the load plate.



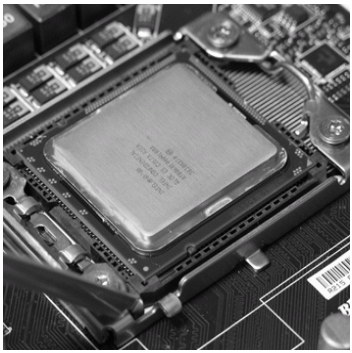
3. The CPU socket has a plastic cap on it to protect the contact from damage. Before you install CPU, always cover it to protect the socket pin. Remove the cap from the lever hinge side.



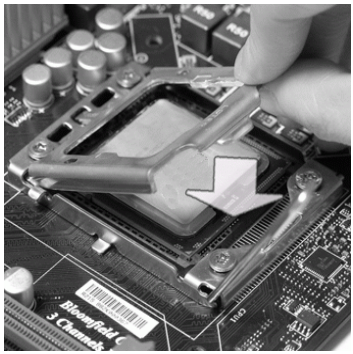
4. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Be sure to grasp on the edge of the CPU base. Note that the alignment keys are matched.



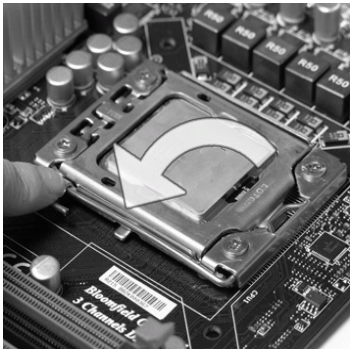
5. Visually inspect if the CPU is seated well into the socket. If not, take out the CPU with pure vertical motion and reinstall.



6. Cover the load plate onto the package.



7. Press down the load lever lightly onto the load plate, and then secure the lever with the hook under the retention tab.



Important

- *Confirm if your CPU cooler is firmly installed before turning on your system.*
- *Do not touch the CPU socket pins to avoid damage.*

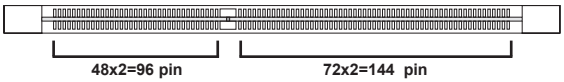
Important

- *Read the CPU status in BIOS.*
- *Whenever CPU is not installed, always protect your CPU socket pin with the plastic cap covered (shown in Figure 1) to avoid damage.*
- *Mainboard photos shown in this section are for demonstration of the CPU installation only. The appearance of your mainboard may vary depending on the model you purchased.*
- *Please refer to the documentation in the CPU fan package for more details about the CPU fan installation.*

MEMORY

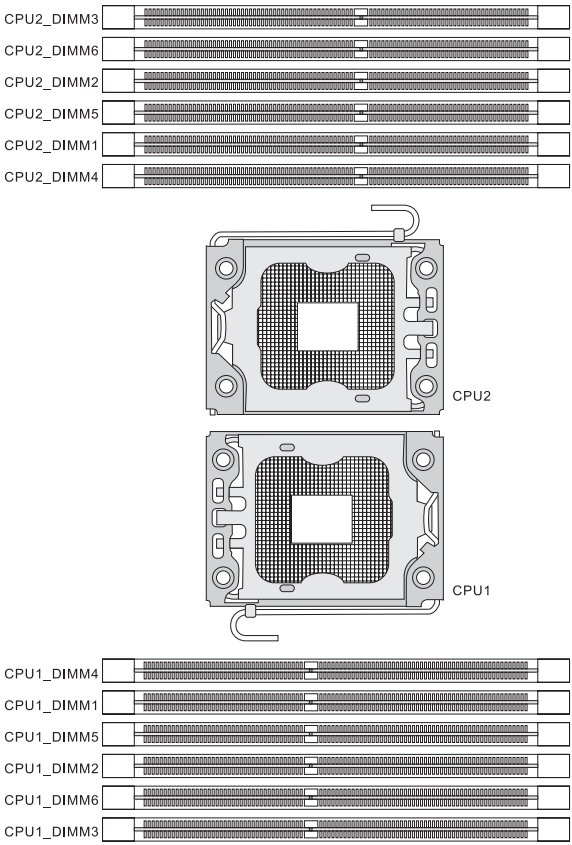
These DIMM slots are intended for memory modules.

DDR3
240-pin, 1.5V



Memory Population Rules

In Multi-Channel mode, make sure that you install memory modules of the **same type and density** in different channel DIMM slots.



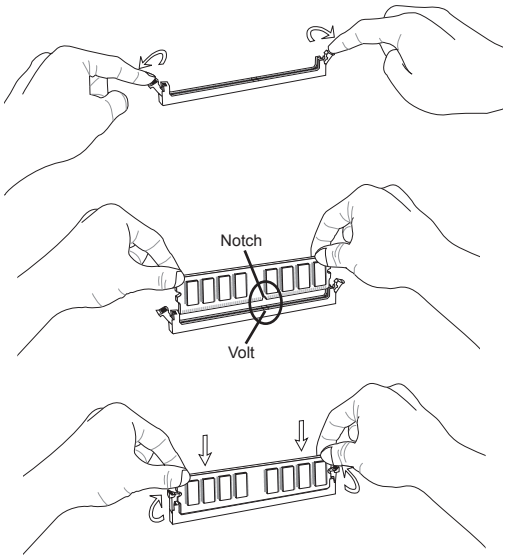
	Population Rules
1 DIMM	CPU1_DIMM1 (Channel A0)
2 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0)
3 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1)
4 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1)
5 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0)
6 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0)
7 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0) + CPU1_DIMM5 (Channel B1)
8 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0) + CPU1_DIMM5 (Channel B1) + CPU2_DIMM5 (Channel B1)
9 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0) + CPU1_DIMM5 (Channel B1) + CPU2_DIMM5 (Channel B1) + CPU1_DIMM3 (Channel C0)
10 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0) + CPU1_DIMM5 (Channel B1) + CPU2_DIMM5 (Channel B1) + CPU1_DIMM3 (Channel C0) + CPU2_DIMM3 (Channel C0)
11 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0) + CPU1_DIMM5 (Channel B1) + CPU2_DIMM5 (Channel B1) + CPU1_DIMM3 (Channel C0) + CPU2_DIMM3 (Channel C0) + CPU1_DIMM6 (Channel C1)
12 DIMMs	CPU1_DIMM1 (Channel A0) + CPU2_DIMM1 (Channel A0) + CPU1_DIMM4 (Channel A1) + CPU2_DIMM4 (Channel A1) + CPU1_DIMM2 (Channel B0) + CPU2_DIMM2 (Channel B0) + CPU1_DIMM5 (Channel B1) + CPU2_DIMM5 (Channel B1) + CPU1_DIMM3 (Channel C0) + CPU2_DIMM3 (Channel C0) + CPU1_DIMM6 (Channel C1) + CPU2_DIMM6 (Channel C1)

Installing Memory Modules

1. The memory module has only one notch on the center and will only fit in the right orientation.
2. Insert the memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the DIMM slot. The plastic clip at each side of the DIMM slot will automatically close when the memory module is properly seated.
3. Manually check if the memory module has been locked in place by the DIMM slot clips at the sides.

Important

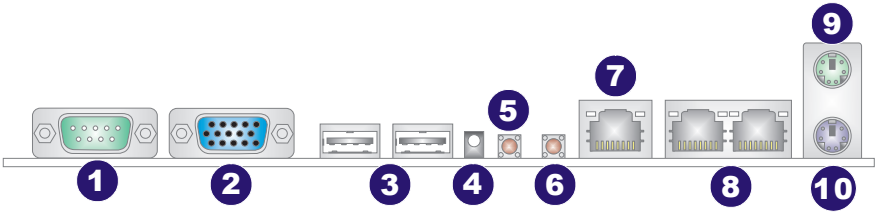
You can barely see the golden finger if the memory module is properly inserted in the DIMM slot.



Important

- *In Multi-Channel mode, make sure that you install memory modules of the* ***same type and density*** *in different channel DIMM slots.*
- *To enable successful system boot-up, always insert the memory modules into the* ***DIMM1 first****.*

Rear Panel I/O

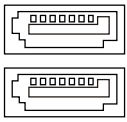


1. **Serial Port**
2. **D-sub VGA Port**
3. **USB Port**
4. **System ID LED**
5. **System ID Switch**
6. **NMI Switch**
7. **Serial Console Port (for BMC)**
8. **Gigabit LAN Jack**
9. **PS/2 Mouse Port**
10. **PS/2 Keyboard Port**

Connector

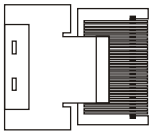
Serial ATA II Connector: SATA1, SATA2

This connector is a high-speed Serial ATA II interface port. Each connector can connect to one Serial ATA II device.



Serial Attached SCSI Connector: MINISAS1

The SAS connector is a new generation serial communication protocol for devices designed to allow for much higher speed data transfers. It supports data transfer speeds up to 3 Gbit/s. SAS uses serial communication instead of the parallel method found in traditional SCSI devices but still uses SCSI commands for interacting with SAS devices. Each SAS connector can connect to 1 disk drive.



Important

Please do not fold the SATA/SAS cable into 90-degree angle. Otherwise, data loss may occur during transmission.

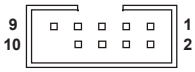
IPMB Connector: JIPMB1

This connector is used to connect the IPMB (Intelligent Platform Management Bus) SMBus.

PIN	SIGNAL
1	SMB Data
2	GND
3	SMB Clock

Serial Port Connector: COM1

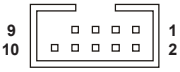
This connector is a 16550A high speed communications port that sends/receives 16 bytes FIFOs. You can attach a serial device to it through the optional serial port bracket.



PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	DSR	Data Set Ready
3	RXD	Serial In or Receive Data
4	RTS	Request To Send
5	TXD	Serial Out or Transmit Data
6	CTS	Clear To Send
7	DTR	Data Terminal Ready
8	RI	Ring Indicate
9	GND	Ground
10	KEY	Key

Front USB Connector: JUSB1, JUSB3, JUSB4, JUSB5

This connector, compliant with Intel I/O Connectivity Design Guide, is ideal for connecting high-speed USB interface peripherals such as USB HDD, digital cameras, MP3 players, printers, modems and the like.



JUSB1

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	KEY	10	NC

JUSB3

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	KEY	10	NC

JUSB4/5

PIN	SIGNAL
1	+5V
2	USB-
3	USB+
4	GND
5	GND

JUMPER

Clear CMOS Jumper: JCLR_CMOS1

There is a CMOS RAM onboard that has a power supply from an external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, set the jumper to clear data.

JCLR_CMOS1

Normal or Clear by BMC (default)

Clear Data

Important

You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

BIOS Recovery Jumper: JRECOVERY1

Users can short connect pin#2-3 to recover the system BIOS with a Recovery Floppy. When the system is done with the job, the buzzer will beep to remind the user to set the jumper to its normal state (pin#1-2 short connected).

JRECOVERY1

Normal (default)

BIOS recovery

BIOS Password Jumper: JPASSWORD1

The jumper is used to clear the BIOS password. You can clear BIOS password byshorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the password while the system is on; it will damage the mainboard.

JPASSWORD1

Normal (default)

Password clear

RAID Select Jumper: JRAID_SEL1

This jumper specifies the RAID solution.

JRAID_SEL1

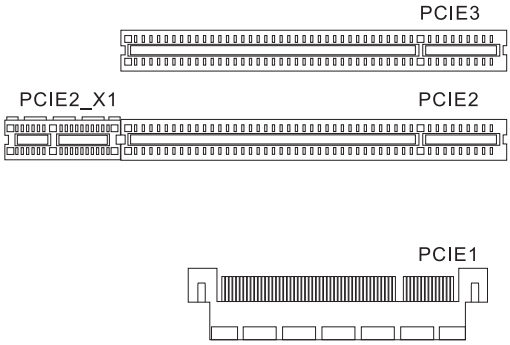
Normal (default)

Software RAID

Slot

PCI (Peripheral Component Interconnect) Express Slot

The PCI Express slots support PCI-E interface expansion cards.



Important

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

Chapter 4
BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Important

- The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.
- Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format:

A9298IMS V1.0 101609 where:

1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX.

2nd - 5th digit refers to the model number.

6th digit refers to the chipset as I = Intel, N = NVIDIA, A = AMD and V = VIA.

7th - 8th digit refers to the customer as MS = all standard customers.

V1.0 refers to the BIOS version.

101609 refers to the date this BIOS was released.

Control Keys

← →	Select Screen
↑ ↓	Select Item
+ -	Change Field
Tab	Select Field
F1	General Help
F10	Save and Exit
Esc	Exit

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

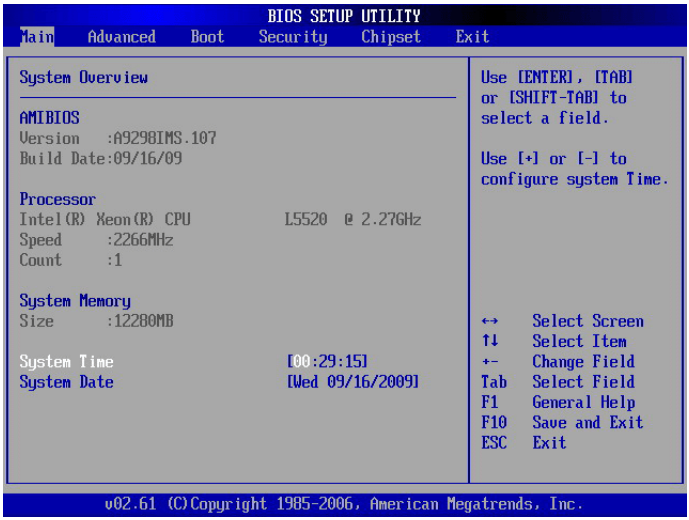
Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

The Menu Bar



▸**Main**

Use this menu for basic system configurations, such as time, date etc.

▸**Advanced**

Use this menu to setup the items of special enhanced features.

▸**Boot**

Use this menu to specify the priority of boot devices.

▸**Security**

Use this menu to set supervisor and user passwords.

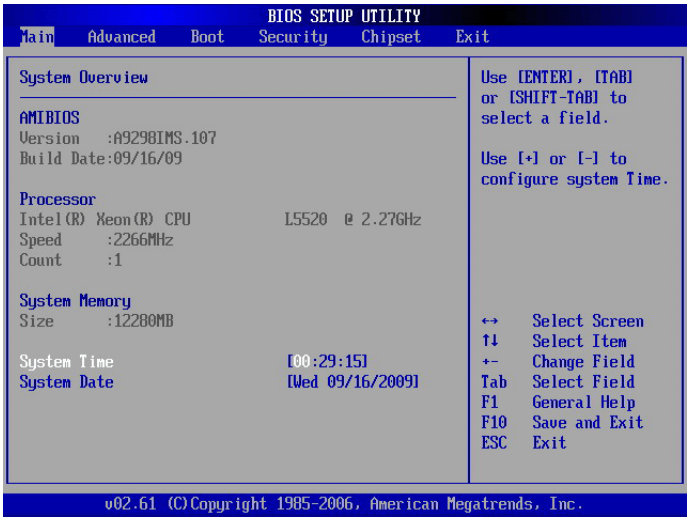
▸**Chipset**

This menu controls the advanced features of the onboard Northbridge and Southbridge.

▸**Exit**

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.

Main



▸AMI BIOS, Processor, System Memory

These items show the firmware and hardware specifications of your system. Read only.

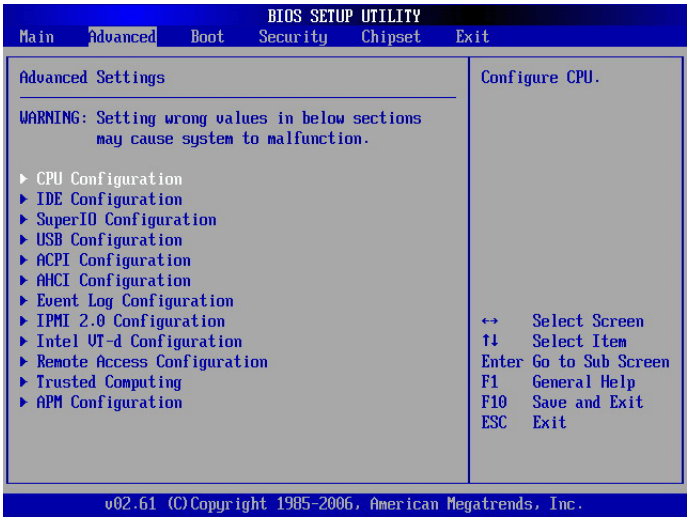
▸System Time

This setting allows you to set the system time. The time format is <Hour> <Minute> <Second>.

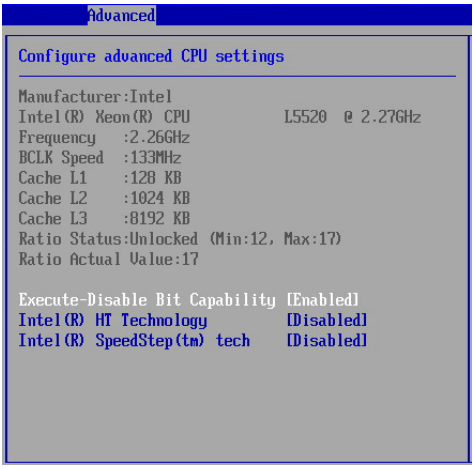
▸System Date

This setting allows you to set the system date. The date format is <Day>, <Month> <Date> <Year>.

ADVANCED



▸CPU Configuration



▸**Execute Disable Bit**

Intel's Execute Disable Bit functionality can prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system. This functionality allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation.

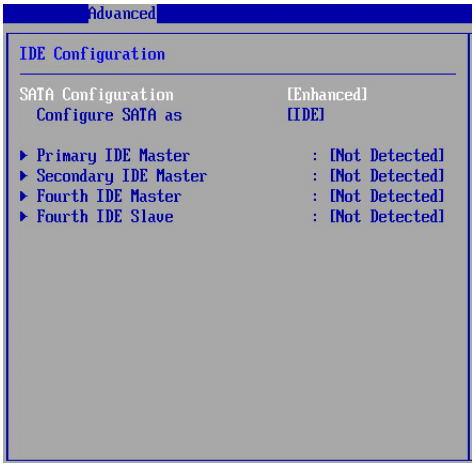
▸**Intel(R) HT Technology**

The processor uses Hyper-Threading technology to increase transaction rates and reduces end-user response times. The technology treats the two cores inside the processor as two logical processors that can execute instructions simultaneously. In this way, the system performance is highly improved. If you disable the function, the processor will use only one core to execute the instructions. Please disable this item if your operating system doesn't support HT Function, or unreliability and instability may occur.

▸**Intel(R) SpeedStep(tm) Tech**

EIST (Enhanced Intel SpeedStep Technology) allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production.

▸**IDE Configuration**



▸**SATA Configuration**

This setting specifies the SATA controller mode.

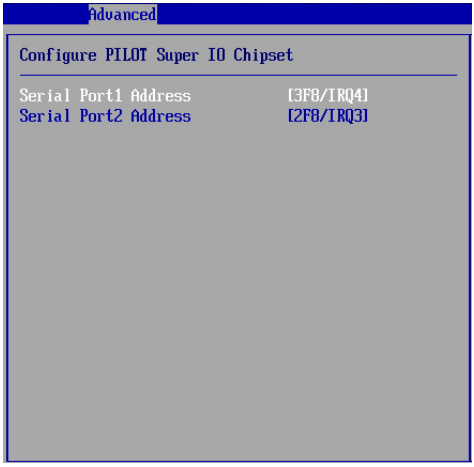
▸**Configure SATA as**

This setting specifies the operation mode of the installed SATA drive.

▸Primary/Secondary/Fourth IDE Master/Slave

[Type]	Press PgUp/<+> or PgDn/<-> to select [Manual], [None] or [Auto] type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use [Manual] to define your own drive type manually.
[LBA/Large Mode]	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors
[Block(Multi-Sector Transfer)]	Any selection except Disabled determines the number of sectors transferred per block
[PIO Mode]	Indicates the type of PIO (Programmed Input/Output)
[DMA Mode]	Indicates the type of Ultra DMA
[S.M.A.R.T.]	This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.
[32 Bit Data Transfer]	Enables 32-bit communication between CPU and IDE controller

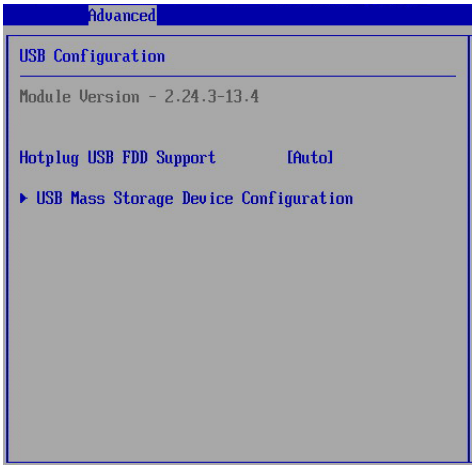
▸Super IO Configuration



▸Serial Port 1 Address, Serial Port 2 Address

Select an address and a corresponding interrupt for the serial port 1/2.

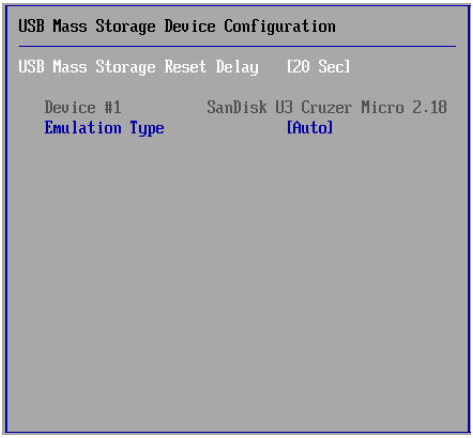
▸USB Configuration



▸Hotplug USB FDD Support

Set to [Enabled] if your need to use a hotplug USB-interfaced FDD in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix.

▸USB Mass Storage Device Configuration



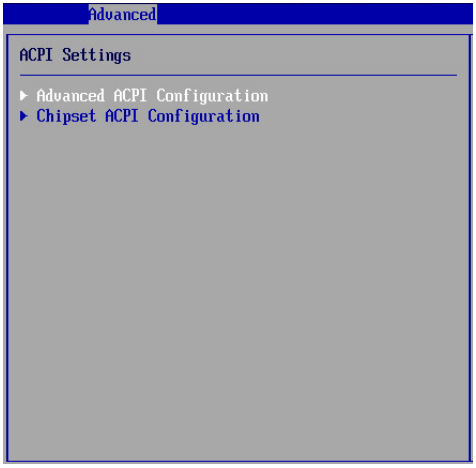
▸**USB Mass Storage Reset Delay**

This setting controls the number of seconds the POST waits for the USB mass storage device after the start unit command is sent.

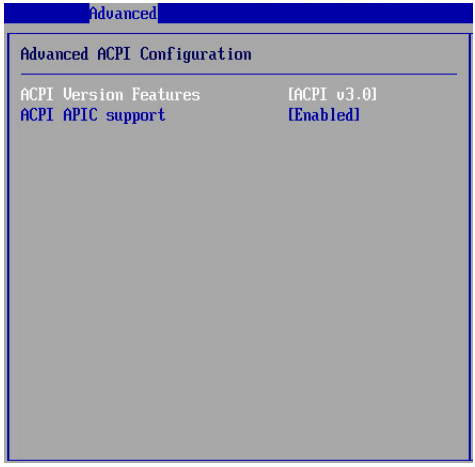
▸**Emulation Type**

This setting enables you to set the type of device you want the USB mass storage device to emulate.

▸**ACPI Configuration**



▸**Advanced ACPI Configuration**



▸**ACPI Version Features**

This setting specifies the ACPI version.

▸**ACPI APIC Support**

This BIOS feature is used to enable or disable the motherboard's APIC (Advanced Programmable Interrupt Controller). The APIC provides multi-processor support, more IRQs and faster interrupt handling.

▸**Chipset ACPI Configuration**

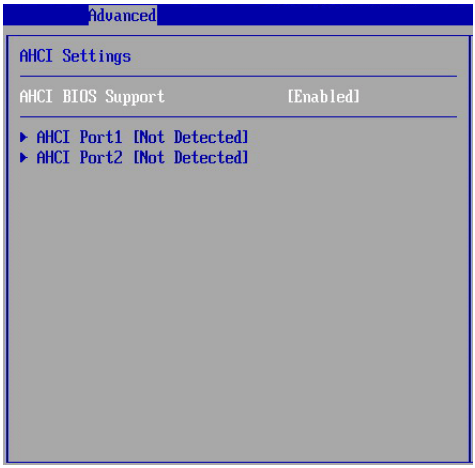
▸**High Performance Event Timer**

The High Precision Event Timer (HPET) was developed jointly by Intel and Microsoft to meet the timing requirements of multimedia and other time-sensitive applications. In addition to extending the capabilities and precision of a system, the HPET also improves system performance.

▸**HPET Memory Address**

This setting specifies the memory address of the High Precision Event Timer (HPET).

▸AHCI Configuration



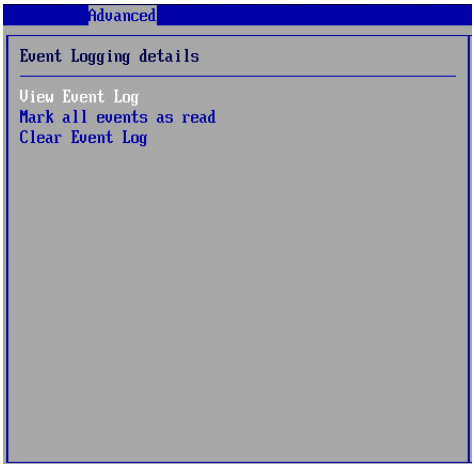
▸AHCI BIOS Support

This BIOS feature controls the SATA controller's AHCI (Advanced Host Controller Interface) functionality. It is a new interface specification that enables advanced SATA features like Native Command Queuing (NCQ) and hot-plugging.

▸AHCI Port 1, AHCI Port 2

Press [Enter] to view the submenu of advanced settings for AHCI ports.

▸Event Log Configuration



▸View Event Log

Press [Enter] to view the contents of the DMI event log.

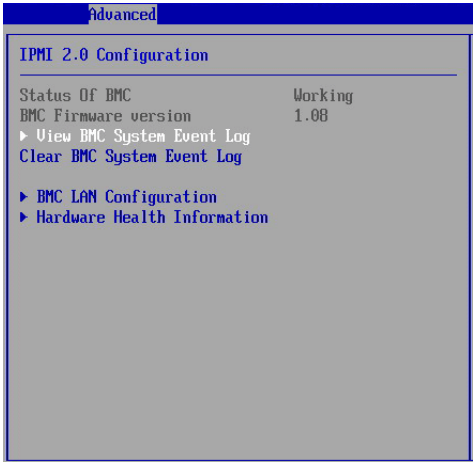
▸Mark All Events as Read

Press [Enter] and a screen pops up, asking users to confirm whether or not to clear all DMI event logs immediately. Press [Y] and [Enter], the BIOS will clear all DMI event logs right away.

▸Clear Event Log

When this setting is set to [OK], the DMI event log will be cleared instantly.

▸IPMI 2.0 Configuration



▸Status of BMC, BMC Firmware Version

These settings show the status of the BMC (Baseboard Management Controller) chip and its firmware version. Read only.

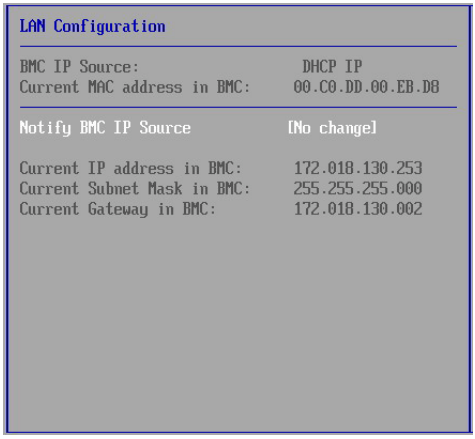
▸View BMC System Event Log

Use this function to view system event logs recorded by BMC.

▸Clear BMC System Event Log

Use this function to clear system event logs recorded by BMC.

▸BMC LAN Configuration



▸**Notify BMC IP Source**

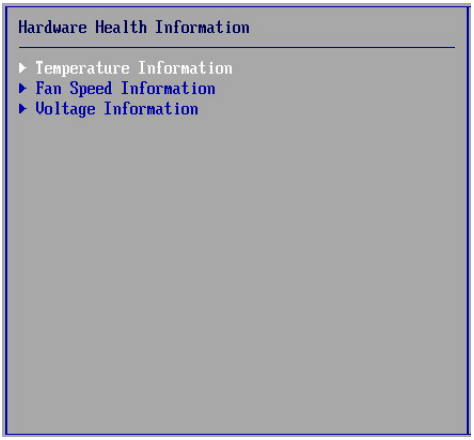
Use this setting to check the BMC IP source.

▸**Current IP Address in BMC, Current Subnet Mask in BMC, Current Gateway in BMC**

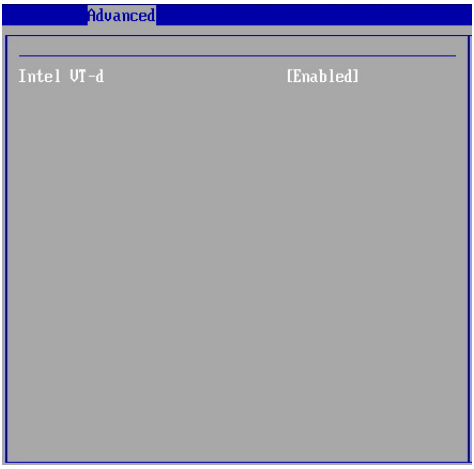
Use these settings to view the IP address, subnet mask, and gateway in BMC.

▸**Hardware Health Information**

These items display the current status of all of the monitored hardware devices/components such as voltages, temperatures and all fans' speeds.



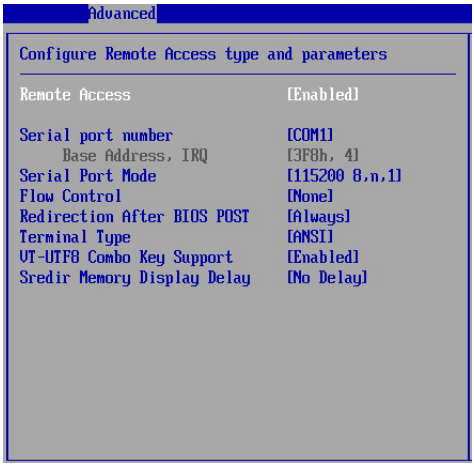
▸**Intel VT-d Configuration**



▸ **Intel VT-d**

Intel Virtualization Technology for Directed I/O (Intel VT-d) provides the capability to ensure improved isolation of I/O resources for greater reliability, security, and availability.

▸**Remote Access Configuration**



▸**Remote Access**

The setting enables/disables the remote access function. When set to [Enabled], users may configure the following settings for remote access type and parameters.

▸ **Serial Port Number, Base Address, IRQ, Serial Port Mode**

Use these settings to configure ports for remote access.

▸**Flow Control**

Flow control is the process of managing the rate of data transmission between two nodes. It's the process of adjusting the flow of data from one device to another to ensure that the receiving device can handle all of the incoming data. This is particularly important where the sending device is capable of sending data much faster than the receiving device can receive it.

▸ **Redirection After BIOS POST**

This setting determines whether or not to keep terminals?console redirection running after the BIOS POST has booted.

▸ **Terminal Type**

To operate the system's console redirection, you need a terminal supporting ANSI terminal protocol and a RS-232 null modem cable connected between the host system and terminal(s). This setting specifies the type of terminal device for console redirection.

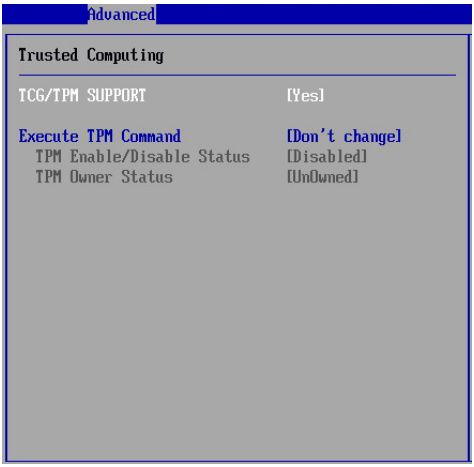
▸**VT-UTF8 Combo Key Support**

This setting enables/disables the VT-UTF8 combination key support for ANSI/VT100 terminals.

▸**Sredir Memory Display Delay**

Use this setting to set the delay in seconds to display memory information.

▸Trusted Computing



▸TCG/TPM Support

This setting controls the Trusted Platform Module (TPM) designed by the Trusted Computing Group (TCG). TPMs are special-purpose integrated circuits (ICs) built into a variety of platforms to enable strong user authentication and machine attestation -- essential to prevent inappropriate access to confidential and sensitive information and to protect against compromised networks.

▸Execute TPM Command

TPM commands are managed through a child node of the TPM Management console named Command Management. To block or allow a TPM command is a task that local administrators can perform during the setup or re-configuration of a TPM-equipped computer.

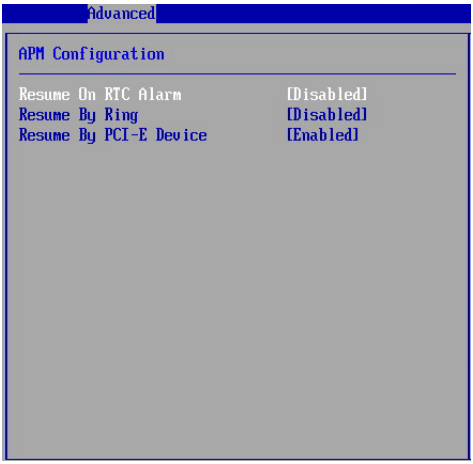
▸TPM Enable/Disable Status

This setting displays the TPM enable/disable status. Read only.

▸TPM Owner Status

This setting shows the TPM ownership. Read only.

▸APM Configuration



▸Resume On RTC Alarm

When [Enabled], your can set the date and time at which the RTC (real-time clock) alarm awakens the system from suspend mode.

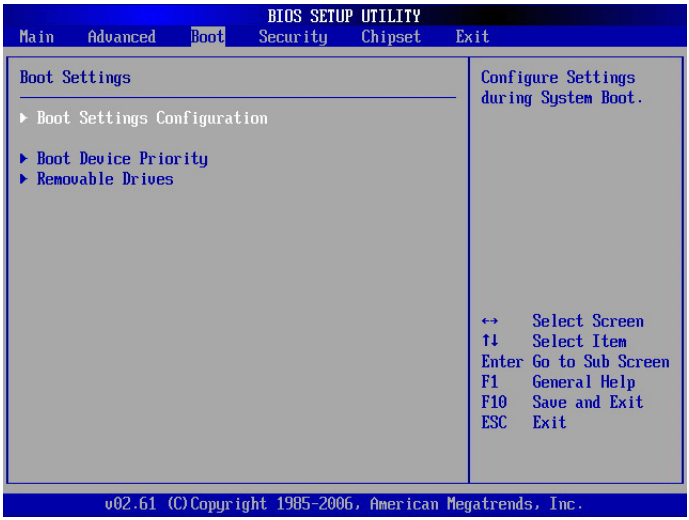
▸Resume By Ring

An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

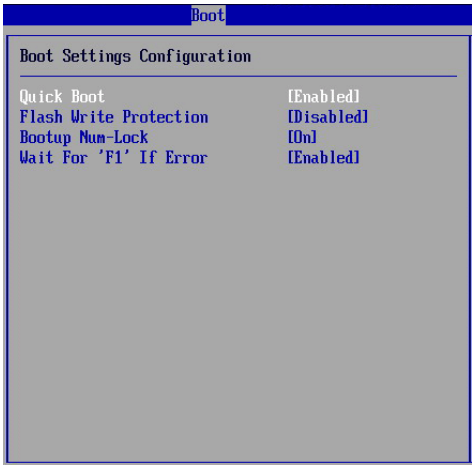
▸Resume By PCI-E Device

When setting to [Enabled], this setting allows your system to be awakened from power saving modes through any PME (Power Management Event) from PCI-E devices.

Boot



▸Boot Settings Configuration



▸Quick Boot

Enabling this setting will cause the BIOS power-on self test routine to skip some of its tests during bootup for faster system boot.

▸**Flash Write Protection**

This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When enabled, the BIOS data cannot be changed when attempting to update the BIOS with a Flash utility. To successfully update the BIOS, you will need to disable this Flash Protection function.

▸**Bootup Num-Lock**

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

▸**Wait For "F1" If Error**

When this setting is set to [Enabled] and the boot sequence encounters an error, it asks you to press F1. If disabled, the system continues to boot without waiting for you to press any keys.

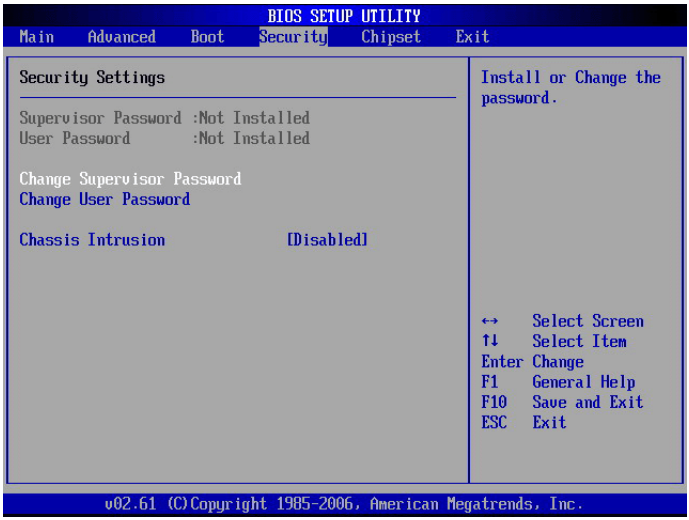
▸**Boot Device Priority**

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

▸**Removable Drives**

This setting allows users to set the priority of the removable devices. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

SECURITY



▸Supervisor Password / Change Supervisor Password

Supervisor Password controls access to the BIOS Setup utility. These settings allow you to set or change the supervisor password.

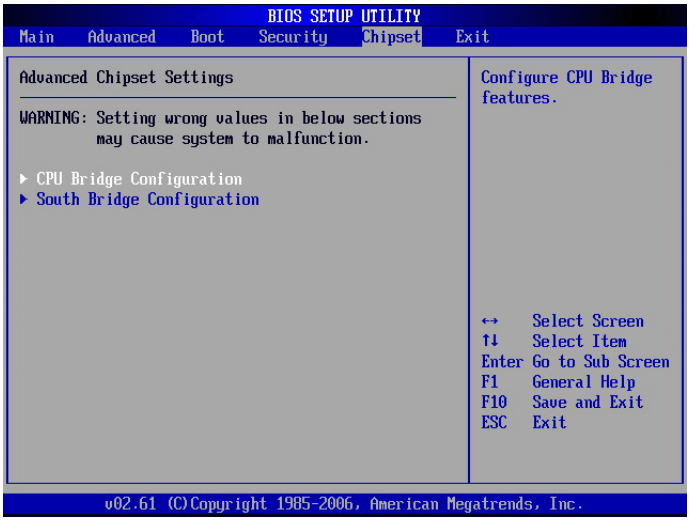
▸User Password / Change User Password

User Password controls access to the system at boot. These settings allow you to set or change the user password.

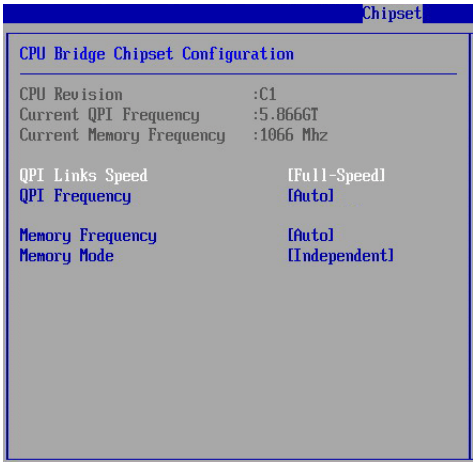
▸Chassis Intrusion

The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to [Reset]. The setting of the field will automatically return to the default value later.

CHIPSET



▸CPU Bridge Configuration



▸QPI Links Speed

QPI is an architecture which features high-speed serial links for interconnec-

tions between chips. This setting allows you to adjust the QPI link speed.

▸ **QPI Frequency**

This setting controls the QuickPath Interconnect clock.

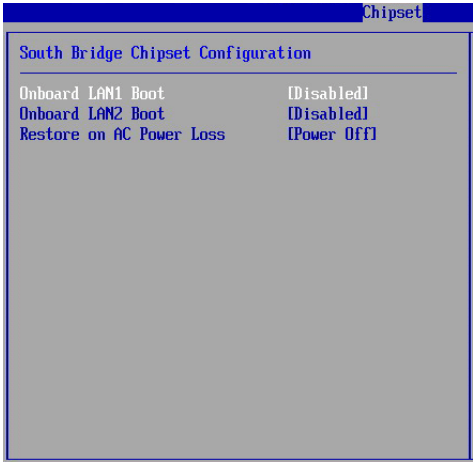
▸**Memory Frequency**

This item allows you to select the memory frequency.

▸**Memory Mode**

This setting specifies the memory mode.

▸**South Bridge Configuration**



▸**Onboard LAN1, LAN2 Boot**

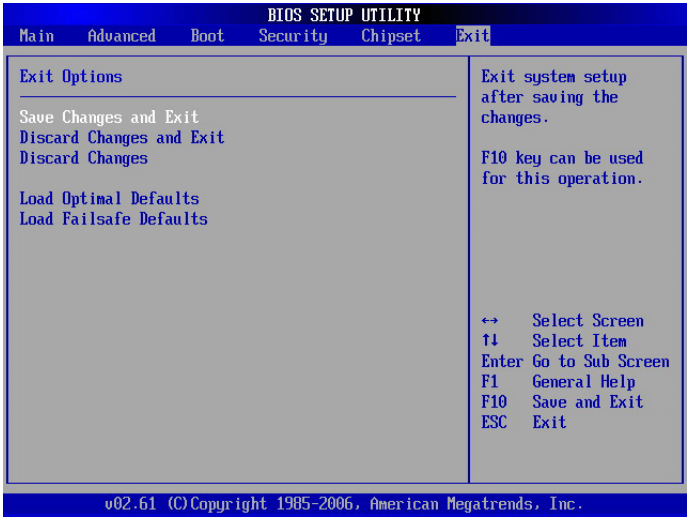
The items enable or disable the initialization of the onboard LAN Boot ROMs during bootup. Selecting [Disabled] will speed up the boot process.

▸**Restore on AC Power Loss**

This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

[Power Off]	Leaves the computer in the power off state.
[Power On]	Leaves the computer in the power on state.
[Last State]	Restores the system to the previous status before power failure or interrupt occurred.

Exit



▸**Save Changes and Exit**

Save changes to CMOS and exit the Setup Utility.

▸**Discard Changes and Exit**

Abandon all changes and exit the Setup Utility.

▸**Discard Changes**

Abandon all changes and continue with the Setup Utility.

▸**Load Optimal Defaults**

Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

▸**Load Failsafe Defaults**

Use this menu to load the default values set by the BIOS vendor for stable system performance.