

GA-X79-UP4

User's Manual

Rev. 1001

12ME-X79UP4-1001R

Declaration of Conformity

We, Manufacturer/Importer,

G.B.T. Technology Trading GmbH

Address: **Bullenkoppel 16, 22047 Hamburg, Germany**

Declare that the product

Product Type: **Motherboard**

Product Name: **GA-X79-UP4**

conforms with the essential requirements of the following directives:

2004/108/EC EMC Directive:

- Conduction & Radiated Emissions: EN 55022:2010
- Immunity: EN 55024:2010
- Power-line harmonics: EN 61000-3-2:2006+A2:2009
- Power-line flicker: EN 61000-3-3:2008

2006/95/EC LVD Directive

- Safety: EN60950-1:2006+A12:2011

2011/65/EU RoHS Directive

- Restriction of use of certain substances in electronic equipment: This product does not contain any of the restricted substances listed in Annex II, in concentrations and applications banned by the directive.

CE marking



Signature: Timmy Huang

(Stamp)

Date: Jul 27, 2012

Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)



Responsible Party Name: G.B.T. INC. (U.S.A.)

Address: 17358 Railroad Street

City of Industry, CA 91748

Phone/Fax No: (626) 854-9338/ (626) 854-9326

hereby declares that the product

Product Name: Motherboard

Model Number: GA-X79-UP4

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107(a) and Section 15.109

(a) Class B Digital Device

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 and (2) this device must accept any interference received, including that may cause undesired operation.

Representative Person's Name: ERIC LU

Signature: Eric Lu

Date: Jul 27, 2012

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Documentation Classifications

In order to assist in the use of this product, GIGABYTE provides the following types of documentations:

- For quick set-up of the product, read the Quick Installation Guide included with the product.
- For detailed product information, carefully read the User's Manual.

For product-related information, check on our website at: <http://www.gigabyte.com>

Identifying Your Motherboard Revision

The revision number on your motherboard looks like this: "REV: X.X." For example, "REV: 1.0" means the revision of the motherboard is 1.0. Check your motherboard revision before updating motherboard BIOS, drivers, or when looking for technical information.

Example:

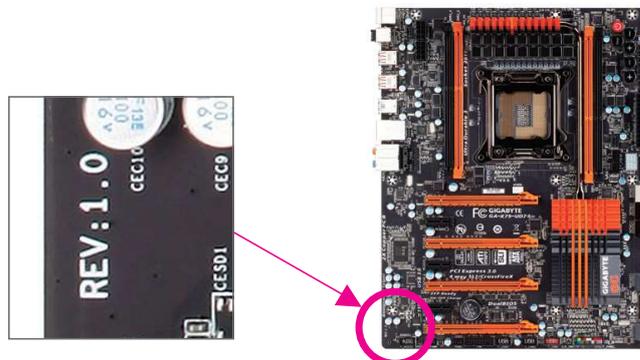


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Box Contents

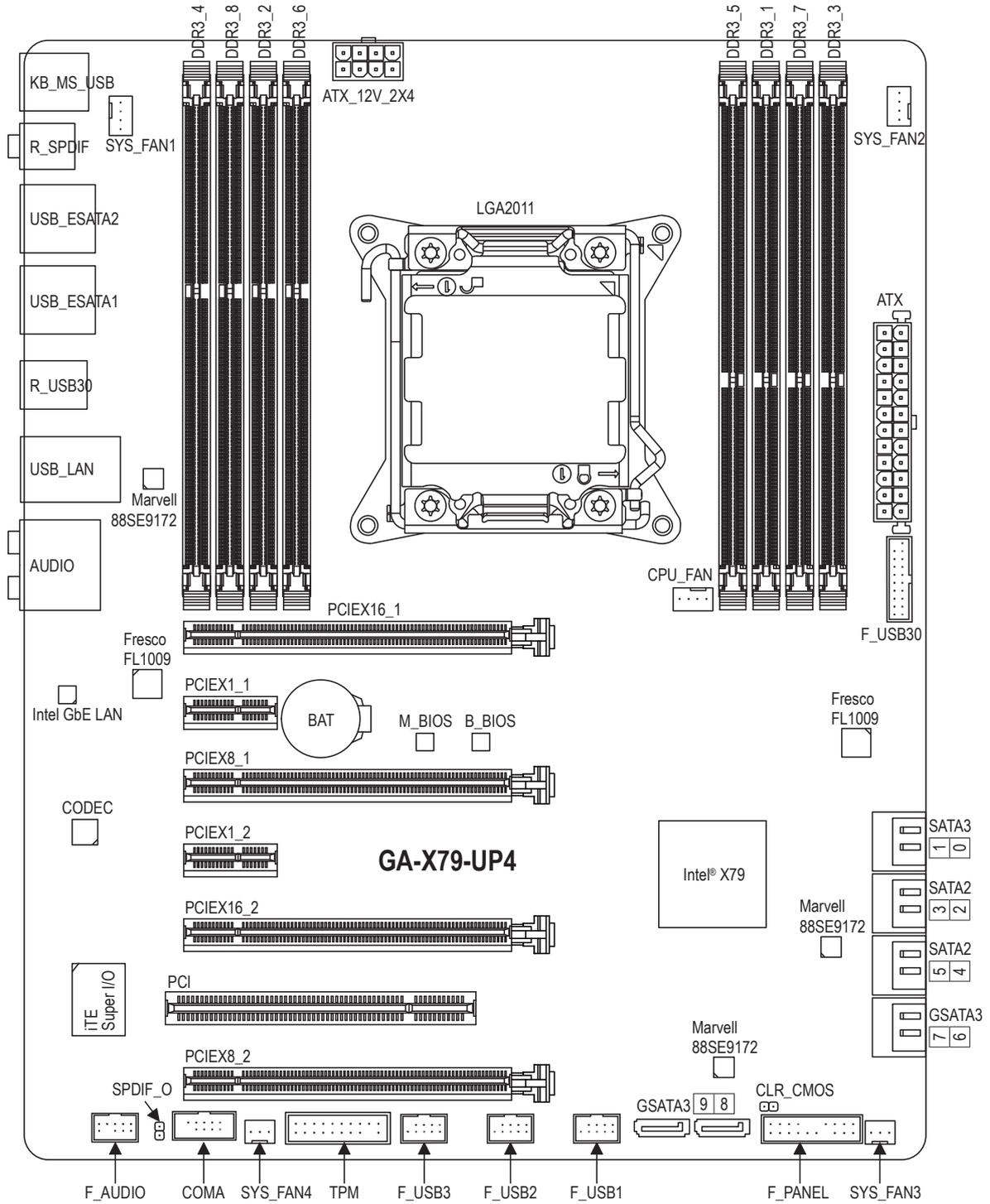
- GA-X79-UP4 motherboard
- Motherboard driver disk
- User's Manual
- Quick Installation Guide
- Four SATA 6Gb/s cables
- I/O Shield
- One 2-Way SLI bridge connector
- One 3-Way SLI bridge connector
- One 4-Way SLI bridge connector
- One 2-Way CrossFireX bridge connector

The box contents above are for reference only and the actual items shall depend on the product package you obtain. The box contents are subject to change without notice.

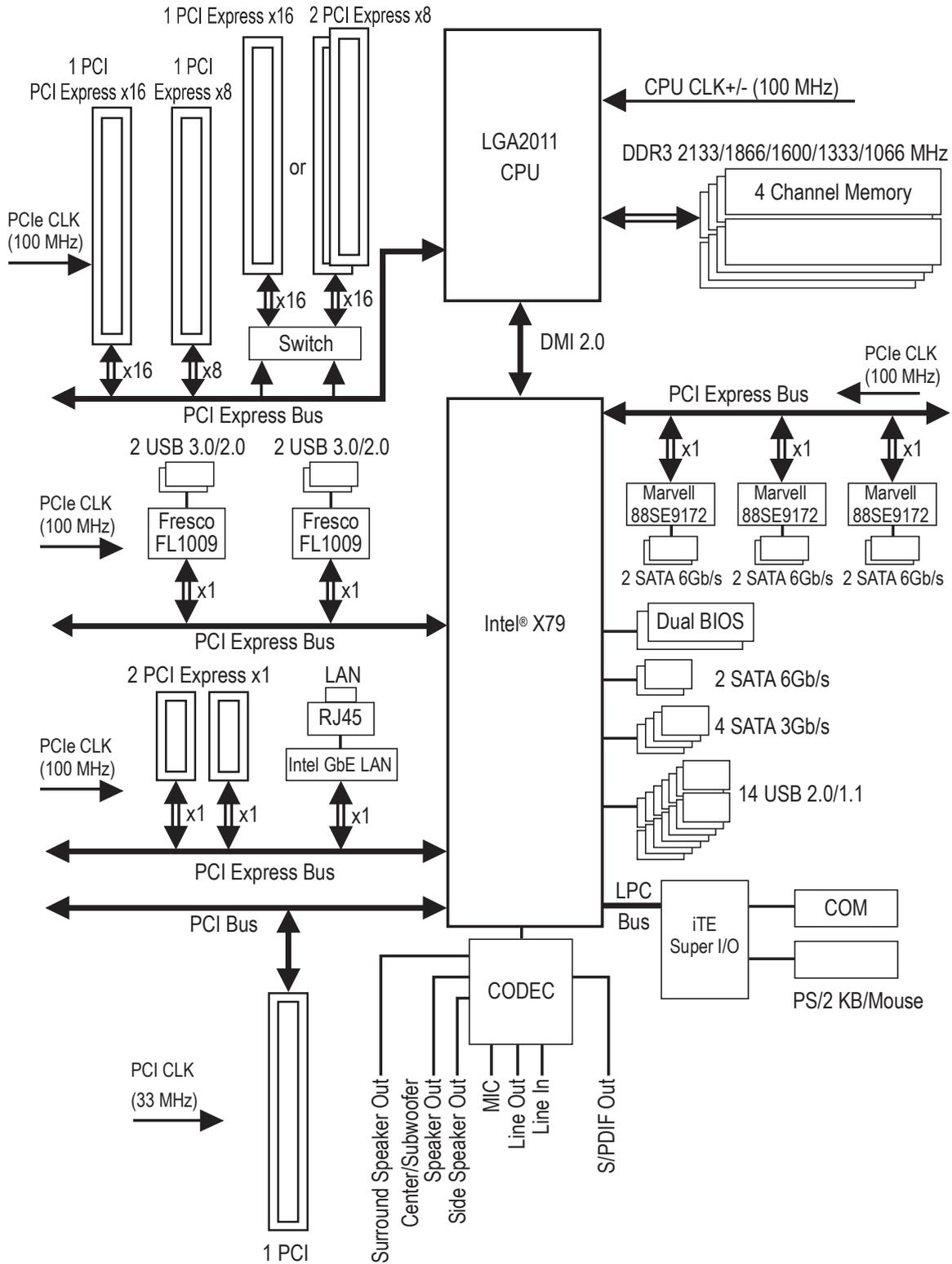
Optional Items

- 2-port USB 2.0 bracket (Part No. 12CR1-1UB030-6*R)
- eSATA bracket (Part No. 12CF1-3SATPW-4*R)
- 3.5" Front Panel with 2 USB 3.0/2.0 ports (Part No. 12CR1-FPX582-0*R)
- COM port cable (Part No. 12CF1-1CM001-3*R)

GA-X79-UP4 Motherboard Layout



GA-X79-UP4 Motherboard Block Diagram



For detailed product information/limitation(s), refer to "1-2 Product Specifications."

Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures:

- Prior to installation, make sure the chassis is suitable for the motherboard.
- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

1-2 Product Specifications

	CPU	<p>Support for Intel® Core™ i7 processors in the LGA2011 package (Go to GIGABYTE's website for the latest CPU support list.)</p> <ul style="list-style-type: none"> ◆ L3 cache varies with CPU
	Chipset	<ul style="list-style-type: none"> ◆ Intel® X79 Express Chipset
	Memory	<ul style="list-style-type: none"> ◆ 8 x 1.5V DDR3 DIMM sockets supporting up to 64 GB of system memory <ul style="list-style-type: none"> * Due to a Windows 32-bit operating system limitation, when more than 4 GB of physical memory is installed, the actual memory size displayed will be less than the size of the physical memory installed. ◆ 4 channel memory architecture ◆ Support for DDR3 2133/1866/1600/1333/1066 MHz memory modules ◆ Support for non-ECC memory modules ◆ Support for Extreme Memory Profile (XMP) memory modules (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
	Audio	<ul style="list-style-type: none"> ◆ Realtek® ALC892 codec ◆ High Definition Audio ◆ 2/4/5.1/7.1-channel ◆ Support for S/PDIF Out
	LAN	<ul style="list-style-type: none"> ◆ Intel® GbE LAN chip (10/100/1000 Mbit)
	Expansion Slots	<ul style="list-style-type: none"> ◆ 2 x PCI Express x16 slots, running at x16 (PCIEX16_1, PCIEX16_2) <ul style="list-style-type: none"> * For optimum performance, if only one PCI Express graphics card is to be installed, be sure to install it in the PCIEX16 slot. ◆ 2 x PCI Express x16 slots, running at x8 (PCIEX8_1, PCIEX8_2) <ul style="list-style-type: none"> * The PCIEX8_2 slot shares bandwidth with the PCIEX16_2 slot. When the PCIEX8_2 slot is populated, the PCIEX16_2 slot will operate at up to x8 mode. (All PCI Express x16 slots conform to PCI Express 3.0 standard.) ◆ 2 x PCI Express x1 slots (All PCI Express x1 slots conform to PCI Express 2.0 standard.) ◆ 1 x PCI slot
	Multi-Graphics Technology	<ul style="list-style-type: none"> ◆ Support for 4-Way/3-Way/2-Way AMD CrossFire™/NVIDIA SLI technology
	Storage Interface	<ul style="list-style-type: none"> ◆ Chipset: <ul style="list-style-type: none"> - 2 x SATA 6Gb/s connectors (SATA3 0/1) - 4 x SATA 3Gb/s connectors (SATA2 2~5) - Support for RAID 0, RAID 1, RAID 5, and RAID 10 <ul style="list-style-type: none"> * When a RAID set is built across the SATA 6Gb/s and SATA 3Gb/s channels, the system performance of the RAID set may vary depending on the devices being connected. ◆ 3 x Marvell 88SE9172 chips: <ul style="list-style-type: none"> - 4 x SATA 6Gb/s connectors (SATA3 6~9) - 2 x eSATA 6Gb/s connectors on the back panel - Support for RAID 0 and RAID 1

	USB	<ul style="list-style-type: none"> ◆ Chipset: <ul style="list-style-type: none"> - 14 USB 2.0/1.1 ports (8 ports on the back panel, 6 ports available through the internal USB headers) ◆ 2 x Fresco FL1009 chips: <ul style="list-style-type: none"> - 4 USB 3.0/2.0 ports (2 ports on the back panel, 2 ports available through the internal USB header)
	Internal Connectors	<ul style="list-style-type: none"> ◆ 1 x 24-pin ATX main power connector ◆ 1 x 8-pin ATX 12V power connector ◆ 6 x SATA 6Gb/s connectors ◆ 4 x SATA 3Gb/s connectors ◆ 1 x CPU fan header ◆ 4 x system fan headers ◆ 1 x front panel header ◆ 1 x front panel audio header ◆ 1 x S/PDIF Out header ◆ 1 x USB 3.0/2.0 header ◆ 3 x USB 2.0/1.1 headers ◆ 1 x serial port header ◆ 1 x Clear CMOS jumper ◆ 1 x Trusted Platform Module (TPM) header
	Back Panel Connectors	<ul style="list-style-type: none"> ◆ 1 x PS/2 keyboard/mouse port ◆ 1 x optical S/PDIF Out connector ◆ 1 x coaxial S/PDIF Out connector ◆ 8 x USB 2.0/1.1 ports ◆ 2 x USB 3.0/2.0 ports ◆ 2 x eSATA 6Gb/s connectors ◆ 1 x RJ-45 port ◆ 6 x audio jacks (Center/Subwoofer Speaker Out, Rear Speaker Out, Side Speaker Out, Line In, Line Out, Mic In)
	I/O Controller	<ul style="list-style-type: none"> ◆ iTE® I/O Controller Chip
	Hardware Monitor	<ul style="list-style-type: none"> ◆ System voltage detection ◆ CPU/System temperature detection ◆ CPU/System fan speed detection ◆ CPU overheating warning ◆ CPU/System fan fail warning ◆ CPU/System fan speed control <p style="margin-left: 40px;">* Whether the CPU/system fan speed control function is supported will depend on the CPU/system cooler you install.</p>

	BIOS	<ul style="list-style-type: none"> ◆ 2 x 64 Mbit flash ◆ Use of licensed AMI UEFI BIOS ◆ Support for DualBIOS™ ◆ PnP 1.0a, DMI 2.7, WfM 2.0, SM BIOS 2.7, ACPI 5.0
	Unique Features	<ul style="list-style-type: none"> ◆ Support for @BIOS ◆ Support for Q-Flash ◆ Support for Xpress Install ◆ Support for EasyTune <ul style="list-style-type: none"> * Available functions in EasyTune may differ by motherboard model. ◆ Support for ON/OFF Charge ◆ Support for 3TB+ Unlock ◆ Support for Q-Share
	Bundled Software	<ul style="list-style-type: none"> ◆ Norton® Internet Security (OEM version)
	Operating System	<ul style="list-style-type: none"> ◆ Support for Windows 7/Vista/XP
	Form Factor	<ul style="list-style-type: none"> ◆ ATX Form Factor; 30.5cm x 24.4cm

* GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice.

* Please visit the **Support & Downloads\Utility** page on GIGABYTE's website to check the supported operating system(s) for the software listed in the "Unique Features" and "Bundled Software" columns.

1-3 Installing the CPU and CPU Cooler

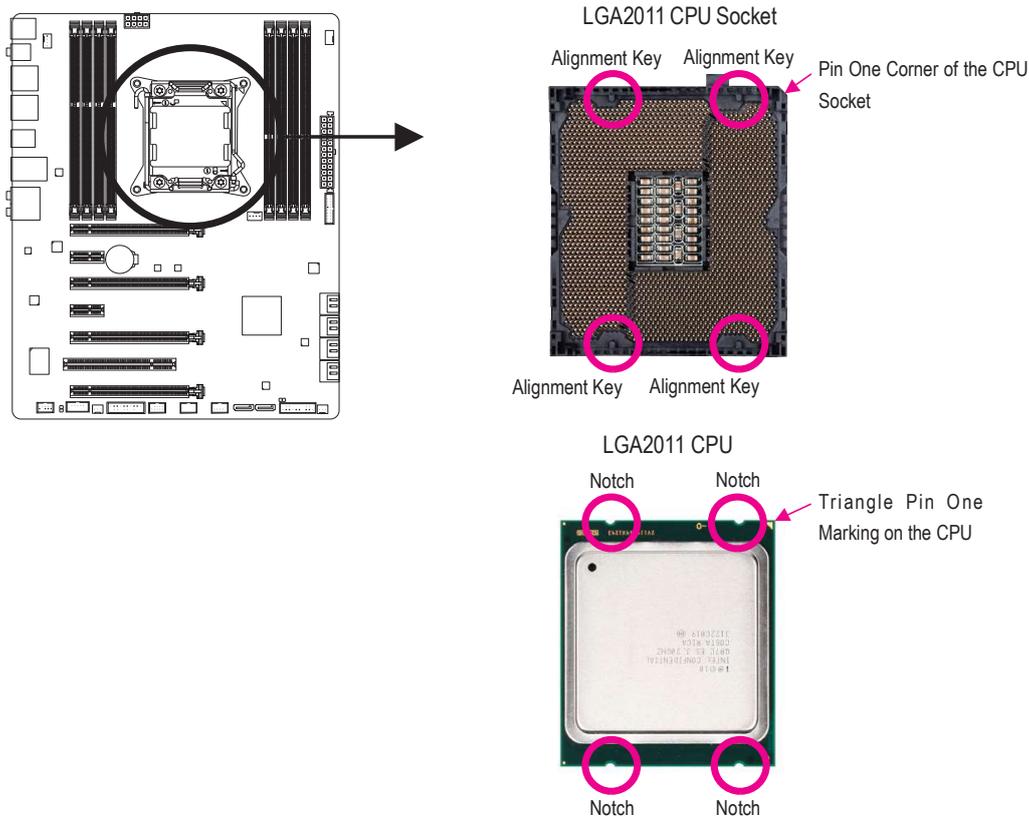


Read the following guidelines before you begin to install the CPU:

- Make sure that the motherboard supports the CPU.
(Go to GIGABYTE's website for the latest CPU support list.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.)
- Apply an even and thin layer of thermal grease on the surface of the CPU.
- Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.
- Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc.

1-3-1 Installing the CPU

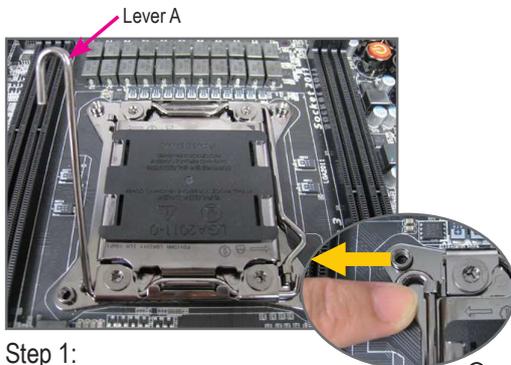
A. Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.



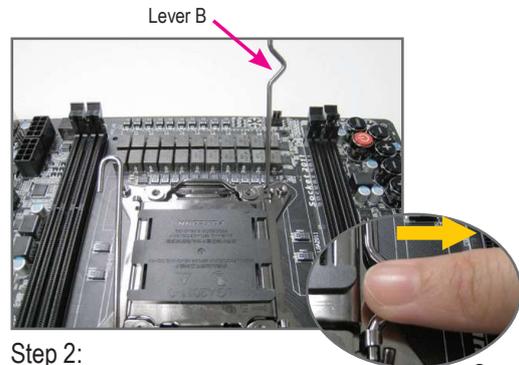
B. Follow the steps below to correctly install the CPU into the motherboard CPU socket.



- Before installing the CPU, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the CPU.
- To protect the socket contacts, do not remove the protective plastic cover unless the CPU is inserted into the CPU socket. Save the cover properly and replace it if the CPU is removed.



Step 1:
Push the lever closest to the "unlock" marking "🔓" (below referred as lever A) down and away from the socket to release it.



Step 2:
Push the lever closest to the "lock" marking "🔒" (below referred as lever B) down and away from the socket. Then lift the lever.



Step 3:
Gently press lever A to allow the load plate to rise. Open the load plate. Note: DO NOT touch the socket contacts after the load plate is opened.



Step 4:
Hold the CPU with your thumb and index fingers. Align the CPU pin one marking (triangle) with the pin one corner of the CPU socket (or align the CPU notches with the socket alignment keys) and carefully insert the CPU into the socket vertically.



Step 5:
Once the CPU is properly inserted, carefully replace the load plate. Then secure lever B under its retention tab. The protective plastic cover may pop off from the load plate during the process of engaging the lever. Remove the cover. Save the cover properly and always replace it when the CPU is not installed.



Step 6:
Finally, secure lever A under its retention tab to complete the installation of the CPU.

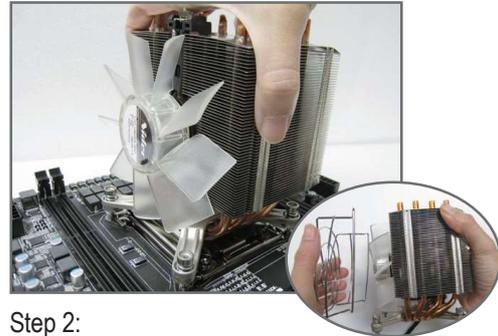
1-3-2 Installing the CPU Cooler

Follow the steps below to correctly install the CPU cooler on the motherboard. (The following procedure uses Intel® boxed cooler as the example cooler.)



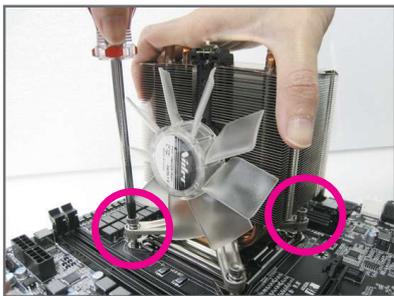
Step 1:

Apply an even and thin layer of thermal grease on the surface of the installed CPU.



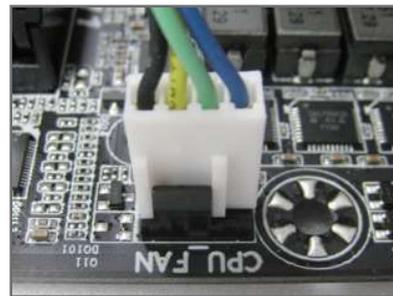
Step 2:

Place the cooler atop the CPU, aligning the four mounting screws with the mounting holes on the ILM. (If your cooler has a fan grill which may cause interference when you tighten the screws, remove it first and replace it after tightening the screws.)



Step 3:

Use one hand to hold the cooler and the other to tighten the screws in a diagonal sequence with a screw driver. Begin tightening a screw with a few turns and repeat with the screw diagonally opposite the one you just tightened. Then do the same to the other pair. Next, fully tighten the four screws.



Step 4:

Finally, attach the power connector of the CPU cooler to the CPU fan header (CPU_FAN) on the motherboard.



Use extreme care when removing the CPU cooler because the thermal grease/tape between the CPU cooler and CPU may adhere to the CPU. Inadequately removing the CPU cooler may damage the CPU.

1-4 Installing the Memory



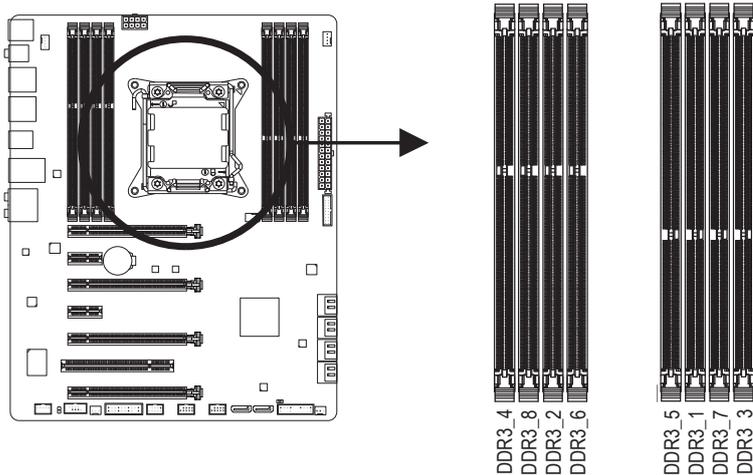
Read the following guidelines before you begin to install the memory:

- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
(Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

1-4-1 4 Channel Memory Configuration

This motherboard provides eight DDR3 memory sockets and supports 4 Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. The eight DDR3 memory sockets are divided into four channels and each channel has two memory sockets as following:

- ▶▶ Channel A: DDR3_1, DDR3_5
- ▶▶ Channel B: DDR3_2, DDR3_6
- ▶▶ Channel C: DDR3_3, DDR3_7
- ▶▶ Channel A: DDR3_4, DDR3_8



▶▶ 4 Channel Memory Configurations Table

	DDR3_4	DDR3_8	DDR3_2	DDR3_6	DDR3_5	DDR3_1	DDR3_7	DDR3_3
Four Modules	DS/SS	--	DS/SS	--	--	DS/SS	--	DS/SS
Eight Modules	DS/SS							

▶▶ Dual/3 Channel Memory Configurations Table

	DDR3_4	DDR3_8	DDR3_2	DDR3_6	DDR3_5	DDR3_1	DDR3_7	DDR3_3
Two Modules	--	--	DS/SS	--	--	DS/SS	--	--
	--	--	--	--	--	DS/SS	--	DS/SS
	DS/SS	--	--	--	--	DS/SS	--	--
	--	--	DS/SS	--	--	--	--	DS/SS
	DS/SS	--	DS/SS	--	--	--	--	--
Three Modules	DS/SS	--	DS/SS	--	--	DS/SS	--	DS/SS
	--	--	DS/SS	--	--	DS/SS	--	--
	DS/SS	--	--	--	--	DS/SS	--	DS/SS
	DS/SS	--	DS/SS	--	--	--	--	DS/SS

(SS=Single-Sided, DS=Double-Sided, "--=No Memory)

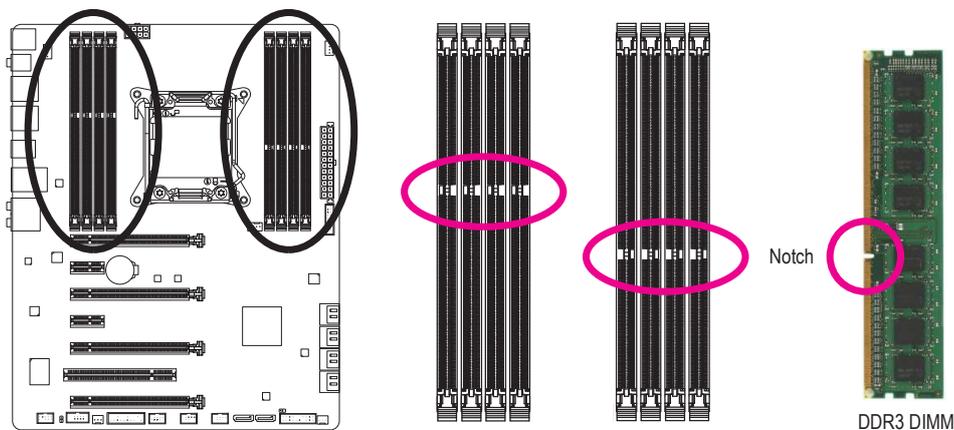
Due to CPU limitations, read the following guidelines before installing the memory in Dual Channel mode.

1. For optimum performance, when enabling Dual Channel mode with two memory modules, we recommend that you install them in the DDR3_1 and DDR3_2 sockets.
2. When installing the memory, make sure to begin with the first socket of each channel, such as DDR3_1, DDR3_2, DDR3_3, and DDR3_4.

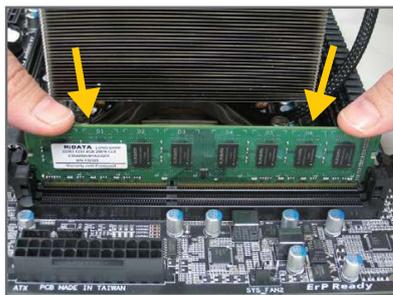
1-4-2 Installing a Memory

 Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module.

DDR3 and DDR2 DIMMs are not compatible to each other or DDR DIMMs. Be sure to install DDR3 DIMMs on this motherboard.



A DDR3 memory module has a notch, so it can only fit in one direction. Follow the steps below to correctly install your memory modules in the memory sockets.



Step 1:

Note the orientation of the memory module. Spread the retaining clips at both ends of the memory socket. Place the memory module on the socket. As indicated in the picture on the left, place your fingers on the top edge of the memory, push down on the memory and insert it vertically into the memory socket.



Step 2:

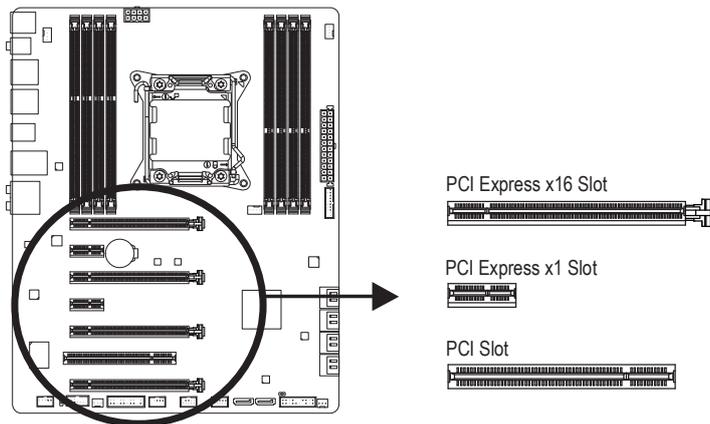
The clips at both ends of the socket will snap into place when the memory module is securely inserted.

1-5 Installing an Expansion Card



Read the following guidelines before you begin to install an expansion card:

- Make sure the motherboard supports the expansion card. Carefully read the manual that came with your expansion card.
- Always turn off the computer and unplug the power cord from the power outlet before installing an expansion card to prevent hardware damage.



Follow the steps below to correctly install your expansion card in the expansion slot.

1. Locate an expansion slot that supports your card. Remove the metal slot cover from the chassis back panel.
2. Align the card with the slot, and press down on the card until it is fully seated in the slot.
3. Make sure the metal contacts on the card are completely inserted into the slot.
4. Secure the card's metal bracket to the chassis back panel with a screw.
5. After installing all expansion cards, replace the chassis cover(s).
6. Turn on your computer. If necessary, go to BIOS Setup to make any required BIOS changes for your expansion card(s).
7. Install the driver provided with the expansion card in your operating system.

Example: Installing and Removing a PCI Express Graphics Card:



- Installing a Graphics Card:
Gently push down on the top edge of the card until it is fully inserted into the PCI Express slot. Make sure the card is securely seated in the slot and does not rock.



- Removing the Card:
Gently push back on the lever on the slot and then lift the card straight out from the slot.

1-6 Setting up AMD CrossFire™/NVIDIA SLI Configuration

A. System Requirements

- The 2-Way CrossFire and 2-Way SLI technologies currently support Windows 7, Vista, XP operating systems
- The 3-Way/4-Way CrossFire/SLI technologies currently support Windows 7 and Vista operating systems
- A CrossFire/SLI-supported motherboard with two/three/four PCI Express x16 slots and correct driver
- Two/three/four CrossFire/SLI-ready graphics cards of identical brand and chip and correct driver (Current GPUs that support 3-Way/4-Way CrossFire technology include the ATI Radeon HD 3800, HD 4800, HD 5800 series, and AMD Radeon HD 6800 and HD 6900 series. Current GPUs that support 3-Way/4-Way SLI technology include the NVIDIA 8800 GTX, 8800 Ultra, 9800 GTX, GTX 260, GTX 280, GTX 470, GTX 480, GTX 570, GTX 580, and GTX 590 series.)
- CrossFire^(Note)/SLI bridge connectors
- A power supply with sufficient power is recommended ^(Note 2) (Refer to the manual of your graphics cards for the power requirement)

B. Connecting the Graphics Cards

Step 1:

Observe the steps in "1-5 Installing an Expansion Card" and install CrossFire/SLI graphics cards on the PCI Express x16 slots. (To set up a 2-Way configuration, we recommend installing the graphics cards on the PCIEX16_1 and PCIEX16_2 slots.)

Step 2:

Insert the CrossFire^(Note)/SLI bridge connectors in the CrossFire/SLI gold edge connectors on top of the cards.

Step 3:

Plug the display cable into the graphics card on the PCIEX16_1 slot.

C. Configuring the Graphics Card Driver

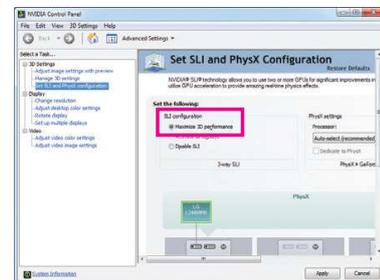
C-1. To Enable CrossFire Function

After installing the graphics card driver in the operating system, go to the **Catalyst Control Center**. Browse to **Performance\AMD CrossFireX™ Configuration** and ensure the **Enable CrossFireX™** check box is selected. Select the GPU combination you want to use and click **Apply**. (Available combination options are dependent on the number of graphics cards.)



C-2. To Enable SLI Function

After installing the graphics card driver in the operating system, go to the **NVIDIA Control Panel**. Browse to the **Set SLI and PhysX Configuration** screen and ensure **Maximize 3D performance** is enabled.

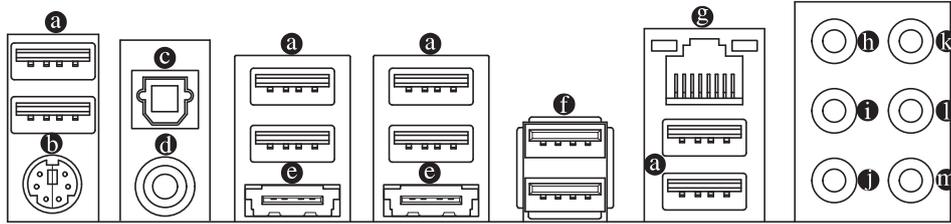


(Note) The bridge connector(s) may be needed or not depending on your graphics cards.



Procedure and driver screen for enabling CrossFire/SLI technology may differ by graphics cards. Refer to the manual that came with your graphics cards for more information about enabling CrossFire/SLI technology.

1-7 Back Panel Connectors



a USB 2.0/1.1 Port

The USB port supports the USB 2.0/1.1 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

b PS/2 Keyboard/Mouse Port

Use this port to connect a PS/2 mouse or keyboard.

c Optical S/PDIF Out Connector

This connector provides digital audio out to an external audio system that supports digital optical audio. Before using this feature, ensure that your audio system provides an optical digital audio in connector.

d Coaxial S/PDIF Out Connector

This connector provides digital audio out to an external audio system that supports digital coaxial audio. Before using this feature, ensure that your audio system provides a coaxial digital audio in connector.

e eSATA 6Gb/s Connector

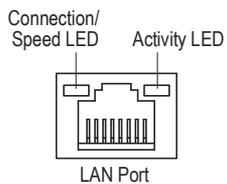
This connector supports SATA 6Gb/s specification. Use the port to connect an external SATA device or a SATA port multiplier.

f USB 3.0/2.0 Port

The USB 3.0 port supports the USB 3.0 specification and is compatible to the USB 2.0/1.1 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

g RJ-45 LAN Port

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.



Connection/Speed LED:

State	Description
Orange	1 Gbps data rate
Green	100 Mbps data rate
Off	10 Mbps data rate

Activity LED:

State	Description
Blinking	Data transmission or receiving is occurring
Off	No data transmission or receiving is occurring



- When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

⑩ **Center/Subwoofer Speaker Out Jack (Orange)**

Use this audio jack to connect center/subwoofer speakers in a 5.1/7.1-channel audio configuration.

⑪ **Rear Speaker Out Jack (Black)**

This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

⑫ **Side Speaker Out Jack (Gray)**

Use this audio jack to connect side speakers in a 7.1-channel audio configuration.

⑬ **Line In Jack (Blue)**

The default line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc.

⑭ **Line Out Jack (Green)**

The default line out jack. Use this audio jack for a headphone or 2-channel speaker. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

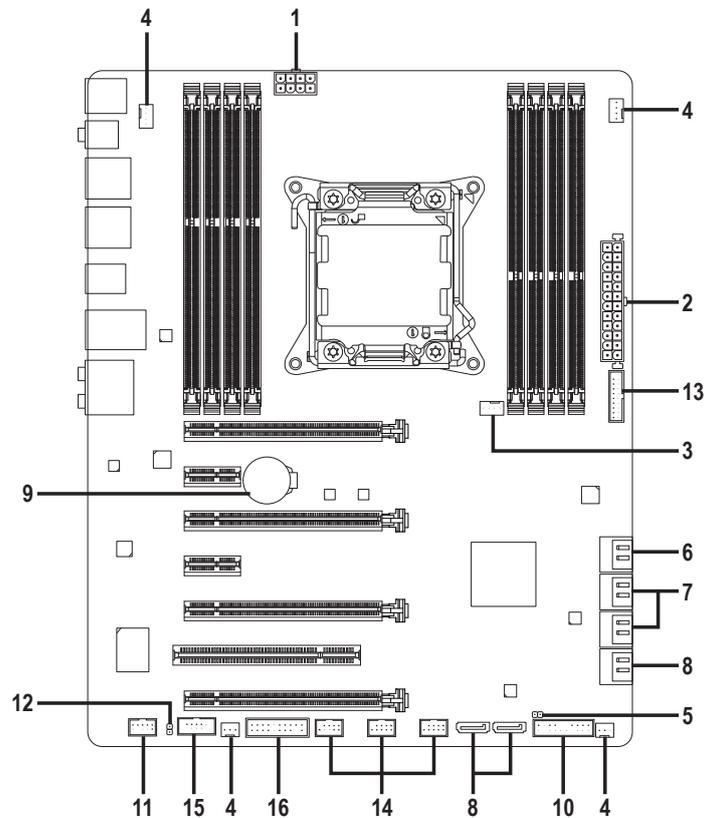
⑮ **Mic In Jack (Pink)**

The default Mic in jack. Microphones must be connected to this jack.



In addition to the default speakers settings, the ⑩ ~ ⑮ audio jacks can be reconfigured to perform different functions via the audio software. Only microphones still **MUST** be connected to the default Mic in jack (⑮). Refer to the instructions on setting up a 2/4/5.1/7.1-channel audio configuration in Chapter 5, "Configuring 2/4/5.1/7.1-Channel Audio."

1-8 Internal Connectors



1) ATX_12V_2X4	9) BAT
2) ATX	10) F_PANEL
3) CPU_FAN	11) F_AUDIO
4) SYS_FAN1/2/3/4	12) SPDIF_O
5) CLR_CMOS	13) F_USB30
6) SATA3 0/1	14) F_USB1/F_USB2/F_USB3
7) SATA2 2/3/4/5	15) COMA
8) GSATA3 6/7/8/9	16) TPM



Read the following guidelines before connecting external devices:

- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

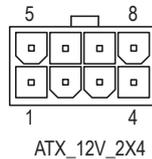
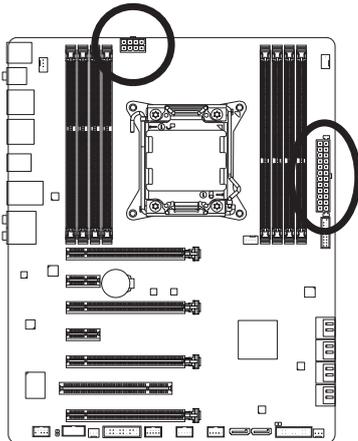
1/2) ATX_12V_2X4/ATX (2x4 12V Power Connector and 2x12 Main Power Connector)

With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation.

The 12V power connector mainly supplies power to the CPU. If the 12V power connector is not connected, the computer will not start.

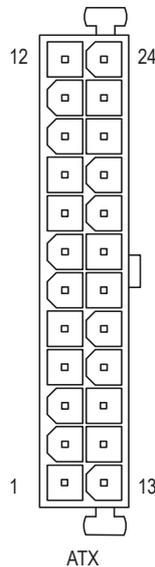


To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.



ATX_12V_2X4:

Pin No.	Definition
1	GND (Only for 2x4-pin 12V)
2	GND (Only for 2x4-pin 12V)
3	GND
4	GND
5	+12V (Only for 2x4-pin 12V)
6	+12V (Only for 2x4-pin 12V)
7	+12V
8	+12V

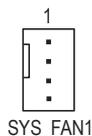
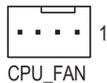
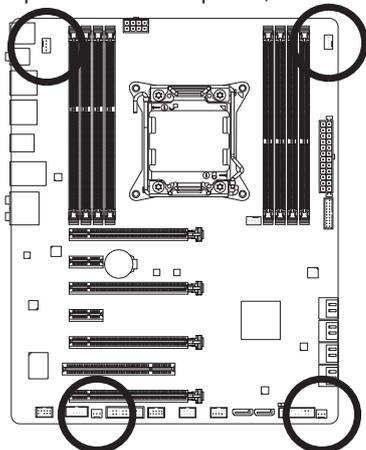


ATX:

Pin No.	Definition	Pin No.	Definition
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON (soft On/Off)
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power Good	20	-5V
9	5VSB (stand by +5V)	21	+5V
10	+12V	22	+5V
11	+12V (Only for 2x12-pin ATX)	23	+5V (Only for 2x12-pin ATX)
12	3.3V (Only for 2x12-pin ATX)	24	GND (Only for 2x12-pin ATX)

3/4) CPU_FAN/SYS_FAN1/SYS_FAN2/SYS_FAN3/SYS_FAN4 (Fan Headers)

The motherboard has a 4-pin CPU fan header (CPU_FAN), two 4-pin (SYS_FAN1/SYS_FAN2) and two 3-pin (SYS_FAN3/SYS_FAN4) system fan headers. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.



CPU_FAN:

Pin No.	Definition
1	GND
2	+12V /Speed Control
3	Sense
4	Speed Control

SYS_FAN1:

Pin No.	Definition
1	GND
2	+12V /Speed Control
3	Sense
4	Reserve

SYS_FAN2:

Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control

SYS_FAN3/SYS_FAN4:

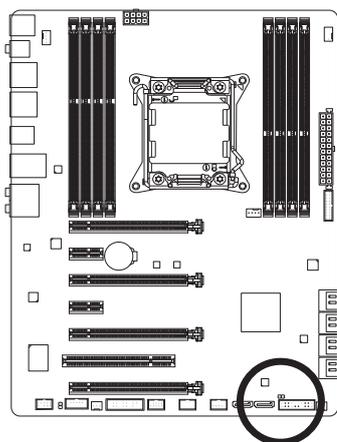
Pin No.	Definition
1	GND
2	+12V
3	Sense



- Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

5) CLR_CMOS (Clear CMOS Jumper)

Use this jumper to clear the CMOS values (e.g. date information and BIOS configurations) and reset the CMOS values to factory defaults. To clear the CMOS values, use a metal object like a screwdriver to touch the two pins for a few seconds.



Open: Normal

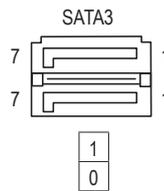
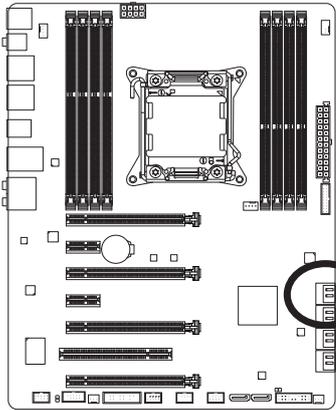
Short: Clear CMOS Values



- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
- After system restart, go to BIOS Setup to load factory defaults (select Load Optimized Defaults) or manually configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations).

6) SATA3 0/1 (SATA 6Gb/s Connectors, Controlled by Intel X79 Chipset)

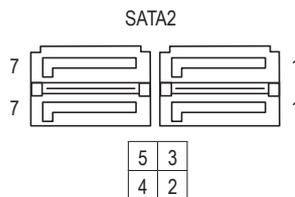
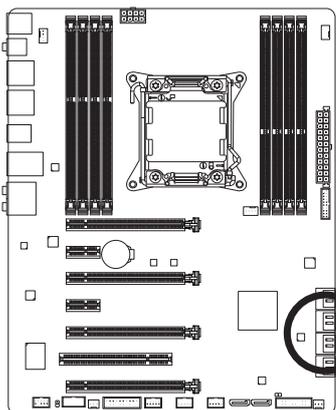
The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The SATA3 0/1 connectors support RAID 0 and RAID 1. RAID 5 and RAID 10 can be implemented on the two connectors with the SATA2 2/3/4/5 connector ^(Note). Refer to Chapter 5, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array.



Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

7) SATA2 2/3/4/5 (SATA 3Gb/s Connectors, Controlled by Intel X79 Chipset)

The SATA connectors conform to SATA 3Gb/s standard and are compatible with SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The Intel X79 Chipset supports RAID 0, RAID 1, RAID 5, and RAID 10. Refer to Chapter 5, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array.



Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

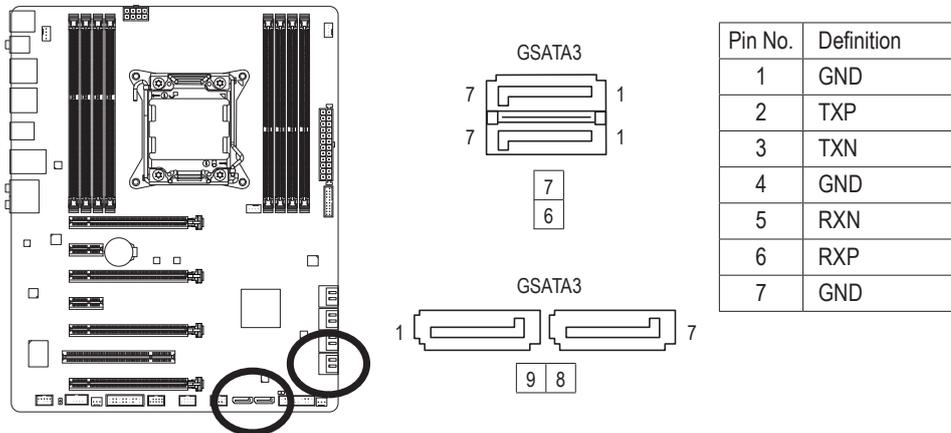


- A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are to be used, the total number of hard drives must be an even number.
- A RAID 5 configuration requires at least three hard drives. (The total number of hard drives does not have to be an even number.)
- A RAID 10 configuration requires four hard drives.

(Note) When a RAID set is built across the SATA 6Gb/s and SATA 3Gb/s channels, the system performance of the RAID set may vary depending on the devices being connected.

8) GSATA3 6/7/8/9 (SATA 6Gb/s Connectors, Controlled by Marvell 88SE9172 Chip)

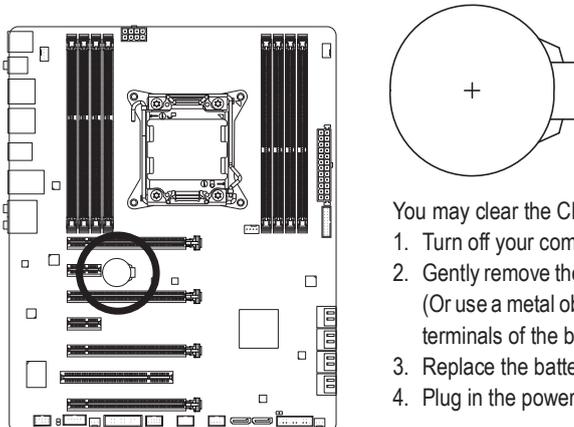
The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The Marvell 88SE9172 chip supports RAID 0 and RAID 1. Refer to Chapter 5, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array.



A RAID 0 or RAID 1 configuration requires two hard drives.

9) BAT (Battery)

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.



You may clear the CMOS values by removing the battery:

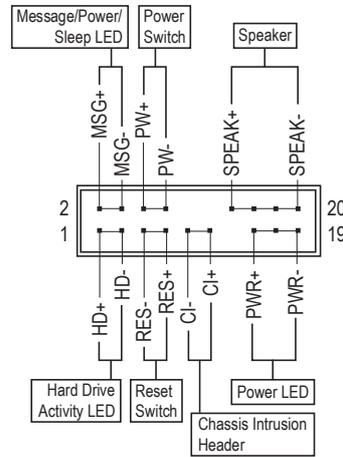
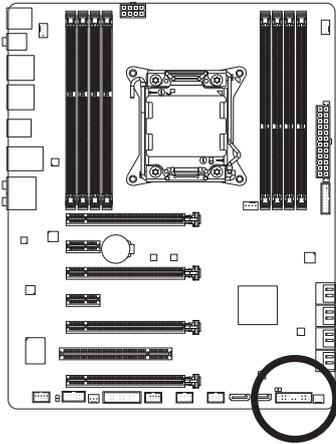
1. Turn off your computer and unplug the power cord.
2. Gently remove the battery from the battery holder and wait for one minute. (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.)
3. Replace the battery.
4. Plug in the power cord and restart your computer.



- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- When installing the battery, note the orientation of the positive side (+) and the negative side (-) of the battery (the positive side should face up).
- Used batteries must be handled in accordance with local environmental regulations.

10) F_PANEL (Front Panel Header)

Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.



- **MSG/PWR** (Message/Power/Sleep LED, Yellow/Purple):

System Status	LED
S0	On
S3/S4/S5	Off

Connects to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S3/S4/S5 sleep state or powered off (S5).

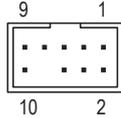
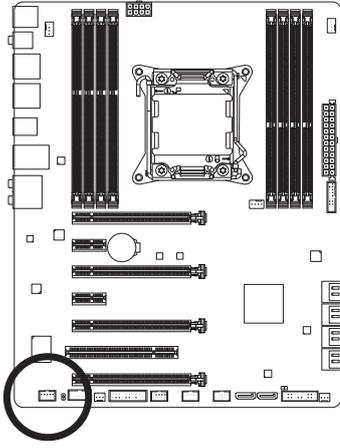
- **PW** (Power Switch, Red):
Connects to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch (refer to Chapter 2, "BIOS Setup," "Power Management," for more information).
- **SPEAK** (Speaker, Orange):
Connects to the speaker on the chassis front panel. The system reports system startup status by issuing a beep code. One single short beep will be heard if no problem is detected at system startup.
- **HD** (Hard Drive Activity LED, Blue):
Connects to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.
- **RES** (Reset Switch, Green):
Connects to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.
- **CI** (Chassis Intrusion Header, Gray):
Connects to the chassis intrusion switch/sensor on the chassis that can detect if the chassis cover has been removed. This function requires a chassis with a chassis intrusion switch/sensor.



The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

11) F_AUDIO (Front Panel Audio Header)

The front panel audio header supports Intel High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.



For HD Front Panel Audio:

Pin No.	Definition
1	MIC2_L
2	GND
3	MIC2_R
4	-ACZ_DET
5	LINE2_R
6	GND
7	FAUDIO_JD
8	No Pin
9	LINE2_L
10	GND

For AC'97 Front Panel Audio:

Pin No.	Definition
1	MIC
2	GND
3	MIC Power
4	NC
5	Line Out (R)
6	NC
7	NC
8	No Pin
9	Line Out (L)
10	NC

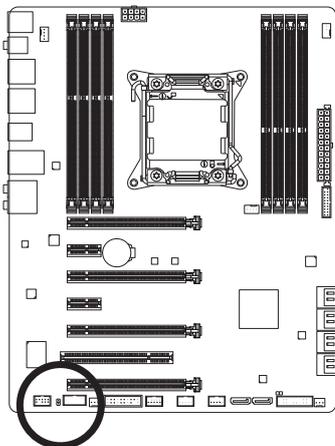


- The front panel audio header supports HD audio by default. If your chassis provides an AC'97 front panel audio module, refer to the instructions on how to activate AC'97 functionality via the audio software in Chapter 5, "Configuring 2/4/5.1/7.1-Channel Audio."
- Audio signals will be present on both of the front and back panel audio connections simultaneously. If you want to mute the back panel audio (only supported when using an HD front panel audio module), refer to Chapter 5, "Configuring 2/4/5.1/7.1-Channel Audio."
- Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer.

12) SPDIF_O (S/PDIF Out Header)

This header supports digital S/PDIF Out and connects a S/PDIF digital audio cable (provided by expansion cards) for digital audio output from your motherboard to certain expansion cards like graphics cards and sound cards. For example, some graphics cards may require you to use a S/PDIF digital audio cable for digital audio output from your motherboard to your graphics card if you wish to connect an HDMI display to the graphics card and have digital audio output from the HDMI display at the same time.

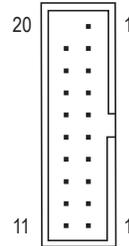
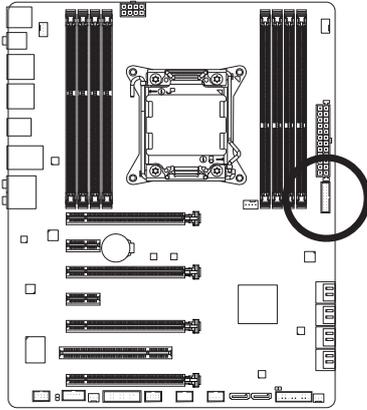
For information about connecting the S/PDIF digital audio cable, carefully read the manual for your expansion card.



Pin No.	Definition
1	SPDIFO
2	GND

13) F_USB30 (USB 3.0/2.0 Header)

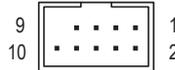
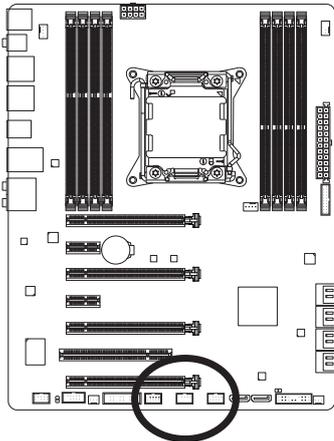
The header conforms to USB 3.0/2.0 specification and can provide two USB ports. For purchasing the optional 3.5" front panel that provides two USB 3.0/2.0 ports, please contact the local dealer.



Pin No.	Definition	Pin No.	Definition
1	VBUS	11	D2+
2	SSRX1-	12	D2-
3	SSRX1+	13	GND
4	GND	14	SSTX2+
5	SSTX1-	15	SSTX2-
6	SSTX1+	16	GND
7	GND	17	SSRX2+
8	D1-	18	SSRX2-
9	D1+	19	VBUS
10	NC	20	No Pin

14) F_USB1/F_USB2/F_USB3 (USB 2.0/1.1 Headers)

The headers conform to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.



Pin No.	Definition
1	Power (5V)
2	Power (5V)
3	USB DX-
4	USB DY-
5	USB DX+
6	USB DY+
7	GND
8	GND
9	No Pin
10	NC



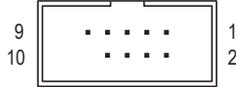
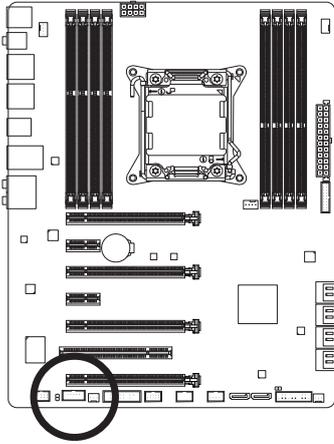
When the system is in S4/S5 mode, only the USB ports routed to the F_USB1 header can support the ON/OFF Charge function.



- Do not plug the IEEE 1394 bracket (2x5-pin) cable into the USB 2.0/1.1 header.
- Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket.

15) COMA (Serial Port Header)

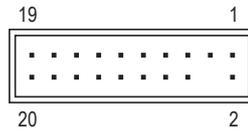
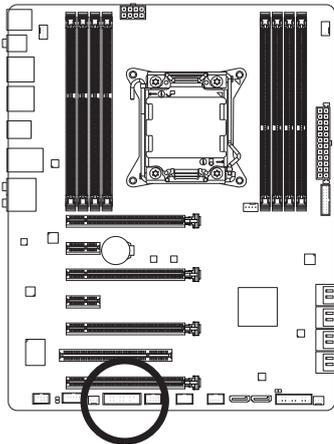
The COM header can provide one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer.



Pin No.	Definition
1	NDCD-
2	NSIN
3	NSOUT
4	NDTR-
5	GND
6	NDSR-
7	NRTS-
8	NCTS-
9	NRI-
10	No Pin

16) TPM (Trusted Platform Module Header)

You may connect a TPM (Trusted Platform Module) to this header.



Pin No.	Definition	Pin No.	Definition
1	LCLK	11	LAD0
2	GND	12	GND
3	LFRAME	13	NC
4	No Pin	14	ID
5	LRESET	15	SB3V
6	NC	16	SERIRQ
7	LAD3	17	GND
8	LAD2	18	NC
9	VCC3	19	NC
10	LAD1	20	SUSCLK

Chapter 2 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features.

When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <Delete> key during the POST when the power is turned on.

To upgrade the BIOS, use either the GIGABYTE Q-Flash or @BIOS utility.

- Q-Flash allows the user to quickly and easily upgrade or back up BIOS without entering the operating system.
- @BIOS is a Windows-based utility that searches and downloads the latest version of BIOS from the Internet and updates the BIOS.

For instructions on using the Q-Flash and @BIOS utilities, refer to Chapter 4, "BIOS Update Utilities."



- Because BIOS flashing is potentially risky, if you do not encounter problems using the current version of BIOS, it is recommended that you not flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Load Optimized Defaults" section in this chapter or introductions of the battery/clear CMOS jumper in Chapter 1 for how to clear the CMOS values.)

2-1 Startup Screen

The following startup Logo screen will appear when the computer boots.



Function Keys:

: BIOS SETUP\Q-FLASH

Press the <Delete> key to enter BIOS Setup or to access the Q-Flash utility in BIOS Setup.

<F9>: SYSTEM INFORMATION

Press the <F9> key to display your system information.

<F12>: BOOT MENU

Boot Menu allows you to set the first boot device without entering BIOS Setup. In Boot Menu, use the up arrow key <↑> or the down arrow key <↓> to select the first boot device, then press <Enter> to accept. The system will boot from the device immediately.

Note: The setting in Boot Menu is effective for one time only. After system restart, the device boot order will still be based on BIOS Setup settings.

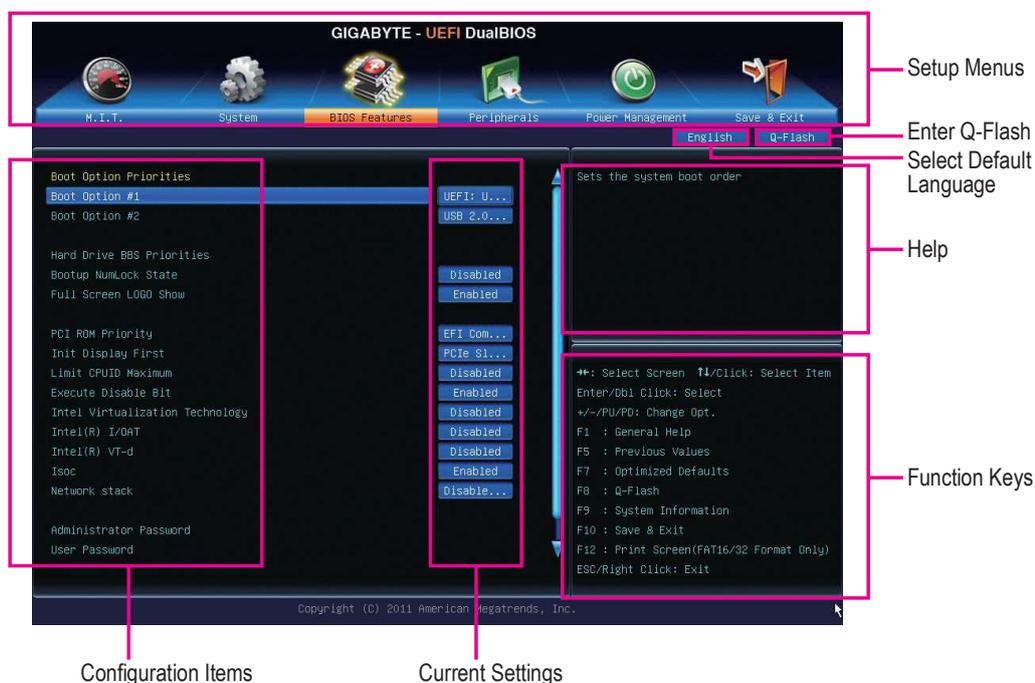
<END>: Q-FLASH

Press the <End> key to access the Q-Flash utility directly without having to enter BIOS Setup first.

2-2 The Main Menu

On the main menu of the BIOS Setup program, press arrow keys to move among the items and press <Enter> to accept or enter a sub-menu. Or you can use your mouse to select the item you want.

(Sample BIOS Version: F1d)



BIOS Setup Program Function Keys

<<-><->>	Move the selection bar to select a setup menu
<↑><↓>	Move the selection bar to select an configuration item on a menu
<Enter>	Execute command or enter a menu
<+>/<Page Up>	Increase the numeric value or make changes
<->/<Page Down>	Decrease the numeric value or make changes
<F5>	Restore the previous BIOS settings for the current submenus
<F7>	Load the Optimized BIOS default settings for the current submenus
<F8>	Access the Q-Flash utility
<F9>	Display system information
<F10>	Save all the changes and exit the BIOS Setup program
<F12>	Capture the current screen as an image and save it to your USB drive
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu

BIOS Setup Menus

■ M.I.T.

Use this menu to configure the clock, frequency, and voltages of your CPU and memory, etc. Or check the system/CPU temperatures, voltages, and fan speeds.

■ System

Use this menu to configure the default language used by the BIOS and system time and date. This menu also displays information on the devices connected to the SATA ports.

■ BIOS Features

Use this menu to configure the device boot order, advanced features available on the CPU, and the primary display adapter.

■ Peripherals

Use this menu to configure all peripheral devices, such as SATA, USB, integrated audio, and integrated LAN, etc.

■ Power Management

Use this menu to configure all the power-saving functions.

■ Save & Exit

Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. You can save the current BIOS settings to a profile or load optimized defaults for optimal-performance system operations.



- When the system is not stable as usual, select the **Load Optimized Defaults** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.

2-3 M.I.T.



Whether the system will work stably with the overclock/overvoltage settings you made is dependent on your overall system configurations. Incorrectly doing overclock/overvoltage may result in damage to CPU, chipset, or memory and reduce the useful life of these components. This page is for advanced users only and we recommend you not to alter the default settings to prevent system instability or other unexpected results. (Inadequately altering the settings may result in system's failure to boot. If this occurs, clear the CMOS values and reset the board to default values.)



This section provides information on the BIOS version, CPU base clock, CPU frequency, memory frequency, total memory size, CPU temperature, Vcore, and memory voltage.

► **M.I.T. Current Status**

This screen provides information on CPU/memory frequencies/parameters.

► **Advanced Frequency Settings**



☞ **BCLK/PCIe Clock Control**

Enables or disables the control of CPU base clock and PCIe bus frequency. **Manual** will allow the **Host Clock Frequency** and **Processor Base Clock** items below to be configurable. Note: If your system fails to boot after overclocking, please wait for 20 seconds for automated system reboot, or clear the CMOS values to reset the board to default values. (Default: Auto)

☞ **Host Clock Frequency**

Allows you to manually set the host clock frequency (which controls CPU, PCIe, and memory frequencies) in 0.01 MHz increments. This item is configurable only when **BCLK/PCIe Clock Control** is set to **Manual**. When you change the Host Clock Frequency setting, the **BCLK/PCIe Clock Evaluation** setting below will be changed synchronously.

Important: It is highly recommended that the CPU frequency be set in accordance with the CPU specifications.

☞ **Processor Base Clock (Gear Ratio)**

Allows you to configure the Processor Base Clock by multiplying the **Host Clock Frequency** by several preset host clock multipliers. This item is configurable only when **BCLK/PCIe Clock Control** is set to **Manual**. When you change the Host Clock Frequency setting, the **BCLK/PCIe Clock Evaluation** setting below will be changed synchronously.

Important: It is highly recommended that the CPU frequency be set in accordance with the CPU specifications.

☞ **BCLK/PCIe Clock Evaluation**

This value is determined by multiplying the **Host Clock Frequency** value by the **Processor Base Clock** value.

☞ CPU Clock Ratio

Allows you to alter the clock ratio for the installed CPU. The adjustable range is dependent on the CPU being installed.

☞ CPU Frequency

This value is determined by multiplying the **Processor Base Clock** value by the **CPU Clock Ratio** value.

▶ Advanced CPU Core Features



☞ CPU Clock Ratio, CPU Frequency

The settings under the two items above are synchronous to those under the same items on the **Advanced Frequency Settings** menu.

☞ Internal CPU PLL Overvoltage

Enabled allows CPU PLL voltage to operate at a higher value. **Disabled** allows CPU PLL voltage to operate at default value. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ Intel(R) Turbo Boost Technology (Note)

Allows you to determine whether to enable the Intel CPU Turbo Boost technology. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ Turbo Ratio (1-Core Active~6-Core Active) (Note)

Allows you to set the CPU Turbo ratios for different number of active cores. **Auto** sets the CPU Turbo ratios according to the CPU specifications. (Default: Auto)

☞ Turbo Power Limit (Watts)

Allows you to set a power limit for CPU Turbo mode. When the CPU power consumption exceeds the specified power limit, the CPU will automatically reduce the core frequency in order to reduce the power. **Auto** sets the power limit according to the CPU specifications. (Default: Auto)

☞ Core Current Limit (Amps)

Allows you to set a current limit for CPU Turbo mode. When the CPU current exceeds the specified current limit, the CPU will automatically reduce the core frequency in order to reduce the current. **Auto** sets the power limit according to the CPU specifications. (Default: Auto)

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel CPUs' unique features, please visit Intel's website.

☞ **CPU Core Enabled** (Note 1)

Allows you to determine whether to enable all CPU cores. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ **Hyper-Threading Technology** (Note 1)

Allows you to determine whether to enable multi-threading technology when using an Intel CPU that supports this function. This feature only works for operating systems that support multi-processor mode. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ **CPU Enhanced Halt (C1E)** (Note 1)

Enables or disables Intel CPU Enhanced Halt (C1E) function, a CPU power-saving function in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ **C3/C6 State Support** (Note 1)

Allows you to determine whether to let the CPU enter C3/C6 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C3/C6 state is a more enhanced power-saving state than C1. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ **CPU Thermal Monitor** (Note 1)

Enables or disables Intel CPU Thermal Monitor function, a CPU overheating protection function. When enabled, the CPU core frequency and voltage will be reduced when the CPU is overheated. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ **CPU EIST Function** (Note 1)

Enables or disables Enhanced Intel SpeedStep Technology (EIST). Depending on CPU loading, Intel EIST technology can dynamically and effectively lower the CPU voltage and core frequency to decrease average power consumption and heat production. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ **Extreme Memory Profile (X.M.P.)** (Note 2)

Allows the BIOS to read the SPD data on XMP memory module(s) to enhance memory performance when enabled.

- ▶▶ Disabled Disables this function. (Default)
- ▶▶ Profile1 Uses Profile 1 settings.
- ▶▶ Profile2 (Note 2) Uses Profile 2 settings.

☞ **System Memory Multiplier**

Allows you to set the system memory multiplier. **Auto** sets memory multiplier according to memory SPD data. (Default: Auto)

☞ **Memory Frequency (MHz)**

The first memory frequency value is the normal operating frequency of the memory being used; the second is the memory frequency that is automatically adjusted according to the **Host Clock Frequency**, **Processor Base Clock**, and **System Memory Multiplier** settings.

(Note 1) This item is present only when you install a CPU that supports this feature. For more information about Intel CPUs' unique features, please visit Intel's website.

(Note 2) This item is present only when you install a memory module that supports this feature.

▶ Advanced Memory Settings



☞ **Extreme Memory Profile (X.M.P.)** (Note), **System Memory Multiplier (SPD)**, **Memory Frequency (Mhz)**

The settings under the three items above are synchronous to those under the same items on the **Advanced Frequency Settings** menu.

☞ **Performance Enhance**

Allows the system to operate at three different performance levels.

- ▶▶ Normal Lets the system operate at its basic performance level.
- ▶▶ Turbo Lets the system operate at its good performance level. (Default)
- ▶▶ Extreme Lets the system operate at its best performance level.

☞ **DRAM Timing Selectable**

Quick and **Expert** allows the **Channel Interleaving**, **Rank Interleaving**, and memory timing settings below to be configurable. Options are: Auto (default), Quick, Expert.

☞ **Profile DDR Voltage**

When using a non-XMP memory module or **Extreme Memory Profile (X.M.P.)** is set to **Disabled**, this item will display as **1.50V**. When **Extreme Memory Profile (X.M.P.)** is set to **Profile1** or **Profile2**, this item will display the value based on the SPD data on the XMP memory.

☞ **Profile VTT Voltage**

The value displayed here is dependent on the CPU being used.

☞ **Channel Interleaving**

Enables or disables memory channel interleaving. **Enabled** allows the system to simultaneously access different channels of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ **Rank Interleaving**

Enables or disables memory rank interleaving. **Enabled** allows the system to simultaneously access different ranks of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

This item is present only when you install a memory module that supports this feature.

► **Channel A/B/C/D Timing Settings**



This sub-menu provides memory timing settings for each channel of memory. The respective timing setting screens are configurable only when **DRAM Timing Selectable** is set to **Quick** or **Expert**. Note: Your system may become unstable or fail to boot after you make changes on the memory timings. If this occurs, please reset the board to default values by loading optimized defaults or clearing the CMOS values.

► **Advanced Voltage Settings**



This sub-menu allows you to set CPU, chipset and memory voltages.

▶ PC Health Status



☞ Reset Case Open Status

- ▶▶ Disabled Keeps or clears the record of previous chassis intrusion status. (Default)
- ▶▶ Enabled Clears the record of previous chassis intrusion status and the **Case Open** field will show "No" at next boot.

☞ Case Open

Displays the detection status of the chassis intrusion detection device attached to the motherboard CI header. If the system chassis cover is removed, this field will show "Yes", otherwise it will show "No". To clear the chassis intrusion status record, set **Reset Case Open Status** to **Enabled**, save the settings to the CMOS, and then restart your system.

- ☞ **CPU Vcore/Dram Channel A/B/C/D Voltage/+5V/+12V/CPU VTT**
Displays the current system voltages.
- ☞ **CPU/PCH/System Temperature**
Displays current CPU/Chipset/System temperature.
- ☞ **CPU/System FAN Speed**
Displays current CPU/system fan speeds.
- ☞ **CPU Warning Temperature**
Sets the warning threshold for CPU temperature. When CPU temperature exceeds the threshold, BIOS will emit warning sound. Options are: Disabled (default), 60°C/140°F, 70°C/158°F, 80°C/176°F, 90°C/194°F.
- ☞ **CPU/System Fan Fail Warning**
Allows the system to emit warning sound if the CPU fan or system fan are not connected or fail. Check the fan condition or fan connection when this occurs. (Default: Disabled)
- ☞ **CPU Fan Control mode**
 - ▶▶ Auto Lets the BIOS automatically detect the type of CPU fan installed and sets the optimal CPU fan control mode. (Default)
 - ▶▶ Voltage Sets Voltage mode for a 3-pin CPU fan.
 - ▶▶ PWM Sets PWM mode for a 4-pin CPU fan.

Note: The Voltage mode can be set for a 3-pin CPU fan or a 4-pin CPU fan. However, for a 4-pin CPU fan that is not designed following Intel PWM fan specifications, selecting PWM mode may not effectively reduce the fan speed.
- ☞ **CPU Fan Speed Control**
Allows you to determine whether to enable the CPU fan speed control function and adjust the fan speed.
 - ▶▶ Normal Allows the CPU fan to run at different speeds according to the CPU temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
 - ▶▶ Silent Allows the CPU fan to run at slow speeds.
 - ▶▶ Manual Allows you to control the CPU fan speed under the **Slope PWM** item.
 - ▶▶ Disabled Allows the CPU fan to run at full speeds.
- ☞ **Slope PWM**
Allows you to control the CPU fan speed. This item is configurable only when **CPU Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.
- ☞ **System Fan Speed Control**
Allows you to determine whether to enable the system fan speed control function and adjust the fan speed.
 - ▶▶ Normal Allows the system fan to run at different speeds according to the system temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
 - ▶▶ Silent Allows the system fan to run at slow speeds.
 - ▶▶ Manual Allows you to control the system fan speed under the **Slope PWM** item.
 - ▶▶ Disabled Allows the system fan to run at full speeds.
- ☞ **Slope PWM**
Allows you to control the system fan speed. This item is configurable only when **System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

2-4 System



This section provides information on your CPU, memory, motherboard model, and BIOS version. You can also select the default language used by the BIOS and manually set the system time.

System Language

Selects the default language used by the BIOS.

System Date

Sets the system date. The date format is week (read-only), month, date, and year. Use <Enter> to switch between the Month, Date, and Year fields and use the <Page Up> or <Page Down> key to set the desired value.

System Time

Sets the system time. The time format is hour, minute, and second. For example, 1 p.m. is 13:0:0. Use <Enter> to switch between the Hour, Minute, and Second fields and use the <Page Up> or <Page Down> key to set the desired value.

Access Level

Displays the current access level depending on the type of password protection used. (If no password is set, the default will display as Administrator.) The Administrator level allows you to make changes to all BIOS settings; the User level only allows you to make changes to certain BIOS settings but not all.

ATA Port Information

This section provides information on the device connected to each SATA port controlled by Intel X79 Chipset.

2-5 BIOS Features



☞ Boot Option Priorities

Specifies the overall boot order from the available devices. For example, you can set hard drive as the first priority (**Boot Option #1**) and DVD ROM drive as the second priority (**Boot Option #2**). The list only displays the device with the highest priority for a specific type. For example, only hard drive defined as the first priority on the **Hard Drive BBS Priorities** submenu will be presented here.

Removable storage devices that support GPT format will be prefixed with "UEFI:" string on the boot device list. To boot from an operating system that supports GPT partitioning, select the device prefixed with "UEFI:" string.

Or if you want to install an operating system that supports GPT partitioning such as Windows 7 64-bit, select the optical drive that contains the Windows 7 64-bit installation disk and is prefixed with "UEFI:" string.

☞ Hard Drive/CD/DVD ROM Drive/Floppy Drive/Network Device BBS Priorities

Specifies the boot order for a specific device type, such as hard drives, optical drives, floppy disk drives, and devices that support Boot from LAN function, etc. Press <Enter> on this item to enter the submenu that presents the devices of the same type that are connected. This item is present only if at least one device for this type is installed.

☞ Bootup NumLock State

Enables or disables Numlock feature on the numeric keypad of the keyboard after the POST. (Default: Disabled)

☞ Full Screen LOGO Show

Allows you to determine whether to display the GIGABYTE Logo at system startup. **Disabled** skips the GIGABYTE Logo when the system starts up. (Default: Enabled)

☞ PCI ROM Priority

Allows you to determine which Option ROM to launch. Options are Legacy ROM and EFI Compatible ROM. (Default: EFI Compatible ROM)

Init Display First

Specifies the first initiation of the monitor display from the installed PCI graphics card or the PCI Express graphics card.

- ▶▶ PCIe Slot 1 Sets the graphics card on the PCIEX16_1 slot as the first display. (Default)
- ▶▶ PCIe Slot 2 Sets the graphics card on the PCIEX8_1 slot as the first display.
- ▶▶ PCIe Slot 3 Sets the graphics card on the PCIEX16_2 slot as the first display.
- ▶▶ PCIe Slot 4 Sets the graphics card on the PCIEX8_2 slot as the first display.
- ▶▶ PCI Sets the graphics card on the PCI slot as the first display.

Limit CPUID Maximum ^(Note)

Allows you to determine whether to limit CPUID maximum value. Set this item to **Disabled** for Windows XP operating system; set this item to **Enabled** for legacy operating system such as Windows NT4.0. (Default: Disabled)

Execute Disable Bit ^(Note)

Enables or disables Intel Execute Disable Bit function. This function may enhance protection for the computer, reducing exposure to viruses and malicious buffer overflow attacks when working with its supporting software and system. (Default: Enabled)

Intel Virtualization Technology ^(Note)

Enables or disables Intel Virtualization Technology. Virtualization enhanced by Intel Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. (Default: Disabled)

Intel(R) I/OAT ^(Note)

Enables or disables Intel I/O Acceleration Technology. (Default: Disabled)

Intel(R) VT-d ^(Note)

Enables or disables Intel Virtualization Technology for Directed I/O. (Default: Disabled)

Isoc ^(Note)

Determines whether to enable specific streams within the CPU and Chipset. (Default: Enabled)

Network stack

Disables or enables booting from the network to install a GPT format OS, such as installing the OS from the Windows Deployment Services server. (Default: Disable Link)

IPv4 PXE Support

Enables or disables IPv4 PXE Support. This item is configurable only when **Network stack** is enabled.

IPv6 PXE Support

Enables or disables IPv6 PXE Support. This item is configurable only when **Network stack** is enabled.

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel CPUs' unique features, please visit Intel's website.

☞ **Administrator Password**

Allows you to configure an administrator password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. Differing from the user password, the administrator password allows you to make changes to all BIOS settings.

☞ **User Password**

Allows you to configure a user password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. However, the user password only allows you to make changes to certain BIOS settings but not all.

To cancel the password, press <Enter> on the password item and when requested for the password, enter the correct one first. When prompted for a new password, press <Enter> without entering any password. Press <Enter> again when prompted to confirm.

2-6 Peripherals



☞ LAN PXE Boot Option ROM

Allows you to decide whether to activate the boot ROM integrated with the onboard LAN chip. (Default: Disabled)

☞ LAN Controller

Enables or disables the onboard LAN function. (Default: Enabled) (Default: Enabled)

If you wish to install a 3rd party add-in network card instead of using the onboard LAN, set this item to **Disabled**.

☞ Audio Device Control

Enables or disables the onboard audio function. (Default: Enabled)

If you wish to install a 3rd party add-in audio card instead of using the onboard audio, set this item to **Disabled**.

☞ USB 2.0 Devices (Intel X79 Chipset)

Enables or disables the USB 2.0 controllers integrated with the Intel X79 Chipset. (Default: Enabled)

☞ Intel SATA Controller Mode (Intel X79 Chipset)

Enables or disables RAID for the SATA controllers integrated in the Intel X79 Chipset or configures the SATA controllers to AHCI mode.

- ▶▶ Disabled Disables this function.
- ▶▶ IDE Mode Disables RAID for the SATA controllers and configures the SATA controllers to IDE mode.
- ▶▶ AHCI Mode Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)
- ▶▶ RAID Mode Enables RAID for the SATA controllers.

☞ Legacy USB Support

Allows USB keyboard/mouse to be used in MS-DOS. (Default: Enabled)

☞ **XHCI Hand-off**

Determines whether to enable XHCI Hand-off feature for an operating system without XHCI Hand-off support. (Default: Enabled)

☞ **EHCI Hand-off**

Determines whether to enable EHCI Hand-off feature for an operating system without EHCI Hand-off support. (Default: Disabled)

☞ **Port 60/64 Emulation**

Enables or disables emulation of I/O ports 64h and 60h. This should be enabled for full legacy support for USB keyboards/mice in MS-DOS or in operating system that does not natively support USB devices. (Default: Disabled)

☞ **USB Storage Devices**

Displays a list of connected USB mass storage devices. This item appears only when a USB storage device is installed.

▶ **Trusted Computing**

☞ **TPM SUPPORT**

Enables or disables Trusted Platform Module (TPM). Set this item to **Enable** when a TPM device is installed. (Default: Disable)

☞ **Fresco USB3.0 Controller#1 (Fresco FL1009 USB 3.0 Controller, USB 3.0/2.0 ports routed to the onboard F_USB30 header)**

Enables or disables the Fresco FL1009 USB 3.0 controllers. (Default: Enabled)

☞ **Fresco USB3.0 Controller#2 (Fresco FL1009 USB 3.0 Controller, USB 3.0/2.0 ports on the back panel)**

Enables or disables the Fresco FL1009 USB 3.0 controllers. (Default: Enabled)

▶ **Super IO Configuration**

This section provides information on the super I/O chip and allows you to configure the serial port.

☞ **Serial Port A**

Enables or disables the onboard serial port. (Default: Enabled)

► Marvell ATA Controller Configuration



☞ **GSATA Controller (Marvell 88SE9172 Chip, GSATA3 6 and GSATA3 7 connectors)**

Enables or disables RAID for the SATA controllers integrated in the Marvell 88SE9172 chip or configures the SATA controllers to AHCI mode. The area below displays the current status of the two SATA ports.

- ▶▶ IDE Mode Disables RAID for the SATA controllers and configures the SATA controllers to IDE mode.
- ▶▶ RAID Mode Enables RAID for the SATA controllers.
- ▶▶ AHCI Mode Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)
- ▶▶ Disabled Disables this function.

☞ **GSATA Controller (Marvell 88SE9172 Chip, GSATA3 8 and GSATA3 9 connectors)**

Enables or disables RAID for the SATA controllers integrated in the Marvell 88SE9172 chip or configures the SATA controllers to AHCI mode. The area below displays the current status of the two SATA ports.

- ▶▶ IDE Mode Disables RAID for the SATA controllers and configures the SATA controllers to IDE mode.
- ▶▶ RAID Mode Enables RAID for the SATA controllers.
- ▶▶ AHCI Mode Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)
- ▶▶ Disabled Disables this function.

☞ **GSATA Controller (Marvell 88SE9172 Chip, eSATA connectors)**

Enables or disables RAID for the SATA controllers integrated in the Marvell 88SE9172 chip or configures the SATA controllers to AHCI mode. The area below displays the current status of the two SATA ports.

- ▶▶ IDE Mode Disables RAID for the SATA controllers and configures the SATA controllers to IDE mode.
- ▶▶ RAID Mode Enables RAID for the SATA controllers.
- ▶▶ AHCI Mode Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)
- ▶▶ Disabled Disables this function.

2-7 Power Management



☞ AC BACK

Determines the state of the system after the return of power from an AC power loss.

- ▶▶ Memory The system returns to its last known awake state upon the return of the AC power.
- ▶▶ Always On The system is turned on upon the return of the AC power.
- ▶▶ Always Off The system stays off upon the return of the AC power. (Default)

☞ Power On By Keyboard

Allows the system to be turned on by a PS/2 keyboard wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

- ▶▶ Disabled Disables this function. (Default)
- ▶▶ Keyboard 98 Press POWER button on the Windows 98 keyboard to turn on the system.
- ▶▶ Any Key Press any key to turn on the system.

☞ Resume by Alarm

Determines whether to power on the system at a desired time. (Default: Disabled)

If enabled, set the date and time as following:

- ▶▶ Wake up day: Turn on the system at a specific time on each day or on a specific day in a month.
- ▶▶ Wake up hour/minute/second: Set the time at which the system will be powered on automatically.

Note: When using this function, avoid inadequate shutdown from the operating system or removal of the AC power, or the settings may not be effective.

☞ High Precision Event Timer ^(Note)

Enables or disables High Precision Event Timer (HPET) for Windows 7/Vista operating system. (Default: Enabled)

(Note) Supported on Windows 7/Vista operating system only.