

GA-X79S-UP5-WIFI

GA-X79S-UP5

User's Manual

Rev. 1002

12ME-X79SUP5-1002R

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-X79S-UP5-WIFI**

GA-X79S-UP5

conforms with the essential requirements of the following directives:

<input checked="" type="checkbox"/> 2004/108/EC EMC Directive:	
<input checked="" type="checkbox"/> Conduction & Radiated Emissions:	EN55022:2006+A1:2007
<input checked="" type="checkbox"/> Immunity:	EN55024:1998+A1:2001+A2:2003
<input checked="" type="checkbox"/> Power-line Harmonics:	EN61000-3-2:2006
<input checked="" type="checkbox"/> Power-line Flicker:	EN61000-3-3:2008

<input checked="" type="checkbox"/> 2006/95/EC LVD Directive	
<input checked="" type="checkbox"/> Safety:	EN60950-1:2006+A11:2009

<input checked="" type="checkbox"/> 2011/65/EU RoHS Directive	
<input checked="" type="checkbox"/> 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: Aug. 3, 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-X79S-UP5-WIFI
GA-X79S-UP5

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: Aug. 3, 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:

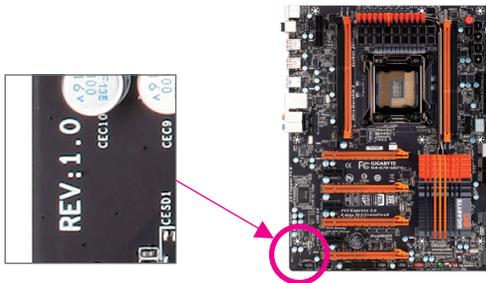


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Box Contents

- GA-X79S-UP5-WIFI or GA-X79S-UP5 motherboard
- Motherboard driver disk
- User's Manual
- Quick Installation Guide
- Six SATA 6Gb/s cables
- I/O Shield
- One 2-Way SLI bridge connector
- One 3-Way SLI bridge connector
- One 2-Way CrossFireX bridge connector
- One GC-WB300D (including two antennas, one USB 2.0 cable, driver disk, and user's manual)^①
- 3.5" Front Panel with 2 USB 3.0/2.0 ports

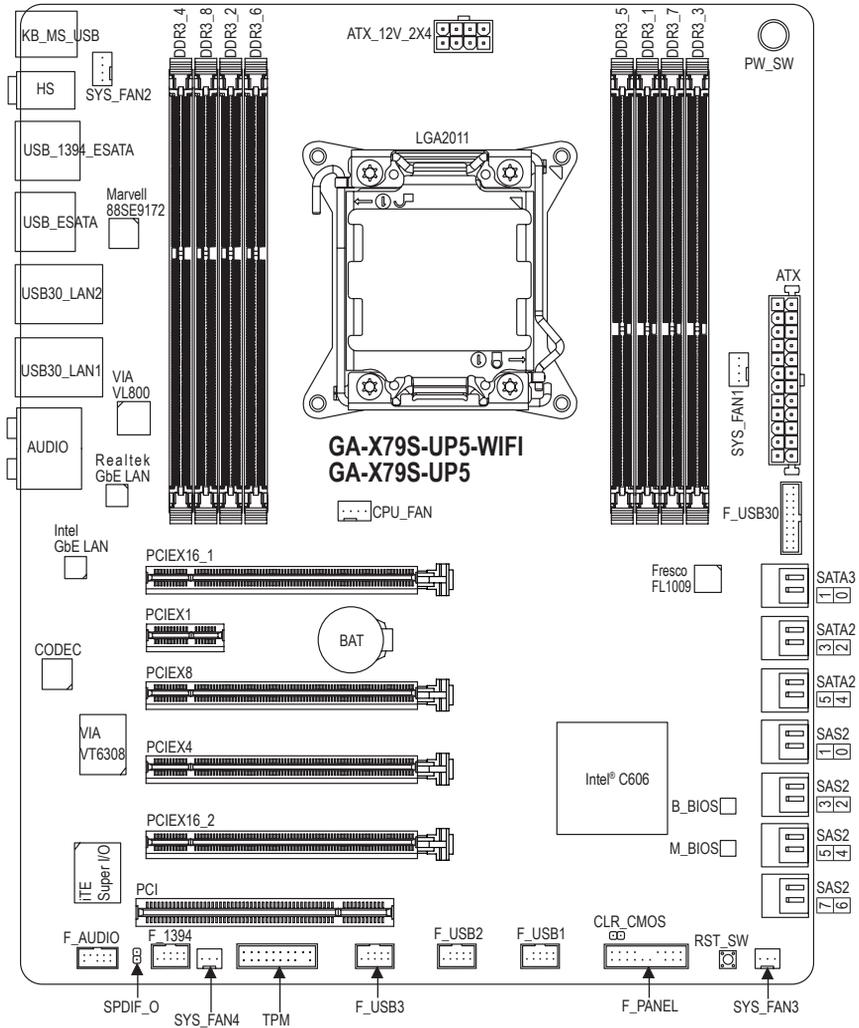
^① Only for GA-X79S-UP5-WIFI

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)
- 2-port IEEE 1394a bracket (Part No. 12CF1-1IE008-0*R)

GA-X79S-UP5-WIFI/GA-X79S-UP5 Motherboard Layout



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	<ul style="list-style-type: none"> ◆ Support for Intel® Core™ i7 processors in the LGA2011 package (Go to GIGABYTE's website for the latest CPU support list.) ◆ L3 cache varies with CPU
 Chipset	<ul style="list-style-type: none"> ◆ Intel® C606 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 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 ALC898 codec ◆ High Definition Audio ◆ 2/4/5.1/7.1-channel ◆ Support for S/PDIF Out
 LAN	<ul style="list-style-type: none"> ◆ 1 x Intel GbE LAN chip (10/100/1000 Mbit) (LAN1) ◆ 1 x Realtek GbE LAN chip (10/100/1000 Mbit) (LAN2)
 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_1 slot; if you are installing two PCI Express graphics cards, it is recommended that you install them in the PCIEX16_1 and PCIEX16_2 slots. ◆ 1 x PCI Express x16 slot, running at x8 (PCIEX8) <ul style="list-style-type: none"> * The PCIEX8 slot shares bandwidth with the PCIEX16_2 slot. When the PCIEX8 slot is populated, the PCIEX16_2 slot will operate at up to x8 mode. ◆ 1 x PCI Express x16 slot, running at x4 (PCIEX4) (The PCIEX16, PCIEX8, and PCIEX4 slots conform to PCI Express 3.0 standard.) ◆ 1 x PCI Express x1 slot (The PCIEX1 slot conforms to PCI Express 2.0 standard.) ◆ 1 x PCI slot
 Multi-Graphics Technology	<ul style="list-style-type: none"> ◆ Support for 3-Way/2-Way AMD CrossFireX™/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) supporting up to 2 SATA 6Gb/s devices - 4 x SATA 3Gb/s connectors (SATA2 2~5) supporting up to 4 SATA 3Gb/s devices - 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. - 8 x SAS 3Gb/s connectors (SAS2 0~7) supporting up to 8 SAS 3Gb/s devices <ul style="list-style-type: none"> * The SAS connectors do not support optical drives. - Support for RAID 0, RAID 1, and RAID 10

	Storage Interface <ul style="list-style-type: none"> ◆ Marvell 88SE9172 chip: <ul style="list-style-type: none"> - 2 x eSATA 6Gb/s connectors (including 1 eSATA/USB Combo) on the back panel supporting up to 2 SATA 6Gb/s devices - Support for RAID 0 and RAID 1
	USB <ul style="list-style-type: none"> ◆ Chipset: <ul style="list-style-type: none"> - Up to 12 USB 2.0/1.1 ports (6 ports on the back panel, including 1 eSATA/USB Combo, 6 ports available through the internal USB headers) ◆ VIA VL800 chip: <ul style="list-style-type: none"> - Up to 4 USB 3.0/2.0 ports on the back panel <ul style="list-style-type: none"> * Due to a Windows 7 limitation, please connect your USB device(s) to the USB 2.0/1.1 port(s) before the VIA USB 3.0 controller driver is installed. ◆ Fresco FL1009 chip: <ul style="list-style-type: none"> - Up to 2 USB 3.0/2.0 ports (available through the internal USB header)
	IEEE 1394 <ul style="list-style-type: none"> ◆ VIA VT6308 chip: <ul style="list-style-type: none"> - Up to 2 IEEE 1394a ports (1 port on the back panel, 1 port available through the internal IEEE 1394a 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 ◆ 2 x SATA 6Gb/s connectors ◆ 4 x SATA 3Gb/s connectors ◆ 8 x SAS 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 IEEE 1394a port ◆ 1 x Clear CMOS jumper ◆ 1 x Trusted Platform Module (TPM) header ◆ 1 x power button ◆ 1 x reset button
	Back Panel Connectors <ul style="list-style-type: none"> ◆ 1 x PS/2 keyboard/mouse port ◆ 1 x CPU overclocking button ◆ 1 x BIOS switch button ◆ 1 x Clear CMOS button ◆ 1 x IEEE 1394a port ◆ 4 x USB 3.0/2.0 ports ◆ 5 x USB 2.0/1.1 ports ◆ 1 x eSATA/USB Combo connector ◆ 1 x eSATA 6Gb/s connector ◆ 2 x RJ-45 ports ◆ 1 x optical S/PDIF Out connector ◆ 5 x audio jacks (Center/Subwoofer Speaker Out, Rear 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 <ul style="list-style-type: none"> * Whether the CPU/system fan speed control function is supported will depend on the CPU/system cooler you install.
	BIOS	<ul style="list-style-type: none"> ◆ 2 x 64 Mbit flash ◆ Use of licensed AMI EFI BIOS ◆ Support for DualBIOS™ ◆ PnP 1.0a, DMI 2.0, SM BIOS 2.6, ACPI 2.0a
	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 ◆ Support for 3D Power
	Bundled Software	<ul style="list-style-type: none"> ◆ Norton Internet Security (OEM version)
	Operating System	<ul style="list-style-type: none"> ◆ Support for Microsoft® Windows 7/Vista
	Form Factor	<ul style="list-style-type: none"> ◆ E-ATX Form Factor; 30.5cm x 26.4cm

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

* Please visit 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

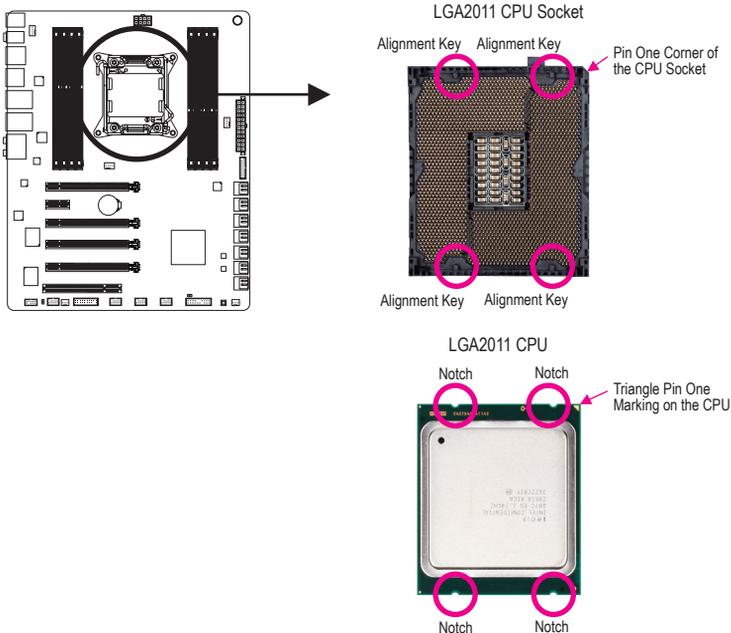


Read the following guidelines before you begin to install the CPU:

- 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

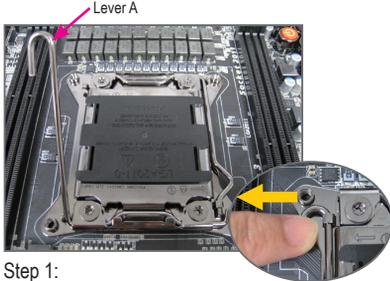
- A. Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.



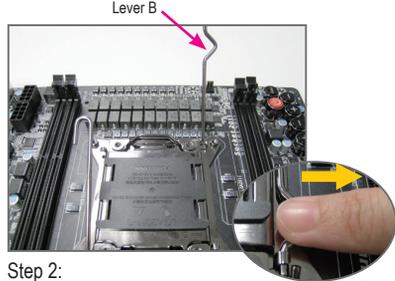
B. Follow the steps below to correctly install the CPU into the motherboard CPU socket.



- 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.



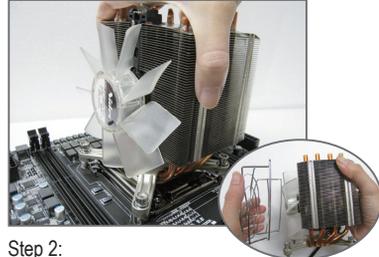
Step 6:
Finally, secure lever A under its retention tab to complete the installation of the CPU.

1-3-2 Installing the CPU Cooler

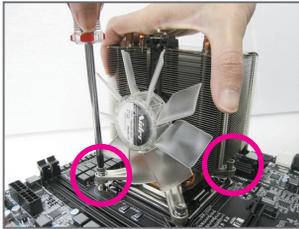
Refer to the steps below to correctly install the CPU cooler on the motherboard. (Actual installation process may differ depending on the CPU cooler to be used. Refer to the user's manual for your CPU cooler.)



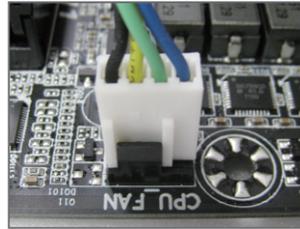
Step 1:
Apply an even and thin layer of thermal grease on the surface of the installed CPU.



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



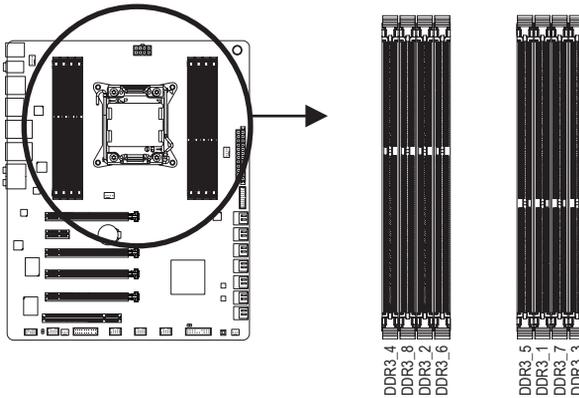
Read the following guidelines before you begin to install the memory:

- 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_4, DDR3_8
- ▶▶ Channel B: DDR3_2, DDR3_6
- ▶▶ Channel C: DDR3_3, DDR3_7
- ▶▶ Channel D: DDR3_1, DDR3_5



▶▶ 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
8 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	--	--	--	--	--
3 Modules	--	--	DS/SS	--	--	DS/SS	--	DS/SS
	DS/SS	--	DS/SS	--	--	DS/SS	--	--
	DS/SS	--	DS/SS	--	--	DS/SS	--	DS/SS

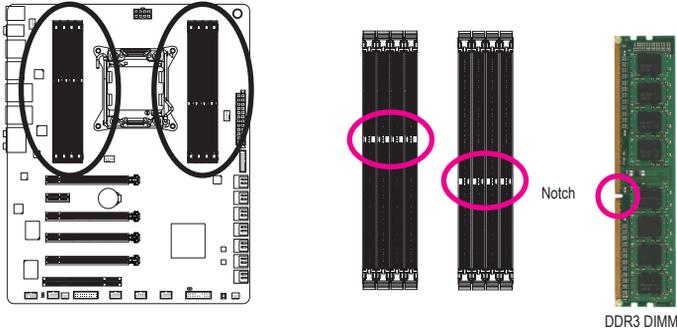
(SS=Single-Sided, DS=Double-Sided, "--"=No Memory)

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

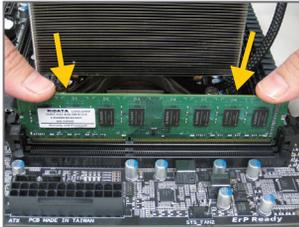
1. For optimum performance, when enabling Dual Channel mode with two memory modules, we recommend that you install them in the DDR3_1 and DDR3_2 sockets.
2. When installing the memory, make sure to begin with the first socket of each channel, such as DDR3_1, DDR3_2, DDR3_3, and DDR3_4.

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.

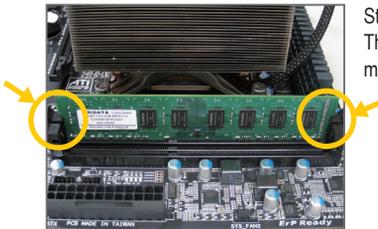


A DDR3 memory module has a notch, so it can only fit in one direction. Follow the steps below to correctly install your memory modules in the memory sockets.



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:

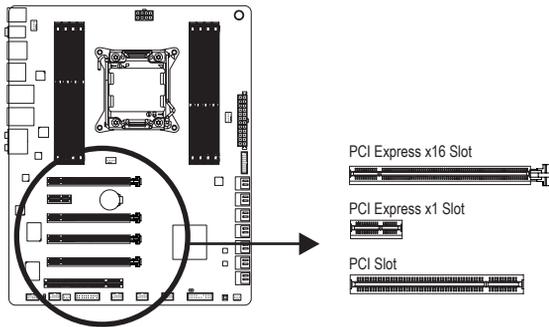
The clips at both ends of the socket will snap into place when the memory module is securely inserted.

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 CrossFireX™/NVIDIA SLI Configuration

A. System Requirements

- Windows 7 or Windows Vista operating system
- A CrossFireX/SLI-supported motherboard with two/three PCI Express x16 slots and correct driver
- Two/three CrossFireX/SLI-ready graphics cards of identical brand and chip and correct driver (Current GPUs that support 3-Way CrossFireX 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 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.)
- CrossFireX^(Note)/SLI bridge connectors
- A power supply with sufficient power is recommended (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 CrossFireX/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 CrossFireX^(Note)/SLI bridge connectors in the CrossFireX/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

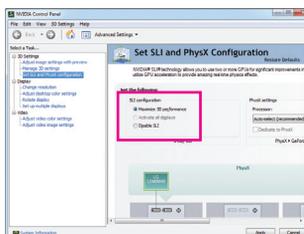
C-1. To Enable CrossFireX Function

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.

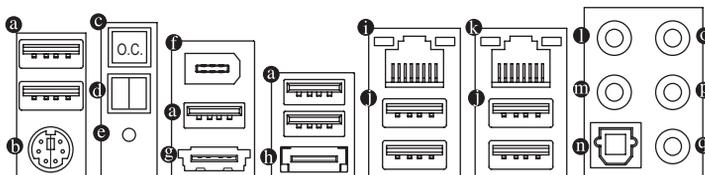


(Note) The bridge connector(s) may be needed or not depending on your graphics cards.



Procedure and driver screen for enabling CrossFireX/SLI technology may differ by graphics cards and driver version. Refer to the manual that came with your graphics cards for more information about enabling CrossFireX/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) CPU Overclocking Button

Press this button to overclock your CPU. To return to the defaults, press this button again.

d) BIOS Switch Button

The button allows users to easily select a different BIOS for boot up or overclocking, helping to reduce BIOS failure during overclocking. Press the button to switch between the main BIOS and backup BIOS. The green LED indicates the main BIOS is active and the blue LED indicates the backup BIOS is active.

e) Clear CMOS Button

Use this button to clear the CMOS values (e.g. date information and BIOS configurations) and reset the CMOS values to factory defaults when needed.

f) IEEE 1394a Port

The IEEE 1394 port supports the IEEE 1394a specification, featuring high speed, high bandwidth and hotplug capabilities. Use this port for an IEEE 1394a device.

g) eSATA/USB Combo Connector

This connector supports SATA 6Gb/s and USB 2.0/1.1 specification. Use the port to connect an external SATA device or a SATA port multiplier. The Marvell 88SE9172 chip supports RAID function. Refer to Chapter 5, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array. Or use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

h) eSATA 6Gb/s Connector

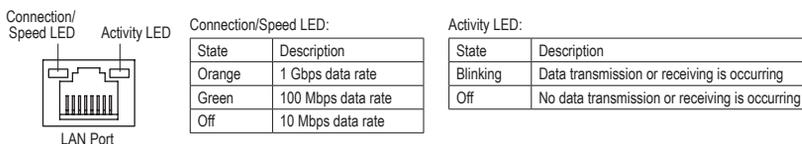
This connector supports SATA 6Gb/s specification. Use the port to connect an external SATA device or a SATA port multiplier. The Marvell 88SE9172 chip supports RAID function. Refer to Chapter 5, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array.



- 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.

❶ RJ-45 LAN Port (LAN2)

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.

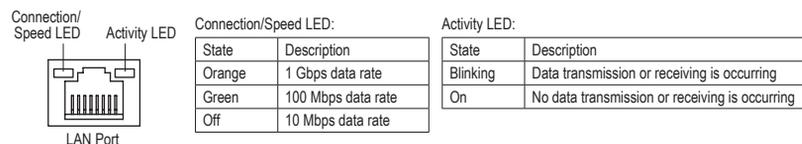


❷ USB 3.0/2.0 Port

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.

❸ RJ-45 LAN Port (LAN1)

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.



❹ Center/Subwoofer Speaker Out Jack (Orange)

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

❺ Rear Speaker Out Jack (Black)

Use this audio jack to connect rear speakers in a 4/5.1/7.1-channel audio configuration.

❻ 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.

❼ Line In Jack (Blue)

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

❽ 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.

❾ Mic In Jack (Pink)

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

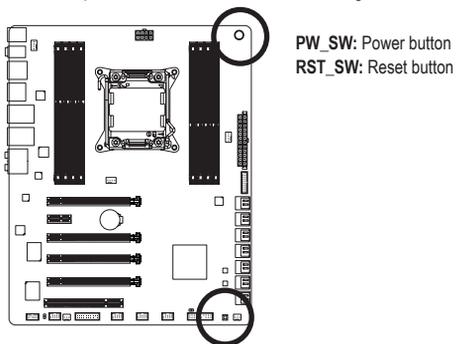


In addition to the default speakers settings, the ❶~❹ audio jacks can be reconfigured to perform different functions via the audio software. Only microphones still MUST be connected to the default Mic in jack (❾). Refer to the instructions on setting up a 2/4/5.1/7.1-channel audio configuration in Chapter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

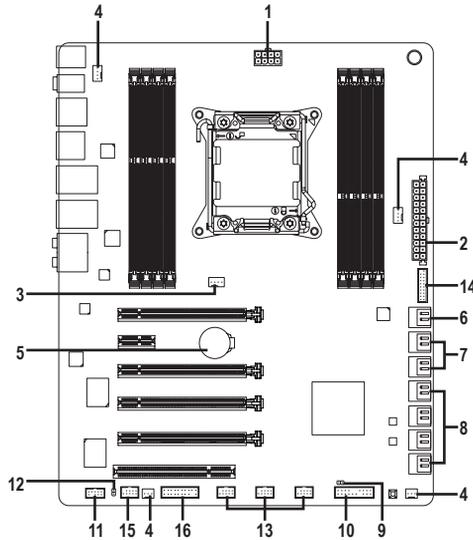
1-8 Onboard Buttons

Quick Buttons

This motherboard has 2 quick buttons: power button and reset button. The power button and reset button allow users to quickly turn on/off or reset the computer in an open-case environment when they want to change hardware components or conduct hardware testing.



1-9 Internal Connectors



1)	ATX_12V_2X4	9)	CLR_CMOS
2)	ATX	10)	F_PANEL
3)	CPU_FAN	11)	F_AUDIO
4)	SYS_FAN1/2/3/4	12)	SPDIF_O
5)	BAT	13)	F_USB1/F_USB2/F_USB3
6)	SATA3 0/1	14)	F_USB30
7)	SATA2 2/3/4/5	15)	F_1394
8)	SAS2 0/1/2/3/4/5/6/7	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.

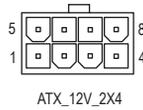
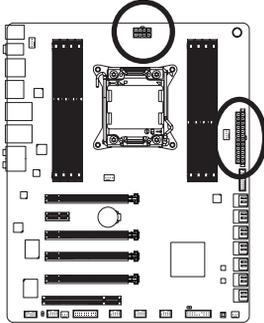
1/2) ATX_12V_2X4/ATX (2x4 12V Power Connector and 2x12 Main Power Connector)

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.

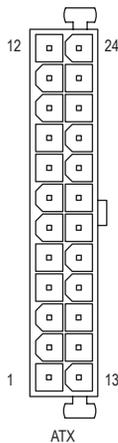


To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.



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

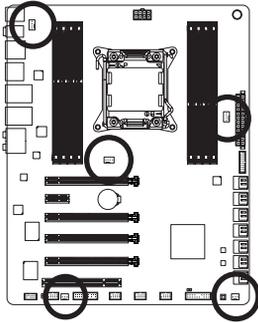


ATX:

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), a 4-pin (SYS_FAN1/2) and the 3-pin (SYS_FAN3/4) 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	+5V

SYS_FAN2:

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



SYS_FAN3/4:

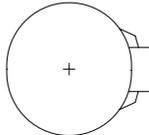
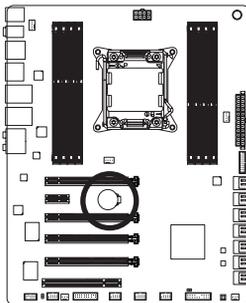
Pin No.	Definition
1	GND
2	+12V
3	Sense



- 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) 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:

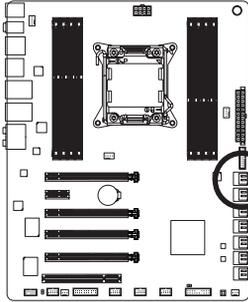
1. Turn off your computer and unplug the power cord.
2. Gently remove the battery from the battery holder and wait for one minute. (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.)
3. Replace the battery.
4.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

6) SATA3 0/1 (SATA 6Gb/s Connectors, Controlled by Intel C606 Chipset)

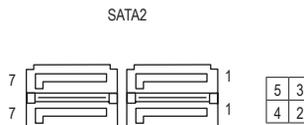
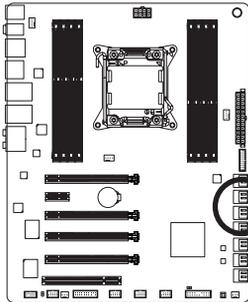
The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The "SATA3 0" and "SATA3 1" connectors support RAID 0 and RAID 1. RAID 5 and RAID 10 can be implemented on the two connectors with the "SATA2 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 C606 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 C606 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

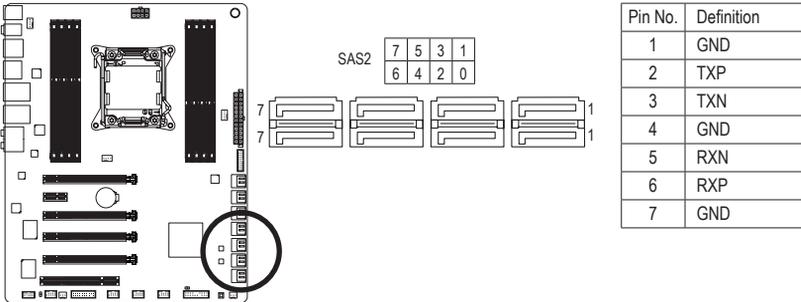


- A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are to be used, the total number of hard drives must be an even number.
- A RAID 5 configuration requires at least three hard drives. (The total number of hard drives does not have to be an even number.)
- 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) SAS2 0/1/2/3/4/5/6/7 (SAS 3Gb/s Connectors, Controlled by Intel C606 Chipset)

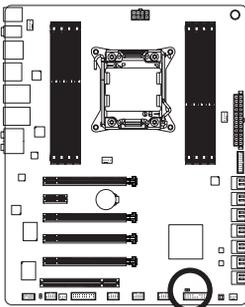
The SAS connectors conform to SAS 3Gb/s standard and are compatible with SAS 1.5Gb/s standard. Each SAS connector supports a single SAS or SATA device. The Intel C606 Chipset supports RAID 0, RAID 1, and RAID 10. Refer to Chapter 5, "Configuring SAS Hard Drive(s)," for instructions on configuring a RAID array.



- 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 10 configuration requires four hard drives.

9) 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

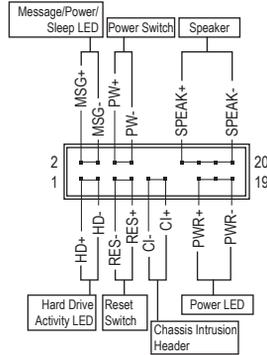
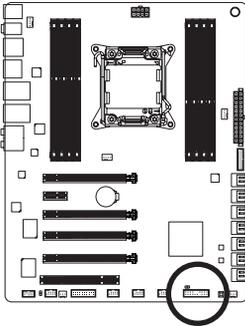
 Short: Clear CMOS Values



- 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).

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 sleep state or powered off (S5).

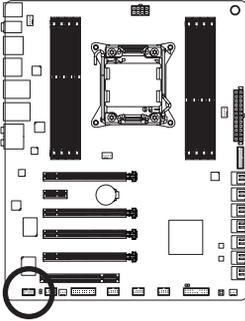
- **PW** (Power Switch, Red):
Connects to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch (refer to Chapter 2, "BIOS Setup," "Power Management," for more information).
- **SPEAK** (Speaker, Orange):
Connects to the speaker on the chassis 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

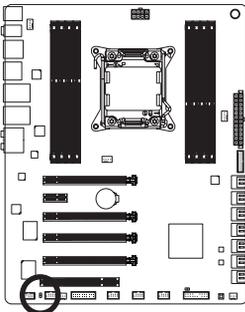


- The front panel audio header supports HD audio by default. If your chassis provides an AC'97 front panel audio module, refer to the instructions on how to activate AC'97 functionality via the audio software in Chapter 5, "Configuring 2/4/5.1/7.1-Channel Audio."
- Audio signals will be present on both 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/SPDIF Out Header)

This header supports digital S/SPDIF Out and connects a S/SPDIF 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/SPDIF 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/SPDIF digital audio cable, carefully read the manual for your expansion card.

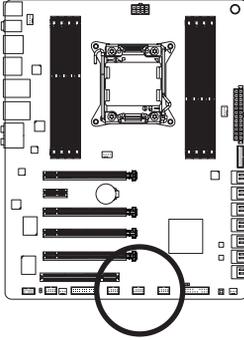


1

Pin No.	Definition
1	SPDIFO
2	GND

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

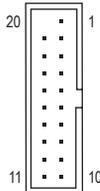
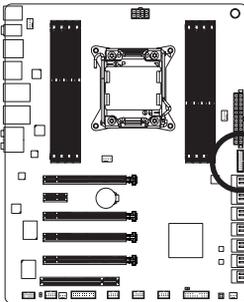
The headers conform to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.



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

14) 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



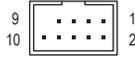
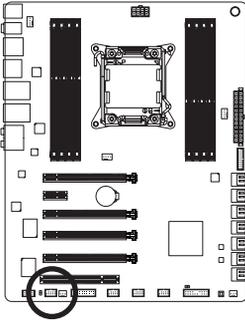
When the system is in S4/S5 mode, only the USB ports routed to the F_USB1 header can support the ON/OFF Charge function.



- 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) F_1394 (IEEE 1394a Header)

The header conforms to IEEE 1394a specification. The IEEE 1394a header can provide one IEEE 1394a port via an optional IEEE 1394a bracket. For purchasing the optional IEEE 1394a bracket, please contact the local dealer.



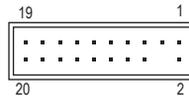
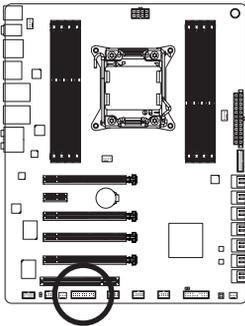
Pin No.	Definition
1	I-TPA1+
2	I-TPA1-
3	GND
4	GND
5	I-TPB1+
6	I-TPB1-
7	Power (12V)
8	Power (12V)
9	No Pin
10	GND



- Do not plug the USB bracket cable into the IEEE 1394a header.
- Prior to installing the IEEE 1394a bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the IEEE 1394a bracket.
- To connect an IEEE 1394a device, attach one end of the device cable to your computer and then attach the other end of the cable to the IEEE 1394a device. Ensure that the cable is securely connected.

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 or the clear CMOS jumper/button 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

A. The 3D BIOS Screen (Default)

On GIGABYTE's uniquely designed 3D BIOS screen, you can use your mouse to move through the motherboard image and click to enter the function menu in each area for quick configuration. For example, pass your mouse arrow over the CPU and memory sockets and enter the **System Tuning** menu to configure CPU/memory frequency, memory timings, and voltage settings. For more detailed configuration items, you can click the function menu icons at the bottom of the screen or press <F1> to switch to the main menu of the BIOS Setup program. (If a mouse is not connected, the 3D BIOS screen will automatically switch to the main menu of the BIOS Setup Program.)



B. The Main Menu of the BIOS Setup Program

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: D1)



Configuration Items

Current Settings

BIOS Setup

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
<F1>	Switch to 3D BIOS screen
<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**



☞ **CPU/PCIe Base Clock**

Allows you to manually set the CPU base clock and PCIe bus frequency in 0.01 MHz increments. (Default: Auto)

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

☞ **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 **CPU/PCIe Base Clock** is set to **Manual**. When you change the Processor Base Clock setting, the Memory Frequency (Mhz) 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**

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 **CPU/PCIe Base Clock** is enabled. When you change the **Processor Base Clock** 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 (SPD)**
 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 **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 CPU and a memory module that support 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)

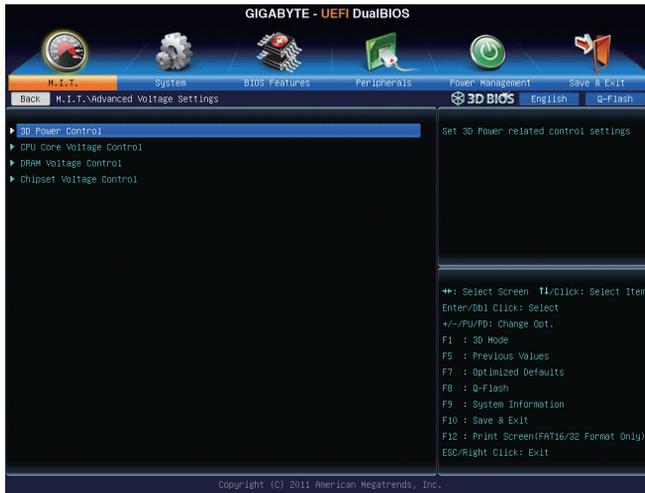
(Note) This item is present only when you install a CPU and a memory module that support this feature.

▶ 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



▶ 3D Power Control



☞ PWM Phase Control

Allows you to automatically change the PWM phase according to the CPU load. The power-saving levels are (from lowest to highest): eXm Perf (Extreme Performance), High Perf (High Performance), Perf (Performance), Balanced, Mid PWR (Mid Power), and Lite PWR (Light Power). **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ Vcore Voltage Response

Allows you to configure the response time for Vcore changes using preset levels.

- ▶▶ Auto Lets BIOS automatically configure this setting. (Default)
- ▶▶ Standard-Fast Selects Standard or Fast which represents different levels of the response time for Vcore changes.

⊞ **Vcore Loadline Calibration**

Allows you to set the Load-Line Calibration level for the Vcore. The levels are (from highest to lowest): Extreme, Turbo, High, Medium, and Standard. Selecting a higher level keeps the Vcore more consistent with what is set in BIOS under heavy load. **Auto** lets the BIOS automatically configure this setting and sets the voltage following Intel's specifications. (Default: Auto)

⊞ **IMC Voltage Loadline Calibration**

Allows you to configure Load-Line Calibration for the IMC voltage. This item allows you to adjust the V-droop value. The higher the V-droop value, the lower the output voltage will be under heavy load.

- ▶▶ Auto Lets the BIOS automatically configure this setting and sets V-droop following Intel specifications. (Default)
- ▶▶ +0%~+180% Adjusts the V-droop value.

⊞ **DDR CH(A/B) Voltage Loadline Calibration**

Allows you to configure Load-Line Calibration for Channel A and Channel B memory voltage. This item allows you to adjust the V-droop value. The higher the V-droop value, the lower the output voltage will be under heavy load.

- ▶▶ Auto Lets the BIOS automatically configure this setting and sets V-droop following Intel specifications. (Default)
- ▶▶ +0%~+180% Adjusts the V-droop value.

⊞ **DDR CH(C/D) Voltage Loadline Calibration**

Allows you to configure Load-Line Calibration for Channel C and Channel D memory voltage. This item allows you to adjust the V-droop value. The higher the V-droop value, the lower the output voltage will be under heavy load.

- ▶▶ Auto Lets the BIOS automatically configure this setting and sets V-droop following Intel specifications. (Default)
- ▶▶ +0%~+180% Adjusts the V-droop value.

⊞ **CPU Vtt Loadline Calibration**

Allows you to configure Load-Line Calibration for the CPU Vtt voltage. This item allows you to adjust the V-droop value. The higher the V-droop value, the lower the output voltage will be under heavy load.

- ▶▶ Auto Lets the BIOS automatically configure this setting and sets V-droop following Intel specifications. (Default)
- ▶▶ +0%~+180% Adjusts the V-droop value.

⊞ **Vcore Protection**

Allows you to set the voltage limit on the Vcore for over-voltage protection. The adjustable range is from 150.0mV to 500.0mV. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

⊞ **DDR CH(A/B) Voltage Protection**

Allows you to set the voltage limit on Channel A and Channel B memory voltage for over-voltage protection. The adjustable range is from 150.0mV to 500.0mV. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

⊞ **DDR CH(C/D) Voltage Protection**

Allows you to set the voltage limit on Channel C and Channel D memory voltage for over-voltage protection. The adjustable range is from 150.0mV to 500.0mV. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

⊞ **Vcore Current Protection**

Allows you to set the current limit on the Vcore for over-current protection in terms of percentage. The adjustable range is from 40.0% to 124.0%. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

- ☞ **CPU Vtt Current Protection**
 Allows you to set the current limit on the CPU Vtt voltage for over-current protection in terms of percentage. The adjustable range is from 50.0% to 155.0%. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **IMC Current Protection**
 Allows you to set the current limit on the IMC voltage for over-current protection in terms of percentage. The adjustable range is from 50.0% to 155.0%. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **DDR CH(A/B) Current Protection**
 Allows you to set the current limit on Channel A and Channel B memory voltage for over-current protection in terms of percentage. The adjustable range is from 50.0% to 155.0%. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **DDR CH(C/D) Current Protection**
 Allows you to set the current limit on Channel C and Channel D memory voltage for over-current protection in terms of percentage. The adjustable range is from 50.0% to 155.0%. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **Vcore PWM Thermal Protection**
 Allows you to set the PWM thermal protection threshold for the Vcore area. Options are 125.0°C to 135.0°C. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **DDR CH(A/B) PWM Thermal Protection**
 Allows you to set the PWM thermal protection threshold for the Channel A and Channel B memory area. Options are 125.0°C to 135.0°C. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **DDR CH(C/D) PWM Thermal Protection**
 Allows you to set the PWM thermal protection threshold for the Channel C and Channel D memory area. Options are 125.0°C to 135.0°C. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **CPU PWM Switch Rate**
 Allows you to set the CPU PWM frequency. The adjustable range is from 300.0KHz to 400.0KHz. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **CPU IMC PWM Switch Rate**
 Allows you to set the CPU IMC PWM frequency. The adjustable range is from 250.0KHz to 400.0KHz. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **CPU Vtt PWM Switch Rate**
 Allows you to set the CPU Vtt PWM frequency. The adjustable range is from 250.0KHz to 400.0KHz. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **DDR CH(A/B) PWM Switch Rate**
 Allows you to set the PWM frequency for Channel A and Channel B memory. The adjustable range is from 250.0KHz and 300.0KHz. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **DDR CH(C/D) PWM Switch Rate**
 Allows you to set the PWM frequency for Channel C and Channel D memory. The adjustable range is from 250.0KHz and 300.0KHz. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

▶ **CPU Core Voltage Control**

This section provides CPU voltage control options.

▶ **DRAM Voltage Control**

This section provides memory voltage control options.

▶ Chipset Voltage Control

This section provides Chipset voltage control options.

▶ 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.

☞ **1st System Fan Speed Control (SYS_FAN1 Connector)**

Allows you to determine whether to enable the system fan speed control function for the system fan connected to the SYS_FAN1 connector 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 **1st System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

☞ **2nd System Fan Speed Control (SYS_FAN2 Connector)**

Allows you to determine whether to enable the system fan speed control function for the system fan connected to the SYS_FAN2 connector 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 **2nd 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 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: Enabled)

☞ **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 PCIEX4 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 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**

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**

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)

☞ **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.

(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.

2-6 Peripherals



⦿ VIA 1394 Controller

Enables or disables the onboard IEEE 1394 function. (Default: Enabled)

⦿ 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 (Intel GbE LAN Chip, LAN1)

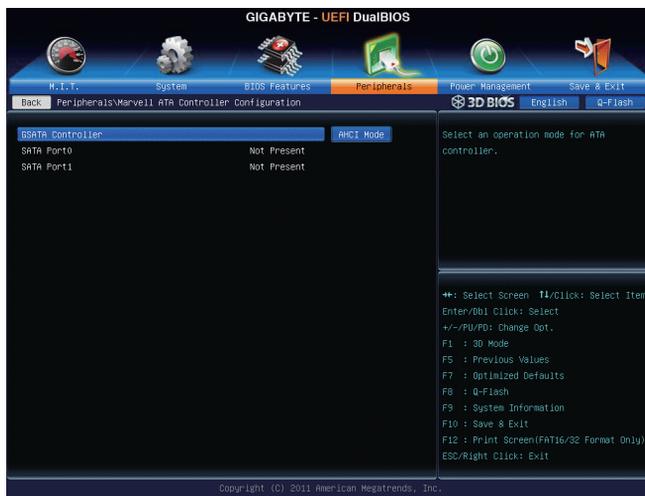
Enables or disables the Intel GbE LAN function. (Default: Enabled)

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

- ☞ **SAS Controller (Intel C606 Chipset)**
Enables or disables the integrated SAS controllers. (Default: 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 Controller**
Enables or disables the integrated USB 2.0/1.1 controller. (Default: Enabled)
- ☞ **Intel SATA Controller Mode (Intel C606 Chipset)**
Enables or disables RAID for the SATA controllers integrated in the Intel C606 Chipset or configures the SATA controllers to AHCI mode.
 - ▶▶ 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.
- ☞ **Port 0~5 Hot Plug**
Enables or disables the hot plug function for the SATA3 0~1 and SATA2 2~5 connectors. (Default: Disabled)
- ☞ **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 (Fresco FL1009 USB Controller, USB 3.0/2.0 ports)**
Enables or disables the Fresco FL1009 USB 3.0/2.0 controller. (Default: Enabled)

- **VIA USB3.0 Controller (VIA VL800 USB Controller, USB 3.0/2.0 ports on the back panel)**
Enables or disables the VIA VL800 USB 3.0/2.0 controller. (Default: Enabled)
- **Realtek LAN Controller (Realtek GbE LAN Chip, LAN2)**
Enables or disables the Realtek GbE LAN function. (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**.

▶ Marvell ATA Controller Configuration



- **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.
 - ▶▶ 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.
 - ▶▶ 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.

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

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)
- ▶▶ Any Key Press any key to turn on the system.
- ▶▶ Keyboard 98 Press POWER button on the Windows 98 keyboard 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 operating system. (Default: Enabled)

Soft-Off by PWR-BTTN

Configures the way to turn off the computer in MS-DOS mode using the power button.

- ▶▶ Instant-Off Press the power button and then the system will be turned off instantly. (Default)
- ▶▶ Delay 4 Sec Press and hold the power button for 4 seconds to turn off the system. If the power button is pressed for less than 4 seconds, the system will enter suspend mode.

(Note) Supported on Windows 7 operating system only.

☞ **Wake on LAN from S5**

Allows the system to be awakened from S5 ACPI sleep state by a wake-up signal from the onboard LAN.
(Default: Enabled)

☞ **ErP Support**

Determines whether to let the system consume least power in S5 (shutdown) state. (Default: Disabled)

Note: When this item is set to **Enabled**, the following functions will become unavailable: PME event wake up, power on by mouse, power on by keyboard, and wake on LAN.

2-8 Save & Exit



Save & Exit Setup

Press <Enter> on this item and select **Yes**. This saves the changes to the CMOS and exits the BIOS Setup program. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.

Exit Without Saving

Press <Enter> on this item and select **Yes**. This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.

Load Optimized Defaults

Press <Enter> on this item and select **Yes** to load the optimal BIOS default settings. The BIOS defaults settings help the system to operate in optimum state. Always load the Optimized defaults after updating the BIOS or after clearing the CMOS values.

Boot Override

Allows you to select a device to boot immediately. Press <Enter> on the device you select and select **Yes** to confirm. Your system will restart automatically and boot from that device.

Save Profiles

This function allows you to save the current BIOS settings to a profile. You can create up to 4 profiles and save as Setup Profile 1~ Setup Profile 4. Press <Enter> to complete.

Load Profiles

If your system becomes unstable and you have loaded the BIOS default settings, you can use this function to load the BIOS settings from a profile created before, without the hassles of reconfiguring the BIOS settings. First select the profile you wish to load and then press <Enter> to complete.

Chapter 3 Drivers Installation



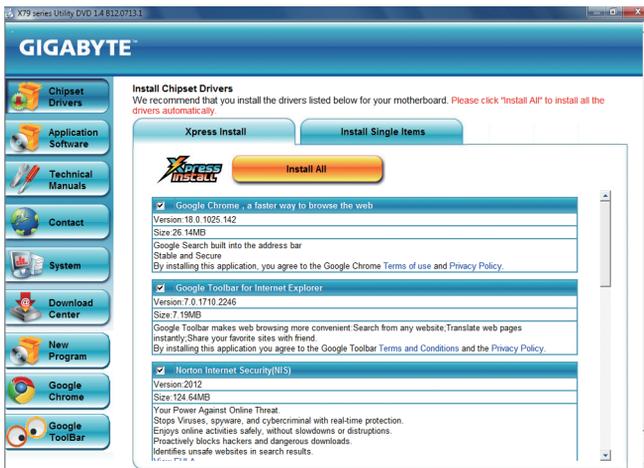
- Before installing the drivers, first install the operating system.
- After installing the operating system, insert the motherboard driver disk into your optical drive. The driver Autorun screen is automatically displayed which looks like that shown in the screen shot below. (If the driver Autorun screen does not appear automatically, go to My Computer, double-click the optical drive and execute the **Run.exe** program.)

3-1 Installing Chipset Drivers



Now Loading Please wait...

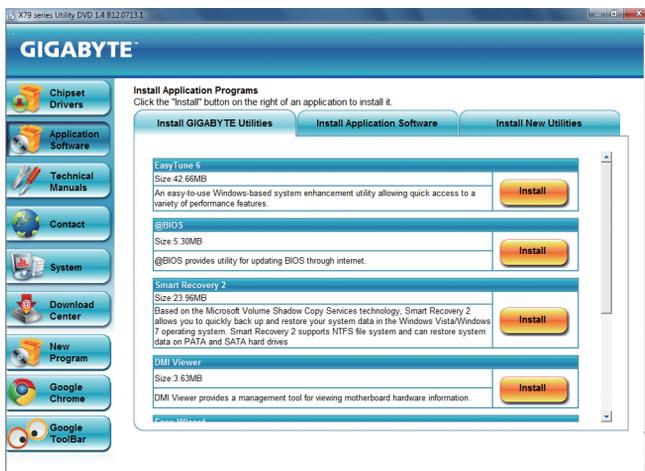
After inserting the driver disk, "Xpress Install" will automatically scan your system and then list all the drivers that are recommended to install. You can click the **Install All** button and "Xpress Install" will install all the recommended drivers. Or click **Install Single Items** to manually select the drivers you wish to install.



- Please ignore the popup dialog box(es) (e.g. the **Found New Hardware Wizard**) displayed when "Xpress Install" is installing the drivers. Failure to do so may affect the driver installation.
- Some device drivers will restart your system automatically during the driver installation. After the system restart, "Xpress Install" will continue to install other drivers.
- After "Xpress Install" installs all of the drivers, a dialog box will appear asking whether to install new GIGABYTE utilities. Click **Yes** to automatically install the utilities. Or click **No** if you want to manually select the utilities to install on the **Application Software** page later.

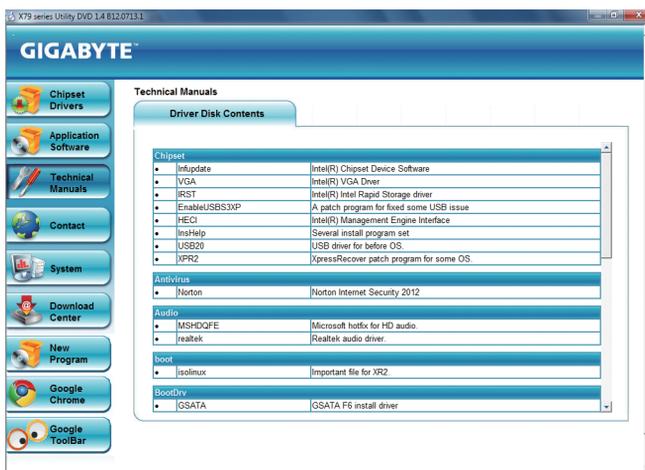
3-2 Application Software

This page displays all the utilities and applications that GIGABYTE develops and some free software. You can click the **Install** button on the right of an item to install it.



3-3 Technical Manuals

This page provides the content descriptions for this driver disk.



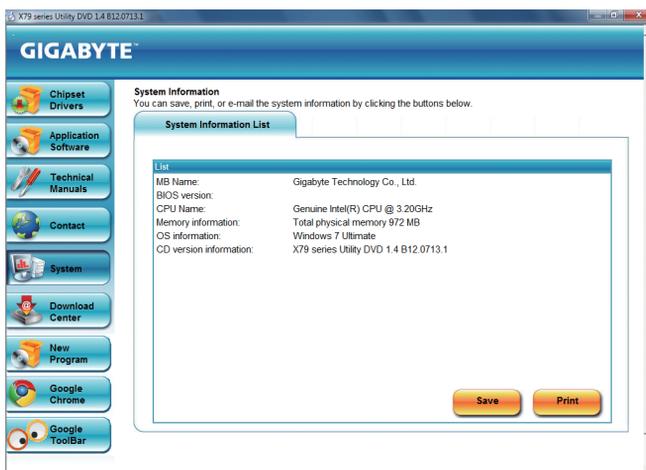
3-4 Contact

For the detailed contact information of the GIGABYTE Taiwan headquarter or worldwide branch offices, click the URL on this page to link to the GIGABYTE website.



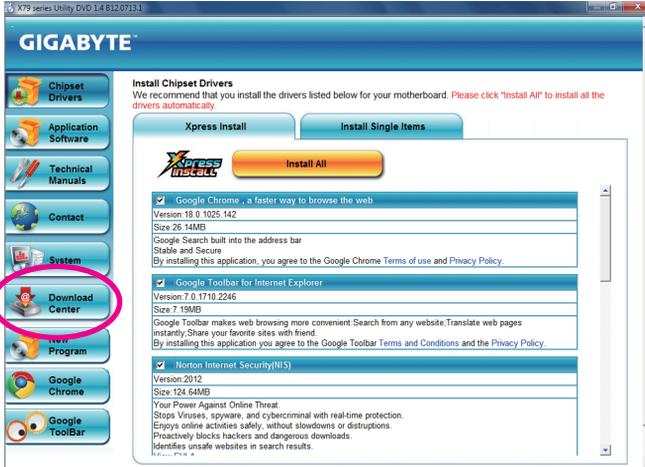
3-5 System

This page provides the basic system information.



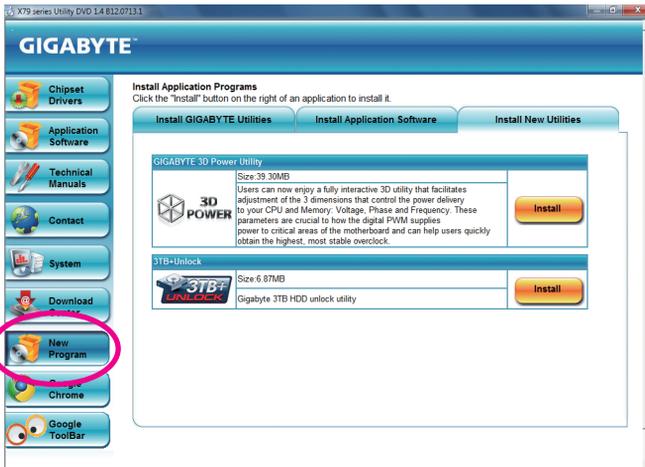
3-6 Download Center

To update the BIOS, drivers, or applications, click the **Download Center** button to link to the GIGABYTE website. The latest version of the BIOS, drivers, or applications will be displayed.



3-7 New Program

This page provides a quick link to GIGABYTE's lately developed utilities for users to install. You can click the **Install** button on the right of an item to install it.



Chapter 4 Unique Features

4-1 BIOS Update Utilities

GIGABYTE motherboards provide two unique BIOS update tools, Q-Flash™ and @BIOS™. GIGABYTE Q-Flash and @BIOS are easy-to-use and allow you to update the BIOS without the need to enter MS-DOS mode. Additionally, this motherboard features the DualBIOS™ design, which enhances protection for the safety and stability of your computer by adding one more physical BIOS chip.



What is DualBIOS™?

Motherboards that support DualBIOS have two BIOS onboard, a main BIOS and a backup BIOS. Normally, the system works on the main BIOS. However, if the main BIOS is corrupted or damaged, the backup BIOS will take over on the next system boot and copy the BIOS file to the main BIOS to ensure normal system operation. For the sake of system safety, users cannot update the backup BIOS manually.



What is Q-Flash™?

With Q-Flash you can update the system BIOS without having to enter operating systems like MS-DOS or Windows first. Embedded in the BIOS, the Q-Flash tool frees you from the hassles of going through complicated BIOS flashing process.



What is @BIOS™?

@BIOS allows you to update the system BIOS while in the Windows environment. @BIOS will download the latest BIOS file from the nearest @BIOS server site and update the BIOS.

4-1-1 Updating the BIOS with the Q-Flash Utility

A. Before You Begin

1. From GIGABYTE's website, download the latest compressed BIOS update file that matches your motherboard model.
2. Extract the file and save the new BIOS file (e.g. X79SUP5.F1) to your USB flash drive or hard drive. Note: The USB flash drive or hard drive must use FAT32/16/12 file system.
3. Restart the system. During the POST, press the <End> key to enter Q-Flash. Note: You can access Q-Flash by either pressing the <End> key during the POST or pressing the <F8> key in BIOS Setup. However, if the BIOS update file is saved to a hard drive in RAID/AHCI mode or a hard drive attached to an independent SATA controller, use the <End> key during the POST to access Q-Flash.



Because BIOS flashing is potentially risky, please do it with caution. Inadequate BIOS flashing may result in system malfunction.

B. Updating the BIOS

In the main menu of Q-Flash, use the keyboard or mouse to select an item to execute. When updating the BIOS, choose the location where the BIOS file is saved. The following procedure assumes that you save the BIOS file to a USB flash drive.

Step 1:

1. Insert the USB flash drive containing the BIOS file into the computer. In the main menu of Q-Flash, select **Update BIOS From Drive**.



- The **Save BIOS to Drive** option allows you to save the current BIOS file.
- Q-Flash only supports USB flash drive or hard drives using FAT32/16/12 file system.
- If the BIOS update file is saved to a hard drive in RAID/AHCI mode or a hard drive attached to an independent SATA controller, use the <End> key during the POST to access Q-Flash.

2. Select **USB Flash Drive**.



3. Select the BIOS update file.



Make sure the BIOS update file matches your motherboard model.

Step 2:

The process of the system reading the BIOS file from the USB flash drive is displayed on the screen. When the message "Are you sure to update BIOS?" appears, select **Yes** to begin the BIOS update. The monitor will display the update process.



- **Do not turn off or restart the system when the system is reading/updating the BIOS.**
- **Do not remove the USB flash drive or hard drive when the system is updating the BIOS.**

Step 3:

When the update process is complete, select **Reboot** to reboot the system.



Step 4:

During the POST, press <Delete> to enter BIOS Setup. Select **Load Optimized Defaults** on the **Save & Exit** screen and press <Enter> to load BIOS defaults. System will re-detect all peripheral devices after a BIOS update, so we recommend that you reload BIOS defaults.



Select **Yes** to load BIOS defaults

Step 5:

Select **Save & Exit Setup** and press <Enter>. And then select **Yes** to save settings to CMOS and exit BIOS Setup. The procedure is complete after the system restarts.

4-1-2 Updating the BIOS with the @BIOS Utility

A. Before You Begin

1. In Windows, close all applications and TSR (Terminate and Stay Resident) programs. This helps prevent unexpected failures when performing a BIOS update.
2. During the BIOS update process, ensure the Internet connection is stable and do NOT interrupt the Internet connection (for example, avoid a power loss or switching off the Internet). Failure to do so may result in a corrupted BIOS or a system that is unable to start.
3. Do not use the G.O.M. (GIGABYTE Online Management) function when using @BIOS.
4. GIGABYTE product warranty does not cover any BIOS damage or system failure resulting from an inadequate BIOS flashing.

B. Using @BIOS



1.  **Update the BIOS Using the Internet Update Function:**
Click **Update BIOS from GIGABYTE Server**, select the @BIOS server site closest to your location and then download the BIOS file that matches your motherboard model. Follow the on-screen instructions to complete.
 If the BIOS update file for your motherboard is not present on the @BIOS server site, please manually download the BIOS update file from GIGABYTE's website and follow the instructions in "Update the BIOS without Using the Internet Update Function" below.
2.  **Update the BIOS without Using the Internet Update Function:**
Click **Update BIOS from File**, then select the location where you save the BIOS update file obtained from the Internet or through other source. Follow the on-screen instructions to complete.
3.  **Save the Current BIOS File:**
Click **Save Current BIOS to File** to save the current BIOS file.
4.  **Load BIOS Defaults after BIOS Update:**
Select the **Load CMOS default after BIOS update** check box and then the system will automatically load BIOS defaults after BIOS update and after the system restarts.

C. After Updating the BIOS

Restart your system after updating the BIOS.



Make sure that the BIOS file to be flashed matches your motherboard model. Updating the BIOS with an incorrect BIOS file could cause your system not to boot.

4-2 EasyTune 6

GIGABYTE's EasyTune 6 is a simple and easy-to-use interface that allows users to fine-tune their system settings or do overclock/overvoltage in Windows environment. The user-friendly EasyTune 6 interface also includes tabbed pages for CPU and memory information, letting users read their system-related information without the need to install additional software.

The EasyTune 6 Interface



Tabs Information

Tab	Function
	The CPU tab provides information on the installed CPU and motherboard.
	The Memory tab provides information on the installed memory module(s). You can select memory module on a specific slot to see its information.
	<p>The Tuner tab allows you to change memory settings and voltages.</p> <ul style="list-style-type: none"> • Quick Boost mode provides you with 3 levels of CPU frequency/base clock to choose to achieve desired system performance. After making changes in Quick Boost mode or clicking Default to restore to default values, be sure to restart your system for these changes to take effect. • Easy mode provides information on CPU/memory. • Advanced mode allows you to individually change system clock settings and voltages settings using the sliders. • Save allows you to save the current settings to a new profile (.txt file). • Load allows you to load previous settings from a profile. <p>After making changes in Easy mode/Advanced mode, be sure to click Set for these changes to take effect or click Default to restore to default values.</p>
	The Graphics tab allows you to change the core clock and memory clock for your AMD or NVIDIA graphics card.
	The Smart tab allows you to specify a Smart Fan mode. Smart Fan Advanced mode allows the fan speed to be changed linearly based on the temperature thresholds you set.
	The HW Monitor tab allows you to monitor hardware temperature, voltage and fan speed and set temperature/fan speed alarm. You can choose the alert sound from the buzzer or use your own sound file (.wav file).



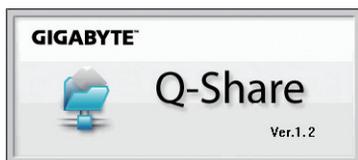
Available functions in EasyTune 6 may differ by motherboard model. Grayed-out area(s) indicates that the item is not configurable or the function is not supported.



Incorrectly doing overclock/overvoltage may result in damage to the hardware components such as CPU, chipset, and memory and reduce the useful life of these components. Before you do the overclock/overvoltage, make sure that you fully know each function of EasyTune 6, or system instability or other unexpected results may occur.

4-3 Q-Share

Q-Share is an easy and convenient data sharing tool. After configuring your LAN connection settings and Q-Share, you are able to share your data with computers on the same network, making full use of Internet resources.



Directions for using Q-Share

After installing Q-Share from the motherboard driver disk, go to Start>All Programs>GIGABYTE>Q-Share.exe to launch the Q-Share tool. Find the **Q-Share** icon  in the notification area and right-click on this icon to configure the data sharing settings.



Figure 1. Data Sharing Disabled



Figure 2. Data Sharing Enabled

Options Descriptions

Option	Description
Connect ...	Displays the computers with data sharing enabled
Enable Incoming Folder ...	Enables data sharing
Disable Incoming Folder ...	Disables data sharing
Open Incoming Folder : C:\Q-ShareFolder	Accesses the shared data folder
Change Incoming Folder : C:\Q-ShareFolder	Changes the data folder to be shared <small>(Note)</small>
Update Q-Share ...	Updates Q-Share online
About Q-Share ...	Displays the current Q-Share version
Exit...	Exits Q-Share

(Note) This option is available only when data sharing is NOT enabled.

Chapter 5 Appendix

5-1 Configuring SATA Hard Drive(s)

RAID Levels

	RAID 0	RAID 1	RAID 5	RAID 10
Minimum Number of Hard Drives	≥2	2	≥3	≥4
Array Capacity	Number of hard drives * Size of the smallest drive	Size of the smallest drive	(Number of hard drives - 1) * Size of the smallest drive	(Number of hard drives/2) * Size of the smallest drive
Fault Tolerance	No	Yes	Yes	Yes

To configure SATA hard drive(s), follow the steps below:

- A. Install SATA hard drive(s) in your computer.
- B. Configure SATA controller mode in BIOS Setup.
- C. Configure a RAID array in RAID BIOS. ^(Note 1)
- D. Install the SATA RAID/AHCI driver and operating system. ^(Note 2)

Before you begin

Please prepare:

- At least two SATA hard drives (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). If you do not want to create RAID, you may prepare only one hard drive.
- Windows 7/Vista setup disk.
- Motherboard driver disk.

5-1-1 Configuring Intel C606 SATA Controllers

A. Installing SATA hard drive(s) in your computer

Attach one end of the SATA signal cable to the rear of the SATA hard drive and the other end to available SATA port on the motherboard. If there is more than one SATA controller on your motherboard, refer to "Chapter 1," "Hardware Installation," to identify the SATA controller for the SATA port. (For example, on this motherboard, the SATA3 0/1 ^(Note 3) and SATA2 2/3/4/5 ports are supported by the C606 Chipset.) Then connect the power connector from your power supply to the hard drive.

(Note 1) Skip this step if you do not want to create RAID array on the SATA controller.

(Note 2) Required when the SATA controller is set to AHCI or RAID mode.

(Note 3) 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.

B. Configuring SATA controller mode in BIOS Setup

Make sure to configure the SATA controller mode correctly in system BIOS Setup.

Step 1:

Turn on your computer and press <Delete> to enter BIOS Setup during the POST (Power-On Self-Test). To create RAID, set **Intel SATA Controller Mode** under the **Peripherals** menu to **RAID Mode** (Figure 1). If you do not want to create RAID, set this item to **IDE Mode** or **AHCI Mode**.



Figure 1

Step 2:

Save changes and exit BIOS Setup.



The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard you have and the BIOS version.

C. Configuring a RAID array in RAID BIOS

Enter the RAID BIOS setup utility to configure a RAID array. Skip this step and proceed with the installation of Windows operating system for a non-RAID configuration.

Step 1:

After the POST memory test begins and before the operating system boot begins, look for a message which says "Press <Ctrl-I> to enter Configuration Utility" (Figure 2). Press <Ctrl> + <I> to enter the RAID Configuration Utility.

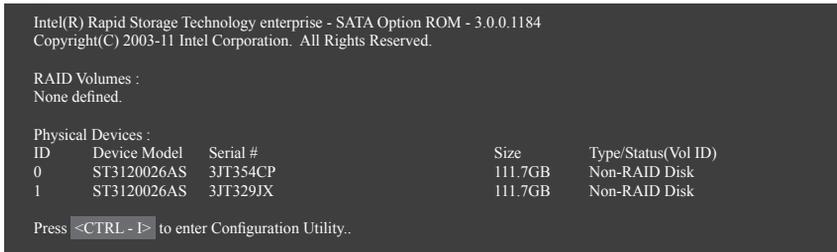


Figure 2

Step 2:

After you press <Ctrl> + <I>, the MAIN MENU screen will appear (Figure 3).

Create RAID Volume

If you want to create a RAID array, select **Create RAID Volume** in **MAIN MENU** and press <Enter>.

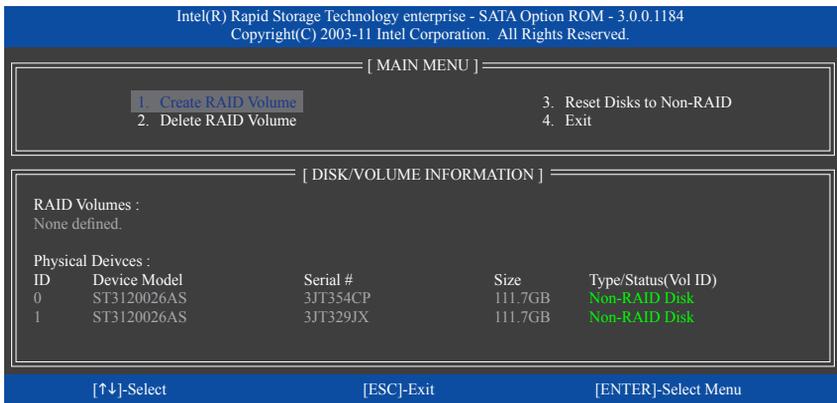


Figure 3

Step 3:

After entering the **CREATE VOLUME MENU** screen, enter a volume name with 1~16 letters (letters cannot be special characters) under the **Name** item and press <Enter>. Then, select a RAID level (Figure 4). RAID levels supported include RAID 0, RAID 1, RAID 10, and RAID 5 (the selections available depend on the number of the hard drives being installed). Press <Enter> to proceed.

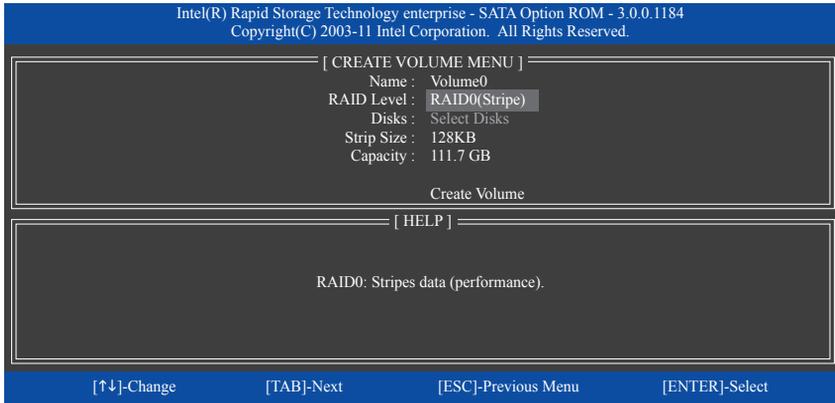


Figure 4

Step 4:

Under **Disks** item, select the hard drives to be included in the RAID array. If only two hard drives are installed, they will be automatically assigned to the array. Set the stripe block size (Figure 5) if necessary. The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, press <Enter>.

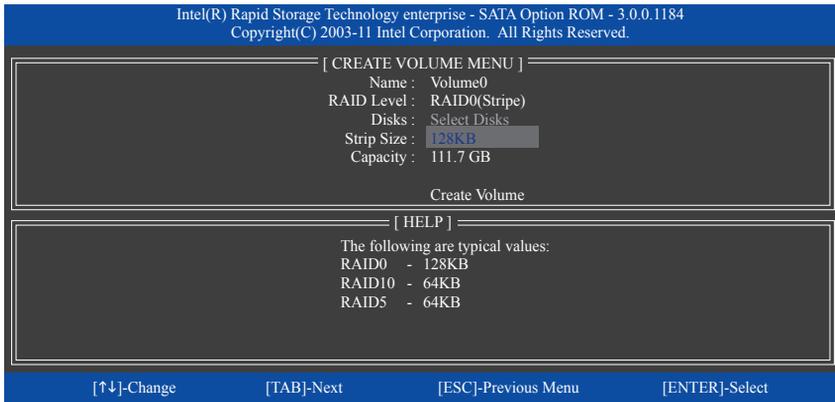


Figure 5

Step 5:

Enter the array capacity and press <Enter>. Finally press <Enter> on the **Create Volume** item to begin creating the RAID array. When prompted to confirm whether to create this volume, press <Y> to confirm or <N> to cancel (Figure 6).

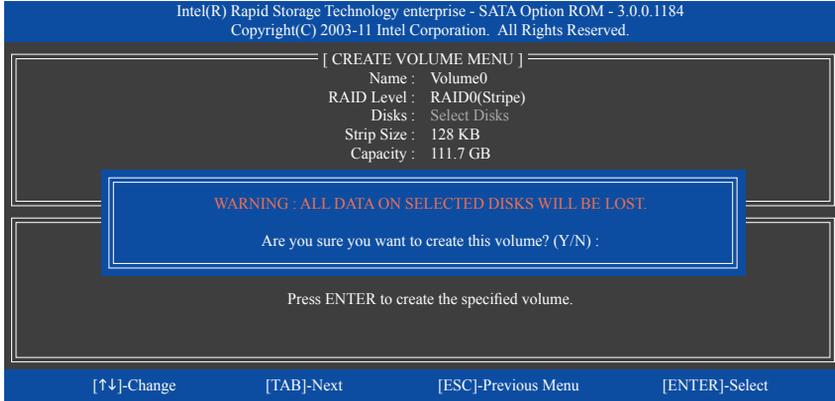


Figure 6

When completed, you can see detailed information about the RAID array in the **DISK/VOLUME INFORMATION** section, including the RAID level, stripe block size, array name, and array capacity, etc. (Figure 7)

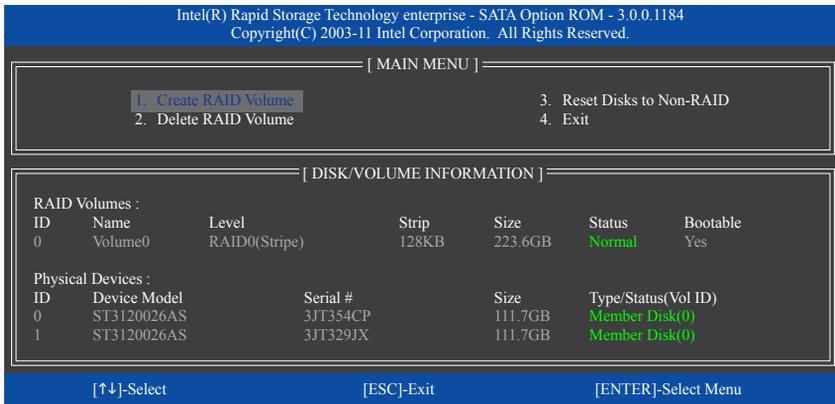


Figure 7

To exit the RAID BIOS utility, press <Esc> or select **4. Exit** in **MAIN MENU**.

Now, you can proceed to install the SATA RAID/AHCI driver and operating system.

Delete RAID Volume

To delete a RAID array, select **Delete RAID Volume** in **MAIN MENU** and press <Enter>. In the **DELETE VOLUME MENU** section, use the up or down arrow key to select the array to be deleted and press <Delete>. When prompted to confirm your selection (Figure 8), press <Y> to confirm or <N> to abort.

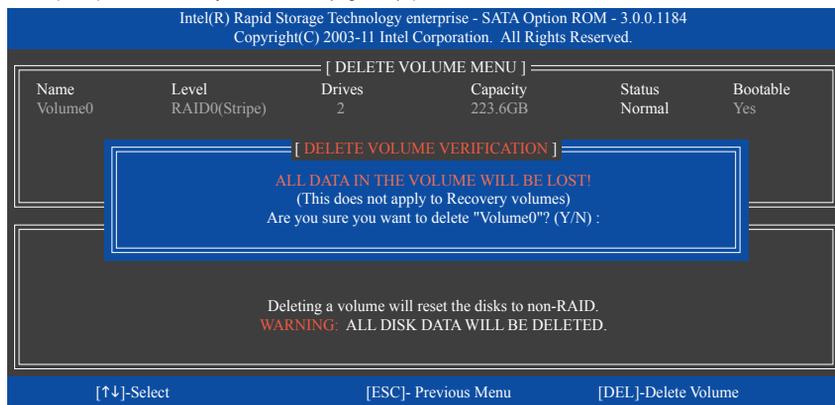


Figure 8

5-1-2 Configuring Marvell 88SE9172 SATA Controllers

A. Installing SATA hard drive(s) in your computer

Attach one end of the SATA signal cable to the rear of the SATA hard drive and the other end to available SATA port on the motherboard. The Marvell 88SE9172 SATA controllers control the onboard eSATA connectors. Then connect the power connector from your power supply to the hard drive.

B. Configuring SATA controller and RAID mode in BIOS Setup

Make sure to configure the SATA controller mode correctly in system BIOS Setup.

Step 1:

Turn on your computer and press <Delete> to enter BIOS Setup during the POST. To create RAID, go to **Peripherals** and set **GSATA Controller** on the **Marvell ATA Controller Configuration** submenu to **RAID Mode** (Figure 2). If you do not want to create RAID, set this item to **IDE Mode** or **AHCI Mode**.



Figure 1



The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard you have and the BIOS version.

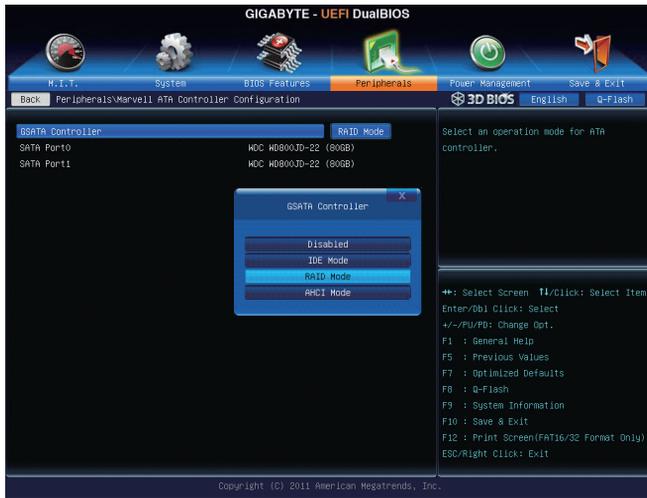


Figure 2

Step 2:
Save changes and exit BIOS Setup.

C. Configuring a RAID array in RAID BIOS

Enter the RAID BIOS setup utility to configure a RAID array. Skip this step and proceed to the installation of Windows operating system for a non-RAID configuration.

After the POST memory test begins and before the operating system boot begins, look for a message which says "Press <Ctrl>+<M> to enter BIOS Setup or <Space> to continue" (Figure 3). Press <Ctrl> + <M> to enter the RAID setup utility.

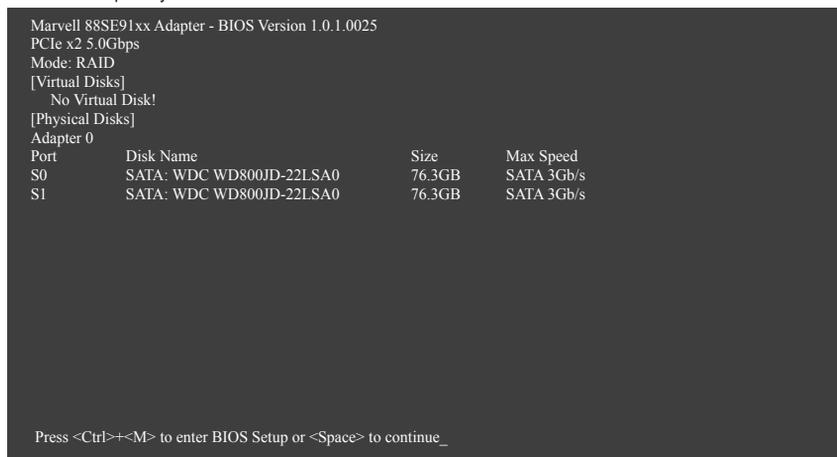


Figure 3

On the main screen of the RAID setup utility (Figure 4), use the left or right arrow key to move through tabs.

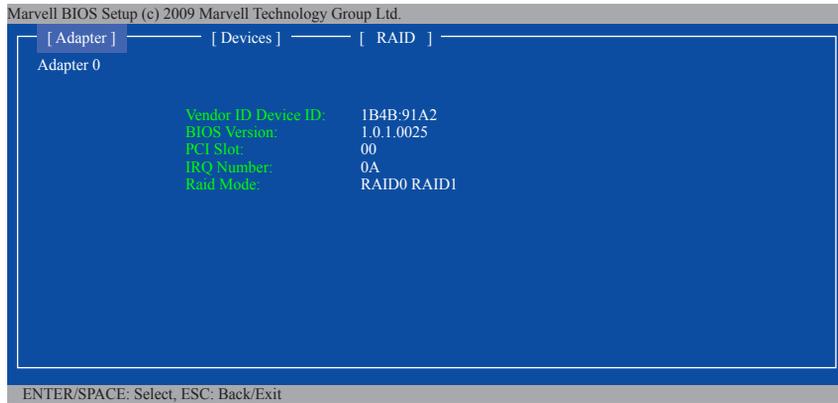


Figure 4

Create a RAID Array:

Step 1: On the main screen, press <Enter> on the RAID tab. Then the RAID Config menu appears (Figure 5). Press <Enter> on the Create VD item.

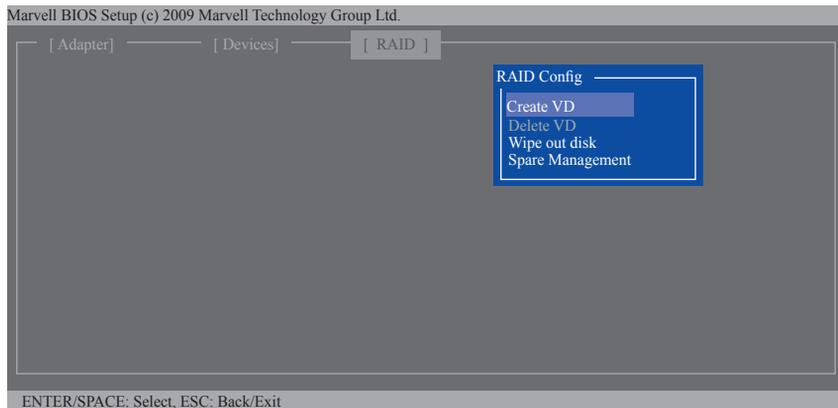


Figure 5

Step 2: The next screen displays the two hard drives you installed. Press <Enter> or <Space> on the two hard drives respectively to add them into the RAID array. Selected hard drives are marked with an asterisk (Figure 6). Then press <Enter> on **NEXT**.

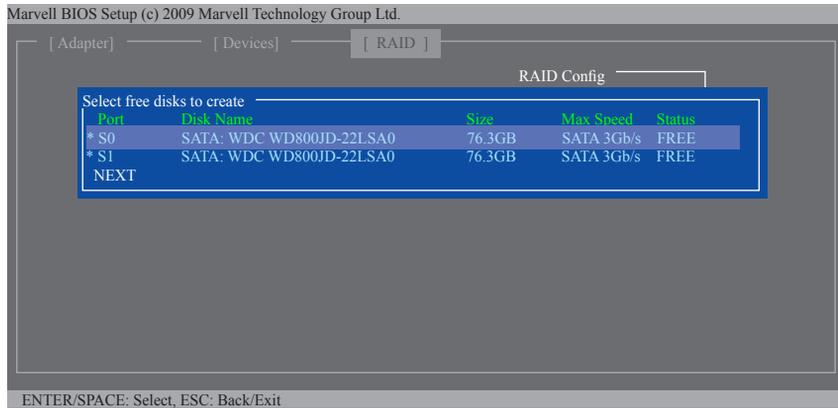


Figure 6

Step 3: On the **Create VD** menu (Figure 7), use the up or down arrow key to move the selection bar to select an item and press <Enter> to display options. Set the required items in sequence and press the down arrow key to proceed to the next item.

Sequence:

- RAID Level:** Select a RAID level. Options include RAID 0 (Stripe) and RAID 1 (Mirror).
- Stripe Size:** Select the stripe block size. Options include 32 KB, 64 KB, and 128 KB.
- Quick Init:** Select whether to quickly erase old data on the hard drives when creating the array.
- Cache Mode:** Select write-back or write-through cache.
- VD Name:** Enter an array name with 1~10 letters (letters cannot be special characters).

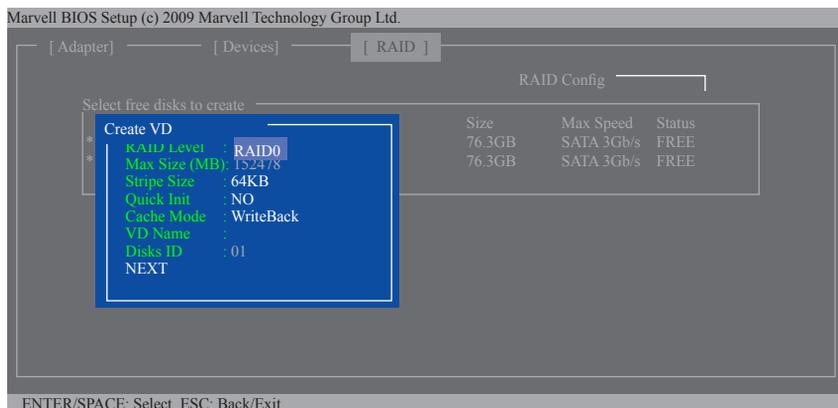


Figure 7

6. **NEXT**: After completing the settings above, move to **NEXT** and press <Enter> to begin creating the array. When prompted to confirm, press <Y> to confirm or <N> to cancel (Figure 8).

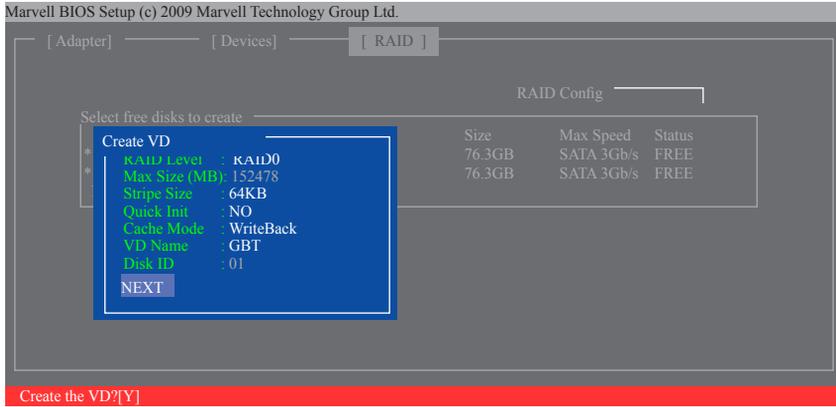


Figure 8

When completed, the **RAID** tab will display the new array. (Figure 9)

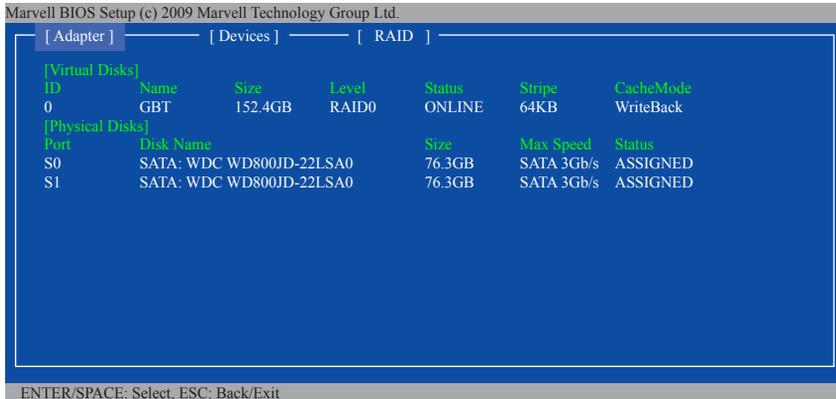


Figure 9

To exit the RAID BIOS utility, press <Esc> on the main screen and press <Y> to confirm. Now, you can proceed to install the operating system.

Delete the RAID Array:

To delete the existing array, press <Enter> on the **RAID** tab and select **Delete VD**. When the **Delete VD** menu appears, press <Enter> on the array to select it and then press <Enter> on **NEXT**. When prompted, press <Y> to confirm (Figure 10). When the message "Do you want to delete the VD's MBR?" appears, press <Y> to clear the MBR or press other keys to ignore.



Figure 10

Use the Marvell Storage Utility in the Operating System:

With the Marvell Storage utility, you can set up an array or view the current array status in the operating system. To install the utility, insert the motherboard driver disk, then go to **Application Software\Install Application Software** and select **Marvell Storage Utility** to install. Note: After the installation, you must login the utility with the same account name and password that you use to login the operating system. If you did not set the account password before, click **Login** to enter the Marvell Storage Utility directly. Please note that if you set the hard drive(s) to IDE or AHCI mode, it is normal that you will not see the hard drive(s) in the Marvell Storage Utility.

5-1-3 Installing the SATA RAID/AHCI Driver and Operating System

With the correct BIOS settings, you are ready to install the operating system.

A. Installing Windows 7/Vista

(The following instructions use Windows 7 as the example operating system.)

Step 1:

Boot from the Windows 7/Vista setup disk and perform standard OS installation steps. When you arrive at the "Where do you want to install Windows?" screen, select **Load Driver**.

Step 2:

Insert the motherboard driver disk and then browse to the location of the driver. The locations of the drivers are as follows:

For the Intel C606:

RAID/AHCI driver for Windows 32-Bit: \BootDrv\iRST\32Bit

RAID/AHCI driver for Windows 64-Bit: \BootDrv\iRST\64Bit

For the Marvell 88SE9172:

RAID driver for Windows 32-bit: \BootDrv\Marvell\RAID\i386

RAID driver for Windows 64-bit: \BootDrv\Marvell\RAID\amd64

AHCI driver for Windows 32-bit: \BootDrv\Marvell\AHCI\Floppy32

AHCI driver for Windows 64-bit: \BootDrv\Marvell\AHCI\Floppy64

Step 3:

For Intel C606, select **Intel(R) C600 Series Chipset SATA RAID Controller** (Figure 1). For Marvell 88SE9172, select **Marvell 91xx SATA 6G RAID Controller** (Figure 2). Click **Next** to load the driver and continue the OS installation.

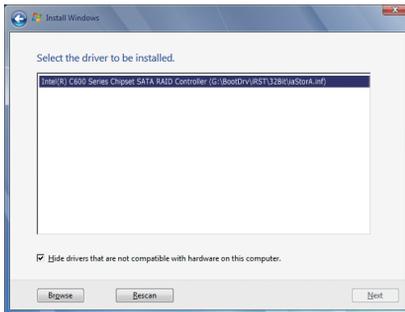


Figure 1

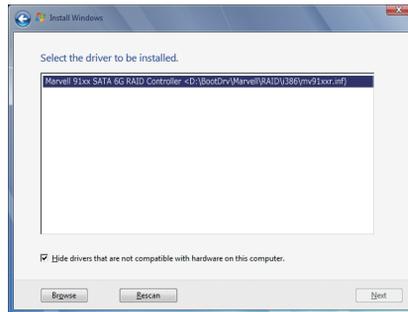


Figure 2

B. Rebuilding an Array

Rebuilding is the process of restoring data to a hard drive from other drives in the array. Rebuilding applies only to fault-tolerant arrays such as RAID 1, RAID 5, and RAID 10 arrays. The procedures below assume a new drive is added to replace a failed drive to rebuild a RAID 1 array. (Note: The new drive must have equal or greater capacity than the old one.)

For the Intel C606:

Turn off your computer and replace the failed hard drive with a new one. Restart your computer.

• Enabling Automatic Rebuild

Step 1:

When the message "Press <Ctrl-I> to enter Configuration Utility" appears, press <Ctrl> + <I> to enter the RAID Configuration Utility. The following screen appears after you enter the RAID Configuration Utility.

Intel(R) Rapid Storage Technology enterprise - SATA Option ROM - 3.0.0.1184
Copyright(C) 2003-11 Intel Corporation. All Rights Reserved.

[MAIN MENU]

[DEGRADED VOLUME DETECTED]

"Degraded volume and disk available for rebuilding detected. Selecting a disk initiates a rebuild. Rebuild completes in the operating system.

Select the port of the destination disk for rebuilding (ESC to exit):

Port	Drive Model	Serial #	Size
1	WDC WD800JD-22LS	WD-WMAM9W736333	111.7GB

[↑↓]-Previous/Next [ENTER]-Select [ESC]-Exit

RAID ID	Devices Model	Serial #	Size	Type/Status(Vol ID)
0	ST3120026AS	3JT354CP	111.7GB	Member Disk (0)
1	WDC WD800JD-22LS	WD-WMAM9W736333	111.7GB	Non-RAID Disk

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

Step 2:

Select the new hard drive to add into the array to be rebuilt and press <Enter>. The following screen appears, indicating that an automatic rebuild will be performed after you enter the operating system. You can access **Intel Rapid Storage Technology enterprise** from **All Programs** in the **Start** menu. You will see that the status of the array displays as **Rebuilding**. If you do not enable automatic rebuild on this stage, you have to manually rebuild the array in the operating system (see the next page for more details).

Intel(R) Rapid Storage Technology enterprise - SATA Option ROM - 3.0.0.1184
Copyright(C) 2003-11 Intel Corporation. All Rights Reserved.

[MAIN MENU]

1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit

[DISK/VOLUME INFORMATION]

RAID Volumes :

ID	Name	Level	Strip	Size	Status	Bootable
0	Volume0	RAID1(Mirror)	N/A	111.7GB	Rebuild	Yes

Physical Devices :

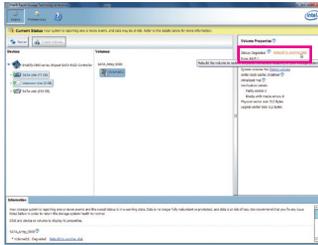
ID	Devices Model	Serial #	Size	Type/Status(Vol ID)
0	ST3120026AS	3JT354CP	111.7GB	Member Disk (0)
1	WDC WD800JD-22LS	WD-WMAM9W736333	111.7GB	Non-RAID Disk (0)

Volumes with "Rebuild" status will be rebuilt within the operating system.

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

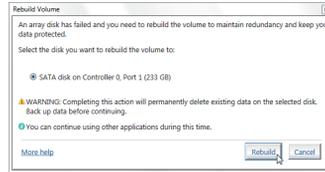
- **Performing the Rebuild in the Operating System**

While in the operating system, make sure the Chipset driver and **Intel Rapid Storage Technology Enterprise RAID Port Drivers** have been installed from the motherboard driver disk. Then launch **Intel Rapid Storage Technology enterprise** from **All Programs** in the **Start** menu.



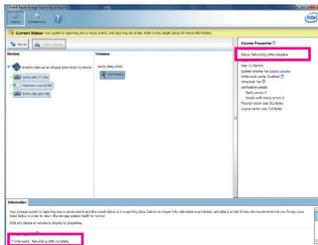
Step 1:

On the right panel of the screen, click **Rebuild** to another disk under **Volume Properties**.

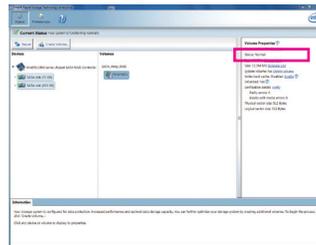


Step 2:

Select a new drive to rebuild the RAID and click **Rebuild**.



The **Status** item on the right of the screen and the **Information** section on the bottom display the rebuild progress.



Step 3:

After the RAID volume rebuilding, the **Status** will display as **Normal**.

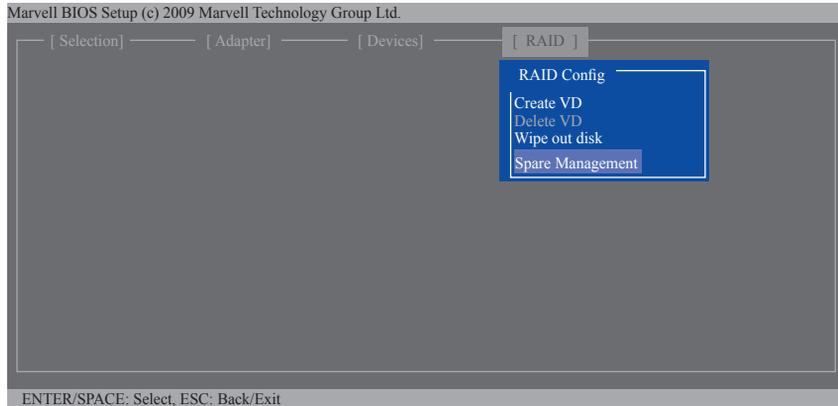
For the Marvell 88SE9172:

Turn off your computer and replace the failed hard drive with a new one. Restart your computer. To enable an automatic rebuild in the operating system, you have to set the new hard drive as a Spare drive in the RAID setup utility first.

- **Enabling Automatic Rebuild**

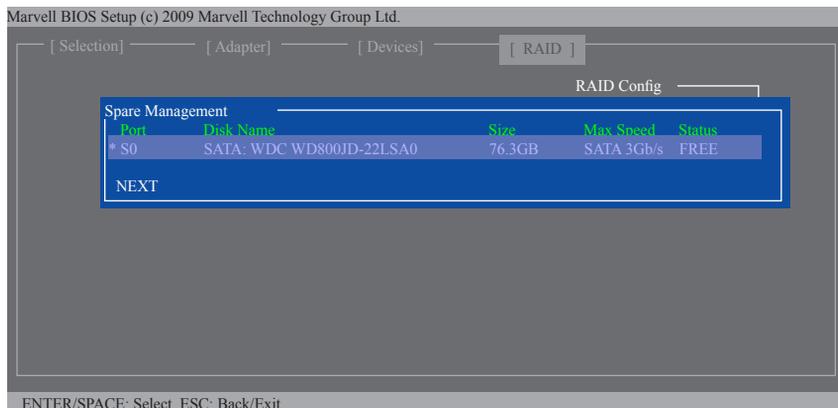
Step 1:

When the message "Press <Ctrl>+<M> to enter BIOS Setup or <Space> to continue" appears, press <Ctrl> + <M> to enter the RAID setup utility. On the main screen, press <Enter> on the **RAID** tab and then press <Enter> on **Spare Management**.



Step 2:

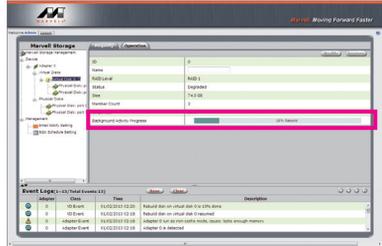
The new hard drive will be displayed on the screen. Press <Enter> or <Space> on the new hard drive to select it and then press <Enter> on **NEXT**. When prompted, press <Y> to confirm. The new hard drive is now set as a Spare drive.



Step 3:

Make sure you have installed the Marvell RAID driver and Marvell Storage Utility from the motherboard driver disk. While in the operating system, launch the Marvell Storage Utility from Start\All Programs\Marvell Storage Utility\Marvell Tray, right-click on the  icon in the notification area, and select **Open MSU**. Then login the Marvell Storage Utility.

Under **Virtual Disk 0**, the **Property** tab displays the rebuild progress on the right of the **Background Activity Progress** item, indicating that the RAID volume is being rebuilt. When completed, the status will display as **Done**.

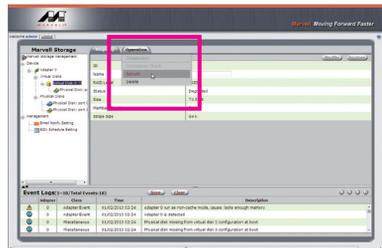


- **Manually Rebuilding RAID 1 in the Operating System**

You can manually rebuild a RAID 1 array without setting the new hard drive as a Spare drive in the RAID setup utility first. While in the operating system, open the Marvell Storage Utility and login.

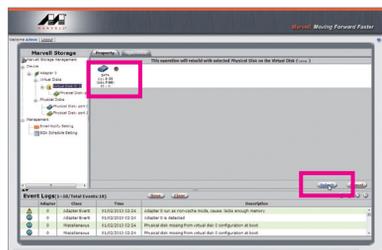
Step 1:

Under **Virtual Disk 0**, click the **Operation** tab and select **Rebuild**.



Step 2:

The screen will display the new hard drive. Click on the hard drive to select it and click the **Submit** button to begin the rebuild.



5-2 Configuring SAS Hard Drive(s)

RAID Levels

	RAID 0	RAID 1	RAID 10
Minimum Number of Hard Drives	≥2	2	≥4
Array Capacity	Number of hard drives * Size of the smallest drive	Size of the smallest drive	(Number of hard drives/2) * Size of the smallest drive
Fault Tolerance	No	Yes	Yes

To configure SAS hard drive(s), follow the steps below:

- A. Install SAS hard drive(s) in your computer.
- B. Configure SAS controller mode in BIOS Setup.
- C. Configure a RAID array in RAID BIOS. (Note 1)
- D. Install the SAS RAID driver and operating system. (Note 2)

Before you begin

Please prepare:

- At least two SAS hard drives (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). If you do not want to create RAID, you may prepare only one hard drive.
- Windows 7/Vista setup disk.
- Motherboard driver disk.

5-2-1 Configuring SAS Controllers

A. Installing SAS hard drive(s) in your computer

Attach one end of the SAS signal cable to the rear of the SAS hard drive and the other end to available SAS port on the motherboard. Then connect the power connector from your power supply to the hard drive.

(Note 1) Skip this step if you do not want to create RAID array on the SAS controller.

(Note 2) Required when the SAS controller is set to RAID mode.

B. Configuring SAS controller mode in BIOS Setup

Make sure to configure the SAS controller mode correctly in system BIOS Setup.

Step 1:

Turn on your computer and press <Delete> to enter BIOS Setup during the POST (Power-On Self-Test). To create RAID, set **SAS Controller** under the **Peripherals** menu to **Enabled** (Figure 1).



Figure 1

Step 2:

Save changes and exit BIOS Setup.



The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard you have and the BIOS version.

C. Configuring a RAID array in RAID BIOS

Enter the RAID BIOS setup utility to configure a RAID array. Skip this step and proceed with the installation of Windows operating system for a non-RAID configuration.

Step 1:

After the POST memory test begins and before the operating system boot begins, look for a message which says "Press <Ctrl-I> to enter Configuration Utility" (Figure 2). Press <Ctrl> + <I> to enter the RAID Configuration Utility.

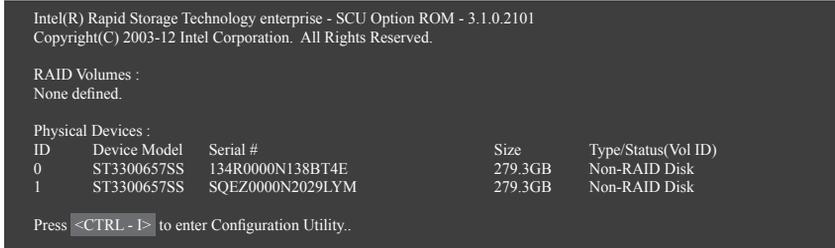


Figure 2

Step 2:

After you press <Ctrl> + <I>, the MAIN MENU screen will appear (Figure 3).

Create RAID Volume

If you want to create a RAID array, select **Create RAID Volume** in **MAIN MENU** and press <Enter>.

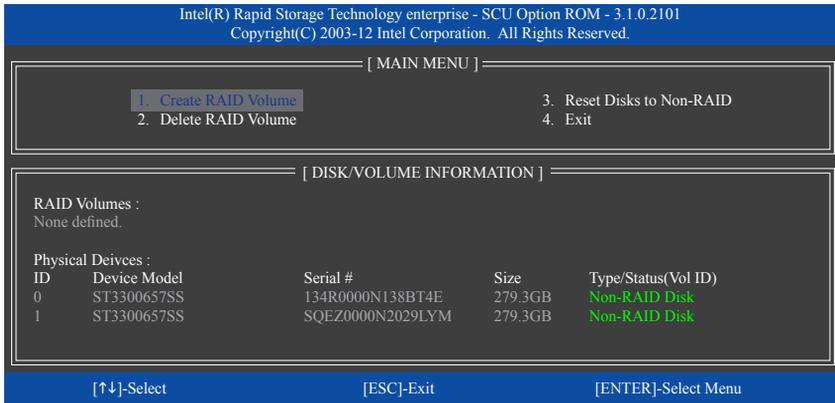


Figure 3

Step 3:

After entering the **CREATE VOLUME MENU** screen, enter a volume name with 1~16 letters (letters cannot be special characters) under the **Name** item and press <Enter>. Then, select a RAID level (Figure 4). RAID levels supported include RAID 0, RAID 1, and RAID 10 (the selections available depend on the number of the hard drives being installed). Press <Enter> to proceed.

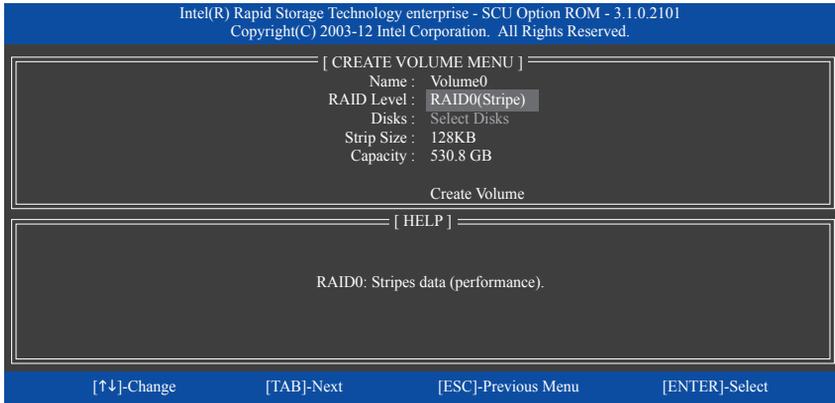


Figure 4

Step 4:

Under **Disks** item, select the hard drives to be included in the RAID array. If only two hard drives are installed, they will be automatically assigned to the array. Set the stripe block size (Figure 5) if necessary. The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, press <Enter>.

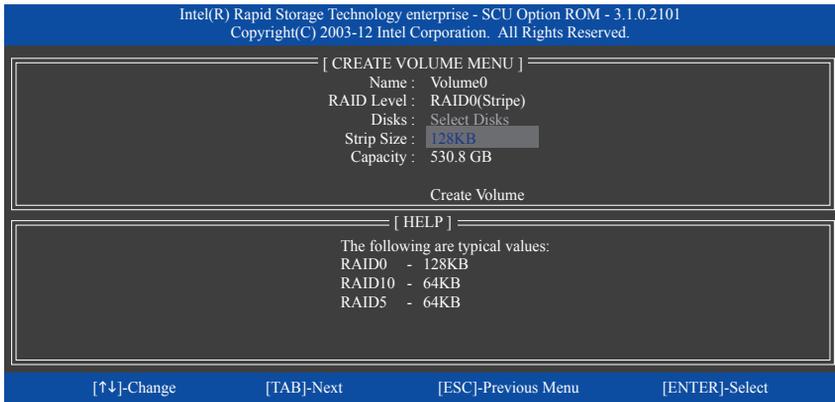


Figure 5

Step 5:

Enter the array capacity and press <Enter>. Finally press <Enter> on the **Create Volume** item to begin creating the RAID array. When prompted to confirm whether to create this volume, press <Y> to confirm or <N> to cancel (Figure 6).

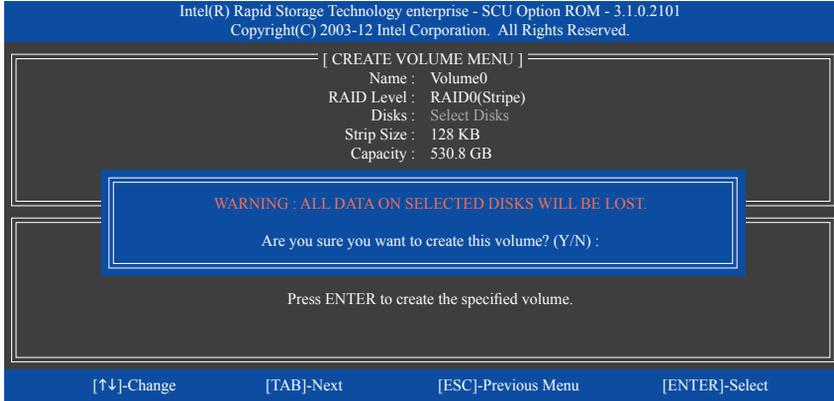


Figure 6

When completed, you can see detailed information about the RAID array in the **DISK/VOLUME INFORMATION** section, including the RAID level, stripe block size, array name, and array capacity, etc. (Figure 7)

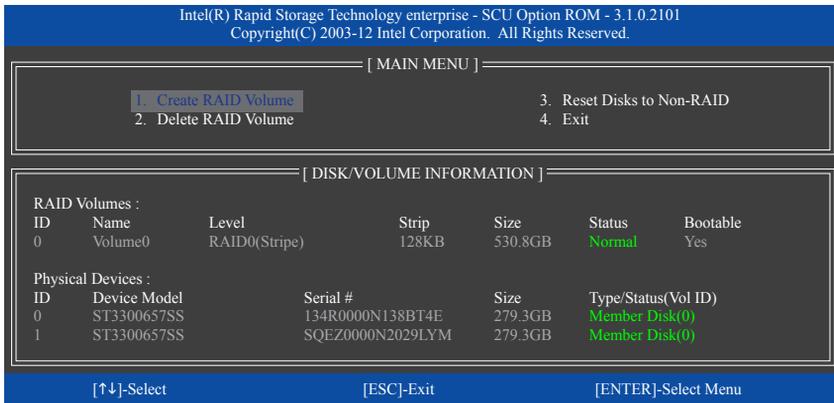


Figure 7

To exit the RAID BIOS utility, press <Esc> or select **4. Exit** in **MAIN MENU**.

Now, you can proceed to install the SAS RAID driver and operating system.

Delete RAID Volume

To delete a RAID array, select **Delete RAID Volume** in **MAIN MENU** and press <Enter>. In the **DELETE VOLUME MENU** section, use the up or down arrow key to select the array to be deleted and press <Delete>. When prompted to confirm your selection (Figure 8), press <Y> to confirm or <N> to abort.

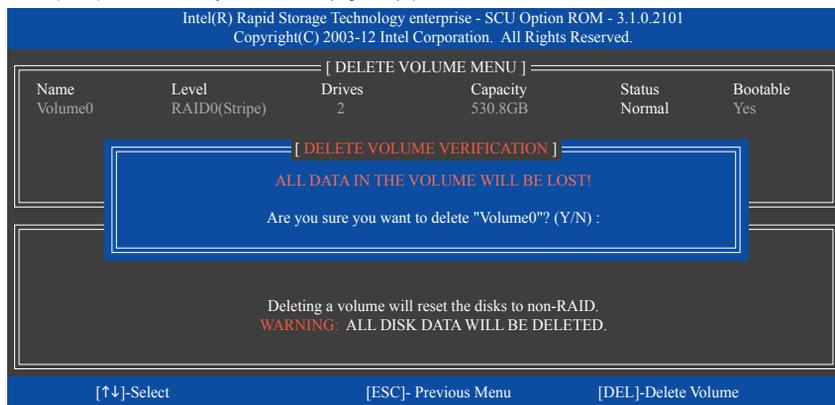


Figure 8

5-2-2 Installing the SAS RAID Driver and Operating System

With the correct BIOS settings, you are ready to install the operating system.

A. Installing Windows 7/Vista

(The following instructions use Windows 7 as the example operating system.)

Step 1:

Boot from the Windows 7/Vista setup disk and perform standard OS installation steps. When you arrive at the "Where do you want to install Windows?" screen, select **Load Driver**.

Step 2:

Insert the motherboard driver disk and then browse to the location of the driver. The locations of the drivers are as follows:

for Windows 32-Bit:\BootDrv\IRST\SAS32

for Windows 64-Bit:\BootDrv\IRST\SAS64

Step 3:

For Intel C606, select **Intel(R) C600 Series Chipset SAS RAID Controller** (Figure 1). Click **Next** to load the driver and continue the OS installation.



Figure 1

B. Rebuilding an Array

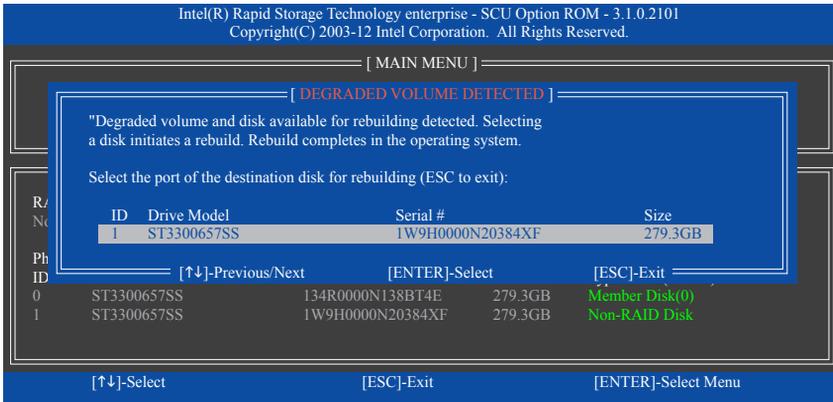
Rebuilding is the process of restoring data to a hard drive from other drives in the array. Rebuilding applies only to fault-tolerant arrays such as RAID 1 and RAID 10 arrays. The procedures below assume a new drive is added to replace a failed drive to rebuild a RAID 1 array. (Note: The new drive must have equal or greater capacity than the old one.)

Turn off your computer and replace the failed hard drive with a new one. Restart your computer.

• Enabling Automatic Rebuild

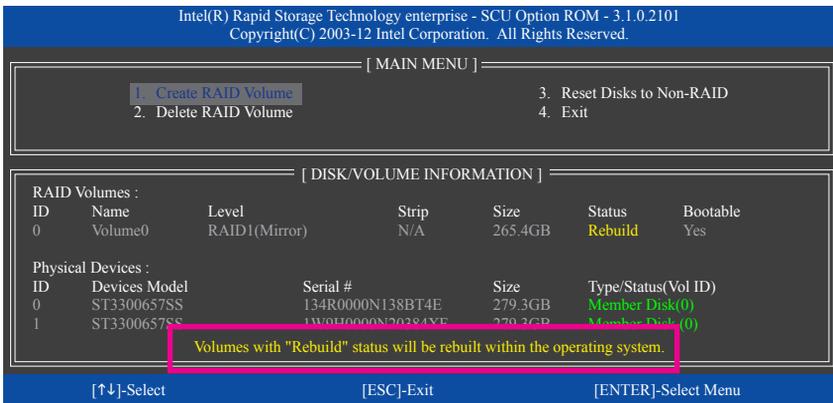
Step 1:

When the message "Press <Ctrl-> to enter Configuration Utility" appears, press <Ctrl> + <I> to enter the RAID Configuration Utility. The following screen appears after you enter the RAID Configuration Utility.



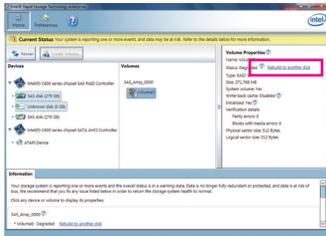
Step 2:

Select the new hard drive to add into the array to be rebuilt and press <Enter>. The following screen appears, indicating that an automatic rebuild will be performed after you enter the operating system. You can access **Intel Rapid Storage Technology enterprise** from **All Programs** in the **Start** menu. You will see that the status of the array displays as **Rebuilding**. If you do not enable automatic rebuild on this stage, you have to manually rebuild the array in the operating system (see the next page for more details).

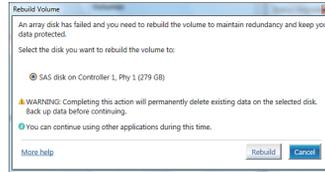


- **Performing the Rebuild in the Operating System**

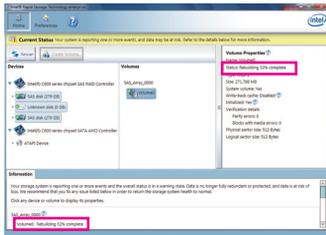
While in the operating system, make sure the Chipset driver and **Intel Rapid Storage Technology Enterprise RAID Port Drivers** have been installed from the motherboard driver disk. Then launch **Intel Rapid Storage Technology enterprise** from **All Programs** in the **Start** menu.



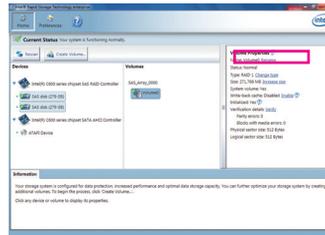
Step 1:
On the right panel of the screen, click **Rebuild** to another disk under **Volume Properties**.



Step 2:
Select a new drive to rebuild the RAID and click **Rebuild**.



The **Status** item on the right of the screen and the **Information** section on the bottom display the rebuild progress.



Step 3:
After the RAID volume rebuilding, the **Status** will display as **Normal**.

5-3 Configuring Audio Input and Output

5-3-1 Configuring 2/4/5.1/7.1-Channel Audio

The motherboard provides five audio jacks on the back panel which support 2/4/5.1/7.1-channel ^(Note) audio. The picture to the right shows the default audio jack assignments.



The integrated HD (High Definition) audio provides jack retasking capability that allows the user to change the function for each jack through the audio driver.

For example, in a 4-channel audio configuration, if a Rear speaker is plugged into the default Center/Subwoofer speaker out jack, you can retask the Center/Subwoofer speaker out jack to be Rear speaker out.



- To install a microphone, connect your microphone to the Mic in jack and manually configure the jack for microphone functionality.
- To configure 4/5.1/7.1-channel audio, you have to retask one of the audio jacks to be Side speaker out through the audio driver.
- 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 instructions on the next page.

High Definition Audio (HD Audio)

HD Audio includes multiple high quality digital-to-analog converters (DACs) and features multistreaming capabilities that allow multiple audio streams (in and out) to be simultaneously processed. For example, users can listen to MP3 music, have an Internet chat, make a telephone call over the Internet, and etc. all at the same time.

A. Configuring Speakers

(The following instructions use Windows 7 as the example operating system.)

Step 1:

After installing the audio driver, the **HD Audio Manager** icon will appear in the notification area. Double-click the icon to access the **HD Audio Manager**.



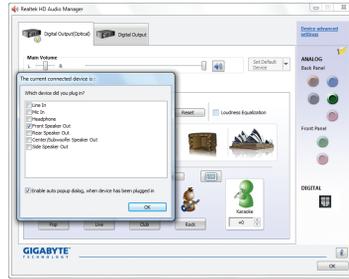
(Note) 2/4/5.1/7.1-Channel Audio Configurations:

Refer to the following for multi-channel speaker configurations.

- 2-channel audio: Headphone or Line out.
- 4-channel audio: Front speaker out and Rear speaker out.
- 5.1-channel audio: Front speaker out, Rear speaker out, and Center/Subwoofer speaker out.
- 7.1-channel audio: Front speaker out, Rear speaker out, Center/Subwoofer speaker out, and Side speaker out.

Step 2:

Connect an audio device to an audio jack. The **The current connected device is** dialog box appears. Select the device according to the type of device you connect. Then click **OK**.



Step 3:

On the **Speakers** screen, click the **Speaker Configuration** tab. In the **Speaker Configuration** list, select **Stereo**, **Quadraphonic**, **5.1 Speaker**, or **7.1 Speaker** according to the type of speaker configuration you wish to set up. Then the speaker setup is completed.

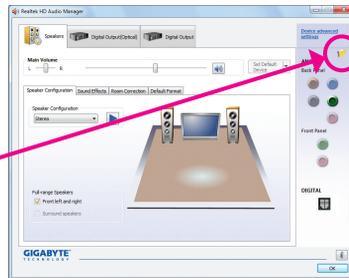


B. Configuring Sound Effect

You may configure an audio environment on the **Sound Effects** tab.

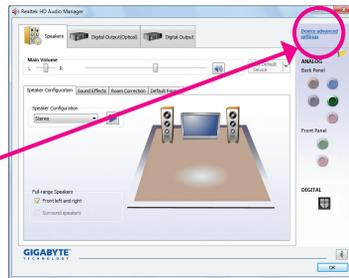
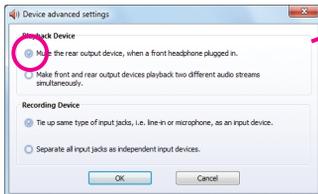
C. Activating an AC'97 Front Panel Audio Module

If your chassis provides an AC'97 front panel audio module, to activate the AC'97 functionality, click the tool icon on the **Speaker Configuration** tab. On the **Connector Settings** dialog box, select the **Disable front panel jack detection** check box. Click **OK** to complete.



D. Muting the Back Panel Audio (For HD Audio Only)

Click **Device advanced settings** on the top right corner on the **Speaker Configuration** tab to open the **Device advanced settings** dialog box. Select the **Mute the rear output device, when a front headphone plugged in** check box. Click **OK** to complete.

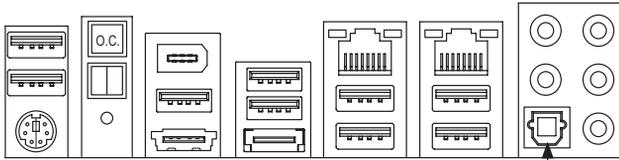


5-3-2 Configuring S/PDIF Out

The S/PDIF Out jack can transmit audio signals to an external decoder for decoding to get the best audio quality.

1. Connecting a S/PDIF Out Cable:

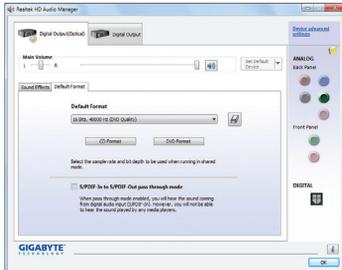
Connect a S/PDIF optical cable to the corresponding S/PDIF out connector as shown below and an external decoder for transmitting the S/PDIF digital audio signals.



Connects to a S/PDIF optical cable

2. Configuring S/PDIF Out:

On the **Digital Output(Optical)** screen (Note), click the **Default Format** tab and then select the sample rate and bit depth. Click **OK** to complete.



(Note) Enter the **Digital Output(Optical)** screen to configure further settings if you use the S/PDIF Out connector(s) on the back panel for digital audio output or enter the **Digital Output** screen if you use the internal S/PDIF Out connector (SPDIF_O) for digital audio output.

5-3-3 Configuring Microphone Recording

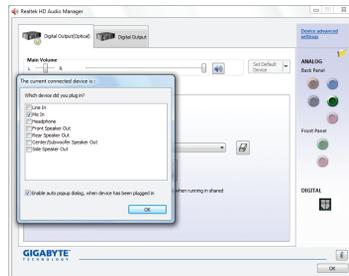
Step 1:

After installing the audio driver, the **HD Audio Manager** icon will appear in the notification area. Double-click the icon to access the **HD Audio Manager**.



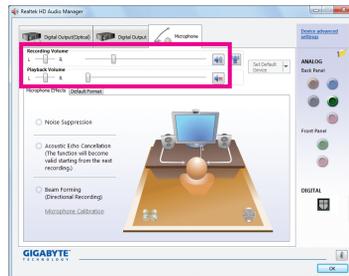
Step 2:

Connect your microphone to the Mic in jack (pink) on the back panel or the Mic in jack (pink) on the front panel. Then configure the jack for microphone functionality. Note: The microphone functions on the front panel and back panel cannot be used at the same time.



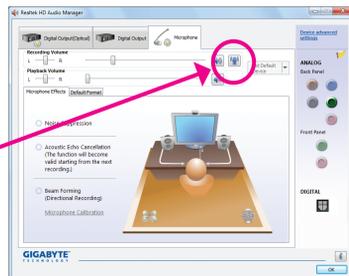
Step 3:

Go to the **Microphone** screen. Do not mute the recording volume, or you'll not be able to record the sound. To hear the sound being recorded during the recording process, do not mute the playback volume. It is recommended that you set the volumes at a middle level.



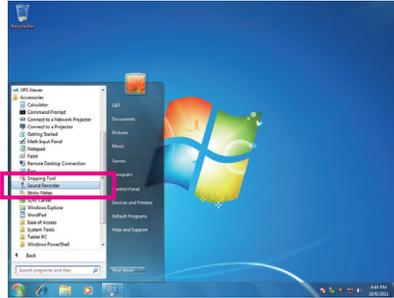
Step 4:

To raise the recording and playback volume for the microphone, click the **Microphone Boost** icon on the right of the **Recording Volume** slider and set the Microphone Boost level.



Step 5:

After completing the settings above, click **Start**, point to **All Programs**, point to **Accessories**, and then click **Sound Recorder** to begin the sound recording.

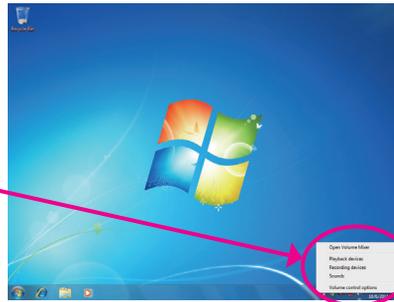


* Enabling Stereo Mix

If the HD Audio Manager does not display the recording device you wish to use, refer to the steps below. The following steps explain how to enable Stereo Mix (which may be needed when you want to record sound from your computer).

Step 1:

Locate the  icon in the notification area and right-click on this icon. Select **Recording Devices**.



Step 2:

On the **Recording** tab, right-click on an empty space and select **Show Disabled Devices**.



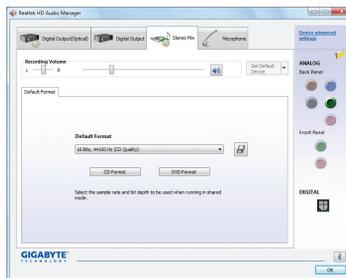
Step 3:

When the **Stereo Mix** item appears, right-click on this item and select **Enable**. Then set it as the default device.

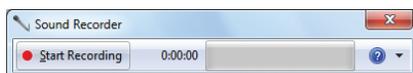


Step 4:

Now you can access the **HD Audio Manager** to configure **Stereo Mix** and use **Sound Recorder** to record the sound.



5-3-4 Using the Sound Recorder



A. Recording Sound

1. Make sure you have connected the sound input device (e.g. microphone) to the computer.
2. To record the audio, click the **Start Recording** button .
3. To stop recording audio, click the **Stop Recording** button .

Be sure to save the recorded audio file upon completion.

B. Playing the Recorded Sound

You can play your recording in a digital media player program that supports your audio file format.

5-4 Troubleshooting

5-4-1 Frequently Asked Questions

To read more FAQs for your motherboard, please go to the **Support & Downloads\FAQ** page on GIGABYTE's website.

Q: Why is the light of my keyboard/optical mouse still on after the computer shuts down?

A: Some motherboards provide a small amount of standby power after the computer shuts down and that's why the light is still on.

Q: How do I clear the CMOS values?

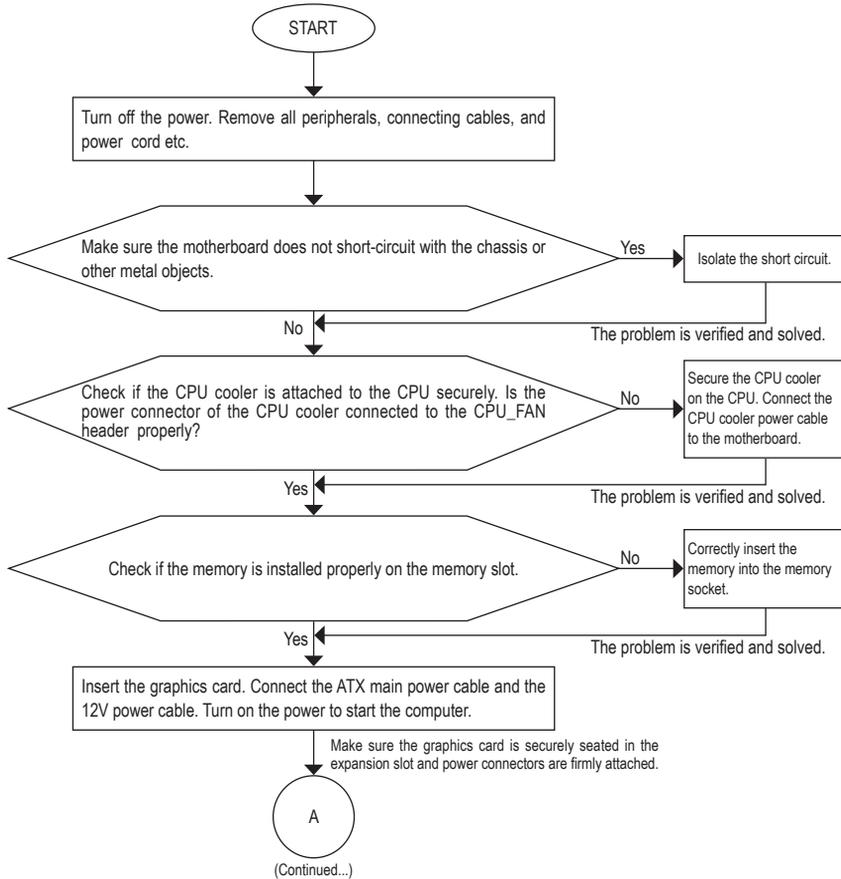
A: For motherboards that have a Clear CMOS button, press this button to clear the CMOS values (before doing this, please turn off the computer and unplug the power cord). For motherboards that have a Clear CMOS jumper, refer to the instructions in Chapter 1 to short the jumper to clear the CMOS values. If your board doesn't have this jumper/button, refer to the instructions on the motherboard battery in Chapter 1. You can temporarily remove the battery from the battery holder to stop supplying power to the CMOS, which will clear the CMOS values after about one minute.

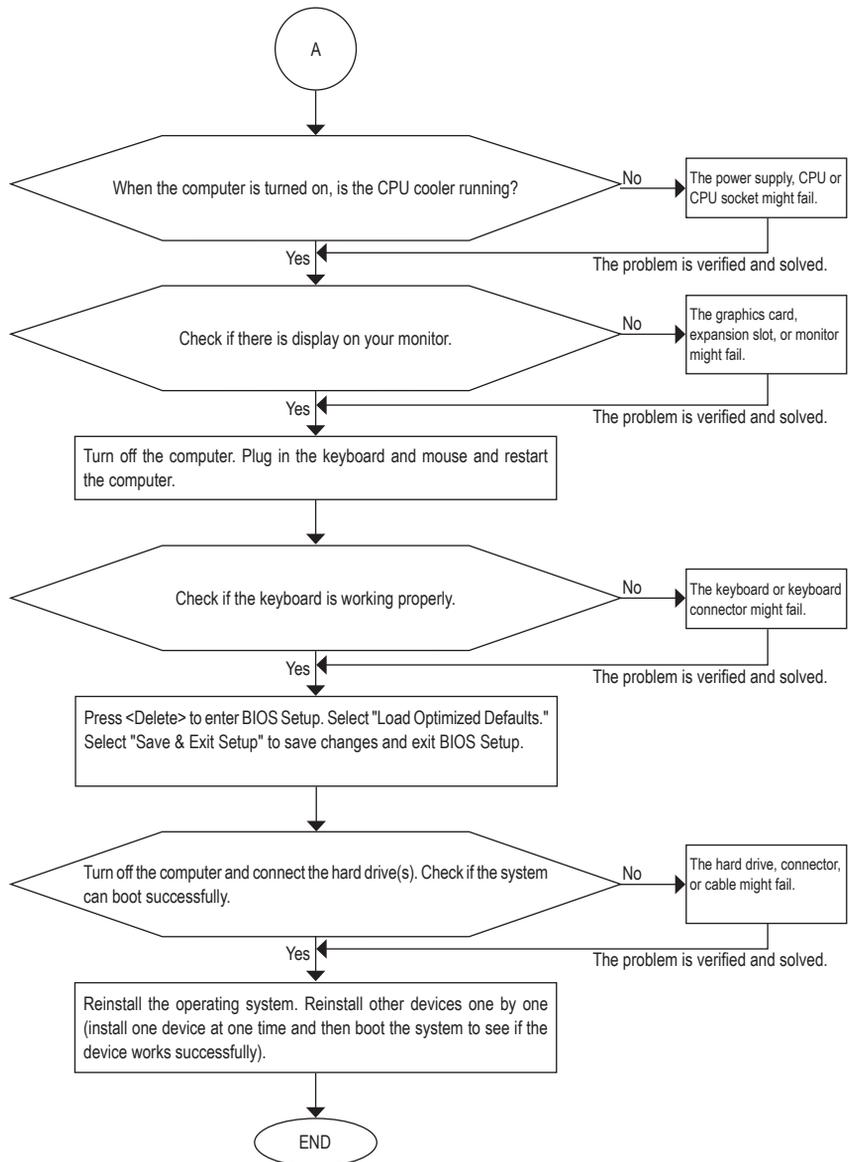
Q: Why do I still get a weak sound even though I have turned my speaker to the maximum volume?

A: Make sure your speaker is equipped with an internal amplifier. If not, try a speaker with power/amplifier.

5-4-2 Troubleshooting Procedure

If you encounter any troubles during system startup, follow the troubleshooting procedure below to solve the problem.





If the procedure above is unable to solve your problem, contact the place of purchase or local dealer for help. Or go to the **Support & Downloads\Technical Support** page to submit your question. Our customer service staff will reply you as soon as possible.

5-5 Regulatory Statements

Regulatory Notices

This document must not be copied without our written permission, and the contents there of must not be imparted to a third party nor be used for any unauthorized purpose. Contravention will be prosecuted. We believe that the information contained herein was accurate in all respects at the time of printing. GIGABYTE cannot, however, assume any responsibility for errors or omissions in this text. Also note that the information in this document is subject to change without notice and should not be construed as a commitment by GIGABYTE.

Our Commitment to Preserving the Environment

In addition to high-efficiency performance, all GIGABYTE motherboards fulfill European Union regulations for RoHS (Restriction of Certain Hazardous Substances in Electrical and Electronic Equipment) and WEEE (Waste Electrical and Electronic Equipment) environmental directives, as well as most major worldwide safety requirements. To prevent releases of harmful substances into the environment and to maximize the use of our natural resources, GIGABYTE provides the following information on how you can responsibly recycle or reuse most of the materials in your "end of life" product.

Restriction of Hazardous Substances (RoHS) Directive Statement

GIGABYTE products have not intended to add and safe from hazardous substances (Cd, Pb, Hg, Cr+6, PBDE and PBB). The parts and components have been carefully selected to meet RoHS requirement. Moreover, we at GIGABYTE are continuing our efforts to develop products that do not use internationally banned toxic chemicals.

Waste Electrical & Electronic Equipment (WEEE) Directive Statement

GIGABYTE will fulfill the national laws as interpreted from the 2002/96/EC WEEE (Waste Electrical and Electronic Equipment) directive. The WEEE Directive specifies the treatment, collection, recycling and disposal of electric and electronic devices and their components. Under the Directive, used equipment must be marked, collected separately, and disposed of properly.

WEEE Symbol Statement



The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, the device should be taken to the waste collection centers for activation of the treatment, collection, recycling and disposal procedure. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or where you purchased the product for details of environmentally safe recycling.

- ◆ When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling.
- ◆ If you need further assistance in recycling, reusing in your "end of life" product, you may contact us at the Customer Care number listed in your product's user's manual and we will be glad to help you with your effort.

Finally, we suggest that you practice other environmentally friendly actions by understanding and using the energy-saving features of this product (where applicable), recycling the inner and outer packaging (including shipping containers) this product was delivered in, and by disposing of or recycling used batteries properly. With your help, we can reduce the amount of natural resources needed to produce electrical and electronic equipment, minimize the use of landfills for the disposal of "end of life" products, and generally improve our quality of life by ensuring that potentially hazardous substances are not released into the environment and are disposed of properly.



Contact Us

- **GIGA-BYTE TECHNOLOGY CO., LTD.**

Address: No.6, Bao Chiang Road, Hsin-Tien Dist.,
New Taipei City 231, Taiwan

TEL: +886-2-8912-4000

FAX: +886-2-8912-4003

Tech. and Non-Tech. Support (Sales/Marketing) :

<http://ggts.gigabyte.com.tw>

WEB address (English): <http://www.gigabyte.com>

WEB address (Chinese): <http://www.gigabyte.tw>

- **G.B.T. INC. - U.S.A.**

TEL: +1-626-854-9338

FAX: +1-626-854-9326

Tech. Support: <http://ggts.gigabyte.com.tw>

Warranty Info: <http://rma.gigabyte.us>

Web address: <http://www.gigabyte.us>

- **G.B.T. INC (USA) - Mexico**

Tel: +1-626-854-9338 x 215 (Soporte de habla hispano)

FAX: +1-626-854-9326

Correo: soporte@gigabyte-usa.com

Tech. Support: <http://rma.gigabyte.us>

Web address: <http://latam.giga-byte.com>

- **Giga-Byte SINGAPORE PTE. LTD. - Singapore**

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- **Thailand**

WEB address : <http://th.giga-byte.com>

- **Vietnam**

WEB address : <http://www.gigabyte.vn>

- **NINGBO G.B.T. TECH. TRADING CO., LTD. - China**

WEB address : <http://www.gigabyte.cn>

- Shanghai**

TEL: +86-21-63410999

FAX: +86-21-63410100

- Beijing**

TEL: +86-10-62102838

FAX: +86-10-62102848

- Wuhan**

TEL: +86-27-87851061

FAX: +86-27-87851330

- GuangZhou**

TEL: +86-20-87540700

FAX: +86-20-87544306

- Chengdu**

TEL: +86-28-85236930

FAX: +86-28-85256822

- Xian**

TEL: +86-29-85531943

FAX: +86-29-85510930

- Shenyang**

TEL: +86-24-83992901

FAX: +86-24-83992909

- **GIGABYTE TECHNOLOGY (INDIA) LIMITED - India**

WEB address : <http://www.gigabyte.in>

- **Saudi Arabia**

WEB address : <http://www.gigabyte.com.sa>

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- **GIGABYTE Global Service System**



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<http://gts.gigabyte.com.tw>

Then select your language to enter the system.