

# GA-Q77M-D2H

## User's Manual

Rev. 1001

12ME-Q77MD2H-1001R

## Declaration of Conformity

We, Manufacturer/Importer

G.B.T. Technology Trading GmbH

Bültenkoppl 16, 22047 Hamburg, Germany

declare that the product

GA-Q77M-D2H

(reference to the specification under which conformity is claimed)

in accordance with the EMC Directive 2004/108/E

EN 55011 Limits and methods of measurement of radio disturbance characteristics of high frequency equipment

EN 61000-3-2 Disturbances in supply systems caused by household appliances and similar electrical equipment "Voltage fluctuations"

EN 55013 Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment

EN 55024 Information Technology equipment/Immunity characteristics/Limits and methods of measurement

EN 55014-1 Limits and methods of measurement of radio disturbance characteristics of portable tools and similar electrical apparatus

EN 50082-1 Generic immunity standard Part 1: Residual, commercial and light industry

EN 50082-2 Generic immunity standard Part 2: Industrial environment

EN 55015 Limits and methods of measurement of radio disturbance characteristics of fluorescent lamps and luminaires

EN 55014-2 Immunity requirements for household appliances tools and similar apparatus

EN 55020 Immunity from radio interference of broadcast receivers and associated equipment

EN 50091-2 EMC requirements for uninterruptible power systems (UPS)

EN 55022 Limits and methods of measurement of radio disturbance characteristics of information technology equipment

DIN VDE 0855 Cabled distribution systems; Equipment for receiving and/or distribution from part 10  
 part 11  
 part 12  
 part 13  
 part 14  
 part 15  
serial and television signals



(CE conformity marking)

CE marking

EN 60065 Safety requirements for mains operated electronic and related apparatus for household and similar general use

EN 50091-1 General and Safety requirements for uninterruptible power systems (UPS)

Manufacturer/Importer

Signature: Timmy Huang

(Stamp)

Date: Apr. 18, 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: 17388 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-Q77M-D2H

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: Apr. 18, 2012

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## **Disclaimer**

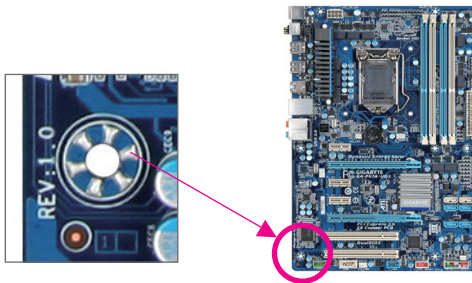
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- In order to assist in the use of this product, carefully read the User's Manual.
- For product-related information, check on our website at: <http://www.gigabyte.com>

## **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.

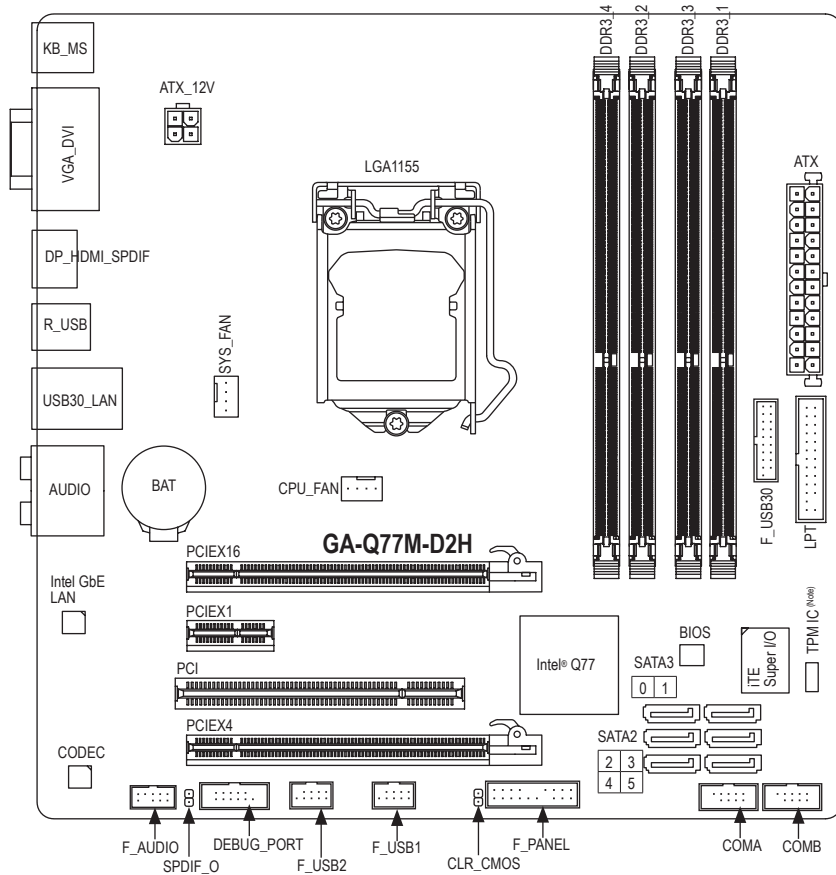
Example:



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# GA-Q77M-D2H Motherboard Layout



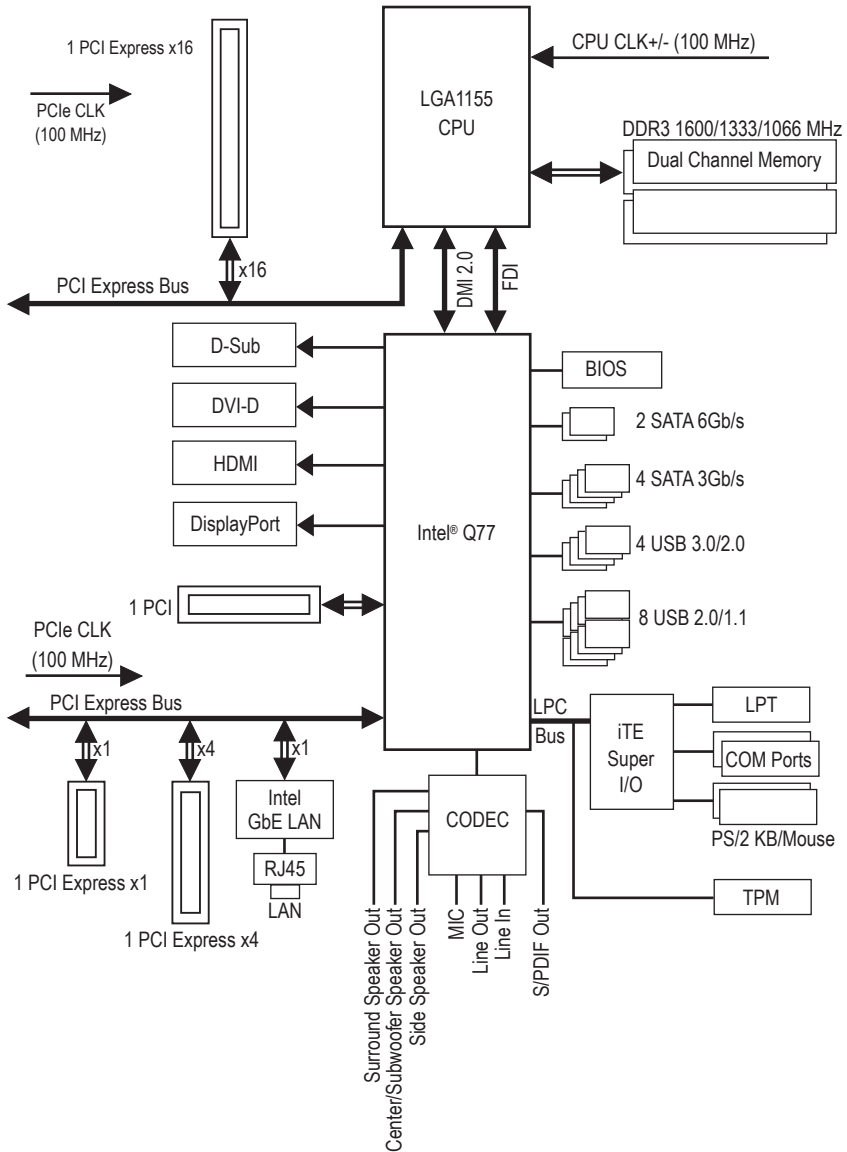
## Box Contents

- GA-Q77M-D2H motherboard
- Motherboard driver disk
- User's Manual
- Two SATA cables
- I/O Shield

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.

(Note) This feature is optional due to different regional policy.

# GA-Q77M-D2H Motherboard Block Diagram



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









# Chapter 1 Hardware Installation

## 1-1 Installation Precautions






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







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

## 1-2 Product Specifications

	CPU	<ul style="list-style-type: none"> <li>◆ Support for Intel® Core™ i7 processors/Intel® Core™ i5 processors/Intel® Core™ i3 processors/Intel® Pentium® processors/Intel® Celeron® processors in the LGA1155 package (Go to GIGABYTE's website for the latest CPU support list.)</li> <li>◆ L3 cache varies with CPU</li> </ul>
	Chipset	<ul style="list-style-type: none"> <li>◆ Intel® Q77 Express Chipset</li> </ul>
	Memory	<ul style="list-style-type: none"> <li>◆ 4 x 1.5V DDR3 DIMM sockets supporting up to 32 GB of system memory               <ul style="list-style-type: none"> <li>* Due to 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 4 GB.</li> </ul> </li> <li>◆ Dual channel memory architecture</li> <li>◆ Support for DDR3 1600/1333/1066 MHz memory modules</li> <li>◆ Support for non-ECC memory modules (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)</li> </ul>
	Onboard Graphics	<ul style="list-style-type: none"> <li>◆ Integrated Graphics Processor:               <ul style="list-style-type: none"> <li>- 1 x D-Sub port</li> <li>- 1 x DVI-D port, supporting a maximum resolution of 1920x1200                   <ul style="list-style-type: none"> <li>* The DVI-D port does not support D-Sub connection by adapter.</li> </ul> </li> <li>- 1 x HDMI port, supporting a maximum resolution of 1920x1200</li> <li>- 1 x DisplayPort, supporting a maximum resolution of 2560x1600</li> </ul> </li> </ul>
	Audio	<ul style="list-style-type: none"> <li>◆ Realtek ALC887 codec</li> <li>◆ High Definition Audio</li> <li>◆ 2/4/5.1/7.1-channel</li> <li>◆ Support for S/PDIF Out</li> </ul>
	LAN	<ul style="list-style-type: none"> <li>◆ 1 x Intel GbE LAN chip (10/100/1000 Mbit)</li> </ul>
	Expansion Slots	<ul style="list-style-type: none"> <li>◆ 1 x PCI Express x16 slot, running at x16 (PCIEX16) (The PCIEX16 slot conforms to PCI Express 3.0 standard.)               <ul style="list-style-type: none"> <li>* For optimum performance, if only one PCI Express graphics card is to be installed, be sure to install it in the PCIEX16 slot.</li> <li>* The PCI Express x16 slots support up to PCI Express 3.0 standard when an Intel 22nm (Ivy Bridge) CPU is installed.</li> </ul> </li> <li>◆ 1 x PCI Express x16 slot, running at x4 (PCIEX4)</li> <li>◆ 1 x PCI Express x1 slot (The PCIEX4 and PCIEX1 slots conform to PCI Express 2.0 standard.)</li> <li>◆ 1 x PCI slot</li> </ul>
	Multi-Graphics Technology	<ul style="list-style-type: none"> <li>◆ Support for AMD CrossFireX™ technology               <ul style="list-style-type: none"> <li>* The PCIEX16 slot operates at up to x4 mode when AMD CrossFireX™ is enabled.</li> </ul> </li> </ul>



	Storage Interface ♦	<ul style="list-style-type: none"> <li>♦ Chipset: <ul style="list-style-type: none"> <li>- 2 x SATA 6Gb/s connectors (SATA3 0/1) supporting up to 2 SATA 6Gb/s devices</li> <li>- 4 x SATA 3Gb/s connectors (SATA2 2/3/4/5) supporting up to 4 SATA 3Gb/s devices</li> <li>- Support for RAID 0, RAID 1, RAID 5, and RAID 10 <ul style="list-style-type: none"> <li>* 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.</li> </ul> </li> </ul> </li> </ul>
	USB ♦	<ul style="list-style-type: none"> <li>♦ Chipset: <ul style="list-style-type: none"> <li>- Up to 8 USB 2.0/1.1 ports (4 ports on the back panel, 4 ports available through the internal USB headers)</li> <li>- Up to 4 USB 3.0/2.0 ports (2 ports on the back panel, 2 ports available through the internal USB header) <ul style="list-style-type: none"> <li>* In Windows XP, the Intel USB 3.0 ports can support up to USB 2.0 transfer speed.</li> </ul> </li> </ul> </li> </ul>
	Internal Connectors ♦	<ul style="list-style-type: none"> <li>♦ 1 x 24-pin ATX main power connector</li> <li>♦ 1 x 4-pin ATX 12V power connector</li> <li>♦ 2 x SATA 6Gb/s connectors</li> <li>♦ 4 x SATA 3Gb/s connectors</li> <li>♦ 1 x CPU fan header</li> <li>♦ 1 x system fan header</li> <li>♦ 1 x front panel header</li> <li>♦ 1 x front panel audio header</li> <li>♦ 1 x S/PDIF Out header</li> <li>♦ 1 x USB 3.0/2.0 header</li> <li>♦ 2 x USB 2.0/1.1 headers</li> <li>♦ 2 x serial port headers</li> <li>♦ 1 x parallel port</li> <li>♦ 1 x debug card header</li> <li>♦ 1 x Clear CMOS jumper</li> </ul>
	Back Panel Connectors ♦	<ul style="list-style-type: none"> <li>♦ 1 x PS/2 Keyboard port</li> <li>♦ 1 x PS/2 mouse port</li> <li>♦ 1 x D-Sub port</li> <li>♦ 1 x DVI-D port</li> <li>♦ 1 x optical S/PDIF Out connector</li> <li>♦ 1 x HDMI port</li> <li>♦ 1 x DisplayPort</li> <li>♦ 2 x USB 3.0/2.0 ports</li> <li>♦ 4 x USB 2.0/1.1 ports</li> <li>♦ 1 x RJ-45 port</li> <li>♦ 6 x audio jacks (Center/Subwoofer Speaker Out/Rear Speaker Out/Side Speaker Out/Line In/Line Out/Microphone)</li> </ul>
	I/O Controller ♦	<ul style="list-style-type: none"> <li>♦ iTE I/O Controller Chip</li> </ul>

	Hardware Monitor	<ul style="list-style-type: none"> <li>◆ System voltage detection</li> <li>◆ CPU/System temperature detection</li> <li>◆ CPU/System fan speed detection</li> <li>◆ CPU overheating warning</li> <li>◆ CPU/System fan fail warning</li> <li>◆ CPU/System fan speed control</li> </ul> <p style="margin-left: 40px;">* Whether the CPU/system fan speed control function is supported will depend on the CPU/system cooler you install.</p>
	BIOS	<ul style="list-style-type: none"> <li>◆ 1 x 64 Mbit flash</li> <li>◆ Use of licensed AMI EFI BIOS</li> <li>◆ PnP 1.0a, DMI 2.0, SM BIOS 2.6, ACPI 2.0a</li> </ul>
	Unique Features	<ul style="list-style-type: none"> <li>◆ Support for @BIOS</li> <li>◆ Support for Xpress Install</li> <li>◆ Support for Xpress Recovery2</li> <li>◆ Support for eXtreme Hard Drive (X.H.D)</li> <li>◆ Support for Auto Green</li> <li>◆ Support for ON/OFF Charge</li> <li>◆ Support for Q-Share</li> <li>◆ Support for EZ Setup</li> <li>◆ Support for Smart TPM</li> </ul> <p style="margin-left: 40px;">* This feature is optional due to different regional policy.</p>
	Bundled Software	<ul style="list-style-type: none"> <li>◆ Norton Internet Security (OEM version)</li> <li>◆ Intel® Rapid Start Technology</li> <li>◆ Intel® Smart Connect Technology</li> <li>◆ Intel® Smart Response Technology</li> </ul>
	Operating System	<ul style="list-style-type: none"> <li>◆ Support for Microsoft® Windows 7/XP</li> </ul>
	Form Factor	<ul style="list-style-type: none"> <li>◆ Micro ATX Form Factor; 24.4cm x 24.4cm</li> </ul>

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

## 1-3 Installing the CPU

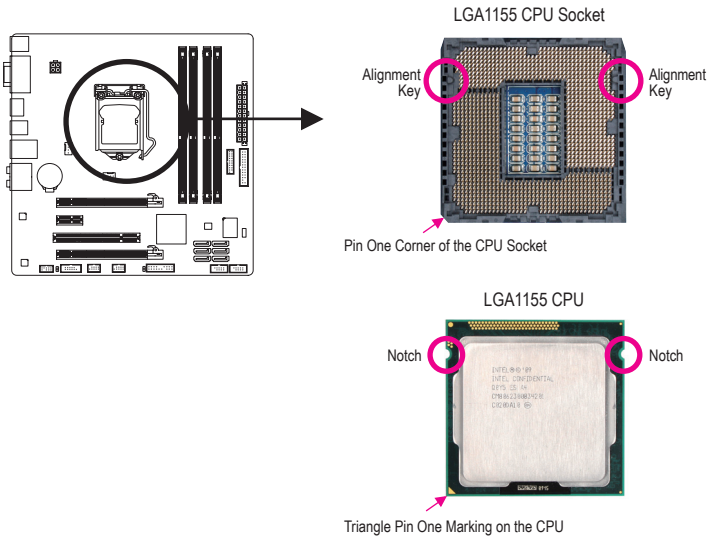


Read the following guidelines before you begin to install the CPU:

- 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.

### Installing the CPU

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

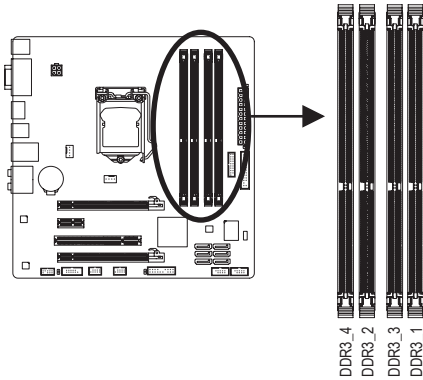
### Dual Channel Memory Configuration

This motherboard provides four DDR3 memory sockets and supports Dual Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Dual Channel memory mode will double the original memory bandwidth.

The four DDR3 memory sockets are divided into two channels and each channel has two memory sockets as following:

▶▶ Channel A: DDR3\_1, DDR3\_3

▶▶ Channel B: DDR3\_2, DDR3\_4



▶▶ Dual Channel Memory Configurations Table

	DDR3_4	DDR3_2	DDR3_3	DDR3_1
Two Modules	--	DS/SS	--	DS/SS
	DS/SS	--	DS/SS	--
Four Modules	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. Dual Channel mode cannot be enabled if only one DDR3 memory module is installed.
2. When enabling Dual Channel mode with two or four memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used and installed in the same colored DDR3 sockets. 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.

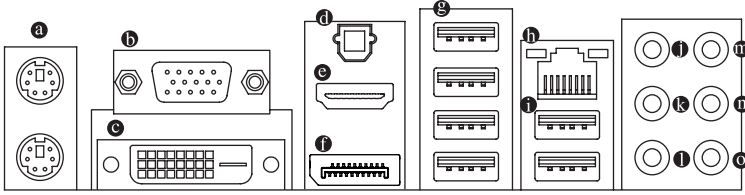
## 1-5 Installing an Expansion Card



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.

## 1-6 Back Panel Connectors



### a PS/2 Keyboard and PS/2 Mouse Port

Use the upper port (green) to connect a PS/2 mouse and the lower port (purple) to connect a PS/2 keyboard.

### b D-Sub Port

The D-Sub port supports a 15-pin D-Sub connector. Connect a monitor that supports D-Sub connection to this port.

### c DVI-D Port (Note)

The DVI-D port conforms to the DVI-D specification and supports a maximum resolution of 1920x1200 (the actual resolutions supported depend on the monitor being used). Connect a monitor that supports DVI-D connection to this port.

### d 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.

### e HDMI Port

**HDMI™** HIGH-DEFINITION MULTIMEDIA INTERFACE The HDMI port is HDCP compliant and supports Dolby True HD and DTS HD Master Audio formats. It also supports up to 192KHz/24bit 8-channel LPCM audio output. You can use this port to connect your HDMI-supported monitor. The maximum supported resolution is 1920x1200, but the actual resolutions supported are dependent on the monitor being used.



After installing the HDMI device, make sure to set the default sound playback device to HDMI. (The item name may differ depending on your operating system. The screenshot below is from Windows 7.)



In Windows 7, select Start>Control Panel>Hardware and Sound>Sound>Playback, set Intel(R) Display Audio to the default playback device.

(Note) The DVI-D port does not support D-Sub connection by adapter.



- 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 DisplayPort

DisplayPort is one of the new generation interface technologies that delivers high quality digital imaging and audio, supporting bi-directional audio transmission. DisplayPort can support both DPCP and HDCP content protection mechanisms. Connect the audio/video device that supports DisplayPort to this port. The DisplayPort Technology can support a maximum resolution of 2560x1600 but the actual resolutions supported depend on the monitor being used.



After installing the DisplayPort device, make sure the default device for sound playback is the DisplayPort device. (The item name may differ from operating system. For example, in Windows 7, go to Start>Control Panel>Hardware and Sound>Sound>Playback and set the DisplayPort device as the default playback device. Refer to the HDMI settings information on the previous page for the configuration dialog box.)

## Dual Display Configurations for the Onboard Graphics:

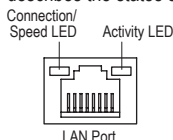
This motherboard provides four video output ports: D-Sub, DVI-D, HDMI, and DisplayPort. Dual monitor configurations are supported in operating system environment only, but not during the BIOS Setup or POST process.

## ❷ 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.

## ❸ RJ-45 LAN Port

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



Connection/Speed LED:

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

Activity LED:

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

## ❹ 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 Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

## ❺ Center/Subwoofer Speaker Out Jack (Orange)

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

## ❻ Rear Speaker Out Jack (Black)

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

## ❼ Side Speaker Out Jack (Gray)

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

## Ⓜ Line In Jack (Blue)

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

## Ⓝ 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.

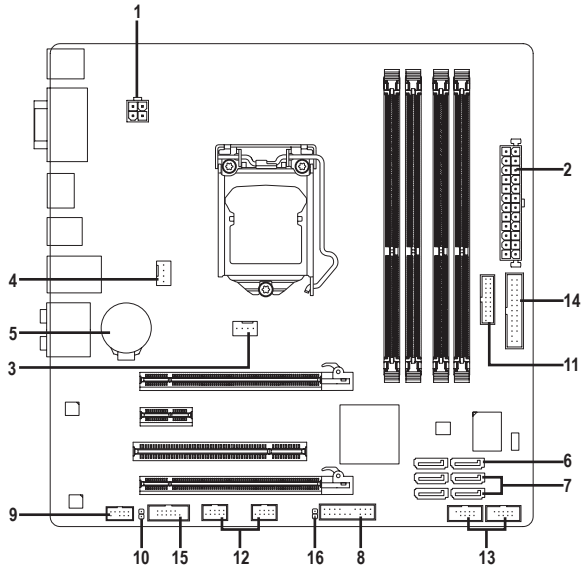
## Ⓟ Mic In Jack (Pink)

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 (Ⓟ).

## 1-7 Internal Connectors



1) ATX_12V	9) F_AUDIO
2) ATX	10) SPDIF_O
3) CPU_FAN	11) F_USB30
4) SYS_FAN	12) F_USB1/2
5) BAT	13) COMA/COMB
6) SATA3 0/1	14) LPT
7) SATA2 2/3/4/5	15) DEBUG_PORT
8) F_PANEL	16) CLR_CMOS



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.

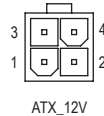
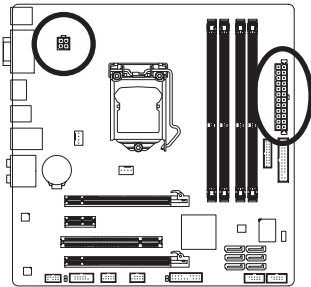
## 1/2) ATX\_12V/ATX (2x2 12V Power Connector and 2x12 Main Power Connector)

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.

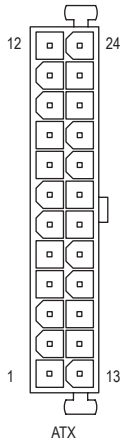


To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.



ATX\_12V:

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



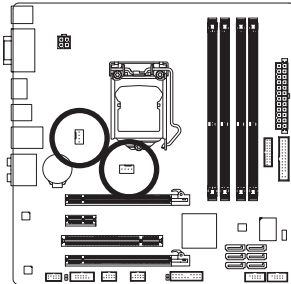
ATX:

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\_FAN (Fan Headers)

All fan headers on this motherboard are 4-pin. 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



SYS\_FAN

CPU\_FAN:

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

SYS\_FAN:

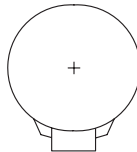
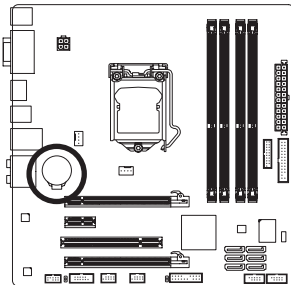
Pin No.	Definition
1	GND
2	Speed Control
3	Sense
4	Reserve



- 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:

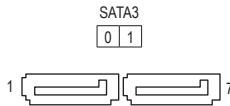
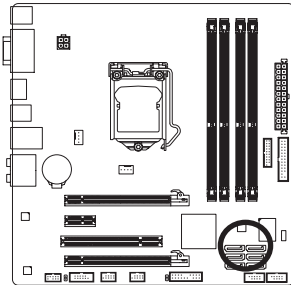
1. Turn off your computer and unplug the power cord.
2. Gently remove the battery from the battery holder and wait for one minute. (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.)
3. Replace the battery.
4. 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 Q77 Chipset)

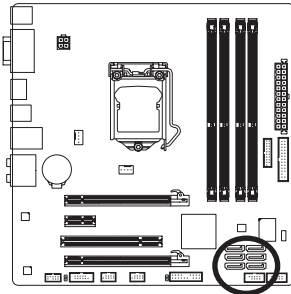
The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The "SATA3 0" and "SATA3 1" connectors support RAID 0 and RAID 1. RAID 5 and RAID 10 can be implemented on the two connectors with the "SATA2 2/3/4/5" connectors <sup>(Note)</sup>.



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 Q77 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 Q77 Chipset supports RAID 0, RAID 1, RAID 5, and RAID 10.



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

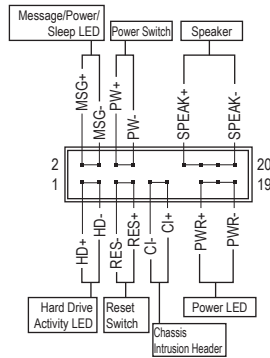
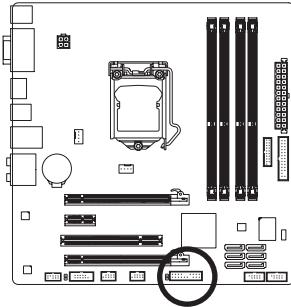


- A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are to be used, the total number of hard drives must be an even number.
- A RAID 5 configuration requires at least three hard drives. (The total number of hard drives does not have to be an even number.)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

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).

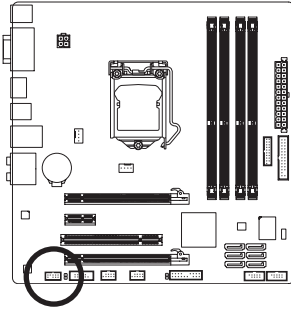
- PW (Power Switch):  
Connects to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch (refer to Chapter 2, "BIOS Setup," "Power Management," for more information).
- Speaker (Speaker):  
Connects to the speaker on the chassis front panel.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

## 9) 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:

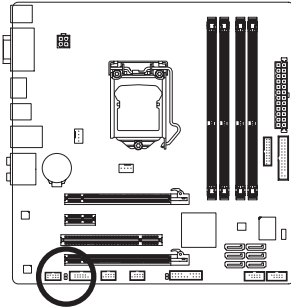
Pin No.	Definition
1	MIC
2	GND
3	MIC Power
4	NC
5	Line Out (R)
6	NC
7	NC
8	No Pin
9	Line Out (L)
10	NC



- The front panel audio header supports HD audio by default.
- Audio signals will be present on both of the front and back panel audio connections simultaneously.
- 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.

## 10) SPDIF\_O (S/PDIF Out Header)

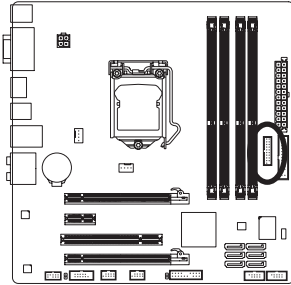
This header supports digital S/PDIF Out and connects a S/PDIF digital audio cable (provided by expansion cards) for digital audio output from your motherboard to certain expansion cards like graphics cards and sound cards. For example, some graphics cards may require you to use a S/PDIF digital audio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



Pin No.	Definition
1	SPDIFO
2	GND

### 11) F\_USB30 (USB 3.0/2.0 Header)

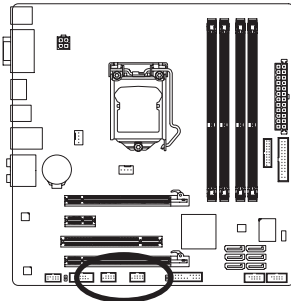
The header conforms to USB 3.0/2.0 specification and can provide two USB ports. For purchasing the optional 3.5" front panel that provides two USB 3.0/2.0 ports, please contact the local dealer.



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

### 12) F\_USB1/2 (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.



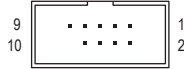
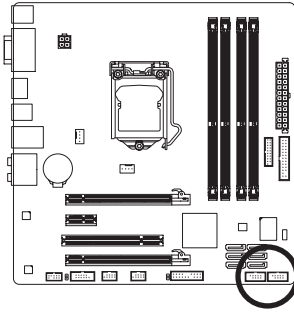
Pin No.	Definition
1	Power (5V)
2	Power (5V)
3	USB DX-
4	USB DY-
5	USB DX+
6	USB DY+
7	GND
8	GND
9	No Pin
10	NC



- 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.

### 13) COMA/COMB (Serial Port Headers)

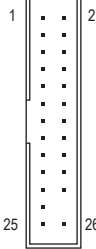
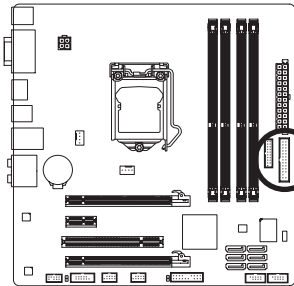
The COM header can provide one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer.



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

### 14) LPT (Parallel Port Header)

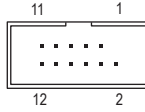
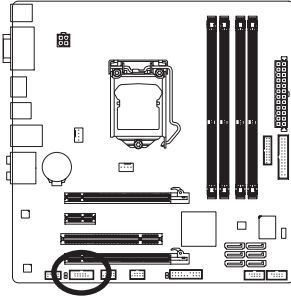
The LPT header can provide one parallel port via an optional LPT port cable. For purchasing the optional LPT port cable, please contact the local dealer.



Pin No.	Definition	Pin No.	Definition
1	STB-	14	GND
2	AFD-	15	PD6
3	PD0	16	GND
4	ERR-	17	PD7
5	PD1	18	GND
6	INIT-	19	ACK-
7	PD2	20	GND
8	SLIN-	21	BUSY
9	PD3	22	GND
10	GND	23	PE
11	PD4	24	No Pin
12	GND	25	SLCT
13	PD5	26	GND

### 15) DEBUG PORT (Debug Card Header) (Note)

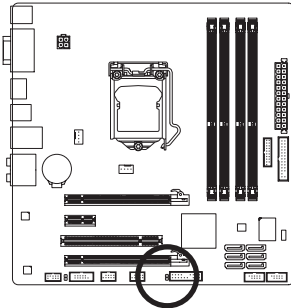
This header can connect a debug card.




Pin No.	Definition
1	No Pin
2	GND
3	VCC3
4	LAD0
5	LAD1
6	LAD2
7	LAD3
8	-LFRAME
9	-PFMRST
10	DB CLK
11	DB_P_SENSOR
12	NC

### 16) 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).

(Note) Whether this feature is supported depends on the product being received.

## 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.

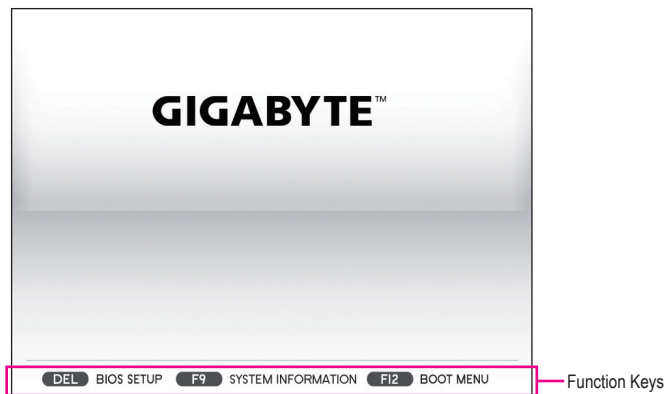
- Q-Flash allows the user to quickly and easily upgrade or back up BIOS without entering the operating system.
- @BIOS is a Windows-based utility that searches and downloads the latest version of BIOS from the Internet and updates the BIOS.



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

### 2-1 Startup Screen

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

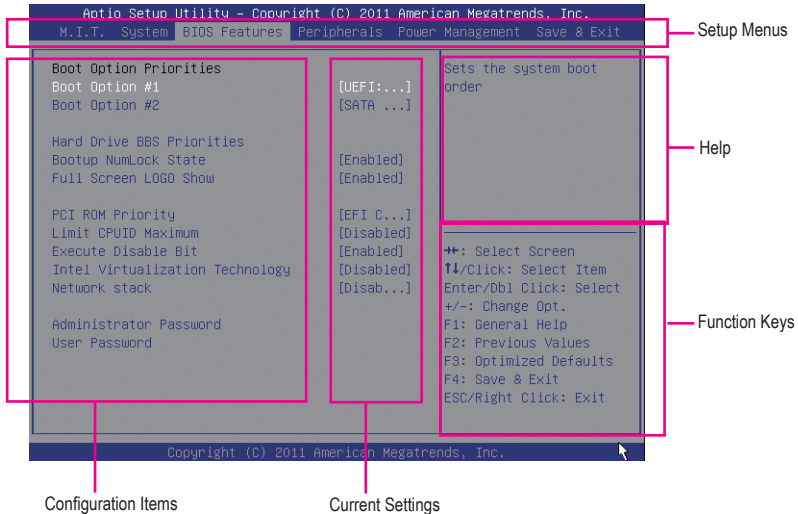




## 2-2 The Main Menu

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

(Sample BIOS Version: E18c)



### 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.

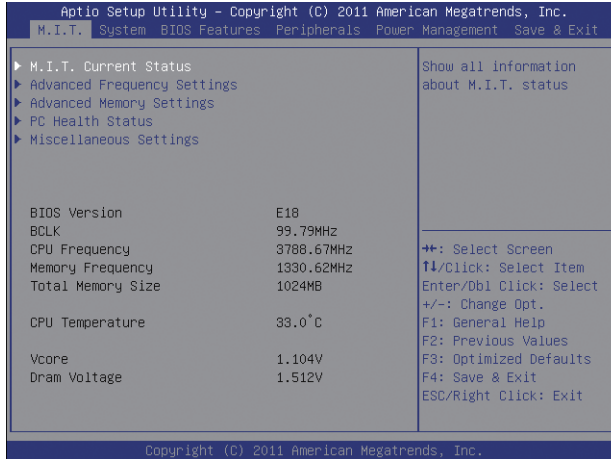
#### ■ Save & Exit

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.

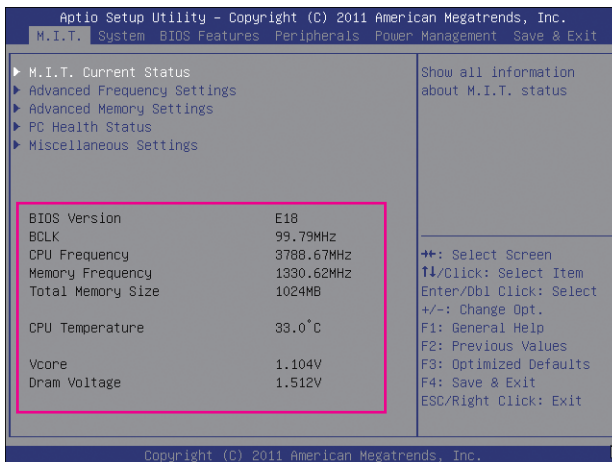


- When the system is not stable as usual, select the **Load Optimized Defaults** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.

## 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.)

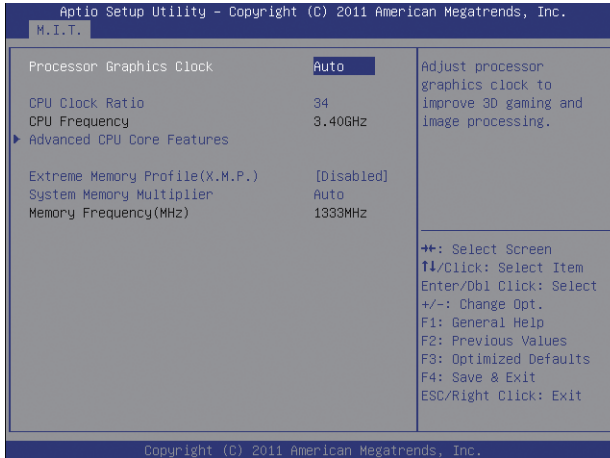


This section provides information on the BIOS version, CPU base clock, CPU frequency, memory frequency, total memory size, CPU temperature, Vcore, and memory voltage.

▶ **M.I.T. Current Status**

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

▶ **Advanced Frequency Settings**



⊞ **Processor Graphics Clock**

Allows you to set the onboard graphics clock. The adjustable range is from 400 MHz to 3200 MHz. (Default: Auto)

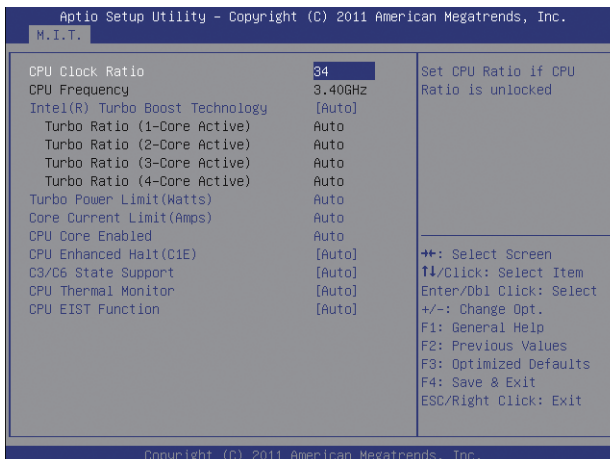
⊞ **CPU Clock Ratio**

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

⊞ **CPU Frequency**

Displays the current operating CPU frequency.

▶ **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.
- ☞ **Intel(R) Turbo Boost Technology** <sup>(Note)</sup>  
 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~4-Core Active)** <sup>(Note)</sup>  
 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)
- ☞ **CPU Core Enabled** <sup>(Note)</sup>  
 Allows you to determine whether to enable all CPU cores. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ☞ **Hyper-Threading Technology** <sup>(Note)</sup>  
 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)** <sup>(Note)</sup>  
 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** <sup>(Note)</sup>  
 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** <sup>(Note)</sup>  
 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** <sup>(Note)</sup>  
 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)

(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.

☞ **Extreme Memory Profile (X.M.P.)** <sup>(Note)</sup>

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 <sup>(Note 2)</sup>      Uses Profile 2 settings.

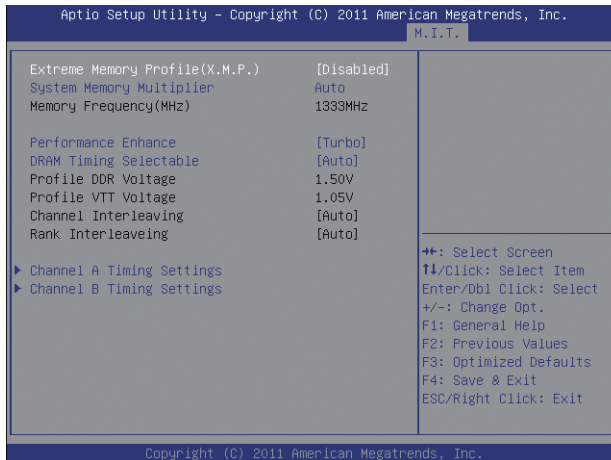
☞ **System Memory Multiplier (SPD)**

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.

▶ **Advanced Memory Settings**



☞ **Extreme Memory Profile (X.M.P.)** <sup>(Note)</sup>, **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.

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

### ☞ 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.

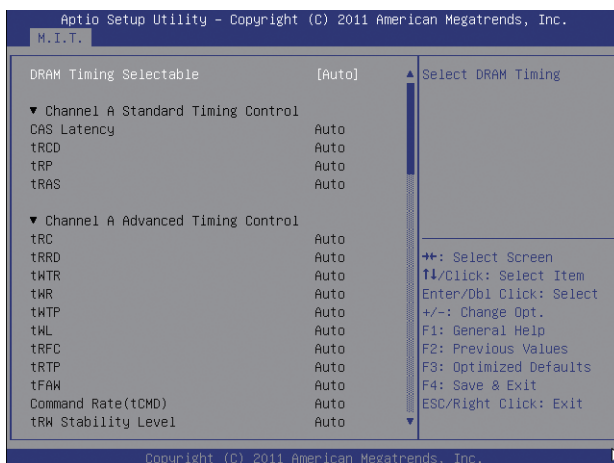
### ☞ Channel Interleaving

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

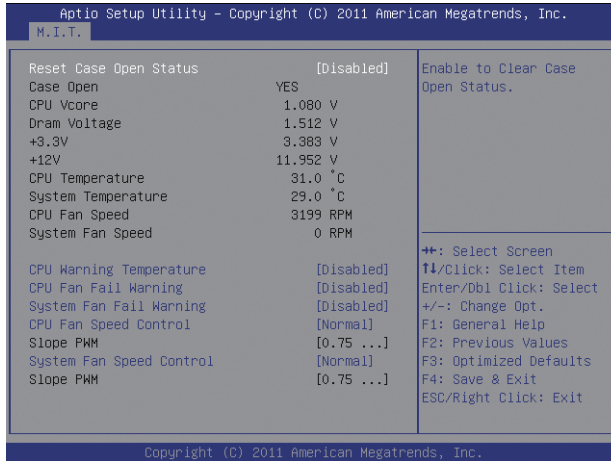
Enables or disables memory rank interleaving. Enabled allows the system to simultaneously access different ranks of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

## ▶ Channel A/B 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.

## ▶ 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 Voltage/+3.3V/+12V

Displays the current system voltages.

### ☞ CPU/System Temperature

Displays current CPU/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 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. (Default)
- ▶ Silent Allows the CPU fan to run at slow speeds.
- ▶ Manual Allows you to control the CPU fan speed under the **Slope PWM** item.
- ▶ Disabled Allows the CPU fan to run at full speeds.

### ☞ Slope PWM

Allows you to control the CPU fan speed. This item is configurable only when **CPU Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

### ☞ System Fan Speed Control

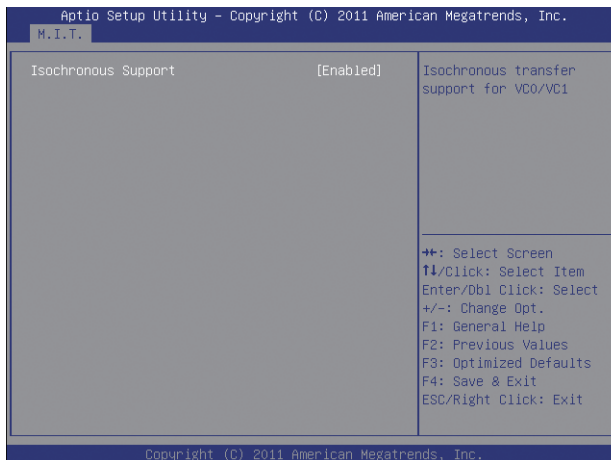
Allows you to determine whether to enable the system fan speed control function and adjust the fan speed.

- ▶▶ Normal Allows the system fan to run at different speeds according to the system temperature. (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/2nd/3rd System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

## ▶ Miscellaneous Settings

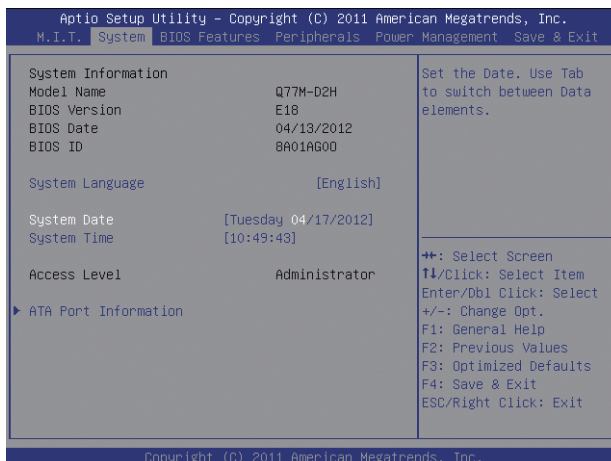


### ☞ Isochronous Support

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



## 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 <+> or <-> 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 <+> or <-> key to set the desired value.

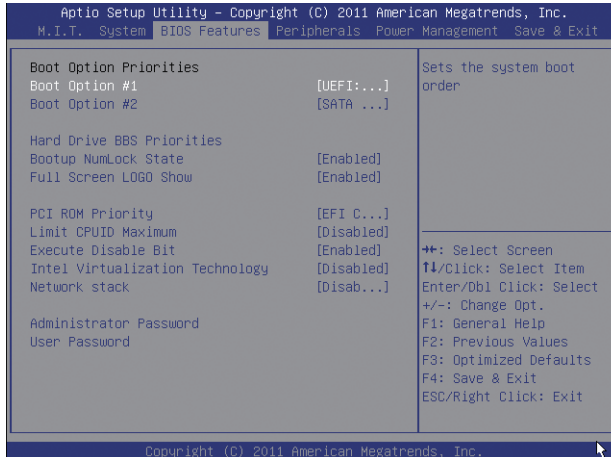
### Access Level

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)

☞ **Limit CPUID Maximum** <sup>(Note)</sup>

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** <sup>(Note)</sup>

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** <sup>(Note)</sup>

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)

☞ **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)

☞ **IPv6 PXE Boot Support**

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

☞ **IPv4 PXE Boot Support**

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

☞ **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.

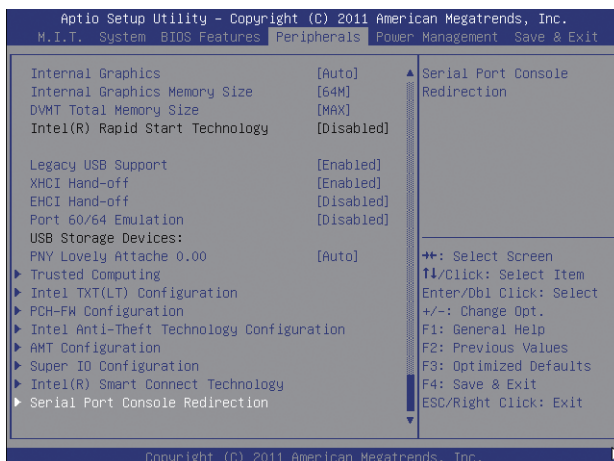
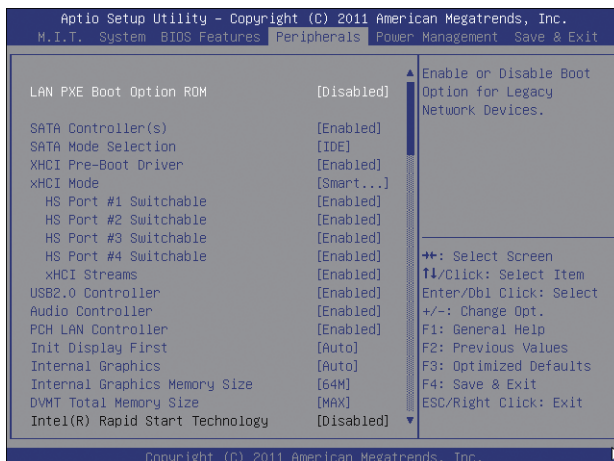
☞ **User Password**

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



### ☞ LAN PXE Boot Option ROM

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

### ☞ SATA Controller(s)

Enables or disables the integrated SATA controllers. (Default: Enabled)

### ☞ **SATA Mode Selection**

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

- ▶▶ IDE Configures the SATA controller to IDE mode. (Default)
- ▶▶ AHCI Configures the SATA controller 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.
- ▶▶ RAID Enables RAID for the SATA controller.

### ☞ **xHCI Pre-Boot Driver**

- ▶▶ Enabled The USB 3.0 ports are routed to the xHCI controller before booting to OS. (Default)
- ▶▶ Disabled The USB 3.0 ports are routed to the EHCI controller before booting to OS.

When this item is set to **Enabled**, the **xHCI Mode** below will be automatically set to **Smart Auto**; when this item is set to **Disabled**, the **xHCI Mode** below will be automatically set to **Auto**.

### ☞ **xHCI Mode**

Allows you to determine the operating mode for the xHCI controller in OS.

- ▶▶ Smart Auto This mode is available only when the BIOS supports the xHCI controller in the pre-boot environment. This mode is similar to **Auto**, but it adds the capability to route the ports to xHCI or EHCI according to setting used in previous boots (for non-G3 boot) in the pre-boot environment. This allows the use of USB 3.0 devices prior to OS boot. xHCI controller enabling and rerouting should follow the steps in **Auto**, when previous boot routs ports to EHCI. Note: This is the recommended mode when BIOS has xHCI pre-boot support. (Default)
- ▶▶ Auto BIOS routes the sharable ports to EHCI controller. Then it uses ACPI protocols to provide an option to enable the xHCI controller and reroute the sharable ports. Note: This is the recommended mode when BIOS does NOT have xHCI pre-boot support.
- ▶▶ Enabled All shared ports are eventually routed to the xHCI controller during the BIOS boot process. If BIOS does not have pre-boot support for the xHCI controller, it should initially route the sharable ports to the EHCI controller and then prior to OS boot it should route the ports to xHCI controller. Note: OS has to provide support for the xHCI controller in this mode. If the OS does not provide support, all sharable ports won't work.
- ▶▶ Disabled The USB 3.0 ports are routed to the EHCI controller and the xHCI controller is turned off. All USB 3.0 devices function as High Speed devices regardless of xHCI software support/availability. If this item is set to **Disabled**, the **HS Port #1/2/3/4 Switchable** and **xHCI Streams** items below will become unconfigurable.

### ☞ **HS Port #1 Switchable~HS Port #4 Switchable**

- ▶▶ Enabled Corresponding USB 3.0 port is routed to xHCI. The USB 3.0 device attached on this port with Super-Speed capability is visible to xHCI controller. (Default)
- ▶▶ Disabled Corresponding USB 3.0 port is routed to EHCI. The USB 3.0 device attached on this port with Super-Speed capability will function as High-Speed.

### ☞ **xHCI Streams**

Enables or disables multi-stream data transfer. Note: For Windows 7 USB 3.0 Streams support, devices may require UASP class driver updates from UASP driver vendors to be fully compatible with Intel USB 3.0 Streams Support. (Default: Enabled)

### ☞ **USB2.0 Controller**

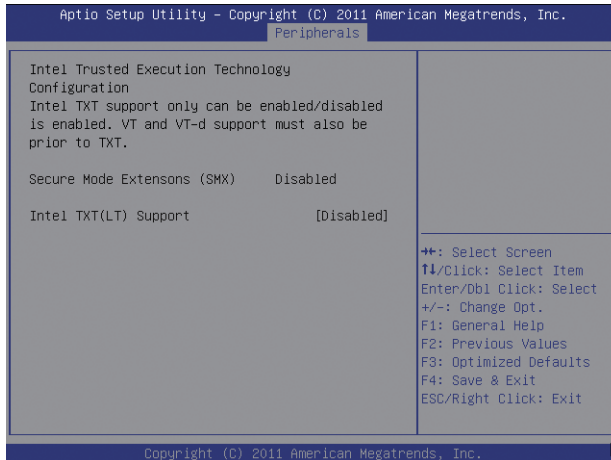
Enables or disables the integrated USB 2.0 controller. (Default: Enabled)

- ☞ **Audio Controller**  
 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**.
- ☞ **PCH LAN Controller**  
 Enables or disables the onboard 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**.
- ☞ **Init Display First**  
 Specifies the first initiation of the monitor display from the installed PCI graphics card, PCI Express graphics card or the onboard graphics.

  - ▶▶ Auto Lets BIOS automatically configure this setting. (Default)
  - ▶▶ IGFX Sets the onboard graphics as the first display.
  - ▶▶ PEG Sets the PCI Express graphics card on the PCIEX16 slot as the first display.
  - ▶▶ PCI Sets the graphics card on the PCI slot as the first display.
- ☞ **Internal Graphics**  
 Enables or disables the onboard graphics function. (Default: Auto)
- ☞ **Internal Graphics Memory Size**  
 Allows you to set the onboard graphics memory size. Options are: 32M~1024M. (Default: 64M)
- ☞ **DVMT Total Memory Size**  
 Allows you to allocate the DVMT memory size of the onboard graphics. Options are: 128M, 256M, MAX. (Default: MAX)
- ☞ **Intel(R) Rapid Start Technology**  
 Enables or disables Intel Rapid Start Technology. This item is configurable only when an SSD is installed. (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 systems 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**

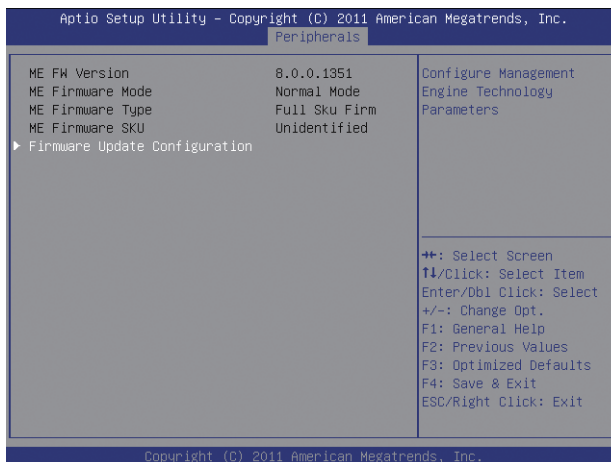
  - ☞ **TPM SUPPORT**  
 Enables or disables Trusted Platform Module (TPM). Set this item to **Enable** when a TPM device is installed. (Default: Disable)

## ▶ Intel TXT(LT) Configuration



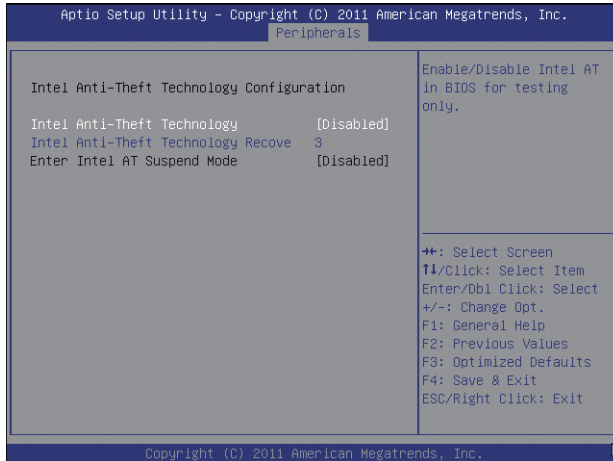
Enables or disables Intel Trusted Execution Technology (Intel TXT). Intel Trusted Execution Technology provides a hardware-based security foundation. By isolating assigned memory through this hardware-based protection, it allows the system to protect data in each virtual partition from unauthorized access from software in another partition. (Default: Disabled)

## ▶ PCH-FW Configuration



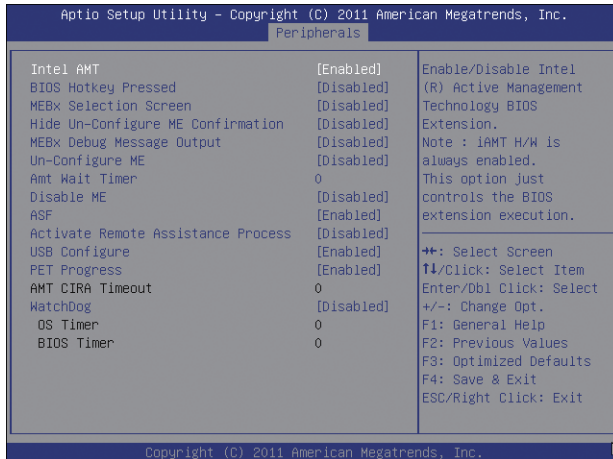
This section provides information on the firmware of the Intel Management Engine (Intel ME) and allows you to enable/disable the firmware update function.

## ▶ Intel Anti-Theft Technology Configuration



This section allows you to enable/disable Intel Anti-Theft Technology (Intel AT), a hardware-based anti-theft protection solution, and provides you with related configuration options.

## ▶ AMT Configuration



This section allows you to enable/disable Intel Active Management Technology (Intel AMT) for remote computer management on hardware level and provides you with further configuration options.

## ▶ Super IO Configuration

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

### Serial Port A/Serial Port B

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



➤ **Parallel Port**

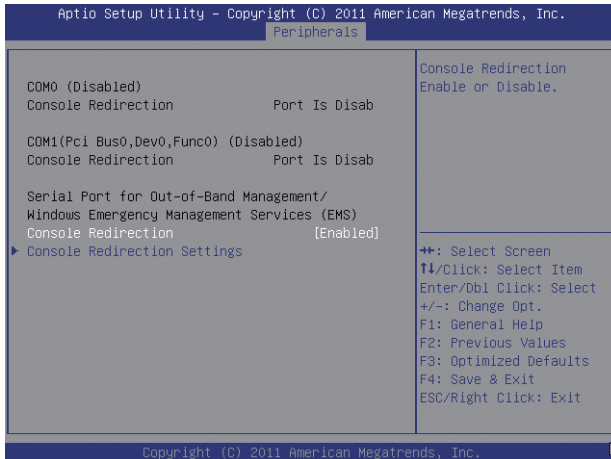
Enables or disables the onboard parallel port. (Default: Enabled)

▶ **Intel(R) Smart Connect Technology**

➤ **ISCT Configuration**

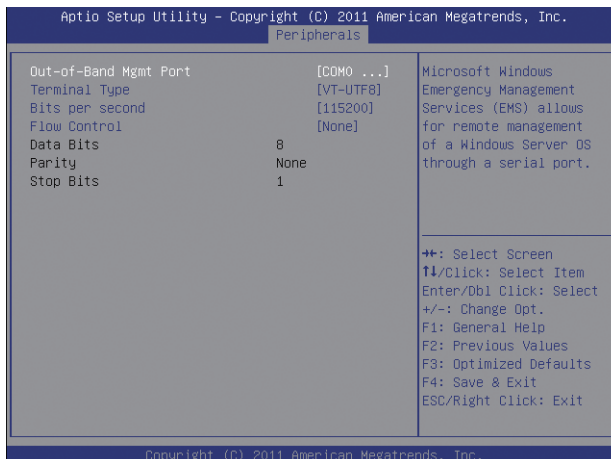
Enables or disables Intel Smart Connect Technology. (Default: Disabled)

▶ **Serial Port Console Redirection**



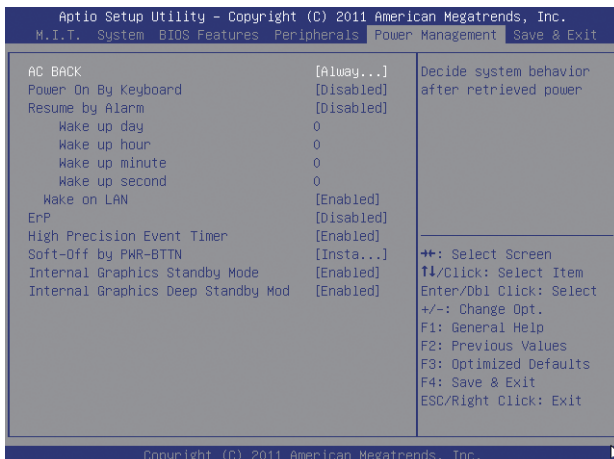
This section allows you to enable/disable serial port console redirection for remote server management through a serial port.

▶ **Console Redirection Settings**



This section provides you with further configuration options for serial port console redirection, such as selecting a serial port number, terminal type, and transfer rate, and configuring flow control.

## 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)
- ▶▶ Keyboard 98 Press POWER button on the Windows 98 keyboard to turn on the system.
- ▶▶ Any Key Press any key to turn on the system.

### ☞ Resume by Alarm

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

If enabled, set the date and time as following:

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

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

### ☞ Wake on LAN

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

### ☞ ErP

Determines whether to let the system consume less than 1W 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.

☞ **High Precision Event Timer** <sup>(Note)</sup>

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.

☞ **Internal Graphics Standby Mode**

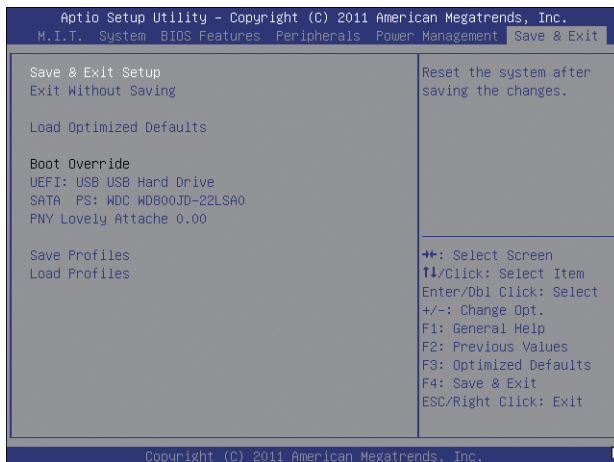
Allows you to determine whether to let the onboard graphics enter standby mode to decrease power consumption. (Default: Enabled)

☞ **Internal Graphics Deep Standby Mode**

Allows you to determine whether to let the onboard graphics enter deeper standby mode. (Default: Enabled)

(Note) Supported on Windows 7 operating system only.

## 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 default 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.

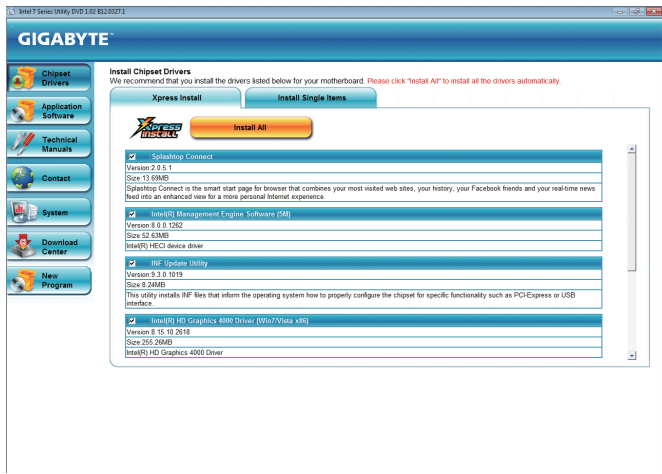
# Chapter 3 Drivers Installation



- 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

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.



## 3-2 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

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

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You may go to the GIGABYTE website, select your language in the language list on the top right corner of the website.

- **GIGABYTE Global Service System**

**GIGABYTE**  **GTS** Global Technical Service

Welcome to GIGABYTE Service system. If you are a GIGABYTE Passport member, please login with your membership E-Mail address and password. Otherwise, you can simply enter E-Mail address to login.

✉ Your Email:

Your Password:  [Forgot password](#)

English 繁體中文 Deutsch 简体中文  
Français Polski Español

To submit a technical or non-technical (Sales/Marketing) question, please link to:

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

Then select your language to enter the system.