RX45Q

Intel® Q45 LGA775 socket for Intel® Core™ 2 Quad Micro ATX Motherboard

User's Manual   Ver. 1.01

Contents

FCC Statement

THIS DEVICE SUPPORTS PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.
(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

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OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

Notice

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This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by BCM, or which have been to misuse, abuse, accident or improper installation. BCM assumes no liability under the terms of this warranty as a consequence of such events.
Because of BCM high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If any of BCM products is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details. If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU type and speed, BCM products model name, hardware & BIOS revision number, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.

2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.

3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.

4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Manual Objectives

This manual describes in detail the BCM RX45Q ATX motherboard.

We strongly recommend that you study this manual carefully before attempting to interface with RX45Q or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors concerning this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

Safety Precautions

Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!

Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

Document Amendment History

Revision	Date	Comment
1.00	6/4/2009	First Release
1.01	6/29/2009	Update BIOS Screen

Chapter 1

This chapter describes the motherboard features and the new technologies it supports.

Product Introduction

RX45Q Specifications

System

CPU	Intel® LGA775 socket for Intel® Core™2 Quad / Core™2 Duo Processors Support Intel® next generation 45nm Multi-Core CPU up to 95W TDP
FSB	1333 / 1066 / 800 MHz
BIOS	Award 32 Mb SPI BIOS
System Chipset	Intel Q45 GMCH/ICH10DO
I/O Chipset	Winbond W83627DHG-A
Memory	Four 240-pin DIMM sockets support up to 8 GB Dual Channel DDR2 800 / 667 MHz
Watchdog Timer	Reset: 1 sec.~255 min. and 1 sec. or 1 min./step
H/W Status Monitor	Monitoring temperatures, voltages, and cooling fan status. Auto throttling control when CPU overheats
Expansion Slots	1 x PCI-E 2.0 x16
	1 x PCI-E x4
	1 x PCI-E x1
	1 x PCI 2.3
DIO	16Bit (8 in / 8 out)
S3/S4	Yes
TPM	Intel Integrated TPM1.2
IAMT	
Wake up on LAN or Ring	LAN (PXE / RPL)

Display

Chipset	Intel® Graphics Media Accelerator 4500 integrated
Display Memory	Intel DVMT 4.0 supports up to 352 MB video memory
Max Resolution	2048 x 1536 bpp(@ 75Hz)
Dual Display	DVI-I + DVI-D
VGA	Yes , through ADD2 card
LVDS	Yes , through ADD2 card
HDMI	Yes , through ADD2 card
DVI	Yes , dual CH. DVI (DVI-I & DVI-D)

Ethernet

LAN1	Intel® 82567-LM PCI-E Gigabit LAN support iAMT 5.0
LAN2	Intel® 82541PI PCI Gb LAN controller

Audio	
Audio Codec	Realtek® ALC888, 5.1+2 CH. with two independent Streaming
Audio Interface	Line-out, Line-in, Mic-in
Audio Amplifier (W)	TPA3005D2 6W Stereo audio amplifier
Onboard I/O Headers	
IDE	
SATA	6 x SATA connectors
USB	4 x USB connectors (PH:2.54mm)support additional 8 USB ports
CPU Fan	1 x CPU Fan connector(4pin PWM)
Chassis Fan	1 x Chassis Fan connector (3pin,Tacho sensor)
System Fan	1 x System Fan connector (3pin,Tacho sensor)
GPIO	1 x 16bit Digital I/O pin (8in/8out)
SPDIF	1 x S/PDIF Out Header
Audio Amplifier	1 x 4-pin Audio Amp.
	1 x AT./ATX mode jumper
	1 x 24-pin ATX Power connector
	1 x 4-pin ATX 12V Power connector
Front Panel	1 x Front panel header
Back I/O Port	
RS232 COM port	1 x PS/2 Keyboard
Display	1 x DVI-I + DVI-D Double Stack
COM	2 x COM Port
LAN	2 x RJ45 port
USB	4 x USB 2.0/1.1
Audio Jack	1 x Audio Jack (3ports)
Mechanical & Environment	
Power Type	AT / ATX Mode
Operating Temp.	0~60°C (32~140°F)
Operating Humidity	0%~90% relative humidity, non-condensing
Form Factor	9.6" x 9.6" (243.84 mm x 243.84 mm)

Size (L x W)	1.40 lbs (0.64 Kg)

* Specifications are subject to change without notice.

Block Diagram

		Intel Core 2 Duo, Conroe, Conroe-L Yorkfield and Wolfdale LGA-775 Pin Socket-T		
VRD 11.1 on board				

Host Bus — Clock Gen II CK505 IDTCV193CPAG TSSOP

Dual DVI Connector — Intel Q45 GMCH — Channel A — DDR2 667/800

PCI Express X16 Slot — PCI-E — Intel Q45 GMCH — Channel B — DDR2 667/800

DMI

12 High Speed USB Ports — 480Mb/s — LCI — Intel 82567LM Gigabit LAN

6 SATA II Port — SATA — Intel ICH10DO — PCI-E — PCI Express X1 / X4 Slot

REALTEK ALC888 HD Codec — AZALIA Link — SMBus — DIO

SPI 32MB — SPI — PCI — 1 x PCI Slot

LPC — Winbond Super I/O W83627DHG-A

Intel LU8254IPI Gigabit LAN

Before you proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.

● Unplug the power cord from the wall socket before touching any component.
● Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity
● Hold components by the edges to avoid touching the ICs on them.
● Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
● Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

Onboard LED

The motherboard comes with a standby power LED that lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.

Motherboard Overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it. Refer to the chassis documentation before installing the motherboard.

⚡	Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

1.1.1   Placement Direction

When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

1.1.2   Screw Holes

Place eight (8) screws into the holes indicated by circles to secure the motherboard to the chassis.

⚠	Do not over tighten the screws! Doing so can damage the motherboard.

Place this side towards the rear of the chassis

Motherboard Layout

1.1.3 Layout Content List

Slots			
Label	**Function**	**Note**	**Page**
DIMM_A1	240-pin DIMM slot 1		N/A
DIMM_A2	240-pin DIMM slot 2		N/A
DIMM_B1	240-pin DIMM slot 3		N/A
DIMM_B2	240-pin DIMM slot 4		N/A
PCIEX1	PCI express x1 slot		N/A
PCIEX4	PCI express x4 slot		N/A
PCIEX16	PCI express x16 slot		N/A
PCI1	PCI slot		N/A

Jumpers			
Label	**Function**	**Note**	**Page**
CLRTC1	Clear CMOS	3 x 1 header, pitch 2.54mm	32
CHASSIS1	Chassis Intrusion Connector	4 x 1 header, pitch 2.54mm	33
COM1 PWR,	COM1 Power Setting	3 x 2 header, pitch 2.00mm	33
COM2 PWR	COM2 Power Setting		
	RI/+12V/+5V Select		
PSON1	AT/ATX Power Mode Select	3 x 1 header, pitch 2.54mm	34

Rear Panel Connector			
Label	**Function**	**Note**	**Page**
KBMS1	PS/2 keyboard and mouse	6-pin Mini-Din	35,36
DUALCOM	Serial Port Connector	D-sub 9-pin, male	35,36
DUAL DVI	DVI Connector	DVI-I connector with blue color	35,36
LAN1_USB12	RJ-45 Ethernet Connector x 1	Intel 82567LM GbLAN (AMT)	35,36
	USB Connector x 2		
LAN2_USB34	RJ-45 Ethernet Connector x 1	Intel 82541PI GbLAN	35,36
	USB Connector x 2		
AUDIO1	Line-in Port, Line-out Port,	5.1 Channel Audio I/O (3 jacks)	35,36
	Microphone Port,		

Internal Connector

Label	Function	Note	Page
AAFP1	Front Panel Audio Connector	5 x 2 header, pitch 2.54mm	37
ATX12V1	ATX Power Connector	2 x 2 header	38
CHA_FAN	Chassis Fan Connector	3 x 1 wafer, pitch 2.54mm	39
CPU_FAN1	CPU Fan Connector	4 x 1 wafer, pitch 2.54mm	39
EATXPWR1	ATX Power Connector	12 x 2 header	38
F_PANEL1	System Panel Connector	5 x 2 header, pitch 2.54mm	40
JAMP1	Amplifier Connector	4 x 1 header, pitch 2.54mm	41
JDIO1	Digital I/O Connector	10 x 2 header, pitch 2.54mm	41
SATA1~6	Serial ATA Connectors 1~6	7-pin header	42
SPDIF_O1	Digital Audio Connector	4 x 1 header, pitch 2.54mm	43
SYS_FAN	System Fan Connector	3 x 1 wafer, pitch 2.54mm	39
USB5&6, USB7&8, USB9&10, USB11&12	USB 2.0 Connector	5 x 2 header, pitch 2.54mm	44

Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA775 socket designed for the Intel® LGA775 socket for Intel® Core™2 Quad / Core™2 Duo CPU processors.

- ● Make sure the AC power is off before you install the CPU.
- ● If installing a CPU, connect the CPU fan cable to the **CPU_FAN1** connector to ensure system stability.

- ● Your boxed Intel® LGA775 socket for Intel® Core™2 Quad / Core™2 Duo CPU processors package should come with installation instructions for the CPU, heatsink, and the retention mechanism. If the instructions in this section do not match the CPU documentation, follow the latter.
- ● Upon purchase of the motherboard, make sure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. Your place of purchase or local distributor will shoulder the cost of repair only if the damage is shipment/transit-related.
- ● Keep the cap after installing the motherboard. Your place of purchase or local distributor will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA775 socket.
- ● The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/ incorrect removal of the PnP cap.

1.1.3 Installing the CPU

1. Locate the CPU socket on the motherboard.
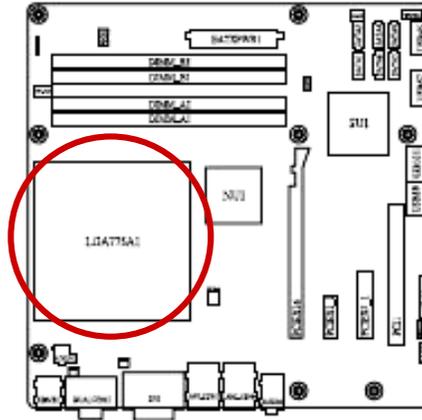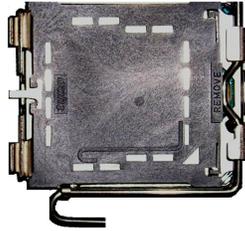
Before installing the CPU, make sure that the socket box is facing towards you and the load lever is on your left.

2. Press the load lever with your thumb (A), then move it to the left (B) until it is released from the retention tab.
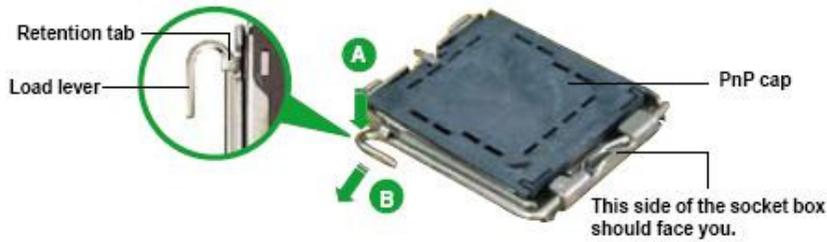
To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

3. Lift the load lever in the direction of the arrow to a 135º angle.

4. Lift the load plate with your thumb and forefinger to a
    100º angle (A), then push the PnP cap from the load
    plate window to remove (B).
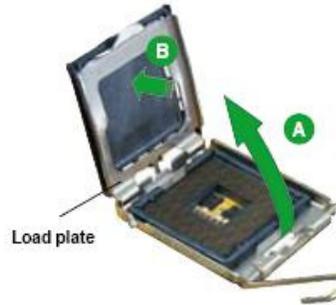
5. Position the CPU over the socket, making sure that
    the gold triangle is on the bottom-left corner of the
    socket then fit the socket alignment key into the CPU
    notch.
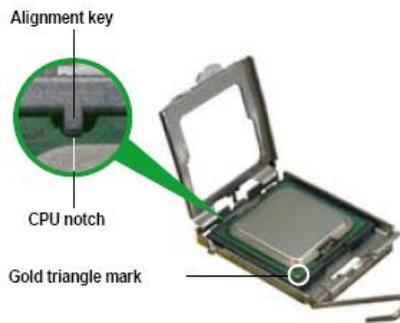
6. Close the load plate (A), then push the load lever (B)
    until it snaps into the retention tab.
7. If installing a CPU, connect the chassis fan cable to
    the **CPU_FAN1** connector to ensure system stability.

The CPU fits in only one correct orientation. DO NOT force the CPU into the socket
to prevent bending the connectors on the socket and damaging the CPU!

The motherboard supports Intel® LGA775 processors with the Intel® Enhanced
Memory 64 Technology (EM64T), Enhanced Intel SpeedStep® Technology (EIST),
and Hyper-Threading Technology.

After installation, make sure to plug-in the ATX power cable to the motherboard.

1.1.4   Installing the CPU Heatsink and Fan

The Intel® LGA775 socket for Intel® Core™2 Quad / Core™2 Duo CPU processors require a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

> ● Install the motherboard to the chassis before you install the CPU fan and heatsink assembly.
> ● When you buy a boxed Intel® processor, the package includes the CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use only Intel®‑certified multi‑directional heatsink and fan.

> If you purchased a separate CPU heatsink and fan assembly, make sure that you have properly applied Thermal Interface Material to the CPU heatsink or CPU before you install the heatsink and fan assembly.

1.   Place the heatsink on top of the installed CPU, making sure that the four fasteners match the holes on the motherboard.

> Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector.

Motherboard hole

Fastener

Narrow end of the groove
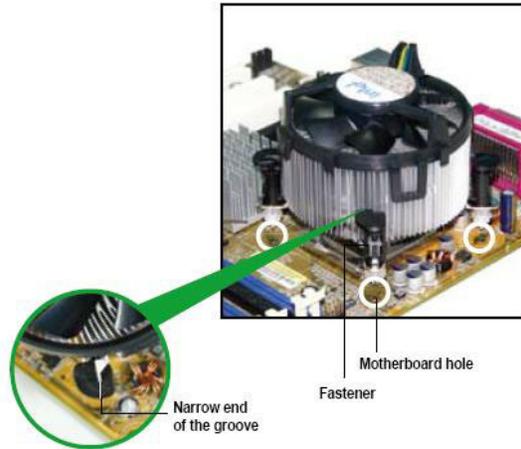
> Make sure each fastener is oriented as shown, with the narrow groove directed outward.

2. Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.
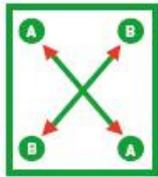
3. Connect the CPU fan cable to the connector on the motherboard labelled **CPU_FAN1.**
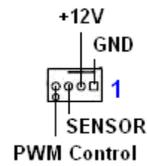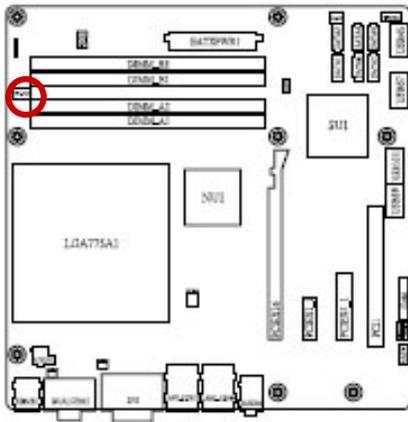
+12V
GND
1
SENSOR
PWM Control

- Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components, and hardware monitoring errors can occur if you fail to plug this connector.
- These are not jumpers! DO NOT place jumper caps on the fan connectors.

1.1.5   Uninstalling the CPU Heatsink and Fan

1. Disconnect the CPU fan cable from the connector on the motherboard.
2. Rotate each fastener counter-clockwise.

3. Pull up two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the motherboard
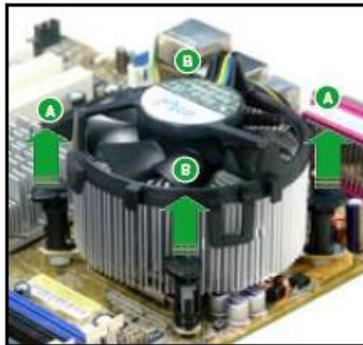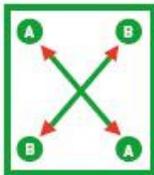
4. Carefully remove the heatsink and fan assembly from the motherboard.

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5. Rotate each fastener clockwise to
    ensure correct orientation when
    reinstalling.
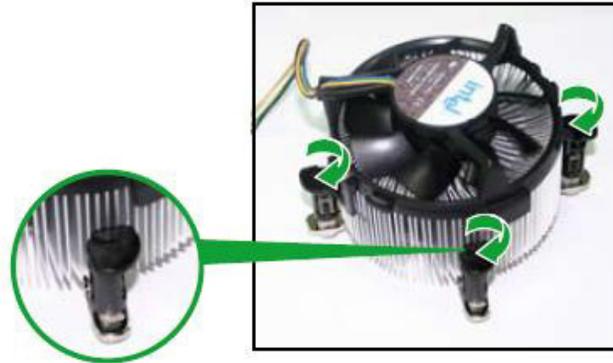
The narrow end of the groove should
point outward after resetting. (The
photo shows the groove shaded for
emphasis.)

Narrow end of the groove

Refer to the documentation in the boxed or stand-alone CPU fan package for
detailed information on CPU fan installation.

System Memory

1.1.6   DIMM Sockets Location

The motherboard comes with four 240-pin Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets.

A DDR2 module has the same physical dimensions as a DDR DIMM but has a 240-pin footprint compared to the 184-pin DDR DIMM. DDR2 DIMMs are notched differently to prevent installation on a DDR DIMM socket. The following figure illustrates the location of the sockets:
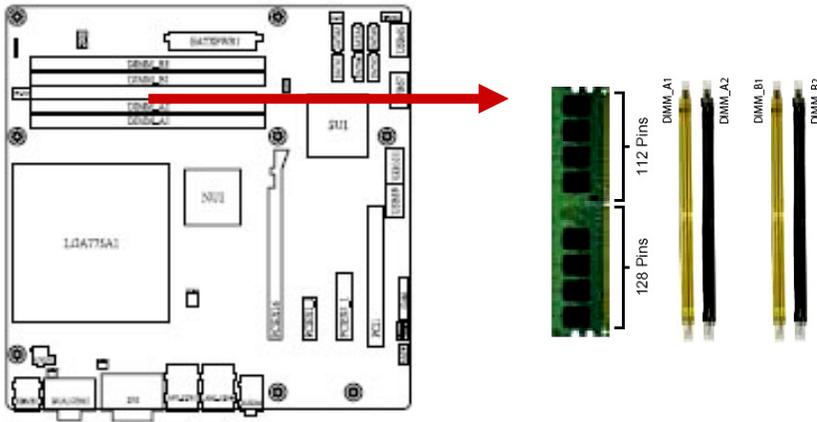
1.1.7   Memory Configurations

You can install 128MB, 256MB, 512MB, 1GB and 2GB DDR2 SDRAM DIMMs into the DIMM sockets using the memory configurations in this section.

- Installing DDR2 DIMM other than the recommended configurations may cause memory sizing error or system boot failure. Use any of the recommended configurations.
- For dual-channel configuration, the total size of memory module(s) installed per channel must be the same (DIMM1 = DIMM2).
- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor. Due to chipset resource allocation, the system may detect less than 1 GB system memory when you installed one 1 GB DDR2 memory modules.

● Recommended memory configuration

Channel	Socket
Channel A	DIMM_A1 and DIMM_A2
Channel B	DIMM_B1 and DIMM_B2

1.1.8 Installing a DDR2 DIMM

Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Unlock a DIMM socket by pressing the retaining clips outward
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM.
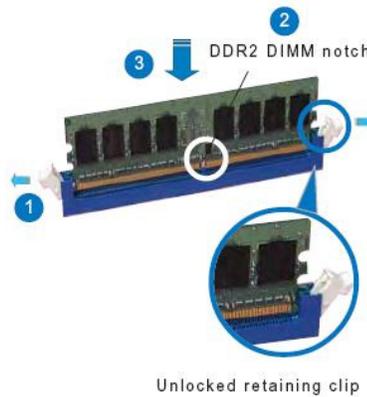
● A DDR2 DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.
● The DDR2 DIMM sockets do not support DDR DIMMs. DO NOT install DDR DIMMs to the DDR2 DIMM socket.

1.1.9   Removing a DDR2 DIMM

1.   Simultaneously press the retaining clips outward to unlock the DIMM.
2.   Remove the DIMM from the socket.

DDR2 DIMM notch
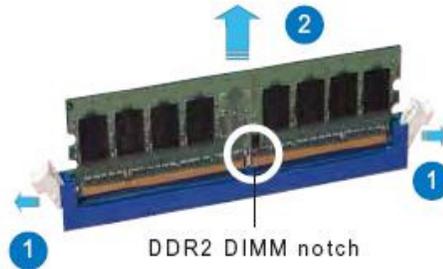
⚠️   Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

Expansion Slots

In the future, you may need to install expansion cards. The following sub‑sections describe the slots and the expansion cards that they support.

⚡   Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

1.1.10   Installing an Expansion Card

1.   Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2.   Remove the system unit cover (if your motherboard is already installed in a chassis).
3.   Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4.   Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5.   Secure the card to the chassis with the screw you removed earlier.
6.   Replace the system cover.

1.1.11   Configuring an Expansion Card

After installing the expansion card, configure it by adjusting the software settings.
1.   Turn on the system and change the necessary BIOS settings if any.
2.   Assign an IRQ to the card if needed. Refer to the tables on the next page.
3.   Install the software drivers for the expansion card.

1.1.12   Standard Interrupt Assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	-	Redirect to IRQ#9
3	11	Communications Port (COM2)
4	12	Communications Port (COM1)*
5	13	LAN1 - 82567LM (iAMT)
6	14	Reserved
7	15	Printer Port (LPT)*
8	3	System CMOS/Rear Time
9	4	Multimedia device (Audio)
10	5	IRQ holder for PCI streeing*
11	6	IRQ holder for PCI streeing*
12	7	PS/2 Compatible Mouse Port*
13	8	Numeric Data Processor
14	9	Primary IDE Channel - Native mode IDE
15	10	Secondary IDE Channel

* There IRQs are usually available for ISA or PCI device.

1.1.13   PCI Slot

This motherboard has one PCI slot. The PCI slot support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. The figure shows a LAN card installed on a PCI slot.
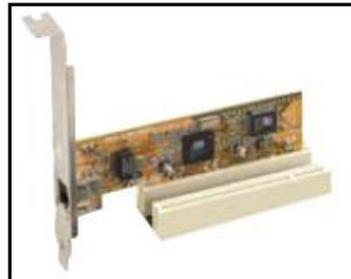
1.1.14 PCI Express X16 Slot

This motherboard supports one PCI Express x16 graphic card that complies with the PCI Express specifications. The figure shows a graphics card installed on the PCI Express x16 slot.

⚠ Onboard DVI (DVI-I & DVI-D) will be disabled when PCI-Ex16 card installed.

1.1.15 PCI Express X4 Slot

This motherboard has one PCI Express x4 slot.

1.1.16 PCI Express X1 Slot

This motherboard has one PCI Express x1 slot.

Jumpers

1.1.17 Clear CMOS (CLRTC1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC
RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords. To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

> Except when clearing the CMOS, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!
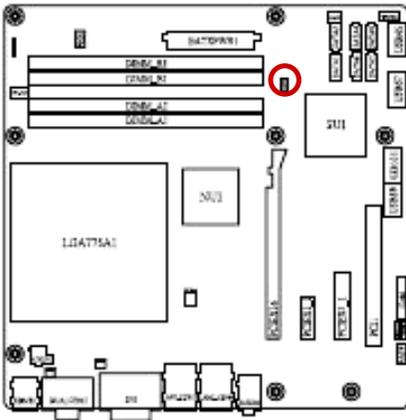
Normal (Default)

Clear RTC

1.1.18   Chassis Intrusion Connector (CHSSIS1)

GND

Chassis Signal

1   +5VSB
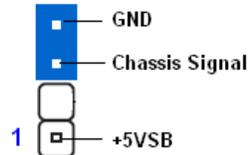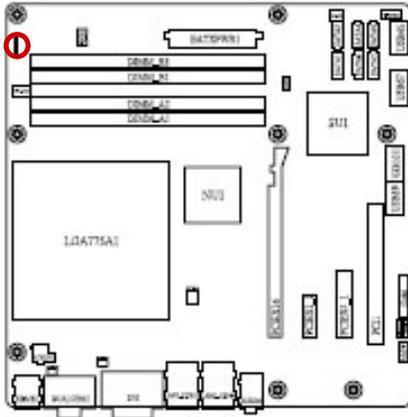
1.1.19   COM1, COM2 Power Setting & RI/+12V/+5V Select (COM1 PWR, COM2 PWR)
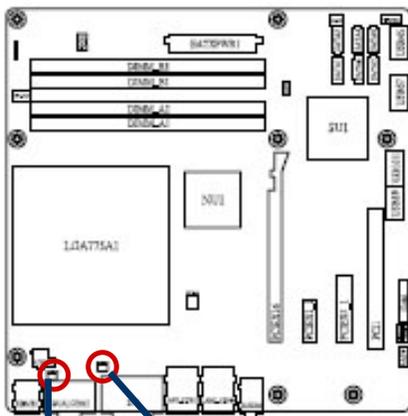
COM2 PWR   COM1 PWR

RI (Default)

1   2

5   6

+12V

1   2

5   6

+5V

1   2

5   6
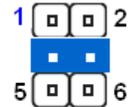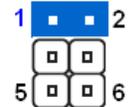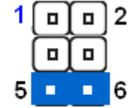
1.1.20   AT/ATX Power Mode Select (PSON1)

ATX Mode (Default)

1

AT Mode

1
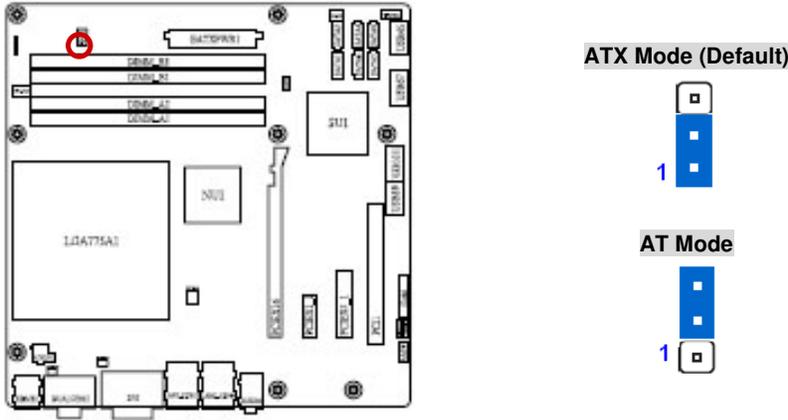
⚠️ This function has need BIOS setting at the same time. Please refer to Chapter 2 BIOS setup / Power Management Setup / Power Type.

Connectors

1.1.21   Rear Panel Connectors
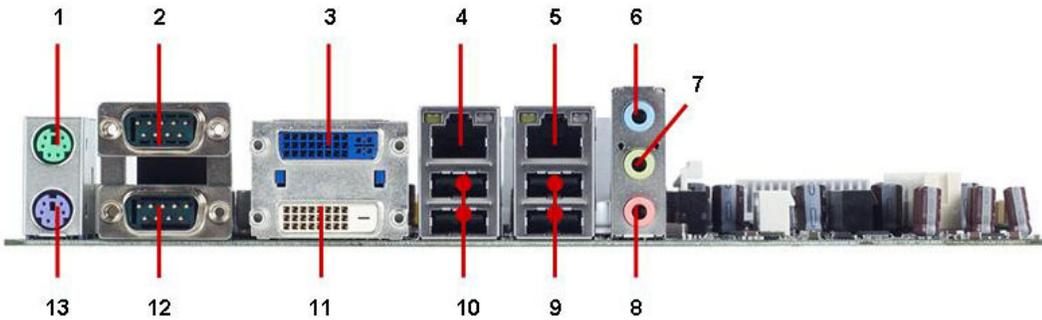
No	Label	Function	Description
1	KBMS1	PS/2 mouse connector	The standard PS/2 mouse DIN connector is for a PS/2 mouse.
2	DUAL COM	COM2 connector	D-Sub 9-pin, male
3	DUAL DVI	DVI-I connector	DVI-I (Blue) output, or transfer to VGA output by DVI-VGA adapter.
4,5	LAN1_USB12, LAN2_USB34	LAN (RJ-45) connector	This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the
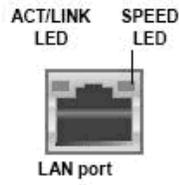
table below for the LAN port LED indications. The optional 10/100 Mbps LAN controller allows 10/100 Mbps connection to a Local Area Network (LAN) through a network hub.

ACT / LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10Mbps connection
Orange	Linked	ORANGE	100Mbps connection
Blinking	Data activity	GREEN	1Gbps connection

6	AUDIO1	Line-In port (Light Blue).	This port connects a tape, CD, DVD player, or other audio sources.
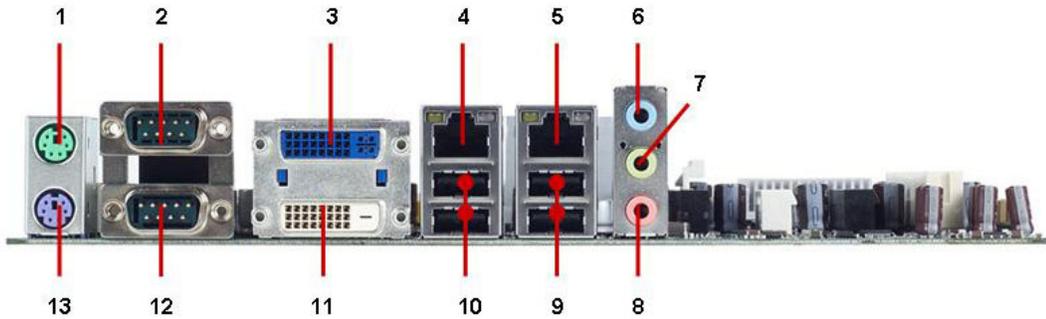
No	Label	Function	Description
7	AUDIO1	Line-Out port (Lime)	This port connects a headphone or a speaker. In 4-channel, 6-channel, and 8-channel configuration, the function of this port becomes Front Speaker Out.
8	AUDIO1	Microphone port (Pink)	This port connects a microphone.
9,10	LAN1_USB12, LAN2_USB34	USB 2.0 connector	These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
11	DUAL DVI	DVI connector	DVI-D display output
12	DUAL COM	COM1 connector	D-Sub 9-pin, male
13	KBMS1	PS/2 KB connector	This port is for a PS/2 keyboard

1.1.22 Front Panel Audio Connector (AAFP1)

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC '97 (optional) audio standard. Connect one end of the front panel audio I/O module cable to this connector.

MIC2_L AGND

MIC2_R 1 FP_PRES#
LIN2_R SRTN1
SENSE B

LIN2_L SRTN2
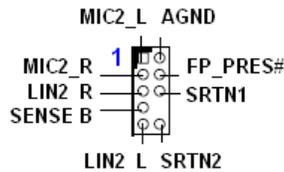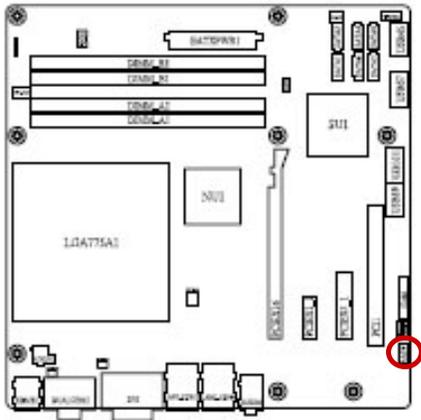
For motherboards with the optional HD Audio feature, we recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high‑definition audio capability.

1.1.23 ATX Power Connector (ATX12V1, EATXPWR1)

These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

ATX12V1

1 3
GND — CPU_+12V
GND — CPU_+12V
2 4

EATXPWR1

+5V +5V -5V GND GND GND PS_ON GND -12V +3V

+12V +5VSB Power OK GND +5V GND +5V GND +3V +3V 1
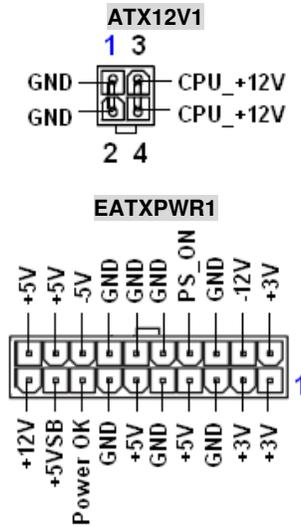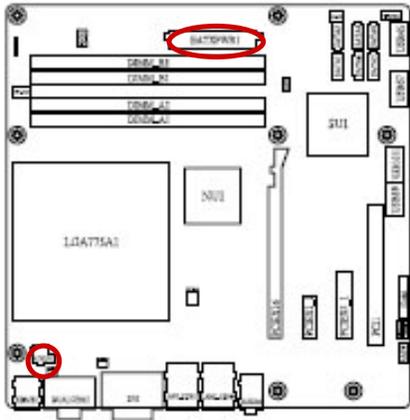
Important notes on the Motherboard Power Requirements

- Make sure that your ATX 12V power supply can provide 8A on the +12V lead and at least 1A on the +5-volt standby lead (+5VSB). The minimum recommended wattage is 230W, or 300W for a fully configured system. The system can become unstable and might experience difficulty powering up if the power supply is inadequate.
- You must install a PSU with a higher power rating if you intend to install additional devices.

1.1.24 Chassis Fan / System Fan Connector (CHA_FAN, SYS_FAN)
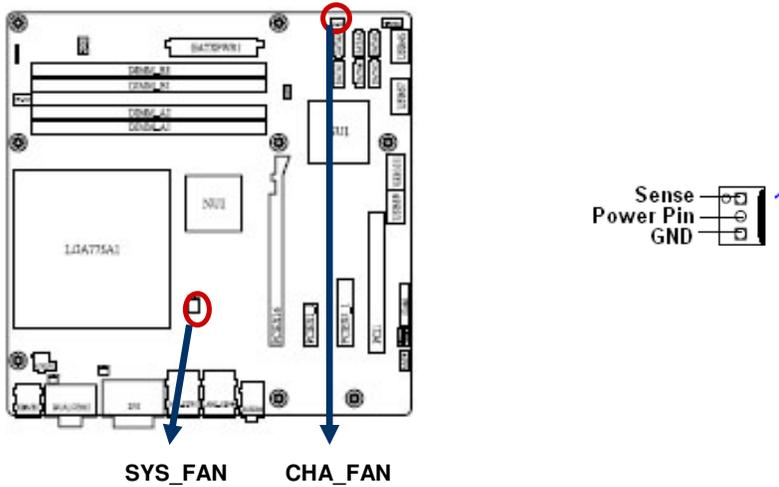
1.1.25 CPU Fan Connector (CPU_FAN1)
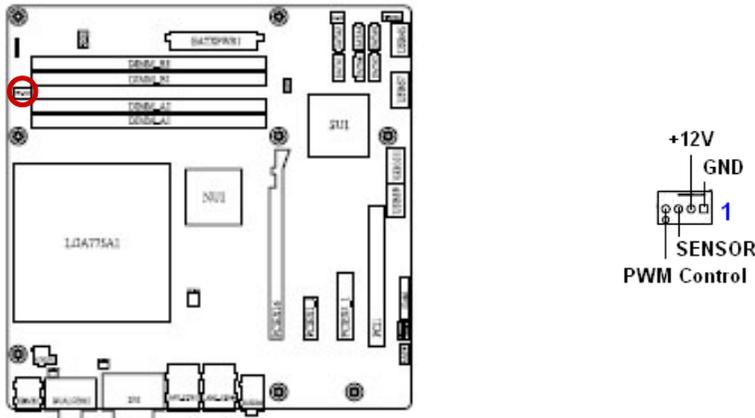
- Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components, and hardware monitoring errors can occur if you fail to plug this connector.
- These are not jumpers! DO NOT place jumper caps on the fan connectors.

1.1.26 System Panel Connector (F_PANEL1)

This connector supports several chassis-mounted functions.
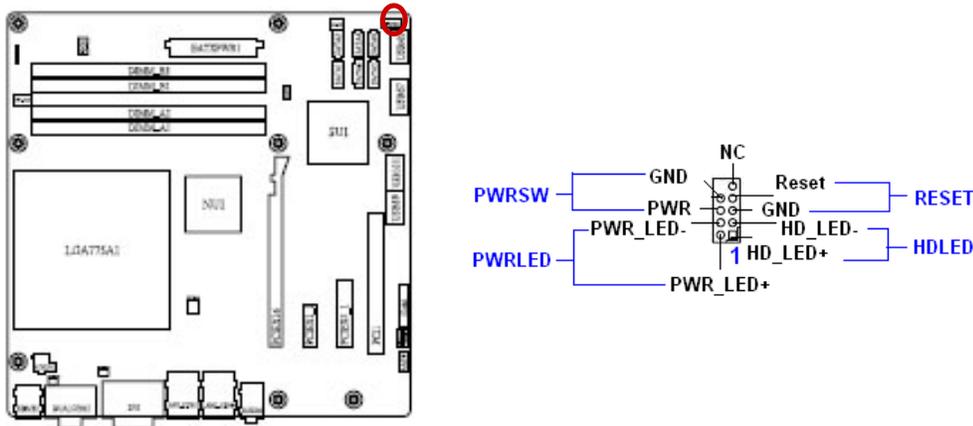
- **System Power LED (2-pin PWRLED)**

  This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **ATX Power Button/Soft-off Button (2-pin PWRSW)**

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

- **Hard Disk Drive Activity LED (2-pin HDLED)**

  This 2-pin connector is for the SATA HDD Activity LED. Connect the SATA HDD Activity LED cable to this connector. The SATA LED lights up or flashes when data is read from or written to the HDD.

- **Reset Button (2-pin RESET)**

  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

1.1.27 Amplifier Connector (JAMP1)

AMP_R+
AMP_R-
AMP_L+
1 AMP_L-
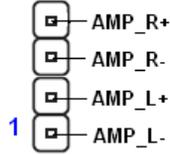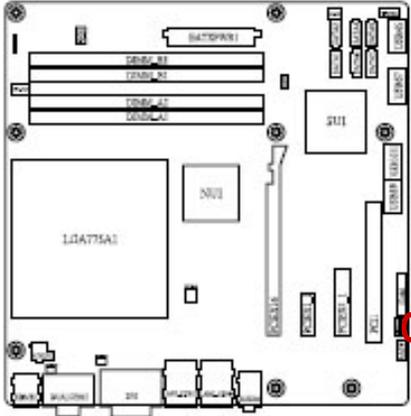
1.1.28 Digital I/O Connector (JDIO1)

+5V		GND
SMBDATA		SMBCLK
DIO_GP17		DIO_GP27
DIO_GP16		DIO_GP26
DIO_GP15		DIO_GP25
DIO_GP14		DIO_GP24
DIO_GP13		DIO_GP23
DIO_GP12		DIO_GP22
DIO_GP11		DIO_GP21
DIO_GP10		DIO_GP20

1
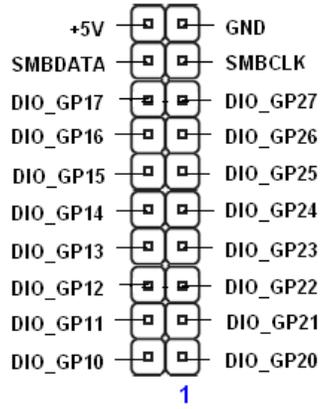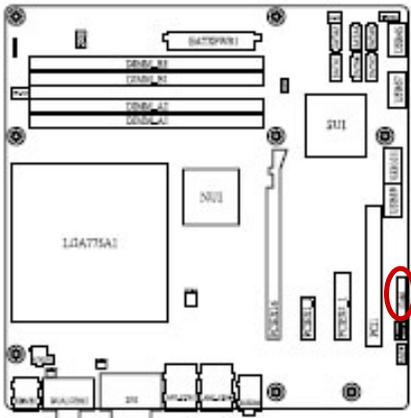
1.1.29 Serial ATA Connector (SATA1~6)

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.

SATA2

SATA_TXN2
GND | SATA_TXP2
GND
1
GND | SATA_RXN2
SATA_RXP2

SATA1

SATA_TXN1
GND | SATA_TXP1
GND
1
GND | SATA_RXN1
SATA_RXP1

SATA4

SATA_TXN4
GND | SATA_TXP4
GND
1
GND | SATA_RXN4
SATA_RXP4

SATA3

SATA_TXN3
GND | SATA_TXP3
GND
1
GND | SATA_RXN3
SATA_RXP3

SATA2, 4, 6

SATA1, 3, 5

SATA6

SATA_TXN6
GND | SATA_TXP6
GND
1
GND | SATA_RXN6
SATA_RXP6
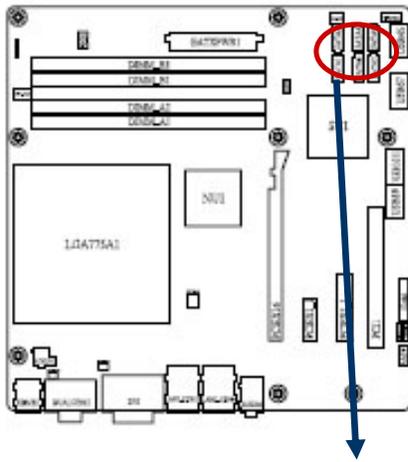
SATA5
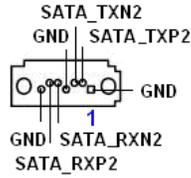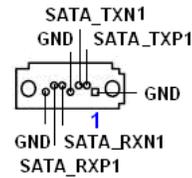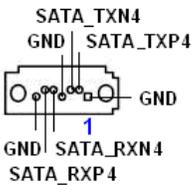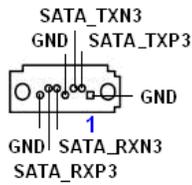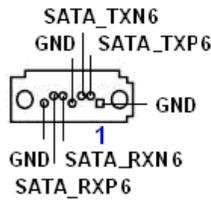
SATA_TXN5
GND | SATA_TXP5
GND
1
GND | SATA_RXN5
SATA_RXP5
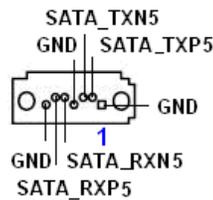
SATA connectors on this motherboard have designed for general SATA cable (180°,7 pin), we DO NOT suggest you use right-angle SATA cables and it might be interfered
with others SATA connectors or internal USB connectors

right angle side
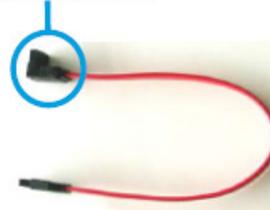
1.1.30   Digital Audio Connector (SPDIF_O1)

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s). Connect S/PDIF module cable to this connector, then install the module to a slot opening at the back of the system chassis.
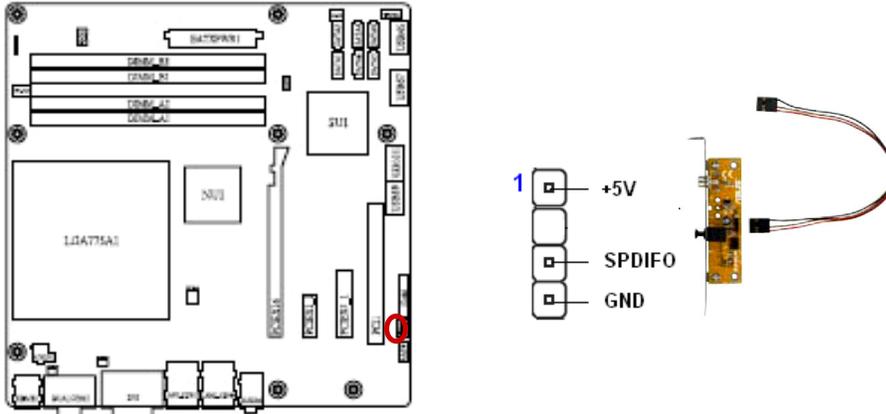
	The S/PDIF module is application demonstration example only.

1.1.31   USB 2.0 Connector (USB5&6, USB7&8, USB9&10, USB11&12)

These connectors are for USB 2.0 ports. Connect the USB/GAME module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.
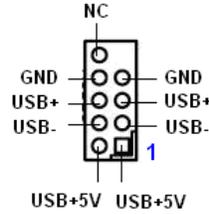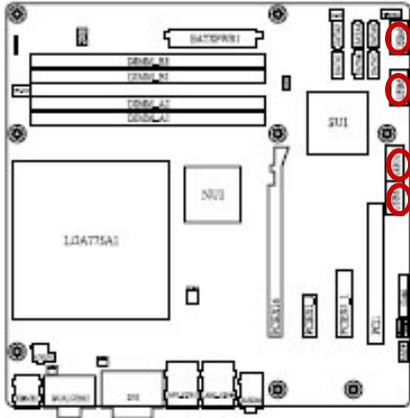
Never connect a **1394 cable** to the USB connectors. Doing so will damage the motherboard!

The USB module is purchased separately.

Chapter 2

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use. You may need to run the Setup program when:

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

BIOS Setup

BIOS Setup Program

This motherboard supports a programmable firmware chip that you can update using the provided utility. Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup." This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware hub.

The firmware hub on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On-Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines. The system also provides Pop up the menu function (F11 key), enables user to be possible to choose the starting installment in the POST process.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** from the BIOS menu screen.
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the system builder's website to download the latest BIOS file for this motherboard

2.1.1　Legend Box

The keys in the legend bar allow you to navigate through the various setup menus

Key(s)	Function Description
↑ ↓ → ←	Move
Enter	Select
+ / - / PU / PD	Value
ESC	Exit
F1	General Help
F2	Item Help
F5	Previous Value
F7	Optimized Defaults
F9	Menu in BIOS
F10	Save

2.1.2   List Box

This box appears only in the opening screen. The box displays an initial list of configurable items in the menu you selected.

2.1.3   Sub-menu

Note that a right pointer symbol (▶) appears to the left of certain fields. This pointer indicates that you can display a sub-menu from this field. A sub-menu contains additional options for a field parameter. To display a sub-menu, move the highlight to the field and press <Enter>. The sub‑menu appears. Use the legend keys to enter values and move from field to field within a sub-menu as you would within a menu. Use the <Esc> key to return to the main menu.

Take some time to familiarize yourself with the legend keys and their corresponding functions. Practice navigating through the various menus and submenus. If you accidentally make unwanted changes to any of the fields, press <F6> to load the fail-safe default values. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right of each menu. This window displays the help text for the currently highlighted field.

BIOS Menu Screen

When you enter the BIOS, the following screen appears. The BIOS menu screen displays the items that allow you to make changes to the system configuration. To access the menu items, press the up/down/right/left arrow key on the keyboard until the desired item is highlighted, then press [Enter] to open the specific menu.

```
         Phoenix - AwardBIOS CMOS Setup Utility

   ▶  Standard CMOS Features       ▶  PC Health Status
   ▶  Advanced BIOS Features       ▶  Frequency/Voltage Control
   ▶  Advanced Chipset Features        Load Setup Defaults
   ▶  Integrated Peripherals           Set Password
   ▶  Security Chip Configuration       Save & Exit Setup
   ▶  Power Management Setup            Exit Without Saving
   ▶  PnP/PCI Configurations


    Esc: Quit                   ↑ ↓ → ← : Select Item
    F10: Save & Exit Setup

              Time, Date, Hard Disk Type...
```

2.2.1 Standard CMOS Features

The Standard CMOS Features screen gives you an overview of the basic system

```
          Phoenix - AwardBIOS CMOS Setup Utility
                    Standard CMOS Features

    Date (mm:dd:yy)      Thu, Feb 21 2008      │    Item Help
    Time (hh:mm:ss)      13 : 51: 24           │
                                               │  Menu Level ▶
  ▶ IDE Channel 0 Master   [    None]          │
  ▶ IDE Channel 0 Slaver   [    None]          │  Change the internal
  ▶ IDE Channel 1 Master   [    None]          │  clock.
  ▶ IDE Channel 1 Slaver   [    None]          │
  ▶ IDE Channel 2 Master   [    None]          │
  ▶ IDE Channel 3 Master   [    None]          │
  ▶ IDE Channel 4 Master   [    None]          │
  ▶ IDE Channel 4 Slaver   [    None]          │

    Driver A              [None]
    Driver B              [None]

    Video                 [EGA/VGA]
    Halt On               [All errors]
    Base Memory              639K
    Extended Memory       505856K
    Total Memory          506880K

  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
        F5: Previous Values  F6: Fail-Safe Defaults  F7: Optimized Defaults
```
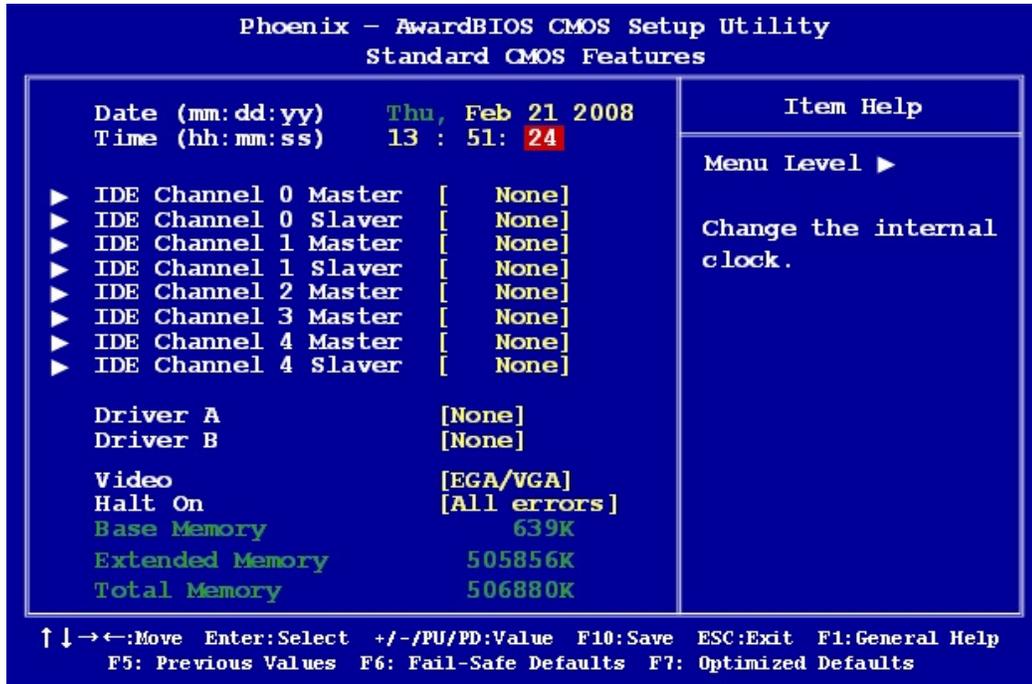
2.2.1.1 Date [Day, xx/xx/xxxx]

The date format is <week>, <month>, <day>, <year>.

2.2.1.2 Time [xx:xx:xx]

The time format is <hour> <minute> <second>, based on the 24-hour clock.

2.2.1.3 IDE Channel 0/1/2/3/4 Master / Slave

● **IDE HDD Auto-Detection**

[Press Enter] to select this option for automatic device detection.

● **IDE Device Setup**

[Auto]: Automatically detects IDE devices during POST
[None]: Select this when no IDE device is used. The system will skip the auto-detection setup to make system start up faster.
[Manual]: User can manually input the correct settings.
✓ Access Mode: The options are CHS/LBA/Large/Auto
✓ Capacity: Capacity of currently installed hard disk
✓ Cylinder: Number of cylinders
✓ Head: Number of heads
✓ Precomp: Write precomp
✓ Landing Zone: Landing zone
✓ Sector: Number of sectors

Driver A/B

Specifies the capacity and physic al size of diskette drive A/B. Do not select [None] if you are using a floppy disk drive. Configuration options: [None] [360K, 5.25 in.] [1.2M, 5.25 in.] [720K, 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

2.2.1.4 Video

This category detects the type of adapter used for the primary monitor that must match your video display card and monitor.
● EGA / VGA: Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA, or PGA monitor adapters.
● CGA 40: Color Graphics Adapter, power up in 40 column mode.
● CGA 80: Color Graphics Adapter, power up in 80 column mode.
● MONO: Monochrome adapter, includes high resolution monochrome adapters.

2.2.1.5 Halt On

Set the system to halt on errors according to the system functions specified in each option. Configuration options: [All Errors] [No Errors] [All, But Keyboard].

2.2.1.6 Memory

This category displays base memory, extended memory, and total memory detected during POST (Power On Self Test).

2.2.2 Advanced BIOS Features

The "Advanced BIOS Features" screen appears when choosing the "Advanced BIOS Features" item from the "Initial Setup Screen" menu. It allows the user to configure according to particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen. A quick booting function is provided for your convenience. Simply enable the Quick Booting item to save yourself valuable time.

```
            Phoenix - AwardBIOS CMOS Setup Utility
                    Advanced BIOS Features

  ► CPU Feature                [Press Enter]        Item Help
  ► Hard Disk Boot Priority    [Press Enter]
    Virus Warning              [Disabled]          Menu Level ►
    Quick Power On Self Test   [Enabled]
    First Boot Device          [Hard Disk]
    Second Boot Device         [CDROM]
    Third Boot Device          [LS120]
    Boot Other Device          [Enabled]
    Swap Floppy Drive          [Disabled]
    Boot Up Floppy Seek        [Enabled]
    Boot Up NumLock Status     [On]
    Gate A20 Option            [Fast]
    Typematic Rate Setting     [Disabled]
  x Typematic Rate (Chars/Sec)  6
  x Typematic Delay (Msec)       250
    Security Option            [Setup]
    APIC Mode                  [Enabled]
    MPS version Control For OS [1.4]
    OS Select For DRAM > 64MB  [Non-OS2]
    Console Redirection         Disabled
  x Baud Rate                    19200
    Agent after boot            Enabled

  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
      F5: Previous Values  F6: Fail-Safe Defaults  F7: Optimized Defaults
```

2.2.2.1 CPU Features

●   PPM Mode
Configuration options: [Native Mode], [SMM Mode]
Native Mode - For Fully support ACPI OS (WinXP, VISTA)
SMM Mode - For Legacy OS (Win2K, Win9x)
●   Limit CPUID MaxVal
Sets Limit CPUID MaxVa1 to 3. This should be disabled for WinXP.
The options: Enabled, Disabled
●   C1E Function
CPU C1E function select.
The options: Auto, Disabled
●   Execute Disable Bit
When disabled, forces the XD feature flag to always return 0
●   SWMRR
The options: Enabled, Disabled
●   Core Multi-Processing
The options: Enabled, Disabled

These items might be appeared or hidden by different type of CPU installed.

2.2.2.2   Hard Disk Boot Priority

Set hard disk boot device priority.


```
        Phoenix - AwardBIOS CMOS Setup Utility
                Hard Disk Boot priority

   1. Bootable Add-in Cards              │    Item Help

                                         │  Menu Level ▶

                                         │  Use <↑> or <↓>
                                         │  to select a
```
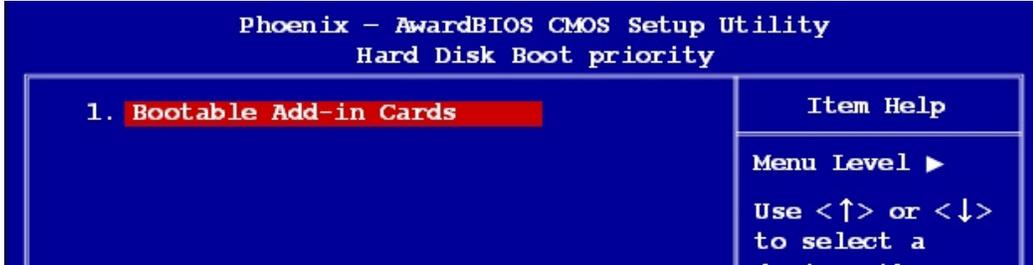
2.2.2.3   Virus Warning

Enables or disables the virus warning.

Item	Description
Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

2.2.2.4   Quick Power On Self Test

This allows the system to skip certain tests to speed up the boot-up procedure.

Item	Description
Enabled	Enable quick POST
Disabled	Normal POST

2.2.2.5   First / Second / Third Boot Device

The BIOS tries to load the OS from the devices in the sequence set here. The options are:

Item	Description
Floppy	Floppy Device
LS120	LS120 Device
HDD	Hard Disk Device
CDROM	CDROM Device
ZIP100	ZIP-100 Device
USB-FDD	USB Floppy Device
USB-ZIP	USB ZIP Device
USB-CDROM	USB CDROM Device
IBA GE Slot 011	IBA GE Slot 011 Device
Legacy LAN	Network Device
Disabled	Disabled any boot device

2.2.2.6 Boot Other Device

Use this to boot another device. The options are "Enabled" and "Disabled".

2.2.2.7 Swap Floppy Drive

A useful feature for those machines that use two floppy drives, when enabled this swaps the A: and B: drives. This enables you to change the bootable floppy without having to open the case and switch the cable.

2.2.2.8 Boot Up Floppy Seek

Selection of the command "Disabled" will speed the boot up.

Item	Description
Enabled	Enable Floppy Seek
Disabled	Disable Floppy Seek

2.2.2.9 Boot Up NumLock Status

Set the boot up Num Lock status. The options are "On" and "Off".

Item	Description
On	Enable NumLock
Off	Disable NumLock

2.2.2.10 Gate A20 Option

Item	Description
Normal	A pin in the keyboard controller controls GateA20
Fast	Lets chipset control GateA20 (Default)

2.2.2.11 Typematic Rate Setting

The typematic rate is the rate key strokes repeat as determined by the keyboard controller. The commands are "Enabled" or "Disabled". Enabling allows the typematic rate and delay to be selected.

2.2.2.12 Typematic Rate (Chars/Sec)

The BIOS accepts the following input values (characters/second) for typematic rate: 6, 8, 10, 12, 15, 20, 24, and 30.

2.2.2.13 Typematic Delay (Msec)

Typematic delay is the time interval between the appearances of two consecutive characters, when the key is continuously depressed. The input values for this category are: 250, 500, 750, and 1000 (ms).

2.2.2.14 Security Option

This category determines whether the password is required when the sys- tem boots up or only when entering setup. The options are:

Item	Description
System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

2.2.2.15 APIC Mode

This setting allows you to enable the APIC mode. The choices are "Disabled" or "Enabled."

2.2.2.16 MPS Version Control for OS

This option is only valid for multiprocessor motherboards as it specifies the version of the Multiprocessor Specification (MPS) that the motherboard will use. The MPS is a specification by which PC manufacturers design and build Intel architecture systems with two or more processors.

MPS 1.1 was the original specification. MPS version 1.4 adds extended configuration tables for improved support of multiple PCI bus configurations and greater expandability in the future. In addition, MPS 1.4 introduces support for a secondary PCI bus without requiring a PCI bridge.

2.2.2.17 OS Select for DRAM > 64MB

Select the operating system that is running with greater than 64MB of RAM on the system.
The choice: Non-OS2, OS2.

2.2.2.18 Console Redirection

The options: Disabled, Enabled.

2.2.2.19 Baud Rate

The default is 19200.

2.2.2.20 Agent after Boot

The options: Enabled, Disabled.

2.2.2.21 Small Logo (EPA) Show

This item allows you enabled/disabled the small EPA logo show on screen at the POST step.

Item	Description
Enabled	EPA Logo shows is enabled
Disabled	EPA Logo show is disabled

2.2.2.22 ASF Support

The default is [Enabled].

2.2.2.23 DMI Event Log

The options: Enabled, Disabled.

2.2.2.24 Clear All DMT Event Log

The options: Yes, No.

2.2.2.25 View DMI Event Log

Show the Event Log history.

The options: Yes, No.

2.2.2.26 Mark DMI Events as Read

The options: Yes, No.

2.2.2.27 Event Log Capacity

Shows the Capacity of the Event Log.

The default is [Space available].

2.2.2.28 Event Log Validity

The default is [Validity].

2.2.3 Advanced Chipset Features

```
          Phoenix - AwardBIOS CMOS Setup Utility
                  Advanced Chipset Features

    DRAM timing Selectable      [By SPD]          Item Help
  x CAS Latency time            Auto
  x DRAM RAS# to CAS# Delay     Auto           Menu Level  ▶
  x DRAM RAS# Precharge         Auto
  x Precharge delay (tRAS)      Auto
  x System Memory Frequency     By SPD
    System BIOS Cacheable       [Enabled]
    Memory Hole At 15M-16M      [Disabled]
  ▶ PCI Express Root Port Func  [Press Enter]
  ▶ Advanced Fan Speed Control  [Press Enter]
    VT-d                        [Disabled]
  ▶ Intel AMT Configuration     [Press Enter]

    ** VGA Setting **
    PEG/Onchip VGA Control      [Auto]
    On-Chip Frame Buffer Size   [128MB]
    DVMT Mode                   [Enabled]
    Total GFX Memory            [256MB]
    PAVP Mode                   [Lite]


↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
     F5: Previous Values  F6: Fail-Safe Defaults  F7: Optimized Defaults
```

> DRAM default timings have been carefully chosen and should ONLY be changed if data is being lost. Please first contact technical sup- port

2.2.3.1 DRAM Timing Selectable

The options: Manual, by SPD

2.2.3.2 System BIOS Cacheable

Selecting "Enabled" allows caching of the system BIOS ROM at F0000h- FFFFFh, resulting in better system performance. However, if any pro- gram writes data to this memory area, a system error may occur. The Choices are "Enabled", and "Disabled".

2.2.3.3 Memory Hole at 15M-16M

Enabling this feature reserves 15 MB to 16 MB memory address space for ISA expansion cards that specifically require this setting. This makes memory from 15 MB and up unavailable to the system. Expansion cards can only access memory up to 16 MB. The default setting is "Disabled".

2.2.3.4 PCI Express Root Port Function
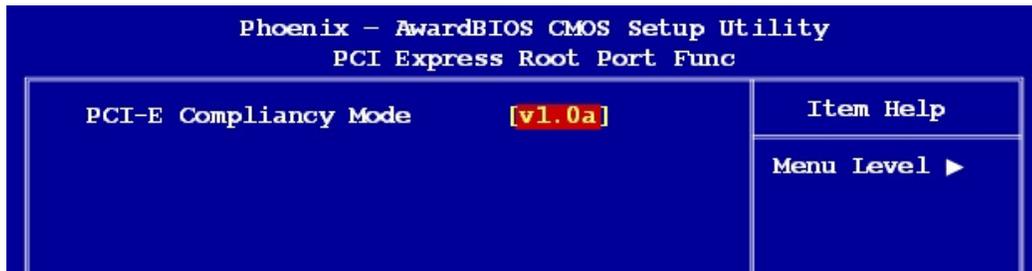
- PCI-E Compliancy Mode

The options: V1.0a, V1.0.

2.2.3.5 Advanced Fan Speed Control
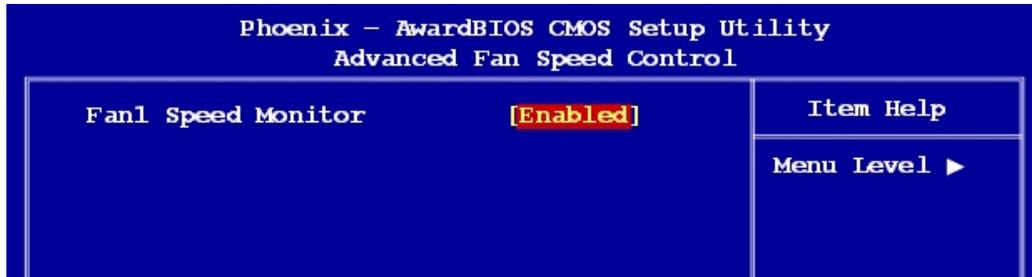
- Fan1 Speed Monitor

The options: Disabled, Enabled

2.2.3.6 VT-d

The options: Disabled, Enabled

2.2.3.7 Intel AMT Configuration

- AMT BIOS Support

The options: Disabled, Enabled

2.2.3.8 PEG/Onchip VGA Control

The selections are "Auto", "Onchip VGA" or "PEG Port".

2.2.3.9 On-Chip Frame Buffer Size

The On-Chip Frame Buffer Size can be set to 32MB, 64MB, 128MB. This memory is shared with the system memory.

2.2.3.10 DVMT Mode

Use this field to select the memory to allocate for video memory. The choices are "Enabled", "Disabled".

2.2.3.11 Total GFX Memory Precharge Delay (tRAS)

The options: 256MB

2.2.3.12 PAVP Mode

The options: Disabled, Lite, Paranoid

2.2.4   Integrated Peripherals

```
          Phoenix - AwardBIOS CMOS Setup Utility
                   Integrated peripherals

   ► OnChip IDE Device        [Press Enter]       Item Help
   ► Onboard Device           [Press Enter]
   ► Super IO Device          [Press Enter]     Menu Level ►
     Onboard Lan1 Boot ROM    [Disabled]
     Onboard Lan2 Boot ROM    [Disabled]
     Watch Dog Timer Select   [  0]
   ► USB Device Setting       [Press Enter]




 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
     F5: Previous Values  F6: Fail-Safe Defaults  F7: Optimized Defaults
```

2.2.4.1 OnChip IDE Device

```
         Phoenix - AwardBIOS CMOS Setup Utility
                   OnChip IDE Device

    IDE HDD Block Mode        [Enabled]        Item Help
    IDE DMA transfer access   [Enabled]
    IDE Primary Master PIO    [Auto]       Menu Level  ▶
    IDE Primary Slave PIO     [Auto]
    IDE Primary Master UDMA   [Auto]       If your IDE hard
    IDE Primary Slave UDMA    [Auto]       drive supports
    On-Chip Secondary PCI IDE [Enabled]    block mode
    IDE Secondary Master PIO  [Auto]       select Enabled
    IDE Secondary Slave PIO   [Auto]       for automatic
    IDE Secondary Master UDMA [Auto]       detection of the
    IDE Secondary Slave UDMA  [Auto]       optimal number
    SATA Mode                 [IDE]        of block
    LEGACY Mode Support       [Enabled]
```

- IDE HDD Block Model

If IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

- IDE DMA Transfer Access

Use this field to enable or disable IDE DMA transfer access.

- IDE Primary/Secondary Master/Slave PIO/UDMA Mode

The channel has both a master and a slave, making four IDE devices possible. Because two IDE devices may have a different Mode timing (0, 1, 2, 3, 4), it is necessary for these to be independent. The default setting "Auto" will allow auto detection to ensure optimal performance.

- SATA Mode

Choose the interface of SATA controller. The default setting is "IDE" which let SATA like parallel ATA controller. The "RAID" setting let SATA controller to support RAID.

The Advanced Host Controller Interface (AHCI) is a hardware mechanism that allows software to communicate with SATA devices, such as hot-plugging and Native Command Queuing (NCQ).

- LEGACY Mode Support

The choices: Disabled, Enabled.

2.2.4.2 Onboard Device

```
         Phoenix - AwardBIOS CMOS Setup Utility
                   Onboard Device

    Azalia Controller        [Auto]            Item Help
    Audio Amplifier          [Enabled]
    Amplifier Gain (dB)      [31.8 dB]     Menu Level  ▶
```
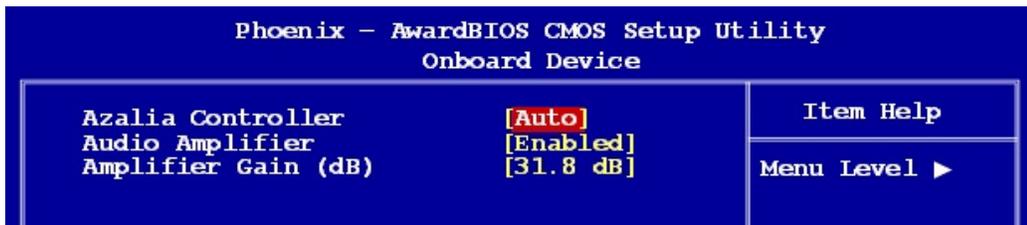
- Azalia Controller

The choices: Auto, Disabled.

- Audio Amplifier

The choices: Enabled, Disabled.

- Amplifier Gain (dB)

The choices: 31.8dB, 27.2dB, 21.2dB, 15.3dB

2.2.4.3 Super I/O Device

```
       Phoenix — AwardBIOS CMOS Setup Utility
                  Super IO Device

    POWER ON Function        [BUTTON ONLY]    │   Item Help
  x KB Power ON Password      Hotkey PowerON  │
  x Hot Key Power ON          Ctrl-F3         │  Menu Level  ▶
    Onboard FDC Controller   [Enabled]        │
    Onboard Serial Port 1    [3F8/IRQ4]       │
    Onboard Serial Port 2    [2F8/IRQ3]       │
    RxD, TxD Active          [Hi, Lo]         │
    POWER After PWR-Fail     [Off]            │
```
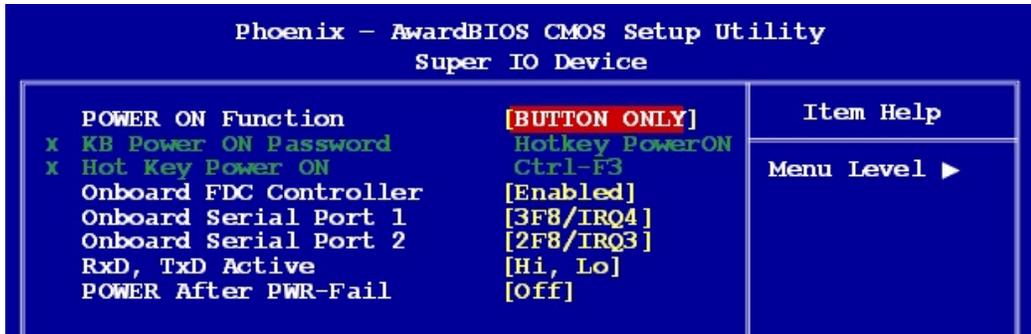
● Power ON Function

This feature allows you to wake up the system using any of the listed options. The selections are "Hot KEY", "Mouse Left", "Mouse Right", "Any KEY" and "BUTTON ONLY".

● KB Power ON Password

Select this item to set or change the KB power on password.

● Hot Key Power ON

Awaken the system by pressing the hot key button. The choices are "Ctrl-F1", "Ctrl-F2", "Ctrl-F3" to "Ctrl-F8".

● Onboard FDC Controller

When enabled, this field allows you to connect your floppy disk drives to the onboard floppy disk drive connector instead of a separate controller card. If you want to use a different controller card to connect the floppy disk drives, set this field to Disabled.

● Onboard Serial Port

The settings are "3F8/IRQ4", "2F8/IRQ3", "3E8/IRQ4", "2E8/IRQ3", "Disabled" and "Auto" for the on-board serial connector.

● RxD, TxD Active

The options: [Hi, Hi,], [Hi, Lo], [Lo, Hi], [Lo, Lo]

● Power After PWR-Fail

Use this to set up the system after power failure. The "Off" setting keeps the system powered off after power failure, the "On" setting boots up the system after failure, and the "Former-Sts" returns the system to the status before power failure.

2.2.4.4   Onboard LAN Boot ROM
The options: Enabled, Disabled.

2.2.4.5   Watch Dog Timer Selection
The options: 0 ~ 255

2.2.4.6   USB Device Setting

```
          Phoenix - AwardBIOS CMOS Setup Utility
                      USB Device Setting

   USB 1.0 Controller        [Enabled]          Item Help
   USB 2.0 Controller        [Enabled]
   USB Operation Mode        [High Speed]     Menu Level ▶
   USB Keyboard function     [Enabled]
   USB Mouse Function        [Enabled]
   USB Storage Function      [Enabled]        [Enabled] or
                                              [Disable]
     *** USB Mass storage Device Boot Setting ***   Universal Host
                                              Controller
```

● USB 1.0 / 2.0 Controller
The choices: Disabled, Enabled.
● USB Operation Mode
Allows you to configure the USB 2.0 controller in HiSpeed (480 Mbps) or Full Speed (12 Mbps). Configuration
options: [Full/Low Speed] [HiSpeed]
● USB Keyboard Function
The choices: Disabled, Enabled.
● USB Mouse Function
The choices: Disabled, Enabled.
● USB Storage Function
The choices: Disabled, Enabled.

2.2.5   Security Chip Configuration

```
            Phoenix - AwardBIOS CMOS Setup Utility
                    Security Chip Configuration

     LT/TXT Initialization          [Disabled]        Item Help
     Reset TPM Flag                 [Disabled]
     TPM Support                    [Disabled]      Menu Level  ▶
     TPM Current Status   Disabled & Deactivated
   x TPM Status                      No change




   ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
      F5: Previous Values  F6: Fail-Safe Defaults  F7: Optimized Defaults
```
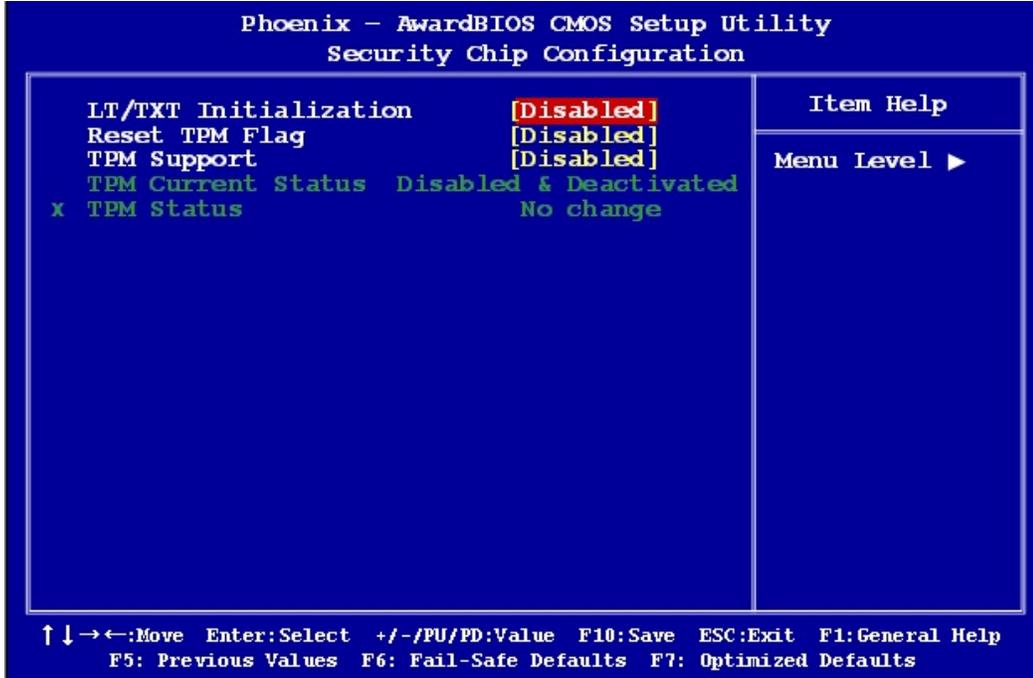
2.2.5.1   LT/TXT Initialization

The options: Disabled, Enabled.

2.2.5.2   Reset TPM Flag

The options: Disabled, Enabled.

2.2.5.3   TPM Support

The options: Disabled, Enabled.

2.2.5.4   TPM Status

The options: No change, Clear, Enable & Activate, Deactivate & Disable.

2.2.6 Power Management Setup

The power management setup controls the single board computer's "green" features to save power. The following screen shows the manufacturer's defaults.

```
            Phoenix - AwardBIOS CMOS Setup Utility
                    Power Management Setup

    ▶  PCI Express PM Function     [Press Enter]          Item Help
       ACPI Function              [Enabled]
    x  ACPI Suspend Type          S1(POS)]            Menu Level ▶
    x  Run VGABIOS if S3 Resume   Auto
       Power Management           [User Define]
       Video Off Method           [DPMS]
       Video Off in Suspend       [Yes]
       Suspend Type               [Stop Grant]
       MODEM Use IRQ              [3]
       Suspend Mode               [Disabled]
       HDD Power Down             [Disabled]
       Soft-Off by PWR-BTTN       [Instant-Off]
       Wake-Up by PCI card        [Disabled]
       Power On by Ring           [Disabled]
       USB KB Wake-Up From S4     [Disabled]
       Resume by Alarm            [Disabled]
    x     Date (of Month) Alarm      0
    x     Time (hh:mm:ss) Alarm       0 : 0: 0

       ** Reload Global Timer Events ***
       Primary IDE 0              [Disabled]
       Primary IDE 1              [Disabled]

  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
       F5: Previous Values  F6: Fail-Safe Defaults  F7: Optimized Defaults
```

```
            Phoenix - AwardBIOS CMOS Setup Utility
                    Power Management Setup

       Secondary IDE 0            [Disabled]          Item Help
       Secondary IDE 1            [Disabled]
       FDD, COM, LPT Port         [Disabled]
       PCI PIRQ [A-D] #           [Disabled]       Menu Level ▶
       Power Type                 [AT]
       HPET Support               [Enabled]
       HPET Mode                  [32-bit mode]
```

2.2.6.1   PCI Express PM Function

```
         Phoenix - AwardBIOS CMOS Setup Utility
                PCI Express PM Function

  DMI Port ASPM           [Disabled]      Item Help

                                          Menu Level ▶
```

● DMI Port ASPM

The choices: Disabled, L1

2.2.6.2   ACPI Function

The choices are "Enabled" and "Disabled".

2.2.6.3   ACPI Suspend Type

This item allows you to set ACPI suspend type to S1/POS(Power On Suspend) or S3/STR(Suspend To RAM).

2.2.6.4   Run VGABIOS if S3 Resume

Select "Auto" to run VGA BIOS if S3 resume automatically. The "Yes" enables running VGA BIOS if S3 resume. The "No" disables this function.

2.2.6.5   Power Management

There are three selections for Power Management, and each of them has fixed mode settings.

Item	Description
Min. Power Saving	Minimum power management, HDD Power Down = 15 Min,
Max. Power Saving	Maximum power management, HDD Power Down =1 Min
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

2.2.6.6   Video Off Method

Use this to select the method to turn off the video. The choices are "Blank Screen", "V/H SYNC+ Blank", and "DPMS".

2.2.6.7 Video Off In Suspend

When the system is in suspend mode, the video will turn off. The choices are "No" and "Yes".

2.2.6.8 Suspend Type

Select the suspend type. The choice: Stop Grant, PWRON suspend.

2.2.6.9 MODEM Use IRQ

This determines the IRQ in which the MODEM can use. The choices: NA, 3, 4, 5, 7, 9, 10, 11.

2.2.6.10 Suspend Mode

Item	Description
Min. Power Saving	Minimum power management, HDD Power Down = 15 Min,
Max. Power Saving	Maximum power management, HDD Power Down =1 Min
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

2.2.6.11 HDD Power Down

Select "1-15 mins" to enable HDD Power Down mode between 1 to 15 mins. Select "Disabled" to disable HDD Power Down function.

2.2.6.12 Soft-off by PWR-BTTN

If you choose "Instant-Off", then pushing the ATX soft power switch but- ton once will switch the system to "system off" power mode. You can choose "Delay 4 sec". If you do, then pushing the button for more than 4 seconds will turn off the system, whereas pushing the button momentarily (for less than 4 seconds) will switch the system to "suspend" mode.

2.2.6.13 Wake-Up by PCI card

The choices are "Enabled" and "Disabled".

2.2.6.14 Power On by Ring

Select "Enabled" to power on the system from a soft off state by an input signal on the serial Ring Indicator (RI) line. The choices are "Enabled" and "Disabled".

2.2.6.15 USB KB Wake-Up from S4

When "Enabled", enter any key to wake up the system from S4 state. The choices are "Enabled" and "Disabled".

2.2.6.16 Resume by Alarm

When "Enabled", set the date and time at which the RTC (real-time clock) alarm awakens the system from suspend mode. The choices are "Enabled" and "Disabled".

2.2.6.17 Primary / Secondary IDE

The options: Disabled, Enabled.

2.2.6.18 FDD, COM, LPT Port

The options: Disabled, Enabled.

2.2.6.19 PCI PIRQ [A-D]

The options: Disabled, Enabled.

2.2.6.20 Power Type

The options: AT, ATX.

2.2.6.21 HPET Support

The options: Disabled, Enabled.

2.2.6.22 HPET Mode

The default is 32-bit mode.

2.2.7   PnP/PCI Configurations

```
          Phoenix - AwardBIOS CMOS Setup Utility
                   PnP/PCI Configurations

   Init Display First        [PCI Slot]         ┌──────────────┐
   Reset Configuration Data  [Disabled]         │  Item Help   │
                                                ├──────────────┤
   Resources Controlled By   [Auto(ESCD)]       │ Menu Level ▶ │
 x IRQ Resources              Press Enter       │              │
                                                │              │
   PCI/VGA Palette Snoop     [Disabled]         │              │
                                                │              │
   ** PCI Express relative items **             │              │
   Maximum Payload Size      [128]              │              │



 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
     F5: Previous Values  F6: Fail-Safe Defaults  F7: Optimized Defaults
```

2.2.7.1   Init Display First

This item allows you to choose the first display interface to initiate while booting. The options: PCI Slot,

Onboard, PCIEx.

2.2.7.2   Rest Configuration Data

The default is "Disabled". Select Enabled to reset Extended System Configuration Data (ESCD) if you have installed a new add-on card, and system configuration is in such a state that the OS cannot boot.

2.2.7.3   Resource Controlled By

The commands here are "Auto (ESCD)" or "Manual". Choosing "Manual" requires you to choose resources from the following sub-menu.

"Auto (ESCD)" automatically configures all of the boot and Plug and Play devices, but you must be using Windows 95 or above.

2.2.7.4 PCI/VGA Palette Snoop

This is set to "Disabled" by default.

2.2.7.5 Maximum Payload Size

This allows you to set the maximum TLP payload size for PCI Express devices.
The options: [128 bytes], [256 bytes], [512 bytes], [1024 bytes], [2048 bytes], and [4096 bytes].

2.2.8 PC Health Status

```
           Phoenix — AwardBIOS CMOS Setup Utility
                      PC Health Status

   Case Open Warning        [Disabled]      ┌─────────────┐
   CPU&Fan Profile          [Disabled]      │  Item Help  │
   SYS&CHA Fan Profile      [Disabled]      ├─────────────┤
   System Temperature        41℃/109℉       │ Menu Level ▶│
   CPU  Temperature           37℃           │             │
   SYS  Fan  Speed          5273 RPM        │             │
   AUX  Fan  Speed          5443 RPM        │             │
   Vcore                     1.20V          │             │
                                            │             │
    12V                     11.84V          │             │
     5V                      4.99V          │             │
   VBAT (V)                  3.16V          │             │
   3VSB(V)                   3.29V          │             │


 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
    F5: Previous Values  F6: Fail-Safe Defaults  F7: Optimized Defaults
```

2.2.8.1 Case Open Warning

The options: Disabled, Enabled.

2.2.8.2 SYS&CHA Fan Profile

The options: Disabled, Optimal Mode, Silent Mode, and Performance Mode.

2.2.8.3 System Temperature

This shows you the current temperature of system.

2.2.8.4 SYS / AUX FAN Speed

This shows the current fan operating speed.

2.2.8.5   Vcore and Others Voltage

This shows the voltage of VCORE, +5V, +12V, VBAT(V), and 3VSB(V).

2.2.9   Frequency/Voltage Control

```
            Phoenix — AwardBIOS CMOS Setup Utility
                   Frequency/Voltage Control
┌─────────────────────────────────────────┬──────────────────┐
│ Auto Detect PCI Clk        [Enabled]     │    Item Help     │
│ Spread Spectrum            [Disabled]    ├──────────────────┤
│ CPU/SRC/PCI                [Default]     │  Menu Level  ▶   │
│                                          │                  │
│                                          │                  │
│                                          │                  │
│                                          │                  │
│                                          │                  │
│                                          │                  │
│                                          │                  │
│                                          │                  │
│                                          │                  │
│                                          │                  │
└─────────────────────────────────────────┴──────────────────┘
 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
   F5: Previous Values  F6: Fail-Safe Defaults  F7: Optimized Defaults
```
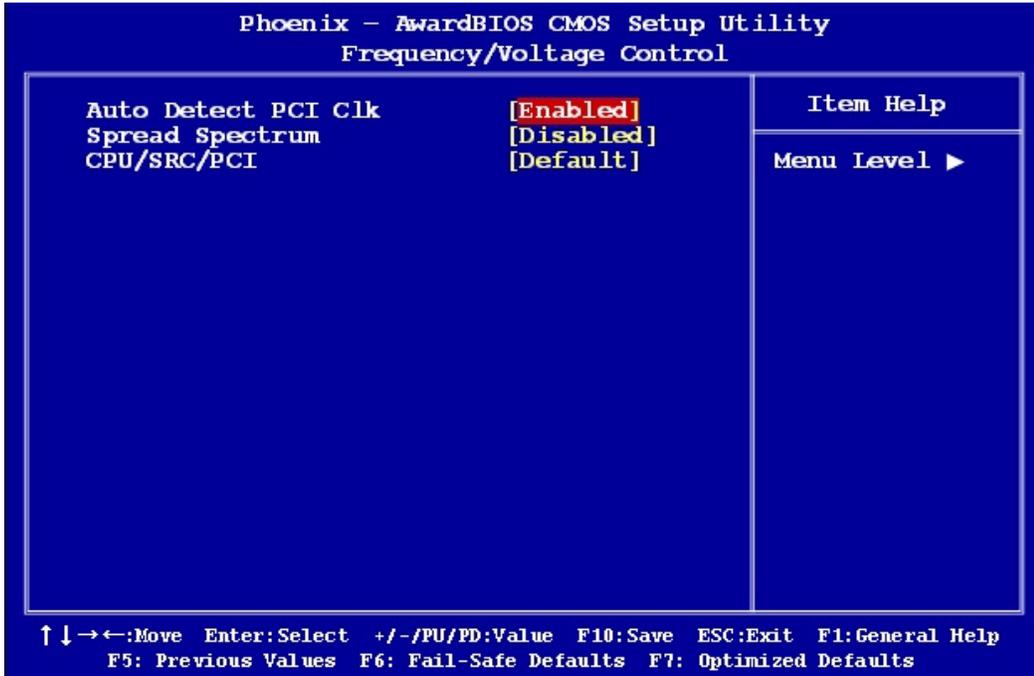
2.2.9.1   Auto Detect PCI Clk

The options: Enabled, Disabled.

2.2.9.2   Spread Spectrum

This setting allows you to reduce EMI by modulating the signals the CPU generates so that the spikes are reduced to flatter curves. This is achieved by varying the frequency slightly so that the signal does not use any particular frequency for more than a moment. The options: Disabled, N+0.3333, N+0.6666.

2.2.9.3   CPU/SRC/PCI

The options: Default, 100/100/33MHz, 133/100/33MHz, 200/100/33MHz, 266/100/33MHz, 333/100/33MHz.

2.2.10   Load Setup Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.
Press <Y> to load the BIOS default values for the most stable, minimal-performance system operations.

```
            Phoenix - AwardBIOS CMOS Setup Utility

  ▶ Standard CMOS Features        ▶ PC Health Status

  ▶ Advanced BIOS Features        ▶ Frequency/Voltage Control

  ▶ Advanced Chipset Features        Load Setup Defaults

  ▶ Integrated Peripherals           Set Password

  ▶ Security Chip Configuration      Save & Exit Setup

  ▶ Power Mana┌──────────────────────────────┐t Saving
              │                              │
  ▶ PnP/PCI Cc│  Load Setup Defaults (Y/N)?  │
              │                              │
              └──────────────────────────────┘

  Esc: Quit                    ↑↓→← : Select Item
  F10: Save & Exit Setup

                   Load Setup Defaults
```

2.2.11   Set Password

You can set password. Supervisor Password: able to enter/change the options of setup menus.

```
          Phoenix - AwardBIOS CMOS Setup Utility

 ►  Standard CMOS Features        ►  PC Health Status
 ►  Advanced BIOS Features        ►  Frequency/Voltage Control
 ►  Advanced Chipset Features        Load Setup Defaults
 ►  Integrated Peripherals           Set Password
 ►  Security Chip Configuration      Save & Exit Setup
 ►  Power Mana                                 t Saving
                   Enter Password:
 ►  PnP/PCI Co


 Esc: Quit                       ↑↓→← : Select Item
 F10: Save & Exit Setup

            Change/Set/Disable Password
```

Follow these steps to change the password.
●   Choose the "Set Password" option from the "Initial Setup Screen" menu and press <Enter>. The screen
      displays the following message:
●   Please Enter Your Password
●   Press <Enter>.
●   If the CMOS is good and this option has been used to change the default password, the user is asked
      for the password stored in the CMOS. The screen displays the following message:

Please Confirm Your Password

●   Type the current password and press <Enter>.
●   After pressing <Enter> (ROM password) or the current password (user-defined), you can change the
      password stored in the CMOS. The password must be no longer than eight (8) characters. Remember,
      to enable the password setting feature, you must first select either "Setup" or "System" from the
      "Advanced BIOS Features" menu.

2.2.12　Save and Exit Setup

If you select this and press <Enter>, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The processor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

```
                Phoenix - AwardBIOS CMOS Setup Utility

   ► Standard CMOS Features      ► PC Health Status

   ► Advanced BIOS Features      ► Frequency/Voltage Control

   ► Advanced Chipset Features      Load Setup Defaults

   ► Integrated Peripherals         Set Password

   ► Security Chip Configuration    Save & Exit Setup

   ► Power Management Setup          Exit Without Saving

   ► PnP/PCI Co

          SAVE to CMOS and EXIT (Y/N)?

   Esc: Quit                    ↑↓→← : Select Item
   F10: Save & Exit Setup

                Save Data to CMOS
```

2.2.13　Exit Without Saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.

```
                Phoenix - AwardBIOS CMOS Setup Utility

   ► Standard CMOS Features      ► PC Health Status

   ► Advanced BIOS Features      ► Frequency/Voltage Control

   ► Advanced Chipset Features      Load Setup Defaults

   ► Integrated Peripherals         Set Password

   ► Security Chip Configuration    Save & Exit Setup

   ► Power Management Setup          Exit Without Saving

   ► PnP/PCI Configurations

          Quit Without Saving (Y/N)?

   Esc: Quit                              lect Item
   F10: Save & Exit Setup

                Abandon all Data
```