

TECHNICAL MANUAL
Of
AMD 785G & SB 750
Based
Mini-ITX M/B for Socket AM2+/AM2
AMD Quad Core Processor

NO.G03-NC84-F

Revision: 3.0

Release date: December, 2010

Trademark:

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Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.



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Manual Revision Information

Reversion
3.0

Revision History
Third Edition

Date
December, 2010

Item Checklist

- Motherboard
- Cable(S)
- DVD for Motherboard Utilities
- Motherboard User's Manual
- Back Panel

Chapter 1

Introduction of the Motherboard

1-1 Feature of motherboard

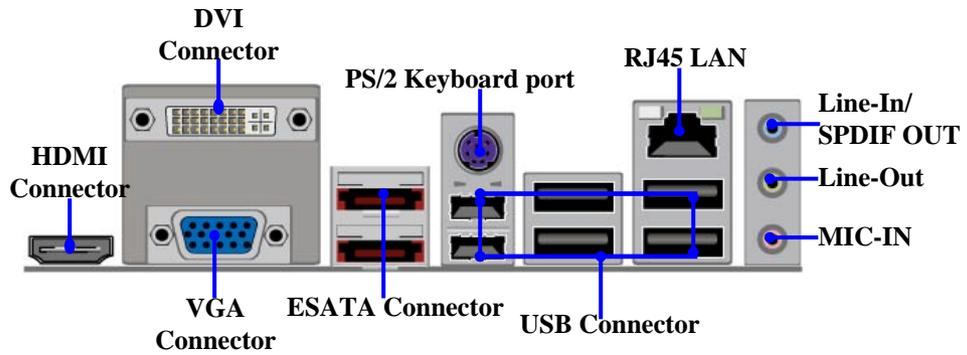
- AMD 785G chipset and SB750 chipset.
- Onboard AMD Socket AM2+/AM2 CPU, with low power consumption never deny high performance.
- Support FSB 2000MHz.
- Support SO-DIMM DDRII 400/533/667/800 up to 4GB.
- Support PCI slot and MINI-PCIE slot.
- Onboard Realtek RTL 8111DL Gigabit Ethernet LAN.
- Integrated Realtek ALC662 6-channel HD audio CODEC.
- Support USB 2.0 data transport demands.
- Support EUP (Energy Using Product) function.

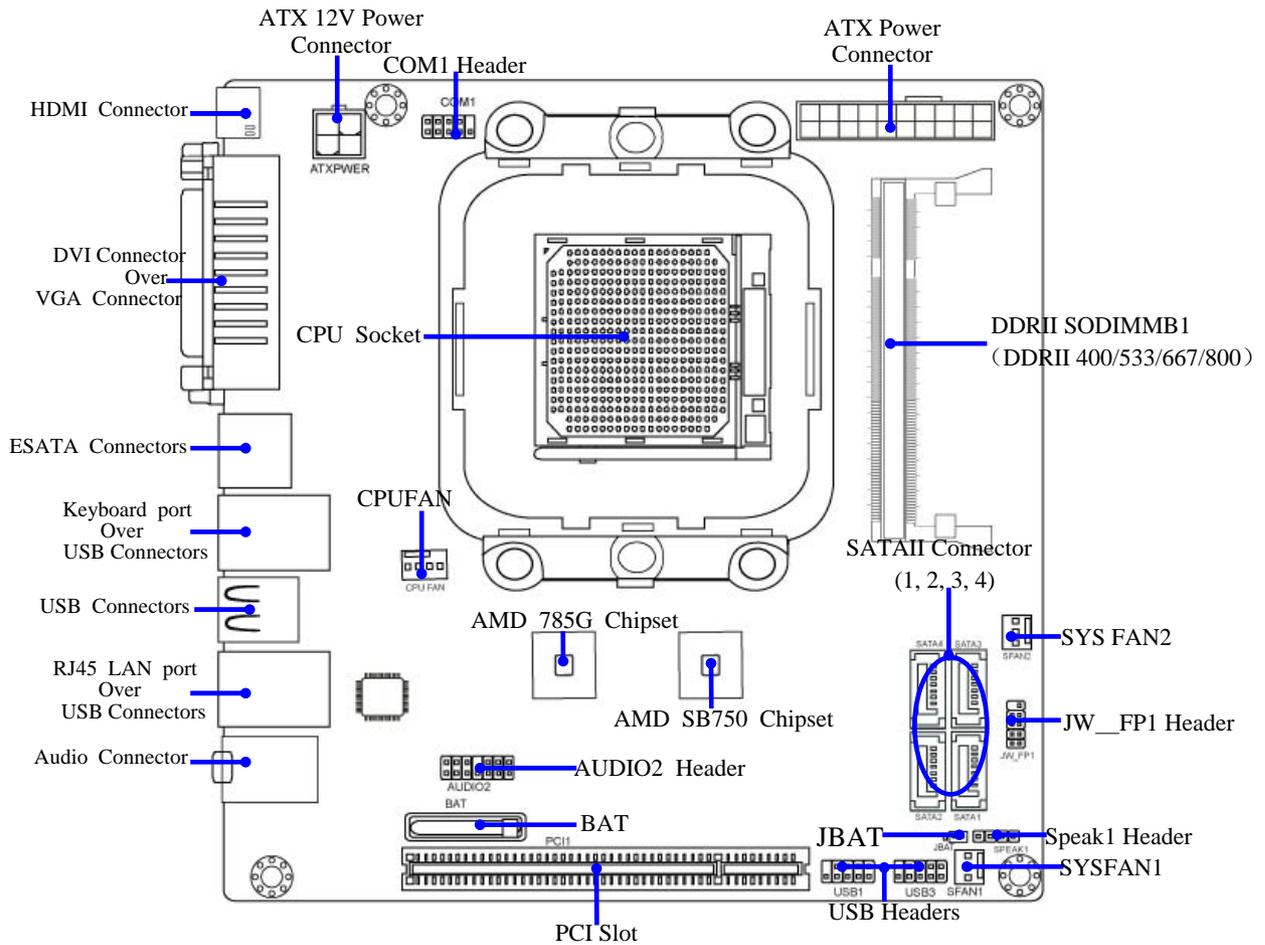
1-2 Specification

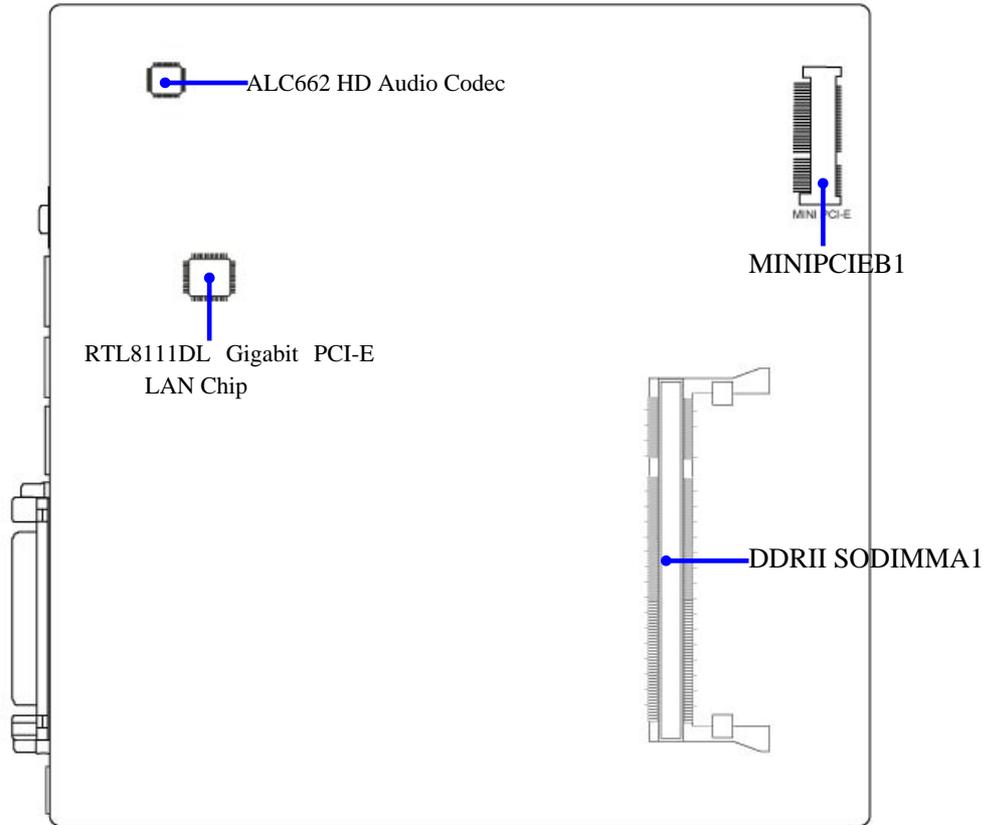
Spec	Description
Design	* Mini ITX form factor 6 layers PCB size: 17.0x17.0cm
Chipset	* AMD 785G Northbridge chipset * AMD SB750 Southbridge chipset
Embedded CPU	* AMD Socket AM2+/AM2 CPU * Low Power Consumption
Memory Socket	* 200-pin DDRII SODIMM socket x2 * Support DDRII 400/533/667/800 MHz system modules DDR memory * expandable to 4GB
Expansion Slots	* 32-bit PCI slot x 1pcs * Mini-PCIE slot x 1pcs
LAN	* Integrated Realtek RTL8111DL PCI-E Gigabit LAN * Support Fast Ethernet LAN function of providing 10Mb/100Mb/1000Mb Ethernet data transfer rate
Audio	* Realtek ALC662 6 channel HD Audio Codec integrated * Audio driver and utility included
BIOS	* AMI 8MB SPI Flash ROM
Multi I/O	* PS/2 keyboard * HDMI Connector x1 * VGA Connector x1 * DVI Connector x1(HDMI Connector and DVI Connector can not be used at the same time) * ESATA Connector x2 * SATAII x4 * USB2.0 port x 6 and header x2 * RJ45 LAN connector x1

	<ul style="list-style-type: none">* Audio1 connector x1* COM1 Header x1* Audio2 header x1
--	---

1-3 Layout Diagram







Jumper

Jumper	Name	Description
JBAT	CMOS RAM Clear Function Setting	3-pin Block

Connectors

Connector	Name	Description
PW1	ATX Power Connector	20-pin Block
ATX12V	ATX 12V Power Connector	4-pin Block
HDMI	High-Definition Multimedia	19-pin Connector
DVI	Digital Visual Interface	24-pin Connector
VGA	D-Sub Connector	15-pin Connector
ESATA1	External Serial ATA2 Connectors	7-pin Connector
PS/2 Keyboard port from UK1	PS/2 Keyboard Connector	6-pin Female
USB from UK1,USB2,UL1	USB Port Connector	4-pin Connector
RJ45 LAN from UL1	RJ45 LAN Connector 8-pin Connector	8-pin Connector
AUDIO1	Line-Out, MIC, Line-In/SPDIF OUT Connector	3 Phone Jack
SATA1,2,3,4	Serial ATAII Connectors	7-pin Connector

Headers

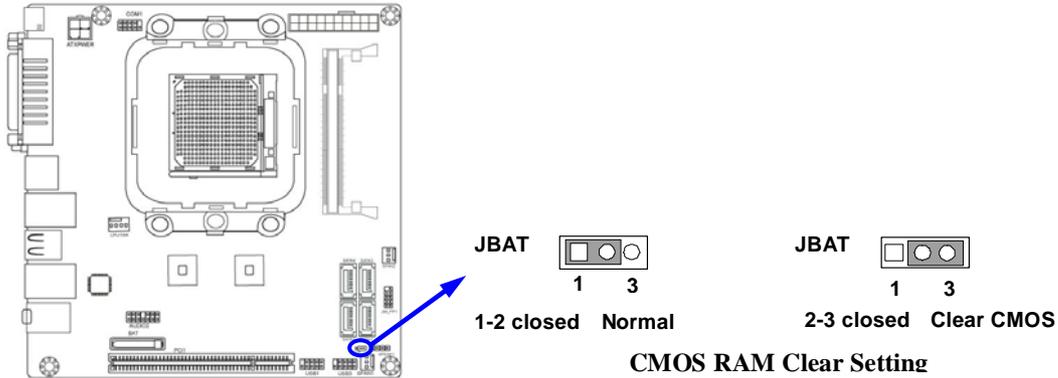
Header	Name	Description
USB1,USB3	USB2.0 Port Headers	9-pin Block
CPUFAN, SFAN1/2	FAN Speed Headers	3-pin Block
JW_FP1 (PWR LED/ IDE LED/ /Power Button /Reset)	Front Panel Headers (PWR LED/ IDE LED/ /Power Button /Reset)	9-pin Block
AUDIO2	Front panel audio Headers	13-pin block
COM1	Serial Port COM1 Header	9-pin Block
SPEAK1	PC Speaker connector	4-pin Block

Chapter 2

Hardware Installation

2-1 Jumper Setting

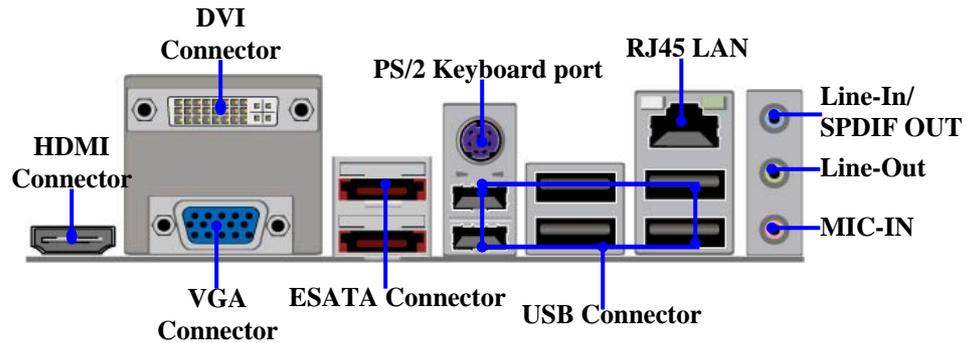
(1) Clear CMOS (3-pin): JBAT



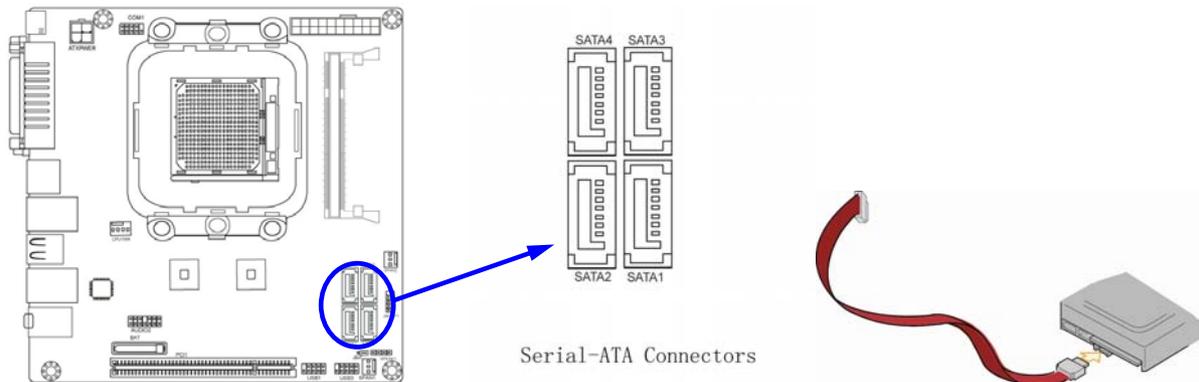
2-2 Connectors and Headers

2-2-1 Connectors

(1) Audio Connector (Line-In /SPDIF OUT, Line-Out, MIC-In): AUDIO1



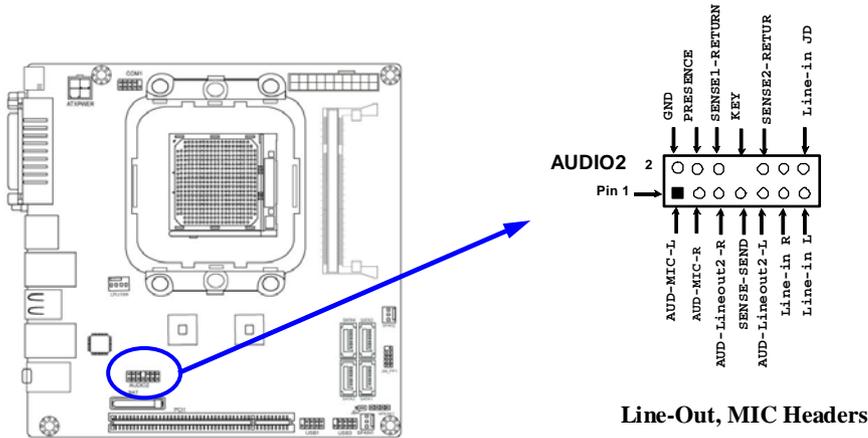
(2) Serial-ATA Port connector: SATAII 1/SATAII 2/SATAII 3/SATAII 4



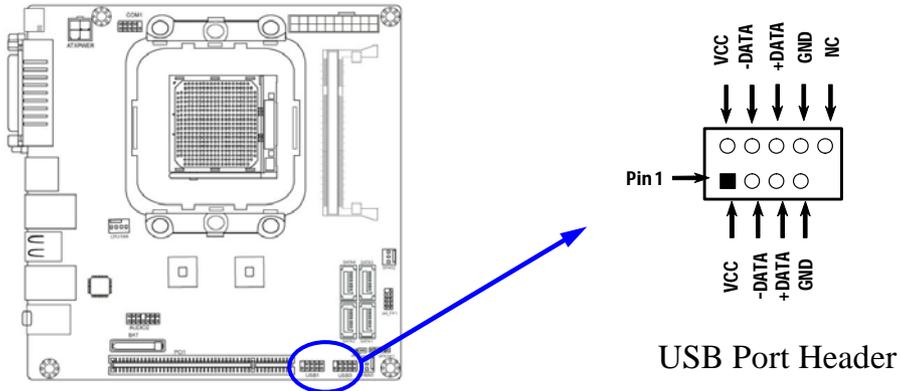
2-2-2 Headers

(1) Line-Out, MIC-In Header (13 pin): Front Panel Audio Header: AUDIO2

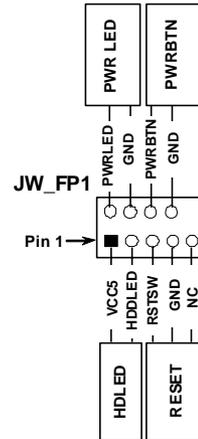
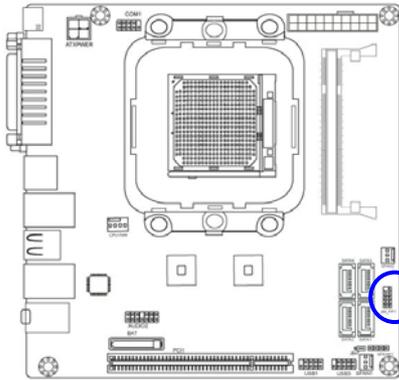
This header connects to Front Panel Line-out, MIC-In connector with cable.



(2) USB Port Headers (9-pin): USB1/USB3



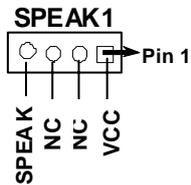
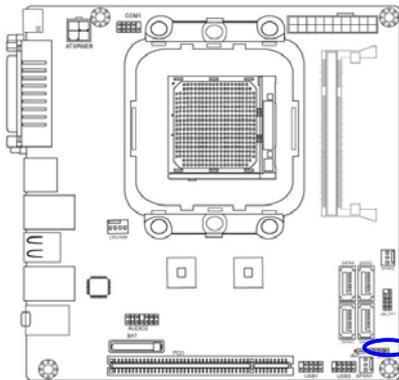
(3) Front Panel Header: JW-FP1



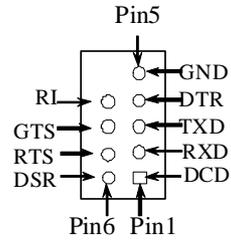
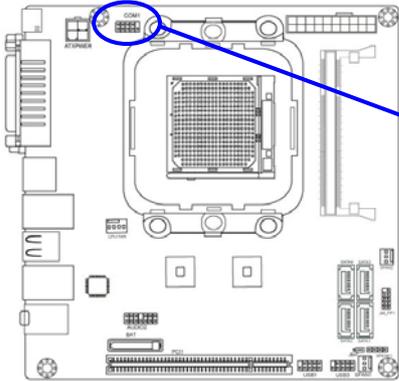
System Case Connections

(4) Speaker Header: SPEAK1

This 4-pin connector connects to the case-mounted speaker. See the figure below.



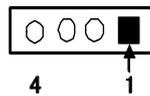
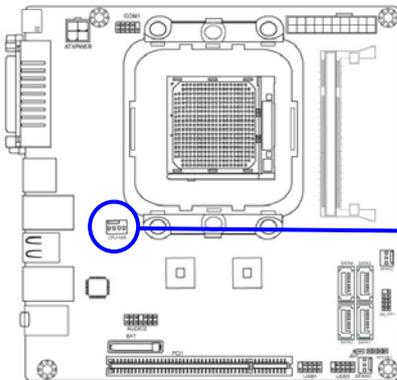
(5) Serial Port Header (9-Pin female): COM1



Serial COM Port 9-pin Block

(6) FAN Headers: CPUFAN (4 pin)

- Pin 1: Ground
- Pin 2: 12V (fan power)
- Pin 3: Detect (fan clock)
- Pin 4: PWM (fan controller)



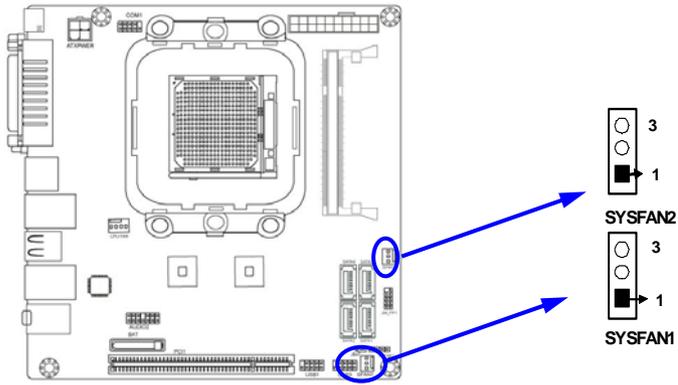
CPUFANHeader

(7) FAN Speed Headers: SYSFAN1(3 pin), SYSFAN2 (3 pin)

Pin1: GND

Pin2: +12V fan power

Pin3: Fan Speed



Chapter 3

Introducing BIOS

The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program will gain control. The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary hardware, it detects the entire hardware device and configures the parameters of the hardware synchronization. Only when these tasks are completed done it gives up control of the computer to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

In the BIOS Setup main menu of Figure 3-1, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press <Esc> to quit the BIOS Setup.
- Press ↑↓←→ (up, down, left, right) to choose, in the main menu, the option you want to confirm or to modify.
- Press <F10> when you have completed the setup of BIOS parameters to save these parameters and to exit the BIOS Setup menu.
- Press Page Up/Page Down or +/- keys when you want to modify the BIOS parameters for the active option.

3-1 Entering Setup

Power on the computer and by pressing immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to

Press to enter Setup

3-2 Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Status Page Setup Menu/Option Page Setup Menu

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <Esc>.

3-3 The Main Menu

Once you enter AMI ® BIOS CMOS Setup Utility, the Main Menu (Figure 3-1) will appear on the screen. The Main Menu allows you to select from twelve setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

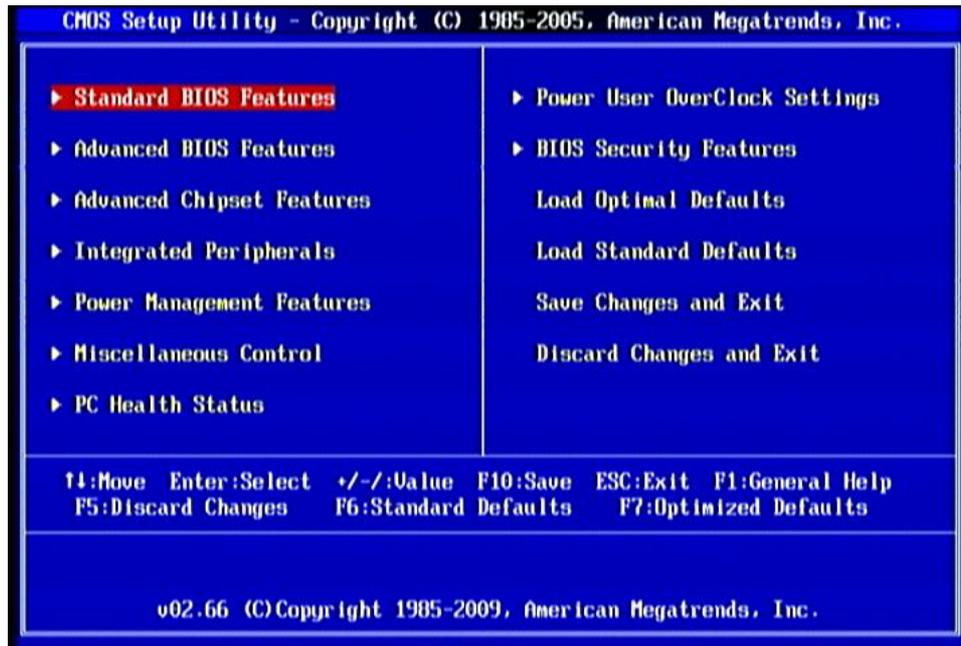


Figure 3-1

Standard CMOS Features

Use this Menu for basic system configurations.

Advanced BIOS Features

Use this menu to set the Advanced Features available on your system.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

Power Management Features

Use this menu to specify your settings for power management.

Miscellaneous Control

Use this menu to specify your settings for Miscellaneous Control.

PC Health Status

This entry shows your PC health status.

Power User OverClock Settings

Use this menu to specify your settings (frequency, Voltage) for overclocking demand.

BIOS Security Features

Use this menu to set supervisor password and user password.

Load Optimal Defaults

Use this menu to load the BIOS default values these are setting for optimal performances system operations for performance use.

Load Standard Defaults

This menu uses a minimal performance setting, but the system would run in a stable way.

Save Changes and Exit

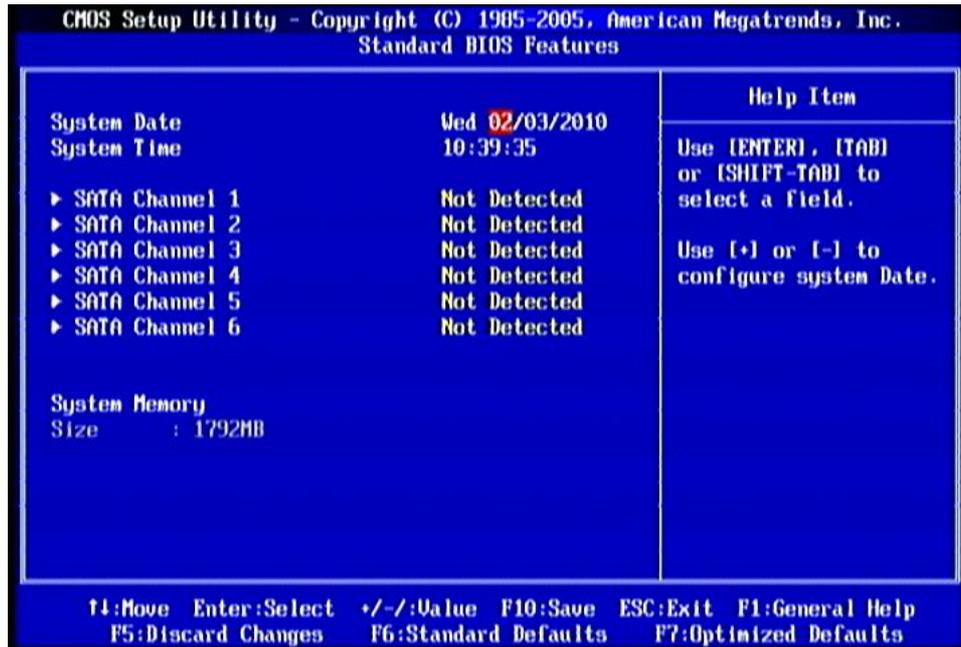
Save CMOS value changes to CMOS and exit setup.

Discard Changes and Exit

Abandon all CMOS value changes and exit setup.

3-4 Standard BIOS Features

The items in Standard CMOS Setup Menu are divided into several categories. Each category includes no one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.



Date

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

Day Day of the week is from Sun to Sat, determined by BIOS. Read-only.

Month The month is from Jan. through Dec.

Date The date from 1 to 31 can be keyed by numeric function keys.

Year The year depends on the year of the BIOS.

Time

The time format is <hour><minute><second>.

SATA Channel 1, 2, 3, 4, 5, 6

While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.

Type

The optional settings are: Not Installed; Auto; CD/DVD and ARMD. Use the item to select the type of device connected to the system.

LBA/Large Mode

The optional settings are Auto; Disabled.

Disabled: disables LBA mode.

Auto: enables LBA Mode if the devices support it and the device is not already formatted with LBA Mode disabled.

Block (Multi-Sector Transfer)

The optional settings are: Disabled and Auto.

Disabled: The Data transfer from and to the device occurs one sector at a time.

Auto: The Data transfer from and to the device occurs multiple sectors at a time if the device supports it.

PIO Mode

The optional settings are: Auto, 0, 1, 2, 3 and 4.

DMA Mode

The optional settings are Auto, SWDMAn, MWDMAAn, UDMAAn.

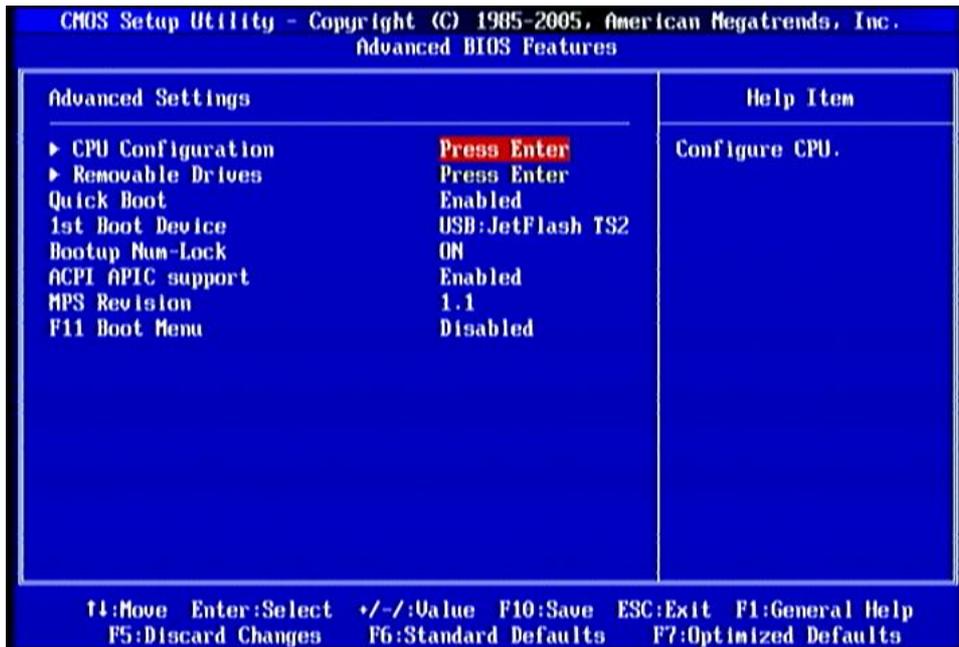
S.M.A.R.T.

This option allows you to enable the HDD S.M.A.R.T Capability (Self-Monitoring, Analysis and Reporting Technology). The optional settings are Auto; Disabled and Enabled.

32 Bit Data Transfer

The optional settings are: Disabled and Enabled.

3-5 Advanced BIOS Features



Removable Drives---1st Drive

Use this item to specify the boot device priority sequence from available drives.

Quick Boot

Use the item to allow BIOS to skip certain tests while booting. This will decrease the needed to boot the system.

1st Boot Device

Specify the boot sequence from the available devices. A device enclosed in parenthesis has been disabled in corresponding type menu.

Bootup Num-Lock The default value is On.

On (default) Keypad is numeric keys.

Off Keypad is arrow keys.

ACPI APIC Support

Include ACPI APIC table pointer to RSDT pointer list. The optional settings are: Disabled and Enabled.

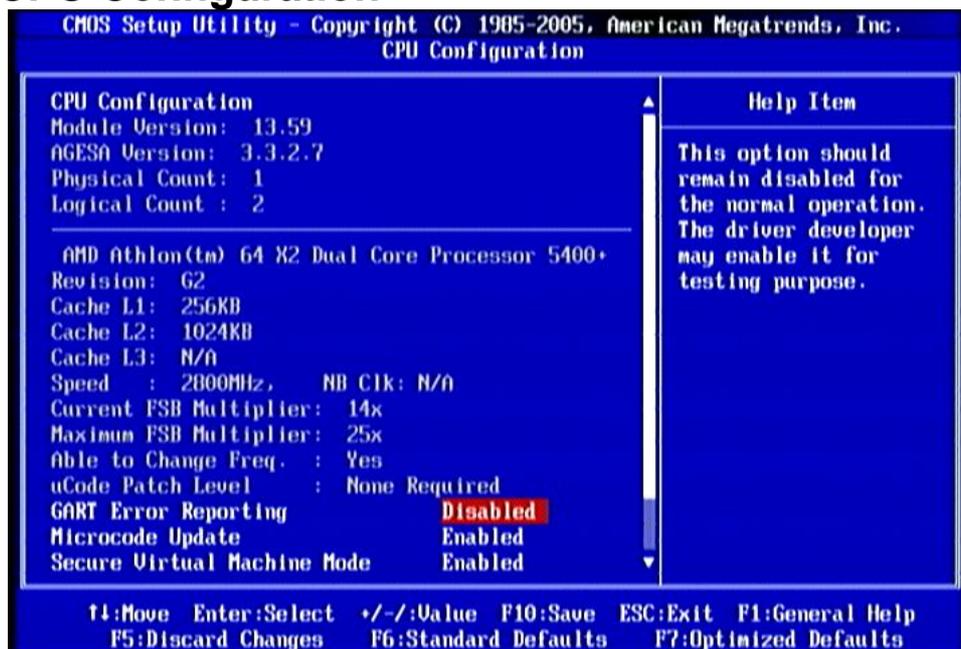
MPS Revision

This option is only valid for multiprocessor motherboards as it specifies the version of the Multiprocessor Specification (MPS) that the motherboard will use.

F11 Boot Menu

The optional settings are: Disabled and Enabled.

3-5-1 CPU Configuration



GART Error Reporting

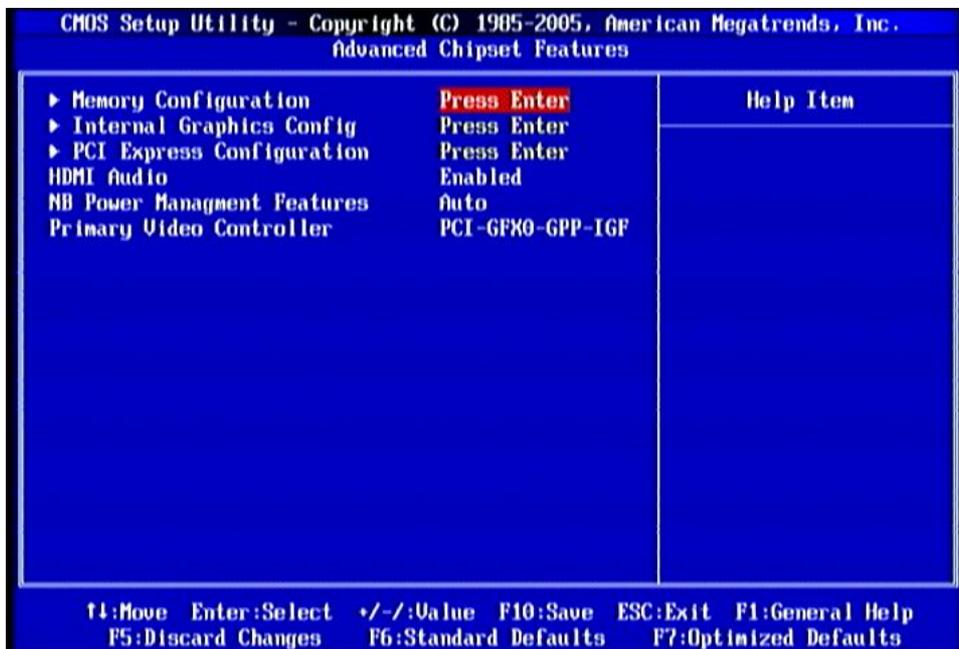
This option should remain disabled for the normal operation. The driver developer may enable it for testing purpose.

Microcode Update

Enable/disable Secure Virtual Machine Mode (SVM).The optional settings are: Disabled and Enabled.

3-6 Advanced Chipset Features

The Advanced Chipset Features Setup option is used to change the values of the chipset registers. These registers control most of the system options in the computer.



HDMI Audio

The optional settings are: Disabled; Enabled.

NB Power Management Features

Dynamic clock gating for ION/NT/MCU/CFG. The optional settings are: Auto; Disabled.

3-6-1 Memory Configuration



DRAM Timing Mode

The optional settings are: Auto; DCT 0; DCT1; Both.

Bank Interleaving

Use this item to enable bank memory interleaving. The optional settings are: Auto; Disabled.

Enable Clock to ALL DIMMs

Enable unused clocks to DIMMS when memory slots are not populated.

Mem CLK Tristate during C3 and Alt VID.

Enable and disable Mem CLK Tri-stating during C3 and Alt VID

Memory Hole Remapping

Enable Memory Remapping around Memory Hole.

DCT Unganged Mode

This allows selection of unganged DRAM MODE (64- bit width).

Auto=Ganged Mode; Always= Unganged Mode.

Power Down Enable

Enable or Disable DDR power down mode.

3-6-2 Internal Graphics Config



Internal Graphics Mode

The optional settings are: Disabled; UMA; SIDEPORT; UMA+SIDEPORT.

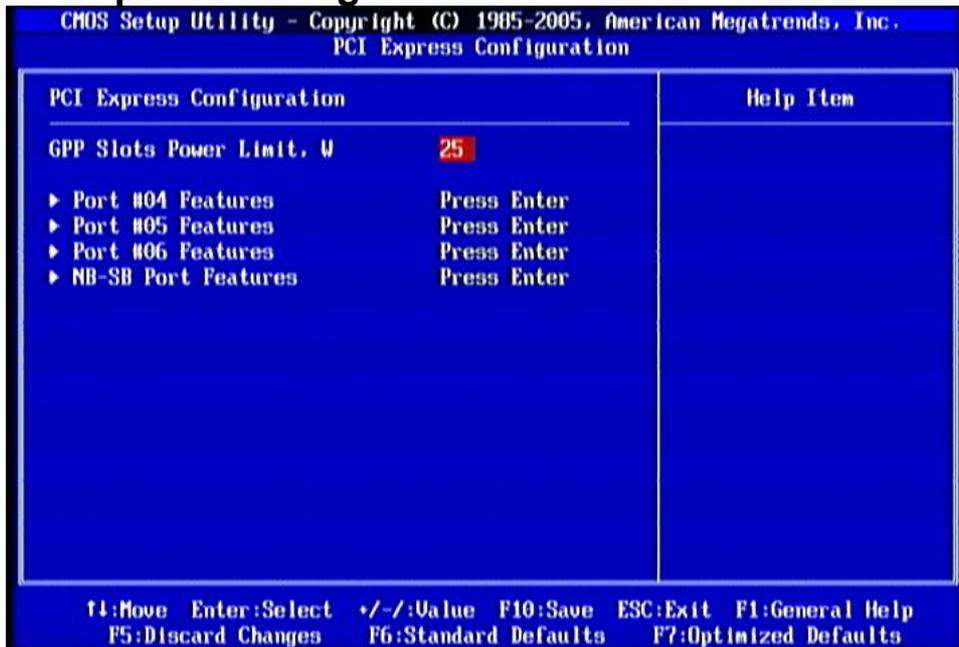
UMA Frame Buffer Size

The optional settings are: Auto; 32MB; 64MB; 128MB; 256MB; 512MB.

FB Location

The optional settings are: Below 4G; Above 4G.

3-6-3 PCI Express Configuration



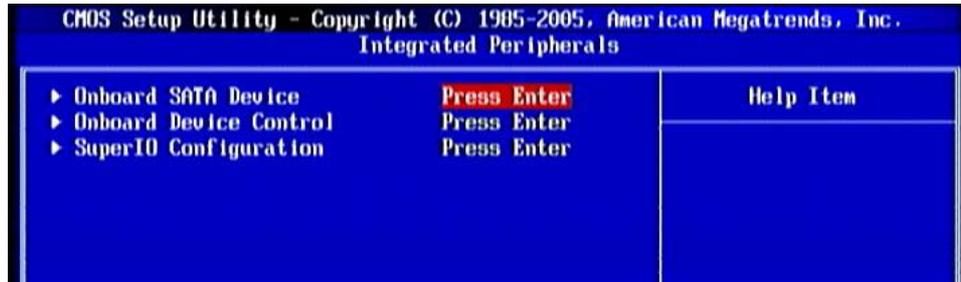
Port #04 Features ~ Port #06Features

Press Enter and set values in the sub-items as Gen2 High Speed Mode, Link ASPM.

NB-SB Port Features

Press Enter and set values in the sub-items as NB-SB Link ASPM; NP NB-SB VC1 Traffic Support and Link Width.

3-7 Integrated Peripherals



3-7-1 Onboard SATA Device



OnChip SATA Channel

Press Enter to enable or disable OnChip SATA Channel.

On Chip SATA Type

Press Enter to select the OnChip SATA type. The optional settings are: Native IDE; RAID; AHCI; Legacy IDE; IDE->AHCI.

SATA IDE Combined Mode

The optional settings are: Enabled; Disabled.

Hard Disk Write Protect

Disables /Enables device write protection. This will be effective only if device is

accessed through BIOS.

IDE Detect Time Out (Sec)

Select the time out value for detecting ATA/ATAPI device(s). The optional settings are: 0; 5; 10; 15; 20; 25; 30; 35.

SATA Run Mode Configuration

The optional settings are: Compatible; Enhanced.

3-7-2 Onboard Device Control



Onboard PCI E Lan Device

Use this item to enable or disable Onboard PCI E Lan.

Onboard Lan Boot ROM

This enables or disables PXE Function.

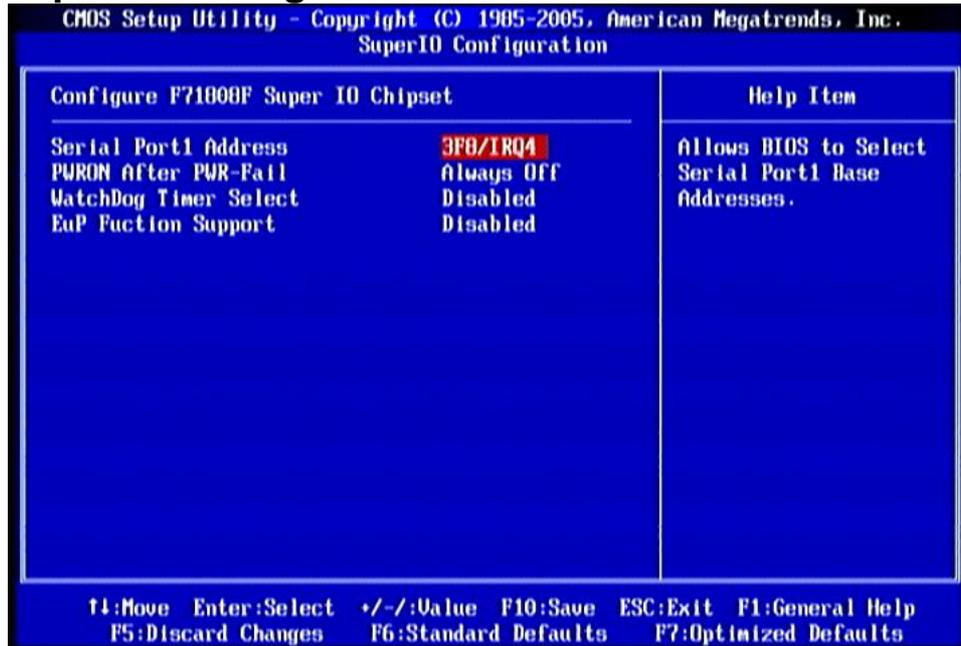
HD Audio Azalia Device

This item allows you to decide to enable/disable the chipset family to support HD Audio. The optional settings are: Auto; Enabled and Disabled.

USB Configuration

Press Enter to set values for sub-items as: Legacy USB Support, USB 2.0 Controller Mode; BIOS EHCI Hand-off etc.

3-7-3 Super IO Configuration



Serial Port1 Address

Use this item to allow BIOS to select serial port1 Base Addresses. Press Enter to set values for sub-items as: serial port1 Address, PWROM After PWR-fail; WatchDog Timer Select.

PWROM After PWR-Fail

The optional settings are: Former-Sts; Always On; Always Off.

WatchDog Timer Select

This item is used to activate the watchdog function. The optional settings are: Disabled; Enabled.

Eup Function Support

The optional settings are: Disabled; Enabled.

3-8 Power Management Features

The Power Management Setup allows you to configure your system to most effectively save energy saving while operating in a manner consistent with your own style of computer use.



CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.		
Power Management Features		
Power Management Features	Help Item	
Suspend mode	S1 (POS)	Select the ACPI state used for System Suspend.
Power Management/APM	Enabled	
Suspend Time Out	Disabled	
Power Button Mode	On/Off	
Video Power Down Mode	Suspend	
Hard Disk Power Down Mode	Suspend	
Hard Disk Time Out (Minute)	Disabled	
Power On By Keyboard	Disabled	
Power On By Mouse	Disabled	
PowerOn by PCI Card	Disabled	
Wake-up by PCIE	Disabled	
WakeUp by USB	Disabled	
RTC Resume	Disabled	

Suspend Mode

Use this item to select the ACPI state used for System Suspend. The optional settings are: S1 (POS); S3 (STR).

Power Management/APM

Use this item to enable or disable SMI based power management and APM support.

Suspend Time Out

If it is set Enabled and no activity during this time period, the BIOS will place the system into suspend low power state. The optional settings are: Disabled; 1~64 minutes.

Power Button Mode

The optional settings are: On/Off; Suspend.

Video Power Down Mode

The optional settings are: Disabled; Standby and Suspend.

Hard Disk Power Down Mode

The optional settings are: Disabled; Standby and Suspend.

Hard Disk Time Out

The optional settings are: Disabled; 1~15 minutes.

PowerOn by PCI Card

Use this item to enable or disable PCI card to generate a wake event.

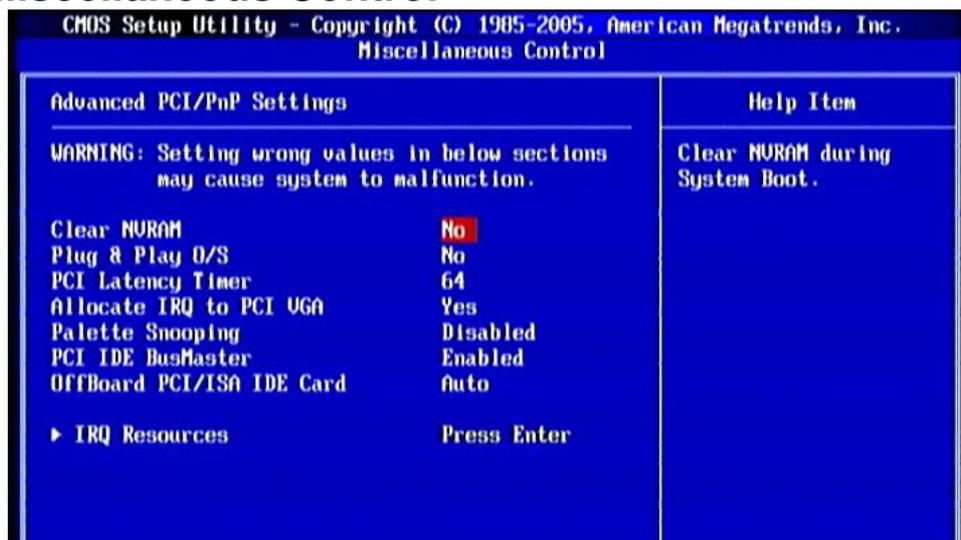
Wake-up by PCIE

Use this item to enable or disable LAN GPI to generate a wake event.

RTC Resume

Use this item to enable or disable RTC to generate a wake event.

3-9 Miscellaneous Control



Clear NVRAM

Use the item to clear NVRAM during System Boot. The optional settings are: No; Yes.

Plug &Play O/S

The optional settings are: No; Yes

No: Let the BIOS configure all the devices in the system.

Yes: Let the operating system configure Plug and Play devices, not required for boot if your system has a Plug and Play system.

PCI Latency Timer

Value in units of PCI clocks for PCI device latency timer register.

Allocate IRQ for PCI VGA

The optional settings are: No; Yes.

Yes: Assigns IRQ to PCI VGA card if card requests IRQ.

No: Does not assign IRQ to PCI VGA card even card requests an IRQ.

Palette Snooping

The optional settings are: Enabled; Disabled.

Enable: inform the PCI device that an ISA graphics devices is installed in the system so the card will function correctly.

PCI IDE Bus Master

The optional settings are: Enabled; Disabled.

Enable: BIOS uses PCI busmastering for reading/writing IDE devices.

Offboard PCI/ISA IDE Card

Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card.

IRQ Resources

Press Enter to set values for sub-items as: IRQ5; IRQ7; IRQ9; IRQ10; IRQ11; IRQ14; IRQ15.

3-10 PC Health Status

This section shows the Status of you CPU, Fan, and Warning for overall system status. This is only available if there is Hardware Monitor onboard.



H/W Health Function

It displays information list below when set as below. The choice is either Enabled and Disabled.

CPU Temperature/SYS Temperature/CPUFAN Speed/SYSFAN1 Speed /VCORE /NB1V2 /VDIMM/3VSYS/5VSYS

This will show the CPU/ /System voltage chart and FAN Speed, etc.

SmartFan Setting

The optional settings are: Auto Fan by Dutycycle; Disabled.

CPU Temperature Limit

Use this item to set CPU temperature setting. Min=0°C; Max=127°C.

3-11 Power User OverClock Settings



CPU/HT Reference Clock

Use this item to set CPU/HT Reference Clock.

PCI E Reference Clock

Use this item to set PCI E Reference Clock.

SB Reference Clock

Use this item to set SB Reference Clock.

Processor Frequency Multiplier

The optional settings are: Auto; x4.0~x10.5.

Processor Voltage

The optional settings are: Auto; 0.800v~1.125v.

AOD Compatibility

Choose Enabled means only AMD over drive can adjust voltage

Choose Disabled means only BIOS can adjust voltage.

VDIMM Select

Use this item to select VDIMM value. The optional settings are: 1.85v; 1.90v; 1.95v; 2.00v.

N Voltage Setting

The optional settings are: 1.10v; 1.15v; 1.20v.

HT Link Speed

The Hyper Transport link will run at this speed if it slower than or equal to system clock and this board is capable. The optional settings are from Auto; 200MHz~1.8GHz.

HT Link Width

The Hyper Transport link will run at this width. The optional settings are Auto; 4 Bit; 8 Bit; 16 Bit.

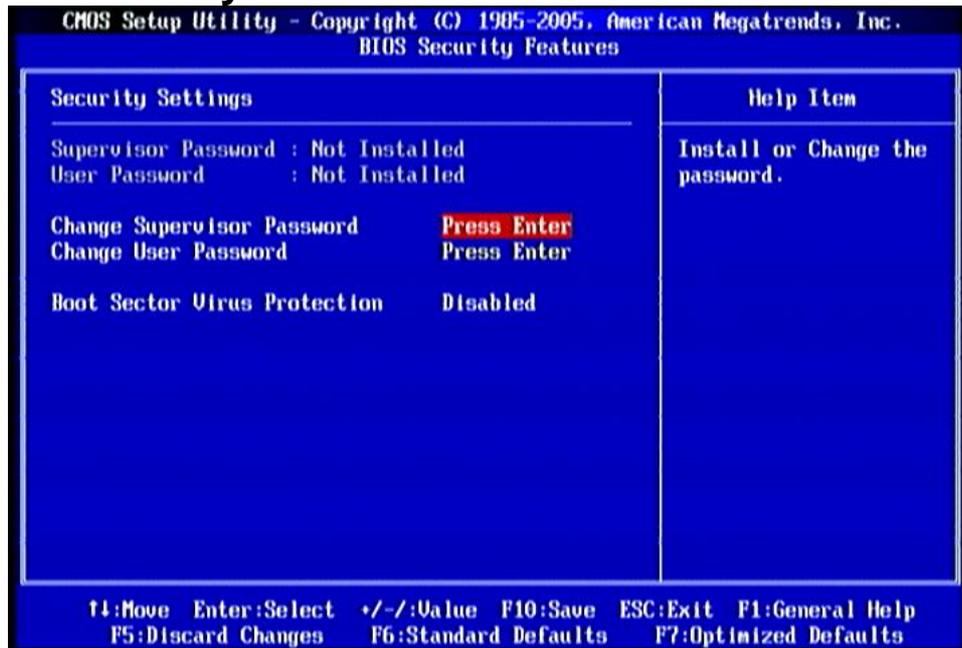
DRAM Command Rate

The optional settings are: Auto; 1T; 2T.

Memory Clock Mode

The optional settings are: Auto; Limit and Manual.

3-12 BIOS Security Features



You can set either supervisor or user password or both of them. The differences are:

Supervisor password: Can enter and change the options of the setup menus.

User password: Can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type the password up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS

memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm that the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

Boot Sector Virus Protection

The selection allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.
Disabled (default) No warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Enabled Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector of hard disk partition table.

3-13 Load Optimal Defaults /Load Standard Defaults

Load Optimal Defaults

When you press <Enter> on this item, you get a confirmation dialog box with a message similar to:



Pressing <OK> loads the default values that are factory settings for optimal performance system operations.

Load Standard Defaults

When you press <Enter> on this item, you get a confirmation dialog box with a message similar to:



Pressing <OK> loads the default values that are factory settings for stable performance system operations.

3-14 Save Changes and Exit / Discard Changes and Exit

Save Changes and Exit

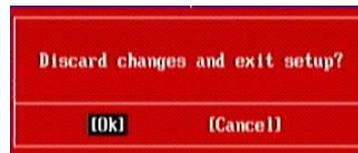
When you press <Enter> on this item, you get a confirmation dialog box with a message similar to:



Pressing <OK> save the values you made previously and exit BIOS setup.

Discard Changes and Exit Setup?

When you press <Enter> on this item, you get a confirmation dialog box with a message similar to:



Pressing <OK> to leave BIOS setting without saving previously set values.

Notice! The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version form our official website.