TECHNICAL MANUAL

Of

NVIDIA MCP7A-ION

Based

Mini-ITX M/B for ATOM Processor

NO.G03-NC63-F

Rev 2.0

Release date: Oct, 2009

Trademark:

*** Specifications and Information contained in this documentation are furnished for information use only, and are subject to change at any time without notice, and should not be construed as a commitment by manufacturer.**

USER'S NOTICE

Manual Revision Information

Reversion	Revision History	Date
2.0	Second Edition	Oct., 2009

Item Checklist

- ☑ Motherboard
- ☑ User's Manual
- ☑ DVD for motherboard utilities
- ☑ Cable(s)
- ☑ I/O Back panel shield

Environmental Safety Instruction

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.

- 0 to 60 centigrade is the suitable temperature. (The figure comes from the request of the main chipset)

- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.

- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.

- Attention to the heat sink when you over-clocking. The higher temperature may decrease the life of the device and burned the capacitor.

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.

TABLE OF CONTENT

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- NVidia MCP7A-ION chipset.
- Onboard Atom CPU, with low power consumption never denies high performance.
- Support FSB 533 MHz.
- Support DDRII DIMM 667/800 up to 8GB.
- Onboard Realtek RTL 8111DL Gigabit Ethernet LAN.
- Integrated ALC 888 6-channel HD audio codec
- Support USB2.0 data transport demands.
- DV Power onboard, 12V input (NC63P series only).
- Integrated NVIDIA ION Graphics, supports DX10, full HD 1080p, Blu-ray/HD-DVD playback

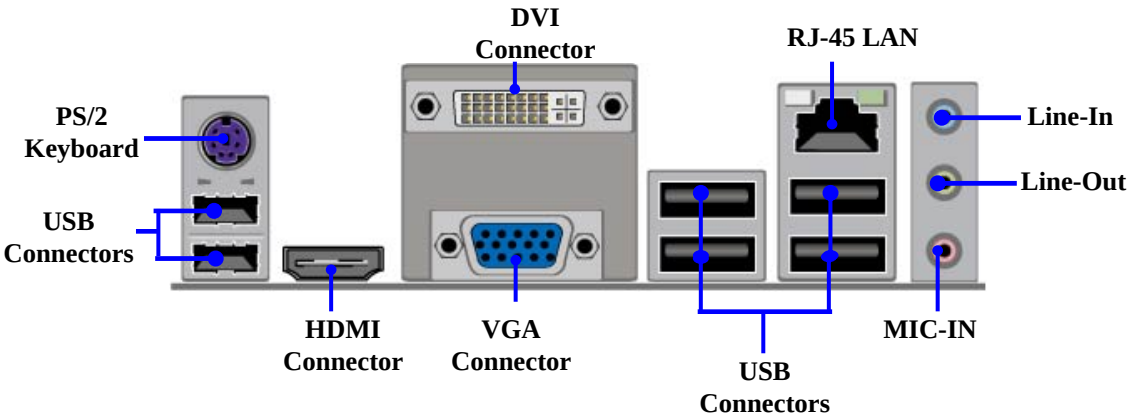
Caution!
Please observe the following notice!
NC63P comes with a build-in DC-DC converter. To avoid high temperature, please DO NOT overload the maximum power of the external power supply while the system is consuming high voltage. Be aware of the maximum temperature allowance of the power supply.

1-2 Specification

Spec	Description
Design	● Mini-ITX form factor 6 layers ; PCB size: 17.0x17.0cm
Chipset	● NVIDIA MCP7A-ION
Embedded CPU	● ATOM CPU
Memory Socket	● 240-pin DDRII DIMM slot x2 ● Support DDRII 667/800 MHz DDRII memory modules ● Expandable to 8GB
Expansion Slot	● Mini-PCIE slot x 1
LAN	● Integrated Realtek RTL8111DL PCI-E Gigabit LAN ● Support Fast Ethernet LAN function of providing 10Mb/100Mb/1000Mb Ethernet data transfer rate
Audio	● ALC 888 6-channel audio codec integrated ● Audio driver and utility included
BIOS	● AMI 8MB Flash ROM
Multi I/O	● PS/2 keyboard connector x 1 ● USB port connector x 6 and USB header x2 ● HDMI connector x 1 ● DVI connector x1 ● VGA connector x1 ● RJ-45 LAN connector x1 ● Audio connector x1 (Line-in, Line-out, MIC) ● Front panel audio header x1 ● Serial port header x1 ● GPIO header x1 ● LPC header x1 ● SATAII x4

1-3 Layout Diagram

NC63 Series Rear I/O



NC63P Series Rear I/O

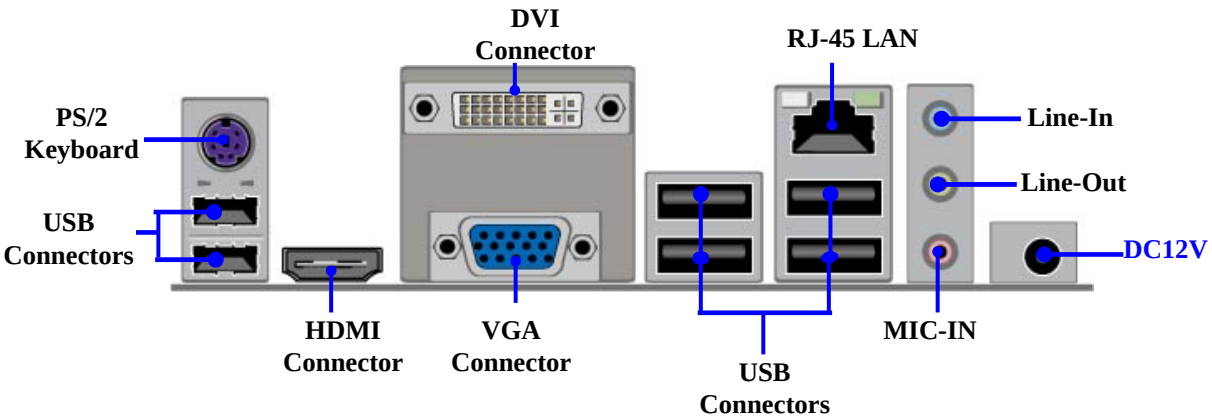


Diagram for NC63 Series:

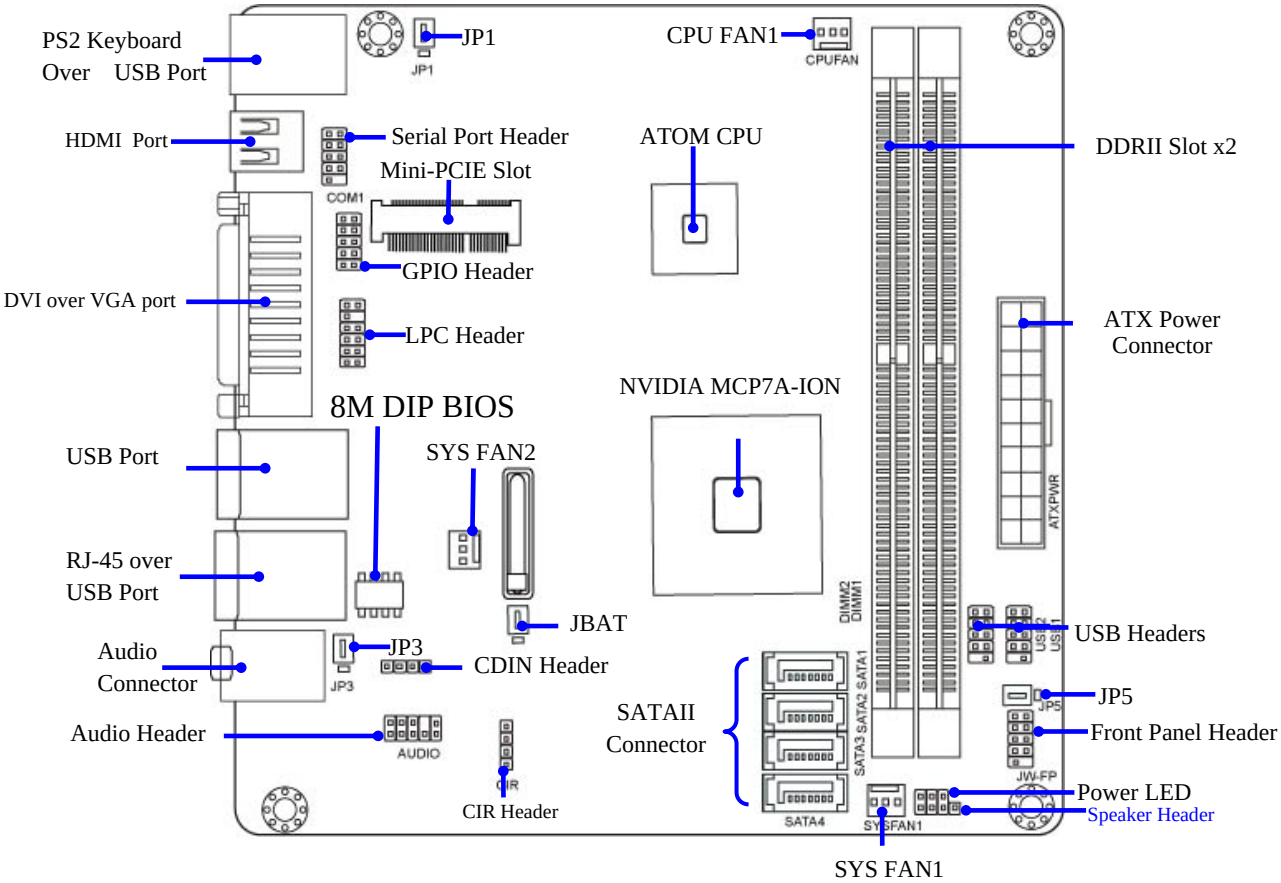
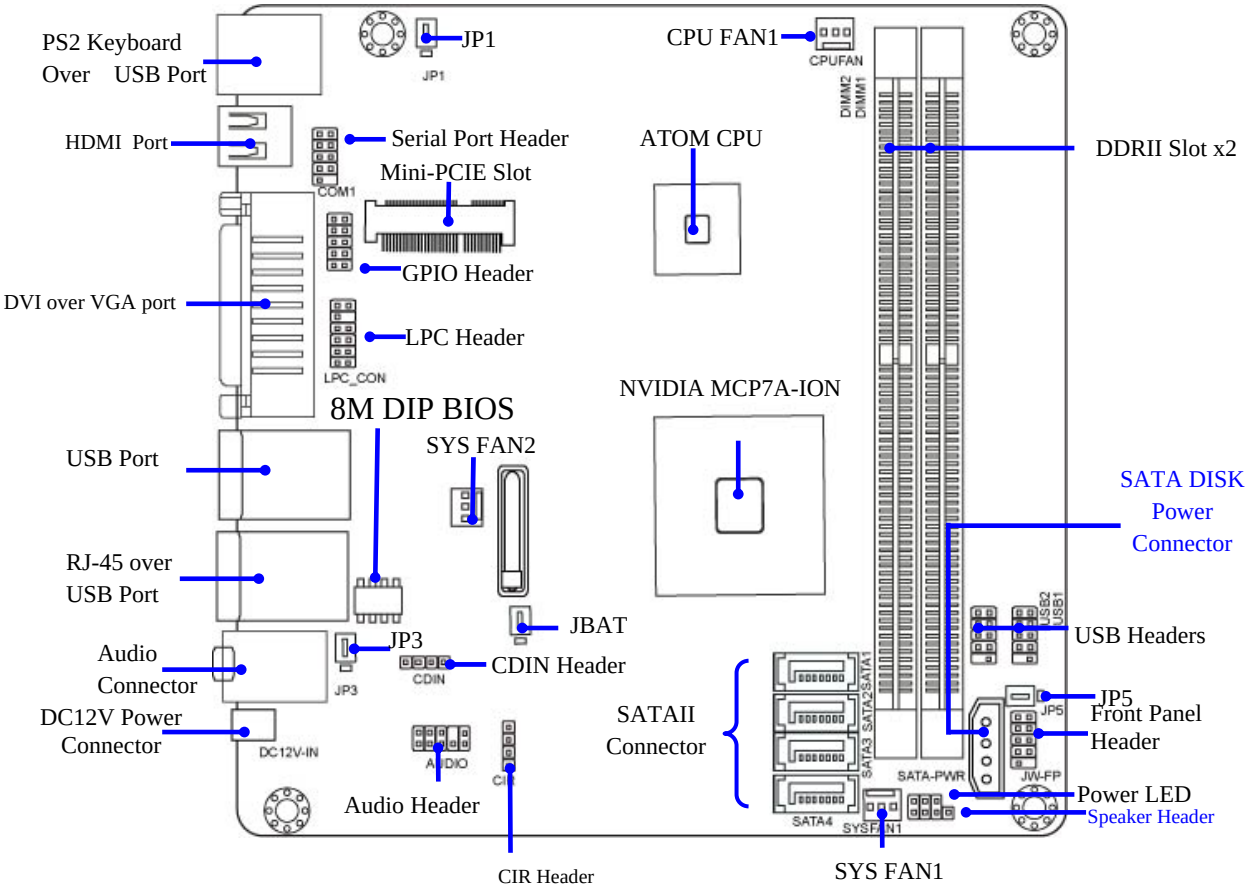


Diagram for NC63P Series:



Jumper

Jumper	Name	Description
JBAT	CMOS RAM Clear Function Setting	3-pin Block
JP1	KB/MS Power on Function Setting	3-pin Block
JP3/JP5	USB Power on Function Setting	3-pin Block

Connectors

Connector	Name	Description
DC12V_IN (for NC63P)	DC power Connector	DC Jack
SATA_PWR(for NC63P)	Power out Connector	4-pin Connector
ATXPWR(for NC63)	ATX Power Connector	24-pin Connector
SATA1~SATA4	Serial ATAII Connector	7-pin Connector
KB from UK1	PS2 Keyboard Connector	6-pin Female
USB from UK1,UL1	USB Port Connectors	4-pin Connectors
LAN from UL1	RJ-45 LAN Connectors	8-pin Connectors
HDMI	High Definition Multimedia Interface	19-pin Connector
DVI	Digital Visual Interface	29-pin Connector
VGA	Video Graphic Attach Connector	15-pin Female
AUDIO	AUDIO Connector	9-pin Connectors

Headers

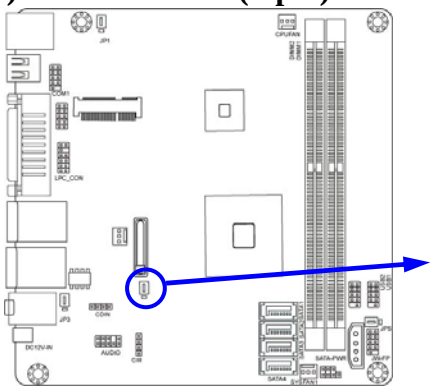
Header	Name	Description
FP_AUDIO	Front panel audio Headers	9-pin block
CDIN	CD Audio-In Header	4-pin Block
USB1; USB2	USB Headers	9-pin Block
JW_FP (PWR LED/ HD LED/ /Power Button /Reset)	Front Panel Header (PWR LED/ HD LED/ /Power Button /Reset)	9-pin Block
PWR LED	Power LED	3-pin Block
SPEAK	Speaker Header	4-pin Block
COM1	Serial Port Header	9-pin Block

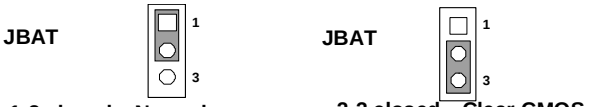
CIR	CIR Header	4-pin Block
GPIO_CON	GPIO header	10-pin Block
LPC_CON	LPC Header	12-pin Block

Chapter 2
Hardware Installation

2-1 Jumper Setting

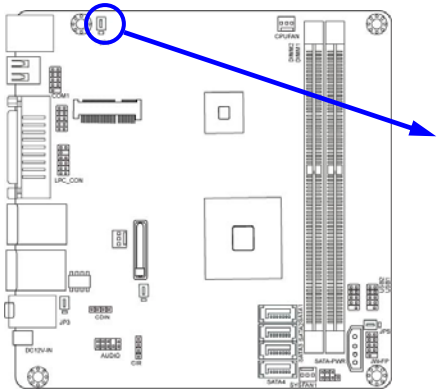
(1) Clear CMOS (3-pin): JBAT

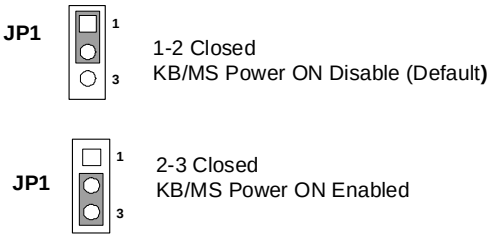




CMOS RAM Clear Setting

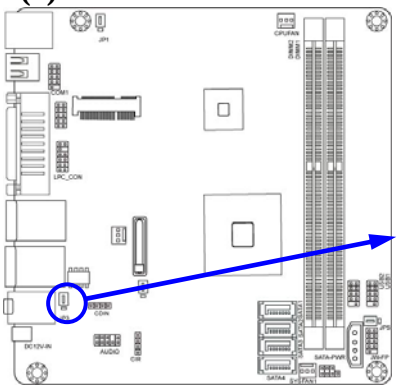
(2) JP1: KB/MS Power on Function Enabled/Disabled (3-pin)

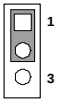




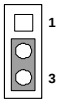
JP1:Keyboard/Mouse Power On Setting

(3) USB Power on Function Enabled/Disabled: JP3



JP3 

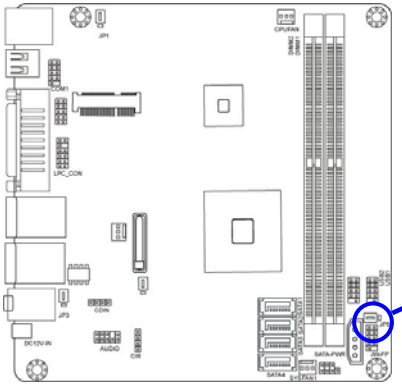
1-2 Closed
USB Power On Disable (Default)

JP3 

2-3 Closed
USB Power ON Enabled

JP3:USB Power On Setting

(4) USB Power on Function Enabled/Disabled: JP5



JP5 

1-2 closed (Default) USB Power On Disable

JP5 

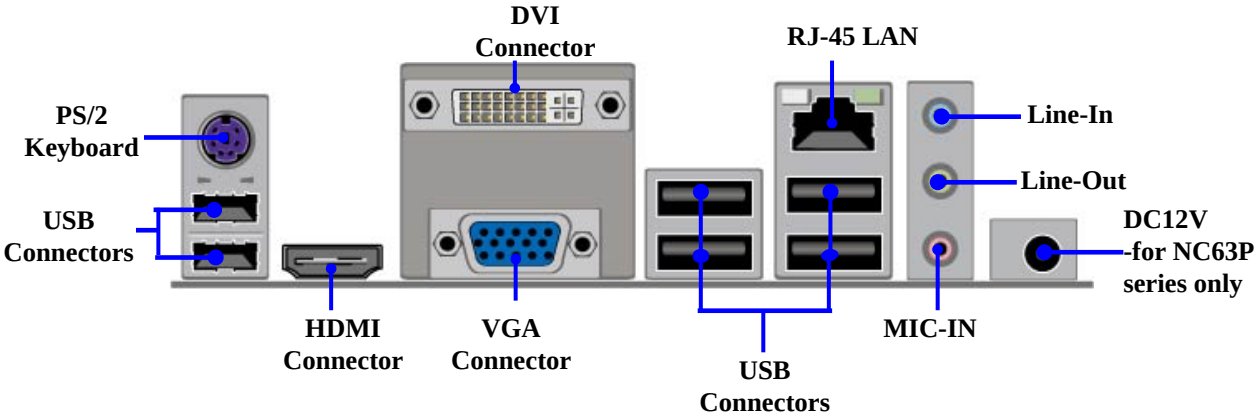
2-3 closed Enabled USB Power On

JP5:USB Power-On Setting

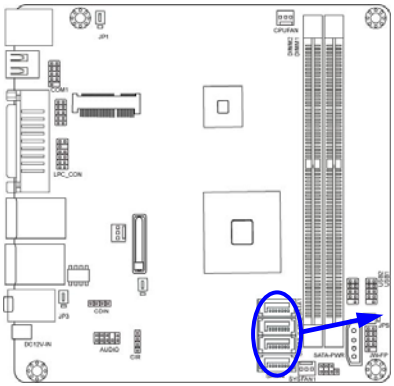
2-2 Connectors and Headers

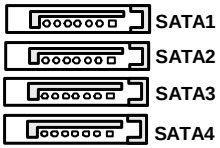
2-2-1 Connectors

(1) Rear Panel Connectors



(2) Serial-ATA Port connector: SATA1/SATA2/SATA3/SATA4

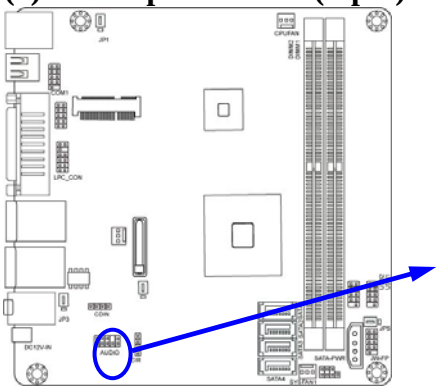


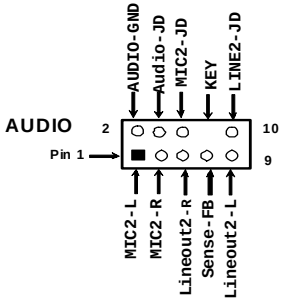


Serial-ATAII Connector

2-2-2 Headers

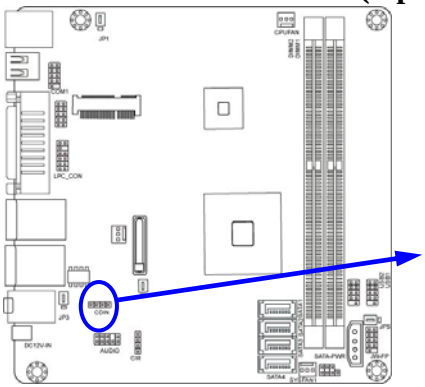
(1) Front panel audio (9-pin): FP_AUDIO

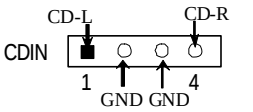




Line-Out, MIC Headers

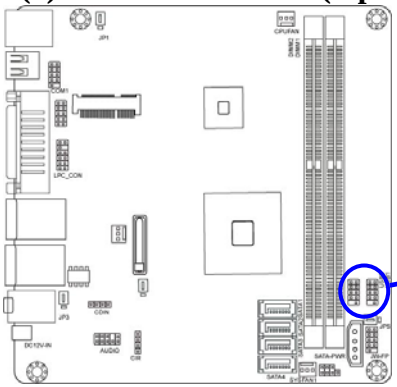
(2) CD AUDIO-In Headers (4-pin): CDIN

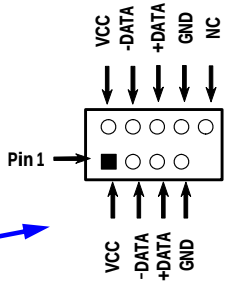




CD Audio-In Headers

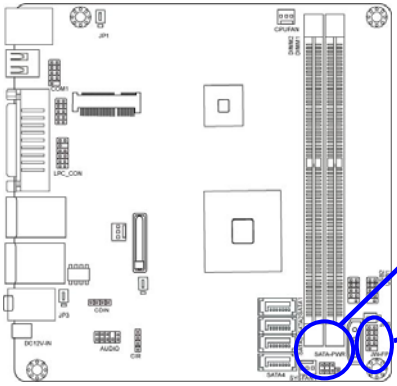
(3) USB Port Headers (9-pin): USB1/USB2

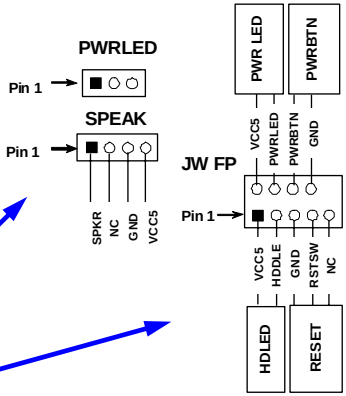




USB Port Header

(4) Front Panel Header: JW-FP





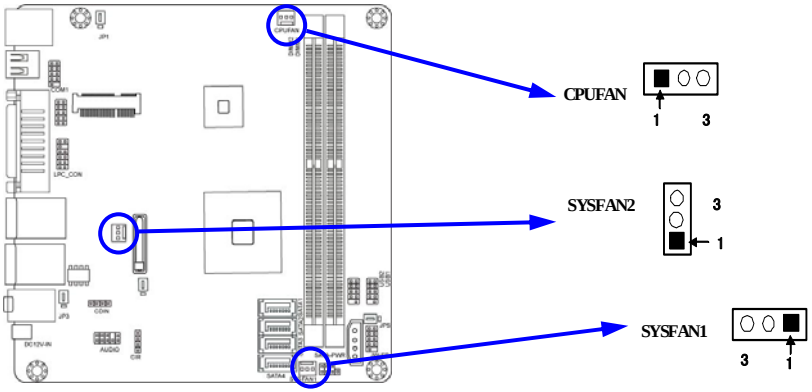
System Case Connections

(5)FAN Speed Headers (3-pin): CPUFAN, SYSFAN1/SYSFAN2

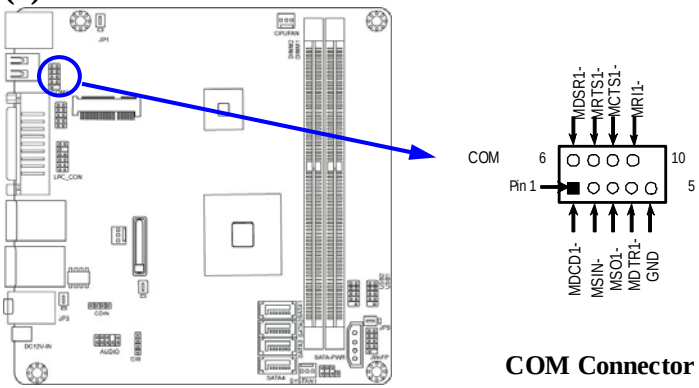
Pin1: GND

Pin2: +12V fan power

Pin3: Fan clock

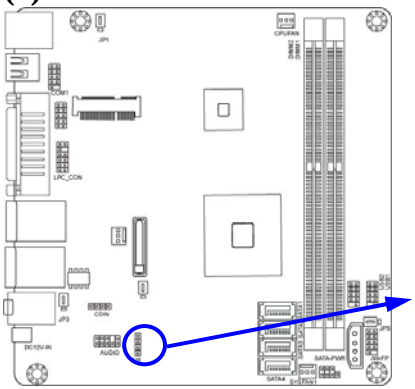


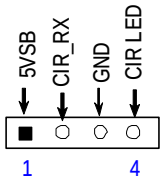
(6) COM Port Header: COM1



COM Connector

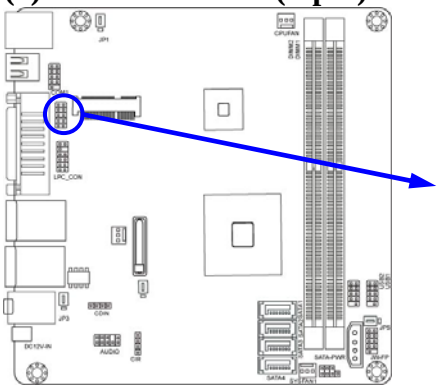
(7) CIR Header: CIR

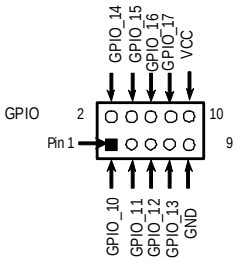




CIR Header

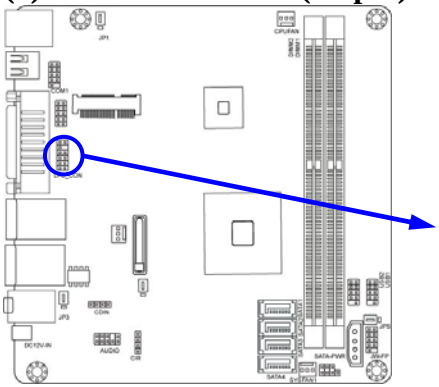
(8) GPIO Header (9-pin): GPIO_CON

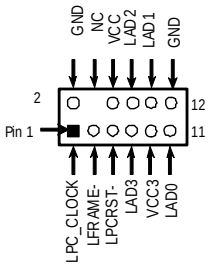




GPIO Connector

(9) LPC Connector (12-pin): LPC_CON





LPC Connector

Chapter 3
Introducing BIOS

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.

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.
- PGUP: Previous Value; PGDN: Next Value.
- Press <F10> when you have completed the setup of BIOS parameters to save these parameters and to exit the BIOS Setup menu.

- Press <+>/<–> keys when you want to modify the BIOS parameters for the active option.

3-1 Entering Setup

Power on the computer and by pressing <Del> 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 <Del> 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 Setup Utility, the Main Menu (Figure 3-1) will appear on the screen. The Main Menu allows you to select from 12 setup functions and 2 exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

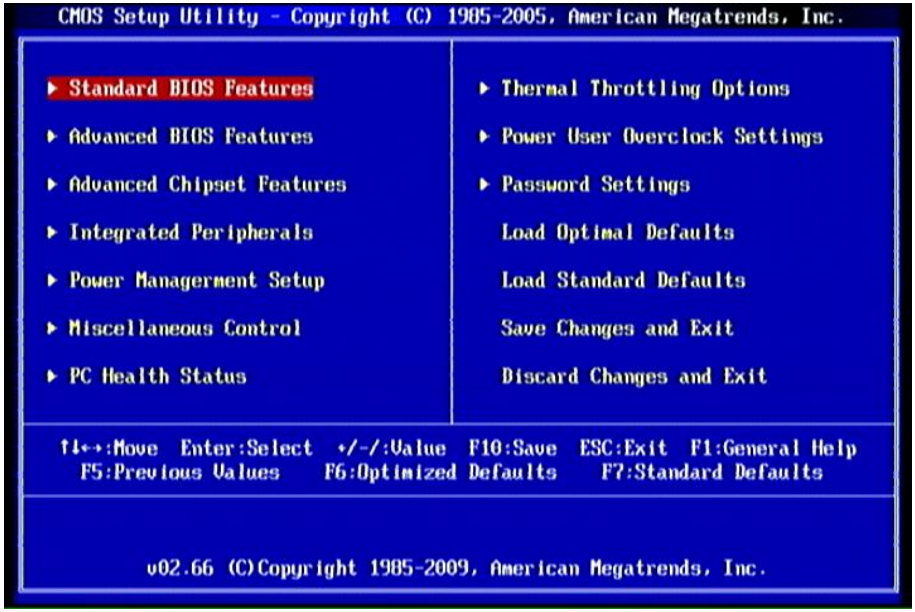


Figure 3-1

Standard BIOS 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 Setup

Use this menu to specify your settings for power management setup.

Miscellaneous Control

Use this menu to specify your settings for Miscellaneous Control.

PC Health Status

Use this item to configure hardware health status.

Thermal Throttling Options

Use this item to configure CPU thermal throttling options.

Power User Overclock Settings

Use this item to change power user overcook settings.

Password Settings

Use this item to set BIOS 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 standard performance setting, but the system would run in a stable way.

Save Changes and Exit

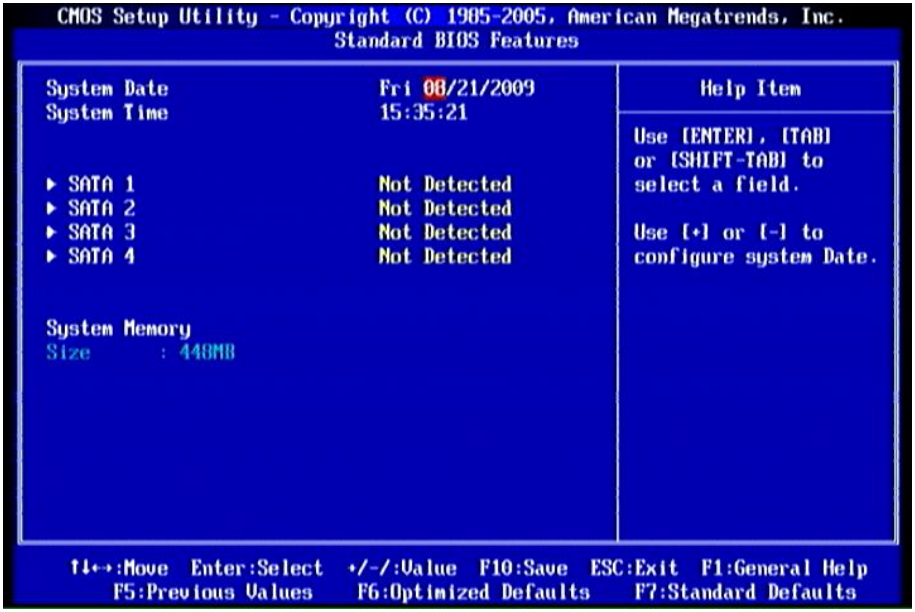
Save CMOS value changes to CMOS and exit setup.

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 <+> or <-> and numerical keyboard keys to select the value you want in each item.



System Date

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

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

Month The month 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.

System Time

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

SATA 1, 2, 3, 4

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

LBA/Large Mode: The optional settings are Auto; Disabled.

Block (Multi-Sector Transfer): The optional settings are: Disabled and Auto.

PIO Mode: the optional settings are: Auto, 0, 1, 2, 3 and 4.

DMA MODE: the optional settings are Auto, SWDMAn, MWDMAn , UDMAn.

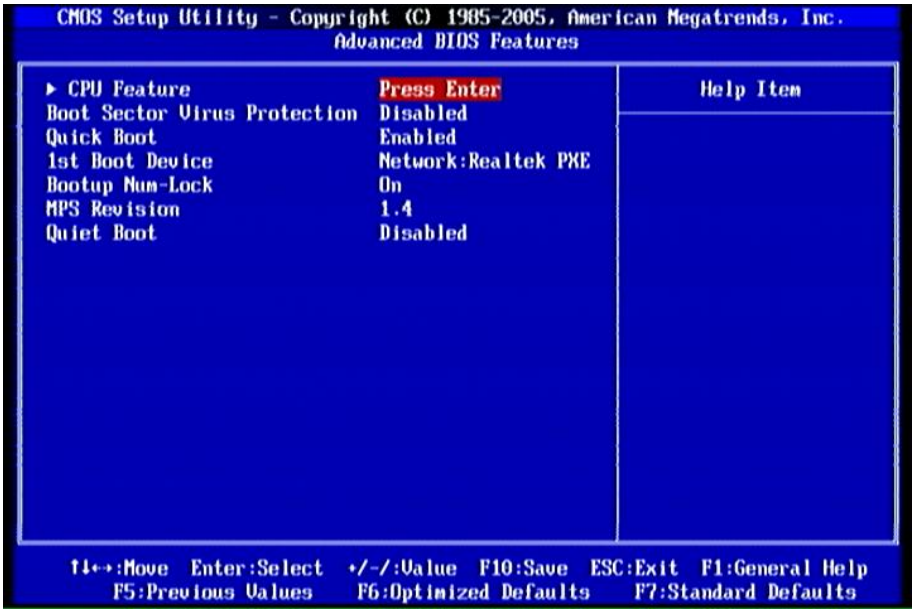
S.M.A.R.T.: This option allows you to enable the HDD S.M.A.R.T Capability (Self-Monitoring, Analysis and Reporting Technology). The optional settings are Auto; Disabled; and Enabled.

32 Bit Data Transfer: the optional settings are: Disabled and Enabled.

System Memory

This item will show information about the memory modules(s) installed.

3-5 Advanced BIOS Features



Boot Sector Virus Protection

The selection Allow 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.

Quick Boot

Allows BIOS to skip certain tests while booting. This will decrease the needed to boot the system.

1st Boot Device

Use this item to specified the boot sequence from the available devices. A device enclosed in parenthesis has been disabled in the corresponding type menu.

Boot Up NumLock Status

The default value is On.

On (default) Keypad is numeric keys.

Off Keypad is arrow keys.

MPS Revision

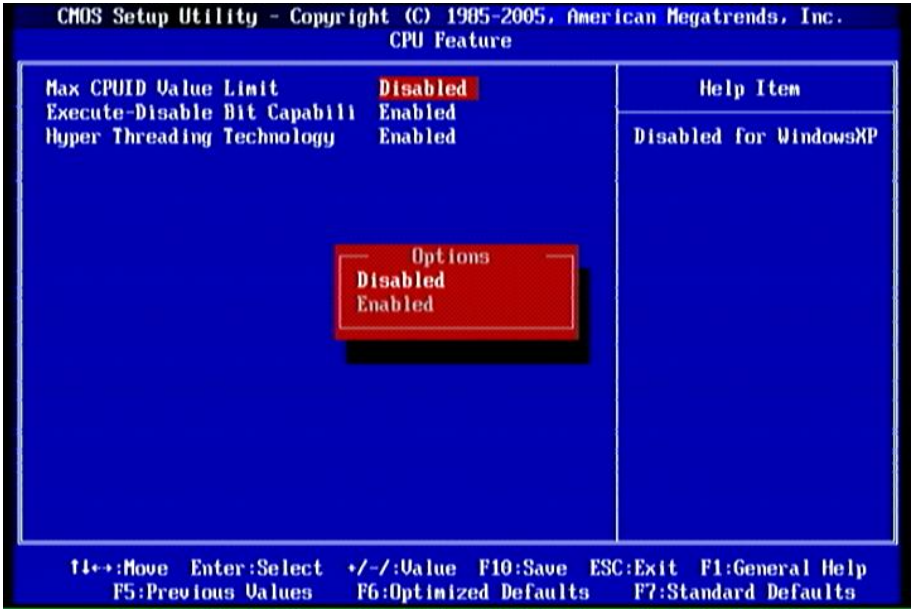
This option is only valid for multiprocessor motherboards as it specifies the version of the Multiprocessor Specification (MPS) that the motherboard will use. The optional settings are: 1.1; 1.4.

Quiet Boot

Disabled: Displays normal POST messages.

Enabled: Display OEM logo instead of POST messages.

3-5-1 CPU Features



Max CPUID Value Limit

Set it as Disabled for Windows XP. The optional settings are: Enabled; Disabled.

Execute-Disable Bit Capabili

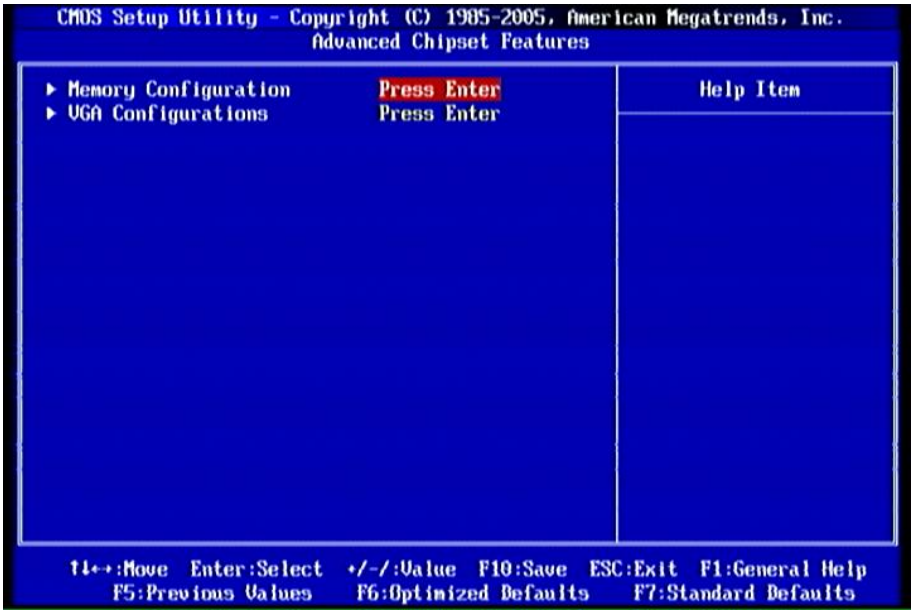
When disabled, force the XD feature flag to always return 0. The optional settings are: Enabled; Disabled.

Hyper Threading Technology

Enabled for Windows XP and Linux(OS optimized for Hyper Threading Technology) and disabled for other OS(OS not optimized for Hyper-Threading Technology).

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.



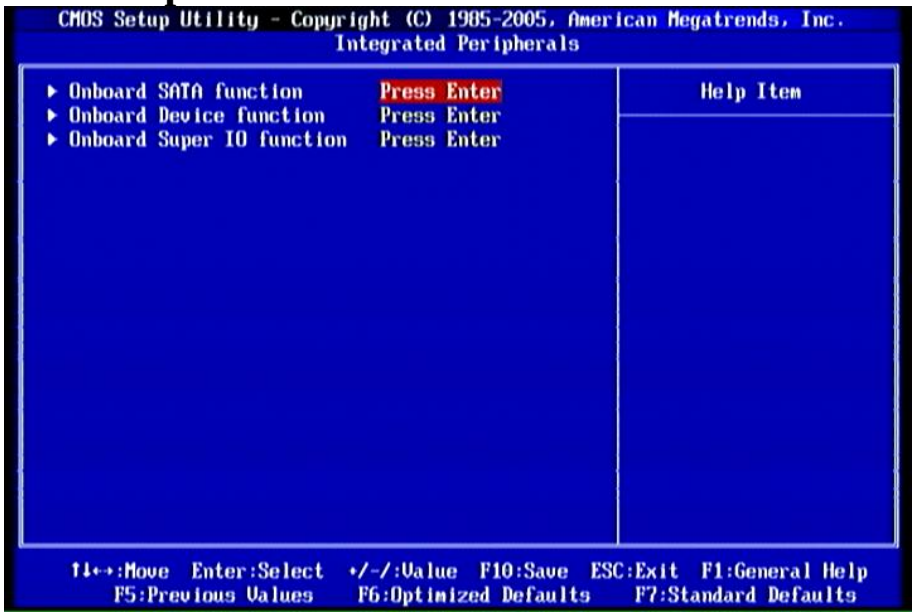
Memory Configuration

Press Enter to set memory timing by auto or manual mode. The optional settings are: Auto; Manual.

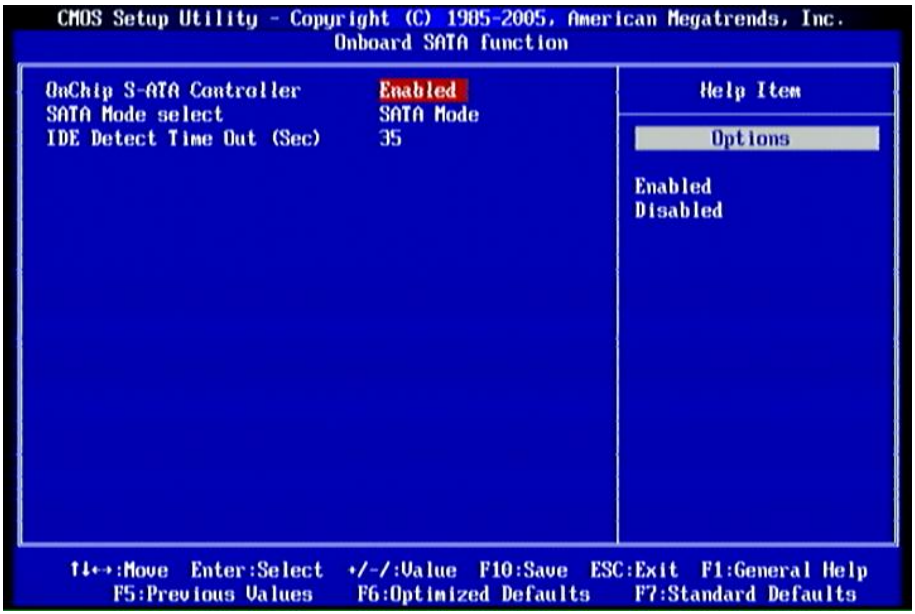
VGA Configuration

Press Enter to change setting for: iGPU Frame Buffer Detect and iGPU Frame Buffer Size

3-7 Integrated Peripherals



3-7-1 Onboard SATA Function



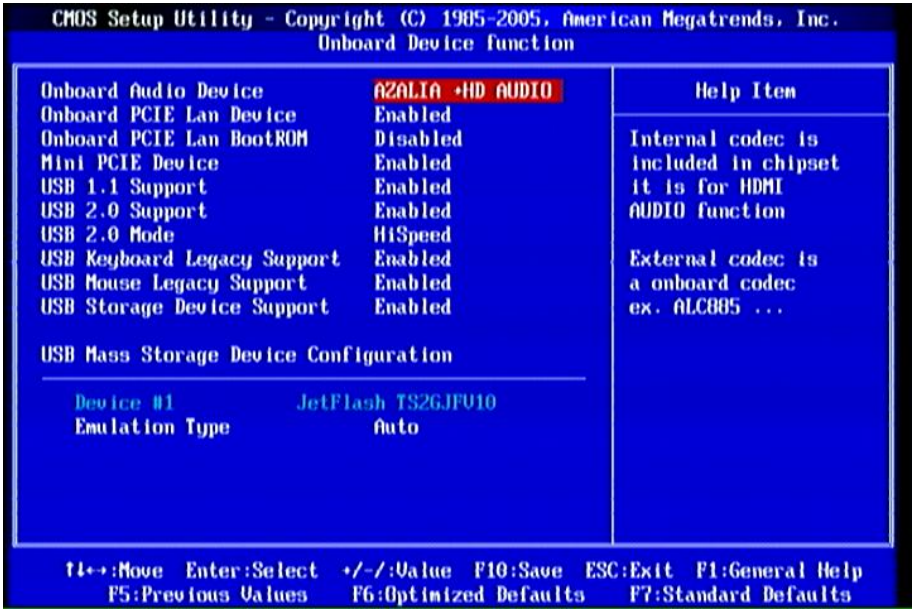
SATA Mode Select

Use this item to set SATA mode. The optional settings are: SATA Mode; RAID Mode; AHCI Mode.

IDE Detect Time Out(Sec)

Use this item to select the time out value for detecting ATA/ATAPI devices.

3-7-2 Onboard Device Function



Onboard Audio Device

The optional settings are: Disabled; AZALIA+HD AUDIO; AZALIA ONLY; HD AUDIO ONLY.

USB 1.1/2.0 Support

Use this item to enable or disable USB 1.1 function support.

USB 2.0 Mode

The optional settings are: FullSpeed(480Mbps); HiSpeed(12Mbps).

USB Keyboard Legacy Support

Enable Legacy support for USB keyboard device.

USB Mouse Legacy Support

Enable Legacy support for USB mouse.

USB Storage Device Support

Enable Legacy support for USB mass storage devices.

3-7-3 Onboard Super IO Function

Onboard CIR Port

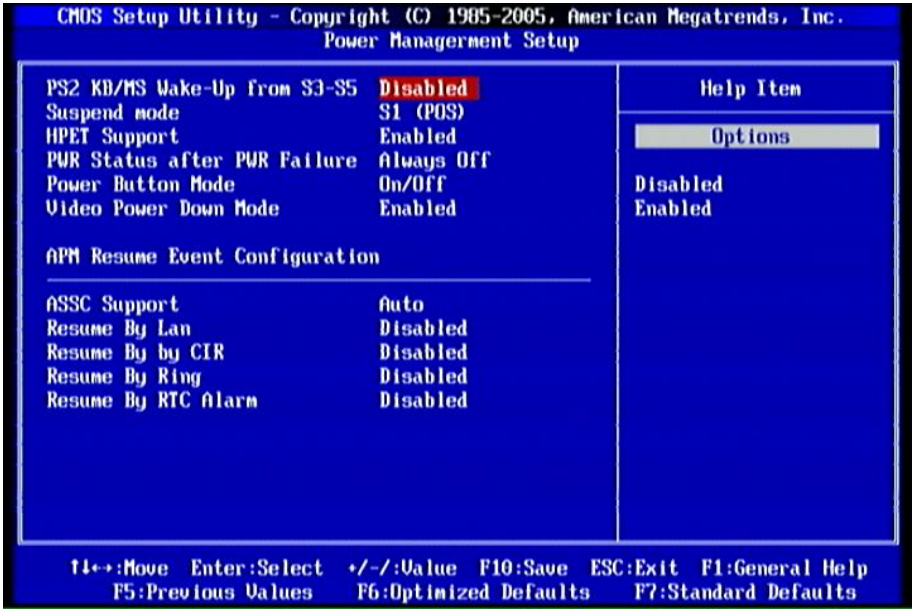
Use this item to enable or disable support for onboard CIR port.

Serial Port1 Address

This allows BIOS to select serial port1 base addresses.

3-8 Power Management Setup

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.



Suspend Mode

Use this item to select the ACPI sate used for system suspend. The optional settings are: S1(POS); S3(STR).

PWR Status after PWR failure

The optional settings are: Always Off; Always On; Former Status.

Power Button Mode

This item determines system to go into On/Off, or suspend when power button is pressed. The optional settings are: On/Off; Delay 4Sec.

ASSC Support

Disabled: Disable ASSC function.

Auto; Auto detect resume item use or not for save more power under power off state.

Resume by Lan / Ring/RTC Alarm

Use these items to disable or enable PCIE PME/Ring/RTC to generate a wake event.

3-9 Miscellaneous Control

iGPU Spread Spectrum

The optional settings are; Disabled; 1.00% Tri-Down; 2.00% Tri-Down; 3.00% Tri -own; 5.00% Tri-Down ; 2.00% Tri-Down(0608).

IRQ Resources

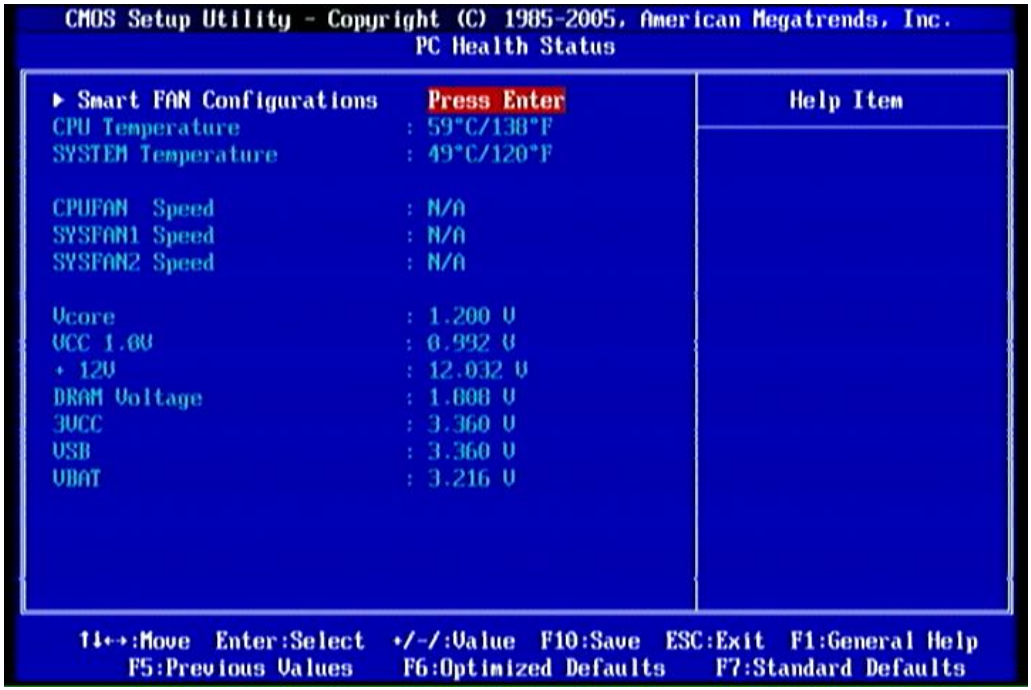
Set it as Available or Reserved.
Available: Specified IRQ is available to be used by PCI/PnP devices.
Reserved: Specified IRQ is reserved for used by legacy ISA devices.

Palette Snooping

The optional settings are: Enabled; Disabled.
Enabled: informs the PCI devices that an ISA graphics device is installed in the system so the card will function correctly.

3-10 PC Health Status

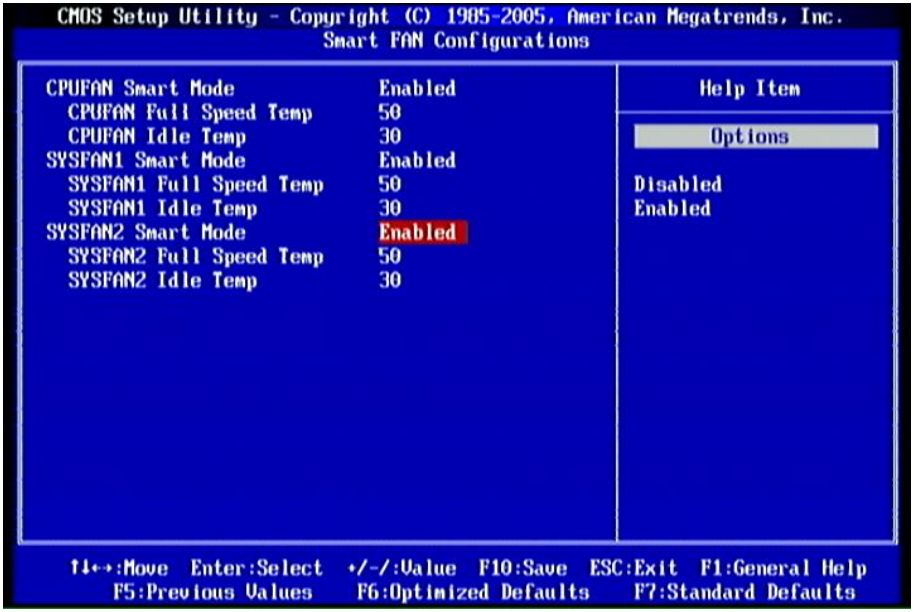
This section shows the Status of you CPU, Fan, and Warning for overall system status. This is only available if there is Hardware Monitor onboard.



CPU Temperature/ System Temperature/CPUFAN Speed/SYSFAN1 Speed/SYSFAN2 Speed /Vcore/VCC1.0V/+12V/DRAM Voltage/3VCC/ VSB/VBAT

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

3-10-1 Smart FAN Configuration



CPUFAN/SYSFAN1/SYSFAN2 Smart Mode
The optional settings are: Enabled; Disabled. When set as Enabled, user can set value for CPUFAN/SYSFAN1/SYSFAN2 Full Speed Temp. And CPUFAN/SYSFAN1/SYSFAN2 Idle Temp.

CPUFAN/SYSFAN1/SYSFAN2 Full Speed Temp.
The setting ranges from 20 to 70.

CPUFAN/SYSFAN1/SYSFAN2 Idle Temp.
The setting ranges from 20 to 70.

3-11 Thermal Throttling Options

CPU Thermal Throttling Options

The optional settings are: Enabled; Disabled. When set as Enabled, user can set values for sub-items such as: CPU Thermal Throttling Temp., CPU Thermal Throttling Beep and CPU Thermal Throttling Duty.

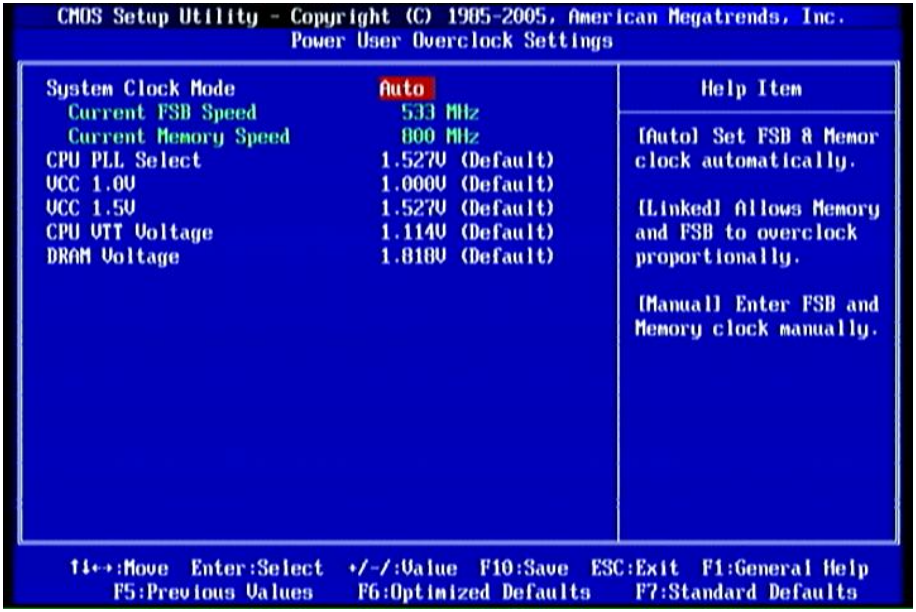
CPU Thermal Throttling Temp.

The setting ranges from 20 to 70.

CPU Thermal Throttling Duty

The setting ranges from 12.5% to 87.5%.

3-12 Power User Overclock Settings



System Clock Mode

The optional settings are: Auto; Manual.When set as Manual, user can sets FSB frequency depend on CPU ranged from 533 to 800 (MHz) and sets memory frequency from 667 to 1066(MHz).

CPU PLL Select

The setting ranges from 1.527v(Default) to 2.530v.

VCC 1.0V

The setting ranges from 1.000v(Default) to 1.992v.

VCC1.5V

The setting ranges from 1.527v(Default) to 3.031v

CPU VTT Voltage

The setting ranges from 1.114v(Default) to 2.210v.

DRAM Voltage

The setting ranges from 1.818v(Default) to 2.500v.

3-13 Password Setting

You can set either supervisor or user password, or both of them. The differences are:
Change Supervisor password: Can enter and change the options of the setup menus.
Change 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 New Word:
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.

3-14 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.

3-15 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 and Exit

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.