

***USER'S MANUAL***  
***Of***  
***AMD 790X & AMD SB750***  
***Based***  
***M/B For Socket AM2+ 64-bit Quad Core***  
***AMD Processor***

*NO. G03-HA03ULTRA -F*

*Rev: 4.0*

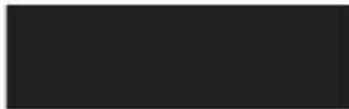
**Release date: October, 2009**

**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	Revision History	Date
4.0	Fourth Edition	October, 2009

### Item Checklist

- AMD 790X Chipset based motherboard
- AMD 790X Chipset motherboard User's Manual
- CD for Motherboard Utilities
- I/O Back Panel Shield
- 8 in 1 Cable Package

## AMD K10 Processor Family Cooling Solutions

As processor technology pushes to faster speeds and higher performance with increasing operation clock, thermal management becomes increasingly crucial while building computer systems. Maintaining the proper computing environment without thermal increasing is the key to reliable, stable, and 24 hours system operation. The overall goal is keeping the processor below its specified maximum case temperature. Heatsinks induce improved processor heat dissipation through increasing surface area and concentrated airflow from attached active cooling fans. In addition, interface materials allow effective transfers of heat from the processor to the heatsink. For optimum heat transfer, AMD recommends the use of thermal grease and mounting clips to attach the heatsink to the processor.

Please refer to the AMD official website for collection of heatsinks evaluated and recommended for Socket AM2+ processors by AMD. In addition, this collection is not intended to be a comprehensive listing of all heatsinks that support Socket-AM2+ processors.

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# Chapter 1

## Introduction of AMD 790X CrossFire Motherboards

### 1-1 Features of motherboard

The AMD 790X CrossFire chipset motherboard series are based on the latest AMD 790X CrossFire Chipset and the SB750 chipset which supports the innovative 64-bit AMD Socket AM2+ dual core multi-tasking Socket AM2+ AMD Phenom™ processors. With an integrated low-latency high-bandwidth DDRII memory controller and a highly-scalable Hyper Transport technology-based system bus up to 2 GHZ. AMD 790X CrossFire Platform Processor Chipset motherboard series deliver the outstanding system performance and professional desktop platform solution with the advantages of 64-bit AMD Socket AM2+ and Socket AM2 AMD Phenom™ FX, AMD Phenom™, Athlon64 FX , Athlon64 X2, Athlon64 & Sempron processors.

The AMD 790X CrossFire Series motherboards support new generation Socket AM2+ processors with an integrated DDRII memory controller for Dual channel DDRII533 /DDRII667 /DDRII800/DDRII1066(AM2 Sempron processors only support up to DDRII667 memory) DDRII Module up to 8 GB. The motherboard is embedded with SB750 chipset of providing ULTRA ATA 133 connector and Serial ATA2 with RAID 0 ,1 , 10, 5 and JBOD functions which support up to two IDE and six Serial ATA2 devices to accelerate hard disk drives and guarantee the data security without failure in advanced computing performance.

The AMD 790X CrossFire motherboards provide 10/100/1000 LAN function with PCI-E Gigabit LAN chip which supports optional 10/100/1000Mbps data transfer rate. And the embedded Azalia 8-channel ALC888 Audio CODEC is fully compatible with Sound Blaster Pro standards that offer you with the home cinema quality and satisfying software compatibility.

The AMD 790X CrossFire Series motherboards deliver outstanding value and performance for gamers, with a true bandwidth design for Multi-GPU configurations. This high bandwidth architecture in the AMD 790X chipset is combined with the flexibility for single or dual card configurations. The AMD 790X chipset provide two x16@8 lane PCI Express 2.0 slots to support simultaneous operation of graphics cards for astonishing performance with brilliant and intense 3D graphics.

AMD 790X CrossFire Series motherboard series offer two PCI-Express2.0 x16@ 8 lane graphics slots. Each PCI-Express2.0 x16 slots deliver up to 4 Gbyte/sec data transfer rate at each relative direction and up 8 Gbyte/sec concurrently. When activated in 8 lane + 8 lane CrossFire mode, the speed of these two graphics cards can be as high as 16 Gbyte/sec. Two PCI Express2.0 x1 I/O slot offers 1 Gbyte/sec concurrently, over 7 times more bandwidth than PCI at 133Mbyte/sec, tackling the most demanding multimedia tasks nowadays .The AMD 790X CrossFire motherboards also carry two 32-bit PCI slots guarantee the rich connectivity for the I/O peripheral devices.

Embedded USB controllers as well as capability of expanding to 12 of USB2.0 functional ports delivering 480Mb/s bandwidth of rich connectivity, these motherboards meet the future

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USB demands which are also equipped with hardware monitor function on system to monitor and protect your system and maintain your non-stop business computing.

Some special features--- *CPU Thermal Throttling/ CPU Vcore X-shift / CPU Smart Fan / DeBug Port OC-CON/CMOS Button/Power On Button/Reset Button* in this motherboard are designed for power user to use the over-clocking function in more flexible ways. But please be caution that the over-clocking maybe causes the fails in system reliabilities. This motherboard provides the guaranteed performance and meets the demands of the next generation computing. But if you insist to gain more system performance with variety possibilities of the components you choose, please be careful and make sure to read the detailed descriptions of these value added product features, please get them in the coming section.

## **1-1.1 Special Features of Motherboard**

### **CPU Thermal Throttling Technology--- (The CPU Overheat Protection Technology)**

To prevent the increasing heat from damage of CPU or accidental shutdown while at high workload, the CPU Thermal Throttling Technology will force CPU to enter partially idle mode from 87.5% to 12.5% according to preset CPU operating temperature in BIOS (from 40 °C to 90°C). When the system senses the CPU operating temperature reaching the preset value, the CPU operating bandwidth will be decreased to the preset idle percentage to cool down the processor. When at throttling mode the beeper sound can be optionally selected to indicate it is in working. (For detail operating please read Section 3-11 Bi-turbo Configuration)

### **CPU Smart Fan---( The Noise Management System )**

It's never been a good idea to gain the performance of your system by sacrificing its acoustics. CPU Smart Fan Noise Management System is the answer to control the noise level needed for now-a-day's high performance computing system. The system will automatically increase the fan speed when CPU operating loading is high, after the CPU is in normal operating condition, the system will low down the fan speed for the silent operating environment. The system can provide the much longer life cycle for both CPU and the system fans for game use and business requirements.

### **CPU Vcore X-Shift--- (Shift to Higher Performance)**

The CPU voltage can be adjusted up by 31 steps for the precisely over-clocking of extra demanding computing performance.

### **Debug Port --- ( The Professional Hardware Diagnosis System )**

Being bugged of abnormal system failure through the tossed and turned nights no more, the embedded Hardware Debug Port offers you the real-time visual system healthy for the demanding usage of computing. No more bugging by unknown system failure and no more time wasted in the first moment of 24-hour nonstop ping business computing, the embedded Debug Port will turn you into a well training hardware professional with the seeing system situation. (The Post Code please refer to appendix)

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## **OC-CON --- ( High-polymer Solid Electrolysis Aluminum Capacitors )**

The working temperature is from 55 degrees Centigrade below zero to 125 degrees Centigrade, OC-CON capacitors possess superior physical characteristics that can be while reducing the working temperature between 20 degrees Centigrade each time, intact extension 10 times of effective product operation lives, at not rising degrees Centigrade of working temperatures each time a relative one, life of product decline 10% only too.

### **CMOS2 Button**

The CMOS Button is to facilitate the clear COMS process for power user overclocking function. The user can easily clear or restore COMS settings by pressing down the button,without taking trouble to remove the case and locate the jumper for clear CMOS.

### **Power on Button**

You can easily start the computer by pressing down this button for a few seconds, without troubling yourself to locate the front panel jumpers to find the Power on jumper.

### **Reset Button**

You can easily restart the computer by pressing down this button for a few seconds, without troubling yourself to locate the front panel jumpers to find the reset jumper.

## 1-2 Specification

Spec	Description
<b>Design</b>	* ATX form factor 4 layers PCB size: 30.5cm x24.5cm
<b>Chipset</b>	* AMD 790X North Bridge Chipset * AMD SB750 South Bridge Chipset
<b>CPU Socket AM2+</b>	* Support 64bit AMD Socket AM2+ processor utilizing Flip-Chip Pin Grid Array package * Support for AMD Athlon64 Dual –Core Athlon 64x2 processor, Athlon 64 & Sempron Processors with HTT Frequency 1GHz and the latest AMD Phenom™ FX, AMD Phenom™ processors with HTT Frequency up to 2GHz.
<b>Memory Socket</b>	* 240-pin DDRII Module socket x 4 * Support 4pcs DDRII533/DDRII667/DDRII800/DDRII1066 Modules Expandable to 8 GB * Dual channel supported
<b>Expansion Slot</b>	* PCI-Express2.0 x16 slot 2pcs deliver up to 4GB/s concurrent bandwidth in Non-CrossFire mode and 16GB/s concurrent bandwidth while CrossFire mode being activated( With a switch card installed on PE4, PE1 will have function equal to PCI-Express2.0x16@16 lane and the speed of PE1 will double). * 2pc PCI-Express2.0 x1 slot each delivers up to 1GB/s concurrent bandwidth * 32-bit PCI slot x 2pcs
<b>Integrate IDE and Serial ATA2 RAID</b>	* One IDE controllers support PCI Bus Mastering, ATA PIO/DMA and the ULTRA DMA 33/66/100/133 functions that deliver the data transfer rate up to 133 MB/s for 2 IDE Devices and for 6 Serial ATA2 ports providing 300 MB/sec data transfer rate with RAID 0, 1, 10,5 and JBOD functions
<b>Gigabit LAN</b>	* Integrated PCI-E 10 / 100 / 1000 LAN. * Support Fast Ethernet LAN function of providing 10Mb/100Mb/1000 Mb/s data transfer rate
<b>8 CH-Audio</b>	* Realtek ALC888 Azalia 8-channel Audio Codec integrated * Support 8-channel 3D surround & Positioning Audio * Audio driver and utility included
<b>BIOS</b>	* AMI 8MB SPI Flash ROM BIOS
<b>Multi I/O</b>	* PS/2 keyboard and PS/2 mouse connectors * Floppy disk drive connector x1/ Hard disk drive connector x1 * SPDIF In/Out Connector x1 * ESATA Connector x1 * USB2.0 port x 6 and headers x 3 * RJ45 LAN Connector x1 * Audio connector x1 (Line-in, Line-out, MIC/ 8CH Audio) * Parallel port header x1 / Serial port header x1 * HDMI-SPDIF header x1 / IR headerx1

## 1-3 Performance List

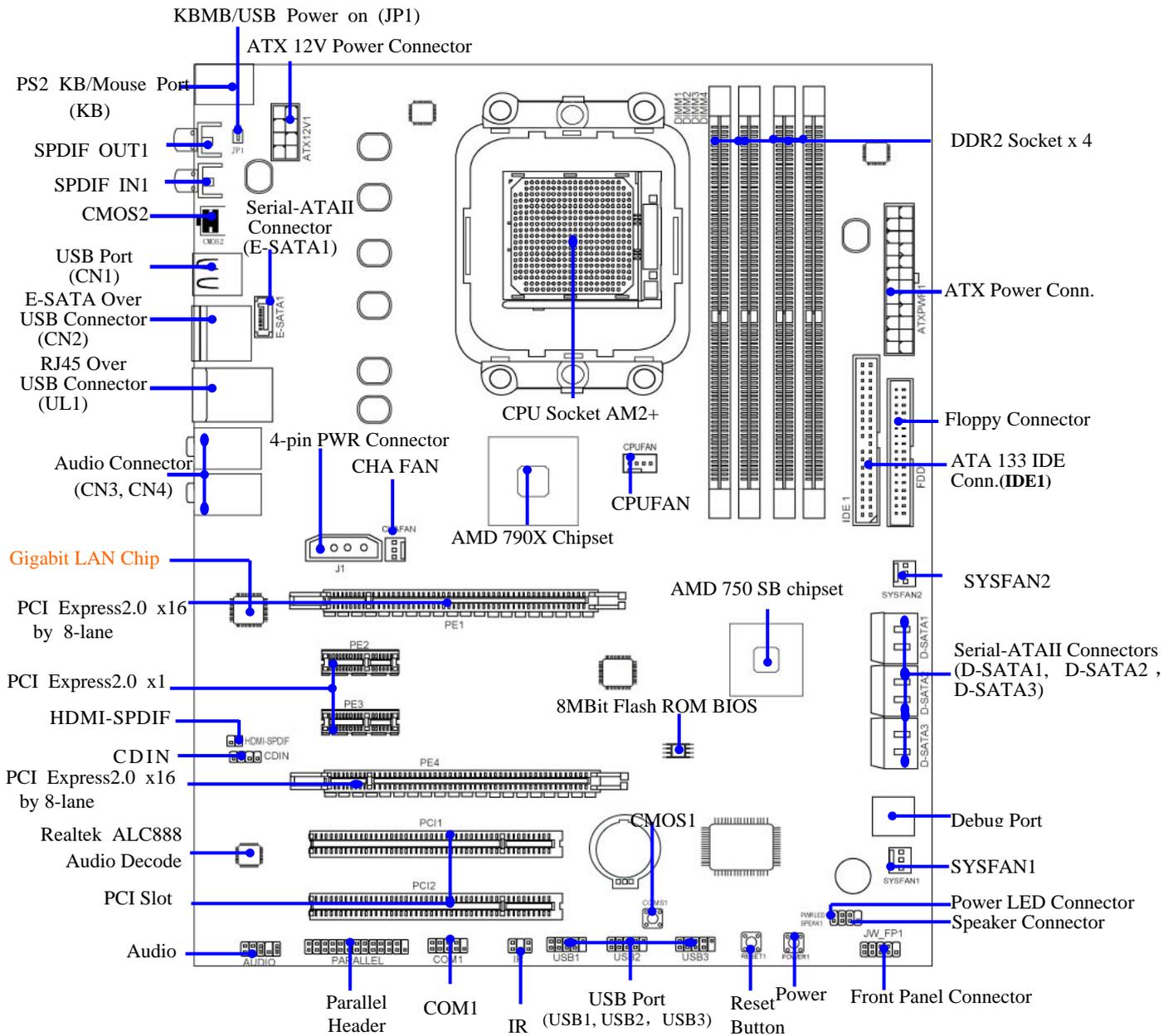
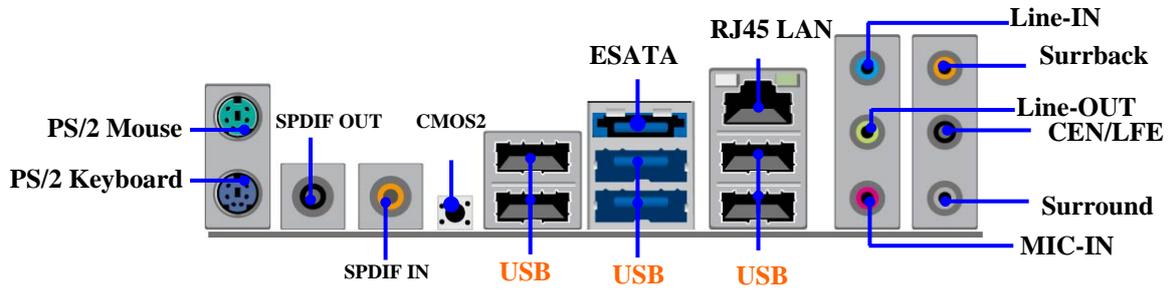
The following performance data list is the testing result of some popular benchmark testing programs. These data are just referred by users, and there is no responsibility for different testing data values gotten by users (the different Hardware & Software configuration will result in different benchmark testing results.)

### Performance Test Report

**CPU:** AMD K8 Sempron2800+  
**DRAM:** Corsair DDR2-800 512MB Memory  
**VGA Card :** GeForce6600GTEI 128C  
**Hard Disk Driver:** Maxtor IDE 80GB  
**BIOS:** Toc  
**OS:** Windows XP Professional (SERVICE PACK 2)

		AMD 790X
<b>3D Mark 2001SE</b>		14485
<b>3D Mark 2003</b>		7786
<b>3D Mark 2005</b>		3420
<b>AQUAMRK3 (GFX / CPU)</b>		45990
<b>PCMark2004</b>		
<b>System / CPU / Memory</b>		3116/2961/4007
<b>Graph / HDD</b>		4511/4017
<b>Content Creation Winstone 2004</b>		22.8
<b>Business Winstone 2004</b>		20.7
<b>Winbench 99 V2.0:</b>		
<b>Business/Hi-end GraphicWinmark99</b>		N/A
<b>Business/Hi-end Graphic Winmark</b>		18600
<b>SISMark 2004: SISMark Rating(Internet Content Creation / Office Productivity )</b>		
<b>SISMark 2007</b>		54
<b>3D Creation</b>		52
<b>Web publication E-learning</b>		51
<b>Productivity</b>		65
<b>Video Creation</b>		48
<b>SISOFT Sandra 2004 : 1.CPU Arithmetic Benchmark 2.Memory bandwidth Benchmark 3.CPU Multi-Media Benchmark</b>		
<b>1.Dhrystone ALU</b>	<b>MIPS</b>	5456
<b>Whetstone FPU iSSE2</b>	<b>FLOPS</b>	4870
<b>2.Int/Float Buffered iSSE2</b>	<b>MB/S</b>	4307/4256
<b>3.Integer/Floating-Point</b>	<b>IT/S</b>	14954/16256
<b>UT2003 Benchmark (flyby/botmatch)</b>		180.9/59
<b>Quake3 DEMO1 /DEMO2</b>		<b>FPS</b> 250.9/244.6
<b>DOOM 3</b>		<b>FPS</b> N/A
<b>Super Pi (1M)</b>		<b>Second</b> 55
<b>CPUZ System / CPU Clock</b>		200x8

# 1-4 Layout Diagram



## Jumpers

Jumper	Name	Description	Page
JP1	Keyboard/USB Power On Enabled/Disabled	3-pin Block	P.7

## Connectors

Connector	Name	Description	Page
ATXPWR1	ATX Power Connector	24-pin Block	P.11
ATX12V1	ATX 12V Power Connector	8-pin Block	P.12
KB	PS/2 Mouse & PS/2 Keyboard Connector	6-pin Female	P.12
USB from CN1,CN2,UL1	USB2.0 Port Connector	4-pin Connector	P.12
ESATA from CN2	External Serial ATA2 Connector	7-pin Connector	P.14
RJ45LAN from UL1	Gigabit LAN Port Connector	RJ-45 Connector	P.12
J2	CrossFire Power Connector	4-Pin Block	P.12
AUDIO : CN3, CN4	8-CH HD Audio Connector	6- phone jack Conn.	P.13
FDD	Floppy Driver Connector	34-pin Block	P.13
IDE1	Primary/Secondary IDE Connector	40-pin Block	P.13
D-SATA1, D-SATA2,D-SATA3, E-SATA1	Serial ATAII IDE Connectors	7-pin Connector	P.14
SPDIF_OUT1	SPDIF Out coaxial Connectors	1- phone jack Conn.	P.15
SPDIF_IN1	SPDIF In coaxial Connectors	1- phone jack Conn.	P.15

## Headers

Header	Name	Description	Page
AUDIO1	SPEAKER, MIC header	9-pin Block	P.15
USB1, USB2 ,USB3	USB Port Headers	9-pin Block	P.15
SPEAK1	PC Speaker connector	4-pin Block	P.15
PWR LED1/ PWR LED	Power LED	3-pin Block	P.16
JW_FP1 (Reset/HDLED/Power Button/PWR LED)	Front Panel Header (including IDE activity LED/Reset switch / Power On Button lead)	9-pin Block	P.16
SYSFAN1/2, CHAFAN	FAN Headers	3-pin Block	P.16
CPUFAN	FAN Header	4-pin Block	P.16
CDIN1	CD Audio-In Header	4-pin Block	P.16
IR	IR infrared module Headers	5-pin Block	P.17
PARALLEL	Parallel Port Header	25-pin Block	P.17
COM1	Serial Port COM1 Header	9-pin Block	P.17
HDMI-SPDIF	SPDIF Out header	2-pin Block	P.18

## Expansion Sockets

Socket/Slot	Name	Description	Page
ZIF Socket AM2+	CPU Socket	940-pin mPGAB Athlon64 CPU Socket	P.8
DIMM1~4	DDRII Module Socket	240-pin DDRII Module Socket	P.9
PCI1~ PCI2	PCI Slots	32-bit PCI Local Bus Expansion slots	P.14
PE2,PE3	PCI-Express2.0 x1Slot	PCI-Express2.0 x1 Expansion Slots	P.11
PE1, PE4	PCI-Express2.0 x16 Slot	PCI-Express2.0 x16 Expansion Slots	P.11

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# Chapter 2

## Hardware Installation

**WARNING!** Turn off your power when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards.

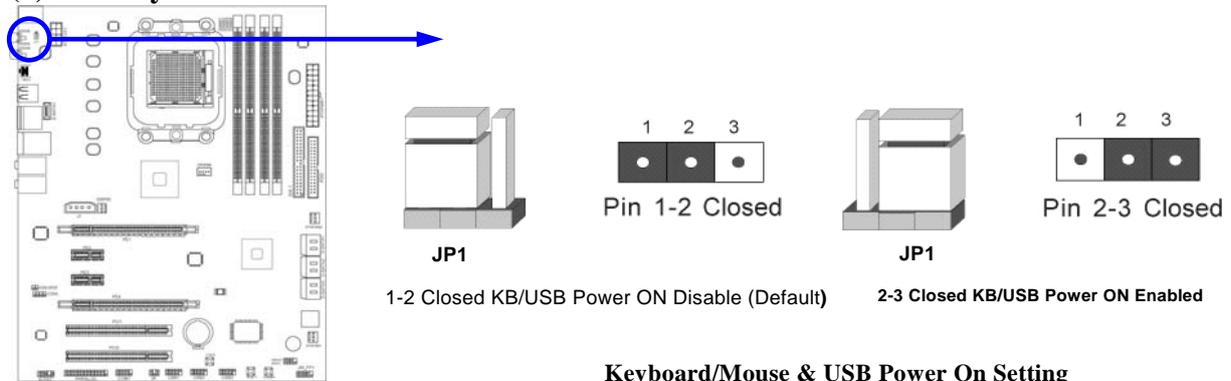
### 2-1 Hardware installation Steps

Before using your computer, you had better complete the following steps:

1. Check motherboard jumper setting
2. Install CPU and Fan
3. Install System Memory (DIMM)
4. Install Expansion cards
5. Connect IDE and Front Panel /Back Panel cable
6. Connect ATX Power cable
7. Power-On and Load Standard Default
8. Reboot
9. Install Operating System
10. Install Driver and Utility

### 2-2 Checking Motherboard's Jumper Setting

#### (1) Keyboard/USB function Enabled/Disabled: JP1



### 2-3 Install CPU

#### 2-3-1 Glossary

**Chipset (or core logic)** - two or more integrated circuits which control the interfaces between the system processor, RAM, I/O devices, and adapter cards.

**Processor slot/socket** - the slot or socket used to mount the system processor on the motherboard.

**Slot (PCI-E, PCI, RAM)** - the slots used to mount adapter cards and system RAM.

**PCI** - Peripheral Component Interconnect - a high speed interface for video cards, sound cards, network interface cards, and modems; runs at 33MHz.

**PCI Express**- Peripheral Component Interconnect Express- a high speed interface for video cards, sound cards, network interface cards, and modems.

**PCI Express2.0**- Peripheral Component Interconnect Express2.0, developed in 2003, the

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speed of each line doubled from the previous PCI-E of 2.5Gbps to 5 Gbps.

**Serial Port** - a low speed interface typically used for mouse and external modems.

**Parallel Port** - a low speed interface typically used for printers.

**PS/2** - a low speed interface used for mouse and keyboards.

**USB - Universal Serial Bus** - a medium speed interface typically used for mouse, keyboards, scanners, and some digital cameras.

**Sound** (interface) - the interface between the sound card or integrated sound connectors and speakers, MIC, game controllers, and MIDI sound devices.

**LAN** (interface) - **Local Area Network** - the interface to your local area network.

**BIOS (Basic Input/Output System)** - the program logic used to boot up a computer and establish the relationship between the various components.

**Driver** - software, which defines the characteristics of a device for use by another device or other software.

**Processor** - the "central processing unit" (CPU); the principal integrated circuit used for doing the "computing" in "personal computer"

**Front Side Bus Frequency** - the working frequency of the motherboard, which is generated by the clock generator for CPU, DRAM and PCI BUS.

**CPU L2 Cache** - the flash memory inside the CPU, normal it depend on CPU type.

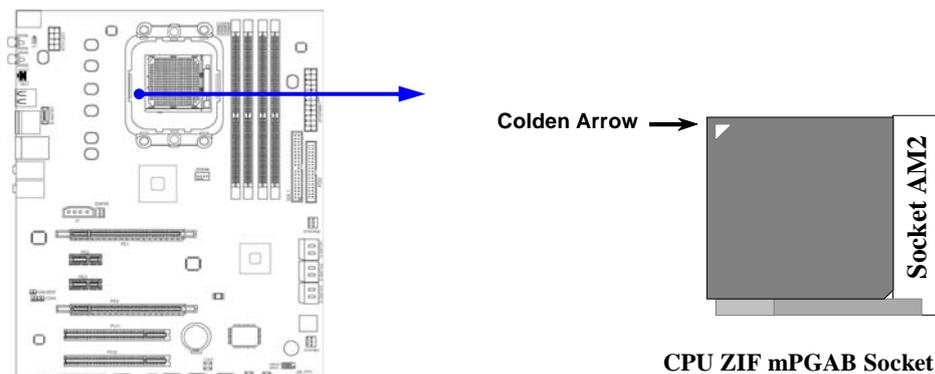
## 2-3-2 About AMD Athlon64 Socket AM2+ CPU

This motherboard provides a surface mount, Zero Insertion Force (ZIF) socket, referred to as the mPGA940 socket supports AMD Athlon64 processor in the package utilizes Flip-Chip Pin Grid Array package technology.

The CPU that comes with the motherboard should have a cooling FAN attached to prevent overheating. If this is not the case, then purchase a correct cooling FAN before you turn on your system.

**WARNING!** Be sure that there is sufficient air circulation across the processor's heatsink and CPU cooling FAN is working correctly, otherwise it may cause the processor and motherboard overheat and damage, you may install an auxiliary cooling FAN, if necessary.

To install a CPU, first turn off your system and remove its cover. Locate the ZIF socket and open it by first pulling the level sideways away from the socket then upward to a 90-degree angle. Insert the CPU with the correct orientation as shown below. The notched corner should point toward the end of the level. Because the CPU has a corner pin for two of the four corners, the CPU will only fit in the orientation as shown.



When you put the CPU into the ZIF socket, No force required to insert of the CPU, and then press the level to locate position slightly without any extra force.

## 2-4 Install Memory

This motherboard provides four 240-pin DDR2 DUAL INLINE MEMORY MODULES (DIMM) socket for DDR2 memory expansion available from minimum memory volume of 128MB to maximum memory volume of 8 GB DDR SDRAM.

### Valid Memory Configurations

Bank	240-Pin DIMM	PCS	Total Memory
Bank 0, 1 (DIMM1)	DDR2 667/DDR2 800/ DDR2 1066 *	X1	128MB~2 GB
Bank 2, 3 (DIMM2)	DDR2 667/DDR2 800/ DDR2 1066*	X1	128MB~2 GB
Bank 4, 5 (DIMM3)	DDR2 667/DDR2 800/ DDR2 1066*	X1	128MB~2 GB
Bank 6,7 (DIMM4)	DDR2 667/DDR2 800/ DDR2 1066*	X1	128MB~2 GB
Total	System Memory (Max 8 GB)	4	128MB~8 GB

\*DDR2 1066 could only be reached in the case of overclocking.

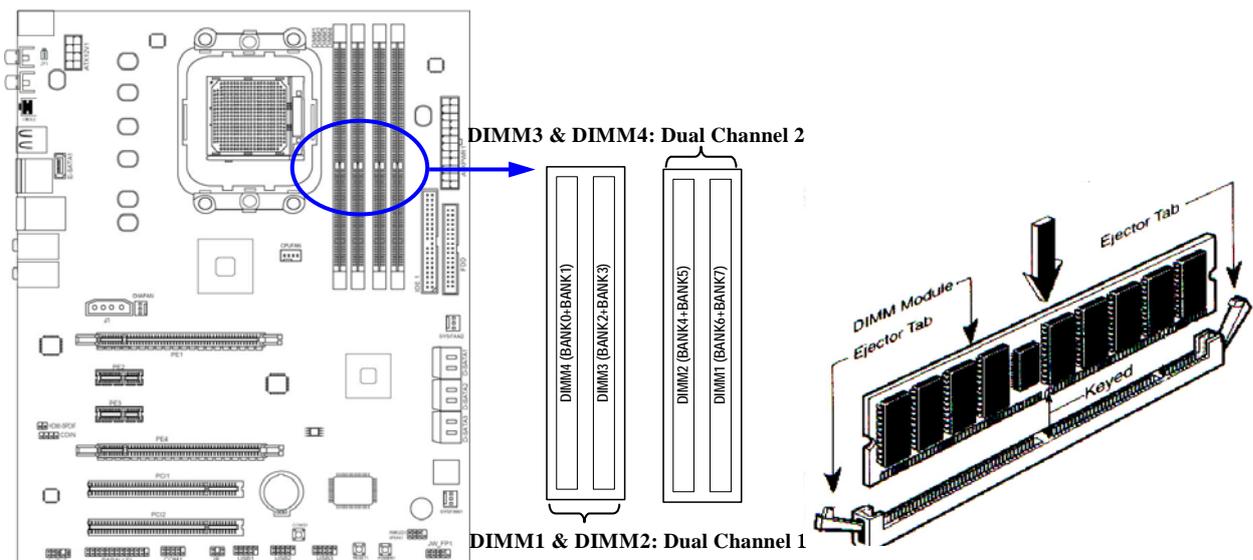
#### Recommend DIMM Module Combination

1. One DIMM Module ----Plug in DIMM1
2. Two DIMM Modules---Plug in DIMM1 and DIMM2 or DIMM3 and DIMM4 for Dual channel function
3. Four DIMM Modules---Plug in DIMM1/DIMM2/DIMM3/DIMM4.

#### Dual channel Limited!

1. Dual channel function only supports when 2 DIMM Modules plug in either both DIMM1 & DIMM2 or DIMM3 & DIMM4, or four DIMM Modules plug in DIMM1~DIMM4.
2. Memory modules plugged in DIMM1 & DIMM2, or DIMM3 & DIMM4 must be of the same type, same size, and same frequency for dual channel function.

Install DDR II modules to your motherboard is not difficult, you can refer to figure below to see how to install a 240-Pin DDRII 667/DDR2 800/DDR21066 module.



#### NOTE!

When you install DIMM module fully into the DIMM socket the eject tab should be locked into the DIMM module very firmly and fit into its indentation on both sides.

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## 2-5 Expansion Cards

### 2-5-1 Procedure For Expansion Card Installation

1. Read the documentation for your expansion card and make any necessary hardware or software setting for your expansion card such as jumpers.
2. Remove your computer's cover and the bracket plate on the slot you intend to use.
3. Align the card's connectors and press firmly.
4. Secure the card on the slot with the screen you remove above.
5. Replace the computer system's cover.
6. Set up the BIOS if necessary.
7. Install the necessary software driver for your expansion card.

### 2-5-2 Assigning IRQs For Expansion Card

Some expansion cards need an IRQ to operate. Generally, an IRQ must exclusively assign to one use. In a standard design, there are 16 IRQs available but most of them are already in use.

#### Standard Interrupt Assignments

IRQ	Priority	Standard function
0	N/A	System Timer
1	N/A	Keyboard Controller
2	N/A	Programmable Interrupt
3 *	8	Communications Port (COM2)
4 *	9	Communications Port (COM1)
5 *	6	Sound Card (sometimes LPT2)
6 *	11	Floppy Disk Controller
7 *	7	Printer Port (LPT1)
8	N/A	System CMOS/Real Time Clock
9 *	10	ACPI Mode when enabled
10 *	3	IRQ Holder for PCI Steering
11 *	2	IRQ Holder for PCI Steering
12 *	4	PS/2 Compatible Mouse Port
13	N/A	Numeric Data Processor
14 *	5	Primary IDE Channel
15 *	1	Secondary IDE Channel

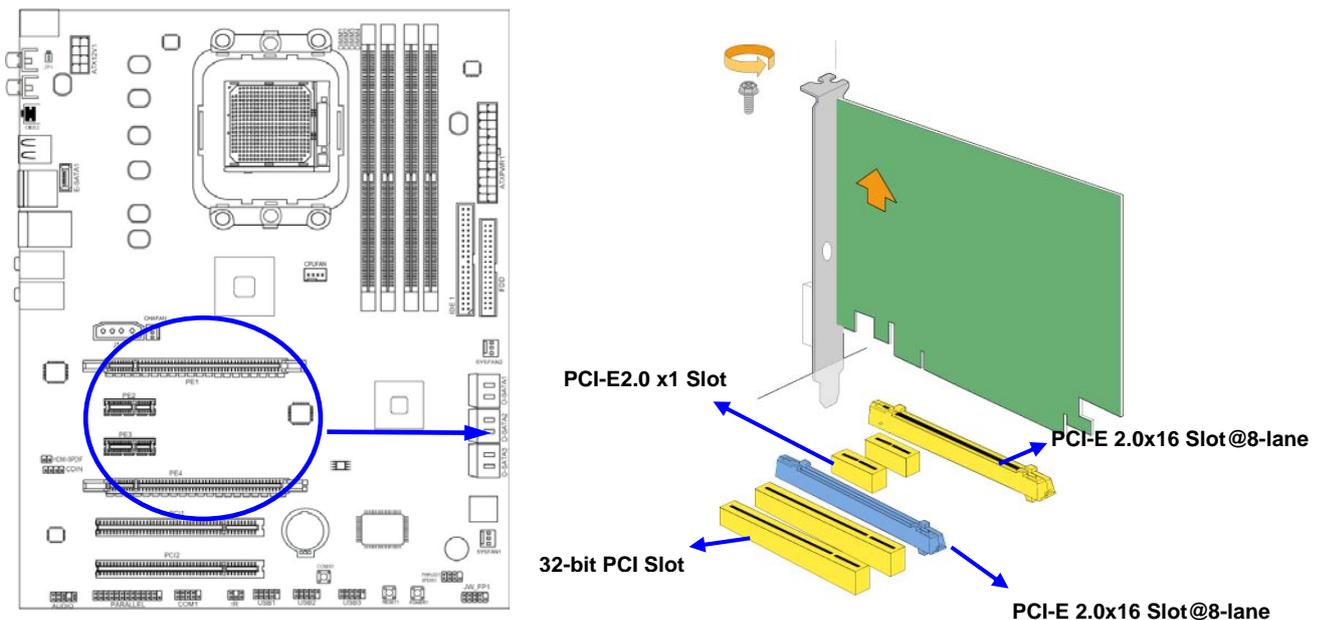
\* These IRQs are usually available for ISA or PCI devices.

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## 2-5-3 PCI Express Slot

AMD 790X CrossFire Series motherboard series offer two PCI-Express2.0 x16@ 8 lane graphics slots. Fully compliant to the PCI Express Base Specification revision 2.0, support PCI Express VGA card, and other PCI Express device. Each PCI-Express2.0 x16 slots deliver up to 4 Gbyte/sec data transfer rate at each relative direction and up 8 Gbyte/sec concurrently. When activated in 8 lane + 8 lane CrossFire mode, the speed of these two graphics cards can be as high as 16 Gbyte/sec. Two PCI Express2.0 x1 I/O slot offers 1 Gbyte/sec concurrently, over 7 times more bandwidth than PCI at 133Mbyte/sec, tackling the most demanding multimedia tasks nowadays.



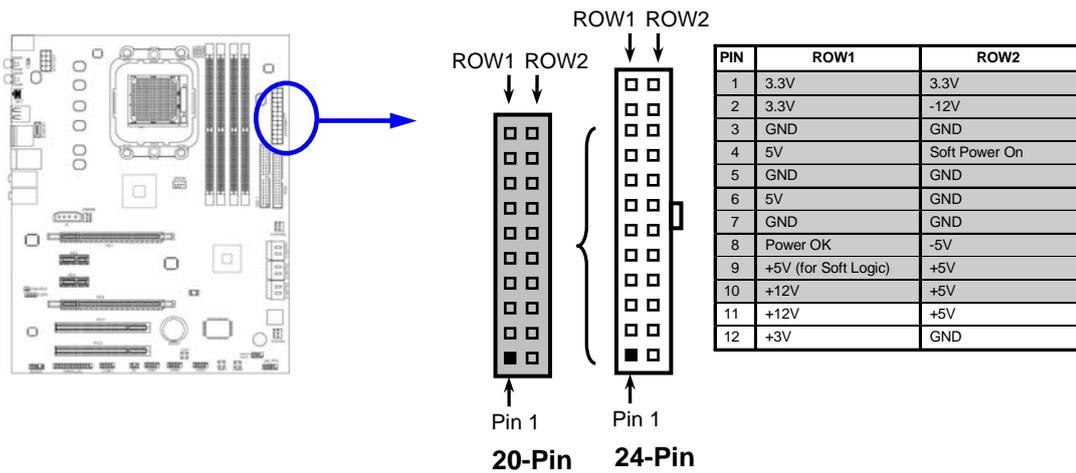
## 2-6 Connectors, Headers

### 2-6-1 Connectors

#### (1) Power Connector (24-pin block) : ATXPWR1

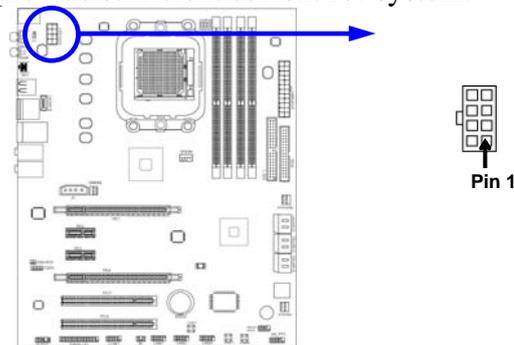
ATX Power Supply connector: This is a new defined 24-pins connector that usually comes with ATX case. The ATX Power Supply allows using soft power on momentary switch that connect from the front panel switch to 2-pins Power On jumper pole on the motherboard. When the power switch on the back of the ATX power supply turned on, the full power will not come into the system board until the front panel switch is momentarily pressed. Press this switch again will turn off the power to the system board.

- \*\* We recommend that you use an ATX 12V Specification 2.0-compliant power supply unit (PSU) with a minimum of 350W power rating. This type has 24-pin and 4-pin power plugs.
- \*\* If you intend to use a PSU with 20-pin and 4-pin power plugs, make sure that the 20-pin power plug can provide at least 15A on +12V and the power supply unit has a minimum power rating of 350W. The system may become unstable or may not boot up if the power is inadequate.



**(2) ATX 12V Power Connector (8-pin block) : ATX12V1**

This is a new defined 8-pins connector that usually comes with ATX Power Supply. The ATX Power Supply which fully supports Socket AM2+ processor must including this connector for support extra 12V voltage to maintain system power consumption. Without this connector might cause system unstable because the power supply can not provide sufficient current for system.



**(3) PS/2 Mouse & PS/2 Keyboard Connector: KB**

The connectors are for PS/2 keyboard and PS/2 Mouse.

**(4) USB Port connector: CN1/CN2/UL1 for USB**

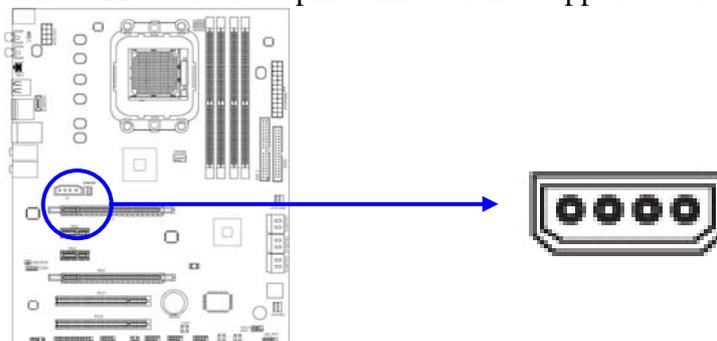
The connectors are 4-pin connector that connects USB devices to the system board.

**(5) LAN Port connector: UL1 for RJ45 LAN**

This connector is standard RJ45 connector for Network. It supports 10M/100Mb/1000Mb s data transfer rate

**(6) Large 4-Pin Power Connector: J2 Power Connector**

The connectors are 4-pin connector that supports extra 12V / 5V power to your system

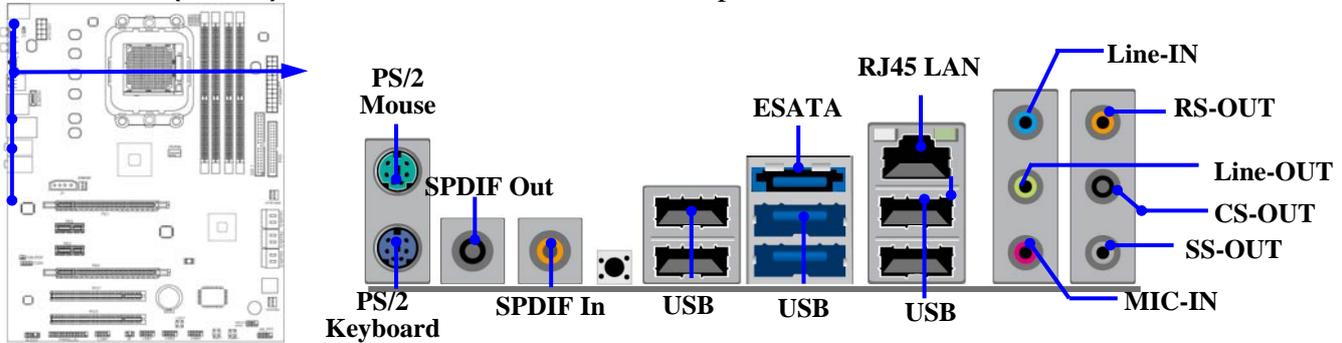


**(7) Audio Line-In, Lin-Out, MIC, RS-Out, CS-Out , SS-Out connector: AUDIO1**

These Connectors are 6 Phone-Jack for LINE-OUT, LINE-IN, MIC, RS-Out, CS-Out , SS-Out audio connections.

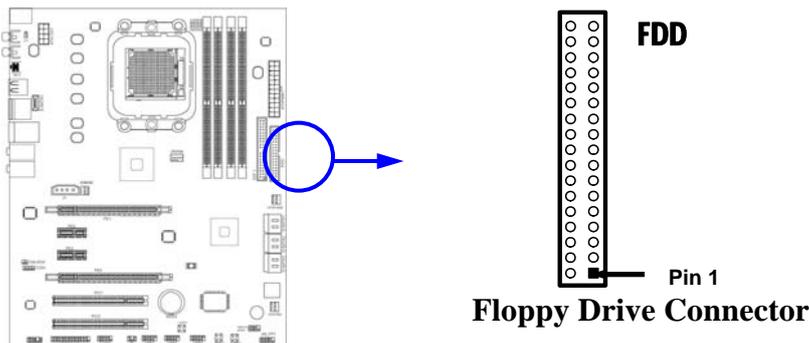
**Line-in : (BLUE)**  
**Line-out : (GREEN)**  
**MIC : (PINK)**  
**RS-OUT : (BLACK)**  
**CS-OUT : (ORANGE)**  
**SS-OUT: (GRAY)**

Audio input to sound chip  
 Audio output to speaker  
 Microphone Connector  
 Rear-Surround audio output  
 Center/ Subwoofer audio output  
 Side-Surround audio output



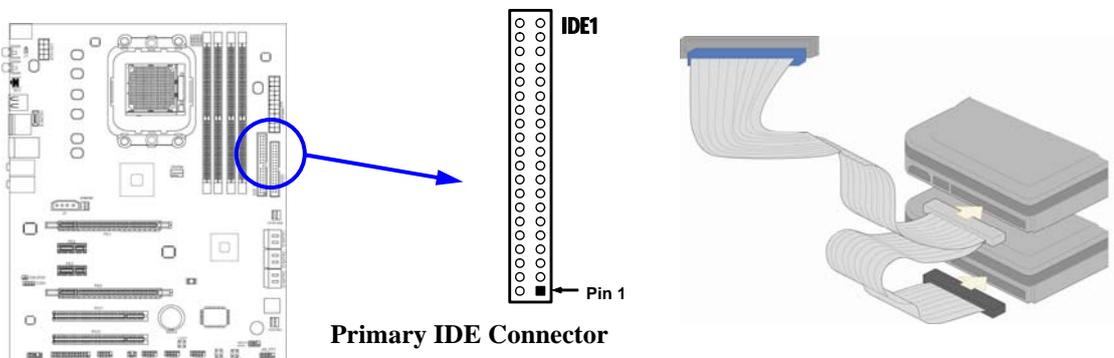
**(8) Floppy drive Connector (34-pin block): FDD**

This connector supports the provided floppy drive ribbon cable. After connecting the single plug end to motherboard, connect the two plugs at other end to the floppy drives.



**(9) Primary IDE Connector (40-pin block): IDE1**

This connector supports the provided IDE hard disk ribbon cable. After connecting the single plug end to motherboard, connect the two plugs at other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumpers accordingly. Please refer to the documentation of your hard disk for the jumper settings.

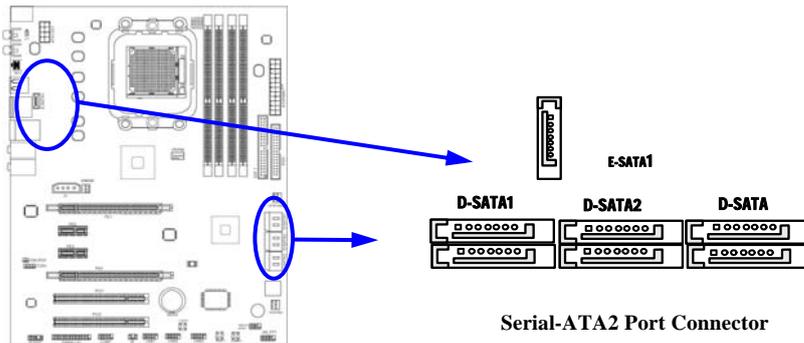


- Two hard disks can be connected to each connector. The first HDD is referred to as the “Master” and the second HDD is referred to as the “Slave”.

- For performance issues, we strongly suggest you don't install a CD-ROM or DVD-ROM drive on the same IDE channel as a hard disk. Otherwise, the system performance on this channel may drop.

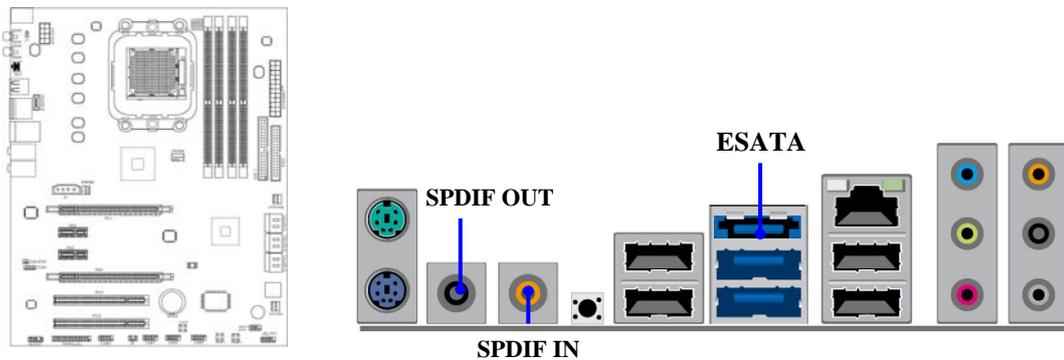
**(10) Serial-ATAII Port connector: D-SATA 1, D-SATA 2, D-SATA 3, E-SATA1**

These connectors support the provided Serial ATA2 hard disk cables to connecting the motherboard with serial ATAII hard disks. E-SATA1 is not for SATA hard drive, it is only for connecting to a SATA connector of the D-SATA1, D-SATA2 or D-SATA3 to let the ESATA port work.



**(11) ESATA Port: CN2 for ESATA**

This connector supports the External Serial ATA2 (ESATA) enable the full SATA interface speed outside the chassis, up to 3Gb/s. The ESATA port can be enabled only when the E-SATA 1 is connected to one connector of D-SATA1, D-SATA2 or D-SATA3.



**(12) SPDIF In/Out header: SPDIF\_IN1/SPDIF\_OUT1**

The SPDIF output is capable of providing digital audio to external speakers or compressed AC3 data to an external Dolby digital decoder. Use this feature only when your stereo system has digital input function. Use SPDIF IN feature only when your device has digital output function.

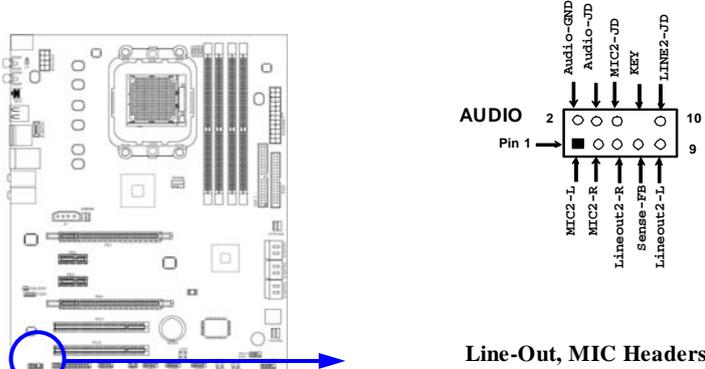
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## 2-6-2 Headers

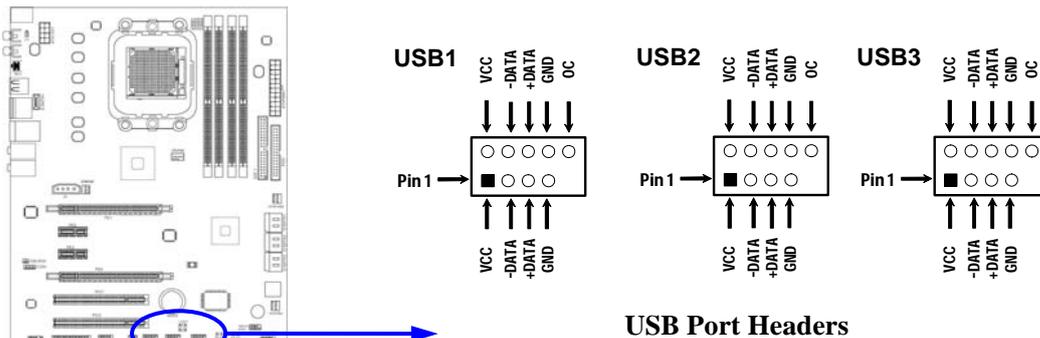
### (1) Line-Out/MIC Header for Front Panel (9-pin): AUDIO1

These headers connect to Front Panel Line-out, MIC connector with cable.



### (2) USB Port Headers (9-pin): USB1/USB2 /USB3

These headers are used for connecting the additional USB port plug. By attaching an option USB cable, you can be provided with two additional USB plugs affixed to the back panel.



### (3) Speaker connector: SPEAK1

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

### (4) Power LED: PWR LED1

The Power LED is light on while the system power is on. Connect the Power LED from the system case to this pin.

### (5) IDE Activity LED: HD LED

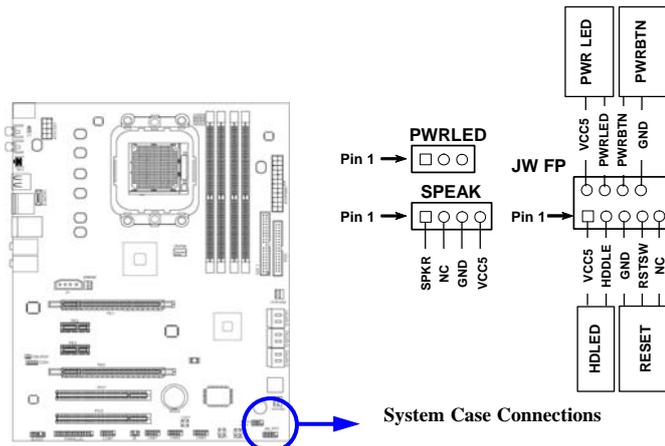
This connector connects to the hard disk activity indicator light on the case.

### (6) Reset switch lead: RESET1

This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch. This is a preferred method of rebooting in order to prolong the life of the system's power supply. See the figure below.

### (7) Power switch: PWR BTN

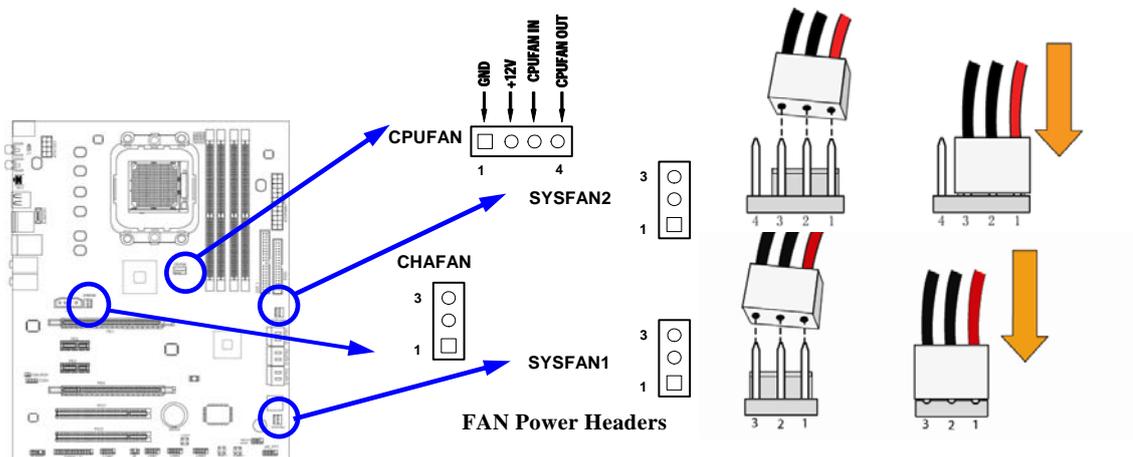
This 2-pin connector connects to the case-mounted power switch to power ON/OFF the system.



System Case Connections

**(8) FAN Power Headers: SYSFAN1, SYSFAN2, CHAFAN (3-pin), CPUFAN (4-pin)**

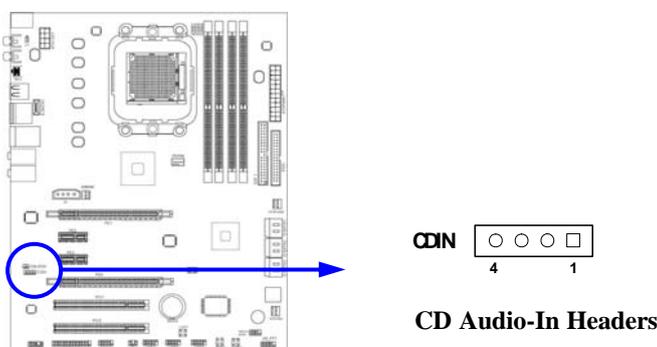
These connectors support cooling fans of 350mA (4.2 Watts) or less, depending on the fan manufacturer, the wire and plug may be different. The red wire should be positive, while the black should be ground. Connect the fan's plug to the board taking into consideration the polarity of connector.



FAN Power Headers

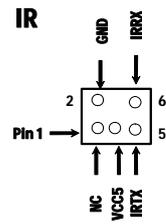
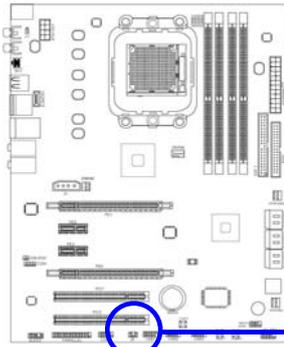
**(9) CD Audio-In Headers (4-pin): CDIN1**

CDIN are the connectors for CD-Audio Input signal. Please connect it to CD-ROM CD-Audio output connector.



**(10) IR infrared module Headers (5-pin): IR**

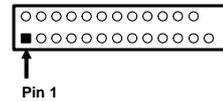
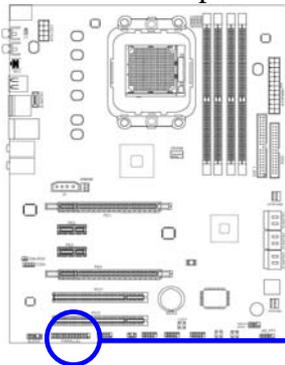
This connector supports the optional wireless transmitting and receiving infrared module. You must configure the setting through the BIOS setup to use the IR function.



IR infrared module Headers

**(11) Parallel Port header (25-pin female): PARALLEL**

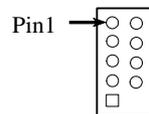
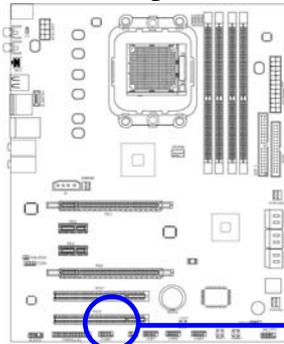
This On-board parallel header is 25-pin header to connect printer.



PARALLEL Connector

**(12) Serial COM Port header: COM1**

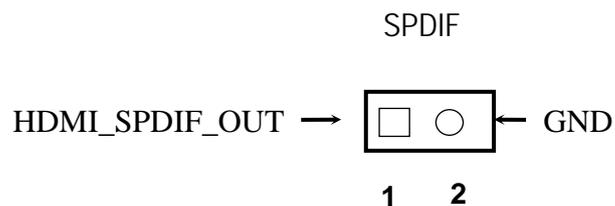
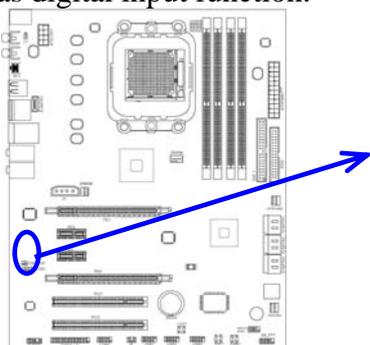
COM2 is a 9-pin RS232 D-Subminiature serial port connector.



Serial COM Port 9-pin Block

**(13) HDMI-SPDIF Out header: SPDIF Out**

The SPDIF output is capable of providing digital audio to external speakers or compressed AC3 data to an external Dolby digital decoder. Use this feature only when your stereo system has digital input function.



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## 2-7 Starting Up Your Computer

1. After all connection are made, close your computer case cover.
2. Be sure all the switch are off, and check that the power supply input voltage is set to proper position, usually in-put voltage is 220V~240V or 110V~120V depending on your country's voltage used.
3. Connect the power supply cord into the power supply located on the back of your system case according to your system user's manual.
4. Turn on your peripheral as following order:
  - a. Your monitor.
  - b. Other external peripheral (Printer, Scanner, External Modem etc...)
  - c. Your system power. For ATX power supplies, you need to turn on the power supply and press the ATX power switch on the front side of the case.
5. The power LED on the front panel of the system case will light. The LED on the monitor may light up or switch between orange and green after the system is on. If it complies with green standards or if it is has a power standby feature. The system will then run power-on test.
6. If you do not see any thing within 30 seconds from the time you turn on the power. The system may have failed on power-on test. Recheck your jumper settings and connections or call your retailer for assistance.
7. During power-on, press <Delete> key to enter BIOS setup. Follow the instructions in BIOS SETUP.
8. **Power off your computer:** You must first exit or shut down your operating system before switch off the power switch. For ATX power supply, you can press ATX power switching after exiting or shutting down your operating system. If you use Windows 9X, click "Start" button, click "Shut down" and then click "Shut down the computer?" The power supply should turn off after windows shut down.

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# 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 <+>/<-> keys when you want to modify the BIOS parameters for the active option.
- Press Home to go to the top of screen; press End to go to the bottom of screen.
- Press Enter to go to sub screen.

### 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>.

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### 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.

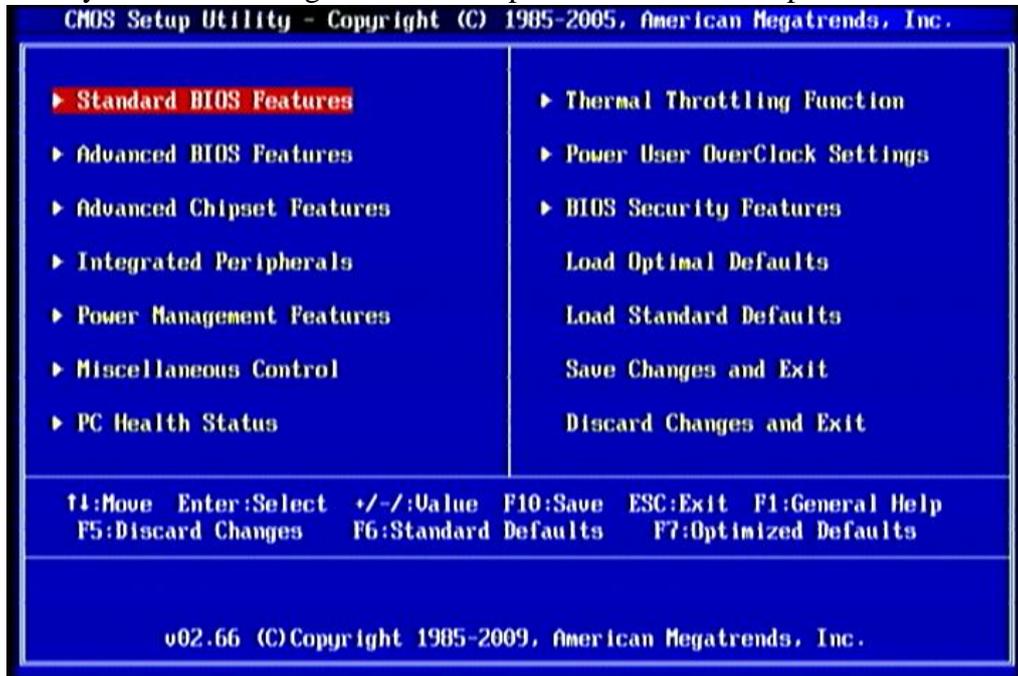


Figure 3-1

#### Standard 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.

#### Thermal Throttling Function

The selection is set for activating the active CPU Thermal Protection by flexible CPU loading adjustment in the range of temperature you define.

#### Power User OverClock Settings

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

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## 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

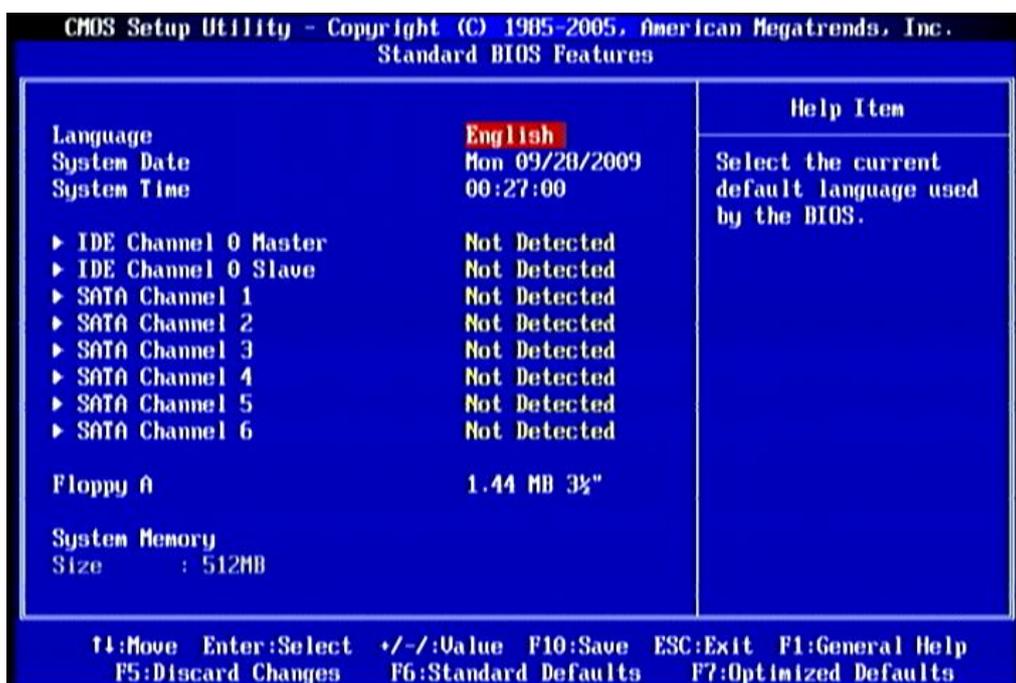
Save CMOS value changes to CMOS and exit setup.

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



### Language

Use this item to select the current default language used in BIOS. The Optional settings are: Chinese (GB): English.

### 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>.

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### IDE Channel 0 Master / Slave

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

While entering setup, BIOS auto detect 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

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

Disabled: Disables LBA Mode.

Auto: Enables LBA Mode if the device supports 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.

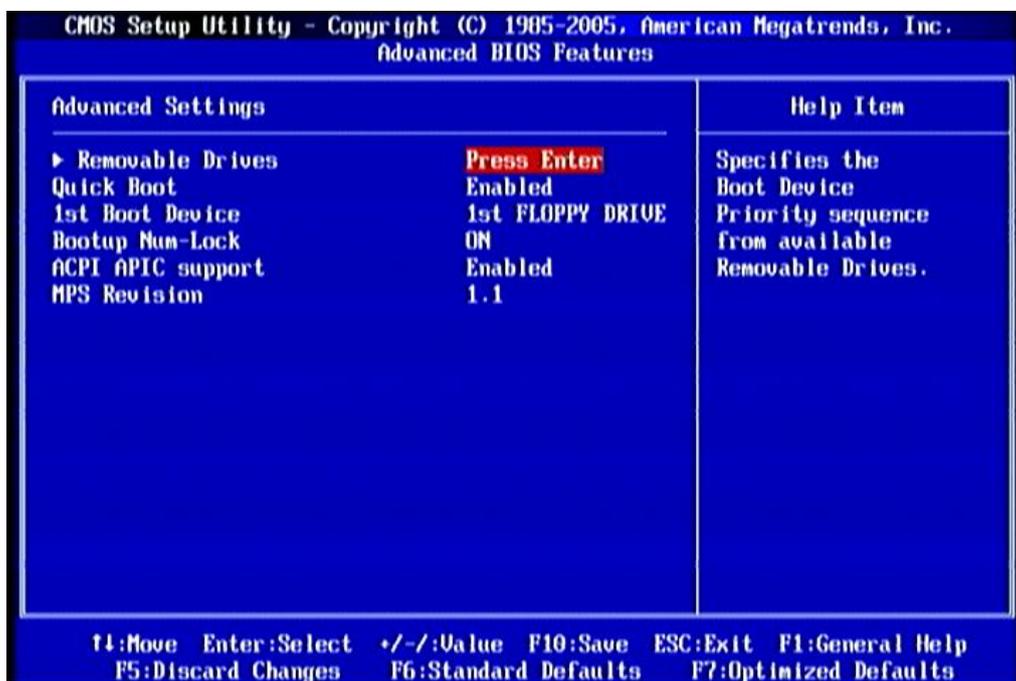
### Floppy A

This item is for specific floppy disk drive settings. Select according to the specification of the floppy disk you use.

### System Memory

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

## 3-5 Advanced BIOS Features



### Removable Drives

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

### Quick Boot

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

### 1<sup>st</sup> Boot Device

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

### Boot Up NumLock Status

The default value is On.

**On** (default) Keypad is numeric keys.

**Off** Keypad is arrow keys.

### ACPI APIC Support

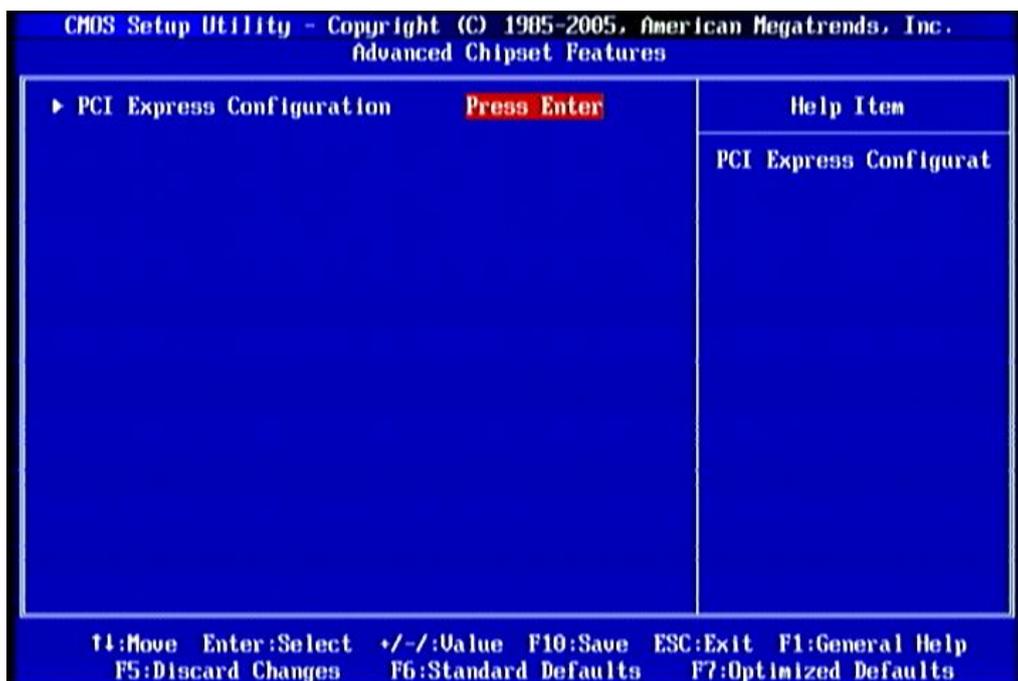
Include ACPI APIC table pointer to RSDT pointer list.

### MPS Revision

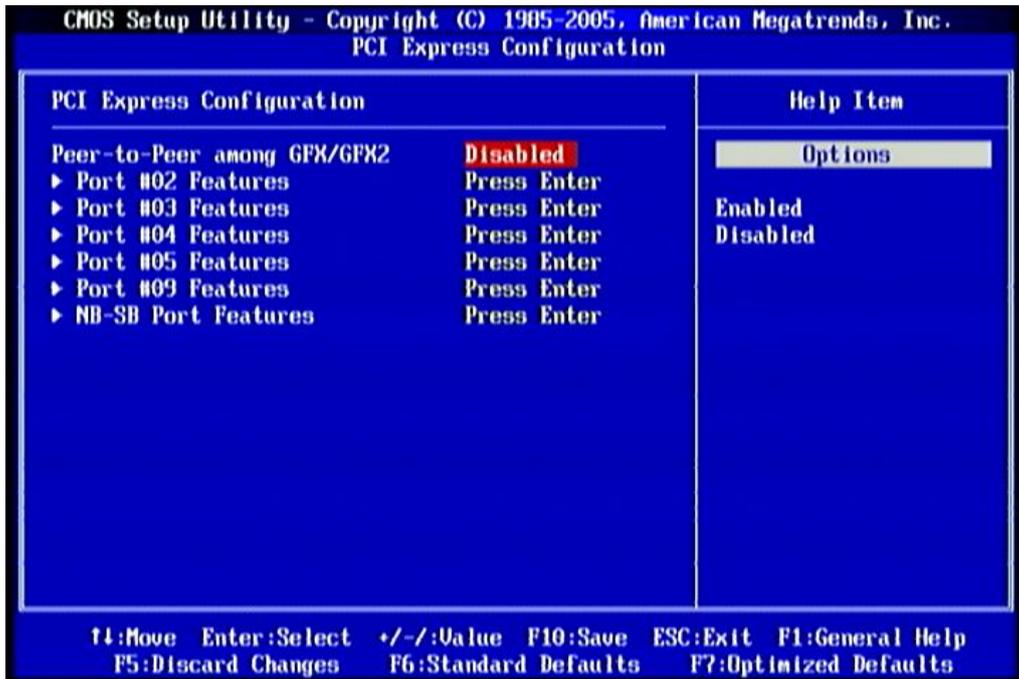
This option is only valid for multiprocessor motherboards as it specifies the version of the Multiprocessor Specification (MPS) that the motherboard will use.

## 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.



## 3-6-1 PCI Express Configuration



### Port #02 Features ~ Port #03 Features

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

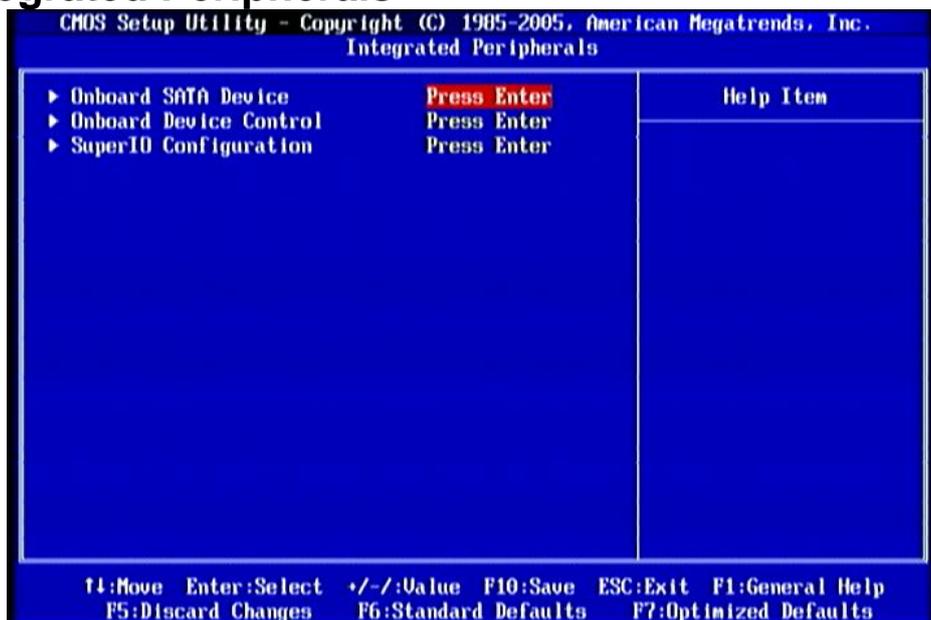
### Port #04 Features~ Port #09 Features

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

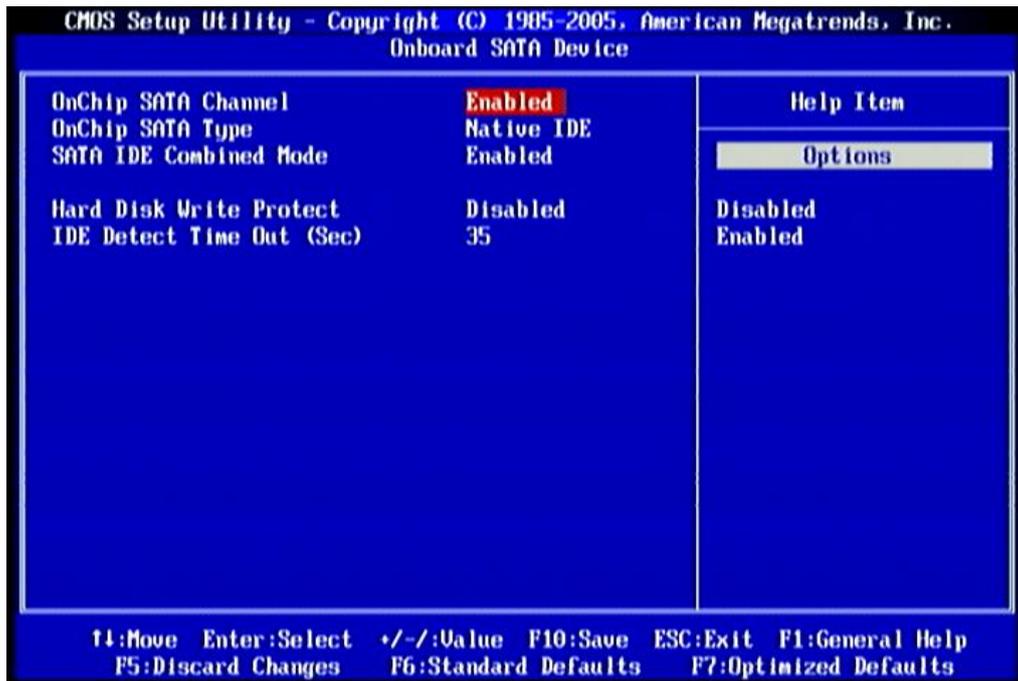
## 3-7 Integrated Peripherals



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### 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 SATA type. The optional settings are: Native IDE; RAID; AHCI; Legacy IDE; IDE->AHCI.

#### SATA IDE Combined Mode

The optional settings are : Enabled; Disabled.

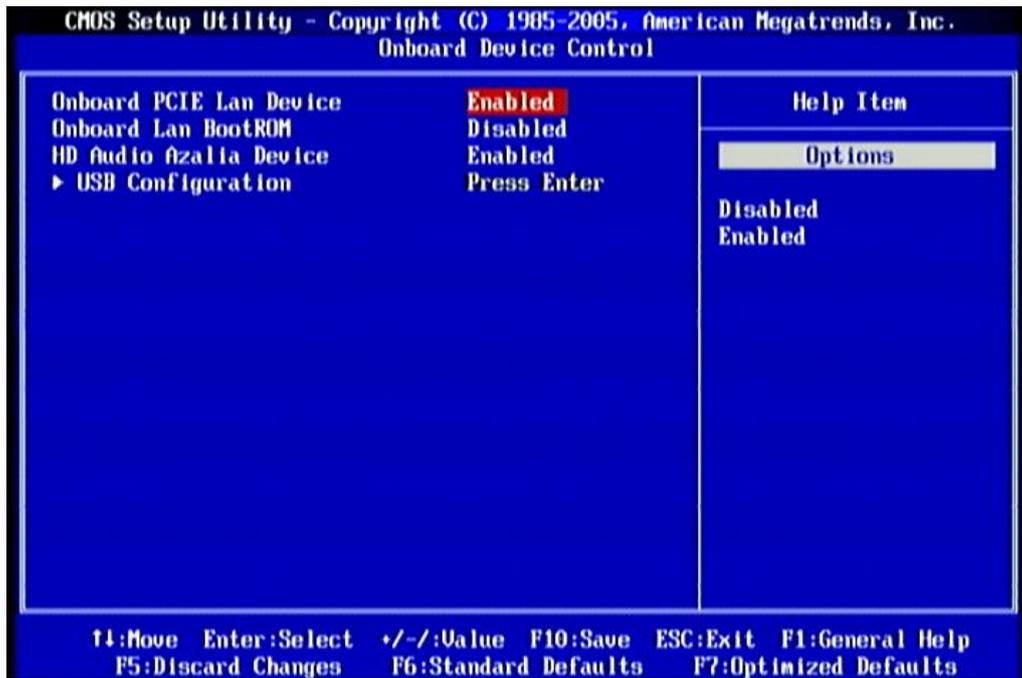
#### Hard Disk Write Protect

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).

## 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



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### **Onboard Floppy Controller**

Select enabled if your system has a floppy disk controller (FDD) installed on the system board and you wish to use it. If you install add-on FDC or the system has no floppy drive, select Disabled in this field. The settings are: Enabled and Disabled.

### **Serial Port1/Port2 Address**

Use this item to allow BIOS to select serial port Base Address

### **Serial Port2 Mode**

Use this item to allow BIOS to select Mode for Base Address.

### **IR Duplex Mode**

This item allows BIOS to select full or half duplex for serial port 2(IR Mode).The optional settings are: Full Duplex; Half Duplex.

### **IRTX Pin Select**

The optional settings are: Normal and Inverse.

This item allows BIOS to select transmit pin in a normal condition or inverse the IRTX(IR Mode).

### **IrRX Pin Select**

The optional settings are: Normal and Inverse.

This item allows BIOS to select receiver pin in normal condition or inverse the IRRX(IR mode).

### **IR Tx to Rx Delay Select**

The optional settings are: No Delay and Reception Delay.

This item allows BIOS to select IR from Tx to RX 4 characters time delay for serial port2(IR mode)

### **IR Rx to Tx Delay Select**

The optional settings are: No Delay and Transmission Delay.

### **Parallel Port Address**

This item allows BIOS to select Parallel Port Base Address.

### **Parallel Port Mode**

This item allows BIOS to select Parallel Port Mode.

### **PWRON After PWR-Fail**

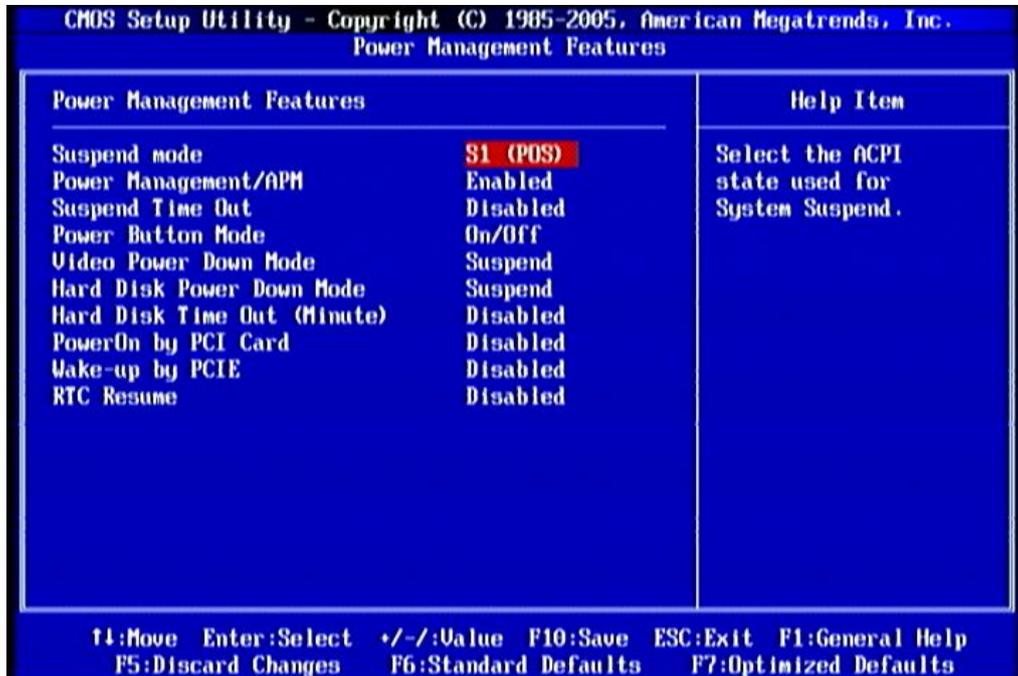
The optional settings are: Former; Always On; Always Off.

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## 3-8 Power Management Features

The Power Management Features 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 state used for System Suspend.

### 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.

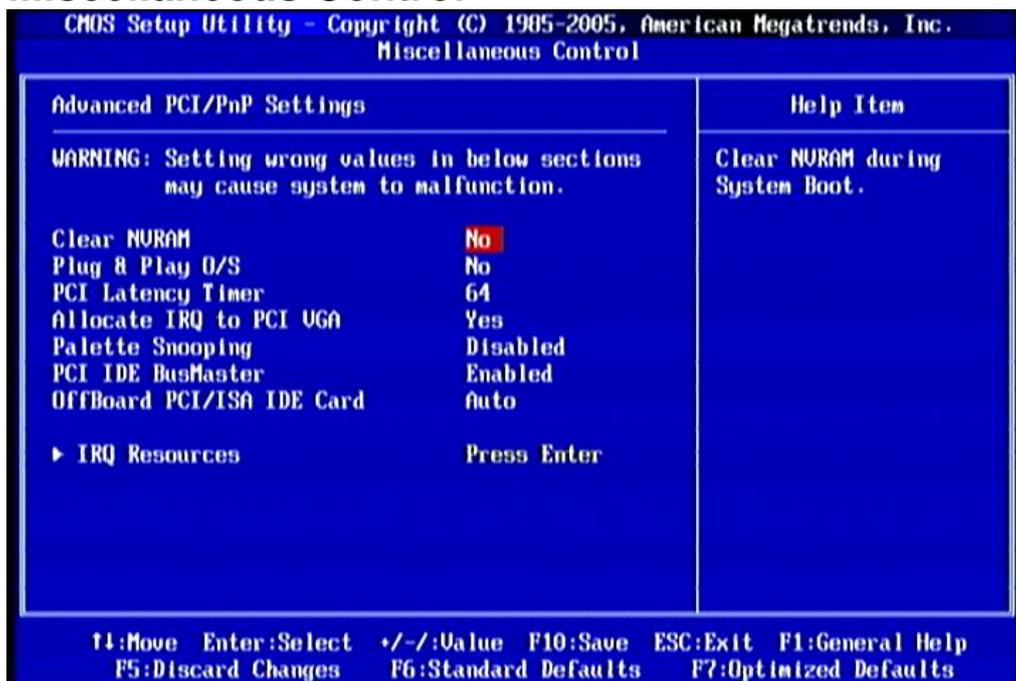
### RTC Resume

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

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## 3-9 Miscellaneous Control



### 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.

## 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.



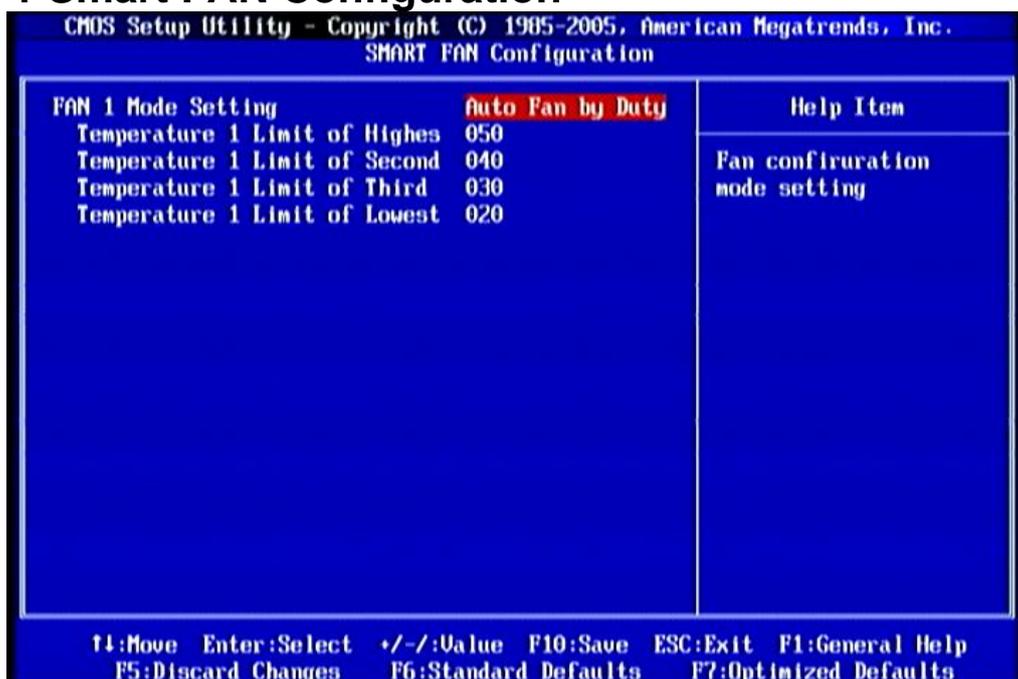
### H/W Health Function,

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

**CPU Temperature/ System Temperature/ CPUFAN1 Speed /SYSFAN1 Speed/SYSFAN2 Speed/VCORE /5V/12V/5VSB/VDIMM**

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

### 3-10-1 Smart FAN Configuration



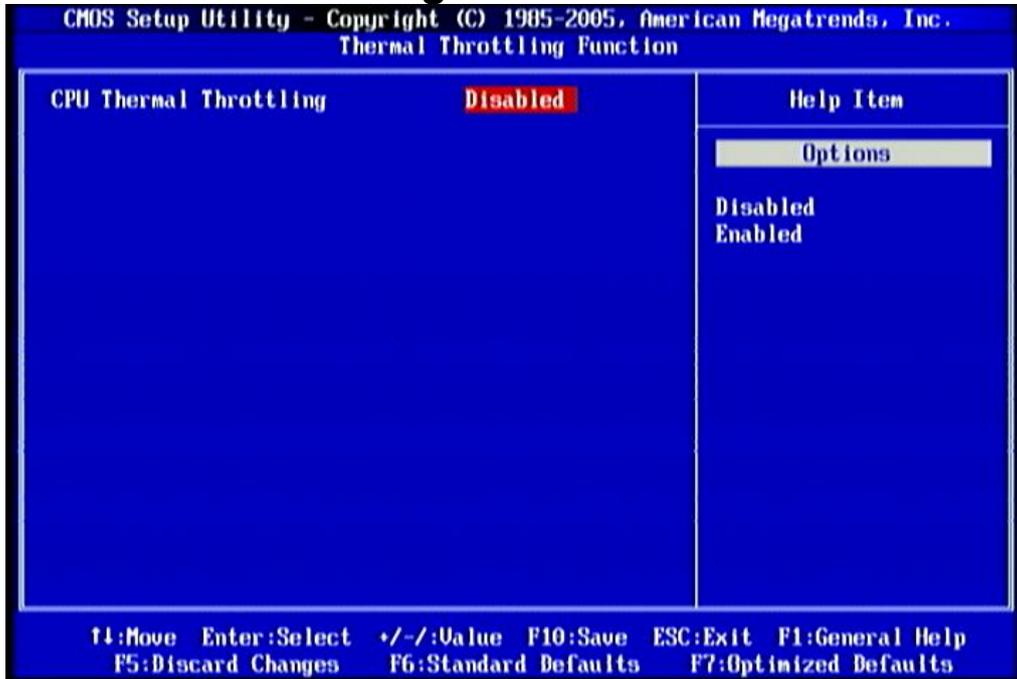
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### Smart FAN Configuration FAN1 Mode Setting

The optional settings are: Auto Fan by RPM; Auto Fan by DutyCycle; Manual Mode by RPM and Manual Mode by DutyCycle.

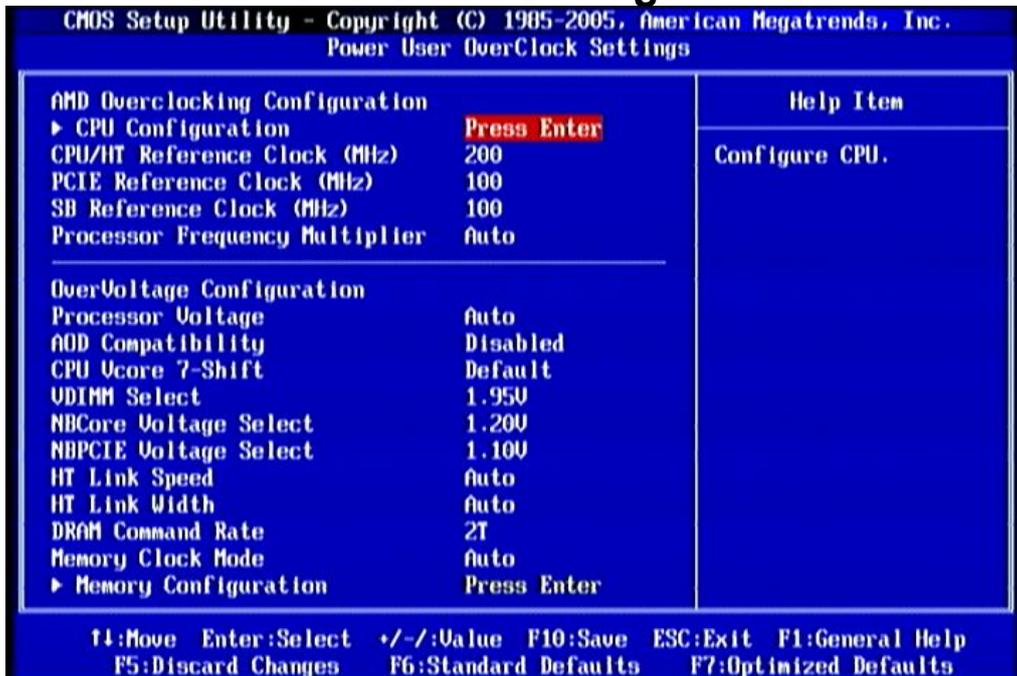
## 3-11 Thermal Throttling Function



### CPU Thermal Throttling

Use this item to enable or disable CPU thermal Throttling. The optional settings are: Enable; Disabled.

## 3-12 Power User OverClock Settings



### CPU/HT Reference Clock

Use this item to set CPU/HT Reference Clock...

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### 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 Voltage

The optional settings are: Auto; 0.800V~1.350V.

### AOD Compatibility

Choose Enabled means only AMD over drive can adjust voltage

Choose Disabled means only BIOS can adjust voltage

### CPU Vcore 7-Shift

Use this item to set value in CPU Vcore 7-Shift function. The optional settings are: Defaults and a range from 50mV to 350mV

### NBCore Voltage Setting

The optional settings are from 1.20v to 1.35v.

### NBPCIE Voltage Setting

The optional settings are from 1.10v to 1.25v.

### HT Link Speed

The HyperTransport link will run at this speed if it slower than or equal to system clock and this board is capable

### HT Link Width

The HyperTransport link will run at this width.

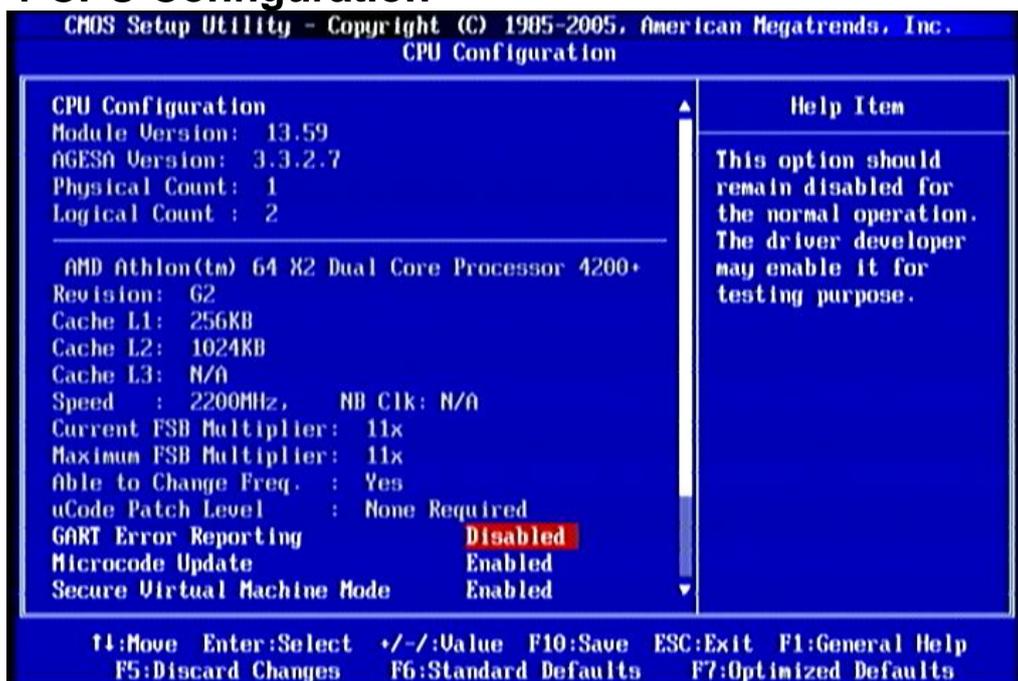
### DRAM Command Rate

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

### Memory Clock Mode

The optional settings are: Auto; Limit and Manual.

## 3-12-1 CPU Configuration



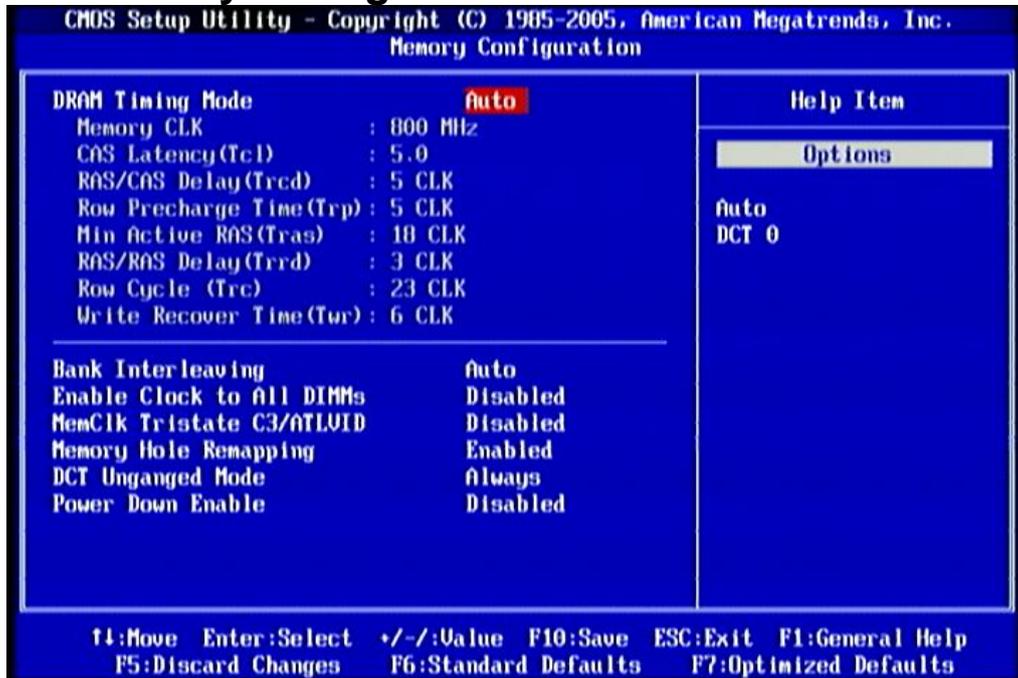
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## GART Error Reporting

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

## 3-12-2 Memory Configuration



### Bank Interleaving

Use this item to enable bank memory interleaving.

### 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.

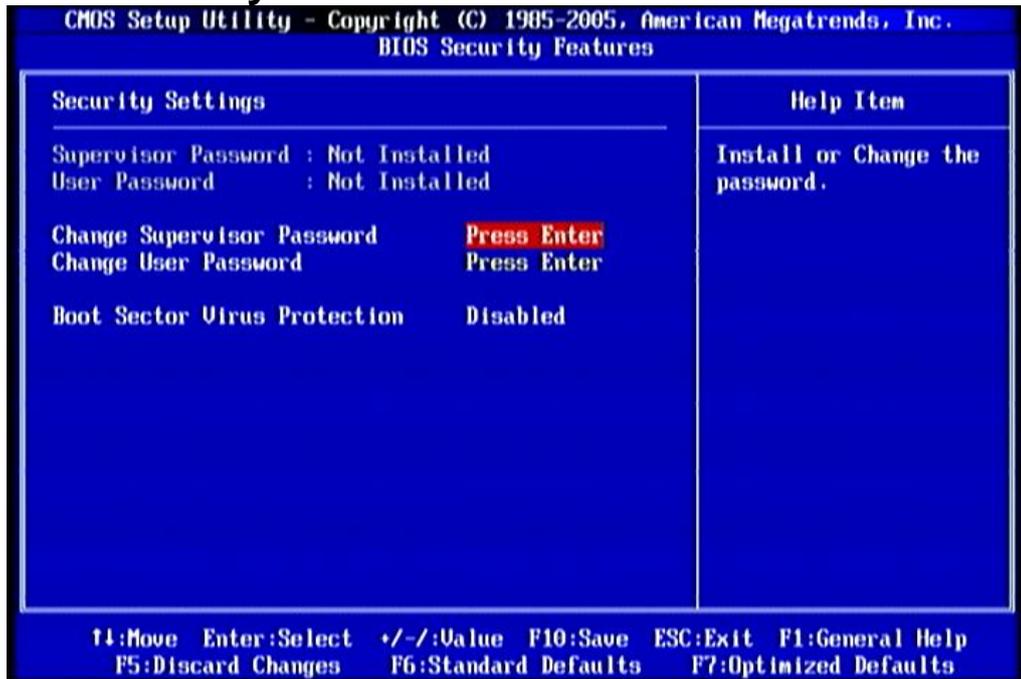
### Power Down Enable

Enable or DisableDDR power down mode.

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## 3-13 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 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.

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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.

### 3-14 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:

Load Optimal Defaults?  
【OK】      【Cancel】

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:

Load Standard Defaults?  
【OK】      【Cancel】

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:

Save configuration changes and exit setup?  
【OK】                      【Cancel】

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:

Discard Changes and Exit Setup?  
【OK】                      【Cancel】

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

<p><b>Notice!</b> 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.</p>
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## Chapter 4

### DRIVER & FREE PROGRAM INSTALLATION

Check your package and there is A MAGIC INSTALL CD included. This CD consists of all DRIVERS you need and some free application programs and utility programs. In addition, this CD also include an auto detect software which can tell you which hardware is installed, and which DRIVERS needed so that your system can function properly. We call this auto detect software MAGIC INSTALL.

#### **MAGIC INSTALL supports WINDOWS 9X/NT/2K/XP**

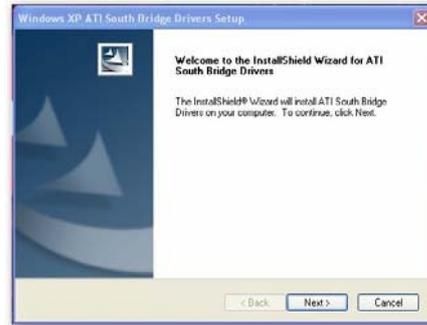
Insert CD into your CD-ROM drive and the MAGIC INSTALL Menu should appear as below. If the menu does not appear, double-click MY COMPUTER / double-click CD-ROM drive or click START / click RUN / type X:\SETUP.EXE (assuming X is your CD-ROM drive).



From MAGIC INSTALL MENU you may take 9 selections:

1. ATI                   install ATI driver pack
2. SOUND               install ALC 888 HD Audio driver
3. LAN                   install RealTek LAN Controller Driver
4. RaidDisk            install SATA RAID Driver and Utility
5. PC-CILLIN           install PC-CILLIN 2008 anti-virus program
6. PC-HEALTH          install My Guard hardware monitor utility
7. OVERCLOCK          install overclocking utilities
8. BROWSE CD          to browse the contents of the CD
9. EXIT                 to exit from MAGIC INSTALL menu

#### **4-1 ATI Install ATI Driver Pack**



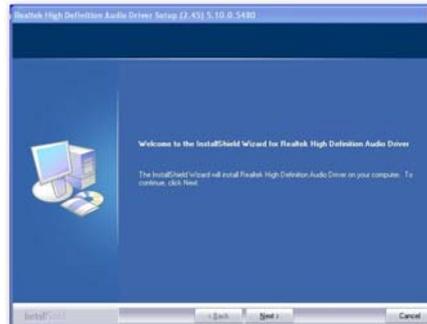
1. Click ATI appears on the MAGIC INSTALL MENU.
2. Click NEXT when ATI software driver pack appears.



3. Click "Yes" to accept the license agreement and start installation.
4. Choose whether you would like to restart and click Finish to restart your computer.

**NOTE: Please upgrade your Windows XP to Service Pack 1 / Windows 2000 to Service Pack 4 Or later before you install the HD Audio CODEC driver**

## 4-2 SOUND Install ALC888 HD Audio Driver



1. Click SOUND when MAGIC INSTALL MENU appears
2. Click NEXT When Realtek High Definition Audio driver windows appear



3. Click FINISH and restart your computer
4. Manual Sound Effect Setting



5. Devices and mixer setting



6. Audio input and output setting.



7. Microphone effect setting.



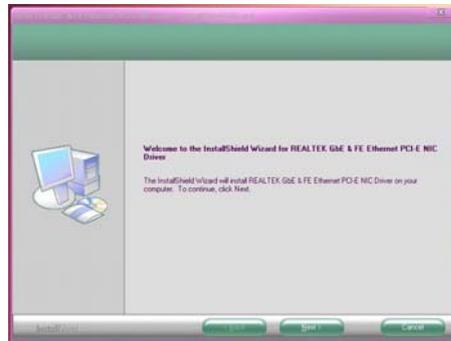
8. 3D demo setting.

**NOTE: Please upgrade your Windows XP to Service Pack 1 / Windows 2000 to Service Pack 4 or later before you the HD Audio CODEC driver.**

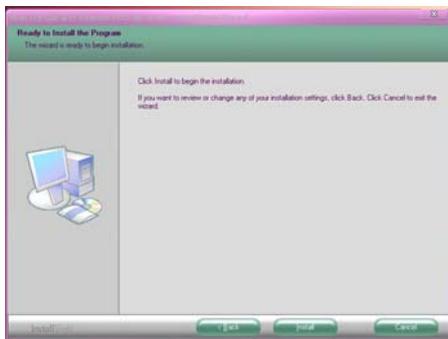
### 4-3 LAN Install RealTek LAN Controller Driver



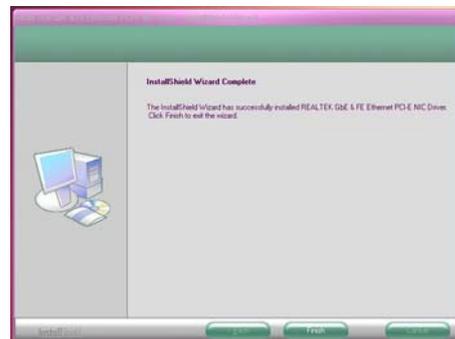
1. Click LAN when Magic Install Menu appears.



2. Click Next to install RealTek LAN Driver.



3. Click Install to begin the installation.



4. After driver installation completed, Click Finish.

### 4-4 RAID Install SATA RAID Driver and Utility





5. Click Next after you select the features you want to install and the folder to install it.



6. Click Install after you select to install the optional online services.

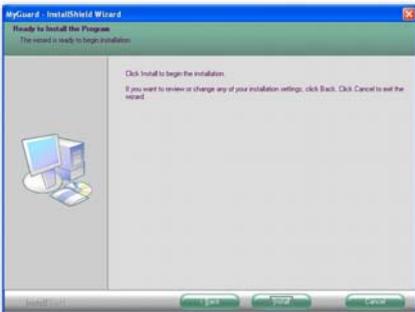
## 4-6 PC-HEALTH Install MyGuard Hardware Monitor Utility



1. Click PC-HEALTH when MAGIC INSTALL MENU appears



2. Click Next on Install shield wizard Window appears.



3. Click Install to begin the installation.

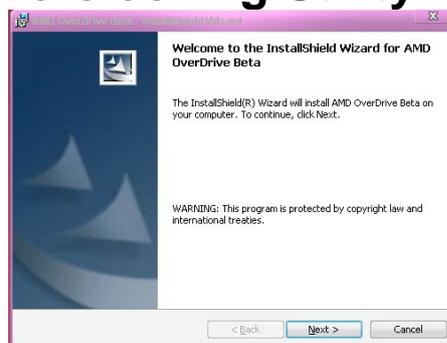


4. Click Finish to complete the installation.

## 4-7 OVERCLOCK Install Overclocking Utility



1. Click OVER CLOCK on the MAGIC

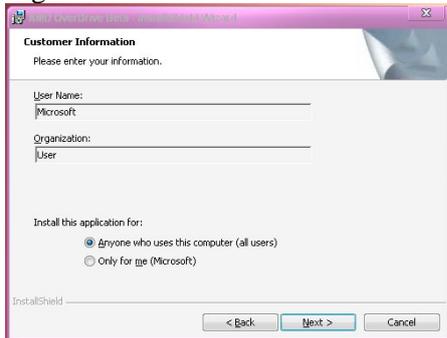


2. Click Next.

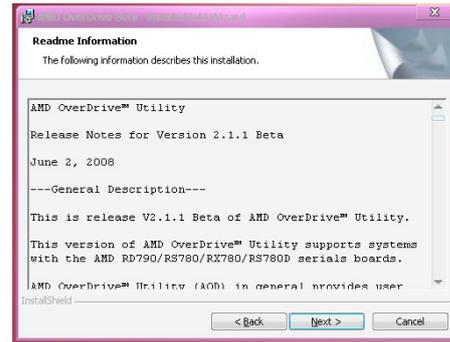
## INSTALL MENU appears



3. Select "I agree the terms in the license agreement" and then click Next.



5. Click Next after you type in the customer information.



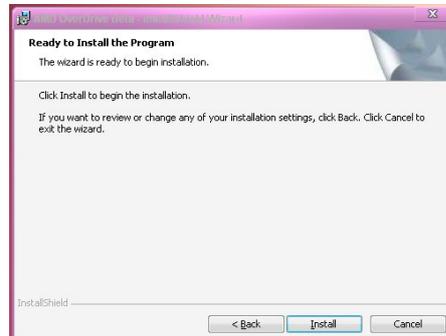
4. Click Next after you read the Readme Information.



6. Click Next after you select the destination folder.



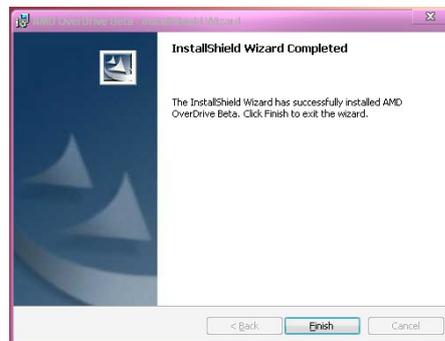
7. Click after you decide whether you would like to have a shortcut of the program on your desktop.



8. Click Install.



9. Installation process.



10. Click Finish to complete the installation process.

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**NOTICE!** The above driver screen and operation steps are for reference only because we might update the drivers or make modifications due to technological need and user's benefits. We reserve these changes or upgrade without advanced notification. Please visit our website for possible driver upgrade.

## 4-8 How to Update BIOS

- Step 1.** Prepare a bootable disk. (You may make one by click START click RUN type SYS A: click OK)
- Step 2.** Download upgrade tools and the latest BIOS files of the motherboard from official website and then make a copy of it to your bootable disk after decompressing these files
- Step 3.** Insert the disk into A: ,start your computer and enter BIOS setup to set the bootable disk as the first boot device, save the settings before you exit BISO setup, restart the computer, then type in "A:\xxxxxx.BAT"(xxxxxxx being the file name of the latest BIOS )
- Step 4.** Type Enter to update and flash the BIOS. The system will restart automatically when BIOS is upgraded.

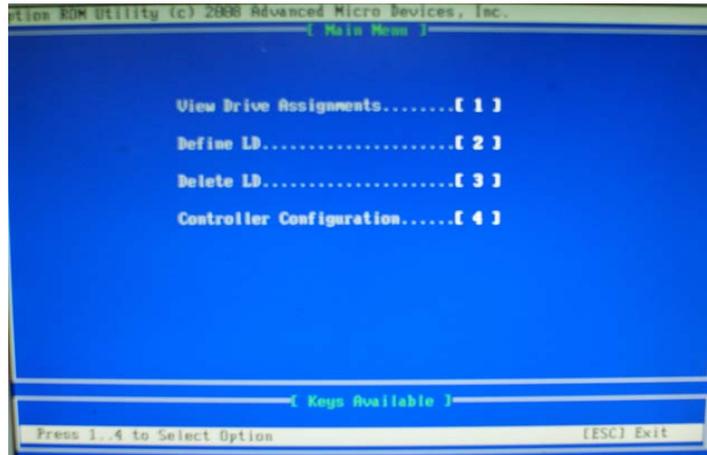
## 4-9 AMD Platform RAID Function Installation

Please set these choice in the BIOS as RAID : BIOS setup \Integrated Peripherals \Onchip SATA Device \ Onchip SATA Type. When the below figures appeared, please press [Ctrl-F] into figure 2



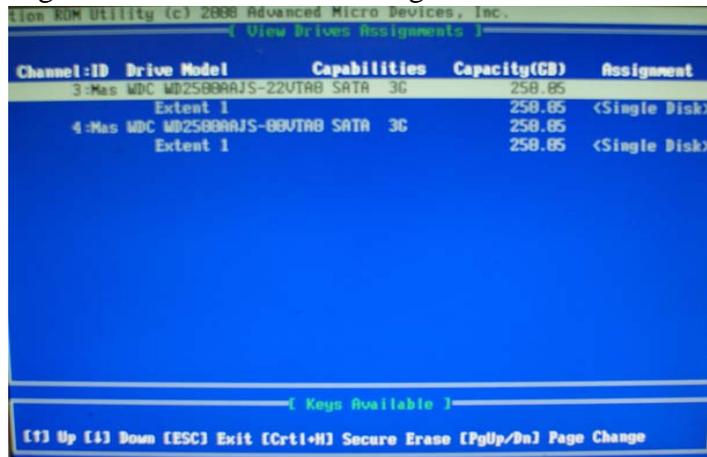
[figure1]

Function: press[1] key, showing the RAID; press [2] key , building RAID; press [3] key, delete the RAID; press[4] key, showing the information of controller.



[figure2]

press[1] key , showing the RAID , as the below figure

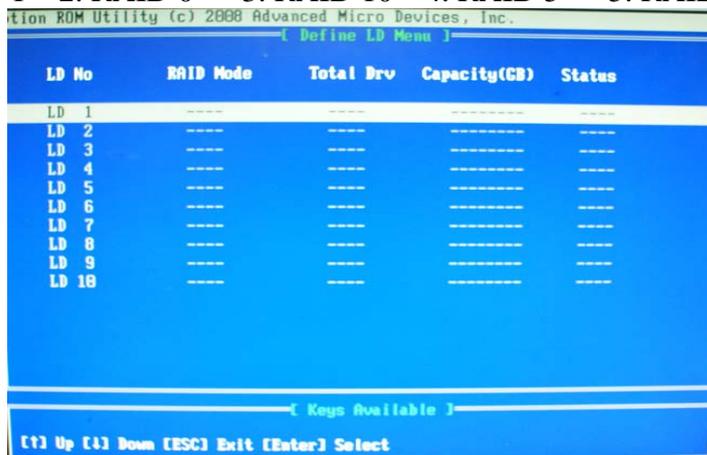


[figure3]

Press [2] key, the interface of RAID, as figure 4.

RAID function:

- 1.RAID 1    2. RAID 0    3. RAID 10    4. RAID 5    5. RAID JBOD



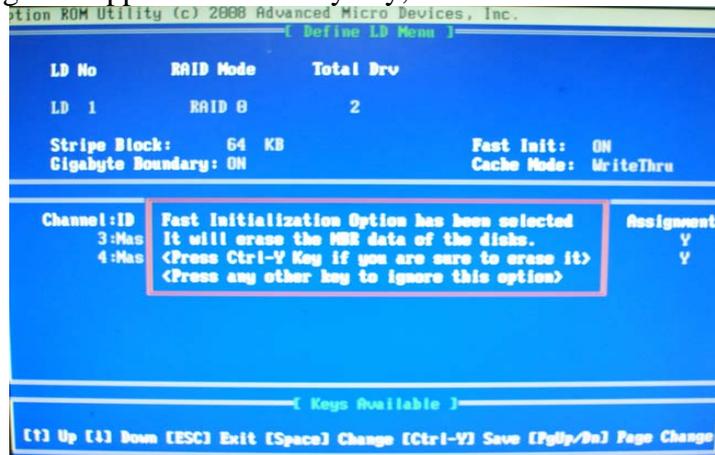
[figure4]

Choose LD 1 then press Enter.

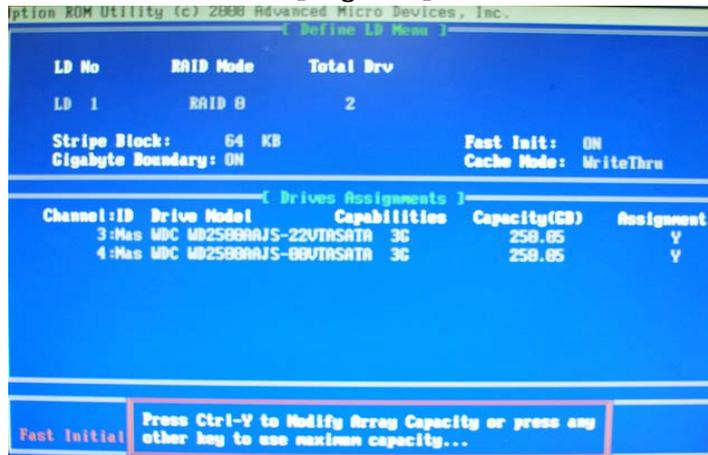
Take Raid0 for example, use [ ↑ ] [ ↓ ] to shift the cursor, press space key to change the choice,

press [Ctrl-Y] to keep.

Set Assignment mode as [Y], press [Ctrl-Y] to keep, then figure 5 appeared, erase the MBR. choose [Ctrl-Y],figure 6 appeared. Press any key, finished the RAID.

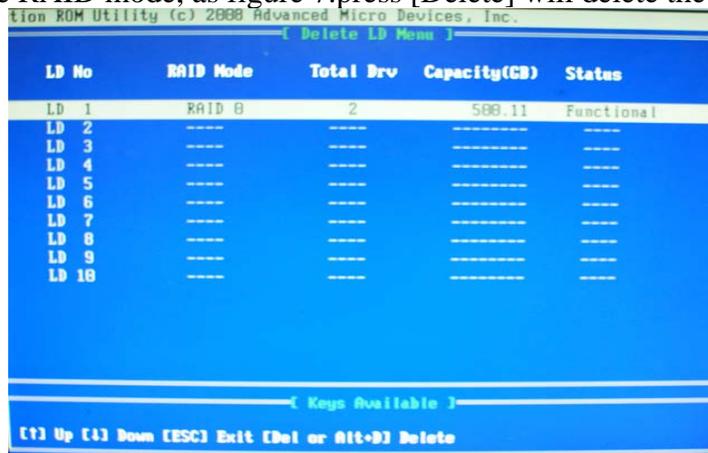


[figure5]



[figure6]

Press [3], delete the RAID mode, as figure 7. press [Delete] will delete the array. As figure 7.



[figure7]

Press [4], showing the information of controller, as figure 8.



[figure8]

### **Making RAID driver diskette before Install WindowsXP/2000**

Before you install the Windows XP or Windows 2000, you will need to make a RAID driver diskette before you start to install the Operating System.

#### **How to make a RAID driver diskette?**

- 1: Insert the diskette which is being formatted in floppy drive on a system which can start OS.
- 2: After booting OS insert the bundle CD in your CD-ROM
- 3: Copy all the files from \NF-orce4\RAIDDisk to floppy diskette

Once you have the SATA driver diskette ready, you may start to install Windows XP or Windows 2000 on your System.

#### **Installation of Windows XP/ Windows 2000**

For installation of Windows XP or Windows 2000, please insert Windows XP or Windows 2000 CD into the CD-ROM drive. Then remove the floppy diskette, and boot the system. At the very beginning, you will see the message at the bottom of screen, "Press F6 if you need to install a third party SCSI or RAID driver...."

At this moment, please press <F6> key and follow the instructions of Windows XP or Windows 2000 for the proper installation.

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## 4-10 Pro Magic Plus Function Introduction

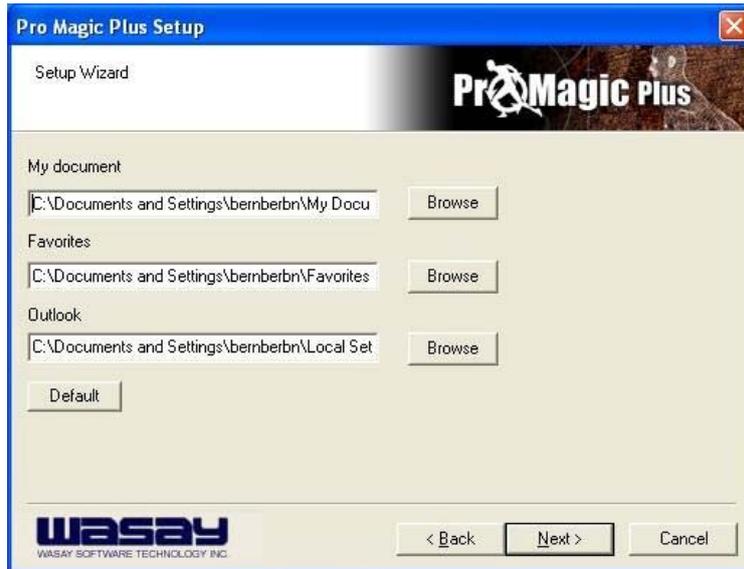
### What's Pro Magic Plus?

Tired with reinstall OS each time when it doesn't work? Does your computer often crash down or unable to work after installed new software? Have you had great loses and troubles because of computer problems? Still using time-consuming backup software that occupies lots of HD space?

Pro Magic Plus- an instant system recovery software tailored to solve these problems for you. It combines various application tools (e.g. anti-virus, backup software, uninstall software, multi-boot software) to satisfy your needs of all sorts of system protections.

### What functions does Pro Magic Plus have?

1. **Instant System Restoration** – Regardless of mis-operation or system crash, install Pro Magic Plus beforehand would allow you to instantly restore your system back by simply reboot your computer.
2. **Easy-to-use** – Auto installation from CD ROM; Supports Mouse
3. **System Uninstall** – Pro Magic provides a protection mode, which allows user to freely test any software. If user does not want to keep the software, just reboot the computer to restore back to the previous state, and Pro Magic will remove it completely from you computer.
4. **Password Security** – Pro Magic provides double password protection, including user password for entering each OS and manager password for managing 'Pro Magic', which can effectively prevent others from using your computer without permission or data from being stolen. (disable item for OEM version)
5. **Complete Protection** – Pro Magic not only protects the system disk, but also can protect your data disk, and does not require to reboot when backup or restore data disk.
6. **Multipoint Save/Restore** – You can backup your system whenever you need and restore them back to anytime you wish, 1 hour, 1 day or 1 month ago. Restore points are unlimited. (disable item for OEM version)
7. **Data Disk Protection** – Pro Magic Plus now comes with data disk protection, provides complete protection for your computer! (disable item for OEM version)
8. **You can choose to change the default path of 'My Document', 'My Favorite' and 'Outlook Express'**, so that when you are restoring the system, data in these folders will not be restored as well. (This is optional, you can leave it as it is).



graph 4

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NOTE: Functions of each version will differ from each other, and will be based on the function descriptions of each version.

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### System Requirements

- ◇ First OS must be Windows 98 SE/ME/2000/XP
- ◇ Support Only Windows OS (No Linux)
- ◇ Windows server OS and Windows NT not supported
- ◇ Minimum of Intel 486 or above, 16MB of memory or above
- ◇ Minimum of 500MB free/usable space or above
- ◇ Support for SCSI & SATA Hard disk

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*Pro Magic Plus only supports SCSI hard disk with Windows 2000 or OS above*

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### Notice Before Installation

1. Before install Pro Magic Plus, turn off all anti-virus software. (Include BIOS anti-virus function)
2. Pro Magic Plus does not support multiple PRI partitions. If you have multiple PRI partitions, please repartition your HD before installation.
3. If your HDD is not fully partitioned (with un-partitioned/unused space at end of HDD), please repartition the HDD before install Pro Magic Plus.

# APPENDIX

## Debug Port Post Code

### *Normal POST Codes*

**NOTE:** EISA POST codes are typically output to port address 300h.

**ISA POST codes are output to port address 80h.**

Code(hex)	Name	Description
C0	Turn Off Chipset And CPU test	OEM Specific-Cache control cache Processor Status (1FLAGS) Verification. Tests the following processor status flags: Carry, zero, sign, overflow, The BIOS sets each flag, verifies They are set, then turns each flag off and verifies it is off. Read/Write/Verify all CPU registers except SS, SP, and BP with data pattern FF and 00. RAM must be periodically refreshed to keep the memory from decaying. This function ensures that the memory refresh function is working properly.
C1	Memory Presence	First block memory detect OEM Specific-Test to size on-board memory. Early chip set initialization Memory presence test OEM chip set routines Clear low 64K of memory Test first 64K memory.
C2	Early Memory Initialization	OEM Specific- Board Initialization
C3	Extend Memory DRAM select	OEM Specific- Turn on extended memory Initialization Cyrix CPU initialization Cache initialization
C4	Special Display Handling	OEM Specific- Display/Video Switch Handling so that Switch Handling display switch errors never occurs
C5	Early Shadow	OEM specific- Early shadow enable for fast boot
C6	Cache presence test	External cache size detection
CF	CMOS Check	CMOS checkup
B0	Spurious	If interrupt occurs in protected mode.
B1	Unclaimed NMI	If unmasked NMI occurs, display Press F1 to disable NMI, F2 reboot.
BF	Program Chip Set	To program chipset from defaults values
E1-EF	Setup Pages	E1- Page 1, E2 - Page 2, etc.
1	Force load Default to chipset	Chipset defaults program
2	Reserved	
3	Early Superio Init	Early Initialized the super IO
Code(hex)	Name	Description
4	Reserved	
5	Blank video	Reset Video controller
6	Reserved	
7	Init KBC	Keyboard controller init
8	KB test	Test the Keyboard
9	Reserved	
A	Mouse Init	Initialized the mouse

B	Onboard Audio init	Onboard audio controller initialize if exist
C	Reserved	
D	Reserved	
E	Checksum Check	Check the intergraty of the ROM, BIOS and message
F	Reserved	
10	Auto detec EEPROM	Check Flash type and copy flash write/erase routines to 0F000h segments
11	Reserved	
12	Cmos Check	Check Cmos Circuitry and reset CMOS
13	Reserved	
14	Chipset Default load	Program the chipset registers with CMOS values
15	Reserved	
16	Clock Init	Init onboard clock generator
17	Reserved	
18	Identify the CPU	Check the CPU ID and init L1/L2 cache
19	Reserved	
1A	Reserved	
1B	Setup Interrupt Vector Table	Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT TBL
1C	Reserved	
1D	Early PM Init	First step initialize if single CPU onboard
1E	Reserved	
1F	Re-initial KB	Re-init KB
20	Reserved	
21	HPM init	If support HPM, HPM get initialized here
22	Reserved	
23	Test CMOS Interface and Battery Status	Verifies CMOS is working correctly, detects bad battery. If failed, load CMOS defaults and load into chipset
24	Reserved	
25	Reserved	
26	Reserved	
27	KBC final Init	Final Initial KBC and setup BIOS data area
28	Reserved	
29	Initialize Video Interface	Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter.
2A	Reserved	
2B	Reserved	
2C	Reserved	
2D	Video memory test	Test video memory, write sign-on message to screen.
2E	Reserved	Setup shadow RAM - Enable shadow according to Setup.
2F	Reserved	
30	Reserved	
31	Reserved	
32	Reserved	
33	PS2 Mouse setup	Setup PS2 Mouse and reset KB
34	Reserved	
35	Test DMA Controller 0	Test DMA channel 0
36	Reserved	
37	Test DMA Controller 1	Test DMA channel 1
38	Reserved	
39	Test DMA Page Registers	Test DMA Page Registers.
3A	Reserved	
3B	Reserved	

3C	Test Timer Counter 2	Test 8254 Timer 0 Counter 2.
3D	Reserved	
3E	Test 8259-1 Mask Bits	Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines.
3F	Reserved	
40	Test 8259-2 Mask Bits	Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines.
41	Reserved	
42	Reserved	
43	Test Stuck8259's Interrupt Bits Test 8259 Interrupt Functionality	Turn off interrupts then verify no interrupt mask register is on. Force an interrupt and verify the interrupt occurred.
44	Reserved	
45	Reserved	
46	Reserved	
47	Set EISA Mode	If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests and clear EISA mode flag.
48	Reserved	
49	Size Base and Extended Memory	Size base memory from 256K to 640K and extended memory above 1MB.
4A	Reserved	
4B	Reserved	
4C	Reserved	
4D	Reserved	
4E	Test Base and Extended Memory	Test base memory from 256K to 640K and extended memory above 1MB using various patterns. NOTE: This test is skipped in EISA mode and can be skipped with ESC key in ISA mode.
4F	Reserved	
50	USB init	Initialize USB controller
51	Reserved	
52	Memory Test	Test all memory of memory above 1MB using Virtual 8086 mode, page mode and clear the memory
53	Reserved	
54	Reserved	
55	CPU display	Detect CPU speed and display CPU vendor specific version string and turn on all necessary CPU features
56	Reserved	
57	PnP Init	Display PnP logo and PnP early init
58	Reserved	
59	Setup Virus Protect	Setup virus protect according to Setup
5A	Reserved	
5B	Awdflash Load	If required, will auto load Awdflash.exe in POST
5C	Reserved	
5D	Onboard I/O Init	Initializing onboard superIO
5E	Reserved	
5F	Reserved	
60	Setup enable	Display setup message and enable setup functions
61	Reserved	
62	Reserved	
63	Initialize & Install Mouse	Detect if mouse is present, initialize mouse, install interrupt vectors.

64	Reserved	
65	PS2 Mouse special	Special treatment to PS2 Mouse port
66	Reserved	
67	ACPI init	ACPI sub-system initializing
68	Reserved	
69	Setup Cache Controller	Initialize cache controller.
6A	Reserved	
6B	Setup Entering	Enter setup check and auto-configuration check up
6C	Reserved	
6D	Initialize Floppy Drive & Controller	Initialize floppy disk drive controller and any drives.
6E	Reserved	
6F	FDD install	Install FDD and setup BIOS data area parameters
70	Reserved	
71	Reserved	
72	Reserved	
73	Initialize Hard Drive & Controller	Initialize hard drive controller and any drives.
74	Reserved	
75	Install HDD	IDE device detection and install
76	Reserved	
77	Detect & Initialize Serial/Parallel Ports	Initialize any serial and parallel ports (also game port).
78	Reserved	
79	Reserved	
7A	Detect & Initialize Math Coprocessor	Initialize math coprocessor.
7B	Reserved	
7C	HDD Check for Write protection	HDD check out
7D	Reserved	
7E	Reserved	
7F	POST error check	Check POST error and display them and ask for user intervention
80	Reserved	
81	Reserved	
82	Security Check	Ask password security (optional).
83	Write CMOS	Write all CMOS values back to RAM and clear screen.
84	Pre-boot Enable	Enable parity checker Enable NMI, Enable cache before boot.
85	Initialize	Initialize any option ROMs present Option ROMs from C8000h to EFFFFh. NOTE: When FSCAN option is enabled, ROMs initialize from C8000h to F7FFFh.
86	Reserved	
87	Reserved	
88	Reserved	
89	Reserved	
8A	Reserved	
8B	Reserved	
8C	Reserved	
8D	Reserved	
8E	Reserved	
8F	Reserved	
90	Reserved	
91	Reserved	
92	Reserved	
93	Boot Medium detection	Read and store boot partition head and cylinders values in RAM
94	Final Init	Final init for last micro details

		before boot
95	Special KBC patch	Set system speed for boot Setup NumLock status according to Setup
96	Boot Attempt	Set low stack Boot via INT 19h.
FF	Boot	

## Quick POST Codes

Code(hex)	Name	Description
65	Init onboard device	Early Initialized the super IO Reset Video controller Keyboard controller init Test the Keyboard Initialized the mouse Onboard audio controller initialize if exist. Check the intergraty of the ROM, BIOS and message Check Flash type and copy flash write/erase routines to 0F000h segments Check Cmos Circuitry and reset CMOS Program the chipset registers with CMOS values Init onboard clock generator
66	Early System setup	Check the CPU ID and init L1/L2 cache Initialize first120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL First step initialize if single CPU onboard. Re-init KB If support HPM, HPM get initialized here
67	KBC and CMOS Init	Verifies CMOS is working correctly, detects bad battery. If failed, load CMOS defaults and load into chipset Final Initial KBC and setup BIOS data area.
68	Video Init	Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter. Test video memory, write sign-on message to screen. Setup shadow RAM - Enable shadow according to Setup.
69	8259 Init	Init 8259 channel 1 and mask IRQ 9
6A	Memory test	Quick Memory Test
6B	CPU Detect and IO init	Detect CPU speed and display CPU vendor specific version string and turn on all necessary CPU features Display PnP logo and PnP early init Setup virus protect according to Setup. If required, will auto load Awdflash.exe in POST Initializing onboard superIO
6C	Reserved	
6D	Reserved	
6E	Reserved	
6F	Reserved	
70	Setup Init	Display setup message and enable setup functions Detect if mouse is present, initialize mouse, install interrupt vectors. Special treatment to PS2 Mouse port ACPI sub-system initializing
71	Setup Cache Controller	Initialize cache controller.

72	Install FDD	Enter setup check and auto-configuration check up Initialize floppy disk drive controller and any drives. Install FDD and setup BIOS data area parameters
73	Install HDD	Initialize hard drive controller and any drives. IDE device detection and install Initialize any serial and parallel ports (also game port).
74	Detect & Initialize Math Coprocessor	Initialize math coprocessor.
75	HDD Check for Write protection	HDD check out
76	Reserved	
77	Display POST error	Check POST error and display them and ask for user intervention Ask password security (optional).
78	CMOS and Option ROM Init	Write all CMOS values back to RAM and clear screen. Enable parity checker Enable NMI, Enable cache before boot. Initialize any option ROMs present from C8000h to EFFFFh. NOTE: When FSCAN option is enabled, ROMs initialize from C8000h to F7FFFh.
79	Reserved	
7A	Reserved	
7B	Reserved	
7C	Reserved	
7D	Boot Medium detection	Read and store boot partition head and cylinders values in RAM
7E	Final Init	Final init for last micro details before boot
7F	Special KBC patch	Set system speed for boot Setup NumLock status according to Setup
80	Boot Attempt	Set low stack    Boot via INT 19h.
FF	Boot	

## ***S4 POST Codes***

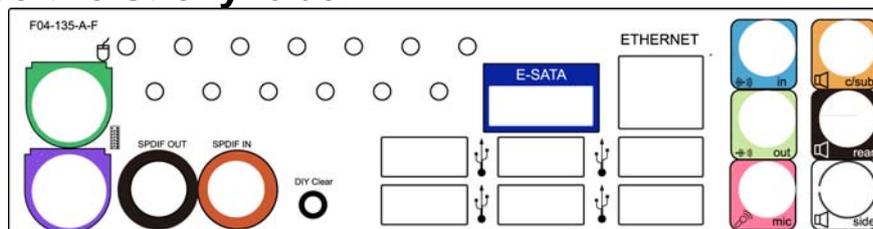
<b>Code(hex)</b>	<b>Name</b>	<b>Description</b>
5A	Early Chipset Init	Early Initialized the super IO Reset Video controller Keyboard controller init Test the Keyboard Initilized the mouse
5B	Cmos Check	Check Cmos Circuitry and reset CMOS
5C	Chipset default Prog	Program the chipset registers with CMOS values. Init onboard clock generator
5D	Identify the CPU	Check the CPU ID and init L1/L2 cache
5E	Setup Interrupt Vector Table	Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and INT 00h-1Fh according to INT_TBL First step initialize if single CPU Onboard. Re-init KB If support HPM, HPM get initialized Here.
5F	Test CMOS Interface and	Verifies CMOS is working correctly, detects bad battery. If failed, load

	Battery status	CMOS defaults and load into chipset
60	KBC final Init	Final Initial KBC and setup BIOS data area
61	Initialize Video Interface	Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter.
62	Video memory test	Test video memory, write sign-on message to screen. Setup shadow RAM - Enable shadow according to Setup.
63	Setup PS2 mouse and test DMA	Setup PS2 Mouse and reset KB Test DMA channel 0
64	Test 8259	Test 8259 channel 1 and mask IRQ 9
65	Init Boot Device	Detect if mouse is present, initialize mouse, install interrupt vectors. Special treatment to PS2 Mouse port ACPI sub-system initializing Initialize cache controller.
66	Install Boot Devices	Enter setup check and auto-configuration check up Initialize floppy disk drive controller and any drives. Install FDD and setup BIOS data area Parameters Initialize hard drive controller and any drives. IDE device detection and install
67	Cache Init	Cache init and USB init
68	PM init	PM initialization
69	PM final Init and issue SMI	Final init Before resume
FF	Full on	

## ***BootBlock POST Codes***

<b>Code(hex)</b>	<b>Name</b>	<b>Description</b>
1	Base memory test	Clear base memory area (0000:0000--9000:ffffh)
5	KB init	Initialized KBC
12	Install interrupt vectors	Install int. vector (0-77), and initialized 00-1fh to their proper place
0D	Init Video	Video initializing
41	Init FDD	Scan floppy and media capacity for onboard superIO
FF	Boot	Load boot sector

## **How to use the sticky label**



Accompanied with your motherboard there is a sticky label for the back panel. It serves the dustproof function and could also enhance the looks of your motherboard.

1. Tear out the sticker and dispose the paper without stickiness.
2. Tear out the semi blow holes of the sticky paper if your motherboard has corresponding

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connectors.

3. Apply the label with stickiness to the back panel of the motherboard; strike lightly with your hand to secure the firmness.