



AXIOMTEK

SHB213

**Intel Embedded Sandy Bridge
Processor PICMG 1.3 Half-size
board**

User's Manual



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February 2012, Version A1

Printed in Taiwan

ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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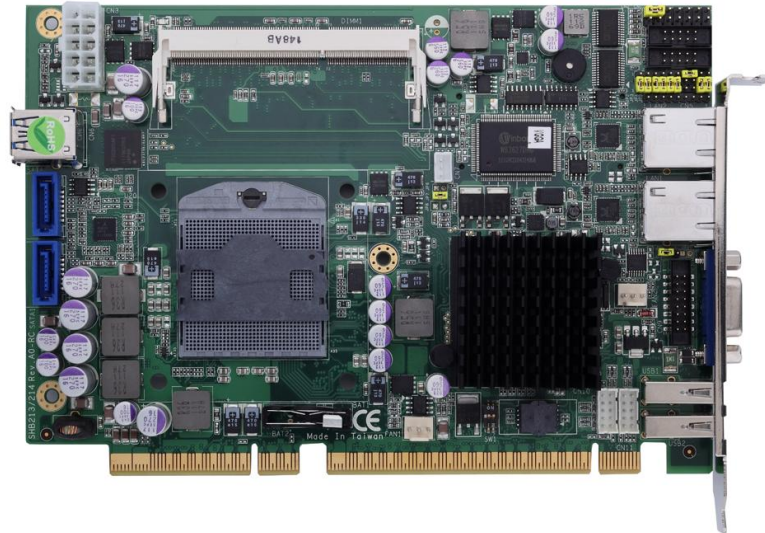
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Chapter 1

Introduction



The SHB213, a PICMG 1.3 Half-size CPU board, supports Intel Sandy Bridge CPU. This board integrates Intel Huron River platform and delivers outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions.

There are two 204-pin unbuffered SO-DIMM socket for single channel DDR3-1066/1333 MHz memory, maximum memory capacity up to 8GB. It also features two Gigabit/Fast Ethernet ports, two serial ATA channels for total two Serial ATA hard drives at maximum transfer rate up to 600MB/sec, six USB 2.0 high-speed compliant and two USB 3.0 high-speed compliant that can achieve the best stability and reliability for industrial applications. Additionally, it provides embedded features, such as two serial ports that applies an extensive array of PC peripherals.

1.1 Features

- Intel Socket G2 Core i3/i5/i7/Celeron processor
- Intel HM65/QM67 Platform Controller Hub
- 2 DDR3 SO-DIMM supports up to 8 GB memory capacity
- 6 USB 2.0 ports
- 2 USB 3.0 ports
- 2 COM ports
- ATX DC-in
- DirectX®10.1 support

1.2 Specifications

- **CPU**
 - Intel® Core™ i7-2710QE(SV) 2.1 GHz
 - Intel® Core™ i5 -2510E(SV) 2.5 GHz
 - Intel® Core™ i3 -2330E(SV) 2.2 GHz
 - Intel® Celeron® B810 (SV) 1.6 GHz
- **System Chipset**
 - Intel HM65/QM67(Optional)
- **BIOS**
 - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS
 - 16Mbit SPI Flash, DMI, Plug and Play
 - RPL/PXE Ethernet Boot ROM
- **System Memory**
 - Two 204-pin unbuffered DDR3 SO-DIMM socket
 - Maximum to 8GB DDR3 1066/1333 MHz memory
- **Onboard Multi I/O**
 - Super I/O Controller: Winbond W83627DHG
 - Serial Ports: One port for RS-232/422/485 and one port for RS-232
 - Serial ATA Ports: Two SATA-600 connectors, RAID 0, 1
- **CFast™ Socket**
 - One CFast™ Socket
- **USB Interface**
 - Six USB ports with fuse protection and complies with USB Spec. Rev. 2.0
 - Two USB ports with fuse protection and complies with USB Spec. Rev. 3.0
 - USB 3.0 Controller: NEC uPD720200A (Optional)
- **Display**
 - A slim type 15-pin D-Sub connector as VGA connector
- **Watchdog Timer**
 - 1~255 seconds or minutes; up to 255 levels
- **Ethernet**
 - Two ports with Realtek RTL8111E for Gigabit/Fast Ethernet
- **Power Management**
 - ACPI(Advanced Configuration and Power Interface)
- **Form Factor**
 - PICMG 1.3 Half-size, 185 x 126 mm



Note: All specifications and images are subject to change without notice.

1.3 Utilities Supported

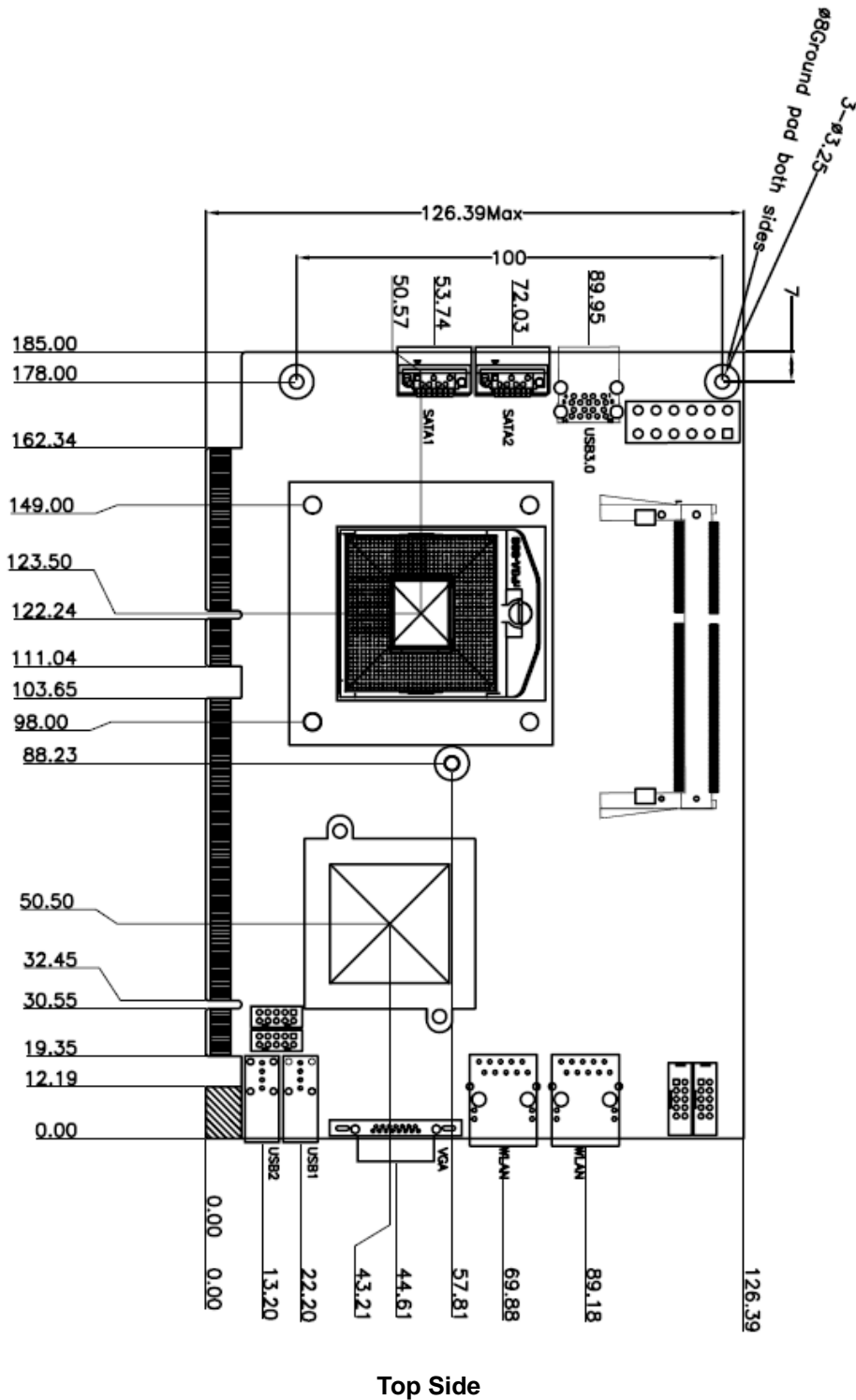
- Chipset and Graphic Driver
- Ethernet Driver (RTL8111E)
- AHCI Driver

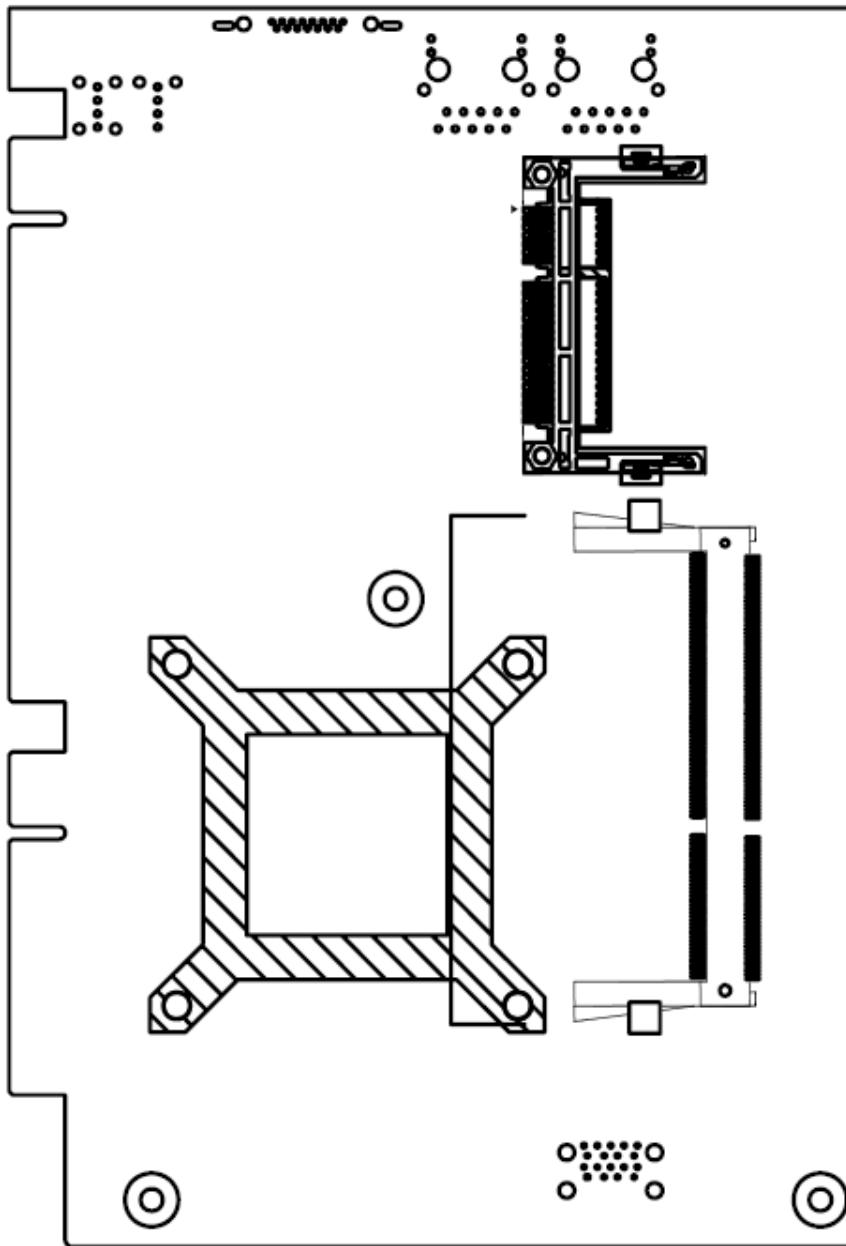
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Chapter 2

Board Layout and Pin Assignments

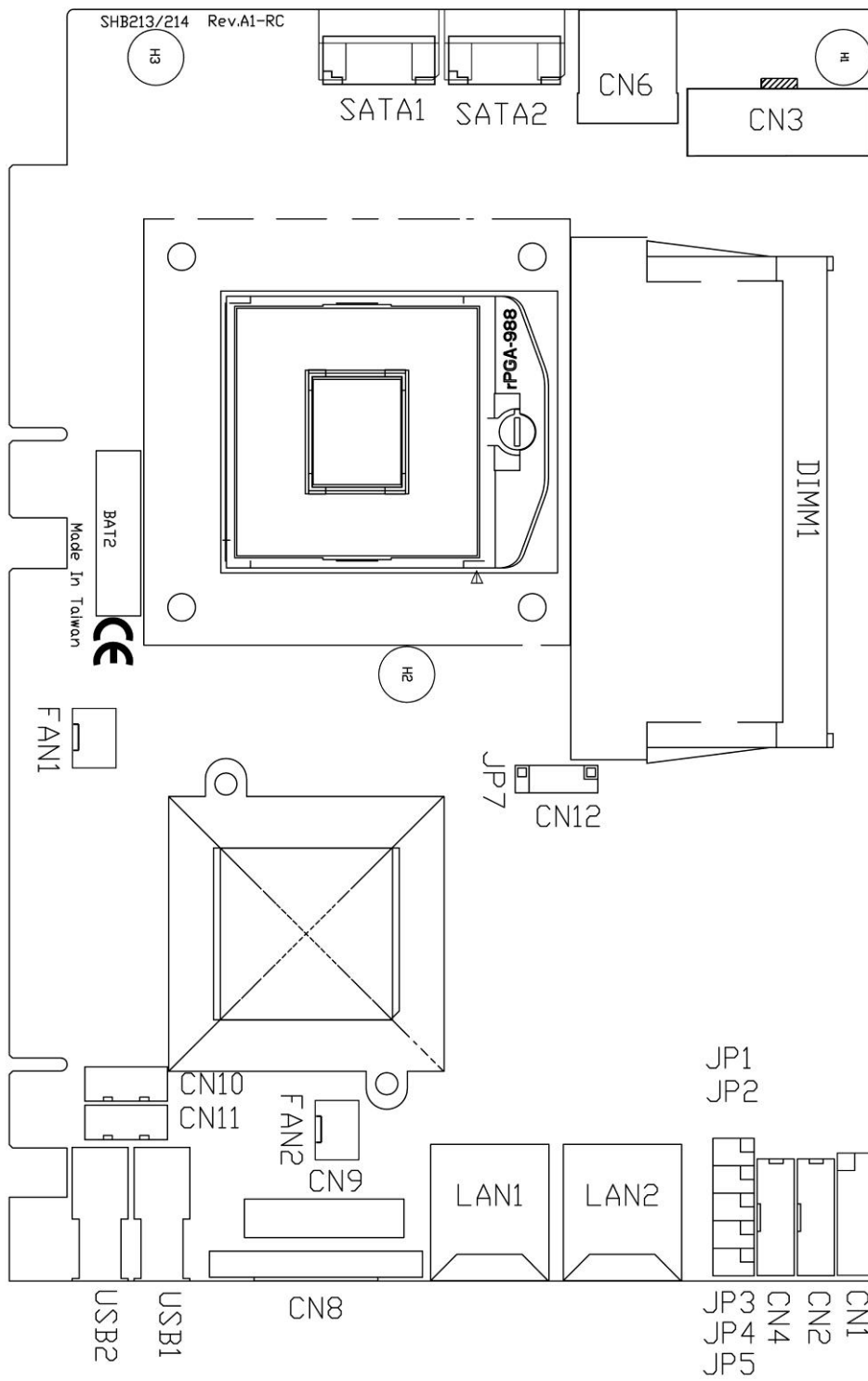
2.1 Board Dimensions and Fixing Holes



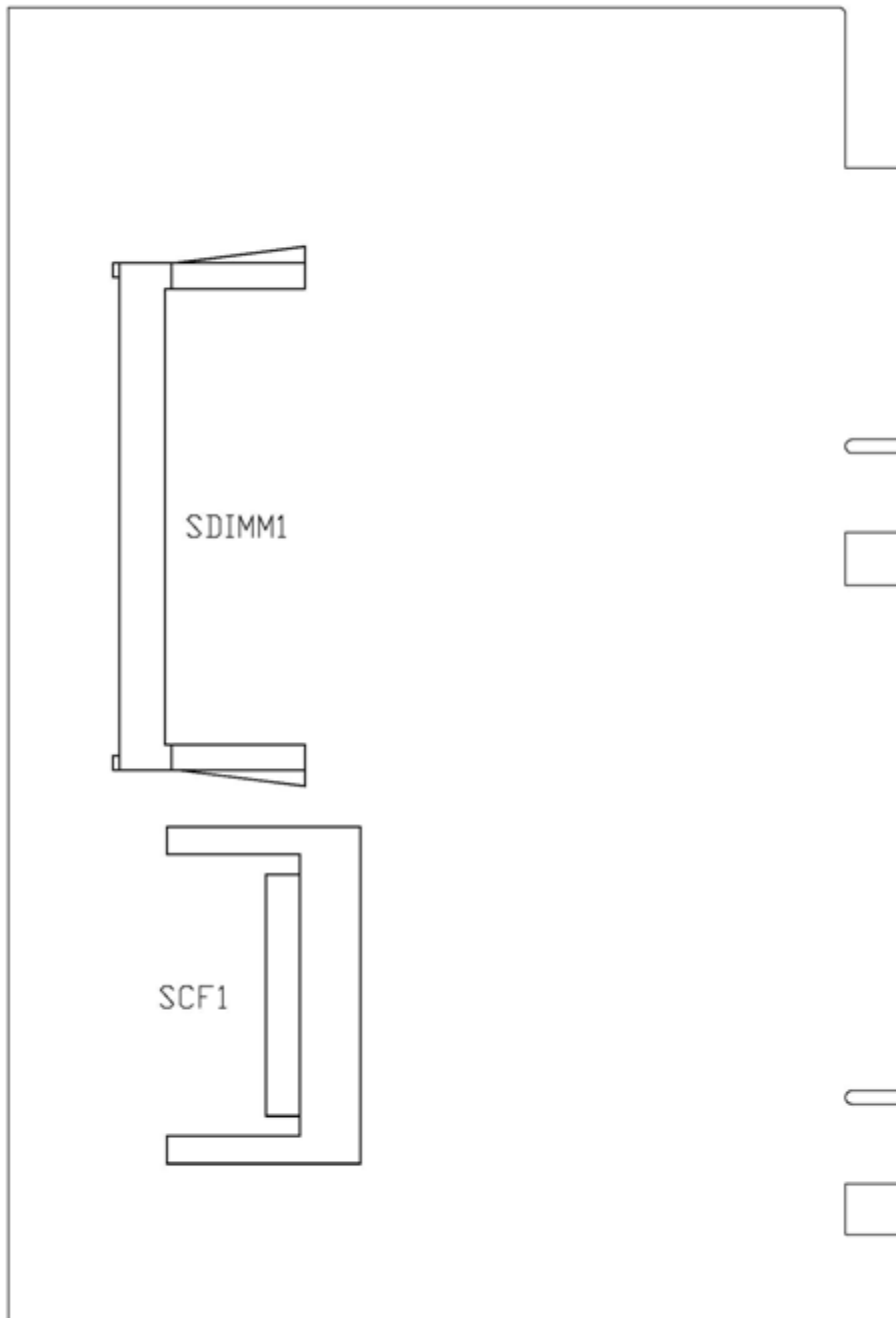


Bottom Side

2.2 Board Layout



Top Side



Bottom Side

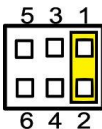
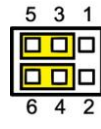
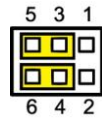
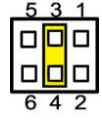
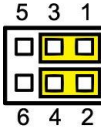
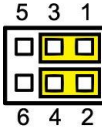
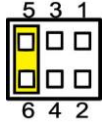
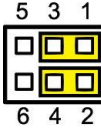
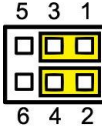
2.3 Jumper Settings

Properly configure jumper settings on the SHB213 to meet your application purpose. Below you can find a summary table of all jumpers and onboard default settings.

Jumper	Default Setting		Jumper Setting
JP4	COM1 Mode Selection Default: RS-232		Short 1-2
JP3	COM1 Mode Selection Default: RS-232		Short 3-5, 4-6
JP5	COM1 Mode Selection Default: RS-232		Short 3-5, 4-6
JP1	COM1 Mode Select	COM1 Pin 1: DCD	Short 3-5
		COM1 Pin 8: RI	Short 4-6
JP2	COM2 Mode Select	COM2 Pin 1: DCD	Short 3-5
		COM2 Pin 8: RI	Short 4-6
JP7	Auto-Power Button Selection Default: Manual Power Button		Short 1-2

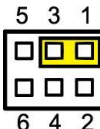
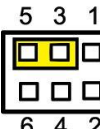
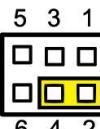
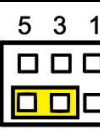
2.3.1 COM1 Mode Select Jumpers (JP4, JP3, JP5)

These jumpers select the COM1 port's communication mode to operate RS-232 or RS-422/485.

Description	Function	Jumper Setting		
COM1	RS-232 (Default)	JP4 	JP3 	JP5 
	RS-422	JP4 	JP3 	JP5 
	RS-485	JP4 	JP3 	JP5 

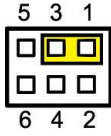
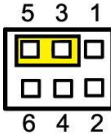
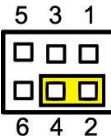
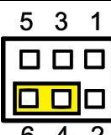
2.3.2 COM2 Mode Selection Jumper (JP2)

The jumper selects the DCD and RI mode of CN4 port.

Description	Function	Jumper Setting
COM2	CN4 Pin 1=5V	
	CN4 Pin 1=DCD (Default)	
	CN4 Pin 8=12V	
	CN4 Pin 8=RI (Default)	



2.3.3 COM1 Mode Selection Jumper (JP1)

The jumper selects the DCD and RI mode of CN2 port.

Description	Function	Jumper Setting
COM1	CN2 Pin 1=5V	
	CN2 Pin 1=DCD (Default)	
	CN2 Pin 8=12V	
	CN2 Pin 8=RI (Default)	

2.3.4 Auto-Power Button selection jumper (JP7)

Use this jumper to select either Auto or Manual Button.

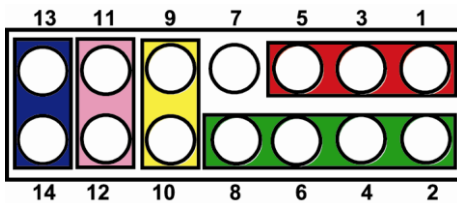
Description	Function	Jumper Setting
Auto-Power Button Selection	Manual Power Button (Default)	
	Automatic Power Button	

2.4 Connectors

Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

Connector	Description
Front Panel Connector	CN1
Serial Port1 Connector	CN2
Power Connector	CN3
Serial Port2 Connector	CN4
USB3.0 Connector	CN6
VGA Connector	CN8
VGA Box header Connector	CN9
CPU FAN Connector	FAN1
SYSTEM FAN Connector	FAN2
Ethernet 1 Connector	LAN1
Ethernet 2 Connector	LAN2
SATA1 Connector	SATA1/3
SATA2 Connector	SATA2/4
USB1 Connector	USB1
USB2 Connector	USB2
USB3 / USB 4 Connector	CN10
USB5 / USB 6 Connector	CN11
CFast Connector	SCF1
DDRIII RAM Connector	DIMM1
DDRIII RAM Connector	SDIMM1
DIO Connector	CN12

2.4.1 Front Panel Connector (CN1)



■ Power LED

This 3-pin connector denoted as **Pin 1, 3 and 5** connects the system power LED indicator to such a switch on the case. Pin 1 is assigned as +, and Pin 5 as -. The Power LED lights up when the system is powered ON. Pin 3 is defined as GND.

■ External Speaker and Internal Buzzer Connector

Pin 2, 4, 6 and 8 can be connected to the case-mounted speaker unit or internal buzzer. While connecting the CPU card to an internal buzzer, please short pins 2-4; while connecting to an external speaker, you need to set pins 2-4 to Open and connect the speaker cable to pin 8 (+) and pin 2 (-).

■ ATX Power On/Off Button

This 2-pin connector denoted as Pin 9 and 10 connects the front panel's ATX power button to the CPU card, which allows users to control ATX power supply to be power on/off.

■ System Reset Switch

Pin 11 and 12 can be connected to the case-mounted reset switch that reboots your computer instead of turning OFF the power switch. It is a better way to reboot your system for a longer life of the system's power supply.

■ HDD Activity LED

This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 13 and 14 connect the hard disk drive to the front panel HDD LED, Pin 13 assigned as -, and Pin 14 as +.

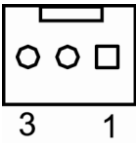

2.4.2 Power Connector (CN3)

Pin	Signal	Pin	Signal
1	PSON#	7	5VSB
2	GND	8	NC
3	GND	9	NC
4	+12V	10	NC
5	+3.3V	11	GND
6	+12V	12	GND

2.4.3 CPU & System Fan Connectors (FAN1,FAN2)

FAN1 is a fan connector for CPU, and FAN2 for system. Pentium microprocessors require a fan for heat dispensing. The CPU/System fan connectors respectively provide power to the CPU/System fans.

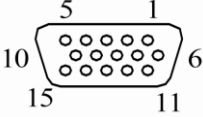
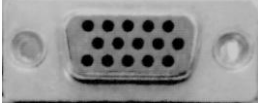
Pin	Signal
1	GND
2	+12V
3	Sensor

2.4.4 VGA Connector (CN8 & CN9)

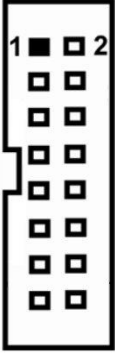
CN8 is a standard 15-pin pin DB15 connector commonly used for the CRT VGA display.

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	2	Green	3	Blue
4	N/A	5	AGND	6	CRT DET#
7	AGND	8	AGND	9	VGA 5V
10	AGND	11	N/A	12	DDC DAT
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK

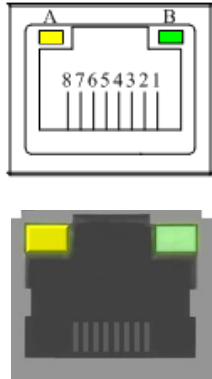
CN9 is an optional 16-pin pin Box-Header connector for ODM customer only. It shares the same VGA signal with CN8 and cannot be used with CN8 simultaneously.

Pin	Signal	Pin	Signal
1	Red	2	AGND
3	Green	4	NC
5	Blue	6	AGND
7	NC	8	DDC DAT
9	AGND	10	AGND
11	AGND	12	Horizontal Sync
13	AGND	14	Vertical Sync
15	DDC CLK	16	NC



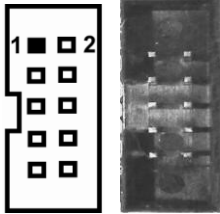
2.4.5 Ethernet RJ45 Connectors (LAN1, LAN2)

The RJ-45 connector LAN1/LAN2 is for Ethernet. To connect the board to 100-Base-T or 1000-Base-T hub, just plug one end of the cable into LAN1 or LAN2, and then, connect the other end (phone jack) to a 100-Base-T hub or 1000-Base-T hub.

Pin	Signal	
1	Tx+ (Data transmission positive)	
2	Tx- (Data transmission negative)	
3	Rx+ (Data reception positive)	
4	RJ-1 (For 100 base T-Only)	
5	RJ-1 (For 100 base T-Only)	
6	Rx- (Data reception negative)	
7	RJ-1 (For 100 base T-Only)	
8	RJ-1 (For 100 base T-Only)	
A	Active LED	
B	100/1000 LAN LED	

2.4.6 Serial Port Interface (CN2, CN4)

The serial interface for the board consists of COM1 port support RS232/422/485 (COM1) and COM2 (COM2) supports RS-232.

Pin	Signal	Pin	Signal	
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)	
3	Receive Data (RXD)	4	Request to Send (RTS)	
5	Transmit Data (TXD)	6	Clear to Send (CTS)	
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)	
9	Ground (GND)	10	NC	

2.4.7 SATA Connectors (SATA1,SATA2)

These SATA connectors SATA1 and SATA2 are for high-speed SATA interface ports and they can be connected to hard disk devices.

Pin	Signal	Pin	Signal
1	GND	2	SATA_TX+
3	SATA_TX-	4	GND
5	SATA_RX-	6	SATA_RX+
7	GND		

2.4.8 USB Connectors (USB1,USB2)

The SHB213 Series features Universal Serial Bus (USB) connectors, compliant with USB 2.0 (480Mbps) that can be adapted to any USB peripherals, such as monitor, keyboard and mouse.

Pin	Signal	USB1
1	USB POWER	
2	USB D1-	
3	USB D1+	
4	GND	

Pin	Signal	USB2
1	USB POWER	
2	USB D2-	
3	USB D2+	
4	GND	

2.4.9 USB Connector (CN10)

The Universal Serial Bus (USB) connector on the board is for the installation of peripherals supporting the USB interface. USB3 and USB4 are 10-pin standard onboard USB connectors.

Pin	Signal	Pin	Signal
1	USB POWER	2	USB POWER
3	USB D3-	4	USB D4-
5	USB D3+	6	USB D4+
7	GND	8	GND
9	GND	10	GND

USB3/USB4

2.4.10 USB Connector (CN11)

The Universal Serial Bus (USB) connector on the board is for the installation of peripherals supporting the USB interface. USB5 and USB6 are 10-pin standard onboard USB connectors.

Pin	Signal	Pin	Signal
1	USB POWER	2	USB POWER
3	USB D5-	4	USB D6-
5	USB D5+	6	USB D6+
7	GND	8	GND
9	GND	10	GND

USB5/USB6

2.4.11 USB 3.0 Connectors (CN6)(Optional)

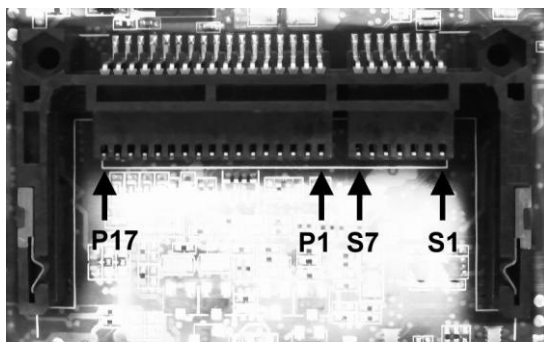
The SHB213 Series features Universal Serial Bus (USB) connectors, compliant with USB 3.0 (5G/b) that can be adapted to any USB peripherals, such as monitor, keyboard and mouse.

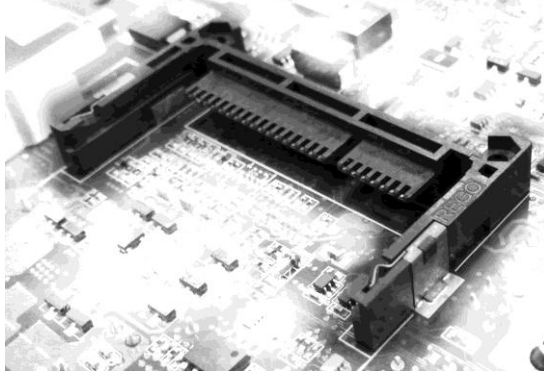
Pin	Signal	Pin	Signal
1	+5V level	2	D0-
3	D0+	4	GND
5	SSRX0-	6	SSRX0+
7	GND	8	SSTX0-
9	SSTX0+	10	+5V level
11	D1-	12	D1+
13	GND	14	SSRX1-
15	SSRX1+	16	GND
17	SSTX1-	18	SSTX1+

2.4.12 CFast™ Socket (SCF1)

The board is equipped with a CFast™ socket on the solder side to support a SATA signal card. The socket is especially designed to avoid incorrect installation of the CFast™ card. When installing or removing the CFast™ card, please make sure the system power is off. The CFast™ is defaulted as the C: or D: disk drive in your PC system.

Pin	Signal	Pin	Signal
S1	GND	P5	NC.
S2	TXP	P6	NC.
S3	TXN	P7	GND
S4	GND	P8	NC.
S5	RXN	P9	NC.
S6	RXP	P10	NC.
S7	GND	P11	NC.
		P12	NC.
		P13	+3.3 V
P1	NC.	P14	+3.3 V
P2	GND	P15	GND
P3	NC.	P16	GND
P4	NC.	P17	NC.

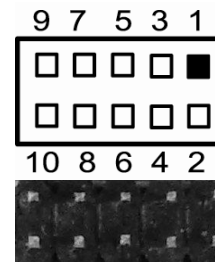




2.4.13 Digital I/O Port Connector (CN12)

The board is equipped with an 8-channel (2 inputs and 6 outputs) digital I/O connector that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. You may use software programming to control these digital signals. The software application method is provided in Appendix B.

Pin	Signal	Pin	Signal
1	Digital Input 0	2	Digital Output 0
3	Digital Input 1	4	Digital Output 1
5	Digital Output 5	6	Digital Output 2
7	GND	8	Digital Output 3
9	GND	10	Digital Output 4



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Chapter 3

Hardware Description

3.1 CPU (Central Processing Unit)

The SHB213 support Intel Socket G2 Core i3/i5/i7/Celeron CPU (Central Processing Unit), which enables your system to operate under Windows® XP, Windows® 7 and Linux environments. The system performance depends on the CPU.

3.2 BIOS

















































The SBH213 uses AMI Plug and Play BIOS with a single 16Mbit SPI Flash.





























3.3 System Memory

The SHB213 supports two 204-pin DDR3 SO-DIMM sockets for a maximum memory of 8GB DDR3 SDRAMs. The memory module comes in sizes of 1GB, 2GB and 4GB.

3.4 I/O Port Address Map


























The Intel CPU communicates via I/O ports. Total 1KB port addresses are available for assigning to other devices via I/O expansion cards.

	[00000000 - 0000000F] Direct memory access controller
	[00000000 - 0000000F] Motherboard resources
	[00000000 - 000003AF] PCI bus
	[00000010 - 0000001F] Motherboard resources
	[00000020 - 00000021] Programmable interrupt controller
	[00000022 - 0000003F] Motherboard resources
	[00000040 - 00000043] System timer
	[00000044 - 0000005F] Motherboard resources
	[00000060 - 00000060] Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
	[00000061 - 00000061] System speaker
	[00000062 - 00000063] Motherboard resources
	[00000064 - 00000064] Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
	[00000065 - 0000006F] Motherboard resources
	[00000070 - 00000071] System CMOS/real time clock
	[00000072 - 0000007F] Motherboard resources
	[00000080 - 00000080] Motherboard resources
	[00000081 - 00000083] Direct memory access controller
	[00000084 - 00000086] Motherboard resources
	[00000087 - 00000087] Direct memory access controller
	[00000088 - 00000088] Motherboard resources
	[00000089 - 0000008B] Direct memory access controller
	[0000008C - 0000008E] Motherboard resources
	[0000008F - 0000008F] Direct memory access controller
	[00000090 - 0000009F] Motherboard resources
	[000000A0 - 000000A1] Programmable interrupt controller
	[000000A2 - 000000BF] Motherboard resources
	[000000C0 - 000000DF] Direct memory access controller
	[000000E0 - 000000EF] Motherboard resources
	[000000F0 - 000000FF] Numeric data processor
	[00000170 - 00000177] Secondary IDE Channel
	[000001F0 - 000001F7] Primary IDE Channel
	[00000274 - 00000277] ISAPNP Read Data Port
	[00000279 - 00000279] ISAPNP Read Data Port
	[00000285 - 00000286] Motherboard resources
	[000002E8 - 000002EF] Communications Port (COM4)
	[000002F8 - 000002FF] Communications Port (COM2)
	[00000376 - 00000376] Secondary IDE Channel
	[000003B0 - 000003BB] AMD Radeon HD 6310 Graphics
	[000003B0 - 000003DF] PCI bus
	[000003C0 - 000003DF] AMD Radeon HD 6310 Graphics
	[000003E0 - 00000CF7] PCI bus
	[000003E8 - 000003EF] Communications Port (COM3)
	[000003F6 - 000003F6] Primary IDE Channel
	[000003F8 - 000003FF] Communications Port (COM1)
	[0000040B - 0000040B] Motherboard resources
	[000004D0 - 000004D1] Motherboard resources
	[000004D6 - 000004D6] Motherboard resources
	[00000800 - 0000089F] Motherboard resources

	[00000900 - 0000090F] Motherboard resources
	[00000910 - 0000091F] Motherboard resources
	[00000A79 - 00000A79] ISAPNP Read Data Port
	[00000B20 - 00000B3F] Motherboard resources
	[00000C00 - 00000C01] Motherboard resources
	[00000C14 - 00000C14] Motherboard resources
	[00000C50 - 00000C51] Motherboard resources
	[00000C52 - 00000C52] Motherboard resources
	[00000C6C - 00000C6C] Motherboard resources
	[00000C6F - 00000C6F] Motherboard resources
	[00000CD0 - 00000CD1] Motherboard resources
	[00000CD2 - 00000CD3] Motherboard resources
	[00000CD4 - 00000CD5] Motherboard resources
	[00000CD6 - 00000CD7] Motherboard resources
	[00000CD8 - 00000CDF] Motherboard resources
	[00000D00 - 0000FFFF] PCI bus
	[0000D000 - 0000D0FF] Realtek PCIe GBE Family Controller #4
	[0000D000 - 0000DFFF] PCI standard PCI-to-PCI bridge
	[0000E000 - 0000E0FF] Realtek PCIe GBE Family Controller #3
	[0000E000 - 0000EFFF] PCI standard PCI-to-PCI bridge
	[0000F000 - 0000F0FF] AMD Radeon HD 6310 Graphics
	[0000F100 - 0000F10F] Standard Dual Channel PCI IDE Controller
	[0000F150 - 0000F15F] Standard Dual Channel PCI IDE Controller
	[0000F160 - 0000F163] Standard Dual Channel PCI IDE Controller
	[0000F170 - 0000F177] Standard Dual Channel PCI IDE Controller
	[0000F180 - 0000F183] Standard Dual Channel PCI IDE Controller
	[0000F190 - 0000F197] Standard Dual Channel PCI IDE Controller
	[0000FE00 - 0000FEFE] Motherboard resources

3.5 Interrupt Controller (IRQ) Map

The SHB213 is 100% PC compatible control boards which consist of 20 interrupt request lines. Four out of 20 can be programmable. The mapping list of the 20 interrupt request lines is shown as the following table.

	(ISA) 0	System timer
	(ISA) 1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
	(ISA) 3	Communications Port (COM2)
	(ISA) 4	Communications Port (COM1)
	(ISA) 7	Communications Port (COM3)
	(ISA) 7	Communications Port (COM4)
	(ISA) 8	System CMOS/real time clock
	(ISA) 9	Microsoft ACPI-Compliant System
	(ISA) 12	Microsoft PS/2 Mouse
	(ISA) 13	Numeric data processor
	(PCI) 16	Microsoft UAA Bus Driver for High Definition Audio
	(PCI) 16	PCI standard PCI-to-PCI bridge
	(PCI) 16	Realtek PCIe GBE Family Controller #3
	(PCI) 17	PCI standard PCI-to-PCI bridge
	(PCI) 17	Realtek PCIe GBE Family Controller #4
	(PCI) 17	Standard Enhanced PCI to USB Host Controller
	(PCI) 17	Standard Enhanced PCI to USB Host Controller
	(PCI) 17	Standard Enhanced PCI to USB Host Controller
	(PCI) 18	AMD Radeon HD 6310 Graphics
	(PCI) 18	Standard OpenHCD USB Host Controller
	(PCI) 18	Standard OpenHCD USB Host Controller
	(PCI) 18	Standard OpenHCD USB Host Controller
	(PCI) 18	Standard OpenHCD USB Host Controller
	(PCI) 19	Microsoft UAA Bus Driver for High Definition Audio
	(PCI) 19	Standard Dual Channel PCI IDE Controller

Chapter 4

AMI BIOS Setup Utility

The AMI UEFI BIOS provides users with a built-in setup program to modify basic system configuration. All configured parameters are stored in a 16MB flash chip to save the setup information whenever the power is turned off. This chapter provides users with detailed description about how to set up basic system configuration through the AMI BIOS setup utility.

4.1 Starting

To enter the setup screens, follow the steps below:

1. Turn on the computer and press the key immediately.
2. After you press the key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.



Note: *If your computer cannot boot after making and saving system changes with Setup, you can restore BIOS optimal defaults by setting JP1 (see section 2.3.1) .*

It is strongly recommended that you should avoid changing the chipset's defaults. Both AMI and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

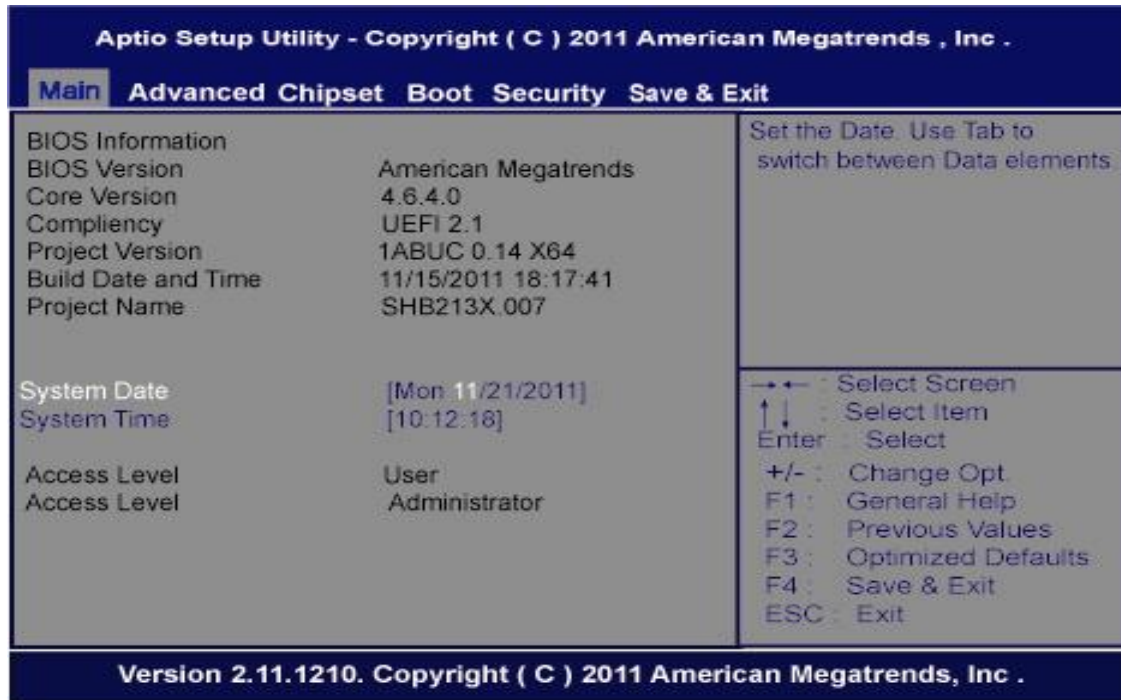


Note: *Some of the navigation keys differ from one screen to another.*

Hot Keys	Description
→← Left/Right	The Left and Right <Arrow> keys allow you to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the General Help screen.
F2	The <F2> key allows you to Load Previous Values.
F3	The <F3> key allows you to Load Optimized Defaults.
F4	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.

4.3 Main Menu

The first time you enter the setup utility, you will be in the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is shown below.



- **System Language**
Use this item to choose the system default language.
- **System Date/Time**
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

4.4 Advanced Menu

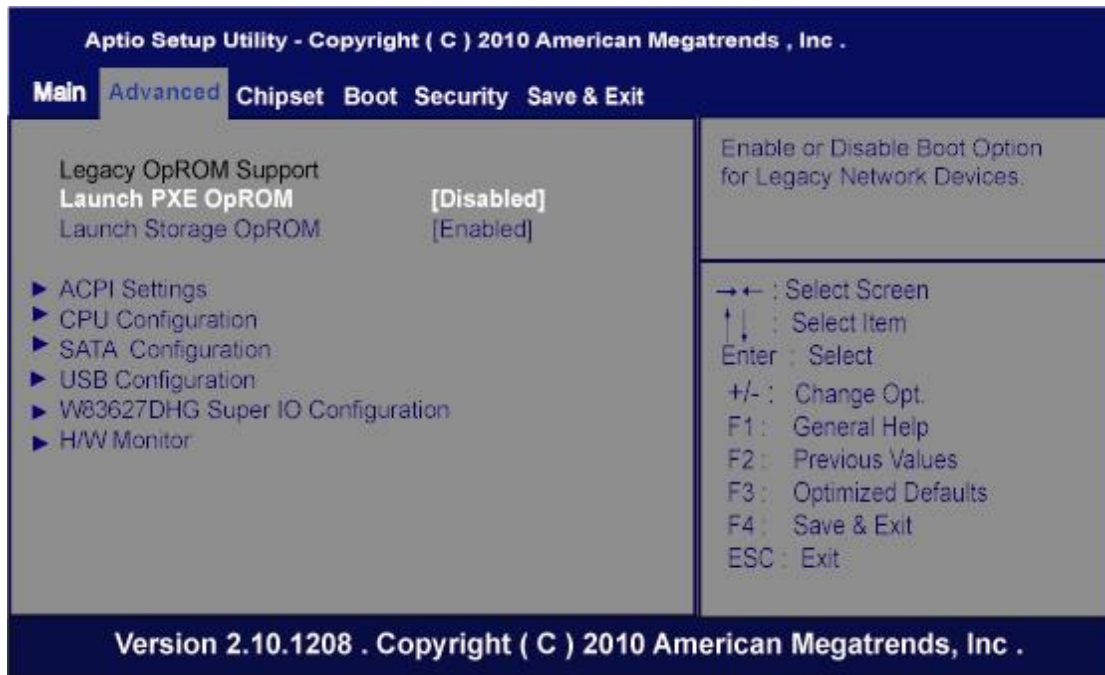
- **Launch PXE OpROM**

Use this item to enable or disable the boot ROM function of the onboard LAN chip when the system boots up.

The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

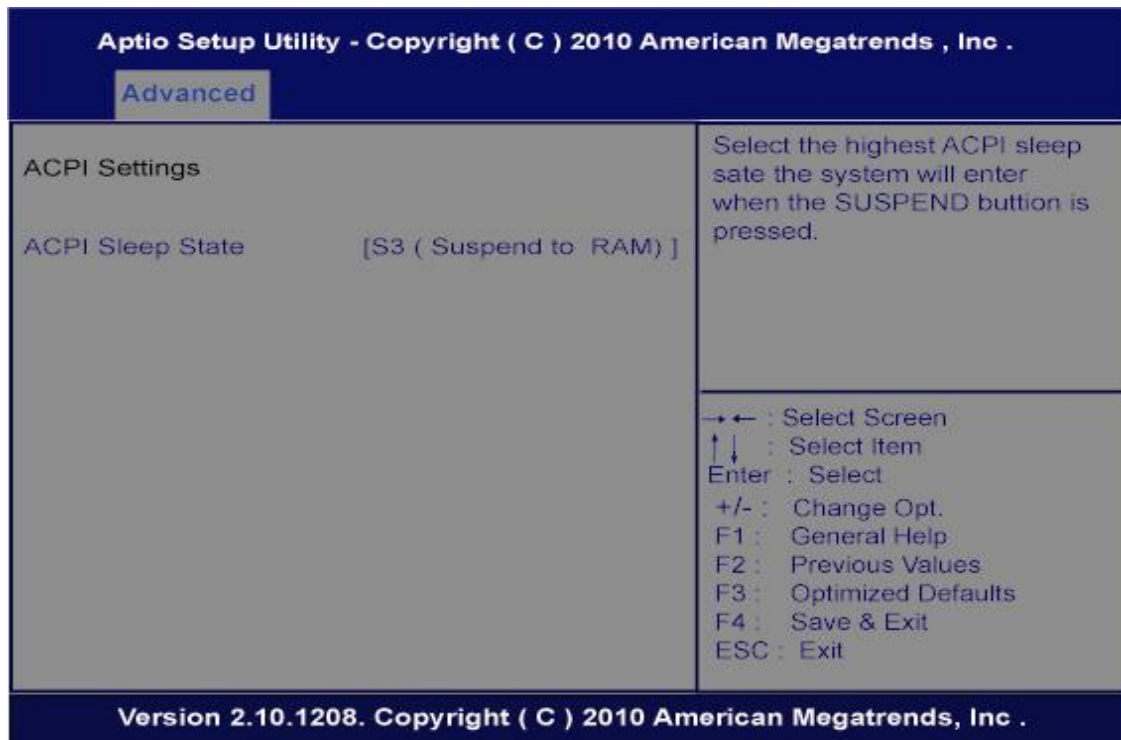
- ▶ ACPI Settings
- ▶ CPU Configuration
- ▶ SATA Configuration
- ▶ USB Configuration
- ▶ Super IO Configuration
- ▶ H/W Monitor

For items marked with “▶”, please press <Enter> for more options.



- **ACPI Settings**

ACPI configuration can be configured in ACPI Settings. A description of the selected item appears on the right side of the screen.



- **Enable ACPI Auto Configuration**
Use this item to enable or disable BIOS ACPI auto configuration.
- **Enable Hibernation**
Enable or disable system ability to hibernate (OS/S4 sleep state).
- **ACPI Sleep State**
Allow you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend. Here are the options for your selection; S1 (CPU Stop Clock), S3 (Suspend to RAM) and Suspend Disable
- **S3 Video Repost**
Enable or disable S3 video repost.

- **CPU Configuration**

This screen shows the CPU Configuration, and you can change the value of the selected option.

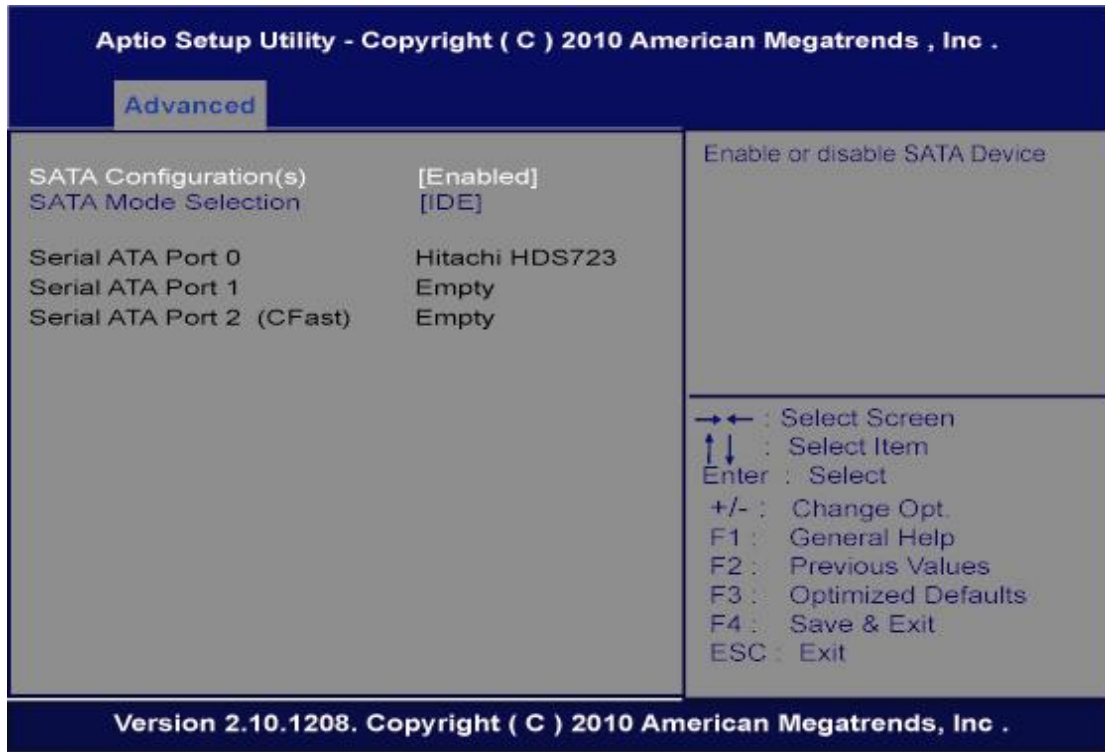
Aptio Setup Utility - Copyright (C) 2010 American Megatrends , Inc .		
Advanced		
CPU Configuration Intel(R) Core(TM) i5-2510E CPU @ 2.50GHZ Processor Stepping 206a7 Microcode Revision 12 Max Processor Speed 2500 MHZ Min Processor Speed 800 MHZ Processor Speed 2500 MHZ Processor Cores 2 Intel HT Technology Supported EMT64 Supported		Enabled for Windows XP AND Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.
Hyper-threading [Enabled] Active Processor Cores [1] Limit cpuid Maximum [Enabled] Execute Disable Bit [Enabled] Hardware Prefetcher [Enabled] Adjacent Cache Line Prefetch [Enabled] Intel Virtualization Technology [Disabled]		→ ← : Select Screen ↑ ↓ : Select Item Enter : Select +/- : Change Opt. F1 : General Help F2 : Previous Values F3 : Optimized Defaults F4 : Save & Exit ESC : Exit
Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc .		

- **Node 0 Information**

View memory information related to Node 0.

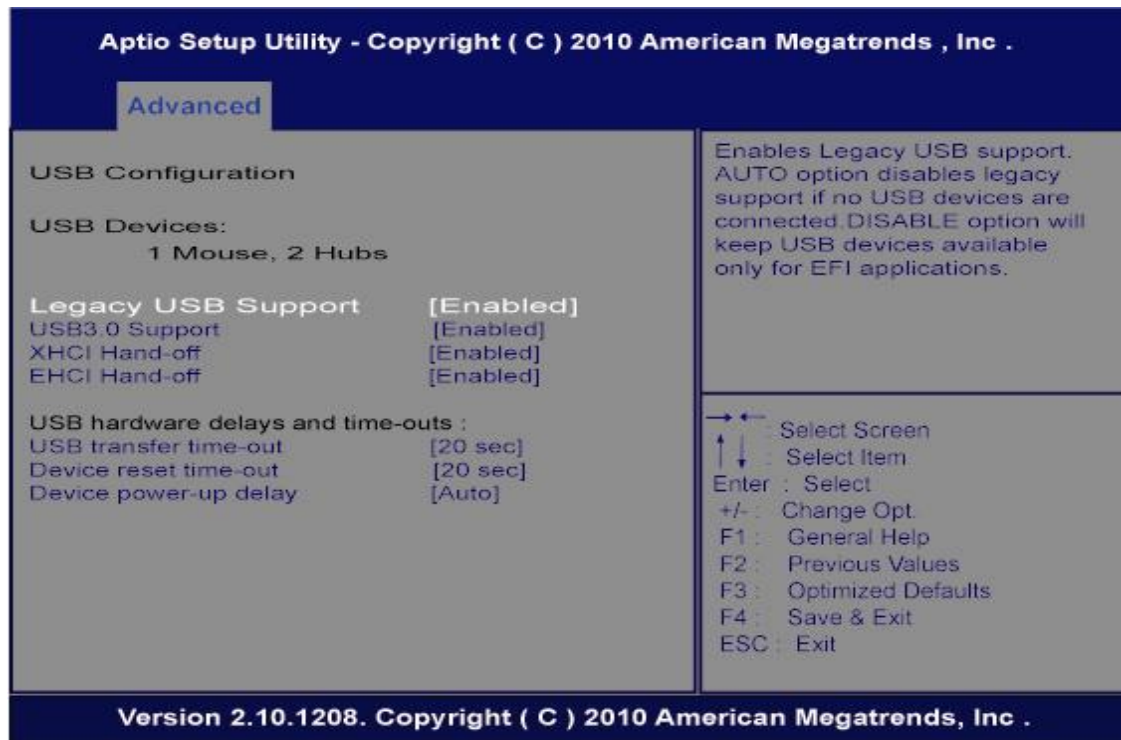
- **SATA Configuration**

You can read the current installed hardware configurations from those SATA ports in the SATA Configuration menu. During system boot up, BIOS will detect the present SATA devices automatically.



- **USB Configuration**

USB configuration can be configured here by selecting and changing each item. A description of the selected item appears on the right side of the screen.



- **Legacy USB Support**

Use this item to enable or disable support for USB device on legacy operating system. The default setting is Enabled. Auto option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications.

- **USB transfer time-out**

The time-out value for control, bulk and interrupt transfers.

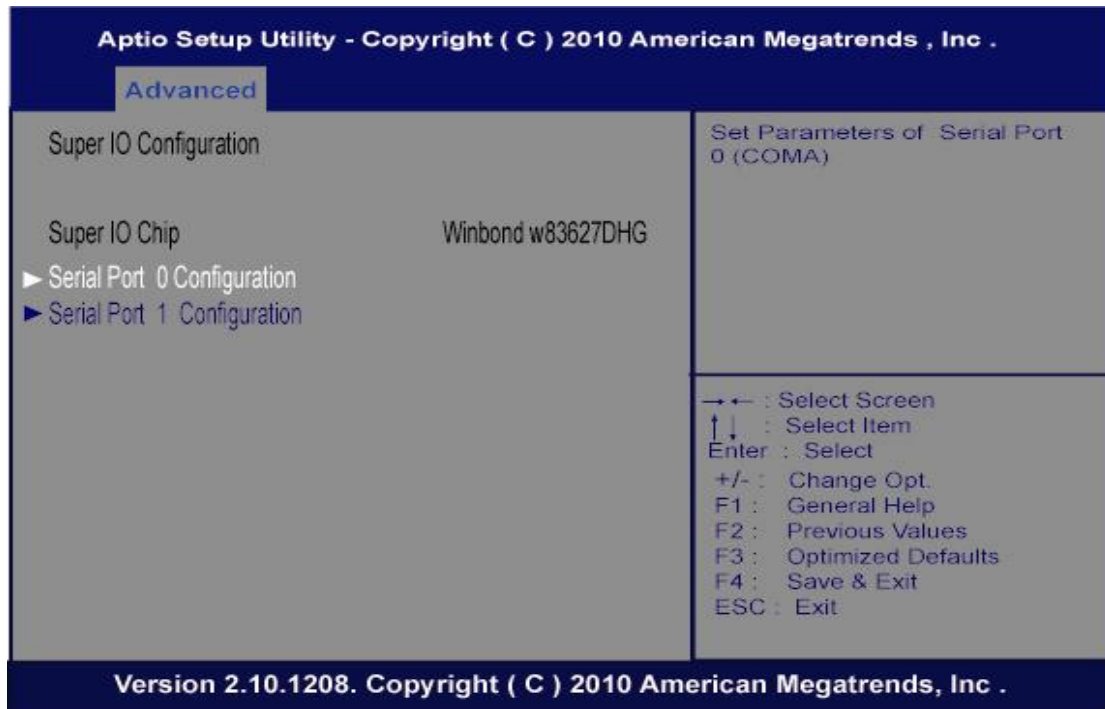
- **Device reset time-out**

USB mass storage device start unit command time-out.

- **Device power-up delay**

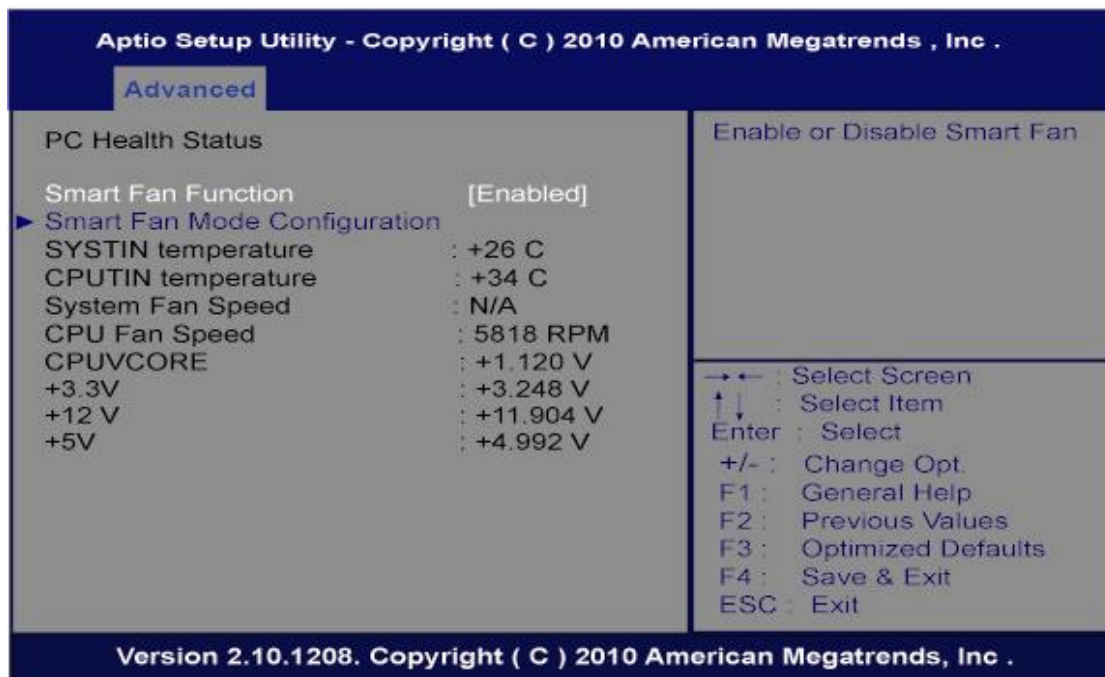
Maximum time the device will take before it properly reports itself to the host controller. "Auto" uses default value: for a root port it is 100ms, for a hub port the delay is taken from hub descriptor

- **Super IO Configuration**



- **W83627UHG Serial Port Configuration**
The configuration of serial port 1~4 are set <Auto> as default.

- **H/W Monitor**
This screen monitors hardware health.



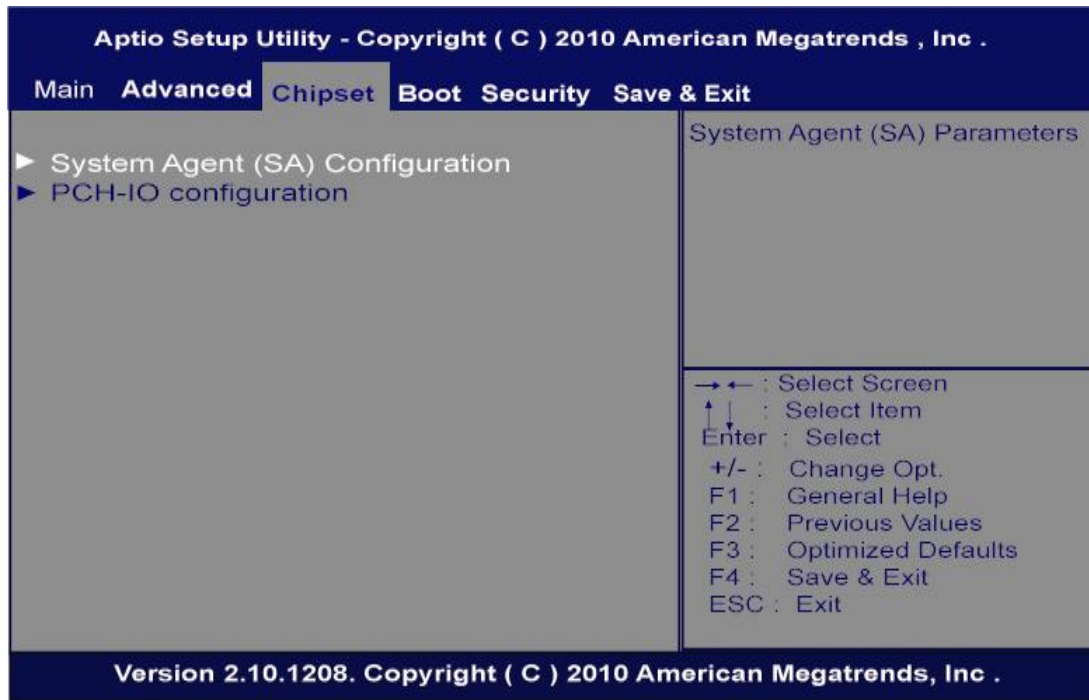
This screen displays the temperature of system and CPU, cooling fan speed in RPM and system voltages (VCORE, +12V, +5V and +3.3V).

4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

- ▶ System Agent (SA) Configuration
- ▶ PCH-IO Configuration

For items marked with “▶”, please press <Enter> for more options.



- ▶ Graphics Configuration
- ▶ Memory Configuration

For items marked with “▶”, please press <Enter> for more options.

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Chlpset

System Agent Version 1.1.1.1 VT-d Capability Supported VT-d [Enabled]	Check to VT-d function on MCH.
▶ Graphics Configuration ▶ Memory Configuration	→← : Select Screen ↑↓ : Select Item Enter : Select +/- : Change Opt. F1 : General Help F2 : Previous Values F3 : Optimized Defaults F4 : Save & Exit ESC : Exit

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● **Graphics Configuration**

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Chlpset

Graphics Configuration IGFX VBIOS Version 2089 IGfX Frequency 650 MHZ Internal Graphics [Auto] GTT Size [2MB] Aperture Size [256MB] DVMT Pre-Allocated [64M] DVMT Total Gfx Mem [256M] Gfx Low Power Mode [Enabled]	Keep IGD enabled based on the setup options.
	→← : Select Screen ↑↓ : Select Item Enter : Select +/- : Change Opt. F1 : General Help F2 : Previous Values F3 : Optimized Defaults F4 : Save & Exit ESC : Exit

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● **Memory Information**

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Chipset

Memory Information	
Memory RC Version	1.1.1.0
Memory Frequency	1.067 Mhz
Total Memory	4096 MB (DDR3)
DIMM#0	2048 MB (DDR3)
DIMM#1	2048 MB (DDR3)

→ ← : Select Screen
 ↑ ↓ : Select Item
 Enter : Select
 +/- : Change Opt.
 F1 : General Help
 F2 : Previous Values
 F3 : Optimized Defaults
 F4 : Save & Exit
 ESC : Exit

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Chlpset

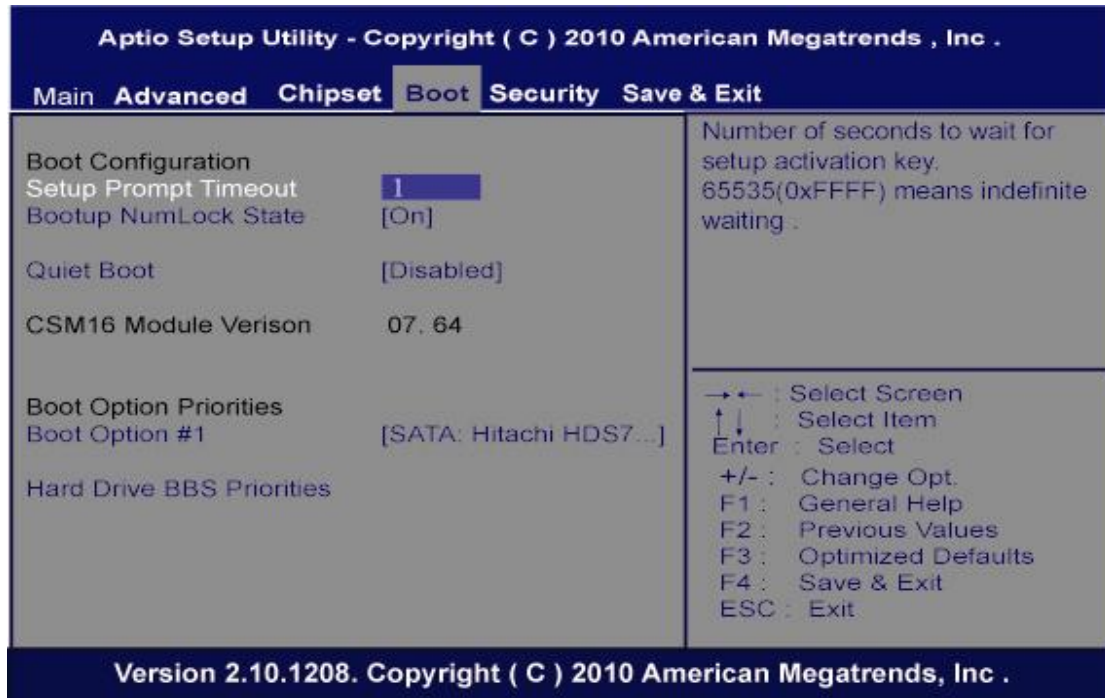
PCH LAN Controller	[Disabled]	Enable or disable onboard NIC.
Azalia	[Disabled]	
Azaila Internal HDMI Codec	[Enabled]	

→ ← : Select Screen
 ↑ ↓ : Select Item
 Enter : Select
 +/- : Change Opt.
 F1 : General Help
 F2 : Previous Values
 F3 : Optimized Defaults
 F4 : Save & Exit
 ESC : Exit

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4.6 Boot Menu

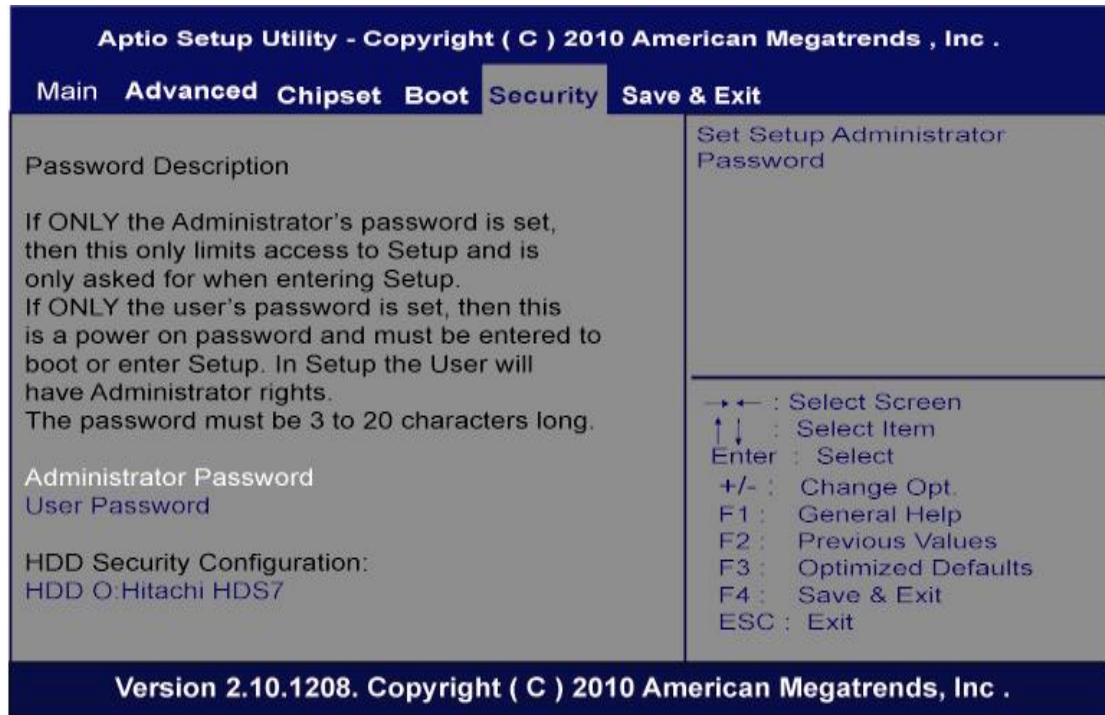
The Boot menu allows users to change boot options of the system.



- **Setup Prompt Timeout**
Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
- **Boot up Unlock State**
Use this item to select the power-on state for the Unlock.
- **Quiet Boot**
Enable or disable Quiet Boot option.

4.7 Security Menu

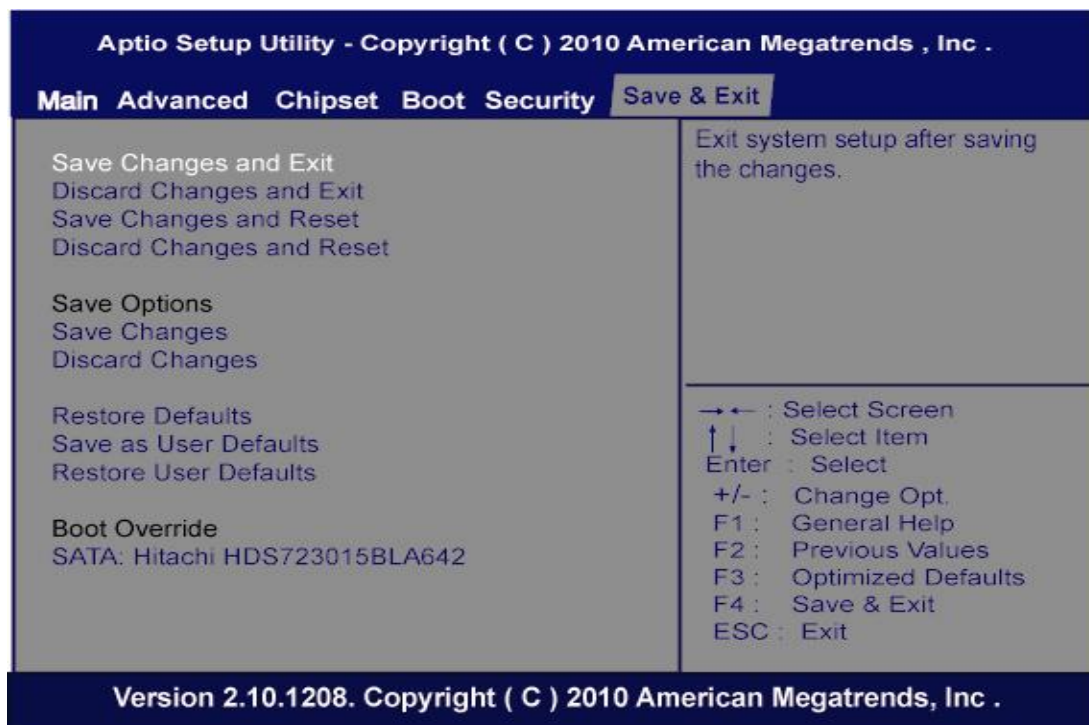
The Security menu allows users to change the security settings for the system.



- **Administrator Password**
This item indicates whether an administrator password has been set (installed or uninstalled).
- **User Password**
This item indicates whether an user password has been set (installed or uninstalled).

4.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or fail-safe default values.



- **Save Changes and Exit**
When finish the system configuration settings, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.
- **Discard Changes and Exit**
Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.
- **Save Changes and Reset**
When finish the system configuration settings, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.
- **Discard Changes and Reset**
Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.
- **Save Changes**
When finish the system configuration settings, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

- **Discard Changes**
Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

- **Restore Defaults**
When select this option, all the settings will be restored to defaults automatically. Select Restore Defaults from the Save & Exit menu and press <Enter>.

- **Save as User Defaults**
Select this option to save your current system configuration settings as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

- **Restore User Defaults**
When select this option, all the settings will be restored to user defaults automatically. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

Appendix A

Watchdog Timer

About Watchdog Timer

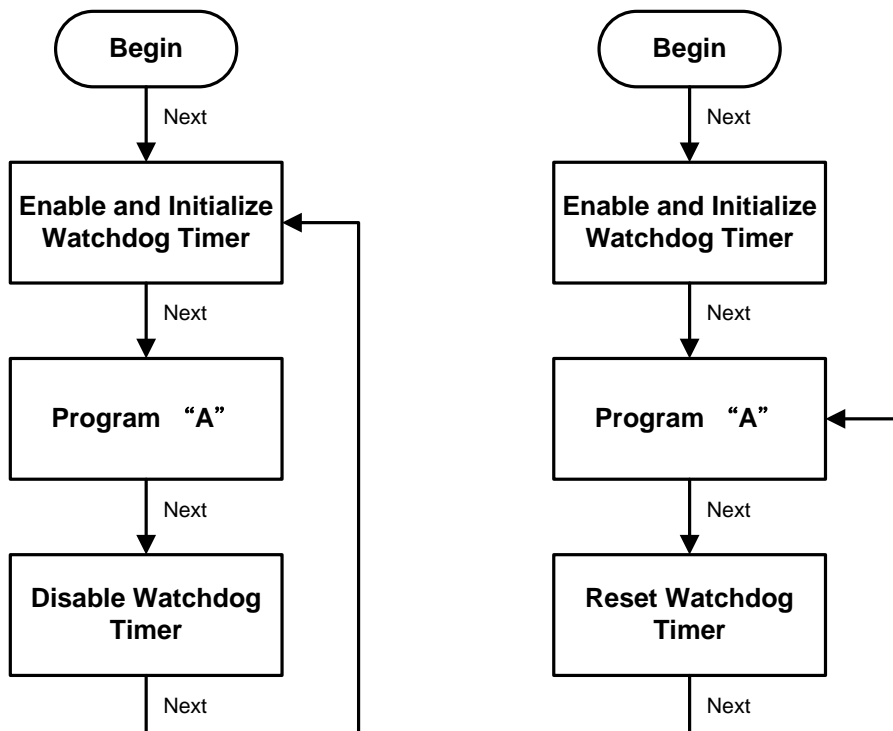
Software stability is major issue in most application. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solution.

The watchdog timer is a counter that triggers a system reset when it counts down to zero from a preset value. The software starts counter with an initial value and must reset it periodically. If the counter ever reaches zero which means the software has crashed, the system will reboot.

How to Use Watchdog Timer

The I/O port base addresses of watchdog timer are 2E (hex) and 2F (hex). The 2E (hex) and 2F (hex) are address and data port respectively.

Assume that program A is put in a loop that must execute at least once every 10ms. Initialize watchdog timer with a value bigger than 10ms. If the software has no problems; watchdog timer will never expire because software will always restart the counter before it reaches zero.



Sample Program

Assembly sample code :

;Enable WDT:

```
mov     dx,2Eh
mov     al,87             ;Un-lock super I/O
out     dx,al
out     dx,al
```

;Set WDT Function:

```
mov     dx,2Eh
mov     al,2Dh
out     dx,al
mov     dx,2Fh
mov     al,20h
out     dx,al
```


;Select Logic device:

```
mov     dx,2Eh
mov     al,07h
out     dx,al
mov     dx,2Fh
mov     al,08h
out     dx,al
```


;Activate WDT:

```
mov     dx,2Eh
mov     al,30h
out     dx,al
mov     dx,2Fh
mov     al,01h
out     dx,al
```

;Set Second or Minute :


```
mov     dx,2Eh
mov     al,0F5h
out     dx,al
mov     dx,2Fh
mov     al,Nh             ;N=00h or 08h(see below  Note)
out     dx,al
```

;Set base timer :

```
mov     dx,2Eh
mov     al,0F6h
out     dx,al
mov     dx,2Fh
mov     al,Mh             ;M=00h,01h,...FFh (hex),Value=0 to 255
out     dx,al             ;(see below  Note)
```

;Disable WDT:

```
mov     dx,2Eh
mov     al,30h
out     dx,al
mov     dx,2Fh
mov     al,00h           ;Can be disabled at any time
out     dx,al
```


 **Note:** If **N=00h**, the time base is set to second. **M** = time value
00: Time-out Disable

01: Time-out occurs after 1 second

02: Time-out occurs after 2 seconds

03: Time-out occurs after 3 seconds

.

FFh: Time-out occurs after 255 seconds

If **N=08h**, the time base is set to minute.

M = time value

00: Time-out Disable

01: Time-out occurs after 1 minute

02: Time-out occurs after 2 minutes

03: Time-out occurs after 3 minutes

.

FFh: Time-out occurs after 255 minutes

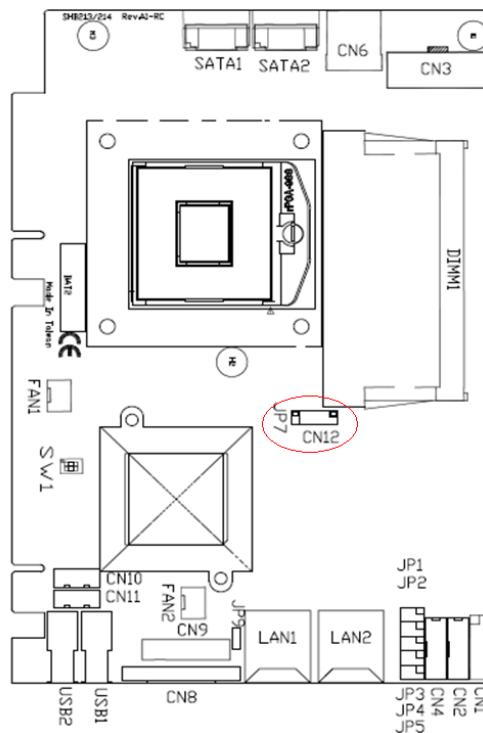
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Appendix B

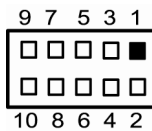
Digital I/O

About Digital I/O

The onboard digital I/O has 8 bits (DIO0~7). Each bit can be set to function as input or output by software programming. In default, all pins are pulled high with +5V level (according to main power). The BIOS default settings are 2 inputs and 6 outputs where all of these pins are set to 1.



CN12



Pin	Signal	Pin	Signal
1	DIO (Bit0)	2	DO0 (Bit 2)
3	DI1 (Bit1)	4	DO1 (Bit 3)
5	DI5 (Bit7)	6	DO2 (Bit 4)
7	GND	8	DO3 (Bit 5)
9	GND	10	DO4 (Bit 6)

Digital I/O Software Programming

Assembly sample code :

Set functionality:

;Start set DIO program:


```
mov     dx,2Eh
mov     al,87h           ;Un-lock super I/O
out     dx,al
out     dx,al
```

```
mov     dx,2Eh
mov     al,07h
out     dx,al
mov     dx,2Fh
mov     al,09h
out     dx,al
```

```
mov     dx,2Eh
mov     al,30h
out     dx,al
mov     dx,2Fh
mov     al,02h
out     dx,al
```


```
mov     dx,2Eh
mov     al,0E7h
out     dx,al
mov     dx,2Fh
mov     al,01h
out     dx,al
```

;Programming DIO as in/out.

```
mov     dx,2Eh
mov     al,0F0h
out     dx,al
mov     dx,2Fh
mov     al,Nh           ;If N=03h, DIO is programmed as 2 inputs
out     dx,al           ;and 6 outputs (see below  Note1)
```


Digital Input:

;Read digital input data.

```
mov     dx,2Eh
mov     al,0F1h
out     dx,al
mov     dx,2Fh
in      dx, al         ;If N=03h, bit0~1 represent DIO0~1,
                     ;bit0~1 are DIO pin 0~1 state (1 High, 0 Low)
                     ;(see below  Note2)
```

Digital Output:

; Set DIO digital output pins' value.

```
mov     dx,2Eh
mov     al,0F1h
out     dx,al
mov     dx,2Fh
mov     al,M           ;If N=03h, bit2~7 represent DIO2~7,
out     dx,al         ;set output value M
                     ;bit2~7 are DIO pin 2~7 state (1 High, 0 Low)
                     ;if M=FFh, all DIO pins are high
                     ;(see below  Note3)
```

 **Note1:**

The **N** has 8 bits. Every bit's value is either 1 or 0.

" 1 " means that the bit is programmed to input.

" 0 " means that the bit is programmed to output.

Ex:

1. $N=00h=00000000b$

DIO7	DIO6	DIO5	DIO4	DIO3	DIO2	DIO1	DIO0
Output	Output	Output	Output	Output	Output	Output	Output

2. $N=02h=00000010b$

DIO7	DIO6	DIO5	DIO4	DIO3	DIO2	DIO1	DIO0
Output	Output	Output	Output	Output	Output	Input	Output

3. $N=07h=00000111b$

DIO7	DIO6	DIO5	DIO4	DIO3	DIO2	DIO1	DIO0
Output	Output	Output	Output	Output	Input	Input	Input

4. $N=F2h=11110010b$

DIO7	DIO6	DIO5	DIO4	DIO3	DIO2	DIO1	DIO0
Input	Input	Input	Input	Output	Output	Input	Output

**Note2:**If $N=03h$

DIO7	DIO6	DIO5	DIO4	DIO3	DIO2	DIO1	DIO0
Output	Output	Output	Output	Output	Output	Input	Input

1. When DIO0~1 are connected to external device, the device sets DIO0~1 to high

DIO7	DIO6	DIO5	DIO4	DIO3	DIO2	DIO1	DIO0
Output	Output	Output	Output	Output	Output	1	1

2. When DIO0~1 are connected to external device, the device sets DIO0 to low and DIO1 to high

DIO7	DIO6	DIO5	DIO4	DIO3	DIO2	DIO1	DIO0
Output	Output	Output	Output	Output	Output	1	0

**Note3:**If $N=03h$

DIO7	DIO6	DIO5	DIO4	DIO3	DIO2	DIO1	DIO0
Output	Output	Output	Output	Output	Output	Input	Input

1. When $M=FFh$

DIO7	DIO6	DIO5	DIO4	DIO3	DIO2	DIO1	DIO0
1	1	1	1	1	1	1	1

2. When $M=D7h$

DIO7	DIO6	DIO5	DIO4	DIO3	DIO2	DIO1	DIO0
1	1	0	1	0	1	1	1

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Appendix C Configuring SATA for RAID Function

Configuring SATA Hard Drive(s) for RAID Function (Controller: Intel®QM67)

Please follow up the steps below to configure SATA hard drive(s):

- (1) Install SATA hard drive(s) in your system.
- (2) Enter the BIOS Setup to configure SATA controller mode and boot sequence.
- (3) Configure RAID by the RAID BIOS.
- (4) Create a floppy disk for the SATA controller driver.
- (5) Install the SATA controller driver during the OS installation.
Before you begin the SATA configuration, please prepare:
 - (a) Two SATA hard drives (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). If you do not want to create RAID with the SATA controller, you may prepare only one hard drive.
 - (b) An empty formatted floppy disk
 - (c) Windows XP setup disk

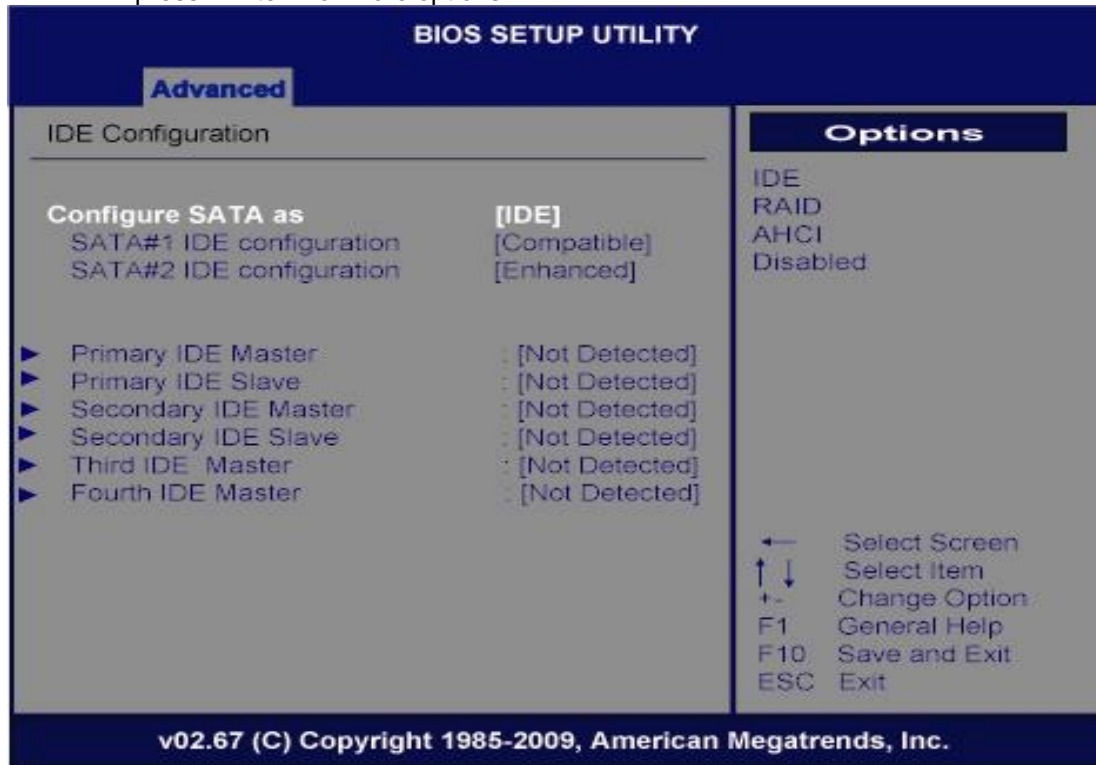
1. **Installing SATA hard drive(s) in your system**

Connect one end of the SATA signal cable to the rear of the SATA hard drive, and the other end to available SATA port(s) on the board. Then, connect the power connector of power supply to the hard drive.

2. Configuring SATA controller mode and boot sequence by the BIOS Setup

You have to make sure whether the SATA controller is configured correctly by system BIOS Setup and set up BIOS boot sequence for the SATA hard drive(s)

- (2)-1-1 Turn on your system, and then press the Del button to enter BIOS Setup during running POST (Power-On Self-Test). If you want to create RAID, just go to the Advanced Settings menu/IDE configuration, select the Configure SATA#1 as, and press <Enter> for more options.



(2)-1-2 A list of options appears, please select RAID.

BIOS SETUP UTILITY

Advanced

<p>IDE Configuration</p> <hr/> <p>Configure SATA as [RAID]</p> <ul style="list-style-type: none"> ▶ Primary IDE Master : [Not Detected] ▶ Primary IDE Slave : [Not Detected] ▶ Secondary IDE Master : [Not Detected] ▶ Secondary IDE Slave : [Not Detected] ▶ Third IDE Master : [Not Detected] ▶ Fourth IDE Master : [Not Detected] <p>Hot Plug [Disabled]</p>	<p style="text-align: center;">Options</p> <p>IDE RAID AHCI Disabled</p> <p>← Select Screen ↑ ↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit</p>
--	--

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BIOS SETUP UTILITY

Main **Advanced** PCIPnP Boot Security Chipset Exit

<p>IDE Configuration</p> <hr/> <p>Mirrored IDER Configuration [Enabled] Configure SATA#1 as [RAID]</p> <ul style="list-style-type: none"> ▶ Primary IDE Master : [Hard Disk] ▶ Primary IDE Slave : [ATAPI CDROM] ▶ Secondary IDE Master : [Hard Disk] ▶ Secondary IDE Slave : [Not Detected] ▶ Third IDE Master : [Not Detected] ▶ Third IDE Slave : [Not Detected] ▶ Fifth IDE Master : [Not Detected] ▶ Sixth IDE Master : [Not Detected] <p>Hot Plug [Disabled]</p>	<p style="text-align: center;">Options</p> <p>IDE RAID AHCI</p> <p>← Select Screen ↑ ↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit</p>
---	---

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(2)-2 Set CDROM for First Boot Device under the Boot Settings menu to boot CD-ROM after system restarts.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Boot Settings ▶ Boot Settings Configuration ▶ Boot Device Priority ▶ Hard Disk Drives ▶ Removable Drives ▶ CD/DVD Drives				Specifies the Boot Device Priority sequence. ← Select Screen ↑ ↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit		
v02.61 (C) Copyright 1985-2006, American Megatrends, Inc.						

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Boot Device Priority 1st Boot Device [CD/DVD:PS-HL-DT-ST] 2nd Boot Device [SATA:PM-ST380817AS] 3rd Boot Device [1st FLOPPY DRIVE]				Specifies the boot sequence from the available devices. A device enclosed in parenthesis has been disabled in the corresponding type menu. ← Select Screen ↑ ↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit		
v02.61 (C) Copyright 1985-2006, American Megatrends, Inc.						

(2)-3 Save and exit the BIOS Setup.

(3) Configuring RAID by the RAID BIOS

Enter the RAID BIOS setup utility to configure a RAID array. Skip this step and proceed to Section 4 if you do not want to create a RAID.

(3)-1 After the POST memory testing and before the operating system booting, a message "Press <Ctrl-I> to enter Configuration Utility" shows up, accordingly, press <CTRL+I> to enter the RAID BIOS setup utility.

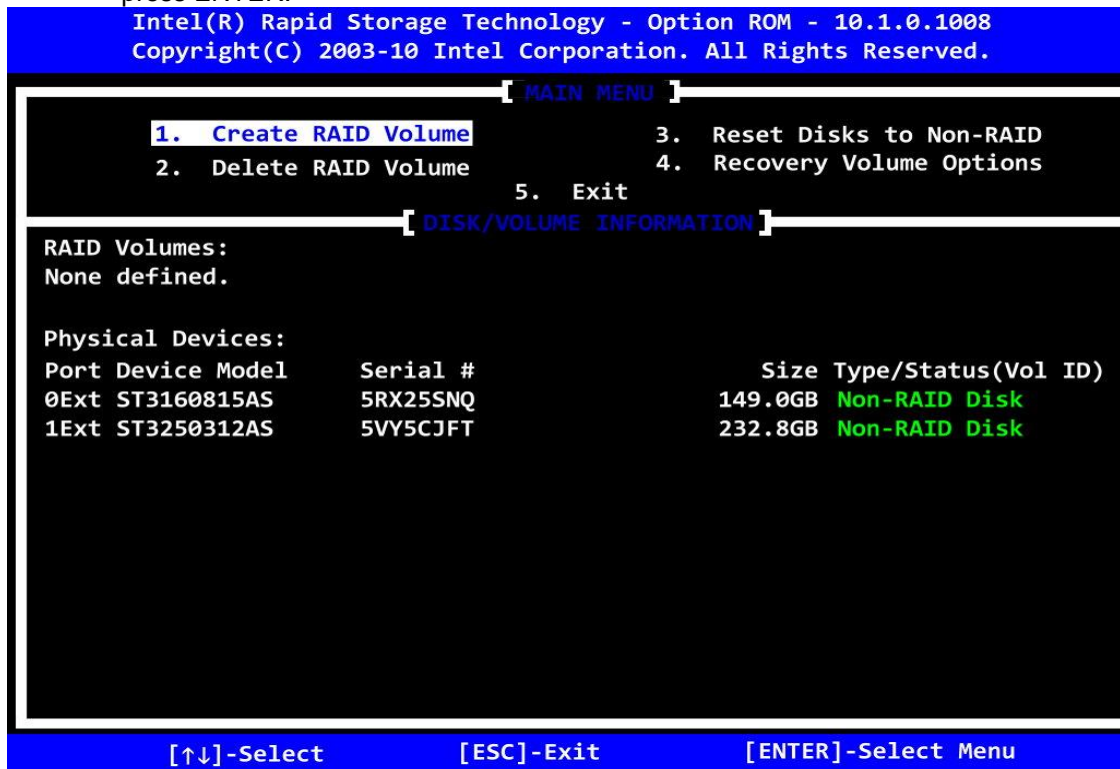
```
Intel(R) Rapid Storage Technology - Option ROM - 10.1.0.1008
Copyright(C) 2003-10 Intel Corporation. All Rights Reserved.

RAID Volumes:
None defined.

Physical Devices:
Port Device Model      Serial #              Size Type/Status(Vol ID)
0Ext ST3160815AS       5RX25SNQ             149.0GB Non-RAID Disk
1Ext ST3250312AS       5VY5CJFT             232.8GB Non-RAID Disk

Press <CTRL-I> to enter Configuration Utility...
```

(3)-2 After you press <CTRL+ I>, the Create RAID Volume screen will appear. If you want to create a RAID array, select the Create RAID Volume option in the Main Menu and press ENTER.



(3)-3-1 After entering the CREATE VOLUME MENU screen, you can type the disk array name with 1~16 letters (letters cannot be special characters) in the item "Name".

Intel(R) Rapid Storage Technology - Option ROM - 10.1.0.1008
Copyright(C) 2003-10 Intel Corporation. All Rights Reserved.

[CREATE VOLUME MENU]

Name: **Volume0**
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.1 GB
Sync: N/A
Create Volume

[HELP]

Enter a unique volume name that has no special characters and is 16 characters or less.

[↑↓]-Select [TAB]-Next [ESC]-Previous Menu [ENTER]-Select Menu

(3)-3-2 When finished, press ENTER to select a RAID level. There are three RAID levels, RAID0, RAID1 and RAID5 & RAID10. Select a RAID level and press ENTER.

Intel(R) Rapid Storage Technology - Option ROM - 10.1.0.1008
Copyright(C) 2003-10 Intel Corporation. All Rights Reserved.

[CREATE VOLUME MENU]

Name: Volume0
RAID Level: **RAID0(Stripe)**
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.1 GB
Sync: N/A
Create Volume

[HELP]

RAID 0: Stripes data (performance).

[↑↓]-Select [TAB]-Next [ESC]-Previous Menu [ENTER]-Select Menu

- (3)-4 Set the stripe block size. The KB is the standard unit of stripe block size. The stripe block size can be 4KB to 128KB. After the setting, press ENTER for the array capacity.

```

Intel(R) Rapid Storage Technology - Option ROM - 10.1.0.1008
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[ CREATE VOLUME MENU ]

Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.1 GB
Sync: N/A
Create Volume

[ HELP ]

The following are typical values:

RAID - 128KB
RAID10 - 64KB
RAID5 - 64KB

[↑↓]-Select [TAB]-Next [ESC]-Previous Menu [ENTER]-Select Menu
    
```

- (3)-5 After setting all the items on the menu, select Create Volume and press ENTER to start creating the RAID array.

```

Intel(R) Rapid Storage Technology - Option ROM - 10.1.0.1008
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[ CREATE VOLUME MENU ]

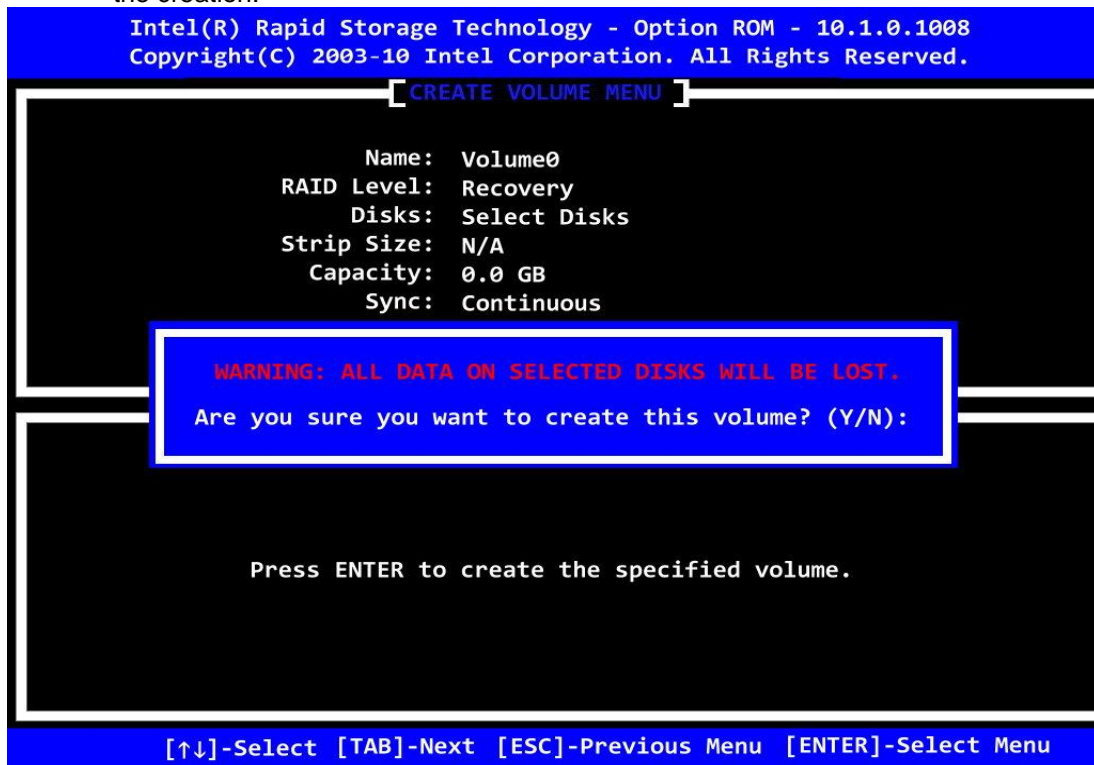
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.1 GB
Sync: N/A
Create Volume

[ HELP ]

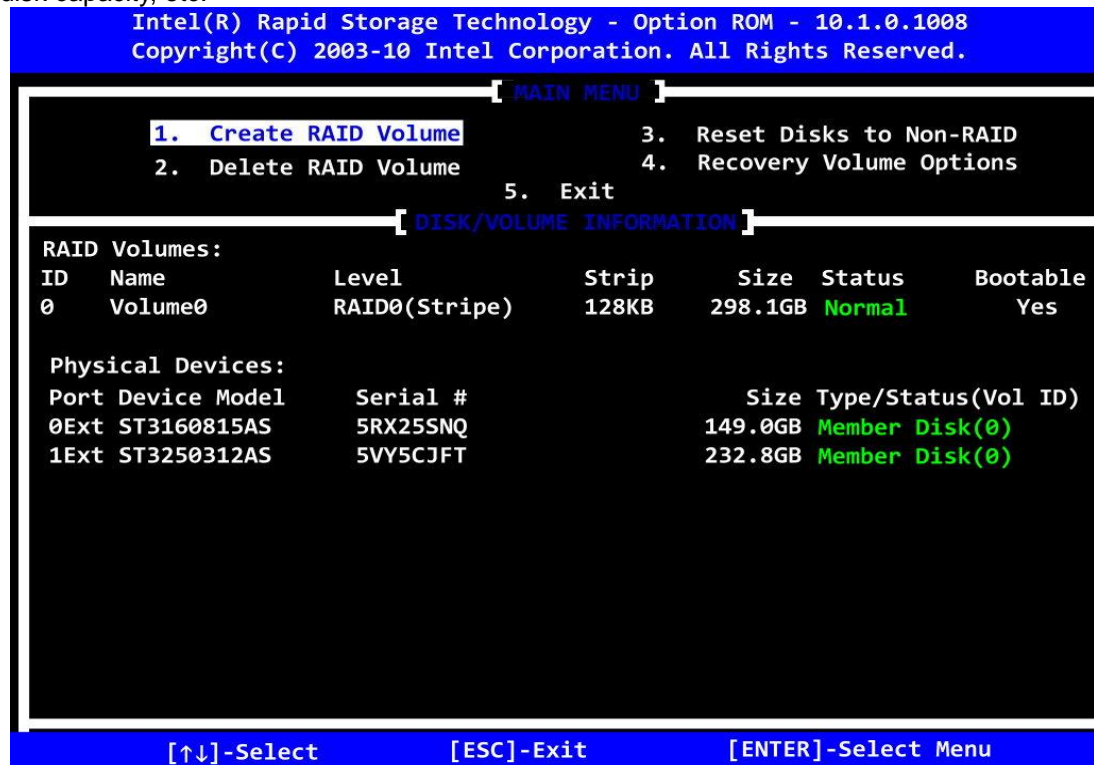
The default value indicates the maximum capacity using the selected
disks. Entering a lower capacity allows you to create a second
volume these disks.

[↑↓]-Select [TAB]-Next [ESC]-Previous Menu [ENTER]-Select Menu
    
```

(3)-6 When prompting the confirmation, press “Y” to create this volume, or “N” to cancel the creation.

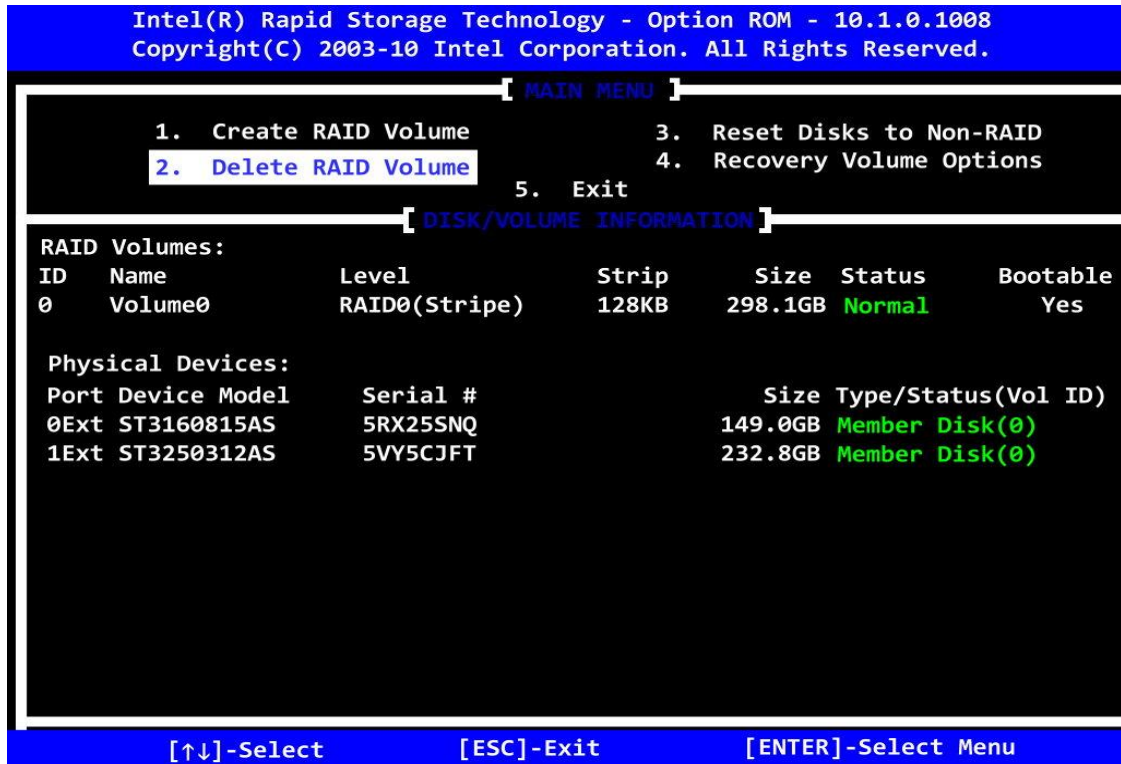


After the creation is completed, you can see detailed information about the RAID Array in the DISK/VOLUME INFORMATION section, including RAID mode, disk block size, disk name, and disk capacity, etc.



- **Delete RAID Volume**

If you want to delete a RAID volume, select the Delete RAID Volume option in Main Menu. Press ENTER and follow on-screen instructions.



Please press [ESC] to exit the RAID BIOS utility.

Now, you can proceed to install a SATA driver controller and the operating system.

(4) Making a SATA Driver Disk

To install the operating system onto a serial ATA hard disk successfully, you need to install the SATA controller driver during the OS installation. Without the driver, the hard disk may not be recognized during the Windows setup process. First of all, please format a blank floppy disk. Secondly, follow up these steps below to produce a SATA driver disk.

Users can insert the Driver CD and the formatted blank floppy disk in another system. And then, please copy all of file of the f6flpy32 folder in the Driver CD to a floppy disk.

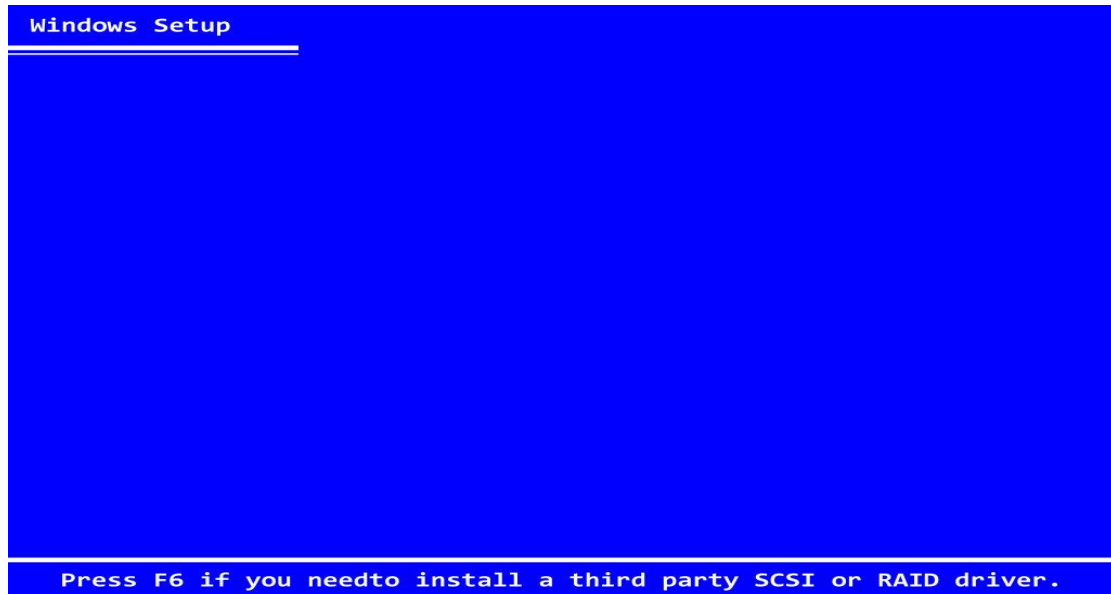


NOTE: Please copy all of file of the f6flpy64 folder, if installing 64-bit Windows Operating System.

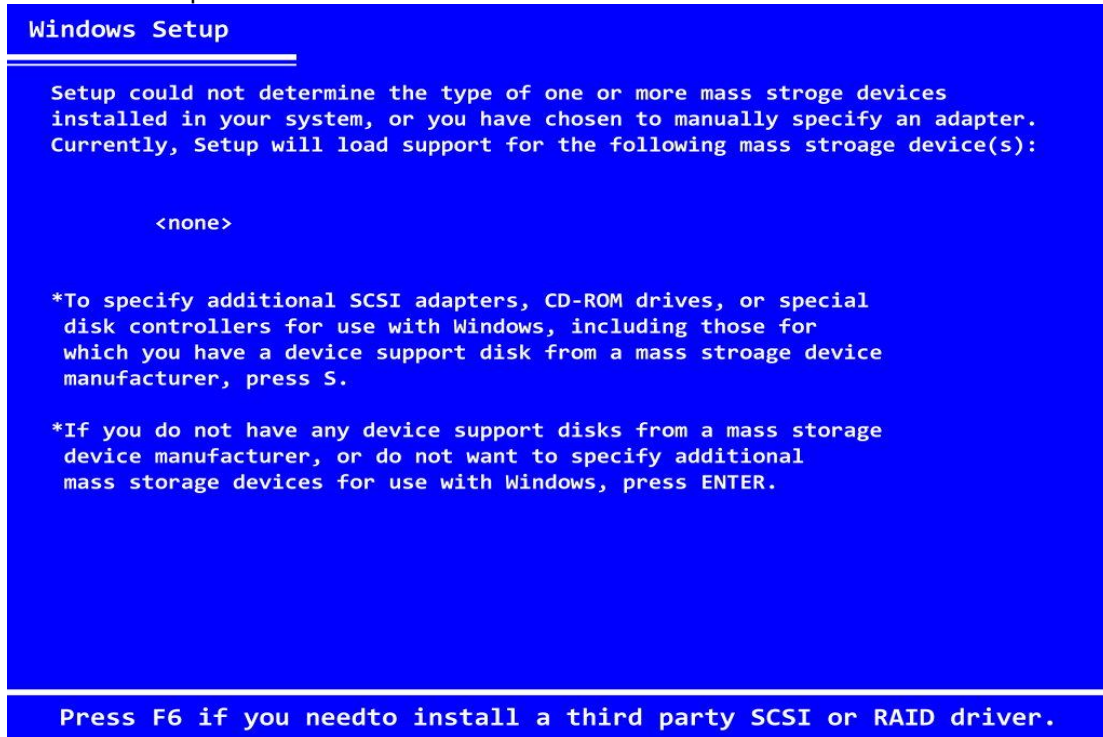
(5) Installing the SATA controller driver during the OS installation

Now, the SATA driver disk is ready, and BIOS settings configured, you can proceed to install Windows 2000/XP onto your SATA hard drive using the SATA driver. Here is an example for Windows XP installation.

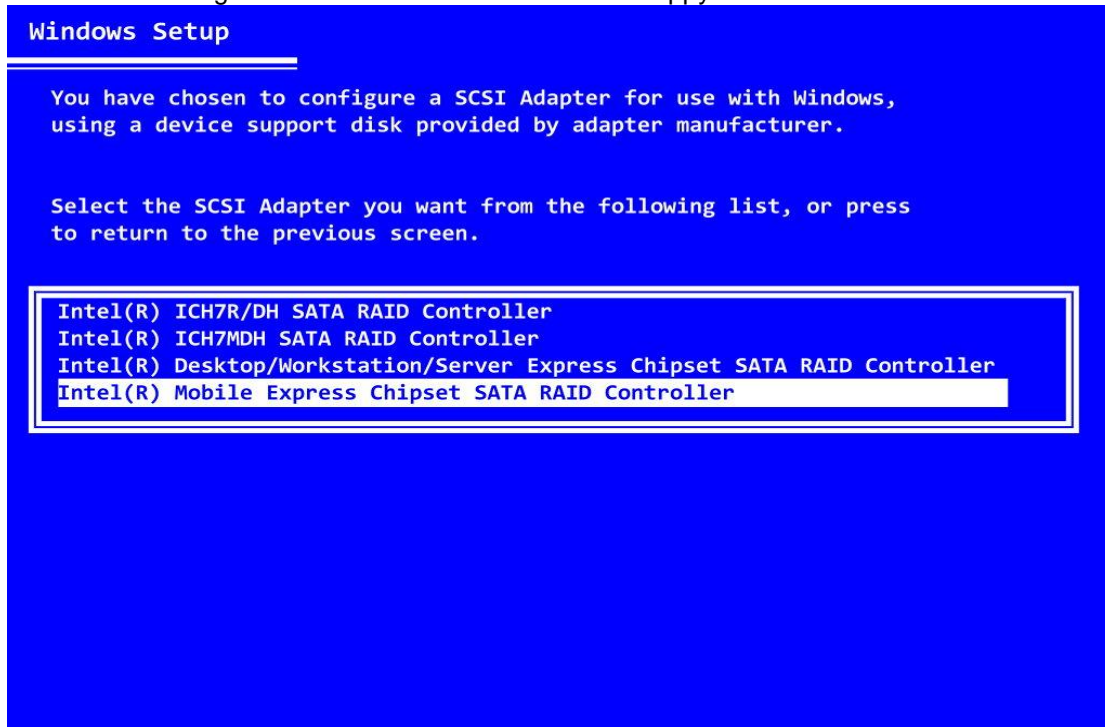
- (5)-1 Restart your system to boot the Windows 2000/XP Setup disk, and press F6 button as soon as you see the message "Press F6 if you need to install a 3rd party SCSI or RAID driver". After pressing the F6 button, there will be a few moments for some files being loaded before next screen appears.



- (5)-2 When you see the screen below, insert the floppy disk containing the SATA driver and press "S".



- (5)-3 If the Setup correctly recognizes the driver of the floppy disk, a controller menu will appear below. Use the ARROW keys to select Intel® ICH8R/ICH9R/ICH10R/DO/PCH SATA RAID Controller and press ENTER. Then it will begin to load the SATA driver from the floppy disk.



ENTER = Select F3 = Exit



Note: If a message on the screen saying that one or some file(s) cannot be found, please check the floppy disk or copy the correct SATA driver again from the driver CD.