SBC86836 Series

Intel® Atom™ Processor N270

Mini ITX Board with LVDS

User's Manual

Disclaimers

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Caution

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

February, 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.

Trademarks Acknowledgments

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CHAPTER 1
INTRODUCTION

The **SBC86836**, a Mini ITX board, supports Intel® Atom™ processor N270, at FSB 533 MT/s (133 MHz). The board integrates chipsets Intel® 945GSE and ICH7M that deliver outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions. There is one 240-pin unbuffered DIMM sockets for singe channel DDR2-400/533 MHz memory, maximum memory capacity up to 2 GB. It also features Gigabit/Fast Ethernet, two serial ATA channels for total two Serial ATA hard drives at maximum transfer rate up to 300MB/sec, eight USB 2.0 high speed compliant, built-in AC'97 audio codec that can achieve the best stability and reliability for industrial applications. It provides one PCI through Riser Card. Additionally, it provides you with unique embedded features, such as 6 serial ports and Mini ITX form factor that applies an extensive array of PC peripherals.

1.1 Specifications

- **CPU**
  - **Intel® Atom™ processor N270**
- **System Chipset**
  - **Intel® 945GSE & ICH7M**
- **Front-Side Bus**
  - **533 MT/s (133 MHz)**
- **BIOS**
  - American Megatrends Inc. BIOS.

- 8Mbit SPI Flash, DMI, Plug and Play
- "Load Optimized Default" to backup customized Setting in the BIOS flash chip to prevent from CMOS battery fail

- **System Memory**
  - One 240-pin unbuffered DDR2 DIMM sockets
  - Maximum to 2GB DDR2 400/533 MHz memory
- **Onboard Multi I/O**
  - Controller: Winbond W83627UHG
  - Serial Ports: One RD-232/422/485, Five ports for RS-232
  - Two SATA-II connectors
- **CompactFlash™ Socket**
  - One CompactFlash™ Type II Socket
- **USB Interface**
  - Eight USB ports with fuse protection and complies with USB Spec. Rev. 2.0
- **Display**
  - CRT connector
  - One 40-pin connector for 24-bit dual channel LVDS via Chrontel CH7308B from SDVO as EFP port and one 7-pin inverter connector(Optional)
- **Watchdog Timer**
  - 1~255 seconds; up to 255 levels
- **Expansion Interface**
  - One PCI slot for dual PCI via riser card.
- **Ethernet**
  - Dual port with RTL8111B for Gigabit/Fast Ethernet
  - RJ-45 over double deck USB
- **Audio**
  - AC'97 Audio compliant (with Speaker/line-out & MIC-in) via ALC203
  - Internal Audio features for speaker-out & MIC-in (L, GND, R, GND, MIC-in) via wafer connector

- **Power Management**
  - ACPI (Advanced Configuration and Power Interface)
- **Form Factor**
  - Mini ITX form factor

NOTE *All specifications and images are subject to change without notice.*

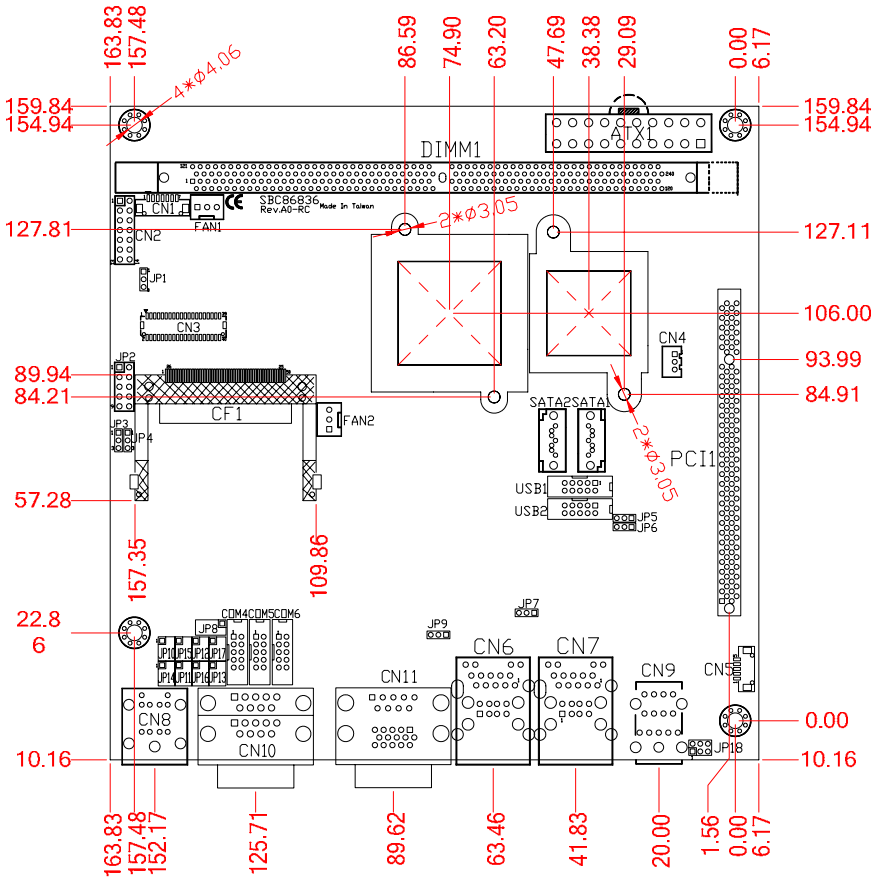
1.2 Utilities Supported

- Chipset Driver
- Ethernet Driver
- Graphic Driver
- Audio Driver

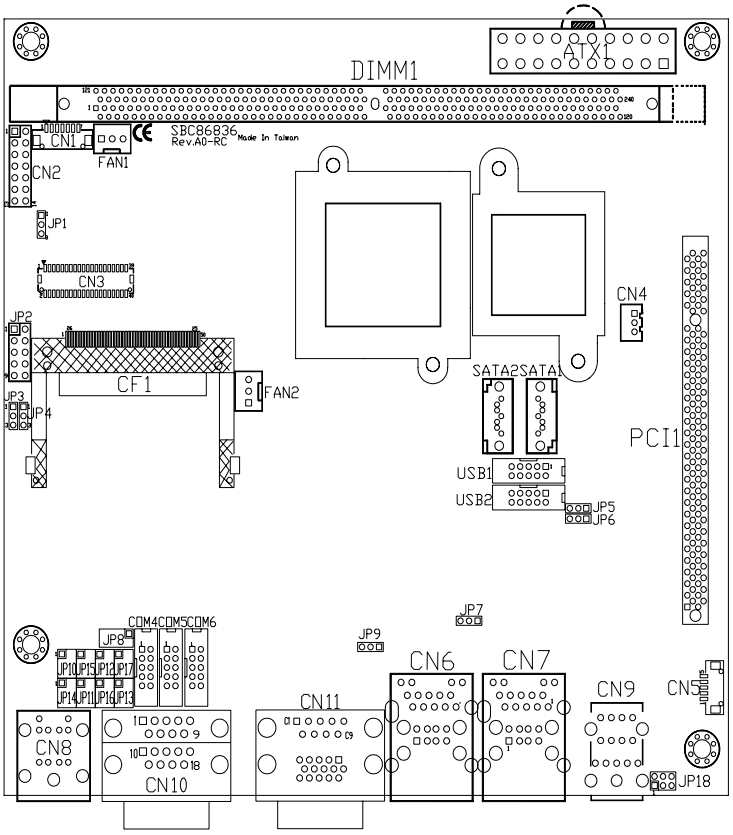
MEMO

CHAPTER 2
JUMPERS AND CONNECTORS

2.1 Board Dimensions and Fixing Holes



2.2 Board Layout



2.3 Jumper Settings

Proper jumer settings configure the **SBC86836** to meet your application purpose. We are herewith listing a summary table of all jumpers and default settings for onboard devices, respectively.

Jumper	Default Setting		Jumper Setting
JP1	Normal Operation/Clear CMOS setting Default: Normal Operation		Short 1-2
JP3	Compact Flash Voltage Selection Default: 3.3V		Short 1-2
JP4	LCD Voltage Select Default: 3.3V		Short 1-2
JP5	USB1 Voltage Select Default: 5V		Short 1-2
JP6	USB2 Voltage Select Default: 5V		Short 1-2
JP7	USB(CN7) Voltage Select Default: 5V		Short 1-2
JP8	COM1 Mode Select Default: RS-232		Short 1-2
JP9	USB(CN6) Voltage Select Default: 5V		Short 1-2
JP10	COM1 Mode Select	CN10 Pin 1: DCD	Short 3-5
		CN10 Pin 9: RI	Short 4-6
JP11	COM3 Mode Select	CN11 Pin C1: DCD	Short 3-5
		CN11 Pin C9: RI	Short 4-6
JP12	COM5 Mode Select	COM5 Pin 1: DCD	Short 3-5
		COM5 Pin 8: RI	Short 4-6
JP13	COM1 Mode Select Default: RS-232		Short 3-5, 4-6

Jumper	Default Setting		Jumper Setting
JP14	COM2 Mode Select	CN10 Pin 10: DCD	Short 3-5
		CN10 Pin 18: RI	Short 4-6
JP15	COM4 Mode Select	COM4 Pin 1: DCD	Short 3-5
		COM4 Pin 8: RI	Short 4-6
JP16	COM6 Mode Select	COM6 Pin 1: DCD	Short 3-5
		COM6 Pin 8: RI	Short 4-6
JP17	COM1 Mode Select Default: RS-232		Short 3-5, 4-6
JP18	Audio Speak Out/Line Out Selection Default: Line Out		Short 1-3, 2-4

2.3.1 CMOS Clear Jumpers (JP1)

You may need to use this jumper is to clear the CMOS memory if incorrect settings in the Setup Utility.

Description	Function	Jumper Setting
CMOS Clear	Normal (Default)	
	Clear CMOS	

2.3.2 CompactFlash™ Voltage Selection Jumper (JP3)

This jumper is to select the voltage for CompactFlash™ interface.

Description	Function	Jumper Setting
CompactFlash Voltage Selection	3.3V (Default)	
	5V	

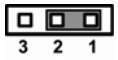
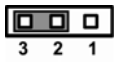
2.3.3 LCD Voltage Selection Jumper (JP4)

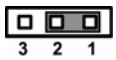
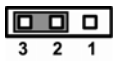
The board supports +3.3V or +5V flat panel displays. Configure the jumper JP4 to the appropriate voltage of the flat panel.

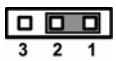
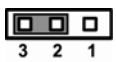
Description	Function	Jumper Setting
LCD Voltage Selection	3.3V (Default)	
	5V	

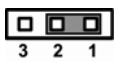
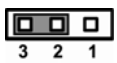
2.3.4 USB Voltage Selection Jumpers (JP5, JP6, JP7, JP9)

These jumpers select the voltage for USB interface.

Description	Function	Jumper Setting
USB1 Connector Voltage Selection **(JP5)**	5V (Default)	
	5V_SBY	

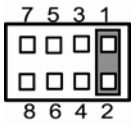
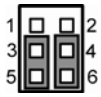
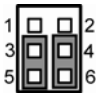
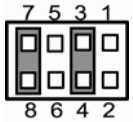
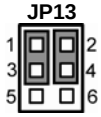
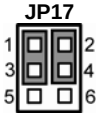
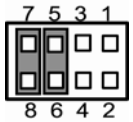
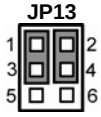
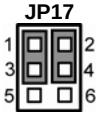
Description	Function	Jumper Setting
USB2 Connector Voltage Selection **(JP6)**	5V (Default)	
	5V_SBY	

Description	Function	Jumper Setting
USB (CN7) Connector Voltage Selection **(JP7)**	5V (Default)	
	5V_SBY	

Description	Function	Jumper Setting
USB (CN6) Connector Voltage Selection **(JP9)**	5V (Default)	
	5V_SBY	

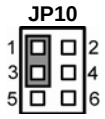
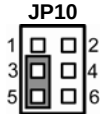
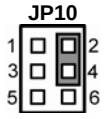
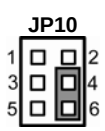
2.3.5 COM1 Mode Selection Jumpers (JP8, JP13, JP17)

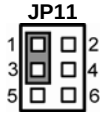
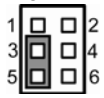
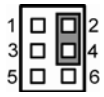
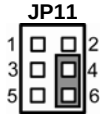
These jumpers select the COM1 port's communication mode to operate RS-232 or RS-422/485.

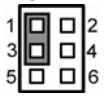
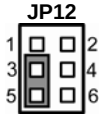
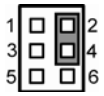
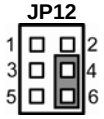
Description	Function	Jumper Setting		
COM1	RS-232 (Default)	JP8 	JP13 	JP17 
	RS-422	JP8 	JP13 	JP17 
	RS-485	JP8 	JP13 	JP17 

2.3.6 COM1~COM6 Mode Selection Jumpers (JP10, JP11, JP12, JP14, JP15 JP16)

These jumpers select the COM1 ~ COM6 ports' DCD and RI mode.

Description	Function	Jumper Setting
COM1	Pin 1=5V	
	*Pin 1=DCD (Default)	
	Pin 9=12V	
	*Pin 9=RI (Default)	

Description	Function	Jumper Setting
COM3	Pin C1=5V	JP11 
	*Pin C1=DCD (Default)	JP11 
	Pin C9=12V	JP11 
	*Pin C9=RI (Default)	JP11 

Description	Function	Jumper Setting
COM5	Pin 1=5V	JP12 
	*Pin 1=DCD (Default)	JP12 
	Pin 8=12V	JP12 
	*Pin 8=RI (Default)	JP12 

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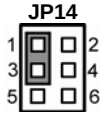
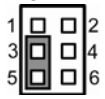
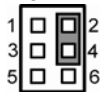
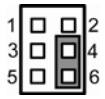
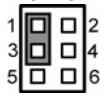
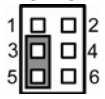
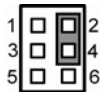
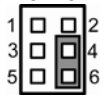
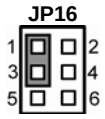
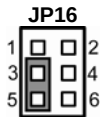
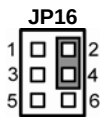
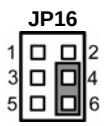
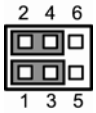
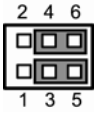
COM2	Pin 10=5V	JP14 
	*Pin 10=DCD (Default)	JP14 
	Pin 18=12V	JP14 
	*Pin 18=RI (Default)	JP14 

Description	Function	Jumper Setting
COM4	Pin 1=5V	JP15 
	*Pin 1=DCD (Default)	JP15 
	Pin 8=12V	JP15 
	*Pin 8=RI (Default)	JP15 

Description	Function	Jumper Setting
COM6	Pin 1=5V	
	*Pin 1=DCD (Default)	
	Pin 8=12V	
	*Pin 8=RI (Default)	

2.3.7 Audio Output Jumper (JP18)

This jumper makes the selection of Audio output.

Description	Function	Jumper Setting
Audio Output Select	Line Out (Default)	
	Speak Out	

2.4 Connectors

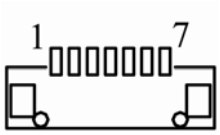
Connectors connect the board with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected. Here is a summary table shows you all connectors on the **SBC86836** Series.

Connectors	Label
Inverter Connector	CN1
Flat Panel Bezel Connector	CN2
LVDS Connector	CN3
SMBUS Connector	CN4
Internal Audio Connector	CN5
LAN1 & Dual USB Connector	CN6
LAN2 & Dual USB Connector	CN7
PS2 Keyboard/Mouse Connector	CN8
Audio Phone Jack Connector	CN9
ATX Power Connector	ATX1
Serial Port1 & Port2 Connector	CN10
VGA & Serial Port3 Connector	CN11
Internal Serial Port4 Connector	COM4
Internal Serial Port5 Connector	COM5
Internal Serial Port6 Connector	COM6
DDRII DIMM Connector	DIMM1
PCI Connector	PCI1
Serial ATA1 Connector	SATA1
Serial ATA2 Connector	SATA2
Internal USB Connector	USB1
Internal USB Connector	USB2
SYSTEM FAN Connector	FAN1
SYSTEM FAN Connector	FAN2
Compact Flash Connector	CF1
DIO Port Connector	JP2

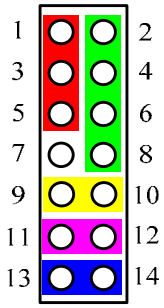
2.4.1 LVDS Backlight Connector (CN1)

The **CN1** is DF13-7S-1.25C 7-pin connectors for inverter that we strongly recommend you to use the matching DF13-7S-1.25C connector.

Pin	Signal
1	+12V
2	+12V
3	+5V
4	ENABLE
5	GND
6	GND
7	GND



2.4.2 Flat Panel Bezel Connector (CN2)



- **Power LED**

  This 3-pin connector has Pin 1 and Pin 5 that connect the system power LED indicator to its corresponding switch on the case. Pin 1 is assigned as +, and Pin 3, Pin 5 as -. The Power LED lights up when the system is powered ON.

- **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 6 (-).

- **ATX Power On/Off Button**

  This 2-pin connector named as Pin 9 and 10 connect 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, not turns 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**

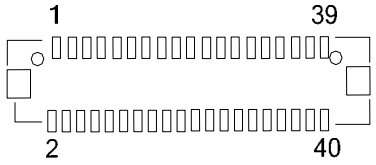
  This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 13 and 14 connect the hard disk drive to the front panel HDD LED, Pin 13 assigned as -, and Pin 14 as +.

2.4.3 LVDS Flat Panel Connector (CN3)

The board has a 40-pin connector **CN3** for LVDS Interface LCD. It is strongly recommended to use the matching JST SHDR-40V-S-B 40-pin connector for LVDS on the board.

Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C.	8	N.C.
9	GND	10	GND
11	Channel B D3-	12	Channel B D0-
13	Channel B D3+	14	Channel B D0+
15	GND	16	GND
17	Channel B CLK-	18	Channel B D1-
19	Channel B CLK+	20	Channel B D1+
21	GND	22	GND
23	Channel A D0-	24	Channel B D2-
25	Channel A D0+	26	Channel B D2+
27	GND	28	GND
29	Channel A D1-	30	Channel A D3-

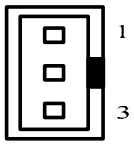
Pin	Signal	Pin	Signal
31	Channel A D1+	32	Channel A D3+
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND



2.4.4 SMBUS Connector (CN4)

Connector CN24 is for SMBUS interface support.

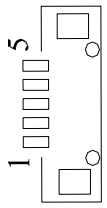
Pin	Signal
1	CLOCK
2	DATA
3	GND



2.4.5 Internal Audio Connector (CN5)

The **SBC86836** supports internal audio interface. **CN5** is a 5pin-header connector commonly used for the audio. After installing onboard audio driver, you may connect speaker to Line Out jack, and microphone to MIC In jack.

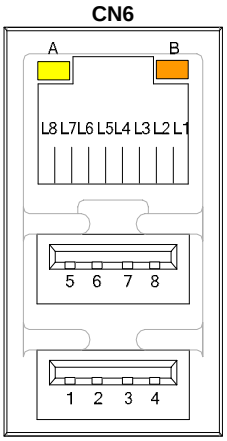
Pin	Signal
1	AUDIO_OUT_L
2	GND
3	AUDIO_OUT_R
4	GND
5	MIC_IN



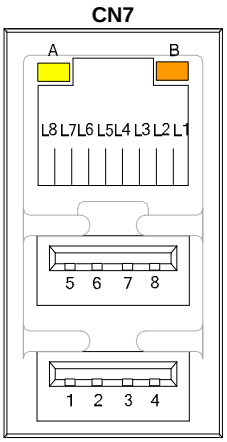
2.4.6 Ethernet with Dual USB Connectors (CN6, CN7)

The **SBC86836 Series** has three layers of GIGA Ethernet & USB Connectors **(CN6, CN7).**
The RJ-45 connector is for Ethernet. To connect the board to a 1000/100/10 Base-T hub, just plug one end of the cable into **CN6 (LAN1)** and **CN7 (LAN2)**, and connect the other end (phone jack) to a 1000/100/10-Base-T hub.
The lower double-deck USB Connector supports USB 2.0 compliant (480Mbps) that can be connected to any USB peripherals, such as keyboard, mouse, scanner.

Pin	Signal	Pin	Signal
L1	MDI0+	1	+5V
L2	MDI0-	2	USB D2-
L3	MDI1+	3	USB D2+
L4	MDI1-	4	Ground (GND)
L5	MDI2+	5	+5V
L6	MDI2-	6	USB D3-
L7	MDI3+	7	USB D3+
L8	MDI3-	8	Ground (GND)
A	Active LED (Yellow)		
B	100 LAN LED (Green)/ 1000 LAN LED (Orange)		



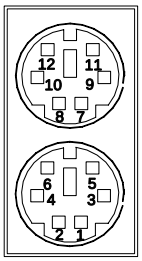
Pin	Signal	Pin	Signal
L1	MDI0+	1	+5V
L2	MDI0-	2	USB D4-
L3	MDI1+	3	USB D4+
L4	MDI1-	4	Ground (GND)
L5	MDI2+	5	+5V
L6	MDI2-	6	USB D5-
L7	MDI3+	7	USB D5+
L8	MDI3-	8	Ground (GND)
A	Active LED (Yellow)		
B	100 LAN LED (Green)/ 1000 LAN LED (Orange)		



2.4.7 Keyboard and PS/2 Connector (CN8)

The **SBC86836** provides a keyboard and Mouse interface with a DIN connector.To install the PS/2 keyboard and mouse, plug the mouse to the upper port (green), and the keyboard to the lower port (purple).

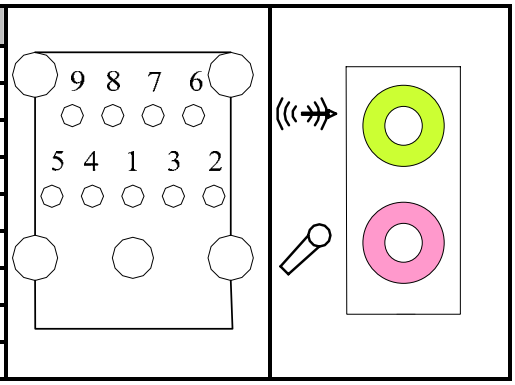
Pin	Signal	Pin	Signal
1	K/B Data	7	M/S Data
2	NC	8	NC
3	GND	9	GND
4	VCC	10	VCC
5	K/B CLK	11	M/S CLK
6	NC	12	NC



2.4.8 Audio Phone Jack Connector (CN9)

After installing onboard audio driver, you may connect speaker to Line Out jack, microphone to MIC in jack.

Pin	Signal
1	Ground (GND)
2	MIC_IN1
3	MIC_IN
4	N.C
5	MIC_IN2
6	LINE_OUT_L
7	LINE_OUT_L1
8	LINE_OUT_R1
9	LINE_OUT_R

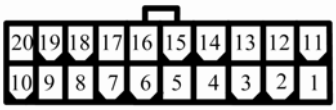


2.4.9 ATX Power Connector (ATX1)

Steady and sufficient power can be supplied to all components on the board by connecting the power connector. Please make sure all components and devices are properly installed before connecting the power connector. Align the power connector with its proper location on the board, and connect it tightly.

If you use a 20-pin ATX power supply, please remove the small cover from the power connector before plugging in the power cord; otherwise, please do not remove it.

Pin	Signal	Pin	Signal
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

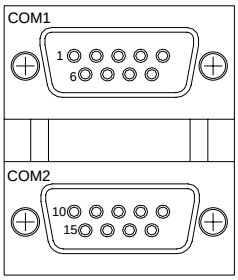


2.4.10 Serial Port and VGA Interface Connectors (CN10, CN11, COM4~6)

COM1, COM2 and COM3 are DB-9 connectors is default. Here is the pin assignment list for your reference.

Pin	Signal
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	DCD, Data carrier detect
11	RXD, Receive data
12	TXD, Transmit data
13	DTR, Data terminal ready
14	GND, ground
15	DSR, Data set ready
16	RTS, Request to send
17	CTS, Clear to send
18	RI, Ring indicator

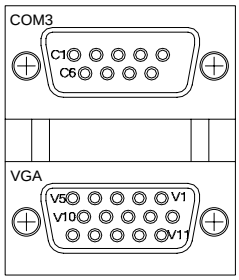
CN10



CN11 is a standard 15-pin DB15 connector commonly for the CRT VGA display.

Pin	Signal
C1	DCD, Data carrier detect
C2	RXD, Receive data
C3	TXD, Transmit data
C4	DTR, Data terminal ready
C5	GND, ground
C6	DSR, Data set ready
C7	RTS, Request to send
C8	CTS, Clear to send
C9	RI, Ring indicator
V1	Red
V2	Green
V3	Blue
V4	N.C
V5	Analog Ground(AGND)
V6	CRT_RET#
V7	Analog Ground(AGND)
V8	Analog Ground(AGND)
V9	GVCC
V10	Analog Ground(AGND)
V11	N.C
V12	DDC DATA
V13	Horizontal Sync
V14	Vertical Sync
V15	DDC CLK

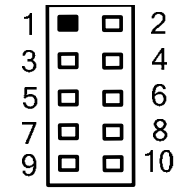
CN11



COM4/COM5/COM6 Serial Port 10-pin (Box-header) Connector Pin Assignment list

Pin	Description	Pin	Description
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	No connector

COM4,COM5,COM6



2.4.11 SATA Connectors (SATA1, SATA2)

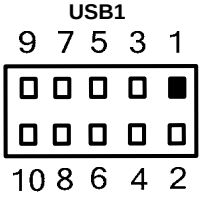
These SATA connectors are for high-speed SATA interface ports and they can be connected to hard disk devices.

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

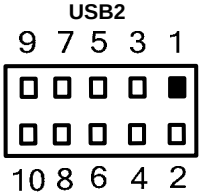
2.4.12 Internal USB Connectors (USB1, USB2)

These Universal Serial Bus (USB) connectors on this board are for installing versatile USB interface peripherals. These are 10-pin standard USB connectors**.**

Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	USB D6-	4	USB D7-
5	USB D6+	6	USB D7+
7	Ground (GND)	8	Ground (GND)
9	Ground (GND)	10	Ground (GND)

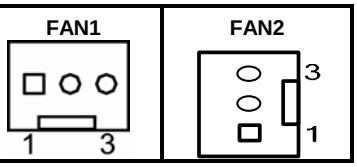


Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	USB D0-	4	USB D1-
5	USB D0+	6	USB D1+
7	Ground (GND)	8	Ground (GND)
9	Ground (GND)	10	Ground (GND)



2.4.13 System Fan Connectors (FAN1, FAN2)

Pin	Signal
1	Ground
2	+12V
3	Sensor

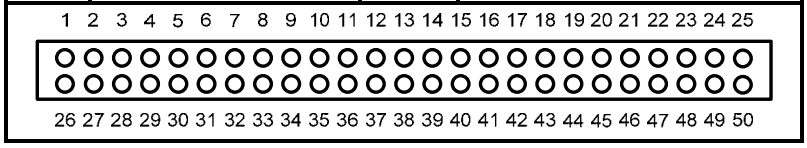


2.4.14 CompactFlash™ Socket (CF1)

The board is equipped with a CompactFlash™ disk type-II socket on the solder side to support an IDE interface CompactFlash™ disk card with DMA mode supported. The socket is especially designed to avoid incorrect installation of the CompactFlash™ disk card. When installing or removing the CompactFlash™ disk card, please make sure the system power is off. The CompactFlash™ disk card is defaulted as the C: or D: disk drive in your PC system.

Pin	Signal	Pin	Signal
1	GND	26	CD1-
2	Data 3	27	Data 11
3	Data 4	28	Data 12
4	Data 5	29	Data 13
5	Data 6	30	Data 14
6	Data 7	31	Data 15
7	CS0#	32	CS1#
8	Address 10	33	VS1#
9	ATASEL	34	IORD#
10	Address 9	35	IOWR#
11	Address 8	36	WE#
12	Address 7	37	INTR
13	VCC	38	VCC
14	Address 6	39	CSEL#
15	Address 5	40	VS2#
16	Address 4	41	RESET#
17	Address 3	42	IORDY#

Pin	Signal	Pin	Signal
18	Address 2	43	DMAREQ
19	Address 1	44	DMAACK-
20	Address 0	45	DASP#
21	Data 0	46	PDIAG#
22	Data 1	47	Data 8
23	Data 2	48	Data 9
24	IOCS16#	49	Data 10
25	CD2#	50	GND



2.4.15 PICMG Compliant PCI Connector (PCI1)

The **SBC86836 Series** provides a free PICMG compliant PCI slot for 32-bit/33MHz PCI device extension.

Pin	Signal	Pin	Signal
B1	-12V	A1	TRST#
B2	Reserved	A2	+12V
B3	GND	A3	Reserved
B4	Reserved	A4	Reserved
B5	+5V	A5	+5V
B6	+5V	A6	INTA#
B7	INTB#	A7	INTC#
B8	INTD#	A8	+5V
B9	REQ3#	A9	Reserved
B10	REQ1#	A10	VIO
B11	GNT3#	A11	Reserved
B12	GND	A12	GND
B13	GND	A13	GND
B14	CLKA	A14	GNT1#
B15	GND	A15	RST#
B16	CLKB	A16	VIO
B17	GND	A17	GNT0#

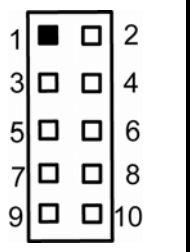
Pin	Signal	Pin	Signal
B18	REQ0#	A18	GND
B19	VIO	A19	REQ2#
B20	AD31	A20	AD30
B21	AD29	A21	Reserved
B22	GND	A22	AD28
B23	AD27	A23	AD26
B24	AD25	A24	GND
B25	Reserved	A25	AD24
B26	CBE3#	A26	GNT2#
B27	AD23	A27	+3.3V
B28	GND	A28	AD22
B29	AD21	A29	AD20
B30	AD19	A30	GND
B31	Reserved	A31	AD18
B32	AD17	A32	AD16
B33	CBE2#	A33	+3.3V
B34	GND	A34	FRAME#
B35	IRDY#	A35	GND
B36	+3.3V	A36	TRDY#
B37	DEVSEL#	A37	GND
B38	GND	A38	STOP#
B39	LOCK#	A39	Reserved
B40	PERR#	A40	SDONE
B41	Reserved	A41	SBO#
B42	SERR#	A42	GND
B43	Reserved	A43	PAR
B44	CBE1#	A44	AD15
B45	AD14	A45	Reserved
B46	GND	A46	AD13
B47	AD12	A47	AD11
B48	AD10	A48	GND
B49	GND	A49	AD09
B52	AD08	A52	CBE0#
B53	AD07	A53	Reserved
B54	Reserved	A54	AD06

Pin	Signal	Pin	Signal
B55	AD05	A55	AD04
B56	AD03	A56	GND
B57	GND	A57	AD02
B58	AD01	A58	AD0
B59	VIO	A59	VIO
B60	Reserved	A60	Reserved
B61	+5V	A61	+5V
B62	+5V	A62	+5V

2.4.16 Digital I/O Port (DIO) Connector (JP2)

The board is equipped an 8-channel digital I/O connector **JP2** 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. The digital I/O is controlled via software programming.

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

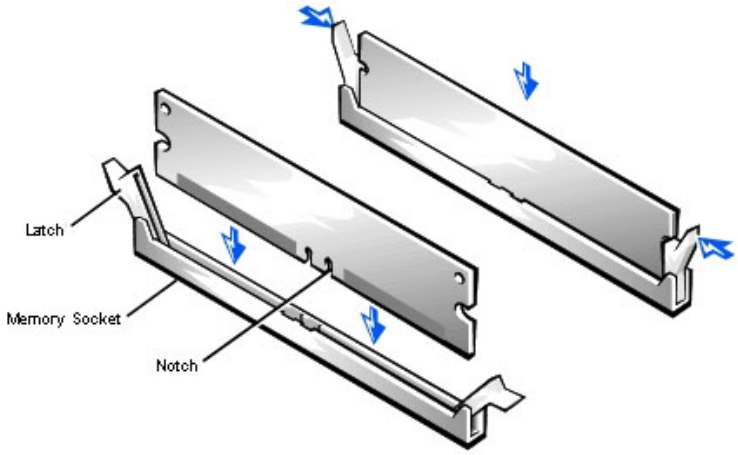


CHAPTER 3
INSTALLING THE MEMORY

The board supports one 240-pin DDR2 DIMM memory sockets with maximum memory capacity up to 1GB.

Please follow steps below to install the memory modules:

1 Push down latches on each side of the DIMM socket.
2 Align the memory module with the socket that notches of memory module must match the socket keys for a correct intallation.
3 Install the memory module into the socket and push it firmly down until it is fully seated. The socket latches are levered upwards and clipped on to the edges of the DIMM.
4 Install any remaining DIMM modules.



MEMO

CHAPTER 4
HARDWARE DESCRIPTION

4.1 Microprocessors

The **SBC86836** Series supports Intel® Atom™ processor N270, which make your system operated under Windows 2000/XP and Windows VISTA environments.The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

4.2 BIOS

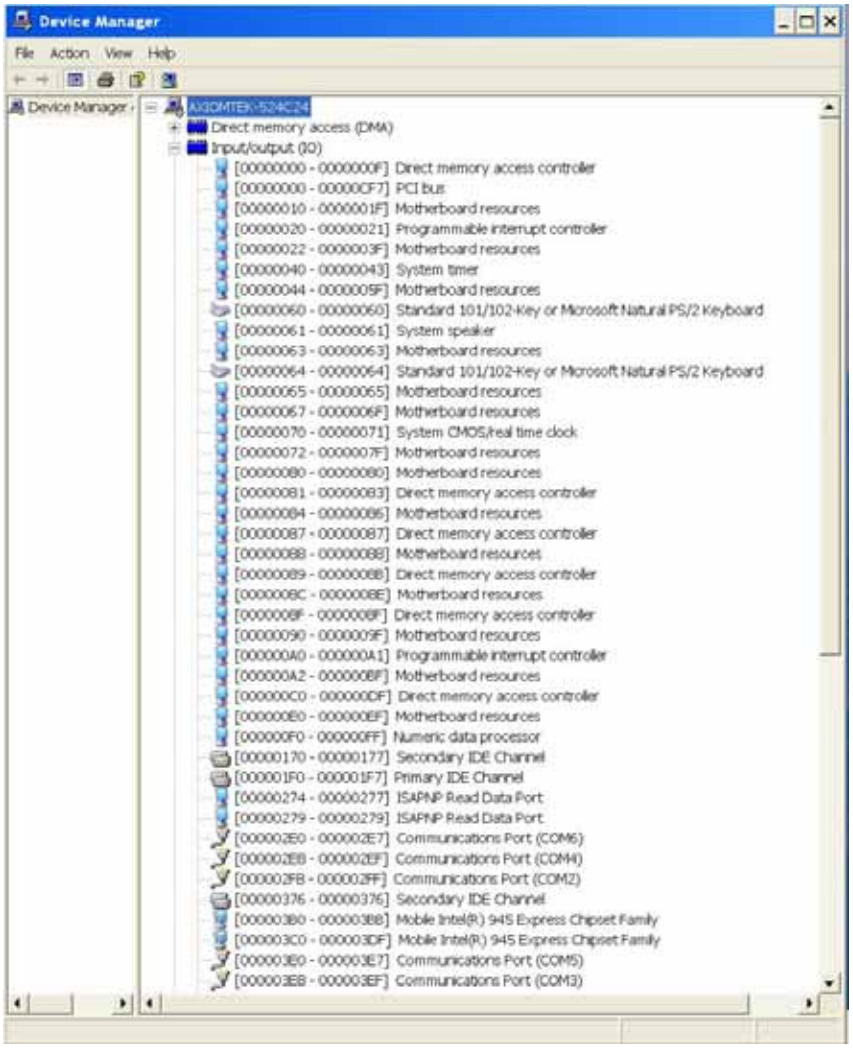
The **SBC86836** Series uses AMI Plug and Play BIOS with a single 8Mbit SPI Flash, DMI, Plug and Play.

4.3 System Memory

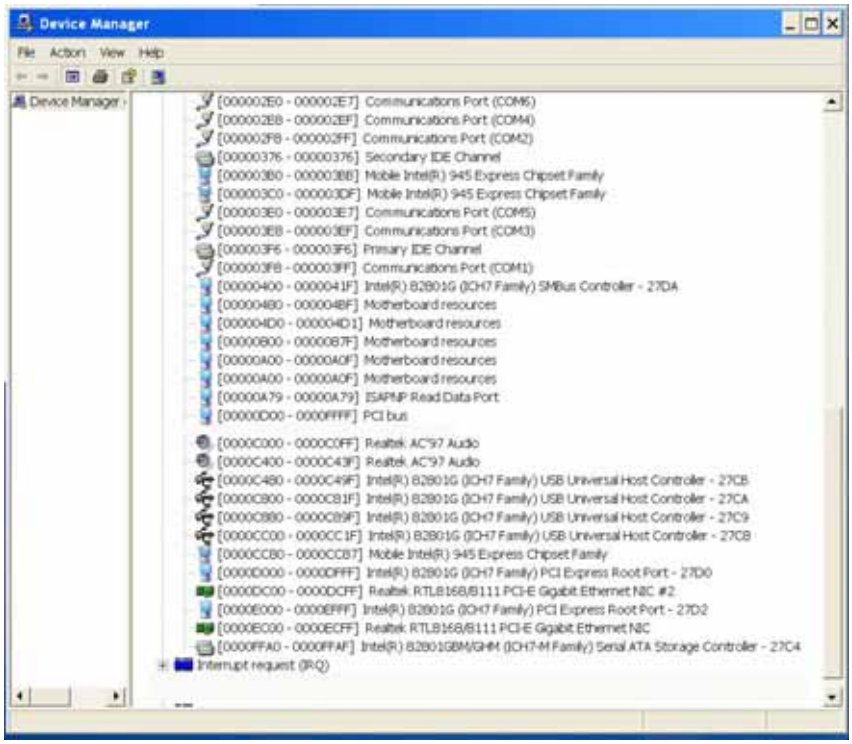
The **SBC86836** Series industrial CPU card supports one 240-pin unbuffered DDR2 DIMM sockets for a maximum memory of 1GB DDR2 SDRAMs. The memory module can come in sizes of 128MB, 256MB, 512MB and 1GB.

4.4 I/O Port Address Map

The Intel® Atom™ Processor N270 can communicate via I/O ports. There are total 1KB port addresses available for assignment to other devices via I/O expansion cards.



(1)


Device Manager
File Action View Help
Device Manager
[000002E0 - 000002E7] Communications Port (COM6)
[000002E8 - 000002EF] Communications Port (COM4)
[000002F8 - 000002FF] Communications Port (COM2)
[00000376 - 00000376] Secondary IDE Channel
[000003B0 - 000003BB] Mobile Intel(R) 945 Express Chipset Family
[000003C0 - 000003DF] Mobile Intel(R) 945 Express Chipset Family
[000003E0 - 000003E7] Communications Port (COM5)
[000003E8 - 000003EF] Communications Port (COM3)
[000003F6 - 000003F6] Primary IDE Channel
[000003F8 - 000003FF] Communications Port (COM1)
[00000400 - 0000041F] Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA
[00000480 - 000004BF] Motherboard resources
[000004D0 - 000004D1] Motherboard resources
[00000B00 - 00000B7F] Motherboard resources
[00000A00 - 00000A0F] Motherboard resources
[00000A00 - 00000A0F] Motherboard resources
[00000A79 - 00000A79] ISAPNP Read Data Port
[00000D00 - 0000FFFF] PCI bus
[0000C000 - 0000C0FF] Realtek AC'97 Audio
[0000C400 - 0000C43F] Realtek AC'97 Audio
[0000C480 - 0000C49F] Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
[0000C800 - 0000C81F] Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
[0000C880 - 0000C89F] Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
[0000CC00 - 0000CC1F] Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
[0000CCB0 - 0000CCB7] Mobile Intel(R) 945 Express Chipset Family
[0000D000 - 0000DFFF] Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[0000DC00 - 0000DCFF] Realtek RTL8168/8111 PCI-E Gigabit Ethernet NIC #2
[0000E000 - 0000EFFF] Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
[0000EC00 - 0000ECFF] Realtek RTL8168/8111 PCI-E Gigabit Ethernet NIC
[0000FFA0 - 0000FFAF] Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
Interrupt request (IRQ)

(2)

4.5 Interrupt Controller

The **SBC86836 Series** is a 100% PC compatible control board. It consists of 16 interrupt request lines, and four out of them can be programmable. The mapping list of the 16 interrupt request lines is shown as the following table.

IRQ	Parity check error
IRQ0	System timer
IRQ1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
IRQ2	Interrupt rerouting from IRQ8 through IRQ15
IRQ3	Serial port #2, #4, #6
IRQ4	Serial port #1, #3, #5
IRQ5	PCI Device Share
IRQ7	PCI Device Share
IRQ8	System CMOS/real time clock
IRQ9	Microsoft ACPI-Conpliant System
IRQ10	PCI Device Share
IRQ11	PCI Device Share
IRQ12	PS/2 Compatible Mouse
IRQ13	Numeric data processor
IRQ14	Primary IDE channel
IRQ15	—

CHAPTER 5
AMI BIOS SETUP UTILITY

This chapter provides users with detailed description how to set up basic system configuration through the AMIBIOS8 BIOS setup utility.

5.1 Starting

To enter the setup screens, follow the steps below:

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

5.2 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>, <F10>, <Enter>, <ESC>, <Arrow> keys, and so on.

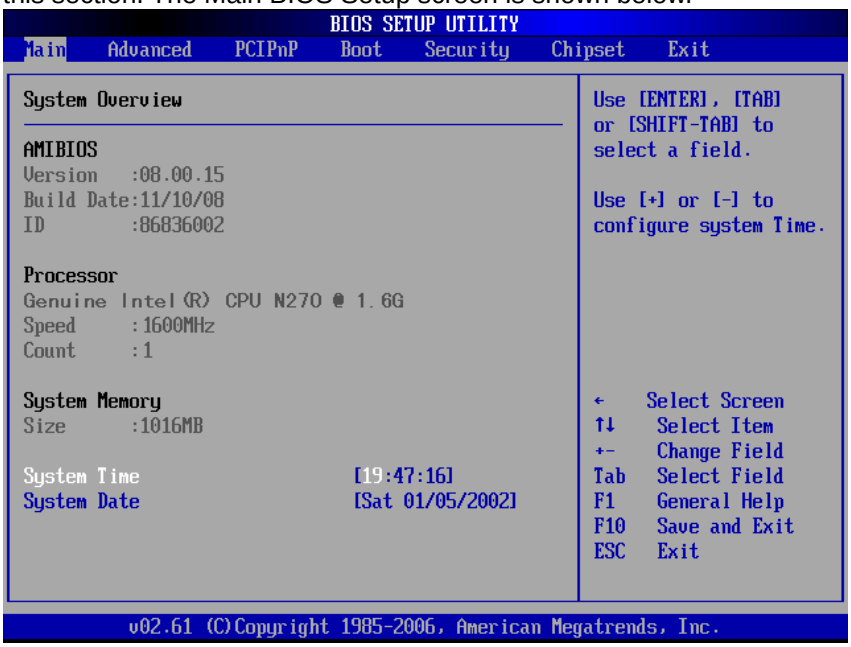
Note *Some of navigation keys differ from one screen to another.*

← 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.

F10	The <F10> key allows you to save any changes you have made and exit Setup. Press the <F10> 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.

5.3 Main Menu

When you first enter the Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.



- **System Time/Date**
  Use this option to change the system time and date. Highlight *System Time* or *System Date* using the <Arrow> keys. Enter new

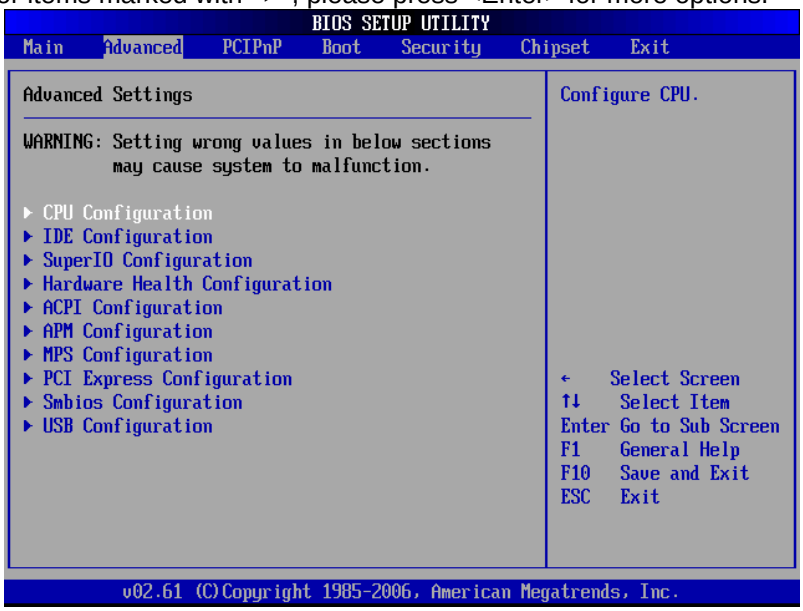
values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

5.4 Advanced Menu

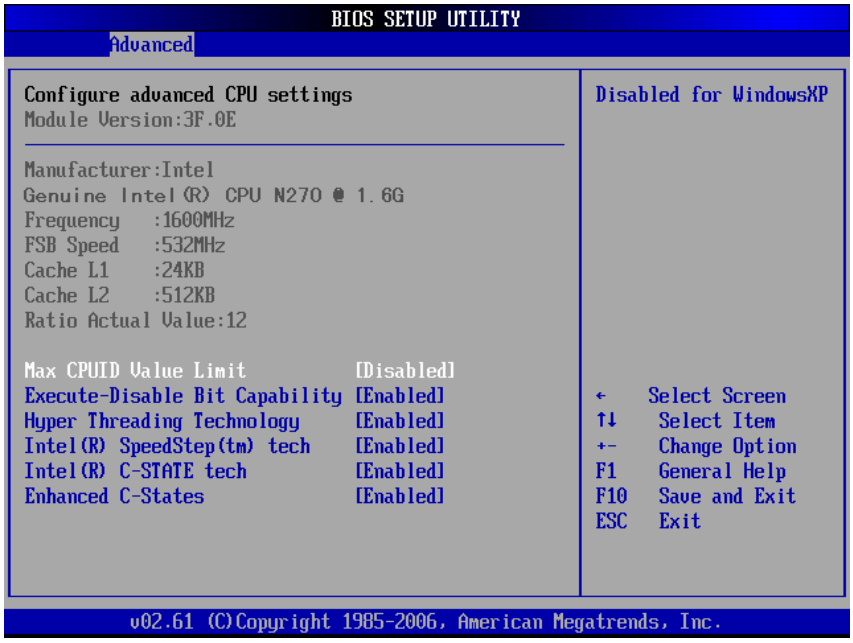
The Advanced menu allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

- CPU Configuration
- IDE Configuration
- SuperIO Configuration
- Hardware Health Configuration
- ACPI Configuration
- APM Configuration
- MPS Configuration
- PCI Express Configuration
- Smbios Configuration
- USB Configuration

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



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

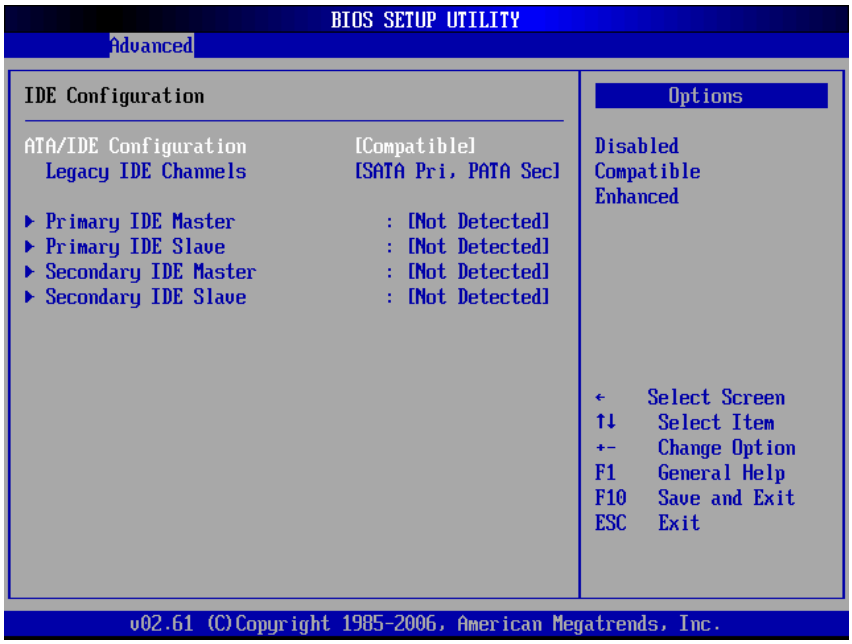


  - **Max CPUID Value Limit**
    You can enable this item to let legacy operating systems boot even without support for CPUs with extended CPU ID functions.
  - **Execute-Disable Bit Capability**
    This item helps you enable or disable the No-Execution Page Protection Technology.
  - **Hyper Threading Technology**
    Use this item to enable or disable Hyper-Threading Technology, which makes a single physical processor perform multi-tasking function as two logical ones.
  - **Intel (R) SpeedStep (tm) tech**
    This item helps you enable or disable the Intel SpeedStep Technology.
  - **Intel (R) C-STATE tech**

Use this item to enable or disable the C-State technology.

- **Enhanced C-States**
  This item allows you to enable or disable any available enhanced C-states (C1E, C2E, C3E, C4E and Hard C4E).

- **IDE Configuration**
  You can use this screen to select options for the IDE Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "▶", please press <Enter> for more options.



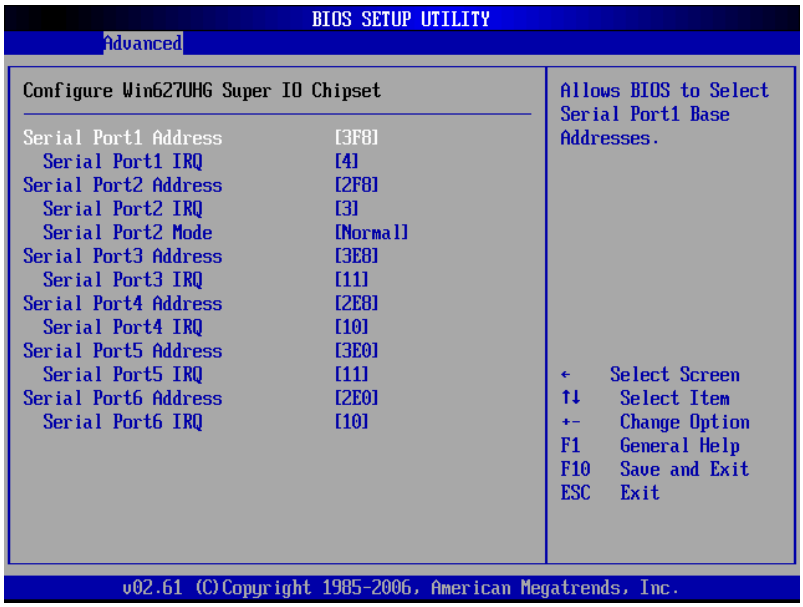
- **ATA/IDE Configuration**
  Use this item to specify the integrated IDE controller. There are three options for your selection: *Disabled*, *Compatible* and *Enhanced*.

- **Legacy IDE Channels**
  When the ATA/IDE Configuration is set to *Compatible*, this item will be displayed.

- **Primary/Secondary/Third IDE Master/Slave**

Select one of the hard disk drives to configure IDE devices installed in the system by pressing <Enter> for more options.

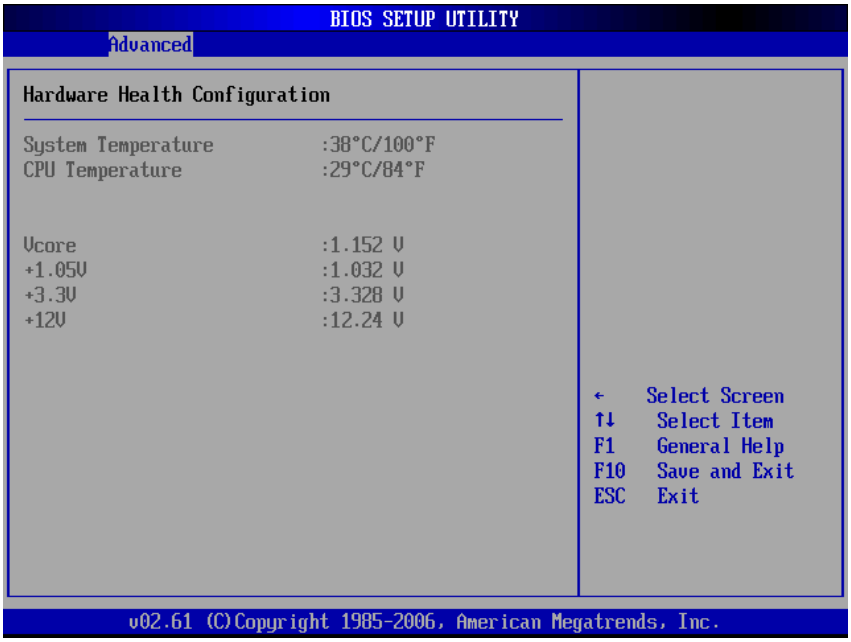
- **SuperIO Configuration**
  You can use this screen to select options for the SuperIO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



  - **Serial Port1 Address**
    This item specifies the base I/O port address and Interrupt Request address of serial port 1. The Optimal setting is *3F8/IRQ4*. The Fail-Safe default setting is *Disabled*.
  - **Serial Port1 IRQ**
    This item specifies the IRQ used by the serial port 1.
  - **Serial Port2 Address**
    This item specifies the base I/O port address and Interrupt Request address of serial port 2. The Optimal setting is *2F8/IRQ3*. The Fail-Safe setting is *Disabled*.

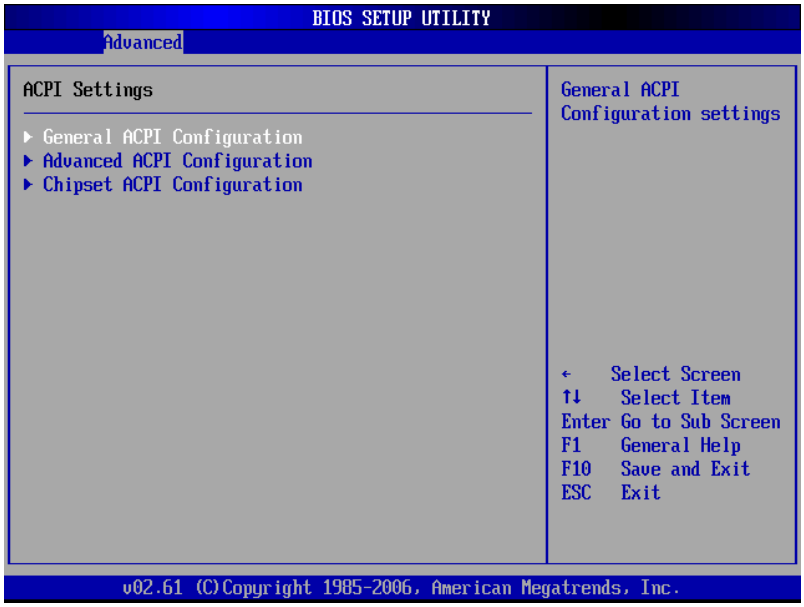
- **Serial Port2 IRQ**
  This item specifies the IRQ used by the serial port 2.
- **Serial Port2 Mode**
  This item specifies the mode used by the serial port 2.
- **Serial Port3 Address**
  This item specifies the base I/O port address and Interrupt Request address of serial port 3.
- **Serial Port3 IRQ**
  This item specifies the IRQ used by the serial port 3.
- **Serial Port4 Address**
  This item specifies the base I/O port address and Interrupt Request address of serial port 4.
- **Serial Port4 IRQ**
  This item specifies the IRQ used by the serial port 4.
- **Serial Port5 Address**
  This item specifies the base I/O port address and Interrupt Request address of serial port 5.
- **Serial Port5 IRQ**
  This item specifies the IRQ used by the serial port 5.
- **Serial Port6 Address**
  This item specifies the base I/O port address and Interrupt Request address of serial port 6.
- **Serial Port6 IRQ**
  This item specifies the IRQ used by the serial port 6.

- **Hardware Health Configuration**
  This screen shows the Hardware Health Configuration, and a description of the selected item appears on the right side of the screen.

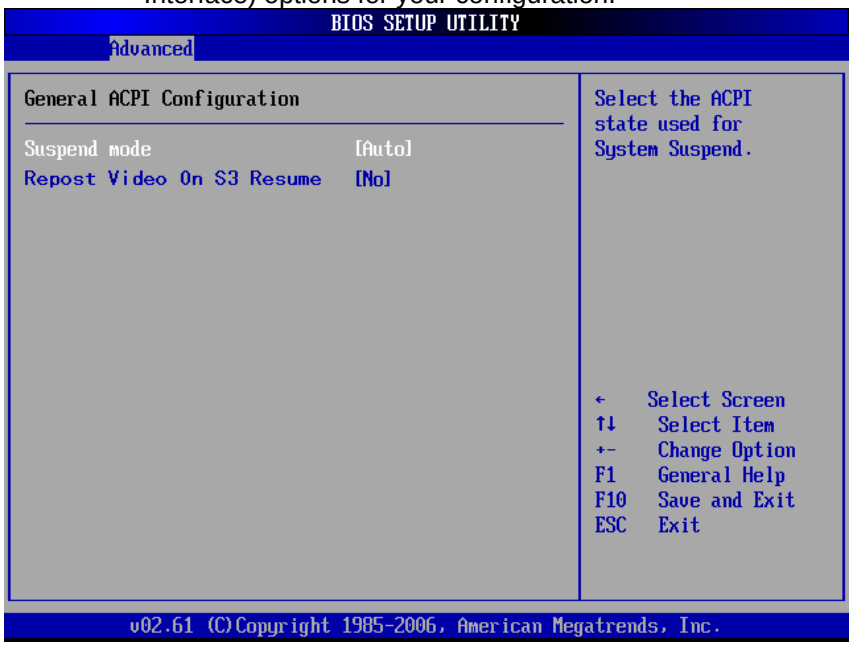


  - **System Temperature/CPU Temperature**
    These items display the temperature of CPU and System, Vcore, etc.

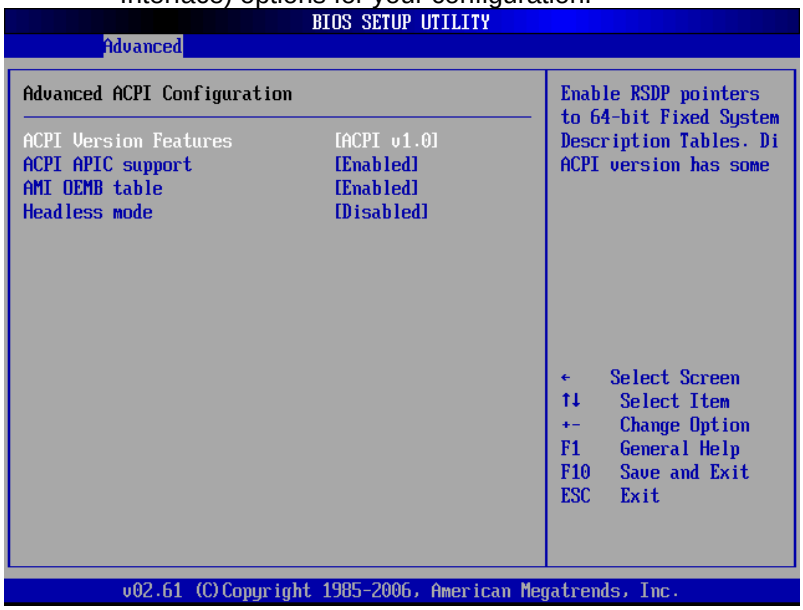
- **ACPI Settings**
  You can use this screen to select options for the ACPI Settings, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



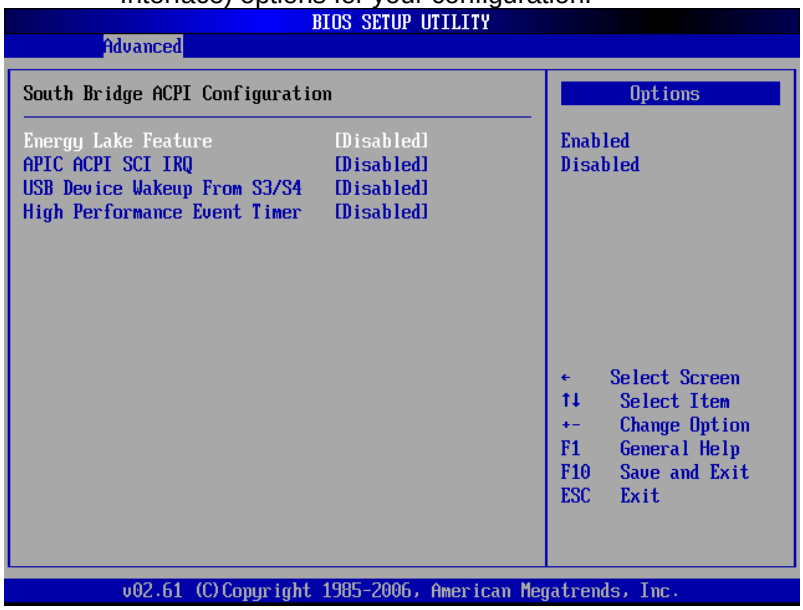
- **General ACPI Configuration**
  Scroll to this item and press <Enter> to view the General ACPI Configuration sub menu, which contains General ACPI (Advanced Configuration and Power Management Interface) options for your configuration.



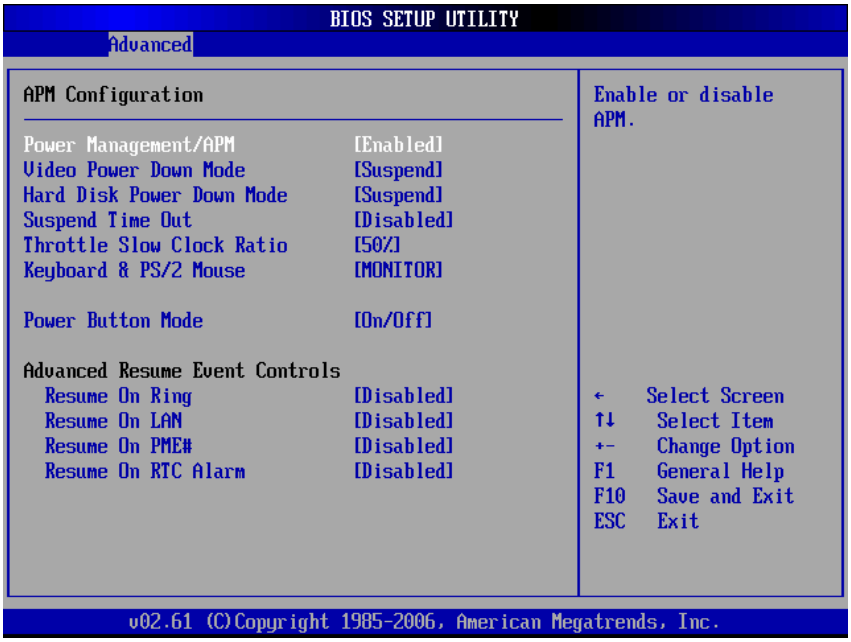
- **Advanced ACPI Configuration**
  Scroll to this item and press <Enter> to view the Advanced ACPI Configuration sub menu, which contains Advanced ACPI (Advanced Configuration and Power Management Interface) options for your configuration.



- **Chipset ACPI Configuration**
  Scroll to this item and press <Enter> to view the Chipset ACPI Configuration sub menu, which contains Chipset ACPI (Advanced Configuration and Power Management Interface) options for your configuration.



- **APM Configuration**
  You can use this screen to select options for the APM Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



  - **Power Management/APM**
    Set this item to allow Power Management/APM support. The default setting is *Enabled*.

Disabled	Set this item to prevent the chipset power management and APM (Advanced Power Management) features.
Enabled	Set this item to allow the chipset power management and APM (Advanced Power Management) features. This is the default setting.

  - **Video Power Down Mode**
    This option specifies the Power State that the video subsystem enters when the BIOS places it in a power saving state after the specified period of display inactivity has expired. The default setting is *Suspend*.

Disabled	This setting prevents the BIOS from initiating any power saving modes concerned with the video display or monitor.
Suspend	This option places the monitor into suspend mode after the specified period of display inactivity has expired. This means the monitor is not off. The screen will appear blacked out. The standards do not cite specific power ratings because they vary from monitor to monitor, but this setting use less power than Standby mode. This is the default setting.

- **Hard Disk Drive Power Down Mode**
  This option specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired. The default setting is *Suspend*.

Disabled	This setting prevents hard disk drive power down mode.
Suspend	This option cuts the power to the hard disk drives during a system suspend. This is the default setting.

- **Suspend Time Out (Minute)**
  This option specifies the length of time the system waits before it enters suspend mode. The default setting is *Disabled*.

Disabled	This setting prevents the system from entering suspend mode. This is the default setting.
1 Min	Set this item to allow the computer system to enter suspend mode after being inactive for 1 minute.
4 Min	Set this item to allow the computer system to enter suspend mode after being inactive for 4 minutes.
10 Min	Set this item to allow the computer system to enter suspend mode after being inactive for 10 minutes.

- **Throttle Slow Clock Ratio**
  Use this item to specify the speed of the system clock when running the power saving states.

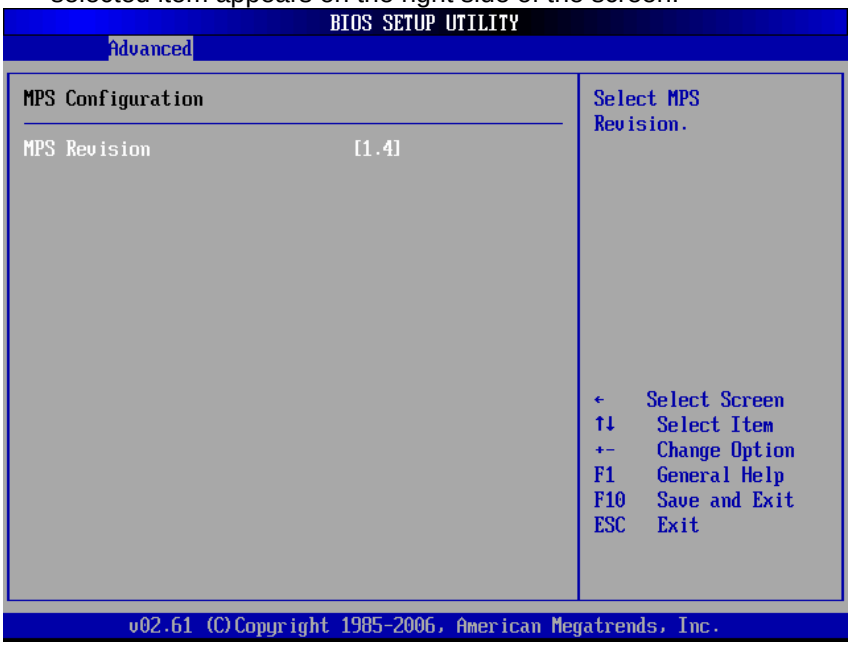
- **Power Button Mode**
  This option specifies how the externally mounted power button on the front of the computer chassis is used. The default setting is *On/Off*.

On/Off	Pushing the power button turns the computer on or off. This is the default setting. This is the default setting.
Suspend	Pushing the power button places the computer in Suspend mode or Full On power mode.

***** Advanced Resume Event Controls *****

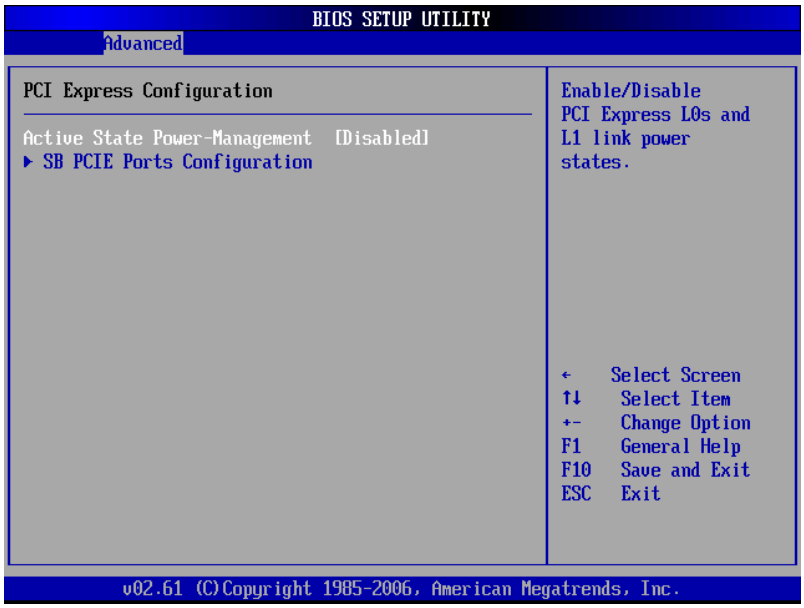
- **Resume On Ring**
  This item enables or disables the function of Resume On Ring that resumes the system through incoming calls.
- **Resume On LAN**
  This item enables or disables the function of Resume On LAN that resumes the system through the network.
- **Resume On PME#**
  This item enables or disables the function of Resume On PME# (Power Management Event). Enabling this item allows the system to resume from standby mode.
- **Resume On RTC Alarm**
  You can set "Resume On RTC Alarm" item to enabled and key in Data/time to power on system.

- **MPS Configuration**
  This screen shows the MPS (Multi Processor Specification) Configuration, and you can change its value. A description of the selected item appears on the right side of the screen.



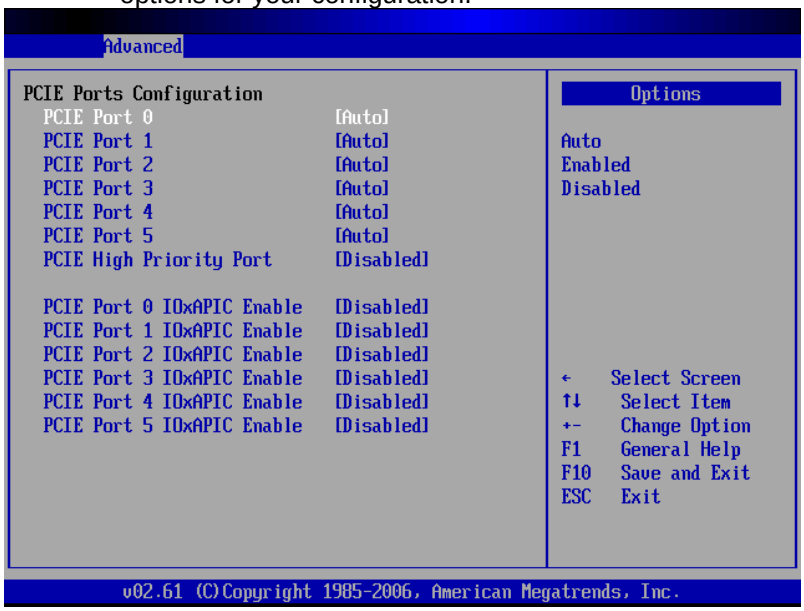
  - **MPS Revision**
    Use this item to select MPS (Multi Processor Specification) Revision 1.1 or 1.4. The default setting is *1.4*.

- **PCI Express Configuration**
  This screen shows the PCI Express Configuration, and you can change its value. A description of the selected item appears on the right side of the screen.

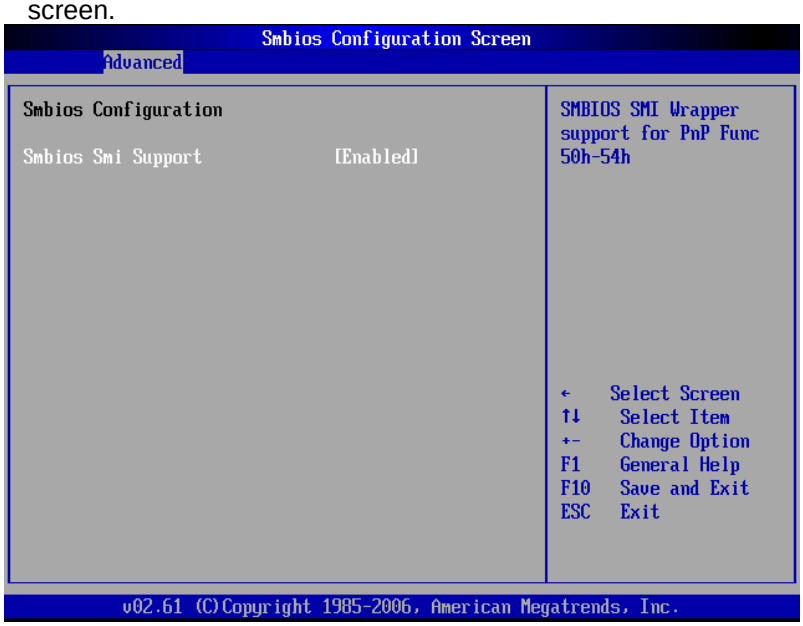


  - **Active State Power-Management**
    Use this item to enable or disable the function of Active State Power-Management to provide you with lower power consumption. The default setting is *Disabled*.

- **SB PCIE Ports Configuration**
  Scroll to this item and press <Enter> to view the SB PCIE Ports Configuration sub menu, which contains several options for your configuration.

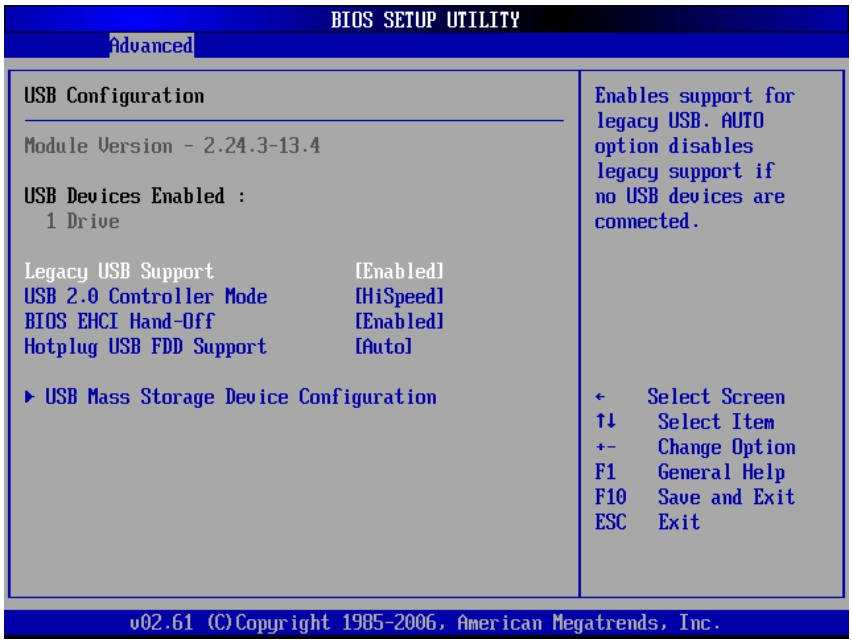


- **Smbios Configuration**
  You can use this screen to select options for the Smbios Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



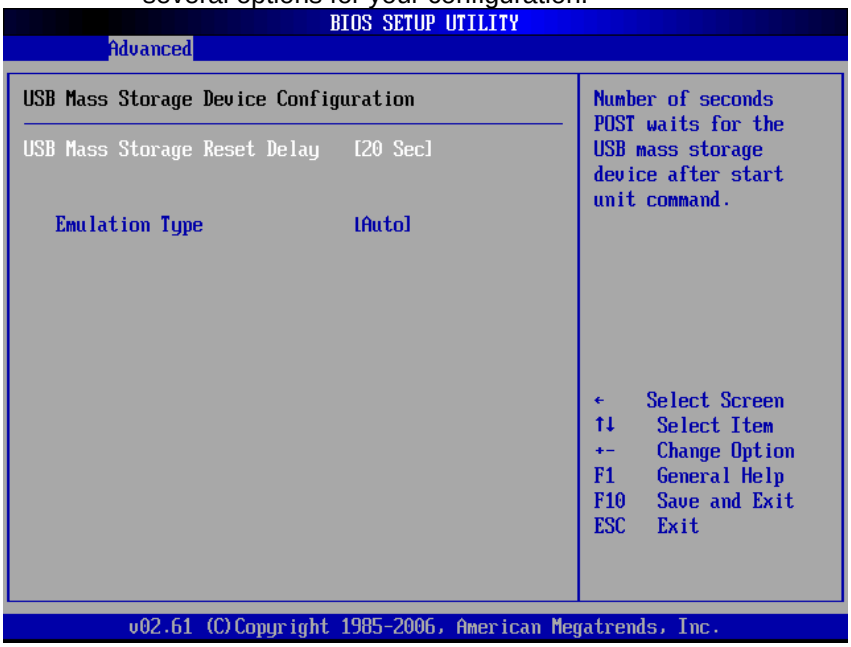
  - **Smbios Smi Support**
    When this item is enabled, the system can support the SMBIOS SMI wrapper for the PnP.

- **USB Configuration**
  You can use this screen to select options for the USB Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



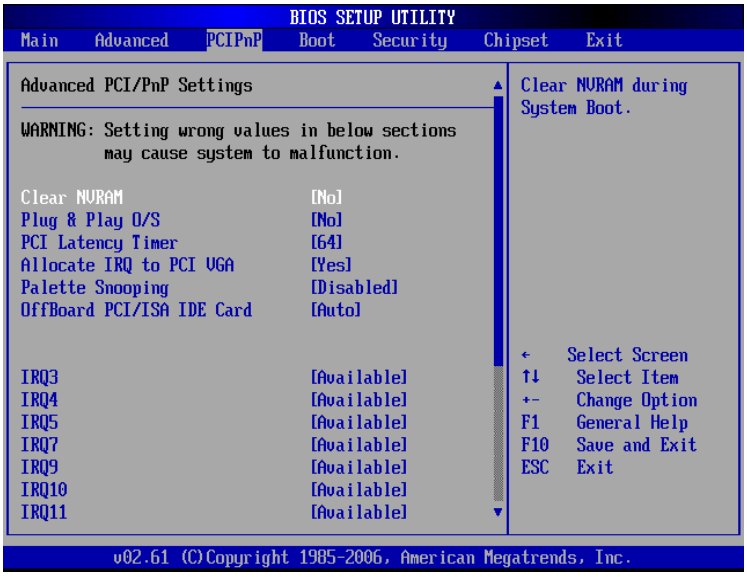
  - **Legacy USB Support**
    Use this item to enable or disable support for USB device on legacy operating system. The default setting is *Enabled*.
  - **USB 2.0 Controller Mode**
    Use this item to configure the USB 2.0 controller. The default setting is *HiSpeed*.
  - **BIOS EHCI Hand-Off**
    Enabling this item provide the support for operating systems without an EHCI hand-off feature. The default setting is *Enabled*.
  - **Hotplug USB FDD Support**
    This item allows you to enable or disable the support for a USB floppy disk drive.

- **USB Mass Storage Device Configuration**
  Scroll to this item and press <Enter> to view the USB Mass Storage Device Configuration sub menu, which contains several options for your configuration.



5.5 PCI PnP Menu

The PCI PnP menu allows users to change the advanced settings for PCI/PnP devices.



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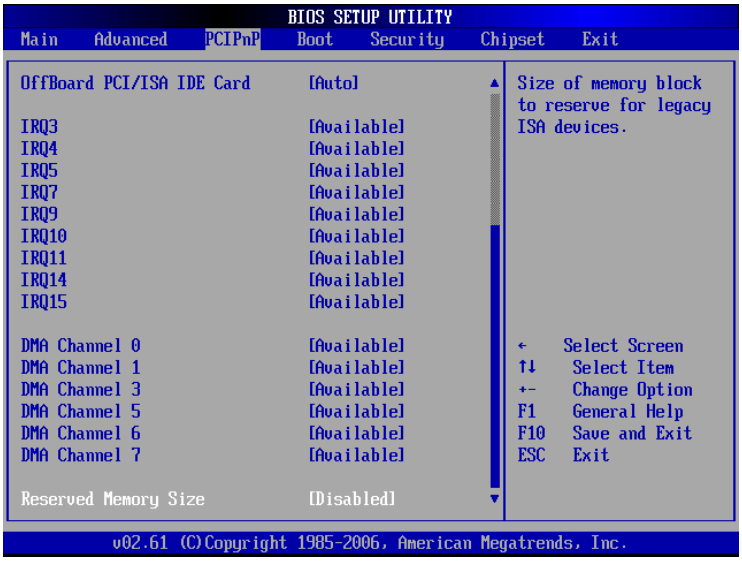


(2)

- **Clear NVRAM**
  Use this item to clear the data in the NVRAM (CMOS). Here are the options for your selection, *No* and *Yes*.

- **Plug & Play O/S**
  When the setting is No, Use this item to configure all the devices in the system. When the setting is Yes and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot. The default setting is *No*.

- **PCI Latency Timer**
  This item controls how long a PCI device can hold the PCI bus before another takes over. The longer the latency, the longer the PCI device can retain control of the bus before handing it over to another PCI device. There are several options for your selection.

- **Allocate IRQ to PCI VGA**
  This item allows BIOS to choose an IRQ to assign for the PCI VGA card. Here are the options for your selection, *No* and *Yes*.

- **Palette Snooping**
  Some old graphic controllers need to "snoop" on the VGA palette, and then map it to their display as a way to provide boot information and VGA compatibility. This item allows such snooping to take place. Here are the options for your selection, *Disabled* and *Enabled*.

- **OffBoard PCI/ISA IDE Card**
  This item is for any other non-onboard PCI/ISA IDE controller adapter. There are several options for your selection.

- **IRQ3/4/5/7/9/10/11/14/15**
  These items will allow you to assign each system interrupt a type, depending on the type of device using the interrupt. The option "Available" means the IRQ is going to assign automatically. Here are the options for your selection, *Available* and *Reserved*.

- **DMA Channel 0/1/3/5/6/7**
  These items will allow you to assign each DMA channel a

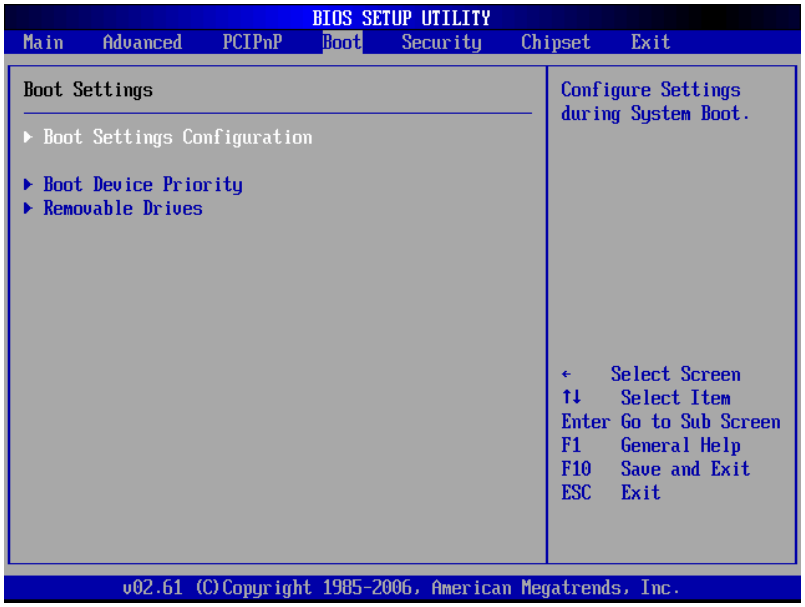
type, depending on the type of device using the channel. The option "Available" means the channel is going to assign automatically. Here are the options for your selection, *Available* and *Reserved*.

5.6 Boot Menu

The Boot menu allows users to change boot options of the system. You can select any of the items in the left frame of the screen to go to the sub menus:

- Boot Settings Configuration
- Boot Device Priority
- Removable Drives

For items marked with "►", please press <Enter> for more options.



- **Boot Settings Configuration**

  - **Quick Boot**
    Enabling this item lets the BIOS skip some power on self tests (POST). The default setting is *Enabled*.

  - **LAN1/LAN2 Boot**
    Use these items to enable or disable the Boot ROM function of the onboard LAN chip when the system boots up.

  - **Quiet Boot**

Disabled	Set this item to allow the computer system to display the POST messages.
Enabled	Set this item to allow the computer system to display the OEM logo. This is the default setting.

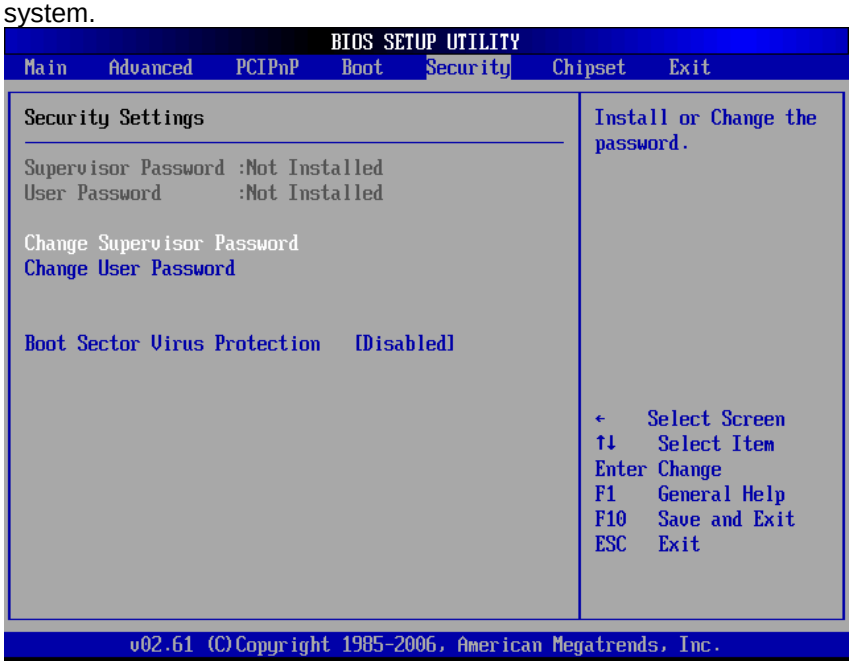
  - **AddOn ROM Display Mode**
    This item selects the display mode for option ROM. The default setting is *Force BIOS*.

  - **Boot Num-Lock**
    Use this item to select the power-on state for the NumLock. The default setting is *On*.

- **PS/2 Mouse Support**
  This item determines if the BIOS should reserve IRQ12 for the PS/2 mouse or allow other devices to make use of this IRQ. Here are the options for your selection, *Auto*, *Enabled* and *Disabled*.
- **Wait For 'F1' If Error**
  If this item is enabled, the system waits for the F1 key to be pressed when error occurs. The default setting is *Enabled*.
- **Hit 'DEL' Message Display**
  If this item is enabled, the system displays the message "Press DEL to run Setup" during POST. The default setting is *Enabled*.

5.7 Security Menu

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



- **Supervisor Password**
  This item indicates whether a supervisor password has

been set. If the password has been installed, Installed displays. If not, Not Installed displays.

- **User Password**
  This item indicates whether a user password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.

- **Change Supervisor Password**
  Select this option and press <Enter> to access the sub menu. You can use the sub menu to change the supervisor password.

- **Change User Password**
  Select this option and press <Enter> to access the sub menu. You can use the sub menu to change the user password.

- **Boot Sector Virus Protection**
  This option is near the bottom of the Security Setup screen. The default setting is *Disabled*.

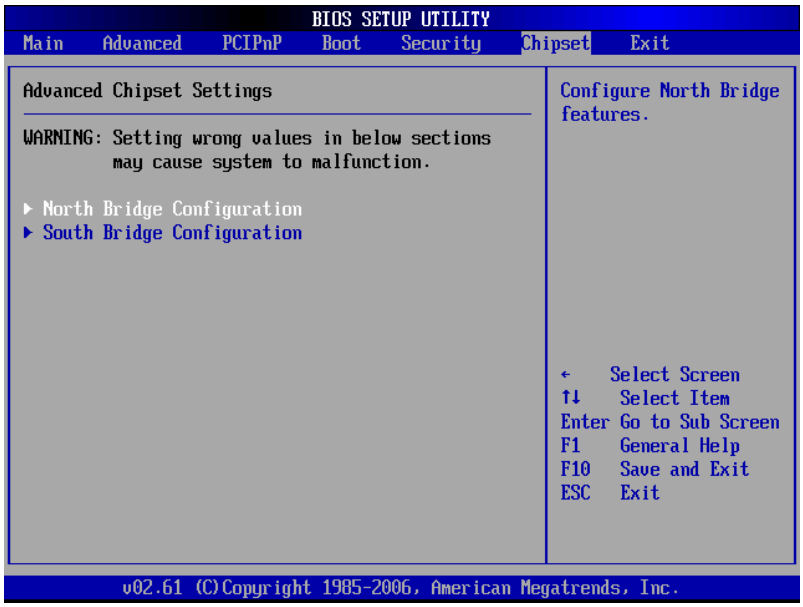
Disabled	Set this item to prevent the Boot Sector Virus Protection. This is the default setting.
Enabled	Select Enabled to enable boot sector protection. It displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. If enabled, the following appears when a write is attempted to the boot sector. You may have to type N several times to prevent the boot sector write. Boot Sector Write! Possible VIRUS: Continue (Y/N)? _ The following appears after any attempt to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard disk drive Service: Format!!! Possible VIRUS: Continue (Y/N)?

5.8 Chipset Menu

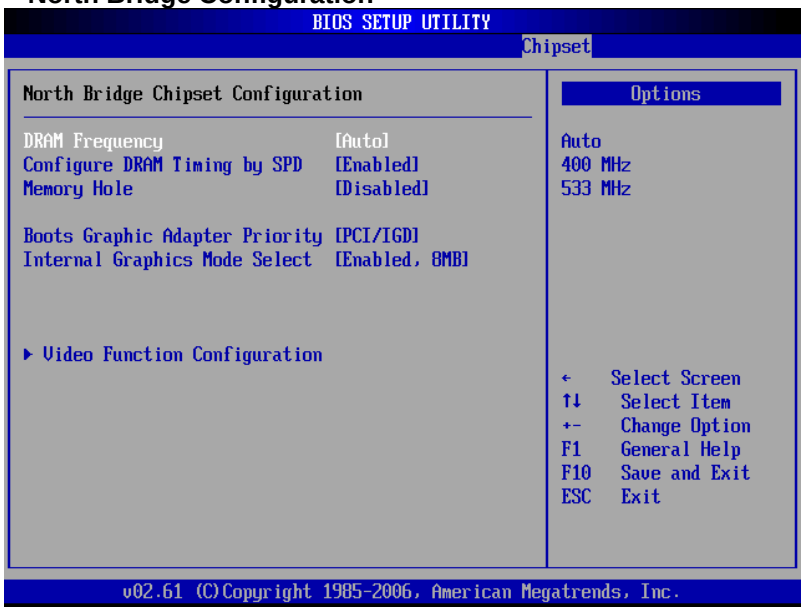
The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

- North Bridge Configuration
- South Bridge Configuration

For items marked with "►", please press <Enter> for more options.



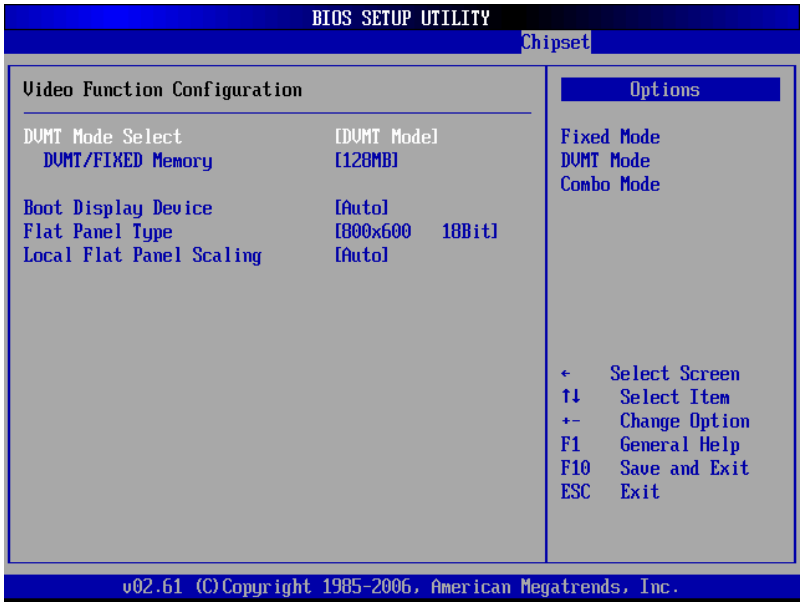
- **North Bridge Configuration**



  - **DRAM Frequency**
    This item allows you to control the Memory Clock.
  - **Configure DRAM Timing by SPD**
    This item can enable or disable DRAM timing by SPD (Serial Presence Detect) device, which is a small EEPROM chip on the memory module, containing important information about the module speed, size, addressing mode and various parameters.
  - **Memory Hole**
    You can reserve this area of system memory for ISA adapter ROM. When this area is reserved it cannot be cached. Check the user information of peripherals that need to use this area o f system memory for the memory requirements. Here are the options, *Disabled* and *15M-16M*.
  - **Boot Graphic Adapter Priority**
    This item allows you to select the graphics controller as the primary boot device.
  - **Internal Graphics Mode Select**

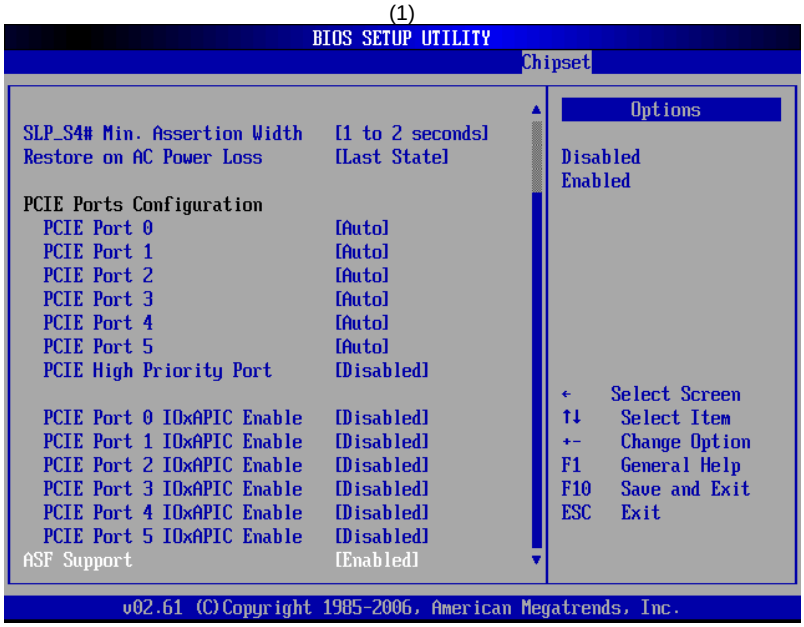
This item allows you to select the amount of system memory used by the internal graphics device.

- **Video Function Configuration**
  Press <Enter> for the sub-menu for setting up video function.



- **South Bridge Configuration**

(1)

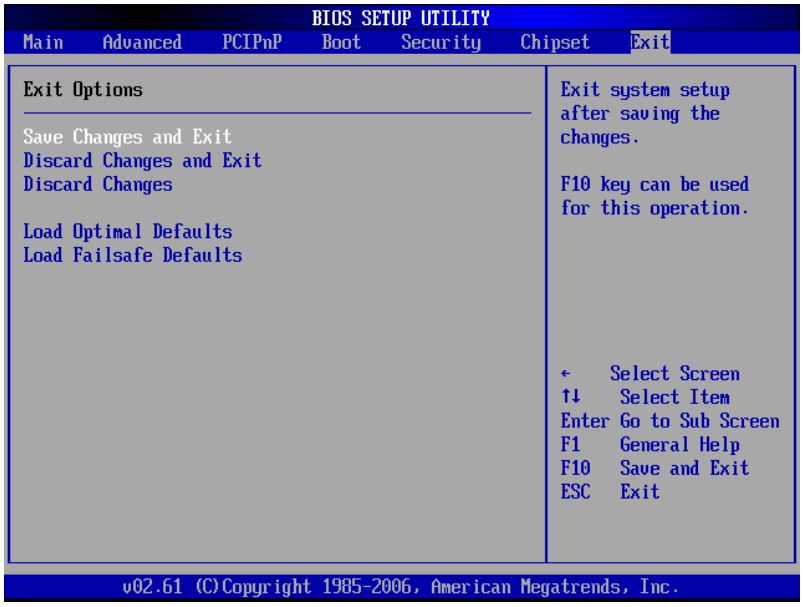


(2)

- **USB Function**
  This item allows you to enable or disable USB function.
- **USB 2.0 Controller**
  This item allows you to enable or disable the USB 2.0 controller.
- **Audio Controller**
  This item allows you to enable or disable the audio support.
- **SLP_S4# Min. Assertion Width**
  This item allows you to set the SLP_S4# Assertion Width.
- **Restore on AC Power Loss**
  This item can control how the PC will behave once power is restored following a power outage, or other unexpected shutdown.
- **PCIE Port Configuration**
  This item allows you to set or disable the PCI Express Ports.

5.9 Exit Menu

The Exit menu allows users to load your system configuration with optimal or failsafe default values.



- **Save Changes and Exit**
  When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select *Save Changes and Exit* from the Exit menu and press <Enter>. Select Ok to save changes and exit.

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

- **Load Optimal Defaults**
  It automatically sets all Setup options to a complete set of default settings when you select this option. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In

particular, do not use the Optimal Setup options if your computer is experiencing system configuration problems. Select Load Optimal Defaults from the Exit menu and press <Enter>.

- **Load Fail-Safe Defaults**
  It automatically sets all Setup options to a complete set of default settings when you select this option. The Fail-Safe settings are designed for maximum system stability, but not maximum performance. Select the Fail-Safe Setup options if your computer is experiencing system configuration problems.
  Select Load Fail-Safe Defaults from the Exit menu and press <Enter>. Select Ok to load Fail-Safe defaults.

APPENDIX A
WATCHDOG TIMER

Watchdog Timer Setting

After the system stops working for a while, it can be auto-reset by the Watchdog Timer. The integrated Watchdog Timer can be set up in the system reset mode by program.

Using the Watchdog Function

Start
↓
Un-Lock WDT:
O 2E 87 ; Un-lock super I/O
O 2E 87 ; Un-lock super I/O
↓
Select Logic device:
O 2E 07
O 2F 08
↓
Activate WDT:
O 2E 30
O 2F 01
↓
Set Second or Minute :
O 2E F5
O 2F N N=00 or 08
↓
Set base timer :
O 2E F6
O 2F M=00,01,02,…FF(Hex) ,Value=0 to 255
↓

; IF to disable WDT:
O 2E 30
O 2F 00 ; Can be disable at any time

- Timeout Value Range
  - 1 to 255
  - Minute / Second
- Program Sample

2E, 87	
2E, 87	
2E, 07	
2F, 08	Logical Device 8
2E, 30	Activate
2F, 01	
2E, F5	
2F, N	Set Minute or Second N=08 (Min),00(Sec)
2E, F6	
2F, M	Set Value M = 00 ~ FF

APPENDIX B
DIGITAL I/O

Digital I/O Software Programming

- GPI program sample:

I 48D	Read bit4~bit7 Status

- GPO program sample:

O 2E 87	
O 2E 87	
O 2E 07	
O 2F 08	Select Device 8
O 2E 30	
O 2F 04	Set GPIO6
O 2E E4	
O 2F F0	GPIO6 pins are programmed as output pins.
O 2E E5	Check Bit 0 ~ Bit 3 (1 High , 0 Low)
O 2F 00	
O 2E 87	
O 2E 87	

MEMO