MANO110 Series

AMD64 Athlon X2/Turion X2/Athlon

Mini ITX Board with AMDRS780E+SB710

User's Manual

Disclaimers

This manual has been carefully checked and believed to contain accurate information. Axiomtek Co., Ltd. assumes no responsibility for any infringements of patents or any third party's rights, and any liability arising from such use.

Axiomtek does not warrant or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information in this document. Axiomtek does not make any commitment to update the information in this manual.

Axiomtek reserves the right to change or revise this document and/or product at any time without notice.

No part of this document may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Axiomtek Co., Ltd.

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.

JULY 2010, 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

Table of Contents

CHAPTER 1

INTRODUCTION

The MANO110 is Mini ITX board with AMD Socket AM2/AM2+, support AMD Athlon™ X2/Turion™ X2/Athlon™ Processors. It integrates AMD RS780E with ATI Radeon™ HD3200 Graphics and SB710 that deliver outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions. There are two 200-pin unbuffered DDR2 SO-DIMM sockets with maximum memory capacity up to 4GB. It also features Dual Giga-bit Ethernet, two SATA2 for Serial ATA hard drives at maximum transfer rate up to 300MB/sec, eight USB 2.0 high speed compliant, built-in high definition audio codec that can achieve the best stability and reliability for industrial applications. It provides one PCI Express x 16 slot(8 lanes) which can support AMD Hybrid CrossFire technology. . Additionally, it provides you with unique embedded features, such as 4 serial ports (COM ports) and Mini ITX form factor that applies an extensive array of PC peripherals.

1.1 Specifications

- **CPU**
  - AMD Athlon™ X2/Turion™ X2/Athlon™ Processors
- **System Chipset**
  - AMD RS780E & SB710
- **CPU Socket**
  - Socket AM2/AM2+
- **BIOS**
  - AMI BIOS with Axiomtek standard features
- **System Memory**
  - Two x 200-pin unbuffered DDR2 SO-DIMM sockets
  - Maximum to 4GB memory capacity
- **Onboard Multi I/O**
  - Controller: Fintek F71863/F81216
  - Four Serial Ports (RS-232 ports)
- **USB Interface**
  - Eight USB ports with fuse protection and complies with USB Spec. Rev. 2.0
- **Graphics**
  - ATI Radeon™ HD3200 Graphics: one HDMI, one DVI-D and one VGA outputs.
  - Display mode: (1)HDMI + DVI-D (2)HDMI + VGA (3) VGA + DVI-D

  When connecting HDMI + DVI-D + VGA at the same time, the default dual view displays will be HDMI + DVI-D.
- **Watchdog Timer**
  - 1~255 seconds; 255 levels
- **Expansion Interface**
  - One PCI Express x 16 slot(8 lanes)

- **Ethernet**
  - Two RTL8111D Giga-bit Ethernet controllers via PCIe x1
- **Audio**
  - HD Audio compliant (with MIC-in/Line-in/line-out & Speaker) via ALC888
  - Amplifier: TPA3005D2 Stereo 6 Watt
- **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
- LAN Driver
- High Definition Audio Codecs Driver
- HDMI Audio Codecs Driver

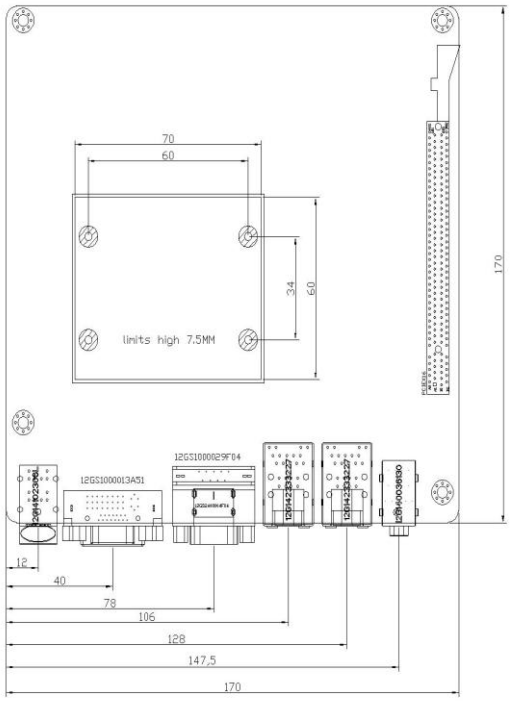
Note:

Under Microsoft Windows XP operating systems the AMD Chipset Driver requires Microsoft .NET Framework prior to installation. The AMD Chipset Driver is an application that allows you to control the configuration of your AMD product. You can verify that you have the .NET Framework by checking in the Add/Remove Programs list in the Control Panel. If the .NET Framework is not listed, please download, and install before proceeding. For more information, please visit Microsoft .NET Framework.

CHAPTER 2

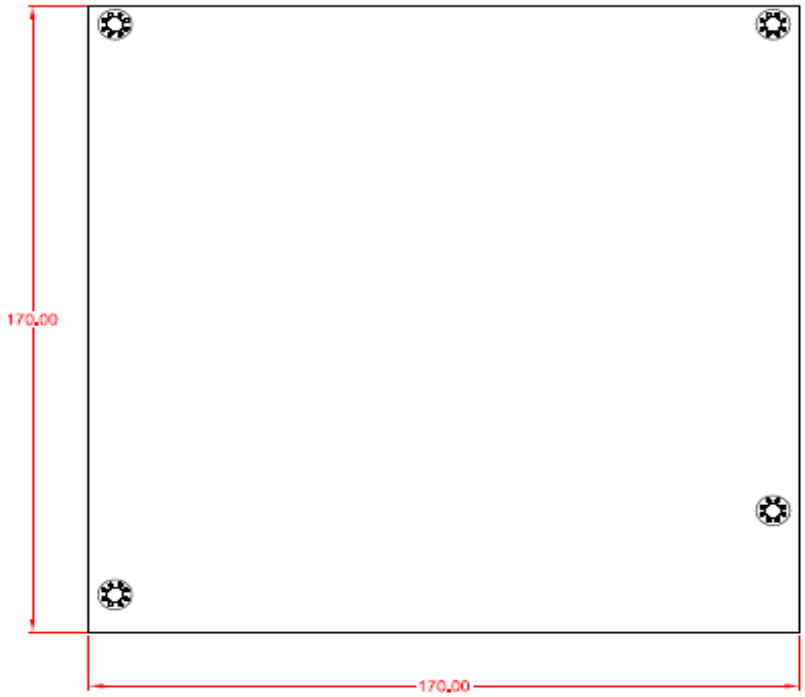
JUMPERS AND CONNECTORS

2.1 Board Dimensions and Fixing Holes

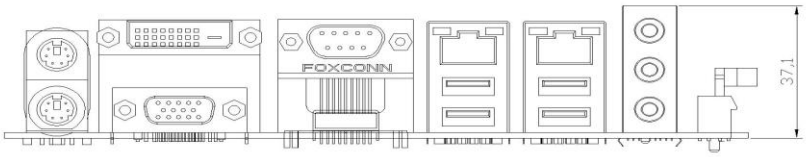


TOP VIEW

Component Side

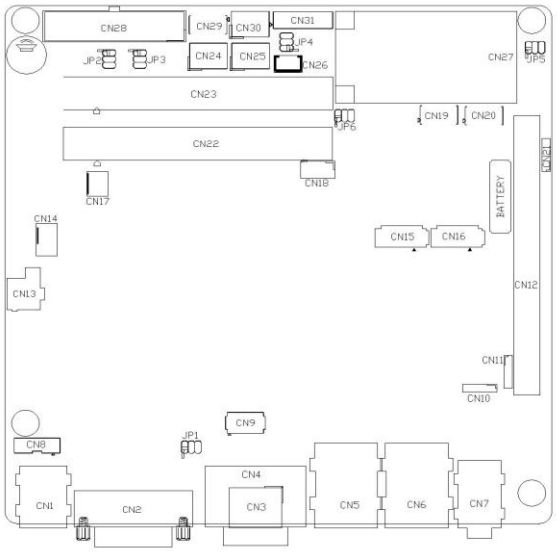


Solder Side

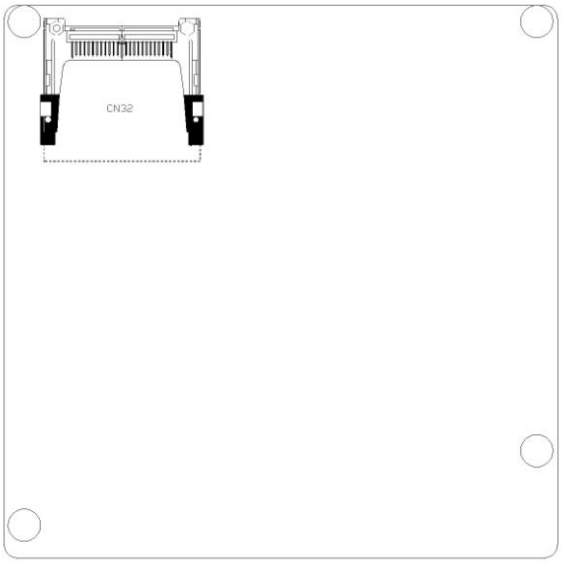


Rear I/O

2.2 Board Layout



Component Side



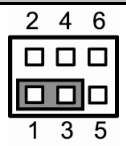
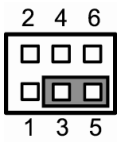
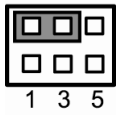
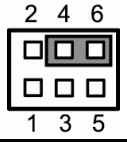
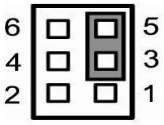
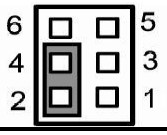
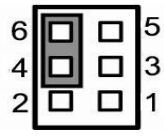
Solder Side

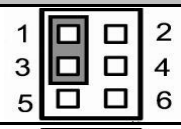
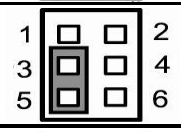
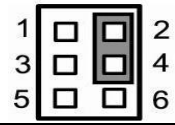
2.3 Jumper Settings

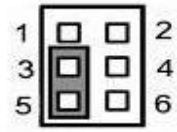
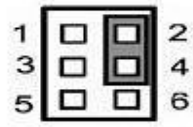
Proper jumper settings configure the **MANO110** to meet your application purpose. We are herewith listing a summary table of all jumpers and default settings for onboard devices, respectively.

Jumper	Default Setting		Jumper Setting
JP1	COM1 Mode Selection	CN4 Pin 1: DCD	Short 3-5
		CN4 Pin 9: RI	Short 4-6
JP2	COM3 Mode Selection	CN24 Pin 1: DCD	Short 3-5
		CN24Pin 8: RI	Short 4-6
JP3	COM4 Mode Selection	CN25 Pin 1: DCD	Short 3-5
		CN25 Pin 8: RI	Short 4-6
JP4	COM2 Mode Selection	CN30 Pin 1: DCD	Short 3-5
		CN30 Pin 9: RI	Short 4-6
JP5	CF Mode Select : Slave		Short 1-3
	CF Power Select: 5V		Short 2-4
JP6	Clear CMOS Setting : Normal		Short 2-4

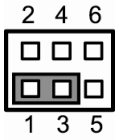
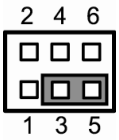
- **2.3.1 COM1 ~ COM4 Mode Selection Jumpers (JP1, JP4, JP2, JP3)**

Description	Function	Jumper Setting
COM1 (JP1)	Pin 1=5V	
	*Pin 1=DCD (Default)	
	Pin 9=12V	
	*Pin 9=RI (Default)	
COM2 (JP4)	Pin 1=5V	
	Pin 1=DCD (Default)	
	Pin 9=12V	
	*Pin 9=RI (Default)	

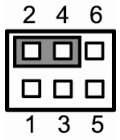
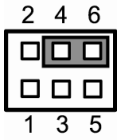
Description	Function	Jumper Setting
COM3 (JP2)	Pin 1=5V	
	*Pin 1=DCD (Default)	
	Pin 8=12V	
	*Pin 8=RI (Default)	

Description	Function	Jumper Setting
COM4 (JP3)	Pin 1=5V	
	*Pin 1=DCD (Default)	
	Pin 8=12V	
	*Pin 8=RI (Default)	

- **2.3.2 CF Mode Setting Jumpers (JP5)**

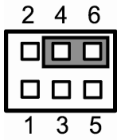
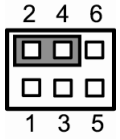
Description	Function	Jumper Setting
CF Mode Select	Slave(Default)	
	Master	

- **2.3.3 CF Power Setting Jumpers (JP5)**

Description	Function	Jumper Setting
CF Power Select	+5V(Default)	
	+3.3V	

2.3.4 CMOS Clear Jumpers (JP6)

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	

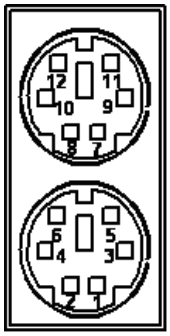
2.4 Connectors

Description	Connector
PS/2 Keyboard and Mouse Connector	CN1
DVI and VGA Connector	CN2
HDMI Connector	CN3
COM1 Connector	CN4
LAN1, USB Port1 and USB Port2 Connector	CN5
LAN2, USB Port2 and USB Port4 Connector	CN6
Audio Connector	CN7
Reserved.	CN8
Reserved	CN9
Speaker Output Connector	CN10
Reserved	CN11
PCIex16 slot, Support up to PCIex8	CN12
ATX12V Power Connector	CN13
CPU FAN Connector	CN14
SATA Port1 Connector	CN15
SATA Port2 Connector	CN16
System FAN Connector	CN17
Reserved	CN18
USB Port5 and USB Port6 Connector	CN19
USB Port7 and USB Port8 Connector	CN20
Reserved	CN21
DDRII SO-DIMM Solt1	CN22
DDRII SO-DIMM Slot2	CN23
COM3 Connector	CN24
COM4 Connector	CN25
SMBus Connector	CN26
Mini PCIe slot	CN27
ATX Power Connector	CN28
DIO Connector	CN29
COM2 Connector	CN30
Front Panel Connector	CN31
CF Connector	CN32

2.4.1 PS/2 Keyboard and Mouse Connector (CN1)

The board supports one PS/2 keyboard and Mouse interface.

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

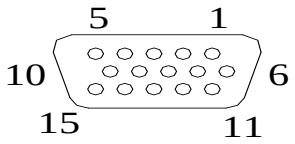


2.4.2 VGA+DVI Connector (CN2)

CN2 is a double deck VGA & DVI connector. **CN2A** is a standard 15-pin DB15 connector commonly used for the CRT VGA display. **CN2B** is a DVI connector for the digital visual interface display.

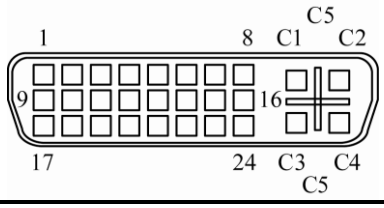
Pin	Signal	Pin	Signal	Pin	Signal
1	Red	2	Green	3	Blue
4	N/A	5	GND	6	AGND
7	AGND	8	AGND	9	N/A
10	GND	11	N/A	12	DDC DAT
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK

CN2A(CRT1)



Pin	Signal	Pin	Signal
1	TX2-	2	TX2+
3	Ground	4	CRT_SPD_CLK
5	CRT_SPD DATA	6	DVI_SPD_CLK
7	DVI_SPD DATA	8	CRT-VSYNC
9	TX1-	10	TX1+
11	Ground	12	NC
13	NC	14	VGAVCC
15	Ground	16	FPDETECT
17	TX0-	18	TX0+
19	Ground	20	NC
21	NC	22	Ground
23	TXC+	24	TXC-
C1	CRT-RED	C2	CRT-GREEN
C3	CRT-BLUE	C4	CRT-HSYNC
C5	VGAGND		

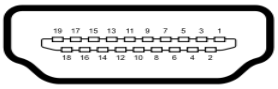
CN2B(DVI-D+CRT2)



● 2.4.3 HDMI Connector (CN3)

Pin	Signal	Pin	Signal
1	TMDS Data2+	2	TMDS Data2 Shield
3	TMDS Data2–	4	TMDS Data1+
5	TMDS Data1 Shield	6	TMDS Data1–
7	TMDS Data0+	8	TMDS Data0 Shield
9	TMDS Data0–	10	TMDS Clock+
11	TMDS Clock Shield	12	TMDS Clock–
13	CEC	14	Reserved (N.C. on device)
15	SCL	16	SDA
17	DDC/CEC Ground	18	+5 V Power
19	Hot Plug Detect	20	

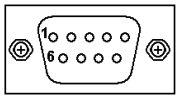
HDMI Connector (CN3)



● 2.4.4 COM1 Connector (CN4)

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

COM1(CN4)

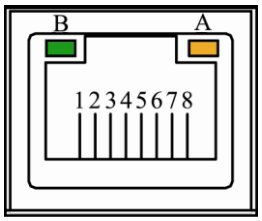


● 2.4.5 USBx2 + LAN Connectors (CN5, CN6)

The board supports two three-layer USB & LAN connectors, CN5 and CN6. The upper CN5B and CN6B ports are for LAN. The board is equipped with a high performance Plug and Play Ethernet interface fully compliant with the IEEE 802.3 standard. To connect the board to 10-Base-T, 100-Base-T or 1000 Base-T hub, just plug one end of cable to the Ethernet connector and connect the other end (phone jack) to a 10-Base-T, 100-Base-T or 1000 Base-T hub.
The lower double-deck CN5A and CN6A are USB 2.0 ports compliant (480Mbps) that can be connected to any USB peripherals, such as keyboard, mouse, and scanner.

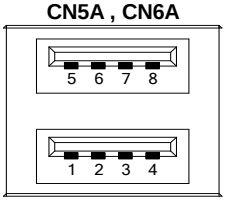
Pin	Signal
1	LAN1_MDI0+
2	LAN1_MDI0-
3	LAN1_MDI1+
4	LAN1_MDI1-
5	LAN1_MDI2+
6	LAN1_MDI2-
7	LAN1_MDI3+
8	LAN1_MDI3-
A	100 LAN LED(Green)/ 1000 LAN LED(Orange)
B	Active LED

CN5B , CN6B

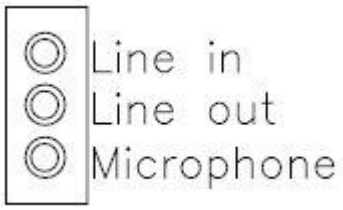


Pin	Signal
1, 5	USB Vcc
2, 6	USB -
3, 7	USB +
4, 8	USB GND

CN5A , CN6A

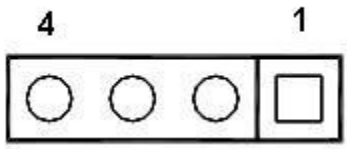


- **2.4.6 Audio Phone Jack Connector (CN7)**



- **2.4.7 Speaker Output Connector (CN10)**

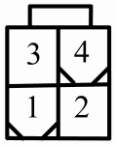
1	negative output for left channel
2	positive output for left channel
3	negative output for right channel
4	positive output for right channel



- **2.4.8 ATX 12V Power Connector (CN13)**

Connect the power cable to **ATX1** for +12V ATX power supply.

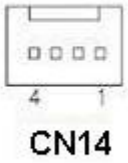
Pin	Signal
1	GND
2	GND
3	+12V
4	+12V



2.4.9 CPU Fan Connector (CN14)

FAN1 is a CPU fan connector. The fan connector on MANO110 provides power to the fan.

Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection
4	NC

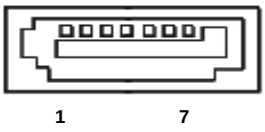


2.4.10 SATA Connectors (CN15, CN16)

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+
7	GND

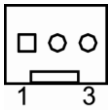
SATA(CN15,CN16)



2.4.11 System Fan Connector (CN17)

Pin	Signal
1	GND
2	+12V
3	Sensor

CN17

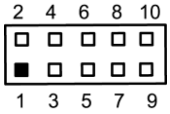


2.4.12 USB Port5 ~ Port8 Connectors (CN19, CN20)

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-	4	USB-
5	USB+	6	USB+
7	Ground (GND)	8	Ground (GND)
9	Key	10	Ground (GND)

USB(CN19,CN20)

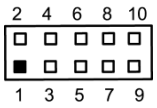


- **2.4.13 COM2, COM3 and COM4 Connectors (CN30,CN24,CN25,)**

Please refer to the RS-232 pin assignment as listed below:

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	Key

COM2/3/4

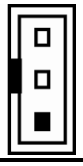


- **2.4.14 SMBUS Connector (CN26)**

Connector SMBUS1 is for SMBUS interface support.

Pin	Signal
1	CLOCK
2	DATA
3	GND

SMBUS(CN26)



2.4.15 Mini PCIe slot (CN27)

CN27 is a PCI Express Mini Card connector with support for a PCI Express x1 link and a USB 2.0 link. A PCI Express Mini Card can be applied to either PCI Express or USB 2.0. The USB 2.0 support will be helpful during the transition to PCI Express, because peripheral vendors will need time to design their chipsets to have the PCI Express function. During the transition, PCI Express Mini Cards can be quickly implemented by using USB 2.0.

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3V
3	N.C	4	GND
5	N.C	6	+1.5V
7	GND	8	N.C
9	GND	10	N.C
11	CLK-	12	N.C
13	CLK+	14	N.C
15	GND	16	N.C
17	N.C	18	GND
19	N.C	20	N.C
21	GND	22	PERST#
23	PERN3	24	+3.3VSB
25	PERP3	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETN3	32	SMB_DATA
33	PETP3	34	GND
35	GND	36	USB_D7-
37	N.C	38	USB_D7+
39	N.C	40	GND
41	N.C	42	N.C
43	N.C	44	N.C

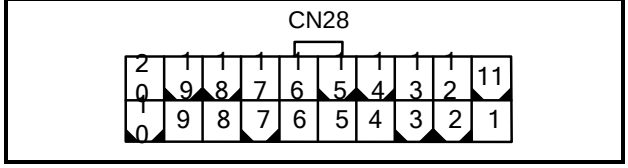
Pin	Signal	Pin	Signal
45	N.C	46	N.C
47	N.C	48	+1.5V
49	N.C	50	GND
51	N.C	52	+3.3V

CN27

2.4.16 ATX Power Connector (CN28)

Steady and sufficient power can be supplied to all components on the board through the power connector. Please make sure all components and devices are properly installed before connecting the power connector. 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	2	3.3V
3	GND	4	5V
5	GND	6	5V
7	GND	8	PW_OK
9	5V_SB	10	12V
11	3.3V	12	-12V
13	GND	14	PS_ON
15	GND	16	GND
17	GND	18	-5V
19	5V	20	5V

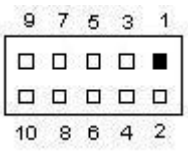


2.4.17 DIO Connector (CN29)

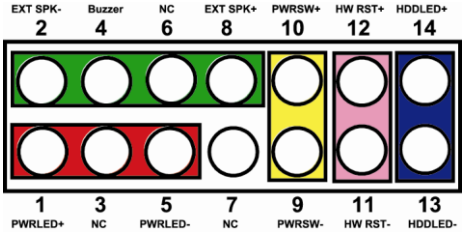
The board is equipped an 8-channel digital I/O connector **CN29** that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers, sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. The digital I/O is controlled via software programming.

Pin	Signal	Pin	Signal
1	DIO0	2	DIO4
3	DIO1	4	DIO5
5	DIO2	6	DIO6
7	DIO3	8	DIO7
9	GND	10	+5V

DIO(CN29)



2.4.18 Flat Panel Bezel Connector (CN31)



- **Power LED**

  This 3-pin connector named as Pin 1, 3 and Pin 5 connect the system power LED indicator to such a 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.

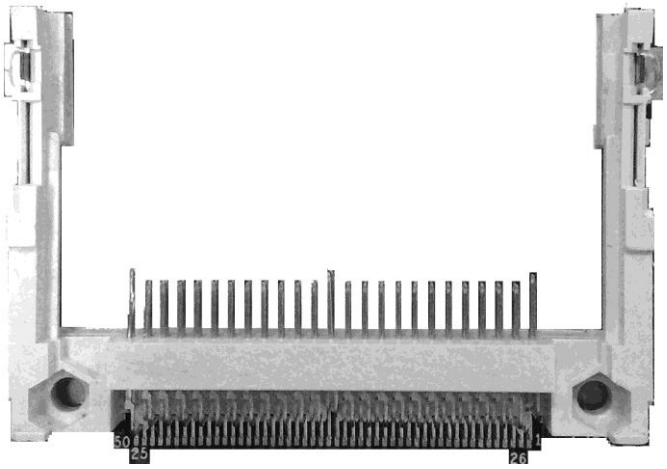
- **HDD Activity LED**

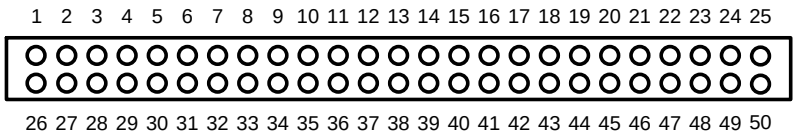
  This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 13 and 14 connect the hard disk drive to the front panel HDD LED, Pin 13 assigned as -, and Pin 14 as +.

2.4.19 CF Connector (CN32)

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#
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


50
25
26
1


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

CHAPTER 3

HARDWARE DESCRIPTION

3.1 Microprocessors

The MANO110 Series supports AMD Athlon™ X2/Turion™ X2/Athlon™ Processors ' which make your system operated under Windows7 and Linux 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.

3.2 BIOS

The MANO110 Series uses American Megatrends BIOS with 8Mbit SPI Flash, DMI, Plug and Play.

3.3 System Memory

The MANO110 Series industrial CPU card supports two 200-pin unbuffered DDR2 SO-DIMM sockets for a maximum memory of 4GB DDR2 SDRAMs. The memory module can come in sizes of 64MB, 128MB, 256MB, 512MB, 1GB and 2GB.

3.4 I/O Port Address Map

There are total 1KB port addresses available for assignment to other devices via I/O expansion cards.

Address	Devices
000-01F	DMA controller #1
020-02D 024-025 028-029 02C-02D	Interrupt controller #1
02E-02F	Forwarded to LPC(LPC Super I/O 2)
030-031 034-035 038-039 03C-03D	Interrupt controller #2
040-043 050-053	Timer/Counter (8254)
04E-04F	Forwarded to LPC(LPC Super I/O 1)
060-06F	Forwarded to LPC(Microcontroller for Keyboard Controller)
070-077	Real time clock, NMI
080-091	DMA page register
092	Processor I/F(Reset Generator)
093-09F	DMA page register
0A0-0BF	Interrupt controller #2
0C0-0DF	DMA controller #2
0F0	Processor I/F
0F8-0FF	Math processor
170-177	Forward to CF(IDE) Controler)
1F0-1F7	Forward to SATA Controler)
300-31F	Prototype card
378-37F	Parallel Port (LPT)
380-38F	SDLC #2
3A0-3AF	SDLC #1
3B0-3BF	MDA video card
3C0-3CF	EGA card

Address	Devices
3D0-3DF	CGA card
3F8-3FF	Serial port #1 (COM1)
3E8-3EF	Serial port #3 (COM3)
2F8-2FF	Serial port #2 (COM2)
2E8-2EF	Serial port #4 (COM4)

3.5 Interrupt Controller

The **MANO110 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 output
IRQ1	Keyboard
IRQ2	Interrupt rerouting from IRQ8 through IRQ15
IRQ3	Serial port #2
IRQ4	Serial port #1
IRQ5	PCI Device Share
IRQ7	Parallel port #1
IRQ8	Real time clock
IRQ9	ACPI Controller
IRQ10	Serial port #3
IRQ11	Serial port #4
IRQ12	PS/2 Mouse
IRQ13	Math coprocessor
IRQ14	Primary IDE channel
IRQ15	SATA channe

CHAPTER 4

AMI BIOS SETUP UTILITY

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

4.1 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.

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

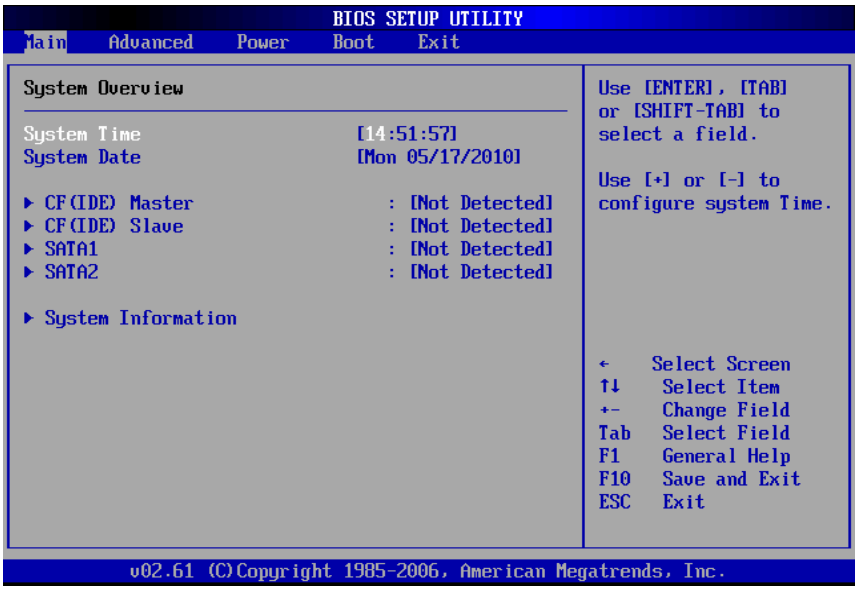
Note *Some of navigation keys differ from one screen to another.*

← 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.

4.3 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.

- **CF (IDE) Master/Slave**
  Select one of the hard disk drives to configure CF (IDE) devices installed in the system by pressing <Enter> for more options.

- **SATA1/SATA2**
  Select one of the hard disk drives to configure SATA devices installed in the system by pressing <Enter> for more options.

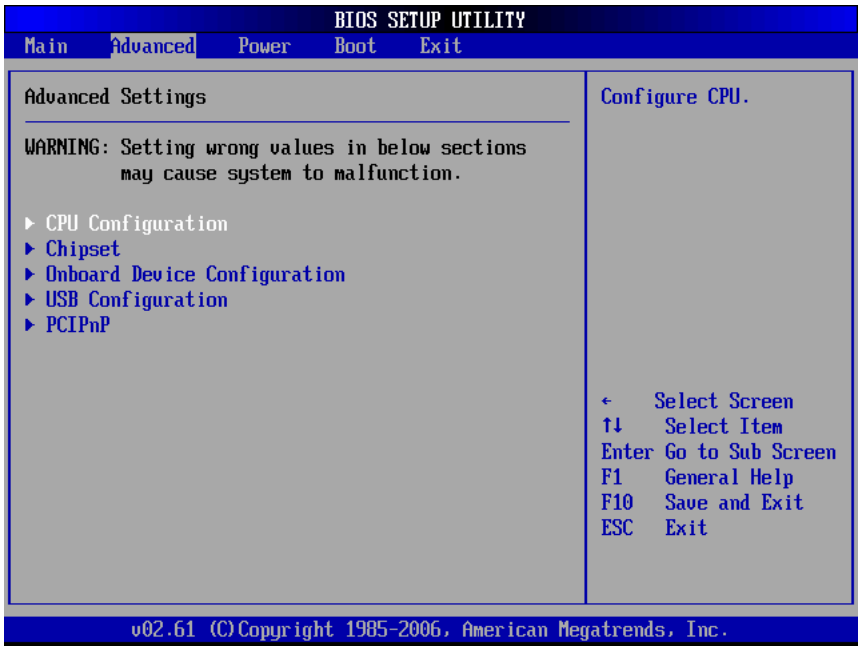
- **System Information**
  Display system information.
  installed in the system by pressing <Enter> for more information.

4.4 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:

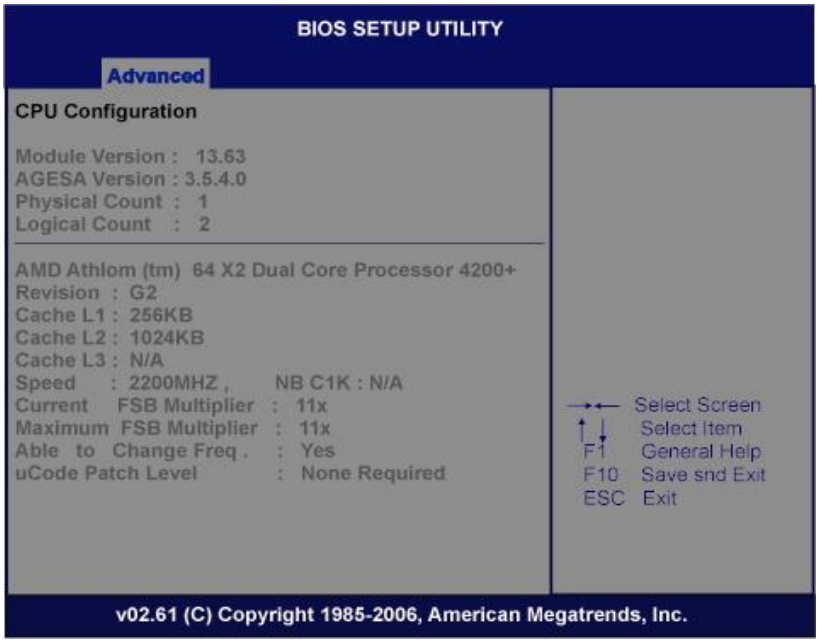
- CPU Configuration
- Chipset
- Onboard Device Configuration
- USBConfiguration
- PCIPnP

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

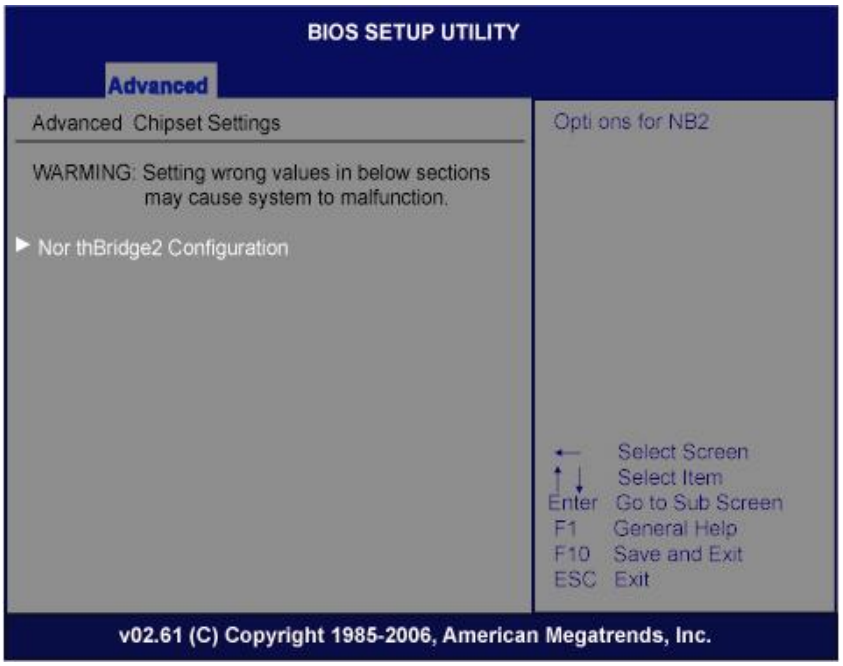


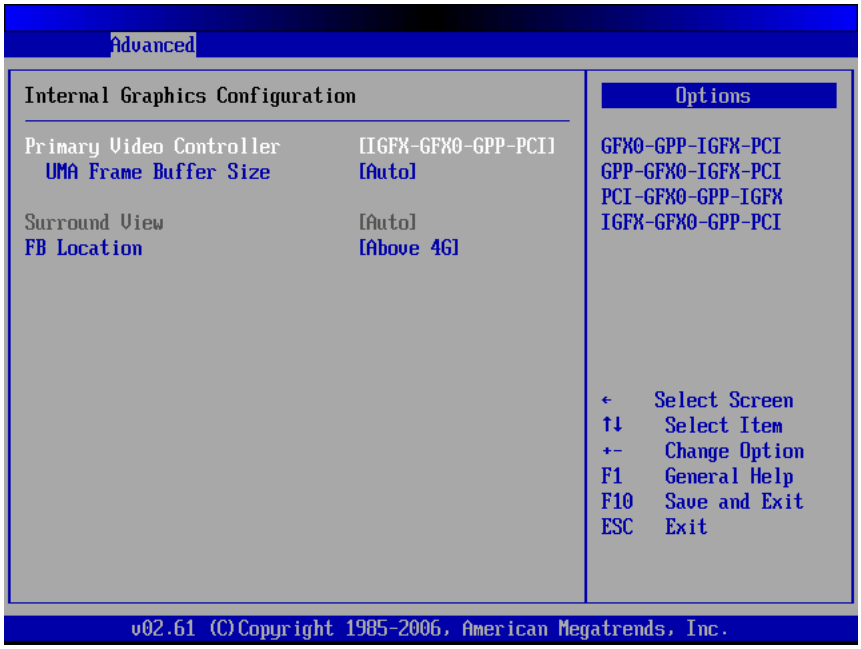
- **CPU Configuration**

  This screen shows the CPU Configuration.



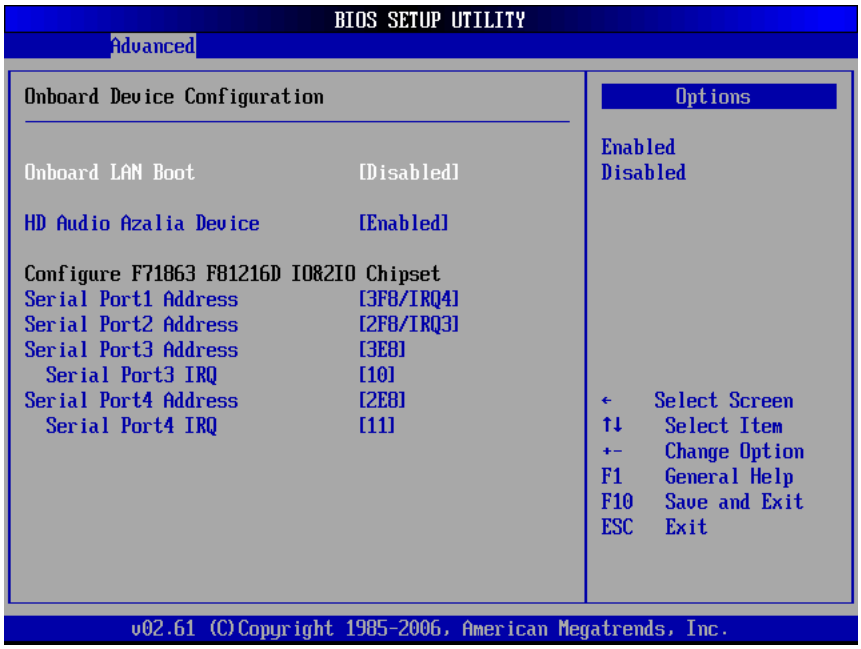
- **Advanced Chipset Settings**





- **Primary Video Controller.**
  IGFX-GFX0-GPP-PCI: Display from onboard VGA first. GFX0-GPP-IGFX-PCI: Display from external PCIe VGA card first.
- **UMA Frame Buffer Size.**
  Frame buffer size is the total amount of system memory allocated solely for the onboard graphics controller. MS-DOS, for example, will use only this memory for display. Options are: Auto (default), 128MB, 256MB, 512MB.
- **FB Location.**
  The optional settings are: Below 4G; Above 4G. FB Location

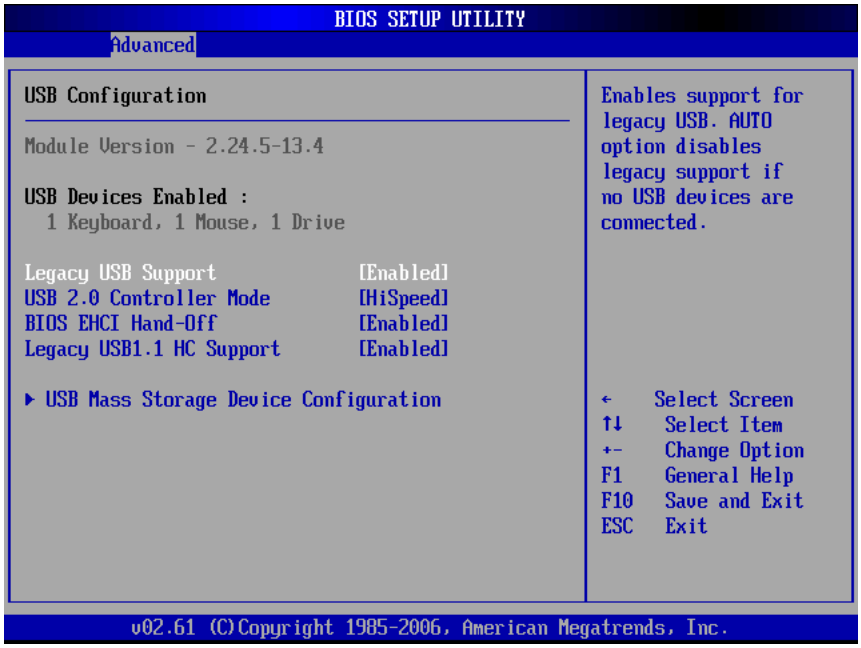
- **Onboard Device Configuration**



- **Onboard LAN Boot.**
  Use these items to enable or disable the Boot ROM function of the onboard LAN chip when the system boots up.
- **HD Audio Azalia Device.**
  Use these items to enable or disable the audio function of the onboard audio chip when the system boots up.
- **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*.
- **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*.
- **Serial Port3 Address**
  This item specifies the base I/O port address. Request address of serial port 3. The Optimal setting is *3E8*

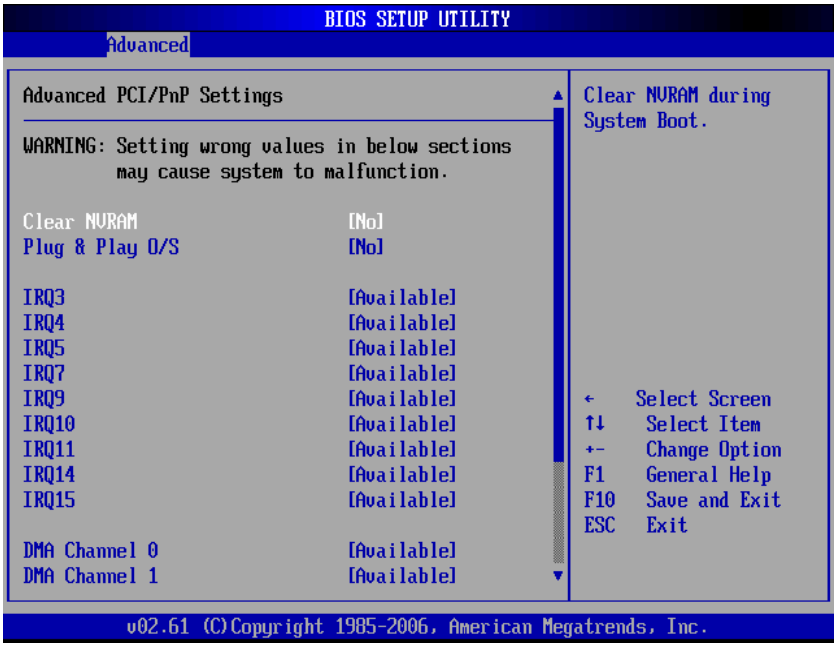
- **Serial Port3 IRQ**
  This item specifies the IRQ used by the serial port 3.
- **Serial Port4 Address**
  This item specifies the base I/O port address. Request address of serial port 4. The Optimal setting is *2E8*.
- **Serial Port4 IRQ**
  This item specifies the IRQ used by the serial port 4.

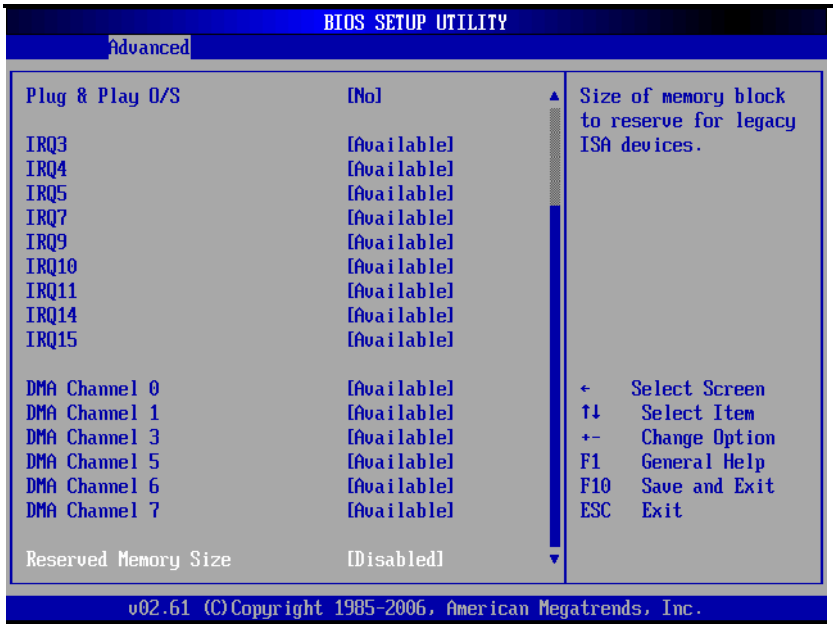
- **USB Configuration**
  You can select options for the USB Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



- **Legacyu 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 *FullSpeed*.
- **BIOS EHCI Hand-Off**
  Enabling this item provide the support for operating systems without an EHCI hand-off feature. The default setting is *Enabled*.
- **Legacy USB 1.1 HC Support**
  Use this item to enable or disable support for USB 1.1 device. The default setting is *Enabled*.

- **PCI/PnP Settings**





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

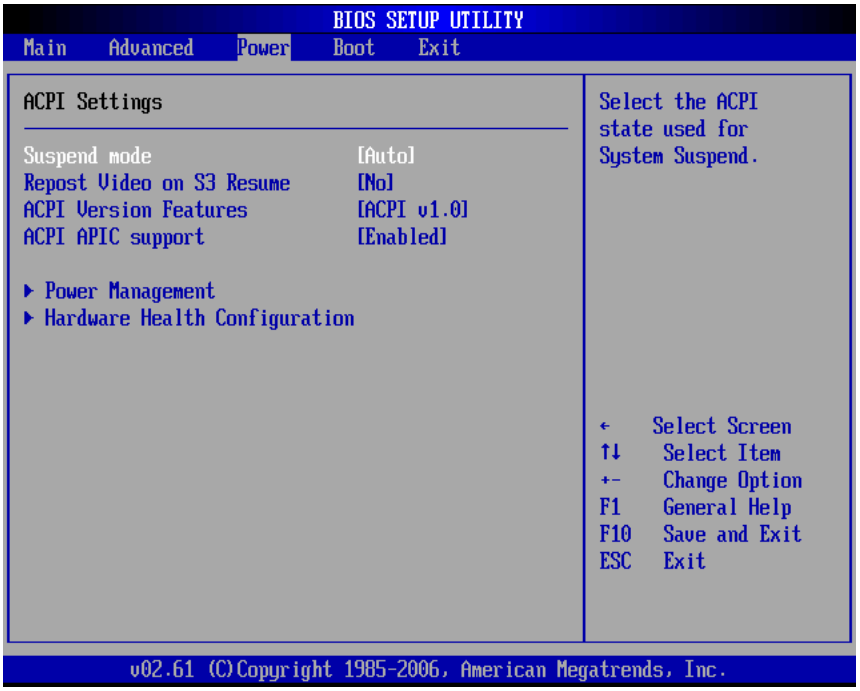
- **Plug & Play O/S**
  When the setting is No, Use this item to configure all the devices in the system. When the setting is Yes and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot. The default setting is *No*.

- **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*.

- **Reserved Memory Size**
  This item allows BIOS to reserve certain memory size for specific PCI device.

4.5 Power ACPI Settings



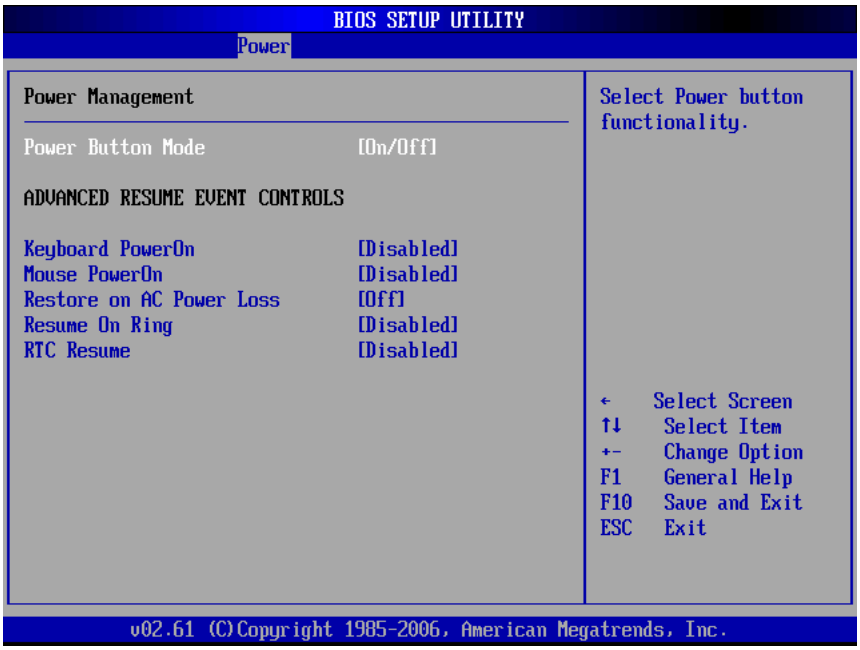
- **Suspend mode**
  Use this item to select the ACPI state used for System Suspend. The optional settings are: S1 (POS); S3 (STR).

- **Repost Video on S3 Resume**
  This feature allows you to repost video on S3 resume.

- **ACPI Version Features**
  Set this value to allow or prevent the system to be complaint with the ACPI version.

- **ACPI APIC support**
  When set to disable, the system disable the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC). When set to enable, the ACPI APIC table pointer is included in the RSDT pointer list.

- **Power Management**



- **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*

- **Keyboard PowerOn**
  Keyboard set to support power on function.

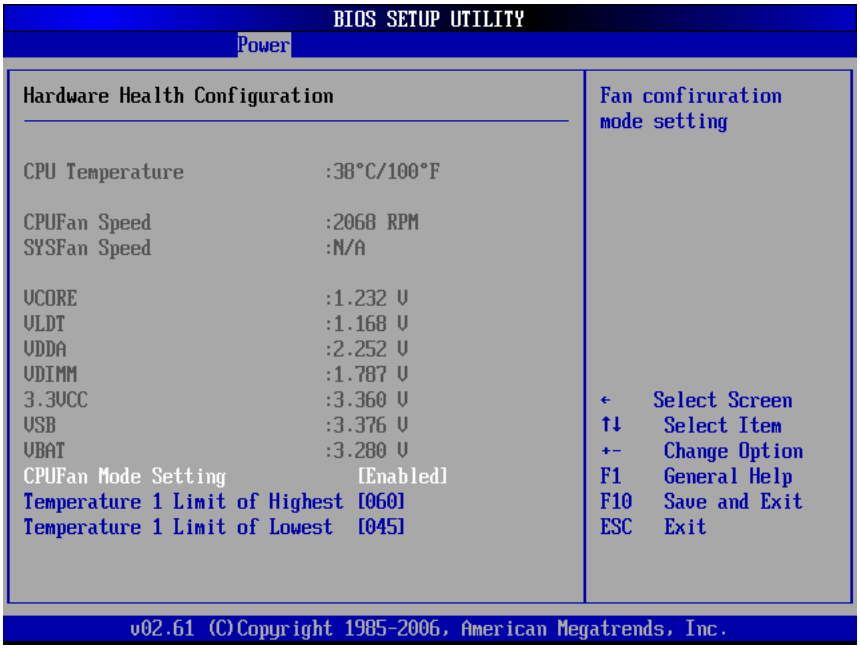
- **Mouse PowerOn**
  Mouse set to support power on function.

- **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.

- **Resume On Ring**
  This item enables or disables the function of Resume On Ring that resumes the system through incoming calls.

- **RTC Resume**
  You can set "Resume On RTC Alarm" item to enabled and key in Data/time to power on system.

- **Hardware Health Configuration**



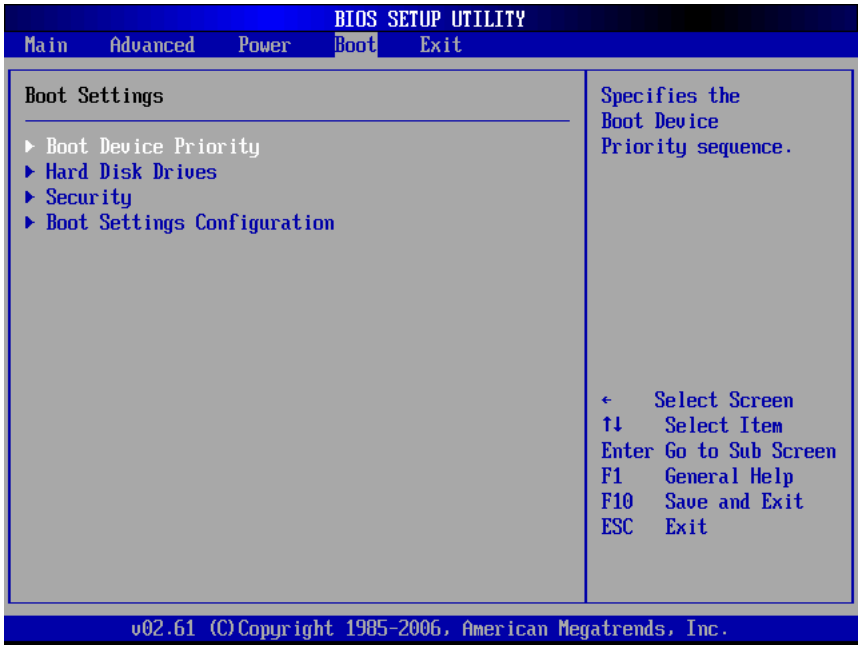
- **Cuban Mode Setting (Smart Fan)**
  When set to disable, the CPU FAN are always on.
- **Temperature 1 Limit of Highest**
  Set the temperature limit for CPU FAN high speed.
- **Temperature 1 Limit of Lowest**
  Set the temperature limit to for CPU FAN low speed.

4.6 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:

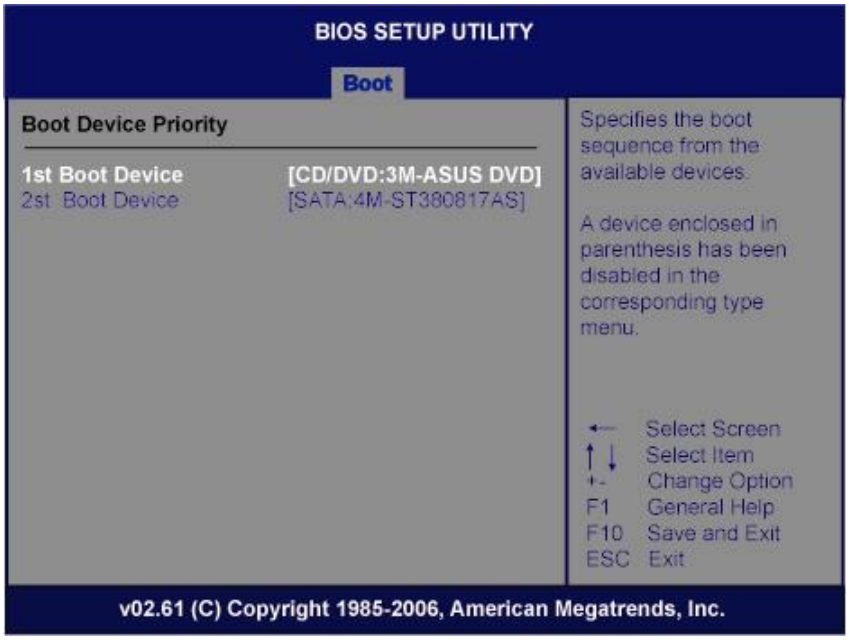
- Boot Device Priority
- Hard Disk Drives
- Security
- Boot Settings Configuration

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



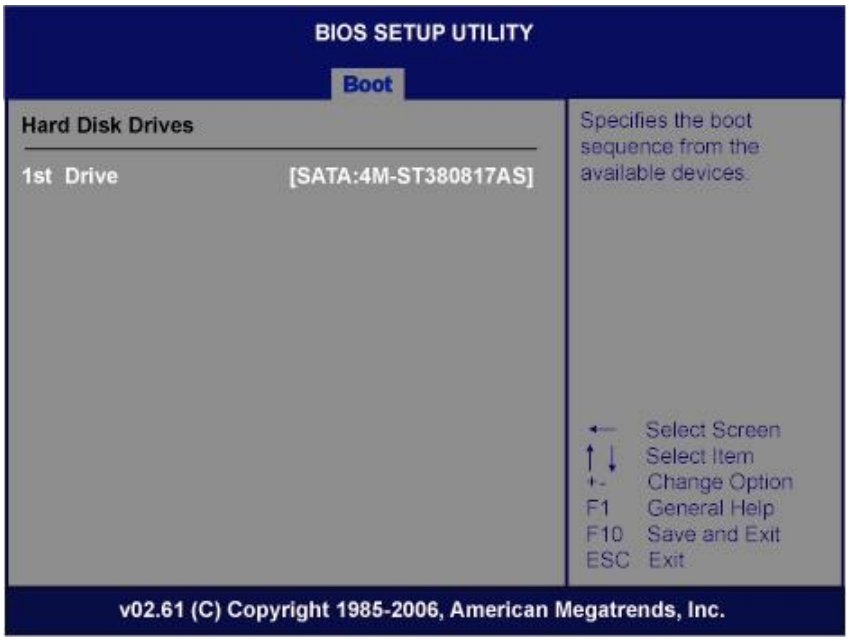
- **Boot Device Priority**

  The Boot Device Priority screen specifies the order in which the system checks for the device to boot from the available devices.

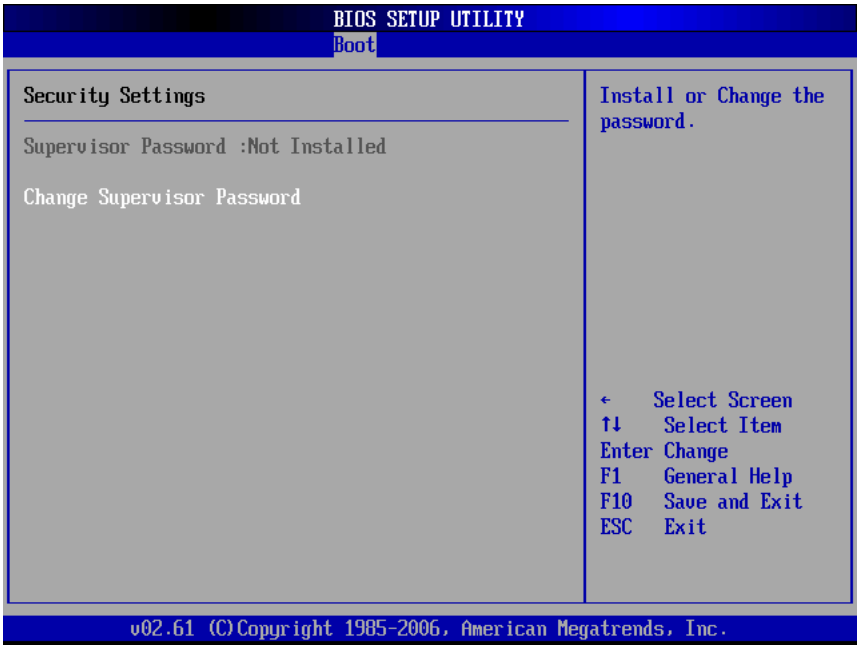


- **Hard Disk Drives**

  Use this screen to view the hard disk drives in the system.

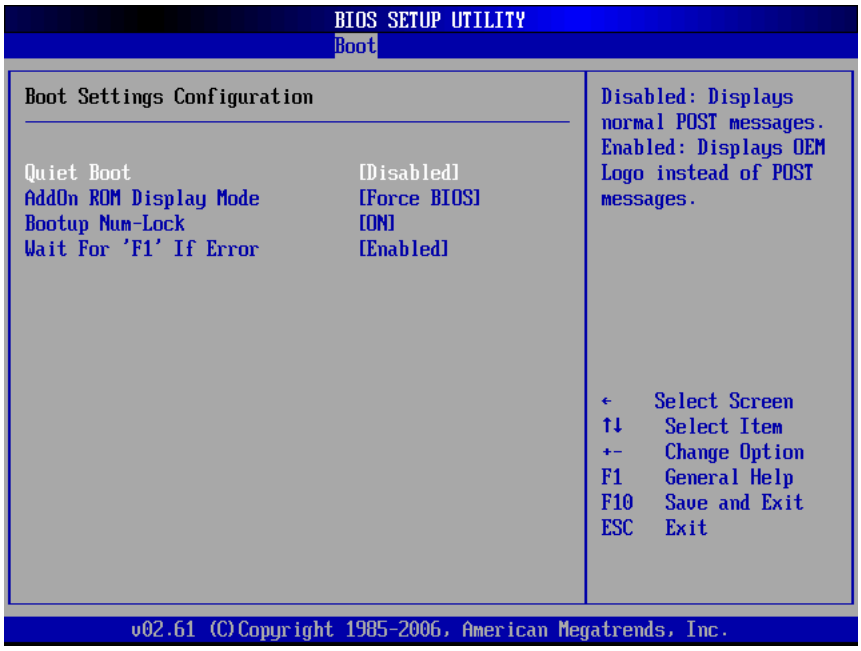


- **Security Settings**



- **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.

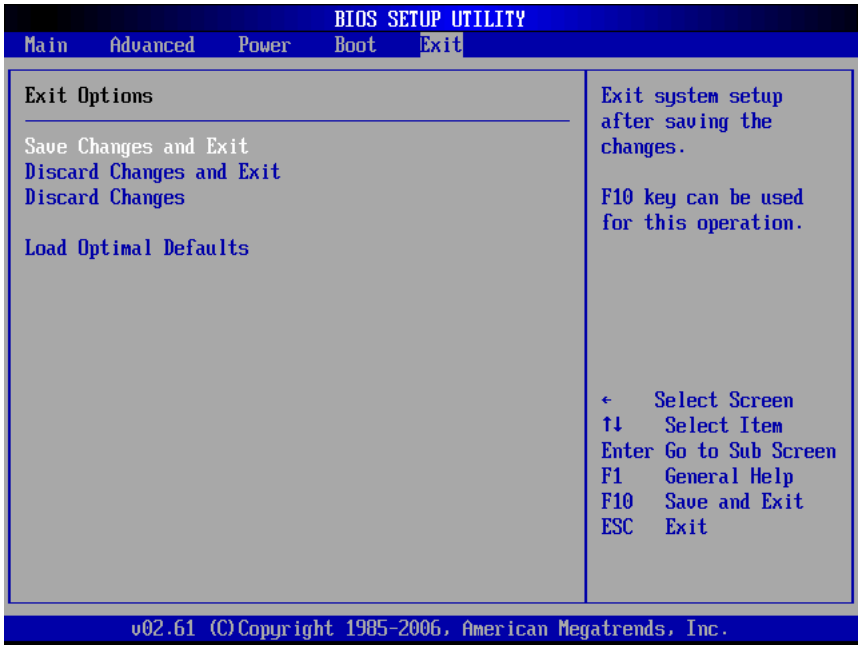
- **Boot Settings Configuration**



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

4.7 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.

- **Discard Changes**
  Use this item to abandon all changes.
- **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>.

APPENDIX A

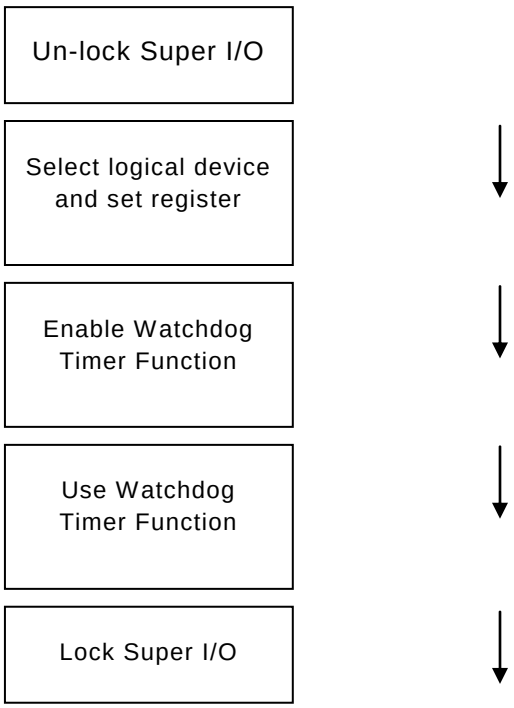
WATCHDOG TIMER

A1 Watchdog Timer

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.

A1.1 Program Watchdog Timer

The Watchdog timer is built in super I/O F71863. The F71863 I/O address port is 2E hex and 2F hex. 2E hex is index port. 2F hex is data port.



Watchdog Timer Register		
Index Port (2E hex)	**Data Port (2F hex)**	**Description**
87 hex	---	Unlock Super I/O. Two successive writes of 87 hex be applied to 2E hex.
2B hex (F71863)	Bit 4	Select WDTO pin function. 1: WDT Output. 0: GPIO14.
07 hex	07 hex	Select register of watchdog timer
30 hex	Bit 0	Write 1 to enable watchdog timer. Disable is write 0.
F0 hex	Bit 7	Write 1 to enable WDTO# output
F5 hex	Bit 3	Write 0 set second as counting unit. Write 1 is minute.
F5 hex	Bit 5	Write 1 counting enable
F5 hex	Bit 4	Write 1 Output mode pulse
F5 hex	Bit 0:1	1: 25 ms pulse width

Watchdog Timer Register		
Index Port (2E hex)	**Data Port (2F hex)**	**Description**
F6 hex	Value	0: Stop timer. 1~FF hex: Write non-zero value the counter to load the value to watchdog counter and start counting down. Write new value to this register can reset timer to count with the new value.
AA hex	---	Lock Super I/O Write AA hex to 2E/2F hex.

A1.2 Example Program Code

The sample code is for debug.exe. Sample code is index port 2E hex, data port 2F hex and time-out value 30 second.

A1.2.1 Set and Start Up The Watchdog Timer

Unlock Super I/O
O 2E 87
O 2E 87
↓
Set WDTO Multifunction Pin Definition
O 2E 2B
O 2F 10
↓
Select Logic Device 7
O 2E 07
O 2F 07
↓
Active Logic Device
O 2E 30
O 2F 01
↓
Enable WDT
O 2E F0
O 2F 80

Set WDT Time-out Value is 30
O 2E F6
O 2F 1E
↓

Enable WDT Counting And setting Mode is: Second Mode/Output mode Pulse, Pulse width 25
O 2E F5
O 2F 31
↓

Lock Super I/O
O 2E AA

A1.2.2 Reset The Watchdog Timer

Unlock Super I/O
O 2E 87
O 2E 87
↓
Select Logic Device 7
O 2E 07
O 2F 07
↓
Active Logic Device
O 2E 30
O 2F 01
↓

Set WDTO Multifunction Pin GPIO14 Definition
O 2E 2B
O 2F 00
↓

Disable WDT
O 2E F0
O 2F 00

Clear Status
O 2E F5
O 2F 40

Back to original register value
O 2E F5
O 2F 00
↓
Set WDT Time-out Value
O 2E F6
O 2F 00
↓
Lock Super I/O
O 2E AA

1.2.3 Disable The Watchdog Timer

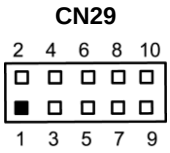
Unlock Super I/O
O 2E 87
O 2E 87
↓
Select Logic Device 8
O 2E 07
O 2F 07
↓
Inactive Logic Device
O 2E 30
O 2F 00
↓
Lock Super I/O
O 2E AA

APPENDIX B

DIGITAL I/O

Digital I/O Software Programming Example

Pin	Signal	Pin	Signal
1	DIO0	2	DIO4
3	DIO1	4	DIO5
5	DIO2	6	DIO6
7	DIO3	8	DIO72
9	GND	10	+5V



GPIO control

```
#define    SMBusBase
           0x0B00
#define    PCA9554SlaveAddr
           0x40
#define    ICH_SMBUS_HOST_STAT                0x00
#define    ICH_SMBUS_HOST_CTRL                0x02
#define    ICH_SMBUS_HOST_CMD                 0x03
#define    ICH_SMBUS_HOST_ADDR                0x04
#define    ICH_SMBUS_HOST_DATA_0              0x05
#define    ICH_SMBUS_HOST_DATA_1              0x06
#define    ICH_SMBUS_HOST_BLK_DATA            0x07
#define    ICH_SMBUS_SLVE_STAT                0x10
```

Configure GPIO pin direction as 4 inputs and 4 outputs

```
outb(0xFF,SMBusBase + ICH_SMBUS_HOST_STAT);
        // Clear host status

outb(PCA9554SlaveAddr, SMBusBase + ICH_SMBUS_HOST_ADDR);
        // Set slave address

outb(0x03, SMBusBase + ICH_SMBUS_HOST_CMD);
                // Configuration register for PCA9554

outb(0xF0, SMBusBase + ICH_SMBUS_HOST_DATA_0);
        //

outb(0x48, SMBusBase + ICH_SMBUS_HOST_CTRL);
        // Trigger SMBus Byte operation
```

Configure GPIO output pin to high

```
outb(0xFF,SMBusBase + ICH_SMBUS_HOST_STAT);
        // Clear host status

outb(PCA9554SlaveAddr, SMBusBase + ICH_SMBUS_HOST_ADDR);
        // Set slave address

outb(0x01, SMBusBase + ICH_SMBUS_HOST_CMD);
                // Output register for PCA9554

outb(0x0F, SMBusBase + ICH_SMBUS_HOST_DATA_0);

outb(0x48, SMBusBase + ICH_SMBUS_HOST_CTRL);
        // Trigger SMBus Byte operation
```