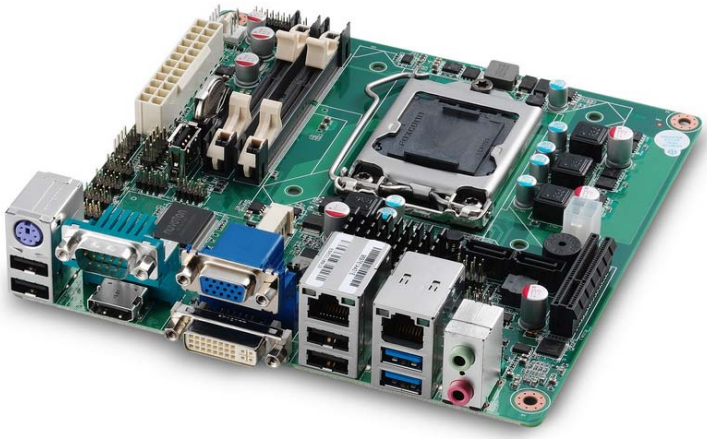
AmITX-IB-I

Mini-ITX Embedded Motherboard with Intel® Xeon® E3-1275/1225, Core™ i7/i5/i3, Pentium®/Celeron®

User's Manual



Manual Rev.: 1.00

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Part No: 50-1X008-1000

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Revision History

Revision	Release Date	Description of Change(s)
1.00	2014/1/6	Initial release

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Preface

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Using this Manual

Audience and Scope

The AmITX-IB-I User's Manual is intended for hardware technicians and systems operators with knowledge of installing, configuring and operating industrial grade computers.

Manual Organization

This manual is organized as follows:

Preface: Presents copyright notifications, disclaimers, trademarks, and associated information on the proper usage of this document and its associated product(s).

Chapter 1, Introduction: Introduces the AmITX-IB-I, its features, applications, and specifications, including functional descriptions and board layout.

Chapter 2, Connectors & Jumpers: Provides technical information on connectors, jumpers and pin assignments for configuring the AmITX-IB-I.

Chapter 3, Getting Started: Describes how to install components and drivers on the AmITX-IB-I.

Chapter 4, BIOS Setup: Presents information and illustrations to help understand and configure the system BIOS.

Appendix A, Super IO Programming Guide: Presents information on understanding and configuring the watchdog timer.

Appendix B, System Resources: Presents information on I/O mapping, IRQ routing, and resource allocation.

Important Safety Instructions: Presents safety instructions all users must follow for the proper setup, installation and usage of equipment and/or software.

Getting Service: Contact information for ADLINK's worldwide offices.

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Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.


NOTE:

Additional information, aids, and tips that help users perform tasks.


CAUTION:

Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.


WARNING:

Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

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1 Introduction

This chapter will introduce the AmITX-IB-I, its features, specifications, functional description, and mechanical layout.

1.1 Package Contents

Please check that your package contains the items below. If you discover damaged or missing items, please contact your vendor.

- AmITX-IB-I Mini-ITX Embedded Motherboard
- I/O shield
- 2x SATA cable
- Driver CD
- Quick Reference Guide



DO NOT install or apply power to equipment that is damaged or if there is missing/incomplete equipment. Retain the shipping carton and packing materials for inspection. Please contact your ADLINK dealer/vendor immediately for assistance. Obtain authorization from your dealer before returning any product to ADLINK.

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1.2 Overview

The ADLINK AmITX-IB-I is a Mini-ITX embedded motherboard based on the Intel® Xeon® E3-1275/1225, Core™ i7/i5/i3, Pentium®/Celeron®, built on 22/32-nm process technology, using the LGA1155 socket. Combined with the Intel® H61 Express Chipset, the AmITX-IB-I, supports Dual Channel DDR3 1333/ 1066 SDRAM up to 16GB, integrated Intel® HD Graphics (VGA, DVI-D, HDMI outputs), dual Gigabit Ethernet, 2x SATA 3 Gb/s ports, 2x USB 3.0 ports, and one USB 2.0 internal vertical type connector. The AmITX-IB-I supports a PCIe x4 slot for expansion card and a PCI Express Mini Card slot for mSATA or Wi-Fi module. With these features, the AmITX-IB-I is ideal for customers who need a compact motherboard with scalable computing power, expandability, rich I/O, and multiple display capability.

1.3 Features

- Mini-ITX form factor (170 mm x 170 mm)
- Supports 22/32-nm process Intel® Xeon® E3-1275/1225, Core™ i7/i5/i3, Pentium®/Celeron®, on LGA1155 socket
- Dual Channel DDR3 1333/ 1066 SDRAM up to 16GB (2x SODIMM)
- Intel® H61 Express Chipset
- Integrated Intel® HD Graphics
  - VGA up to 2048 x 1536@75 Hz
  - DVI-D up to 1920x1200@60 Hz
  - HDMI V1.3a up to 1920x1200@60 Hz
  - Dual display: VGA+DVI-D, VGA+HDMI, DVI+HDMI
- 2x SATA 3 Gb/s
- 2x USB 3.0 + 4x USB 2.0 on rear I/O
- 1x USB 2.0 onboard (vertical type), 2x USB 2.0 pin header by onboard pin headers
- 2x 10/100/1000BASE-T Ethernet ports (Realtek RTL8111E)
- PCIe x4 and Mini PCIe expansion slots
- Watchdog Timer

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1.4 Specifications

System	
CPU	• Intel® Xeon® E3-1275v2, 3.5 GHz, 8M Cache, 22nm, 77W TDP, LGA1155 (4C) • Intel® Xeon® E3-1225v2 , 3.2 GHz, 8M Cache, 22nm, 77W TDP, LGA1155 (4C) • Intel® Core™ i7-3770, 3.40 GHz, 8M Cache, 22nm, 77W TDP, LGA1155 (4C) • Intel® Core™ i5-3550S, 3.0 GHz, 6M Cache, 22nm, 65W TDP, LGA1155 (4C) • Intel® Core™ i3-3220, 3.30 GHz, 3M Cache, 22nm, 55W TDP, LGA1155 (2C) • Intel® Pentium® G2120, 3.10 GHz, 3M Cache, 22nm, 55W TDP, LGA1155 (2C) • Intel® Celeron® G1620, 2.7 GHz, 2M Cache, 22nm, 55W TDP, LGA1155 (2C)
Chipset	• Intel® H61 Express Chipset
Memory	• Dual Channel DDR3 1333/ 1066 SDRAM, up to 16GB, non-ECC (2x SODIMM)
BIOS	• AMI 32 Mb SPI BIOS
Audio	• Realtek ALC892 HD Audio • Line-out and Mic-in
Watchdog Timer	• 1-255 second/minute programmable
Hardware Monitor	• CPU/System temperature, fan speed and onboard DC voltages
Operating System	• Windows® XP/7 32/64-bit, Fedora™ 17, Red Hat™ Enterprise Linux 6
Graphics	
Processor	• Intel® HD Graphics (dependent on CPU specification)
VGA	• VGA up to 2048 x 1536@75 Hz
DVI	• DVI-D up to 1920x1200@60 Hz
HDMI	• HDMI V1.3a up to 1920x1200@60 Hz
Dual Display	• VGA+DVI-D, VGA+HDMI, DVI+HDMI
Ethernet	
Controller	• Realtek RTL8111E GbE controller
Ports	• 2x RJ-45 Ethernet port

Table 1-1: AmITX-IB-I General Specifications

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I/O Interfaces	
Serial ATA	• 2x Serial ATA ports with 3 Gb/s data transfer
Onboard I/O	• 1x USB 2.0 onboard (vertical type) • 2x USB 2.0 pin header by onboard pin headers • 5x RS-232 serial ports by pin header • GPIO pin header: 8-in/8-out, one +5V, one ground pin, one SMB_CLK and one SMB_DATA pin
Rear I/O	• One PS/2 port for mouse/KB • 2x USB 3.0 ports • 4x USB 2.0 Ports • One RS-232/422/485 • One VGA port • One DVI-D port • One HDMI port • 2x RJ-45 ports • One audio port (Line-out, Mic-in)
Expansion Slots	• 1x PCI Express x4 slot (PCI Express Base 2.0) • 1x Mini-PCIe full card support
Mechanical and Environment	
Form Factor	• Mini-ITX Embedded Motherboard
Dimensions	• 170 mm x 170 mm (L x W)
Operating Temp.	• 0°C to 60°C
Storage Temp.	• -20ºC to 80ºC
Rel. Humidity	• 10 - 90% RH
Safety	• CE, FCC Class A

Table 1-1: AmITX-IB-I General Specifications

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1.5 Block Diagram

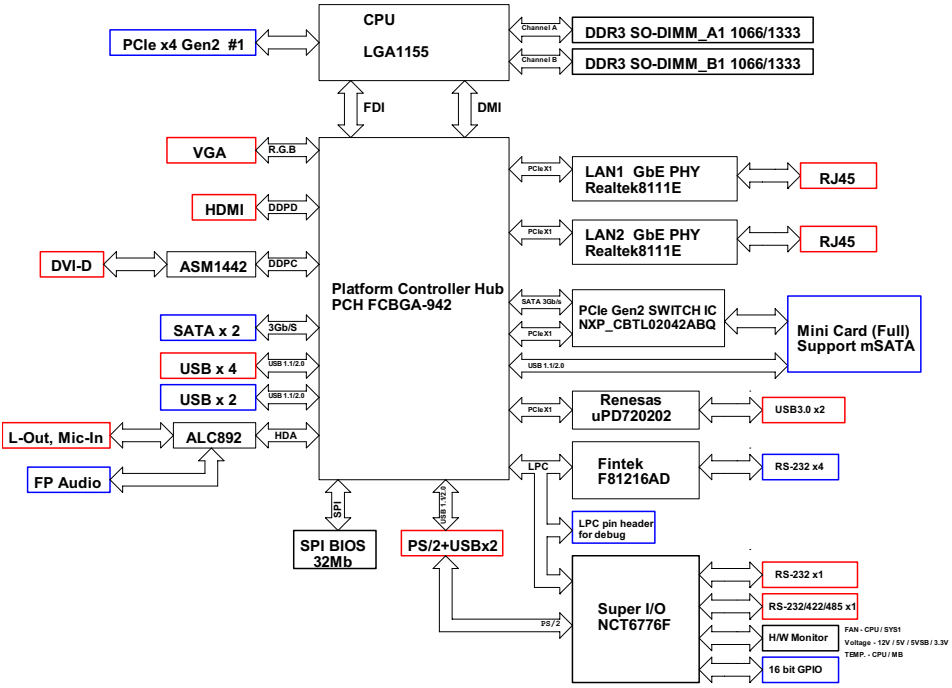
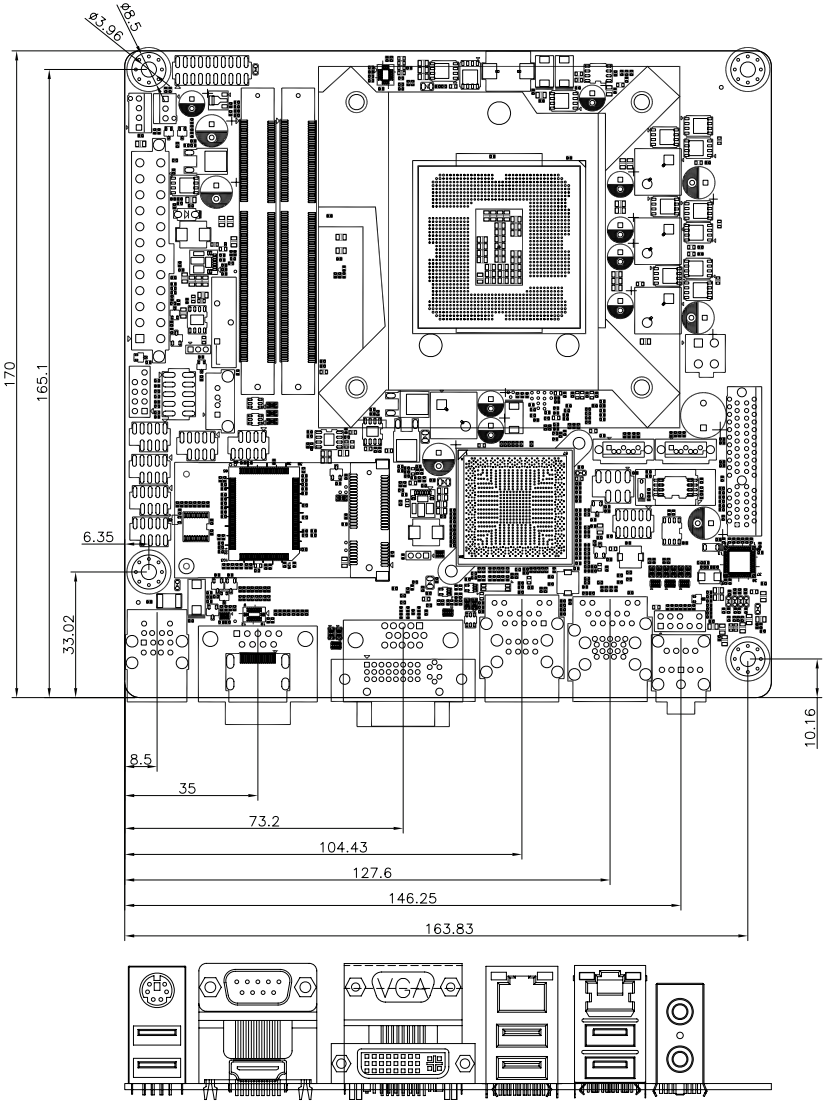


Figure 1-1: AmITX-IB-I Block Diagram

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1.6 Mechanical Dimensions



Dimensions in mm

Figure 1-2: AmITX-IB-I Board Dimensions

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2 Connectors & Jumpers

2.1 Board Layout

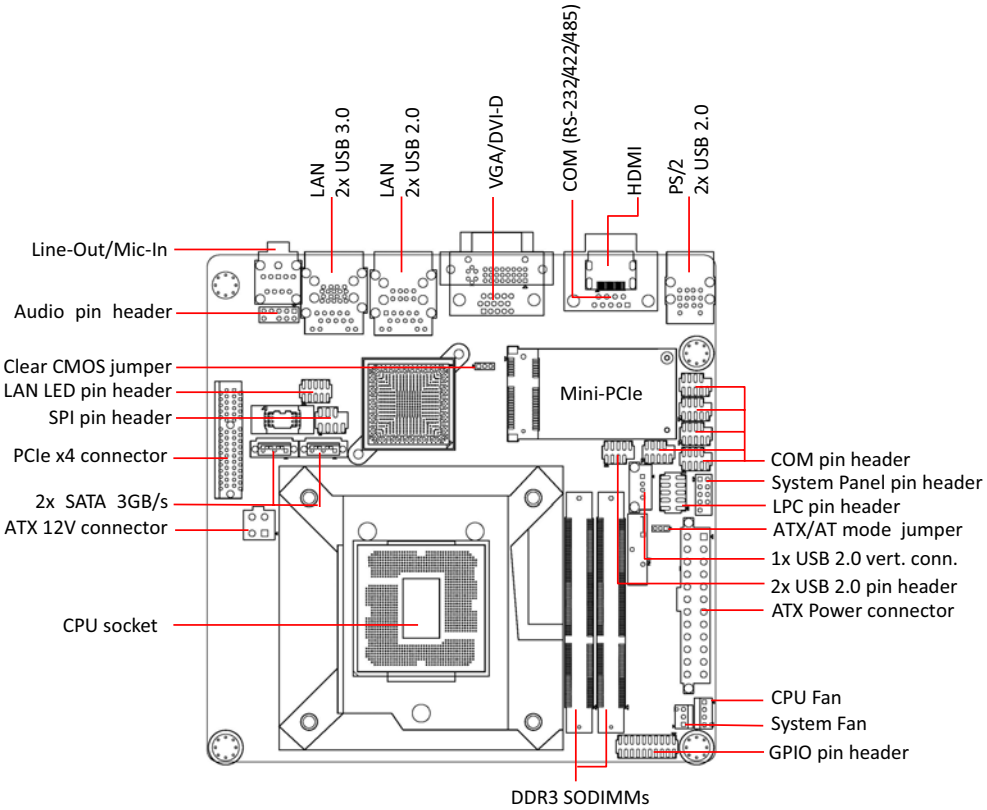


Figure 2-1: AmITX-IB-I Board Layout

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ATX12V1	ATX 12V Power connector
CLCMOS	Clear CMOS jumper
COM2~6	COM pin header
CPU_FAN1	CPU Fan connector
EATXPWR1	ATX Power connector
F_PANEL	System Panel header
FPAUD1	Audio Mic.-In, Line-Out header
JDIO	GPIO pin header
JPSON1	AT/ATX power mode select jumper
MINI-PCIE	Mini-PCIe slot
PCIEX4	PCIe x4 slot
SATA1 ~ 2	SATA connectors
SODIMM 1	204-pin DDR3 SO-DIMM Slot A1
SODIMM 2	204-pin DDR3 SO-DIMM Slot B1
SPI1	SPI pin header
SYS_FAN1	System Fan connector
USB78	USB pin header
USB9	USB Vertical-type connector

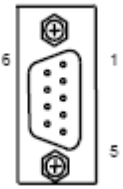
Table 2-1: AmITX-IB-I Onboard Connector Labels Legend

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2.2 Rear I/O Connectors

Serial Port Connectors (COM1)

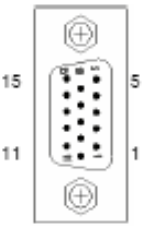
Pin #	RS-232	RS-422	RS-485
1	DCD, Data Carrier Detect	TX-	RTX-
2	RXD, Receive Data	TX+	RTX+
3	TXD, Transmit Data	RX+	—
4	DTR, Data Terminal Ready	RX-	—
5	GND, ground	—	—
6	DSR, Data Set Ready	—	—
7	RTS, Request to Send	—	—
8	CTS, Clear to Send	—	—
9	RI, Ring Indicator	—	—



NOTE: RS-232/422/485 mode is set in BIOS.

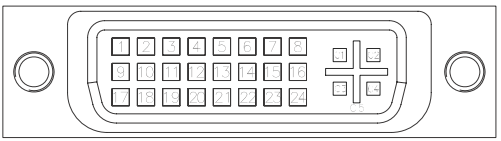
VGA Connector.

Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	VCC pull-up
GND	5	6	GND
GND	7	8	GND
VCC	9	10	GND
VCC pull-up	11	12	DDC2B DATA
HSYNC	13	14	VSYNC
DDC2B CLK	15		



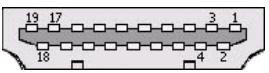
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DVI-D Connector (CN1-L)



Pin #	Signal	Pin #	Signal
1	DVI_TDC2-N	16	DVI_HTPLG
2	DVI_TDC2-P	17	DVI_TDC0-N
3	GND	18	DVI_TDC0-P
4	NC	19	GND
5	NC	20	NC
6	DDCCLK_5V	21	NC
7	DDCDAT_5V	22	GND
8	NC	23	DVI_TLC-P
9	DVI_TDC1-N	24	DVI_TLC-N
10	DVI_TDC1-P	C1	NC
11	GND	C2	NC
12	NC	C3	NC
13	NC	C4	NC
14	P5V	C5	GND
15	GND		

HDMI Connector

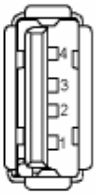


Pin #	Signal	Pin #	Signal
1	TMDS Data2+	2	TMDS Data2 Shield
3	TMDS Data2–	4	TMDS Data1+
5	TMDS Data1 Shield	6	TMDS Data1–
7	TMDS Data0+	8	TMDS Data0 Shield
9	TMDS Data0–	10	TMDS Clock+
11	TMDS Clock Shield	12	TMDS Clock–
13	CEC	14	Reserved
15	SCL	16	SDA
17	DDC/CEC Ground	18	+5 V Power
19	Hot Plug Detect		

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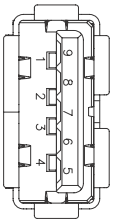
USB 2.0 Connectors

Pin #	Signal Name
1	Vcc
2	USB-
3	USB+
4	GND



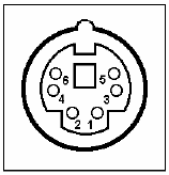
USB 3.0 Connectors

Pin #	Signal Name
1	USB3.0_P5VA
2	USB2_CMAN
3	USB2_CMAP
4	GND
5	USB3A_CMRXN
6	USB3A_CMRXP
7	GND
8	USB3A_CMTXN
9	USB3A_CMTXP



PS/2 Keyboard/Mouse

Pin #	Signal	Function
1	KBDAT	Keyboard Data
2	MSDAT	Mouse Data
3	GND	Ground
4	5V	Power
5	KBCLK	Keyboard Clock
6	MSCLK	Mouse Clock

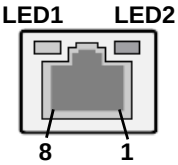


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LAN Port (RJ-45)

This port allows gigabit connection to a Local Area Network (LAN) using a network hub. The LAN port comes with two LEDs to indicate link, activity and speed. Refer to the tables below for the LAN port pin and LED definitions ..

Pin #	10BASE-T/100BASE-TX	1000BASE-T
1	TX+	BI_DA+
2	TX-	BI_DA-
3	RX+	BI_DB+
4	--	BI_DC+
5	--	BI_DC-
6	RX-	BI_DB-
7	--	BI_DD+
8	--	BI_DD-



LED2		LED1	
Status	**Description**	**Status**	**Description**
Off	10 Mb connection	Off	No Link
Orange	100 Mb connection	Orange	Linked
Green	1 Gb connection	Blinking	Data Activity

Audio I/O port

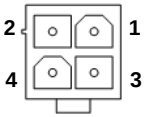
The two-jack audio I/O supports Line-Out, and Mic-In functions. The green Line-Out port connects to a speaker or headphone, while the pink Mic-In jack connects to a microphone.

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2.3 Onboard Connectors

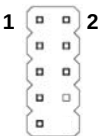
ATX 12V Power Connector (ATX12V1)

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



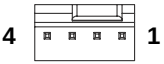
Serial Port Connectors - RS-232 (COM2~6)

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



CPU Fan Connector (CPU_FAN1)

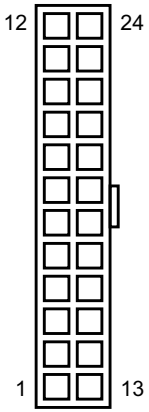
Pin #	Signal
1	GND
2	+12V
3	Tach
4	PWM



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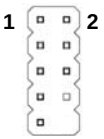
ATX Power Connector (EATXPWR1)

Pin #	Signal	Pin #	Signal
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS-ON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWRGD	20	NC
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND



System Panel Header (F_PANEL)

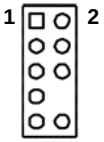
Pin #	Signal	Function
1	HDDLED+	HDD Activity
2	POWERLED+	Power LED
3	HDDLED-	HDD Activity
4	POWERLED-	Power LED
5	GND	Reset Button
6	PWSWITCH	ATX Power/Soft-off Button
7	RESET	Reset Button
8	GND	ATX Power/Soft-off Button
9	NC	Not Connected
10	NC	Key



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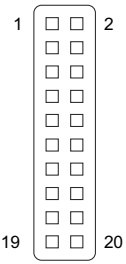
Front Panel Audio Pin Header (FPAUD1)

Pin #	Signal	Pin #	Signal
1	MIC2_L	2	GND
3	MIC2_R	4	PRESENSE
5	LIN2_R	6	MIC2_JD
7	FIO_SENSE A	8	NC
9	LIN2_L	10	LINE_JD



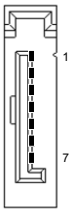
GPIO Connector (JDIO)

Pin #	Signal	Pin #	Signal
1	SIO_GPIO0	2	SIO_GPIO8
3	SIO_GPIO1	4	SIO_GPIO9
5	SIO_GPIO2	6	SIO_GPIO10
7	SIO_GPIO3	8	SIO_GPIO11
9	SIO_GPIO4	10	SIO_GPIO12
11	SIO_GPIO5	12	SIO_GPIO13
13	SIO_GPIO6	14	SIO_GPIO14
15	SIO_GPIO8	16	SIO_GPIO15
17	SMB_CLK_MAIN	18	SMB_DAT_MAIN
19	GND	20	+5V_SB



SATA Connectors (SATA1~2)

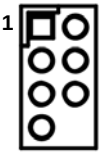
Pin #	Signal
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND



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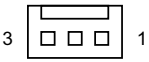
SPI Header (SPI1)

Pin #	Signal	Pin #	Signal
1	+3V ROM	2	GND
3	SPI_CS#	4	SPI_CLK
5	SPI_MISO	6	SPI_MOSI
7	SPI_HOLD#	8	Key



System Fan Connector (SYS_FAN)

Pin #	Signal
1	GND
2	VCC (PWM)
3	IO



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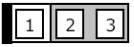
2.4 Jumpers

Clear CMOS (JCMOS1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS (date, time, and system setup parameters). The onboard button cell battery powers the RAM data in CMOS, which includes system setup information such as system passwords.

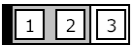
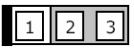
To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

Mode	Connection	PWR_JP1
+5	1 – 2	
RI#	2 – 3	

NOTE: Except when clearing the RTC RAM, never remove the cap on Clear CMOS jumper from its default position. Removing the cap will cause a system boot failure.

AT/ATX Power Mode Select (JPSON)

Mode	Connection	PWR_JP1
ATX Mode	1 – 2	
AT Mode	2 – 3	

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3 Getting Started

This chapter provides information on how to install components on the AD-mITX-T40H motherboard.

3.1 Installing the CPU

The AD-mITX-T40H supports a 22/32nm Intel® Xeon® E3-1275/1225, Core™ i7/i5/ i3, Pentium/Celeron® processor in an LGA1155 socket.

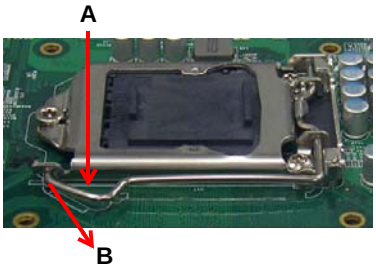
WARNING:

Disconnect all power to the board before installing a CPU to prevent damaging the board and CPU.

Do not touch socket contacts. Damaging the contacts voids the product warranty. Follow the installation instructions carefully to avoid damaging the board components.

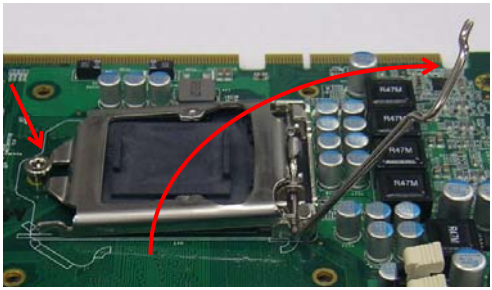
To install the CPU:

1. Press down on the locking arm (A), then push it away from the socket to disengage it from the retention tab (B).

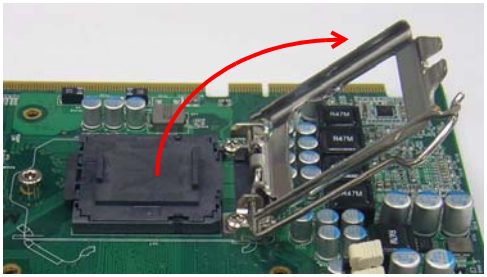


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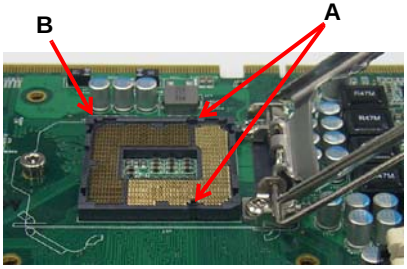
2. Raise the locking arm to unlock the load plate.



3. Lift the load plate to uncover the socket.



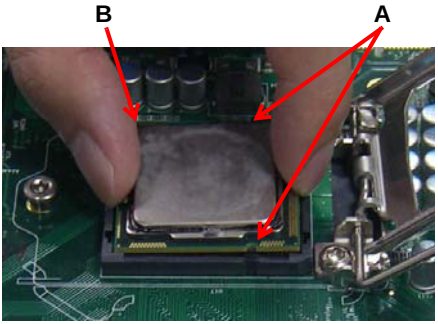
4. Remove the plastic protective cover from the socket. Note the locations of the alignment keys (A) and Pin 1 indicator (B).



WARNING:

Do NOT touch socket contacts.

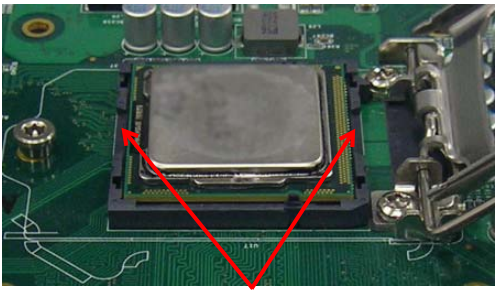
5. Hold the CPU using thumb and forefinger as shown. Position the CPU over the socket, matching the notches on the sides of the CPU with the alignment keys on the socket (A). The golden triangle on the CPU must be positioned at the corner of the socket with the Pin 1 indicator as shown (B).



WARNING:

The CPU fits into the socket in only one orientation. DO NOT force it into the socket to avoid causing damage.

6. Carefully place the CPU into the socket vertically. The socket has cutouts for your fingers to fit into.

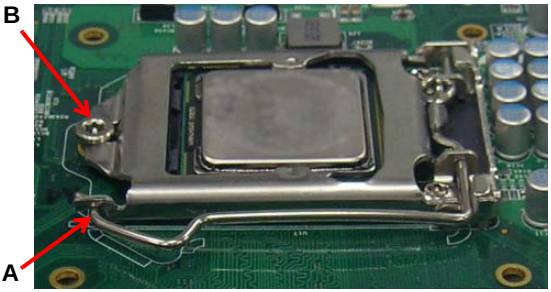


Cutouts

7. Gently lower the load plate. Make sure the front edge of the plate is under the screw as indicated.



8. Lower the locking arm and fasten it to the retention tab (A). The load plate should be locked underneath the screw as shown (B).



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3.2 Installing the CPU Fan and Heatsink



The CPU requires a chassis with an airflow inlet. A specially-designed CPU fan and heatsink must be installed before using the motherboard. Failure to install a CPU fan and heatsink may damage the system host board and/or the CPU.

When the CPU fan installation procedures presented here are inconsistent with the installation procedures you obtained from the CPU fan and heatsink package, follow the latter.

To install the CPU fan:

1. Apply thermal grease evenly on top of the installed CPU.
2. Lower the CPU fan to the CPU, then secure it using the provided attachments or screws.
3. Connect the CPU fan cable to the CPU fan connector on the motherboard labeled FAN1 (see CPU Fan Connector (CPU_FAN1) on page 13).

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3.3 System Memory

The AmITX-IB-I supports up to 16 GB of DDR3-1066/1333 SDRAM in two 204-pin SO-DIMM sockets. See Figure 2-1 on page 7 for SO-DIMM socket locations.

Memory Module Installation

The DDR3 memory modules are notched to facilitate correct installation in the DIMM sockets.

WARNING:

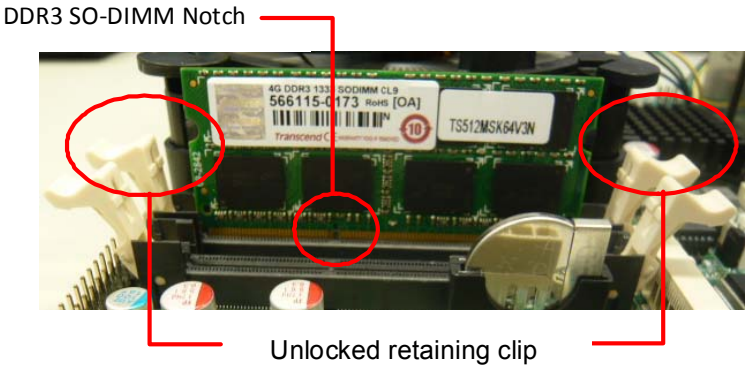
Disconnect all power supply to the board before installing a memory module to prevent damaging the board and memory module .

To install a memory module:

1. Unlock the SO-DIMM socket by pressing the retaining clips outward.

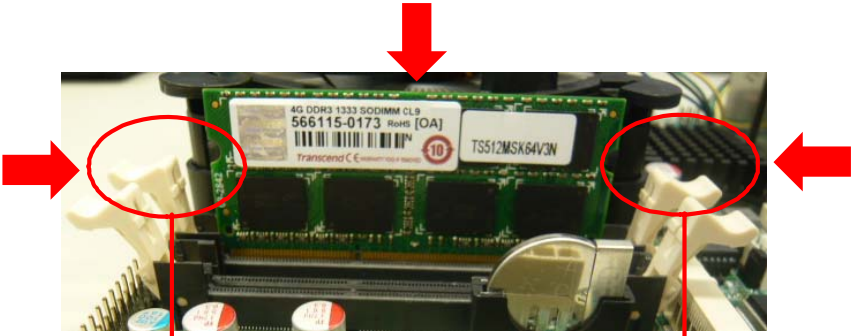


2. Align the memory module on the socket, making sure that the notch matches the break on the socket.



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3. Insert the module firmly into the slot until the retaining clips snap back inwards and the module is securely seated.



Unlocked retaining clip

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3.4 Driver Installation

The AmITX-IB-I drivers for **Windows 7 32-bit** are located in the following directories on the Driver CD, or can be downloaded from the ADLINK website (**http://www.adlinktech.com**):

Chipset	X:\AmITX-IB-I_Driver\CHIP\
Display	X:\AmITX-IB-I_Driver\VGA\Ivy Bridge\ VGA_driver_intel_Integrated_Graphics _Windows7_64bit\
LAN	X:\AmITX-IB-I_Driver\LAN\Win7\Network_driver_Realtek _Network_Adapter for Windows 7\
Audio	X:\AmITX-IB-I_Driver\Audio_driver_Realtek_Windows 7\
USB 3.0	X:\AmITX-IB-I_Driver\USB 30_driver_Renesas _All_WinOS\

Follow the instructions below to install the required AmITX-IB-I drivers. Install the Windows operating system before installing any driver. Most standard I/O device drivers are installed during Windows installation.

1. Install the **Chipset driver** by running the program **X:\AmITX-IB-I_Driver\CHIP\Chipset driver_Intel_INF_ Update_Utility_All_WinOS\infinst_autol_9.2.0.1030.exe**. Follow the instructions given and reboot when instructed.
2. Install the **Display driver** and utilities by running the program **X:\AmITX-IB-I_ Driver\VGA\Ivy Bridge\ VGA_driver_intel_ Integrated_Graphics_Windows7_64bit\Setup.exe**. Follow the instructions given and reboot when instructed.
3. Install the **LAN driver** by running the program **X:\AmITX-IB-I_ Driver\LAN\ Network_driver_Realtek_ Network_Adapter for Windows 7\Setup.exe**. Follow the instructions given and reboot if required.
4. Install the **Audio** driver by running the program **X:\AmITX-IB-I_ Driver\Audio_driver_Realtek_Windows 7\ 64Bit\64bit_Vista_Win7_Win8_R270.exe**. Follow the instructions given and reboot if required.

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5. Install the **USB 3.0** driver by running the program **X:\AmITX-IB-I_Driver\USB 30_driver_Renesas_All_WinOS\ Setup.exe**. Follow the instructions given and reboot if required.

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4 BIOS Setup

4.1 Introduction

This section explains how to use the UEFI Setup Utility to configure your system. The UEFI chip on the motherboard stores the UEFI Setup Utility. You may run the UEFI Setup Utility when you start the computer. Please press <F2> or <Del> during the Power-On-Self-Test (POST) to enter the UEFI Setup Utility, otherwise POST will continue with its test routines.

If you wish to enter the UEFI Setup Utility after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.



Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purposes only, and they may not exactly match what you see on your screen.

4.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

- **Main**: To set up the system time/date information
- **Advanced**: To set up the advanced UEFI features
- **Chipset**: To set up advanced chipset features
- **Boot**: To set up the default system device to locate and load the Operating System
- **Security**: To set up the security features
- **Exit**: To exit the current screen or the UEFI Setup Utility

Use the < ← > key or < → > key to choose between the selections on the menu bar, and then press <Enter> to get into the sub screen. You can also use the mouse to choose your required item by clicking.

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4.1.2 Navigation

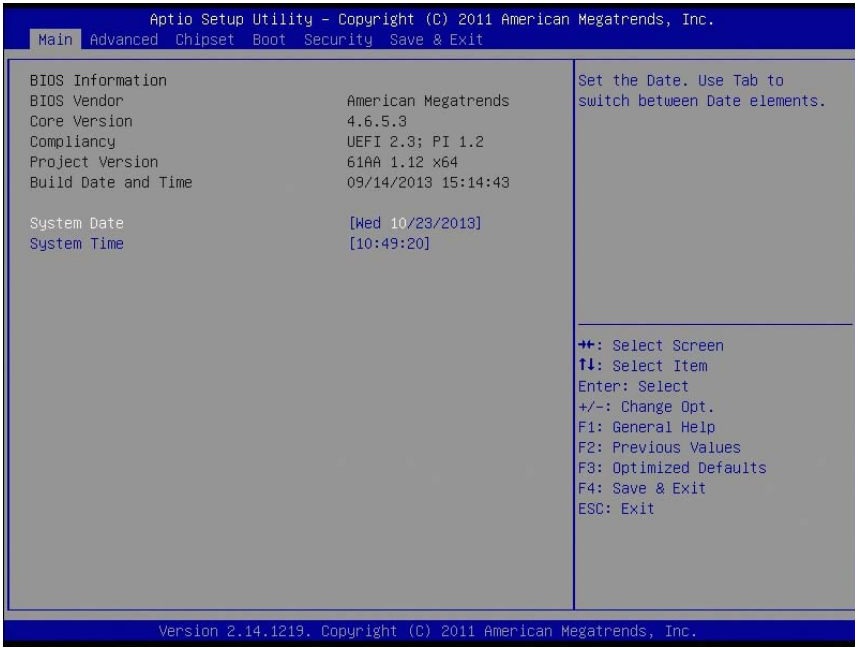
The following table describes the functions of each navigation key.

Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	Choose between options of the selected item
<Enter>	Bring up the selected screen
<F1>	Display the General Help Screen
<F7>	Discard changes
<F9>	Load optimal default values for all settings
<F10>	Save changes and exit the UEFI Setup Utility
<F12>	Print screen
<Esc>	Jump to the Exit Screen or exit the current screen

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4.2 Main Setup

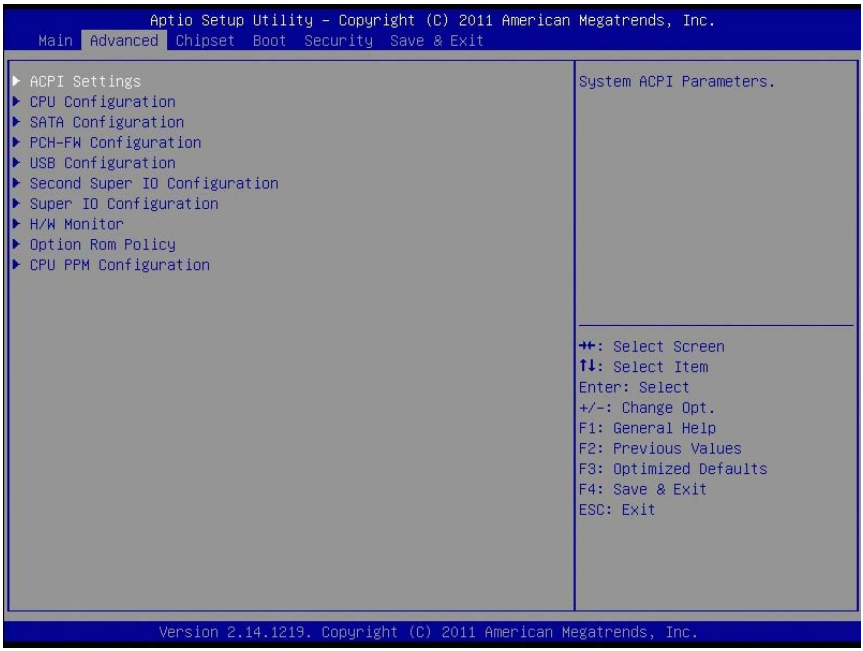
When you enter the UEFI Setup Utility, the Main screen will appear and display the system overview.



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4.3 Advanced Setup

In this section, you may set the configurations for the following items: ACPI Configuration, CPU Configuration, SATA Configuration, PCH-FW Configuration, USB Configuration, Second Super IO Configuration, Super IO Configuration, H/W Monitor Option Rom Policy and CPU PPM Configuration.

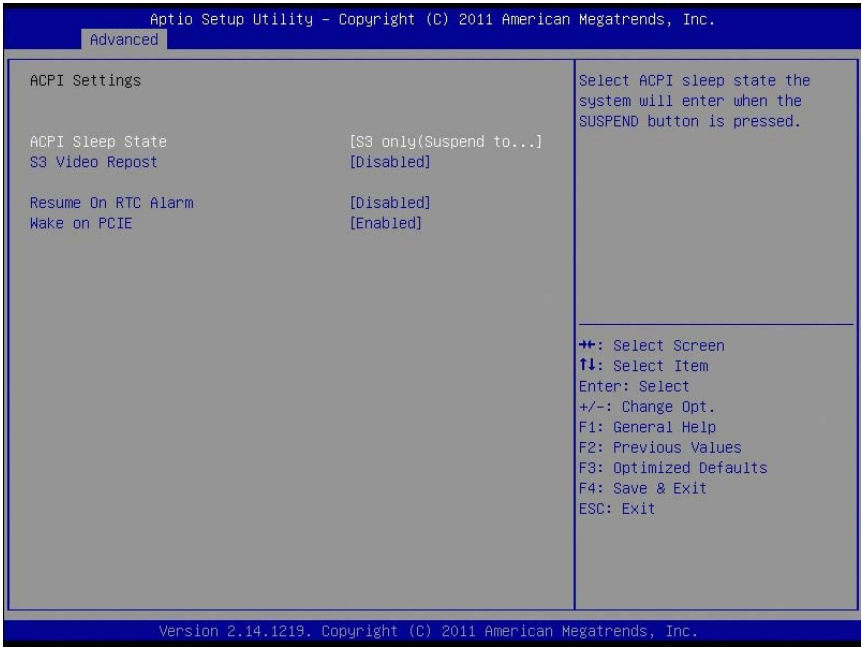


CAUTION:

Setting incorrect values in this section may cause the system to malfunction.

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4.3.1 ACPI Configuration



ACPI sleep State

Use this option to select whether to auto-detect or disable the Suspend-to- RAM feature. Selecting [Auto] will enable this feature if the OS supports it.

S3 Video Repost

Use this to enable/disable S3 Video Repost. The default value is [Enabled].

RTC Alarm Power On

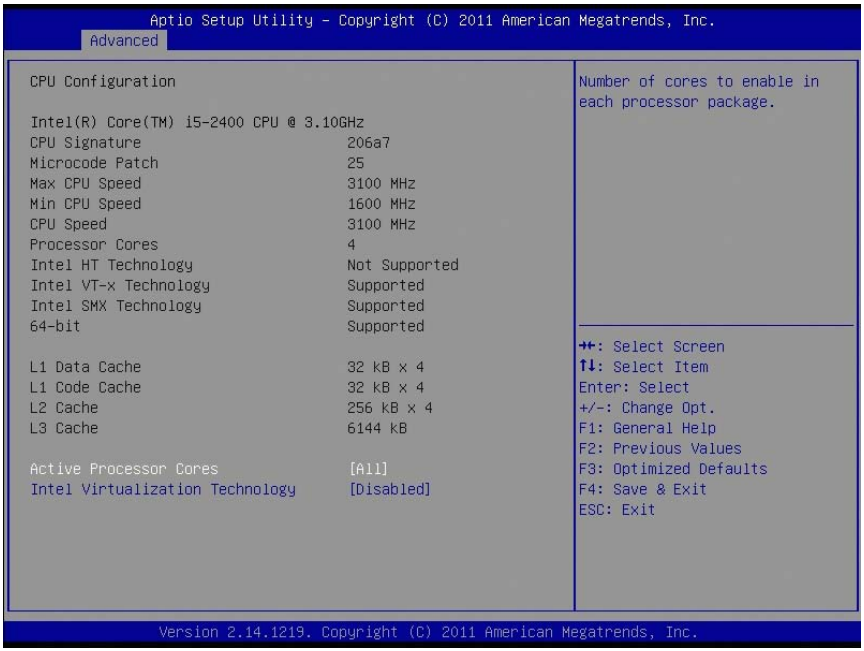
Use this option to enable/disable RTC (Real Time Clock) alarm to power on the system.

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Wake on PCIE

Use this option to enable or disable PCIE wake event to power on the system.

4.3.2 CPU Configuration



Intel Hyper-Threading Technology

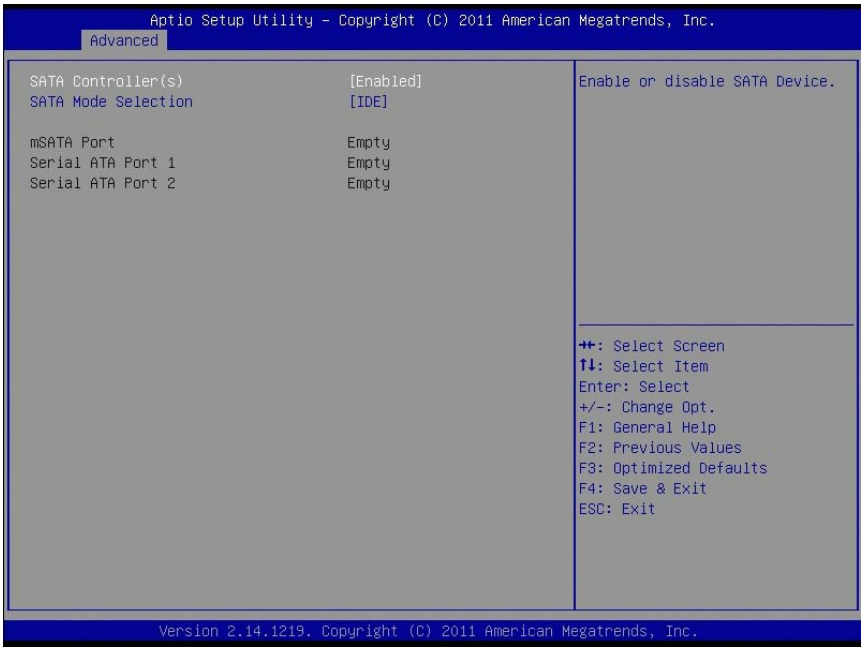
Enabling this feature requires a computer system with an Intel processor that supports Hyper-Threading Technology and an operating system that includes optimization for this technology, such as Microsoft Windows 7. Set to [Enabled] if using Microsoft® Windows® 7.

Intel Virtualization Technology

When enabled, a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Vanderpool Technology.

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4.3.3 SATA Configuration



SATA Controller(s)

Enables or disables SATA devices.

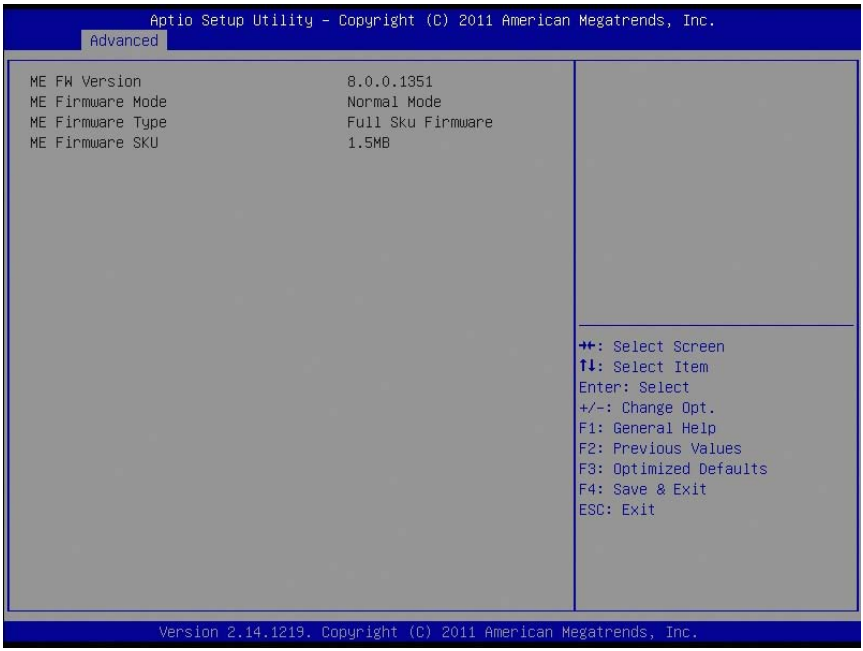
SATA Mode

Use this to select the SATA mode. Configuration options: [IDE Mode], [AHCI Mode]. The default value is [IDE Mode].

NOTE: AHCI (Advanced Host Controller Interface) supports NCQ and other new features that improves SATA disk performance. IDE mode does not support these features.

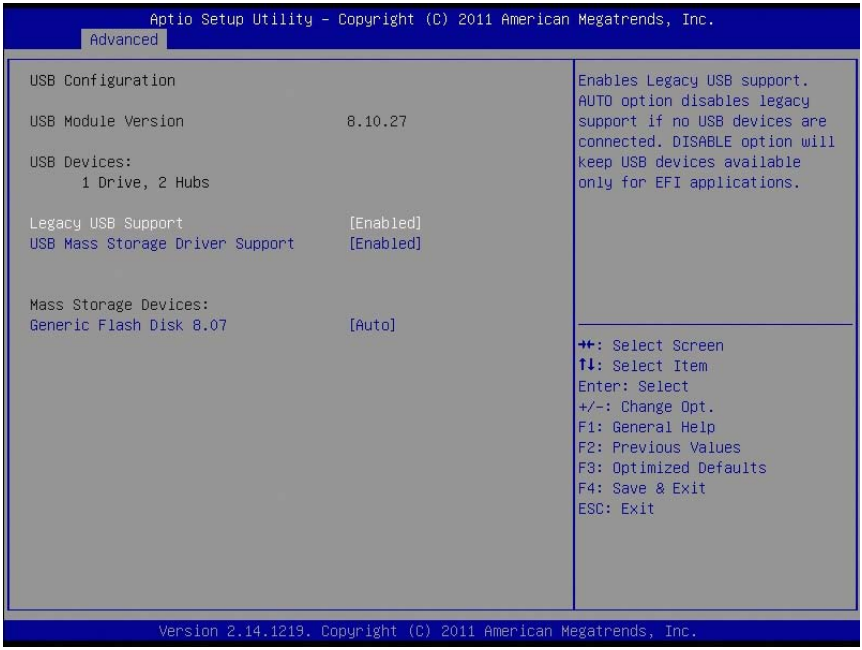
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4.3.4 PCH-FW Configuration



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4.3.5 USB Configuration



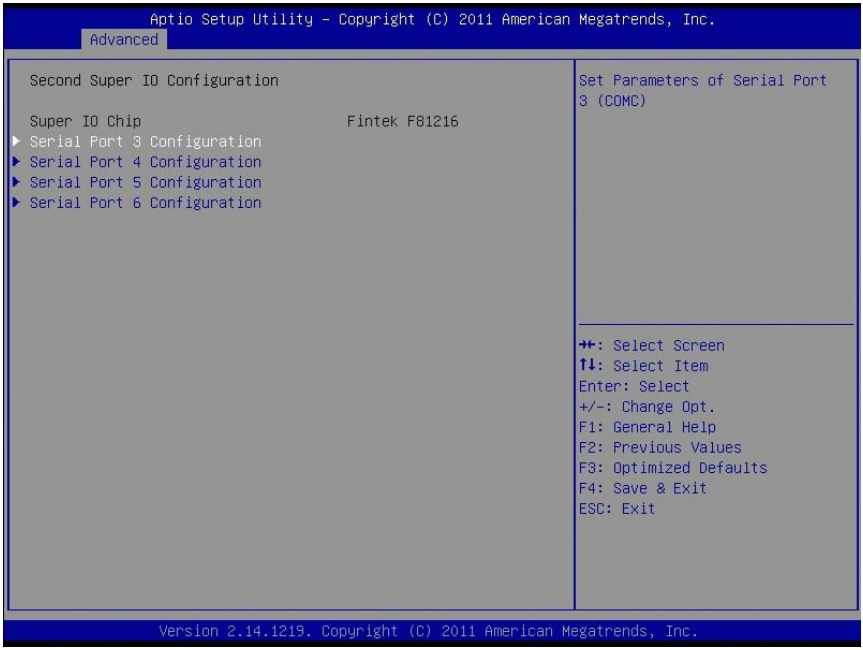
Legacy USB Support

Use this option to select legacy support for USB devices. There are three configuration options: [Enabled], [Disabled] and [Auto]. The default value is [Enabled]. Please refer to the following descriptions for details of these three options:

- [Enabled]: Enables support for legacy USB.
- [Auto]: Enables legacy support if USB devices are connected.
- [Disabled]: USB devices are disabled under legacy OS setup.

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4.3.6 Second Super IO Configuration

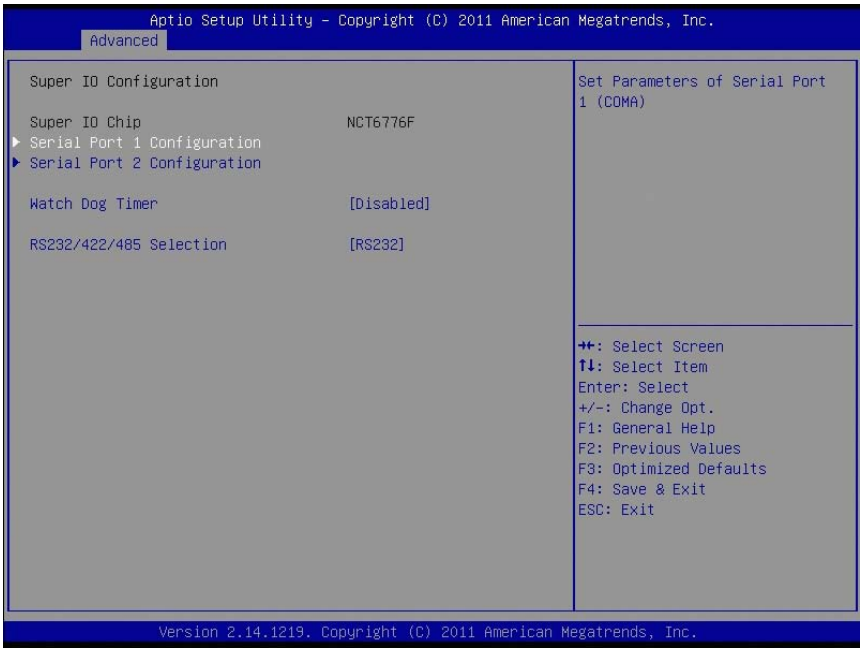


Serial Port 3~6 Configuration

Use this option to set parameters of COM3~6.

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4.3.7 Super IO Configuration



Serial Port 1~2 Configuration

Use this option to set parameters of COM1~2.

Watch Dog Timer

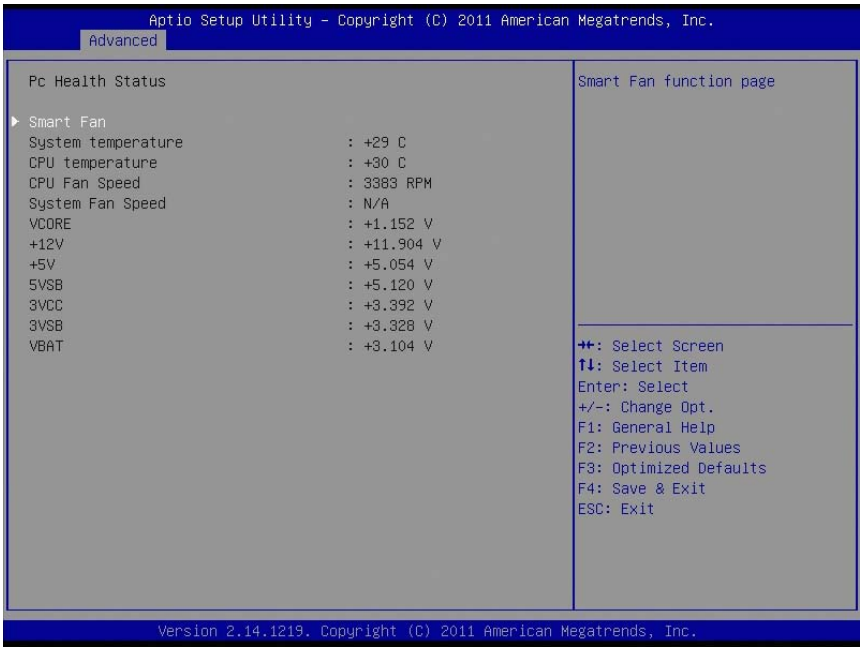
This allows users to enable/disable the Watchdog Timer timeout to reset system. The default value is [Disabled].

RS232/422/485 Selection

Select COM Port type for RS-232, RS-422 or RS-485.

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4.3.8 H/W Monitor

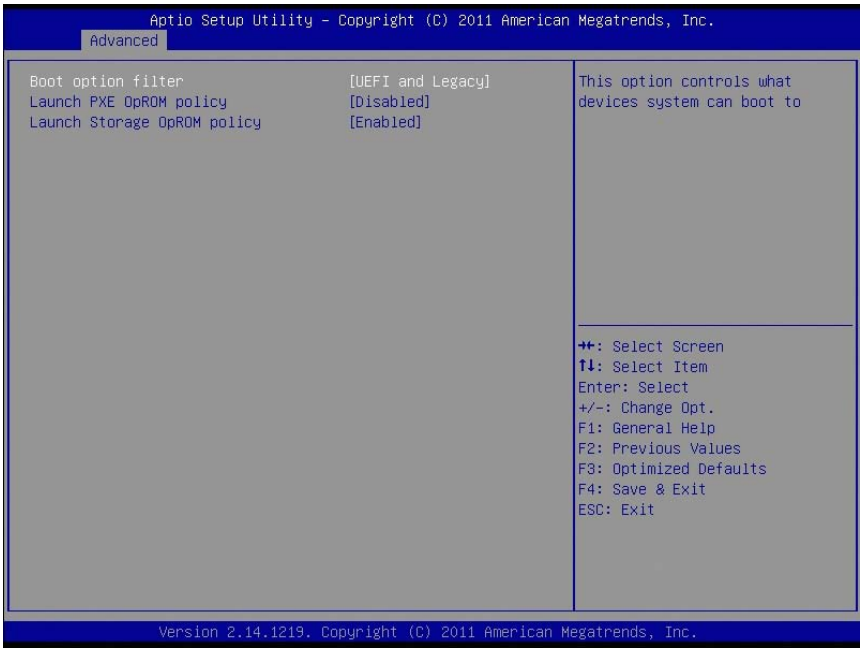


Smart Fan Mode Configuration

Smart Fan Mode Select.

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4.3.9 Option ROM Policy



Boot Option Filter

This option controls what devices the system can boot from.

Launch PXE OpROM policy

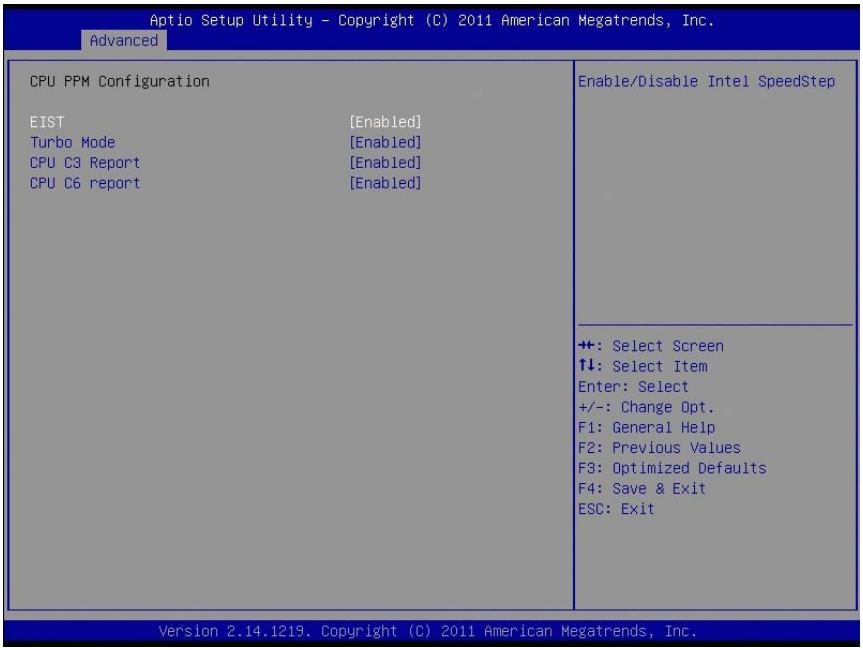
Controls the execution of UEFI and Legacy PXE Option ROM.

Launch Storage OpROM policy

Controls the execution of UEFI and Legacy Storage Option ROM.

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4.3.10 CPU PPM Configuration



EIST

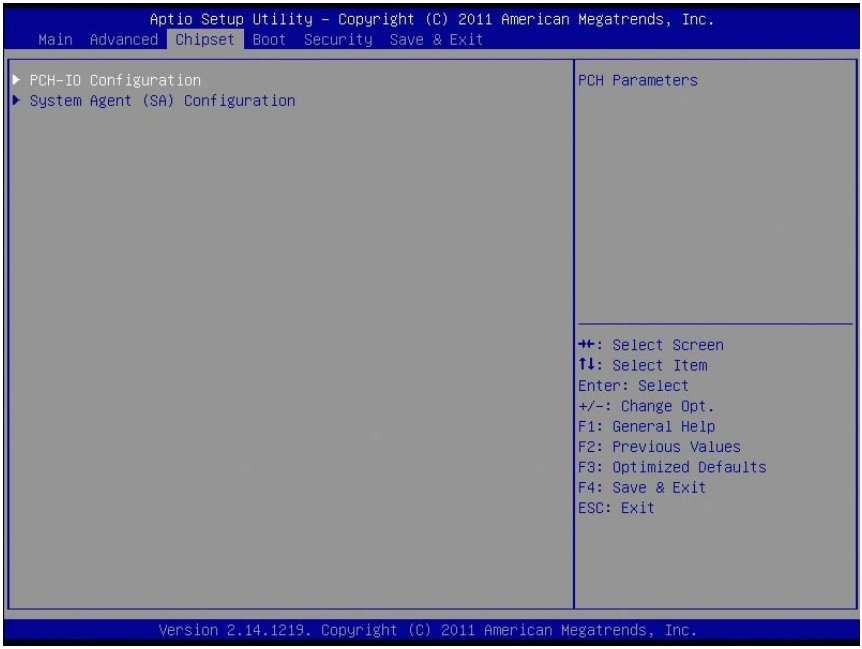
Enable/Disable Intel SpeedStep.

Turbo Mode

Turbo Mode.

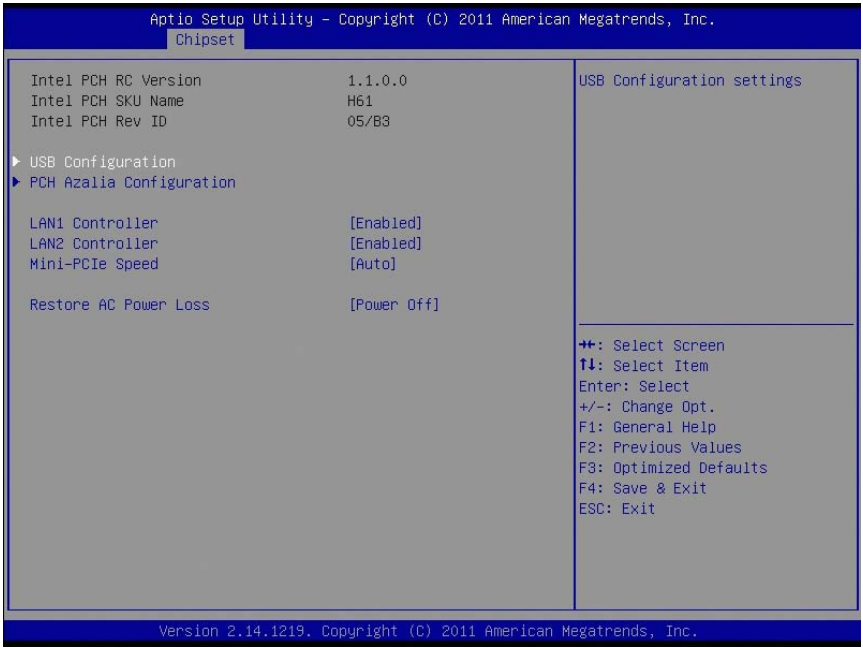
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4.4 Chipset Setup



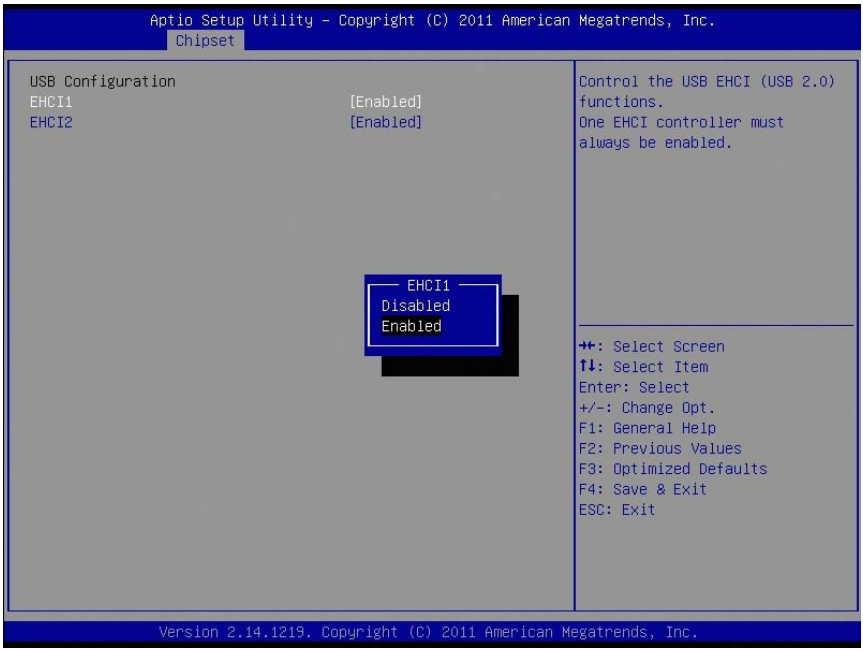
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4.4.1 PCH-IO Configuration



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USB Configuration

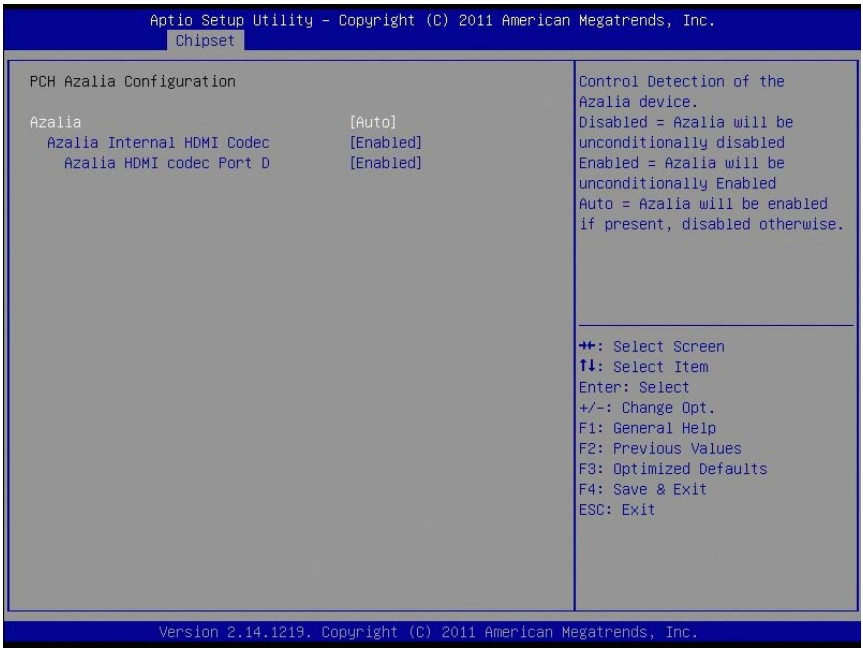


EHCI1/2

Controls the USB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.

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PCH Azalia Configuration



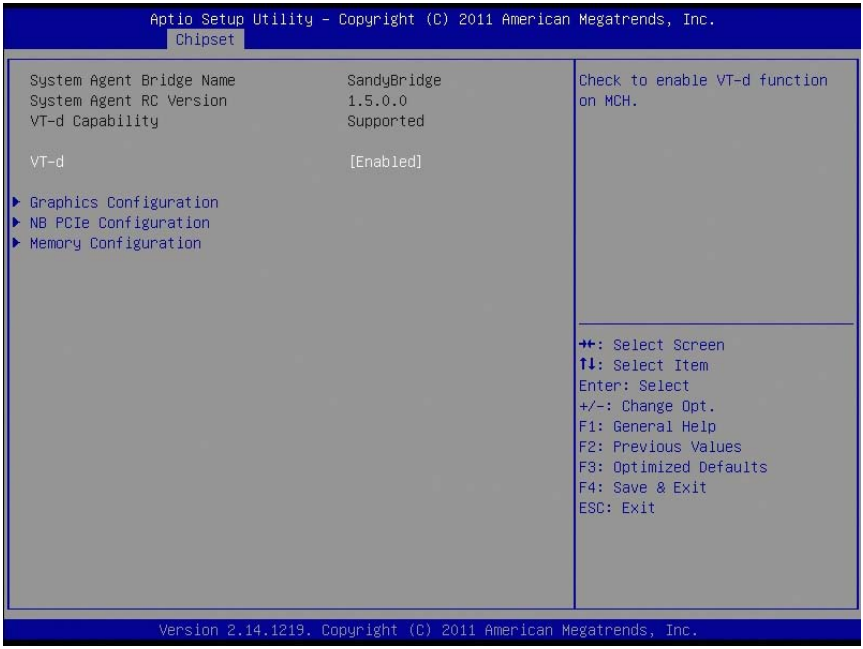
Azalia

Controls detection of the Azalia device.

- [Disabled]: Azalia will be unconditionally disabled.
- [Enabled]: Azalia will be unconditionally enabled.
- [Auto]: Azalia will be enabled if present, disabled otherwise.

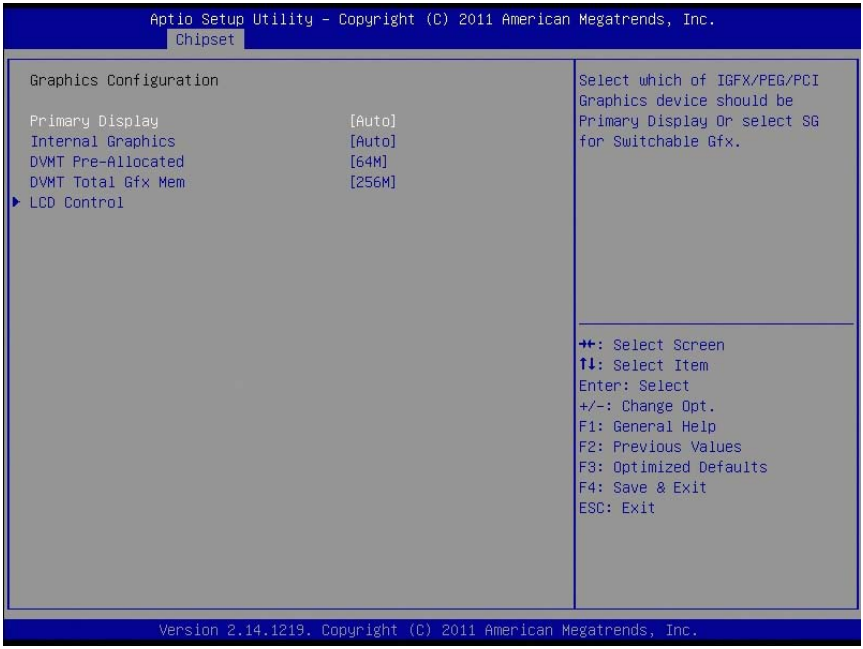
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4.4.2 System Agent (SA) Configuration



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Graphics Configuration



Primary Display

Select which graphics device should be Primary Display (IGFX/PEG/PCI), or select SG for switchable graphics.

Internal Graphics

Keep IGD enabled based on the setup options.

DVMT Pre-Allocated

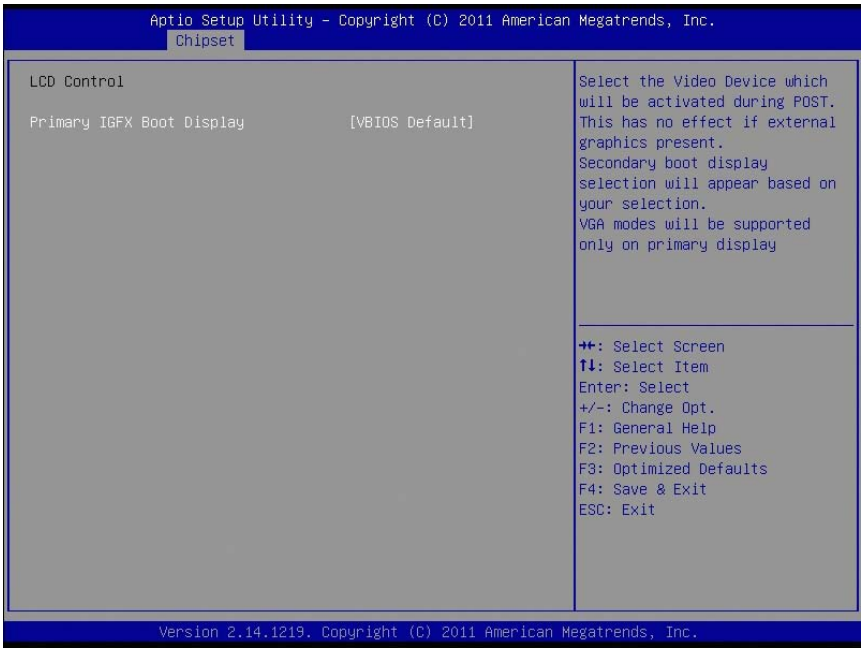
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

DVMT Total Gfx Mem

Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

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LCD Control

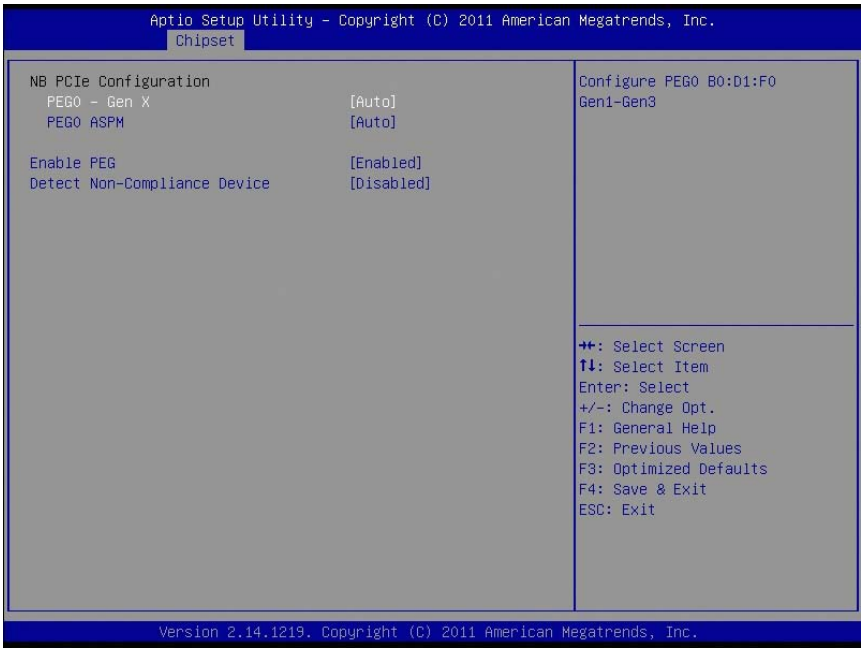


Primary IGFX Boot Display

Select the Video Device which will be activated during POST. This has no effect if external graphics is present. Secondary boot display will appear based on your selection. VGA modes will be supported only on the primary display

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NB PCIe Configuration



PEG0 - Gen X

Configure PEG0 B0:D1:F0 Gen1-Gen3

PEG0 ASPM

Control ASPM support for the PEG: Device1 Function 0.This has no effect if PEG is not the currently active device.

Enable PEG

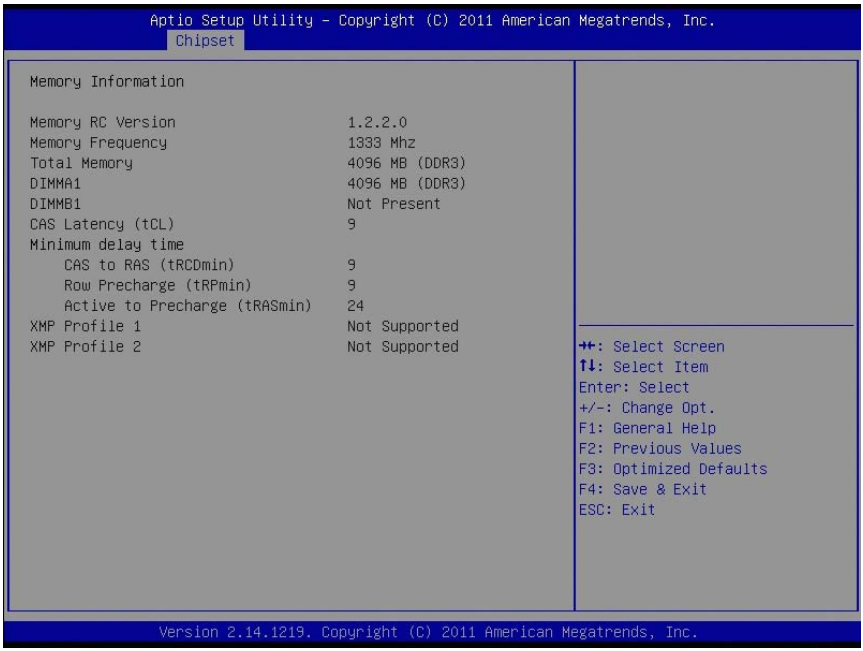
Enable or disable the PEG.

Detect Non-Compliance Device

Detect non-compliant PCI Express device in PEG.

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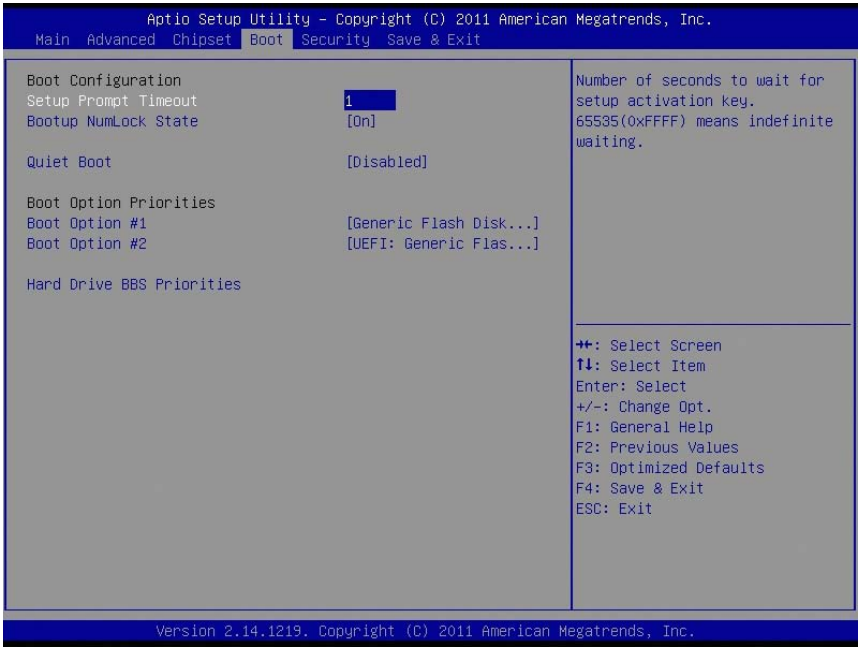
Memory Configuration



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4.5 Boot Setup

This section of the BIOS settings displays the available devices on your system for configuring the boot settings and boot priority.



Setup Prompt Timeout

This shows the number of seconds to wait for the setup activation key; 65535(0XFFFF) means wait indefinitely.

Bootup Num-Lock State

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

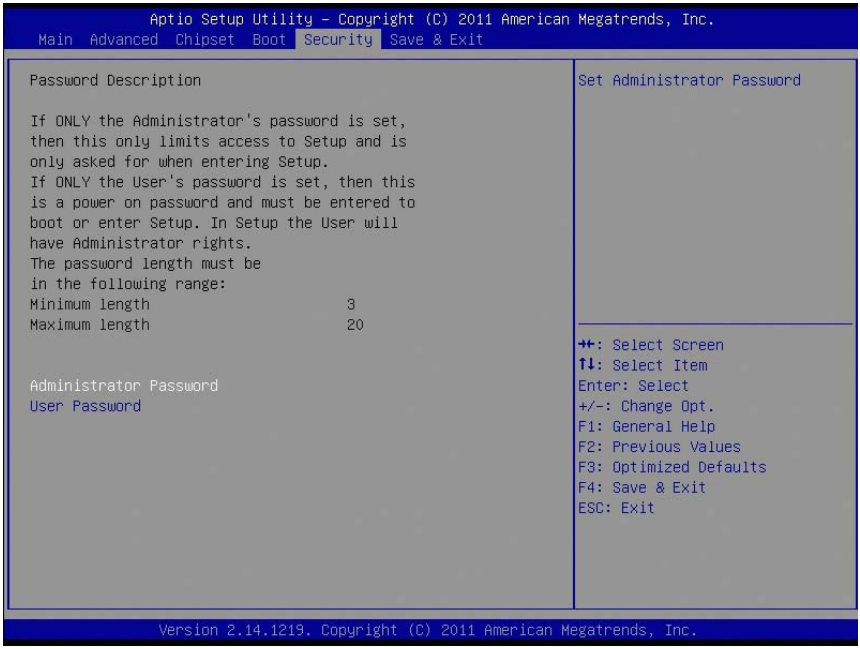
Quiet Boot

Enable or disable the Quiet Boot option.

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4.6 Security Setup

This section of the BIOS settings enables you to set, change or clear the supervisor/user password for the system.



Administrator Password

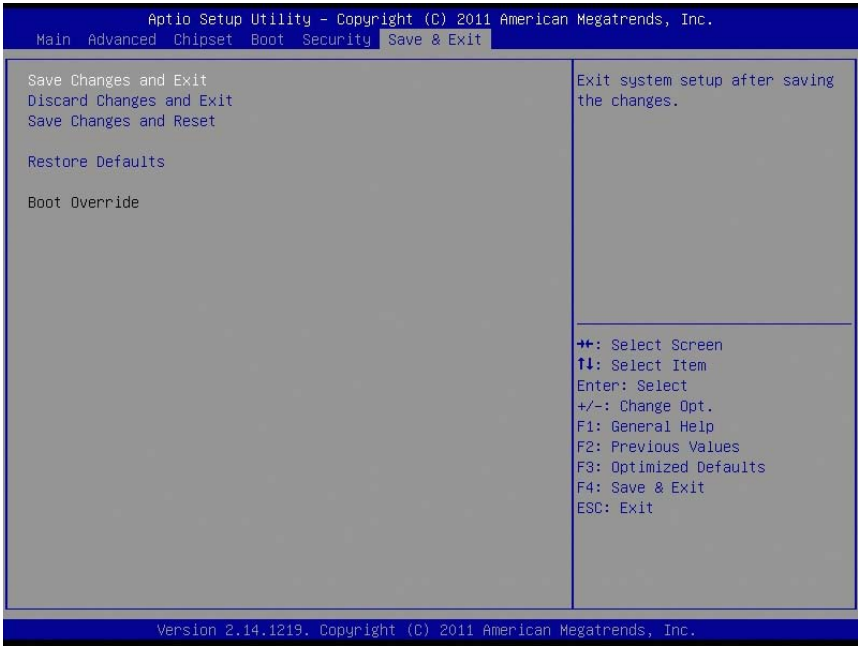
Set Administrator Password

User Password

Set User Password

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4.7 Save & Exit Menu



Save Changes and Exit

Selecting this option will display the message "Save configuration changes and exit setup?" Select [OK] to save changes and exit the UEFI Setup Utility.

Discard Changes and Exit

Selecting this option will display the message "Discard changes and exit setup?" Select [OK] to exit the UEFI Setup Utility without saving any changes.

Save changes and Reset

Reset the system after saving changes.

Restore Defaults

Restore/Load Default values for all setup options.

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Appendix A - Super IO Programming Guide

The programming instructions for the AmITX-IB-I's Super IO are as follows.

```
void SIOEnterConfig(void)
{
outportb(bSIO_CONFIG_INDEX_PORT,
     bSIO_CONFIG_ENTER_KEY);
outportb(bSIO_CONFIG_INDEX_PORT,
     bSIO_CONFIG_ENTER_KEY);
return;
}
void SIOExitConfig(void)
{
outportb(bSIO_CONFIG_INDEX_PORT,
     bSIO_CONFIG_EXIT_KEY);
return;
}
void SIOWrite(char bIndex, char bValue)
{
outportb(bSIO_CONFIG_INDEX_PORT,
     bSIO_CONFIG_EXIT_KEY);
return;
}
void SIORead(char bIndex, char bValue)
{
outportb(bSIO_CONFIG_INDEX_PORT,
     bSIO_CONFIG_EXIT_KEY);
return;
}
```

Programming steps: Use QM67 as example.

```
SIO_CONFIG_INDEX_PORT = 2Eh (QM67 uses 2Eh)
SIO_CONFIG_DATA_PORT = 2Fh
SIO_CONFIG_ENTER_KEY = 87h (Please check SIO datasheet)
SIO_CONFIG_EXIT_KEY = AAh (Please check SIO datasheet)
```

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A.1 Program GPIO Function to Output

```
// before SIO programming, must enter config mode. //
SIOEnterConfig(); Enter SIO configure mode.
// bIndex = 07h as logical device selection register.
// bValue = 07h as logical device number (QM67 uses
     GPIO 6)
SIOWrite(0x07, 0x07); Select to Logical Device 7
// bIndex = F4h as control register
// bValue = 00h as output enabled.
SIOWrite(0xF4, 0x00); Set all GPI/O to output.
```

GPIO Function to AllOutput High

```
// bIndex = F5h as output register
// bValue = FFh as output level high
SIOWrite(0xF4, 0x00); set all GPI/O to output.
```

GPIO function to All Output Low

```
// bIndex = F5h as output register
// bValue = 00h as output level high
SIOWrite(0xF5, 0x00); set all GPI/O to output.
```

GPIO function to Output High (GPIOx)

```
// bIndex = F5h as output register
bValue = SIORead(0xF5); read back output register
bValue |= 1 << x; x means GPIO number.
SIOWrite(0xF5, bValue); set GPI/Ox to output high.
```

GPIO function to Output Low (GPIOx)

```
// bIndex = F5h as output register
bValue = SIORead(0xF5); read back output register
bValue &= ~(1 << x); x means GPIO number
SIOWrite(0xF5, bValue); set GPI/Ox to output low.

// after SIO programming, must exit config mode. //
SIOExitConfig(); Exit SIO configure mode.
```

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A.2 Program GPIO Function to Input

```
// before SIO programming, must enter config mode. //
SIOEnterConfig(); Enter SIO configure mode.
// bIndex = 07h as logical device selection register.
// bValue = 07h as logical device number (QM67 uses
     GPIO 6)
SIOWrite(0x07, 0x07); Select to Logical Device 7
// bIndex = F4h as control register
// bValue = FFh as input enabled.
SIOWrite(0xF4, 0xFF); set all GPI/O to input
```

Read back GPIO Input Status

```
// bIndex = F5h as input register.
bValue = SIORead(0xF5); read back input register
// bValue = GPI/O input status.

// after SIO programming, must exit config mode. //
SIOExitConfig(); Exit SIO configure mode.
```

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A.3 Watchdog Sample Code

```
TOKEN
      Name  = "NCT6776F_CONFIG_INDEX"
      Value  = "0x2E"
      TokenType = Integer
      TargetEQU = Yes
      TargetH = Yes
End

TOKEN
      Name  = "NCT6776F_CONFIG_MODE_ENTER_VALUE"
      Value  = "0x87"
      Help  = "Value to enter Configuration Mode.Please
      check your hardware"
      TokenType = Integer
      TargetH = Yes
End

TOKEN
      Name  = "NCT6776F_CONFIG_MODE_EXIT_VALUE"
      Value  = "0xAA"
      Help  = "Value to EXIT Configuration Mode.Please
      check your hardware"
      TokenType = Integer
      TargetH = Yes
End

void Oem_WDT_Init (
IN SETUP_DATA *SetupData
)
{

IoWrite8 (NCT6776F_CONFIG_INDEX ,
      NCT6776F_CONFIG_MODE_ENTER_VALUE);
IoWrite8 (NCT6776F_CONFIG_INDEX ,
      NCT6776F_CONFIG_MODE_ENTER_VALUE);

IoWrite8 (NCT6776F_CONFIG_INDEX , 0x2B);
      // Pin80 function selection to GP34
Data8 = IoRead8(NCT6776F_CONFIG_DATA) | 0x10;
IoWrite8 (NCT6776F_CONFIG_DATA , Data8);
```

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```
IoWrite8 (NCT6776F_CONFIG_INDEX ,
     NCT6776F_LDN_SEL_REGISTER); //LDN 0x09
IoWrite8 (NCT6776F_CONFIG_DATA , NCT6776F_LDN_GPIO3);

IoWrite8 (NCT6776F_CONFIG_INDEX ,
     NCT6776F_ACTIVATE_REGISTER);       //CR 30h
Data8 = IoRead8(NCT6776F_CONFIG_DATA) | 0x08;
IoWrite8 (NCT6776F_CONFIG_DATA , Data8);

IoWrite8 (NCT6776F_CONFIG_INDEX , 0xE4);
     //Set GP34 to output mode
Data8 = IoRead8(NCT6776F_CONFIG_DATA) & 0xEF;
IoWrite8 (NCT6776F_CONFIG_DATA , Data8);

IoWrite8 (NCT6776F_CONFIG_INDEX , 0xE5);
     //Set GP34 to output High
Data8 = IoRead8(NCT6776F_CONFIG_DATA) | 0x10;
IoWrite8 (NCT6776F_CONFIG_DATA , Data8);

IoWrite8 (NCT6776F_CONFIG_INDEX , 0xEA);
     // selection Pin 34 to WDTO
Data8 = IoRead8(NCT6776F_CONFIG_DATA) | 0x10;
IoWrite8 (NCT6776F_CONFIG_DATA , Data8);

IoWrite8 (NCT6776F_CONFIG_INDEX ,
     NCT6776F_LDN_SEL_REGISTER);       //LDN 0x08
IoWrite8 (NCT6776F_CONFIG_DATA , NCT6776F_LDN_GPIO2);

IoWrite8 (NCT6776F_CONFIG_INDEX ,
     NCT6776F_ACTIVATE_REGISTER);      //CR 30h
Data8 = IoRead8(NCT6776F_CONFIG_DATA) |
     gSetup.WDT_Control;               //VC312D+
IoWrite8 (NCT6776F_CONFIG_DATA , Data8);
     //VC312D+

IoWrite8(NCT6776F_CONFIG_INDEX, 0xF5);
     //Watchdog Timer: CR F5h Bit3
Data8 = IoRead8(NCT6776F_CONFIG_DATA) |
     gSetup.WDT_CountMode;
IoWrite8 (NCT6776F_CONFIG_DATA , Data8);
```

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```
IoWrite8(NCT6776F_CONFIG_INDEX, 0xF6);
     //Watchdog Timer Counter Register
IoWrite8(NCT6776F_CONFIG_DATA, gSetup.WDT_TimeOut);

IoWrite8 (NCT6776F_CONFIG_INDEX ,
     NCT6776F_CONFIG_MODE_EXIT_VALUE);
}
```

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Appendix B - System Resources

B.1 System Memory Map

Address Range (decimal)	Address Range (hex)	Size	Description
(4GB-2MB)	FFE00000 – FFFFFFFF	2 MB	High BIOS Area
(4GB-18MB) – (4GB-17MB-1)	FEE00000 – FEEFFFFF	1 MB	FSB Interrupt Memory Space
(4GB-20MB) – (4GB-19MB-1)	FEC00000 – FECFFFFF	1 MB	APIC Configuration Space
960 K – 1024 K	F0000 – FFFFF	64 KB	System BIOS Area
896 K – 960 K	E0000 – EFFFF	64 KB	Extended System BIOS Area
768 K – 896 K	C0000 – DFFFF	128 KB	PCI expansion ROM area
640 K – 768 K	A0000 – BFFFF	128 KB	Video Buffer & SMM space
0 K – 640 K	00000 – 9FFFF	640 KB	DOS Area
0 K – 640 K	00000 – 9FFFF	640 KB	DOS Area

Table B-1: System Memory Map

B.2 Direct Memory Access Channels

Channel Number	Data Width	System Resource
0	–	Open
1	–	Open
2	–	Open
3	–	Open
4	–	DMA Controller
5	–	Open
6	–	Open
7	–	Open

Table B-2: Direct Memory Access Channels

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B.3 I/O Map

Hex Range	Device
000-00F	DMA controller 1
020-021	Programmable interrupt controller
024-025	Programmable interrupt controller
028-029	Programmable interrupt controller
02C-02D	Programmable interrupt controller
030-031	Programmable interrupt controller
034-035	Programmable interrupt controller
038-039	Programmable interrupt controller
03C-03D	Programmable interrupt controller
040-043	System timer
050-053	System timer
060, 064	8742 equivalent (keyboard)
061	System speaker
070-077	System CMOS/Real time clock
081-091	DMA page register
093-09F	DMA page registers continued
0A0-0B1 and 0B4-0BD	Interrupt controller 2, 8259 equivalent
0C0-0DF	DMA controller 2, 8237A-5 equivalent
0F0-0FF	Math Processor
2E0 – 2E7	Serial Port 5
2E8 – 2EF	Serial Port 4
2F0– 2F7	Serial Port 6
2F8 – 2FF	Serial Port 2
170-177 and 1F0-1F7 376 and 3F6	ATA Channel 0
3B0 – 3BB	Mono/VGA mode video
3C0- 3DF	VGA registers
3E8 – 3EF	Serial Port 3
3F8 – 3FF	Serial Port 1
4D0 and 4D1	Interrupt controller
D00-0FFFF	PCI bus
D000-D0FF	Realtek GBE Controller #2

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Hex Range	Device
D000-DFFF	PCI-to-PCI Bridge
E000-E0FF	Realtek GBE Controller #1
E000-EFFF	PCI-to-PCI Bridge
F000-F03F	Intel(R) HD Graphics
F040-F05F	Smbus Controller
F060-F07F F080-F083 F090-F097 F0A0-F0A3 F0B0-F0B7	SATA AHCI Controller

Table B-3: I/O Map

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B.4 Interrupt Request (IRQ) Lines

IRQ#	Typical Interrupt Resource	Connected to Pin
0	System Timer	N/A
1	Keyboard controller	N/A
2	N/A	N/A
3	Serial Port 2 (COM2) / PCI / ISA	IRQ3 via SERIRQ, IRQ3 at ISA bus
4	Serial Port 1 (COM1) / PCI / ISA	IRQ4 via SERIRQ, IRQ4 at ISA bus
5	Serial Port 3, 4 (COM3,4) / PCI / ISA	IRQ5 via SERIRQ, IRQ5 at ISA bus
6	N/A	N/A
7	N/A	N/A
8	Real-time clock	N/A
9	N/A	N/A
10	Serial Port 5 (COM5,6) / PCI / ISA	IRQ10 via SERIRQ, IRQ10 at ISA bus
11	N/A	N/A
12	N/A	N/A
13	Math Processor	N/A
14	N/A	N/A
15	N/A	N/A
16	PCI-to-PCI bridge, PCI-to-USB Host Controller	N/A
17	PCI-to-PCI bridge	N/A
18	N/A	N/A
19	N/A	N/A
20	N/A	N/A
21	N/A	N/A
22	High Definition Audio Contoller	N/A
23	AHCI SATA Contoller	N/A

Table B-4: IRQ Lines APIC Mode

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B.5 PCI Configuration Space Map

Bus Number	Device Number	Function Number	Routing	Description
00h	00h	00h	N/A	Intel Host Bridge
00h	01h	00h	Internal	PCI Express Root Port
00h	02h	00h	Internal	Intel Integrated Graphics Device
00h	16h	00h	Internal	Intel Management Engine Interface
00h	1Ah	00h	Internal	Intel USB EHCI Controller #2
00h	1Bh	00h	Internal	High Definition Audio controller
00h	1Ch	00h	Internal	PCI Express Root port 1
00h	1Ch	01h	Internal	PCI Express Root port 2
00h	1Ch	04h	Internal	PCI Express Root port 5
00h	1Ch	05h	Internal	PCI Express Root port 6
00h	1Dh	00h	Internal	Intel USB EHCI Controller #1
00h	1Fh	00h	N/A	Intel ISA Interface Bridge
00h	1Fh	02h	Internal	Intel AHCI controller
00h	1Fh	03h	Internal	Intel SMBus Controller
00h	1Fh	05h	Internal	Intel SATA controller #2
03h	00h	00h	Internal	USB Controller(PCI Express)
04h	00h	00h	Internal	Realtek Ethernet (PCI Express)
05h	00h	00h	Internal	Realtek Ethernet (PCI Express)

Table B-5: PCI Configuration Space Map

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Important Safety Instructions

For user safety, please read and follow all **instructions**, **WARNINGS**, **CAUTIONS,** and **NOTES** marked in this manual and on the associated equipment before handling/operating the equipment.

- Read these safety instructions carefully.
- Keep this user's manual for future reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment:
  - Turn off power and unplug any power cords/cables.
- To avoid electrical shock and/or damage to equipment:
  - Keep equipment away from water or liquid sources;
  - Keep equipment away from high heat or high humidity;
  - Keep equipment properly ventilated (do not block or cover ventilation openings);
  - Make sure to use recommended voltage and power source settings;
  - Always install and operate equipment near an easily accessible electrical socket-outlet;
  - Secure the power cord (do not place any object on/over the power cord);
  - Only install/attach and operate equipment on stable surfaces and/or recommended mountings; and,
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.

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- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.

A Lithium-type battery may be provided for uninterrupted, backup or emergency power.



Risk of explosion if battery is replaced with one of an incorrect type. Dispose of used batteries appropriately.

- Equipment must be serviced by authorized technicians when:
  - The power cord or plug is damaged;
  - Liquid has penetrated the equipment;
  - It has been exposed to high humidity/moisture;
  - It is not functioning or does not function according to the user's manual;
  - It has been dropped and/or damaged; and/or,
  - It has an obvious sign of breakage.

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Getting Service

Contact us should you require any service or assistance.

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