AXIOMTEK

MANO831 Series

Intel® Atom™ D2550 Mini ITX Motherboard

User's Manual

RoHS

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CAUTION

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

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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

Conventions Used in This Manual

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

Warning

Information to prevent injury to yourself when trying to complete a task.

Caution

Information to prevent damage to the components when trying to complete a task.

Important

Instructions that you MUST follow to complete a task.

Note

Tips and additional information to help you complete a task.

Table of Contents

Chapter 1
Introduction

The MANO831 is designed to unleash the power of the new Intel® Atom™ processor D2550 which supports the new revolutionary two–chip layout. The Intel® Cedarview processor also provides additional flexibility and upgradeability with two slots of single channel DDR3 memory at 1066 MHz supporting up to 4GB maximum. With breakthrough low-power silicon, MANO831 can be used with a passive thermal solution based on the recommended boundary conditions.

MANO831 represents a fundamental shift in system design—small, yet powerful enough to enable a big internet experience for all audiences.

1.1 Features

- Intel® Atom™ D2550
- 2 DDR3 1066/800MHz up to 4GB
- 7 USB 3.0 supported
- 2 SATA 2.0 supported

1.2 Specifications

- **CPU**
  - Intel® Atom™ D2550 1.86GHz dual-core processor.
- **System Chipset**
  - Intel® NM10.
- **BIOS**
  - AMI 16Mb SPI ROM.
- **System Memory**
  - D2550: Two 204-pin SO-DIMM sockets support up to 4GB single channel DDR3 1066/800MHz SDRAM.
- **Onboard Multi I/O**
  - Controller: Winbond 83627DHG.
  - Serial ports: Two RS-232 ports with 5V/12V power and two RS-232/422/485 with 5V/12V power.
  - One PS/2 keyboard/mouse.
- **Serial ATA**
  - Two SATA 2.0 ports (3Gb/s performance).
- **USB Interface**
  - Seven USB 2.0 ports.
- **Display**
  - One DVI
  - One VGA
  - Two LVDS.
- **Ethernet**
  - Two Realtek RTL8111E Gigabit LAN.
- **Audio**
  - HD audio compliant (with MIC-in/line-out/line-in and front audio header) via Realtek ALC892.
- **Expansion Interface**
  - One PCI slot.
  - One PCI-Express Mini Card.
- **Hardware Monitoring**
  - Monitoring temperature, voltage and cooling fan status. Auto throttling control when CPU overheats.
- **Watchdog Timer**
  - 1~255 seconds; up to 256 levels.
- **Power Management**
  - ACPI (Advanced Configuration and Power Interface).

- **Form Factor**
  - Mini ITX form factor.

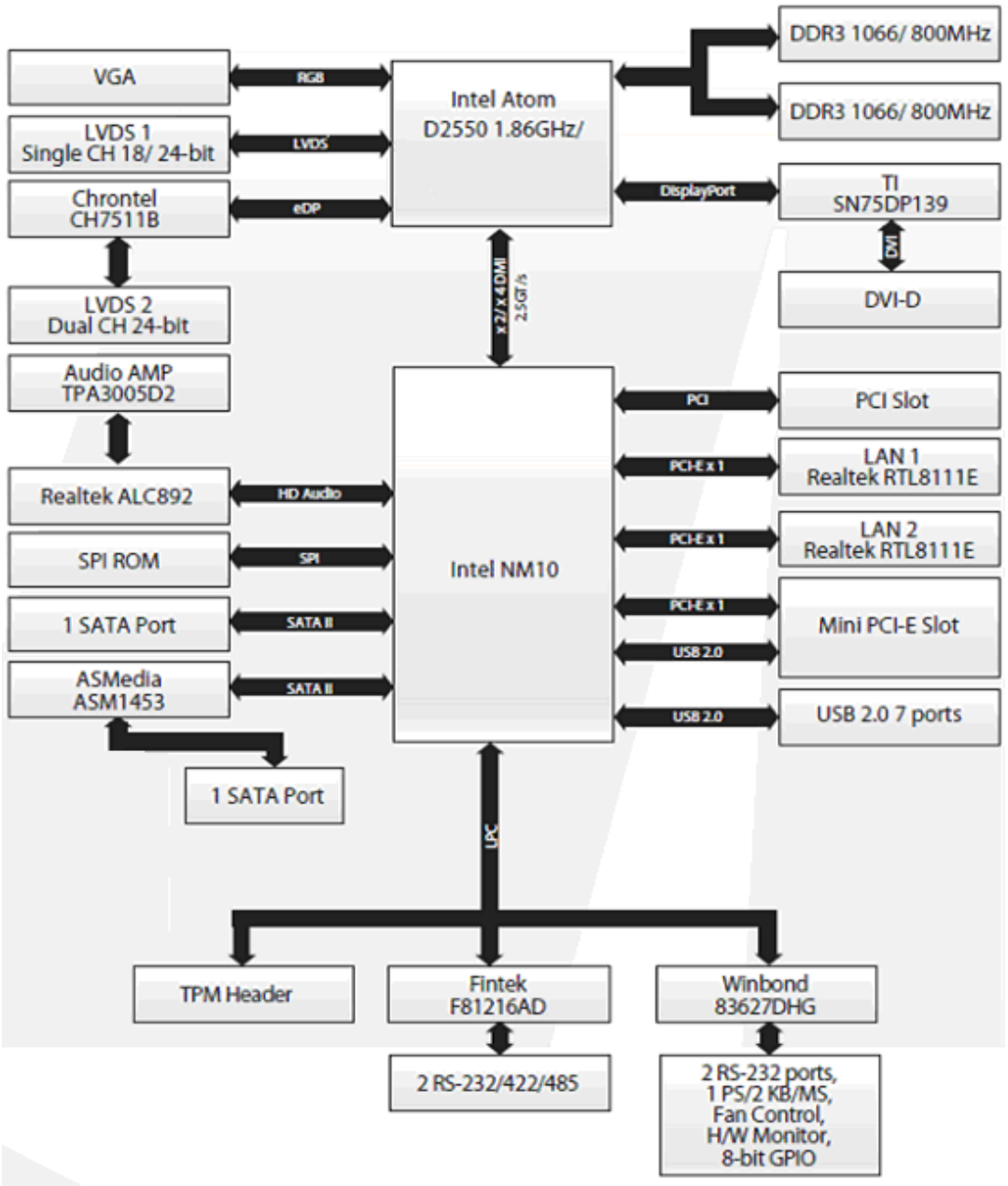
Note

All specifications and images are subject to change without notice.

1.3 Utilities Supported

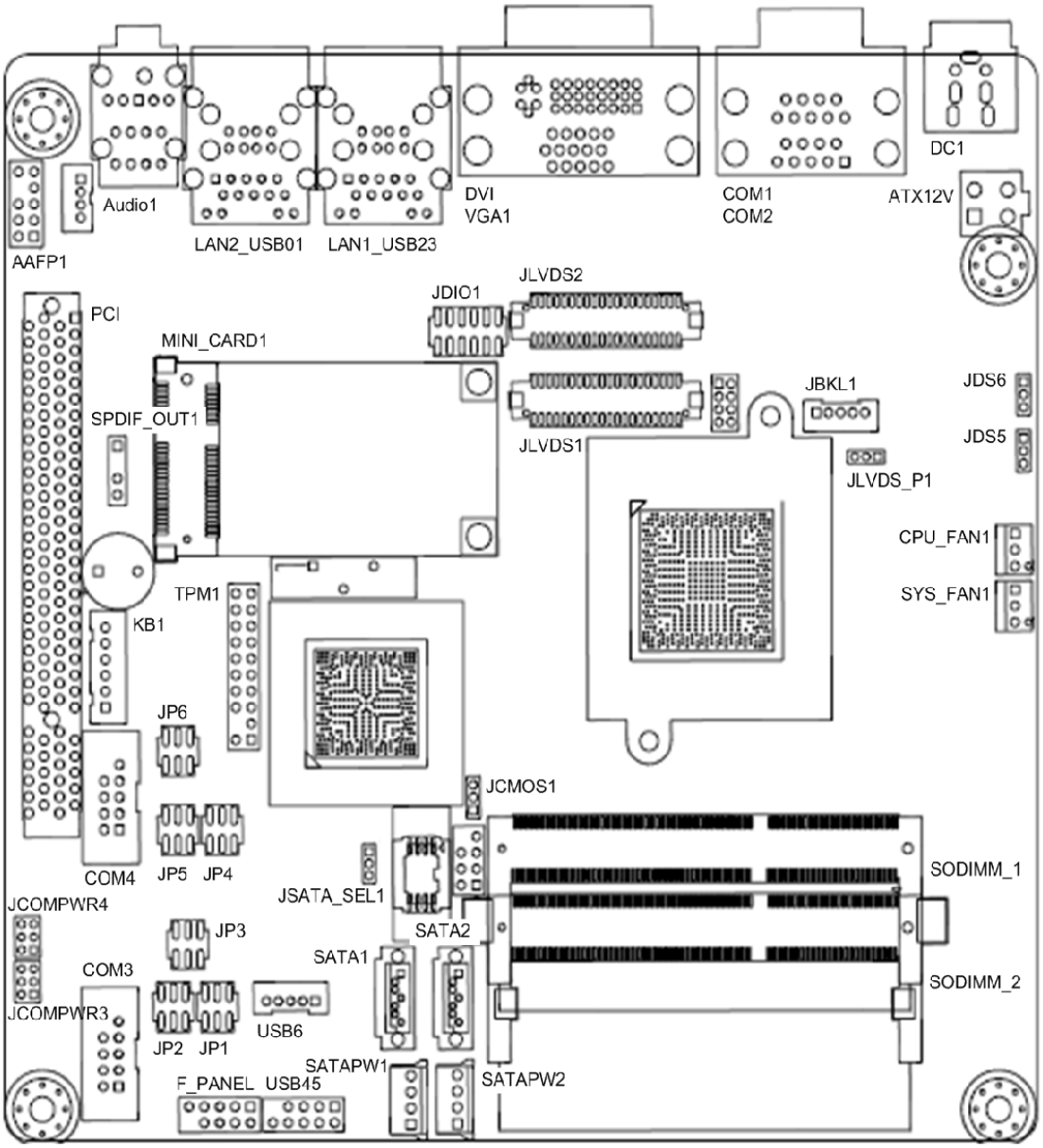
- Chipset driver
- Ethernet driver
- Graphics driver
- Audio driver
- TPM driver
- ME driver
- RAID driver
- USB3.0 driver

1.4 Block Diagram



Chapter 2
Board and Pin Assignments

2.1 Board Layout



Top View

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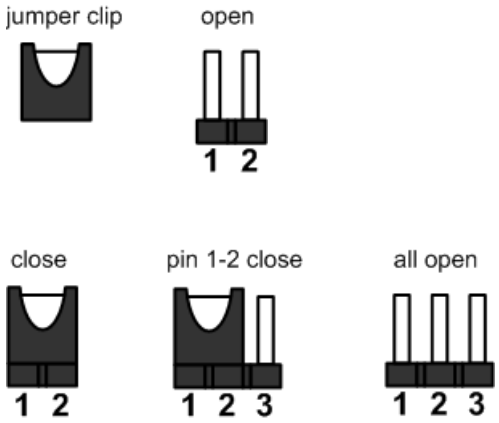
2.2 Jumper Settings

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. The following illustration shows how to set up jumper.



Before applying power to MANO831 Series, please make sure all of the jumpers are in factory default position. Below you can find a summary table and onboard default settings.

Jumper	Description	Setting
JCMOS1	Clear CMOS Default: Normal Operation	1-2 close
JP1	COM3 RS-232/422/485 Mode Setting Default: RS-232 Mode	1-3, 2-4 close
JP2		1-3, 2-4 close
JP3		1-2 close
JP4	COM4 RS-232/422/485 Mode Setting Default: RS-232 Mode	1-3, 2-4 close
JP5		1-2 close
JP6		1-3, 2-4 close
JCOMPWR3	COM3 RI/+5V/+12V Selection Default: RI	3-4 close
JCOMPWR4	COM4 RI/+5V/+12V Selection Default: RI	3-4 close
JLVDS_P1	LVDS Backlight Power Selection Default: +3.3V	2-3 close
JDS6	AT/ATX Power Mode Selection Default: ATX Mode	2-3 close
JSATA_SEL1	SATA Port 2 Function Selection Default: SATA HDD	2-3 close
JDS5	System Deep S5 Power Saving Control Default: Normal ACPI S5 State	2-3 close

2.2.1 Clear CMOS (JCMOS1)

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

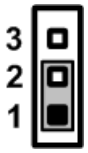
To erase the RTC RAM:

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.

Caution

Except when clearing the RTC RAM, never remove the cap on this jumper default position. Removing the cap will cause system boot failure!

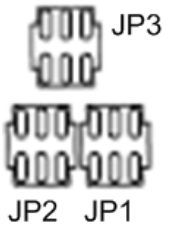
Function	Setting
Normal operation (Default)	1-2 close
Clear CMOS	2-3 close



2.2.2 COM3 RS-232/422/485 Mode Setting (JP1, JP2, JP3)

This jumper allows you to select the operation mode of COM port 3.

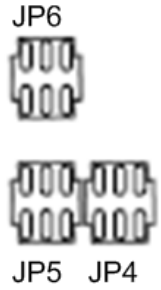
Function	Setting
RS-232 mode (Default)	JP1 1-3, 2-4 close JP2 1-3, 2-4 close JP3 1-2 close
RS-422 mode	JP1 3-5, 4-6 close JP2 3-5, 4-6 close JP3 3-4 close
RS-485 mode	JP1 3-5, 4-6 close JP2 3-5, 4-6 close JP3 5-6 close



2.2.3 COM4 RS-232/422/485 Mode Setting (JP4, JP5, JP6)

This jumper allows you to select the operation mode of COM port 4.

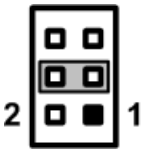
Function	Setting
RS-232 mode (Default)	JP4 1-3, 2-4 close JP5 1-2 close JP6 1-3, 2-4 close
RS-422 mode	JP4 3-5, 4-6 close JP5 3-4 close JP6 3-5, 4-6 close
RS-485 mode	JP4 3-5, 4-6 close JP5 5-6 close JP6 3-5, 4-6 close



2.2.4 COM3 RI/+5V/+12V Selection (JCOMPWR3)

This jumper allows you to select the power mode of COM port 3.

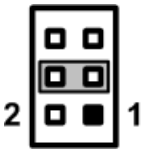
Function	Setting
+12V	1-2 close
RI (Default)	3-4 close
+5V	5-6 close



2.2.5 COM4 RI/+5V/+12V Selection (JCOMPWR4)

This jumper allows you to select the power mode of COM port 4.

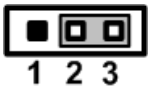
Function	Setting
+12V	1-2 close
RI (Default)	3-4 close
+5V	5-6 close



2.2.6 LVDS Backlight Power Selection (JLVDS_P1)

This jumper allows you to select LVDS backlight power.

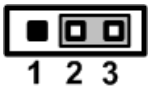
Function	Setting
+5V	1-2 close
+3.3V (Default)	2-3 close



2.2.7 AT/ATX Power Mode Selection (JDS6)

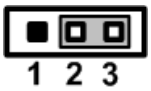
This jumper allows you to select AT mode or ATX mode.

Function	Setting
AT mode	1-2 close
ATX mode (Default)	2-3 close



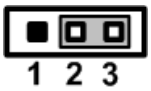
2.2.8 SATA Port 2 Function Selection (JSATA_SEL1)

Function	Setting
CF(if CF socket installed)	1-2 close
SATA HDD (Default)	2-3 close



2.2.9 System Deep S5 Power Saving Control (JDS5)

Function	Setting
Deep S5 state	1-2 close
Normal ACPI S5 state (Default)	2-3 close

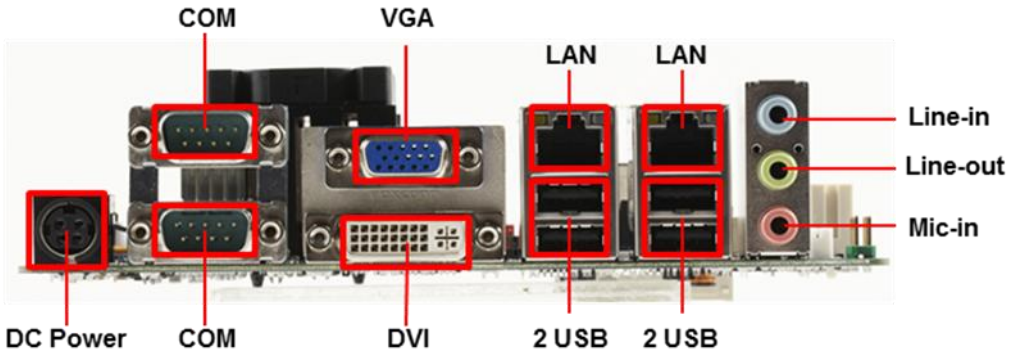


2.3 Connectors

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

Connector	Description
COM1, COM2	COM1 and COM2 Connector
VGA1	VGA Port
DC1	12V DC IN
DVI	DVI–D Port
LAN1_USB23	LAN1 and USB 2.0 Connector
LAN2_USB01	LAN2 and USB 2.0 Connector
Audio1	Audio Jack
SODIMM_1	204-pin DDR3 SO-DIMM Slot 1
SODIMM_2	204-pin DDR3 SO-DIMM Slot 2
PCI	PCI Slot
MINI-CARD1	PCI-Express Mini Card Connector
CPU_FAN1	CPU Fan Connector
SYS_FAN1	System Fan Connector
F_PANEL	Front Panel Connector
ATX12V	ATX Power Connector
COM3, COM4	Serial Connectors
AAFP1	Internal Audio Connector
SPDIF_OUT1	Digital Audio Connector
TPM1	TPM Connector
SATA1, SATA2	Serial ATA Connectors
USB45, USB6	USB Connectors
KB1	Keyboard/Mouse Connector
JLVDS1, JLVDS2	LVDS Connectors
JBKL1	LVDS Backlight Connector
JDIO1	GPIO Connector
SATAPW1, SATAPW2	Serial ATA Power Connectors

2.3.1 Rear Panel Connectors

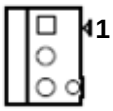


2.3.2 FAN Connectors (CPU_FAN1 and SYS_FAN1)

The fan connectors support cooling fans of 280mA (3.36 W max.) at 4800rpm or a total of 1A (12W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.

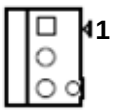
CPU fan interface is available through CPU_FAN1, see table below.

Pin	Signal
1	GND
2	+12VPWM
3	Sensor



System fan interface is available through SYS_FAN1, see table below.

Pin	Signal
1	GND
2	+12VPWM
3	Sensor



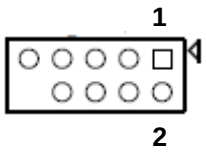
Caution

Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors.

2.3.3 Front Panel Connector (F_PANEL)

This connector is for a chassis-mounted front panel I/O module that supports power on/reset switch and HDD/power LED indicate.

Pin	Signal
1	HDD_LED+
2	SUPLED
3	SATA_LED#
4	GND
5	GND
6	PANSWIN#
7	SRST#
8	GND
9	NC



ATX Power Button/Soft-off Button (Pin 6-8 PWRBT)
This 2-pin connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch and holding it for more than four seconds while the system is ON turns the system OFF.

Reset Button (Pin 5-7 SYS_RST)
This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

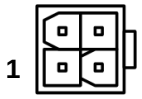
Power LED (Pin 2-4 PWRLED)
This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

Hard Disk Drive Activity LED (Pin 1-3 HDLED)
This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

2.3.4 ATX Power Connector (ATX12V)

This connector is for ATX power supply plug. The power supply plug is designed to fit this connector in only one orientation. Find the proper orientation and push down firmly until the connector completely fit.

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



Note

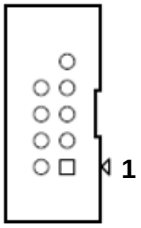
- ***Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.***
- ***Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system.***

2.3.5 Serial Connectors (COM3 and COM4)

These connectors are for serial (COM) ports. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.

Pin	Signal
1	DDCD2#
2	RRXD2
3	TTXD2
4	DDTR2#
5	GND
6	DDSR2#
7	RRTS2#
8	CCTS2#
9	RRI2

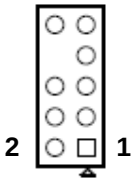
COM3, COM4



2.3.6 Internal Audio Connector (AAFP1)

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC '97 (optional) audio standard. Connect one end of the front panel audio I/O module cable to this connector.

Pin	Signal
1	MIC2_L
2	GND
3	MIC2_R
4	PRESENSE
5	LIN2_R
6	SENSE1_RTN
7	SENSE_B
8	NC
9	LIN2_L
10	SENSE2_RTN



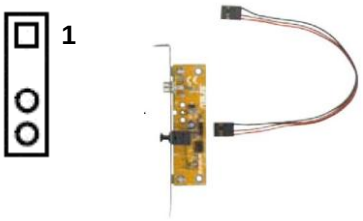
Important

For motherboards with the optional HD Audio feature, we recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high definition audio capability.

2.3.7 Digital Audio Connector (SPDIF_OUT1)

This connector is for the S/PDIF audio module to allow digital sound output. Connect one end of the S/PDIF audio cable to this connector and the other end to the S/PDIF module.

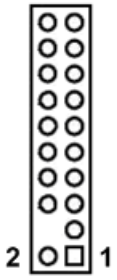
Pin	Signal
1	+5V
2	NA
3	SPDIF_O
4	GND



2.3.8 TPM Connector (TPM1)

This connector is for support TPM.

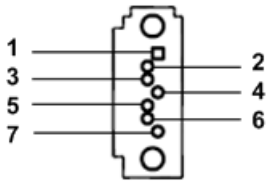
Pin	Signal	Pin	Signal
1	CK_33M	2	GND
3	LFRAME#	4	NA
5	PLTRST#	6	SMB_DATA
7	LAD3	8	LAD2
9	3V	10	LAD1
11	LAD0	12	GND
13	NC	14	NC
15	3VSB	16	SERIRQ
17	GND	18	CLKRUN#
19	LPCPD#	20	SMB_CLK



2.3.9 Serial ATA Connectors (SATA1 and SATA2)

These connectors support SATA 2.0 and are for hard disk drives.

Pin	Signal
1	GND
2	SATA_TXP2
3	SATA_TXN2
4	GND
5	SATA_RXN2
6	SATA_RXP2
7	GND

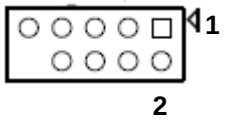


2.3.10 USB Connectors (USB45 and USB6)

These connectors are for USB 2.0 ports. Connect the optional USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.

Pin	Signal	Pin	Signal
1	USB+5V	2	USB+5V
3	USB_P4_N	4	USB_P5_N
5	USB_P4_P	6	USB_P5_P
7	GND	8	GND
9	NC		

USB45



Pin	Signal
1	+5V
2	USB_P6_N
3	USB_P6_P
4	GND
5	NC

USB6

Caution

Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

2.3.11 Keyboard/Mouse Connector (KB1)

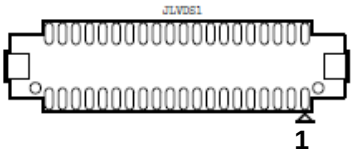
This connector is for PS/2 keyboard and mouse.

Pin	Signal
1	Keyboard Clock
2	Keyboard Data
3	Mouse Data
4	GND
5	+5V STBY
6	Mouse Clock

2.3.12 LVDS Connectors (JLVDS1 and JLVDS2)

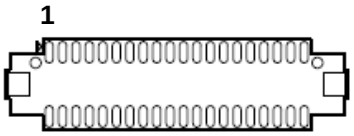
The JLVDS1 is for 18/24-bit single channel LVDS panel.

Pin	Signal	Pin	Signal
1	+3.3V	2	+5V
3	+3.3V	4	+5V
5	LVDS DDC CLK	6	LVDS DDC DATA
7	GND	8	GND
9	LVDS_TX1_P	10	LVDS_TX0_P
11	LVDS_TX1_N	12	LVDS_TX0_N
13	GND	14	GND
15	LVDS_TX3_P	16	LVDS_TX2_P
17	LVDS_TX3_N	18	LVDS_TX2_N
19	GND	20	GND
21	NC	22	NC
23	NC	24	NC
25	GND	26	GND
27	NC	28	NC
29	NC	30	NC
31	GND	32	GND
33	NC	34	LVDS_CLK_P
35	NC	36	LVDS_CLK_N
37	GND	38	GND
39	+12V	40	+12V



The JLVDS2 is for 18/24-bit dual channel LVDS panel.

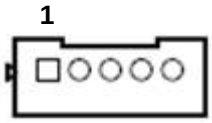
Pin	Signal	Pin	Signal
1	+3.3V	2	+5V
3	+3.3V	4	+5V
5	LVDS2 DDC CLK	6	LVDS2 DDC DATA
7	GND	8	GND
9	LVDS0_TX1_P	10	LVDS0_TX0_P
11	LVDS0_TX1_N	12	LVDS0_TX0_N
13	GND	14	GND
15	LVDS0_TX3_P	16	LVDS0_TX2_P
17	LVDS0_TX3_N	18	LVDS0_TX2_N
19	GND	20	GND
21	LVDS1_TX1_P	22	LVDS1_TX0_P
23	LVDS1_TX1_N	24	LVDS1_TX0_N
25	GND	26	GND
27	LVDS1_TX3_P	28	LVDS1_TX2_P
29	LVDS1_TX3_N	30	LVDS1_TX2_N
31	GND	32	GND
33	LVDS1_CLK_P	34	LVDS0_CLK_P
35	LVDS1_CLK_N	36	LVDS0_CLK_N
37	GND	38	GND
39	+12V	40	+12V



2.3.13 LVDS Backlight Connector (JBKL1)

The connector is for the control of internal LVDS brightness.

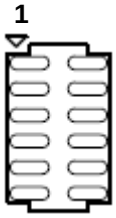
Pin	Signal
1	+12V
2	GND
3	Backlight Enable
4	Backlight Ctrl
5	+5V



2.3.14 GPIO Connector (JDIO1)

This connector is for GPIO function.

Pin	Signal	Pin	Signal
1	SIO_GPIO0	2	SIO_GPIO4
3	SIO_GPIO1	4	SIO_GPIO5
5	SIO_GPIO2	6	SIO_GPIO6
7	SIO_GPIO3	8	SIO_GPIO7
9	SMBUS CLOCK	10	SMBUS DATA
11	GND	12	+5V STBY

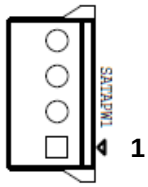


2.3.15 Serial ATA Power Connectors (SATAPW1 and SATAPW2)

These connectors provide 5V/12V power for Serial ATA hard disk drives.

Pin	Signal
1	+12V
2	GND
3	GND
4	+5V

SATAPW1, SATAPW2



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Chapter 3
Hardware Installation

Take note of the following precautions before you install motherboard components or change any motherboard settings.

Caution

- ***Unplug the power cord from the wall socket before touching any component.***
- ***Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.***
- ***Hold components by the edges to avoid touching the ICs on them.***
- ***Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that came with the component.***
- ***Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.***

3.1 Motherboard Overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it. Refer to the chassis documentation before installing the motherboard.

Warning

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

3.1.1 Placement Direction

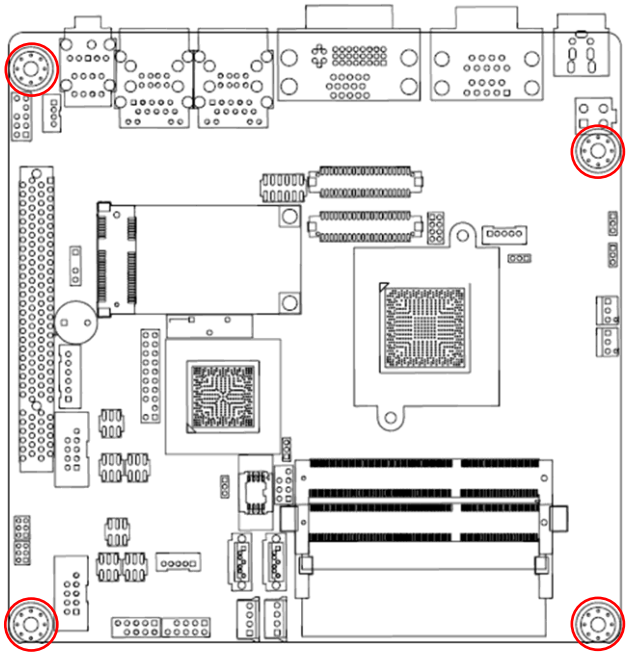
When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

3.1.2 Screw Holes

Place four (4) screws into the holes indicated by circles to secure the motherboard to the chassis.

Caution

Do not over tighten the screws! Doing so can damage the motherboard.



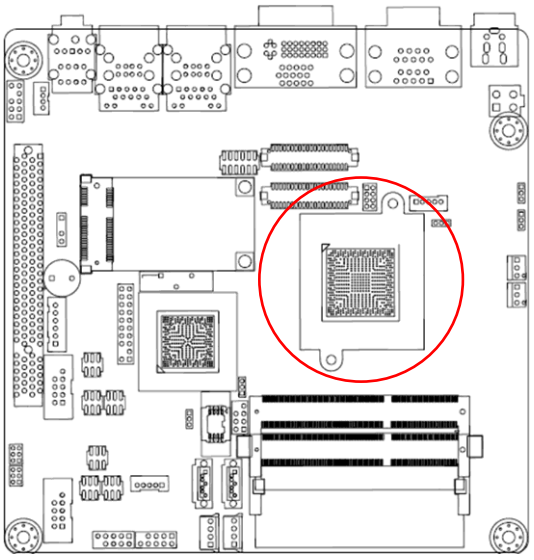
Place this side towards the rear of the chassis.

3.2 Central Processing Unit (CPU)

The motherboard comes with onboard Intel® Atom™ D2550 processor.

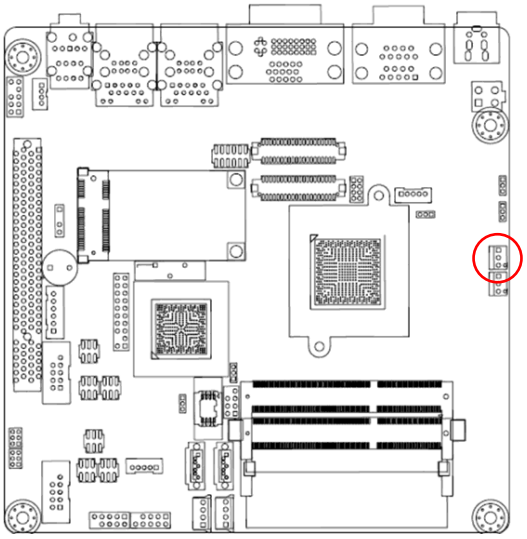
3.2.1 CPU Location

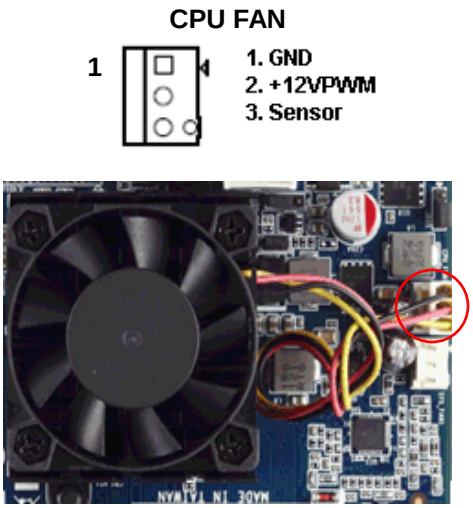
Locate the CPU on the motherboard.



3.2.2 The CPU Heatsink and Fan

Intel® Atom™ processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.





Caution

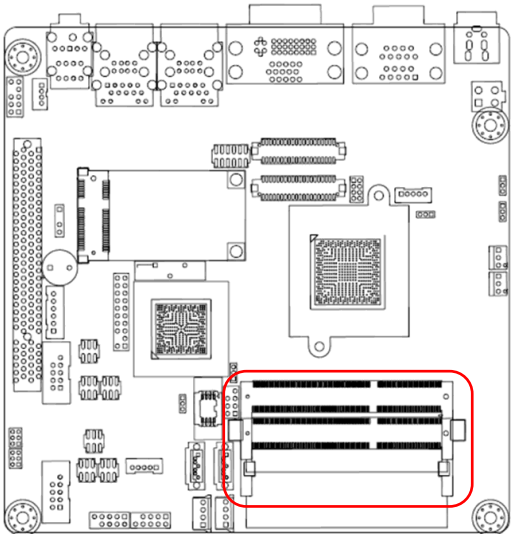
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors.

3.3 System Memory

3.3.1 Overview

The motherboard comes with two 204-pin Double Data Rate 3 (DDR3) Small Outline Dual Inline Memory Modules (SO-DIMM) sockets.

A DDR3 module has the same physical dimensions as a DDR SO-DIMM but has a 204-pin footprint compared to the 204-pin DDR2 DIMM. DDR3 SO-DIMM is notched differently to prevent installation on a DDR2 SO-DIMM socket. The following figure illustrates the location of the sockets:



Channel	Socket
Single Channel	SODIMM_1
	SODIMM_2

204-pin DDR3 SO-DIMM sockets

Note: Due to Intel Cedartail limitation, if install 1 memory module only, please slot into DIMM_2.

3.3.2 Memory Configurations

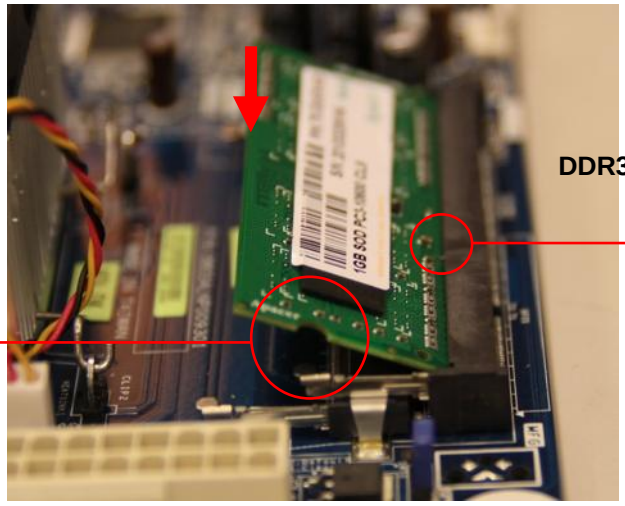
You may install 1GB and 2GB unbuffered non-ECC DDR3 SO-DIMMs into the SO-DIMM sockets using the memory configurations in this section.

Important

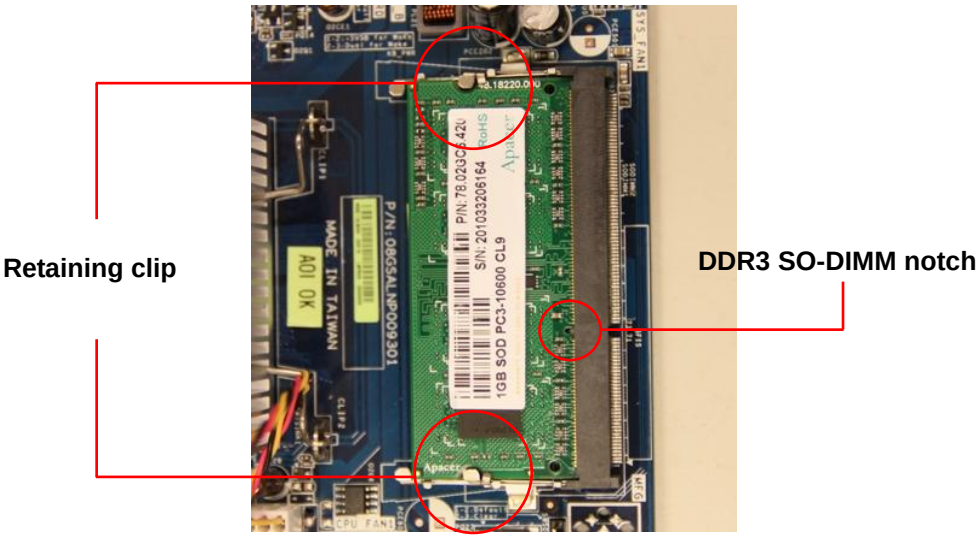
- ***IF you installed two 2GB memory modules, the system may detect less than 3GB of total memory because of address space allocation for other critical functions. This limitation applies to Windows XP 32-bit version operating system since it does not support PAE (Physical Address Extension) mode.***
- ***IF you install Windows XP 32-bit version operating system, we recommend that you install less than 3GB of total memory.***

3.3.3 Installing a SO-DIMM

1. Align a SO-DIMM on the socket such that the notch on the SO-DIMM matches the break on the socket.



2. Firmly insert the SO-DIMM into the socket until the retaining clips snap back in place and the SO-DIMM is properly seated.



Important

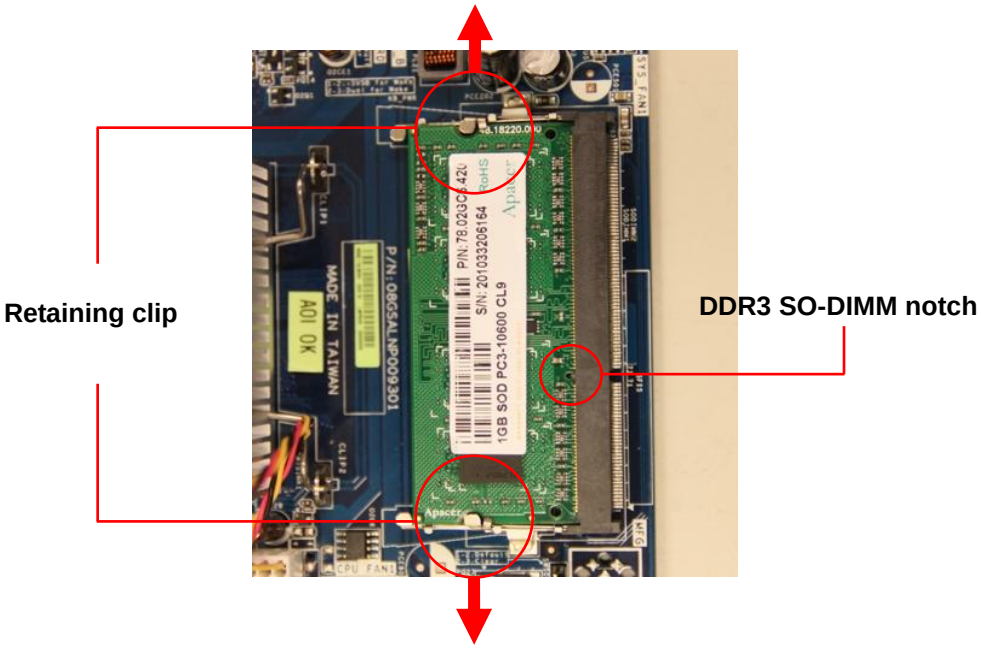
- ***A DDR3 SO-DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a SO-DIMM into a socket to avoid damaging the SO-DIMM.***
- ***The DDR3 SO-DIMM sockets do not support DDR2 SO-DIMMs. DO NOT install DDR2 SO-DIMM to the DDR3 SO-DIMM socket.***

Caution

Make sure to unplug the power supply before adding or removing SO-DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

3.3.4 Removing a SO-DIMM

1. Simultaneously press the retaining clips downward to unlock the SO-DIMM.
2. Remove the SO-DIMM from the socket.



Note ***Support the SO-DIMM lightly with your fingers when pressing the retaining clips. The SO-DIMM might get damaged when it flips out with extra force.***

3.4 Expansion Card

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.

Warning ***Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.***

3.4.1 Installing an Expansion Card

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

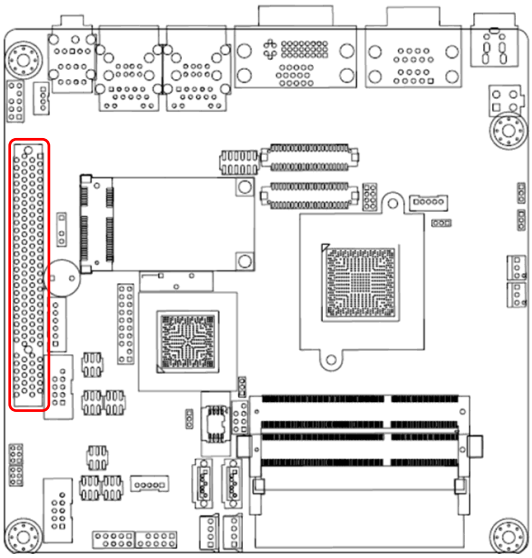
3.4.2 Configuring an Expansion Card

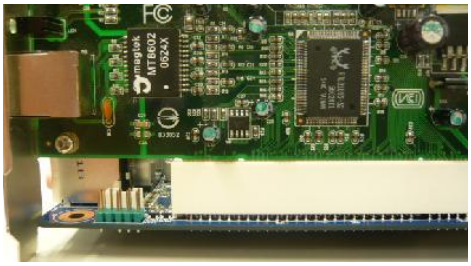
After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 5 for information on BIOS setup.
2. Assign an IRQ to the card if needed.
3. Install the software drivers for the expansion card.

3.4.3 PCI Slot

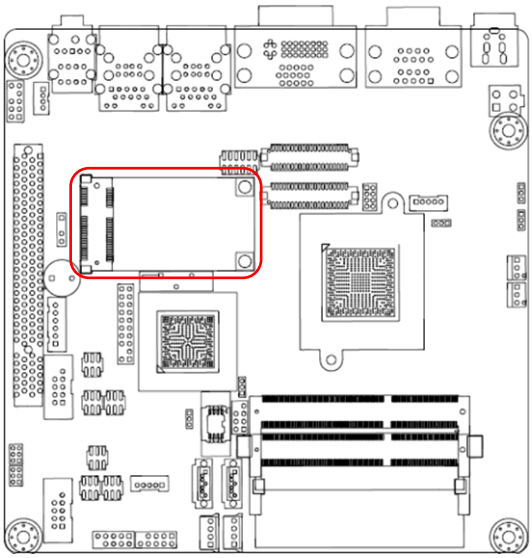
This motherboard supports one PCI slot that complies with the PCI specifications. The following figure shows an IC card installed on the PCI slot.

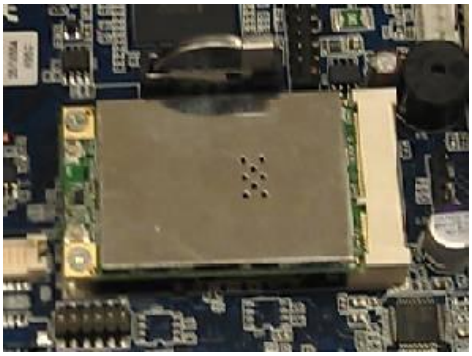




3.4.4 PCI-Express Mini Card Connector

This motherboard supports one PCI-Express Mini Card connector that complies with the PCI-Express Mini Card specifications. The following figure shows a capture card installed on this connector.





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Chapter 4
Hardware Description

4.1 Microprocessors

The MANO831 Series supports Intel® Atom™ D2550 processors, which enable your system to operate under Windows® XP, Windows® 7 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.

4.2 BIOS

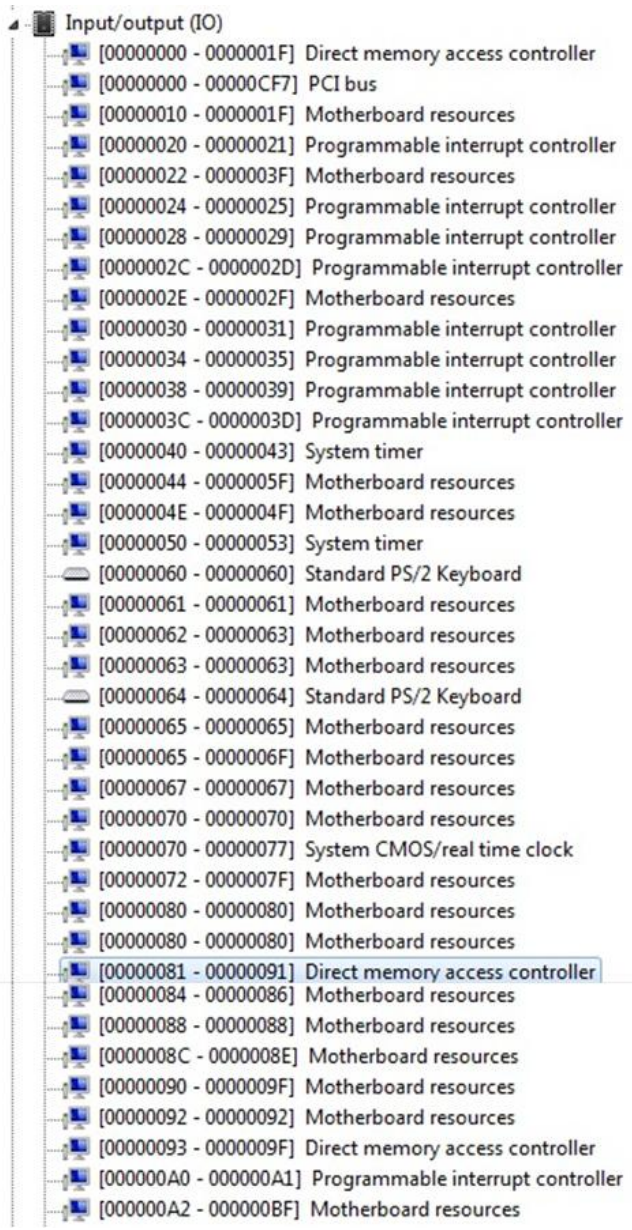
The MANO831 Series uses AMI Plug and Play BIOS with a single 16Mbit SPI Flash.

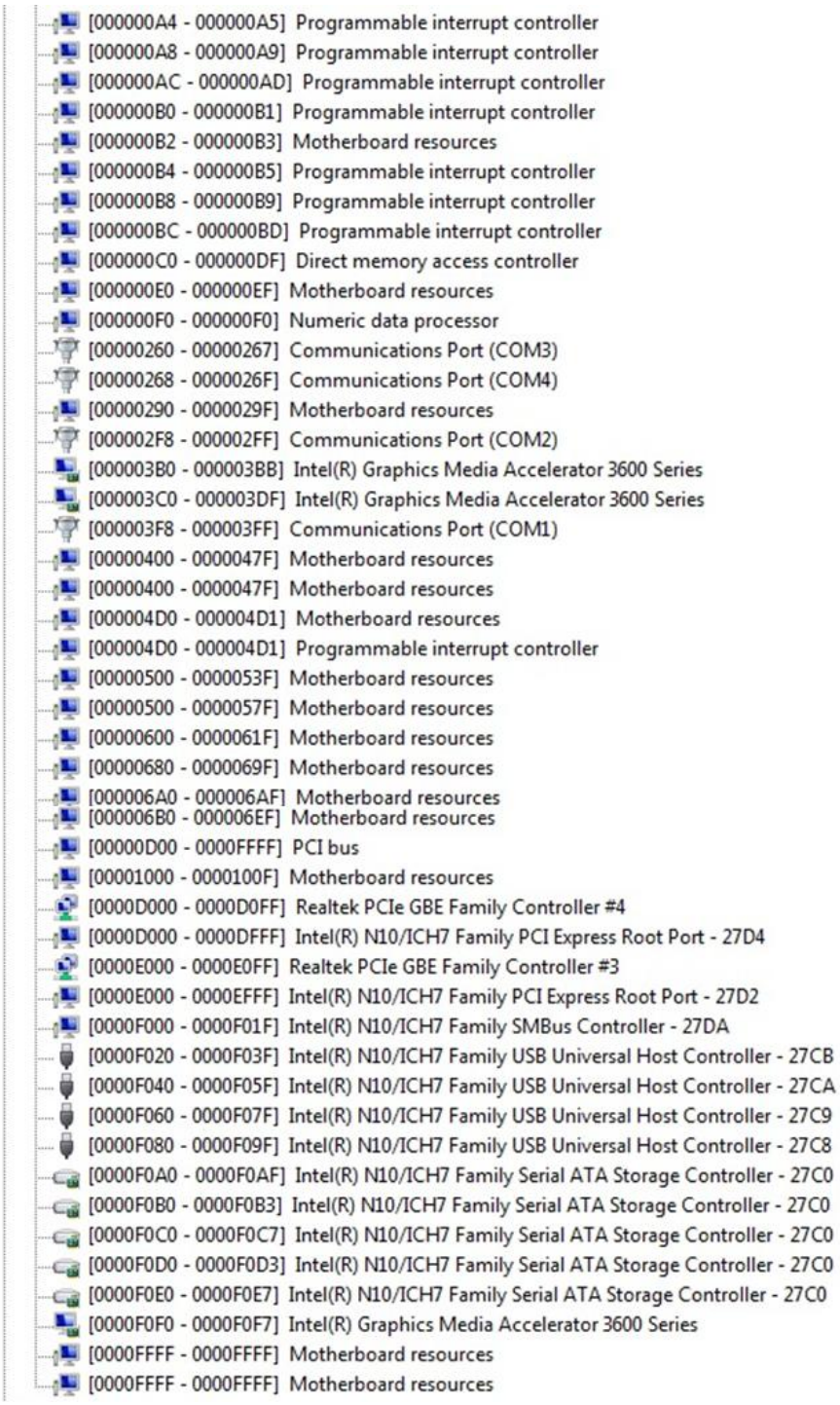
4.3 System Memory

The MANO831 Series supports two 204-pin DDR3 SO-DIMM sockets for a maximum memory of 4GB DDR3 SDRAMs. The memory module comes in sizes of 1GB and 2GB.

4.4 I/O Port Address Map

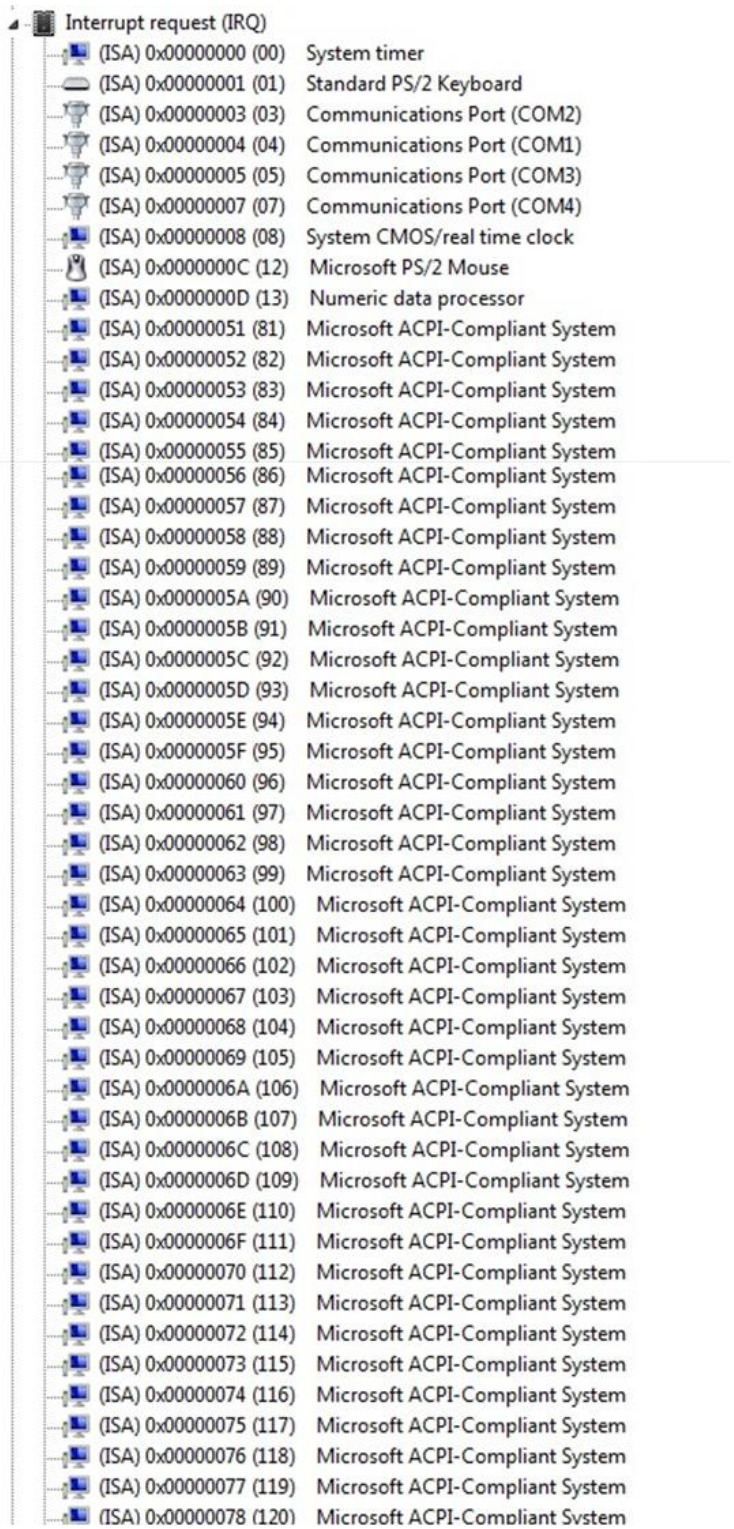
The Intel® Atom™ D2550 processors communicate via I/O ports. Total 1KB port addresses are available for assigning to other devices via I/O expansion cards.

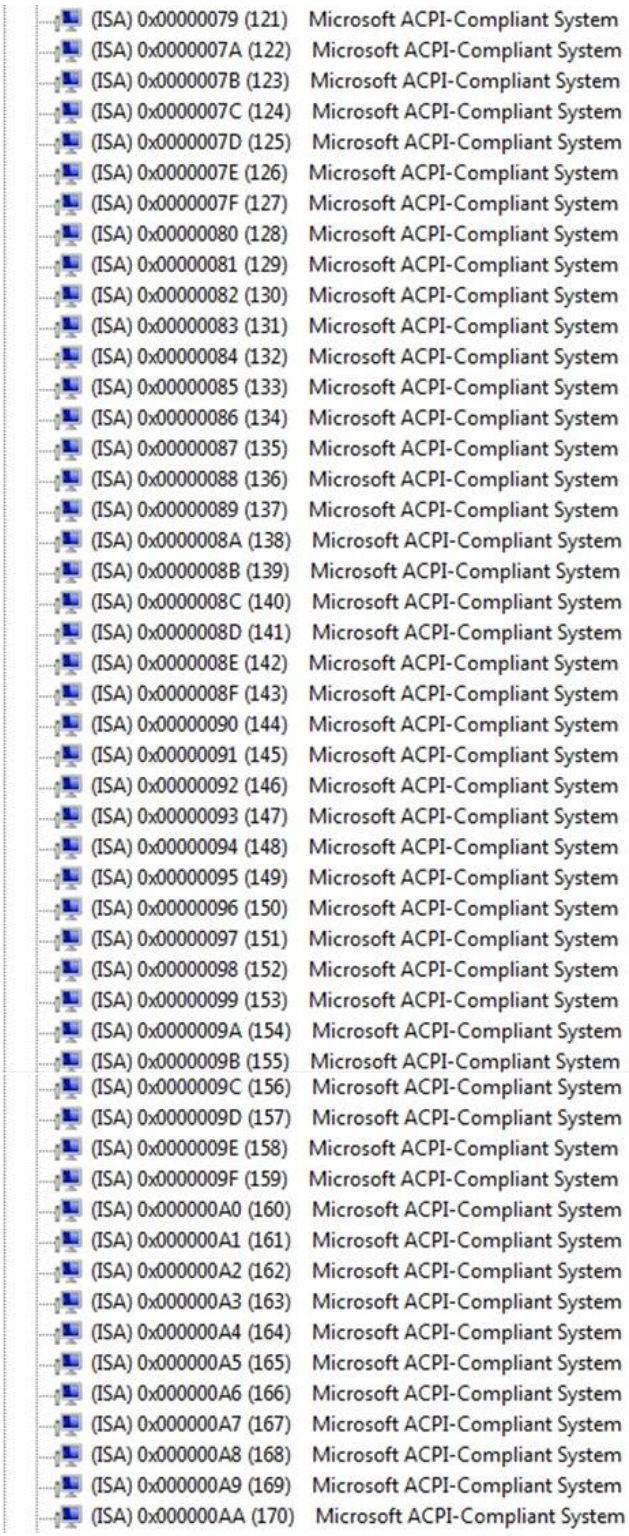


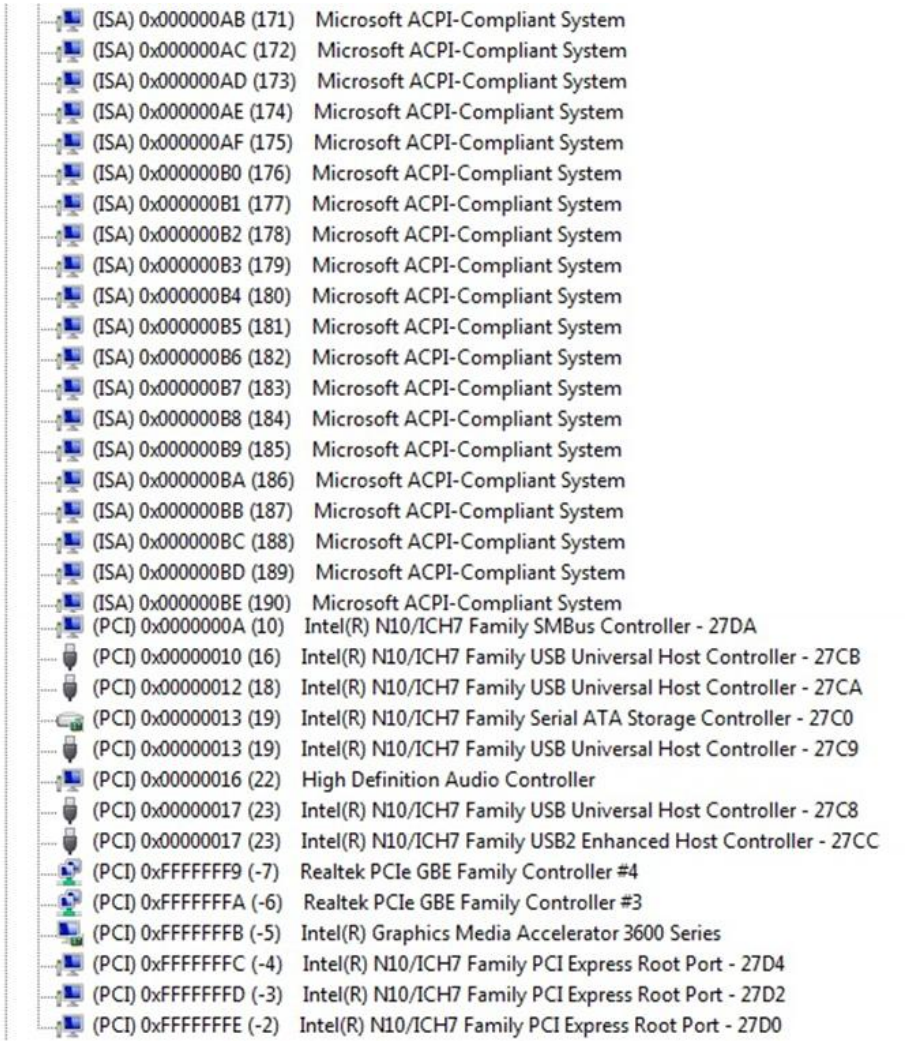

[000000A4 - 000000A5] Programmable interrupt controller
[000000A8 - 000000A9] Programmable interrupt controller
[000000AC - 000000AD] Programmable interrupt controller
[000000B0 - 000000B1] Programmable interrupt controller
[000000B2 - 000000B3] Motherboard resources
[000000B4 - 000000B5] Programmable interrupt controller
[000000B8 - 000000B9] Programmable interrupt controller
[000000BC - 000000BD] Programmable interrupt controller
[000000C0 - 000000DF] Direct memory access controller
[000000E0 - 000000EF] Motherboard resources
[000000F0 - 000000F0] Numeric data processor
[00000260 - 00000267] Communications Port (COM3)
[00000268 - 0000026F] Communications Port (COM4)
[00000290 - 0000029F] Motherboard resources
[000002F8 - 000002FF] Communications Port (COM2)
[000003B0 - 000003BB] Intel(R) Graphics Media Accelerator 3600 Series
[000003C0 - 000003DF] Intel(R) Graphics Media Accelerator 3600 Series
[000003F8 - 000003FF] Communications Port (COM1)
[00000400 - 0000047F] Motherboard resources
[00000400 - 0000047F] Motherboard resources
[000004D0 - 000004D1] Motherboard resources
[000004D0 - 000004D1] Programmable interrupt controller
[00000500 - 0000053F] Motherboard resources
[00000500 - 0000057F] Motherboard resources
[00000600 - 0000061F] Motherboard resources
[00000680 - 0000069F] Motherboard resources
[000006A0 - 000006AF] Motherboard resources
[000006B0 - 000006EF] Motherboard resources
[00000D00 - 0000FFFF] PCI bus
[00001000 - 0000100F] Motherboard resources
[0000D000 - 0000D0FF] Realtek PCIe GBE Family Controller #4
[0000D000 - 0000DFFF] Intel(R) N10/ICH7 Family PCI Express Root Port - 27D4
[0000E000 - 0000E0FF] Realtek PCIe GBE Family Controller #3
[0000E000 - 0000EFFF] Intel(R) N10/ICH7 Family PCI Express Root Port - 27D2
[0000F000 - 0000F01F] Intel(R) N10/ICH7 Family SMBus Controller - 27DA
[0000F020 - 0000F03F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CB
[0000F040 - 0000F05F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CA
[0000F060 - 0000F07F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C9
[0000F080 - 0000F09F] Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C8
[0000F0A0 - 0000F0AF] Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
[0000F0B0 - 0000F0B3] Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
[0000F0C0 - 0000F0C7] Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
[0000F0D0 - 0000F0D3] Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
[0000F0E0 - 0000F0E7] Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
[0000F0F0 - 0000F0F7] Intel(R) Graphics Media Accelerator 3600 Series
[0000FFFF - 0000FFFF] Motherboard resources
[0000FFFF - 0000FFFF] Motherboard resources

4.5 Interrupt Controller (IRQ) Map

The interrupt controller (IRQ) mapping list is shown as follows:

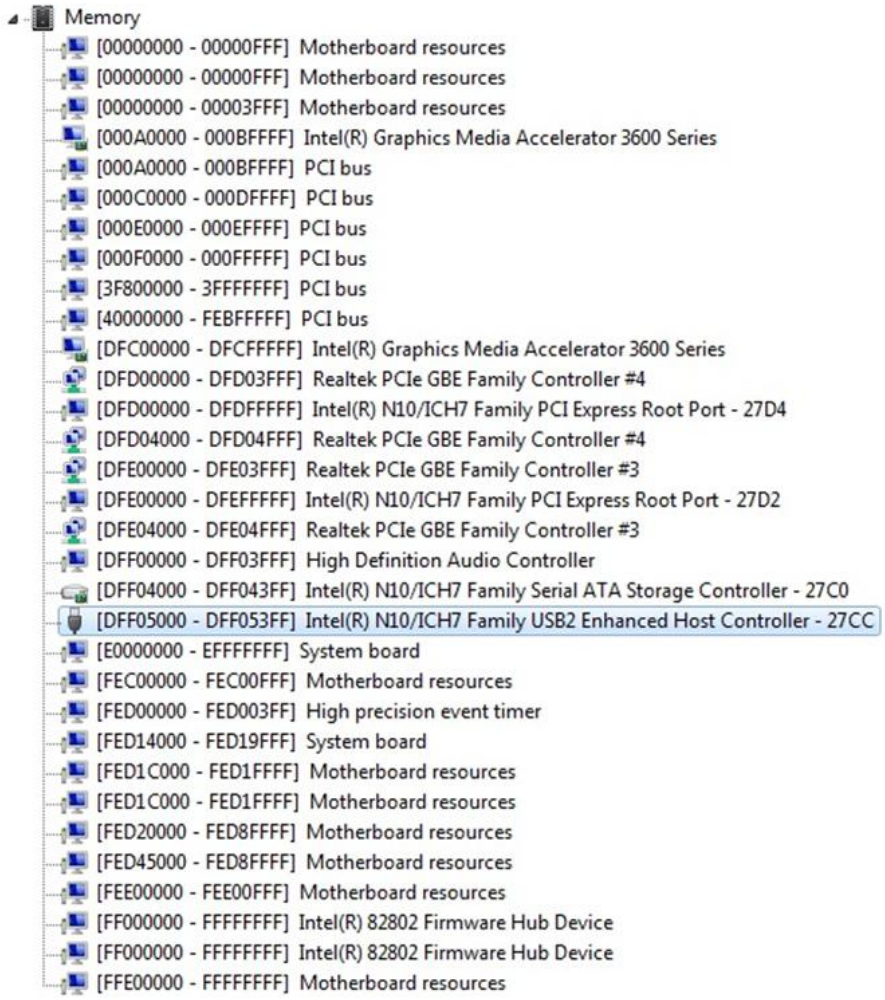



(ISA) 0x00000079 (121) Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122) Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123) Microsoft ACPI-Compliant System
(ISA) 0x0000007C (124) Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125) Microsoft ACPI-Compliant System
(ISA) 0x0000007E (126) Microsoft ACPI-Compliant System
(ISA) 0x0000007F (127) Microsoft ACPI-Compliant System
(ISA) 0x00000080 (128) Microsoft ACPI-Compliant System
(ISA) 0x00000081 (129) Microsoft ACPI-Compliant System
(ISA) 0x00000082 (130) Microsoft ACPI-Compliant System
(ISA) 0x00000083 (131) Microsoft ACPI-Compliant System
(ISA) 0x00000084 (132) Microsoft ACPI-Compliant System
(ISA) 0x00000085 (133) Microsoft ACPI-Compliant System
(ISA) 0x00000086 (134) Microsoft ACPI-Compliant System
(ISA) 0x00000087 (135) Microsoft ACPI-Compliant System
(ISA) 0x00000088 (136) Microsoft ACPI-Compliant System
(ISA) 0x00000089 (137) Microsoft ACPI-Compliant System
(ISA) 0x0000008A (138) Microsoft ACPI-Compliant System
(ISA) 0x0000008B (139) Microsoft ACPI-Compliant System
(ISA) 0x0000008C (140) Microsoft ACPI-Compliant System
(ISA) 0x0000008D (141) Microsoft ACPI-Compliant System
(ISA) 0x0000008E (142) Microsoft ACPI-Compliant System
(ISA) 0x0000008F (143) Microsoft ACPI-Compliant System
(ISA) 0x00000090 (144) Microsoft ACPI-Compliant System
(ISA) 0x00000091 (145) Microsoft ACPI-Compliant System
(ISA) 0x00000092 (146) Microsoft ACPI-Compliant System
(ISA) 0x00000093 (147) Microsoft ACPI-Compliant System
(ISA) 0x00000094 (148) Microsoft ACPI-Compliant System
(ISA) 0x00000095 (149) Microsoft ACPI-Compliant System
(ISA) 0x00000096 (150) Microsoft ACPI-Compliant System
(ISA) 0x00000097 (151) Microsoft ACPI-Compliant System
(ISA) 0x00000098 (152) Microsoft ACPI-Compliant System
(ISA) 0x00000099 (153) Microsoft ACPI-Compliant System
(ISA) 0x0000009A (154) Microsoft ACPI-Compliant System
(ISA) 0x0000009B (155) Microsoft ACPI-Compliant System
(ISA) 0x0000009C (156) Microsoft ACPI-Compliant System
(ISA) 0x0000009D (157) Microsoft ACPI-Compliant System
(ISA) 0x0000009E (158) Microsoft ACPI-Compliant System
(ISA) 0x0000009F (159) Microsoft ACPI-Compliant System
(ISA) 0x000000A0 (160) Microsoft ACPI-Compliant System
(ISA) 0x000000A1 (161) Microsoft ACPI-Compliant System
(ISA) 0x000000A2 (162) Microsoft ACPI-Compliant System
(ISA) 0x000000A3 (163) Microsoft ACPI-Compliant System
(ISA) 0x000000A4 (164) Microsoft ACPI-Compliant System
(ISA) 0x000000A5 (165) Microsoft ACPI-Compliant System
(ISA) 0x000000A6 (166) Microsoft ACPI-Compliant System
(ISA) 0x000000A7 (167) Microsoft ACPI-Compliant System
(ISA) 0x000000A8 (168) Microsoft ACPI-Compliant System
(ISA) 0x000000A9 (169) Microsoft ACPI-Compliant System
(ISA) 0x000000AA (170) Microsoft ACPI-Compliant System


(ISA) 0x000000AB (171) Microsoft ACPI-Compliant System
(ISA) 0x000000AC (172) Microsoft ACPI-Compliant System
(ISA) 0x000000AD (173) Microsoft ACPI-Compliant System
(ISA) 0x000000AE (174) Microsoft ACPI-Compliant System
(ISA) 0x000000AF (175) Microsoft ACPI-Compliant System
(ISA) 0x000000B0 (176) Microsoft ACPI-Compliant System
(ISA) 0x000000B1 (177) Microsoft ACPI-Compliant System
(ISA) 0x000000B2 (178) Microsoft ACPI-Compliant System
(ISA) 0x000000B3 (179) Microsoft ACPI-Compliant System
(ISA) 0x000000B4 (180) Microsoft ACPI-Compliant System
(ISA) 0x000000B5 (181) Microsoft ACPI-Compliant System
(ISA) 0x000000B6 (182) Microsoft ACPI-Compliant System
(ISA) 0x000000B7 (183) Microsoft ACPI-Compliant System
(ISA) 0x000000B8 (184) Microsoft ACPI-Compliant System
(ISA) 0x000000B9 (185) Microsoft ACPI-Compliant System
(ISA) 0x000000BA (186) Microsoft ACPI-Compliant System
(ISA) 0x000000BB (187) Microsoft ACPI-Compliant System
(ISA) 0x000000BC (188) Microsoft ACPI-Compliant System
(ISA) 0x000000BD (189) Microsoft ACPI-Compliant System
(ISA) 0x000000BE (190) Microsoft ACPI-Compliant System
(PCI) 0x0000000A (10) Intel(R) N10/ICH7 Family SMBus Controller - 27DA
(PCI) 0x00000010 (16) Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CB
(PCI) 0x00000012 (18) Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CA
(PCI) 0x00000013 (19) Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
(PCI) 0x00000013 (19) Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C9
(PCI) 0x00000016 (22) High Definition Audio Controller
(PCI) 0x00000017 (23) Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C8
(PCI) 0x00000017 (23) Intel(R) N10/ICH7 Family USB2 Enhanced Host Controller - 27CC
(PCI) 0xFFFFFFF9 (-7) Realtek PCIe GBE Family Controller #4
(PCI) 0xFFFFFFFA (-6) Realtek PCIe GBE Family Controller #3
(PCI) 0xFFFFFFFB (-5) Intel(R) Graphics Media Accelerator 3600 Series
(PCI) 0xFFFFFFFC (-4) Intel(R) N10/ICH7 Family PCI Express Root Port - 27D4
(PCI) 0xFFFFFFFD (-3) Intel(R) N10/ICH7 Family PCI Express Root Port - 27D2
(PCI) 0xFFFFFFFE (-2) Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0

4.6 Memory Map

The memory mapping list is shown as follows:



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Chapter 5
AMI BIOS Setup Utility

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

5.1 Starting

To enter the setup screens, follow the steps below:

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

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

5.2 Navigation Keys

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

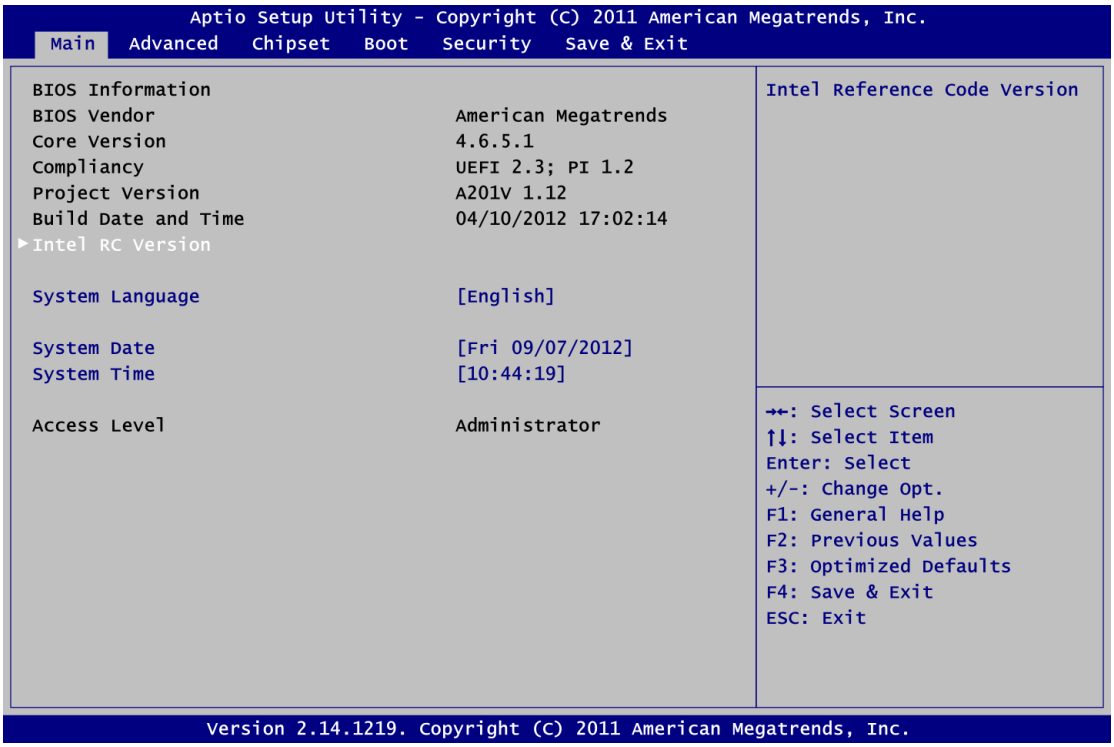
Note

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

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

5.3 Main Menu

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



BIOS Information
Display the auto-detected BIOS information.

Intel RC Version
Intel Reference Code version.

System Language
Use this option to choose the system default language.

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

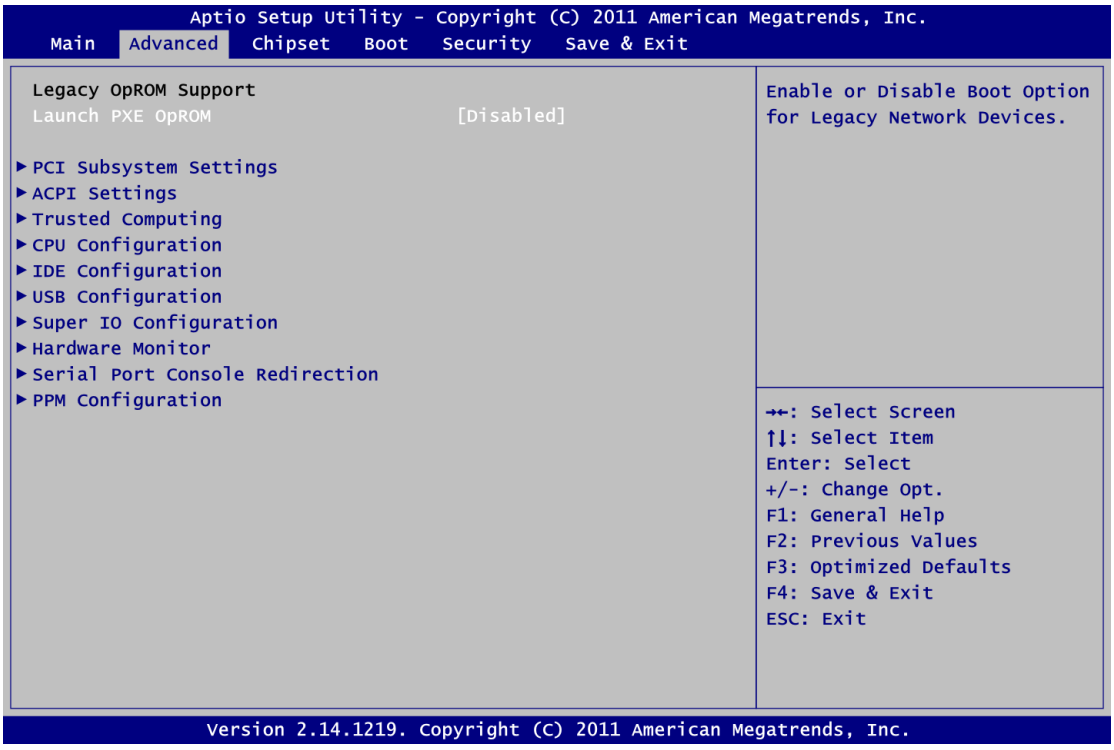
5.4 Advanced Menu

- **Launch PXE OpROM**
  Enable or disable the boot ROM function of the onboard LAN chip when the system boots up.

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

- ► PCI Subsystem Settings
- ► ACPI Settings
- ► Trusted Computing
- ► CPU Configuration
- ► IDE Configuration
- ► USB Configuration
- ► Super IO Configuration
- ► Hardware Monitor
- ► Serial Port Console Redirection
- ► PPM Configuration

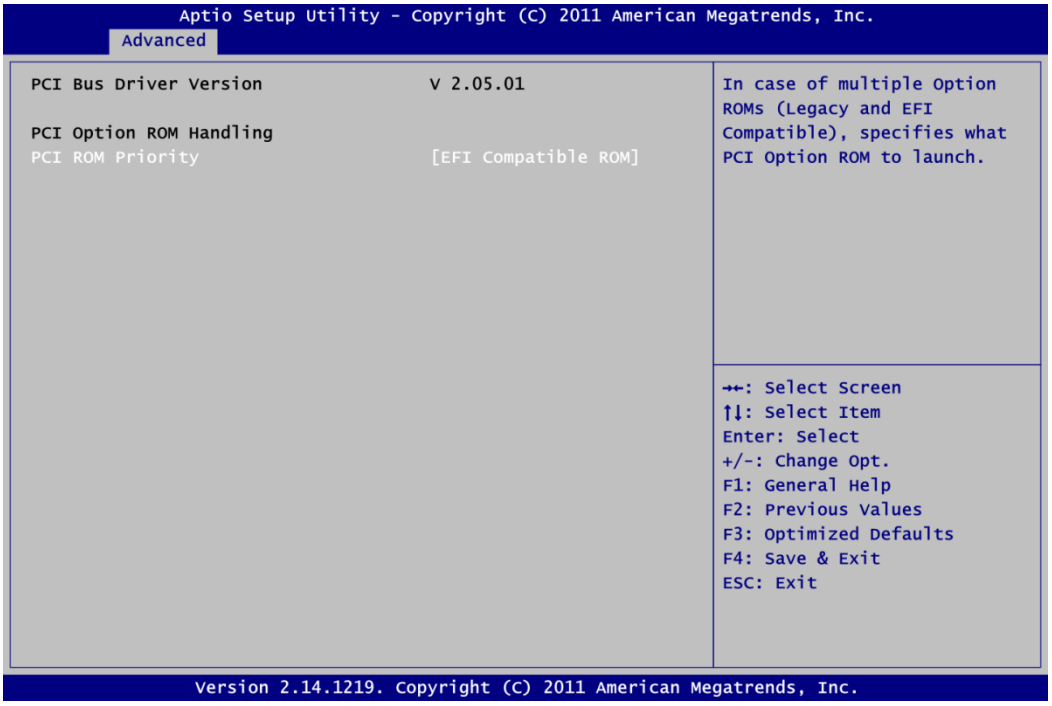
For items marked with "►", please press <Enter> for more options.



Caution

Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

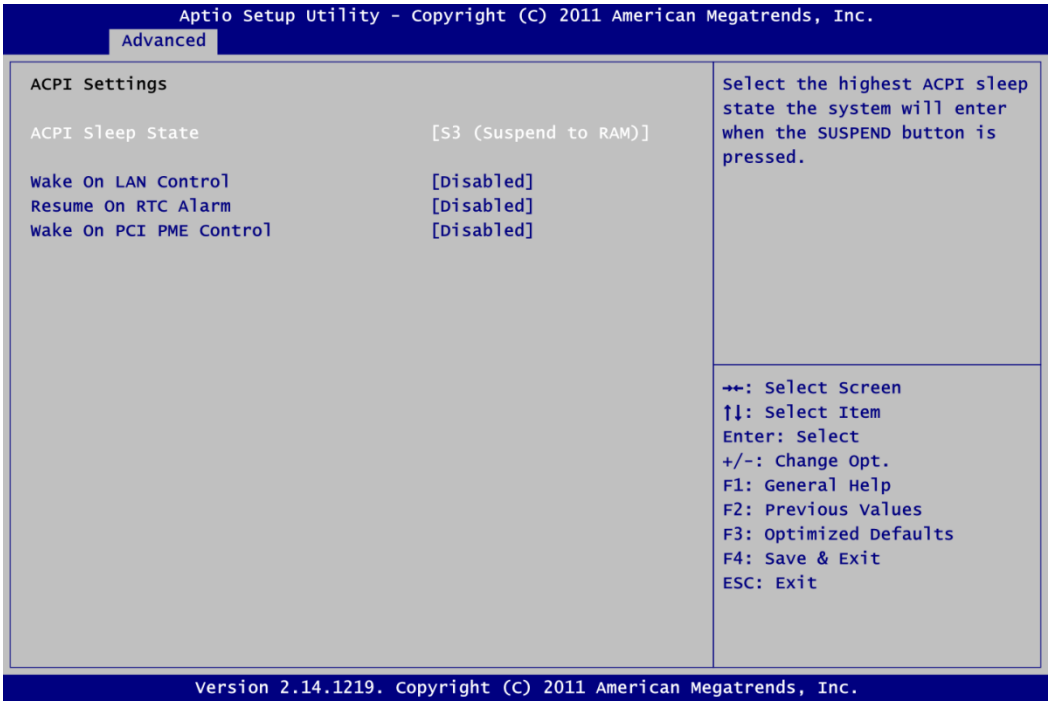
- **PCI Subsystem Settings**
  You can use this screen to select options for PCI subsystem settings, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



PCI Bus Driver Version
Display the information of PCI bus driver version.

PCI ROM Priority
In case of multiple option ROMs (Legacy and EFI Compatible), specifies what PCI option ROM to launch.

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



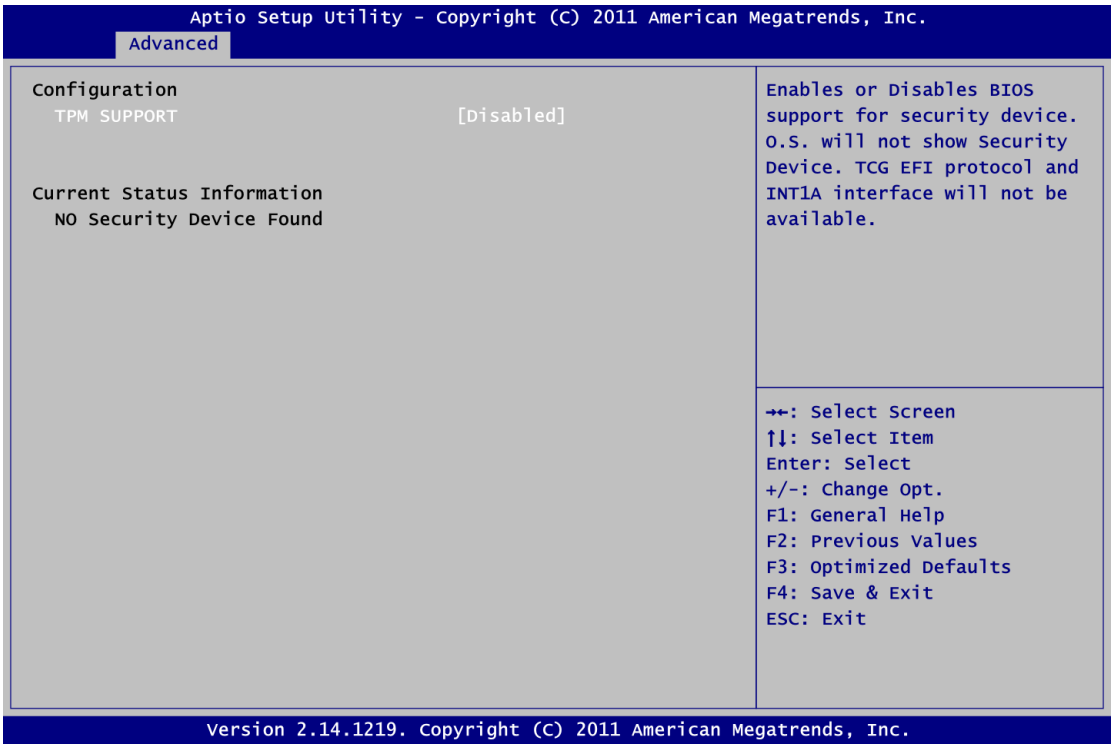
ACPI Sleep State
Select the ACPI sleep state the system will enter when the suspend button is pressed. Configuration options are Suspend Disabled, S1 only (CPU Stop Clock), and S3 only (Suspend to RAM).

Wake On LAN Control
Enable or disable Wake on LAN control.

Resume On RTC Alarm
Enable or disable system wake on alarm even. When enabled, system will wake upon the hr/min/sec specified.

Wake On PCI PME Control
Enable or disable Wake on PCI PME control.

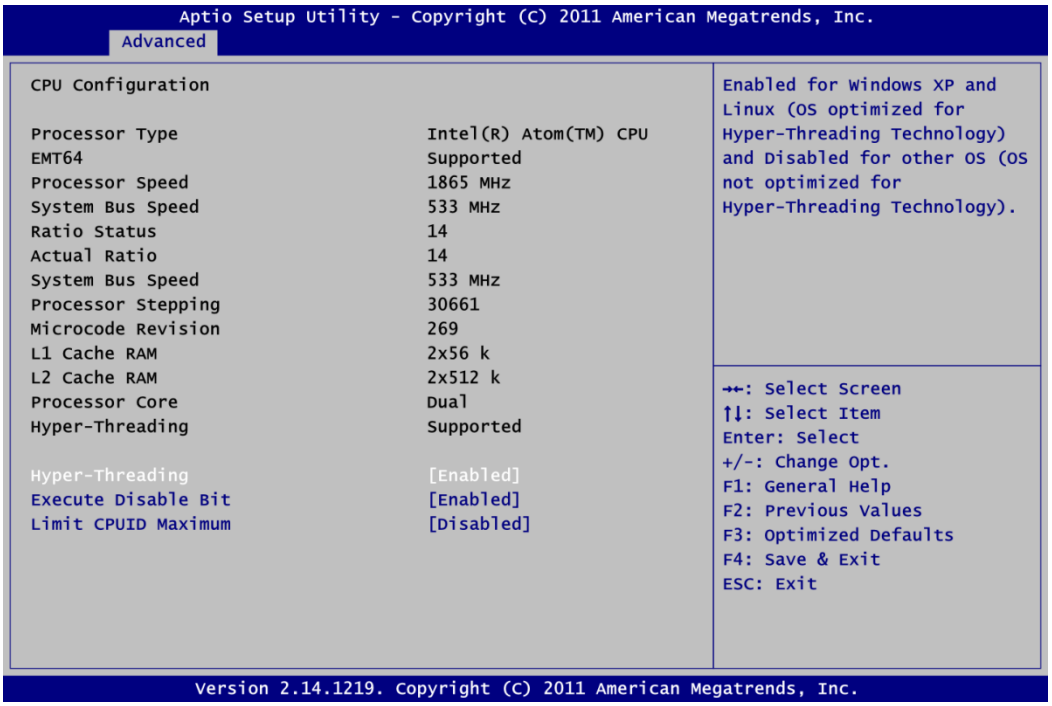
- **Trusted Computing**
  This screen provides function for specifying the Trusted Platform Module (TPM) settings.



TPM Support
Enable or disable TPM support.

Current Status Information
Display current TPM status information.

- **CPU Configuration**
  This screen shows the CPU information.

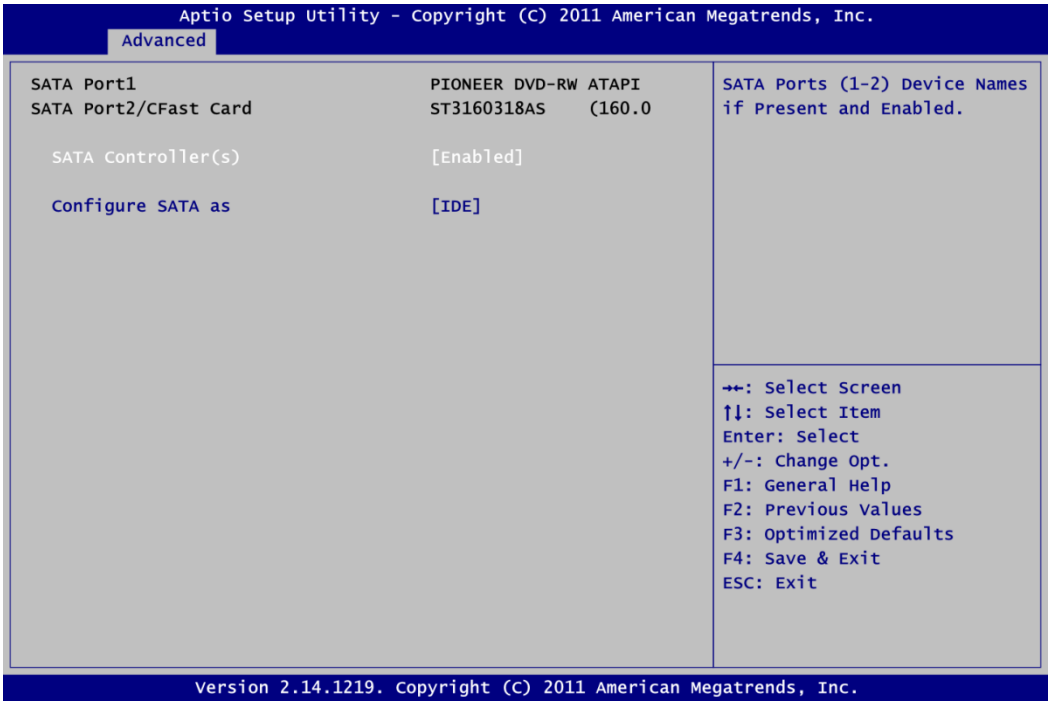


Hyper-threading
Use this item to enable or disable Hyper-Threading Technology, which makes a single physical processor perform multi-tasking function as two logical ones.

Execute Disable Bit
Enable or disable the No-Execution Page Protection Technology.

Limit CPUID Maximum
You can enable this item to let legacy operating systems boot even without support for CPUs with extended CPU ID functions. This item should be disabled for Windows XP.

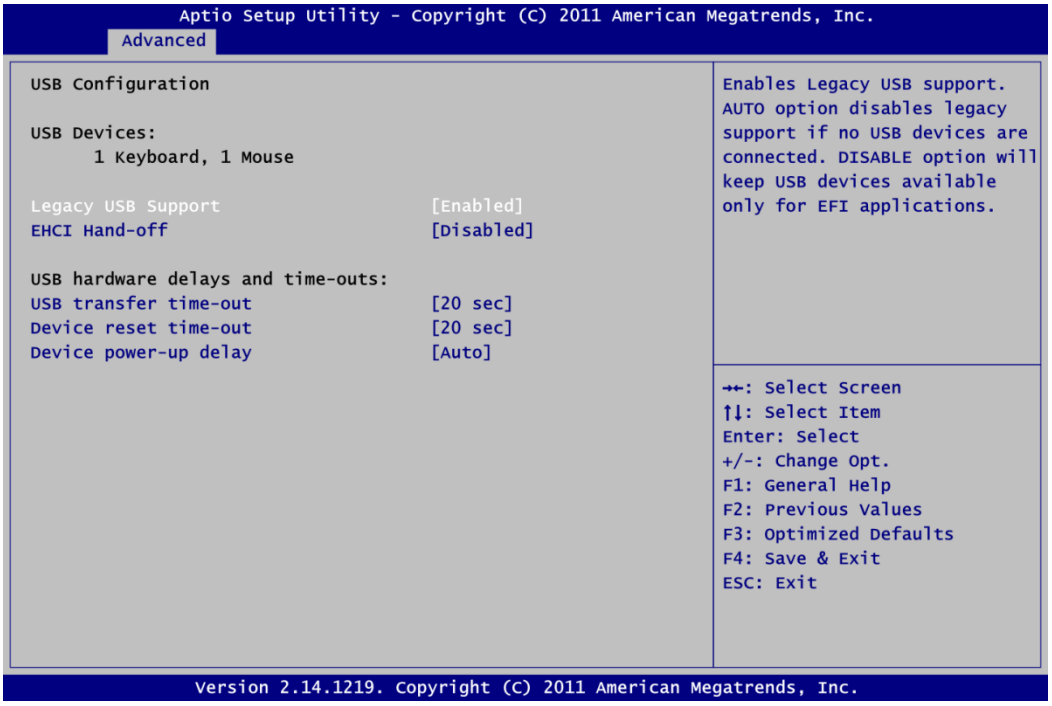
- **IDE Configuration**
  In this Configuration menu, you can see the currently installed hardware in the IDE ports. During system boot up, the BIOS automatically detects the presence of SATA devices.



SATA Controller(s)
Enable or disable SATA controller(s).

Configure SATA as
Determine how SATA controller(s) operate. Operation mode options are IDE Mode, AHCI Mode and RAID Mode.

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



USB Devices
Display all detected USB devices.

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

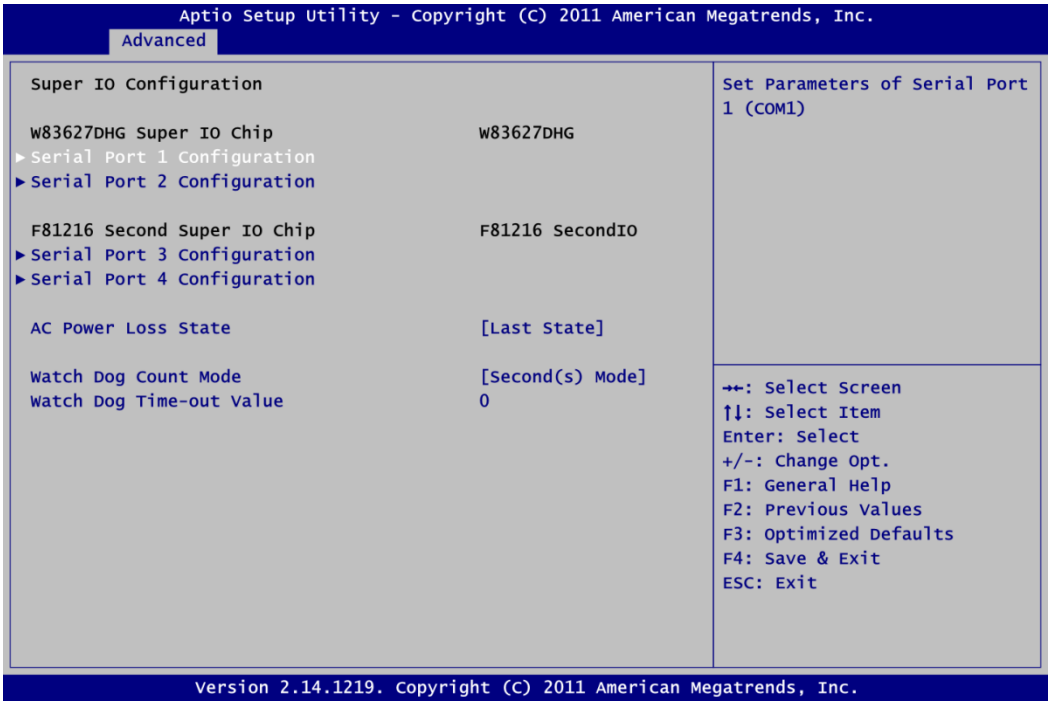
EHCI Hand-off
This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

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

Device reset time-out
USB mass storage device start unit command time-out.

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

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



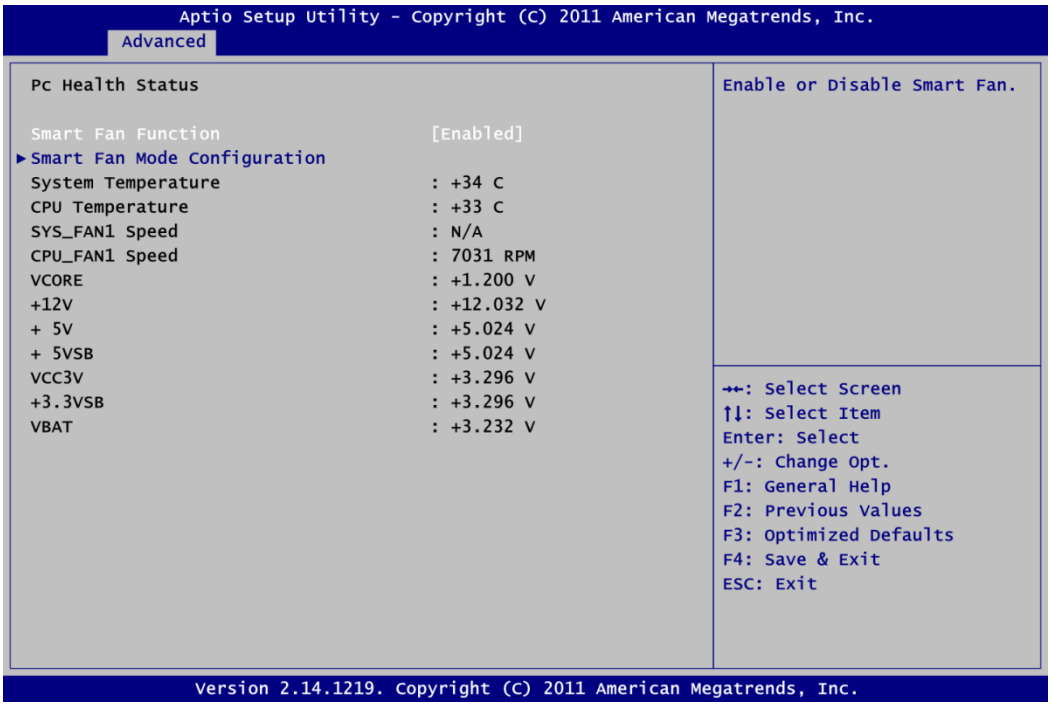
Serial Port 1~4 Configuration
Use this item to set parameters of serial port 1~4.

AC Power Loss State
Set the system power status when power returns from a power failure situation. The system power status options are Power Off, Power On and Last State.

Watch Dog Count Mode
Set watchdog count mode.

Watch Dog Time-out Value
Set watchdog time-out value.

- **Hardware Monitor**
  Use this screen for Smart Fan configuration and hardware health status monitoring.

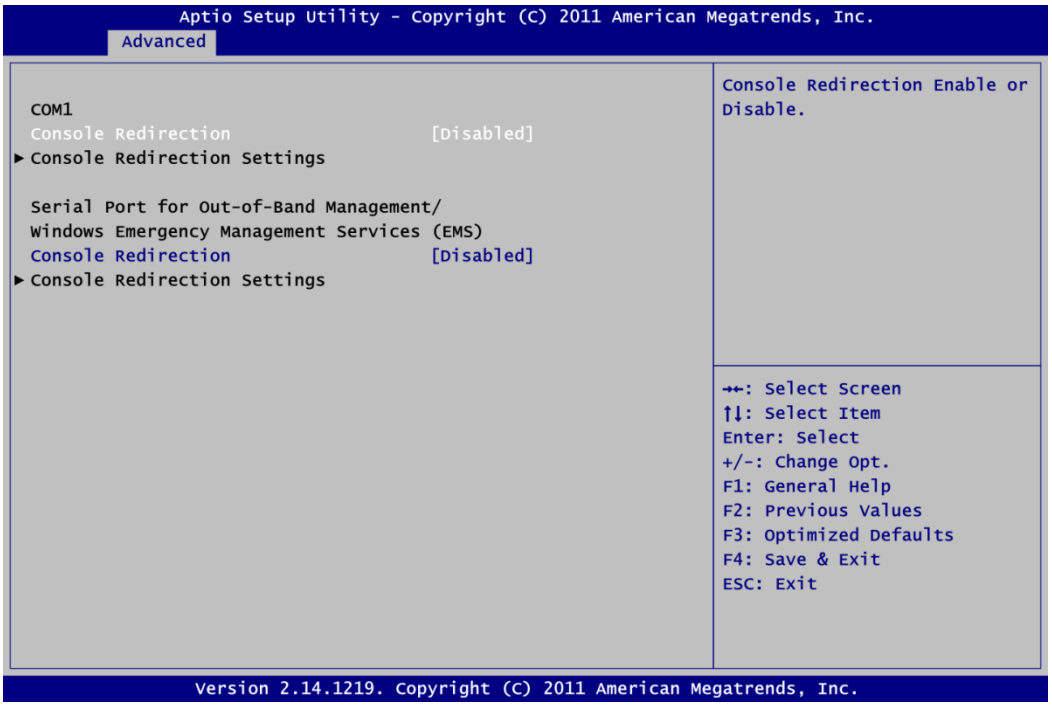


This screen displays the temperature of system and CPU, cooling fan speed in RPM and system voltages (VCORE, +12V, +5V, +5VSB, etc).

Smart Fan Function
Enable or disable Smart Fan.

Smart Fan Mode Configuration
Use this option for Smart Fan mode configuration.

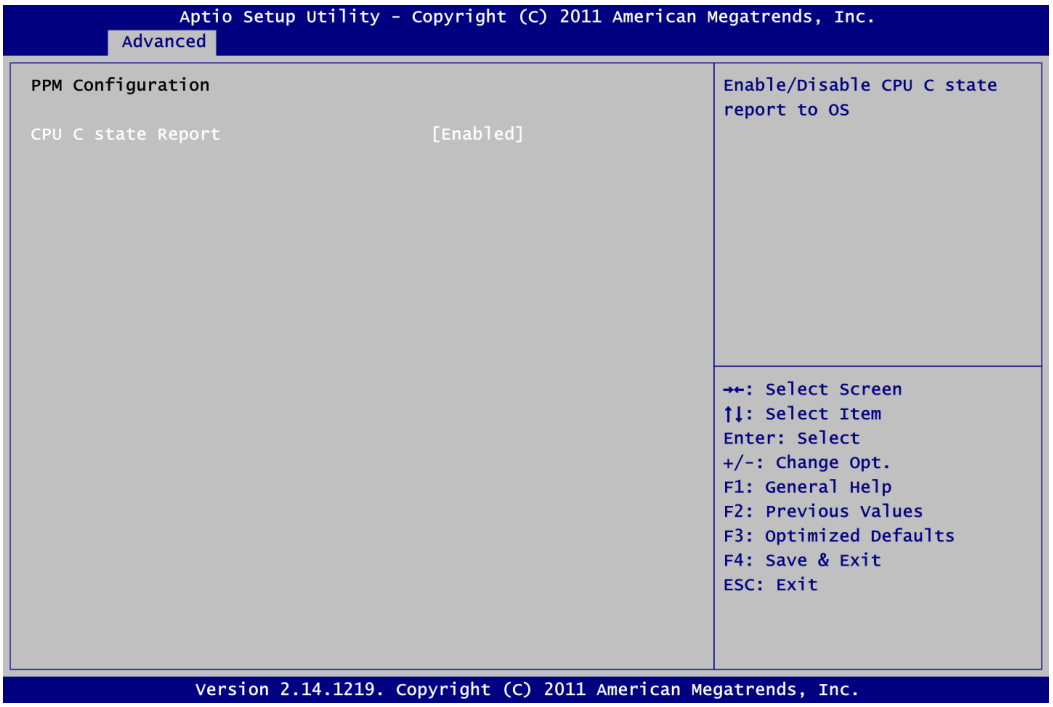
- **Serial Port Console Redirection**



Console Redirection
Enable or disable console redirection for Microsoft Windows Emergency Management Services (EMS).

Console Redirection Settings
Display console redirection settings screen.

- **PPM Configuration**
  Use this screen for PPM configuration.



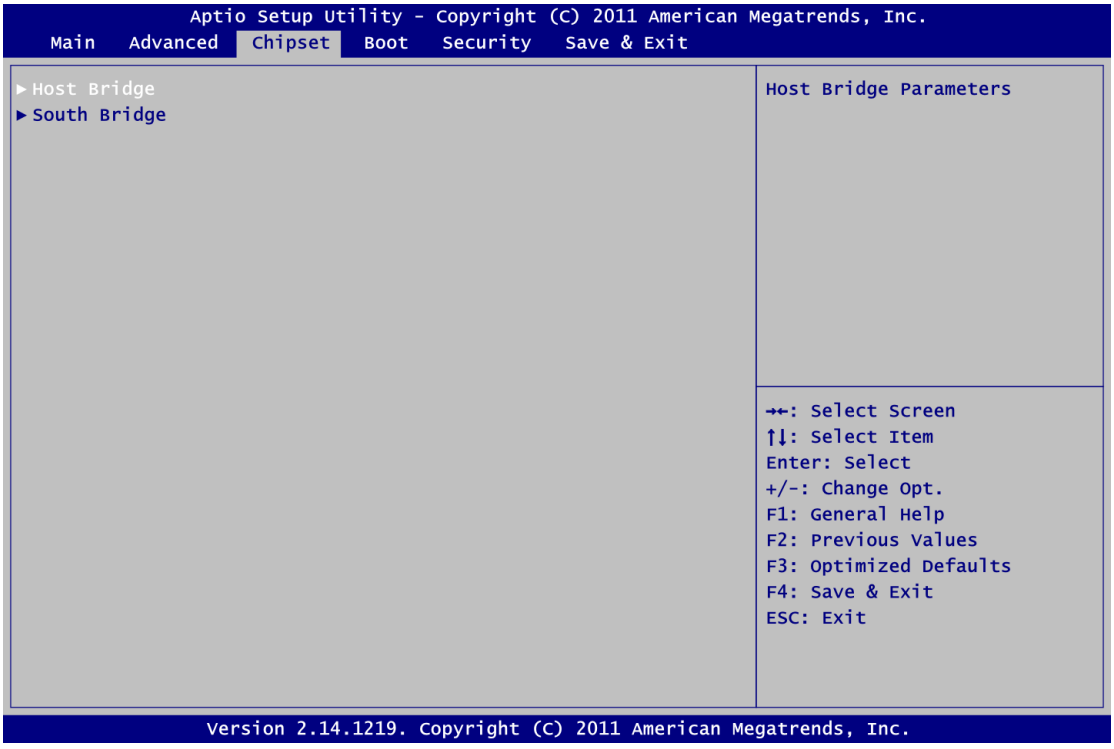
CPU C state Report
Enable or disable CPU C state report to OS.

5.5 Chipset Menu

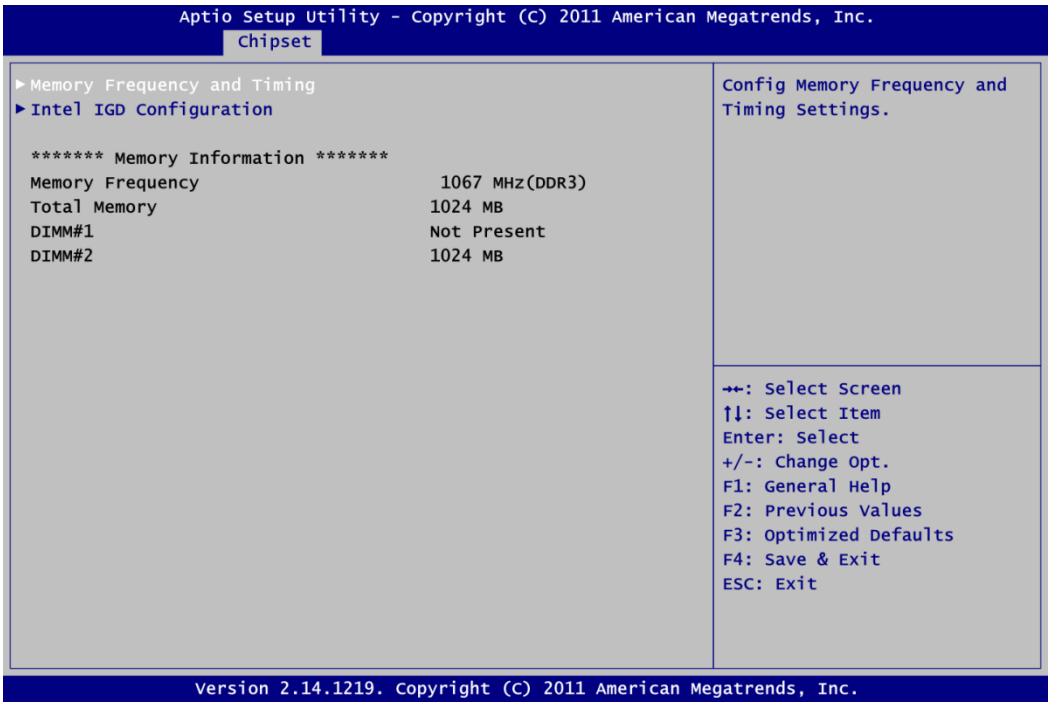
The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

- ► Host Bridge
- ► South Bridge

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



- **Host Bridge**
  This screen allows users to set Host Bridge parameters.

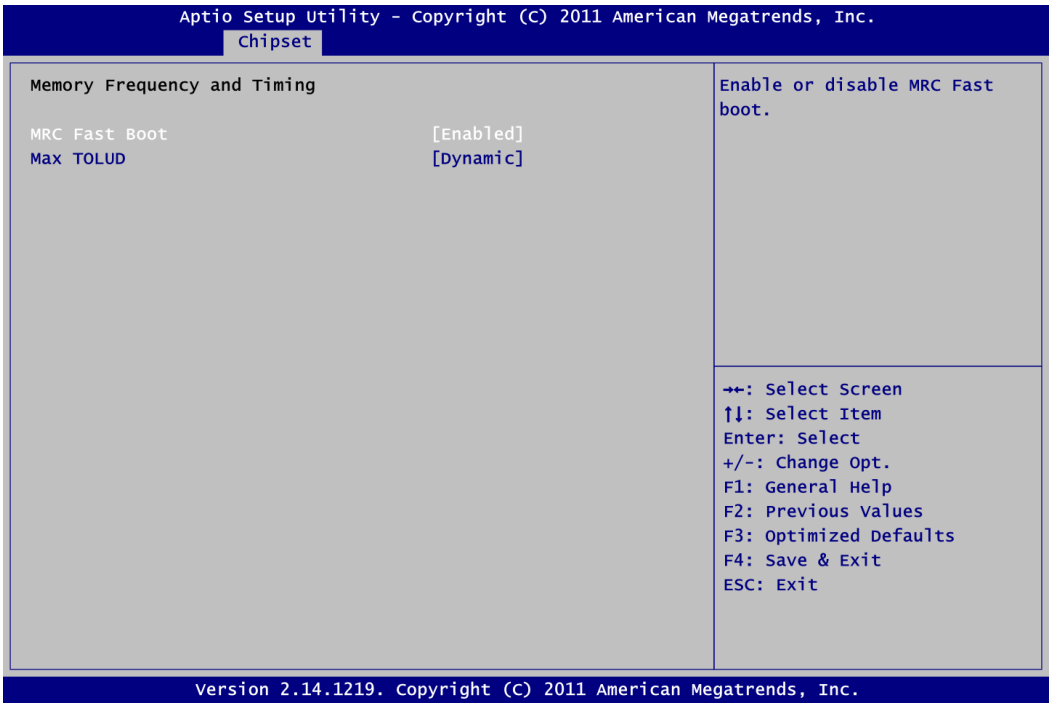


Memory Frequency and Timing
Display memory frequency and timing settings screen.

Intel IGD Configuration
Display internal graphics configuration screen.

Memory Information
Display detected memory information.

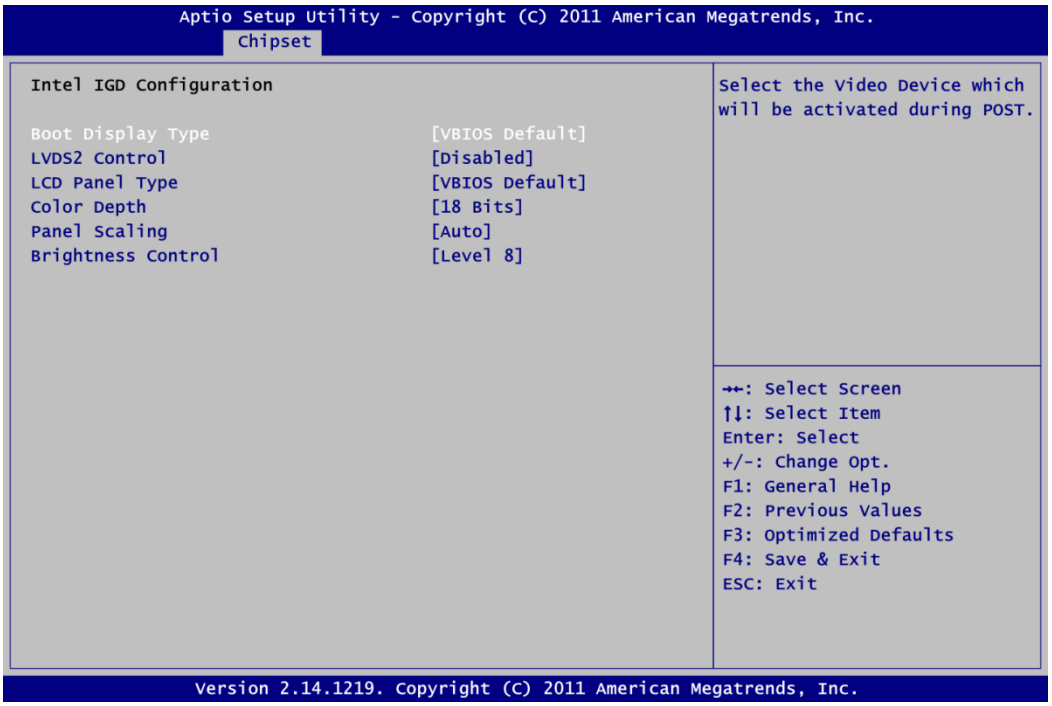
- **Memory Frequency and Timing**



MRC Fast Boot
Enable or disable MRC fast boot function.

Max TOLUD
Maximum value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.

- **Intel IGD Configuration**



Boot Display Type
Select the video device which will be activated during POST.

LVDS2 Control
Enable and disable LVDS2 control.

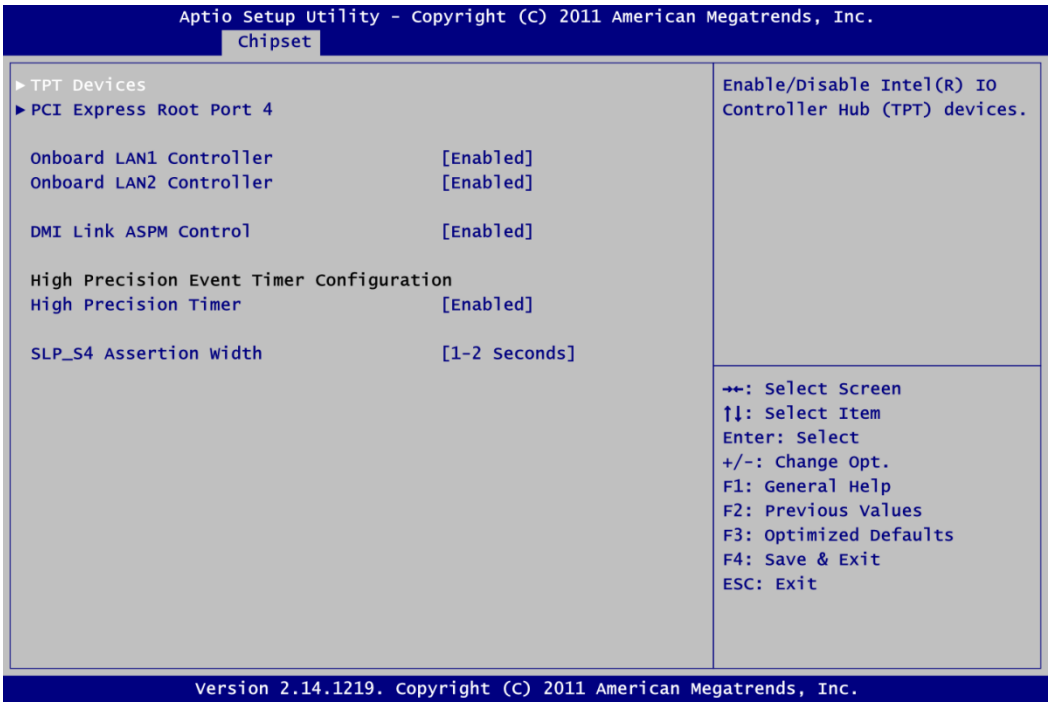
LCD Panel Type
Select LCD panel type for LVDS port.

Color Depth
Select the panel color depth. Configuration options are 18 Bit and 24 Bit.

Panel Scaling
This items allow users to set panel scaling.

Brightness Control
Select LVDS brightness control level.

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



TPT Devices
Enable or disable Intel® IO controller hub (TPT) devices.

PCI Express Root Port 4
Control the PCI Express root port.

Onboard LAN1/2 Controller
Enable or disable onboard LAN1/LAN2 controller.

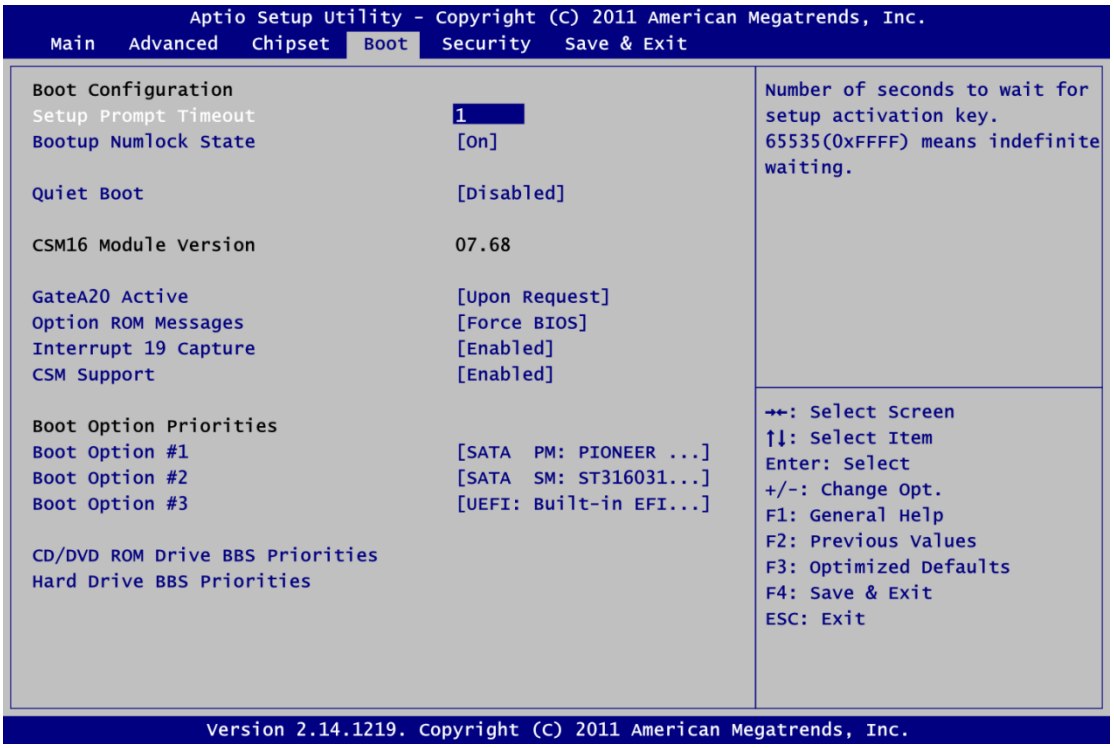
DMI Link ASPM Control
Enable or disable the control of Active State Power Management of the DMI Link.

High Precision Timer
Enable or disable the high precision timer

SLP_S4 Assertion Width
Set the minimum assertion width of the SLP_S4# signal to guarantee that the DRAMs have been safely power-cycled.

5.6 Boot Menu

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



- **Setup Prompt Timeout**
  Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

- **Bootup NumLock State**
  Use this item to select the power-on state for the keyboard NumLock.

- **Quiet Boot**
  Select to display either POST output messages or a splash screen during boot-up.

- **GateA20 Active**
  If Upon Request is selected, GA20 can be disabled using BIOS services. If Always is selected, disabling G20 is not allowed; this option is useful when any RT code is executed above 1MB.

- **Option ROM Messages**
  Set display mode for option ROM. Configuration options are Force BIOS and Keep Current.

- **Interrupt 19 Capture**
  If this item is enabled, this function makes the option ROMs to trap Interrupt 19. The default setting is Disabled.

- **CSM Support**
  Enable or disable CSM support.

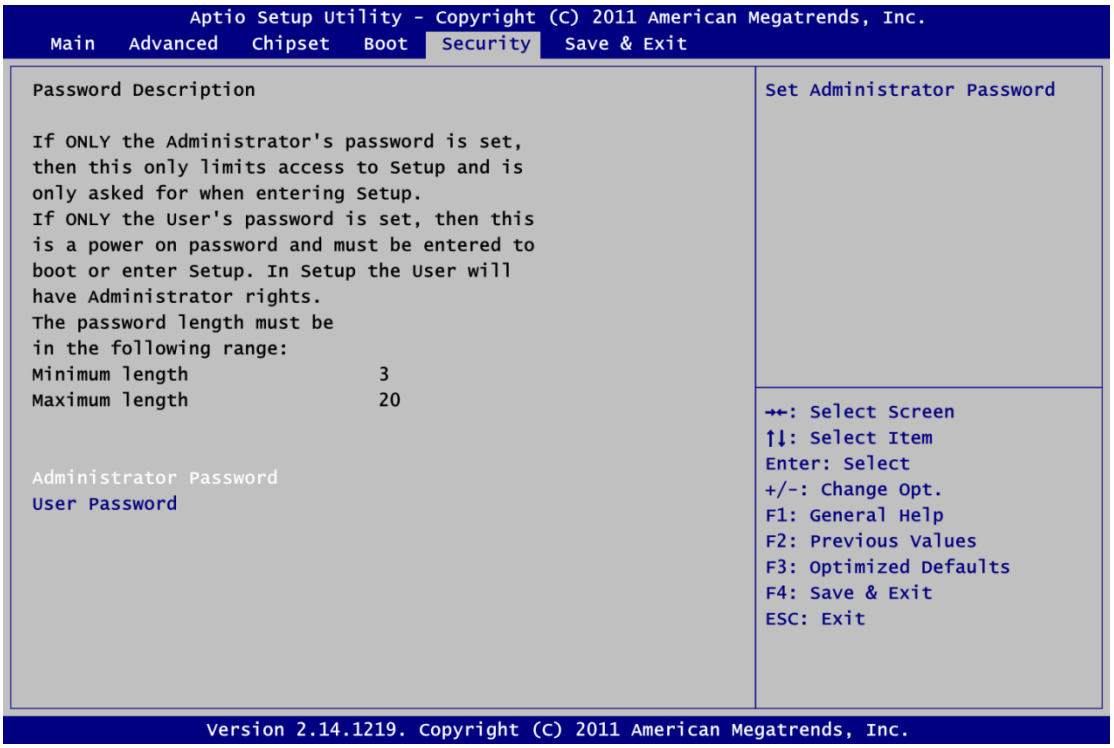
- **Boot Option Priorities**
  These are settings for boot priority. Specify the boot device priority sequence from the available devices.

- **Boot Option #1..#2**
  These items are used to form the boot order and are dynamically generated. They represent either a legacy BBS (BIOS Boot Specification) class of devices or a native EFI boot entry. Press <Return> on each option to select the BBS class / EFI boot entry desired.

- **CD/DVD ROM Drive BBS/Hard Drive BBS Priorities**
  These items are for configuring the boot order for a specific device class. These options are only visible if at least one device for this class is detected.

5.7 Security Menu

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

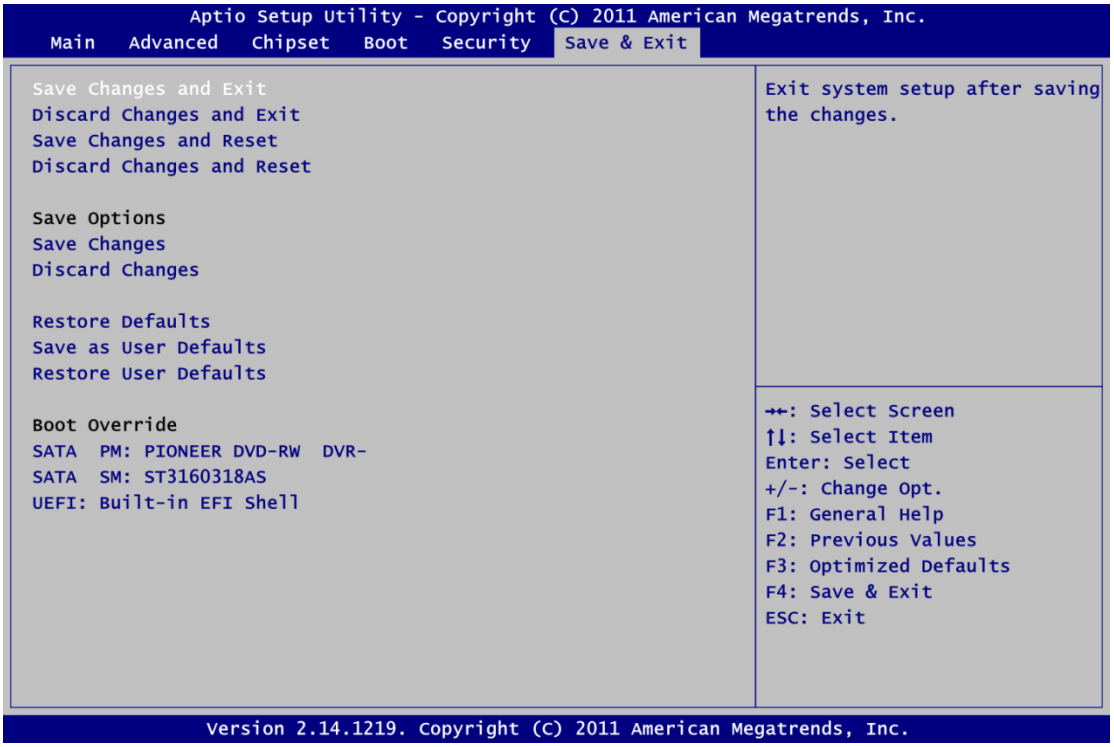


- **Administrator Password**
  This item indicates whether an administrator password has been set (installed or uninstalled).

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

5.8 Save & Exit Menu

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



- **Save Changes and Exit**
  When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

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

- **Save Changes and Reset**
  When 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 Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

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

- **Save Changes**
  When you have completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

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

- **Restore Defaults**
  It automatically sets all Setup options to a complete set of default settings when you select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.

- **Save as User Defaults**
  Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

- **Restore User Defaults**
  It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

- **Boot Override**
  Select a drive to immediately boot that device regardless of the current boot order.