BC87Q

Intel® Q87 with Core™ i7/ i5 /i3 ATX Motherboard

User's Manual

Ver. 1.1

Safety Information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

The symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

Safety Declaration

This device complies with the requirements in Part 15 of the FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This manual contains the following parts:

- **Chapter 1: Product introduction**
  This chapter describes the features of the motherboard and the new technology it supports. This chapter also lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.
- **Chapter 2: BIOS setup**
  This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor.

2. Optional documentation

Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

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


DANGER/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.

Typography

Bold text	Indicates a menu or an item to select
Italics	Used to emphasize a word or a phrase
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key Example: <Enter> means that you must press the Enter or Return key
<Key1>+<Key2>+<Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+) Example: <Ctrl>+<Alt>+<D>
Command	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets Example: At the DOS prompt, type the command line: **afudos /i[filename]** **afudos /iP5P800VM.ROM**

Packing List

Before you begin installing your single board, please make sure that the following materials have been shipped:

- 1 x BC87Q ATX Main board
- 2 x COM cable
- 2 x SATA cable
- 1 x I/O Shield

If any of the above items is damaged or missing, please contact your retailer.

Revision History

Revision	Revision History	Date
V 1.0	First release version	2013/08/20
V 1.1	Remove Manual from Packing List	2013/10/15

Specifications Summary

Features	**CPU**	Socket LGA1150 supports Core i7/i5/i3 CPU
	Chipset	Intel® Q87
	Memory	4 DIMM Up to 32GB Dual Channel DDR3 1600 MHz
	Display	Intel® GMA HD 4600 (GT2); DVMT Support up to 1.7GB Memory
	Audio	Realtek® ALC892, 5.1 with Multiple Streaming HD Audio
	LAN	Intel I210AT Gigabit Ethernet controller Intel I217 Gigabit Ethernet controller
	Expansion	1 x PCI-E x16 1 x PCI-E x4 2 x PCI-E x1 3 x PCI
	Rear I/O	1x PS2 MS/KB 2 x Display Port 1 x VGA & 1 x DVI-D 2 x Giga LAN & 4 x USB 3.0 1 x Audio included Line-in, Line-out, Microphone

Specifications

System	
CPU	Socket LGA1150 supports Core i7/i5/i3 CPU
BIOS	AMI 64 Mb BIOS
System Chipset	Intel® Q87
I/O Chipset	Nuvoton NCT6776F
Memory	4 DIMM Up to 32GB Dual Channel DDR3 1600 MHz
Watchdog Timer	Reset: 1 sec.~255 min. and 1 sec. or 1 min./step
H/W Status Monitor	Monitoring temperatures, voltages, and cooling fan status. Auto throttling control when CPU overheats
Expansion Slots	1 x PCI-E x16 1 x PCI-E x4 2 x PCI-E x1 3 x PCI
DIO	16 Bit
S3 / S4	Yes
TPM	TPM1.2 (Infineon® TPM chip 9635 TT 1.2 on board)
Wake up on LAN or Ring	LAN (PXE)
Smart Fan Control	Yes

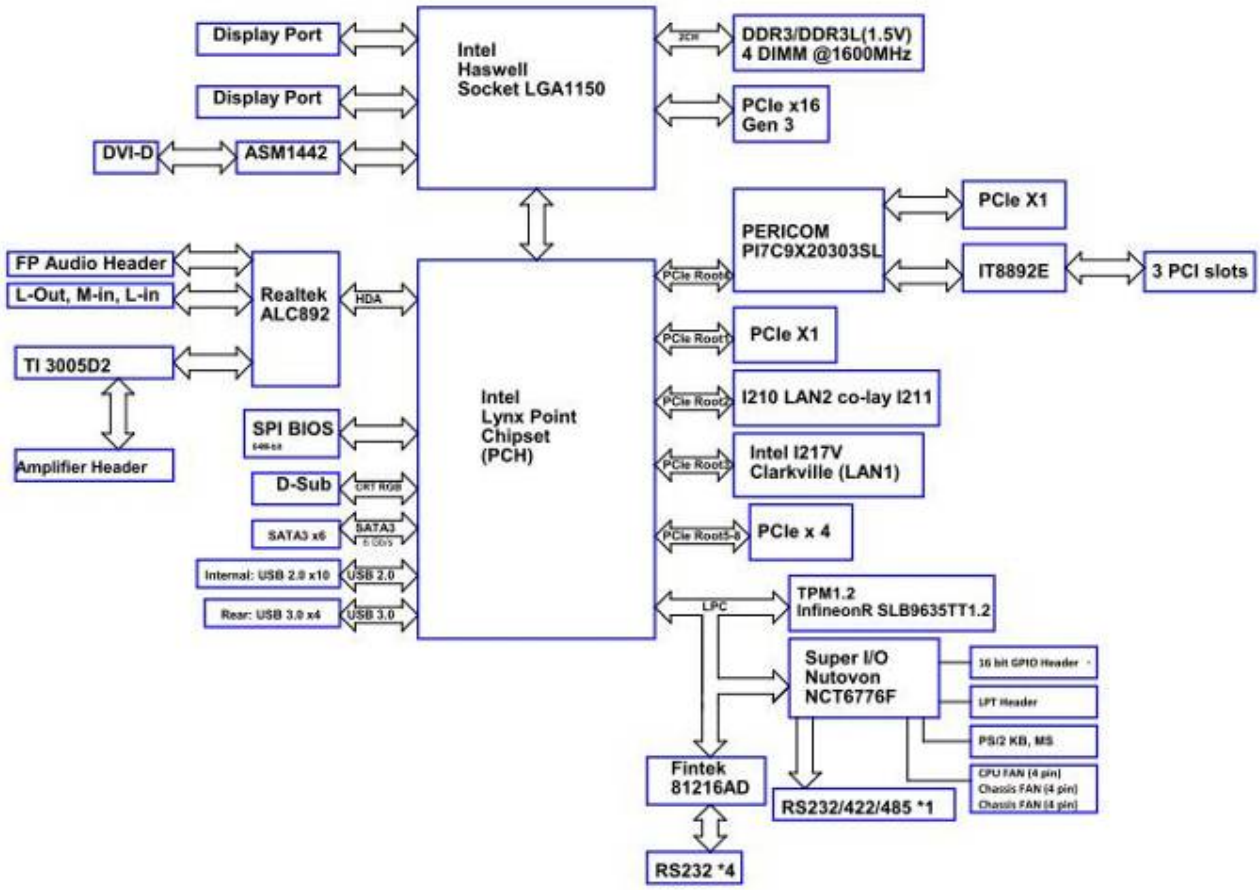
Display	
Chipset	Intel® HD Graphics 4600 (GT2) integrated
Display Memory	DVMT Support up to 1.7GB Memory
Max. Resolution	2048 x 1536 bpp(@ 75Hz)
Dual Display Port	on Board
VGA	on board
DVI	on board, via level shifter

Audio	
Audio Codec	Realtek® ALC892, 5.1 +2 with two independent Streaming
Audio Interface	Line in, Line Out, Mic-in

Ethernet	
LAN1	Intel i217LM GbLAN Controller
LAN2	Intel i210AT GbLAN Controller
Back I/O Port	
Back Panel	2 x Display Port 1 x VGA 1 x DVI-D 2 x RJ45 port 4 x USB 3.0 1 x 3 Audio Jacks(Line-in/Line-Out/Mic in)
Internal I/O Connector	
Internal I/O	6 x SATAIII connectors 5 x USB connectors support additional 10 USB 2.0 ports 5 x COM header 1 x CPU Fan connector 1 x System Fan connector 1 x Chassis Intrusion header 1 x Front Audio connector 1 x Front panel header 1 x Printer port 1 x 16 Bit DIO connector 1 x 24-pin ATX Power connector 1 x 2x2pin ATA 12V Power connector
Mechanical & Environmental	
Power Type	AT/ATX
Operating Temperature	0~60°C (32~140°F)
Operating Humidity	0%~90% relative humidity, non-condensing
Size (L x W)	12" x 9.6" (304.8 mm x 243.84 mm)
Weight	1.32 lbs (0.6 Kg)

* Specifications are subject to change without notice.

Block Diagram



This chapter describes the motherboard features and the new technologies it supports.

1 Product Introduction

Chapter 1 - Product Introduction

1.1 Product highlights

1.1.1 Product Overview

Supports latest Intel LGA 1150 CPU-socket interface processor, the 4th Generation Intel® Core i7/i5/i3 Haswell desktop processors which are built on 22 nm technologies to provide smart performance and responsiveness on executing tasks, It combines the CPU and GPU to offer fantastic HD media and graphics, especiallyon 3D gaming experience. Doubles the bandwidth of your system memory up to 16GB/s and pumps up the system performance at lower power.

DMI (Direct Media Interface) architecture connects between the processor and chipset at 5.0GT/s which twice the speed of previous version. The exceptionally increased interconnect bit rate from 2.5GT/s up to 5.0GT/s would effectively eliminates the bottle neck of the system performance and brings the most terrific computing experience fromthe present to the future. SATA 3.0 doubles the transfer speed of SATA 2.0,running at speed up to 6.0Gb/s, and can connect with any other SATA 3.0Gb/s and 1.5Gb/s devices for backward compatibility.

Supports RAID 0(Striped disk array), RAID 1(Mirroring disk array), RAID 5(Block Interleaved Distributed Parity), RAID 10 (A Stripe of Mirrors). Provides users the performance and protection. Integrated 5.1-channel HD Audio CODEC delivering advanced multi-channel audio and bringing you the experience of home theater-quality sound. Delivers transfer speed ten times faster than conventional 10/ 100 Ethernet connections, supporting a high transfer rate up to Gigabit/s. Gigabit LAN is the networking standards for the future and is ideal for handing large amount of data such as video, audio, and voice.

Choose an environment-friendly, fully RoHS-compliant ECS product as the foundation for keeping harmful substances out of our ecosystem.

1.1.2 Platform Features and Benefits

•Integrated Gfx (Intel® HD Graphics 4600) with enhanced operating modes to enable excellent graphics performance in power and cost sensitive embedded applications
• DirectX® 11.1 & Open GL 3.2 let you enjoy awesome graphics performance, stunning 3D visual effect and dynamic interactivity
• Memory support, integrated low voltage DDR3 memory controller
• Operating system support:
  - Microsoft

-WindRiver
-Redhat
-Novell
-Green Hills
-QNX
- LinuxWorks

1.1.3 Key Architecture Features

• Supports Intel LGA 1150 CPU, the 4th Generation Intel® Core i3, i5, i7 desktop processors.
-22nm monolithic die
-Integrated Gfx Intel® HD Graphics 4600 (GT2) & memory controller
-4 &2 Cores, up to 6MB LLC
-HW accelerated video CODECs
- Compatible with high speed DDR3-1600
-PCIe* (CPU): Gen 3.0, 8GT/s, up to 20 lanes (4 ctls)**
-TDP: 35W-45W (Low Power), 65W-95W (Scalable)
• Intel® Turbo Boost Technology 2.0
-More efficient power sharing between CPU and Graphics
• Intel® Hyper-Threading Technology
• Intel® Advanced Vector Extensions (Intel® AVX)
•Transactional Synchronization Extensions (TSX)
• Integrated Display Interfaces
- Dual Independent Display Support
- DVI-D
- Analog VGA
• Intel® HD Graphics 4600
- DirectX® 11.1
- Improved realism for DX 3D applications. Improved rendering.
- OpenGL 3.2
- Improved realism for OGL 3D based application
- UVD (Unified Video Decoder) 2.01
Hardware decode of most common HD codecs (MPEG-2, H.264/AVC MPEG-4 and VC-1)
- Supports ATI Hybrid CrossFireXTM Technology2
• Intel Quick Sync Video
- Enables faster and higher quality video editing, recording and sharing
• I/O
- PCI Express® x 16 Gen 3 8GT/s
- Six SATA III ports support RAID 0,1, 5, 10
- Gigabit Ethernet Media Access Controller (GbE MAC)

IPv4 and IPv6 Checksum Offload

- High Definition Audio
- USB: 4 x Gen 3.0 and 10 x Gen 2.0
- SMBus 2.0
- LPC Bus

Supports SPI devices

- Hardware Monitor

Fan control (Voltage, Temp)

Watchdog timer

• Power Management

- Dual Dynamic Power Management

Separate power planes for cores and memory controller

- Advanced Configuration and Power Interface (ACPI) 3.0

1.2 Before you Proceed

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

- 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.

1.3 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.

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.

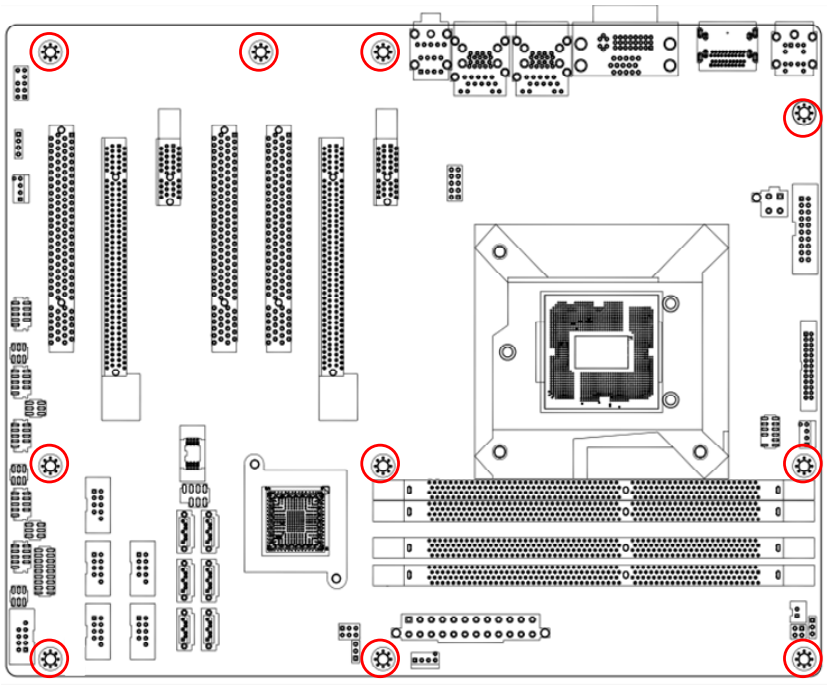
1.3.1 Placement Direction

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.

1.3.2 Screw Holes

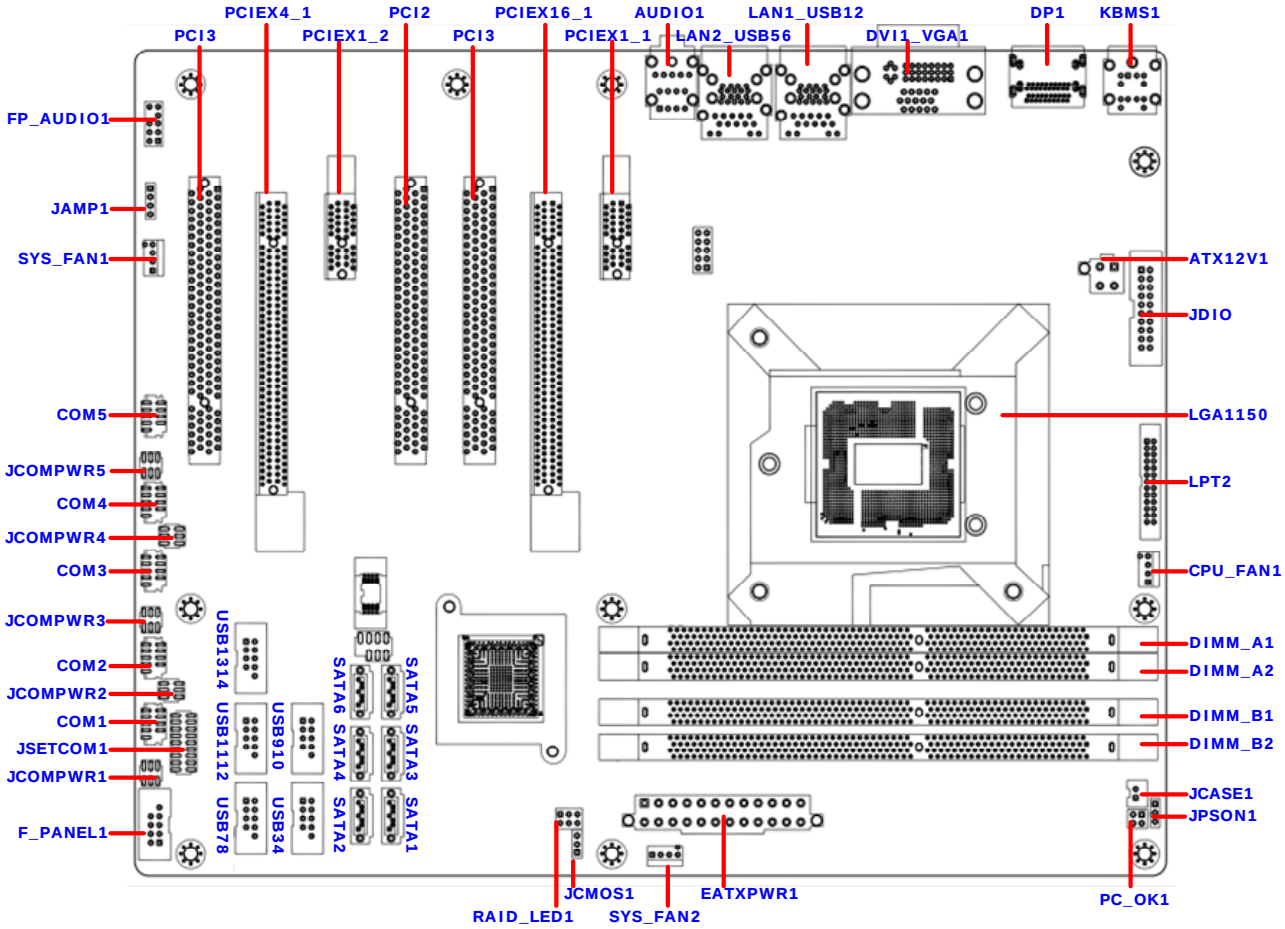
Place four (4) screws into the holes indicated by circles to secure the motherboard to the chassis.

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



Place this side towards the rear of the chassis.

1.3.3 Motherboard Layout



1.3.4 Layout Content List

Slots & socket			
Label	**Function**	**Note**	**Page**
LGA1155	LGA1150 socket		20
DIMM_A1	240-pin DDR3 DIMM Slot A1		26
DIMM_A2	240-pin DDR3 DIMM Slot A2		26
DIMM_B1	240-pin DDR3 DIMM Slot B1		26
DIMM_B2	240-pin DDR3 DIMM Slot B2		26
PCIEX16_1	PCI-e x16 Slot		30
PCIEX4_1	PCI-e x4 Slot		31
PCIEX1_1~2	PCI-e x1 Slot		31
PCI1~3	PCI Slot		32

Jumpers			
Label	**Function**	**Note**	**Page**
JCMOS1	Load CMOS Default	3 x 1 header, pitch 2.54mm	32
PSON1	AT/ATX Power Select	3 x 1 header, pitch 2.54mm	33
JSETCOM1	COM1 RS232/ RS422/ RS485 Select	9 x 2 header, pitch 2.00mm	34
JCOMPWR1~5	COM1 5 RI/+5V/+12V Select	3 x 2 header, pitch 2.00mm	35

Rear Panel Connector			
Label	**Function**	**Note**	**Page**
KB/MS	PS/2 keyboard and mouse		35,36
DP1	Display Port Connector x 2		35,36
DVI1_VGA1	VGA Connector DVI Connector	D-sub 15-pin, female Dual Link DVI-D; 24 pins	35,36
LAN1_USB12	RJ-45 Ethernet Connector x 1 USB Connector x 2		35,36
LAN2_USB56	RJ-45 Ethernet Connector x 1 USB Connector x 2		35,36
AUDIO1	Line-in Port, Line-out Port, Microphone Port,	5.1 Channel Audio I/O (3 jacks)	35,36

Internal Connector			
Label	**Function**	**Note**	**Page**
F_PANEL1	System Panel Connector	5 x 2 wafer, pitch 2.54mm	37
ATX12V1	ATX 12V Connector	2 x 2 connector	38
EATXPWR1	ATX Power Connector	12 x 2 connector	38
CPU_FAN1	CPU Fan Connector	4 x 1 wafer, pitch 2.54mm	36
SYS_FAN1	System Fan Connector	4 x 1 wafer, pitch 2.54mm	36
SYS_FAN2	System Fan Connector	4 x 1 wafer, pitch 2.54mm	36
COM 1~5	Serial Port Connector 1~5	5 x 2 wafer, pitch 2.0mm	39
JDIO	Digital I/O Connector	10 x 2 wafer, pitch 2.54mm	40
FP_AUDIO1	Front Panel Audio Connector	5 x 2 header, pitch 2.54mm	41
JAMP1	Amplifier Connector	4 x 1 header, pitch 2.54mm	41
LANLED1	LAN LED header	5 x 2 header, pitch 2.54mm	42
SATA1~6	Serial ATA Connectors 1~4	7-pin header	42
USB34/78/910/1112/1314	USB 2.0 Connector	5 x 2 wafer, pitch 2.54mm	43

RAID_LED1	RAID LED header	3 x 2 header, pitch 2.54mm	44
PC_OK1	PC OK LED header	2 x 2 header, pitch 2.54mm	44

1.4 Central Processing Unit (CPU)

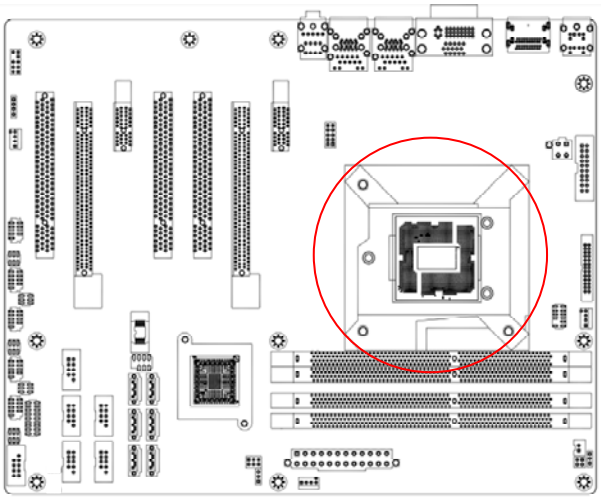
The motherboard comes with a surface mount LGA1150 socket designed for the Intel® Core™ i7/ i5/ i3 processor in the 1150-land package.

- Your boxed Intel® Core™ i7/ i5/ i3 LGA1150 processor package should come with installation instructions for the CPU, fan and heatsink assembly. If the instructions in this section do not match the CPU documentation, follow the latter.
- Upon purchase of the motherboard, make sure that the PnP cap is on the socket and the socket pins are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket pins/motherboard components. BCM will shoulder the cost of repair only if the damage is shipment/transit-related.
- Keep the cap after installing the motherboard. BCM will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA1150 socket.
- The product warranty does not cover damage to the socket pins resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.
- Install the CPU fan and heatsink assembly before you install motherboard to the chassis.

If you purchased a separate CPU heatsink and fan assembly, make sure that you have properly applied Thermal Interface Material to the CPU heatsink or CPU before you install the heatsink and fan assembly.

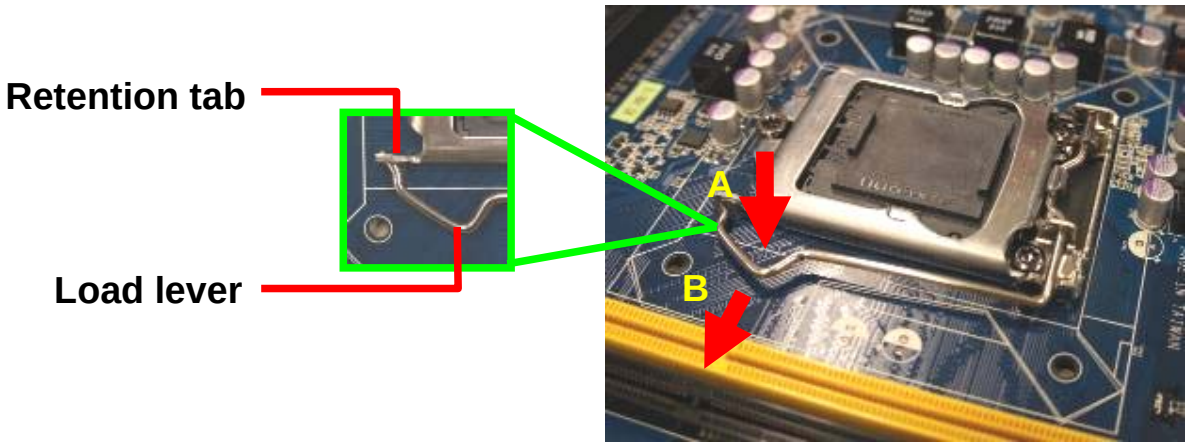
1.4.1 Installing the CPU

1. Locate the CPU socket on the motherboard.



Before installing the CPU, make sure that the socket box is facing towards you and the load lever is on your left.

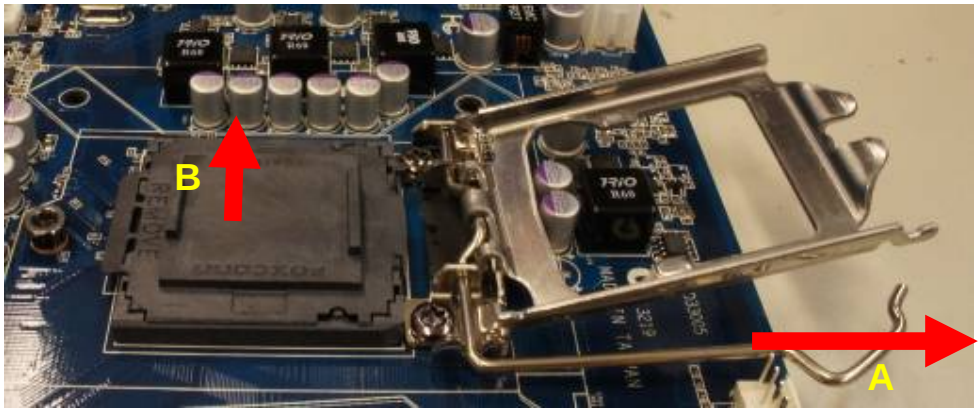
2. Press the load lever with your thumb (A), then move it to the left (B) until it is released from the retention tab.



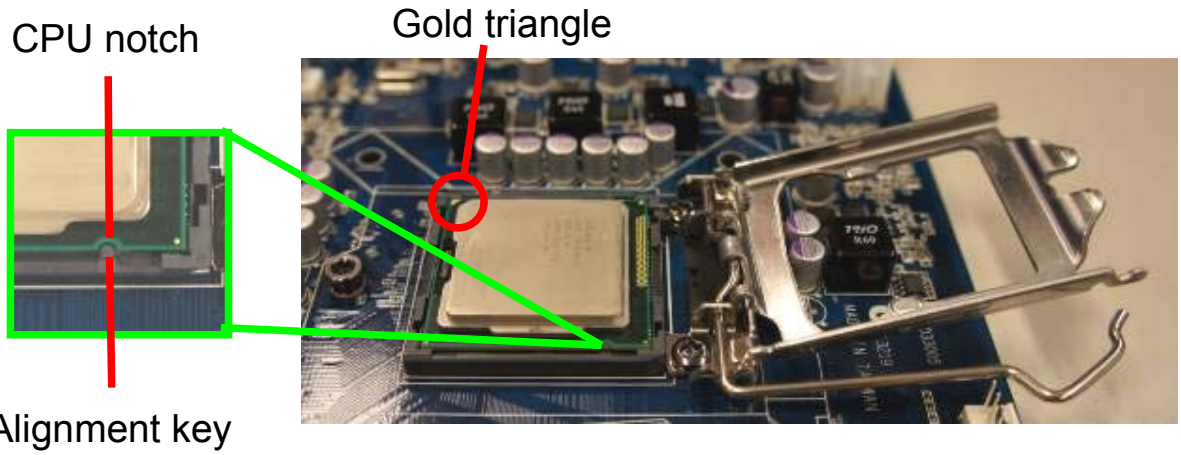
To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

3. Lift the Load lever with your thumb and forefinger to around 180º angle (A), then pull the

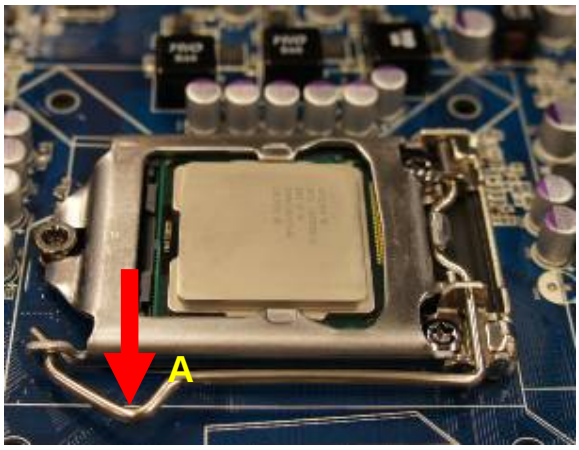
PnP cap from the CPU socket to remove (B).



4. Position the CPU over the socket, making sure that the gold triangle is on the top-left corner of the socket then fit the socket alignment key into the CPU notch.



5. Pull back the load lever , then push the load lever (A) until it snaps into the retention tab.



The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!

1.4.2 Installing the CPU Heatsink and Fan

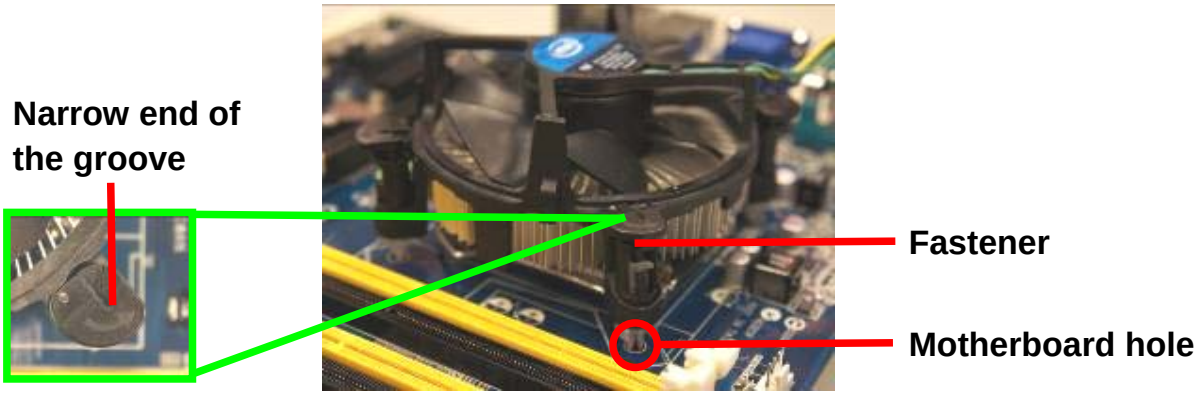
Intel® Core™ i7/ i5/ i3 LGA1150 processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

- Install the motherboard to the chassis before you install the CPU fan and heatsink assembly.
- When you buy a boxed Intel® Core™ i7/ i5/ i3 LGA1150 processor, the package includes the CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use only Intel® certified multi-directional heatsink and fan.
- Your Intel® Core™ i7/ i5/ i3 LGA1150 processor LGA1150 heatsink and fan assembly comes in a push-pin design and requires no tool to install.

If you purchased a separate CPU heatsink and fan assembly, make sure that you have properly applied Thermal Interface Material to the CPU heatsink or CPU before you install the heatsink and fan assembly.

To install the CPU heatsink and fan:

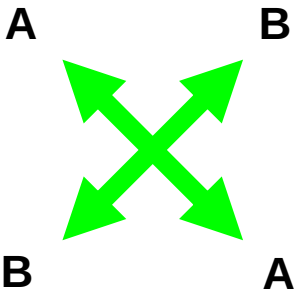
1. Place the heatsink on top of the installed CPU, making sure that the four fasteners match the holes on the motherboard.

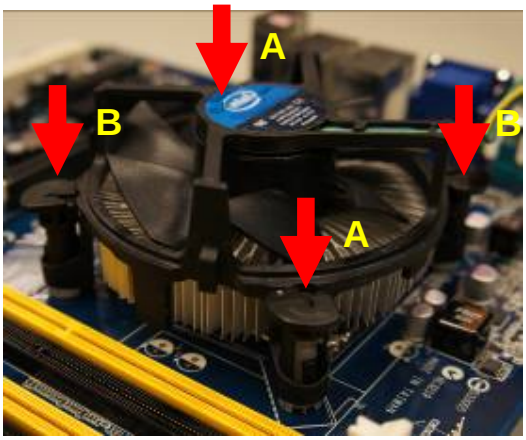


Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector.

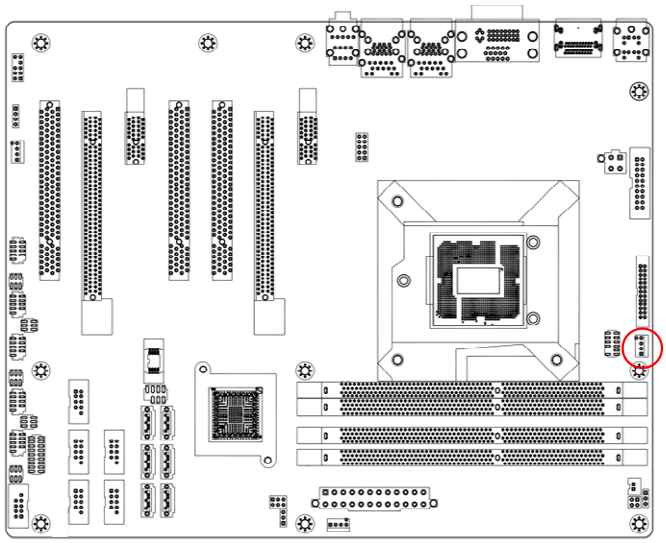
- Make sure each fastener is oriented as shown, with the narrow groove directed outward.

2. Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.



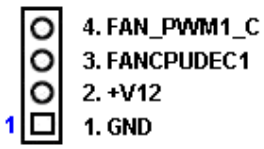


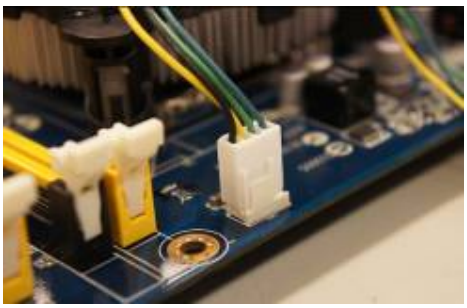
3. Connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN.



CPU_FAN 1

CPU FAN





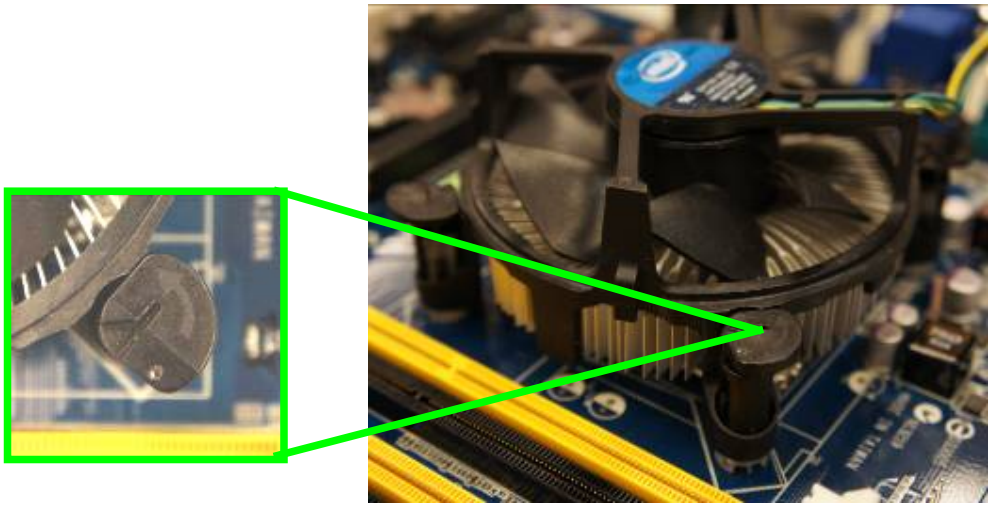
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components.

These are not jumpers! DO NOT place jumper caps on the fan connectors.

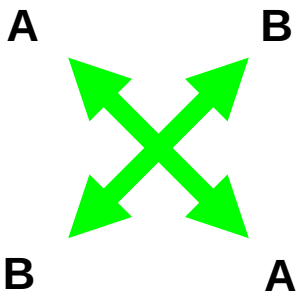
1.4.3 Uninstalling the CPU Heatsink and Fan

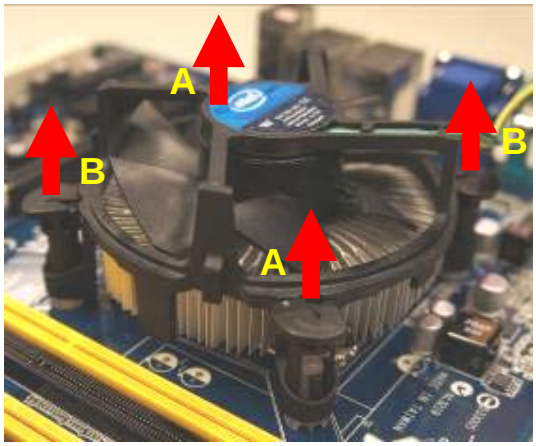
To uninstall the CPU heatsink and fan:

1. Disconnect the CPU fan cable from the connector on the motherboard.
2. Rotate each fastener counterclockwise



3. Pull up two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the motherboard.





4. Carefully remove the heatsink and fan assembly from the motherboard.

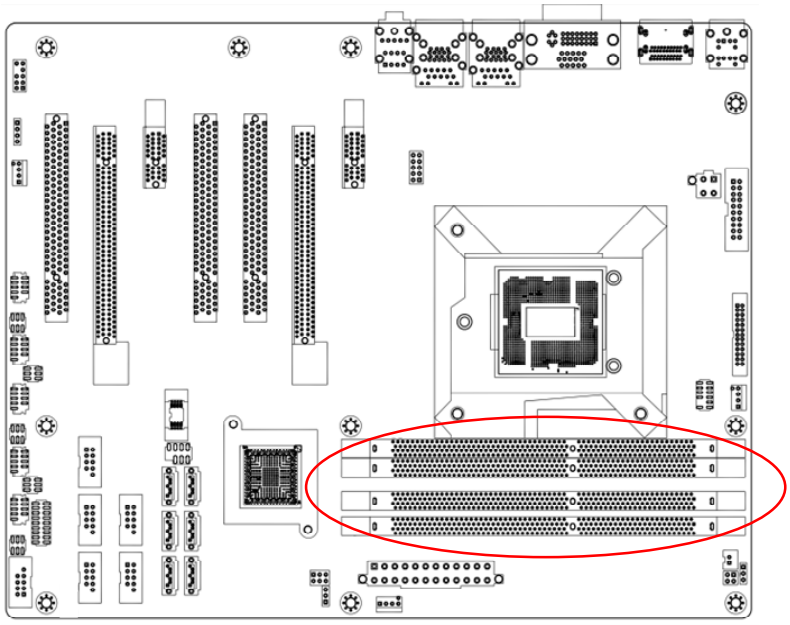
5. Rotate each fastener clockwise to ensure correct orientation when reinstalling.

1.5 System Memory

1.5.1 Overview

The motherboard comes with four 240-pin Double Data Rate 3 (DDR3) Dual Inline Memory Modules (DIMM) sockets.

A DDR3 module has the same physical dimensions as a DDR DIMM but has a 240-pin footprint compared to the 240-pin DDR2 DIMM. DDR3 DIMMs are notched differently to prevent installation on a DDR2 DIMM socket. The following figure illustrates the location of the sockets:



240-Pin DDR3 DIMM sockets

Channel	Socket
Channel A	DIMMA1
	DIMMA2
Channel B	DIMMB1
	DIMMB2

1.5.2 Memory Configurations

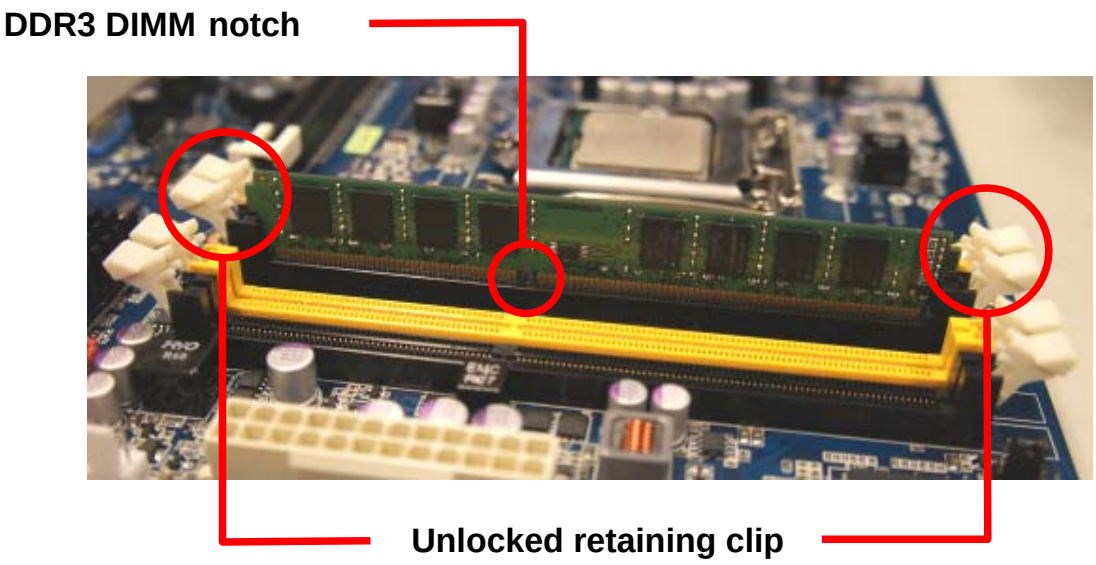
You may install 1 GB, 2 GB , and 4 GB unbuffered ECC or non-ECC DDR3 DIMMs into the DIMM sockets using the memory configurations in this section.

- IF you installed four 1GB 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.
- For dual-channel configuration, the total size of memory module(s) installed per channel must be the same for better performance (DIMMA1 +DIMMA2=DIMMB1+DIMMB2).
- When using one DDR3 DIMM module, install into DIMMB1 slot only.
- When using two DDR3 DIMM modules, install into DIMMA1 and DIMMB1 slots only.
- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor. Refer to the memory Qualified Vendors List on the next page for details.
- Due to CPU limitation, DIMM modules with 128 Mb memory chips or double-sided x16 memory chips are not supported in this motherboard.

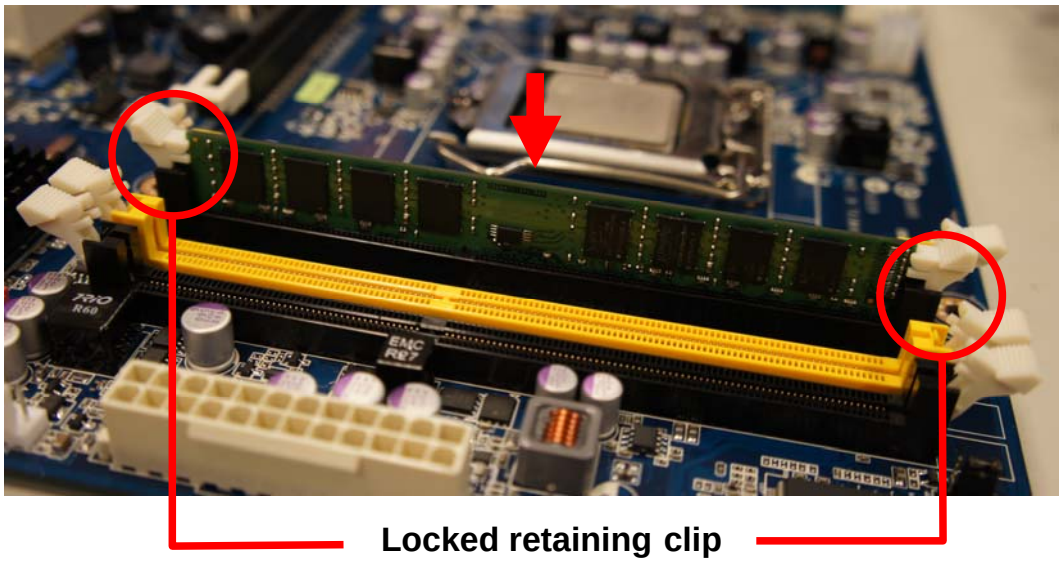
1.5.3 Installing a DDR3 DIMM

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

1. Unlock a DIMM socket by pressing the retaining clips outward
2. Alig3n a DIMM on the socket such that the notch on the DIMM matches the break on the socket



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



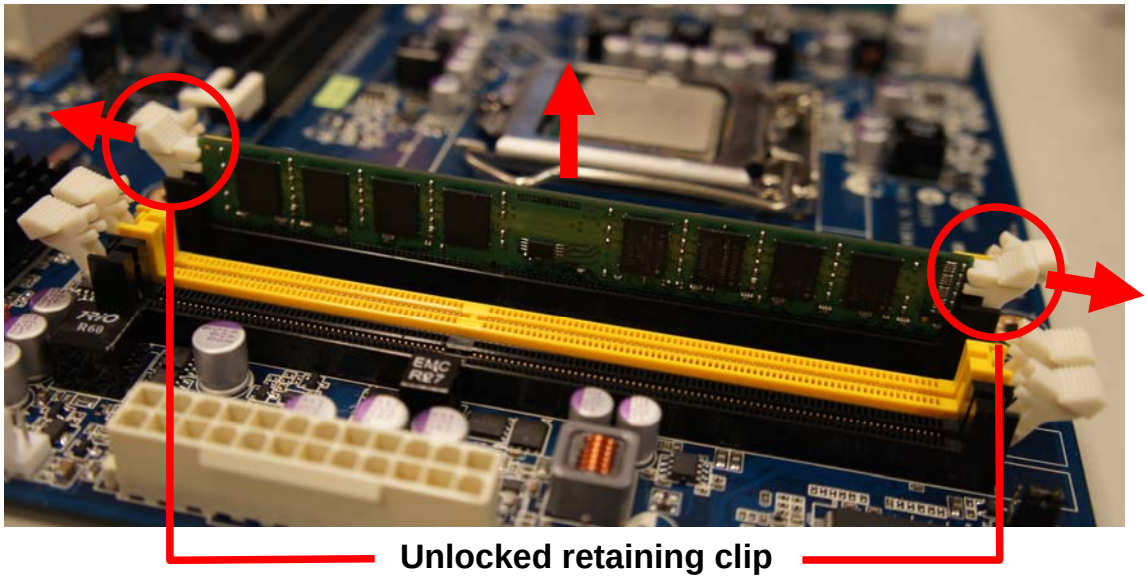
- A DDR3 DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.
- The DDR3 DIMM sockets do not support DDR DIMMs. DO NOT install DDR2 DIMMs to the DDR3 DIMM socket.

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

1. Unlock a DIMM socket by pulling the retaining clips outward
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.

1.5.4 Removing a DIMM

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



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

1.6 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.

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.

1.6.1 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.

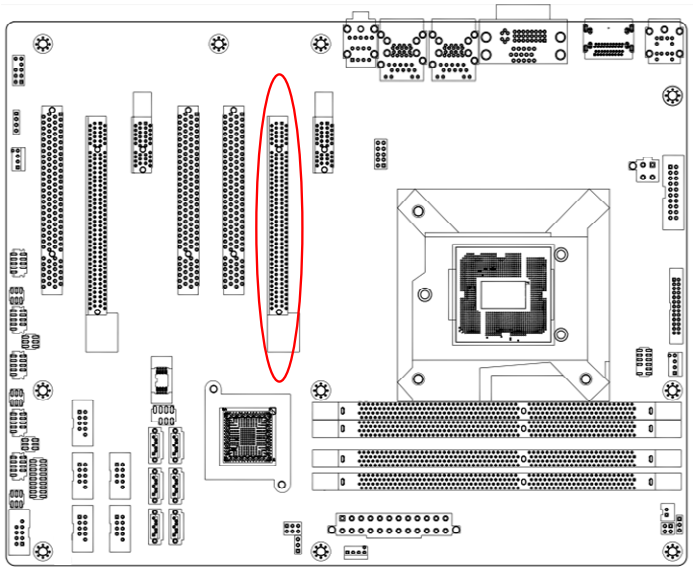
1.6.2 Configuring an Expansion Card

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 2 for information on BIOS setup.
2. Assign an IRQ to the card if needed. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.

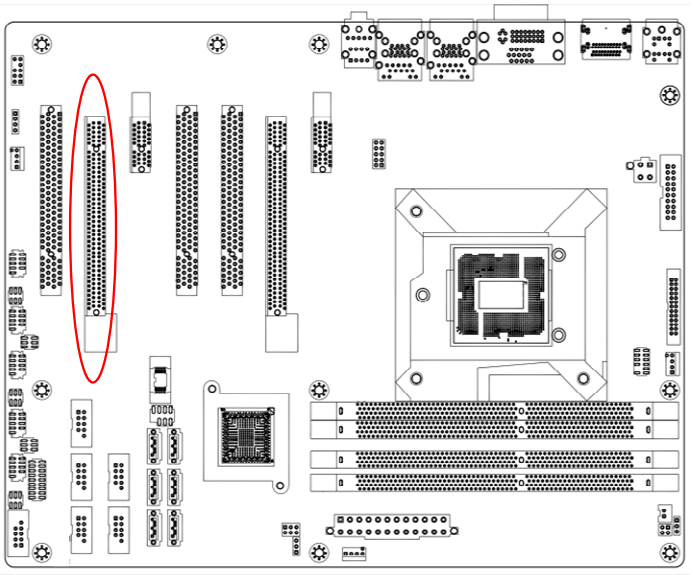
1.6.2.1 PCI Express x16 slot

This motherboard supports one PCI Express x16 slot that complies with the PCI Express specifications. The following figure shows a graphics card installed on the PCI Express x16 slot.



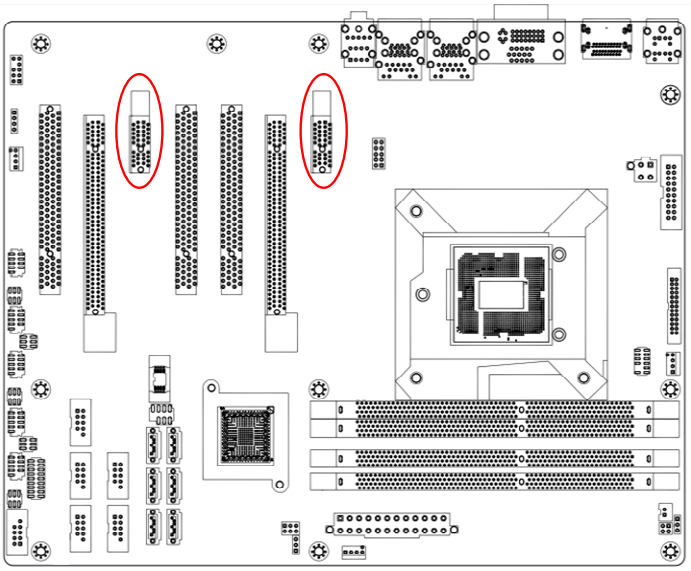
1.6.2.2 PCI Express x 4 slot

This motherboard supports one PCI Express x4 slot that complies with the PCI Express specifications. The following figure shows a RAID card installed on the PCI Express x 4 slot.



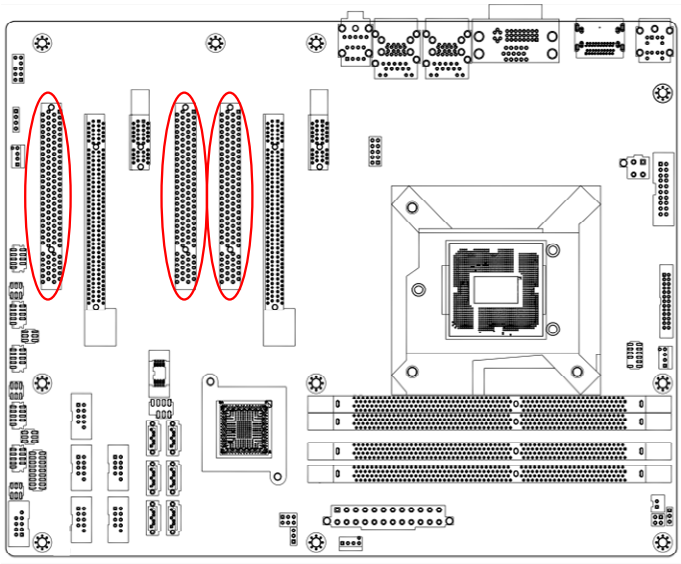
1.6.2.3 PCI Express x 1 slot

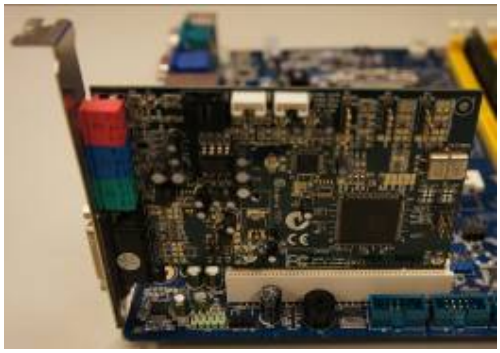
This motherboard supports two PCI Express x1 slots that complies with the PCI Express specifications. The following figure shows an expansion card installed on the PCI Express x 1 slot.



1.6.2.4 PCI slot

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





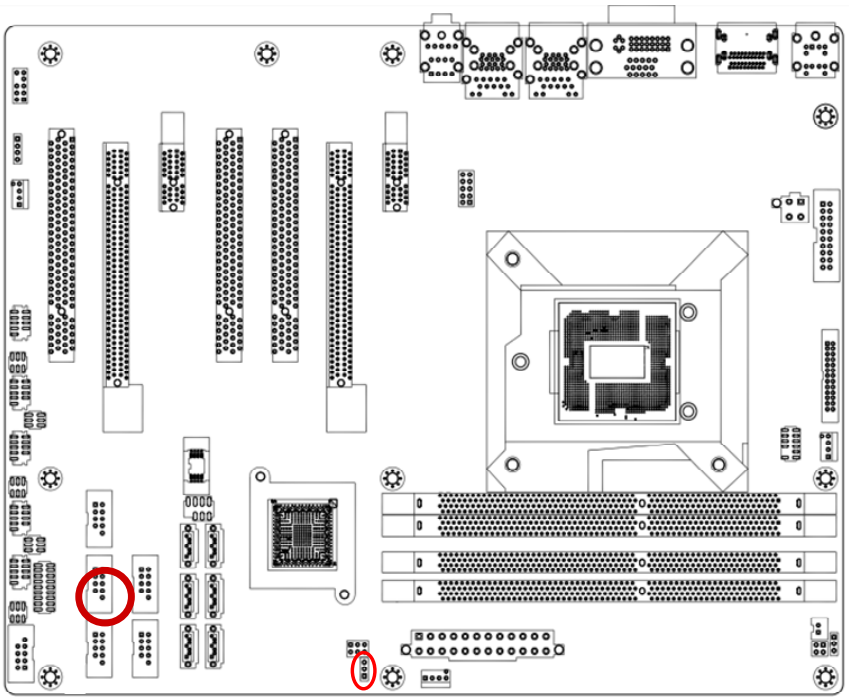
1.7 Jumpers

1.7.1 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.



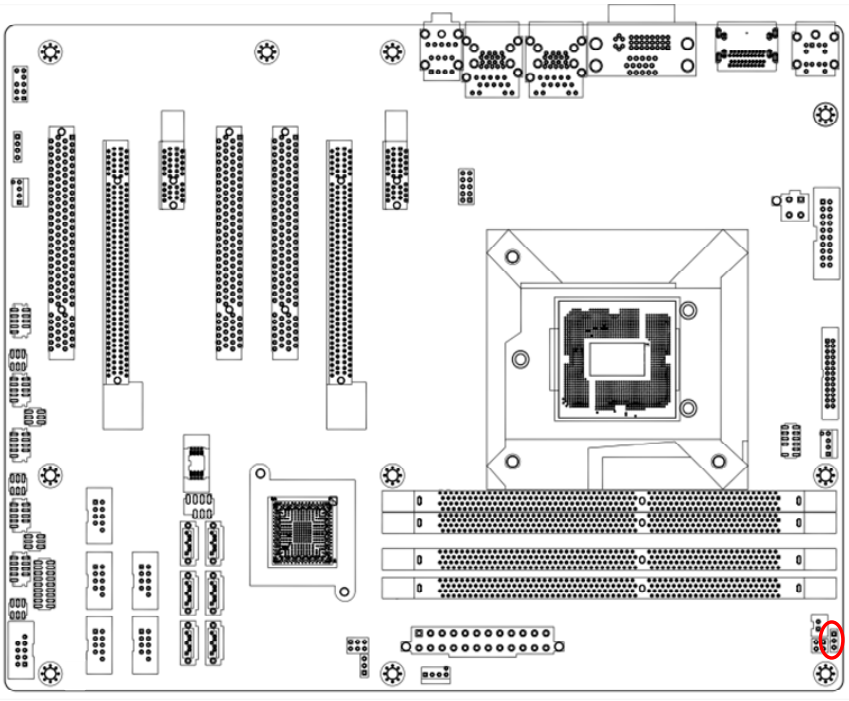
Normal (Default)

Clear CMOS

You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

1.7.2 AT/ATX Power Mode Select (PSON1)

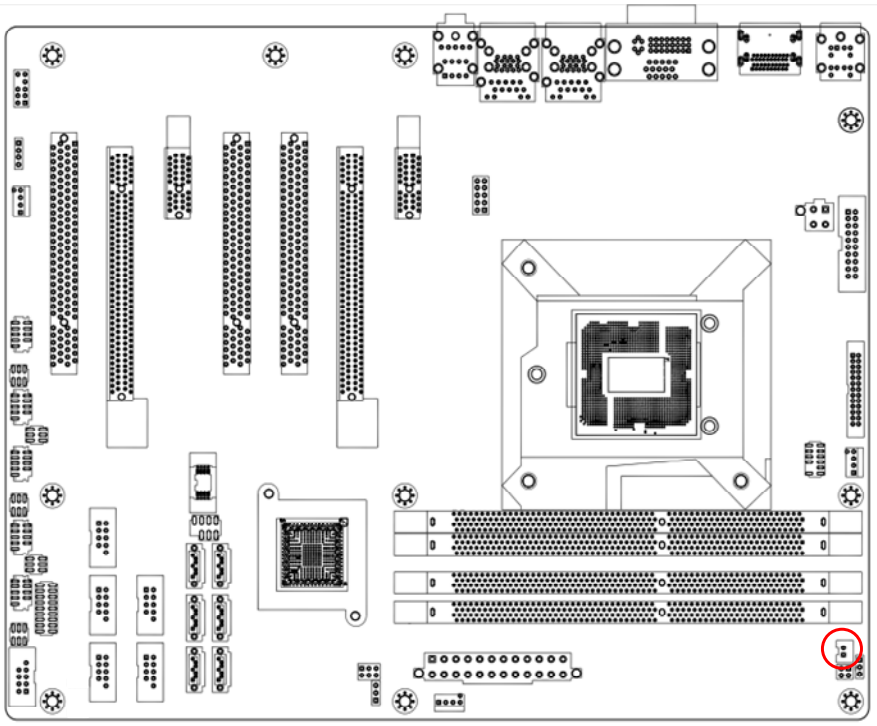
This jumper allows you to select ATX Mode or AT mode .

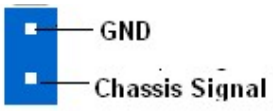


ATX mode (Default)

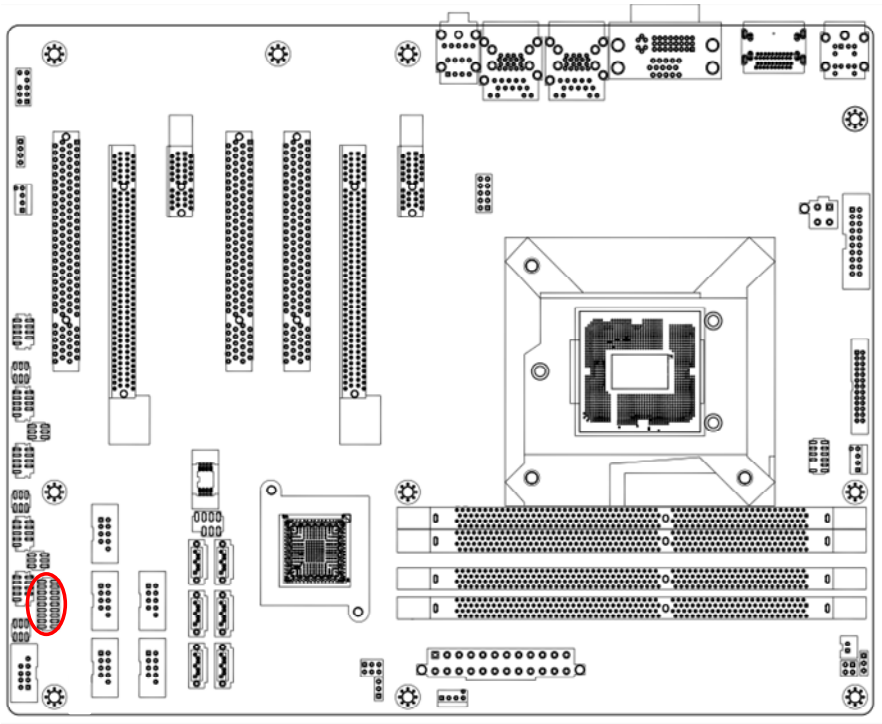
AT Mode

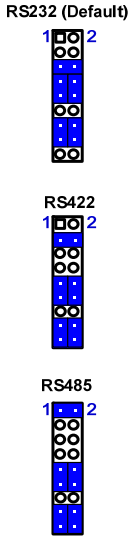
1.7.3 Chassis Intrusion Connector (JCASE1)



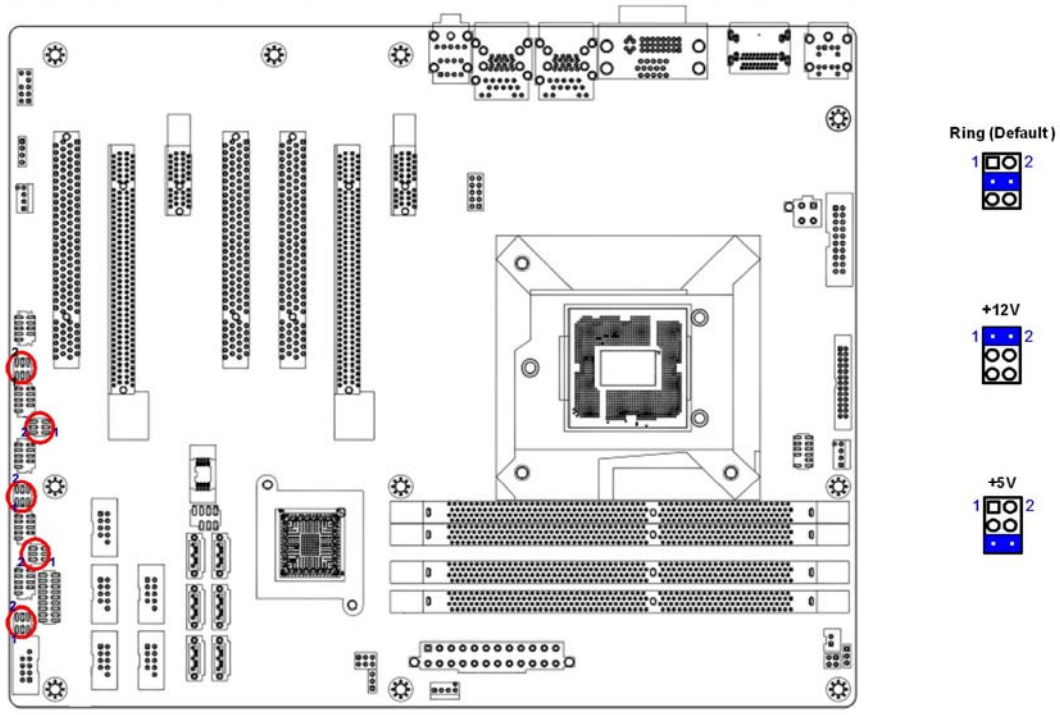


1.7.4 COM1 RS232/ RS422/ RS485 Select (JSETCOM1)



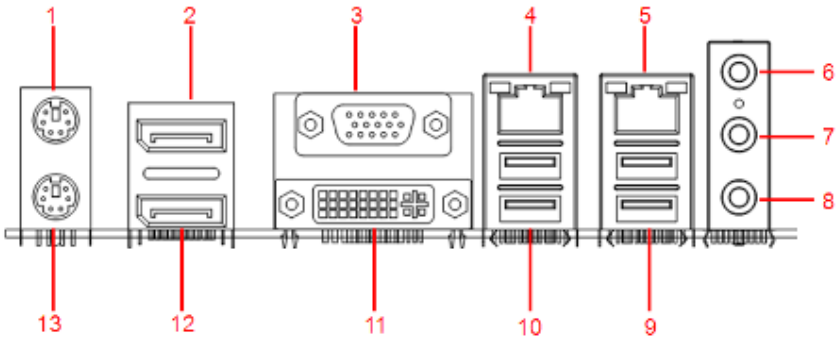


1.7.5 COM1, COM2, COM3, COM4, COM5 Ring-In/ +12V/ +5V Select (JCOMPWR1, JCOMPWR2, JCOMPWR3, JCOMPWR4, JCOMPWR5)

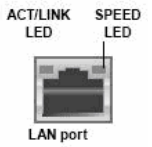


1.8 Connectors

1.8.1 Rear panel connectors

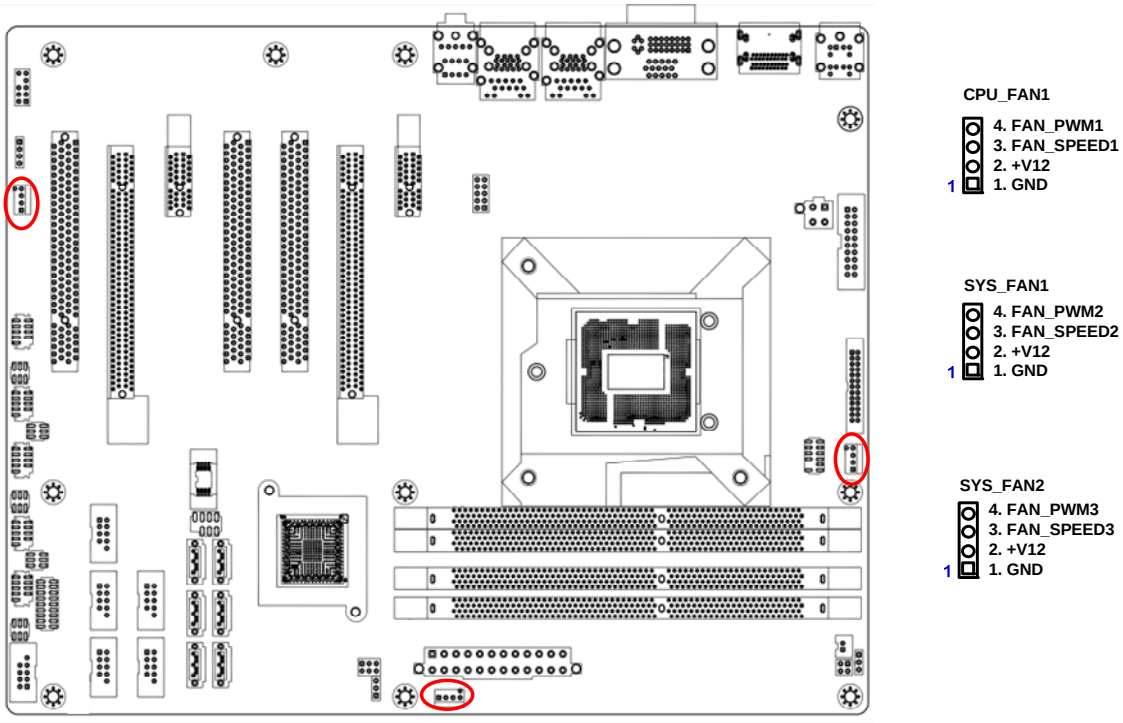


Item	Name	Function	Description
1	KBMS	PS/2 Mouse Connector	The port is for a PS/2 mouse.
2	DP1	Display Port 2	
3	VGA	VGA Video Port	The VGA15-pin Connector.

<table>
<tr><td>4/5</td><td>LAN1/
LAN2</td><td>Gigabit LAN
(RJ-45)
Connectors
 
</td><td>This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.
<table><tr><td colspan="2">ACT/Link LED</td><td colspan="2">Speed LED</td></tr><tr><td>Status</td><td>Description</td><td>Status</td><td>Description</td></tr><tr><td>OFF</td><td>No link</td><td>OFF</td><td>10Mbps connection</td></tr><tr><td>Orange</td><td>Linked</td><td>Orange</td><td>100Mbps connection</td></tr><tr><td>Blinking</td><td>Data activity</td><td>Green</td><td>1Gbps connection</td></tr></table></td></tr>
<tr><td>6</td><td>AUDIO</td><td>Line-in port
(Light blue)</td><td>This port connects a tape, CD, DVD player, or other audio sources.</td></tr>
<tr><td>7</td><td>AUDIO</td><td>Line-out port
(Lime)</td><td>This port connects a headphone or a speaker. In 4-channel, 6-channel, and 8-channel configuration, the function of this port becomes Front Speaker Out.</td></tr>
<tr><td>8</td><td>AUDIO</td><td>Microphone port
(Pink)</td><td>This port connects a microphone.</td></tr>
<tr><td>9</td><td>USB</td><td>USB 3.0
Connectors</td><td>These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 3.0 devices.</td></tr>
<tr><td>10</td><td>USB</td><td>USB 3.0
Connectors</td><td>These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 3.0 devices.</td></tr>
<tr><td>11</td><td>DVI</td><td>DVI Video Port</td><td>DVI-D 24-Pin Connector.</td></tr>
<tr><td>12</td><td>DP1</td><td>Display Port 1</td><td></td></tr>
<tr><td>13</td><td>KBMS</td><td>PS/2 Keyboard
Connector</td><td>This port is for a PS/2 keyboard.</td></tr>
</table>

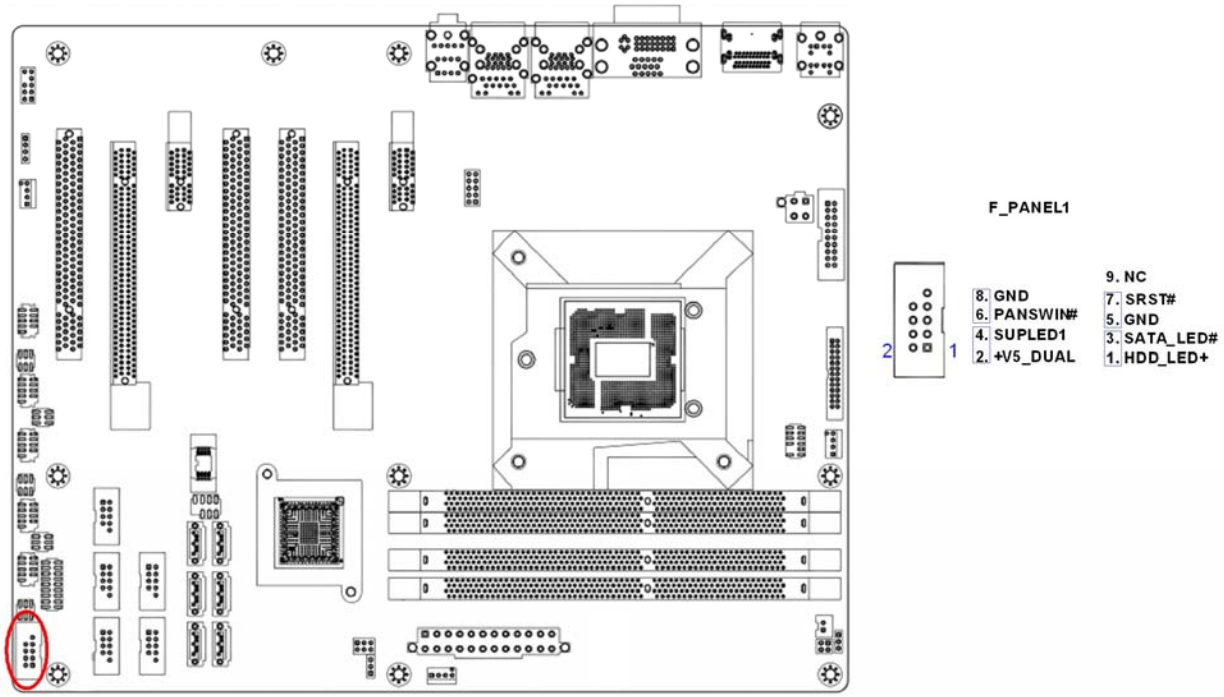
1.8.2 Fan Connectors (CPU_FAN1, SYS_FAN1, SYS_FAN2)

The fan connectors support cooling fans of 280mA (3.36 W max.) at 4800rpm or a total of 1A~2.22A (26.64W 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.



1.8.3 System Panel (F_PANEL1)

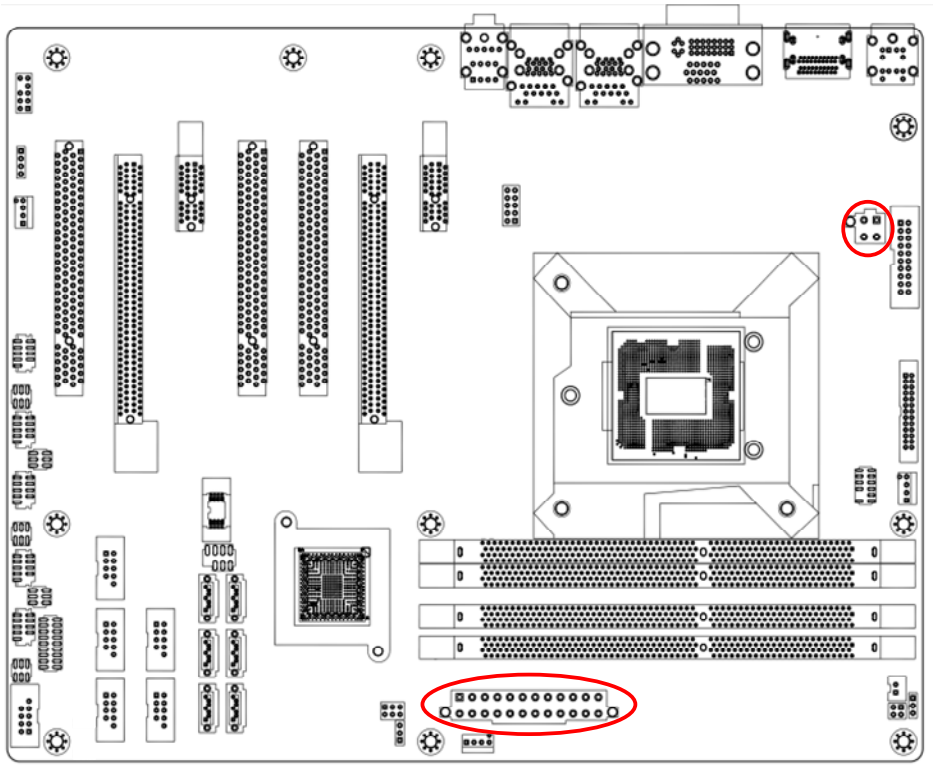
This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 audio standard.

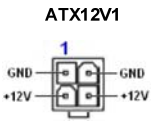


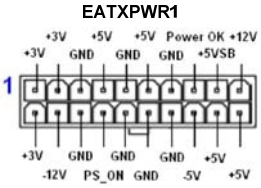
- **ATX Power Button/Soft-off Button (Pin 6-8)**
  This 2-pin connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch and holding it for more than four seconds while the system is ON turns the system OFF.
- **Reset Button (Pin 5-7)**
  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)**
  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)**
  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.

1.8.4 ATX power connectors (EATXPWR1 (24-Pin), ATX12V1 (4-pin))

The connector is for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.



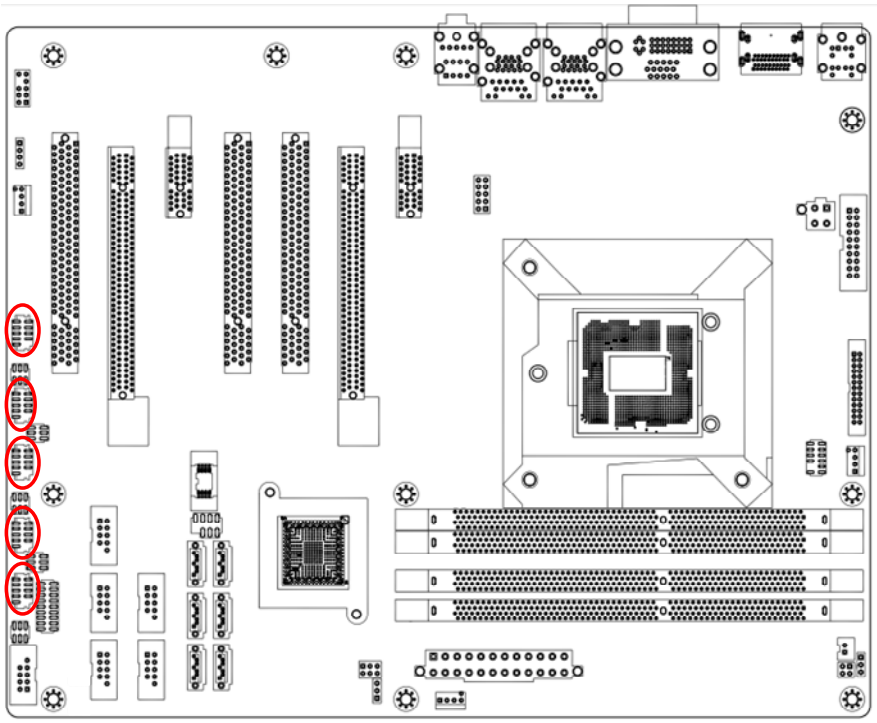


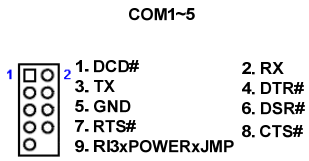


- Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system.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

1.8.5 Serial Port connectors (COM1, COM2, COM3, COM4, COM5)

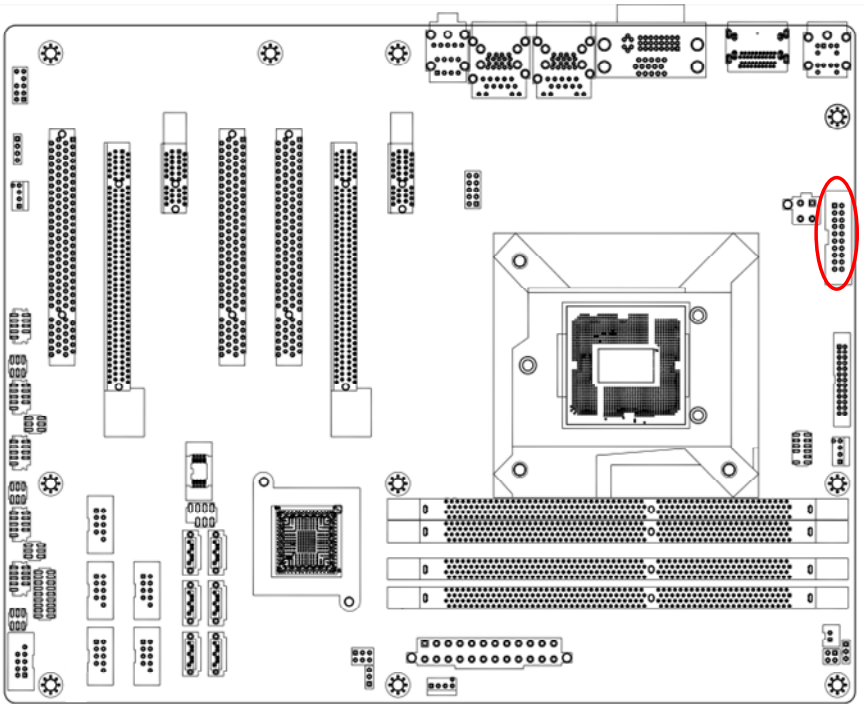
This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



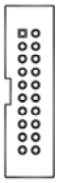


1.8.6 Digital IO Connector (JDIO1)

This connector is for 8-bit General purpose I/O function.

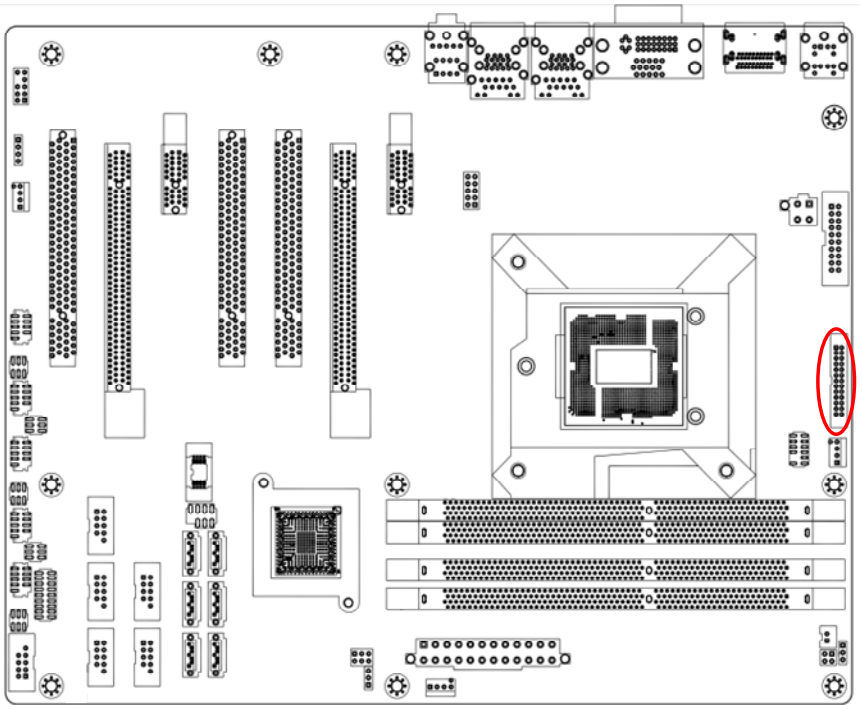


JDIO1

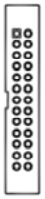


1. SIO_GPIO8	2. SIO_GPIO0
3. SIO_GPIO9	4. SIO_GPIO1
5. SIO_GPIO10	5. SIO_GPIO2
7. SIO_GPIO11	7. SIO_GPIO3
9. SIO_GPIO12	9. SIO_GPIO4
11. SIO_GPIO13	11. SIO_GPIO5
13. SIO_GPIO14	13. SIO_GPIO6
15. SIO_GPIO15	15. SIO_GPIO7
17. SMB_CLK_RESUME	17. SMB_DATA_RESUME
19. GND	19. +5V

1.8.7 PARALLEL PORT Connector (LPT2)



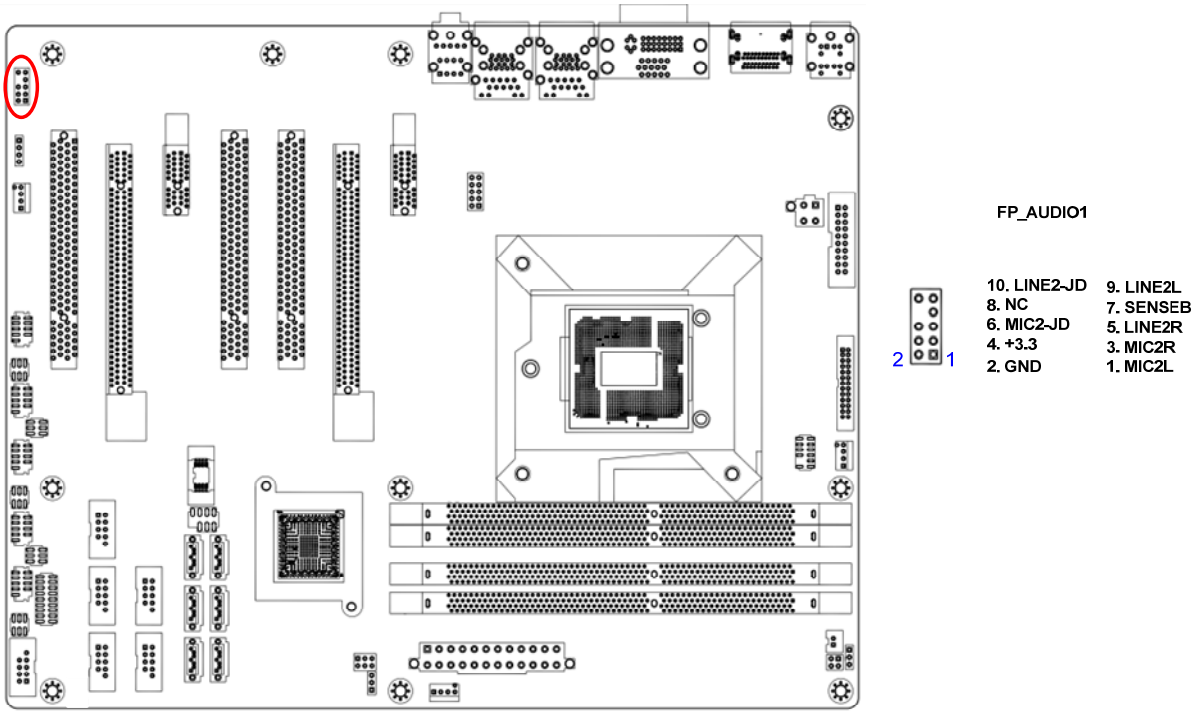
LPT2



1. LPT_STB#	2. LPT_AFD#
3. LPT_PD0	4. LPT_ERR#
5. LPT_PD1	6. LPT_INIT#
7. LPT_PD2	8. LPT_SLIN#
9. LPT_PD3	10. GND
11. LPT_PD4	12. GND
13. LPT_PD5	14. GND
15. LPT_PD6	16. GND
17. LPT_PD7	18. GND
19. LPT_ACK#	20. GND
21. LPT_BUSY	22. GND
23. LPT_PE	24. GND
25. LPT_SLCT	26. NC

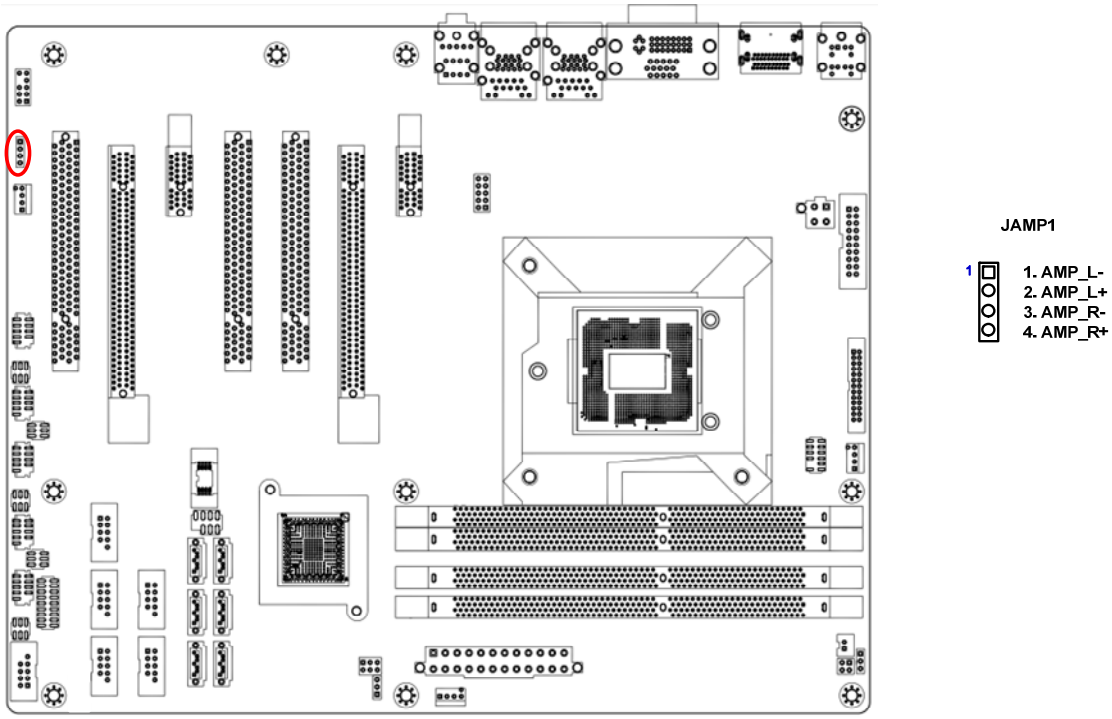
1.8.8 Audio Mic.-In & Line-Out Connector (FP_AUDIO1)

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.

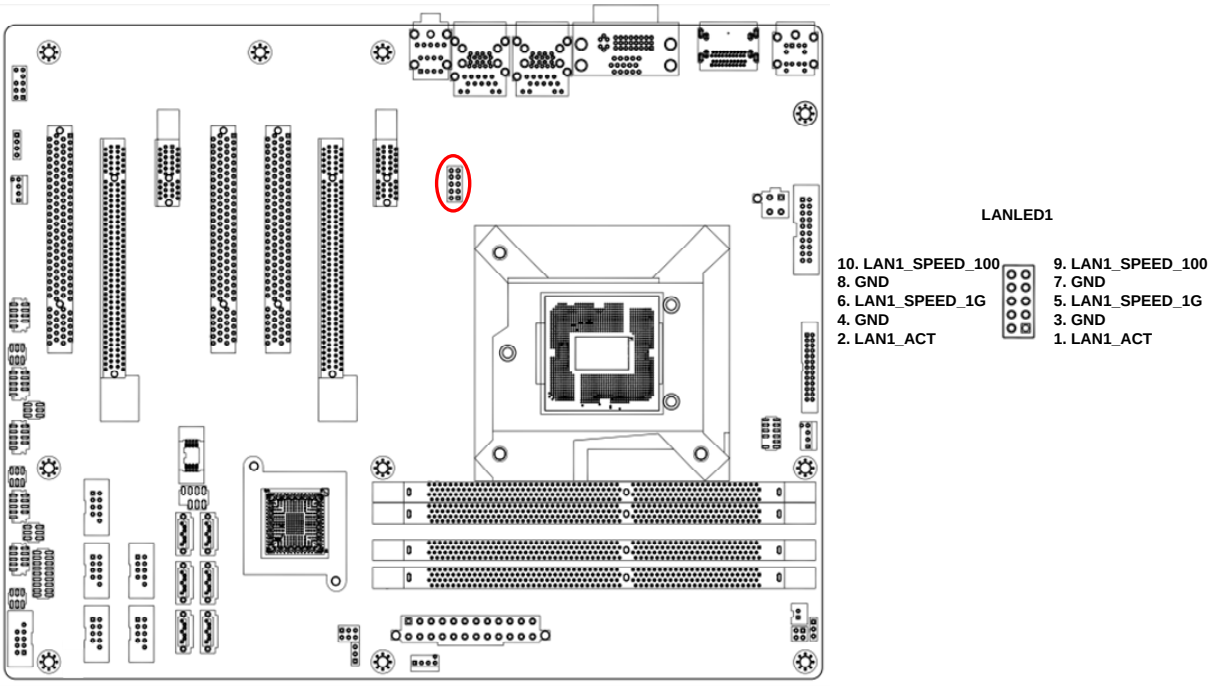


	For motherboards with the optional HD Audio feature, we recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

1.8.9 Amplifier Connector (JAMP1)

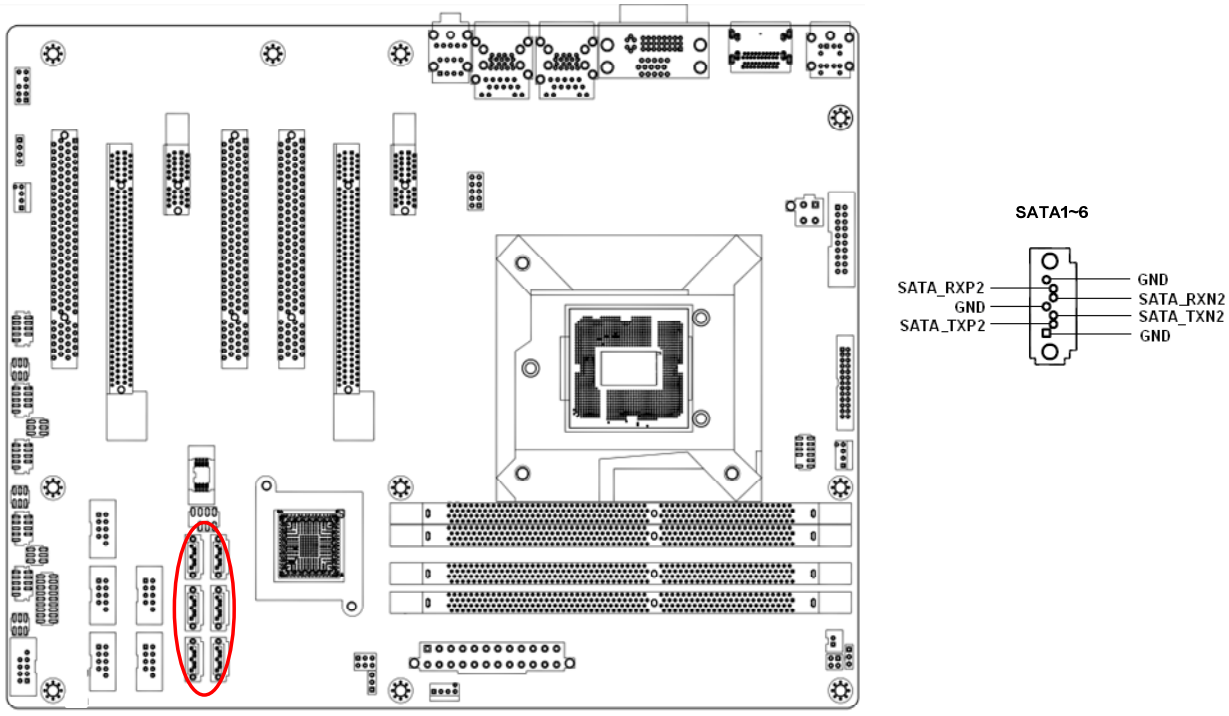


1.8.10 LAN LED Header (LANLED_1)

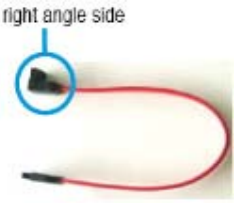


1.8.11 Serial ATA Connector (SATA1, SATA2, SATA3, SATA4, SATA5, SATA6)

These connectors support SATA 3.0 and are for the Serial ATA signal cables for Serial ATA hard disk drives.

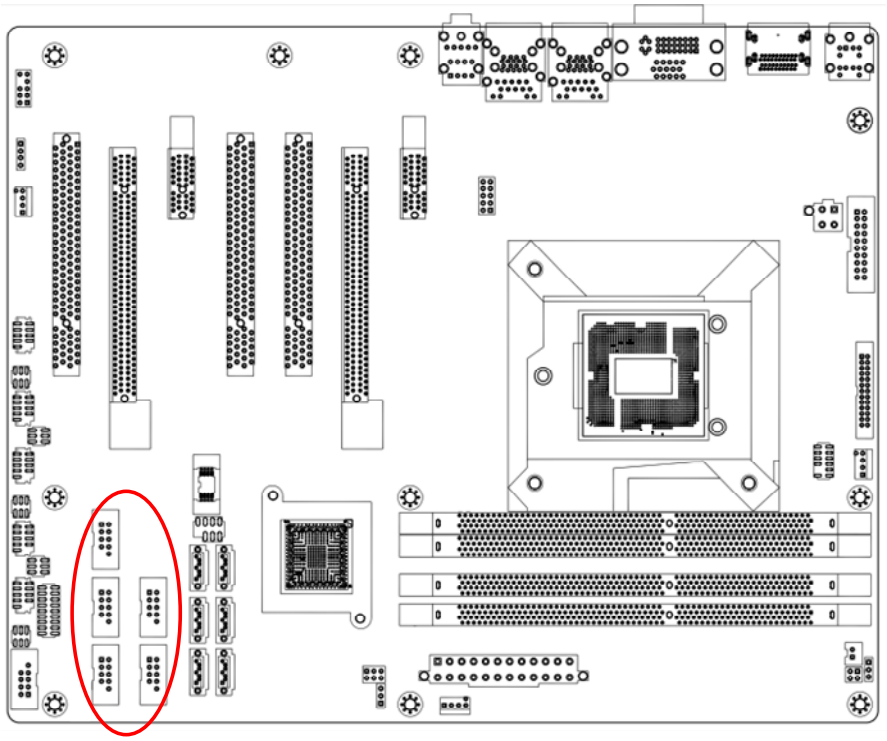


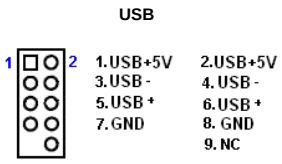
Connect the right-angle side of SATA signal cable to SATA device. Or you may connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with large graphics cards.



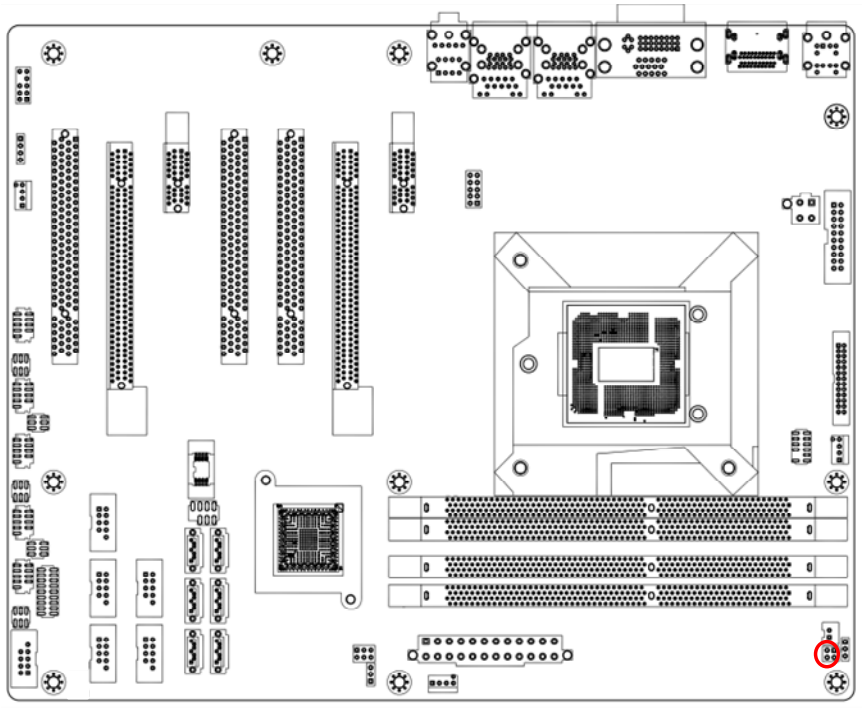
1.8.12 Front USB Headers: USB34, USB78, USB910, USB1112, USB1314

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.





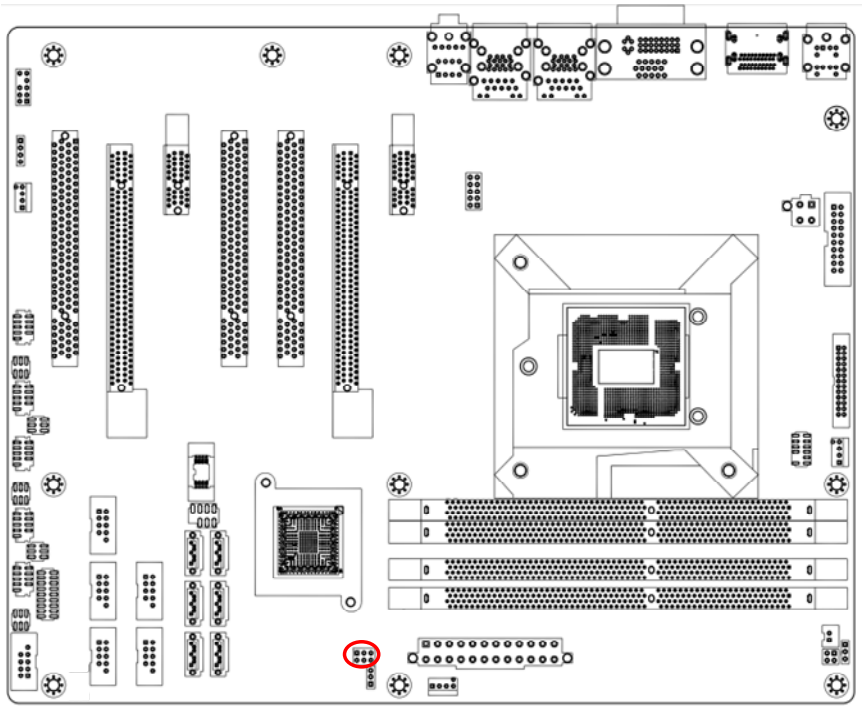
1.8.13 PC OK Connector (PC_OK1)



PC_OK1

1. LED_GPIO1
2. LED_GPIO2
3. LED_GPIO3
4. GND

1.8.14 RAID LED Connector (RAID_LED1)



RAID_LED1

1. +3.3V
2. SDATAOUT1
3. SDATAOUT2
4. GND
5. SCLOCK
6. SLOD

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

2

Chapter 2 - BIOS Setup

2.1 BIOS Setup Program

This motherboard supports a programmable firmware chip that you can update using the provided utility. Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup." This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware hub.

The firmware hub on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On-Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** from the BIOS menu screen.
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the system builder's website to download the latest BIOS file for this motherboard

2.1.1 Legend Box

The keys in the legend bar allow you to navigate through the various setup menus

Key(s)	Function Description
←	Select Screen
↑↓	Select Item
Enter	Select
+ -	Change Option
F1	General Help
F2	Previous Values
F3	Optimized Defaults
F4	Save and Exit
ESC	Exit

2.1.2 List Box

This box appears only in the opening screen. The box displays an initial list of configurable items in the menu you selected.

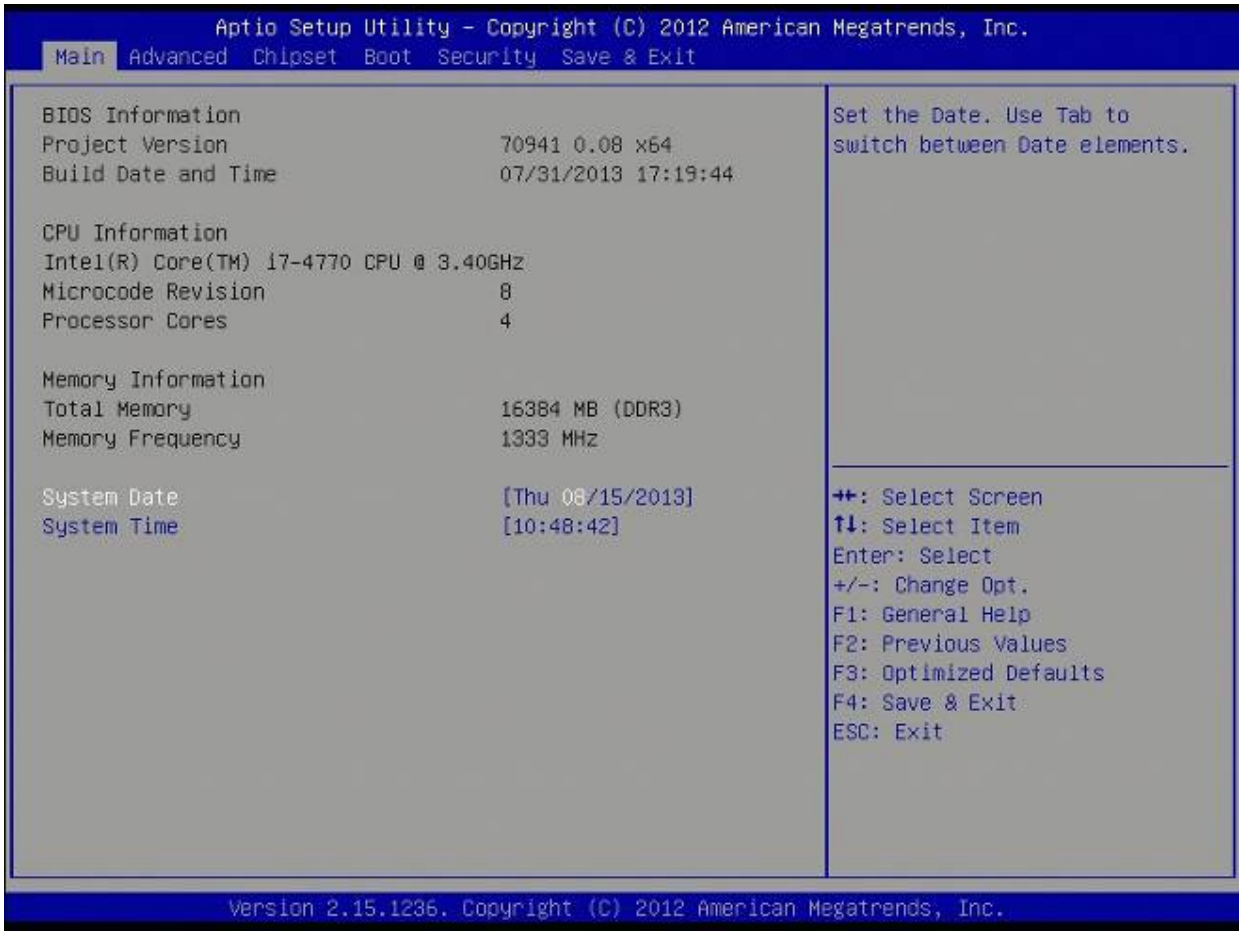
2.1.3 Sub-menu

Note that a right pointer symbol  appears to the left of certain fields. This pointer indicates that you can display a sub-menu from this field. A sub-menu contains additional options for a field parameter. To display a sub-menu, move the highlight to the field and press <Enter>. The sub-menu appears. Use the legend keys to enter values and move from field to field within a sub-menu as you would within a menu. Use the <Esc> key to return to the main menu.

Take some time to familiarize yourself with the legend keys and their corresponding functions. Practice navigating through the various menus and submenus. If you accidentally make unwanted changes to any of the fields, press <F9> to load the optimal default values. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right of each menu. This window displays the help text for the currently highlighted field.

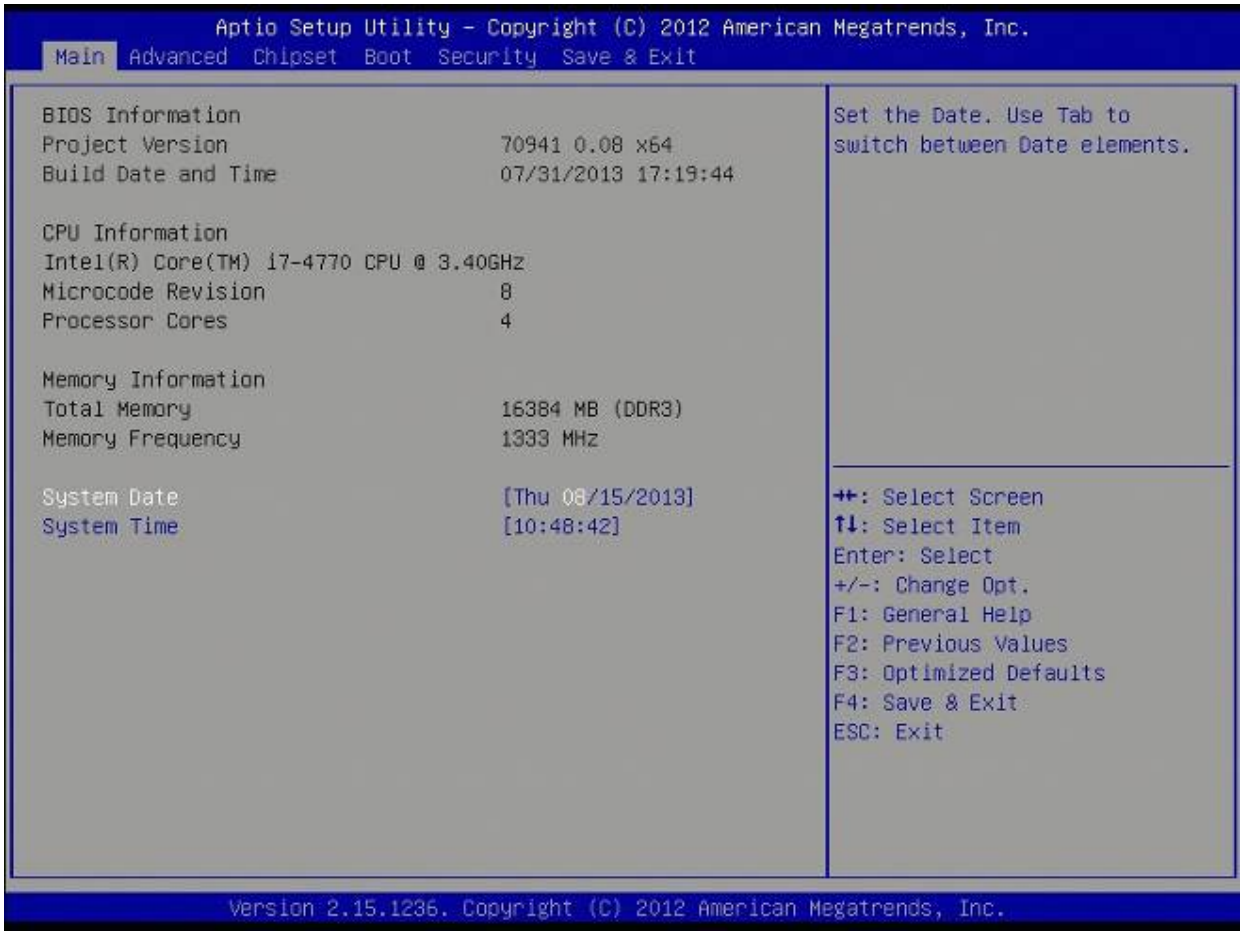
2.2 BIOS Menu Screen

When you enter the BIOS, the following screen appears. The BIOS menu screen displays the items that allow you to make changes to the system configuration. To access the menu items, press the up/down/right/left arrow key on the keyboard until the desired item is highlighted, then press [Enter] to open the specific menu.



2.3 Main Setup

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu. Use this menu for basic system configurations, such as time, date etc.



- **BIOS Information**

Displays the auto-detected BIOS information.

- **System Date**

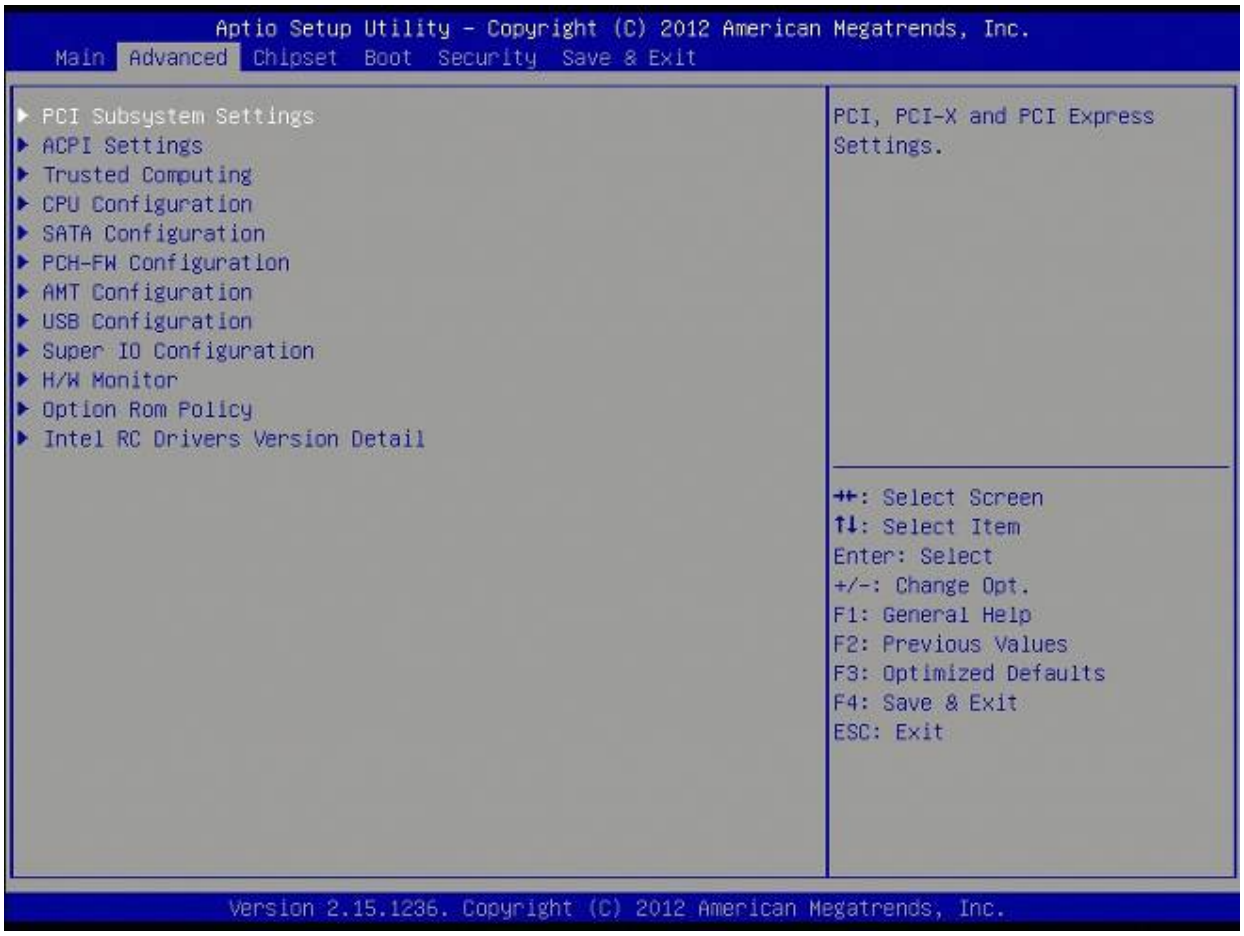
The date format is <Date>,<Month>,<Day>,<Year>.

- **System Time**

The time format is <Hour>,<Minute>,<Second>.

2.4 Advanced BIOS Setup

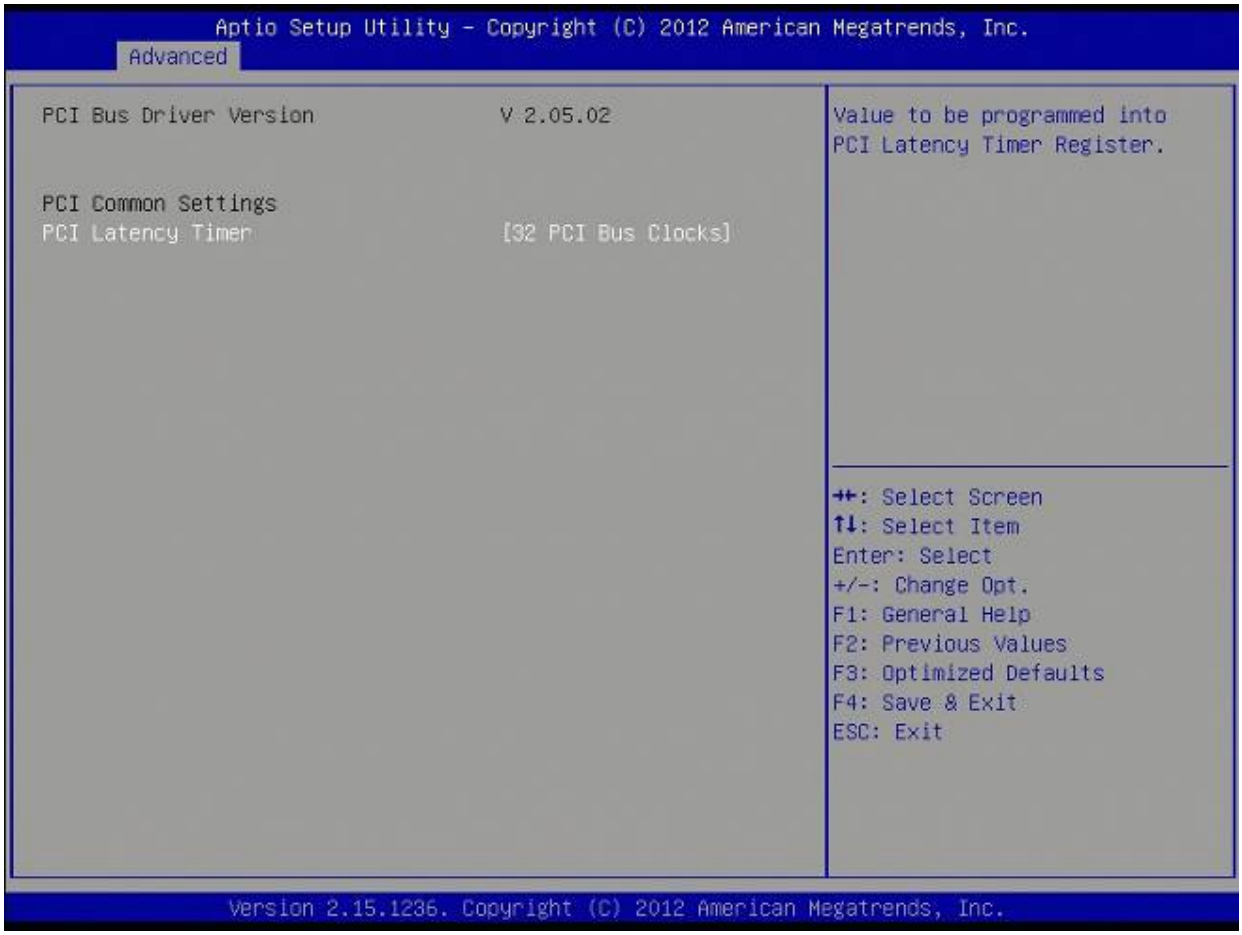
Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Chipset configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



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

2.4.1 PCI Subsystem Setting

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel resources for either PCI/PnP or legacy ISA devices, and setting the memory size block for legacy ISA devices.



- **PCI Bus Driver Version**

Displays the information of PCI Bus Driver Version

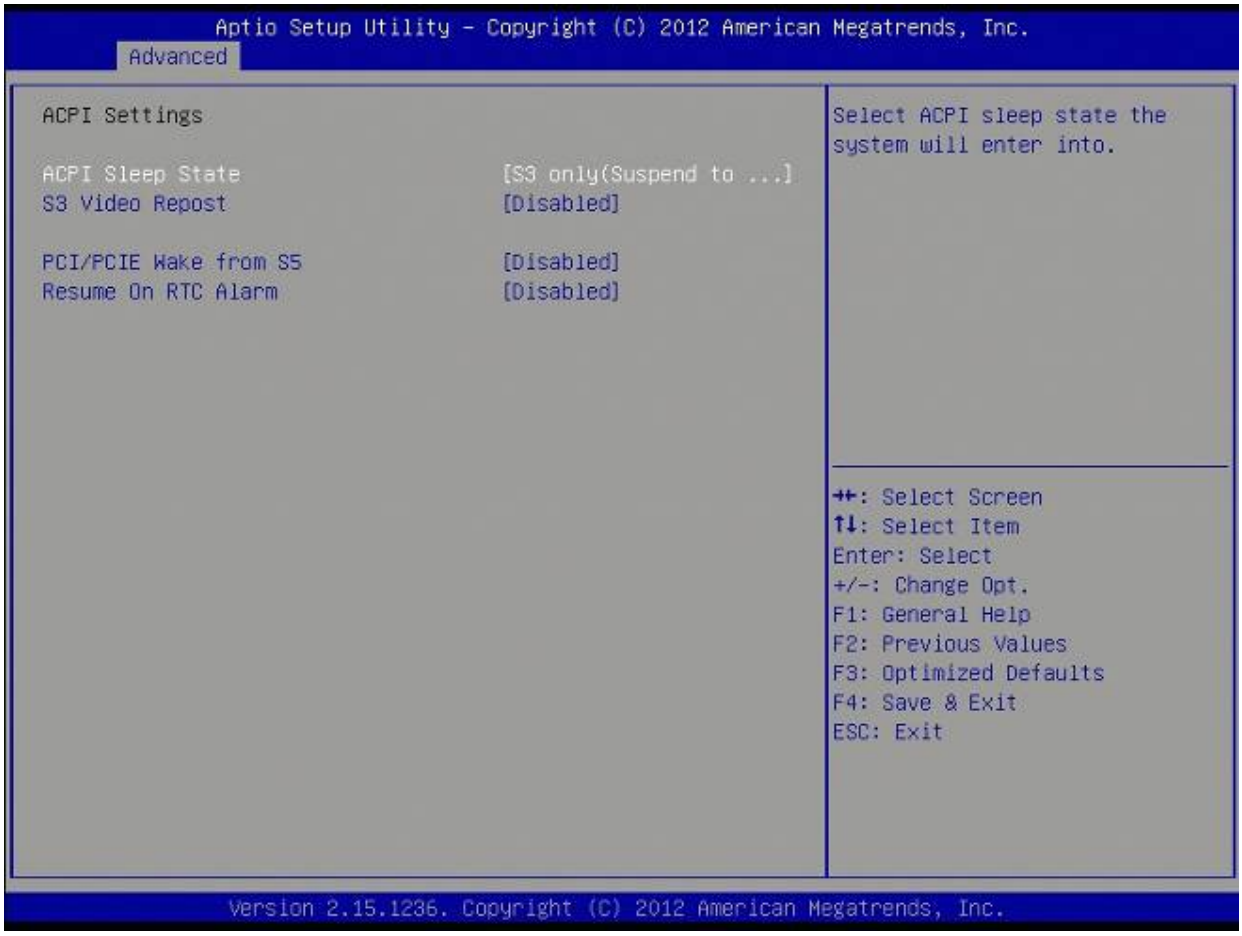
PCI Common Settings

- **PCI Latency Timer**

Value to be programmed into PCI Latency Timer Register

Configuration options: [32 PCI Bus Clocks] [64 PCI Bus Clocks] [96 PCI Bus Clocks] [128 PCI Bus Clocks] [160 PCI Bus Clocks] [192 PCI Bus Clocks] [224 PCI Bus Clocks] [248 PCI Bus Clocks]

2.4.2 ACPI Settings



- **ACPI Sleep State [S3 (suspend to RAM)]**

Select the highest ACPI sleep state the system will enter the SUSPEND button is press.
Configuration options: [S1 (CPU Stop Clock)] [S3 (suspend to RAM)]

- **S3 Video Repost[Disabled]**

Allows you to determine whether to invoke VGA BIOS POST on S3/STR resume.
Configuration options: [Disabled] [Enabled]

- **PCI/PCIE Wake from S5 [Disabled]**

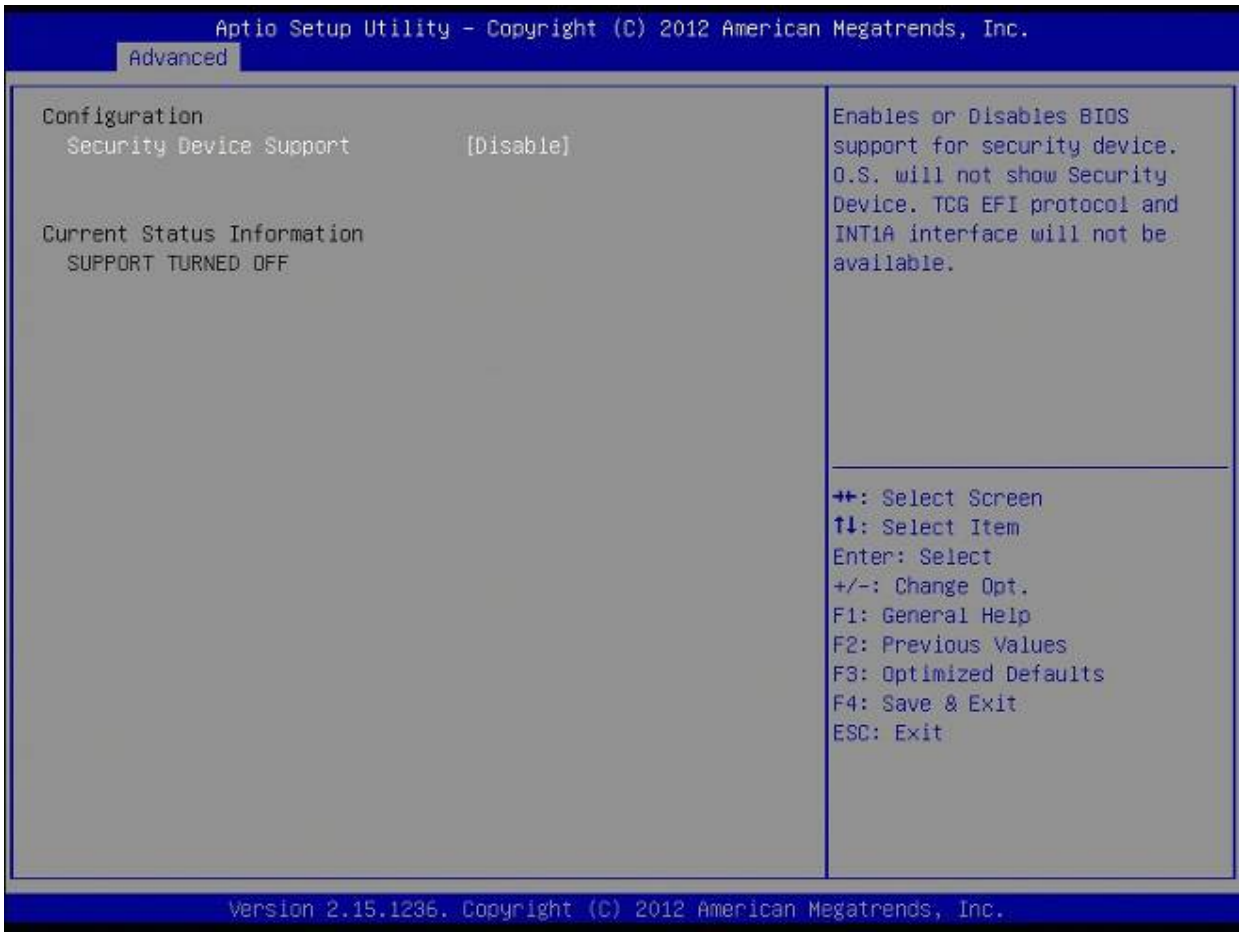
Control PCI/PCIE wake up function
Configuration options: [Disabled] [Enabled]

- **Resume On RTC Alarm [Disabled]**

Enable or disable system wake on alarm even. When enabled, system will wake upon the hr/min/sec specified.
Configuration options: [Disabled] [Enabled]

2.4.3 Trusted computing

Trusted computing (TPM) settings.



Configuration

- **Security Device Support [Disabled]**

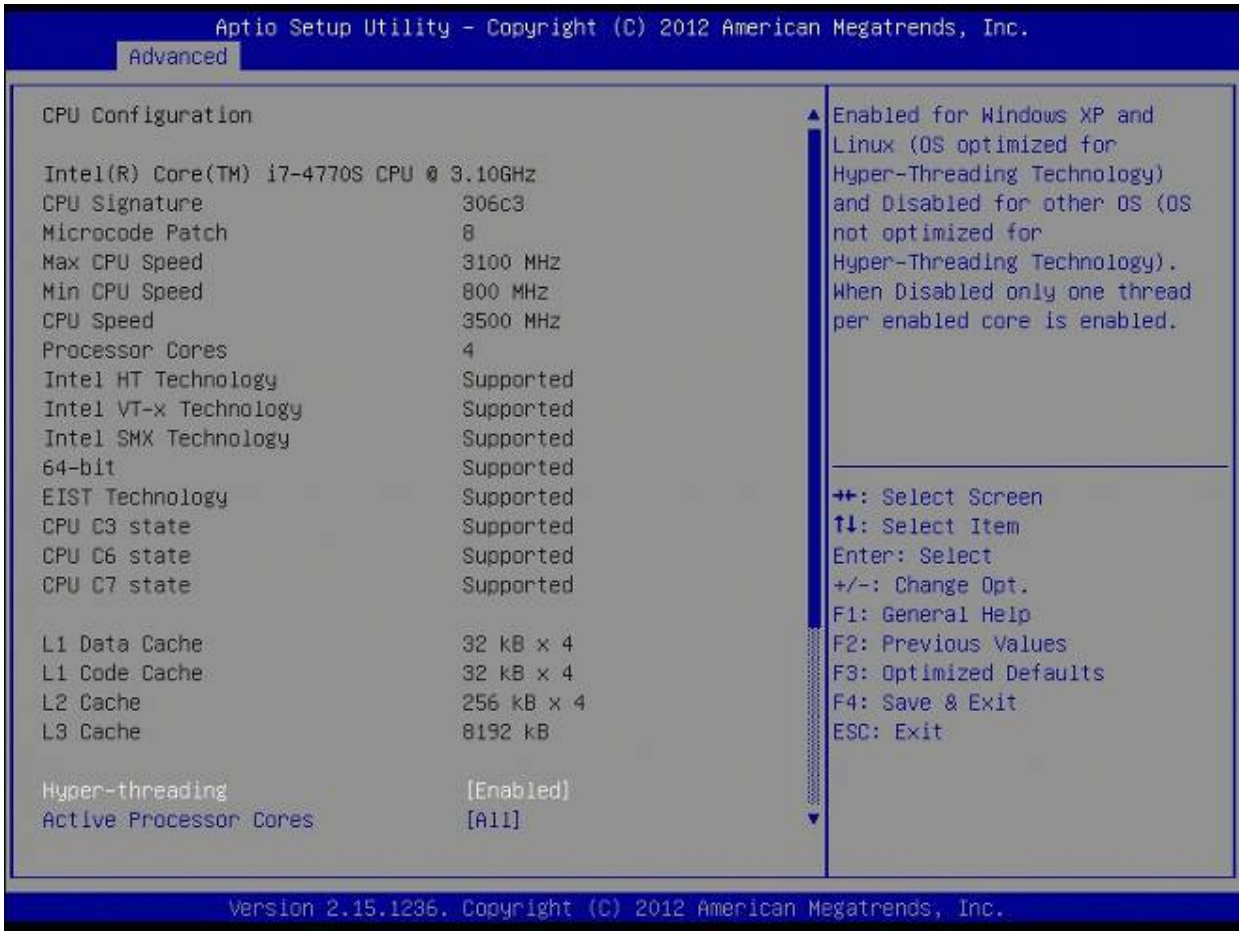
Enable or disable TPM support.

Configuration options: [Disabled] [Enabled]

- **Current Status Information**

Displays the TPM status information

2.4.4 CPU configuration



- **CPU configuration**

Displays the CPU information

- **Hyper-threading [Enabled]**

Enabled or disabled Hyper-Treading Technology

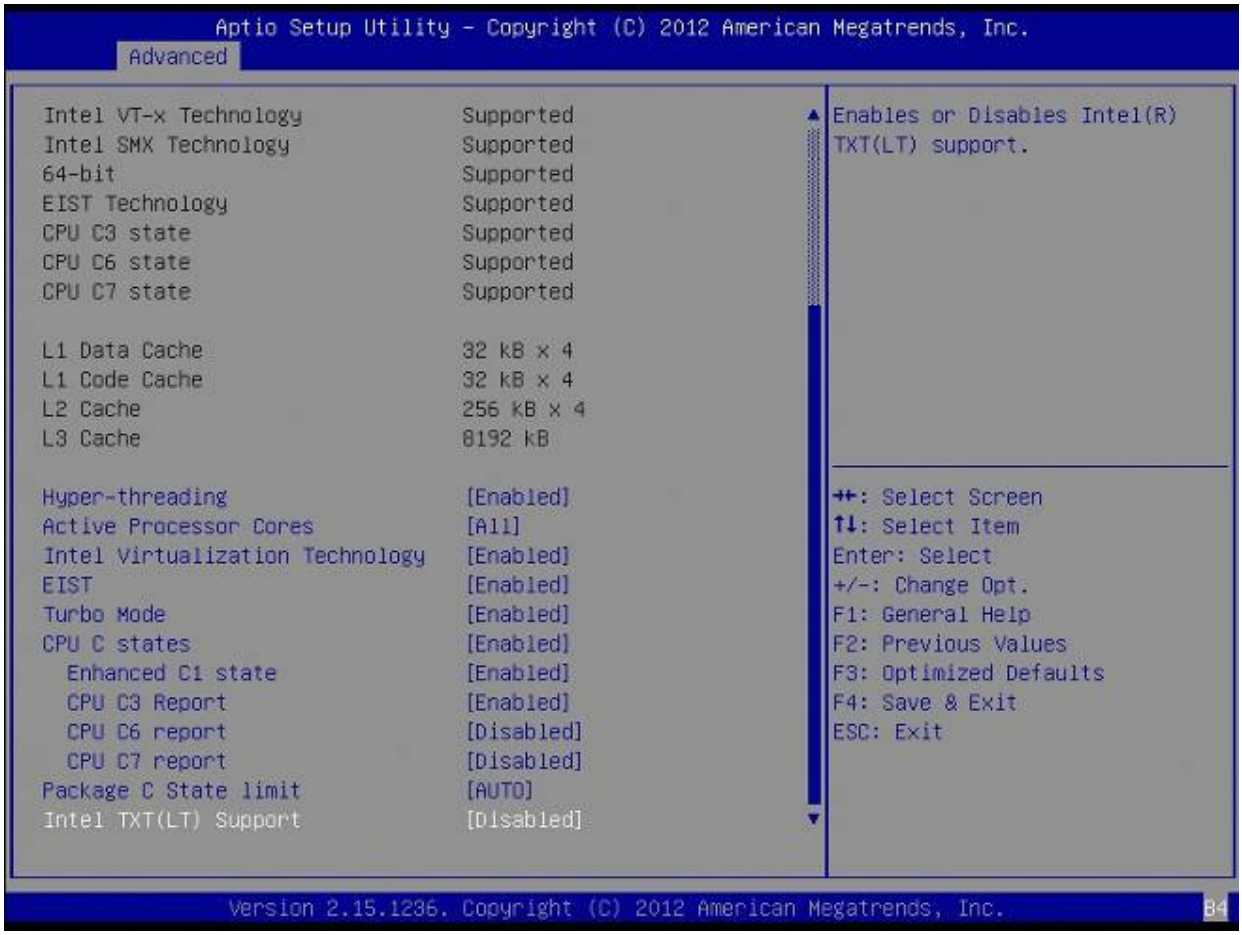
Configuration options: [Disabled] [Enabled]

- **Active Processor Cores [All]**

Select the numbers of cores in each processor package.

Configuration options: [All] [1] [2] [3] [4] [5] [6] [7]

It depends on each CPU type.



- **Intel Virtualization Technology [Enabled]**

When enable, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Configuration options: [Disabled] [Enabled]

- **EIST[Enabled]**

Enable or disable speed step.

Configuration options: [Disabled] [Enabled]

- **Turbo Mode[Enabled]**

Enable or Disable CPU Turbo Mode.

Configuration options: [Disabled] [Enabled]

- **CPU C States [Enabled]**

Enable or Disable CPU C states

Configuration options: [Disabled] [Enabled]

- **Enhanced C1 state [Enabled]**

Enhanced C1 state

Configuration options: [Disabled] [Enabled]

- **CPU C3 State Support [Enabled]**

Use this to enable or disable CPU C3 (ACPI C2) report to OS.
Configuration options: [Disabled] [Enabled]

- **CPU C6 State Support [Disabled]**

Use this to enable or disable CPU C6 (ACPI C3) report to OS.
Configuration options: [Disabled] [Enabled]

- **CPU C7 State Support [Disabled]**

Use this to enable or disable CPU C7 report to OS.
Configuration options: [Disabled] [Enabled]

Note: The C6/C7 power state will have a new minimum load spec of 0.05 Amps for the 12V2 rail. For customer systems which do not use a PSU that meets Intel®'s minimum current load specifications, Intel strongly suggests to disable the processors' C6/C7 power states in your motherboard BIOS. When the processor's C6/C7 state is disabled, the next lowest power state will be C3 (Deep Sleep Mode) which should be enabled.

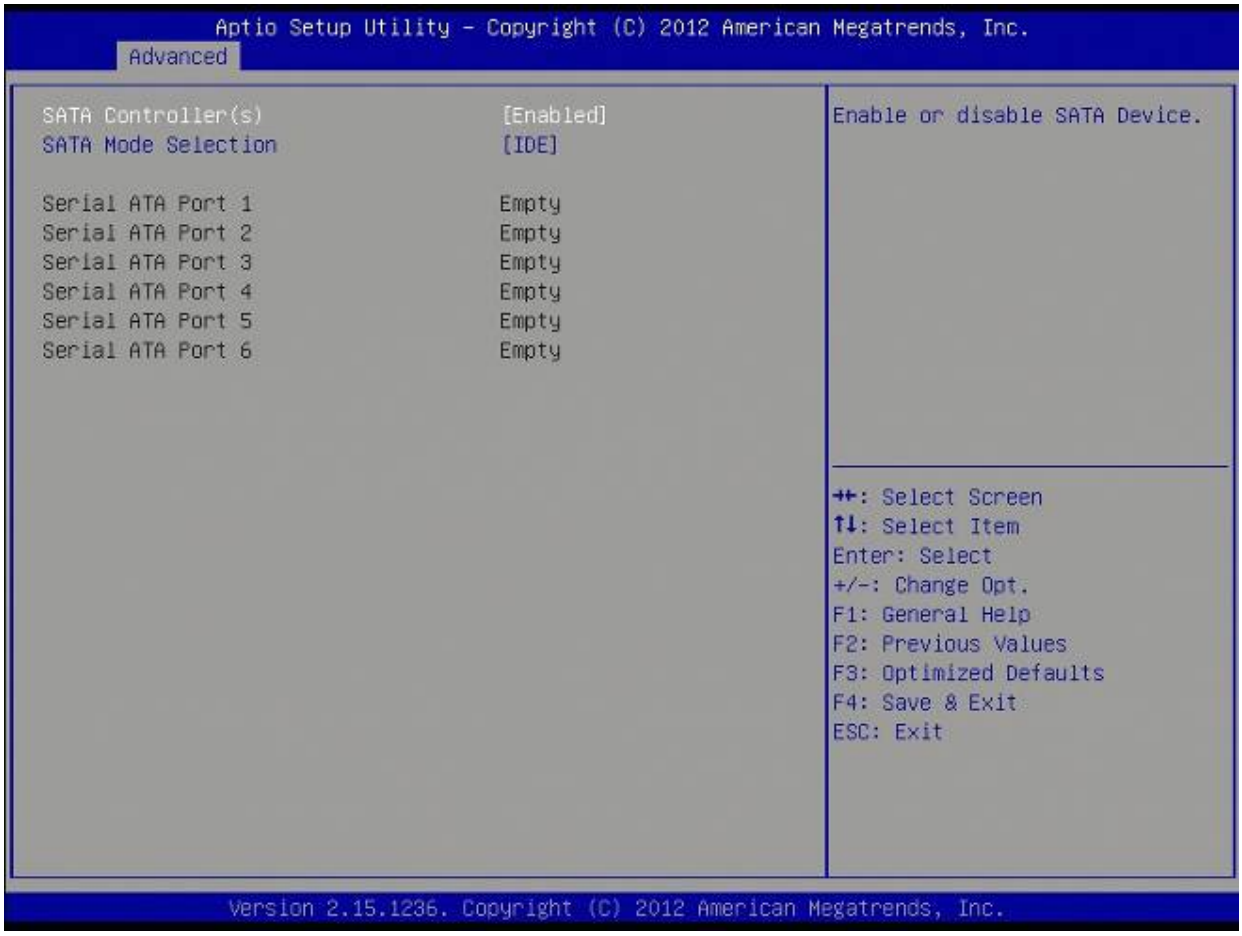
- **Package C State limit [AUTO]**

Package C State limit.
Configuration options: [C0/C1] [C2] [C3] [C6] [C7] [C7s] [AUTO]

- **Intel TXT(LT) Support [Disabled]**

Enable or disable Intel TXT(LT) support.
Configuration options: [Disabled] [Enabled]

2.4.5 SATA Configuration



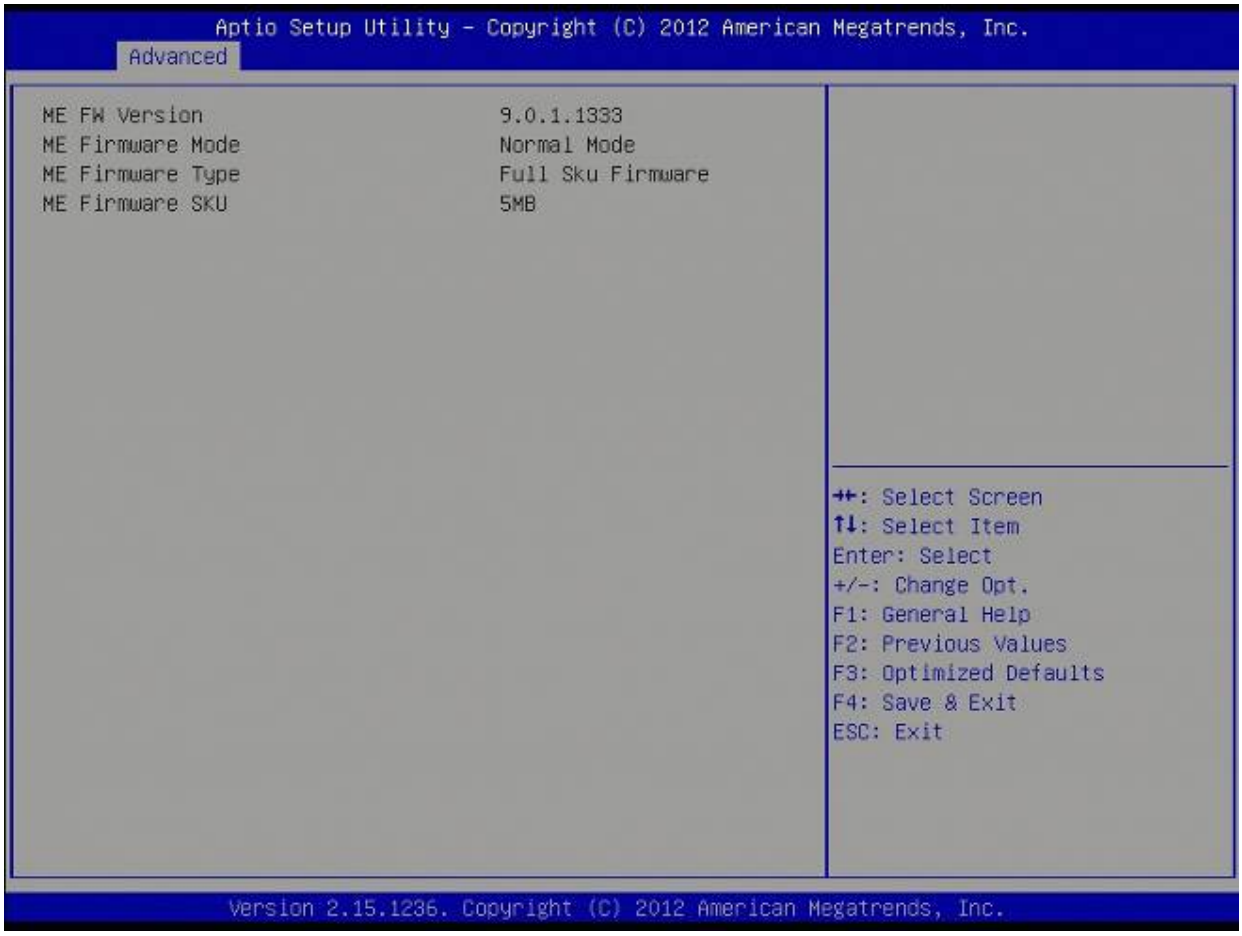
- **Serial-ATA Controller(s) [Enable]**

Enabled/Disabled Serial-ATA Controller 0
Configuration options: [Disabled] [Enabled]

- **SATA Mode [IDE]**

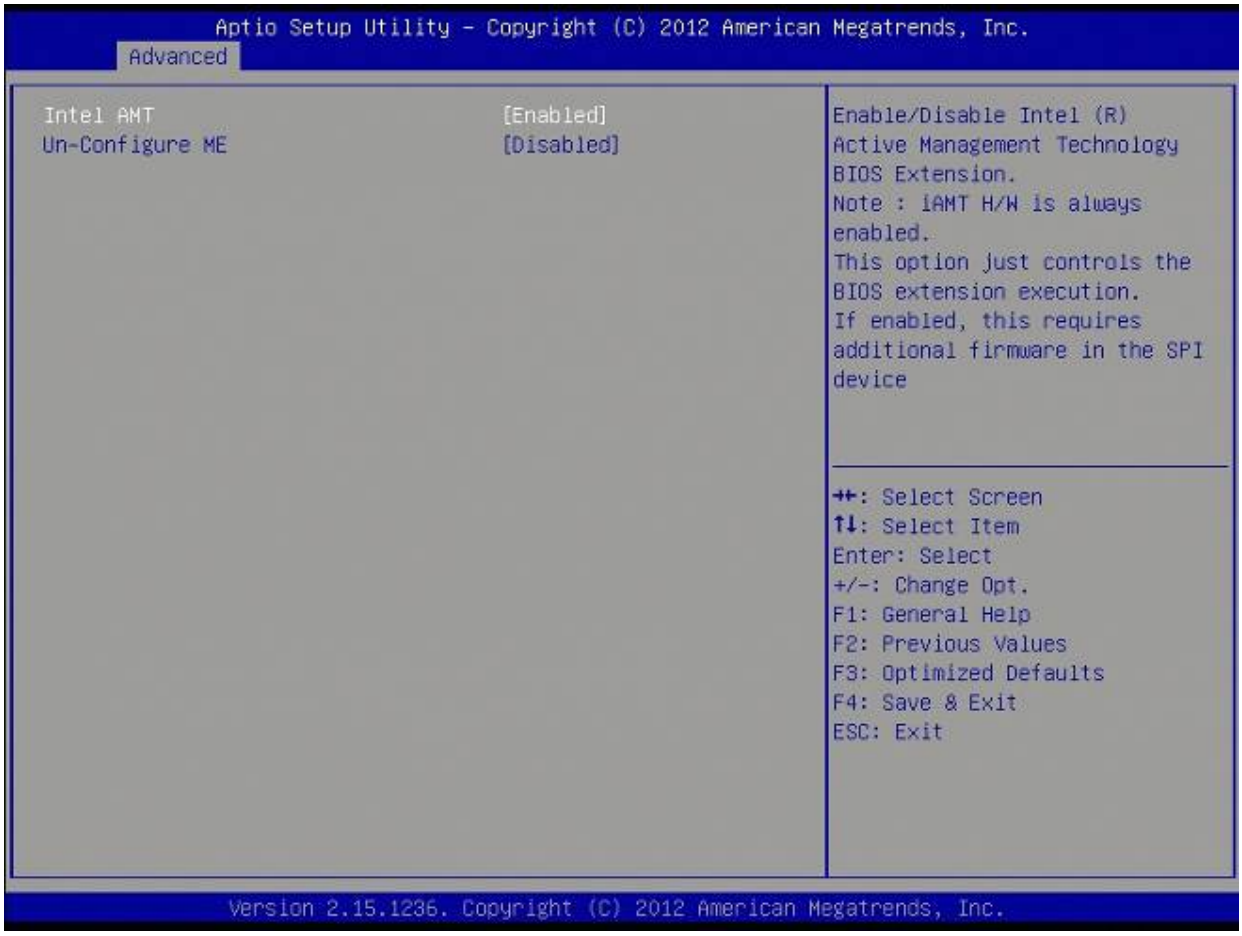
Determines how SATA controller(s) operate.
Configuration options: [IDE][AHCI][RAID]

2.4.6 PCH-FW Configuration



Display ME firmware information

2.4.7 AMT Configuration



- **Intel AMT [Enabled]**

Enable/Disable Intel Active Management Technology.

Configuration options: [Disabled] [Enabled]

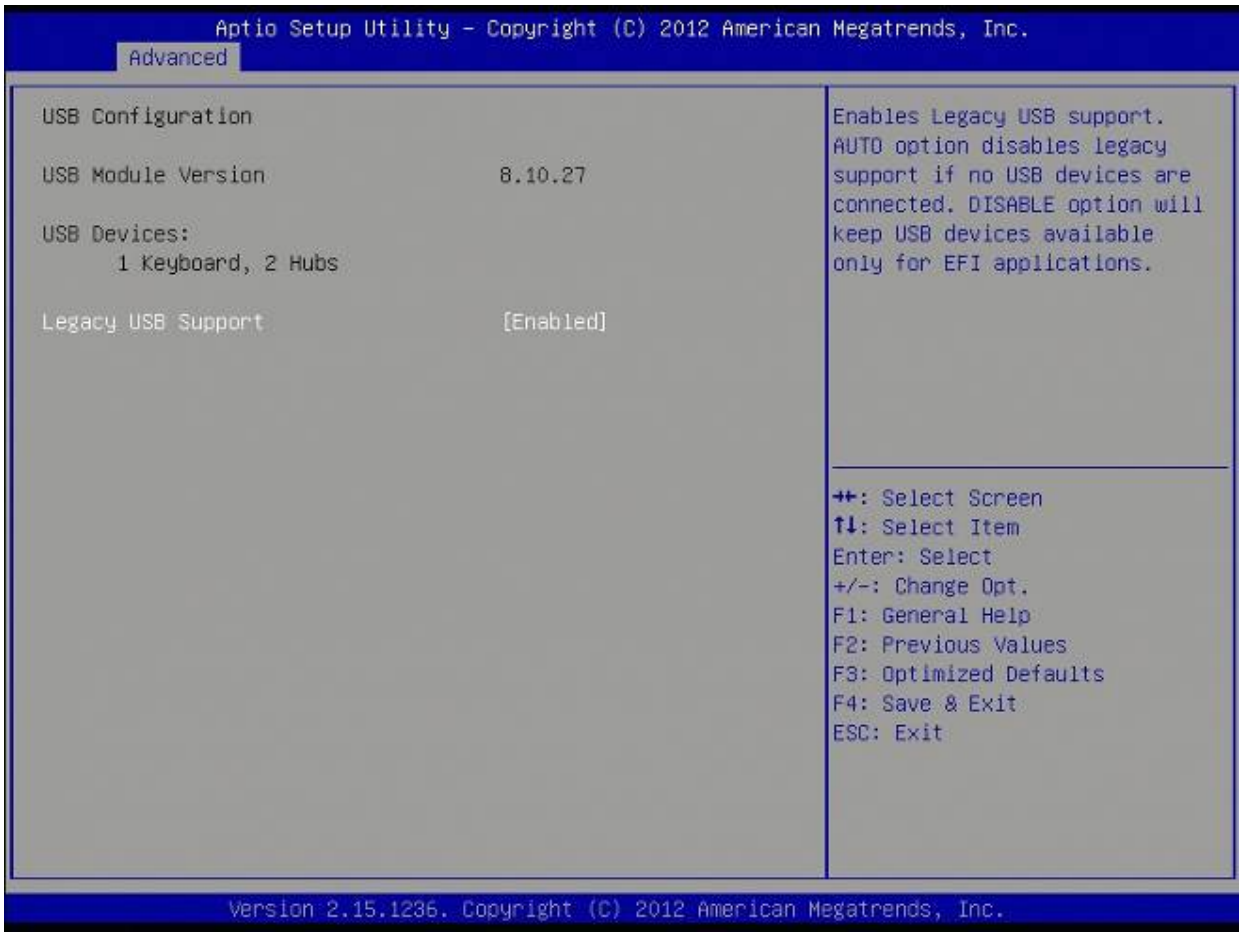
- **Un-Configure ME [Disabled]**

Un-Configure ME without password.

Configuration options: [Disabled] [Enabled]

2.4.8 USB Configuration

USB Configuration Parameters



- **USB Device**

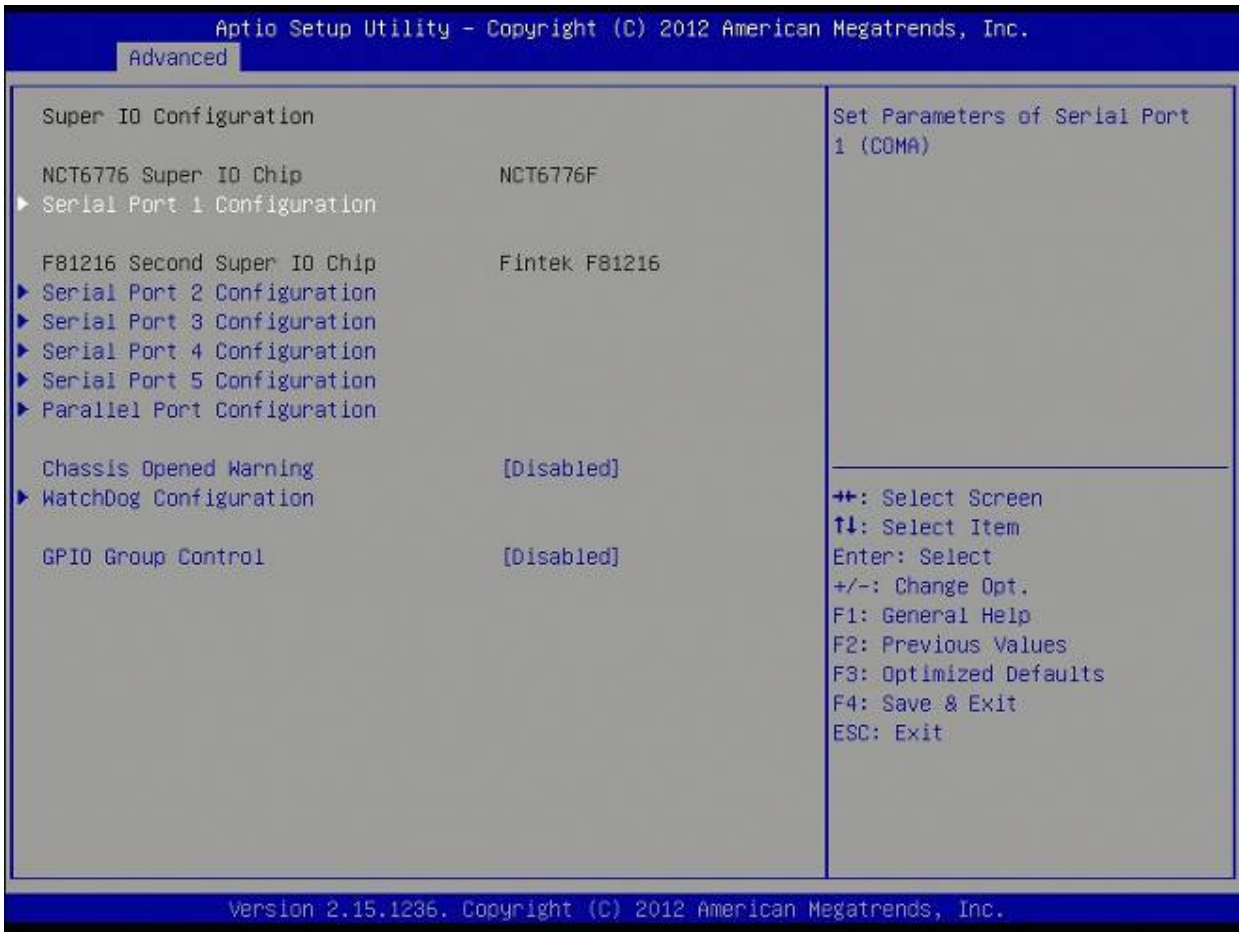
Display how many devices are connected.

- **Legacy USB Support [Enabled]**

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
Configuration options: [Enabled] [Disabled][Auto]

2.4.9 Super IO Configuration

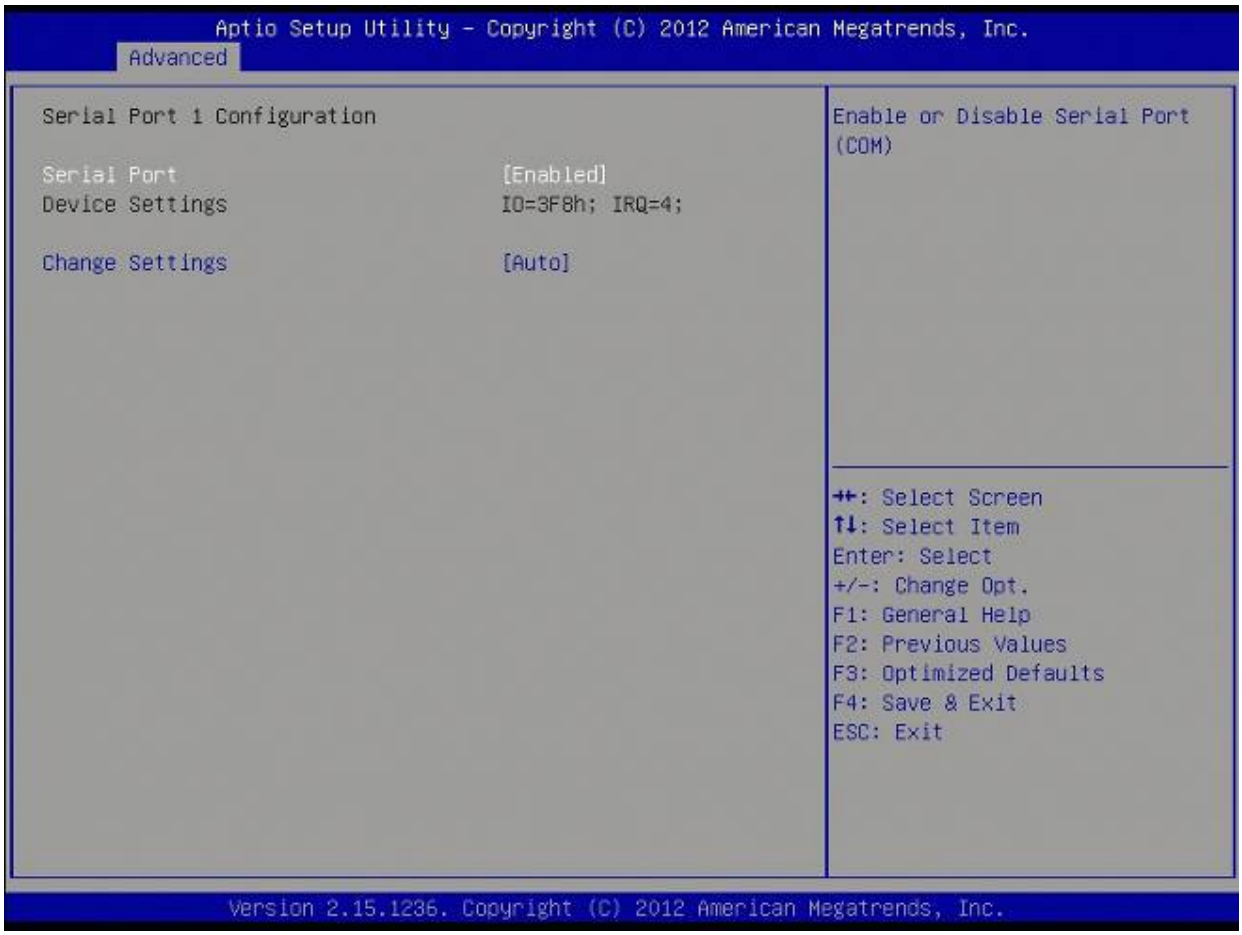
System Super IO Chip Parameters.



Super IO Configuration
NCT6776 Super IO Chip [NCT6776F]

2.4.9.1 Serial Port 1 configuration

Set Parameters of Serial Port 1



- **Serial Port [Enable]**

Enable or Disable Serial Port.
Configuration options: [Disabled] [Enabled]

- **Device Setting [IO=3F8h; IRQ=4]**

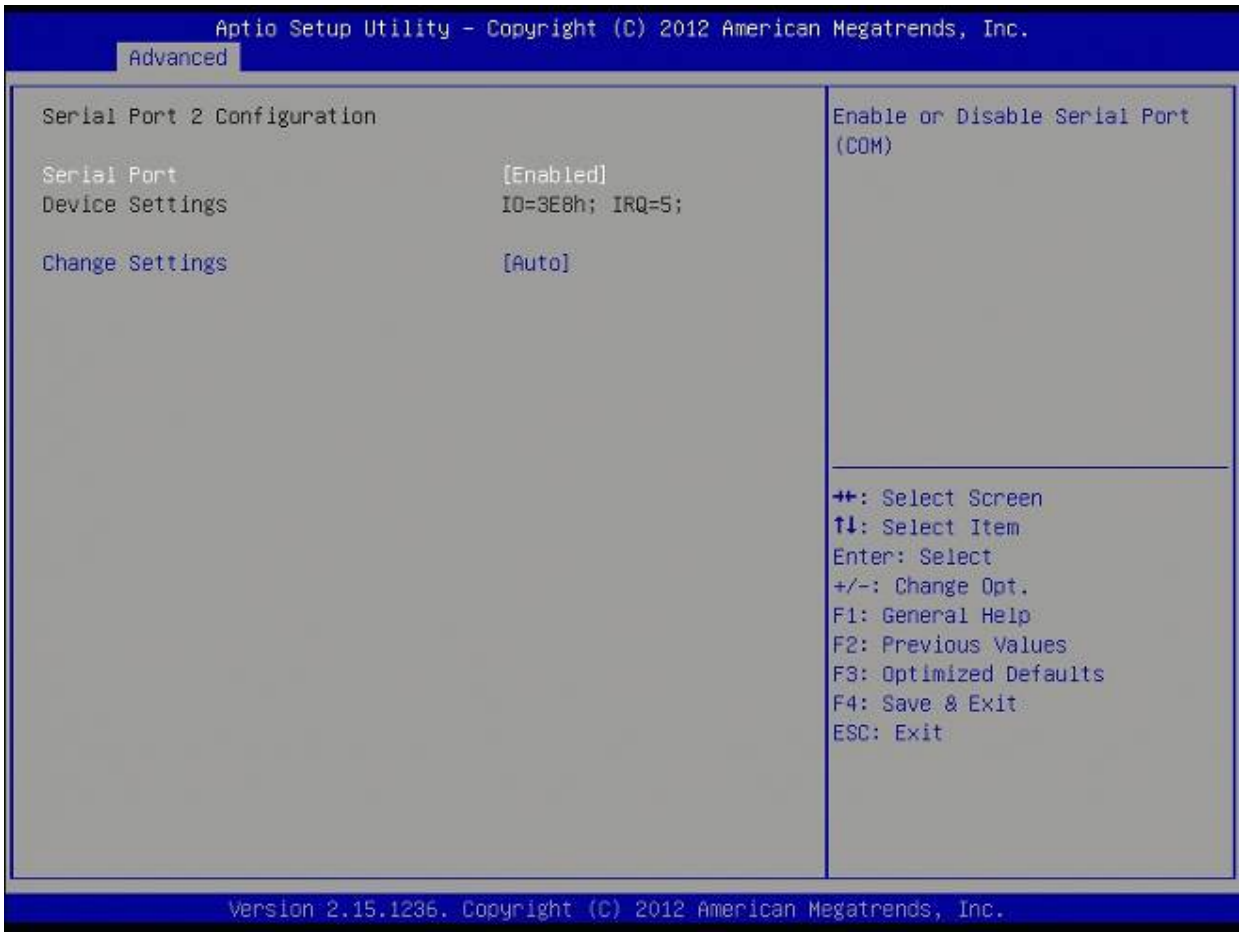
- **Change Setting[Auto]**

Select an optimal setting for Super IO device.
Configuration options: [Auto] [IO=3F8h; IRQ=4] [IO=3F8h; IRQ=3, 4, 5, 6, 7, 9. 10, 11, 12] [IO=2F8h; IRQ=3, 4, 5, 6, 7, 9. 10, 11, 12] [IO=3E8h; IRQ=3, 4, 5, 6, 7, 9. 10, 11, 12] [IO=2E8h; IRQ=3, 4, 5, 6, 7, 9. 10, 11, 12]

F81216 Second Super IO Chip [Fintek F81216]

2.4.9.2 Serial Port 2 configuration

Set Parameters of Serial Port 2



Serial Port 2 Configuration

- **Serial Port [Enable]**

Enable or Disable Serial Port.

Configuration options: [Disabled] [Enabled]

- **Device Setting [IO=3E8h; IRQ=5]**

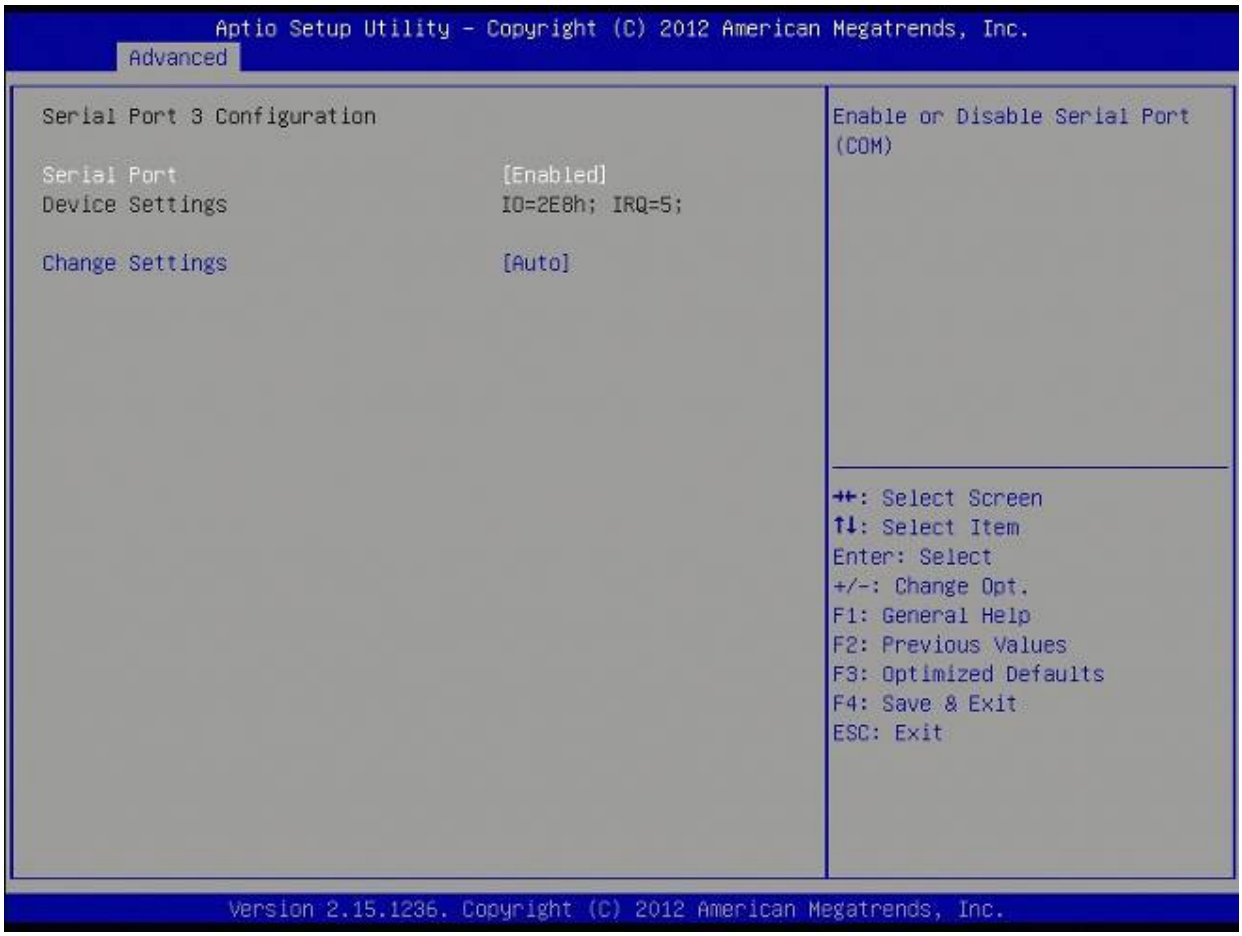
- **Change Setting[Auto]**

Select an optimal setting for Super IO device.

Configuration options: [Auto] [IO=3E8h; IRQ=5] [IO=3F8h; IRQ=5, 10] [IO=2F8h; IRQ=5, 10] [IO=3E8h; IRQ=5, 10] [IO=2E8h; IRQ=5, 10]

2.4.9.3 Serial Port 3 configuration

Set Parameters of Serial Port 3



Serial Port 3 Configuration

- **Serial Port [Enable]**

Enable or Disable Serial Port.

Configuration options: [Disabled] [Enabled]

- **Device Setting [IO=2E8h; IRQ=5]**

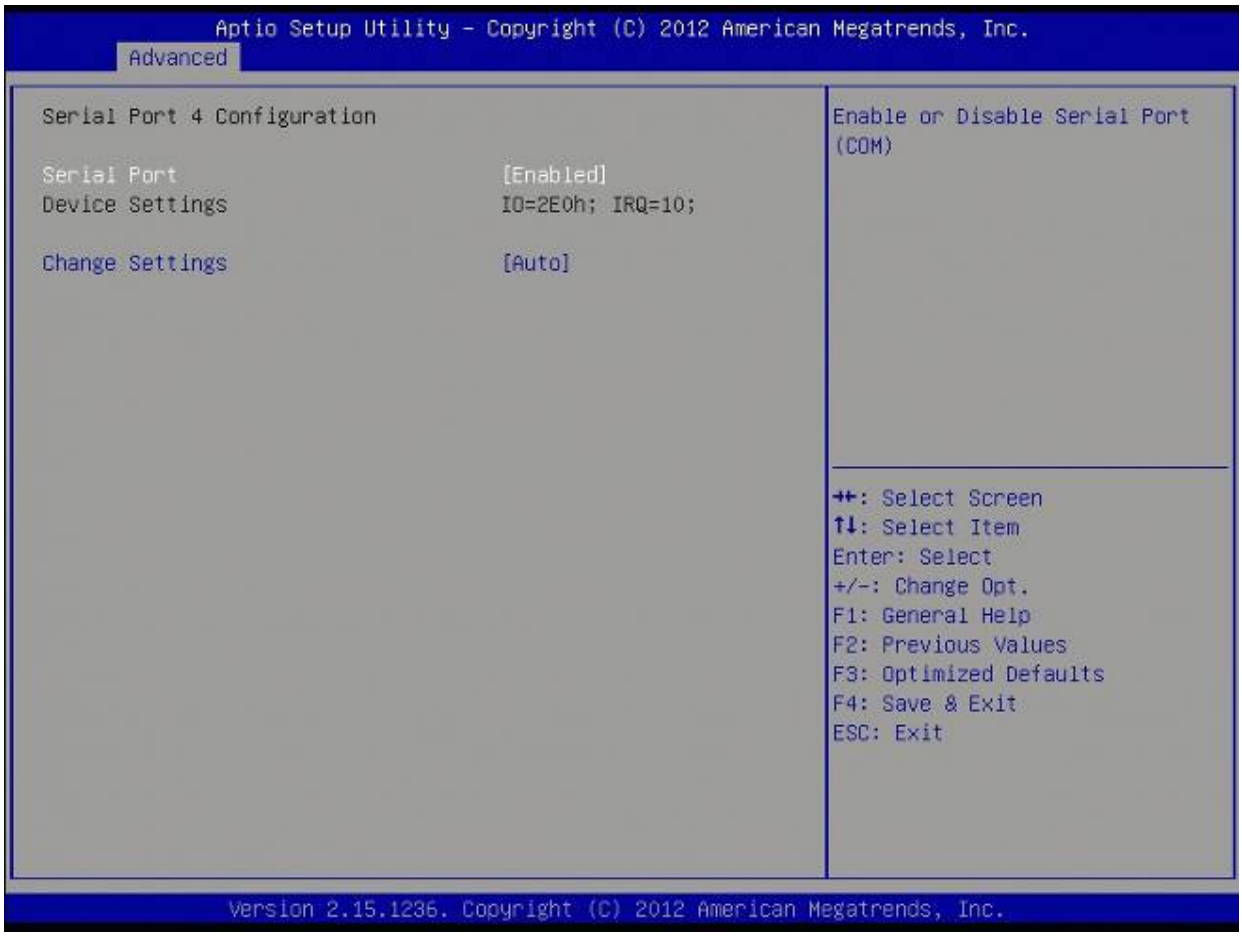
- **Change Setting[Auto]**

Select an optimal setting for Super IO device.

Configuration options: [Auto] [IO=2E8h; IRQ=5] [IO=3F8h; IRQ=5, 10] [IO=2F8h; IRQ=5, 10] [IO=3E8h; IRQ=5, 10] [IO=2E8h; IRQ=5, 10]

2.4.9.4 Serial Port 4 configuration

Set Parameters of Serial Port 4



Serial Port 4 Configuration

- **Serial Port [Enable]**

Enable or Disable Serial Port.

Configuration options: [Disabled] [Enabled]

- **Device Setting [IO=2E0h; IRQ=10]**

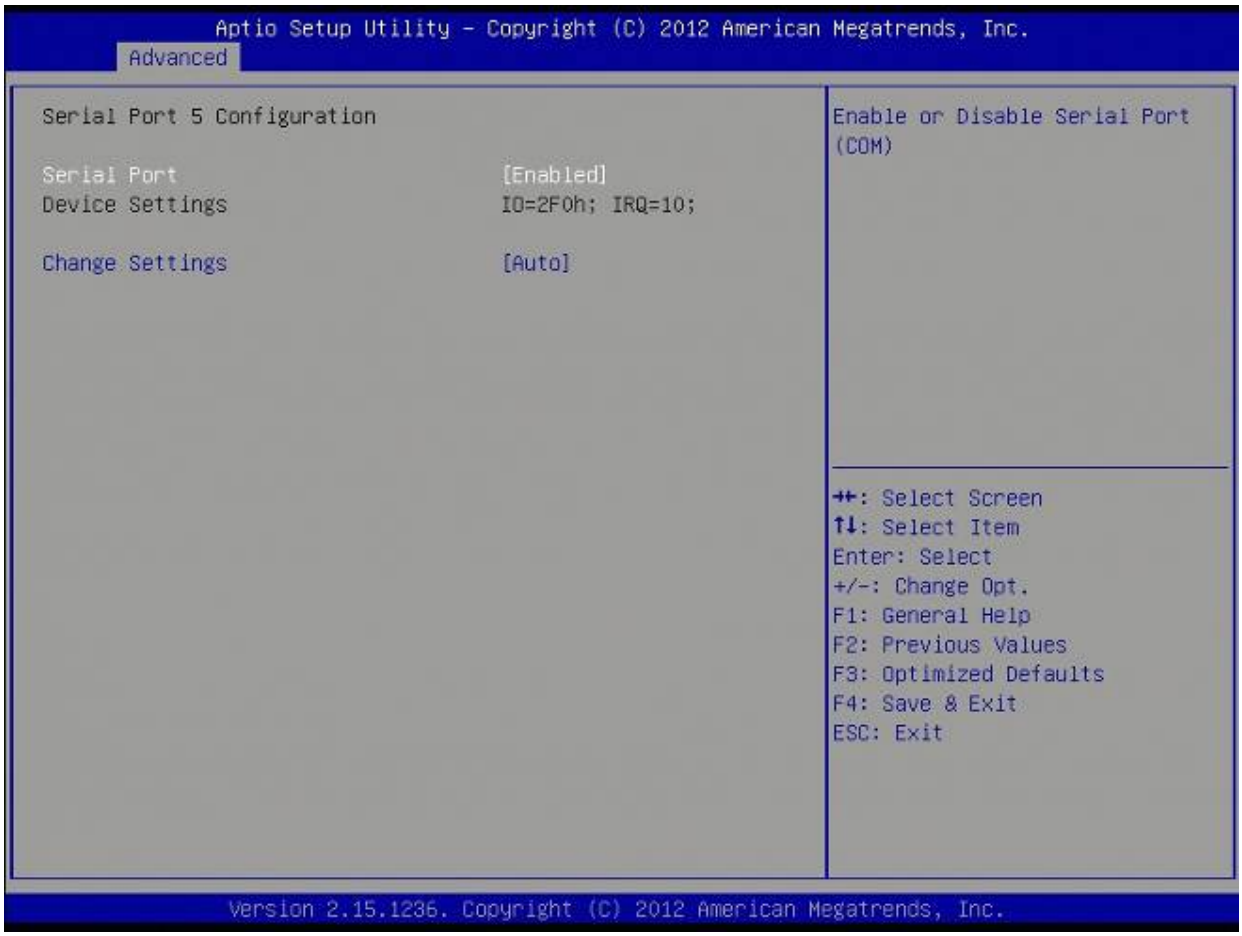
- **Change Setting[Auto]**

Select an optimal setting for Super IO device.

Configuration options: [Auto] [IO=2E0h; IRQ=10] [IO=3F8h; IRQ=5, 10] [IO=2F8h; IRQ=5, 10] [IO=3E8h; IRQ=5, 10] [IO=2E8h; IRQ=5, 10] [IO=2E0h; IRQ=5, 10] [IO=2F0h; IRQ=5, 10]

2.4.9.5 Serial Port 5 configuration

Set Parameters of Serial Port 5



Serial Port 5 Configuration

- **Serial Port [Enable]**

Enable or Disable Serial Port.

Configuration options: [Disabled] [Enabled]

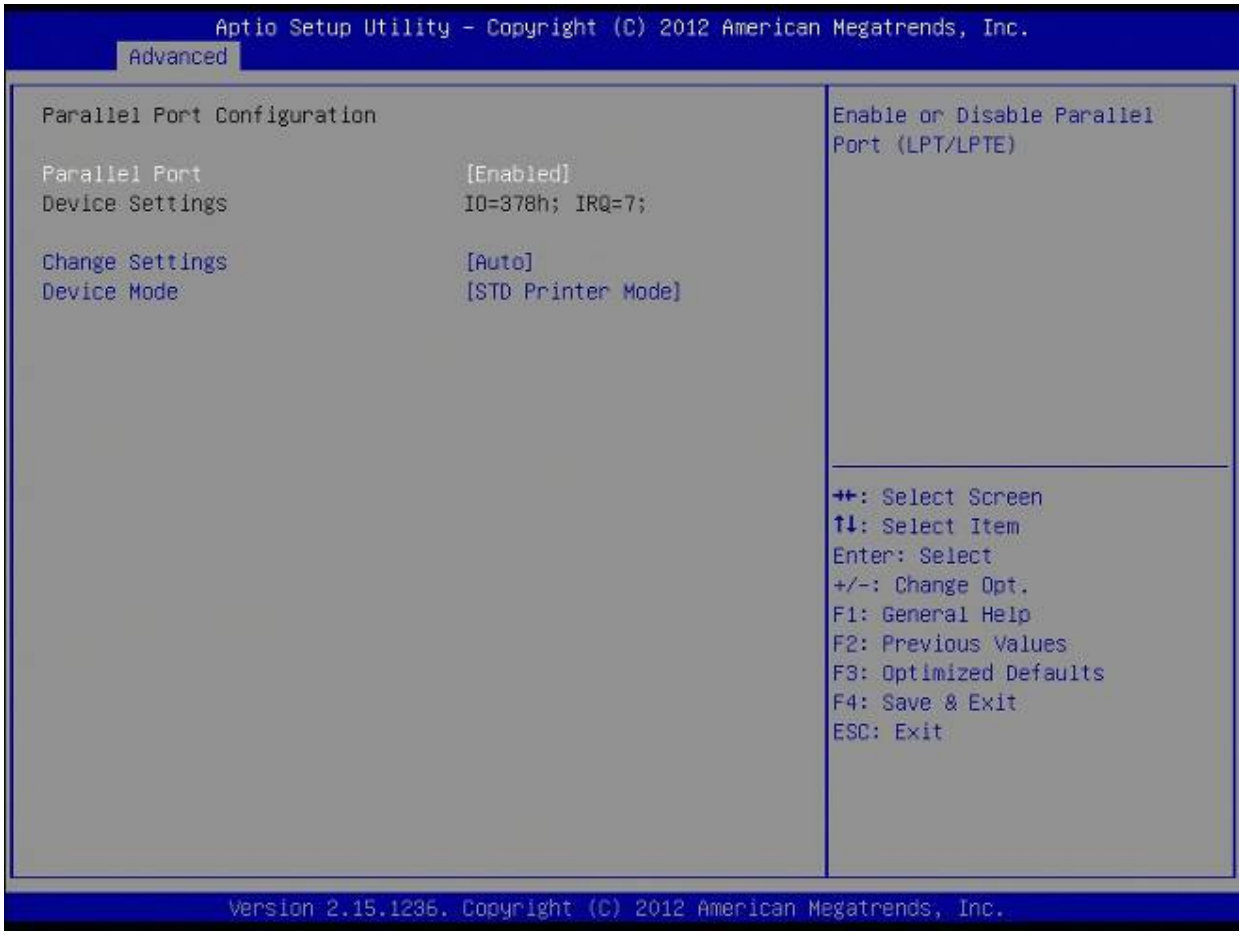
- **Device Setting [IO=2F0h; IRQ=10]**

- **Change Setting[Auto]**

Select an optimal setting for Super IO device.

Configuration options: [Auto] [IO=2F0h; IRQ=10] [IO=3F8h; IRQ=5, 10] [IO=2F8h; IRQ=5, 10] [IO=3E8h; IRQ=5, 10] [IO=2E8h; IRQ=5, 10] [IO=2E0h; IRQ=5, 10] [IO=2F0h; IRQ=5, 10]

2.4.9.6 Parallel Port Configuration



- **Parallel Port [Enable]**

Use this item to enable or disable the onboard parallel port.
Configuration options: [Disabled] [Enabled]

- **Change Settings [Auto]**

Use this item to select an optional setting for Super IO device.
Configuration Options: [Auto] [IO=378h; IRQ=7] [IO=378h; IRQ=6,7,9,11,12] [IO=278h; IRQ=6,7,9,11,12]

- **Device Mode [STD Printer Mode]**

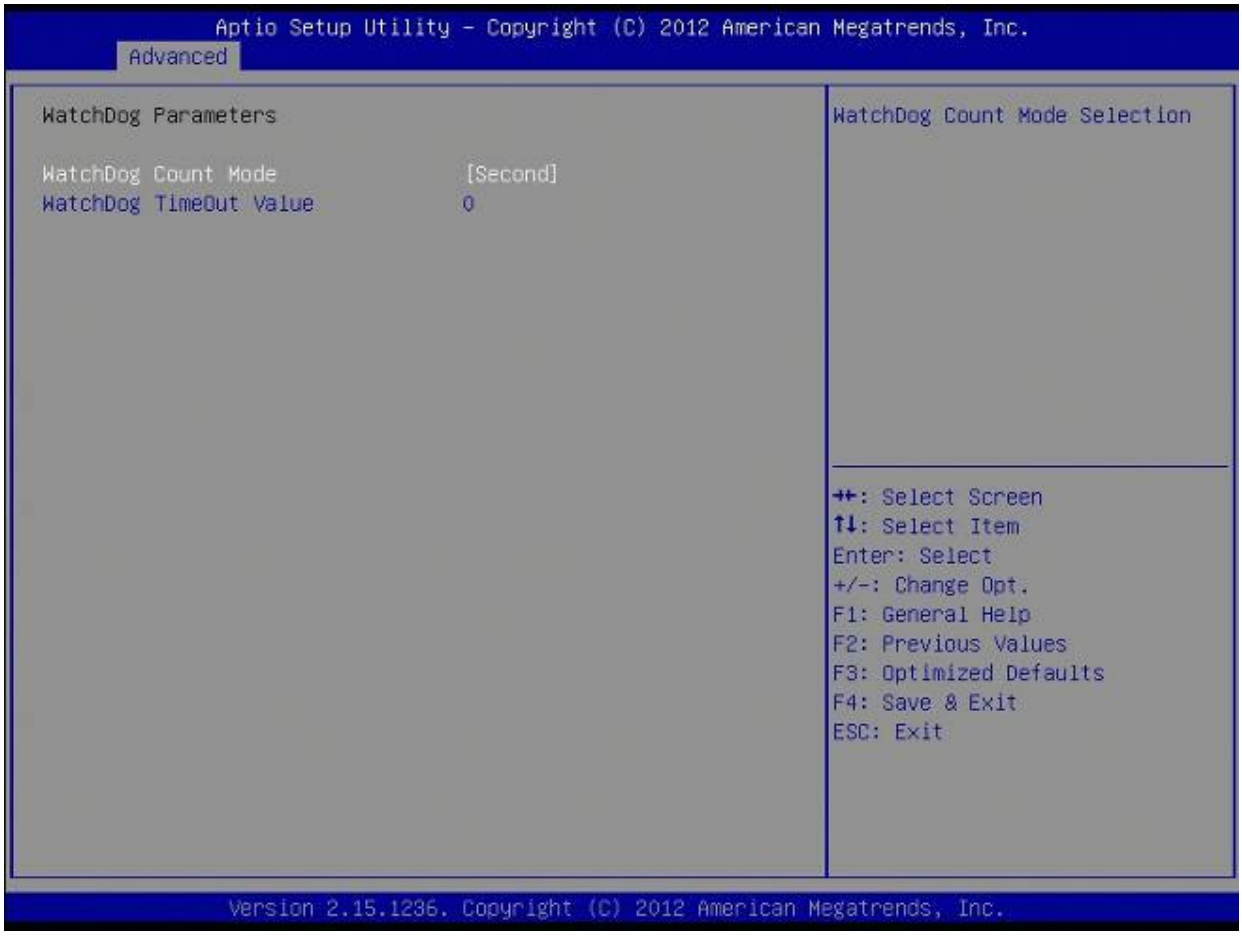
Use this item to change the Printer Port mode.
Configuration Options: [STD Printer Mode] [SPP Mode] [EPP-1.9 and SPP Mode] [EPP-1.7 and SPP Mode] [ECP Mode] [ECP Mode and EPP-1.9 Mode] [ECP Mode and EPP-1.7 Mode]

- **Chassis Opened Warning [Disabled]**

Select whether to enable Chassis Intrusion Detection.

Configuration options: [Disabled] [Enabled]

2.4.9.7 WatchDog Configuration



- WatchDog Count Mode [Second(s) Mode]

Select Watch Dog Count Mode.

Configuration options: [Second(s) Mode [Minute(s) Mode]

- WatchDog TimeOut Value [0]

Timer will start to count from end of POST. 00 – Timeout Disable

- **GPIO Group Control [Disabled]**

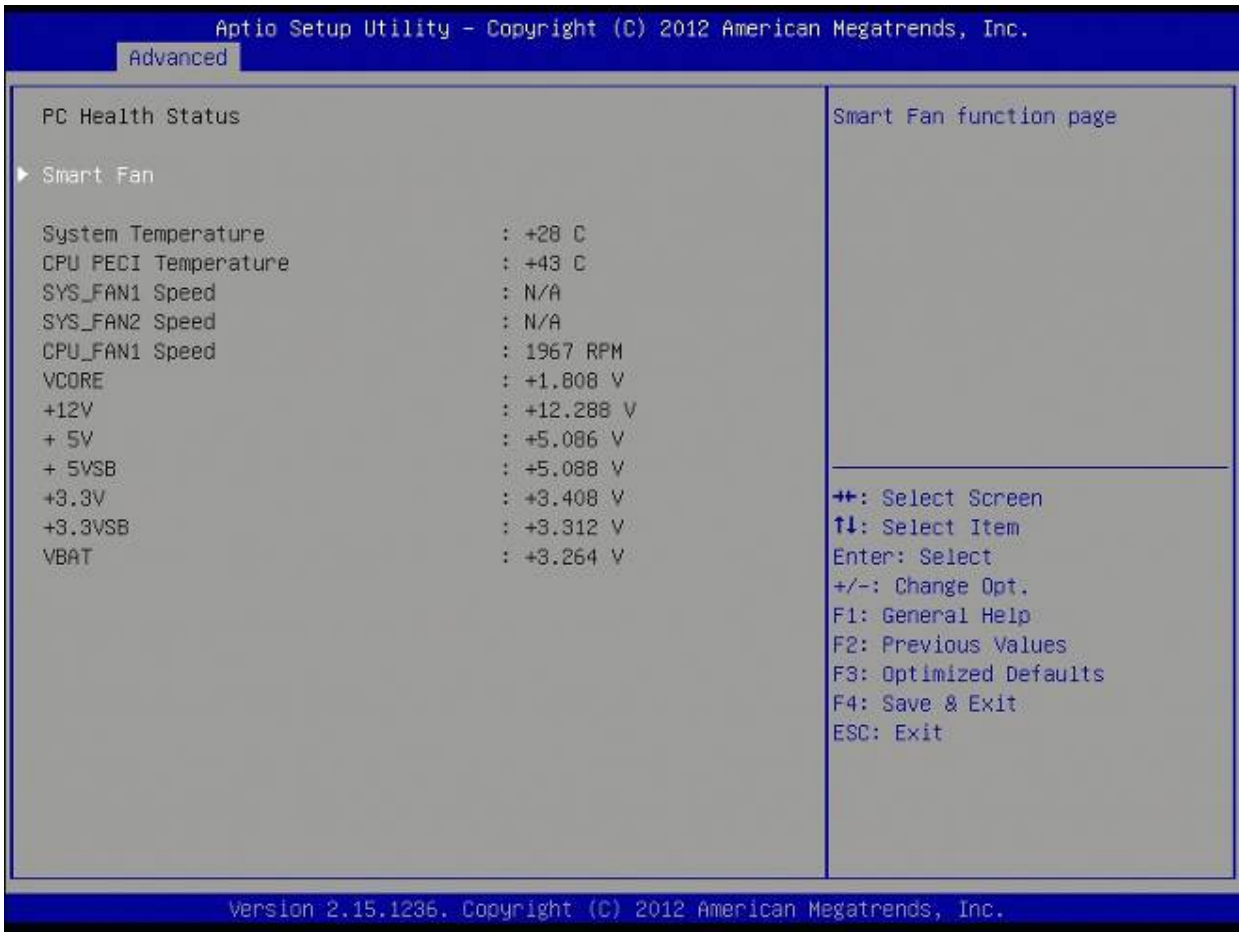
Configure the digital GPIO pins.

Configuration options: [Disabled] [Enabled]

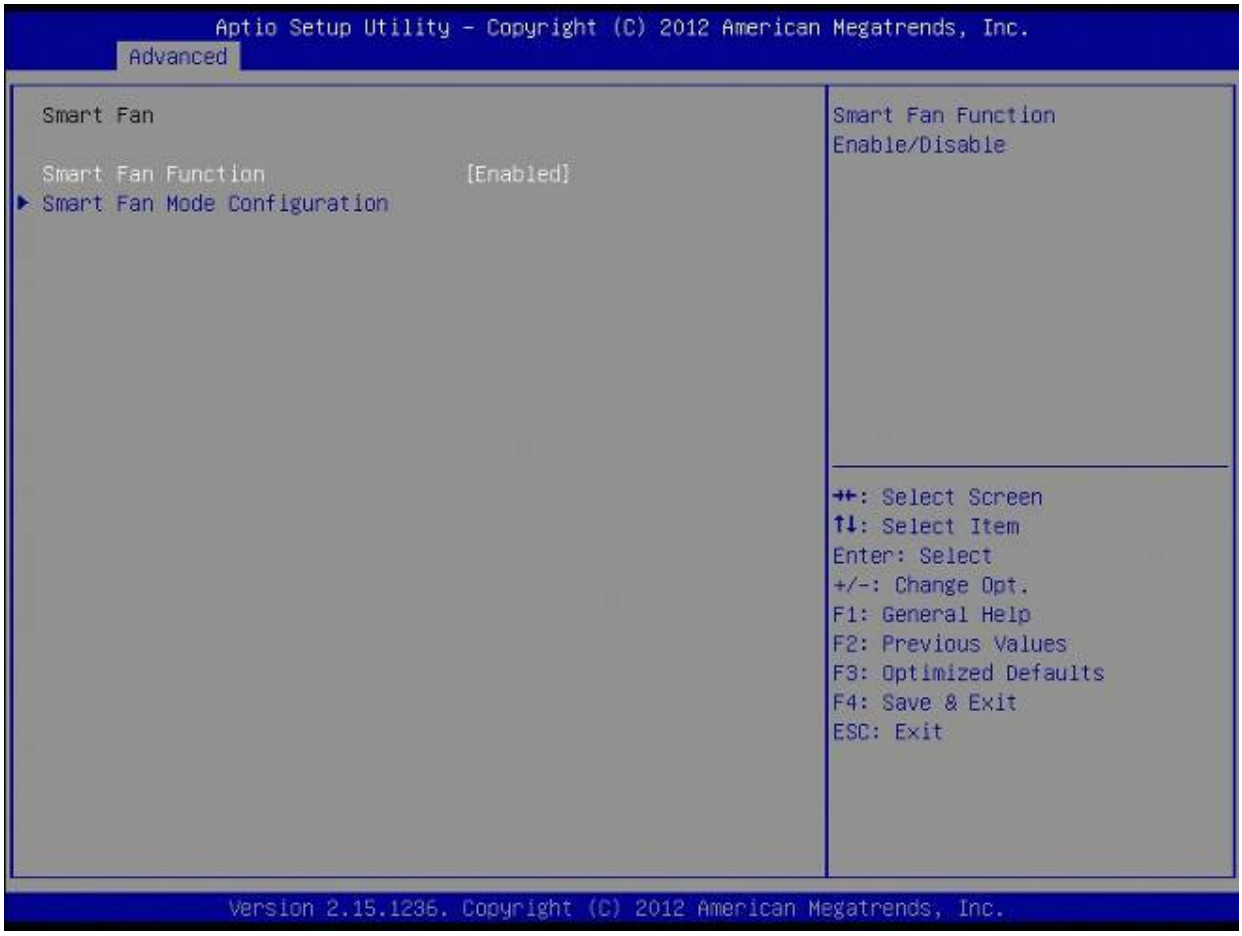
2.4.10 H/W Monitor

- **PC Health Status**

Display system health status



2.4.10.1 Smart Fan



- **Smart Fan Function [Enable]**

Smart Fan Function enable/disable

Configuration options: [Disabled] [Enabled]

2.4.10.2 Smart Fan Mode Configuration

Smart Fan Mode configuration

- **SYS Smart Fan1 Target [Disabled]**

SYS Smart Fan1 Target Temperature

Configuration options: [Disabled] [40 C] [45 C] [50 C] [55 C] [60 C] [65 C] [70 C]

- **SYS Smart Fan2 Target [Disabled]**

SYS Smart Fan2 Target Temperature

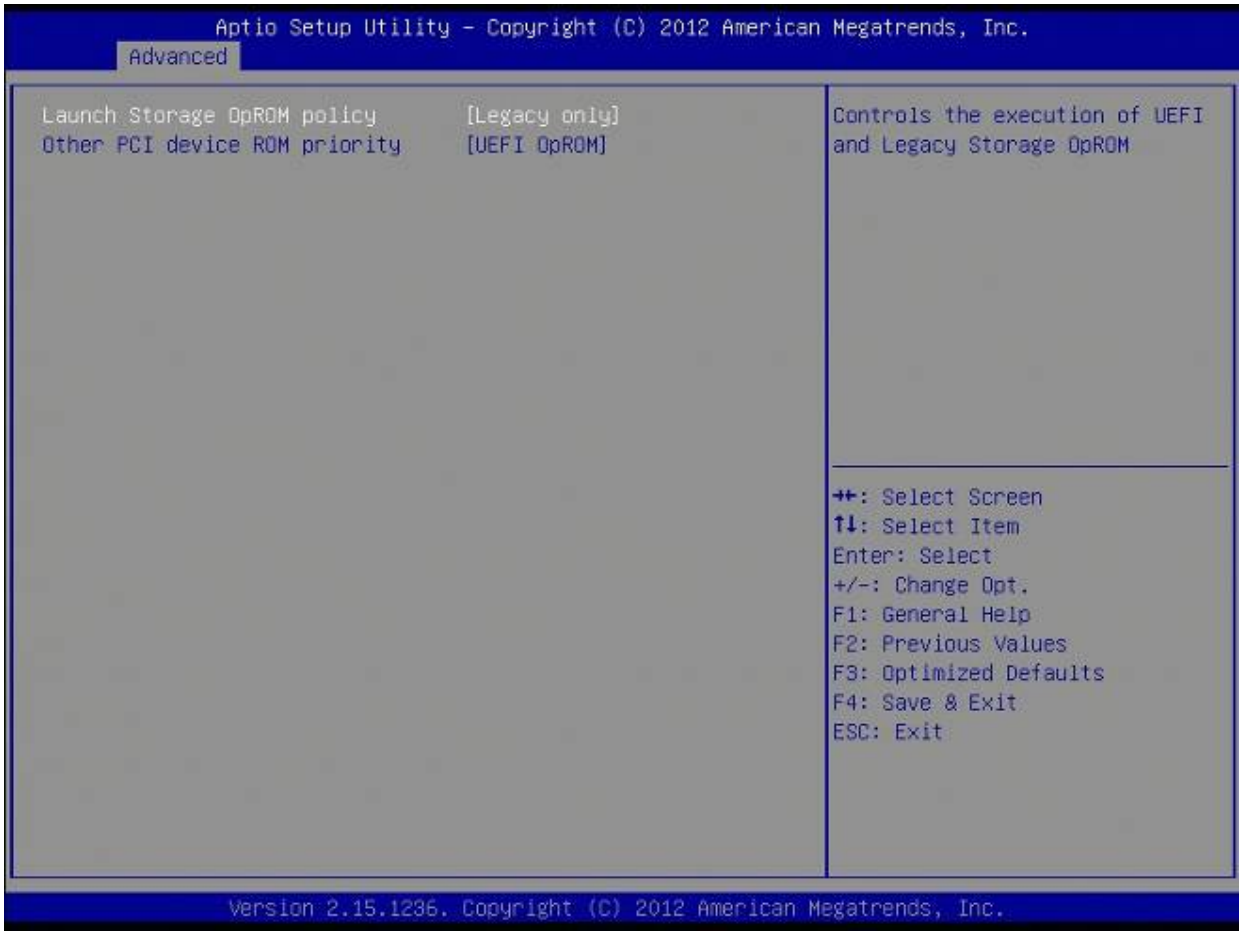
Configuration options: [Disabled] [40 C] [45 C] [50 C] [55 C] [60 C] [65 C] [70 C]

- **CPU Smart Fan Target [Disabled]**

CPU Smart Fan Target Temperature

Configuration options: [Disabled] [40 C] [45 C] [50 C] [55 C] [60 C] [65 C] [70 C]

2.4.11 Option ROM Policy



- **Launch Storage OpROM [Legacy only]**

Enable or Disable Boot Option For Legacy Mass Storage Devices with Option ROM
Configuration options: [Do not launch] [UEFI only] [Legacy only]

- **Other PCI Device ROM priority [UEFI OpROM]**

Configuration options: [UEFI OpROM] [Legacy OpROM]

2.4.12 Intel RC Driver Version Detail

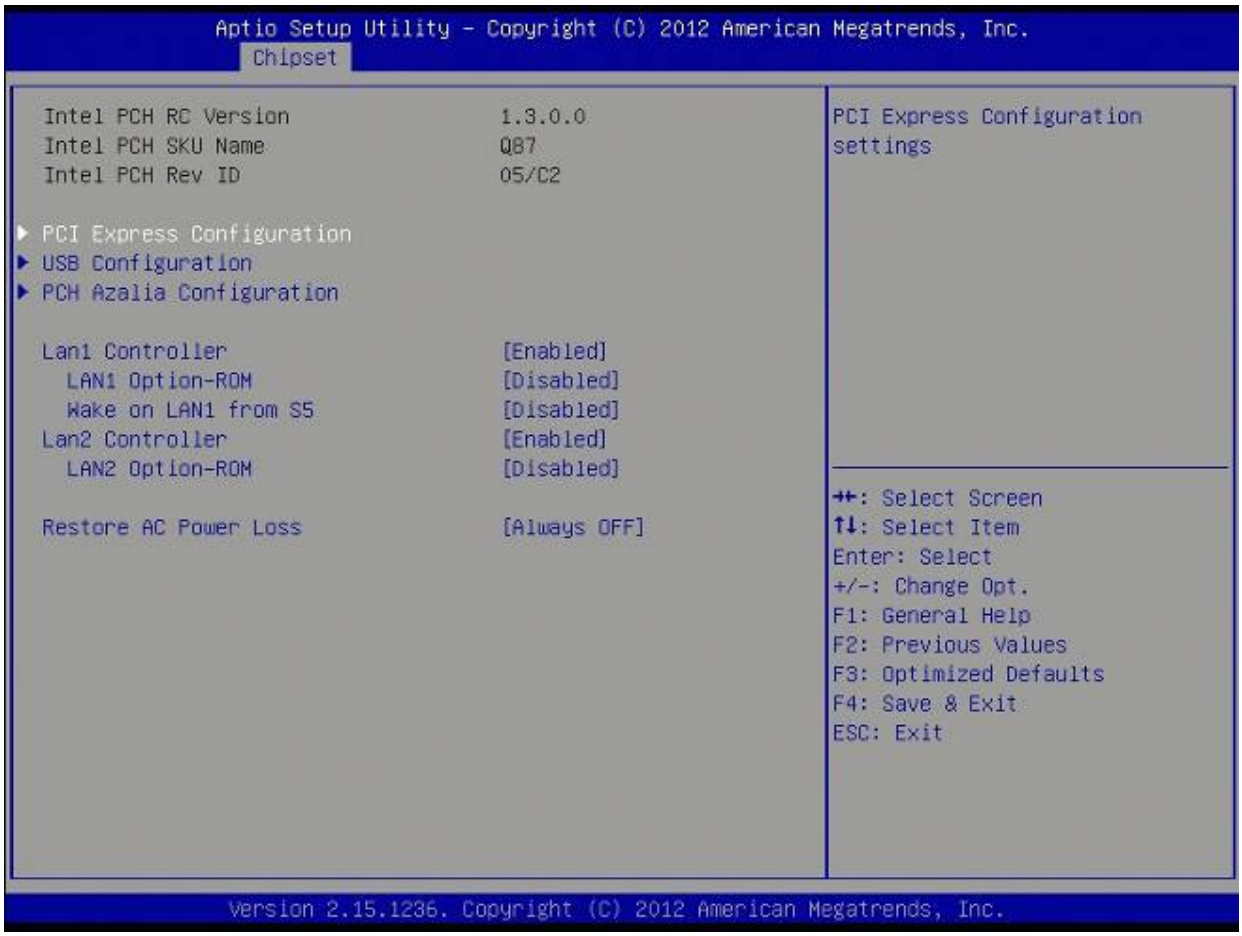
Displays Version String for drivers

2.5 Chipset


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
PCH-IO Configuration
System Agent (SA) Configuration
PCH Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

2.5.1 PCH-IO Configuration

PCH-IO Configuration



- **LAN1 Controller [Enable]**

Enable/Disable LAN1 Controller

Configuration options: [Disabled] [Enabled]

- **LAN1 Option-ROM [Disable]**

Enable/Disable LAN1 boot option for legacy network devices.

Configuration options: [Disabled] [Enabled]

- **LAN2 Controller [Enable]**

Enable/Disable LAN1 Controller

Configuration options: [Disabled] [Enabled]

- **LAN2 Option-ROM [Disable]**

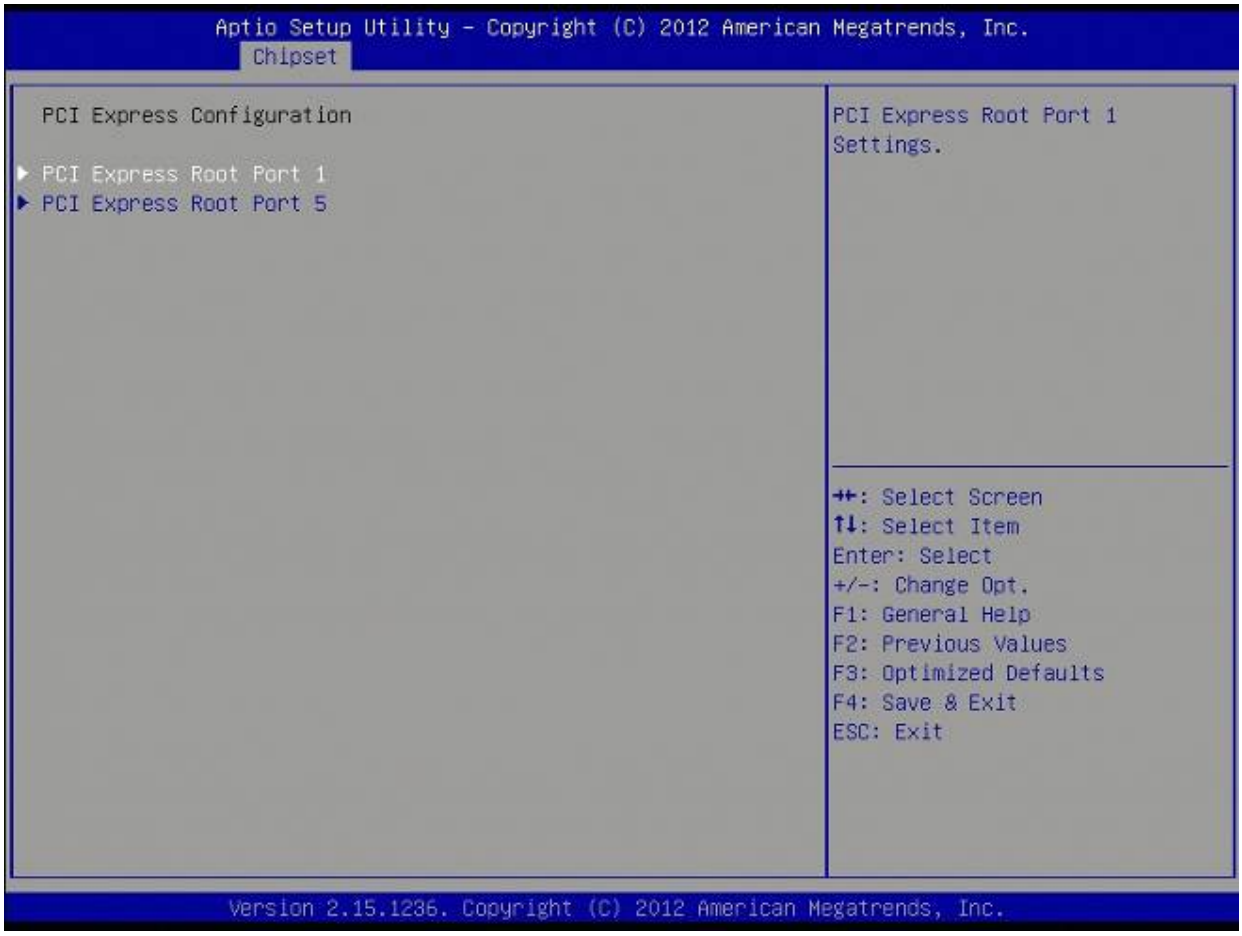
Enable/Disable LAN2 boot option for legacy network devices.

Configuration options: [Disabled] [Enabled]

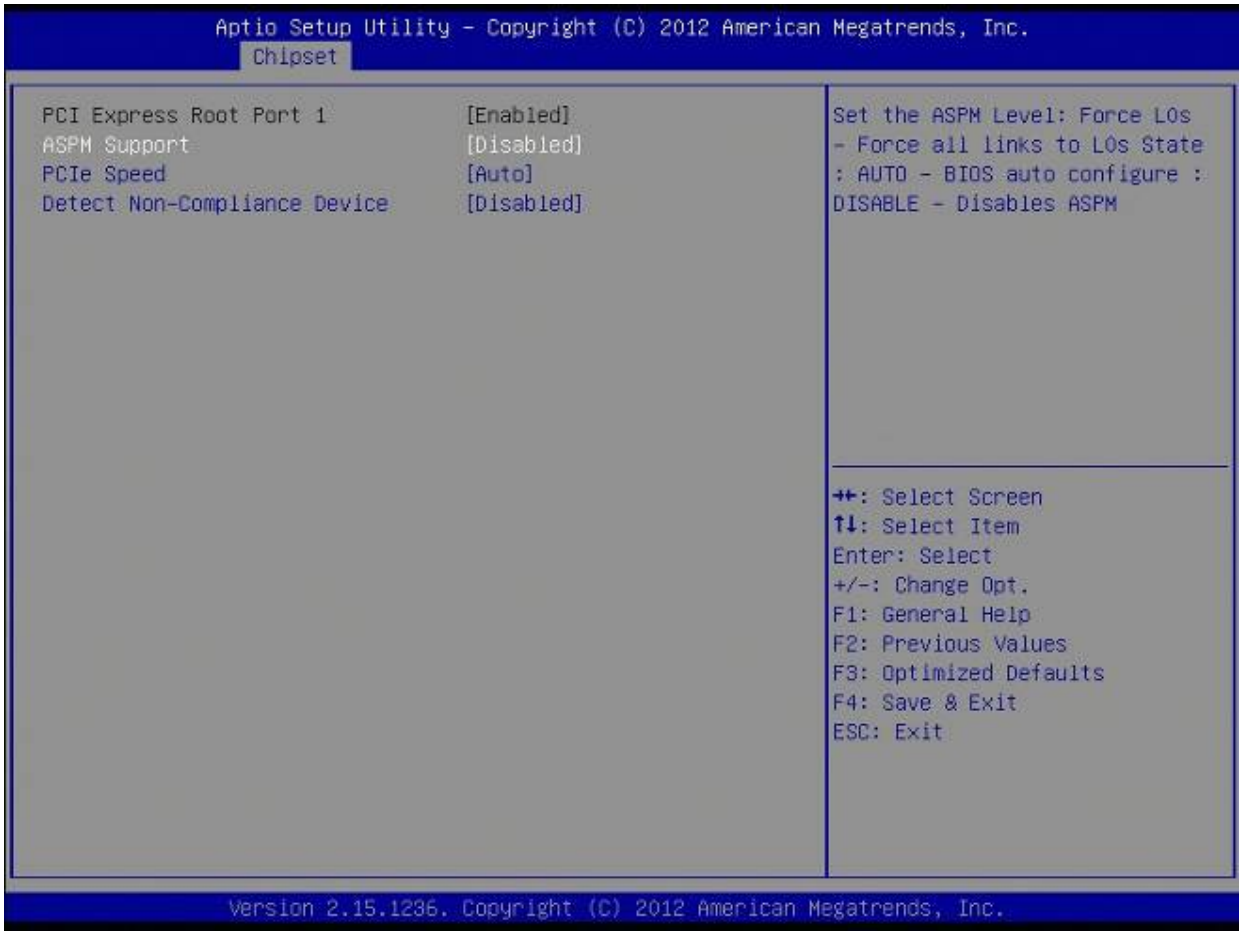
- **Restore AC Power Loss [Always Off]**

Specify what state to go to when power is re-applied after a power failure.
Configuration options: [Always Off] [Always On] [Last state]

2.5.1.1 PCI Express Configuration



PCI Express Root Port 1



- **ASPM Support [Disabled]**

Set the ASPM Level1: Force L0s – Force all links to L0s State, AUTO – BIOS auto configure, Disabled – Disables ASPM

Configuration options: [Disabled] [L0s] [L1] [L0sL1] [AUTO]

- **PCIe Speed [Auto]**

Select PCI Express port speed.

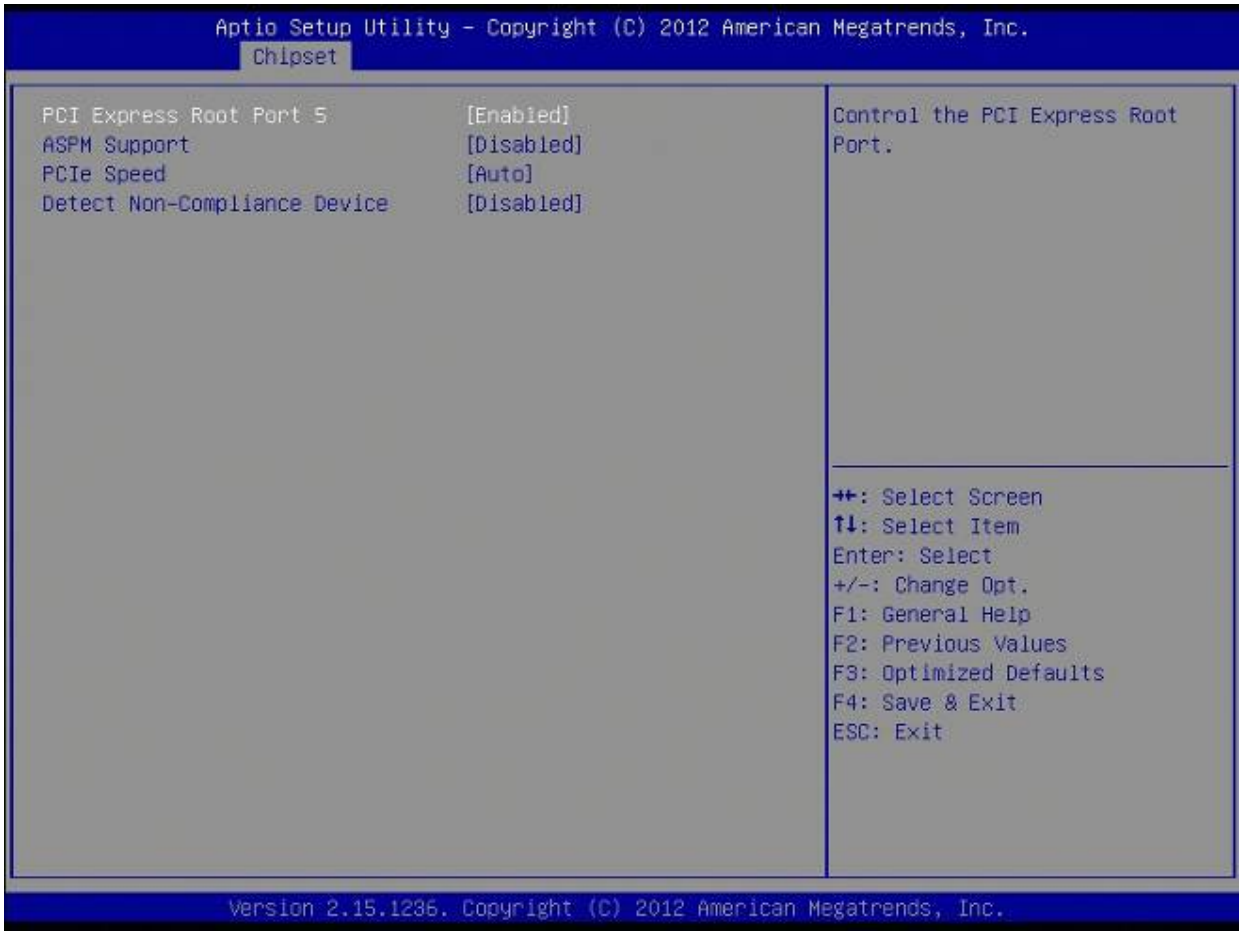
Configuration options: [AUTO] [Gen1] [Gen2]

- **Detect Non-Compliance Device [Disabled]**

Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time

Configuration options: [Disabled] [Enabled]

PCI Express Root Port 5



- **PCI Express Root Port 5 [Enabled]**

Control the PCI Express Root Port.
Configuration options: [Disabled] [Enabled]

- **ASPM Support [Disabled]**

Set the ASPM Level1: Force L0s – Force all links to L0s State, AUTO – BIOS auto configure, Disabled – Disables ASPM
Configuration options: [Disabled] [L0s] [L1] [L0sL1] [AUTO]

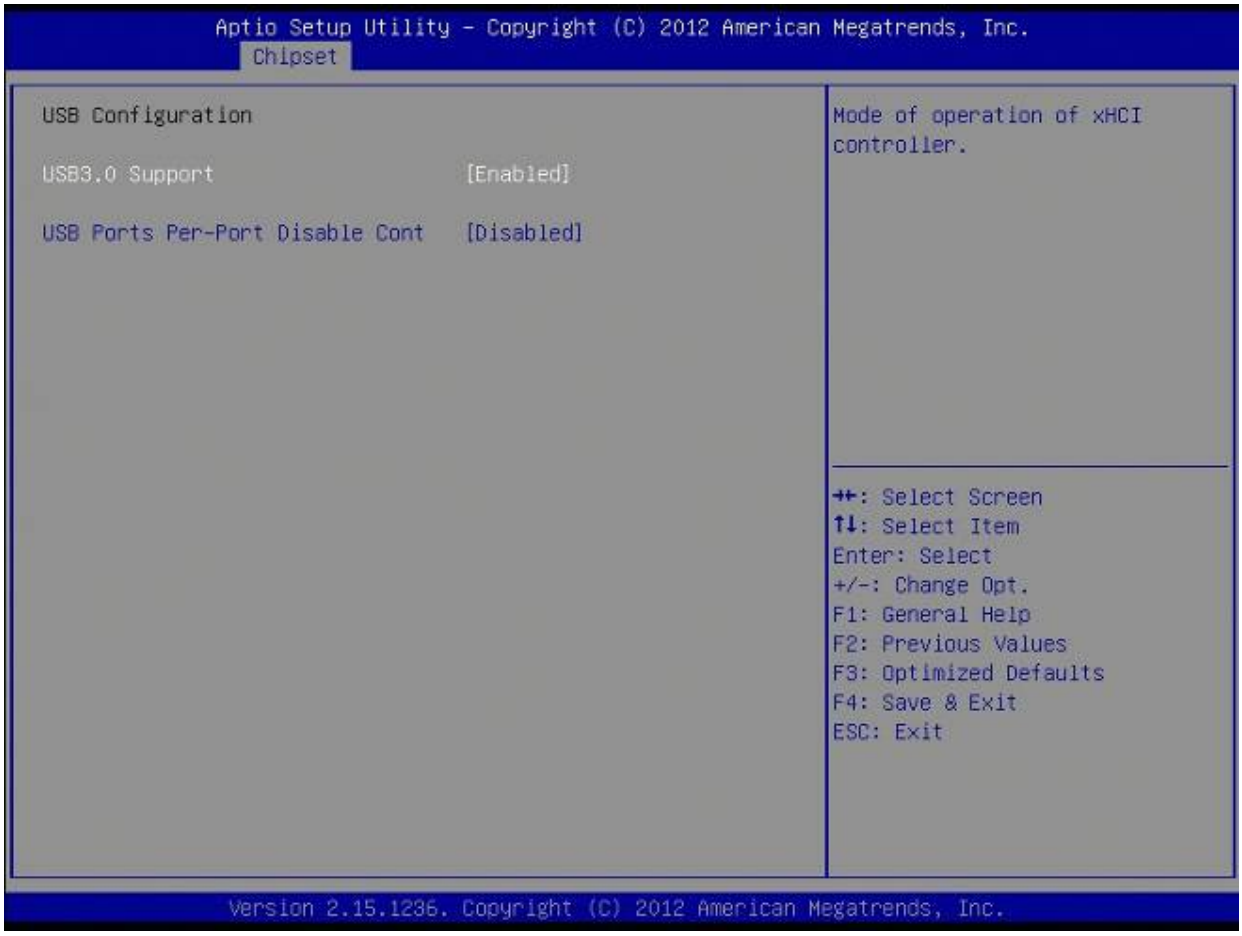
- **PCIe Speed [Auto]**

Select PCI Express port speed.
Configuration options: [AUTO] [Gen1] [Gen2]

- **Detect Non-Compliance Device [Disabled]**

Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time
Configuration options: [Disabled] [Enabled]

2.5.1.2 USB Configuration



- **USB3.0 Support [Enabled]**

Enable/Disable USB 3.0 support

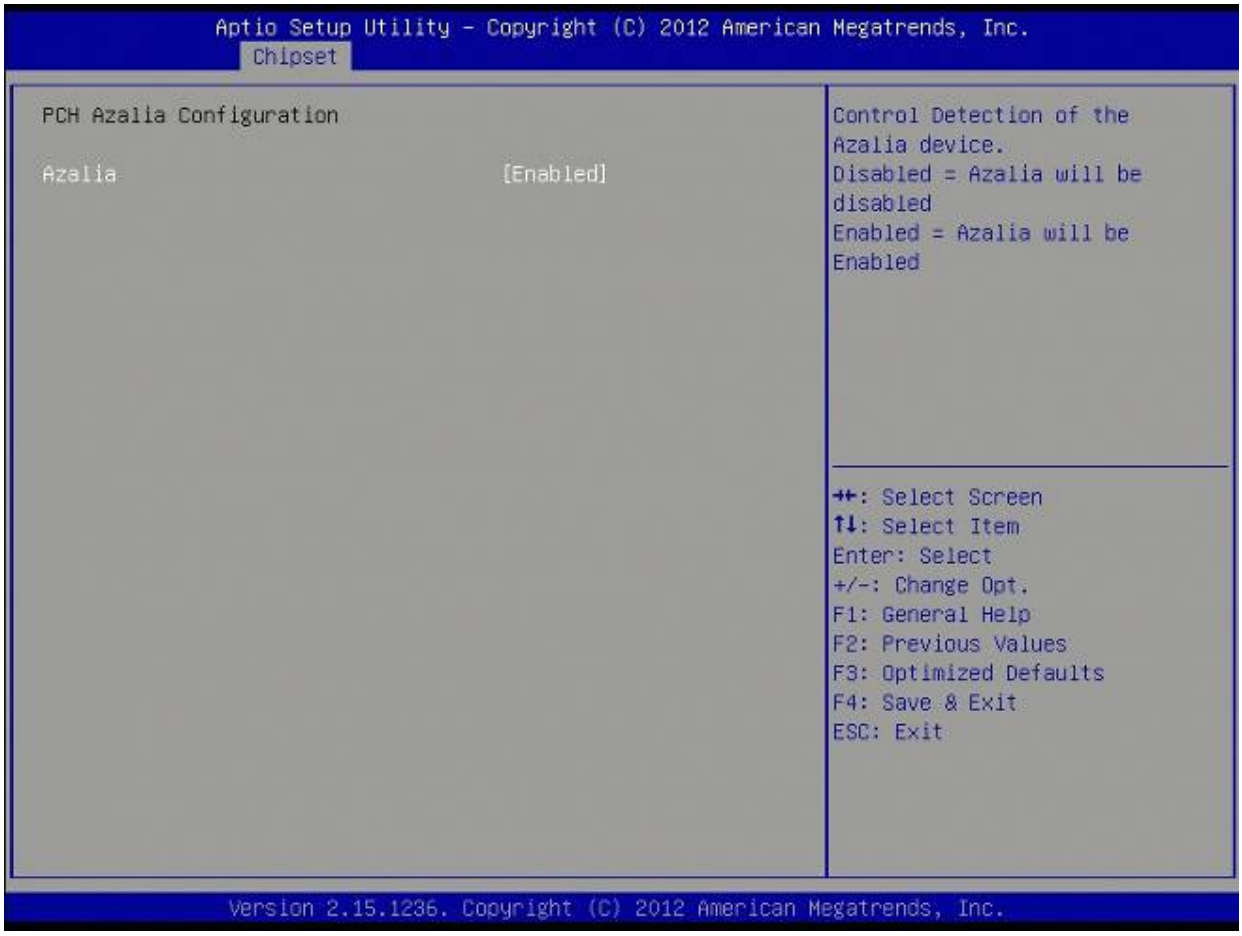
Configuration options: [Disabled] [Enabled]

- **USB ports per-port disable cont [Disabled]**

Control each of the USB ports (1~14) disabling.

Configuration options: [Disabled] [Enabled]

2.5.1.3 PCH Azalia Configuration

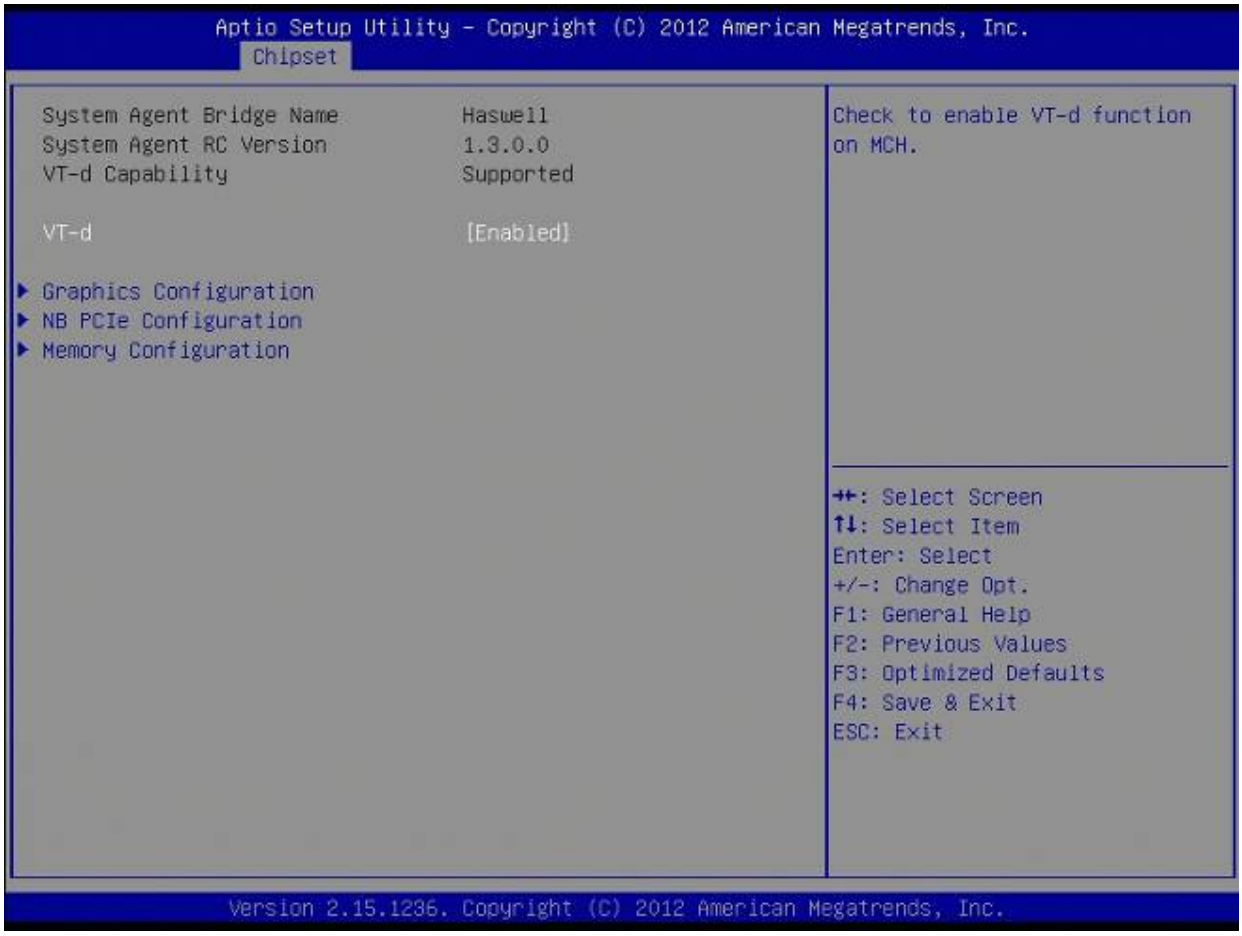


- **Azalia [Enabled]**

Control Detection of the Azalia device.

Configuration options: [Disabled] [Enabled]

2.5.2 System Agent (SA) Configuration

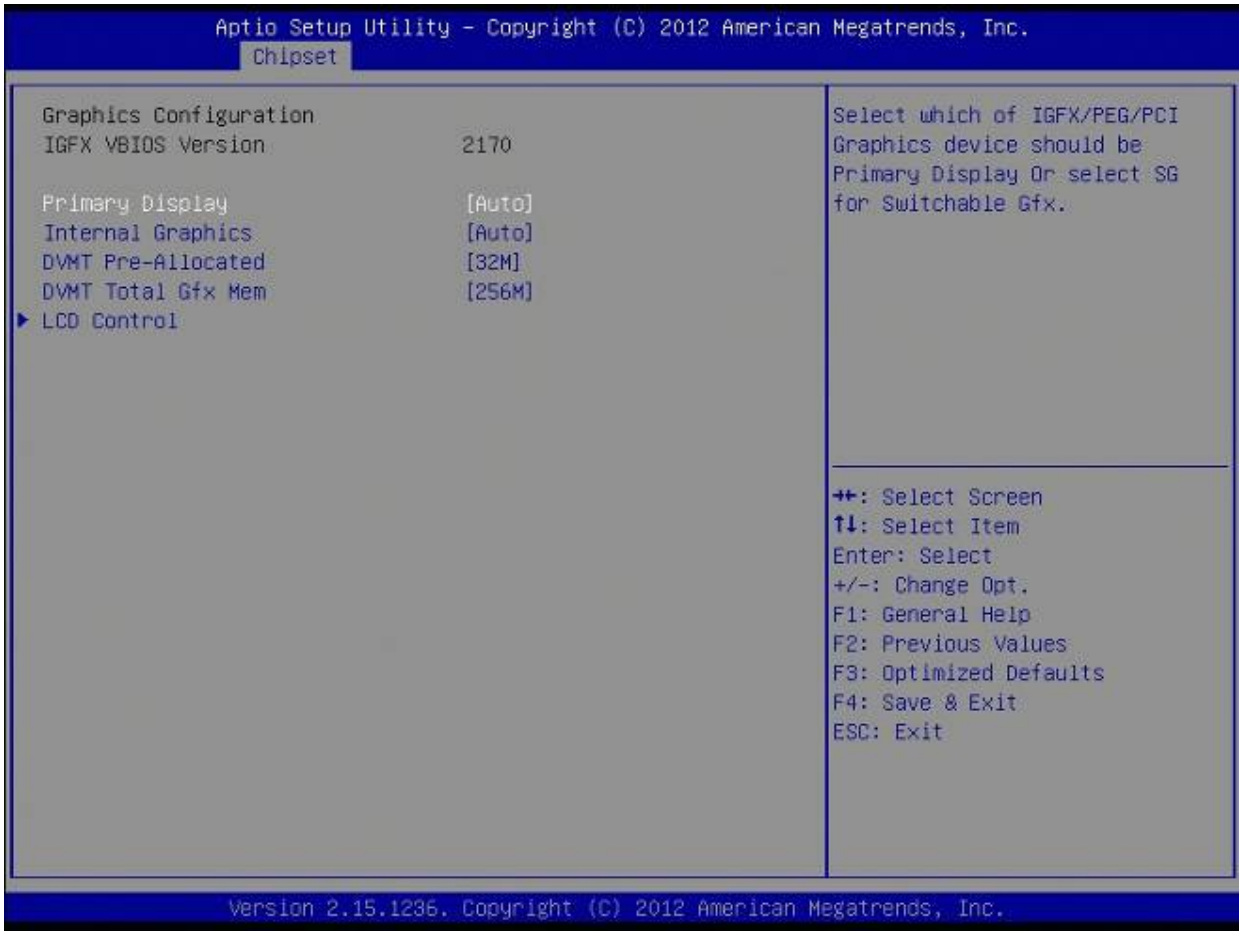


- **VT-d [Disable]**

Set VT-d Enable or Disable

Configuration options: [Disabled] [Enabled]

2.5.2.1 Graphics Configuration



- **Primary Display [Auto]**

Select which of IGFX/PEG/PCI Graphics device should be Primary Display or select SG for Switchable Gfx.
Configuration options: [AUTO][IGFX][PEG]

- **Internal Graphics [Auto]**

Keep IGD enabled based on the setup options.
Configuration options: [Auto] [Disabled] [Enabled]

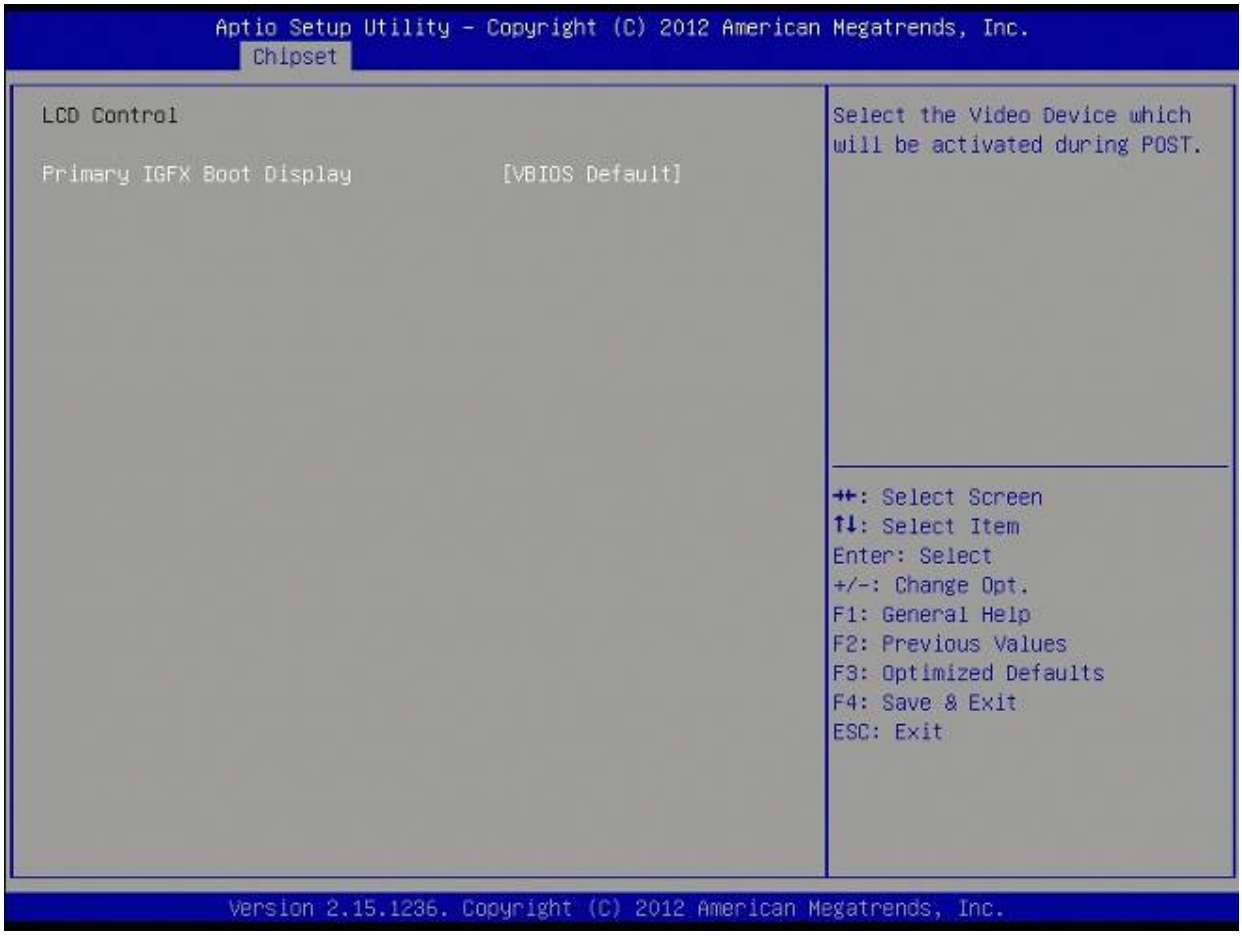
- **DVMT Pre-Allocated [32M]**

Select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device. Configuration options: [32M]~[512M]

- **DVMT Total Gfx Mem [256M]**

Select DVMT 5.0 total graphics memory size used by the internal graphics device.
Configuration options: [128M][256M][MAX]

2.5.2.1.1 LCD Control

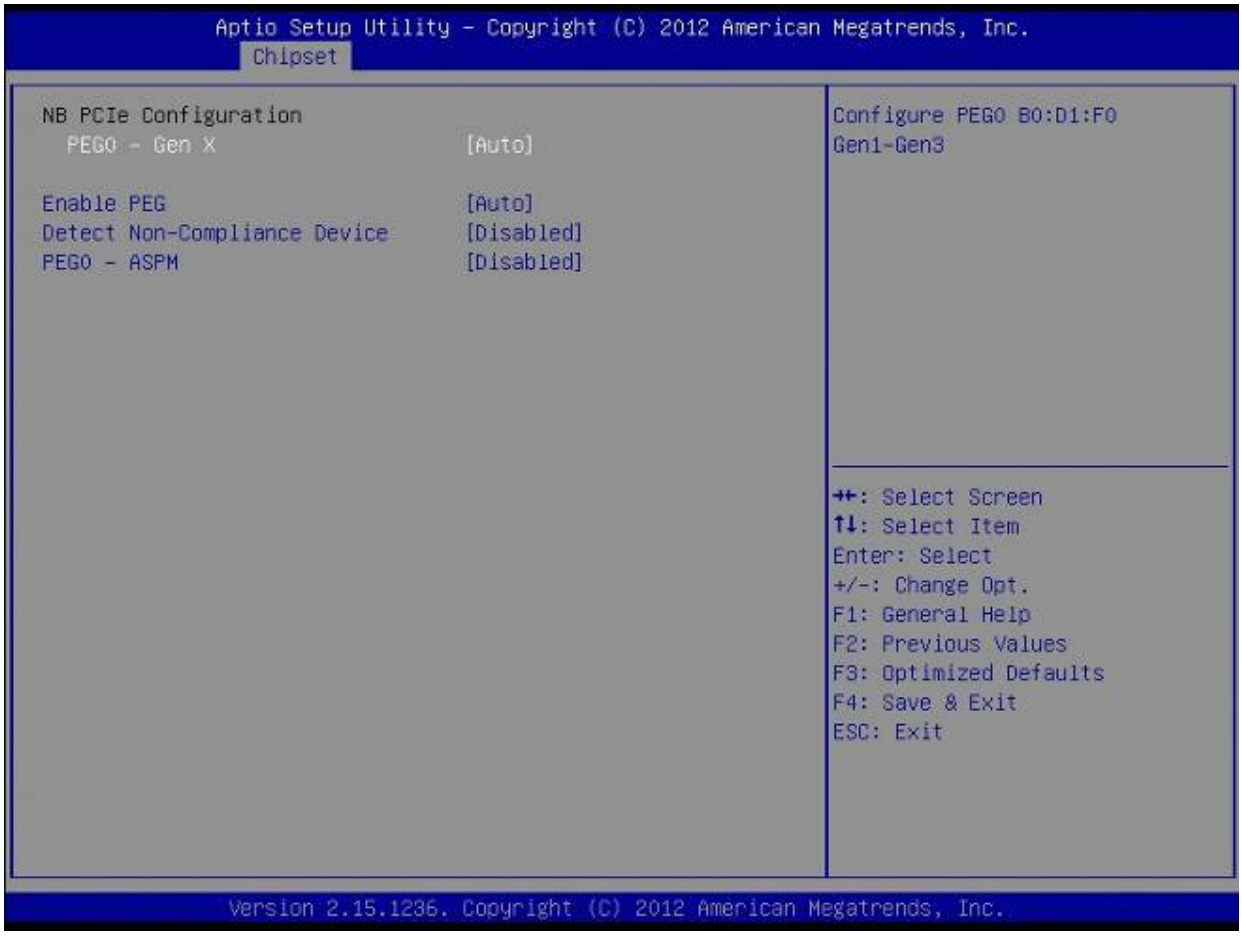


- **Primary IGFX Boot Display [VBIOS Default]**

Select the Video Device that will be activated during POST.

Configuration options: [VBIOS Default] [CRT] [Display Port1] [DVI-D] [Display Port2]

2.5.2.2 NB PCIe Configuration



- **PEG0 – Gen X [Auto]**

Configure PEG0 Gen1~Gen3

Configuration options: [Auto][Gen1][Gen2][Gen3]

- **Enable PEG [Auto]**

To enable/Disable the PEG slot.

Configuration options:[Auto][Enabled][Disabled]

- **Detect Non-Compliance Device [Disabled]**

Detect Non-Compliance PCI Express Device in PEG.

Configuration options: [Disabled] [Enabled]

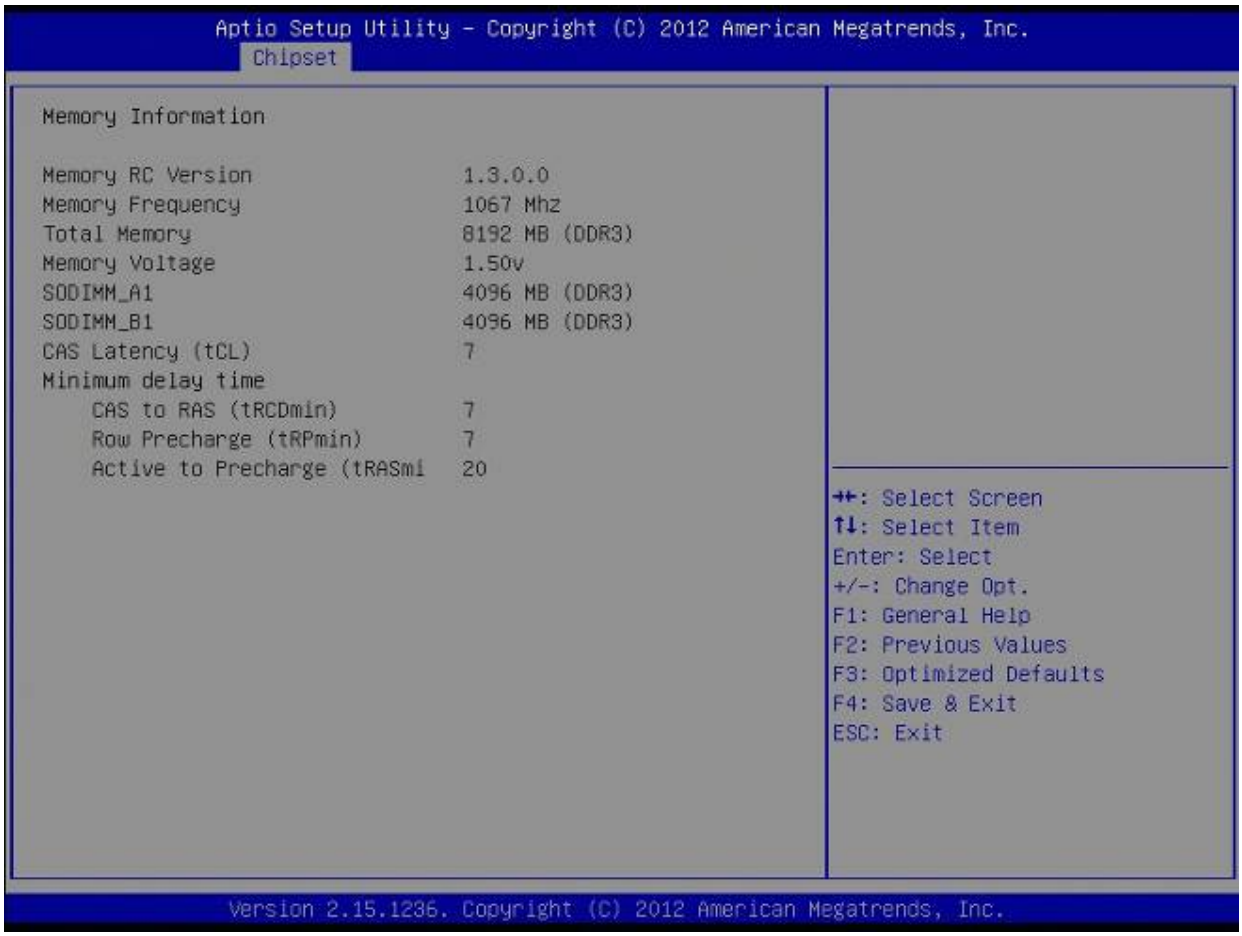
- **PEG1 - ASPM [Disabled]**

Control ASPM support for the PEG Device. This has no effect if PEG is not the currently active device.

Configuration options: [Disabled] [Auto] [ASPM L0s] [ASPM L1] [ASPM L0sL1]

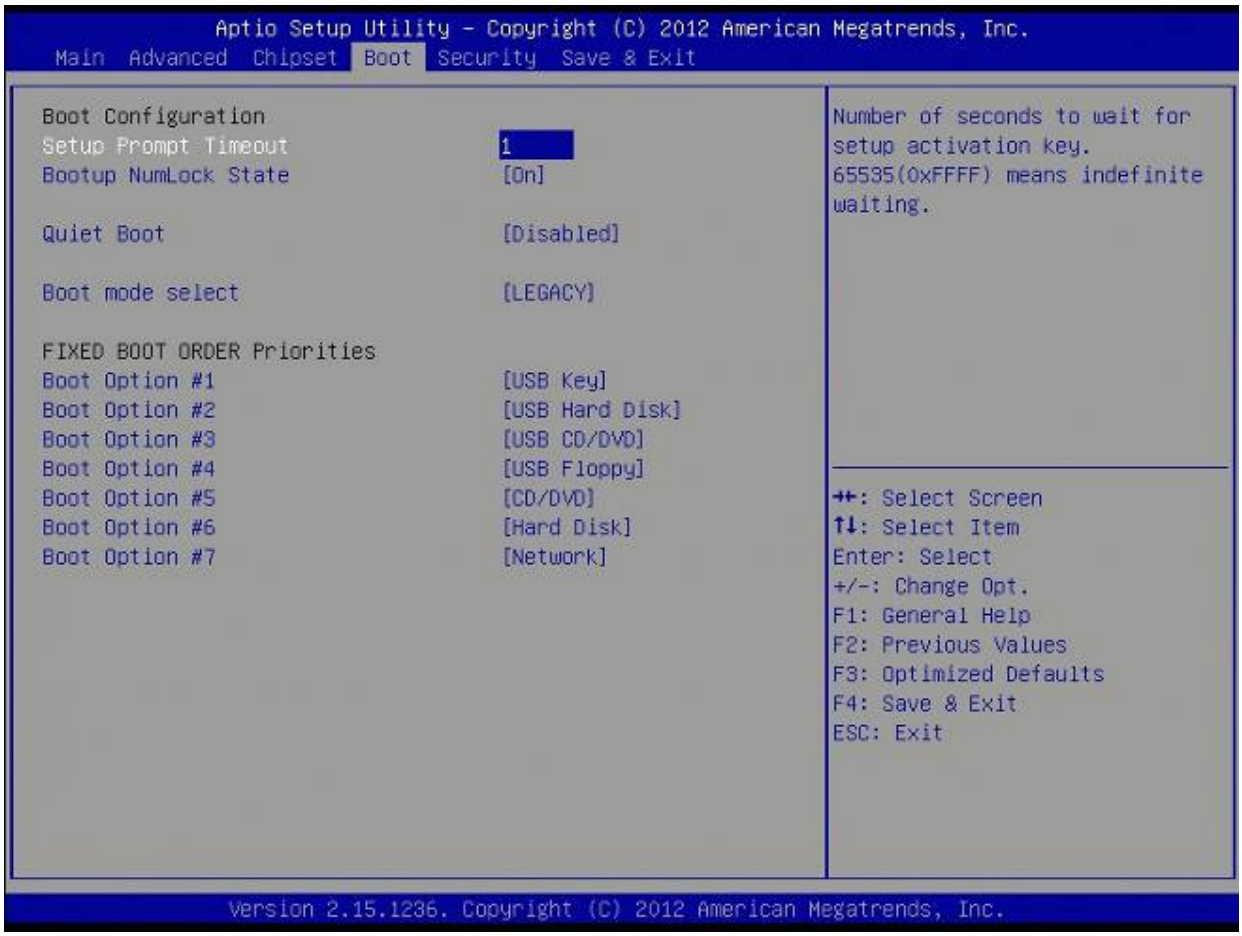
2.5.2.3 Memory Information

Display Memory Information



2.6 Boot

Boot Configuration



- **Setup Prompt Timeout [1]**

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

- **Bootup NumLock State [On]**

Select the keyboard NumLock state

Configuration options: [On] [Off]

- **Quiet Boot [Disabled]**

Enables or disables Quiet Boot option.

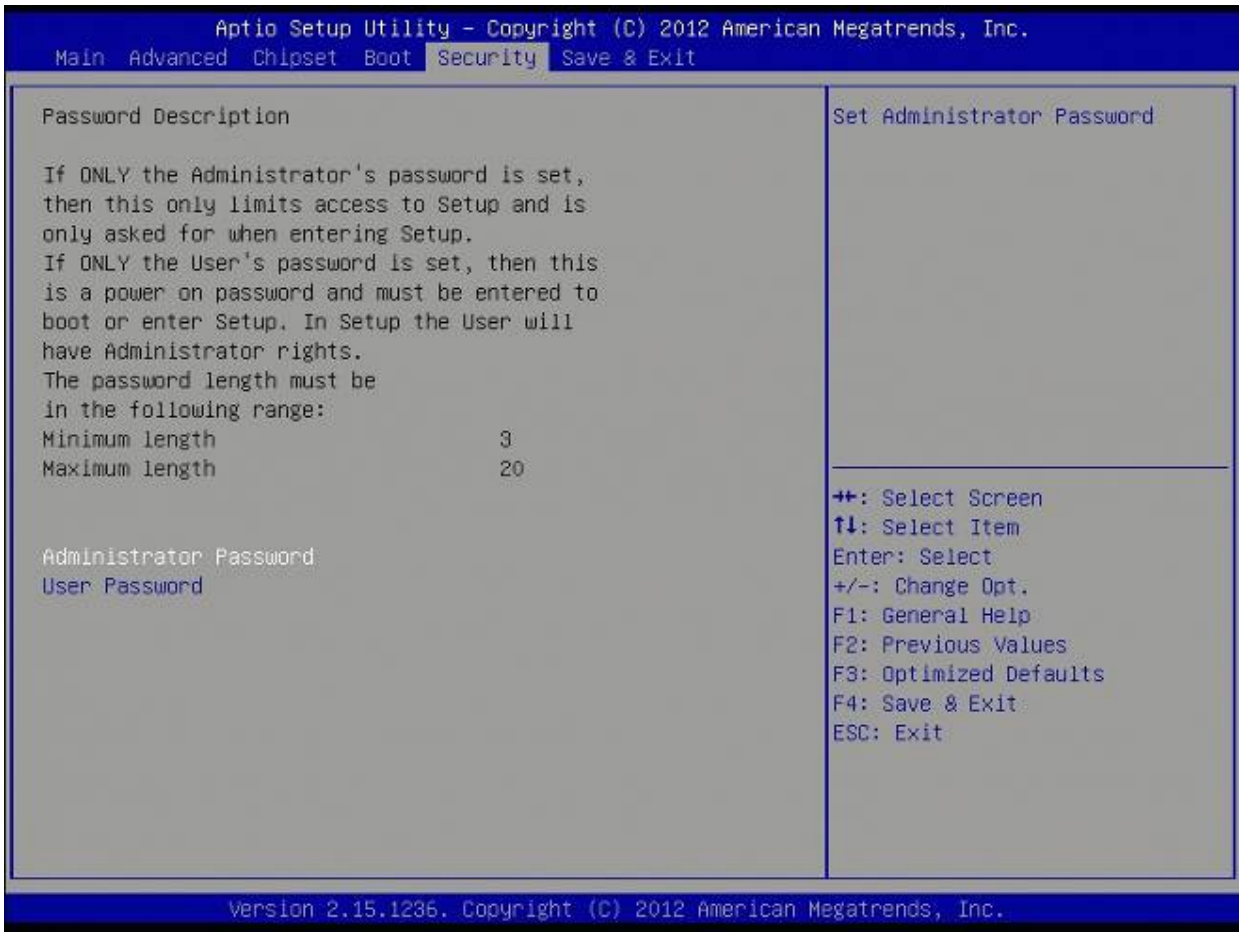
Configuration options: [Disabled] [Enabled]

- **Boot mode select [LEGACY]**

Select boot mode LEGACY/UEFI.

Configuration options: [LEGACY] [UEFI]

2.7 Security



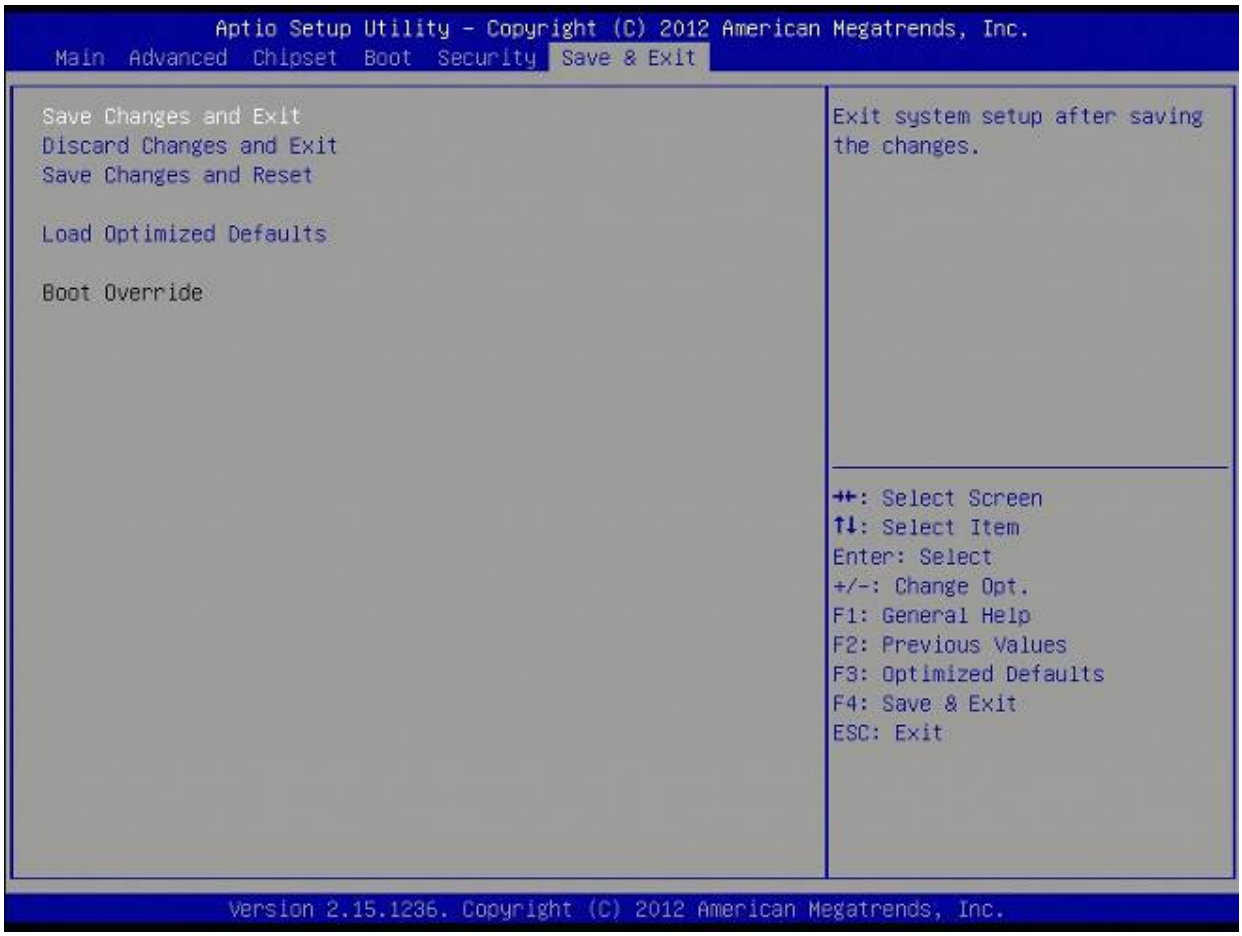
- **Administrator Password**

Set setup Administrator Password

- **User Password**

Set User Password

2.8 Save & Exit



- **Save changes and Exit**

Exit system setup after saving the changes.

- **Discard changes and Exit**

Exit system setup without saving the changes.

- **Save changes and Reset**

Reset the system after saving the changes.

- **Load Optimized Defaults**

Restore/Load default values for all the setup option.