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 local distributor.

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 any technical problems with the product, contact your local distributor

Statement

Revision History

Revision	Date (yyyy/mm/dd)	Changes
V1.0	2014/7/15	Initial release
V1.1	2014/8/8	Update for system information
V1.2	2014/09/19	1. Change BRACKET EAR-2, BRACKET EAR-1 P/N 2. Add Screw Flower Flat Plating Ni White M3 L:4mm ø5.0*8pcs for screw the HDD/SSD (P/N: 0F0102500400000L)
V1.3	2015/09/08	Add memory module installation
V1.4	2017/04/25	Update I/O spec

Packing list

☐ 19” 1U Rack-mount Intel® QM77 Fanless Rugged System

☐ Accessories:

Item	P/N	Description	Q’ty
1	0P0600000003000L	Driver CD	1
2	0C1210122103100L	CONN DIP 1*3 P:5.0mm Pluggable terminal block Female	1
3	0R0100250160000L	Thermal pad GR-Hm 24.5x16.2mm T:0.3mm	1
4	0N0600000000000L	BRACKET EAR-L SPGC 280x43.4x21.3mm t:3mm	2
5	0N0600000000010L	BRACKET EAR-S SPGC 90x43.4x21.3mm t:3mm	2
6	0F0130600600000L	Screw cross circle Plating Ni White M4 L:6mm	10
7	0F0132700800000L	Screw Flat Plating Ni White M4 L:8mm	10
8	0F0102500400000L	Screw Flower Flat Plating Ni White M3 L:4mm	8

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

Ordering information

Model Number	Description
ROC235A-ET	Intel® QM77 Fanless Rugged System with Intel® Ivy Bridge Core™ i7/i5/i3 Processor, with 1xPCI & 1x PCIe Expansion, 9V to 24V DC-in, Wide Temp. (-20 to 70°C)
ROC235A-UT	Intel® QM77 Fanless Rugged System with Intel® Ivy Bridge Core™ i7/i5/i3 Processor, with 1xPCI & 1x PCIe Expansion, 9V to 24V DC-in, Wide Temp. (-40 to 70°C Optional)
Processor	
Intel® Core™ i7-3610QE Processor (6M Cache, 2.30 GHz), 45 W Intel® Core™ i5-3610ME Processor (3M Cache, 2.70GHz), 35W Intel® Core™ i3-3120ME Processor (3M Cache, 2.40 GHz), 35W	

Table of Contents

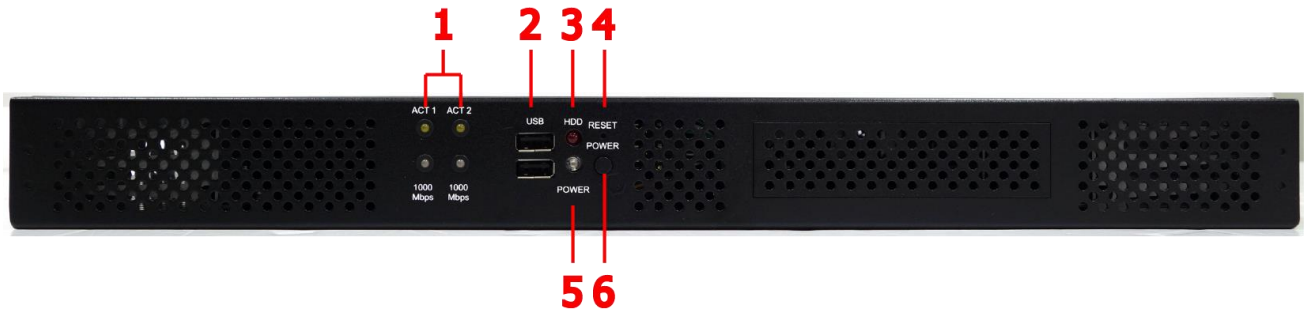
Chapter 1: Product Introduction

1.1 Key Features

System	
CPU Type	Intel® 22nm Ivy Bridge Processor (Mobile) socket (rPGA988) Core™ i7-3610QE 2.3 GHz (6M Cache, 45W) Core™ i5-3610ME 2.7 GHz (3M Cache, 35W) Core™ i3-3120ME 2.4 GHz (3M Cache, 35W)
Chipset	Intel® QM77
Memory Type	2 x 204-pin SO-DIMM DDR3 1333/1600 MHz up to 16 GB
Expansion Slot	2 x PCI 1 x Mini PCIe
Storage Device	2 x 2.5" HDD/SSD Supports RAID 0,1
Front I/O	
Power Button	1
Power LED	1
HDD LED	1
LAN Status LED	2 sets
USB	2 x USB 2.0
Reset	1
Rear I/O	
VGA	1
DVI-D	1
HDMI	1
Ethernet	2 x RJ45
Audio	Mic-in, Line-out
COM	1x RS232/422/485 with 5V/12V selectable
USB	4 x USB 3.0
Pre-cut hole	1 x D-sub pre-cut hole
DC-in	1 x 3-pin Terminal Block
Mechanical & Environment	
Power Requirements	9V to 24V DC-in
Dimension (W x H x D)	440 x 44 x 380mm (17.32” x 1.73” x 14.96”)
Operating Temp.	-20 to 70°C (ambient with air flow)
Storage Temp.	-20 to 80°C
Relative Humidity	10% to 90%, non-condensing
Certification	CE, FCC

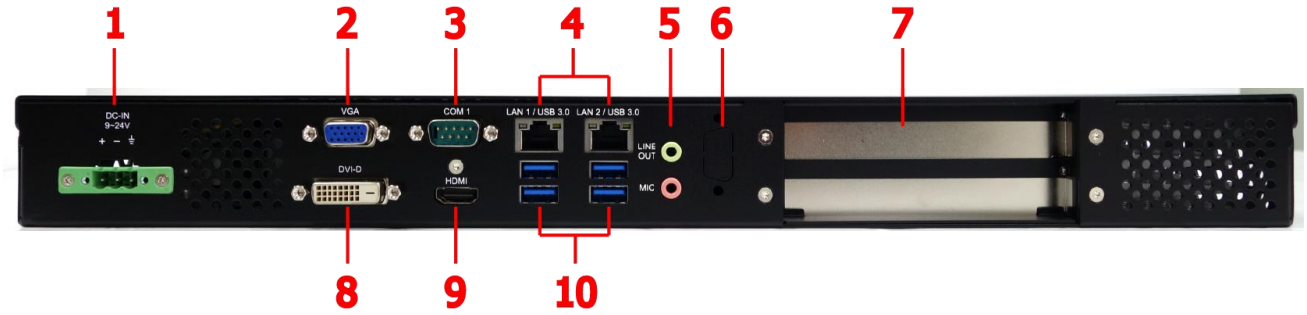
Specifications are subject to change without notice

1.2 Front Panel Components



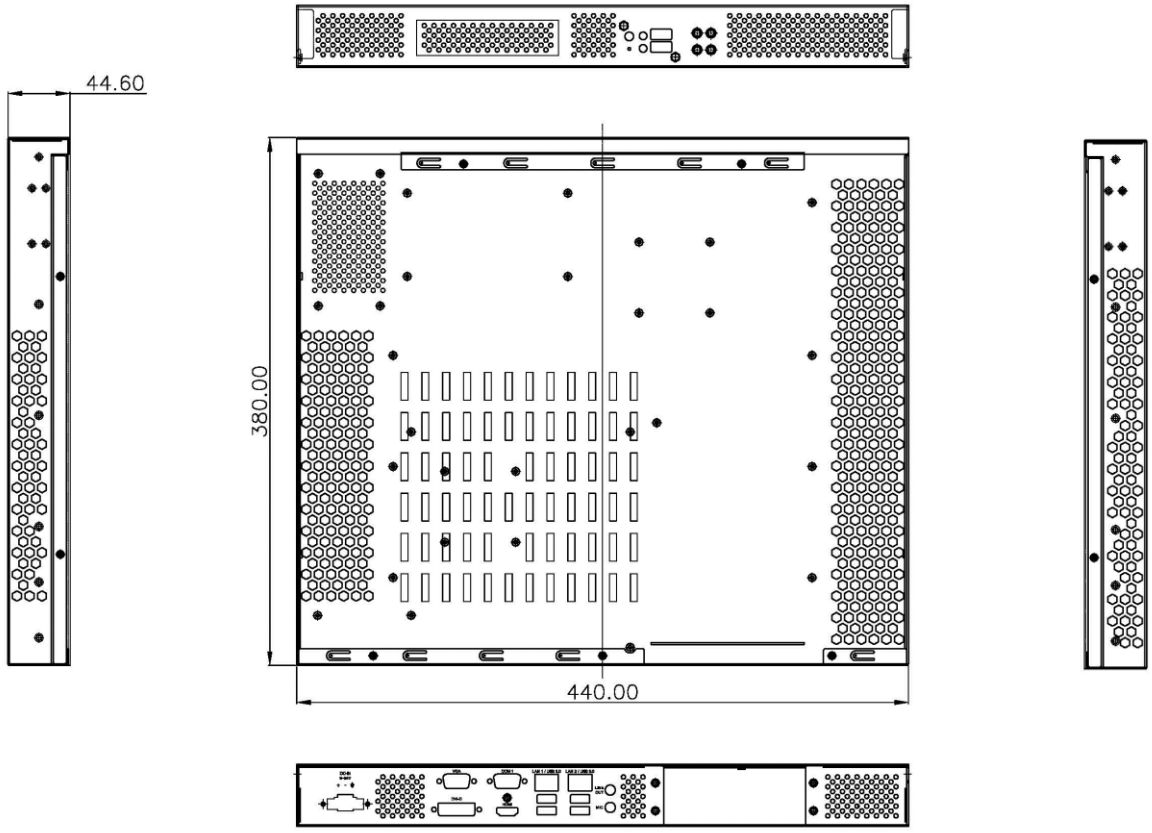
1	LAN Status LED
2	USB 2.0 x 2
3	HDD LED
4	Reset Button
5	Power LED
6	Power Button

1.3 Rear Panel Components



1	Power Input 9V to 24V DC-in (by terminal block)
2	VGA port
3	COM port, RS232/422/485 with 5V/12V selectable
4	LAN port, 2 x RJ45
5	Audio jack (Mic-in, Line-out)
6	Pre-cut hole for D-sub connector
7	2 x Expansion slot (PCI)
8	DVI-D port
9	HDMI port
10	4 x USB 3.0

1.4 Mechanical Dimensions

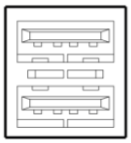


Chapter 2: Jumpers and Connectors

2.1 Front Panel Connector Pin Definitions

USB Port: USB2.0

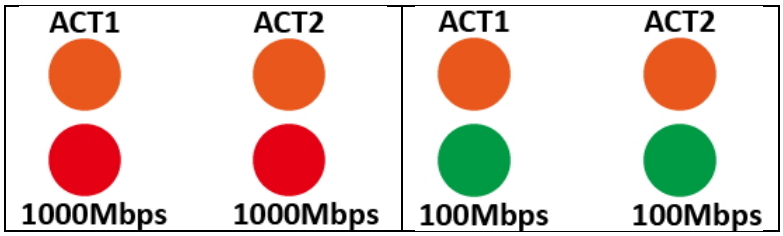
Pin	Definition	Pin	Definition
1	+5V	5	+5V
2	USBD-	6	USBD-
3	USBD+	7	USBD+
4	GND	8	GND



Status Indicators

Status	LED Color
HDD	RED
PWR	BLUE

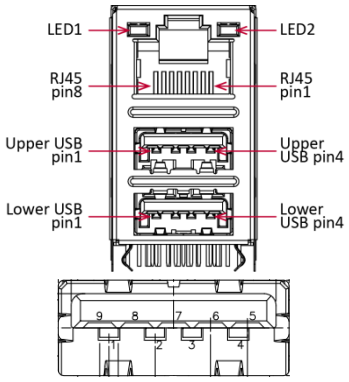
SPEED LED:	ACTIVE 1 LED:	ACTIVE 2 LED:
RED: 1000Mbps	ORANGE (BLINKING): ACTIVITY	ORANGE (BLINKING): ACTIVITY
GREEN: 100Mbps	ORANGE (NO BLINKING): ACTIVITY	ORANGE (NO BLINKING): ACTIVITY



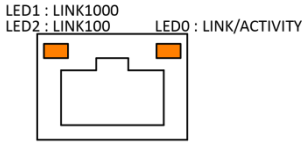
2.2 Rear Panel Connector Pin Definitions

LAN1_USB12: USB3.0 port 0,1 and LAN connector 1
LAN2_USB34: USB3.0 port 3,4 and LAN connector 2

Upper USB		Lower USB		LAN	
Pin	Definition	Pin	Definition	Pin	Definition
1	+5VDUAL	1	+5VDUAL	1	D0+
2	D-	2	D-	2	D0-
3	D+	3	D+	3	D1+
4	GND	4	GND	4	D1-
5	StdA_SSTX-	5	StdA_SSTX-	5	D2+
6	StdA_SSTX+	6	StdA_SSTX+	6	D2-
7	GND_DRIAN	7	GND_DRIAN	7	D3+
8	StdA_SSRX-	8	StdA_SSRX-	8	D3-
9	StdA_SSRX-	9	StdA_SSRX-		

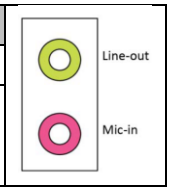


SPEED LED: (Lift)	ACTIVE LED: (Right)
GREEN: 1000Mbps	ORANGE (BLINKING): ACTIVITY
ORANGE: 100Mbps	No Light: NOT LINK
No Light: 10Mbps	ORANGE (NO BLINKING): LINK



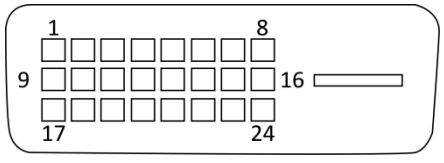
AUDIO1: LINE-OUT/MIC-IN

Pin	Definition
1	Line-out
2	Mic-in



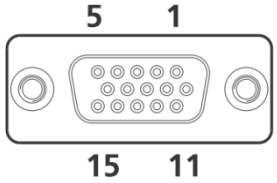
DVI-D: DVI-D

Pin	Definition	Pin	Definition
1	TMDS2-	13	NC
2	TMDS2+	14	+5V
3	GND	15	GND
4	NC	16	HOTPLUG_DETECT
5	NC	17	TMDS0-
6	DDC_CLK	18	TMDS0+
7	DDC_DATA	19	GND
8	NC	20	NC
9	TMDS1-	21	NC
10	TMDS1+	22	GND
11	GND	23	TMDSCLK+
12	NC	24	TMDSCLK-



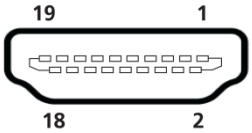
VGA: VGA

Pin	Definition	Pin	Definition
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	DDC DATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDC LOCK
8	GND		



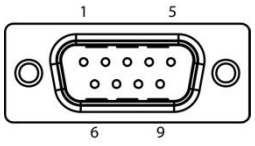
HDMI: HDMI

Pin	Definition	Pin	Definition
1	HDMI_2P	11	GND
2	GND	12	HDMI_CLKN
3	HDMI_2N	13	NC
4	HDMI_1P	14	NC
5	GND	15	DDC CLOCK
6	HDMI_1N	16	DDC DATA
7	HDMI_0P	17	GND
8	GND	18	+5V
9	HDMI_0N	19	HOTPLUG_DETECT
10	HDMI_CLKP		



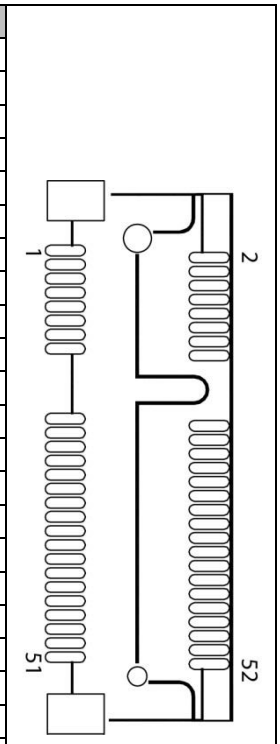
COM1: RS232/422/485 with +12V/+5V selection

Pin	RS-232	RS-422	Half Duplex RS-485
1	DCD-	TX-	DATA-
2	RXD	RX+	NA
3	TXD	TX+	DATA+
4	DTR-	RX-	NA
5	GND	GND	GND
6	DSR-	NA	NA
7	RTS-	NA	NA
8	CTS-	NA	NA
9	COM1P9SEL (Define by JP5)	COM1P9SEL (Define by JP5)	COM1P9SEL (Define by JP5)



MINI_MPCIE: Mini PCIe connector

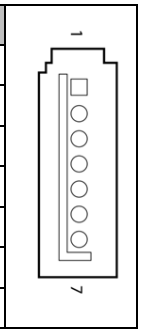
Pin	Definition	Pin	Definition
1	WAKE#	2	+3.3VAUX
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ#	8	NC
9	GND	10	NC
11	REF CLK-	12	NC
13	REF CLK+	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	Wireless LAN Disable#
21	GND	22	RESET#
23	RXN	24	+3.3VAUX
25	RXP	26	GND
27	GND	28	+1.5V
29	GND	30	SMBUS CLOCK
31	TXN	32	SMBUS DATA
33	TXP	34	GND
35	GND	36	USB DATA-
37	GND	38	USB DATA+
39	+3.3VAUX	40	GND
41	+3.3VAUX	42	NC
43	GND	44	NC
45	Control Link CLOCK	46	NC
47	Control Link DATA	48	+1.5V
49	Control Link RESET#	50	GND
51	Blue Tooth Disable#	52	+3.3V VAUX



2.3 Internal Connectors

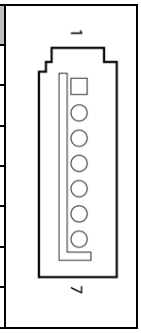
SATA1, SATA2: Serial ATA 3.0 Connector

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



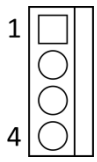
SATA3, SATA4: Serial ATA 2.0 Connector

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



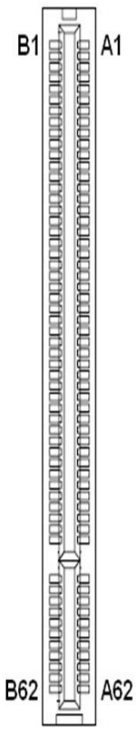
SATAP0, SATAP1: SATA Power Connector

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



PCI: PCI

Pin	Definition	Pin	Definition	Pin	Definition	Pin	Definition
A1	Pull down 4.7K to GND	A32	AD16	B1	-12V	B32	AD17
A2	+12V	A33	+3.3	B2	GND	B33	CBE2#
A3	GND	A34	FRAME#	B3	GND	B34	GND
A4	GND	A35	GND	B4	NC	B35	IRDY#
A5	+5V	A36	TRDY#	B5	+5V	B36	+3.3V
A6	INTA#	A37	GND	B6	+5V	B37	DEVSEL#
A7	INTC#	A38	STOP#	B7	INTB#	B38	GND
A8	+5V	A39	+3.3V	B8	INTD#	B39	LOCK#
A9	GNT1#	A40	SMBUS CLOCK	B9	NC	B40	PERR#
A10	+5V	A41	SMBUS DATA	B10	REQ1#	B41	+3.3V
A11	NC	A42	GND	B11	NC	B42	SERR#
A12	GND	A43	PAR	B12	GND	B43	+3.3V
A13	GND	A44	AD15	B13	GND	B44	CBE1#
A14	+3.3VAUX	A45	+3.3V	B14	CLOCK1	B45	AD14
A15	RESET#	A46	AD13	B15	GND	B46	GND
A16	+5V	A47	AD11	B16	CLOCK0	B47	AD12
A17	GNT0#	A48	GND	B17	GND	B48	AD10
A18	GND	A49	AD9	B18	REQ0#	B49	GND
A19	PCI_PME#	A50	Keyway	B19	+5V	B50	Keyway
A20	AD30	A51	Keyway	B20	AD31	B51	Keyway
A21	+3.3V	A52	CBE0#	B21	AD29	B52	AD8
A22	AD28	A53	+3.3V	B22	GND	B53	AD7
A23	AD26	A54	AD6	B23	AD27	B54	+3.3V
A24	GND	A55	AD4	B24	AD25	B55	AD5
A25	AD24	A56	GND	B25	+3.3V	B56	AD3
A26	AD20	A57	AD2	B26	CBE3#	B57	GND
A27	+3.3V	A58	AD0	B27	AD23	B58	AD1
A28	AD22	A59	+5V	B28	GND	B59	+5V
A29	AD20	A60	REQ64#	B29	AD21	B60	ACK64#
A30	GND17	A61	+5V	B30	AD19	B61	+5V
A31	AD18	A62	+5V	B31	+3.3V	B62	+5V



Chapter 3: System Setup

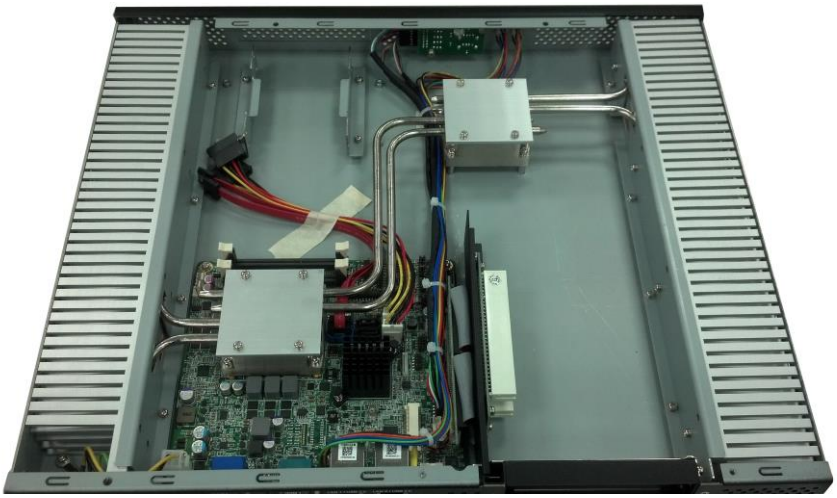
This chapter provides more detailed information and let you know how to install components into the ROC235A embedded System.

Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

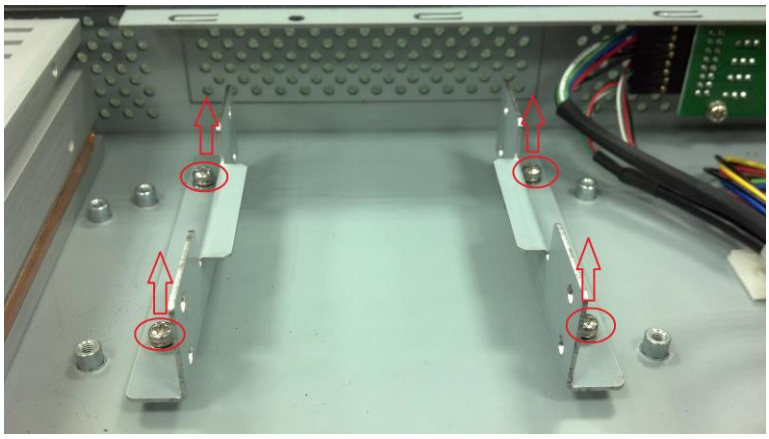
3.1 2.5" SATA HDD/SSD installation

ROC235A supports 2 x 2.5" SATA HDD/SSD

1. Drive five screws off for remove the upper case from chassis.

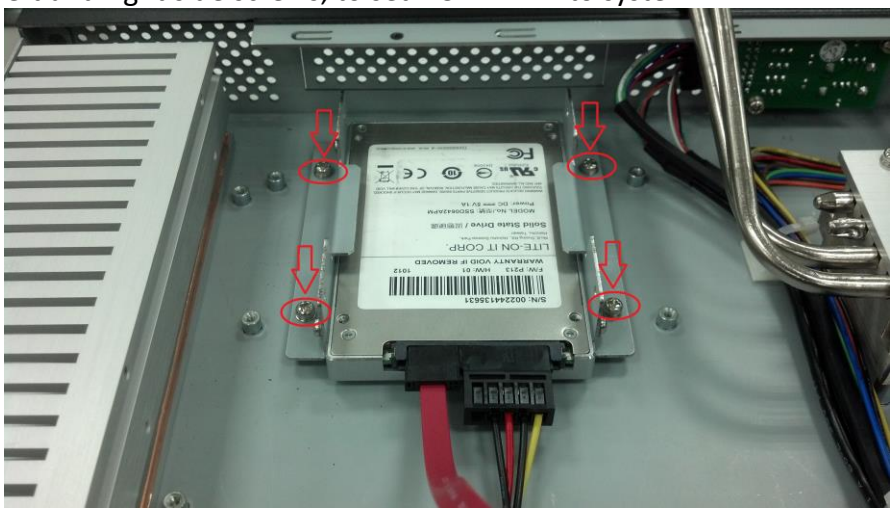


2. Remove 4 screws from the screw hole to take off the HDD bracket.



3. Insert left and right side 4 screws to firmed the 2.5” HDD. Using accessory item P/N: 0F0102500400000L

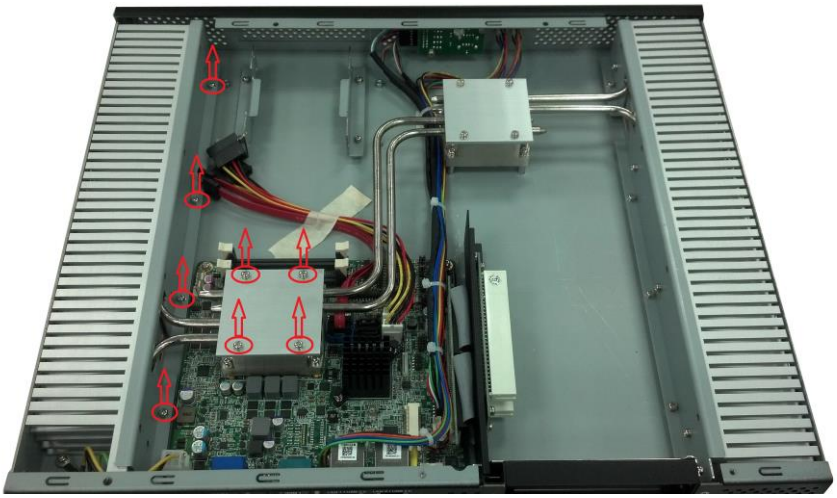
4. Insert each of left and right side screws, to set 2.5” HDD into system.



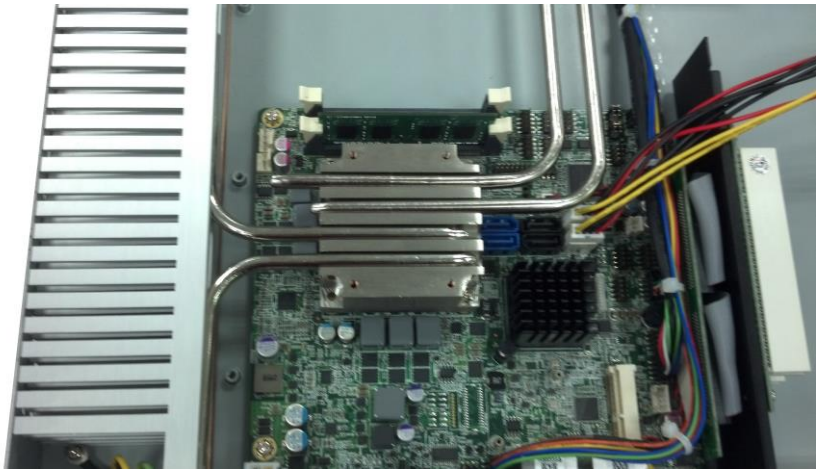
3.2 CPU installation

ROC235A supports Intel® 22nm Ivy Bridge Processor (Mobile) socket (rPGA988)
Core™ i7-3610QE (4C x 3.3 GHZ), 6M L2 cache (45W)
Core™ i5-3610ME (2C x 2.7 GHZ), 3M L2 cache (35W)
Core™ i3-3120ME (2C x 2.4 GHZ), 3M L2 cache (35W)

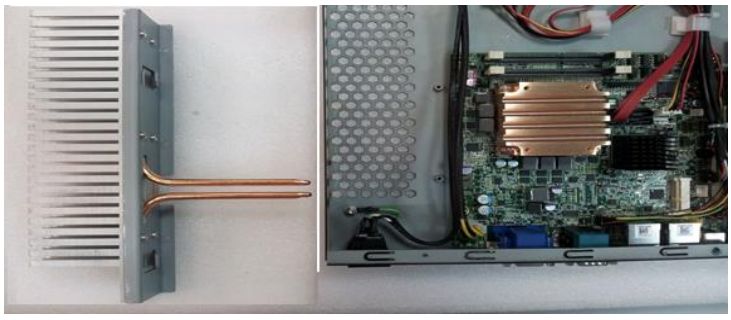
1. Remove 4 screws from CPU heat sink's cover, and 4 screws of left bracket from system heat sink.



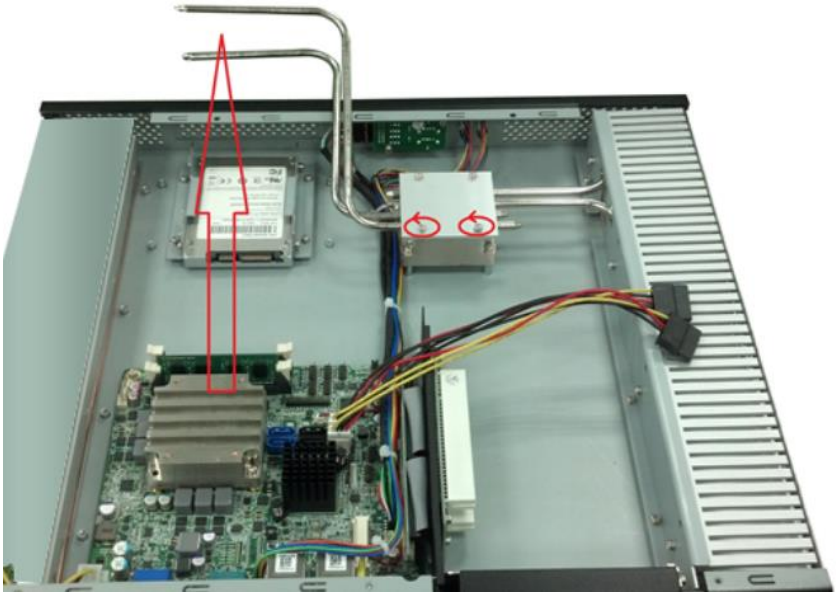
2. Take off the CPU heat sink's cover.



3. Pull out the heatsink on the left side.



4. Unscrew two of screws on system heat sink, and pull the heat pipe up from CPU heat sink. Drive 4 screws off to remove CPU heat sink.



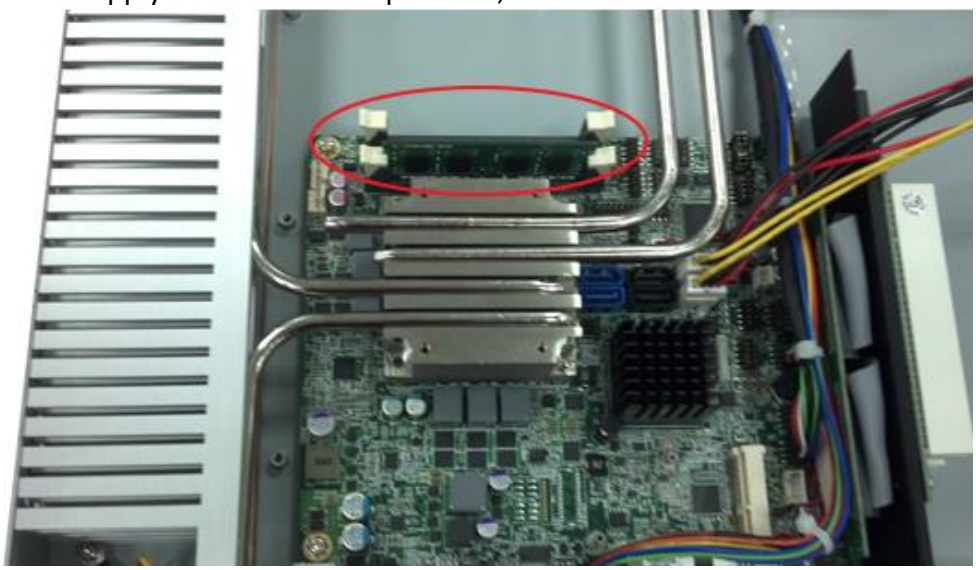
5. After pick up CPU heat sink you can set CPU on CPU socket.

6. Put the thermal pad (P/N: 0R0100250160000L) on the CPU, screw the system heatsink back, put the heat sink with heatpipe back on the left side, screw the heatsink's cover back, then fasten 4 screws of left bracket from system heat sink.

3.3 Memory module installation

ROC235A supports 2 x 204-pin SO-DIMM DDR3 1333/1600 MHz up to 16GB

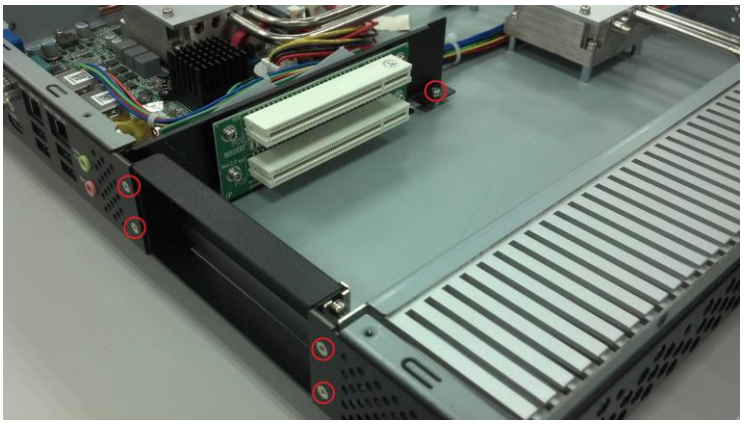
1. Remove the top case and locate 2 memory slots on the motherboard.
2. Insert the RAM into the RAM slot. Align the notch on the module with the notch in the slot, and then apply equal pressure onto the stick until the clamps on the side click and lock the RAM in. You may have to apply a fair amount of pressure, but never force it in.



3.4 PCI riser card installation

ROC235A supports 2 x PCI expansion slots.

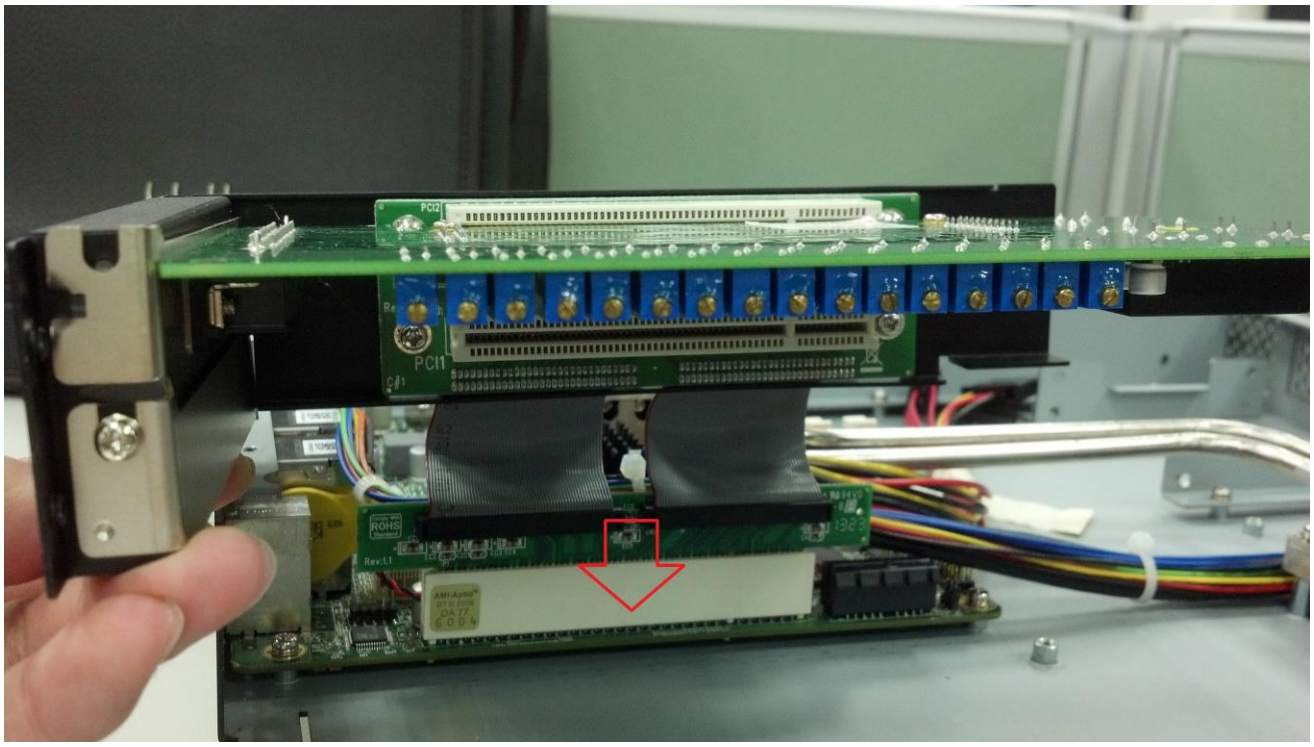
1. Drive each 5 screws off as the marks for remove riser card.



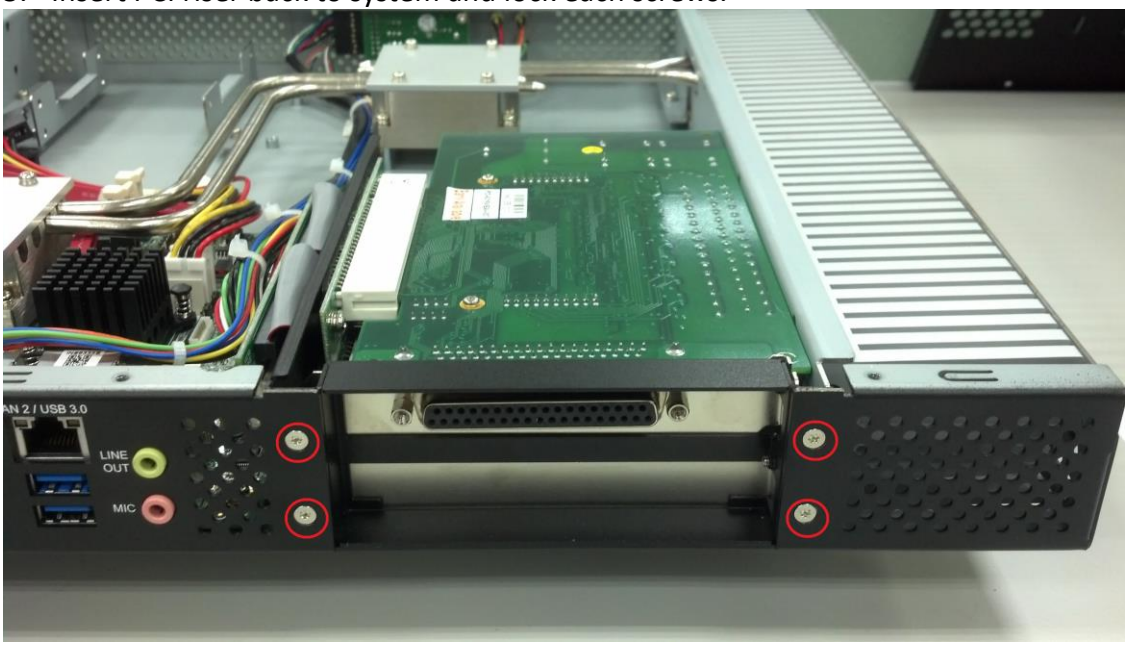
2. Remove the screws to set PCI add-on card on PCI riser card.

3. Insert PCI add-on card into PCI slot from riser card.

4. Insert add-on card screw to firmed the add-on card, and insert the PCI riser's bridge board to motherboard PCI slot.



5. Insert PCI riser back to system and lock each screws.



3.5 Rack mount bracket installation

For install rack mount bracket, insert each screws (P/N: 0F0130600600000L and 0F0132700800000L)
as red spot screw holes to firmed the bracket.

Chapter 4: AMI BIOS UTILITY

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMI BIOS setup utility.

4.1 Starting

To enter the setup screens, perform the following steps:

- Turn on the computer and press the <Del> key immediately.
- After the <Del> key is pressed, the main BIOS setup menu displays. Other setup screens can be accessed from the main BIOS setup menu, such as the Chipset and Power menus.

4.2 Navigation Keys

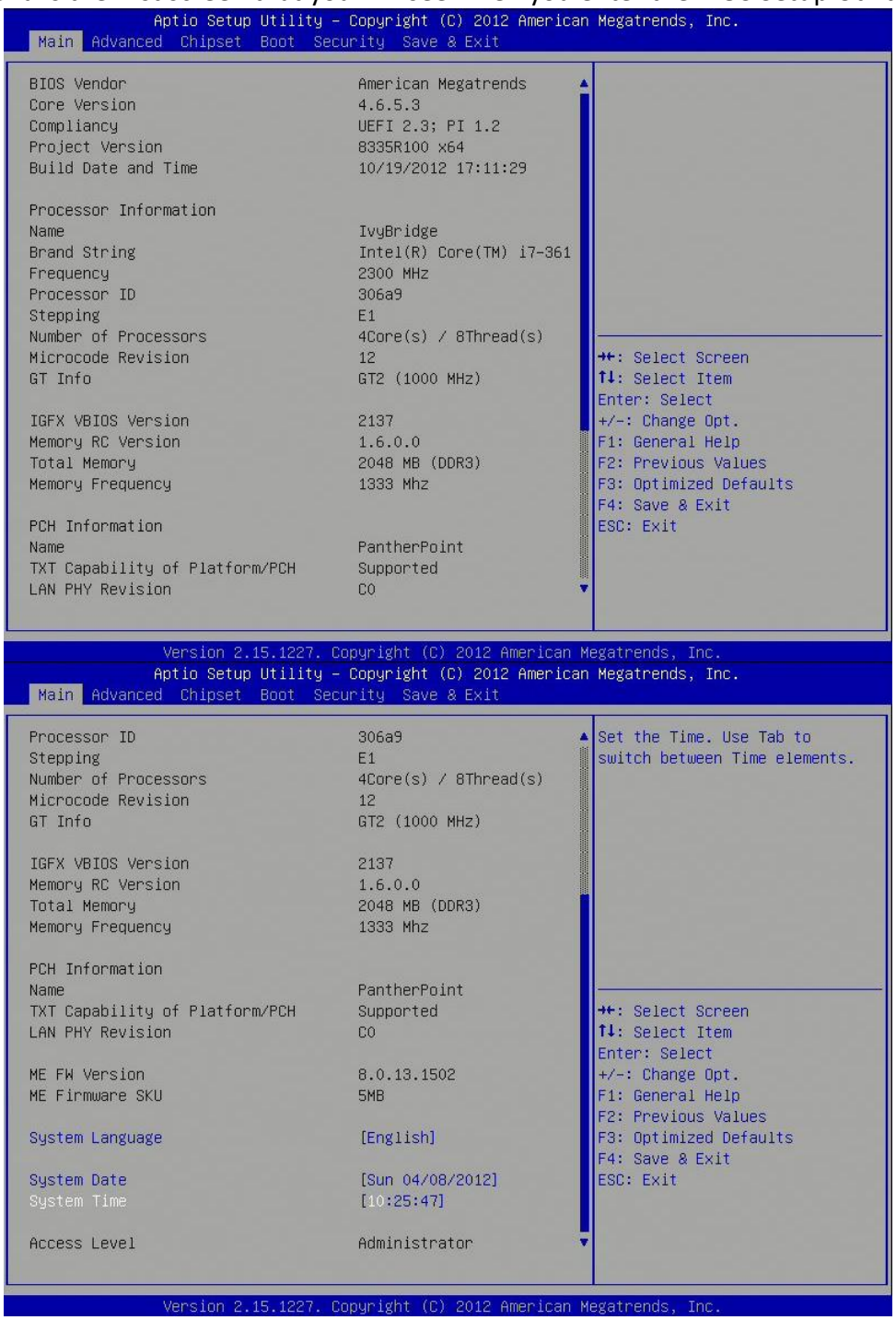
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.
Some of the hot keys are <F1>, <F10>, <Enter>, <ESC>, and <Arrow> keys.

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

Left/Right	The Left and Right <Arrow> keys moves the cursor to select a menu.
Up/Down	The Up and Down <Arrow> keys moves the cursor to select a setup screen or sub-screen.
+− Plus/Minus	The Plus and Minus <Arrow> keys changes the field value of a particular setup setting.
Tab	The <Tab> key selects the setup fields.
F1	The <F1> key displays the General Help screen.
F10	The <F10> key saves any changes made and exits the BIOS setup utility.
Esc	The <Esc> key discards any changes made and exits the BIOS setup utility.
Enter	The <Enter> key displays a sub-screen or changes a selected or highlighted option in each menu.

4.3 Main Menu

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.



System Language

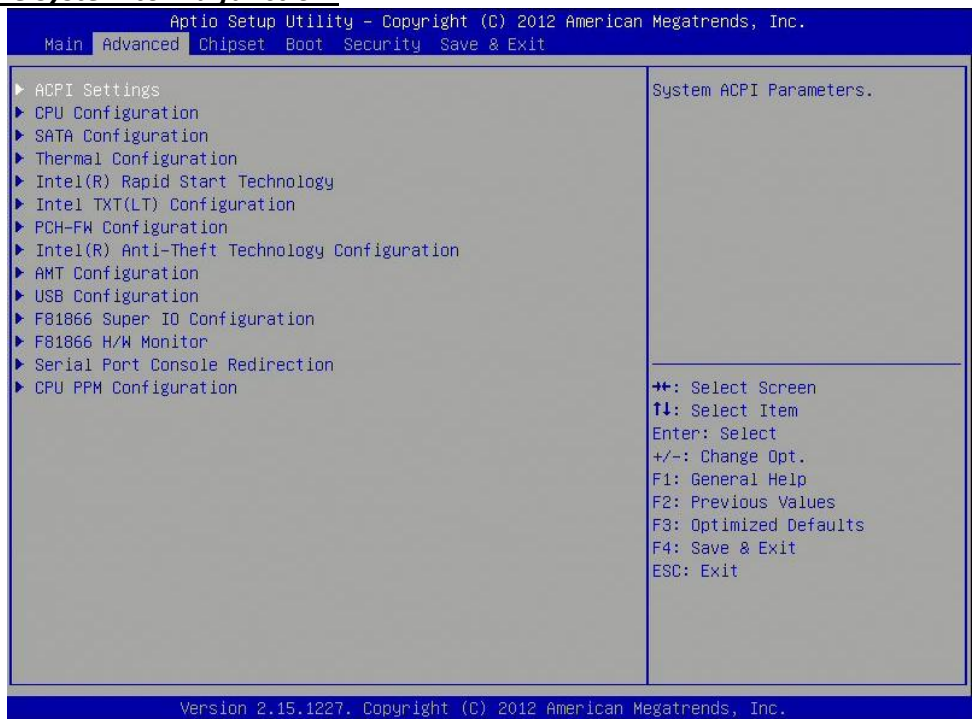
Use this function to select the system language.

System Date
Use this function to change the system date.
Select System Date using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.
The date setting must be entered in MM/DD/YY format.

System Time
Use this function to change the system time.
Select System Time using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.
The time setting is entered in HH:MM:SS format.
Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

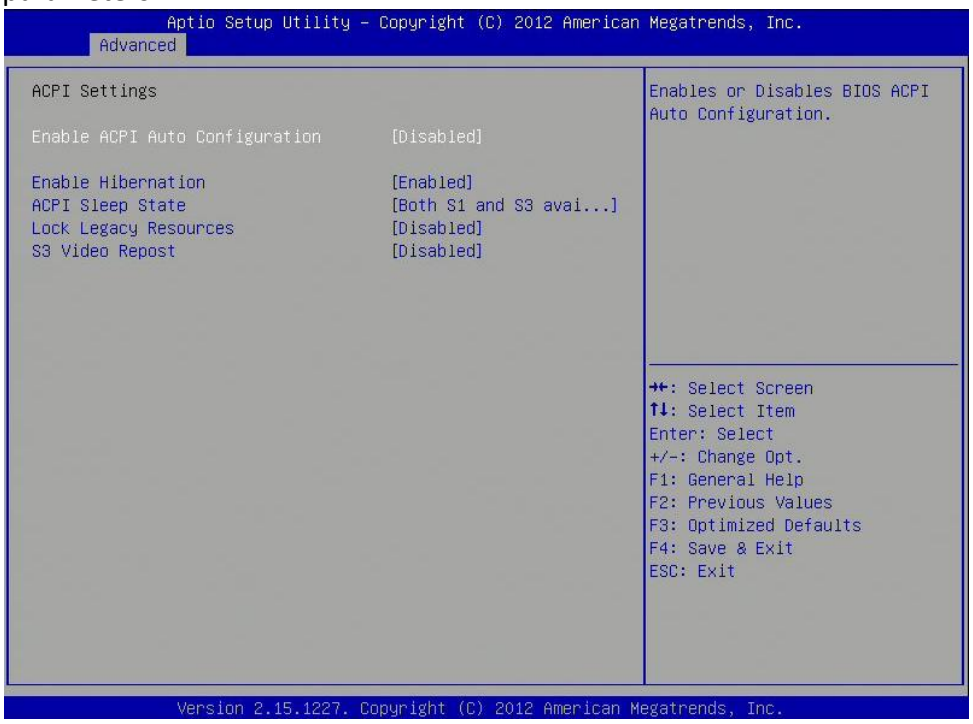
Access Level
Displays the access level of the current user in the BIOS.

4.4 Advanced Menu
The Advanced Menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference. ***Setting incorrect field values may cause the system to malfunction.***



4.4.1 ACPI Settings

System ACPI parameters



Enable ACPI Auto Configuration

Enables or disables BIOS ACPI auto configuration.

Enable Hibernation

Enables or disables system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

ACPI Sleep State

Select the ACPI sleep state the system will enter when the suspend button is pressed.

Lock Legacy Resources

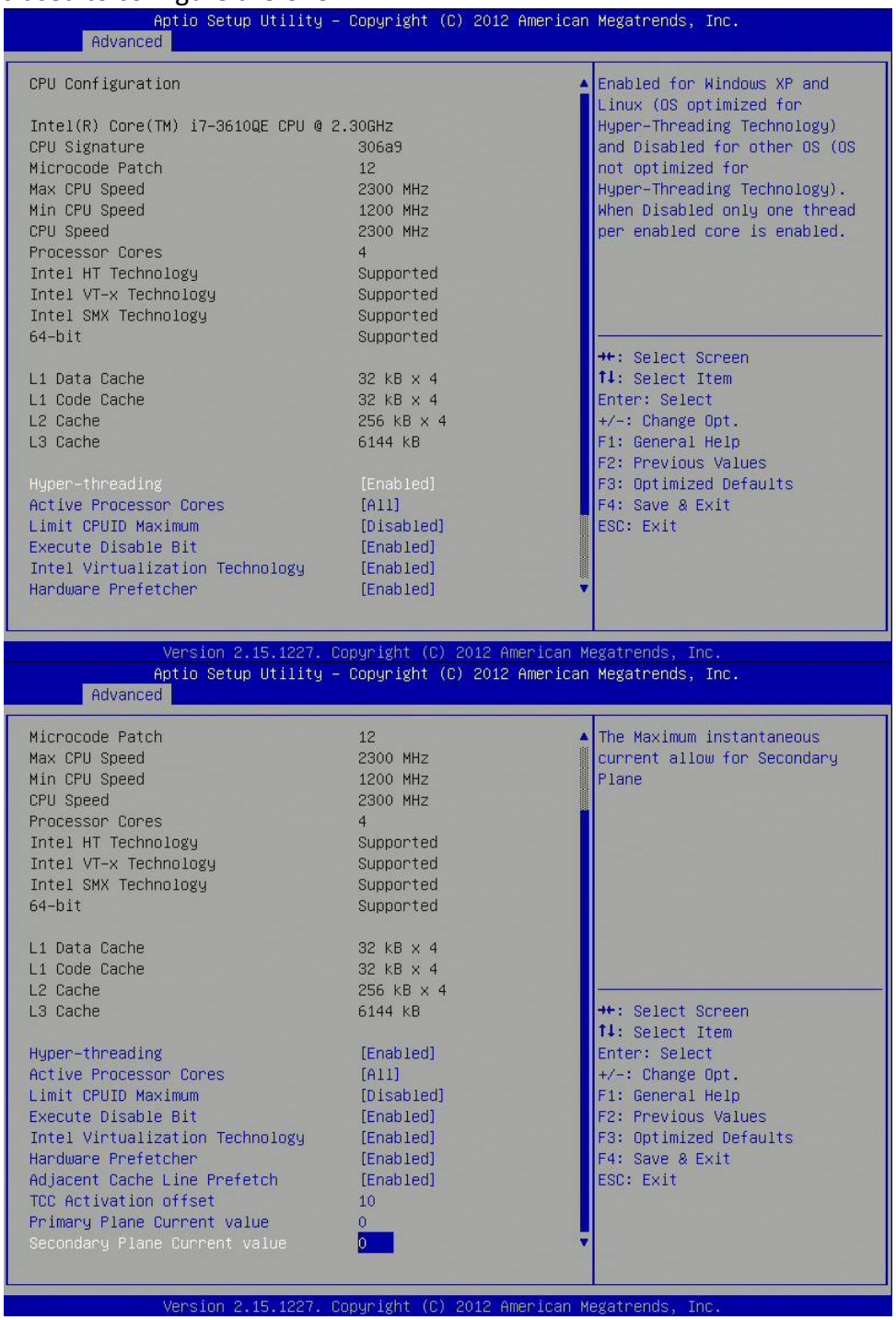
Enables or Disables System Lock of Legacy Resources.

S3 Video Repost

Enable or disable S3 Video Repost.

4.4.2 CPU Configuration

This section is used to configure the CPU.



Hyper-threading
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When disabled only one thread per enabled core is enabled.

Active Processor Cores
Number of cores to enable in each processor package.

Limit CPUID Maximum
Disabled for Windows XP.

Execute Disable Bit
XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Sever 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.)

Intel Virtualization Technology
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hardware Prefetcher
To turn on/off the Mid Level Cache (L2) streamer prefectcher

Adjacent Cache Line Prefetche
To turn on/off prefectching of adjacent cache lines

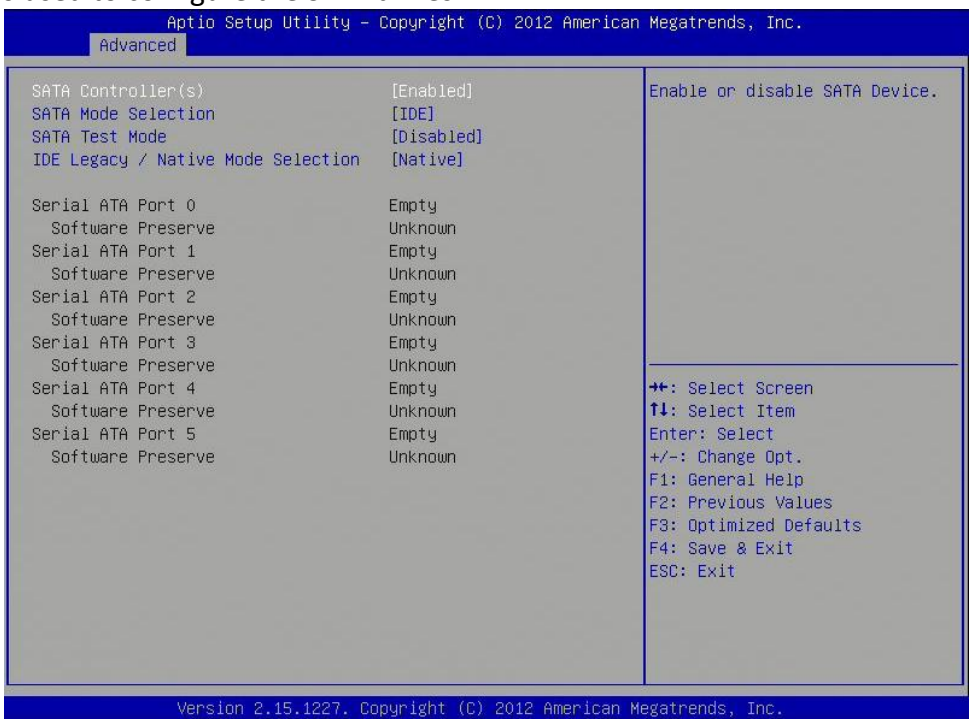
TCC Activation Offset
Offset from the factory TCC activation temperature

Primary Plane Current Value
The Maximum instantaneous current allow for primary plane

Secondary Plane Current Value
The Maximum instantaneous current allow for secondary plane

4.4.3 SATA Configuration

This section is used to configure the SATA drives.



SATA Controller(s)

Enable or disable SATA device.

SATA Mode Selection

Determines how SATA controller(s) operate.

SATA Test Selection

Enable or disable Test Mode

IDE Legacy/Native Mode Selection

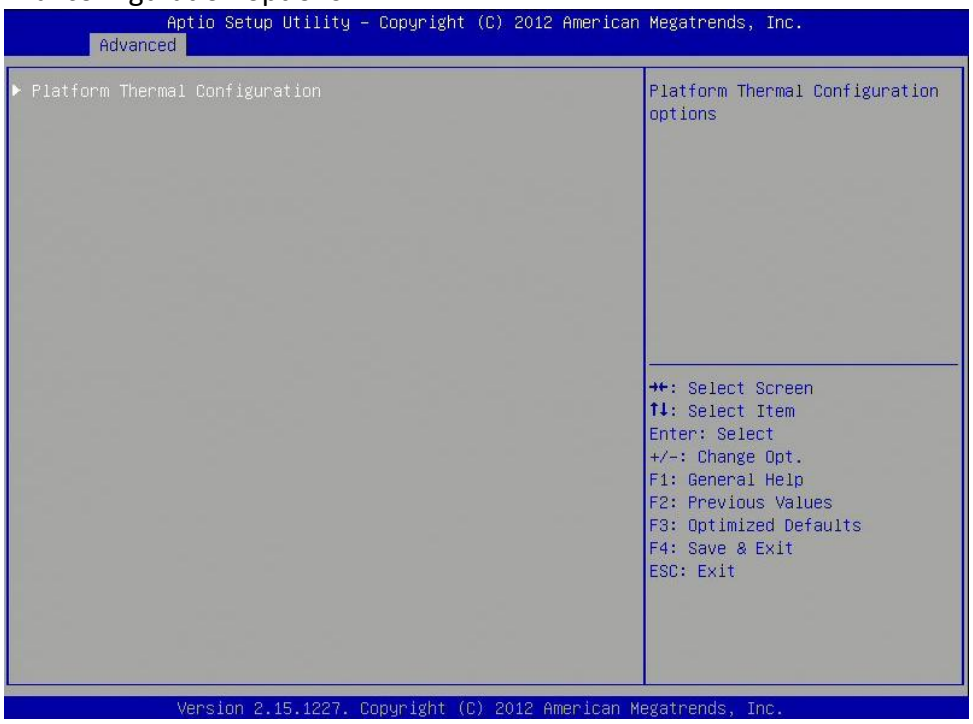
IDE Legacy/Native Mode Selection

Serial ATA Port 0 – 5

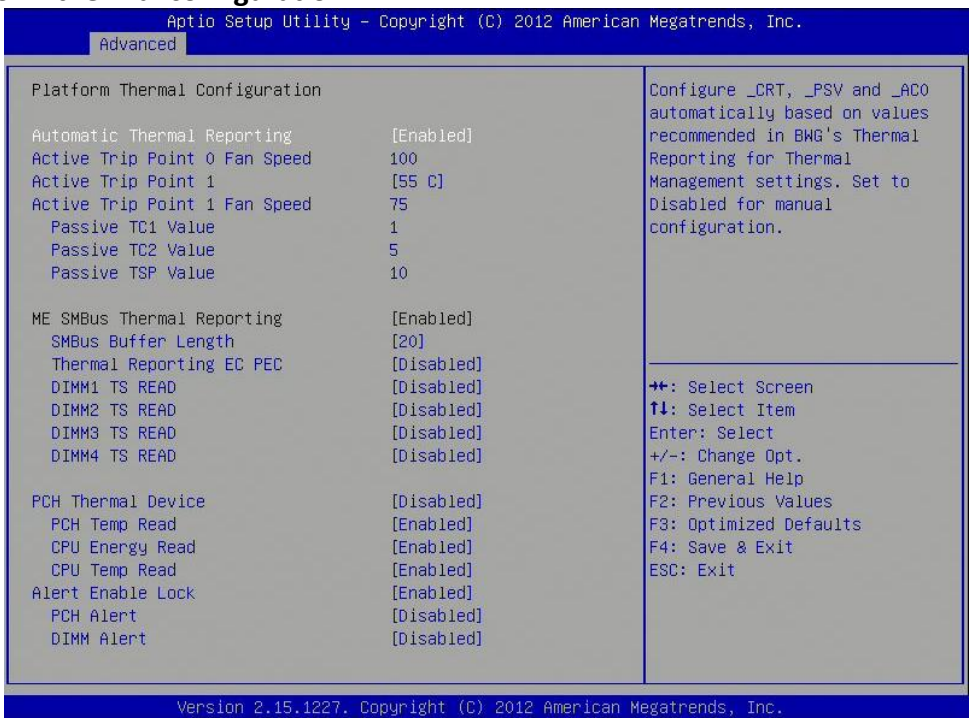
Displays information on the SATA devices detected

4.4.4 Thermal Configuration

Platform thermal configuration options



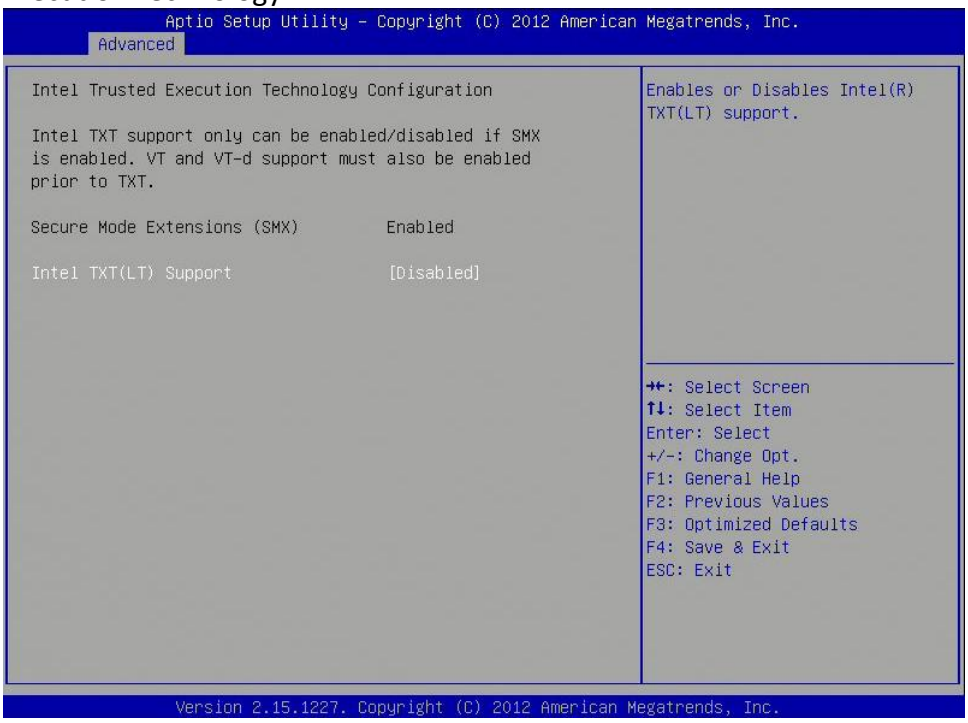
4.4.4.1 Platform thermal configuration



4.4.5 Intel Rapid Start Technology

4.4.6 Intel TXT(LT) Configuration

Intel Trusted Execution Technology

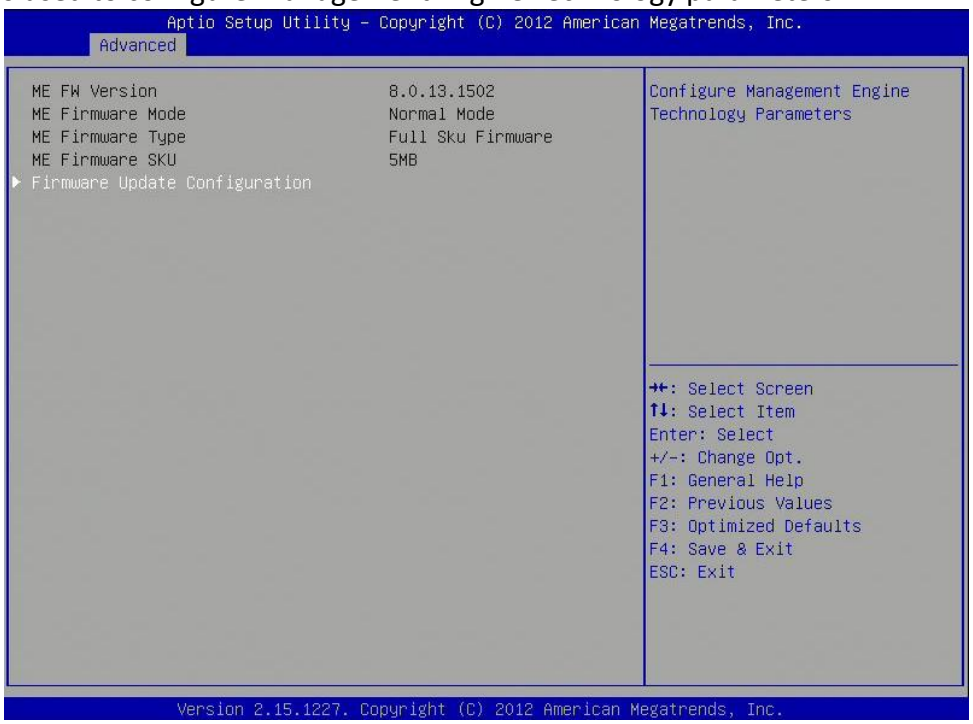


Intel TXT(LT) Support

Enables or disables Intel TXT(LT) support

4.4.7 PCH-FW Configuration

This section is used to configure Management Engine Technology parameters.



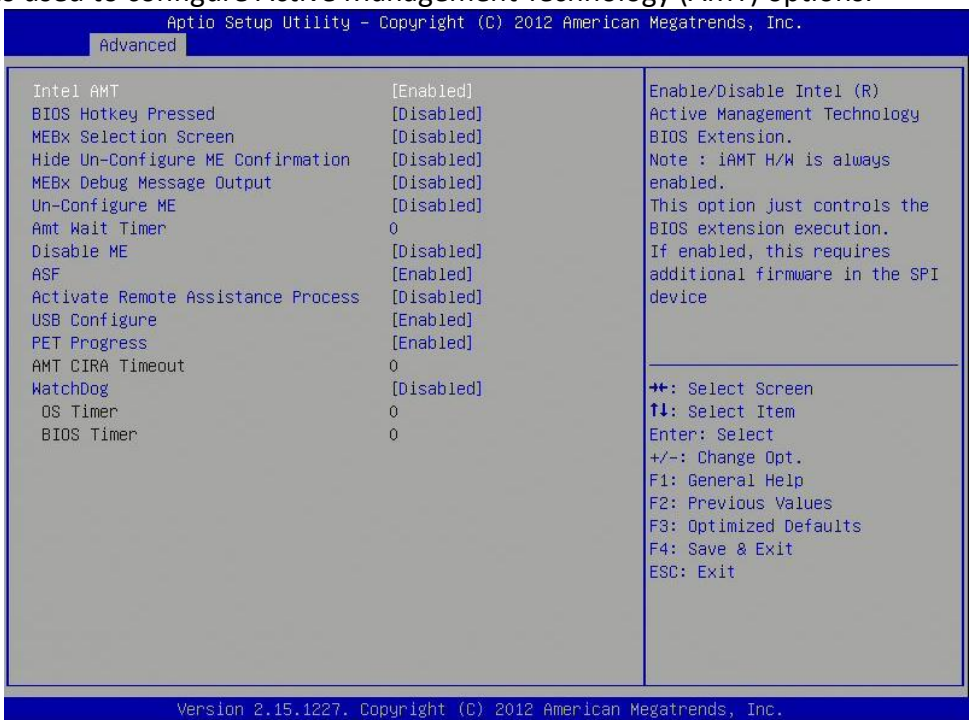
4.4.8 Intel Anti-Theft Technology Configuration

Disabling Intel AT allow user to login platform. This is strictly for testing only. This does not disable Intel AT services in ME

Intel Anti-Theft Technology
Enable or Disable Intel AT in BIOS for testing only

Intel Anti-Theft Technology Rec
Set the number of times Recovery attemped will be allowed.

4.4.9 AMT Configuration
This section is used to configure Active Management Technology (AMT) options.



Intel AMT
Enable/disables Intel Active Management Technology BIOS extension.
Note: iAMT H/W is always enabled.
This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.

BIOS Hotkey Pressed
Enable/disable BIOS hotkey press.

MEBx Selection Screen
Enable/disable MEBx Selection Screen

Hide Un-Configure ME Confirmation
Hide Un-Configure ME without password confirmation prompt

MEBx Debug Message Screen
Enable MEBx debug message output

Un-Configure ME
Perform AMT/ME unconfigure without password operation.

Amt Wait Timer
Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

Disable ME
Set ME to Soft Temporary Disabled

ASF
Enable/Disable Alert specification Format

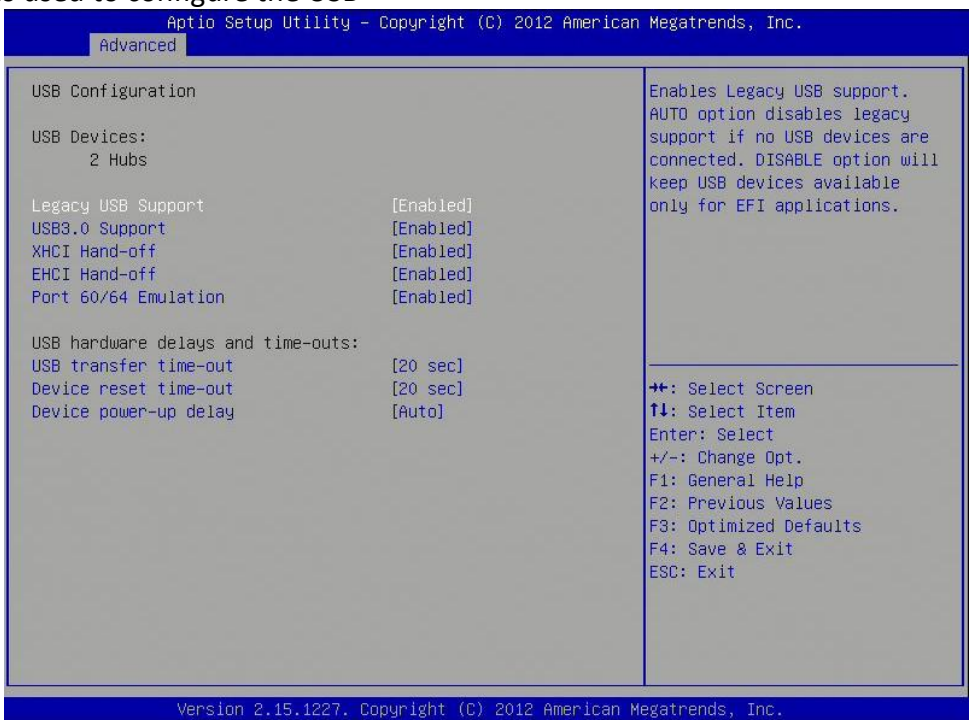
Activate Remote Assistance Process
Trigger CIRA boot.

USB Confirgure
Enable/Disable USB configure function.

PET Progress
User can Enable/Disable PET Events progress to receive PET events or not.

Watchdog Timer
Enable/Disable Watchdog Timer.

4.4.10 USB Configuration
This section is used to configure the USB



Legacy USB Support
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.

USB3.0 Support
Enable/Disable USB3.0 (XHCI) Controller support.

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

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

Port 64/60 Emulation
Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

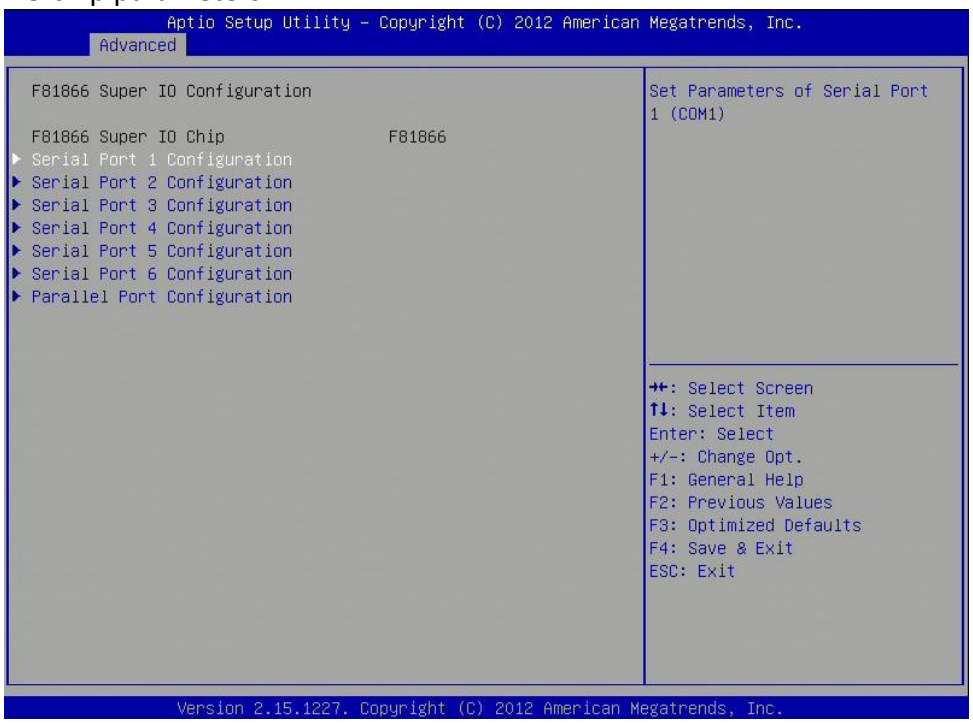
USB Transfer time-out
The time-out value for Control, Bulk, and Interrupt transfers.

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’ uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

4.4.11 F81866 Super IO Configuration

System super IO chip parameters



Serial Port Configuration

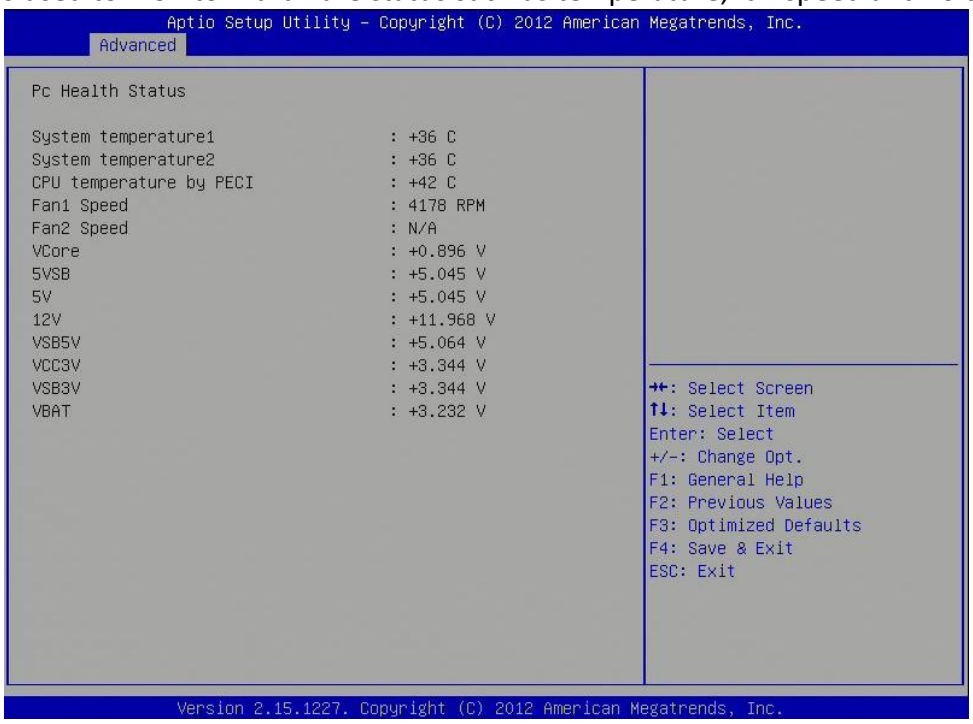
Set Parameters of Serial Ports. User can Enable/Disable the serial port and Select an optimal settings for the Super IO Device.

Parallel Port configuration

Set parameters of parallel port (LPT/LPTE)

4.4.12 F81866 H/W Monitor

This section is used to monitor hardware status such as temperature, fan speed and voltages.



System Temperature

Detects and displays the current system temperature.

CPU Temperature

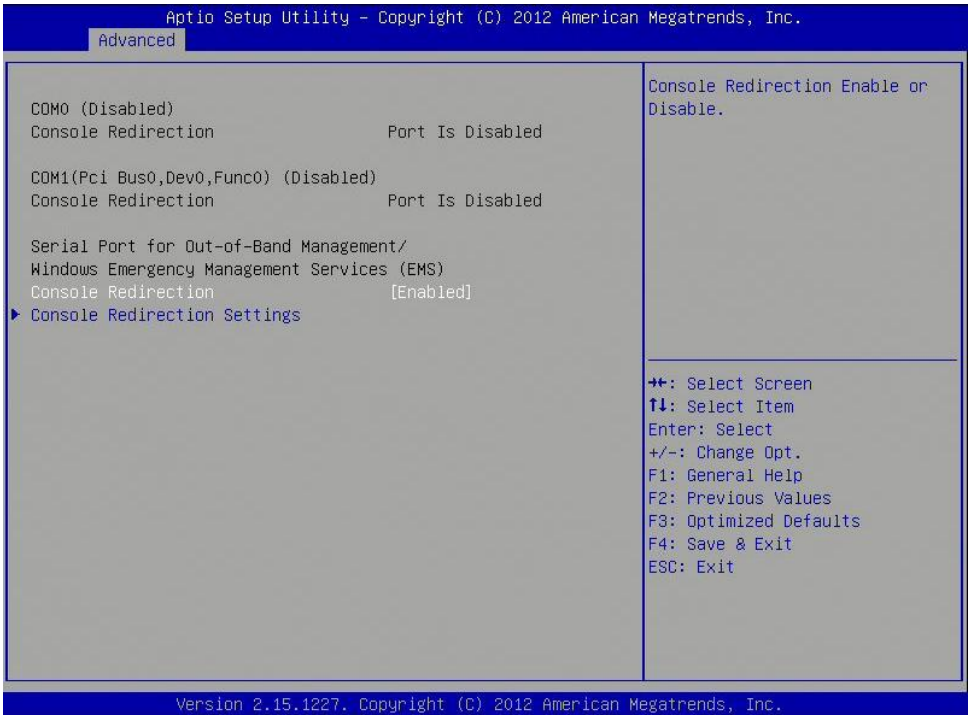
Detects and displays the current CPU temperature.

Fan1/2 Speed

Detects and displays the current CPU fan speed.

4.4.13 Serial Port Console Redirection

This screen provides information about functions for specifying the Serial Port Console Redirection configuration settings. Console redirection can be used to remotely operate system settings and the EFI console.



Console Redirection

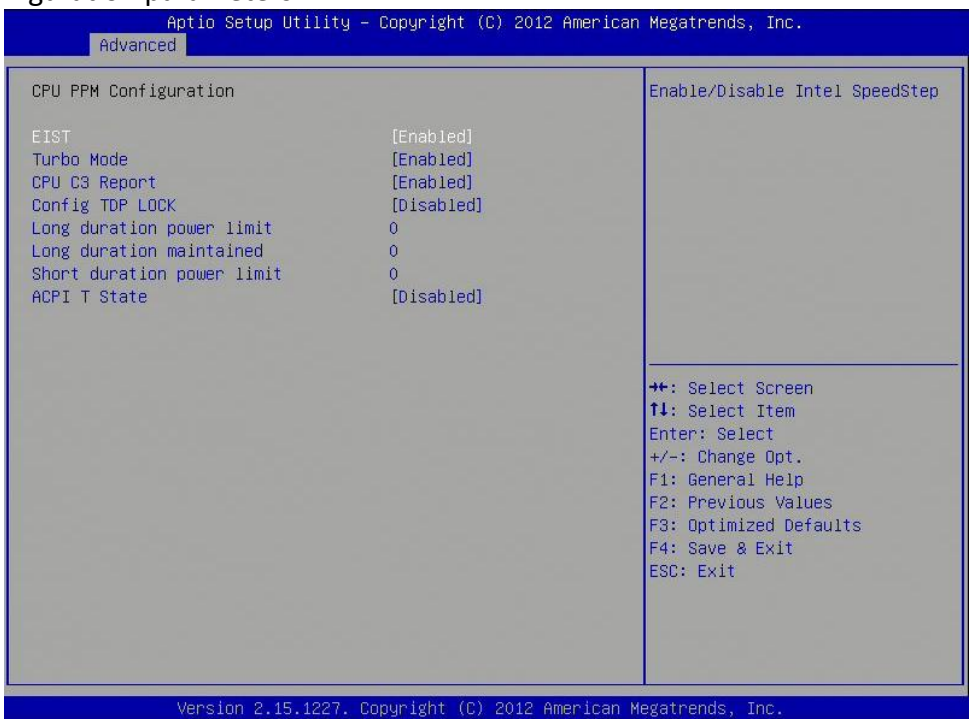
Console Redirection Enable or Disable.

Console Redirection Settings

The setting specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

4.4.14 CPU PPM Configuration

CPU PPM configuration parameters



EIST

Enables or disables Intel SpeedStep.

CPU C3 Report

Enable or disable CPU C3 (ACPI C2) report to OS.

Config TDP LOCK

Lock the Config TDP control register

Long duration power limit

Long duration power limit in Watts, 0 means use factory default.

Long duration maintained

Time window which the long duration power is maintained.

Short duration power limit

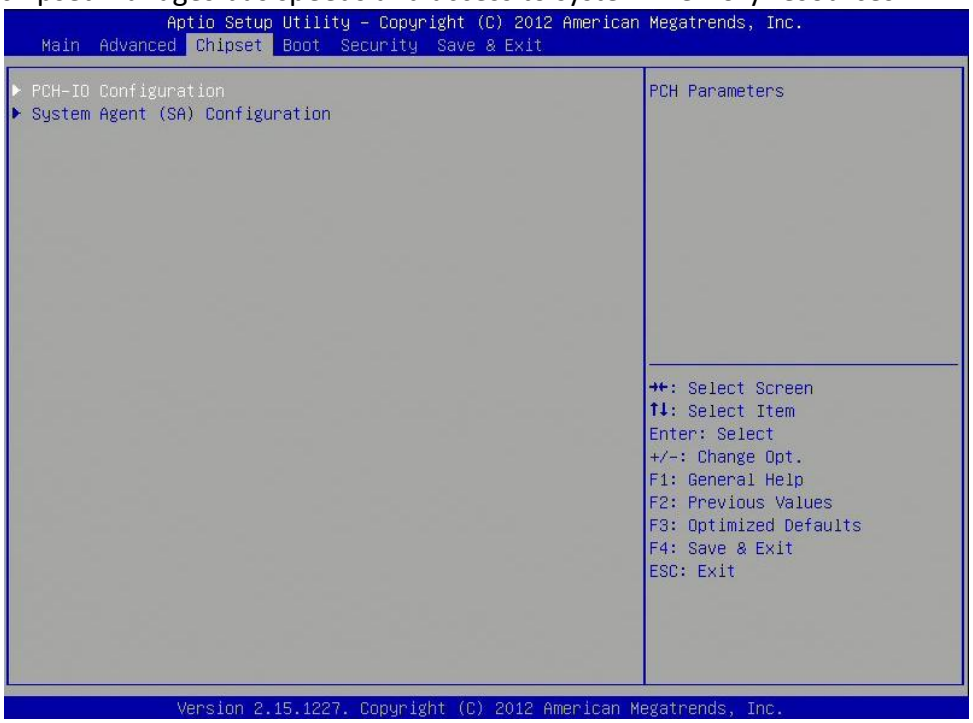
Short duration power limit in Watts, 0 means use factory default.

ACPI T State

Enable or disable ACPI state support.

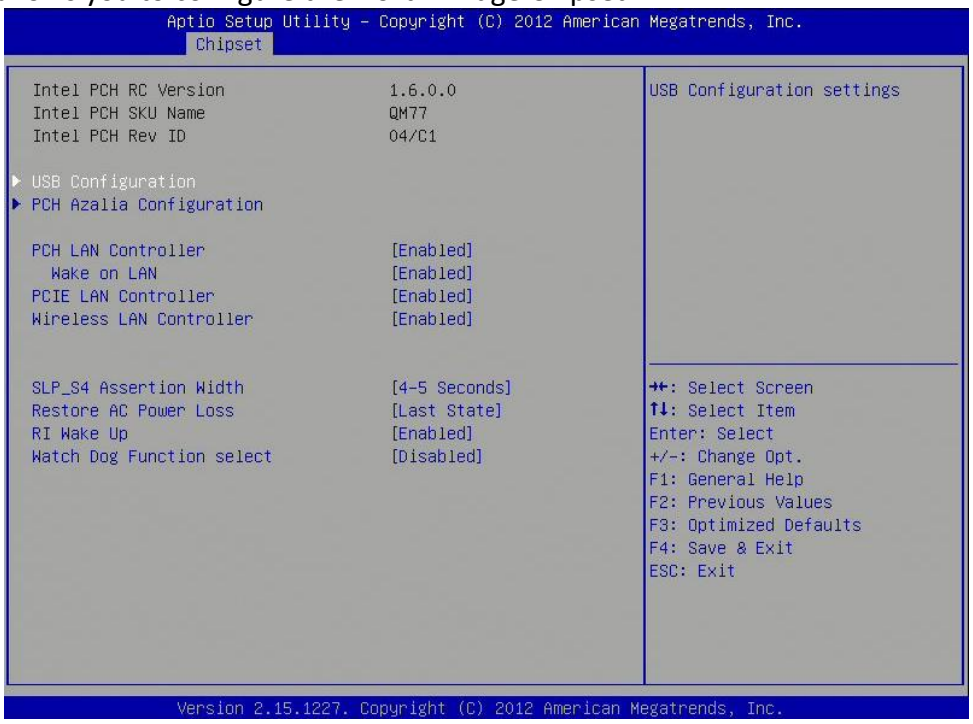
4.5 Chipset

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.



4.5.1 PCH-IO Configuration

This section allows you to configure the North Bridge Chipset.



USB Configuration

USB configuration settings

PCH Azalia Configuration
PCH Azalia configuration settings

PCH LAN Controller
Enable or disable onboard NIC.

Wake on LAN
Enable or disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)

PCIE LAN Controller
Enable or disable onboard PCIE LAN

Wireless LAN Controller
Enable or disable onboard MPCIE LAN-Wireless LAN.

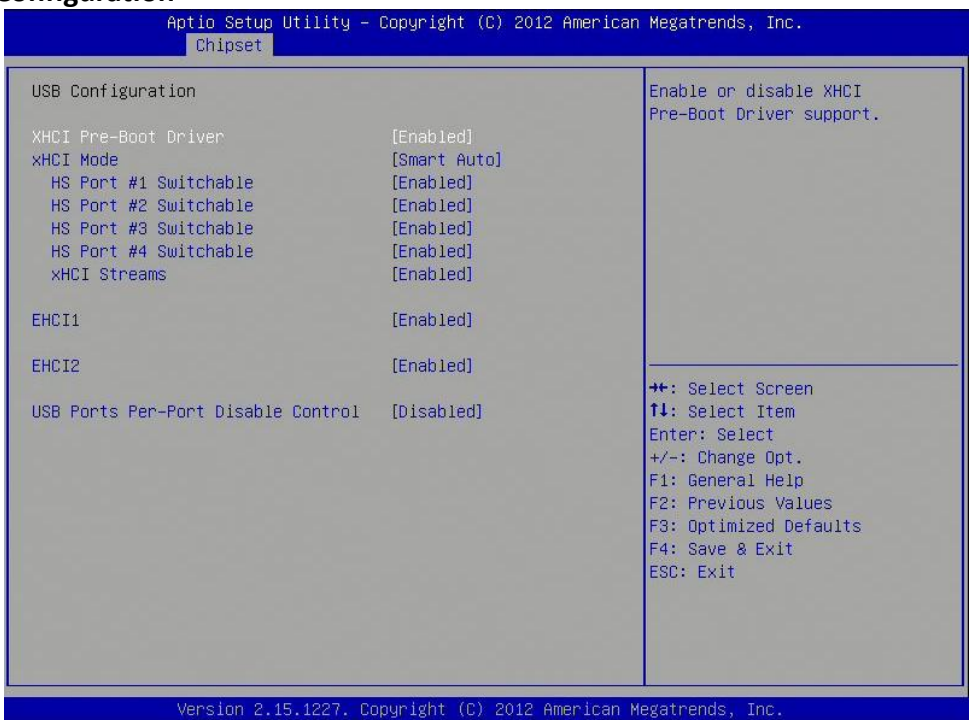
SLP_S4 Assertion Width
Select a minimum assertion width of the SLP_S4# signal.

Restore AC Power Loss
Select AC power state when power is re-applied after a power failure.

RI Wake Up
RI wake up function select.

Watch Dog Function select
Watch Dog function enabled or disabled.

4.5.1.1 USB Configuration



XHCI Pre-Boot Driver
Enable or disable XHCI Pre-Boot driver support.
XHCI Mode
Mode of operation of XHCI controller

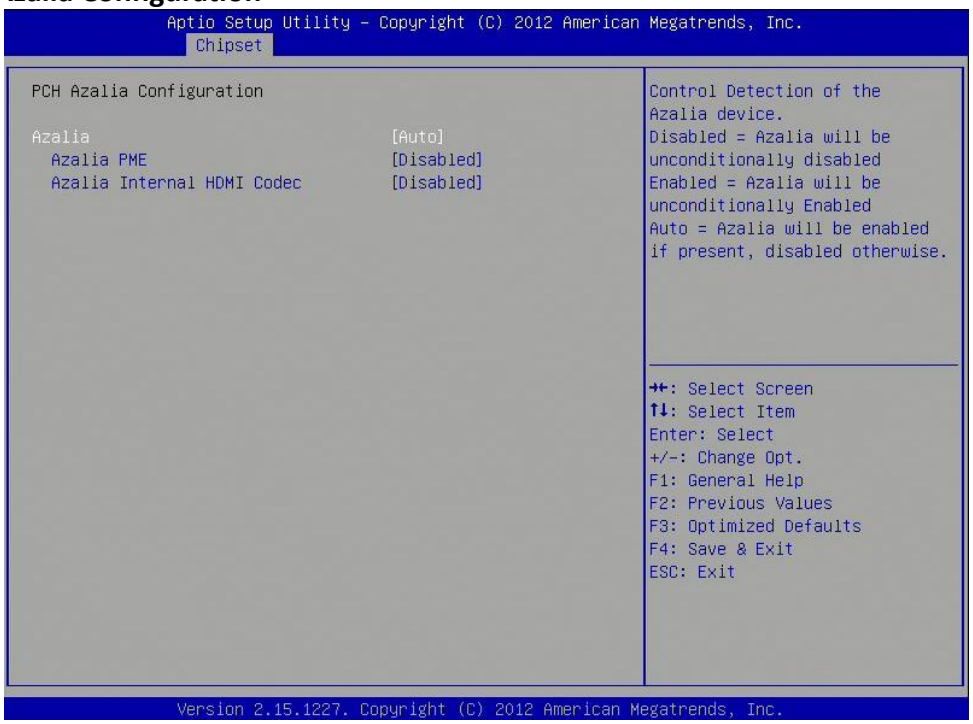
HS Port #1/2/3/4 Switchable
Allows for HS port switching between xHCI and EHCI. If disabled, port is routed to EHCI. If HS port is routed to xHCI, the corresponding SS port is enabled.

xHCI Streams
Enable or disable xHCI Maximum Primary Stream Array Size.

EHCI1/2
Control the USAB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.

USB Ports Per-Port Disable Control
Control each of the USB ports (0~13) disabling.

4.5.1.2 PCH Azalia Configuration



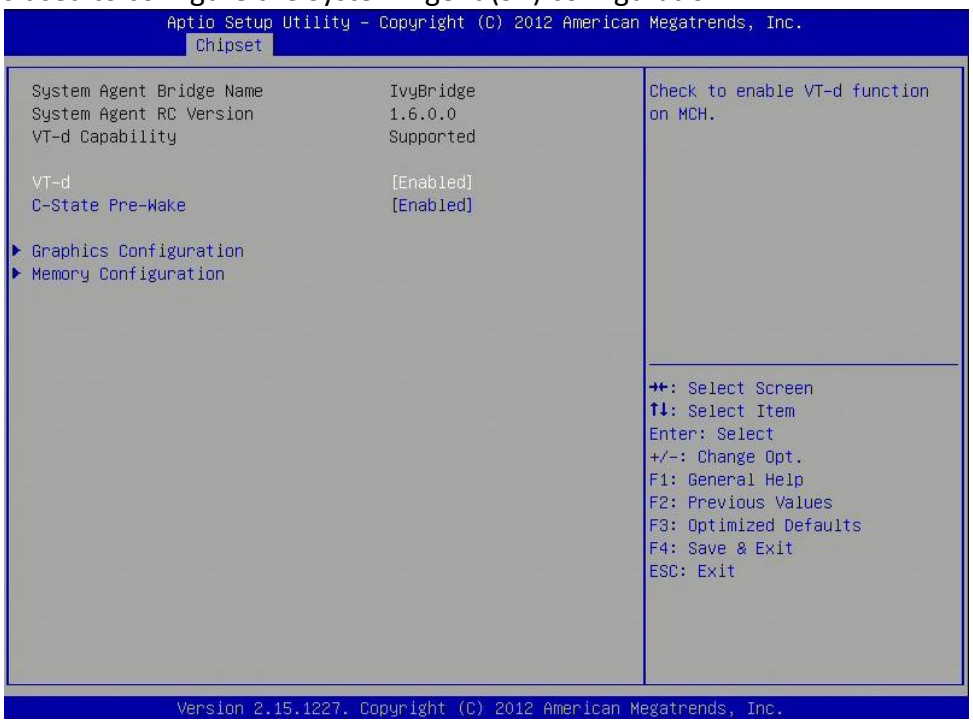
Azalia
Control Detection of the Azalia device.
Disabled=Azalia will unconditionally disabled.
Enabled=Azalia will be unconditionally enabled.
Auto=Azalia will enabled if present, disabled otherwise.

Azalia PME
Enable or disable Power Management capability of audio controller.

Azalia Internal HDMI codec
Enable or disable internal HDMI codec for Azalia.

4.5.2 System Agent (SA) Configuration

This section is used to configure the System Agent (SA) configuration.



VT-d

Check to enable VT-d function on MCH.
Enable NB CRID
Enable or disable NB CRID WorkAround.

C-State Pre-Wake

Controls C-State Pre-Wake feature for ARAT, in SSKPD[57].

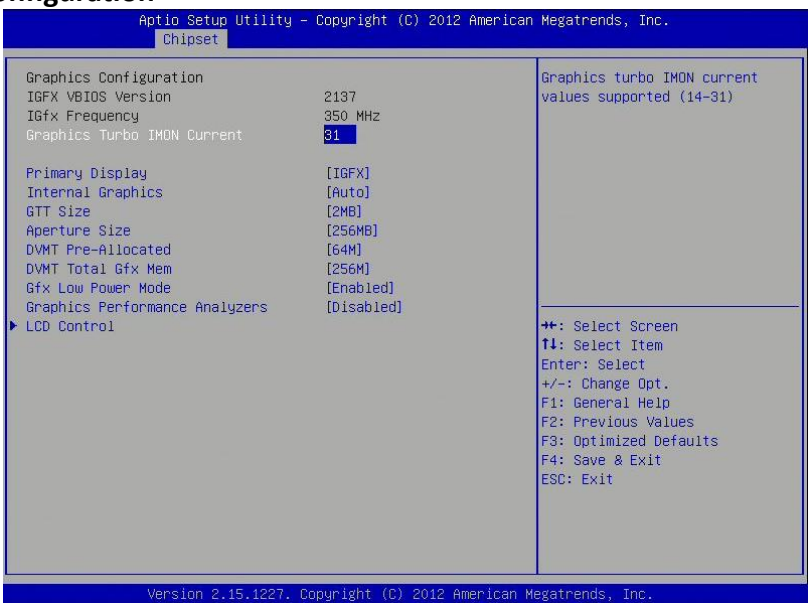
Graphics Configuration

Configure graphics settings

Memory Configuration

Memory configuration parameters

4.5.2.1 Graphics Configuration



Primary Display
Select which of IGFX/PEG/PCI graphics device should be primary display or select SG for switchable Gfx.

Internal Graphics
Keep IGD enabled based on the setup options.

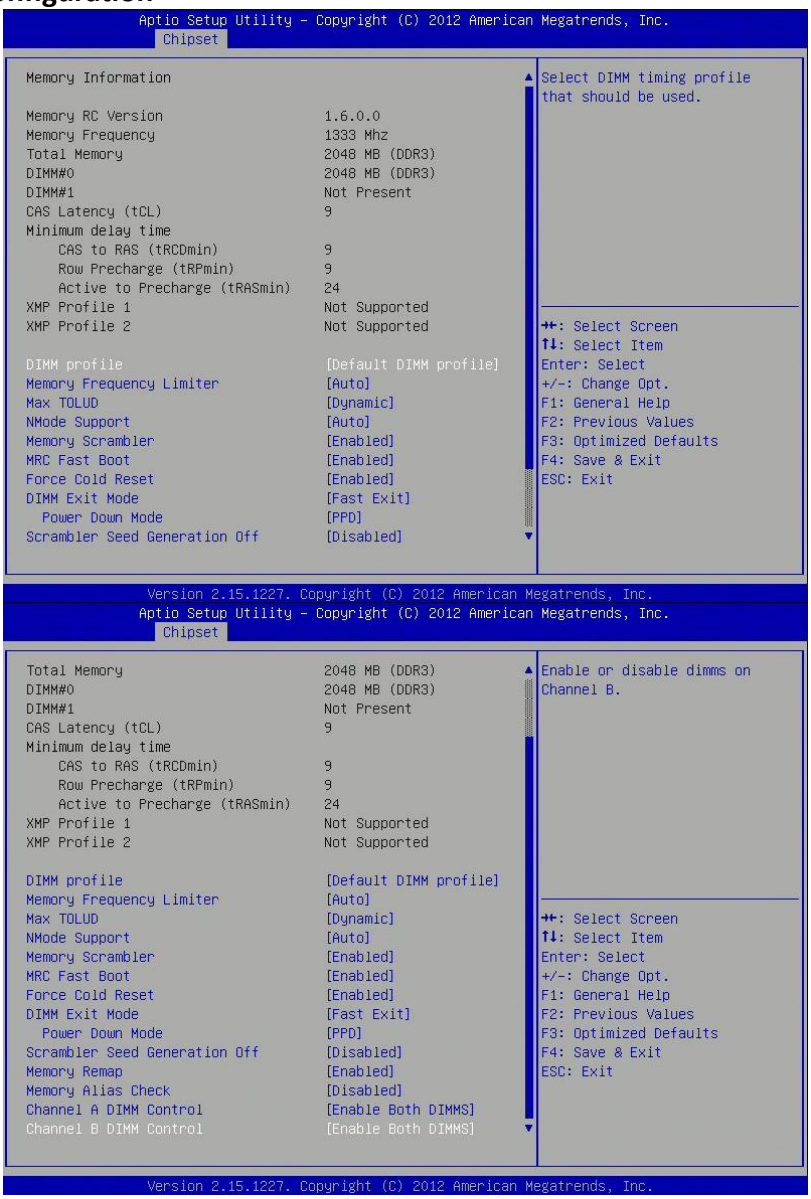
DVMT Pre-Allocated
Select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device.

DVMT Total Gfx Mem
Select DVMT 5.0 total graphics memory size used by the internal graphics device.

Gfx Low Power Mode
This option is applicable for SFF only.

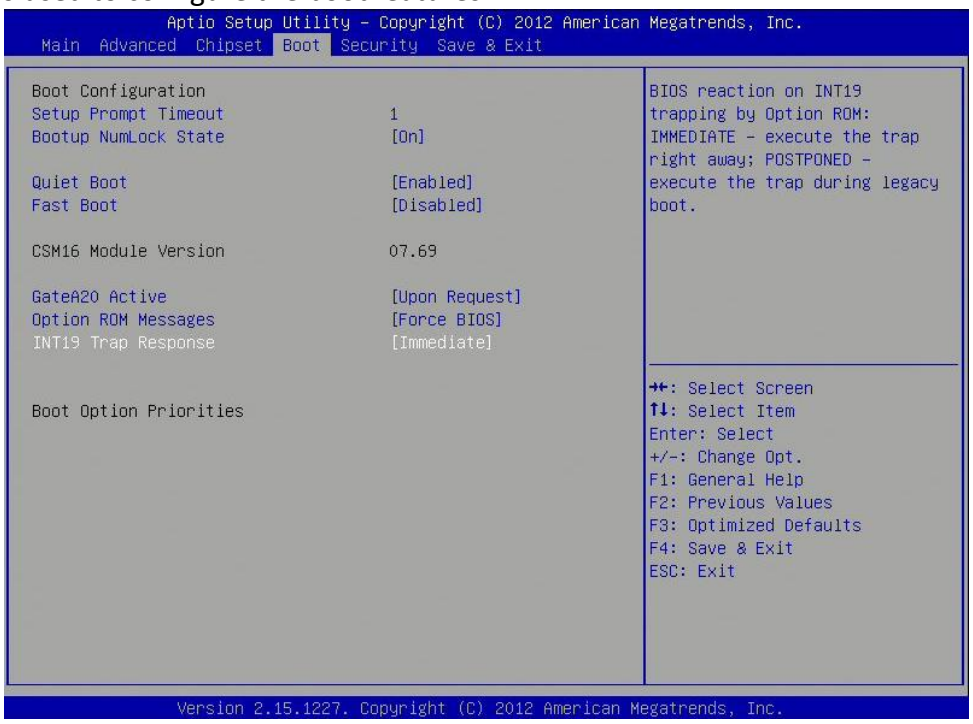
Graphics Performance Analyzers
Enable or disable Intel graphics performance analyzers counters.

4.5.2.2 Memory Configuration



4.6 Boot Setting

This section is used to configure the boot features.



Setup Prompt Timeout

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

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or Disables Quiet Boot option.

Fast Boot

Enables or Disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

GateA20 Active

UPON REQUEST – GA20 can be disabled using BIOS services.
ALWAYS – do not allow disabling GA20; this option is useful when any
RT code is executed above 1MB.

Option ROM Messages

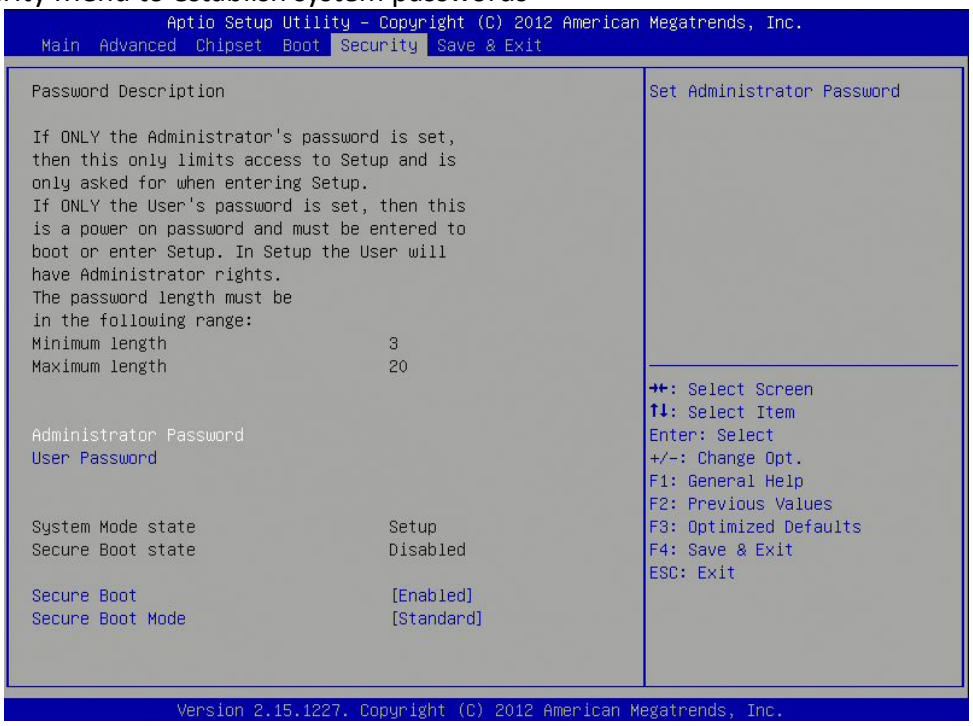
Set display mode for Option ROM.

INT19 Trap Response

BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE – execute the trap right away; POSTPONED – execute the trap during legacy boot.

Boot Option Priorities
Sets the system boot order.

4.7 Security
Use the Security Menu to establish system passwords



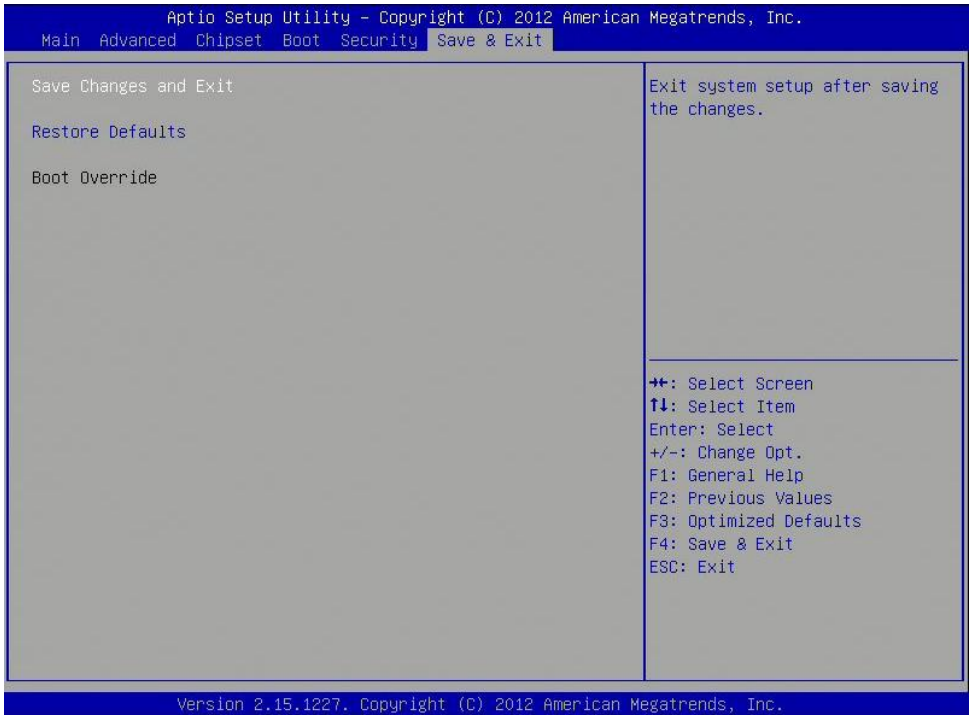
Administrator Password
Set administrator password.

User Password
Set User Password.

Secure Boot
Secure boot flow control. Secure boot is possible only if system runs in user mode.

Secure Boot Mode
Secure boot mode selector. ‘Standard’ – fixed secure boot policy, ‘custom’ – changeable image execution policy and secure boot key databases.

4.8 Save and exit
This screen provides functions for handling changes made to the BIOS settings and the exiting of the Setup program.



Save Changes and Exit
Exit system setup after saving the changes.

Restore Defaults
Restore or Load Defaults values for all the setup options.

7STARLAKE

ROC235A-ESK Manual

Michael

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 local distributor.

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 any technical problems with the product, contact your local distributor

Statement

Revision History

Revision	Date (yyyy/mm/dd)	Changes
V1.0	2014/7/15	Initial release
V1.1	2014/8/8	Update for system information
V1.2	2014/09/19	3. Change BRACKET EAR-2, BRACKET EAR-1 P/N 4. Add Screw Flower Flat Plating Ni White M3 L:4mm ø5.0*8pcs for screw the HDD/SSD (P/N: 0F0102500400000L)
V1.3	2015/09/08	Add memory module installation
V1.4	2017/04/25	Update I/O spec
V1.5	2023/07/25	Update Power module, DC-IN spec. EMI filter

Packing list

☐ 19” 1U Rack-mount Intel® QM77 Fanless Rugged System

☐ Accessories:

Item	P/N	Description	Q’ty
1	0P0600000003000L	Driver CD	1
2	0C1210122103100L	CONN DIP 1*3 P:5.0mm Pluggable terminal block Female	1
3	0R0100250160000L	Thermal pad GR-Hm 24.5x16.2mm T:0.3mm	1
4	0N0600000000000L	BRACKET EAR-L SPGC 280x43.4x21.3mm t:3mm	2
5	0N0600000000010L	BRACKET EAR-S SPGC 90x43.4x21.3mm t:3mm	2
6	0F0130600600000L	Screw cross circle Plating Ni White M4 L:6mm	10
7	0F0132700800000L	Screw Flat Plating Ni White M4 L:8mm	10
8	0F0102500400000L	Screw Flower Flat Plating Ni White M3 L:4mm	8

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

Ordering information

Model Number	Description
ROC235A-ET	Intel® QM77 Fanless Rugged System with Intel® Ivy Bridge Core™ i7/i5/i3 Processor, with 1xPCI & 1x PCIe Expansion, 9V to 24V DC-in, Wide Temp. (-20 to 70°C)
ROC235A-UT	Intel® QM77 Fanless Rugged System with Intel® Ivy Bridge Core™ i7/i5/i3 Processor, with 1xPCI & 1x PCIe Expansion, 9V to 24V DC-in, Wide Temp. (-40 to 70°C Optional)
ROC235A-ESK	Intel® QM77 Fanless Rugged System with Intel® Ivy Bridge Core™ i7/i5/i3 Processor, with 1xPCI & 1x PCIe Expansion, 13V to 35V DC-in, Wide Temp. (-20 to 70°C)
Processor	
Intel® Core™ i7-3610QE Processor (6M Cache, 2.30 GHz), 45 W Intel® Core™ i5-3610ME Processor (3M Cache, 2.70GHz), 35W Intel® Core™ i3-3120ME Processor (3M Cache, 2.40 GHz), 35W	

Table of Contents

Chapter 1: Product Introduction

1.1 Key Features

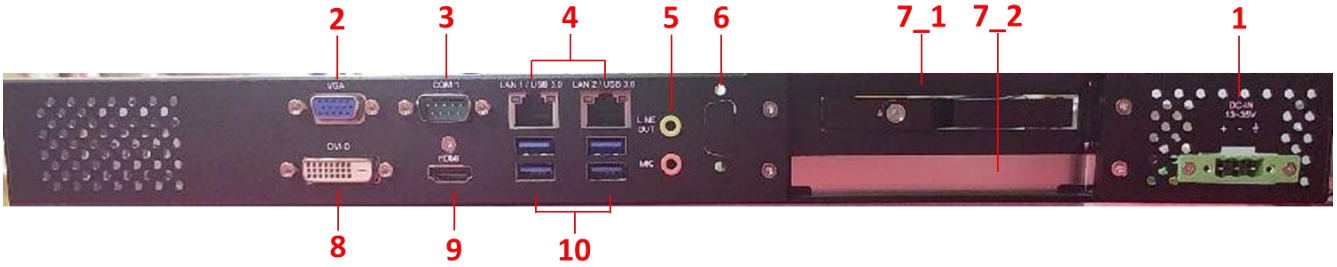
System	
CPU Type	Intel® 22nm Ivy Bridge Processor (Mobile) socket (rPGA988) Core™ i7-3610QE 2.3 GHz (6M Cache, 45W) Core™ i5-3610ME 2.7 GHz (3M Cache, 35W) Core™ i3-3120ME 2.4 GHz (3M Cache, 35W)
Chipset	Intel® QM77
Memory Type	2 x 204-pin SO-DIMM DDR3 1333/1600 MHz up to 16 GB
Expansion Slot	2 x PCI 1 x Mini PCIe
Storage Device	3 x 2.5" Swappable SSD Supports RAID 0,1
Front I/O	
Power Button	1
Power LED	1
HDD LED	1
LAN Status LED	2 sets
USB	2 x USB 2.0
Reset	1
Rear I/O	
VGA	1
DVI-D	1
HDMI	1
Ethernet	2 x RJ45
Audio	Mic-in, Line-out
COM	1x RS232/422/485 with 5V/12V selectable
USB	4 x USB 3.0
Pre-cut hole	1 x D-sub pre-cut hole
DC-in	1 x 3-pin Terminal Block
Mechanical & Environment	
Power Requirements	13V to 35V DC-in
Dimension (W x H x D)	440 x 44 x 380mm (17.32” x 1.73” x 14.96”)
Operating Temp.	-20 to 70°C (ambient with air flow)
Storage Temp.	-20 to 80°C
Relative Humidity	10% to 90%, non-condensing
Certification	CE, FCC

Specifications are subject to change without notice

1.2 Front Panel Components

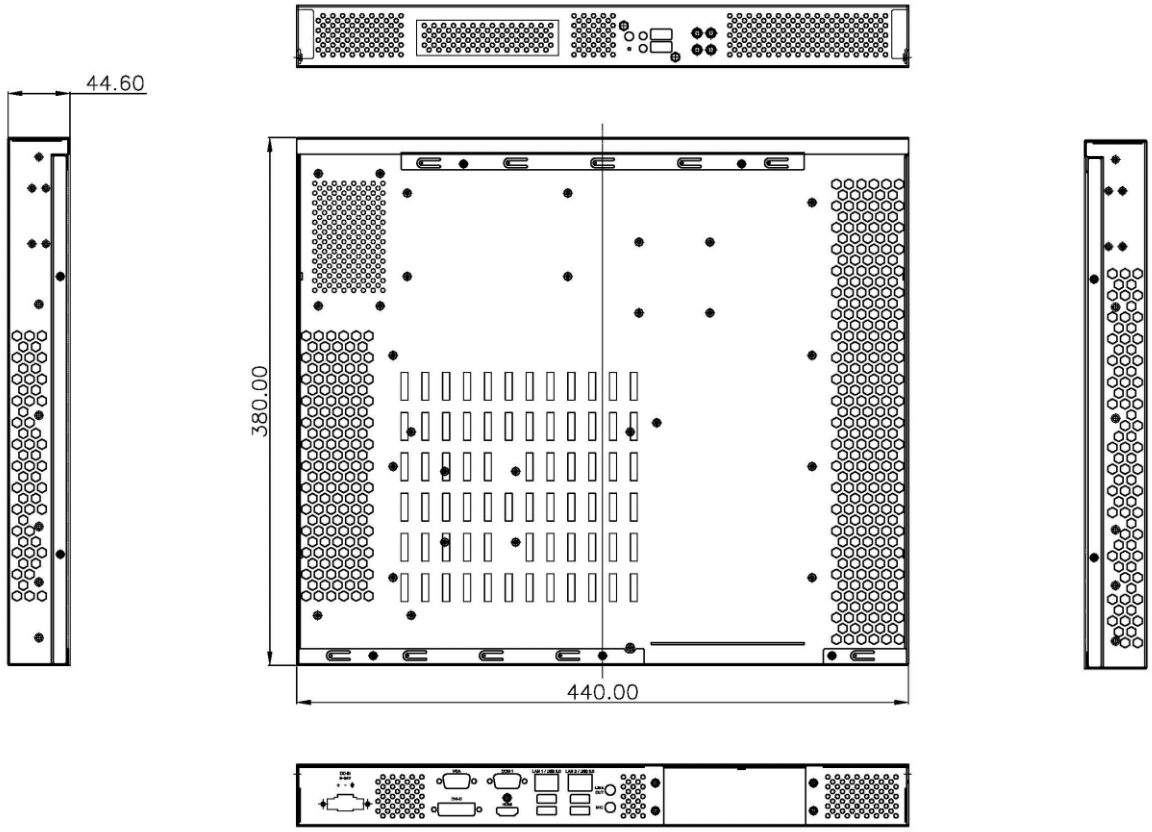
1	LAN Status LED
2	USB 2.0 x 2
3	HDD LED
~~4~~	~~Reset Button~~
5	Power LED
6	Power Button

1.3 Rear Panel Components



1	Power Input 13V to 35V DC-in (by terminal block)
2	VGA port
3	COM port, RS232/422/485 with 5V/12V selectable
4	LAN port, 2 x RJ45
5	Audio jack (Mic-in, Line-out)
6	Pre-cut hole for D-sub connector
7_1	1x Swappable SSD Tray [in an Expansion slot (PCI)]
7_2	1x Expansion slot (PCI)
8	DVI-D port
9	HDMI port
10	4 x USB 3.0

1.4 Mechanical Dimensions

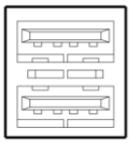


Chapter 2: Jumpers and Connectors

2.1 Front Panel Connector Pin Definitions

USB Port: USB2.0

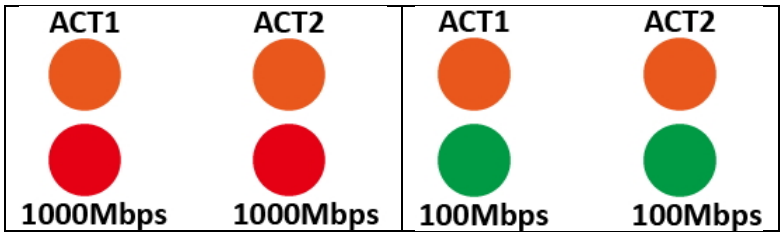
Pin	Definition	Pin	Definition
1	+5V	5	+5V
2	USBD-	6	USBD-
3	USBD+	7	USBD+
4	GND	8	GND



Status Indicators

Status	LED Color
HDD	RED
PWR	BLUE

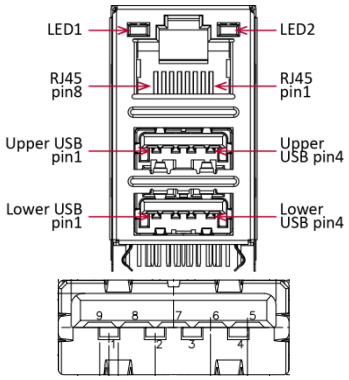
SPEED LED:	ACTIVE 1 LED:	ACTIVE 2 LED:
RED: 1000Mbps	ORANGE (BLINKING): ACTIVITY	ORANGE (BLINKING): ACTIVITY
GREEN: 100Mbps	ORANGE (NO BLINKING): ACTIVITY	ORANGE (NO BLINKING): ACTIVITY



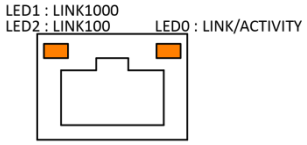
2.2 Rear Panel Connector Pin Definitions

LAN1_USB12: USB3.0 port 0,1 and LAN connector 1
LAN2_USB34: USB3.0 port 3,4 and LAN connector 2

Upper USB		Lower USB		LAN	
Pin	Definition	Pin	Definition	Pin	Definition
1	+5VDUAL	1	+5VDUAL	1	D0+
2	D-	2	D-	2	D0-
3	D+	3	D+	3	D1+
4	GND	4	GND	4	D1-
5	StdA_SSTX-	5	StdA_SSTX-	5	D2+
6	StdA_SSTX+	6	StdA_SSTX+	6	D2-
7	GND_DRIAN	7	GND_DRIAN	7	D3+
8	StdA_SSRX-	8	StdA_SSRX-	8	D3-
9	StdA_SSRX-	9	StdA_SSRX-		

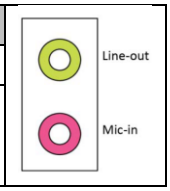


SPEED LED: (Lift)	ACTIVE LED: (Right)
GREEN: 1000Mbps	ORANGE (BLINKING): ACTIVITY
ORANGE: 100Mbps	No Light: NOT LINK
No Light: 10Mbps	ORANGE (NO BLINKING): LINK



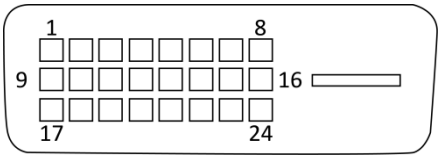
AUDIO1: LINE-OUT/MIC-IN

Pin	Definition
1	Line-out
2	Mic-in



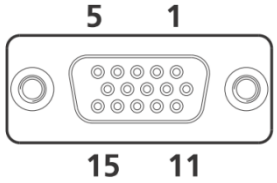
DVI-D: DVI-D

Pin	Definition	Pin	Definition
1	TMDS2-	13	NC
2	TMDS2+	14	+5V
3	GND	15	GND
4	NC	16	HOTPLUG_DETECT
5	NC	17	TMDS0-
6	DDC_CLK	18	TMDS0+
7	DDC_DATA	19	GND
8	NC	20	NC
9	TMDS1-	21	NC
10	TMDS1+	22	GND
11	GND	23	TMDSCLK+
12	NC	24	TMDSCLK-



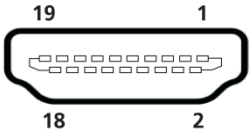
VGA: VGA

Pin	Definition	Pin	Definition
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	DDC DATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDC LOCK
8	GND		



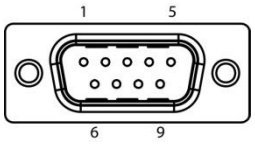
HDMI: HDMI

Pin	Definition	Pin	Definition
1	HDMI_2P	11	GND
2	GND	12	HDMI_CLKN
3	HDMI_2N	13	NC
4	HDMI_1P	14	NC
5	GND	15	DDC CLOCK
6	HDMI_1N	16	DDC DATA
7	HDMI_0P	17	GND
8	GND	18	+5V
9	HDMI_0N	19	HOTPLUG_DETECT
10	HDMI_CLKP		



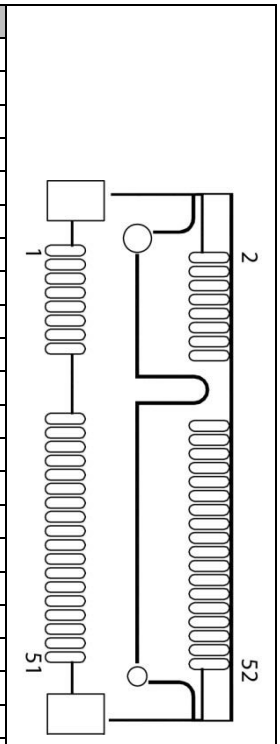
COM1: RS232/422/485 with +12V/+5V selection

Pin	RS-232	RS-422	Half Duplex RS-485
1	DCD-	TX-	DATA-
2	RXD	RX+	NA
3	TXD	TX+	DATA+
4	DTR-	RX-	NA
5	GND	GND	GND
6	DSR-	NA	NA
7	RTS-	NA	NA
8	CTS-	NA	NA
9	COM1P9SEL (Define by JP5)	COM1P9SEL (Define by JP5)	COM1P9SEL (Define by JP5)



MINI_MPCIE: Mini PCIe connector

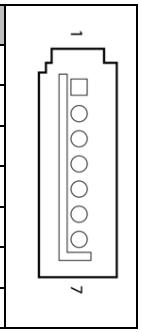
Pin	Definition	Pin	Definition
1	WAKE#	2	+3.3VAUX
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ#	8	NC
9	GND	10	NC
11	REF CLK-	12	NC
13	REF CLK+	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	Wireless LAN Disable#
21	GND	22	RESET#
23	RXN	24	+3.3VAUX
25	RXP	26	GND
27	GND	28	+1.5V
29	GND	30	SMBUS CLOCK
31	TXN	32	SMBUS DATA
33	TXP	34	GND
35	GND	36	USB DATA-
37	GND	38	USB DATA+
39	+3.3VAUX	40	GND
41	+3.3VAUX	42	NC
43	GND	44	NC
45	Control Link CLOCK	46	NC
47	Control Link DATA	48	+1.5V
49	Control Link RESET#	50	GND
51	Blue Tooth Disable#	52	+3.3V VAUX



2.3 Internal Connectors

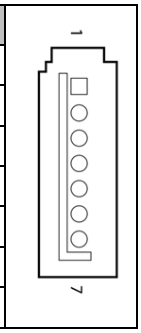
SATA1, SATA2: Serial ATA 3.0 Connector

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



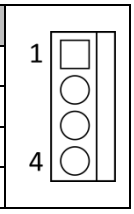
SATA3, SATA4: Serial ATA 2.0 Connector

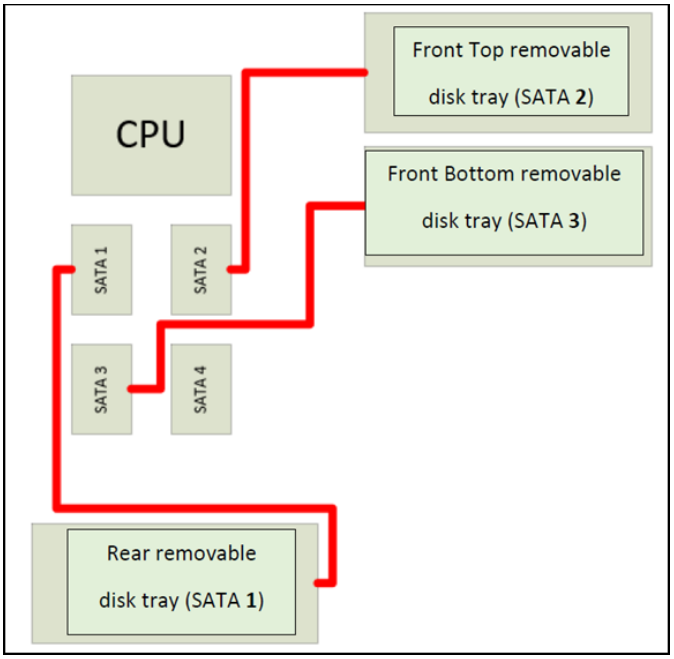
Pin	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND



SATAP0, SATAP1: SATA Power Connector

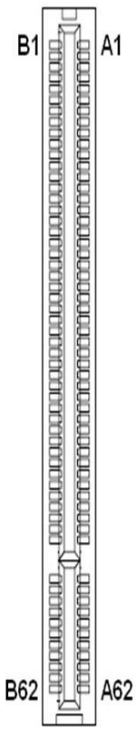
Pin	Definition
1	+5V
2	GND
3	GND
4	+12V





PCI: PCI

Pin	Definition	Pin	Definition	Pin	Definition	Pin	Definition
A1	Pull down 4.7K to GND	A32	AD16	B1	-12V	B32	AD17
A2	+12V	A33	+3.3	B2	GND	B33	CBE2#
A3	GND	A34	FRAME#	B3	GND	B34	GND
A4	GND	A35	GND	B4	NC	B35	IRDY#
A5	+5V	A36	TRDY#	B5	+5V	B36	+3.3V
A6	INTA#	A37	GND	B6	+5V	B37	DEVSEL#
A7	INTC#	A38	STOP#	B7	INTB#	B38	GND
A8	+5V	A39	+3.3V	B8	INTD#	B39	LOCK#
A9	GNT1#	A40	SMBUS CLOCK	B9	NC	B40	PERR#
A10	+5V	A41	SMBUS DATA	B10	REQ1#	B41	+3.3V
A11	NC	A42	GND	B11	NC	B42	SERR#
A12	GND	A43	PAR	B12	GND	B43	+3.3V
A13	GND	A44	AD15	B13	GND	B44	CBE1#
A14	+3.3VAUX	A45	+3.3V	B14	CLOCK1	B45	AD14
A15	RESET#	A46	AD13	B15	GND	B46	GND
A16	+5V	A47	AD11	B16	CLOCK0	B47	AD12
A17	GNT0#	A48	GND	B17	GND	B48	AD10
A18	GND	A49	AD9	B18	REQ0#	B49	GND
A19	PCI_PME#	A50	Keyway	B19	+5V	B50	Keyway
A20	AD30	A51	Keyway	B20	AD31	B51	Keyway
A21	+3.3V	A52	CBE0#	B21	AD29	B52	AD8
A22	AD28	A53	+3.3V	B22	GND	B53	AD7
A23	AD26	A54	AD6	B23	AD27	B54	+3.3V
A24	GND	A55	AD4	B24	AD25	B55	AD5
A25	AD24	A56	GND	B25	+3.3V	B56	AD3
A26	AD20	A57	AD2	B26	CBE3#	B57	GND
A27	+3.3V	A58	AD0	B27	AD23	B58	AD1
A28	AD22	A59	+5V	B28	GND	B59	+5V
A29	AD20	A60	REQ64#	B29	AD21	B60	ACK64#
A30	GND17	A61	+5V	B30	AD19	B61	+5V
A31	AD18	A62	+5V	B31	+3.3V	B62	+5V



Chapter 3: System Setup

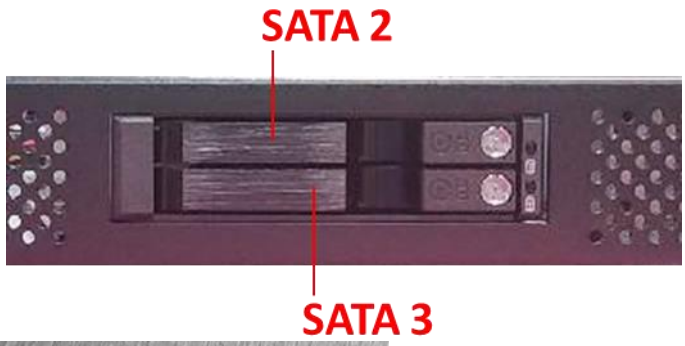
This chapter provides more detailed information and let you know how to install components into the ROC235A embedded System.

Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

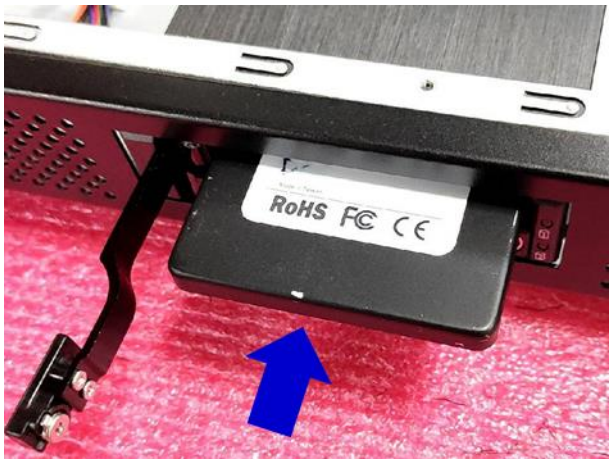
3.1 2.5" SATA SSD installation

ROC235A supports 2 x 2.5" SATA HDD/SSD

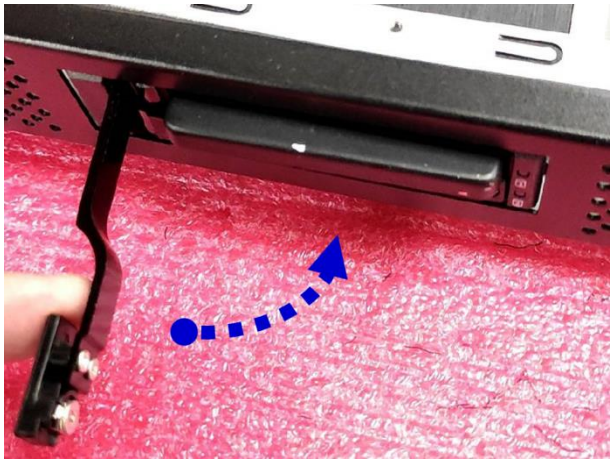
5. Install/remove the SSD into/from the front SSD swappable tray.



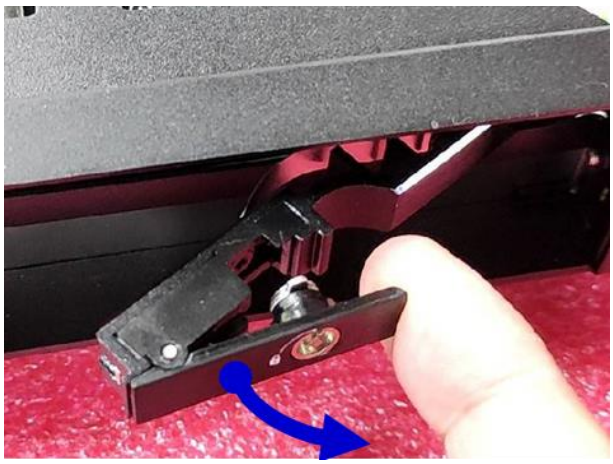
6.  Open the Tray._____

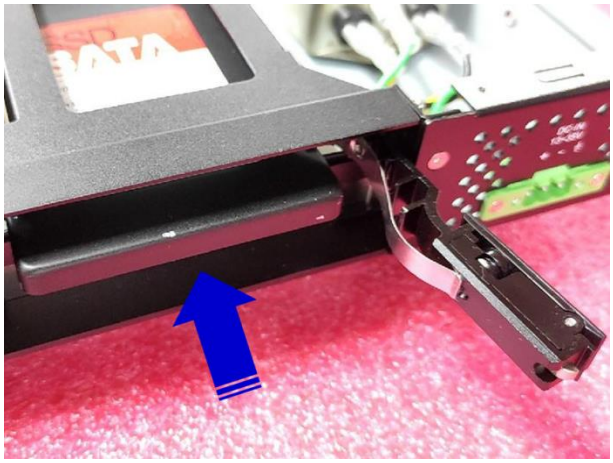
7. 

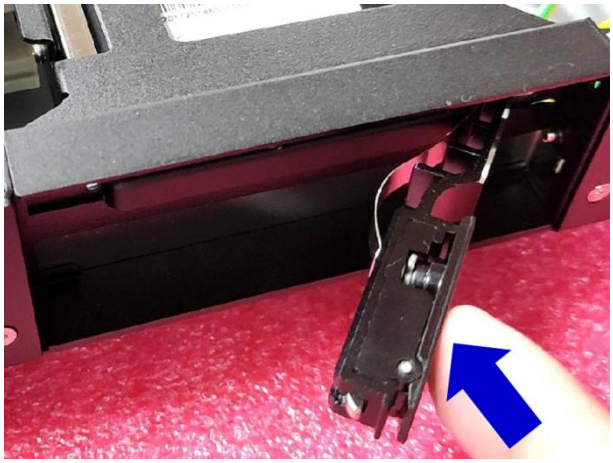
Plug in to the 2.5" SSD

8.  Push in the SSD with tray

9. Install/Remove the SSD into/from the rear Swappable tray.

10.  Open the Tray.

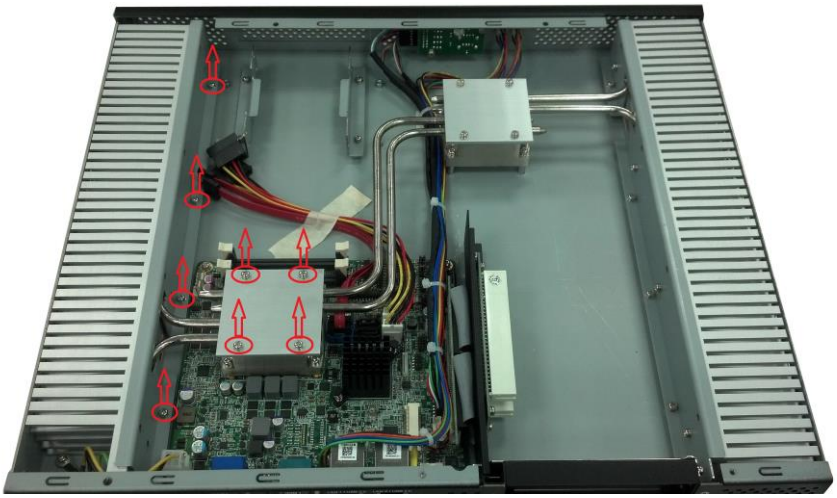
11.  Plug in to the 2.5” SSD

12.  Push in the SSD with tray

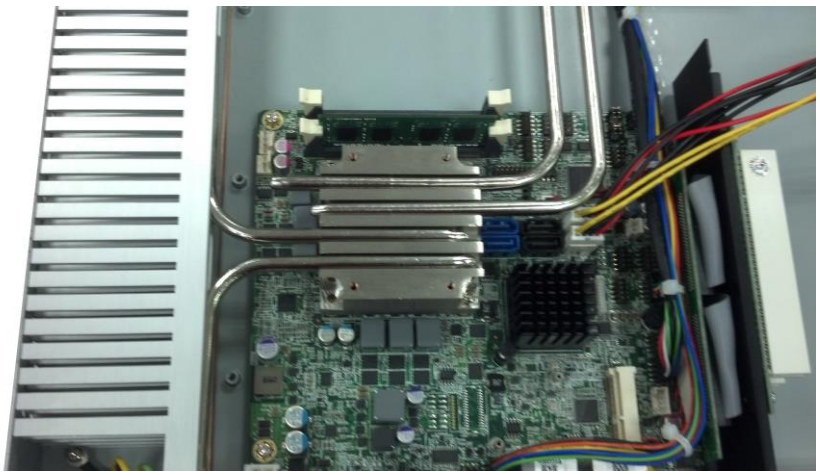
3.2 CPU installation

ROC235A supports Intel® 22nm Ivy Bridge Processor (Mobile) socket (rPGA988)
Core™ i7-3610QE (4C x 3.3 GHZ), 6M L2 cache (45W)
Core™ i5-3610ME (2C x 2.7 GHZ), 3M L2 cache (35W)
Core™ i3-3120ME (2C x 2.4 GHZ), 3M L2 cache (35W)

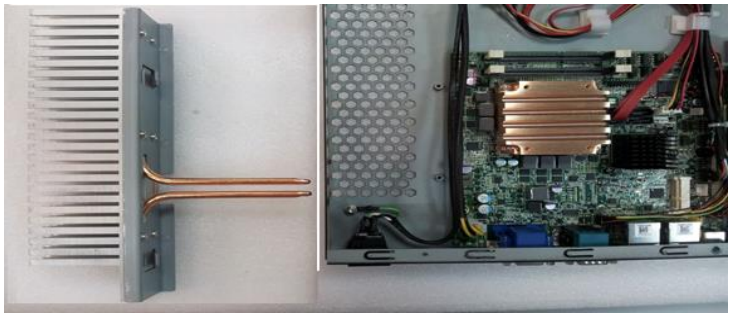
7. Remove 4 screws from CPU heat sink's cover, and 4 screws of left bracket from system heat sink.



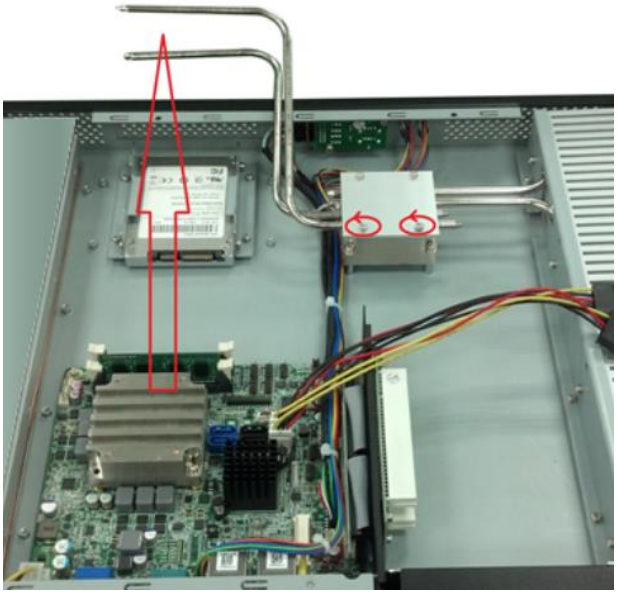
8. Take off the CPU heat sink's cover.



9. Pull out the heatsink on the left side.



10. Unscrew two of screws on system heat sink, and pull the heat pipe up from CPU heat sink. Drive 4 screws off to remove CPU heat sink.
    PS: ROC235A-ESK had removed the right heat sink and replaced by a new power Module for 13~35V DC-IN. (Refer the right picture)



ROC235A-ET/UT

ROC235A-ESK

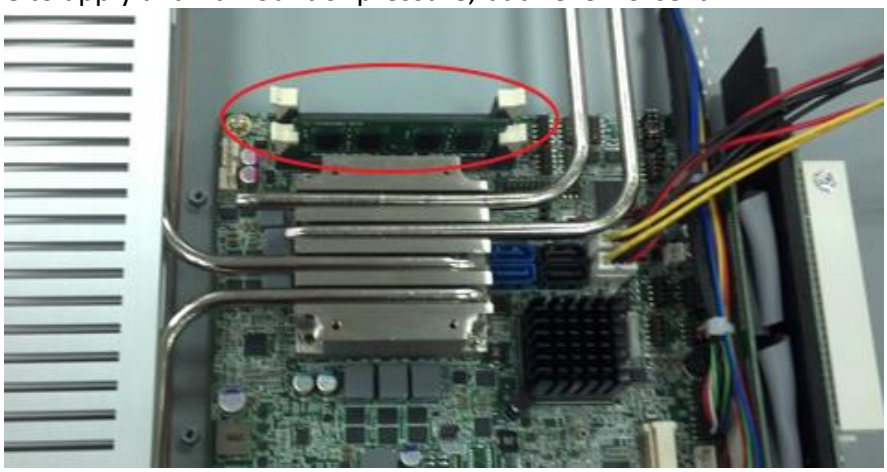
11. After pick up CPU heat sink you can set CPU on CPU socket.

12. Put the thermal pad (P/N: 0R0100250160000L) on the CPU, screw the system heatsink back, put the heat sink with heatpipe back on the left side, screw the heatsink's cover back, then fasten 4 screws of left bracket from system heat sink.

3.3 Memory module installation

ROC235A supports 2 x 204-pin SO-DIMM DDR3 1333/1600 MHz up to 16GB

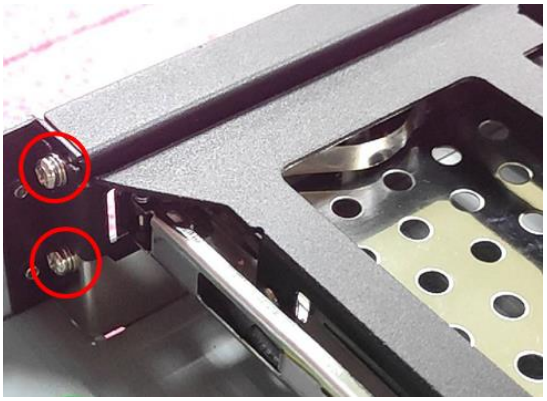
3. Remove the top case and locate 2 memory slots on the motherboard.
4. Insert the RAM into the RAM slot. Align the notch on the module with the notch in the slot, and then apply equal pressure onto the stick until the clamps on the side click and lock the RAM in. You may have to apply a fair amount of pressure, but never force it in.



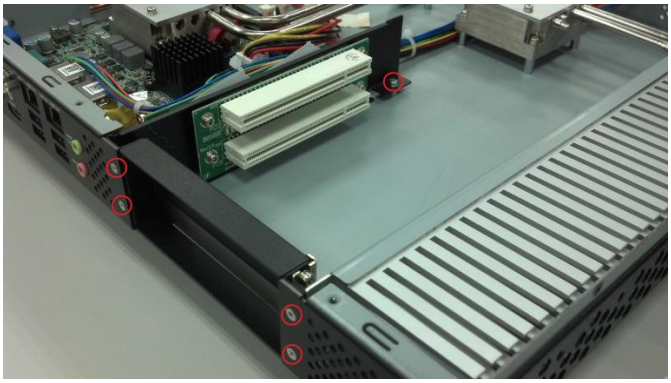
3.4 PCI riser card installation

ROC235A supports 2 x PCI expansion slots.

Before PCI card installation, you have to remove the Swappable tray. Remove the two screws then release the tray.



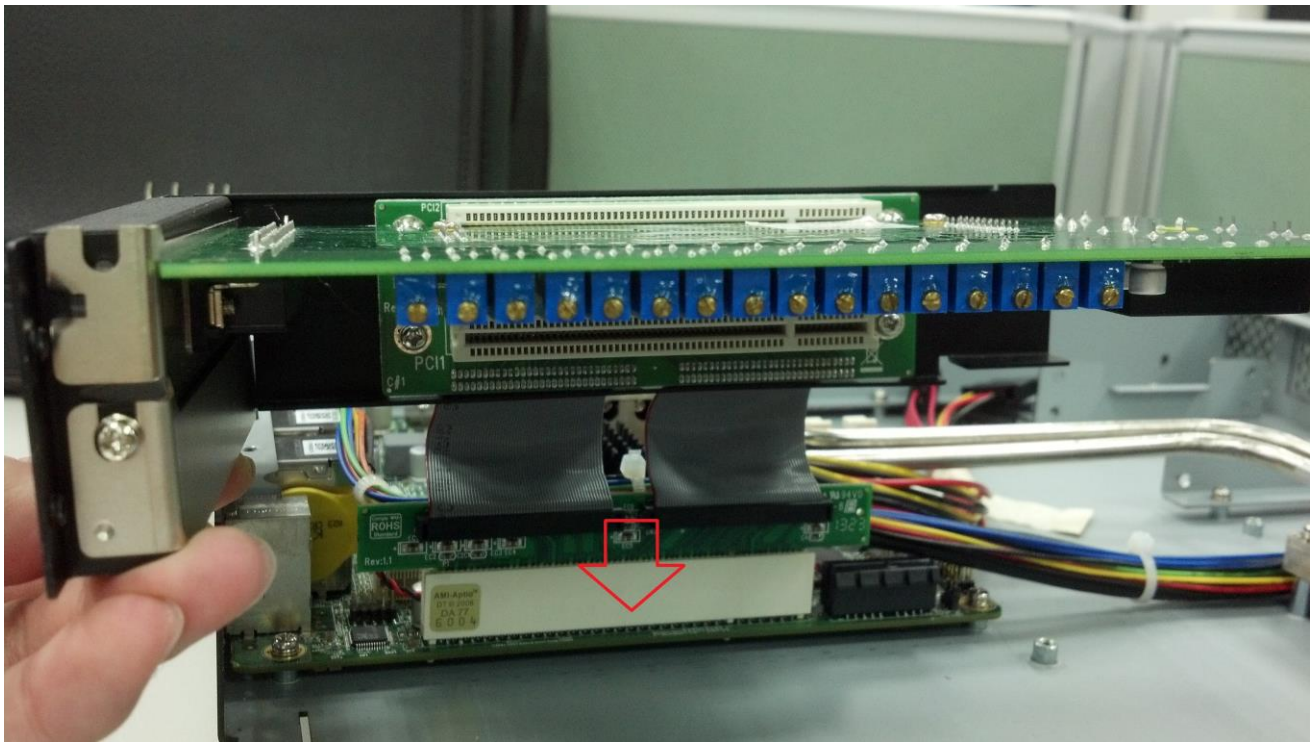
6. Drive each 5 screws off as the marks for remove riser card.



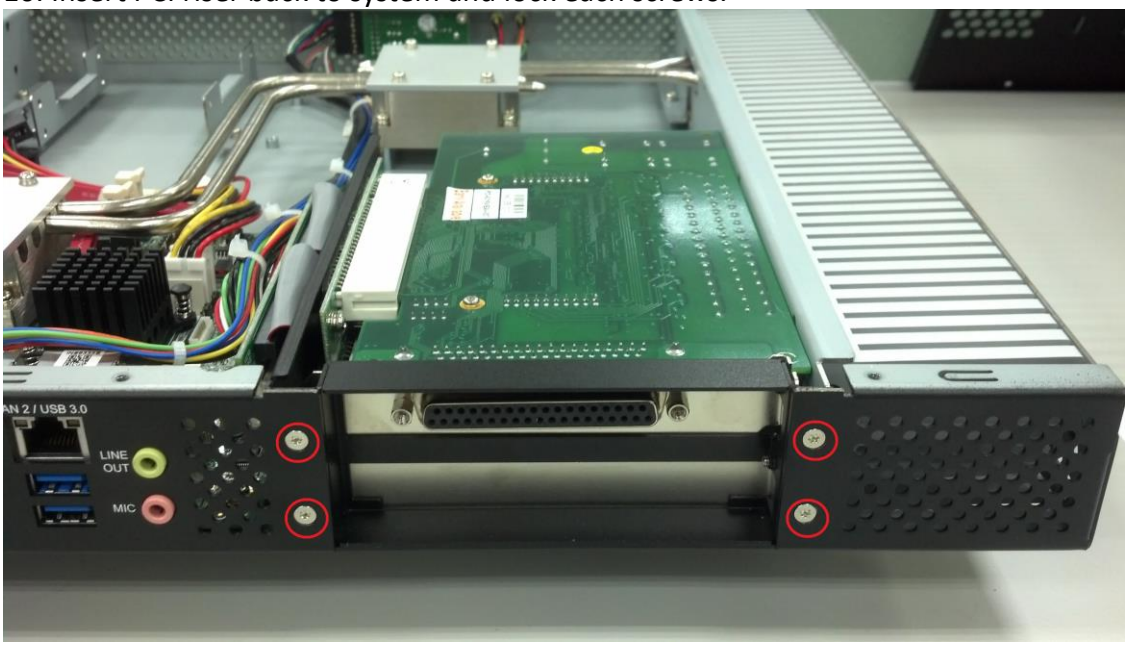
7. Remove the screws to set PCI add-on card on PCI riser card.

8. Insert PCI add-on card into PCI slot from riser card.

9. Insert add-on card screw to firmed the add-on card, and insert the PCI riser's bridge board to motherboard PCI slot.



10. Insert PCI riser back to system and lock each screws.



3.5 Rack mount bracket installation

For install rack mount bracket, insert each screws (P/N: 0F0130600600000L and 0F0132700800000L)
as red spot screw holes to firmed the bracket.

Chapter 4: AMI BIOS UTILITY

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMI BIOS setup utility.

4.1 Starting

To enter the setup screens, perform the following steps:

- Turn on the computer and press the <Del> key immediately.
- After the <Del> key is pressed, the main BIOS setup menu displays. Other setup screens can be accessed from the main BIOS setup menu, such as the Chipset and Power menus.

4.2 Navigation Keys

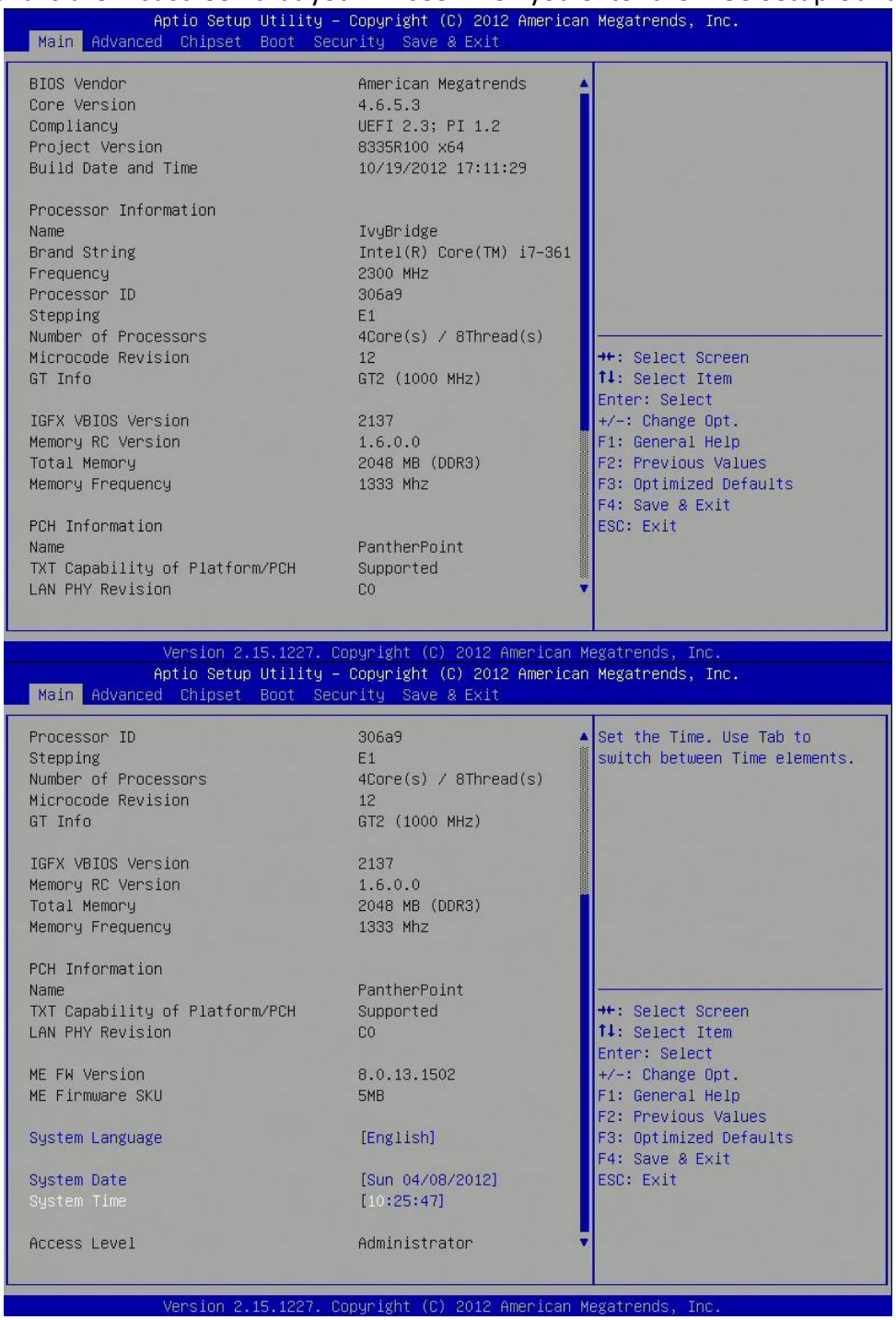
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.
Some of the hot keys are <F1>, <F10>, <Enter>, <ESC>, and <Arrow> keys.

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

Left/Right	The Left and Right <Arrow> keys moves the cursor to select a menu.
Up/Down	The Up and Down <Arrow> keys moves the cursor to select a setup screen or sub-screen.
+− Plus/Minus	The Plus and Minus <Arrow> keys changes the field value of a particular setup setting.
Tab	The <Tab> key selects the setup fields.
F1	The <F1> key displays the General Help screen.
F10	The <F10> key saves any changes made and exits the BIOS setup utility.
Esc	The <Esc> key discards any changes made and exits the BIOS setup utility.
Enter	The <Enter> key displays a sub-screen or changes a selected or highlighted option in each menu.

4.3 Main Menu

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.



System Language

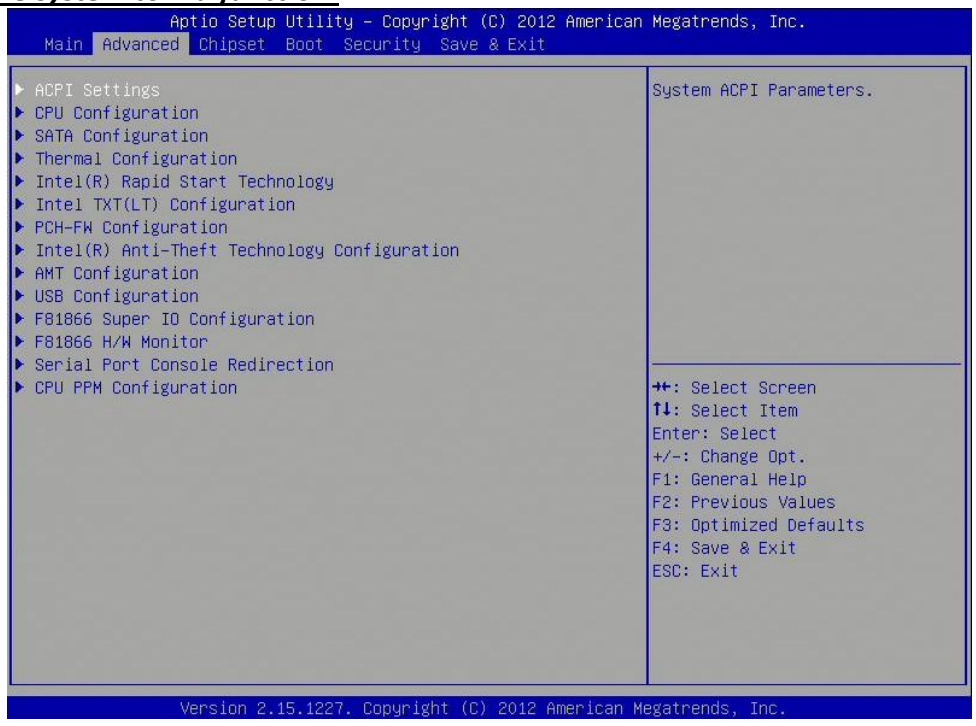
Use this function to select the system language.

System Date
Use this function to change the system date.
Select System Date using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.
The date setting must be entered in MM/DD/YY format.

System Time
Use this function to change the system time.
Select System Time using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.
The time setting is entered in HH:MM:SS format.
Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

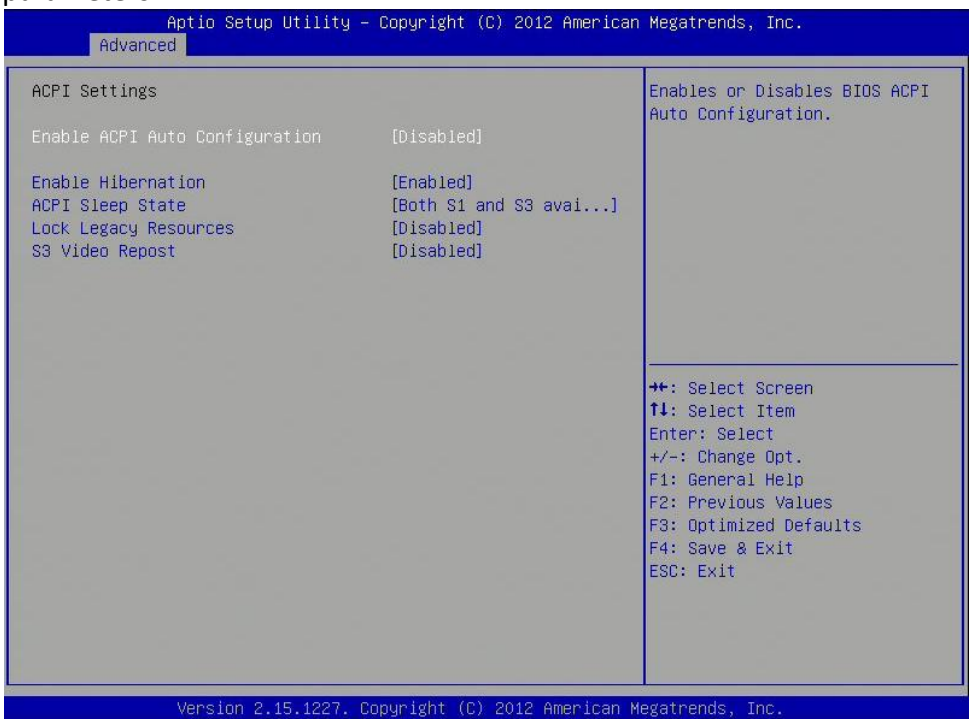
Access Level
Displays the access level of the current user in the BIOS.

4.4 Advanced Menu
The Advanced Menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference. ***Setting incorrect field values may cause the system to malfunction.***



4.4.1 ACPI Settings

System ACPI parameters



Enable ACPI Auto Configuration

Enables or disables BIOS ACPI auto configuration.

Enable Hibernation

Enables or disables system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

ACPI Sleep State

Select the ACPI sleep state the system will enter when the suspend button is pressed.

Lock Legacy Resources

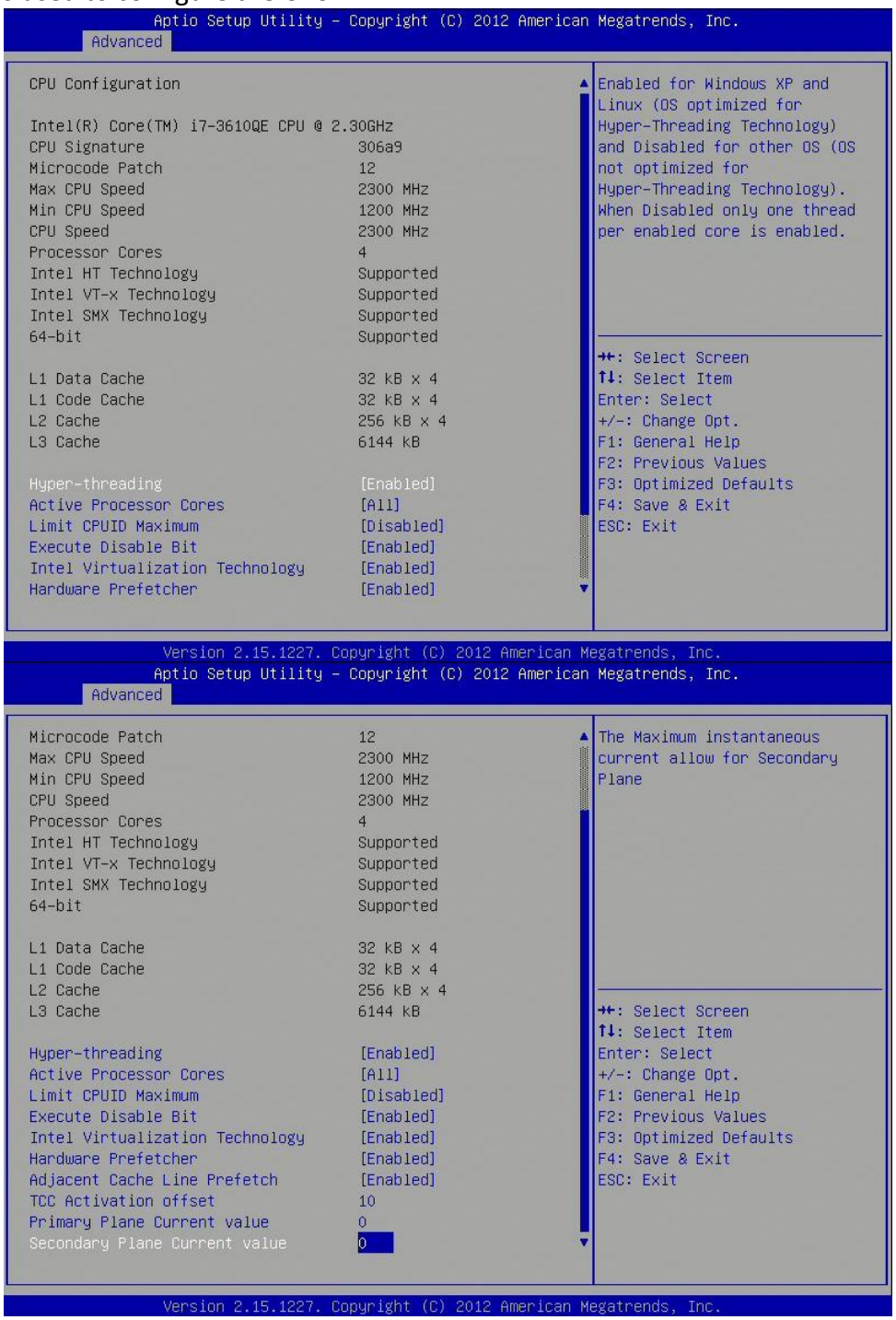
Enables or Disables System Lock of Legacy Resources.

S3 Video Repost

Enable or disable S3 Video Repost.

4.4.2 CPU Configuration

This section is used to configure the CPU.



Hyper-threading
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When disabled only one thread per enabled core is enabled.

Active Processor Cores
Number of cores to enable in each processor package.

Limit CPUID Maximum
Disabled for Windows XP.

Execute Disable Bit
XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Sever 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.)

Intel Virtualization Technology
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hardware Prefetcher
To turn on/off the Mid Level Cache (L2) streamer prefectcher

Adjacent Cache Line Prefetche
To turn on/off prefectching of adjacent cache lines

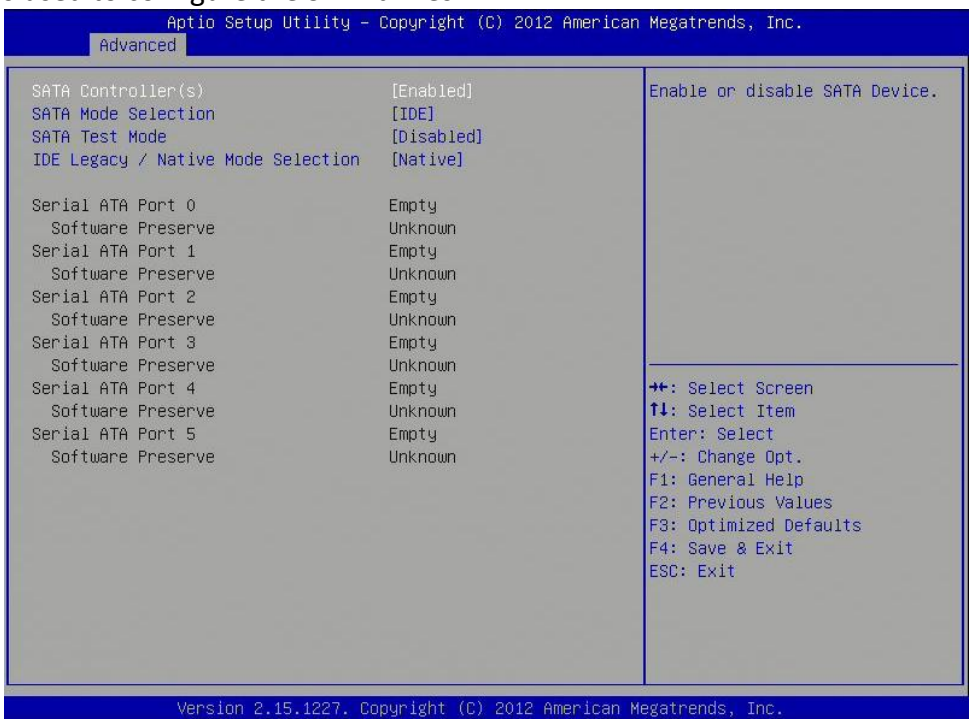
TCC Activation Offset
Offset from the factory TCC activation temperature

Primary Plane Current Value
The Maximum instantaneous current allow for primary plane

Secondary Plane Current Value
The Maximum instantaneous current allow for secondary plane

4.4.3 SATA Configuration

This section is used to configure the SATA drives.



SATA Controller(s)

Enable or disable SATA device.

SATA Mode Selection

Determines how SATA controller(s) operate.

SATA Test Selection

Enable or disable Test Mode

IDE Legacy/Native Mode Selection

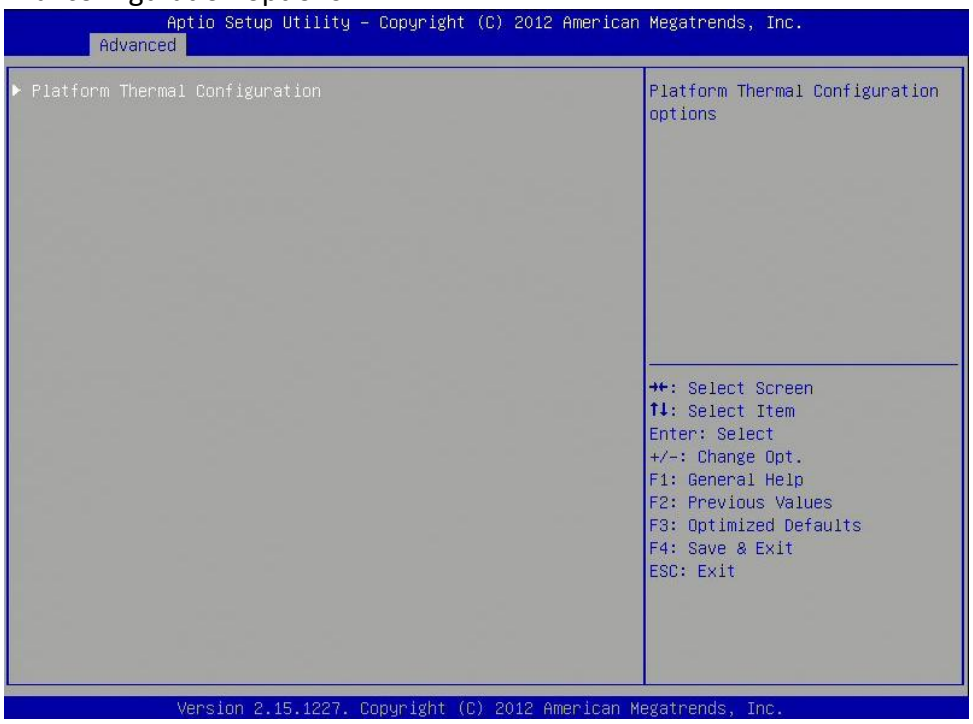
IDE Legacy/Native Mode Selection

Serial ATA Port 0 – 5

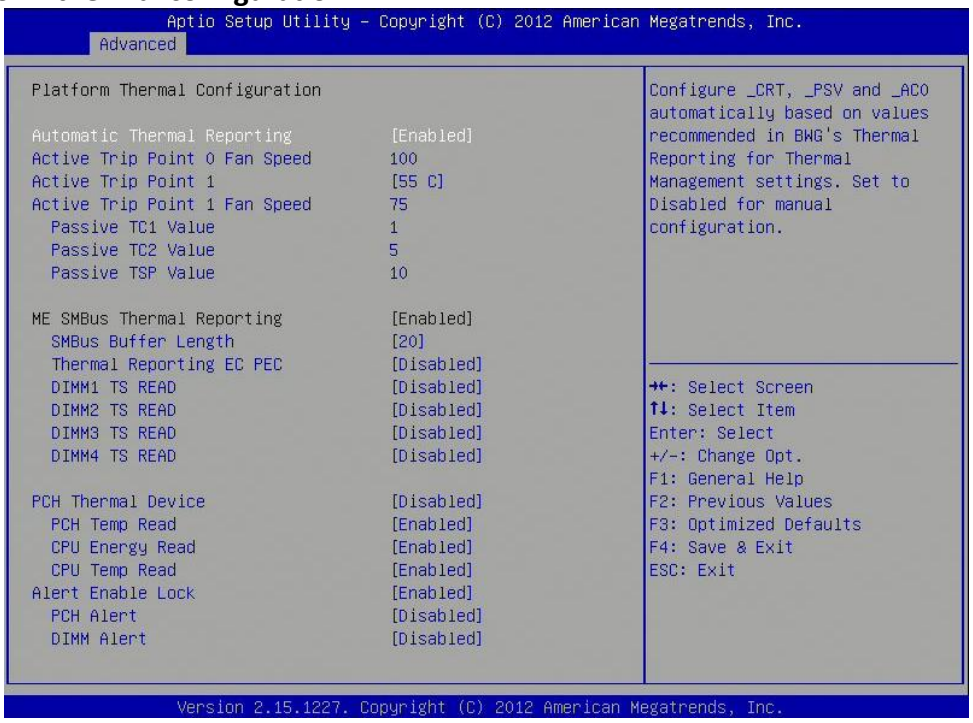
Displays information on the SATA devices detected

4.4.4 Thermal Configuration

Platform thermal configuration options



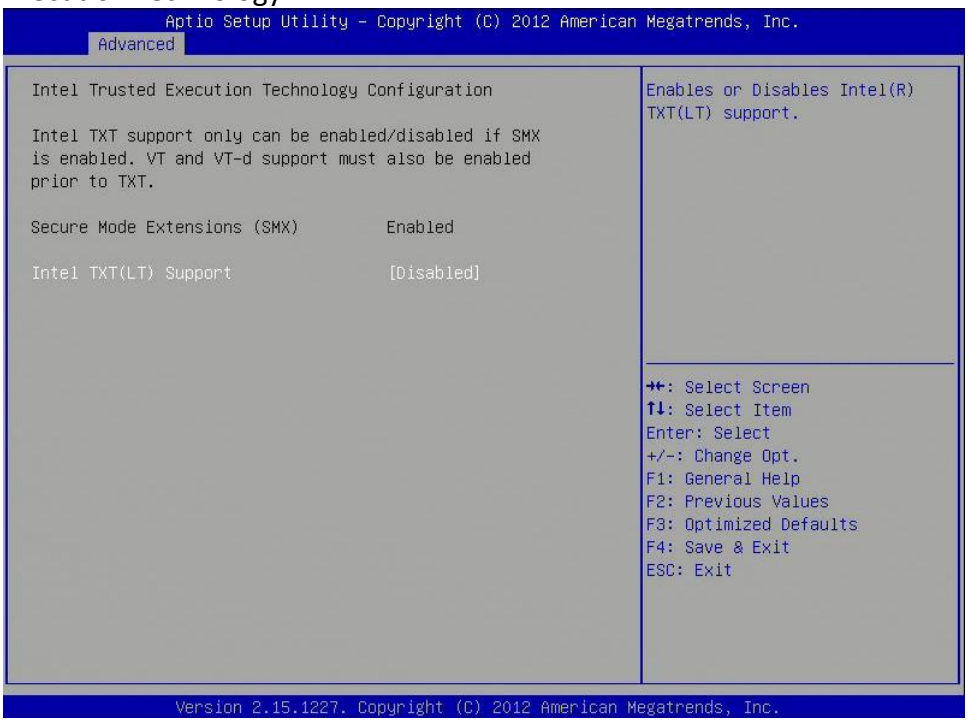
4.4.4.1 Platform thermal configuration



4.4.5 Intel Rapid Start Technology

4.4.6 Intel TXT(LT) Configuration

Intel Trusted Execution Technology

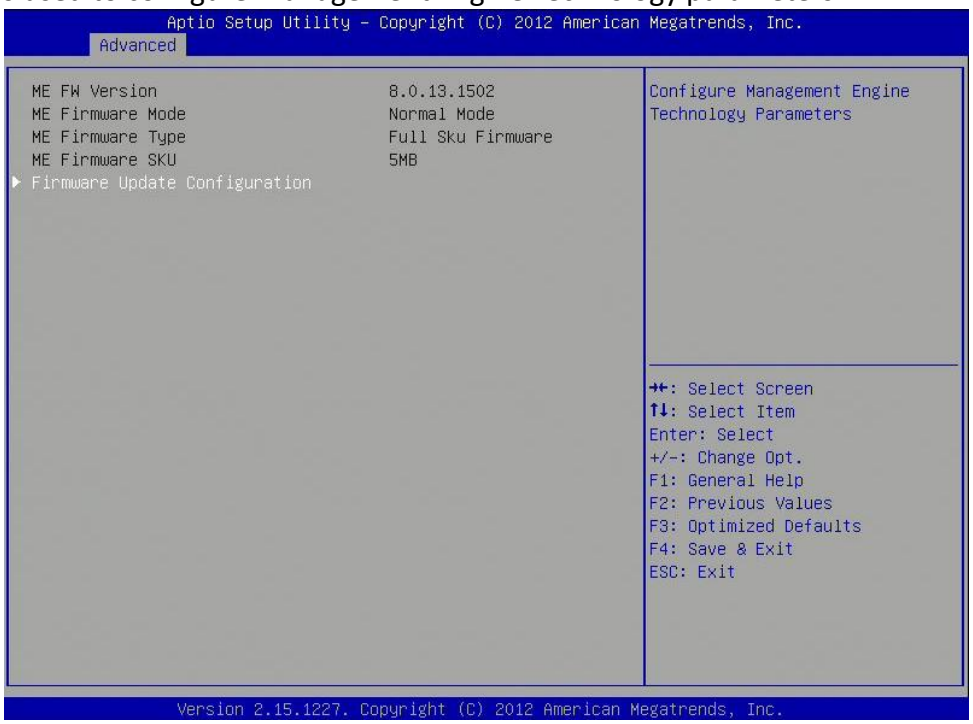


Intel TXT(LT) Support

Enables or disables Intel TXT(LT) support

4.4.7 PCH-FW Configuration

This section is used to configure Management Engine Technology parameters.



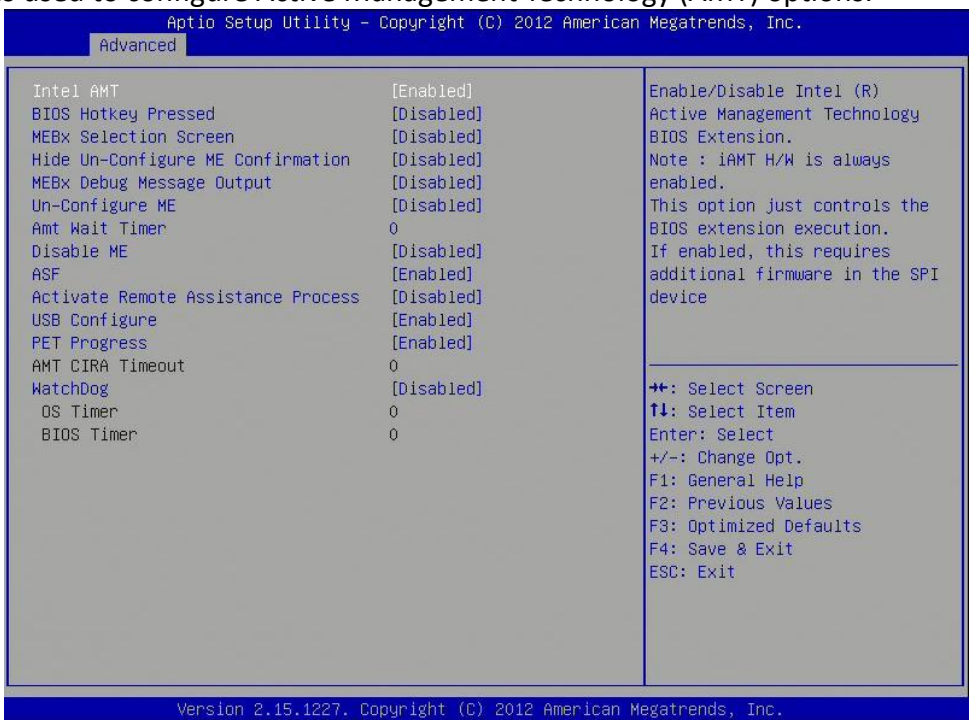
4.4.8 Intel Anti-Theft Technology Configuration

Disabling Intel AT allow user to login platform. This is strictly for testing only. This does not disable Intel AT services in ME

Intel Anti-Theft Technology
Enable or Disable Intel AT in BIOS for testing only

Intel Anti-Theft Technology Rec
Set the number of times Recovery attemped will be allowed.

4.4.9 AMT Configuration
This section is used to configure Active Management Technology (AMT) options.



Intel AMT
Enable/disables Intel Active Management Technology BIOS extension.
Note: iAMT H/W is always enabled.
This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.

BIOS Hotkey Pressed
Enable/disable BIOS hotkey press.

MEBx Selection Screen
Enable/disable MEBx Selection Screen

Hide Un-Configure ME Confirmation
Hide Un-Configure ME without password confirmation prompt

MEBx Debug Message Screen
Enable MEBx debug message output

Un-Configure ME
Perform AMT/ME unconfigure without password operation.

Amt Wait Timer
Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

Disable ME
Set ME to Soft Temporary Disabled

ASF
Enable/Disable Alert specification Format

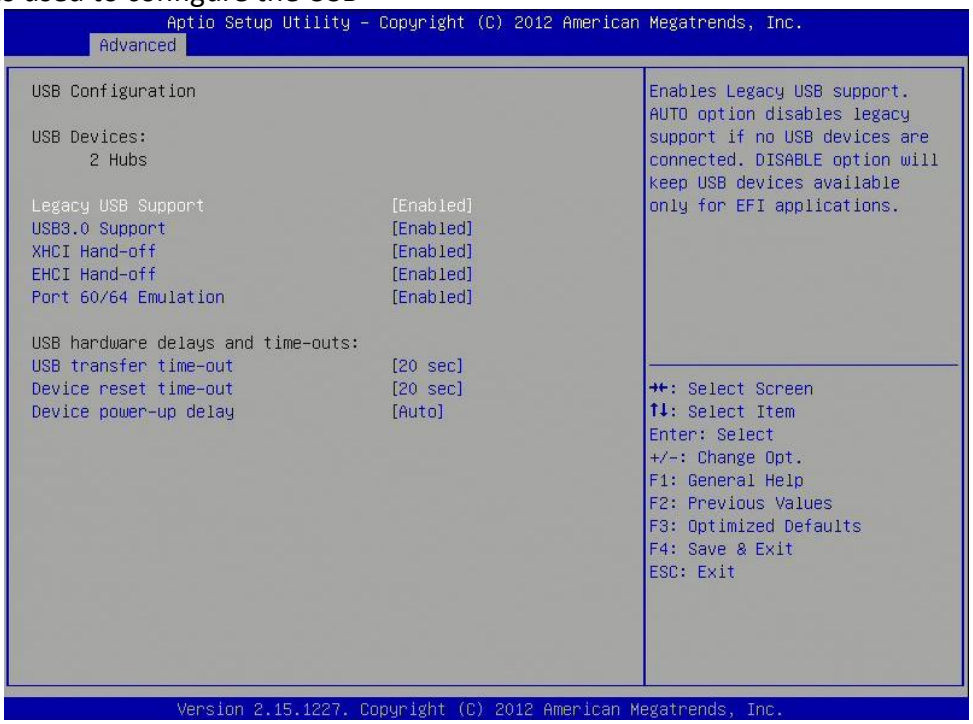
Activate Remote Assistance Process
Trigger CIRA boot.

USB Confirgure
Enable/Disable USB configure function.

PET Progress
User can Enable/Disable PET Events progress to receive PET events or not.

Watchdog Timer
Enable/Disable Watchdog Timer.

4.4.10 USB Configuration
This section is used to configure the USB



Legacy USB Support
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.

USB3.0 Support
Enable/Disable USB3.0 (XHCI) Controller support.

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

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

Port 64/60 Emulation
Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

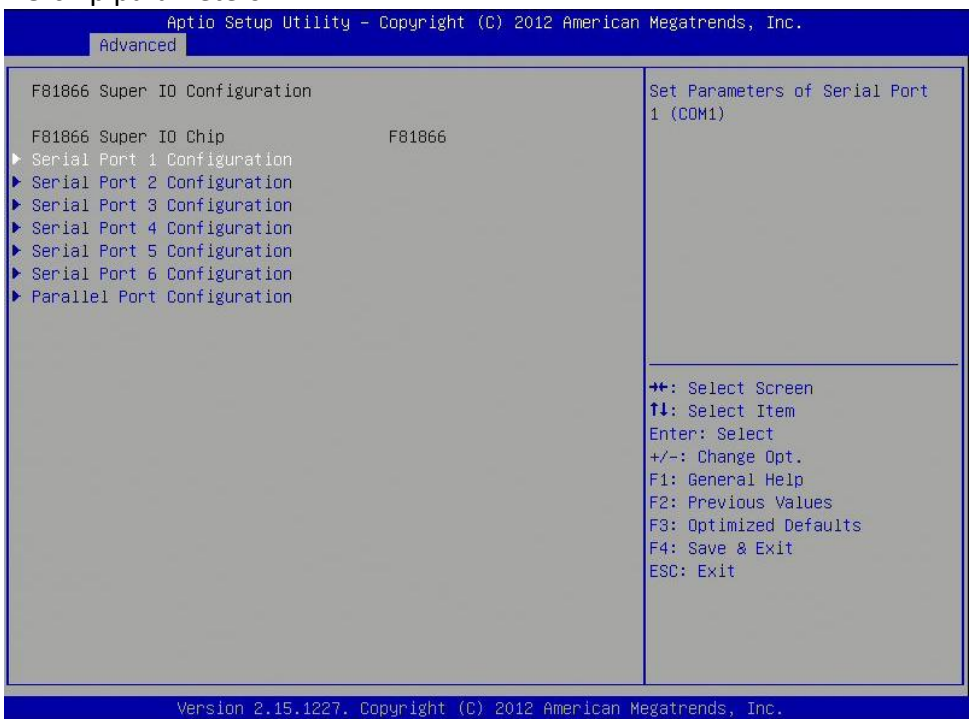
USB Transfer time-out
The time-out value for Control, Bulk, and Interrupt transfers.

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’ uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

4.4.11 F81866 Super IO Configuration

System super IO chip parameters



Serial Port Configuration

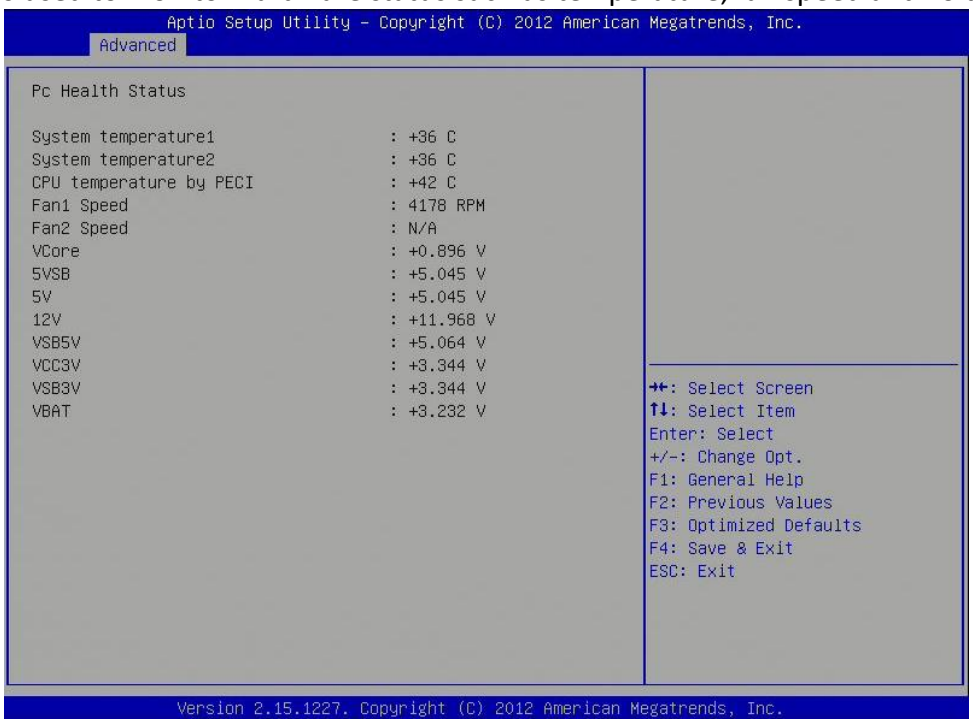
Set Parameters of Serial Ports. User can Enable/Disable the serial port and Select an optimal settings for the Super IO Device.

Parallel Port configuration

Set parameters of parallel port (LPT/LPTE)

4.4.12 F81866 H/W Monitor

This section is used to monitor hardware status such as temperature, fan speed and voltages.



System Temperature

Detects and displays the current system temperature.

CPU Temperature

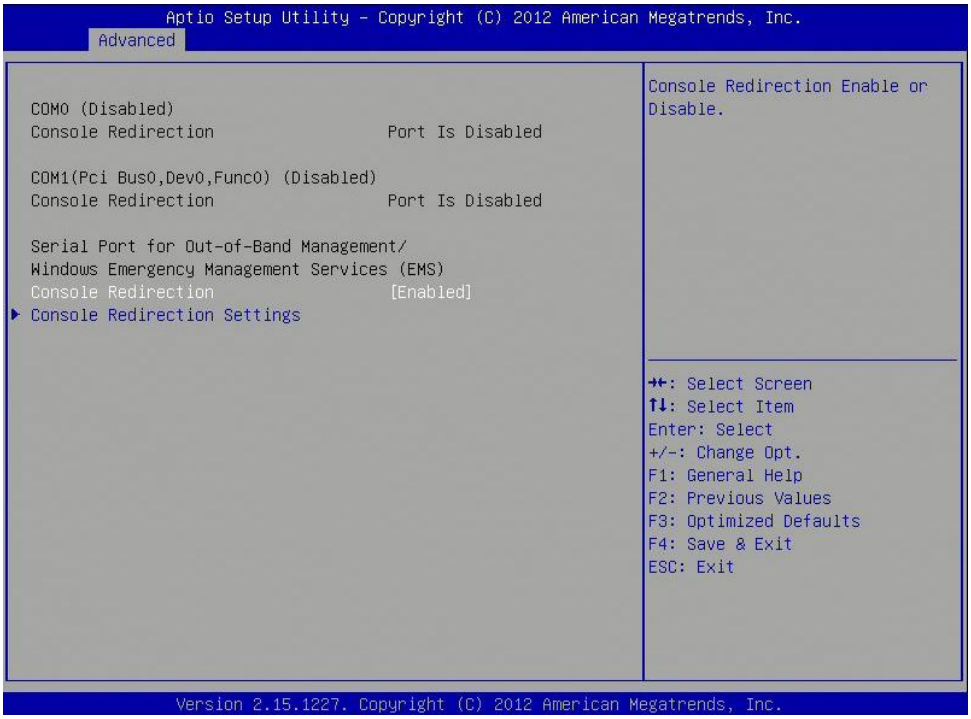
Detects and displays the current CPU temperature.

Fan1/2 Speed

Detects and displays the current CPU fan speed.

4.4.13 Serial Port Console Redirection

This screen provides information about functions for specifying the Serial Port Console Redirection configuration settings. Console redirection can be used to remotely operate system settings and the EFI console.



Console Redirection

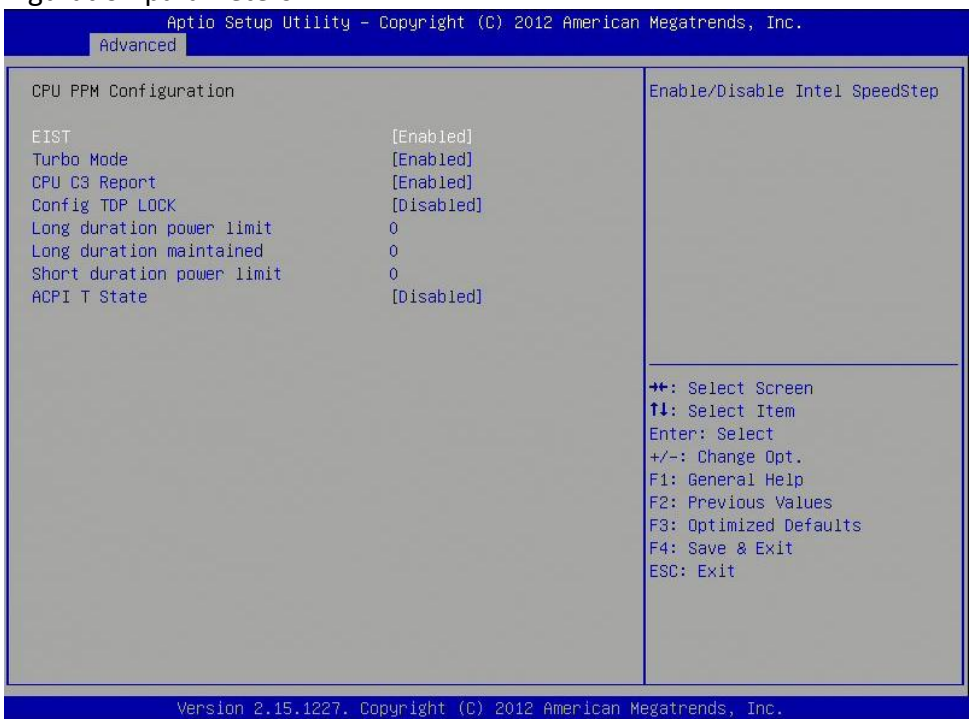
Console Redirection Enable or Disable.

Console Redirection Settings

The setting specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

4.4.14 CPU PPM Configuration

CPU PPM configuration parameters



EIST

Enables or disables Intel SpeedStep.

CPU C3 Report

Enable or disable CPU C3 (ACPI C2) report to OS.

Config TDP LOCK

Lock the Config TDP control register

Long duration power limit

Long duration power limit in Watts, 0 means use factory default.

Long duration maintained

Time window which the long duration power is maintained.

Short duration power limit

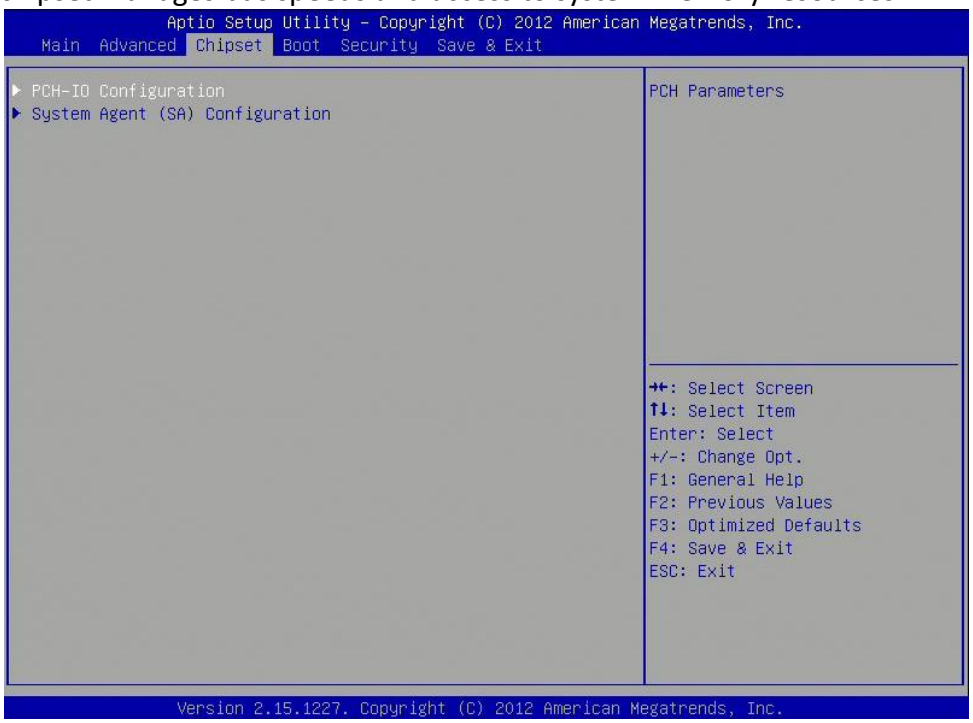
Short duration power limit in Watts, 0 means use factory default.

ACPI T State

Enable or disable ACPI state support.

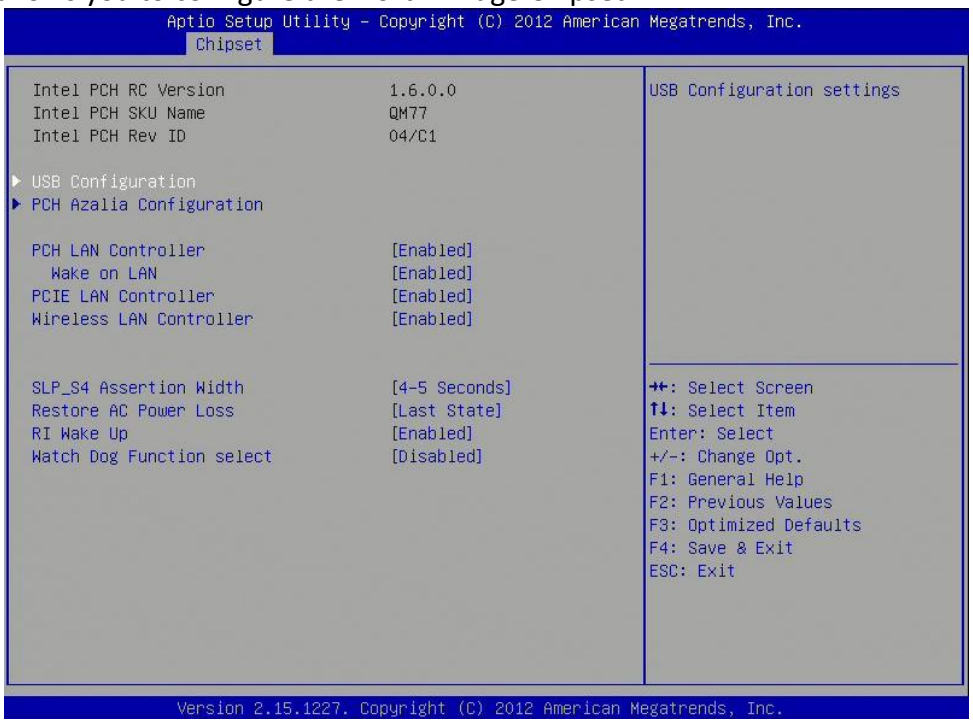
4.5 Chipset

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.



4.5.1 PCH-IO Configuration

This section allows you to configure the North Bridge Chipset.



USB Configuration

USB configuration settings

PCH Azalia Configuration
PCH Azalia configuration settings

PCH LAN Controller
Enable or disable onboard NIC.

Wake on LAN
Enable or disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)

PCIE LAN Controller
Enable or disable onboard PCIE LAN

Wireless LAN Controller
Enable or disable onboard MPCIE LAN-Wireless LAN.

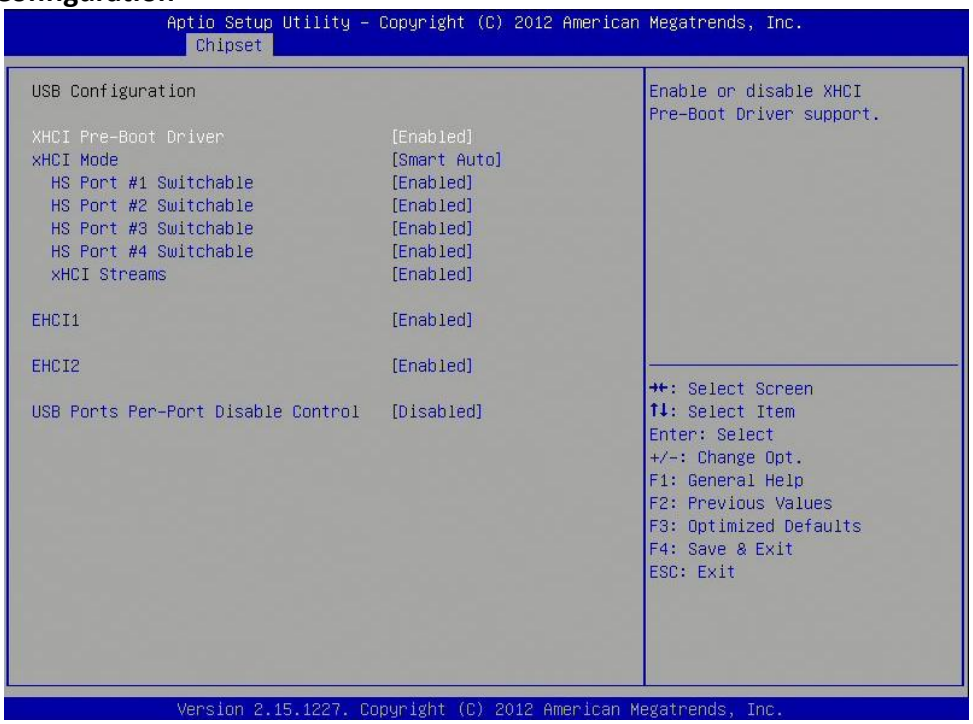
SLP_S4 Assertion Width
Select a minimum assertion width of the SLP_S4# signal.

Restore AC Power Loss
Select AC power state when power is re-applied after a power failure.

RI Wake Up
RI wake up function select.

Watch Dog Function select
Watch Dog function enabled or disabled.

4.5.1.1 USB Configuration



XHCI Pre-Boot Driver
Enable or disable XHCI Pre-Boot driver support.
XHCI Mode
Mode of operation of XHCI controller

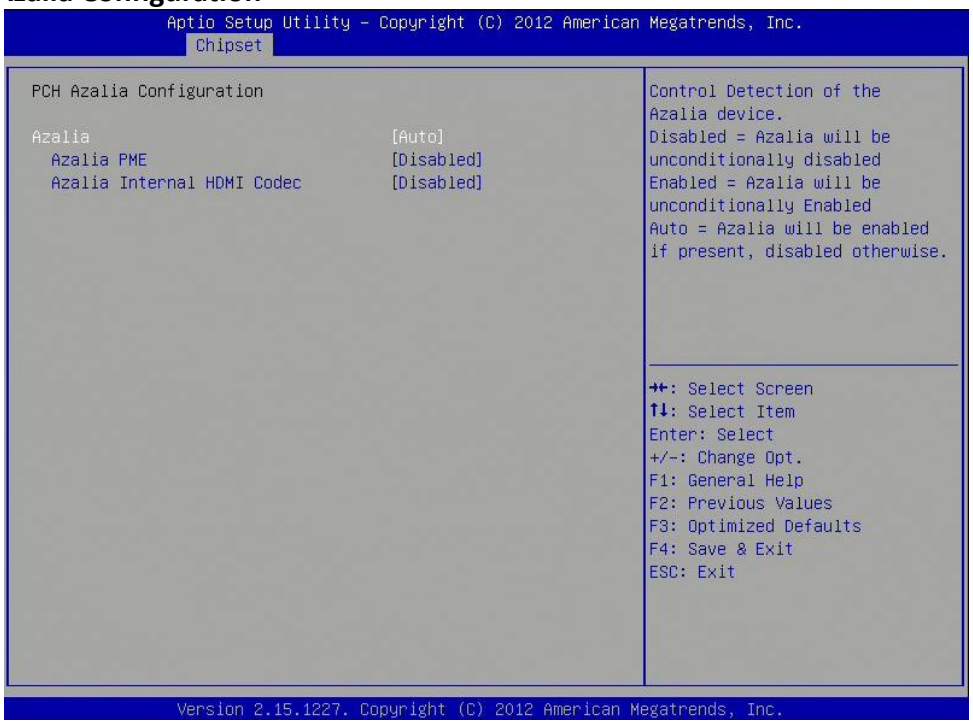
HS Port #1/2/3/4 Switchable
Allows for HS port switching between xHCI and EHCI. If disabled, port is routed to EHCI. If HS port is routed to xHCI, the corresponding SS port is enabled.

xHCI Streams
Enable or disable xHCI Maximum Primary Stream Array Size.

EHCI1/2
Control the USAB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.

USB Ports Per-Port Disable Control
Control each of the USB ports (0~13) disabling.

4.5.1.2 PCH Azalia Configuration



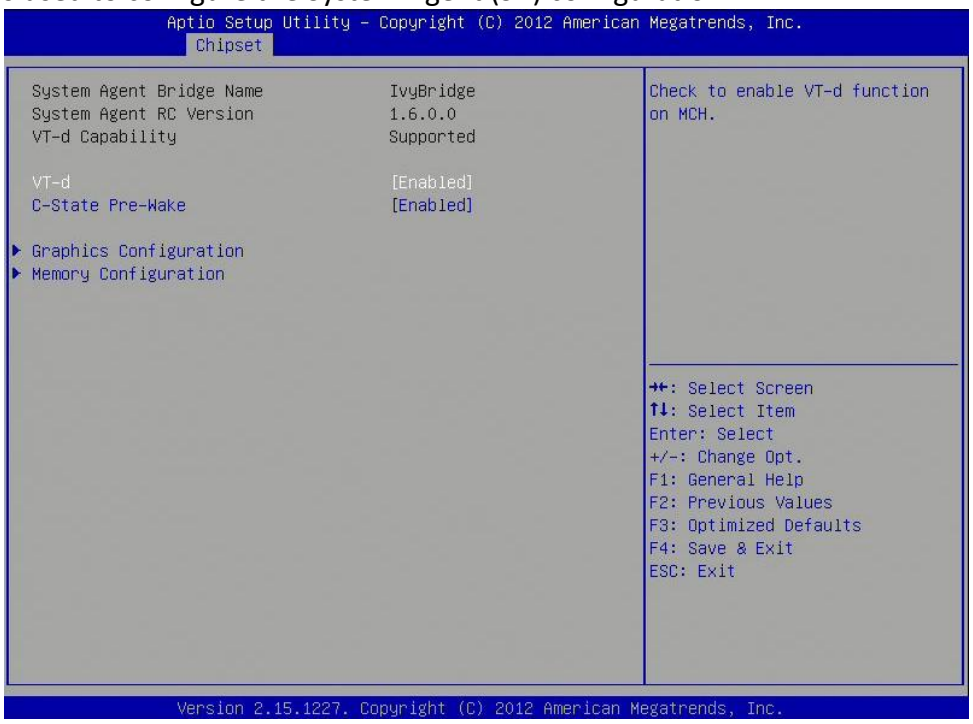
Azalia
Control Detection of the Azalia device.
Disabled=Azalia will unconditionally disabled.
Enabled=Azalia will be unconditionally enabled.
Auto=Azalia will enabled if present, disabled otherwise.

Azalia PME
Enable or disable Power Management capability of audio controller.

Azalia Internal HDMI codec
Enable or disable internal HDMI codec for Azalia.

4.5.2 System Agent (SA) Configuration

This section is used to configure the System Agent (SA) configuration.



VT-d

Check to enable VT-d function on MCH.
Enable NB CRID
Enable or disable NB CRID WorkAround.

C-State Pre-Wake

Controls C-State Pre-Wake feature for ARAT, in SSKPD[57].

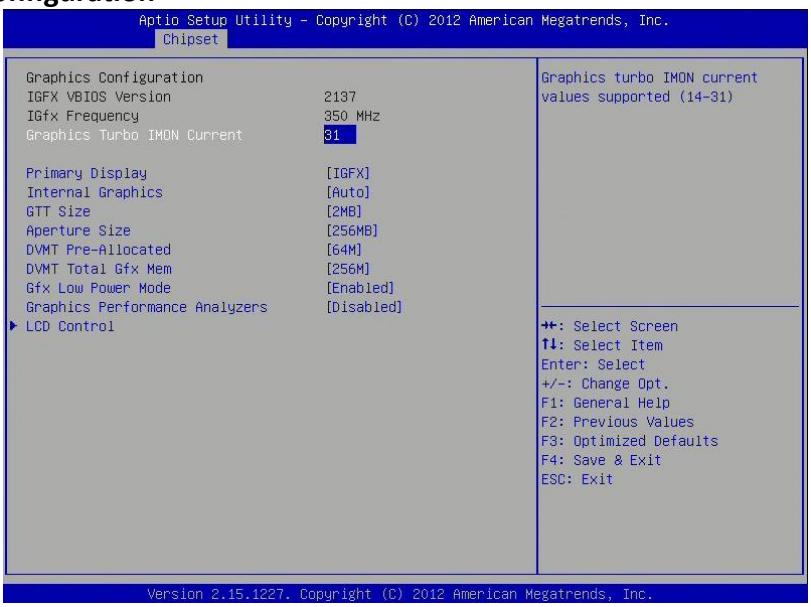
Graphics Configuration

Configure graphics settings

Memory Configuration

Memory configuration parameters

4.5.2.1 Graphics Configuration



Primary Display
Select which of IGFX/PEG/PCI graphics device should be primary display or select SG for switchable Gfx.

Internal Graphics
Keep IGD enabled based on the setup options.

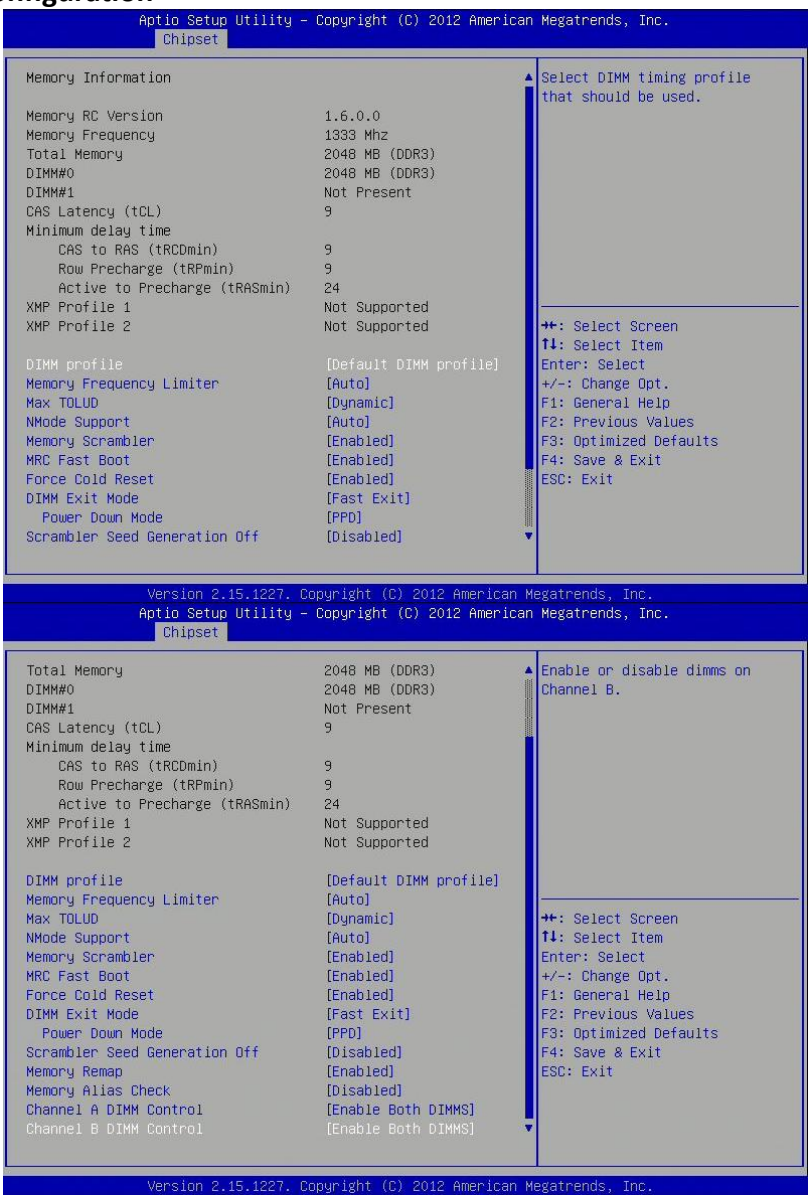
DVMT Pre-Allocated
Select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device.

DVMT Total Gfx Mem
Select DVMT 5.0 total graphics memory size used by the internal graphics device.

Gfx Low Power Mode
This option is applicable for SFF only.

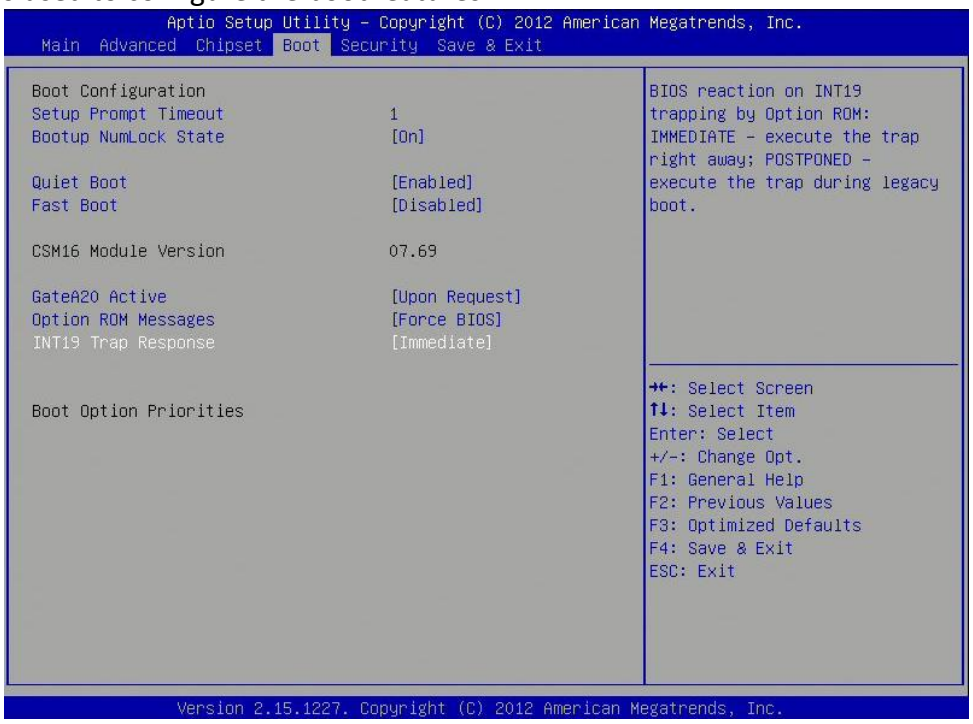
Graphics Performance Analyzers
Enable or disable Intel graphics performance analyzers counters.

4.5.2.2 Memory Configuration



4.6 Boot Setting

This section is used to configure the boot features.



Setup Prompt Timeout

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

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or Disables Quiet Boot option.

Fast Boot

Enables or Disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

GateA20 Active

UPON REQUEST – GA20 can be disabled using BIOS services.
ALWAYS – do not allow disabling GA20; this option is useful when any
RT code is executed above 1MB.

Option ROM Messages

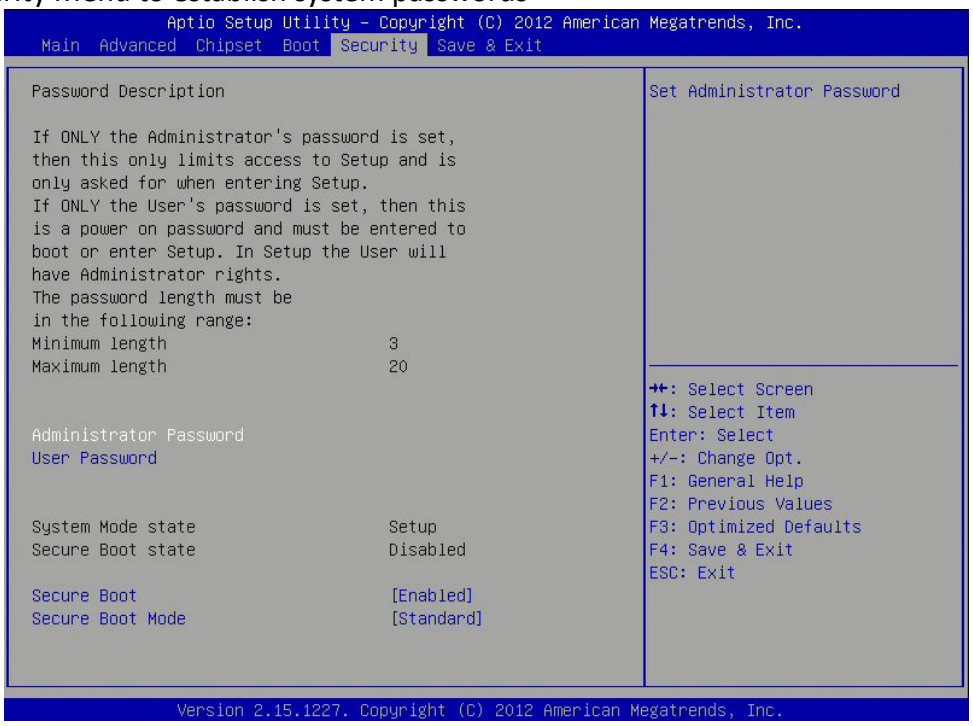
Set display mode for Option ROM.

INT19 Trap Response

BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE – execute the trap right away; POSTPONED – execute the trap during legacy boot.

Boot Option Priorities
Sets the system boot order.

4.7 Security
Use the Security Menu to establish system passwords



Administrator Password
Set administrator password.

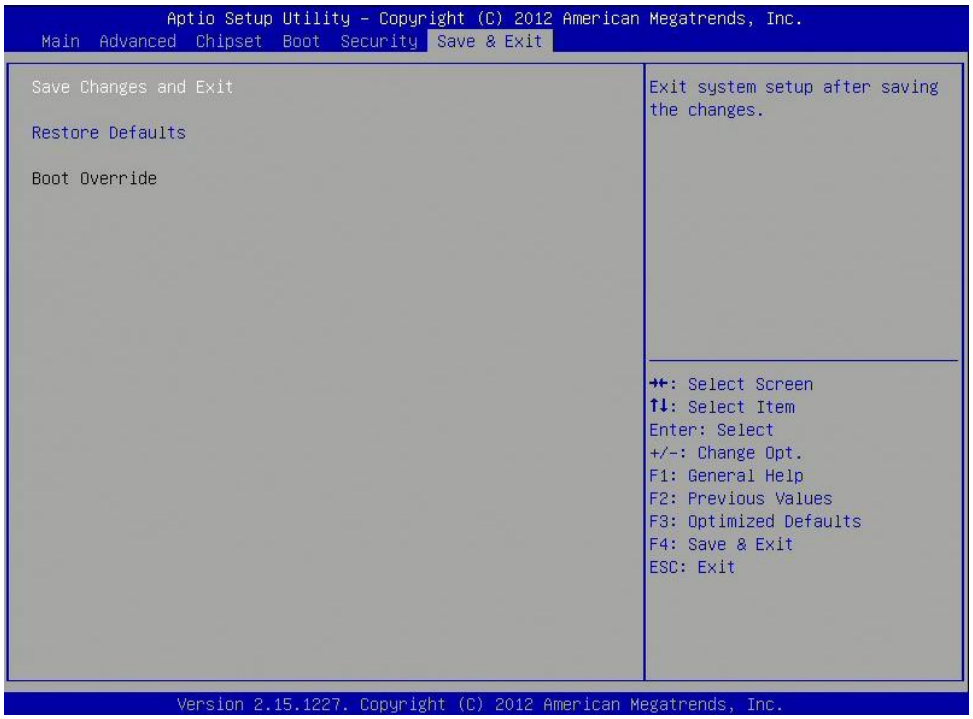
User Password
Set User Password.

Secure Boot
Secure boot flow control. Secure boot is possible only if system runs in user mode.

Secure Boot Mode
Secure boot mode selector. ‘Standard’ – fixed secure boot policy, ‘custom’ – changeable image execution policy and secure boot key databases.

4.8 Save and exit

This screen provides functions for handling changes made to the BIOS settings and the exiting of the Setup program.



Save Changes and Exit

Exit system setup after saving the changes.

Restore Defaults

Restore or Load Defaults values for all the setup options.