

ASMB-925 Series

EATX Serverboard with Dual
LGA3647-P0 Intel® Xeon® CPUs,
12 DDR4 Slots, 5 PCIe x16, 1
PCIe x8, 1 PCI, 8 SATA3.0, 6 USB
3.0, Dual 10GbE, and IPMI

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. In this event, users are required to correct the interference at their own expense.

Initial Inspection

Before installing the serverboard, check to make sure that the following items have been included in the shipment:

- 1 x ASMB-925 series EATX motherboard
- 1 x ASMB-925 series user manual
- 1 x Driver CD
- 2 x Serial ATA HDD data cables
- 1 x I/O port bracket
- 2 x CPU power cable (8P)
- 2 x SATA power cable
- 1 x Warranty card
- 2 x Heatsink clip for CPU

If any of the above items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the ASMB-925 series mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. When unpacking the ASMB-925 serverboard, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or fails to meet the specifications, notify our service department or local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Ordering Information

Part Number	Chipset	HDD	Expansion Slot	GbE/10GbE LAN	IPMI
ASMB-925T2-00A1	C622	8 x SATA3	5 x PCIe x16, 1 x PCIe x8 (Gen 3.0), 1 x PCI	2/2	Yes
ASMB-925I-00A1	C621	8 x SATA3	5 x PCIe x16, 1 x PCIe x8 (Gen 3.0), 1 x PCI	2/-	Yes
ASMB-925-00A1	C621	8 x SATA3	5 x PCIe x16, 1 x PCIe x8 (Gen 3.0), 1 x PCI	2/-	-

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Chapter 1

Overview

1.1 Introduction

Advantech's ASMB-925 series are advanced serverboards aimed at server-grade IPC applications that require high-performance computing and multiple expansion slots. These serverboards feature Intel® Xeon® Scalable processors, up to 1.5TB of DDR4 2133/2400/2666/2933 MHz memory, 5 x PCIe x16 (Gen 3), 1 x PCIe x8 (Gen 3), and 1 x PCI slot.

The ASMB-925 series serverboards are also equipped with dual Gigabit Ethernet LAN ports (via a dedicated PCIe x1 bus) that offer a bandwidth of up to 250 MB/s, eliminating network bottlenecks. LAN2 shares IPMI function, enabling remote control for ASMB-925I/ASMB-925T2 SKU.

With the inclusion of an Intel® C621/C622 chipset, the ASMB-925 series supports 8 x onboard SATA III interfaces, Intel® RSTe (Rapid Storage Technology Enterprise), and RAID 0, 1, 10, and 5 (Windows only).

The system I/O includes 5 x USB 2.0 and 6 x USB 3.0 for integrating additional peripherals and data storage modules.

- Note!**
1. An IPMI module is included with the ASMB-925I/ASMB-925T2 SKU.
 2. Refer to the release note for the specific Linux OS for information regarding whether the Intel C621/C622 chipset supports SATA RAID function.



1.2 Features

General

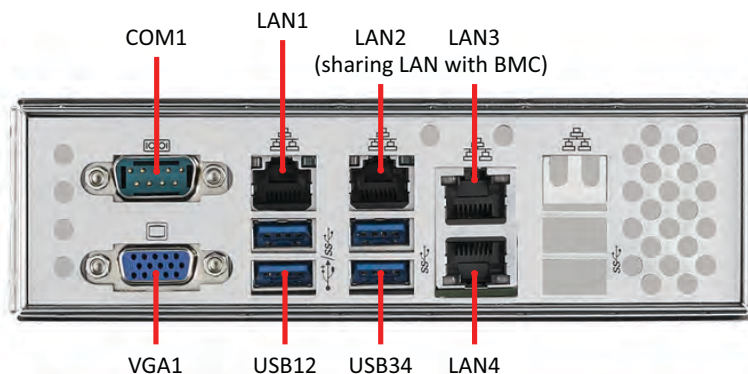
- **Intel® Xeon® scalable processor:** Can support two Intel® Xeon® Platinum/Gold/Silver/Bronze processors for up to 28-core processing
- **High-performance I/O:** Provides dual 10 Gigabit LAN (for ASMB-925T2 SKU only), dual Gigabit LAN, 5 x PCIe x16, 1 x PCIe x8, 8 x SATA connectors, 5 x USB 2.0, and 6 x USB 3.0
- **Industrial-grade standard EATX form factor:** Offers industrial-grade features, such as a long product lifecycle, wide operating temperature range, and a watchdog timer
- **IPMI 2.0 support:** The ASMB-925I/ASMB-925T2 SKU is equipped with an ASPEED 2500 BMC chip that supports IPMI 2.0 via LAN2
- **KVM over IP:** Enables BIOS-level remote control of the ASMB-925I/ASMB-925T2 SKU system from your computer

1.3 Specifications

Table 1.1: Specifications	
Processor	
CPU	<ul style="list-style-type: none"> ■ Dual Intel® LGA3647-P0 Xeon® processor sockets ■ Supports 1st/2nd gen. Intel® Xeon® Scalable family, up to 28 cores ■ Supports up to 205 W processor TDP
System Memory	
Memory Capacity	<ul style="list-style-type: none"> ■ DDR4 memory bus ■ 12 memory slots ■ Up to 1.5TB of memory ■ One DIMM per channel
Memory Type	Supports DDR4 2133/2400/2666/2933 MHz RDIMM/LRDIMM modules
DIMM Sizes	Each memory slot supports 4GB, 8GB, 16GB, 32GB, 64GB and 128GB modules
Memory Voltage	1.2 V
Error Detection	<ul style="list-style-type: none"> ■ Corrects single-bit errors ■ Detects double-bit errors (using ECC memory)
On-Board Devices	
Chipsets	Intel® C621/C622 PCH provides 20 x PCIe Gen3 lanes
Network Controllers	<ul style="list-style-type: none"> ■ 2 x Intel® I210-AT Gigabit Ethernet controllers connected to C621/C622 via a PCIe Gen1 lane ■ Intel® X557-AT2 10 Gigabit Ethernet controller connected to C622 via a PCIe Gen3 lane ■ Above network supports 10GbE Base-T and 10/100/1000 Base-T, with RJ-45 output
VGA	ASPEED AST2500/2510 controller with 64MB VGA memory provides basic 2D VGA function
EC	ITE IT8528E chip provides motherboard, keyboard, mouse, RS-232, and hardware monitoring functions
BMC (925I/925T2 SKUs)	One of Intel I210 Gigabit Ethernet and one of Intel X557 10GbE connected to AST2500 for BMC remote management
Input/Output	
Storage	<ul style="list-style-type: none"> ■ 8 x SATA provides 6 Gb/s bandwidth ■ RAID 0, 1, 5, 10 support (Windows only. For Linux support, refer to item 2 of the in Section 1.1).
LAN	■ 4 x RJ-45 LAN ports (2 x 10GbE + 2 x GbE LAN)
USB	<ul style="list-style-type: none"> ■ 4 x USB 3.0 ports at rear window ■ 2 x USB 2.0 internal headers (4 ports) ■ 1 x USB 3.0 internal header (2 ports) ■ 1 x internal USB 2.0 (Type-A) port
VGA	■ 1 x VGA port
Keyboard/Mouse	■ 1 x PS/2 keyboard and mouse internal header (on board)
Serial Port/Header	<ul style="list-style-type: none"> ■ 1 x internal header (2 x 5P, 2.54 mm, pitch) ■ 1 x external RS-232 port at rear window

Table 1.1: Specifications	
Power Connector	
System Power	1 x 24-pin SSI EPS 12 V power connector (input 12V, 5V, 3.3V, 5V standby)
CPU Power	2 x 8-pin SSI EPS 12V power connector for CPU and memory power (12V)
PCIe Slot Power	1 x 8-pin 12V power connector for PCIe, 12 V input
Expansion Slots	
PCI-Express	<ul style="list-style-type: none"> ■ 5 x PCI-e x16 (Gen3 x16 link) <ul style="list-style-type: none"> – PCIEX16_SLOT2 (from CPU 1) – PCIEX16_SLOT3 (from CPU 1) – PCIEX16_SLOT4 (from CPU 0) – PCIEX16_SLOT5 (from CPU 1) – PCIEX16_SLOT6 (from CPU0) ■ 1 x PCI-e x8 (Gen3 x8 link) <ul style="list-style-type: none"> – PCIEX8_SLOT7 (from CPU 0)
PCI	<ul style="list-style-type: none"> ■ 1 x PCI <ul style="list-style-type: none"> – PCI_SLOT1 (from IT8896 and PCH)
System BIOS	
BIOS Type	128 Mb SPI Flash EEPROM with AMI BIOS
PC Health Monitoring	
Voltage	Monitors for CPU cores, +3.3 V, +5 V, +12 V, +5 V Standby, VBAT
Fan	<ul style="list-style-type: none"> ■ 2 x 4-pin heads for CPU cooler, 5 x 4-pin headers for system fan ■ All fans feature tachometer status monitoring ■ Thermal control for all fan connectors
Temperature	<ul style="list-style-type: none"> ■ Monitoring for CPU (PECI) ■ Monitoring for system external thermal sensor
Other Features (Case Open)	<ul style="list-style-type: none"> ■ Chassis intrusion detection ■ Chassis intrusion header
Operating Environment/Compliance	
RoHS	RoHS-compliant 6/6 Pb free
Environmental	<ul style="list-style-type: none"> ■ Operating temperature: 0 ~ 40° C/32 ~ 104° F ■ Storage temperature: -40 to 85° C/-40 ~ 185 ° F ■ Operating Relative Humidity: 10% to 90% (non-condensing) ■ Storage Relative Humidity: 10% to 95% (non-condensing)

ASMB-925T2-00A1



ASMB-925-00A1
ASMB-925I-00A1

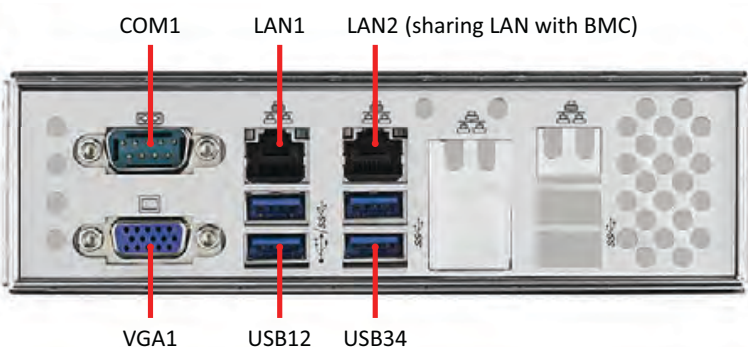


Figure 1.2 Rear I/O

Table 1.2: Onboard LAN LED Color Definition

10/100/1000 Mbps LAN Link/Activity LED Scheme

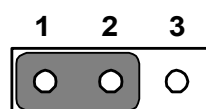
		LAN1 & LAN2 (1G)	
		Left LED	Right LED
10 Mbps	Link Active	Off	Green
	Active	Off	Blinking green
100 Mbps	Link Active	Amber	Green
	Active	Amber	Blinking green
1000 Mbps	Link Active	Green	Green
	Active	Green	Blinking green
No Link		Off	Off

1/10 Gbps LAN Link/Activity LED Scheme

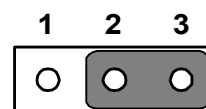
		LAN3 & LAN4 (10G)	
		Left LED	Right LED
1G Mbps	Link Active	Amber	Green
	Active	Amber	Blinking green
10G Mbps	Link Active	Green	Green
	Active	Green	Blinking green

Table 1.3: Jumpers

Label	Function	Default
JCMOS1	CMOS clear	1-2
JME1	ME update	1-2
JWDT1	Watchdog function enable	1-2
PSON1	AT (1-2)/ATX (2-3) mode	2-3
JCASE1	Chassis case open alarm disable	1-2
JTHR_SEL	On board (1-2)/external (2-3) thermistor	1-2
JPCICLK1	PCI clock selection for 33 MHz (2-3)/66 MHz (1-2)	2-3



Keep CMOS data/
Disable ME update/



Clear CMOS data/
Enable ME update/

Table 1.4: Connectors

Label	Function
ATXPWR1	ATX 24 pin main power connector
ATX12V1	Processor power connector (for CPU0)
ATX12V2	Processor power connector (for CPU1)
SLOT12V1	For PCIe slot 12V input only
SATA0~SATA7	Serial ATA0~7
USB7_8, USB9_10	USB 2.0 header 7, 8, 9, 10
USB11	USB 2.0 port 11 (Type-A)
USB1_2, USB3_4, USB5_6	USB 3.0 port 1, 2, 3, 4; USB 3.0 port 5, 6 (20-pin header)
PCI_SLOT1	PCI slot
PCIEX16_SLOT2	PCIe x16 slot
PCIEX16_SLOT3	PCIe x16 slot
PCIEX16_SLOT4	PCIe x16 slot
PCIEX16_SLOT5	PCIe x16 slot
PCIEX16_SLOT6	PCIe x16 slot
PCIEX8_SLOT7	PCIe x8 slot
DIMMA1~DIMML1	DDR4 slot
CPUFAN0, CPUFAN1	CPU FAN connector
SYSFAN0~SYSFAN4	System FAN connector
LAN1, LAN2	GbE LAN connector
LAN34	10GbE LAN connector
VGA1_COM1	VGA and COM connector
COM2	Serial port: RS-232
KBMS1	External keyboard and mouse connector (6 pin)
BIOS_SKT1	BIOS ROM
LANLED1	LAN LED extension connector
SMBUS1	Front panel SMBus header

Table 1.4: Connectors	
BMC_CN1, BMC_CN2	IPMI module header
GPIO1	GPIO connector
SGPIO1	SATA SGPIO header
HDAUD1	Audio header
JFP1, JFP2, JFP3	Front panel header
PMBUS1	Power supply SMBbus I2C header
EX_THR1	For external thermistor cable use
SYS_LED1	For optional system LED indicator
LPC1	Low pin count connector for Advantech designed LPC modules
VOLT1	Alarm Board Power connector
SPI_CN1	SPI flash card pin header
PEHP1	NVMe RAID LED control
BH2	Battery connector
VROC1	VROC hardware key header
CN1	CPLD code update header
PCN1	CPU power code update header
SPI_SKT1_U512	EC ROM

Table 1.5: Onboard LED			
LED	Description	LED Definition	
5V_LED1	Power on LED	Off: Power off	On (Green): System is On
5VSB_LED1	Standby LED	Off: No input AC Power	On (Green): System is ON, in sleep mode, or in soft-off mode
LED3	BMC heartbeat LED (ASMB-925I/ASMB-925T2 SKU Only)	Blinking (Green): Controller is working normally	

1.5 Block Diagram

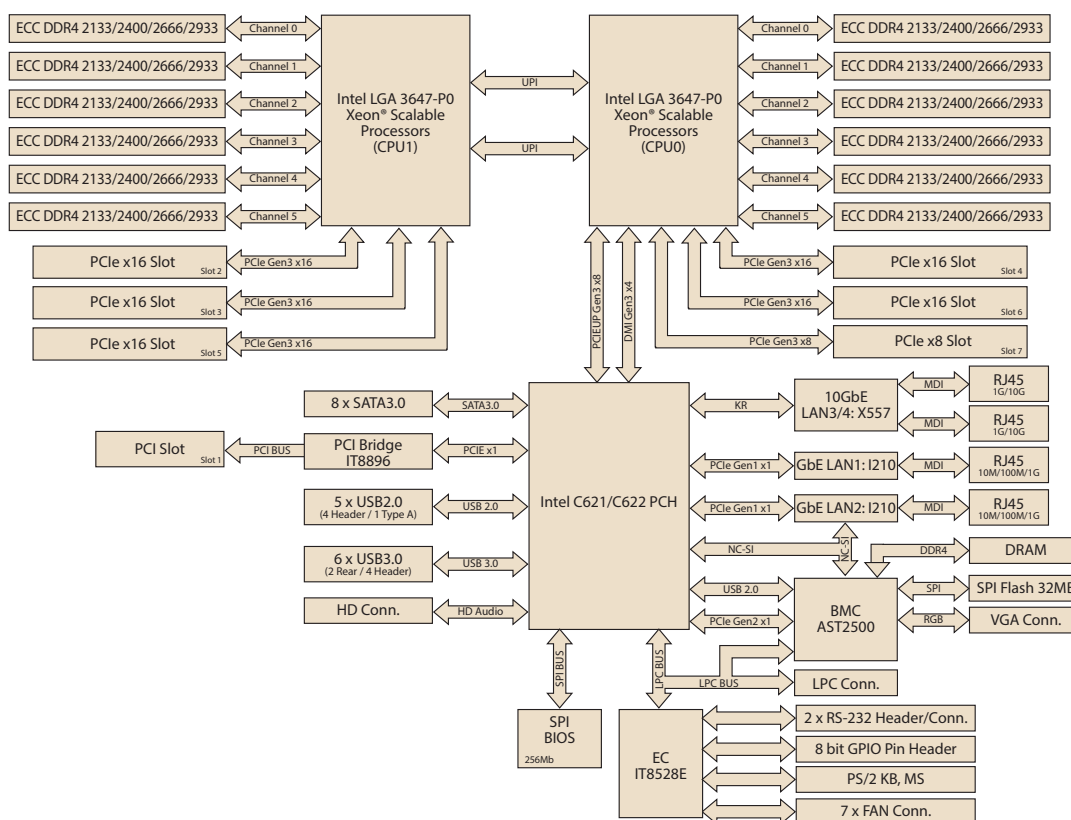


Figure 1.3 Block Diagram

1.6 System Memory

The ASMB-925 Series serverboards have twelve 288-pin memory slots for DDR4 2133/2400/2666/2933 MHz memory modules, with maximum capacity of 1.5TB (Maximum 128GB for each DIMM). ASMB-925 supports registered DIMM memory modules.

1.7 Memory Installation

Memory performance is affected by different DIMM configurations. To reach optimal memory interleaving, be sure to install identical DIMM types of the same size, speed, and number of ranks on the memory slots corresponding to the correct processor.

The following table lists recommended DIMM configurations with a single and dual processor. Based on the guideline, users can adjust the memory configuration according to the PCIe expansion card configuration.

Intel® Xeon® Scalable (82xx/62xx/52xx/4215) processors support Intel® Optane™ DC persistent memory modules (DCPMM).

Table 1.6: DIMM Configuration with Single CPU

	Quantity of Memory Installed					
CPU0	1	2	3	4	5	6
DIMMA1	v	v	v	v		v
DIMMB1		v	v	v		v
DIMMC1			v			v
DIMMD1				v		v
DIMME1				v		v
DIMMF1						v
DIMMG1						
DIMMH1						
DIMMI1						
DIMMJ1						
DIMMK1						
DIMML1						

Note! A DIMM population of 5 is not recommended.



Table 1.7: DIMM Configuration with Dual CPU

	Quantity of Memory Installed											
CPU0 & CPU1	1	2	3	4	5	6	7	8	9	10	11	12
DIMMA1		v		v		v		v		v		v
DIMMB1				v		v		v		v		v
DIMMC1						v				v		v
DIMMD1								v		v		v
DIMME1								v		v		v
DIMMF1										v		v
DIMMG1		v		v		v		v		v		v
DIMMH1				v		v		v		v		v
DIMMI1						v						v
DIMMJ1								v		v		v
DIMMK1								v		v		v
DIMML1												v

Note! DIMM populations of 1, 3, 5, 7, 9, and 11 are not recommended when dual CPUs are installed.

**Table 1.8: DCPMM Population Matrix**

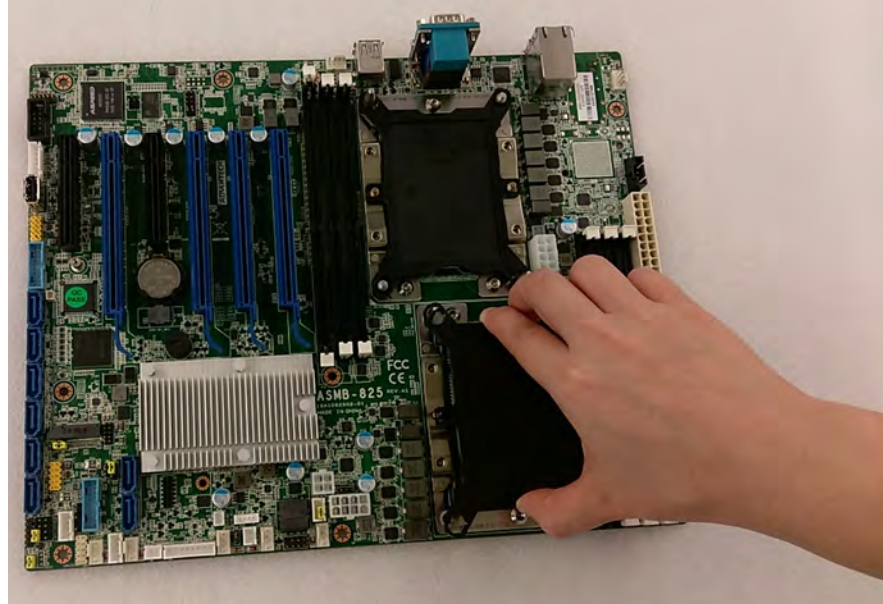
	Symmetric Population within CPU0					
Modes	DIMMF1	DIMME1	DIMMD1	DIMMC1	DIMMB1	DIMMA1
AD	DCPMM	DRAM1	DRAM1	DCPMM	DRAM1	DRAM1
MM	DCPMM	DRAM1	DRAM1	DCPMM	DRAM1	DRAM1
AD+MM	DCPMM	DRAM3	DRAM3	DCPMM	DRAM3	DRAM3
	Symmetric Population within CPU1					
Modes	DIMML1	DIMMK1	DIMMJ1	DIMMI1	DIMMH1	DIMMG1
AD	DCPMM	DRAM1	DRAM1	DCPMM	DRAM1	DRAM1
MM	DCPMM	DRAM1	DRAM1	DCPMM	DRAM1	DRAM1
AD+MM	DCPMM	DRAM3	DRAM3	DCPMM	DRAM3	DRAM3

- AD: App Direct Mode; MM: Memory Mode; AD+MM: Mixed Mode.
- DRAM1: RDIMM, 3DS RDIMM, LRDIMM, 3DS LRDIMM
- DRAM2: RDIMM
- DRAM3: RDIMM; 3DS RDIMM; LRDIMM
- Andy capacity of DCPMM is allowed

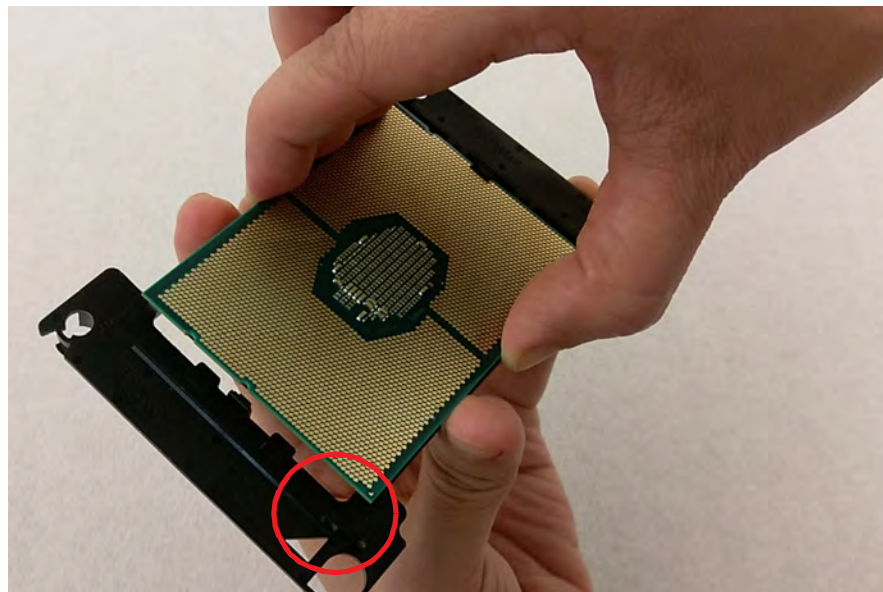
1.8 Processor Installation

ASMB-925 Series serverboards are designed for Intel® Xeon® Scalable processors.

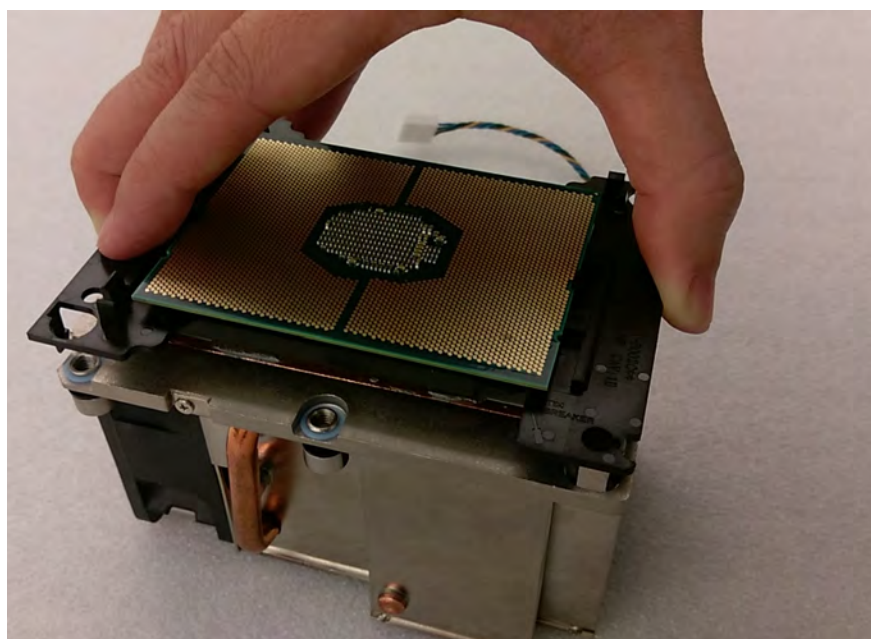
1. Remove dust cover.



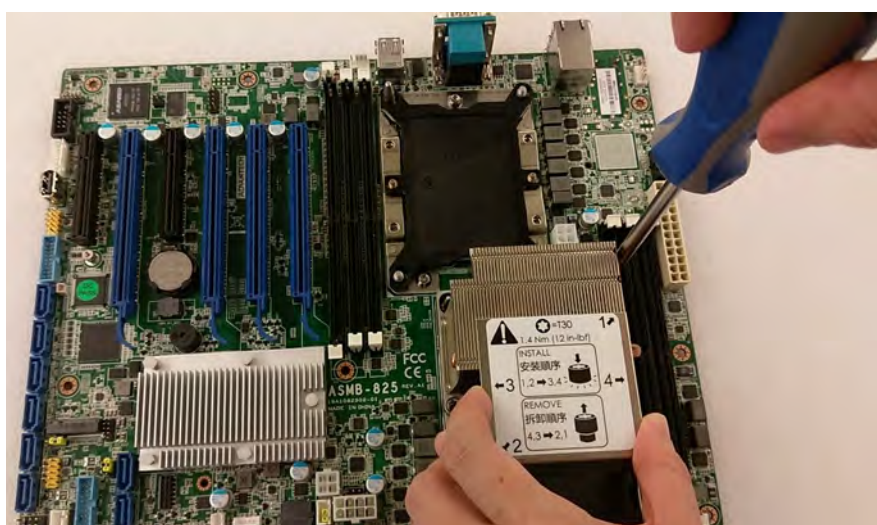
2. Install CPU on CPU clip and align it with the pin-1 mark.



3. Install the assembled CPU clip on the heatsink to create a processor + heatsink module.



4. Attach the processor heatsink module to the motherboard bolster plate using a T-30 screw driver (follow the heatsink label directions 1-2-3-4).



Chapter 2

Connections

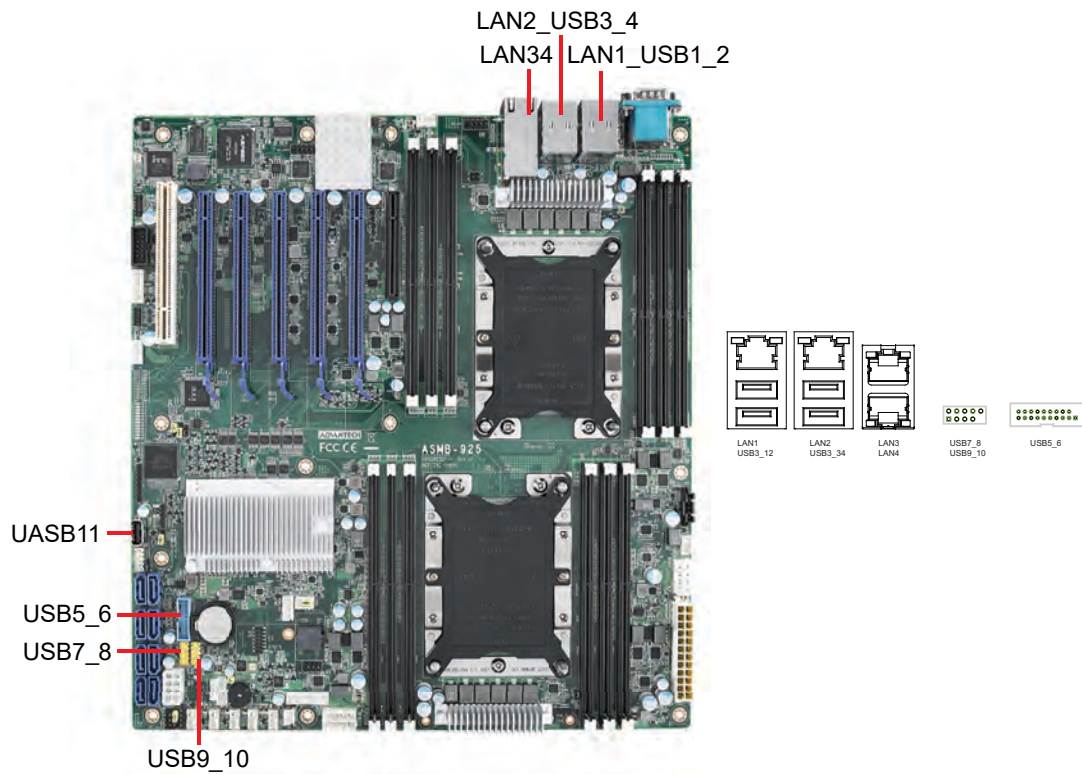
2.1 Introduction

Most of the connectors can be accessed from the top of the board during installation in the chassis. If several cards have been installed, you may need to partially remove a card to make all the connections.

2.2 USB and LAN Ports (USB1~USB11, LAN1~LAN4)

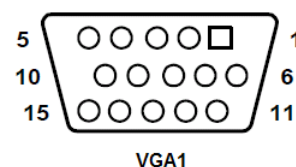
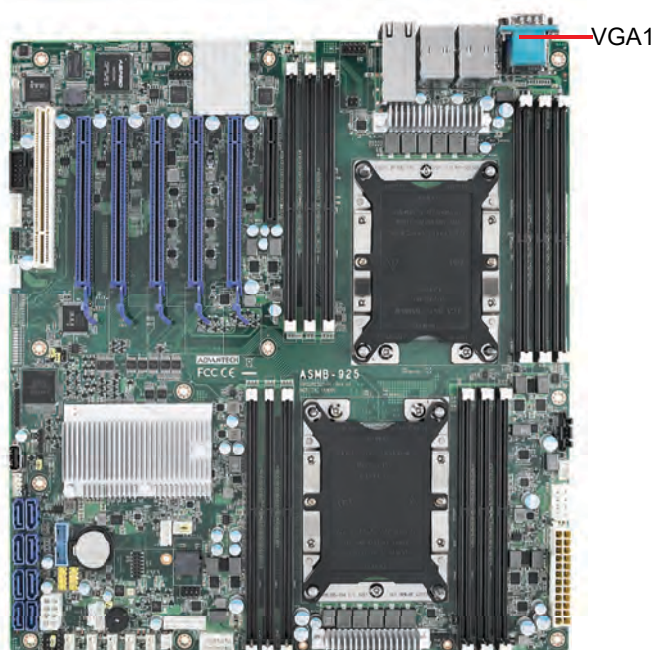
The USB ports comply with USB 2.0 and 3.0 specifications. Transmission rates are up to 480 Mbps (USB 2.0) and 5 Gbps (USB 3.0) and fuse protection is supported. The USB interface can be disabled in the BIOS.

ASMB-925 is equipped with two 10GbE and two 1GbE LAN ports with RJ-45 jacks that are supported by all major network operating systems. One GbE LAN and one 10GbE LAN (LAN2 and LAN3) are shared with IPMI for system management.



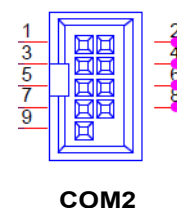
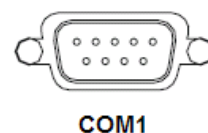
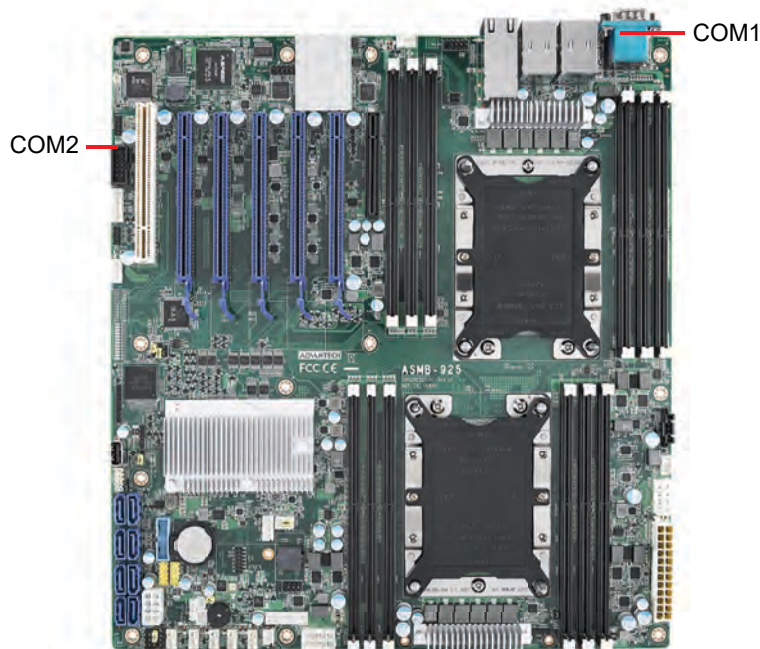
2.3 VGA Connector (VGA1)

ASMB-925 serverboards feature a VGA interface that supports conventional CRT and LCD displays.



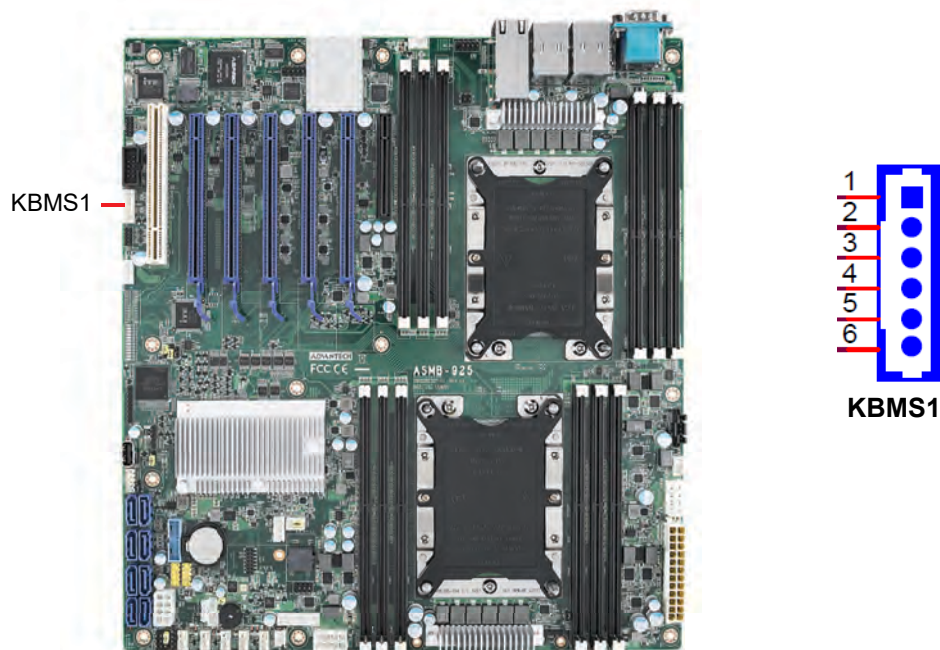
2.4 Serial Ports (COM1, COM2)

ASMB-925 serverboards feature 2 serial ports (one on the rear panel and one onboard).



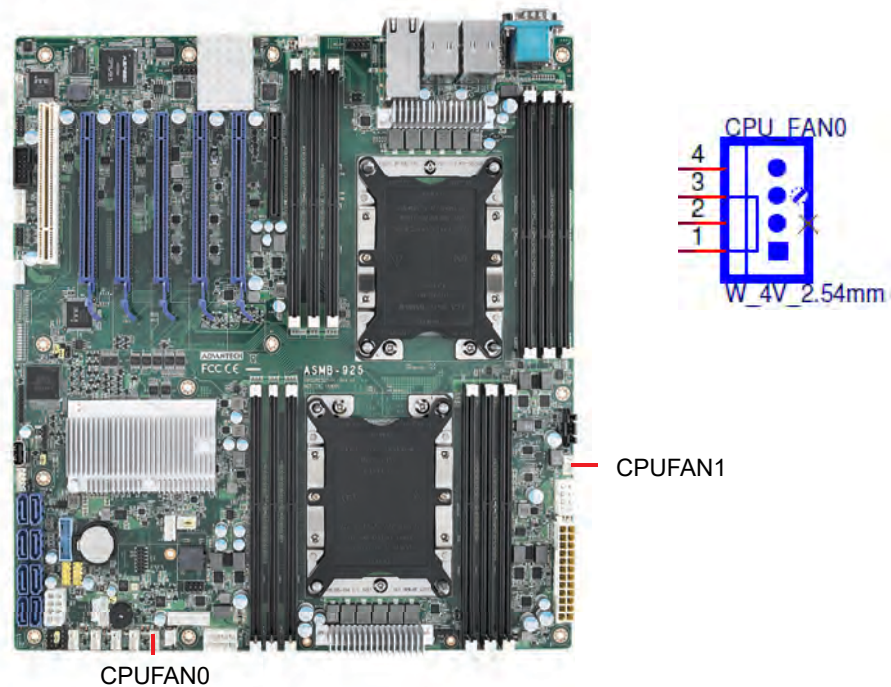
2.5 PS2 Keyboard and Mouse Connector (KBMS1)

KBMS1 is an external keyboard and mouse connector on the motherboard.

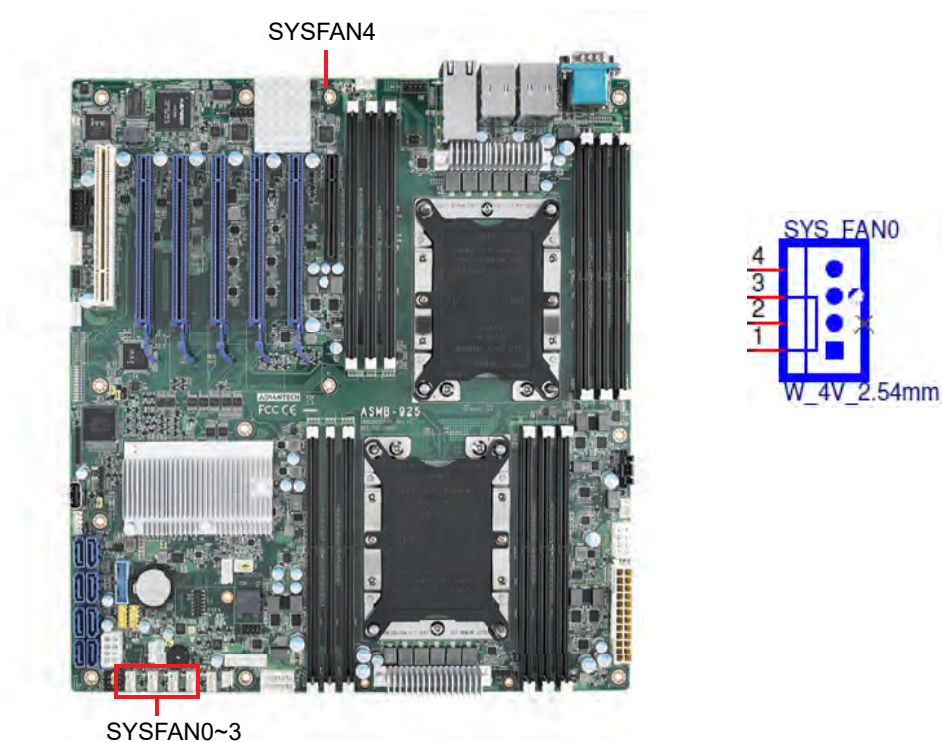


2.6 CPU Fan Connector (CPUFAN0, CPUFAN1)

If a fan is used, this connector supports cooling fans that draw up to 500 mA (6 W).

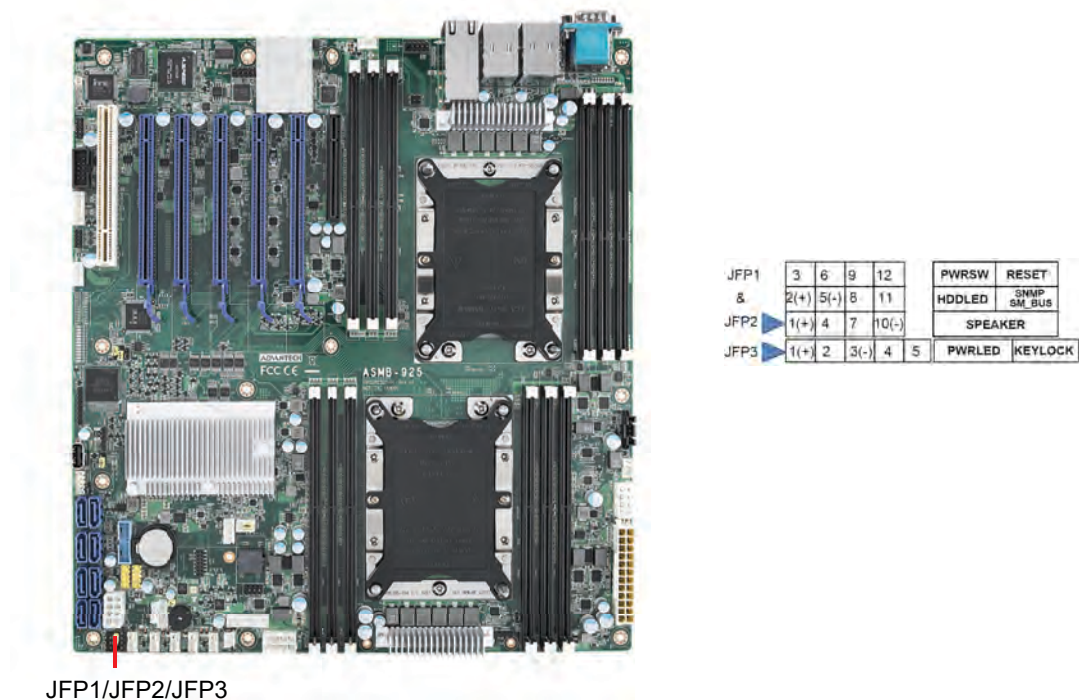


2.7 System Fan Connector (SYSFAN0~SYSFAN4)



2.8 Front Panel Connector (JFP1, JFP2, JFP3)

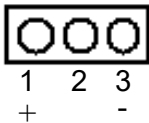
There are several external switches and LEDs for monitoring and controlling the ASMB-925 serverboards.



2.8.1 Power LED (JFP3)

JFP3 pin 1 and pin 3 are for the power LED. Refer to Appendix B for detailed information regarding pin assignments. The table below explains the power LED status if an ATX power supply is used.

Table 2.1: ATX Power Supply LED Status	
ACPI Power Mode	LED (ATX power)
System On (S0)	On
System Standby (S1)	Fast flashes
System Hibernation(S4)	Slow flashes
System Off (S5)	Off



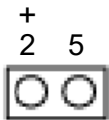
2.8.2 External Speaker (JFP2 Pins 1, 4, 7, 10)

JFP2 pins 1, 4, 7, and 10 connect to an external speaker. ASMB-925 serverboards provide an onboard buzzer as an alternative. To enable the buzzer, set pins 7 ~ 10 to closed.



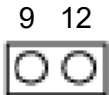
2.8.3 HDD LED Connector (JFP1 Pins 2 & 5)

An LED can be connected to the JFP1 connector to indicate when the HDD is active.



2.8.4 Reset Connector (JFP1 Pins 9 & 12)

Many computer cases offer the convenience of a reset button.



2.8.5 SNMP Connector (JFP1 Pins 8 & 11)

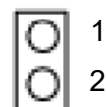
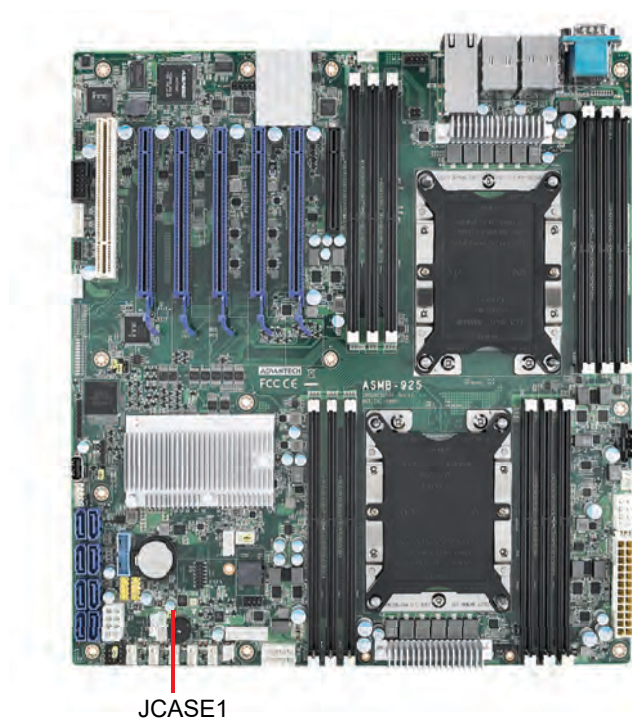
An SNMP connector is used for connecting to an Advantech SAB-2000 remote control board; however, SAB-2000 is not supported by all Intel® Xeon® Scalable server-boards.

8 11
(Data) (CLK)

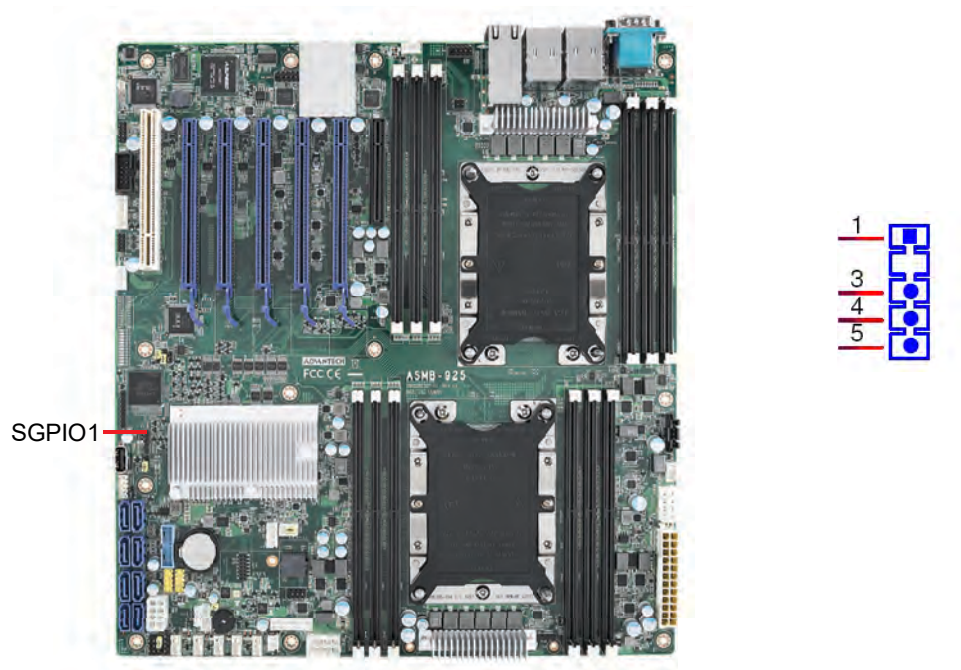


2.9 Case Open (JCASE1)

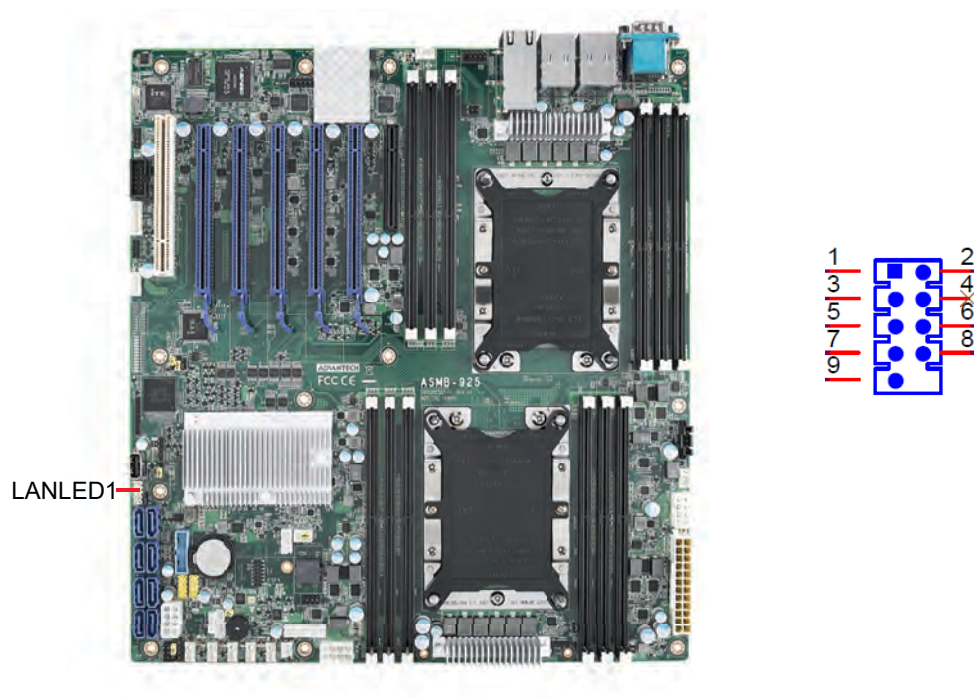
A chassis intrusion header is located at JCASE1 on the motherboard. Attach the appropriate cable from the chassis to be informed of a chassis intrusion when the chassis is opened. The default function is disabled and pins 1 and 2 are bridged by a jumper cap.



2.10 SATA SGPIO (SGPIO1)

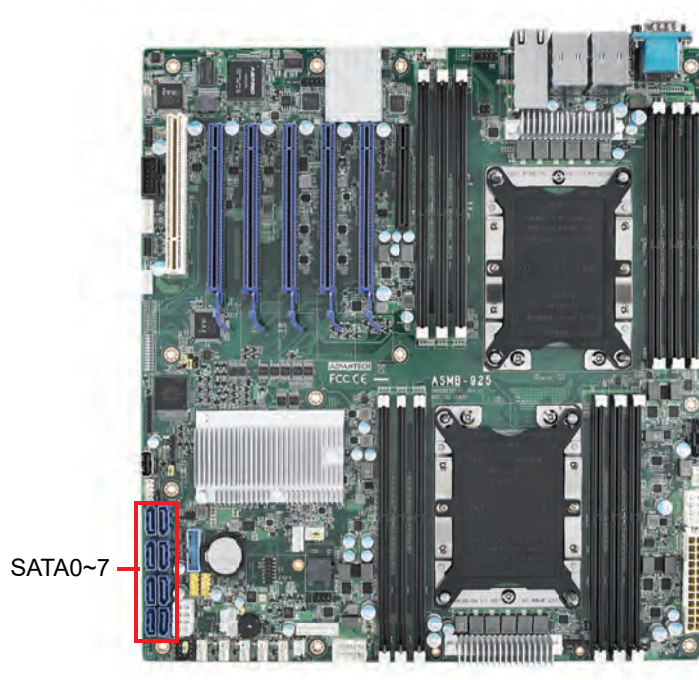


2.11 Front Panel LAN Indicator Connector (LANLED1)



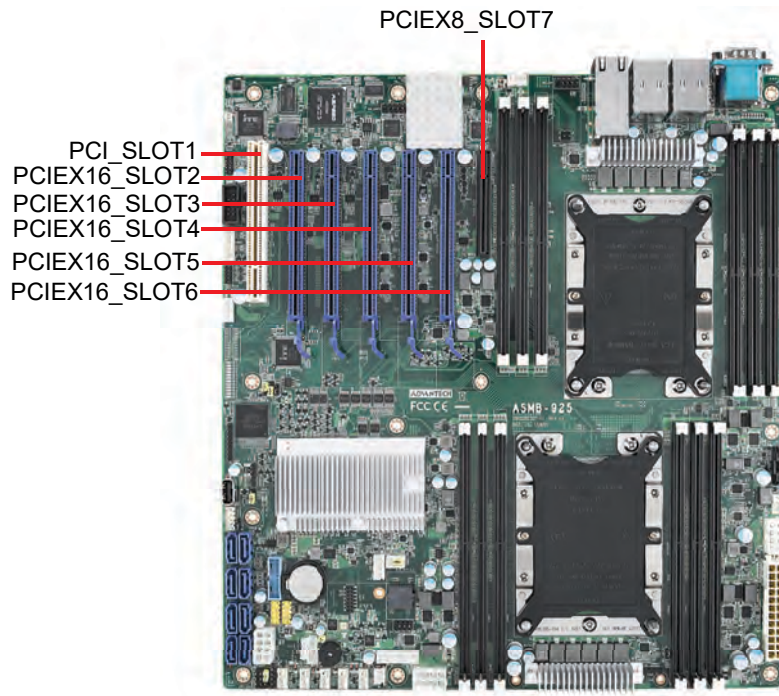
2.12 Serial ATA Interface (SATA0~SATA7)

ASMB-925 Series features eight serial ATA III interfaces (up to 600 MB/s), which can be connected to hard drives.



2.13 PCIe and PCI Expansion Slot

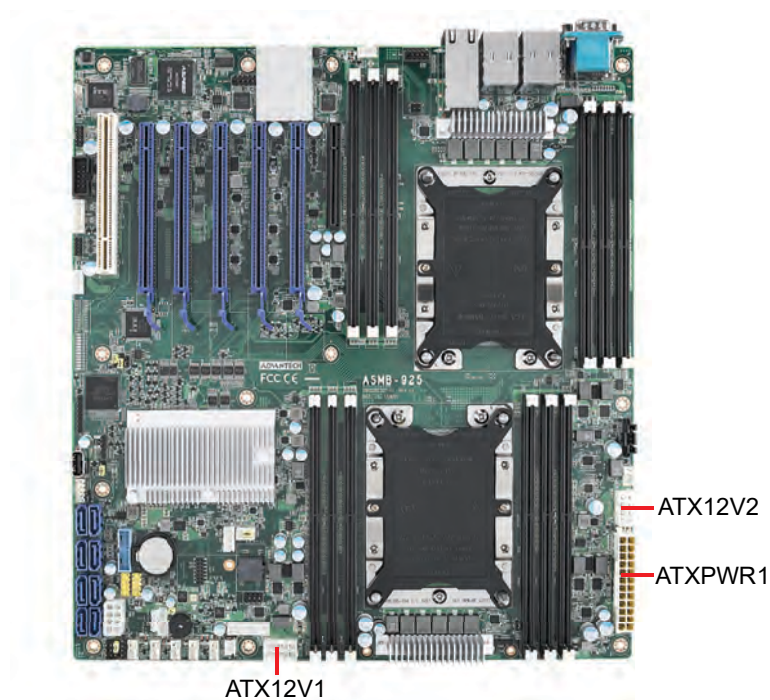
ASMB-925 Series serverboards feature several expansion slots.



	Slot Length	Link	PCI-E Generation	PCIe Link Provided From
PCI_SLOT1	PCI	PCI		PCH
PCIEX16_SLOT2	PCI-E x16	PCI-E x16	3	CPU1
PCIEX16_SLOT3	PCI-E x16	PCI-E x16	3	CPU1
PCIEX16_SLOT4	PCI-E x16	PCI-E x16	3	CPU0
PCIEX16_SLOT5	PCI-E x16	PCI-E x16	3	CPU1
PCIEX16_SLOT6	PCI-E x16	PCI-E x16	3	CPU0
PCIEX8_SLOT7	PCI-E x8	PCI-E x8	3	CPU0

	Part Number	Description	Remarks
Riser Card	ASMB-RF388-21A1E	ASMB-RF388 (2U riser card)	2 x PCI-E x8 or 1 x PCI-E x8 + 2 x PCI-E x4
	ASMB-RF348-21A1E	ASMB-RF348 (2U riser card)	2 x PCI-E x4 + 1 x PCI-E x8
	ASMB-RF3X8-21A1E	ASMB-RF3X8 (2U riser card)	1 x PCI-E x4 + 2 x PCI-X
	AIMB-RF10F-01A1E	AIMB-RF10F (1U riser card)	1 x PCI-E x16

2.14 Auxiliary Power Connector (ATXPWR1, ATX12V1, ATX12V2)

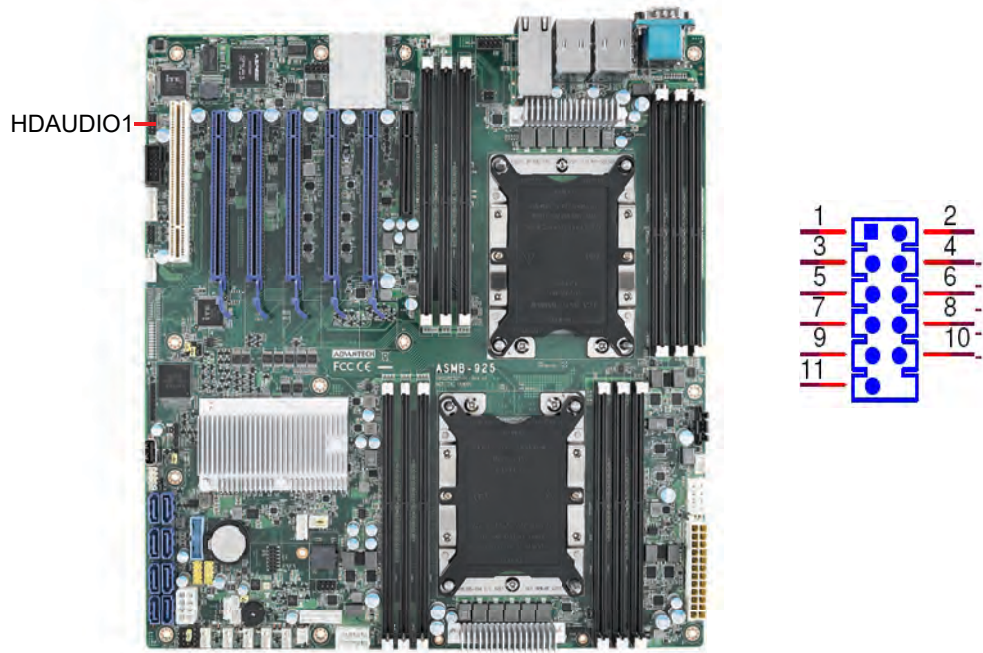


- Note!**
1. Use a SSI-type power supply with a minimum output of 700W with 5Vsb @2.5A.
 2. ATXPWR1, ATX12V1, and ATX12V2 should be connected to the power supply, otherwise the ASMB-925 serverboard will not bootup normally.



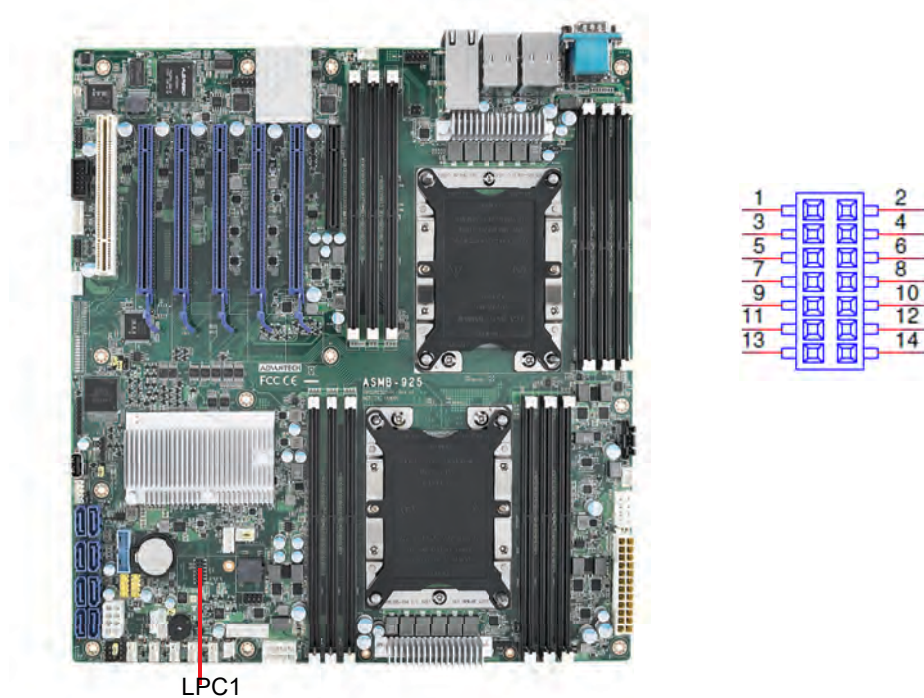
2.15 HD Audio Interface Connector (HDAUD1)

ASMB-925 features one audio connector for installing an audio board.
(Advantech P/N: PCA-AUDIO-HDB1E)



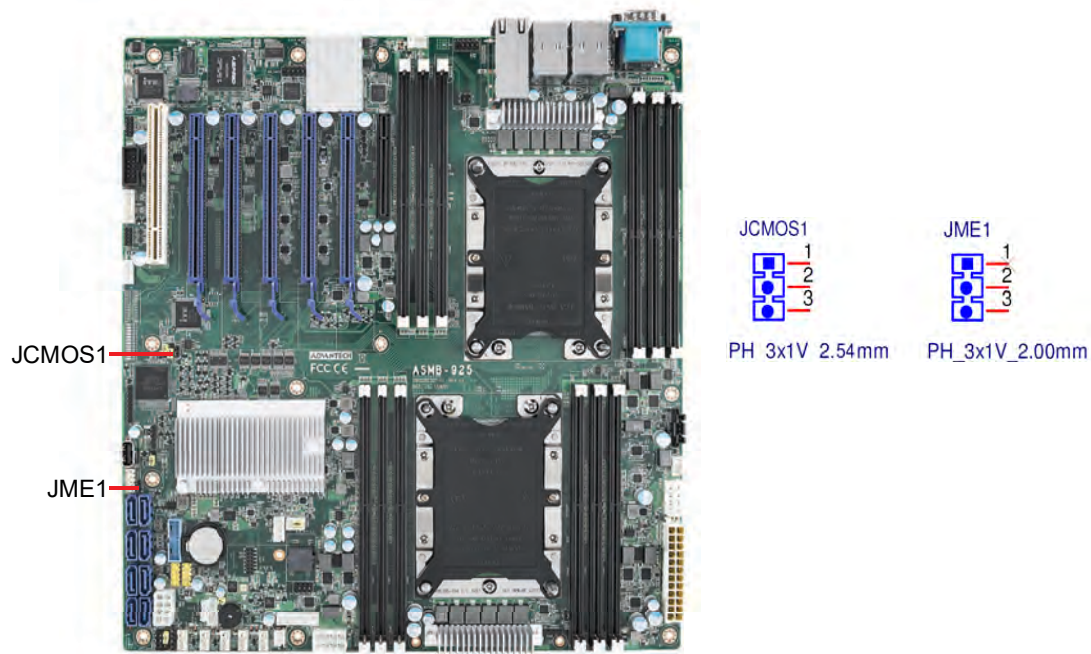
2.16 LPC Connector (LPC1) for Optional TPM

ASMB-925 features one LPC connector for installing a Trusted Platform module for hardware-based security.
(Advantech P/N: PCA-TPM-00A1E, PCA-TPM-00B1E)

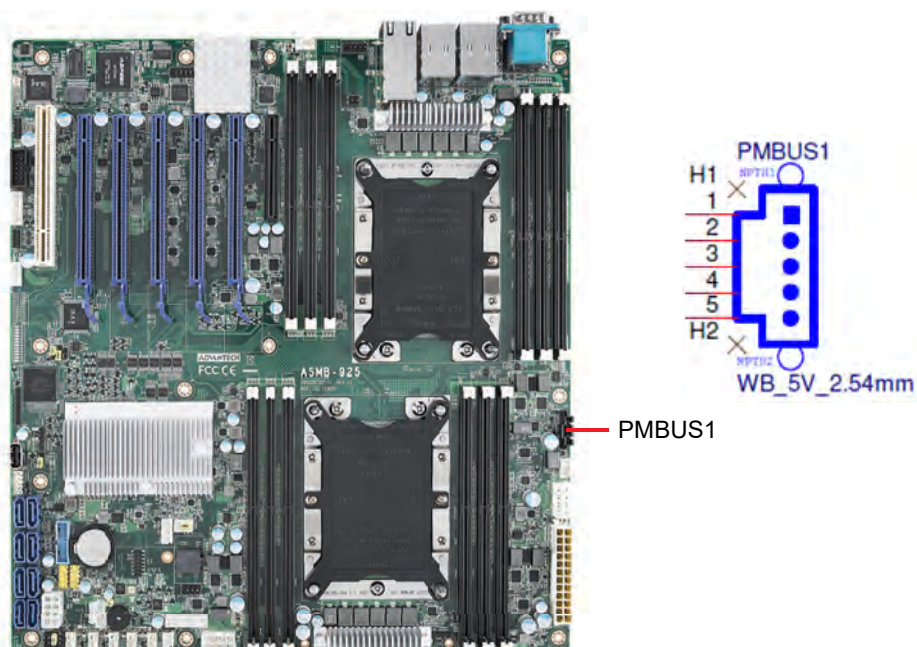


2.17 CMOS Clear and ME Update Connector (JCMOS1, JME1)

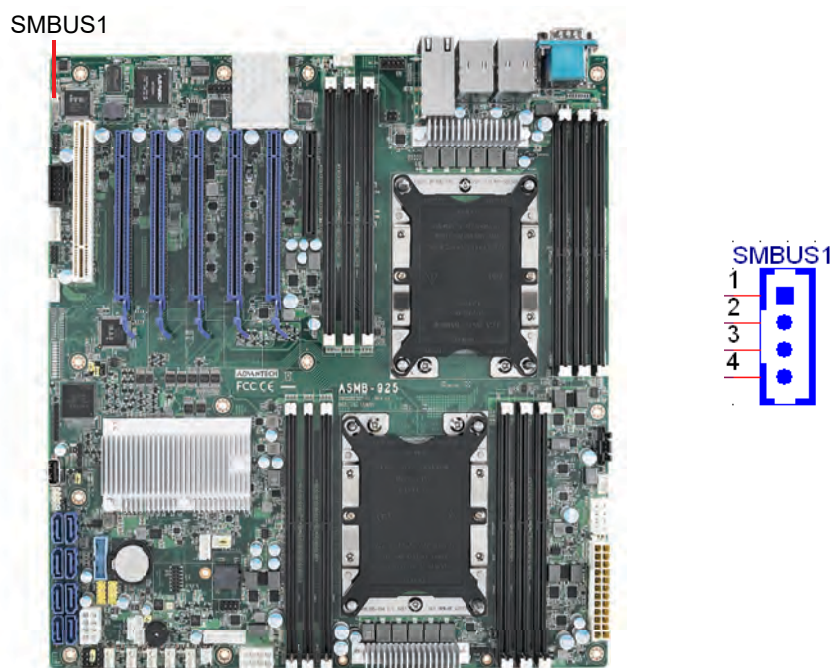
Sets the jumper from pin 1-2 to pin 2-3, then back to pin 1-2 to reset CMOS data and enable ME updates.



2.18 PMBUS Connector (PMBUS1)



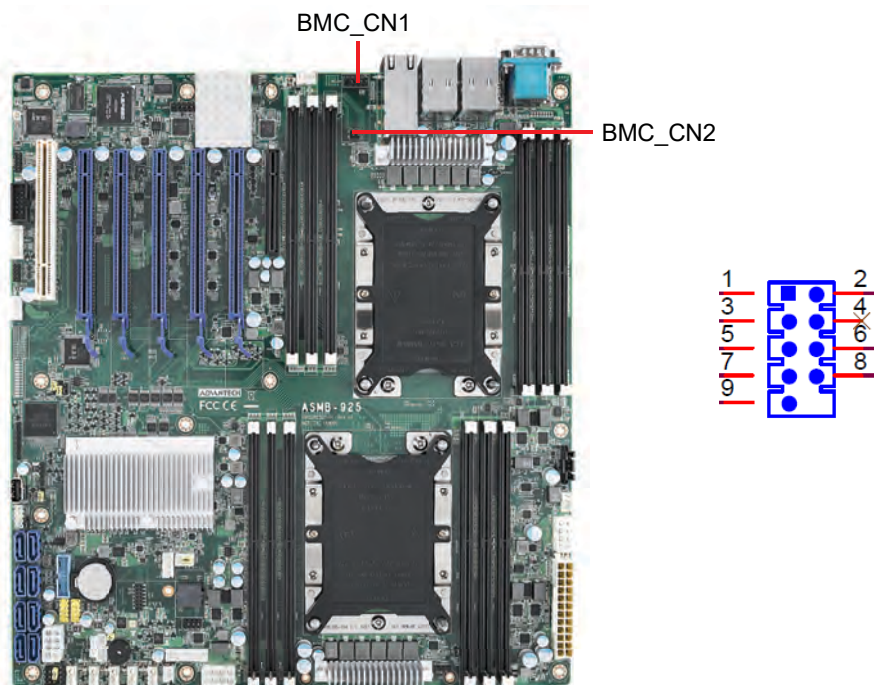
2.19 Front Panel SMBUS Connector (SMBUS1)



2.20 IPMI Module Connector (BMC_CN1, BMC_CN2)

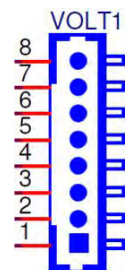
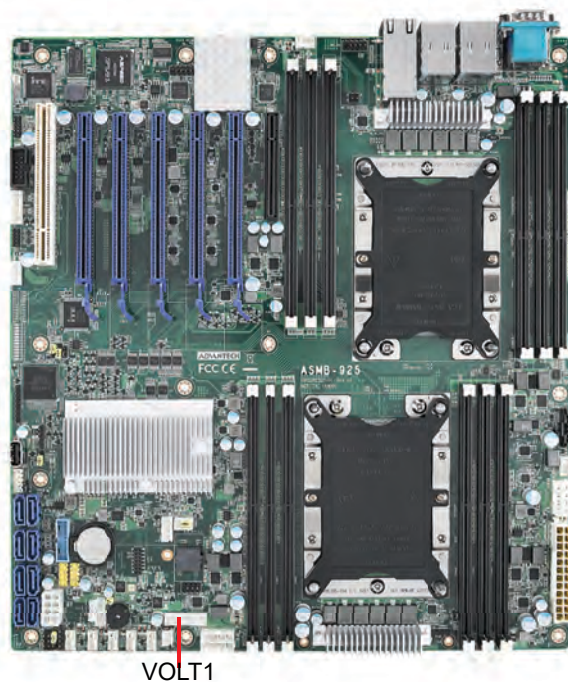
Enable the IPMI feature through BMC_CN1 and BMC_CN2.

A BMC module is pre-installed on the ASMB-925I and ASMB-925T2 SKU.

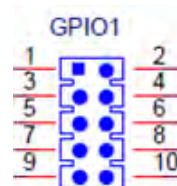
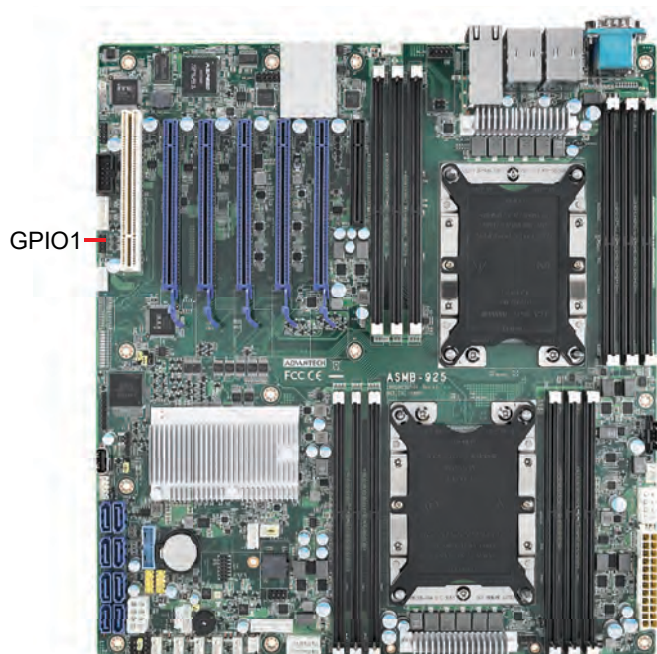


2.21 VOLT1 Connector (VOLT1)

VOLT1 connects to the alarm board on the Advantech chassis. These alarm boards give warnings if a power supply or fan fails, if the chassis overheats, or if the back-plane malfunctions.

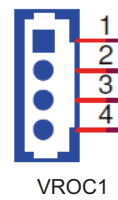
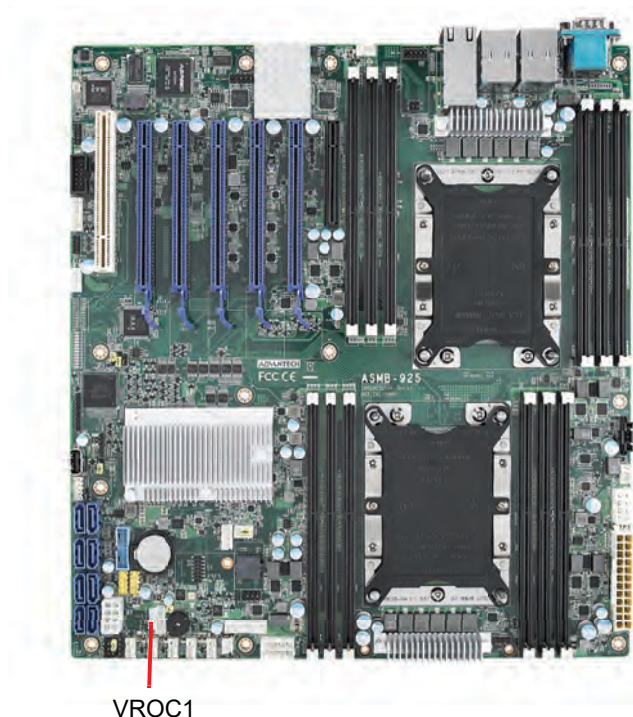


2.22 GPIO Connector (GPIO1)



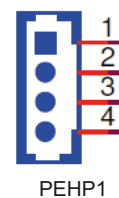
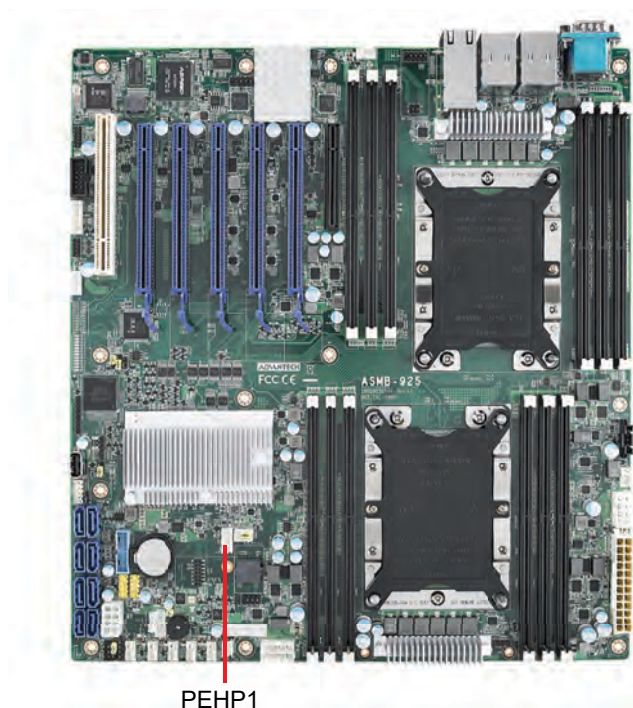
2.23 Intel Virtual RAID (VROC1)

The Intel VROC license key of VMD allows NVMe SSDs to connect via PCIe and directly manages the CPU for superior RAID performance. Enable NVMe SSD RAID, hot-plugging and LED management features via the VROC connector.



2.24 NVMe RAID LED Control (PEHP1)

Connect to the storage chassis to enable NVMe RAID LED control feature.



Chapter 3

AMI BIOS

3.1 Introduction

The AMI BIOS ROM features a built-in setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS to ensure the setup information is retained when the power is turned off. This chapter explains the basic navigation of the BIOS setup screens.



Note! The BIOS setup screens shown in this chapter are for reference only and may not exactly match what is displayed on your device.



3.2 BIOS Setup

3.2.1 Main Menu

Press during bootup to enter AMI BIOS CMOS Setup Utility; the Main Menu will appear on the screen. Use the arrow keys to select items and press <Enter> to accept or enter the sub-menu.



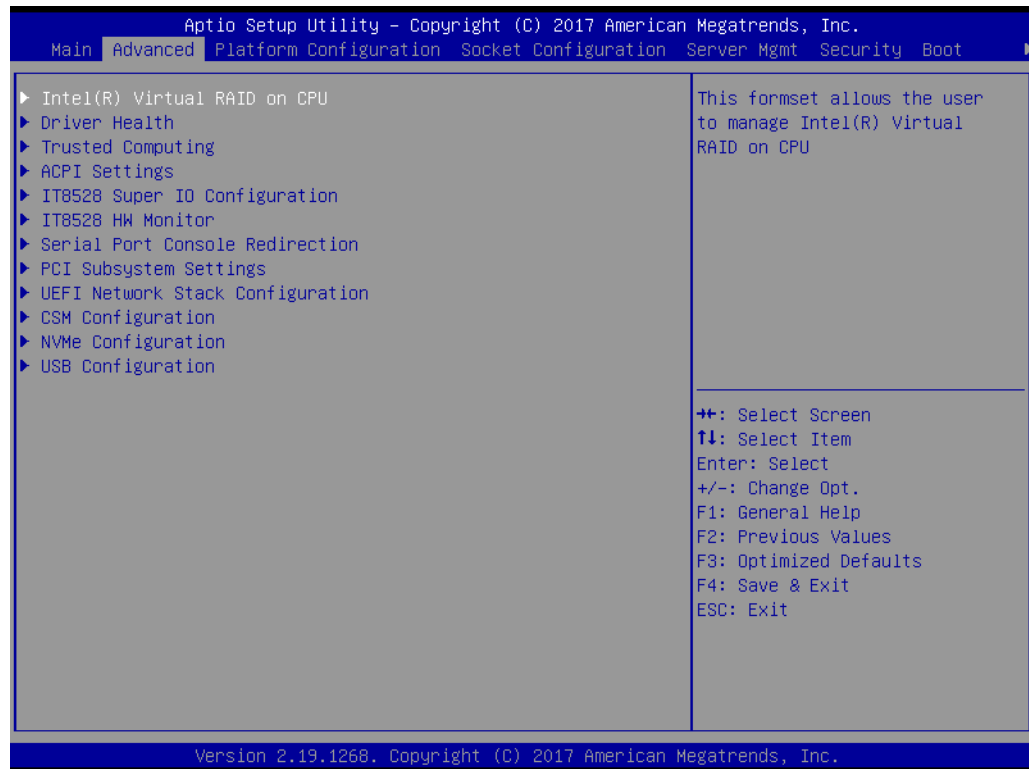
The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can be. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often an accompanying text message will be displayed.

■ System Date/System Time

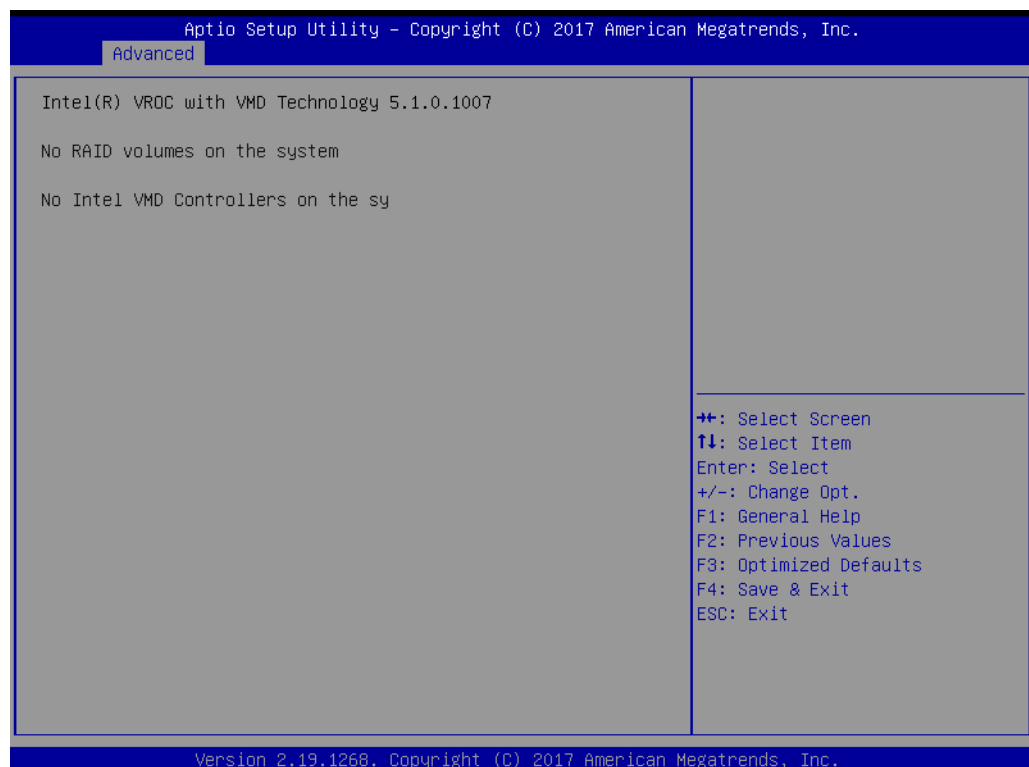
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features Setup

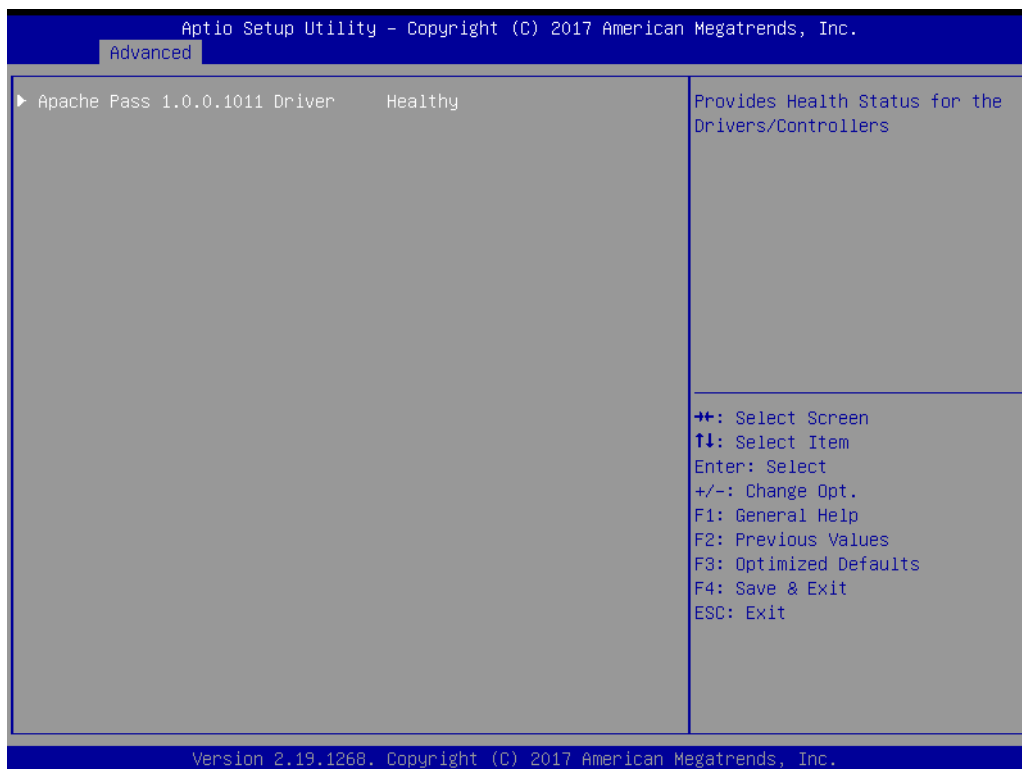
Select the Advanced tab from the BIOS menu to enter the Advanced BIOS setup screen. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.



3.2.2.1 Intel Virtual RAID on CPU



3.2.2.2 Driver Health



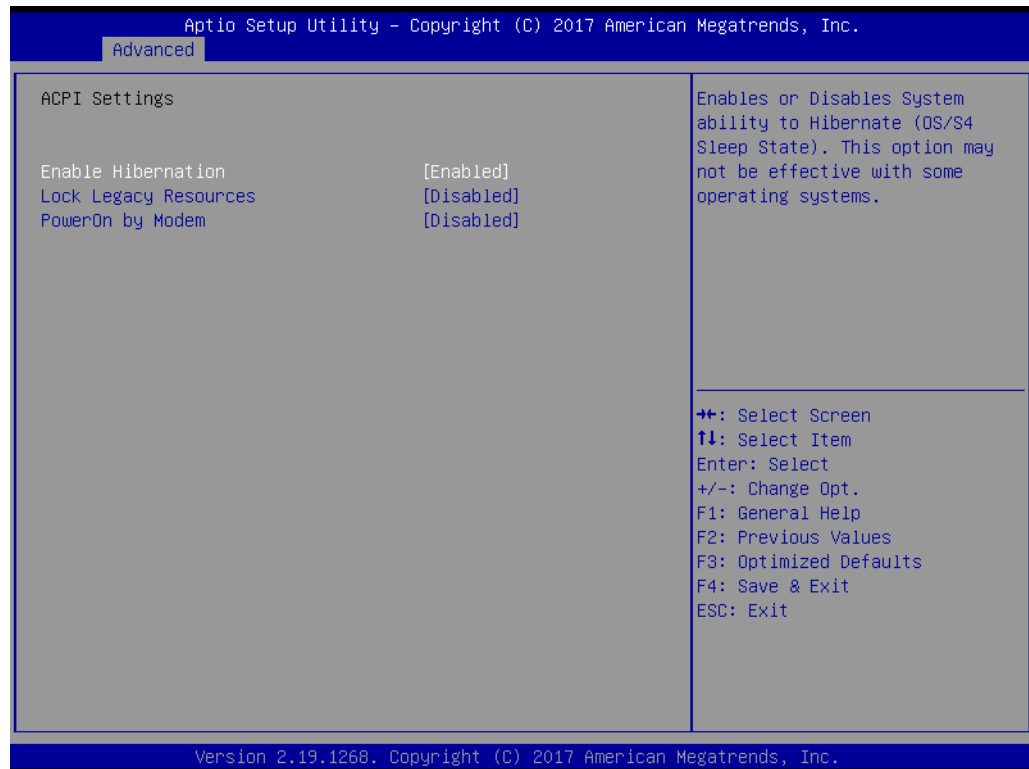
3.2.2.3 Trusted Computing



■ Security Device Support

This item enables/disables BIOS support for security devices.

3.2.2.4 ACPI Settings

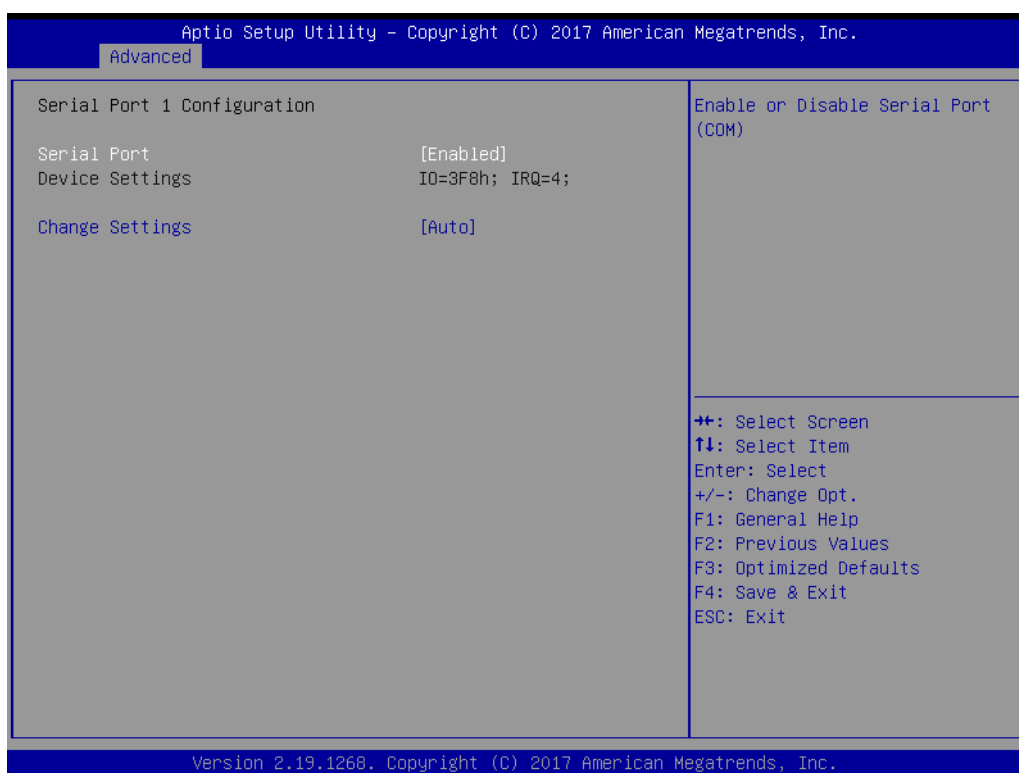


- **Enable Hibernation**
This item enables/disables the hibernation function.
- **Lock Legacy Resources**
This item enables/disables the lock legacy resources function.
- **PowerOn By Modem**
This item enables/disables the power-on-by-modem function.

3.2.2.5 IT8528 EC Super IO Configuration

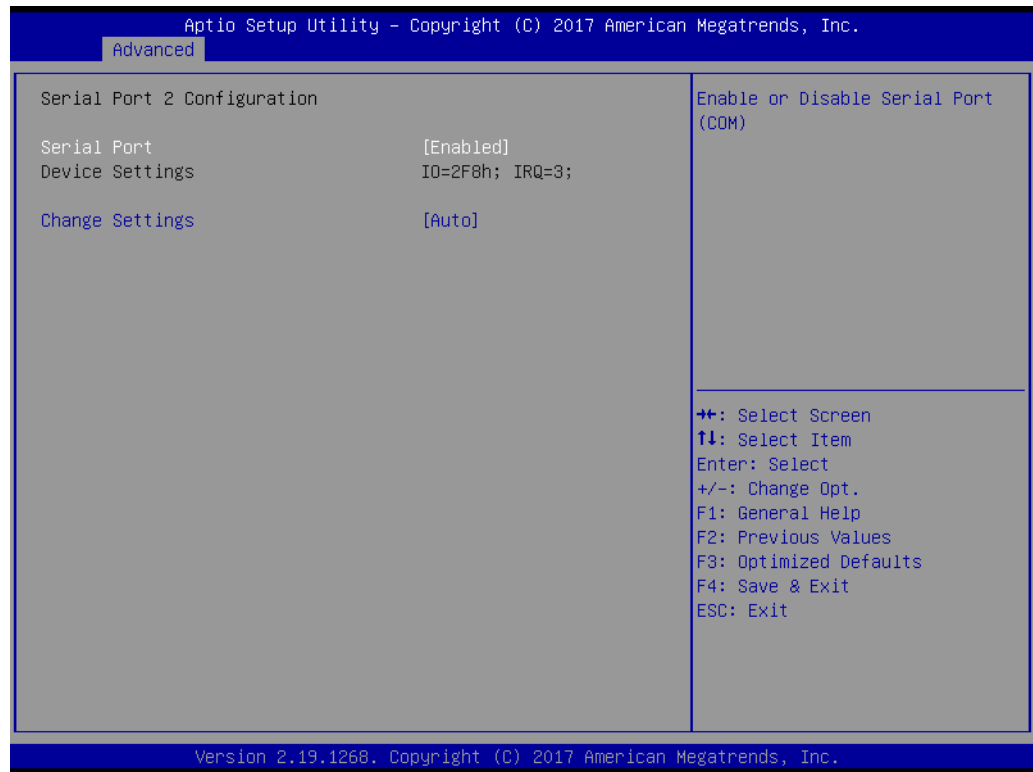


■ Serial Port 1 Configuration



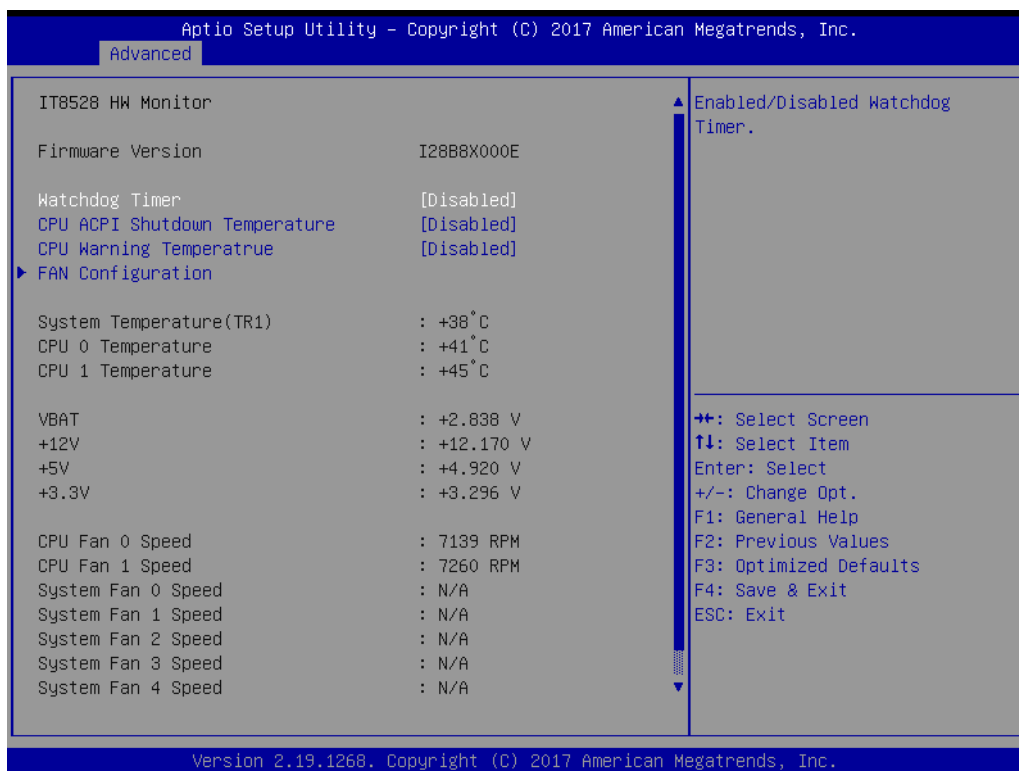
- **Serial Port**
This item enables/disables serial port 1.
- **Change Settings**
This item is used to select the optimal settings for serial port 1.

■ Serial Port 2 Configuration

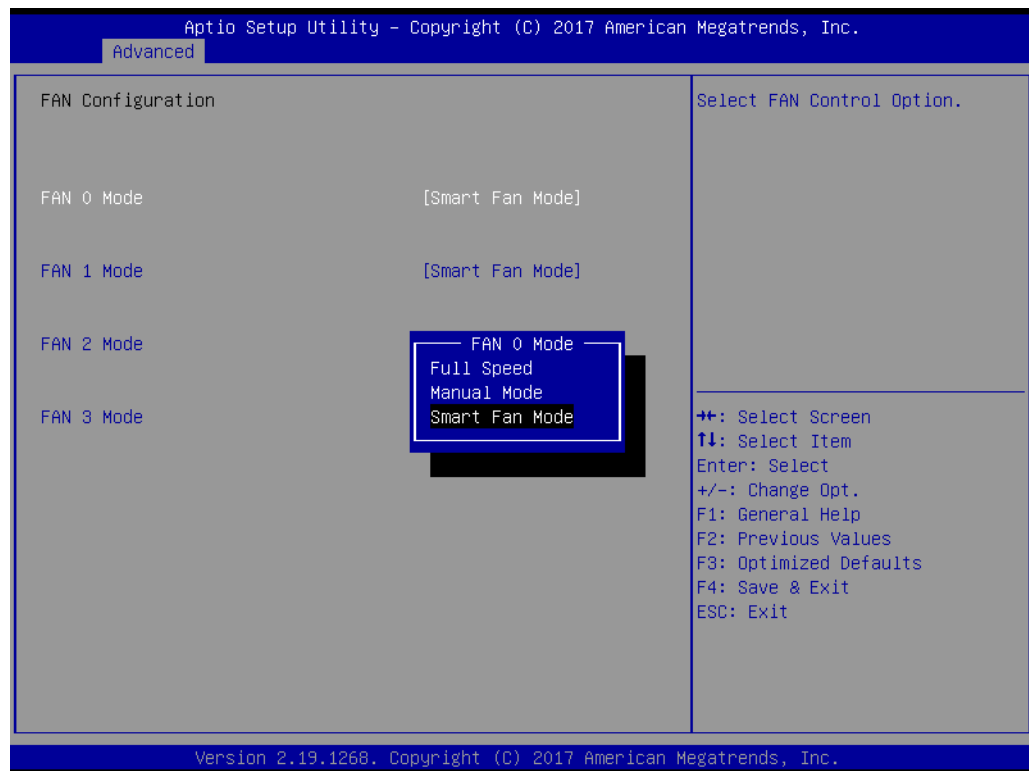


- **Serial Port**
This item enables/disables serial port 2.
- **Change Settings**
This item is used to select the optimal settings for serial port 2.

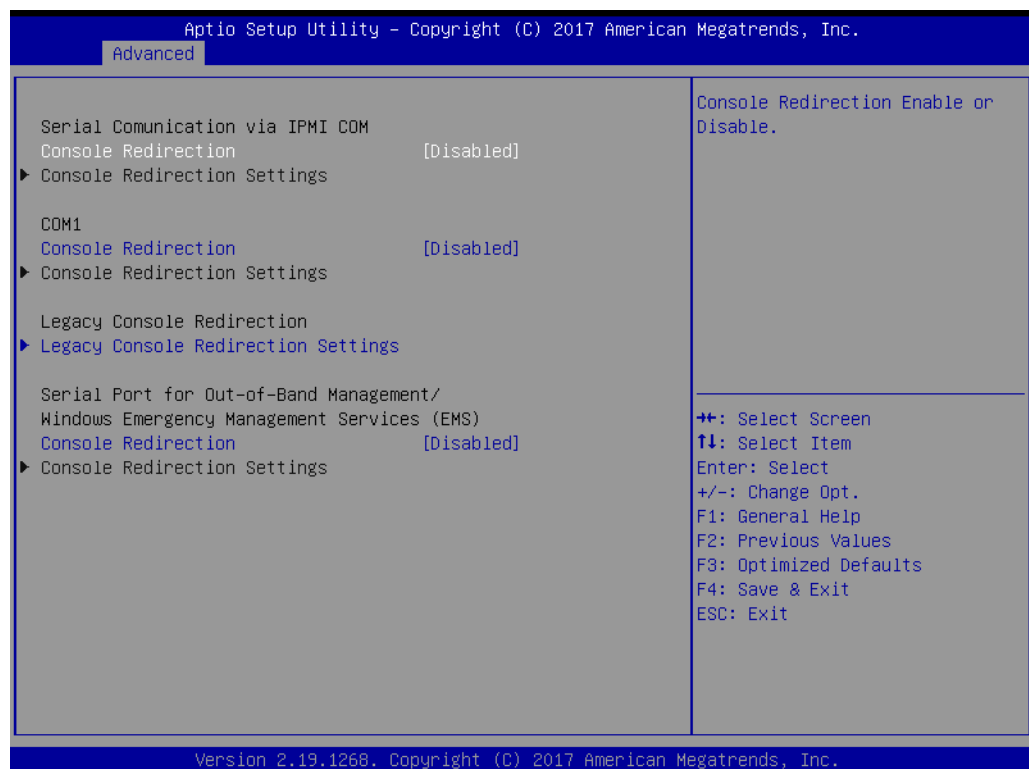
3.2.2.6 IT8528 HW Monitor



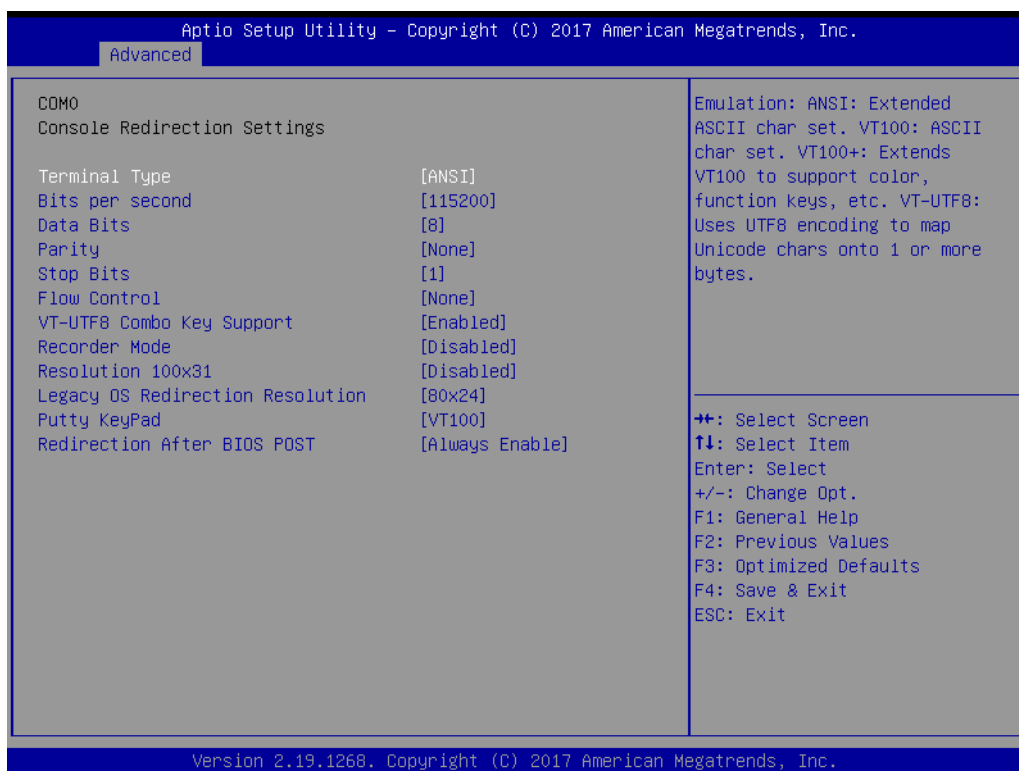
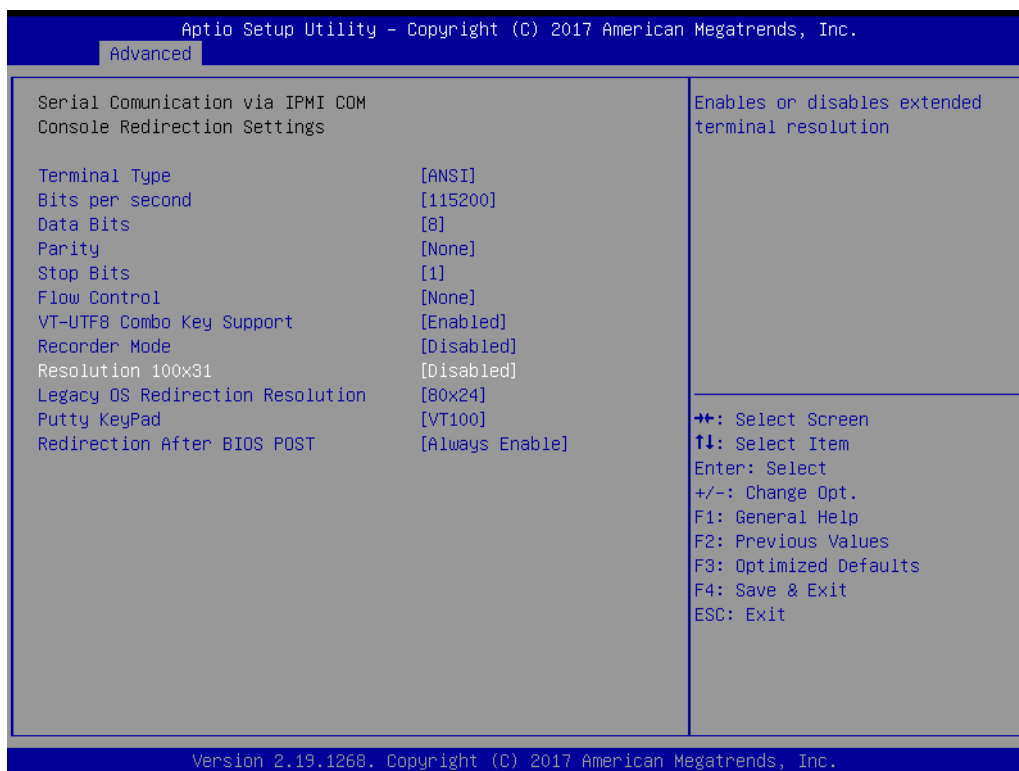
- **Watchdog Timer**
This item enables/disables the watchdog timer function.
- **CPU ACPI Shutdown Temperature**
This item enables/disables the ACPI shutdown temperature threshold. When the system reaches the shutdown temperature, it will automatically be shut down by the ACPI OS to protect the system from overheating.
- **CPU Warning Temperature**
This item enables/disables the CPU warning temperature threshold. When the system reaches the warning temperature, the speaker will emit an audible alert.
- **Fan Configuration**
The default setting for the system fan is Smart Fan mode. The BIOS automatically controls the fan speed according to the CPU temperature.
When set to Manual mode, the fan duty setting can be changed. The range is from 30% to 100%; the default setting is 50%.



3.2.2.7 Serial Port Console Redirection



■ COM1 Console Redirection Settings



– Terminal Type

Select a terminal type to be used for console redirection.

Available options: VT100/VT100+/ANSI/VT-UTF8.

– Bits Per Second

Select the baud rate for console redirection.

Available options: 9600/19200/57600/115200.

- **Data Bits**

- **Parity**

A parity bit can be sent with the data bits to detect transmission errors.

Even: Parity bit is 0 if the number of 1s in the data bits is even.

Odd: Parity bit is 0 if number of 1s in the data bits is odd.

Mark: Parity bit is always 1. Space: Parity bit is always 0.

Mark and space parity do not allow for error detection.

Available options: None/Even/Odd/Mark/Space

- **Stop Bits**

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

Available options: 1/2

- **Flow Control**

Flow control can prevent data losses due to buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. Once the buffers are empty, a “start” signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

Available options: None/Hardware RTS/CTS

- **VT-UTF8 Combo Key Support**

This item enables/disables VT-UTF8 combination key support for ANSI/VT100 terminals.

- **Recorder Mode**

This item enables/disables Recorder mode. When enabled, only text will be sent. This is used for capturing terminal data.

Available options: Enable/disable

- **Resolution 100x31**

This item enables/disables extended terminal resolution.

- **Legacy OS Redirection Resolution**

This item allows users to set the number of rows and columns that support redirection on legacy OS.

Available options: 80 x 24/80 x 25

- **Putty Keypad**

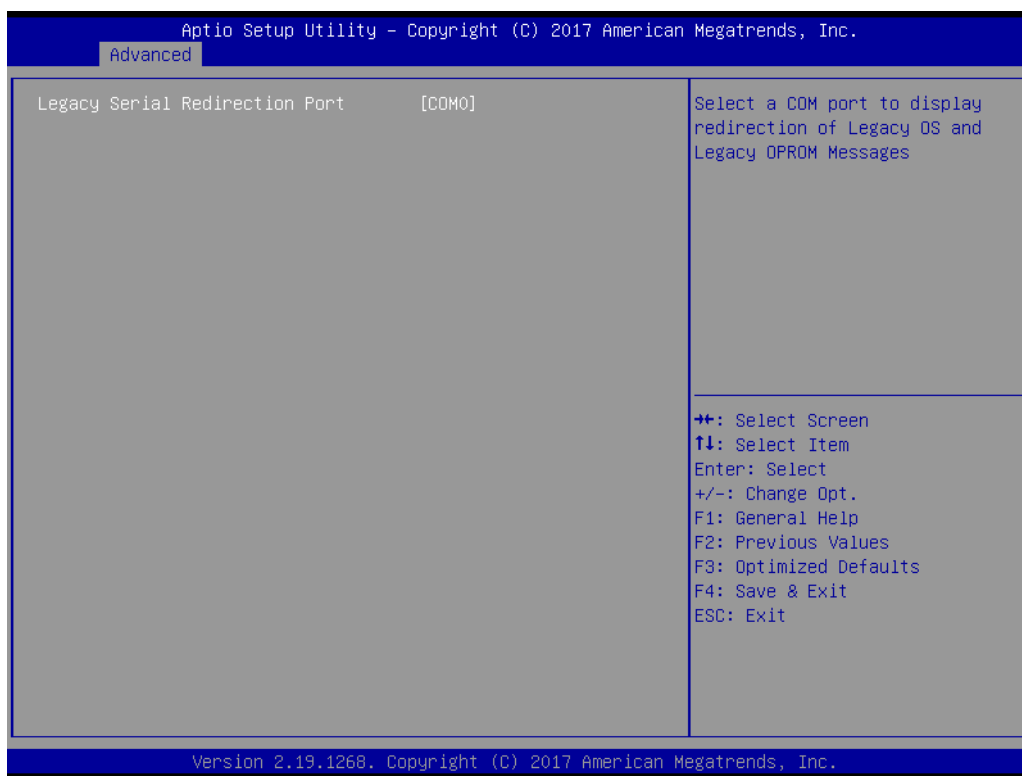
This item allows users to select the function key and keypad on putty.

- **Redirection After BIOS Post**

When Bootloader is selected, legacy console redirection is disabled before booting to legacy OS. When Always Enable is selected, legacy console redirection is enabled for legacy OS. The default setting for this item is Always Enable.

■ Legacy Console Redirection Settings

Select a COM port to display redirection of legacy OS and legacy OPRM messages.



■ Console Redirection Settings

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.

Advanced

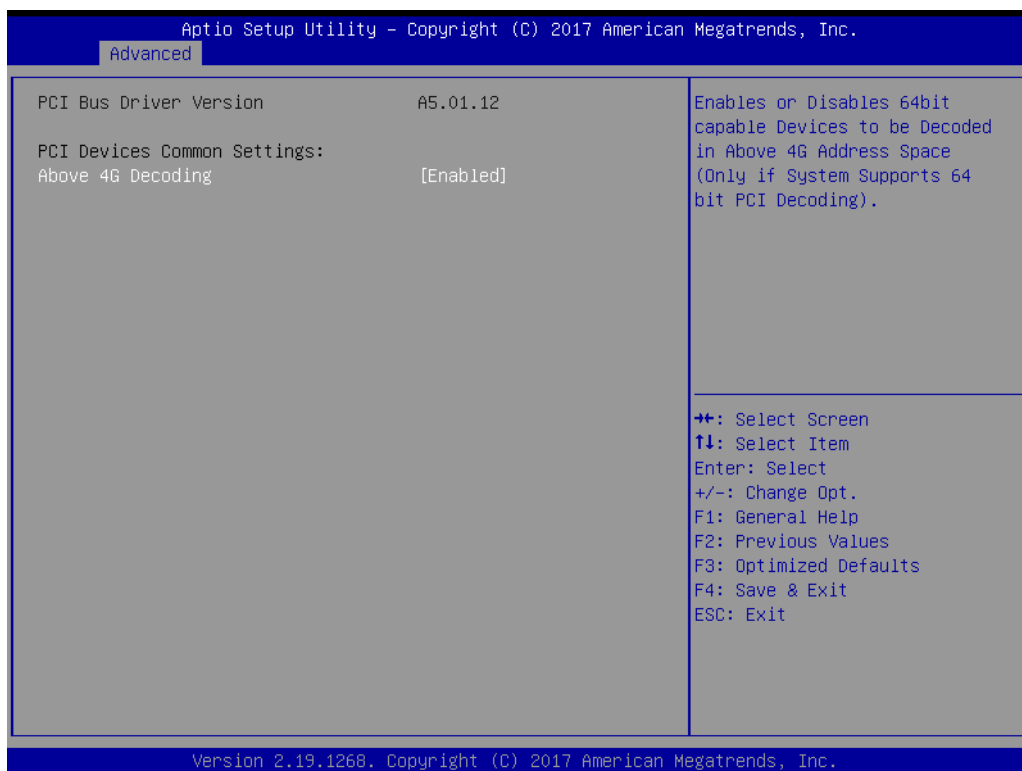
Out-of-Band Mgmt Port	COM0	VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.
Terminal Type	[VT-UTF8]	
Bits per second	[115200]	
Flow Control	[None]	
Data Bits	8	
Parity	None	
Stop Bits	1	

++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

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- **Out-of-Band Mgmt Port**
Select the COM port to allow console redirection.
- **Terminal Type**
Choose between VT100, VT100+, VT-UTF8, and ANSI. The default setting is VT-UTF8.
- **Bits Per Second**
To select serial port transmission, the speed must be matched on the other side. Choose between 9600, 19200, 57600, and 115200. The default setting is 115200.
- **Flow Control**
Flow control can prevent data losses due to buffer overflow. This item can be configured as None, Hardware RTS/CTS, or Software Xon/Xoff. The default setting is None.
- **Data Bits**
- **Parity**
- **Stop Bits**

3.2.2.8 PCI Subsystem Settings



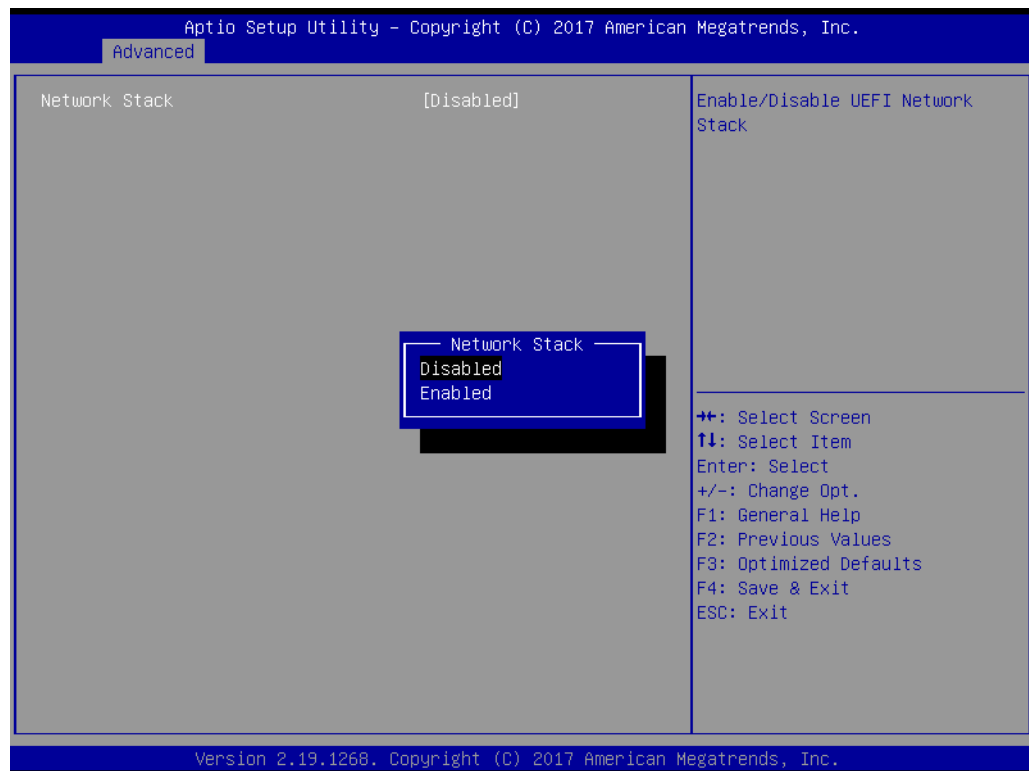
■ Above 4G Decoding

This item enables/disables 64-bit capability. Some devices can be decoded above 4G address space (only if the system supports 64-bit PCI decoding).

Note! For some graphics cards or GPUs, 4G decoding must be enabled.



3.2.2.9 UEFI Network Stack Configuration



■ Network Stack

This item enables/disables the UEFI network stack function.

3.2.2.10 CSM Configuration

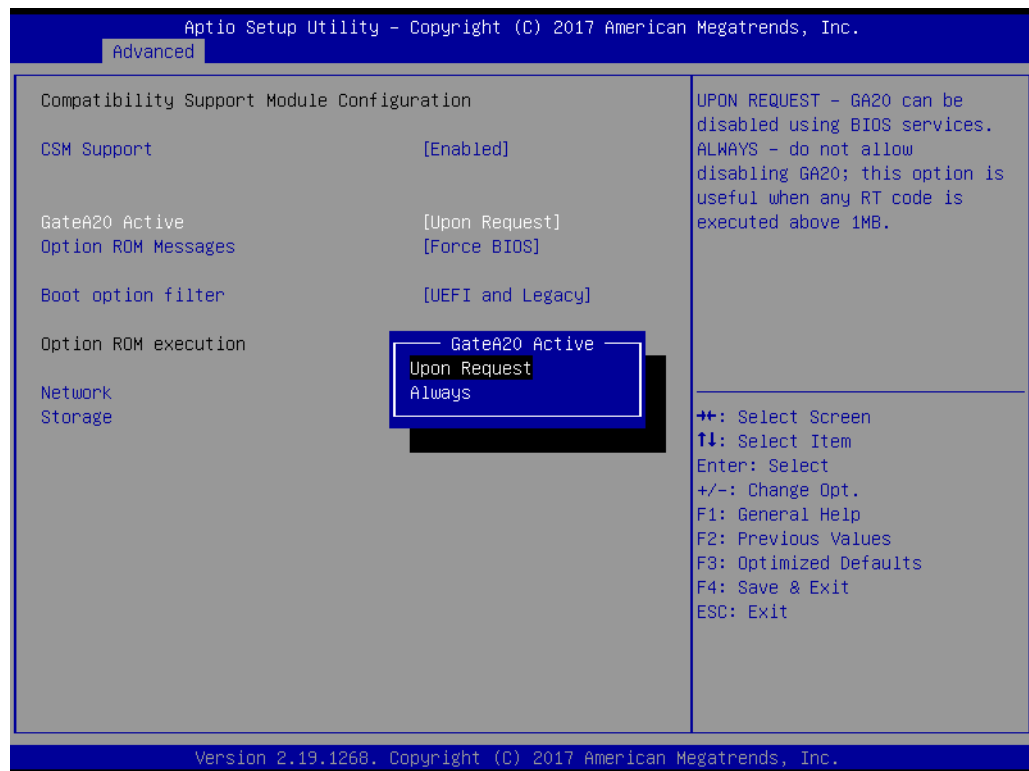


- **CSM Support**

This item enables/disables the UEFI CSM (compatibility support module) from supporting a legacy PC boot process.

- **GateA20 Active**

This item is useful when RT code is executed above 1MB. When set as Upon Request, GA20 can be disabled in the BIOS. When set as Always, disabling of GA20 is not allowed.

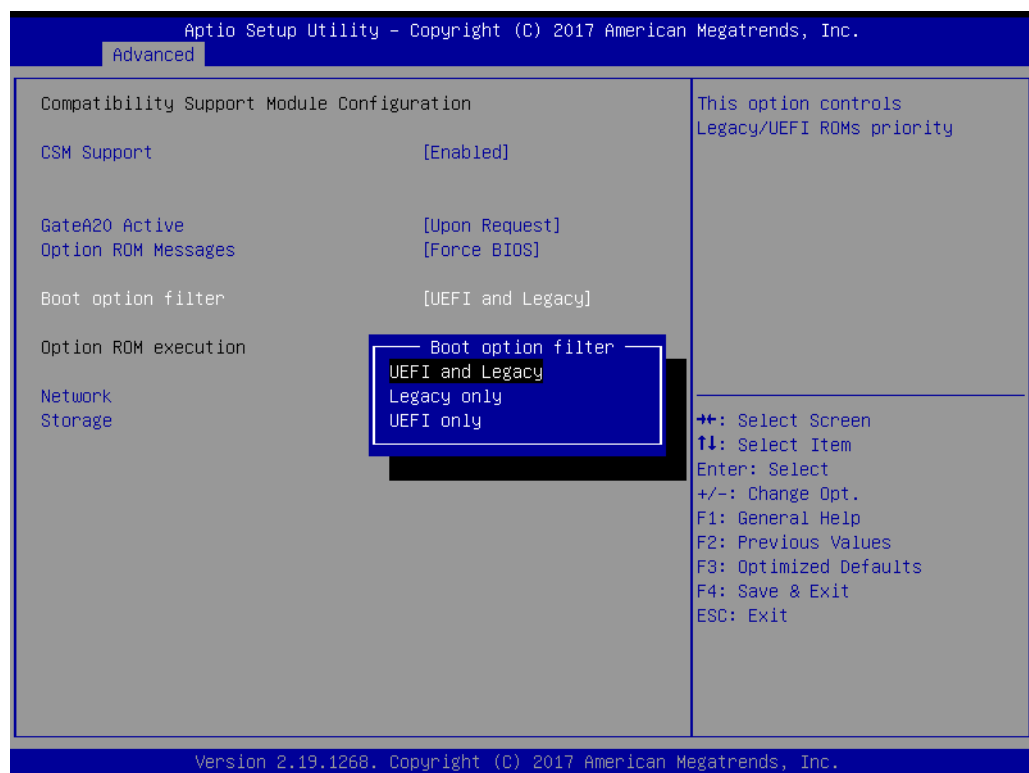


■ Option ROM Messages

This item allows users to set the display mode for Option ROM.

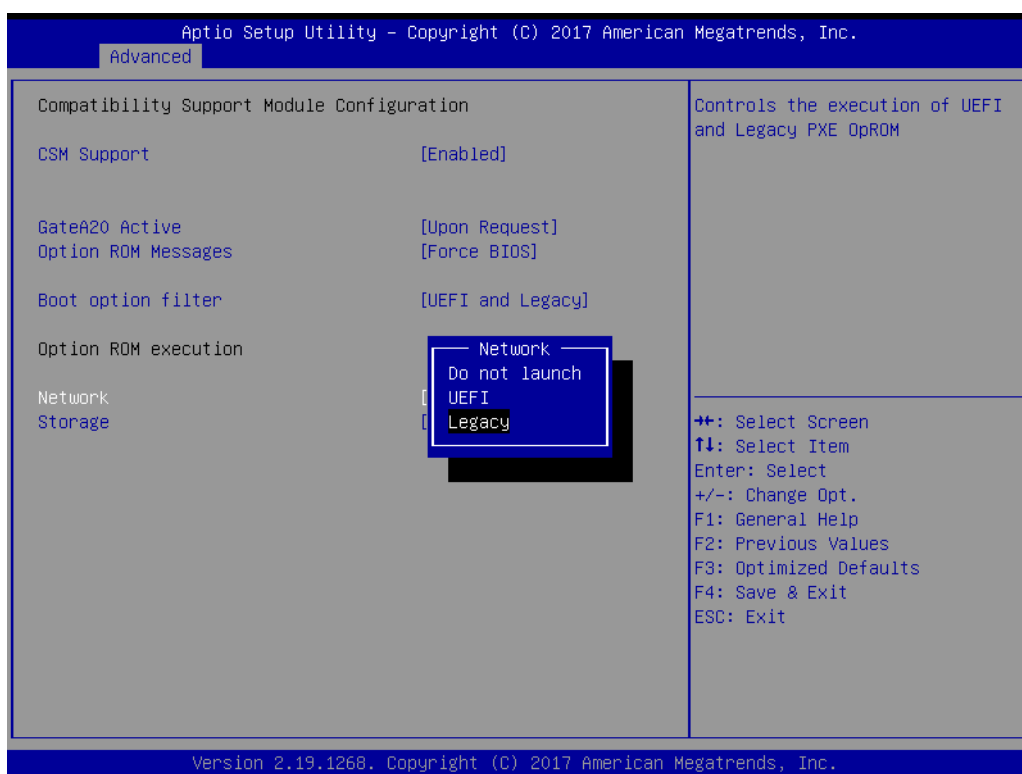
■ Boot Option Filter

This item allows users to change the UEFI/legacy ROM priority for boot option.



■ Network

This item is used to control the execution of UEFI and legacy PXE OpROM.



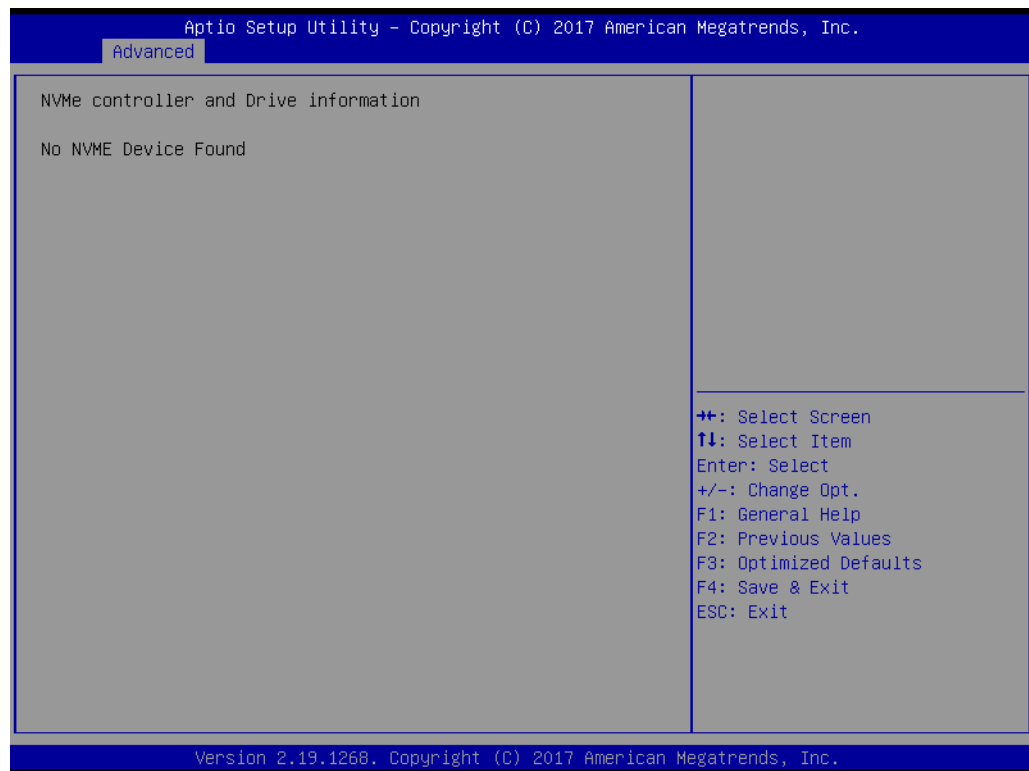
■ Storage

This item is used to control the execution of UEFI and legacy storage OpROM.

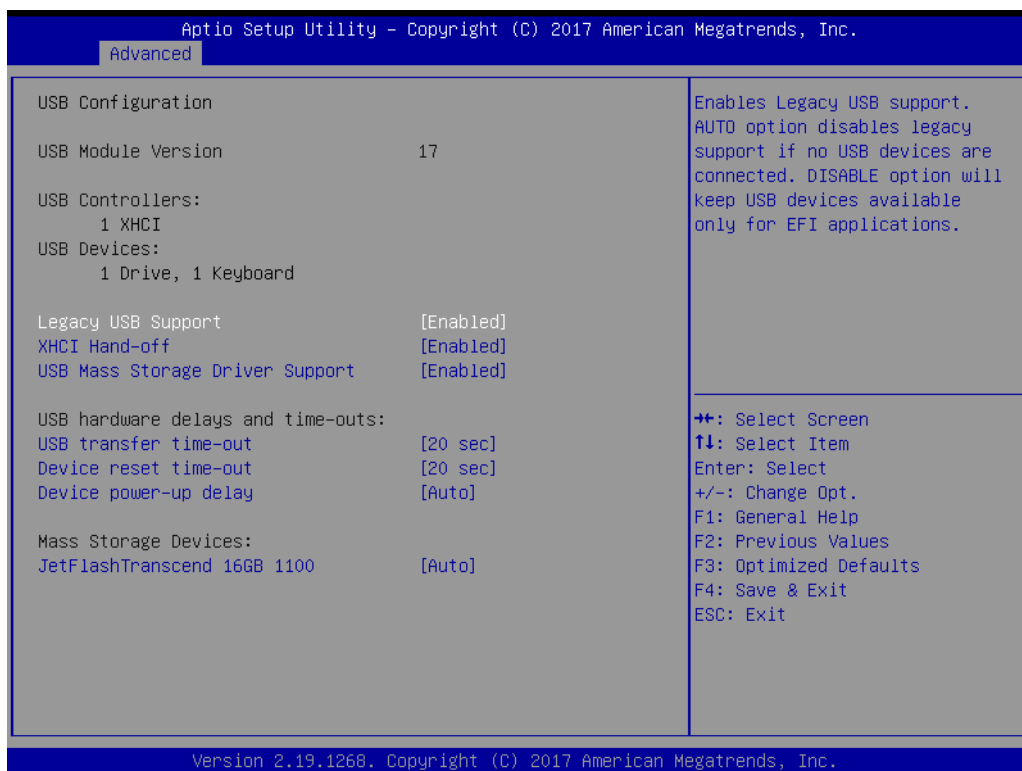


3.2.2.11 NVMe Configuration

Setup NVMe device options.



3.2.2.12 USB Configuration



■ Legacy USB Support

This item is for supporting a USB device under a legacy OS such as DOS. If Auto is selected, the system will automatically detect if a USB device is plugged into the computer and enable it. Disable USB legacy mode when no USB device is attached.

■ XHCI Hand-Off

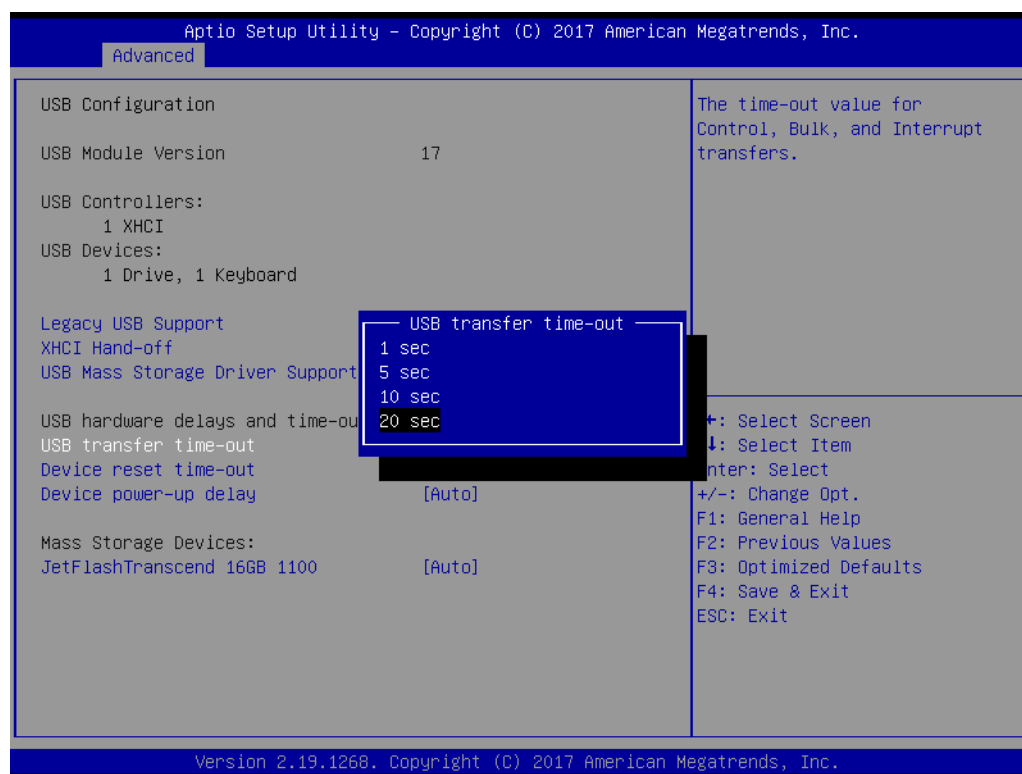
This is a workaround for OS without XHCI hand-off support. The XHCI ownership change should be conducted by the XHCI driver.

■ USB Mass Storage Driver Support

This item enables/disables USB mass storage driver support.

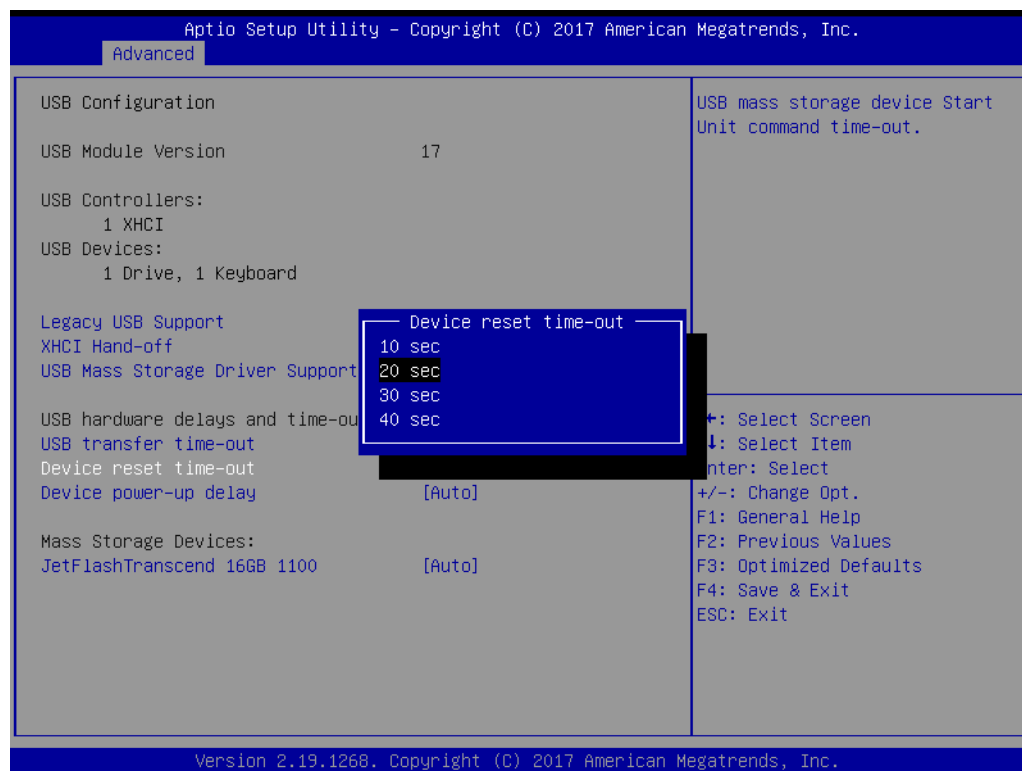
■ USB Transfer Time-out

Set the USB transfer time-out value [1,5,10,20 sec].



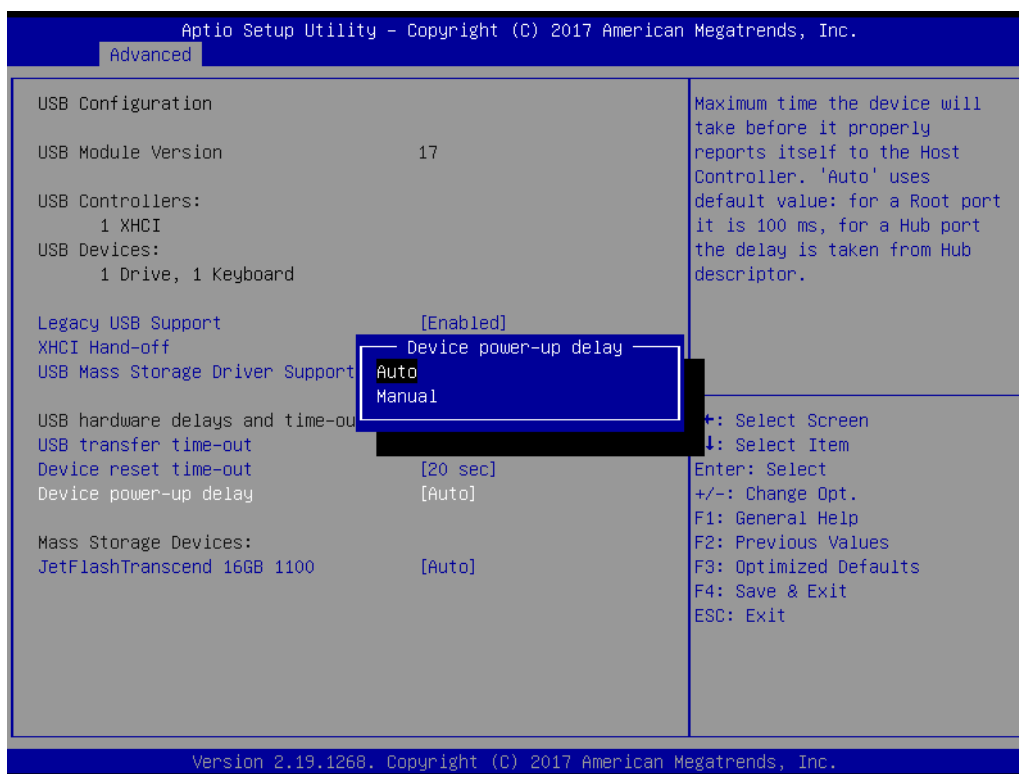
■ Device Reset Time-Out

Set the USB device reset time-out value [10,20,30,40 sec].



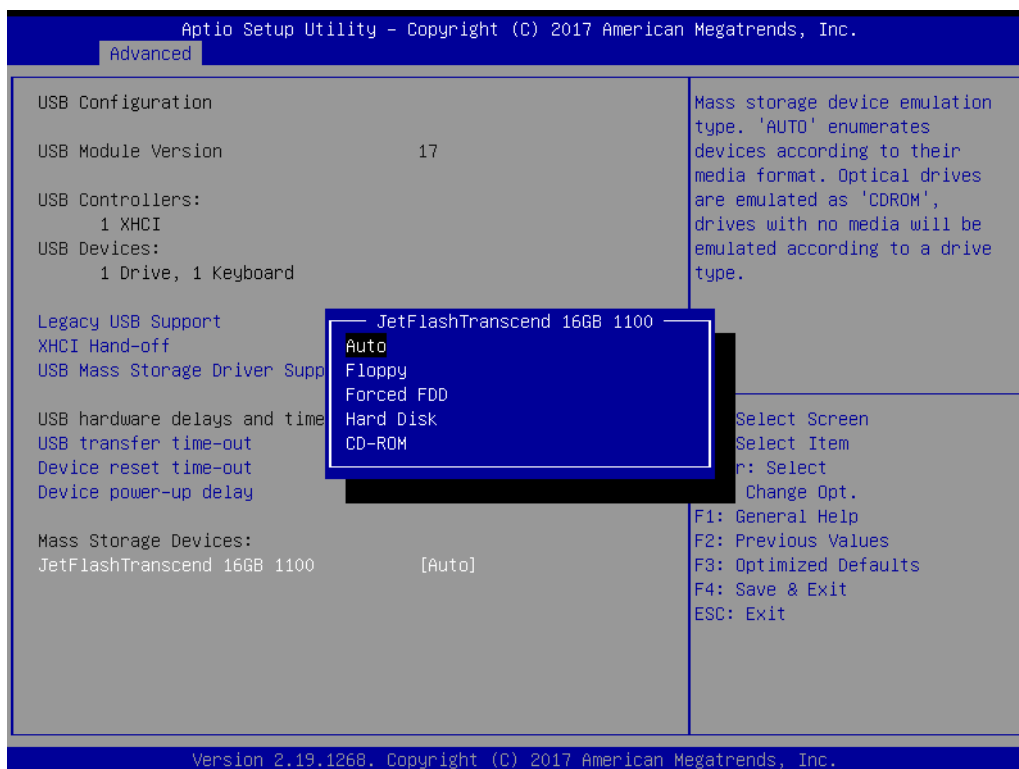
■ Device Power-Up Delay

The delay time can only be configured if device power-up delay is set to Manual.

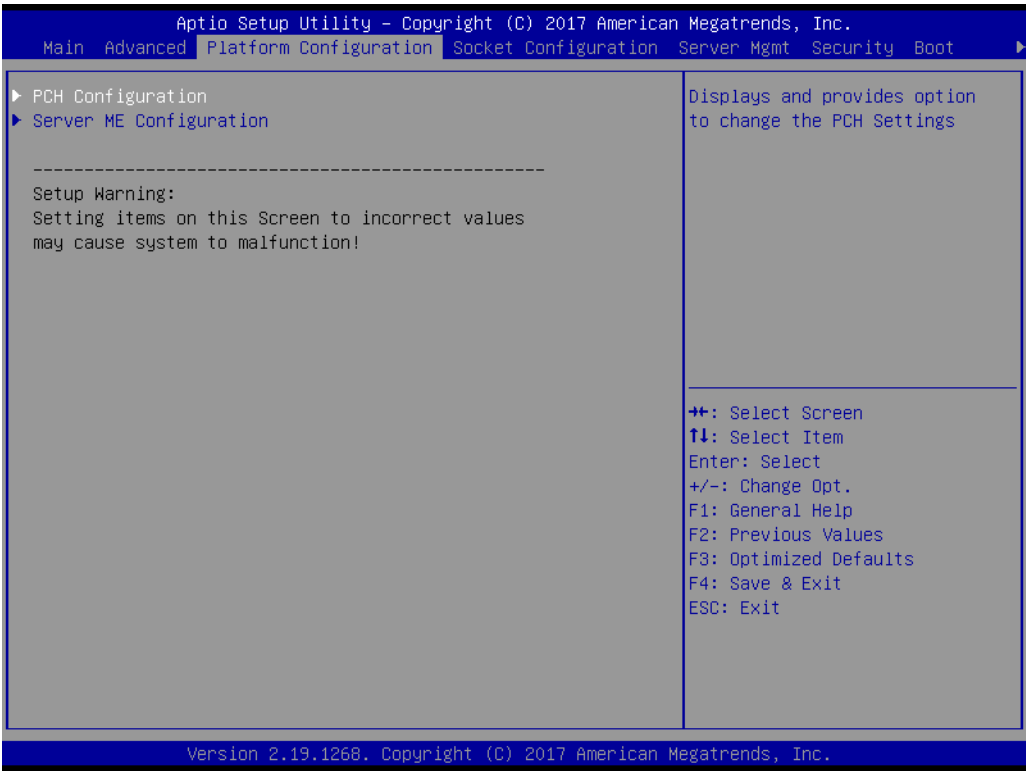


■ Mass Storage Devices

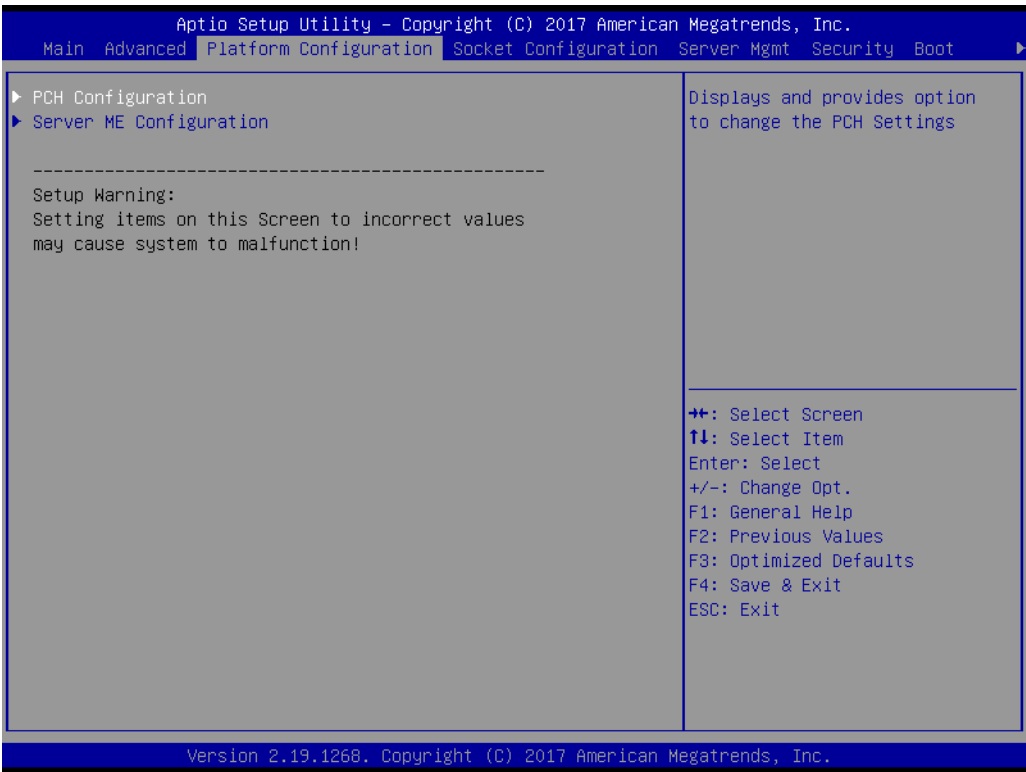
This item is for setting the configuration of mass storage devices. The default setting is Auto.

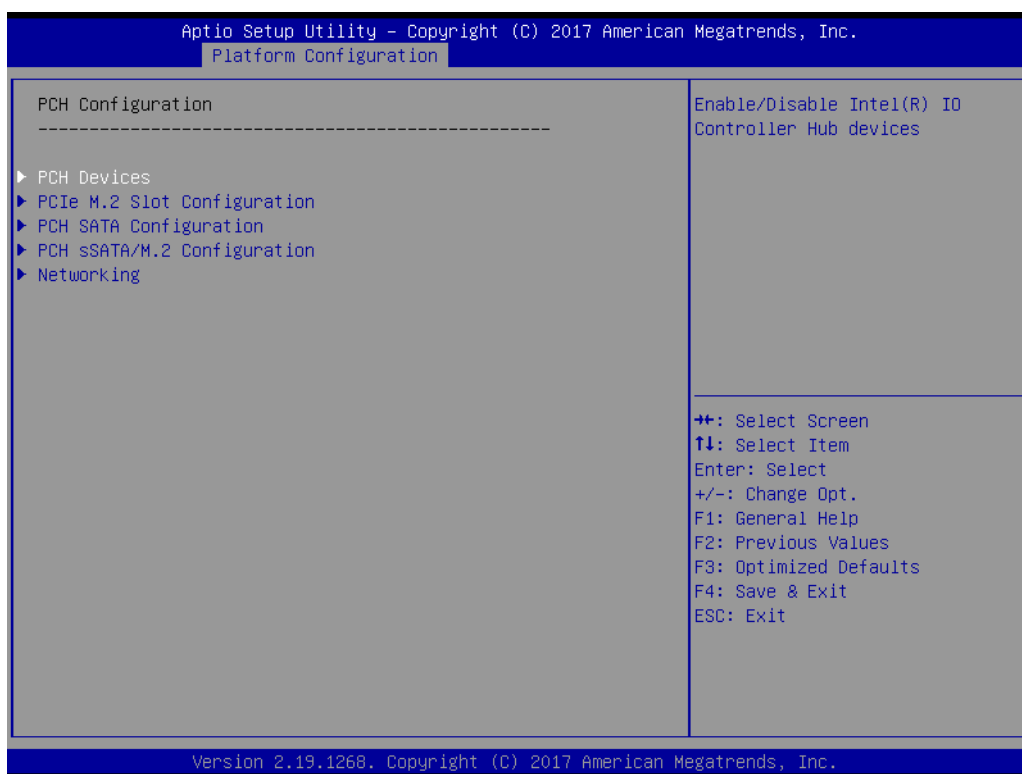


3.2.3 Platform Configuration



3.2.3.1 PCH Configuration



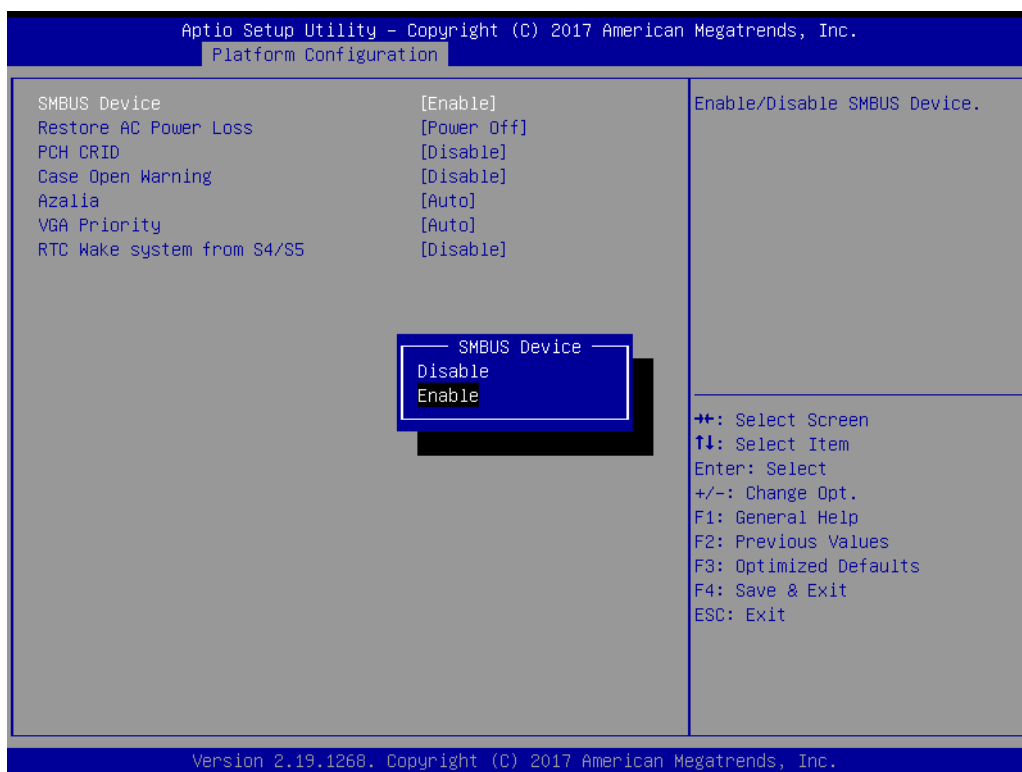


■ PCH Devices

This item is for configuring I/O controller hub devices.

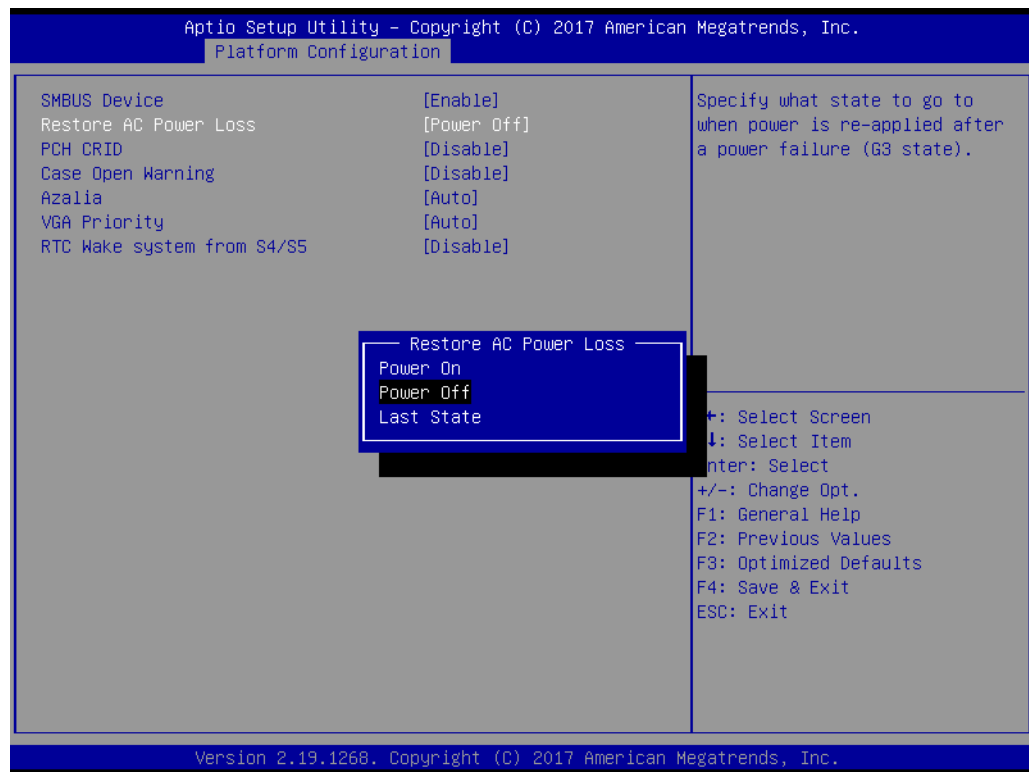
– SMBus Controller

This item enables/disables the SMBus controller.



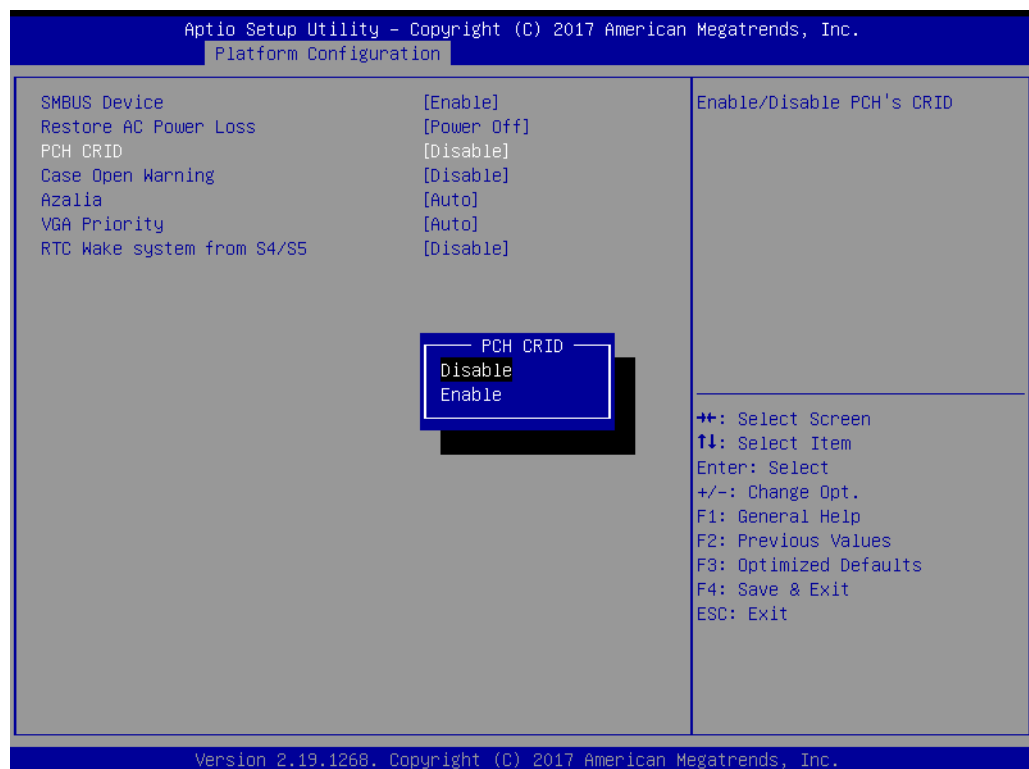
– Restore AC Power Loss

This item allows users to specify the system state when power is restored following a power failure (G3 state).



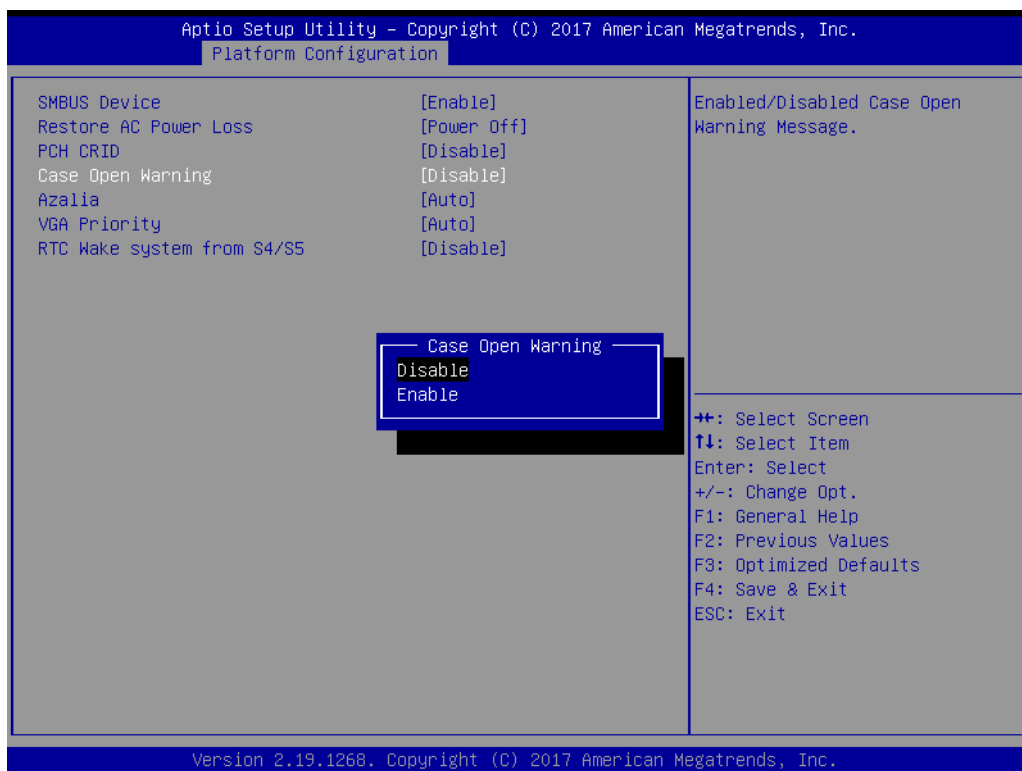
– PCH CRID

This item enables/disables the PCH compatibility revision ID (CRID) function.



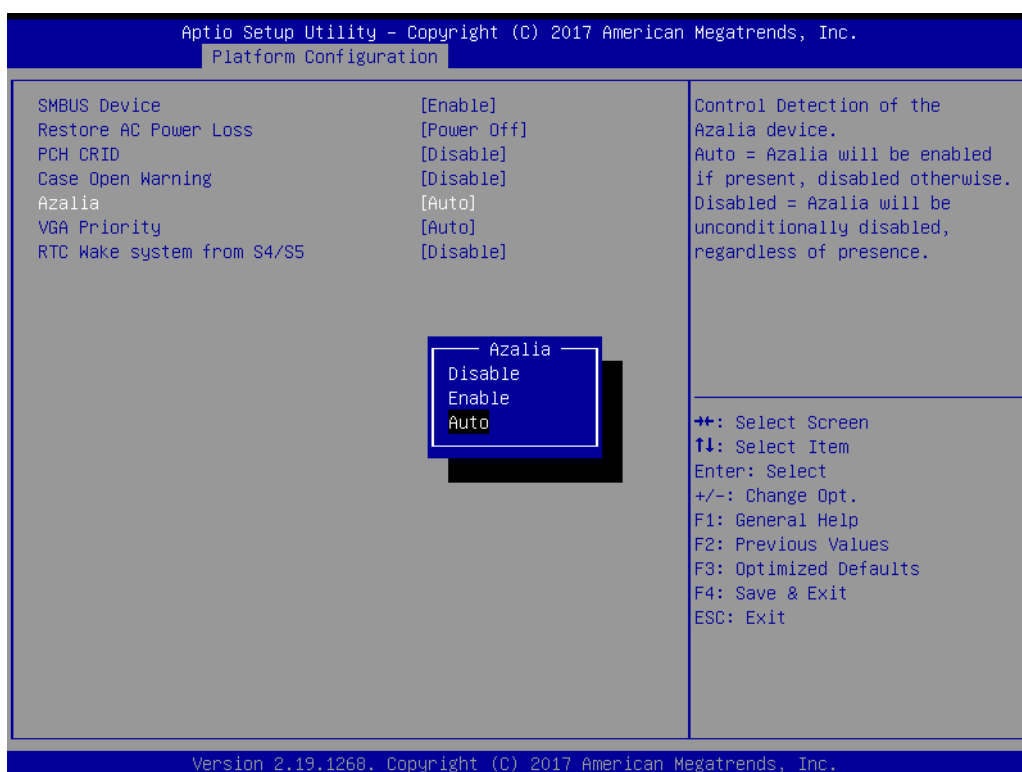
– Case Open Warning

This item enables/disables the chassis intrusion monitoring function. When Enabled and the case is opened, a warning message will be displayed on the POST screen.



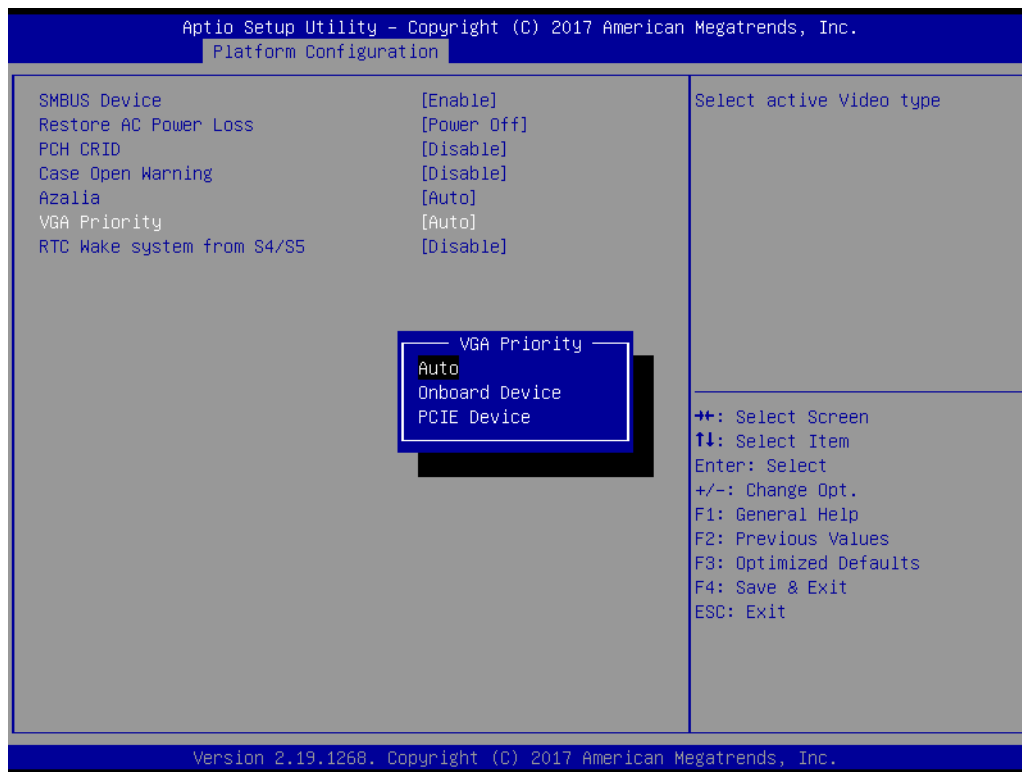
– Azalia

This item enables/disables Azalia devices.



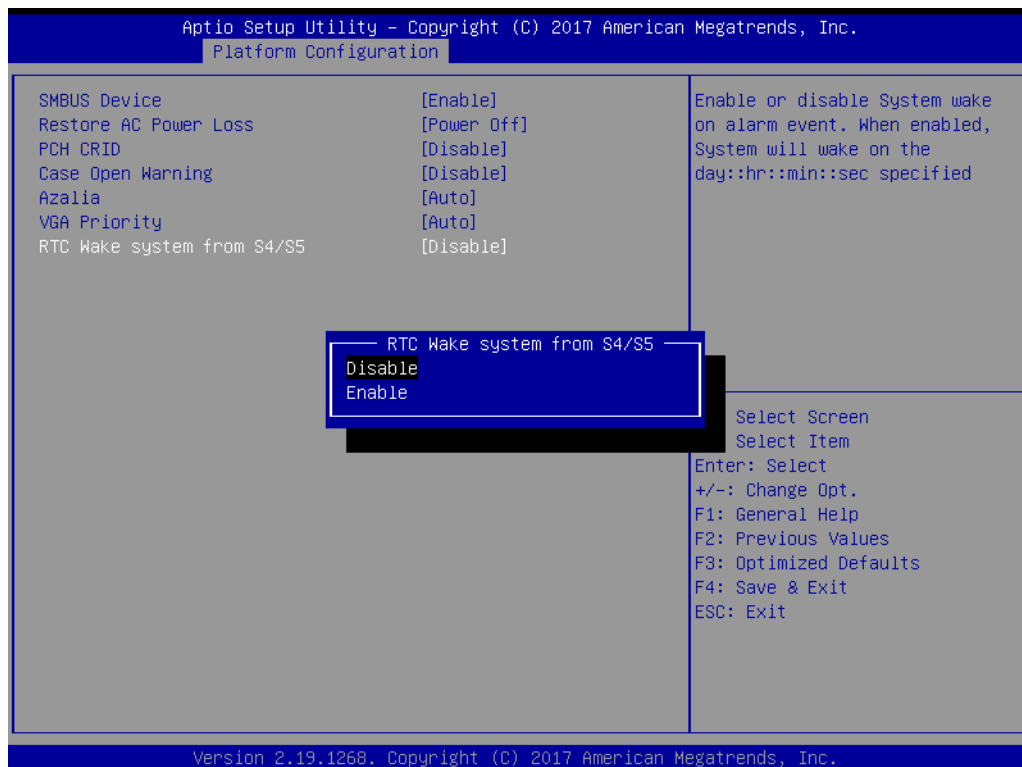
– VGA Priority

This item sets the priority between onboard and first off-board video device found.



– RTC Wake system from S4/S5

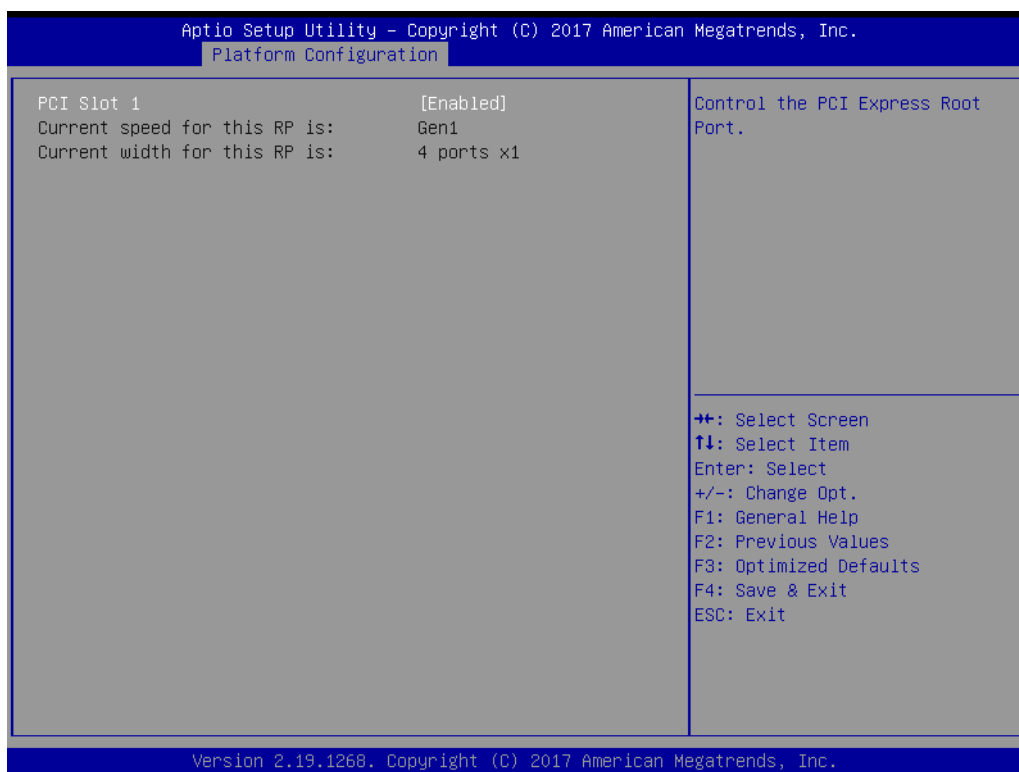
This item enables/disables system wake-on-alarm-event.



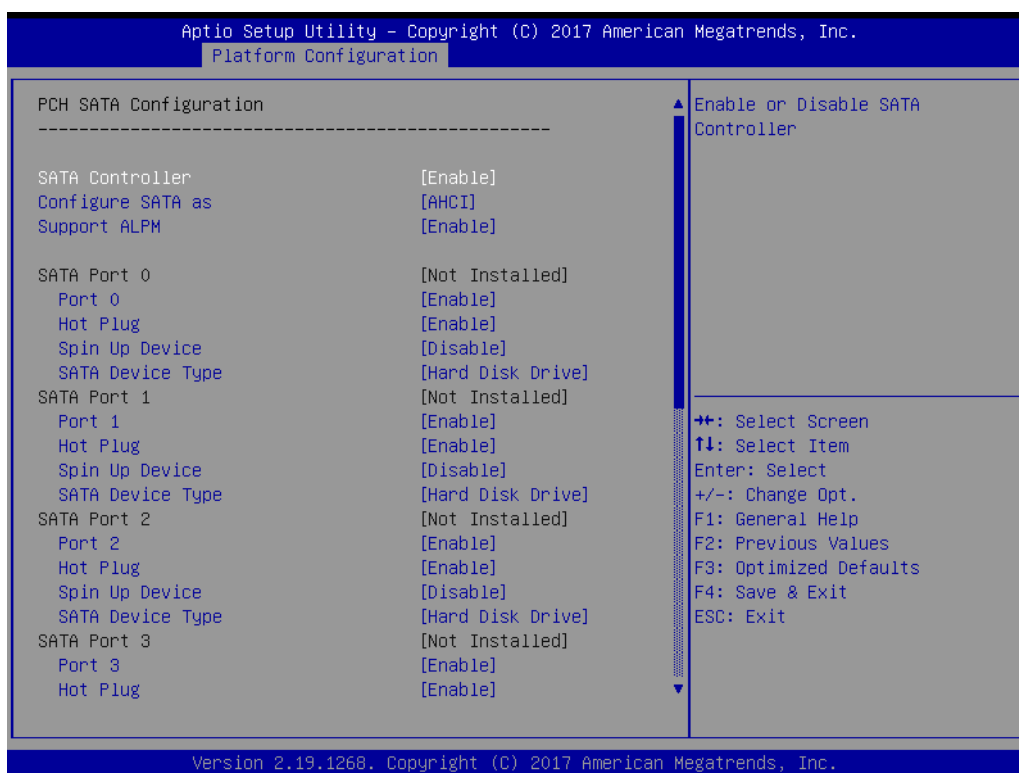
■ PCI Slot 1 Configuration

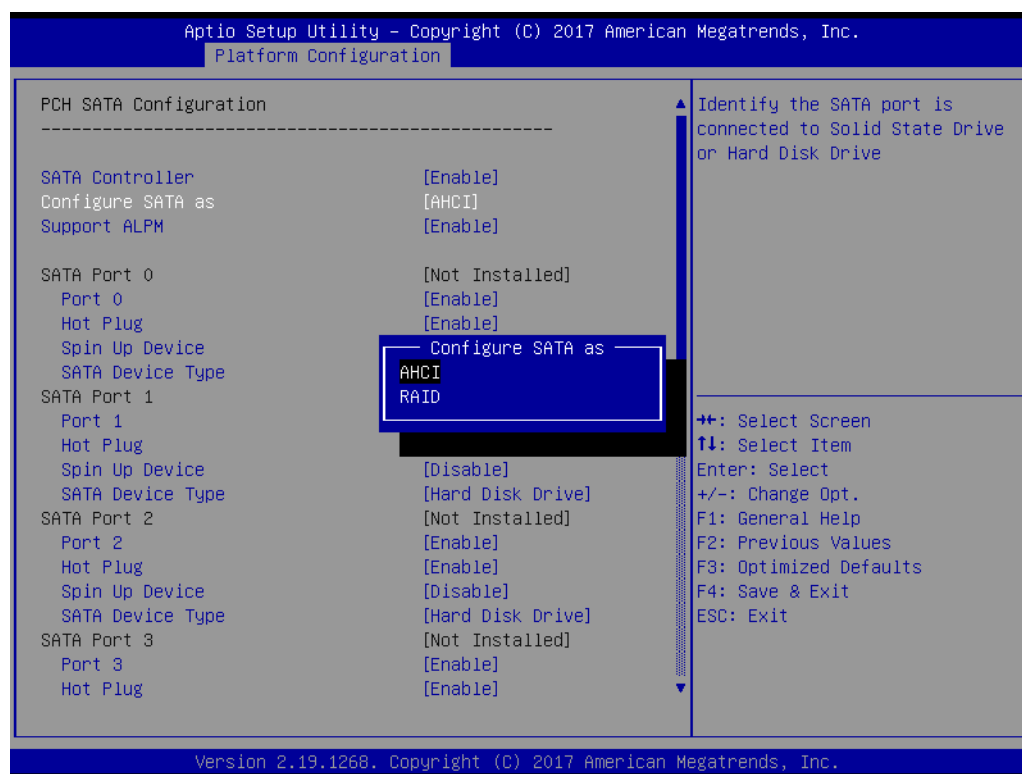
– PCI Slot 1

This item enables/disables the PCI Express root port.



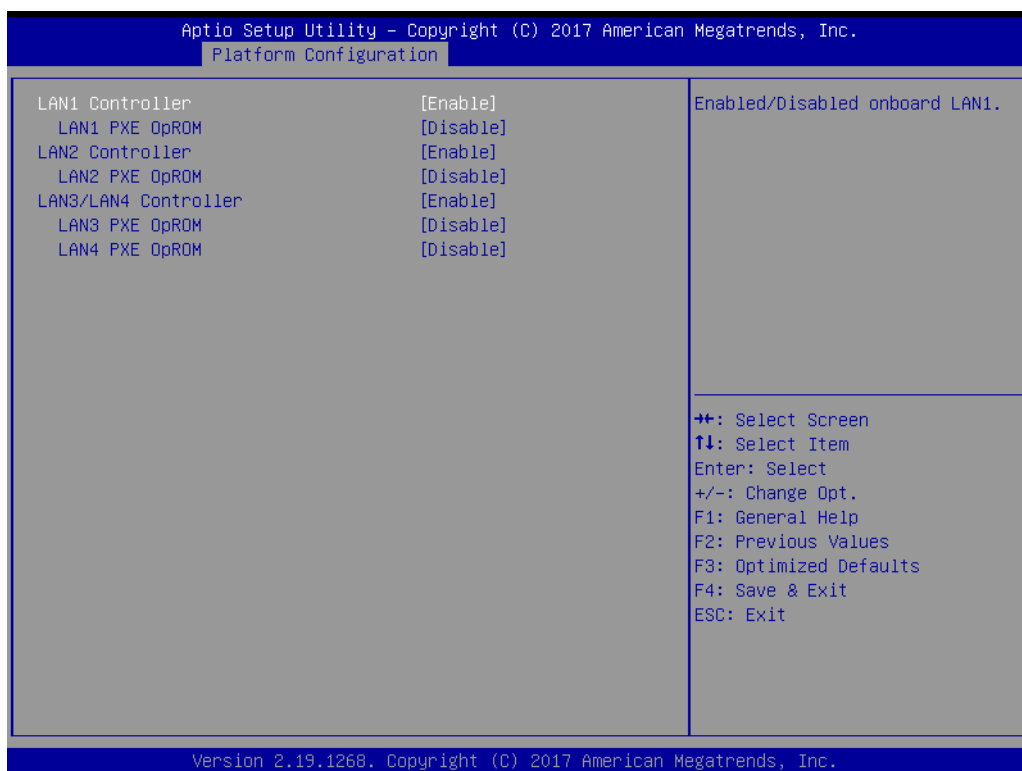
■ PCH SATA Configuration





- **SATA Controller**
This item enables/disables SATA devices.
- **Configure SATA As**
Set as AHCI or RAID when SATA controllers are enabled.
- **Support ALPM**
This item enables/disables the ALPM protocol for Advanced Host Controller Interface-compliant SATA devices.
- **SATA Port 0~7**
This item enables/disables SATA ports 0 ~ 7.
- **Hot Plug Port 0~7**
This item designates SATA ports 0 ~ 7 as supporting hot plugging.
- **SATA Port 0~7 Spin Up Device**
On an edge detection from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.
- **SATA Port 0~7 Device Type**
This item is used to identify if the SATA is connected to an SSD or HDD.

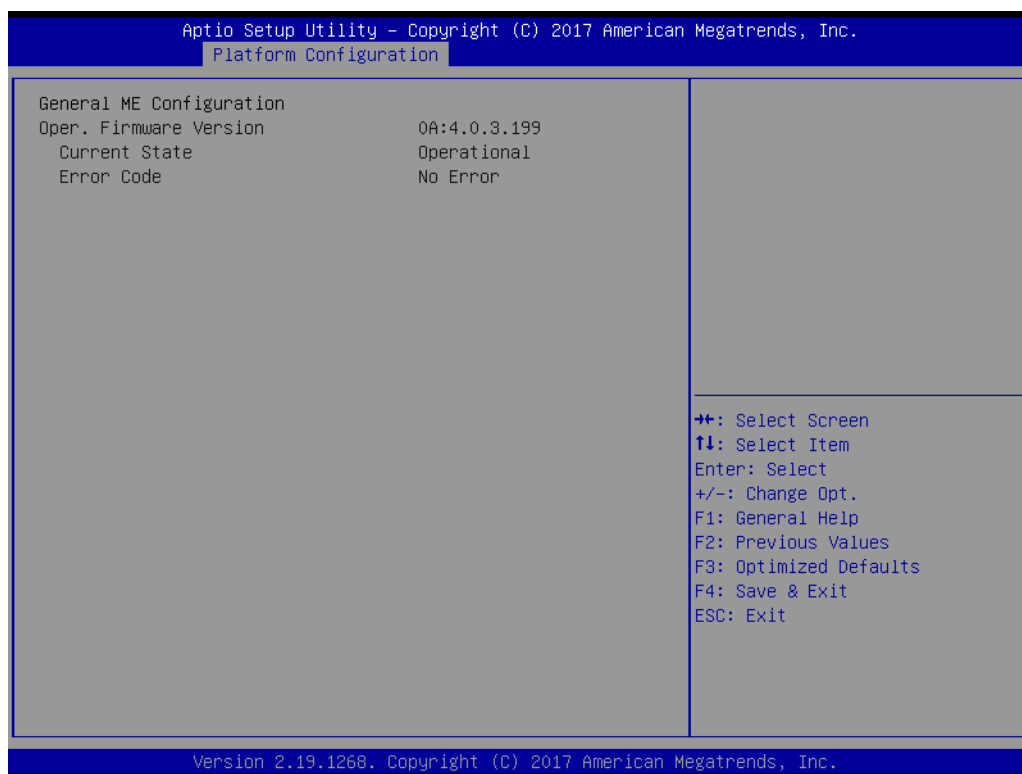
■ Networking



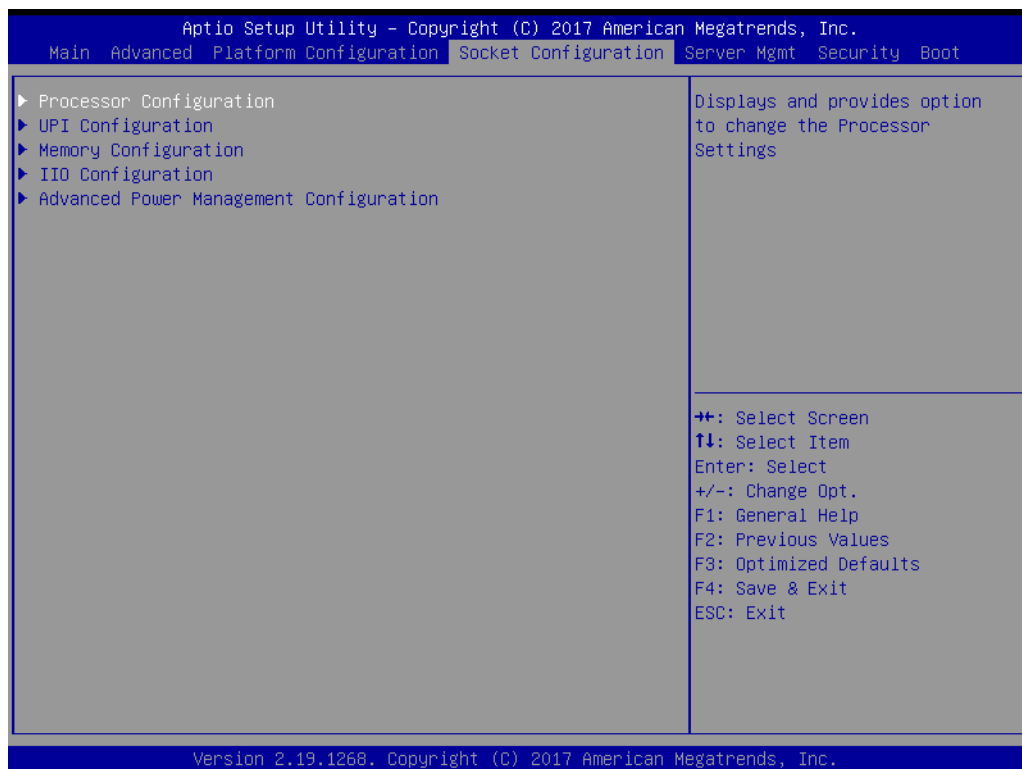
- **LAN1 Controller**
This item enables/disables Intel® I210 controller support.
- **LAN1 PXE OpROM**
This item enables/disables boot option for Intel® I210 controller.
- **LAN2 Controller**
This item enables/disables Intel® I210 controller support.
- **LAN2 PXE OpROM**
This item enables/disables boot option for Intel® I210 controller.
- **LAN3/LAN4 Controller**
This item enables/disables Intel® X557 controller support.
- **LAN3 PXE OpROM**
This item enables/disables boot option for Intel® X557 controller.
- **LAN4 PXE OpROM**
This item enables/disables boot option for Intel® X557 controller.

3.2.3.2 Server ME Configuration

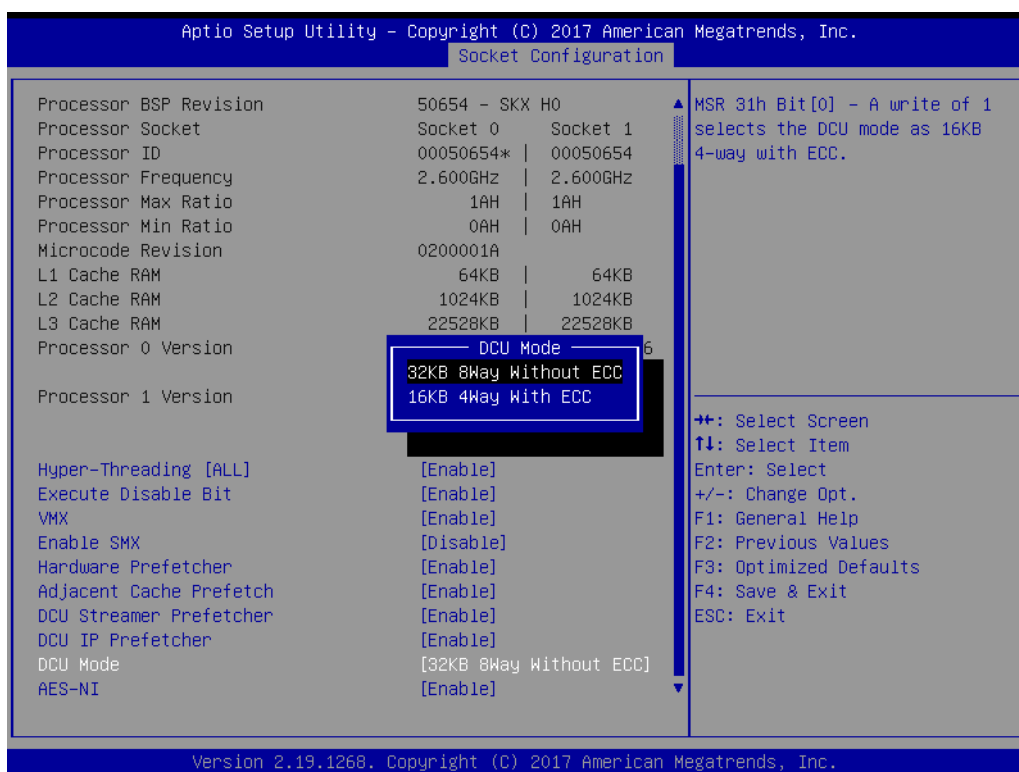
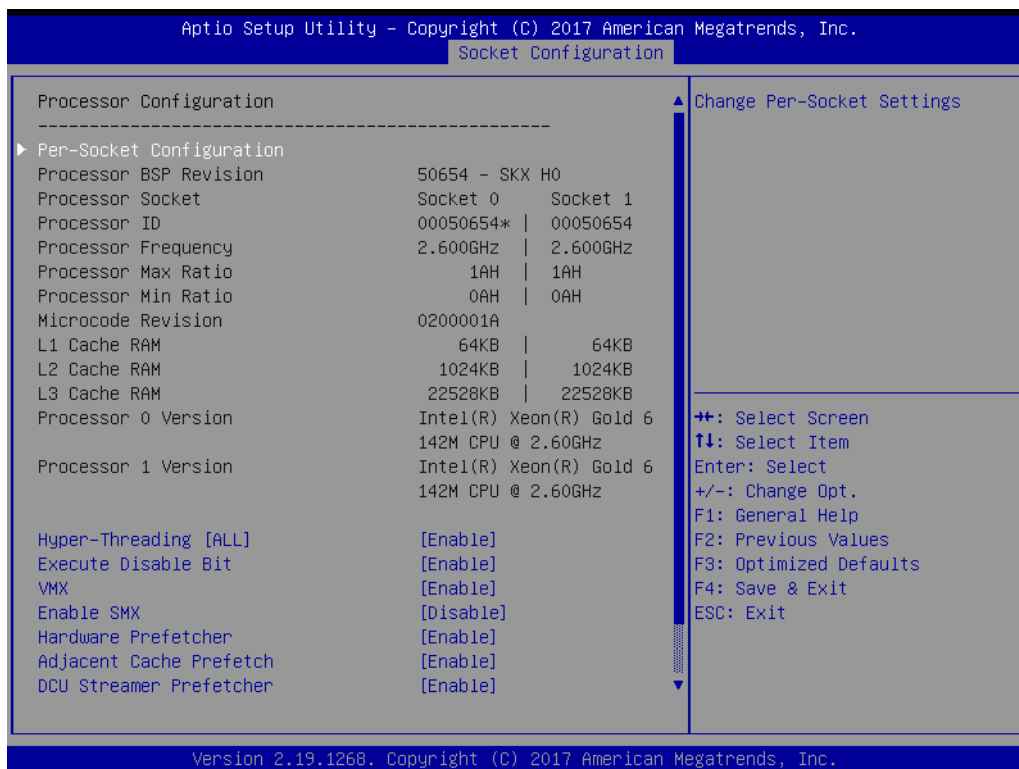
This page shows the Server ME configuration information.



3.2.4 Socket Configuration



3.2.4.1 Processor Configuration



■ Per-Socket Configuration

This item is used to select the number of processor cores to activate when using a dual or quad-core processor.

■ Hyper-Threading [All]

This item enables/disables Intel® Hyper-Threading technology.

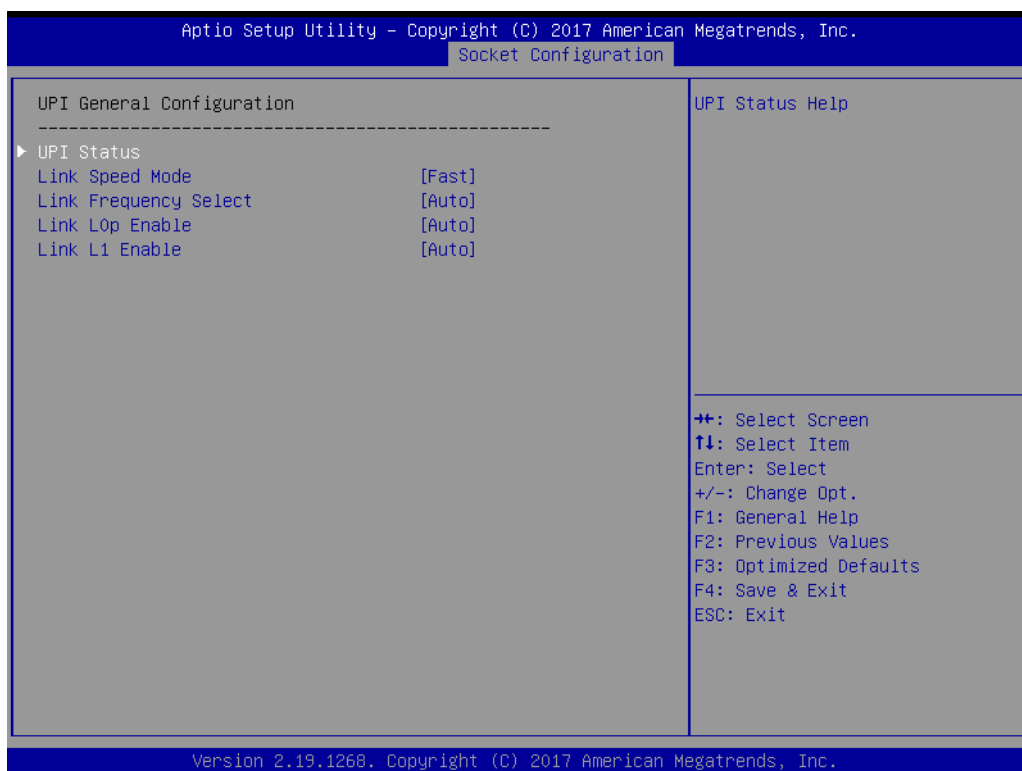
-
- **Execute Disable Bit**
This item enables/disables the Execute Disable Bit function. The Optimal and Fail-Safe default setting is Enabled. If disabled, the BIOS forces the XD feature flag to always return to 0.
 - **VMX**
This item enables/disables Intel® Virtual Machine Extensions (VMX) for IA-32 processors that support Intel® Vanderpool Technology.
 - **Enable SMX**
This item enables/disables safer mode extensions (SMX). SMX provides a means for system software to launch an MLE and establish a measured environment within the platform to support trust decisions by end users.
 - **Hardware Prefetcher**
Hardware Prefetcher is a technique that retrieves instructions and/or data from memory and uploads it to the CPU cache memory before the CPU needs it for improved load-to-use latency.
 - **Adjacent Cache Prefetch**
The Adjacent Cache-Line Prefetch mechanism, like automatic Hardware Prefetching, operates without programmer intervention. When enabled, two 64-byte cache lines are fetched into a 128-byte sector, regardless of whether the additional cache line has been requested or not.
 - **DCU Streamer Prefetcher**
This item enables/disables prefetching of the next L1 data line based on multiple loads in same cache line.
 - **DCU IP Prefetcher**
This item enables/disables prefetching of the next L1 line based on sequential load history.
 - **DCU Mode**
This item is used to change the data cache unit mode.
 - **AES-NI**
This item enables/disables CPU advanced encryption standard instructions.

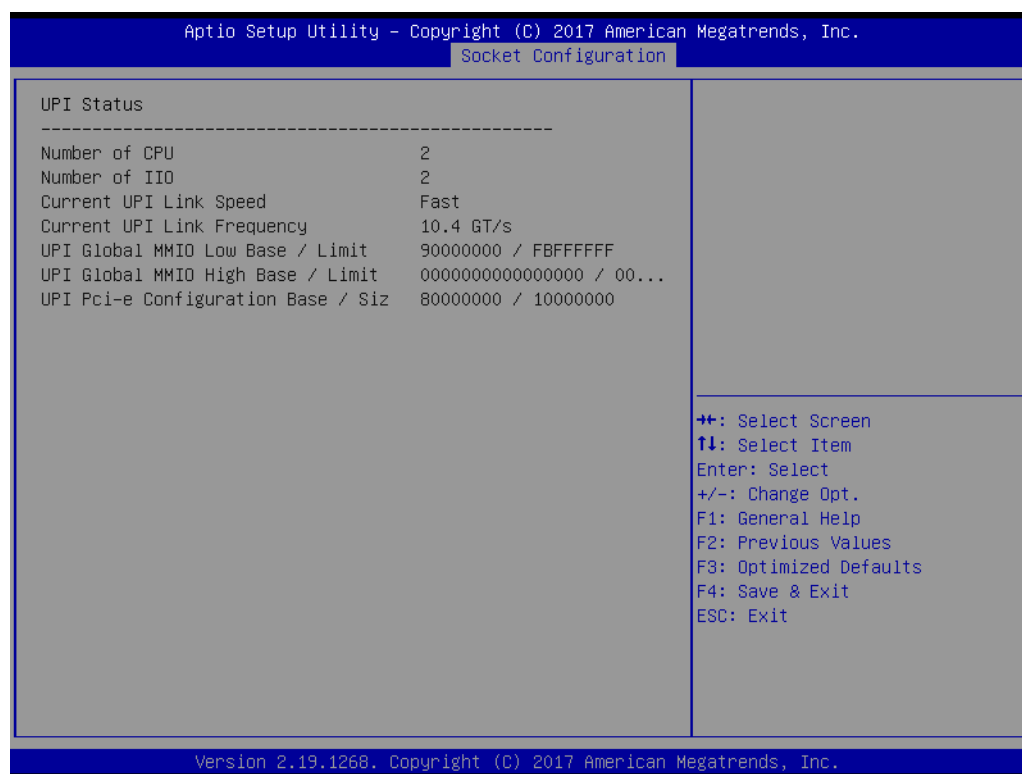
3.2.4.2 UPI Configuration



■ UPI Status

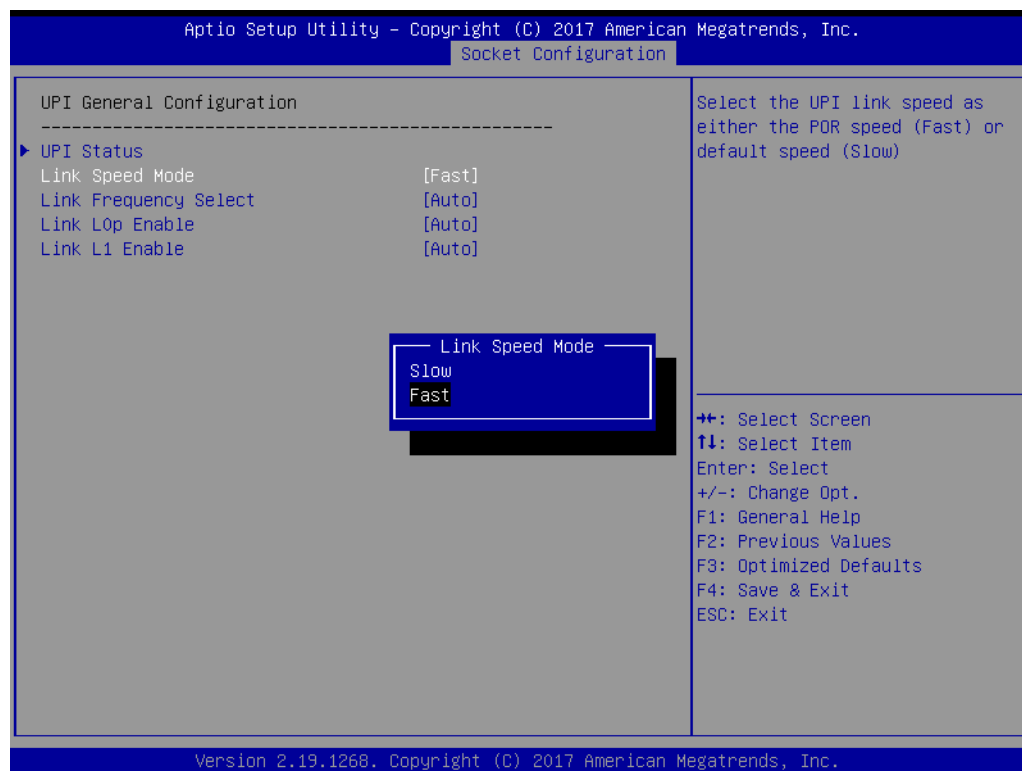
This item is used to display Intel® UltraPath Interconnect (UPI) information.





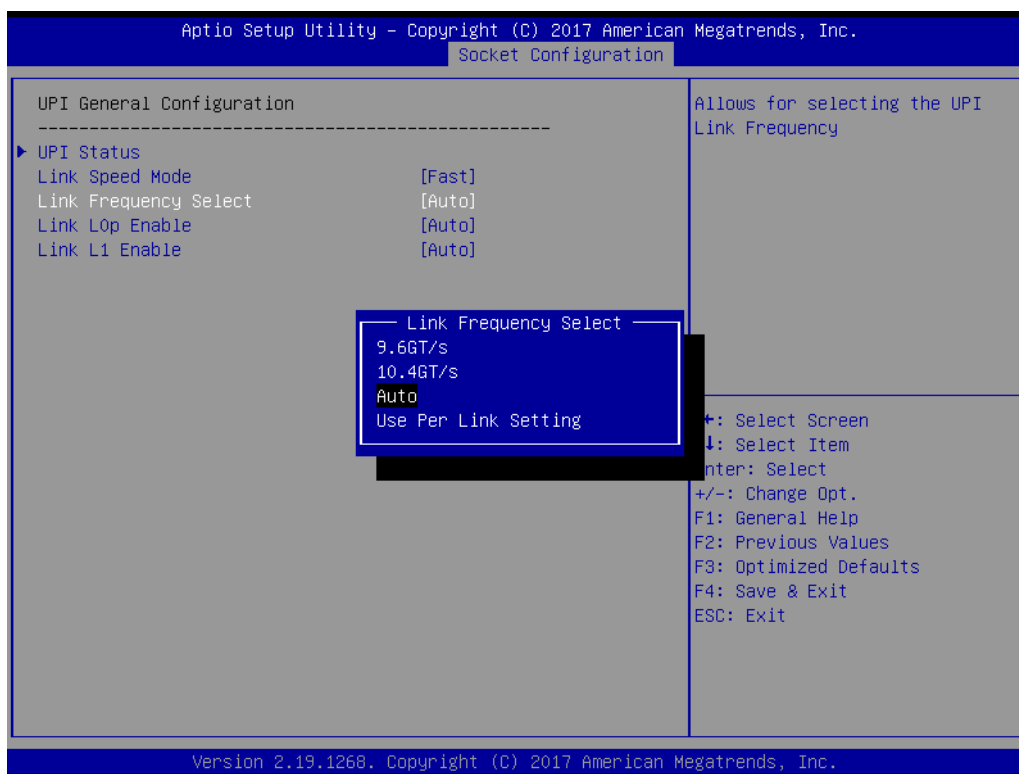
■ Link Speed Mode

This item is used to set the QPI link speed mode as either Fast or Slow.



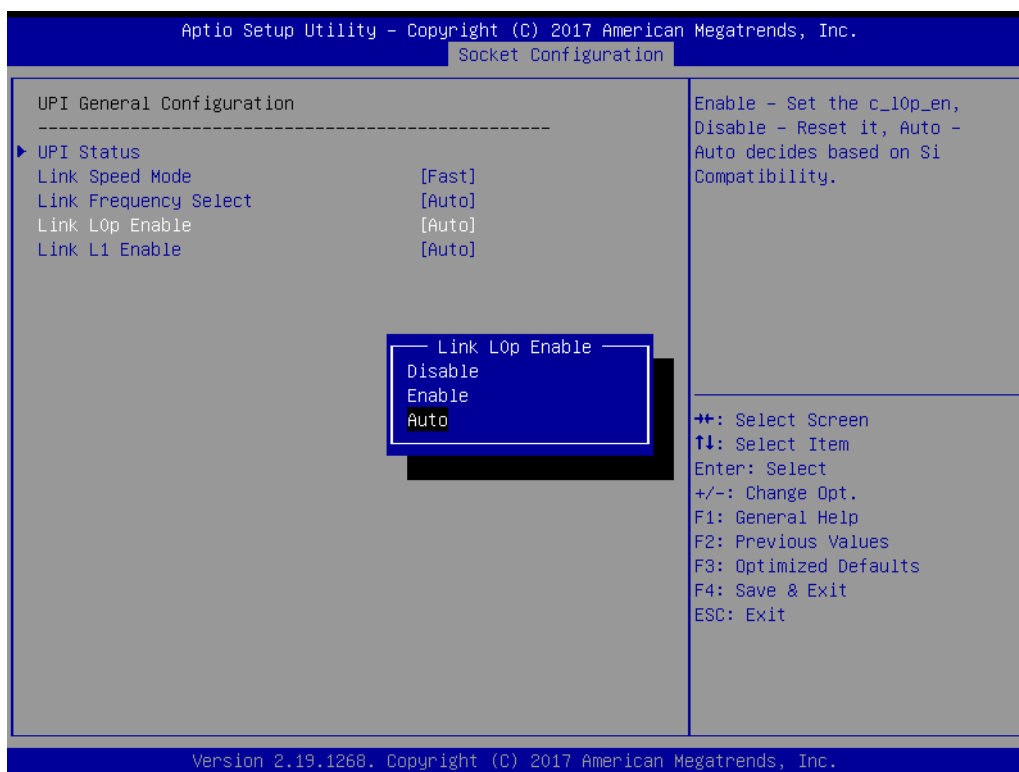
■ Link Frequency Select

This item is used to select the QPI link frequency.



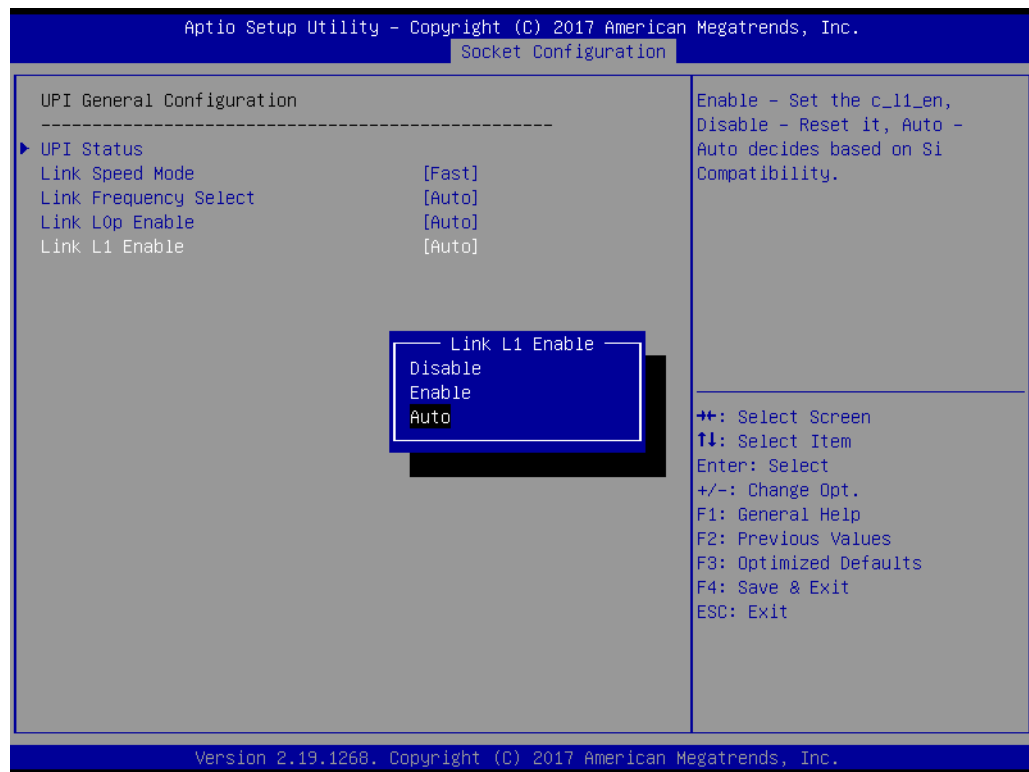
■ Link L0p Enable

This item enables/disables QPI Link0p.

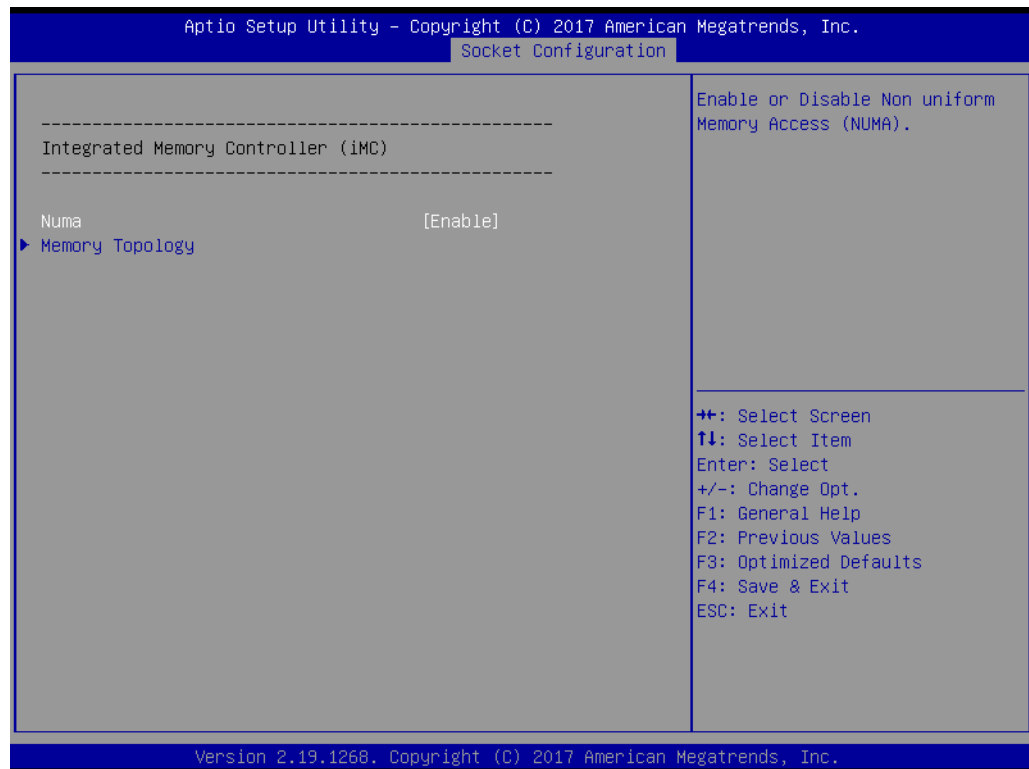


■ Link L1 Enable

This item enables/disables QPI Link1.



3.2.4.3 Memory Configuration



■ Numa

This item enables/disables non uniform memory access (NUMA).

■ Memory Technology

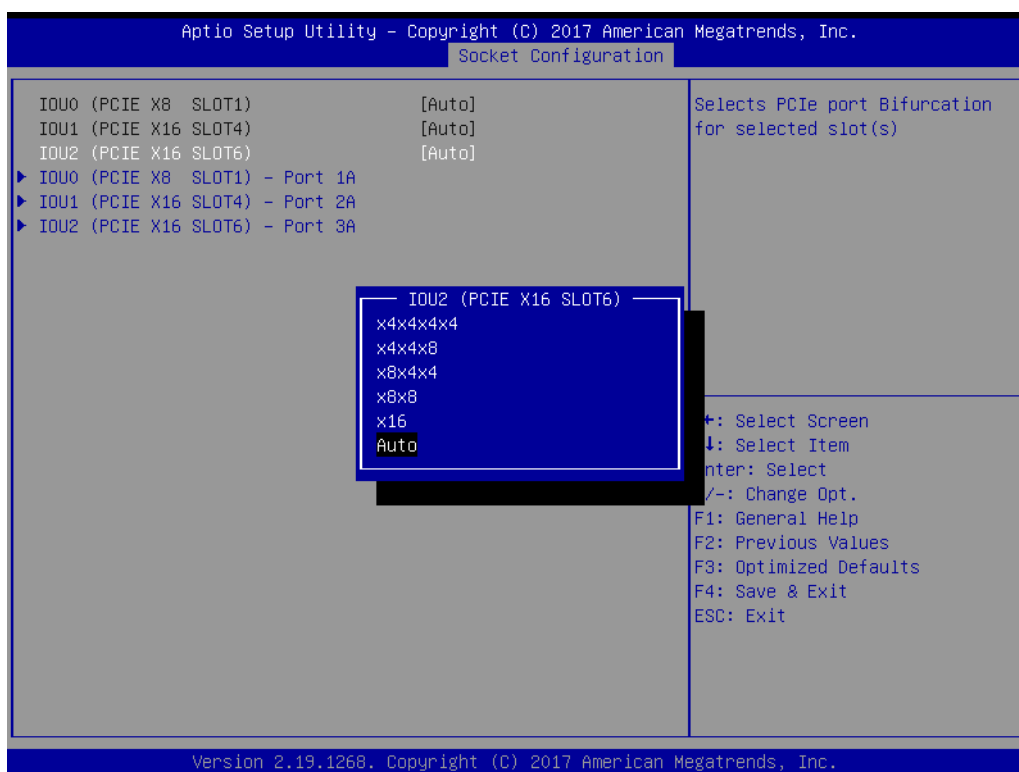
This item is used to display memory topology with DIMM population information.

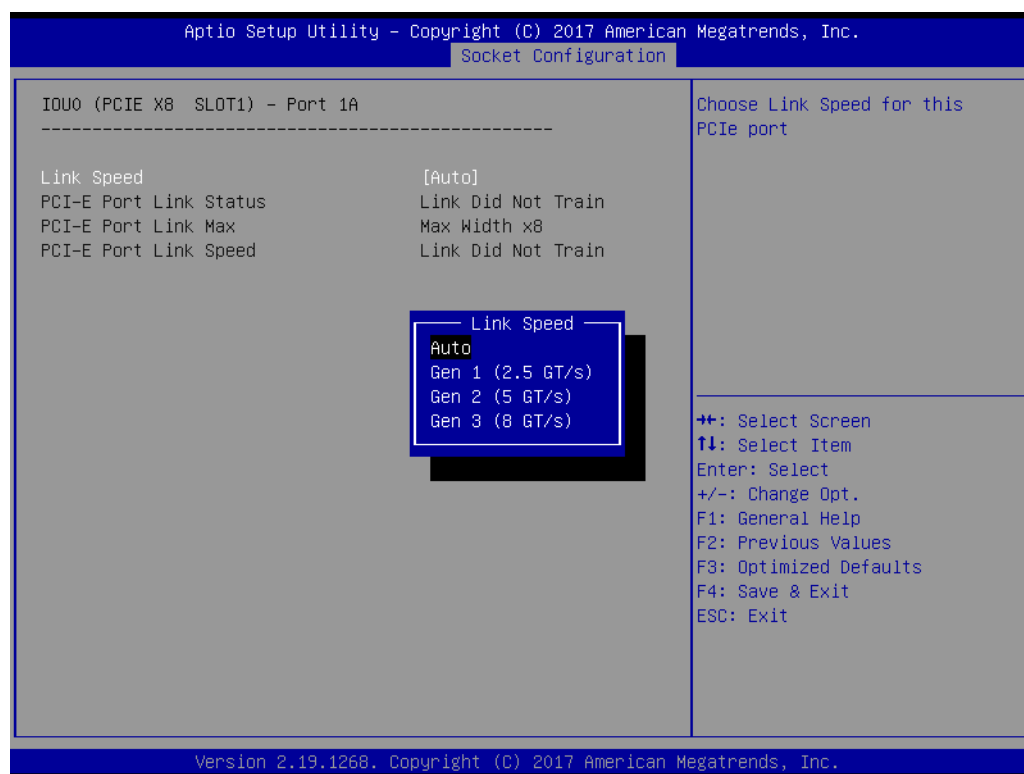
3.2.4.4 I/O Configuration

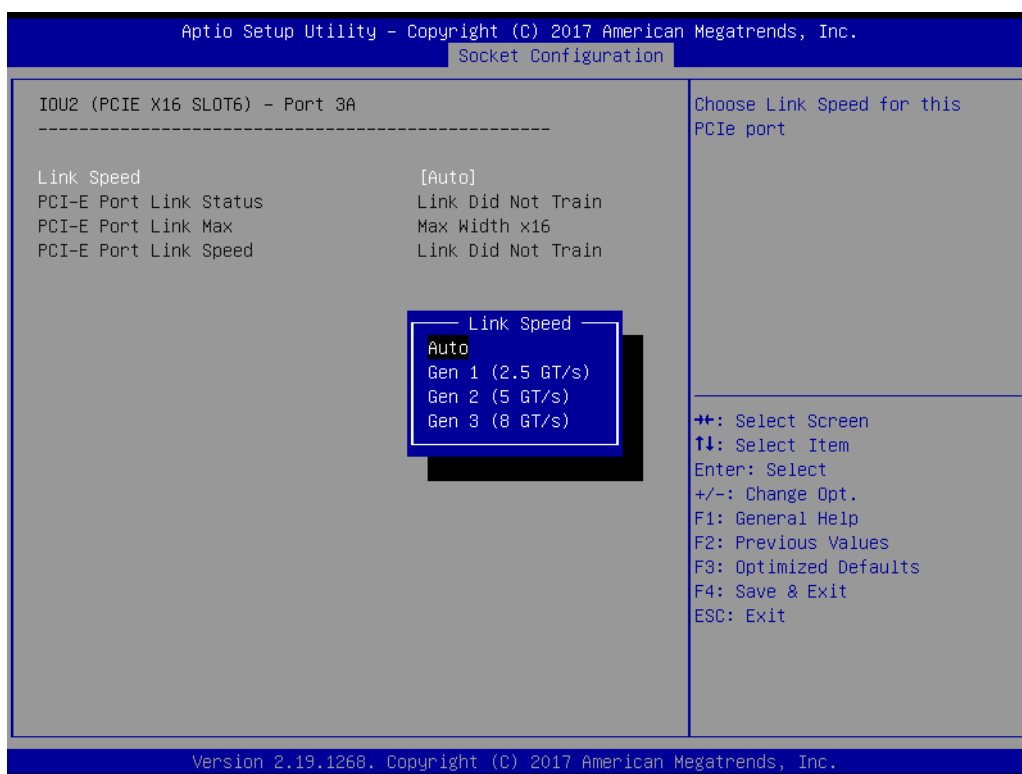


■ Socket0 PCIe Configuration

This item is used for PCIe port bifurcation control and to set the target link speed as Gen1, Gen2, or Gen3.

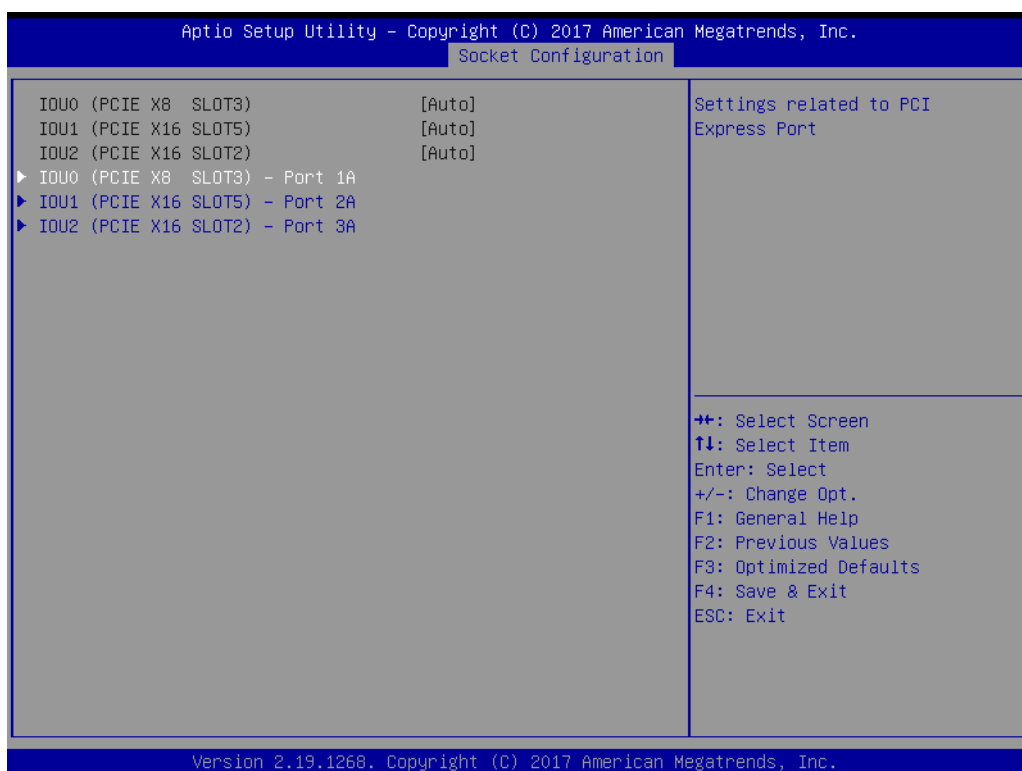


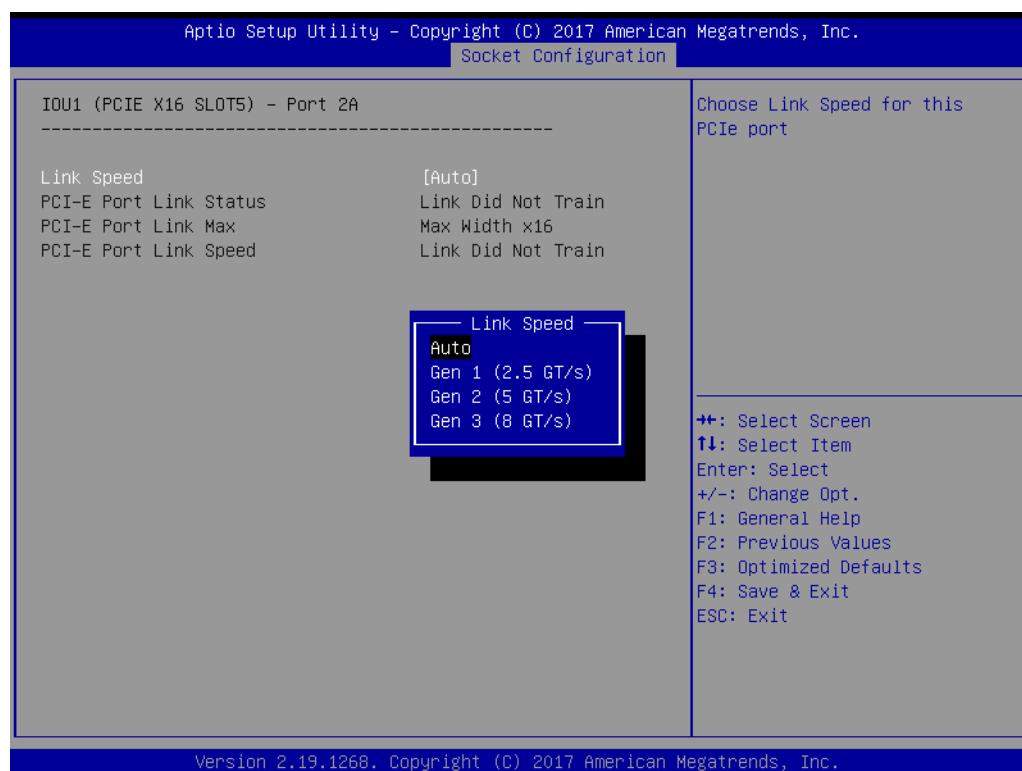
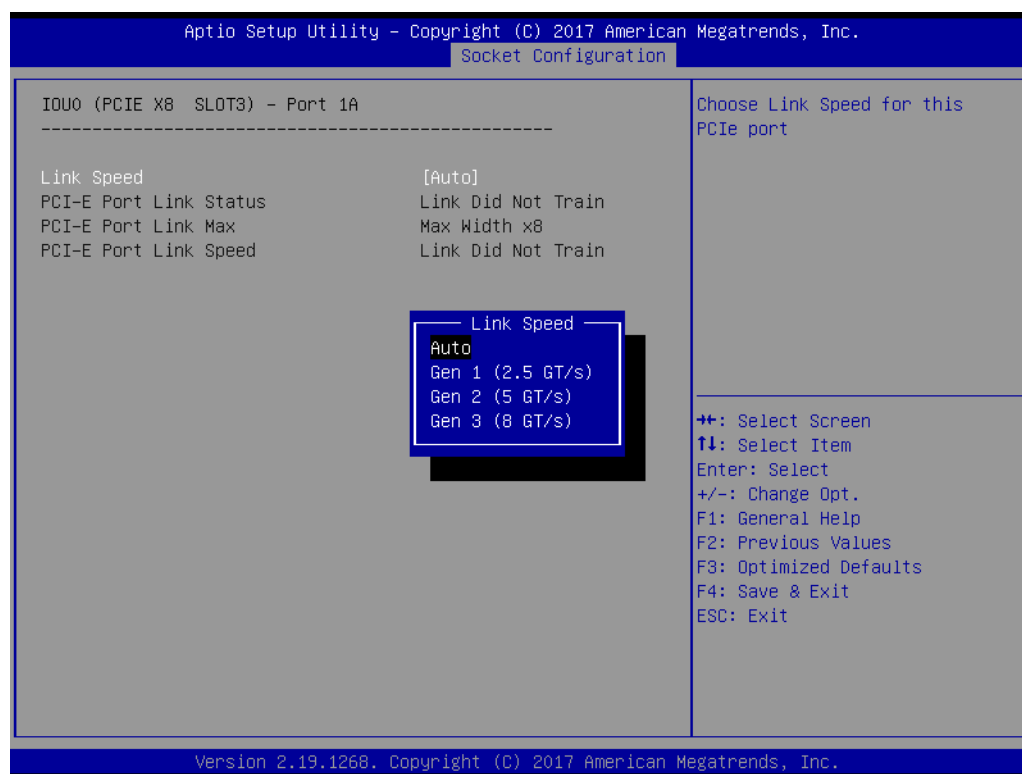




■ Socket1 PCIe Configuration

This item is used for PCIe port bifurcation control and to set the target link speed as Gen1, Gen2, or Gen3.

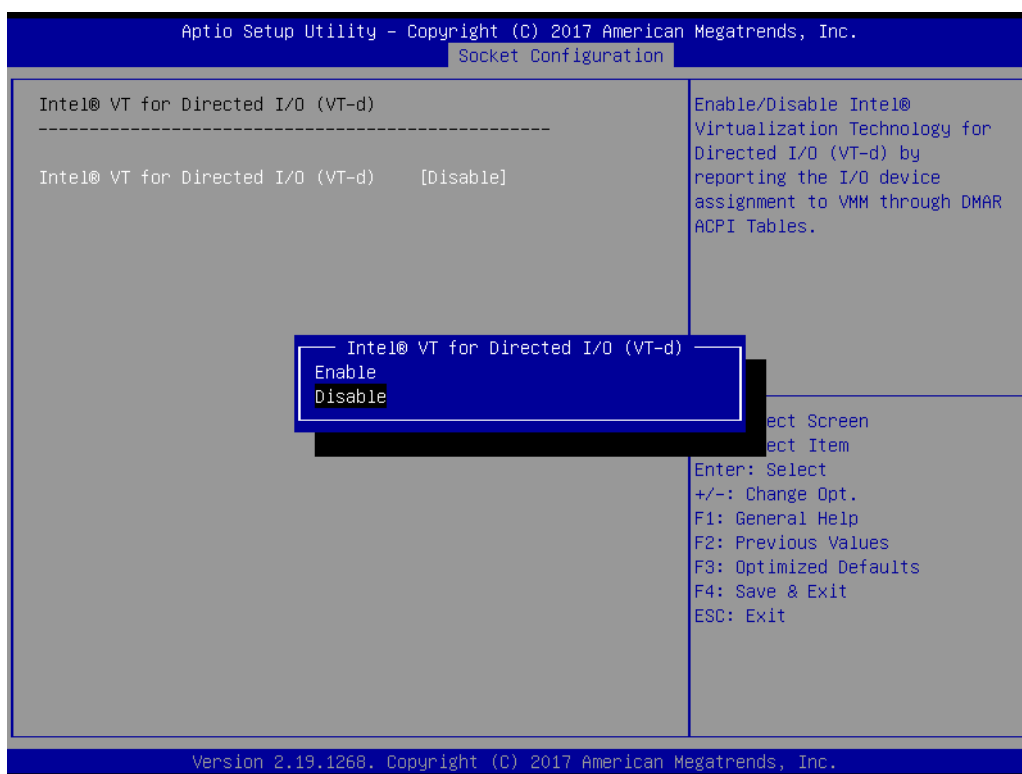






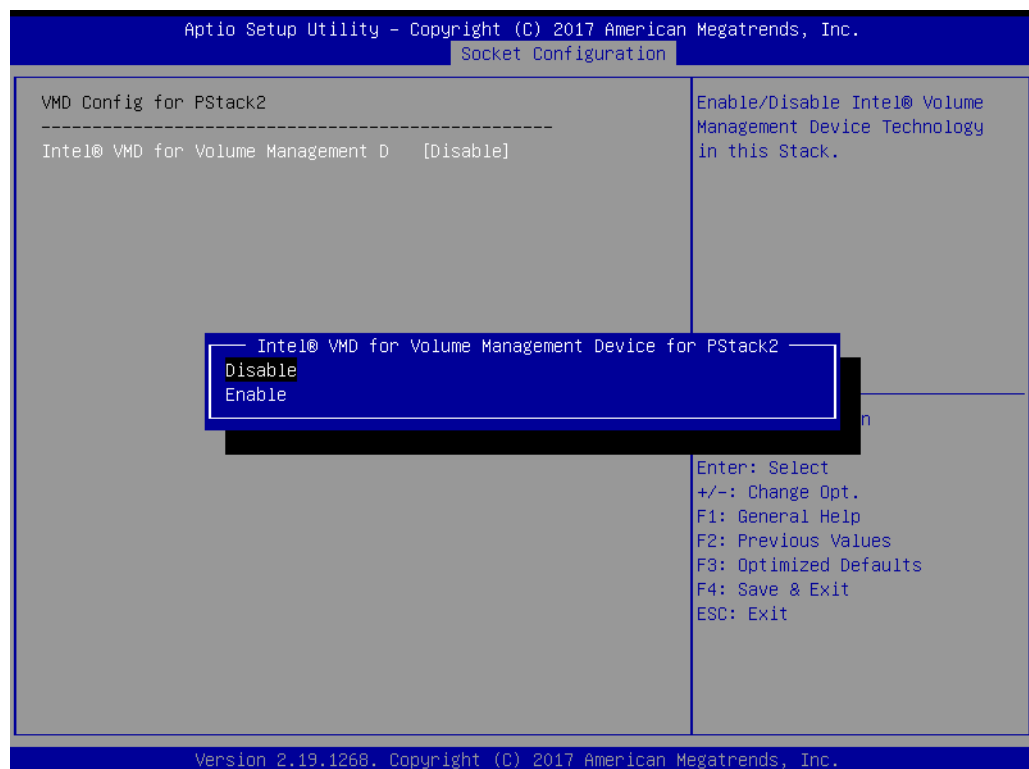
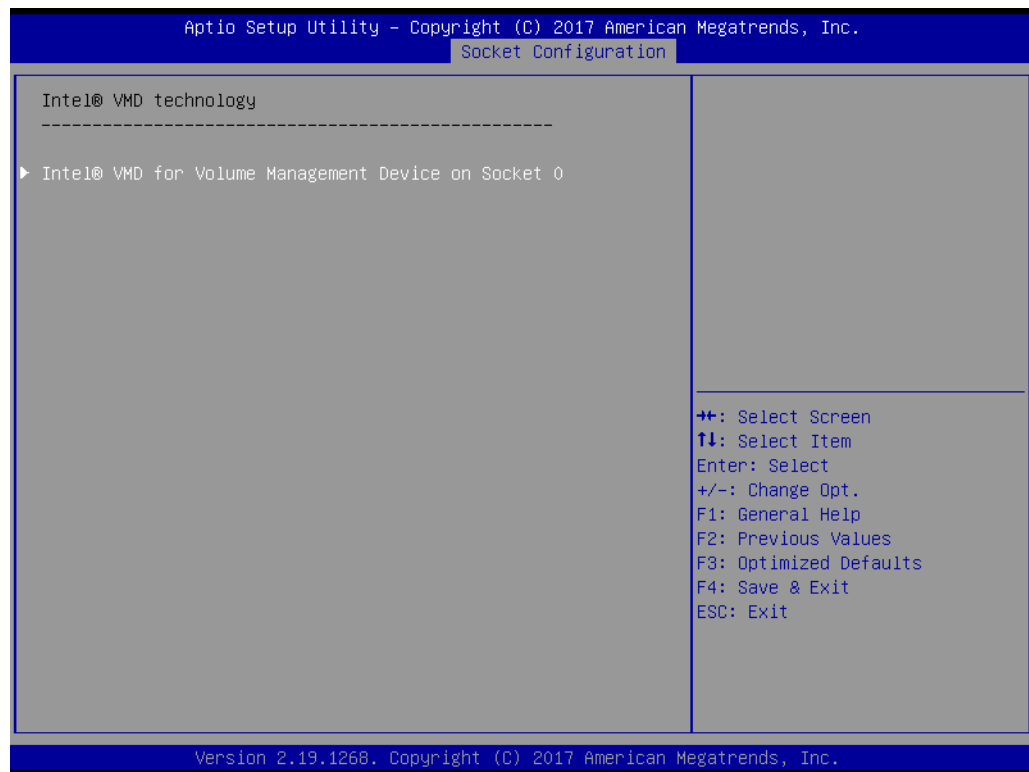
■ Intel VT for Directed I/O (VT-d)

This item enables/disables Intel® Virtualization Technology for directed I/O.



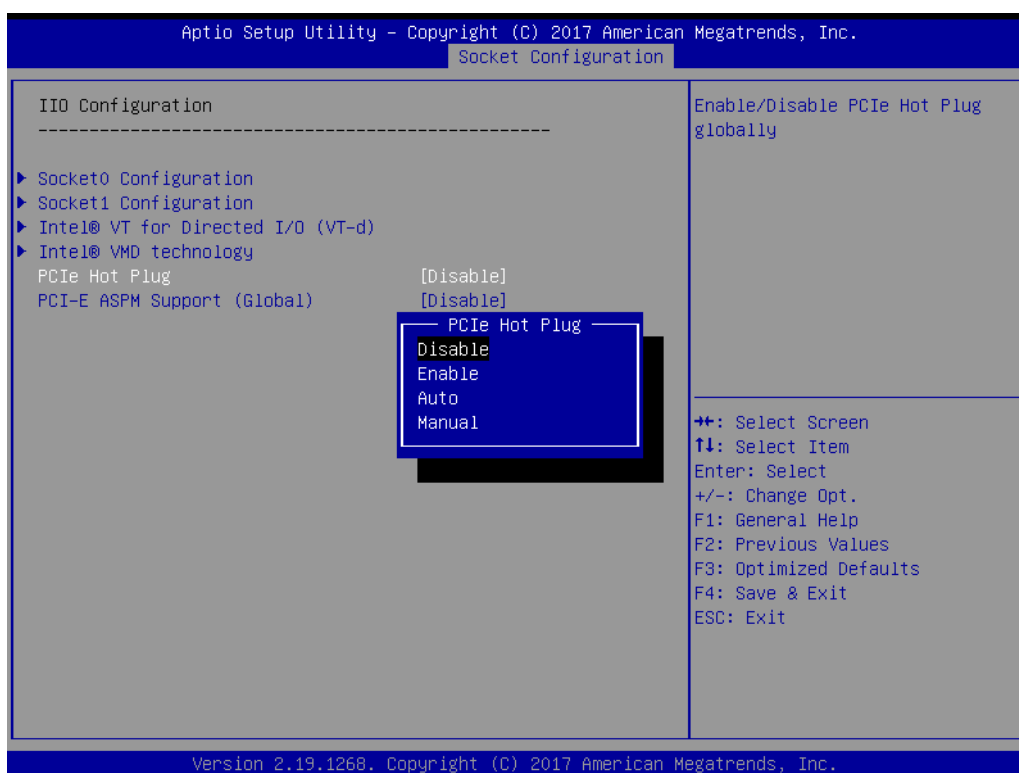
■ Intel VMD technology

This item enables/disables Intel® Volume Management Device Technology.



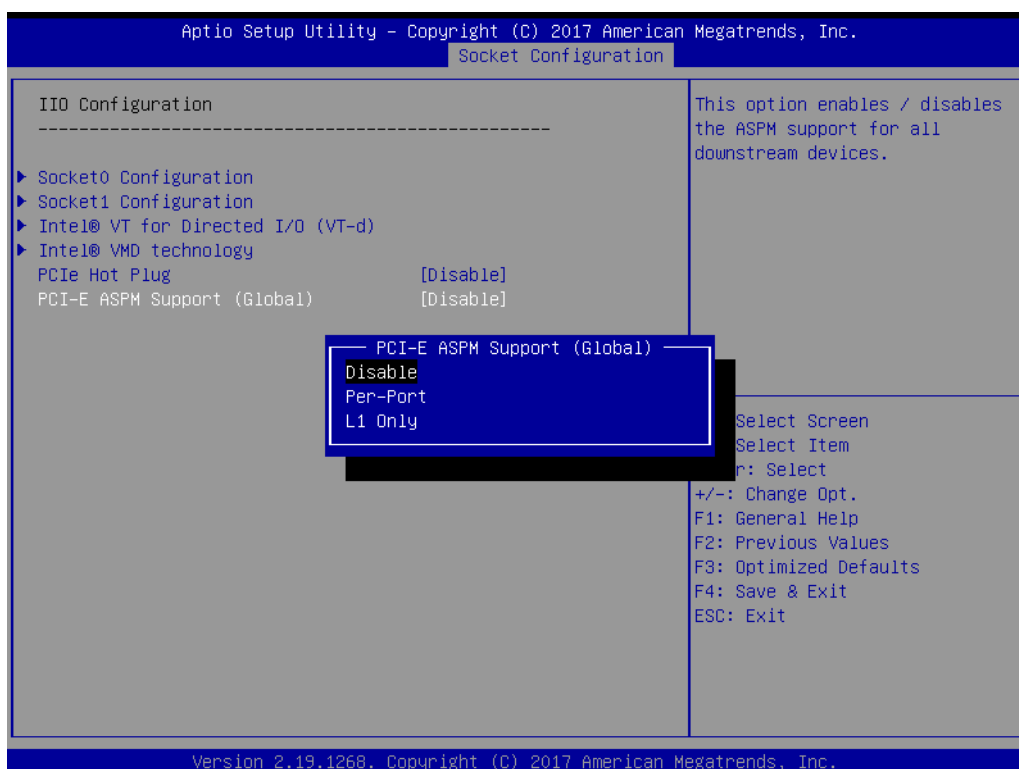
■ PCIe Hot Plug

This item enables/disables PCIe hot plugging globally.

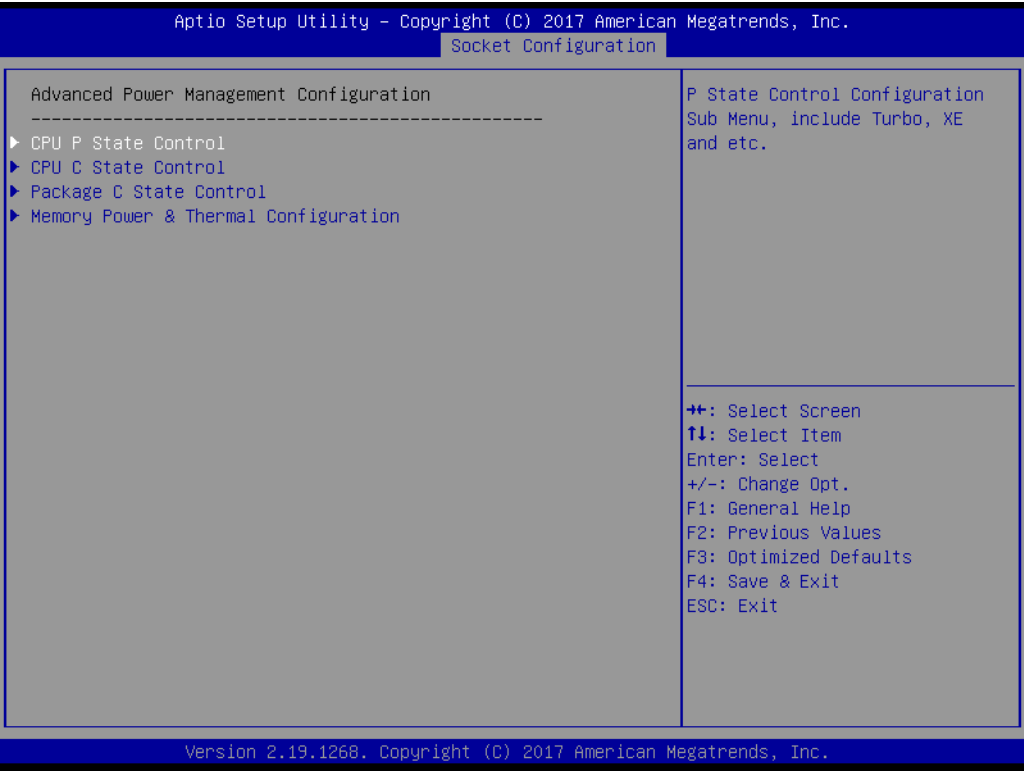


■ PCI-E ASPM Support (Global)

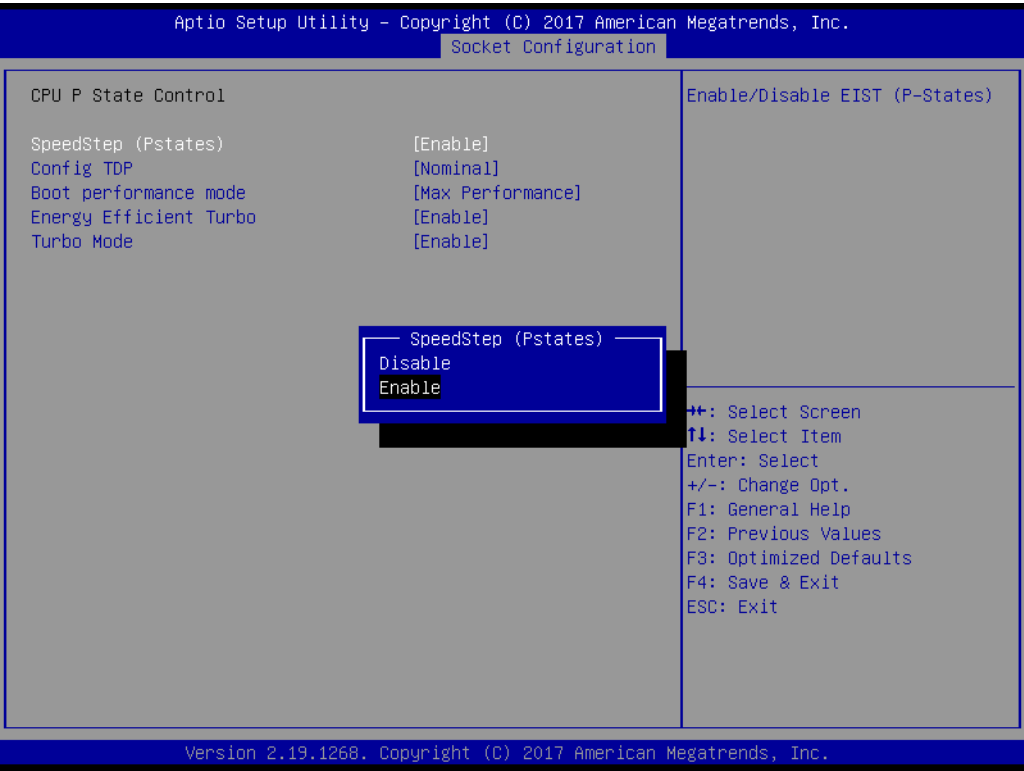
This item is used to set the ASPM support level as disables, per port, or L1 state only.

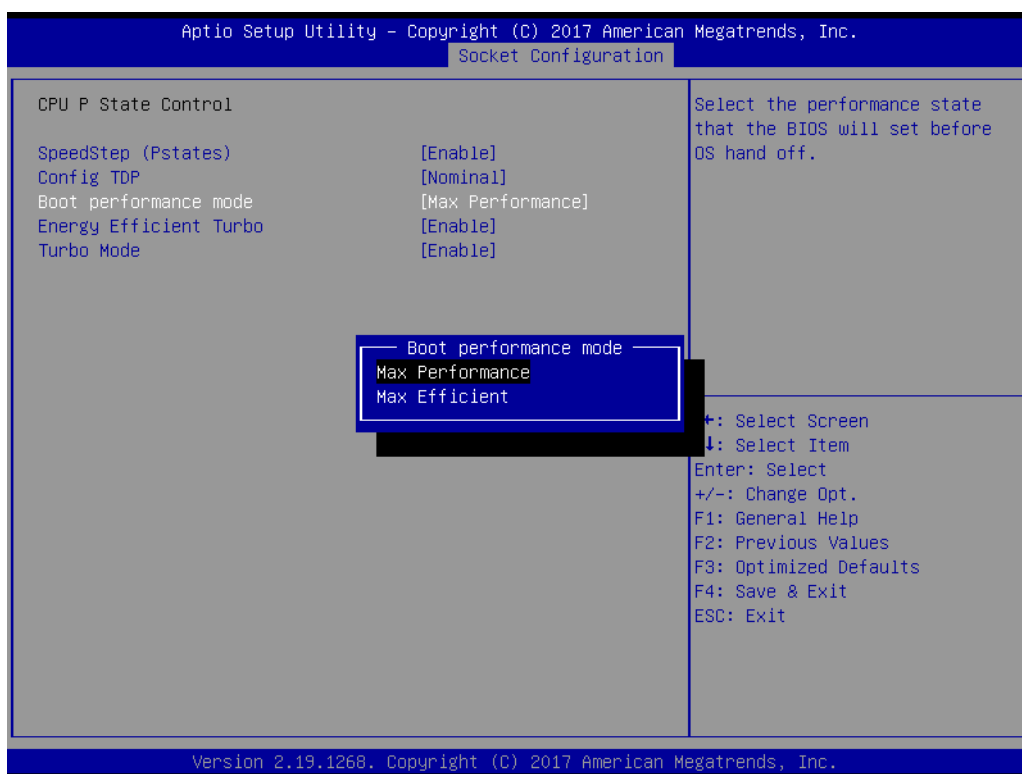
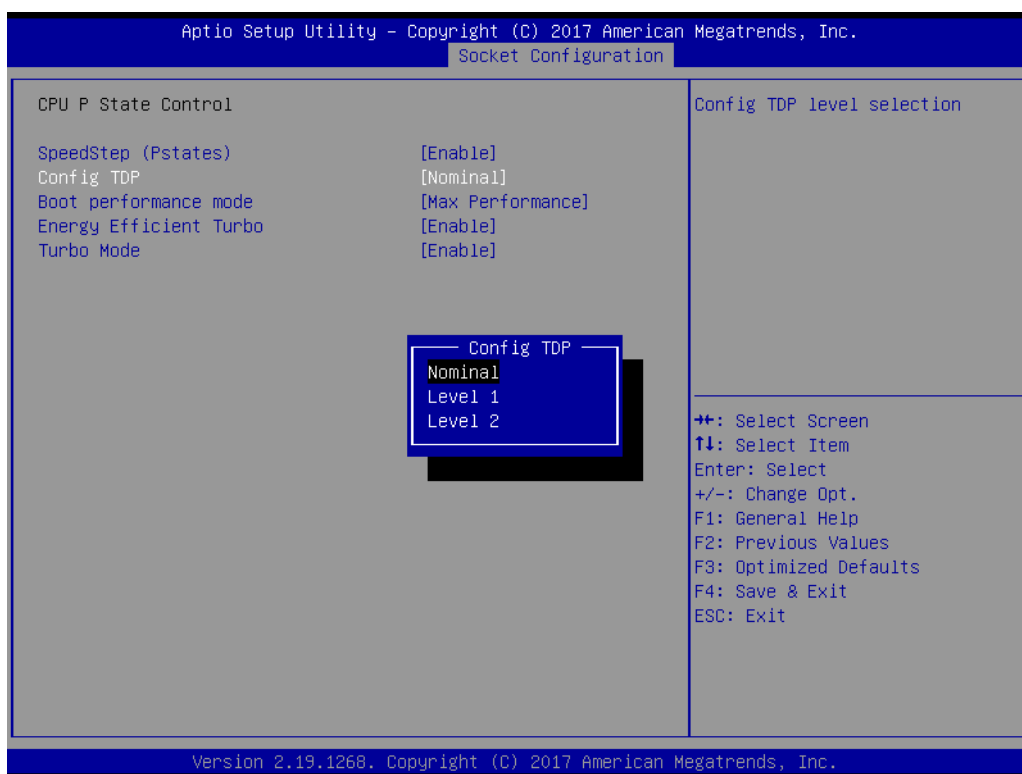


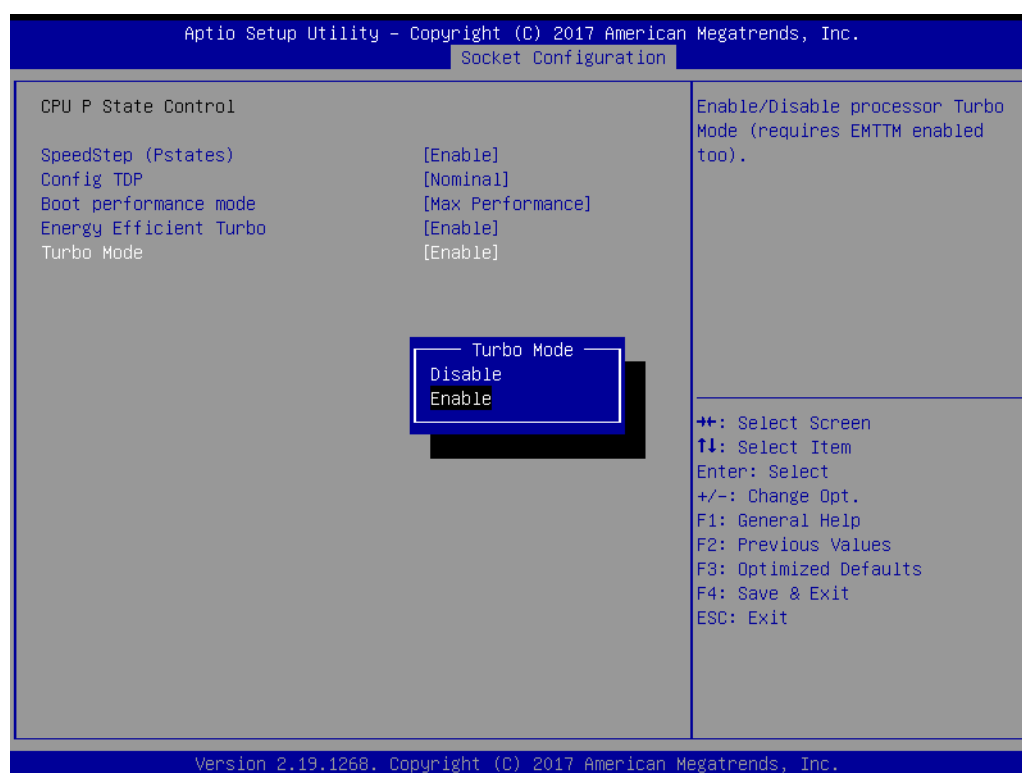
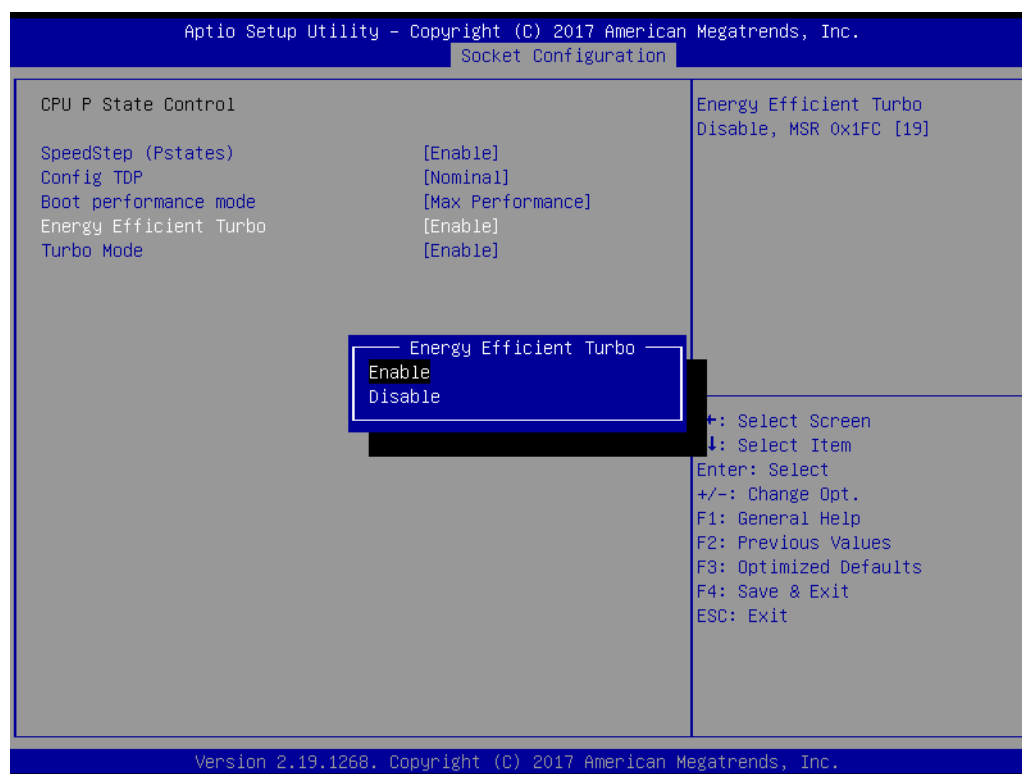
3.2.4.5 Advanced Power Management Configuration



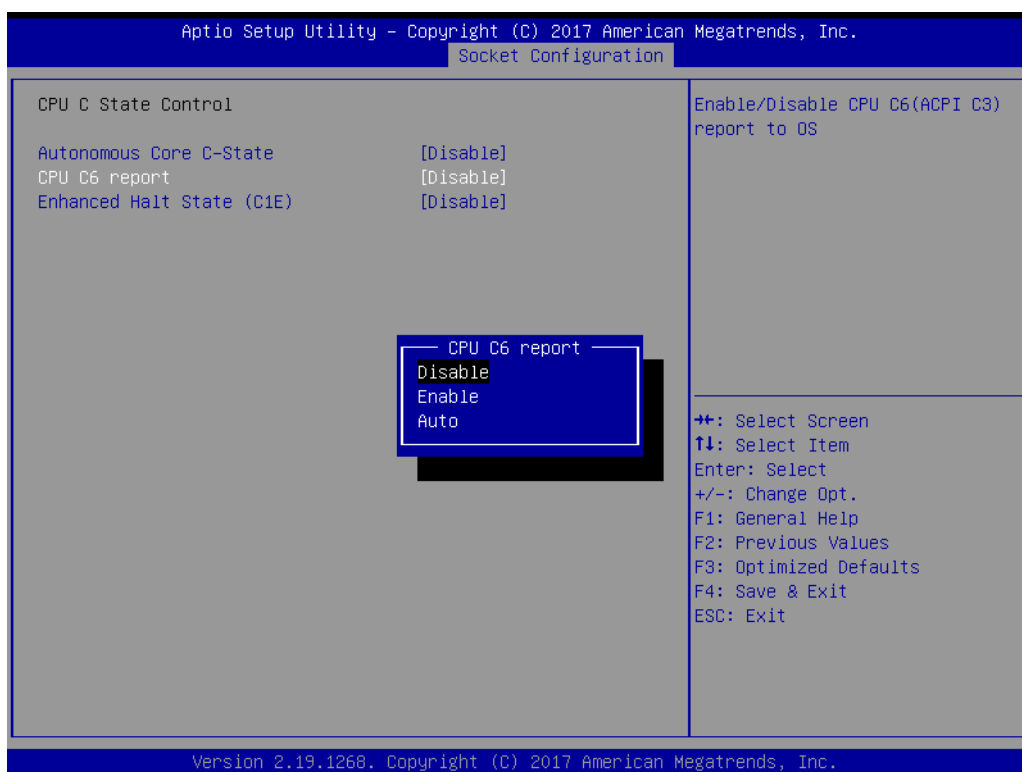
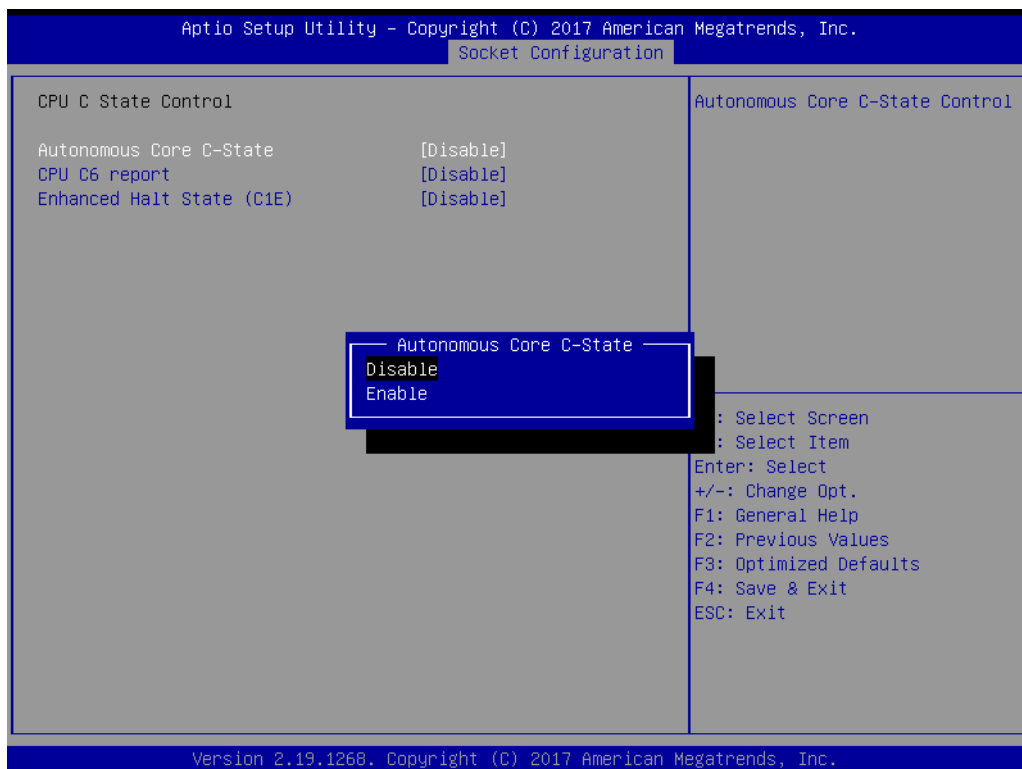
■ CPU P State Control

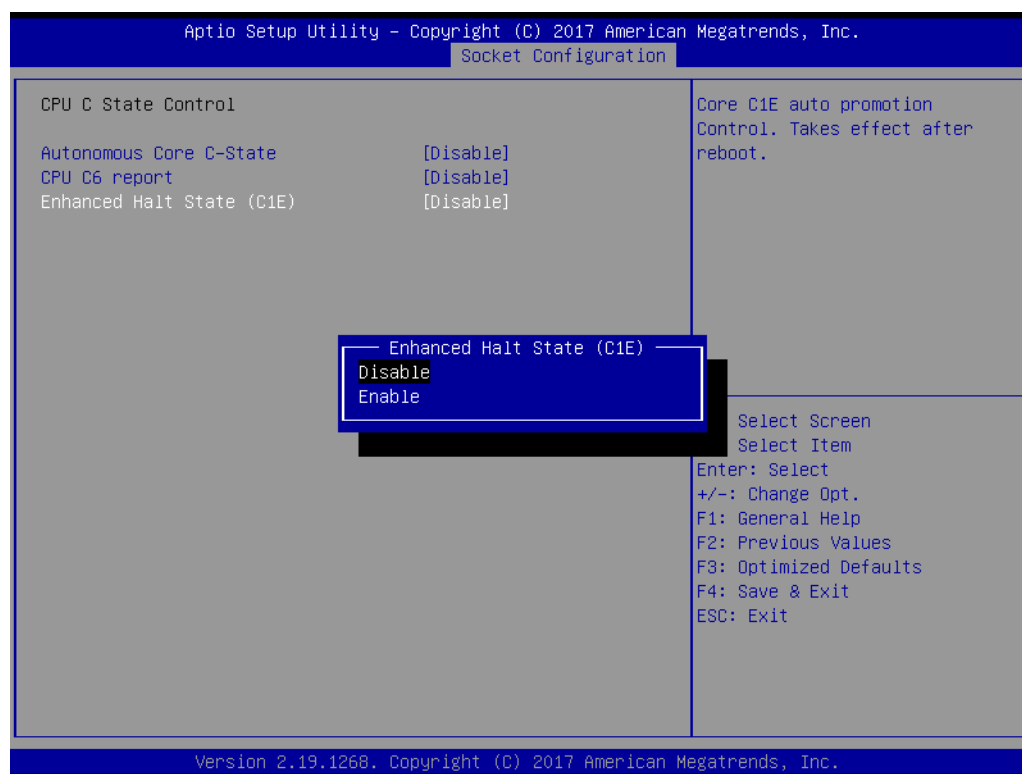




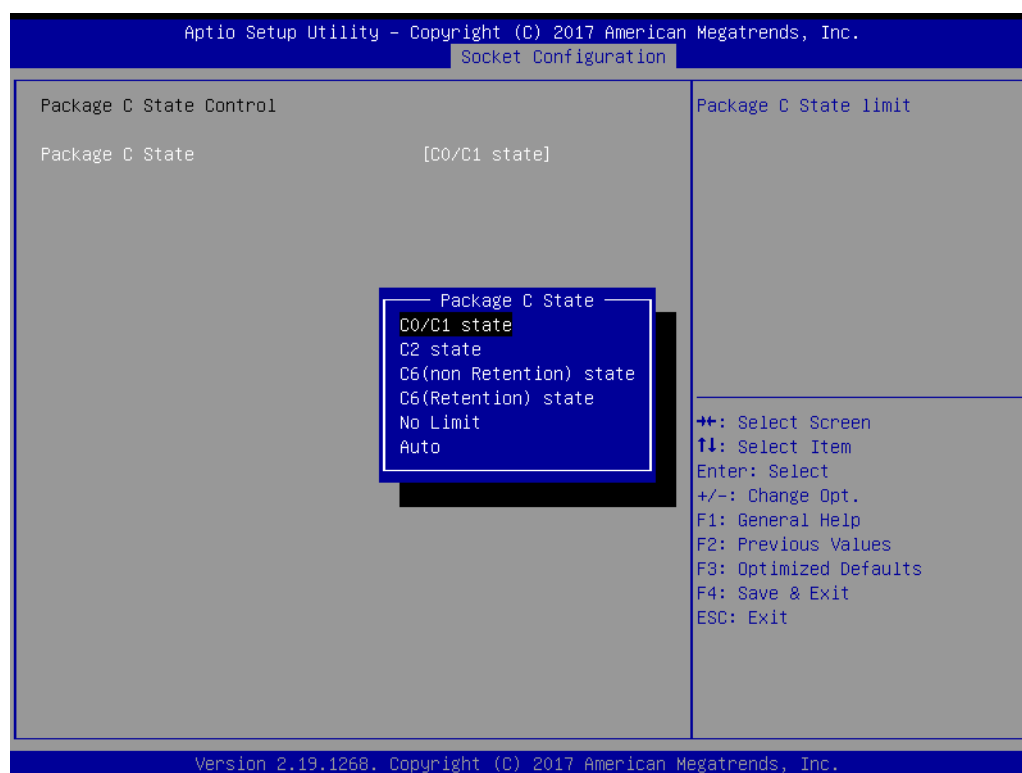


■ CPU C State Control

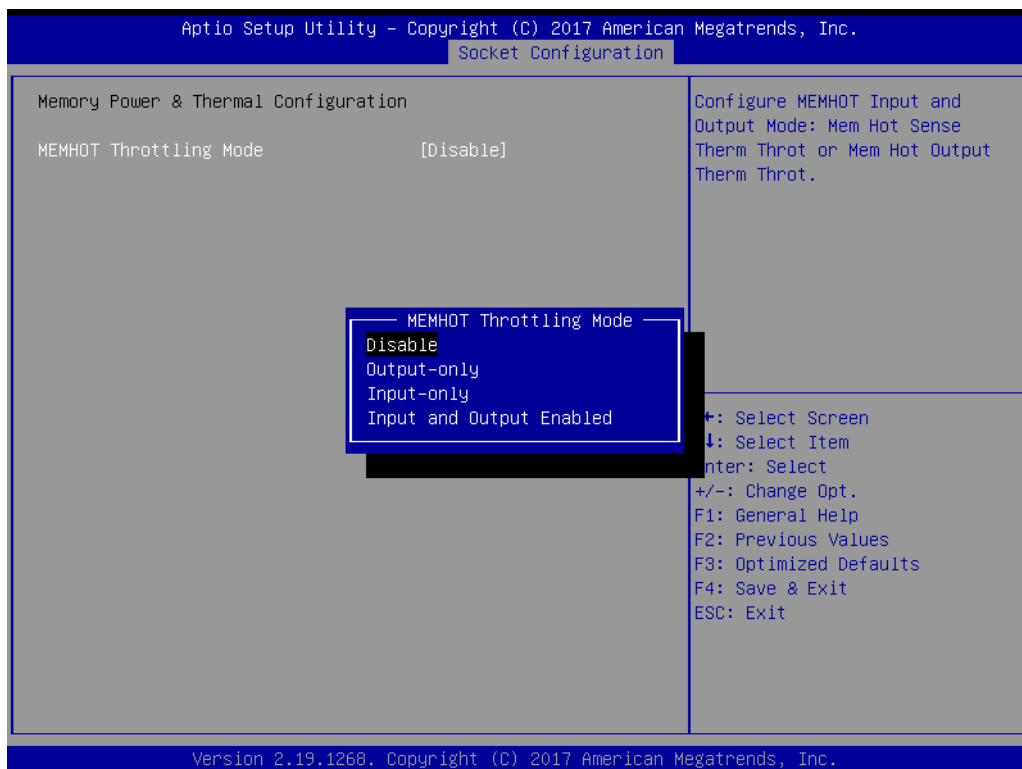




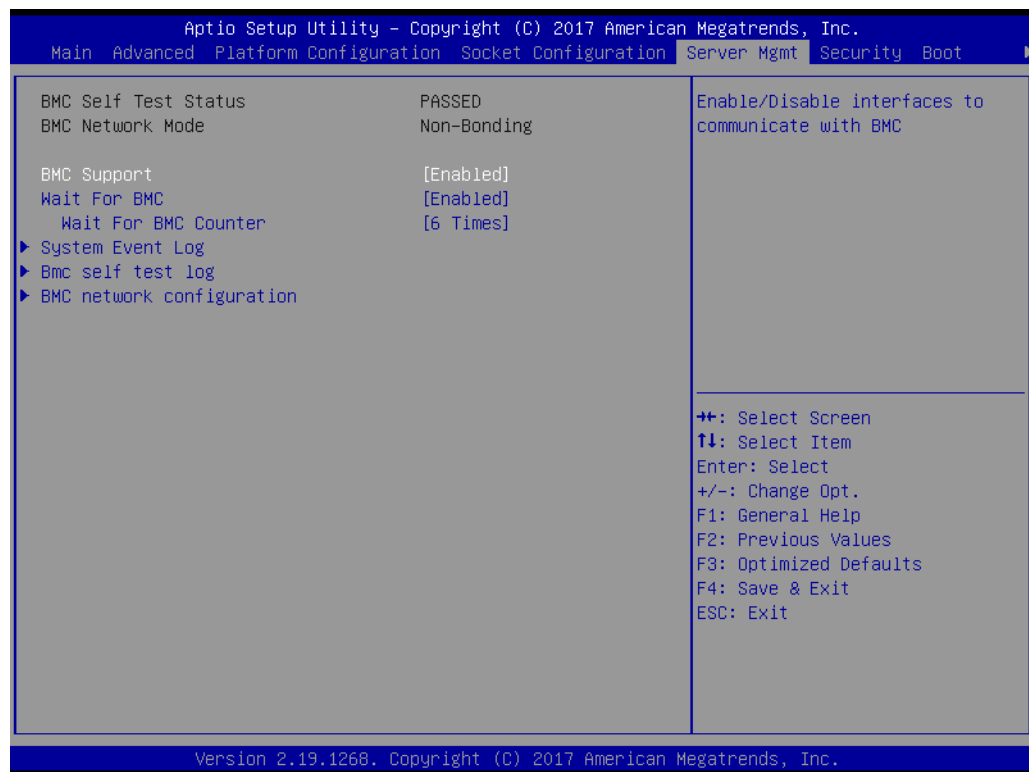
■ Package C State Control



■ Memory Power & Thermal Configuration



3.2.5 Server Management



■ BMC Support

This item enables/disables interface communication with BMC.

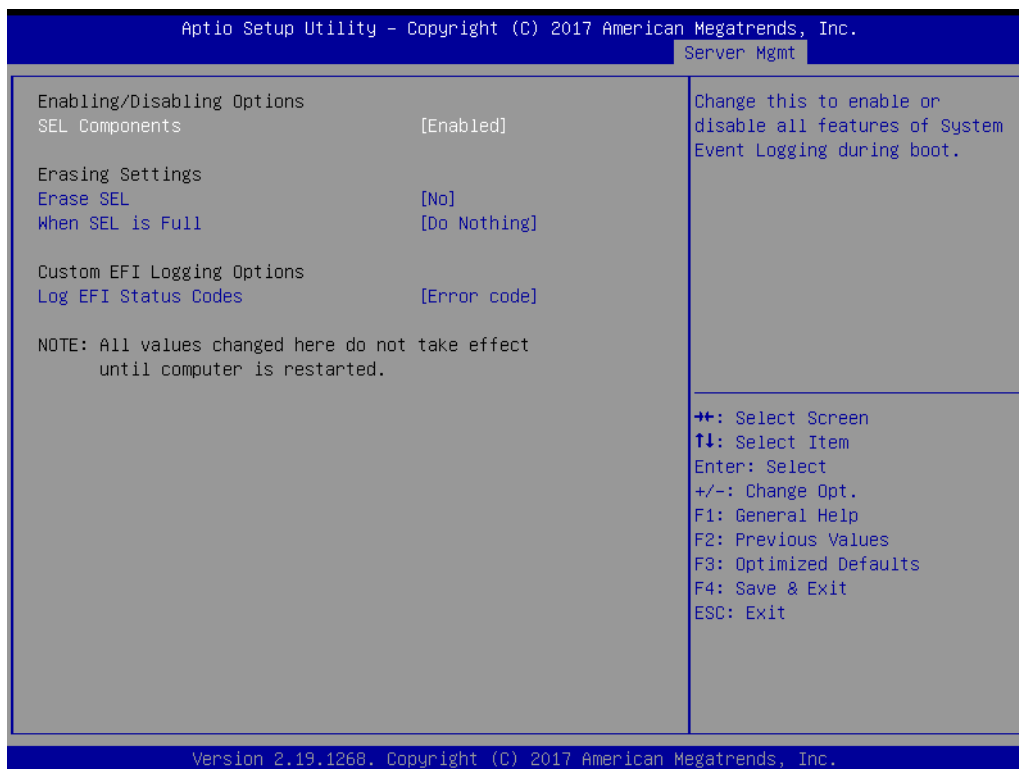
■ Wait for BMC

This item enables/disables the Wait for BMC function. If enabled, the motherboard will wait 30 ~ 60 seconds until the BMC module boots up. Then the normal BIOS post screen will be displayed. If disabled, the motherboard will not wait for a response from the BMC module.

■ Wait for BMC counter

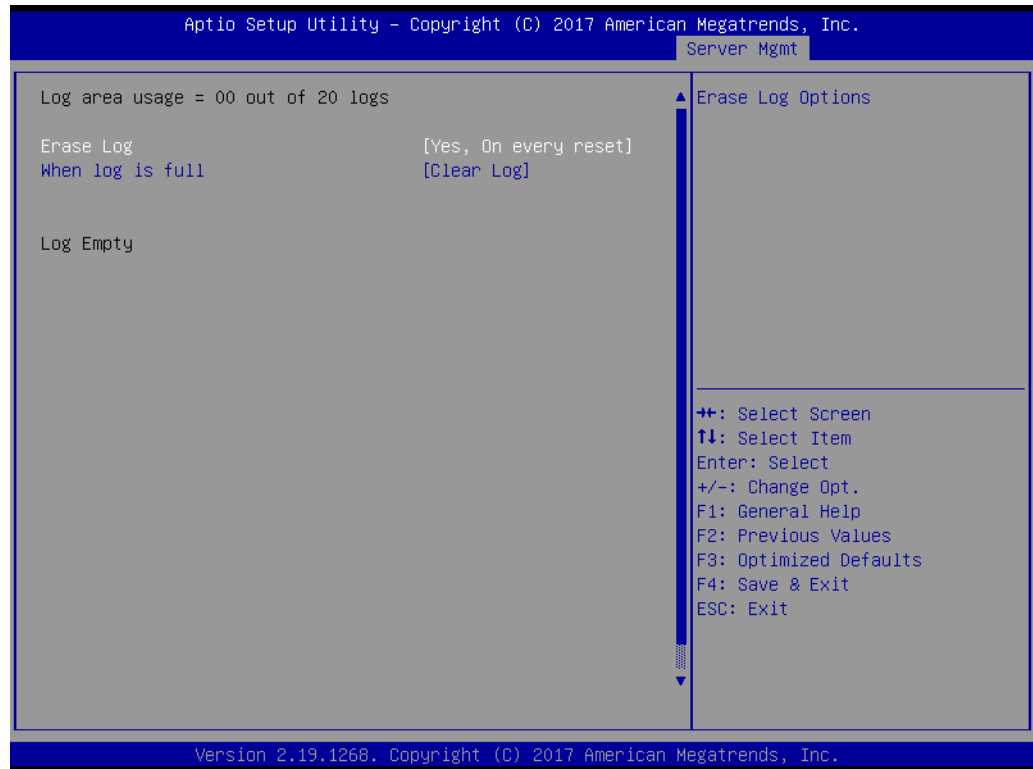
This item is used to initialize the host for BMC interfaces. The MB beeps per 5 seconds to check it.

3.2.5.1 System Event Log



- **SEL Components**
This item enables/disables all features of system event logging during boot.
- **Erase SEL**
This item is used to configure the Erase SEL function.
- **When SEL is Full**
This item is used to choose options for reactions to a full SEL.
- **Log EFI Status Codes**
This item enables/disables the logging of EFI status codes to log only error codes or only progress codes or both.

3.2.5.2 BMC Self Test Log



- **Erase Log**
This item is used to configure the erase log options.
- **When Log is Full**
This item is used to configure the action to be taken when the log is full.

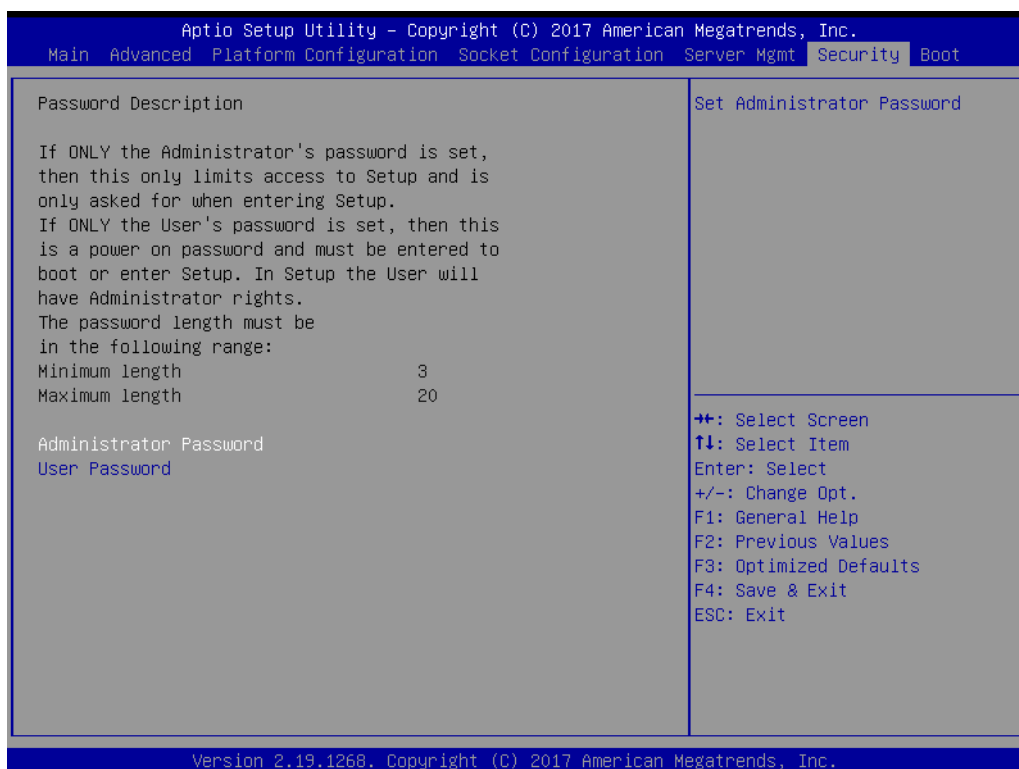
3.2.5.3 BMC Network Configuration

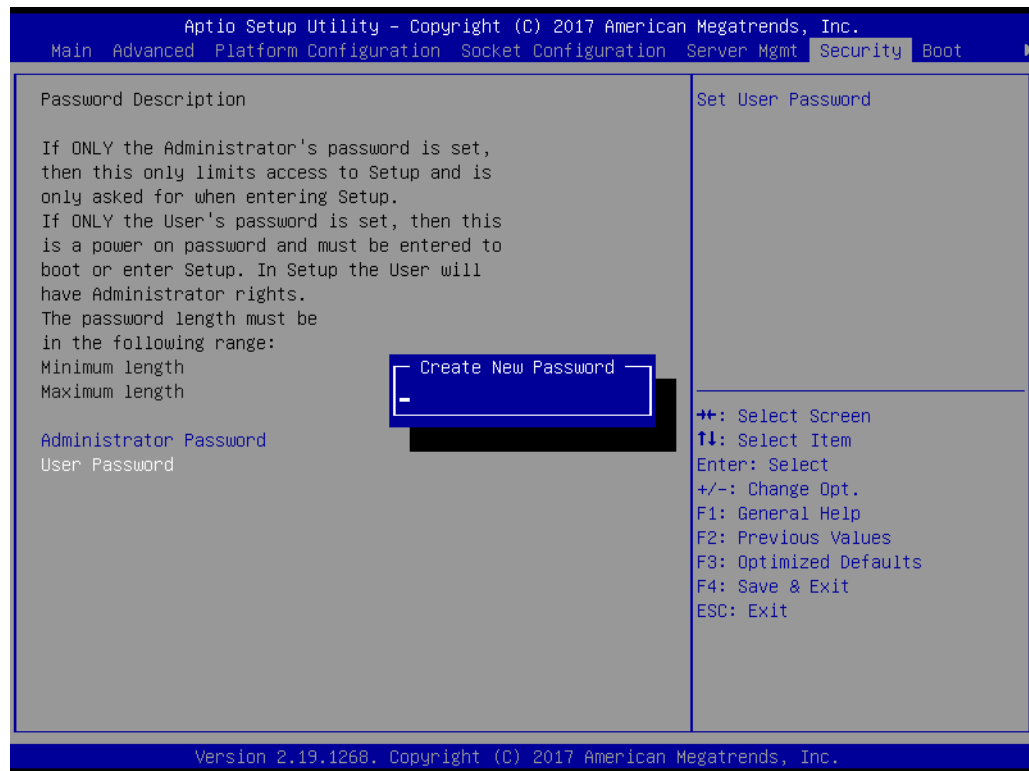


■ Configuration Address Source

This item is used to configure LAN channel parameters statically or dynamically (by BMC). If unspecified, BMC network parameters will not be modified.

3.2.6 Security





Note! ***With AC power and CMOS battery. Short CMOS1 jumper.***



Date/Time and Password: keep

Settings: reset to default

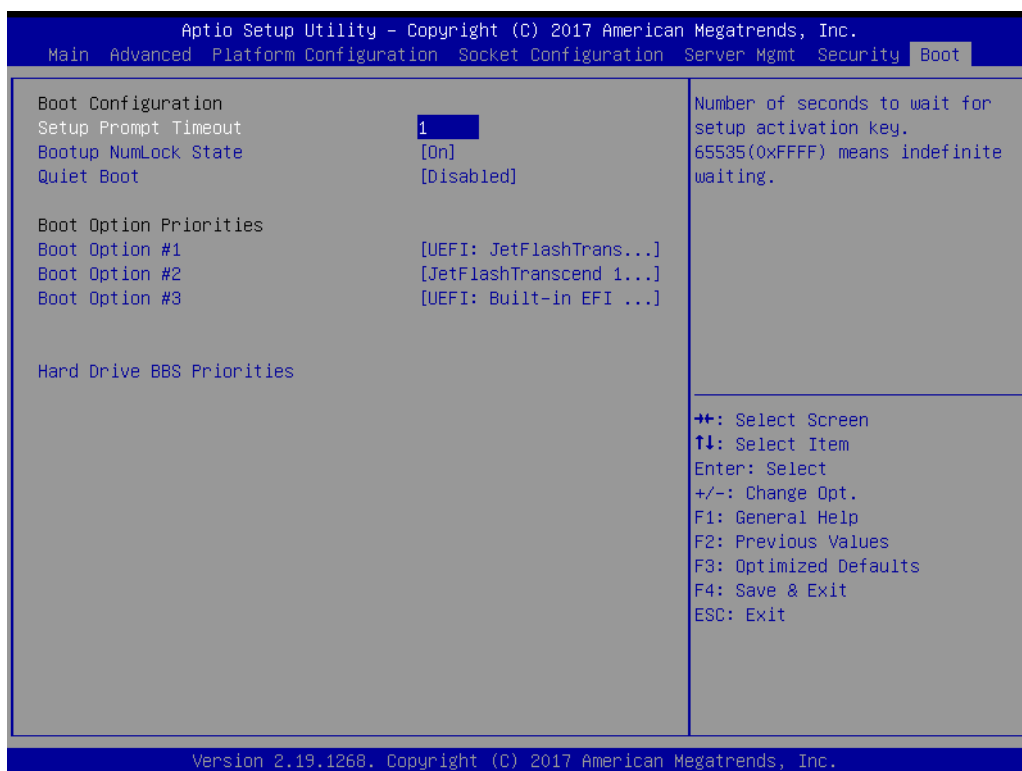
Without AC power and CMOS battery. Short CMOS1 jumper.

Date/Time: reset to default

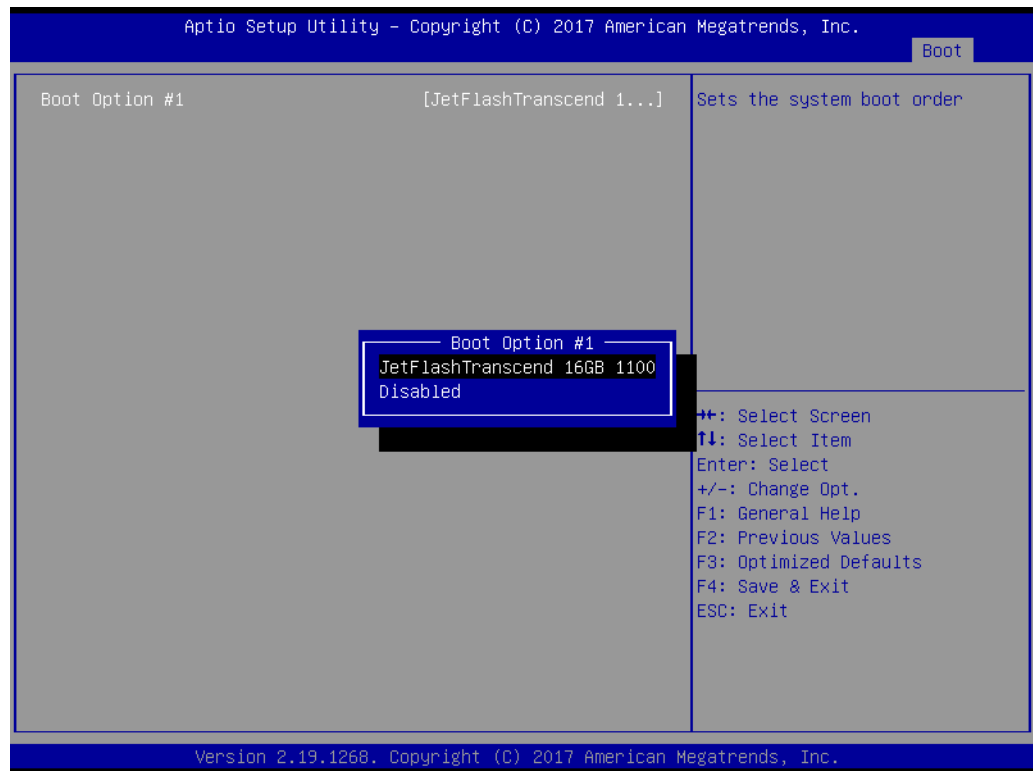
Password: keep

Settings: reset to default

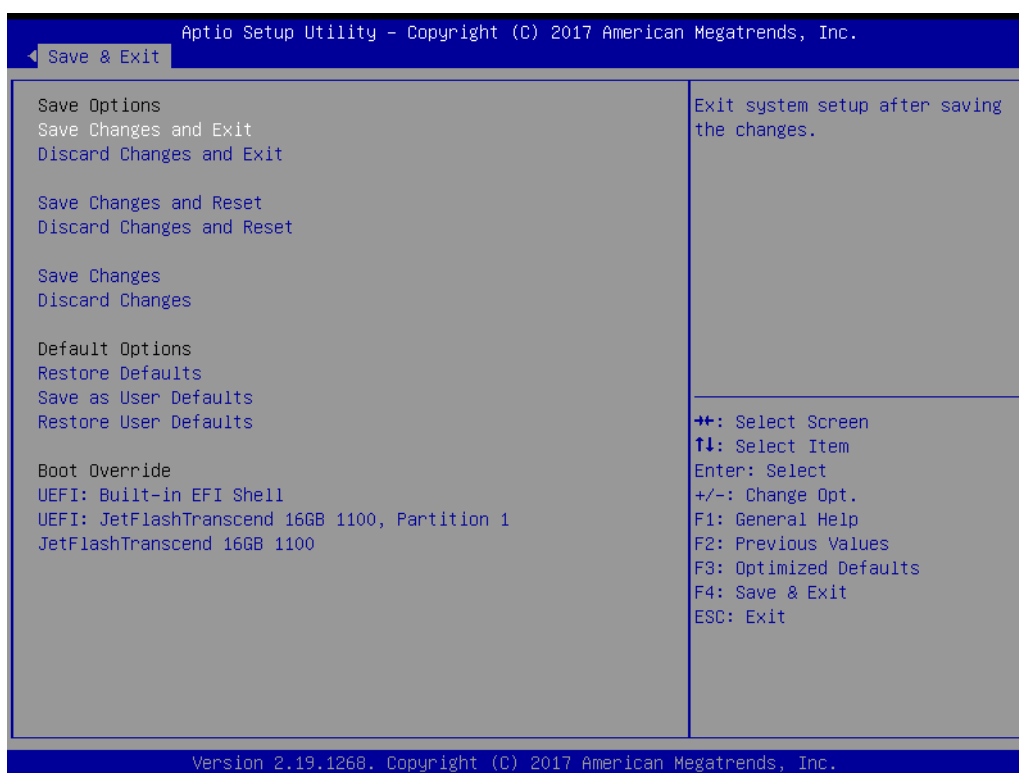
3.2.7 Boot



- **Setup Prompt Timeout**
This item is used to set the number of seconds to wait for setup activation key.
- **Bootup NumLock State**
This item is used to set the keyboard NumLock state as On or Off.
- **Quiet Boot**
This item enables/disables quiet boot function.
- **Boot Option Priorities**
This item is used to set the system boot priorities.
- **Hard Drive BBS Priorities**
This item is used to set boot priorities. This item is only displayed when external legacy devices are plugged in.



3.2.8 Save & Exit



- **Save Changes and Exit**
This item is used to exit system setup after saving changes.
- **Discard Changes and Exit**
This item is used to exit system setup without saving changes.
- **Save Changes and Reset**
This item is used to reset the system after saving changes.
- **Discard Changes and Reset**
This item is used to reset the system without saving changes.
- **Save Changes**
This item is used to save changes to any setup options.
- **Discard Changes**
This item is used to discard changes to any setup options.
- **Restore Defaults**
This item is used to restore/load default values for the setup options.
- **Save as User Defaults**
This item is used to save changes as user defaults.
- **Restore User Defaults**
This item is used to restore the setup options to the user default settings.

Chapter 4

Chipset Software
Installation Utility

4.1 Before Beginning

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the ASMB-925 serverboards are provided on the software installation CD.

Before beginning, it is important to note that the relevant software application must be installed on the system prior to installing the enhanced display drivers. Additionally, many of the installation procedures assume users are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of the application software's user manual before performing the installation.

4.2 Introduction

4.2.1 Main Menu

The Intel® Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

- Core PCI PnP services
- Serial ATA interface support
- USB 1.1/2.0/3.0 support
- Identification of Intel® chipset components in the Device Manager

Note! *The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.*



Note! *The chipset driver is used for the following versions of Windows and must be installed before installing drivers:*



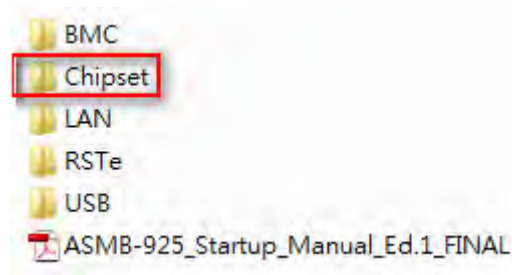
Windows Server 2016 Standard	x64
Windows Server 2012 R2 Standard	x64
Windows 10 Ultimate	x64

Note! *All Microsoft hot fix files must be up to date when using this OS.*



4.3 Windows Series Driver Setup

Insert the driver CD into the system's CD-ROM drive. Then access the Chipset folder. Find the executable in the folder and click on it to install the driver.



Chapter 5

VGA Setup

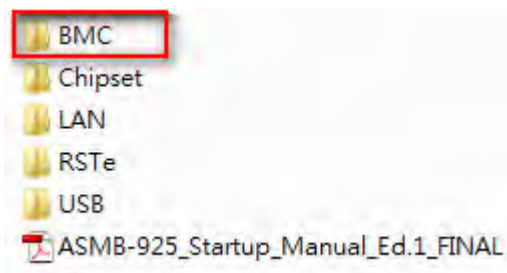
5.1 Introduction

Install the ASPEED VGA driver to enable this function, which includes the following features:

- 32-bit 2D graphics engine on board for normal operation
- 64 MB RAM for this chip, the highest resolution is 1920 x 1200

5.2 Windows Series Driver Setup

Insert the driver CD into the system's CD-ROM drive. When the folder is displayed, navigate to the BMC folder. Click the executable file to complete the installation of the drivers for the OS required.



Note!



1. *If the ASMB-925 serverboard carries an additional graphics card for VGA output, set this additional graphic card as “major output” in the Display Properties settings of the OS.*
2. *The WDDM driver can support the following OS versions:*
 - Windows 8 x86/x64 version
 - Windows 8.1 x86/x64 version
 - Windows Server 2012 version (WHQL)
 - Windows Server 2012R2 version (WHQL)
 - Windows 10 x86/x64 version
 - Windows Server 2016 version (WHQL)
3. *ASPEED Graphics WDDM driver limitation on Microsoft Windows OS*
 - *Because ASPEED VGA is a 2D VGA, it is a non WHQL-certified driver. The WHQL requires WDDM drivers to have 3D VGA function.*
 - *Because it is non WHQL-certified driver, there may be some compatibility issues with certain applications*

Chapter 6

LAN & USB 3.0 Configuration

6.1 LAN Configuration

6.1.1 Introduction

ASMB-925 serverboard features two Gigabit Ethernet LAN connections via dedicated PCI Express x1 lanes: GbE LAN1 (Intel® I210) and GbE LAN2 (Intel® I210), and two 10G BASE-T LAN connectors: LAN3 and LAN4 (Intel® X557 PHY). These connections eliminate bottlenecks of network data and incorporate Gigabit Ethernet at 10 Gbps.

6.1.2 Features

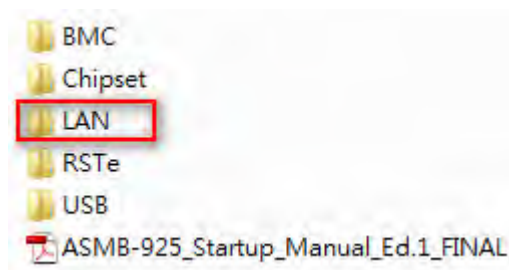
- 10/100/1000 and 10G BASE-T Ethernet controller
- 10/100/1000 and 10G BASE-T triple-speed MAC
- Full duplex at 10/100/1000 Mbps or 10 Gbps and half duplex at 10/100/1000 Mbps
- Wake-on-LAN (WOL) support
- PCIe x1 host and PHY interface

6.1.3 Installation

The integrated Intel® Gigabit Ethernet controller supports all major network OS. However, the installation procedure varies with different OS. Follow the driver setup procedure for the OS you are using.

6.1.4 Windows Series Driver Setup

Insert the driver CD into the system's CD-ROM drive. Open the LAN folder and click on the LAN driver for your OS.



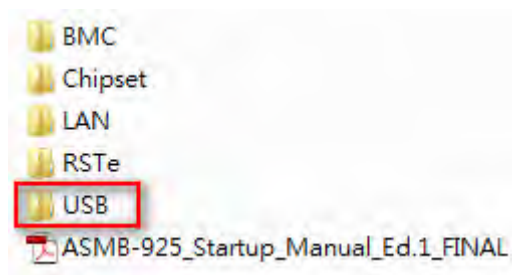
6.2 USB 3.0

6.2.1 Introduction

ASMB-925 serverboards feature six USB 3.0 ports, four at the rear and two via the onboard header. USB 3.0 offers a bandwidth of up to 500MB/s to reduce the time required for data transmissions.

6.2.2 Windows Series Driver Setup

Insert the driver CD into the system's CD-ROM. Access the USB folder and click the .exe driver file for your OS.



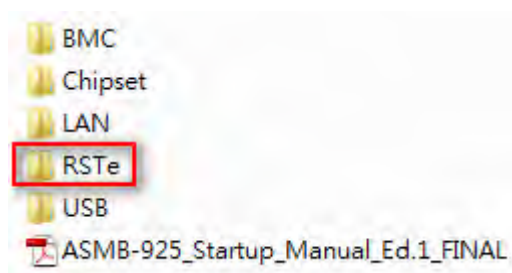
6.3 SATA & PCIe SSD RAID

The Intel® C621/C622 PCH chip offers SATA and PCIe SSD RAID support for Windows OS.

Note!



1. Visit the Intel website to download the Intel Rapid Storage Technology Enterprise for Microsoft Windows Operating System Software User Guide.
2. Visit the Microsoft website to download the hotfix file.



Appendix **A**

Programming the Watchdog Timer

The ASMB-925 serverboards' watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1 Watchdog Timer Overview

The watchdog timer is built into the EC controller IT8528E. It provides the following functions for user programming:

- Can be enabled and disabled
- Timer can be set from 1 to 255 seconds
- Generates an interrupt or reset signal if the software fails to reset the timer before timeout

A.2 Programming the Watchdog Timer

The I/O port address of the watchdog timer is listed below.

Address	Description	
0x57	Event - Warm Reset: 0x04	
0x5E	Warm Reset Timer (High BYTE)	Based 100ms
0x5F	Warm Reset Timer (Low BYTE)	

Below is a step-by-step example for programming the watchdog timer.

Step	Action	Description
00	Read 0x299 port	Clear I/O port
	Wait IBF clear	0x29A, BIT1, = 0
01	Write 0x89 to 0x29A	
	Wait IBF clear	0x29A, BIT1, = 0
02	Write 0x5E to 0x299 port	
	Wait IBF clear	0x29A, BIT1, = 0
03	Write 0x00 to 0x299 port	Set 10 sec (high byte)
	Wait IBF clear	0x29A, BIT1, = 0
04	Write 0x89 to 0x29A	
	Wait IBF clear	0x29A, BIT1, = 0
05	Write 0x5F to 0x299 port	
	Wait IBF clear	0x29A, BIT1, = 0
06	Write 0x64 to 0x299 port	Set 10 sec (low byte)
	Wait IBF clear	0x29A, BIT1, = 0
07	Write 0x89 to 0x29A	
	Wait IBF clear	0x29A, BIT1, = 0

08	Write 0x57 to 0x299 port	Watchdog Event
	Wait IBF clear	0x29A, BIT1, = 0
09	Write 0x04 to 0x299 port	(Warm) Reset event
	Wait IBF clear	0x29A, BIT1, = 0
10	Write 0x28 to 0x29A	Start watchdog
Wait 1 ~ 9 sec		
	Wait IBF clear	0x29A, BIT1, = 0
11	Write 0x29 to 0x29A	Stop watchdog
	Wait IBF clear	0x29A, BIT1, = 0
12	Go to Step 07	

Appendix **B**

I/O Pin Assignments

B.1 USB Header (USB7_8, USB9_10)

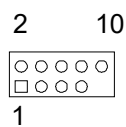


Table B.1: USB Header

Pin	Signal	Pin	Signal
1	USB_VCC5	2	USB_VCC5
3	USB_D-	4	USB_D-
5	USB_D+	6	USB_D+
7	GND	8	GND
9	Key	10	N/C

B.2 USB3.0 Header (USB5_6)

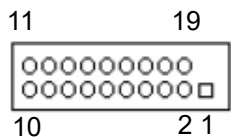


Table B.2: USB Header

Pin	Signal	Pin	Signal
1	+5 V	2	STDA_SSRX-
3	STDA_SSRX+	4	GND
5	STDA_SSRX-	6	STDA_SSRX+
7	GND	8	D-
9	D+	10	N/C (OC pin reserved)
11	D+	12	D-
13	GND	14	STDA_SSRX+
15	STDA_SSRX-	16	GND
17	STDA_SSRX+	18	STDA_SSRX-
19	+5 V	20	

B.3 VGA Connector (VGA1)

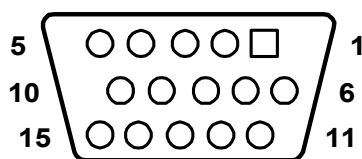


Table B.3: VGA Connector

Pin	Signal	Pin	Signal
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK
8	GND		

B.4 RS-232 Interface (COM2)

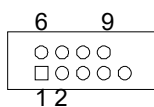


Table B.4: RS-232 Interface

Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

B.5 External Keyboard Connector (KBMS1)

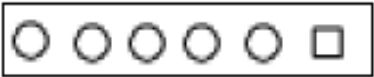


Table B.5: External Keyboard Connector

Pin	Signal
1	KB CLK
2	KB DATA
3	MS DATA
4	GND
5	VCC
6	MS CLK

B.6 CPU and System Fan Power Connector (CPUFAN0~1, SYSFAN0~SYSFAN4)

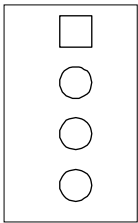


Table B.6: Fan Power Connector

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

B.7 Power LED (JFP3)

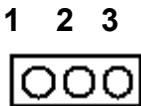


Table B.7: Power LED

Pin	Function
1	LED power (3.3 V)
2	N/C
3	Ground

B.8 External Speaker Connector (JFP2)

1 4 7 10



Table B.8: External Speaker Connector

Pin	Function
1	SPK+
4	N/C
7	BZ-
10	SPK-

B.9 Reset Connector (JFP1)

9 12



Table B.9: Reset Connector

Pin	Signal
9	RESET
12	GND

B.10 HDD LED Connector (JFP1)

2 5



Table B.10: HDD LED Connector

Pin	Signal
2	HDD_LED+
5	HDD_LED-

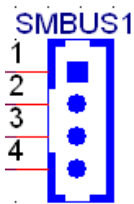
B.11 ATX Soft Power Switch (JFP1)



Table B.11: ATX Soft Power Switch

Pin	Signal
3	PWR-BTN
6	GND

B.12 Front Panel SMBus Connector (SMBUS1)



1	+V5
2	SMB_SCL_FRU
3	SMB_SDA_FRU
4	GND

B.13 USB/LAN Ports (LAN1_USB1_2, LAN2_USB3_4)

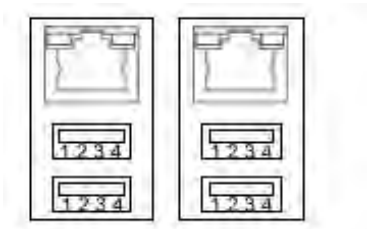


Table B.12: USB Port

Pin	Signal	Pin	Signal
1	VCC_DUAL	3	Data0+
2	Data0-	4	GND

Table B.13: Giga LAN 10/100/1000 BASE-T RJ-45 Port

Pin	Signal	Pin	Signal
1	MID0+	4	MID2+
2	MID0-	5	MID2-
3	MID1+	7	MID3+
6	MID1-	8	MID3-

B.14 Front Panel Audio Connector (HDAUD1)

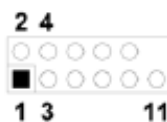


Table B.14: Front Panel Audio Connector

Pin	Signal	Pin	Signal
1	ACZ_VCC	2	GND
3	ACZ_SYNC	4	ACZ_BITCLK
5	ACZ_SDOUT	6	ACZ_SDIN0
7	ACZ_SDIN1	8	ACZ_RST
9	ACZ_12V	10	GND
11	GND	12	N/C

B.15 Alarm Board Connector (VOLT1)

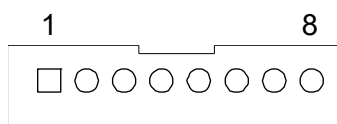


Table B.15: Alarm Board Connector

Pin	Signal	Pin	Signal
1	5VSB	5	+5V
2	GND	6	+3.3V
3	GND	7	-12V
4	-5V	8	+12V

B.16 Case Open Connector (JCASE1)

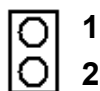


Table B.16: Case Open Connector

Pin	Signal
1	CASEOP
2	GND

B.17 Front Panel LAN LED Connector (LANLED1)

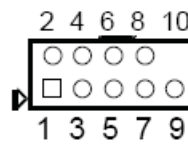
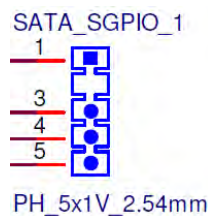


Table B.17: Front Panel LAN LED Connector

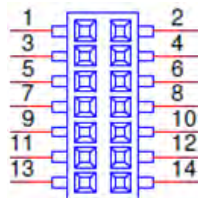
Pin	Signal	Pin	Signal
1	LAN1/3_LED0_ACT	2	LAN2/4_LED1_ACT
3	+V3.3_AUX	4	+V3.3_AUX
5	LAN1/3_LED1_1000M	6	LAN2/4_LED2_1000
7	+V3.3_AUX	8	+V3.3_AUX
9	VCC3	10	N/C

B.18 SATA SGPIO (SGPIO1)



1	SGPIO_SATA_CLOCK
2	N/C
3	SGPIO_SATA_LOAD
4	SGPIO_SATA_DATA0
5	SGPIO_SATA_DATA1

B.19 LPC Connector (LPC1)



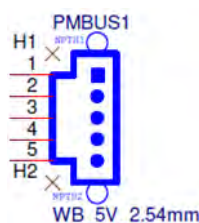
1	CLK_24M_LPCCN	2	LPC_AD1
3	PLTRST_LPC	4	LPC_AD0
5	LPC_FRAME	6	+3.3 V
7	LPC_AD3	8	GND
9	LPC_AD2	10	SMB_SCL_LPC
11	SERIRQ_PCH	12	SMB_SDA_LPC
13	+5V_AUX	14	+5V

B.20 Clear CMOS and Update ME Connector (JCMOS1, JME1)



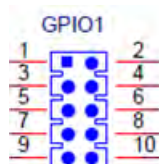
	JCMOS1	JME1
1	N/C	N/C
2	RTC_RST_PCH	PCH_HDA_SDO
3	GND	V3.3_AUX

B.21 PMBUS Connector (PMBUS1)



1	SMB_SCL_PM
2	SMB_SDA_PM
3	SMB_ALT_PM
4	GND
5	+V3.3_AUX

B.22 GPIO Connector (GPIO1)



1	EC_GPIO0	2	EC_GPIO4
3	EC_GPIO1	4	EC_GPIO5
5	EC_GPIO2	6	EC_GPIO6
7	EC_GPIO3	8	EC_GPIO7
9	+VCC_GPIO	10	GND



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