

User Manual

SKY-6200

**2U Rackmount Dual Intel®
Xeon® Scalable GPU server,
Supporting 4 x PCIe x16 double-
deck FH/FL card + 1 x PCIe x8
single-deck card or 9 x PCIe x8
single-deck card**

ADVANTECH

Enabling an Intelligent Planet

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Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

A Message to the Customer

Advantech Customer Services

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known.

Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and are easily solved over the phone.

In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

Declaration of Conformity

FCC Class A

Note: 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 which case the user will be required to correct the interference at his own expense.

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. Do not leave this equipment in an environment unconditioned where the storage temperature under 0° C (32° F) or above 35° C (95° F), it may damage the equipment.
8. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
9. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet and with earth connection. Ensure to connect the power cord to a socket-outlet with earthing connection.
10. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
11. All cautions and warnings on the equipment should be noted.
12. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
13. Never pour any liquid into an opening. This may cause fire or electrical shock.
14. Never open the equipment. For safety reasons, repair of the device may only be carried out by trained service personnel.
15. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
16. **CAUTION:** The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacture. Discard used batteries according to the manufacturer's instructions.
 - (1) **CAUTION:** Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.
 - (1) **ATTENTION:** Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebus les batteries usagées selon les instructions.
17. **THE COMPUTER IS PROVIDED WITH CD DRIVES (or Laser Product) COMPLY WITH APPROPRIATE SAFETY STANDARDS INCLUDING IEC 60825-1 or EN 60825-1.**
 - (1) Avoid direct exposure to the laser beam. Do not open the laser device enclosure. There are no user serviceable components inside.
 - (2) Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.
 - (3) Allow only authorized service technicians to repair the laser device.

18. This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
 - (1) This device may not cause harmful interference, and
 - (2) This device must accept any interference received, including interference that may cause undesired operation.
19. CAUTION: Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges.

CLASS 1 LASER PRODUCT KLASSE 1 LASER PRODUKT

20. CAUTION: Always ground yourself to remove any static charge before touching the mainboard, backplane, or add-on cards. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.
21. CAUTION: Any unverified component could cause unexpected damage. To ensure the correct installation, please always use the components (ex. screws) provided with the accessory box.
22. CAUTION: This product is not intended for use by children (this product is not a toy).
 - (1) This equipment is not suitable for use in locations where children are likely to be present.
23. CAUTION: Improper installation of VESA mounting can result in serious personal injury! Use suitable mounting apparatus to avoid risk of injury. VESA mount installation should be operated by professional technician, please contact the service technician or your retailer if you need this service.
24. Repair of the device may only be carried out by trained service personnel. Advantech recommends that a service contract be obtained with Advantech Service and that all repairs also be carried out by them. Otherwise the correct functioning of the device may be compromised.
25. CAUTION: Do not modify this equipment without authorization of the manufacturer.
26. CAUTION: To avoid risk of electric shock, this equipment must only be connected to supply mains with protective earth.
27. CAUTION: Remove the power cord to fully turn off the device.
28. CAUTION: If this device was not used in the manner which manufacturer suggested, the end system shall evaluate for further compliance.
29. CAUTION: Never immerse equipment or electrical connectors in water or other liquids.
30. CAUTION: Remove the power cord before change FUSE and replace only with the same ratings and type of FUSE.
31. Observe local occupational health and safety requirements and guidelines for manual materials handling.
32. Do not attempt to move a equipment by yourself; at least two people are needed to move a equipment.
33. Use only the power cords and power supply units provided with your equipment. The equipment might have one or more power cords. For North America, a UL listed and CSA labeled power cord must be used with the equipment.
34. Operation of the device without regulatory approval is illegal.

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35. CAUTION: Disposal of a battery (or battery pack) into fire or a hot oven, or mechanically crushing or cutting of a battery (or battery pack), that can result in an EXPLOSION; leaving a battery (or battery pack) in an extremely high temperature surrounding environment that can result in an EXPLOSION or the leakage of flammable liquid or gas; a battery (or battery pack) subjected to extremely low air pressure that may result in an EXPLOSION or the leakage of flammable liquid or gas. Discard used batteries according to the manufacturer's instructions.
 36. CAUTION: To disconnect power, remove all power cords.
 37. CAUTION: Monitor equipment (or display): It may endanger eyes when over-used.
 - (1) Please take a rest for 10 minutes after using 30 minutes.
 - (2) Do not let the children under 2 years old watching the monitor (or display). For children over (including) 2 years old, do not watch the monitor (od display) over 1 hour each day.
 38. CAUTION: If the user does not follow the user manual to use the equipment, it will have risk to cause the bottom side opening of the equipment.
 39. CAUTION: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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Safety Information

Retain and follow all product safety and operating instructions provided with your equipment. In the event of a conflict between the instructions in this guide and the instructions in equipment documentation, follow the guidelines in the equipment documentation.

Observe all warnings on the product and in the operating instructions. To reduce the risk of bodily injury, electric shock, fire and damage to the equipment, observe all precautions included in this guide.

You must become familiar with the safety information in this guide before you install, operate, or service Advantech products.

Machine Room Environment

- Make sure that the area in which you install the system is properly ventilated and climate-controlled.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the electrical rating label of the equipment.
- Do not install the system in or near a plenum, air duct, radiator, or heat register.
- Never use the product in a wet location.

Equipment Chassis

- Do not block or cover the openings to the system.
- Never push objects of any kind through openings in the equipment.
- Dangerous voltages might be present.
- Conductive foreign objects can produce a short circuit and cause fire, electric shock, or damage to your equipment.
- Lift equipment using both hands and with your knees bent.

Rack Mount Instructions

The following or similar rack-mount instructions are included with the installation instructions:

- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over current protection and supply wiring.
- Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing - Reliable earthing of rackmounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

- Make sure only one component is extended at a time. A rack might become unstable if more than one component is extended.

Equipment Batteries*

- The system battery contains lithium manganese dioxide. If the battery pack is not handled properly, there is risk of fire and burns.
- Do not disassemble, crush, puncture, short external contacts, or dispose of the battery in fire or water.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- The system battery is not replaceable. If the battery is replaced by an incorrect type, there is danger of explosion. Replace the battery only with a spare designated for your product.
- Do not attempt to recharge the battery.
- Dispose of used batteries according to the instructions of the manufacturer.
- Do not dispose of batteries with the general household waste. To forward them to recycling or proper disposal, use the public collection system or return them to Advantech, your authorized Advantech partner, or their agents.

Equipment Modifications

- Do not make mechanical modifications to the system. Advantech is not responsible for the regulatory compliance of Advantech equipment that has been modified.

Equipment Repairs and Servicing

- The installation of internal options and routine maintenance and service of this product should be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy levels.
- Do not exceed the level of repair specified in the procedures in the product documentation. Improper repairs can create a safety hazard.
- Allow the product to cool before removing covers and touching internal components.
- Remove all watches, rings, or loose jewelry when working before removing covers and touching internal components.
- Do not use conductive tools that could bridge live parts.
- Use gloves when you remove or replace system components; they can become hot to the touch.
 - If the product sustains damage requiring service, disconnect the product from the AC electrical outlet and refer servicing to an authorized service provider. Examples of damage requiring service include:
 - The power cord, extension cord, or plug has been damaged.
 - Liquid has been spilled on the product or an object has fallen into the product.
 - The product has been exposed to rain or water.
 - The product has been dropped or damaged.
 - The product does not operate normally when you follow the operating instructions.

Peripheral Compatibility

Category	Advantech PN	Vendor	Part Description	Remarks
CPU	TBD	Intel	Xeon Bronze 3104/1.70GHz/ 8.25M/6Cores	85W
	96MPXE-1.7-11M36	Intel	Xeon Bronze 3106/1.70GHz/ 11M/8Cores	85W
	TBD	Intel	Xeon Silver 4108/1.80GHz/11M/ 8Cores	85W
	96MPXE-2.0-11M36	Intel	Xeon Silver 4109T/2.0GHz/11M/ 8Cores	70W
	96MPXE-2.1-11M36	Intel	Xeon Silver 4110/2.1GHz/11M/ 8Cores	85W
	TBD	Intel	Xeon Silver 4112/2.6GHz/8.25M/ 4Cores	85W
	TBD	Intel	Xeon Silver 4114/2.2GHz/ 13.75M/10Cores	85W
	96MPXE-2.1-16M36	Intel	Xeon Silver 4116/2.1GHz/16.5M/ 12Cores	85W
	TBD	Intel	Xeon Gold 5115/2.4GHz/ 13.75M/10Cores	85W
	96MPXE-2.3-16M36	Intel	Xeon Gold 5118/2.3GHz/16.5M/ 12Cores	105W
	TBD	Intel	Xeon Gold 5120/2.2GHz/ 19.25M/14Cores	105W
	96MPXE-2.2-19M36	Intel	Xeon Gold 5120T/2.2GHz/ 19.25M/14Cores	105W
	TBD	Intel	Xeon Gold 6140/2.3GHz/ 24.75M/18Cores	140W
Memory	AQD-D4U4GR24-HG	ADATA	4G DDR4-2400 RDIMM	REG- ECC
	SQR-RD4M- 32G2K4SRB	Advantech	32G DDR4-2400 RDIMM	REG- ECC
	SQR- RD4N8G2K4SZBBB	Advantech	8G DDR4-2400 RDIMM	REG- ECC
*SATA HDD	96ND1T-ST-SG7E	Seagate	2.5" Enterprise SATAIII 1TB	ST1000N X0313
	96ND2TB-ST-SG7KE	Seagate	2.5" Enterprise SATAIII 2TB	ST2000N X0253
	TISGED020007	Transcend	2.5" 64G SSD	ST95006 20SS
	TISGED020011	Transcend	2.5" 256G SSD	ST95006 20SS
	TISGED020025	Transcend	2.5" 128G SSD	ST95006 20SS
CPU Heatsink	1960081155N101	CoolJag	H.S R3 I-Skylake-SP S-165W 108x78.0x25.5-SC	For CPU1
	1960081155N001	CoolJag	Heatsink I-Skylake-EP S-165W 107.75x78.0x25.5-SC	For CPU0

Riser Card	96916200030	Advantech	SKY-6200 UR 2x PCIe x16 riser card (w/switch)	-
	96916200040	Advantech	SKY-6200 UL 2x PCIe x16 riser card (w/switch)	-
	9696910R70E	Advantech	SKY-6200 UM 1x PCIe x8 riser card	-
Power supply	96PSRM-A2KWCRP	Delta	2000W CRPS Module	
GPU Card	SKY-TESL-P100-16P	nVidia	Tesla P100-PCIE-16GB x16 HS	
	SKY-TESL-P100-PE	nVidia	Tesla P100 128GB PCI-E x16 HS	
	SKY-TESL-P4-PE	nVidia	Tesla P4 8GB PCI-E x16 HS	
	SKY-TESL-P40-PE	nVidia	Tesla P40 24GB PCI-E x16 HS	
	SKY-TESL-V100-P	nVidia	Tesla V100 16GB PCI-E x16 HS	

Note! SKY-6200 system **MUST** use the SSD or enterprise level SATA HDD or SAS HDD.



Initial Inspection

Before powering up the system, please make sure that the following materials have been shipped:

- 1 x SKY-6200 system
- 1 x SKY-6200 Startup Manual
- 2 x CPU heatsink with clip
- 1 x Front bezel
- 2 x Mounting ears with handles
- 1 x Warranty card

If any of these items are missing or damaged, contact distributor or sales representative immediately. We have carefully inspected the SKY-6200 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. When unpacking the SKY-6200, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it 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.

Order Information

Part number	Expansion slot	Lan port	IPMI
SKY-6200-R20A1	4*PCIe x16 + 1*PCIe x8	4	Yes

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Chapter 1

Overview

1.1 Introduction

The SKY-6200 is a high performance Intel Xeon scalable processor system for GPU applications that require high computing power & multi-expansion slots in a 2U system. This system supports dual Intel Xeon scalable processors and DDR4 ECC-REG 2133/2400/2666 MHz memory up to 1536 GB.

In addition, SKY-6200 provides dual 10GbE Ethernet and dual Gigabit Ethernet LAN ports, eliminating network bottlenecks. 4 x PCIe x16 slots support up to 4 x double-deck expansion cards or 8* single-deck expansion cards.

SKY-6200 uses the Intel C622 chipset and offers a variety of features such as 8 x SATA III interfaces (via Mini-SAS HD connector), Intel RSTe (Rapid Storage Technology Enterprise), RAID 0,1,10,5 (Windows only*), 1 x M.2 2280 SATA device for OS installation, 4 x USB3.0 ports on the rear side, and 2 x USB 2.0 on the front side.

These powerful I/O capabilities ensure even more reliable data storage capabilities and high-speed I/O peripheral connectivity.

1.2 Features

General

- Intel Xeon Scalable Family processor support: SKY-6200 supports two Intel Scalable Family series multi-core (up to twenty cores) processors.
- High performance I/O capability: 2* 10GbE + 2 x Gigabit LAN, 4* PCIe x16(x16 link) + 1*PCIe x8(x8 link), 2* Mini-SAS HD connectors, 1* SATA M.2 2280 slot, 4* USB3.0 ports in rear side, 2* USB2.0 ports in front side.
- Proprietary form factor with industrial features: SKY-6200 provides industrial features like long product lifecycle, reliable operation, watchdog timer, etc.
- IPMI 2.0 support: SKY-6200 equipped with ASPEED 2500 BMC chip supports IPMI 2.0 (Intelligent Platform Management Interface 2.0) via LAN1 and LAN4 ports.
- KVM over IP: SKY-6200 KVM over IP function allows remote control of system through your own computer.

Note! Please refer to the release notes of each Linux OS for Intel's C622 chipset SATA RAID function support.



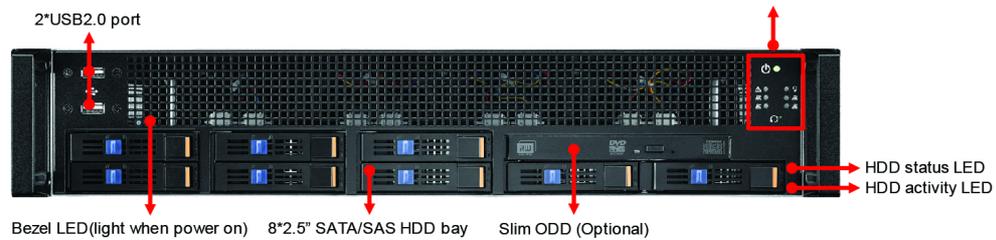
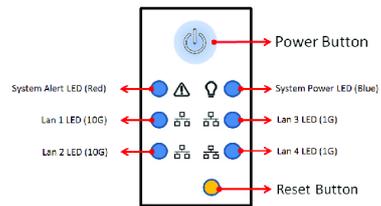
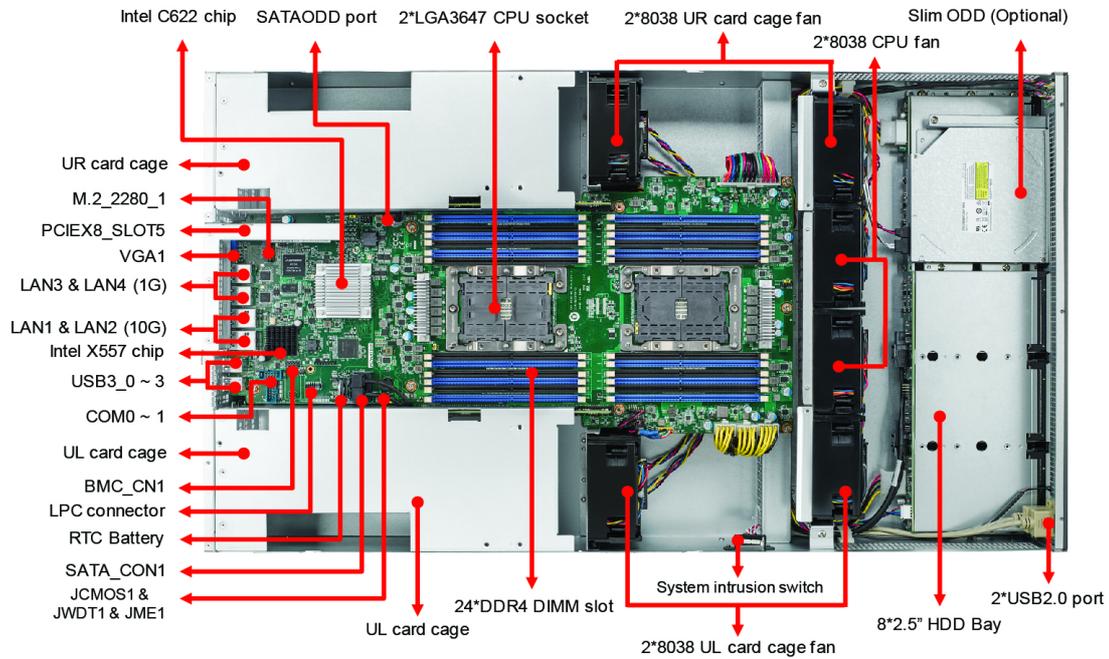
1.3 System Specifications

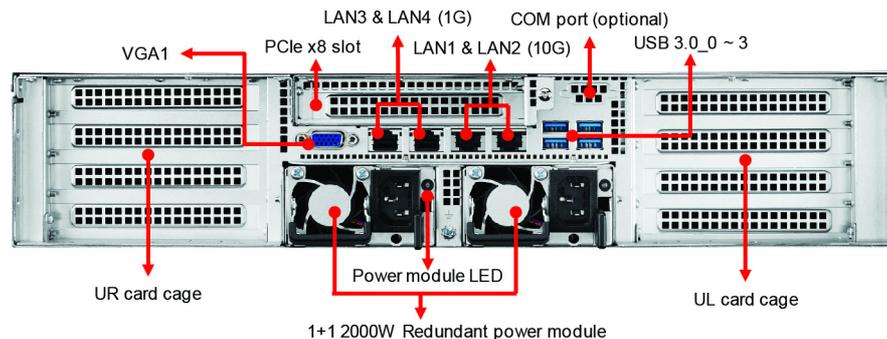
Processor	
CPU	<ul style="list-style-type: none"> ■ Dual Intel LGA3647 Xeon processor sockets ■ Supports Intel Xeon scalable family processor ■ Supports processor TDP up to 140 W.
System Memory	
Memory Capacity	<ul style="list-style-type: none"> ■ Intel Xeon processor supports DDR4 memory bus ■ Total 24 x 288-pin memory slots provided ■ Supports total capacity up to 1536 GB ■ 6 channels per processor, 2 memory slot per channel
Memory Type	■ Supports DDR4 2133/2400/2666 MHz ECC-REG Modules
Memory Sizes	Each memory slot supports 4GB, 8GB, 16GB, 32GB memory 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 C622 PCH
Network Controllers	<ul style="list-style-type: none"> ■ Intel X557-T for LAN1/2 10 GbE and 2 * Intel I210AT Gigabit Ethernet Controller for LAN3/4 connected to PCH ■ Above network Supports 10 GbE Base-T and 10/100/1000 Base-T, with RJ-45 output
VGA	ASPEED AST2500 controller with 64 MB VGA memory provides basic 2D VGA function.
EC	ITE 8528E chip provide motherboard, RS-232 and hardware monitor functions.
BMC	Sharing with the LAN 1/4.
Input / Output	
Storage	<ul style="list-style-type: none"> ■ Total 8 x 2.5" HDD bays, all support 12 Gb/s bandwidth ■ RAID 0,1,10,5 support (Windows only).
LAN	4 x RJ-45 LAN ports (2* 10GbE + 2* 10/100/1000 Base-T GbE)
USB	<ul style="list-style-type: none"> ■ 4 x USB 3.0 ports at rear window. ■ 2 x USB 2.0 ports at front window.
VGA	1 x D-Sub port
Serial Port / Header	2 x Internal header (2 * 5 pin, 2.5 mm pitch) for UART port.
Power Supply	
Power	80 PLUS Platinum 1+1 redundant power supply 1000 W @ 100 ~ 127 V 2000 W @ 200 ~ 240 V
Power Cable for Expansion card	
Cable Type	8 x 6-pin to 6+2pin PCIE type + 4 x 8-pin to 8-pin CPU type power cable.
Expansion Slots	

PCI-express	<ul style="list-style-type: none"> ■ UR Card Cage (From CPU0) <ul style="list-style-type: none"> – Slot 1 (PCIe x8 or N/A link) – Slot 2 (PCIe x16 or x8 link) – Slot 3 (PCIe x8 or N/A link) – Slot 4 (PCIe x16 or x8 link) ■ UM Card Cage (From CPU0) <ul style="list-style-type: none"> – Slot 1 (PCIe x8 link) ■ UL Card Cage (From CPU1) <ul style="list-style-type: none"> – Slot 1 (PCIe x16 or x8 link) – Slot 2 (PCIe x8 or N/A link) – Slot 3 (PCIe x16 or x8 link) – Slot 4 (PCIe x8 or N/A link)
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 80x38 fan for CPU cooling. ■ 4 x 4-pin 80x38 fan for expansion card cooling. ■ All fans with tachometer status monitoring
Temperature	Monitoring for CPU0 & CPU1 (PECI) Monitoring for System (HWM)
Other Features (Case Open)	<ul style="list-style-type: none"> ■ Chassis intrusion detection
Operating Environment / Compliance	
RoHS	RoHS Compliant
Environmental Spec.	<ul style="list-style-type: none"> ■ Operating Temperature: 0 to 35° C ■ Non-operating Temperature: -20 to 60° C ■ Operating Relative Humidity: 10~85% @ 40° C (non-condensing) ■ Non-operating Relative Humidity: 10~95% @ 40° C (non-condensing)

1.4 System Layout, LED, Jumpers and Connectors

Connectors on the SKY-6200 are linked to external devices such as hard disk drives. In addition, SKY-6200 has a jumper that are used to clean CMOS for BIOS. The tables below list the functions of each jumper and connector. Later sections in this chapter give instructions for setting jumpers. Chapter 2 gives instructions for connecting external devices to SKY-6200.





1.4.1 LED Definitions

Front I/O LED

LED	State	Color	Description
Power LED	On	Green	System is turned on
	Blinking	Green	System is under S1 or S4 state
	Off	Off	Power off
LAN1 ~ LAN4 LED	Blinking	Green	LAN active
	On	Green	LAN linked
	Off	Off	LAN unlinked
Information LED	On	Red	Hardware monitor fail*; Location**
	Off	Off	No failure

*hardware monitor fail can be over temperature, fan fail, over voltage, case intrusion etc... please check BMC web UI for more information.

**Location function is used to locate the server on rack from remote location

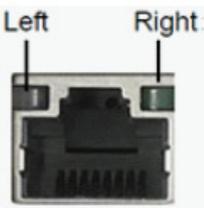
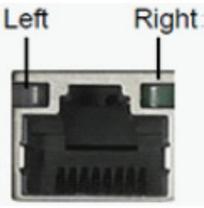
HDD LED

HDD status	Status LED Color: Amber	Activity LED Color: Green
No driver present or power disconnected	Off	-
Driver present	No activity	On
	Access activity	Blinking
HDD fail	On (only work under the RAID mode)	
Identify (locate the HDD)	4 Hz Blinking (only work under the RAID mode)	
SATA/SAS RAID building	1 Hz Blinking (only work under the RAID mode)	

On-Board LED

LED	State	Color	Description
5V LED1	On	Green	System power on
	Off	Off	Power off
5VSB LED1	On	Green	System power on, in sleep mode or in soft-off mode
	Off	Off	No AC power input
BMC LED1	Blinking	Green	BMC Controller is working normally

Rear I/O LED (1)

LED	Left LED	Right LED	Description
 LAN 1 / LAN2 LED	Off	Green	100M bps linked
	Off	Blinking Green	100M bps Active
	Amber	Green	1G bps linked
	Amber	Blinking Green	1G bps Active
	Green	Green	10G bps linked
	Green	Blinking Green	10G bps Active
 LAN 3 / LAN4 LED	Off	Green	10M bps linked
	Off	Blinking Green	10M bps Active
	Amber	Green	100M bps linked
	Amber	Blinking Green	100M bps Active
	Green	Green	1G bps linked
	Green	Blinking Green	1G bps Active
	Off	Off	No Link

Rear I/O LED(2)

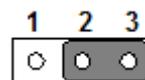
Power module LED	Blinking	Red	No AC power to this module
	Blinking	Blue	AC present standby output on
	On	Red	Power supply failure
	On	Blue	Power supply DC output ON and OK
	Off	Off	No AC power to power module

1.4.2 Jumpers

Label	Function	Default
JCMOS1	CMOS clear	1-2
JME1	ME update	1-2



Keep CMOS data / Disable ME update



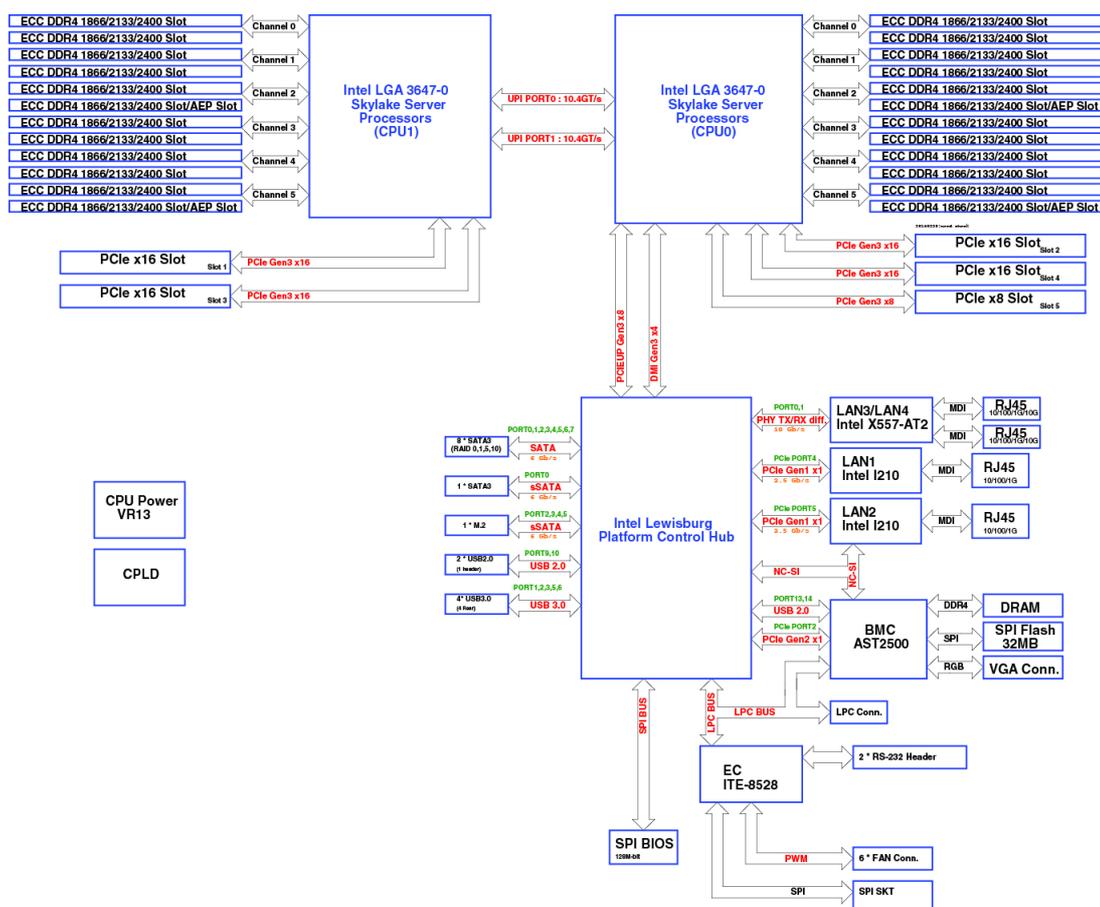
Clear CMOS data / Enable ME update

1.4.3 Connectors

CPU0	Intel LGA3647 CPU0 socket
CPU1	Intel LGA3647 CPU1 socket
SYS FAN0 ~ SYS FAN5	System fan connector (4-pin)
DIMM A1	Channel A DIMM1 of CPU0
DIMM A2	Channel A DIMM2 of CPU0
DIMM B1	Channel B DIMM1 of CPU0
DIMM B2	Channel B DIMM2 of CPU0
DIMM C1	Channel C DIMM1 of CPU0
DIMM C2	Channel C DIMM2 of CPU0
DIMM D1	Channel D DIMM1 of CPU0

DIMM D2	Channel D DIMM2 of CPU0
DIMM E1	Channel E DIMM1 of CPU0
DIMM E2	Channel E DIMM2 of CPU0
DIMM F1	Channel F DIMM1 of CPU0
DIMM F2	Channel F DIMM2 of CPU0
DIMM G1	Channel G DIMM1 of CPU1
DIMM G2	Channel G DIMM2 of CPU1
DIMM H1	Channel H DIMM1 of CPU1
DIMM H2	Channel H DIMM2 of CPU1
DIMM I1	Channel I DIMM1 of CPU1
DIMM I2	Channel I DIMM2 of CPU1
DIMM J1	Channel J DIMM1 of CPU1
DIMM J2	Channel J DIMM2 of CPU1
DIMM K1	Channel K DIMM1 of CPU1
DIMM K2	Channel K DIMM2 of CPU1
DIMM L1	Channel L DIMM1 of CPU1
DIMM L2	Channel L DIMM2 of CPU1
ATXPWR1	Connect to ATXPWR1 of SKY-6200 PDB for system power
ATXPWR2	Connect to ATXPWR2 of SKY-6200 PDB for CPU0 & CPU1 12V power
ATXPWR3	Connect to ATXPWR3 of SKY-6200 PDB for CPU0 & CPU1 12V power
ATXPWR4	Connect to ATXPWR4 of SKY-6200 PDB for CPU0 & CPU1 12V power
BMC_CN1 ~ BMC_CN2	IPMI module connector
SATA_CON1	For SKY-6200 BP CN1 & CN2 connector
SATAODD	For SKY-6200 slim ODD (optional)
M2_2280_1	Slot for M.2 2280 type SSD (PCIe/SATA)
PDBCN1	Connect to PDBCN1 of SKY-6200 PDB
PDBCN2	Connect to PDBCN2 of SKY-6200 PDB
PCIEX16_SLOT1	PCIe x16 slot(Gen3 x16 link) slot from CPU1 to PCIEX16_1 slot of UL riser card
PCIEX16_SLOT3	PCIe x16 slot(Gen3 x16 link) slot from CPU1 to PCIEX16_3 slot of UL riser card
PCIEX16_SLOT2	PCIe x16 slot(Gen3 x16 link) slot from CPU0 to PCIEX16_2 slot of UR riser card
PCIEX16_SLOT4	PCIe x16 slot(Gen3 x16 link) slot from CPU0 to PCIEX16_4 slot of UR riser card
PCIEX8_SLOT5	PCIe x8 slot(Gen3 x8 link) slot from CPU0 to PCIEX8_SLOT1 slot of UM riser card
LPC1	LPC port for debug & TPM module
COM0 ~ COM1	Serial port : RS-232
USB2_1	For front panel 2*USB 2.0 ports

1.5 Block Diagram



1.6 System Memory

SKY-6200 has twenty-four 288-pin memory slots for DDR4 2133/2400/2666 MHz memory modules with maximum capacity of 1536 GB (Maximum 64 GB for each DIMM). SKY-6200 supports registered DIMMs ONLY.

1.7 Memory Installation Procedures

	Single processor installed (CPU0)					Dual processor installed (CPU1)			Quantity of memory mod- ule installed
	1	2	4	8	12	16	20	24	
DIMM A1	V	V	V	V	V	V	V	V	DIMM G1
DIMM A2				V	V		V	V	DIMM G2
DIMM B1		V	V	V	V	V	V	V	DIMM H1
DIMM B2				V	V		V	V	DIMM H2
DIMM C1					V			V	DIMM I1
DIMM C2					V			V	DIMM I2
DIMM D1			V	V	V	V	V	V	DIMM J1
DIMM D2				V	V		V	V	DIMM J2
DIMM E1			V	V	V	V	V	V	DIMM K1
DIMM E2				V	V		V	V	DIMM K2
DIMM F1					V			V	DIMM L1
DIMM F2					V			V	DIMM L2

Chapter 2

Setting up

2.1 Before you Begin

This chapter explains how to install the CPUs, CPU heatsinks, memory modules, and hard drives. Instructions on inserting add on cards are also given.

2.1.1 Work Area

Make sure you have a stable, clean working environment. Dust and dirt can get into components and cause malfunctions. Use containers to keep small components separated. Putting all small components in separate containers prevents them from becoming lost. Adequate lighting and proper tools can prevent you from accidentally damaging the internal components.

2.1.2 Tools

The following procedures require only a few tools, including the following:

- A cross head (Phillips) screwdriver
- A T-30 Torx driver
- A grounding strap or an anti-static pad

Most of the electrical and mechanical connections can be disconnected with your hands. It is recommended that you do not use pliers to remove connectors as it may damage the soft metal or plastic parts of the connectors.

2.1.3 Precautions

Components and electronic circuit boards can be damaged by discharges of static electricity. Working on a system that is connected to a power supply can be extremely dangerous. Follow the guidelines below to avoid damage to SKY-6200 or injury to yourself.

- Ground yourself properly before removing the top cover of the system. Unplug the power from the power supply and then touch a safely grounded object to release static charge (i.e. power supply case). If available, wear a grounded wrist strap. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Avoid touching motherboard components, IC chips, connectors, memory modules, and leads.
- The motherboard is pre-installed in the system. When removing the motherboard, always place it on a grounded anti-static surface until you are ready to reinstall it.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Do not flex or stress circuit boards.
- Leave all components inside the static-proof packaging that they ship with until they are ready for installation.
- After replacing optional devices, make sure all screws, springs, or other small parts are in place and are not left loose inside the case. Metallic parts or metal flakes can cause electrical shorts.

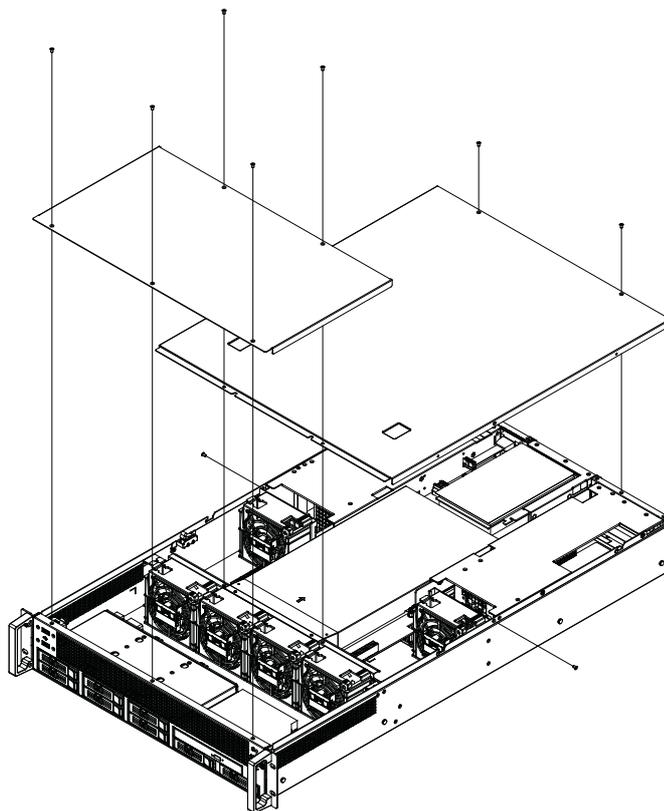
2.2 Installing Motherboard Components

This section describes how to install components on to the mainboard, including CPUs, memory modules and add on cards.

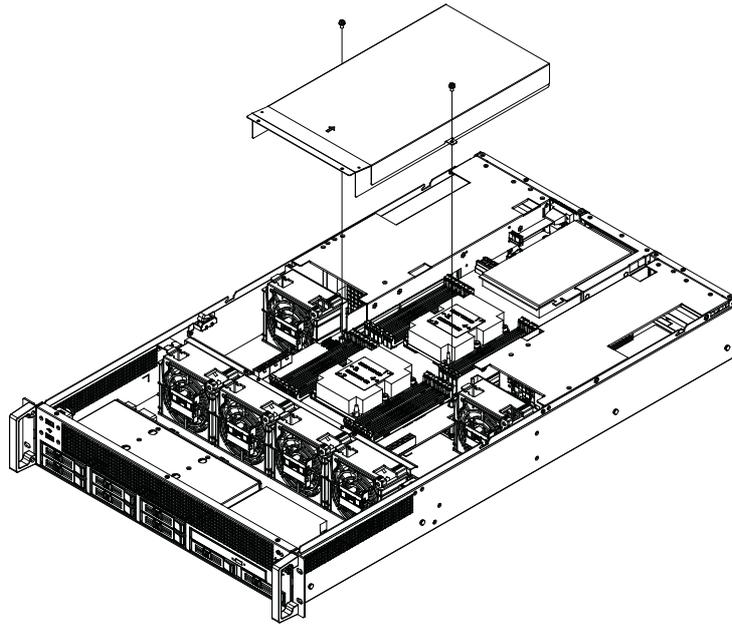
2.2.1 Removing the Chassis Cover and CPU Duct

Follow these instructions to remove SKY-6200 chassis cover.

1. Unscrew the top cover as shown.



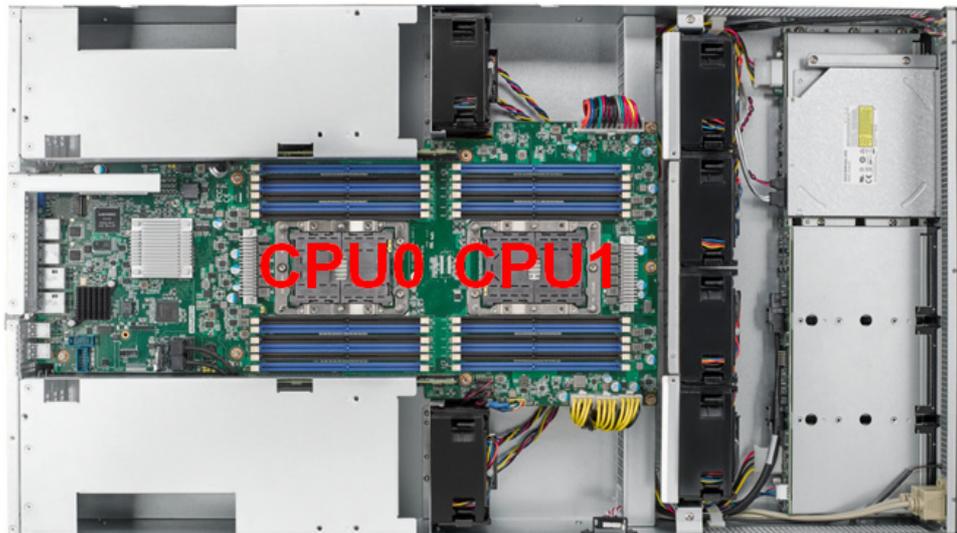
2. Remove CPU air duct.



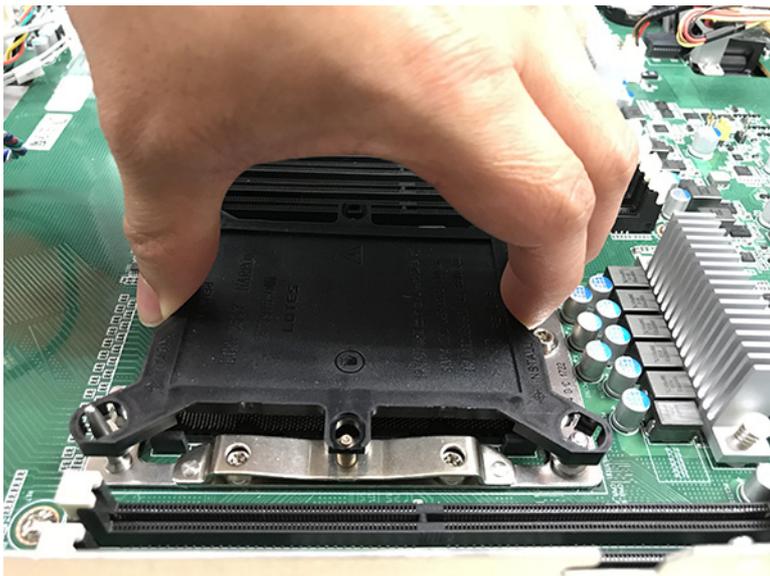
2.2.2 Installing the CPU and Heatsink

Follow the steps below to install CPUs and CPU heatsinks.

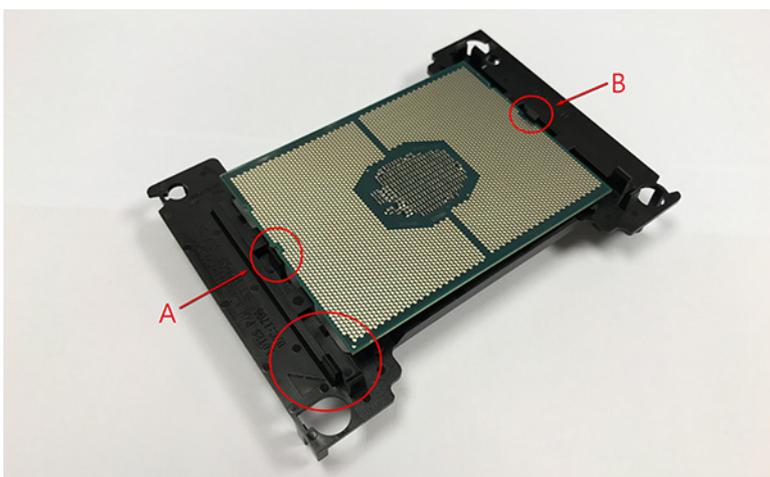
1. Locate the CPU sockets - you must install in the CPU0 socket first.



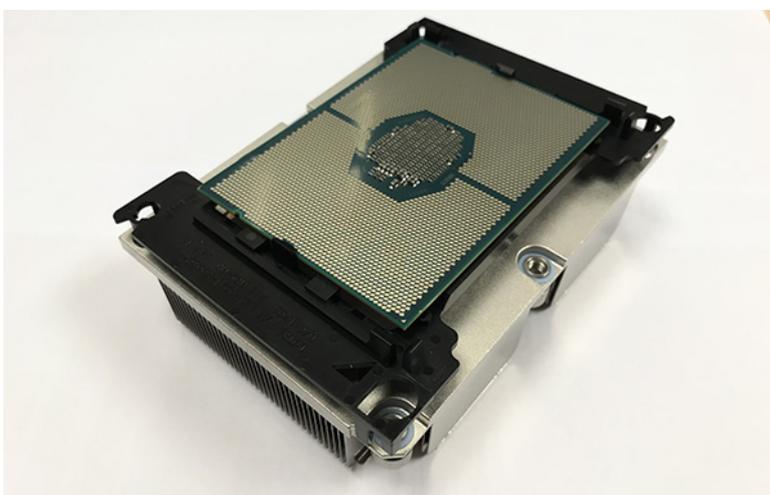
2. Remove CPU dust cover from the CPU socket.



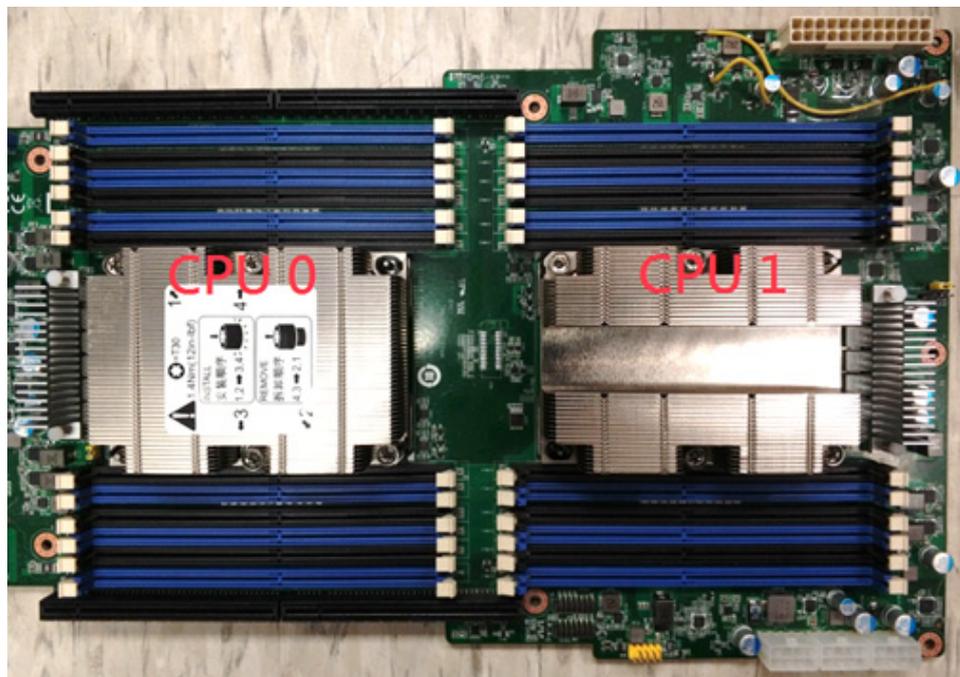
3. Assemble the CPU with CPU clip and align the triangle mark on both CPU and the clip, make sure both notch A and B on the CPU is carefully aligned with CPU clip.



4. Assemble the heatsink and the sub assembly as in the previous step.



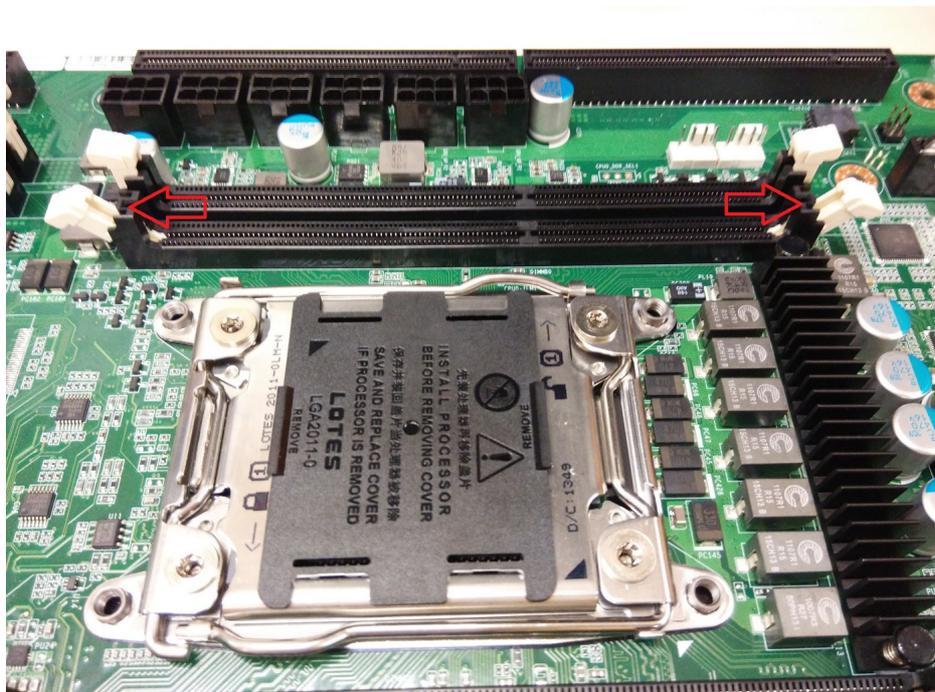
- Carefully align the triangle mark on the CPU against the triangle mark on the CPU socket then place the CPU with heatsink into the CPU socket.
- Use a T30 Torx screwdriver for tighten the screws in the order of 1,2 -> 3,4 with a torque of 12lbf.
- When removing CPU and heatsink, use a T30 Trox screwdriver to loosen the screws in the order of 4,3 -> 2,1, then lift the CPU and heatsink up.



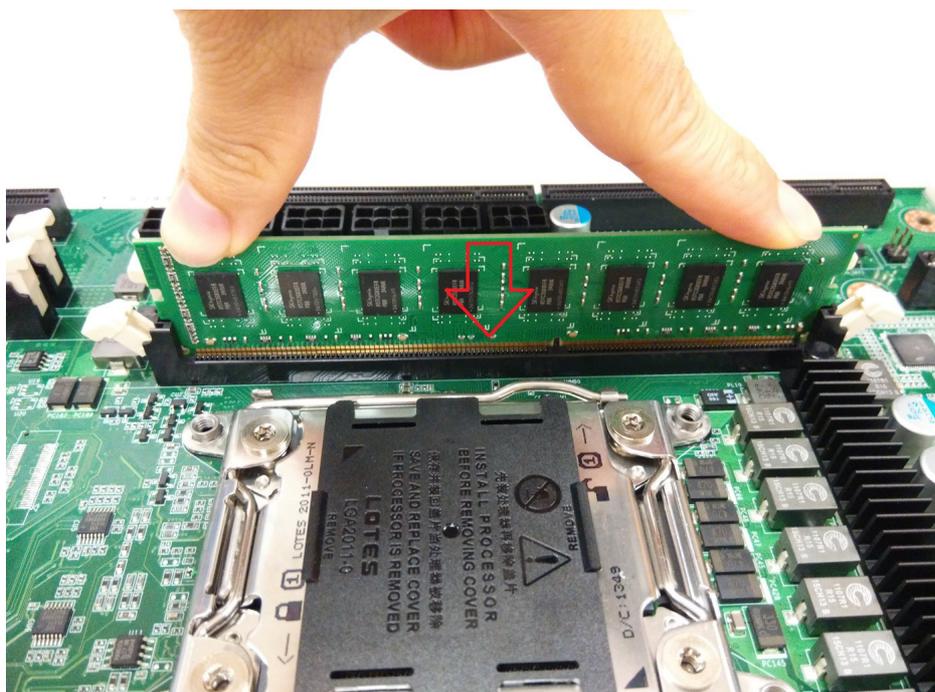
2.2.3 Installing the Memory

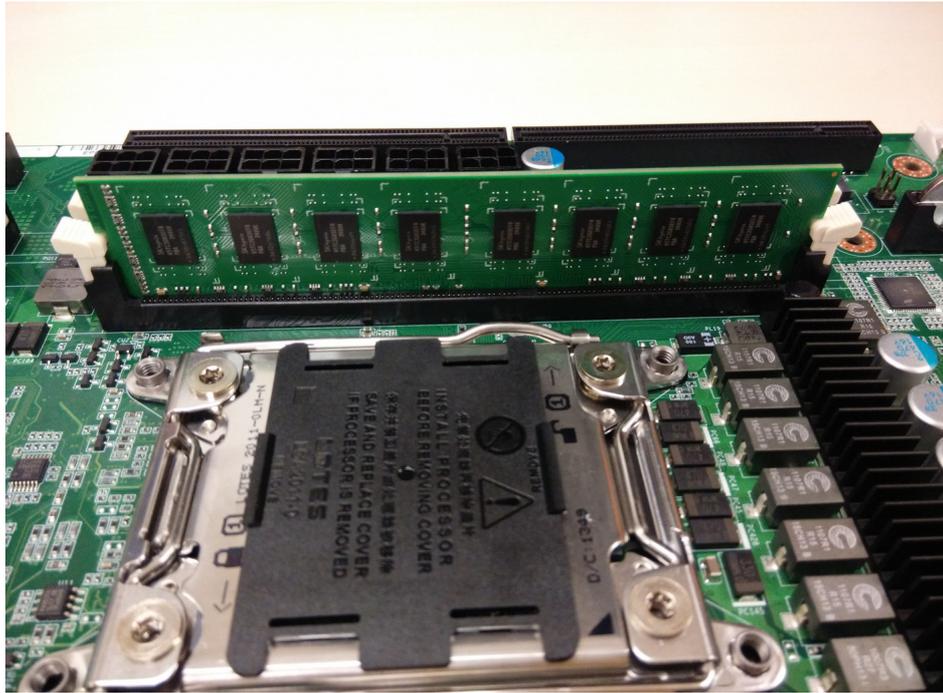
Follow these instructions to install the memory modules onto the motherboard.

1. Locate the memory slots on the motherboard.
2. Press the memory slot locking levers in the direction of the arrows as shown in the following illustration.



3. Align the memory module with the slot. When inserted properly, the memory slot locking levers lock automatically onto the indentations at the ends of the module. Follow the recommended memory population table to install the other memory modules.





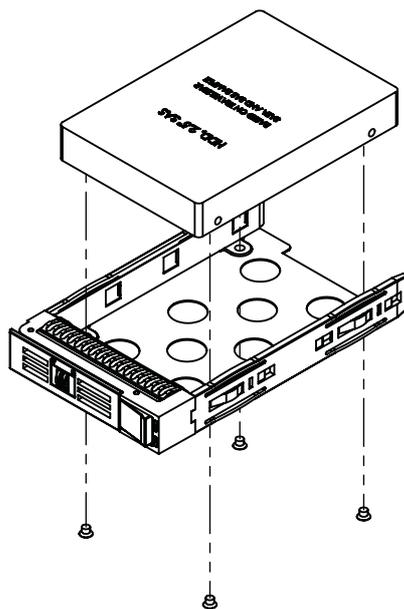
2.2.4 Installing Hard Drives

The SKY-6200 supports eight 2.5" hard drives. Follow these instructions to install a hard drive.

1. Press the locking lever latch and pull the locking lever open, then slide the HDD tray out.

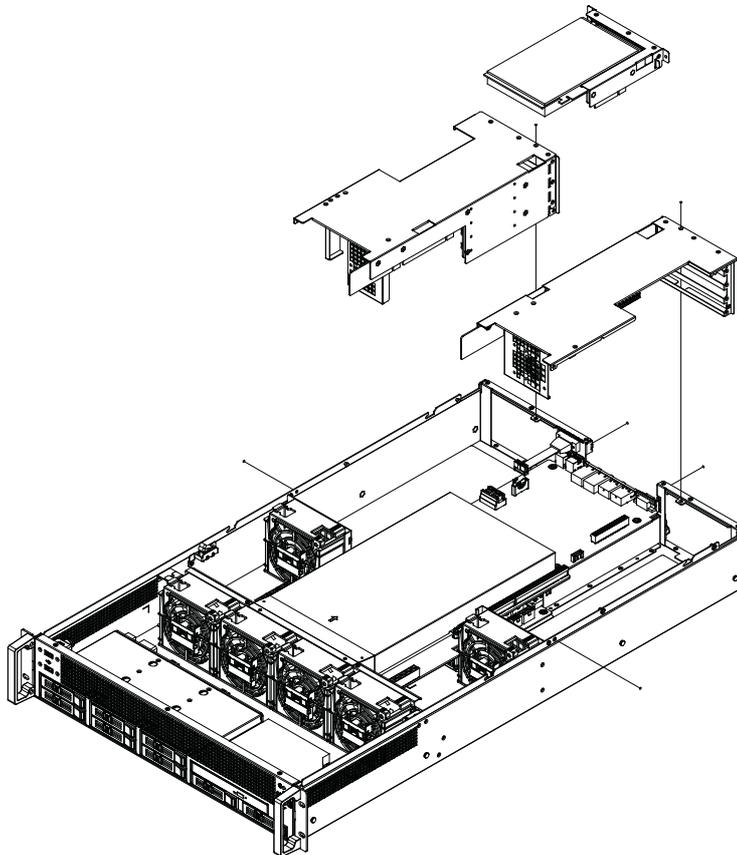


2. Place a hard drive into the drive tray and use the screws to secure the HDD, then insert the HDD tray into the chassis and press the locking lever to secure the tray.



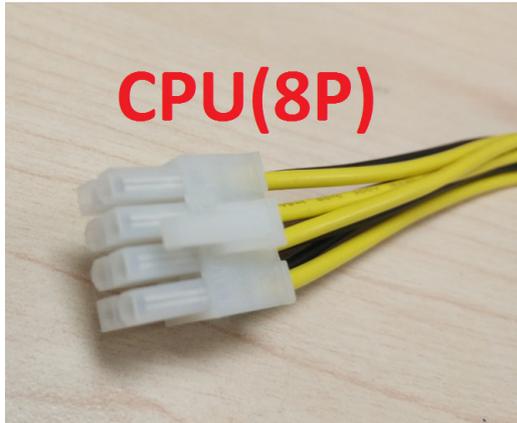
2.2.5 Installing UR/UL/UM Riser Card Cage

For all riser card cages (UR/UL/UM) removal, refer to instructions below.



NOTE:

1. UL & UR card cages are both equipped with 2 x CPU(8P) + 4 x PCIe (6+2P) cables for expansion cards.



2. When installing expansion cards (e.g.:TESLA P100), use CPU(8P) cables.

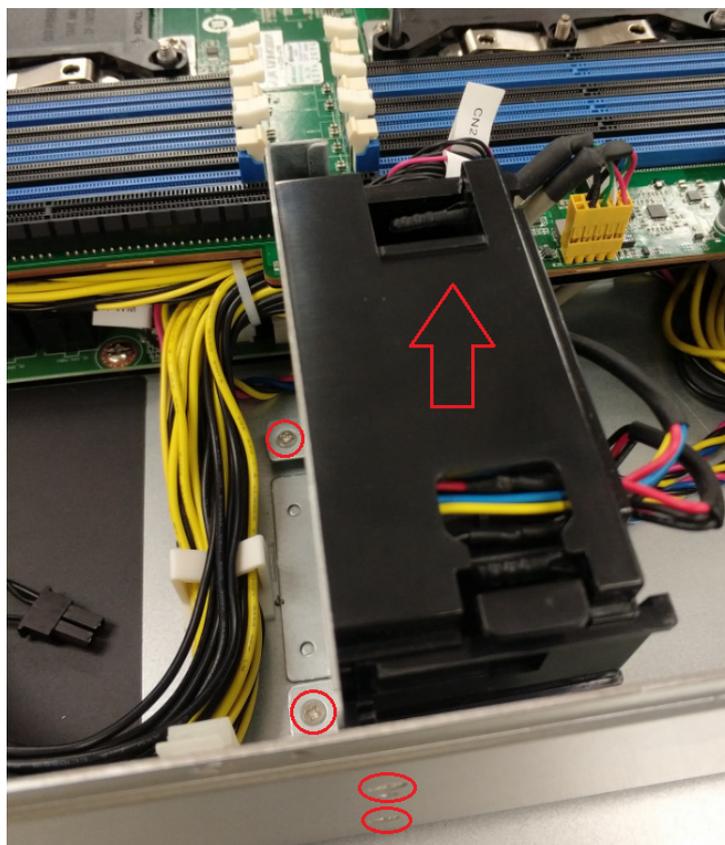


3. When installing expansion cards (e.g.:TESLA K40), use PCIe (6+2P) cable for it.



4. ONLY UL card cage can support GTX series expansion card (card length up to 280mm)

5. If the expansion card is hard to install in the system, unscrew the four screws on the GPU fan bracket, then remove the fan module for expansion card installation. Please note: don't forget to re-install the GPU fan module back in the original place.

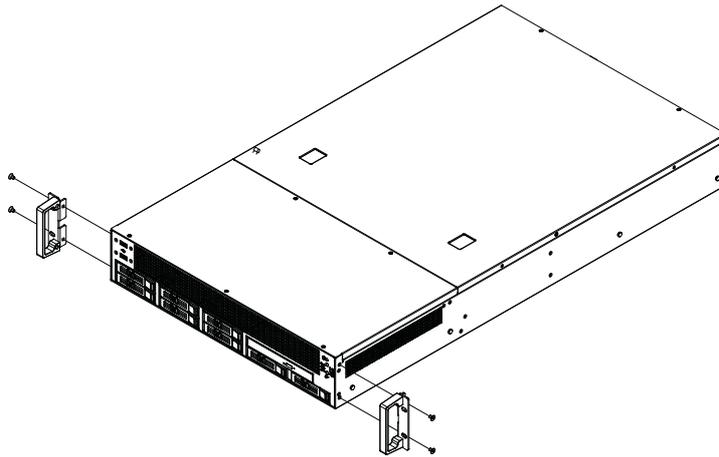


2.3 Rack Mounting

After installing the necessary components, SKY-6200 can be mounted in a rack using the optional rack mounting kit. We strongly recommend that the minimum depth of cabinet is 1100mm.

2.3.1 Installing the Server in a Rack

Before mounting the SKY-6200 in a rack, ensure that all internal components have been installed and that the unit has been fully tested. Both sides of the chassis ear must be assembled with screws (PN:1930005209) after you assemble the slide rail kit.

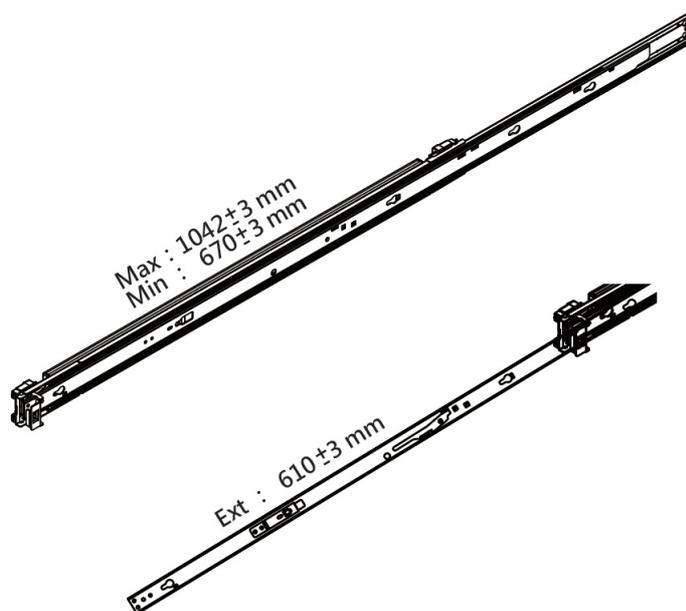


Follow these instructions to mount the SKY-6200 onto the rackmount kit.

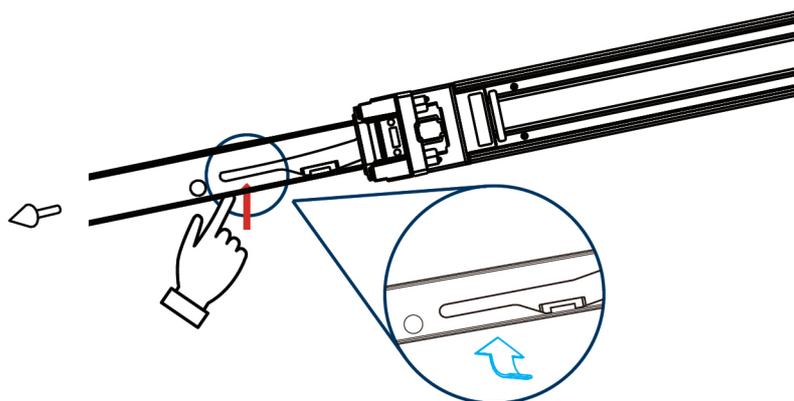
2.3.2 Slide Rail installation

Please read prior to installation. The server slides are developed for 1U or 2U applications of which system load does not exceed 75lbs.

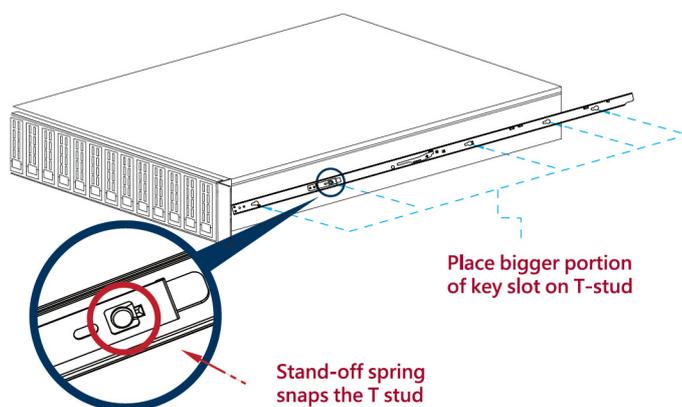
The slide length is 1041 ± 3.0 mm. The rear bracket is extendable to a max/min post to post distance of 670-1042 mm. The slide extension is 610.0 ± 3.0 mm.



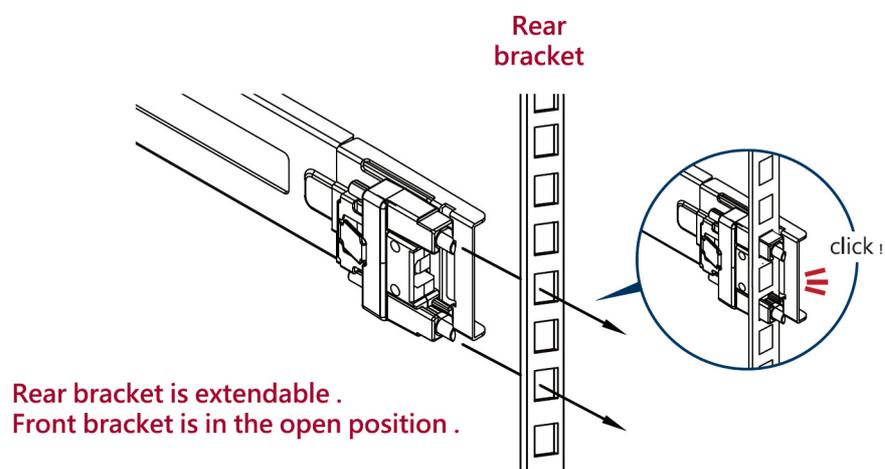
1. Remove inner member.
Pull inner member out as in the illustration.



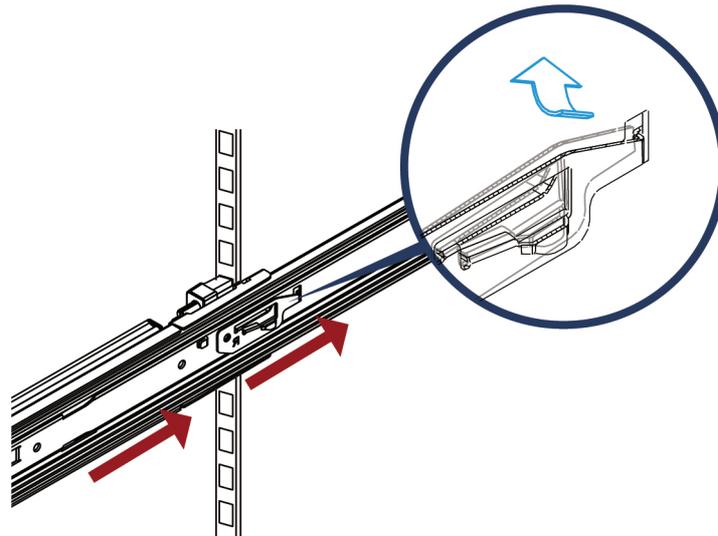
2. Mount the inner member onto the chassis.
Place the key slot on T stud, and push the inner member toward the back.



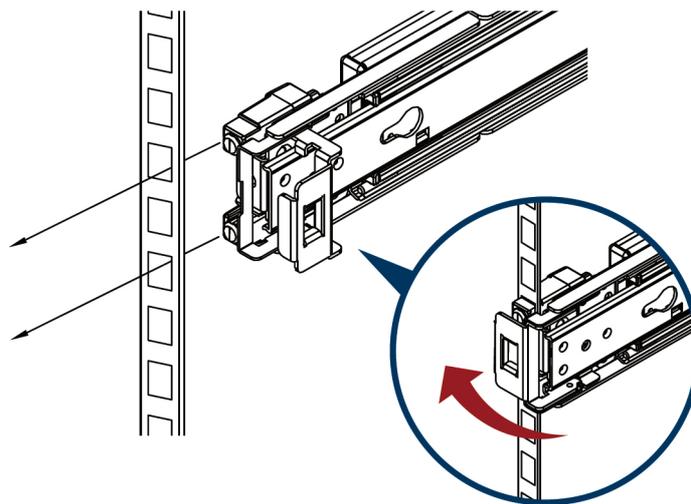
3. Mount the cabinet member to the posts.
Align the positioning pin to the desired complete U location, and pull the bracket forwards to lock it to the post. The bracket is locked to the post after you hear a “click” sound.



4. Release the locking latch upward.

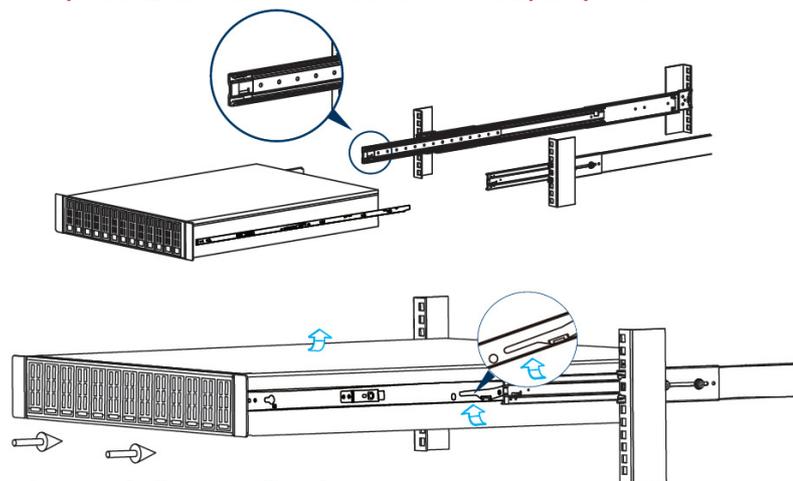


5. Push the middle member forward to the rear of the slide.



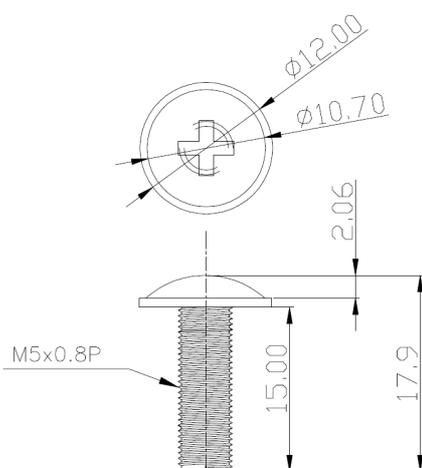
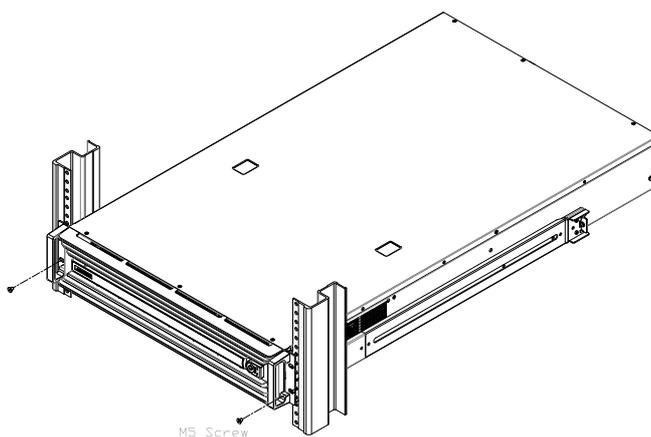
6. Install the chassis.
As shown, insert the inner member to the cabinet member. Make sure the ball retainer is in the open position. It might cause damage to the slides if the ball retainer is not on the front position. After the inner member goes in, push up/down the disconnect lever to unlock the slides and keep pushing the chassis to the fully closed position.

Attention please , ball retainer must be in the open position.

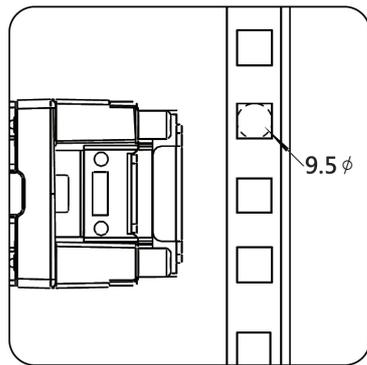


Push up / down the lever

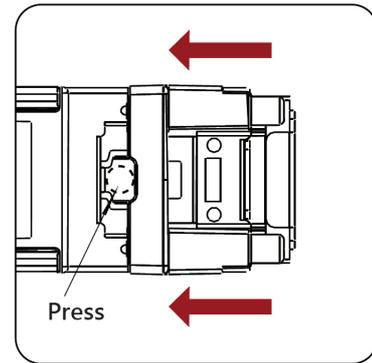
7. Screw the system in the cabinet.



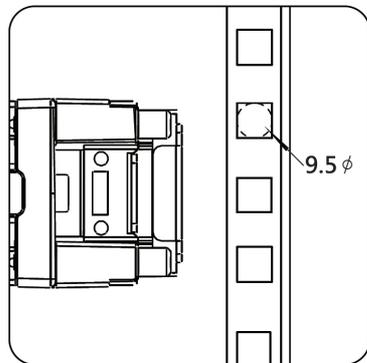
Tips.



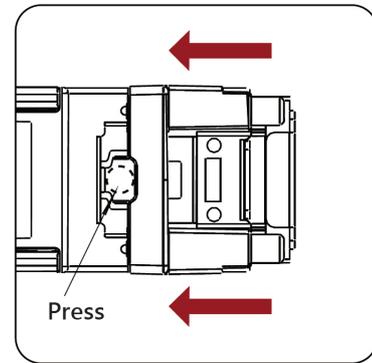
For EIA square hole diecasting



Press the latch to transfer from square to cylinder (for EIA 7.5 round hole)



Uninstall the bracket



Remove the inner member

Note! *Rack Mount Instructions - The following or similar rackmount instructions are included with the installation instructions:*



- *Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.*
- *Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.*
- *Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.*
- *Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.*
- *Reliable Earthing - Reliable earthing of rackmounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).*
- *Please note that you must install the handle bar and mounting ear after the slide rail kit has been installed completely.*

Instructions de montage en rack - Le rack en suivant ou similaire - monter instructions sont incluses avec les instructions d'installation:

- *Température de fonctionnement élevée - il est installé dans une unité fermée ou plusieurs Ensemble formant bâti, la température ambiante de fonctionnement de l'environnement de l'armoire peut être supérieure à la chambre ambiante. Par conséquent, il devrait être donnée à l'installation de l'équipement dans un environnement compatible avec la température ambiante maximale (T_{ma}) spécifiée par le fabricant.*
- *Débit d'air réduit - Installation de l'équipement dans un rack doit être tel que la quantité de flux d'air nécessaire au bon fonctionnement de l'appareil ne soit pas compromise.*
- *Chargement mécanique - Le montage de l'équipement dans le rack doit être telle qu'une situation dangereuse ne soit générée à inégale chargement mécanique.*
- *Surcharge du circuit - Il faut tenir compte à la connexion de l'équipement au circuit d'alimentation et l'effet que la surcharge des circuits pourrait avoir sur la protection contre les surintensités et le câblage d'alimentation. Considération appropriée de l'équipement plaque signalétique évaluations doivent être utilisés pour répondre à cette préoccupation.*
- *Fiabilité de la mise - Fiable mise à la terre de l'équipement monté en rack doit être maintenue. Une attention particulière devrait être accordée à fournir connexions autres que les connexions directes sur le circuit de branche (par exemple l'utilisation de multiprises).*

Chapter 3

AMI BIOS

3.1 Introduction

With the AMI BIOS Setup program, you can modify BIOS settings and control the special features of your system. The Setup program uses a number of menus for making changes and turning the special features on or off. This chapter describes the basic navigation of the SKY-6200 setup screens.



AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed up CMOS so it retains the Setup information when the power is turned off.

Note! *The BIOS setup screens shown in this chapter are for reference only, it may not exactly match what you see on your display devices.*



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 arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.



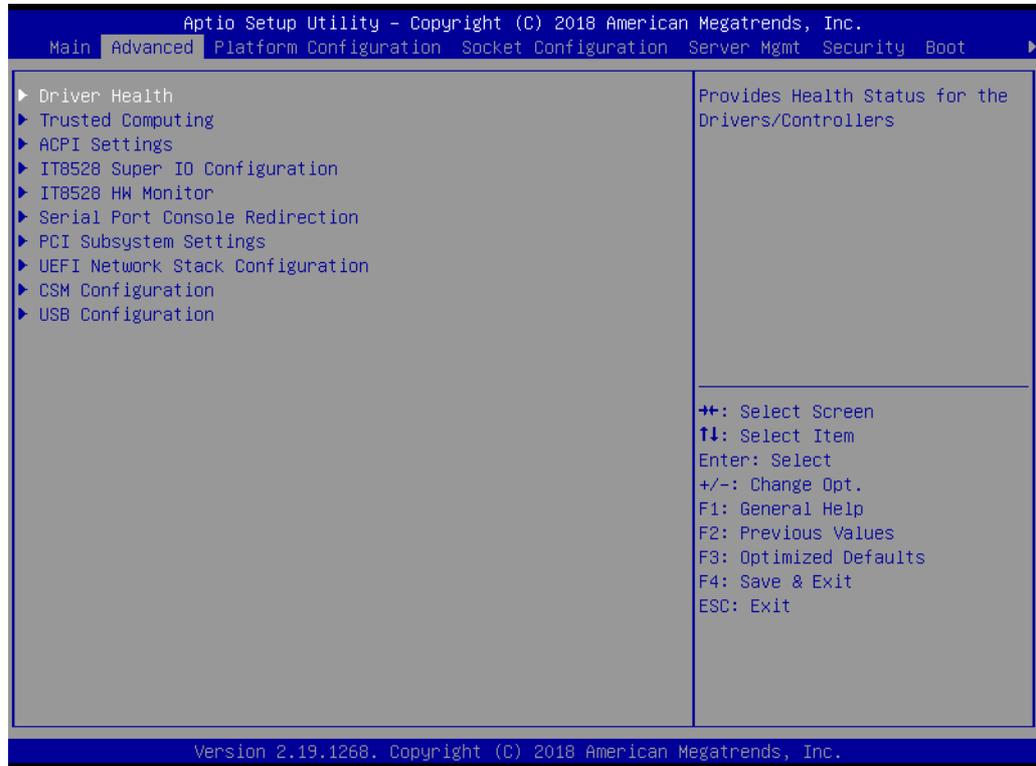
The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can be. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected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

■ System Time / System Date

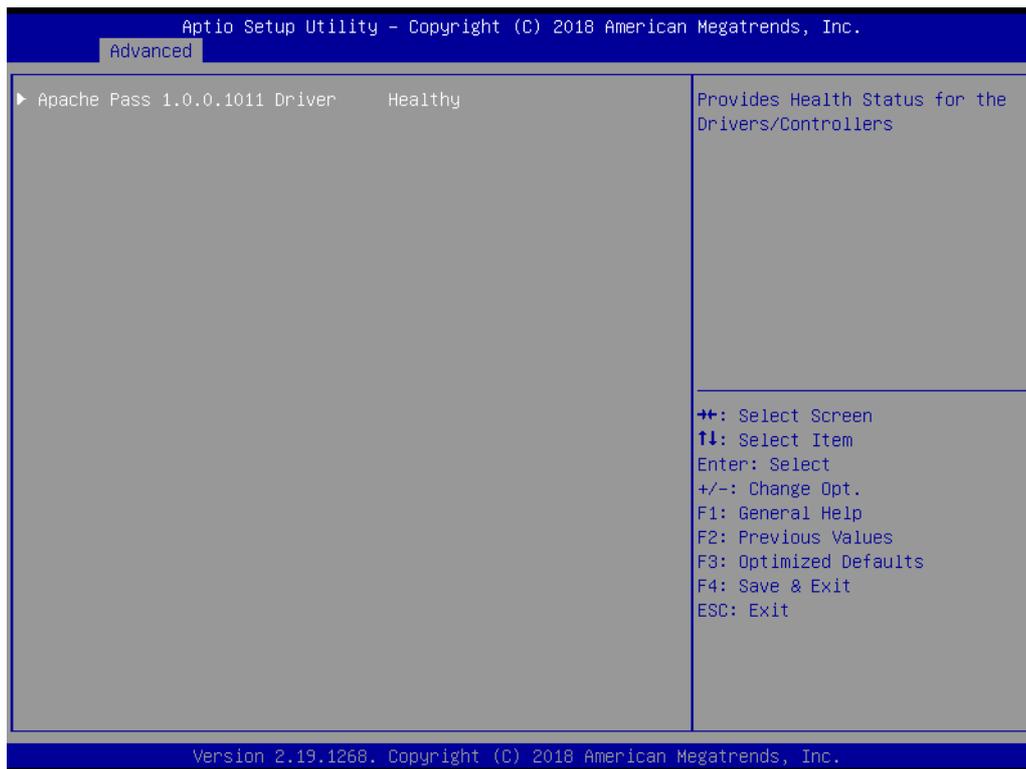
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the SKY-6200 setup screen to enter the Advanced BIOS setup screen. You can select any of the items in the left frame of the screen, such as CPU configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.

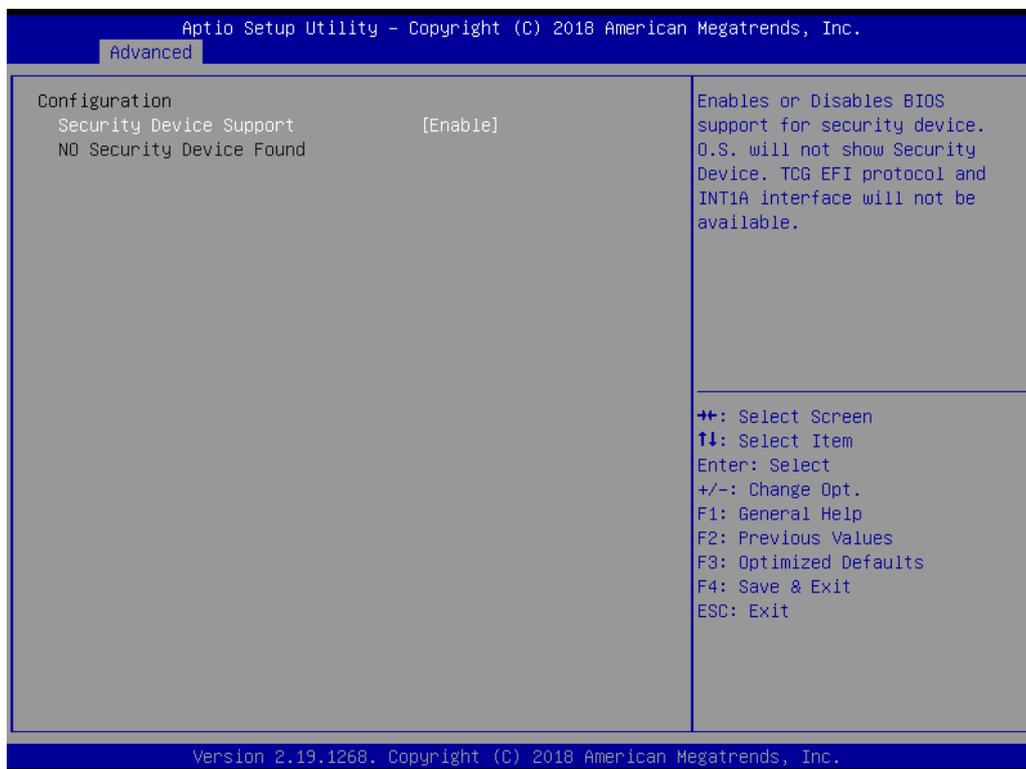


3.2.2.1 Apache Pass Driver Health



- **Driver Health**
Provides health status for the driver/controller

3.2.2.2 Trusted Computing



- **Security Device Support**

Enables or disables BIOS support for security devices.

Note! Purchase Advantech LPC TPM module to enable TPM function. P/N: PCATPM-00A1E.



3.2.2.3 ACPI Settings



- **Enable Hibernation**

Enable or Disable Hibernation.

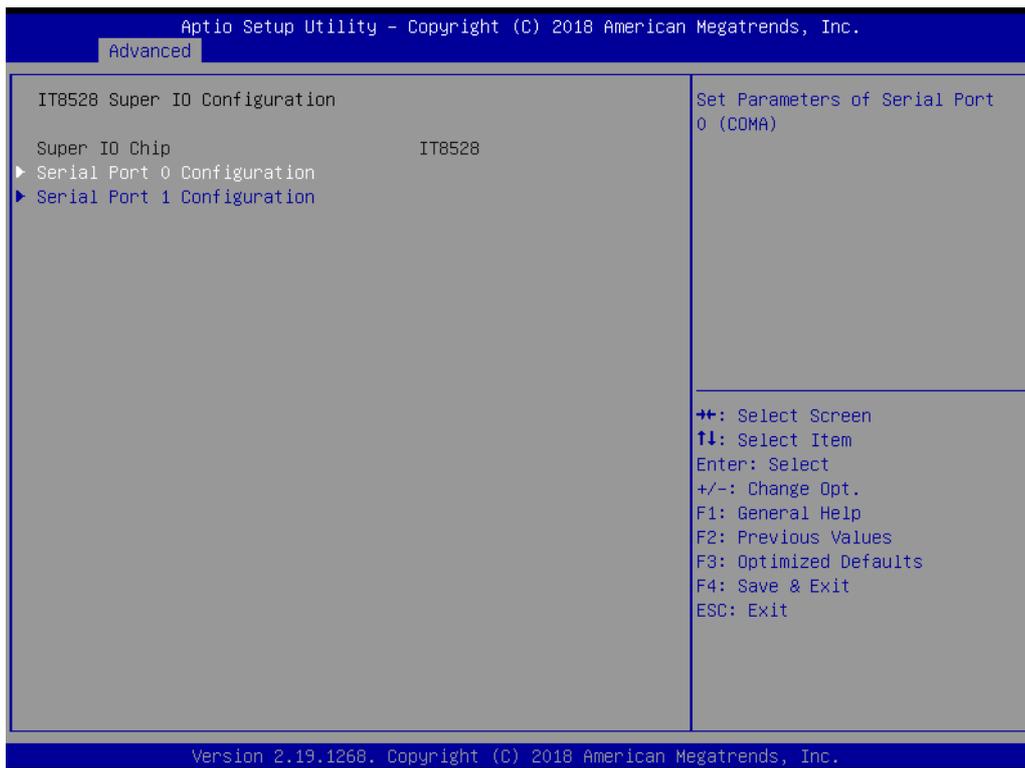
- **Lock Legacy Resources**

Enable or Disable Lock Legacy Resources.

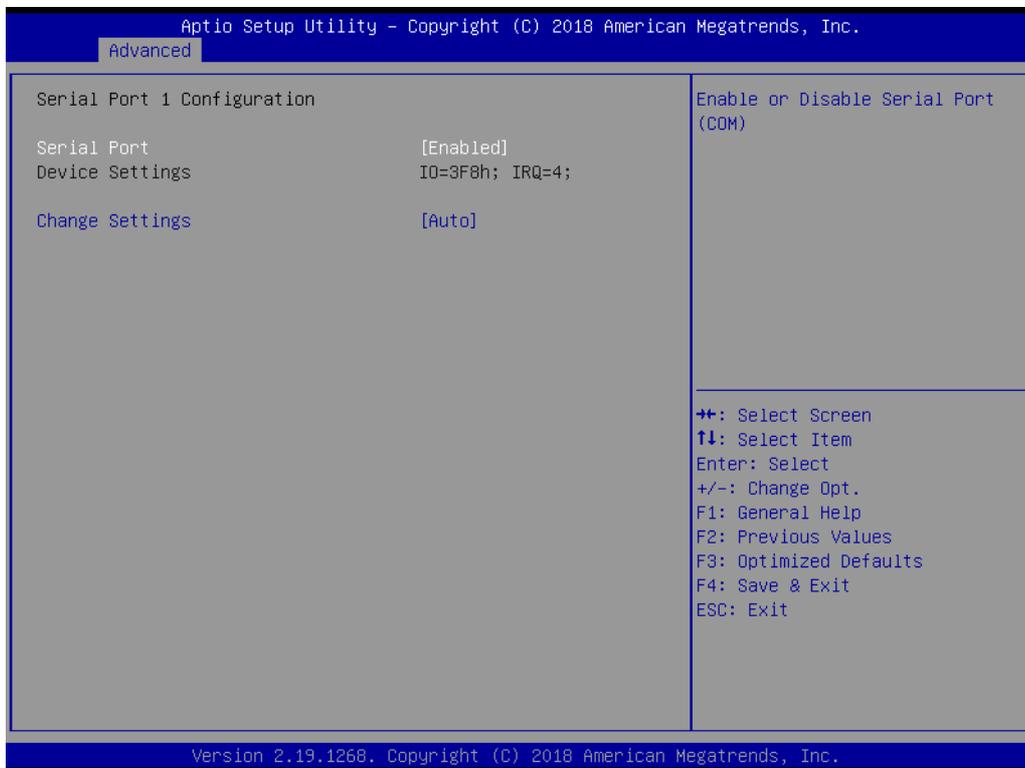
- **Power on by Modem**

Enable or Disable Power On by Modem

3.2.2.4 ITE8528 Super IO Configuration



■ Serial Port 0 Configuration

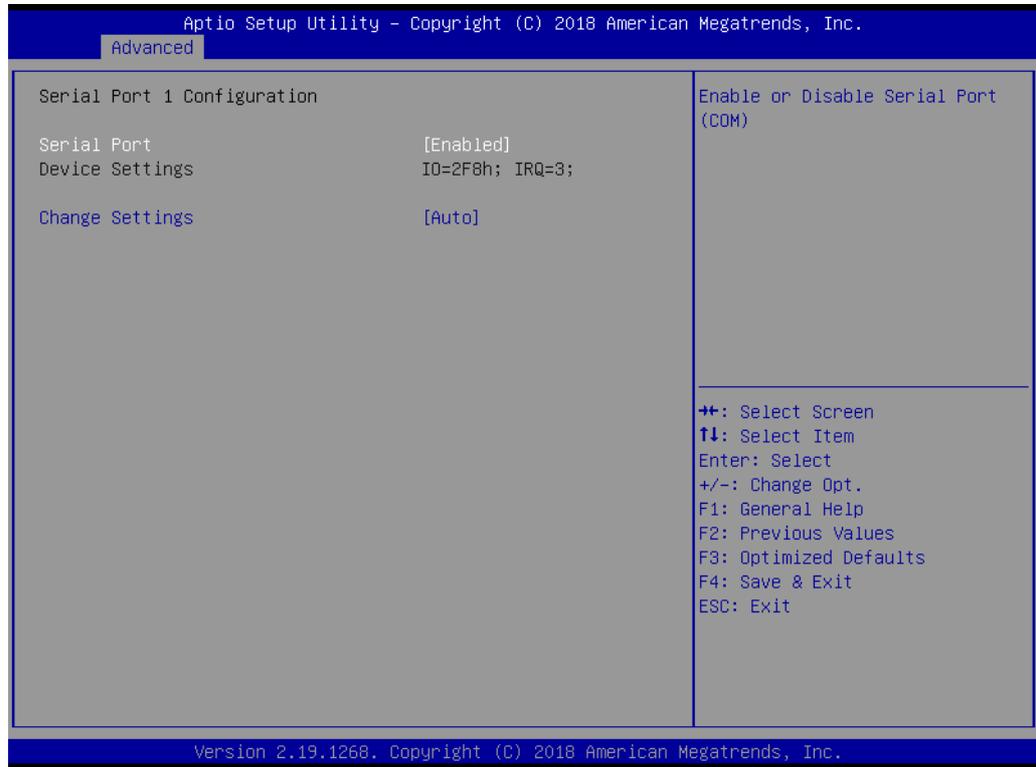


- **Serial Port**
Enable or Disable Serial Port 0.

- **Change Settings**

To select an optimal setting for serial port 0.

- **Serial Port 1 Configuration**



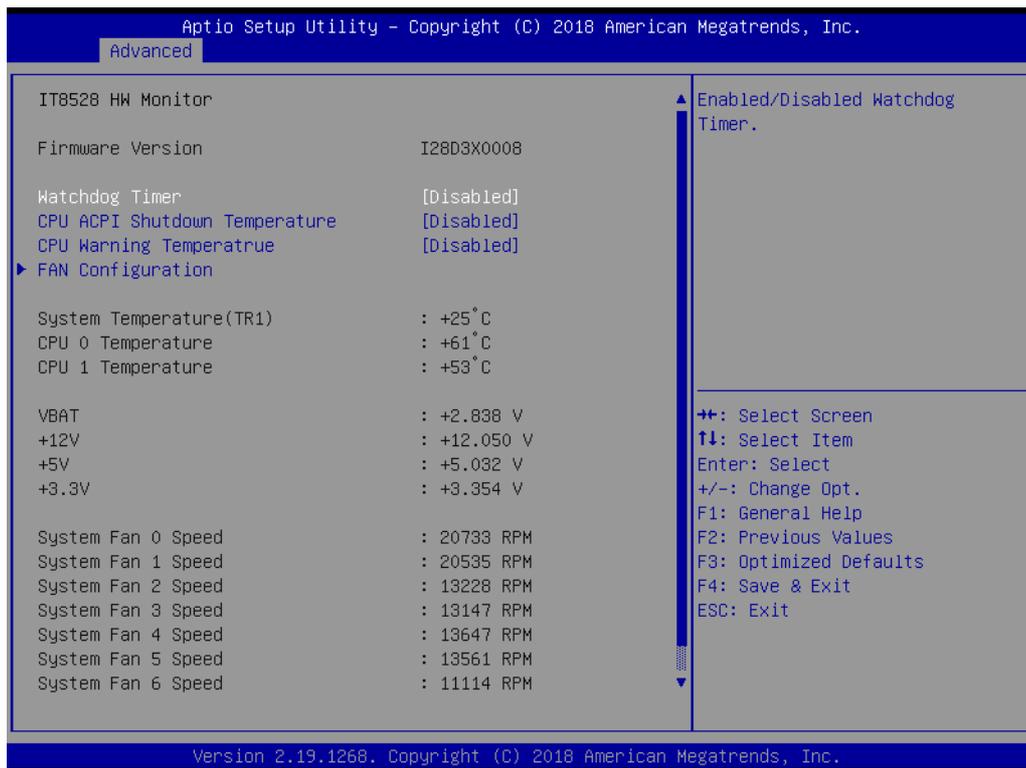
- **Serial Port**

Enable or Disable Serial Port 1.

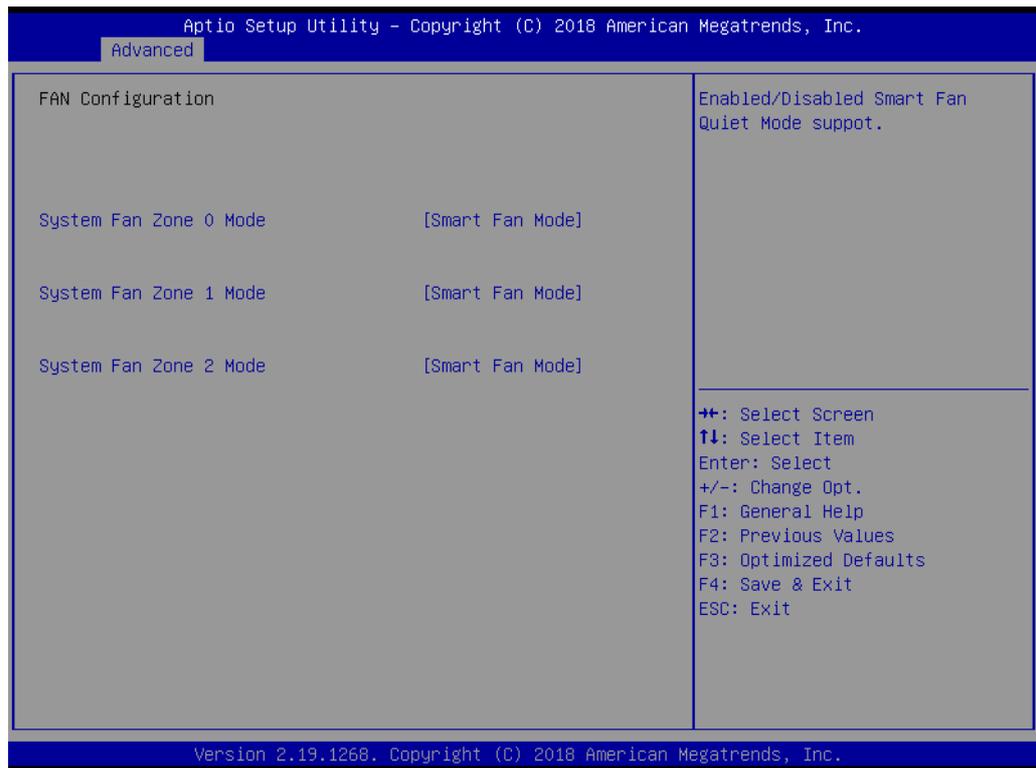
- **Change Settings**

To select an optimal setting for Serial Port 1.

3.2.2.5 ITE8528 H/W Monitor



- **Watchdog Timer**
Enable and Disable the watchdog timer function.
- **CPU ACPI Shutdown Temperature**
Set the CPU ACPI shutdown temperature threshold. When the system reaches the shutdown temperature, it will be automatically shutdown by ACPI OS to protect the system from overheat damage.
- **CPU Warning Temperature**
Set the CPU warning temperature threshold. When the system reaches the warning temperature, the speaker will beep.



■ Fan Configuration

There are three fan zones in SKY-6200

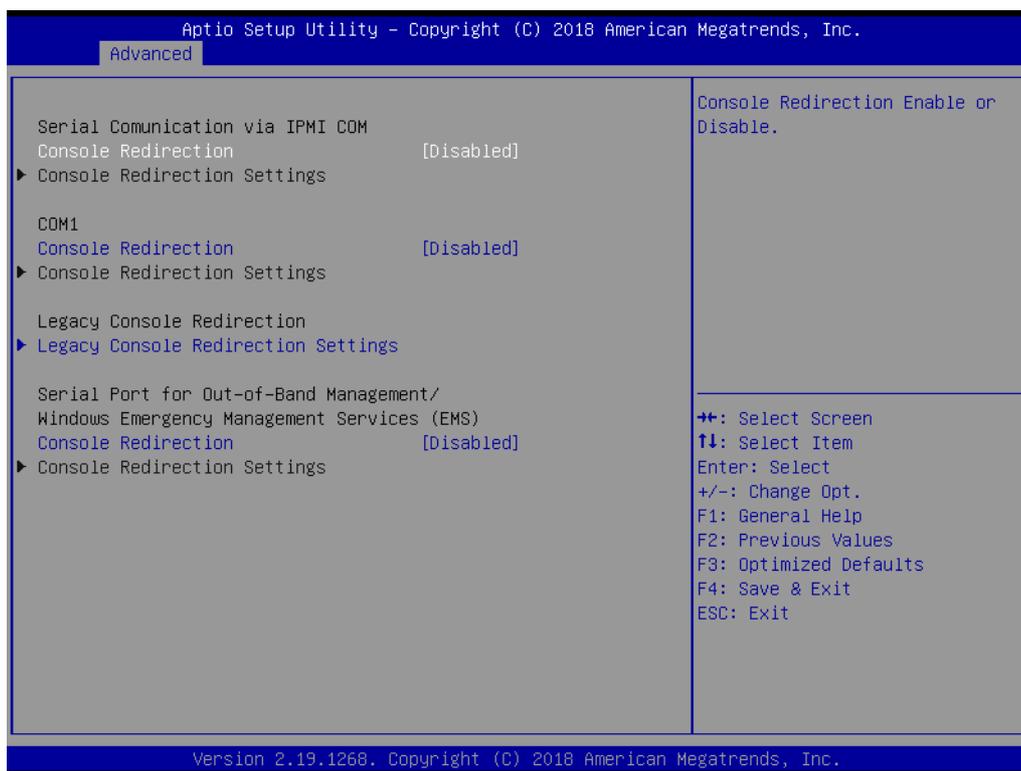
- Zone 0 for CPU & memory & UM card cooling.
- Zone 1 for UL card cage cooling
- Zone 2 for UR card cage cooling

When set to manual mode, fan duty setting can be changed; the range is from 10%~100%, default setting is 100%.

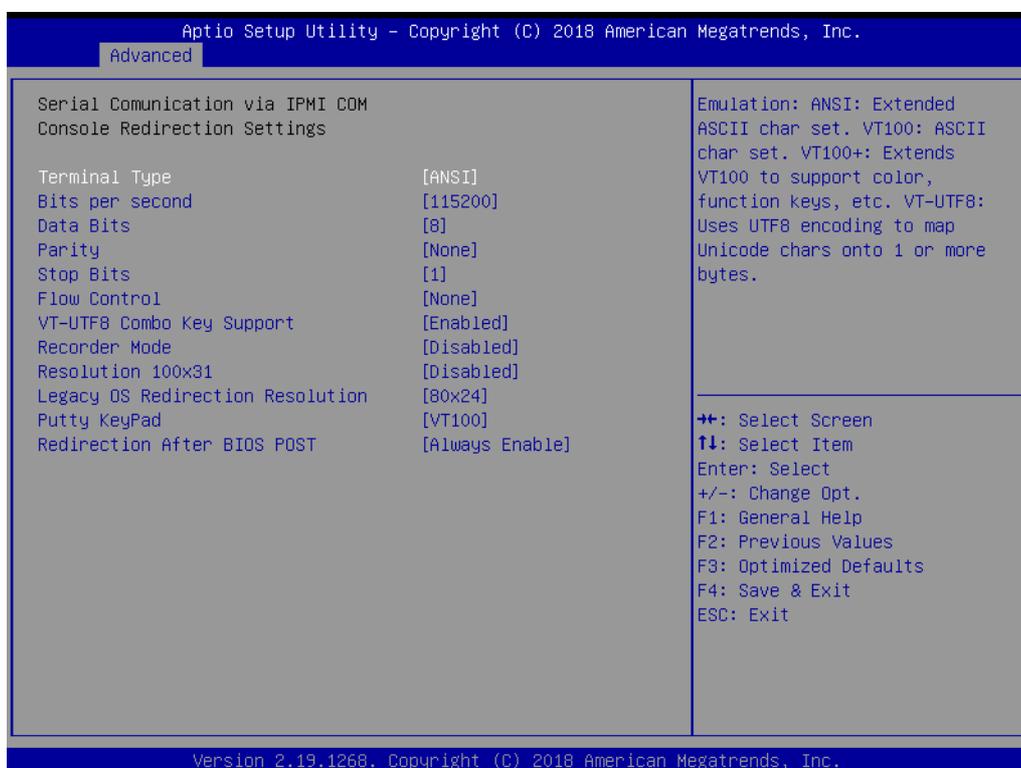
3.2.2.6 Serial Port Console Redirection

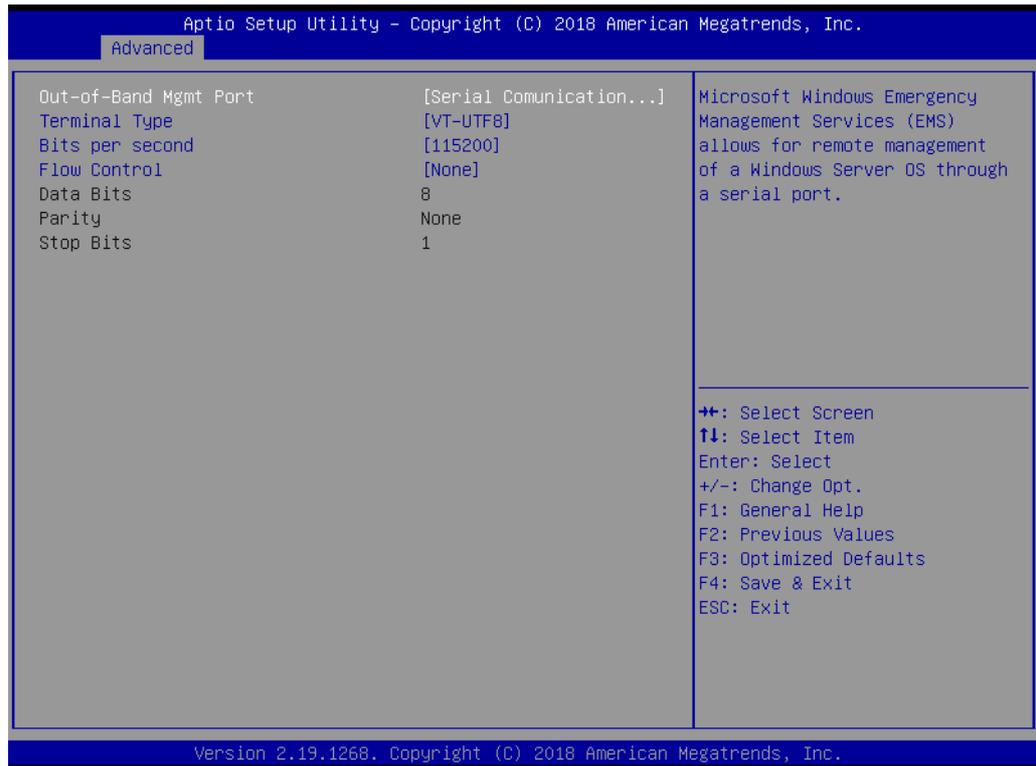
■ Console Redirection

Enable or Disable console redirection feature.



■ Console Redirection Settings





- **Terminal Type**
Select a terminal type to be used for console redirection.
Options available: VT100/VT100+/ANSI /VT-UTF8.

- **Bits Per Second**
Select the baud rate for console redirection.
Options available: 9600/19200/57600/115200.

- **Parity**
A parity bit can be sent with the data bits to detect some transmission errors.
Even: parity bit is 0 if the number of 1's in the data bits is even.
Odd: parity bit is 0 if number of 1's 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.
Options available: 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.
Options available: 1/2.

- **Flow Control**
Flow control can prevent data loss from 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.

Options available: None/Hardware RTS/CTS.

- **Recorder Mode**

When this mode enabled, only text will be send. This is to capture Terminal data.

Options available: Enabled/Disabled.

- **Legacy OS Redirection Resolution**

On Legacy OS, the number of Rows and Columns supported redirection.

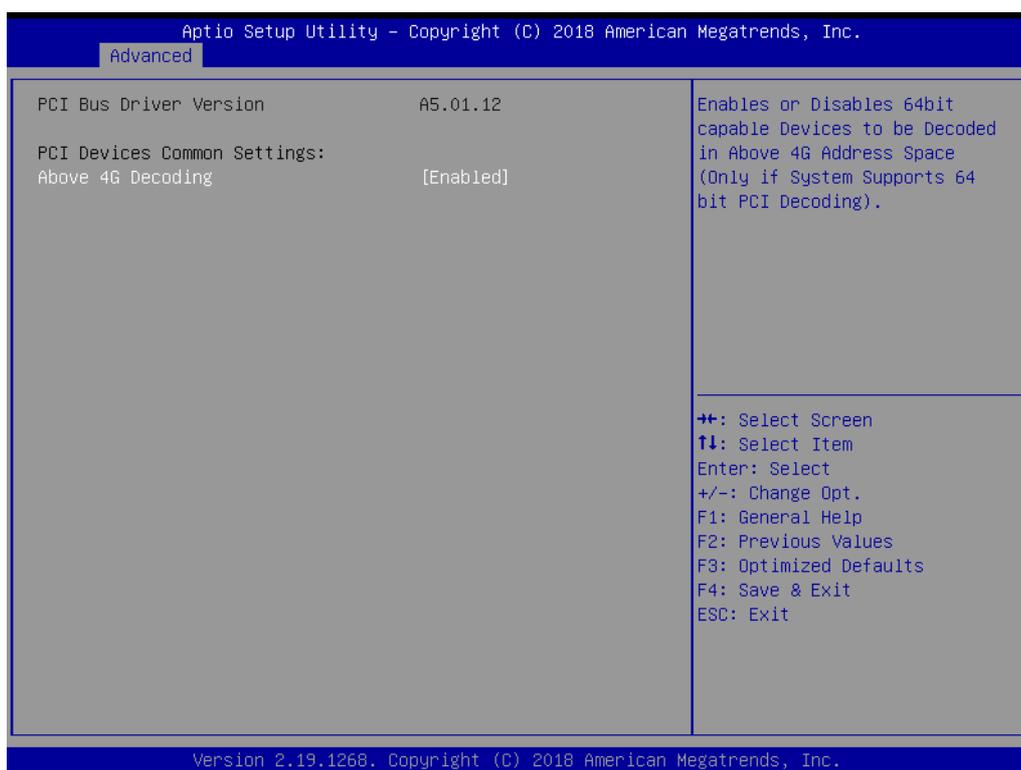
Options available: 80x24/80X25.

- **Putty Keypad**

Select function key and keypad on putty.

- **Redirection After BIOS Post**

3.2.2.7 PCI Subsystem Settings



- **Above 4G Decoding**

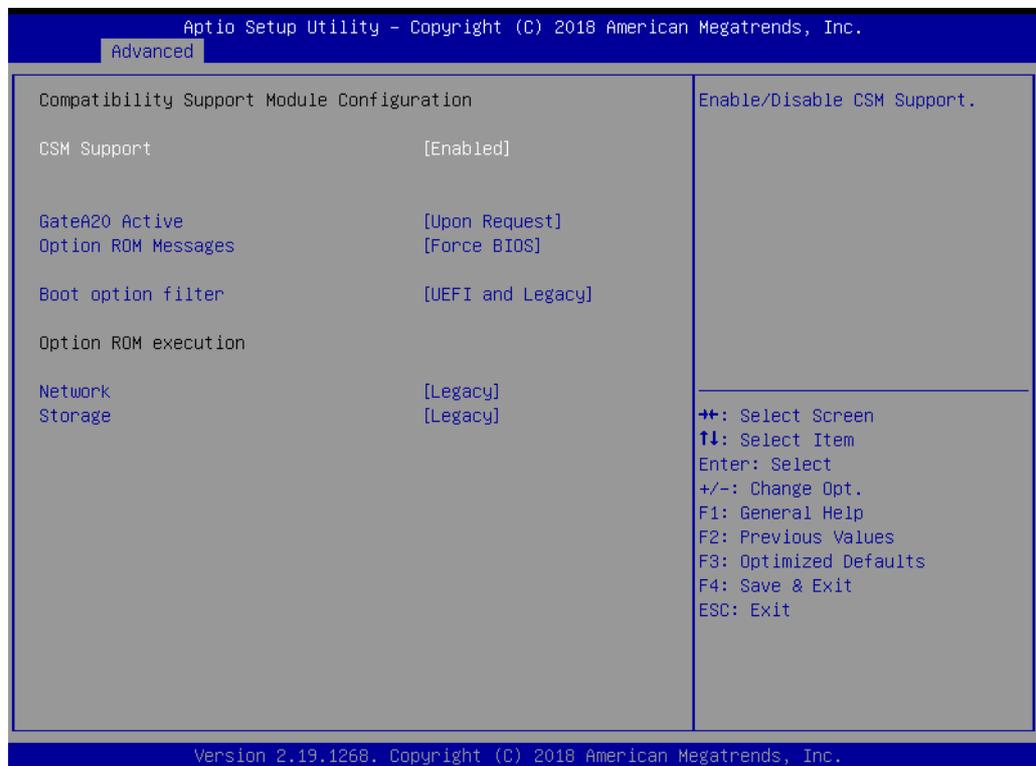
Enable or disable 64-bit capable devices to be decoded in above 4G address space. This setting is available only if system supports 64-bit decoding.

3.2.2.8 Network Stack



- **Network stack**
Enable or disable UEFI Network Stack for Network access under BIOS setup.

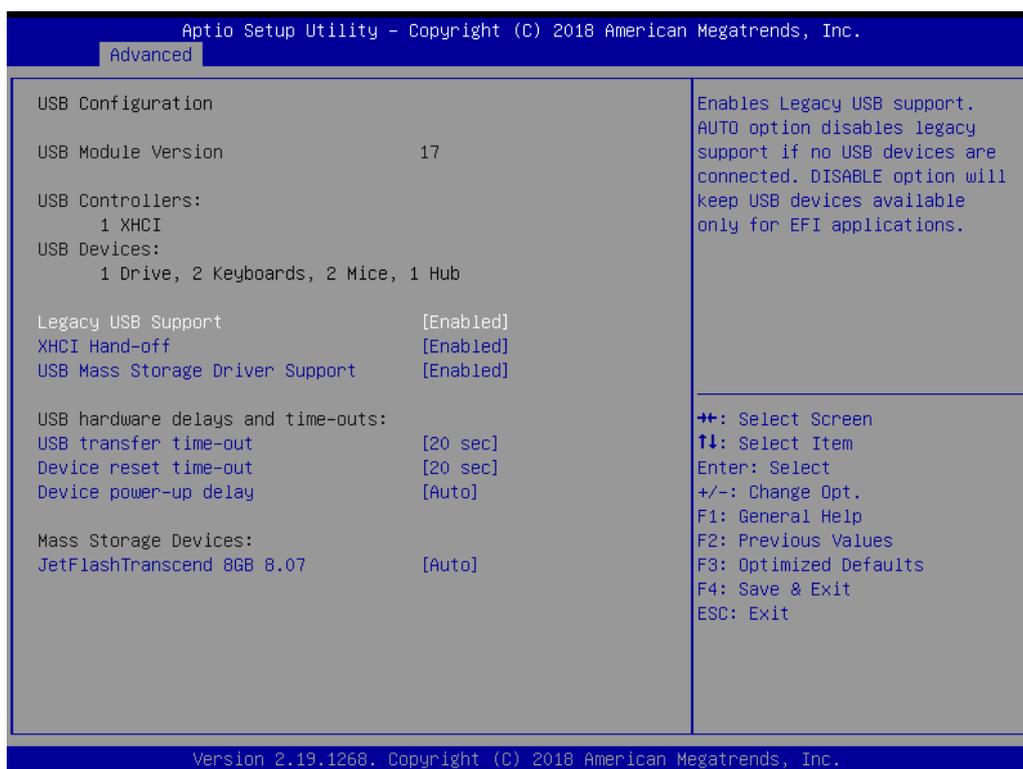
3.2.2.9 CSM Configuration



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

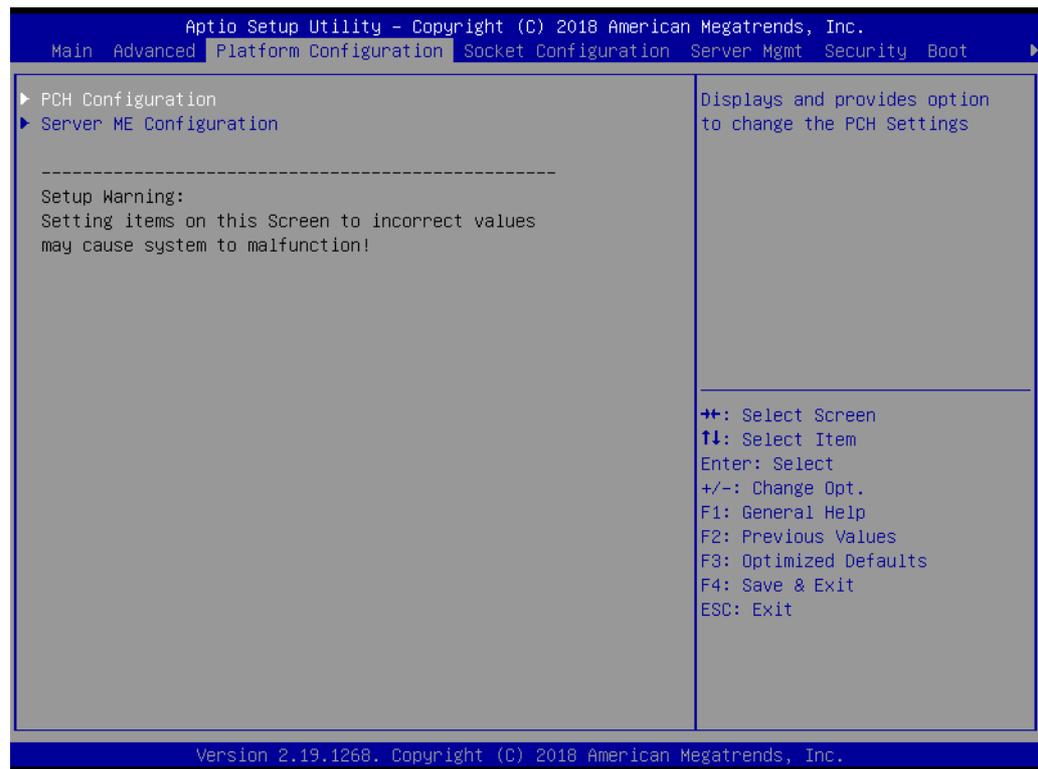
- **GateA20 Active**
UPON REQUEST - GA20 can be disabled using BIOS services.
Do not allow disabling of GA20; this option is useful when any RT code is executed above 1MB.
- **Option ROM Message**
Set display mode for Option ROM.
- **Boot option filter**
Controls and filter the option ROM in UEFI or legacy mode or both.
- **Option ROM Execution**
Controls the execution of UEFI and Legacy OpROM for each device

3.2.2.10 USB Configuration

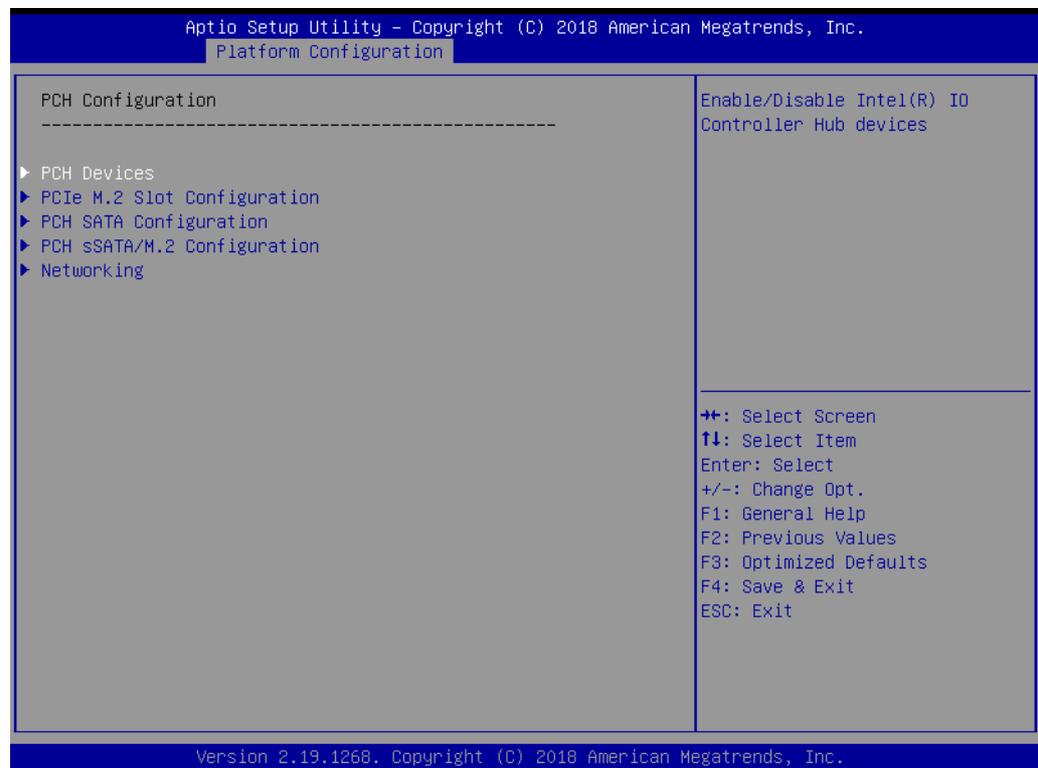


- **Legacy USB Support**
This is for supporting USB device under a legacy OS such as DOS. When choosing "AUTO", the system will automatically detect if any USB device is plugged into the computer and enable USB legacy mode when a USB device is plugged and disable USB legacy mode when no USB device is attached.
- **XHCI Hand-off**
This is a workaround for OS without XHCI hand-off support.
The XHCI ownership change should be claimed by XHCI driver.
- **USB Mass Storage Driver Support**
Enable or disable USB mass storage driver support.
- **USB Transfer Time-out**
Selects the USB transfer time-out value. [1,5,10,20sec]
- **Device Reset Time-out**
Selects the USB device reset time-out value. [10,20,30,40 sec]
- **Device Power-up Delay**
This item appears only when device power-up delay item is set to [manual]

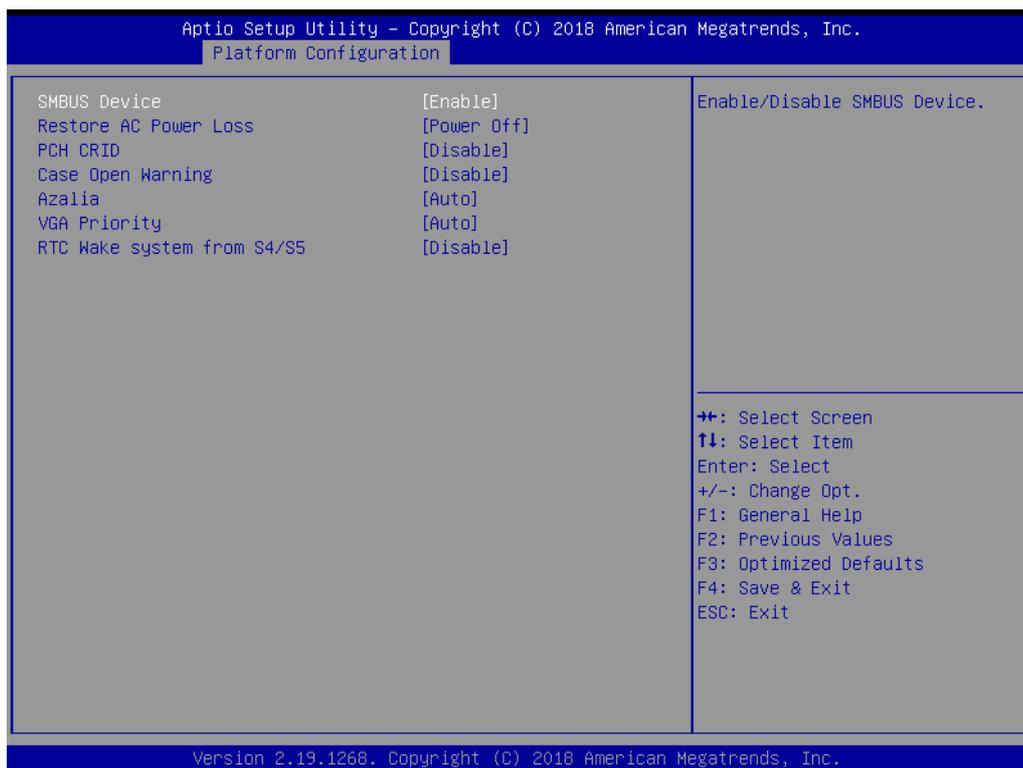
3.2.3 Platform Configuration



3.2.3.1 PCH Configuration

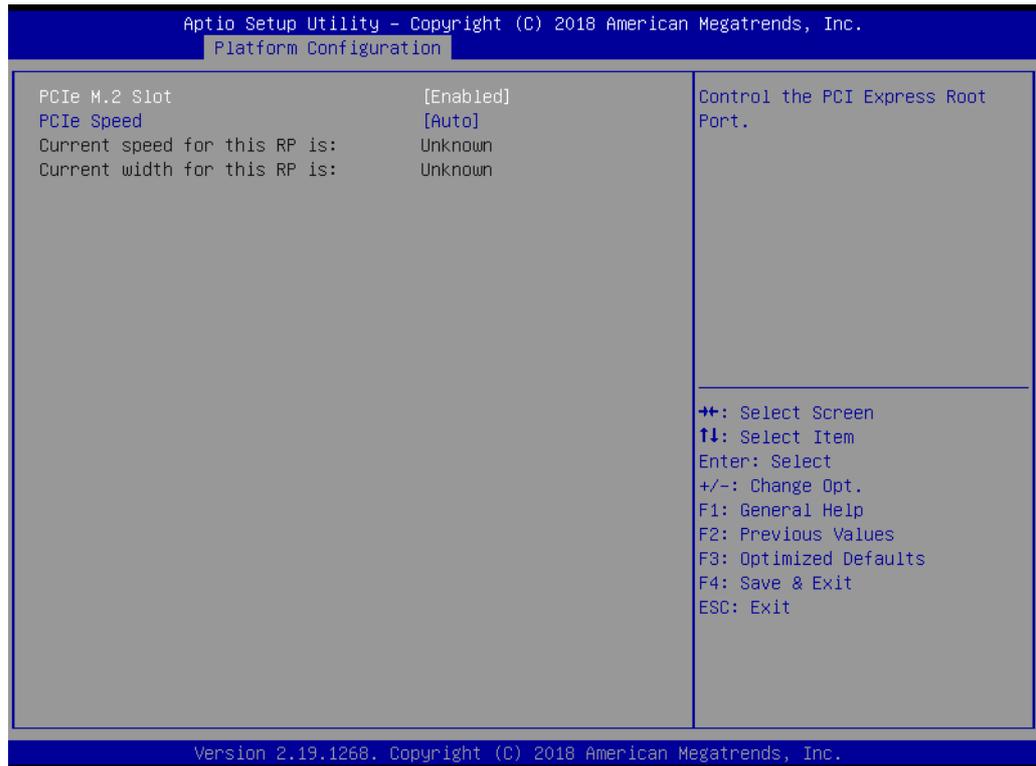


■ PCH Device



- **SMBus Device**
Enable or disable SMBus Device.
- **Restore AC Power Loss**
Specify what state to go to when power is re-applied after a power failure (G3 state).
- **PCH Compatibility RID**
Enable or disable PCH Compatibility Revision ID (CRID) functionality.
- **Case Open Warning**
Enable or disable the chassis Intrusion monitoring function. When enabled and the case is opened, the warning message will show in POST screen.
- **VGA Priority**
Select active video type as on board device or PCIE device. Default auto is PCIE device priority higher than on board device.
- **RTC wake system from S4/S5**
Enable or Disable system wake on alarm event. When enabled, system will wake on the day and time specified.

■ PCIe M.2 Slot Configuration

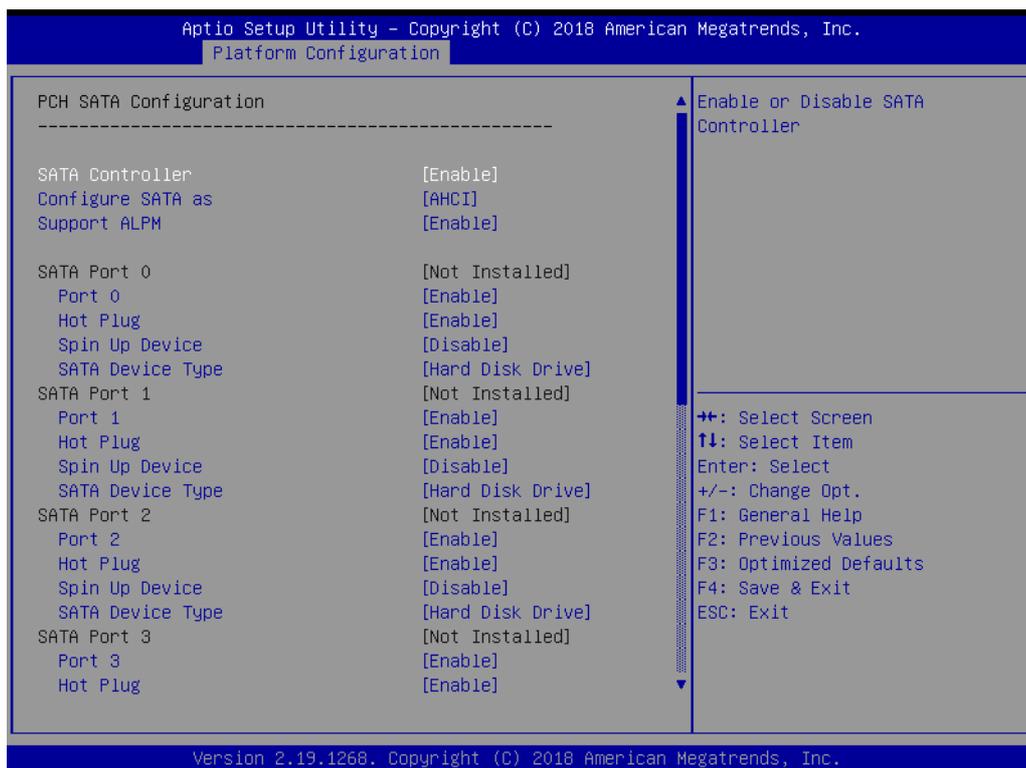


- **PCIe M.2 Slot**
Enable or disable PCI Express M.2 Root Port
- **PCIe Speed**
Change the link speed with "Auto / Gen1 / Gen2 / Gen3" items.

■ PCH sSATA/M.2 Configuration

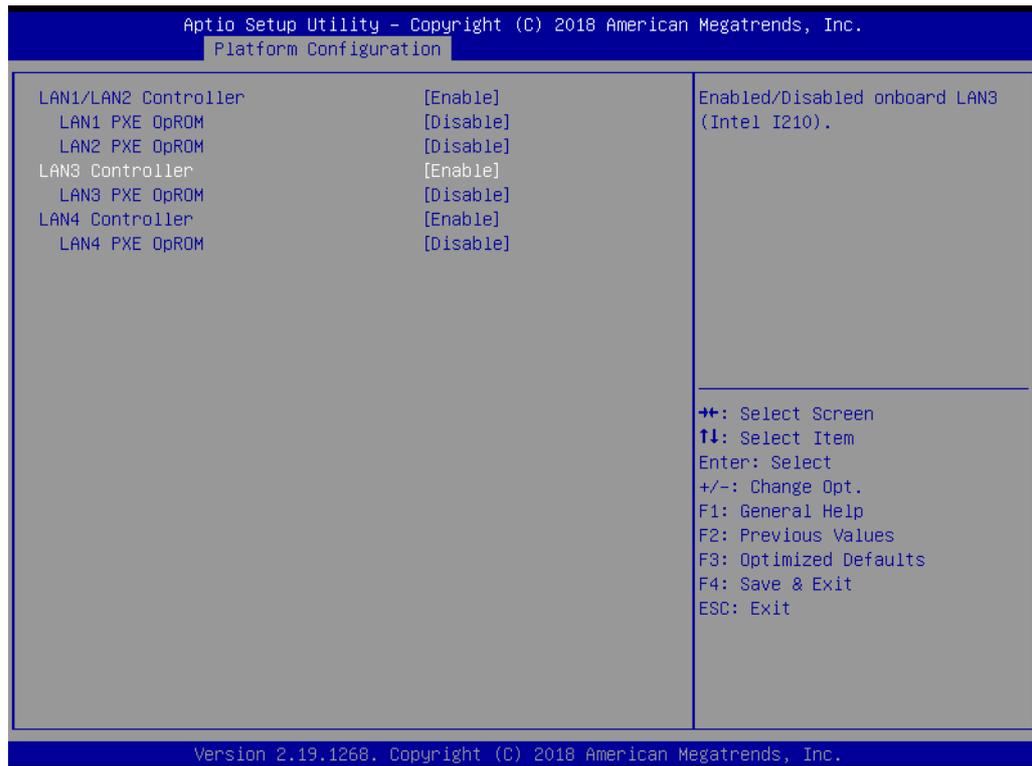


■ PCH SATA Configuration



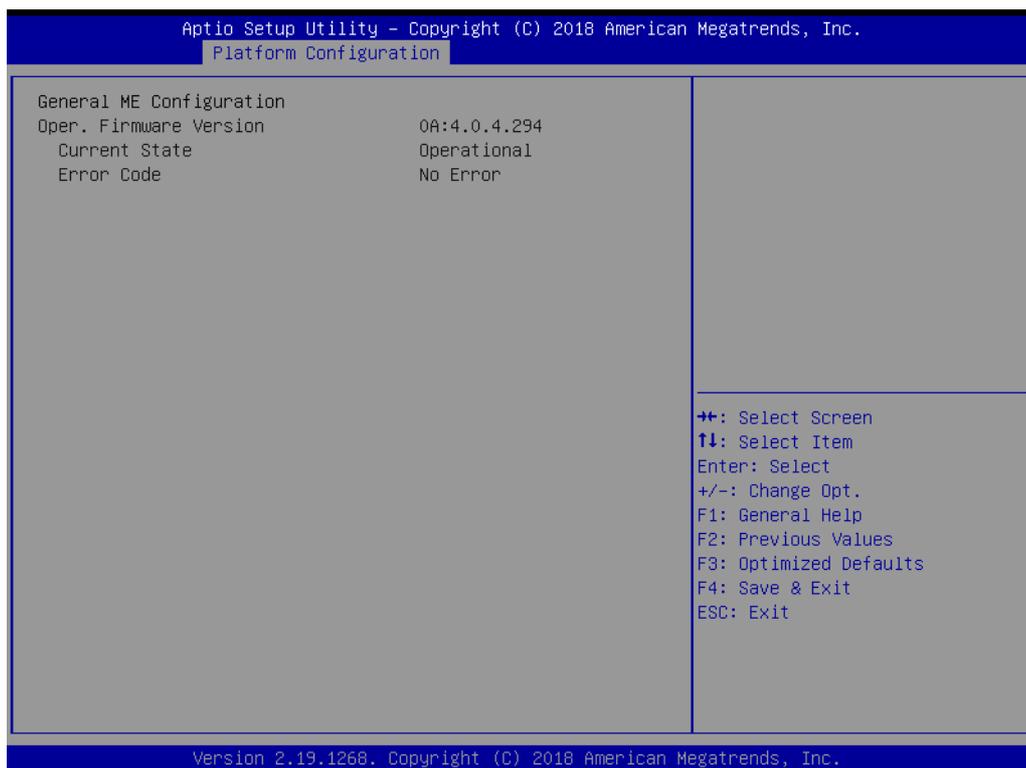
- **SATA Controller**
Enables/Disables sSATA controller.
- **Configure SATA as**
Configured as AHCI/RAID mode.
- **Support ALPM**
Enables/Disables SATA Aggressive Link Power Management. This item will appear when "AHCI" or "RAID" is selected.

■ Networking



- **LAN1/LAN2 Controller**
Enable or disable on board LAN1/LAN2 from Intel X557AT2 Controller support.
- **LAN1 PXE OpROM**
Enable or disable Legacy Boot option for LAN1 from Intel X557AT2 controller.
- **LAN2 PXE OpROM**
Enable or disable Legacy Boot option for LAN2 from Intel X557AT2 controller.
- **LAN3 Controller**
Enable or disable on board LAN3 from Intel I210AT Controller support.
- **LAN3 PXE OpROM**
Enable or disable Boot option for LAN3 from Intel I210AT controller.
- **LAN4 Controller**
Enable or disable on board LAN4 from Intel I210AT Controller support.
- **LAN4 PXE OpROM**
Enable or disable Boot option for LAN4 from Intel I210AT controller.

3.2.3.2 Server ME Configuration

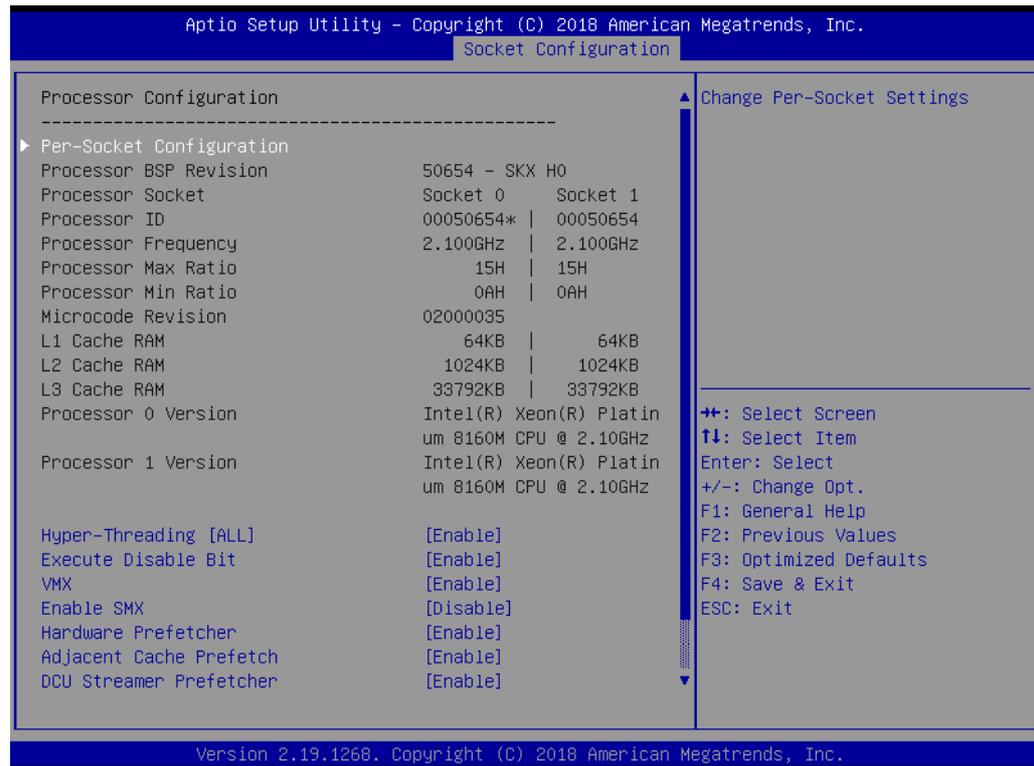


This page shows the operating ME firmware version and state.

3.2.4 Socket Configuration

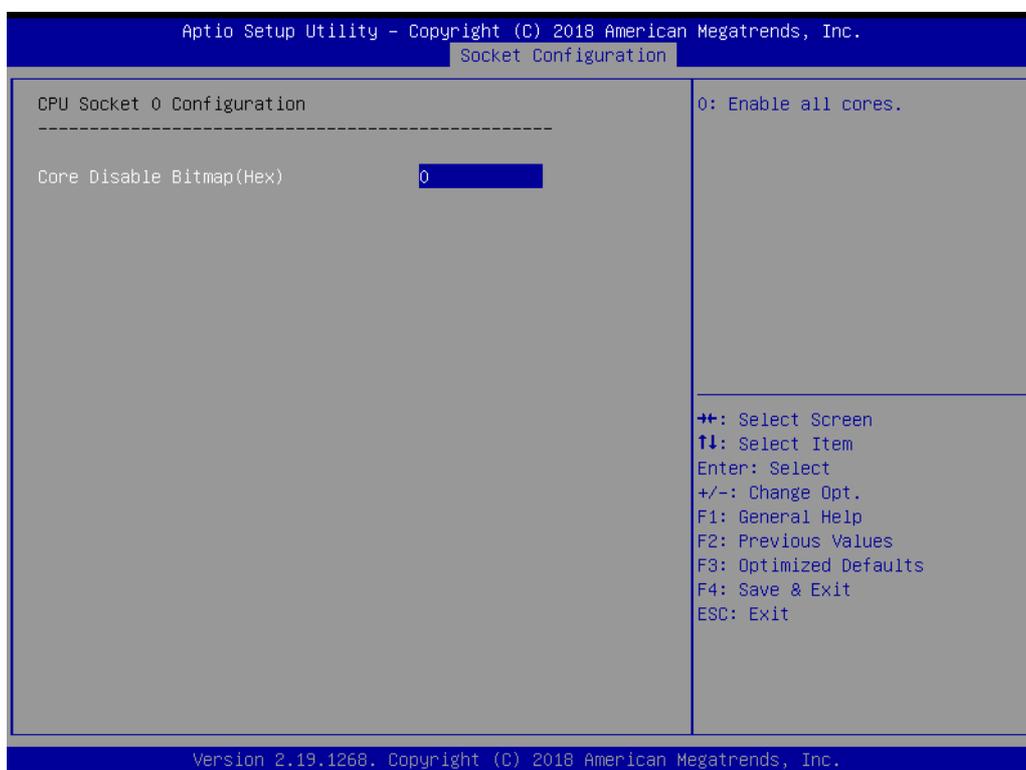
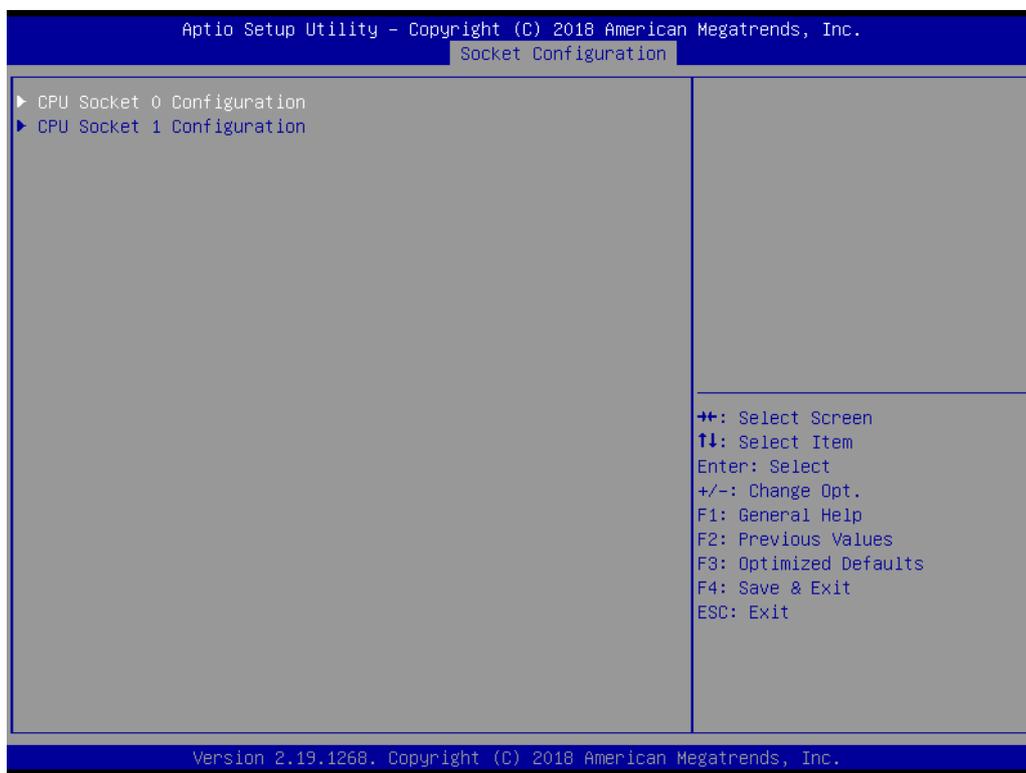


3.2.4.1 Processor Configuration



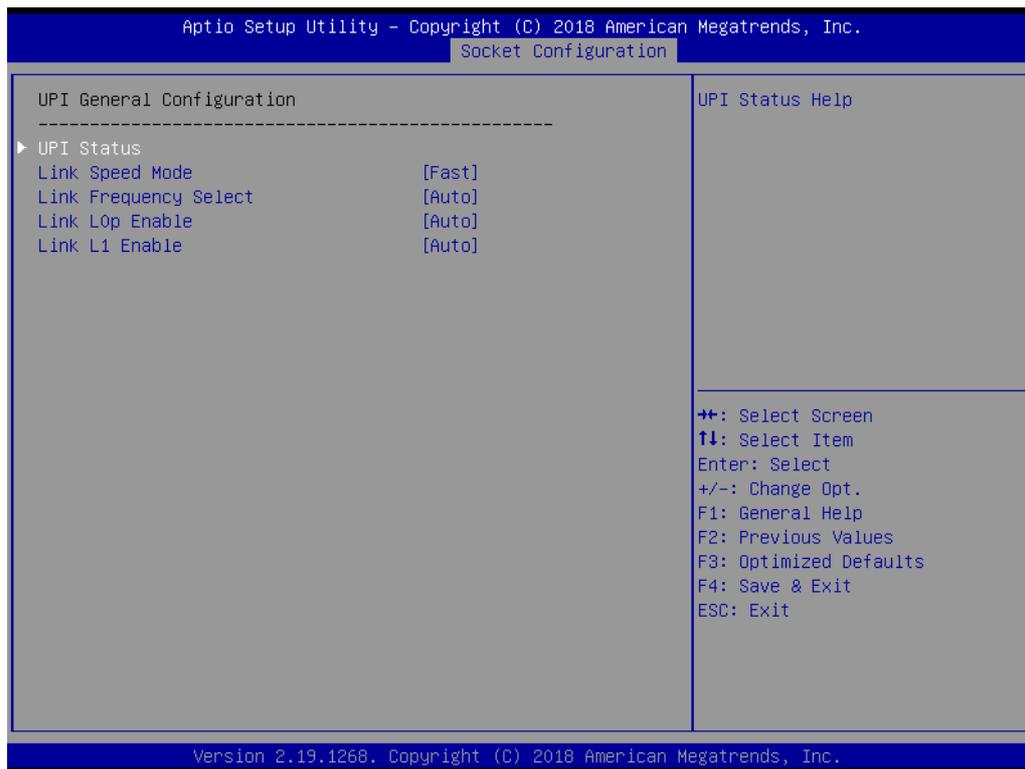
- **Hyper-Threading**
Enables Hyper Threading (software method to enable or disable logical processor threads).
- **Execute Disable Bit**
This item specifies the execute disable bit feature. The settings are enabled and disabled. The optimal and fail-safe default setting is enabled. If disabled is selected, the BIOS forces the XD feature flag to always return to 0.
- **VMX**
Enables the Vanderpool Technology, takes effect after reboot.
- **Enable SMX**
Enables Safer Mode Extensions (SMX).
- **Hardware Prefetcher**
Hardware Prefetcher is a technique that fetches instructions and/or data from memory into the CPU cache memory well before the CPU needs it, so that it can improve the load-to-use latency. Set to enable or disable.
- **Adjacent Cache Line Prefetch**
The Adjacent Cache-Line Prefetch mechanism, like automatic hardware prefetch, operates without programmer intervention. When enabled through the BIOS, two 64- byte cache lines are fetched into a 128-byte sector, regardless of whether the additional cache line has been requested or not. Set to enable or disable.
- **DCU Streamer Prefetch**
Enable prefetch of next L1 data line based upon multiple loads in same cache line.
- **DCU IP Prefetcher**
Enable prefetch of next L1 line based upon sequential load history.

- **DCU Mode**
MSR 31h Bit[0] - A write of 1 selects the DCU mode as 16KB 4-way with ECC.
- **AES-NI**
Enable or disable AES-NI support.

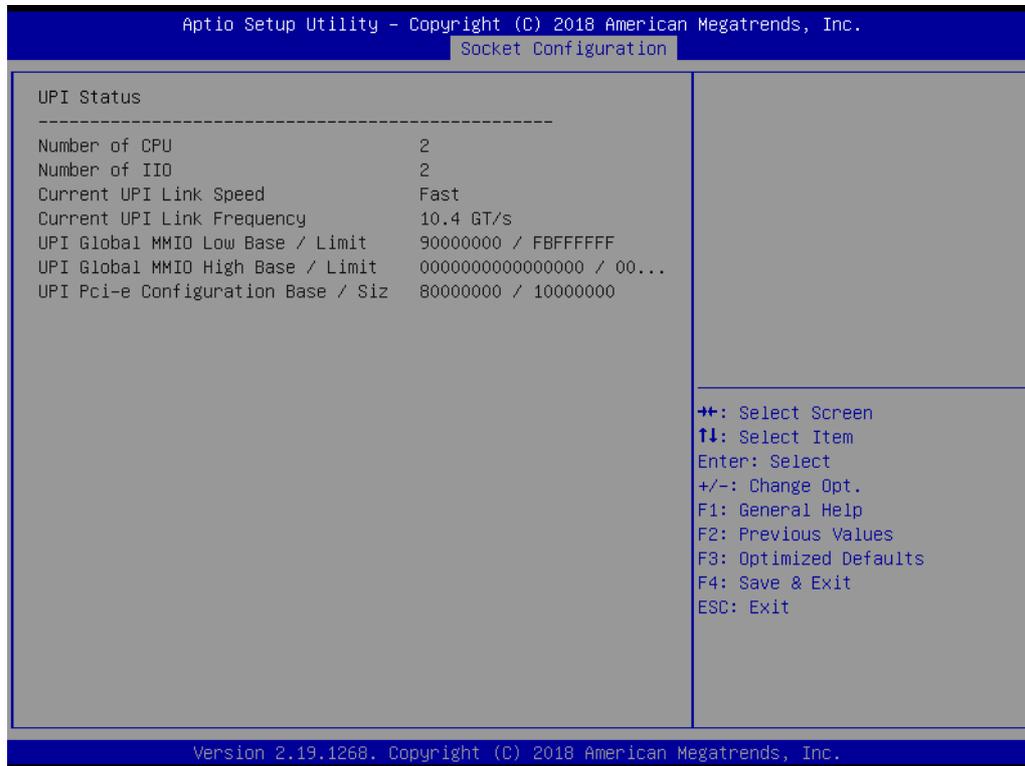


- **Core Disable Bitmap (Hex)**
Hex value for CPU Core disable, default value 0 is enable all cores.

3.2.4.2 UPI Configuration



– UPI status

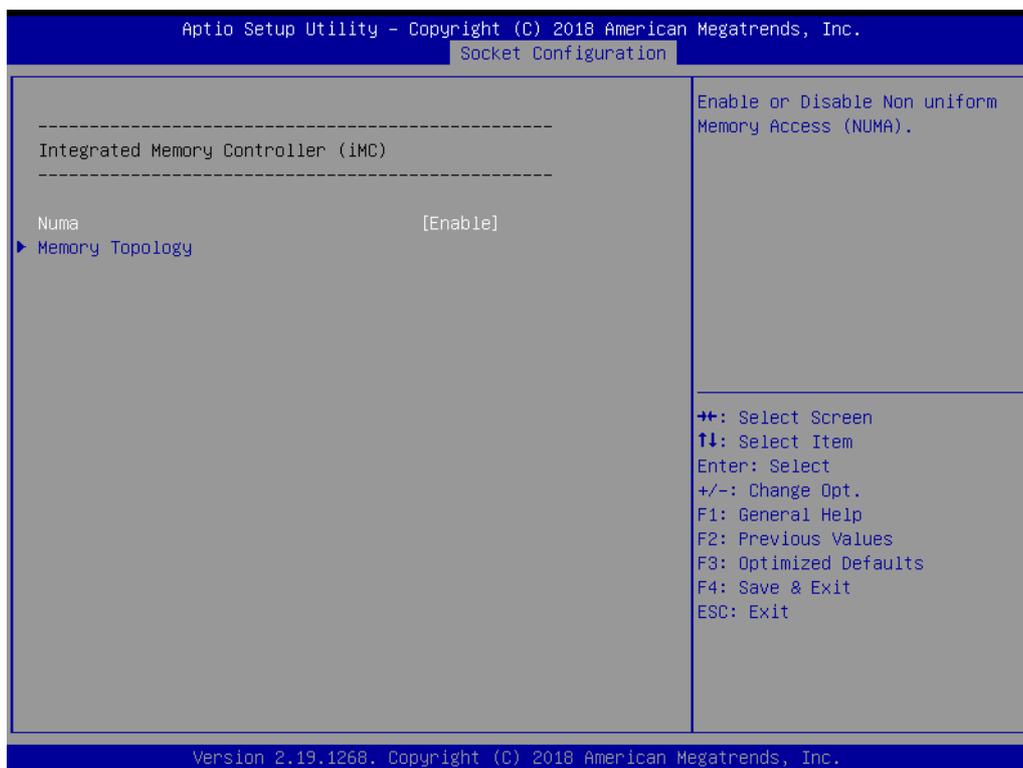


– Link Speed Mode

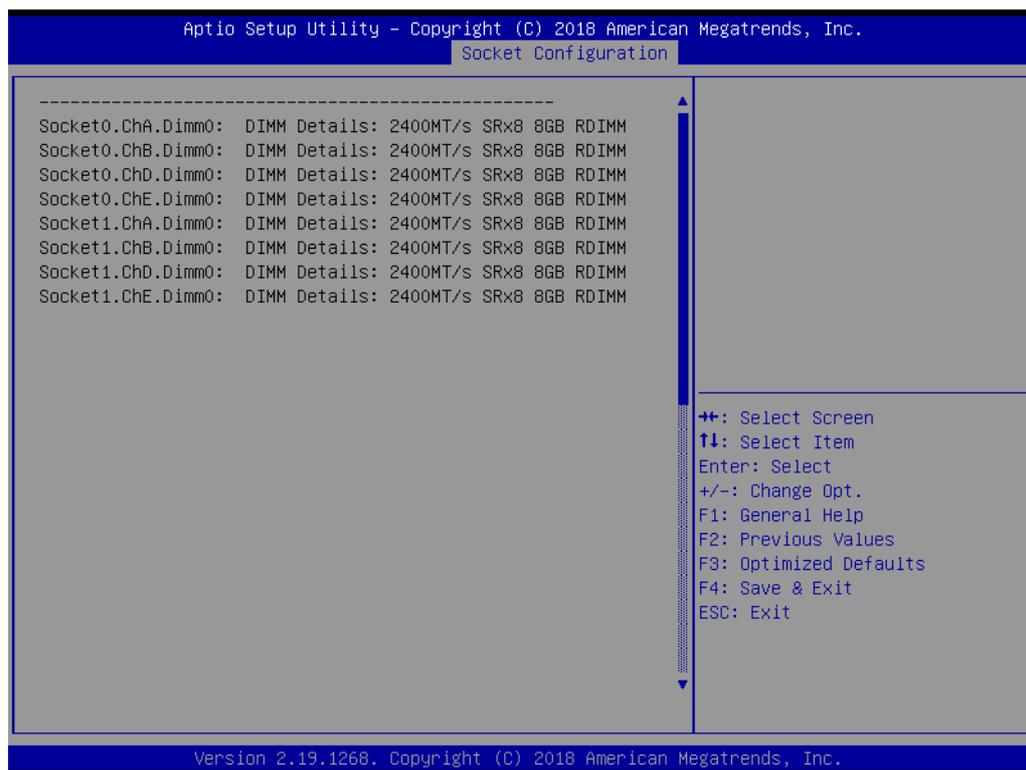
Select the QPI link speed as either the POR speed (Fast) or default speed (Slow).

- **Link Frequency Select**
Allows for selecting the QPI Link frequency.
- **Link L0p Enable**
Enable or disable QPI Link0p.
- **Link L1 Enable**
Enable or disable QPI L1.

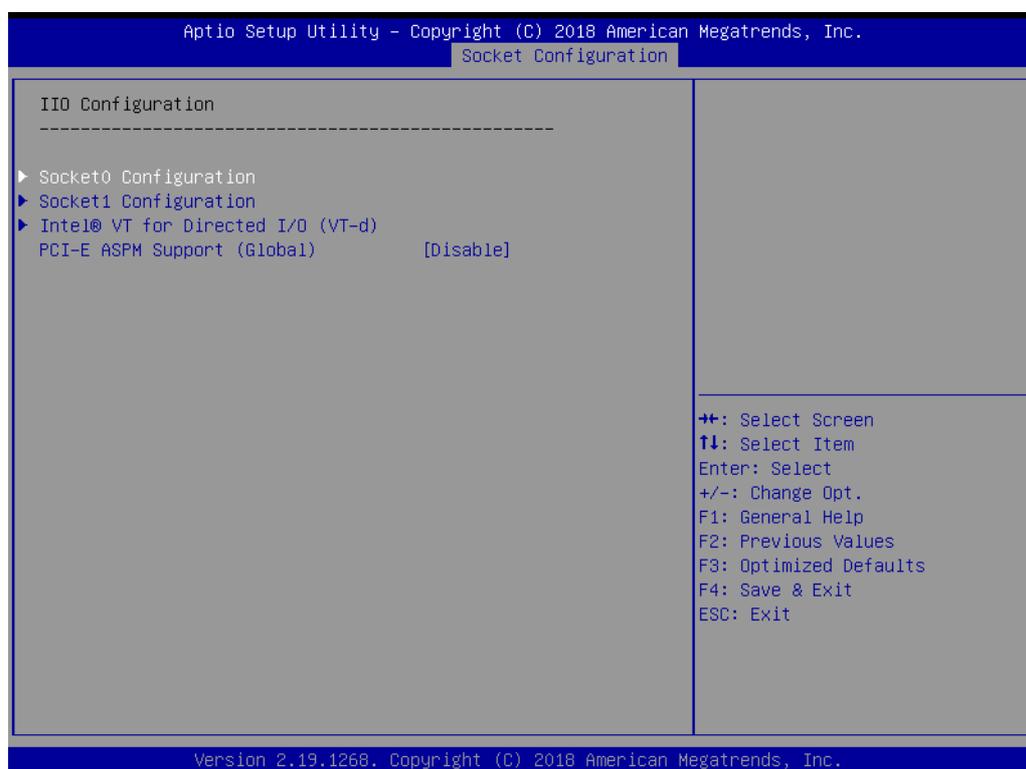
3.2.4.3 Memory Configuration



- **NUMA**
Enable or disable Non-uniform Memory Access (NUMA).
- **Memory Topology**

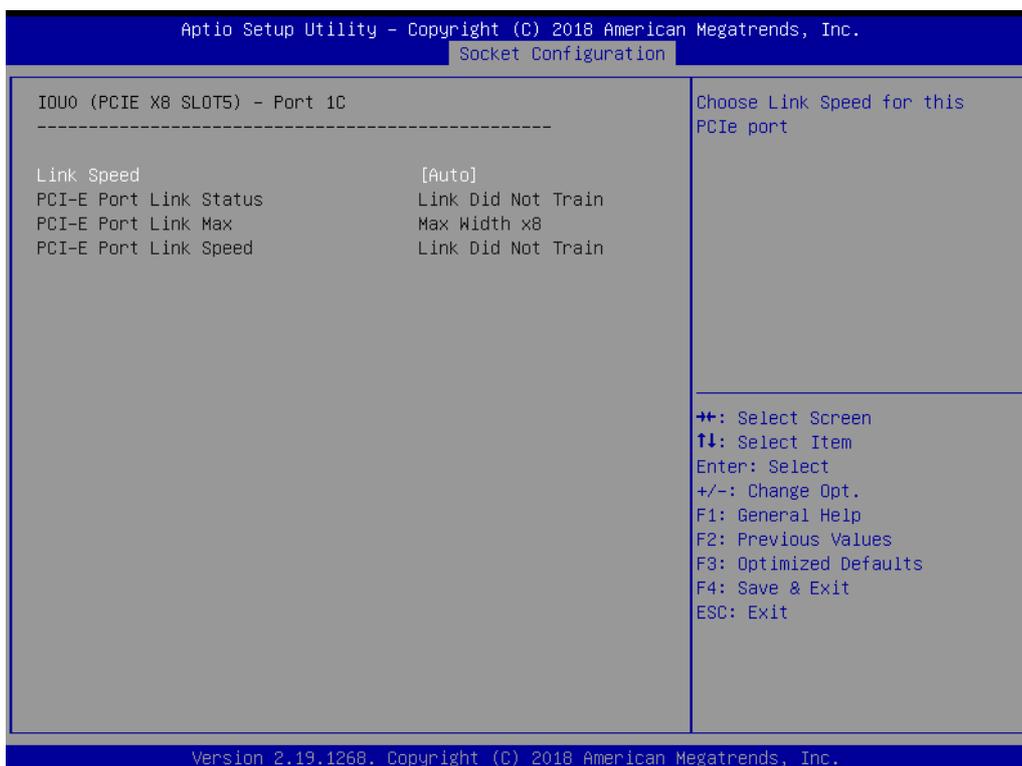
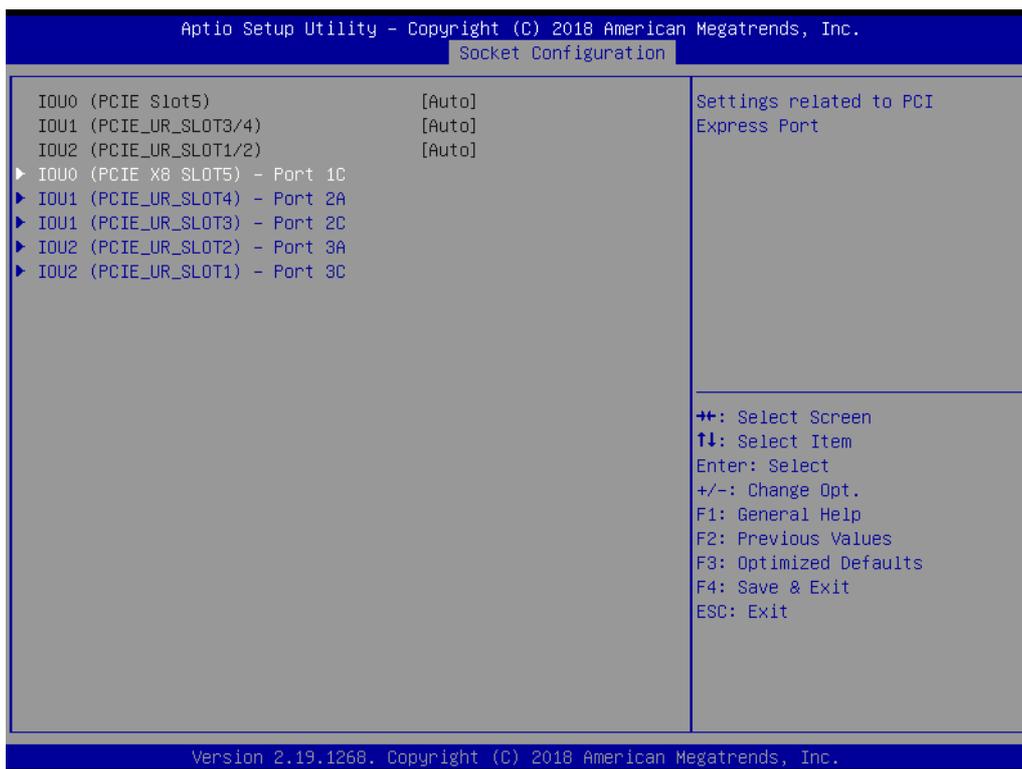


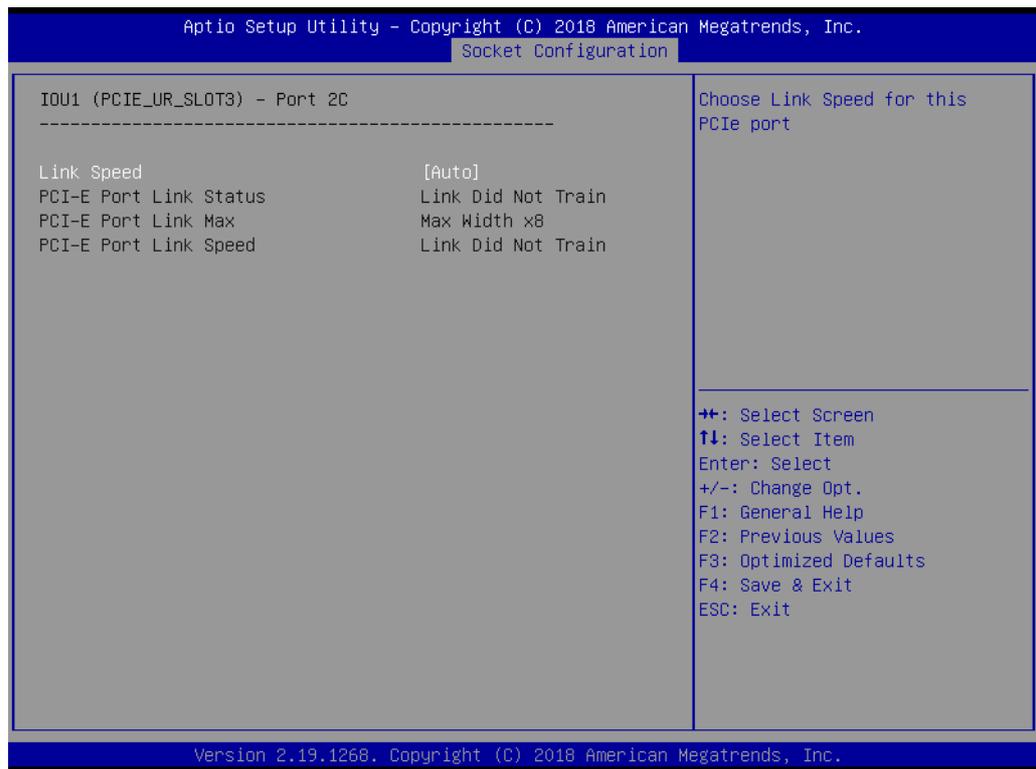
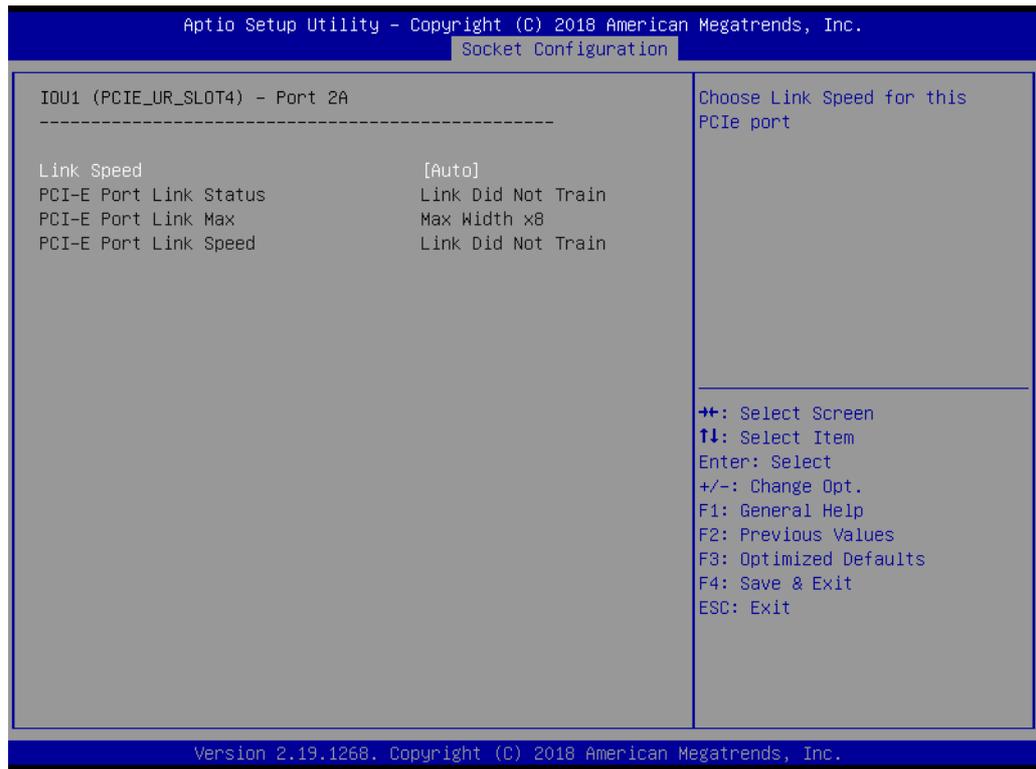
3.2.4.4 I/O Configuration

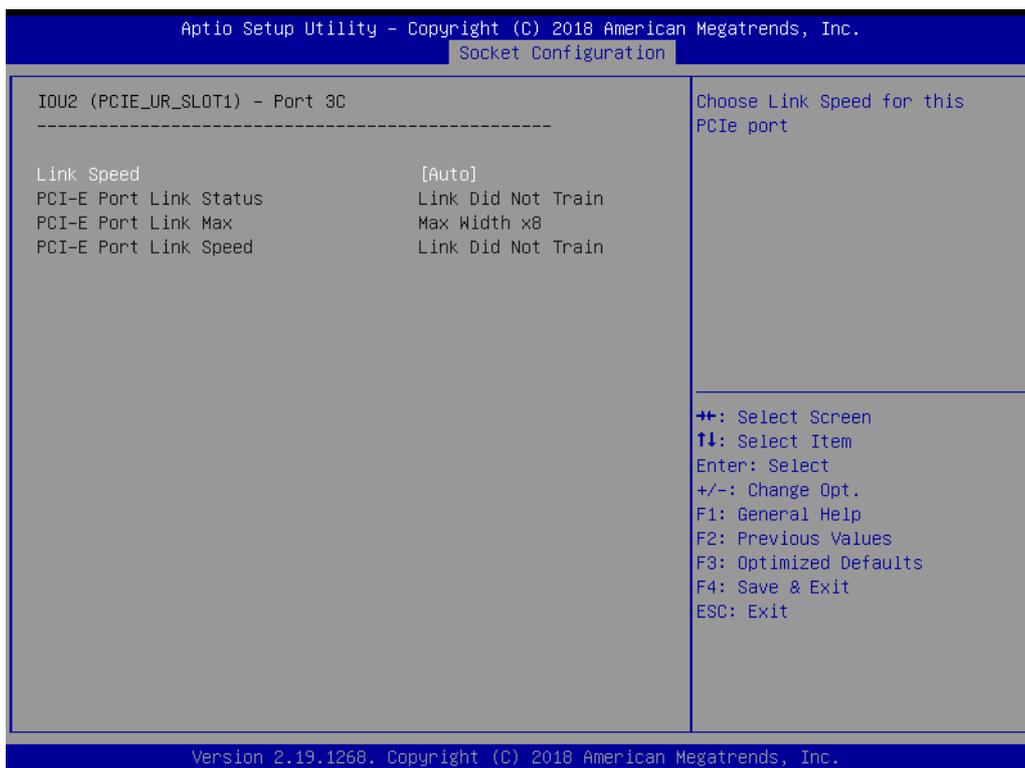


- **PCI-E ASPM Support (Global)**
Enable or disable the Active State Power Management for all PCI-Express slots.

■ Socket 0 Configuration





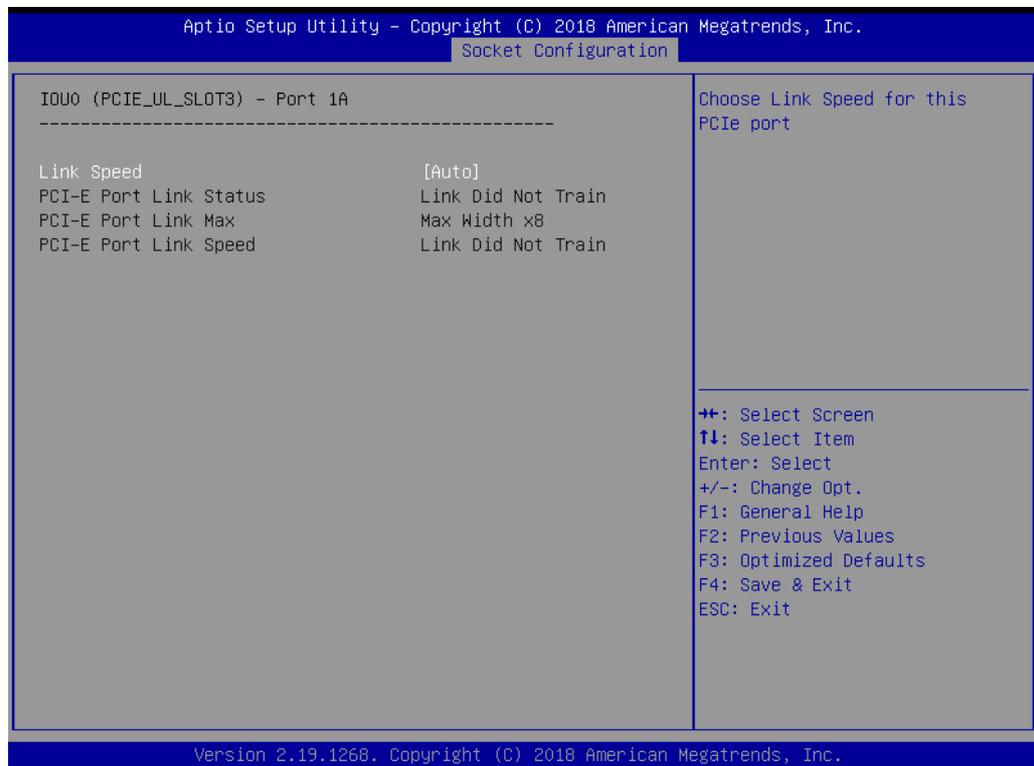
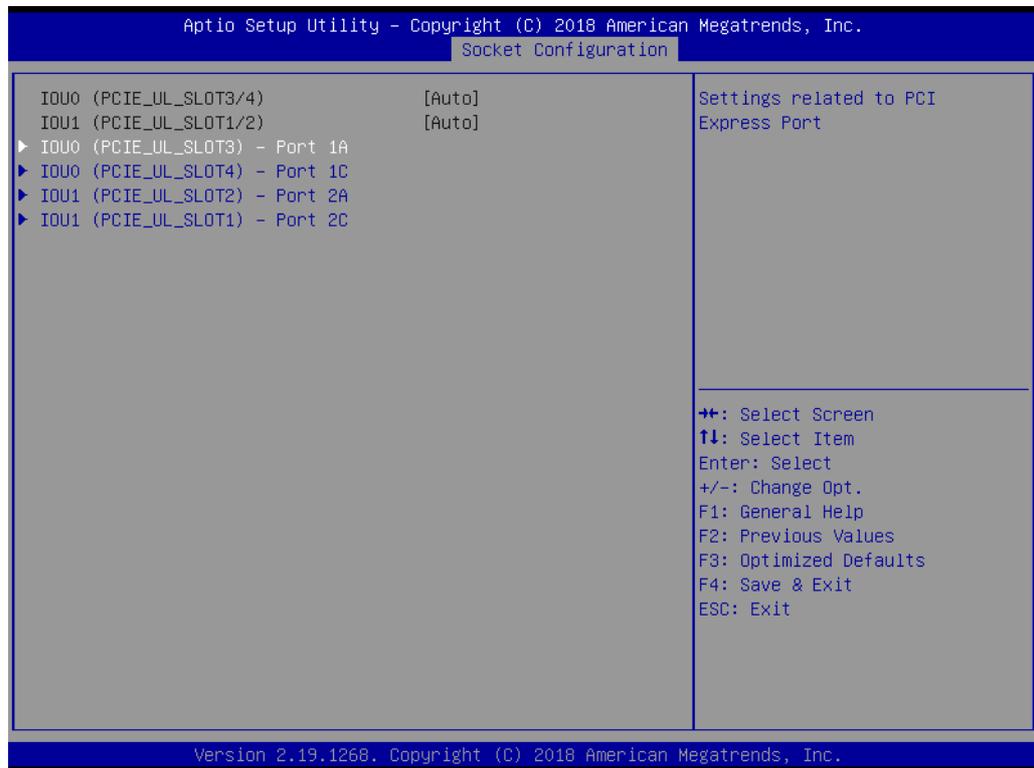


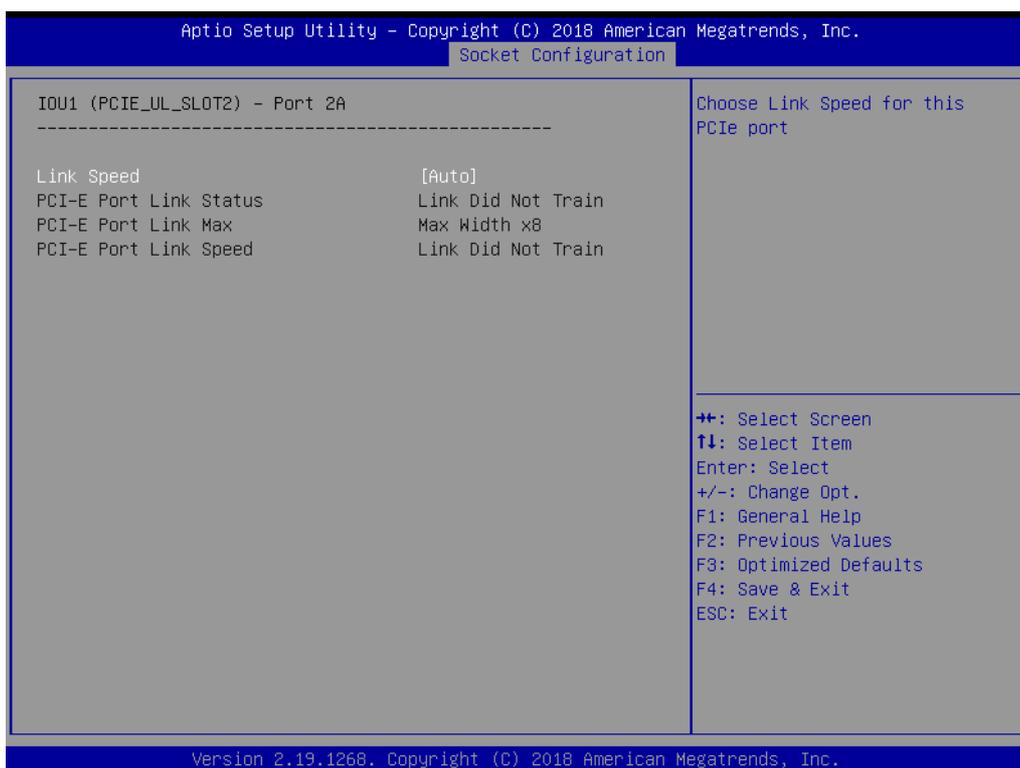
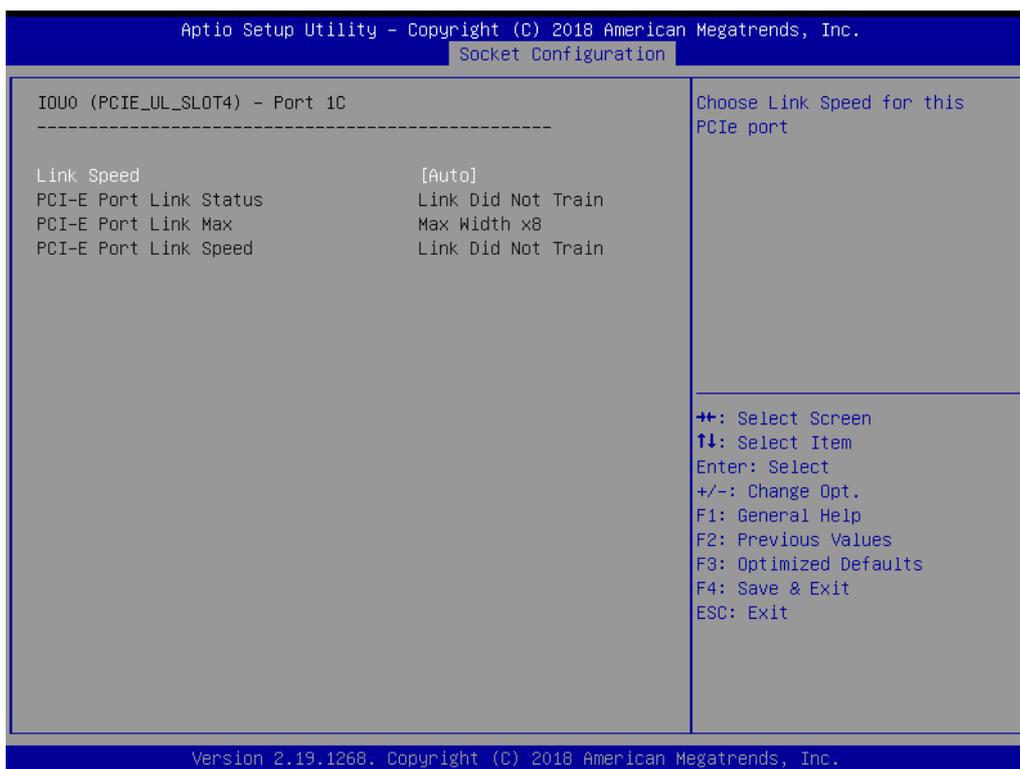
IOU0 (PCIE x8 Slot5)
IOU1 (PCIE_UR_Slot4)
IOU1 (PCIE_UR_Slot3)
IOU2 (PCIE_UR_Slot2)
IOU2 (PCIE_UR_Slot1)

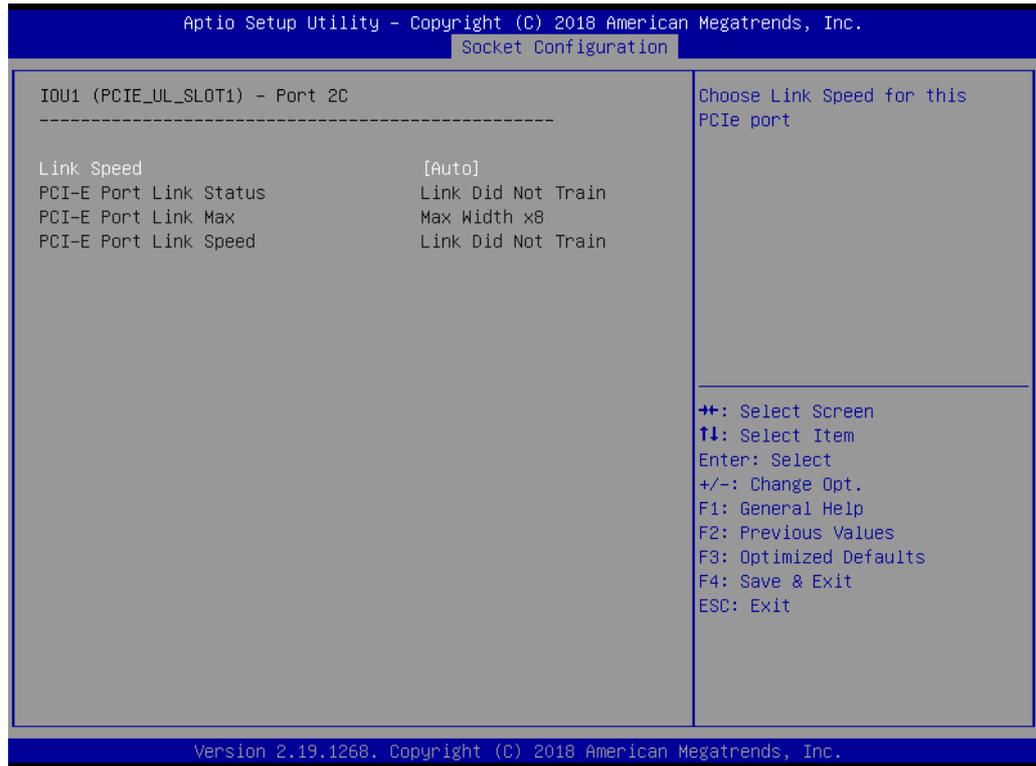
– **Link Speed**

Select target link speed as Auto, Gen1, Gen2, Gen3.

■ **Socket 1 Configuration**







IOU0 (PCIE_UL_Slot3)

IOU0 (PCIE_UL_Slot4)

IOU1 (PCIE_UL_Slot2)

IOU1 (PCIE_UL_Slot1)

– **Link Speed**

Select target link speed as Auto, Gen1, Gen2, Gen3.

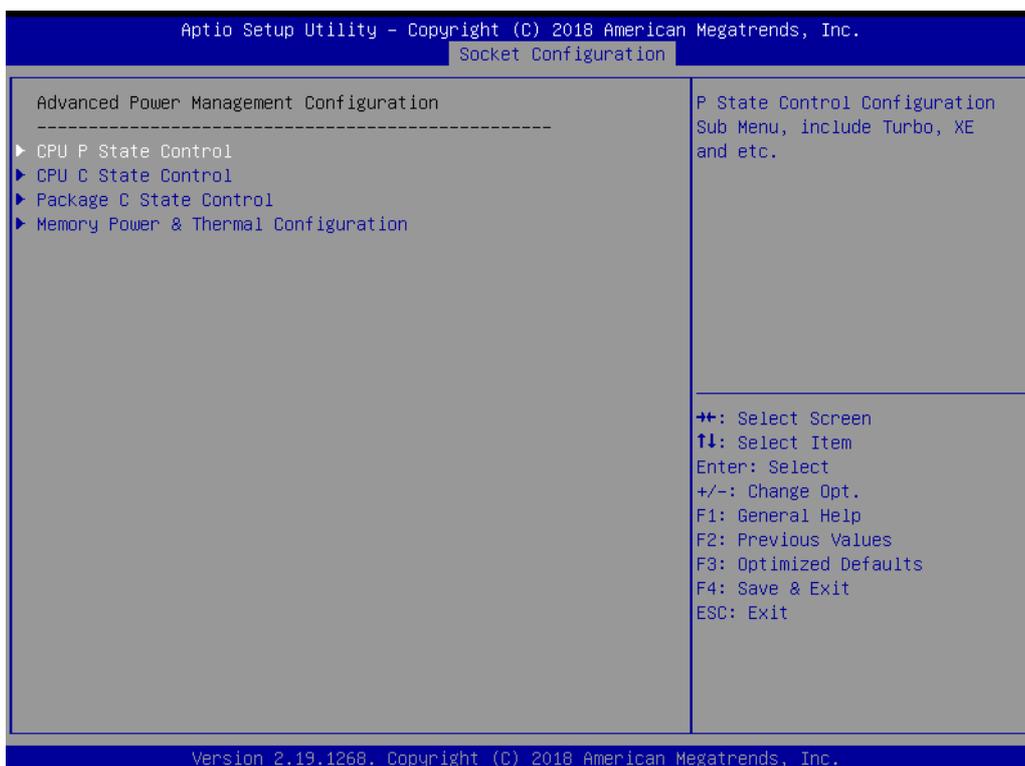
■ Intel VT for Direct I/O (VT-d)

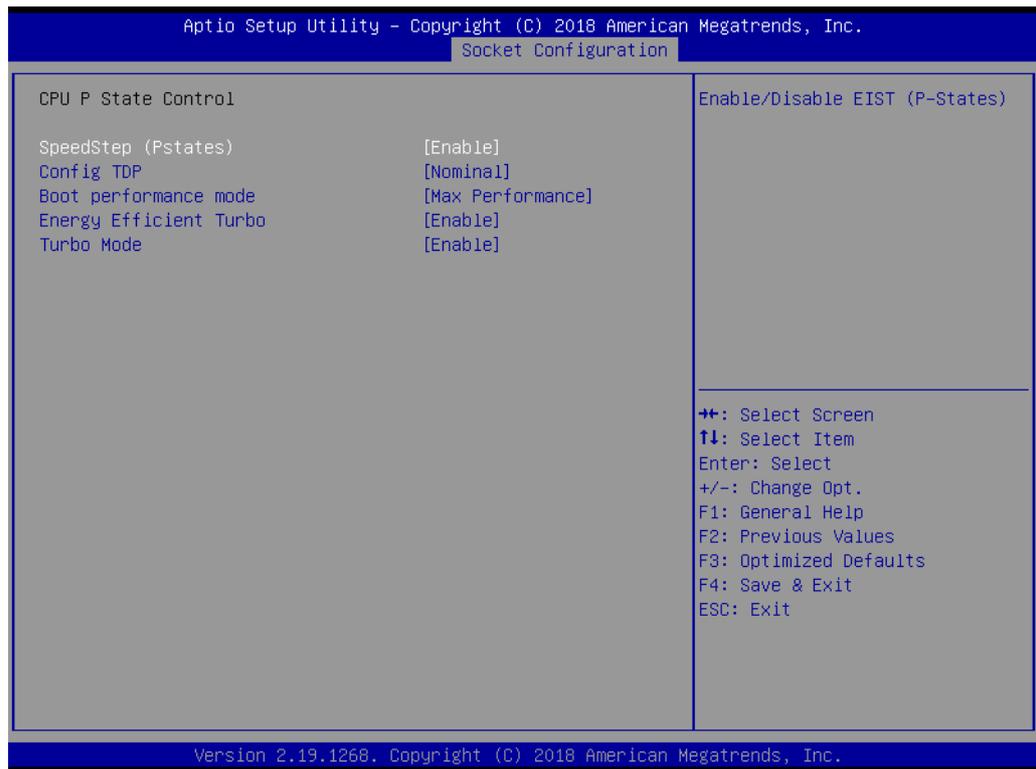


– Intel VT for Direct I/O (VT-d)

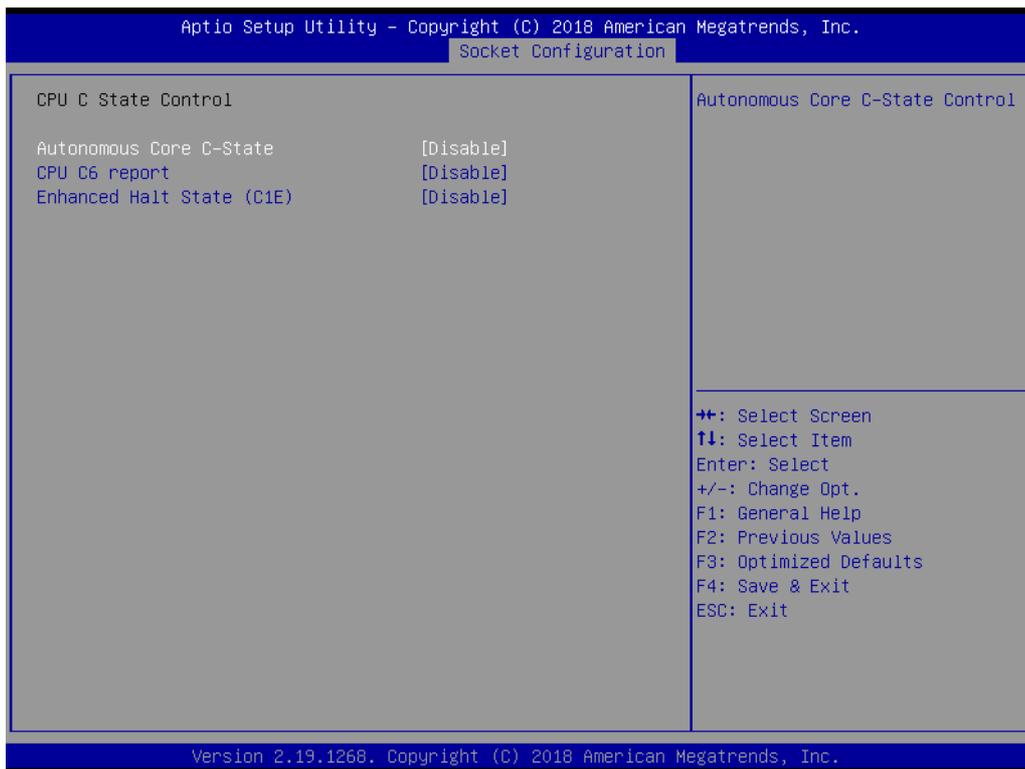
Enable or disable Intel Virtualization Technology for directed I/O (VT-d) by reporting the I/O device assignment to VMM through DMAR ACPI tables.

3.2.4.5 Advanced Power Management Configuration





- **SpeedStep (P-state)**
When enabled, OS sets CPU frequency according to load. When disabled, CPU frequency is set at max non-turbo.
- **Config TDP**
Config TDP level selection.
- **Boot performance mode**
Select the performance state that BIOS will set before the OS hands off.
- **Energy Efficient Turbo**
Enable or disable energy efficiency to regulates a good balance between power consumption and performance,
- **Turbo Mode**
Turbo mode allows a CPU logical processor to execute a higher frequency when enough power is available not exceeding CPU defined limits.



- **Autonomous Core C-State**
 Enable or disable autonomous C-State control for CPU cores. Default is disable.
- **CPU C6 report**
 Enable or disable CPU C6 report. Default is disable.
- **Enhanced Halt State (C1E)**
 Enable or disable C1E for lower power consumption, default is disable.

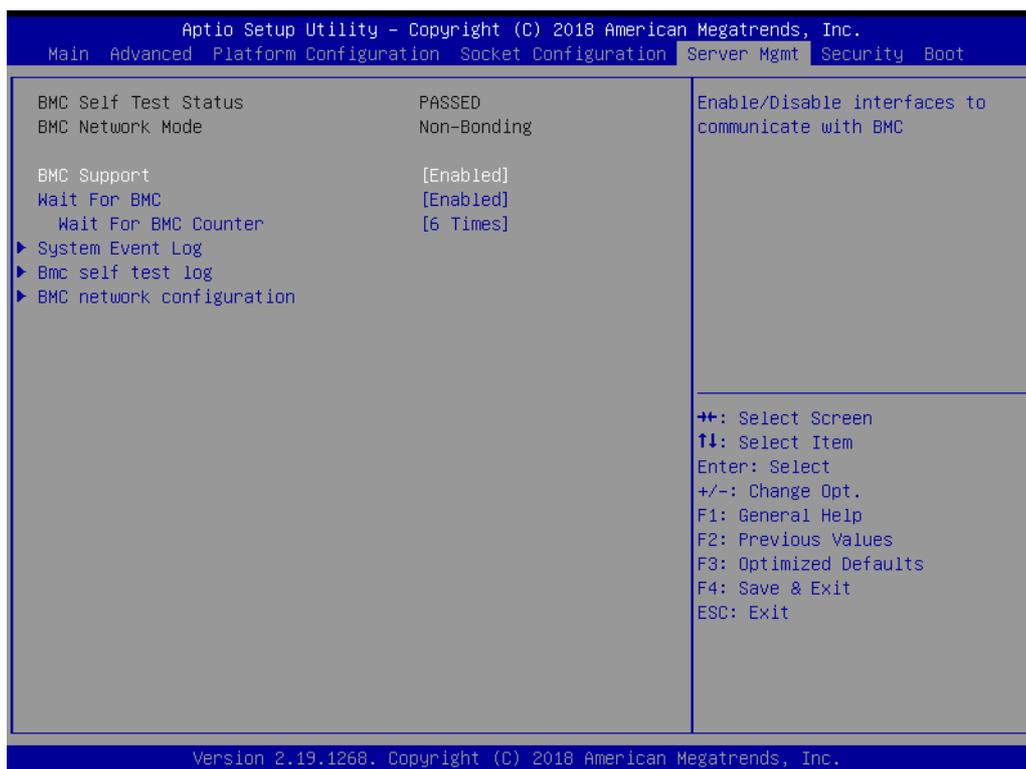


- **Package C State**
Set package C state limit, default is C0/C1 state.



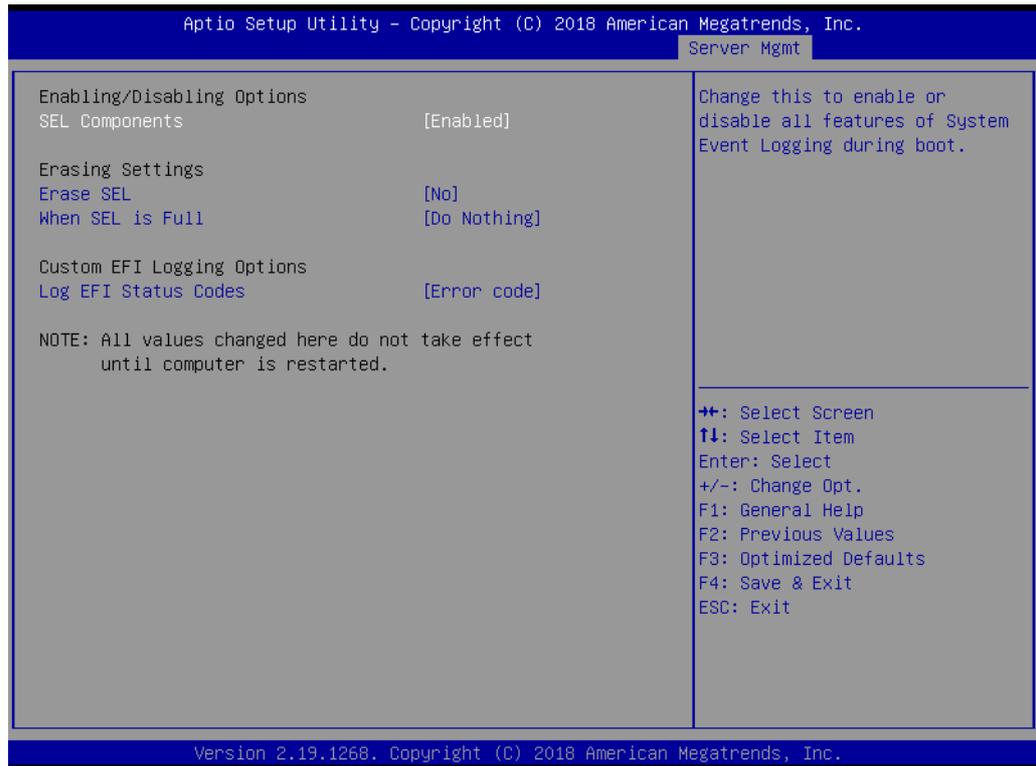
- **MEMHOT Throttling Mode**
Configure MEMHOT input and output mode: Options available: Disabled/Output only/Input only. Default setting is Input only.

3.2.5 Server Management



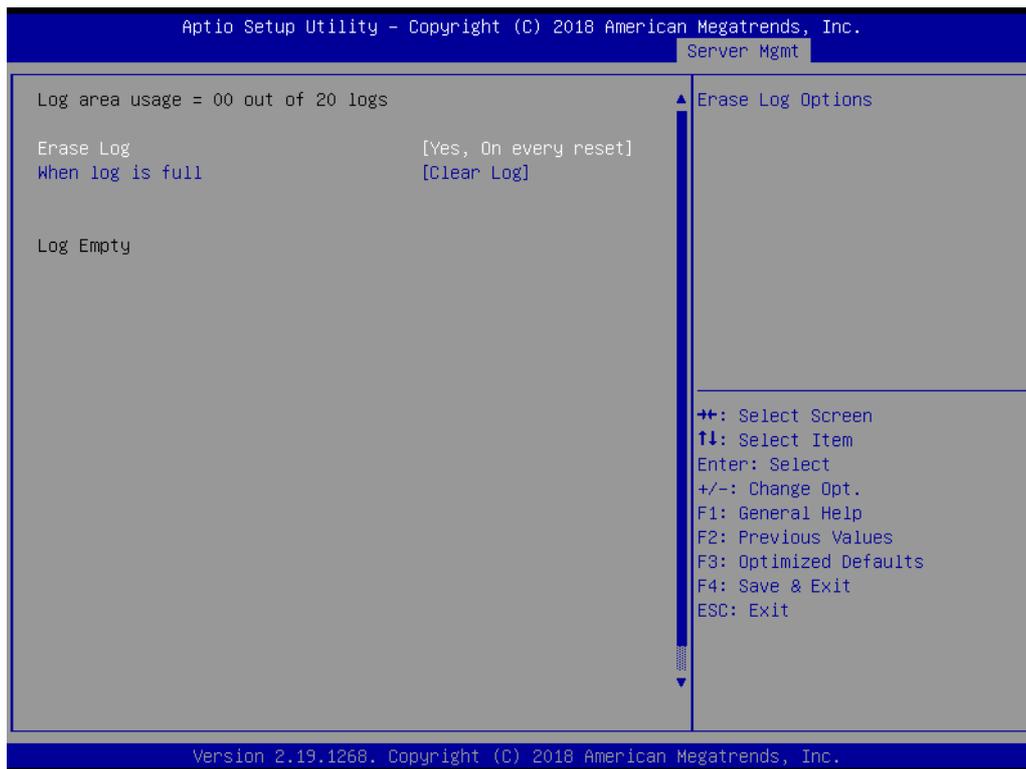
- **BMC Support**
Enable or disable interfaces to communicate with BMC.
- **Wait for BMC**
If enabled, motherboard will wait 30 ~ 60 seconds until BMC module boots up completely. After that, the normal BIOS post screen will be displayed.
If disabled, the motherboard will not wait for BMC module's response.
- **Wait for BMC counter**
Wait for BMC counter for initialize host to BMC interfaces. The MB beeps per 5 seconds to check it.

■ System Event Log



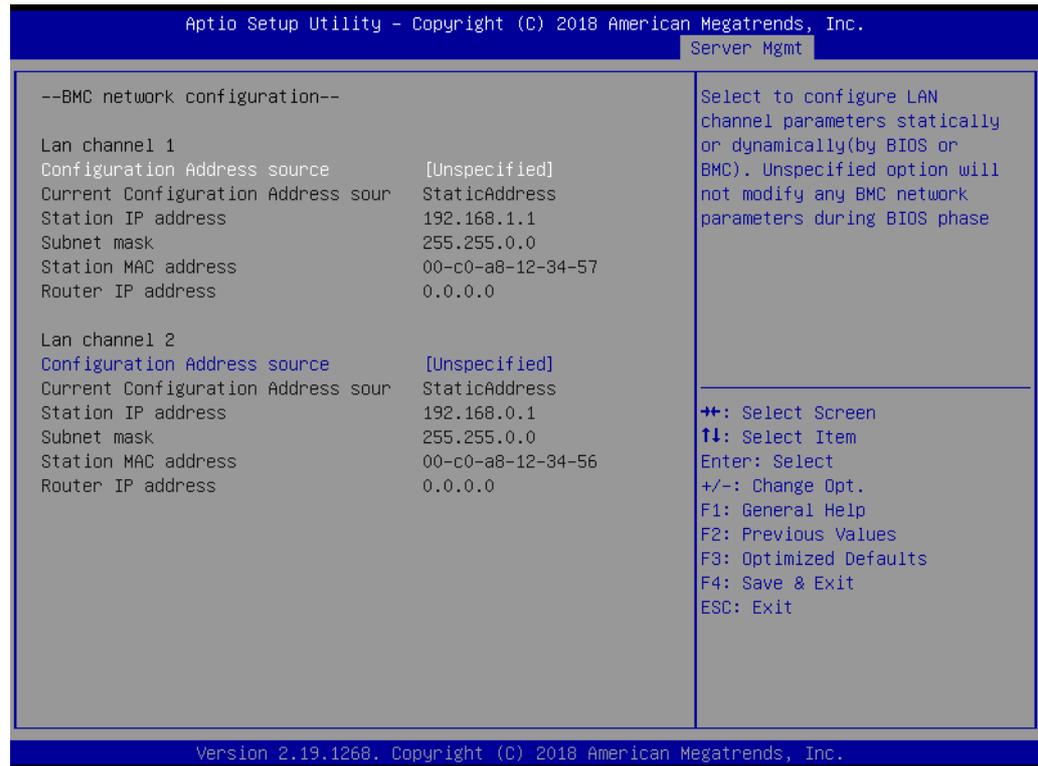
- **SEL Components**
Enable or disable all features of system event logging during boot.
- **Erase SEL**
Choose options for erasing SEL.
- **When SEL is Full**
Choose options for reactions to a full SEL.
- **Log EFI Status Codes**
Disable the logging of EFI status codes, or log only error codes, or only progress codes, or both.

■ BMC Self Test Log



- **Erase Log**
Erase log options.
- **When Log is Full**
Select the action to be taken when log is full.

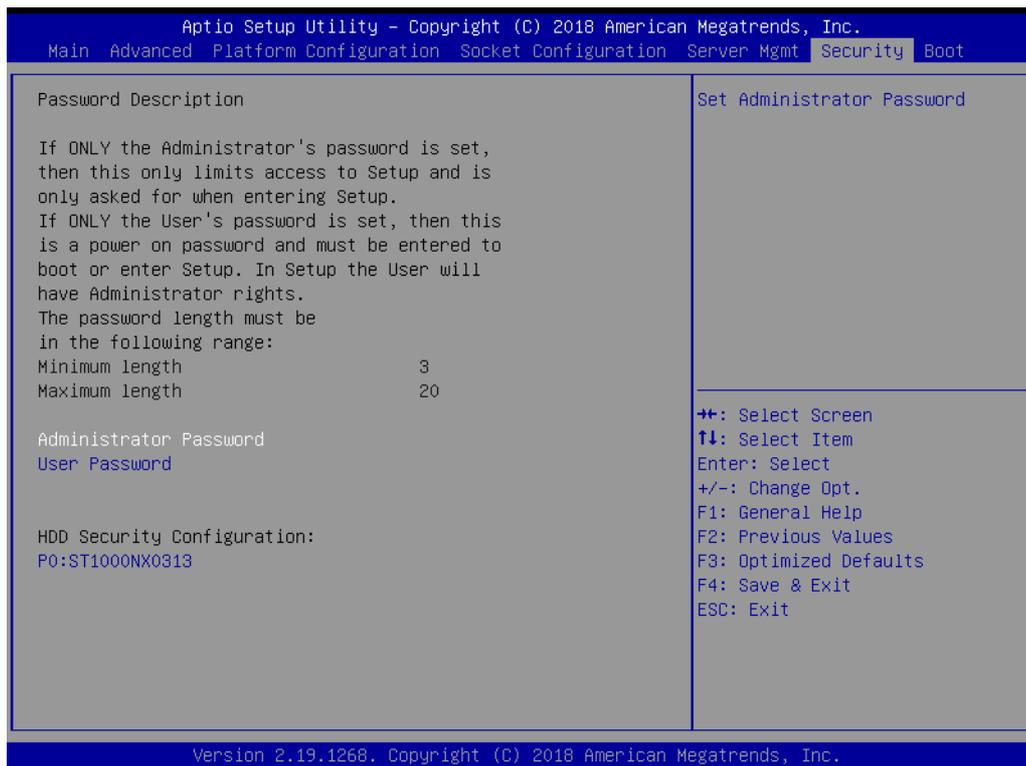
■ BMC Network Configuration



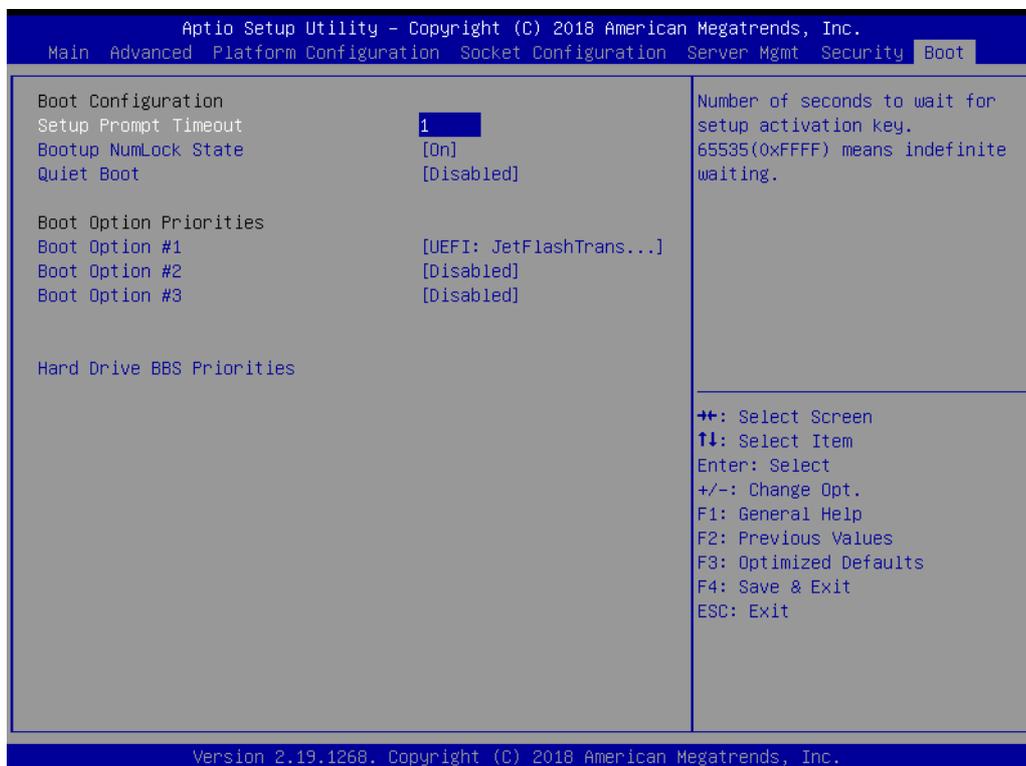
– Configuration Address Source

Select to configure LAN channel parameters statically or dynamically (by BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.

3.2.6 Security



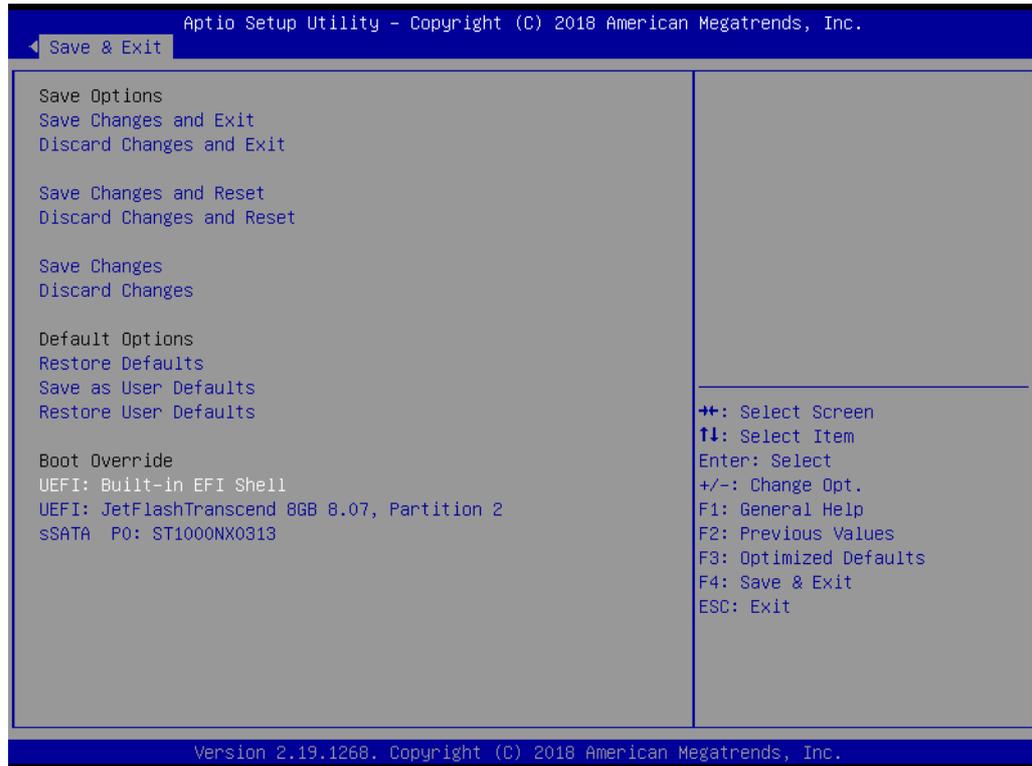
3.2.7 Boot



- Setup Prompt Timeout**
 Number of seconds to wait for setup activation key. 16 (0x10) means indefinite waiting.

- **Bootup NumLock State**
Select the keyboard NumLock state.
- **Quiet Boot**
Enable or disable quiet boot option.
- **Boot Option**
Sets the system boot priorities.

3.2.8 Save & Exit



- **Save Changes and Exit**
Exit system setup after saving the changes.
- **Discard Changes and Exit**
Exit system setup without saving any changes.
- **Save Changes and Reset**
Reset the system after saving changes.
- **Discard Changes and Reset**
Reset system setup without saving any changes.
- **Save Changes**
Save changes done so far to any of the setup options.
- **Discard Changes**
Discard changes done so far to any of the setup options.
- **Restore Defaults**
Restore/Load default values for all the setup options.
- **Save as User Defaults**
Save the changes done so far as user defaults.
- **Restore User Defaults**
Restore the user defaults to all the setup options.

Chapter 4

Chipset Software
Installation Utility

4.1 Before You Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. Please visit the Advantech website or scan the QR code below for quick access to download the driver for SKY-6200.

Before beginning, it is important to note that most display drivers need to have the relevant software application already installed on the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user manual before performing the installation.



4.2 Introduction

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 support
- Identification of Intel chipset components in the Device Manager

Note! *The chipset driver is used for the following versions of Windows, and it has to be installed before installing all the other drivers:*



<i>Windows Server 2016 Standard</i>	<i>x64</i>
<i>Windows Server 2012 R2 Standard</i>	<i>x64</i>

4.3 Windows OS Driver Setup

1. Download the Chipset driver on the website, the file downloaded is compressed, unzip the folder then install the Chipset driver by running the SetupChipset.exe

WinServer2012R2/WinServer2016 driver for SKY-6200

Solution :

Download File	Released Date	Download Site	
SKY-6200_Chipset_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_Graphic_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_LAN_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_RSTe_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_USB_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary

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 use.
- 64 MB RAM for this chip, the highest resolution is 1920x1200.

5.2 Windows Series Driver Setup

Download the Graphic driver on the website, the file downloaded is compressed, unzip the folder then install the Graphic driver.

WinServer2012R2/WinServer2016 driver for SKY-6200

Solution :

Download File	Released Date	Download Site	
SKY-6200_Chipset_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_Graphic_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_LAN_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_RSTe_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_USB_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary

Note!



1. If SKY-6200 carries an additional graphics card for VGA output, please set this additional graphic card as "major output" under the "Display properties" of OS.
2. The WDDM driver can support for the following OS versions:
 - Windows Server 2012 version (WHQL)
 - Windows Server 2012R2 version (WHQL)
 - Windows Server 2016 version (WHQL)
3. ASPEED Graphics WDDM Driver Limitation on Microsoft Windows OS.
 - It is a non-WHQL certified driver because ASPEED VGA is a 2D VGA, it cannot meet the WHQL requirement of WDDM drivers which require 3D VGA functions.
 - Because it is a non-WHQL certified driver, it may have some compatibility issues with some specific applications
 - Does not support modes with different display frequencies.

Chapter 6

LAN / SATA
RAID&AHCI / USB 3.0

6.1 LAN Configuration

6.1.1 Introduction

The SKY-6200 has two 10G Base-T Ethernet LAN 1/2 connections - Intel X557 PHY and two GbE LAN 3/4 - Intel I210. They eliminate bottlenecks in network data flow when incorporating Gigabit Ethernet at 10Gbps.

6.1.2 Features

- 10/100/1000 & 10G Base-T Ethernet controller
- 10/100/1000 & 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 operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides the driver setup procedure for the operating system you are using.

6.1.4 Windows Series Driver Setup (LAN)

1. Download the Ethernet driver on the website, the file downloaded is compressed, unzip the folder then install the Ethernet driver.

WinServer2012R2/WinServer2016 driver for SKY-6200

Solution :

Download File	Released Date	Download Site	
SKY-6200_Chipset_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_Graphic_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_LAN_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_RSTe_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_USB_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary

6.2 AHCI & SATA RAID

6.2.1 Introduction

Intel C622 PCH chip offers SATA RAID with RAID 0, 1, 10, 5 under Windows operating system.

- Note!**  1. Please visit the Intel download center for "Intel Rapid Storage Technology enterprise for Microsoft Windows Operating System Software User's Guide" file download,
2. For the hotfix file download, please visit Microsoft website.

6.2.2 Windows Series Driver Setup

Download the RSTe driver on the website, the file downloaded is compressed, unzip the folder then install the RSTe driver.

WinServer2012R2/WinServer2016 driver for SKY-6200

Solution :

Download File	Released Date	Download Site	
SKY-6200_Chipset_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_Graphic_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_LAN_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_RSTe_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_USB_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary

6.3 USB3.0

6.3.1 Introduction

SKY-6200 offers four USB 3.0 ports in rear side.

The USB 3.0 could provide the bandwidth up to 500MB/s to shorter the time for data transmission.

6.3.2 Windows Series Driver Setup

Download the USB driver on the website, the file downloaded is compressed, unzip the folder then install the USB driver.

WinServer2012R2/WinServer2016 driver for SKY-6200

Solution :

Download File	Released Date	Download Site	
SKY-6200_Chipset_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_Graphic_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_LAN_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_RSTe_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary
SKY-6200_USB_WinServer 2012R2_WinServer 2016 (64bit).zip	2018-08-21	Primary	Secondary

Appendix **A**

Programming the Watchdog Timer

The SKY-6200's 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 in to the EC controller IT8528E. It provides the following functions for user programming:

- Can be enabled and disabled by user's program
- Timer can be set from 1 to 255 seconds
- Generates an interrupt or reset signal if the software fails to reset the timer before time-out

A.2 Programming the Watchdog Timer

The I/O port address of the watchdog timer is as below:

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

Here is an example to step by step program 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	

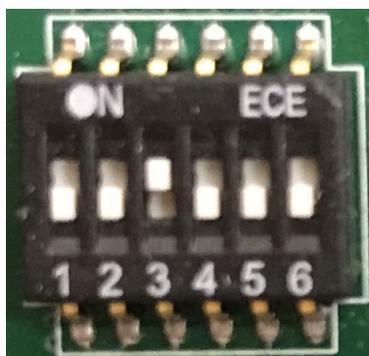
Appendix **B**

Riser DIP Switch
Setting for PCIe

SKY-6200 has thirty-two DIP switches on the UR and UL riser cards. The below sections illustrates the default setting for each switch which is optimized for qualified GPU cards listed in the peripheral compatibility list.

For each DIP switch, there are six bits to configure for the high and low status, if the DIP switch is set to "ON", then the corresponding bit is set to high (1), on the contrary, the bit is set to low (0)

Below is an example of the high (1) and low (0) status of a DIP switch



	bit1	bit2	bit3	bit4	bit5	bit6
SW	0	0	1	0	0	0

B.1 UR Riser Card default setting

	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6
RPT1_SW1	1	0	0	0	0	1
RPT1_SW2	0	1	0	0	0	1
RPT2_SW1	1	0	0	0	0	1
RPT2_SW2	0	1	0	0	0	1
RPT3_SW1	1	0	0	0	0	1
RPT3_SW2	0	1	0	0	0	1
RPT4_SW1	1	0	0	0	0	1
RPT4_SW2	0	1	0	0	0	1
RPT5_SW1	1	0	0	0	0	1
RPT5_SW2	0	1	0	0	0	1
RPT6_SW1	1	0	0	0	0	1
RPT6_SW2	0	1	0	0	0	1
RPT7_SW1	1	0	0	0	0	1
RPT7_SW2	0	1	0	0	0	1
RPT8_SW1	1	0	0	0	0	1
RPT8_SW2	0	1	0	0	0	1

For Tesla V100 PCIe, following switch setting must be changed.

	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6
RPT2_SW2	0	0	1	1	0	0
RPT6_SW2	0	0	1	1	0	0

B.2 UL Riser Card default setting

	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6
RPT1_SW1	1	0	0	0	0	1
RPT1_SW2	0	1	0	0	0	1
RPT2_SW1	1	0	0	0	0	1
RPT2_SW2	0	1	0	0	0	1
RPT3_SW1	1	0	0	0	0	1
RPT3_SW2	0	1	0	0	0	1
RPT4_SW1	1	0	0	0	0	1
RPT4_SW2	0	1	0	0	0	1
RPT5_SW1	1	0	0	0	0	1
RPT5_SW2	0	1	0	0	0	1
RPT6_SW1	1	0	0	0	0	1
RPT6_SW2	0	0	1	1	0	0
RPT7_SW1	1	0	0	0	0	1
RPT7_SW2	0	1	0	0	0	1
RPT8_SW1	1	0	0	0	0	1
RPT8_SW2	0	1	0	0	0	1

Appendix **C**

RoHS Declaration

限用物質含有情況標示聲明書

Declaration of the Presence Condition of the Restricted Substances Marking

設備名稱：伺服器 Equipment name	型號（型式）：SKY-6200-R20A1 Type designation (Type)					
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr+6)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
電路板	—	○	○	○	○	○
電源供應器	—	○	○	○	○	○
存取裝置 (HDD)	—	○	○	○	○	○
內外殼 (外殼、內部框架 ... 等)	—	○	○	○	○	○
配件 (排線、傳輸線、 網路線 ... 等)	—	○	○	○	○	○
其它固定組件 (螺絲、夾具、卡 榫)	—	○	○	○	○	○
散熱模組 (風扇)	—	○	○	○	○	○
光碟機	—	○	○	○	○	○
分離式電源線組	○	○	○	○	○	○
<p>備考 1. “超出 0.1 wt %” 及 “超出 0.01 wt %” 係指限用物質之百分比含量超出百分比含量基準值。 Note 1: “Exceeding 0.1 wt %” and “exceeding 0.01 wt %” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.</p> <p>備考 2. “○” 係指該項限用物質之百分比含量未超出百分比含量基準值。 Note 2: “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.</p> <p>備考 3. “—” 係指該項限用物質為排除項目。 Note 3: The “—” indicates that the restricted substance corresponds to the exemption.</p>						

产品中有害物质的名称及含量

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件	X	0	0	0	0	0
面板(如有)	X	0	0	0	0	0

本表格依据SJ/T11364的规定编制。

0: 表示该有害物质在该部件所有均质材料中的含量均在GB/T26572-2011标准规定的限量要求以下。

X: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T26572-2011标准规定的限量要求。

KAQ-A-071-F001 A5

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