

ASMB-977 Series

**ASMB-977 Dual LGA4677 4th
Gen Intel® Xeon® Scalable
Proprietary Server Board with
16x DDR5, 5 x PCIe x16, 9 x
SATA3.0, 4 x USB 3.2 (Gen 1),
Dual 10GbE, and IPMI**

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Initial Inspection

Before installing motherboard, please make sure that the following materials have been shipped:

- 1 x ASMB-977 Server Board
- 1 x ASMB-977 Startup Manual
- 1 x Serial ATA HDD data cables
- 1 x Serial ATA HDD power cables
- 1 x I/O port bracket
- 2 x CPU power cable (8P)
- 2 x CPU carriers
- 1 x M.2 screw

If any of these items are missing or damaged, contact distributor or sales representative immediately. We have carefully inspected the ASMB-977 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. When unpacking the ASMB-977, 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	Chipset	Memory	GbE/10GbE LAN	IPMI	VGA Chip
ASMB-977I-00A1	C741	16 x DDR5 RDIMM	2/-	Yes	AST 2600
ASMB-977T2-00A1	C741	16 x DDR5 RDIMM	2/2	Yes	AST 2600

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Chapter

1

Overview

1.1 Introduction

The ASMB-977 serverboard is the most advanced Intel Xeon Processor Scalable Family series board for server-grade IPC applications that require high-performance computing power & multi-expansion slots. This serverboard supports DDR5 ECC-REG 3200/3600/4000/4400/4800 MHz memory up to 4TB. ASMB-977 provides 5 x PCIe x16 Gen5 slots and 5 x PCIe x8 Gen4 slots. In addition, the ASMB-977T2 has dual Gigabit and dual 10GbE Ethernet LAN ports that eliminate network bottlenecks. A fifth RJ-45 LAN connector (LAN5) is dedicated for IPMI functions that allow remote control management. RJ-45 LAN jacks (LAN 3/4) from a 10GbE port can also be used as IPMI LAN. High reliability and outstanding performance makes the ASMB-977 the ideal platform for industrial server/networking applications.

By using the Intel C741 chipset, the ASMB-977 offers a variety of features, such as 4 x USB3.2 gen1 and 1 x USB 2.0 type A connectivity, 9 x SATA III and 2 x M.2 (SATA/PCIe x4 from PCH + PCIe x4 from CPU0) interface, 8 x SATA 3.0 (6 Gb/s) via mini SAS HD (SFF-8643), supports software RAID 0, 1, 5, 10 (Windows only), and with the latest Intel RSTe (Rapid Storage Technology Enterprise) it provides a compelling RAID solution for NVMe SSDs via Intel VROC (Virtual RAID on Chip) HW key.

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

- Note!**
- 
1. *IPMI module will be included in ASMB-977I and ASMB-977T2 SKUs.*
 2. *One USB 2.0 port (Type- A) and four USB 3.2 gen1 ports (2 ports from on-board 20-pin header and 2 port from the rear I/O).*
 3. *Please refer to the release note of each Linux OS for Intel's C741 chipset SATA RAID function support.*

1.2 Features

General

- **Intel Xeon Processor Scalable Family support:** The ASMB-977 is equipped with two CPU sockets to support Intel Xeon Platinum/Gold/Silver series up to 60-core processors.
- **High performance I/O capability:** 2 x 10GbE (T2 SKU only) + 2 x GbE LAN, 5 x PCIe x16 slots (x16 link) + 5 x PCIe x8 slots (x8 link), 9 x SATA and 2 x M.2 connectors, 4 x USB 3.2 gen1 and 1 x USB 2.0 (1 x Type-A) ports.
- **Outstanding industrial features:** The ASMB-977 provides industrial features like long product lifecycle, reliable operation under wide temperature range, watchdog timer, etc.
- **IPMI 2.0 support:** The ASMB-977I/ASMB-977T2 is equipped with an ASPEED 2600 BMC chip and supports IPMI 2.0 (Intelligent Platform Management Interface 2.0) via a dedicated LAN port.
- **KVM over IP:** The KVM over IP function allows BIOS level remote control of the ASMB-977I/ASMB-977T2 SKU system through your own computer.

1.3 Specifications

Table 1.1: Specifications

Processor	
CPU	■ Dual Intel LGA4677 Xeon processor sockets ■ Supports Intel 4th Gen Xeon scalable family, up to 60 cores ■ Supports the TDP of processor up to 225 W (please consider extended air thermal solution while using CPU> 205 W TDP)
System Memory	
Memory Capacity	■ Supports DDR5 memory buses ■ 16 total memory slots provided ■ Supports up to 4TB of memory ■ 1 DIMM slot per channel, 8 channels per processor
Memory Type	Supports DDR5 3200/3600/4000/4400/4800 MHz RDIMM/LRDIMM modules
DIMM Sizes	Each memory slot supports 16GB, 32GB, 64GB, 128GB, and 256GB memory modules
Memory Voltage	1.2 V
Error Detection	■ Corrects single-bit errors (only if using ECC memory) ■ Detects double-bit errors (only if using ECC memory)
On-Board Devices	
Chipsets	Intel C741 PCH
Network Controllers	■ 2 x Intel X710 10GbE and 2 x Intel I210 Gigabit Ethernet controllers connected to PCH. ■ Above network supports 10 GbE Base-T and 100/1000 Base-T, with RJ-45 output.
VGA	ASPEED AST2600 controller with 64 MB VGA memory provides basic 2D VGA function.
EC	ITE IT5121VG chip provide motherboard keyboard mouse, RS-232, parallel port and hardware monitor functions
BMC	One Realtek RTL8211FSI Gigabit PHY connected to AST2600 for BMC remote management (ASMB-977I/977T2 SKU)
Input/Output	
Storage	■ Total 9 x SATA ports and 1 x M.2 (SATA/PCIe x4 gen3 compatible from PCH) provide 6 Gb/s and 8 Gb/s, and 1 x M.2 (PCIe x4 gen4 compatible with CPU) provide 16 Gb/s ■ RAID 0, 1, 5, 10 support (Windows only. For Linux support please refer to note item 3 of chapter 1.1)
LAN	■ 4 x RJ-45 LAN ports (2 x 10GbE + 2 x 10/100/1000 Base-T LAN) ■ 1 x RJ-45 dedicated IPMI LAN port(10/100/1000 base-T) for IPMI only, there is no regular LAN function (ASMB-977I/977T2 SKU)
USB	■ 2 x USB 3.2 gen1 ports at rear window ■ 1 x USB 3.2 gen1 internal header (2 ports) ■ 1 x USB 2.0 internal Type-A port
Graphics	■ 1 x VGA port.
Serial Port/Header	■ 1 x RS232 port at rear window, 1 x internal header (2 x 5P pitch: 2.50 mm), both ports are RS-232 (5 V)
Keyboard/Mouse	■ PS/2 keyboard and mouse internal header (onboard)

Table 1.1: Specifications**Power Connector**

System Power	1 x 24-pin SSI EPS 12 V power connector (input 12 V, 5 V, 3.3 V, 5 Vsb)
CPU Power	4 x 8-pin SSI EPS 12 V power connector for CPU & memory power (12 V)
PCIe Slot Power	2 x 8-pin power connectors for PCIe slot 12 V input

Expansion Slots

PCI-Express	■ 5 x PCIe x16 slot (Gen5 x16 link) – PCIEX16_SLOT2 (from CPU 0) – PCIEX16_SLOT4 (from CPU0) – PCIEX16_SLOT6 (from CPU 0) – PCIEX16_SLOT8 (from CPU1) – PCIEx16 SLOT9 (from CPU1)
	■ 5 x PCIe x8 slot (Gen4 x8 link) – PCIEX8_SLOT1 (from CPU0) – PCIEX8_SLOT5 (from CPU1) – PCIEX8_SLOT7 (from CPU1) – PCIEX8_SLOT10 (from CPU 1) – PCIEx8 SLOT11 (from CPU1)

System BIOS

BIOS Type	256 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	■ Two 4-pin headers for CPU cooler and five 4-pin headers for system fans, and two 8-pin headers for external fans
	■ All fans with tachometer status monitoring
	■ Thermal control for all fan connectors
Temperature	■ Monitoring for CPU (PECI)
	■ Monitoring for system (EC)
Other Features (Case Open)	■ Chassis intrusion detection
	■ Chassis intrusion header

Operating Environment/Compliance

RoHS	RoHS compliant 6/6 Pb free
Environmental Specs.	■ Operating temperature: 0 ~ 40°C
	■ Non-operating temperature: -40 ~ 85°C
	■ Operating relative humidity: 10% to 90% (non-condensing)
	■ Non-operating relative humidity: 10% to 95% (non-condensing)

1.4 Board Layout, Jumpers, and Connectors

Connectors on the ASMB-977 are linked to external devices, such as hard disk drives. In addition, the ASMB-977 has a number of jumpers that are used to configure the system for specific applications.

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 ASMB-977.

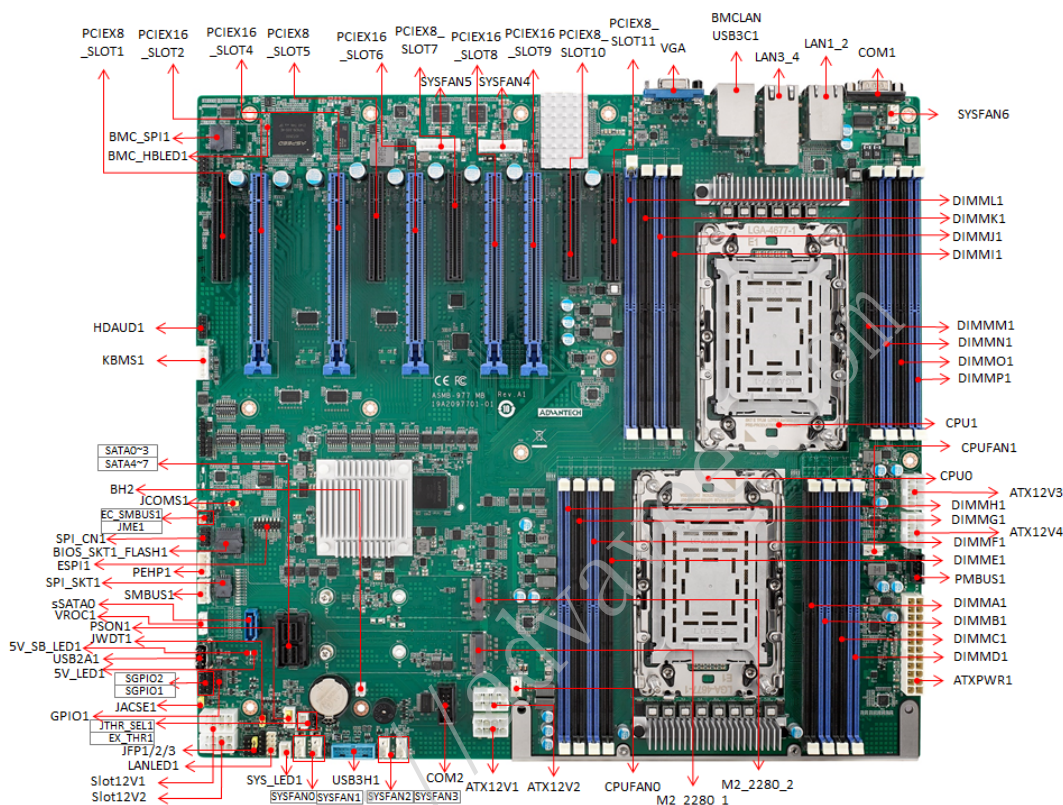


Figure 1.1 Board Layout

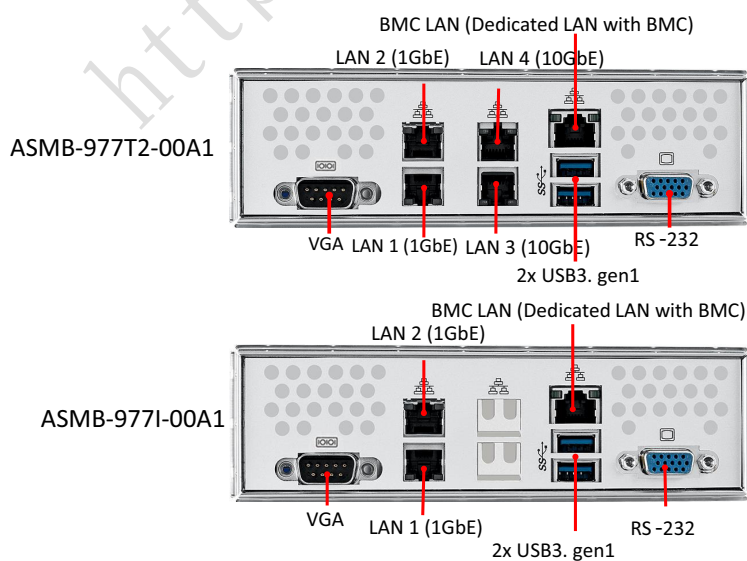
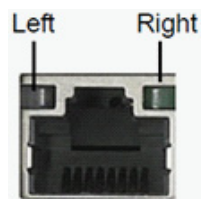
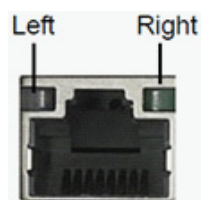


Figure 1.2 Rear I/O of full SKU

Table 1.2: Onboard LAN LED color definition**10/100/1000 Mbps LAN Mbps LAN Link/Activity LED Scheme**

LAN1 & LAN2 (1G)

		Left LED	Right LED
10 Mbps	Link Active	Green Blinking green	Off Off
100 Mbps	Link Active	Green Blinking green	Amber Amber
1000 Mbps	Link Active	Green Blinking green	Green Green
No Link		Off	Off

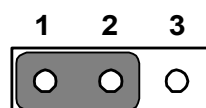
Table 1.3: Onboard LAN LED color definition**100/1000 & 10G bps LAN Mbps LAN Link/Activity LED Scheme**

LAN3 & LAN4 (10G)

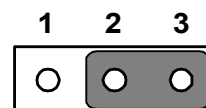
		Left LED	Right LED
100M bps	Link Active	Off Off	Green Blinking green
1G bps	Link Active	Amber Amber	Green Blinking green
10G bps	Link Active	Green Green	Green Blinking green
No Link		Off	Off

Table 1.4: Jumpers

Label	Function	Default
JCMOS1	CMOS clear	1-2
JME1	ME update	1-2
JWDT1	Watch dog reset	1-2
PSON1	AT(1-2) / ATX(2-3)	2-3
JCASE1	Chassis case open alarm	1-2
JTHR_SEL	On board(1-2)/external thermistor(2-3)	1-2



Keep CMOS data/
disable ME update/



Clear CMOS data/
Enable ME update/

Table 1.5: Connectors

Label	Function
ATX12V1/V2	SSI EPS 12 V auxiliary power connector (for CPU0) and memory
ATX12V3/V4	SSI EPS 12 V auxiliary power connector (for CPU1) and memory
ATXPWR1	SSI EPS 24-pin main power connector (for system)
BH2	For optional battery kit
BIOS_SKT1_FLASH1	BIOS SPI ROM
BMC_SPI1	BMC IC socket for IPMI function
COM2	Serial port: RS-232
CPU0	Intel LGA4677 CPU0 socket
CPU1	Intel LGA4677 CPU1 socket
CPUFAN0	CPU0 fan connector (4-pin)
CPUFAN1	CPU1 fan connector (4-pin)
DIMMA1	Channel A1 DIMMA1 of CPU0
DIMMB1	Channel B1 DIMMB1 of CPU0
DIMMC1	Channel C1 DIMMC1 of CPU0
DIMMD1	Channel D1 DIMMD1 of CPU0
DIMME1	Channel E1 DIMME1 of CPU0
DIMMF1	Channel F1 DIMMF1 of CPU0
DIMMG1	Channel G1 DIMMG1 of CPU0
DIMMH1	Channel H1 DIMMH1 of CPU0
DIMMI1	Channel I1 DIMMI1 of CPU1
DIMMJ1	Channel J1 DIMMJ1 of CPU1
DIMMK1	Channel K1 DIMMK1 of CPU1
DIMML1	Channel L1 DIMML1 of CPU1
DIMMM1	Channel M1 DIMMM1 of CPU1
DIMMN1	Channel N1 DIMMN1 of CPU1
DIMMO1	Channel O1 DIMMO1 of CPU1
DIMMP1	Channel P1 DIMMP1 of CPU1
EC_SMBUS1	For EC debug

Table 1.5: Connectors

EX_THR1	Connector for external thermistor
GPIO1	GPIO function for customize usage
HDAUD1	Audio header
JFP1/JFP2/JFP3	Front panel pin header
KBMS1	For additional keyboard/mouse
LAN1_2, LAN3_4	RJ-45 LAN connector
LANLED1	LAN LED extension connector
LPC1	LPC port for debug & TPM module
M.2	2 x M.2 connector for 2280
PMBUS1	PMBUS connector to communicate with power supply
PEHP1	NVMe RAID LED control
SATA0~SATA7	Serial ATA0~7
sSATA0	sSATA port 0
SGPIO1	Supports Serial_Link interface for onboard SATA connections
SLOT1	PCIe x8 slot of CPU0
SLOT2	PCIe x16 slot of CPU0
SLOT4	PCIe x16 slot of CPU0
SLOT5	PCIe x8 slot of CPU1
SLOT6	PCIe x16 slot of CPU0
SLOT7	PCIe x8 slot of CPU1
SLOT8	PCIe x16 slot of CPU1
SLOT9	PCIe x16 slot of CPU1
SLOT10	PCIe x8 slot of CPU1
SLOT11	PCIe x8 slot of CPU1
SLOT12V1/SLOT12V2	For PCIe slot 12 V input only
SMBUS1	Front panel SMBus header
SPI_CN1	Connector for BIOS update tool
SPI_SKT1	EC EEPROM
SYSFAN0-SYSFAN6	System FAN connector
SYS_LED1	System LED connector
USB3H1	USB 3.2 gen1 port 3,4 (20-pin header)
USB2A1	USB 2.0 port (Type-A)
BMCLAN_USB3C1	RJ-45 LAN port + USB 3.2 gen1 port x 2 connectors
LAN1~LAN4	RJ-45 LAN port x 4 (only 1G LAN x 2 ports for I SKU, 1G LAN x 2 ports + 10G LAN x 2ports for T2 SKU)
VROC1	Intel Virtual RAID (VROC) key
VGA1_COM1	VGA and COM connector
COM2	Serial port: RS-232

Table 1.6: Onboard LED

LED	Description	LED Definition	
5V_LED1	Power ON LED	Off: Power off	On (green): System is ON
5V_SB_LED1	Standby LED	Off: No input AC power	On (green): System is ON, in sleep mode, or in soft-off mode
BMC_HBLED1	BMC heartbeat LED	Blinking (green): controller is working normally	

1.5 Block Diagram

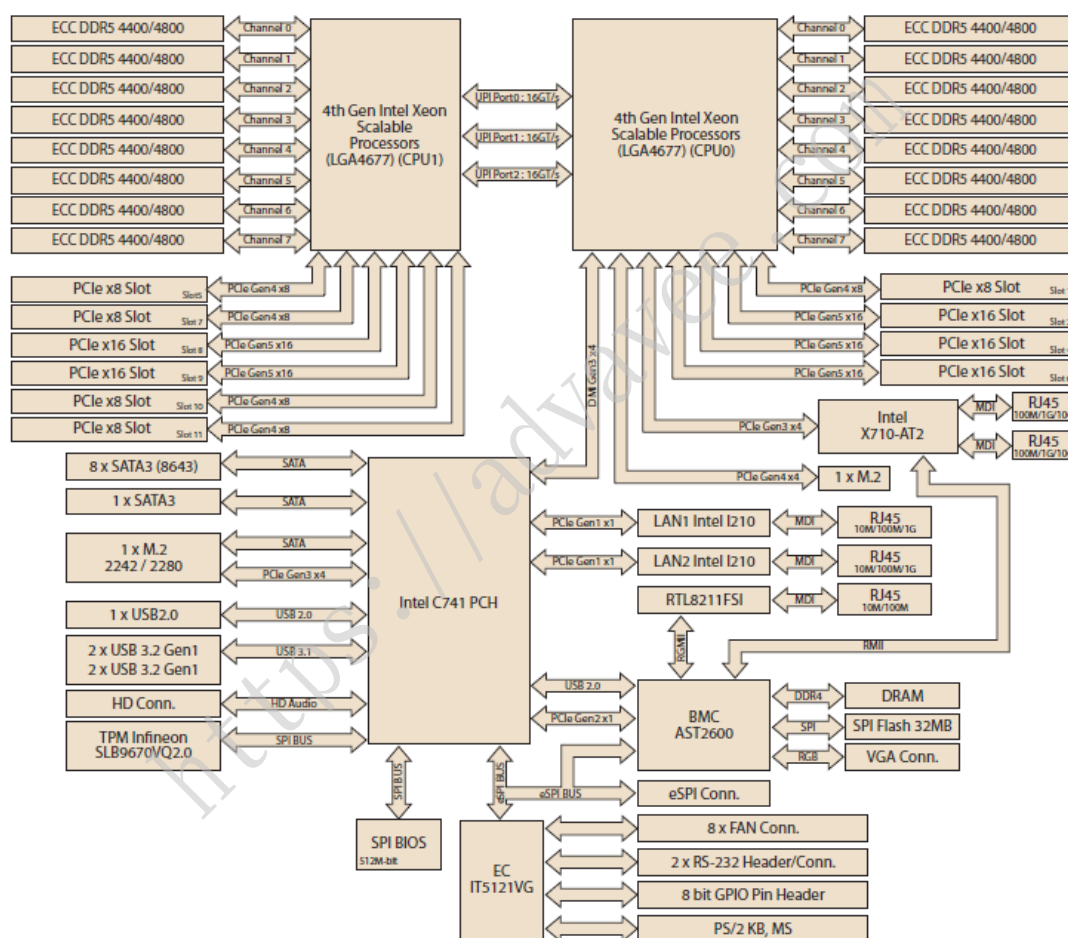


Figure 1.3 Block Diagram

1.6 System Memory

The ASMB-977 has sixteen 288-pin memory slots for DDR5 3200/3600/4000/4400/4800 MHz memory modules with maximum capacity of 4TB (maximum 256 GB for each DIMM). The ASMB-977 supports registered DIMMs memory module.

1.7 Memory Installation Procedures

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

The following table indicates recommended DIMM configurations with a single and dual processor. Base on the guideline, you may adjust your memory configuration according to your PCIe expansion card configuration.

The 4th Gen Xeon Scalable (Bronze-3xxx/Silver-4xxx, Gold-5xxx/6xxx, Platinum-8xxx) processors support Optane DC persistent memory module (DCPMM).

Table 1.7: DIMM configuration with single CPU

Channel		DIMMA1	DIMMB1	DIMMC1	DIMMD1	DIMME1	DIMMF1	DIMMG1	DIMMH1
Quantity of memory installed	1	V							
			V						
						V			
							V		
	2	V						V	
				V		V			
	4	V		V		V		V	
		V		V	V	V	V	V	
	6	V	V	V		V		V	V
			V	V	V	V	V		V
		V	V		V		V	V	V
		V	V	V	V	V	V	V	V

Note! 3, 5, 7 DIMMs are not recommended DIMM population.



Table 1.8: DIMM configuration with dual CPU

Channel		DIM-MA1	DIM-MB1	DIM-MC1	DIM-MD1	DIM-ME1	DIM-MF1	DIM-MG1	DIM-MH1	DIM-MI1	DIM-MJ1	DIM-MK1	DIM-ML1	DIM-MM1	DIM-MN1	DIM-MO1	DIM-MP1
Quantity of memory installed	2	V								V							
			V								V						
						V								V			
							V								V		
	4	V						V		V						V	
				V		V						V		V			
	8	V		V		V		V		V		V		V		V	
		V		V	V	V	V	V		V		V	V	V	V	V	
	12	V	V	V		V		V	V	V	V	V		V		V	V
			V	V	V	V	V		V		V	V	V	V	V		V
		V	V		V		V	V	V	V		V			V	V	V
		V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

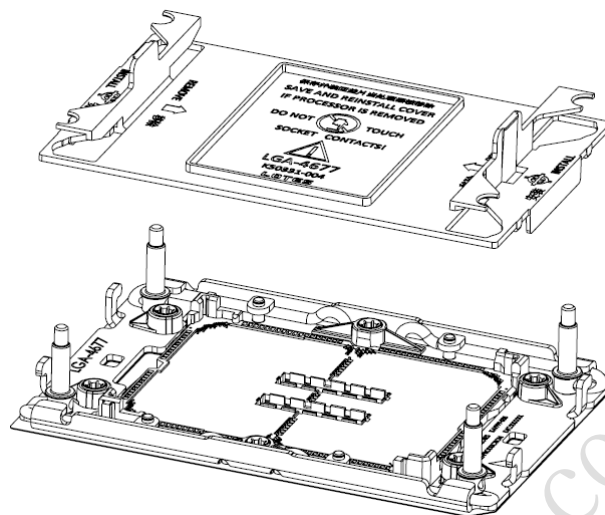
Note! 1, 3, 5, 6, 9, 10, 11, 13, 14, 15 DIMMs are not recommended DIMM population when dual CPU were installed.



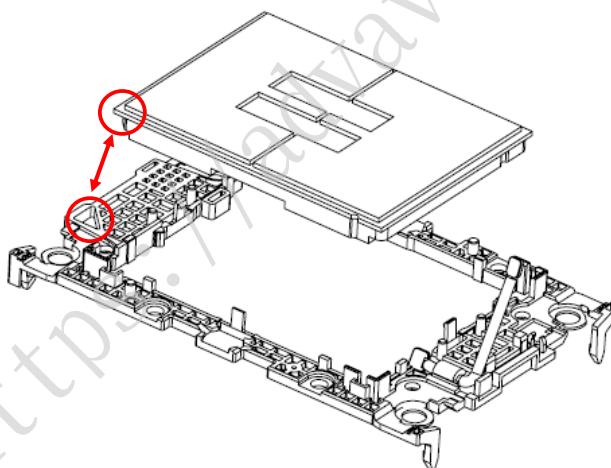
1.8 Processor Installation

The ASMB-977 is designed for Intel Xeon processor scalable family.

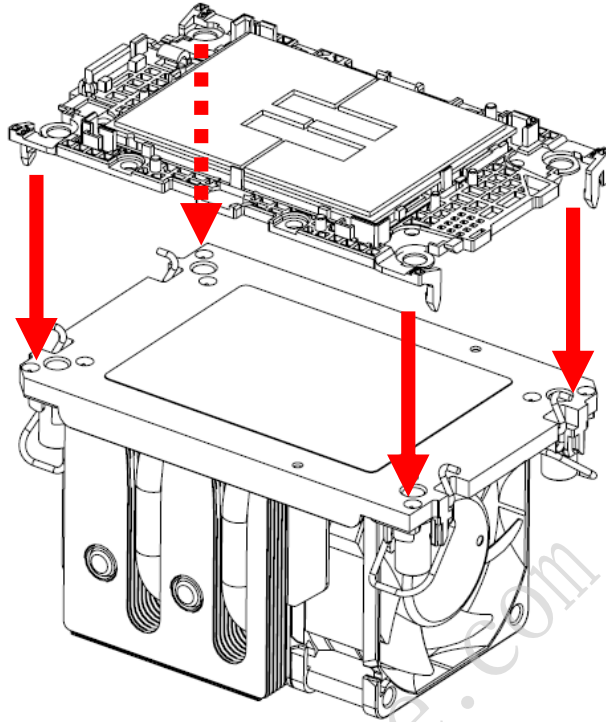
1. Remove dust cover.



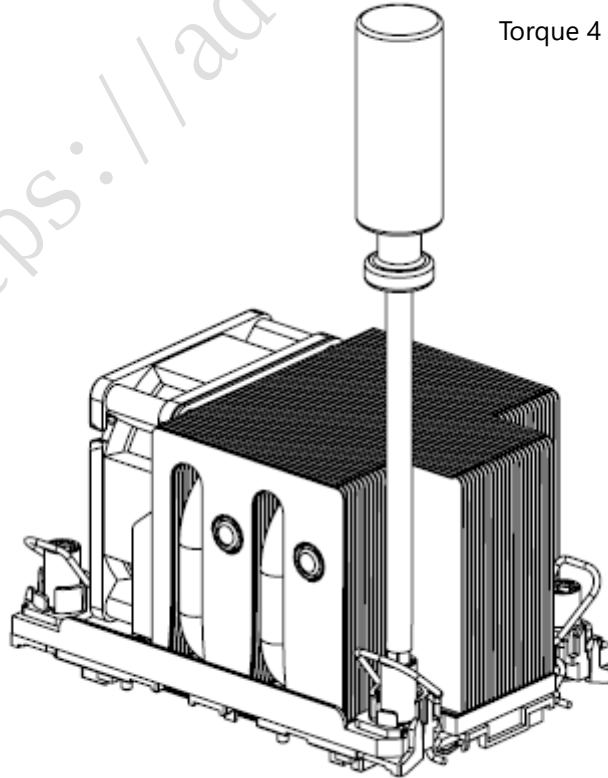
2. Install CPU on CPU clip and align pin 1 mark.



3. Install the CPU clip assembly on the heatsink as a processor + heatsink module.



4. Put the processor heatsink module into the motherboard bolster plate by using a T-30 screw driver (follow heatsink label direction 1-2-3-4).



Torque 4 Nuts to 8 in-lbs

Chapter

2

Connections

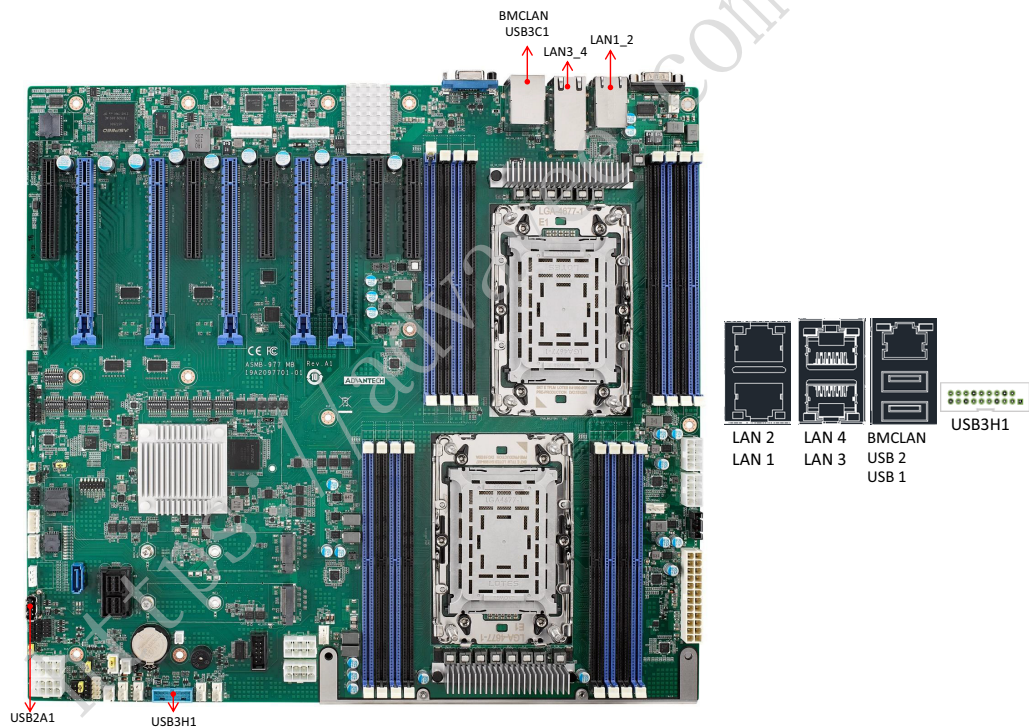
2.1 Introduction

You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed, you may need to partially remove a card to make all the connections.

2.2 USB Ports and LAN Port (USB3H1/3C1/2A1, LAN1~LAN5 (BMC LAN))

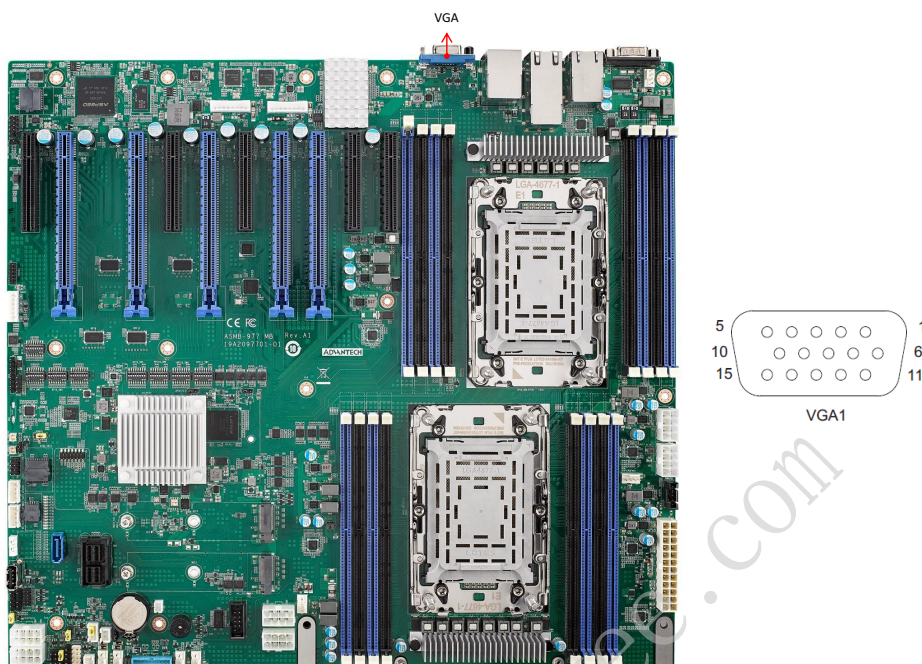
The USB ports comply with USB 2.0 & 3.2 gen1. Transmission rates of up to 480 Mbps (USB 2.0)/5Gbps (USB 3.2 gen1) and fuse protection are supported. The USB interface can be disabled in the system BIOS setup.

ASMB-977 is equipped with two 10GbE and two 1GbE LAN ports. They are all equipped with RJ-45 jacks and supported by all major network operating systems. LAN5 is a dedicated LAN port for IPMI function. One of 10 GbE LAN (LAN3) can be used as IPMI LAN as well for system management.



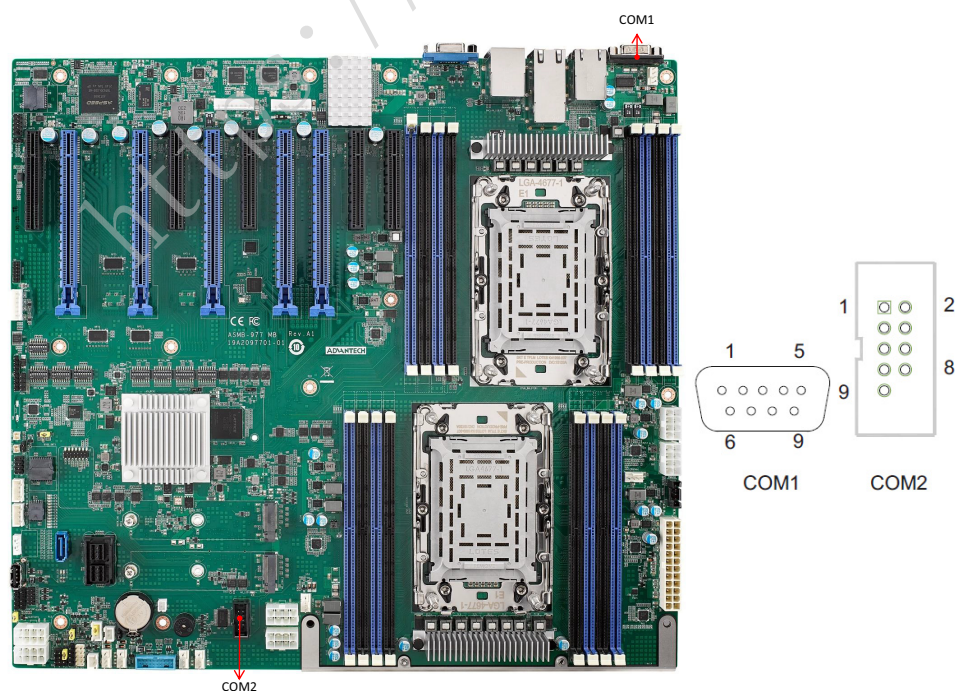
2.3 VGA Connector (VGA1)

The ASMB-977 includes a VGA interface that can drive conventional CRT and LCD displays.



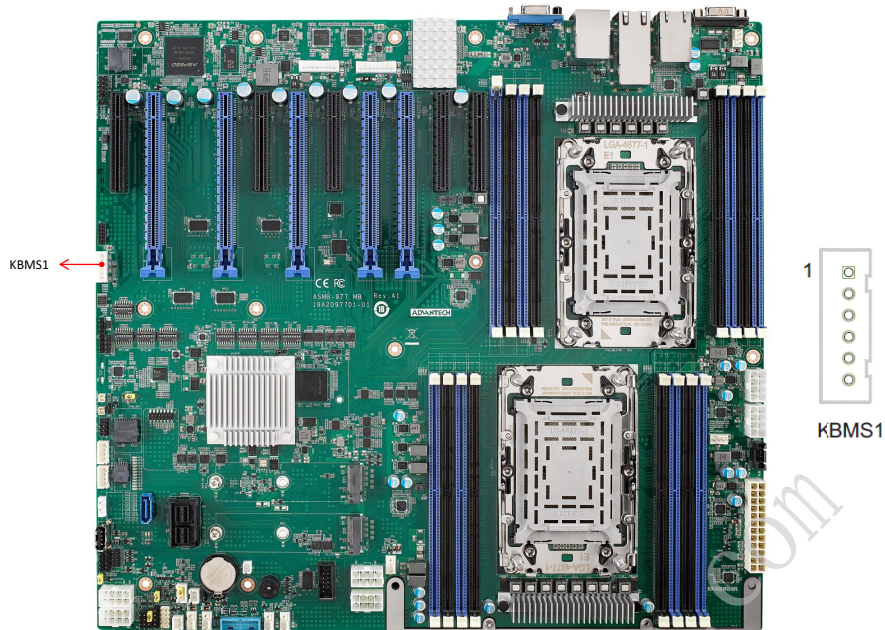
2.4 Serial Ports (COM1~2)

The ASMB-977 offers one serial port on the rear plate and one 2.54mm pitch 9-pin header onboard.



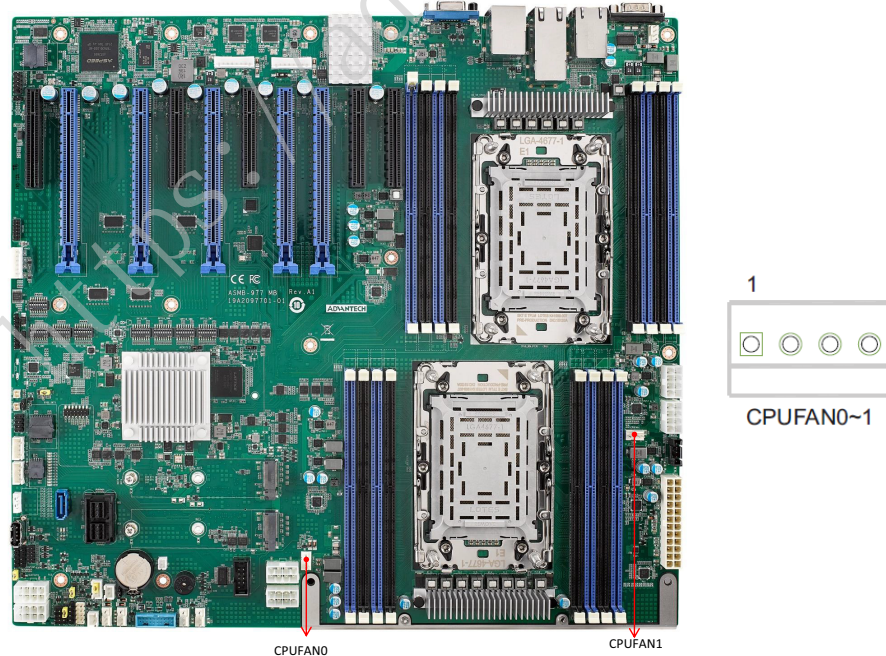
2.5 PS2 Keyboard and Mouse Connectors (KBMS1)

The 6-pin KBMS1 connector is for additional keyboard & mouse device usage.

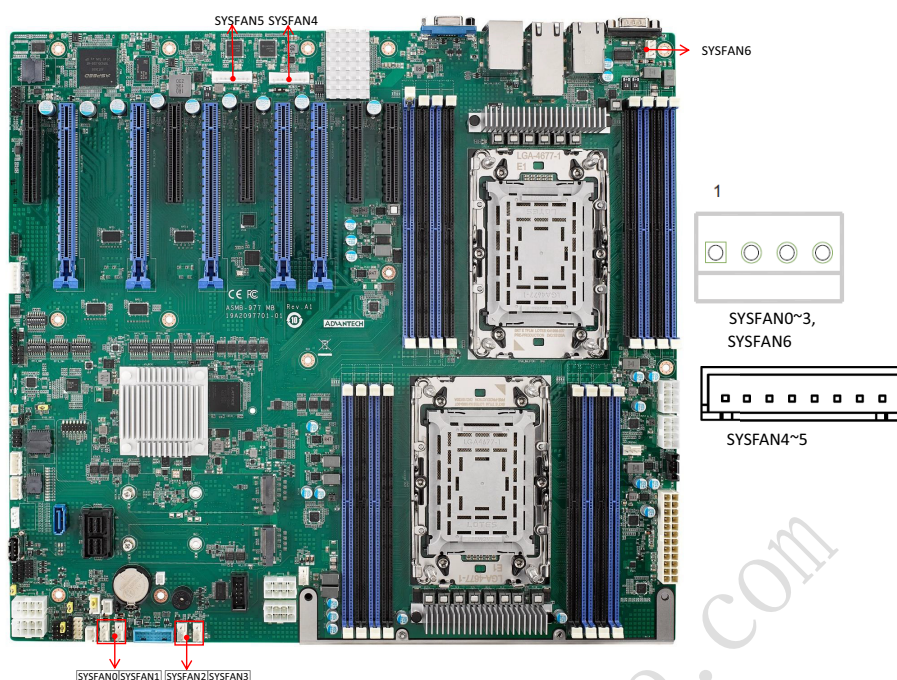


2.6 CPU Fan Connector (CPUFAN0~1)

If a fan is used, this connector supports cooling fans that draw up to 1.5 A (18 W).

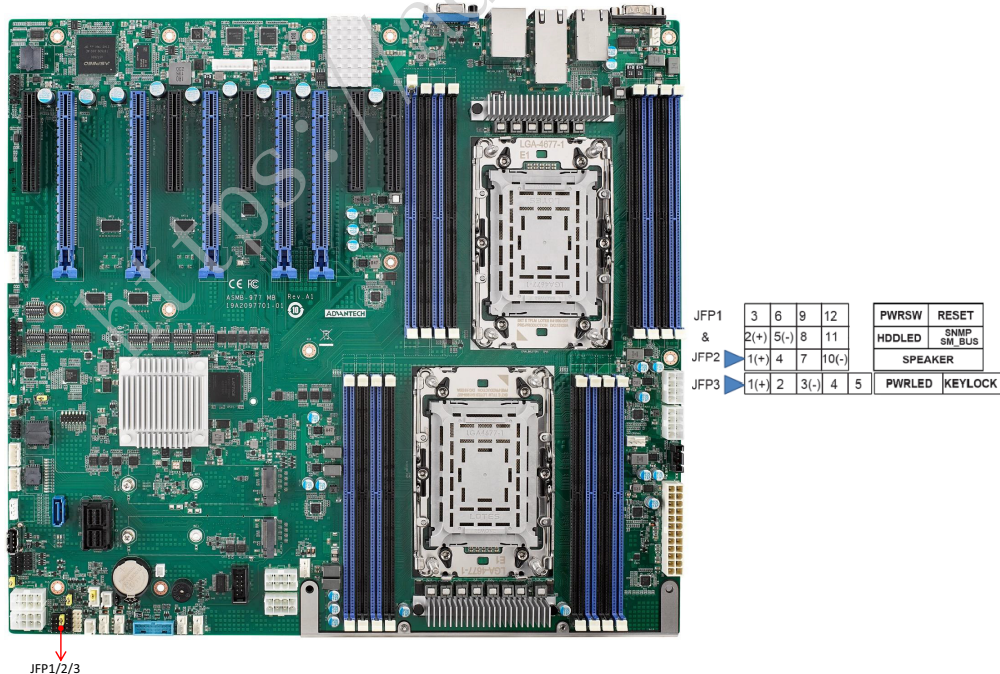


2.7 System Fan Connector (SYSFAN0~6)



2.8 Front Panel Connector (JFP1)

There are several external switches and LEDs to monitor and control the ASMB-977.

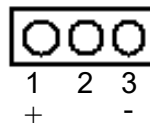


2.8.1 Power LED (JFP3)

JFP3 pins 1 and 3 are for the power LED. Refer to Appendix B for detailed information on the pin assignments. If an ATX power supply is used, the system's power LED status will be as indicated as follows.

Table 2.1: ATX Power supply LED status

ACPI Power Mode	LED (ATX Power)
System On (S0)	On
System Hibernation(S4)	Slow flashes
System Off (S5)	Off



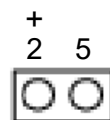
2.8.2 External Speaker (JFP2 Pins 1, 4, 7, 10)

JFP2 pins 1, 4, 7, 10 connect to an external speaker. The ASMB-977 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 7-10 closed.



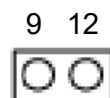
2.8.3 HDD LED Connector (JFP1 Pins 2 & 5)

You can connect an LED to connector JFP1 to indicate when the HDD is active.



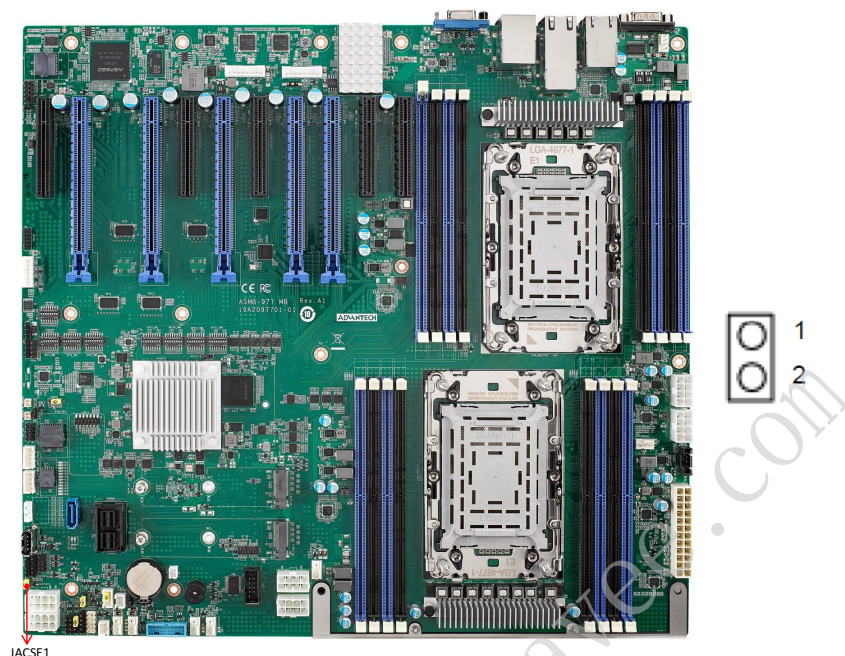
2.8.4 Reset Connector (JFP1 Pins 9 & 12)

Many computer cases offer the convenience of a reset button.

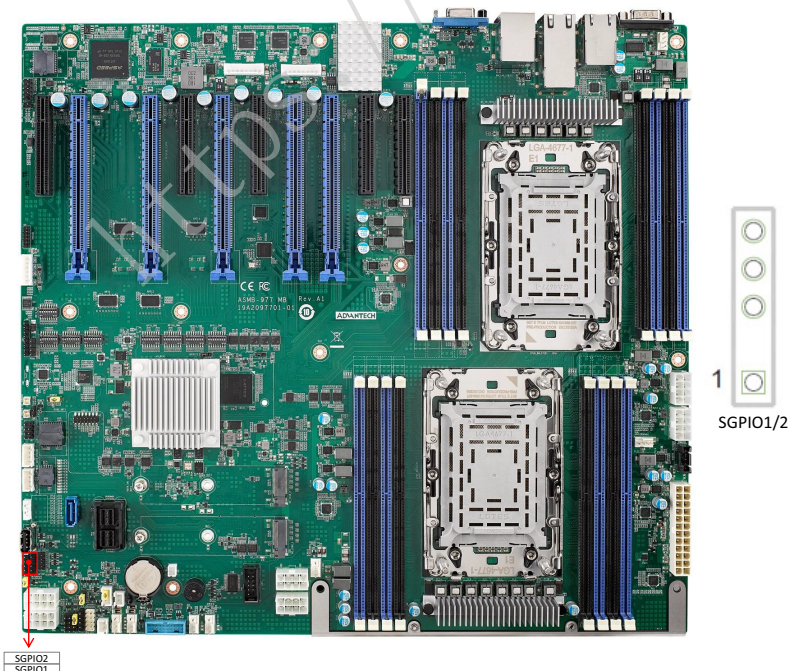


2.9 Case Open (JCASE1)

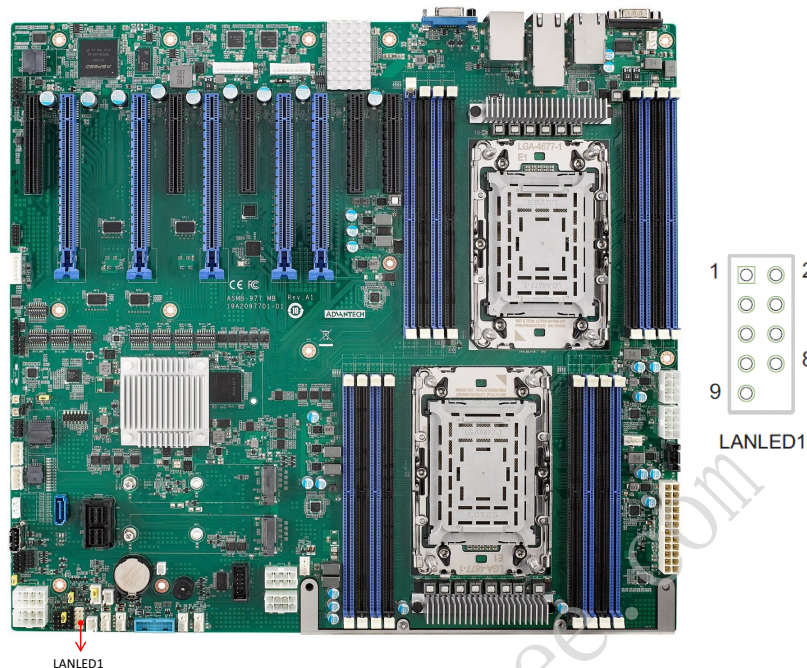
A chassis intrusion header is located at JCASE1 on the motherboard. Attach the appropriate cable from the chassis to be informed of a chassis intrusion when the chassis is opened. The default function is disabled and Pin 1-2 is bridged by a jumper cap.



2.10 SATA SGPIO (SGPIO1)

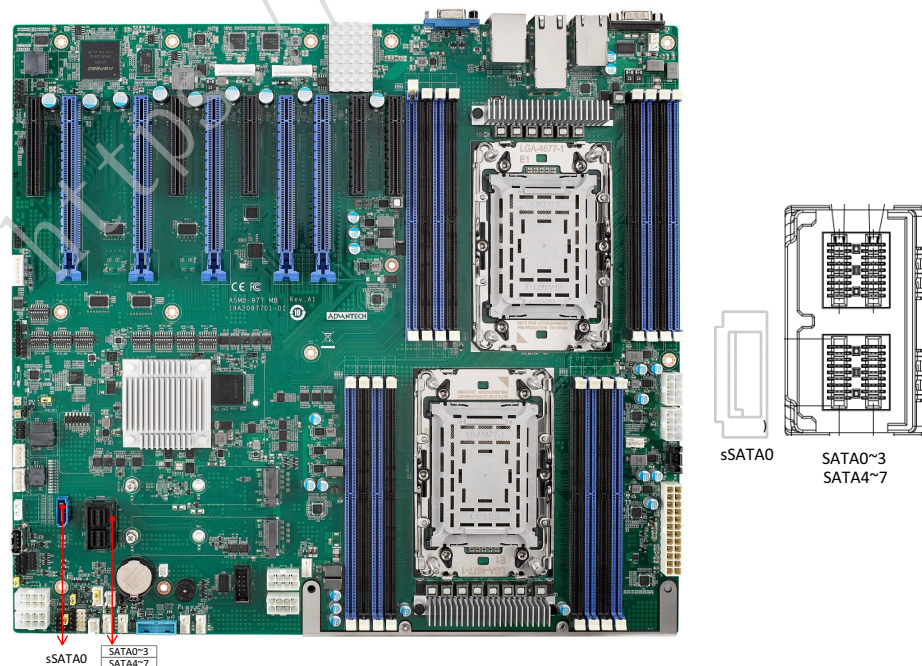


2.11 Front Panel LAN Indicator Connector (LANLED1)



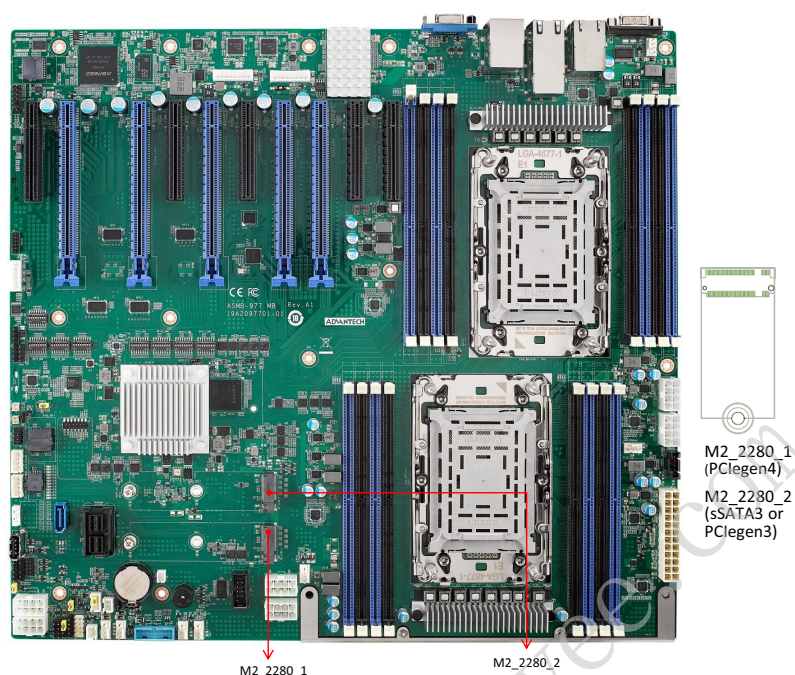
2.12 SATA and sSATA (SATA0~7, sSATA0)

The ASMB-977 features nine serial ATA III interfaces (up to 600 MB/s) which eases cabling to hard drives with thin and long cables.



2.13 M.2 Connector (sSATA3, PCIe Gen3, and PCIe Gen4)

The M.2 2280 connectors support SATA and PCIe components.



2.14 PCIe Expansion Slots

The ASMB-977 provides ten expansion slots that can support four double-deck cards, one PCIe x16 card, and two PCIe x4 cards.

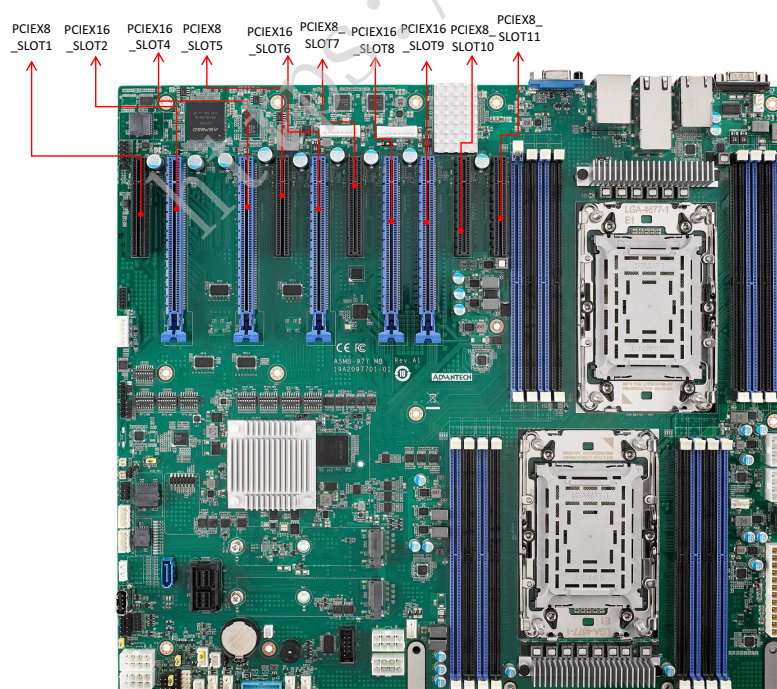
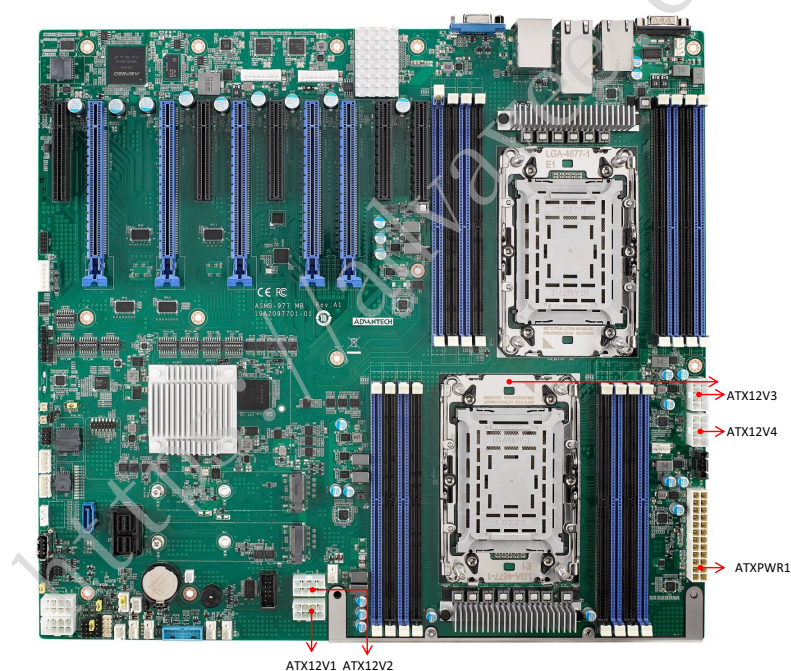


Table 2.2: PCIe expansion slots

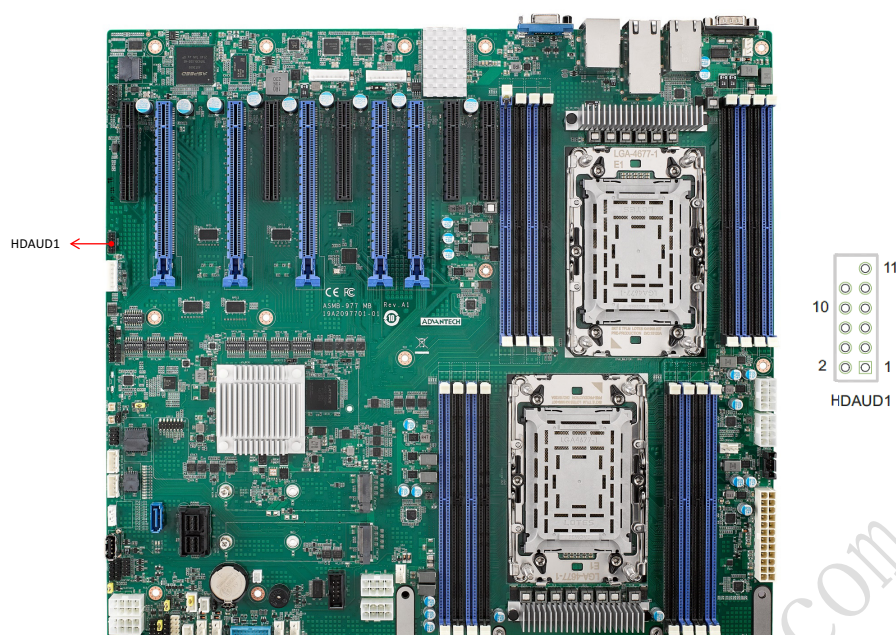
	Slot Length	Link	PCIe Generation	PCIe link provided from
SLOT1	PCIe x8	PCIe x8	4	CPU0
SLOT2	PCIe x16	PCIe x16	5	CPU0
SLOT4	PCIe x16	PCIe x16	5	CPU0
SLOT5	PCIe x8	PCIe x8	4	CPU1
SLOT6	PCIe x16	PCIe x16	5	CPU0
SLOT7	PCIe x8	PCIe x8	4	CPU1
SLOT8	PCIe x16	PCIe x16	5	CPU1
SLOT9	PCIe x16	PCIe x16	5	CPU1
SLOT10	PCIe x8	PCIe x8	4	CPU1
SLOT11	PCIe x8	PCIe x8	4	CPU1

2.15 Auxiliary Power Connector (ATXPWR1/ATX12V1/ATX12V2/ATX12V3/ATX12V4)



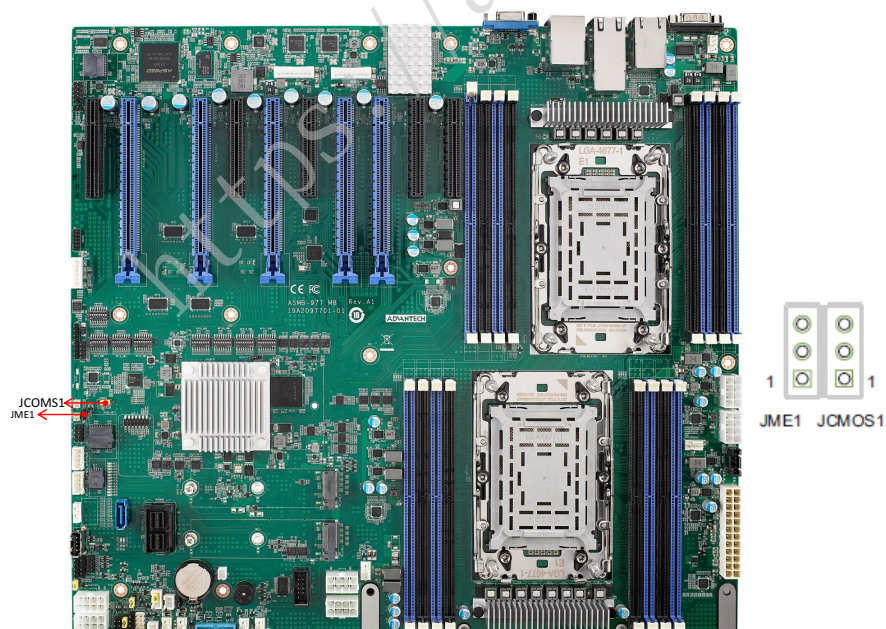
- Note!**
1. Please use a power supply which is of SSI type. The minimum output should be at least 700 W with 5 Vsb @2.5 A.
 2. ATXPWR1 & ATX12V1 & ATX12V2 should be all connected with power supply, ATX12V3 & ATX12V4 will be connected with power supply, which be based on CPU power beyond 300 W, and CPU's cooler can dissipate heat from CPU. Otherwise ASMB-977 will not boot up normally.

2.16 HD Audio Interface Connector (HDAUD1)

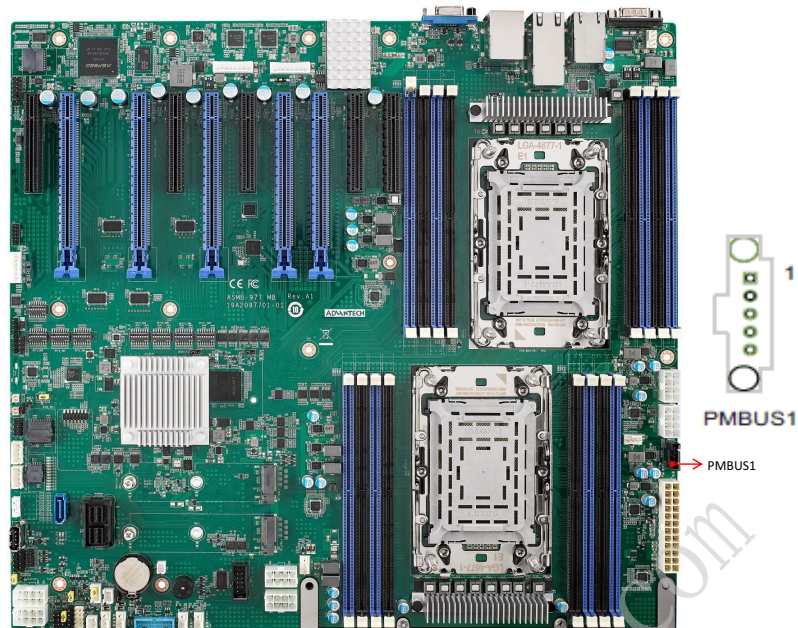


2.17 CMOS Clear and ME Update Connector (JCMOS1, JME1)

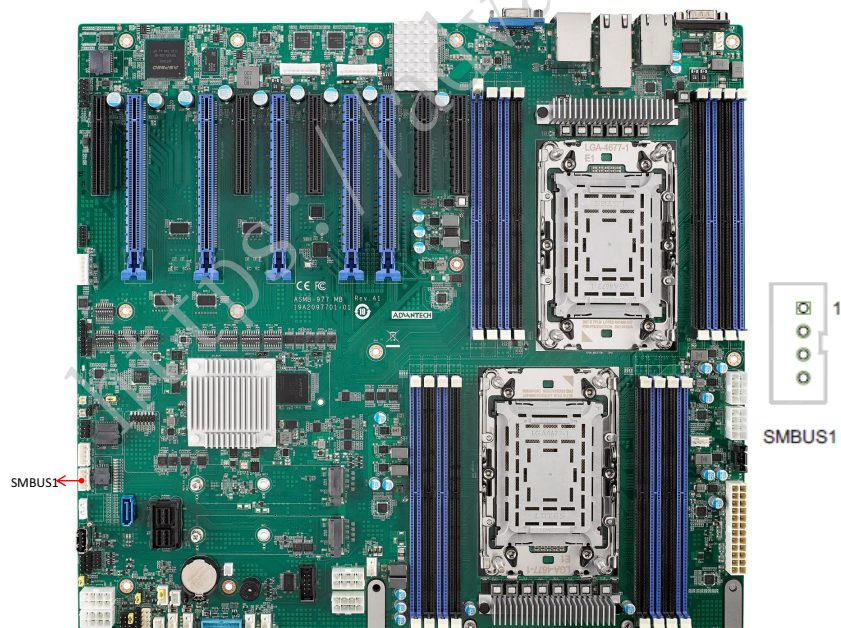
Set jumpers from pins 1-2 to pins 2-3, then back to pins 1-2 to reset CMOS data and enable ME updates.



2.18 PMBUS Connector (PMBUS1)

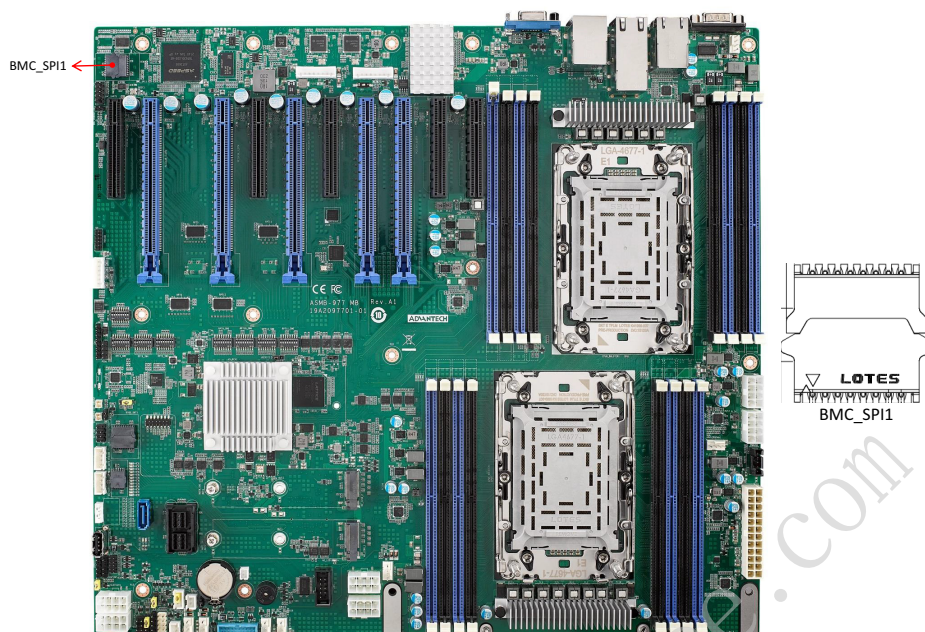


2.19 Front Panel SMBUS Connector (SMBUS1)

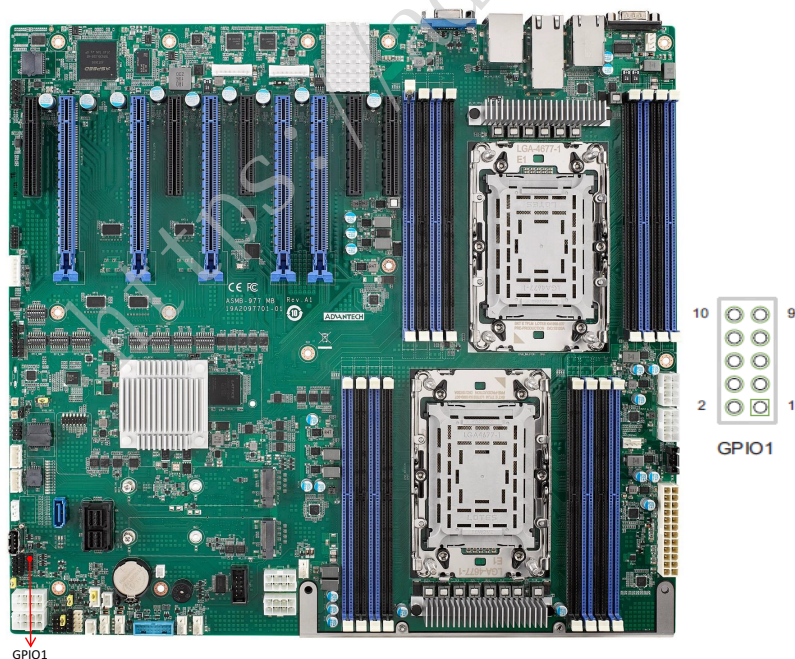


2.20 BMC IC Socket (BMC_SPI1)

Enable IPMI features through the BMC_SPI1. The BMC IC socket has already been pre-installed on ASMB-977I and ASMB-977T2 SKUs.

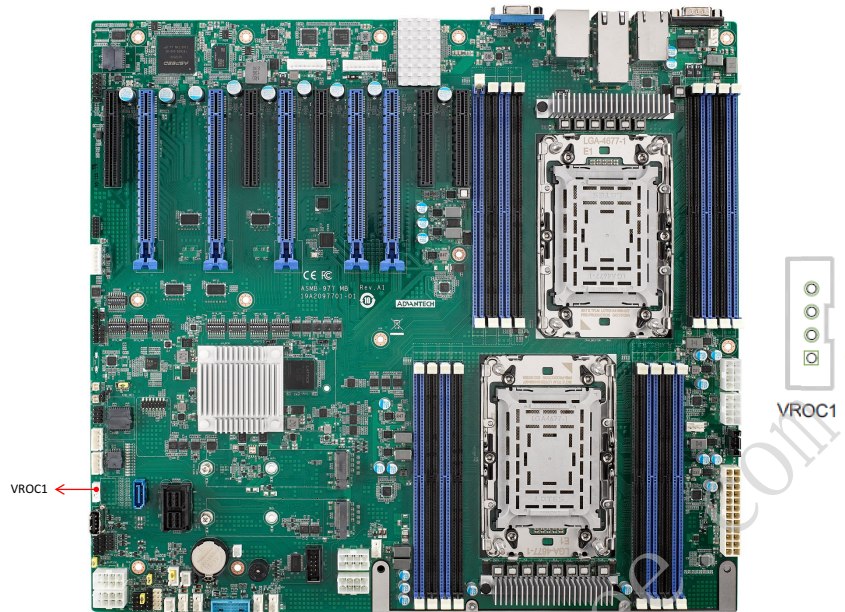


2.21 GPIO Connector (GPIO1)



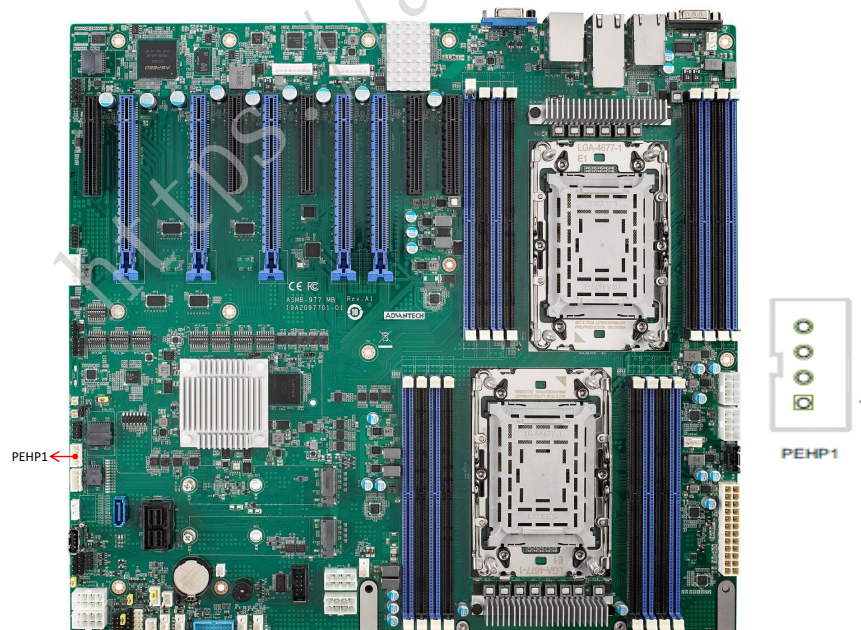
2.22 Intel Virtual RAID (VROC1)

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



2.23 NVMe RAID LED Control (PEHP1)

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



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 computer. 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 ASMB-977 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. They 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 the 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.



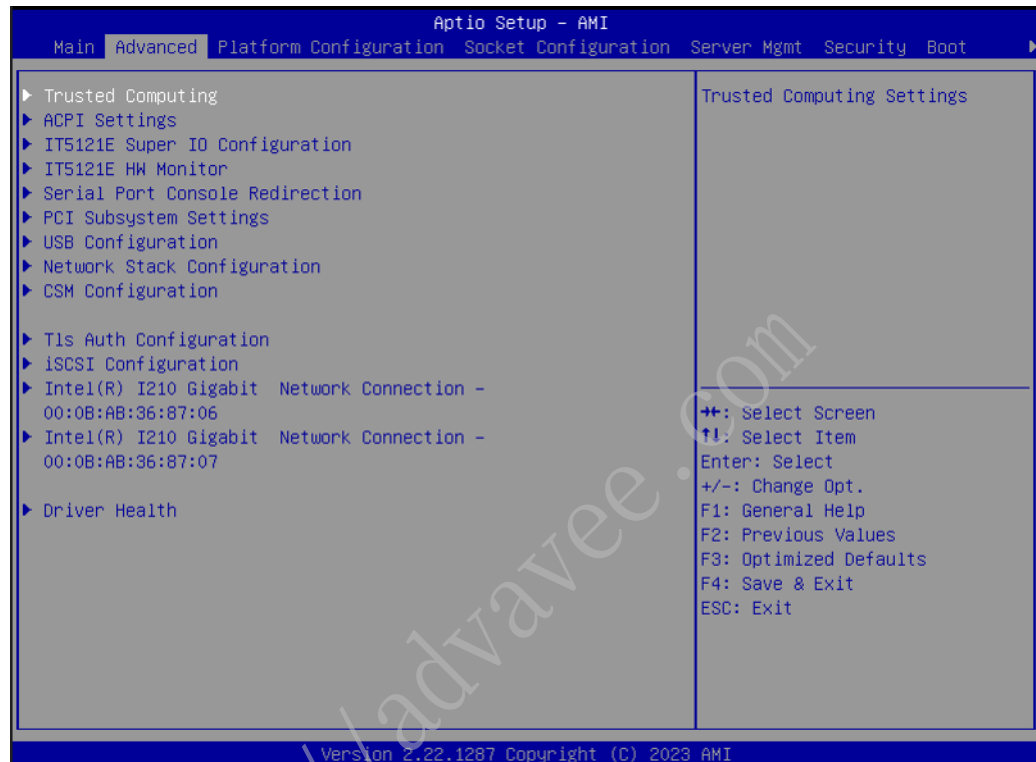
The main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can be. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected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

■ System 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 ASMB-977 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 Trusted Computing



■ Security Device Support

Enables or disables BIOS support for security device.

Purchase an Advantech LPC TPM Module to use the TPM function.

3.2.2.2 ACPI Settings

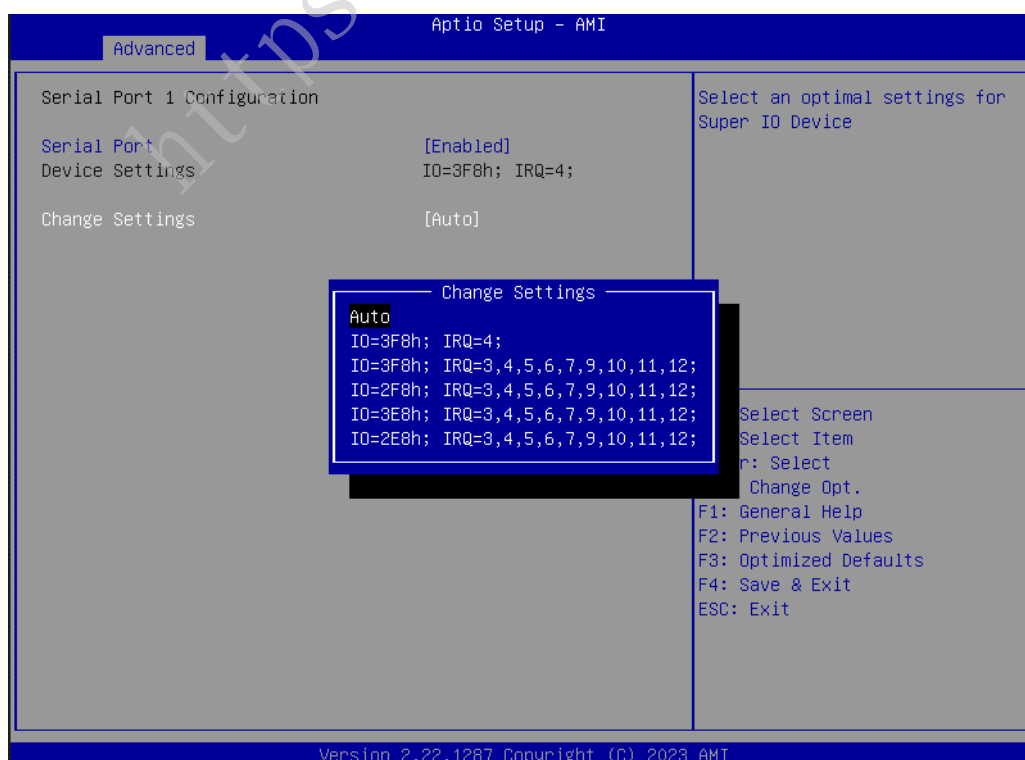


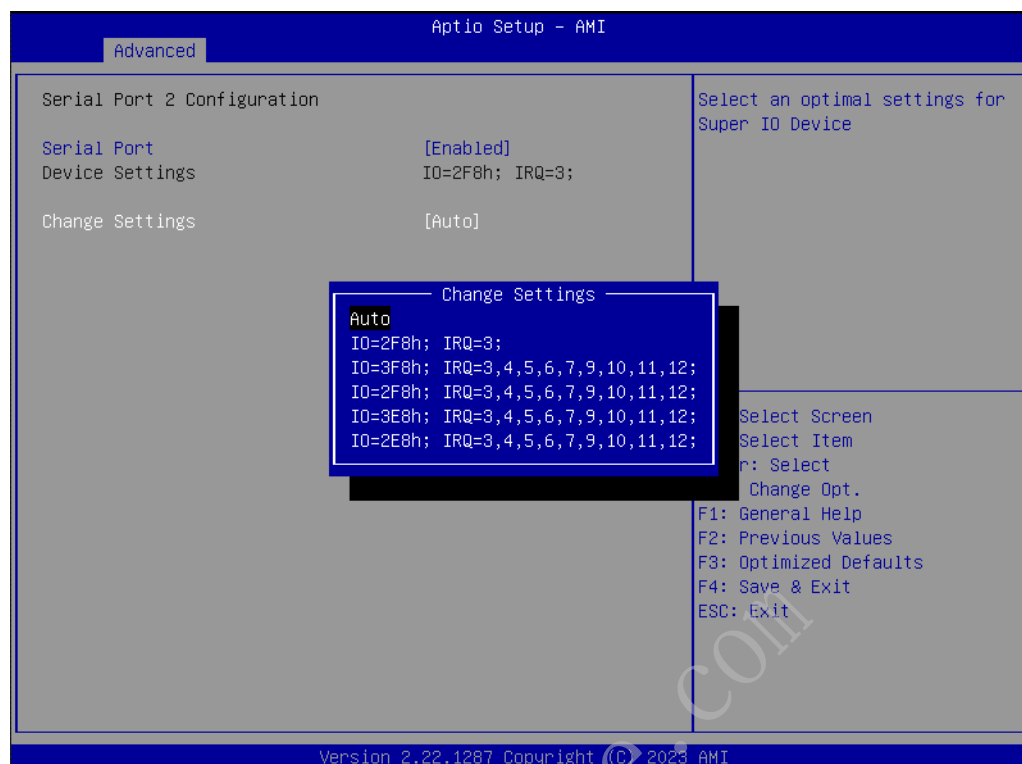
- **Lock Legacy Resources**
Enable or disable the lock legacy resources feature.

3.2.2.3 IT5152E Super IO Configuration

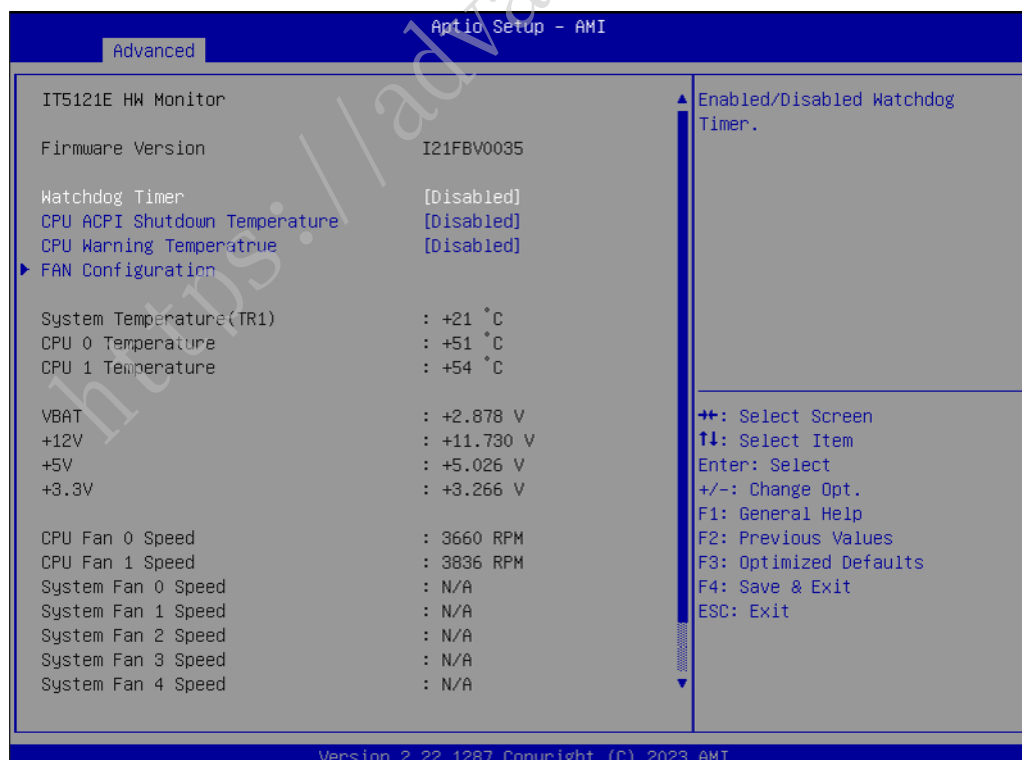


- **Serial Port**
Enable or disable serial port 1.
- **Change Settings**
To select an optimal setting for serial port 1.
- **Serial Port 1/Port 2 Configuration**





3.2.2.4 IT5121E HW Monitor



- **Watchdog Timer**
Enable or disable the watchdog timer function.
- **CPU ACPI Shutdown Temperature**
Enable or disable the ACPI shutdown temperature threshold. When the system

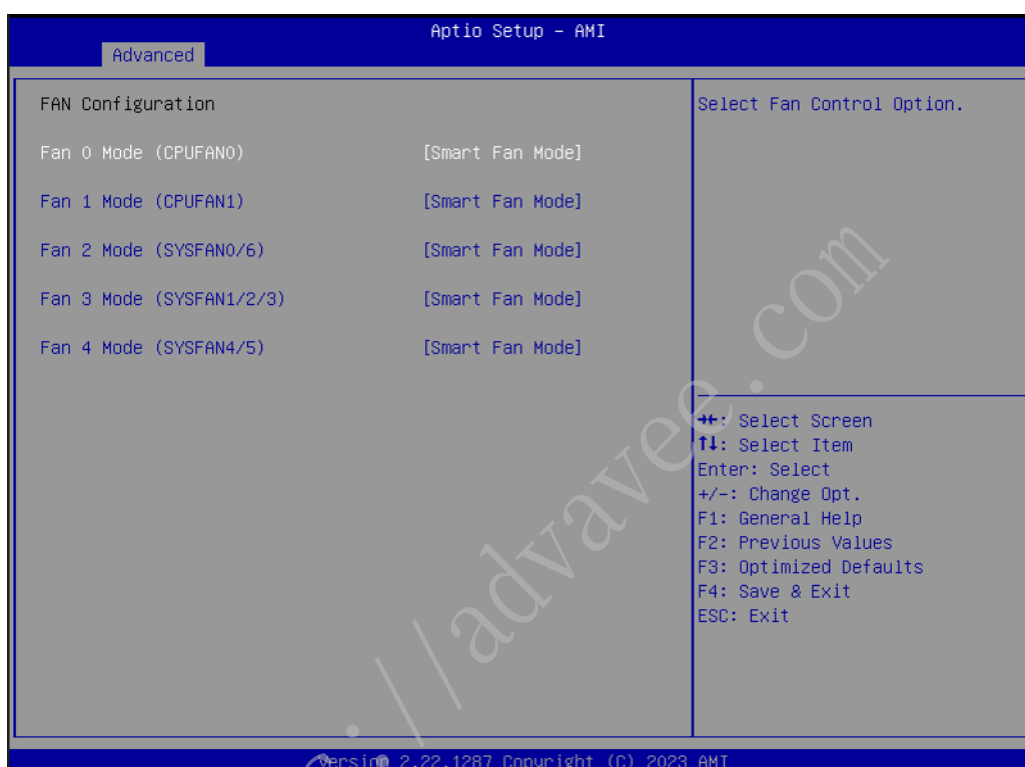
reaches the shutdown temperature, it will be automatically shut down by the ACPI OS to protect the system from overheat damage.

- **CPU Warning Temperature**

Enable or disable the CPU warning temperature threshold. When the system reaches the warning temperature, the speaker will beep.

- **Fan Configuration**

The default of CPU/System FAN is Smart FAN mode and the BIOS will automatically control the FAN speed based on the CPU temperature. When set to manual mode, fan duty settings can be changed from 30%~100% with a default setting of 50%.



3.2.2.5 Serial Port Console Redirection



■ 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.
- **Data Bits: 7/8**
- **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 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.
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.
- **VT-UTF8 Combo Key Support**
Enable VT-UTF8 combination key support for ANSI/VT100 terminals.
- **Recorder Mode**
When this mode enabled, only text will be sent. This is to capture terminal data.
- **Resolution: 100 x 31**
Enables or disables extended terminal resolution.
- **Putty Keypad**
Select function key and keypad on putty.

- **Legacy Console Redirection Settings**
Select a COM port to display redirection of legacy OS and legacy OPROM messages.



3.2.2.6 PCI Subsystem Settings



■ Above 4G Decoding

Enable or disable 64-bit capability. Devices need to be decoded in above 4G address spaces (only if the system supports 64-bit PCI decoding).

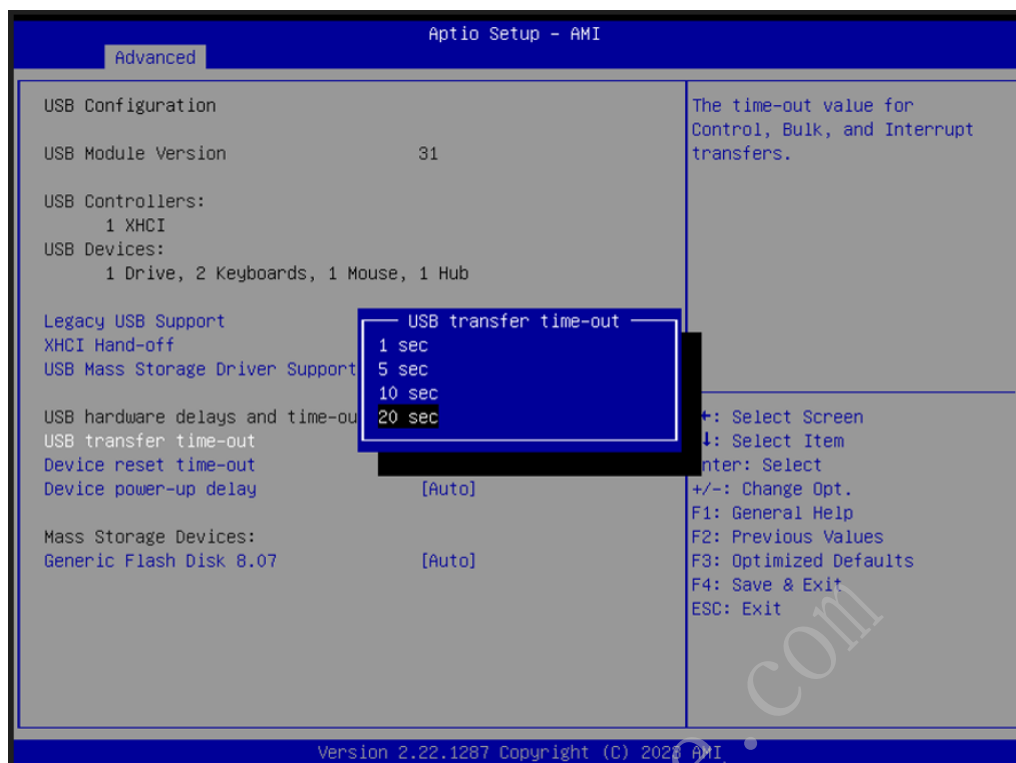
Note! Some graphic or GPU cards need to enable 4G decoding.



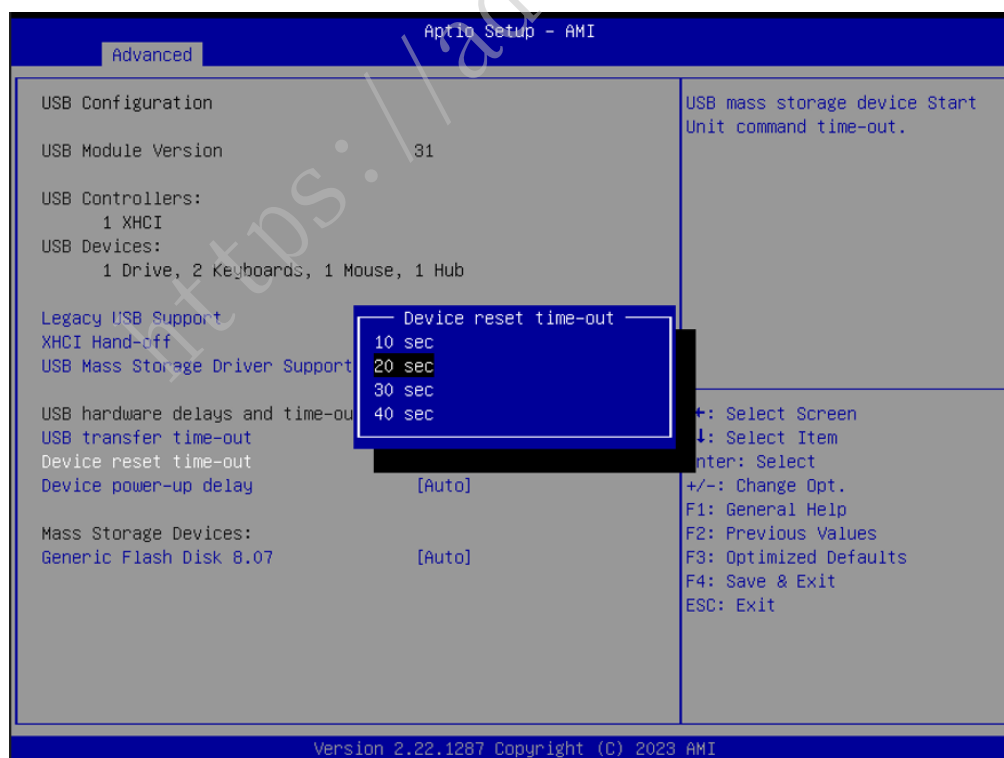
3.2.2.7 USB Configuration



- **Legacy USB Support**
This is for supporting USB devices 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, or 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 the 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]

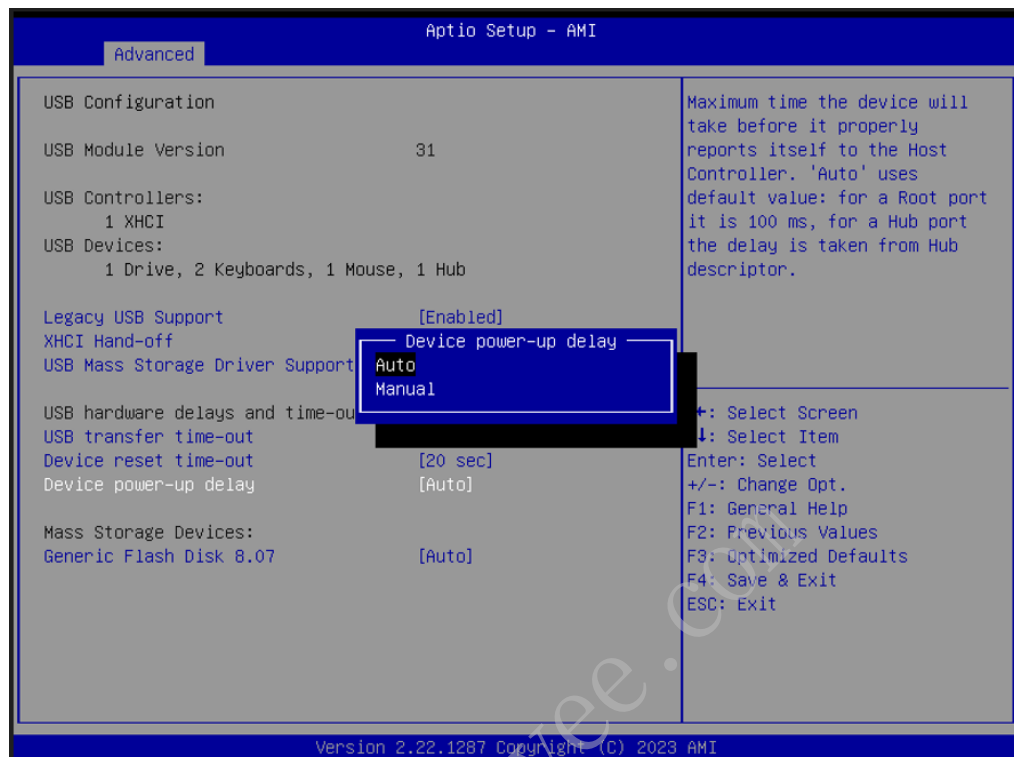


- **Device Reset Time-out**
Selects the USB device reset time-out value. [10,20,30,40 sec]



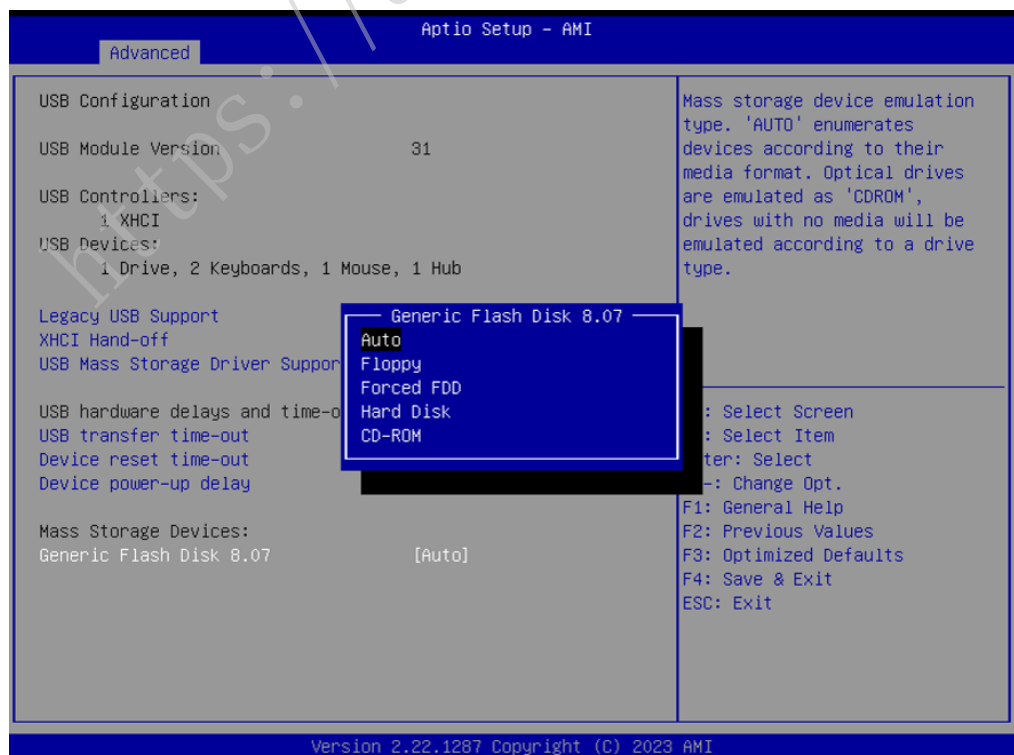
■ Device Power-Up Delay

This item appears only when the device power-up delay item is set to [manual].

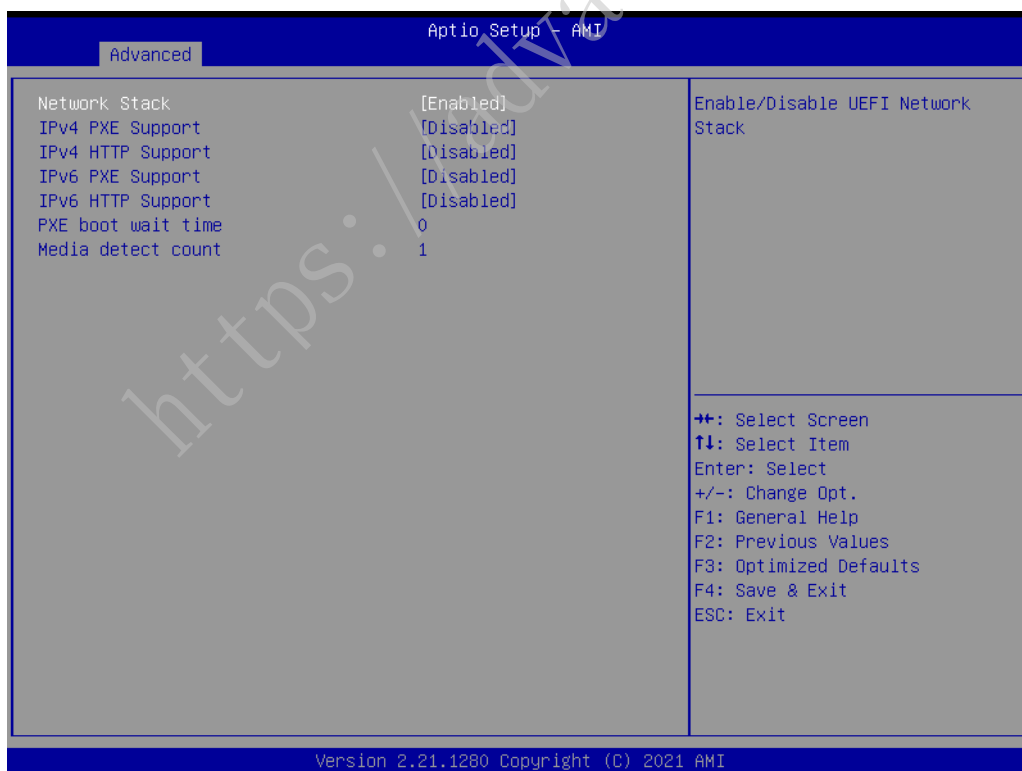


■ Mass Storage Devices

Default is "Auto" to enumerate mass storage devices according to media format.

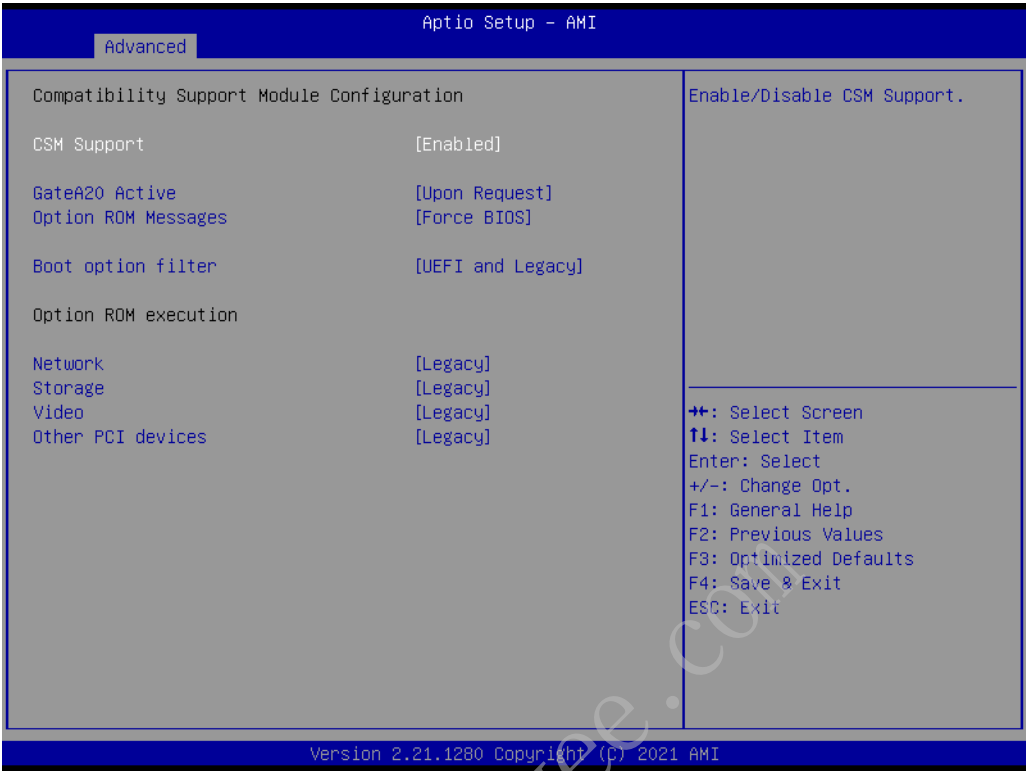


3.2.2.8 Network Stack Configuration



Enable or disable UEFI network stack functions.

3.2.2.9 CSM Configuration

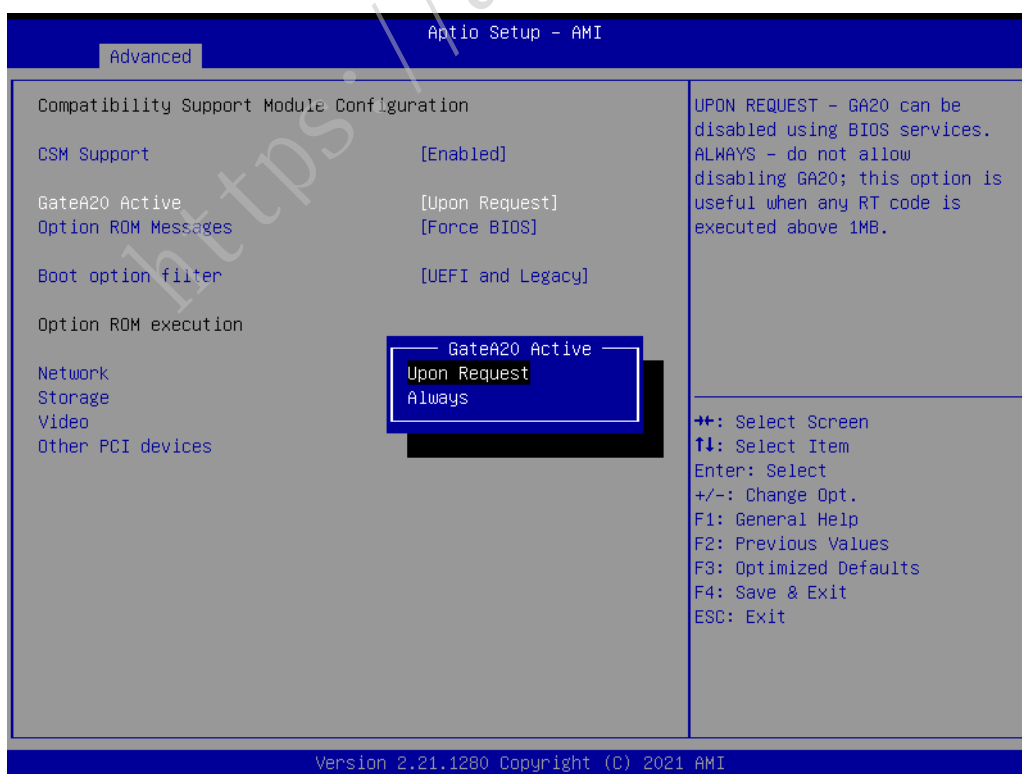


- **CSM Support**
Enables or disables UEFI CSM (Compatibility Support Module) to support a legacy PC boot process. Default is disabled.



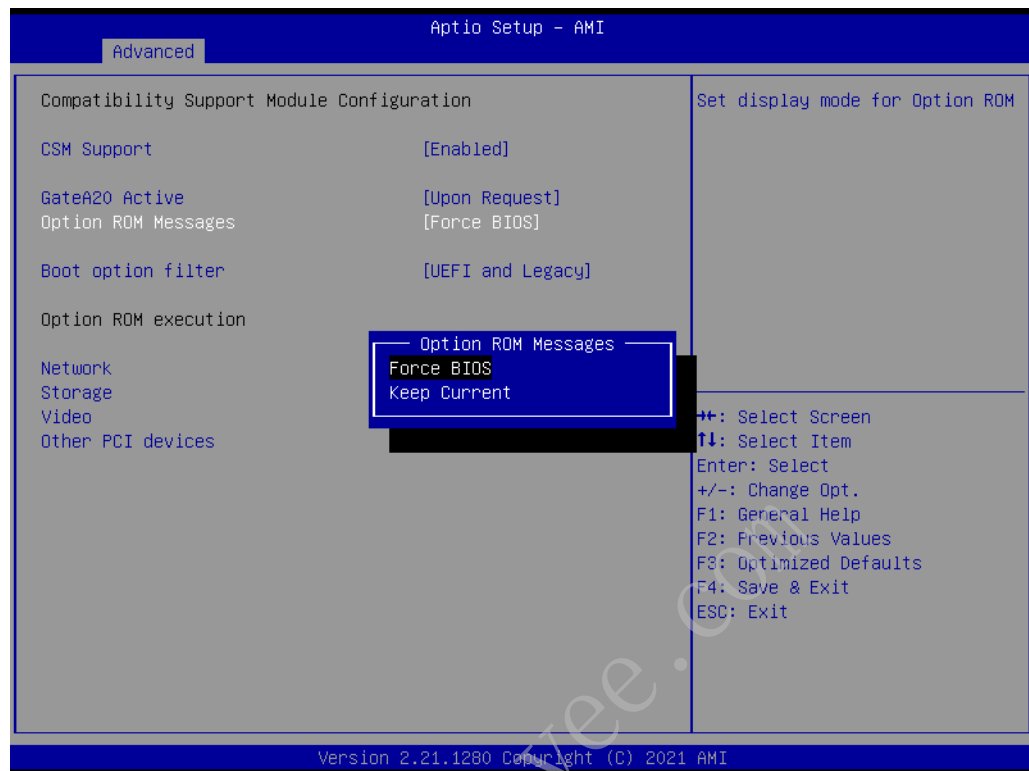
■ GateA20 Active

This item is useful when RT code is executed above 1MB. When it's set as "Upon Request", GA20 can be disabled using BIOS services. When it's set as "Always" it does not allow disabling of GA20.



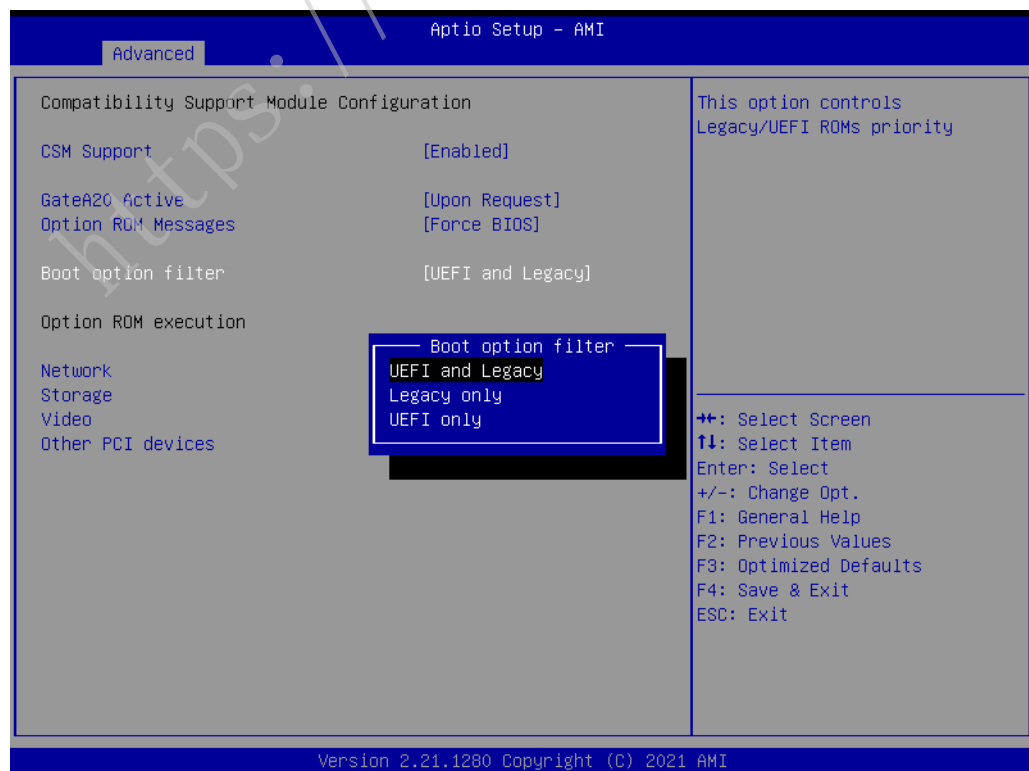
■ Option ROM Messages

To “Force BIOS or keep current” set the display mode for option ROM.



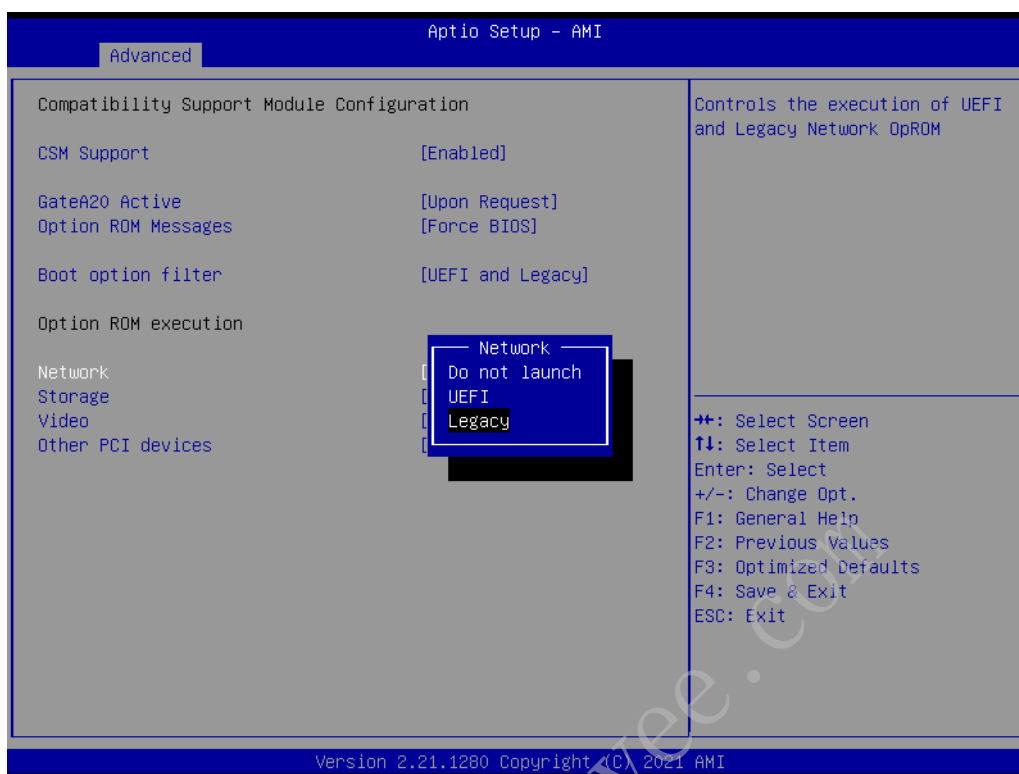
■ Boot Option Filter

Change UEFI/legacy ROM priority for boot option.



■ Network

Control the execution of UEFI and legacy PXE OpROM.

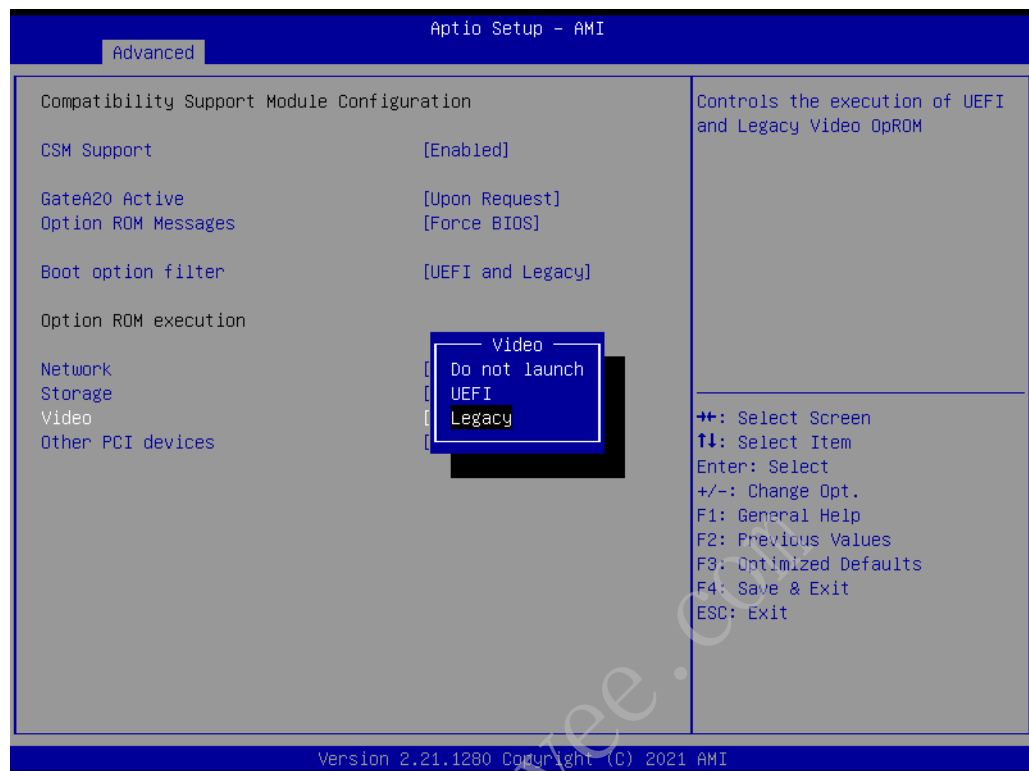


■ Storage

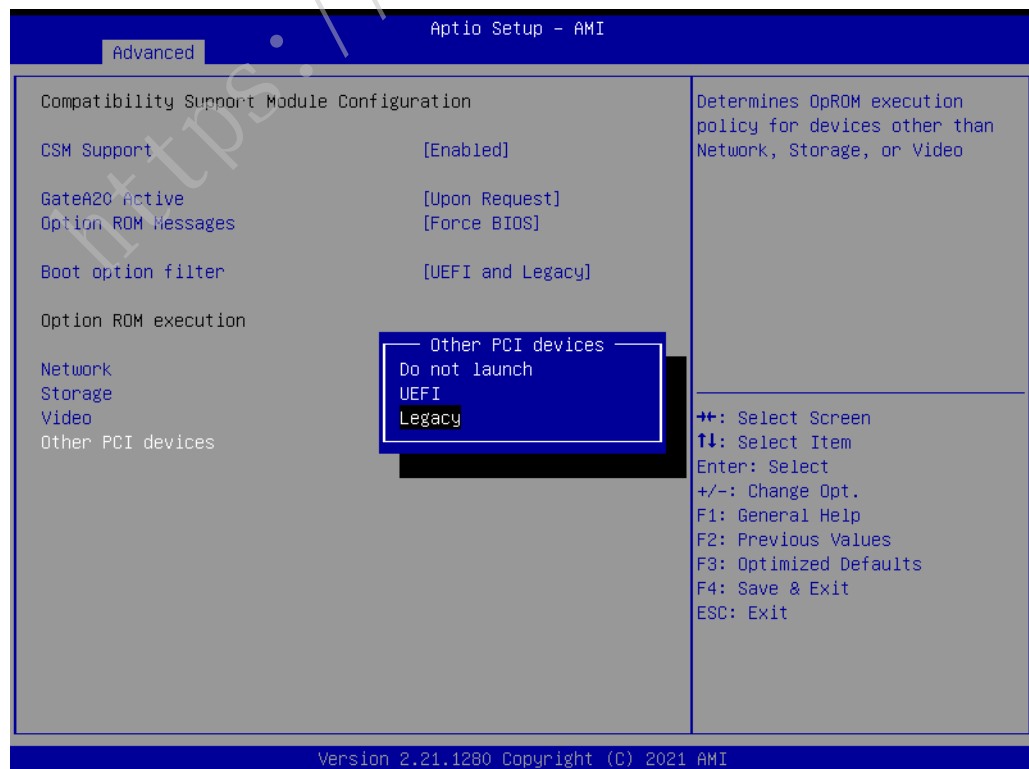
Control the execution of UEFI and legacy storage OpROM.



- **Video**
Control the execution of UEFI and legacy video OpROM.



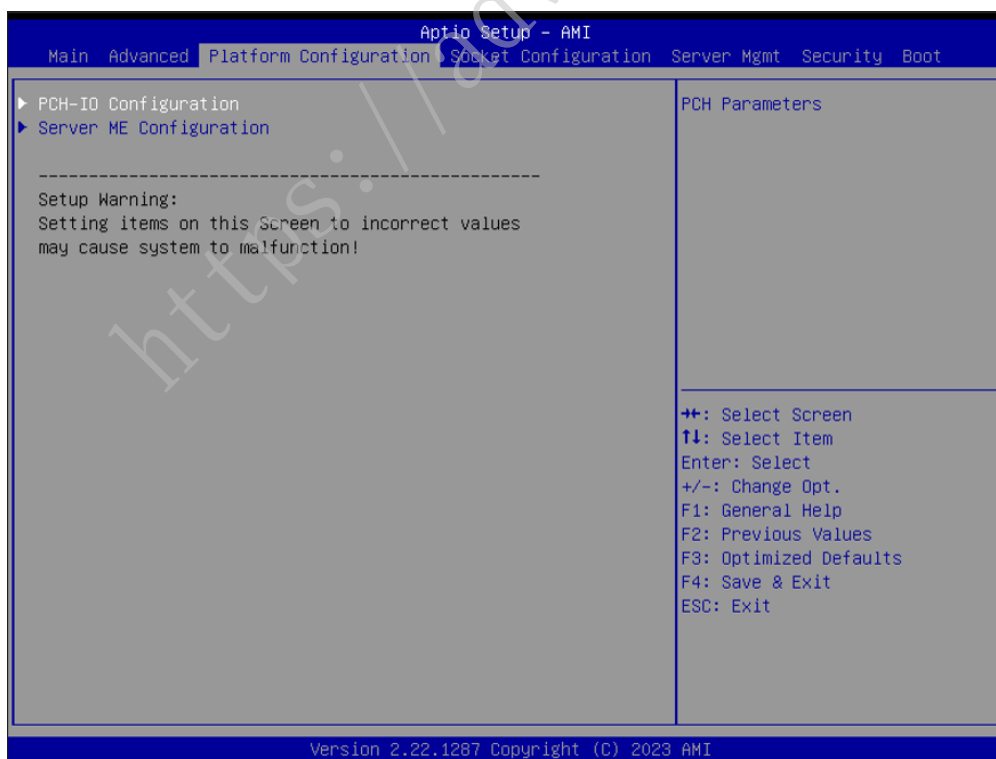
- **Other PCI Devices**
Determines OpROM execution policy for devices other than network., storage, or video.



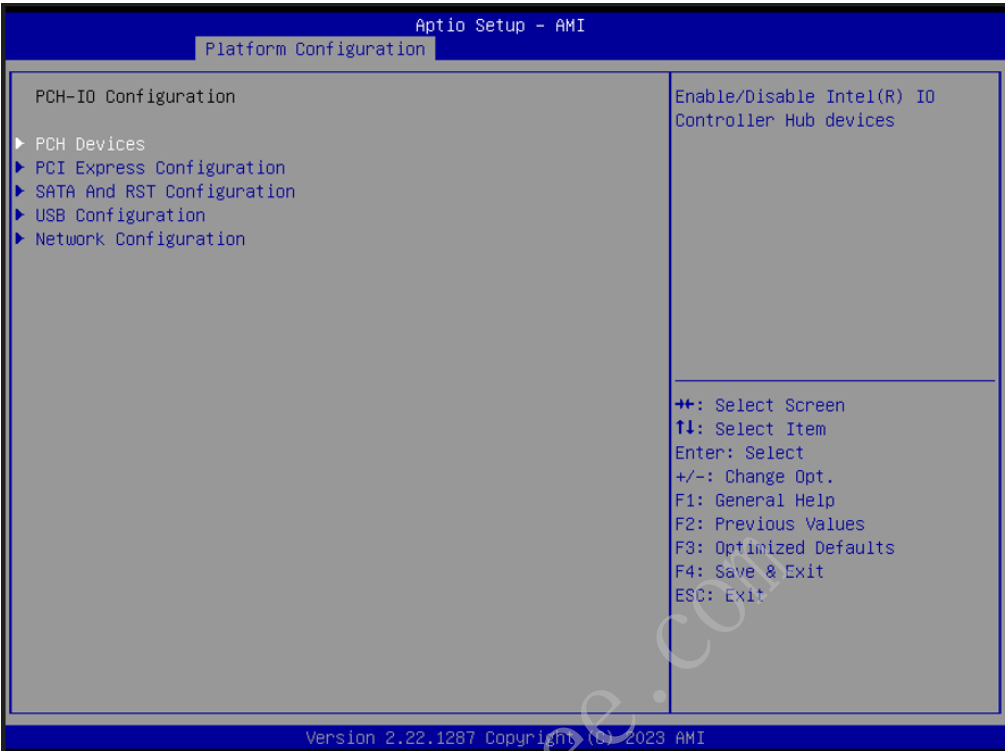
3.2.2.10 iSCSI Configuration



3.2.3 Platform Configuration



3.2.3.1 PCH-IO Configuration

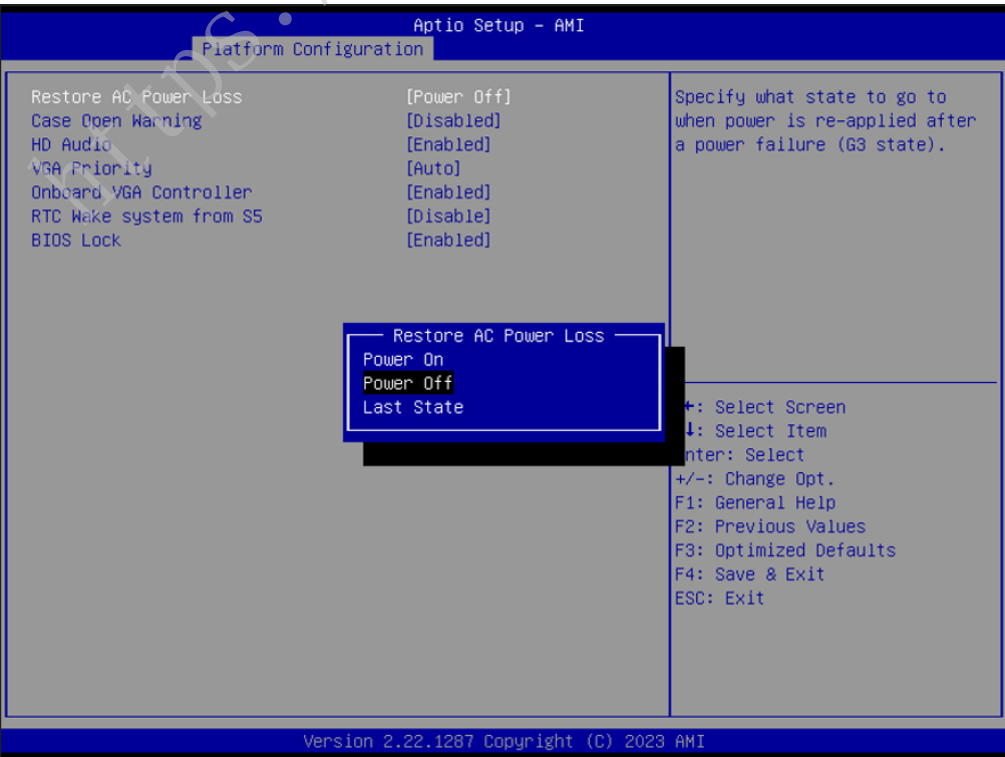


■ PCH Devices

This item is to set up IO controller hub devices.

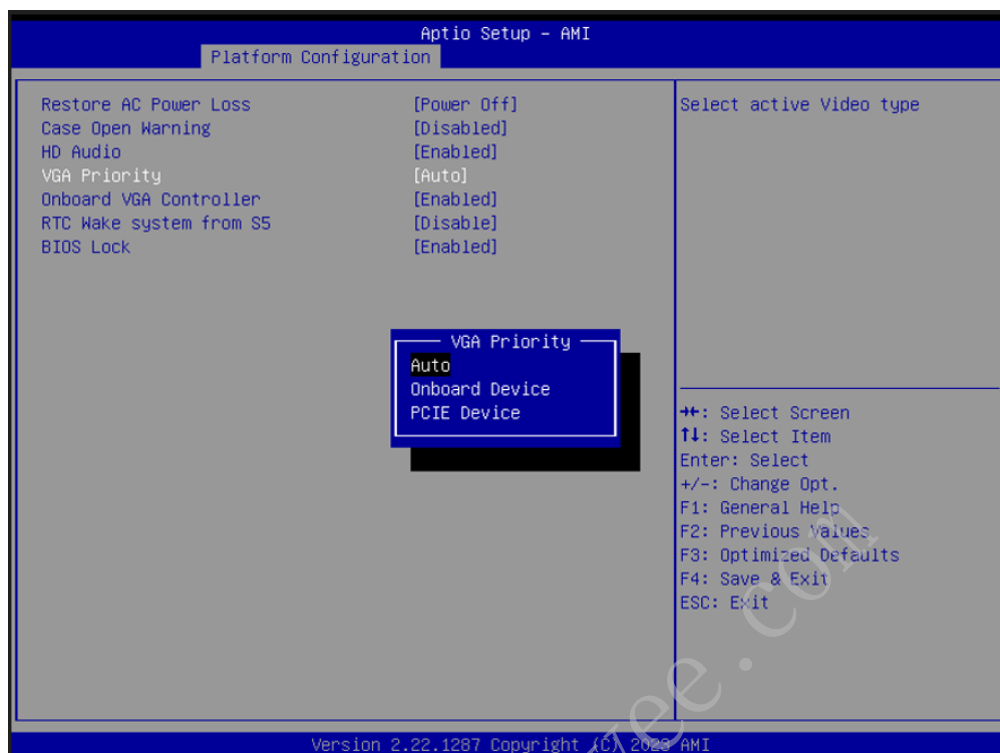
– Restore AC Power Loss

Specify which state to go to when power is re-applied after a power failure (G3 state).



– VGA Priority

Determines priority between onboard and 1st off-board video device found.



– Onboard VGA Controller

Enable/disable onboard VGA controller (ASPEED AST2500).

– Detected Display Device

Select to display from which PCIe slot.

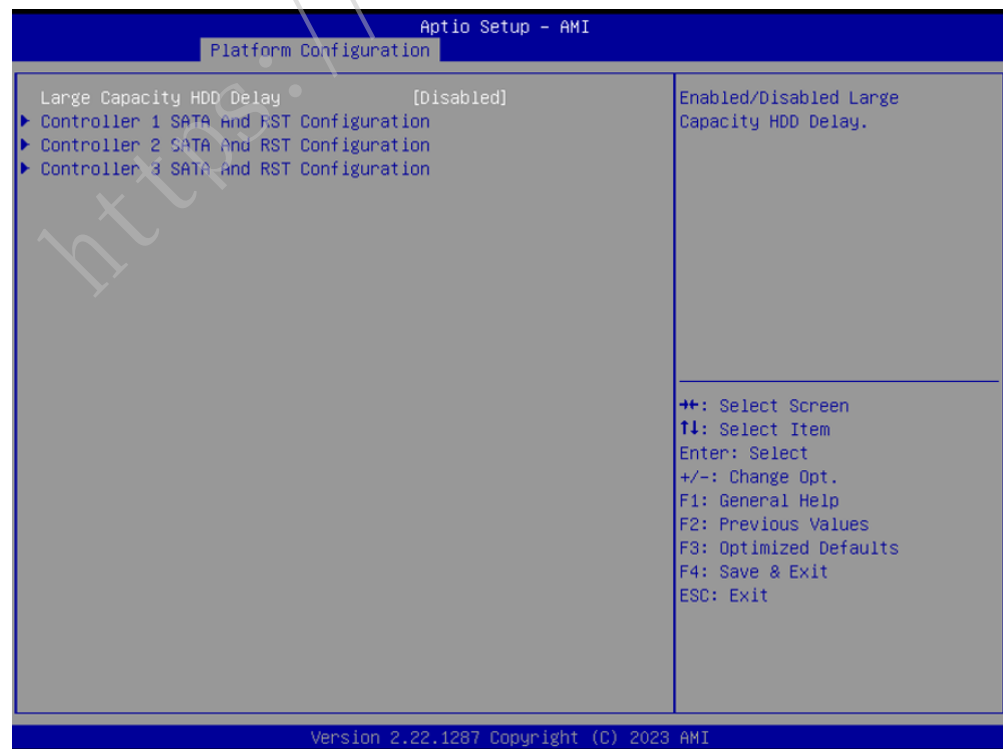
– RTC Wake System from S5

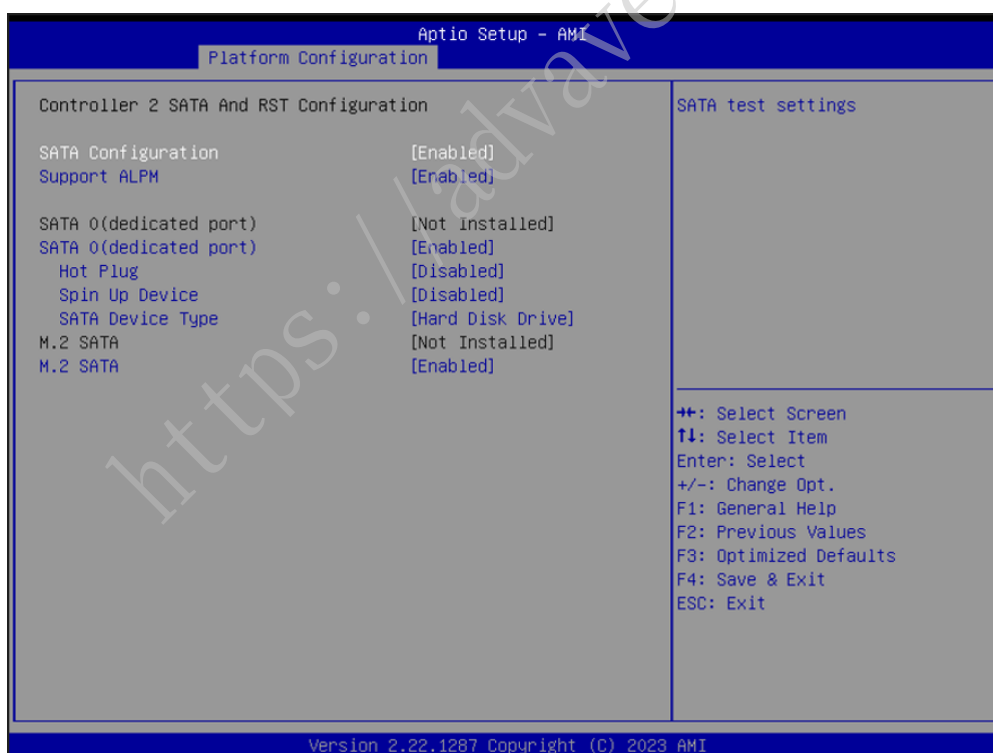
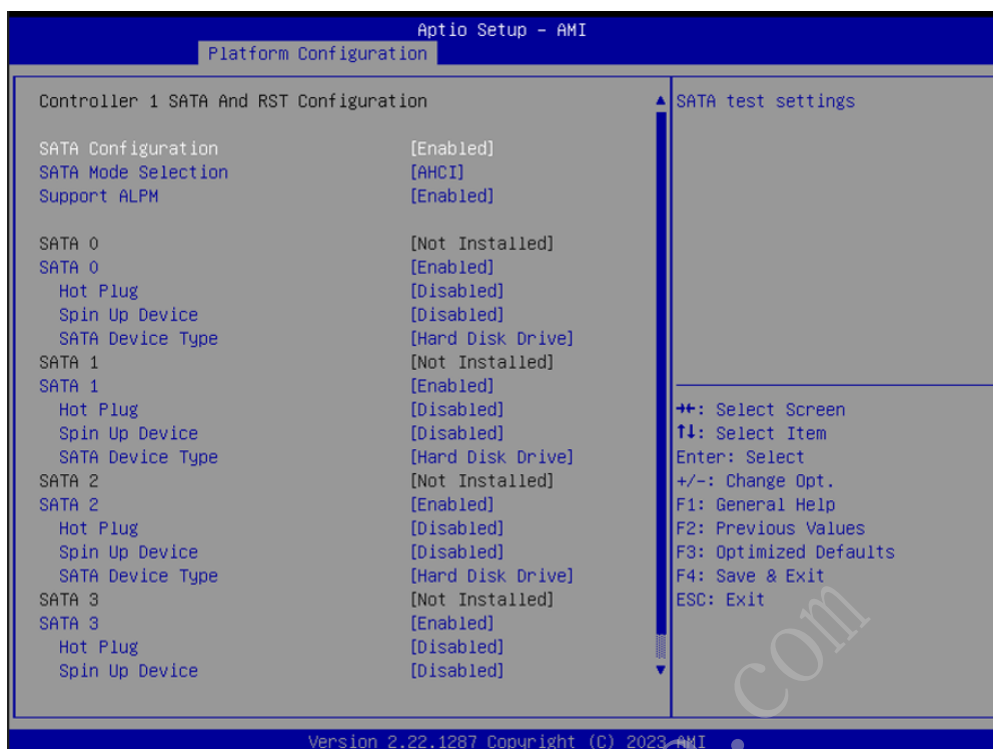
Enable or disable system wake on alarm event.

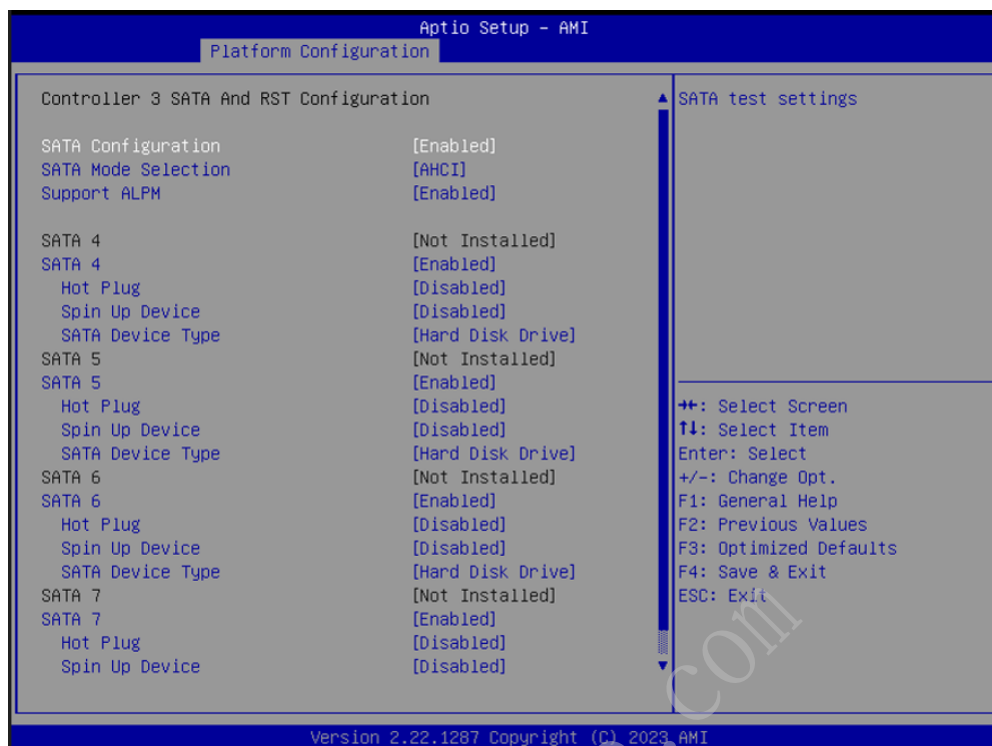
- **PCI Express Configuration**
 - **M.2_2 PCIe Slot Root Port**
Enable or disable the PCI express root port.



- **SATA And RST Configuration**

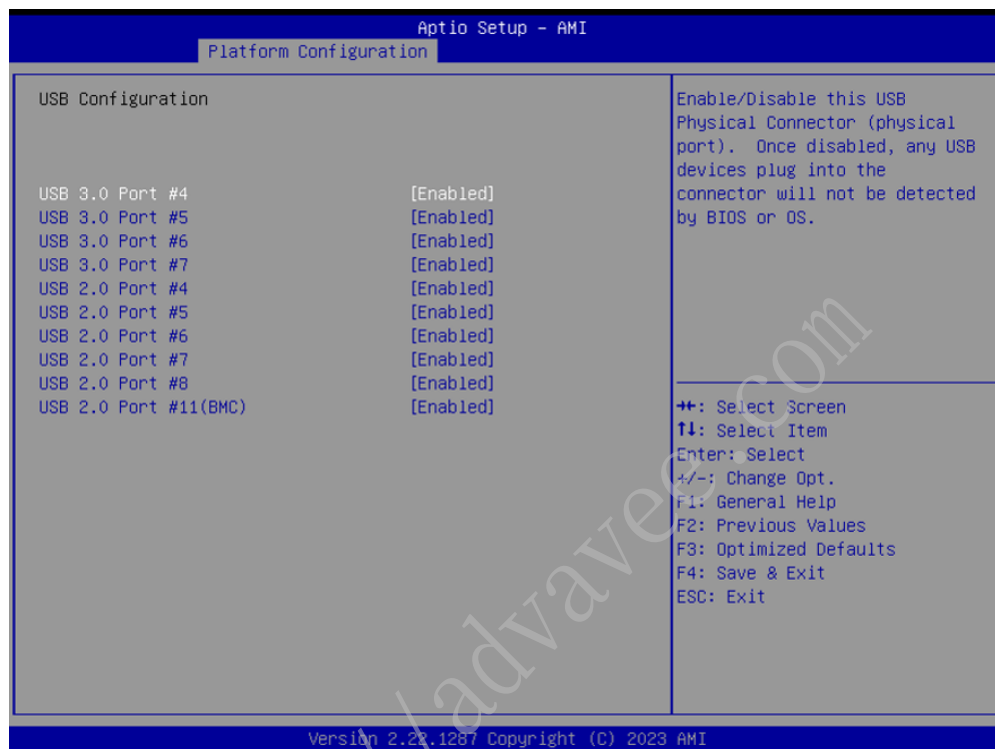




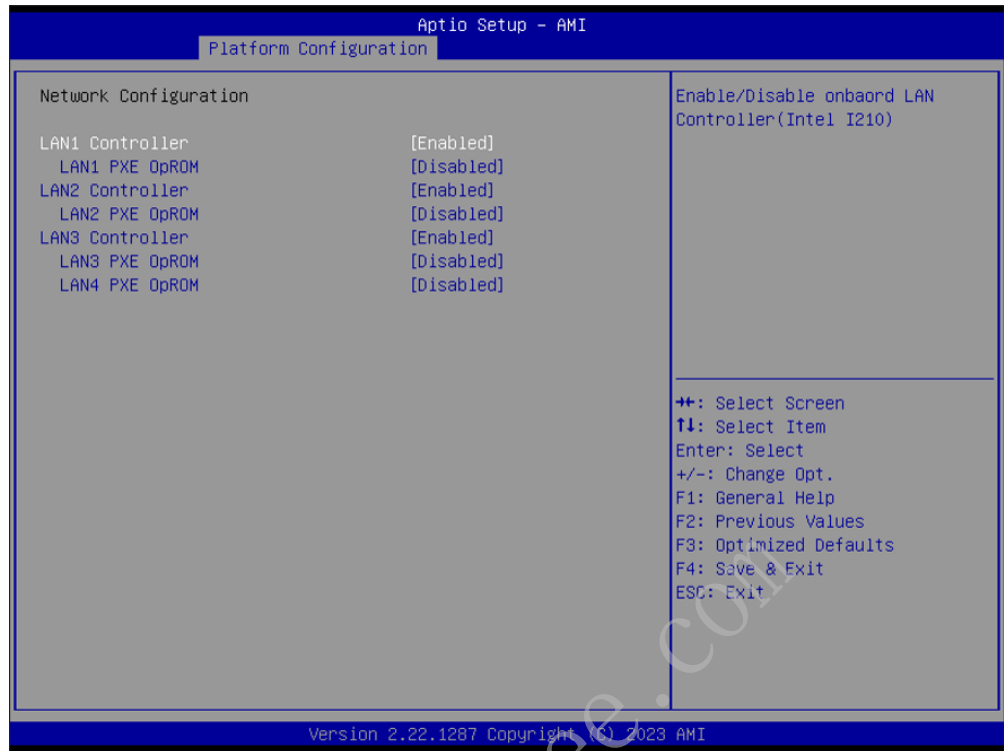


- **SATA Configuration**
Enable or disable SATA devices.
- **SATA Mode Selection**
Set as AHCI or RAID when SATA controllers are enabled.
- **Support ALPM**
Enable or disable Aggressive Link Power Management (ALPM) protocol for advanced host controller Interface-compliant (AHCI) Serial ATA (SATA) devices.
- **SATA Port 0~7 (SATA port 0~3 are for Controller 1, SATA port 4~7 are for Controller 3)**
Enable or disable SATA port 0~7.
- **Hot Plug Port 0~7 (SATA port 0~3 are for Controller 1, SATA port 4~7 are for Controller 3)**
Designates SATA port 0~7 as hot pluggable.
- **SATA Port 0~7 Spin Up Device (SATA port 0~3 are for Controller 1, SATA port 4~7 are for Controller 3)**
On an edge detect from 0 to 1, the PCH starts a COM RESET initialization sequence to the device.
- **SATA Port 0~7 Device Type (SATA port 0~3 are for Controller 1, SATA port 4~7 are for Controller 3)**
To identify the SATA is connected to SSD or HDD.

- **PCH sSATA/M.2 Configuration (sSATA0 and M.2 are for Controller 2)**
 - **sSATA/M.2 Controller**
Enable or disable sSATA/M.2 controller.
 - **SATA M.2 Port**
Enable or disable SATA port.
- **USB Configuration**



■ Network Configuration



- **LAN1 controller**
Enable or disable Intel I210 controller support.
- **LAN1 PXE OpROM**
Enable or disable Boot option for Intel I210 controller.
- **LAN2 controller**
Enable or disable Intel I210 controller support.
- **LAN2 PXE OpROM**
Enable or disable Boot option for Intel I210 controller.
- **LAN3/LAN4 controller**
Enable or disable Intel X710 controller support.
- **LAN3 PXE OpROM**
Enable or disable boot option for Intel X710 controller.
- **LAN4 PXE OpROM**
Enable or disable boot option for Intel X710 controller.

3.2.3.2 Server ME Configuration

This page shows the Server ME configuration information.

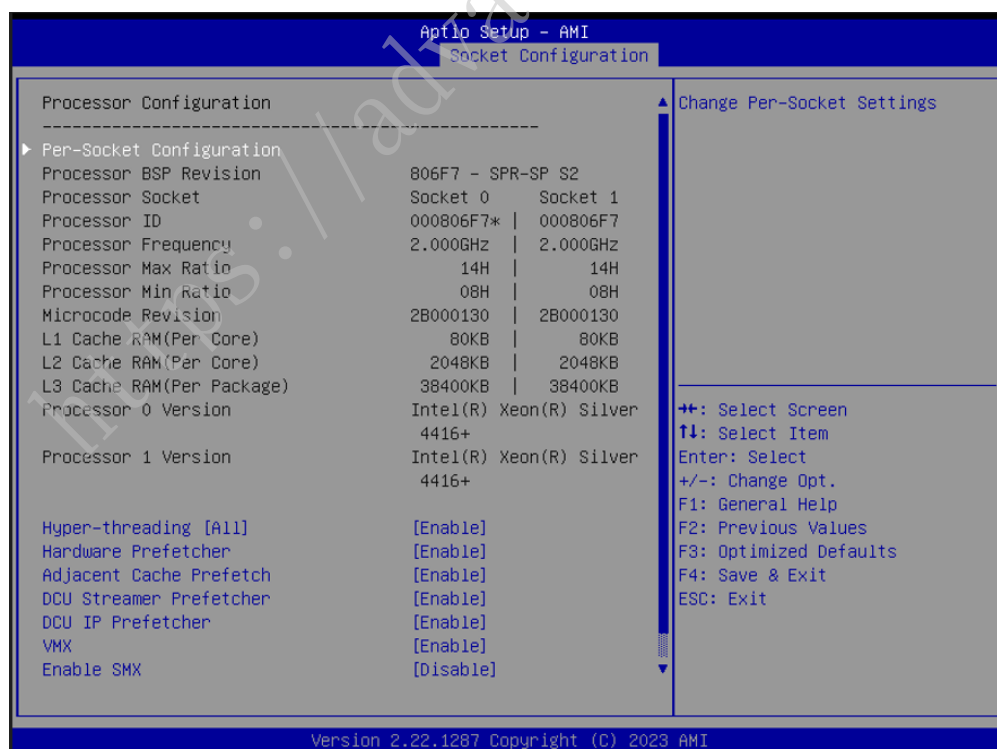


3.2.4 Socket Configuration





3.2.4.1 Processor Configuration



- **Per-Socket Configuration**

Use this to select how many processor cores you want to activate when you are using a dual or quad core processor.

- **Hyper-Threading [All]**

Enable or disable Intel hyper threading technology.

- **Execute disable Bit**
Enable or disable the execute disable Bit feature. The optimal and fail-safe default setting is enabled. If disable is selected, the BIOS forces the XD feature flag to always return to 0.
- **VMX**
Enable or disable Intel Virtual Machine Extensions (VMX) for IA-32 processors that support Intel® Vanderpool Technology
- **Enable SMX**
Enable or disable Safer Mode Extensions. Safer Mode Extensions (SMX) provide 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 prefetching is a technique that fetches instructions and/or data from memory into the CPU cache memory well before the CPU needs it so it can improve the load-to-use latency.
- **Adjacent Cache 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.
- **DCU Streamer Prefetcher**
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**
Change the data cache unit mode.
- **AES-NI**
This item is to enable or disable CPU advanced encryption standard instructions.

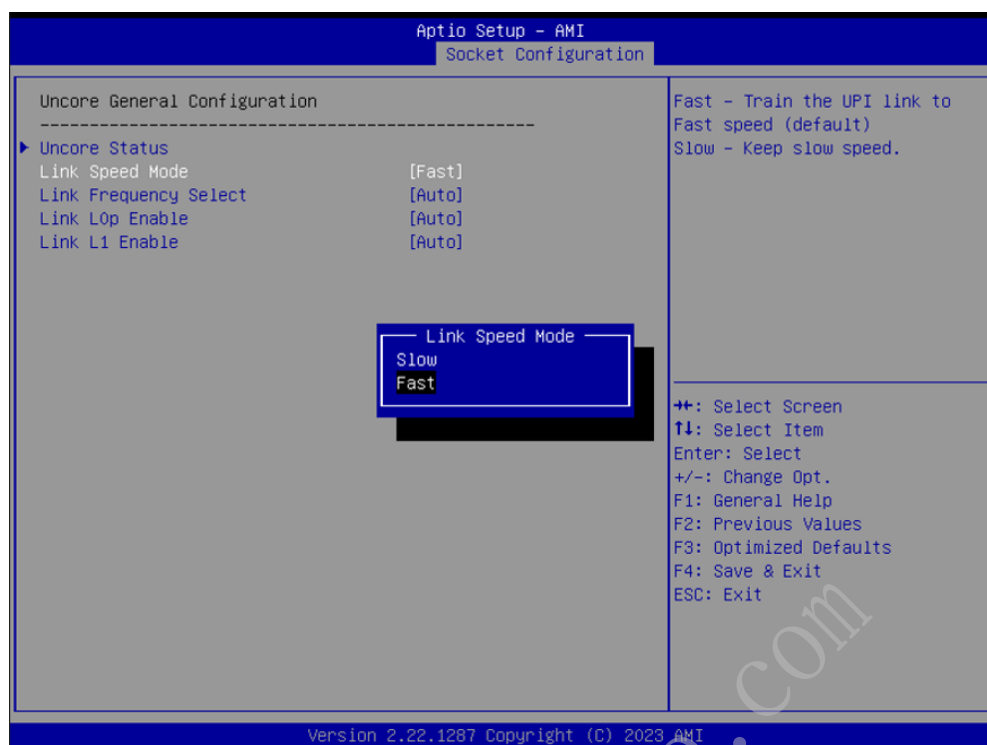
3.2.4.2 UPI Configuration



- **UPI Status**
Display information of Intel UltraPath Interconnect (UPI).

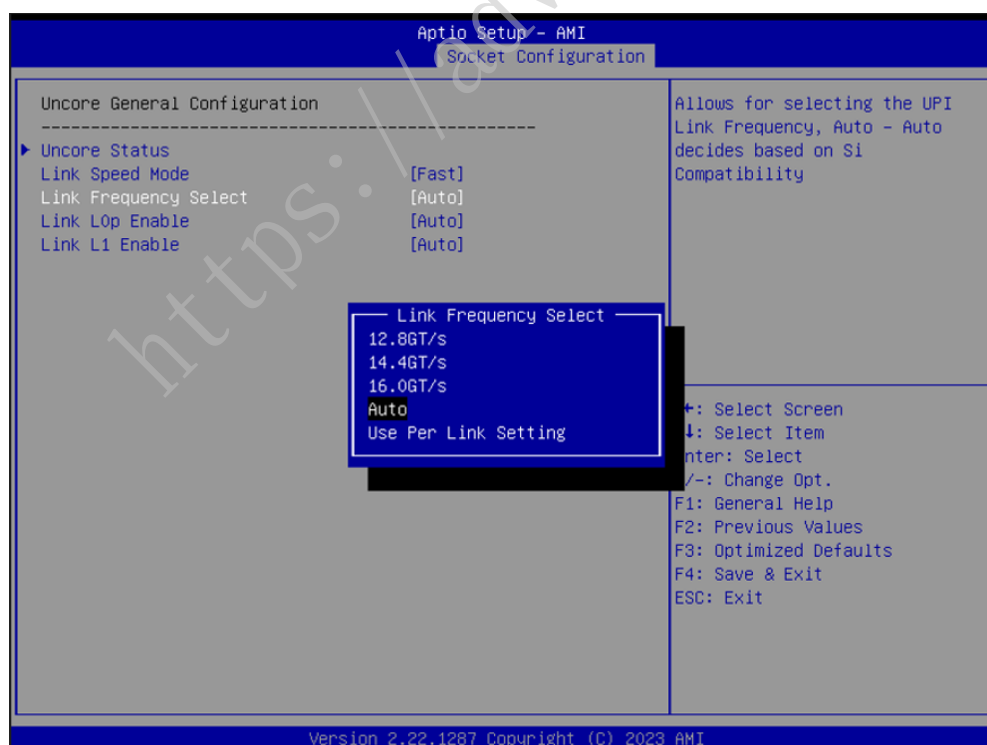


- **Link Speed Mode**
Select the QPI link speed as either the fast mode or slow mode.



■ Link Frequency Select

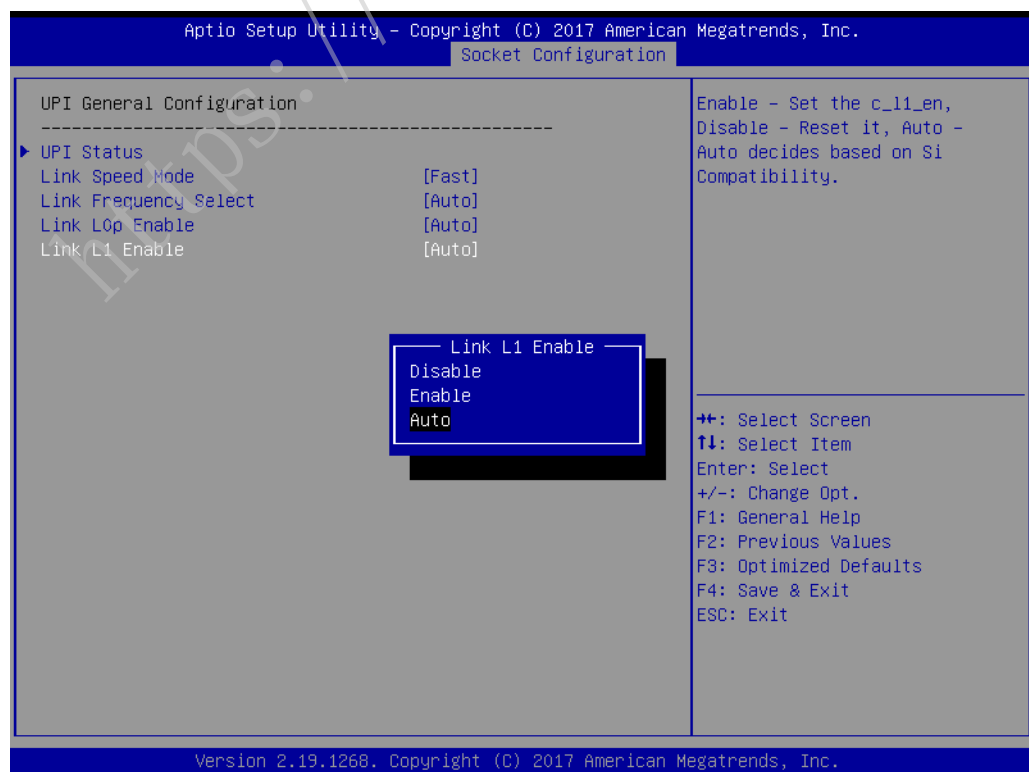
Allows for selecting the QPI link frequency.



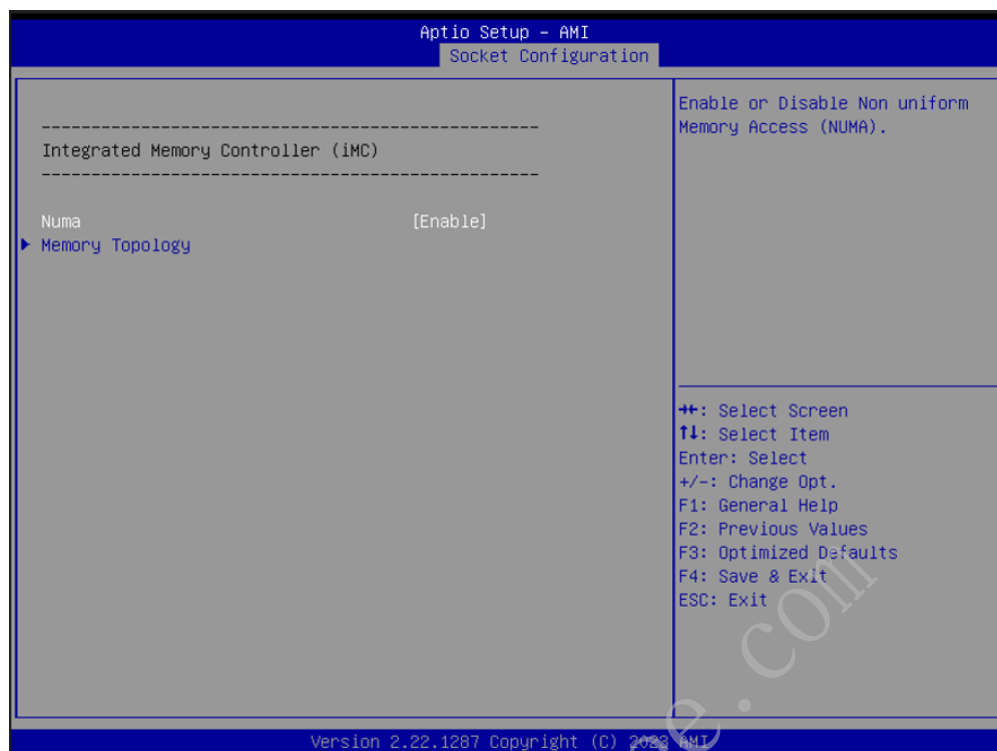
- **Link L0p Enable**
Enable or disable QPI link0p.



- **Link L1 Enable**
Enable or disable QPI link1.

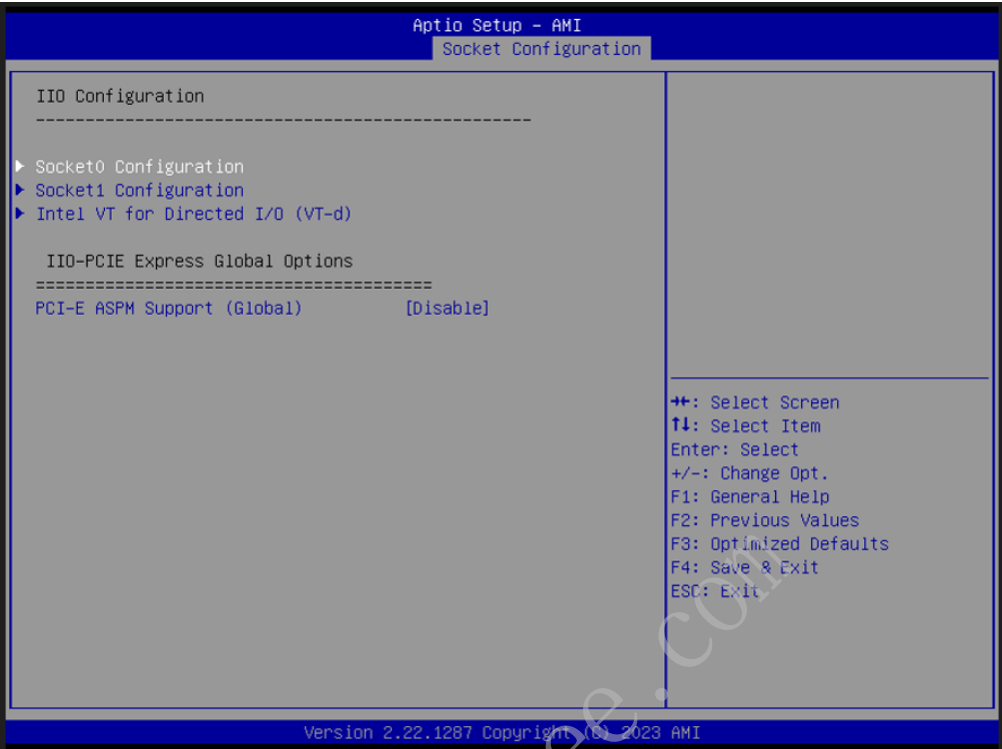


3.2.4.3 Memory Configuration

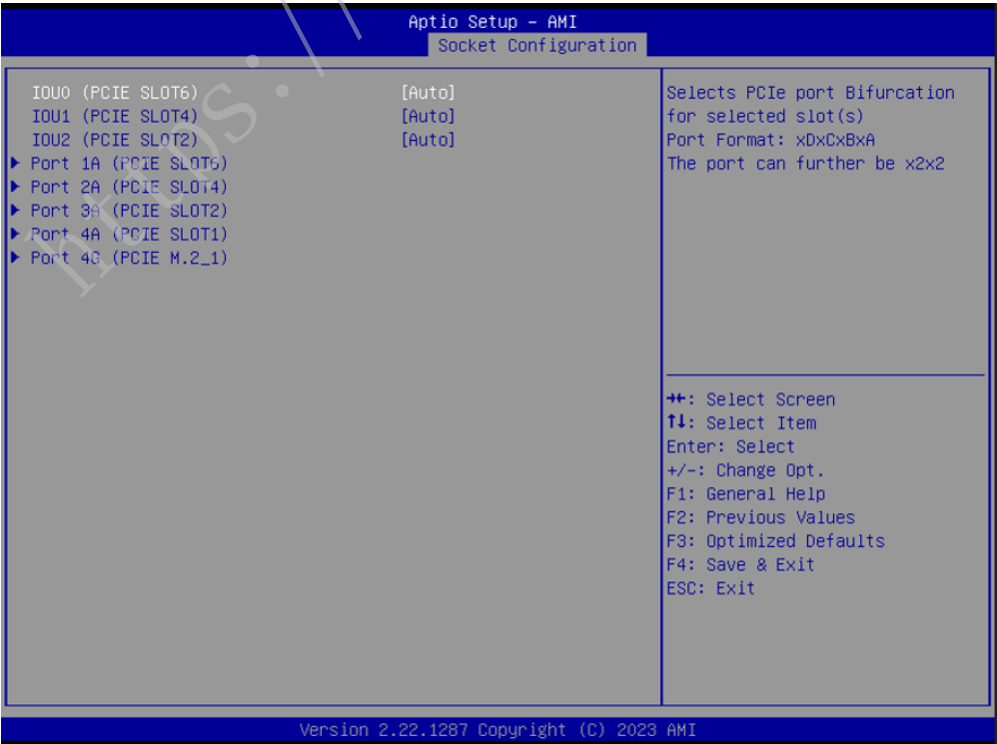


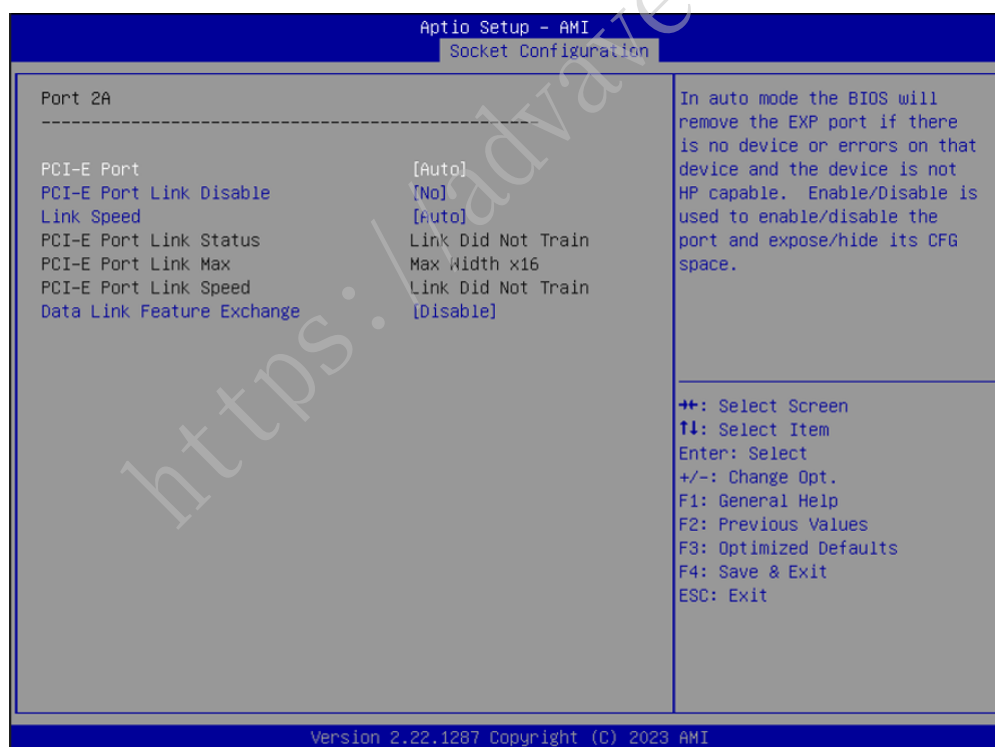
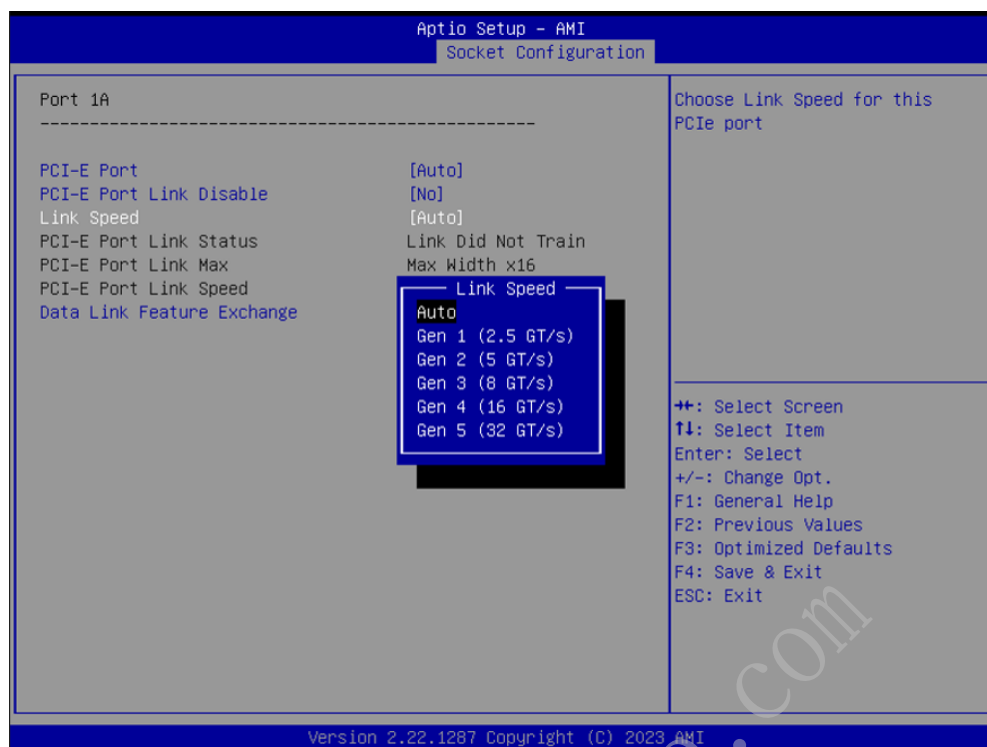
- **NUMA**
Enable or disable non uniform memory access (NUMA).
- **Memory Technology**
Display memory topology with DIMM population information.

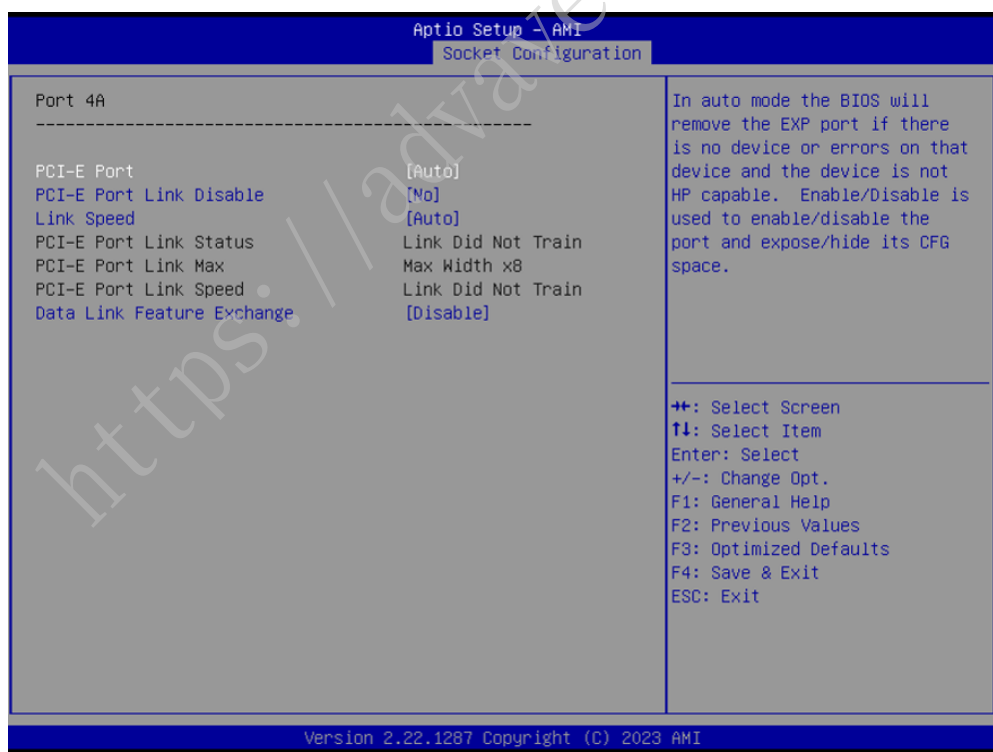
3.2.4.4 IIO Configuration

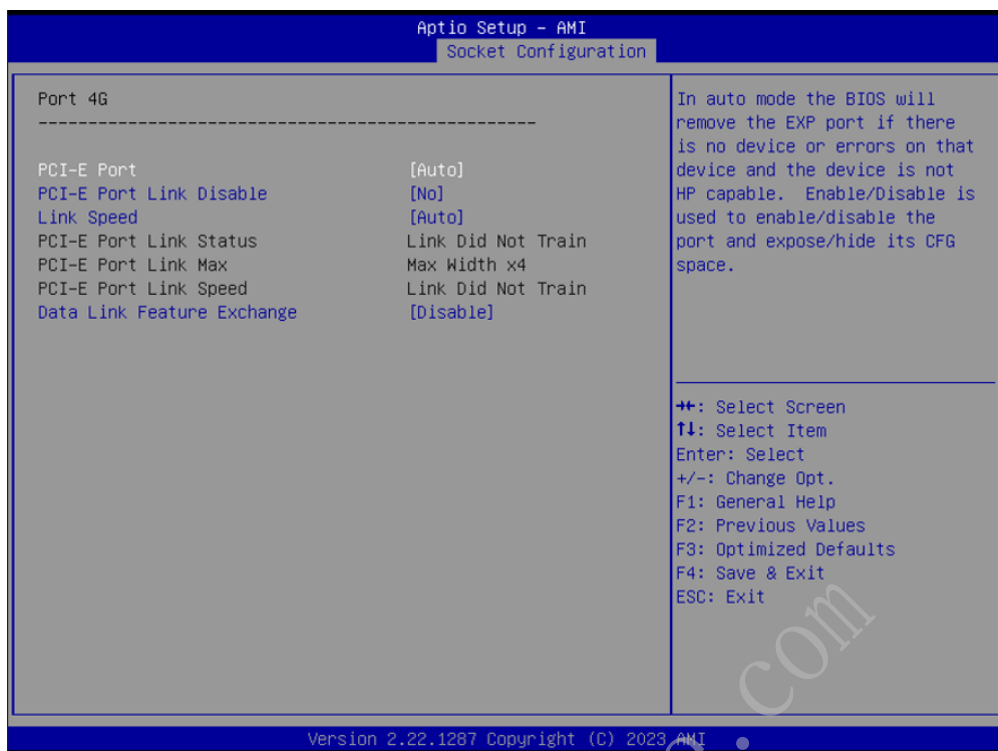


- **Socket0 Configuration**
PCIe port bifurcation control and select target link speed as Gen1, Gen2, Gen3, Gen4, Gen5.



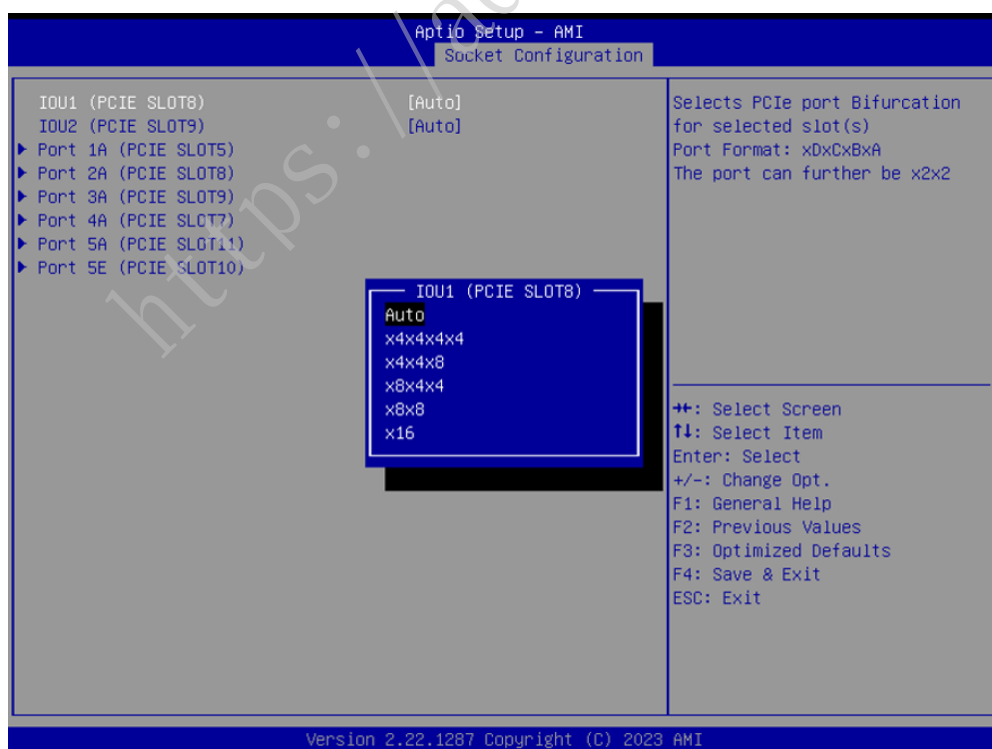


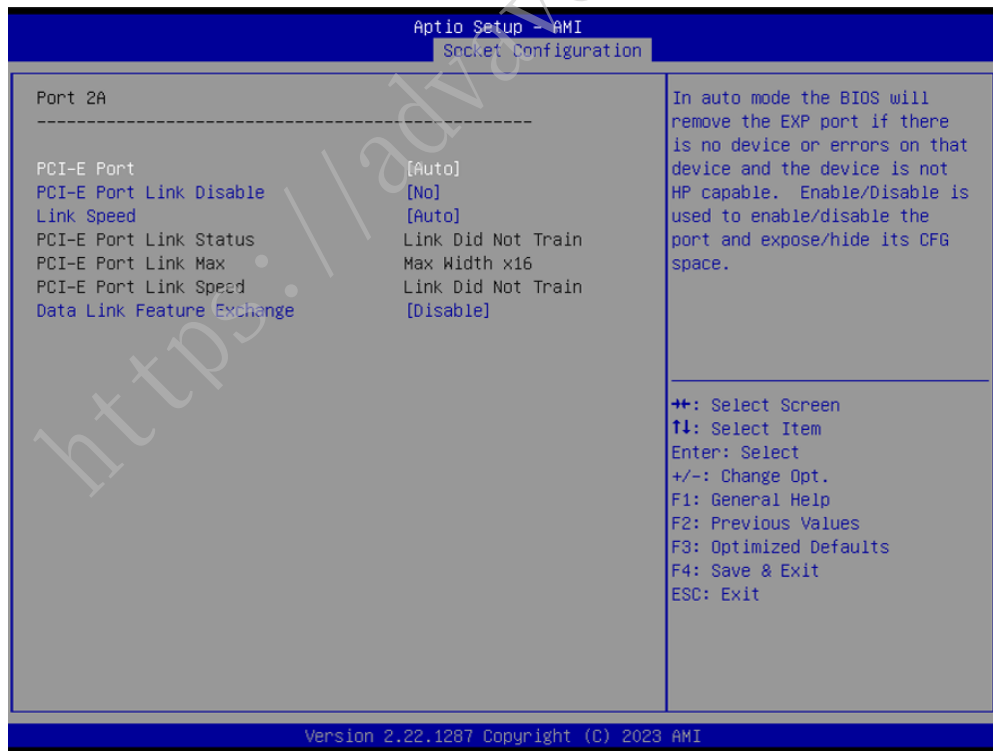
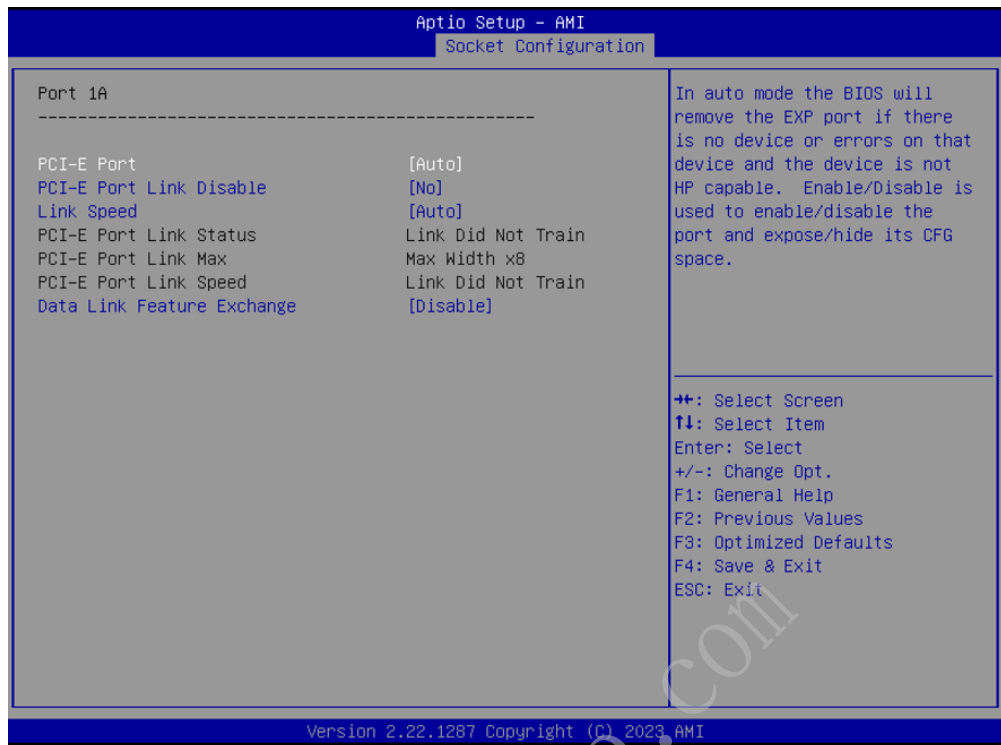




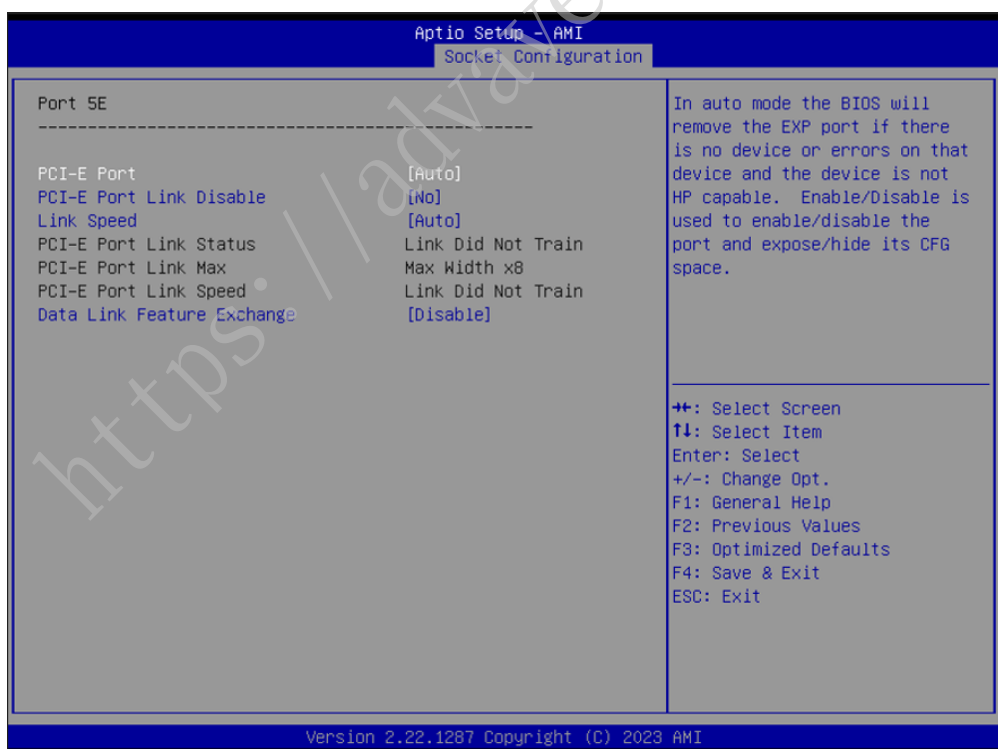
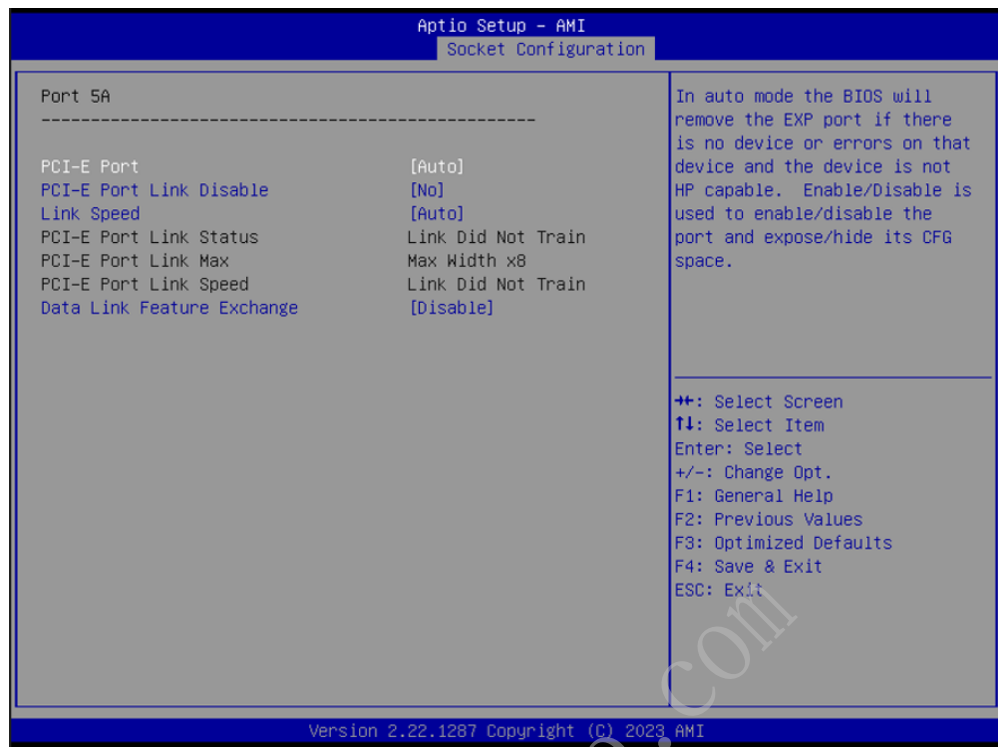
■ Socket1 Configuration

PCIe port bifurcation control and select target link speed as Gen1, Gen2, Gen3, Gen4, Gen5.



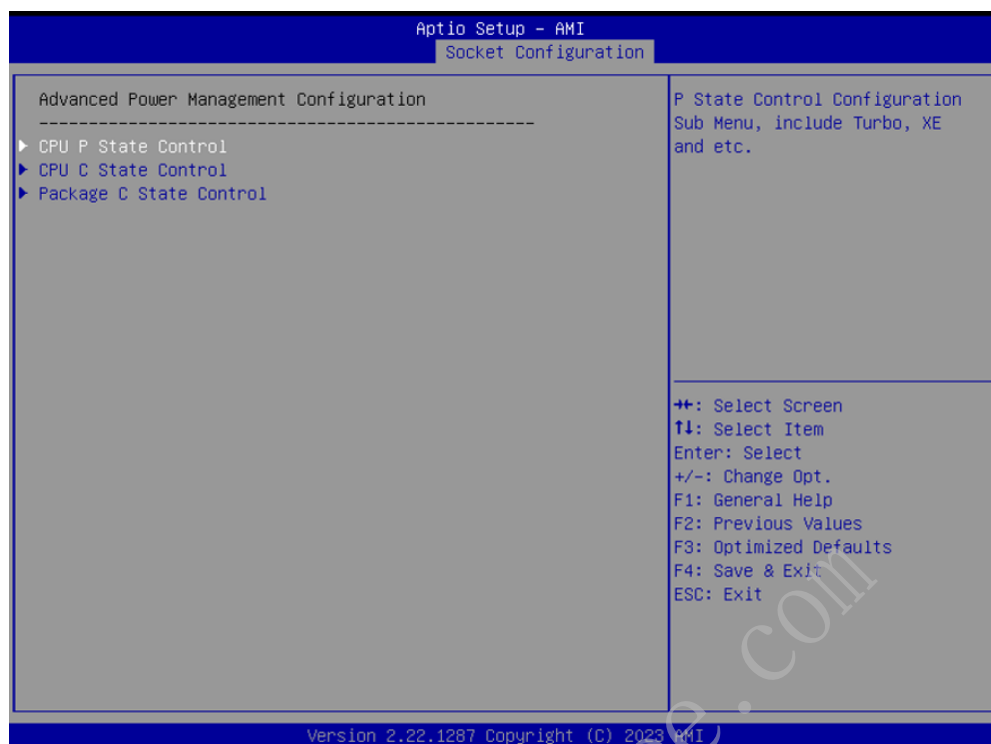






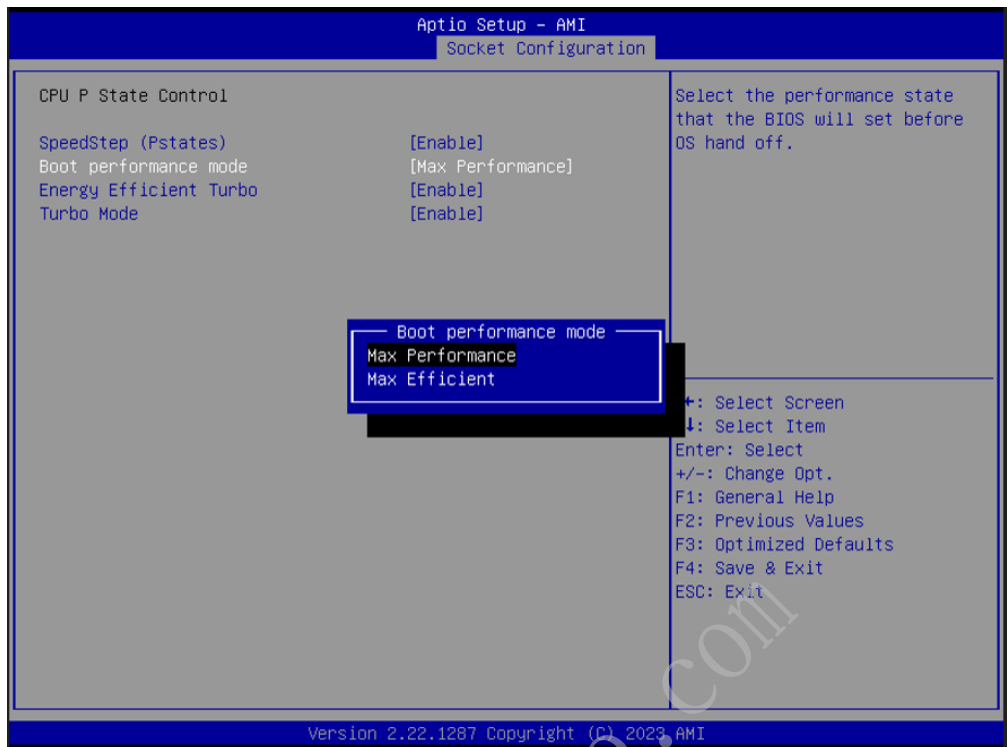
- **Intel VT for Directed I/O (VT-d)**
Enable or disable Intel virtualization technology for directed I/O.

3.2.4.5 Advanced Power Management Configuration

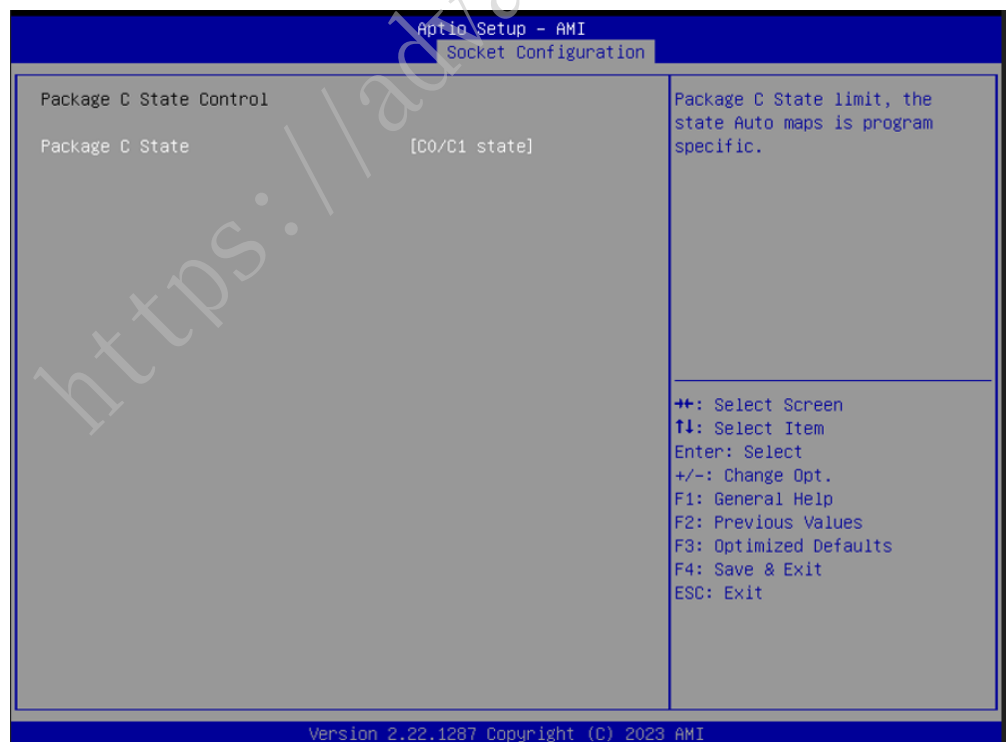


■ CPU P State Control

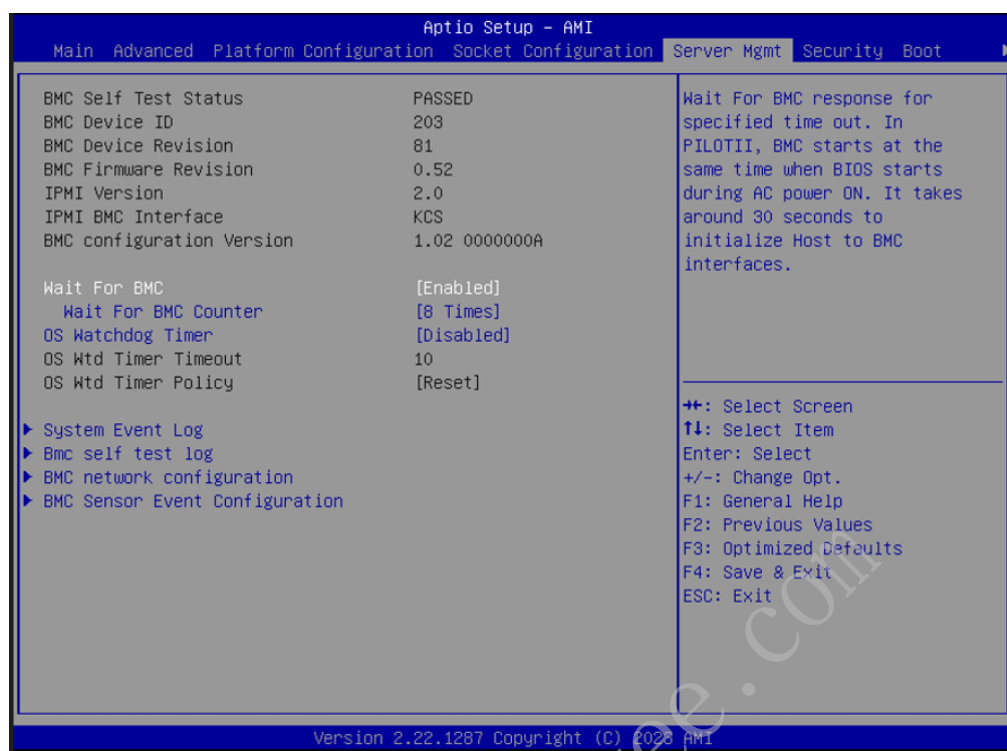




■ Package C State Control

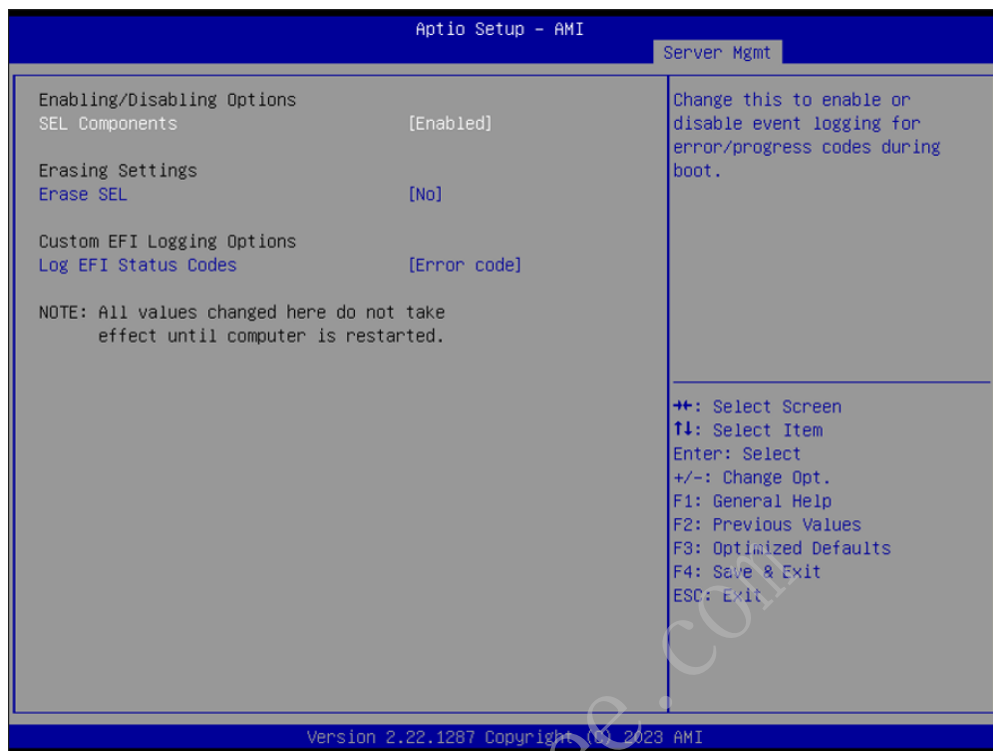


3.2.5 Server Management



- **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, motherboard will not wait for the BMC module's response.
- **Wait for BMC Counter**
Initializes host to BMC interfaces.
The MB beeps once per 5 seconds to check it.
- **OS Watchdog Timer**
If enabled, starts a BIOS timer which can only be shut off by management software after the OS loads.

3.2.5.1 System Event Log



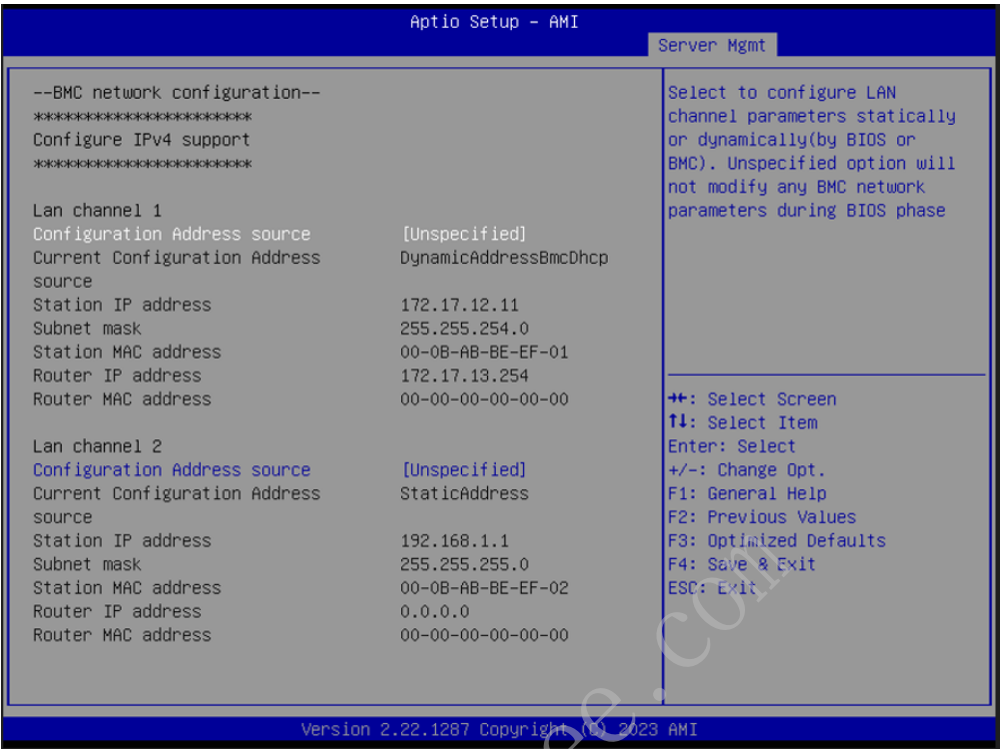
- **SEL Components**
Enable/disable all features of system event logging during boot.
- **Erase SEL**
Choose options for erasing SEL.
- **When SEL is Full**
Choose options for reactions to a full SEL.
- **Log EFI Status Codes**
Disable the logging of EFI status codes or log only error code or only progress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

3.2.5.2 BMC Self Test Log



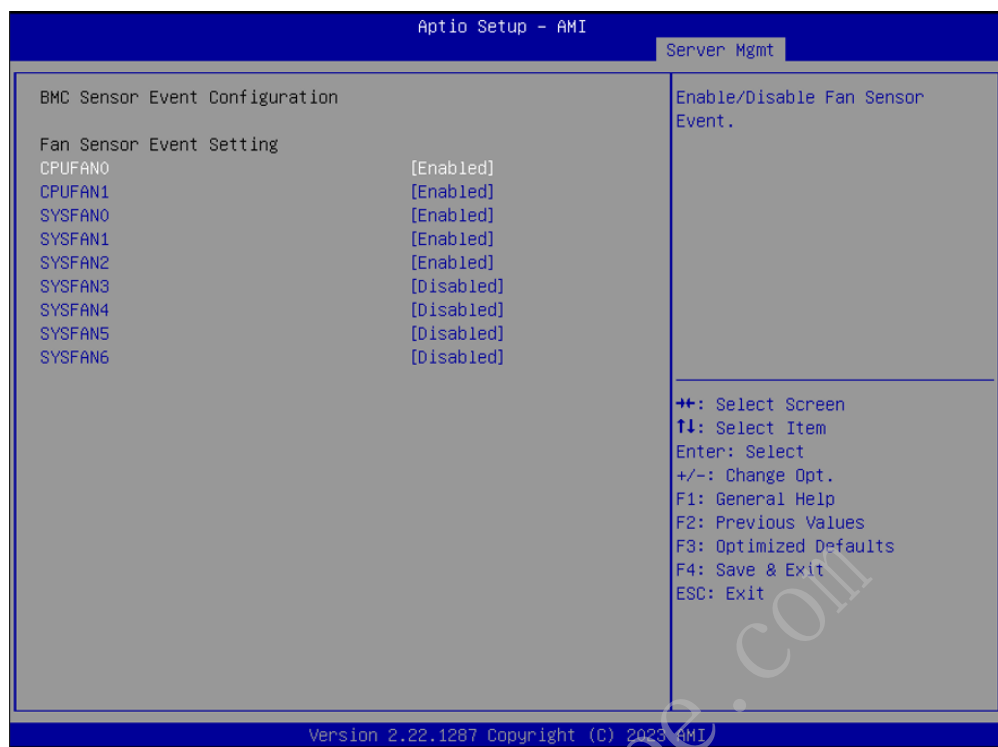
- **Erase Log**
Erase log options.
- **When Log is Full**
Select the action to be taken when the log is full.

3.2.5.3 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.

3.2.5.4 BMC Sensor Event Configuration



3.2.6 Security





Note! **With AC power & Battery. Short CMOS1 Jumper:**



Date/Time & Password: Keep

Setting: reset to default

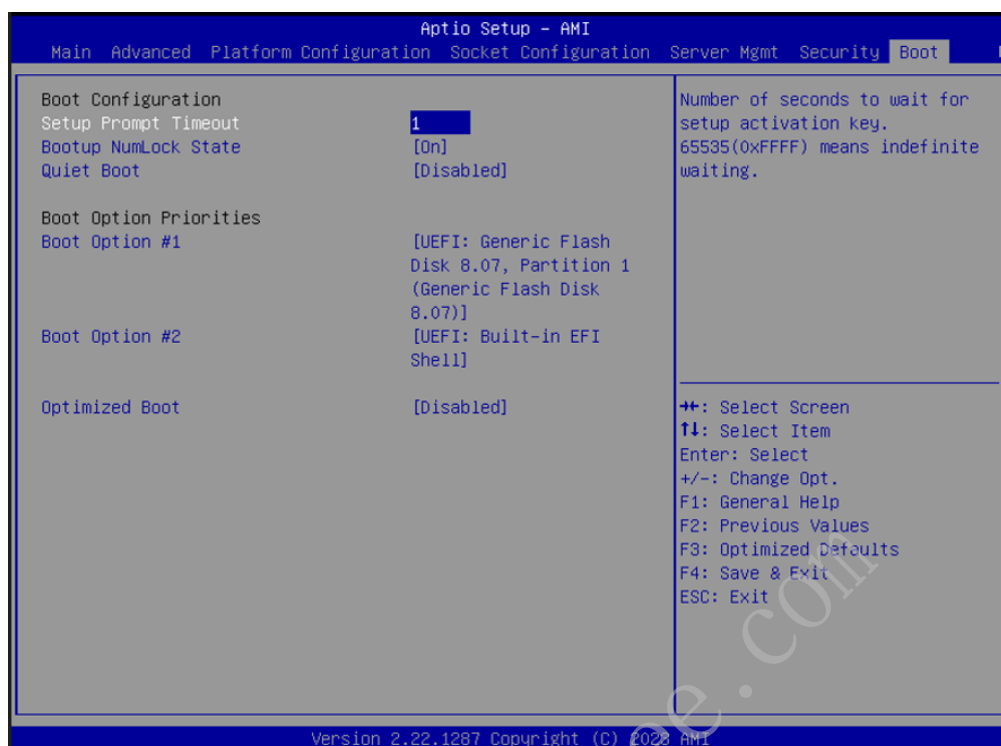
AC power and CMOS battery are removed. Short CMOS1 Jumper:

Date/Time: reset to default

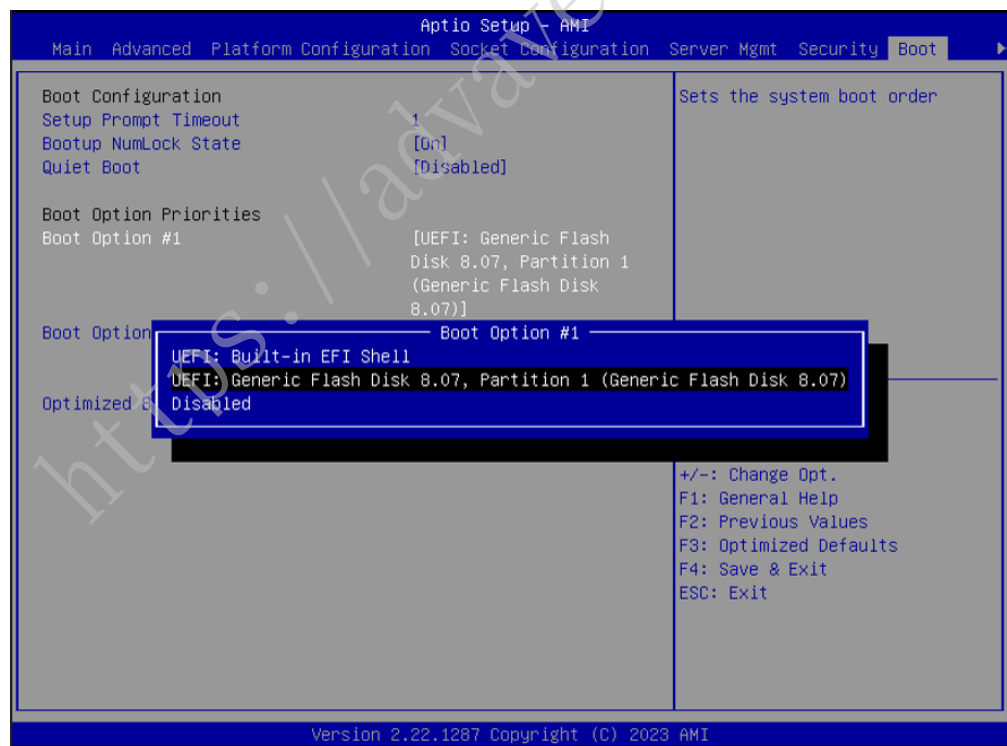
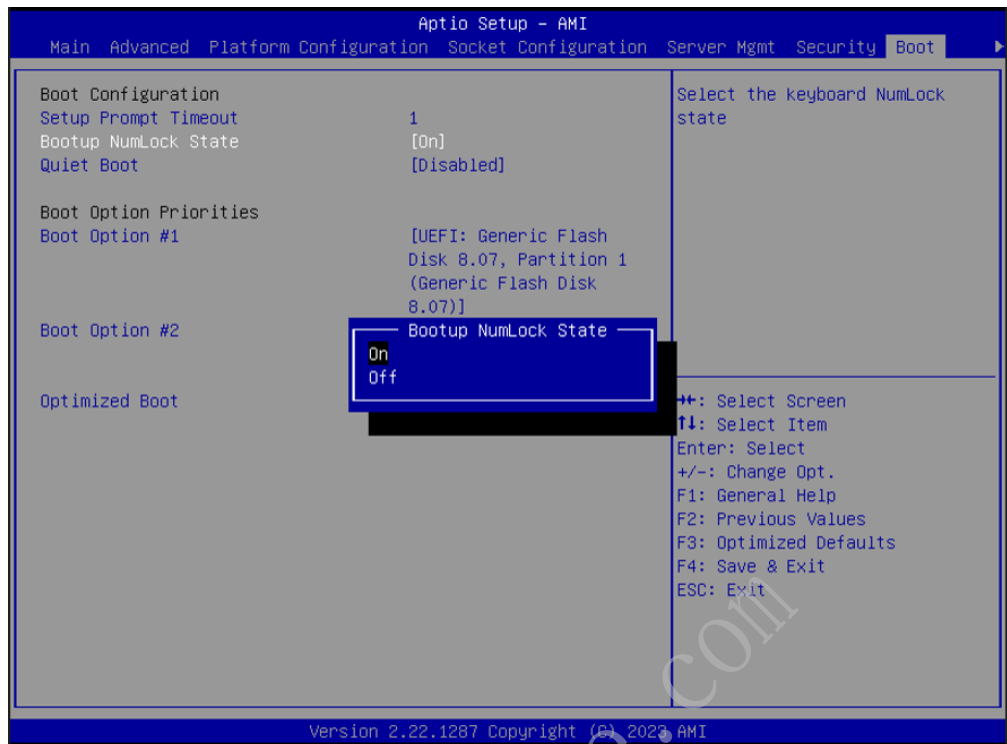
Password: keep

Setting: reset to default

3.2.7 Boot



- **Setup Prompt Timeout**
Number of seconds to wait for setup activation key.
- **Bootup NumLock State**
Select the keyboard NumLock state as "On" or "Off."
- **Quiet Boot**
Enable or disable quiet boot option.
- **Boot Option Priorities**
Sets the system boot priorities.
- **Hard Drive BBS Priorities**
Display this item when external legacy devices are plugged in to set 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.

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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-977 are available online for download from the Advantech support website.

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

4.2.1 Main Menu

The Intel Chipset Software Installation (CSI) utility installs the Windows INF files that outline the operating system and 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 1.1/2.0/3.2 gen1 support
- Identification of Intel chipset components in the device manager

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



Windows Server 2020 Standard	x64
Windows Server 2019 Standard	x64
Windows 10 Ultimate	x64

Note! *It is necessary to update all the latest Microsoft hot fix files when using this OS.*



Chapter

5

Graphic Setup

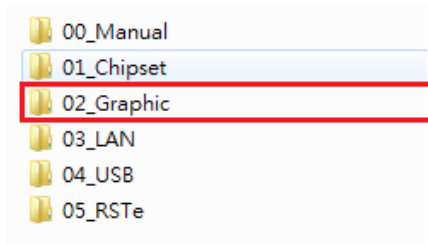
5.1 Introduction

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

- 2D Video Graphic Adapter with PCIe bus interface, 1920 x 1200 @60Hz 32bpp
- DDR4 1600Mbps 16-bit bus support

5.2 Windows Series Driver Setup

When the folder is displayed, navigate to the "Graphic" folder and click the executable file to complete the installation of the drivers for the OS that you need.



Note!



1. If the ASMB-977 Series 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 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.
 - It is a non-WHQL certified driver because ASPEED VGA is a 2D VGA, it cannot meet the WHQL requirement of WDDM driver which requires 3D VGA function.
 - Because it is non-WHQL certified driver, it may meet some compatible issues with some specific applications.

Chapter

6

LAN Configuration

6.1 LAN Configuration

6.1.1 Introduction

The ASMB-977T2 Series has two Gigabit Ethernet LAN connections via dedicated PCI Express x1 lanes: GbE LAN1 - Intel I210; GbE LAN2 - I210; two 10G Base-T LAN connectors LAN3 and LAN4 - Intel X710 PHY. They eliminate bottlenecks of network data flow and incorporate Gigabit Ethernet at 10 Gbps.

6.1.2 Features

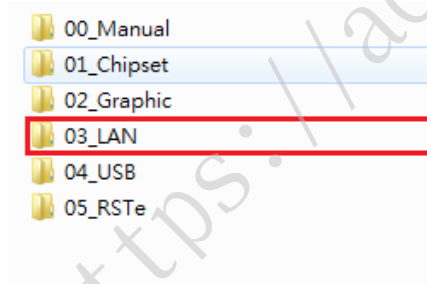
- 10/100/1000 & 10G Base-T Ethernet controller
- 10/100/1000 & 10G Base-T triple-speed MAC
- Full duplex at 10/100/1000 Mbps or 10 Gbps and half duplex at 10/100/1000 Mbps
- Wake-on-LAN (WOL) support
- PCIe x1 host and PHY interface

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.

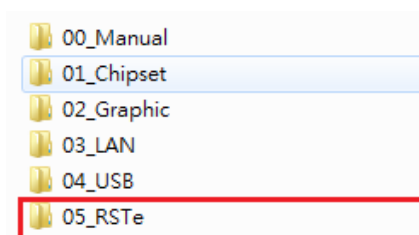
6.1.4 Windows Series Driver Setup (LAN)

1. Select folder "03_LAN" then click the proper LAN driver for the OS.



6.2 SATA & PCIe SSD RAID

Intel C741 PCH chips offers SATA & PCIe SSD RAID under the Windows operating system.



Note!



1. Please visit the Intel download center to download the "Intel Rapid Storage Technology enterprise for Microsoft Windows Operating System Software User's Guide" file.

2. For the hotfix file download, please visit Microsoft website.

Appendix **A**

Programming the Watchdog Timer

The ASMB-977 Series 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 IT5121E. It provides the following functions for user programming:

- Can be enabled and disabled by user program
- Timer can be set from 1 to 255 seconds
- Generates an interrupt or resets 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:

Table A.1: I/O port Addresses

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

Based 100 ms

Here is an example to step by step program the watchdog timer.

Table A.2: Step by step guide

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	

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Appendix **B**

I/O Pin Assignments

B.1 USB3.2 Gen1 Header (USB3H1)

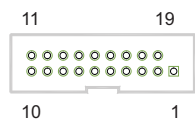


Table B.1: USB header

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.2 VGA Connector (VGA1)

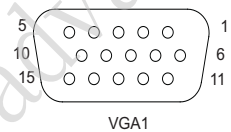


Table B.2: VGA connector

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.3 RS-232 Connector (COM2)

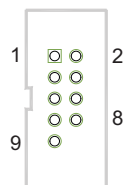


Table B.3: RS-232 connector (COM2)

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

B.4 External Keyboard Connector (KBMS1)



Table B.4: External keyboard connector

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

B.5 CPU and System Fan Power Connector (CPUFAN0~1, SYSFAN0~SYSFAN3, SYSFAN6)

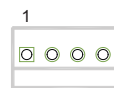


Table B.5: Fan Power Connector

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

B.6 System Fan4~5 Connector



Table B.6: System Fan4~5 Connector

Pin	Signal
1	PWM
2	TACH
3	+12V
4	GND
5	PSNT#
6	X
7	+12V
8	GND

B.7 Power LED (JFP3)

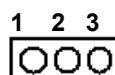


Table B.7: Power LED

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

B.8 External Speaker Connector (JFP2)

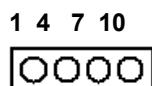


Table B.8: External Speaker Connector

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

B.9 Reset Connector (JFP1)



Table B.9: Reset Connector

Pin	Signal
9	RESET
12	GND

B.10 HDD LED Connector (JFP1)



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)

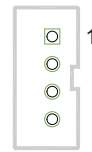


Table B.12: Front panel SMBus connector (SMBUS1)

Pin	Signal
1	+V5
2	SMB_CLK_RESUME
3	SMB_DATA_RESUME
4	GND

B.13 USB/LAN Ports (BMCLAN_USB3C1)

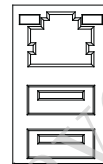


Table B.13: USB Port

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

Table B.14: 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 Audio Connector (HDAUD1)

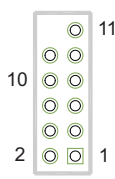


Table B.15: Front panel audio connector

Pin	Signal	Pin	Signal
1	+5V_AUDIO	2	GND
3	ACZ_SYNC	4	ACZ_BITCLK
5	ACZ_SDOUT	6	ACZ_SDIN0
7	ACZ_SDIN1	8	ACZ_RST
9	+12V_AUDIO	10	GND
11	GND		

B.15 Case Open Connector (JCASE1)



Table B.16: Case open connector

Pin	Signal
1	CASEOP
2	GND

B.16 Front Panel LAN LED Connector (LANLED1)

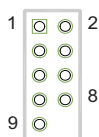


Table B.17: LAN LED connector

Pin	Signal	Pin	Signal
1	LAN1_LED_ACT#	2	LAN2_LED_ACT#
3	+V3.3_AUX	4	+V3.3_AUX
5	LAN3_LED_ACT#	6	LAN4_LED_ACT#
7	+V3.3_AUX	8	+V3.3_AUX
9	NC		

B.17 SATA SGPIO (SGPIO1/SGPIO2)



Table B.18: SATA SGPIO connector

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

B.18 PEHP Connector (PEHP1)

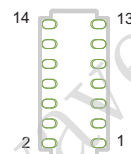


Table B.19: LPC connector (LPC1)

Pin	Signal	Pin	Signal
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.19 Clear CMOS and Update ME Connector (JCMOS1, JME1)



Table B.20: Clear CMOS and update ME connector (JCMOS1, JME1)

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

B.20 PMBUS Connector (PMBUS1)

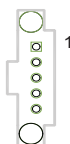


Table B.21: PMBUS connector (PMBUS1)

Pin	Signal
1	SMB_SCL_PM
2	SMB_SDA_PM
3	SMB_ALERT_PM#
4	GND
5	+V3.3_AUX

B.21 GPIO Connector (GPIO1)

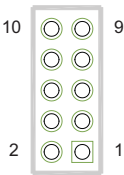


Table B.22: GPIO connector (GPIO1)

Pin	Signal	Pin	Signal
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

B.22 PEHP Connector



Table B.23: PEHP connector

Pin	Signal
1	ALERT
2	CLK
3	DATA
4	GND

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