

ASMB-830 Series

**Socket SP3 (LGA 4094) AMD
EPYC™ 7002/7003 Server Board
with 8 REG-DDR4, 5 PCIe 4.0
x16, 2 PCIe 4.0 x8, 2 M.2 NVMe,
9 SATA3, 5 USB 3.2 Gen1, Dual
10GbE, IPMI**

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This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to a power outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for assistance.

Caution! *There is danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*



Initial Inspection

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

- 1 x ASMB-830 ATX motherboard
- 1 x ASMB-830 Startup Manual
- 1 x Serial ATA HDD data cable
- 1 x I/O port bracket
- 2 x CPU power cables (8P)
- 1 x SATA power cable
- 1 x front panel converter cable
- 2 x screws for an M.2 device
- 1 x warranty card

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the ASMB-830 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. When unpacking the ASMB-830, 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.

Ordering Information

Part Number	Storage	Expansion Slot	IPMI	10GbE LAN	VGA Chip
ASMB-830I-00A1	9*SATA3 + 2*M.2	5 PCIe x16 + 2 PCIe x8 (Gen4)	Yes	No	AST2500
ASMB-830T2-00A1	9*SATA3 + 2*M.2	5 PCIe x16 + 2 PCIe x8 (Gen4)	Yes	Yes	AST2500

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Chapter 1

Overview

1.1 Introduction

The ASMB-830 server board is the most advanced AMD EPYC 7002/7003 Processor family board for server-grade IPC applications that require high-performance computing power and multi-expansion slots. This server board supports DDR4 ECC-REG 3200 MHz memory up to 2048 GB. ASMB-830 is equipped with PCIe 4.0 and provides five PCIe x16 slots and two PCIe x8 slots. In addition, the ASMB-830T2 SKU has dual Gigabit and dual 10GbE Ethernet LAN ports that eliminate network bottlenecks.

One dedicated GbE LAN RJ-45 can be shared with the IPMI function to allow remote-control management. With AST-2500 BMC, high reliability and outstanding performance make ASMB-830 the ideal platform for industrial server/networking applications.

By using EPYC processors, ASMB-830 offers a variety of features such as 5 x USB 3.2 Gen1 connectivity, 2 x Mini-SAS HD (support 8 x SATA III), 1 x SATA III, and 2 x M.2 NVMe (PCIe 4.0) interface. AMD Infinity Guard helps decrease potential attack surfaces as software boots, executes, and it keeps your data protected as it is being processed.

Powered by an EPYC processor, the single-socket ASMB-830 server board delivers compute power that is capable of handling large workloads so that you can satisfy your business requirements without having to scale up to dual-socket servers— thus helping minimize licensing costs and reduce power consumption.

Note!



1. The IPMI module will be included in ASMB-830I and ASMB-830T2 SKUs. Only the ASMB-830T2 SKU can support 10GbE LAN ports.

2. Please refer to the ordering information at the front for IPMI and LAN support for individual product SKUs.

1.2 Features

1.2.1 General

- **AMD EPYC 7002/7003 Series Processor support:** ASMB-830 is equipped with a single CPU socket to support AMD EPYC 7002/7003 Series processors from 8 to 64 cores (or 16 to 128 threads per socket).
- **High performance I/O capability:** 2 x 10GbE + 2 x GbE LAN, 5 x PCIe 4.0 x16 slots (x16 link) + 2 x PCIe 4.0 x8 slots (x8 link), 9 x SATA (incl. 8 via Mini-SAS HD), and 2 x M.2 NVMe 2280/22110, 5 x USB 3.2 Gen1 (incl. 1 x Type-A) ports.
- **Standard ATX form factor with industrial features:** ASMB-830 provides industrial features like a long product lifecycle, reliable operation under a wide temperature range, watchdog timer, etc.
- **IPMI 2.0 support:** ASMB-830 (T2 and I SKUs) is equipped with an ASPEED 2500 BMC chip and supports IPMI 2.0 (Intelligent Platform Management Interface 2.0) via a dedicated LAN and a shared LAN port.
- **KVM over IP:** KVM over IP allows BIOS level remote control of ASMB-830 (T2 and I SKUs) through your own computer.

1.3 Specifications

Table 1.1: Specifications	
Processor	
CPU	■ Single socket LGA4096 SP3 ■ Supports the AMD EPYC 7002/7003 processor family, from 8 to 64 cores (16 to 128 threads) ■ Supports TDP for up to 225 W
System Memory	
Memory Capacity	■ DDR4 memory bus ■ Total 8 memory slots ■ Maximum 128GB ECC-REG per DIMM ■ One DIMM per channel
Memory Type	Supports DDR4 2666/2933/3200 MHz RDIMM/LRDIMM modules
DIMM Sizes	Each memory slot supports 8GB, 16GB, 32GB, 64GB, 128GB memory modules.
Memory Voltage	1.2 V
Error Detection	■ Corrects single-bit errors ■ Detects double-bit errors (using ECC memory)
Onboard Devices	
SoC	AMD EPYC 7002/7003 SoC
Network Controllers	■ 2 x Intel® X550 10GbE and 2 x Intel® I210 Gigabit Ethernet Controllers connected to an AMD EPYC CPU (ASMB-830I & T2 SKUs) ■ Network supports 10GbE 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 functionality.
EC	ITE IT8528E chip provides motherboard, keyboard, mouse, RS-232, and hardware monitor functions.
BMC Chip	One Realtek 8201F Gigabit PHY connected to AST2500 for BMC remote management (ASMB-830I & T2 SKUs)
Input/Output	
Storage	■ Total 9 x SATA ports and 2 x M.2 (SATA/PCIe x4 compatible) provides SATA 6 Gb/s and PCIe 8 Gb/s bandwidth
LAN	■ 4 x RJ-45 LAN ports (2 x 10GbE + 2 x GbE LAN) ■ 1 x RJ-45 dedicated IPMI LAN port (10/100 Mbps) for IPMI only, there is no regular LAN function (ASMB-830I & T2 SKUs)
USB	■ 2 x USB 3.2 Gen1 ports at the rear window ■ 1 x USB 3.2 Gen1 internal header (2 ports) ■ 1 x USB 3.2 Gen1 internal Type-A port
Graphics	■ 1 x VGA port.
Keyboard/Mouse	■ PS/2 keyboard and mouse internal header (onboard)
Serial Port/Header	■ 1 x RS232 port at the rear window, 1 x internal header (2 x 5P pitch: 2.50 mm)

Table 1.1: Specifications

Power Connector	
System Power	1 x 24-pin SSI EPS 12V power connector (Input 12V, 5V, 3.3V, 5Vsb)
CPU Power	2 x 8-pin SSI EPS 12V power connector for CPU & memory power (12V)
PCIe slot power	1 x 8-pin 12V power connector for PCIe slot 12V input
Expansion Slots	
PCI-Express Gen4	■ 5 x PCIe x16 slots – PCIe16_SLOT1 (Gen4 x16 link, from CPU) – PCIe16_SLOT3 (Gen4 x16 link, from CPU) – PCIe16_SLOT5 (Gen4 x16 link, from CPU) – PCIe16_SLOT6 (Gen4 x16 link, from CPU) – PCIe16_SLOT7 (Gen4 x16 link, from CPU) ■ 2 x PCIe x8 slots – PCIe8_SLOT2 (Gen4 x8 link, from CPU) – PCIe8_SLOT4 (Gen4 x8 link, from CPU)
System BIOS	
BIOS Type	128 Mb SPI Flash EEPROM with AMI BIOS
PC Health Monitoring	
Voltage	Monitors for CPU Cores, +3.3V, +5V, +12V, +5V Standby, VBAT
FAN	■ One 4-pin header for the CPU cooler and six 4-pin headers for system fans (front*5 + rear*1) ■ All fans have 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 6/6 Pb-Free Compliant
Environmental Spec.	■ Operating temperature: 0 to 60 °C ■ Non-operating temperature: -40 to 85 °C ■ Operating relative humidity: 10% to 95% (non-condensing) ■ Non-operating relative humidity: 10% to 95% (non-condensing)

1.4 Board Layout, Jumpers and Connectors

Connectors on the ASMB-830 are linked to external devices such as hard disk drives. In addition, ASMB-830 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-830.

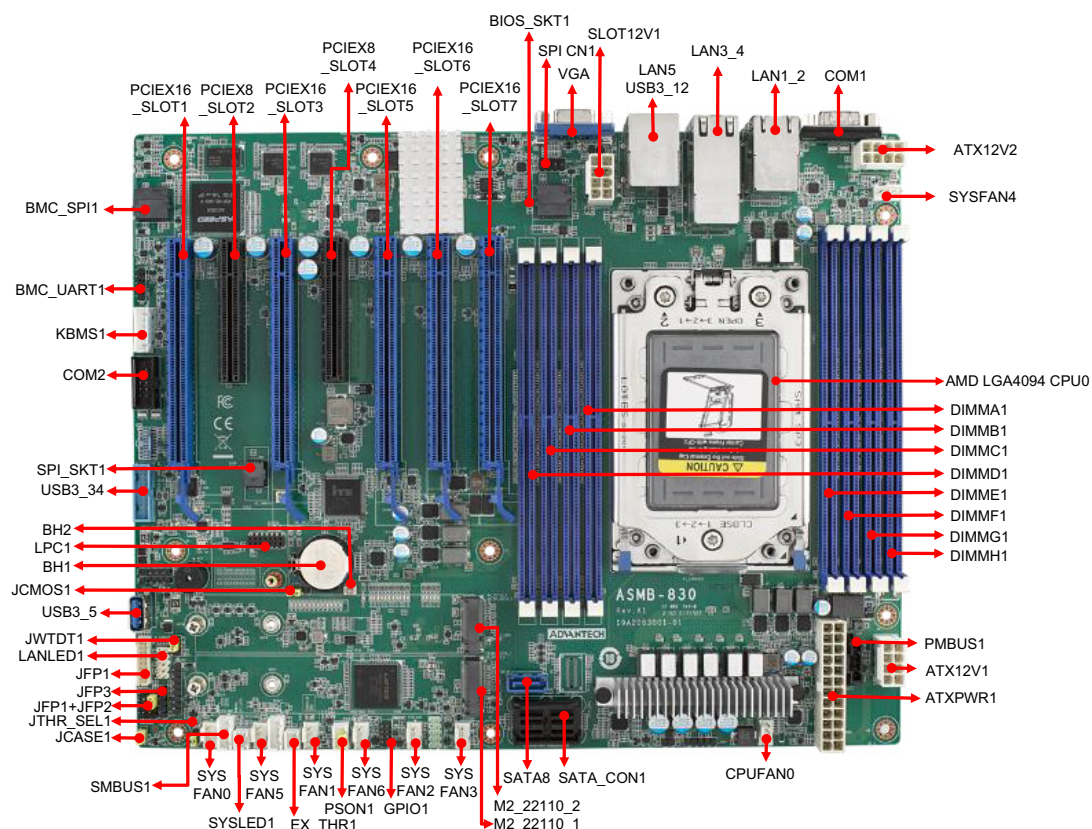


Figure 1.1 Board Layout

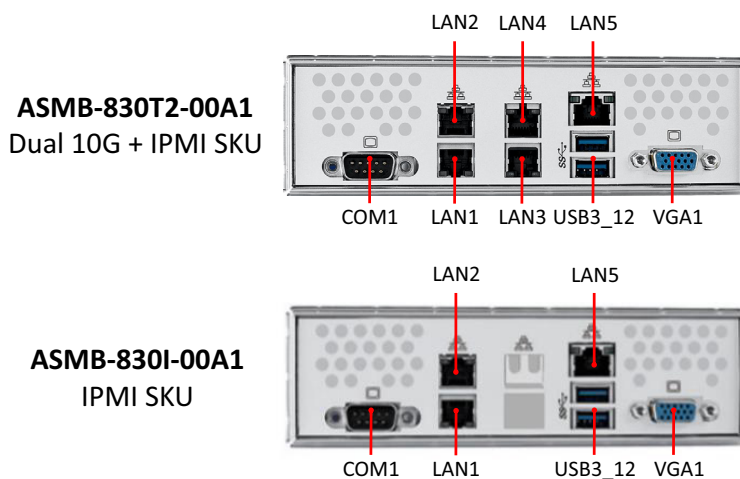


Figure 1.2 Rear I/O of the Two SKUs

- LAN 4 is a shared LAN with BMC.
- LAN 5 is a dedicated BMC LAN.

Table 1.2: Onboard LAN LED Color Definition

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

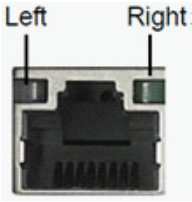
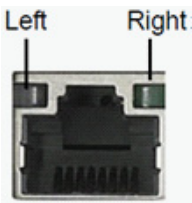
		LAN1 & LAN2 (1G)	
		LAN3 & LAN4 (10G)	
		Left LED	Right LED
10 Mbps	Link Active	Off Off	Green Blinking green
100 Mbps	Link Active	Amber Amber	Green Blinking green
1000 Mbps	Link Active	Green Green	Green Blinking green
		LAN1 & LAN2 (1G)	
		Left LED	Right LED
10 Mbps	Link Active	Off Off	Green Blinking green
100 Mbps	Link Active	Amber Amber	Green Blinking green
1000 Mbps	Link Active	Green Green	Green Blinking green
No Link		Off	Off

Table 1.3: Jumpers

Label	Function	Default
JCMOS1	Clear CMOS	1-2
JWDT1	Watchdog timer reset	1-2
PSON1	AT(1-2) / ATX(2-3)	2-3
JCASE1	Chassis case open alarm	1-2
JTHR_SEL	Onboard (1-2) / external thermistor (2-3)	1-2



Keep CMOS data



Clear CMOS data

Table 1.4: Connectors

Label	Function
ATX12V1	SSI EPS 12V auxiliary power connector for CPU0 and memory
ATX12V2	SSI EPS 12V auxiliary power connector
ATXPWR1	SSI EPS 24-pin main power connector (for system)
BH2	For optional battery kit
BIOS_SKT1	BIOS SPI ROM
BMC_SPI1	BMC SPI ROM
COM2	Serial port: RS-232
CPU0	AMD LGA4094 CPU0 socket
CPUFAN0	CPU0 fan connector (4-pin)
DIMMA1	Channel A DIMM1
DIMMB1	Channel B DIMM1
DIMMC1	Channel C DIMM1
DIMMD1	Channel D DIMM1
DIMME1	Channel E DIMM1
DIMMF1	Channel F DIMM1
DIMMG1	Channel G DIMM1
DIMMH1	Channel H DIMM1
EX_THR1	Connector for external thermistor
GPIO1	GPIO function for customized usage
JFP1/JFP1+JFP2/JFP3	Front panel pin header
KBMS1	For additional keyboard/mouse
LAN1_2, LAN3_4	RJ-45 LAN connector
LAN5	IPMI dedicated LAN connector
LANLED1	LAN LED extension connector
LPC1	LPC port for debug & TPM module
M2_22110_1	M.2 connector (SATA & PCIe x4)
M2_22110_2	M.2 connector (PCIe x4)
PMBUS1	PMBUS connector to communicate with power supply
SATA_CON1, SATA8	Serial ATA0~8 (SATA 0~7 via SFF8643 connector)
PCIEX16_SLOT1	PCIe x16 slot (x16 link) (CPU)
PCIEX8_SLOT2	PCIe x8 slot (x8 link) (CPU)
PCIEX16_SLOT3	PCIe x16 slot (x16 link) (CPU)
PCIEX8_SLOT4	PCIe x8 slot (x8 link) (CPU)
PCIEX16_SLOT5	PCIe x16 slot (x16 link) (CPU)
PCIEX16_SLOT6	PCIe x16 slot (x16 link) (CPU)
PCIEX16_SLOT7	PCIe x16 slot (x16 link) (CPU)
SLOT12V1	For PCIe slot 12V input only
SMBUS1	SMBus header (SMBus from either BMC or CPU)
SPI_CN1	Connector for BIOS update tool
SPI_SKT1	EC EEPROM
SYSFAN0~SYSFAN6	System FAN connector
SYS_LED1	System LED connector
USB3_12, USB3_34, USB3_5	USB 3.2 port 1, 2; USB 3.2 port 3, 4 (20-pin header); USB 3.2 port 5 (Type-A)
VGA1, COM1	VGA & COM connector

Table 1.5: Onboard LED			
LED	Description	LED Definition	
+5V_LED1	Power on LED	Off: Power off	On (Green): System is on
+5V_S-B_LED1	Standby LED	Off: No input AC Power	On (Green): System is on, in sleep mode, or in soft-off mode
BMC_H-BLED1	BMC heartbeat LED (ASMB-830 T2 and I SKUs)	Blinking (Green): Controller is working normally	

1.5 Block Diagram

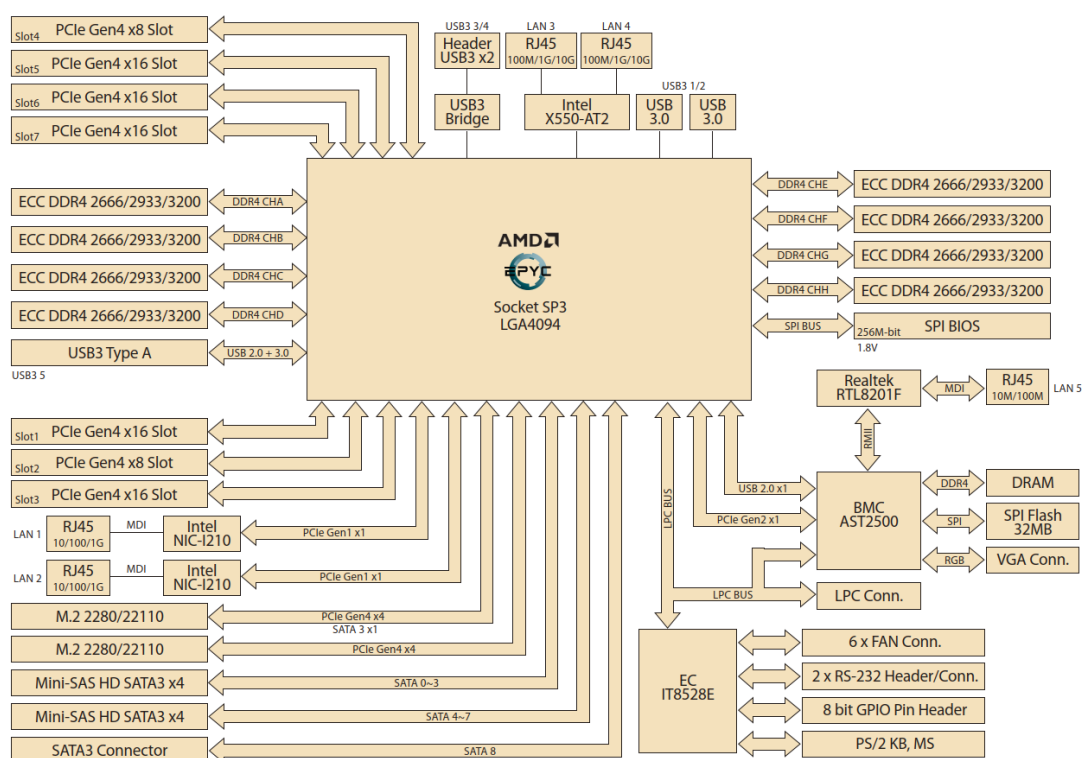


Figure 1.3 Block Diagram

1.6 System Memory

ASMB-830 has 8 x 288-pin memory slots for DDR4 2666/2933/3200 MHz memory modules, maximum 128 GB for each DIMM. ASMB-830 supports registered DIMM memory modules.

1.7 Installation of Memory Modules

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 EPYC processor. Based on the guideline, you may adjust your memory configuration according to your PCIe expansion card configuration.

The motherboard will support odd-numbered modules (1 or 3 modules installed) but is unable to activate Dual Channel Technology. For great performance, a balanced memory population is recommended.

Table 1.6: DIMM Configurations with a Single CPU					
	Quantity of memory installed				
	1	2	4	6	8
DIMMA1				V	V
DIMMB1					V
DIMMC1	V	V	V	V	V
DIMMD1		V	V	V	V
DIMME1				V	V
DIMMF1					V
DIMMG1			V	V	V
DIMMH1			V	V	V

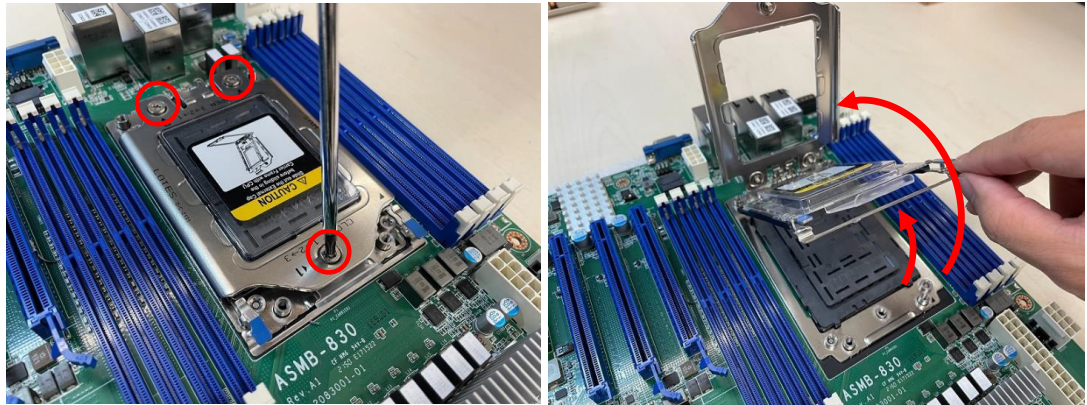
Note! 3, 5, 7 DIMMs are not recommended DIMM populations.



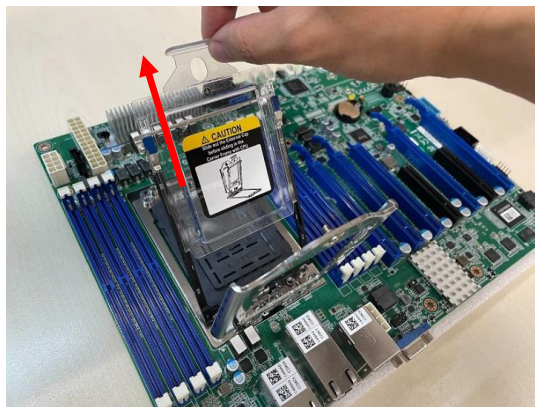
1.8 Processor Installation

The ASMB-830 is designed for AMD EPYC 7002/7003 Series processors.

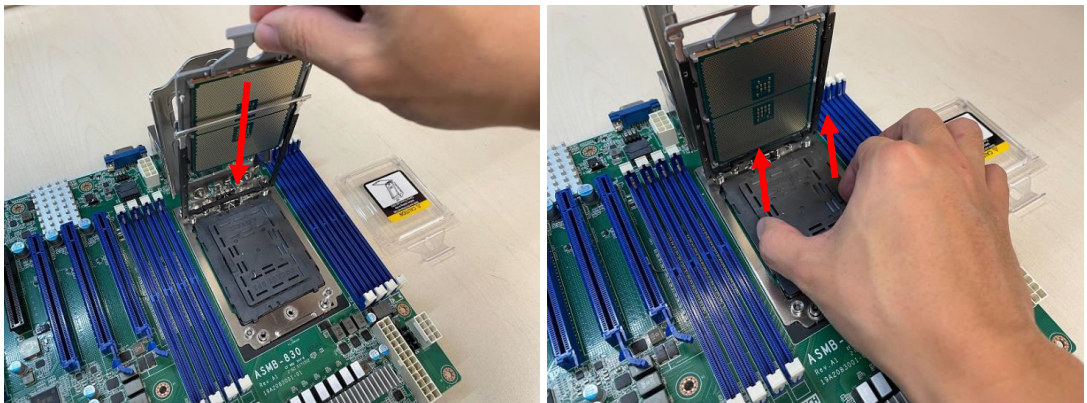
1. Unscrew the three screws (shown above in red circles) on the top of the socket retention mechanism (SRM), then rotate the Retention Frame and Rail Frame (with external cap).



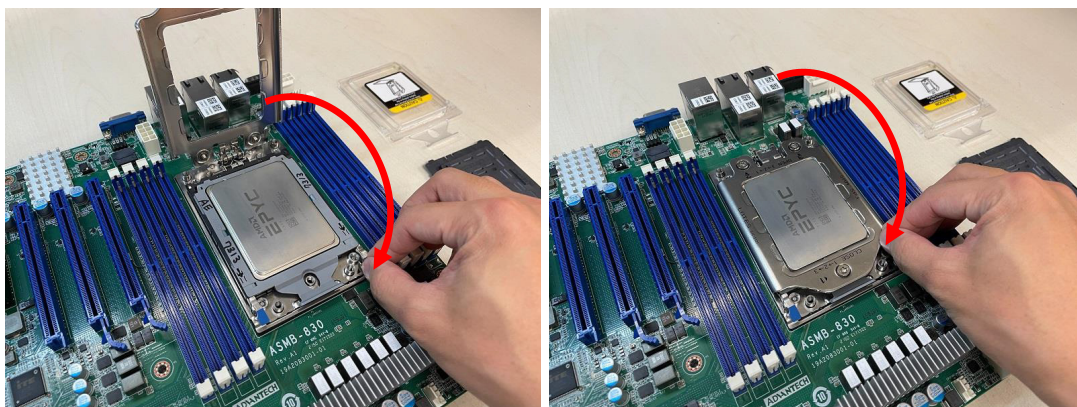
2. Remove the external cap by pulling upwards.



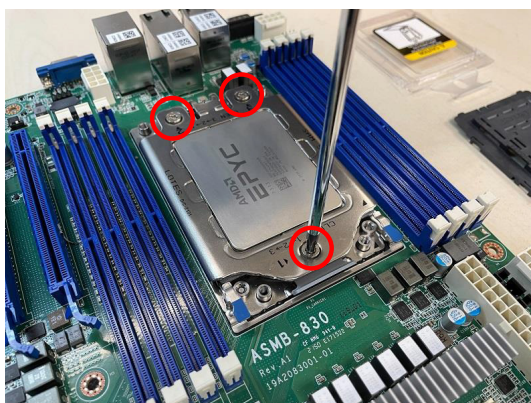
3. Install the carrier frame/CPU package to the rail frame, then remove the PnP cover cap. Be very careful not to drop the PnP cover cap into the exposed contact field during the removal process.



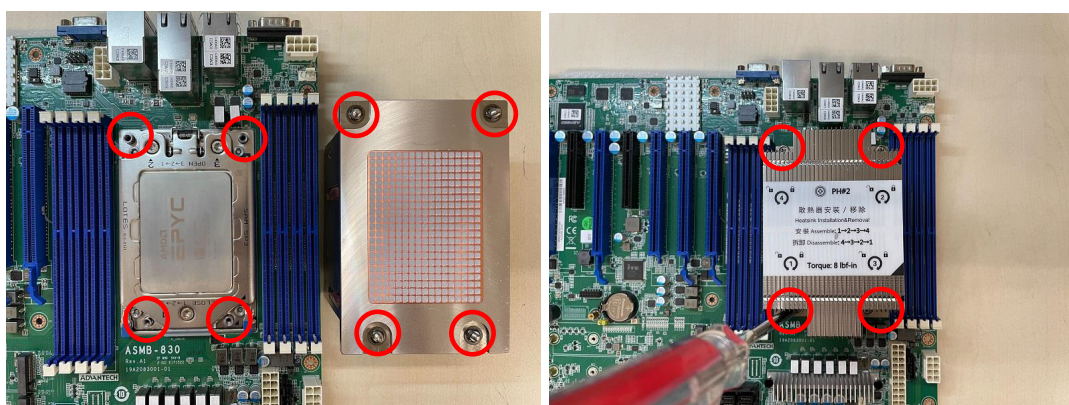
4. Rotate and push the rail frame and retention frame until they are in the horizontal position.



5. Tighten the three screws (shown above in red circles) by using a T-20 screwdriver.



6. Install the processor heatsink module into the socket retention mechanism (SRM) by using a T-20 screwdriver (follow the heatsink label direction 1-2-3-4).



Chapter 2

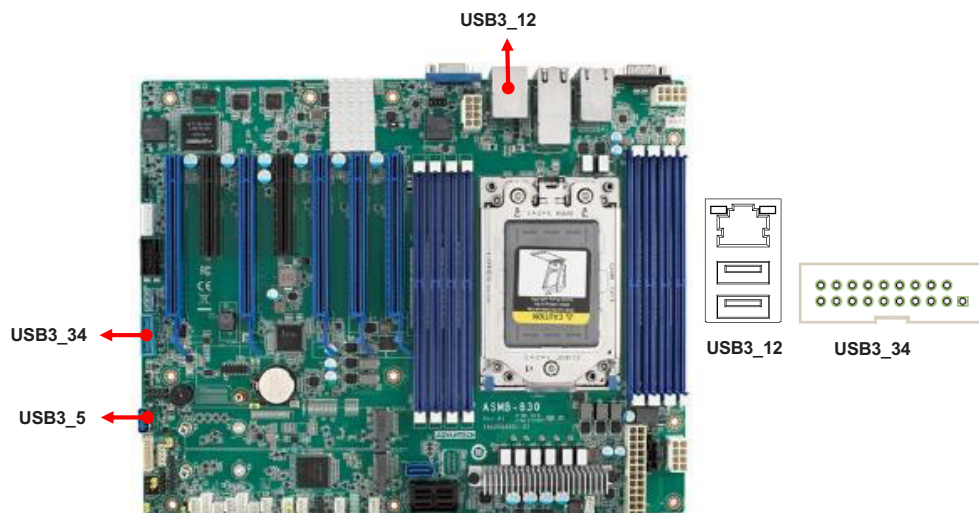
Connections

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.

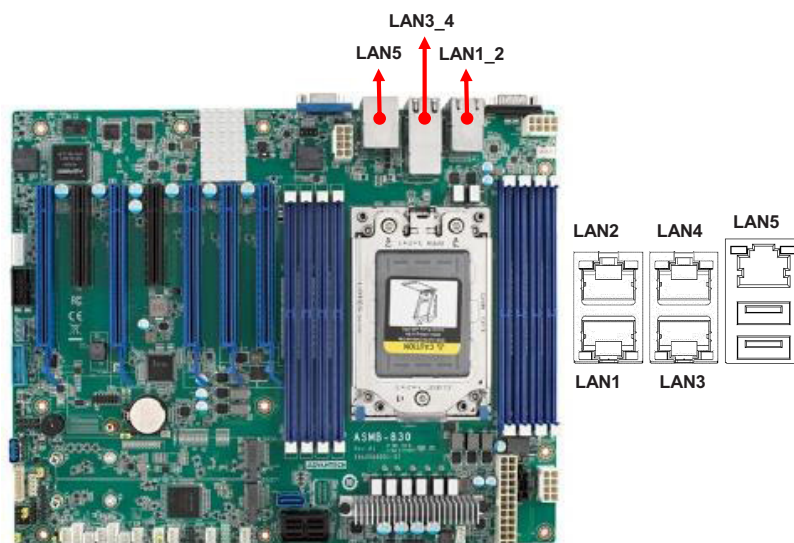
2.2 USB Ports (USB3_12, USB3_34, USB3_5)

The USB ports comply with USB 2.0 and USB 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.



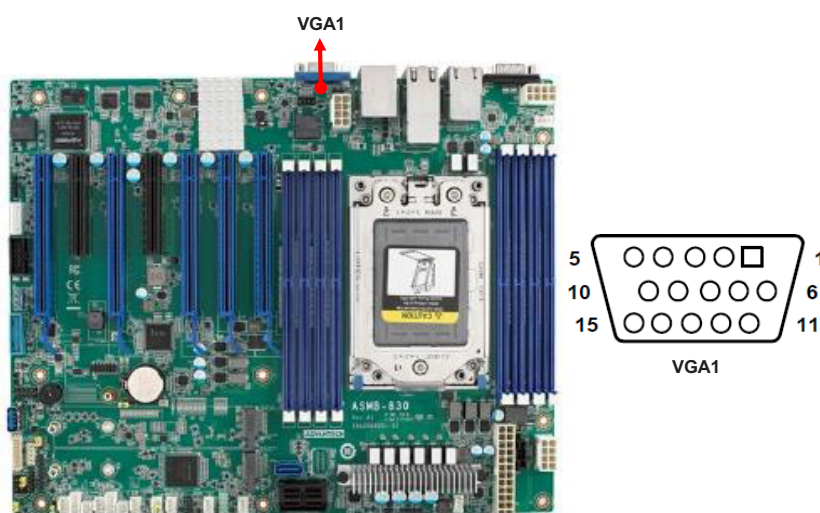
2.3 LAN Ports (LAN1_2, LAN3_4, LAN5)

The ASMB-830 is equipped with two 10GbE and two GbE LAN ports. They are all with RJ-45 jacks and supported by all major network operating systems. One GbE LAN (LAN5) is shared with IPMI for system management.



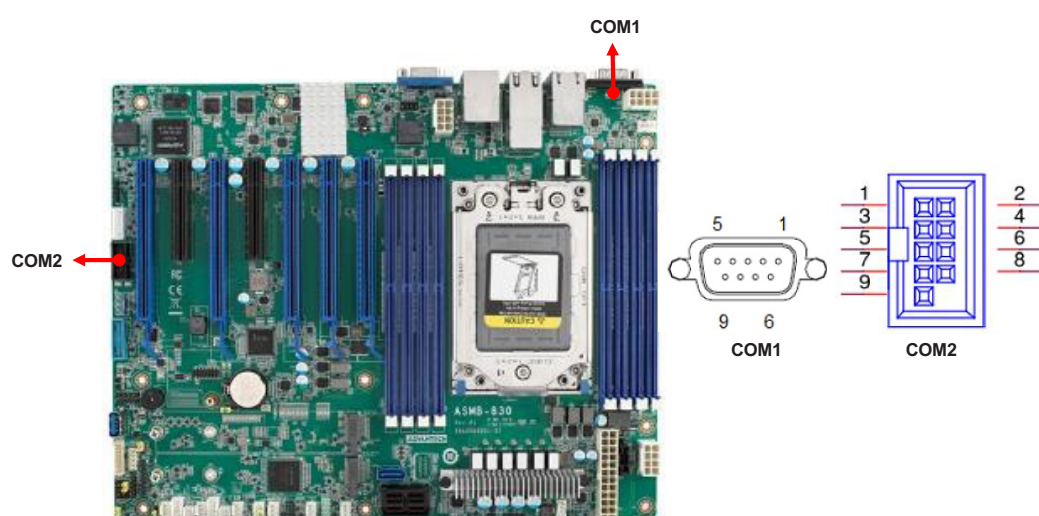
2.4 VGA Connector (VGA1)

The ASMB-830 includes a VGA interface that can drive conventional CRT and LCD displays.



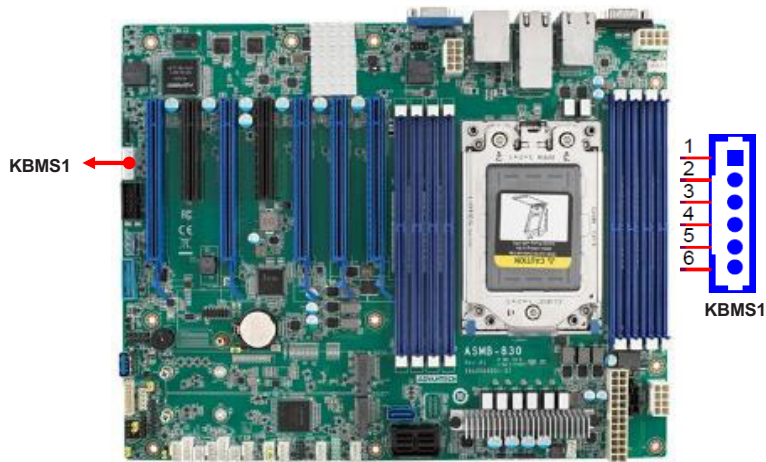
2.5 Serial Ports (COM1, COM2)

The ASMB-830 offers one serial port on the rear plate and one 2.50 mm on board with 2 x 5-pin pitch.



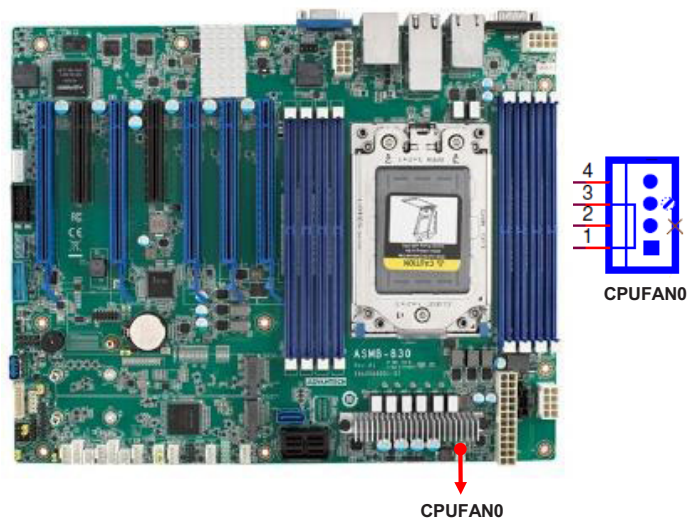
2.6 PS2 Keyboard and Mouse Connectors (KBMS1)

The 6-pin KBMS1 connector is for additional keyboard and mouse devices.

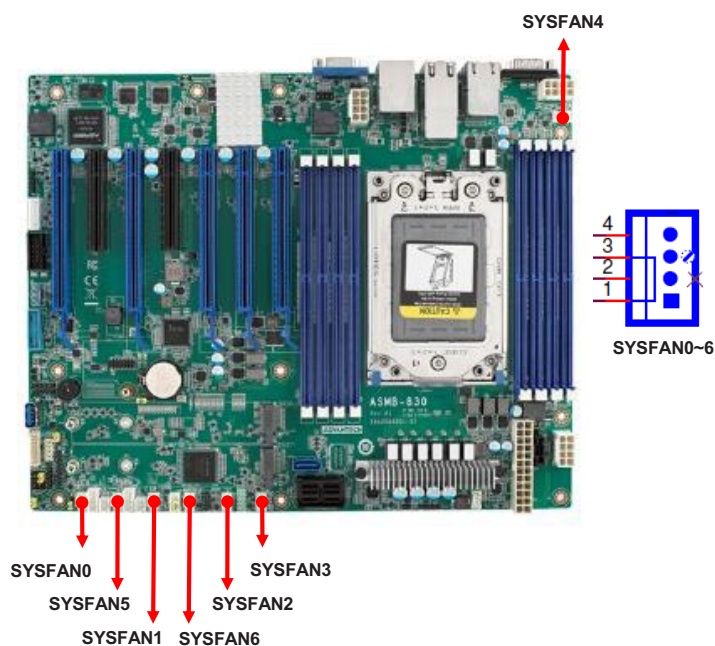


2.7 CPU Fan Connector (CPUFAN0)

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

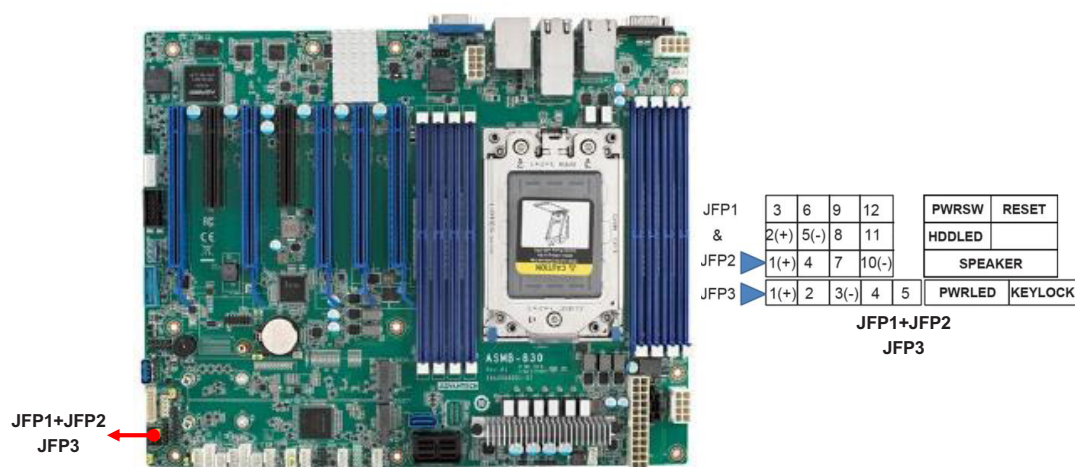


2.8 System Fan Connector (SYSFAN0~6)

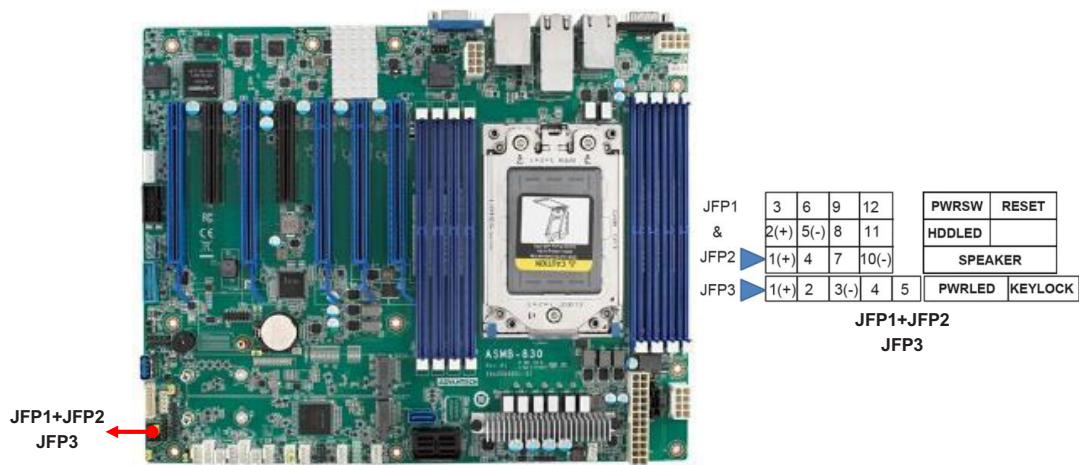


2.9 Front Panel Connector (JFP1+JFP2, JFP3)

There are several external switches and LEDs to monitor and control the ASMB-830.



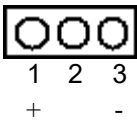
There are several external switches and LEDs to monitor and control the ASMB-830.



2.9.1 Power LED (JFP3)

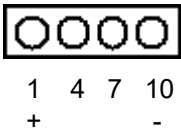
JFP3 pin 1 and pin 3 are for the power LED. Refer to Appendix B for detailed information on the pin assignments. If an ATX power supply is used, the system’s power LED status will be as indicated.

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



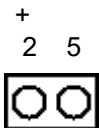
2.9.2 External Speaker (JFP1+JFP2 Pins 1, 4, 7, 10)

JFP1+JFP2 pins 1, 4, 7, and 10 connect to an external speaker. ASMB-830 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 7-10 as closed.



2.9.3 HDD LED Connector (JFP1+JFP2 Pins 2 & 5)

You can connect an LED to JFP1+JFP2 to indicate when the HDD is active.



2.9.4 Reset Connector (JFP1+JFP2 Pins 9 & 12)

Many computer cases offer the convenience of a reset button.

9 12



2.10 Front Panel Connector (JFP1)

There are several external switches and LEDs to monitor and control the ASMB-830.



2.0 mm JPF on board			
Description	Pin Number		Description
RST BTN	2	▼1	PWR BTN
RST GND	4	3	PWR GND
LAN1_LED+	6	5	LAN2_LED+
LAN1_LED-	8	7	LAN2_LED-
CRPS Detect (Reserved)	10	9	SYS_LED+ (Reserved)
GND	12	11	SYS_LED- (Reserved)
PWR_LED+	14	13	HDD_LED+
PWR_LED-	16	15	HDD_LED-

2.0 mm JPF to 2.54 mm Pitch Header			
Description	Pin Number		Description
(Red) PWR BTN	▼1	2	RST BTN (White)
(Black) PWR GND	3	4	RST GND (Black)
(Blue) LAN1_LED+	5	6	LAN2_LED+ (Brown)
(Red) LAN1_LED-	7	8	LAN2_LED- (Black)
		Key	
(Orang) HDD_LED+	13	14	PWR_LED+ (Red)
(Black) HDD_LED-	15		
	Key	16	PWR_LED- (Black)

2.10.1 ATX Soft Power Switch (Pins 1, 3)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to pins 1 and 3 on JFP1. This connection enables you to turn your computer on and off.

2.10.2 Reset Connector (Pins 2, 4)

JFP1 pins 2 & 4 are for a reset button.

2.10.3 Front Panel LAN Indicator Connector (Pins 5, 6, 7, 8)

You can connect an LED to connector JFP1 to indicate when LAN1 & LAN2 are active.

2.10.4 HDD LED Connector (Pins 13, 15)

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

2.10.5 Power LED (Pins 14, 16)

Refer to Appendix B for detailed information on the pin assignments. If an ATX power supply is used, the system's power LED status is as follows.

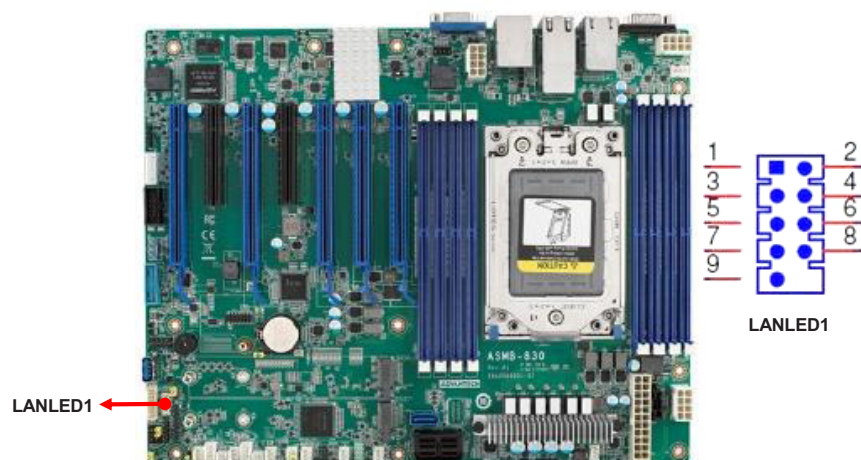
Table 2.2: Power LED (Pins 14, 16)	
Power Mode	LED Status
System On	On
System Suspend	Fast Flash (S1, S3) / Slow Flash (S4)
System Off	Off
System Off in deep sleep	Off

2.11 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 has been opened. The default function is disabled and Pins 1 and 2 are bridged by a jumper cap.

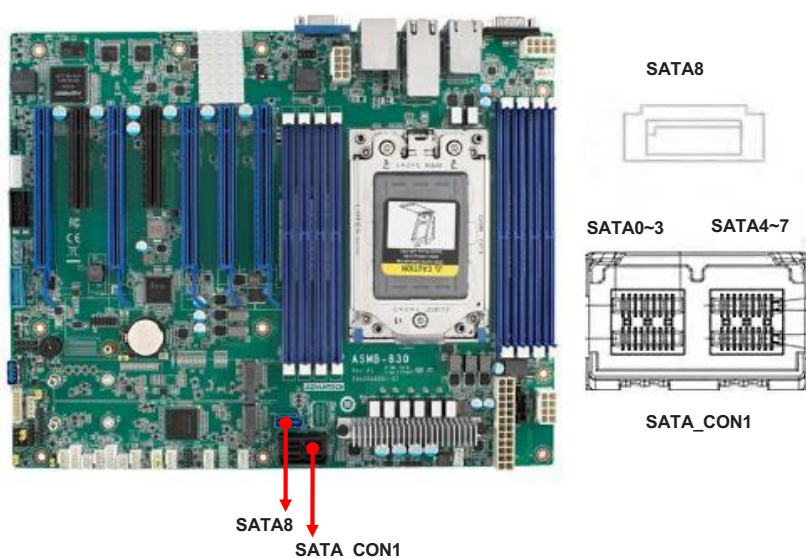


2.12 Front Panel LAN Indicator Connector (LANLED1)



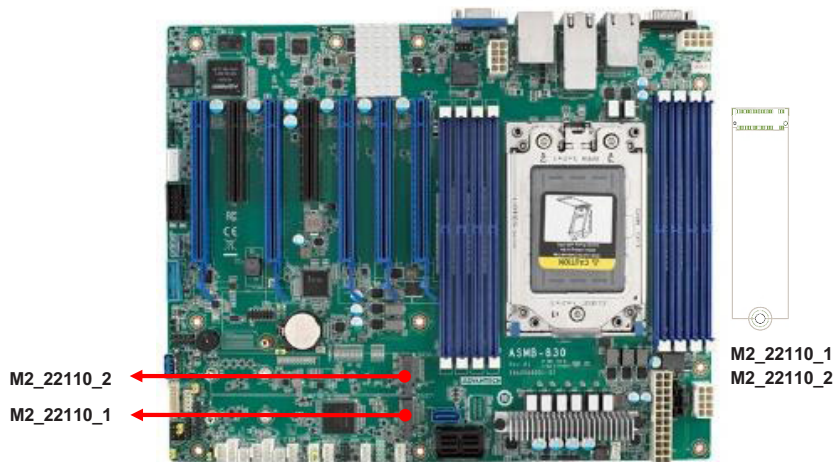
2.13 SATA Connector (SATA_CON1, SATA8)

ASMB-830 features eight serial ATA III interfaces (up to 600 MB/s) and eases cabling to hard drives with long and thin cables.



2.14 M.2 Connector (M2_22110_1, M2_22110_2)

The M.2 22110 connector can support both SATA and PCIe SSD devices.



2.15 PCIe Expansion Slots

The ASMB-830 provides seven expansion slots that can support four double-deck cards. The riser card for 1U or 2U chassis can be used in slot 6 only.

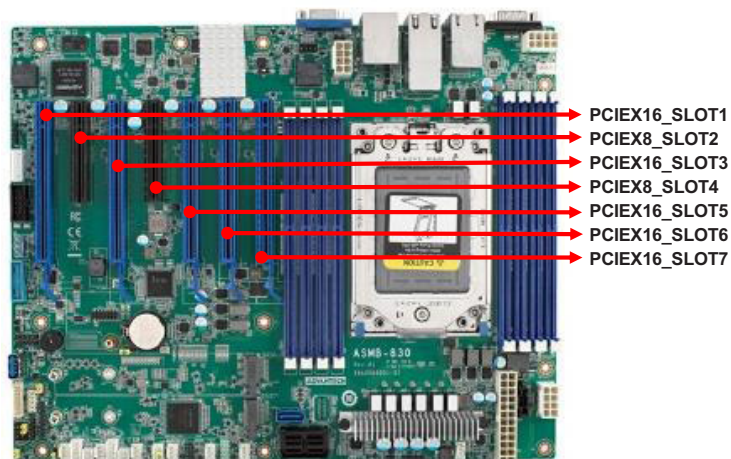


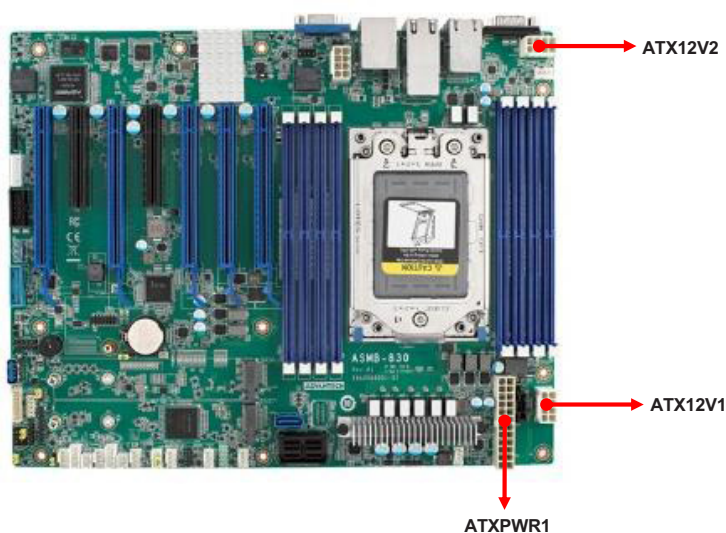
Table 2.3: PCIe Expansion Slots

	Slot Length	Link	PCI-E Generation	PCIe link from
SLOT1	PCI-E x16	PCI-E x16	4	CPU
SLOT2	PCI-E x8	PCI-E x8	4	CPU
SLOT3	PCI-E x16	PCI-E x16	4	CPU
SLOT4	PCI-E x8	PCI-E x8	4	CPU
SLOT5	PCI-E x16	PCI-E x16	4	CPU
SLOT6	PCI-E x16	PCI-E x16	4	CPU
SLOT7	PCI-E x16	PCI-E x16	4	CPU

Table 2.4: Part Numbers

	Part Number	Description	Remarks
Riser Card	ASMB-RF388-21A1E	ASMB-RF388 (2U riser card)	2*PCI-E x8 or 1*PCI-Ex8 + 2*PCI-E x4
	ASMB-RF348-21A1E	ASMB-RF348 (2U riser card)	2*PCI-E x4 + 1*PCI-Ex8
	ASMB-RF1F-10A1E	ASMB-RF10F (1U riser card)	1*PCI-E x16

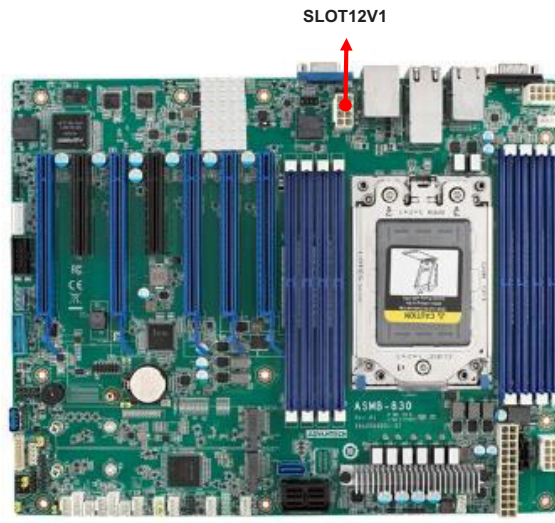
2.16 Auxiliary Power Connector (ATXPWR1/ ATX12V1/ATX12V2)



- Note!**
1. Please use a power supply of SSI type; minimum output should be at least 700W with 5Vsb @ 2.5A.
 2. ATXPWR1 & ATX12V1 & ATX12V2 should be all connected to the power supply, otherwise ASMB-830 will not boot up normally.



2.17 PCIe Power Connector (SLOT12V1)



Note! This EPS style connector is only necessary if PCIe cards that draw more than 70 watts from the PCIe bus are installed on the motherboard.



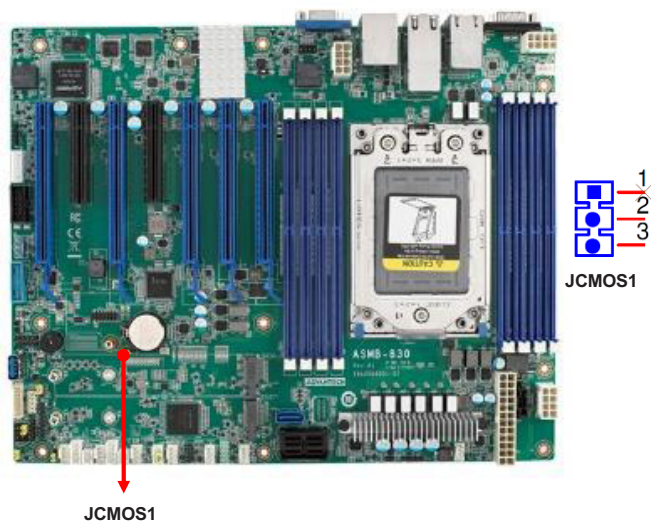
2.18 LPC Connector (LPC1)

ASMB-830 has one LPC connector that can be used to install Advantech's TPM Module (P/N: PCA-TPM-00A1E, PCA-TPM-00B1E) for security management.

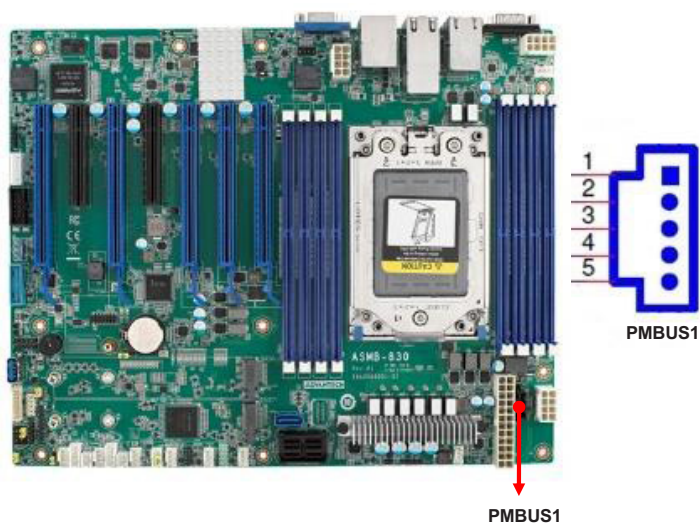


2.19 Clear CMOS Connector (JCMOS1)

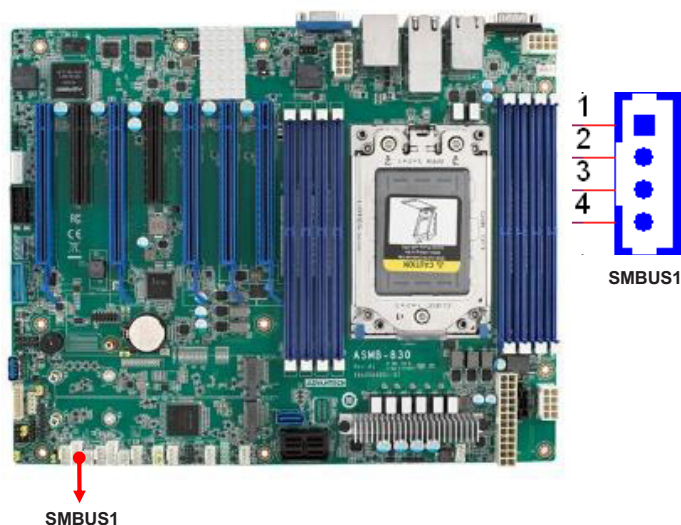
Setting the jumper from pins 1-2 to pins 2-3, then back to pins 1-2 resets the CMOS data.



2.20 PMBUS Connector (PMBUS1)

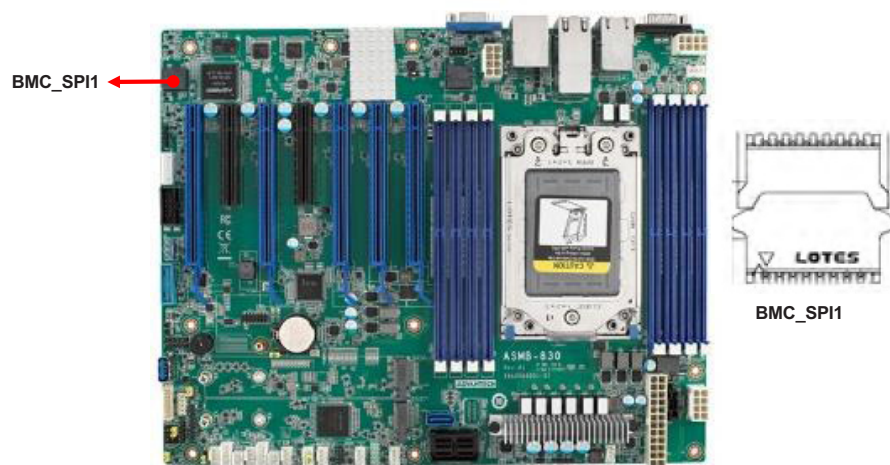


2.21 Front Panel SMBUS Connector (SMBUS1)

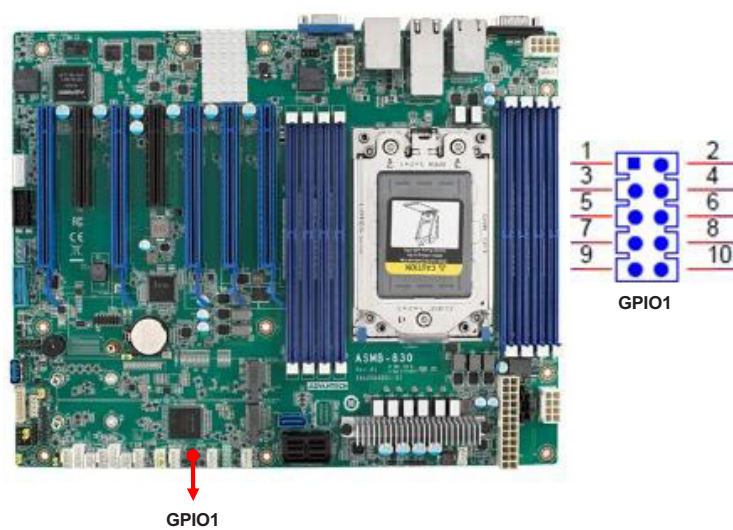


2.22 BMC IC Socket (BMC_SPI1)

The IPMI feature can be enabled with BMC_SPI1. The BMC IC socket has already been pre-installed on ASMB-830I and ASMB-830T2.



2.23 GPIO Connector (GPIO1)



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 special features on or off. This chapter describes the basic navigation of the ASMB-830 setup screens.



Figure 3.1 Main Setup Screen

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 CMOS which is backed up by a battery to retain 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 Entering 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 the arrow keys to select among the items and press <Enter> to accept or enter the submenu.



Figure 3.2 Main Setup Screen

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 legend. Above the 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.

3.2.2 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.

3.3 Advanced BIOS Features Setup

Select the Advanced tab from the ASMB-830 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 submenu 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 submenus are described on the following pages.

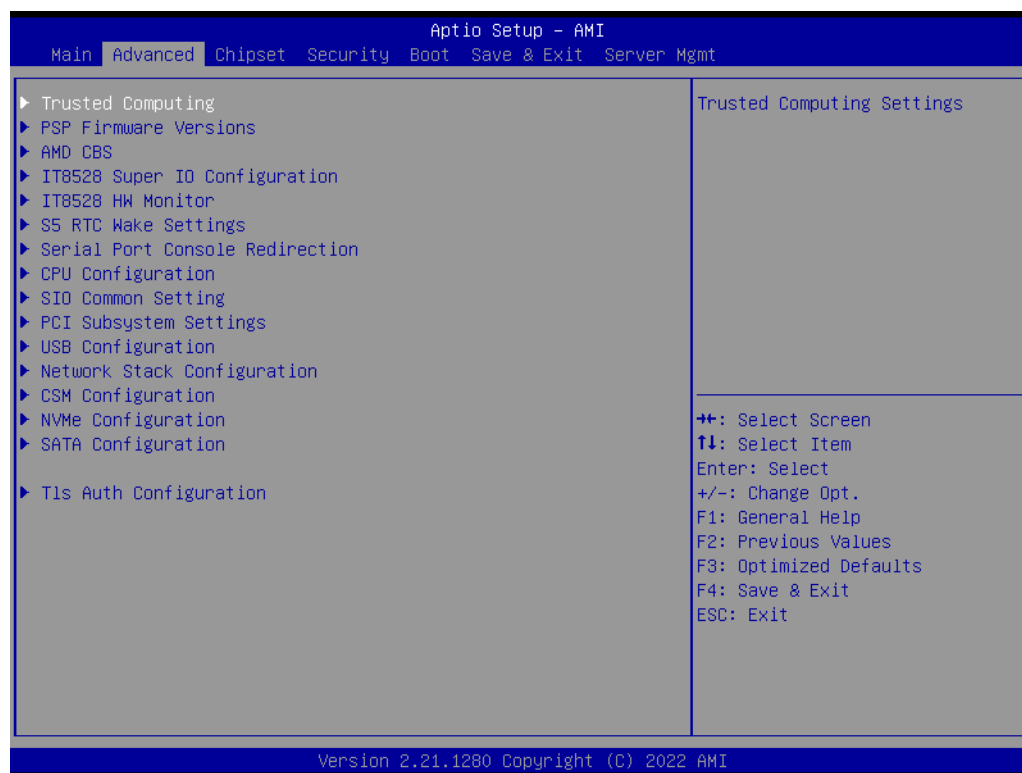


Figure 3.3 Advanced BIOS Features Setup Screen

3.3.1 Trusted Computing



Figure 3.4 Trusted Computing Screen

- **Security Device Support**
Enables or Disables BIOS support for security devices.

Note! Purchase the Advantech LPC TPM module to enable the TPM function.
P/N: PCA-TPM-00A1E_B1E.



3.3.2 PSP Firmware Versions

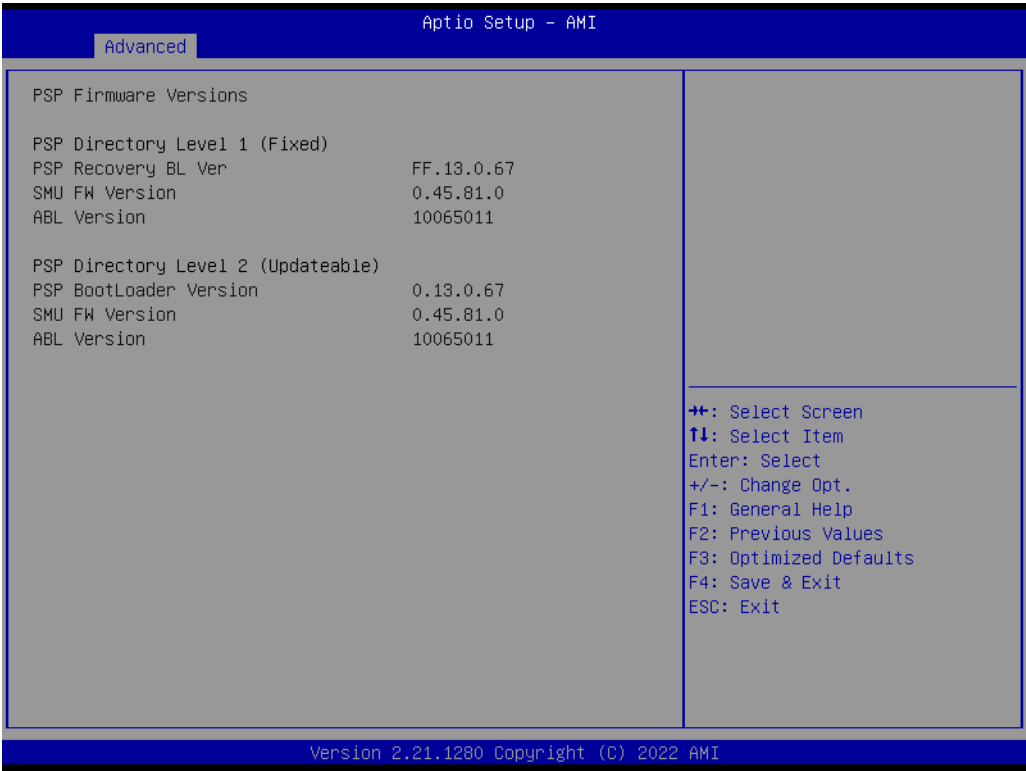


Figure 3.5 PSP Firmware Versions Screen

3.3.3 AMD CBS

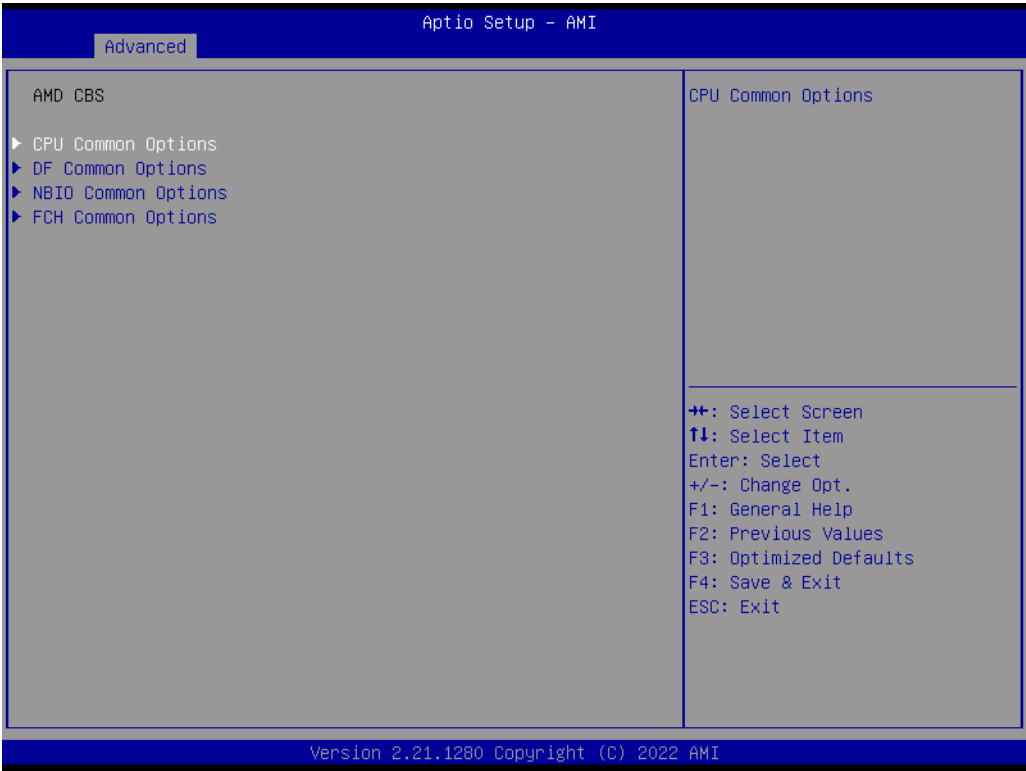


Figure 3.6 AMD CBS Screen

3.3.3.1 CPU Common Options

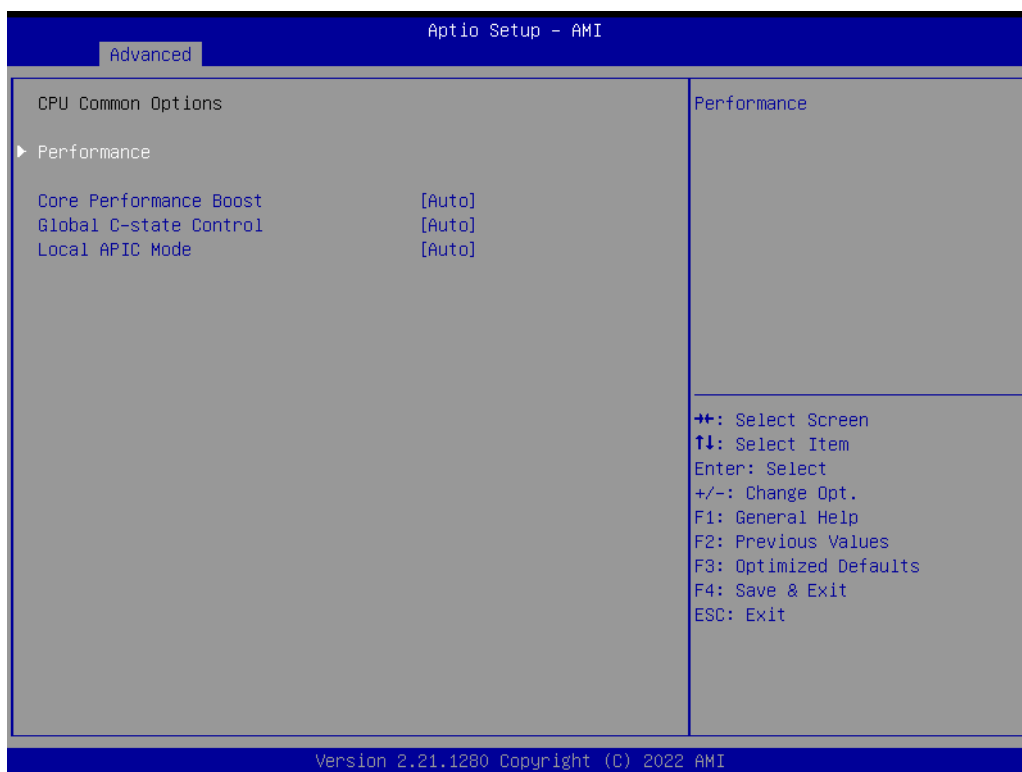


Figure 3.7 CPU Common Options Screen

- **Core Performance Boost**
Enable or Disable Core Performance Boost (CPB) options.
- **Global C-state Control**
Controls I/O-based C-state generation and DF C-states.
- **Local APIC Mode**
Select local APIC mode:
Compatibility, xAPIC or x2APIC.

■ Performance

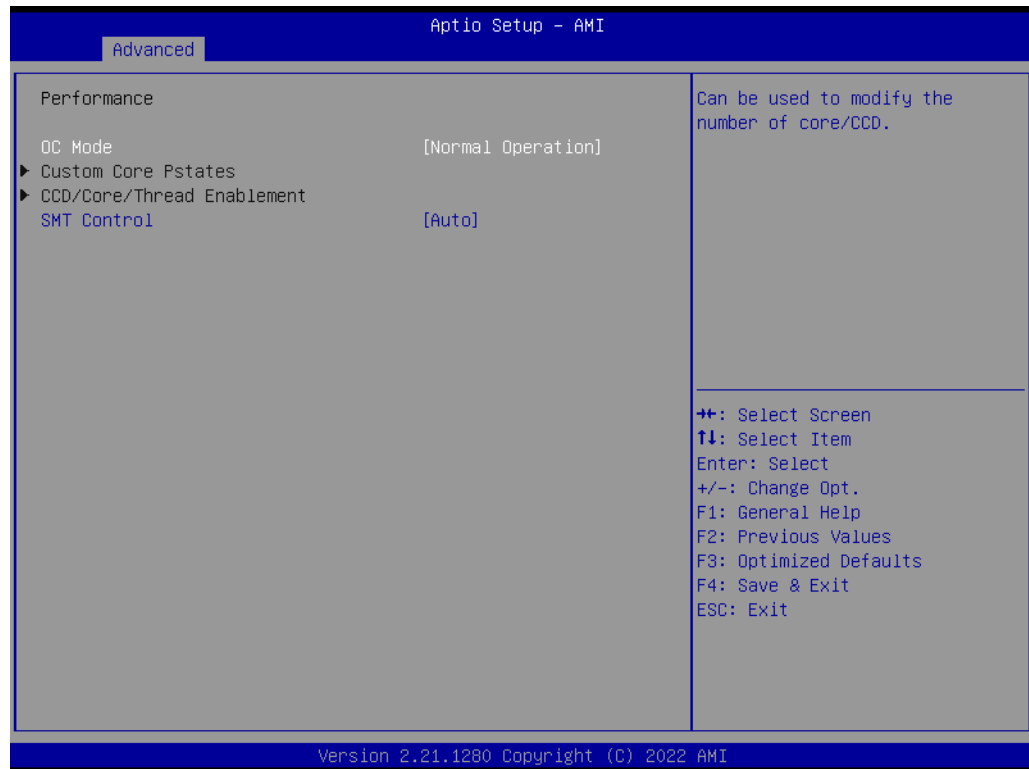


Figure 3.8 CPU Common Options - Performance Screen

- **OC Mode**
Can be used to modify the number of cores/CCD.
- **Custom Core P-states**
- **CCD/Core/Thread Enablement**
- **SMT Control**
Can be used to disable symmetric multithreading. To re-enable SMT, a POWER CYCLE is needed after selecting the 'Enable' option. Select 'Auto' based on the BIOS PCD (PcdAmdSmtMode) default setting.

3.3.3.2 DF Common Options



Figure 3.9 DF Common Options Screen

■ Memory Addressing



Figure 3.10 DF Common Options - Memory Addressing Screen

- **NUMA nodes per socket**
Specifies the number of desired NUMA nodes per socket.

3.3.3.3 NBIO Common Options

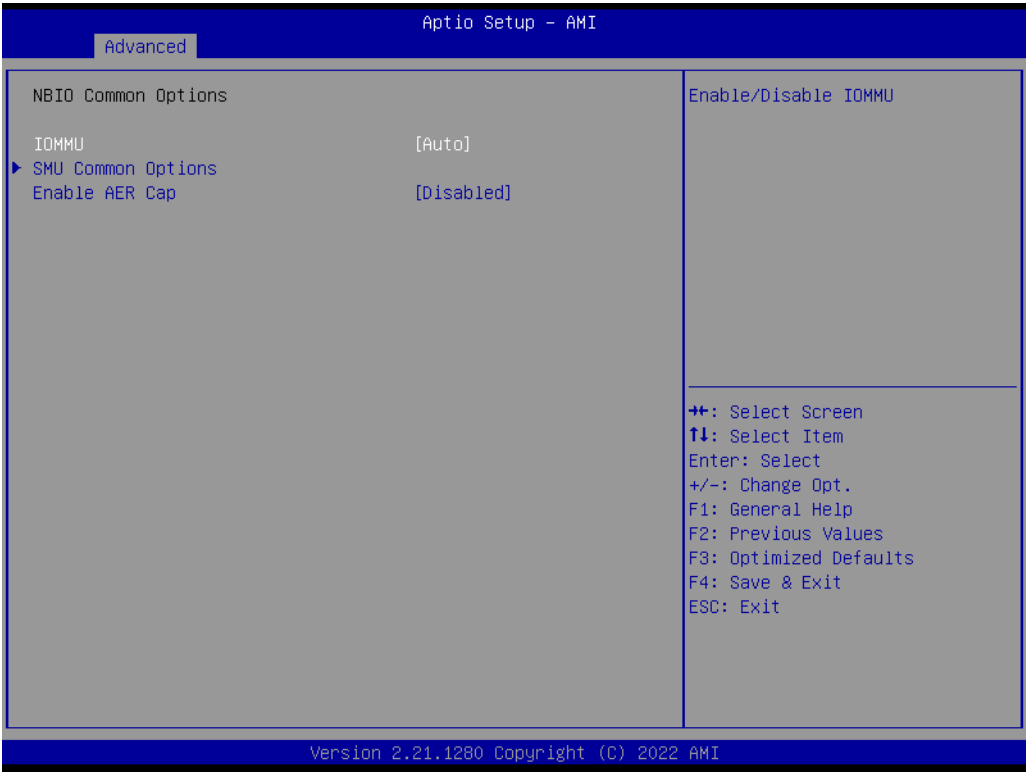


Figure 3.11 NBIO Common Options Screen

- **IOMMU**
Enable or Disable IOMMU function.
- **Enable AER Cap**
Enables Advanced Error Reporting Capability.

■ **SMU Common Options**

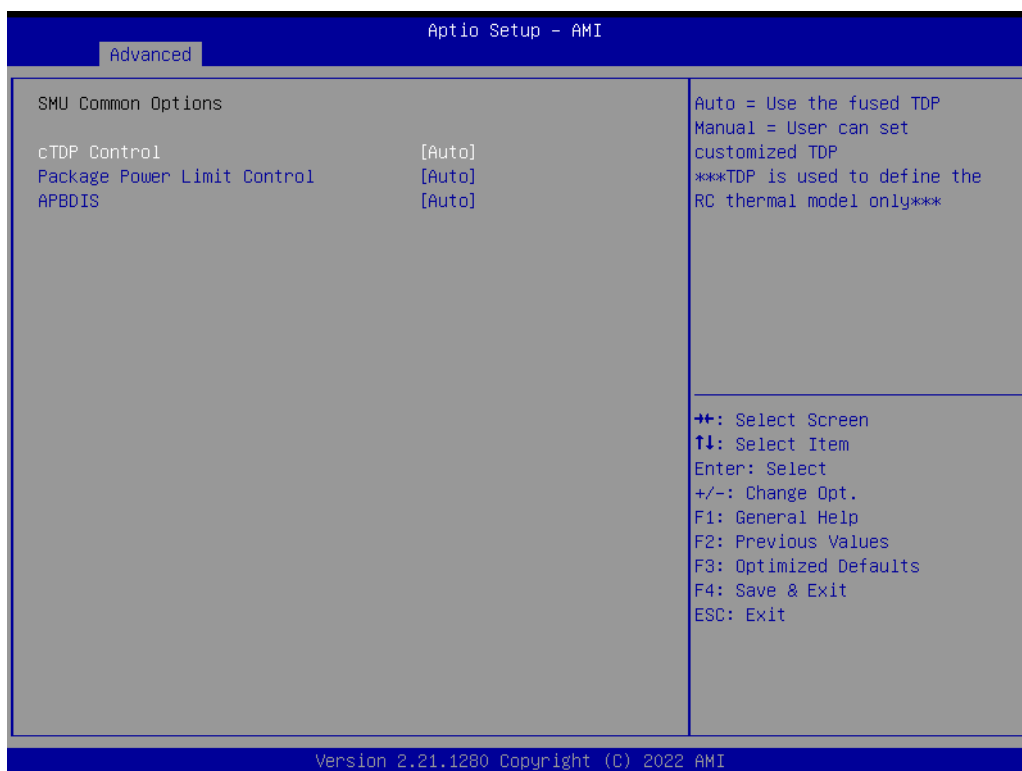


Figure 3.12 SMU Common Options Screen

- **cTDP Control**
Auto = Use the fused TDP; Manual = User can set customized TDP.
- **Package Power Limit Control**
Auto = Use the fused PPT; Manual = User can set customized PPT.
- **APBDIS**
0 = not APBDIS (mission mode), 1 = APBDIS.

3.3.3.4 FCH Common Options

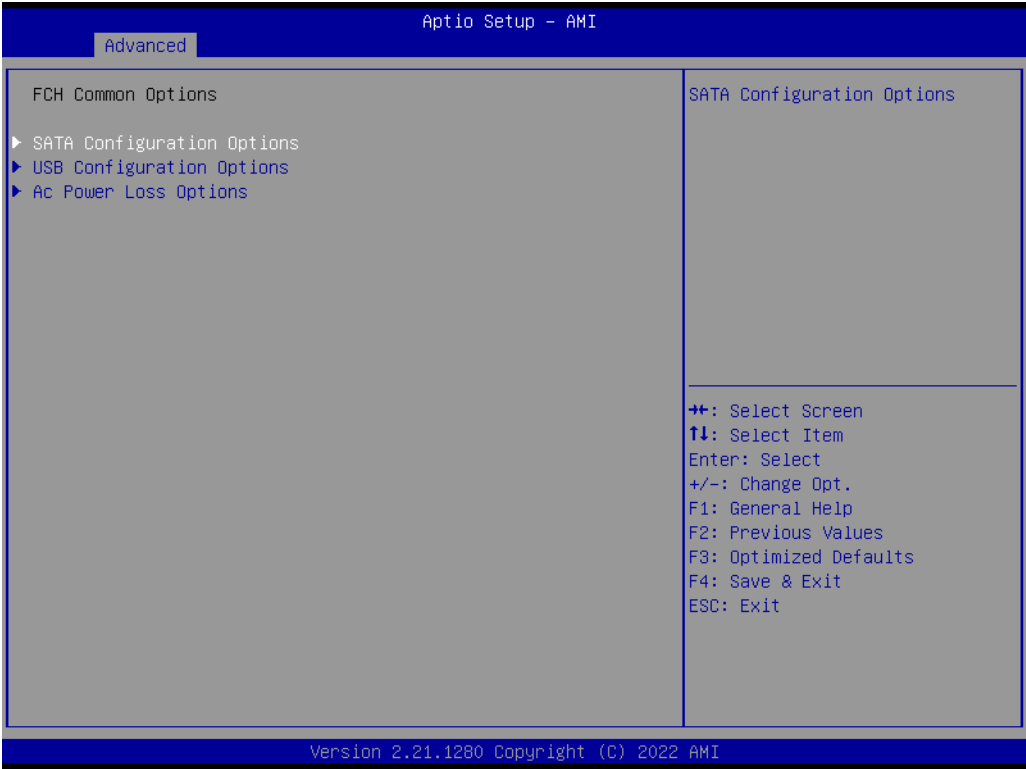


Figure 3.13 FCH Common Options Screen

■ SATA Configuration Options



Figure 3.14 SATA Configuration Options Screen

– SATA Enable

Disable or enable the OnChip SATA controller.

SATA Controller options



Figure 3.15 SATA Controller Options Screen

SATA Controller Enable

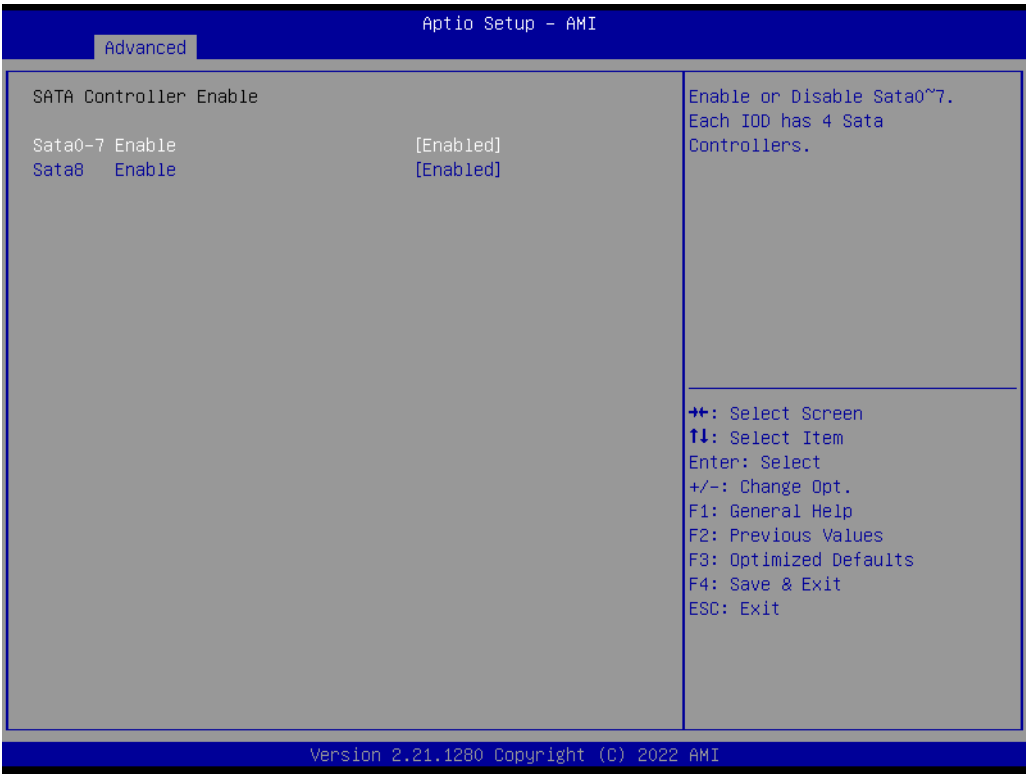


Figure 3.16 SATA Controller Enable Screen

- **Sata0-7 Enable**
Enable or Disable Sata0~7. Each IOD has 4 SATA Controllers.
- **Sata8 Enable**
Enable or Disable Sata8. Each IOD has 4 SATA Controllers.

SATA Controller eSATA



Figure 3.17 SATA Controller eSATA Screen

- **SATA Port HotPlug**
Enable or Disable SATA Port0~Port8 HotPlug function.

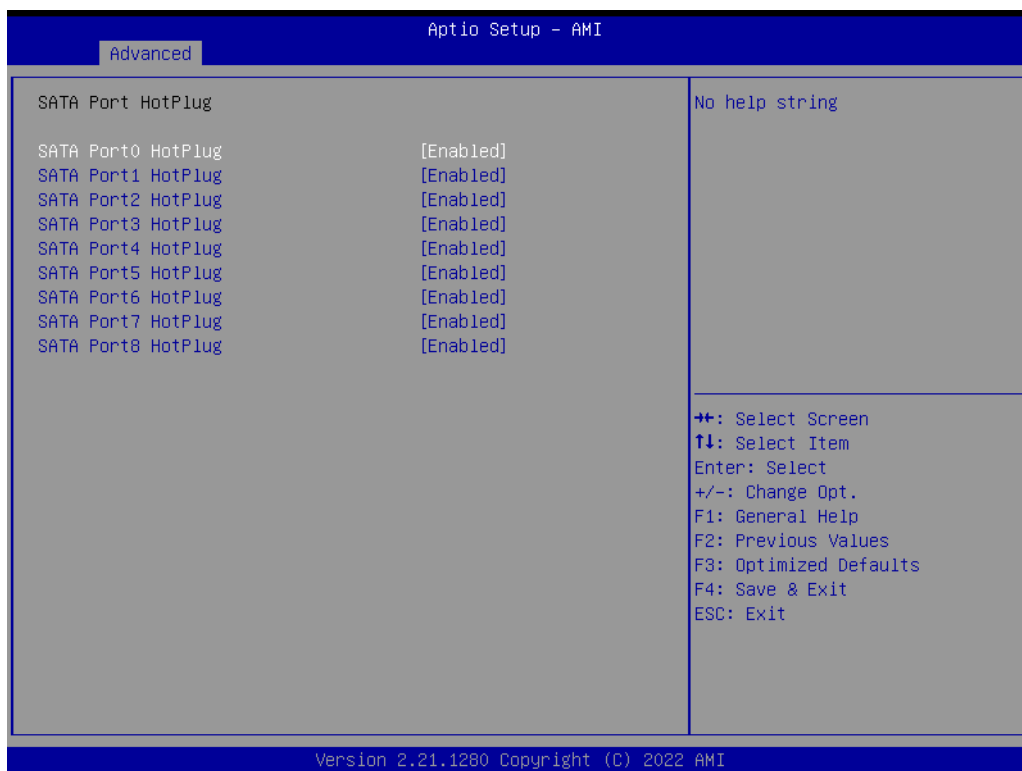


Figure 3.18 SATA Port HotPlug Screen

■ USB Configuration Options

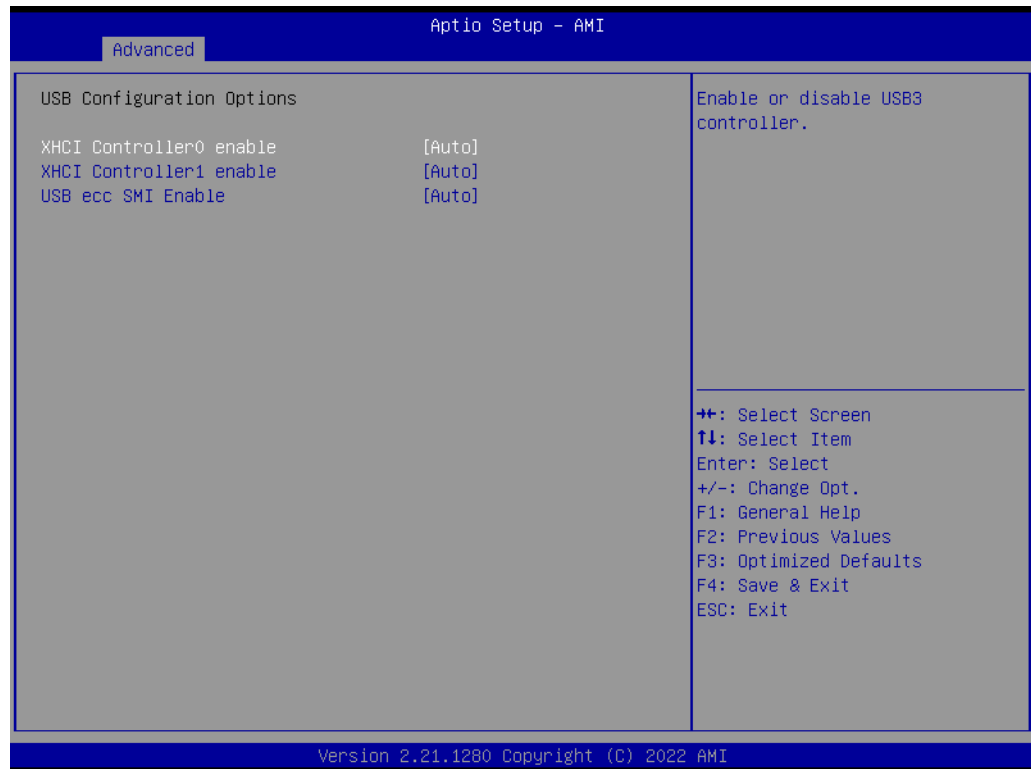


Figure 3.19 USB Configuration Options Screen

- **XHCI Controller0 enable**
Enable or disable USB3 controller0.
- **XHCI Controller1 enable**
Enable or disable USB3 controller1.
- **USB ecc SMI Enable**
Enable or disable USB ECC SMI function.

■ AC Power Loss Options

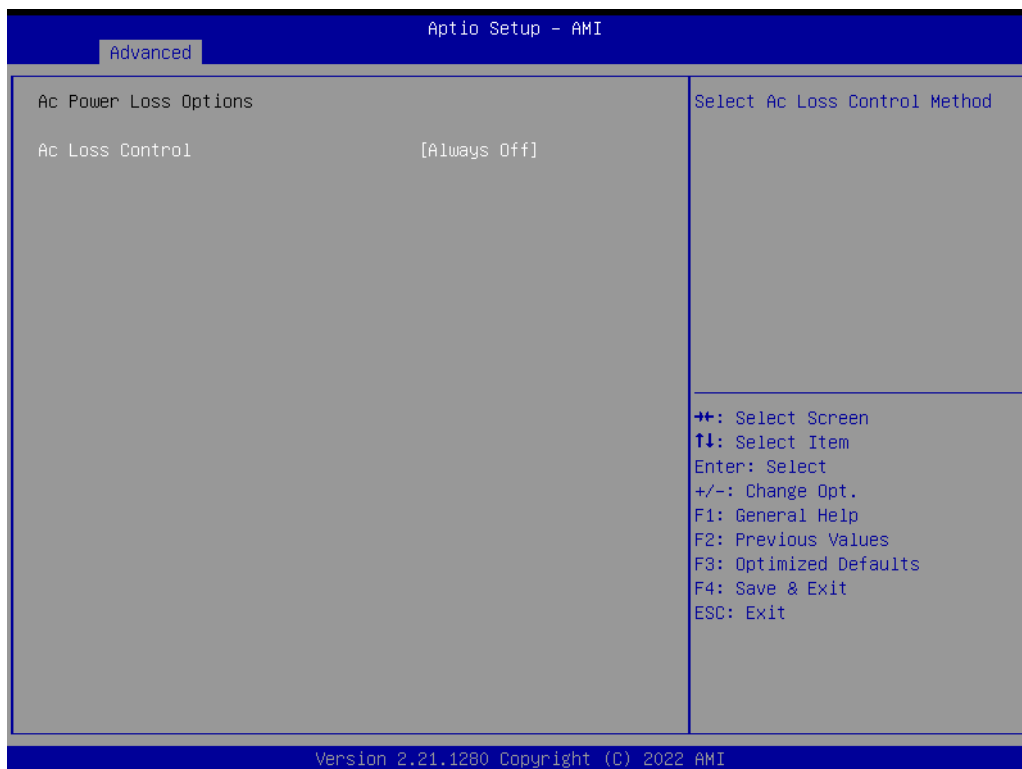


Figure 3.20 AC Power Loss Options Screen

- **AC Loss Control**
Select Ac Loss Control Method.

3.3.4 IT8528 Super IO Configuration



Figure 3.21 IT8528 Super IO Configuration Screen

■ Serial Port 1 Configuration

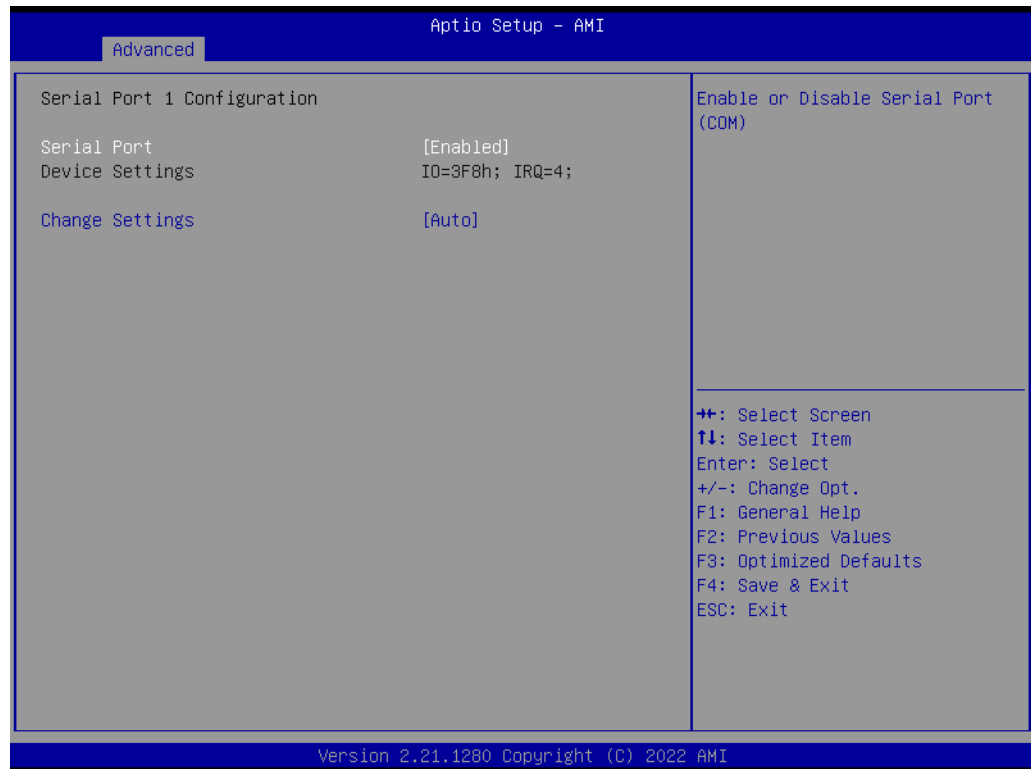


Figure 3.22 Serial Port 1 Configuration Screen

- **Serial Port**
Enable or Disable Serial Port 1.
- **Change Settings**
To select an optimal setting for Serial Port 1.

■ Serial Port 2 Configuration

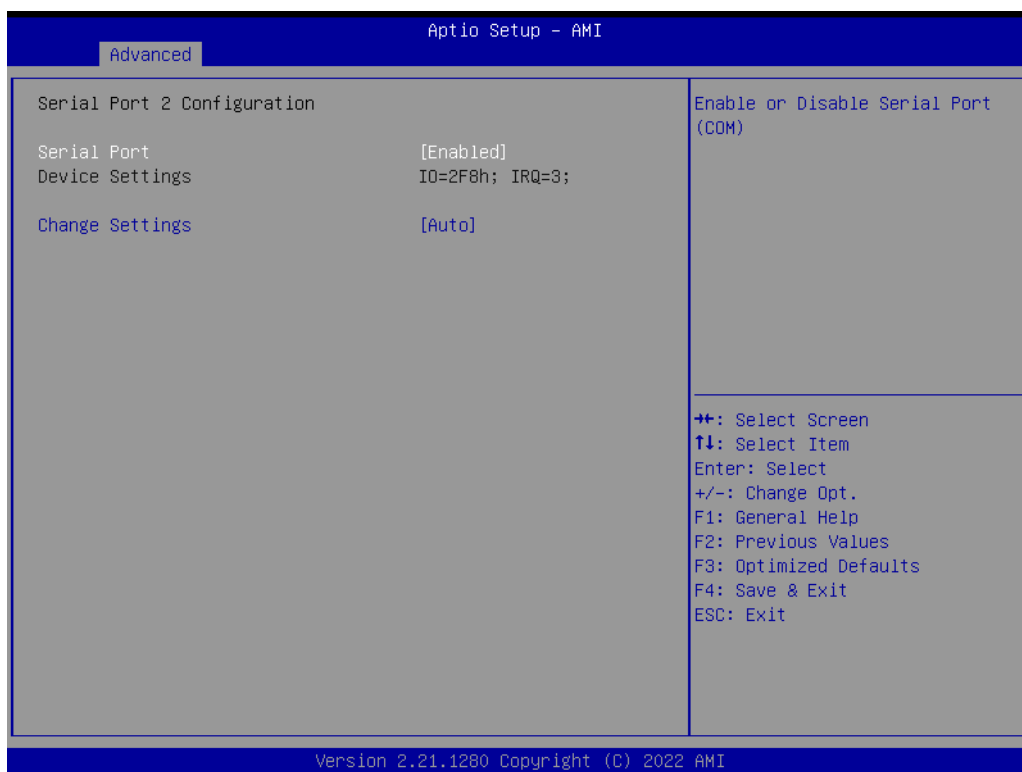


Figure 3.23 Serial Port 2 Configuration Screen

- **Serial Port**
Enable or Disable Serial Port 2.
- **Change Settings**
To select an optimal setting for Serial Port 2.

3.3.5 IT8528 HW Monitor

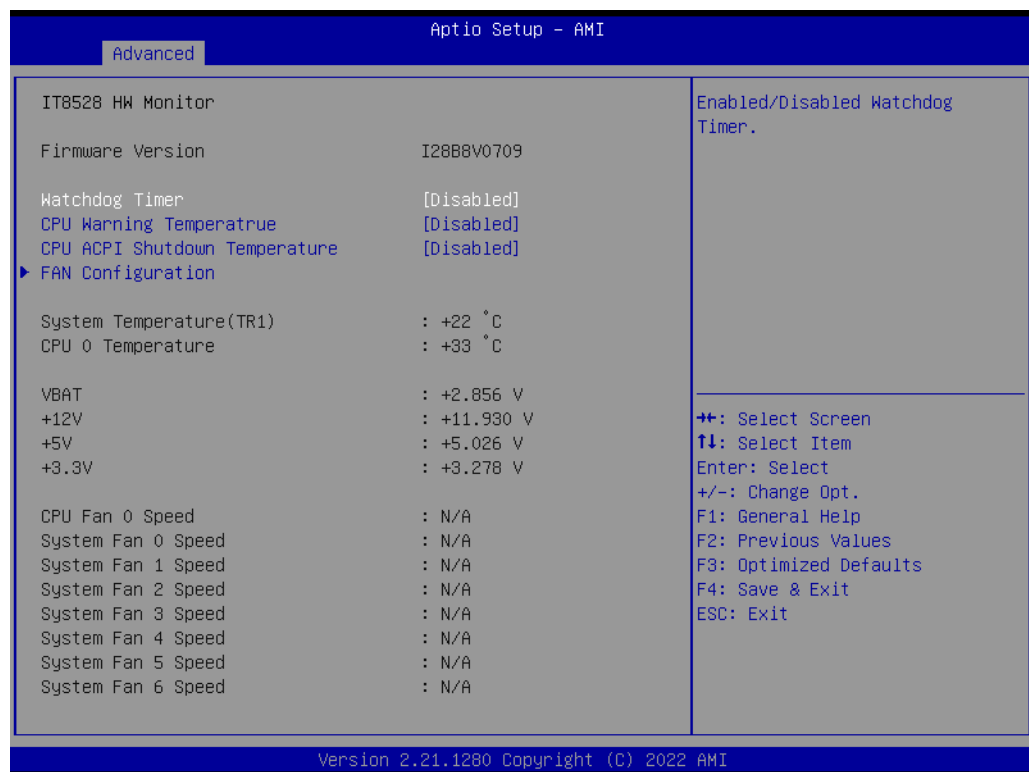


Figure 3.24 IT8528 HW Monitor Screen

- **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 overheating 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 mode of the CPU/System FAN is Smart FAN mode and the BIOS will automatically control the FAN speed according to the CPU temperature. When set to manual mode, the fan duty setting can be changed; the range is from 30%~100%, and the default setting is 50%.

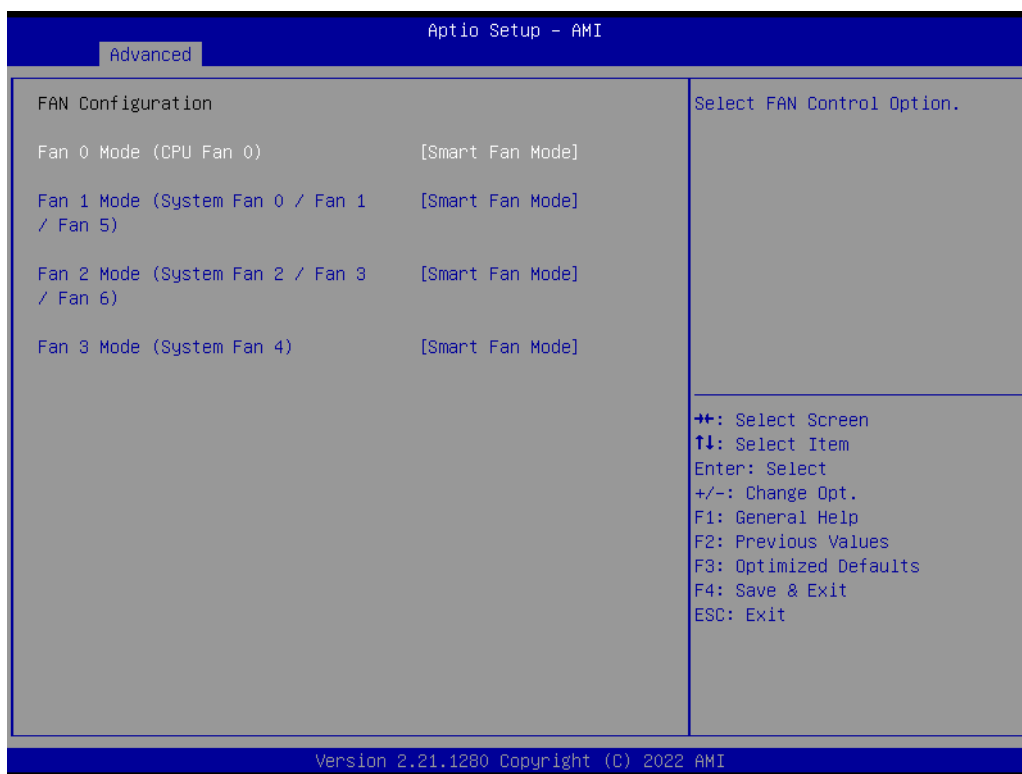


Figure 3.25 Fan Configuration Screen

3.3.6 S5 RTC Wake Settings

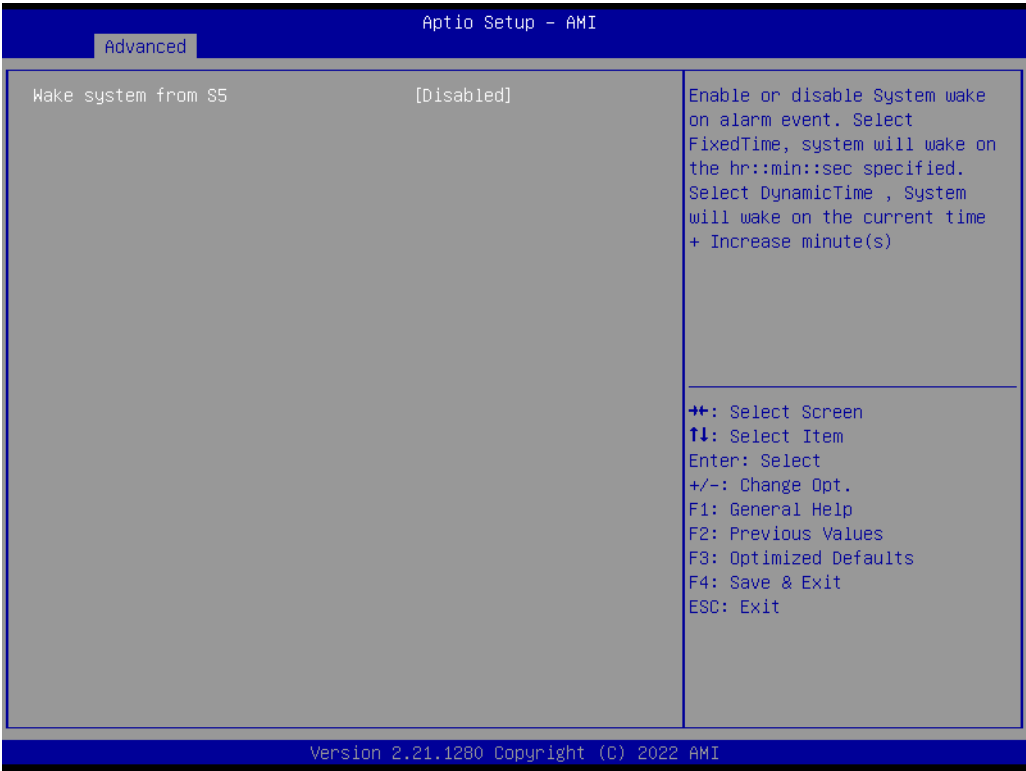


Figure 3.26 S5 RTC Wake Settings Screen

- **Wake system from S5**
Enable or disable system wake on alarm event. Select FixedTime, and the system will wake on the hr:min:sec specified. Select DynamicTime, and the system will wake at the current time + the added minute(s).

3.3.7 Serial Port Console Redirection

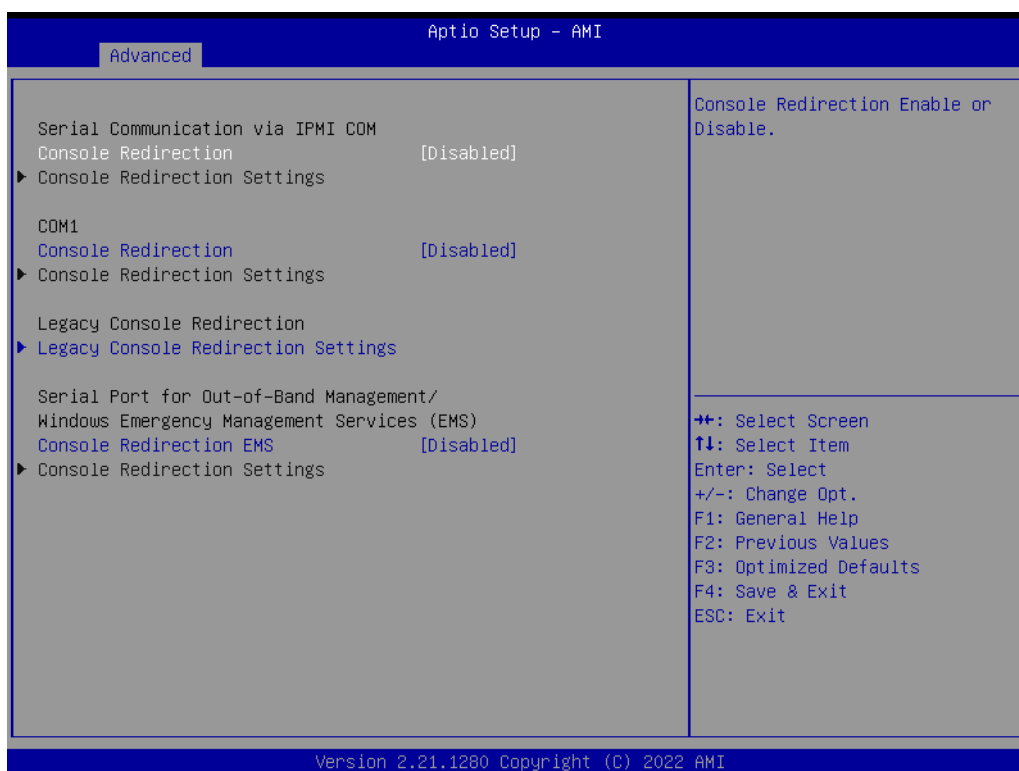


Figure 3.27 Serial Port Console Redirection Screen

■ COM1 Console Redirection Settings

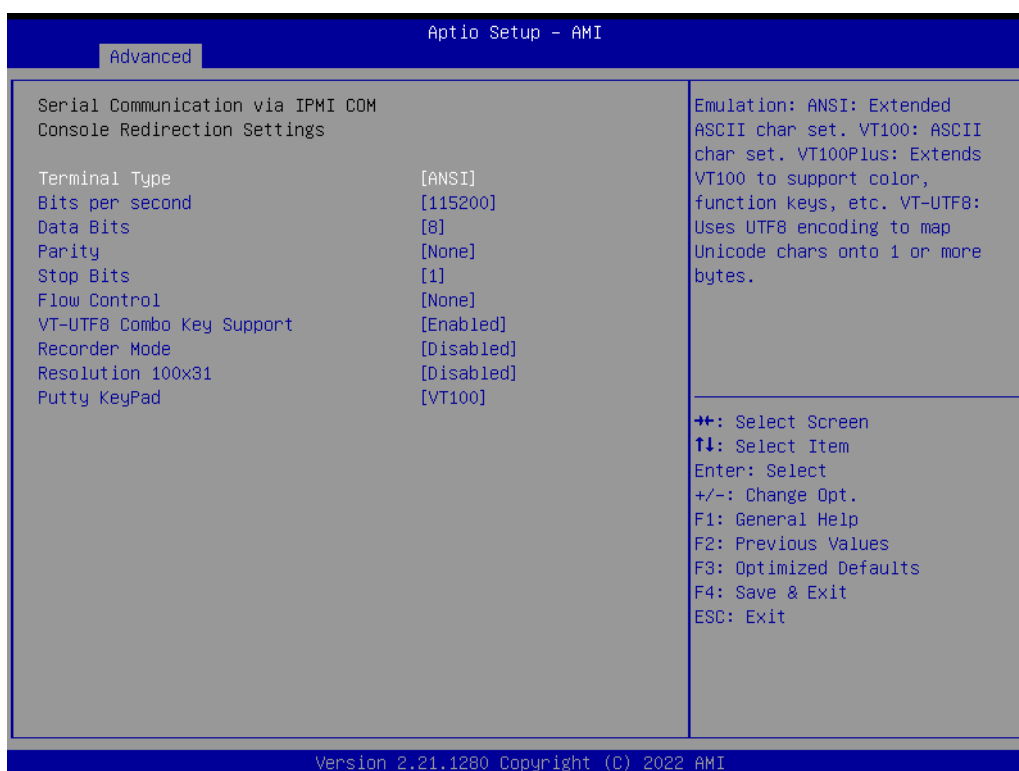


Figure 3.28 COM1 Console Redirection Settings Screen

-
- **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**
 - **Parity**
A parity bit can be sent with the data bits to detect 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 the 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 is enabled, only text will be sent. This is to capture terminal data.
Options available: Enabled/Disabled.
 - **Resolution 100x31**
Enables or disables extended terminal resolution.
 - **Putty Keypad**
Select function keys and keypad on putty.



Figure 3.29 Legacy Console Redirection Settings Screen

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

■ Console Redirection Settings

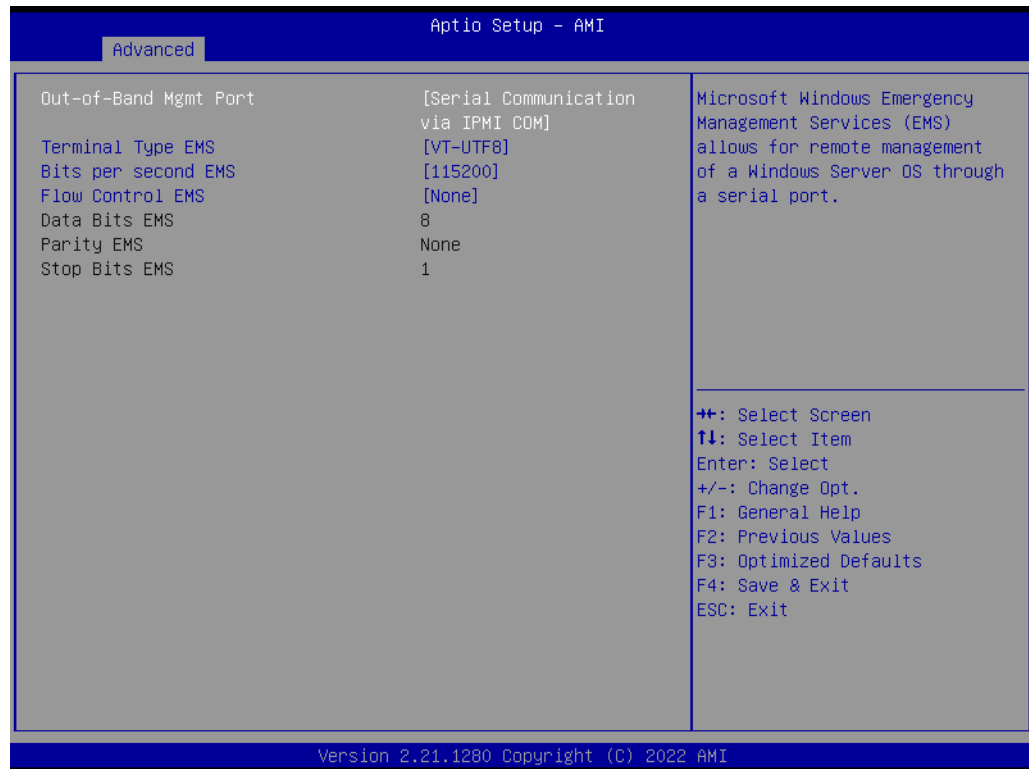


Figure 3.30 Console Redirection Settings Screen

- **Out-of-Band Mgmt Port**
To select the com port the user would like to set for console redirection.
- **Terminal Type EMS**
Set as "VT100", "VT100+", "VT-UTF8", or "ANSI". "VT-UTF8" is the default setting.
- **Bits Per Second EMS**
To select serial port transmission, the speed must be matched on the other side. It can be set as "9600", "19200", "57600", or "115200". "115200" is the default setting.
- **Flow Control EMS**
Flow control can prevent data loss from buffer overflow. It can be set as "None", "Hardware RTS/CTS", or "Software Xon/Xoff". "None" is the default setting.
- **Data Bits EMS**
- **Parity EMS**
- **Stop Bits EMS**

3.3.8 CPU Configuration

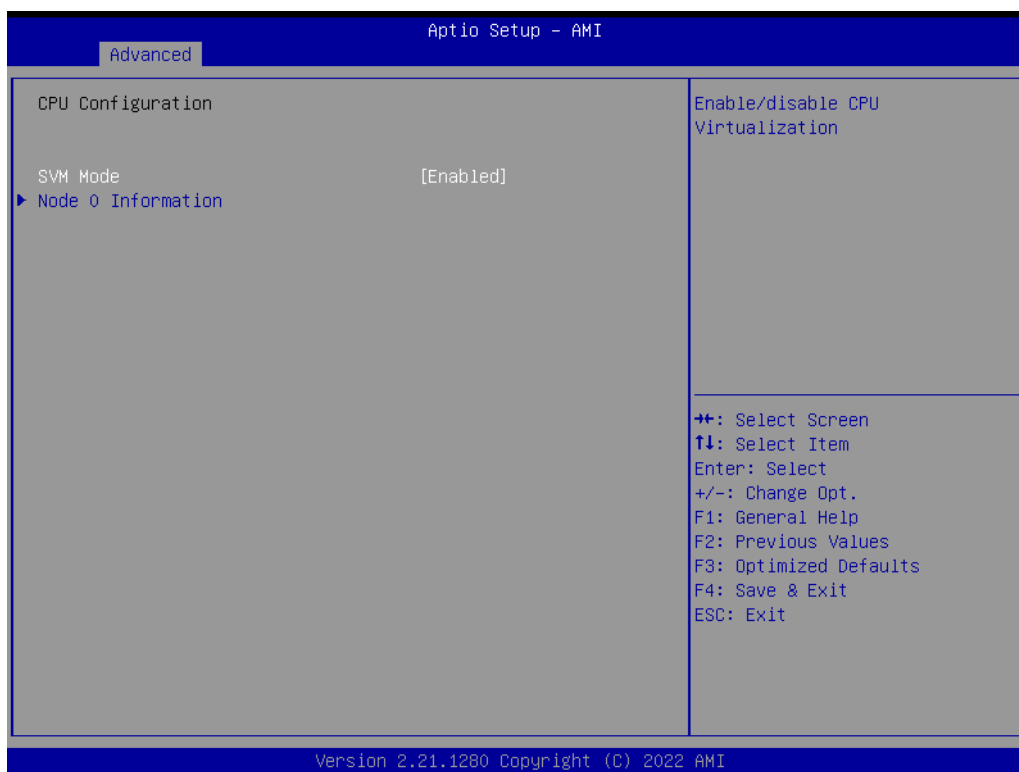


Figure 3.31 CPU Configuration Screen

- **SVM Mode**
Enable/Disable CPU Virtualization.
- **Node 0 Information**
View memory information related to Node 0 AMD EPYC CPU.

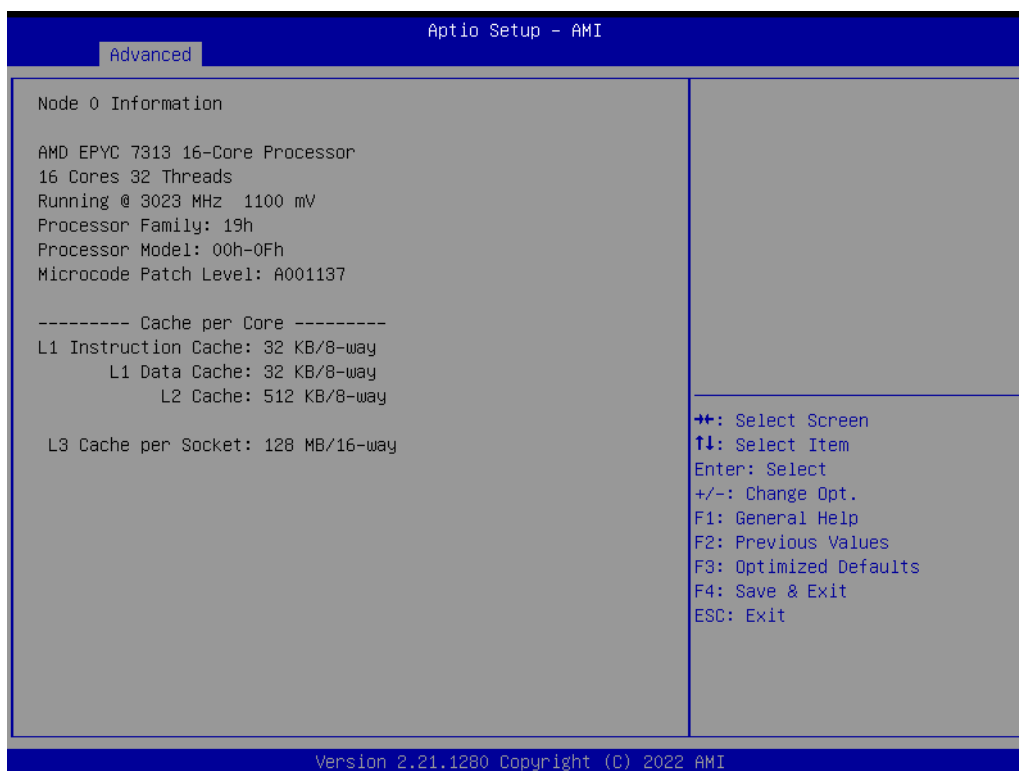


Figure 3.32 Node 0 Information Screen

3.3.9 SIO Common Setting

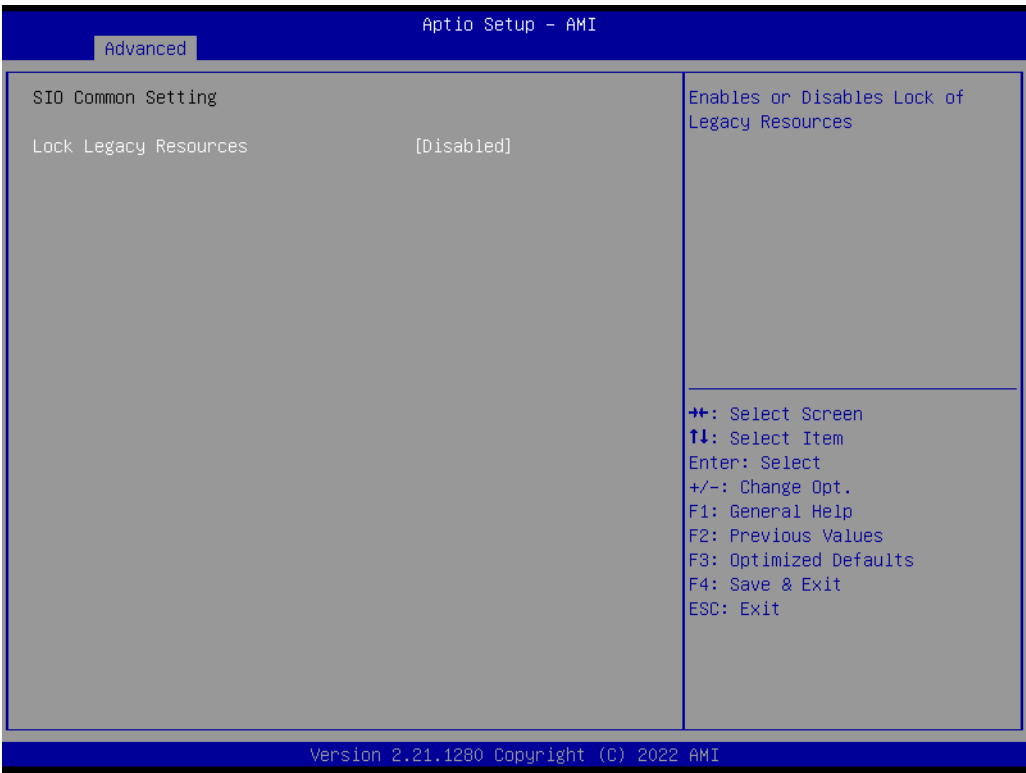


Figure 3.33 SIO Common Setting Screen

- **Lock Legacy Resources**
Enables or disables Lock Legacy Resources.

3.3.10 PCI Subsystem Settings



Figure 3.34 PCI Subsystem Settings Screen

- **Above 4G Decoding**
Enable or Disable 64-bit capable devices to be decoded in the above 4G address space (Only if the system supports 64-bit PCI decoding).

Note! *Some graphics or GPU cards need to have 4G decoding enabled.*



- **SR-IOV Support**
If the system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization support.

3.3.11 USB Configuration

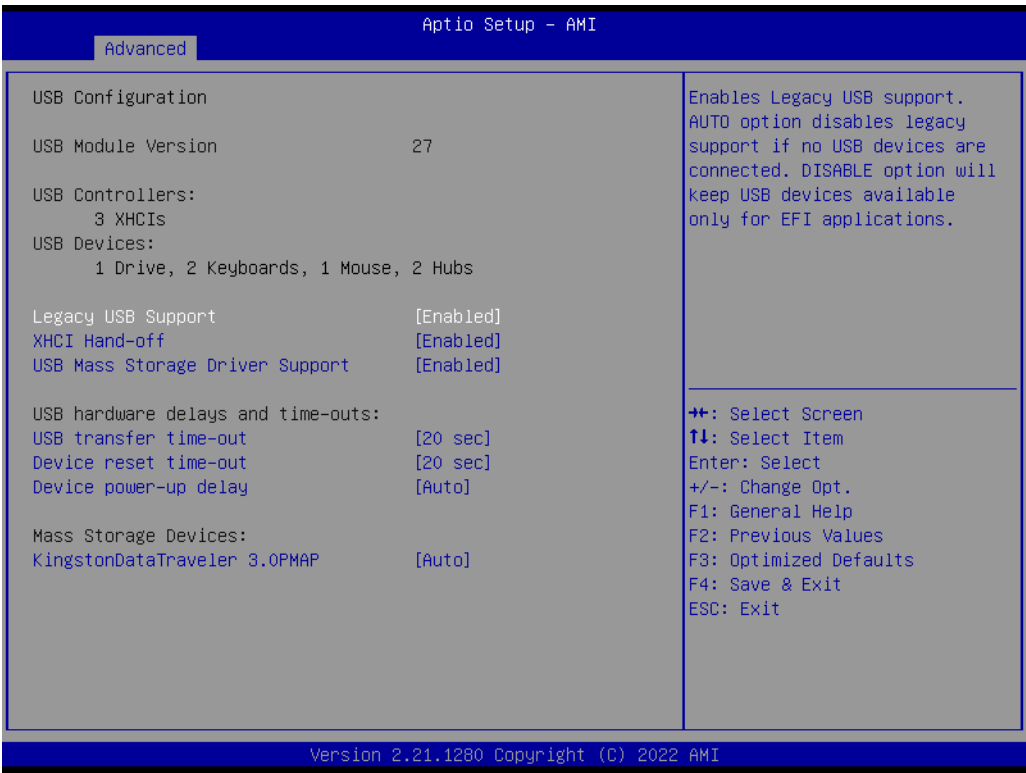


Figure 3.35 USB Configuration Screen

- **Legacy USB Support**
This is to support a USB device under a legacy OS such as DOS. When "Auto" is selected, the system will automatically detect if a USB device is plugged into the computer and enable USB legacy mode when a USB device is plugged in, or disable USB legacy mode when no USB device is attached.
- **XHCI Hand-off**
This is a workaround for an 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.

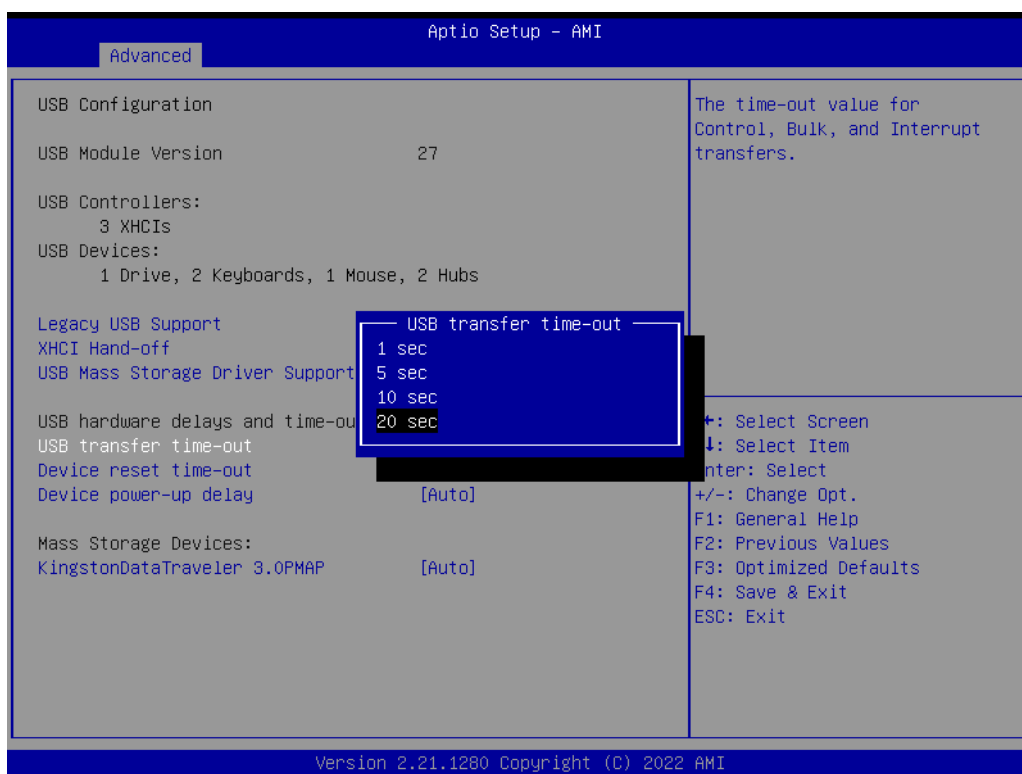


Figure 3.36 USB Transfer Time-Out Screen

- **USB Transfer Time-out**
The time-out value for Control, Bulk, and Interrupt transfers. Selects the USB transfer time-out value. [1, 5, 10, 20 sec]

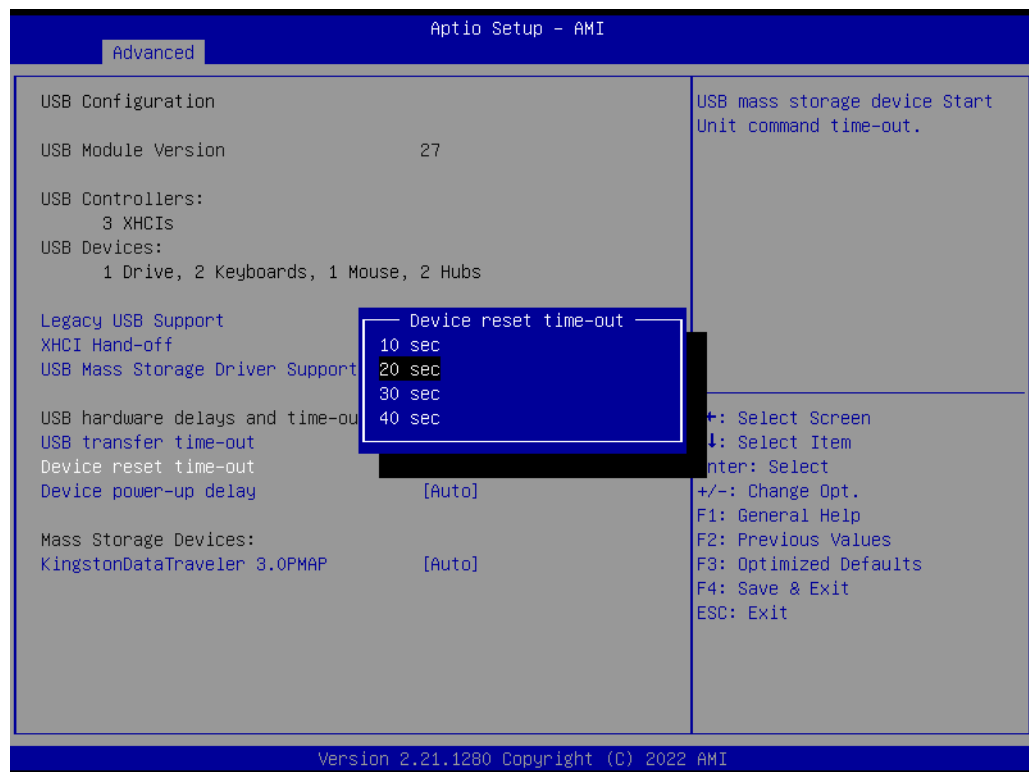


Figure 3.37 Device Reset Time-Out Screen

- **Device Reset Time-out**
USB mass storage device Start Unit command time-out. It selects the USB device reset time-out value [10, 20, 30, 40 sec].

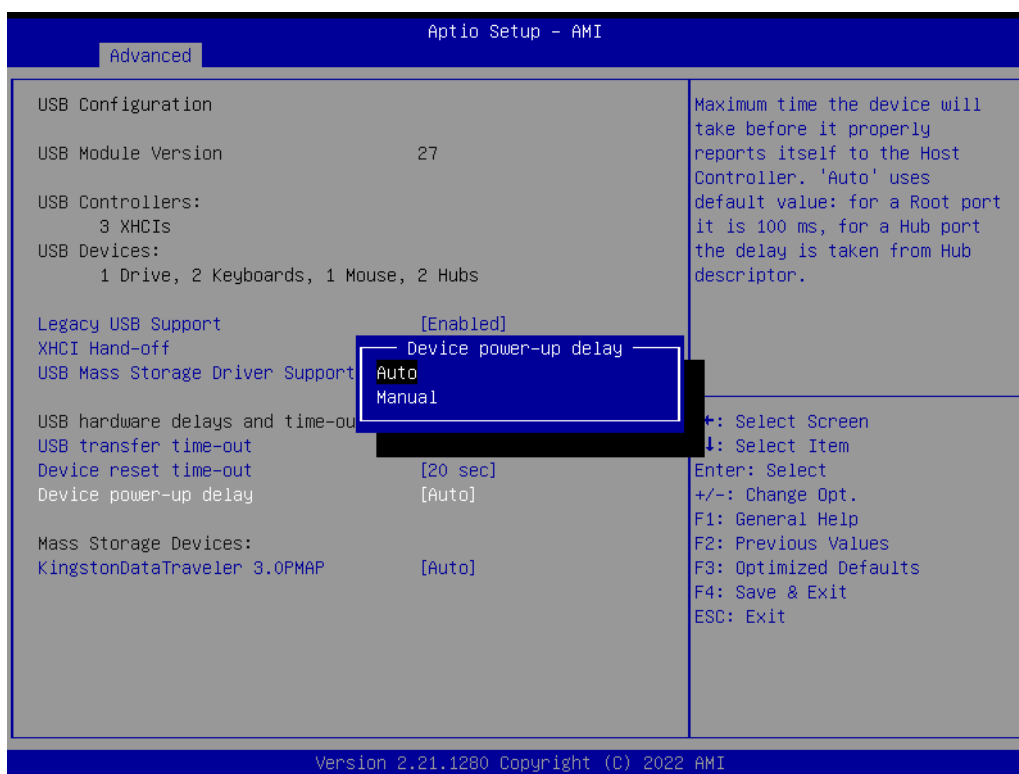


Figure 3.38 Device Power-Up Delay Screen

■ Device Power-Up Delay

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

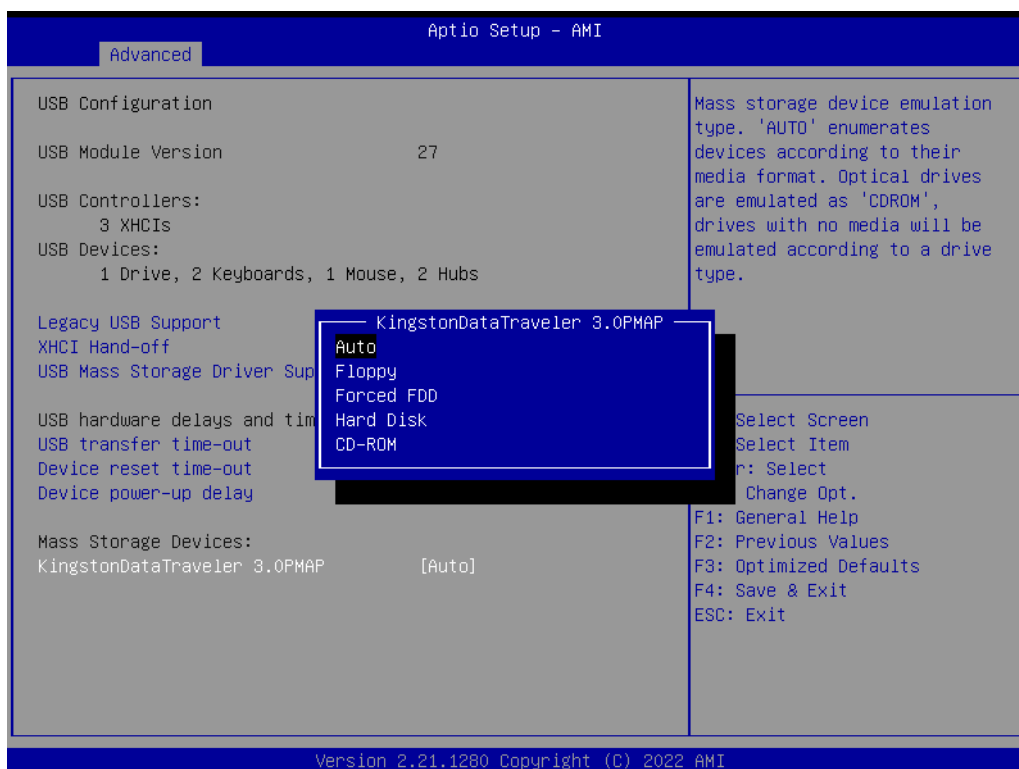


Figure 3.39 Mass Storage Devices Screen

■ Mass Storage Devices

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

3.3.12 Network Stack Configuration



Figure 3.40 Network Stack Configuration Screen

- **Network Stack**
Enable or Disable UEFI network stack function.
IPv4 PXE support
IPv4 HTTP support
IPv6 PXE support
IPv6 HTTP support
PXE boot wait time
Media detect count

3.3.13 CSM Configuration

Enable or disable CSM (Compatibility Support Module) configuration support. When disabled, the system can only support UEFI mode.

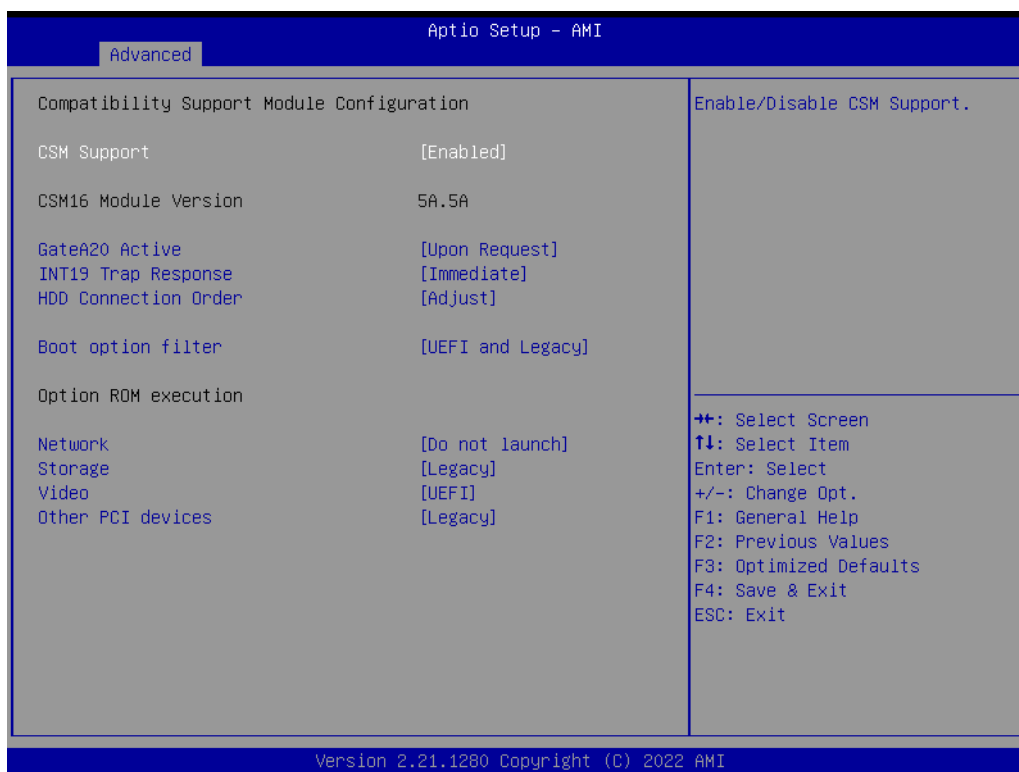


Figure 3.41 CSM Configuration Screen

- **GateA20 Active**
This 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.
- **INT19 Trap Response**
The BIOS INT19 trap response is set by option ROM. When it's set as 'Immediate', the trap will be executed right away. When it's set as 'Postponed', the trap will be executed during legacy boot.
- **HDD Connection Order**
Some OS require HDD handles to be adjusted.

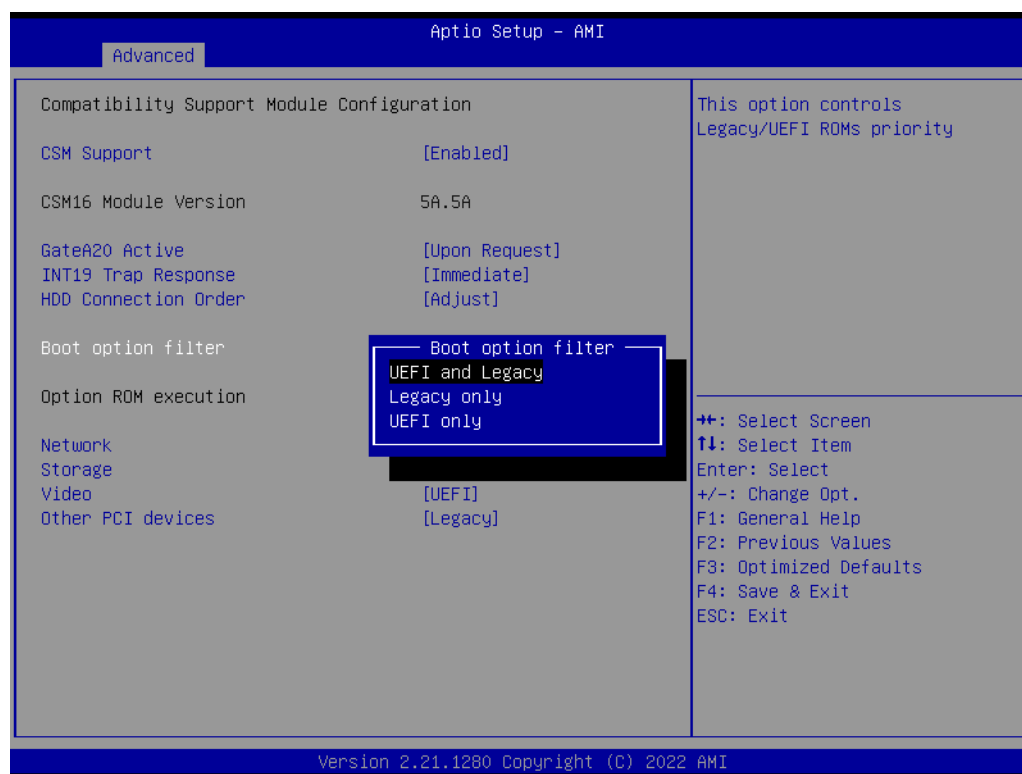


Figure 3.42 Boot Option Filter Screen

- **Boot Option Filter**
Change UEFI/legacy ROM priority for the boot option.

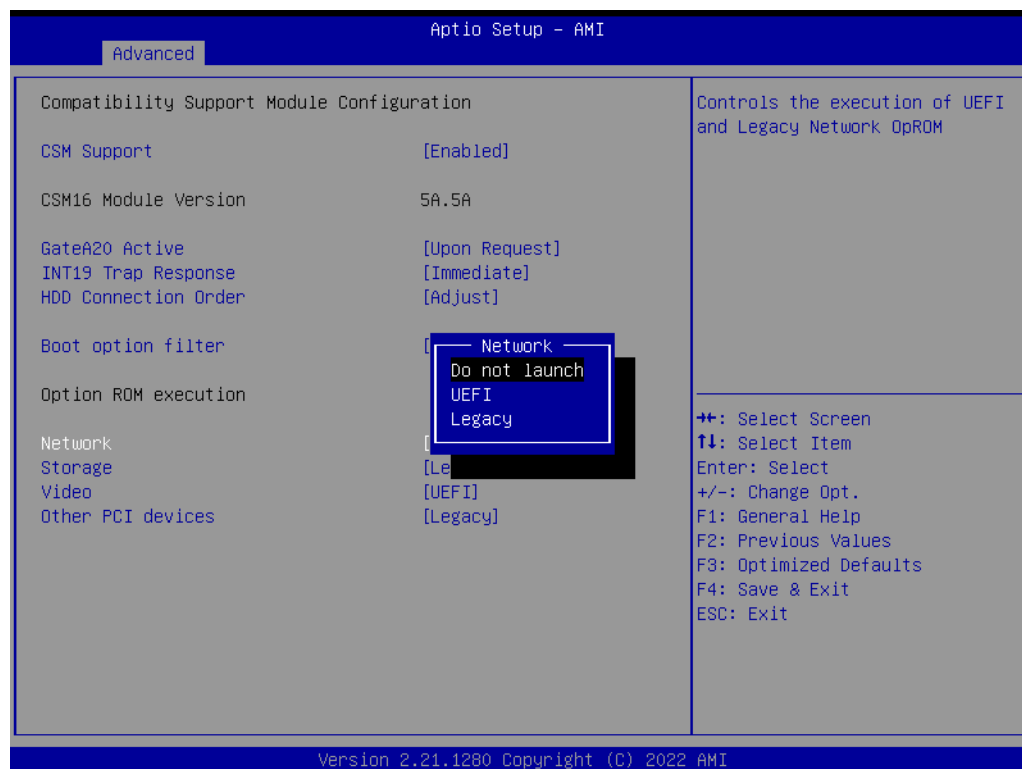


Figure 3.43 Option ROM Execution - Network Screen

- **Network**
Controls the execution of UEFI and legacy PXE OpROM.

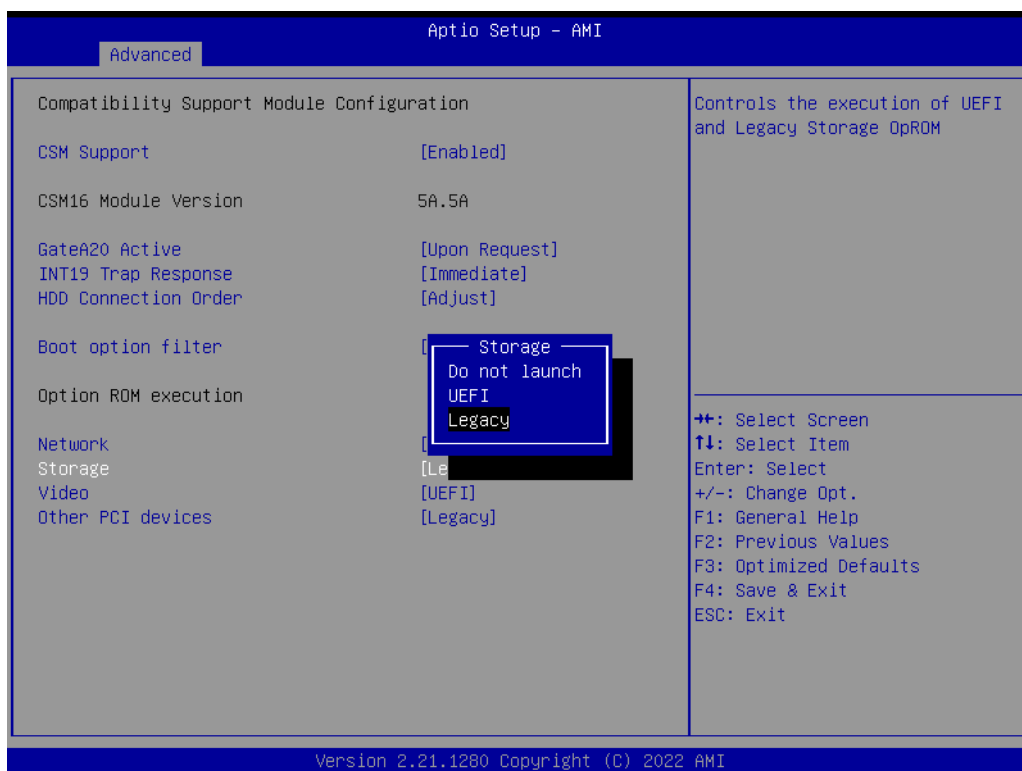


Figure 3.44 Option ROM Execution – Storage Screen

- **Storage**
Control the execution of UEFI and legacy storage OpROM.
- **Video**
Control the execution of UEFI and legacy Video OpROM.
- **Other PCI devices**
Determines execution of OpROM policy for devices other than Network, Storage, or Video.

3.3.14 NVMe Configuration

NVMe Device Options Settings

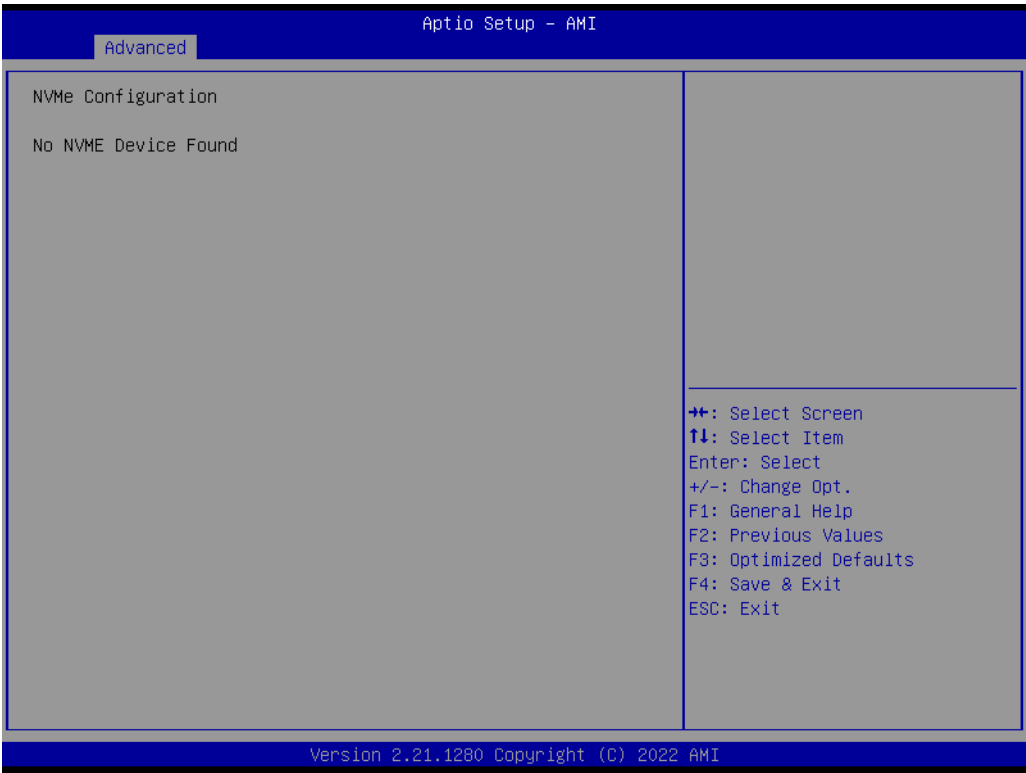


Figure 3.45 NVMe Configuration Screen

3.3.15 SATA Configuration

SATA Device Information

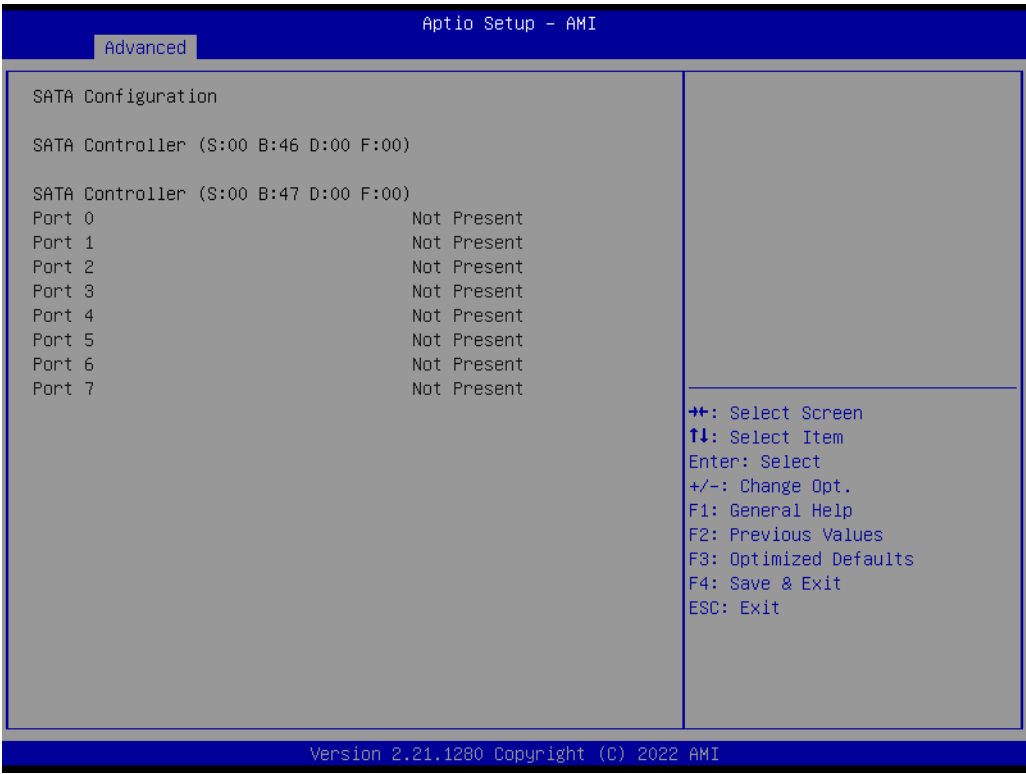


Figure 3.46 SATA Configuration Screen

3.3.16 TLS Auth Configuration

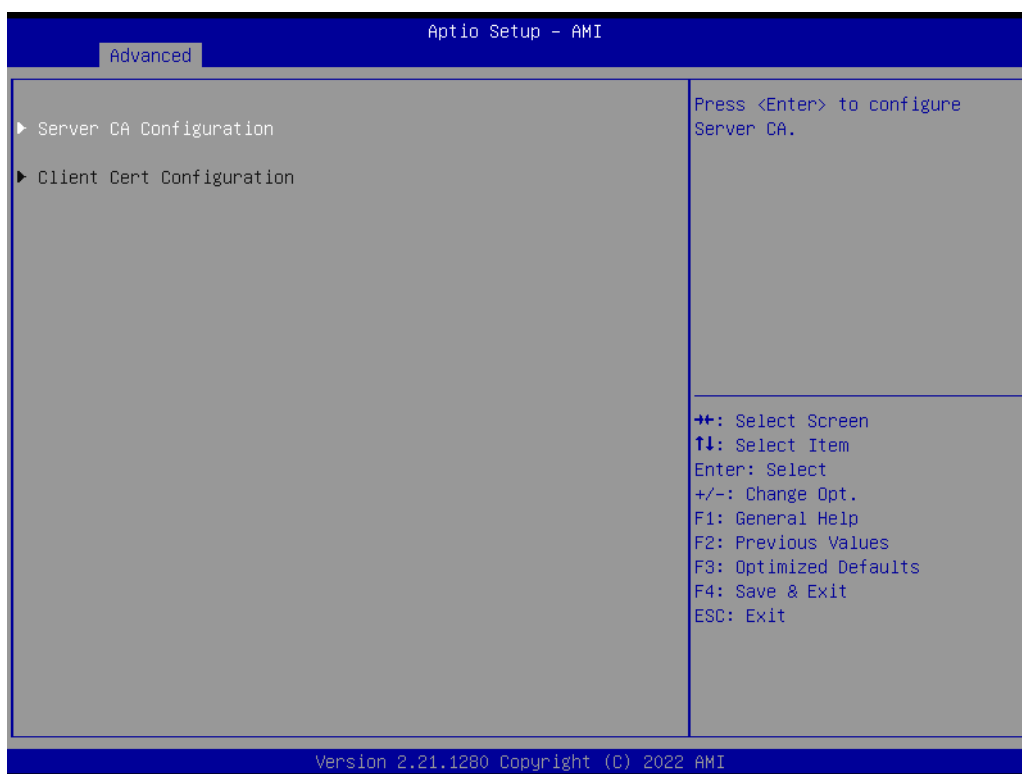


Figure 3.47 TLS Auth Configuration Screen

- **Server CA Configuration**
Configure Server CA. Enroll or Delete Cert.

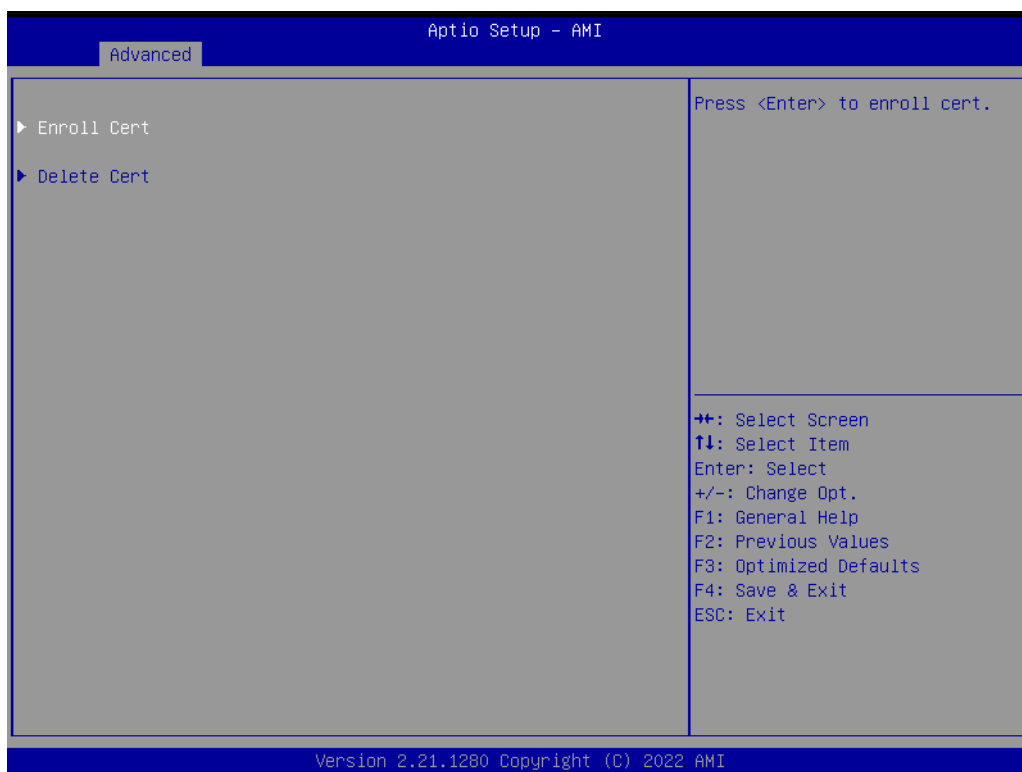


Figure 3.48 Server CA Configuration Screen

3.4 Chipset

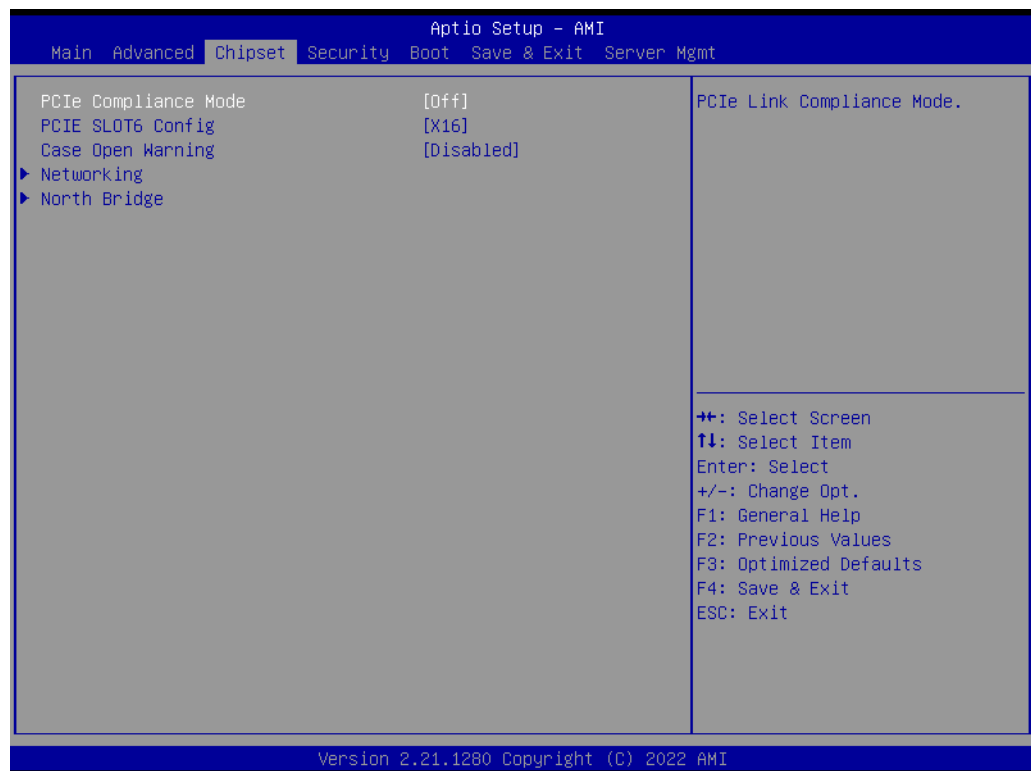


Figure 3.49 Chipset Screen

3.4.1 PCIe Compliance Mode

PCIe Link Compliance Mode

3.4.2 PCIe SLOT6 Config

Select PCIe SLOT6 Configuration, X16, X8X8, X8X4X4, X4X4X4X4.

3.4.3 Case Open Warning

Enable or Disable the Case Open Warning function.

3.4.4 Networking



Figure 3.50 Networking Screen

- **Onboard PCIE LAN(I210)**
Enable or Disable Intel® I210 Controller support.
- **LAN1(I210) PXE OpROM**
Enable or Disable the Boot option for the Intel® I210 controller.
- **Onboard PCIE LAN2(I210)**
Enable or Disable Intel® I210 Controller support.
- **LAN2(I210) PXE OpROM**
Enable or Disable the Boot option for the Intel® I210 controller.

3.4.5 North Bridge

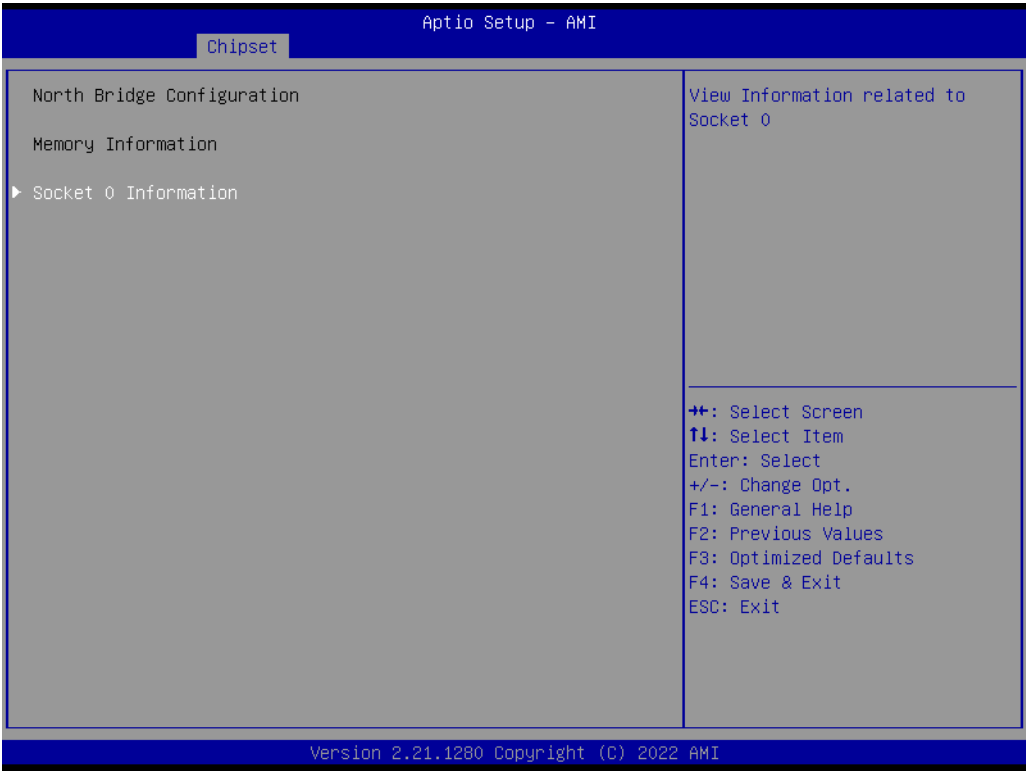


Figure 3.51 North Bridge Screen

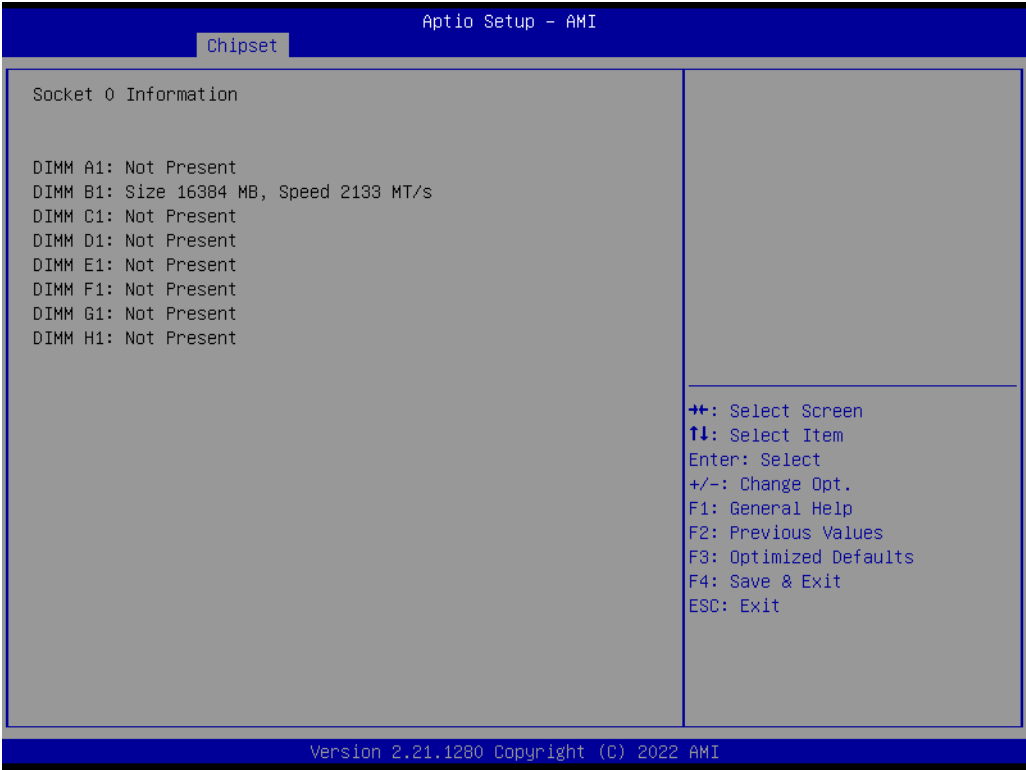


Figure 3.52 Socket 0 Information Screen

- **Socket 0 Information**
View Information related to Node 0 AMD EPYC CPU.

3.5 Security



Figure 3.53 Security Screen

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



Date/Time & Password: Keep

Setting: reset to default

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

Date/Time: reset to default

Password: keep

Setting: reset to default

■ Secure Boot



Figure 3.54 Secure Boot Screen

■ Key Management



Figure 3.55 Key Management Screen

3.6 Boot

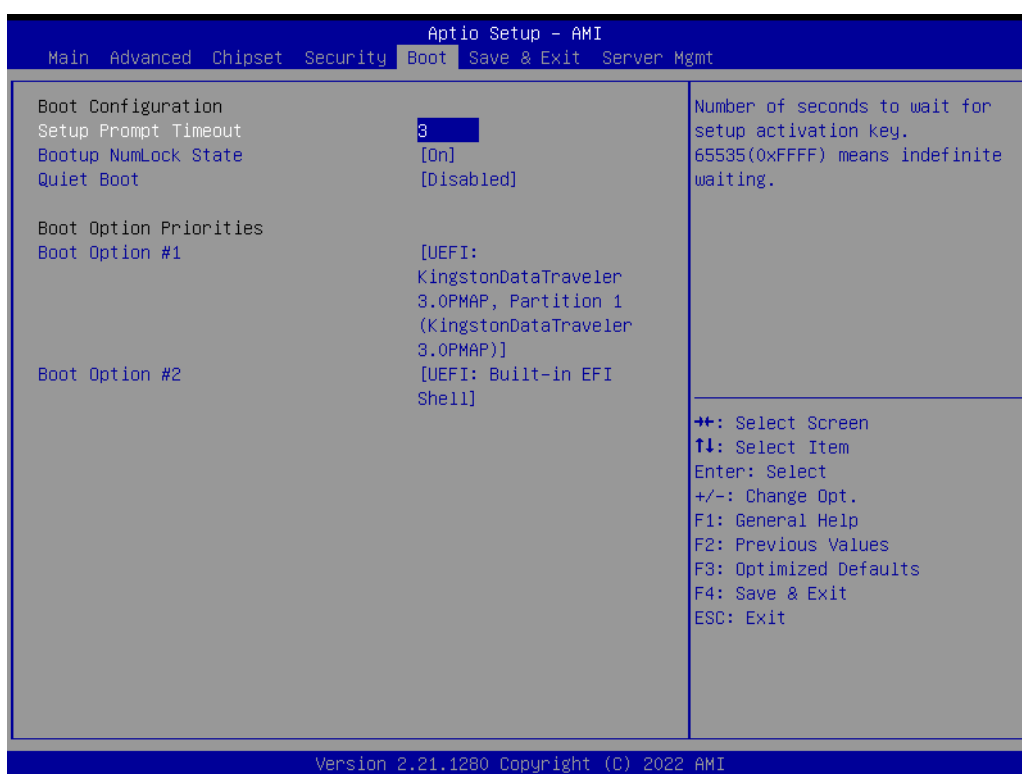


Figure 3.56 Boot Screen

- **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 the quiet boot option.
- **Boot Option Priorities**
Sets the system boot priorities.

3.7 Save & Exit

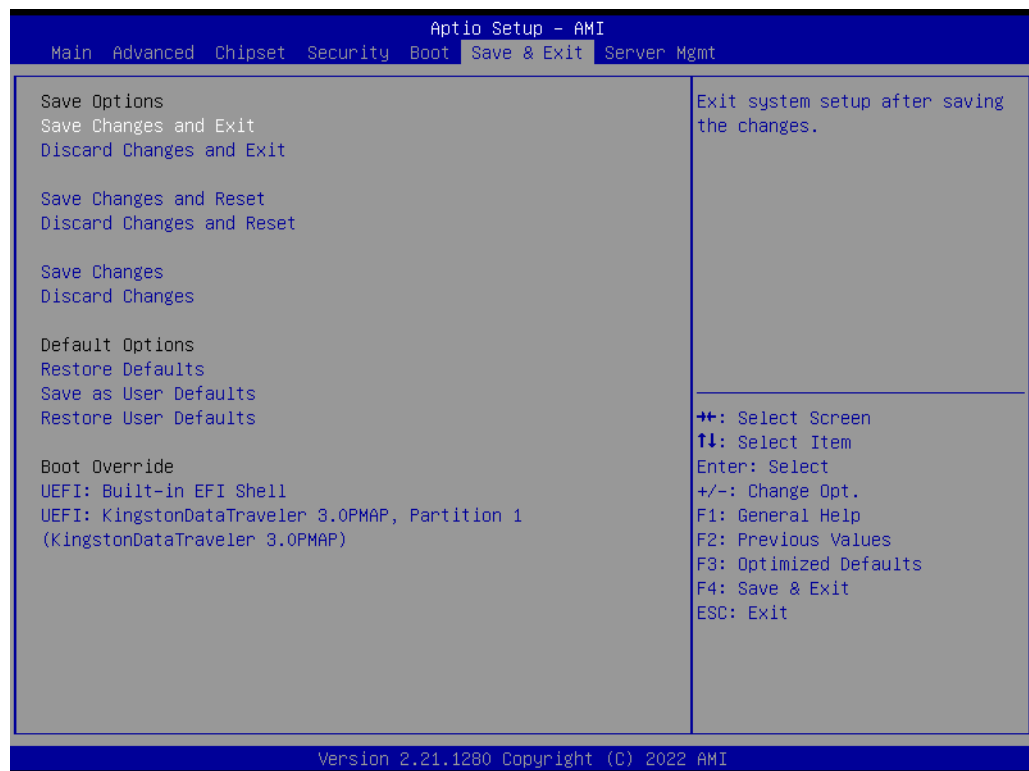


Figure 3.57 Save & Exit Screen

- **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.

3.8 Server Management

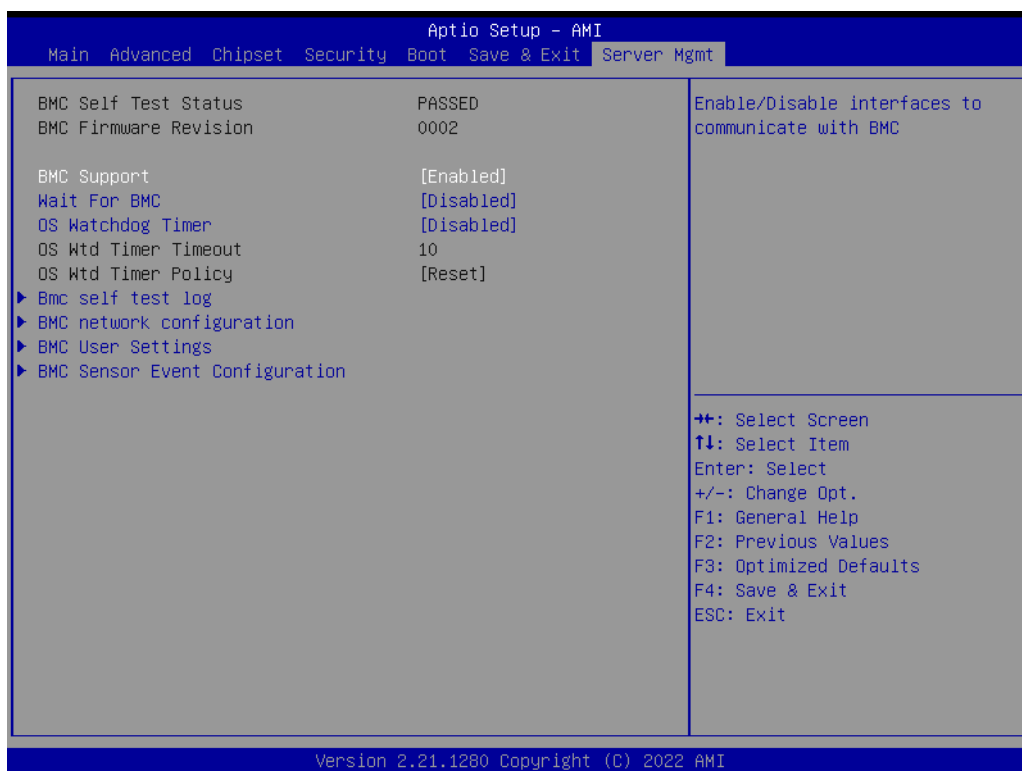


Figure 3.58 Server Management Screen

- **BMC Support**
Enable or Disable interfaces to communicate with BMC.
- **Wait for BMC**
If enabled, the motherboard will wait 30 ~ 60 seconds until the BMC module boots up completely. After that, the normal BIOS post screen will be displayed. If disabled, the motherboard will not wait for the BMC module's response.
- **OS Watchdog Timer**
If enabled, this starts a BIOS timer which can only be shut off by Management Software after the OS loads.

3.8.1 BMC Self Test Log

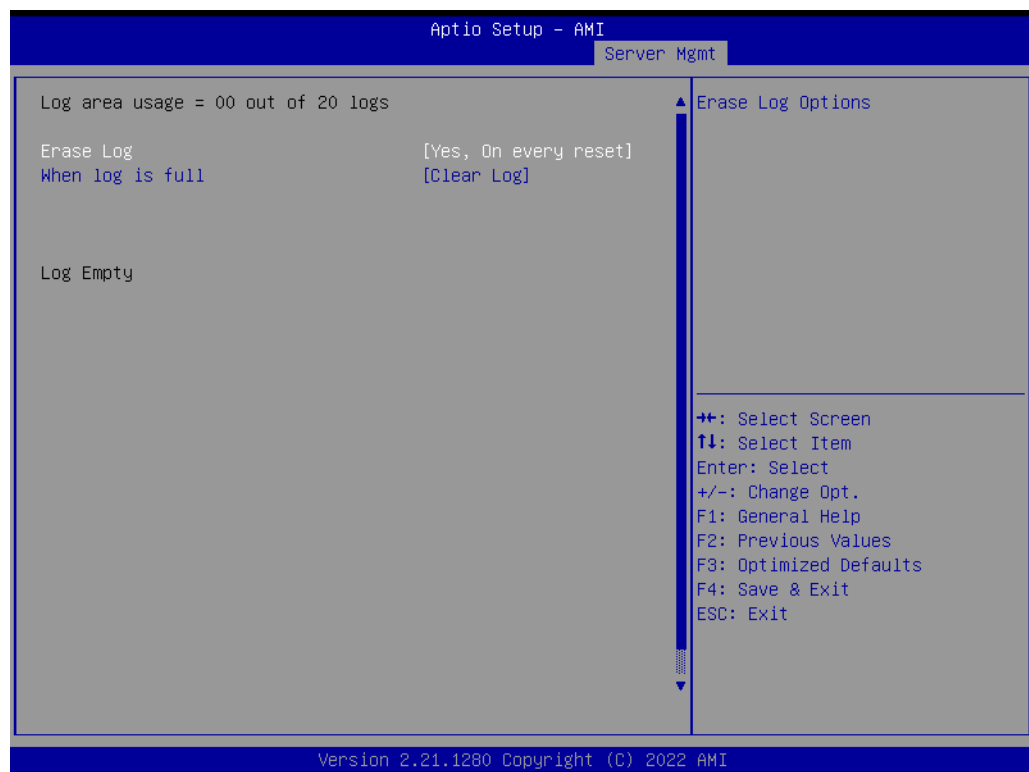


Figure 3.59 BMC Self-Test Log Screen

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

3.8.2 BMC Network Configuration



Figure 3.60 BMC Network Configuration Screen

- **Configuration Address Source**
Select to configure LAN channel parameters statically or dynamically (by BMC). The Unspecified option will not modify any BMC network parameters during the BIOS phase.

3.8.3 BMC User Settings

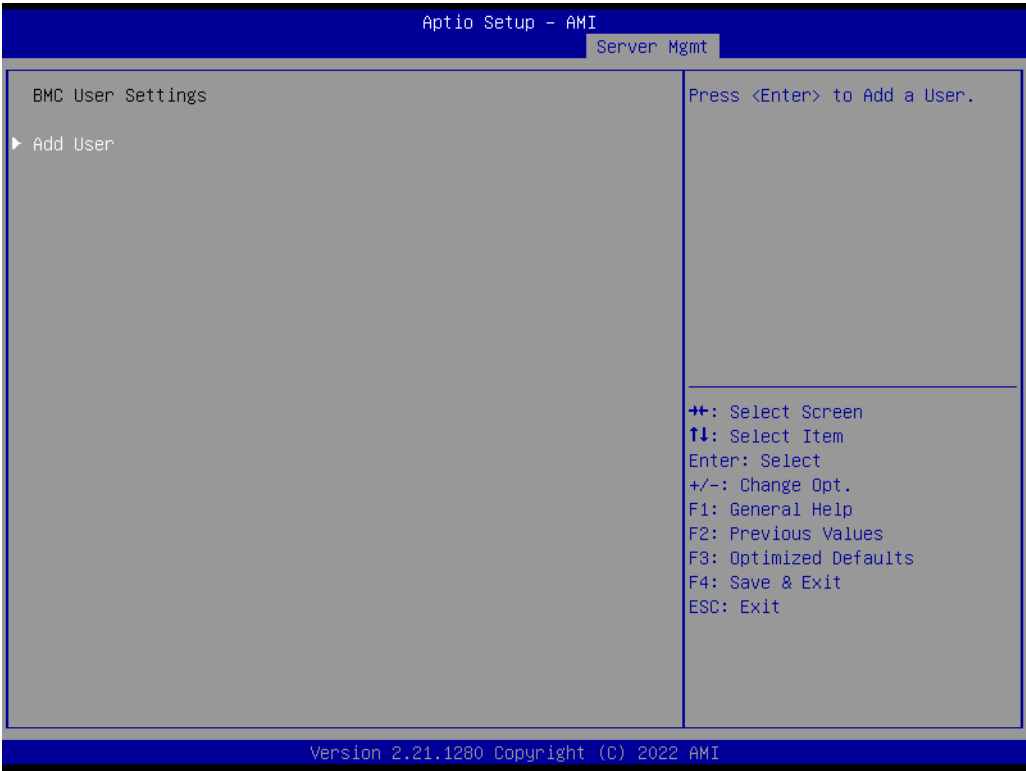


Figure 3.61 BMC User Settings Screen

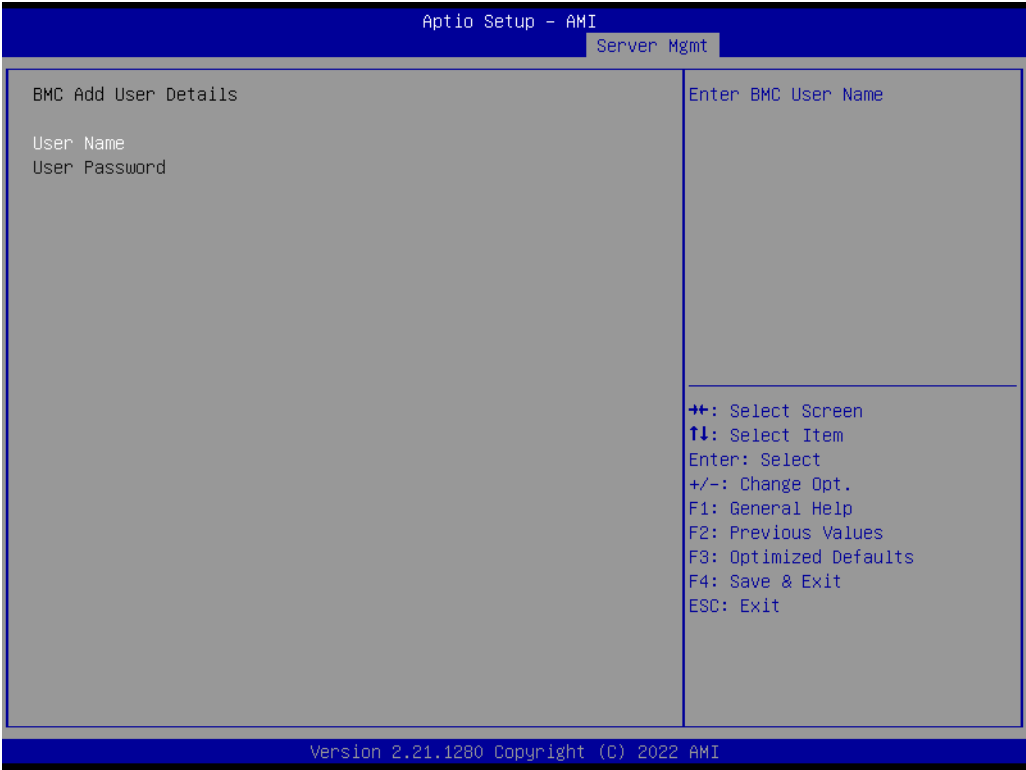


Figure 3.62 BMC Add User Details Screen

3.8.4 BMC Sensor Event Configuration

Enable/Disable System/CPU FAN Sensor Event

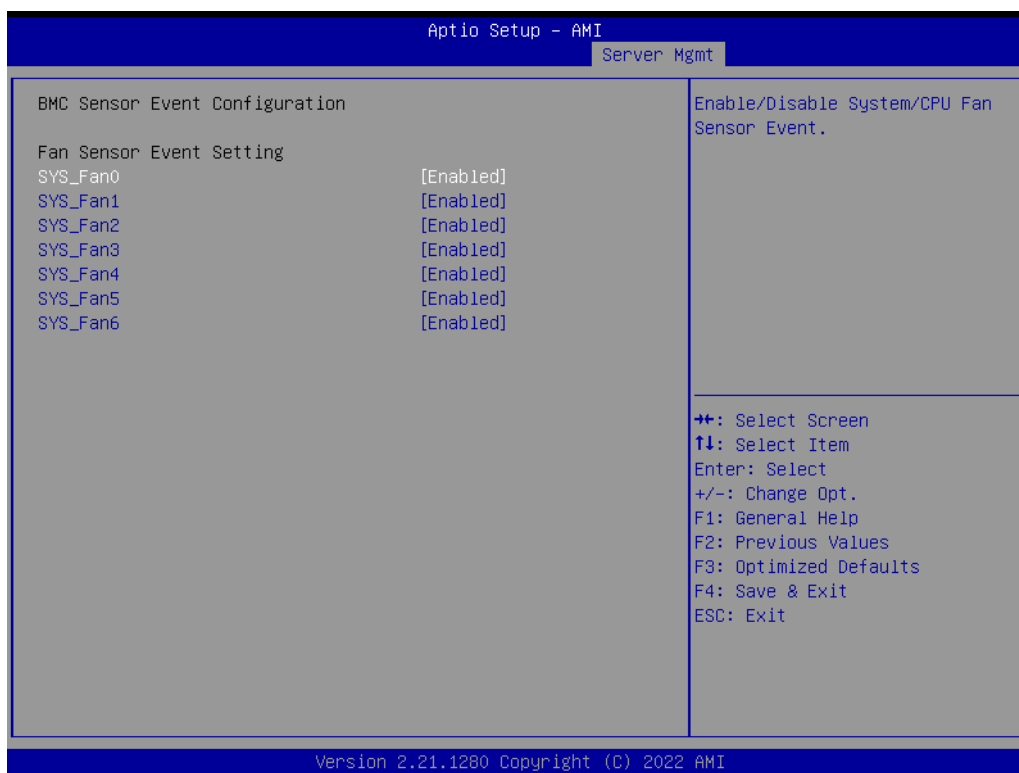


Figure 3.63 BMC Sensor Event Configuration Screen

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-830 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

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

- Core PCI PnP services
- Serial ATA interface support
- USB 1.1/2.0/3.0 support
- Identification of AMD 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:*



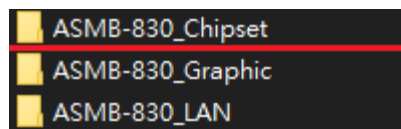
Windows Server 2019 Standard	x64
Windows Server 2016 Standard	x64
Windows 10 Ultimate	x64

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



4.3 Windows Series Driver Setup

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



Chapter 5

Graphics Setup

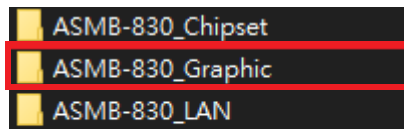
5.1 Introduction

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

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 ASMB-830 carries an additional graphics card for VGA output, please set this additional graphics card as "major output" under the "Display properties" of the OS.
2. The WDDM driver supports the following OS versions:
 - Windows 10 x86/x64 version
 - Windows Server 2012 version (WHQL)
 - Windows Server 2012R2 version (WHQL)
 - Windows Server 2016 version (WHQL)
 - Windows Server 2019 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 for 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.

Chapter 6

LAN Configuration

6.1 LAN Configuration

6.1.1 Introduction

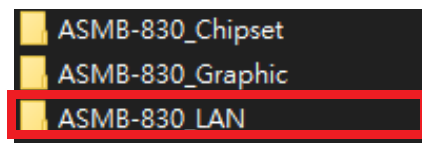
The ASMB-830 has two Gigabit Ethernet LAN connections via dedicated PCI Express x1 lanes: GbE LAN1 - Intel® I210 and GbE LAN2 - Intel® I210; two 10G Base-T LAN connectors LAN3 and LAN4 - Intel® X550. They eliminate the bottleneck of network data flow and incorporate Gigabit Ethernet at 10 Gbps.

- 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

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.

6.1.2 Windows Series Driver Setup

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



Appendix **A**

Programming the Watchdog Timer

The ASMB-830'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 into the EC controller IT8528E. It provides the following functions for user programming:

- It can be enabled and disabled by the user's program.
- The timer can be set from 1 to 255 seconds.
- It 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:

Table A.1: Watchdog Timer

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

Here is an example for each step to program the Watchdog Timer.

Table A.2: Watchdog Timer Example

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

Table A.2: Watchdog Timer Example

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

Appendix **B**

I/O Pin Assignments

B.1 USB 3.2 Gen1 Header (USB3_34)

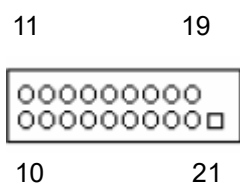


Table B.1: USB Header (USB3_34)

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

B.2 LAN Ports (LAN1_2, LAN3_4)

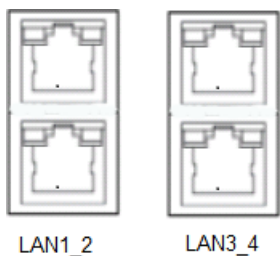


Table B.2: LAN RJ-45 Port (LAN1_2, LAN3_4)

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

B.3 VGA Connector (VGA1)

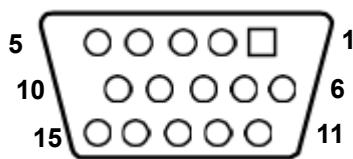


Table B.3: VGA Connector (VGA1)

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

B.4 RS-232 Interface (COM1, COM2)

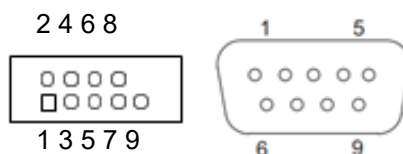


Table B.4: RS-232 Connector (COM1, COM2)

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

B.5 External Keyboard Connector (KBMS1)

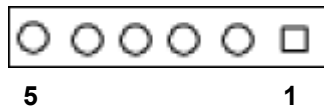


Table B.5: External Keyboard Connector (KBMS1)

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

B.6 System & CPU Fan Power Connector (SYSFAN0~6, CPUFAN0)



Table B.6: CPU FAN Connector (CPUFAN0)

	CPUFAN0
1	GND
2	+12V
3	CPU_FAN0_TACH
4	CPU0_PWM

Table B.7: SYS FAN Connector (SYSFAN0~6)

	SYSFAN0	SYSFAN1	SYSFAN2	SYSFAN3	SYSFAN4	SYSFAN5	SYSFAN6
1	GND	GND	GND	GND	GND	GND	GND
2	+12V	+12V	+12V	+12V	+12V	+12V	+12V
3	FAN0_TACH	FAN1_TACH	FAN2_TACH	FAN3_TACH	FAN4_TACH	FAN5_TACH	FAN6_TACH
4	FAN0_PWM	FAN1_PWM	FAN2_PWM	FAN3_PWM	FAN4_PWM	FAN5_PWM	FAN6_PWM

B.7 Power LED (JFP3)

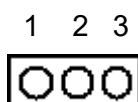


Table B.8: Power LED Connector (JFP3)	
Pin	Function
1	LED power (3.3 V)
2	NC
3	Ground

B.8 External Speaker Connector (JFP1+JFP2)

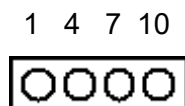


Table B.9: External Speaker Connector (JFP1+JFP2)	
Pin	Function
1	SPK+
4	NC
7	BZ-
10	SPK-

B.9 Reset Connector (JFP1+JFP2)

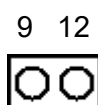


Table B.10: Reset Connector (JFP1+JFP2)	
Pin	Signal
9	RESET
12	GND

B.10 HDD LED Connector (JFP1+JFP2)

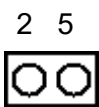


Table B.11: HDD LED Connector (JFP1+JFP2)	
Pin	Signal
2	HDD_LED+
5	HDD_LED-

B.11 ATX Soft Power Switch (JFP1+JFP2)

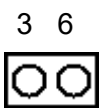


Table B.12: ATX Soft Power Switch (JFP1+JFP2)	
Pin	Signal
3	PWR-BTN
6	GND

B.12 ATX Soft Power Switch (JFP1)

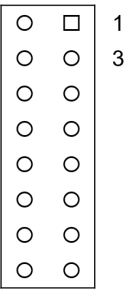


Table B.13: ATX Soft Power Switch (JFP1)	
Pin	Signal
1	PWR BTN
3	PWR GND

B.13 Reset Connector (JFP1)

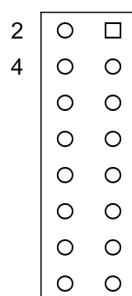


Table B.14: Reset Connector (JFP1)

Pin	Signal
2	RST BTN
4	RST GND

B.14 Front Panel LAN LED Connector (JFP1)

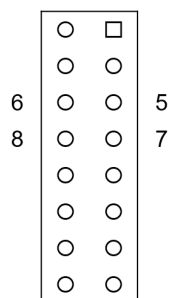


Table B.15: Front Panel LAN LED Connector (JFP1)

Pin	Signal
5	LAN2_LED+
6	LAN1_LED+
7	LAN2_LED-
8	LAN1_LED-

B.15 HDD LED Connector (JFP1)

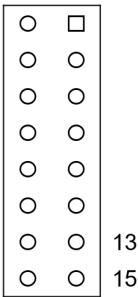


Table B.16: SNMP SMBus Connector (JFP2)

Pin	Signal
13	HDD_LED+
15	HDD_LED-

B.16 Power LED (JFP1)

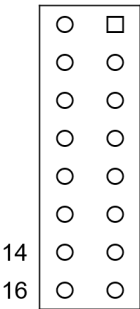


Table B.17: Power LED (JFP1)

Pin	Signal
14	PWR_LED+
16	PWR_LED-

B.17 SMBus Connector (SMBUS1)

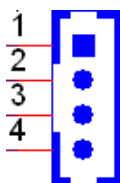


Table B.18: Front Panel SMBus Connector (SMBUS1)	
Pin	Signal
1	+5V
2	RESUME_SMB_CLK
3	RESUME_SMB_DATA
4	GND

B.18 USB & LAN Ports (LAN5_USB3_12)

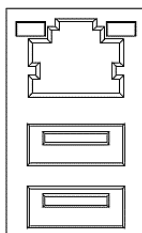


Table B.19: USB Port (LAN5_USB3_12)	
Pin	Signal
1	VBUS
2	D-
3	D+
4	GND
5	StdA_SSRX-
6	StdA_SSRX+
7	GND_DRAIN
8	StdA_SSTX-
9	StdA_SSTX+

Table B.20: LAN RJ-45 Port (LAN5_USB3_12)			
Pin	Signal	Pin	Signal
1	MID0+	4	MID2+
2	MID0-	5	MID2-
3	MID1+	7	MID3+
6	MID1-	8	MID3-

B.19 LPC Connector (LPC1)

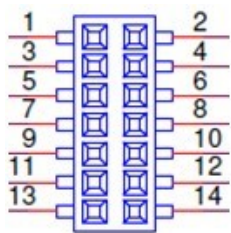


Table B.21: LPC Connector (LPC1)

Pin	Signal	Pin	Signal
1	R_LPCCLK_LPCCN	2	LPC_AD1
3	LPCRST_LPC_N	4	LPC_AD0
5	LPC_LFRAME#	6	+3.3V
7	LPC_AD3	8	GND
9	LPC_AD2	10	LPC_SMB_CLK
11	LPC_SERIRQ	12	LPC_SMB_DATA
13	+5V_AUX	14	+5V

B.20 Case Open Connector (JCASE1)

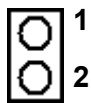


Table B.22: Case Open Connector (JCASE1)

Pin	Signal
1	CASEOP
2	GND

B.21 Front Panel LAN LED Connector (LANLED1)

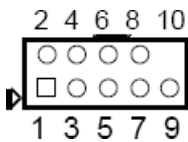


Table B.23: LAN LED Connector (LANLED1)

Pin	Signal	Pin	Signal
1	LAN1_LED1_ACT#	2	LAN2_LED1_ACT#
3	+V3.3_AUX	4	+V3.3_AUX
5	LAN3_ACT_LVC3#	6	LAN4_ACT_LVC3#
7	+V3.3_AUX	8	+V3.3_AUX
9	NC	10	NC

B.22 Clear CMOS Connector (JCMOS1)

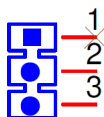


Table B.24: Clear CMOS Connector (JCMOS1)

Pin	Signal
	JCMOS1
1	NC
2	RTC_RST_PCH
3	GND

B.23 PMBUS Connector (PMBUS1)

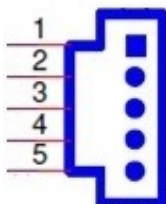


Table B.25: PMBUS Connector (PMBUS1)

Pin	Signal
1	PMBUS_SMB_CLK
2	PMBUS_SMB_DATA
3	PMBUS_SW_ALERT#
4	GND
5	+V3.3_AUX

B.24 GPIO Connector (GPIO1)

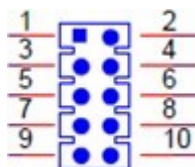


Table B.26: GPIO Connector (GPIO1)

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



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