

AIMB-592

**AMD EPYC 7003 Zen 3 Core,
MicroATX with 4 PCIe X 16 Slots,
2 10GbE LANs, 2 2.5GbE LANs, 5
USB 3.2 Gen1, IPMI 2.0**

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Declaration of Conformity

FCC Class B

Note: 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 instructions, 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 into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CPU Compatibility

CPU Family	Core Number	TDP(W)	Max. Speed	L3 Cache
7313P	16	155W	3.7GHz	128MB
7543P	32	225W	3.7GHz	256MB
7713P	64	225W	3.675GHz	256MB

Memory Compatibility

Category	Speed	Capacity	Vendor	Module_PN	Chip_PN	ADVANTEC H P/N	ECC	Result
DDR5	4800	32GB	Advantech	SQR-SD5N32G4K8 MNAB	IVA45 D8BNJ	SQR-SD5N32G4K 8MNAB	N	PASS
DDR5	4800	16GB	Advantech	SQR-SD5N16G4K8 MNAB	2AA45 D8BNJ	SQR-SD5N16G4K 8MNAB	N	PASS

Ordering Information

P/N	AIMB-592SF-00A1	AIMB-592SL-00A1
USB 3.2 (Rear)	4	4
USB 3.2 (Internal)	1	1
VGA	1	1
PCIe x16 Gen4	4	4
DDR4 Memory	6	6
10GbE LAN	2	0
2.5GbE LAN	2	2
IPMI2.0	Yes	No
BMC	1 (AST2500)	1 (AST2510)*
BMC LAN	1	0
SATA III	8	8
M.2 M-key	1	1
TPM	1	1
Slimline	2 (PCIex4)	2 (PCIex4)

* No BMC function

Initial Inspection

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

- 1 x AIMB-592 AMD EPYC 7003 Zen 3 Core MicroATX Motherboard
- 4 x SATA HDD cable
- 1 x I/O port bracket
- 1 x Warranty card
- 2 x M.2 screws

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-592 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the AIMB-592, 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 your 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.

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Chapter 1

General Information

1.1 Introduction

The AIMB-592 motherboard utilizes the AMD EPYC 7003 Zen 3 Core processor, catering to industrial applications that necessitate high-performance computing and advanced power management capabilities. It supports the AMD EPYC 7003 Zen 3 Core, boasting a sizable 256MB L3 cache and DDR4 3200 MHz with a maximum capacity of 768GB (6 x 128GB per slot). The motherboard offers extensive I/O connectivity, including 4 x PCIe x16 slots, up to 2 x 10GbE LAN, 2 x 2.5GbE LAN, 5 x USB 3.2 Gen2, 8 x SATA III ports, and IPMI2.0.

1.2 Features

- **Rich I/O connectivity:** up to dual 10GbE LAN and dual 2.5 Gbe LAN via PCIe x1 bus, 4 x PCIe x16 slot (Gen 4), 5 USB 3.2 Gen1, 2 slimline via PCIe x4 bus.
- **Standard Micro ATX form factor with industrial features:** The AIMB-592 is a full featured Micro ATX motherboard with balanced expandability and performance.
- **Diverse Storage Devices:** SATA HDD, M.2 M-key SSD
- **Optimized Integrated Graphics:** no integrated graphic.

1.3 Specifications

1.3.1 Processor

- CPU: AMD EPYC™ 7003 Series Processors
- BIOS: AMI EFI 256 Mb SPI (with Lotus SPI socket)
- SATA hard disk drive interface: On-board SATA connectors with data transmission rate up to 600 MB

1.3.2 Memory

- RAM: Up to 768 GB in six slots, 288-pin DIMM sockets. Supports dual-channel up to DDR4 3200MHz RDIMM.
 - The ECC compatibility of AIMB-592 is supported.

1.3.3 Input/Output

- **PCIe slot:** 4 PCIe x16 expansion slot
- **Serial port:** a serial port of RS-232
- **USB port:** Supports up to 5 USB 3.2 Gen1 ports with transmission rates up to 5Gbps.
- **GPIO:** AIMB-592 supports 8-bit GPIO from super I/O for general-purpose control application.

1.3.4 Graphics

- **Controller:** ASPEED AST2500/AST2510 BMC Chip
- **VGA:** VGA up to 1920x1200@60Hz

1.3.5 Ethernet LAN

- Supports up to two 10/100/1000/2500 Mbps Ethernet port (s) via PCI Express x1 bus and two 100/1000/10000 Mbps Ethernet port (s) via PCI Express x4 bus
- **Controller:** LAN1/LAN2: Intel I226LM(AIMB-592SF/AIMB-592SL) LAN3/LAN4: Intel X550-AT (AIMB-592SF); LAN5: Realtek 8211FSI(AIMB-592SF)

1.3.6 Industrial Features

- **Watchdog timer:** Can generate a system reset. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels).

1.3.7 Mechanical and Environmental Specifications

- **Operating temperature:** 0 ~ 60°C (32 ~ 140°F, depending on CPU).
- **Storage temperature:** -40 ~ 85°C (-40 ~ 185°F).
- **Power supply voltage:** +5V, +12V, +3.3V, +5 VSB, +12V_8P
- **Power consumption:**

+5 V	3.3 V	12 V	12 V(8-pin)	+5VSB
13.3A	36.2A	33.5A	13.7A	2A

Measure the maximum current value which system under maximum load (CPU: Top speed, RAM & Graphic: Full loading)
- **Board size:** 244 mm x 244 mm (9.6" x 9.6")
- **Board weight:** 0.3 kg.

1.4 Jumpers and Connectors

Connectors on the AIMB-592 motherboard link it to devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

1.5 Board layout: Jumper and Connector Locations

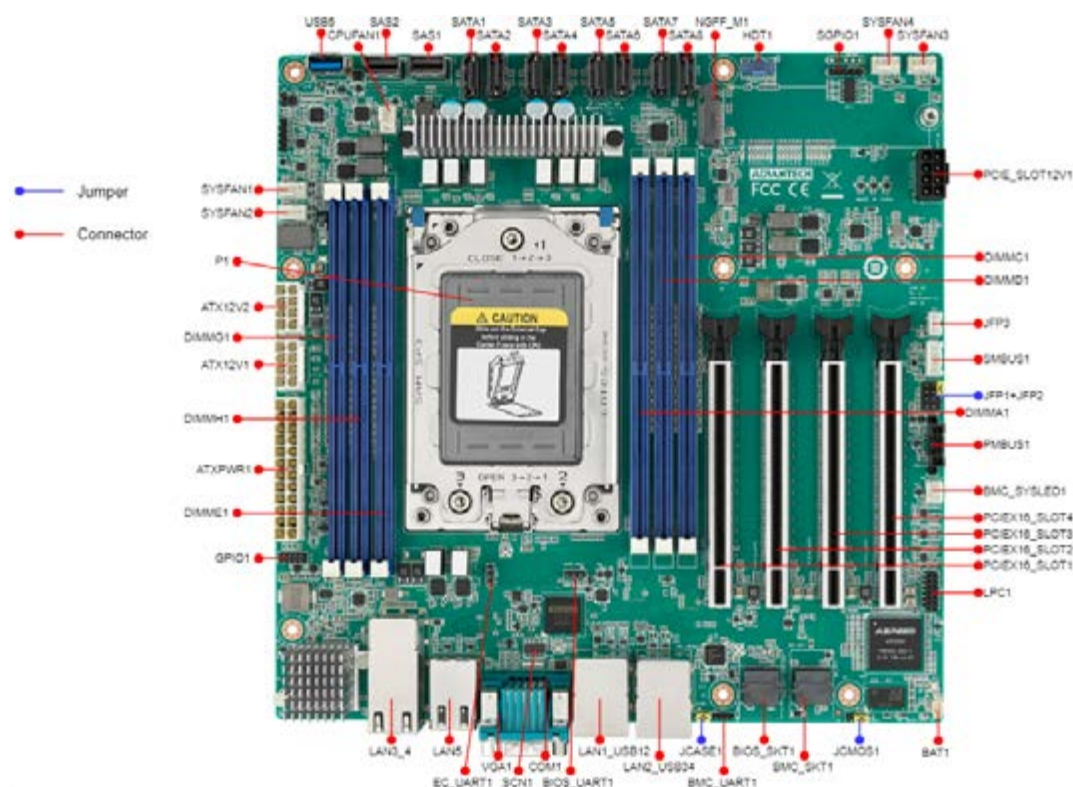
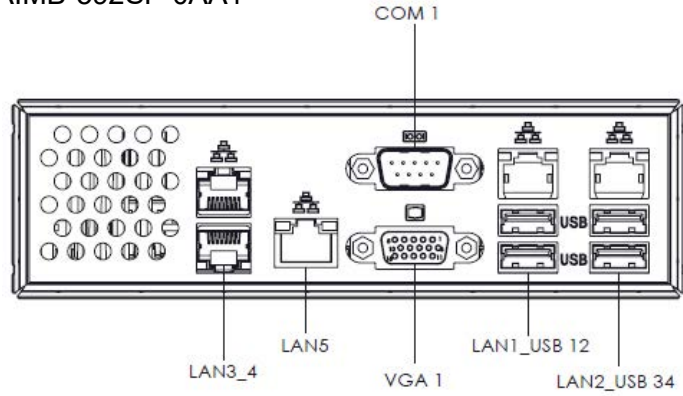


Figure 1.1 Board Layout

AIMB-592SF-0AA1



AIMB-592SL-0AA1

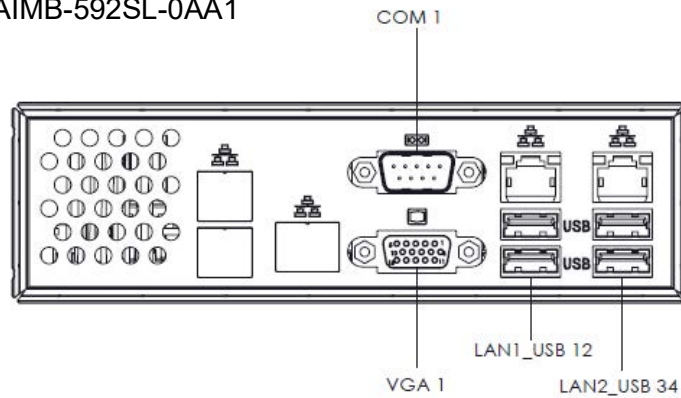


Figure 1.2 Rear I/O of the Two SKUs

Table 1.1: Jumper Setting List

	Description	Part Reference
1	Clear CMOS jumper	JCMOS1
2	Case open pin header	JCASE1
3	Front Panel1 + Front Panel2 header	JFP1+JFP2

Table 1.2: Connector / Header List:

	Description	Part Reference
1	10G LAN Port *2	LAN3_4
2	BMC LAN	LAN5
3	BMC VGA	VGA1
4	COM Port	COM1
5	2.5G LAN+USB3.2 Gen1 *2	LAN1_USB12
6	2.5G LAN+USB3.2 Gen1 *2	LAN2_USB34
7	BIOS SPI ROM socket	BIOS_SKT1
8	BMC ROM socket	BMC_SKT1
9	Battery Holder	BAT1
10	LPC Debug header	LPC1
11	PCIe x16 slot	PCIEX16_SLOT1
12	PCIe x16 slot	PCIEX16_SLOT2
13	PCIe x16 slot	PCIEX16_SLOT3

Table 1.2: Connector / Header List:

14	PCIe x16 slot	PCIEX16_SLOT4
15	System Error Led wafer	BMC_SYSLED1
16	PMBus wafer	PMBUS1
17	HW SMBUS	SMBUS1
18	Front Panel3	JFP3
19	Graphics Card 12V slot	PCIE_SLOT12V1
20	System FAN3 connector	SYSFAN3
21	System FAN4 connector	SYSFAN4
22	Serial GPIO	SGPIO1
23	AMD Debug connector	HDT1
24	M.2 M key 2280 slot	NGFF_M1
25	SATA connector	SATA8
26	SATA connector	SATA7
27	SATA connector	SATA6
28	SATA connector	SATA5
29	SATA connector	SATA4
30	SATA connector	SATA3
31	SATA connector	SATA2
32	SATA connector	SATA1
33	Slimline SAS 4i connector	SAS1
34	Slimline SAS 4i connector	SAS2
35	CPU FAN connector	CPUFAN1
36	USB3.2 Gen1 vertical connector	USB5
37	System FAN1 connector	SYSFAN1
38	System FAN2 connector	SYSFAN2
39	ATX 12V IN connector	ATX12V2
40	ATX 12V IN connector	ATX12V1
41	ATX 24pin IN connector	ATXPWR1
42	GPIO header	GPIO1
43	DDR4 RDIMM slot	DIMME1
44	DDR4 RDIMM slot	DIMMH1
45	DDR4 RDIMM slot	DIMMG1
46	DDR4 RDIMM slot	DIMMA1
47	DDR4 RDIMM slot	DIMMD1
48	DDR4 RDIMM slot	DIMMC1
49	CPU socket	P1
50	EC programing header	SCN1

1.6 AIMB-592 Board Diagram

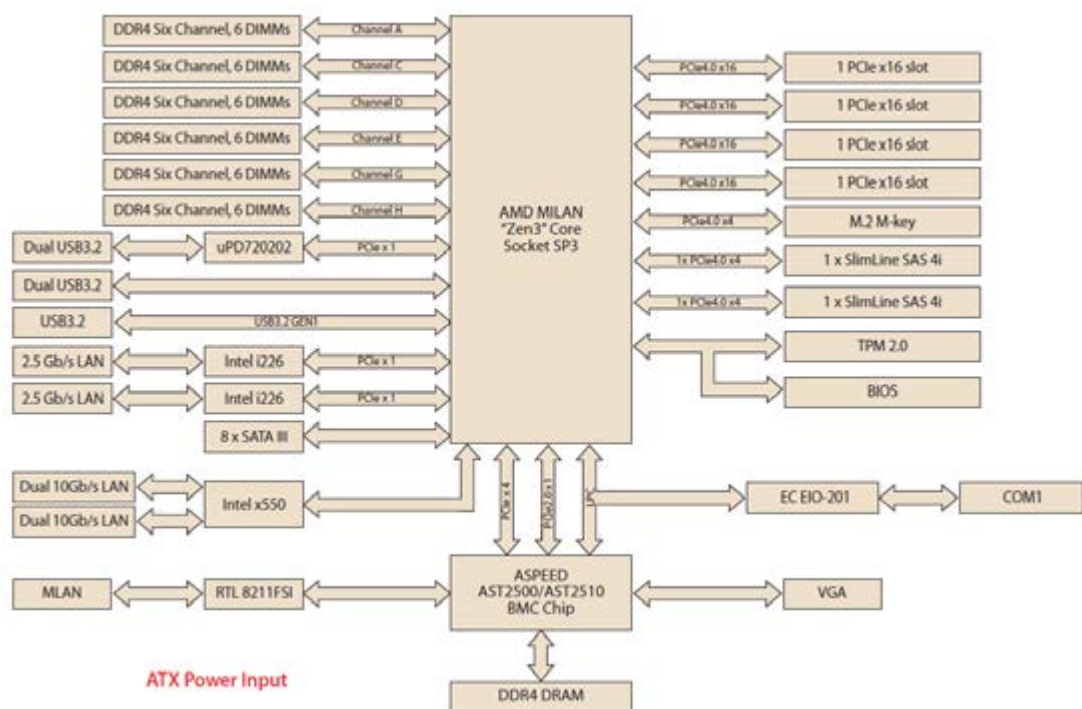


Figure 1.3 AIMB-592 Board Diagram

1.7 Safety Precautions

Warning! Always completely disconnect the power cord from chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.



Caution! Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to electro-static discharges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.



Caution! The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.



Caution! There is a 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.



1.8 Jumper Settings

This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboard's default settings and your options for each jumper.



1.8.1 How to Set Jumpers

You can configure your motherboard to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" (or turn ON) a jumper, you connect the pins with the clip. To "open" (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.8.2 CMOS Clear (JCMOS1)

Pin	Signal Pin Definition
1	+V1.5_RTC_JMP
2	+V1.5_RTC
3	GND

Table 1.3: JCMOS1

Function	Jumper Settings
Keep CMOS data (Default)	 1 2 3 1-2
Clear CMOS data	 1 2 3 2-3

1.9 System Memory

AIMB-592 has six 288-pin memory sockets and supports up to DDR4 3200MHz RDIMM with maximum capacity of 768 GB (Maximum 128 GB for each DIMM).

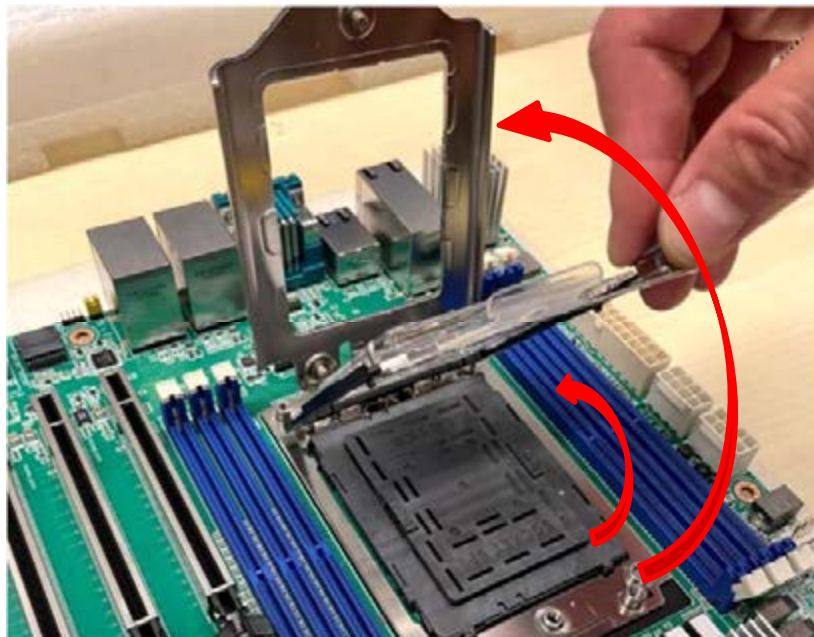
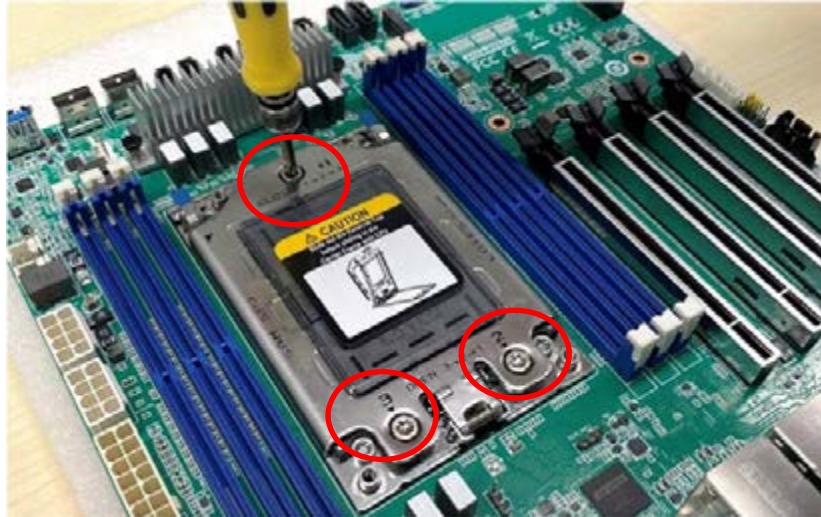
1.10 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the "open" position, i.e., the handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then firmly but gently (avoid pushing down too hard) press the DIMM module well down into the socket, until you hear a click when the two handles have automatically locked the memory module into the correct position of the DIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism.

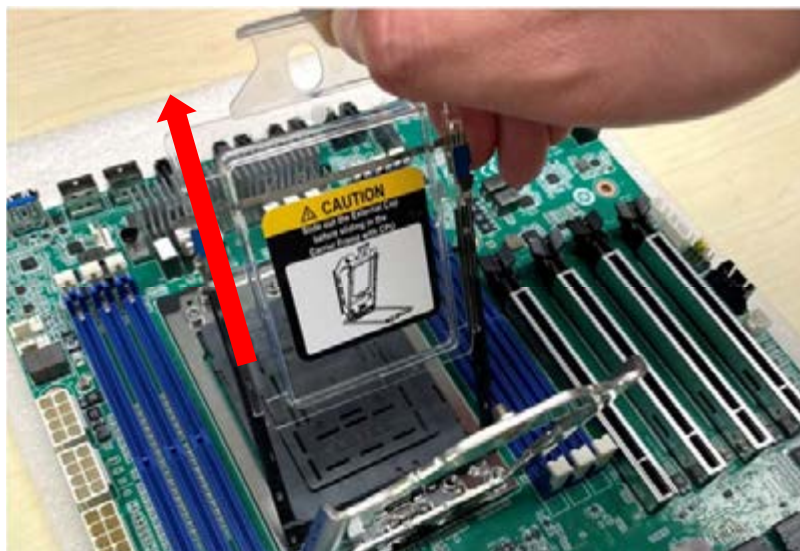
1.11 Processor Installation

The AIMB-592 is designed for AMD EPYC 7003 Series processors. Please follow the processor installation as below.

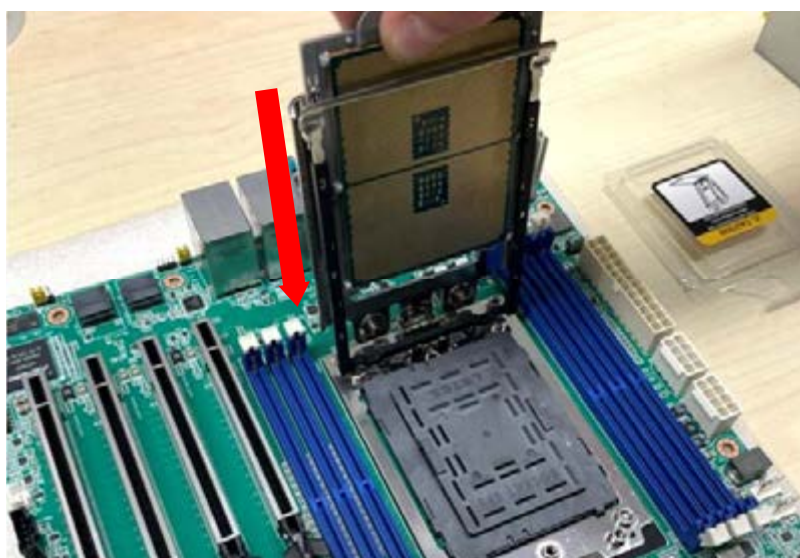
1. Unscrew the three screws (shown above in red circles) on the top of the socket retention mechanism (SRM), then rotate the retention frame and rail frame (with external cap).



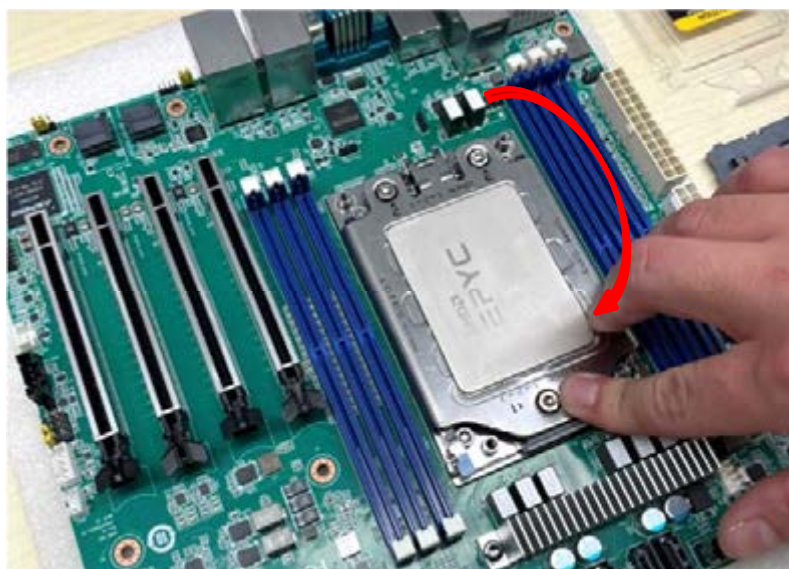
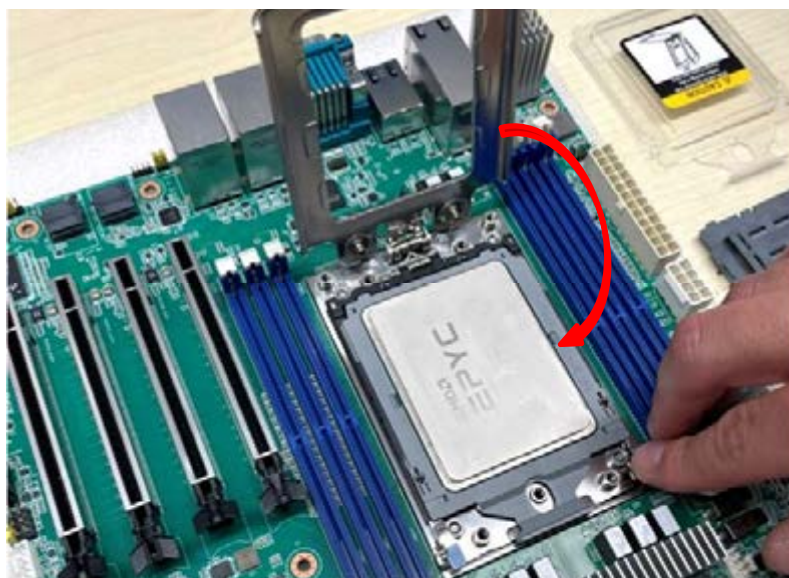
2. Remove the external cap by pulling upwards.



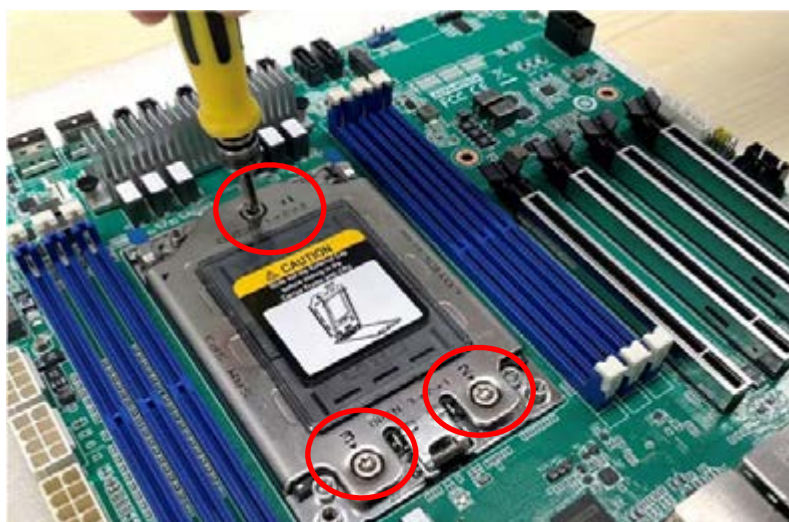
3. Install the carrier frame/CPU package to the rail frame, and then remove the PnP cover cap. Be very careful not to drop the PnP cover cap into the exposed contact field during the removal process.



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

Connecting
Peripherals

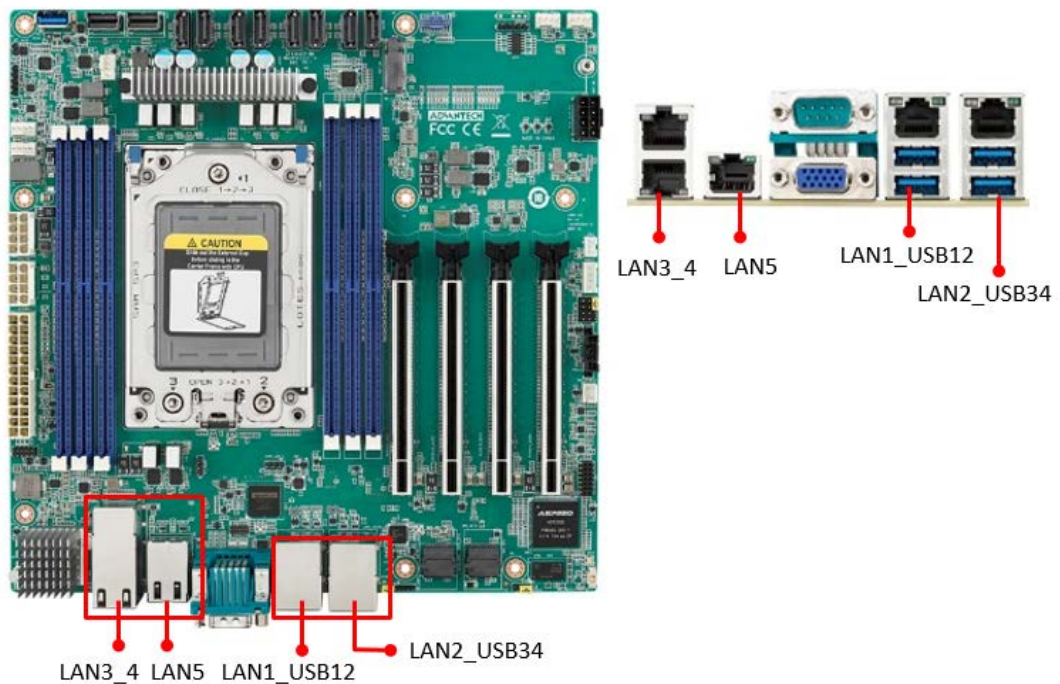
2.1 Introduction

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 or have a packed chassis, you may need to partially remove the card to make all the connections.

2.2 LAN and USB Ports (LAN1_USB12/ LAN2_USB34/ LAN3_4/LAN5)

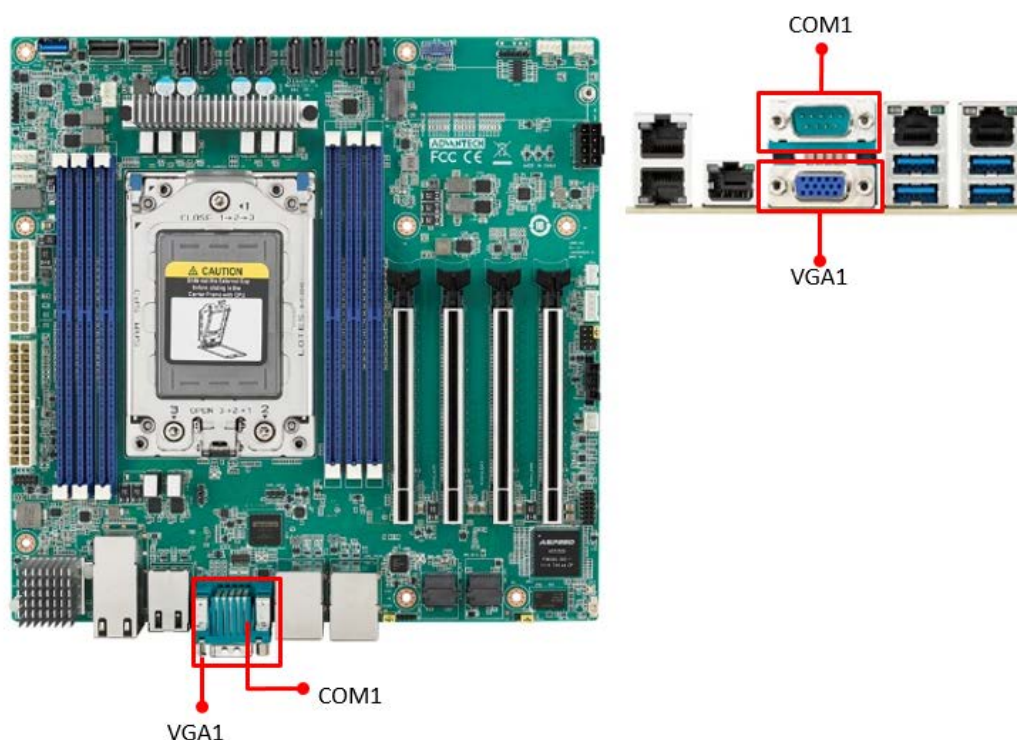
The AIMB-592 provides up to five USB3.2 gen1 ports. (4 x USB ports on the rear side, 1 x USB port via the board pin header) The USB interface complies with USB Specification Rev 2.0 supporting transmission rates up to 480 Mbps and Rev 3.0 supporting transmission rate up to 5 Gbps. The USB interface can be disabled in the system BIOS setup.

The AIMB-592 is equipped with up to two 2.5G Mbps and two 10G Mbps Ethernet LAN adapters and one BMC LAN which are supported by all major network operating systems. The RJ-45 jacks on the rear panel provides convenient LAN connection.

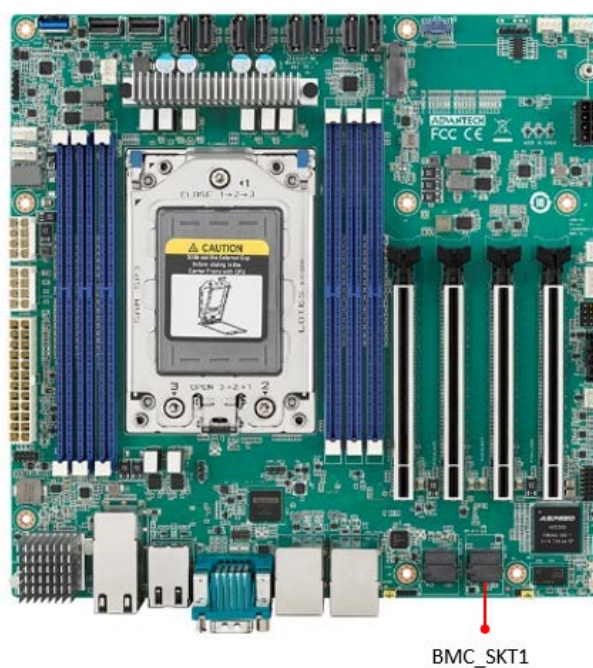


2.3 VGA and Serial Ports (VGA1/COM1)

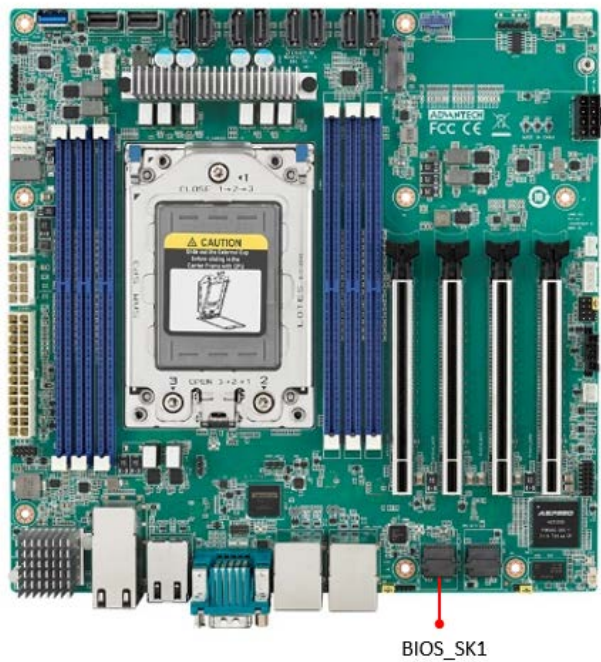
AIMB-592 includes VGA1 interfaces that can drive conventional VGA1 displays. The serial port supports RS-232 and can connect to serial devices, such as a mouse or a printer, or to a communications network.



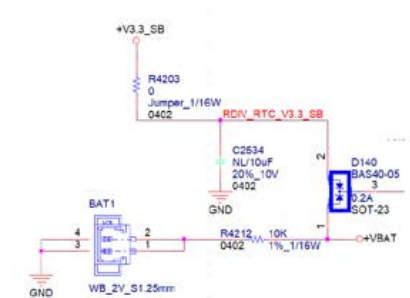
2.4 BMC ROM socket (BMC_SKT1)



2.5 BIOS SPI ROM socket (BIOS_SKT1)



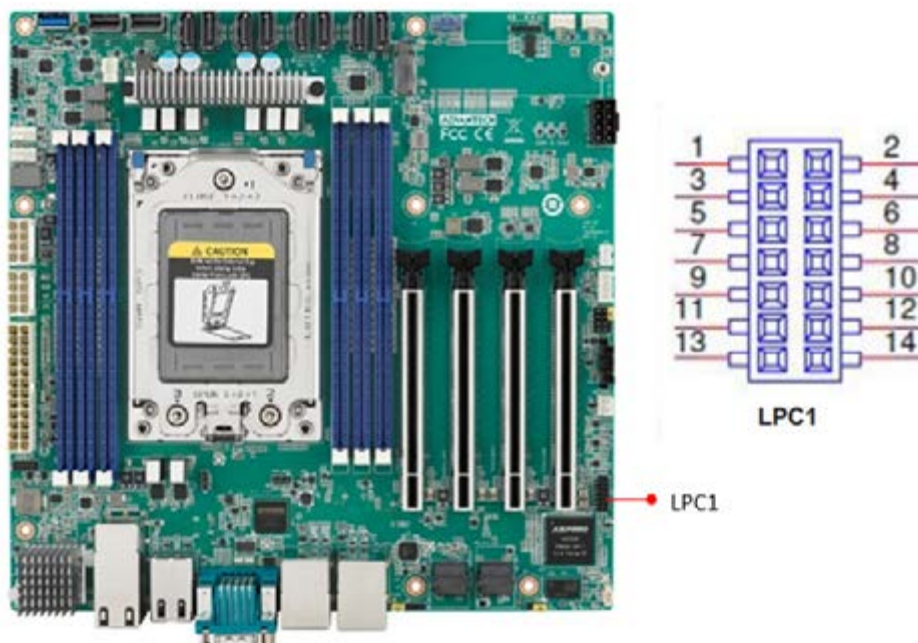
2.6 Battery Holder (BAT1)



Pin	Signal
1	+VBAT
2	+VBAT
3	GND
4	GND

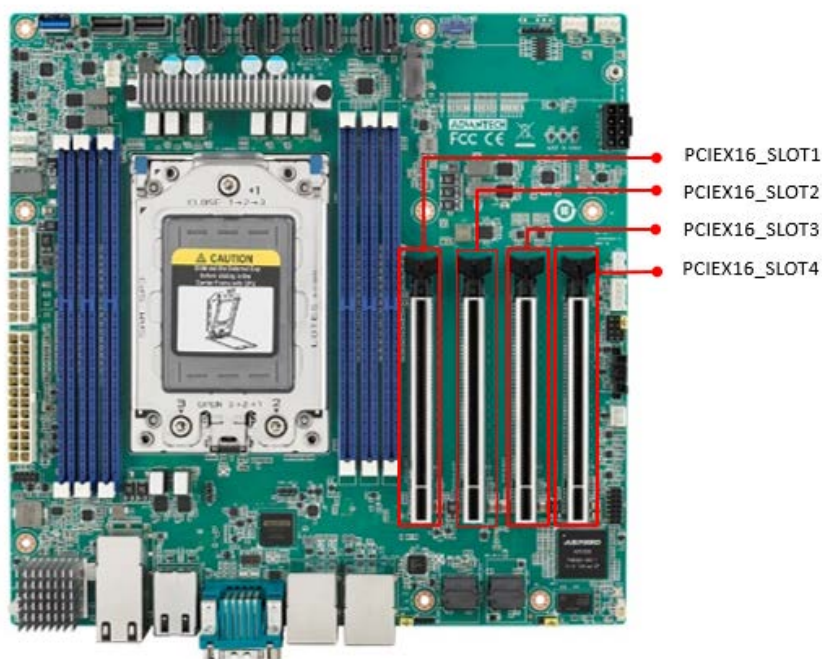
2.7 LPC Connector (LPC1)

AIMB-592 has one LPC connector which is for BIOS usage.



2.8 PCIe Expansion Slot (PCIEX16_SLOT1/ PCIEX16_SLOT2/ PCIEX16_SLOT3/ PCIEX16_SLOT4)

AIMB-592 provides four PCIe x16 slots that can support up to two double-deck cards.

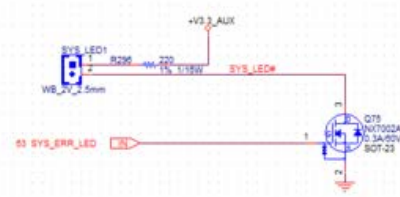


Note!

1. 16_SLOT4, There will be institutional interference with the connectors at LPC1, SYS_LED1, JFP1+JFP2, JFP3, SMBUS1, SLOT12V1, PMBUS1, SYSFAN3, SYSFAN4. The actual situation still needs to be based on the length of the graphic card.
2. Under POST, only BMC VGA output is supported, and external graphics cards on PCIe Slot must be installed the driver, then it can display normally under the OS.
3. Depending on the fan used, if install the graphic card on the PCIEX16_SLOT1, should remove it as follows steps.
4. When using with STD Cooler (1970004817N001): Remove the memory inserted in the DIMMC1 position before removing the graphics card.
5. When using with Customized VC Heatsink: Remove this fan, uninstall the memory at DIMMC1 before removing the graphics card.
6. If users would insert an Add-on card, it is recommended to use the Add-on card with PCIe Gen4.

2.9 System Error LED wafer (BMC_SYSLED1)

System Error LED wafer is for usage of identify the chassis location by "ipmitool chassis identify" command.



Pin	Signal
1	+V3.3_AUX
2	SYS_LED#

• BMC_SYSLED1

2.10 PMBus wafer (PMBUS1)

PMBUS connector is for communicating with power supply that has PMBUS function supported.

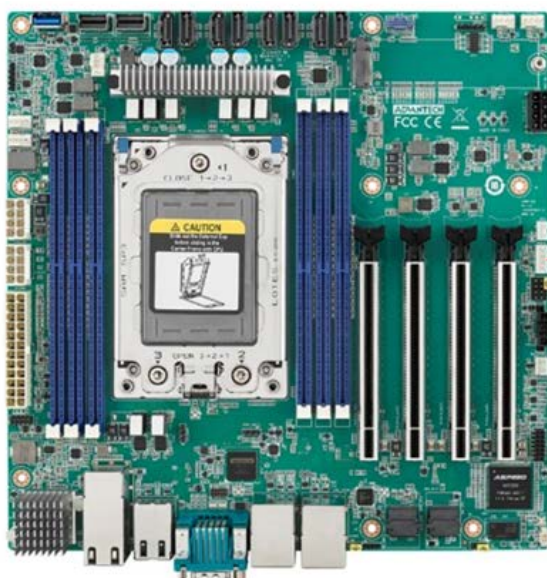


PMBUS CONN.

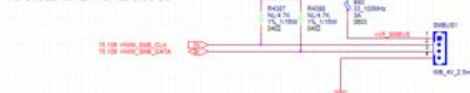


Pin	Signal
1	PMBUS_SMB_CLK
2	PMBUS_SMB_DATA
3	PMBUS_SW_ALERT#
4	GND
5	+V3.3_AUX

2.11 Hardware SMBUS (SMBUS1)

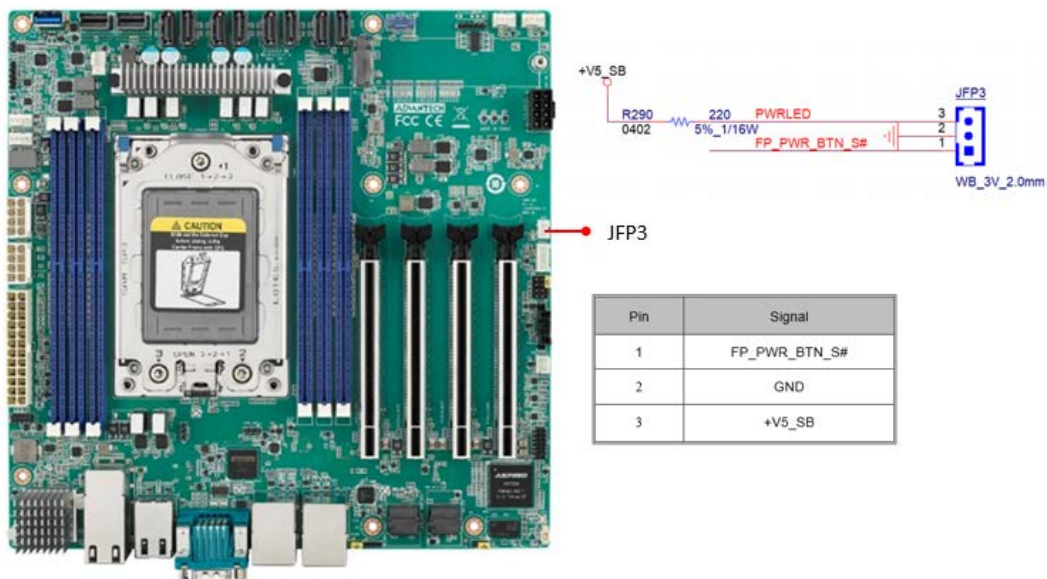


SMBUS CONN.

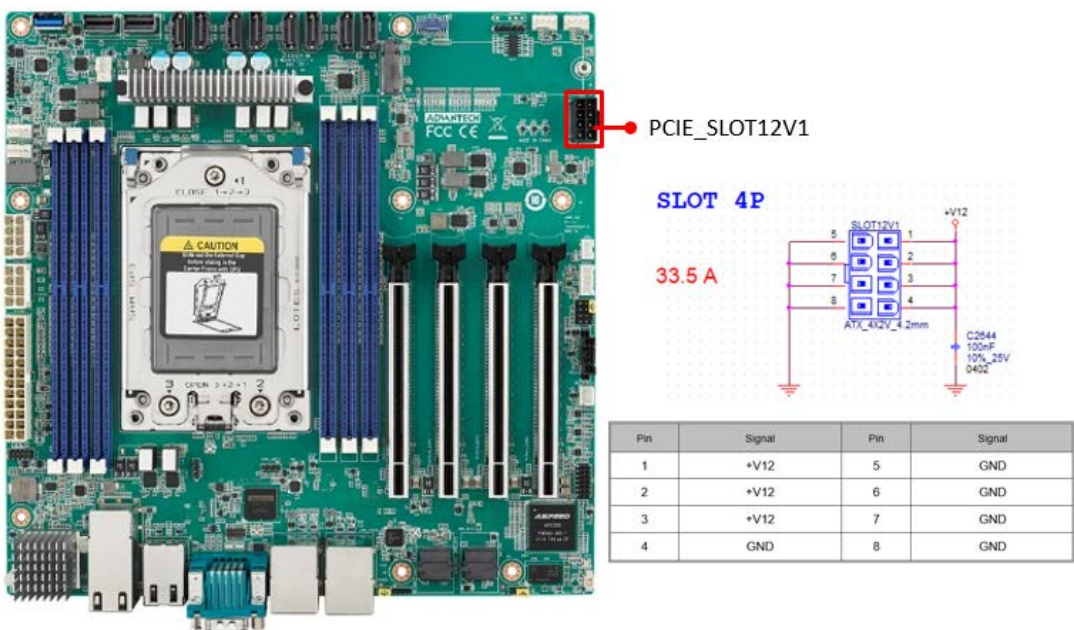


Pin	Signal
1	+V5
2	HWM_SMB_CLK
3	HWM_SMB_DATA
4	GND

2.12 Front Panel3 (JFP3)



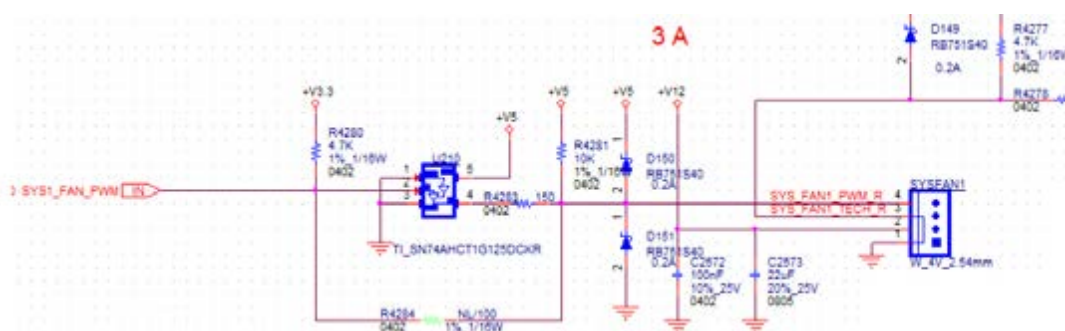
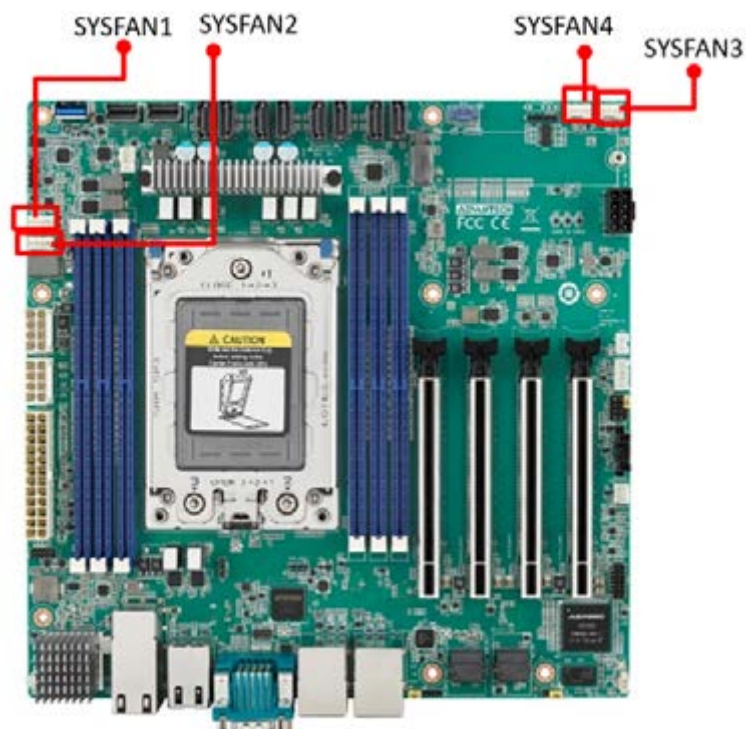
2.13 Graphics Card 12V slot (PCIE_SLOT12V1)



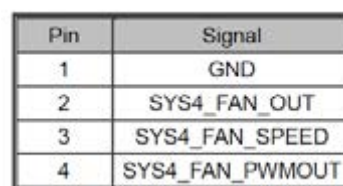
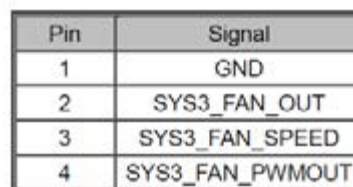
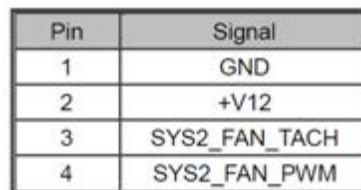
Note! This connector is only necessary if PCIe cards that draw more than 70 watts from the PCIe bus are fully-installed on four slots on the motherboard and it is only for power input usage.



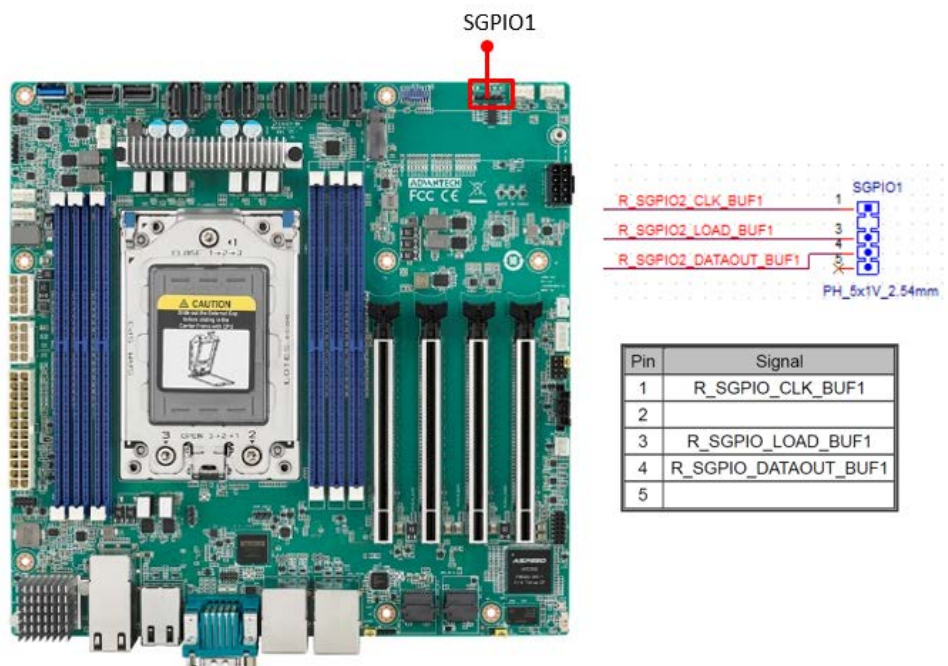
2.14 System FAN Connector (SYSFAN1/SYSFAN2/SYSFAN3/SYSFAN4)



Pin	Signal
1	GND
2	+V12
3	SYS1_FAN_TACH
4	SYS_FAN1_PWM

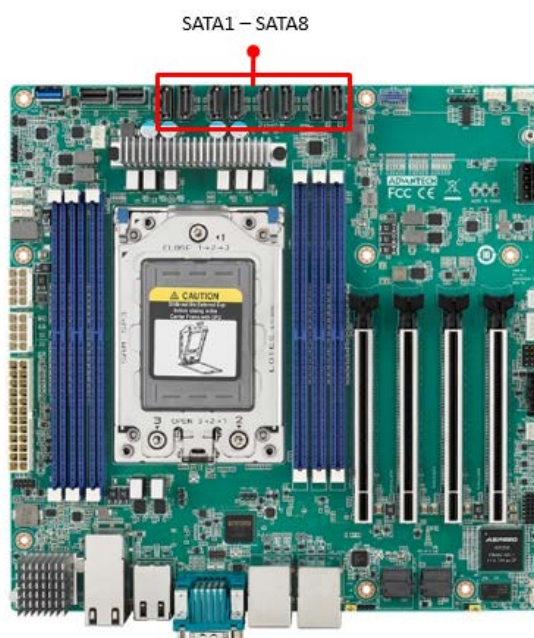


2.15 Serial General Purpose I/O Connector (SGPIO1)



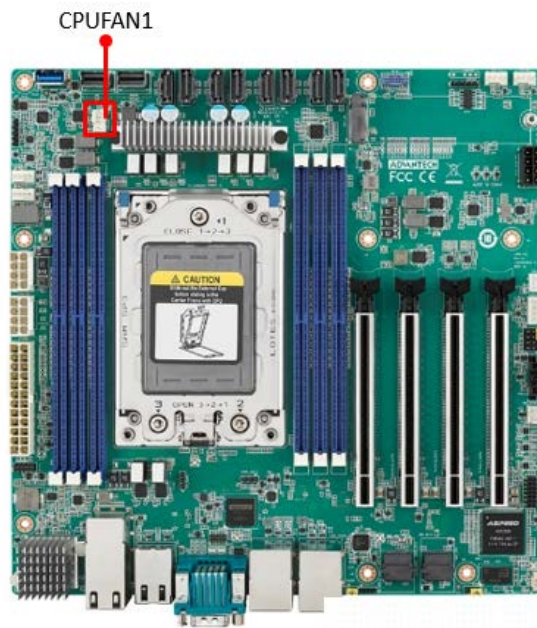
2.16 Serial ATA Interface Connector (SATA1~8)

AIMB-592 features eight serial ATA III interfaces (up to 600 MB/s) and eases cabling to hard drives with long and space-saving cables.

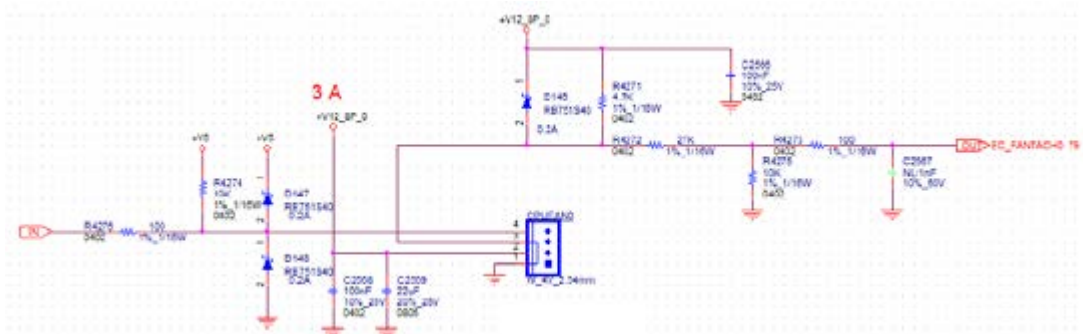


2.17 CPU Fan Connector (CPUFAN1)

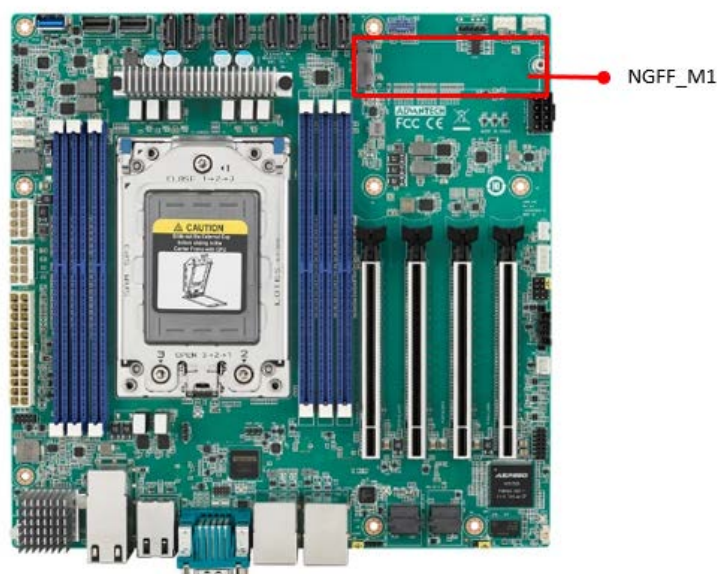
If a fan is used, this connector supports cooling fans that draw up to 2A (24W).



Pin	Signal
1	GND
2	+V12_8P_0
3	EC_FANTACH0
4	EC_CPU_PWM



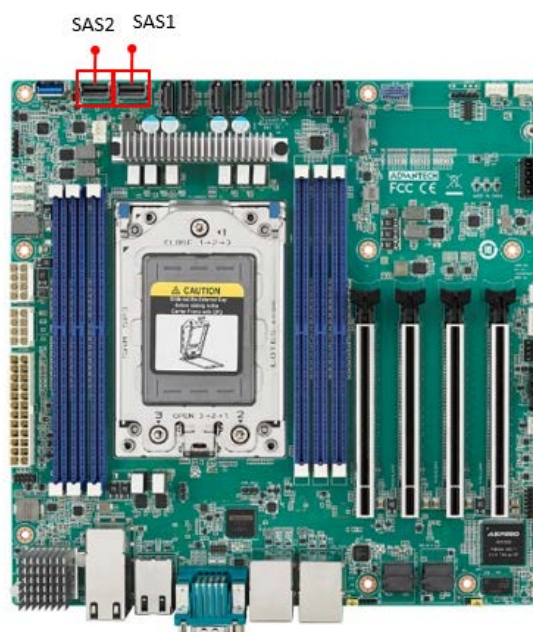
2.18 NGFF M.2 M-Key (NGFF_M1)



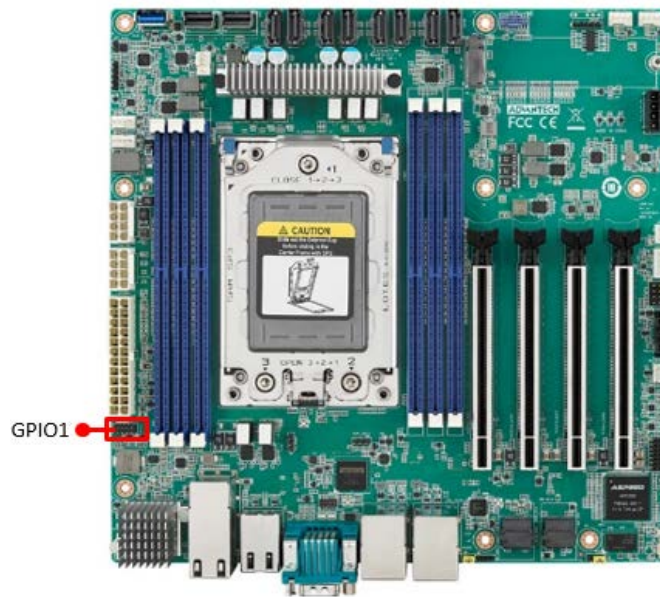
- M.2 M-key: 2280, support SATA III or PCIe4 interface, and can support NVMe devices.

2.19 Slimline SAS 4i Connector (SAS1/SAS2)

This connector has PCIE Gen 4 signal.

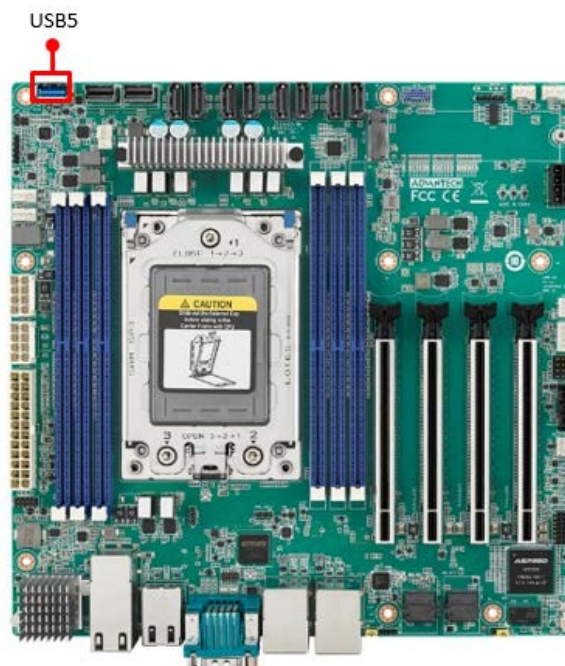


2.20 General purpose I/O Connector (GPIO1)

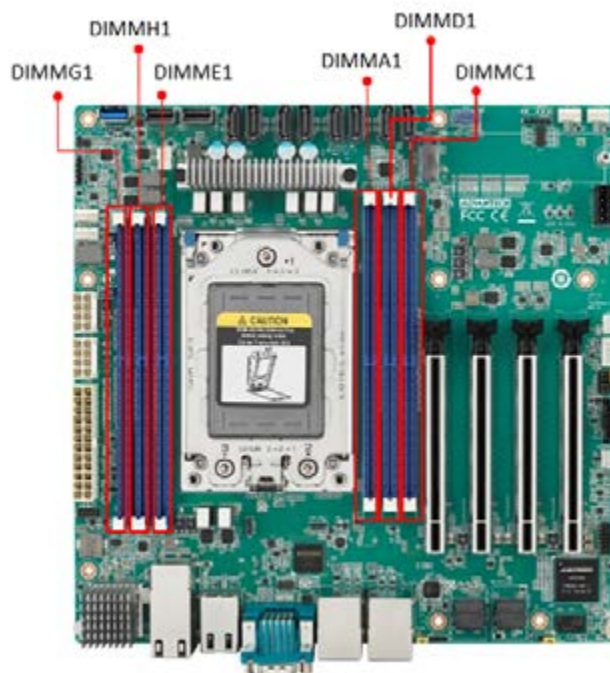


2.21 USB3.2 Gen1 vertical connector (USB5)

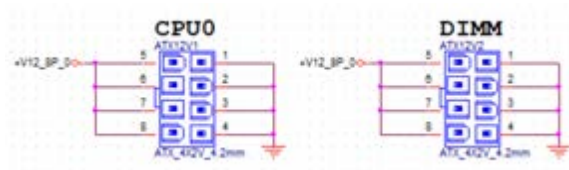
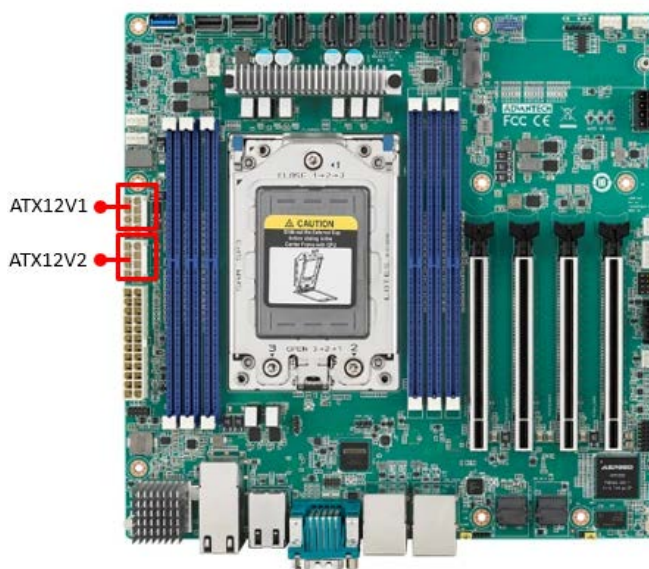
The USB port complies with USB 3.2 Gen1. Transmission rates of up to 5Gbps. Fuse protection is supported.



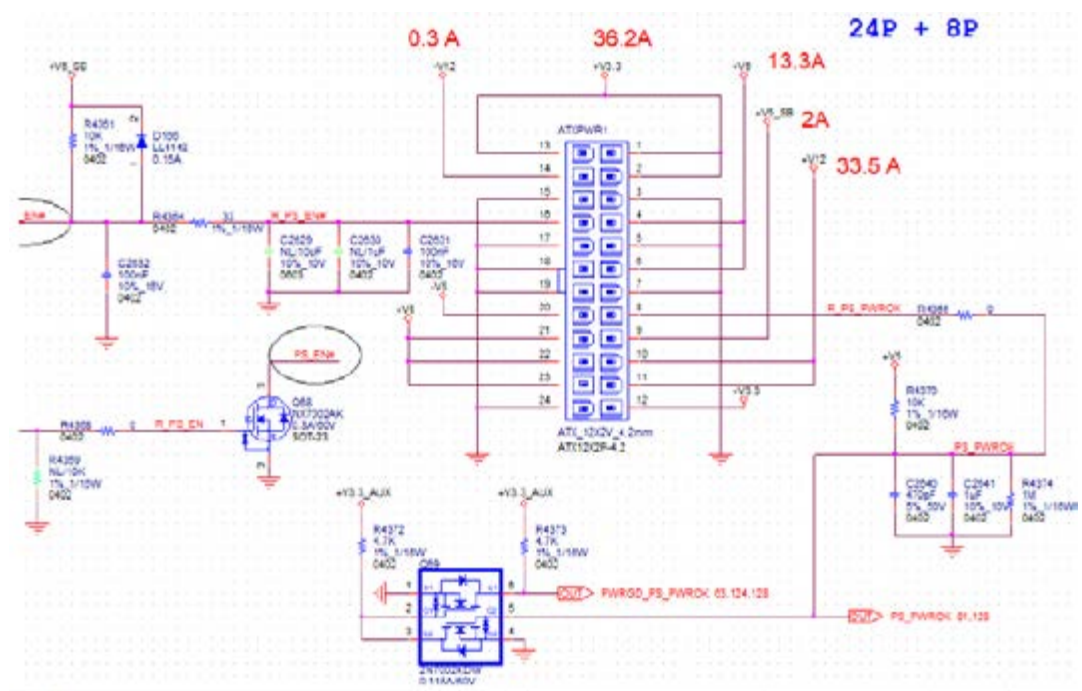
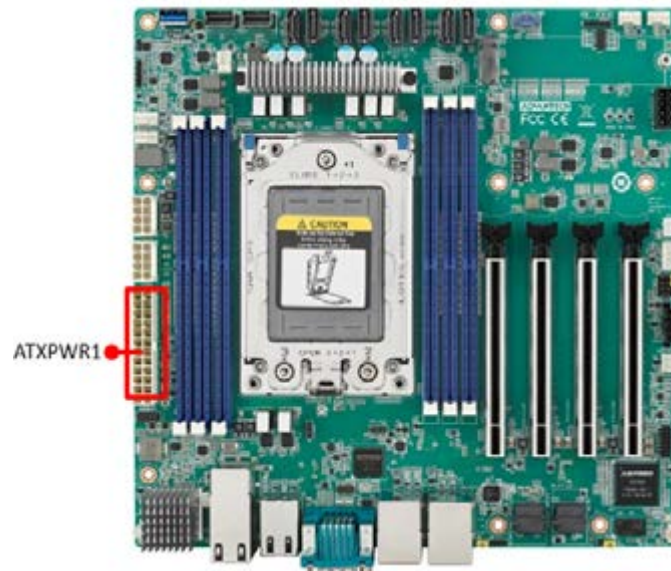
2.22 DDR4 RDIMM slot (DIMME1/ DIMMH1/ DIMMG1/ DIMMA1/ DIMMD1/ DIMMC1)



2.23 ATX Power Connector (ATX12V1/ ATX12V2/ ATXPWR1)



Pin	Signal	Pin	Signal
1	GND	5	+V12_8P_0
2	GND	6	+V12_8P_0
3	GND	7	+V12_8P_0
4	GND	8	+V12_8P_0



Pin	Signal Pin Definition	Pin	Signal Pin Definition
1	+V3.3	13	+V3.3
2	+V3.3	14	-V12
3	GND	15	GND
4	+V5	16	PS_ON#
5	GND	17	GND
6	+V5	18	GND
7	GND	19	GND
8	PWR_OK	20	-V5
9	+V5_SB	21	+V5
10	+V12	22	+V5
11	+V12	23	+V5
12	+V3.3	24	GND

This connector is for an ATX Micro-Fit power supply. The plugs from the power supply are designed to fit these connectors from only one direction. Determine the proper orientation and push down firmly until the connectors join completely.

Note!



1. Please connect the ATX12V1 and ATX12V2 connector with the PSU ATX 12V 8-pin connector, otherwise AIMB-592 will not boot up normally.
2. For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and minimum output should be at least 700W.

Chapter 3

BIOS and BMC Operation

3.1 Introduction

AMI BIOS has been integrated into many motherboards, and has been very popular for over a decade. With the AMI BIOS Setup program, you can modify BIOS settings to control the special features of your computer. The Setup program uses a number of menus for making changes. This chapter describes the basic navigation of the AIMB-592 setup screens.

3.2 BIOS Setup

The AIMB-592 Series system has AMI BIOS built in, with a SETUP utility that allows users to configure required settings or to activate certain system features.

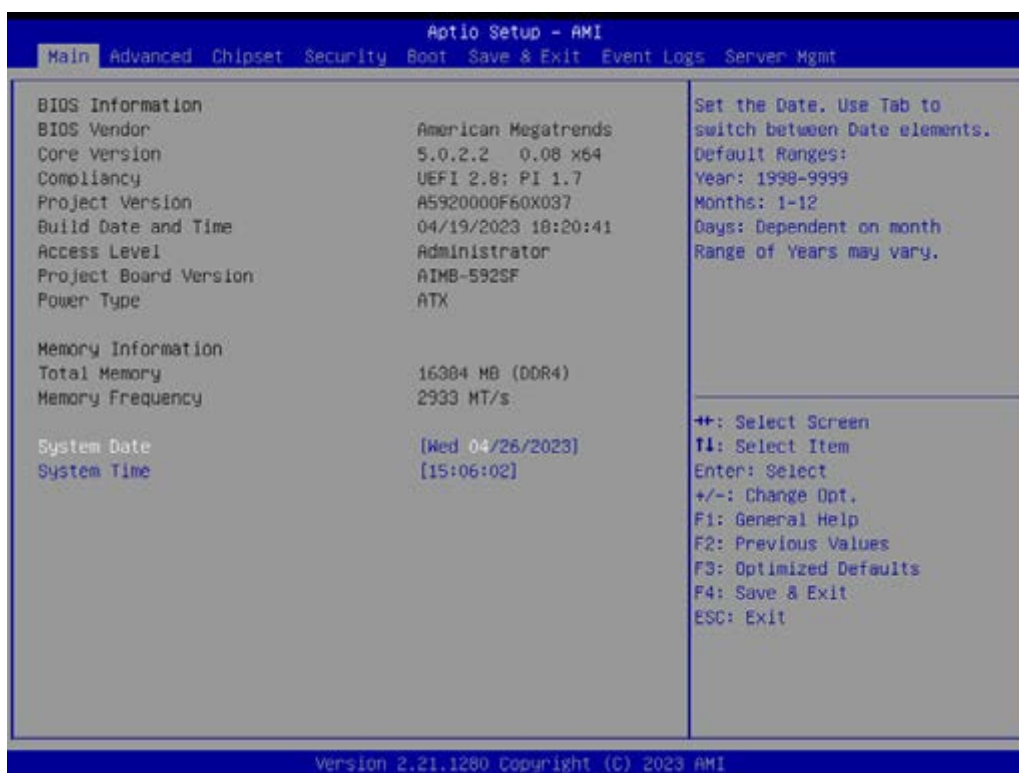
The SETUP saves the configuration in the FLASH of the motherboard. When the power is turned off, the battery on the board supplies the necessary power to preserve the FLASH.

When the power is turned on, press the or <Esc> button during the BIOS POST (Power-On Self Test) to access the CMOS SETUP screen.

Control Keys	
< ← > ← → >	Select Screen
< ↑ > ↓ >	Select Item
<Enter>	Select
<+/->	Change Opt
<F1>	General help
<F2>	Previous Values
<F3>	Optimized Defaults
<F4>	Save & Exit
<Esc>	Exit

3.2.1 Main Menu

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



The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

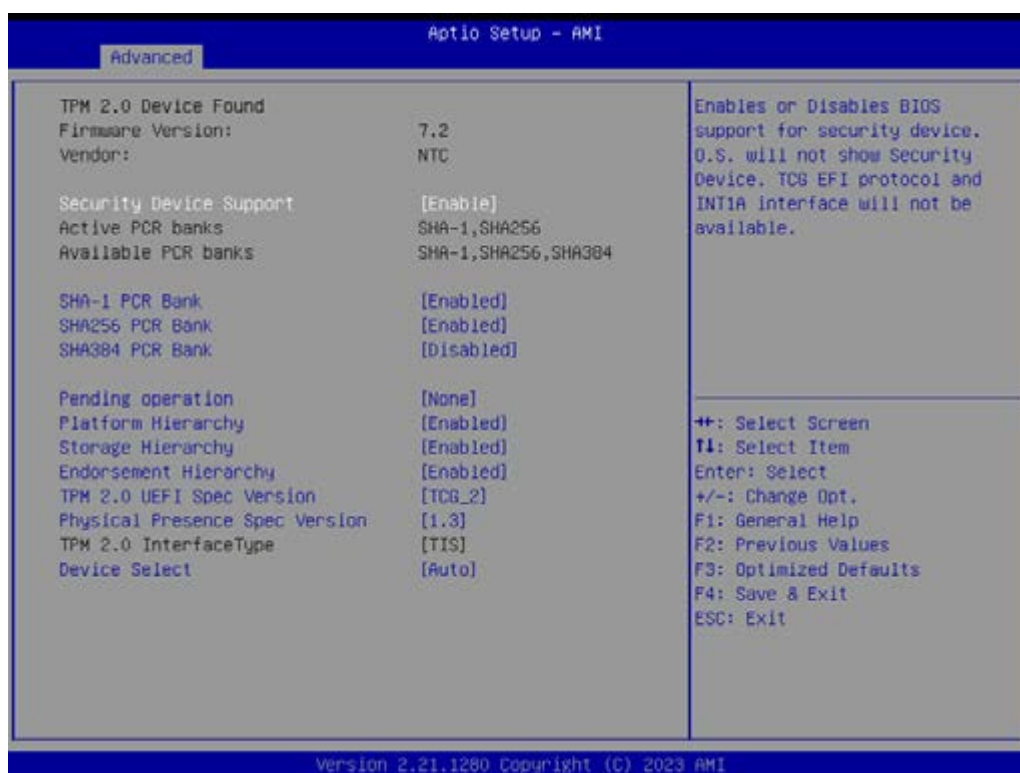
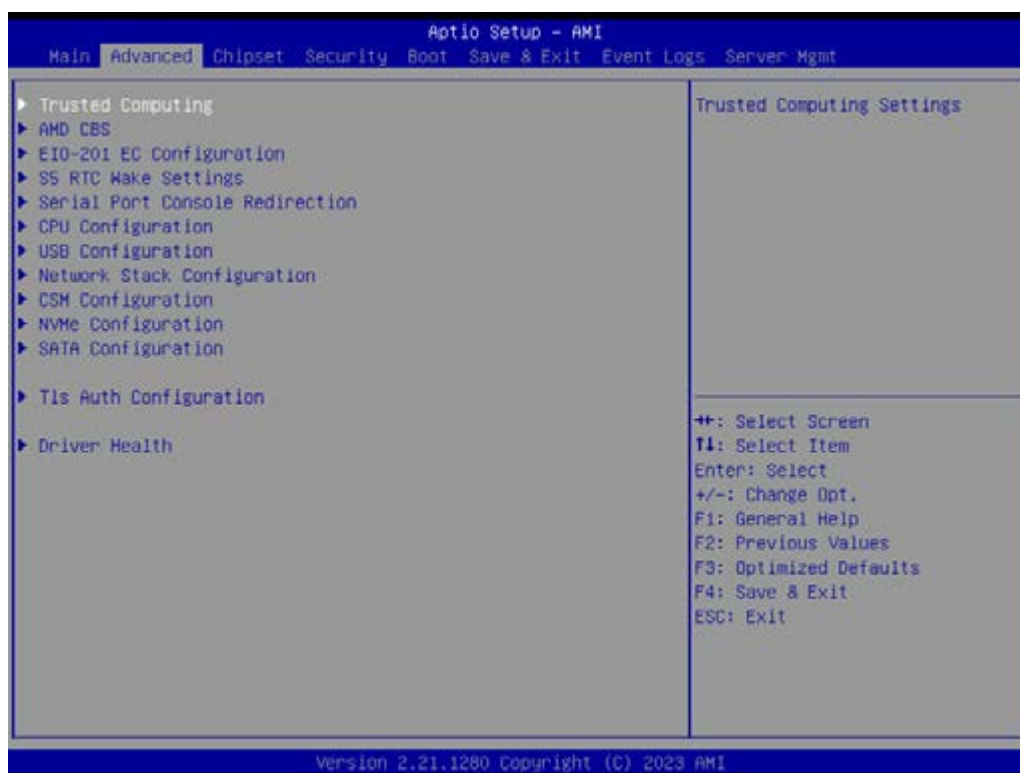
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

■ System Time/System Date

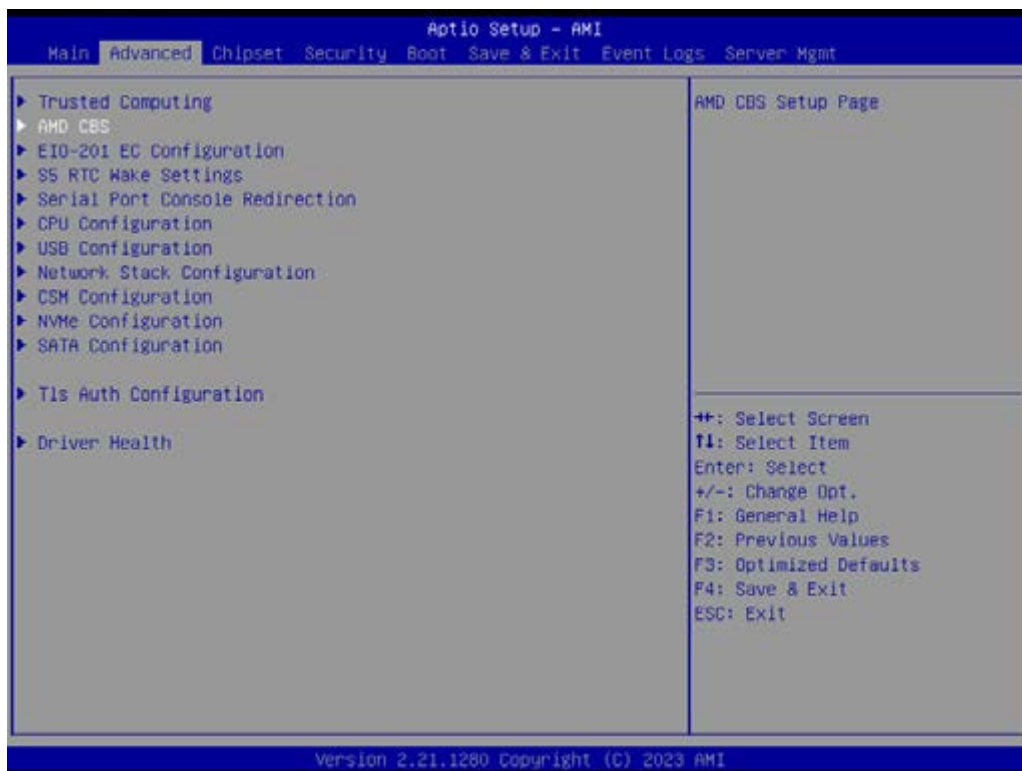
Use this option to change the system time and date. Highlight the System Time or System Date using the <Arrow> keys. Enter new values via the keyboard. Press the <Tab> or <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features

Select the Advanced tab from the AIMB-592 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 screen is shown below. The sub menus are described on the following pages.



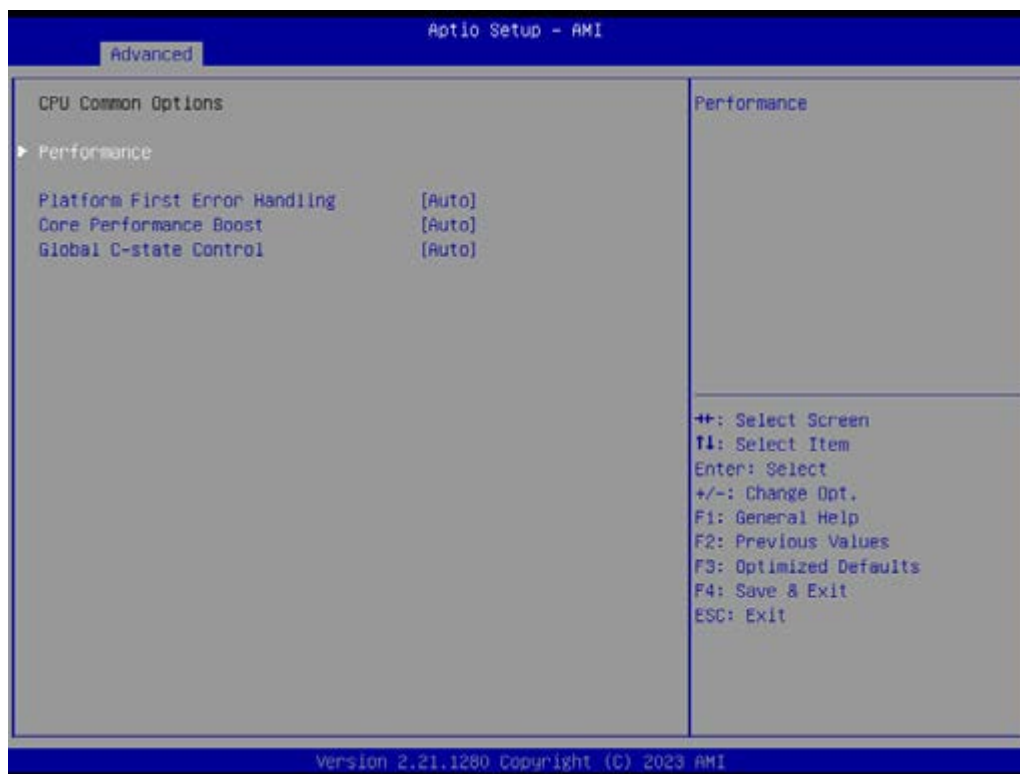
3.2.2.1 AMD CBS



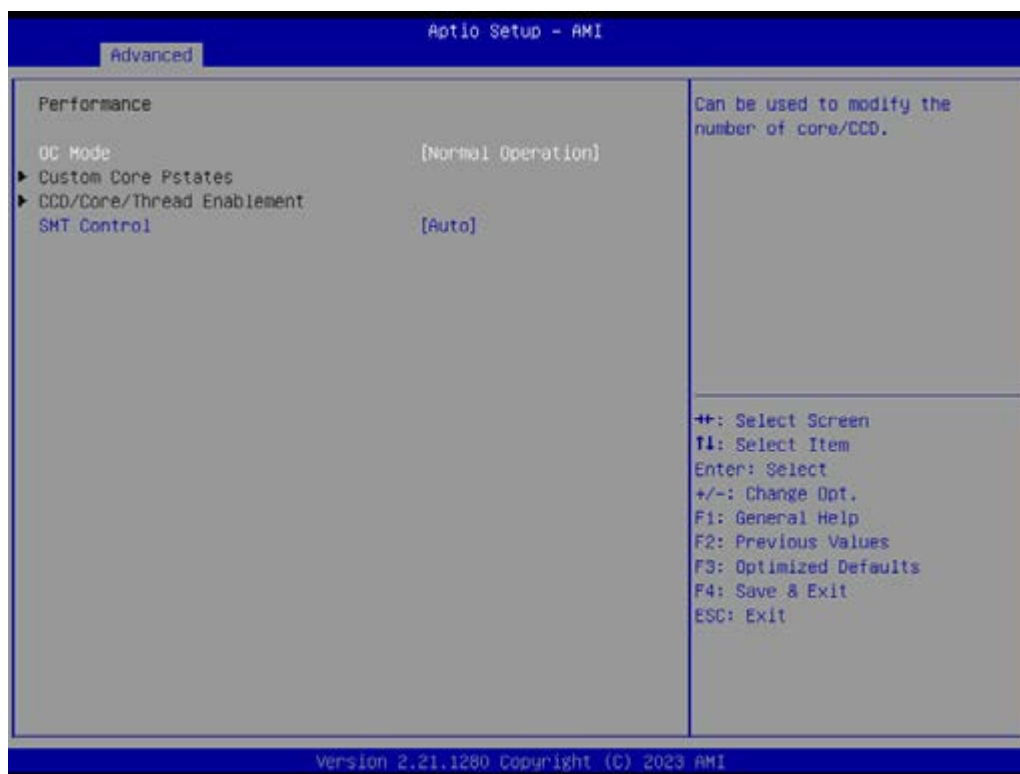
AMD CBS Setup Page



CPU Common Options - Performance



- Platform First Error Handling [Auto]
- Core Performance Boost [Auto]
- Global C-state Control [Auto]



- OC Mode [Normal Operation] Can be used to modify the number of core/CCD.
- Custom Core P-states
- CCD/Core/Thread Enablement
- SMT Control [Auto]



UMC Common Options - DDR4 Common Options



DDR4 Common Options - Common RAS



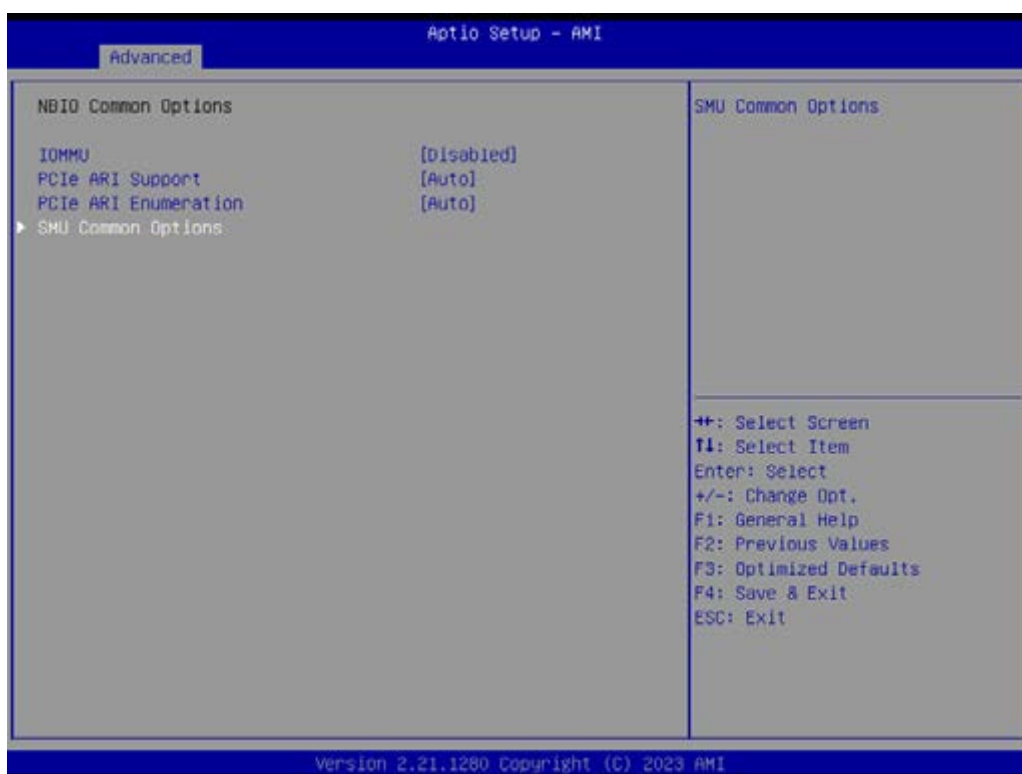
DDR4 Common Options - Common RAS - ECC Configuration



- DRAM ECC Symbol Size [Auto]
- DRAM ECC Enable [Auto]
- DRAM UECC Retry [Auto]



NBIO Common Options



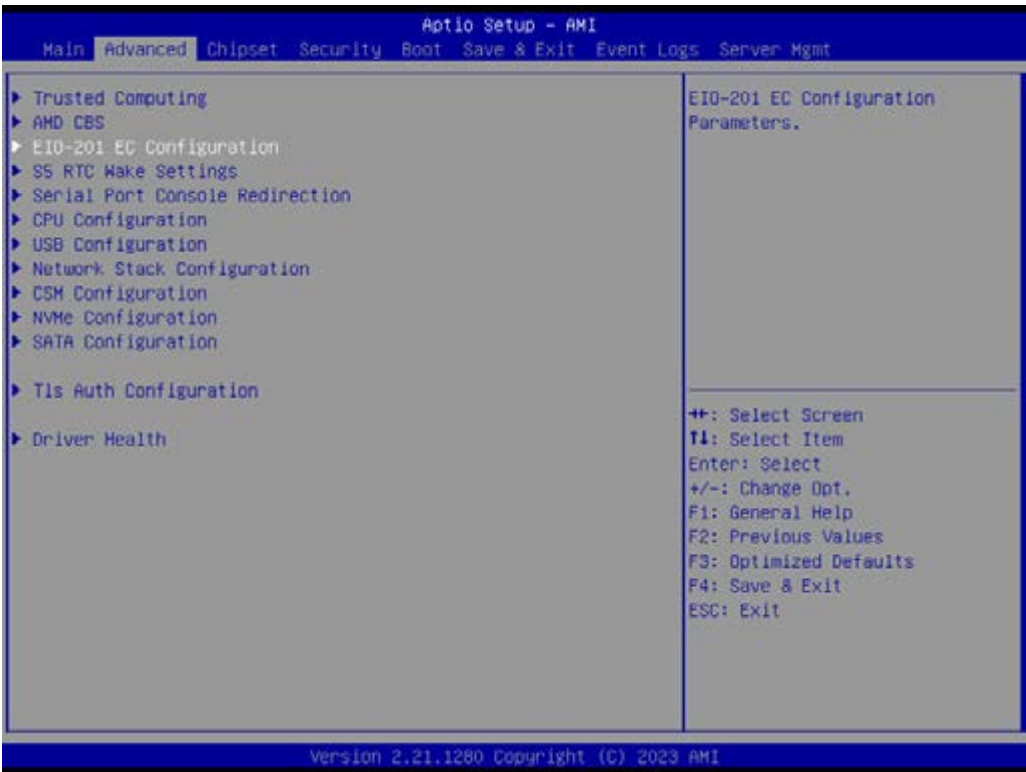
- IOMMU [Disabled]
- PCIe ARI Support [Auto]
- PCIe ARI Enumeration [Auto]
- SMU Common Options

SMU Common Options



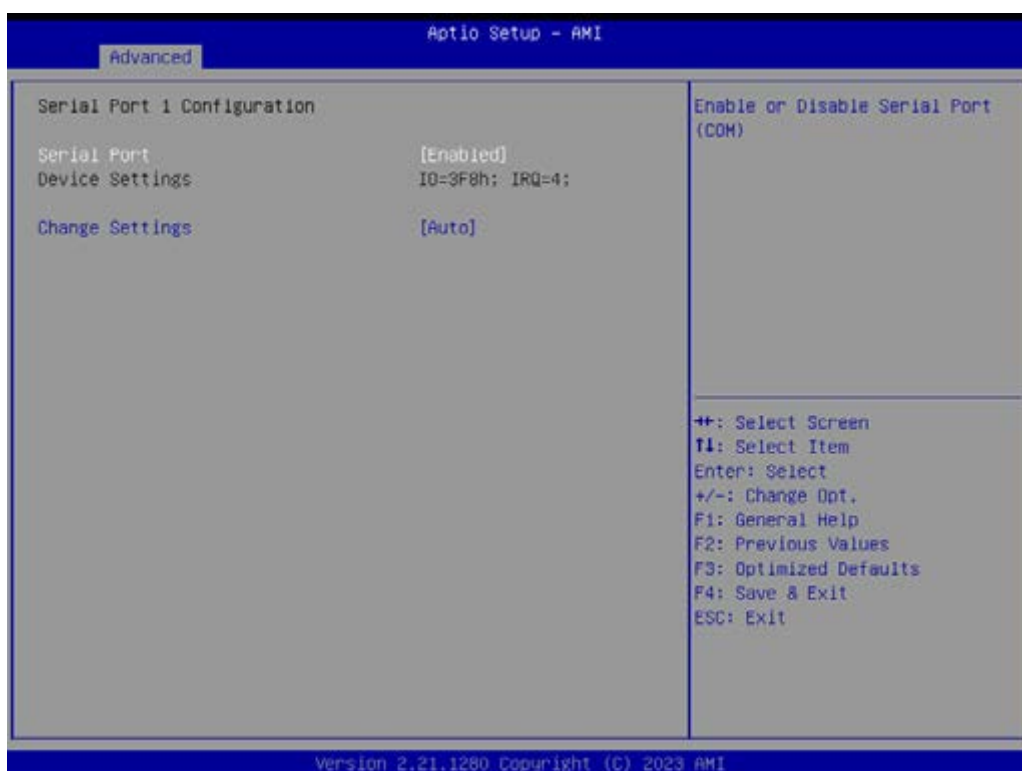
- APBDIS [Auto]
- CPPC [Auto]

3.2.2.2 EIO-201 EC Configuration





- Serial Port 1 Configuration
Set Parameters of Serial Port1 (COMA)



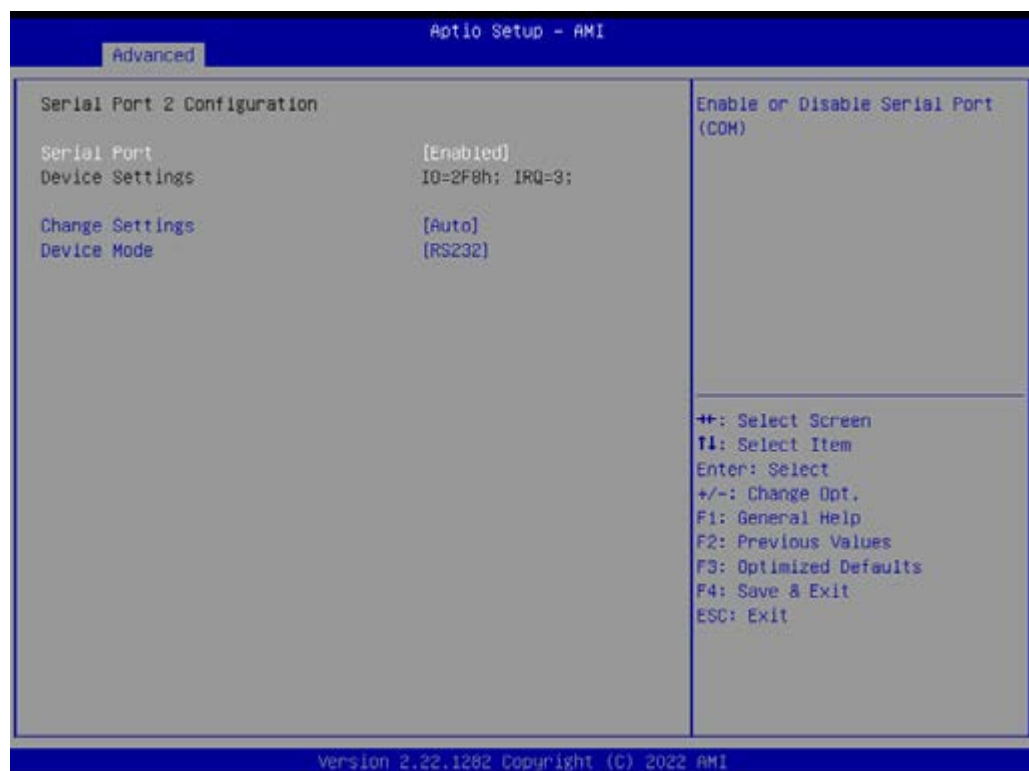
- Serial Port
 - Enable or Disable Serial Port (COM)
 - Serial Port [Enable]
 - Device Settings IO=3F8h; IRQ=4;
 - Change Settings [Auto]

- Serial Port 2 Configuration
Set Parameters of Serial Port2 (COMB)



]

- Serial Port
Enable or Disable Serial Port (COM)



- Serial Port [Enable]
- Device Settings IO=2F8h; IRQ=3;


- Change Settings [Auto]
- Device Mode [RS232]

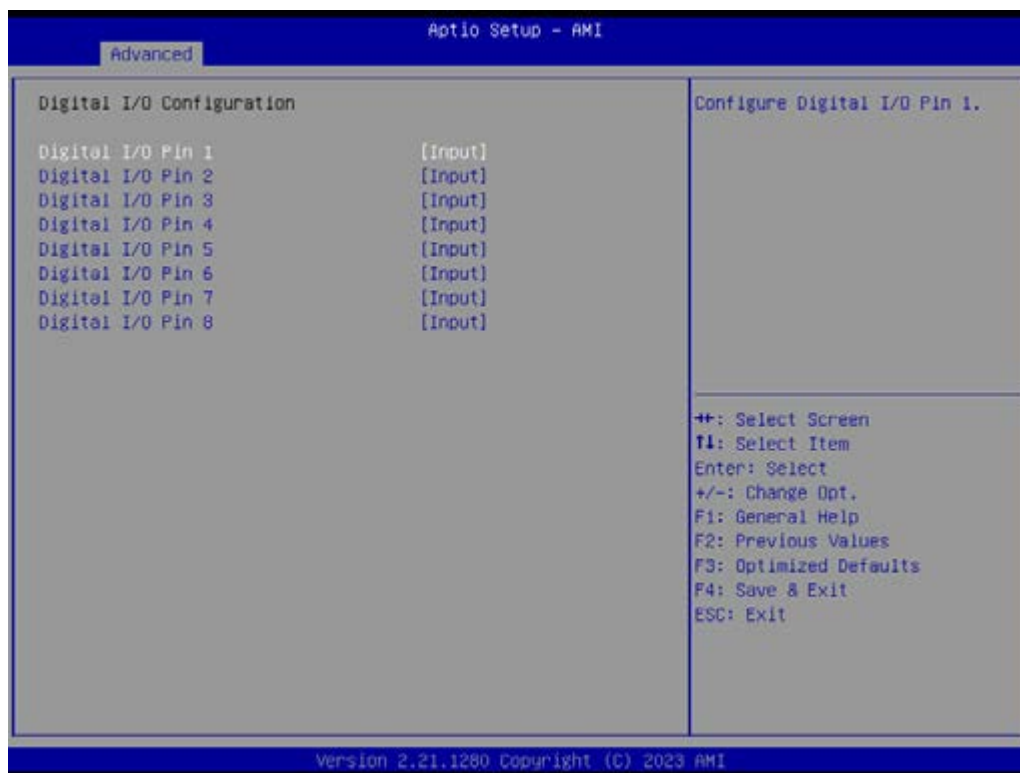


- Digital I/O Configuration
Configure Digital I/O Pins.



- Case Open Warning [Disabled]
- Wake On Ring [Disabled]
- Watch Dog Timer [Disabled]

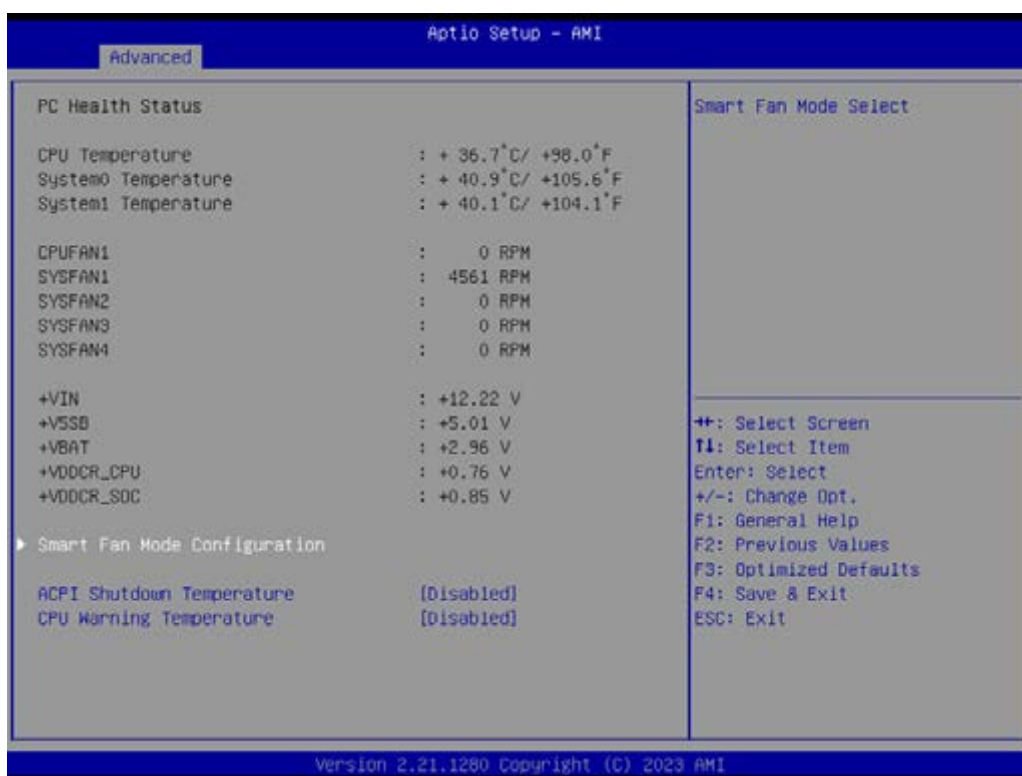
- Note!** 1. Watch Dog Timer will initial after ASPEED chip and ASPEED chip will initial for about 45 seconds.
-  2. The beep sounds of Case Open warning temperature is continuous 1 short beep.



- Digital I/O Pin 1 [Input]
- Digital I/O Pin 2 [Input]
- Digital I/O Pin 3 [Input]
- Digital I/O Pin 4 [Input]
- Digital I/O Pin 5 [Input]
- Digital I/O Pin 6 [Input]
- Digital I/O Pin 7 [Input]
- Digital I/O Pin 8 [Input]

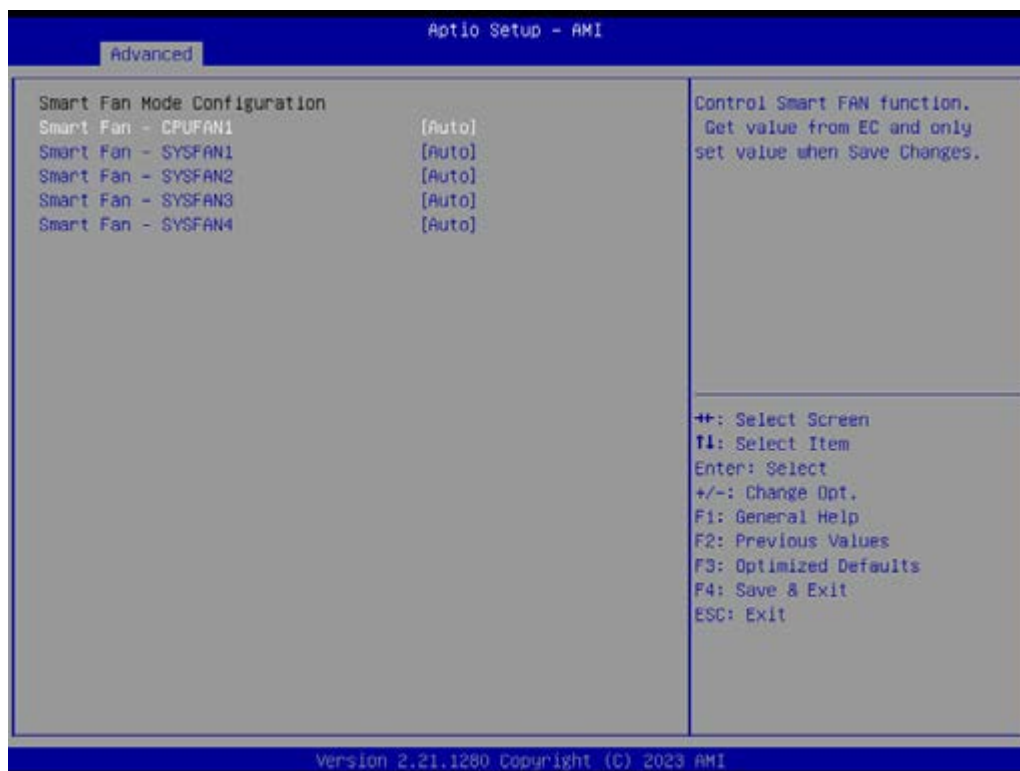


- Hardware Monitor
Monitor hardware status



- Smart Fan Mode Configuration
Smart Fan Mode Select
- ACPI Shutdown Temperature [Disabled]
- CPU Warning Temperature [Disabled]

- Note!**
1. If actual fan speed is under 500RPM, it will show "0RPM" on BIOS menu and EC tool.
 2. The beep sounds of CPU warning temperature is continuous 2 short beep and 1 long beep.

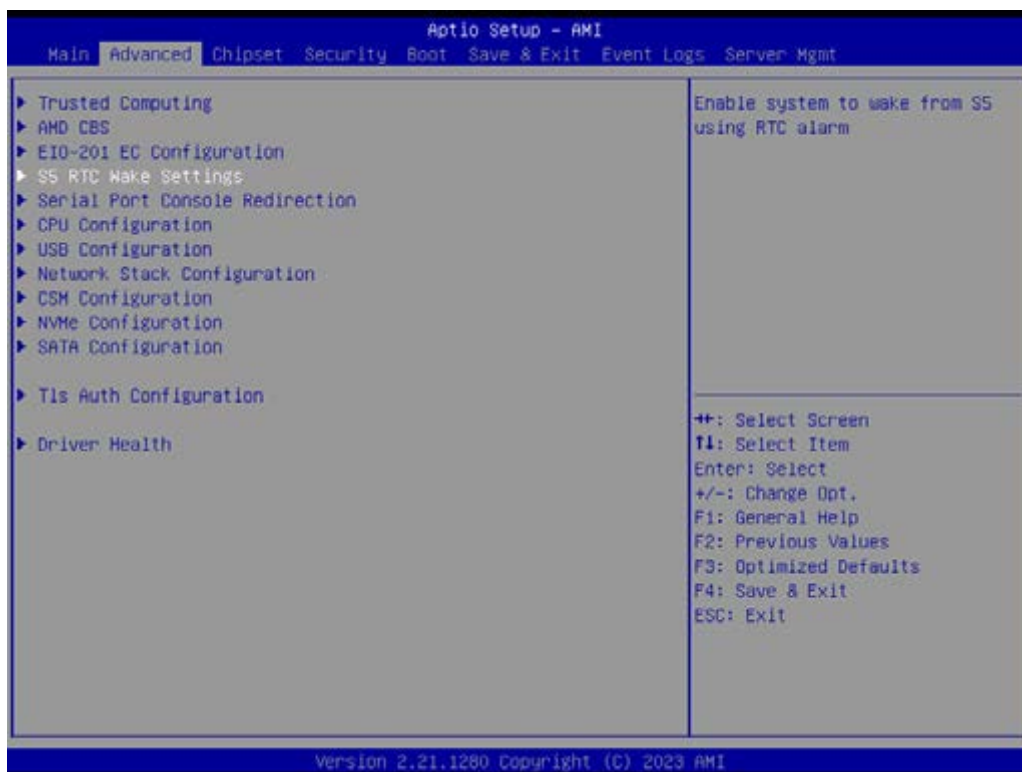


Control Smart FAN function. Get value from EC and only set value when save changes.

- Smart Fan – CPUFAN1 [Auto]
- Smart Fan – SYSFAN1 [Auto]
- Smart Fan – SYSFAN2 [Auto]
- Smart Fan – SYSFAN3 [Auto]
- Smart Fan – SYSFAN4 [Auto]

-

3.2.2.3 S5 RTC Wake Settings

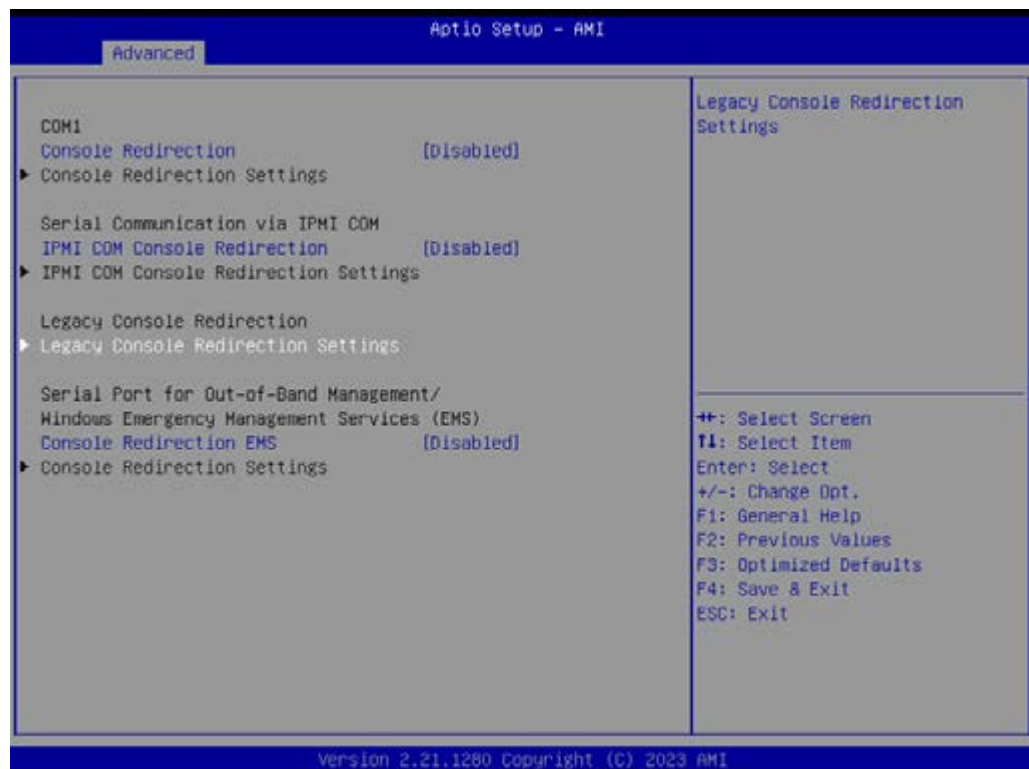
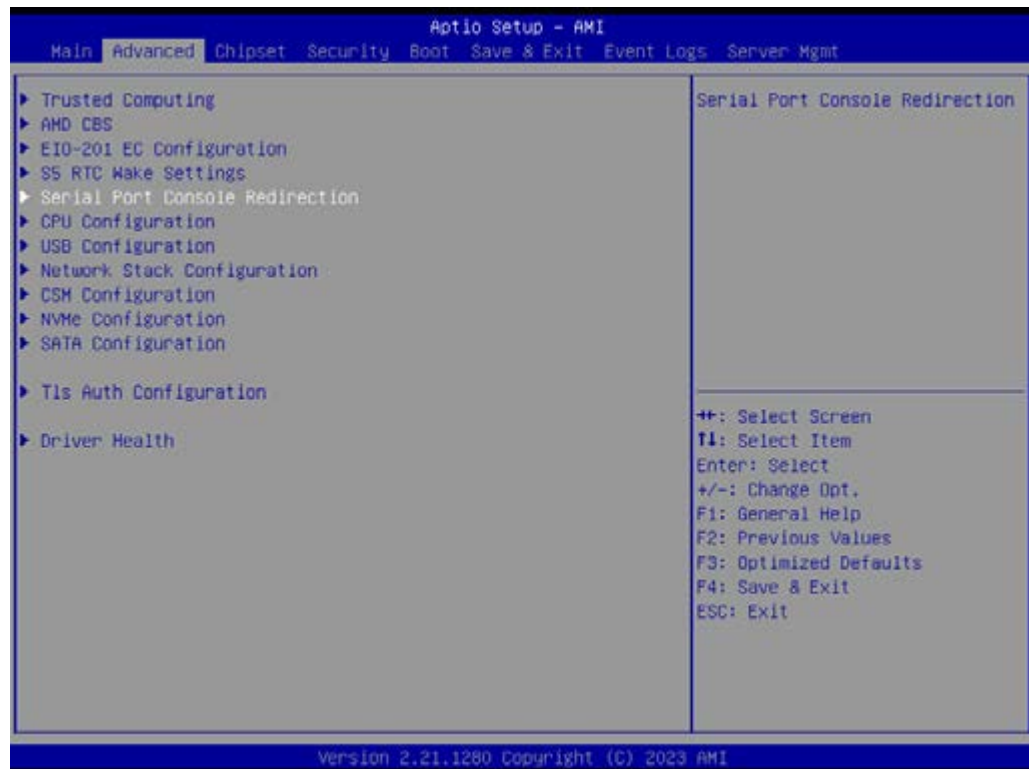


- Wake system from S5 [Disabled]



Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr: :min: :sec specified. Select DynamicTime, System will wake on the current time + Increase minute(s)

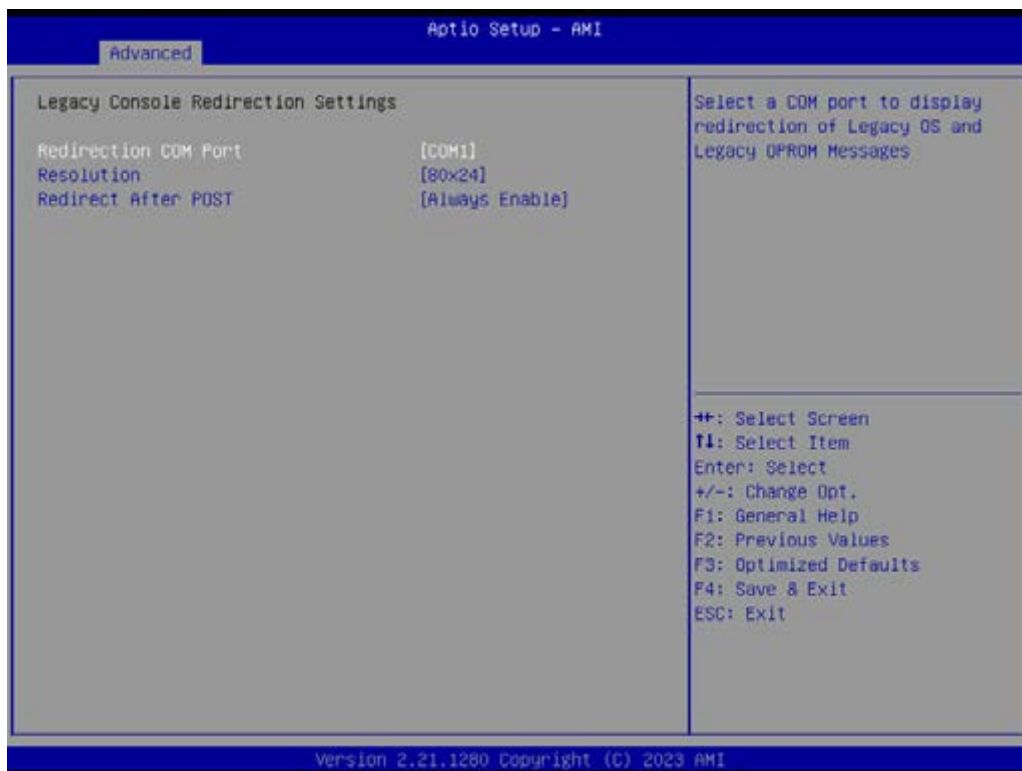
3.2.2.4 Serial Port Console Redirection



- Console Redirection [Disabled]
- IPMI COM Console Redirection [Disabled]
- Console Redirection EMS [Disabled]

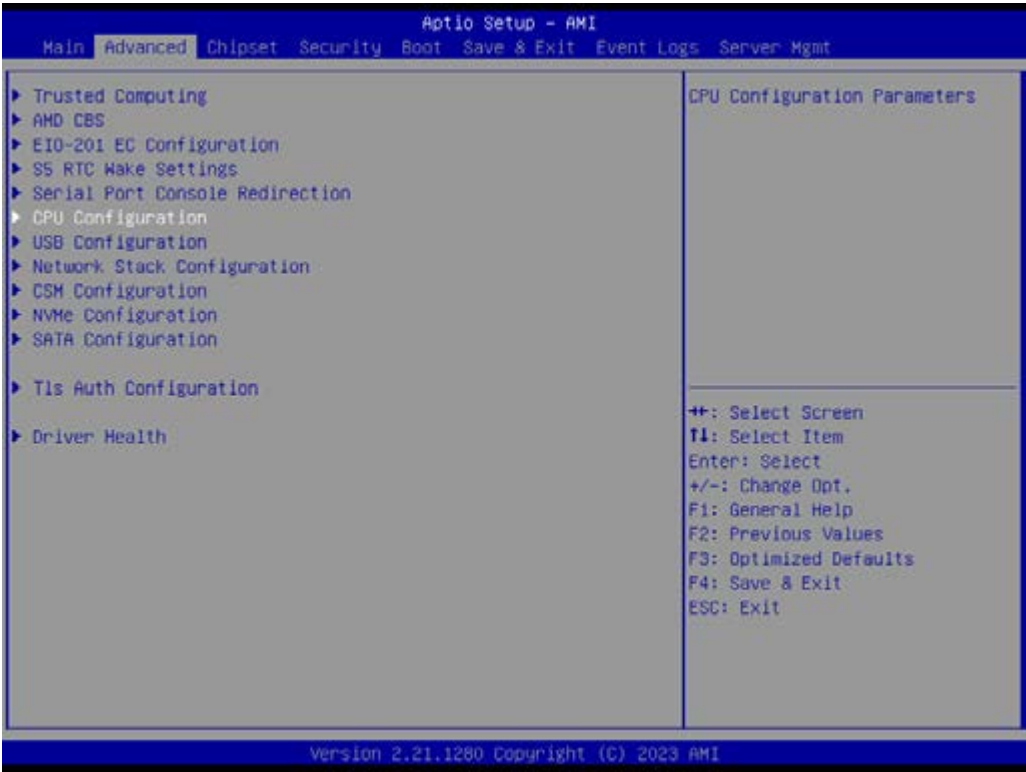
Serial Port Console Redirection – Legacy Console Redirection Settings

Select a COM port to display redirection of Legacy OS and Legacy OPIROM Messages



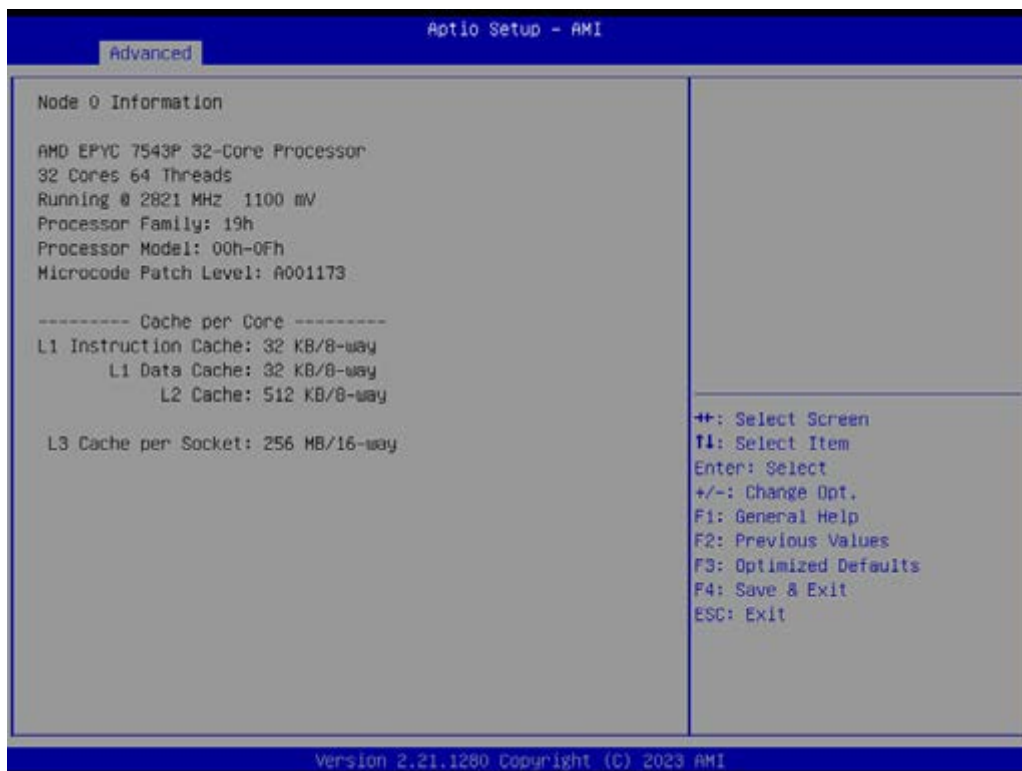
- Redirection COM Port [COM1]
- Resolution [80x24]
- Redirect After POST [Always Enable]

3.2.2.5 CPU Configuration



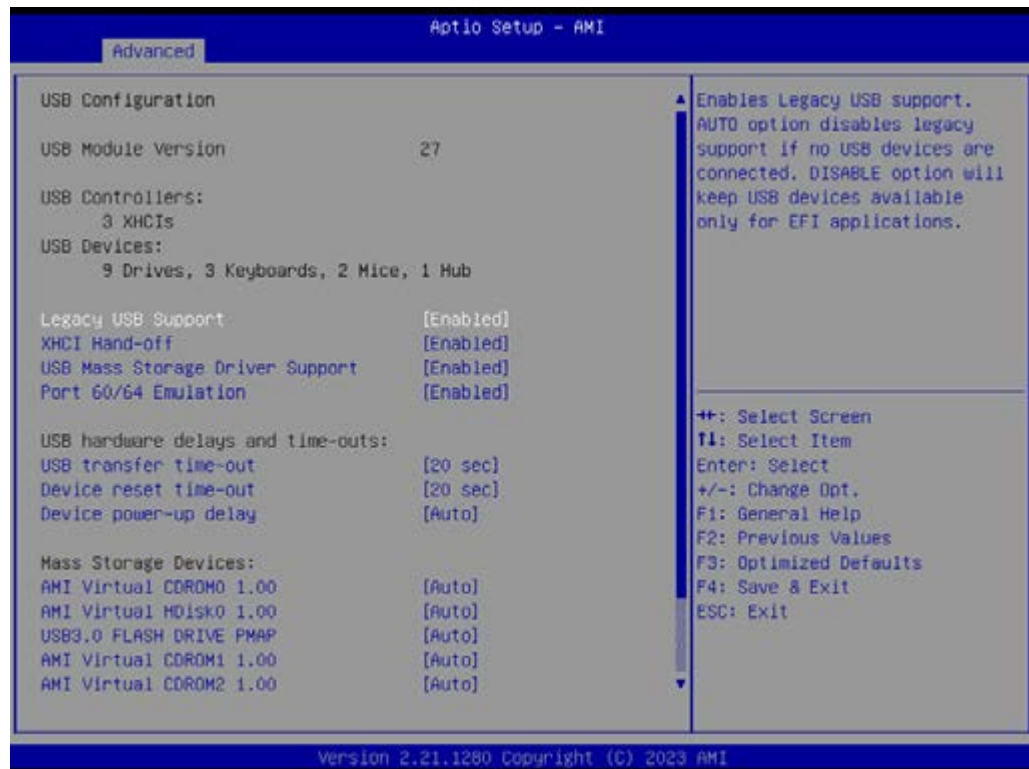
- SVM Mode [Enable]
- Node 0 Information

CPU Configuration - Node 0 Information

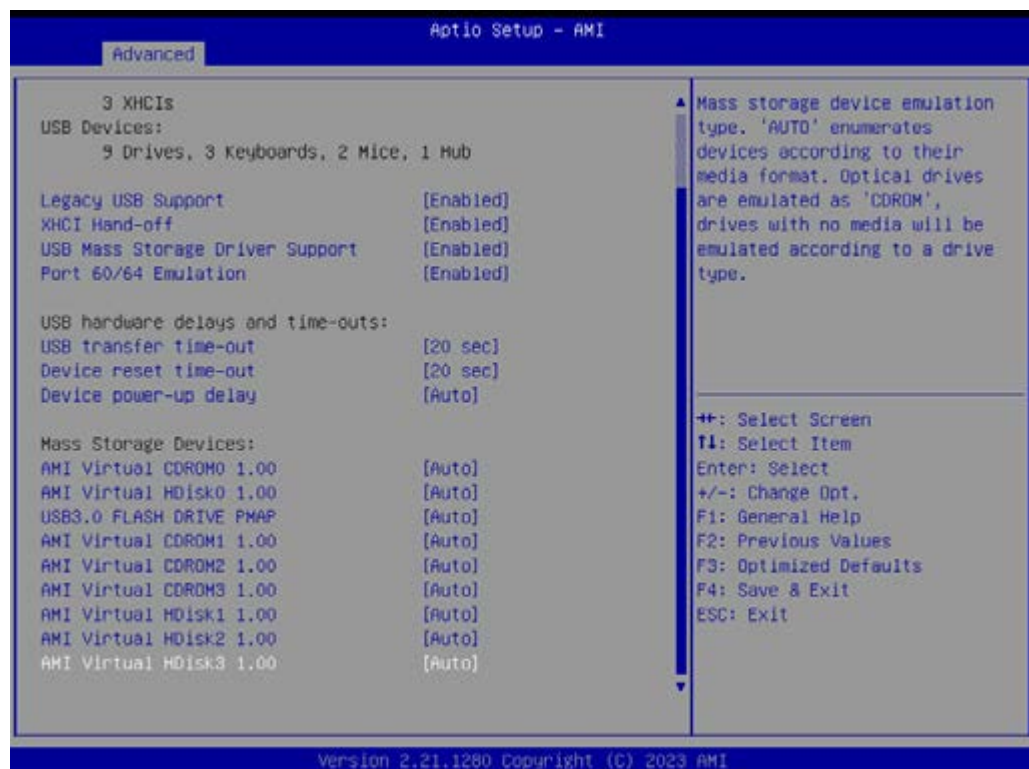


3.2.2.6 USB Configuration

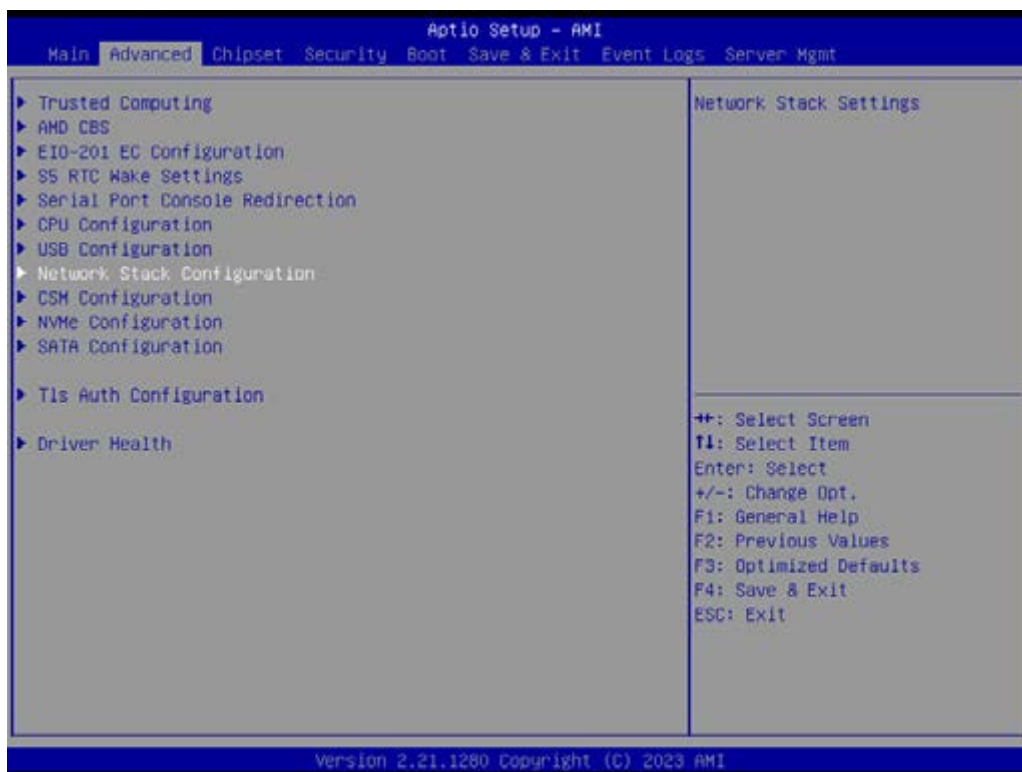




- Legacy USB Support [Enabled]
Enables Legacy USB support, AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
- XHCI Hand-off [Enabled]
- USB Mass Storage Driver Support [Enabled]
- Port 60/64 Emulation [Enabled]

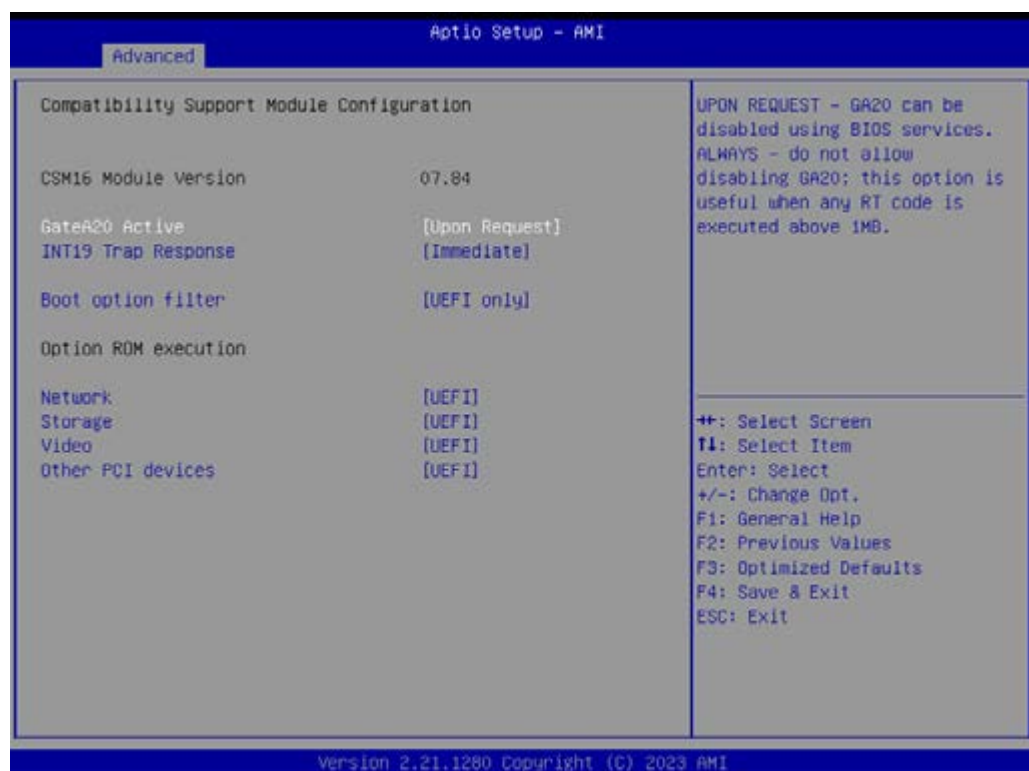
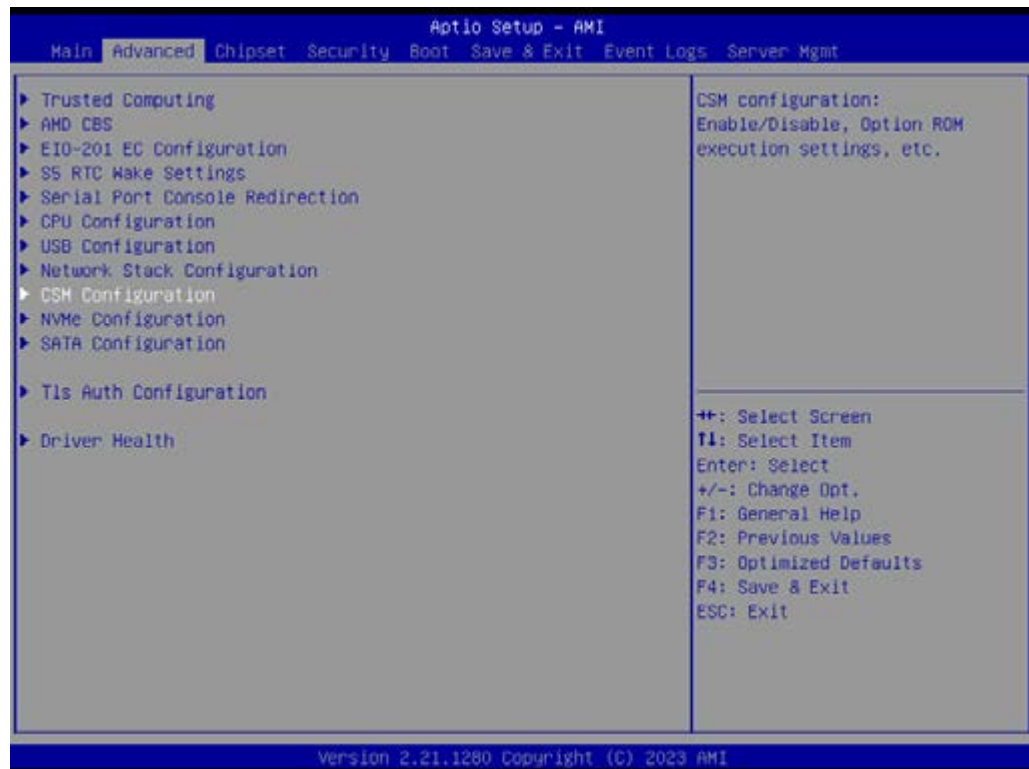


3.2.2.7 Network Stack Configuration



- Network Stack [Disabled]
Enable/Disable UEFI Network Stack

3.2.2.8 CSM Configuration



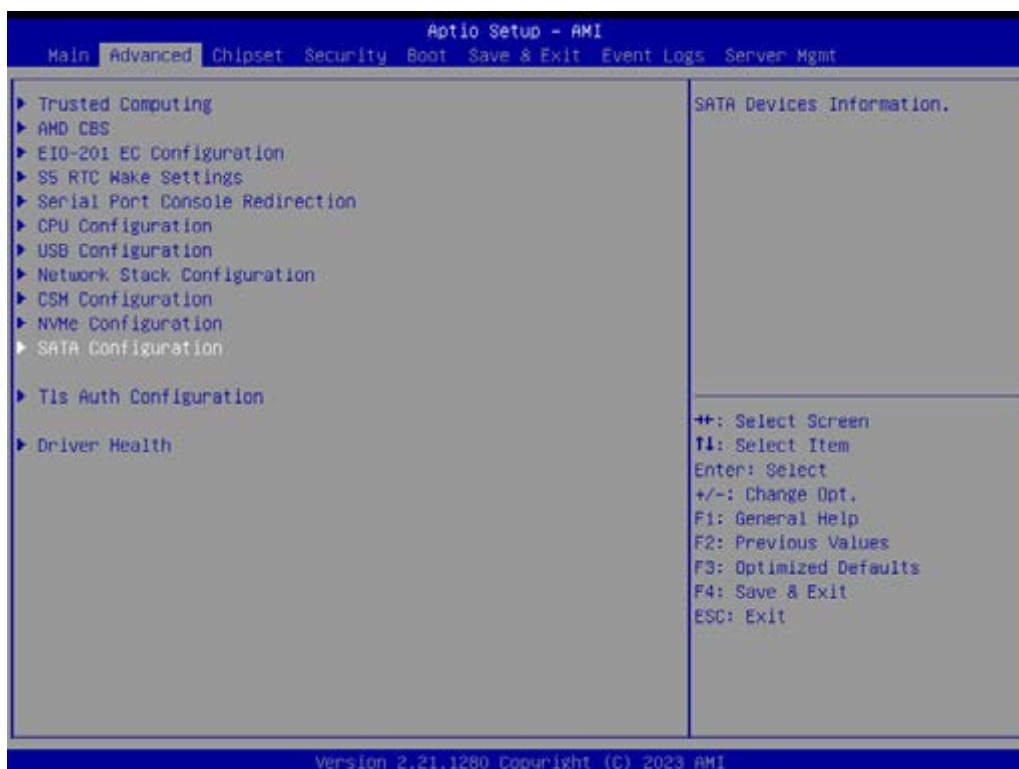
- GateA20 Active [Upon Request]
UPON REQUEST – GA20 can be disabled using BIOS services.
ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
- INT19 Trap Response [Immediate]
- Boot option filter [UEFI only]

- Network [UEFI]
- Storage [UEFI]
- Video [UEFI]
- Other PCI devices [UEFI]

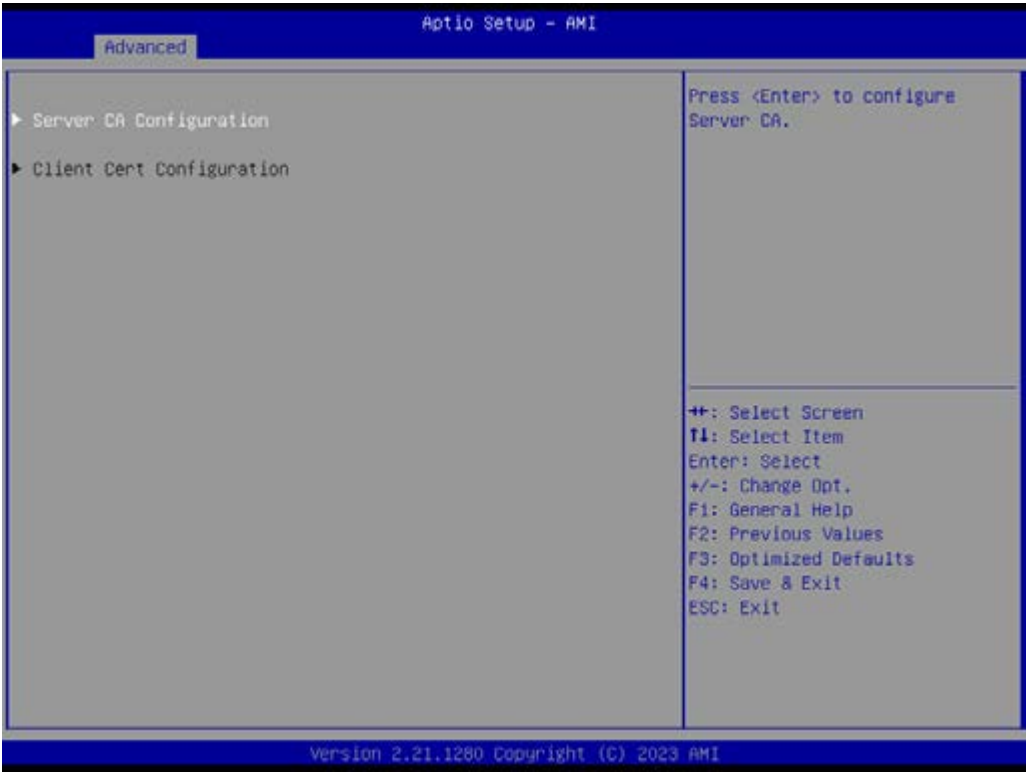
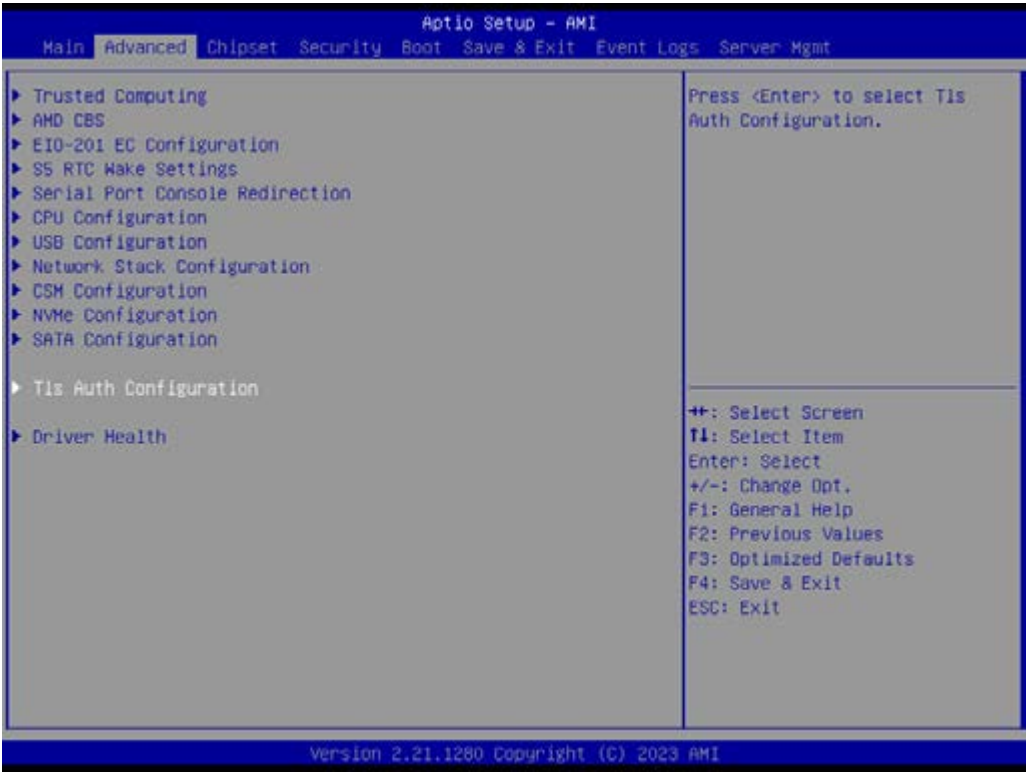
3.2.2.9 NVMe Configuration



3.2.2.10 SATA Configuration



3.2.2.11 Tls Auth Configuration



- Server CA Configuration
- Client Cert Configuration

Server CA Configuration – Enroll Cert



Server CA Configuration – Enroll Cert – Enroll Cert Using File

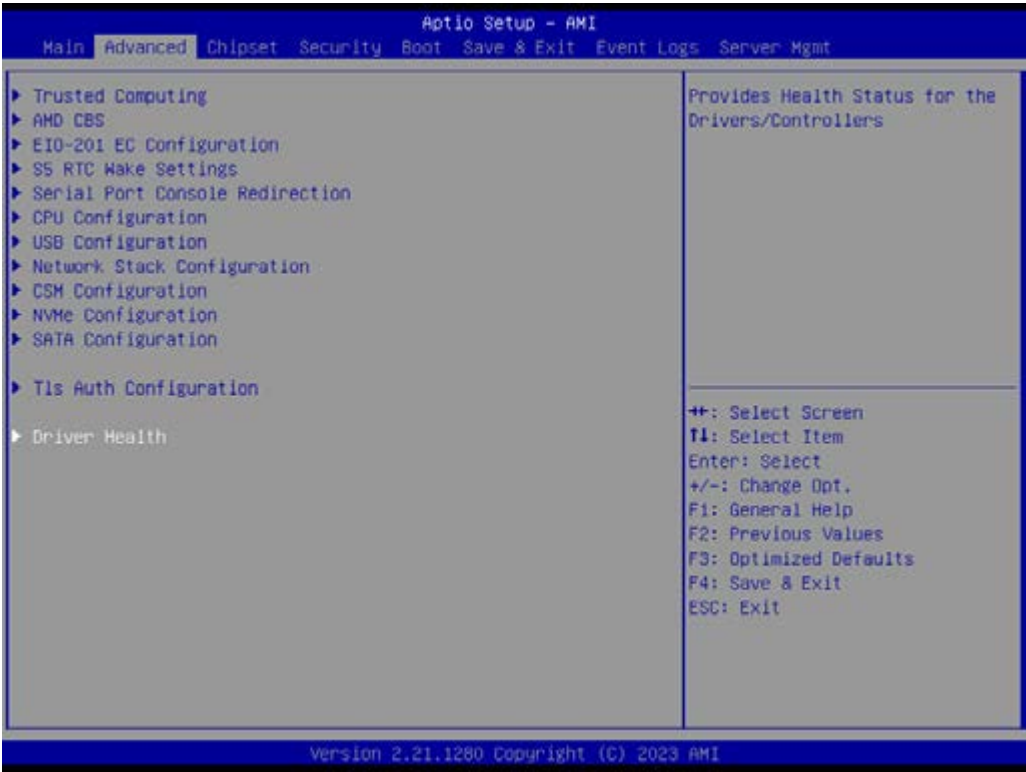


Server CA Configuration – Delete Cert



3.2.2.12 Driver Health

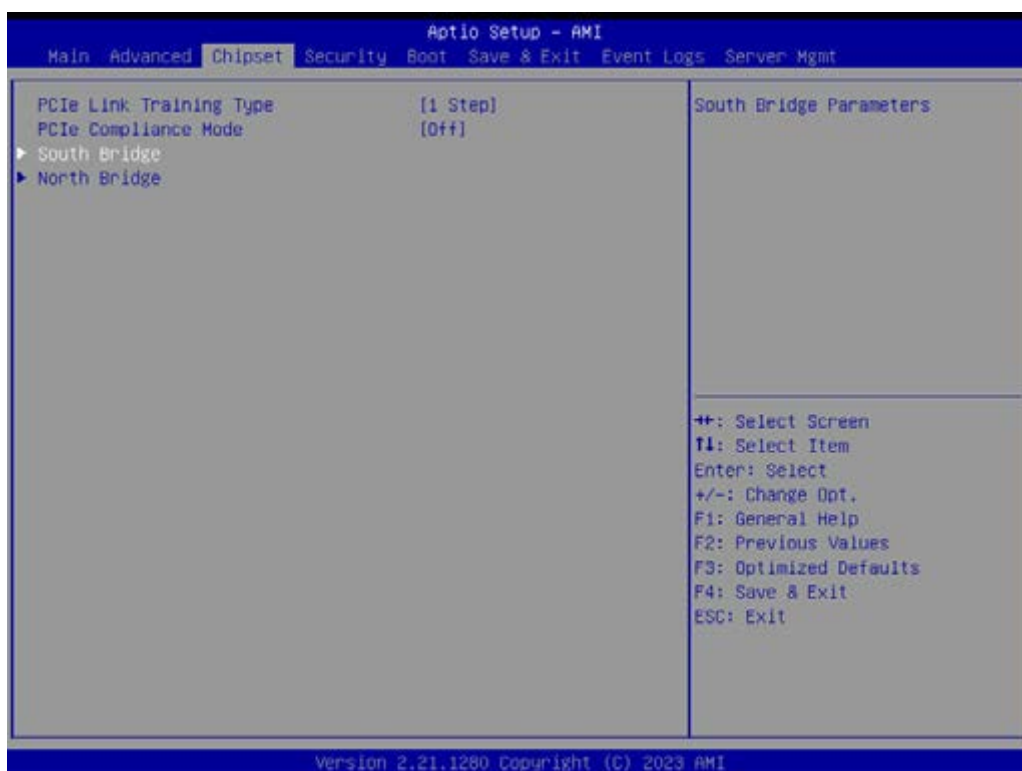
Provides Health Status for the Drivers/Controllers





3.2.3 Chipset Configuration Setting

Select the chipset tab from the BIOS setup screen to enter the Chipset Setup screen. Users can select any item in the left frame of the screen, such as South Bridge Parameters, to go to the sub menu for that item. Users can display a Chipset Setup option by highlighting it using the <Arrow> keys. All Chipset Setup options are described in this section. The Chipset Setup screens are shown below. The sub menus are described on the following pages.

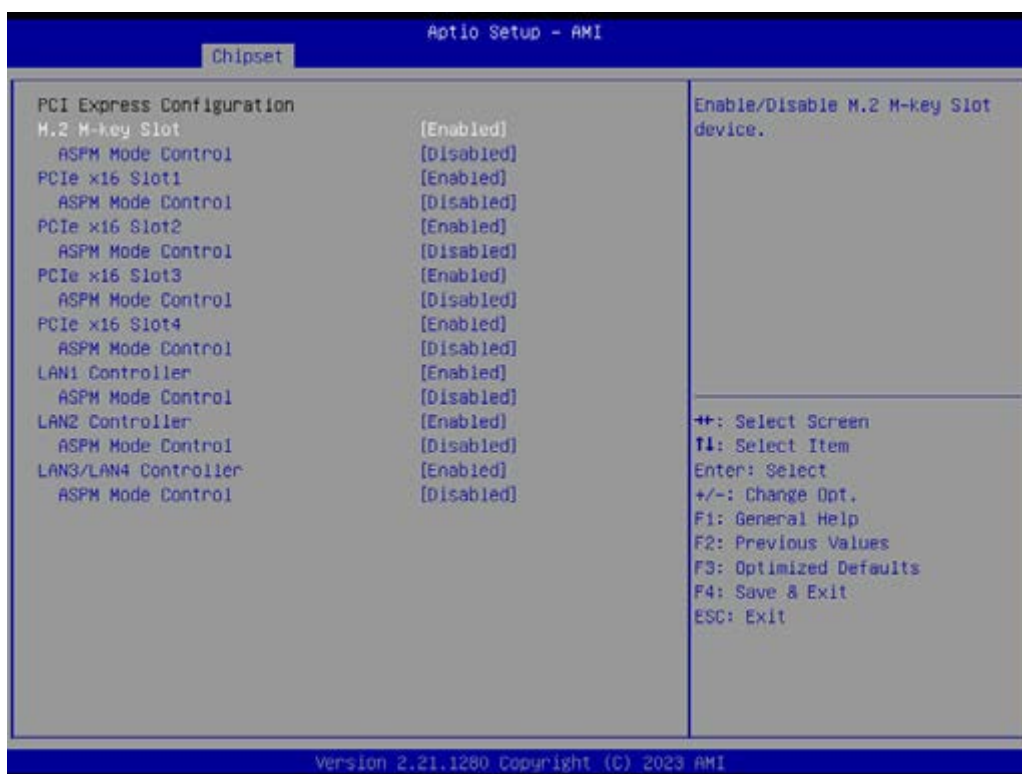


3.2.3.1 South Bridge



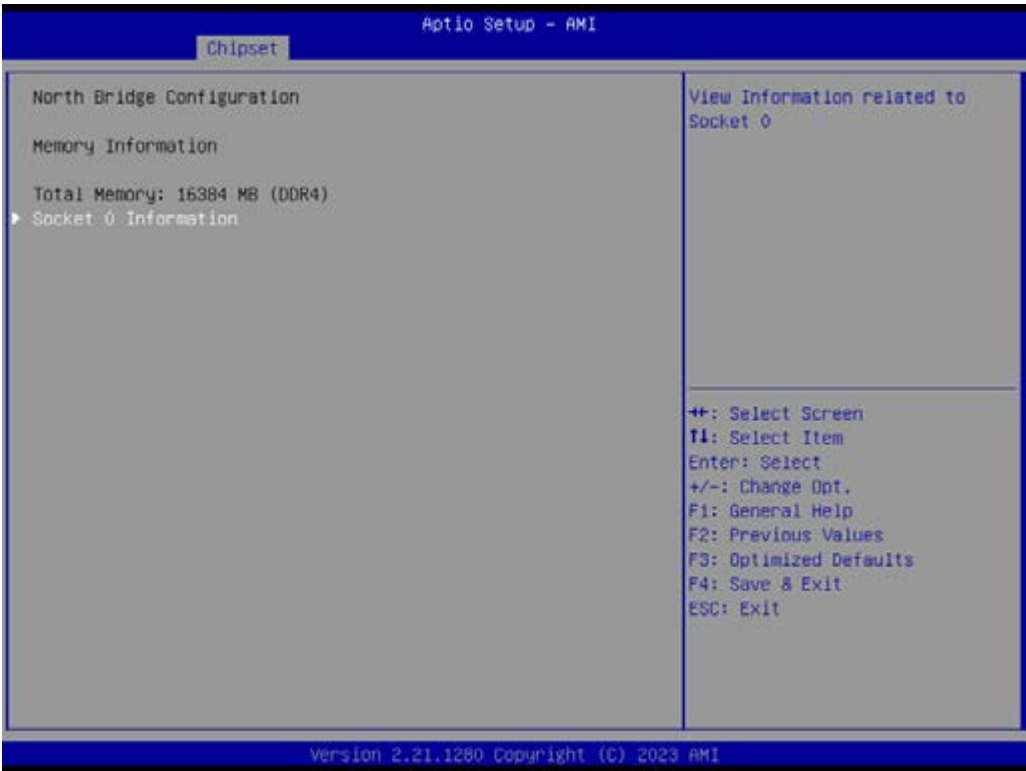
- LAN1 Controller [Enable]
- LAN2 Controller [Enable]
- LAN3/4 Controller [Enable]
- PCIe Wake [Disabled]
- Restore AC Power Loss [Power off]
- PCIe Device Initial Delay 0

- PCI Express Configuration
User can enable or disable PCI express devices.



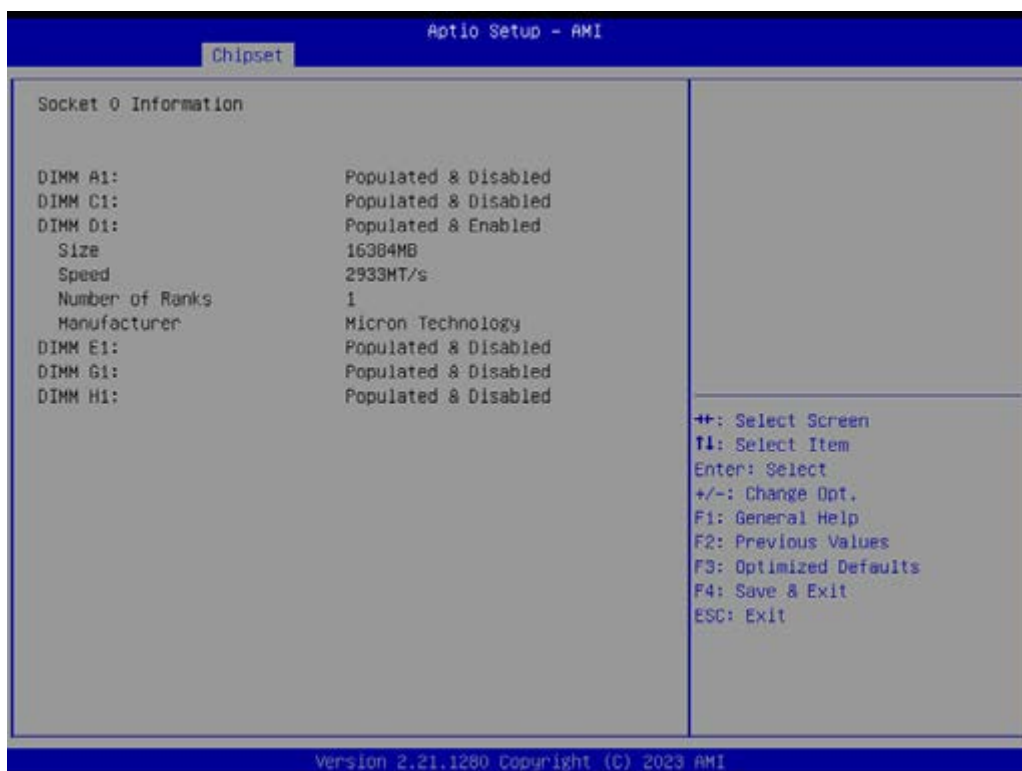
- M.2 M-key Slot [Enabled]
- PCIe x16 Slot1 [Enabled]
- PCIe x16 Slot2 [Enabled]
- PCIe x16 Slot3 [Enabled]
- PCIe x16 Slot4 [Enabled]
- LAN1 Controller [Enabled]
- LAN2 Controller [Enabled]
- LAN3/LAN4 Controller [Enabled]

3.2.3.2 North Bridge

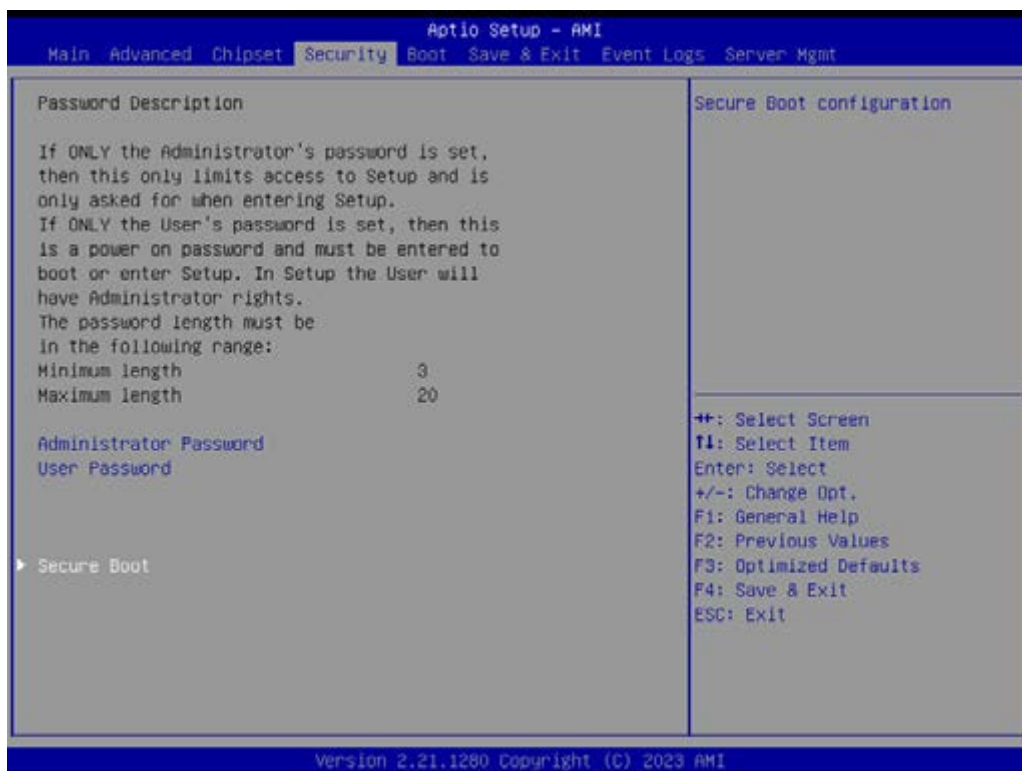


■ Memory Information

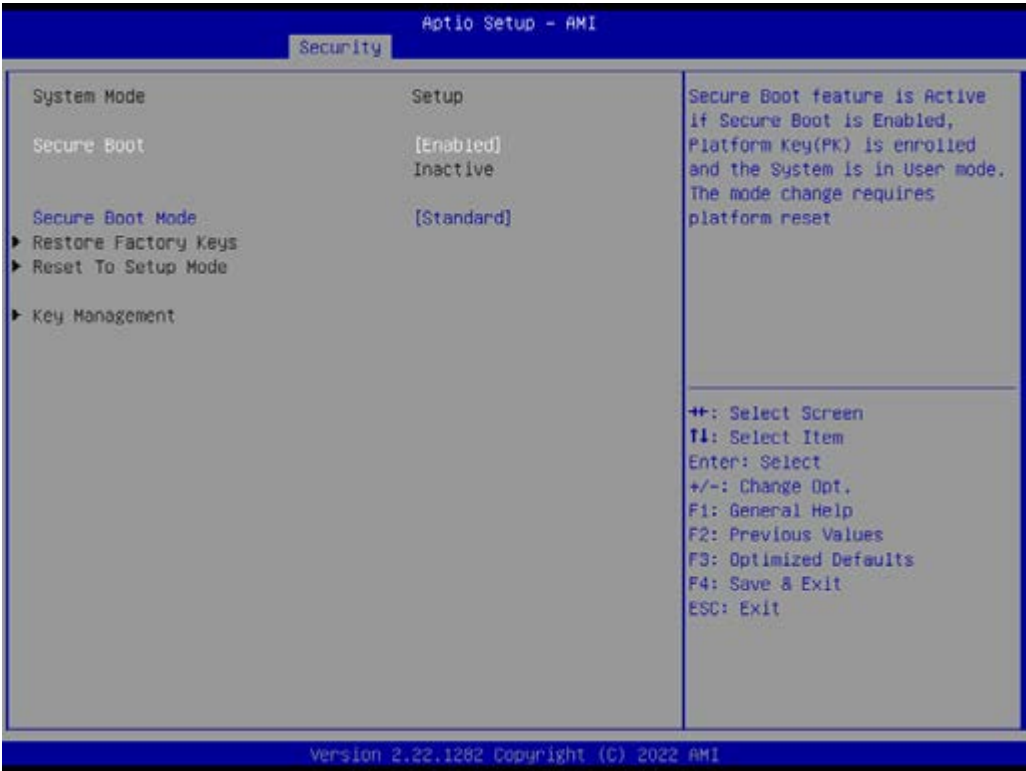
■ Socket 0 Information



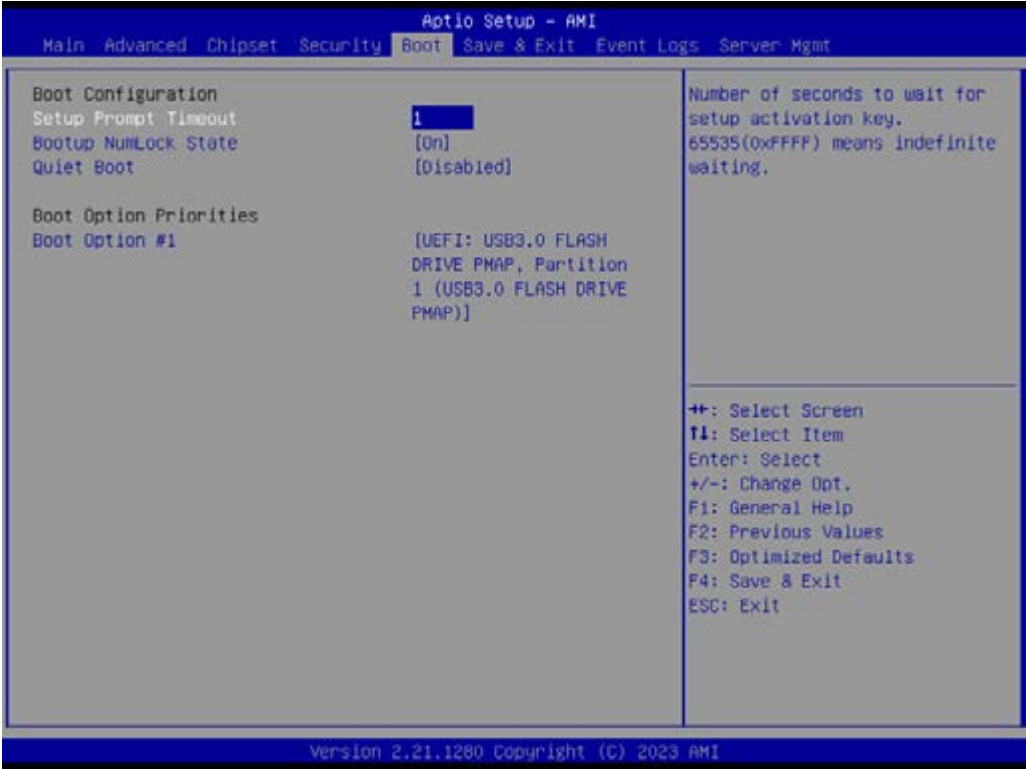
3.2.4 Security Setting



3.2.4.1 Secure Boot



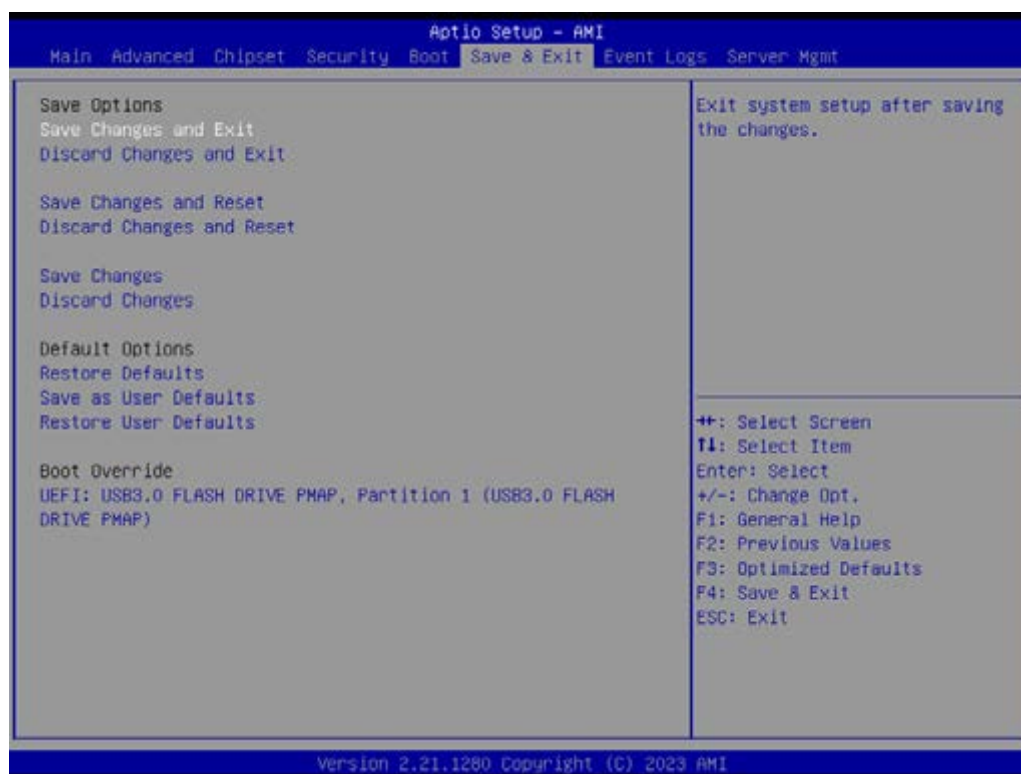
3.2.5 Boot Setting



- 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.

3.2.6 Save & Exit

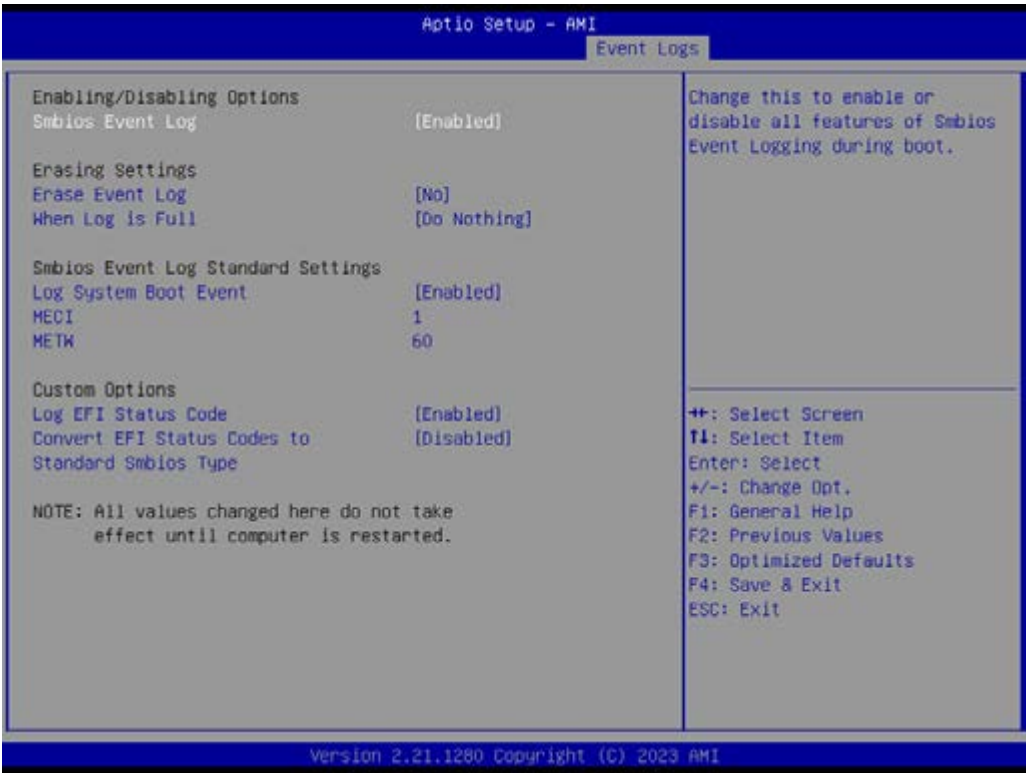


- **Save Changes and Exit**
Exit system setup after saving the changes.
- **Discard Changes and Exit**
Exit system setup without saving any changes.
- **Save Changes and Reset**
Reset the system after saving changes.
- **Discard Changes and Reset**
Reset system setup without saving any changes.
- **Save 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.

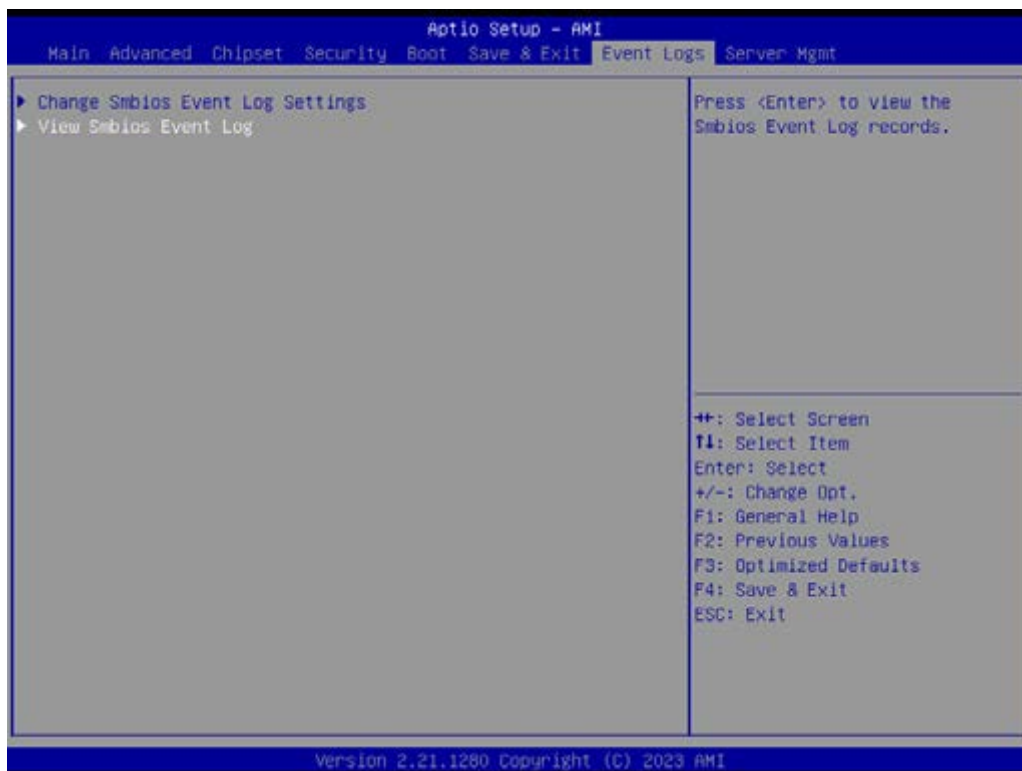
3.2.7 Event Logs



■ Change Smbios Event Log Settings



■ View Smbios Event log



The screenshot shows the 'Aptio Setup - AMI' interface with the 'Event Logs' tab selected. The 'View Smbios Event Log' option has been chosen, displaying a table of event logs. The table has columns for DATE, TIME, ERROR CODE, SEVERITY, COUNT, and DESCRIPTION. The log entries show various Smbios and EFI events. A legend at the bottom right lists keyboard shortcuts: ++ for Select Screen, F1 for Select Item, Enter for Select, +/- for Change Opt., F1 for General Help, F2 for Previous Values, F3 for Optimized Defaults, F4 for Save & Exit, and ESC for Exit. The footer indicates 'Version 2.21.1280 Copyright (C) 2023 AMI'.

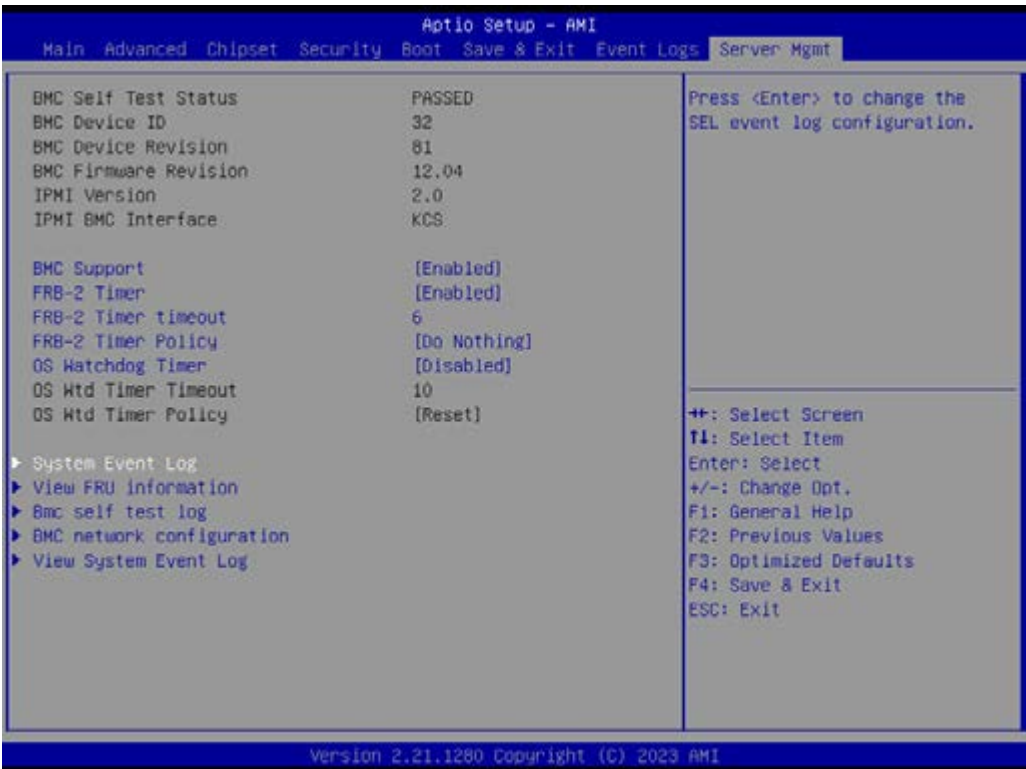
DATE	TIME	ERROR CODE	SEVERITY	COUNT	DESCRIPTION
01/01/22	00:00:51	Smbios 0x16	N/A	N/A	Log Area Reset and Count is applicable only for Multi-Events
01/01/22	00:00:51	Smbios 0x17	N/A	N/A	
01/01/22	00:00:51	EFI 0300000A	Minor	01	
01/01/22	00:01:31	Smbios 0x17	N/A	N/A	
04/26/23	15:01:26	Smbios 0x17	N/A	N/A	
04/26/23	15:03:32	Smbios 0x17	N/A	N/A	

3.2.8 Server Mgmt



- **BMC Support**
Enable or Disable interfaces to communicate with BMC.
- **OS Watchdog Timer**
If enabled, this starts a BIOS timer which can only be shut off by Management Software after the OS loads.

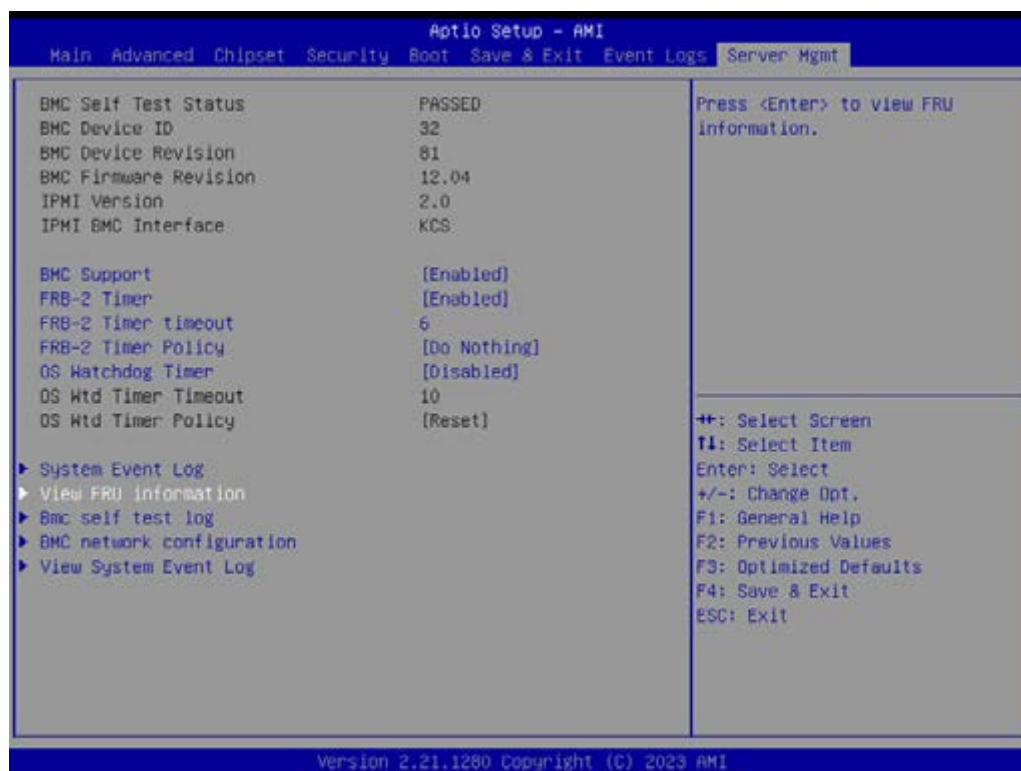
3.2.8.1 System Event Log

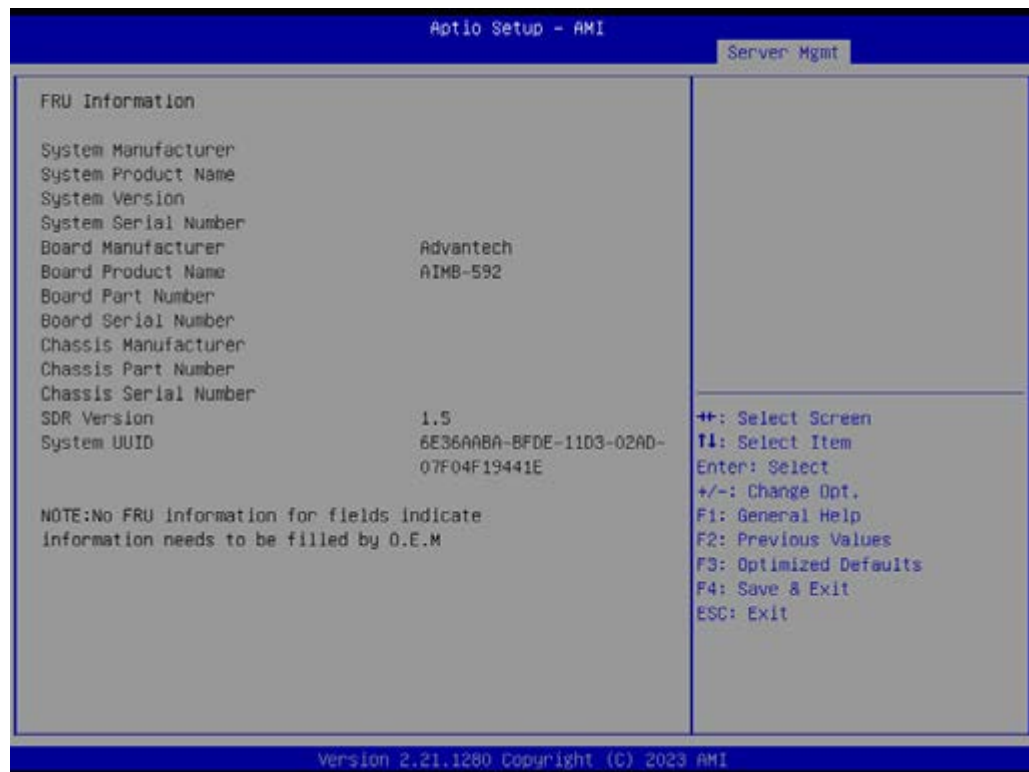




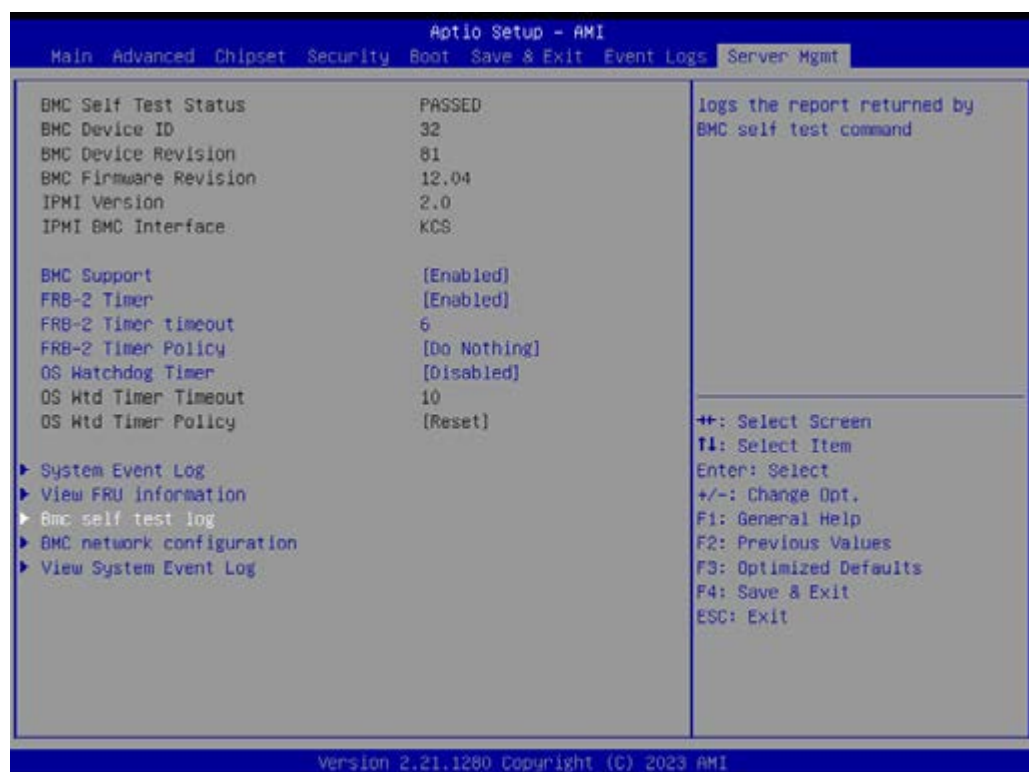
- SEL Components [Enabled]
- Erase SEL [No]
- Log EFI Status Codes [Error code]

3.2.8.2 View FRU information





3.2.8.3 BMC Self Test Log

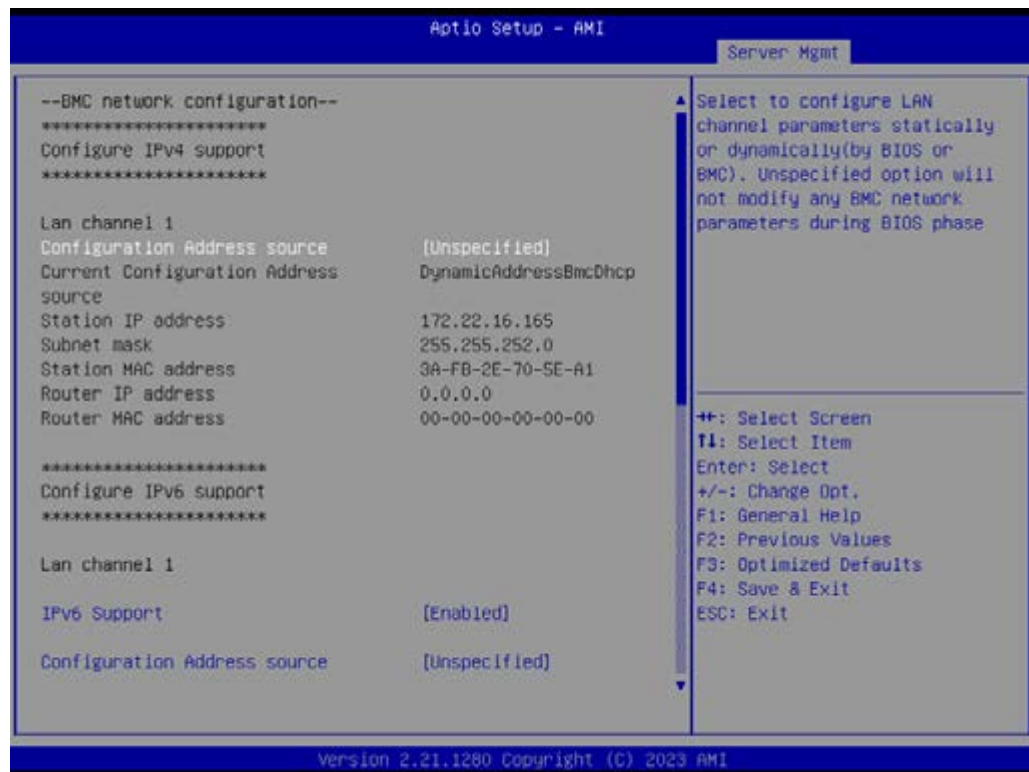




- Erase Log
Erase log options.
- When Log is Full
Select the action to be taken when the log is full.

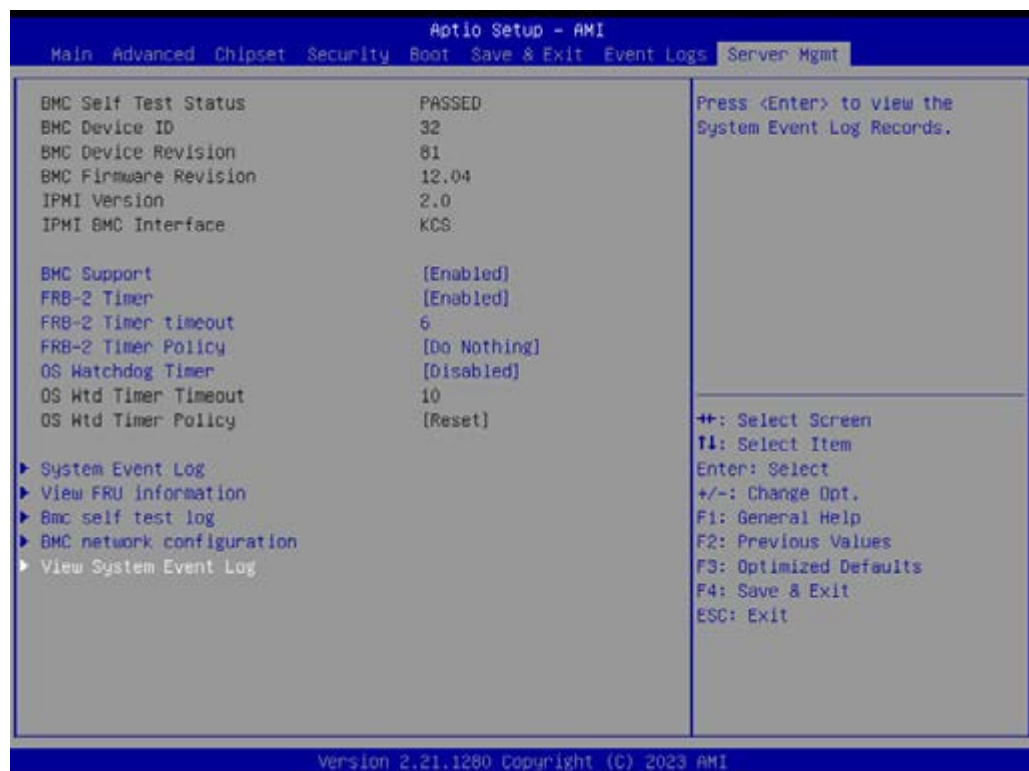
3.2.8.4 BMC Network Configuration



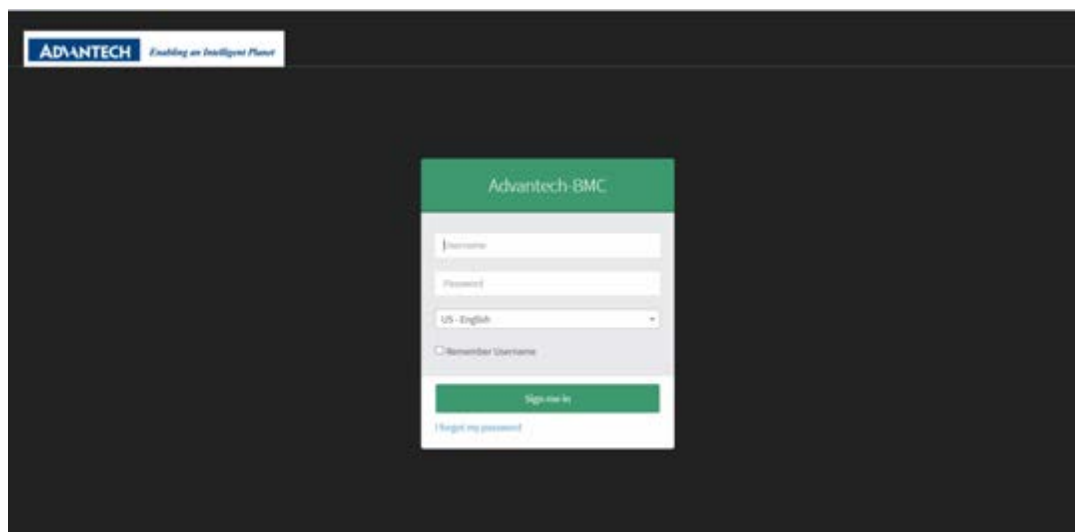


- Configuration Address Source
Select to configure LAN channel parameters statically or dynamically (by BMC). The Unspecified option will not modify any BMC network parameters during the BIOS phase.

3.2.8.5 View System Event Log



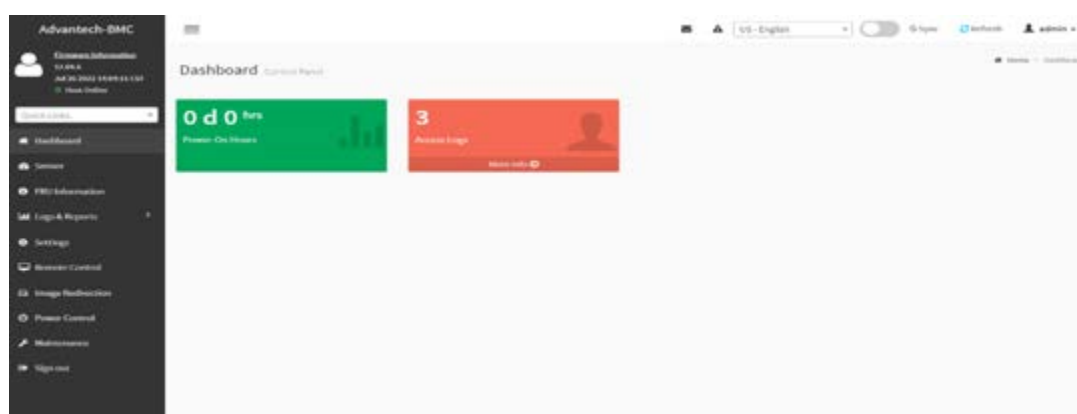
3.2.9 BMC - Setting of WEB Browser



- User should check the “Station IP address” of BIOS menu (chapter 3.8.4) before logging in the web browser and the URL should begin with “https://”
- Default user login
Administrator: admin
Password: admin
- It is mandatory to change the password for the default user at first successful login. Once the password is changed, login page will be reloaded, enter the username and modified password to login the Browser.
- Straight password format policies are enforced on the BMC, the password will need to include at least a capital letter, small capital letter or special characters. The password management policies will also be enforced on the IPMI of the BMC interface.

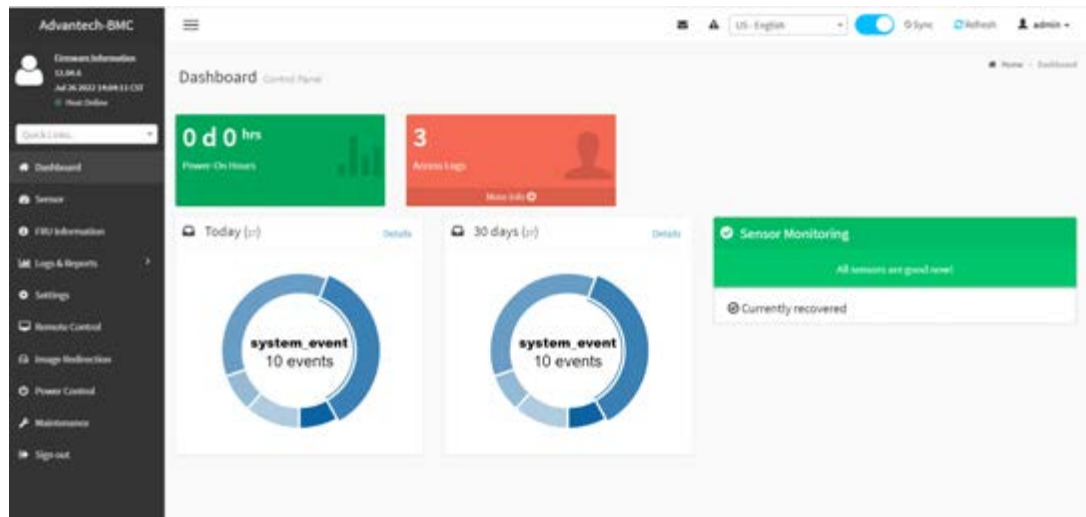
3.2.9.1 Dashboard Page

- OFF state



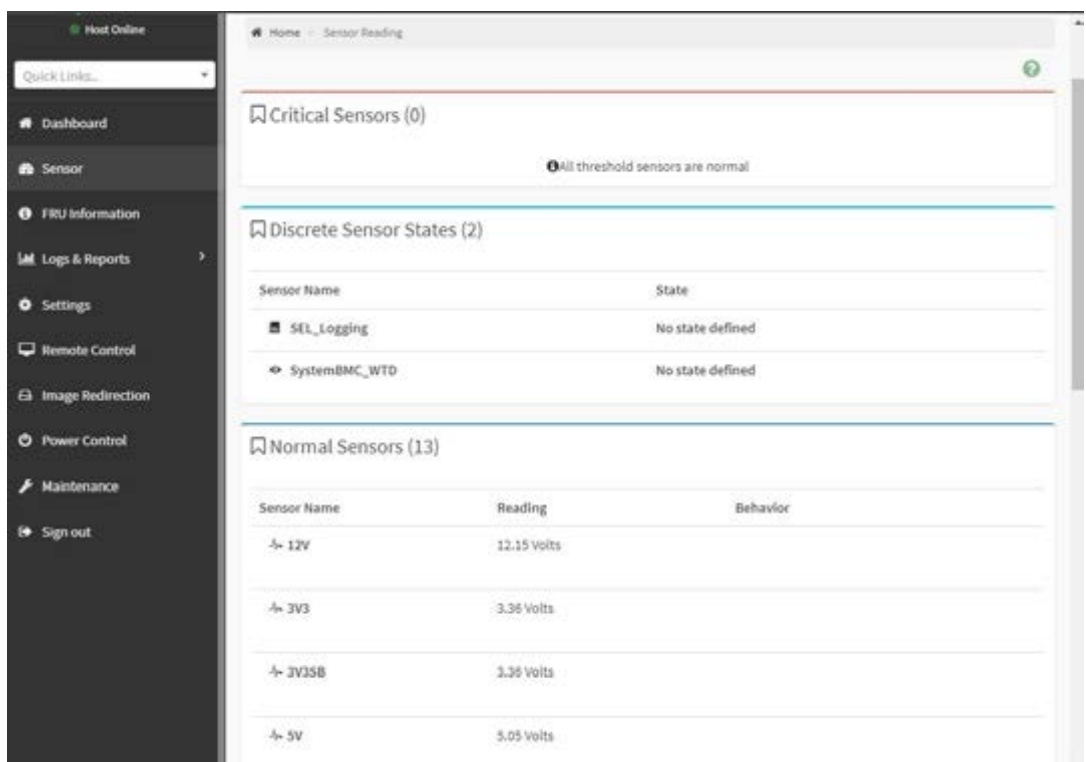
- The dashboard page will show power-on hours and access log information only when the toggle button is in the OFF state. The area of power-on hours will keep on accumulating and it will reset to zero when the system is in power-off, and access logs will show all events incurred by various sensors.

■ ON state



- When the toggle button is in ON state, it will show 'Today & 30 Days' and 'Sensor Monitoring' information.

3.2.9.2 Sensor



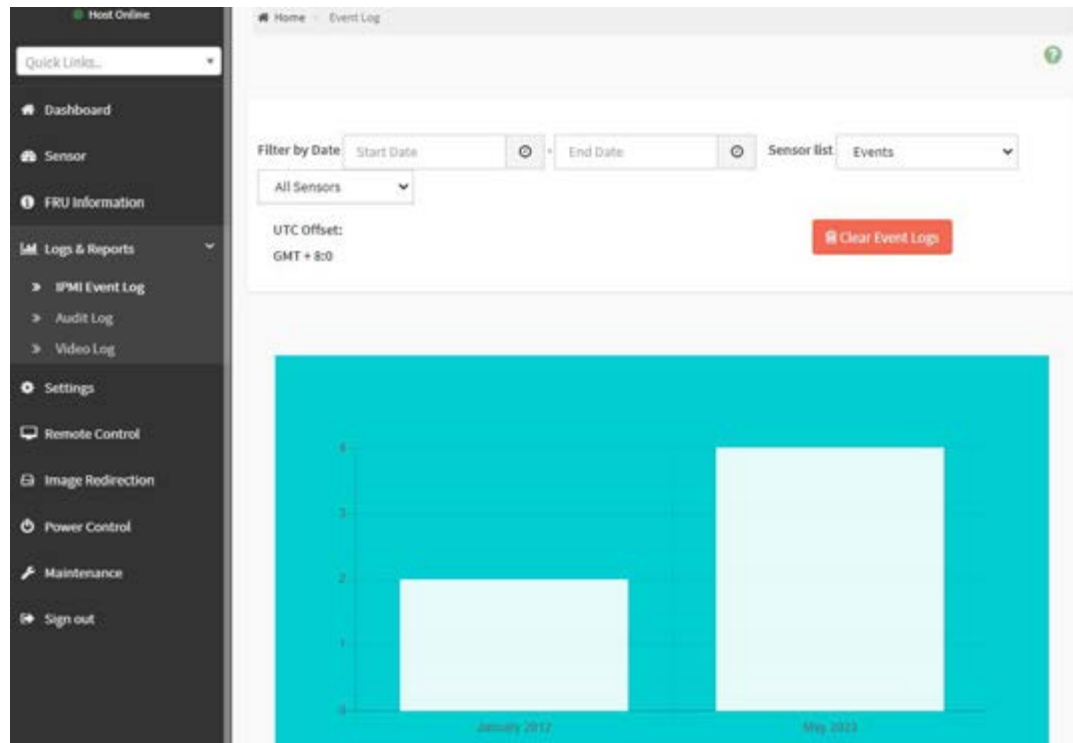
3.2.9.3 FRU Information

The screenshot displays the 'FRU Information' page. On the left is a sidebar with navigation links: Dashboard, Sensor, FRU Information (selected), Logs & Reports, Settings, Remote Control, Image Redirection, Power Control, Maintenance, and Sign out. The main content area is titled 'Available FRU Devices' and includes a search bar for 'FRU Device ID' and a dropdown for 'FRU Device Name' (currently set to 'Board FRU'). Below this, three panels provide detailed information:

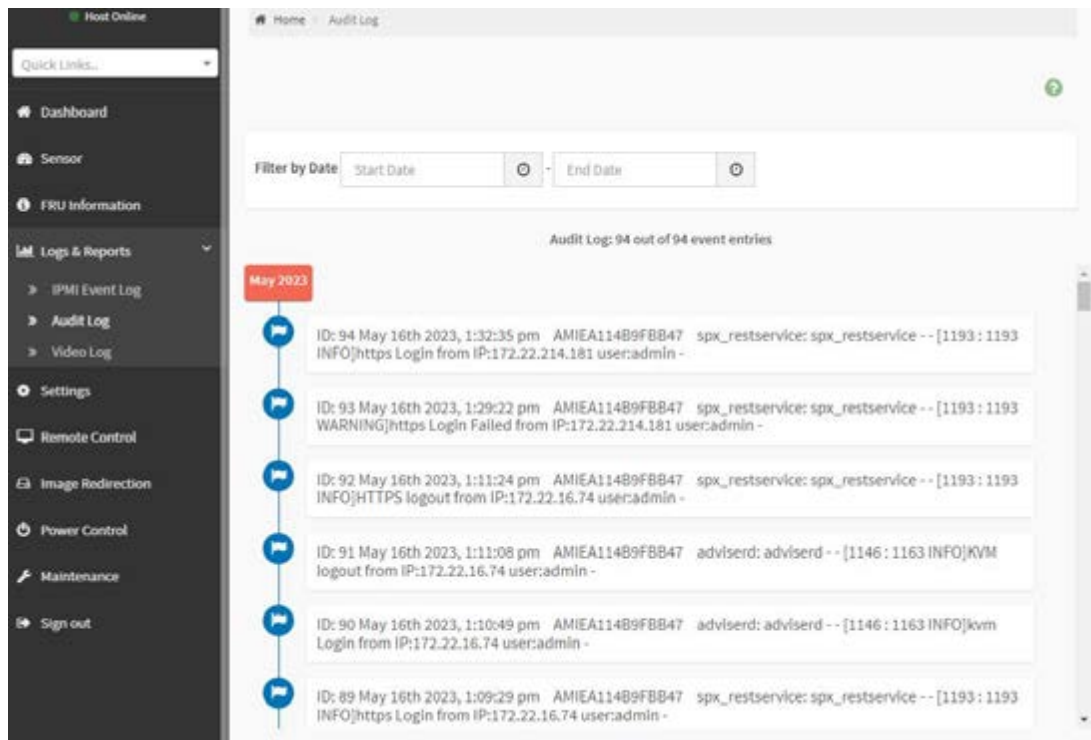
- Chassis Information:**
 - Chassis Information Area: 1
 - Format Version: 1
 - Chassis Type: Other
 - Chassis Part Number:
 - Chassis Serial Number:
- Board Information:**
 - Board Information Area: 1
 - Area Format Version: 1
 - Language: English
 - Manufacture Date Time: Mon Oct 24 22:00:00 2022
 - Board Manufacturer: Advantech
 - Board Product Name: AIMB-592
 - Board Serial Number:
 - Board Part Number:
- Product Information:**
 - Product Information Area: 1
 - Format Version: 1
 - Language: English
 - Product Manufacturer:
 - Product Name:
 - Product Part Number:
 - Product Version:
 - Product Serial Number:
 - Asset Tag:

- Shows information of chassis, board or product information of FRU device.

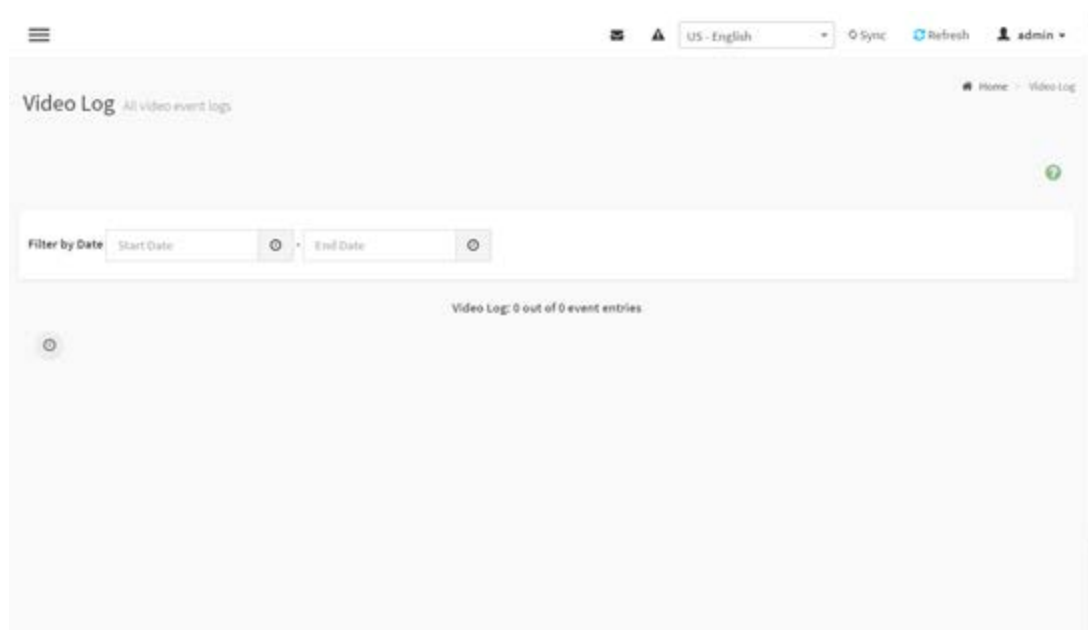
3.2.9.4 LOG & Reports - IPMI Event Log



3.2.9.5 LOG & Reports – Audit Log

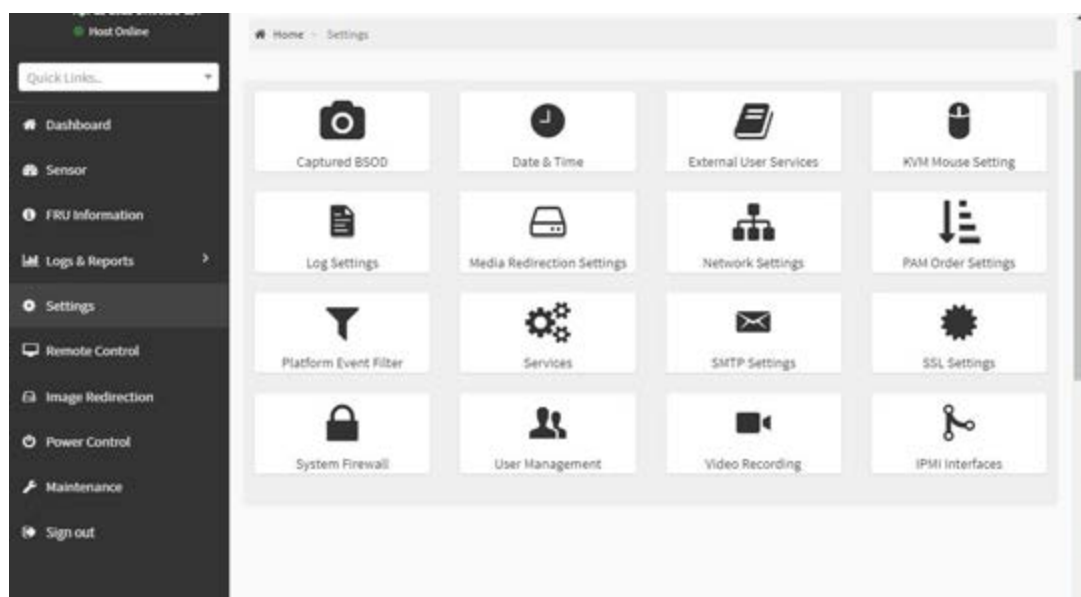


3.2.9.6 LOG & Reports – Video Log



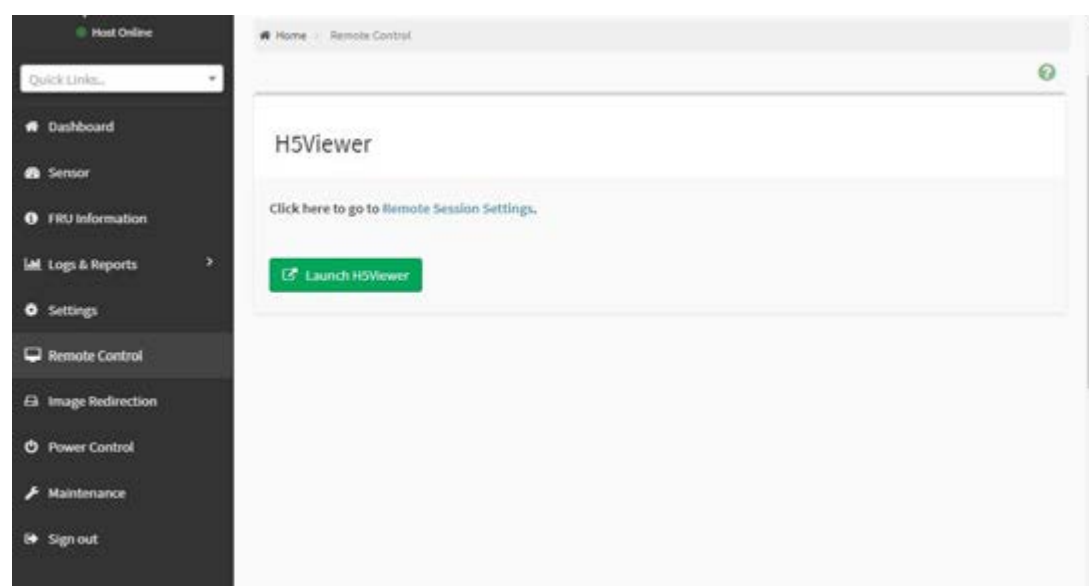
- This page will display the video log when video trigger settings is enabled, user can adjust under “Setting -> Video Recording -> Auto Video Settings -> Video Trigger Settings” item.

3.2.9.7 Settings

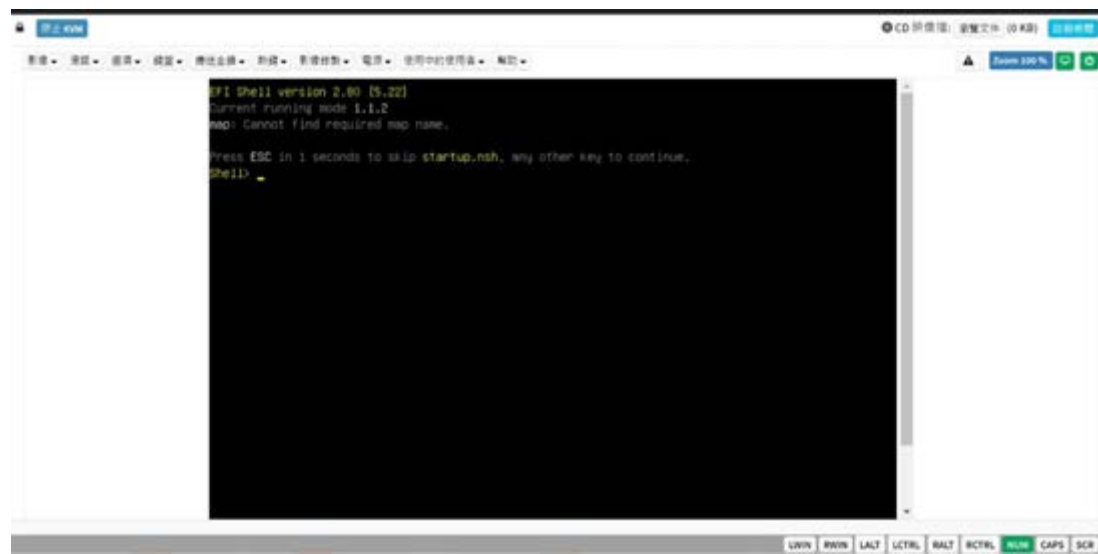


- Users can access various configuration settings through this page

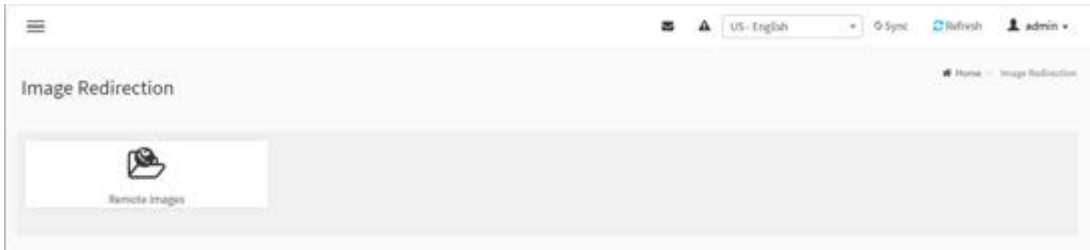
3.2.9.8 Remote Control



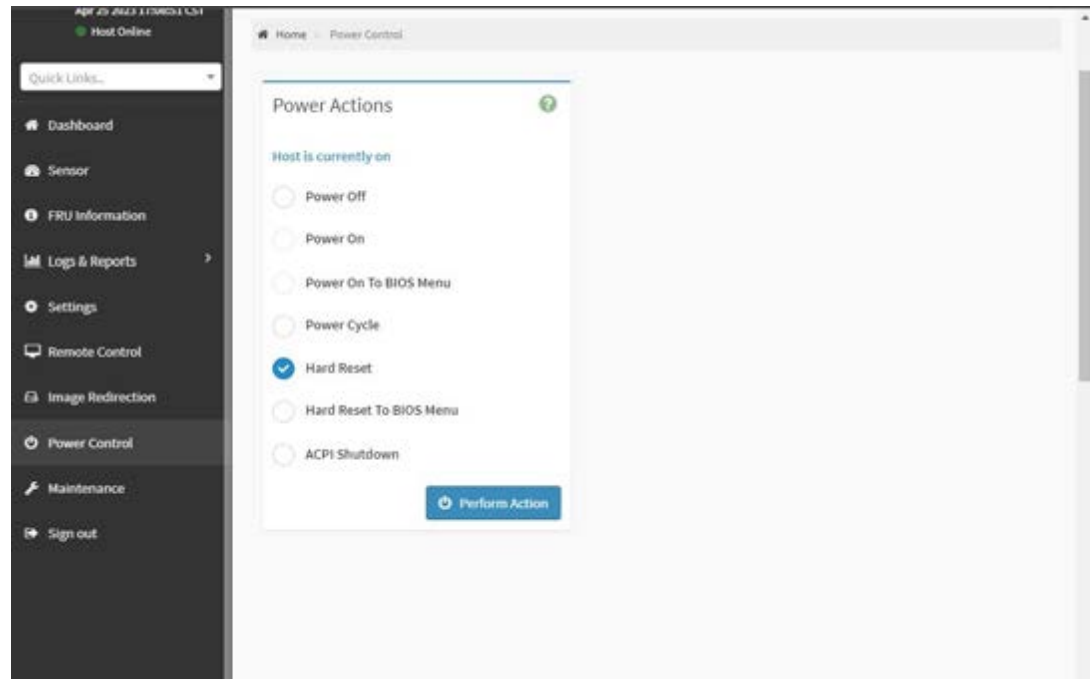
Remote Control – Launch H5viewer



3.2.9.9 Image Redirection

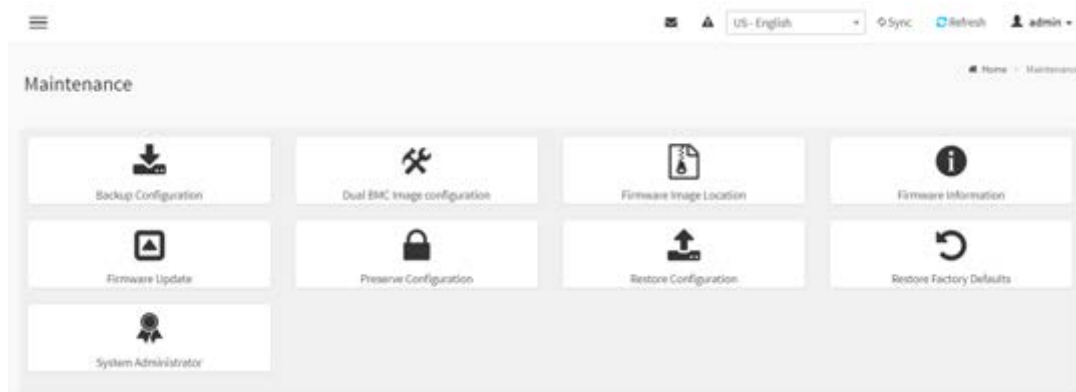


3.2.9.10 Power Control



- This page allows the user to view and control the power of the system platform from a remote device.

3.2.9.11 Maintenance



Chapter 4

Software Introduction
& Service

4.1 Introduction

The mission of Advantech Embedded Software Services is to "Enhance quality of life with Advantech platforms and Microsoft® Windows® embedded technology." We enable Windows® Embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (hardware suppliers, system integrators, embedded OS distributors) for projects. Our goal is to make Windows® Embedded Software solutions easily and widely available to the embedded computing community.

4.2 Value-Added Software Services

Software API: An interface that defines the ways by which an application program may request services from libraries and/or operating systems. Provides not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speeds development, enhances security and offers add-on value for Advantech platforms. It plays the role of catalyst between developer and solution, and makes Advantech embedded platforms easier and simpler to adopt and operate with customer applications.

4.2.1 Software API

4.2.1.1 Control

GP I/O



General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off the device. Our API also provide Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

SMBus



SMBus is the System Management Bus defined by Intel Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

4.2.1.2 Display

Brightness Control



The Brightness Control API allows a developer to access embedded devices and easily control brightness.

Brightness Control



The Backlight API allows a developer to control the backlight (screen) on/off in embedded devices.

4.2.1.3 Monitor

Watchdog



A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own. A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

Hardware Monitor



The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

4.2.1.4 Power Saving

CPU Speed



Makes use of Intel SpeedStep technology to save power consumption. The system will automatically adjust the CPU speed depending on the system loading.

System Throttling



Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. This API allows the user to adjust the clock from 87.5% to 12.5%.

4.2.2 Software Utility

BIOS Flash



The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up current BIOS by copying it from the flash chip to a file on the customers' disk. The BIOS Flash utility also provides a command line version and an API for fast implementation into customized applications.

Monitoring



Monitoring is a utility for customers to monitor system health, like voltage, CPU and system temperature and fan speed. These items are important to a device, if critical errors occur and are not solved immediately, permanent damage may be caused.

Chapter 5

Chipset Software
Installation Utility

5.1 Before You Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the AIMB-592 are available online for download from the Advantech support website.

5.2 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 2.0/3.1 support
- Identification of AMD chipset components in the Device Manager

Note! This utility 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

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



5.3 Windows Series Driver Setup

1. When enter the website of Advantech, then search product AIMB-592. There is "Chip" driver inside.

WinSvr19 driver for AIMB-592

2023-05-26 | Driver | Document No.1-5161758611

Related Product:

AIMB-592

Solution:

WinSvr19 driver for AIMB-592	
AIMB-592_Chip_WinSvr19 2023-05-09	Download
AIMB-592_Graphic_WinSvr19 2023-05-09	Download
AIMB-592_Lan_WinSvr19 2023-05-26	Download

Chapter 6

LAN Configuration

6.1 Introduction

AIMB-592 features dual 2.5 Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel i226-LM for LAN1&2) that supports 10/100/1000/2500 Mbps Ethernet speed and dual 10 Gigabit Ethernet LANs via dedicated PCI Express x4 lanes (Intel X550-AT for LAN3&4) that supports 100/1000/10000 Mbps Ethernet speed.

6.2 Windows Series Driver Setup

When enter the website of Advantech, then search product AIMB-592. There is "LAN" driver inside.

WinSvr19 driver for AIMB-592

2023-05-26 | Driver | Document No.1-5161758611

Related Product:

AIMB-592

Solution:

WinSvr19 driver for AIMB-592

WinSvr19 driver for AIMB-592

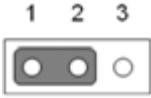
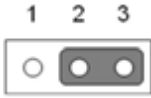
AIMB-592_Chip_WinSvr19 2023-05-09	Download
AIMB-592_Graphic_WinSvr19 2023-05-09	Download
AIMB-592_Lan_WinSvr19 2023-05-26	Download

Appendix **A**

Pin Assignments

A.1 CMOS Clear Jumper (JCMOS1)

Table A.1: CMOS Clear Jumper (JCMOS1)

Function	Jumper Setting
Keep COMS Data (Default)	
Clear CMOS Date	
Pin	Signal Pin Definition
1	+V1.5_RTC_JMP
2	+V1.5_RTC
3	GND

A.2 Front Panel1 + Front Panel2 header (JFP1+JFP2)

Table A.2: Front Panel1 + Front Panel2 header (JFP1+JFP2)

Pin	Signal Pin Definition	Pin	Signal Pin Definition
1	FRP_SPK2	7	FRP_SPK3
2	+V3.3	8	HWM_SMB_DATA
3	FP_PWR_BTN_S#	9	FP_RST_BTN_S#
4		10	FRP_SPK4
5	SATA_LED#	11	HWM_SMB_CLK
6	GND	12	GND

A.3 Case open pin header (JCASE1)



Table A.3: Case open pin header (JCASE1)

Pin	Signal
1	CASEOP
2	GND

A.4 ATX 12V IN connector (ATX12V1/ ATX12V2)ATX/ AT Mode Selection (PSON1)

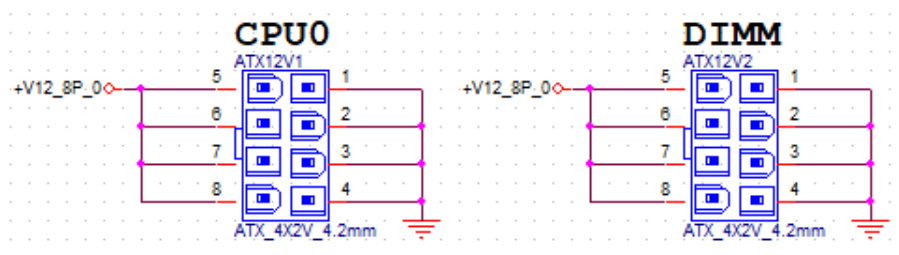


Table A.4: ATX 12V IN connector (ATX12V1/ ATX12V2)ATX/AT Mode Selection (PSON1)

Pin	Signal	Pin	Signal
1	GND	5	+V12_8P_0
2	GND	6	+V12_8P_0
3	GND	7	+V12_8P_0
4	GND	8	+V12_8P_0

A.5 ATX 24pin IN connector (ATXPWR1)

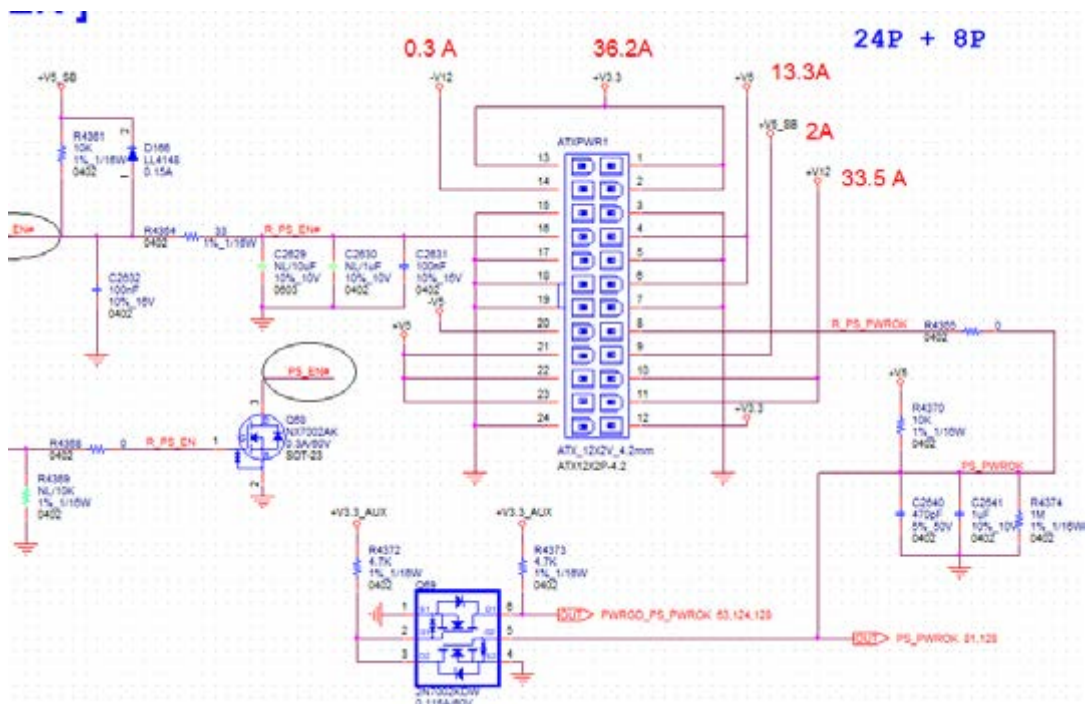


Table A.5: ATX 24pin IN connector (ATXPWR1)

Pin	Signal	Pin	Signal
1	+V3.3	13	+V3.3
2	+V3.3	14	-V12
3	GND	15	GND
4	+V5	16	PS_ON#
5	GND	17	GND
6	+V5	18	GND
7	GND	19	GND
8	PWR_OK	20	-V5
9	+V5_SB	21	+V5
10	+V12	22	+V5
11	+V12	23	+V5
12	+V3.3	24	GND

A.6 GPIO header (GPIO1)

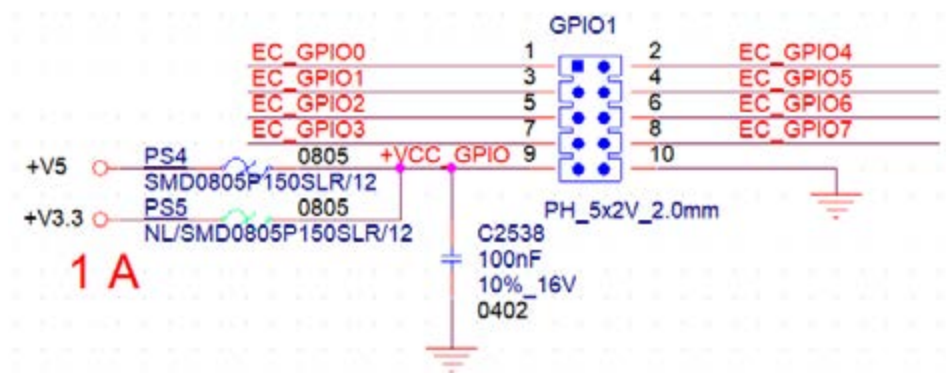


Table A.6: GPIO header (GPIO1)

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	+V5	10	GND

A.7 EC programing header (SCN1)



Table A.7: EC programing header (SCN1)

Pin	Signal	Pin	Signal
1	GND	2	RDC_TMS
3	GND	4	RDC_TDI
5	GND	6	RDC_TDO
7	GND	8	RDC_TCK
9	GND	10	GND
11	GND	12	SPI_RDC_CLK

A.8 System FAN Connector (SYSFAN1/SYSFAN2/SYSFAN3/SYSFAN4)

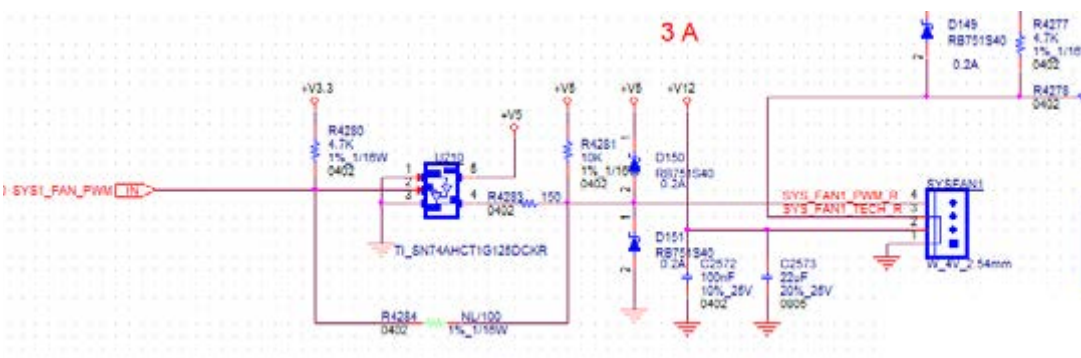


Table A.8: System FAN Connector (SYSFAN1)

Pin	Signal
1	GND
2	+V12
3	SYS1_FAN_TACH
4	SYS_FAN1_PWM

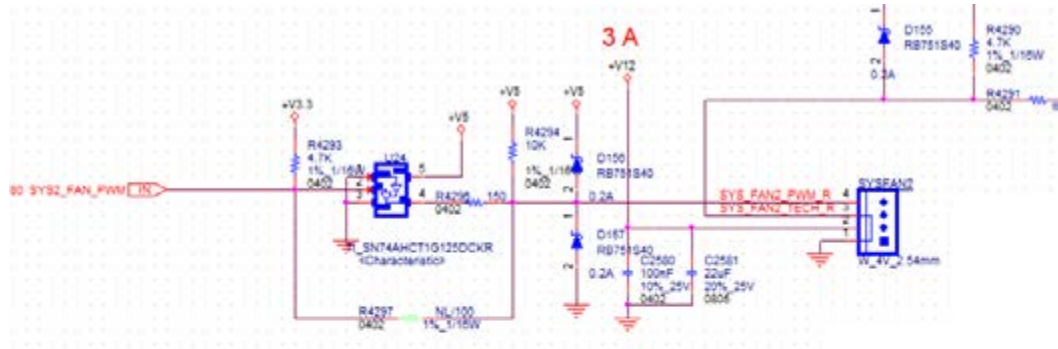


Table A.9: System FAN Connector (SYSFAN2)

Pin	Signal
1	GND
2	+V12
3	SYS2_FAN_TACH
4	SYS2_FAN_PWM

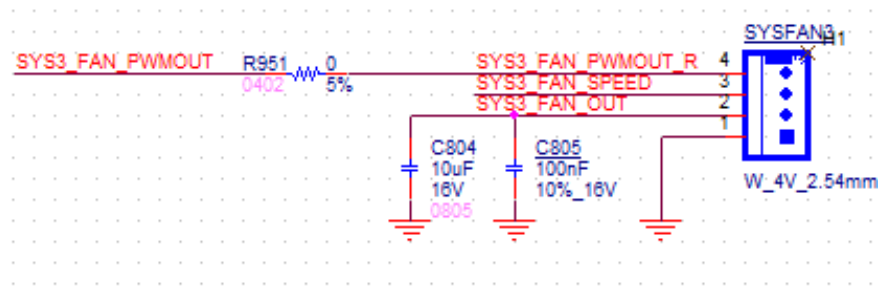


Table A.10: System FAN Connector (SYSFAN3)

Pin	Signal
1	GND
2	SYS3_FAN_OUT
3	SYS3_FAN_SPEED
4	SYS3_FAN_PWMOUT

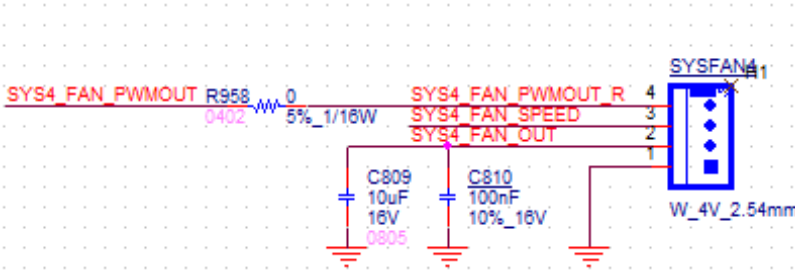


Table A.11: System FAN Connector (SYSFAN4)

Pin	Signal
1	GND
2	SYS4_FAN_OUT
3	SYS4_FAN_SPEED
4	SYS4_FAN_PWMOUT

A.9 CPU FAN connector (CPUFAN1)

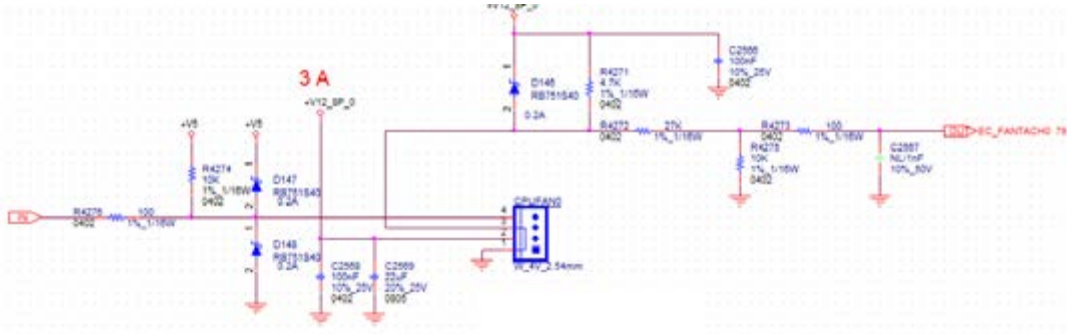


Table A.12: CPU FAN connector (CPUFAN1)

Pin	Signal
1	GND
2	+V12_8P_0
3	EC_FANTACH0
4	EC_CPU_PWM

A.10 Serial GPIO (SGPIO1)

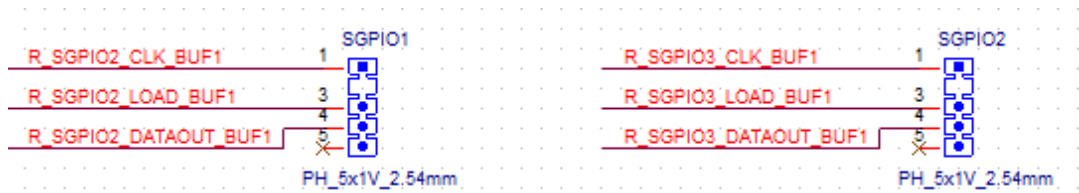


Table A.13: Serial GPIO (SGPIO1)

Pin	Signal
1	R_SGPIO_CLK_BUF1
2	
3	R_SGPIO_LOAD_BUF1
4	R_SGPIO_DATAOUT_BUF1
5	

A.11 System Error Led wafer (BMC_SYSLED1)

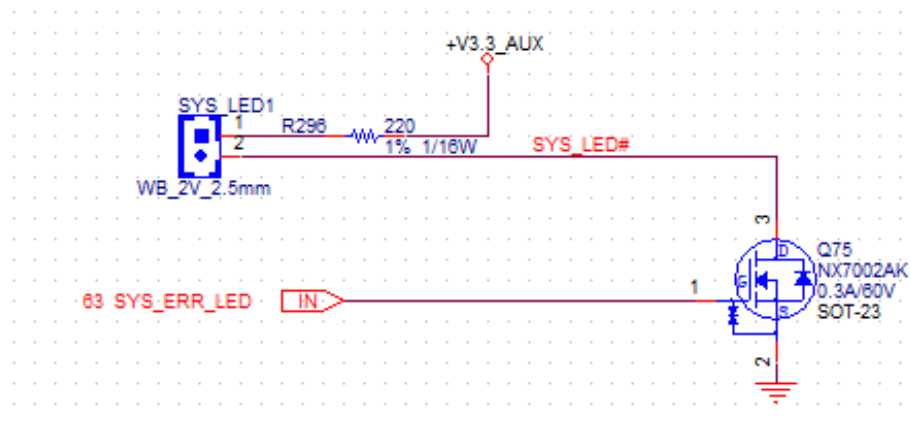


Table A.14: System Error Led wafer (BMC_SYSLED1)

Pin	Signal
1	+V3.3_AUX
2	SYS_LED#

A.12 PMBus wafer (PMBUS1)

PMBUS CONN.

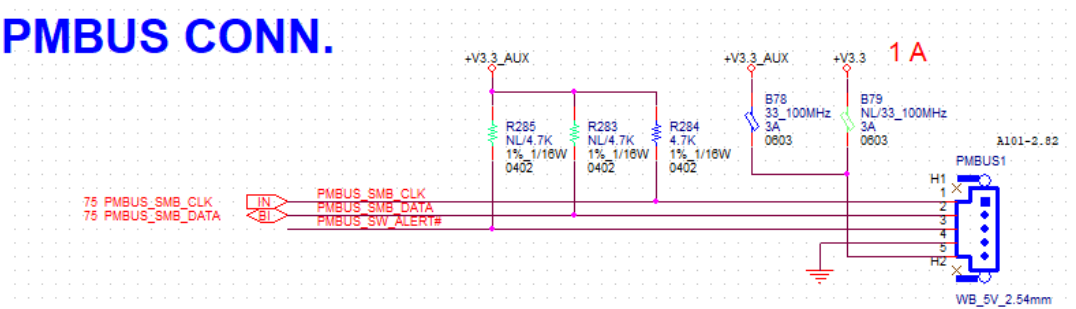


Table A.15: PMBus wafer (PMBUS1)

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

A.13 HW SMBUS (SMBUS1)

SMBUS CONN.

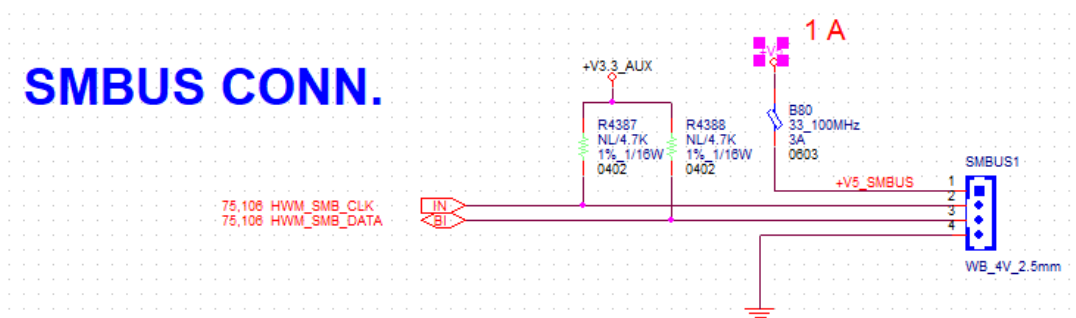


Table A.16: HW SMBUS (SMBUS1)

Pin	Signal
1	+V5
2	HWM_SMB_CLK
3	HWM_SMB_DATA
4	GND

A.14 Front Panel3 (JFP3)

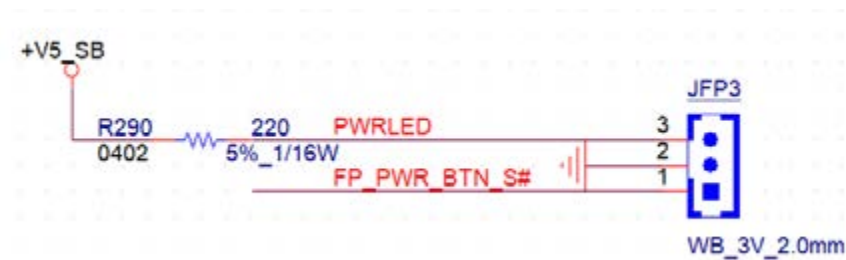


Table A.17: Front Panel3 (JFP3)

Pin	Signal
1	FP_PWR_BTN_S#
2	GND
3	+V5_SB

A.15 Graphics Card 12V slot (SLOT12V1)

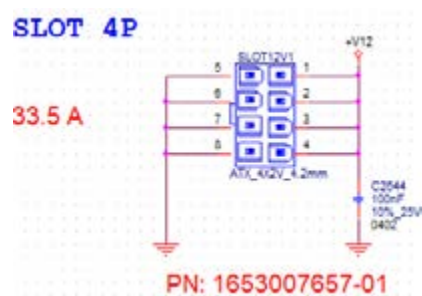


Table A.18: Graphics Card 12V slot (SLOT12V1)

Pin	Signal	Pin	Signal
1	+V12	5	GND
2	+V12	6	GND
3	+V12	7	GND
4	GND	8	GND



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