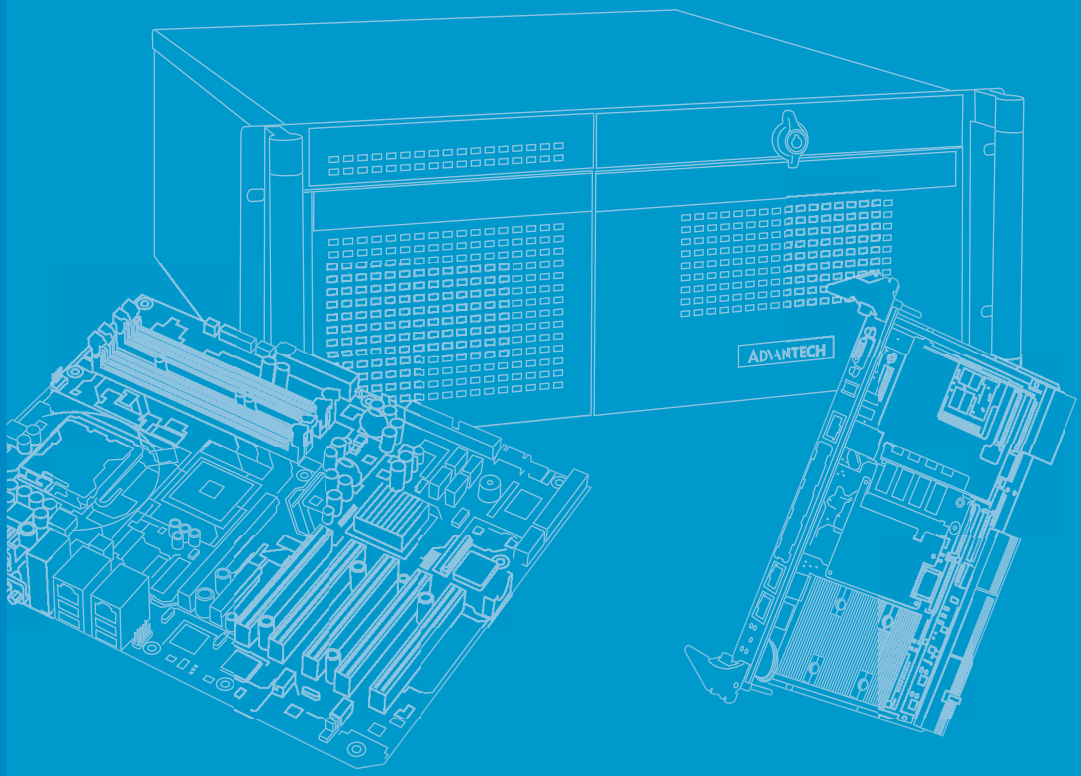

User Manual

AIMB-723

LGA1718 AMD Ryzen™ 7000 ATX Motherboard with DP/HDMI/ VGA, DDR5, USB 3.2, M.2

ADVANTECH

Enabling an Intelligent Planet

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A Message to the Customer

Advantech Customer Service

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

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

Technical Support

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

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

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

Part No. Edition 1

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Declaration of Conformity

FCC

This device complies with the requirements in part 15 of the FCC rules:

Operation is subject to the following two conditions:

- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation.

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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

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.*

Product Warranty (2 years)

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

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

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

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

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

Initial Inspection

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

- 1 x AIMB-723 motherboard
- 1 x AIMB-723 startup manual
- 2 x Serial ATA HDD data cables
- 1 x I/O port bracket

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-723 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-723, 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.

Contents

Chapter 1

Hardware Configuration

1.1 Introduction

Advantech's AIMB-723 motherboard is an AMD B650 board for industrial applications that require high-performance computing. The motherboard supports Ryzen™ 7000 Series Desktop Processors and DDR5 5600 (All DDR5 3200 Change to DDR5 5600) memory up to 128 GB. AIMB-723 delivers cost-effective integrated graphics with shared memory subjected to the OS.

AIMB-723 is equipped with one PCIe x16 (Gen 4), three PCIe x4 (Gen4, one x2 link), one PCIe x1 (Gen3), and one PCI slots. It's triple display interfaces allow users to simultaneously connect monitors to the on-board DP, HDMI, and VGA ports. In addition, AIMB-723 provides dual Gigabit Ethernet LAN via dedicated PCIe x1 bus. This offers up to 1Gb/s bandwidth and eliminates network bottlenecks.

By using the AMD B650 chipset, the AIMB-723 offers a variety of features such as M.2 2280 M-key socket (PCIe Gen 4 x2 bandwidth), four on-board SATA 3.0 interfaces (bandwidth = 600 MB/s) with software RAID (0, 1, 10), four USB 3.2 Gen 2 ports, four USB 3.2 Gen 1 ports, four USB 2.0 ports, and HD Audio.

1.2 Features

- **PCIe architecture:** 1 x PCIe x16, 3 x PCIe x4 (1 x2 link), 1 x PCIe x1 slot.
- **High performance I/O capability:** Dual Gigabit LAN via PCIe x1 bus, 1 x M.2 socket, 4 x SATA 3.0 (software RAID 0, 1, 5, 10), 4 x USB 3.2 Gen 2, 4 x USB 3.2 Gen 1, and 4 x USB 2.0.
- **Standard ATX form factor with industrial features:** AIMB-723 provides industrial features like long product life, reliable operation in wide temperatures, and watchdog timer functions.
- **Supports DDR5 5600 up to 128 GB:** DDR5 provides up to 50 percent increased performance and bandwidth while saving up to 40 percent more power.
- **SUSI API:** AIMB-723 supports SUSI API which helps customers develop their own remote management programs under Windows 10.

1.3 Specifications

1.3.1 System

- **CPU:** LGA1718 socket supporting Ryzen™ 7000 Series Desktop processors
- **Cache:** Refer to CPU specifications for detailed information
- **BIOS:** AMI SPI BIOS (256 Mbit)
- **System Chipset:** AMD B650 FCH

Note! *Legacy platforms are not supported.*

1.3.2 Memory

- **RAM:** Up to 128 GB in four 288-pin DIMM sockets supporting dual-channel DDR5 5600 SDRAM. AIMB-723 supports non-ECC unbuffered DIMMs and does not support any memory configuration that mixes non-ECC with ECC unbuffered DIMMs. During the initial boot, the memory training process for improved compatibility may result in a longer boot time—up to five minutes. However, subsequent boots will return to the normal boot time.

1.3.3 Input/Output

- **PCIe slot:** 1 x PCIe x16 Gen4, 3 x PCIe x4 Gen4 (1 x2 link), 1 x PCIe x1 Gen3
- **PCI bus:** 1 x PCI slot, 32-bit, 33/66 MHz PCI 2.2 compliant
- **Serial port:** 6 x serial ports (2 x DB-9 connectors with RS-232 located in the rear panel, 1 x RS-232/422/485 header with hardware auto-flow control, and 3 x RS-232 headers)
- **USB port:** 4 x USB 3.2 Gen 2 ports on rear with up to 10 Gb/s data rate, 4 x USB 3.2 Gen 1 ports (2 rear, 2 via header), 4 x USB 2.0 ports (2 x via header, 2 x internal Type-A)
- **M.2 socket:** 1 x M.2 socket supports up to PCIe x2 Gen 4 M-key 2280 type storage devices
- **SATA port:** 4 x SATA 3.0 with software RAID 0, 1, 10.
- **SPI interface:** Advantech-designed SPI connector supports optional dTPM 2.0 module
- **GPIO:** 8-bit GPIO from super I/O for general purpose control applications

1.3.4 Graphics

- **Controller:** Integrated AMD Radeon™ Graphics
- **Display memory:** Shared memory is subject to OS
- **DisplayPort:** Resolution up to 4096 x 2304 @ 60 Hz refresh rate
- **HDMI:** Resolution up to 4096 x 2304 @ 60 Hz refresh rate
- **VGA:** Resolution up to 1920 x 1200 @ 60 Hz refresh rate

1.3.5 Ethernet LAN

- Supports dual 10/100/1000/2500 Base-T Ethernet ports via PCIe x1 bus which provides a 500 MB/s data transmission rate
- **Interface:** 10/100/1000Base-T
- **Controller:** Intel® I226-V(NIC) for LAN1, Intel® I226-V (NIC) for LAN2

1.3.6 Industrial Features

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

1.3.7 Mechanical and Environmental Specifications

- **Operating temperature:** 0 ~ 60 °C (32 ~ 140 °F, depending on CPU speed and system thermal solution)
- **Storage temperature:** -40 ~ 85 °C (-40 ~ 185 °F)
- **Humidity:** 5 ~ 95% non-condensing
- **Power supply voltage:** +3.3 V, +5 V, ±12 V, +5 VSB
- **Power consumption:** AMD Ryzen™ 7 7700X 105W; DDR5 32 GB x 4 Maximum: +3.3 V at 4.28 A, +5 V at 4.24 A, +12 V at 1.15 A, -12 V at 0.12 A, -5V at 0.03 A
- **Board size:** 304.8 x 244 mm (12 x 9.6 in)
- **Weight of board:** 0.8 kg (1.71 lb)

Note! *All specifications are subject to the data-sheet on the official website. The information in this manual is subject to change without notice.*

1.4 Jumpers and Connectors

Connectors on the AIMB-723 motherboard link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers that are used to configure your system for your application.

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

Table 1.1: Jumpers

Label	Function
JCMOS1	CMOS clearness
JWDT1	Watchdog timer reset
PSON1	AT/ATX mode selection
JPCICLK1	PCI clock selection
JSETCOM3	COM3 RS-232/422/485 jumper setting
JT1, JR1	COM3 RS-422/485 termination resistor
JFV1	VGA dummy load setting
SMB1, SMB2	PCIe SMBus clock/data setting for PCIE1 slot
SMB3, SMB4	PCIe SMBus clock/data setting for PCIE2 ~ PCIE5 slots

Table 1.2: Connector List

Label	Function
PCIe1	PCIe x16 slot (Gen4)
NVME1	M.2 M key 2280 slot (via PCIe x2 Gen4)
PCIe2	PCIe x1 slot (Gen3)
PCIe3	PCIe x4 slot (Gen4)
PCIe4	PCIe x4 slot (Gen4)
PCIe5	PCIe x4 slot (x2 link, Gen4)
PCI1	PCI slot
AUDIO1~AUDIO2	AUDIO connectors (Line-Out & MIC-In)
LAN2_USB3C3	GbE LAN port & USB 3.2 Gen 1 port *2
LAN1_USB3C2	GbE LAN port & USB 3.2 Gen 2 port *2
HDMI1_USB3C1	USB 3.2 Gen 2 port *2 & HDMI connector
DP1	DP connector
COM2	Serial port: RS-232 (DB-9 connector)
VGA1	VGA connector
COM1	Serial port: RS-232 (DB-9 connector)
USB3H1	USB 3.2 Gen1 port *2 (20-pin header)
USB2H1	USB 2.0 port *2 (10-pin header)
USB2A1~USB2A2	Internal USB 2.0 Type-A port *2
COM3	Serial port: RS-232/422/485 (9-pin header)
COM4~COM6	Serial port: RS-232 (9-pin header)
ATX12V1, ATX12V2	ATX 12 V auxiliary power connector (for CPU)
EATXPWR1	ATX 24-pin main power connector (for system)
SATA1~SATA4	Serial ATA 3.0 port
SYSFAN1~SYSFAN3	System fan connector (4-pin)

Table 1.2: Connector List	
CPUFAN1	CPU fan connector (4-pin)
VOLT1	LED board power connector
GPIO1	8-bit GPIO connector from super I/O
SPI_TPM1	SPI (Serial Peripheral Interface) connector for Advantech dTPM 2.0 module.
SMBUS1	SMBus connector from PCH
LANLED1	Front panel LAN indicator connector
JCASE1	Case open connector

1.5 Board Layout: Jumper and Connector Locations

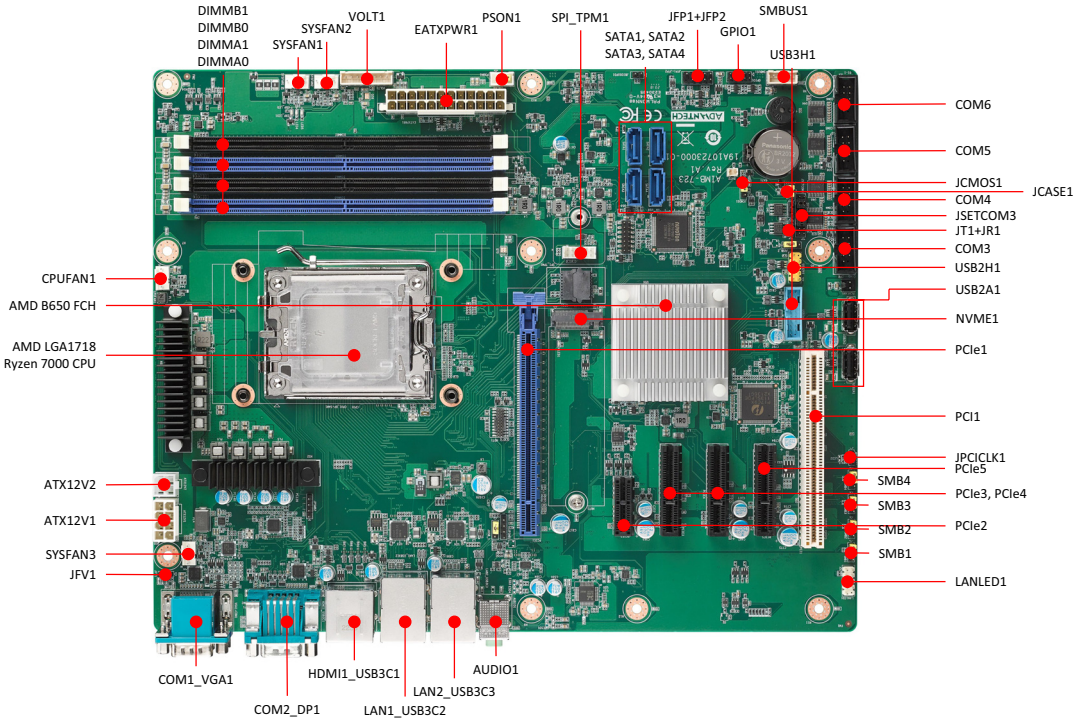


Figure 1.1 Jumper and Connector Locations

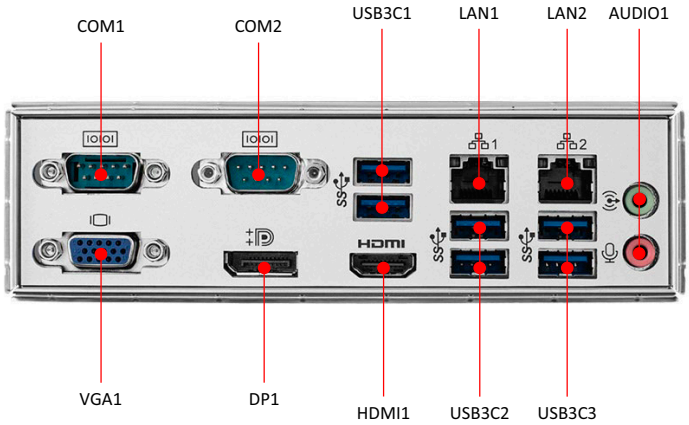


Figure 1.2 I/O Connectors

1.6 Block Diagram

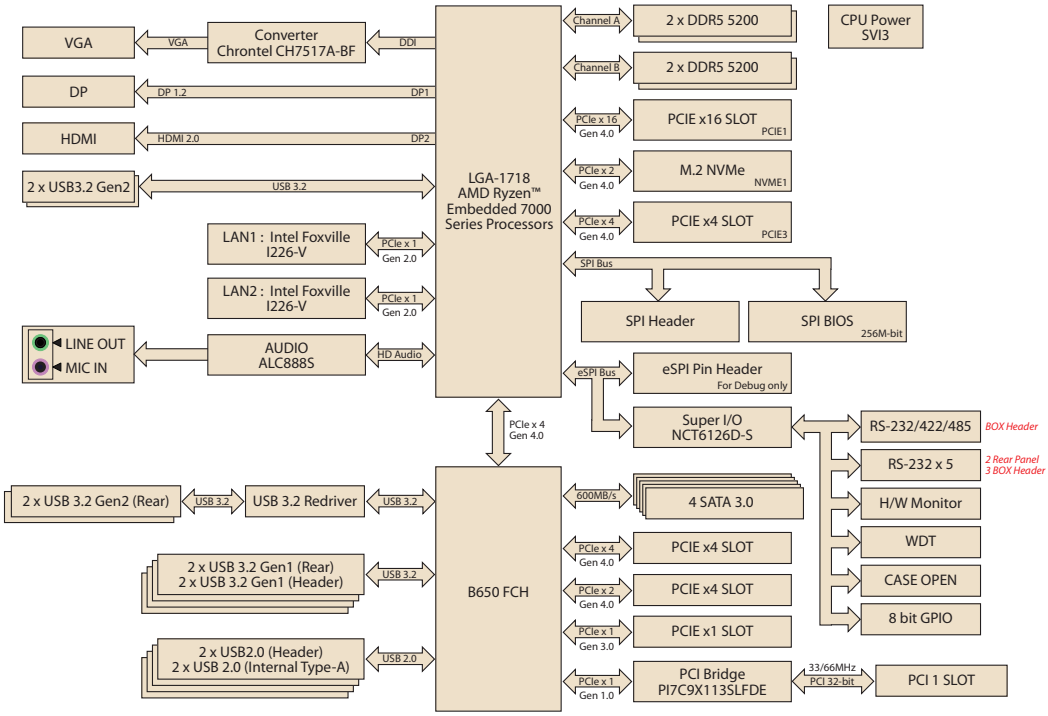


Figure 1.3 Block Diagram

1.7 Safety Precautions

Warning! *Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. 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 static electric 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 default settings and your options for each jumper.

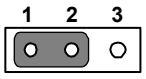
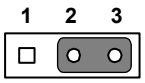
1.8.1 How to set jumpers

You can configure your motherboard to match the needs of your application by setting 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)

The AIMB-723 motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set JCMOS1 to pins 2-3 closed for just a few seconds, and then move the jumper back to pins 1-2 closed. This procedure will reset the CMOS to its default setting.

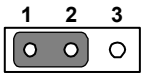
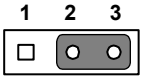
Table 1.3: CMOS clear (JCMOS1)

Function	Jumper Setting	
* Keep CMOS data		1-2 closed
Clear CMOS data		2-3 closed

* default setting

1.8.3 ATX/AT mode selection (PSON1)

Table 1.4: ATX/AT mode selection (PSON1)

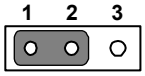
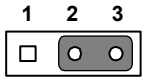
Function	Jumper Setting	
AT mode		1-2 closed
* ATX mode		2-3 closed

* default setting

1.8.4 PCI clock selection (JPCICLK1)

Pins 1-2 are closed as default. This supports most PCI cards whether the clock is 33 or 66 MHz. In the event of a rare compatibility issue, try changing to pins 2-3 closed.

Table 1.5: PCI clock selection (JPCICLK1)

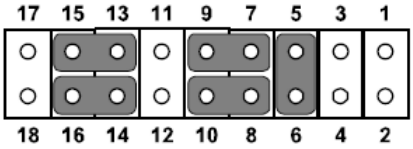
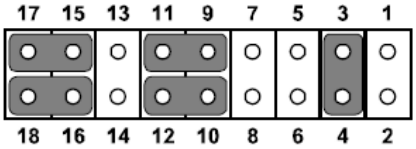
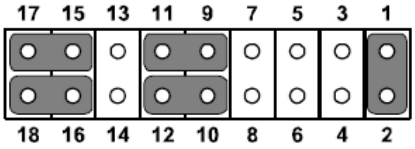
Function	Jumper Setting	
*33/66 MHz auto-detected		1-2 closed
Fixed at 33 MHz		2-3 closed

* default setting

1.8.5 COM3 RS-232/422/485 jumper setting (JSETCOM3)

Use JSETCOM3 to select the RS-232/422/485 mode for COM3. Refer to Chapter 3 for further selection of device mode in the BIOS menu. The default setting is RS-232.

Table 1.6: COM3 RS-232/422/485 jumper setting (JSETCOM3)

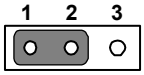
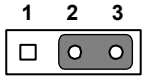
Function	Setting
*RS-232	
RS-422	
RS-485	

*default setting

1.8.6 COM3 RS-422/485 termination resistor (JT1, JR1)

To stabilize communications, JT1 and JR1 can enable or disable 120 ohm of termination resistor at board side for COM3 RS-422/485 mode to match impedance, depending on user's device application. JT1 is for TX signal line; JR1 is for RX signal line.

Table 1.7: COM3 RS-422/485 termination resistor (JT1, JR1)

Function	Jumper Setting	
Disable termination		1-2 closed
*Enable termination		2-3 closed

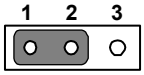
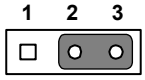
* default setting

1.8.7 VGA dummy load setting (JFV1)

The AIMB-723 contains an optional VGA dummy load feature set by the JFV1 jumper. The default setting is disabled.

If JFV1 is set to enable, a dummy monitor on the VGA port is created to prevent the on-board graphics from being switched off while no physical monitors are connected. This function is useful when you control the AIMB-723 via remote KVM and do not intend to connect any monitors.

Table 1.8: VGA dummy load setting (JFV1)

Function	Jumper Setting	
Enable VGA dummy load		1-2 closed
*Disable VGA dummy load		2-3 closed

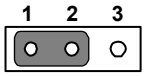
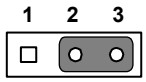
* default setting

Note! *We recommend leaving this function disabled if you use HDMI/DP as your main display.*

1.8.8 PCIe SMBus connection setting of clock (SMB1) and data (SMB2) for PCIE1 slots

Some PCIe add-on cards or devices may have SMBus address conflicts with DIMM slots at slave address of 0xA6. In the case, users may disable the SMBus connection of clock (SMB1) and data (SMB2), while VPD (Vital Product Data) will not be accessed. The default setting is enabled. Please note that both SMB1 and SMB2 jumpers should be switched to the same setting, either pins 1-2 closed or pins 2-3 closed.

Table 1.9: PCIe SMBus connection setting of clock (SMB1) and data (SMB2) for PCIE1 slots

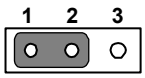
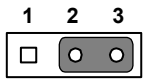
Function	Jumper Setting	
*Enable PCIe SMBus connection		1-2 closed
Disable PCIe SMBus connection		2-3 closed

* default setting

1.8.9 PCIe SMBus connection setting of clock (SMB3) and data (SMB4) for PCIE2 ~ PCIE5 slots

Some PCIe add-on cards or devices may have SMBus address conflicts with DIMM slots at slave address of 0xA6. In the case, users may disable the SMBus connection of clock (SMB3) and data (SMB4), while VPD (Vital Product Data) will not be accessed. The default setting is enabled. Please note that both SMB3 and SMB4 jumpers should be switched to the same setting, either pins 1-2 closed or pins 2-3 closed.

Table 1.10: PCIe SMBus connection setting of clock (SMB3) and data (SMB4) for PCIE2 ~ PCIE5 slot

Function	Jumper Setting	
*Enable PCIe SMBus connection		1-2 closed
Disable PCIe SMBus connection		2-3 closed

* default setting

1.9 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, and then press the DIMM module down into the socket, until you hear two clicks. This is 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 in the socket.

Note!

Always install at least one memory module on DIMMA1 or DIMMB2. Only install additional memory module on DIMMA0 or DIMMB0 when DIMMA1 and DIMMB2 are both installed.

When both channel 0 and channel 1 are occupied, memories work in dual-channel mode and improve performance. Therefore, also considering motherboard memory layout, the recommended DIMM configurations are:

	Number of memory modules installed			
	1	2	3	4
DIMMA1	V	V	V	V
DIMMA0			V	V
DIMMB1		V	V	V
DIMMB0				V

1.10 Processor Installation

Note!

Do not remove the CPU socket's plastic cap before installing the processor.

The AIMB-723 is equipped with LGA1718 socket supporting AMD Ryzen™ 7000 Series Desktop Processors.

Step 1 Press down and push the release lever away to release it from the securing tab.

Step2 Lift the lever upward to lift the processor cover.

Step3 Align the pin-1 corner of the processor with the pin 1 corner of the processor socket, and then place the processor in the processor socket.

Step 4 When the processor is fully seated in the socket, close the processor cover, then remove the cover's cap.

Step 5 Press down and push the release lever under the securing tab to lock it.

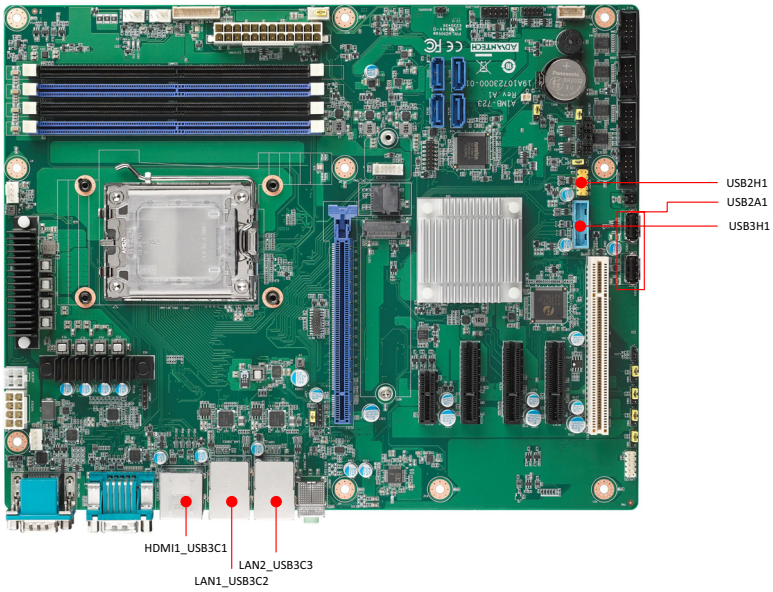
Chapter 2

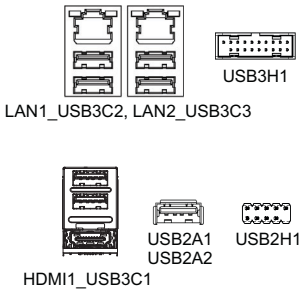
Connecting Peripherals

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, you may need to partially remove a card to make all the connections.

2.2 LAN Port (LAN1, LAN2) and USB Port (USB3C1, USB3C2, USB3C3, USB3H1, USB2H1, USB2A1, USB2A2)

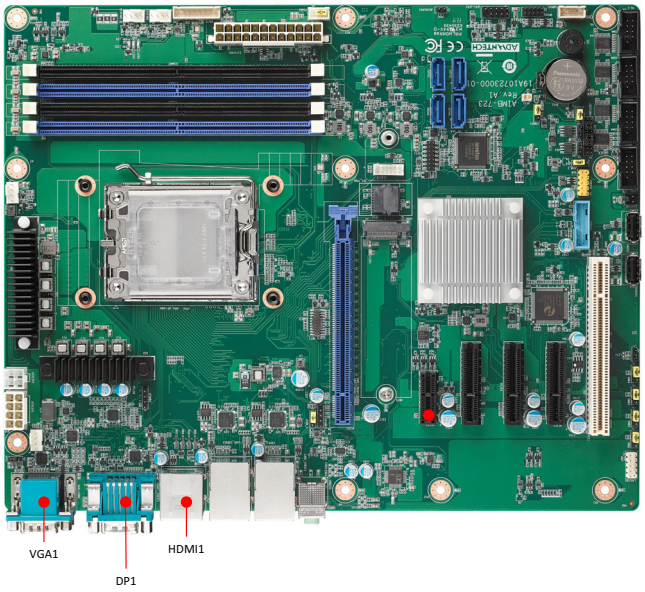


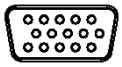


The AIMB-723 is equipped with two high-performance 2500 Mbps Ethernet LANs. They are supported by all major network operating systems. The RJ-45 jacks on the rear plate provide convenient 2500Base-T operation.

The AIMB-723 provides 12 USB ports. USB2C1, USB2A1 and USB2A2 are USB 2.0 ports supporting transmission rates up to 480 Mbps. USB3C3 and USB3H1 are USB 3.2 Gen 1 ports supporting transmission rates up to 5 Gbps. USB3C1 and USB3C2 are USB 3.2 Gen 2 ports delivering data rates up to 10 Gbps. The USB interface can be disabled in the system BIOS setup menu.

2.3 VGA Connector (VGA1), HDMI Connector (HDMI1), and DisplayPort Connector (DP1)



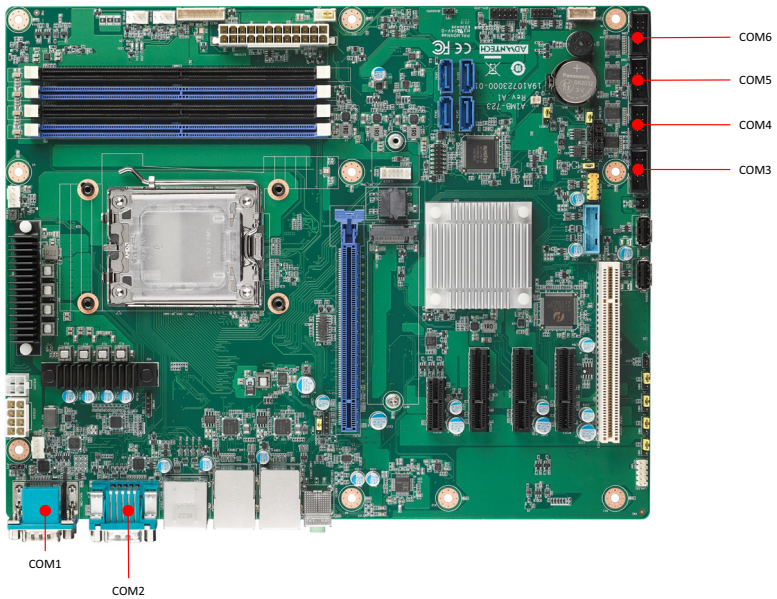

VGA1

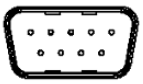

HDMI1

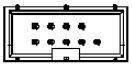

DP1

The AIMB-723 includes VGA, HDMI, and DisplayPort interface that can connect display devices. Pin assignments are detailed in Appendix B.

2.4 Serial Port (COM1 ~ COM6)

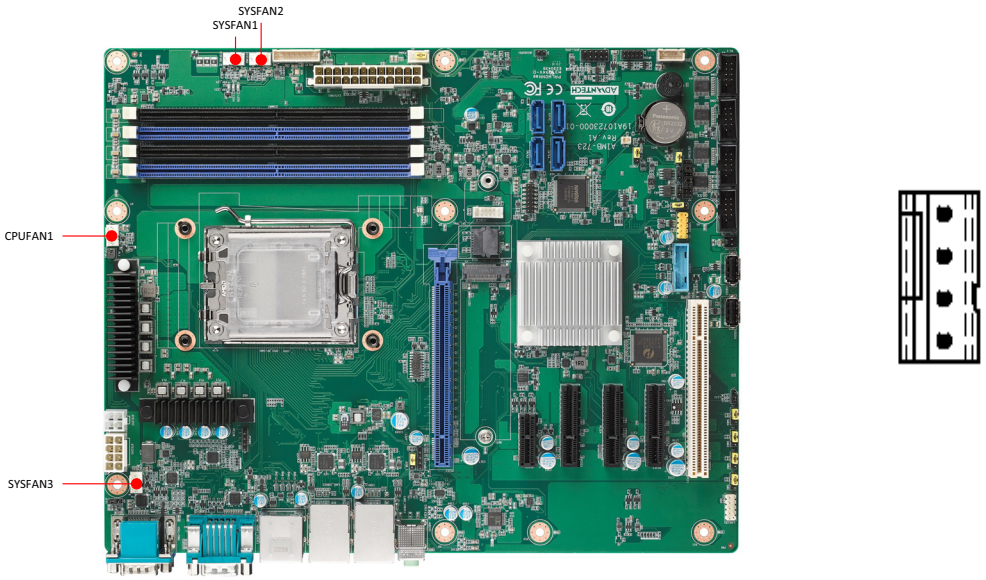



COM1 ~ 2


COM3 ~ 6

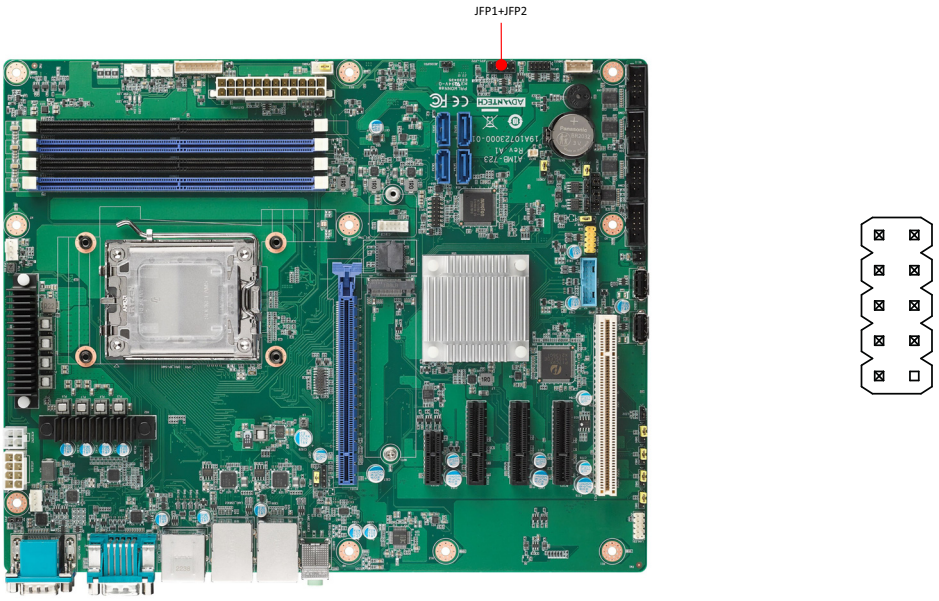
The AIMB-723 offers six serial ports (one on the rear panel and five on-board). COM3 can be configured as RS-232/422/485 by jumper settings (see Chapter 1) and BIOS selection (see Chapter 3). These ports can connect to a serial mouse, printer or communications network. The IRQ and address ranges for those ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup. Different devices implement the RS-232/422/485 standards in different ways. If you are having problems with a serial device, please be sure to check the pin assignments for the connector.

2.5 CPU and System Fan Connector (CPUFAN1, SYSFAN1 ~ SYSFAN3)



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

2.6 Front Panel Connector (JFP1, JFP2)



There are several external switches and LEDs that monitor and control the AIMB-723.

Table 2.1: Front Panel Connector (JFP1+JFP2)

Pin	Signal	Pin	Signal
1	HDD_LED+	2	PANSWIN#
3	HDD_LED-	4	GND
5	POWER_LED+	6	SYSTEM RESET#
7	POWER_LED-	8	GND
9	POWER_LED-		

2.6.1 Power LED (JFP1 pins 5,7,9)

A 3-pin connector for the power LED. Refer to Appendix B for detailed information on the pin assignments. If a PS/2 or ATX power supply is used, the system's power LED status will be as indicated as follows.

Table 2.2: PS/2 or ATX power supply LED status

Power mode	LED (PS/2 power)	LED (ATX power)
System On	On	On
System Suspend	Fast flashes	Fast flashes
System Off	Off	Off
System Off in deep sleep	Off	Off

2.6.2 HDD LED Connector (JFP1 pins 1, 3)

You can connect a LED to pins 1 and 3 of JFP1 to indicate when the HDD is active.

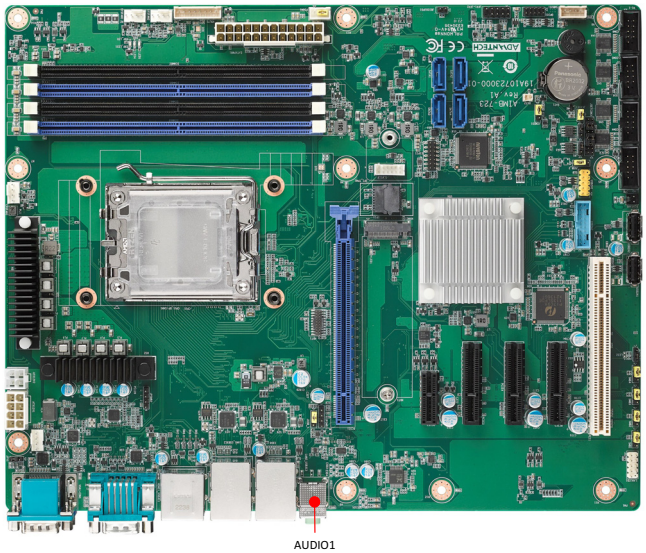
2.6.3 ATX Soft Power Switch (JFP2 pins 2, 4)

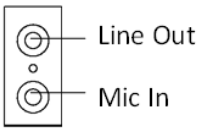
If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to pins 2 and 4 of JFP2. This connection enables you to turn your computer on and off.

2.6.4 Reset Connector (JFP2 pins 6, 8)

Many computer cases offer the convenience of a reset button.

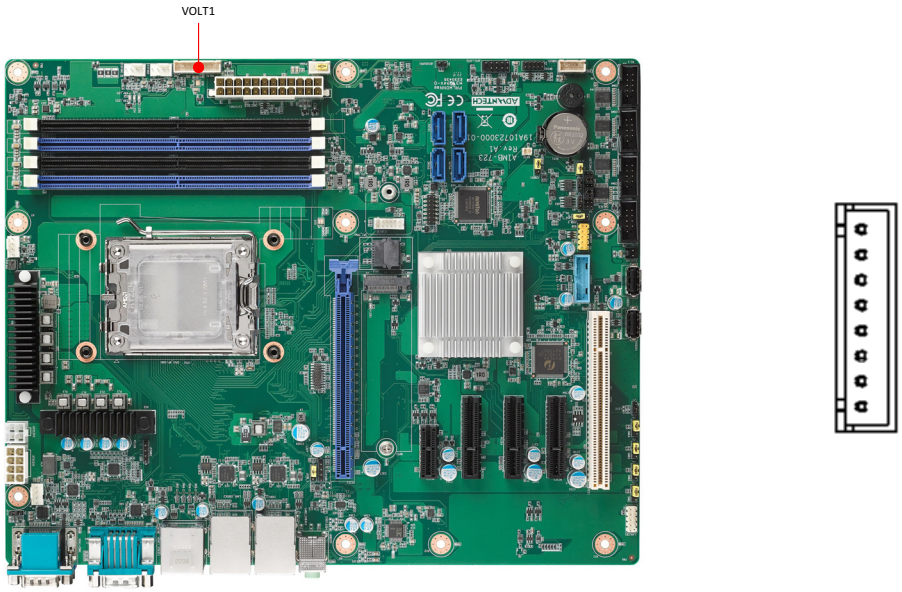
2.7 Line Out, Mic In Connector (AUDIO1)





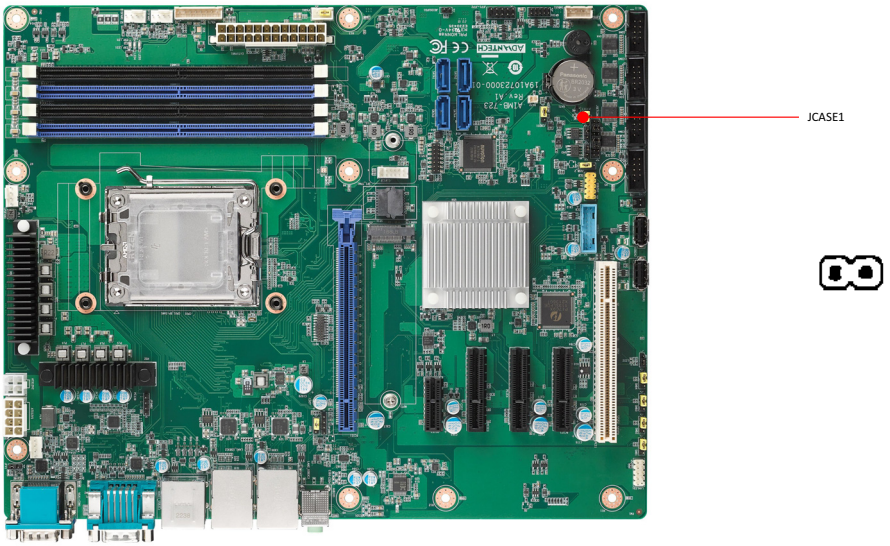
Line Out can be connected to external audio devices like speakers or headphones. Mic In can be connected to a microphone.

2.8 8-pin Alarm Board Connector (VOLT1)



VOLT1 connects to the alarm board on the Advantech chassis. The alarm board gives warnings if a power supply or fan fails, the chassis overheats, or the backplane malfunctions.

2.9 Case Open Connector (JCASE1)



JCASE1 is for chassis with case open sensors. The buzzer on the motherboard sounds if the case is opened unexpectedly. The default function is disabled and pins 1-2 is bridged by a jumper cap.

2.10 Front Panel LAN Indicator Connector (LANLED1)

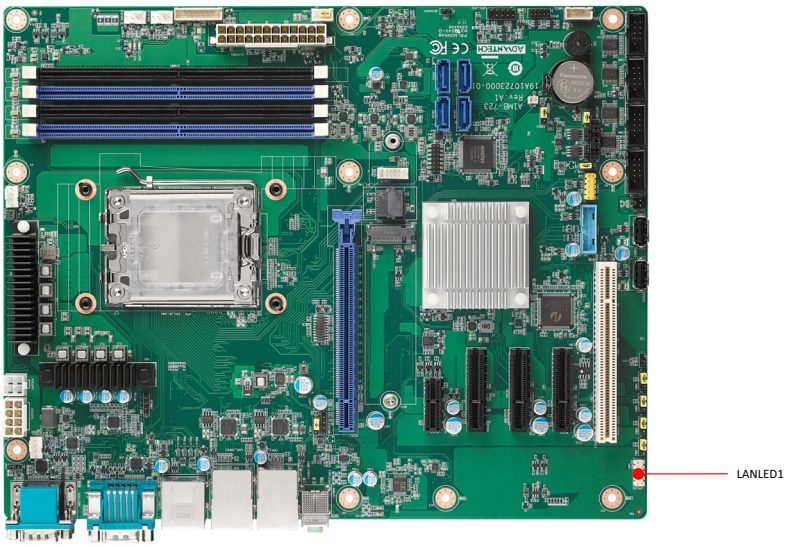
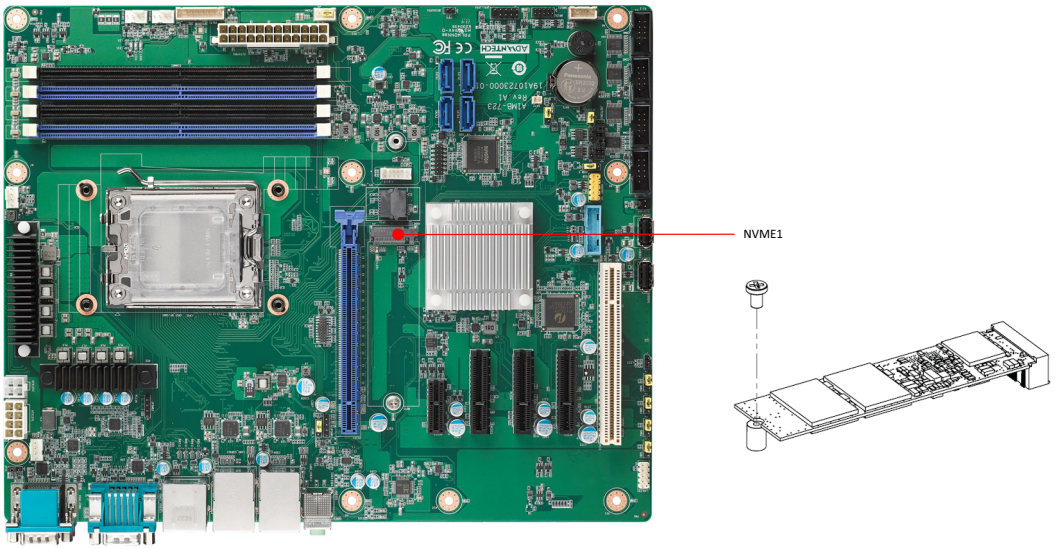


Table 2.3: Front Panel LAN Indicator Connector

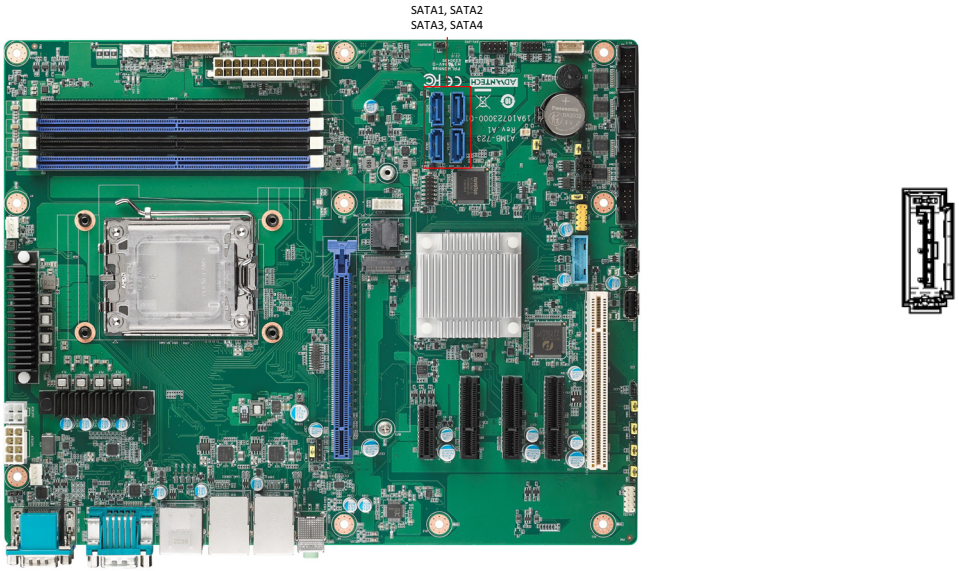
LAN Mode	Indicator
LAN Link ON	ON
LAN Active	Flash
LAN Link Off	OFF

2.11 M.2 Socket (NVME1)



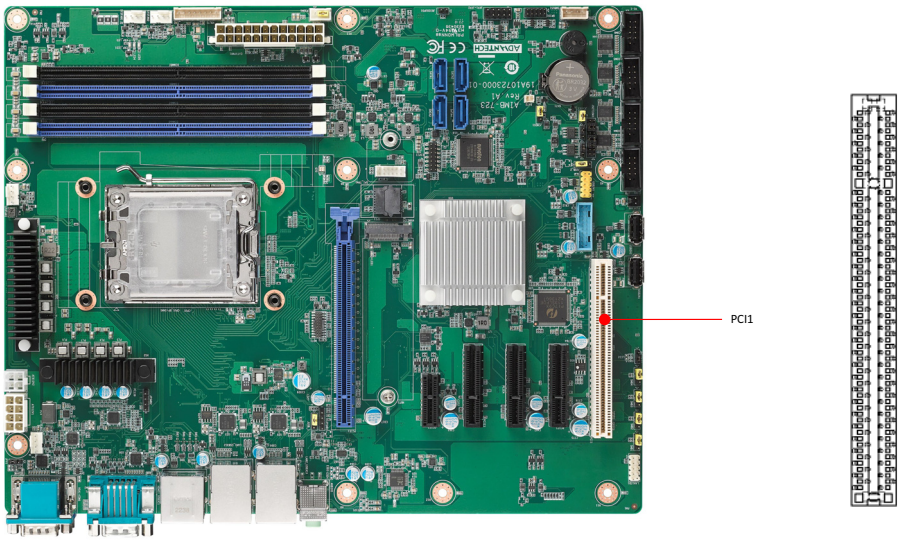
The AIMB-723 is equipped with one M.2 socket to support up to PCIe x2 M-key 2280 type storage devices. A screw to fasten the device is already installed on the nut.

2.12 Serial ATA Interface (SATA1 ~ SATA4)



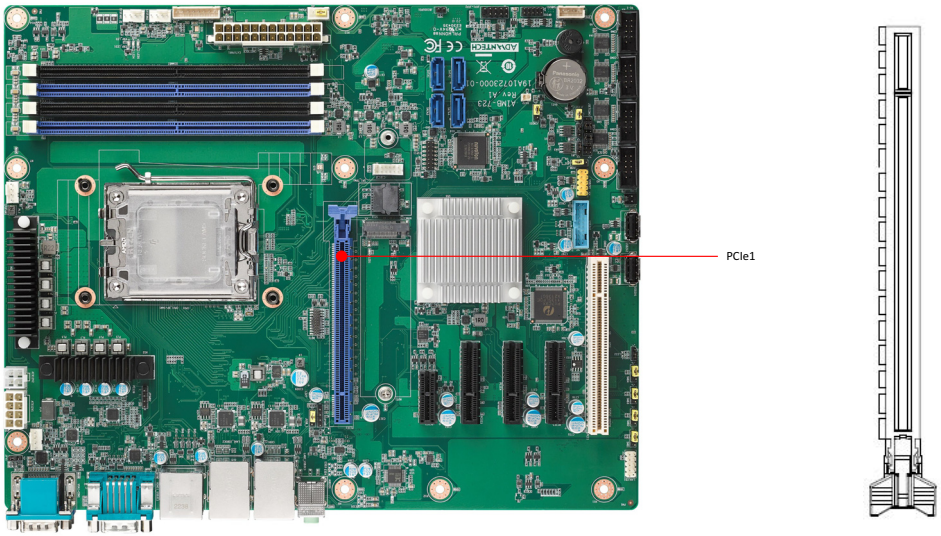
The AIMB-723 features four high performance serial ATA 3.0 interfaces (up to 600 MB/s) with long, thin, easy-to-run SATA cables.

2.13 PCI Slot (PCI1)



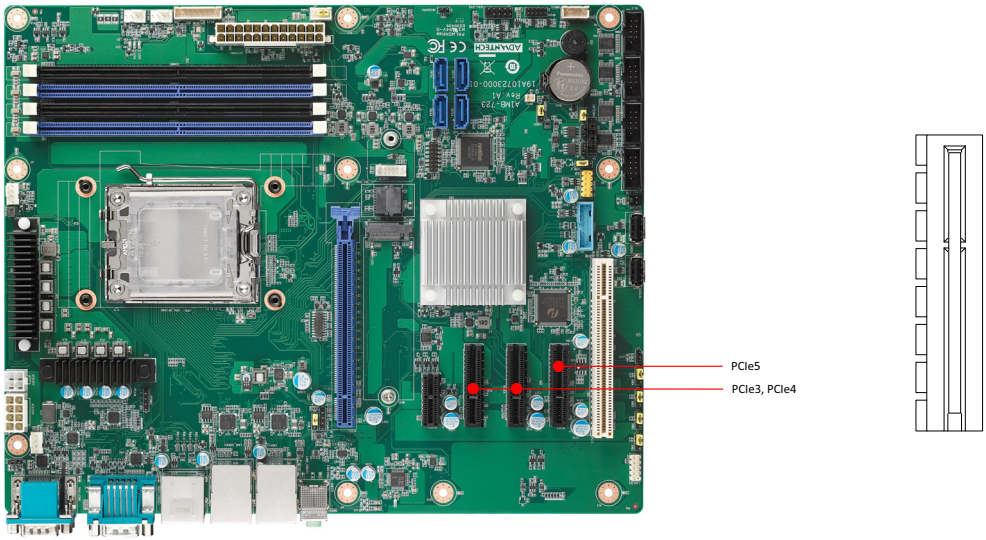
The AIMB-723 provides a 32-bit / 33 MHz PCI slot.

2.14 PCIe x16 Expansion Slot (PCIE1)



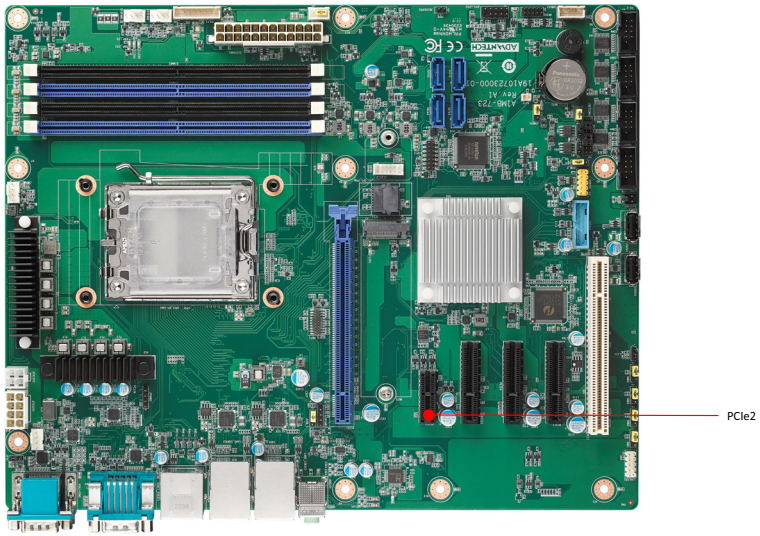
The AIMB-723 provides a PCIe x16 slot for users to install an add-on peripheral card for extension requirements.

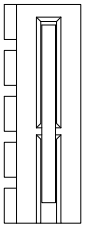
2.15 PCIe x4 Expansion Slot (PCIE3~5)



The AIMB-723 offers three PCIe x4 slots for users to install add-on cards for extension requirements. The signal of PCIE5 slot is PCIe x2.

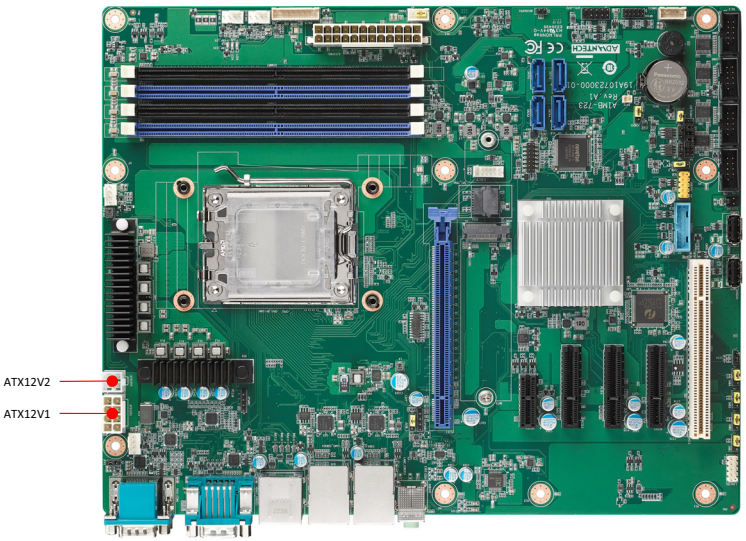
2.16 PCIe x1 Expansion Slot (PCIE2)

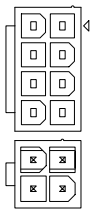




The AIMB-723 offers a PCIe x1 slot for users to install add-on cards for extension requirements.

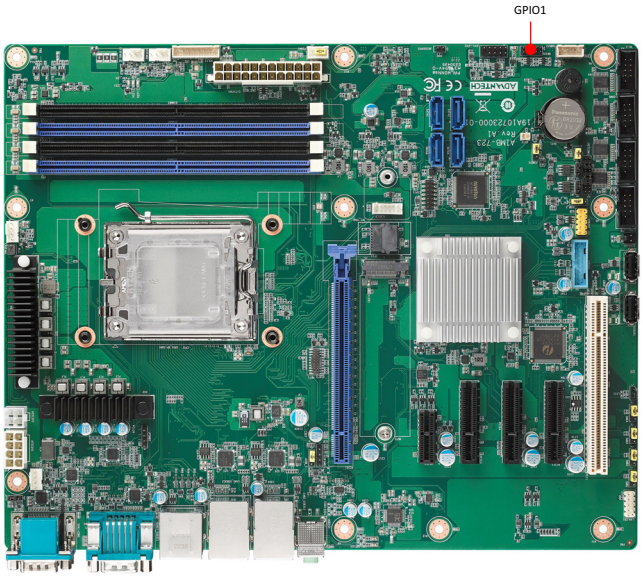
2.17 Auxiliary 8-pin Power Connector (ATX12V1, ATX12V2)





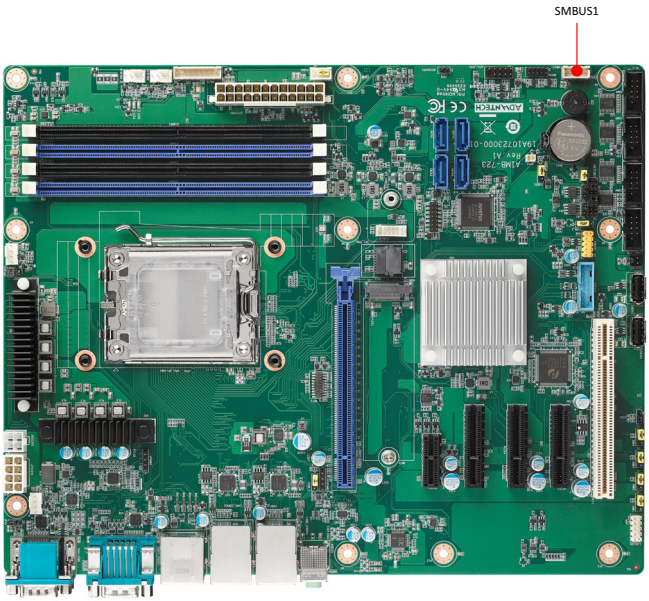
To ensure that the enough power is supplied to the CPU, one auxiliary 8-pin + 4-pin power connector is available on the AIMB-723. ATX12V1 and ATX12V2 must be used to provide sufficient 12 V power to ensure the stable operation of the system.

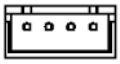
2.18 GPIO Connector (GPIO1)



GPIO1 provides input and output connections based on your custom pin definitions.

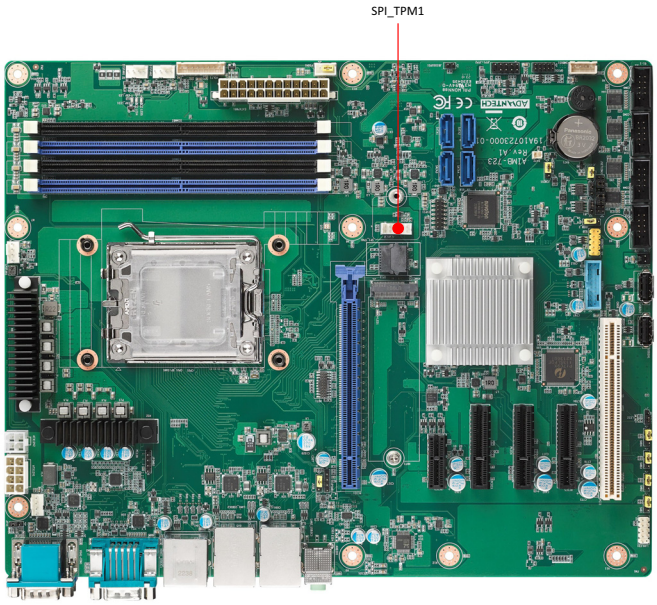
2.19 SMBus Connector (SMBUS1)





SMBus connects the AIMB-723 to the alarm board on the Advantech chassis.

2.20 Serial Peripheral Interface (SPI) Connector (SPI_TPM1)



The AIMB-723 offers SPI connector to support optional Advantech dTPM 2.0 module.

Table 2.4: Advantech SPI TPM Module List

P/N	Description
PCA-TPMSPI-00A1	dTPM 2.0 module by SPI

Chapter 3

BIOS Operation

3.1 Introduction

With the AMI BIOS Setup Utility, you can modify BIOS settings and control the specific features of your computer. The Setup Utility uses a number of menus for making changes and turning the specific features on or off. This chapter describes the basic navigation of the AIMB-723 setup screens.

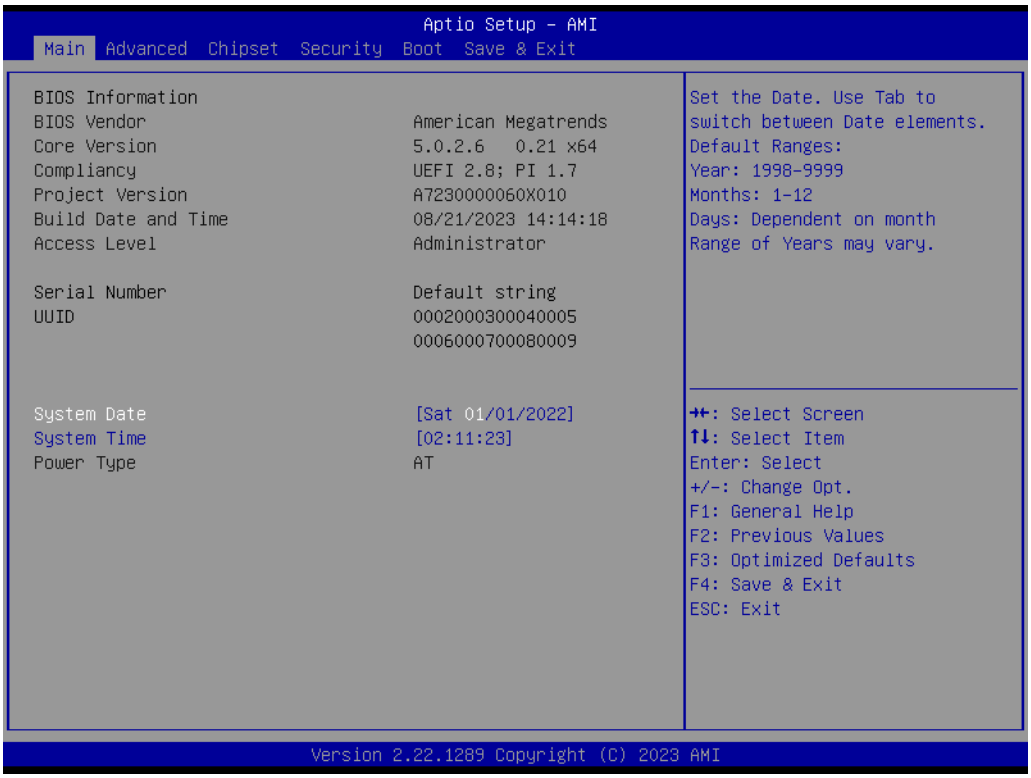


Figure 3.1 Main setup screen

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

3.2 Entering BIOS Setup

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

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

The key legend above 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.

3.2.1 Main Menu

When users first enter the BIOS Setup Utility, they enter the Main setup screen. Users can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options described in this section. The Main BIOS Setup screen is shown below.

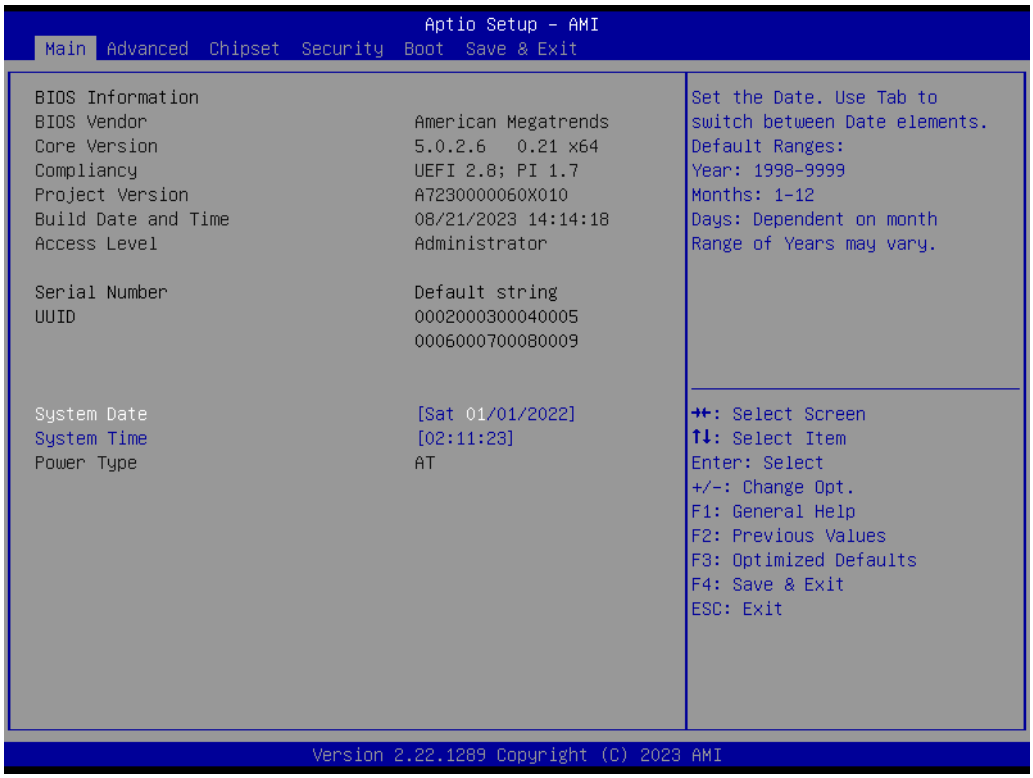


Figure 3.2 Main setup screen

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 key legend.

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

- **System time / System date**

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

- **Serial Number**
  The information is acquired from DMI table "Base Board (Type 2)" of the main board product. "Default string" is shown if no serial number is recorded on DMI table.
- **UUID**
  The information is acquired from DMI table "UUID" of the main board product. "Default string" is shown if no UUID is recorded on DMI table.

3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the AIMB-723 setup screen to enter the Advanced BIOS setup screen. You can select any of the items in the left frame of the screen, such as CPU configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.

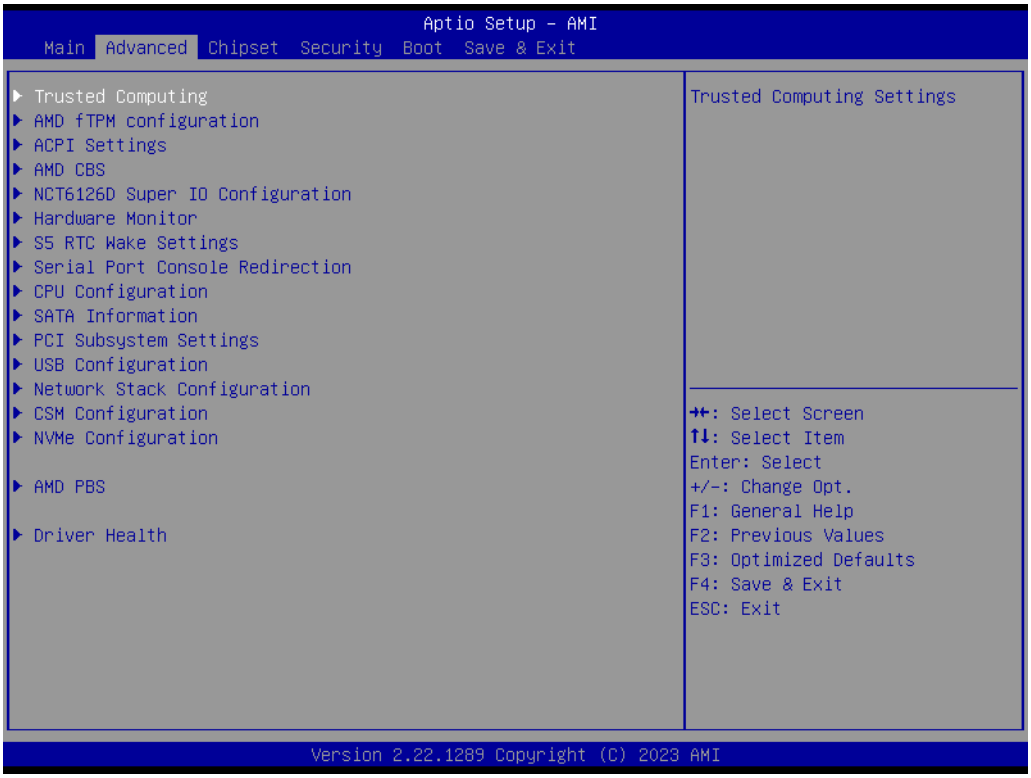


Figure 3.3 Advanced BIOS features setup screen

3.2.2.1 Trusted Computing

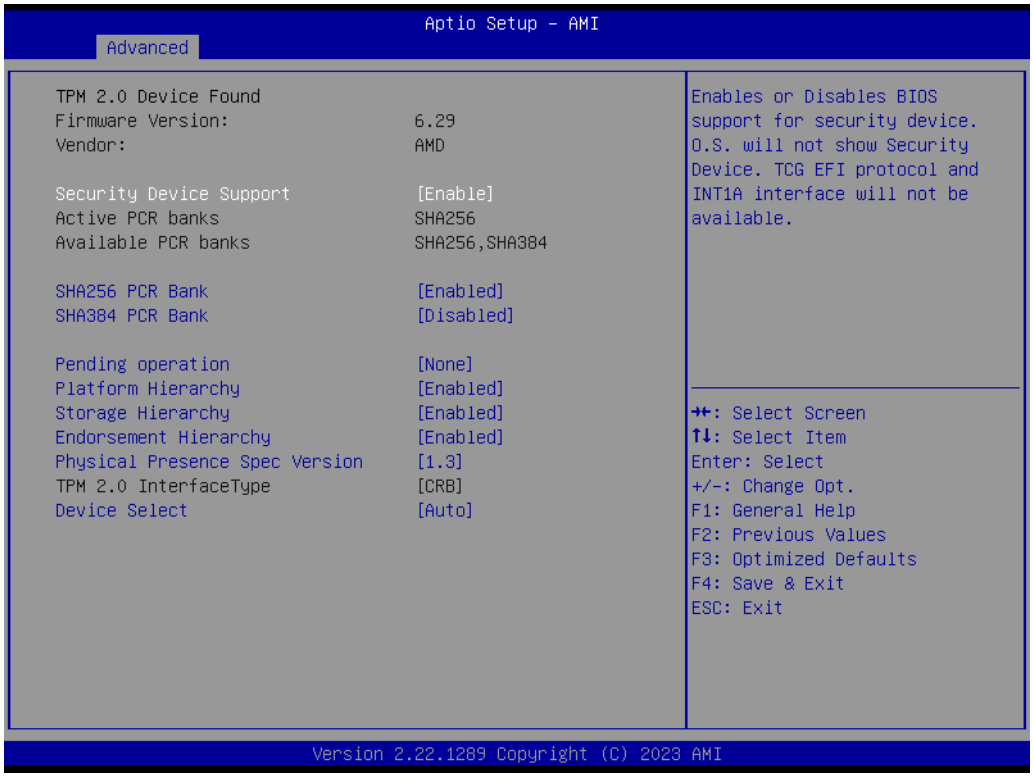


Figure 3.4 Trusted Computing

- **Security Device Support**
  Enable of Disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available. You can purchase an Advantech-designed dTPM 2.0 module to enable TPM function. P/N: PCA-TPMSPI-00A1.
- **SHA256 PCR Bank**
  Enable or Disable SHA256 PCR Bank.
- **SHA384 PCR Bank**
  Enable or Disable SHA384 PCR Bank.
- **Pending operation**
  Schedule and Operation for the Security Device. BOTE: Your Computer will reboot during restart in order to change State of Security Device.
- **Platform Hierarchy**
  Enable or Disable Platform Hierarchy.
- **Storage Hierarchy**
  Enable or Disable Storage Hierarchy.
- **Endorsement Hierarchy**
  Enable or Disable Endorsement Hierarchy.
- **Physical Presence Spec Version**
  Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note. Some HCK tests might not support 1.3.
- **Device Select**
  Select between TPM 1.2 and TPM 2.0 devices or Auto.

3.2.2.2 AMD fTPM Configuration

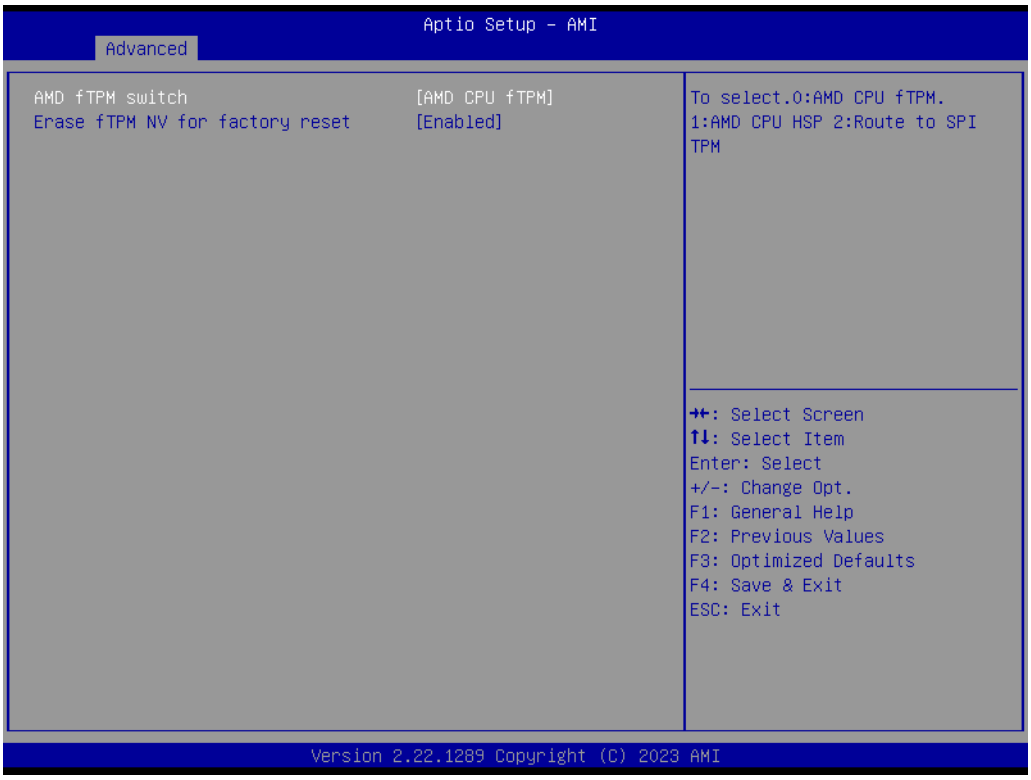


Figure 3.5 AMD fTPM Configuration

- **AMD fTPM switch**
  Select AMD CPU fTPM or AMD CPU HSP or SPI TPM.
- **Erase fTPM NV for factory reset**
  Select Enabled to rest fTPM or Disabled to keep previous fTPM record.

3.2.2.3 ACPI Settings

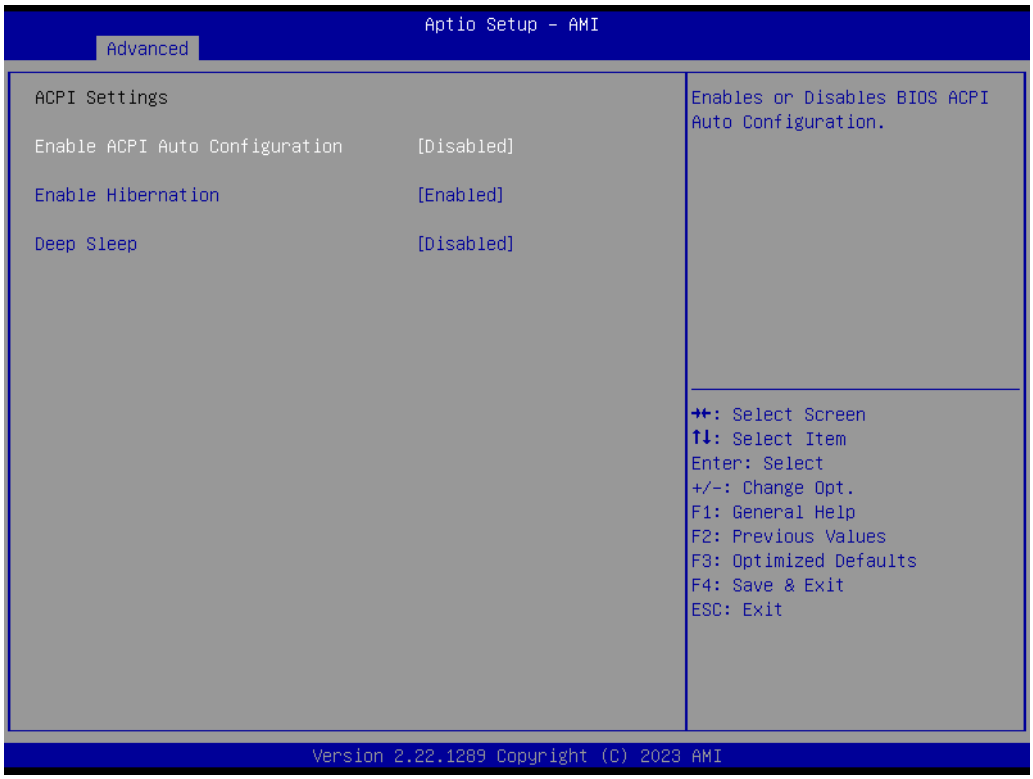


Figure 3.6 ACPI Settings

- **Enable ACPI Auto Configuration**
  "Enable or Disable" ACPI auto configuration.
- **Enable Hibernation**
  "Enable or Disable" Hibernation (OS/S4 Sleep State). This option may not be applied in some OS.
- **Deep Sleep**
  Select "Disabled" or "Enable (S4+S5)" or "Enable (S5 only)" sleep mode.
  Enable this function to cut off the power of peripherals in sleep state. Please enable this function to comply with EU ErP (Energy-related Product) regulations if required. If "Enable (S5 only)" is chosen, only power button can turn on system (fast startup must be disabled under OS)

3.2.2.4 AMD CBS

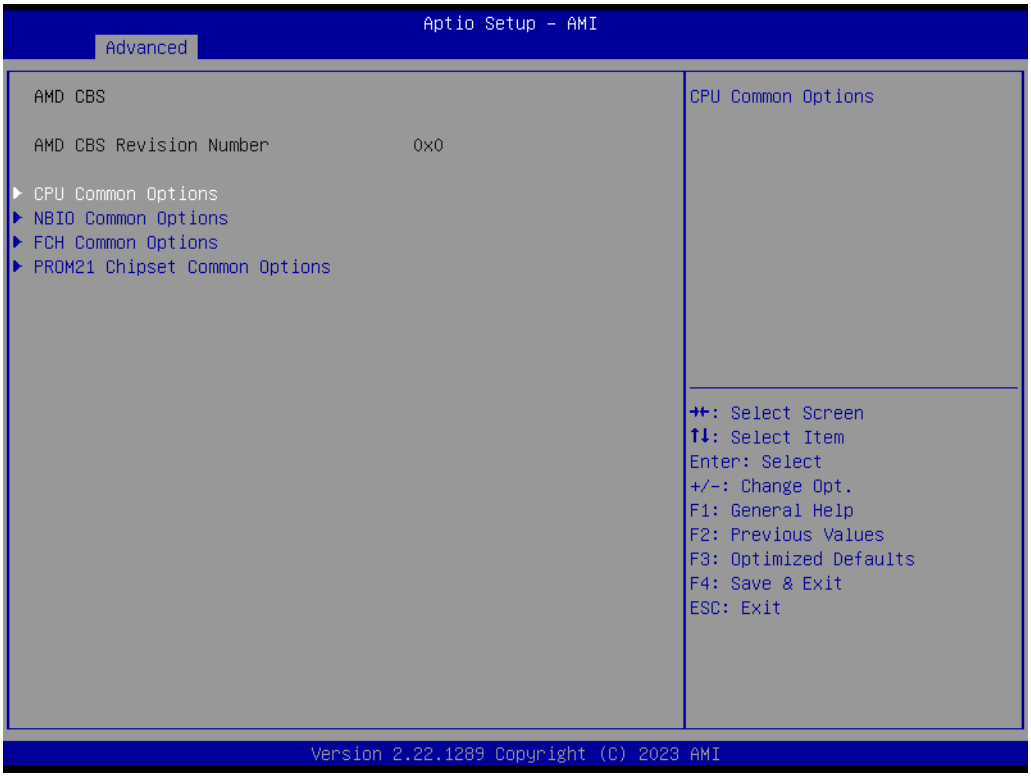


Figure 3.7 AMD CBS

- **CPU Common Options**

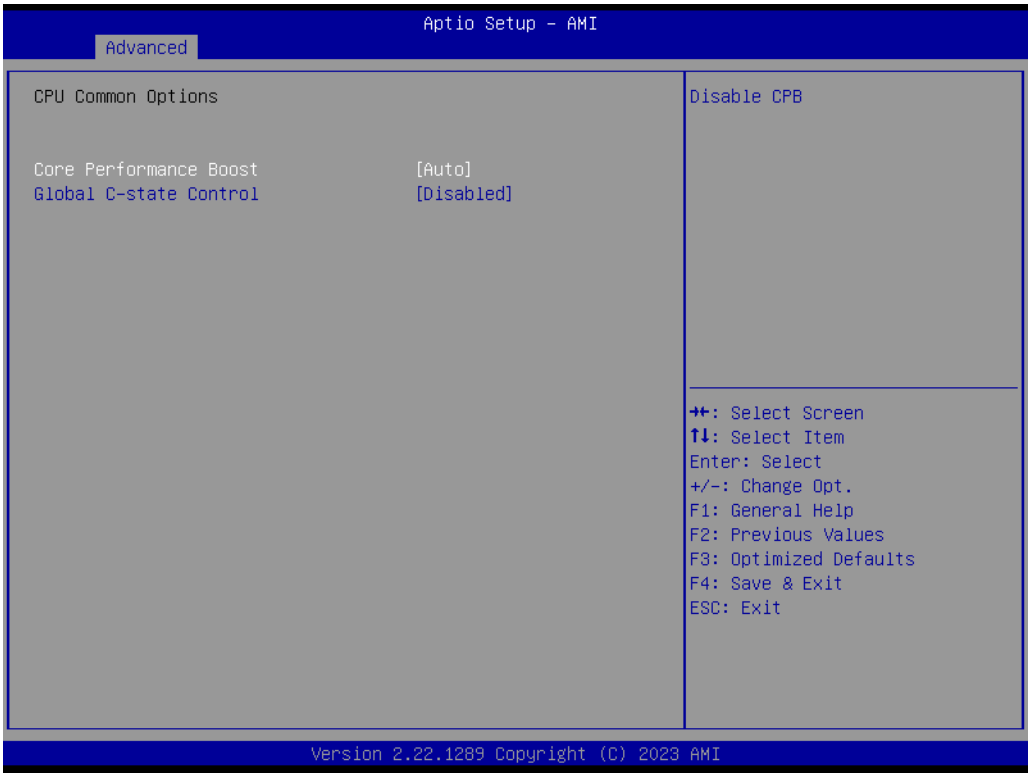


Figure 3.8 CPU Common Options

NBIO Common Options

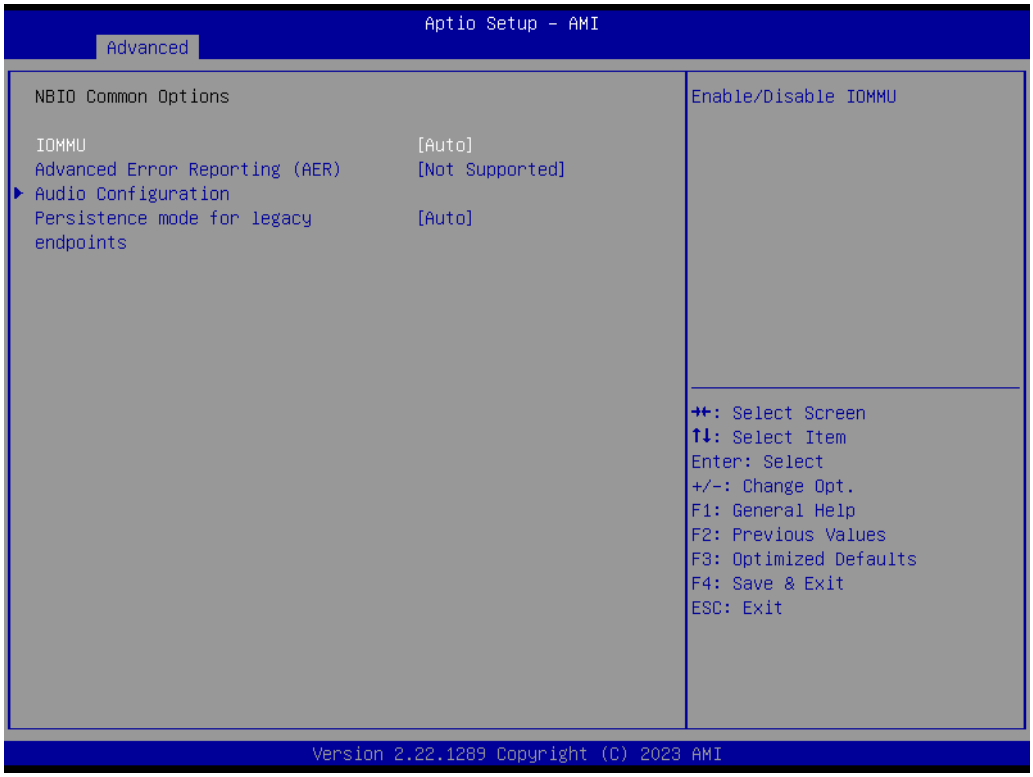


Figure 3.9 NBIO Common Options

- **IOMMU**
  Set between Enable, Disable, or Auto IOMMU.
- **Audio Configuration**
  “Enable or Disable” HD Audio controller.
- **Persistence mode for legacy endpoints**
  "Enable or Disable" Persistence mode for legacy endpoints.

FCH Common Options

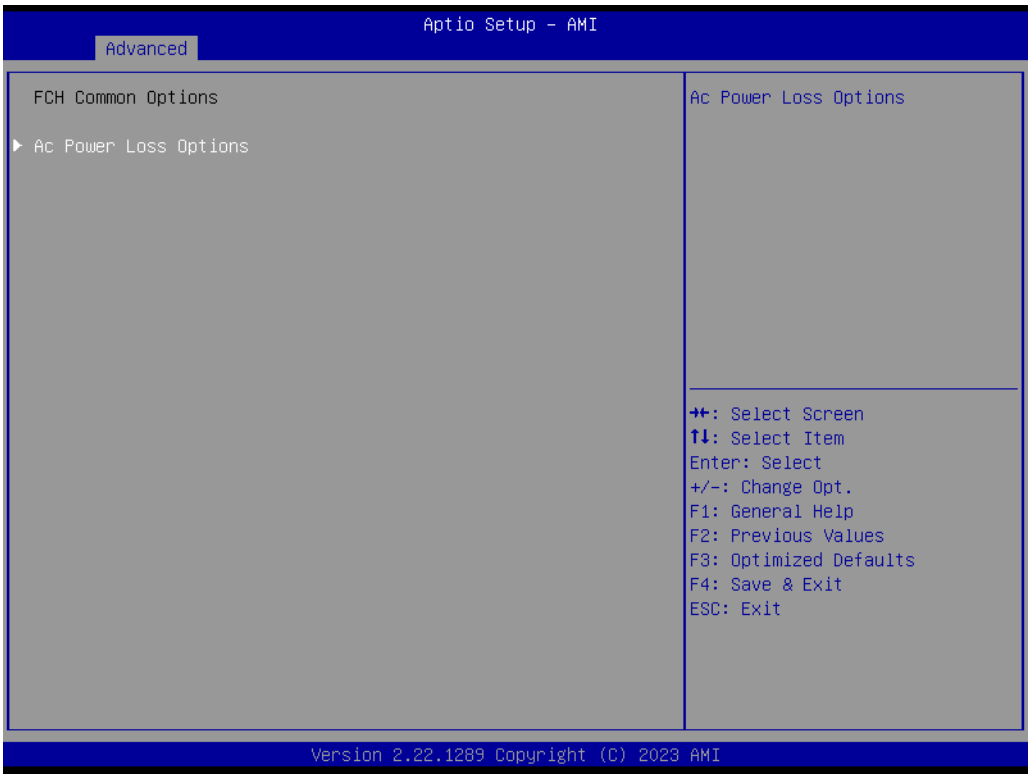


Figure 3.10 FCH Common Options

Ac Power Loss Options

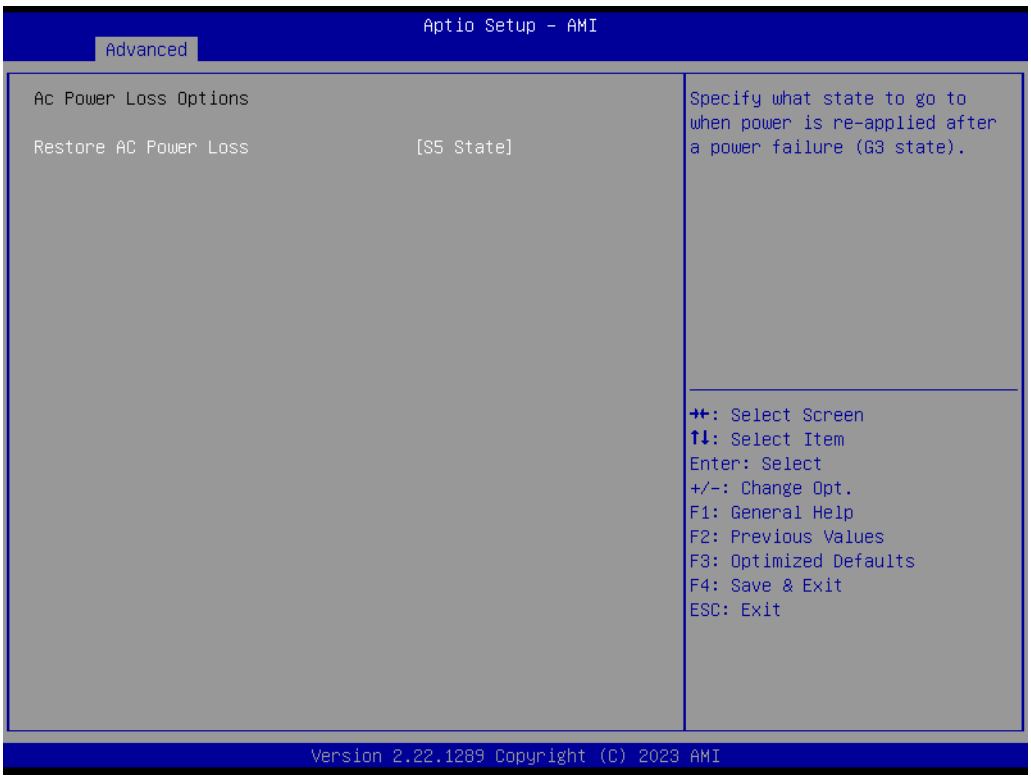


Figure 3.11 Ac Power Loss Options

- **Restore AC Power Loss**
  Specify what state to go to when power is re-applied after a power failure (G3 state).

PTT Configuration

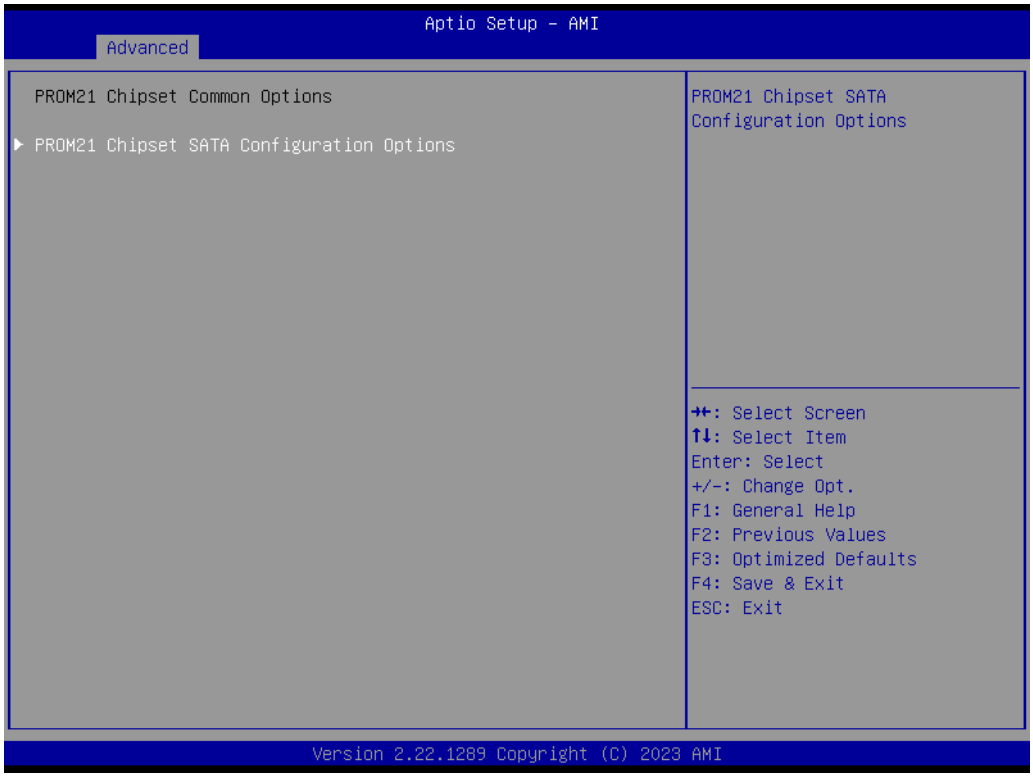


Figure 3.12 PROM21 Chipset Common Options

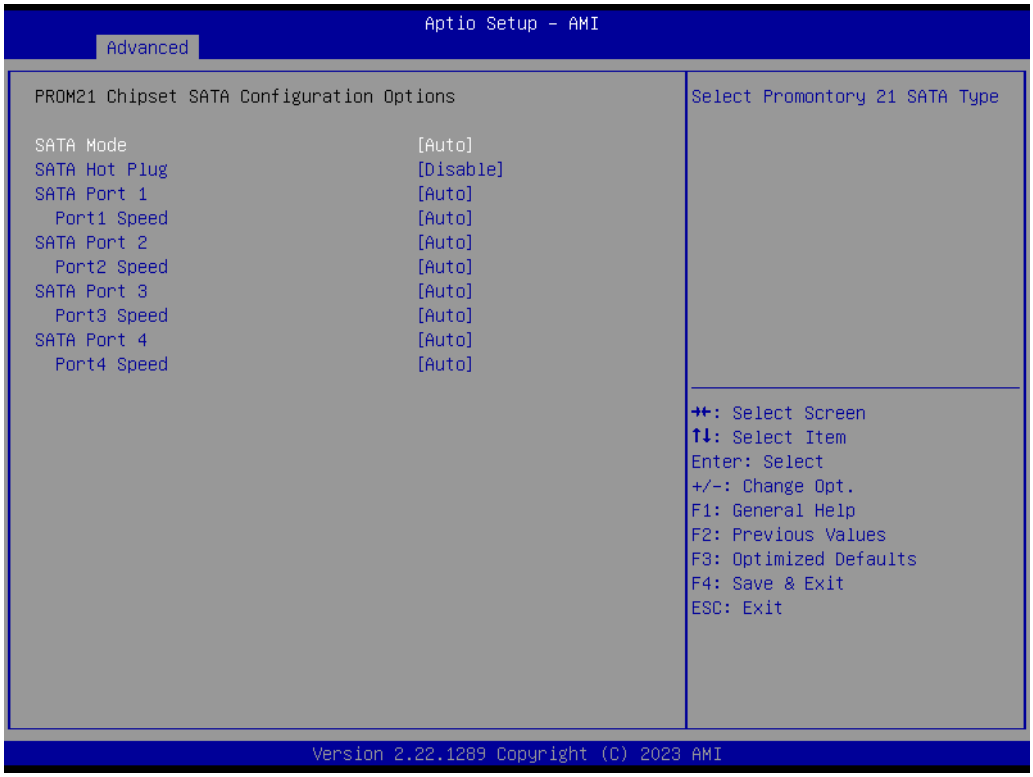


Figure 3.13 PROM21 Chipset SATA Configuration Options

- **SATA mode**
  Select SATA mode AHCI, RAID, or AUTO.
- **SATA Hot Plug**
  Enable or Disable SATA Hot Plug.

– **SATA Port 1**
  Enable or Disable SATA port 1
– **Port1 Speed**
  Select SATA port speed.

3.2.2.5 NCT6126D Super IO Configuration

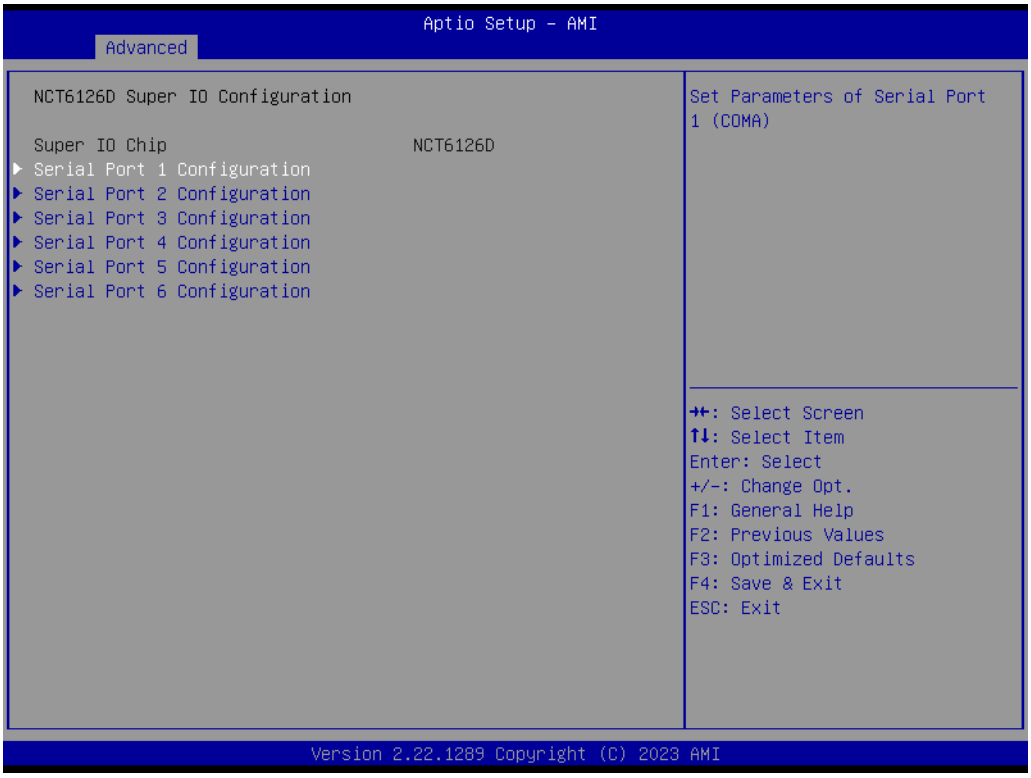


Figure 3.14 NCT6126D Super IO Configuration

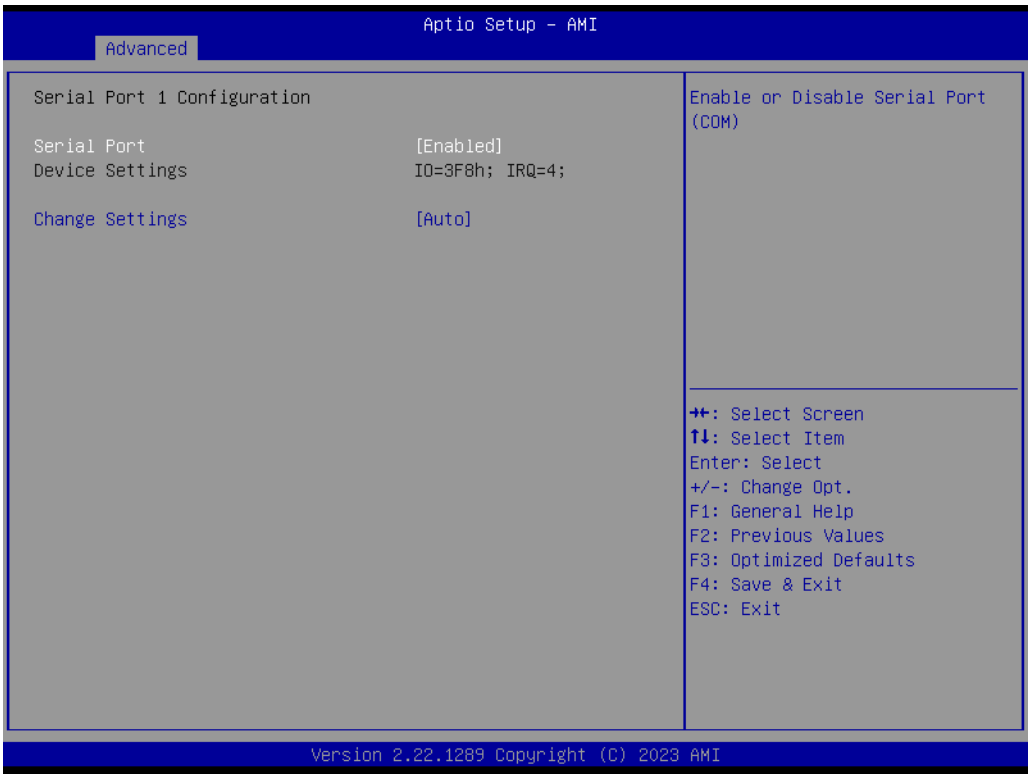


Figure 3.15 Serial Port 1 Configuration

- **Serial Port 1 Configuration**
  - **Serial Port**
    "Enable or Disable" Serial Port 1.
  - **Change Settings**
    Select an optimal setting for serial port 1.
- **Serial Port 2 Configuration**
  - **Serial Port**
    "Enable or Disable" Serial Port 2.
  - **Change Settings**
    Select an optimal setting for serial port 2.

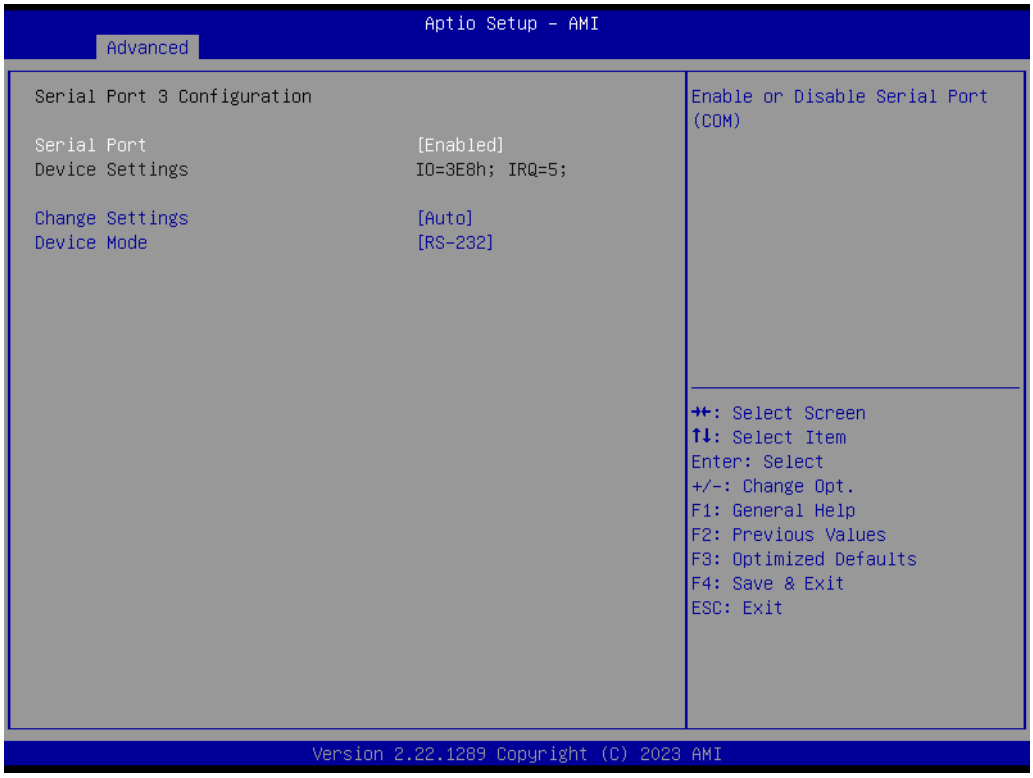


Figure 3.16 Serial Port 3 Configuration

- **Serial Port 3 Configuration**
  - **Serial Port**
    "Enable or Disable" serial port 3.
  - **Change Settings**
    Select an optimal setting for serial port 3.
  - **Device Mode**
    When serial port 3 (connector COM3) is set to RS-232, RS-422, or RS-485 via jumper JSETCOM3, this BIOS item should be selected as its corresponding one, "RS-232" or "RS-422 (Full Duplex)" or "RS-485 (Half Duplex)". Default for this Device Mode is "RS-232".

3.2.2.6 Hardware Monitor

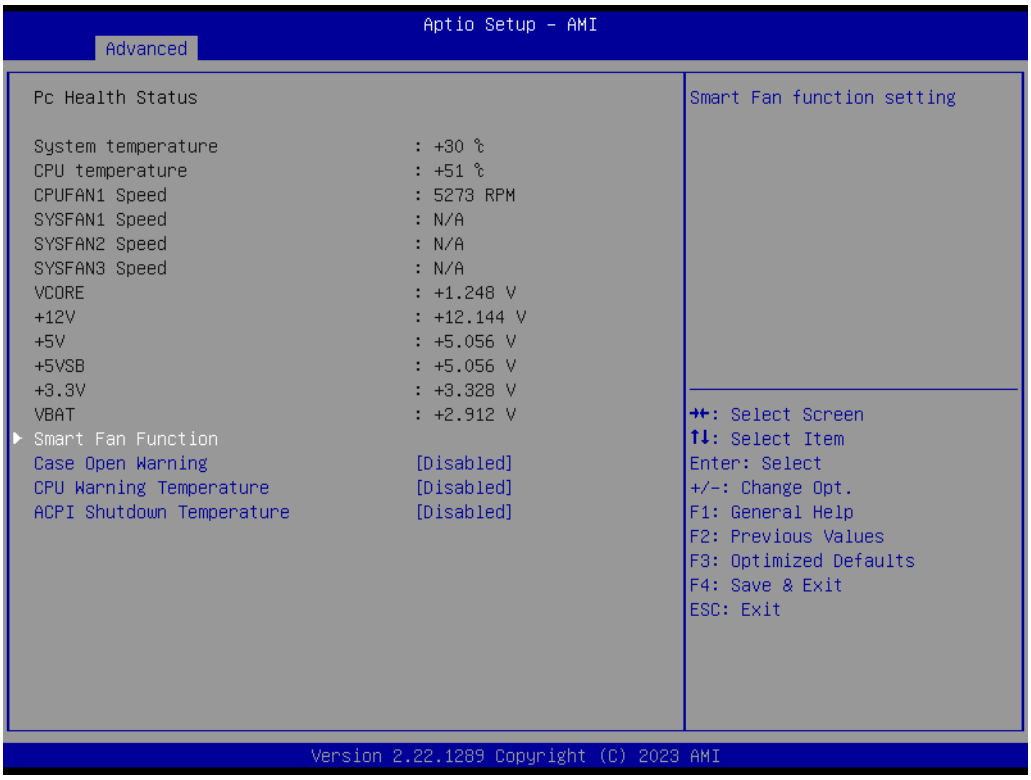


Figure 3.17 Hardware Monitor

Figure 3.18 Smart Fan Function

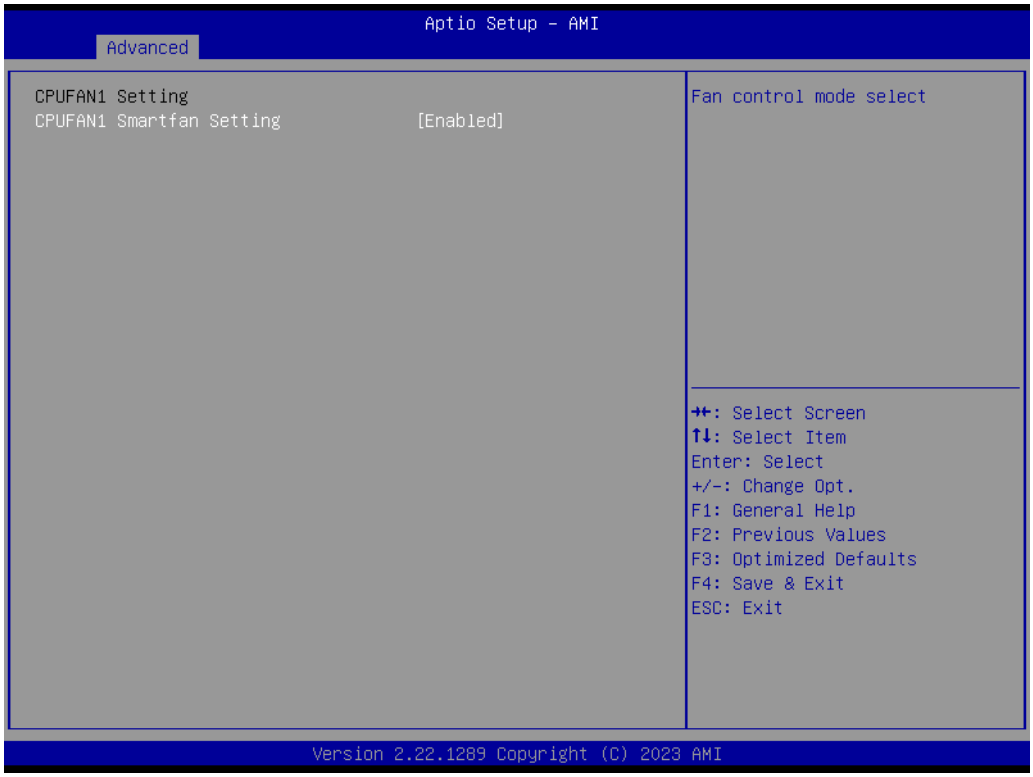


Figure 3.19 CPUFAN1 Setting

- **Smart Fan Function**
  - **CPUFAN1 Setting**
    "Enable or Disable" SYSFAN1 control mode to Smartfan Setting.
  - **SYSFAN1 Setting**
    "Enable or Disable" CPUFAN1 control mode to Smartfan Setting.
  - **SYSFAN2 Setting**
    "Enable or Disable" SYSFAN2 control mode to Smartfan Setting.
  - **SYSFAN3 Setting**
    "Enable or Disable" SYSFAN3 control mode to Smartfan Setting.
- **Case Open Warning**
  "Enable or Disable" the Chassis Intrusion monitoring function. When it is enabled and the case is opened, the speaker beeps.
- **CPU Warning Temperature**
  Use this item to set the CPU warning temperature. When the system reaches the warning temperature, the speaker will beep.
- **ACPI Shutdown Temperature**
  Use this item to set the ACPI shutdown temperature. When the system reaches the shutdown temperature, it will be automatically shut down by ACPI OS to protect the system from overheat damage.

3.2.2.7 S5 RTC Wake Settings

Figure 3.20 S5 RTC Wake Settings

- **Wake system with Fixed Time**
  "Enable or Disable" System wake on alarm event. The system will wake on the hr:min:sec as specified..

3.2.2.8 Serial Port Console Redirection

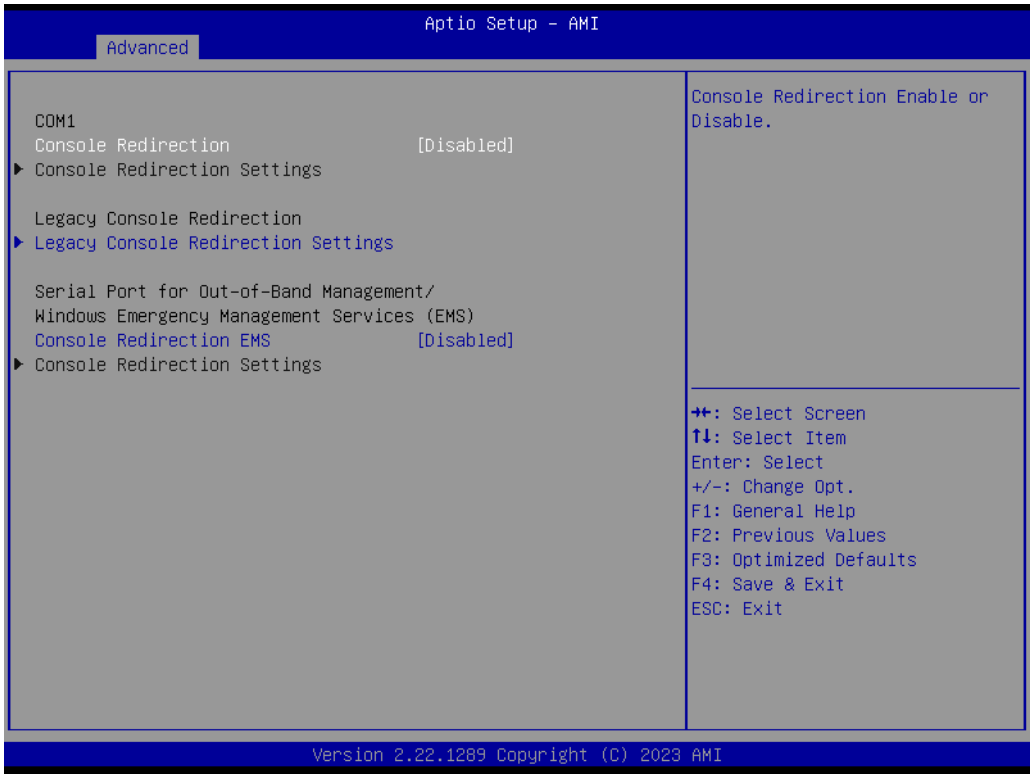


Figure 3.21 Serial Port Console Redirection

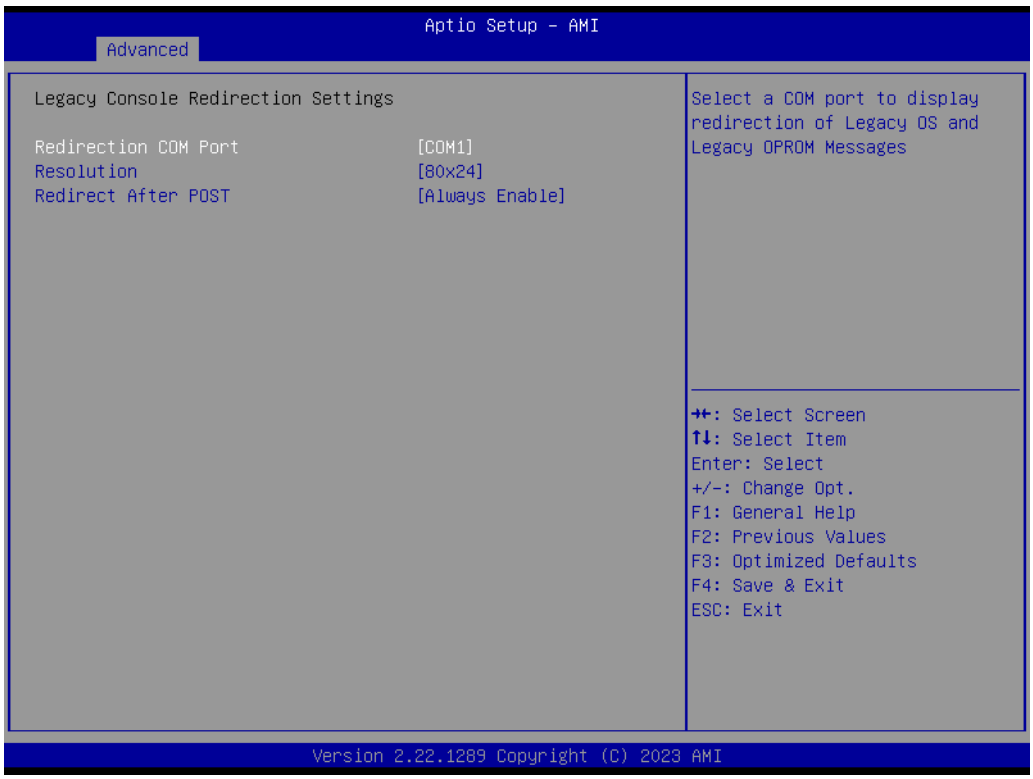


Figure 3.22 Legacy Console Redirection Settings

- **COM1**
  - **Console Redirection Settings**
    Console Redirection “Enable or Disable”.?

- **Legacy Console Redirection**
  - **Legacy Console Redirection Settings**
    Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.
- **Serial Port for Out-of-Band Management/ Windows Emergency Management services (EMS)**
  - **Console Redirection Settings**
    Console Redirection “Enable or Disable”.

3.2.2.9 CPU Configuration

Figure 3.23 CPU Configuration

- **Node 0 Information**
  View Memory Information related to Node 0.

3.2.2.10 SATA Information

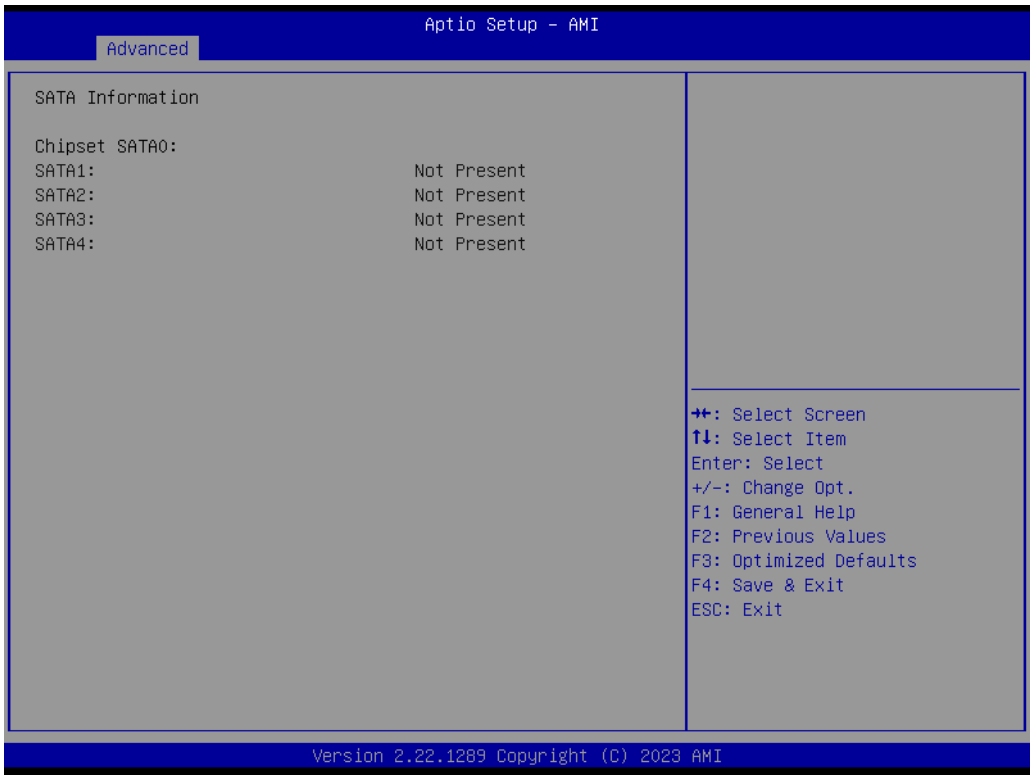


Figure 3.24 SATA Information

3.2.2.11 PCI Subsystem Settings

Figure 3.25 PCI Subsystem Settings

- **Above 4G Decoding**
  Globally Enable or Disable 64bit capable devices to be decoded in above 4G address space (Only if System supports 64 bit PCI decoding) .
- **Re-Size BAR Support**
  If system has Resizable BAR capable PCIe Devices, this option Enables or Disables Re-Size BAR Support.

3.2.2.12 USB Configuration

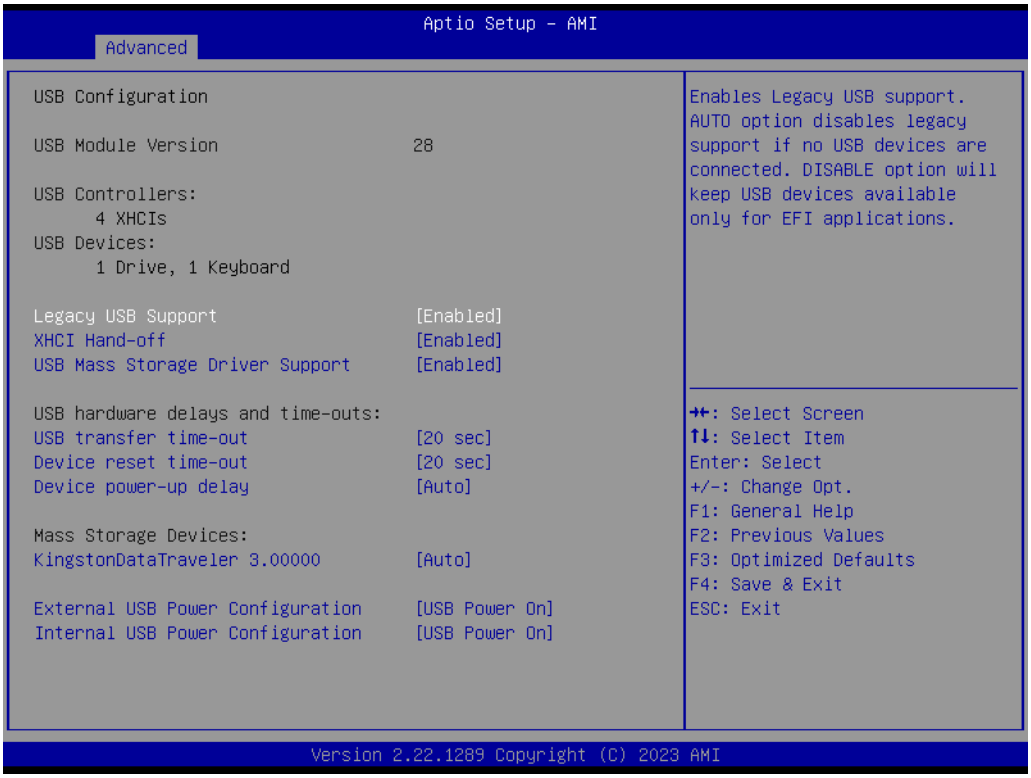


Figure 3.26 USB Configuration

- **Legacy USB Support**
  This supports USB device under legacy OS such as DOS. When choosing "AUTO", the system will automatically detect if any USB device is plugged into the computer and enable USB legacy mode when a USB device is plugged in and disable USB legacy mode when no USB device is plugged in.
- **XHCI Hand-off**
  This is a workaround for OS without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
- **USB Mass Storage Driver Support**
  “Enable or Disable” USB Mass Storage driver support.
- **USB transfer time-out**
  Allows you to select the USB transfer time-out value. [1,5,10,20sec]
- **Device reset time-out**
  Allows you to select the USB device reset time-out value. [10,20,30,40sec]
- **Device power-up delay**
  Maximum time the device will take before it properly reports itself to the Host Controller. "Auto" uses default value: for a Root port it is 100 ms, for a Hub port the delay is take from Hub descriptor.

- **External USB Power Configuration**
  Disable or Enable External USB port power under S3,S4,S5 state.
- **Internal USB Power Configuration**
  Disable or Enable Internal USB port power under S3,S4,S5 state.

3.2.2.13 Network Stack Configuration

Figure 3.27 Network Stack Configuration

- **Network Stack**
  "Enable or Disable" UEFI Network Stack.

3.2.2.14 CSM Configuration

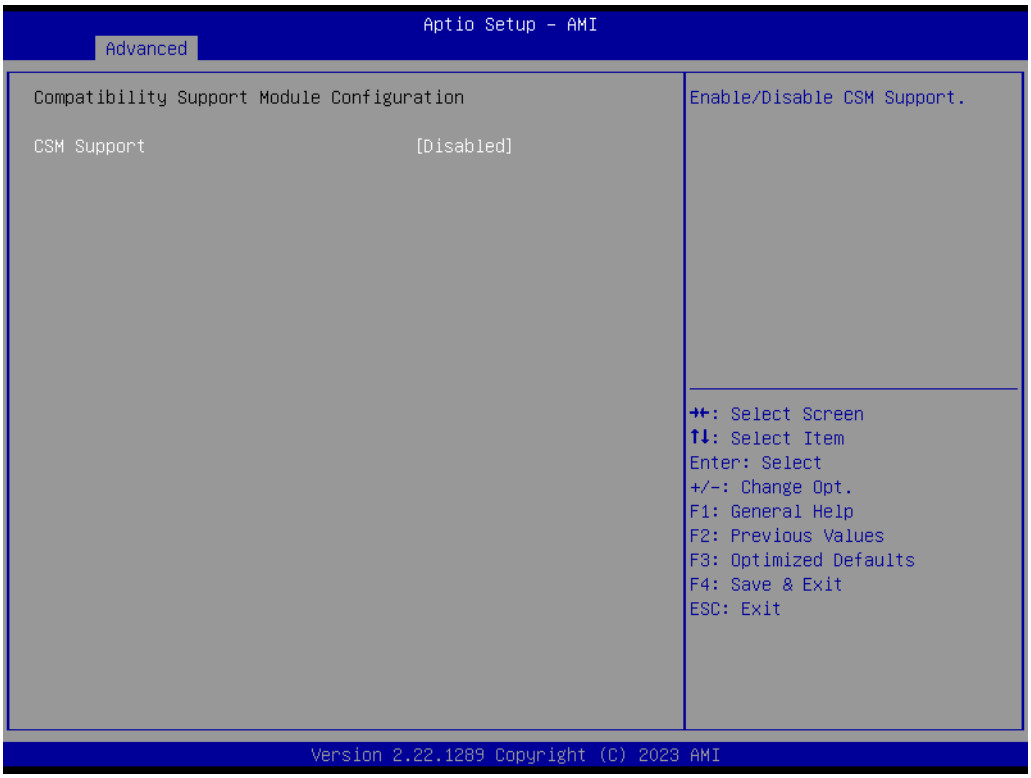


Figure 3.28 CSM Configuration

- **CSM Support**

  "Enable or Disable" CSM Support. The default setting is "Disabled". If your graphics card does not support UEFI mode, make sure to select "Enabled" to allow non-UEFI boot mode before installing the graphics card to turn on the computer.

3.2.2.15 NVMe Configuration

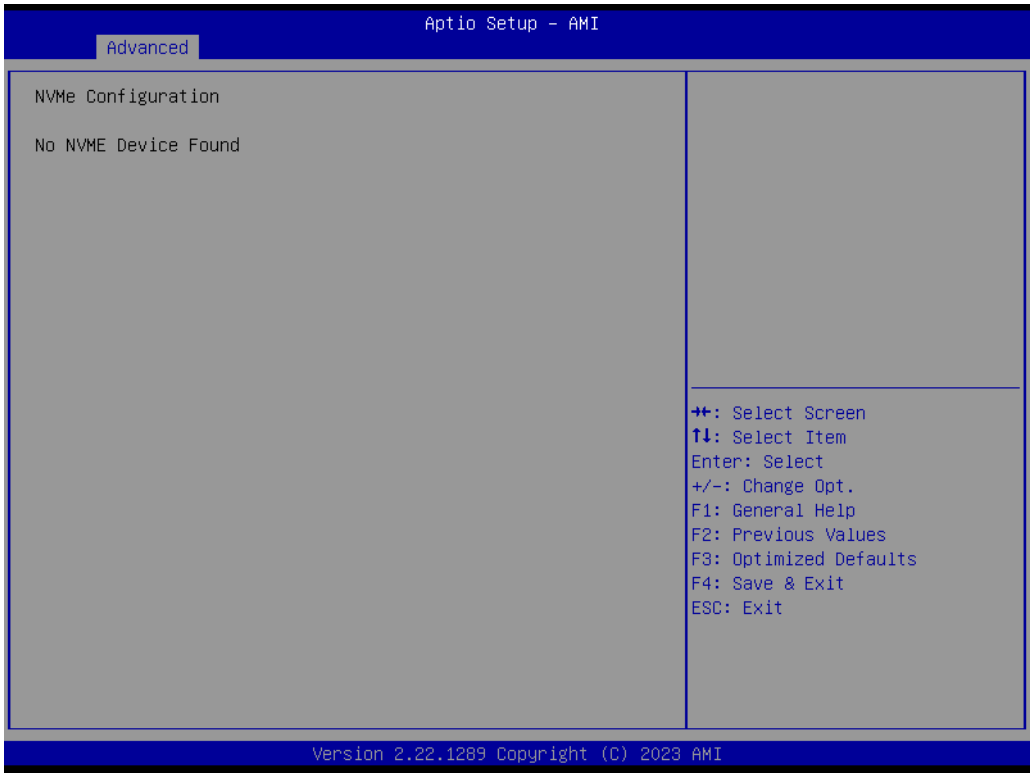


Figure 3.29 NVMe Configuration

3.2.2.16 AMD PBS

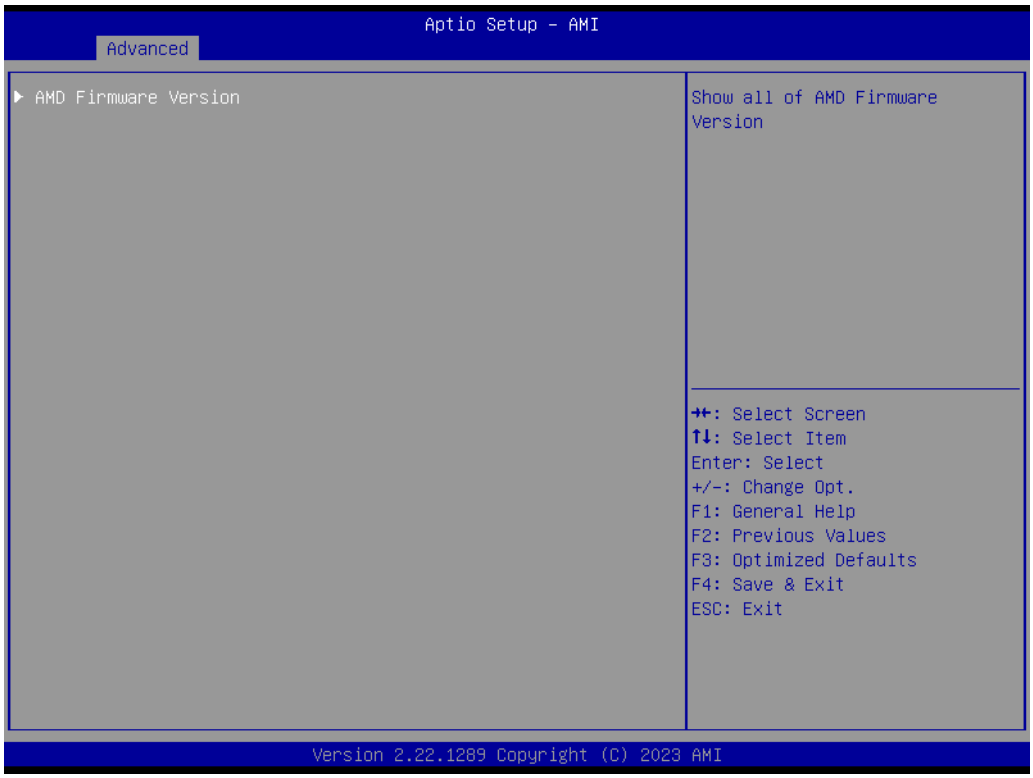


Figure 3.30 AMD PBS

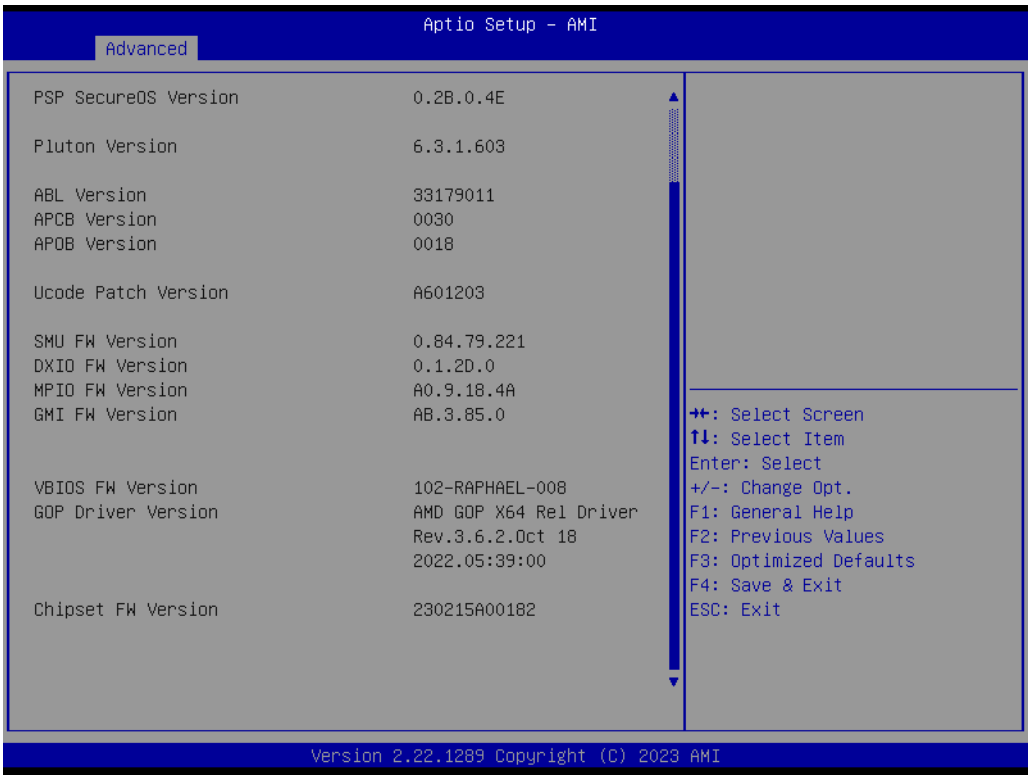


Figure 3.31 AMD Firmware Version

3.2.2.17 Driver Health

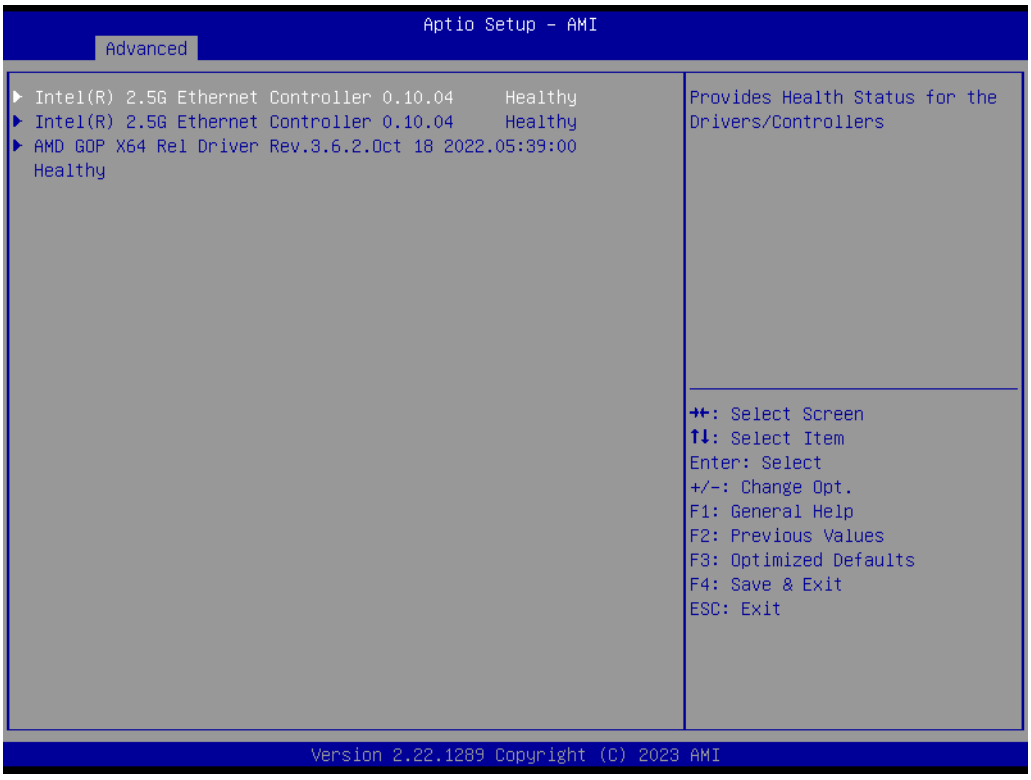


Figure 3.32 Driver Health

3.2.3 Chipset

Figure 3.33 Chipset

This page provides information on the AIMB-723 chipset.

3.2.3.1 South Bridge

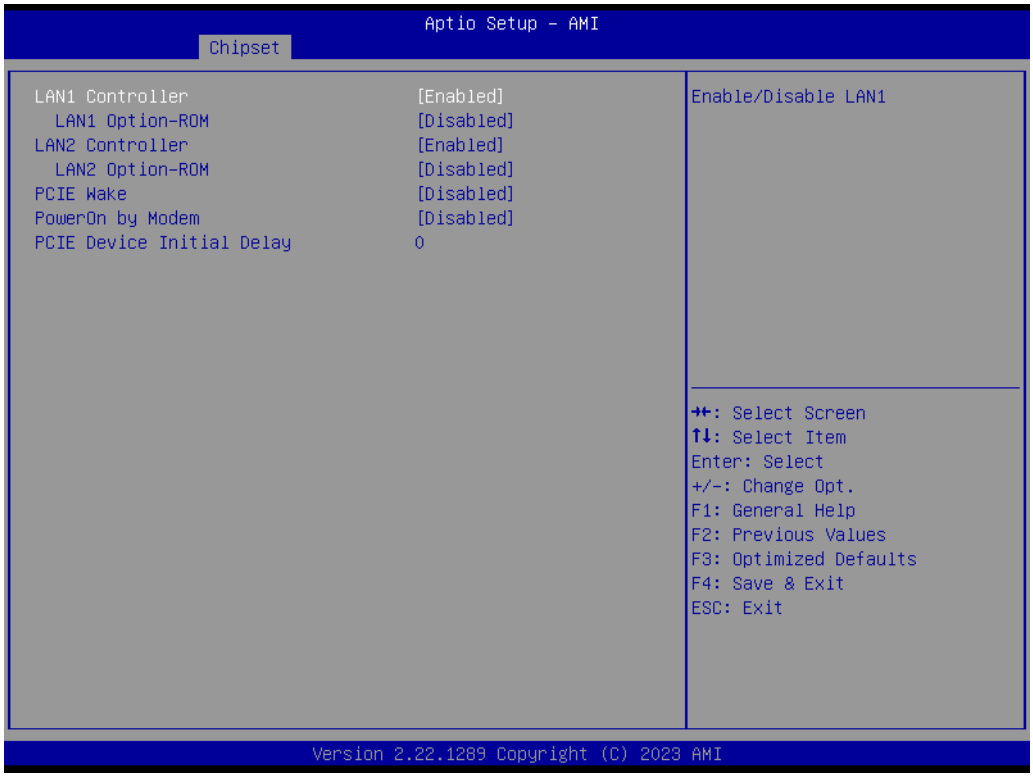


Figure 3.34 South Bridge

- **LAN1 Controller**
  Enable or Disable LAN1
- **LAN1 Option-ROM**
  Enable or Disable Boot Option ROM Network Devices.
- **PCIE Wake**
  Enable or Disable PCIE to wake the system from S5.
- **PowerOn by Modem**
  Enable or Disable PowerOn by Modem
- **PCIE Device Initial Delay**
  Set PCIE device initial delay from 0~30 seconds.

3.2.3.2 North Bridge

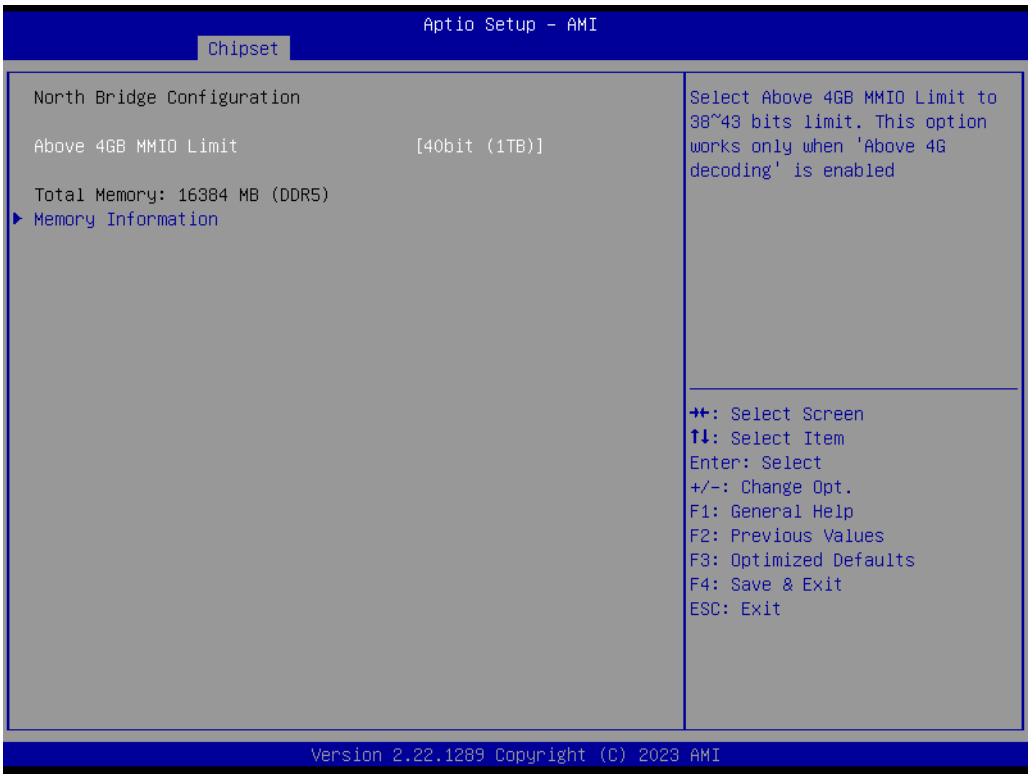


Figure 3.35 North Bridge

- **Above 4GB MMIO Limit**
  Select Above 4GB MMIO Limit to 38~42 bits limit. This option works only when 'Above 4G decoding' is enabled.

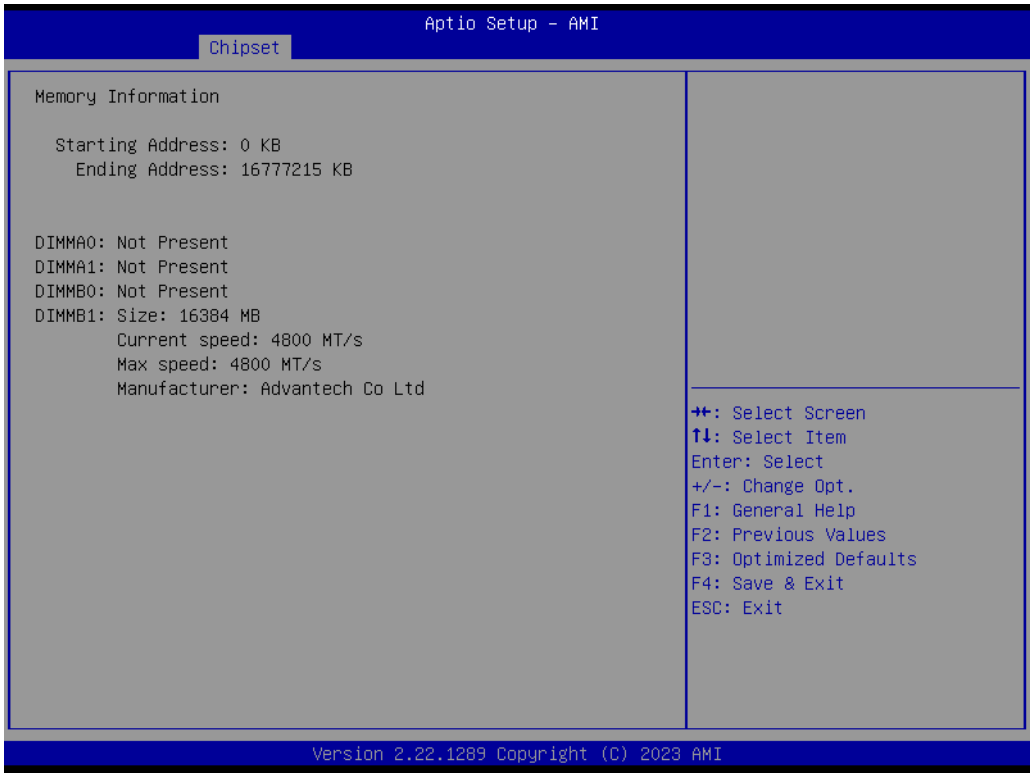


Figure 3.36 Memory Information

3.2.4 Security

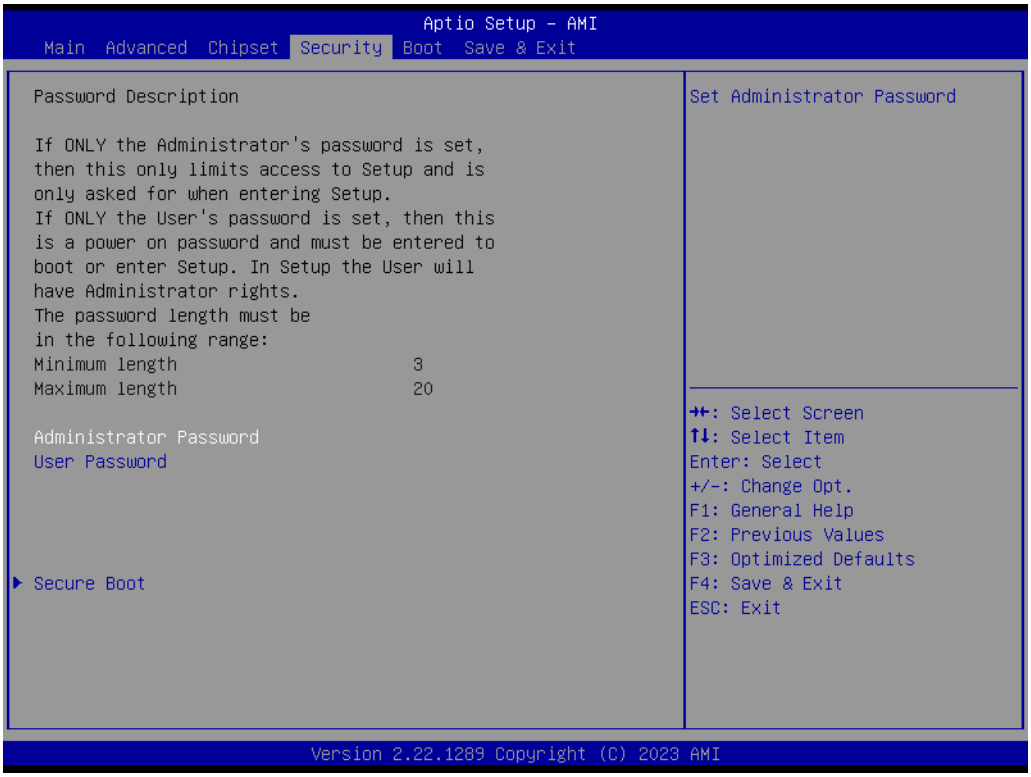


Figure 3.37 Security

Select Security Setup from the AIMB-723 BIOS setup menu. All Security Setup options, such as password protection and Secure Boot, are displayed in this section.

Note! *If only one user password is set, the user will have Administrator rights. Setting an administrator password is strongly recommended if you have security concerns.*

3.2.5 Boot

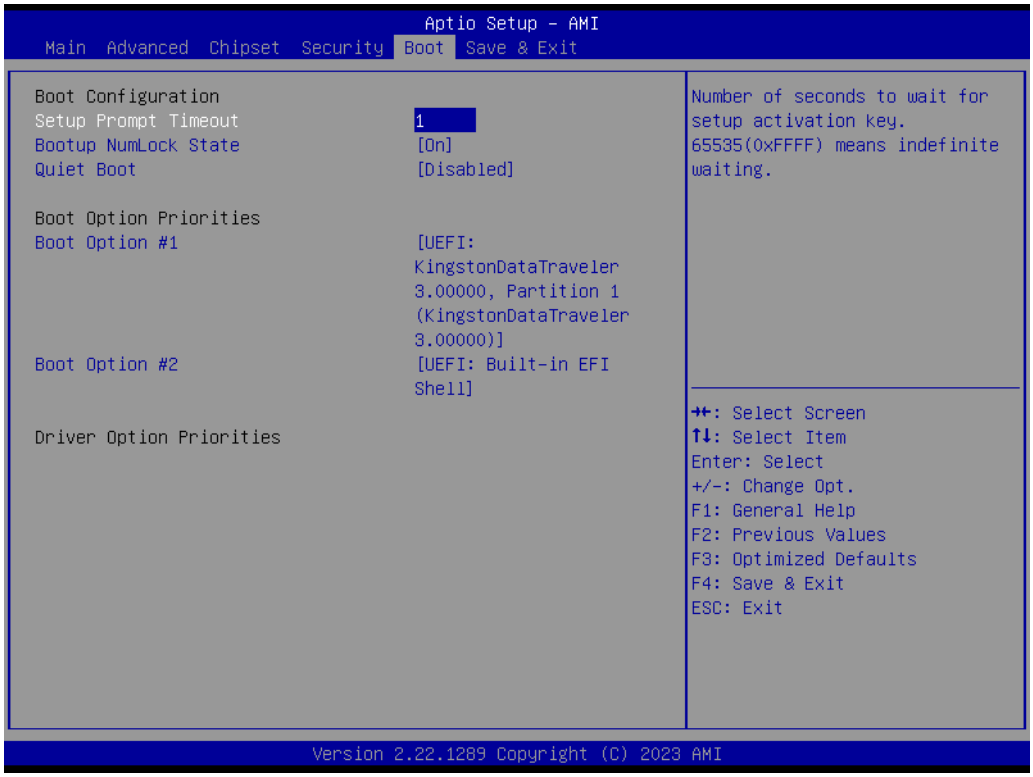


Figure 3.38 Boot

- **Setup Prompt Timeout**
  Directly key in the number, or use the <+> and <-> keys to adjust the number of seconds to wait for setup activation key.
- **Bootup NumLock State**
  Default state for the NumLock key during power on.
- **Quiet Boot**
  "Enable or Disable" Quiet Boot option. When enabled, BIOS logo will show in place of POST screen.
- **Boot Option Priorities**
  Set the boot order.

3.2.6 Save & Exit

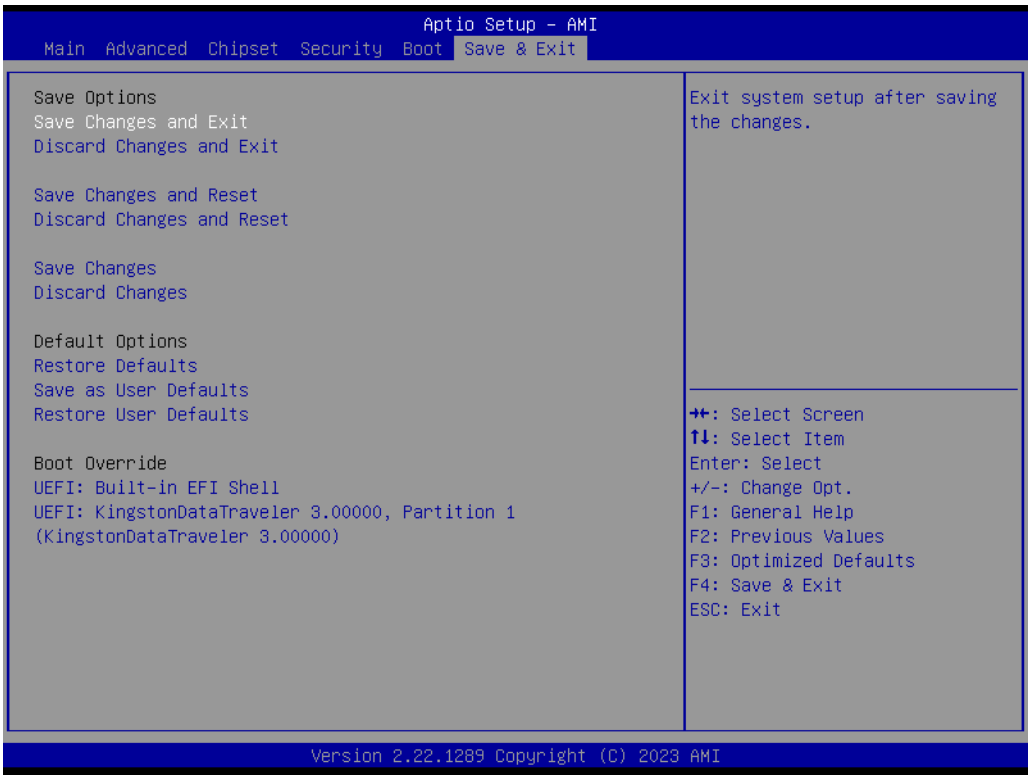


Figure 3.39 Save & Exit

Save Changes and Exit

When you complete system configuration, select this option to save your changes, exit BIOS setup and reboot the computer so the new system configuration parameters can take effect.

1. Select Exit Saving Changes from the Exit menu and press <Enter>. The following message appears:

   Save Configuration Changes and Exit Now?

   [Yes] [No]

2. Select Yes or No.

Discard changes and exit

Select this option to quit Setup without making any permanent changes to the system configuration.

1. Select Exit Discarding Changes from the Exit menu and press <Enter>. The following message appears:

   Quit without saving?

   [Yes] [No]

2. Select Yes to discard changes and exit.

Discard Changes

Select Discard Changes from the Exit menu and press <Enter>.

Chapter 4

Chipset Software Installation Utility

4.1 Before you begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the AIMB-723 are located on Advantech support website (http://www.advantech.com/support). Updates are provided via Service Packs from Microsoft.

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in 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.

Note! *For system stability, installing the drivers in the following sequence is highly recommended:*

- *Chipset*
- *Graphics*
- *Other drivers*

4.2 Introduction

The AMD Ryzen Chipset Drivers 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
- 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 10 (64-bit)*

4.3 Windows Driver Setup

Enter the Advantech support website, then search product AIMB-723. You can see "Chipset" driver inside.

Chapter 5

Integrated Graphic Device Setup

5.1 Introduction

The AMD Ryzen processors are embedded with integrated graphics controllers. You need to install the VGA driver to enable their function. The VGA driver provides graphics, computing, media, and display capabilities.

5.2 Windows Driver Setup

Note! *Before installing this driver, make sure the INF driver has been installed in your system. See Chapter 4 for information on installing the INF driver.*

Go to the Advantech support website and search for AIMB-723. You can find the "Graphics" drivers inside.

Chapter 6

LAN Configuration

6.1 Introduction

The AIMB-723 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel® I226-V), eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 2500 Mbps.

6.2 Features

- 10/100/1000/2500Base-T Ethernet controller
- Full duplex at 10, 100, 1000, or 2500 Mbps and half duplex at 10 or 100 Mbps
- Wake-on-LAN (WOL) support
- PCIe x1 host interface

6.3 Installation

Note! *Before installing the LAN drivers, make sure the CSI utility have been installed on your system. See Chapter 4 for information on installing the CSI utility.*

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.

6.4 Windows Driver Setup

Go to the Advantech support website and search for AIMB-723. You can find "LAN" drivers inside.

Chapter 7

SATA RAID Setup

7.1 Introduction

To support demanding disk I/O, AMD B650 chipset integrates four serial ATA controllers with software RAID 0, 1, 10 capabilities.

RAID 0 striping increases storage performance and is designed to speed up data transfer rates for disk-intensive applications.

RAID 1 mirroring protects valuable data that might be lost in the event of a hard drive failure.

RAID 10 array uses four hard drives to create a combination of RAID levels 0 and 1. The data is striped across a two-drive array forming the RAID 0 component. Each of the drives in the RAID 0 array is then mirrored by a RAID 1 component.

7.2 SATA RAID Driver and Utility Setup

Go to the Advantech support website and search for AIMB-723. There you will see the "RAID_AHCI" folder containing the RAID driver.

Chapter 8

HD Audio

8.1 Introduction

AIMB-723 is equipped with a Realtek ALC888S Audio chip. It provides "Line-out" & "Microphone" ports for varying applications.

8.2 Installation

Go to the Advantech support website and search for the AIMB-723. You will find the "Audio" drivers inside.

Appendix A

Programming the Watchdog Timer

The AIMB-723's watchdog timer can be used to monitor system software operations 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 super I/O controller NCT6126D. It provides the following functions for user programming:

- Can be enabled and disabled via the user's program.
- The timer can be set from 1 to 255 seconds/minutes.
- 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 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. You must first write an address value into address port 2E (hex), and then write/read data to/from the assigned register through data port 2F (hex).

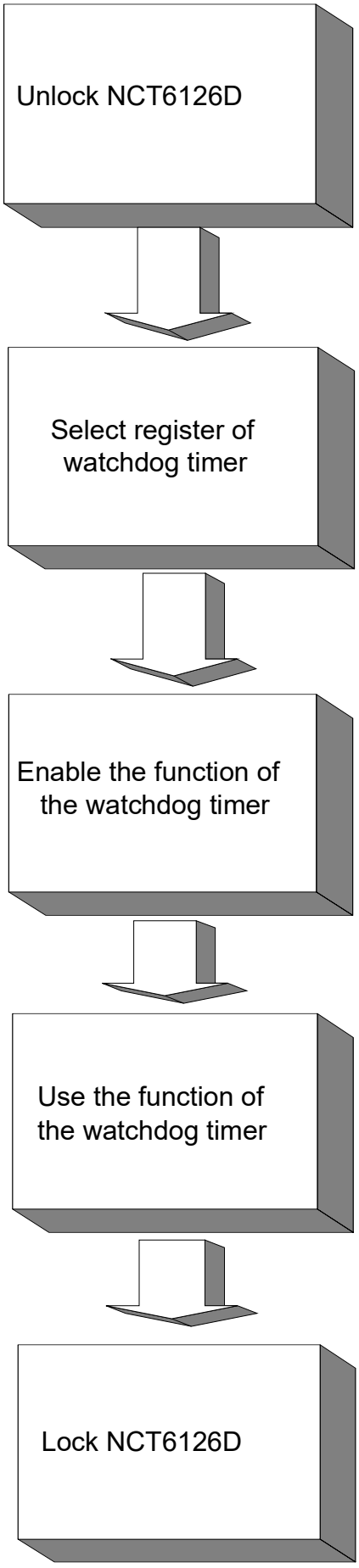

Unlock NCT6126D
Select register of watchdog timer
Enable the function of the watchdog timer
Use the function of the watchdog timer
Lock NCT6126D

Table A.1: Watchdog timer registers		
Address of register (2E)	Read/ Write	Value (2F) & description.
87 (hex)	-	Write this address to I/O address port 2E (hex) twice to unlock the NCT6126D.
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog timer. Enabled is set as default.
F0 (hex)	write	Set seconds or minutes as units for the timer. Write 0 to bit 3: set seconds as counting unit. [default]. Write 1 to bit 3: set minutes as counting unit.
F1 (hex)	write	0: stop timer [default] 01 ~ FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F0 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F2 (hex)	read/ write	Bit 6: Write 1 to enable keyboard to reset the timer, 0 to disable.[default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is “timeout”.
AA (hex)	-	Write this address to I/O port 2E (hex) to lock NCT6126D.

Appendix B

I/O Pin Assignments

B.1 LAN Port and USB 3.2 Port (LAN1_USB3C2, LAN2_USB3C3)

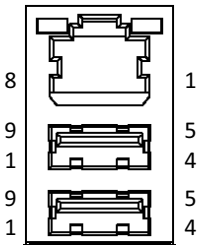


Table B.1: LAN Port (LAN1, LAN2)

Pin	Signal	Pin	Signal
1	DA+	5	DC+
2	DA-	6	DC-
3	DB+	7	DD+
4	DB-	8	DD-

Table B.2: USB 3.2 Port (USB3C2, USB3C3)

Pin	Signal
1	+5V
2	D-
3	D+
4	GND
5	STDA_SSRX−
6	STDA_SSRX+
7	Shield GND_DRAIN
8	STDA_SSTX−
9	STDA_SSTX+

B.2 USB 2.0 Port (USB2A1)

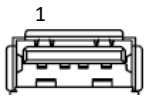


Table B.3: USB 2.0 Port (USB2A1)

Pin	Signal
1	+5V
2	D-
3	D+
4	GND

B.3 USB 3.2 Header (USB3H1)

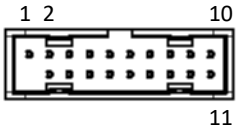


Table B.4: USB 3.2 Header (USB3H1)			
Pin	**Signal**	**Pin**	**Signal**
1	+5V	2	STDA_SSRX-
3	STDA_SSRX+	4	GND
5	STDA_SSTX-	6	STDA_SSTX+
7	GND	8	D-
9	D+	10	OC#
11	D+	12	D-
13	GND	14	STDA_SSTX+
15	STDA_SSTX-	16	GND
17	STDA_SSRX+	18	STDA_SSRX-
19	+5V		

B.4 USB 2.0 Header (USB2H1)

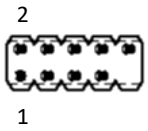


Table B.5: USB 2.0 Header (USB2H1)			
Pin	**Signal**	**Pin**	**Signal**
1	+5V	2	+5V
3	D-	4	D-
5	D+	6	D+
7	GND	8	GND
9	N/A	10	N/C

B.5 VGA Connector (VGA1)

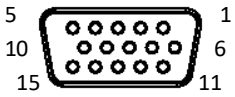


Table B.6: VGA Connector (VGA1)

Pin	Signal	Pin	Signal
1	RED	9	KEY/PWR
2	GREEN	10	GND
3	BLUE	11	ID0/RES
4	ID2/RES	12	ID1/SDA
5	GND	13	HSYNC
6	RED_RTN	14	VSYNC
7	GREEN_RTN	15	ID3/SCL
8	BLUE_RTN		

B.6 HDMI Connector (HDMI1)

Table B.7: HDMI Connector (HDMI1)

Pin	Signal	Pin	Signal
1	TMDS Data 2+	11	TMDS Clock Shield
2	TMDS Data 2 Shield	12	TMDS Clock-
3	TMDS Data 2-	13	CEC
4	TMDS Data 1+	14	N.C.
5	TMDS Data 1 Shield	15	SCL
6	TMDS Data 1-	16	SDA
7	TMDS Data 0+	17	DDC/CEC GND
8	TMDS Data 0 Shield	18	+5V Power
9	TMDS Data 0-	19	Hot Plug Detect
10	TMDS Clock+		

B.7 DisplayPort Connector (DP1)

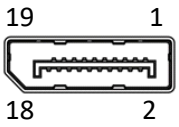


Table B.8: DisplayPort Connector (DP1)			
Pin	**Signal**	**Pin**	**Signal**
1	TMDS D2+	11	GND
2	GND	12	TMDS CLK-
3	TMDS D2-	13	N/C
4	TMDS D1+	14	N/C
5	GND	15	SCL
6	TMDS D1-	16	SDA
7	TMDS D0+	17	GND
8	GND	18	VCC (+5V)
9	TMDS D0-	19	Hot plug detect
10	TMDS CLK+		

B.8 RS-232 and COM3 Interface (COM1 ~ COM6)

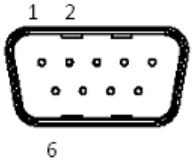


Table B.9: RS-232 DB-9 Connector (COM1)	
Pin	**Signal**
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

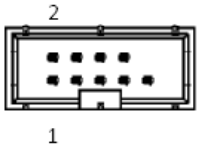


Table B.10: RS-232 Header (COM2, COM4 ~ COM6)	
Pin	**Signal**
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	GND

Table B.11: RS-232/422/485 Header (COM3)	
Pin	**Signal**
1	422/485 TX-
2	DSR
3	422/485 TX+
4	RTS
5	RX+
6	CTS
7	RX-
8	RI
9	GND

Table B.12: COM Brackets Connectors (1701090401/1701092300)			
Pin	**RS-232**	**RS-422**	**RS-485**
1	DCD	Tx-	Data-
2	RxD	Tx+	Data+
3	TxD	Rx+	-
4	DTR	Rx-	-
5	GND	GND	GND
6	DSR	RTS-	-
7	RTS	RTS+	-
8	CTS	CTS+	-
9	RI	CTS-	-

B.9 CPU and System Fan Power Connector (CPUFAN1, SYSFAN1 ~ SYSFAN3)

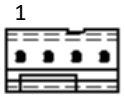


Table B.13: CPU and System Fan Power Connector (CPUFAN1, SYSFAN1 ~ SYSFAN3)

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

B.10 Power LED (JFP1+JFP2)

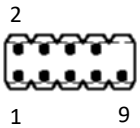


Table B.14: Power LED (JFP1+JFP2)

Pin	Function
5	POWER_LED+
7	POWER_LED-
9	POWER_LED-

B.11 HDD LED Connector (JFP1+JFP2)

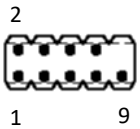


Table B.15: HDD LED Connector (JFP1+JFP2)

Pin	Signal
1	HDD_LED+
3	HDD_LED-

B.12 ATX Soft Power Switch (JFP1+JFP2)

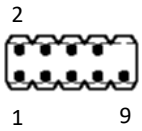


Table B.16: ATX Soft Power Switch (JFP1+JFP2)

Pin	Signal
2	PANSWIN#
4	GND

B.13 Reset Connector (JFP1+JFP2)

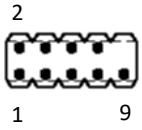


Table B.17: Reset Connector (JFP1+JFP2)

Pin	Signal
6	SYSTEM RESET#
8	GND

B.14 8-pin Alarm Board Connector (VOLT1)

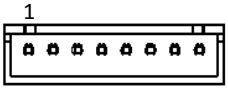


Table B.18: 8-pin Alarm Board Connector (VOLT1)

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

B.15 Case Open Connector (JCASE1)

Table B.19: Case Open Connector (JCASE1)	
Pin	**Signal**
1	CASEOP
2	GND

B.16 GPIO Connector (GPIO1)

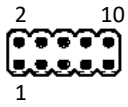


Table B.20: GPIO Connector (GPIO1)			
Pin	**Signal**	**Pin**	**Signal**
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	+5V_DUAL_GPIO	10	GND

B.17 SMBus Connector (SMBUS1)

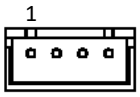


Table B.21: SMBus Connector (SMBUS1)	
Pin	**Signal**
1	+V5
2	SMB CLK
3	SMB DAT
4	GND

B.18 Serial Peripheral Interface (SPI) Connector (SPI_TPM1)

Table B.22: Serial Peripheral Interface(SPI) Connector (SPI_TPM1)

Pin	Signal	Pin	Signal
1	CS#	7	MISO
2	PRSNT#	8	N.C.
3	CLK	9	IRQ#
4	GND	10	GND
5	MOSI	11	RESET#
6	GND	12	+3.3V POWER

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