MX-RPLPS

LGA 1700 socket supports Intel® Core™ i7/i5/i3 Processor, formerly the Raptor Lake PS / Alder Lake PS Platform Mini ITX Motherboard

User's Manual

Ver. 1.0

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Safety Information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

The symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

Safety Declaration

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.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This manual contains the following parts:

- **Chapter 1: Product introduction**

  This chapter describes the features of the motherboard and the new technology it supports. This chapter also lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.

- **Chapter 2: BIOS setup**

  This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor.

2. Optional documentation

Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Typography

Bold text	Indicates a menu or an item to select
Italics	Used to emphasize a word or a phrase
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key Example: <Enter> means that you must press the Enter or Return key
<Key1>+<Key2>+<Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+) Example: <Ctrl>+<Alt>+<D>
Command	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets Example: At the DOS prompt, type the command line: **afuEfix64.efi /i[filename]** **afuEfix64.efi /71891100.ROM /P /B**

Packing List

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

- 1 x MX-RPLPS mini-ITX
- 1 x I/O Shield
- 1 x SATA cable

If any of the above items is damaged or missing, please contact your retailer.

Revision History

Revision	Revision History	Date
V 0.1	First Draft version	August, 2024
V 0.2	Format Cleaning	November, 2024
V 1.0	First release	February, 2025

Specifications Summary

Specifications	
System	
CPU	LGA 1700 Socket supports Intel® Raptor Lake PS / Alder Lake PS Core™ i7, Core™ i7, Core™ i5, Core™ i3, Pentium, Celeron Processor up to 16 Cores 24 Threads Hybrid
BIOS	Socket Type 256Mb SPI BIOS
Memory	2 x DDR5 5200MHz SODIMM Sockets support up to 96GB
Watchdog Timer	1 ~ 255 sec timer
H/W Status Monitor	CPU & system temperature monitoring Voltages monitoring
Expansion Slots	1 x Gen 4 PCIe x4 (x16 Physical Slot) 1 x M.2 E-Key 2230 (PCIe x1 Channel & USB Signal) 1 x M.2 M-Key 2280 & 2242 NVMe (Gen4 PCIe) 1 x M.2 B-Key 3052 & 3042 (PCIe x2 & USB Signal)
Smart Fan Control	Yes
Display	
Chipset	Integrated Intel® Graphics
Display Memory	Shared Memory
Display Output	4 x DisplayPort 1.4a @ 60Hz 18/24 bits Dual Channel LVDS. Optional eDP
Multi-Display	Supports 4 Independent Displays
Ethernet	
LAN1	Intel® I226-LM Ethernet Controller
LAN2	Intel® I226-LM Ethernet Controller
Back I/O Port	
Back Panel	4 x DisplayPort (DP++) 4 x USB 3.2 Gen 2 Type-A Connectors 2 x USB 2.0 Type A Connectors 1 x USB Type C Thunderbolt 4 Connector 2 x RJ45 1 x Line-out, 1 x Mic-in 1 x Barrel Type DC-in Connector
Internal I/O Connector	
Internal I/O	1 x LVDS Header 1 x JBKL1 2 x SATA III (Red) 1 x USB 3.2 Gen 1 Header (2 Ports) 1 x eDP Header (Optional)

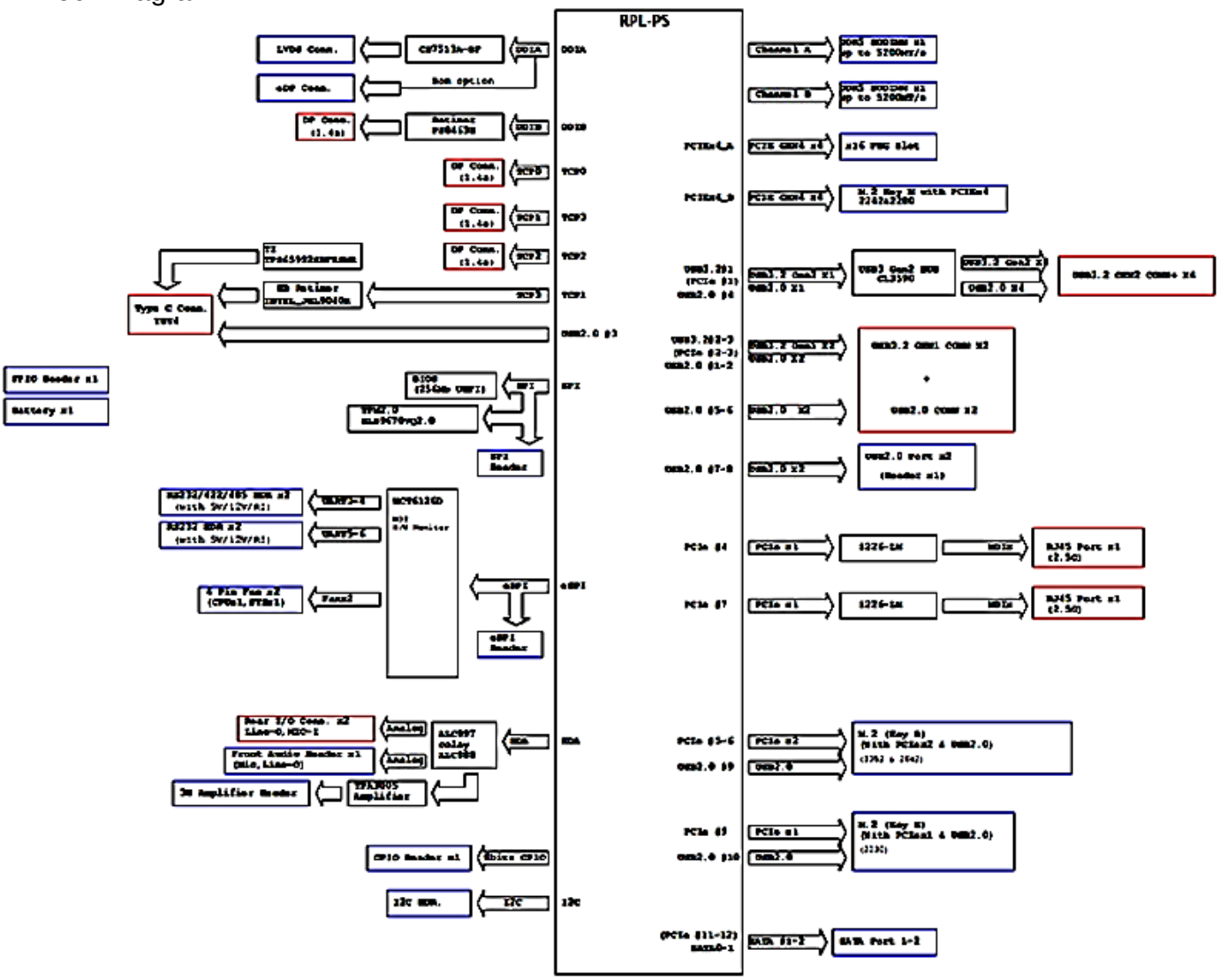
	1 x RI SEL2 1 X RI SEL1 1 x USB 2.0 Header (2 Ports) 1 X JDIO 1 X ESPI1 1 X CPU_FAN1 1 X SYS_FAN1 1 X JPSON 2 x RS-232/422/485 Headers 2 x RS-232 Headers 1 X JBKLVOL 1 X JLVDS_BKL1 1 X CLCMOS 1 X F_PANEL 1 X JSAMBS 1 X SATAPWR 1 x I²C 1 X FP_AUDIO 1 X JAMP1 1 X FP_AUDIO 1 X ATX12V
Mechanical & Environmental	
Operating Temperature	0~60°C (32~140°F)
Operating Humidity	5% ~ 85% Relative Humidity, Non-condensing
Size (L x W)	Mini ITX Form Factor 6.7"x 6.7" (170mm x 170mm)

Raptor Lake PS 45W - Processor Raptor Lake PS 15W - Processor

Brand	Processor Number MM# Order Code	Processor Cores	Number of P-cores	Number of E-cores	Number of Threads	Intel® Smart Cache (L3)	Max Turbo Freq (GHz) [1] P-core	Max Turbo Freq (GHz) [1] E-core	Processor Base Frequency (GHz) P-core	Processor Base Frequency (GHz) E-core	Graphics Max Freq (GHz)	Intel® vPro® Enterprise[2]	Number of Execution Units (EUs)	Video Decode Boxes
Intel® Core™ Processor (Series 1)	Core 7 160HL	14	6	8	20	24MB	5.2	4.0	2.9 (@65W) 2.5 (@45W) 1.9 (@35W)	1.8	1.5	√	96	2
Intel® Core™ Processor (Series 1)	Core 7 150HL	14	6	8	20	24MB	5.0	3.7	2.9 (@65W) 2.4 (@45W) 1.7 (@35W)	1.8	1.5		96	2
Intel® Core™ Processor (Series 1)	Core 5 130HL	12	4	8	16	18MB	4.8	3.6	3.3 (@65W) 2.8 (@45W) 2.2 (@35W)	2.1	1.5	√	80	2
Intel® Core™ Processor (Series 1)	Core 5 120HL	12	4	8	16	18MB	4.7	3.5	3.2 (@65W) 2.6 (@45W) 1.9 (@35W)	1.9	1.45		80	2
Intel® Core™ Processor (Series 1)	Core 3 100HL	8	4	4	12	12MB	4.6	3.4	2.6 (@65W) 2.1 (@45W) 1.2 (@35W)	1.5	1.4		48	1

Warning! MX-RPLPS mainboard can only supports Intel (Series 1) PS processors, other processor might damage the board. https://www.intel.com/content/www/us/en/ark/products/series/236798/intel-core-processors-series-1.html

Block Diagram



This chapter describes the motherboard features and the new technologies it supports.

1 Product Introduction

Chapter 1 - Product Introduction

1.1 Before you Proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.

Ensure the power cord is unplugged from the wall socket before handling any component.

Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity

Hold components by the edges to avoid touching the ICs on them.

Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that came with the component.

Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

1.2 Motherboard Overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it. Consult the chassis documentation before installing the motherboard to ensure compatibility.

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

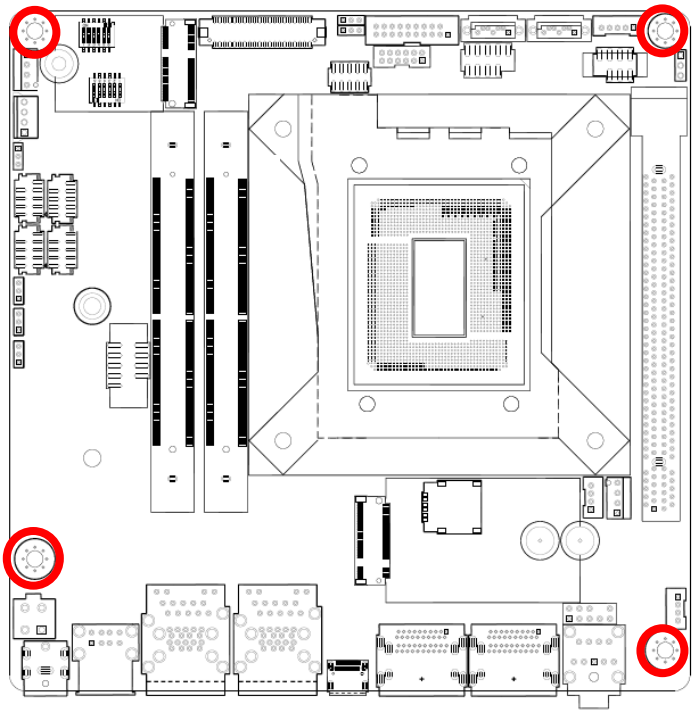
1.2.1 Placement Direction

When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

1.2.2 Screw Holes

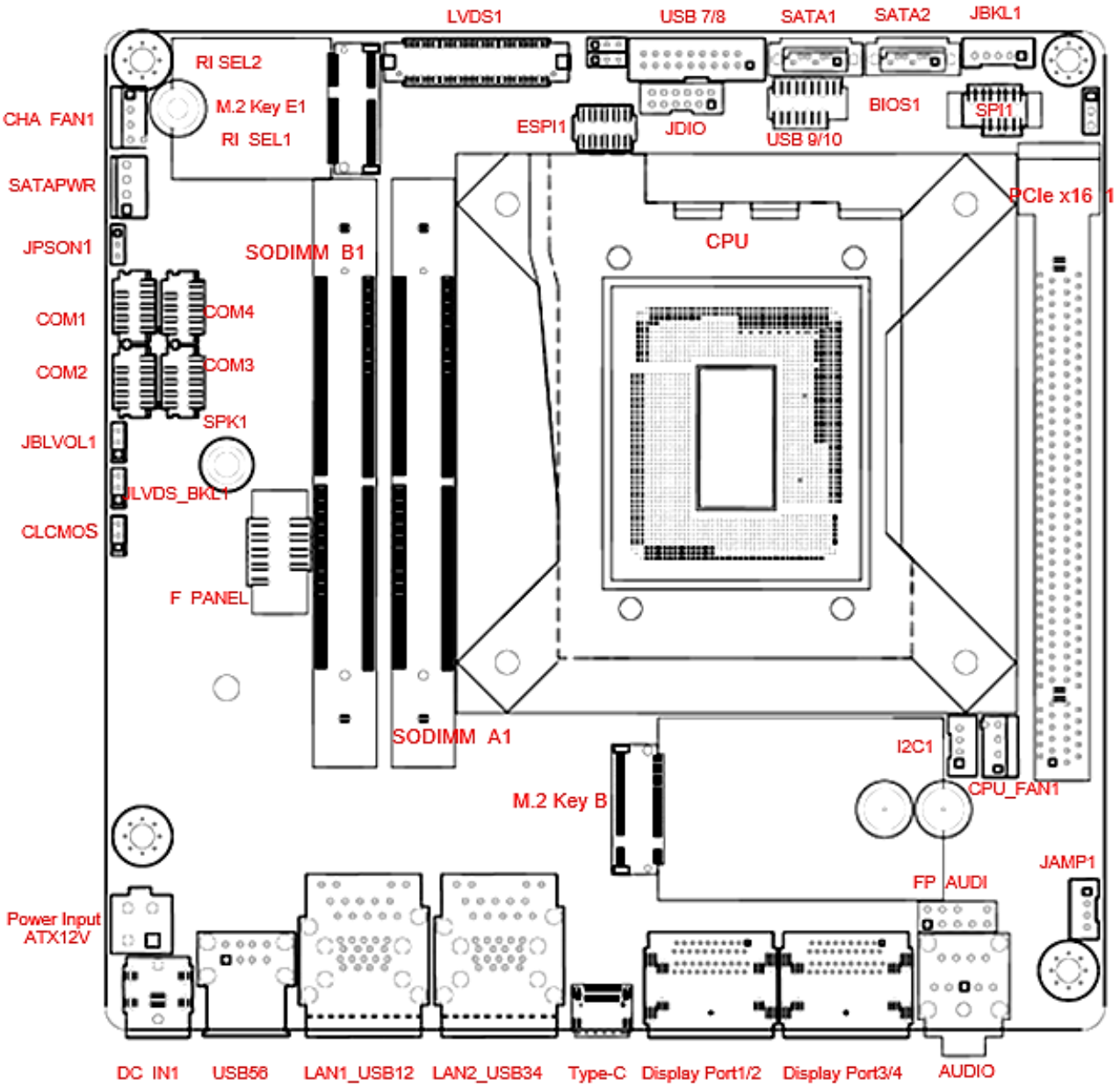
Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.

Do not over tighten the screws! Doing so can damage the motherboard.



Place this side towards the rear of the chassis.

1.2.3 Motherboard Layout



https://www.intel.com/content/www/us/en/products/details/embedded-processors/core/ps.html

Raptor Lake PS 45W - Processor | Raptor Lake PS 15W - Processor

Brand	Processor Number MM# Order Code	Processor Cores	Number of P-cores	Number of E-cores	Number of Threads	Intel® Smart Cache (L3)	Max Turbo Freq (GHz) [1] P-core	Max Turbo Freq (GHz) [1] E-core	Processor Base Frequency (GHz) P-core	Processor Base Frequency (GHz) E-core	Graphics Max Freq (GHz)	Intel® vPro® Enterprise[2]	Number of Execution Units (EUs)	Video Decode Boxes
Intel® Core™ Processor (Series 1)	Core 7 160HL	14	6	8	20	24MB	5.2	4.0	2.9 (@65W) 2.5 (@45W) 1.9 (@35W)	1.8	1.5	√	96	2
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Intel® Core™ Processor (Series 1)	Core 3 100HL	8	4	4	12	12MB	4.6	3.4	2.6 (@65W) 2.1 (@45W) 1.2 (@35W)	1.5	1.4		48	1

1.2.4 Layout Content List

Slots & socket		
Label	**Function**	**Note**
CPU1	LGA1700 socket	
DIMMA1~B1	2x DDR5 5200MHz SODIMM sockets	
PCIe x4	1x Gen 4 PCIe x4	x16 Physical Slot
M.2 E-Key	1x M.2 E-Key 2230	PCIe x1 Channel & USB Signal
M.2 M-Key	1x M.2 M-Key 2280 & 2242 NVMe	Gen4 PCIe
M.2 B-Key	1x M.2 B-Key 3052 & 3042	PCIe x2 & USB Signal
Jumpers		
Label	**Function**	**Note**
CLCMOS1	Clear CMOS	1 x 3 header, pitch 2.00mm
JBKLVOL1	LVDS panel voltage Selection	1 x 3 header, pitch 2.00mm
JLVDS_BKL1	LVDS brightness control mode Selection	1 x 3 header, pitch 2.00mm
JPSON1	AT/ATX Mode Select	1 x 3 header, pitch 2.00mm
RI SEL 1-2	COM power setting	12P 8.75*8.3mm

Rear Panel Connector

Label	Function	Note
DC-in	1 x Barrel Type DC-in Connector	
DP	4 x DisplayPorts (DP++)	
USB56	USB2.0 Type A Connector x 1	
LAN1_USB12	RJ-45 Ethernet Connector x 1 USB3.2 Type A Connector x 2	Gigabit Ethernet
LAN2_USB34	RJ-45 Ethernet Connector x 1 USB3.2 Type A Connector x 2	Gigabit Ethernet
AUDIO1	Audio phone jack	Line-out, Mic-in

Internal Connector		
Label	**Function**	**Note**
CPU_FAN1	CPU Fan Connector	WAFER 1x4P, 2.54mm
CHA_FAN1	Chassis Fan Connector	WAFER 1x4P, 2.54mm
F_PANEL1	Intel Front Panel connector	BOX header 2x5P, 2.54mm
ATX12V1	12V ATX power connectors	ATX PWR Conn. 2x2P 4.2mm
COM1~4	Serial Port Connector	Wafer 2x5K
SATA1~2	SATA Connector	7P 1.27mm
SATAPW1	SATA power	WAFER 4P 2.54mm
FP_ Audio	Front Panel Audio Connector	PIN HEADER 2x5P 2.54m
JDIO1	Digital I/O Connector	WAFER 6x2P 2.0mm
I2C	I2C connector	WAFER BOX 4P 2.00mm
USB78	Front USB 3.2 Header	BOX HEADER 2x10P 2.0mm
USB910	Front USB 2.0 Headers	PIN HEADER 2x5P 2.54mm
JSMB1	SM bus connector	PIN HEADER 1X3P 2.54mm
JAMP1	Amplifier Connector	WAFER BOX 4P 2.00mm
LANLED1	LAN LED Headers	LED Amber SMD 2P

1.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA1700 socket designed for the Intel® Core™ i7/ i5/ i3 processor in the 1700-land package.

- Your boxed Intel® Core™ i7/ i5/ i3 LGA1700 processor package should come with installation instructions for the CPU, fan and heatsink assembly. If the instructions in this section do not match the CPU documentation, follow the latter.
- Upon purchase of the motherboard, make sure that the PnP cap

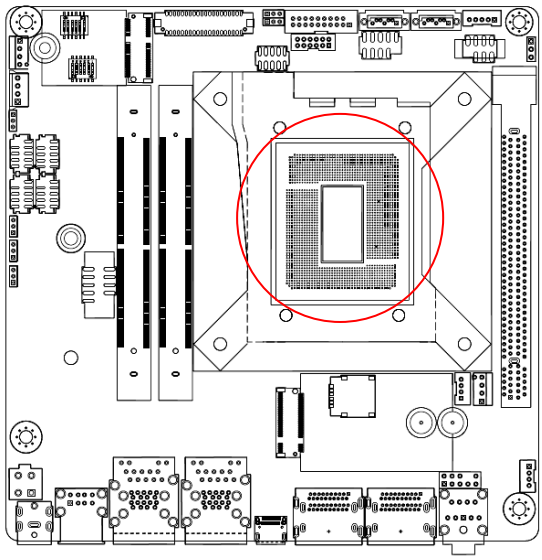
is on the socket and the socket pins are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket pins/motherboard components. BCM will shoulder the cost of repair only if the damage is shipment/transit-related.

- Retain the cap after CPU installation for warranty purposes and future reference. BCM will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA1700 socket.
- The product warranty does not cover damage to the socket pins resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.
- Install the CPU fan and heatsink assembly before you install motherboard to the chassis.

If you purchased a separate CPU heatsink and fan assembly, make sure that you have properly applied Thermal Interface Material to the CPU heatsink or CPU before you install the heatsink and fan assembly.

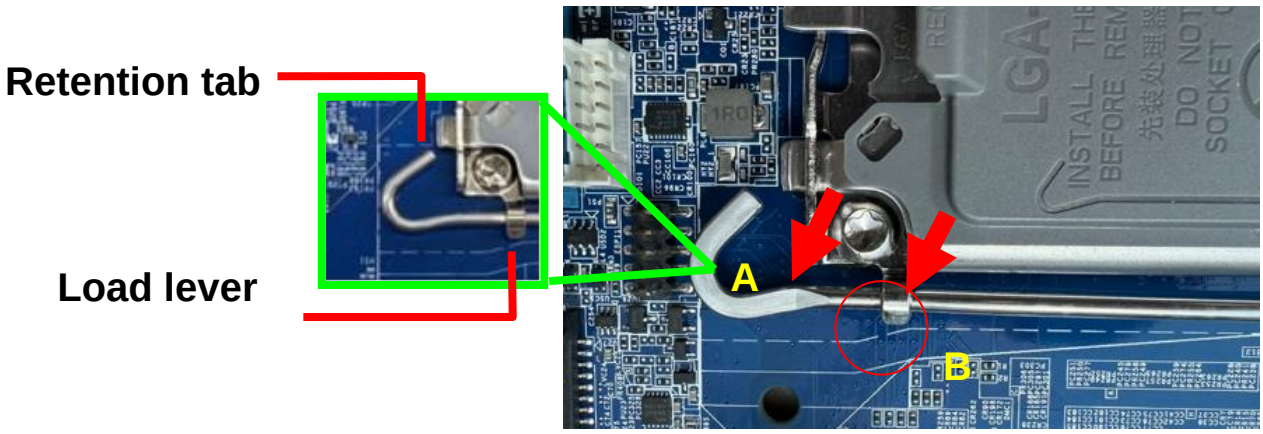
1.3.1 Installing the CPU

1. Locate the CPU socket on the motherboard.



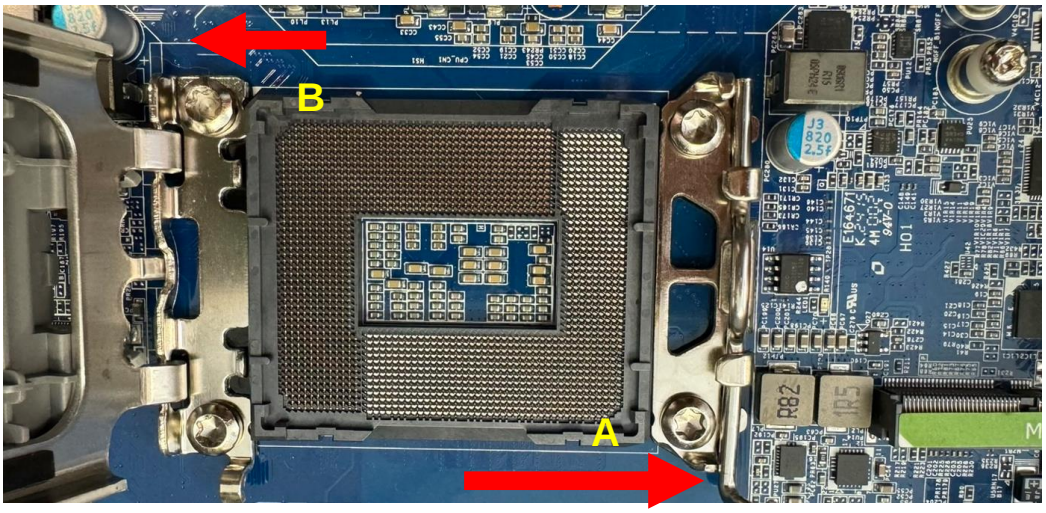
Before installing the CPU, make sure that the socket box is facing towards you and the load lever is on your left.

2. Press the load lever with your thumb (A), then move it to the left (B) until it is released from the retention tab.

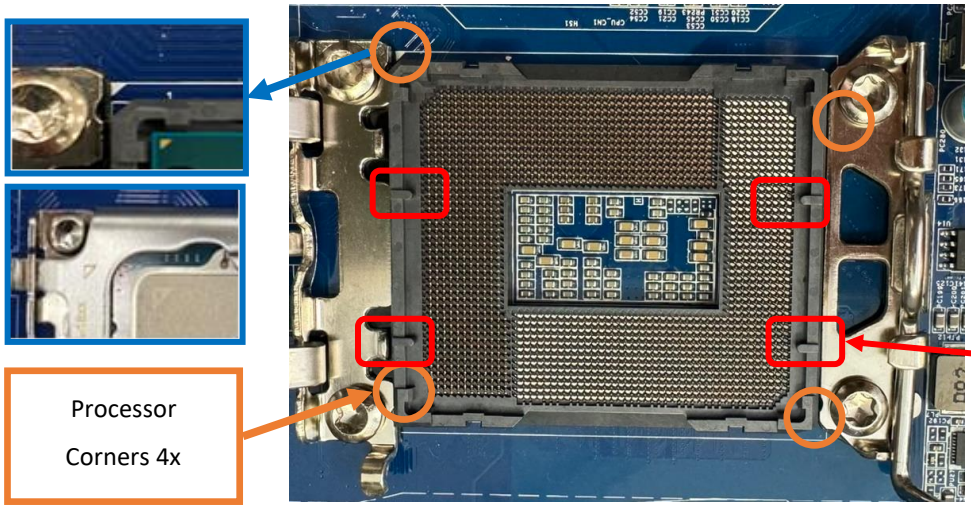


To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

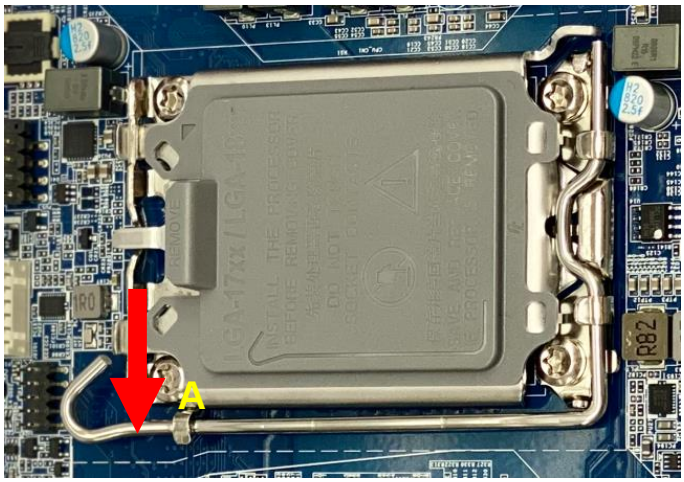
3. Lift the Load lever with your thumb and forefinger to around 120º angle (A), then pull the PnP cap from the CPU socket to remove (B).



4. Position the CPU over the socket, making sure that the gold triangle is on the top-left corner of the socket then fit the socket alignment key into the CPU notch.



5. Pull back the load lever, then push the load lever (A) until it snaps into the retention tab.



The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!

1.3.2 Installing the CPU Heatsink and Fan

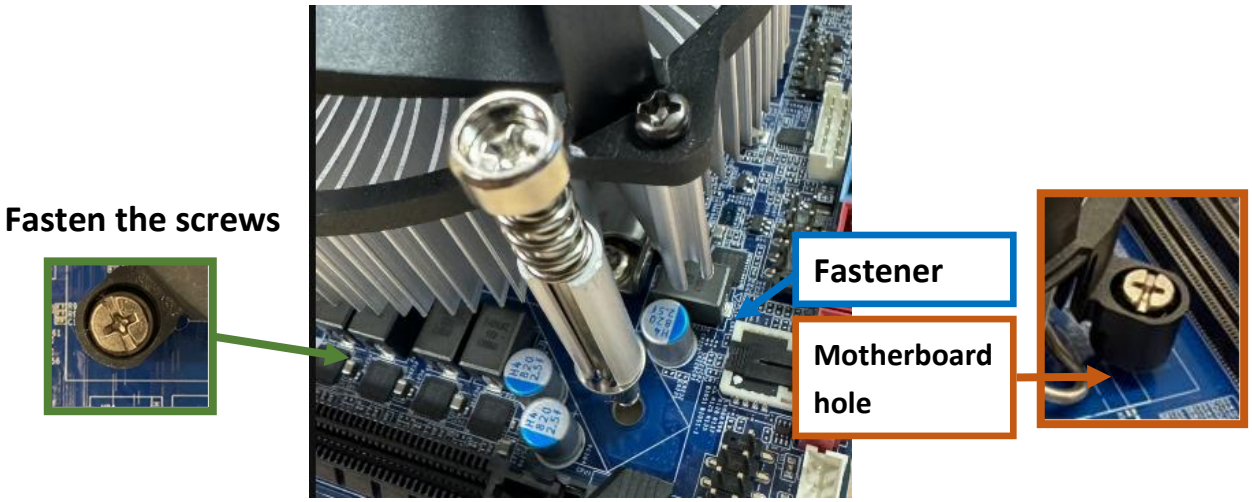
Intel® Core™ i9/ i7/ i5/ i3 LGA1700 processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

- Install the motherboard to the chassis before you install the CPU fan and heatsink assembly.
- When you buy a boxed Intel® Core™ i9/ i7/ i5/ i3 LGA1700 processor, the package includes the CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use only Intel® certified multi-directional heatsink and fan.
- Your Intel® Core™ i9/ i7/ i5/ i3 LGA1700 processor LGA1700 heatsink and fan assembly comes in a push-pin design and requires no tool to install.

If you purchased a separate CPU heatsink and fan assembly, make sure that you have properly applied Thermal Interface Material to the CPU heatsink or CPU before you install the heatsink and fan assembly.

To install the CPU heatsink and fan:

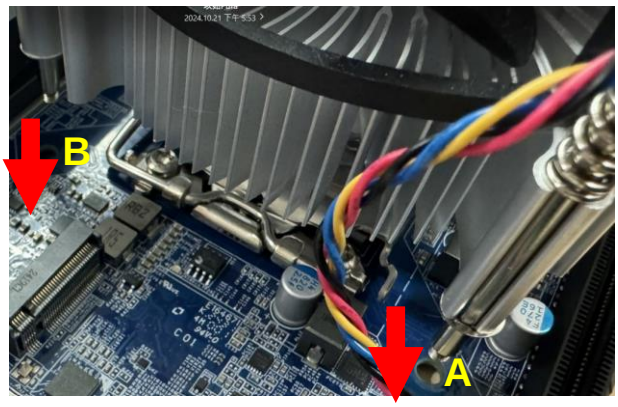
1. Place the heatsink on top of the installed CPU, making sure that the four fasteners match the holes on the motherboard.

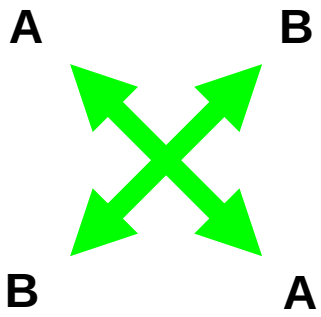


Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector.

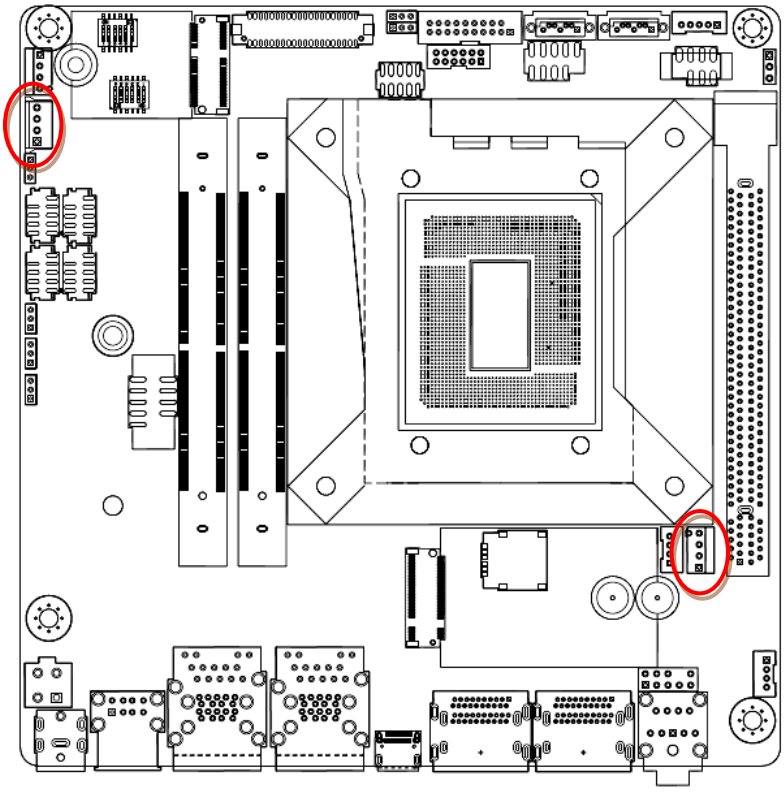
Make sure each fastener is oriented as shown.

2. Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.





3. Connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN.



Fan Connectors: SYS_FAN1

Fan Connectors: CPU_FAN1

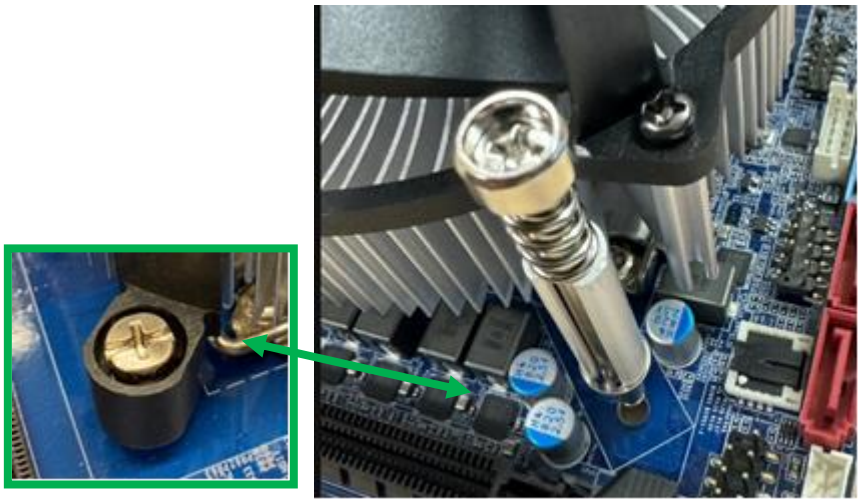
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components.
These are not jumpers! DO NOT place jumper caps on the fan connectors.

1.3.3 Uninstalling the CPU Heatsink and Fan

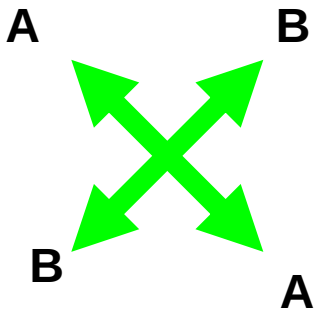
4. Carefully remove the heatsink and fan assembly from the motherboard.

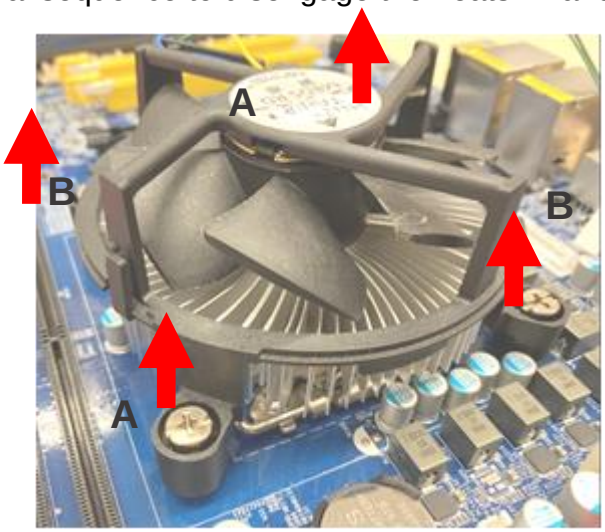
To uninstall the CPU heatsink and fan:

1. Disconnect the CPU fan cable from the connector on the motherboard.
2. Rotate each fastener counterclockwise



3. Pull up two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the motherboard.





5. Rotate each fastener clockwise to ensure correct orientation when reinstalling.

1.4 System Memory

1.4.1 Overview

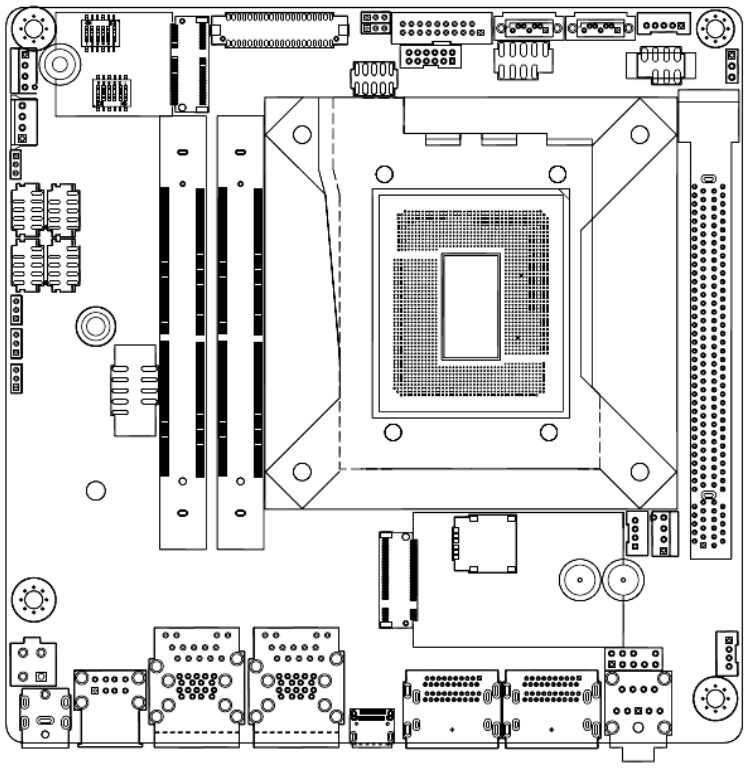
The motherboard is equipped with two DDR5 SODIMM (Small Outline Dual Inline Memory Module) slots.

DDR5 SODIMM memory brings several key performance improvements and power optimizations, while also introducing new design challenges.

According to the JEDEC JESD79-5 DDR5 standard, the DDR5 SODIMM specifications offer significant advancements in capacity, speed, and voltage.

Structurally, the Power Management IC (PMIC) has been moved to the SODIMM module, reducing redundant power management circuitry on the motherboard for unused SODIMM slots.

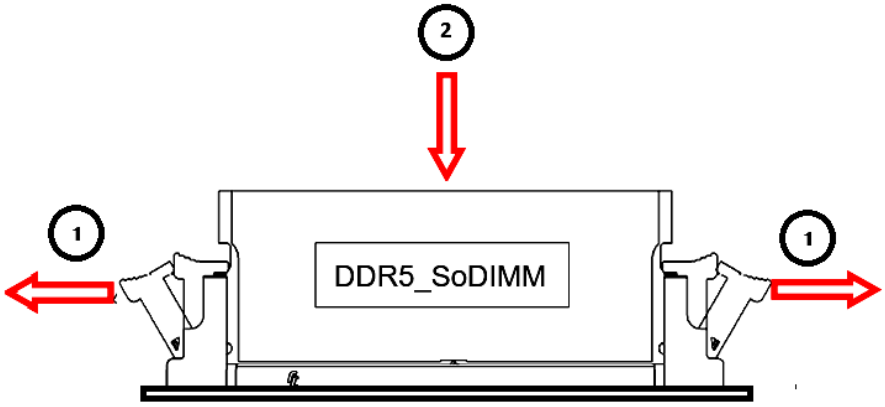
The DDR5 SODIMM specifications enable up to 128GB per module, with maximum data transfer speeds of 6400MT/s, and operate at a reduced voltage of 1.1V for improved efficiency.



1.4.2 Installing a DIMM

Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Locate the DIMM socket on the board.
2. Hold two edges of the DIMM module carefully, and keep away of touching its connectors.
3. Align the notch key on the module with the rib on the slot.
4. Firmly press the modules into the socket which will automatically snap into the mounting notch. Do not force the DIMM module in with extra force as the DIMM module only fits in one direction.



1.4.3 Removing a DDR5 SODIMM

1. Press the two tabs on the slot outward simultaneously, and then pull out the DIMM module.

- A DDR5 SODIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.
- The DDR5 SODIMM sockets does not support DDR/DDR2/DDR3/DDR4 SODIMMs.
- DO NOT install DDR/DDR2/DDR3/DDR4 SODIMMs to the DDR5 SODIMM socket.

Support the DIMM lightly with your fingers when pressing the ejector tabs. The DIMM might get damaged when it flips out with extra force.

1.5 Expansion Card

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.

Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

1.5.1 Installing an Expansion Card

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the expansion card with the slot, pressing firmly until it is fully seated.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

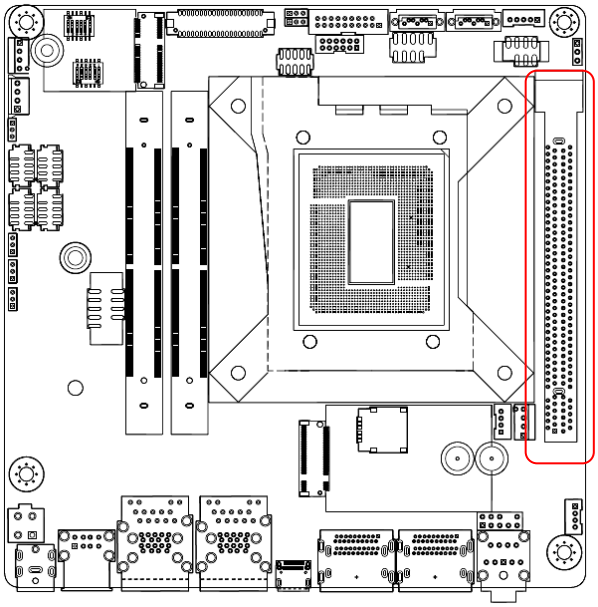
1.5.2 Configuring an Expansion Card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 2 for information on BIOS setup.
2. Assign an IRQ to the card if needed. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.

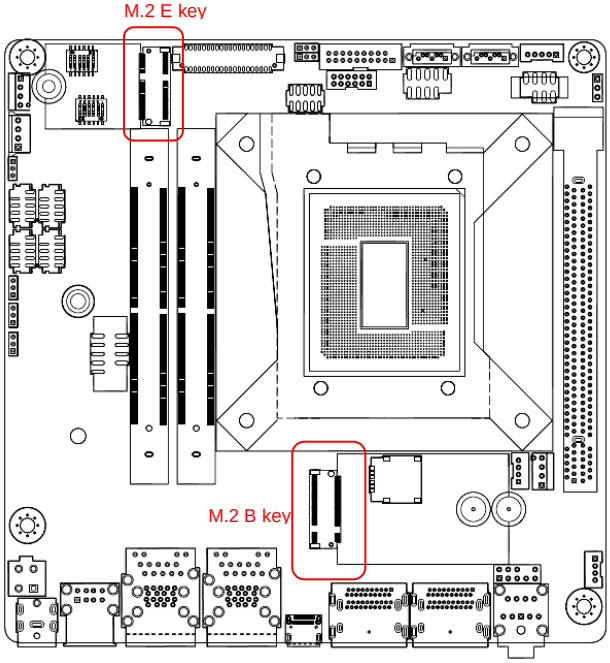
1.5.3 PCI Express x16 slot

This motherboard supports three PCI Express x16 slots that complies with the PCI Express specifications.



1 x Gen 4 PCIe x4 (x16 Physical Slot)

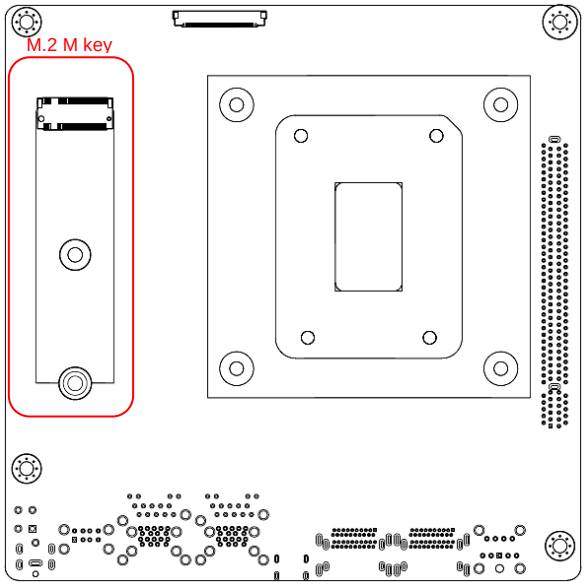
1.5.4 M.2 connector



1 x M.2 E-Key 2230 (PCIe x1 Channel & USB Signal)

1 x M.2 M-Key 2280 & 2242 NVMe (with Gen 4 PCIe)

1 x M.2 B-Key 3052 & 3042 (with PCIe x2 & USB Signal)


M.2 M key

1.6 Jumpers

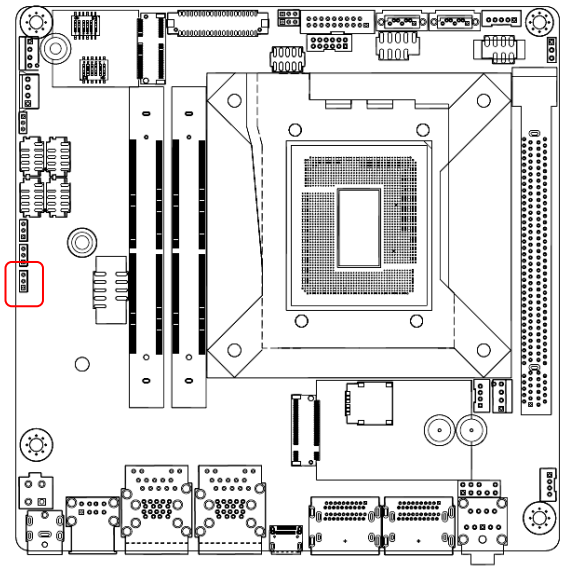
1.6.1 Clear CMOS (JCMOS1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which includes system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

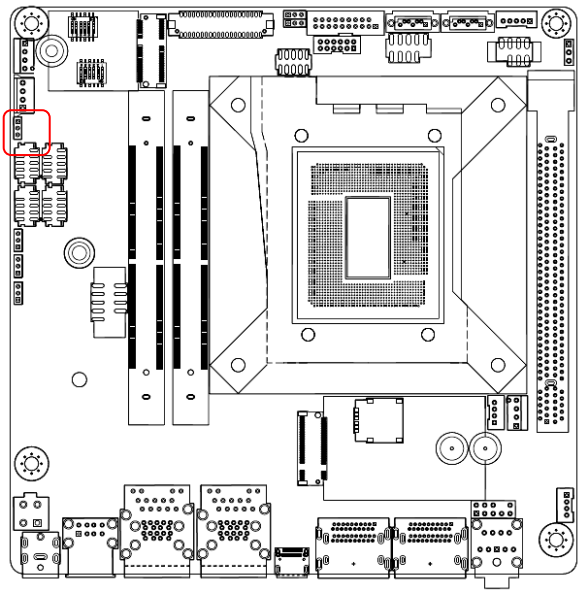
Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!



Item	Description	Remarks
Clear CMOS	• One 1x3 2.00mm pin header with one black, long-tail Jump CAP • 1-2(default)=Normal, 2-3= Clear CMOS	CLCMOS1

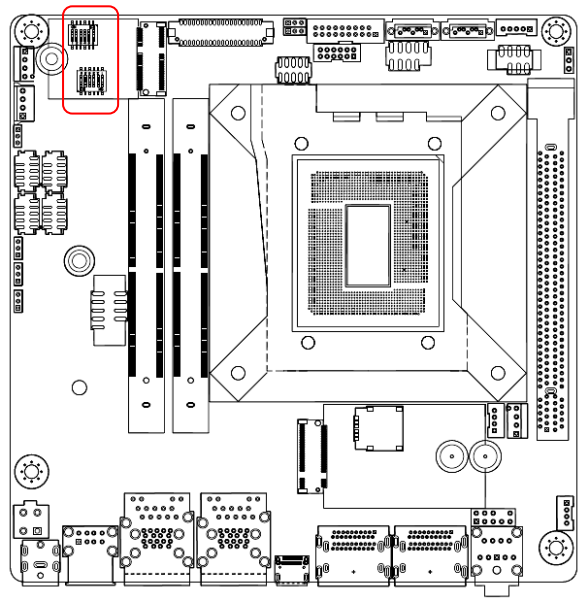
1.6.2 AT/ATX Power Mode Select (JPSON1)

This jumper allows you to select ATX Mode or AT mode



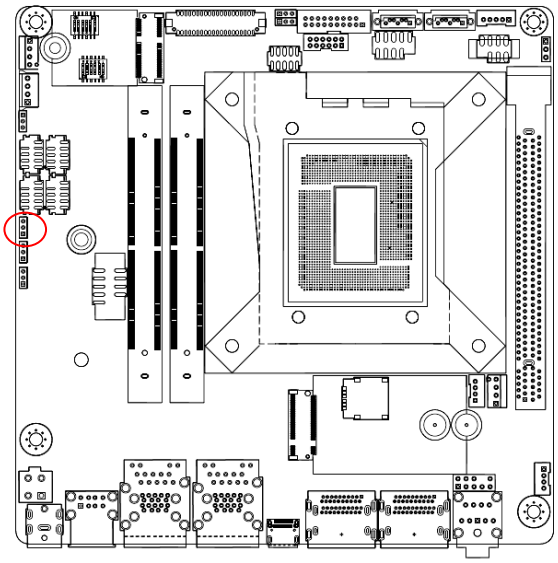
Item	Description	Remarks
AT/ATX mode (HW)	• One 1x3 2.00mm pin header with one black, long-tail Jump CAP • 2-3 (default)=ATX Mode; 1-2=AT mode	JPSON1

1.6.3 COM POWER SETTING (JCOMPWR1~4)



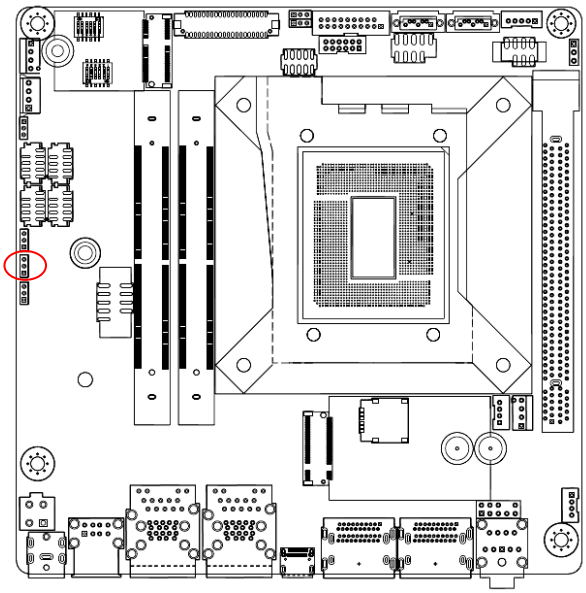
Item	Description	Remarks
Com port voltage	• Standard 0.05" integrated circuit pitch • Smaller size makes better heat convection during PC board wave soldering. • 2-11=+12V; 1-12 (default)=Ring; 3-10=+5V (COM1, COM3) • 5-8=+12V; 4-9 (default)=Ring; 6-7=+5V (COM2, COM4)	RI_SEL1, RI_SEL2

1.6.4 LVDS panel voltage Selection: JBKLVOL1



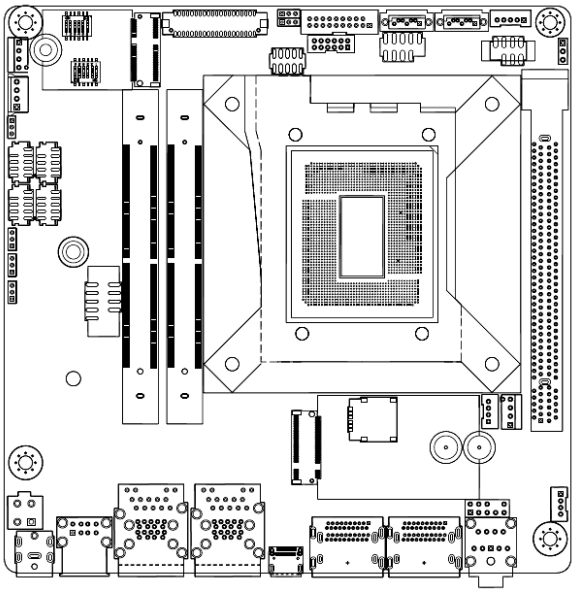
Item	Description	Remarks
JBKLVOL1	• One 1x3 2.00mm pin header with one black, long-tail Jump CAP • 2-3 (default)=3.3V; 1-2=5V	

1.6.5 LVDS brightness control mode Selection: JLVDS_BKL1



Item	Description	Remarks
JLVDS_BKL1	• One 1x3 2.00mm pin header with one black, long-tail Jump CAP • 1-2 (default)=SIO control; 2-3=SMBUS control	

1.6.6 COM power setting: RI SEL 1-2



RI_SEL1

	1-12(default)	2-11	3-10
COM1_PIN9	COM1_RI#	12V	5V
	4-9(default)	5-8	6-7
COM2_PIN9	COM2_RI#	12V	5V

RI_SEL2

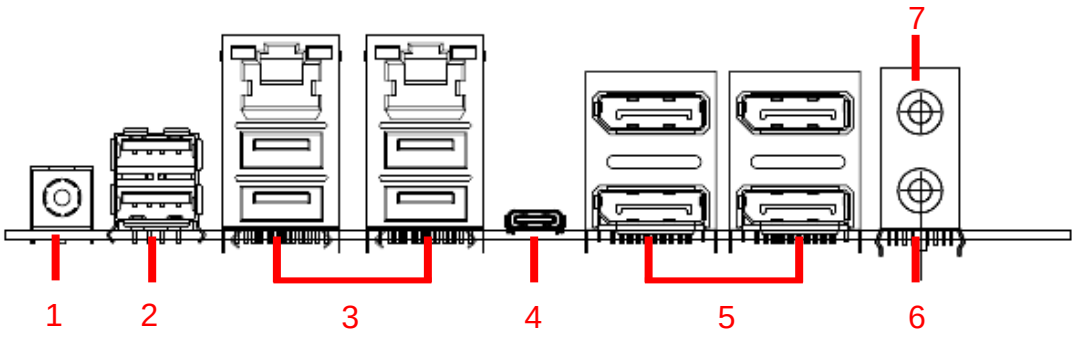
	1-12(default)	2-11	3-10
COM1_PIN9	COM3_RI#	12V	5V
	4-9(default)	5-8	6-7
COM2_PIN9	COM4_RI#	12V	5V

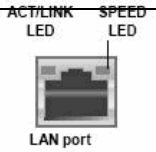
Item	Description	Remarks
Com port voltage	• Standard 0.05" integrated circuit pitch • Smaller size makes better heat convection during PC board wave soldering. • 2-11=+12V; 1-12 (default)=Ring; 3-10=+5V (COM1, COM3) • 5-8=+12V; 4-9 (default)=Ring; 6-7=+5V (COM2, COM4)	RI_SEL1, RI_SEL2

1.7 Connectors

1.7.1 Rear panel connectors

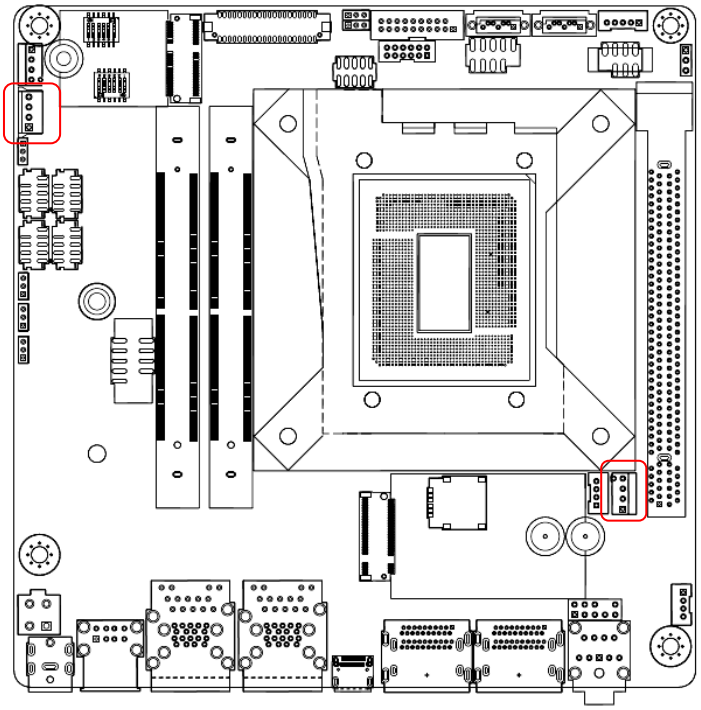
Back Panel IO:



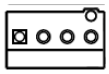
<table>
<tr><th>Item</th><th>Name</th><th>Function</th><th>Description</th></tr>
<tr><td>1</td><td>DC_IN</td><td>DC-in connector</td><td>The connector is for DC-in (12-24V)</td></tr>
<tr><td>2</td><td>USB 2.0 Type A</td><td>USB 2.0 Connectors</td><td>These two Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.</td></tr>
<tr><td>3</td><td>USB 3.2 Type A</td><td>USB 3.2 Gen 2 Connectors</td><td>These four Universal Serial Bus (USB) ports are available for connecting USB 3.2 Gen2 devices.</td></tr>
<tr><td>3</td><td>RJ45</td><td> 
</td><td>This port allows 2.5G connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.
<table>
<tr><th colspan="2">ACT/Link LED</th><th colspan="2">Speed LED</th></tr>
<tr><td>Status</td><td>Description</td><td>Status</td><td>Description</td></tr>
<tr><td>OFF</td><td>No link</td><td>OFF</td><td>10/100Mbps connection</td></tr>
<tr><td>Orange</td><td>Linked</td><td>Green</td><td>1Gbps connection</td></tr>
<tr><td>Blinking</td><td>Data activity</td><td>Orange</td><td>2.5Gbps connection</td></tr>
</table></td></tr>
<tr><td>4</td><td>USB3.2 Type C</td><td>USB 3.2 Connectors</td><td>This Universal Serial Bus (USB) port is available for connecting USB 3.2 Type C devices.</td></tr>
<tr><td>5</td><td>DP</td><td>Display port</td><td>Four Display Port Connectors
(DP++, 1.4a supported)</td></tr>
<tr><td>6</td><td>AUDIO</td><td>Microphone port (Pink)</td><td>This port connects a microphone.</td></tr>
<tr><td>7</td><td>AUDIO</td><td>Line-out port
(Lime)</td><td>This port connects a headphone or a speaker.</td></tr>
</table>

1.7.2 CPU and System fan connectors (CPU_FAN1, CHA_FAN1, CHA_FAN2)

The fan connectors support cooling fans of 280mA (3.36 W max.) at 4800rpm or a total of 1A~2.22A (26.64W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.



The fan header supports +12 V at 1 A maximum



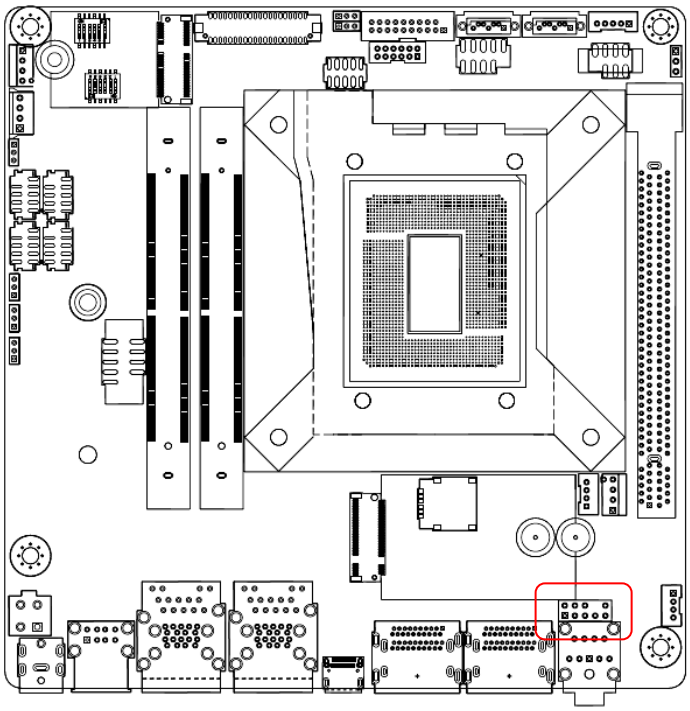
Pin	Signal Name	Description
1	GND	Ground
2	+12 V	FAN Power
3	Tach	FAN Tachometer
4	PWM	FAN PWM

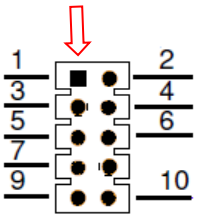
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components.

These are not jumpers! DO NOT place jumper caps on the fan connectors.

1.7.3 System Front Panel Audio (FP_Auido)

This connector is for a chassis-mounted front panel. The functions are as following.



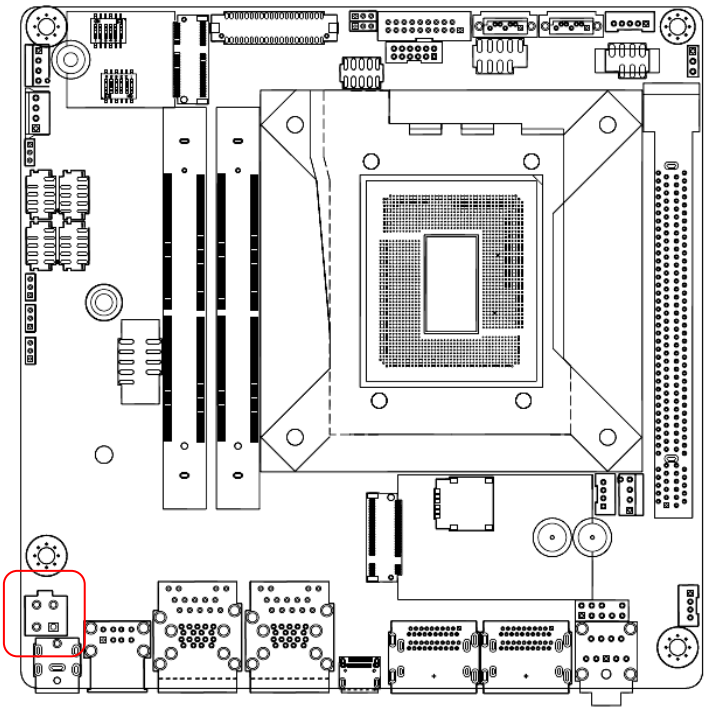


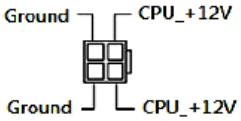
Pin	Signal Name	Pin	Signal Name
1	MIC2L	2	AGND
3	MIC2R	4	PRESENCE# (Dongle present)
5	LINE2R	6	MIC2 detect
7	SENSE_SEND (Jack detection)	8	Key (no pin)
9	LINE2L	10	LINE2 detect

- **ATX Power Button/Soft-off Button (Pin 6-8)**
  This 2-pin connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch and holding it for more than four seconds while the system is ON turns the system OFF.
- **Reset Button (Pin 5-7)**
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.
- **Power LED (Pin 2-4)**
  This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.
- **Hard Disk Drive Activity LED (Pin 1-3)**
  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

1.7.4 ATX power connectors (ATX12V1)

The connector is for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.



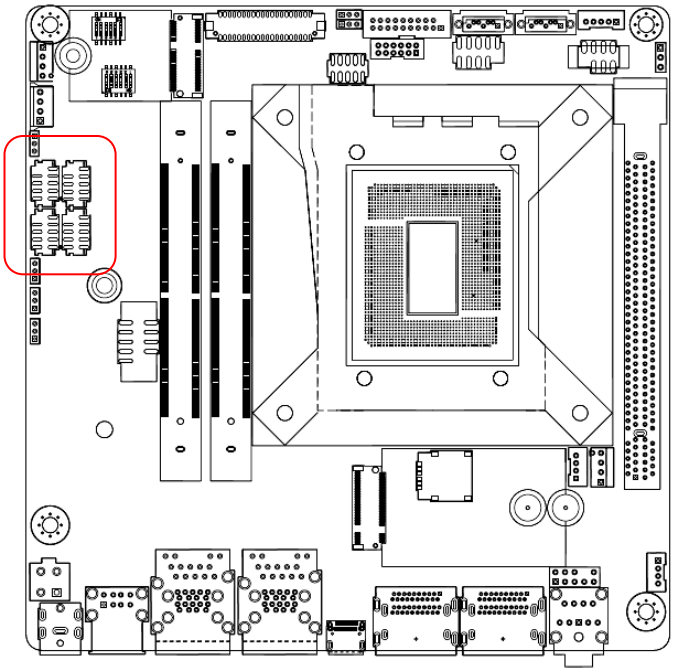


Pin	Signal Name	Pin	Signal Name
2	Ground	3	+12Vdc
1	Ground	4	+12Vdc

- Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. See the table below for details.

1.7.5 Serial Port connectors (COM1~4)

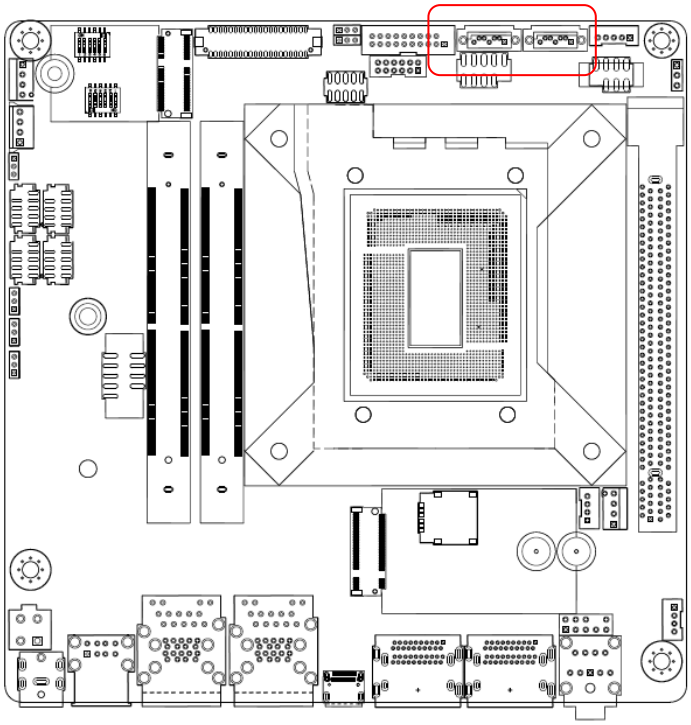
This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



Pin	Signal Name	Description	Pin	Signal Name	Description
1	DCD	Data Carrier Detect	2	RXD#	Receive Data
3	TXD#	Transmit Data	4	DTR	Data Terminal Ready
5	Ground		6	DSR	Data Set Ready
7	RTS	Request To Send	8	CTS	Clear To Send
9	RI or 5V or 12V	Ring Indicator	10	KEY	No Pin

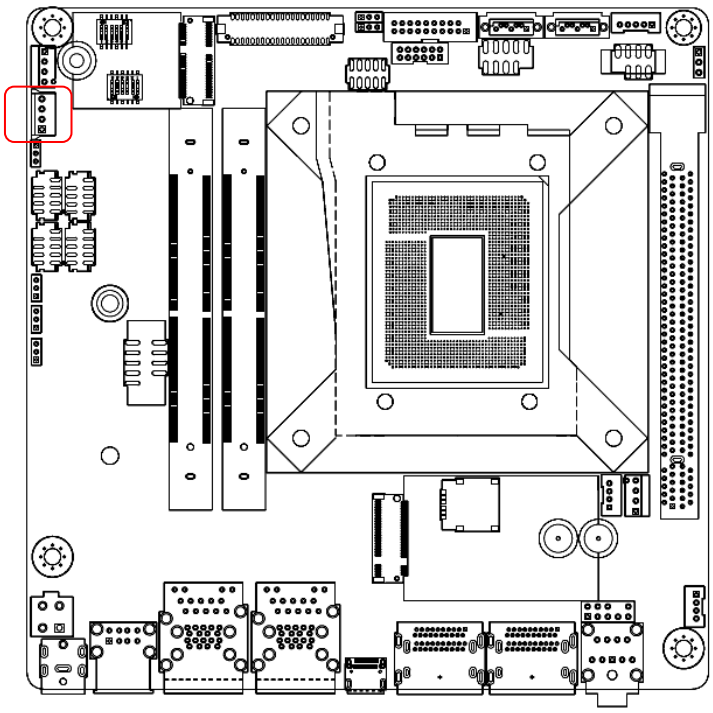
1.7.6 Serial ATA Connector

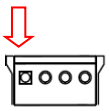
SATA support SATA 3.0. These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.



Pin	Signal Name	Description
1	GND	Ground
2	TXP	Transmit diff data - positive
3	TXN	Transmit diff data - negative
4	GND	Ground
5	RXN	Receive diff data - negative
6	RXP	Receive diff data - positive
7	GND	Ground

SATA power connector

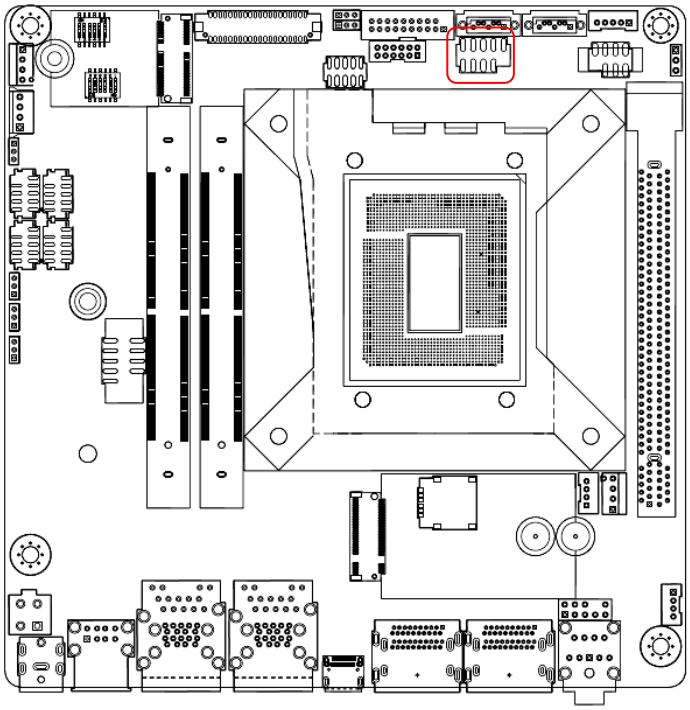


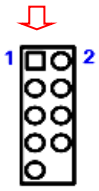


Pin	Signal Name
1	+5V
2	GND
3	GND
4	+12V

1.7.7 USB connectors (USB910)

These connectors are for USB 2.0 ports. Connect the optional USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.



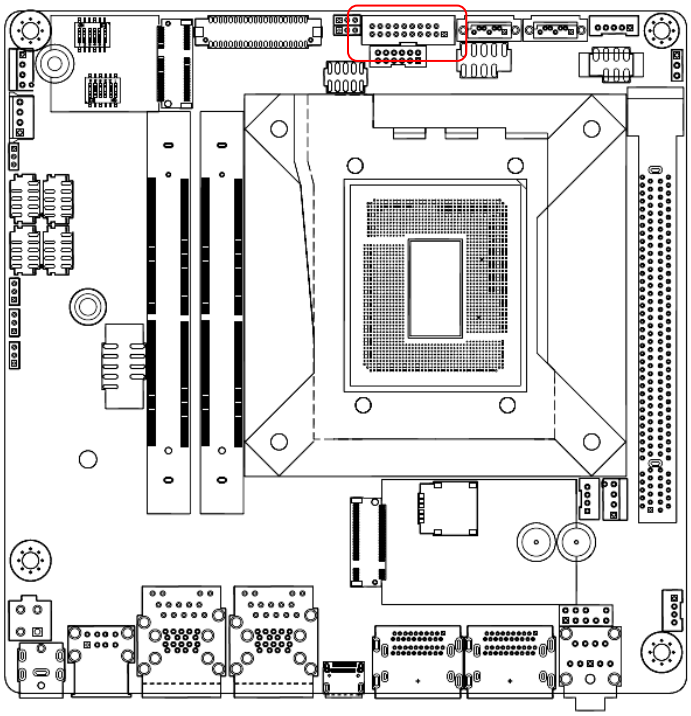


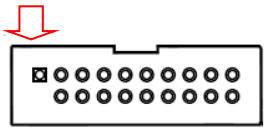
1. DCD#
2. RX
3. TX
4. DTR#
5. GND
6. DSR#
7. RTS#
8. CTS#
9. RI3xPOWERxJMP

	Never connect a **1394 cable** to the USB connectors. Doing so will damage the motherboard!
	The USB module is purchased separately.

1.7.8 USB3.2 connector (USB78)

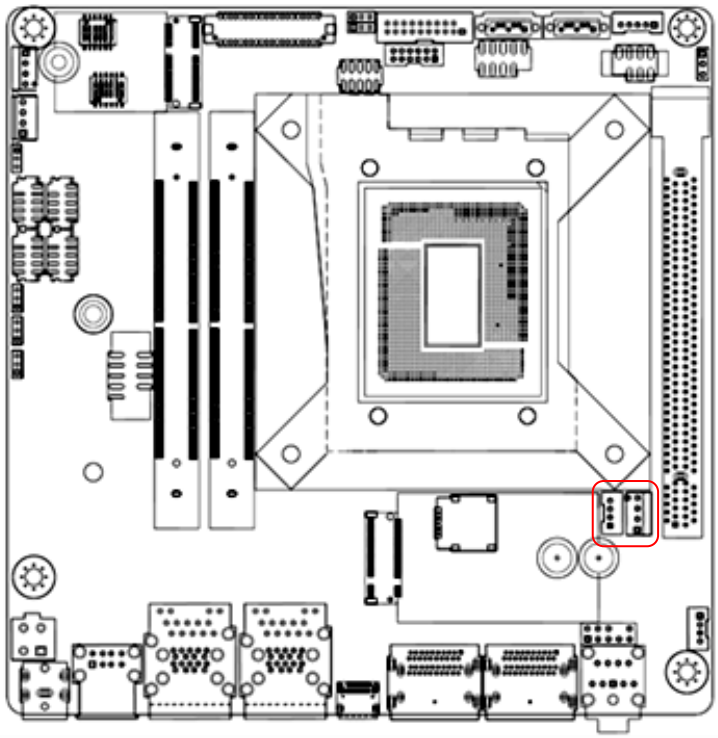
This connector provides 2 USB3.2 Gen1 ports. Connect the optional USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB3.2 specification that supports up to 5Gbps connection speed.

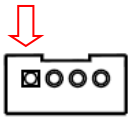




Pin	Signal Name	Pin	Signal Name
1	+5VSB	11	USB2_P
2	USB3_RX_N3	12	USB2_N
3	USB3_RX_P3	13	GND
4	GND	14	USB3_TX_P4
5	USB3_TX_N3	15	USB3_TX_N4
6	USB3_TX_P3	16	GND
7	GND	17	USB3_RX_P4
8	USB2_N	18	USB3_RX_N4
9	USB2_P	19	+5VSB
10	NC	20	key

1.7.9 I2C header (I2C1)

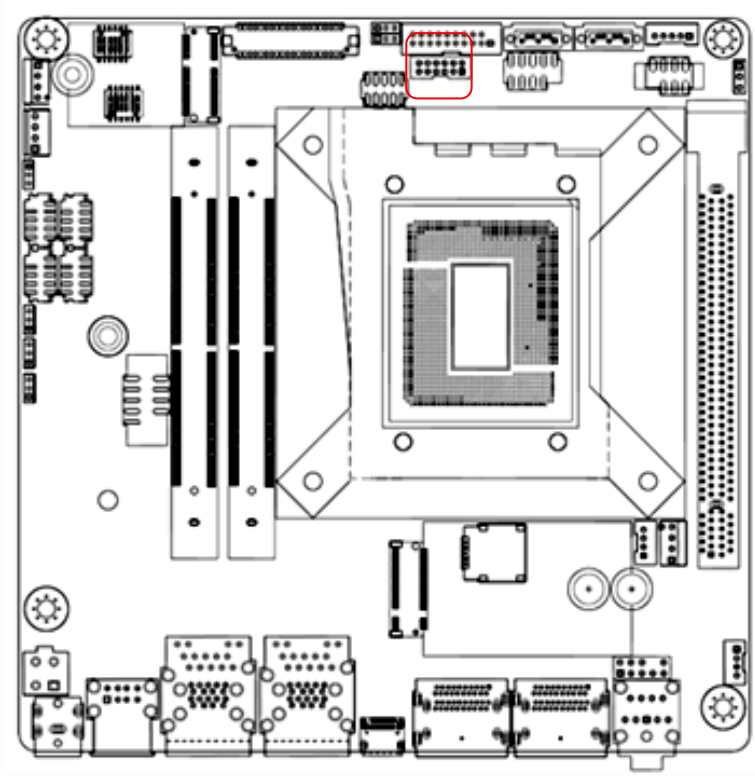


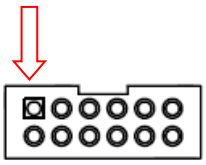


Pin	Signal Name
1	+3.3VSB
2	I2C_SCL
3	I2C_SDA
4	GND

1.7.10 8 bit GPIO header (JDIO1)

This connector provides an 8 bits input or output for general purpose.

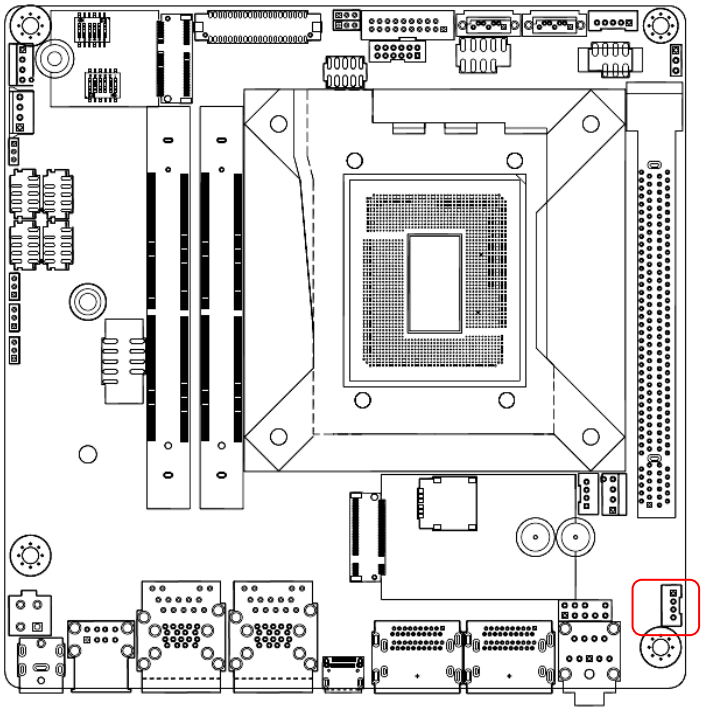


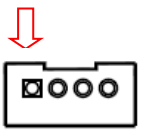


Pin	Signal Name	Pin	Signal Name
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	SMBCLK	10	SMBDATA
11	GND	12	+3.3VSB

1.7.12 Amplifier Connector (JAMP1)

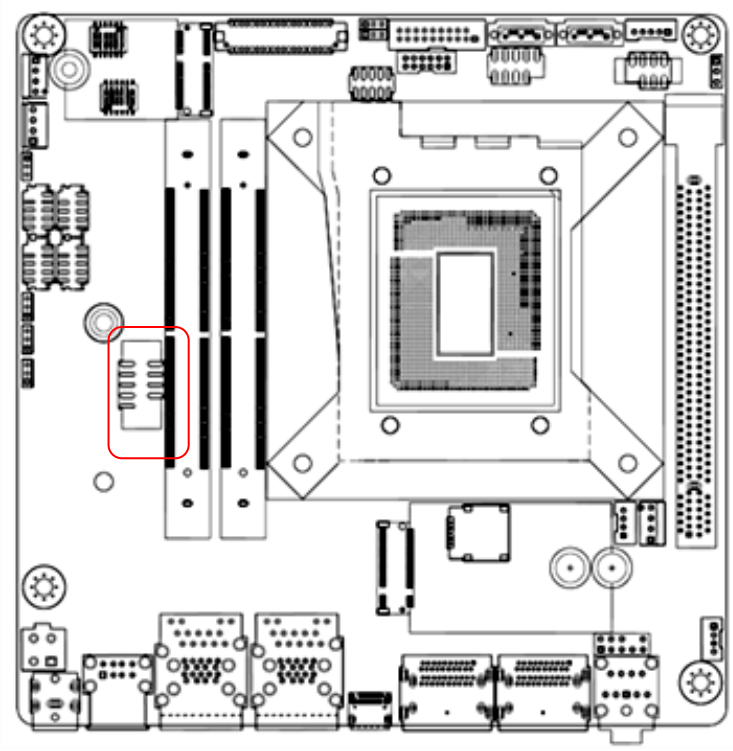
This connector allow user to connect an external audio amplifier.

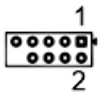




Pin	Signal Name
1	AMP_R-
2	AMP_R+
3	AMP_L-
4	AMP_L+

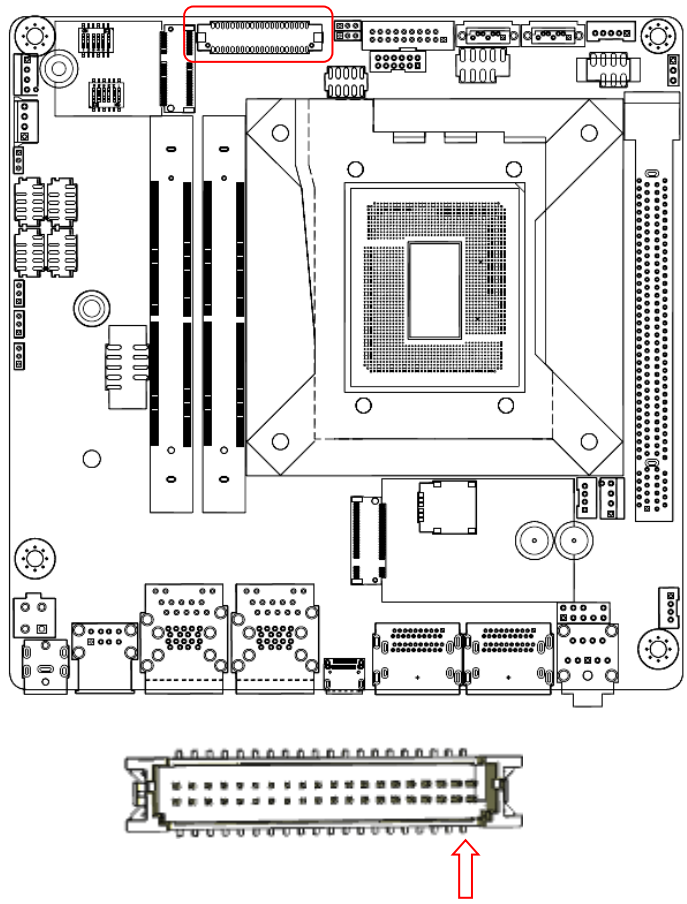
1.7.13 Front Panel





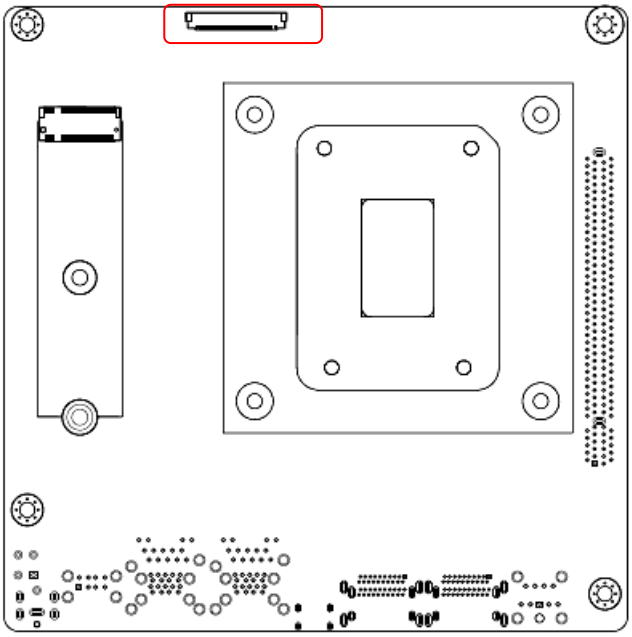
1. HDD LED+ 2. +5VSB
3. HDD LED# 4. PWR LED#
5. GND 6. PANSWIN#
7. RST 8. GND
9. N/A

1.7.14 LVDS Data Connector – 40-pin



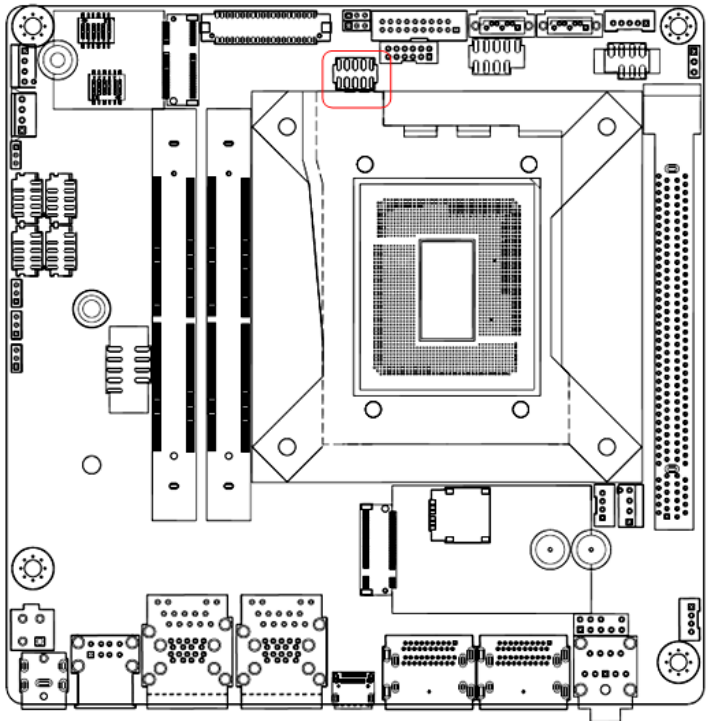
Pin	Signal Name	Pin	Signal Name
1	+3.3V_LVDS	2	+5V_LVDS
3	+3.3V_LVDS	4	+5V_LVDS
5	DDC_CLK	6	DDC_DATA
7	GND	8	NC
9	LVDSA_P1	10	LVDSA_P0
11	LVDSA_N1	12	LVDSA_N0
13	GND	14	GND
15	LVDSA_P3	16	LVDSA_P2
17	LVDSA_N3	18	LVDSA_N2
19	GND	20	GND
21	LVDSB_P1	22	LVDSB_P0
23	LVDSB_N1	24	LVDSB_N0
25	GND	26	GND
27	LVDSB_P3	28	LVDSB_P2
29	LVDSB_N3	30	LVDSB_N2
31	GND	32	GND
33	LVDSB_CLK_P	34	LVDSA_CLK_P
35	LVDSB_CLK_N	36	LVDSA_CLK_N
37	GND	38	GND
39	+12V_LVDS	40	+12V_LVDS

1.7.15 eDP1 Connector



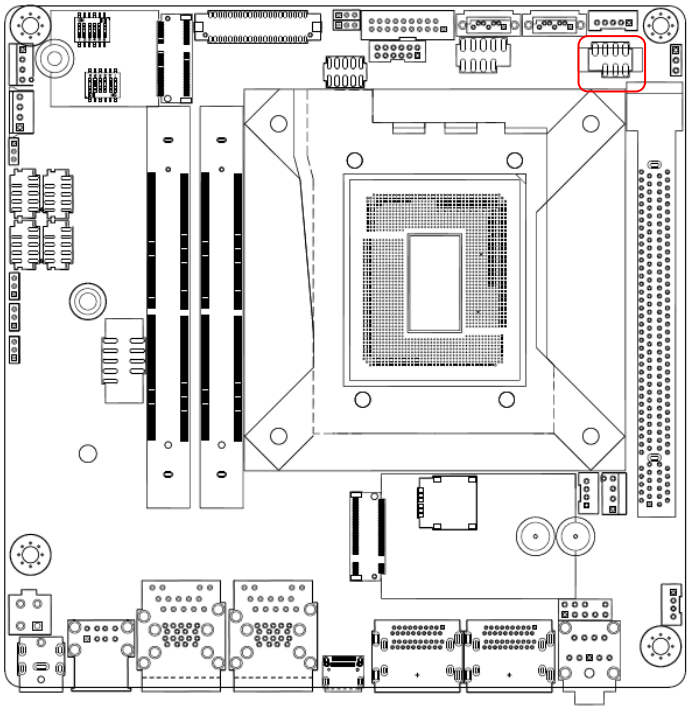
Pin	Signal Name	Pin	Signal Name
1	NC	21	+3.3V_LVDS
2	GND	22	NC
3	EDP_DN3	23	GND
4	EDP_DP3	24	GND
5	GND	25	GND
6	EDP_DN2	26	GND
7	EDP_DP2	27	EDP_HPD
8	GND	28	GND
9	EDP_DN1	29	GND
10	EDP_DP1	30	GND
11	GND	31	GND
12	EDP_DN0	32	BL_EN
13	EDP_DP0	33	Brightness
14	GND	34	NC
15	EDP_AUX_P	35	NC
16	EDP_AUX_N	36	+12V_LVDS
17	GND	37	+12V_LVDS
18	+3.3V_LVDS	38	+12V_LVDS
19	+3.3V_LVDS	39	+12V_LVDS
20	+3.3V_LVDS	40	NC

1.7.16 eSPI1 Debug Header



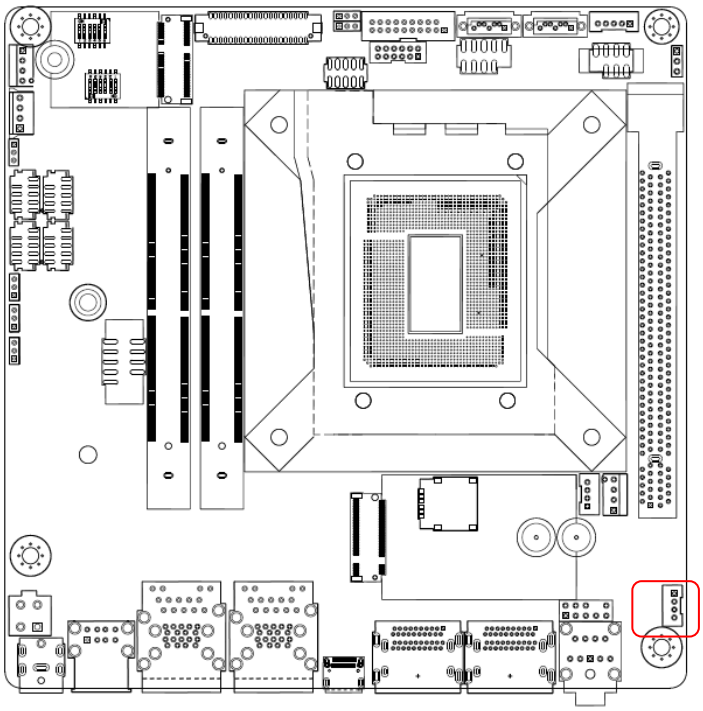
Pin	Signal Name	Pin	Signal Name
1	eSPI_IO0	2	+3.3VSB
3	eSPI_IO1	4	eSPI_RST#
5	eSPI_IO2	6	eSPI_CS1#
7	eSPI_IO3	8	eSPI_CLK
9	+3.3V	10	GND

1.7.17 SPI Header



Pin	Signal Name	Pin	Signal Name
1	VCC3	2	GND
3	SPI_CS#	4	SPI_CLK
5	SPI_MISO	6	SPI_MOSI
7	HOLD#	8	Key

1.7.18 Amplified Audio Header



Pin	Signal Name
1	AMP_R-
2	AMP_R+
3	AMP_L-
4	AMP_L+

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

2

BIOS Step

Chapter 2 - BIOS Setup

2.1 BIOS Setup Program

This motherboard supports a programmable firmware chip that you can update using the provided utility. Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup." This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware hub.

The firmware hub on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On-Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** from the BIOS menu screen.
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the system builder's website to download the latest BIOS file for this motherboard

2.1.1 Legend Box

The keys in the legend bar allow you to navigate through the various setup menus

Key(s)	Function Description
→←	Select Screen
↑↓	Select Item
Enter	Select
+ -	Change Opt.
F1	General Help
F2	Previous Values
F3	Optimal Defaults
F4	Save and Exit
ESC	Exit

2.1.2 List Box

This box appears only in the opening screen. The box displays an initial list of configurable items in the menu you selected.

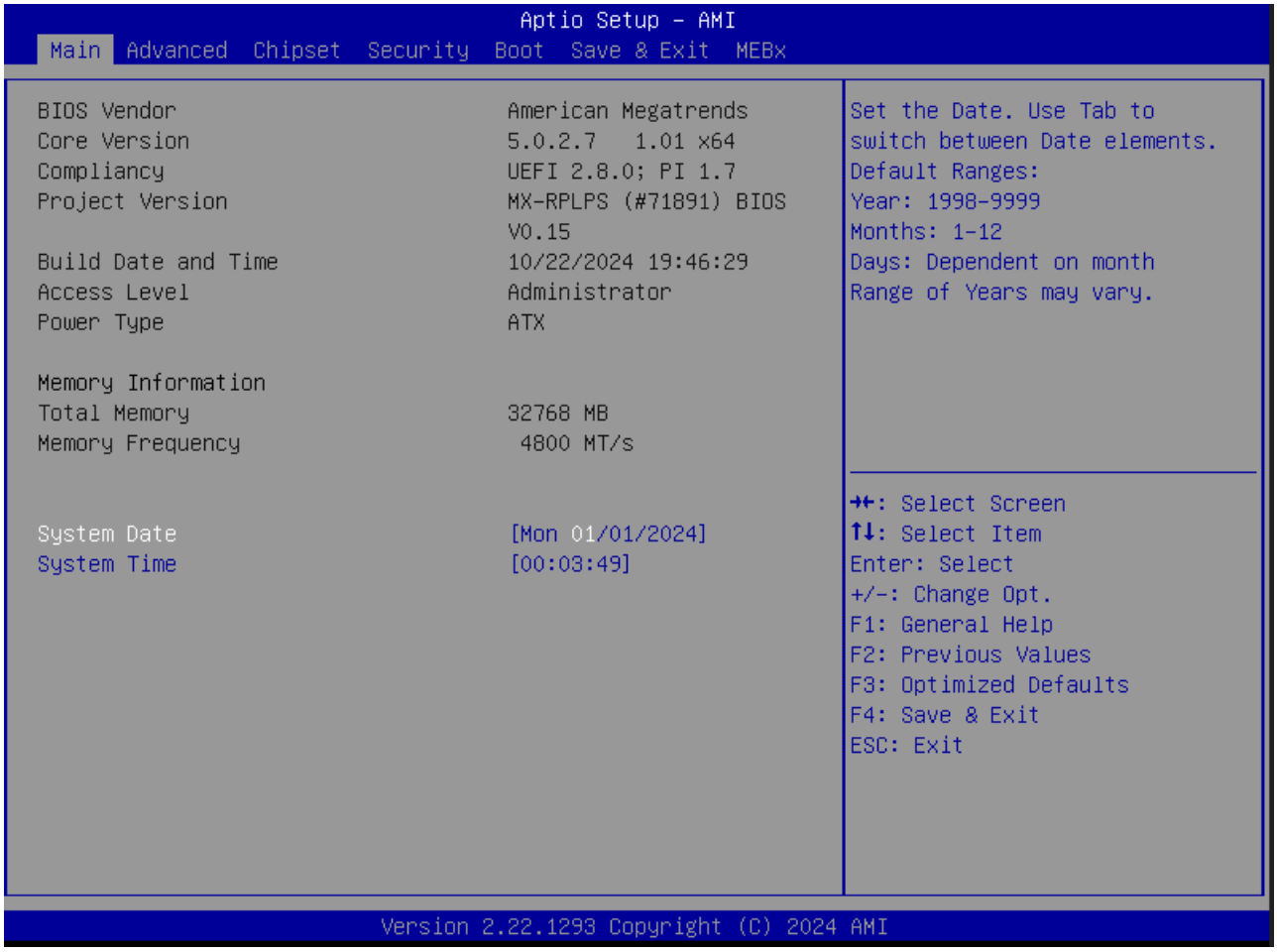
2.1.3 Sub-menu

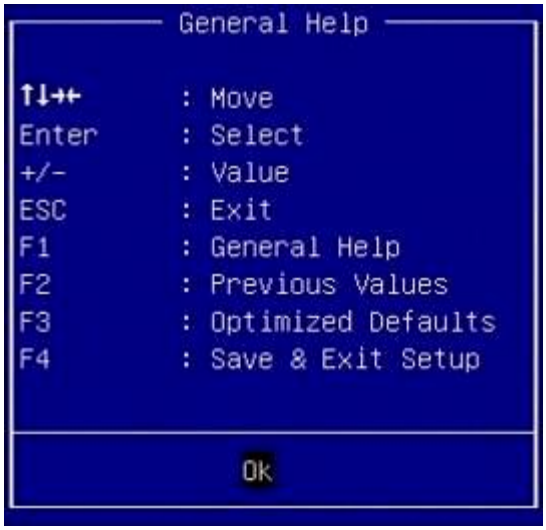
Note that a right pointer symbol appears to the left of certain fields. This pointer indicates that you can display a sub-menu from this field. A sub-menu contains additional options for a field parameter. To display a sub-menu, move the highlight to the field and press <Enter>. The sub-menu appears. Use the legend keys to enter values and move from field to field within a sub-menu as you would within a menu. Use the <Esc> key to return to the main menu.

Take some time to familiarize yourself with the legend keys and their corresponding functions. Practice navigating through the various menus and submenus. If you accidentally make unwanted changes to any of the fields, press <F3> to load the optimal default values. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right of each menu. This window displays the help text for the currently highlighted field.

2.2 BIOS Menu Screen

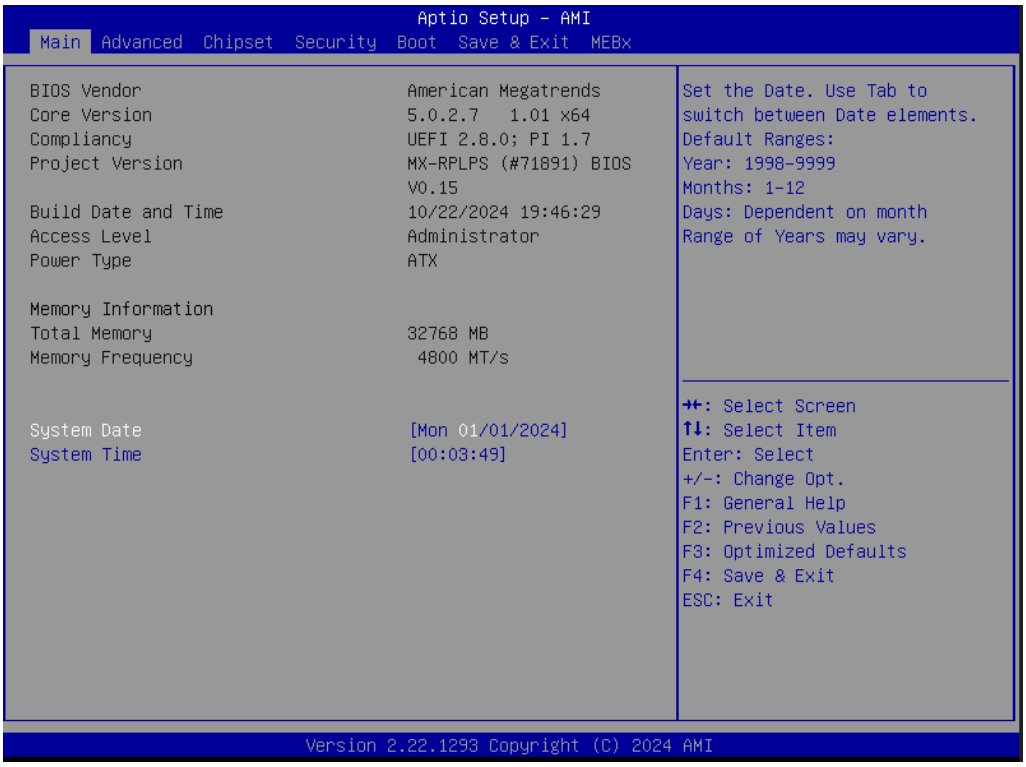
When you enter the BIOS, the following screen appears. The BIOS menu screen displays the items that allow you to make changes to the system configuration. To access the menu items, press the up/down/right/left arrow key on the keyboard until the desired item is highlighted, then press [Enter] to open the specific menu.





2.3 Main Setup

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu. Use this menu for basic system configurations, such as time, date etc.



BIOS Information

Displays the auto-detected BIOS information.

- **System Date**

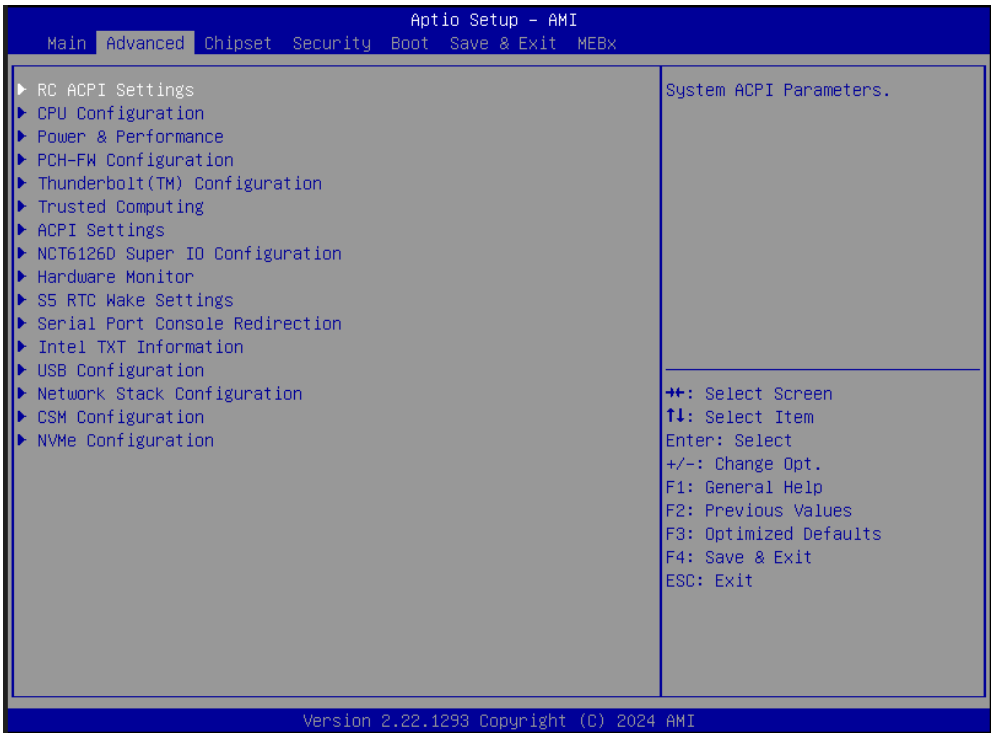
The date format is <Date>, <Month>, <Day>,<Year>.

- **System Time**

The time format is <Hour>, <Minute>, <Second>.

2.4 Advanced BIOS Setup

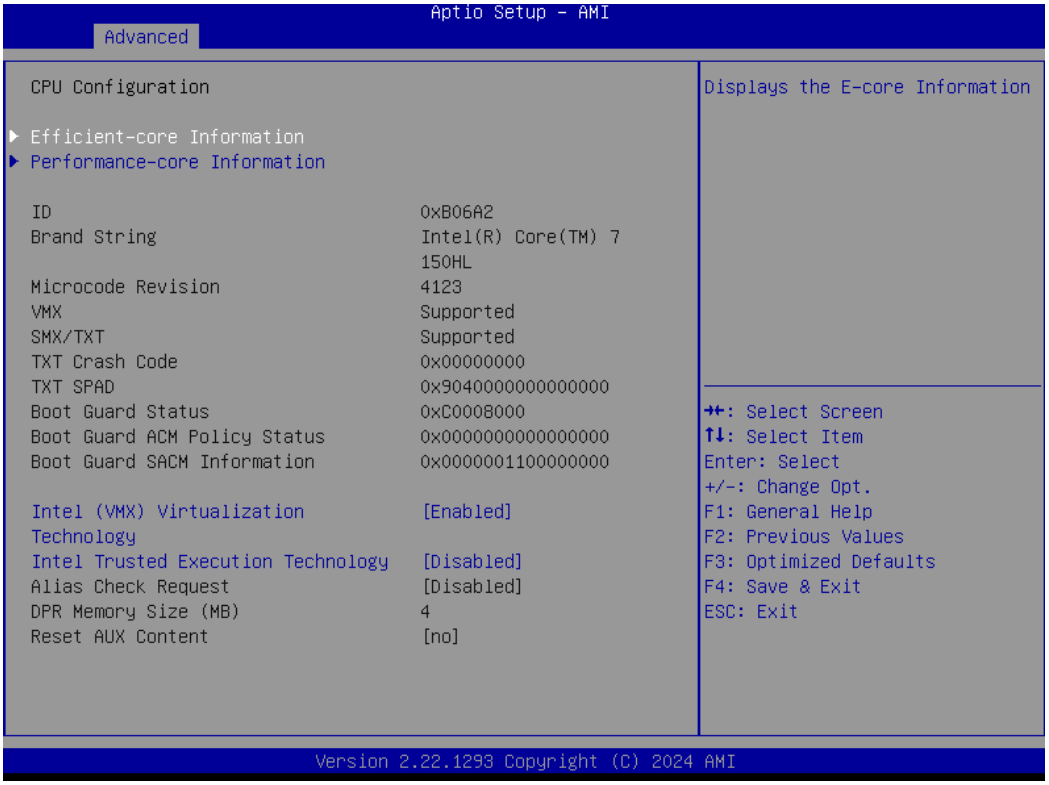
Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Chipset configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> 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.



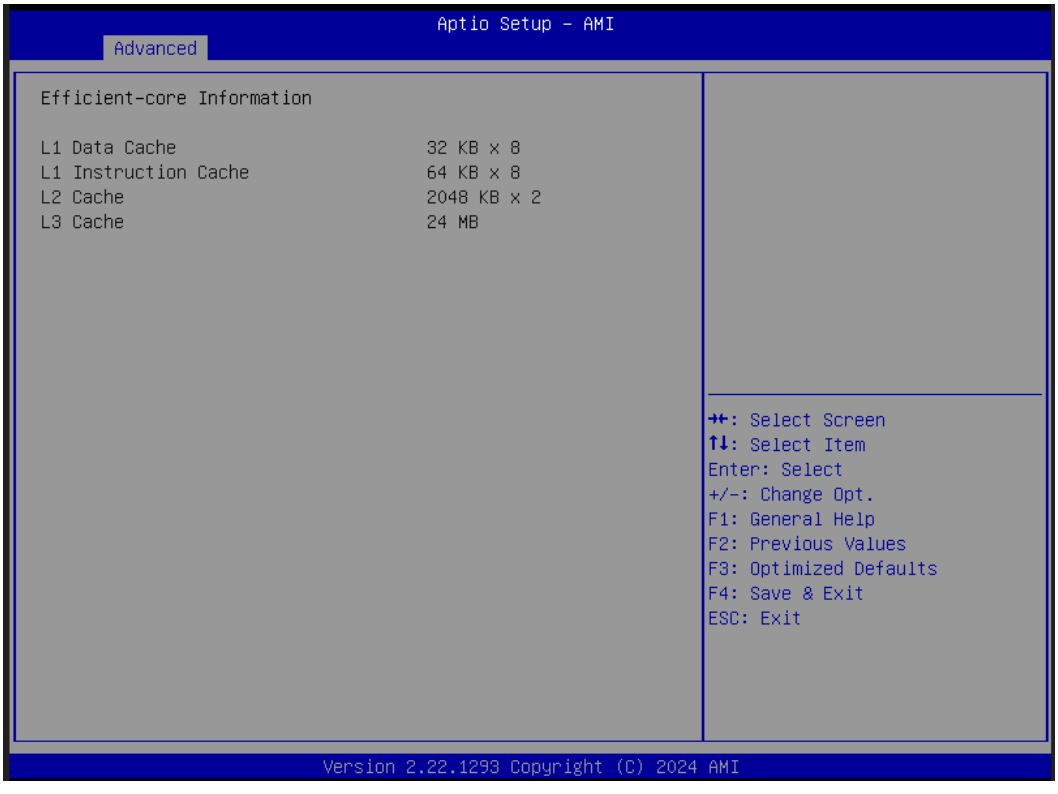
Proceed with caution when modifying Advanced menu settings, as incorrect values may cause system instability. Incorrect field values can cause the system to malfunction.

2.4.1 CPU Configuration

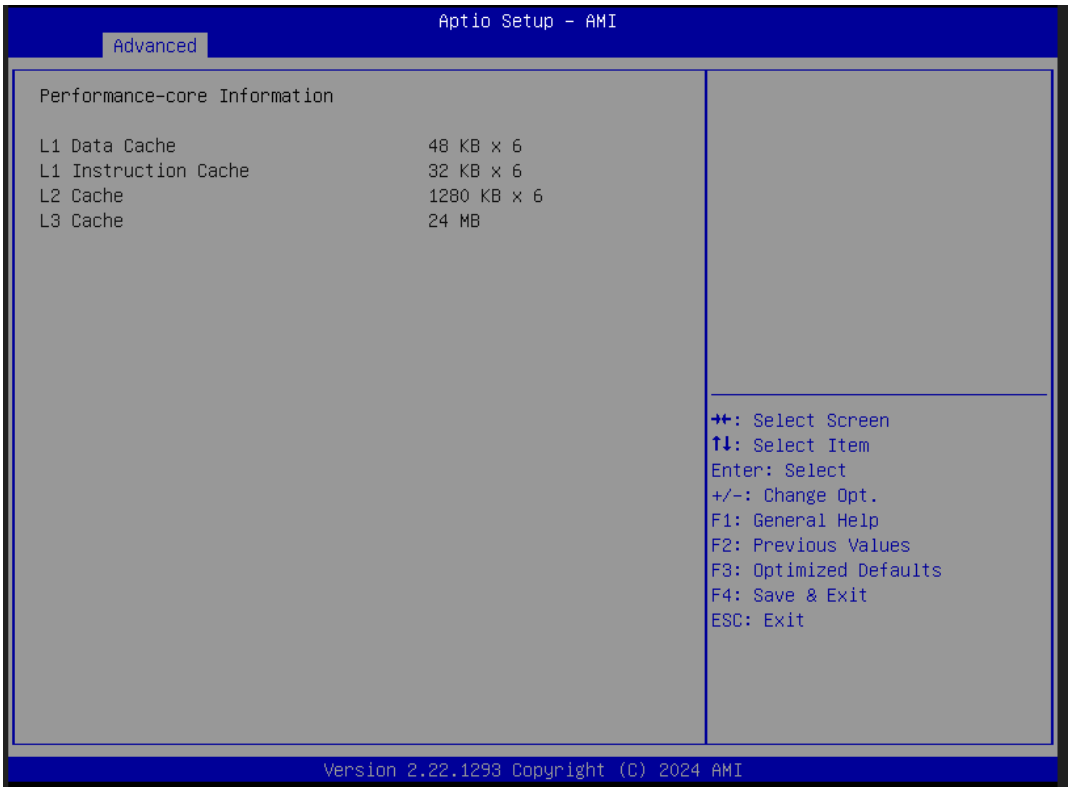
Display CPU information and related setting



- Efficient-core Information



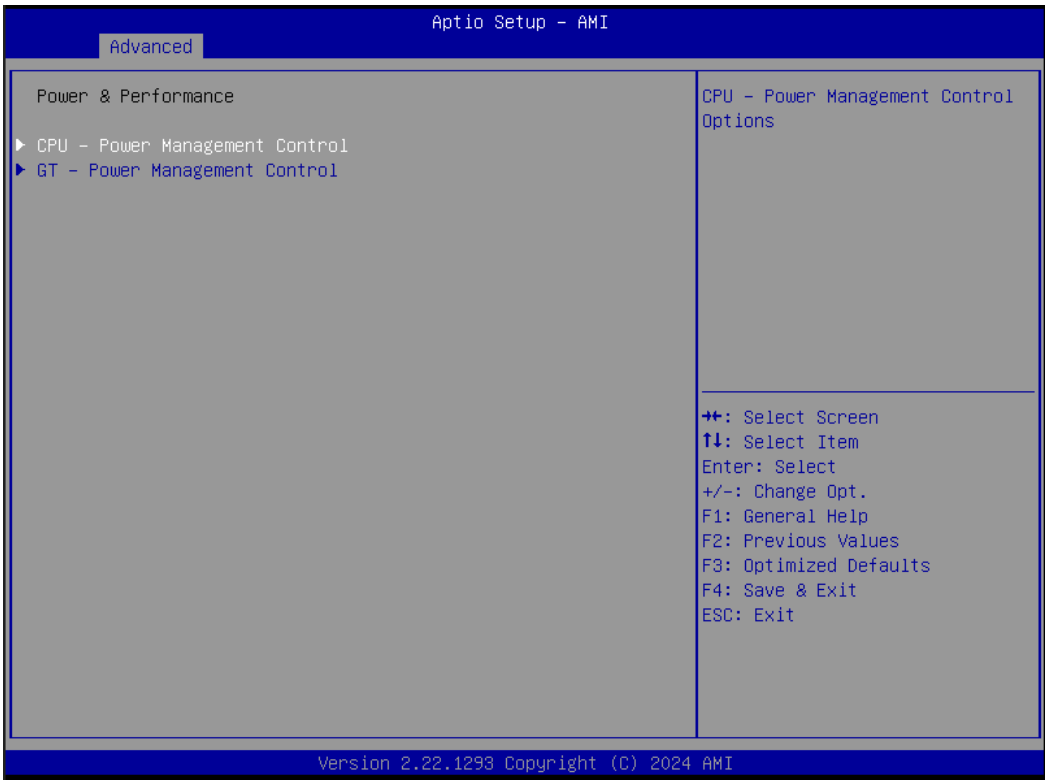
- Performance-core Information



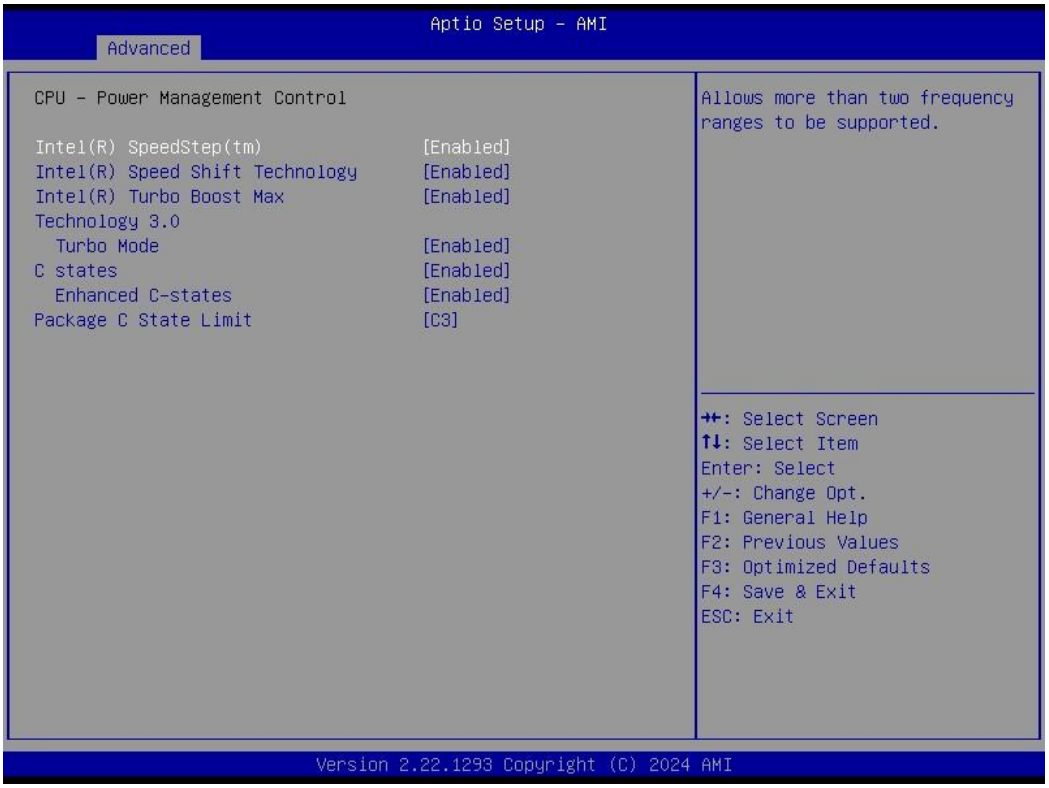
- Intel (VMX) Virtualization Technology: [Enabled]/ [Disabled]
- Intel Trusted Execution Technology: [Enabled]/ [Disabled]
- Alias Check Request: [Disabled]
- DPR Memory Size (MB): 4
- Reset AUX Content: [no]

2.4.2 Power & Performance

Power management control for CPU



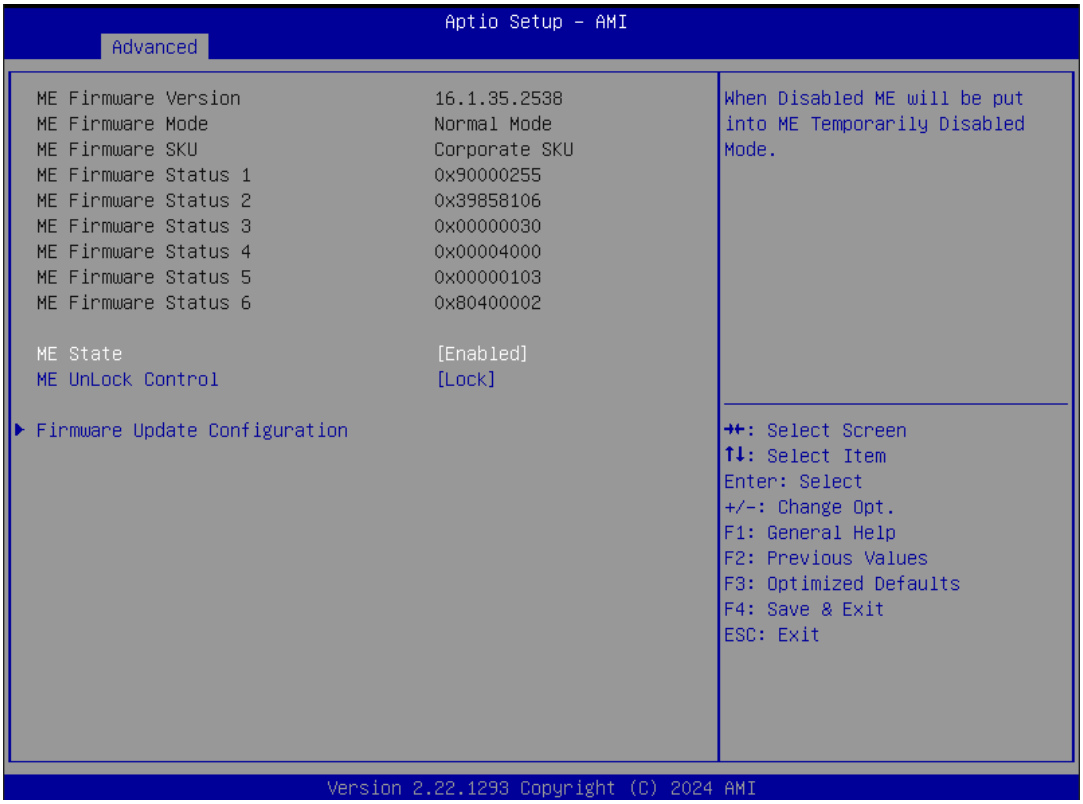
- CPU Power Management Control



- GT Power Management Control

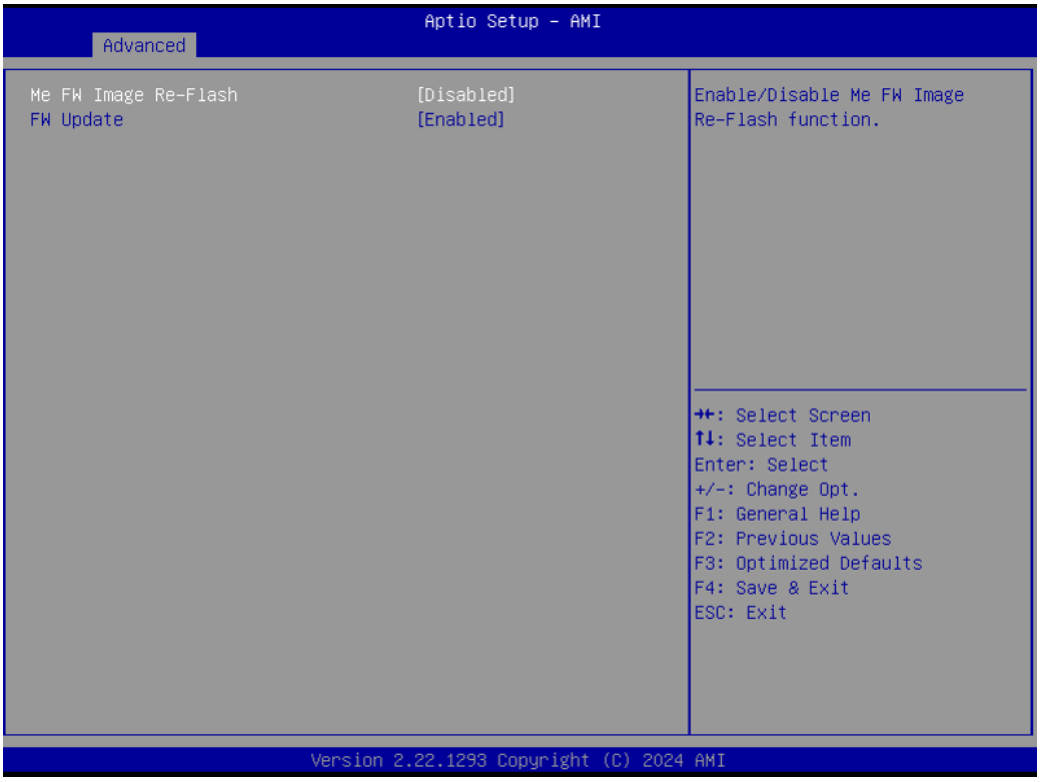
2.4.3 PCH-FW configuration

Configure Management Engine Technology Parameters



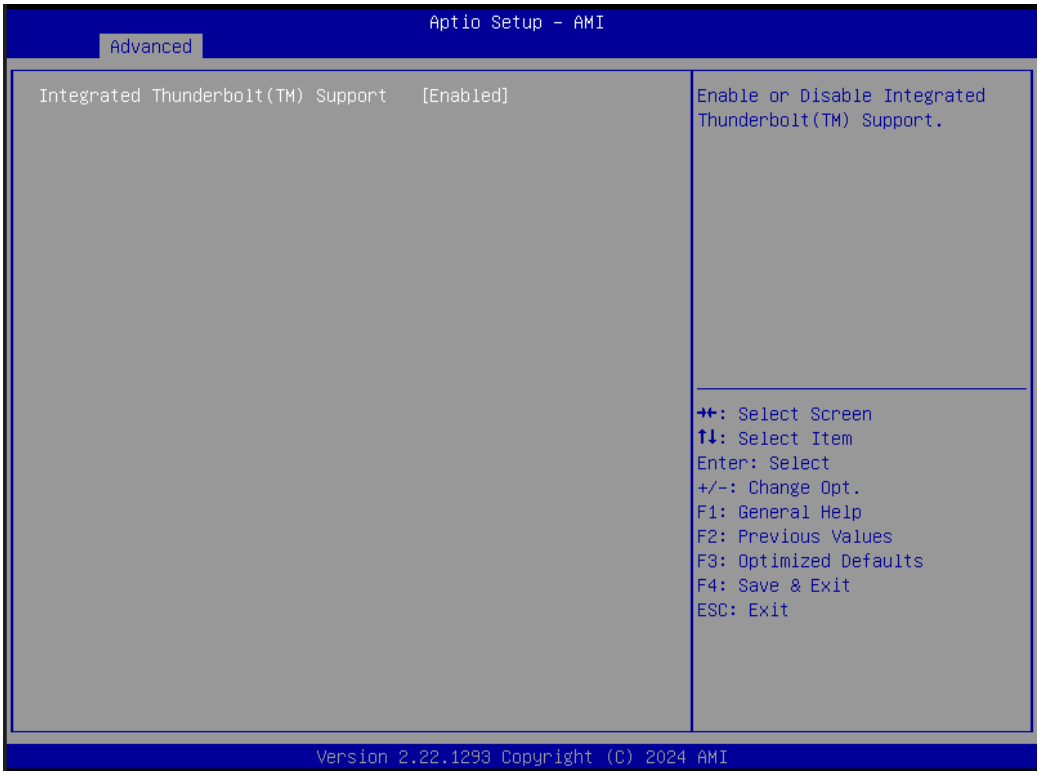
- ME State: [Enabled]/ [Disabled]

- ME UnLock Control: [Lock]/ [UnLock]
- Firmware Update Configuration



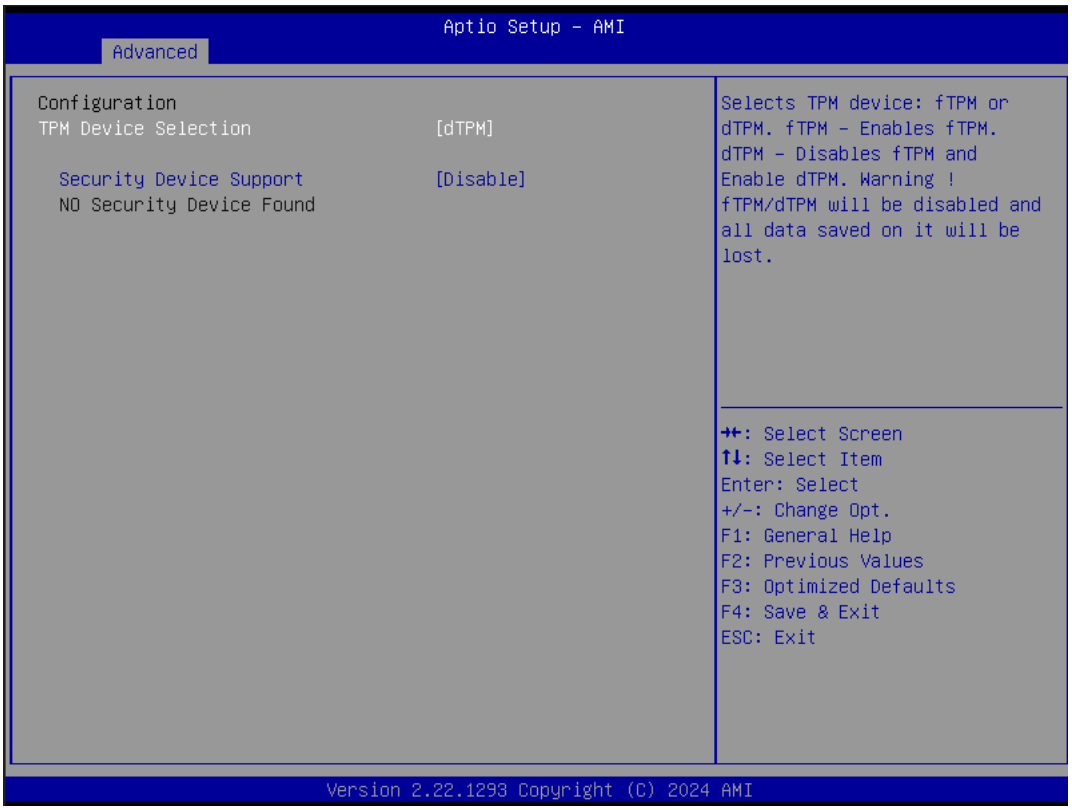
2.4.4 Thunderbolt configuration

Thunderbolt Support: Enable or disable Thunderbolt functionality.: [Enabled]/ [Disabled]

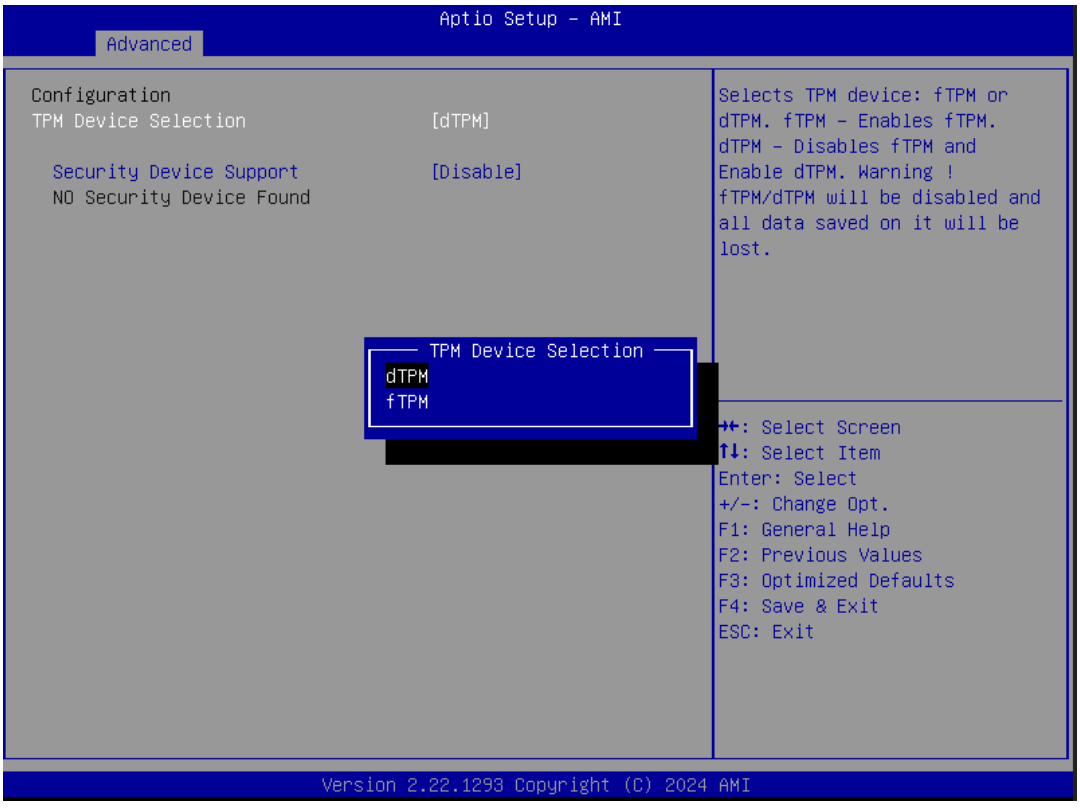


2.4.5 Trusted Computing

Security device settings



- **TPM Device Selection: [dtpm]/[ftpm]**



- **Security Device support [Disabled]**

  Enable or disable BIOS support for the security device.

  Configuration options: [Enable] [Disable]

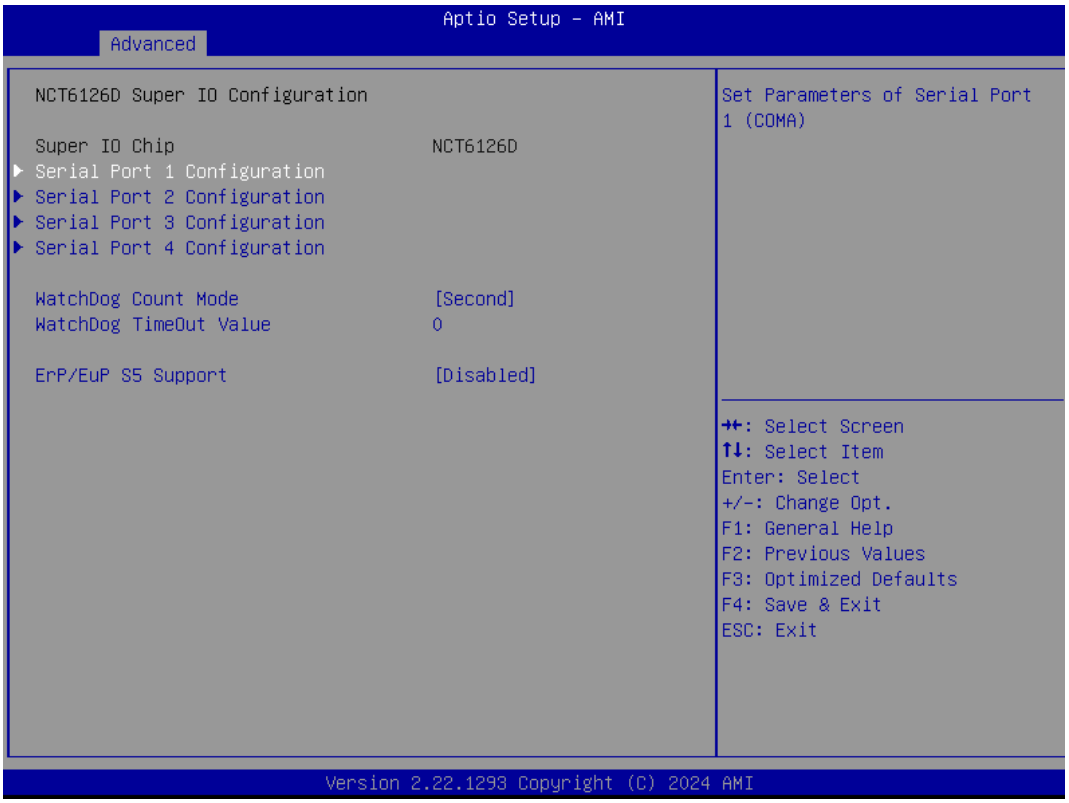
2.4.5 ACPI Settings

- **Enable Hibernation [Enable]**
  Enable or Disable system ability to Hibernation.
  Configuration options: [Enable] [Disable]
- **ACPI Sleep State [S3 only (Suspend to RAM)]**
  Select the highest ACPI sleep state the system will enter the SUSPEND button is press.
  Configuration options: [Suspend Disable] [S3 (suspend to RAM)]

- **PCIE# wake from S5 [Disabled]**
  Enable or disable PCIE wake the system from S5.
  Configuration options: [Disabled] [Enabled]
- **Wake on Ring [Disabled]**
  Enable or disable wake on ring function under ACPI S3/S4/S5.
  Configuration options: [Disabled] [Enabled]

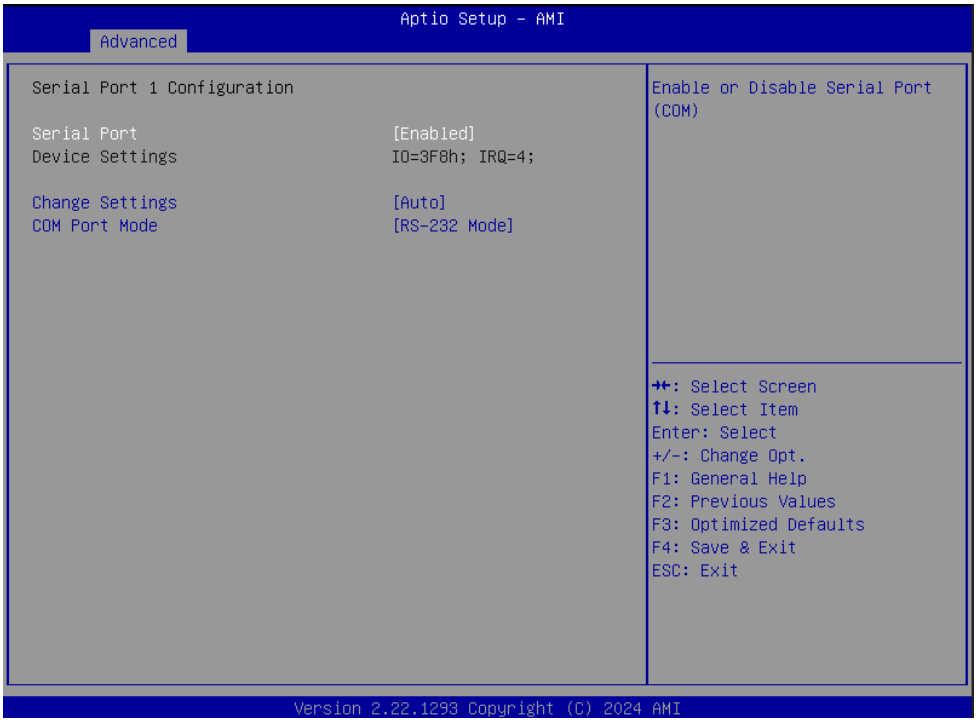
2.4.6 NCT6126D Super IO configuration

Provide NCT6126D super IO configuration settings

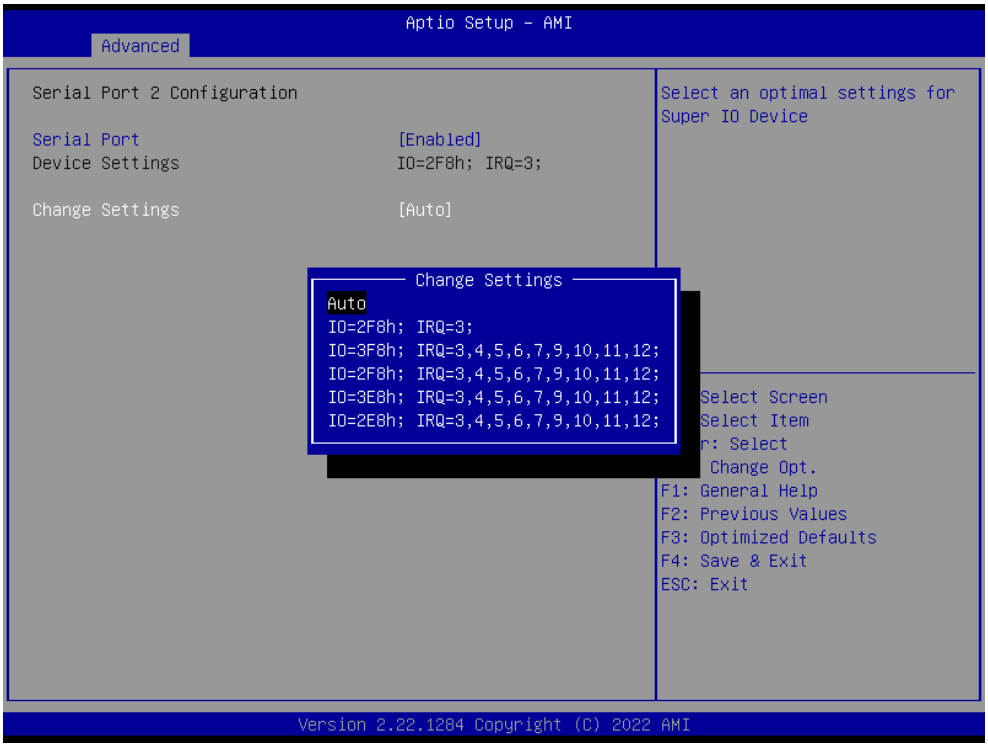


- **WatchDog count mode [Second]**
  WatchDog count mode Selection
  Configuration options: [Second] [Minute]
- **WatchDog Timeout value**
  Fill watchdog timeout value, 0 means disables
- **ErP/EuP S5 Support [Disabled]**
  Configuration options : [Disabled] [Enabled]

2.4.6.1 Serial Port 1 Configuration

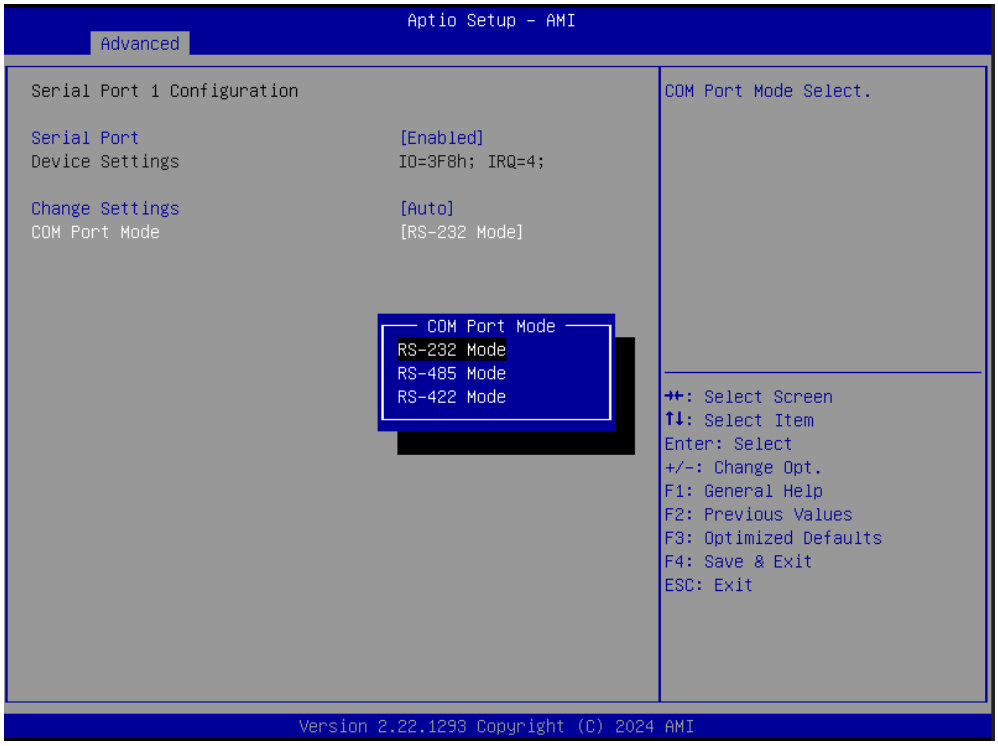


- **Serial Port [Enabled]**
  Enable or Disable serial Port (COM)
  Configuration options: [Disabled] [Enabled]
- **Change Setting [Auto]**
  Select an optimal settings for super IO device
  Configuration options: as below



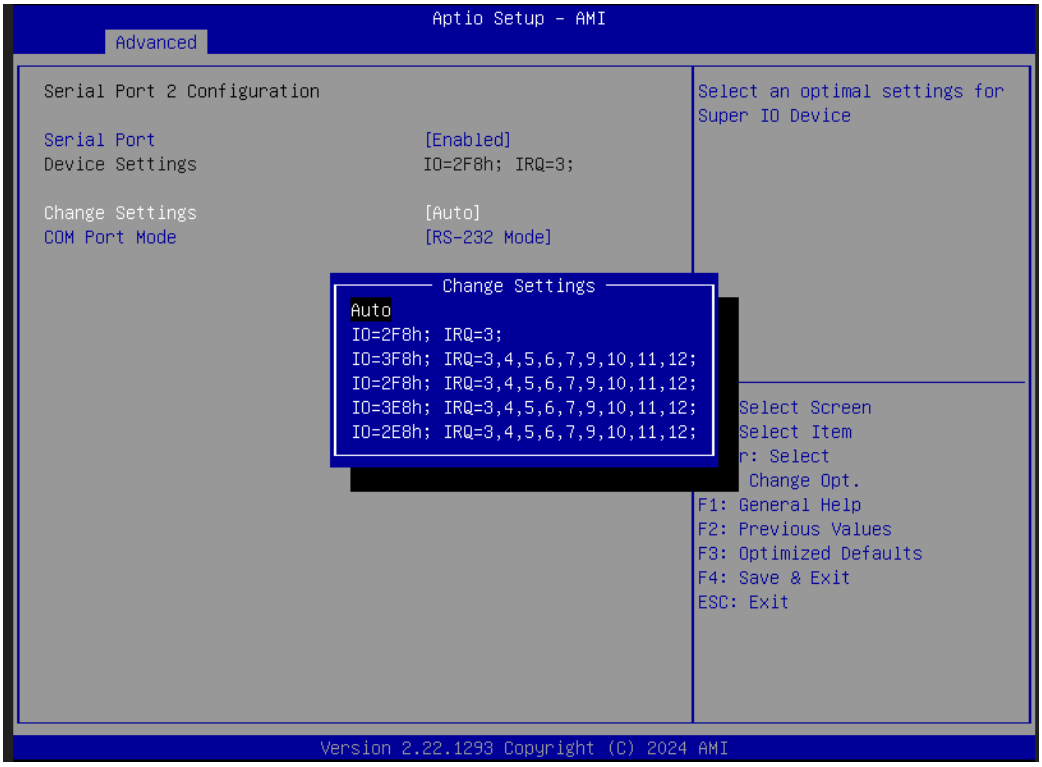
- **COM Mode Select [RS232]**
  Configure the COM port Mode

Configuration options: [RS232][RS485 Half Duplex][RS422 Full Duplex]



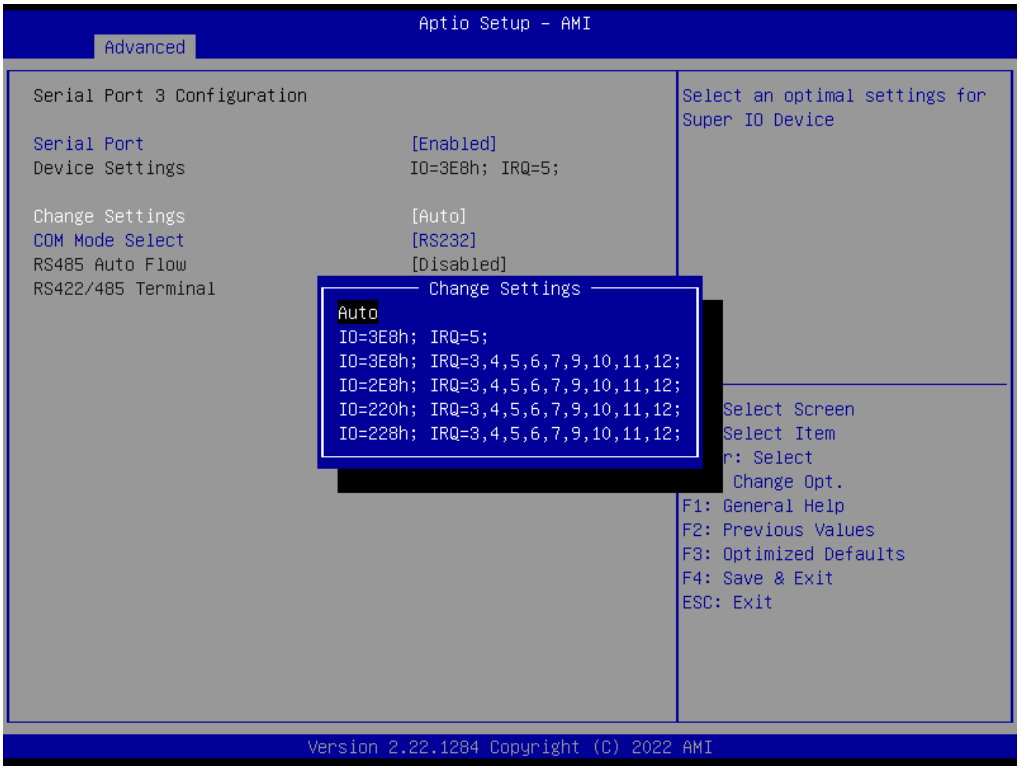
2.4.6.2 Serial Port 2 Configuration

- **Serial Port [Enabled]**
  Enable or Disable serial Port (COM)
  Configuration options: [Disabled] [Enabled]
- **Change Settings [Auto]**
  Select an optimal settings for super IO device
  Configuration options: as below
- **COM Mode Select [RS232]**
  Configure the COM port Mode
  Configuration options: [RS232][RS485 Half Duplex][RS422 Full Duplex]



2.4.6.3 Serial Port 3 Configuration

- **Serial Port [Enabled]**
  Enable or Disable serial Port (COM)
  Configuration options: [Disabled] [Enabled]
- **Change Settings [Auto]**
  Select an optimal settings for super IO device
  Configuration options: as below



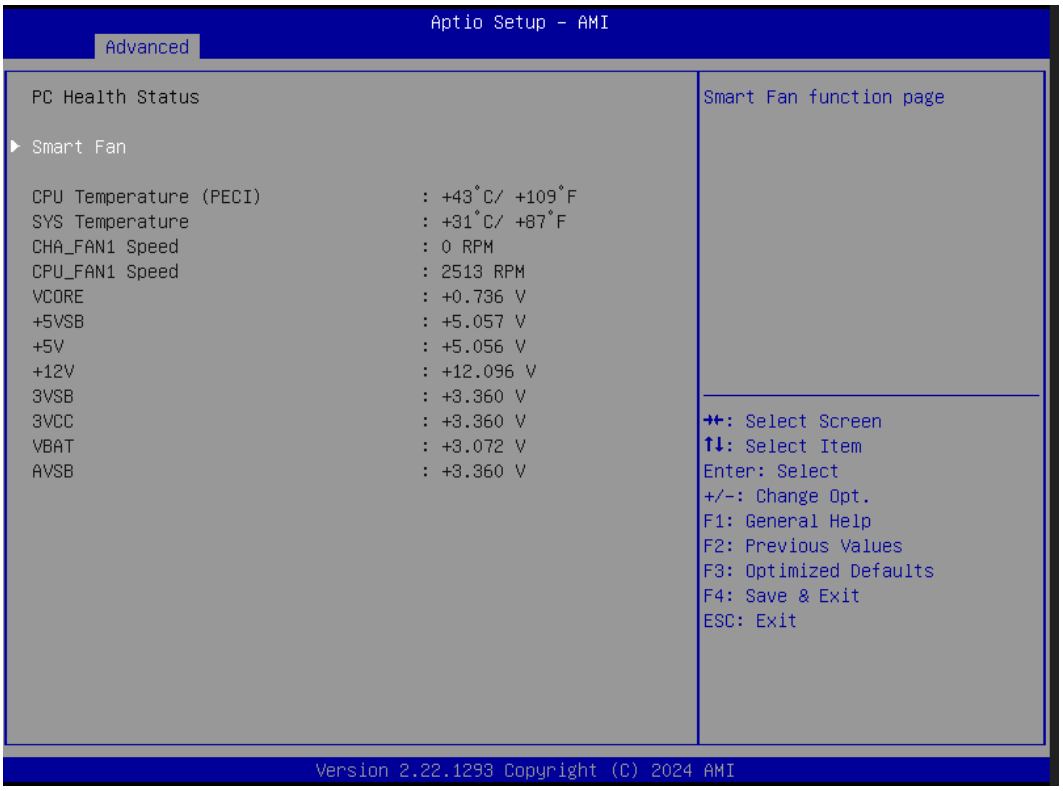
- **COM Mode Select [RS232]**

  Configure the COM port Mode

  Configuration options: [RS232][RS485 Half Duplex][RS422 Full Duplex]

2.4.7 Hardware monitor

Display Hardware monitor information

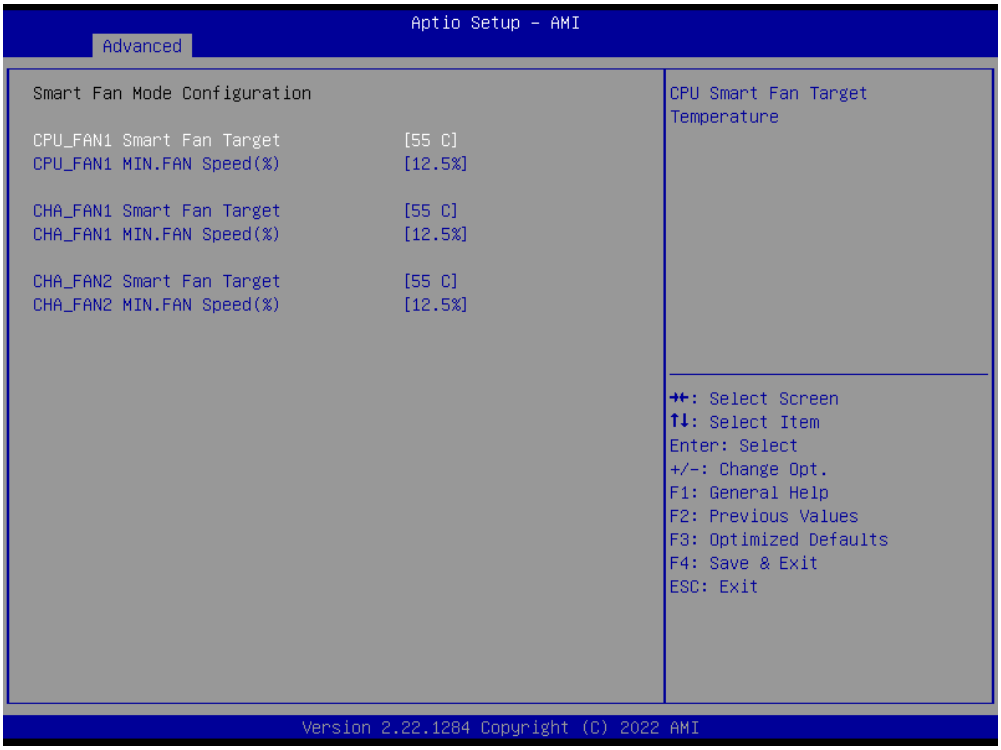


2.4.7.1 Smart FAN

- **Smart FAN Function [Enabled]**
  Smart fan function Enable/Disabled
  Configuration Options : [Enabled] [Disabled][Manual]

- *2.4.7.1.1 Smart FAN mode Configuration*

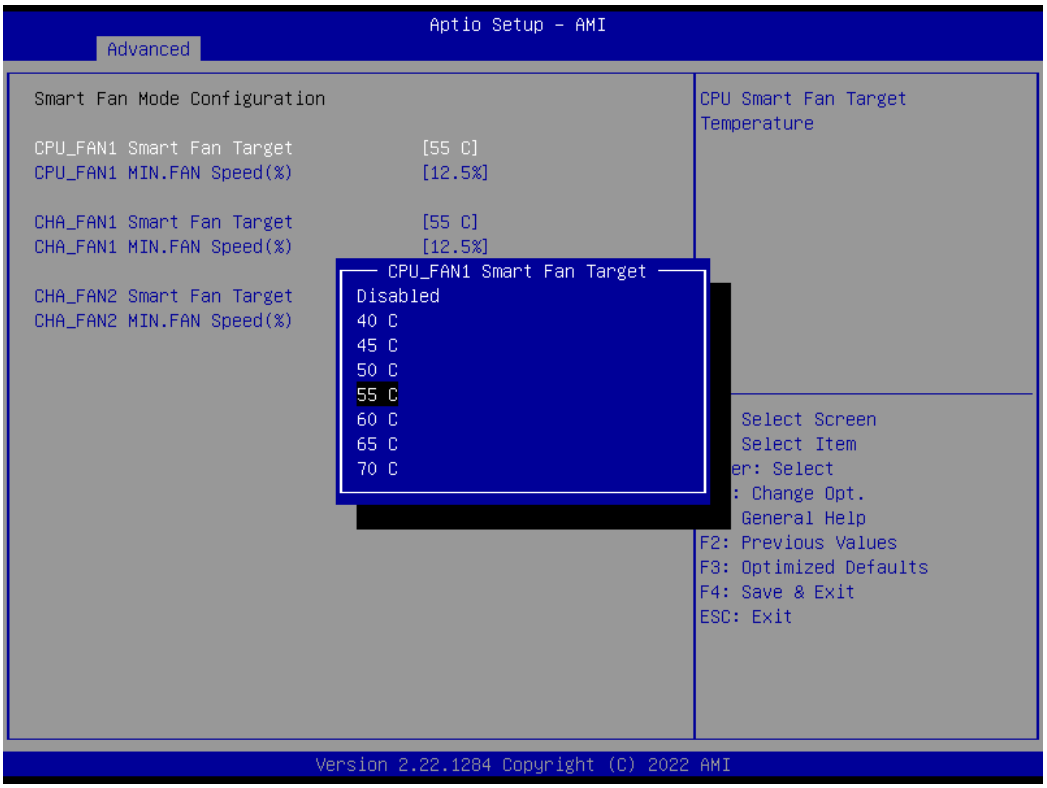
Setting different FAN on this motherboard



- **SYS_FAN1/CPU_FAN1/CHA_FAN1 FAN Target**

  Smart FAN target temperature

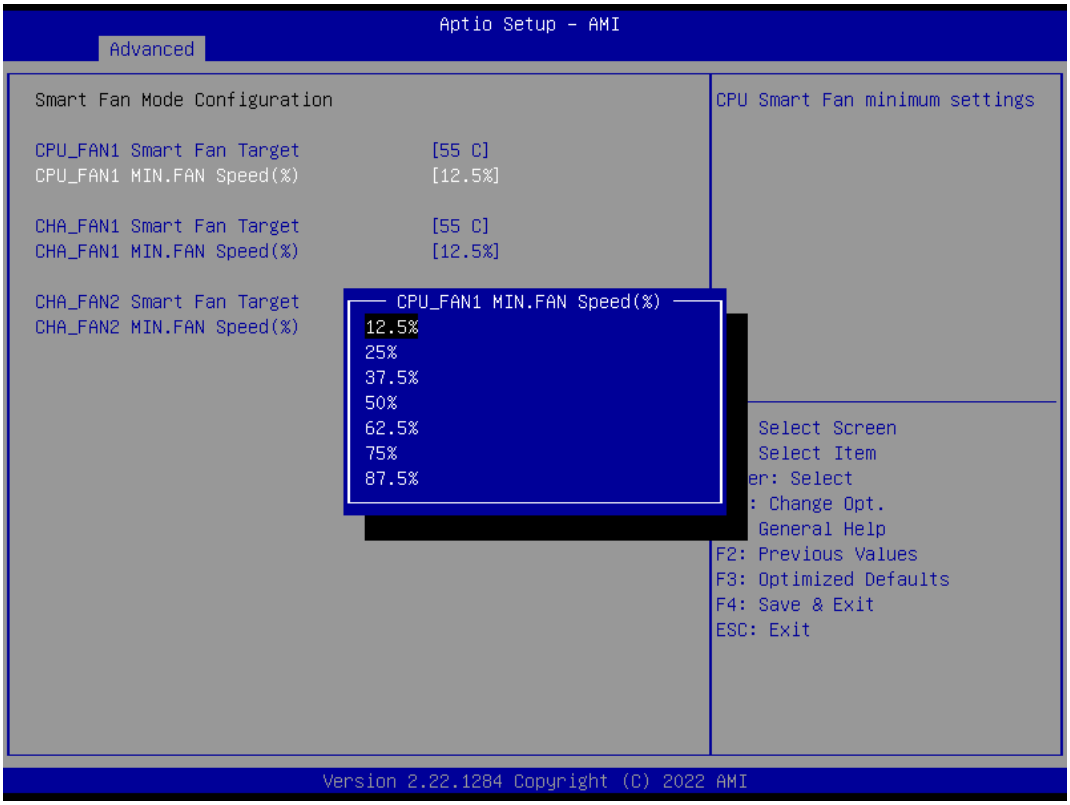
  Configuration options: Please see below picture



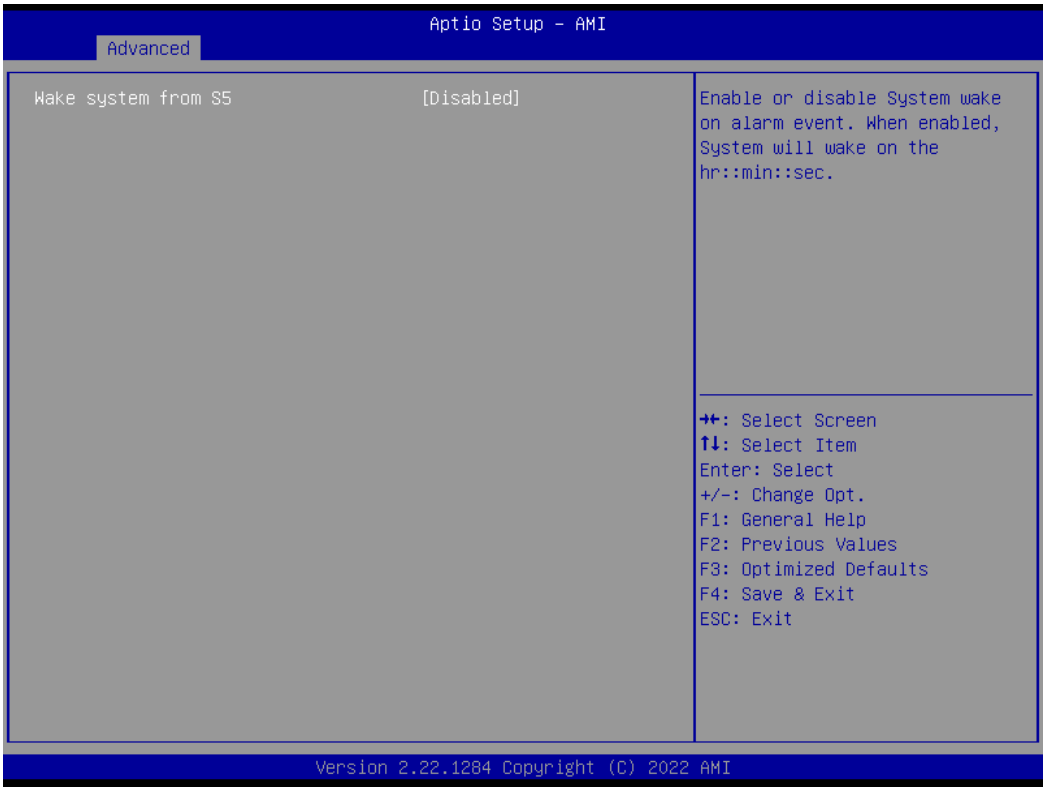
- **CPU_FAN1/CHA_FAN1/CHA_FAN2 MIN.FAN Speed (%)**

  CPU or Chassis Smart FAN minimum settings

  Configuration options: Please see below picture



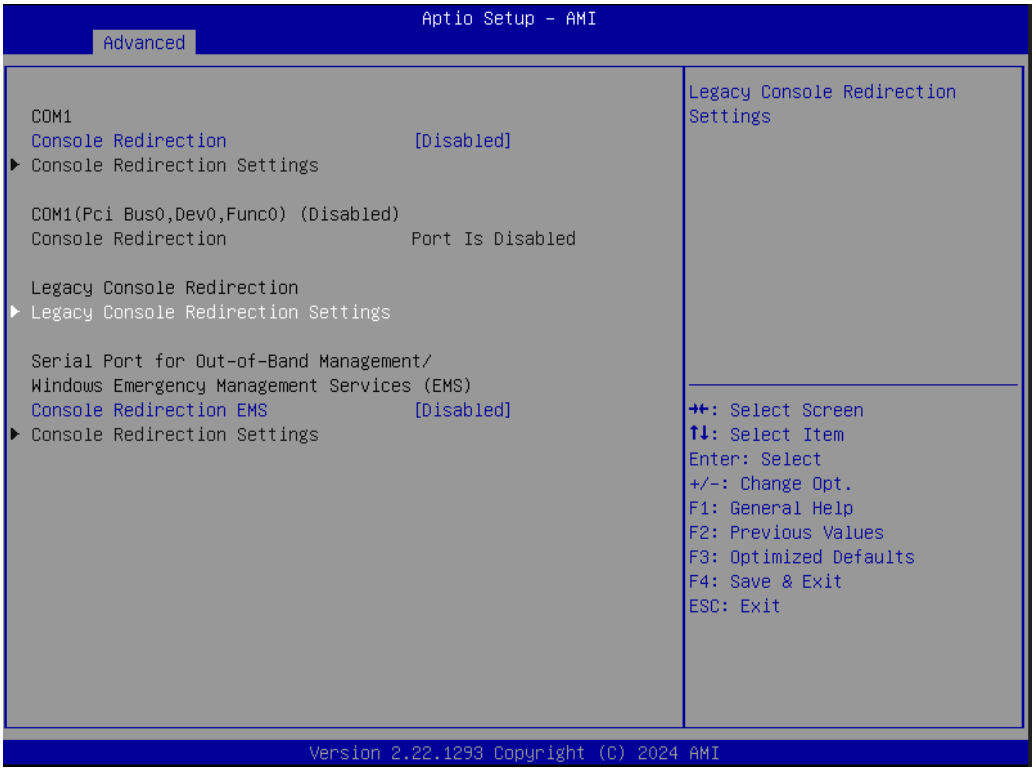
2.4.8 S5 RTC wake settings



- **Wake system from S5 [Disabled]**
  Enabled or Disabled system wake on alarm event
  Configuration options: [Enabled] [Disabled]

2.4.9 Serial Port Console Redirection

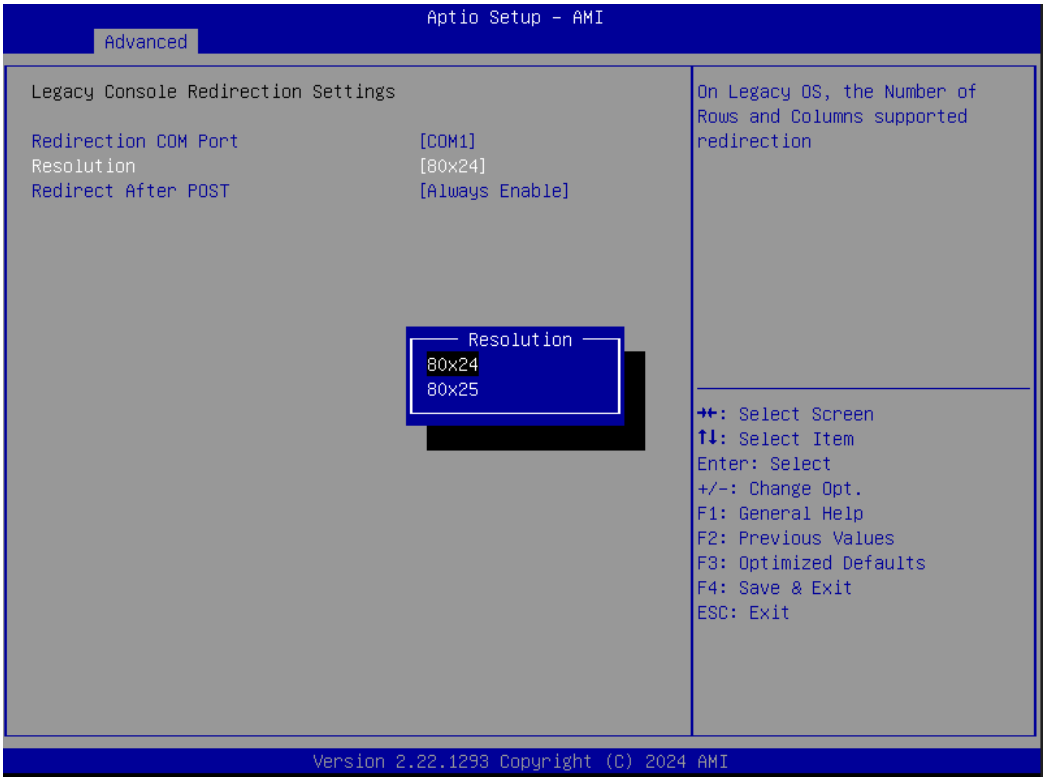
Display CPU configuration

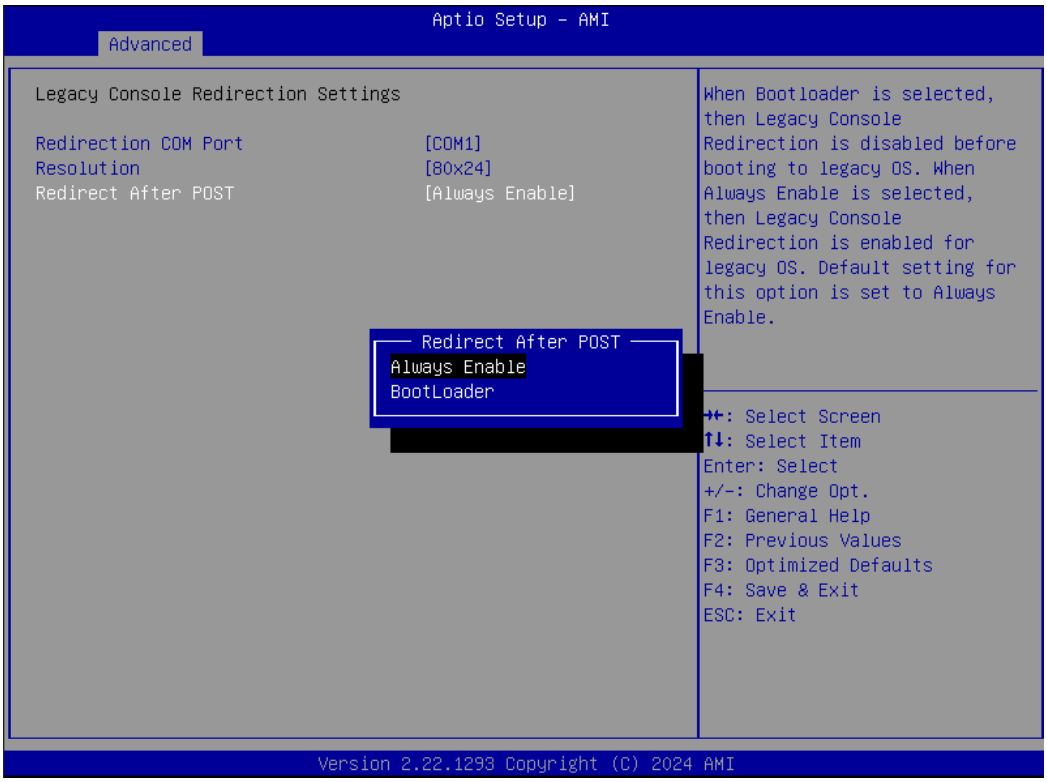


- **Console Redirection [Disabled]**

Enabled or Disabled COM1 Console redirection

Configuration options: [Disabled][Enabled]

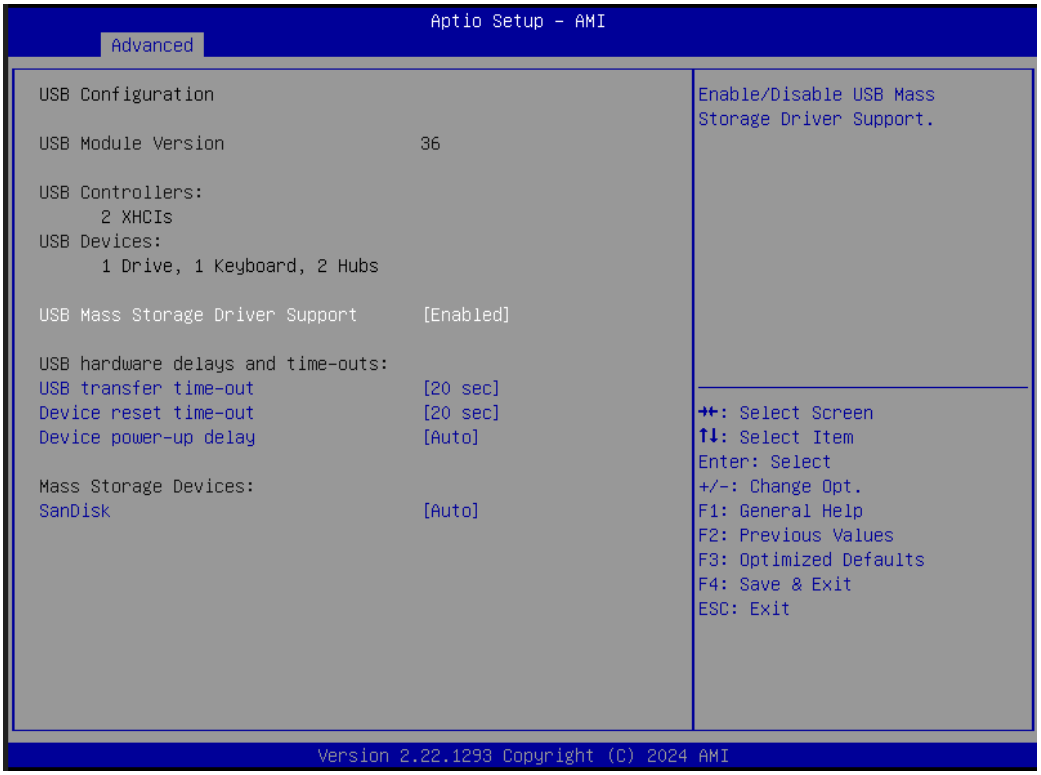

Aptio Setup – AMI
Advanced
Legacy Console Redirection Settings
Redirection COM Port [COM1]
Resolution [80x24]
Redirect After POST [Always Enable]
Resolution
80x24
80x25
On Legacy OS, the Number of Rows and Columns supported redirection
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1293 Copyright (C) 2024 AMI


Aptio Setup – AMI
Advanced
Legacy Console Redirection Settings
Redirection COM Port [COM1]
Resolution [80x24]
Redirect After POST [Always Enable]
When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable.
Redirect After POST
Always Enable
BootLoader
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1293 Copyright (C) 2024 AMI

2.4.10 intel TXT information

Display Intel TXT information. This depends on CPU sku.

2.4.11 USB configuration



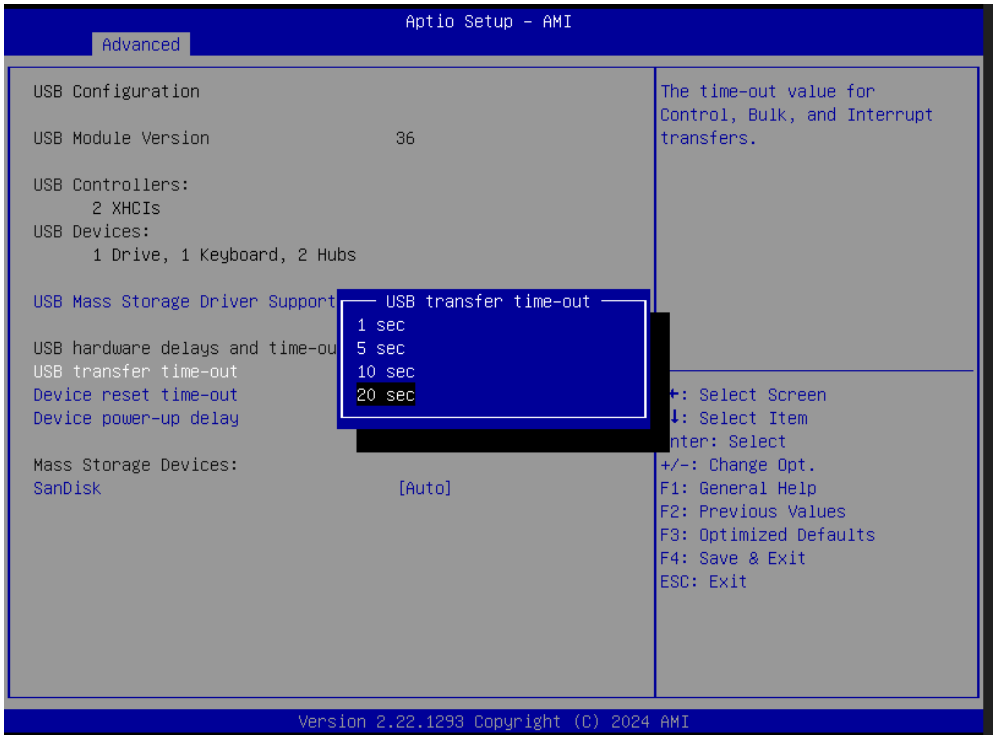
- **USB Mass Storage Driver Support [Enabled]**

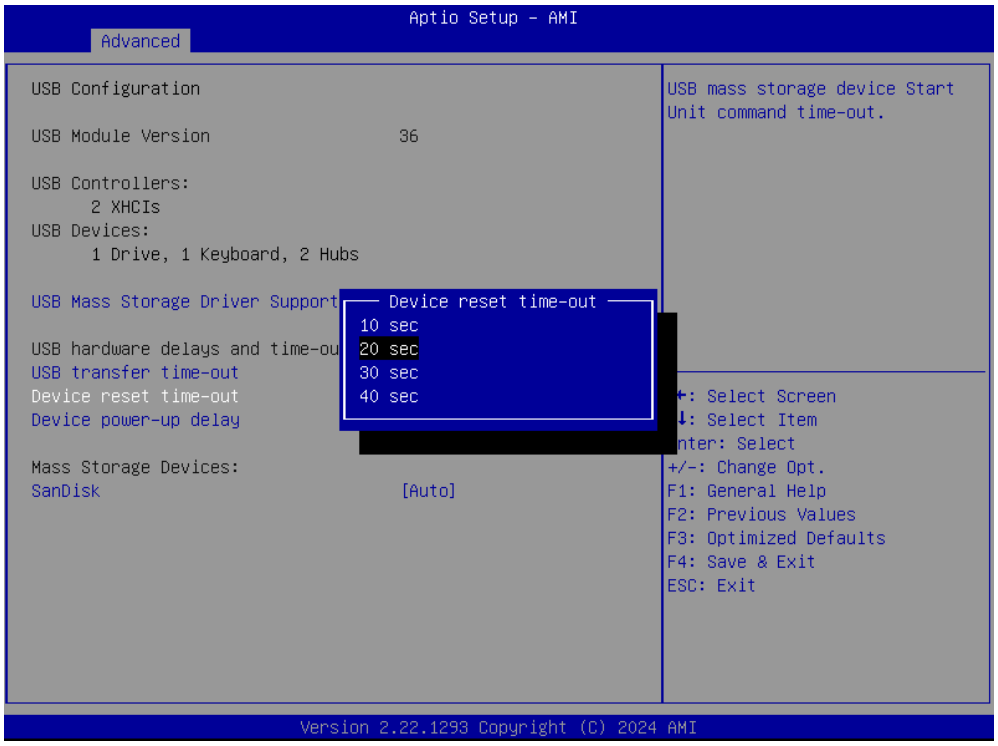
Enable or Disable USB Mass Storage Driver Support

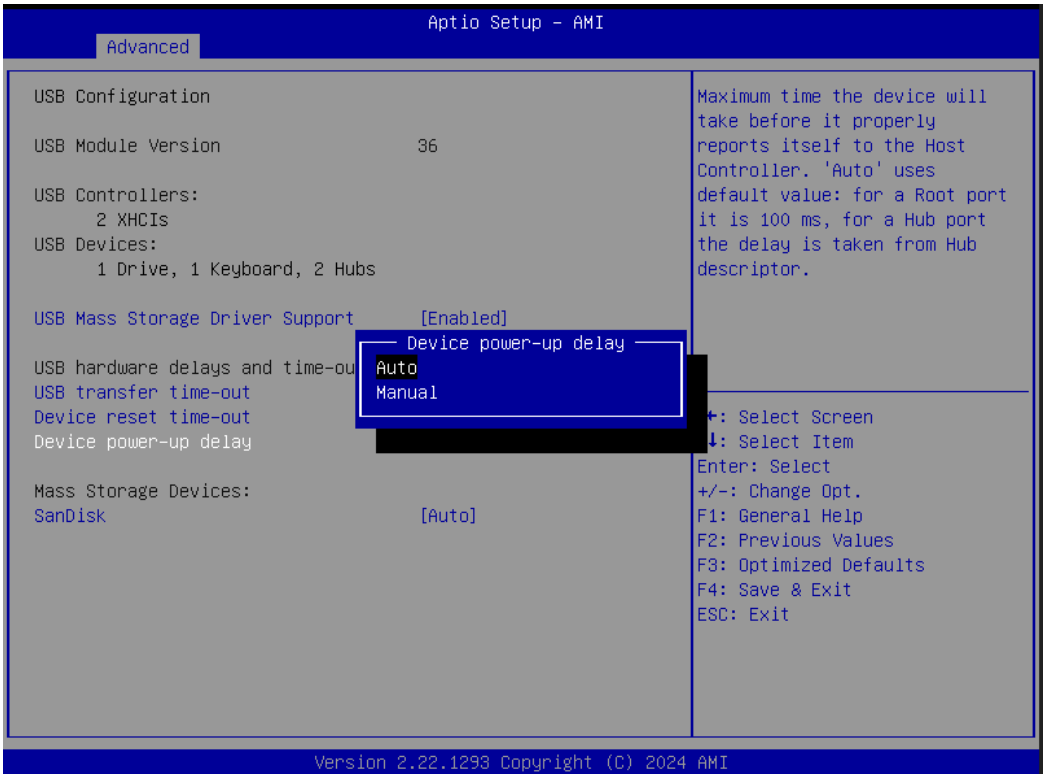
Configuration options: [Enabled][Disabled]

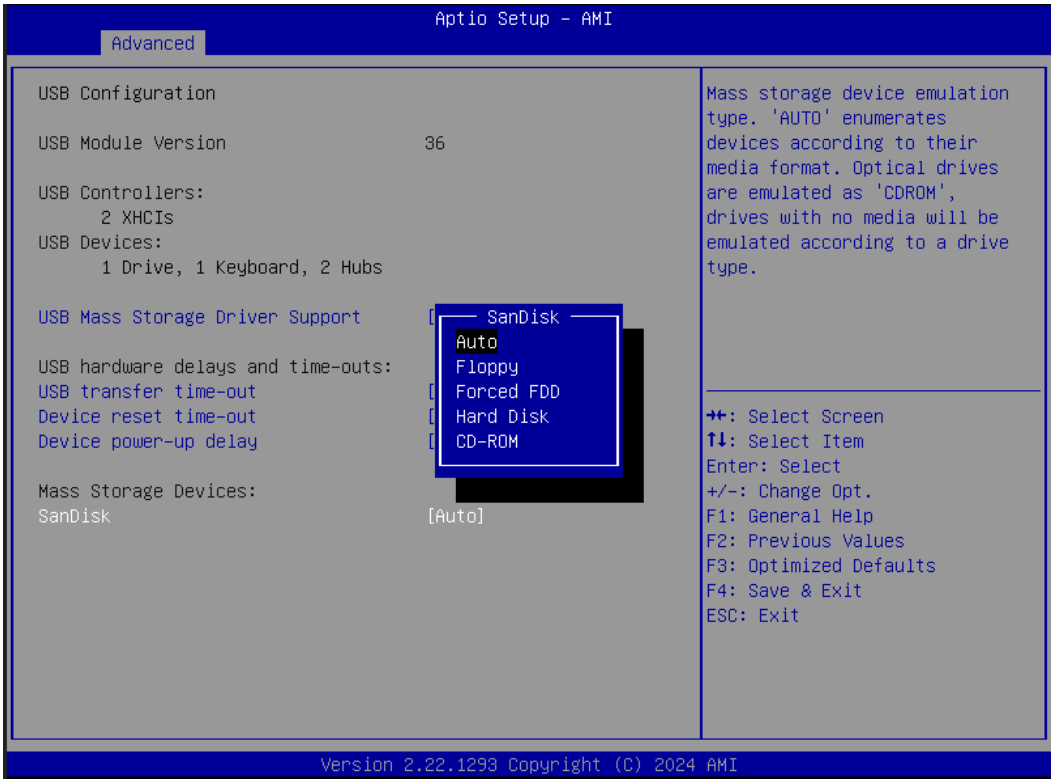
- **Mass Storage Devices [Auto]**

  Mass Storage device emulation Type. "Auto" enumerates device according to its media format.






Aptio Setup - AMI
Advanced
USB Configuration
USB Module Version 36
USB Controllers:
2 XHCIs
USB Devices:
1 Drive, 1 Keyboard, 2 Hubs
USB Mass Storage Driver Support [Enabled]
USB hardware delays and time-ou
USB transfer time-out
Device reset time-out
Device power-up delay
Mass Storage Devices:
SanDisk [Auto]
Device power-up delay
Auto
Manual
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 taken from Hub descriptor.
+: Select Screen
↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1293 Copyright (C) 2024 AMI


Aptio Setup - AMI
Advanced
USB Configuration
USB Module Version 36
USB Controllers:
2 XHCIs
USB Devices:
1 Drive, 1 Keyboard, 2 Hubs
USB Mass Storage Driver Support
USB hardware delays and time-outs:
USB transfer time-out
Device reset time-out
Device power-up delay
Mass Storage Devices:
SanDisk [Auto]
SanDisk
Auto
Floppy
Forced FDD
Hard Disk
CD-ROM
Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.
+: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1293 Copyright (C) 2024 AMI

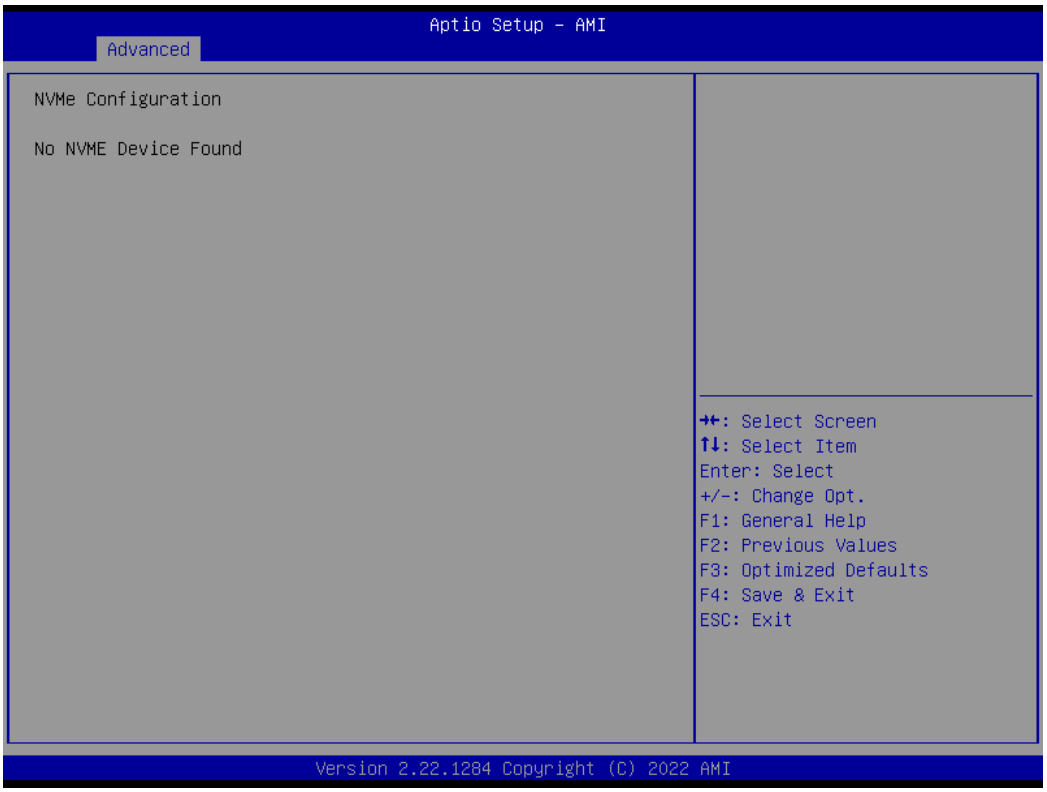
2.4.12 Network Stack Configuration

Network Stack setting

- **Network Stack [Disabled]**
  Enabled/Disabled UEFI Network Stack
  Configuration options: [Enabled][Disabled]

2.4.14 NVMe Configuration

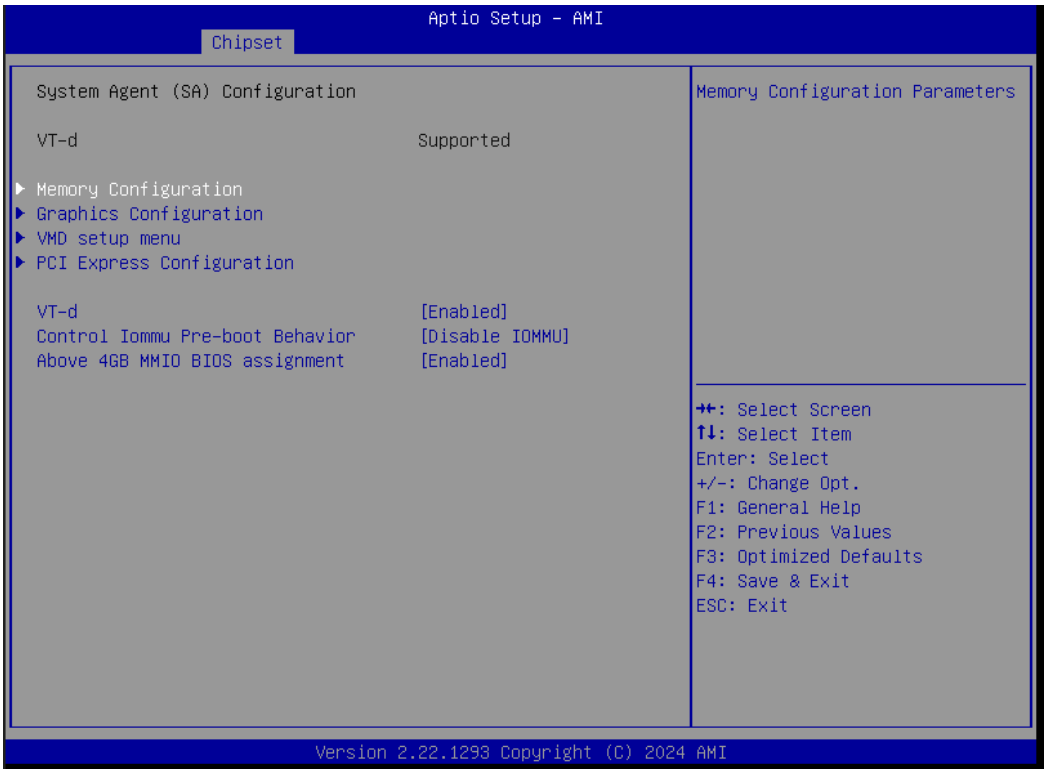
Display NVMe controller or Drive information


Aptio Setup – AMI
Advanced
NVMe Configuration
No NVME Device Found
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1284 Copyright (C) 2022 AMI

2.5 Chipset

Aptio Setup – AMI
Main Advanced Chipset Security Boot Save & Exit MEBx
System Agent (SA) Configuration
PCH-IO Configuration
System Agent (SA) Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1293 Copyright (C) 2024 AMI

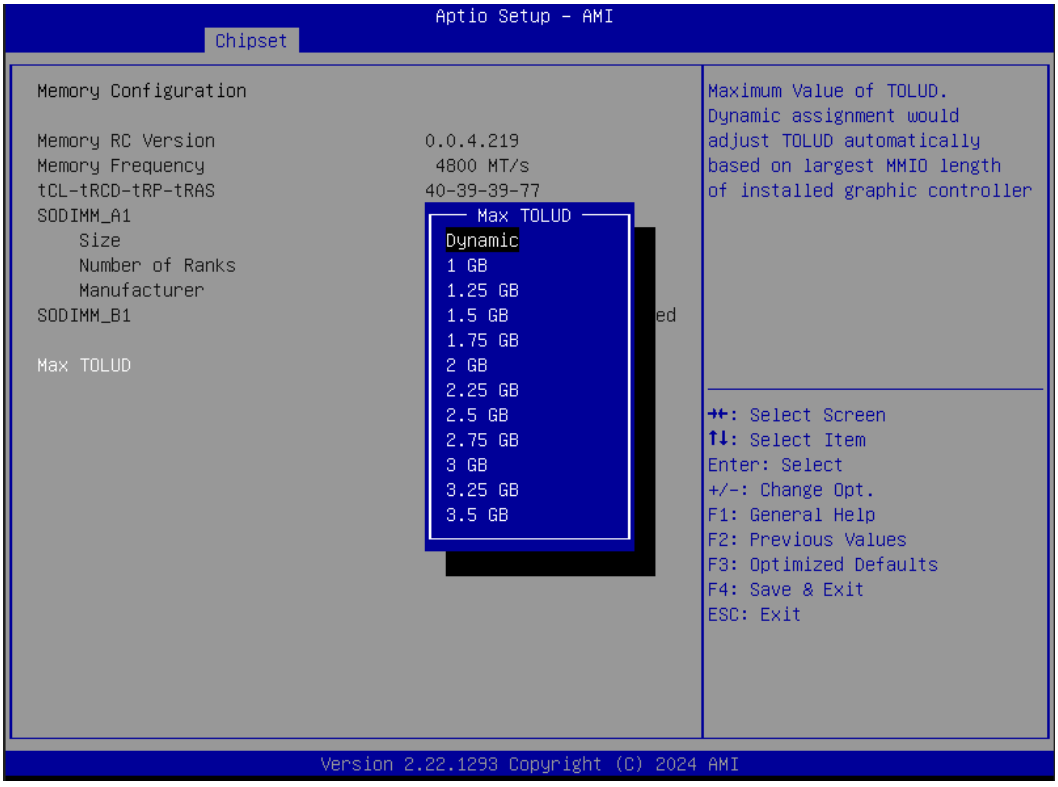
2.5.1 System Agent (SA) Configuration



- **VT-d [Supported]**

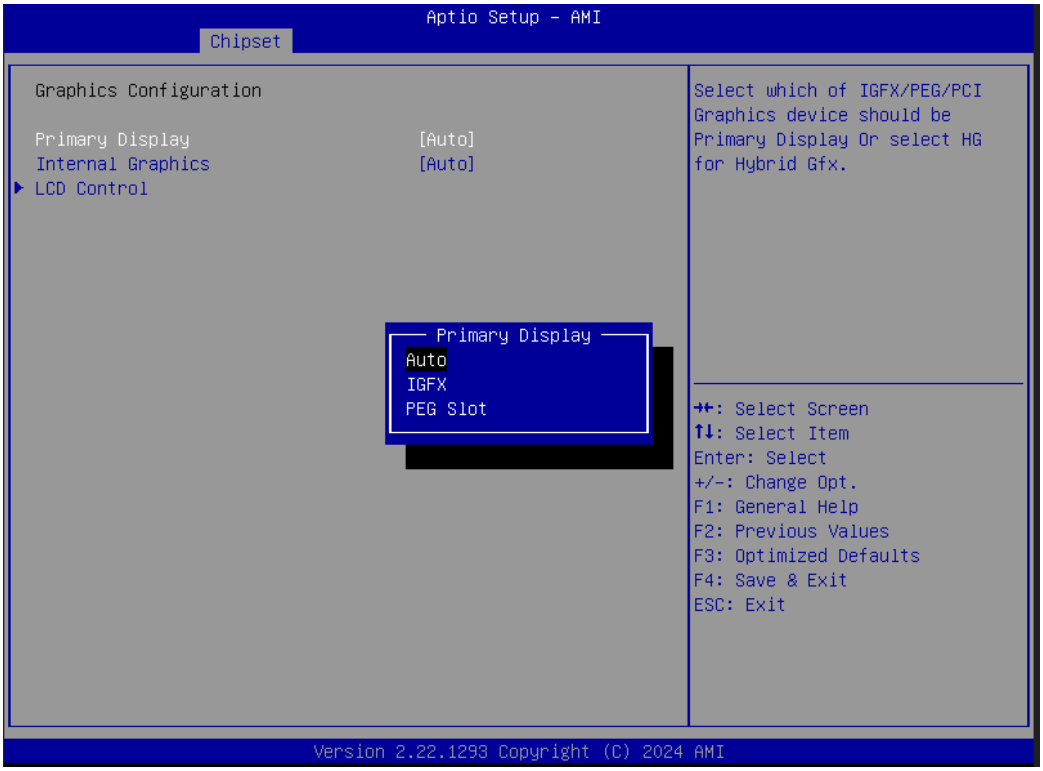
2.5.1.1 Memory Configuration

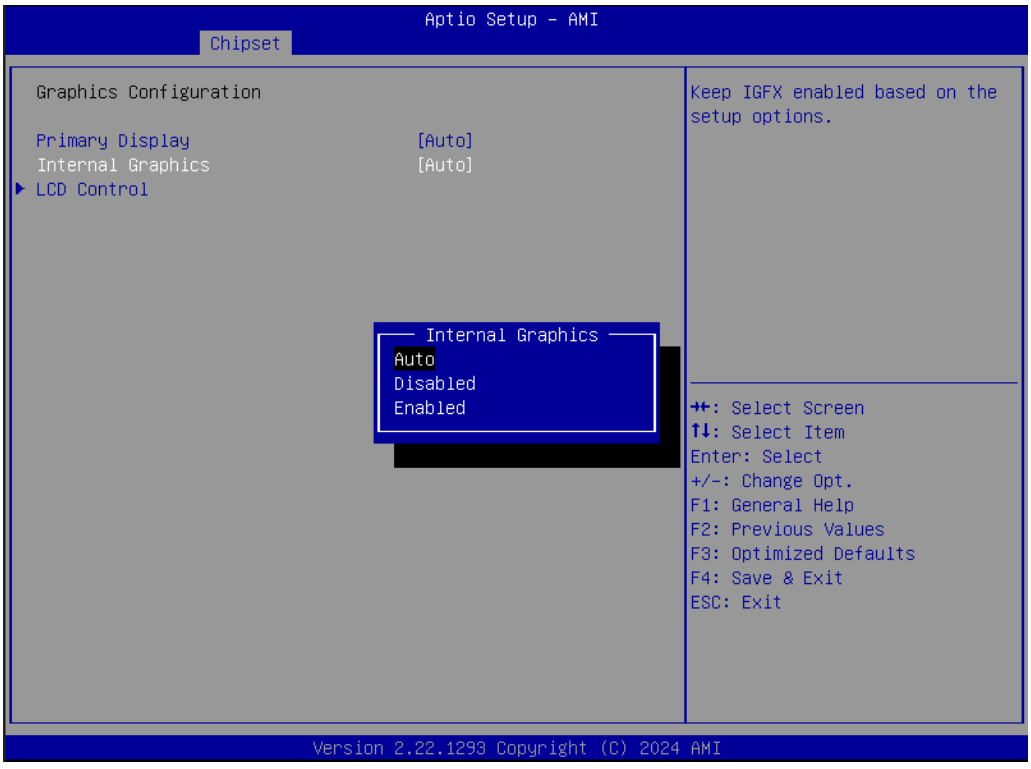
Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.



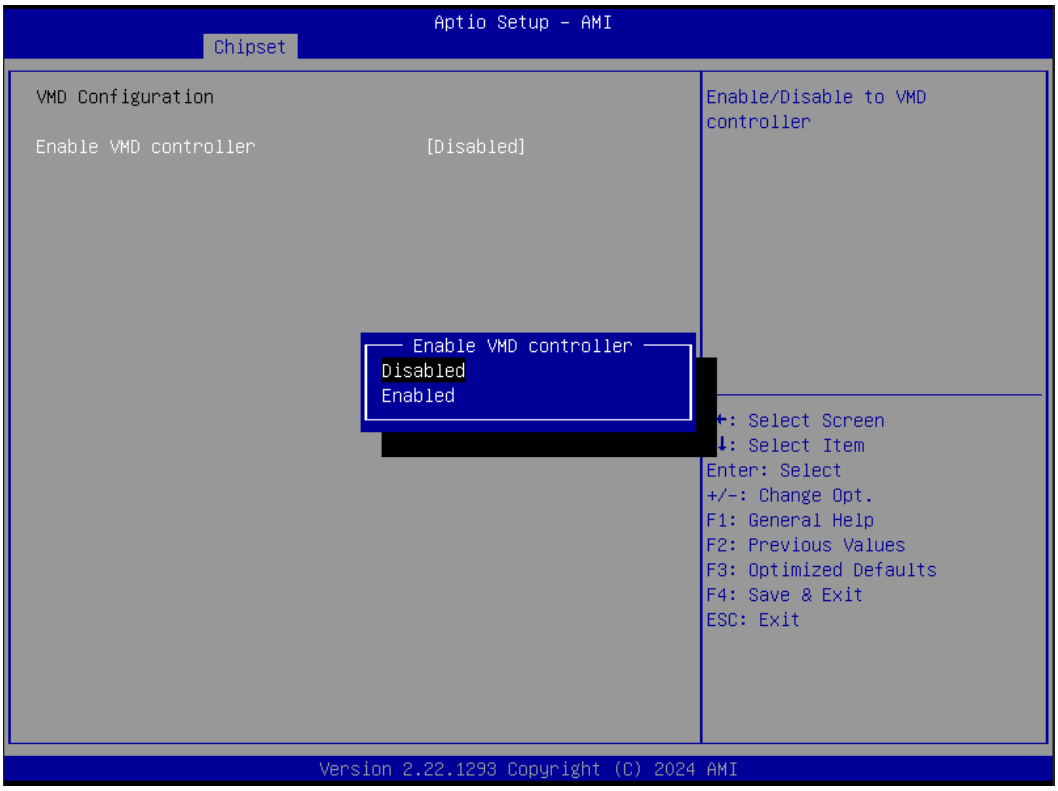
2.5.1.2 Graphic Configuration

Graphic configuration settings





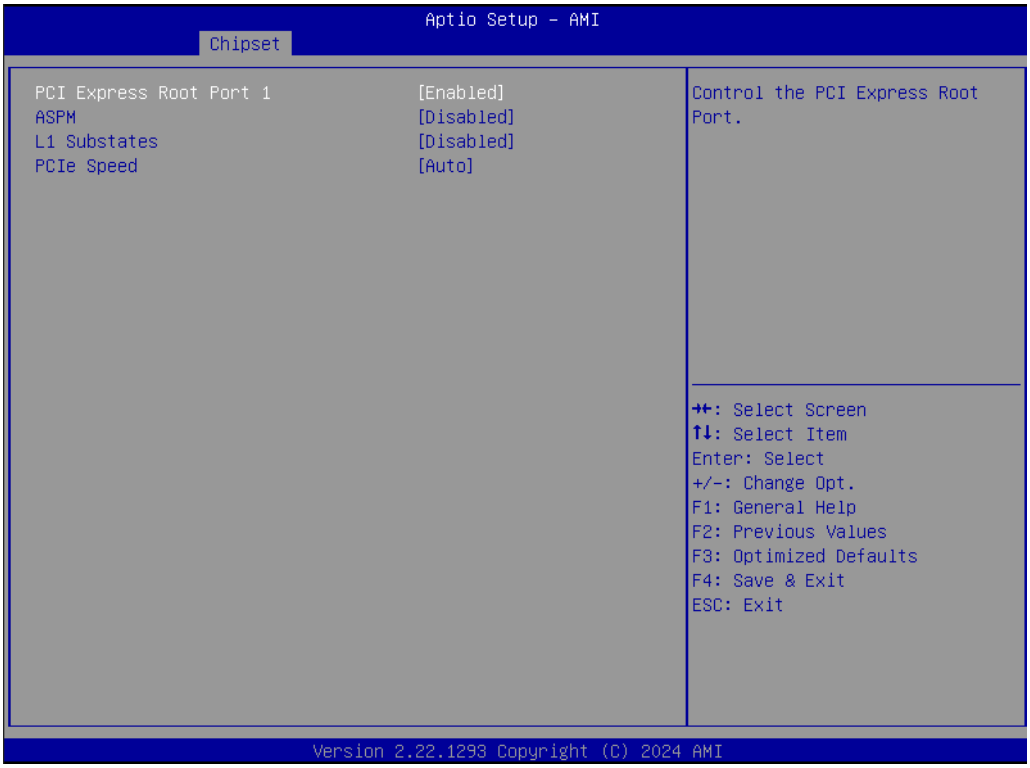
2.5.1.3 VMD setup menu



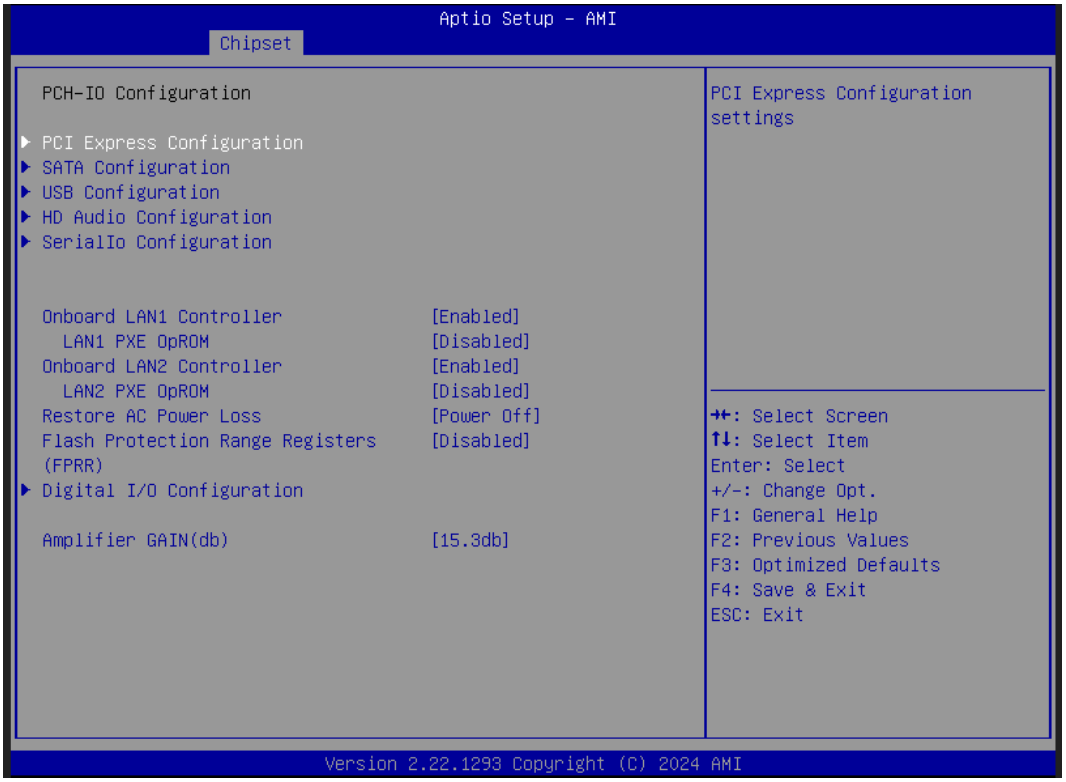
2.5.1.4 PCI Express Configuration

- **Detect Non-compliance Device [Disabled]**
  Detect Non-compliance Device in PEG

Configuration options: [Disabled][Enabled]



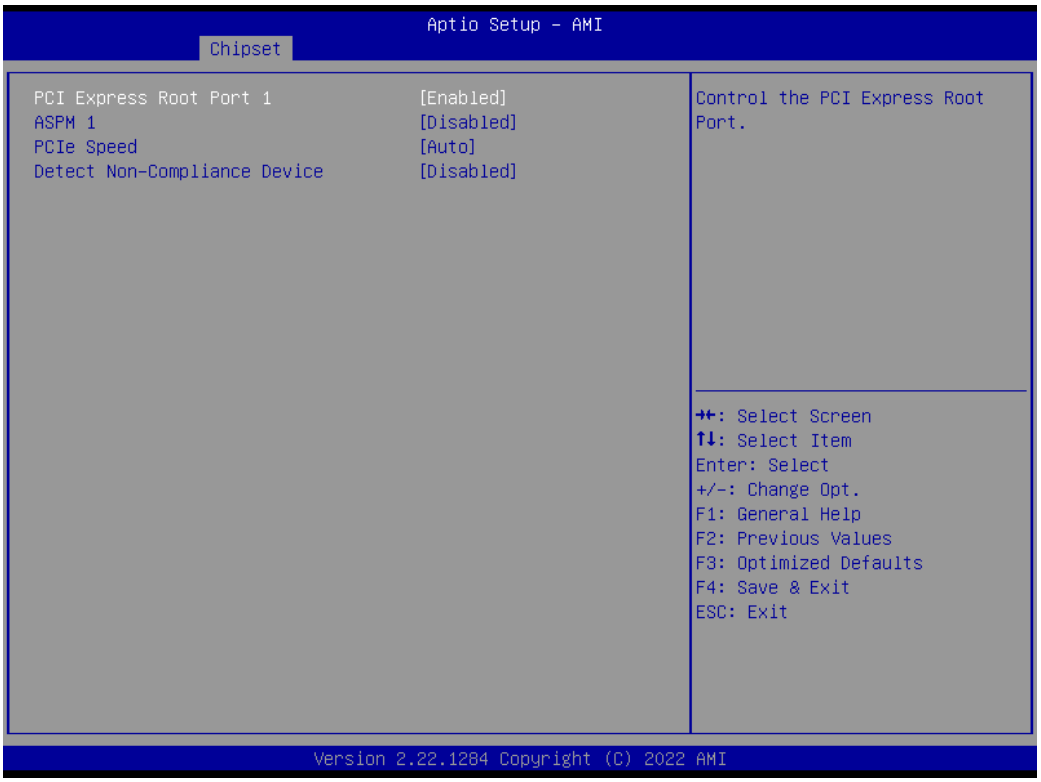
2.5.2 PCH-IO Configuration



- **Lan1 Controller [Enabled]**
  Enable or Disable onboard LAN1
  Configuration Options: [Disabled][Enabled]
- **Lan1 PXE OpROM [Disabled]**
  Enabled or Disabled boot option for LAN1 controller
  Configuration options: [Disabled][Enabled]
- **Lan2 Controller [Enabled]**
  Enable or Disable onboard LAN2
  Configuration Options: [Disabled][Enabled]
- **Lan2 PXE OpROM [Disabled]**
  Enabled or Disabled boot option for LAN2 controller
  Configuration Options: [Disabled][Enabled]
- **Flash Protection Range Registers(FPRR) [Disabled]**
  Enabled Flash Protection Range Registers
  Configuration Options: [Disabled][Enabled]
- **GPIO Group Control [Disabled]**
  Configure the digital GPIO pins
  Configuration Options: [Disabled][Enabled]
- **Amplifier GAIN(db) [15.3db]**
  Select Amplifier GAIN value
  Configuration Options: [15.3db][21.2db][27.2db][31.8db]

2.5.2.1 PCI Express Configuration

- *2.5.2.1.1 PCI Express Root Port 5(x2 M.2)*

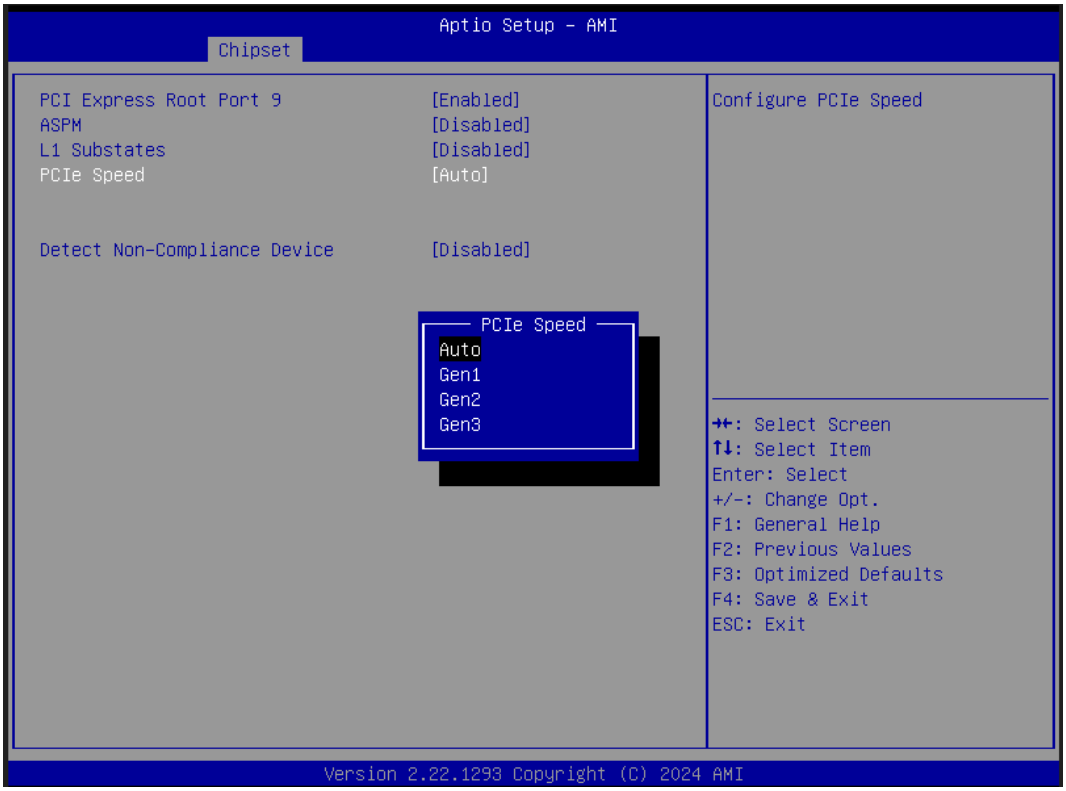


- **PCI Express Root Port 5 [Enabled]**
  Control the PCI Express Port

Configuration options: [Disabled][Enabled]

- **ASPM Support [Disabled]**
  Set the ASPM level: Force L0s- Force all links to L0s State; Auto- BIOS auto configure; Disabled- Disables ASPM
  Configuration options: [Disabled][L1][Auto]
- **L1 Substates [Disabled]**
- **PCIe Speed [Auto]**
  Select PCI Express Port speed
  Configuration options: [Auto][Gen1][Gen2][Gen3]
- **Detect Non-compliance device [Disabled]**
  Detect non-compliance PCI express Device, If enabled, it will take more time at Post time.
  Configuration options: [Disabled][Enabled]

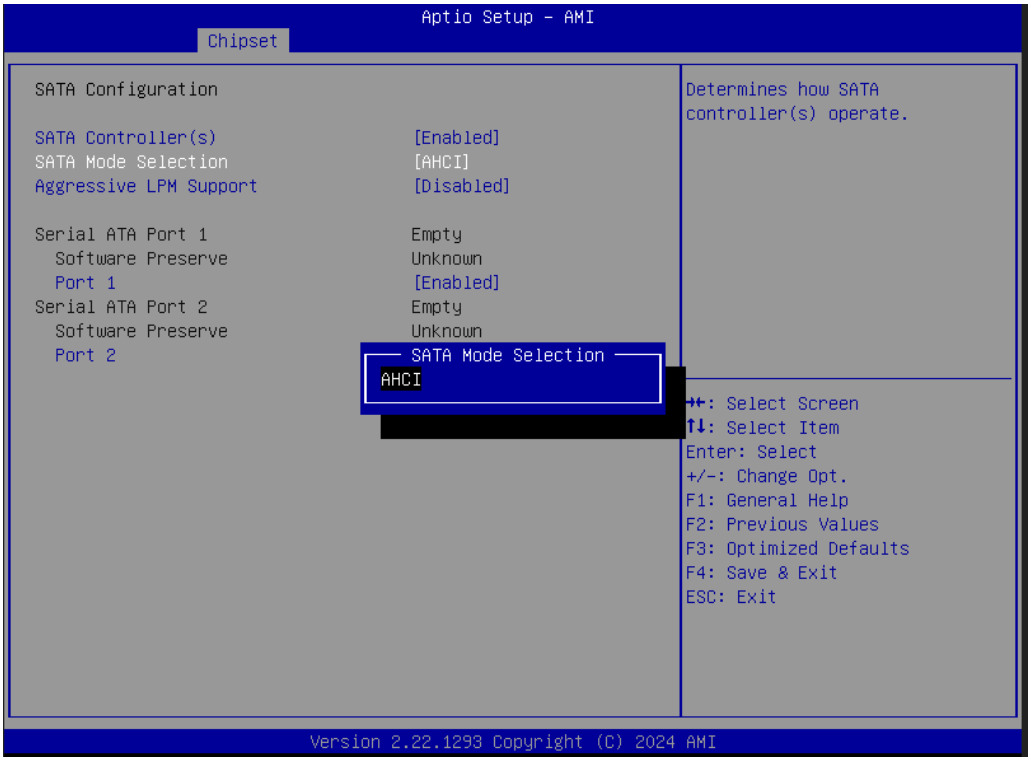
- *2.5.2.1.2 PCI Express Root Port 9(x1 Key E)*



- **PCI Express Root Port 9 [Enabled]**
  Control the PCI Express Port
  Configuration options: [Disabled][Enabled]
- **ASPM [Disabled]**
  Set the ASPM level: Force L0s- Force all links to L0s State; Auto- BIOS auto configure; Disabled- Disables ASPM
  Configuration options: [Disabled][L1][Auto]
- **L1 Substates [Disabled]**

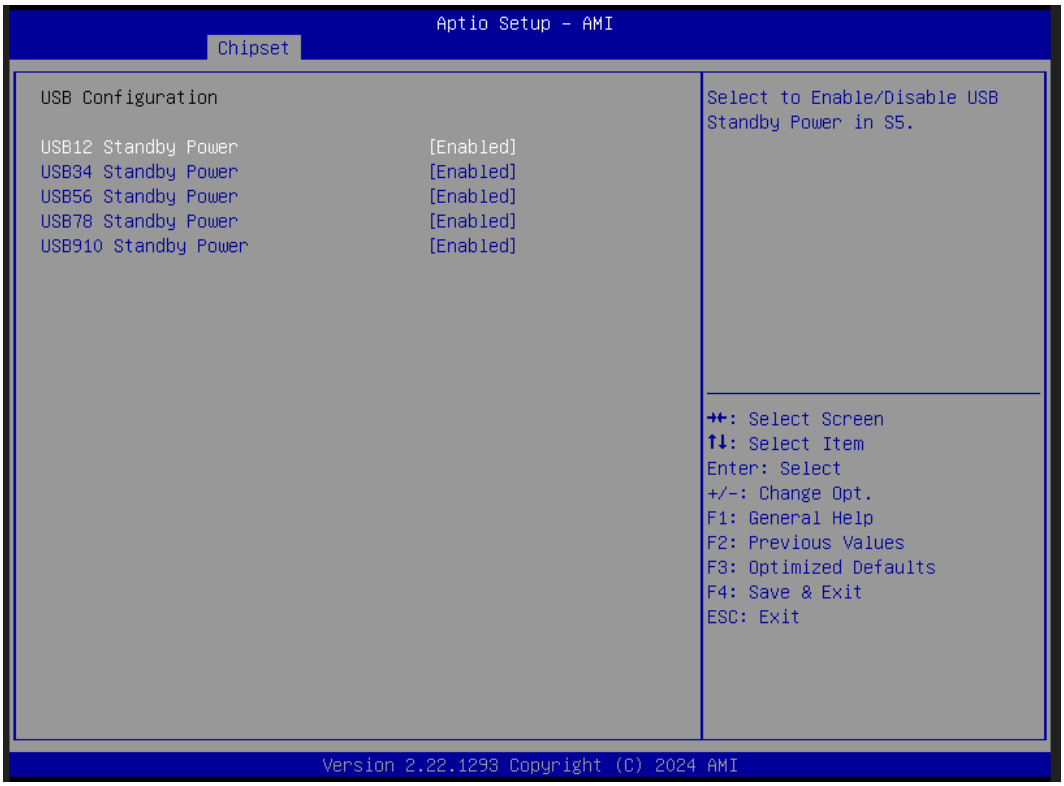
- **PCIe Speed [Auto]**
  Select PCI Express Port speed
  Configuration options: [Auto][Gen1][Gen2][Gen3]
- **Detect Non-compliance device [Disabled]**
  Detect non-compliance PCI express Device, If enabled, it will take more time at Post time.
  Configuration options: [Disabled][Enabled]

2.5.2.2 SATA Configuration



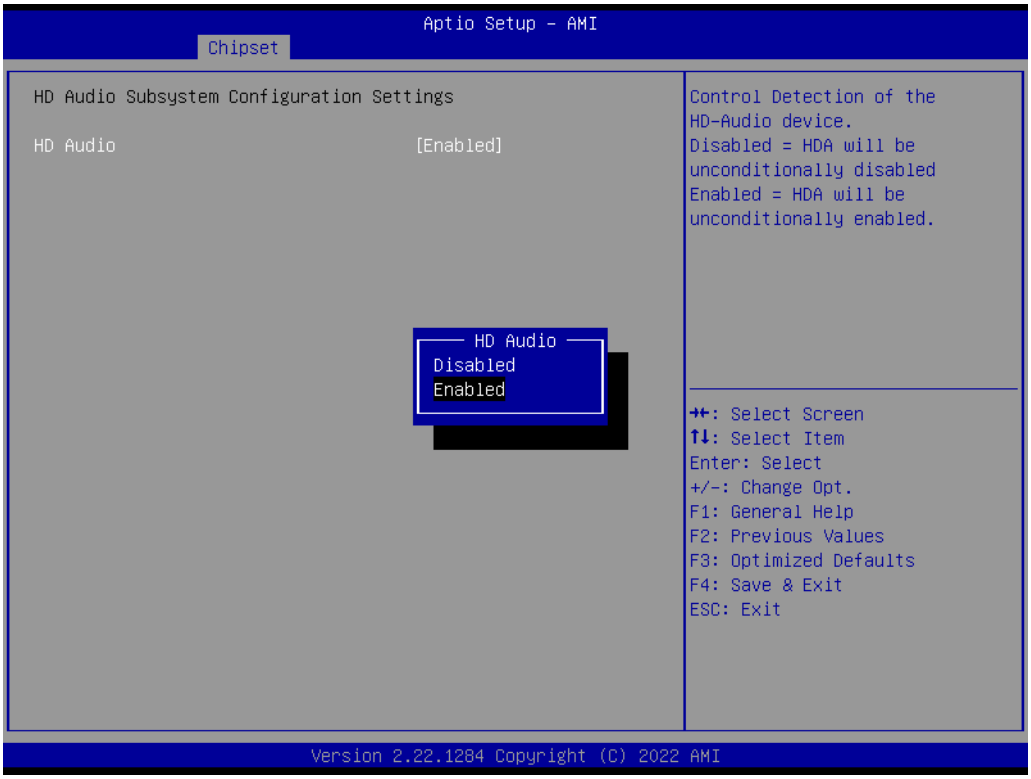
- **SATA Controller(s) [Enabled]**
  Enable or Disable SATA device
  Configuration options: [Enabled][Disabled]
- **SATA Mode Selection [AHCI]**
  Determines how SATA controller operate
  Configuration options: [AHCI]
- **Port 1[Enabled]**
  Enable or Disable SATA port 1
  Configuration options: [Enabled][Disabled]
- **Port 2 [Enabled]**
  Enable or Disable SATA port 2
  Configuration options: [Enable][Disabled]

2.5.2.3 USB Configuration



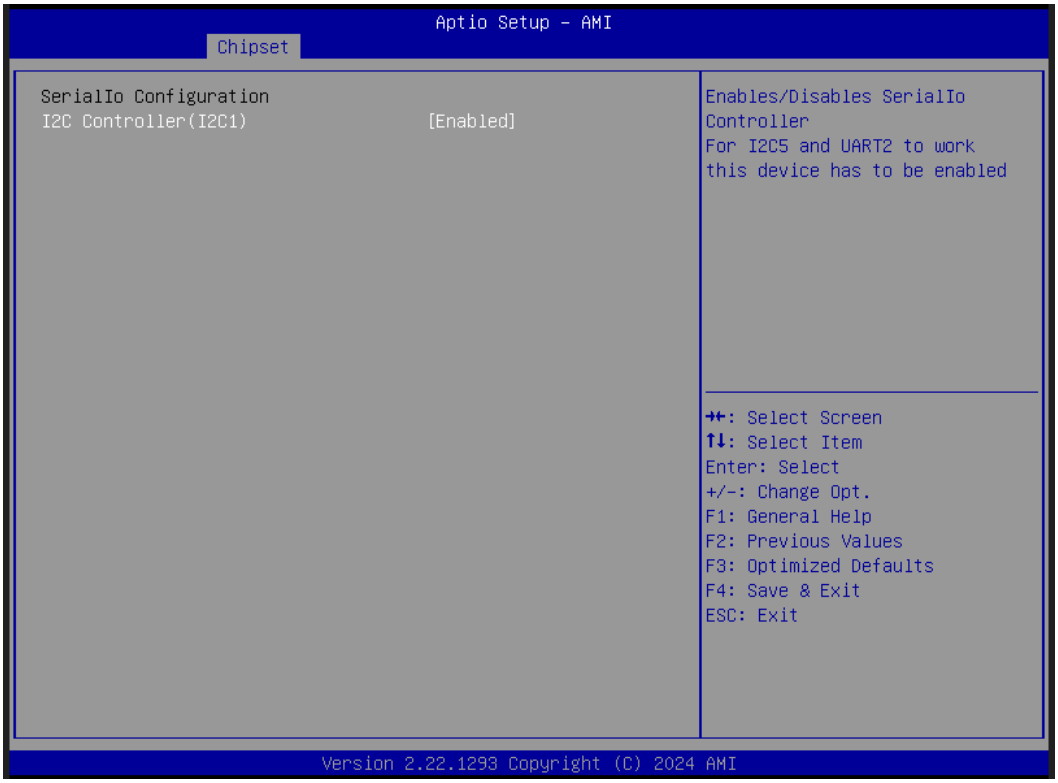
- **USB12 Standby Power[Enabled]**
  Enable or Disable USB standby power
  Configuration options: [Disabled] [Enabled]
- **USB34 Standby Power[Enabled]**
  Enable or Disable USB standby power
  Configuration options: [Disabled] [Enabled]
- **USB56 Standby Power[Enabled]**
  Enable or Disable USB standby power
  Configuration options: [Disabled] [Enabled]
- **USB78 Standby Power[Enabled]**
  Enable or Disable USB standby power
  Configuration options: [Disabled] [Enabled]
- **USB910 Standby Power[Enabled]**
  Enable or Disable USB standby power
  Configuration options: [Disabled] [Enabled]

2.5.2.4 HD audio Configuration



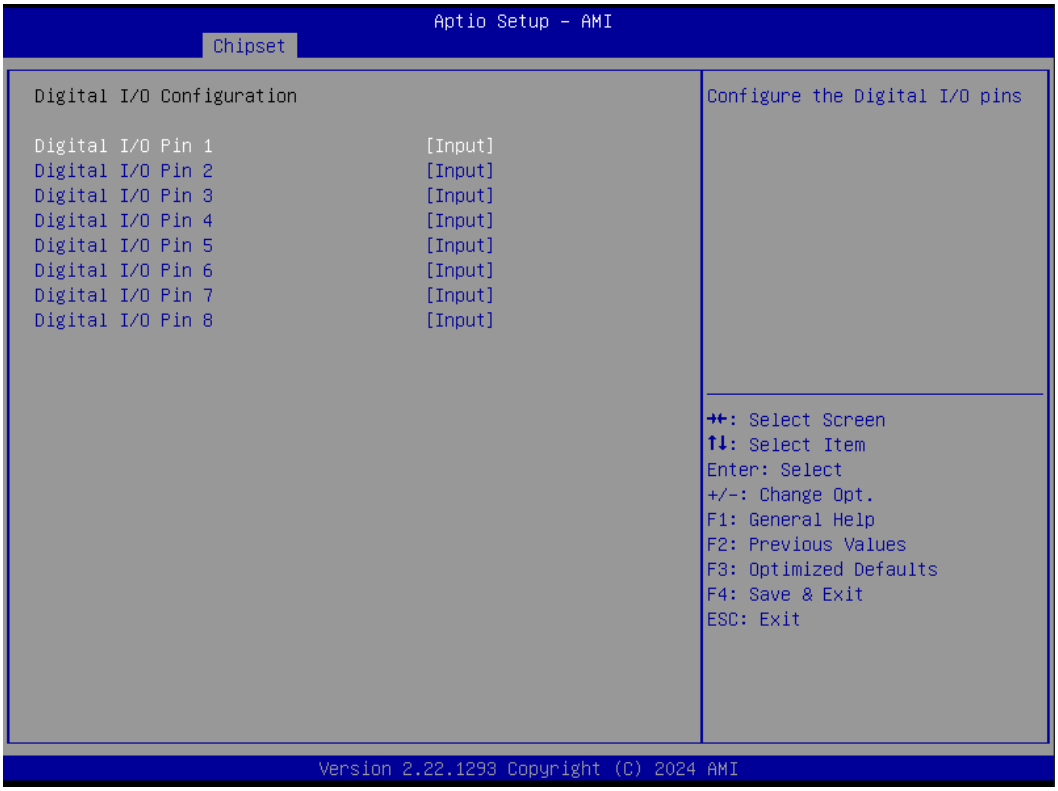
- **HD audio [Enabled]**
  Control Detection of the HD-Audio device.
  Configuration options: [Disabled] [Enabled]

2.5.2.5 Serial IO Configuration

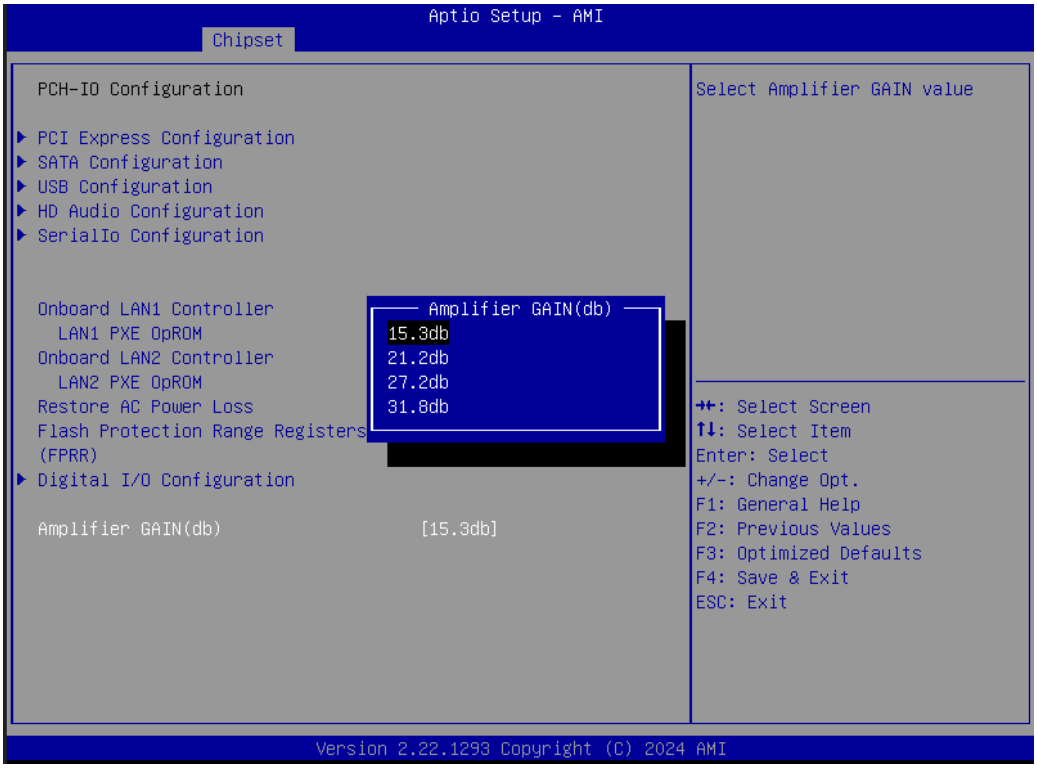


- **I2C0 Controller[Enabled]**
  Enabled/Disabled Serial IO Controller
  Configuration options: [Disabled] [Enabled]

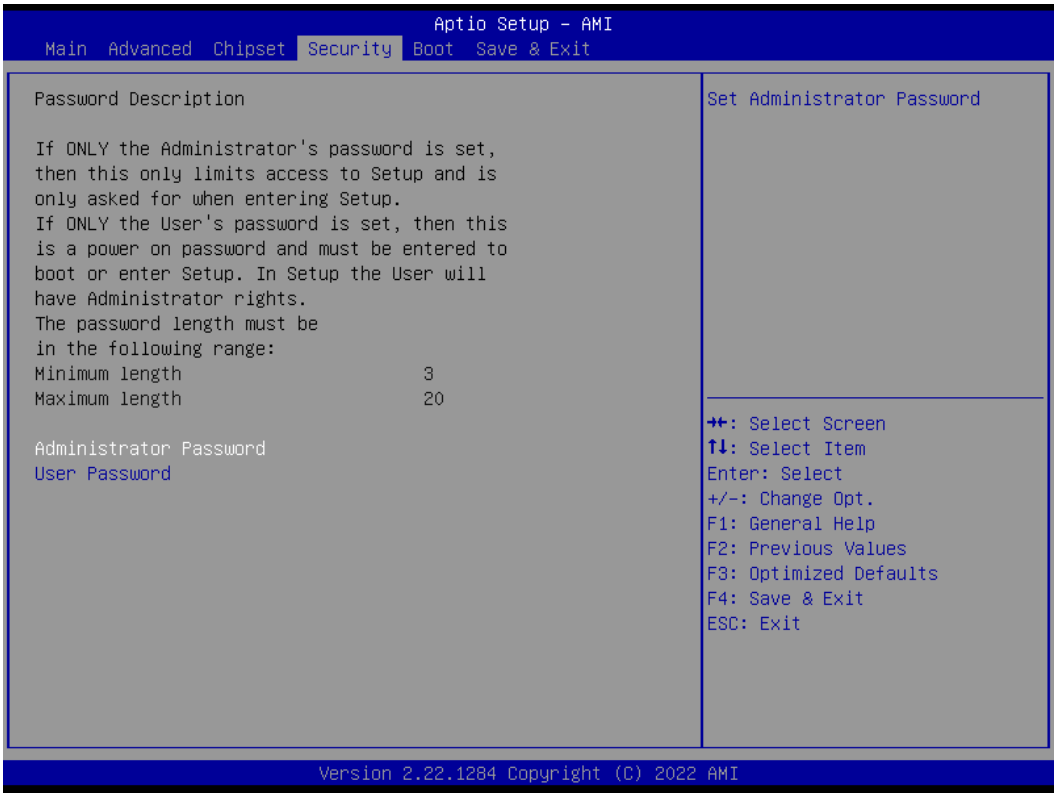
2.5.2.6 Digital IO Configuration



2.5.2.7 Amplifier GAIN(db)

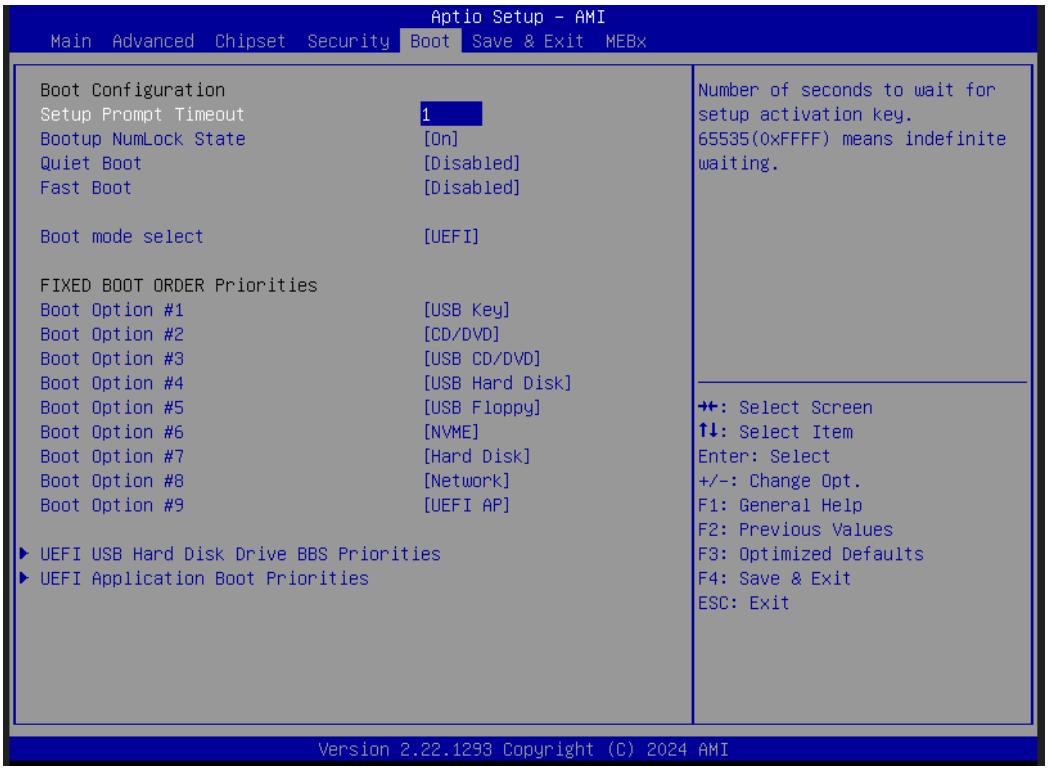


2.6 Security



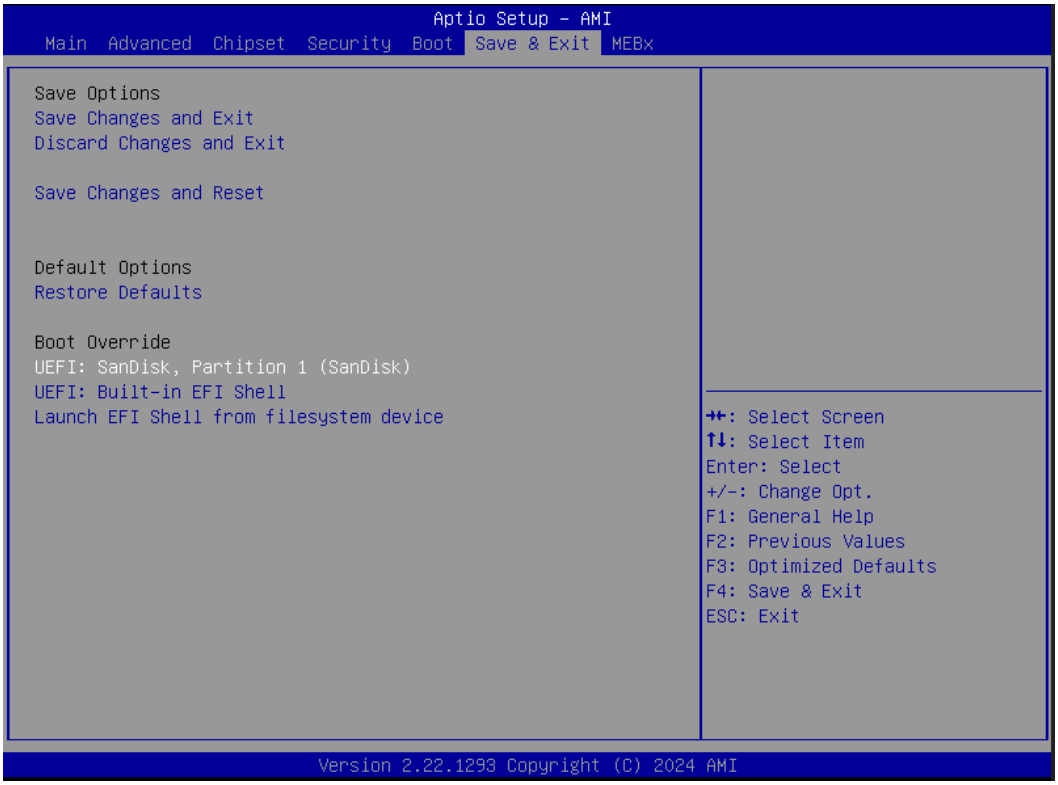
- **Administrator Password**
  Set Administrator Password
- **User Password**
  Set User Password

2.7 Boot



- **Setup Prompt Timeout [1]**
  Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
- **Bootup NumLock State [On]**
  Choose the desired NumLock state for the keyboard at boot.
  Configuration options: [On] [Off]
- **Quick Boot [Disable]**
  Enable or disable Quick Boot option
  Configuration options: [Disabled] [Enabled]
- **Fast Boot [Disable]**
  Enable or disable Quick Boot option
  Configuration options: [Disabled] [Enabled]
- **Boot mode select [UEFI]**
  Select boot mode LEGACY/UEFI
  Configuration options: [LEGACY] [UEFI]
- **UEFI USB Key Drive BBS Priorities**
  Specifies the boot device priority sequence from available UEFI USB key Drives.
- **UEFI Application Boot Priorities**
  Specifies the boot device priority sequence from available UEFI Application.

2.8 Save & Exit



- **Save changes and Exit**
  Exit system setup after saving the changes.
- **Discard changes and Exit**
  Exit system setup without saving the changes.
- **Save changes and Reset**
  Reset the system after saving the changes.
- **Restore Defaults**
  Restore/Load default values for all the setup options.
- **UEFI: SanDisk, Partition (SanDisk)**
- **UEFI: Built-in EFI Shell**
- **Launch EFI Shell from the filesystem device**
  Attempts to launch EFI shell application from one of the available filesystem devices.