

User Manual

ALD-75 ATX Motherboard



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ALD75 Motherboard

User Manual

(Version 1.0)

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Chapter 1 Product Introduction

1.1 Brief Introduction

The ALD-75 is an ATX motherboard based on the Intel Alder Lake-S (FCLGA1700 socket) processor with Z690 chipset.

1.2 Parameters

CPU: PCH Z690 + Intel Alder Lake-S series processor

Memory: 4x UDIMM DDR4-3200MHz, maximum capacity for single slot:32GB, maximum memory capacity in total: 128GB.

GPU: Integrated Graphics varies on the processor SKU. It provides 1x HDMI2.0b, 1xDVI-I interfaces for display.

Storage: 1 x M.2_Key M type 2280 for NVMe/SATA SSD, 4 x SATA3.0 standard interfaces.

USB: 4x USB3.2Gen 1 ports, 2xUSB3.2 onboard headers, 2xUSB2.0 ports, 4x USB2.0 onboard headers.

PS/2: 1x PS/2 interface (supports mouse and keyboard 2-in-1, default support: PS/2 keyboard.)

Ethernet: Two Intel Gigabit Ethernet Controllers (1x Intel i219 Data Rate Per Port: 1.0Gbps + 1x Intel i225 Data Rate Per Port: 2.5 Gbps)

Audio: Realtek High-Definition Audio Codec, support rear audio ports: Line_out, Line_in and Mic_in; front Line out, Mic-in onboard headers.

Serial I/O: 6x RS232 COM by default. The COM5, COM 6 can be set as RS485/RS422 by jumper.

Expansion: 1x PCIe16X, 5x PCIe4X, 1x PCIe2X

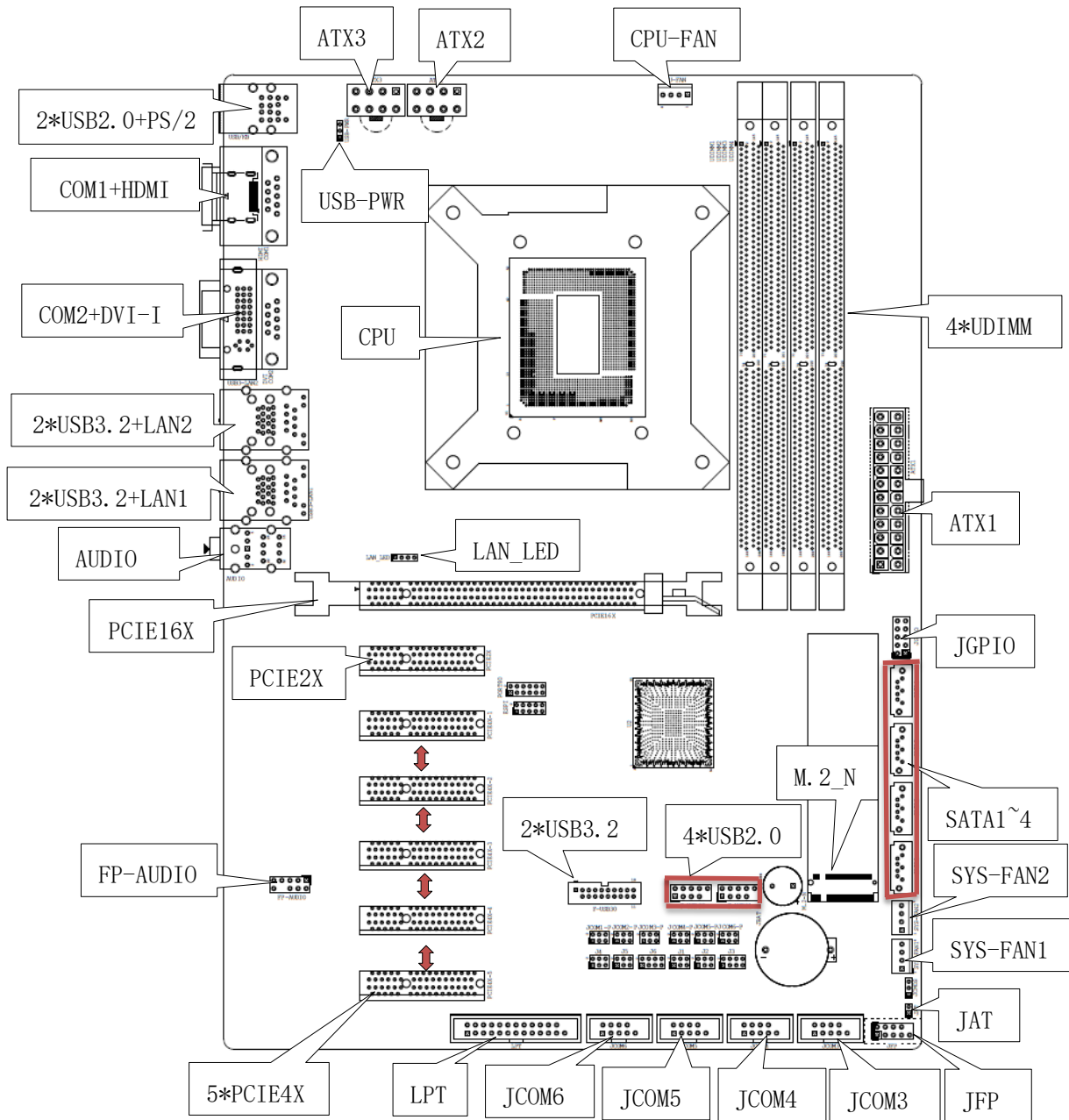
Other I/O: 1*GPIO header, 1x LPT header

Dimension: 304.8mm x 218.44mm

Power: ATX_24PIN+2*8 PIN

Operating Temperature: -20°C~60°C

1.3 Connector Diagram



Chapter 2 Hardware

2.1 Installations

Please refer to the following steps for installations:

1. Read the user manual carefully to make sure all the adjustments on the ALD75 are correct.
2. Installing the Memory:
 - Press the ejector tab of the memory slot outwards with your fingertips.
 - Hold the memory module and align the key to the module with that on the memory slot.
 - Gently push the module into the slot until the ejector levers return completely to the closed position, holding the module in place when the module touches the bottom of the slot. To remove the module, press the ejector levers outwards to unseat the module.
3. Installing the expansion cards:
 - Locate the expansion slots and remove the screw, insert the cards into the slot at a 45-degree angle then attach the screw to the expansion cards, gently press down on it then install the screw back.
4. Connect all signal wires, cables, panel control wiring, and power supplies.
5. Start the computer and complete the setup of the BIOS program.

The board's components are integrated circuits and can easily be damaged by Electrostatic Discharge or ESD; therefore, please follow the instructions:

- Hold the board's edge when handing, and do not touch onboard pins, components, or plug sockets.
- When touching integrated circuit components (such as CPU, RAM, etc.), please wear an anti-static wrist strap/glove to avoid electrostatic discharge damage to the board or other sensitive components.
- Before installing the integrated circuits/sensitive components, place the sensitive components in anti-static bags to keep them safe from ESD.
- Please make sure the power switch is OFF before plugging the power plug.

2.2 Jumper Setting

Please configure the jumpers according to your requirements before installing the hardware.

How to identify the first header of jumpers and pins: Observe the mark beside the jumper or pins and find the header marked by "1" or bold line or triangular symbol. Or observe the rear panel and the header with a square solder pad is the first header.

2.3 Memory Slots

The board is equipped with four UDIMM DDR4 slots, with a memory frequency of 3200MHz. It supports a maximum capacity of 32GB for a single slot and a maximum memory capacity of 128GB in total.

Attention: Make sure to hold the memory module and align the key to the module with that on the memory slot. While choosing a memory module, please make sure the module matches the specification.

2.4 Display Interfaces

The board is equipped with one HDMI2.0b standard interface (supporting HDCP 2.3) and one DVI-I interface (compatible with analog and digital signals).

2.5 Storage (Screen Printing: SATA1, SATA2, SATA3, SATA4, M.2-N)

The board provides 1 x M.2_Key M type 2280 for NVMe/SATA SSD, 4 x SATA3.0 standard interfaces.

2.6 USB, PS/2 Interfaces (Screen Printing: F-USB20, F-USB21, USB/KB, F-USB30)

The board supports 4x USB3.2 Gen 1 standard ports, 2x USB3.2 Gen 1 onboard pins/headers, 2xUSB2.0 ports, 4x USB2.0 onboard pins/headers 2.54mm for spacing, and 1x PS/2 interface (supports mouse and keyboard 2-in-1, default support: PS/2 keyboard.)

Screen printing USB-PWR: The pin controls the rear port (Screen printing USB/KB) through a jumper cap, which supports two modes: startup with power(5V) and standby with power(5V).

USB2.0 Pin (Screen Printing: F-USB20, F-USB21)

Signal	Pin		Singal
VCC 5V	1	2	VCC 5V
USB DATA-	3	4	USB DATA-
USB DATA+	5	6	USB DATA+
GND	7	8	GND
(NULL)	9	10	NC

USB-PWR (Screen Printing: USB-PWR)

Interface	Setting	Function
1-2	Close	5V (startup with power)
2-3	Close	5V (standby with power)

USB3.2 Pin (Screen Printing: F-USB30)

Signal	Pin		Signal
VCC 5V	1	20	(Null)
RX1-	2	19	VCC 5V
RX1+	3	18	RX0-
GND	4	17	RX0+
TX1-	5	16	GND
TX1+	6	15	TX0-
GND	7	14	TX0+
D1-	8	13	GND
D1+	9	12	D0-

GND	10	11	D0+
-----	----	----	-----

2.7 Audio (Screen Printing: FP-AUDIO)

The board features Realtek High-Definition Audio Codec, interface colored blue is the audio input connector (Line-in), colored green is the audio output connector (Line-out), and colored pink is the microphone input connector (MIC-in). The FP-Audio is the front audio pin (2.54mm spacing).

FP-AUDIO (Screen Printing: FP-AUDIO)

Signal	Pin		Signal
MIC2-L	1	2	AGND
MIC2-R	3	4	AVCC
FRO-R	5	6	MIC2-JD
F-IO-SEN(AGND)	7	8	(NULL)
FRO-L	9	10	LIN2-JD

2.8 GPIO (Screen Printing: JGPIO)

The board provides a set of 2x5Pin GPIO (2.54mm spacing), originating from the Platform Controller Hub (PCH); eight programmable inputs/outputs in total.

GPIO (Screen Printing: JGPIO)

Signal	Pin		Signal
GPP_B7	1	2	3.3V
GPP_B8	3	4	GPP_B15
GPP_B9	5	6	GPP_B16
GPP_B10	7	8	GPP_C12
GND	9	10	GPP_C13

2.9 COM (Screen Printing: COM1, COM2, JCOM3, JCOM4, JCOM5, JCOM6)

The board provides six standard RS232 serial ports (four pin spacing 2.54mm, two DB-9 interfaces). All COM ports can be powered by configuring the voltage through jumpers: JCOM1-P, JCOM2-P, JCOM3-P, JCOM4-P, JCOM5-P, and JCOM6-P for either 5V or 12V voltage.

The COM5 and COM6 can be configured as RS485/RS422 ports through jumper settings.

COM1, COM2 (Screen Printing: COM1, COM2 Pins are the DB-9 plug pins)

Pin	RS232
1	DCD
2	RXD

3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

COM Pin Definition (Screen Printing: JCOM3, JCOM4, JCOM5, JCOM6)

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

COM5, COM6

Pin	RS232	RS485	RS422
1	DCD	DATA-	TX-
2	RXD	DATA+	TX+
3	TXD	(NC)	RX+
4	DTR	(NC)	RX-
5	GND	GND	GND
6	DSR	(NC)	(NC)
7	RTS	(NC)	(NC)
8	CTS	(NC)	(NC)
9	RI	(NC)	(NC)

COM5, COM6 Jumper Setting

Interface	RS232	RS485	RS422
COM5	J1(1-3,2-4)	J1(3-5,4-6)	J1(3-5,4-6)
	J2(1-3,2-4)	J2(3-5,4-6)	J2(3-5,4-6)
	J3(1-2,3-5)	J3(3-4,7-8)	J3(1-3,5-6)
COM6	J4(1-3,2-4)	J4(3-5,4-6)	J4(3-5,4-6)
	J5(1-3,2-4)	J5(3-5,4-6)	J5(3-5,4-6)
	J6(1-2,3-5)	J6(3-4,7-8)	J6(1-3,5-6)

JCOM1-P, JCOM2-P, JCOM3-P, JCOM4-P, JCOM5-P, JCOM6-P

Pin	Setting	Function
1-2	Close	5V
3-4	Close	RI
5-6	Close	12V

Only one of the three pin sets mentioned above can be short-circuited.

2.10 LPT (Screen Printing: LPT)

The board provides a 2x13-pin parallel port, it requires an adapter cable to convert it into a standard parallel interface for use. The port can be connected to parallel devices such as printers based on the user's requirements.

LPT (Screen Printing: LPT)

Signal	Pin		Signal
LPT_STB#	1	2	LPT_AFD#
LPT_PPD0	3	4	LPT_ERR#
LPT_PPD1	5	6	LPT_INIT#
LPT_PPD2	7	8	LPT_SLIN#
LPT_PPD3	9	10	GND
LPT_PPD4	11	12	GND
LPT_PPD5	13	14	GND
LPT_PPD6	15	16	GND
LPT_PPD7	17	18	GND
LPT_ACK#	19	20	GND
LPT_BUSY	21	22	GND
LPT_PE	23	24	GND
LPT_SLCT	25	26	(NULL)

2.11 Switch Panel Socket (screen printing: JFP)

The board provides a front control panel pin for connecting to the function buttons and indicators on the front panel of the chassis.

Switch Panel Pin (screen printing: JFP)

Signal	Pin		Signal
HDD_LED+	1	2	PWR_LED+
HDD_LED-	3	4	PWR_LED-
RSTBTN-	5	6	PWR_ON+
RSTBTN+	7	8	PWR_ON-

(NC)	9	10	(NULL)
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2.12 System Fan/CPU Fan Socket (Screen Printing: CPU-FAN, SYS-FAN1, SYS-FAN2,)

The board provides one 4Pin CPU fan socket for smart cooling, two 4Pin system fan sockets.

CPU Fan Definition (screen printing: CPU-FAN)

Pin	Signal
1	GND
2	12V
3	TAC
4	CTL

System Fan Definition (screen printing: SYS-FAN1, SYS-FAN2)

Pin	Signal
1	GND
2	12V
3	TAC
4	CTL

2.13 ATX Power Supply (Screen printing: ATX1, ATX2, ATX3)

The board power supply: ATX power supply mode (ATX_24PIN+2*8PIN).

ATX_24PIN DEFINITION (screen printing: ATX1)

Signal	Pin		Signal
+3.3V	1	13	+3.3V
+3.3V	2	14	-12V
GND	3	15	GND
+5V	4	16	PS_ON
GND	5	17	GND
+5V	6	18	GND
GND	7	19	GND
PWR_OK	8	20	NC
5VSB	9	21	+5V

+12V	10	22	+5V
+12V	11	23	+5V
+3.3V	12	24	GND

8PIN DEFINITION (screen printing: ATX2, ATX3)

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

2.14 LAN (Screen printing: LAN1, LAN2, LAN_LED)

The board features two high-speed ethernet controllers, which include 1x Intel i219 Data Rate Per Port: 1.0 Gbps plus 1x Intel i225 Data Rate Per Port: 2.5 Gbps. ***Please note the Intel i225 network controller only supports one-time programming for the MAC address, which cannot be changed later.**

In additional, the LAN1 (Intel i219) supports network wake-up (Magic packet wake-up), while LAN2 (Intel i225) supports UEFI PXE network boot. To utilize UEFI PXE network boot, it is necessary to set (IPv4 PXE Support) to "Enabled" in the BIOS.

The board also provides a LAN_LED pin header, enabling the extension of the (orange) status indicator light to the chassis panel.

LED Interface Status Indicators:

LI_LED (Green) Status	Function	ACT_LED (Orange) Status	Function
Always on	Network Connect	Blinking	Data Transmission

2.15 Expansion Slot (screen printing: PCIE16X, PCIE4X-1, PCIE4X-2, PCIE4X-3, PCIE4X-4, PCIE4X-5, PCIE2X)

- 1 PCIe 16X slot for expanding PCIe devices such as graphics cards. (Supporting Rate of Speed: PCIe5.0)
- 5 PCIe 4X slots for expanding Network Interface Cards (NICs) and other PCIe devices (screen printing: PCIE4X-1, PCIE4X-3, PCIE4X-4 support PCIe4.0 rate; screen printing: PCIE4X-2, PCIE4X-5 support PCIe3.0 rate).
- 1 PCIe 2X slot for expanding PCIe devices such as NICs (supports PCIe3.0 rate).

2.16 CMOS Clearance/Retention (screen printing: JCMOS)

CMOS is powered by onboard button batteries. Clearing CMOS will permanently remove the previous system settings and restore the board system to original settings (factory settings).

1. Turn off the computer and disconnect the power.
2. Use a jumper cap to short the 1st and 2nd pins of JCMOS for approximately 30 seconds, then

remove the jumper cap.

3. Reinsert the jumper cap onto the 2nd and 3rd pins of JCMOS (Note: Closing pins 1 and 2 clears the CMOS).
4. Start the computer and press the key to enter the BIOS. Load optimized default values, save the settings, and exit.

CMOS (Screen Printing: JCMOS)

Pin	Setting	Function
1-2	Close	Clear CMOS
2-3	Close	NC

 **Do not clear the CMOS while the computer is powered on to prevent potential damage to the board.**

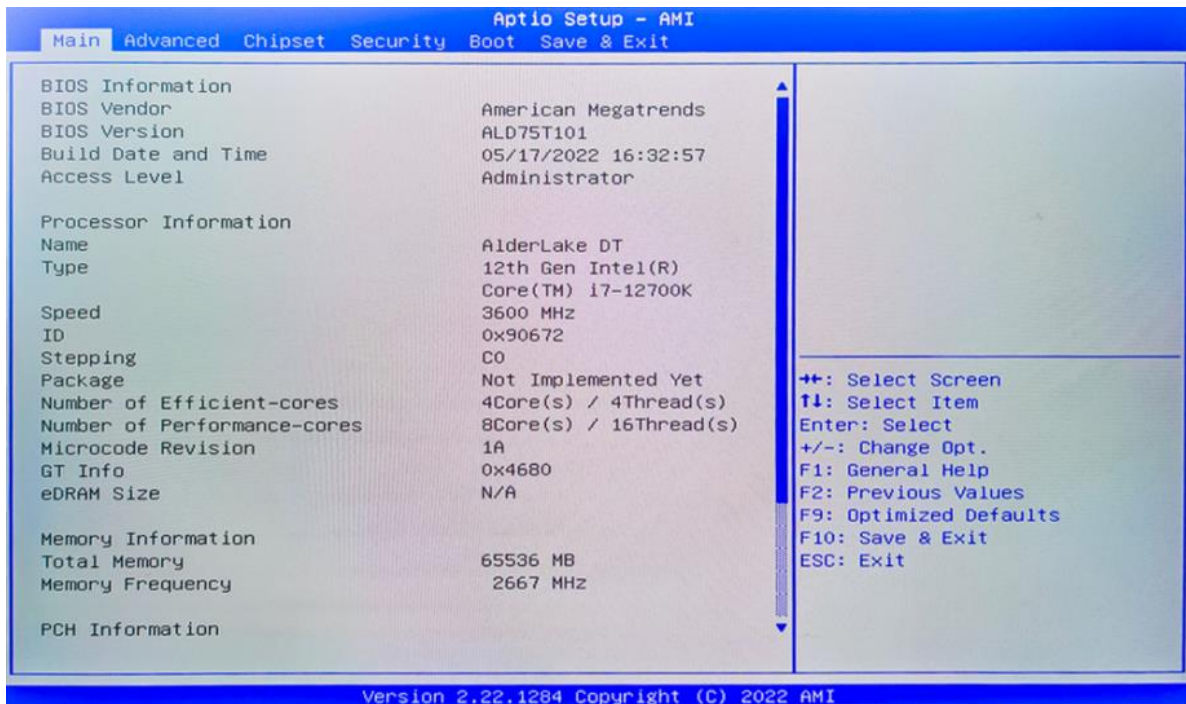
Chapter 3 BIOS Setup

3.1 Entering the BIOS

1. Turn on the computer and press <Delete> entering the BIOS
2. After the computer is turned on, keep pressing F11, select enter Setup
3. BIOS Hotkeys:
 - F9: Restore to Factory setting.
 - F10: Save and Exit.
 - ESC: Exit

3.2 Main Setup (BIOS info, Date, Time)

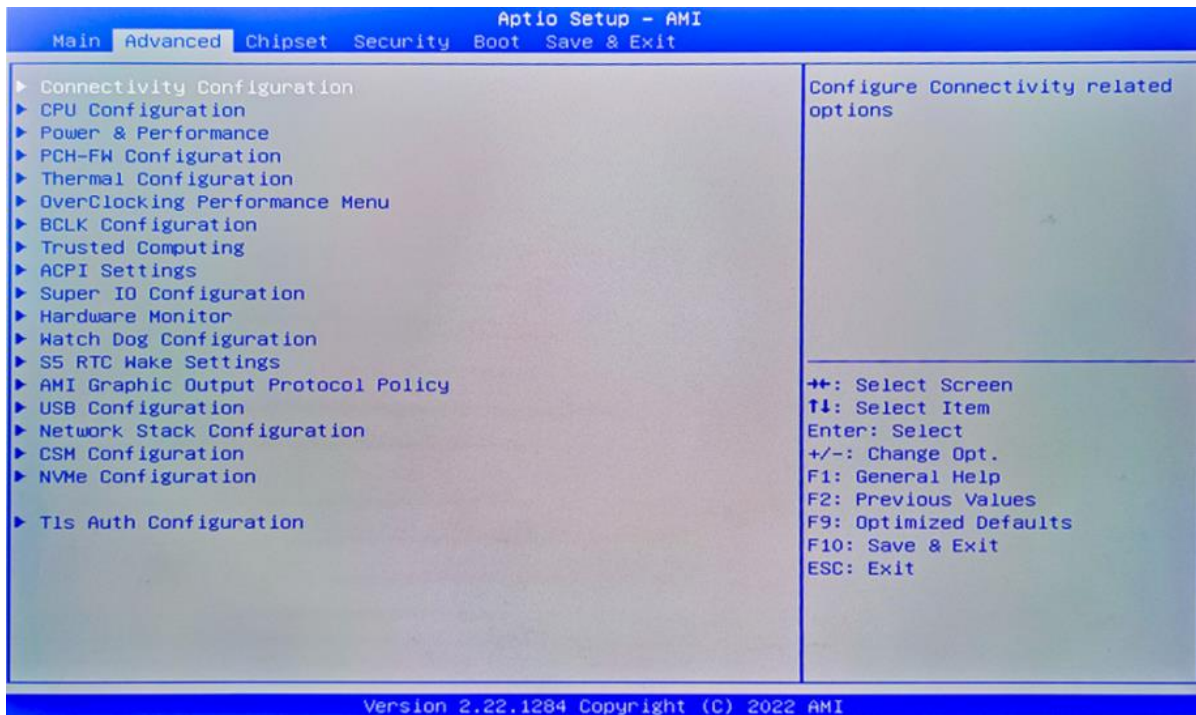
When you enter the BIOS Setup utility the first things you will encounter is the Main Setup screen. Shown below is the Main BIOS Setup screen. You can always return to the Main setup by selecting the Main tab.



System Date: Set the date. MM/DD/YY format.

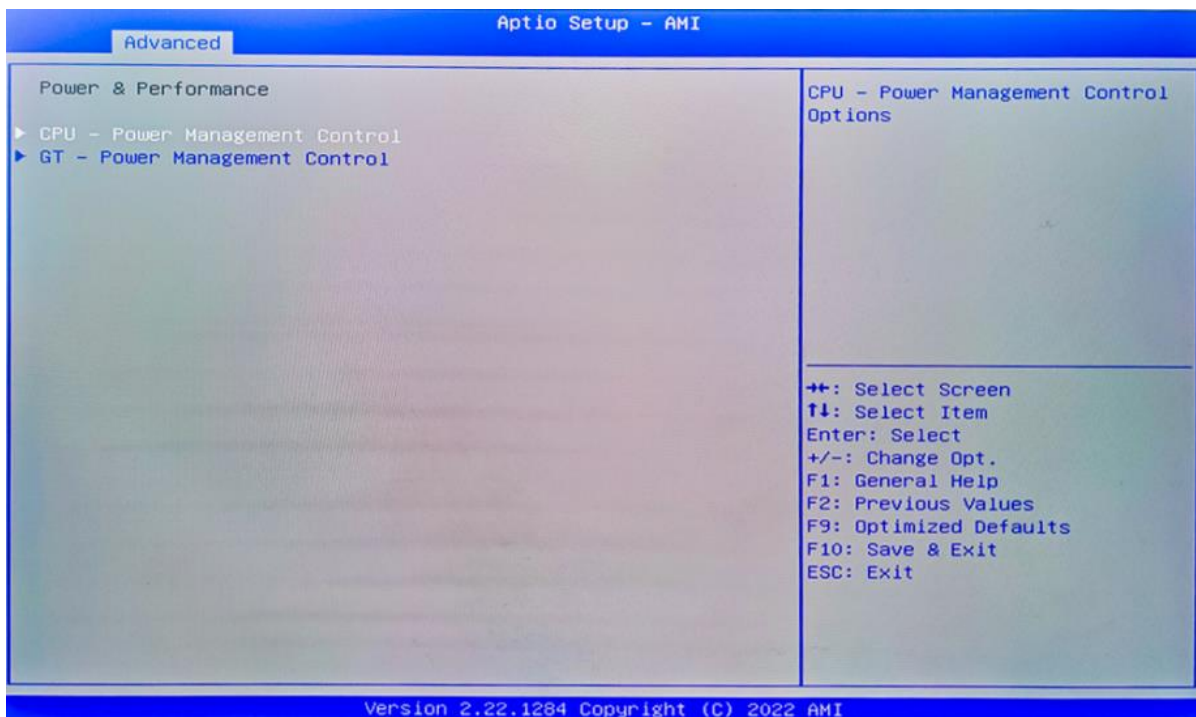
System Time: Set the time. HH:MM: SS format.

3.3 Advanced Settings



Select any of the items in the left frame of the screen. The advanced sections allow you to configure, improve and set up system features according to the preference of the CPU Configuration. All Advanced BIOS Setup options are described as follows.

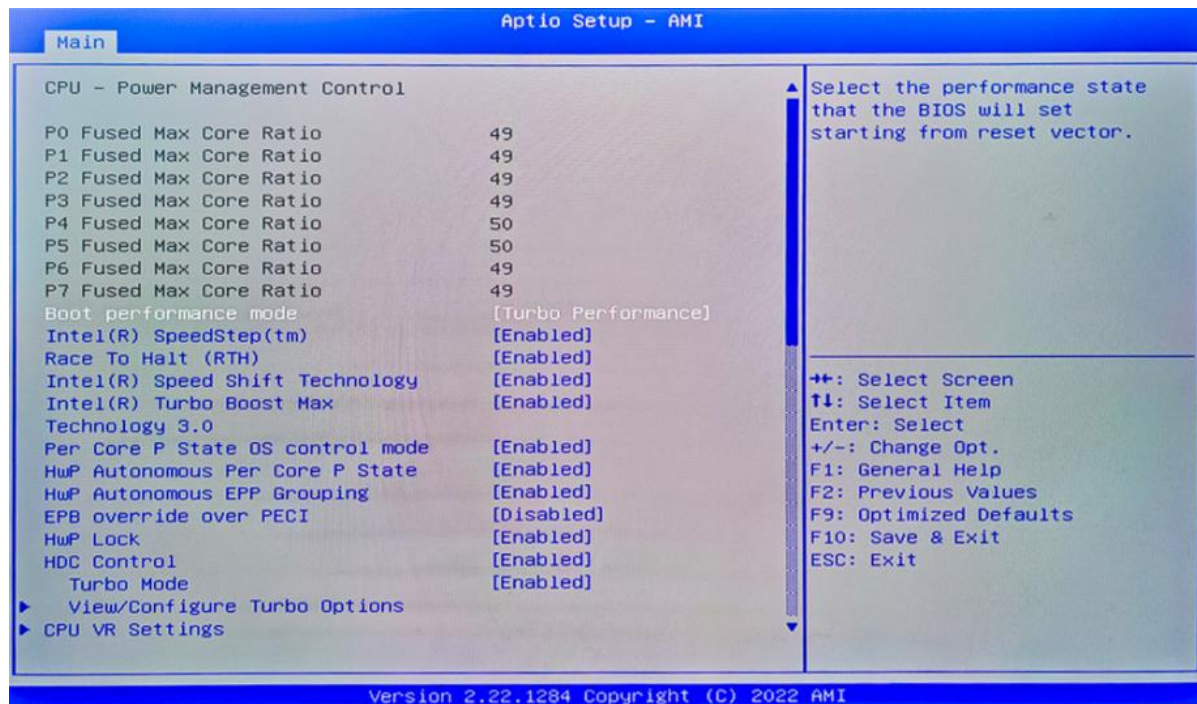
3.3.1 Power & Performance



CPU-Power Management Control

GT-Power Management Control

3.3.2 CPU-Power Management Control



1) Intel® Speedstep®(TM):

Enhanced Intel SpeedStep® Technology enables the operating system to control multiple frequencies and voltage points for optimal performance and power efficiency.

2) Intel® Speed Shift Technology:

An energy-efficient frequency control method by the hardware rather than relying on OS control. Processor decision is based on the different system constraints for example Workload demand, and thermal limits while taking into consideration the minimum and maximum levels and activity window of performance requested by the operating system. Default enabled.

3) Intel® Turbo Boost Max Technology 3.0

When Intel Turbo Boost Technology is activated, the CPU dynamically modifies its clock frequency (core frequency) according to the present workload. This empowers the CPU to provide peak performance during demanding tasks and optimize energy efficiency during lighter workloads. This feature is activated by default (Enabled).

4) Turbo Mode

The Turbo mode refers to Nehalem's "Integrated Power Gate" power management technology, which allows running off some cores and adding power to the others so that they run at a higher frequency. The capacity of the entire CPU remains unchanged, and the efficiency of the CPU is optimized. Default enabled.

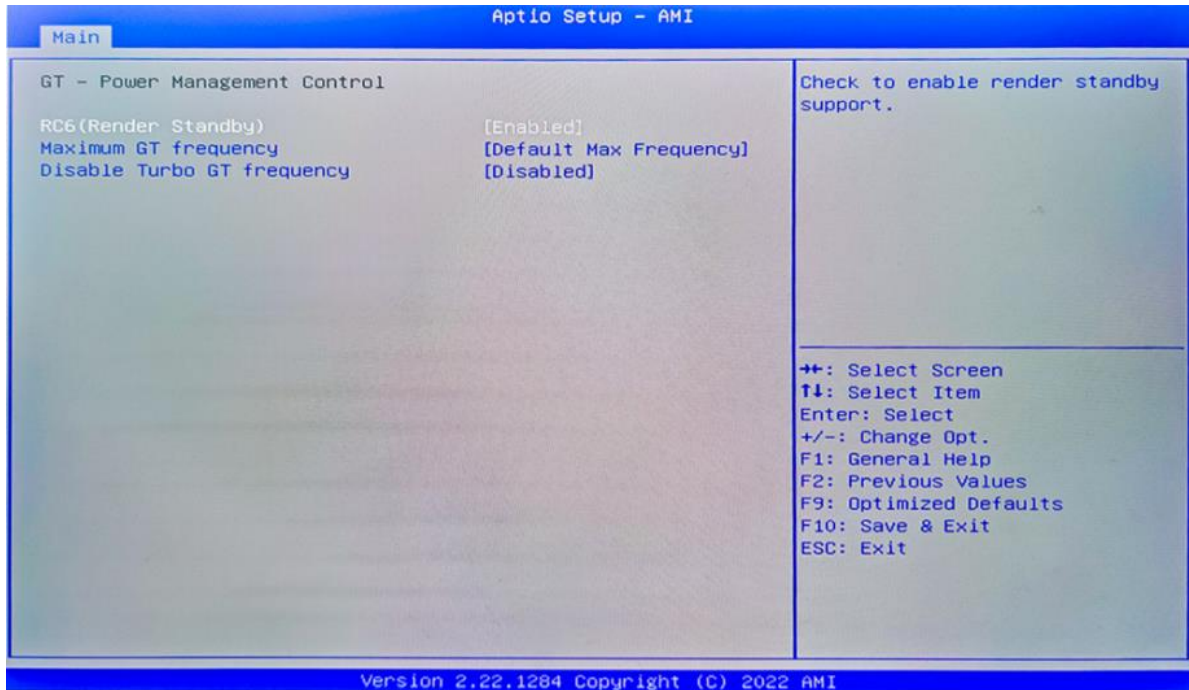
5) C states

Idle States (C-states) are used to save power when the processor is idle. C0 is the operational state, meaning that the CPU is doing useful work 100% load. C1 is the first idle state, C2 the second, and so on, where more power-saving actions are taken for numerically higher C-states. C1 to C3 cuts off the clock inside the CPU, and C4 to C6 reduces the CPU voltage. Default enabled.

6) Enhanced C states

C1 to C3 cuts the clock inside the CPU. C4 and C6 mode reduces CPU voltage. Features two way "Enhanced" mode, enable by default.

3.3.3 GT-Power Management Control

**RC6(Render Standby):**

Allow/Prohibit integrated graphics card standby, the setting item has been Enabled/Prohibited, and the default setting is (Enabled).

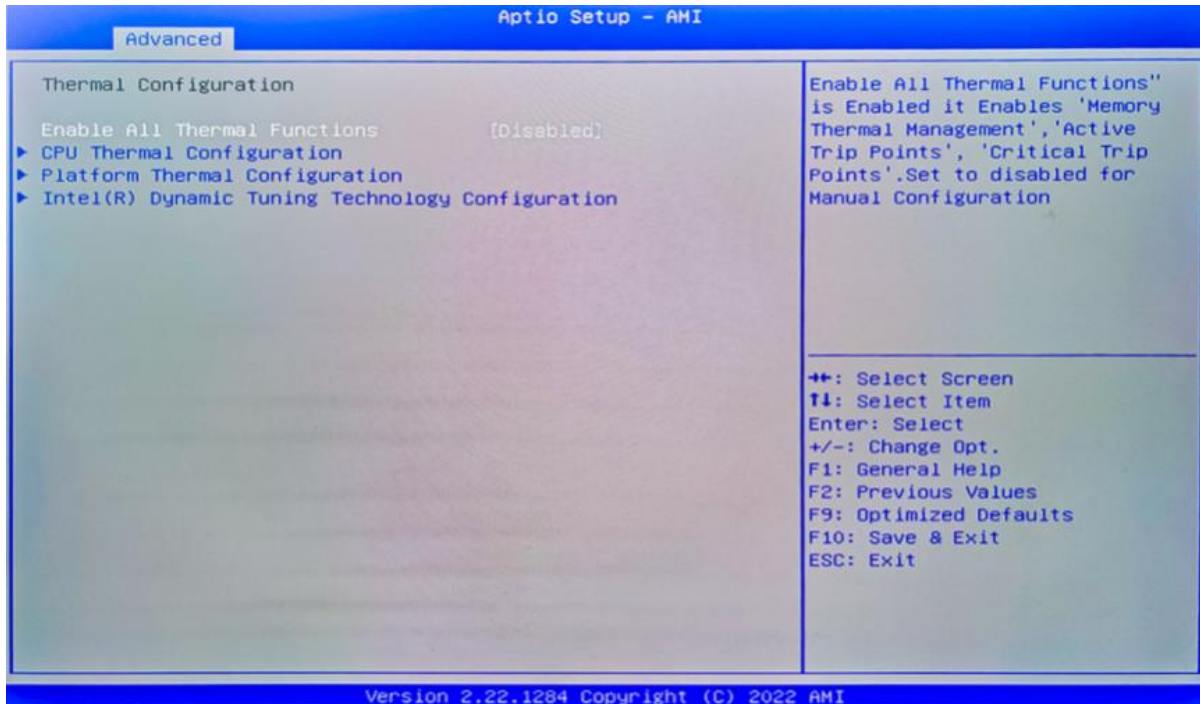
Maximum GT frequency:

Maximum GT Frequency, Default max frequency.

Disable Turbo GT frequency:

Disable Turbo GT Frequency mode, Default disabled.

3.3.4 Thermal Configuration



Enable All Thermal Functions

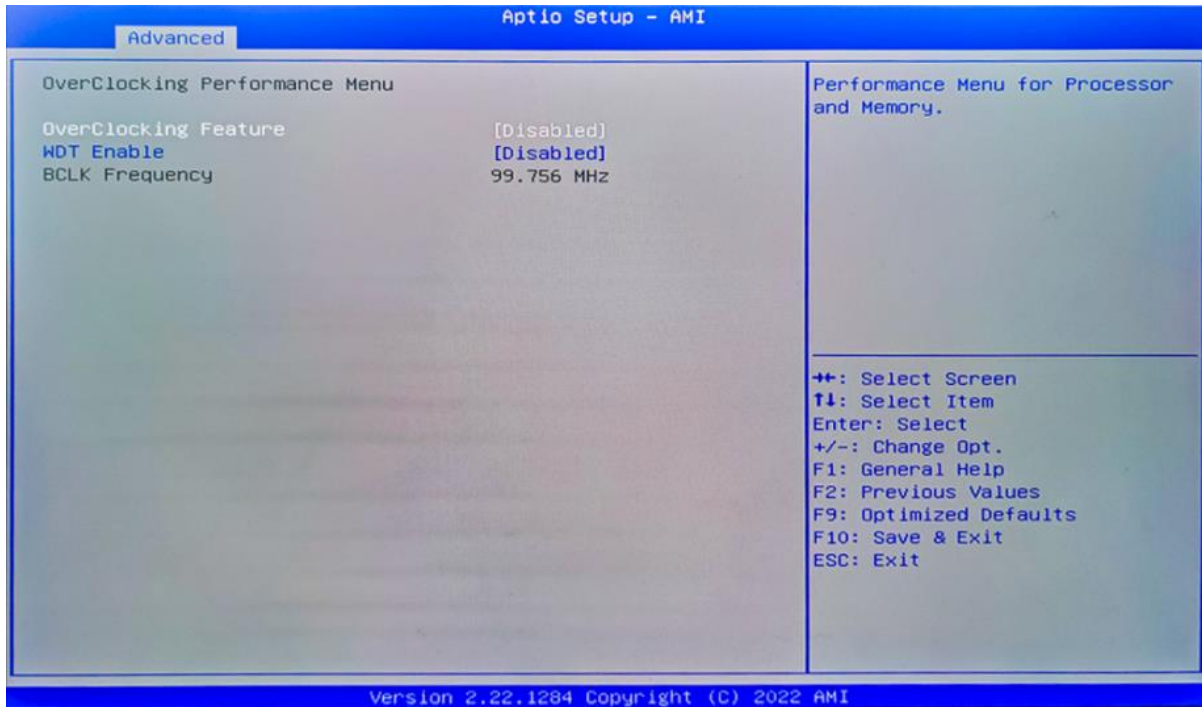
CPU Thermal Configuration:

Unlocks the temperature setting, the “Tcc Activation Offset” is the temperature adjustment option, the highest temperature is 105°C. Change the temperature by minus the number of degrees you wish to change. For example, minus 0(105-0) to set the temperature at 105°C, minus 20(105-20) to set the temperature at 85°C.

Platform Thermal Configuration

Intel® Dynamic Tuning Technology Configuration

3.3.5 OverClocking Performance Menu

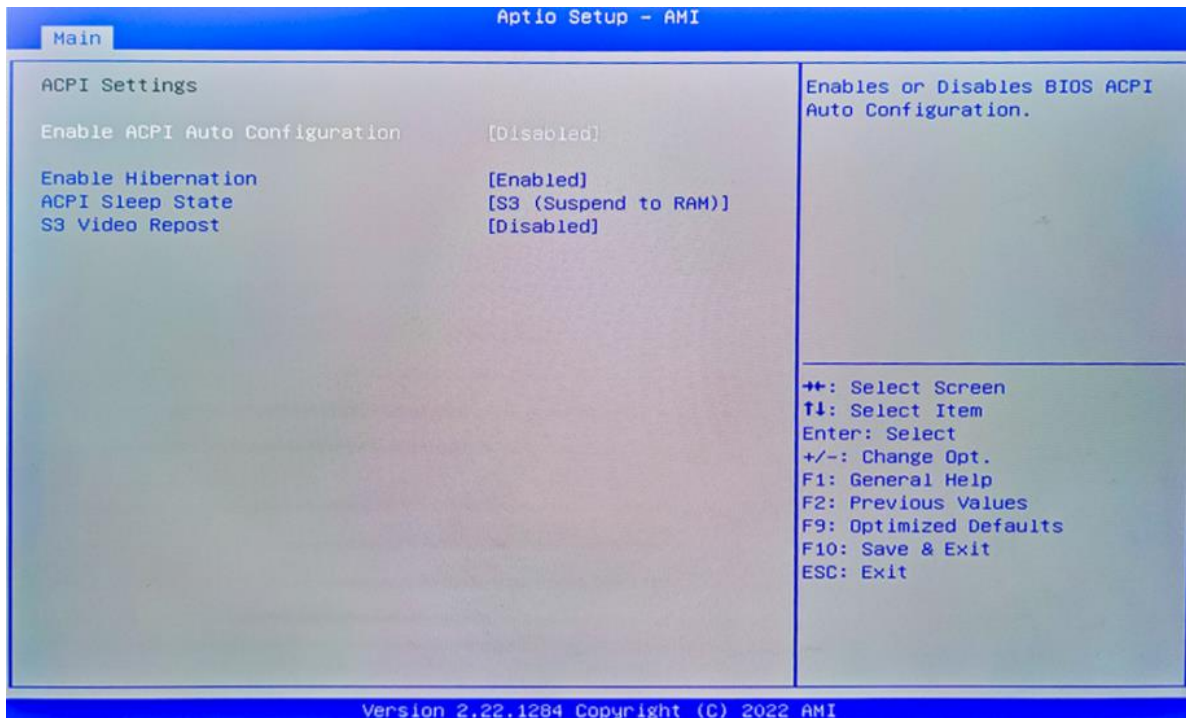


Over Clocking Feature: Disabled

WDT (Watchdog Timer) Enable: Disabled

BCLK Frequency

3.3.6 ACPI Settings



Enabled ACPI Auto Configuration

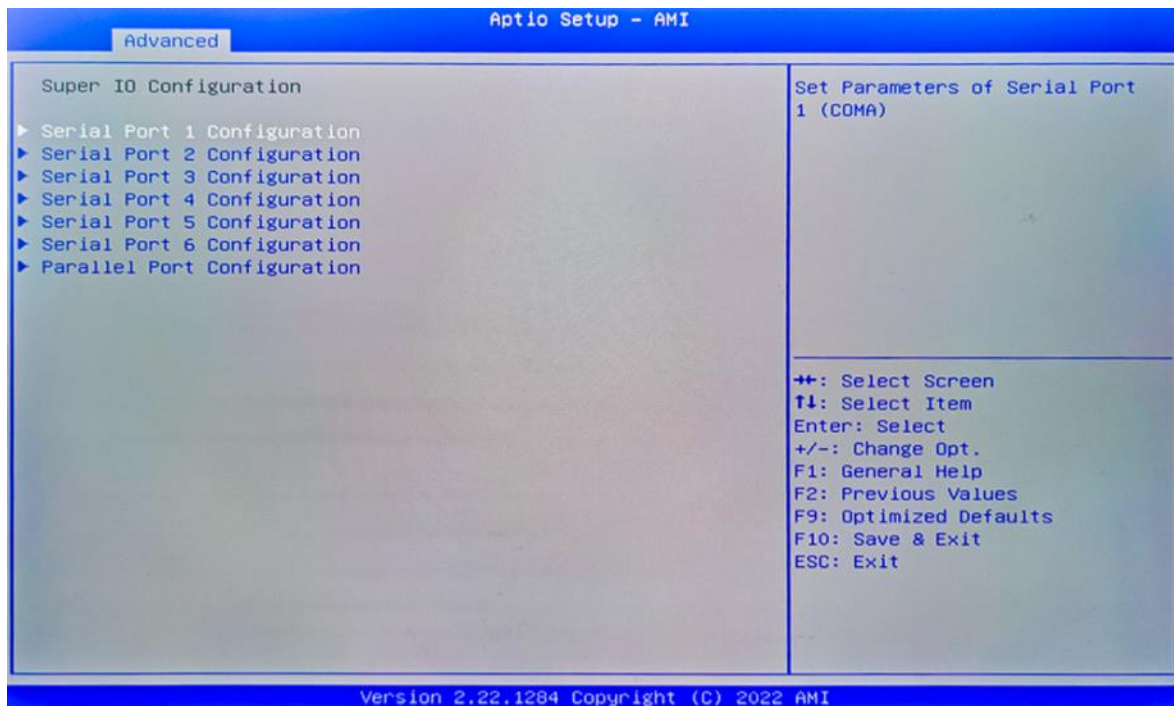
Enabled Hibernation

ACPI Sleep State

S3 Video Repost:

S3 Sleep Mode (Enable VGA BIOS POST function when waking up from S3 Sleep mode)

3.3.7 Super IO Configuration



Serial Port 1~6 Configuration

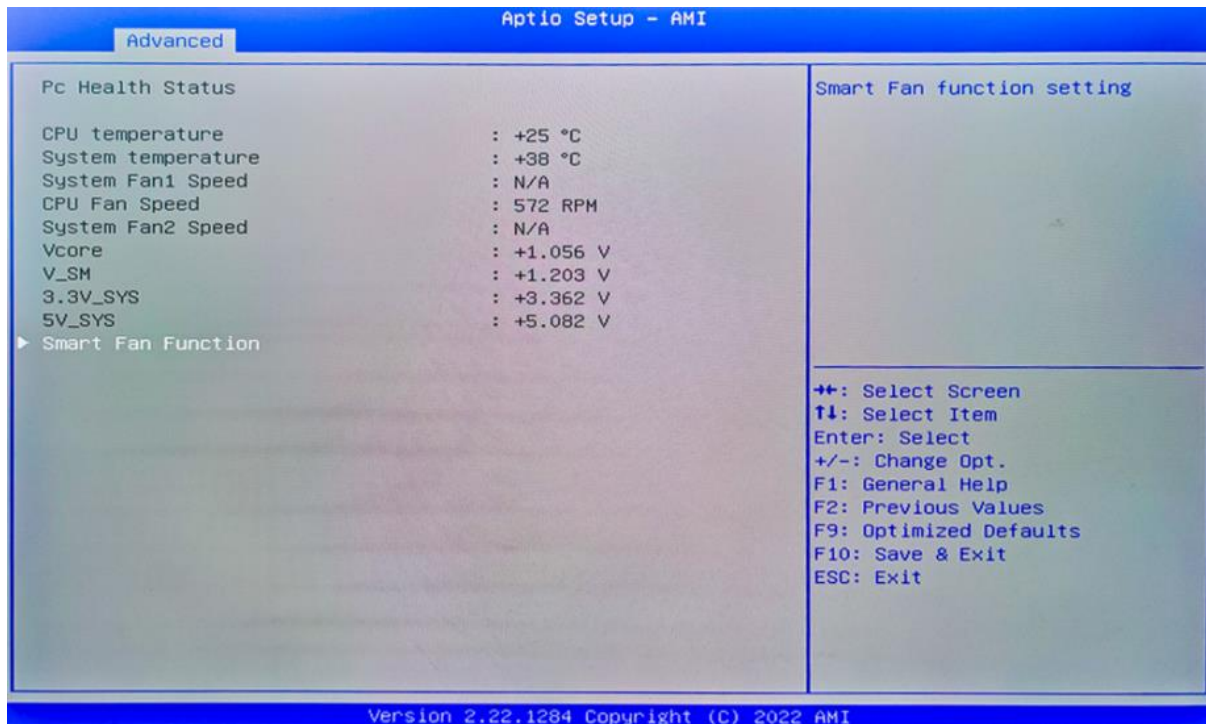
Serial Port: Enable or disable serial port (COM).

Device Setting (Read-only): Displays serial ports' interrupt and location.

Change Setting: Change serial port settings and suggest setting "Auto" as default.

Parallel Port Configuration

3.3.8 Hardware Monitor



PC Health Status

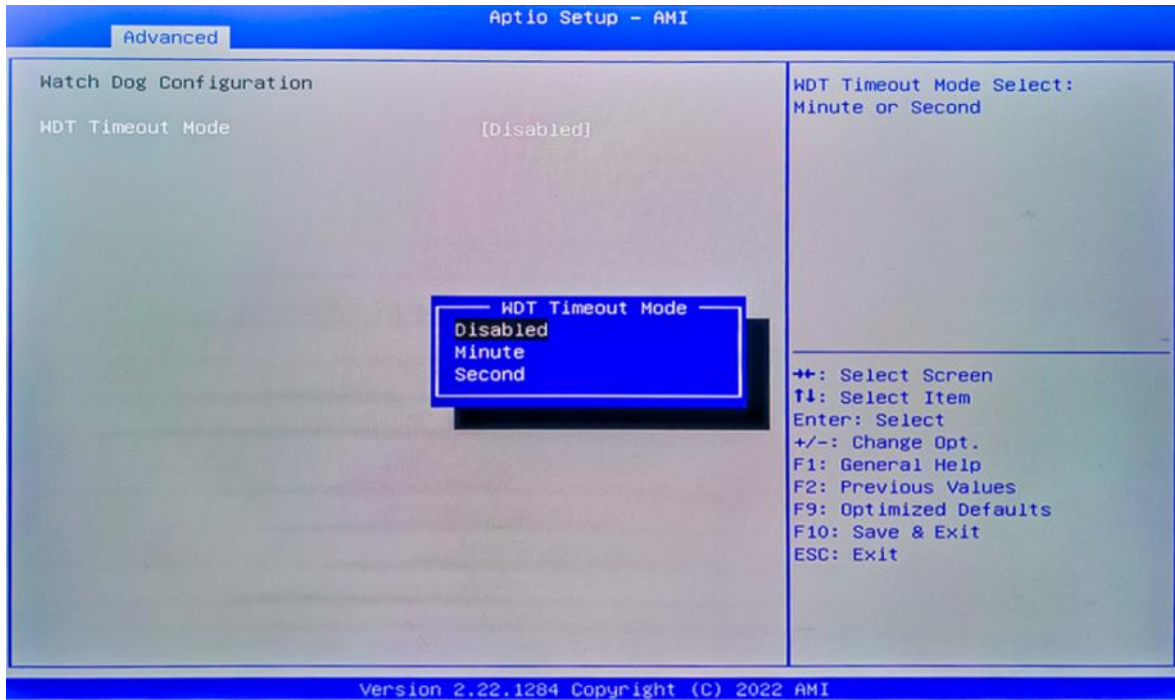
The PC health status displays CPU temperature, system temperature, fan speed, and other relevant voltage values. The above parameters have a certain range, and the system cannot run beyond these ranges.

1. CPU Temperature
2. System Temperature
3. System Fan1 Speed
4. CPU Fan Speed
5. System Fan2 Speed
6. VCore: Core Voltage
7. V_SM
8. +3.3V_SYS: 3.3V
9. +5V_SYS: 5V
10. Smart Fan Function:
 - 1) System Fan1 Setting
 - 2) CPU Fan Setting
 - 3) System Fan2 Setting

The CPU Fan Speed and the System Fan Speed can be set separately according to specific needs:

- 1) Automatic Mode
- 2) Full on Mode
- 3) Manual Mode

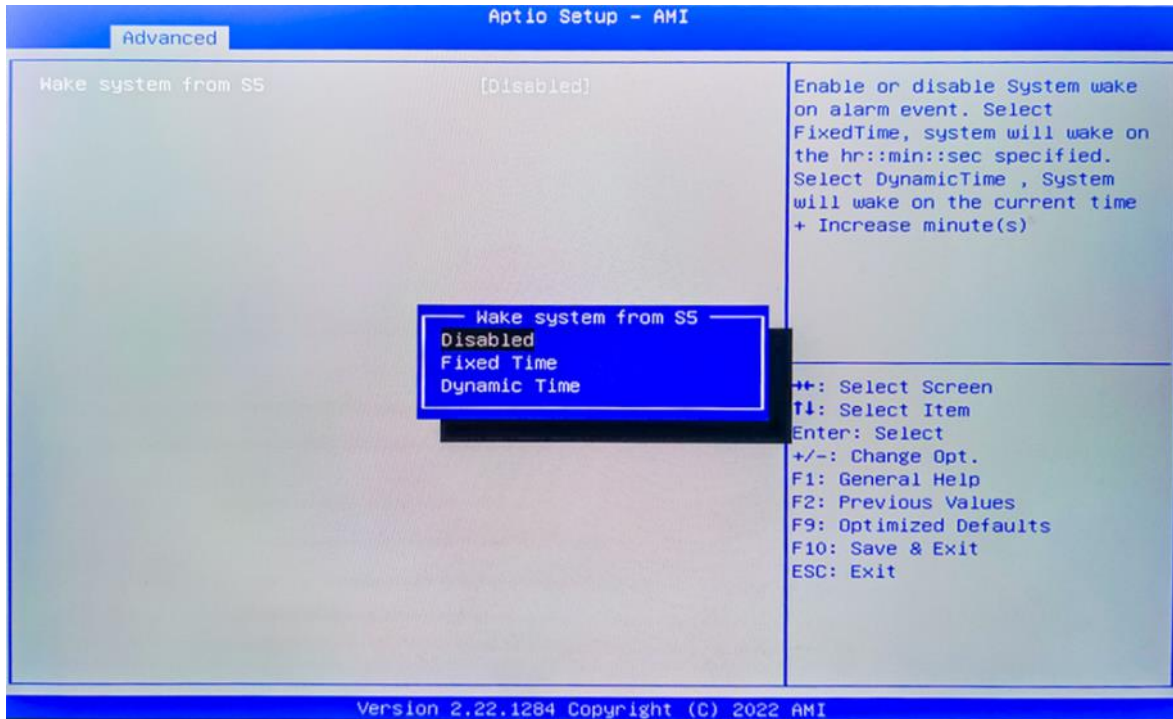
3.3.9 Watch Dog Configuration



Watch Dog Configuration

WDT Timeout Mode select: Minute or Second

3.3.10 S5 RTC Wake Settings

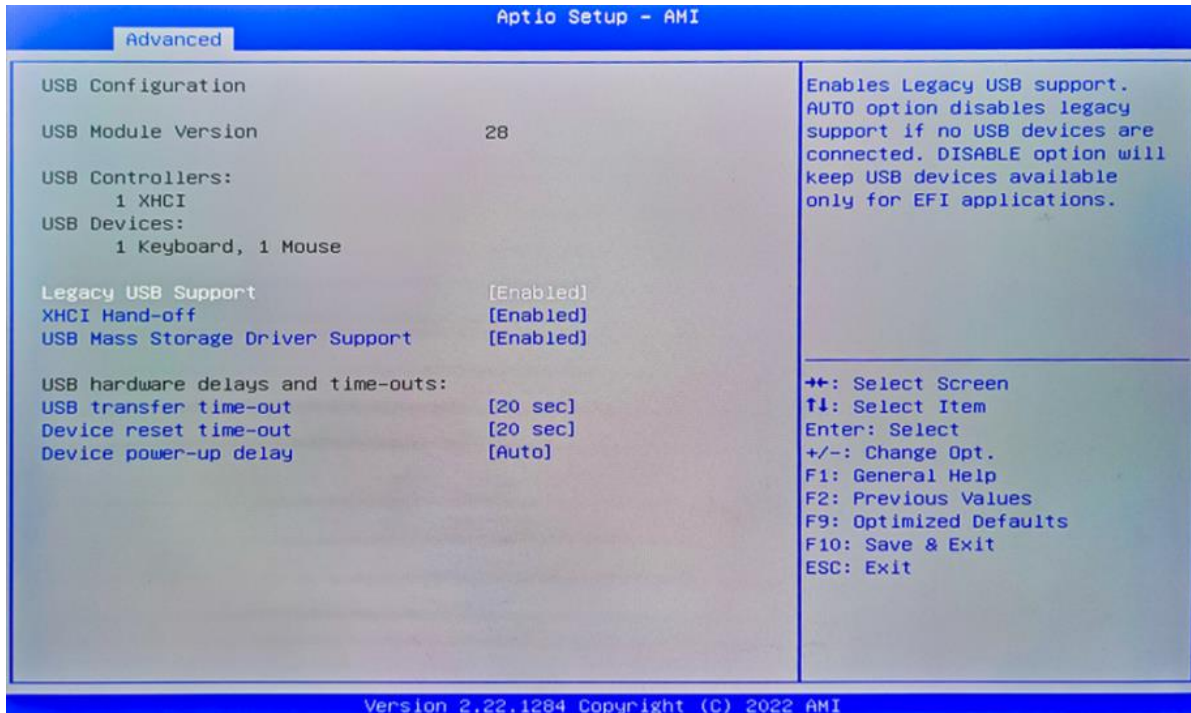


Wake system From S5: timing boot settings, disabled by default.

Fixed Time: Select Fixed Time and the system will wake on the Hr: Min: Sec specified.

Dynamic Time: Select Dynamic Time and the system will wake on a dynamic time.

3.3.11 USB Configuration



Legacy USB Support

Enable Legacy USB support. Disables legacy support if no USB devices are connected. Select enable will keep USB devices available under UEFI's support.

XHCI Hand-off

Whether to enable the USB XCHI transfer protocol. A workaround for OS without XHCI hand-off support. The XHCI ownership change should be claimed by the USB XCHI driver.

USB Mass Storage Driver Support

Enable(default) or disable USB Mass Storage Driver Support.

USB transfer time-out

Time-out value for control, bulk, and interrupt transfers, default time:20 second.

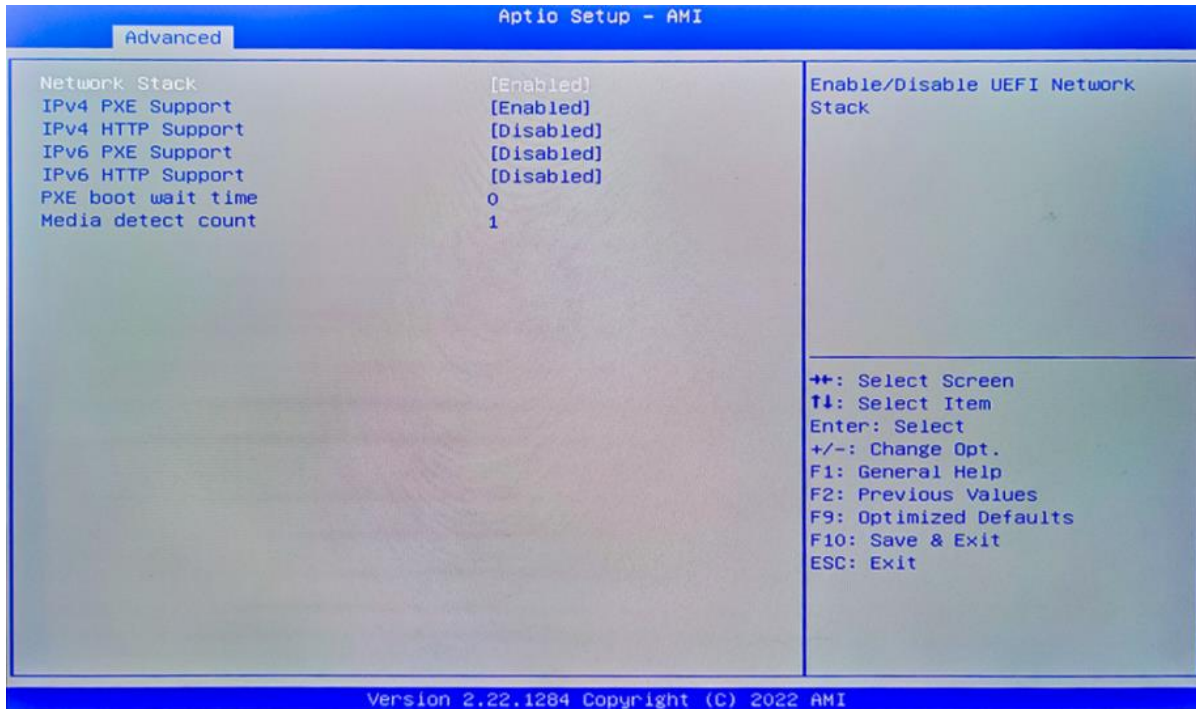
Device reset time-out

USB mass storage device start unit command time-out, default time:20 second.

Device Power-up Delay

Maximum time the device will take before it properly reports itself to the host controller.

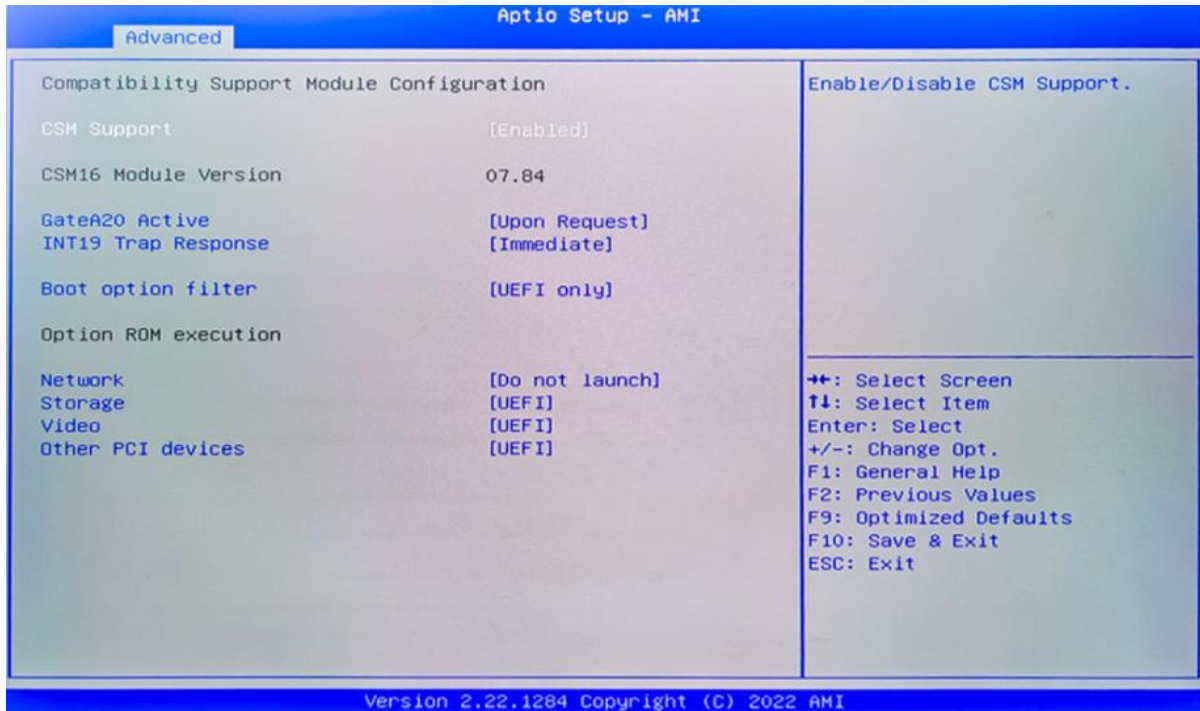
3.3.12 Network Stack Configuration



Network Stack

PXE Network boot setting, disabled by default.

3.3.13 CSM Configuration

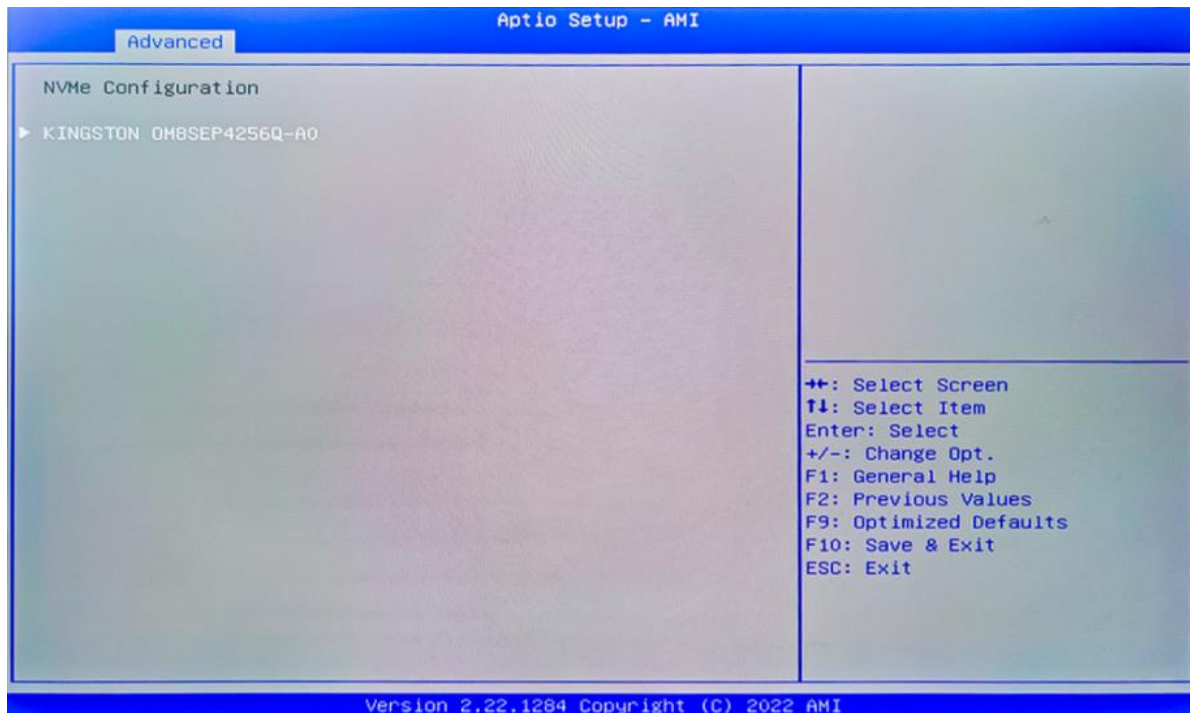


Boot Option Filter

Option ROM Execution

- Network
- Storage
- Video
- Other PCI Devices

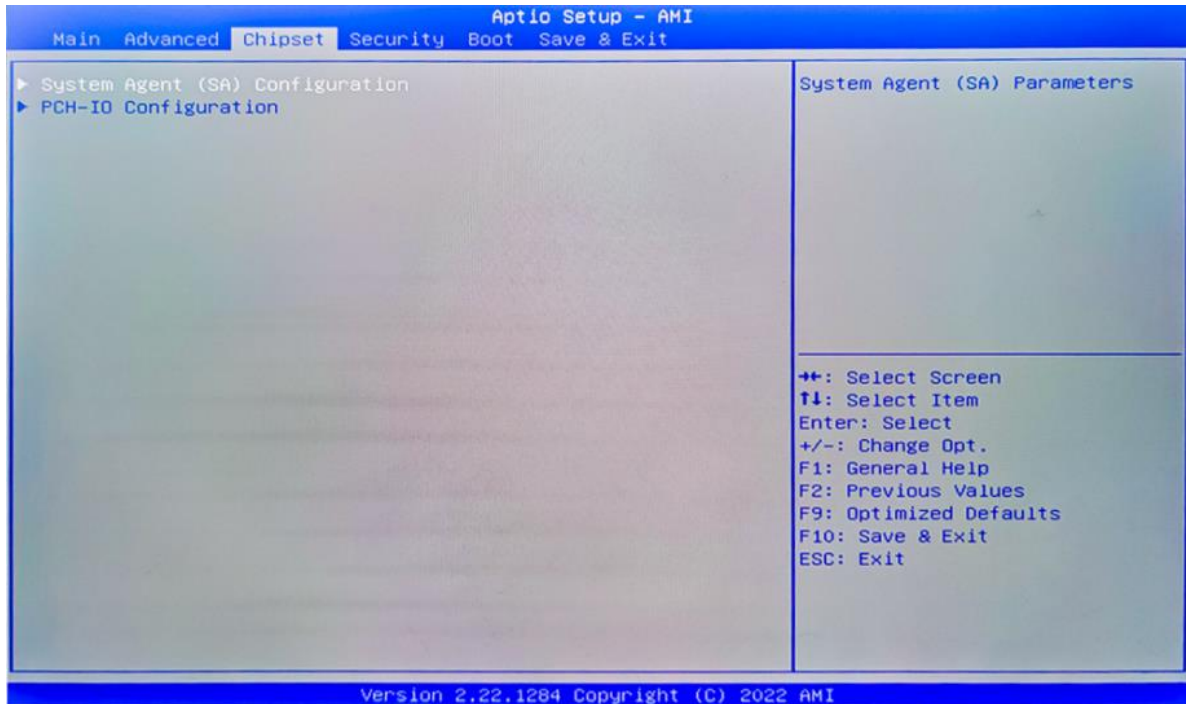
3.3.14 NVMe Configuration



The capacity and model of the SSD will be displayed under the option after the NVMe protocol SSD has been installed.

3.4 Chipset

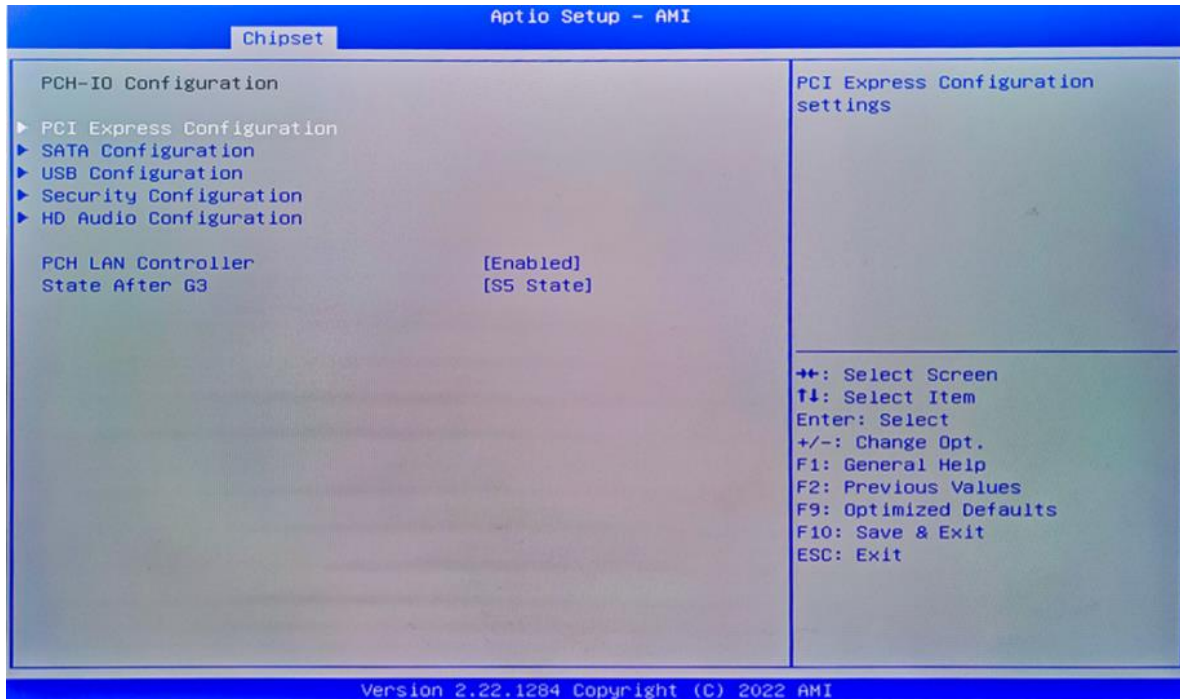
Select the chipset tab from the setup screen to enter the chipset BIOS Setup screen.



System Agent (SA) Configuration: Northbridge configuration options, including video memory, display devices, and other options.

PCH-IO Configuration: Southbridge configuration options, including hard disk, sound card equipment, and other options

3.4.1 PCH-IO Configuration



PCI Express Configuration

SATA Configuration

USB Configuration

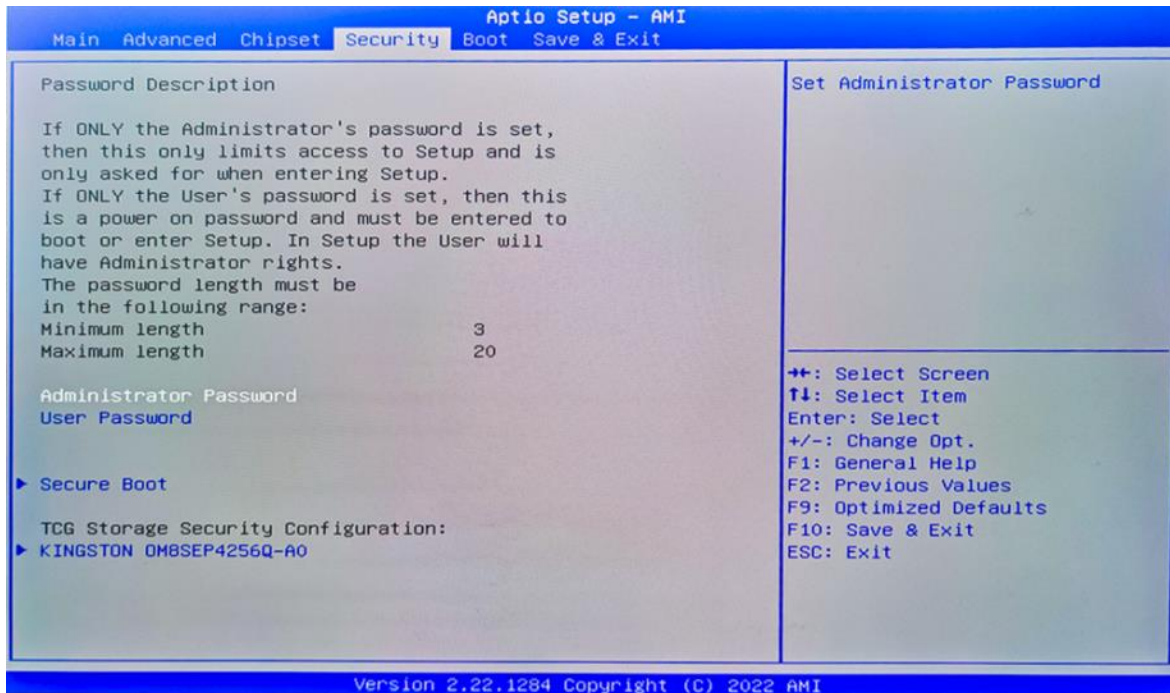
Security Configuration

HD Audio Configuration

PCH LAN Controller

State After G3 setting: S0 State (auto-start after power-on), S5 State by default.

3.5 Security

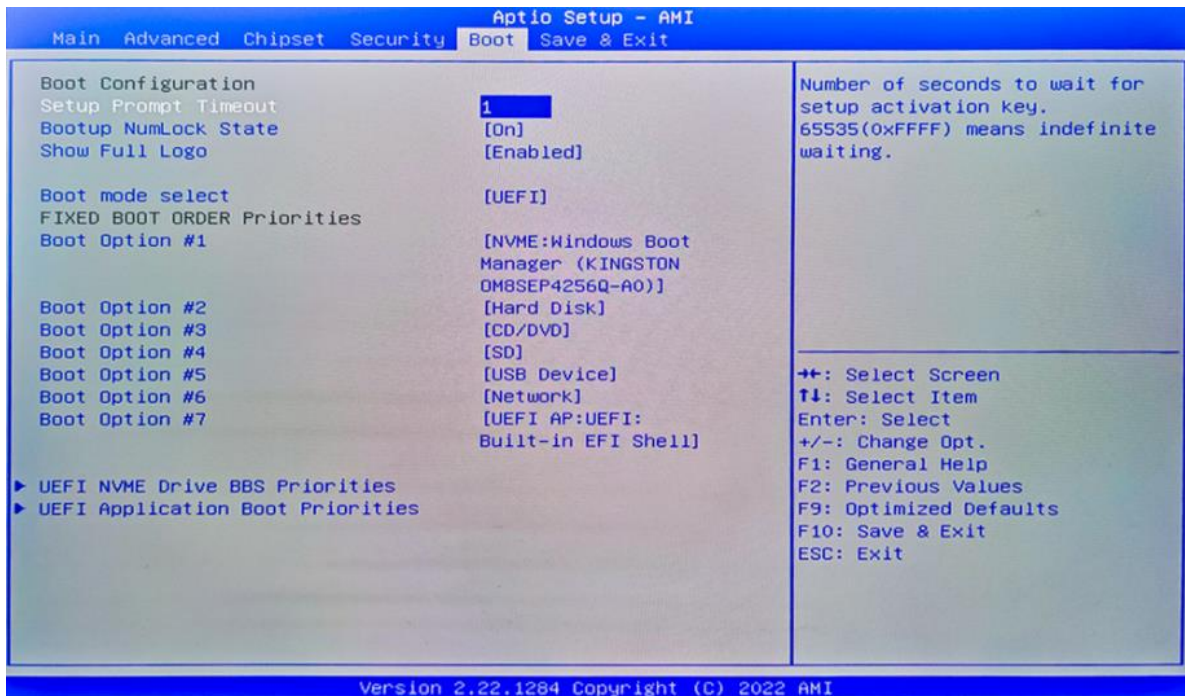


Administrator Password: Set the Administrator Password.

User Password: Set User Password.

Secure Boot: Secure boot

3.6 BOOT



Setup Prompt Timeout:

Number of seconds that the firmware will wait before initiating the original default boot selection. A value of 0 indicates that the default boot selection is to be initiated immediately on boot. A value of 65535(0xFFFF) indicates that firmware will wait for user input before booting. This means the default boot selection is not automatically started by the firmware.

Bootup NumLock State:

Select the keyboard NumLock state. The Bootup NumLock State allows activation of the Keypad number lock function after the system is powered on to the DOS system. When the default is set to ON, the NumLock is on when the system starts. When it is set to OFF, the keypad is in the cursor control state when starting.

Show Full Logo:

Enabled/Disabled Displays customized boot logo.

Boot Option #1~#7:

Set the system boot order from Number 1 to Number 7.

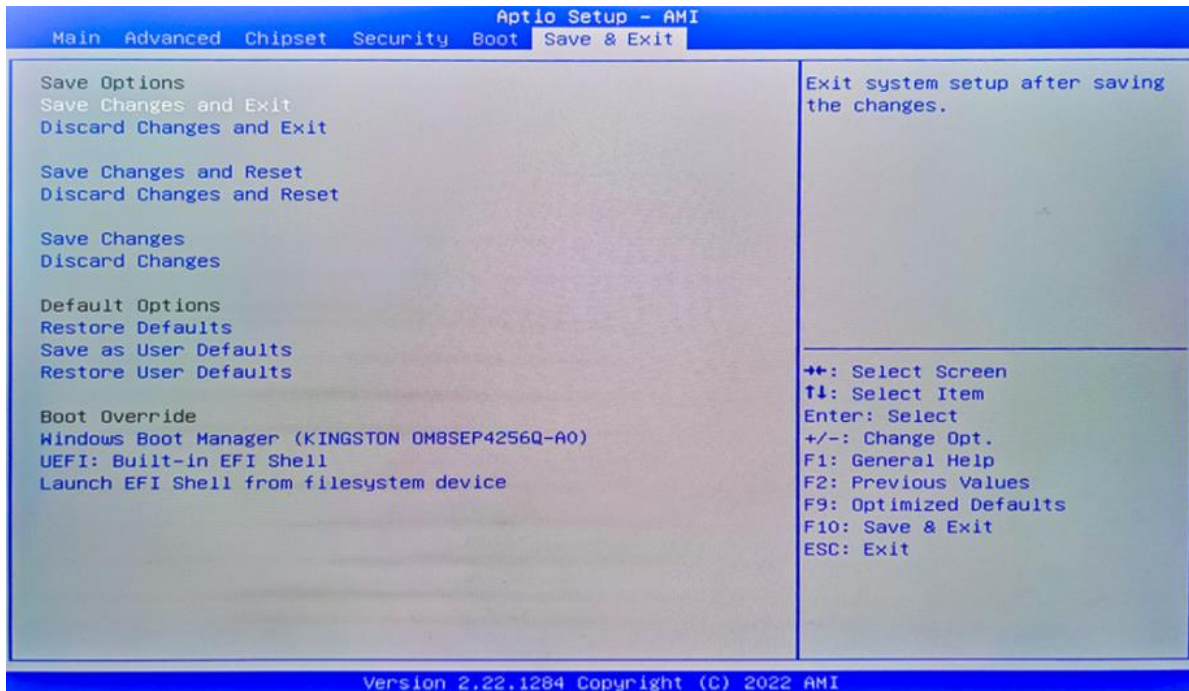
UEFI NVME Drive BBS Priorities:

UEFI NVME drive boot priorities setting.

UEFI Application boot Priorities:

UEFI application boot priority.

3.7 Save & Exit



Save Changes and Exit:

Exit the system setup after saving the changes and continue to start the computer.

Discard Changes and Exit:

Exit the system setup without saving any changes and continue to start the computer.

Save Changes and Reset:

Reset the system after saving the changes.

Discard changes and Reset:

Reset the system without saving any changes.

Save Changes:

Save changes done so far to any of the options.

Discard Changes:

Discard changes done so far to any of the options.

Restore Defaults:

Restore/load default values for all the options.

Save as User Defaults:

Save the changes done so far as the user defaults.

Restore User Defaults:

Restore the user defaults to all the options.

Boot Override:

Boot device selection can override your boot priority. Select the specified boot device such as SATA, USB Flash Disk, EFI Shell, PXE, etc., and boot directly. Or press F11 boot by selecting the specified boot device.