DTEC-C012
DTEC-C014
DTEC-C016

Embedded Rugged Fan-less System Featuring 12th Gen Intel® Core™ i3/i5/i7 Mobile Processors

User's Manual

Version 2.0

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Table of Contents

How to Use This Manual

Chapter 1 System Overview 1-1

- 1.1 Introduction 1-1
- 1.2 Check List 1-2
- 1.3 Product Specification 1-2
- 1.4 Mechanical Dimension 1-3
- 1.5 Product Environment Information 1-4
- 1.6 Adaptor Information 1-4

Chapter 2 System Installation 2-1

- 2.1 CPU and Memory module Installation 2-1
- 2.2 Wi-Fi module Installation 2-4
- 2.3 I/O Interfaces 2-10
- 2.3.1 Front View 2-10
- 2.3.2 Rear View 2-11
- 2.4 Getting Started 2-13

Chapter 3 BIOS Setup Information 3-11

- 3.1 Main 3-12
- 3.2 Security 3-21
- 3.3 Boot 3-31
- 3.4 Save & Exit 3-41

Chapter 4 Important Instructions 4-1

- 4.1 Note on the Warranty 4-1
- 4.2 Exclusion of Accident Liability Obligation 4-1
- 4.3 Liability Limitations / Exemption from the Warranty Obligation 4-1
- 4.4 Declaration of Conformity 4-1

How to Use This Manual

The manual describes how to configure your DTEC-C012 & DTEC-C014 & DTEC-C016 system to meet various operating requirements. It is divided into four chapters, with each chapter addressing a basic concept and operation of Embedded System.

Chapter 1: System Overview. Present what you have in the box and give you an overview of the product specifications and basic system architecture for this embedded system.

Chapter 2: System Installation. Show the definitions and locations of all the interfaces and describe a proper installation guide so that you can easily configure your system.

Chapter 3: BIOS Setup Information. Specify the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 4: Important Instructions. Indicate some instructions which must be carefully followed when the embedded system is used.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. The vendor may make supplement or change in the products described in this document at any time.

Revision History

Revision	Date	Details of Change(s)
V1.0	2023/08	Initial Release

Chapter 1
System Overview

1.1 Introduction

Portwell introduces the DTEC-C012, DTEC-C014, and DTEC-C016, stylish fan-less medical systems with exceptional performance, making them ideal solutions for hospitals. These rugged systems are equipped with embedded boards based on the 12th Generation Intel® Core™ Processor, ensuring improved 3D graphics performance and faster 4K encode and decode operations.

The DTEC-C012, DTEC-C014, and DTEC-C016 systems boast a range of features, including a single channel SO-DIMM DDR5 4800 MHz up to 64GB, 4x USB 3.2 and 5x USB 2.0 ports, and 1x HDMI plus 1x DP supporting a maximum resolution of up to 8K. They also offer versatile storage options including 1x SATA III port and 1x M.2 slot supporting NVMe. The compact chassis platform measuring 152(W) x 196(D) x 44(H) mm includes Wi-Fi, Bluetooth module, and antenna, ensuring seamless communication and wireless connectivity. Additionally, the inclusion of 1x RJ45 COM port makes it a perfect solution for controlling medical equipment.

The DTEC-C012, DTEC-C014, and DTEC-C016 by Portwell deliver robust performance surpassing their predecessors, with a thermal design power (TDP) of under 15W. These systems are designed to support a wide voltage range of power input from 12V to 24V, making them suitable for rugged applications.

Featuring ingenious mechanical design and high processing capabilities, thanks to the Intel® Core™ processor with ten-core processing power, the fan-less medical grade DTEC-C012, DTEC-C014, and DTEC-C016 systems are robust solutions for telehealth, digital signage, automation, IoT, and control box applications.

1.2 Check List

The DTEC-C012, DTEC-C014, and DTEC-C016 package should cover the following basic items:

- ✓ One BOX PC System
- ✓ One Adapter

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

DTEC-C012:

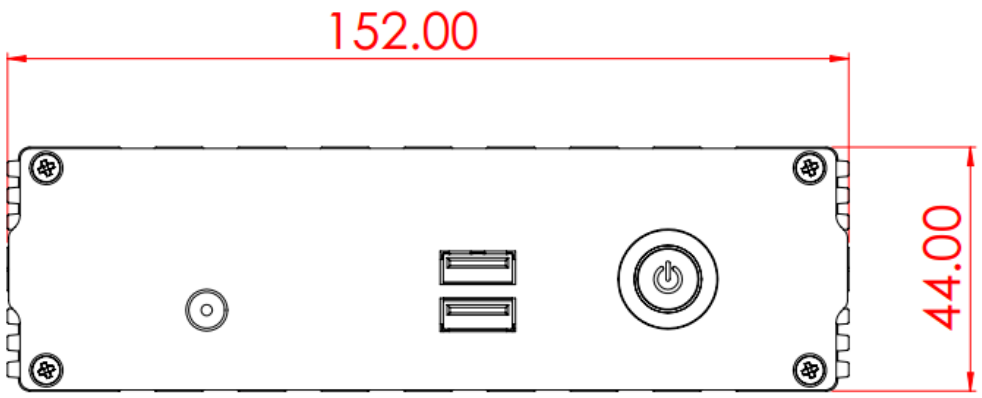
System	
Processor	Intel Alder Lake Core™ i3-1215UE PL1 15W/ PL2 25W
Memory	2x SO-DIMM up to 64GB DDR 5 4800
Storage	- 1x M.2 NVME with PCIe x4 for SSD - 1x SATA3.0 (6.0 Gb/s)
BIOS	AMI uEFI BIOS (SPI ROM)
Expansion	- Optional 1x M.2 2230 - support Intel WiFi 6 + BT Module

I/O Interface	
Serial Port	2x RJ45 COM port
USB	- 4x USB 3.2 (Type-A) - 5x USB 2.0 (Type-A)
Audio	Realtek ALC 897 Audio Codec MIC In/Line-out
Ethernet	2x Intel I225 With 2.5G Gigabit LAN
Display	- 1x HDMI up to 8K resolution - 1x DP up to 8K resolution

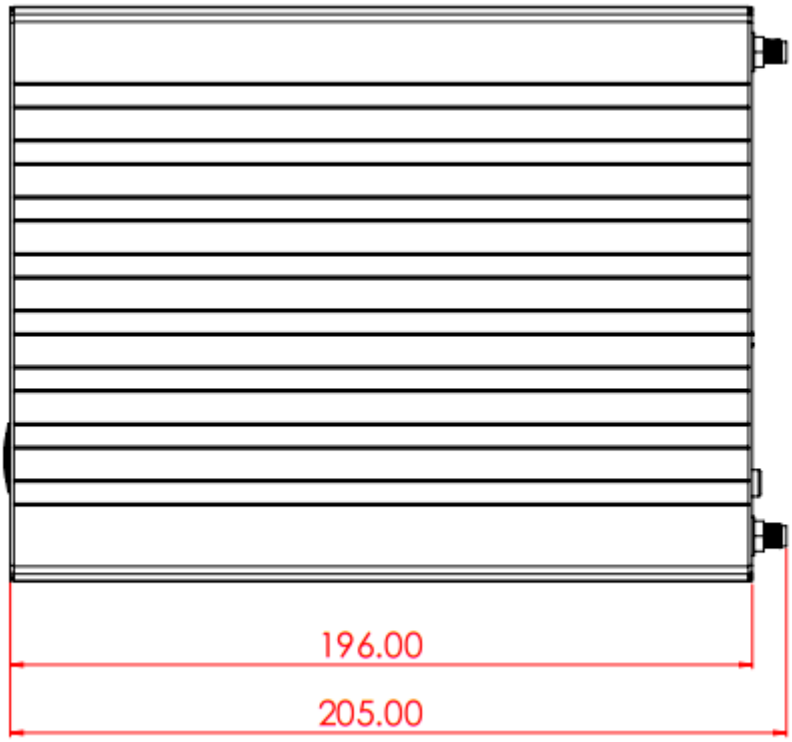
Power Supply	
Power Input	DC 12~24V DC input

Mechanical & Environmental	
Operation Temperature	(-)5°C ~ 40°C
Storage Temperature	(-)40°C ~ 70°C
Dimension	196(L) x 152(W) x 44(H)mm

1.4 Mechanical Dimension



Front view of the system



Top view of the system

1.5 Product Environment Information

Relative Humidity	**0% to 95%**
Operating Temperature	**-5℃ to 40℃**
Atmospheric Pressure	**70 to 106 kPa**
Storage Temperature	**-40℃ to 70℃**
Storage Humidity	**0%-95%**
Transportation Temperature	**-40℃ to 70℃**
Transportation Humidity	**0%-95%**

1.6Adaptor Information

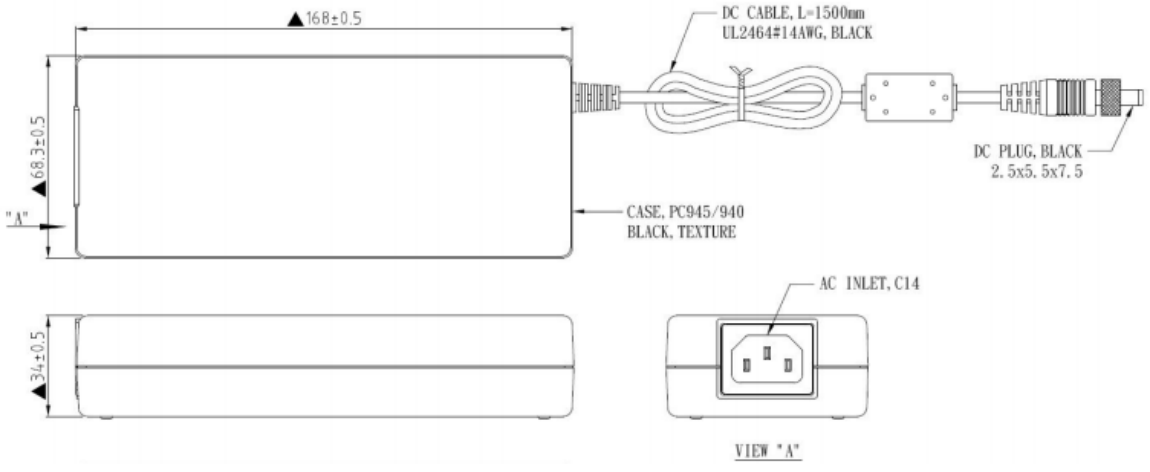
Brand：AOEN

Model name：A1218MD-120100

Spec:

Output Voltage	12V
Minimum Load	0A
Maximum Load	10A
Line Regulation	+/-1%
Load Regulation	+/-5%
Voltage Accuracy	11.4V – 12.6V
Ripple & Noise	200mV Max.

Drawing：

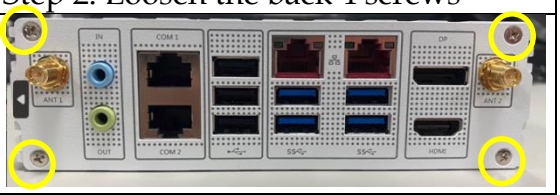
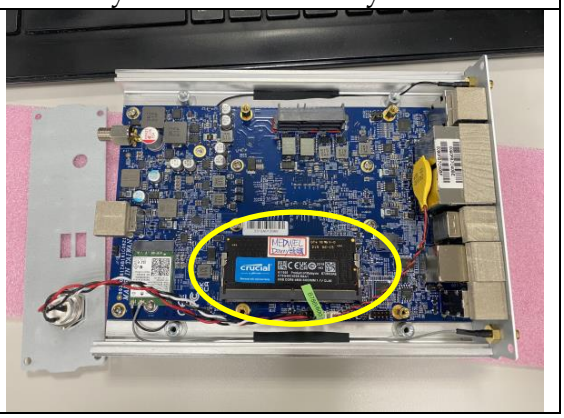


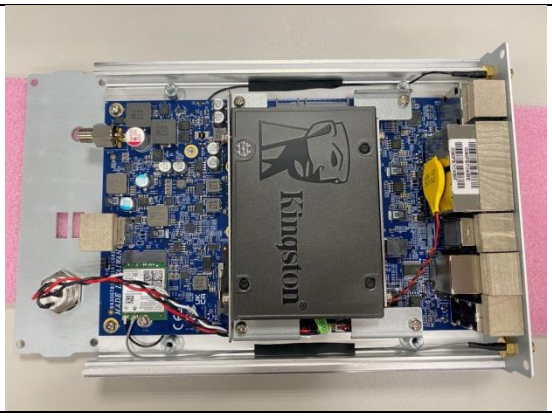
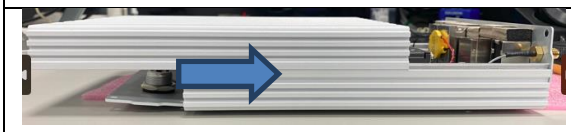
Chapter 2

System Installation

This chapter provides you with instructions to set up your system. Definitions and locations of all the interfaces are described so that you can easily configure your system. For more detailed PIN assignment and jumper setting, please refer to user's manual of motherboard.

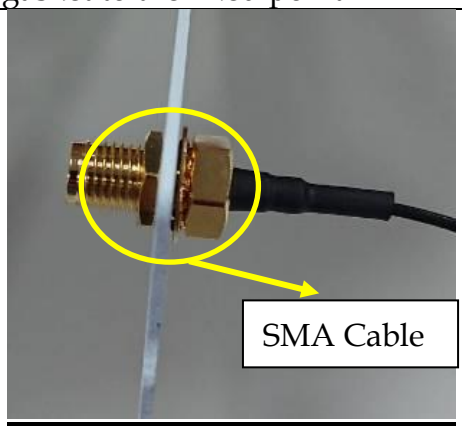
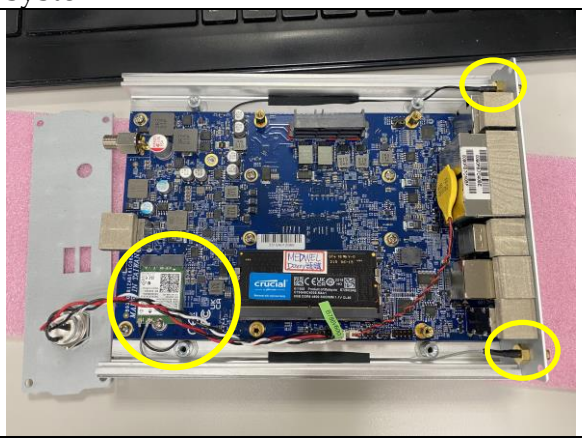
2.1 Memory & SSD module Installation

Step 1. Loosen the front 5 screws	Step 2. Loosen the back 4 screws
	
Step 3. Plug out the power button two connectors	Step 4. Install DDR5 SO-DIMM Memory Module on the system
	

Step 5. 2.5″ SSD storage with bracket	Step 6. Lock the SSD with bracket on the main board
	
Step 7. Assemble the top cover and bottom cover, and lock 4 screws on the rear cover	Step 8. Lock 5 screws on the front cover
	

2.2 Wi-Fi module Installation

Special M.2 design for easy installation and maintenance of Wi-Fi modules and antennas. Optional design offers customers more choices.

<table>
<tr><td>Step 1. M.2 Wi-Fi module</td><td>Step 2. SMA cable Installation</td></tr>
<tr><td>
</td><td> </td></tr>
<tr><td>Step 3. Lock the SMA cable and gasket to the fixed point</td><td>Step 4. Install the Wi-Fi Module on the system</td></tr>
<tr><td> 
</td><td>  </td></tr>
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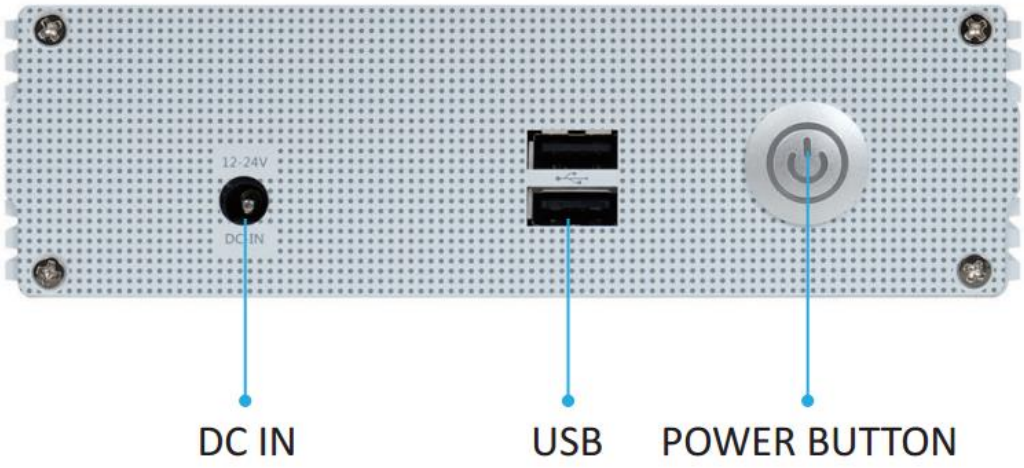
2.3 I/O Interfaces

2.3.1 Front View



DC in 12-24V:

Provide power connection of the system to the main power source via DC power cable or AC/DC power adapter.

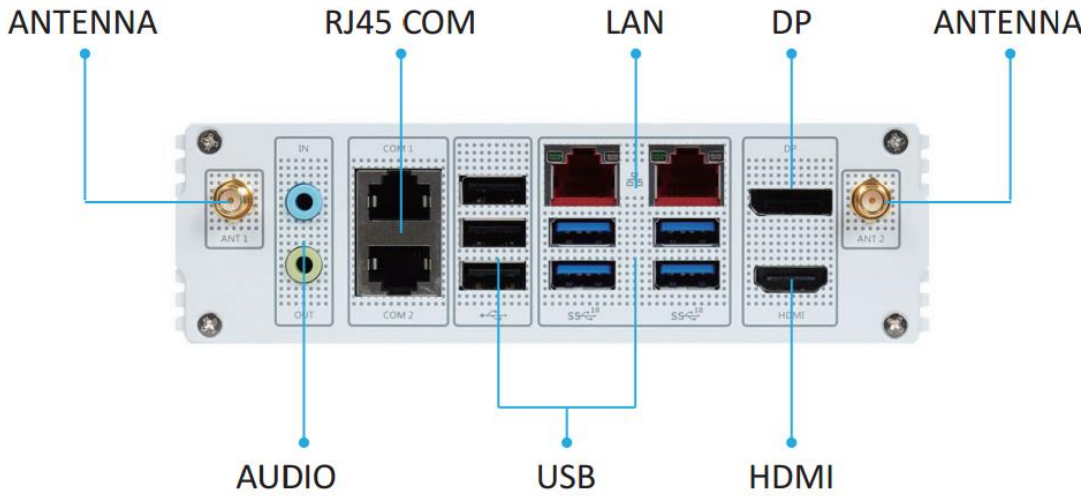
Power Button:

Turn on/ off the Box PC

USB:

2 x USB 2.0 Type-A ports

2.3.2 Rear View



LAN:
2x Intel I225 With 2.5G Ethernet LAN

USB3.2:
4x USB3.2 Type A (Universal Serial Bus) ports

USB2.0:
3x USB2.0 Type A (Universal Serial Bus) ports

HDMI:
Type A HDMI display output

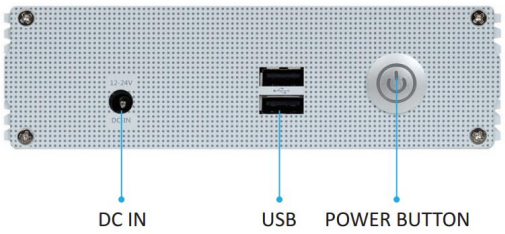
DP:
DP display output

Audio:
Connectors for Mic-In, Line-In and Line-Out

COM port:
2x RJ-45 COM ports

2.4 Getting Started

To start the system, please follow these simple steps: Insert the power jack and press the power button.

Step 1. Insert the power connector into the DC input and press the power button to start	Power connector outlook
	

Chapter 3

BIOS Setup Information

3.1 Introduction

The following section describes the BIOS setup program. The BIOS setup program can be used to view and change the BIOS settings for the module. Only experienced users should change the default BIOS settings.

3.2 BIOS Setup

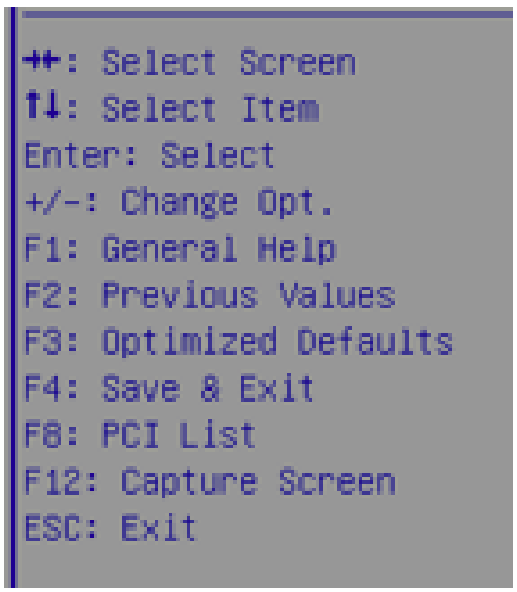
Power on the computer and the system will start POST (Power on Self Test) process. When the message below appears on the screen, press <Delete> or <F2> key will enter BIOS setup screen.

Press<Delete> or <ESC> to enter SETUP

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

Press <F1> to Run General Help or Resume

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help Screen.



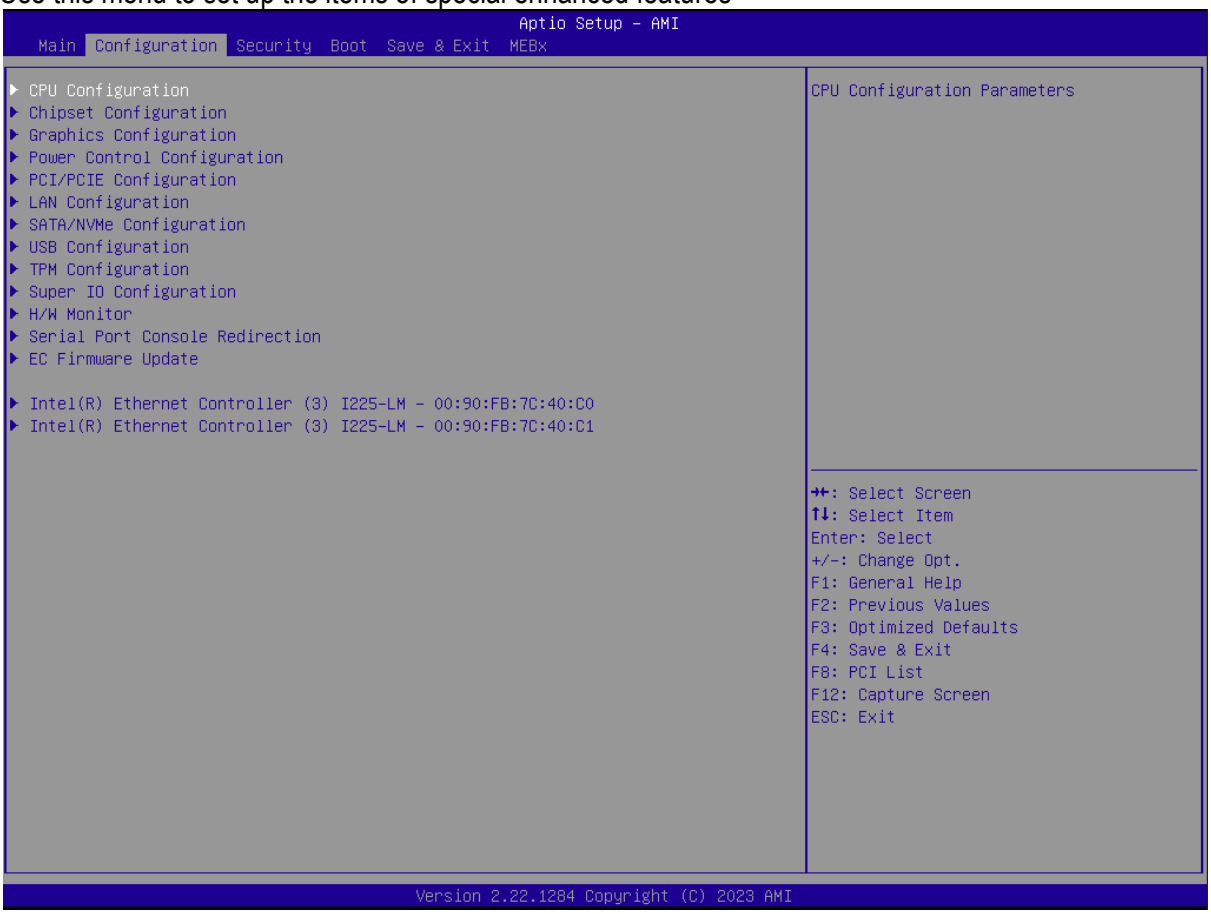
3.2.1 Main

Use this menu for basic system configurations, such as time, date etc.

Feature	Description
System Date	The date format is <Day>, <Month> <Date> <Year>. Use [＋] or [－] to configure system Date.
System Time	The time format is <Hour> <Minute> <Second>. Use [＋] or [－] to configure system Time.

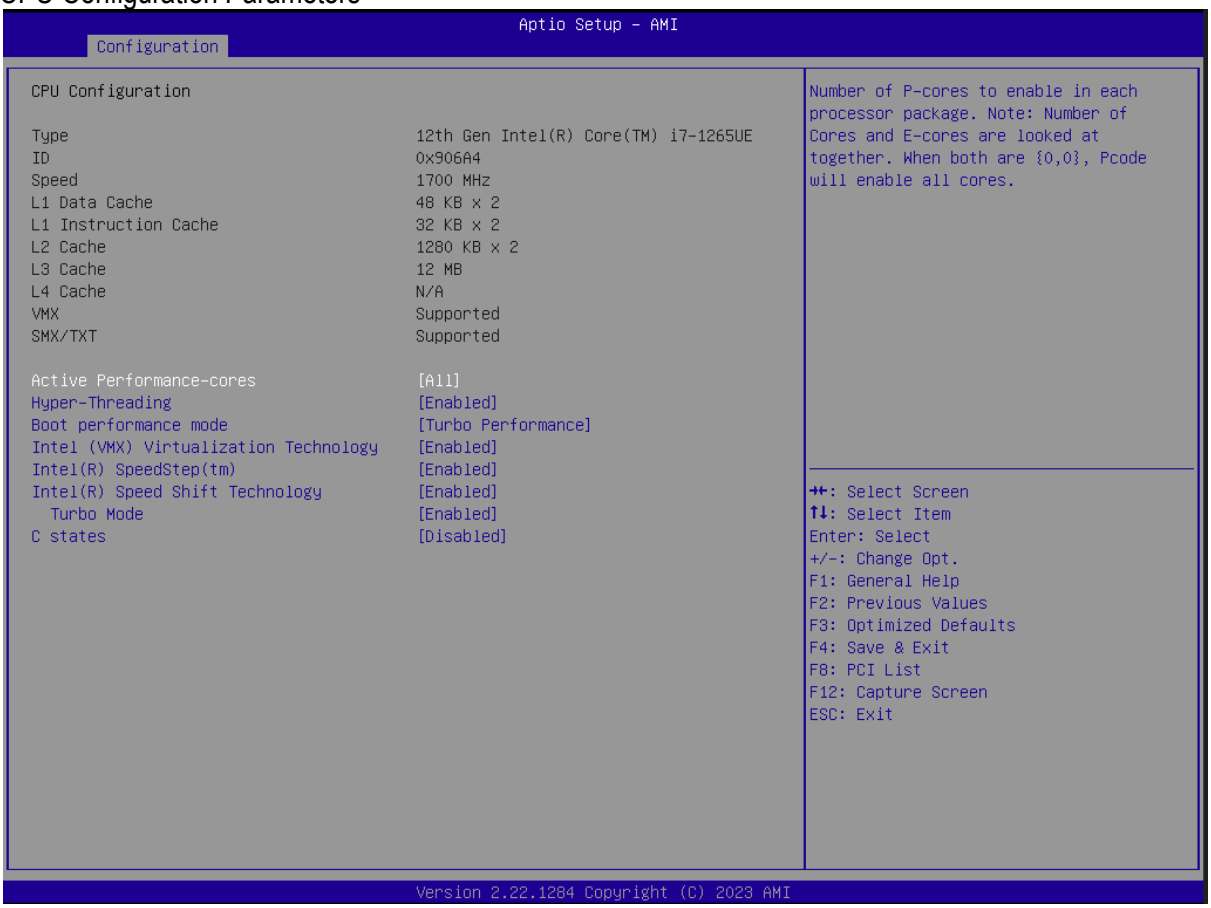
3.2.2 Advanced

Use this menu to set up the items of special enhanced features



CPU Configuration

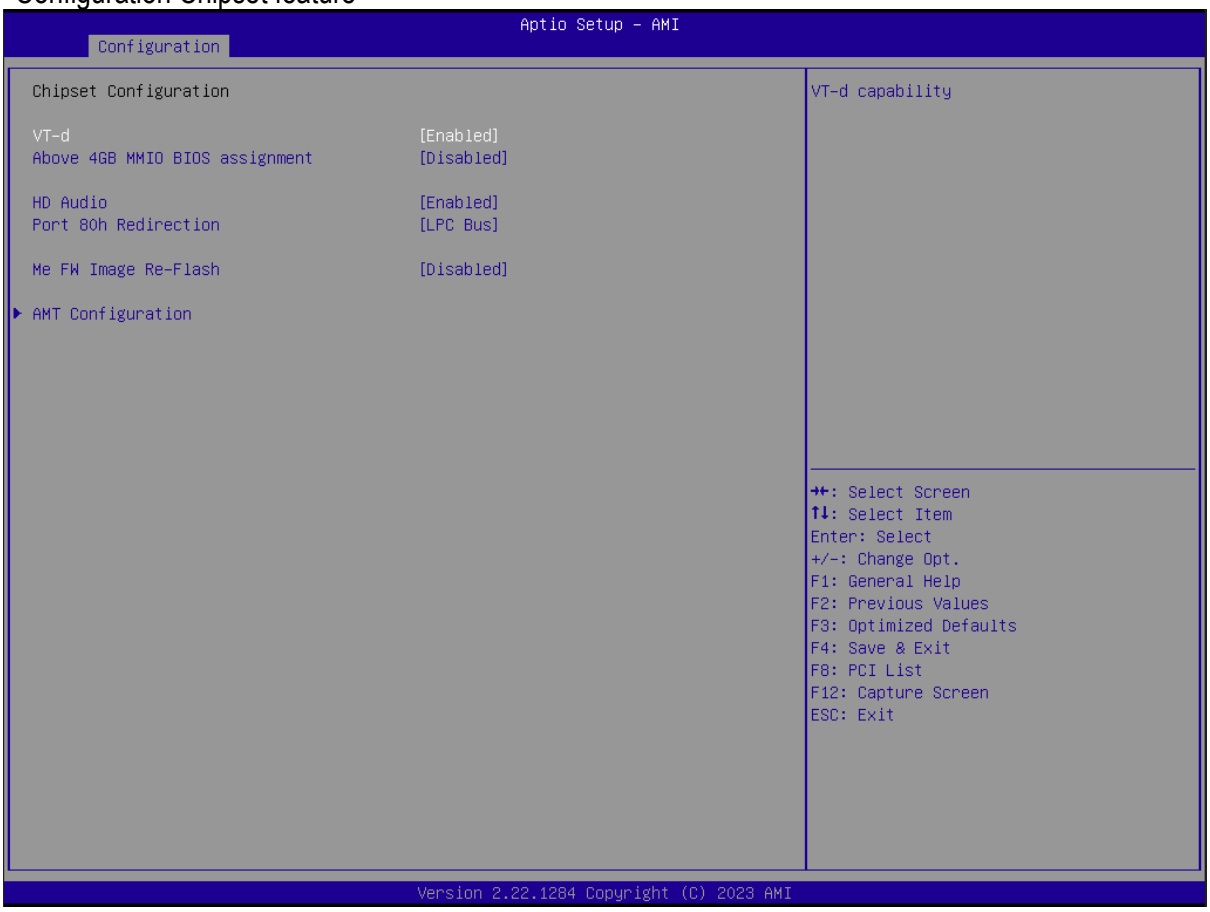
CPU Configuration Parameters



CPU Configuration	
Active Performance-Cores	√All, 1
Hyper-Threading	√Enable, Disabled
Boot performance mode	Max Battery, Max Non-Turbo Performance, √Turbo Performance
Intel (VMX) Virtualization Technology	√Enable, Disabled
Intel (R) SpeedStep(tm)	√Enable, Disabled
Intel (R) Speed Shift Technology	√Enable, Disabled
Turbo Mode	√Enable, Disabled
C States	Enable, √Disabled

Chipset Configuration

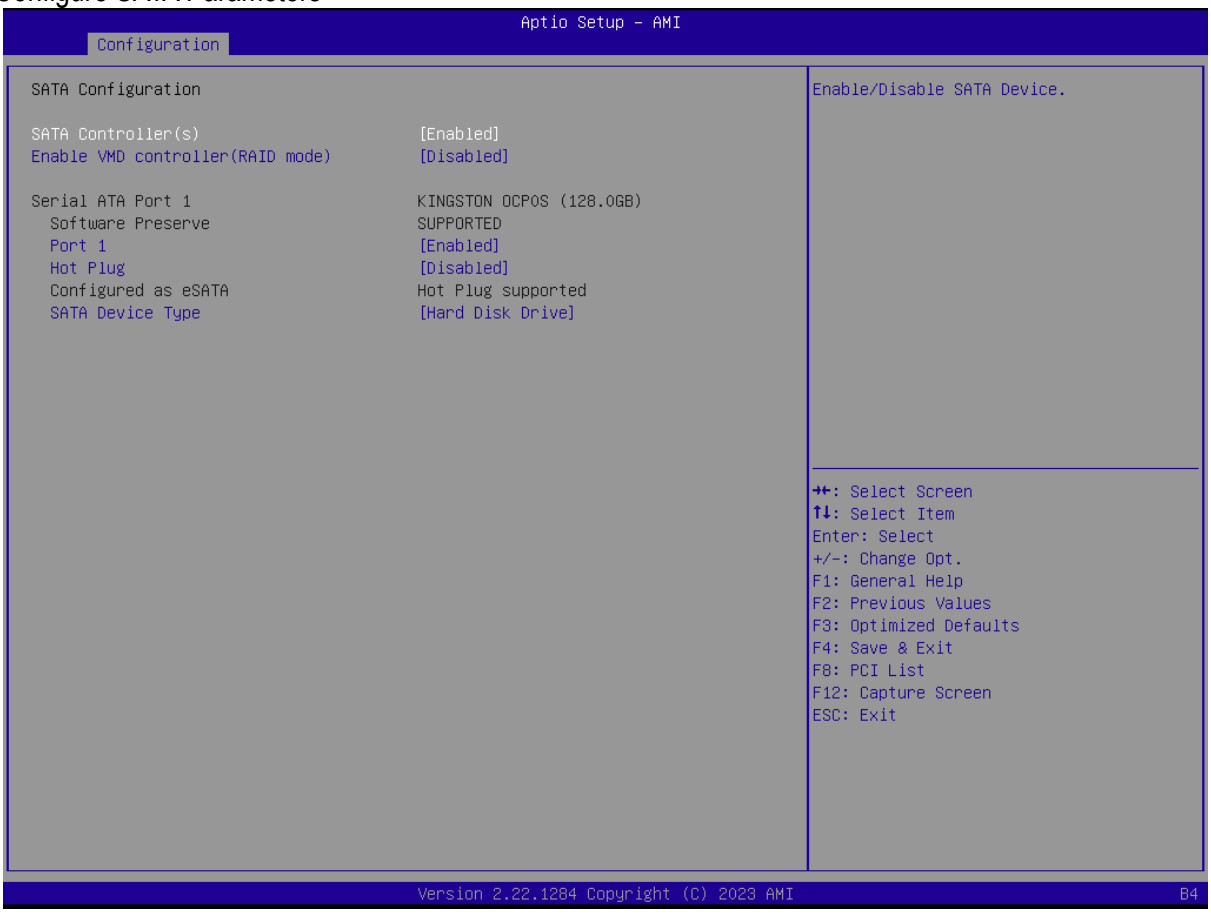
Configuration Chipset feature



Chipset Configuration	
VT-d	√Enable, Disabled
Above 4GB MMIO BIOS assignment	Enable, √Disabled
HD Audio	√Enable, Disabled
Port 80H Redirection	√LPC Bus, PCIE Bus
ME FW Image Re-Flash	Enable, √Disabled
AMT Configuration	
AMT BIOS Featues	√Enable, Disabled
ME Unconfig on RTC Clear	Enable, √Disabled

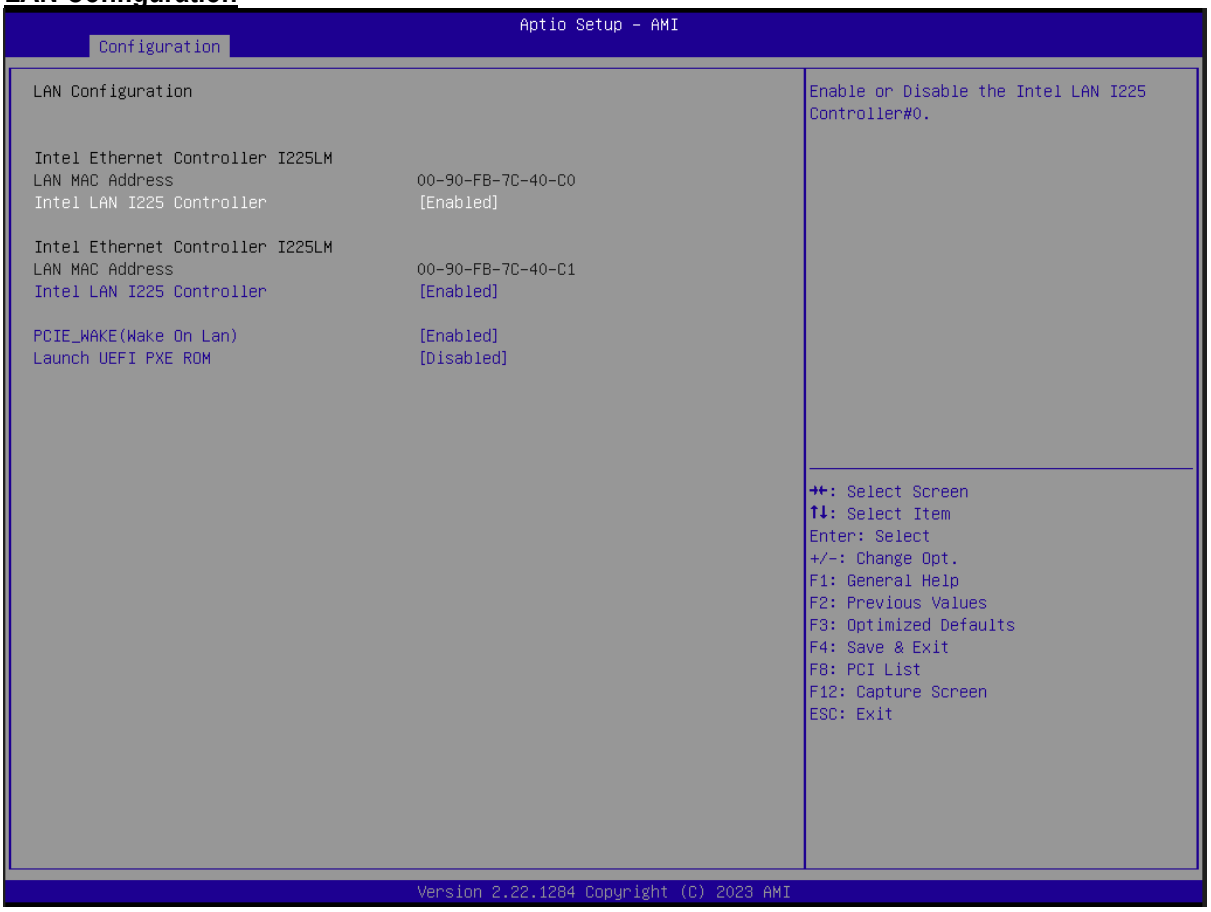
SATA Configuration

Configure SATA Parameters



SATA Configuration	
SATA Controller(S)	√Enable, Disabled
Enable VMD controller(RAID mode)	Enable, √Disabled
Part 1	√Enable, Disabled
Hot Plug	Enable, √Disabled
SATA Device Type	√Hard Disk Drive, Solid State Drive

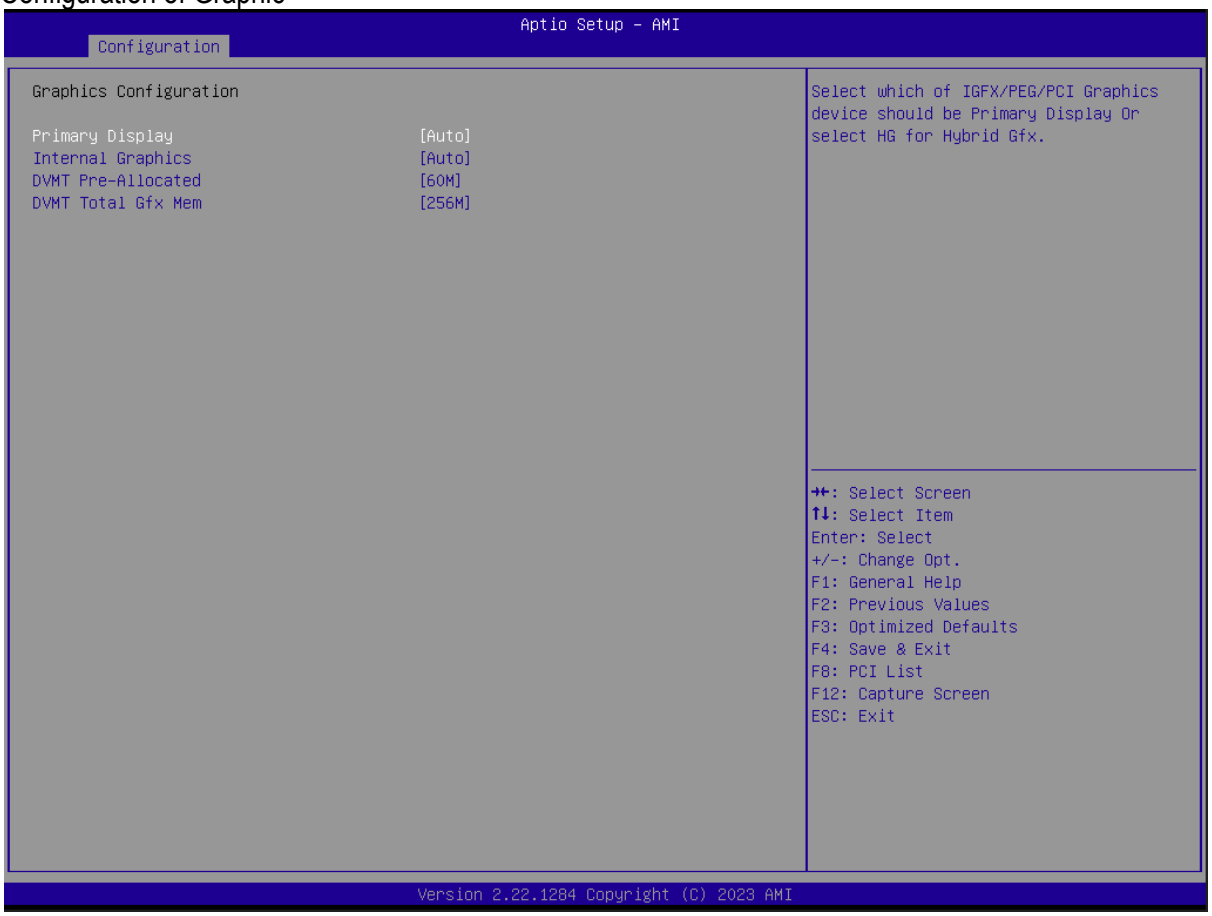
LAN Configuration



LAN Configuration	
Intel LAN I225 Controller	√Enable, Disabled
Intel LAN I225 Controller	√Enable, Disabled
PCIE_WAKE(Wake On Lan)	√Enable, Disabled
Launch UEFI PXE ROM	Enable, √Disabled

Graphic Configuration

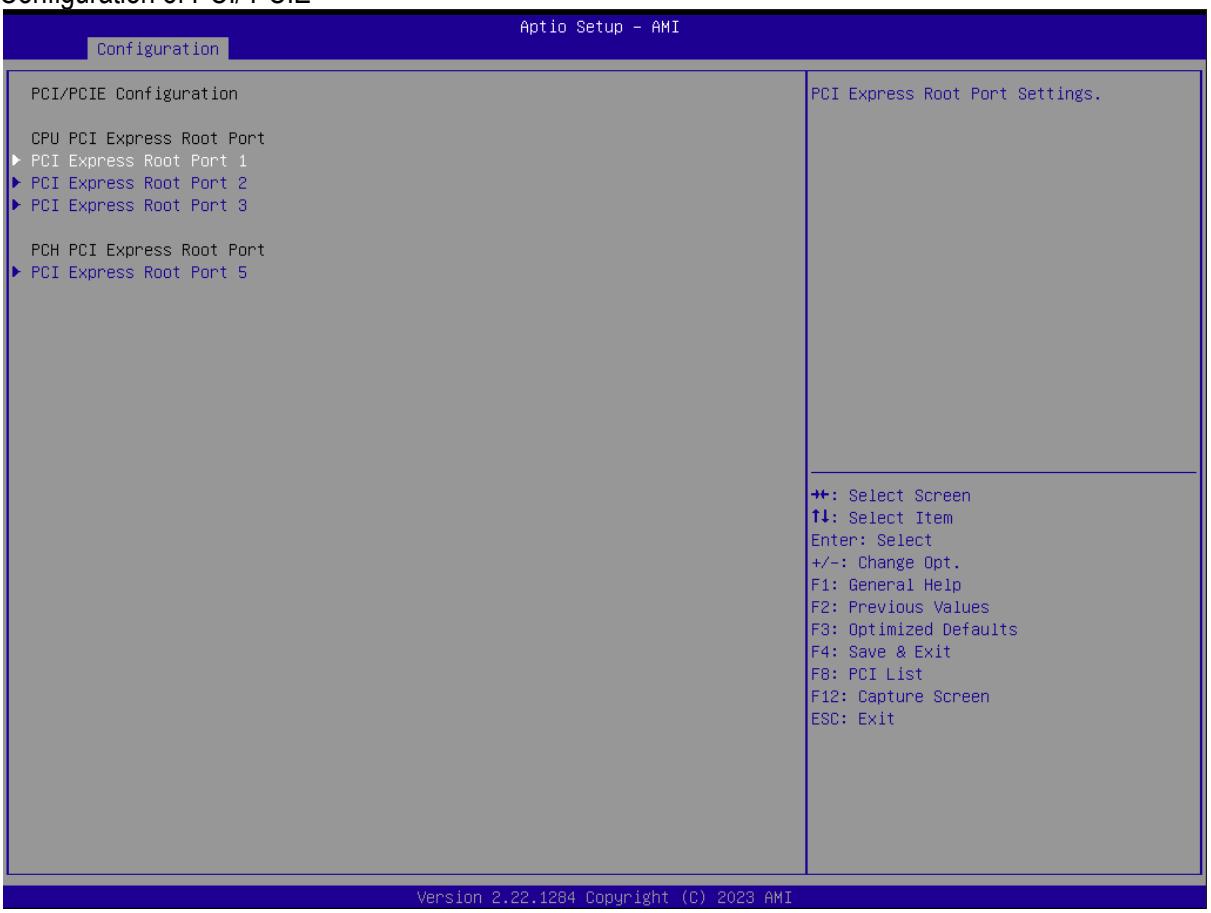
Configuration of Graphic



Graphic Configuration	
Primary Display	√Auto, IGFX, PEG, PCI, SG
Internal Graphics	√Auto, Disabled, Enabled
DVMT Pre-Allocated	32M, 64M, 4M, 8M, 12M, 16M, 20M, 24M, 28M, 32M/F7, 36M, 40M, 44M, 48M, 52M, 56M, √60M
DVMT Total Gfx Mem	√256M, 128M, MAX

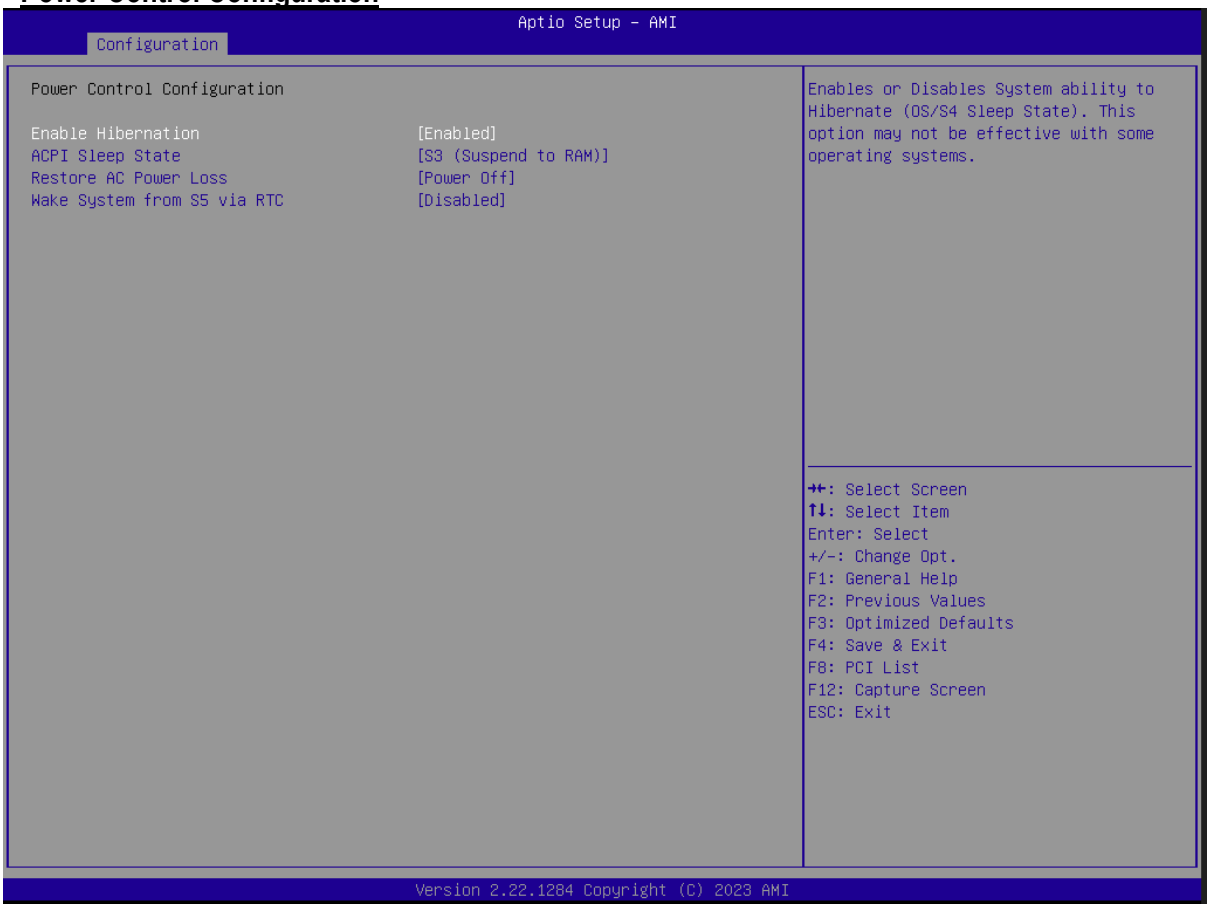
PCI/ PCIE Configuration

Configuration of PCI/ PCIE



PCI Express Root Part 1	
PCI Express Root Port 1	√Enable, Disabled
ASPM	√Disabled, Auto, L0sL1, L1, L0s
PCIe Speed	√Auto, Gen1, Gen2, Gen3
PCI Express Root Part 2	
PCI Express Root Port 2	√Enable, Disabled
ASPM	√Disabled, Auto, L0sL1, L1, L0s
PCIe Speed	√Auto, Gen1, Gen2, Gen3
PCI Express Root Part 3	
PCI Express Root Port 3	√Enable, Disabled
ASPM	√Disabled, Auto, L0sL1, L1, L0s
PCIe Speed	√Auto, Gen1, Gen2, Gen3
PCI Express Root Part 5	
PCI Express Root Port 5	√Enable, Disabled
ASPM	√Disabled, Auto, L0sL1, L1, L0s
PCIe Speed	√Auto, Gen1, Gen2, Gen3

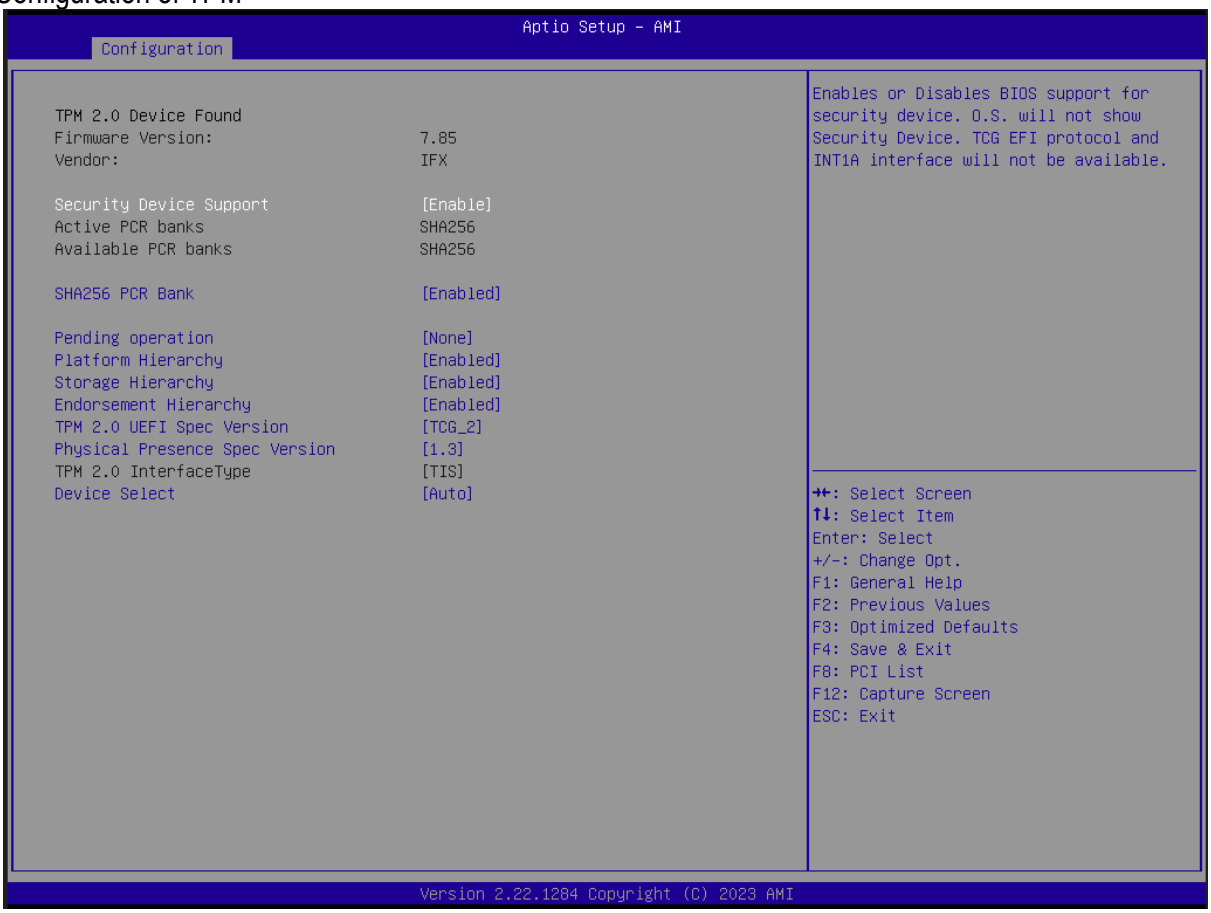
Power Control Configuration



Power Control Configuration	
Enable Hibernation	√Enable, Disabled
ACPI Sleep State	Suspend Disabled, √S3(Suspend to RAM)
Restore AC Power Loss	Power On, √Power off, Last State
RTC Wakeup	Enable, √Disabled

TPM Configuration

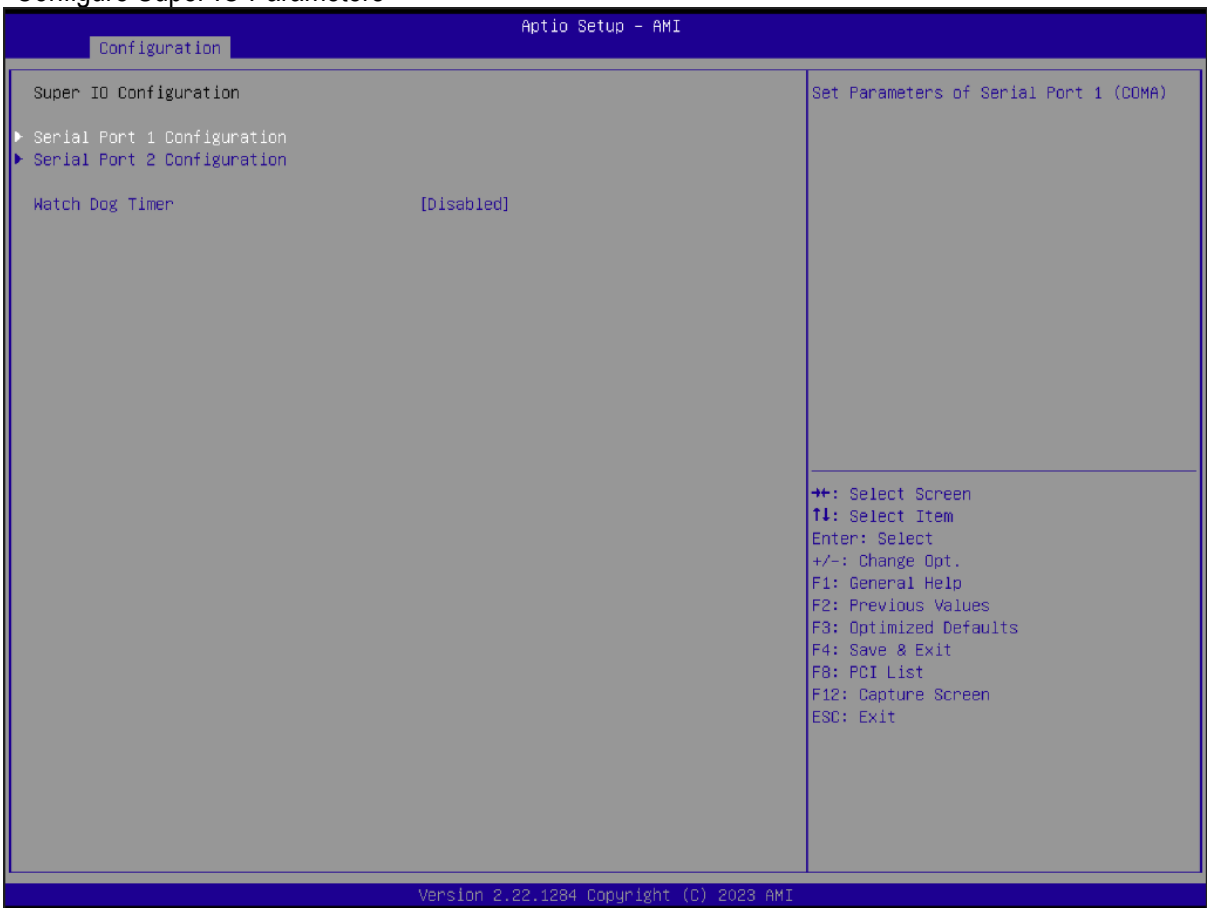
Configuration of TPM



TPM Configuration	
Security Device Support	√Enable, Disabled
SHA256 PCR Bank	√Enable, Disabled
Pending oepration	√None, TPM Clear
Platform Hierarchy	√Enable, Disabled
Storage Hierarchy	√Enable, Disabled
Endorsement Hierarchy	√Enable, Disabled
TPM2.0 UEFI Spec Version	√TCG_2, TCG_1.2
Physical Presence Spec Version	√1.3, 1.2
Device Select	√Auto, TPM1.2, TPM2.0

Super IO Configuration

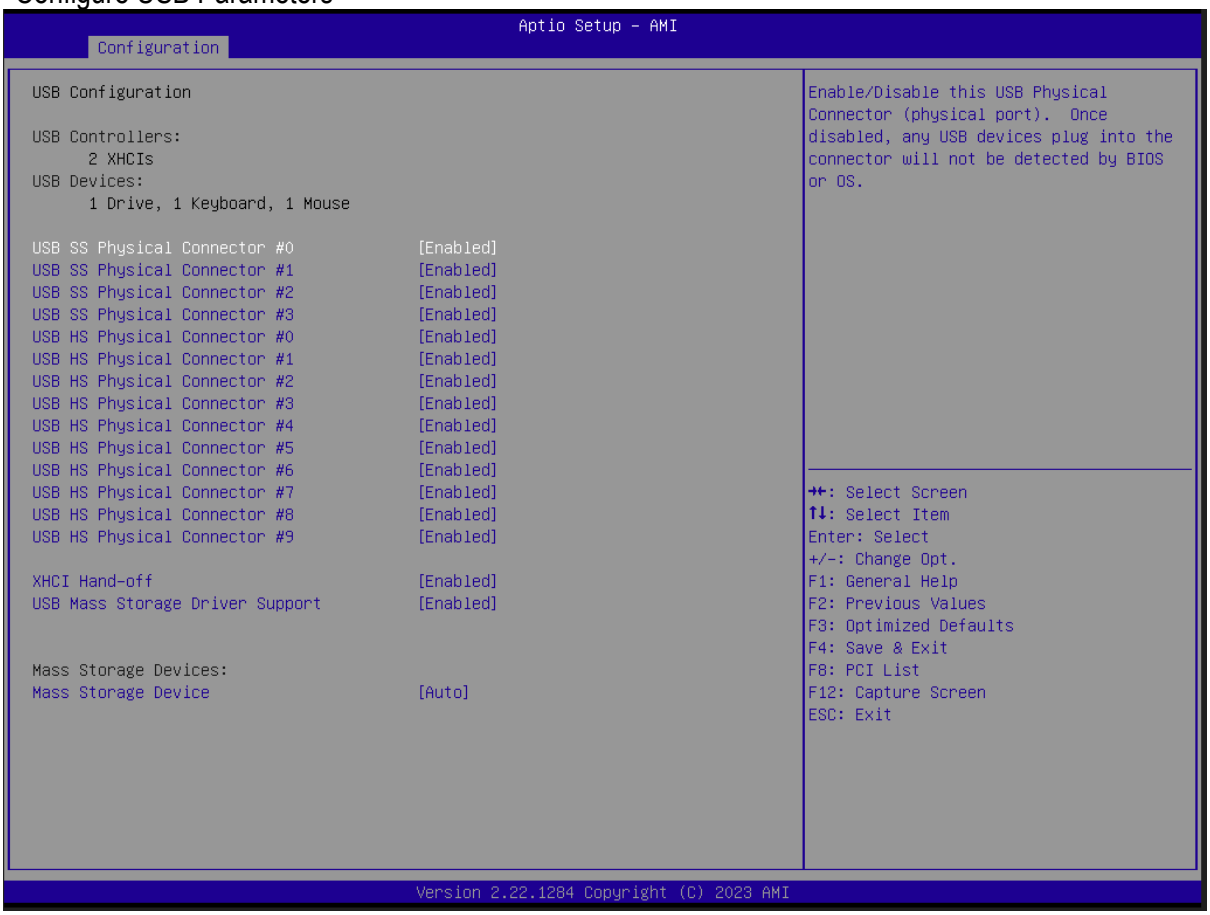
Configure Super IO Parameters



Super IO Configuration	
Watch Dog Timer	√Disable, Enable
Serial Port 1 Configuration	
Serial Port	√Enable, Disabled
Serial Port 2 Configuration	
Serial Port	√Enable, Disabled

USB Configuration

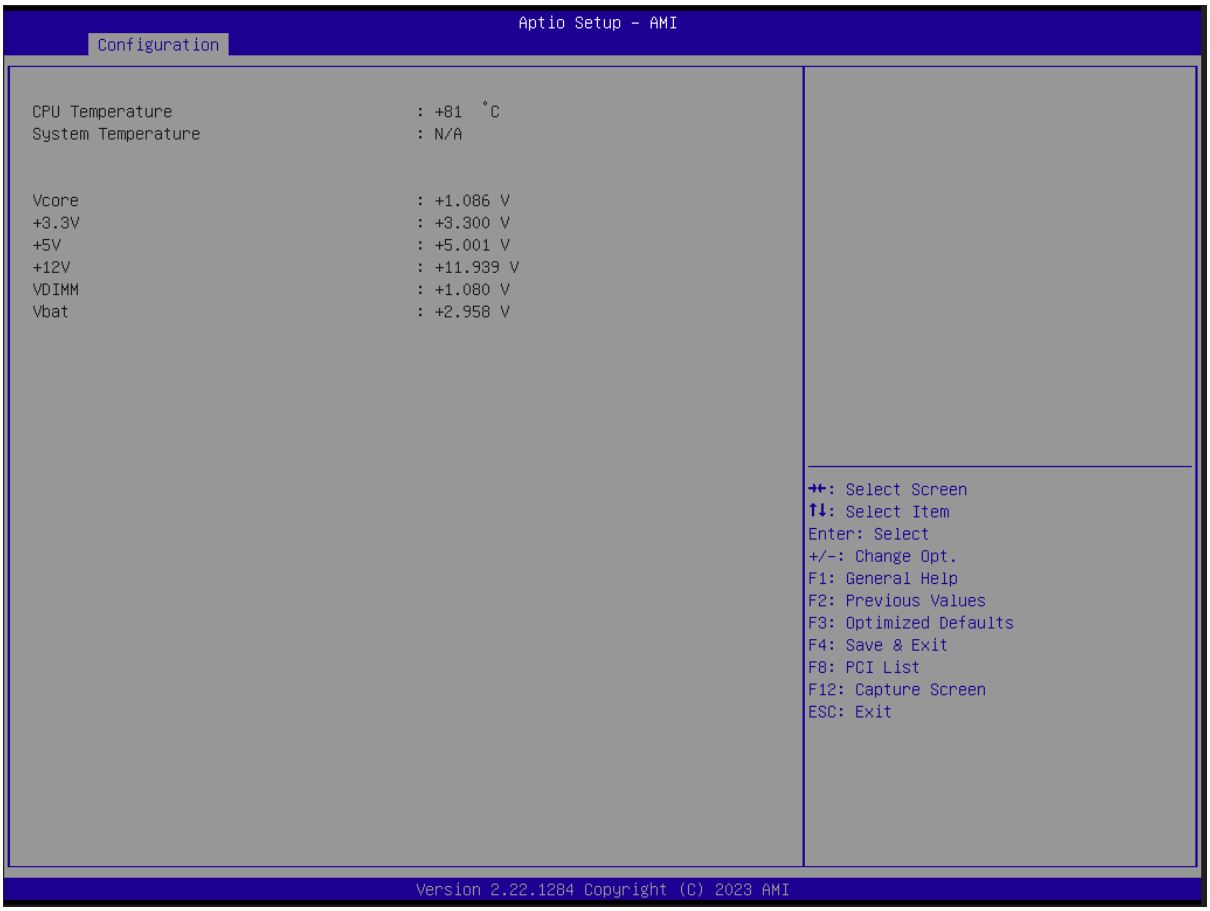
Configure USB Parameters



SoC USB Configuration	
USB SS Physical Connector #0	√Enable, Disabled
USB SS Physical Connector #1	√Enable, Disabled
USB SS Physical Connector #2	√Enable, Disabled
USB SS Physical Connector #3	√Enable, Disabled
USB HS Physical Connector #0	√Enable, Disabled
USB HS Physical Connector #1	√Enable, Disabled
USB HS Physical Connector #2	√Enable, Disabled
USB HS Physical Connector #3	√Enable, Disabled
USB HS Physical Connector #4	√Enable, Disabled
USB HS Physical Connector #5	√Enable, Disabled
USB HS Physical Connector #6	√Enable, Disabled
USB HS Physical Connector #7	√Enable, Disabled
USB HS Physical Connector #8	√Enable, Disabled
USB HS Physical Connector #9	√Enable, Disabled
XHCI Hand-off	√Enable, Disabled
USB Mass Storage Driver Support	√Enable, Disabled
Mass Storage Devices	
Mass Storage Devices	√Auto, Floppy, Forced FDD, Hard Disk, CD-ROM

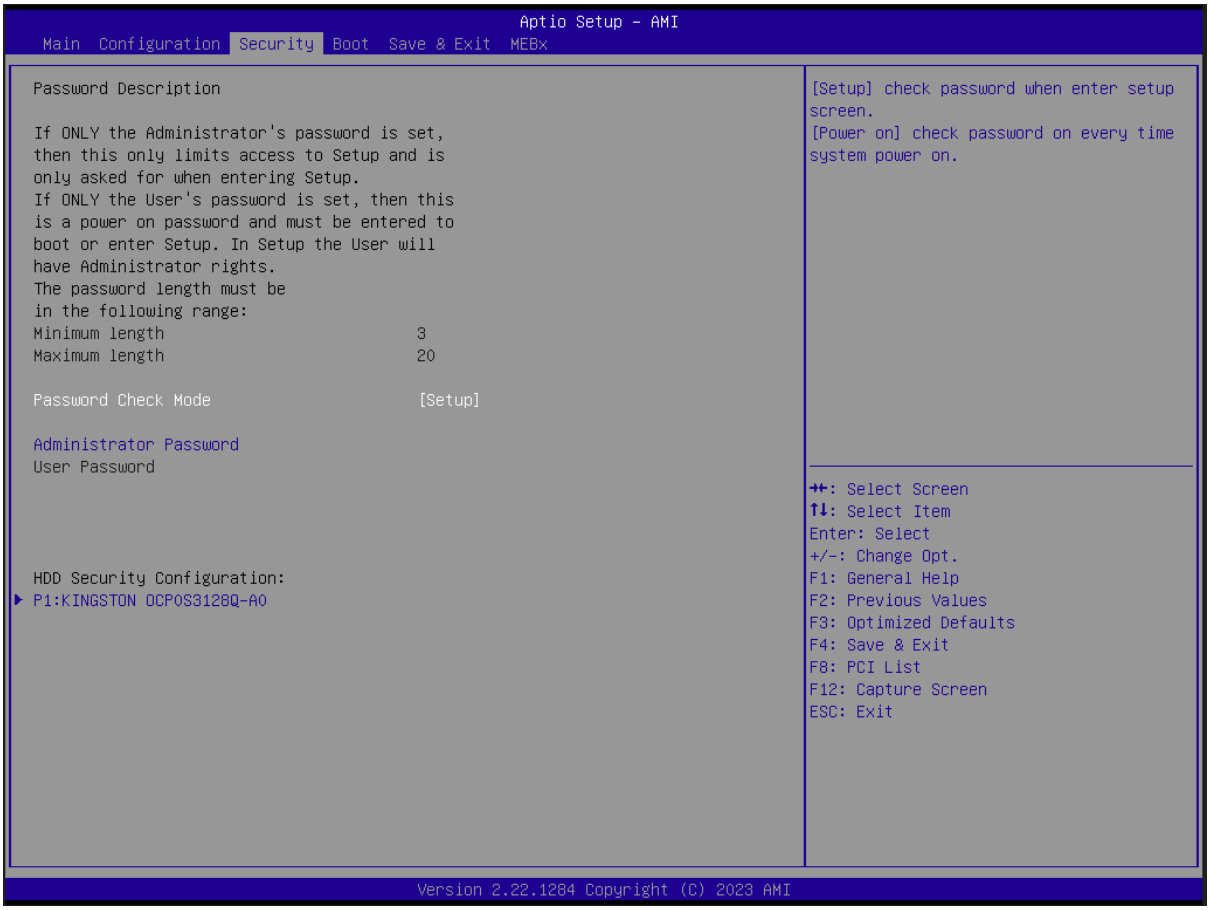
3.2.3 H/W Monitor

Monitor hardware status



3.2.4 Security

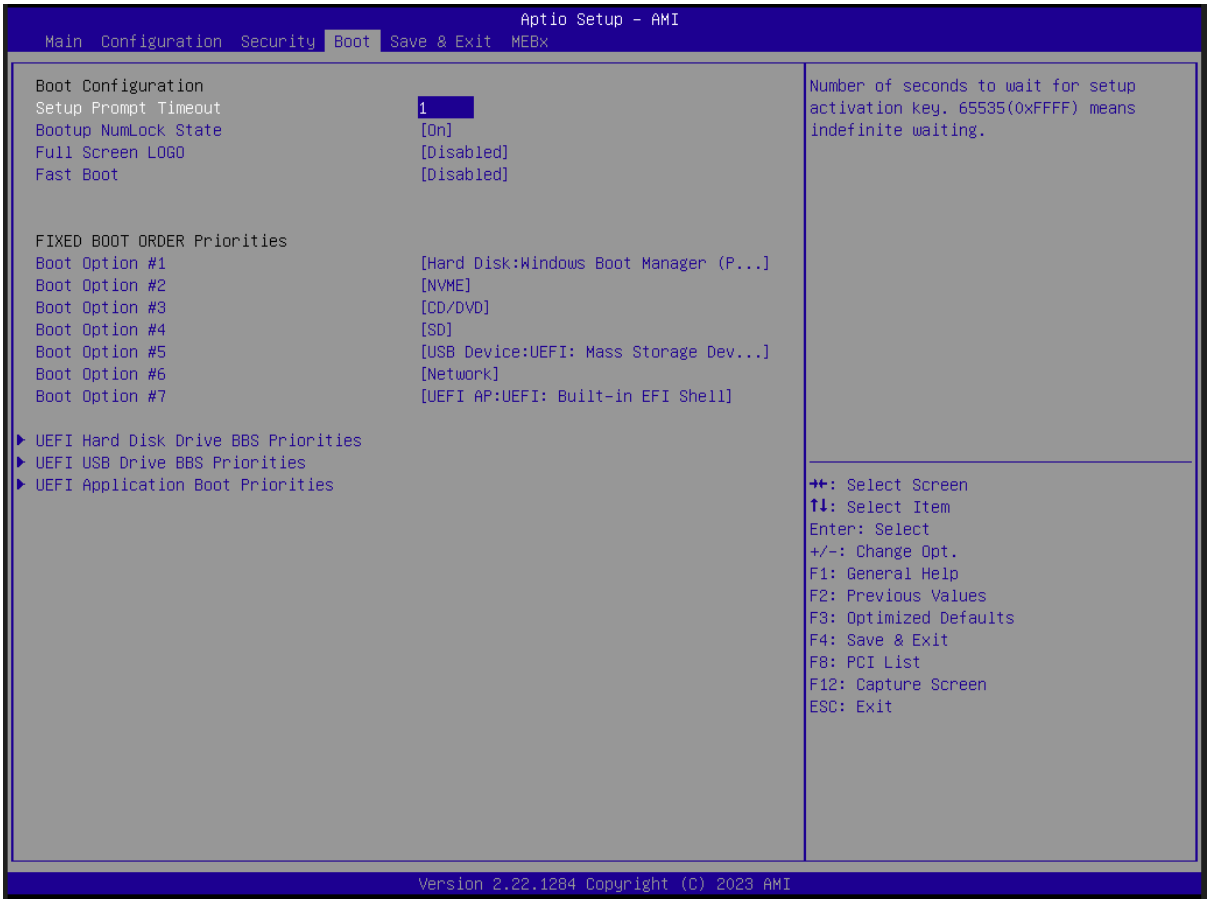
This section lets you set security passwords to control access to the system at boot time and/or when entering the BIOS setup program.



Password Description	
Password Check Mode	√Setup, Power on

3.2.5 Boot

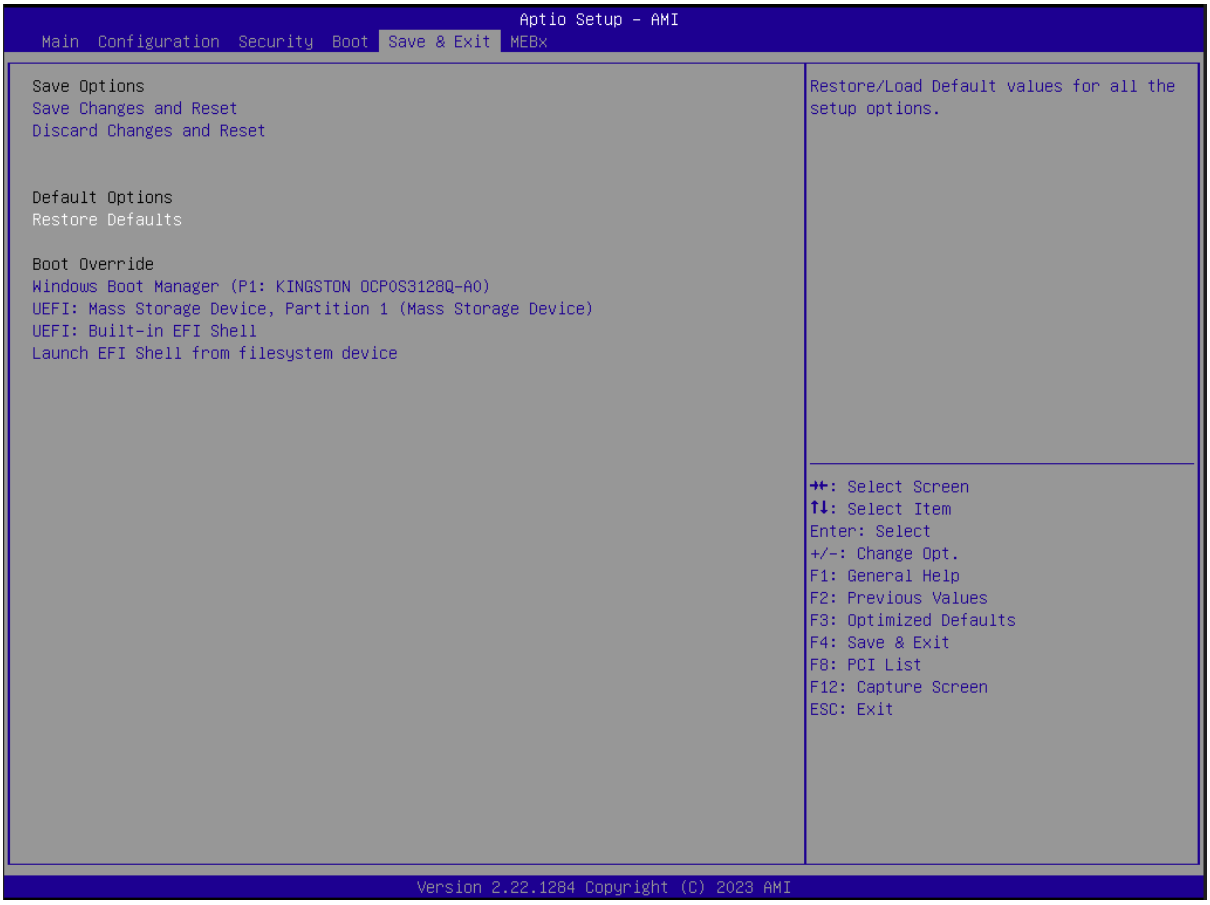
In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



Boot Configuration	
Setup Prompt Timeout	1
Bootup NumLock State	√On, Off
Full Screen Logo	Enable, √Disabled
Fast Boot	Enable, √Disabled
FIXED BOOT ORDER Priorities	
Boot Option #1	USB Device, √Hard Disk, CD/DVD, Network, NVMe, SD, UEFI AP, Disabled
Boot Option #2	USB Device, Hard Disk, CD/DVD, Network, √NVMe, SD, UEFI AP, Disabled
Boot Option #3	USB Device, Hard Disk, √CD/DVD, Network, NVMe, SD, UEFI AP, Disabled
Boot Option #4	USB Device, Hard Disk, CD/DVD, Network, NVMe, √SD, UEFI AP, Disabled
Boot Option #5	√USB Device, Hard Disk, CD/DVD, Network, NVMe, SD, UEFI AP, Disabled
Boot Option #6	USB Device, Hard Disk, CD/DVD, √Network, NVMe, SD, UEFI AP, Disabled

Boot Option #7	USB Device, √Hard Disk, CD/DVD, Network, NVMe, SD, √UEFI AP, Disabled
Mass Storage Devices	
Mass Storage Devices	√Auto, Floppy, Forced FDD, Hard Disk, CD-ROM

● 3.2.6 Exit



EXIT	
Save Changes and Exit	Exit system setup after saving the changes. F4 key can be used for this operation.
Discard Changes and Exit	Exit system setup without saving any changes. Esc key can be used for this operation.

Chapter 4 Important Instructions

This chapter includes instructions which must be carefully followed when the embedded system is used.

4.1 Note on the Warranty

Due to their limited service life, parts which, by their nature, are especially subject to wear are not included in the guarantee beyond the legal stipulations.

4.2 Exclusion of Accident Liability Obligation

Portwell, Inc. shall be exempt from the statutory accident liability obligation if users fail to abide by the safety instructions.

4.3 Liability Limitations / Exemption from the Warranty Obligation

In the event of damage to the system unit caused by failure to abide by the hints in this manual and on the unit (especially the safety instructions), Portwell, Inc. shall not be required to respect the warranty even during the warranty period and shall be free from the statutory accident liability obligation.

4.4 Declaration of Conformity

EMC

CE/FCC Class B

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This equipment may not cause harmful interference.
2. This equipment must accept any interference that may cause undesired operation.