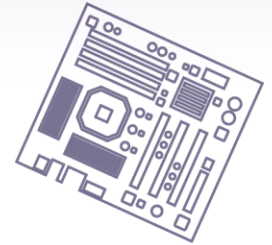
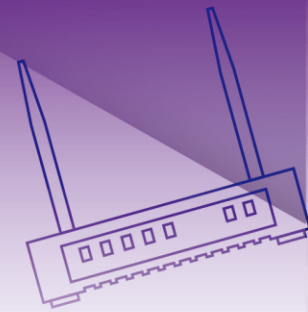
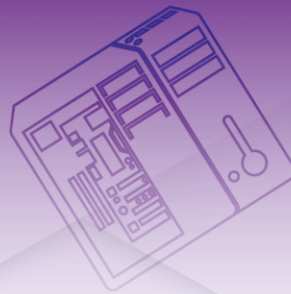


 Portwell



RICH-61F0

Fan-less Embedded System

User Manual

Version R1.0

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Revision History

Version	Description
R1.0	Official Release

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Chapter 1

Product Overview

- 1.1 Introduction
- 1.2 Product Specifications
- 1.3 Dimension

1.1 Introduction

Portwell Inc., a world-leading innovator in the industrial PC(IPC) market, announced RICH-61F0, a fan-less intelligent embedded system featuring 6W~12W SKUs of the intel Atom® x7000RE family SoC. Its rugged, compact design and high performance make the RICH-61F0, a perfect solution for applications in harsh environments, such as industrial Automation, Kiosk and Digital Signage.

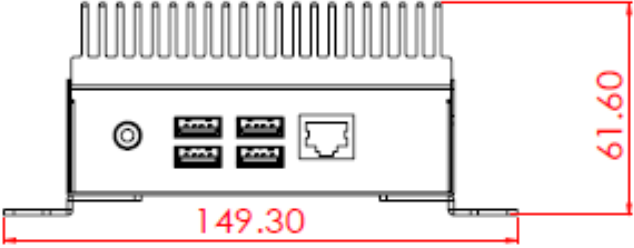
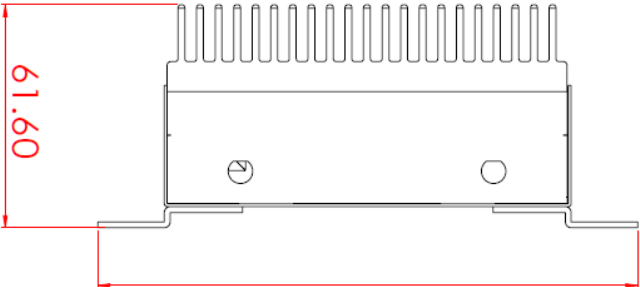
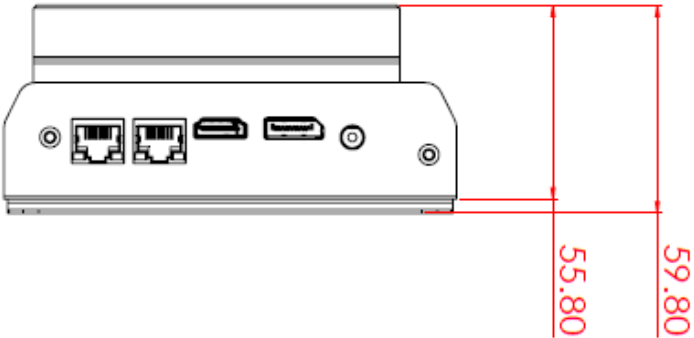
The new rugged RICH-61F0 is equipped with the Portwell (WUX-8100), a NUC board based on the Intel Atom® x7000RE family SoC product family. Processors available in this product family combine low power consumption with high processing power and improved performance compared to previous generation processor. The compact RICH-61F0 embedded system also features DDR4 SO-DIMM up to 32GB supporting 3200 MT/s; four USB 3.2 Gen 2 ports (10Gbps) and one COM port for RS-232/422/485 selected by BIOS with RJ45 connector on the front I/O; two ethernet ports and two display ports (DP/HDMI®) on the side I/O; one audio jack supports Line-out. Also support one M.2 2242 M key socket for storage and one M.2 2230 E Key for wireless module.

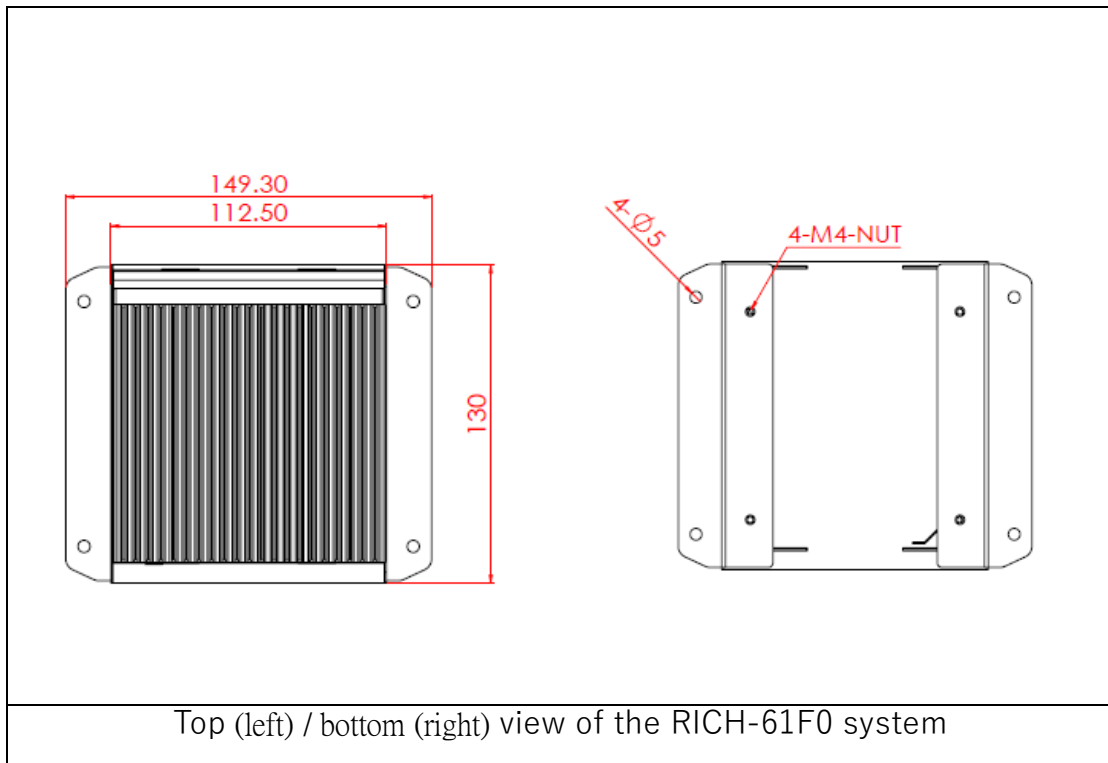
The rugged, fan-less design makes the RICH-61F0 durable in harsh environment applications, such as factory automation and industrial automation. The rugged and compact RICH-61F0 supports an operating temperature range from -40°C to 60°C for harsh environment operations, while at the same time, its fan-less design ensures silent operation, reliability and low maintenance rate and costs. In addition, it has already passed a vibration test of 5Grms/ 10~500Hz and a shock test of 50G, assuring its solidity and reliability. The system accepts 12V~19V wide input voltage. With its superior processing power, high capability, and support for 4K resolution (4096x2160), Portwell's RICH-61F0 is indeed an ideal solution for high computing power and/or high 3D video/Image applications.

1.2 Product Specifications

General	
CPU	Intel® Atom® x7211RE, 2 cores, 6 W Intel® Atom® x7433RE, 4 cores, 9 W Intel® Atom® x7835RE, 8 cores, 12 W
BIOS	AMI UEFI BIOS
Memory	Support up to 32GB DDR4 3200 MT/s on 1 SODIMM
Storage	1 x M.2 Key-M NVMe PCIe Gen 3 x2 / SATA 2242 1 x eMMC 128G on board support up to 256GB
Graphic Controller	Intel® UHD Graphics
System I/O	
Series Ports	1 x RJ45 Port Support RS-232/422/485
Display	1 x HDMI® 2.0b 1 x DP 1.4
USB	4 x USB 3.2 Gen2 x1 (10Gbps) Type A
Audio	1 x Audio Jack Line-out
Ethernet	2 x 2.5 GbE LAN w/ Intel® WGI226IT
Antenna	2 x SMA Antenna holes for Wi-Fi
Expansion I/O	
M.2	1 x M key w/ 2242 PCIe Gen3 x2 or SATA III for storage 1 x E Key w/ 2230 PCIe Gen3 x1 and USB 2.0 for WiFi/BT
Mechanical/Environment	
Dimension (WxDxH)	130 x 112.5 x 55.8 mm (5.12" x 4.43" x 2.20")
Weight	1.5 kg
Power Supply	DC Jack 12V~19V
Mounting	Wall mounting
Vibration	5G 10~500Hz with Wall mount (IEC/EN 60068-2-6)
Shock	50G 11m sec with Wall mount (IEC/EN 60068-2-27)
Operating Temperature	-40 ~ 60 ° C (-40.0 ~ 140.0 ° F) (Adapter limited temp to 40° C)
Storage Temperature	-40 ~ 85 ° C (-40.0 ~ 185.0 ° F)
Cooling	Fanless
Relative Humidity	5% to 95%, non-condensing
Certification	CE/FCC/UKCA Class B, LVD (EN 62368-1)
Other	PET

1.3 Dimension


Front view of the RICH-61F0 system

Rear view of the RICH-61F0 system

Side view of the RICH-61F0 system



Chapter 2

System Overview

- 2.1 Package List
- 2.2 Front View
- 2.3 Side View
- 2.4 Jumpers and Connectors
- 2.5 Jumper settings

2.1 Package list

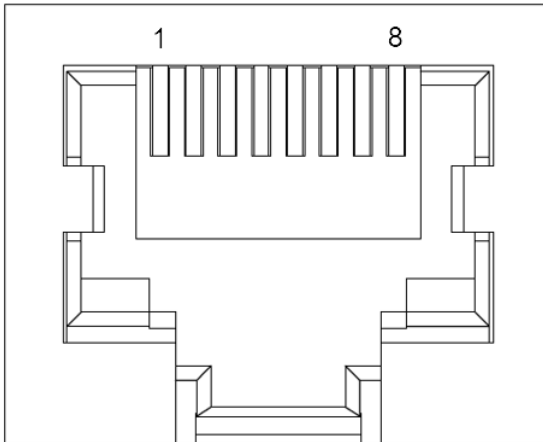
The RICH-61F0 package should cover the following basic items:
 One RICH-61F0 Fan-less Embedded System/ one 60W AC/DC power adapter DC-plug / other optional accessories. If any of these items are damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

2.2 Front view



No.	Item	Description
F1	Audio	Audio Jack with Line-out
F2	USB 3.2	4 x USB 3.2 Gen2 (Universal Serial Bus) ports
F3	COM	1 x RS-232/422/485* on RJ45

* Note: RS-232/422/485 configuration is determined by BIOS setting. Check BIOS setting for details.



PIN No.	Signal Description	PIN No.	Signal Description
1	DSR	2	RTS
3	GND	4	TXD/422R_P
5	RXD/485D/422T_P	6	DCD/485D/422T_N
7	CTS	8	DTR/422R_N

2.3 Side view



No.	Item	Description
S1	LAN 1 / LAN 2	2x Intel [®] 2.5GbE Ethernet control (I226-IT) with two RJ45 connectors.
S2	HDMI [®]	HDMI [®] display output.
S3	DP	DP display output.
S4	DC-in	DC 12V~19V in, using the provided DC source to connect to the system.

2.4 Jumpers and Connectors

Figure 1, WUX-8100 Top View

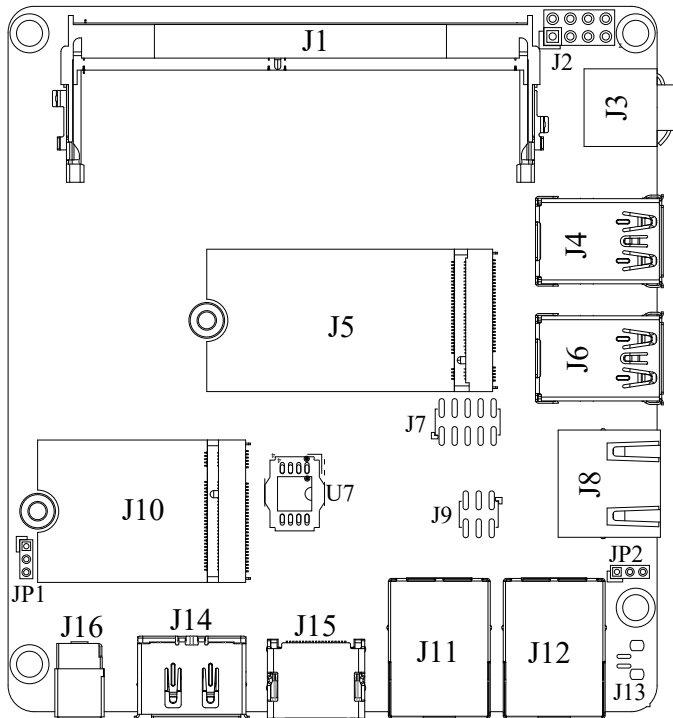
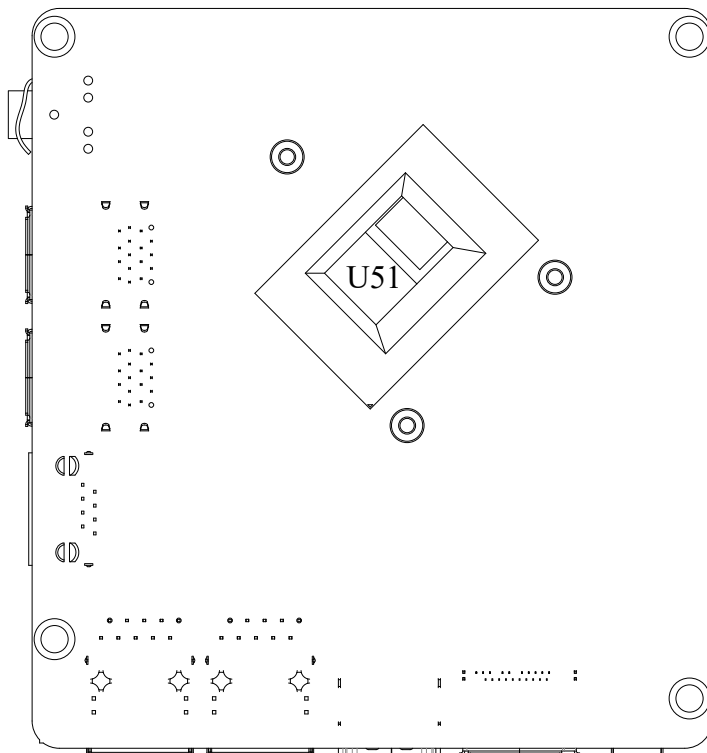


Figure 2, WUX-8100 Bottom View



2.5 Jumper settings

For users to customize WUX-8100's features. In the following sections, Short means covering a jumper cap over jumper pins; Open or N/C (Not Connected) means removing a jumper cap from jumper pins. Users can refer to Figure 1 for the Jumper allocations.

Jumper Table

The jumper settings are schematically depicted in this manual as follows:

Jump Function List:

Jump	Function	Remark
JP1	CPU VCORE debug header	3x1 pin header
JP2	CMOS Clear	
J1	DDR4 SO-DIMM Socket	
J2	External Audio (Mic + Line_in + Line_out)Pin HDR.	4x2 pin header
J3	Audio Jack (Line_out)	
J4/J6	USB3 Connector	
J5	M.2 key M Socket	PCIe x2
J7	80 Port Connector	5x2 pin header
J8	RS232/422/485	RJ45 Connector
J9	Front Panel Pin HDR	3x2 pin header
J10	M.2 key E Socket	
J11/J12	RJ45 Connector	
J13	Battery Socket	

J14	DP Port	Only DP not support DP++
J15	HDMI [®] Port	
J16	DC Jack	+12 -19V Input

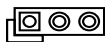
JP1: CPU VCORE debug header



#1

PIN No.	Signal Description
1	VR_VCORE_VCCGT_SDA_P
2	VR_VCORE_VCCGT_SCL_P
3	GND

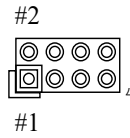
JP2 : CMOS Clear



#1

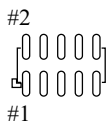
PIN No.	Signal Description
1-2 Short	Clear CMOS
2-3 Short	n/a

J2 : External Audio Connector



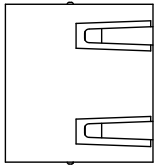
PIN No.	Signal Description	PIN No.	Signal Description
1	MIC_L	2	Line_in_L
3	Ground	4	Line_in_R
5	Line_out_L	6	Ground
7	Line_out_R	8	MIC_R

J7 : 80 Port Connector



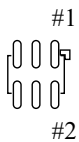
PIN No.	Signal Description	PIN No.	Signal Description
1	SEG_A	2	3.3V
3	SEG_B	4	SEG_E
5	SEG_C	6	SEG_F
7	SEG_D	8	SEG_G
9	SEG_L#	10	GND

J8 : RS232/422/485 (RJ45 Connector)



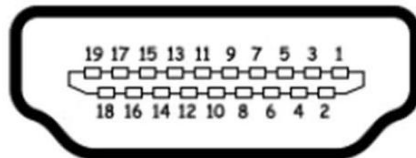
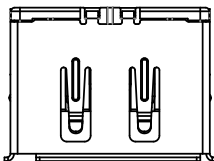
PIN No.	Signal Description	PIN No.	Signal Description
1	DSR	2	RTS
3	GND	4	TXD/422R_P
5	RXD/485D/422T_P	6	DCD/485D/422T_N
7	CTS	8	DTR/422R_N

J9 : Front Panel Pin HDR

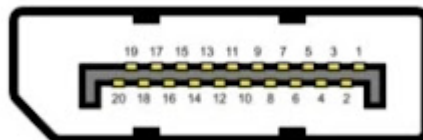
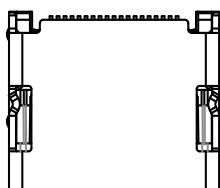


PIN No.	Signal Description	PIN No.	Signal Description
1	Debug_RX_uart0	2	Debug_TX_uart0
3	Reset (+)	4	Reset (-)
5	Power On(-)	6	Power On(+)

J14 : DP Port (Follow standard pin definitions)



J15 : HDMI[®] Port (Follow standard pin definitions)



Chapter 3

System Installation

- 3.1 Opening the Chassis
- 3.2 Memory Installation
- 3.3 M.2 2242 M key Storage installation
- 3.4 M.2 2230 E key Wi-Fi Module installation
- 3.5 Wall Mounting Installation
- 3.6 Getting Started

3.1 Opening the Chassis



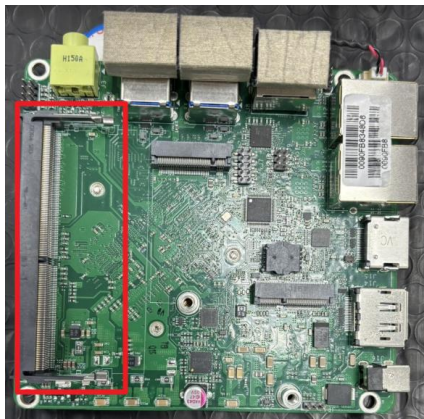
There are 4 screws (as shown) that tightly hold the bottom cover with the main frame of the chassis. Unscrew all the screws to remove the bottom cover.


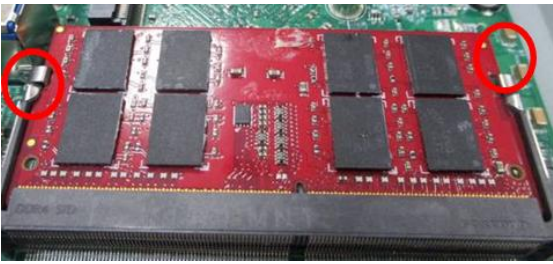



Then you can easily open the bottom cover to replace the RAM / SSD.

3.2 Memory installation

Follow the instructions below to provide a general installation and handling information for SO-DIMM memory module.



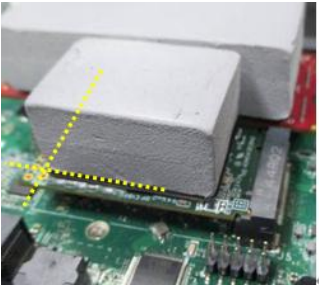


	<p>Align and insert module into the SO-DIMM slot.</p>
	<p>Push down the RAM module until it clicks in place.</p>
	<p>Place the thermal pad (24*60*15T) onto the memory chip, ensuring it is properly aligned with the memory ICs.</p>

3.3 M.2 2242 M key Storage installation

Follow the instructions below for M.2 2242 storage installation.



	<p>Align and insert the M.2 card into the module slot.</p>
	<p>Push down and secure the M.2 card in place using the bundled screw (M3 x 6L).</p>
	<p>Place the thermal pad (20*30*15T) onto the M.2 drive, aligning it with the M.2 drive IC.</p>

3.4 M.2 2230 E key Wi-Fi Module installation

Follow the instructions below for M.2 2230 Wi-Fi Module installation.



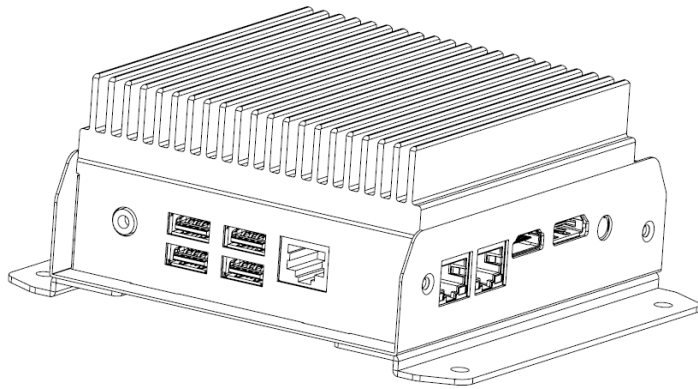
Align and insert the M.2 wireless module into the module slot.





Push down and secure the M.2 card in place using the bundled screw (M3 x 6L).

	<p>Carefully connect antenna cables into their respective sockets on the module. Make sure to align them well before applying force to click them into place, as the connectors are small and fragile.</p>
	<p>Put the Antenna cable through the antenna hole. Push the SMA jack through the hole from inside the chassis.</p>
	<p>Push on the washer and tighten the nut with a 8mm hex tool.</p>
	<p>Install the Antenna.</p>

3.5 Wall Mounting Installation



The wall mount kit is shown in the picture below.

	<p>Secure the BOX PC to the wall mount kit using the M3x6L screws provided in the accessory bag. (circled in blue).</p>
	<p>Next, use the four screw holes (circled in red) to mount the BOX PC (with the wall mount kit attached) onto the wall.</p> <p>Note: Customers must use their own screws for wall mounting.</p>

3.6 Getting Started

It is easy to get the system started.

Once the power supply (12~19V) is properly connected, the device will automatically power on.



Chapter 4

BIOS setup items

- 4.1 Entering Setup
- 4.2 Main
- 4.3 Configuration
- 4.4 Security
- 4.5 Boot
- 4.6 Save & Exit

RICH-61F0 system adopts WUX-8100 mother board. 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.

4.1 Entering Setup

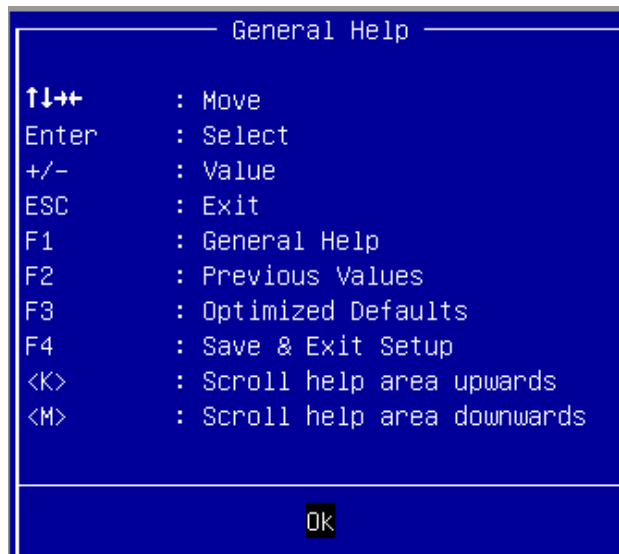
Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press key will enter BIOS setup screen.

Press 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.



4.2 Main

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



Feature	Description	Options
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.	

Detailed System Information

Aptio Setup - AMI

Main

```

FSP Information
FSP version          0C.02.89.40
RC version           0C.E0.89.40
Build Date
FSP Mode             Dispatch Mode

Board Information
Board Name           WUX-8100

Processor Information
Name                 AlderLake ULX
Type                 Intel(R) Atom(TM) x7433RE
Speed                1500 MHz
ID                   0xB06E0
Stepping             A0
Package              Not Implemented Yet
Number of Efficient-cores 4Core(s) / 4Thread(s)
Microcode Revision   17
GT Info              0x46D0
eDRAM Size           N/A

IGFX GOP Version     21.0.1066
Memory RC Version    0.0.4.74
Total Memory         4096 MB
Memory Frequency     2667 MHz
MC 0 Ch 0 DIMM 0    Populated & Enabled
Size                 4096 MB (DDR4)

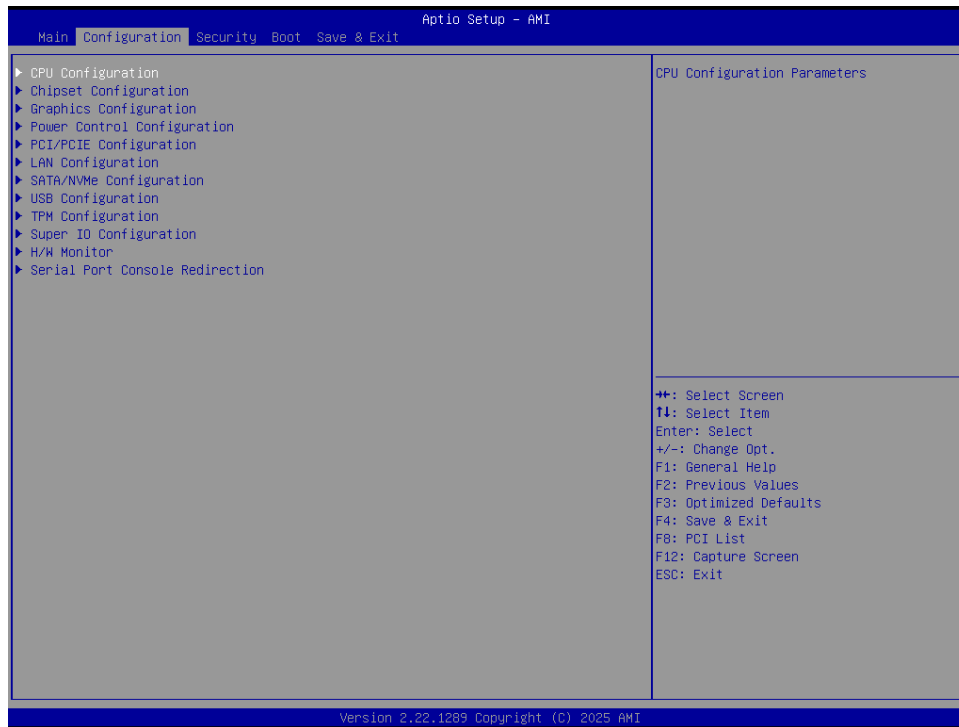
PCH Information
Name                 PCH-N
PCH SKU              N ASL IOT INDU SKU
Stepping             A0
ChipsetInit Base Revision 2
ChipsetInit OEM Revision 0
Package              Not Implemented Yet
TXT Capability of Platform/PCH Unsupported
Production Type      Production

Dual Output Fast Read support Supported
Read ID/Status Clock Freq 50 MHz
Write and Erase Clock Freq 50 MHz
Fast Read Clock Freq 50 MHz
Fast Read support     Supported
Number of Components 1 Component
SPI Component 0 Density 32 MB

eSPI Flash Sharing Mode G3
EC PECI Mode          Legacy PECI mode
ME FW Version         16.50.10.1351
ME Firmware SKU       Consumer SKU
PMC FW Version        160.50.0.1009
  
```

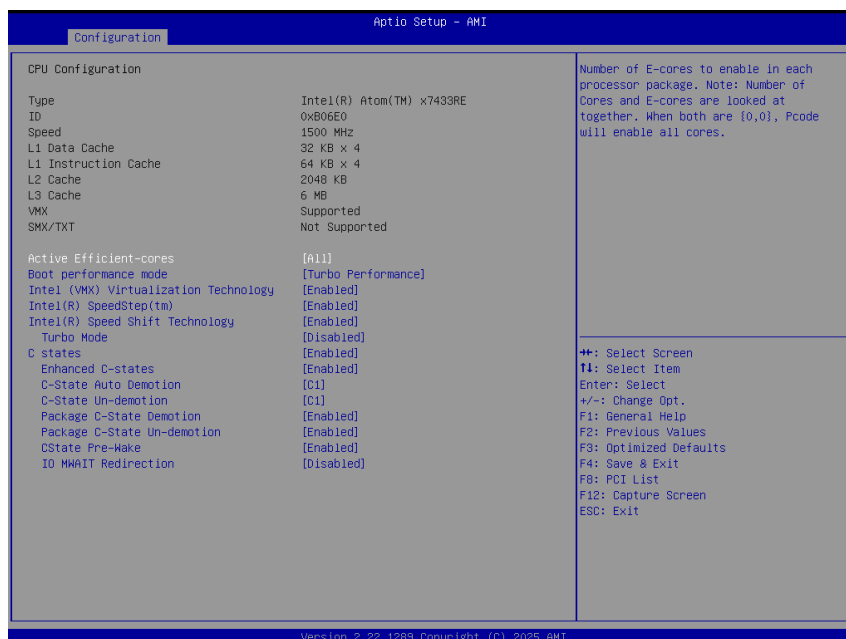
Version 2.22.1289 Copyright (C) 2025 AMI

4.3 Configuration



4.3.1 CPU Configuration

CPU Configuration Parameters

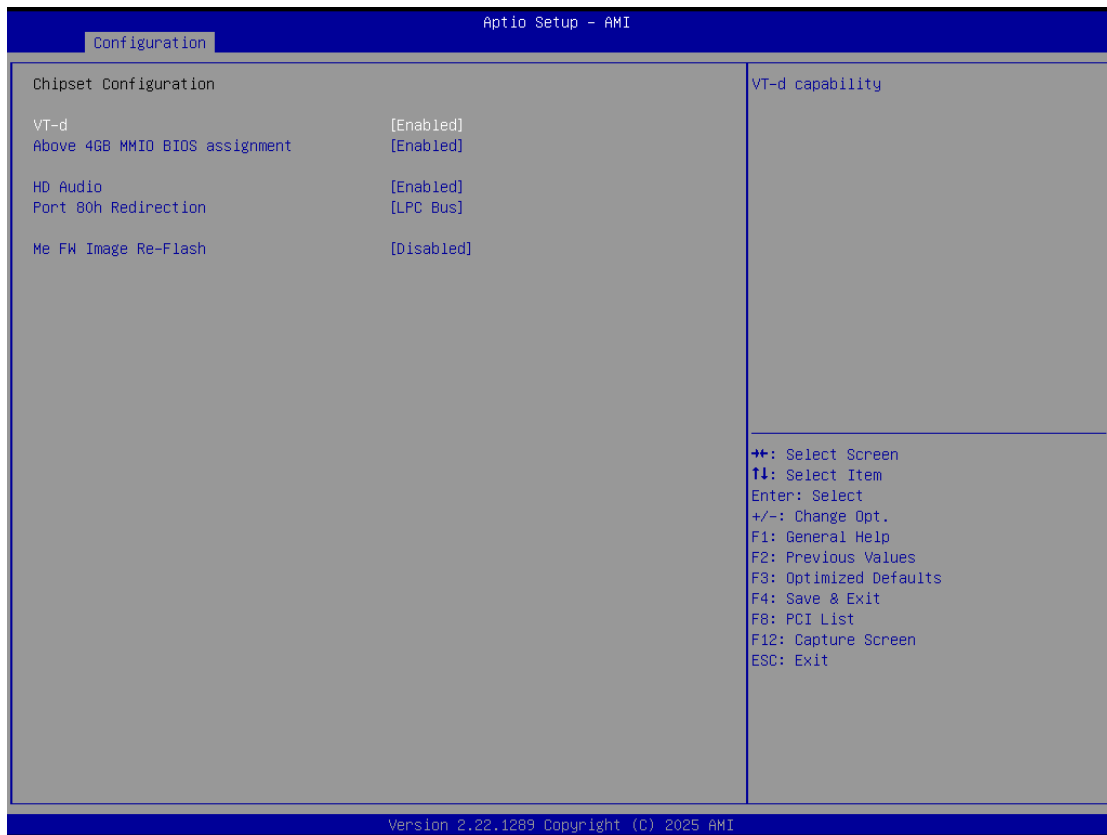


Feature	Description	Options
Active Efficient-Cores	Number of E-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together, When both are {0,0}, Pcode will enable all cores.	★All, 3, 2,1
Boot performance mode	Select the performance state that the BIOS will set starting from reset vector	Max Battery, Max Non-Turbo Performance, ★Turbo Performance
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology.	Disabled, ★Enabled
Intel®Speed Step™	Allows more than two frequency ranges to be supported.	Disabled, ★Enabled
Intel® Speed Shift Technology	Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states	Disabled, ★Enabled
Turbo Mode	Enable/Disable processor Turbo Mode (requires EMTTM enabled too).AUTO means enabled.	★Disabled, Enabled
C states	Enable/disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized	Disabled, ★Enabled
Enhanced C-states	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-state	Disabled, ★Enabled

C-State Auto Demotion	Configure C-State Auto Demotion	Disable, ★C1
C-State Un-demotion	Configure C-State Un-demotion	Disable, ★C1
Package C State Demotion	Package C-State Demotion	Disabled, ★Enabled
Package C State Un-demotion	Package C-State Un-demotion	Disabled, ★Enabled
C State Pre-Wake	Disable – Sets bit 30 of POWER_CTL MSR(0x1FC) to 1 to disable the C state Pre-Wake	Disabled, ★Enabled
IO MWAIT Redirection	When set, will map IO_read instructions sent to IO registers PMG_IO_BASE_ADDRBASE+offset to MWAIT(offset)	★Disabled, Enabled

4.3.2 Chipset Configuration

Configuration Chipset feature

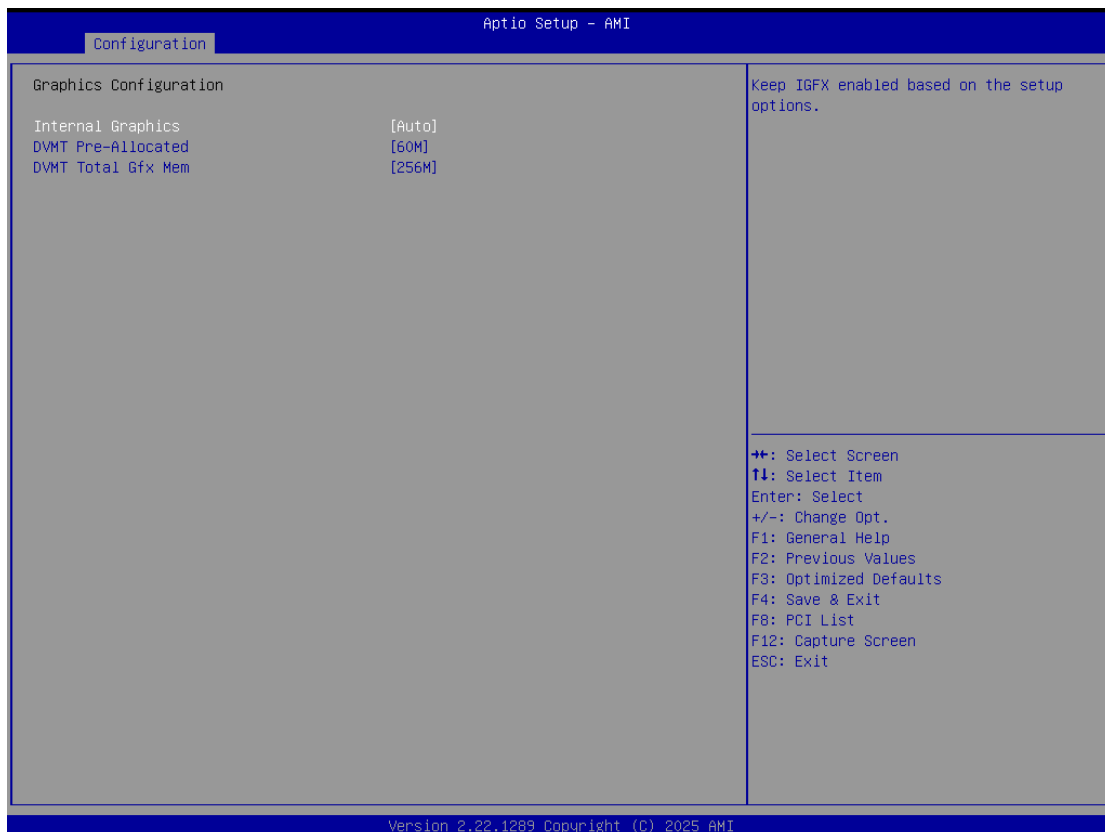


Feature	Description	Options
VT-d	VT-d capability	Disabled, ★Enabled
Above 4GB MMIO BIOS assignment	Enable/Disable above 4GB Memory Mapped IO BIOS assignment. This is enabled automatically when Aperture Size is set to 2048MB.	★Enabled , Disabled
HD Audio	Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled	Disabled, ★Enabled

Port 80h Redirection	Control when the Port 80h cycles are sent.	★LPC Bus, PCIE Bus
Me FW Image Re-Flash	Enable/Disable Me FW Image Re-Flash function.	★Disabled, Enabled

4.3.3 Graphics Configuration

Configuration Graphics Settings

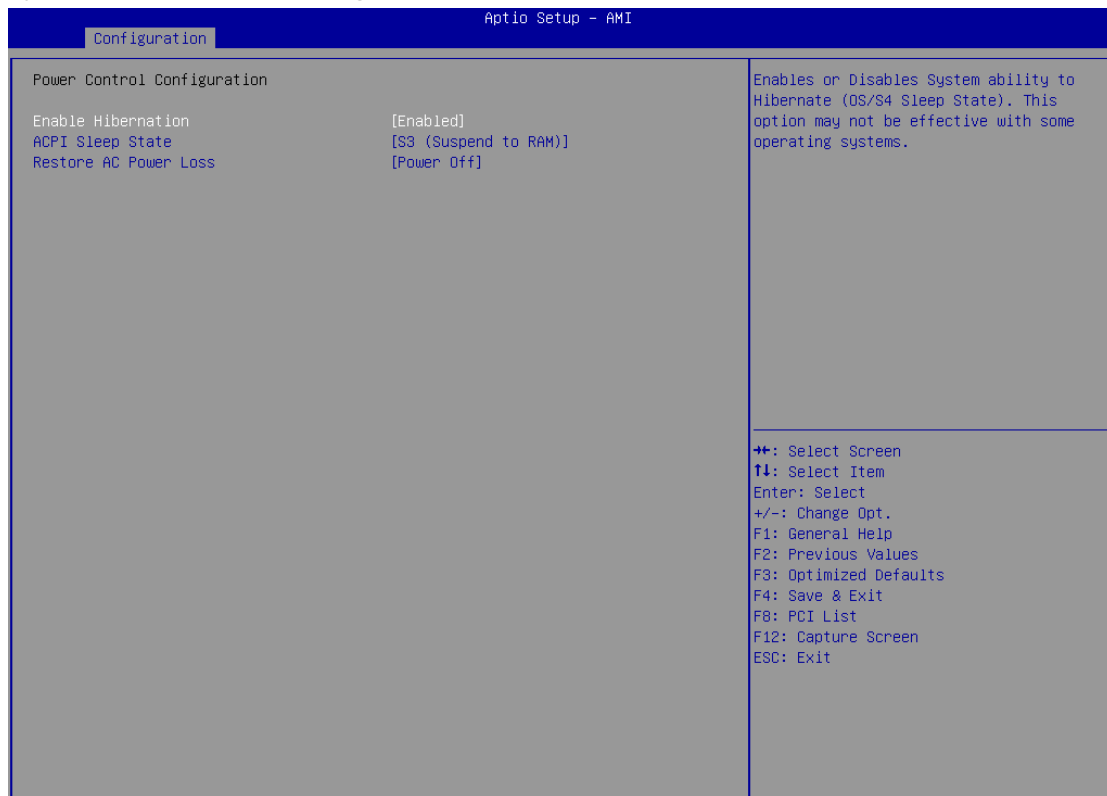


Feature	Description	Options
Internal Graphics	Keep IGFX enable based on the setup options.	★Auto, Disable, Enable
DVMT Pre-Allocated	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.	32M, 64M, 96M, 128M, 160M, 12M, 16M, 20M, 24M, 28M, 32M/F7, 36M,

		40M, 44M, 48M, 52M, 56M, ★60M
DVMT Total Gfx Mem	Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device	128M, ★256M, MAX

4.3.4 Power control Configuration

System Power Control Configuration Parameters



The screenshot shows the 'Configuration' tab in the 'Aptio Setup - AMI' utility. Under 'Power Control Configuration', the following options are listed:

- Enable Hibernation: [Enabled]
- ACPI Sleep State: [S3 (Suspend to RAM)]
- Restore AC Power Loss: [Power Off]

A description on the right states: 'Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.'

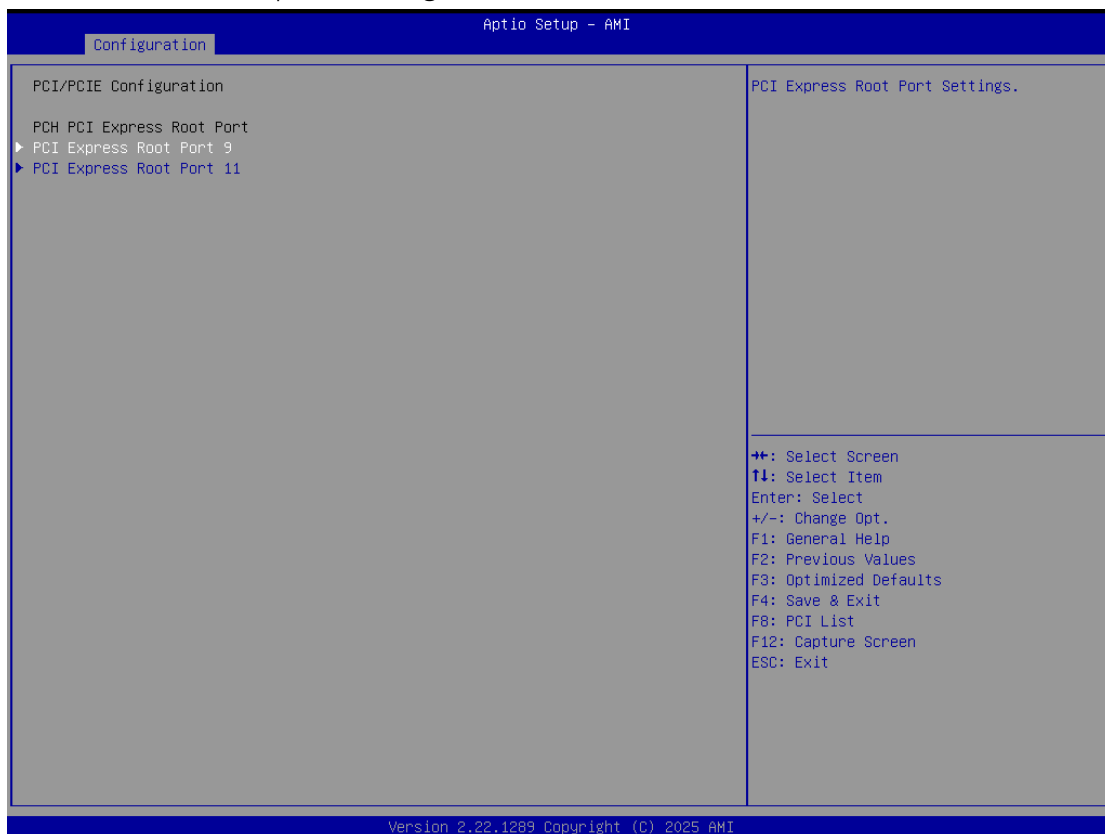
Navigation keys listed at the bottom right include: ++: Select Screen, F1: Select Item, Enter: Select, +/-: Change Opt., F1: General Help, F2: Previous Values, F3: Optimized Defaults, F4: Save & Exit, F8: PCI List, F12: Capture Screen, ESC: Exit.

Feature	Description	Options
Enable Hibernation	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.	Disabled, ★Enabled

ACPI Sleep State	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.	Suspend Disabled, ★S3 (Suspend to RAM)
Restore AC Power Loss	Specify what state to go to when power is re-applied after a power failure (G3 state)	Power On, ★Power Off, Last State

4.3.5 PCI/PCIE Configuration

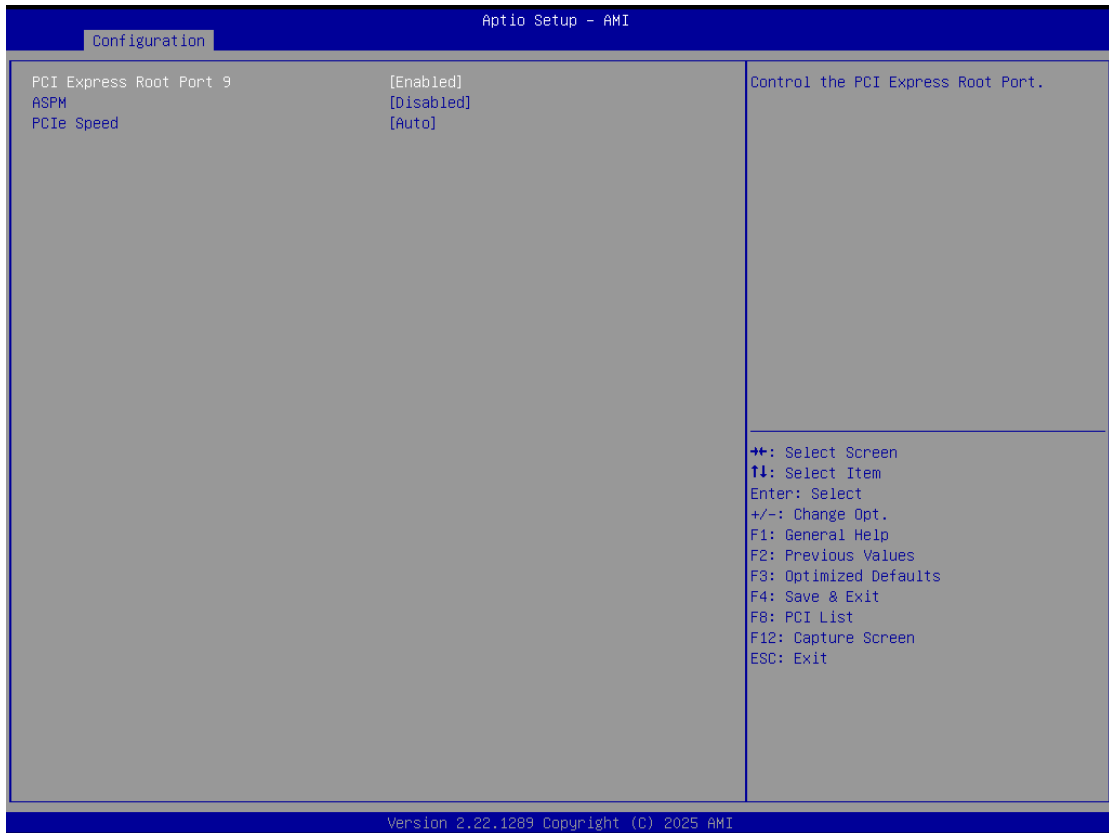
PCI, PCI-X and PCI Express Settings



Feature	Description	Options
PCI Express Root Port 9,Port11	PCI Express Root Port Settings	

PCI Express Root Port 9

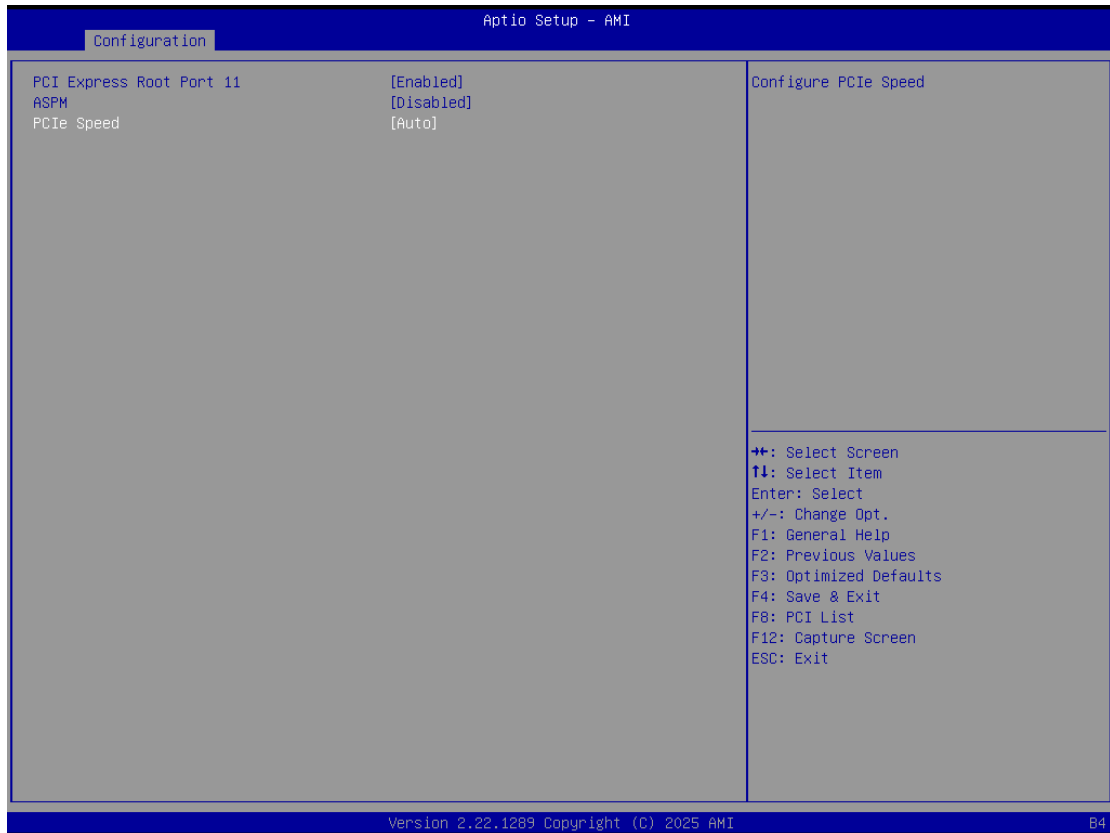
PCI Express Root Port Settings



Feature	Description	Options
PCI Express Root Port 9	Control the PCI Express Root Port.	Disabled, ★Enabled
ASPM	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO - BIOS auto configure DISABLE – Disables ASPM	★Disabled, L1, Auto
PCIe Speed	Configure PCIe Speed	★Auto, Gen1, Gen2, Gen3

PCI Express Root Port 11

PCI Express Root Port Settings



Feature	Description	Options
PCI Express Root Port 11	Control the PCI Express Root Port.	Disabled, ★Enabled
ASPM	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO-BIOS auto configure DISABLE –Disables ASPM	★Disabled, L1, Auto
PCIe Speed	Configure PCIe Speed	★Auto, Gen1, Gen2, Gen3

4.3.6 LAN Configuration

Configuration On Board LAN Device

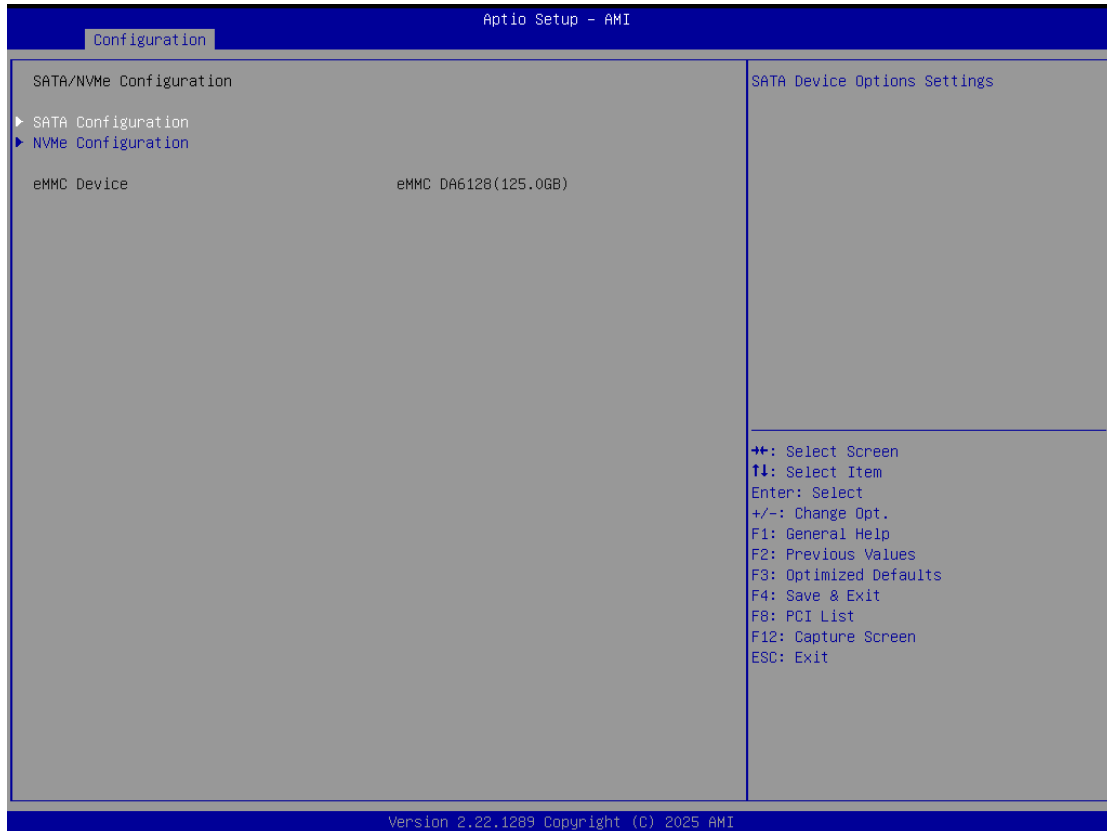


Feature	Description	Options
On Board 1 UEFI Driver	Control On Board LAN UEFI Driver Disabled or Enabled.	Enabled , ★Disabled
On Board 2 UEFI Driver	Control On Board LAN UEFI Driver Disabled or Enabled.	Enabled , ★Disabled
PCIE_WAKE (Wake On Lan)	Control PCIE Wake# pin for Wake On Lan function.	★Enabled , Disabled
Launch UEFI PXE ROM	Enable/Disable UEFI Network Stack	Enabled , ★Disabled
Launch UEFI PXE ROM (Enabled)		

IPv4 PXE Support	Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.	Disabled, ★Enabled
IPv4 HTTP Support	Enable/Disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.	Disabled, ★Enabled
IPv6 PXE Support	Enable/Disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.	Disabled, ★Enabled
IPv6 HTTP Support	Enable/Disable IPv6 HTTP boot support. If disabled, IPv6 HTTP boot support will not be available.	Disabled, ★Enabled
PXE boot wait time	Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.	★0
Media detect count	Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.	★1

4.3.7 SATA/NVME Configuration

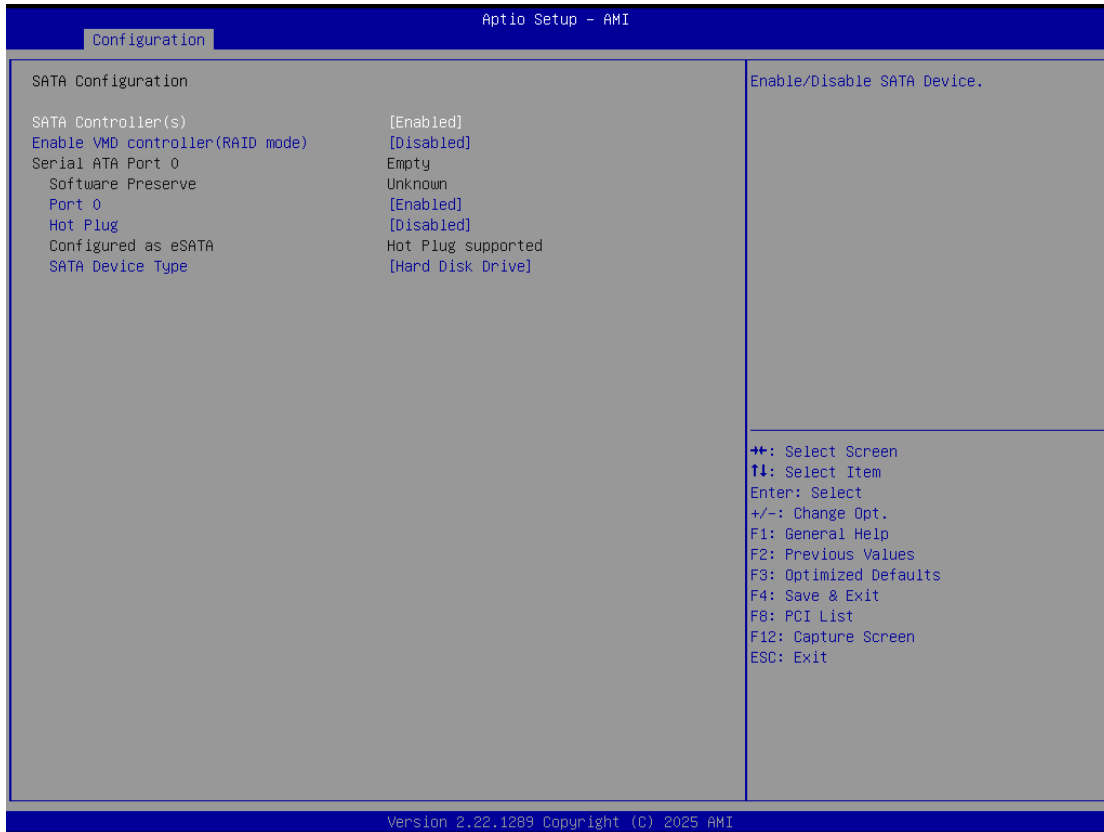
SATA/NVME Device Options Settings



Feature	Description	Options
SATA Configuration	SATA Device Options Settings	
NVMe Configuration	NVMe Device Options Settings	

SATA Configuration

SATA Device Options Settings

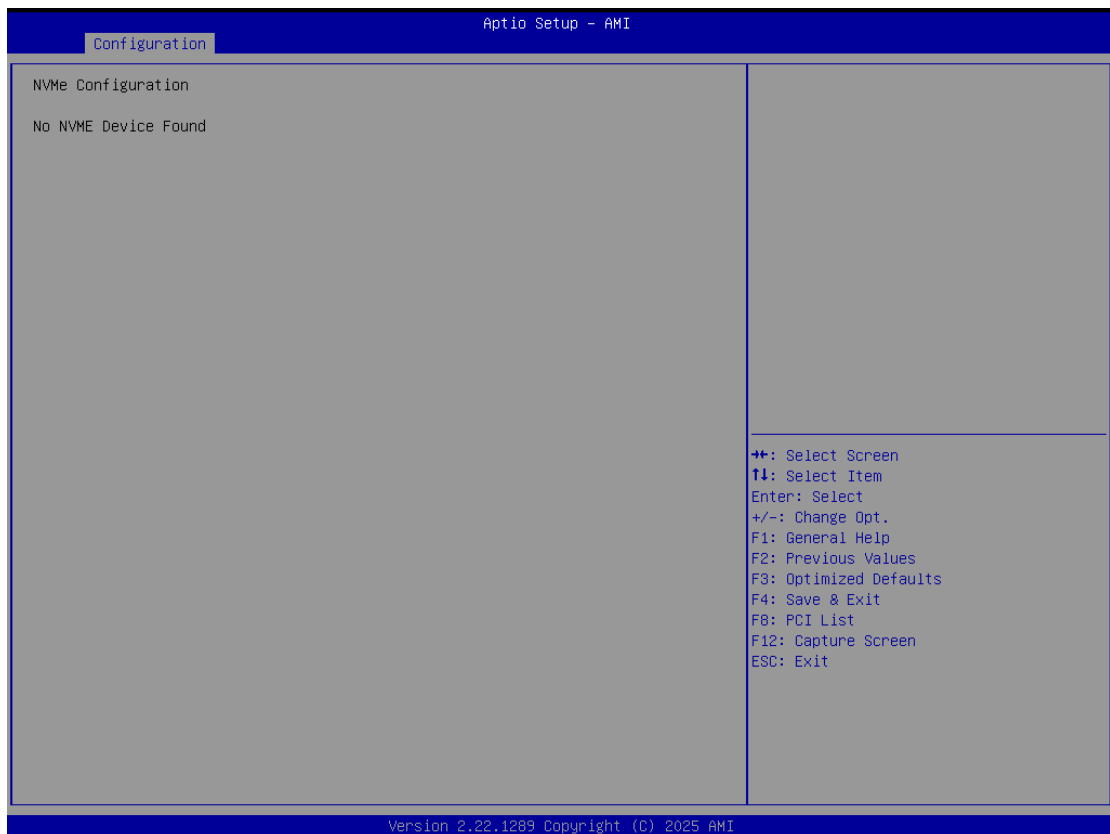


Feature	Description	Options
SATA Controller(s)	Enable/Disable SATA Device	★Enabled , Disabled
Enable VMD controller(RAID mode)	Enable/Disable to VMD controller	★Disabled, Enabled
Serial ATA Port 0		
Port 0	Enabled or Disabled SATA Port	Disabled, ★Enabled

Hot plug	Designates this port as Hot Pluggable.	★Disabled, Enabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.	★Hard Disk Drive, Solid State Drive

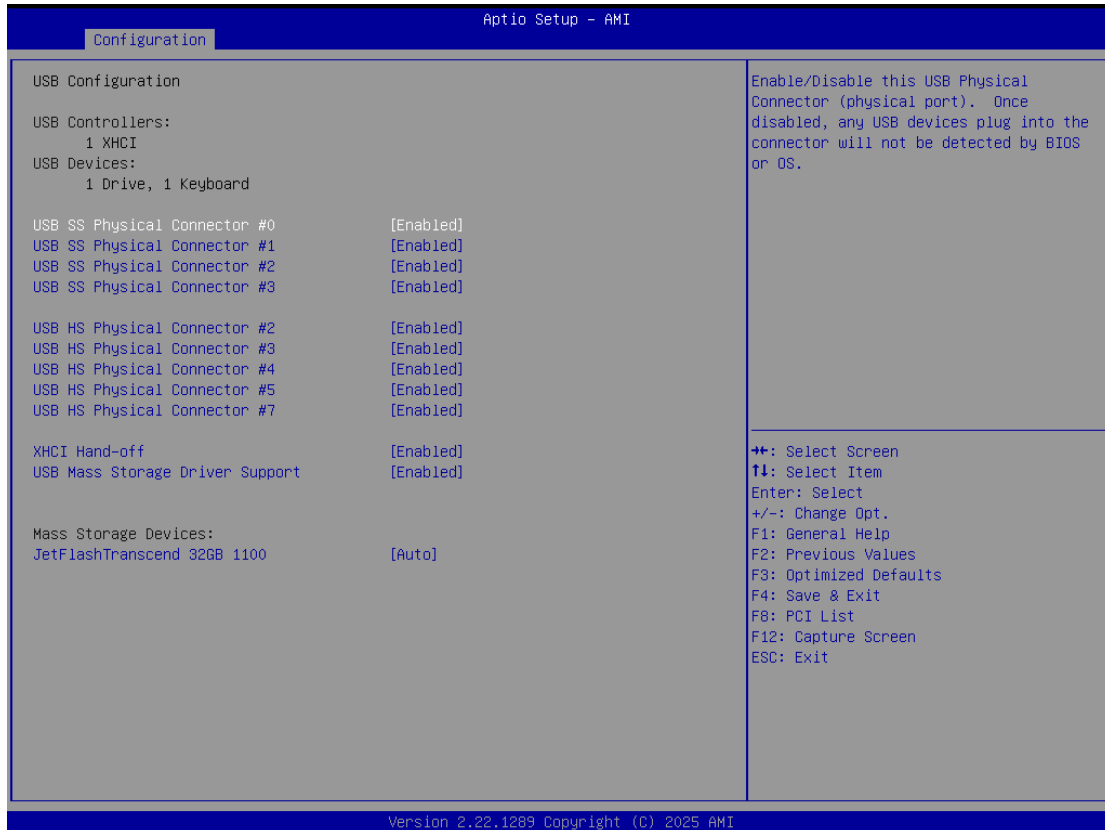
NVME Configuration

NVME Device Options Settings



4.3.8 USB Configuration

USB Configuration Parameters

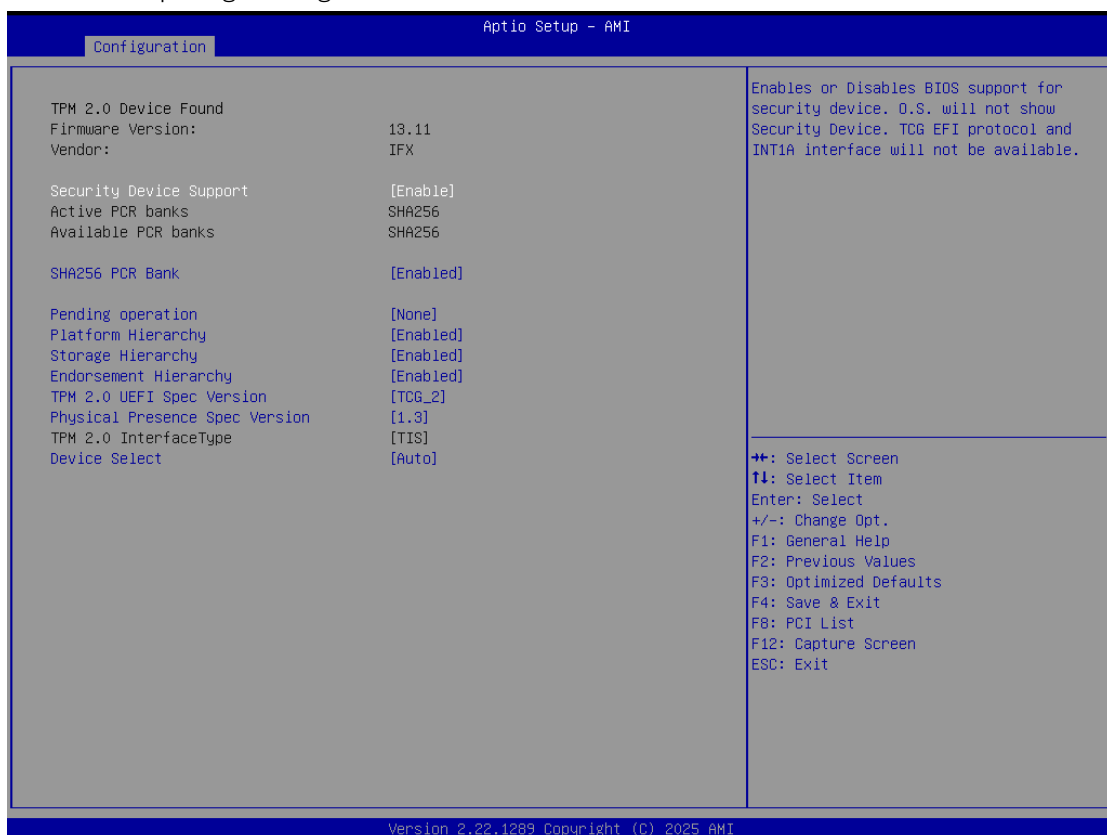


Feature	Description	Options
USB SS Physical Connector #0 ~ #3	Enable/Disable this USB Physical connector (physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.	Disabled, ★Enabled
USB HS Physical Connector #2 ~ #5, #7	Enable/Disable this USB Physical connector (Physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.	Disabled, ★Enabled

XHCI Hand-off	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver	★Enabled , Disabled
USB Mass Storage Driver Support	Enable/Disable USB Mass Storage Driver Support	Disabled, ★Enabled

4.3.9 TPM Configuration: TPM 2.0 Device Found

Trusted Computing Settings

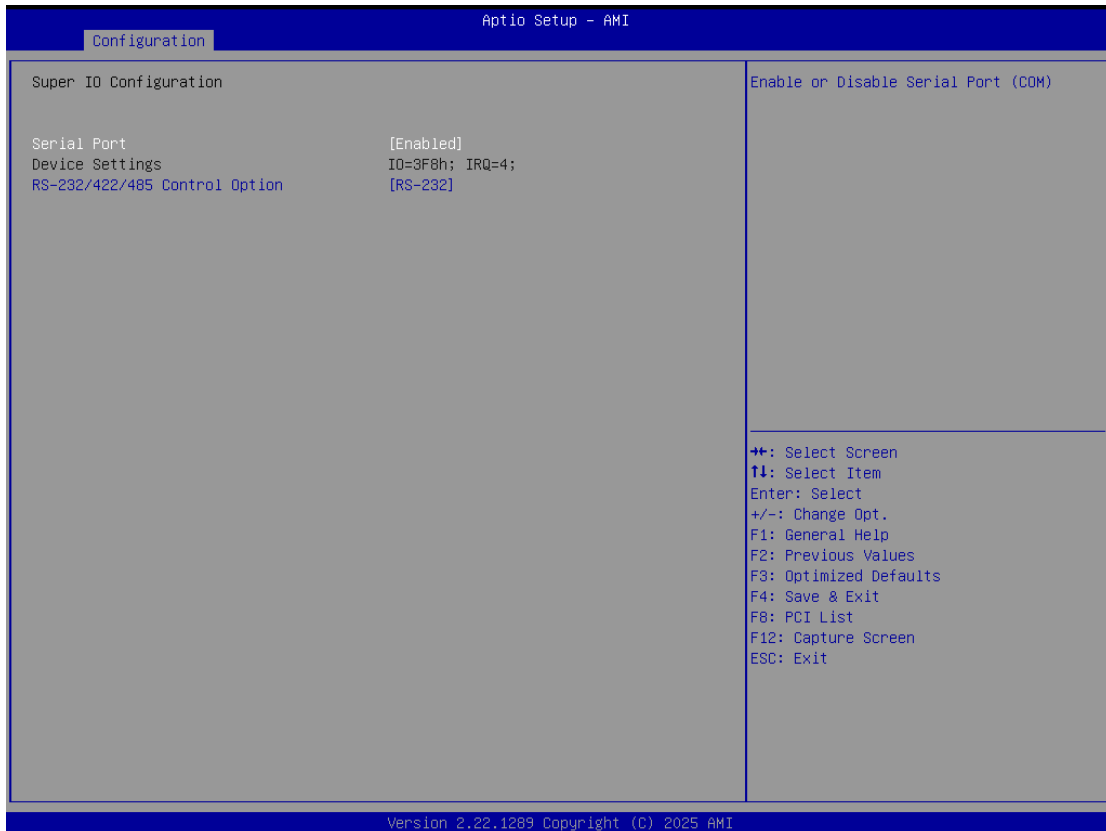


Feature	Description	Options
Security Device Support	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A Interface will not be available.	Disabled, ★ Enabled
SHA256 PCR Bank	Enables or Disables SHA256 PCR Bank.	Disabled, ★ Enabled

Pending operation	Schedule an Operation for the Security Device. Note: Your Computer will reboot during restart in order to change State of Security Device.	★None, TPM Clear
Platform Hierarchy	Enables or Disables Platform Hierarchy.	Disabled,★ Enabled
Storage Hierarchy	Enables or Disables Storage Hierarchy.	Disabled,★ Enabled
Endorsement Hierarchy	Enables or Disables Endorsement Hierarchy.	Disabled,★ Enabled
TPM2.0 UEFI Spec Version	Select the TCG2 Spec Version Support. TCG_1_2: the Compatible mode for Win8/Win10. TCG_2: Support new TCG2 protocol and event format for Win10 or later.	TCG_1_2,★ TCG_2
Physical Presence Spec Version	Select to Tell O.S. to Support PPI Spec Version 1.2 or 1.3. Not some HCK tests might not support 1.3.	1.2,★1.3
Device Select	TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated.	TPM 1.2, TPM 2.0,★Auto

4.3.10 Super IO Configuration

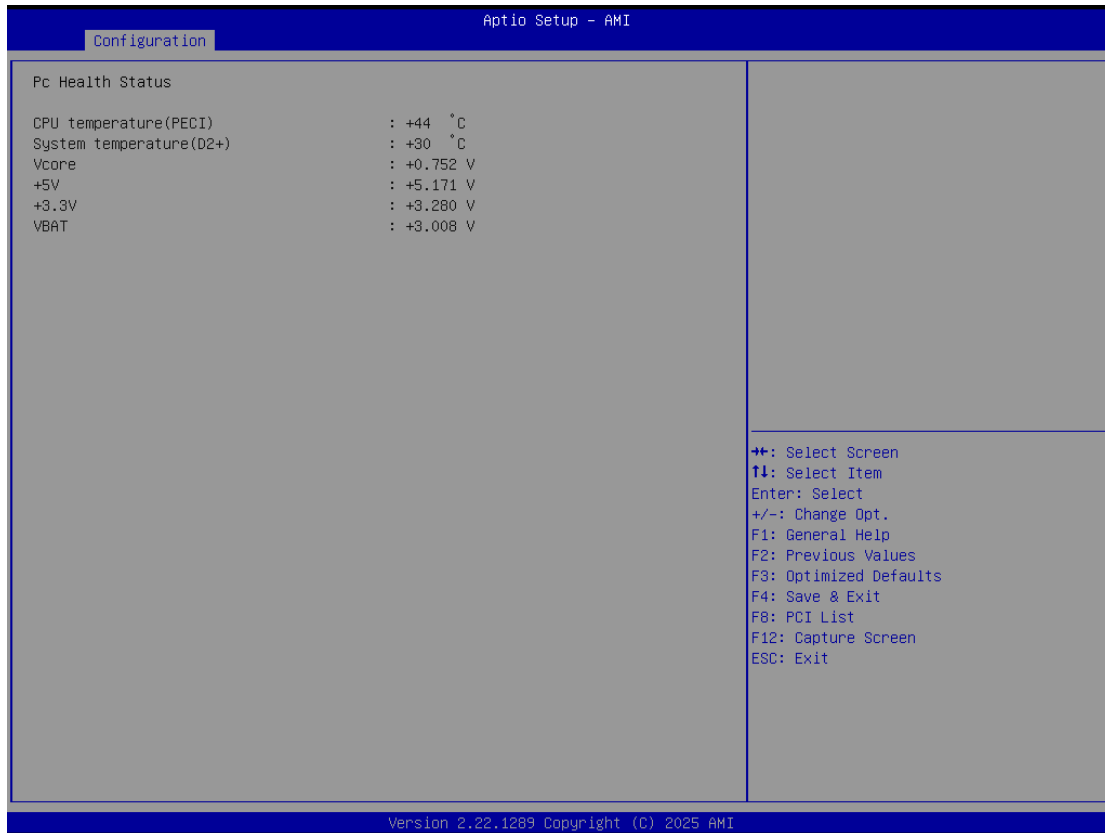
System Super IO Chip Parameters



Feature	Description	Options
Serial Port	Enable or Disable Serial Port (COM)	Disabled,★ Enabled
RS-232/422/485 Control Option	Select RS-232/422/485 Control Option	★RS-232, RS-485 HALF DUPLEX, RS-422 FULL DUPLEX,

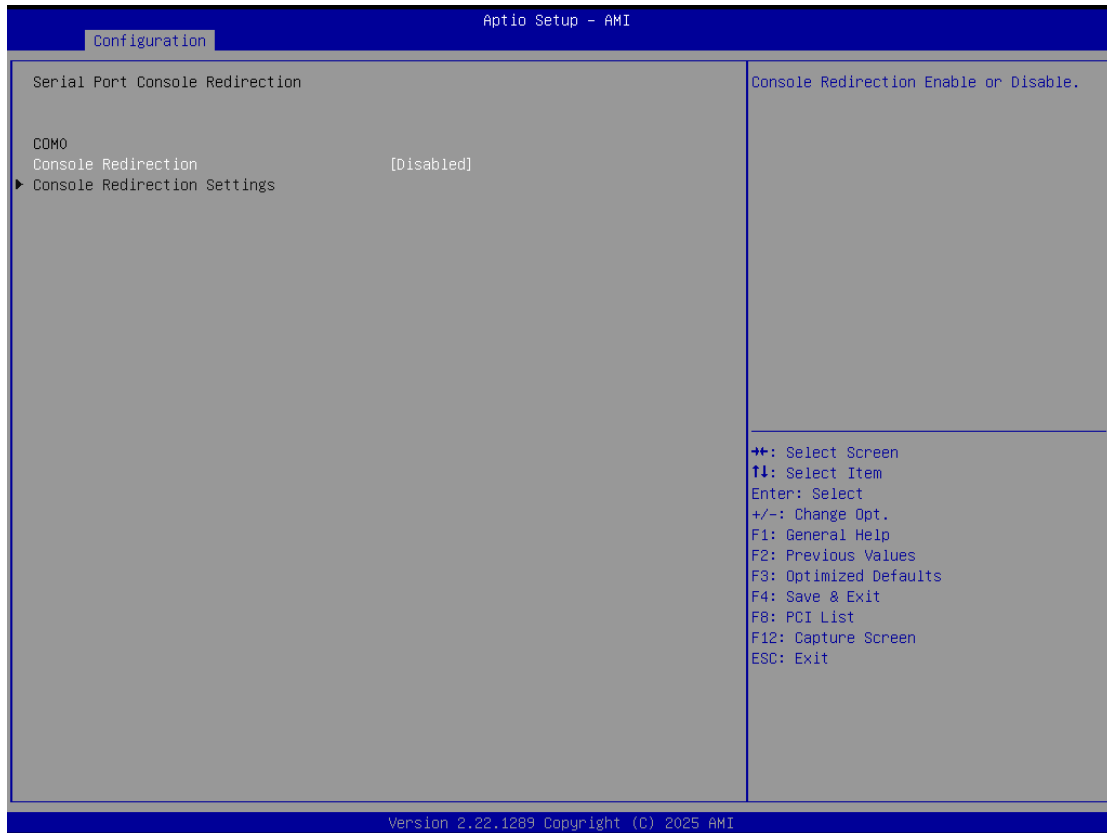
4.3.11 HW monitor

Monitor hardware status



4.3.12 Serial Port Console Redirection

Serial Port Console Redirection



Feature	Description	Options
Console Redirection	Console Redirection Enable or Disable	★Disabled, Enabled

COM0 Console Redirection Settings

Aptio Setup - AMI

Configuration

<p>COM0 Console Redirection Settings</p> <p>Terminal Type [VT100Plus] Bits per second [115200] Data Bits [8] Parity [None] Stop Bits [1] Flow Control [None] VT-UTF8 Combo Key Support [Enabled] Recorder Mode [Disabled] Resolution 100x31 [Disabled] Putty Keypad [VT100]</p>	<p>Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100Plus: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.</p> <hr/> <p> ++: Select Screen ↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F8: PCI List F12: Capture Screen ESC: Exit </p>
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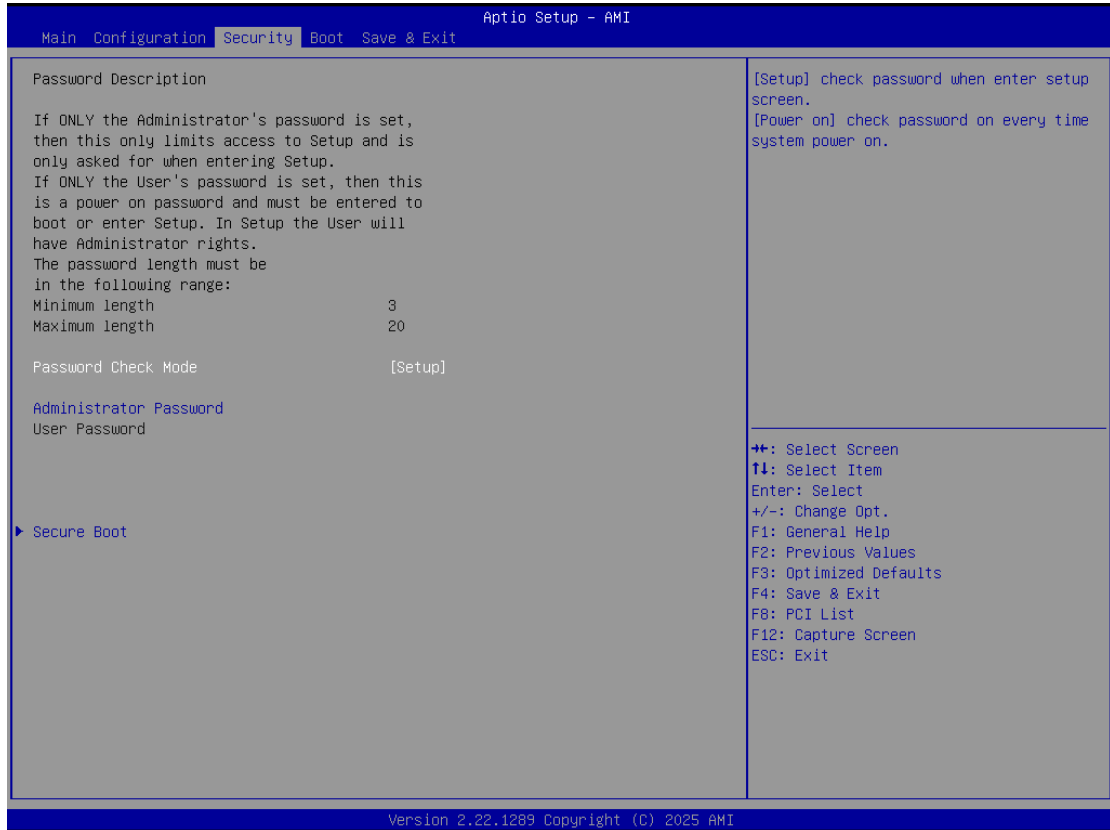
Version 2.22.1289 Copyright (C) 2025 AMI

Feature	Description	Options
Terminal Type	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100Plus: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.	VT100,★VT100Plus,VT-UTF8 ,ANSI
Bits per second	Select Serial port transmission speed. The speed must be matched on other side. Long or noisy lines may require lower speeds.	9600, 19200, 38400, 57600, ★115200
Data bits	Data bits	★8, 7

Parity	A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.	★None, Even, Odd, Mark, Space
Stop Bits	Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.	★1,2
Flow Control	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signal.	★None, Hardware RTS/CTS
VT-UTF8 Combo Key Support	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals	★Disabled, Enabled
Recorder Mode	With this mode enabled only text will be sent. This is to capture Terminal data.	★Disabled, Enabled
Resolution 100x31	Enables or disables extended terminal resolution	★Disabled, Enabled

Putty KeyPad	Select Function Key and KeyPad on Putty	★VT100, LINUX, XTERMR6, SCO, ESCN, VT400
--------------	---	--

4.4 Security



Feature	Description	Options
Password Check Mode	[Setup] check password when enter setup screen. [Power on] check password on every time system power on.	★Setup, Power On
Administrator Password	Set Administrator Password	
Secure Boot	Secure Boot configuration	

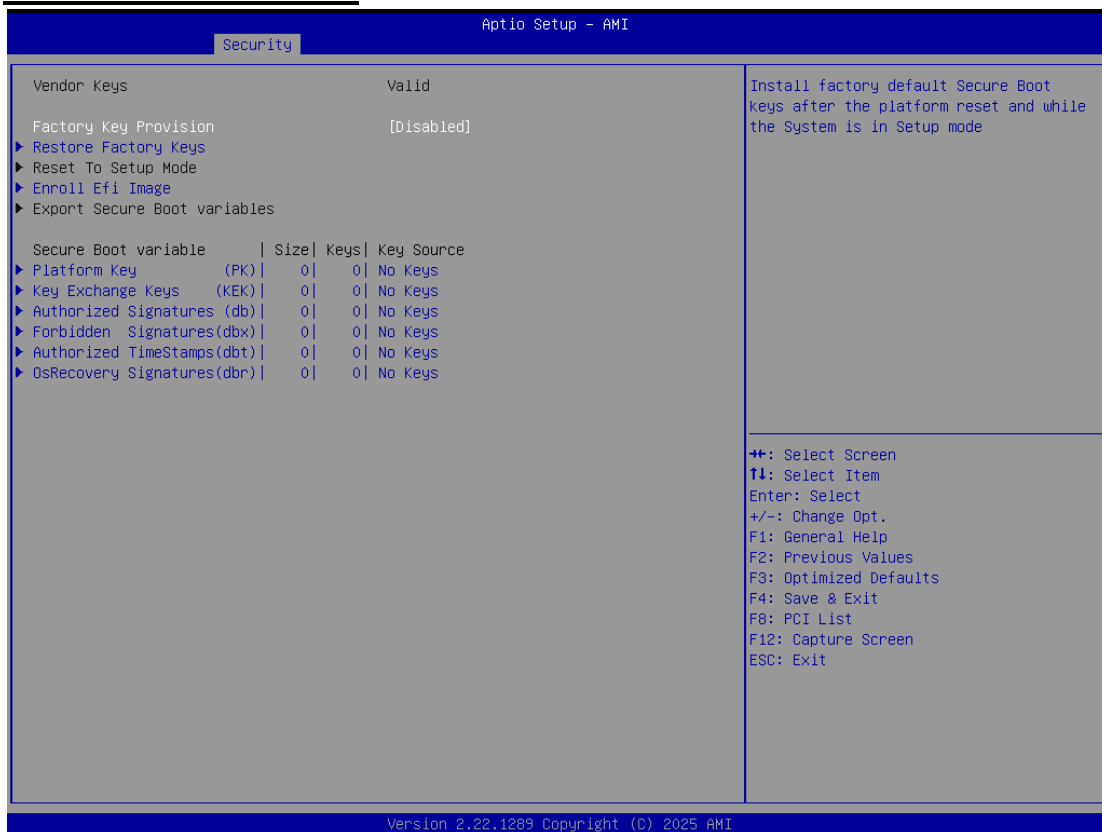
4.4.1 Secure Boot



Feature	Description	Options
Secure Boot	Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset.	★Disabled, Enabled
Secure Boot Mode	Secure Boot Mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication	Standard, ★Custom

Restore Factory keys	Force System to User Mode. Install factory default Secure Boot key databases	Yes, No
Key Management	Enables expert users to modify Secure Boot Policy variables without variable authentication	

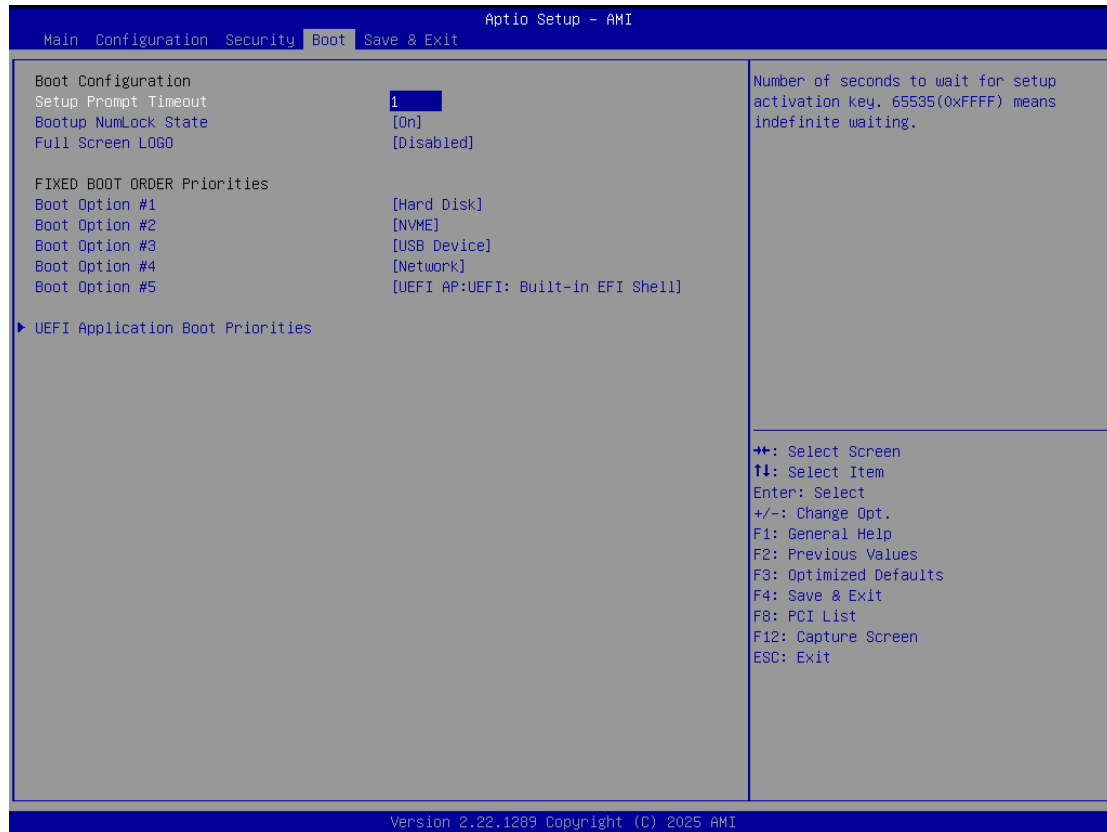
4.4.2 Key Management



Feature	Description	Options
Factory keys Provision	Install factory default Secure Boot key after the platform reset and while the System is in Setup mode.	★Disabled, Enabled
Restore Factory keys	Force System to User Mode. Install factory default Secure Boot key databases	Yes, No
Enroll Efi Image	Allow Efi image to run in Secure Boot mode. Enroll SHA256 Hash	

	certificate of a PE image into Authorized Signature Database (db)	
Platform Key(PK)	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048 (bin) d) EFI_CERT_SHAXXX 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Factory, Modified, Mixed	
Key Exchange Keys(KEK)		
Authorized Signatures(db)		
Forbidden Signatures(dbx)		
Authorized TimeStamps(dbt)		
OsRecovery Signatures(dbr)		

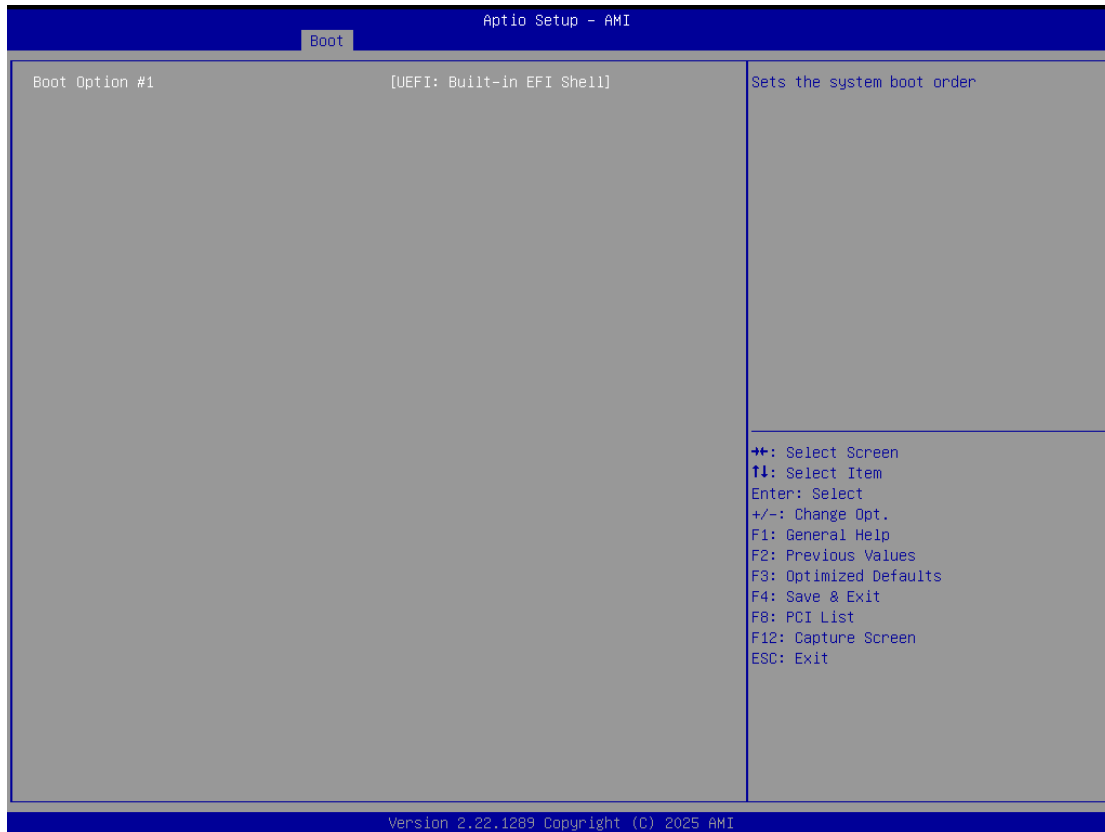
4.5 Boot



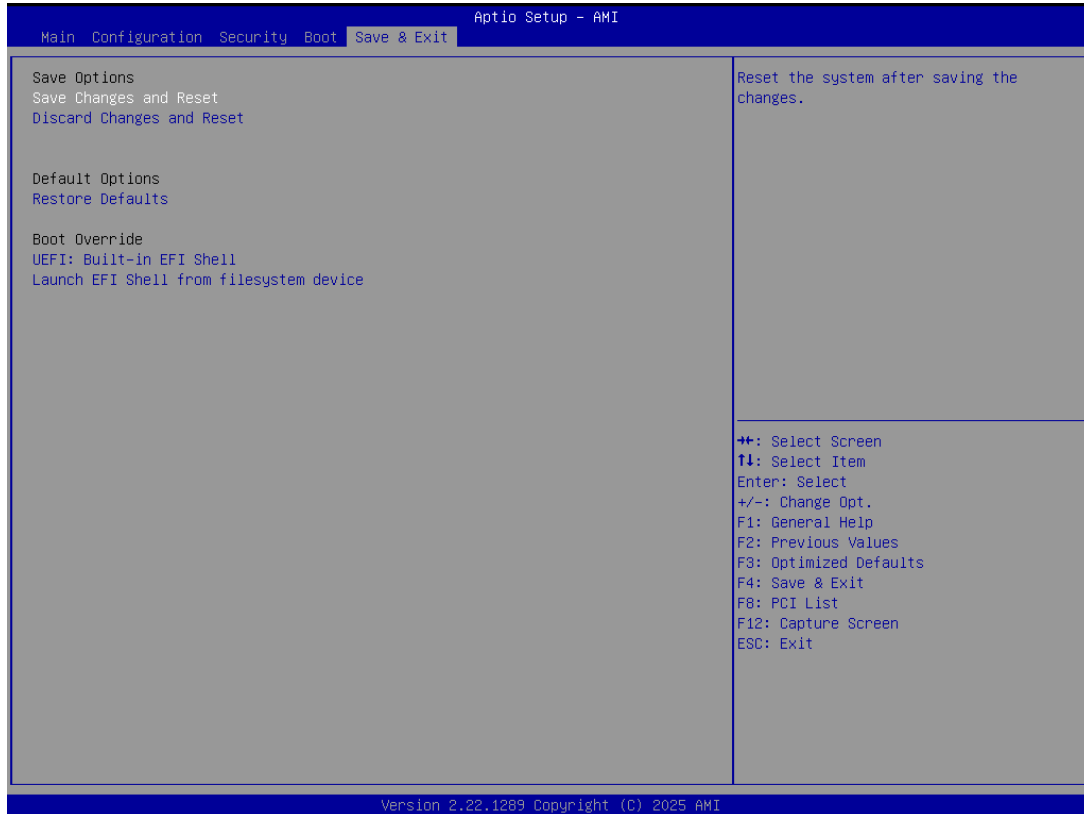
Feature	Description	Options
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.	★1
Bootup NumLock State	Select the keyboard NumLock state.	★On, Off
Full Screen LOGO	Enables or disables Quiet Boot option and Full screen Logo.	★Disabled, Enabled
Boot Option #1 ~ #5	Sets the system boot order	Hard Disk, NVME, CD/DVD, USB Device; Network, UEFI AP: UEFI:

		Built-in EFI Shell, Disabled
UEFI Application Boot Priorities	Specifies the Boot Device Priority sequence from available UEFI Application	

UEFI Application Boot Priorities:



4.6 Save & Exit



Feature	Description	Options
Save Changes and Reset	Reset the system after saving the changes.	
Discard Changes and Reset	Reset system setup without saving any changes.	
Restore Defaults	Restore/Load Default values for all the setup options.	
UEFI: Built-in EFI Shell		
Launch EFI Shell from filesystem device	Attempts to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices.	

Chapter 5

Important instructions

- 5.1 Note on the Warranty
- 5.2 Exclusion of Accident Liability Obligation
- 5.3 Liability limitations / Exemption from the Warranty Obligation
- 5.4 Declaration of Conformity

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

5.1 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.

5.2 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.

5.3 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.

5.4 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.

Chapter 6

6.1 PET tool

6.1 PET tool

Portwell Evaluation Tool (PET)

The Portwell Evaluation Tool (PET) is an API which Portwell's customers can access the GPIO, I2C, SMBus, etc under Windows and Linux OS. For more information, please contact Portwell.

Please visit our Download Center to obtain the necessary documents and files, such as the catalog, user manual, PET, BIOS, and driver.

<https://www.portwell.com.tw/support-center/download-center/>

If you have other additional technical information or request which is not covered in this manual, please fill in the technical request form as below hyperlink.

<https://www.portwell.com.tw/support-center/technical-request/>

We will do our best to provide a suggestion or solution for you.

Chapter 7

7.1 Frequently Asked Questions

7.1 Frequently Asked Questions

- Question: How to update the BIOS file?

Answer: WUX-8100 BIOS UEFI Update SOP process under UEFI Shell

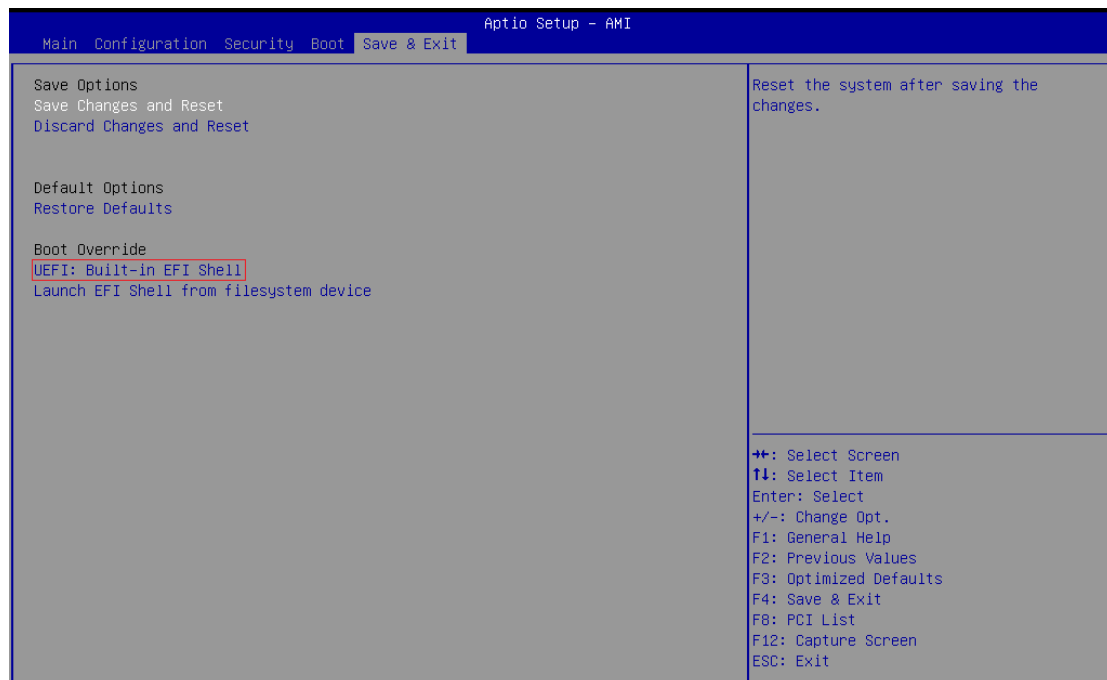
Step1. Prepare a USB DOK.

Step 2. Unzip BIOS update file to the USB DOK.

Step 3. Plug the USB DOK into the target system and then boot in UEFI Shell

By selecting UEFI: Built-In EFI shell in the BIOS “Save&Exit” page

Shown as below picture



Step4. Under the UEFI shell, direct to your USB DOK, below picture is an example using fs1. Then direct to the folder with BIOS updated file and then enter command:” Update.efi” to start updating BIOS

```

DN/OFF Client Counter <64 Bit>
<COM PORT ADDR. : 0x3F8>

294

2013/11/30 v1.3 FoxYang

fs0:\> => 0294
fs0:\>
fs0:\>
fs0:\> fs1:

fs1:\>
fs1:\>
fs1:\> cd Update_FPT_WUX_B100_0_0_4

fs1:\Update_FPT_WUX_B100_0_0_4> Update.efi_

```

Step 5. The updating process will start, and you can see the updating progress.

When you see the following pictures, which means the BIOS update processes finished.

Please cut the AC power off and wait for 10 seconds before powering on.

```

        UPDATING...
        >>DO NOT TURN OFF POWER<<

        PLEASE RESET SYSTEM
        AFTER UPDATING COMPLETE!

64 Bit

Intel (R) Flash Programming Tool Version: 16.50.0.1215
Copyright (C) 2005 - 2022, Intel Corporation. All rights reserved.

Reading HSFSTS register... Flash Descriptor: Valid

--- Flash Devices Found ---
ID:0xC22019   Size: 32768KB (262144Kb)

GbE Region does not exist.

- Erasing Flash Block [0x2000000] - 100 percent complete.
- Programming Flash [0x2000000] 32768KB of 32768KB - 100 percent complete.
- Verifying Flash [0x2000000] 32772KB of 32768KB - 100 percent complete.
RESULT: The data is identical.

FPT Operation Successful.

fs1:\Update_FPT_WUX_B100_0_0_4> _

```

(BIOS update finished)

- Question: I forgot my password for system BIOS, what am I supposed to do?

Answer: You can switch off your power supply then find the RTC Battery on WUX-8100. Then remove the RTC battery and wait 5 seconds to clean your password then to switch on your power supply.



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