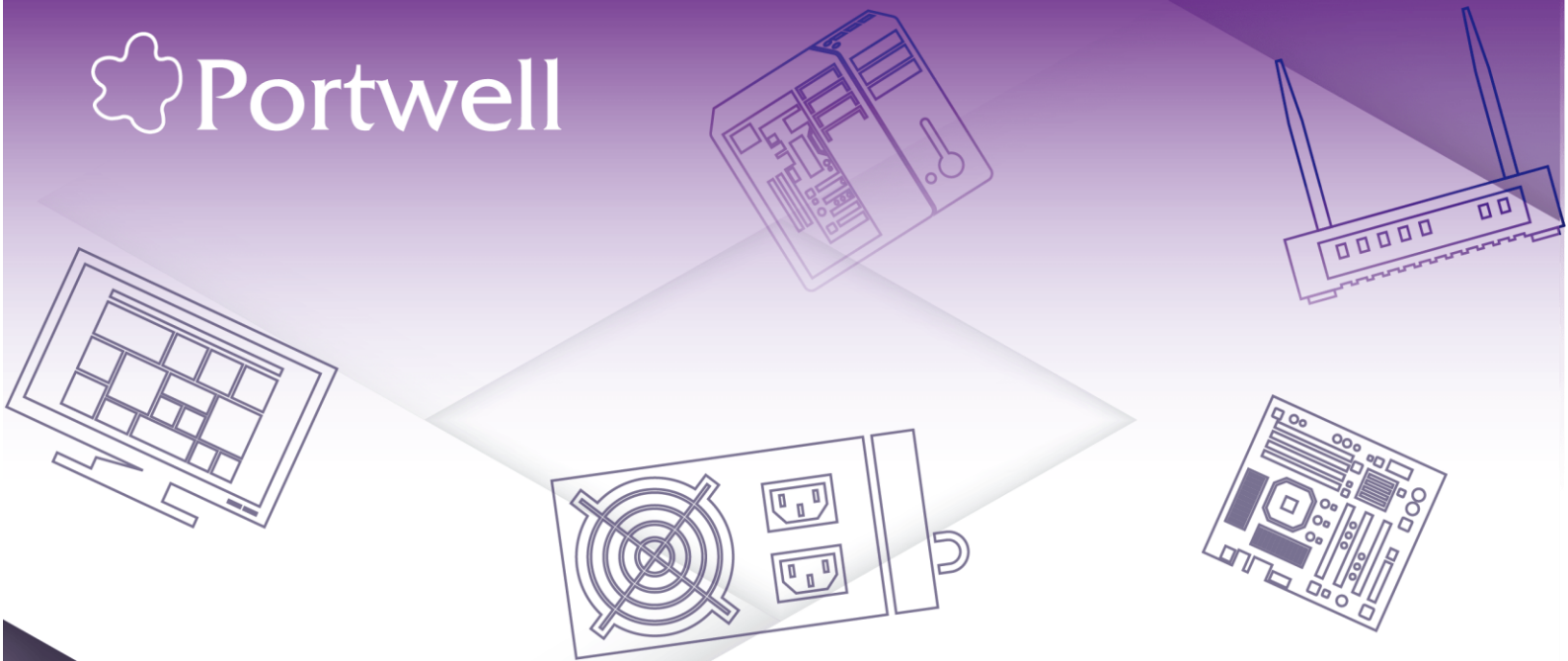




LYNX-8110

SFF Embedded System

User Manual

Version R 1.1

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Revision History

R 1.0	Initial Release Rev. 1.0
R 1.1	Revise photos & add VESA mount installation

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Chapter 1

Product Overview

- 1.1 Instruction
- 1.2 Product Specification
- 1.3 Dimension

1.1 Introduction

The LYNX-8110 series is a compact and reliable industrial computing platform powered by Intel® Amston Lake processors, offering 4 cores with a low 9W TDP for power-efficient performance. Designed for industrial automation and control applications, it supports up to 32GB of high-speed LPDDR5 memory at 4800MT/s, ensuring smooth data processing and system responsiveness.

For storage flexibility, the system provides one M.2 M Key 2242 socket supporting both PCIe and SATA SSDs, along with onboard eMMC storage of up to 256GB, making it suitable for data logging, system backups, and real-time operations.

The LYNX-8110 delivers versatile connectivity with dual Intel® I226IT 2.5GbE LAN ports, ideal for industrial Ethernet communication.

Additionally, it offers multiple I/O options including two USB 3.2 Gen2 ports, one USB Type-C port with DisplayPort and USB 10Gbps support, and one HDMI® 1.4a port for human-machine interfaces (HMI) and monitoring.

For additional expansion, the system features an M.2 E-Key 2230 socket to support Wi-Fi modules, enabling wireless communication where needed. Engineered for harsh industrial environments, the LYNX-8110 supports a wide 12V to 30V DC power input and operates reliably across a broad temperature range from -40° C to 70° C. With robust durability features including IP30 protection, vibration resistance up to 5Grms, and shock tolerance up to 50G, it is well-suited for factory automation, machine control, and edge computing tasks in challenging conditions.

With its fan-less design, compact footprint, and industrial-grade reliability, the LYNX-8110 is the ideal solution for automation systems, embedded control, and intelligent edge applications.

1.2 Product Specification

Model name	LYNX-8110
General	
CPU	Intel Amston Lake X7433RE, 4 cores, TDP 9W
System Memory	LPDDR5 4800 MT/s Non-ECC Memory chip up to 32GB (default: 8GB)
Storage	1x M.2 M Key 2242 socket (For SATA SSD) Onboard eMMC up to 256GB (default:128GB)
Power Input	DC 12V~30V
Operating System	Windows 10/Windows 11/Linux
TPM	TPM2.0
Expansion	1x M.2 E Key 2230 socket (For M.2 Wi-Fi module)
I/O Interface	
Power Connector	1x 2-Pin Terminal Block Connector
Ethernet	2x Intel® I226IT 2.5GbE LAN
USB	2x USB 3.2 Gen2 (10Gbps) 1x USB Type C (DisplayPort/USB 10Gbps support)
Display	1x HDMI® 1.4a port 1x USB type C with DP ALT mode
Certificate	
Certificate	CE (EN 55032; EN 55024/ EN 55035) CE (EN 61000-6-4; EN 61000-6-2) FCC (Part 15 Subpart Class A) LVD (EN 62368)
Environmental & Mechanical	
Storage Temp.	-40° C ~ 85 ° C
Operating Temp.	-40° C ~ 70° C
Permissible Humidity	40° C, 95%RH, non-condensing
Operation Vibration	5Grms/10~500Hz, IEC 60068-2-6
Operation Shock	50G, 11msec, IEC 60068-2-27

Degree of Protection	IP40
Dimension	120mm(W) x 54mm(H) x 120mm(D)

1.3 Dimension



Figure 1: LYNX-8110 Mechanical Dimension

Chapter 2

System Overview

- 2.1 I/O View
- 2.2 Jumper Setting

2.1 I/O View

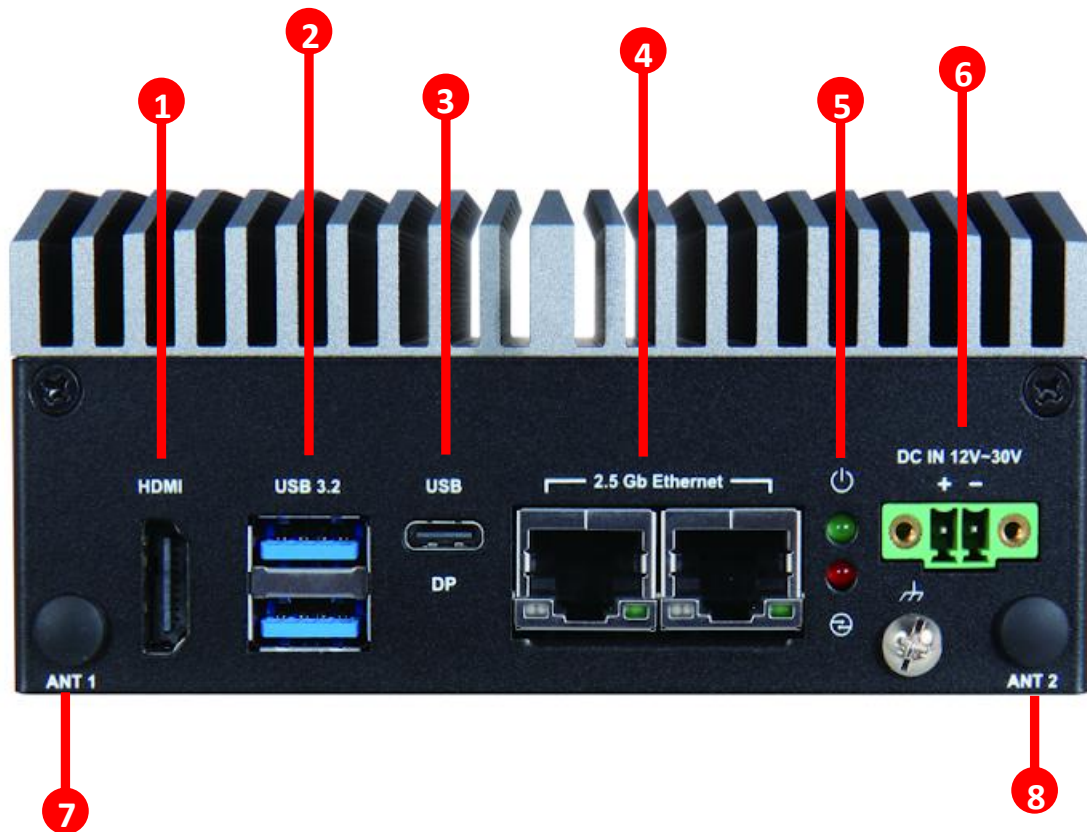


Figure 2: LYNX-8110 I/O View

NO.	Description
1	1x HDMI® 1.4a port
2	2x USB 3.2 Gen2 (10Gbps) Ports
3	1x USB Type C (DisplayPort/USB 10Gbps support) Port
4	2x Intel® I226IT 2.5GbE RJ45 Ports
5	LED Indicators The Green LED on the top: System power The Red LED at the bottom: Storage Activity
6	1x 2-Pin Terminal Block Connector
7 & 8	SMA connectors for Wi-Fi / LTE module (Optional)

2.2 Jumper Setting

This chapter indicates jumpers' headers and connectors' locations. Users may find useful information related to hardware settings in this chapter.

Drawing Overview

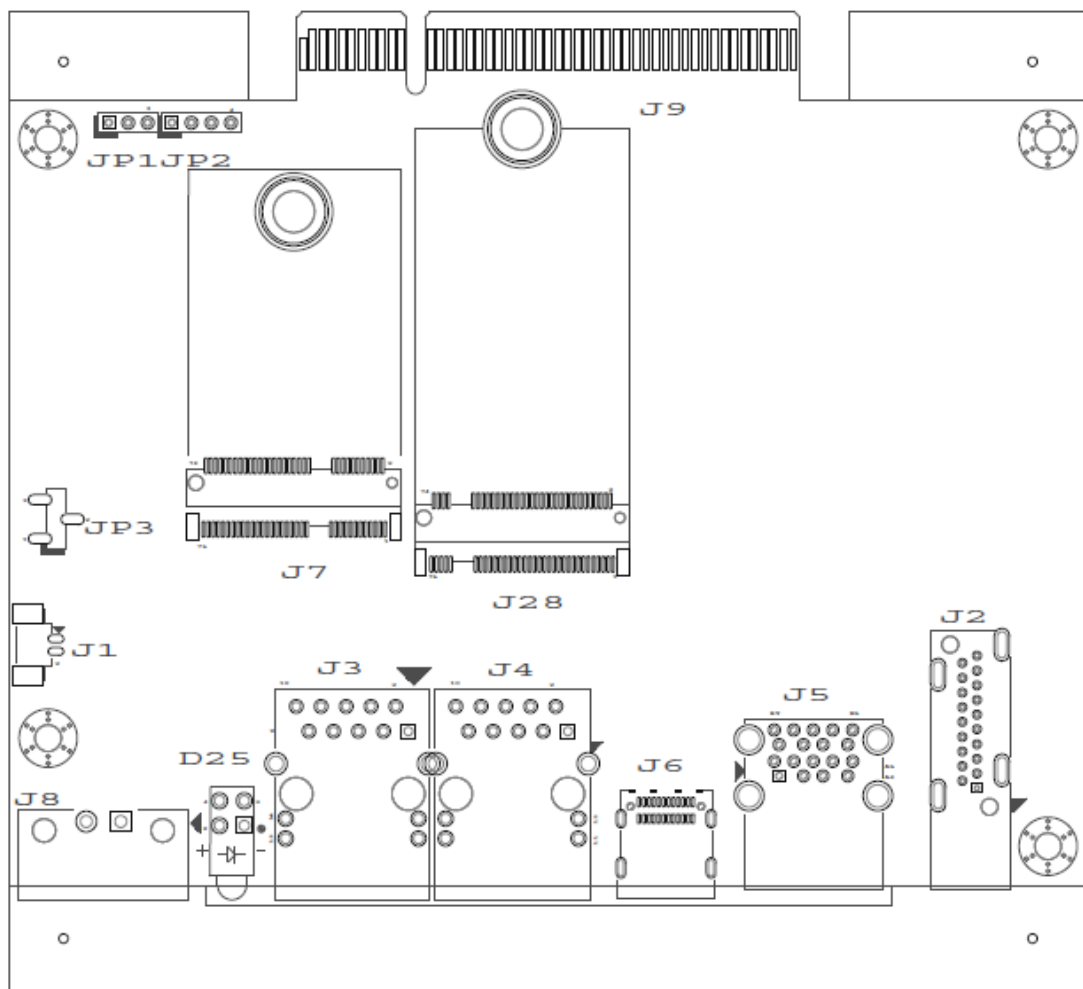


Figure 3: Component Side

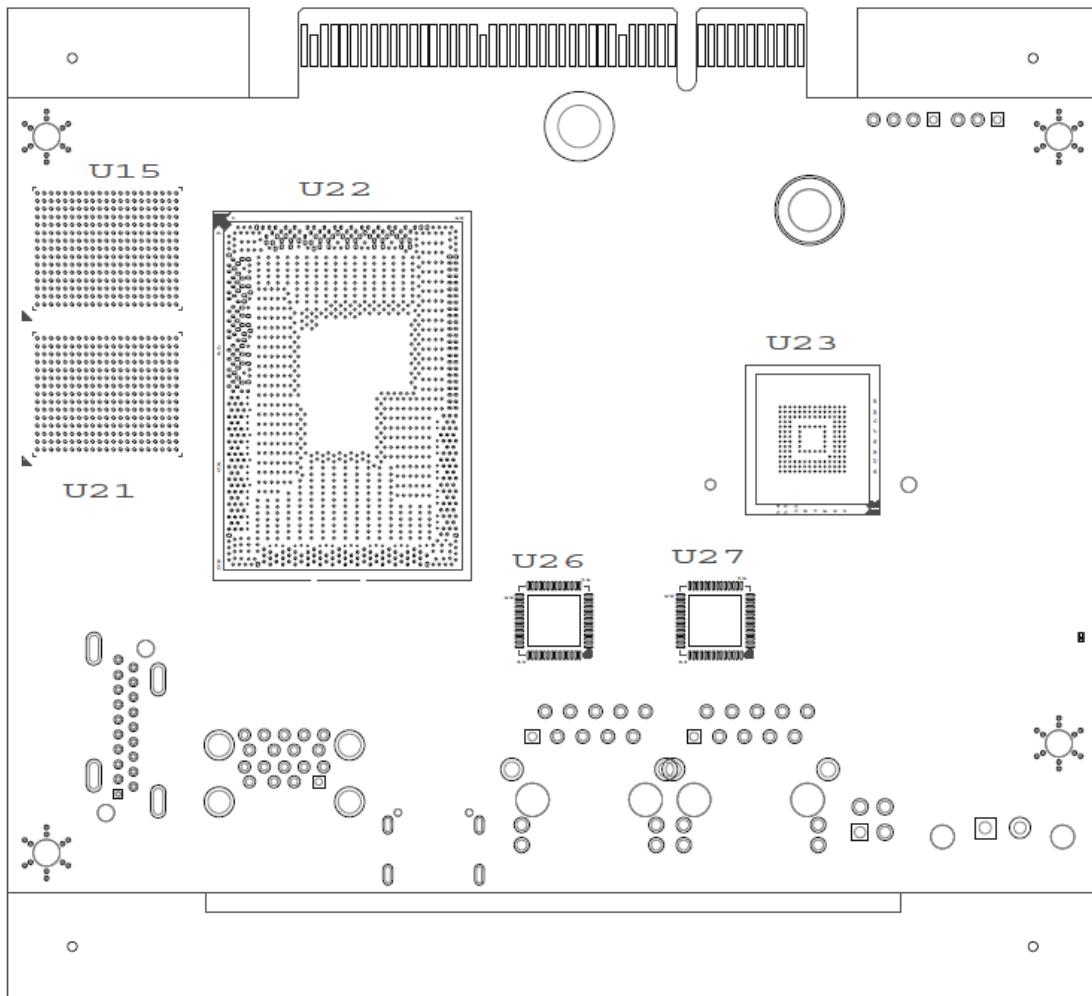


Figure 4: Solder Side

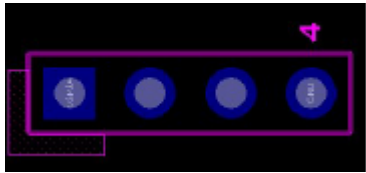
Jumper Setting List

Location	Function
JP1	AT/ATX mode
JP2	Reserve for EC SMBus
JP3	Clear CMOS setting

JP1 AT/ATX Mode (Pitch 2.0mm)

PCB Footprint	Jumper Setting	Function Description
	1-2	★AT Mode
	2-3	Reserve

JP2 Reserve for EC SMBus (EC SMBus (Pitch 2.0mm):Reserve)

PCB Footprint	Jumper Setting	Function Description
	1	3.3V
	2	CLK
	3	DATA
	4	GND

JP3 CMOS Setup(Pitch 2.0mm)

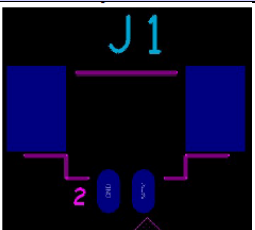
PCB Footprint	Jumper Setting	Function Description
	1-2	Clear CMOS
	2-3	Clear ME RTC

NOTES: Default (Floating)

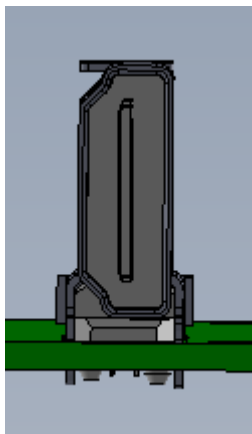
Connector Function List

Location	Function
J1	Battery Connector
J2	HDMI® Connector
J3	RJ45 Connector
J4	RJ45 Connector
J5	USB2.0/3.0 Connector
J6	DP ALT mode Type C Connector
J7	M.2 Key E Wifi Connector
J8	DC Power Connector
J28	M.2 Key M SATA Connector

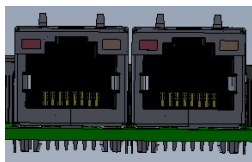
J1: Battery Connector

PCB Footprint	Pin No.	Signal Description
	1	BAT3V
	2	GND

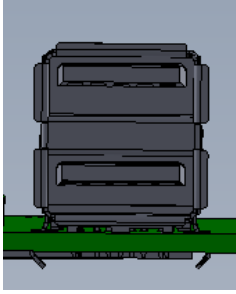
J2: HDMI® Connector

PCB Footprint	Pin No.	Signal Description	Pin No.	Signal Description
	1	D2+	2	D2 Shield
	3	D2-	4	D1+
	5	D1 Shield	6	D1-
	7	D0+	8	D0 Shield
	9	D0-	10	CLK+
	11	CLK Shield	12	CLK-
	13	CEC	14	HEC Data/Reserve
	15	SCL	16	SDA
	17	DDC/CEC/HEC GND	18	5V
	19	HPD		

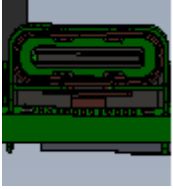
J3/J4: RJ45 Connector

PCB Footprint	Pin No.	Signal Description	Pin No.	Signal Description
	1	TRxP0	2	TRxN0
	3	TRxP1	4	TRxP2
	5	TRxN2	6	TRxN1
	7	TRxP3	8	TRxN3

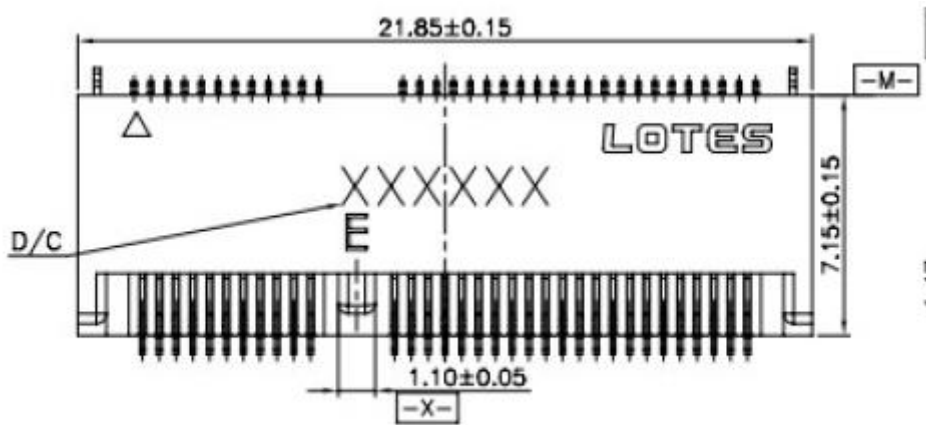
J5: USB2.0/3.0 Connector

PCB Footprint	Pin No.	Signal Description	Pin No.	Signal Description
	A1	5V	B1	GND
	A2	D1-	B2	D0-
	A3	D1+	B3	D0+
	A4	GND	B4	GND
	A5	SSRX1-	B5	SSRX0-
	A6	SSRX1+	B6	SSRX0+
	A7	GND	B7	GND
	A8	SSTX1-	B8	SSRTX0-
	A9	SSTX1+	B9	SSRTX0+

J6: DP ALT Mode Type C Connector

PCB Footprint	Pin No.	Signal Description	Pin No.	Signal Description
	A1	GND	B12	GND
	A2	SSTXp1(TX1+)	B11	SSRXp1(RX1+)
	A3	SSTXn1(TX1-)	B10	SSRXn1(RX1-)
	A4	Vbus	B9	Vbus
	A5	CC1	B8	SBU2
	A6	D+	B7	D-
	A7	D-	B6	D+
	A8	SBU1	B5	CC2
	A9	Vbus	B4	Vbus
	A10	SSRXn2(RX2-)	B3	SSRTn2(TX2-)
	A11	SSRXp2(RX2+)	B2	SSRTp2(TX2+)
	A12	GND	B1	GND

J7: M.2 Key E WiFi Connector

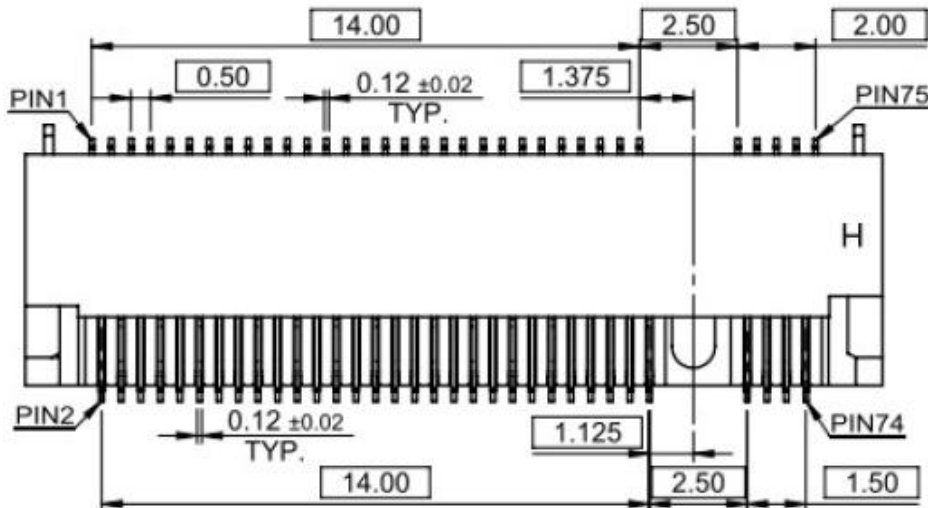


Follow PCI Express M.2 Specification Ver5.1

J8: DC Power input Connector

PCB Footprint	Jumper Setting	Function Description
	1	GND
	2	+12V

J28: M.2(SATA interface TYPE:2242) Connector



Follow PCI Express M.2 Specification Ver5.1

Chapter 3

System Overview

- 3.1 Open The Chassis
- 3.2 M.2 2242 M Key SATA SSD Installation
- 3.3 M.2 2230 E Key Wi-Fi Module Installation
- 3.4 Wi-Fi Antenna and SMA Bulkhead Jack Installation
- 3.5 Wall Mount Installation
- 3.6 Din Rail Installation
- 3.7 VESA mount Installation

3.1 Open the System

Before disassembly, ensure the system is powered off and all power sources and signal cables are disconnected.



There are 9 screws (as shown) that tightly fix the bottom cover of LYNX-8110. Loosen these screws (M3x4L) securing the bottom cover.



Gently lift the bottom cover to remove it, and the mainboard will be visible.

3.2 M.2 2242 M Key SATA SSD

Installation

The system is equipped with one M.2 M Key 2242 socket for a SATA SSD. Follow the instructions below to install the SSD.



Align the M.2 card with the module slot, insert it at a slight angle, and ensure the connector is fully seated.

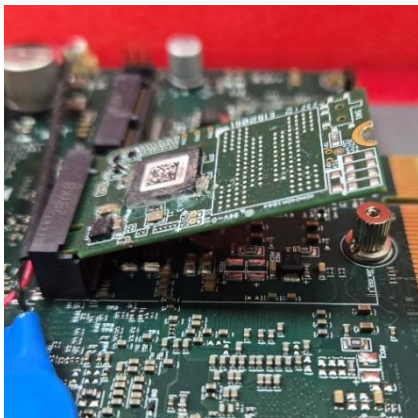


Press the M.2 card down to a horizontal position and secure it with the bundled screw (M3x6L).

3.3 M.2 2230 E Key Wi-Fi Module

Installation

The system is equipped with one M.2 E Key 2230 socket for Wi-Fi card. Follow the instructions below to install it.



Align the M.2 card with the module slot, insert it at a slight angle, and ensure the connector is fully seated.



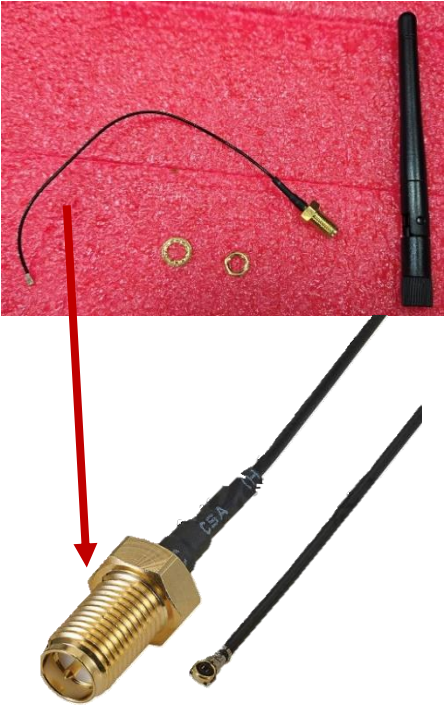
Press the M.2 card down to a horizontal position and secure it with the bundled screw (M3x6L).

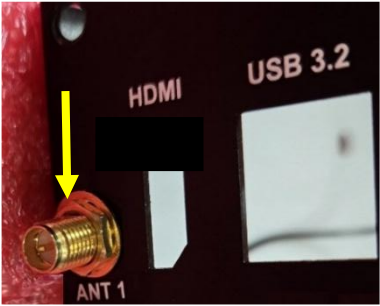
3.4 Wi-Fi Antenna and SMA

Bulkhead Jack Installation

LYNX-8110 has 2 antenna holes to support Wi-Fi Antenna.

Follow the instructions below for installation.

	<p>If Wi-Fi module is purchased, the accessory box will include the following items in addition to the Wi-Fi card:</p> <ul style="list-style-type: none"> 1 × serrated washer 1 × hex nut 2 × SMA cables (SMA female to IPEX MHF4L) 2 × external Wi-Fi antennas
	<ol style="list-style-type: none"> 1. Remove the antenna hole plug. 2. Insert the SMA cable through the antenna hole so that the threaded part protrudes outside.

	<p>(Take the antenna holes on the front panel as an example.)</p> <ol style="list-style-type: none"> 1. On the outside of the chassis, place the serrated washer over the threaded connector. 2. Secure the connector by tightening the hex nut.
	<p>Inside the chassis, align each MHF4 connector on the antenna cable with the corresponding port on the Wi-Fi card.</p>
	<p>Press straight down until a click is felt or heard.</p>
	<ol style="list-style-type: none"> 1. Screw each external Wi-Fi antenna onto the SMA connector on the chassis. 2. Adjust the antennas to the desired position for optimal signal reception.

3.5 Wall mount Installation



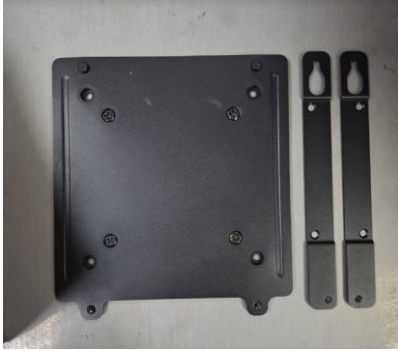
Remove the pre-installed screws and align the wall mount brackets with the mounting holes on the bottom cover of the system. Secure the brackets to the system using the supplied screws (M3 × 6L).

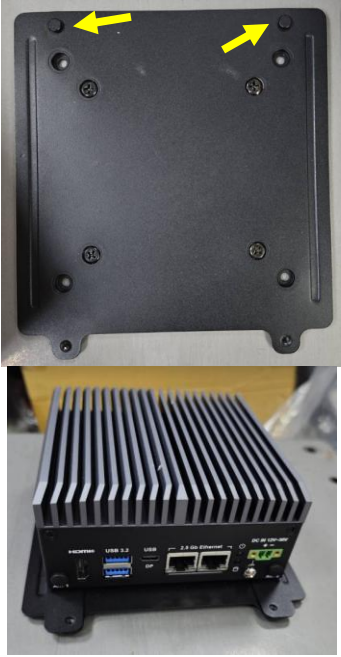
3.6 Din Rail Installation



Remove the pre-installed screws on the rear panel of the system, then align the DIN rail brackets with the mounting holes. Secure the brackets to the system using the supplied screws (M3 × 6L).

3.7 VESA mount Installation

	<p>The VESA mount kit contained:</p> <ol style="list-style-type: none"> 1. VESA Mounting Plate (1 pc): A black metal plate featuring standard VESA mounting patterns. 2. Device Mounting Brackets (2 pcs): Long brackets equipped with teardrop keyholes at the top for secure hanging. 3. Screw Pack (Not shown in image): Typically includes M4 screws for monitor attachment and for securing the device.
	<p>Remove the pre-installed screws and align the wall mount brackets with the mounting holes on the bottom cover of the system.</p>
	<ol style="list-style-type: none"> 1. Mount the VESA Plate: First, secure the VESA mounting plate onto your target surface (e.g., the back of a monitor or a wall mount). 2. Position the Brackets: Place the brackets onto the device (example showed I/O ports facing downward.) 3. Secure the Screws: Insert and tighten the four screws (indicated by the yellow arrows) to firmly attach the brackets to the device.

	<ol style="list-style-type: none"> 1. Align the Keyholes: Lift the LYNX-8110 and align the teardrop keyholes on the brackets with the mounting studs (I-shaped pins) on the VESA plate. 2. Slide to Lock: Insert the studs into the wider part of the keyholes, then gently slide the device downward until it is firmly locked into place. <p>Final Check: Ensure the device is secure and level before releasing your grip.</p>
	<ol style="list-style-type: none"> 1. Fasten the Security Screws: Install and tighten the two security screws at the bottom of the VESA plate to lock the mounting brackets in place. 2. Prevent Detachment: This step ensures the device is firmly fixed to the VESA plate and prevents it from accidentally sliding out or being detached. <p>Final Inspection: Double-check that all screws (both the bracket-to-device and plate-to-bracket screws) are fully tightened.</p>

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

LYNX-8110 is equipped with the AMI BIOS stored in Flash ROM. These BIOS have a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, LYNX-8110 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

4.1 Entering Setup -- Launch System Setup

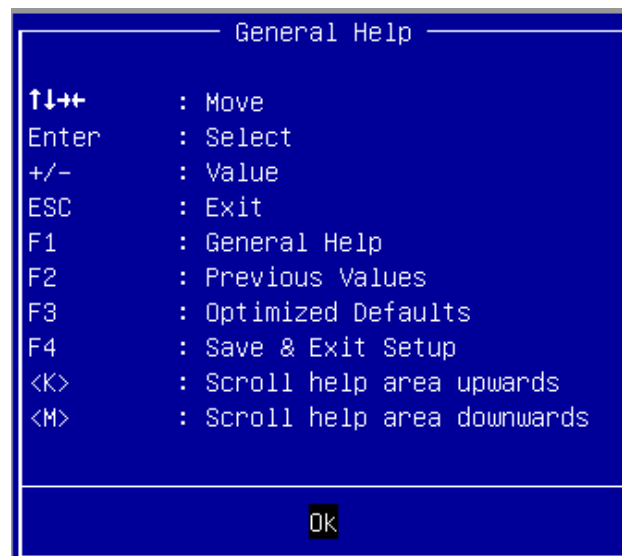
Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press key will enter BIOS setup screen.

Press to enter SETUP

If the message disappears before responding and still wishes 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	
System Time	The time format is <Hour> <Minute> <Second>. Use [+] or [-] to configure system Time.	

Detailed System Information

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	LSMC-M1013
Board ID	N/A
Fab ID	Default string
LAN PHY Revision	N/A
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	15
GT Info	0x46D0
eDRAM Size	N/A
IGFX GOP Version	21.0.1065
Memory RC Version	0.0.4.74
Total Memory	8192 MB
Memory Frequency	4800 MHz
MC 0 Ch 0 DIMM 0	Populated & Enabled
Size	2048 MB (LPDDR5)
MC 0 Ch 1 DIMM 0	Populated & Enabled
Size	2048 MB (LPDDR5)
MC 0 Ch 2 DIMM 0	Populated & Enabled

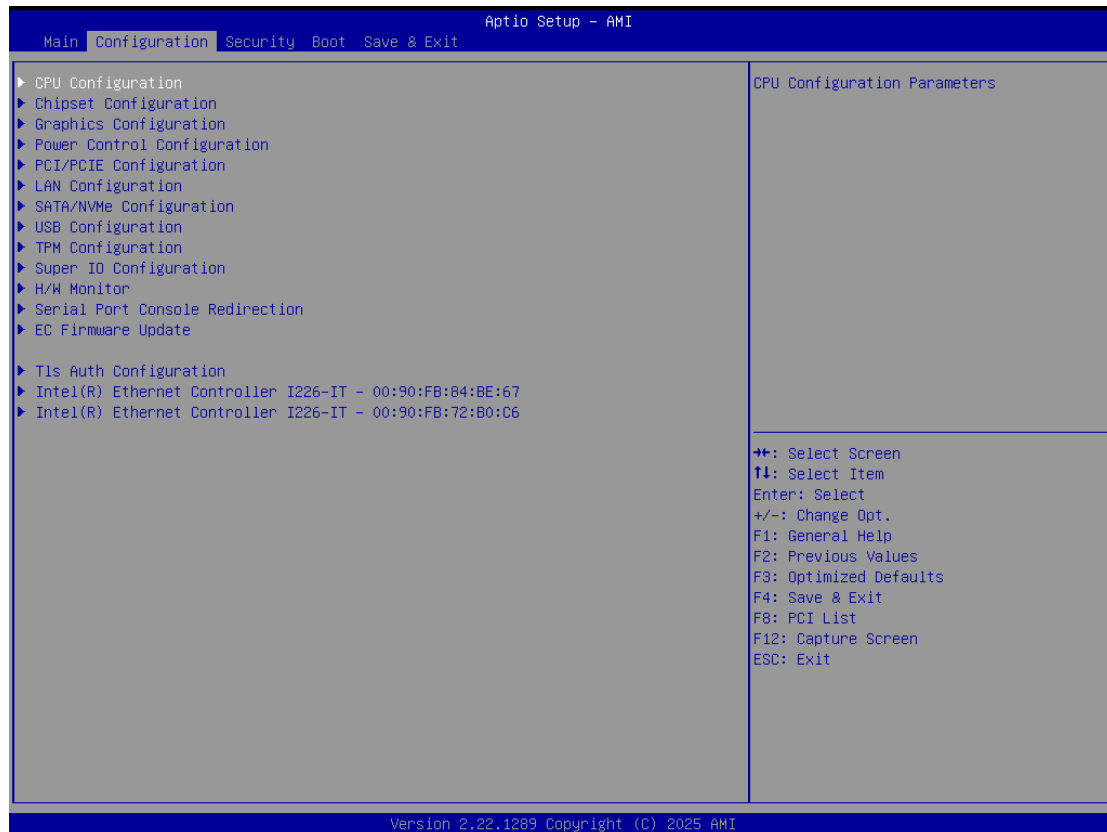
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Main	
MC 0 Ch 1 DIMM 0	Populated & Enabled
Size	2048 MB (LPDDR5)
MC 0 Ch 2 DIMM 0	Populated & Enabled
Size	2048 MB (LPDDR5)
MC 0 Ch 3 DIMM 0	Populated & Enabled
Size	2048 MB (LPDDR5)
MC 1 Ch 0 DIMM 0	Not Populated / Disabled
MC 1 Ch 1 DIMM 0	Not Populated / Disabled
MC 1 Ch 2 DIMM 0	Not Populated / Disabled
MC 1 Ch 3 DIMM 0	Not Populated / Disabled
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

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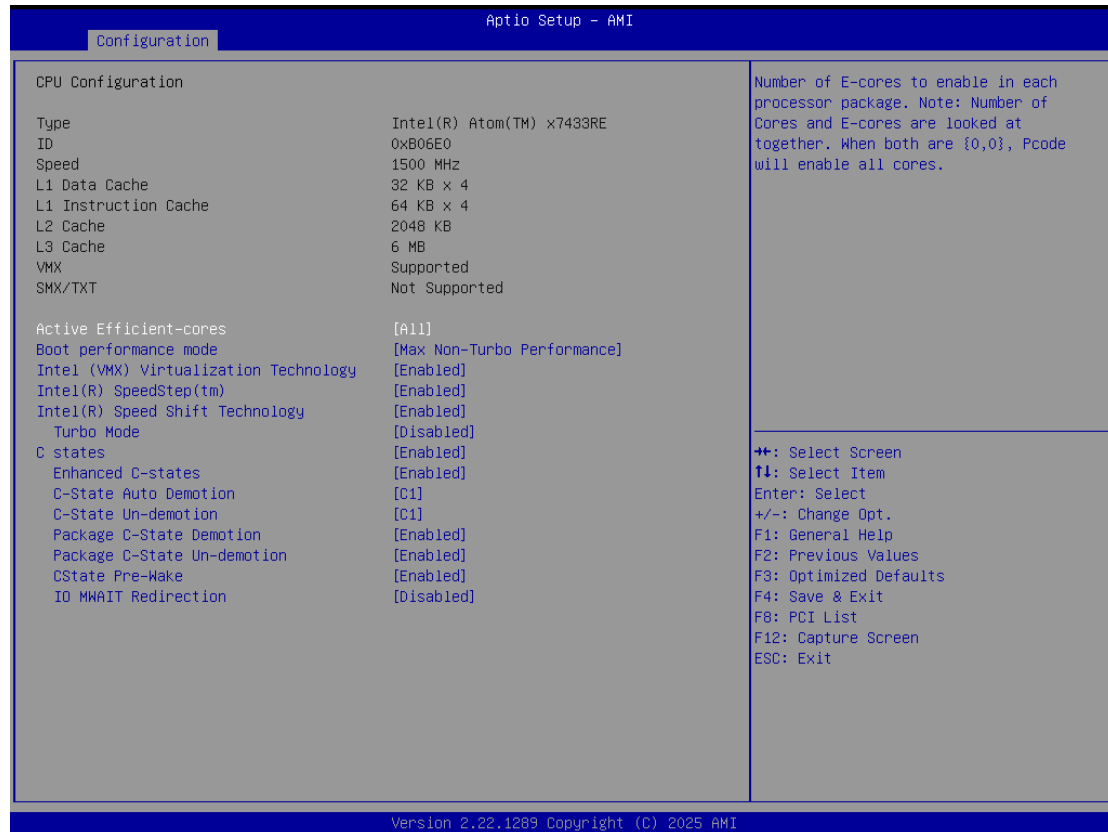
4.3 Configuration

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



4.3.1 CPU Configuration

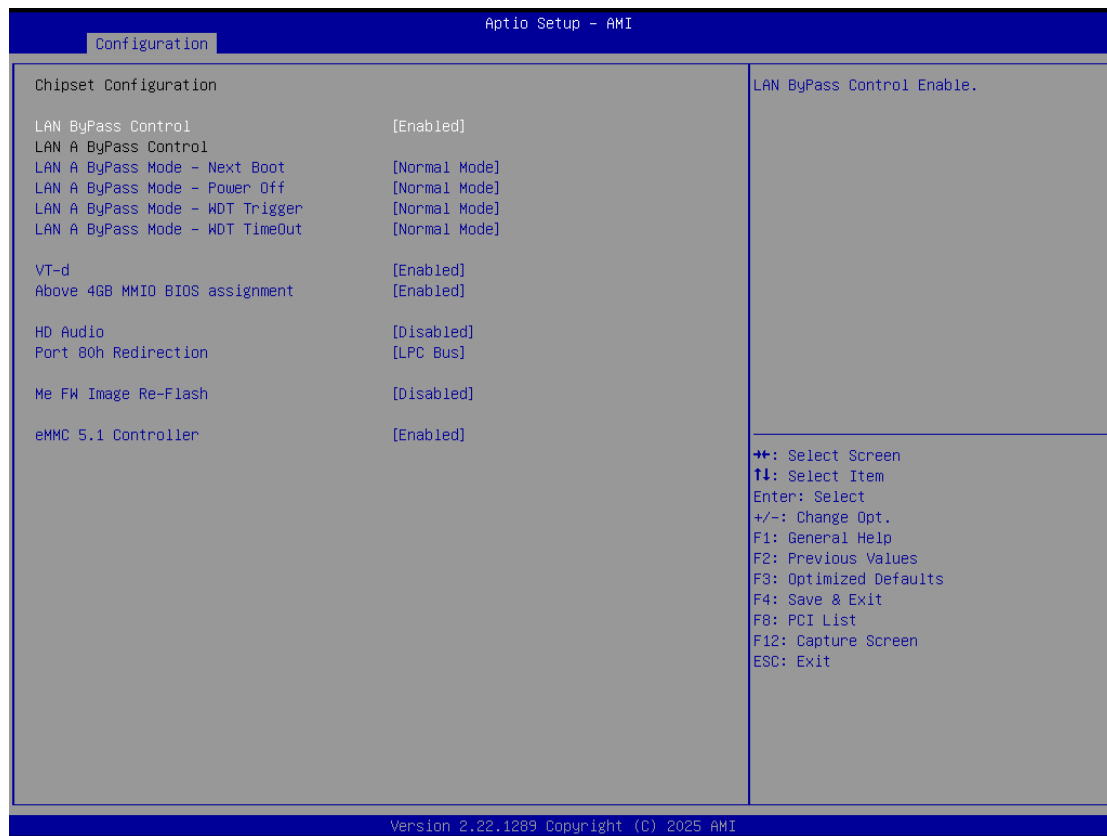
CPU Configuration Parameters



Feature	Description	Options
Boot performance mode	Select the performance state that the BIOS will set starting from reset vector	★ Max Non-Turbo Performance, Turbo Performance, Max Battery
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology.	Disabled, ★Enabled
Intel® Speed Step™	Allow 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

Feature	Description	Options
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

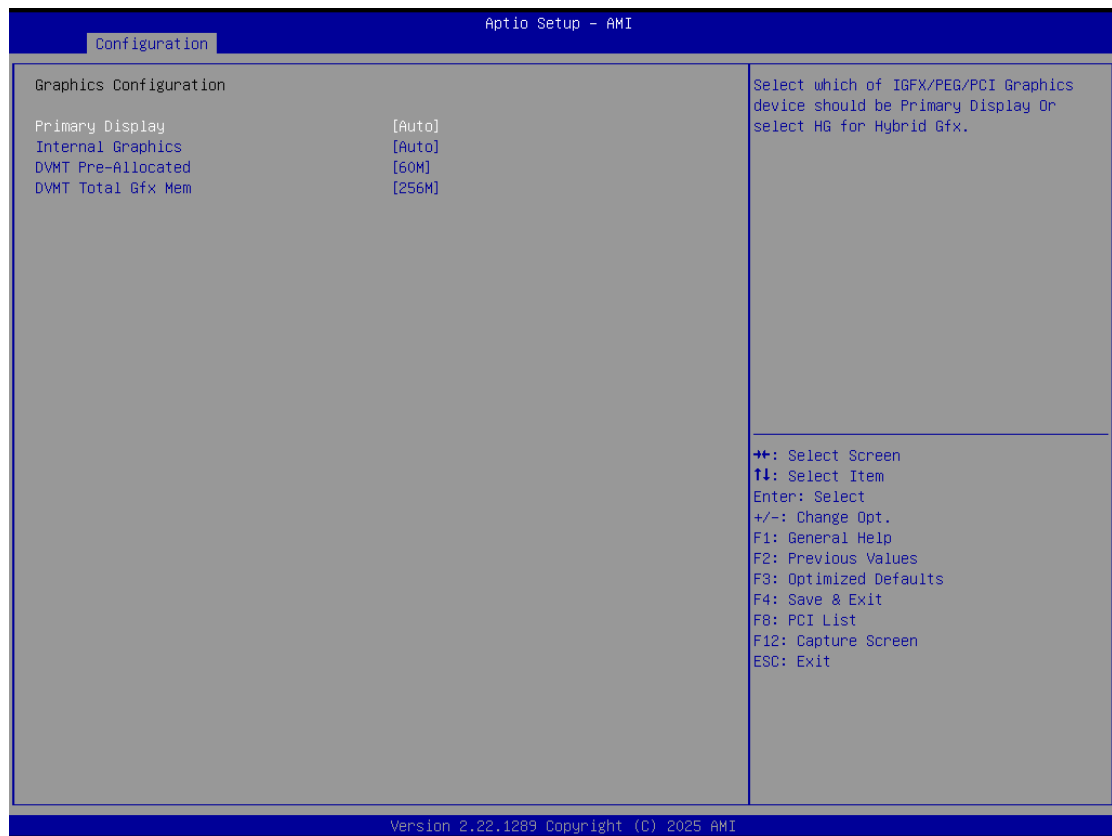
4.3.2 Chipset Configuration



Feature	Description	Options
LAN ByPass Control	LAN ByPass Control Enabled.	Disabled, ★Enabled
LAN A ByPass Mode - Next Boot	Next Boot ByPass Mode Config	★Normal Mode, Open Mode, ByPass Mode
LAN A ByPass Mode - Power Off	Power Off ByPass Mode Config.	★Normal Mode, Open Mode, ByPass Mode
LAN A ByPass Mode - WDT Trigger	WDT Trigger ByPass Mode Config.	★Normal Mode, Open Mode, ByPass Mode
LAN A ByPass Mode - WDT TimOut	WDT TimOut ByPass Mode Config.	★Normal Mode, Open Mode, ByPass Mode
VT-d	VT-d Capability	Disabled, ★Enabled

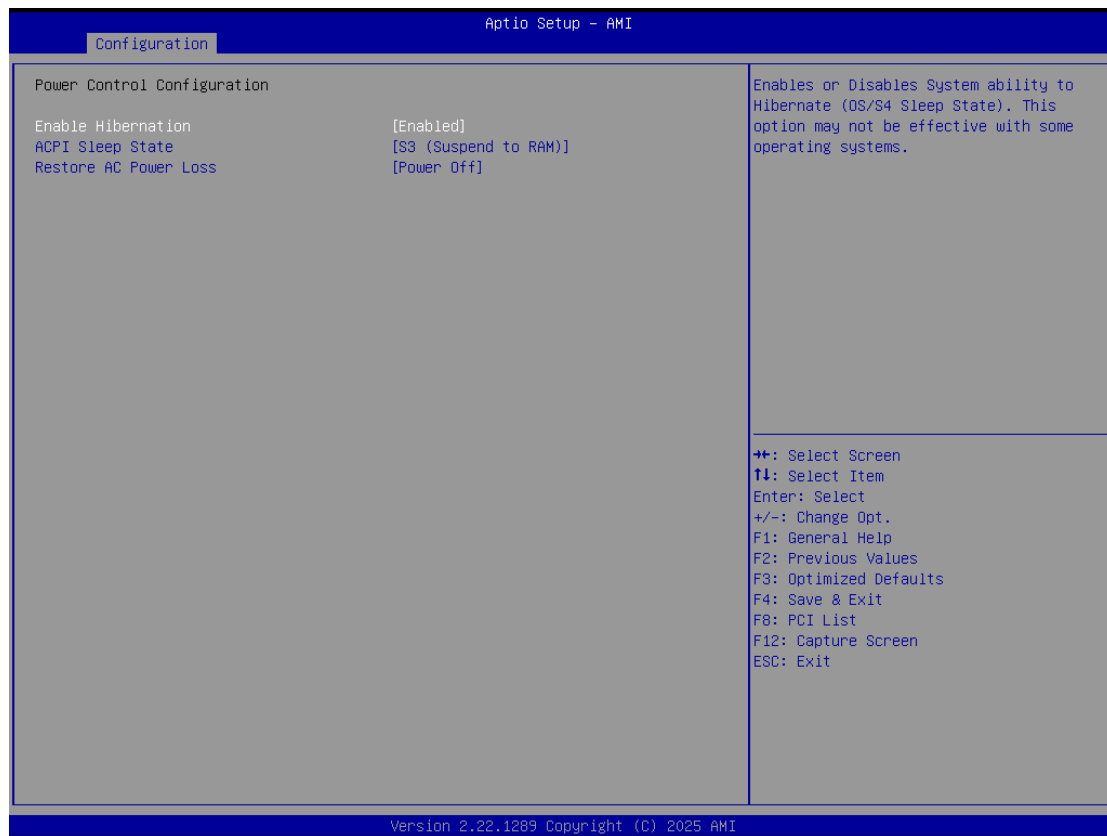
Feature	Description	Options
Above 4GB MMIO BIOS assignment	Enable/Disable above 4GB Memory Mapped IO BIOS assignment This is enabled automatically when	Disabled, ★Enabled
HD Audio	Control Detection of the HD-Audio device. Disabled = HDA unconditionally disabled Enabled = HDA unconditionally enabled	★Disabled, 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
eMMC 5.1 Controller	Enable or Disable SCS eMMC 5.1 Controller	Disabled, ★Enabled

4.3.3 Graphics Configuration



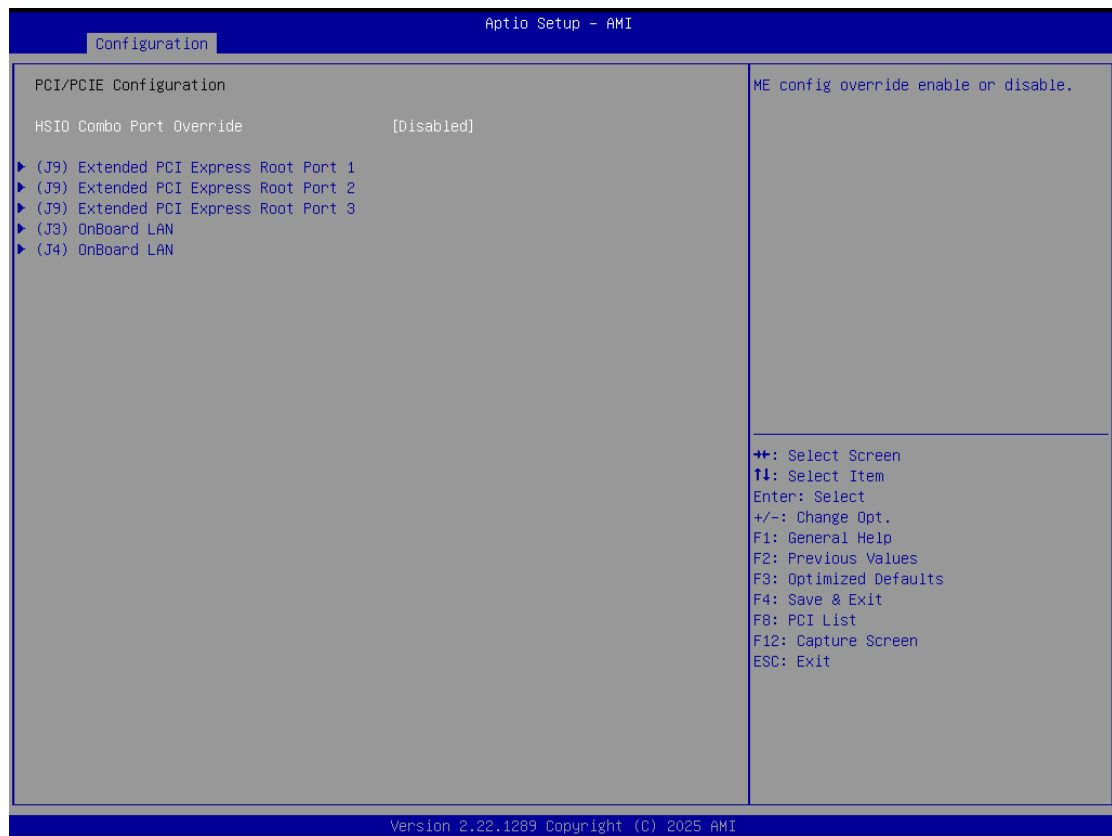
Feature	Description	Options
Primary Display	Select which of IGFX/PEG/PCI Graphics device should be Primary Display or Select HG for Hybrid Gfx.	★Auto, IGFX, PEG Slot, PCH PCI
Internal Graphics	Keep IGFX enable based on the setup options.	★Auto, Disabled, Enabled
DMT Pre-Allocated	Select DMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.	★60M, 32M, 64M, 96M, 128M, 160M, 12M, 16M, 20M, 24M, 28M, 32M/F7, 36M, 40M, 44M, 48M, 52M, 56M,
DMT Total Gfx Mem	Select DMT5.0 Total Graphic Memory size used by the Internal Graphics Device	★256M, 128M, MAX

4.3.4 Power control Configuration



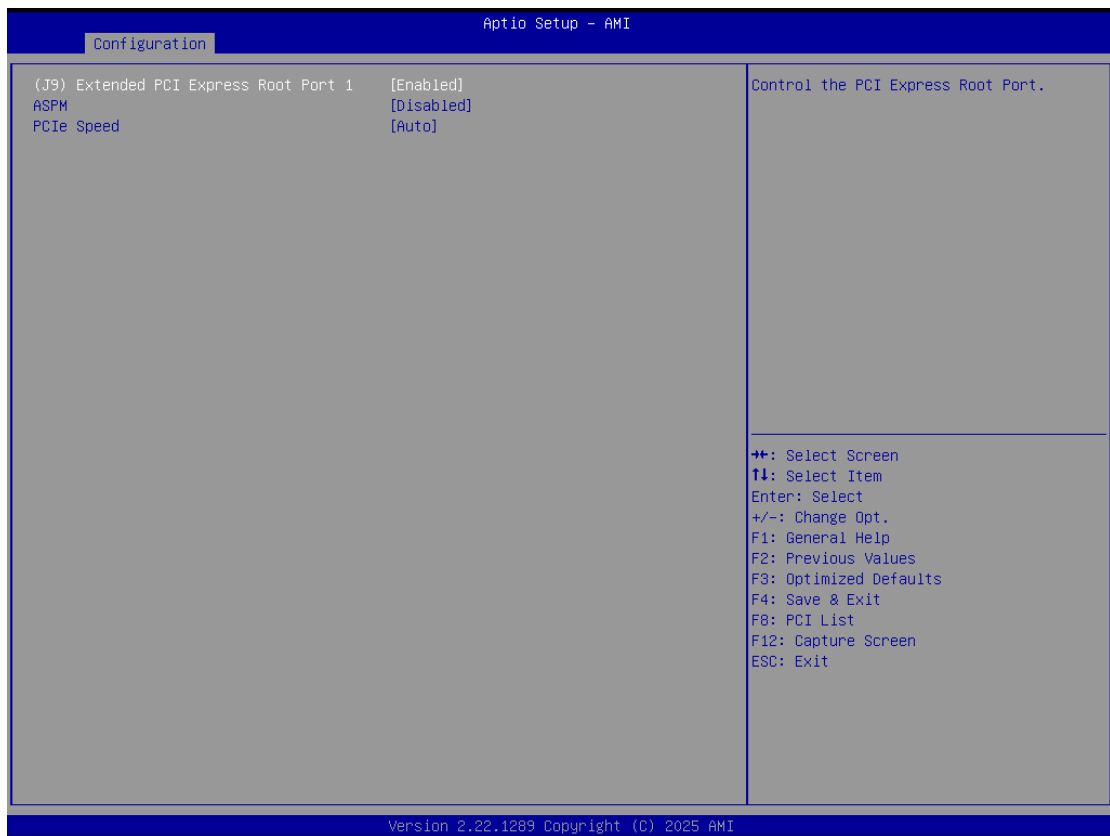
Feature	Description	Options
Enable Hibernation	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.	★Enabled, Disabled
ACPI Sleep State	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.	★S3 (Suspend to RAM), Suspend Disabled
Restore AC Power Loss	Specify what state to go to when power is re-applied after a power failure (G3 state)	★Power Off, Power On, Last State

4.3.5 PCI/PCIE Configuration



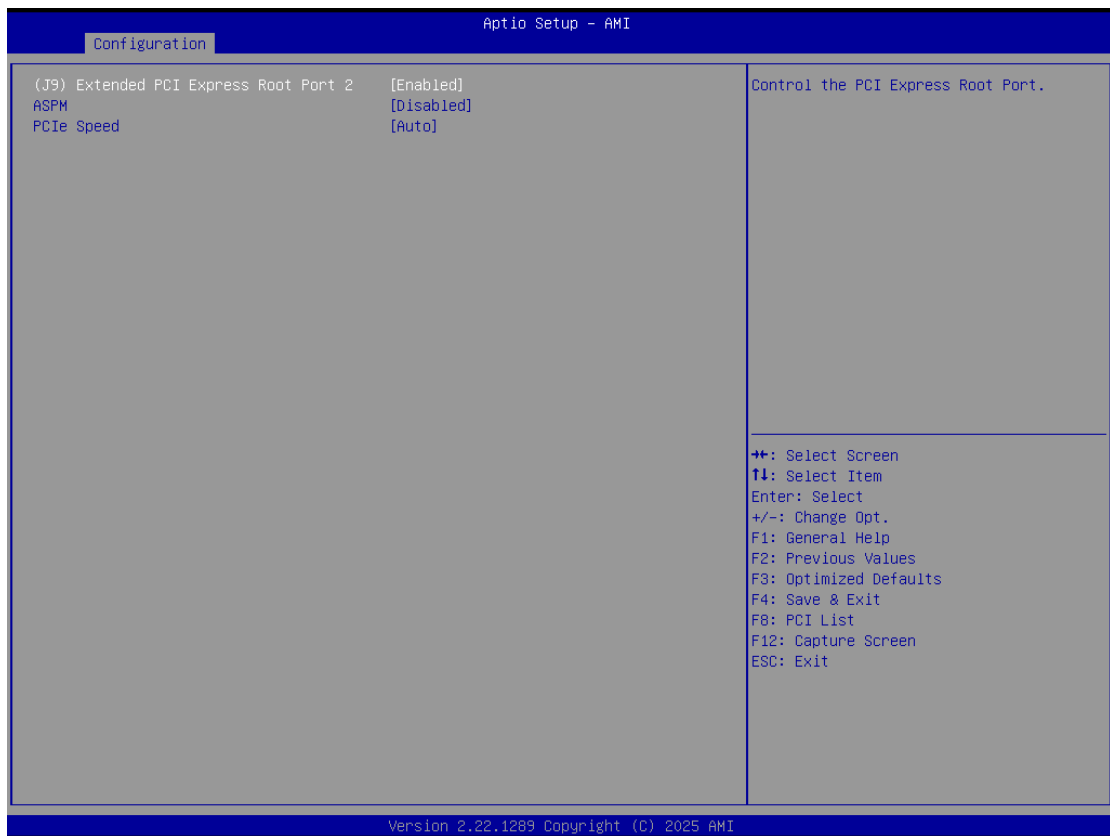
Feature	Description	Options
HSIO Combo Port Override	ME config override enable or disable.	★Disabled, Enabled
HSIO Combo Port Override [Enabled]		
(J9) Extended IO PCIe 1/2 Bifurcation	Control PCH PCIe lane width.	2x1, ★1x2
(J9) Extended IO 2 Type	Control USB/PCIe combo port.	USB, ★PCIe
(J9) Extended IO 3 Type	Control USB/PCIe combo port.	USB, ★PCIe

(J9) Extended PCI Express Root Port 1



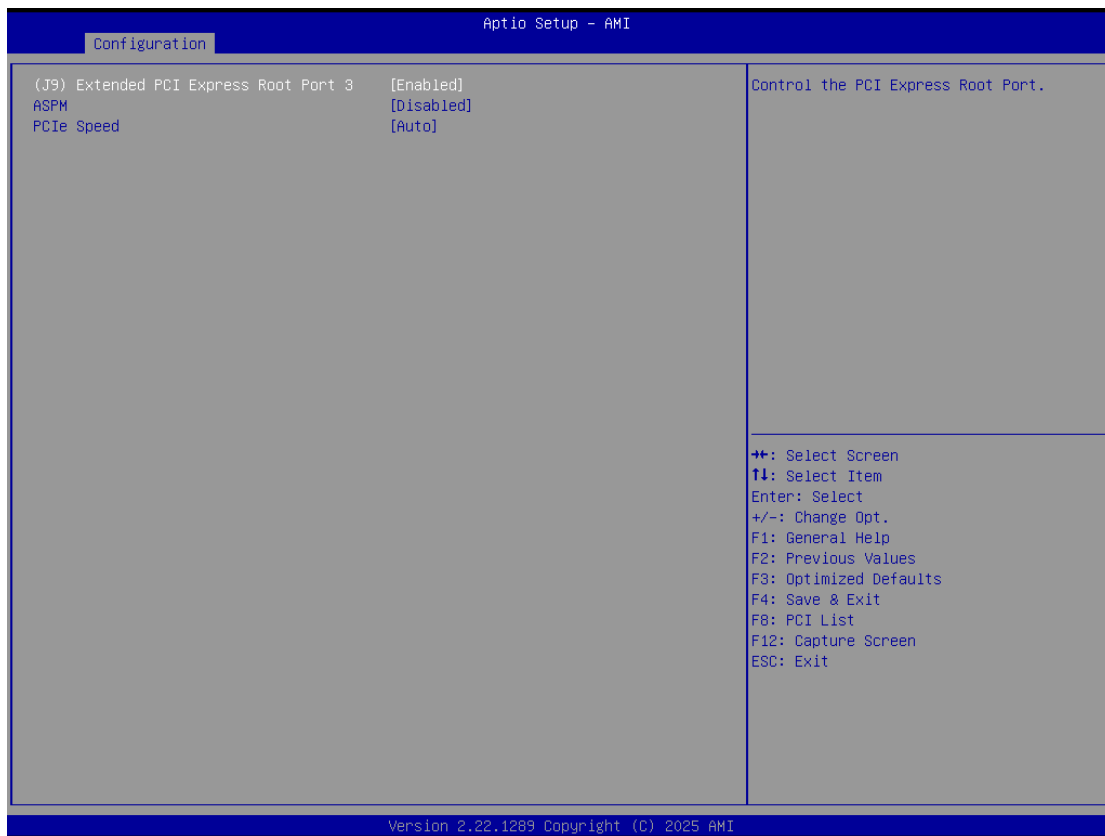
Feature	Description	Options
(J9) Extended PCI Express Root Port 1	Control the PCI Express Root Port.	Disabled, ★Enabled
ASPM	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO - BIOS auto configure DISABLE – Disables ASPM	★Disabled, L1, Auto
PCIe Speed	Configure PCIe Speed	★Auto, Gen1, Gen2, Gen3

(J9) Extended PCI Express Root Port 2



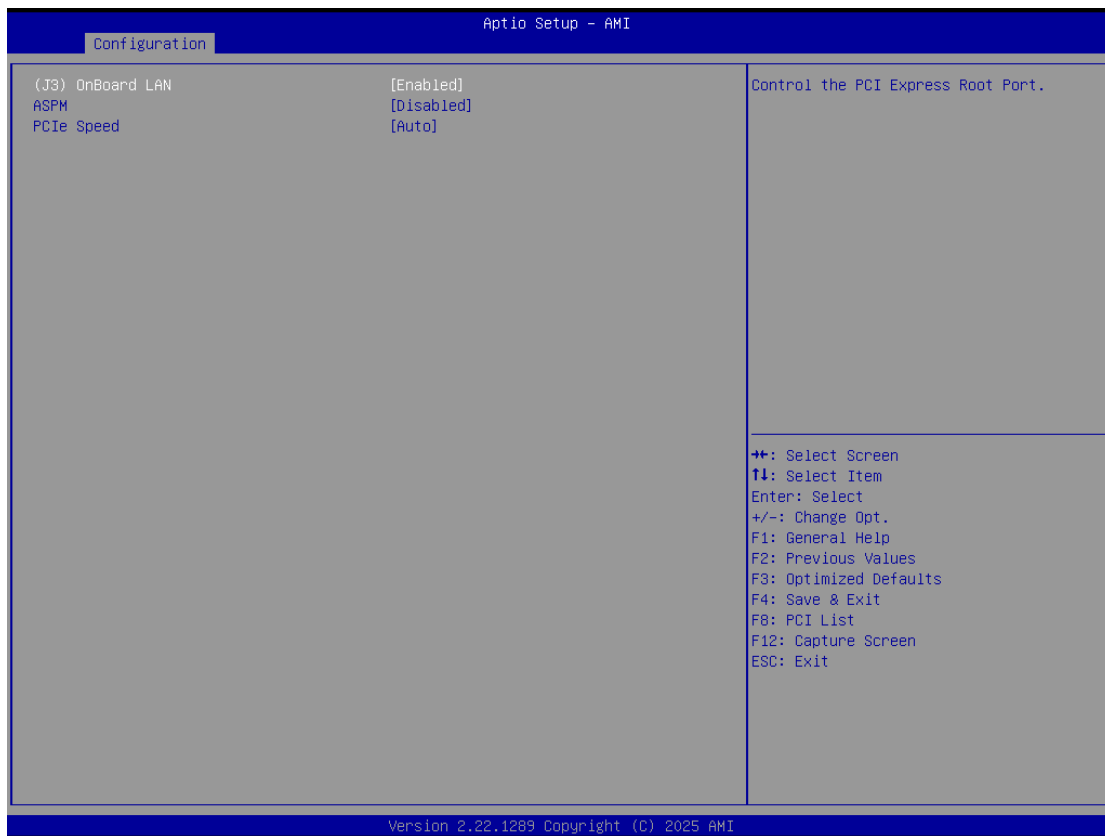
Feature	Description	Options
(J9) Extended PCI Express Root Port 2	Control the PCI Express Root Port.	Disabled, ★Enabled
ASPM	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO - BIOS auto configure DISABLE – Disables ASPM	★Disabled, L1, Auto
PCIe Speed	Configure PCIe Speed	★Auto, Gen1, Gen2, Gen3

(J9) Extended PCI Express Root Port 3



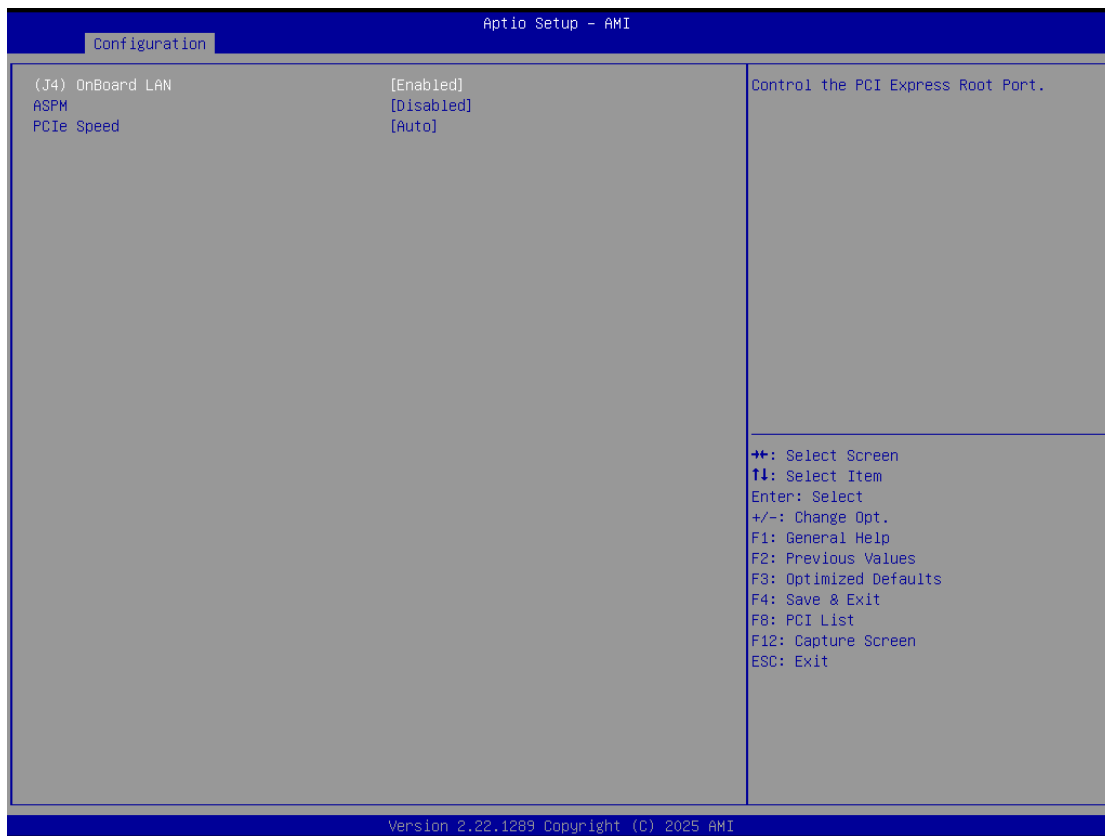
Feature	Description	Options
(J9) Extended PCI Express Root Port 3	Control the PCI Express Root Port.	Disabled, ★Enabled
ASPM	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO - BIOS auto configure DISABLE – Disables ASPM	★Disabled, L1, Auto
PCIe Speed	Configure PCIe Speed	★Auto, Gen1, Gen2, Gen3

(J3) OnBoard LAN



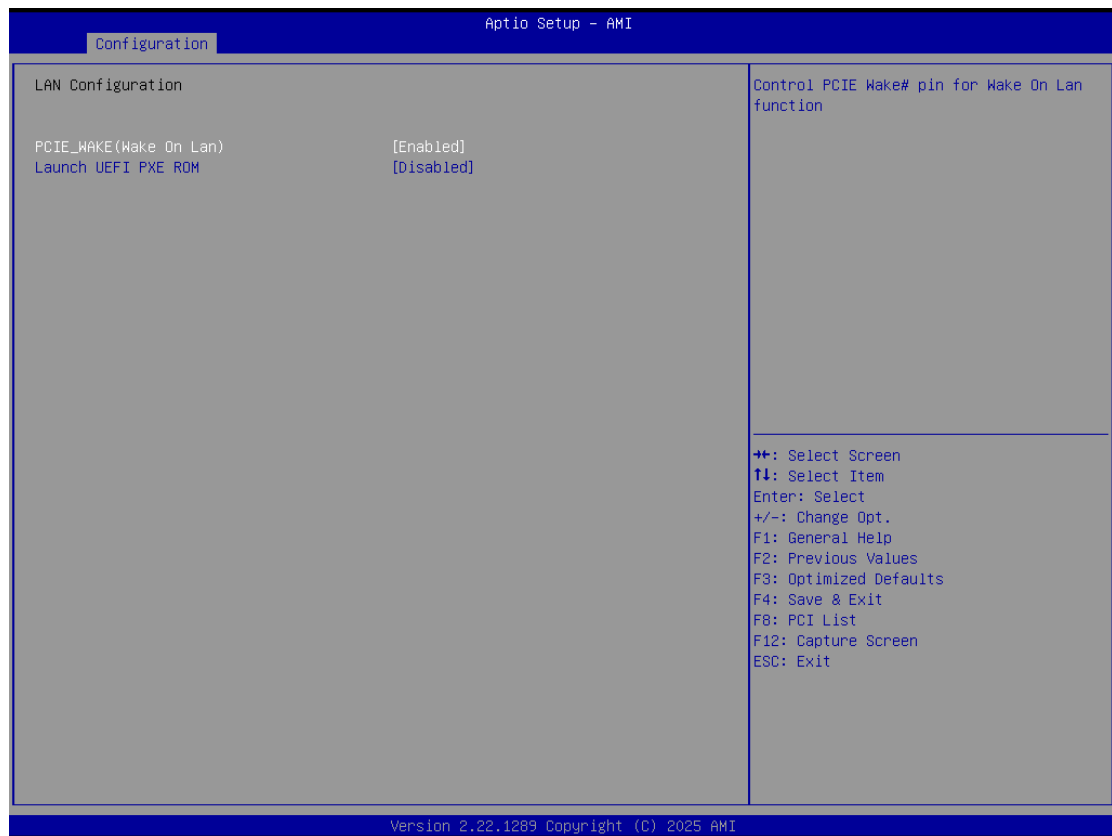
Feature	Description	Options
(J3) OnBoard LAN	Control the PCI Express Root Port.	Disabled, ★Enabled
ASPM	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO - BIOS auto configure DISABLE – Disables ASPM	★Disabled, L1, Auto
PCIe Speed	Configure PCIe Speed	★Auto, Gen1, Gen2, Gen3

(J4) OnBoard LAN



Feature	Description	Options
(J4) OnBoard LAN	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

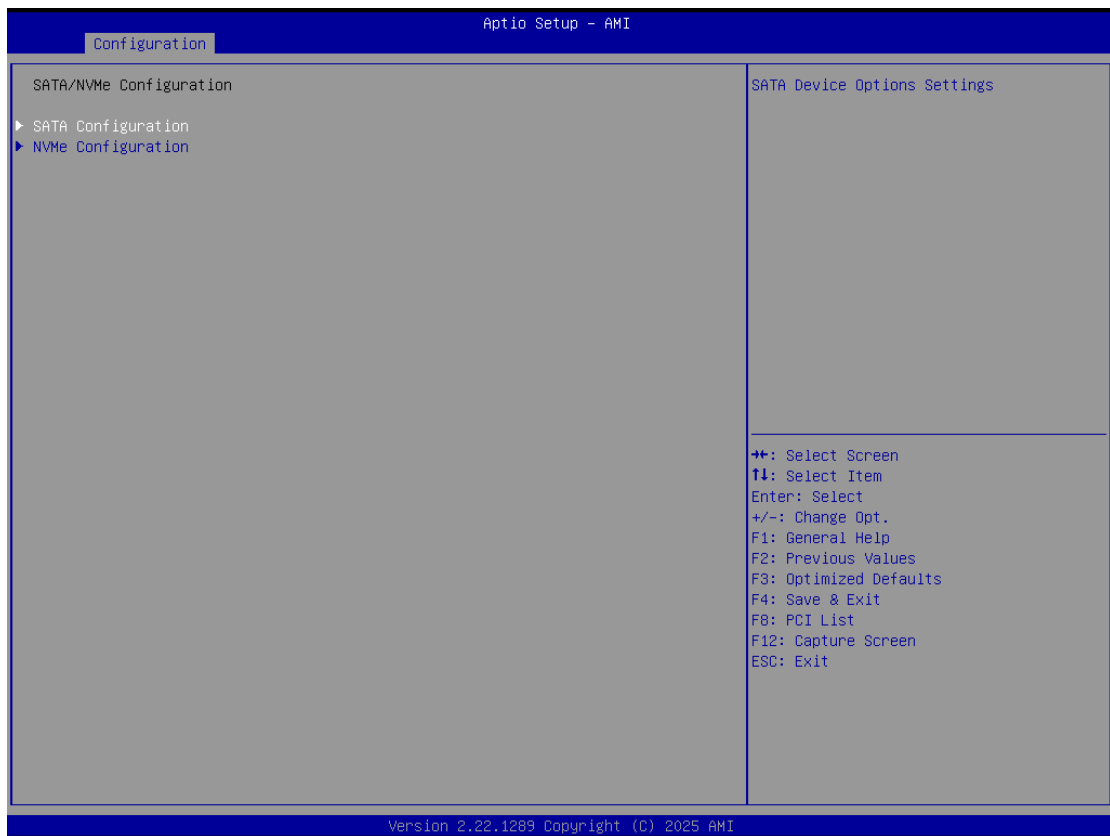
4.3.6 LAN Configuration



Feature	Description	Options
PCIE_WAKE (Wake on Lan)	Control PCIE Wake# pin for wake on Lan function.	Disabled, ★Enabled
Launch UEFI PXE ROM	Enable/Disable UEFI Network Stack	★Disabled, Enabled
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

Feature	Description	Options
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

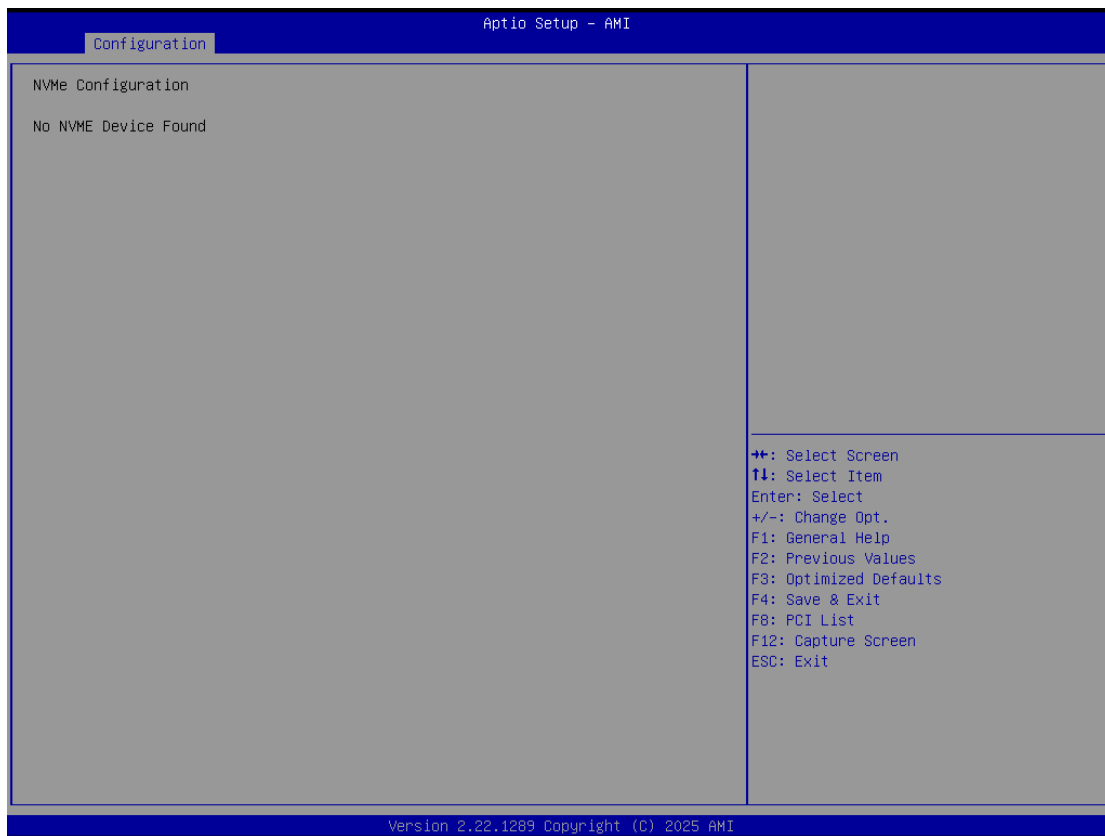


4.3.7.1 SATA Configuration

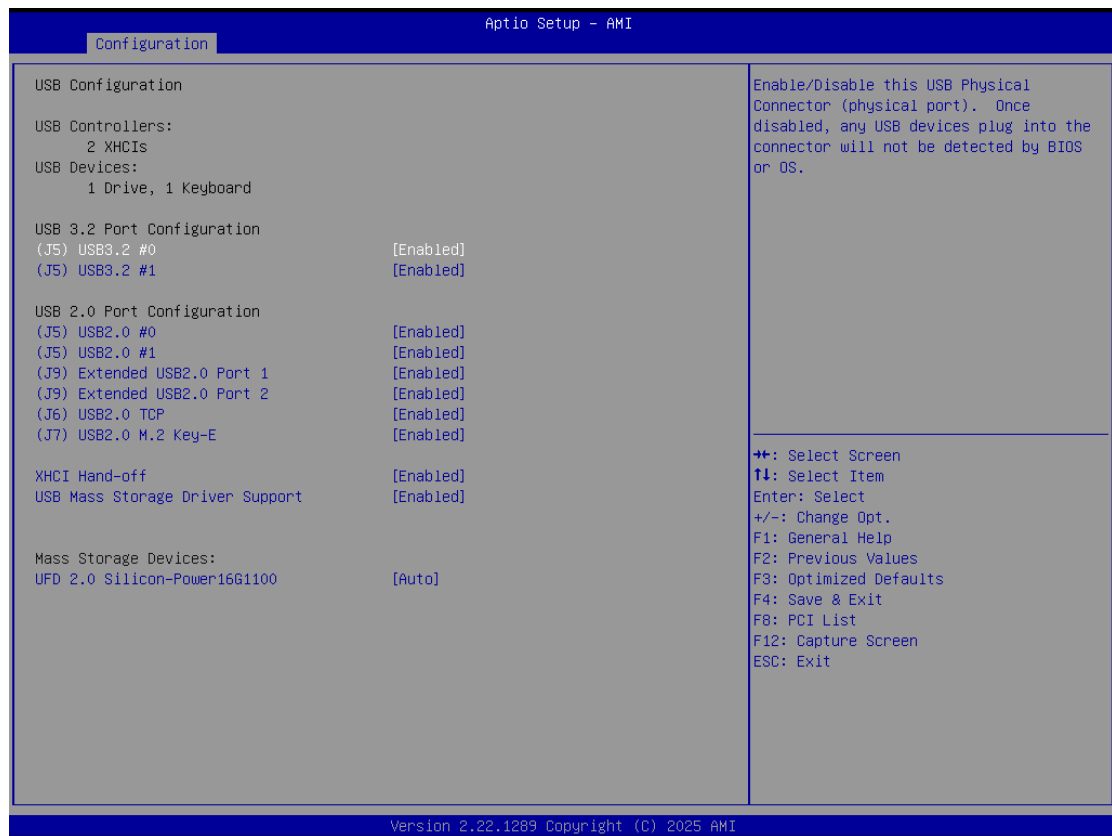


Feature	Description	Options
SATA Controller(s)	Enable/Disable SATA Device	Disabled, ★Enabled
Enabled VDM controller (RAID mode)	Enable/Disable to VDM controller	★Disabled, Enabled
(J28) Serial ATA Port 0		
Port 0	Enabled or Disabled SATA Port	Disabled, ★Enabled
Hot plug	Designates this port as Hot pluggable.	★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

4.3.7.2 NVMe Configuration



4.3.8 USB Configuration

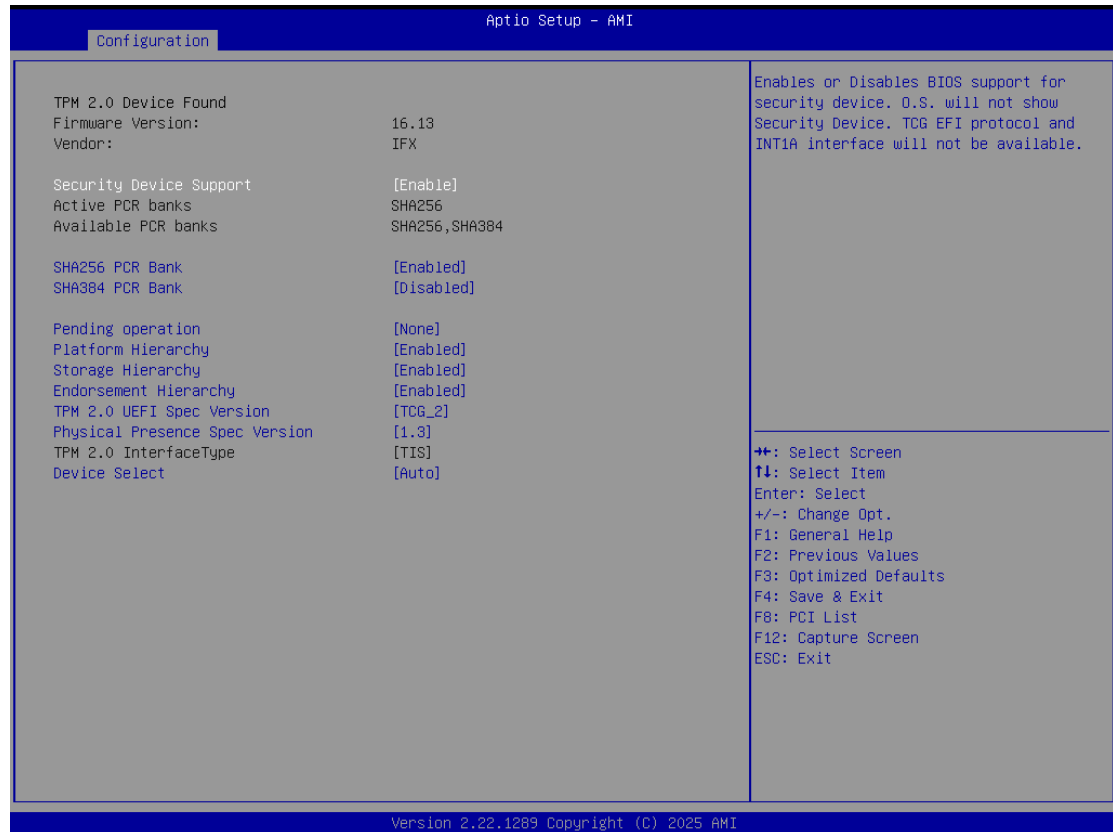


Feature	Description	Options
USB 3.2 Port Configuration		
(J5) USB3.2 #0	Enable/Disable this USB Physical connector (Physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.	Disabled, ★Enabled
(J5) USB3.2 #1	Enable/Disable this USB Physical connector (Physical port). Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.	Disabled, ★Enabled

Feature	Description	Options
USB 2.0 Port Configuration		
(J5) USB2.0 #0	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
(J5) USB2.0 #1	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
(J9) Extended USB2.0 Port 1	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
(J9) Extended USB2.0 Port 2	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
(J6) USB2.0 TCP	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
(J7) USB2.0 M.2 Key-E	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	Disabled, ★Enabled
USB Mass Storage Driver Support	Enable/Disable USB Mass Storage Driver Support	Disabled, ★Enabled

4.3.9 TPM Configuration:

TPM 2.0 Device Found

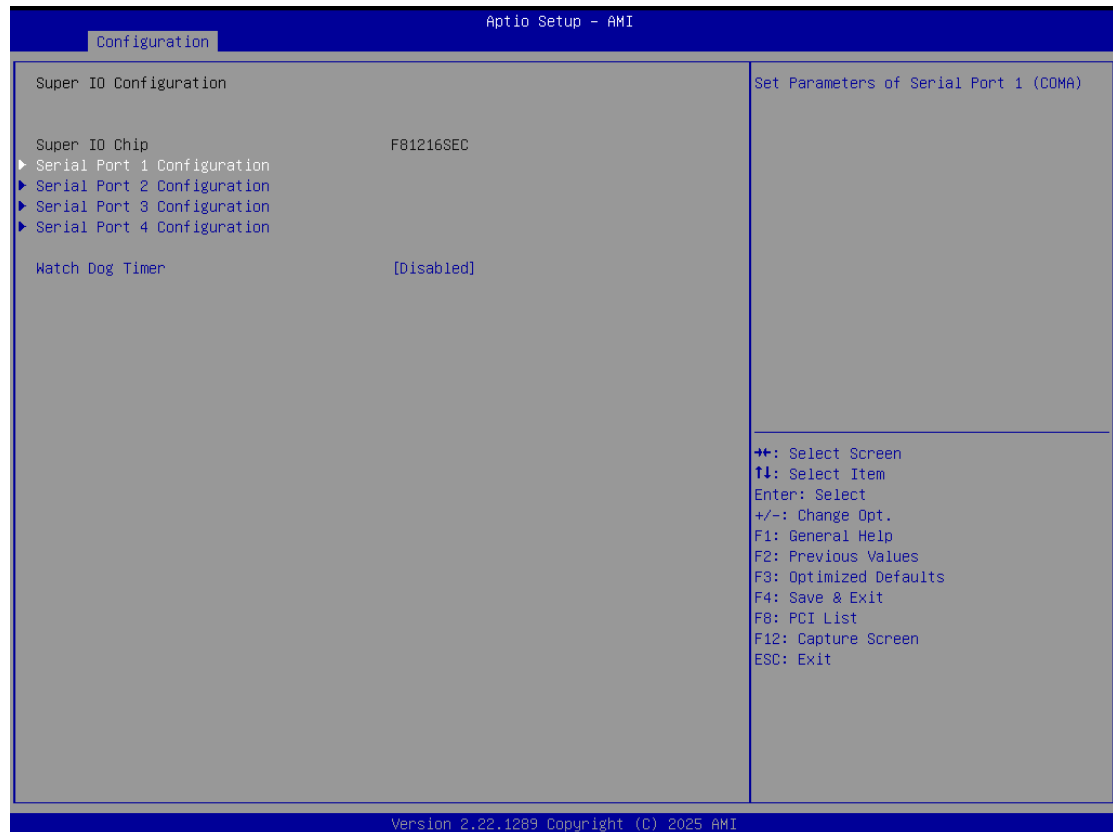


Feature	Description	Options
Security Device Support	Enables or Disables BIOS support for security devices. O.S. will not show Security Device. TCG EFI protocol and INT1A Interface will not be available.	Disabled, ★Enabled
SHA256 PCR Bank	Enables or Disables SHA256 PCR Bank.	Disabled, ★Enabled
SHA384 PCR Bank	Enables or Disables SHA384 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

Feature	Description	Options
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.	★Auto, TPM 1.2, TPM 2.0

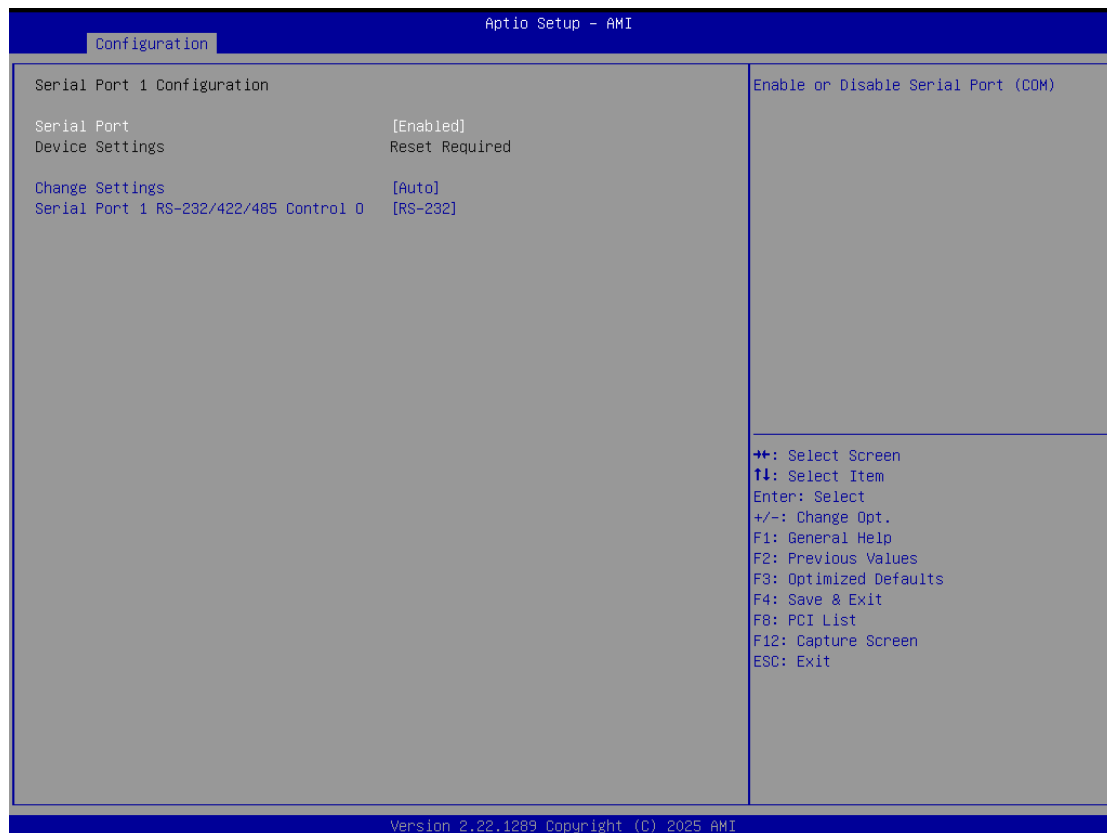
4.3.10 Super IO Configuration

**4.3.10 is applicable only to double-layer models of the LYNX-8000 series.



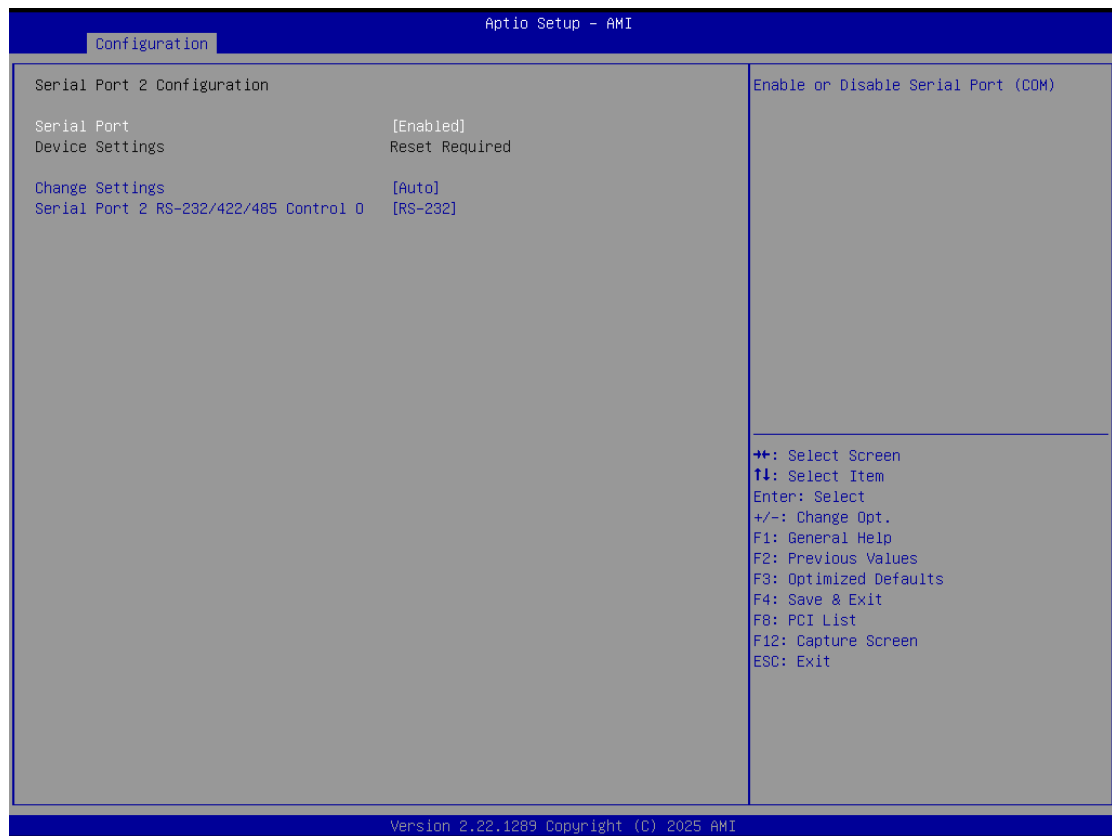
Feature	Description	Options
Watch Dog Timer	Enable/Disable Watch Dog Timer	★Disabled, Enabled
Watch Dog Timer [Enabled]		
Timer Unit	Select Timer count unit of WDT	★Second, Minute
Timer value	Set WDT Timer value seconds / minutes	★20

Serial Port 1 Configuration



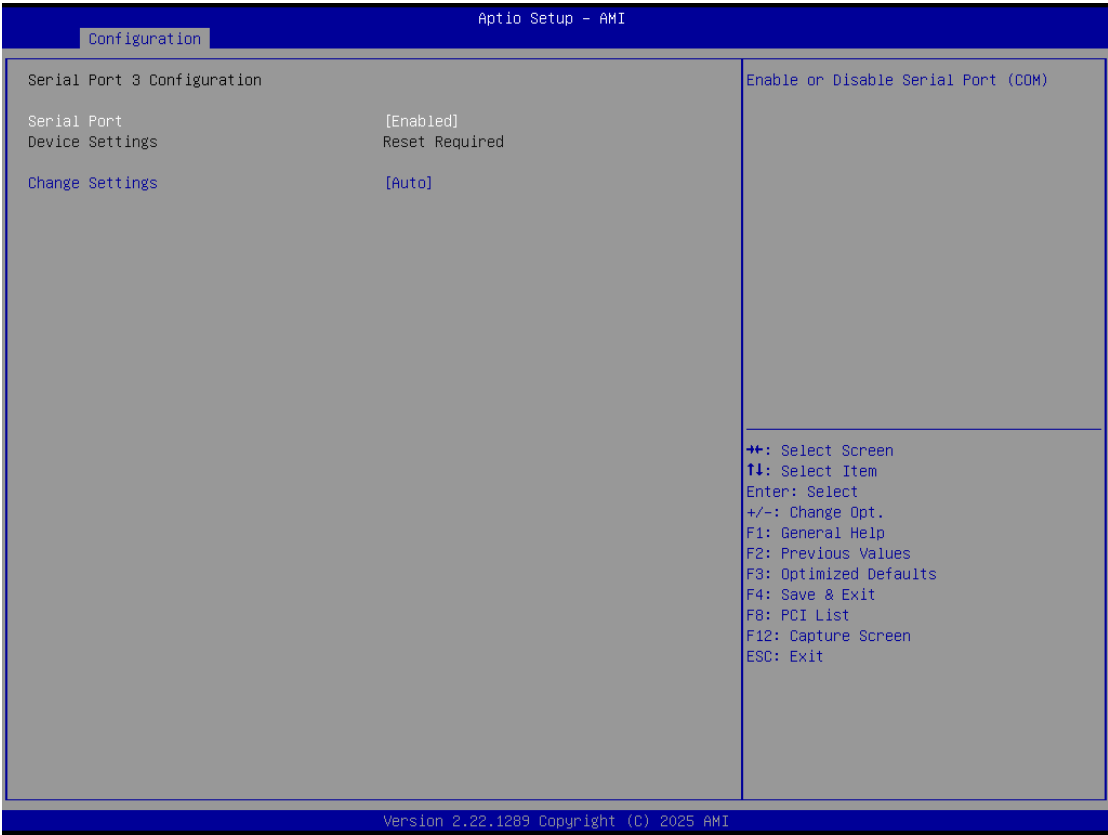
Feature	Description	Options
Serial Port	Enable or Disable Serial Port (COM)	Disabled, ★Enabled
Change Settings	Select an optimal setting for Super IO Device.	★Auto IO=3F8h; IRQ=4 IO=3F8h; IRQ=3,4,10,11 IO=2F8h; IRQ=3,4,10,11 IO=3E8h; IRQ=3,4,10,11 IO=2E8h; IRQ=3,4,10,11,
Serial Port 1 RS-232/422/485 Control Option	Serial Port 1 RS-232/422/485 Control Option	★RS-232, RS-485 HALF DUPLEX, RS-422 FULL DUPLEX,

Serial Port 2 Configuration



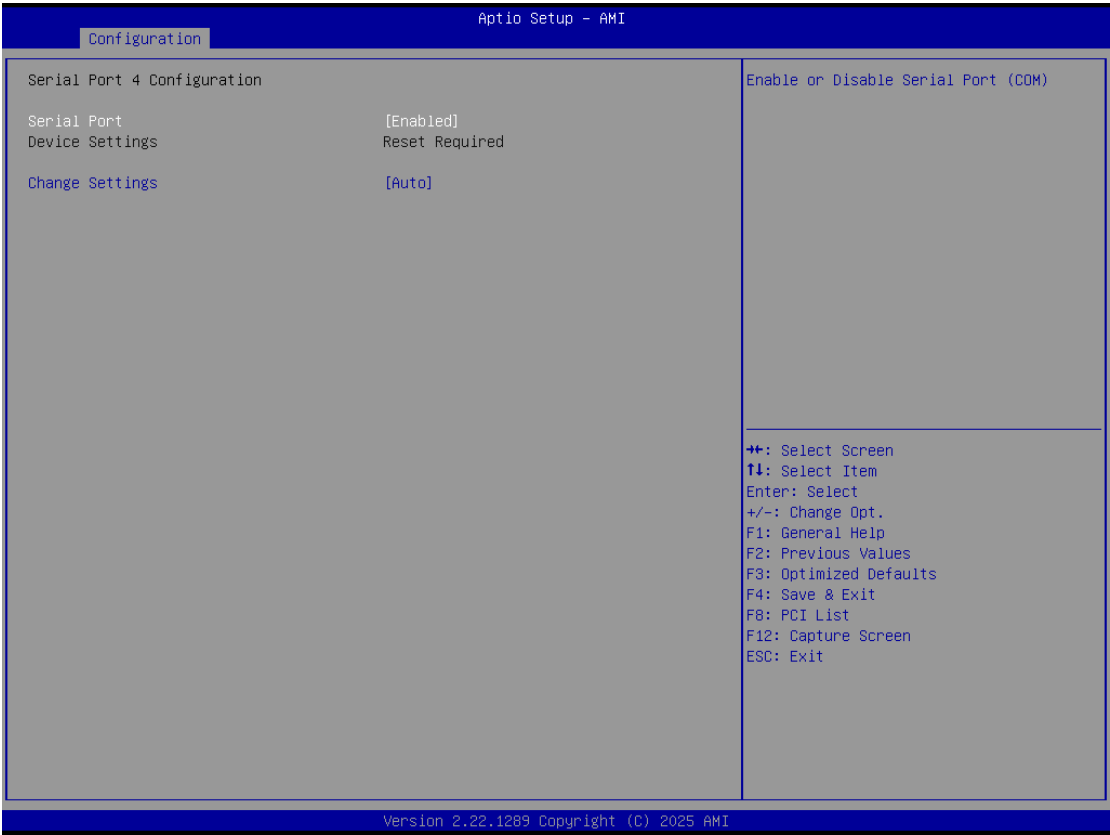
Feature	Description	Options
Serial Port	Enable or Disable Serial Port (COM)	Disabled, ★Enabled
Change Settings	Select an optimal setting for Super IO Device.	★Auto IO=3F8h; IRQ=4 IO=3F8h; IRQ=3,4,10,11 IO=2F8h; IRQ=3,4,10,11 IO=3E8h; IRQ=3,4,10,11 IO=2E8h; IRQ=3,4,10,11,
Serial Port 2 RS-232/422/485 Control Option	Serial Port 1 RS-232/422/485 Control Option	★RS-232, RS-485 HALF DUPLEX, RS-422 FULL DUPLEX,

Serial Port 3 Configuration



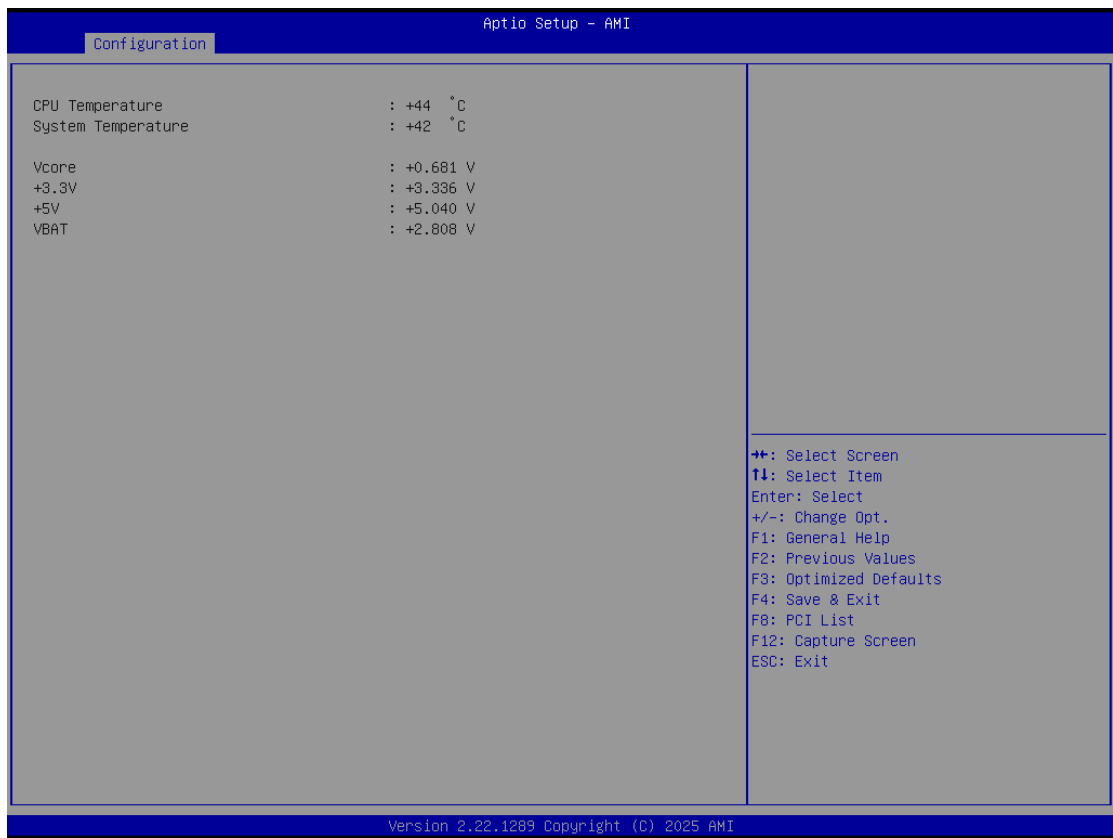
Feature	Description	Options
Serial Port	Enable or Disable Serial Port (COM)	Disabled, ★Enabled
Change Settings	Select an optimal setting for Super IO Device.	★Auto IO=3F8h; IRQ=4 IO=3F8h; IRQ=3,4,10,11 IO=2F8h; IRQ=3,4,10,11 IO=3E8h; IRQ=3,4,10,11 IO=2E8h; IRQ=3,4,10,11,

Serial Port 4 Configuration

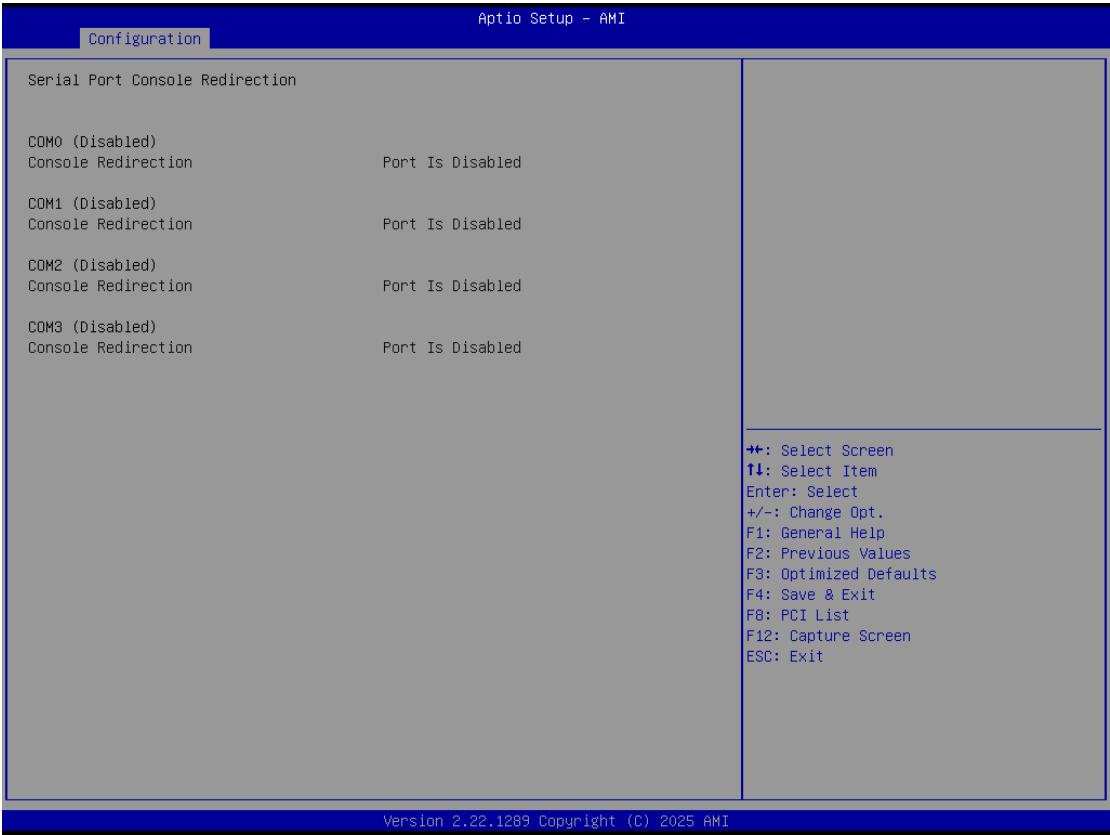


Feature	Description	Options
Serial Port	Enable or Disable Serial Port (COM)	Disabled, ★Enabled
Change Settings	Select an optimal setting for Super IO Device.	★Auto IO=3F8h; IRQ=4 IO=3F8h; IRQ=3,4,10,11 IO=2F8h; IRQ=3,4,10,11 IO=3E8h; IRQ=3,4,10,11 IO=2E8h; IRQ=3,4,10,11,

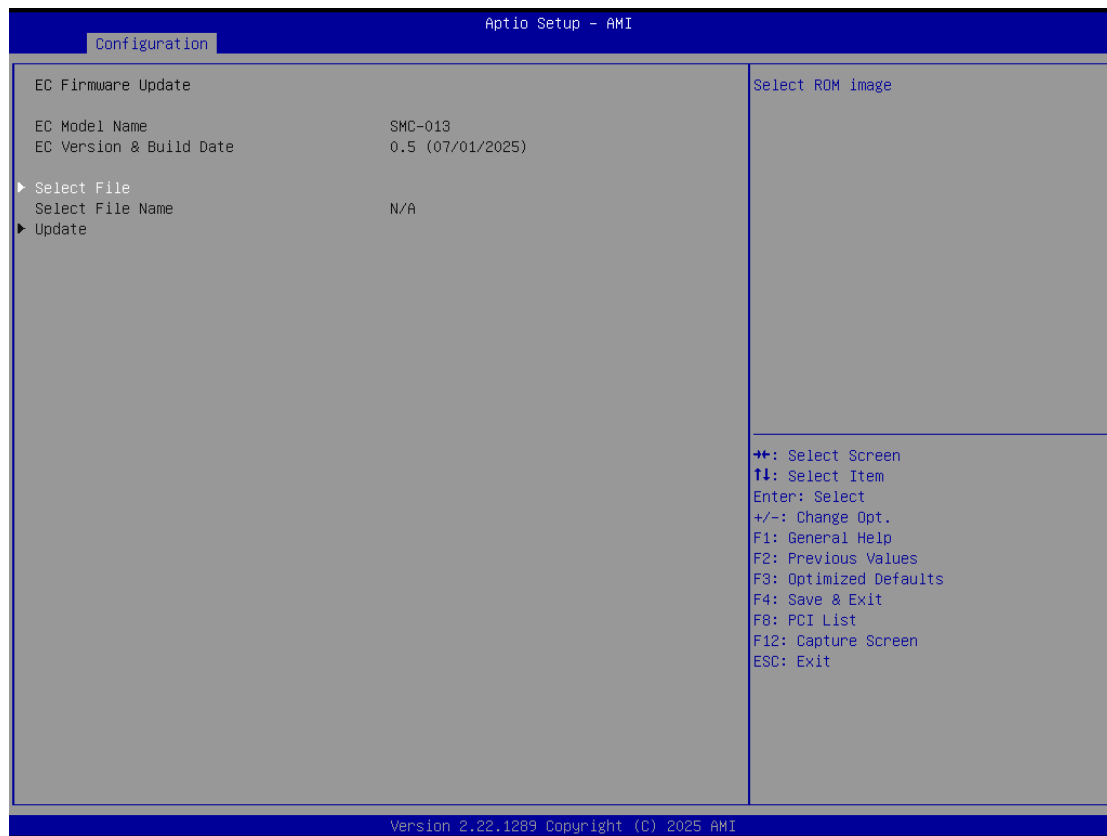
4.3.11 HW monitor



4.3.12 Serial Port Console Redirection

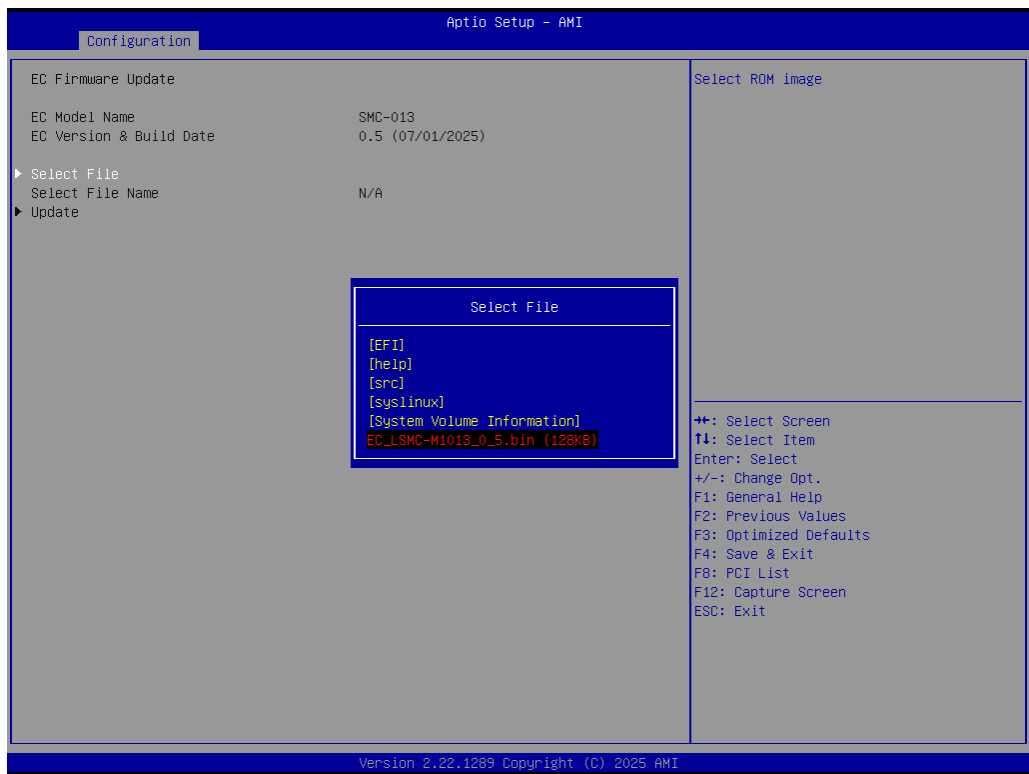


4.3.13 EC Firmware Update

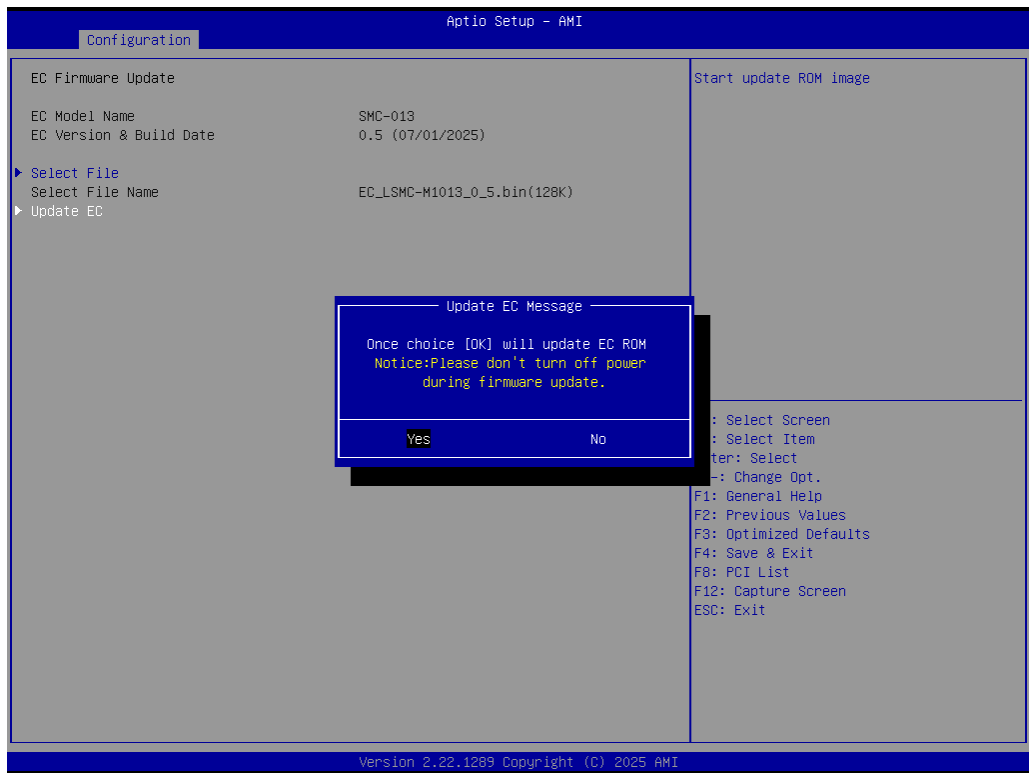


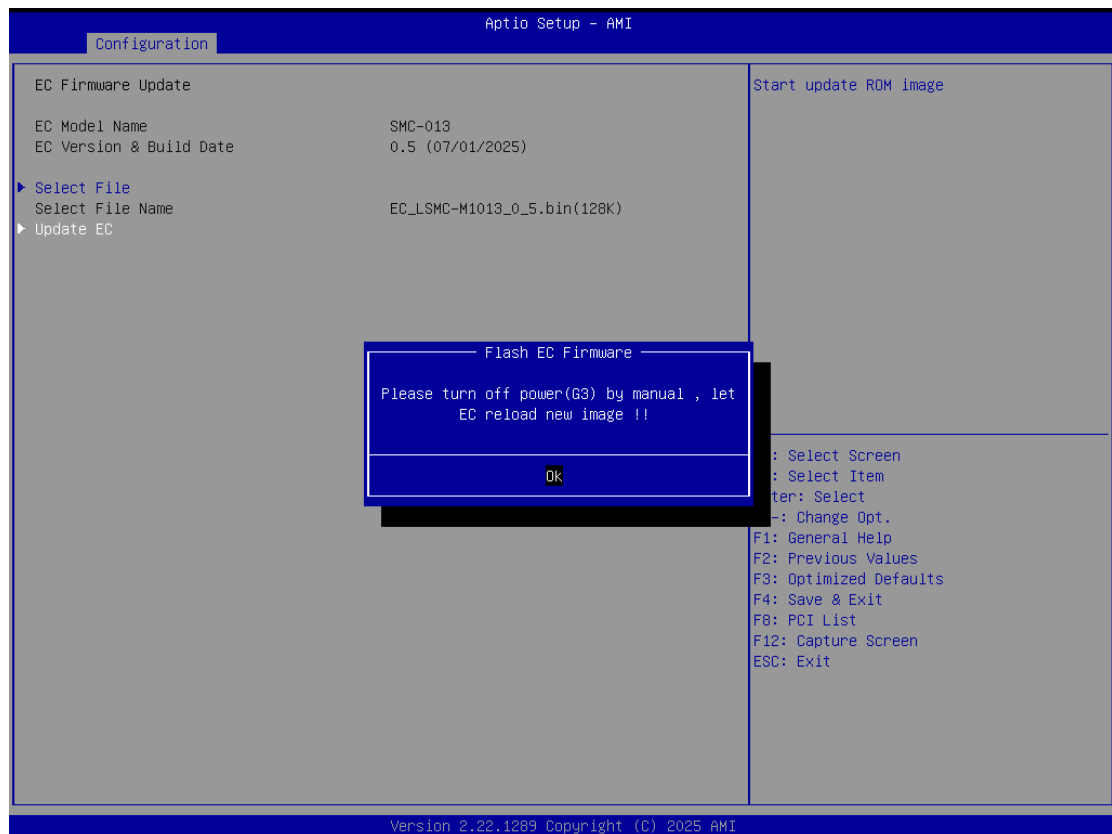
Feature	Description	Options
Select File	Select BIOS BIN file in (USB) drive to update	
Update	Start updating ROM image	

Select file



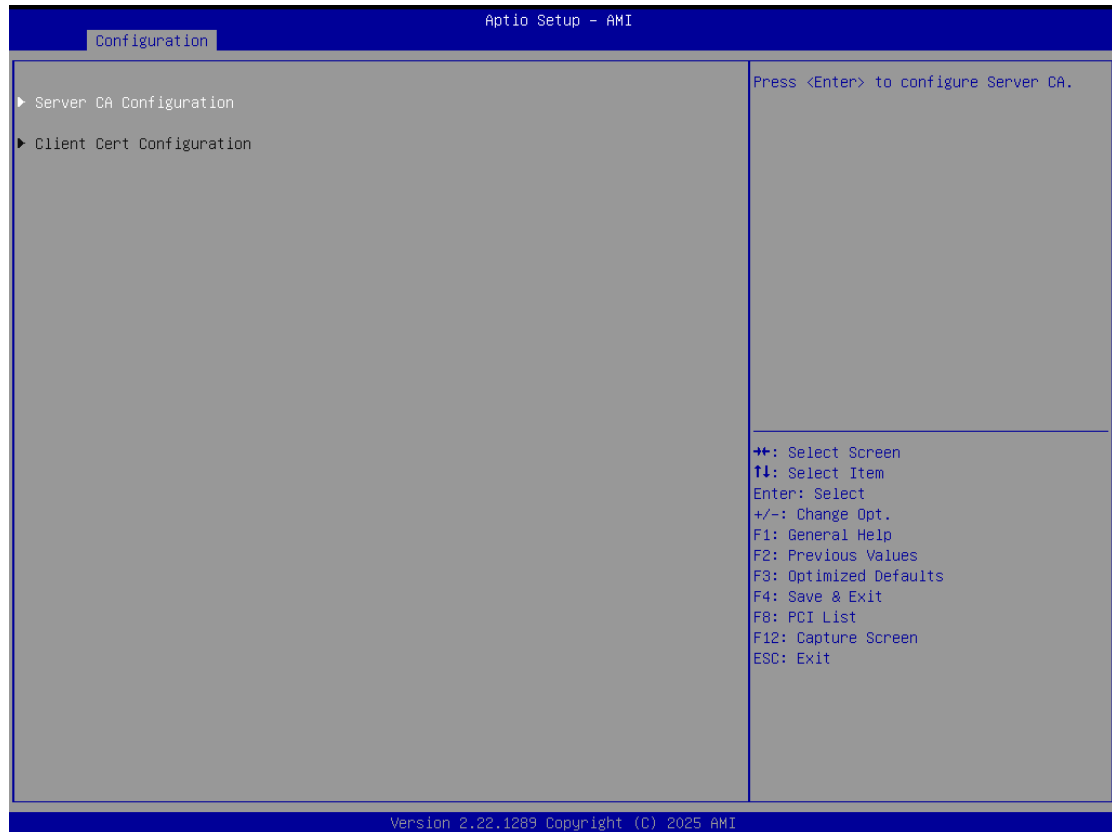
Update EC





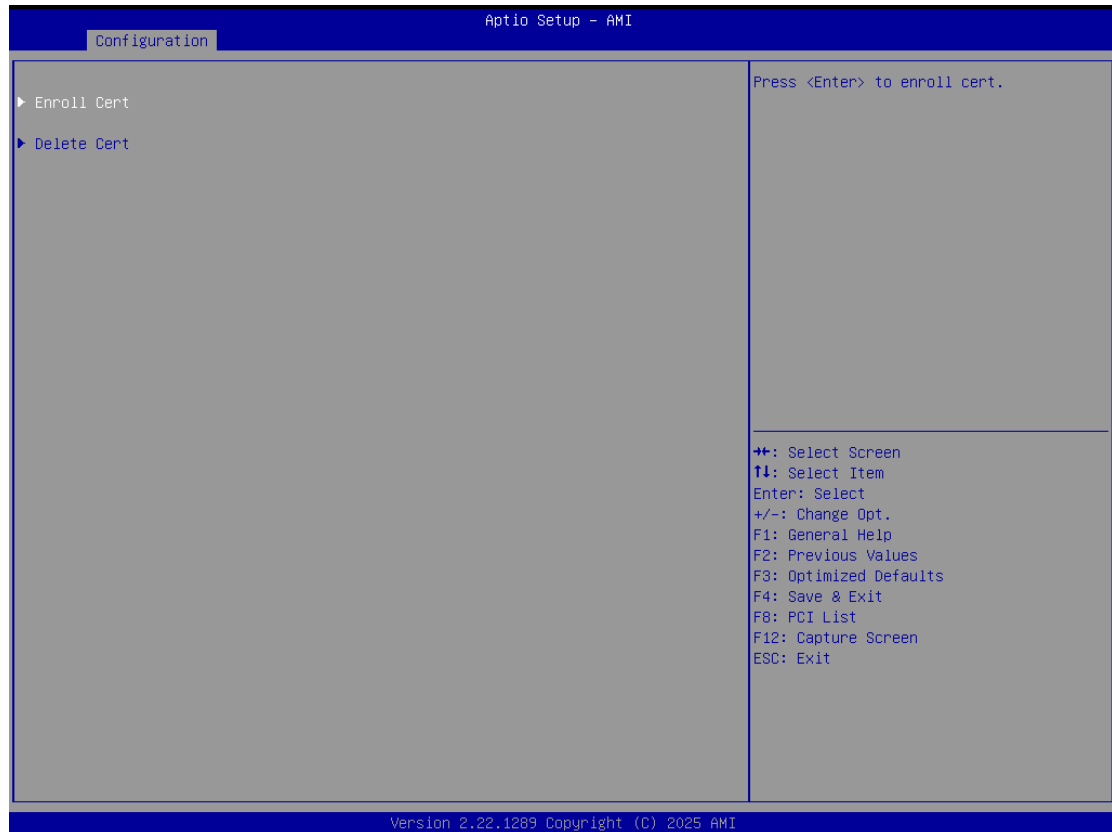
4.3.14 Server CA Configuration

Press <Enter> to configure Server CA.



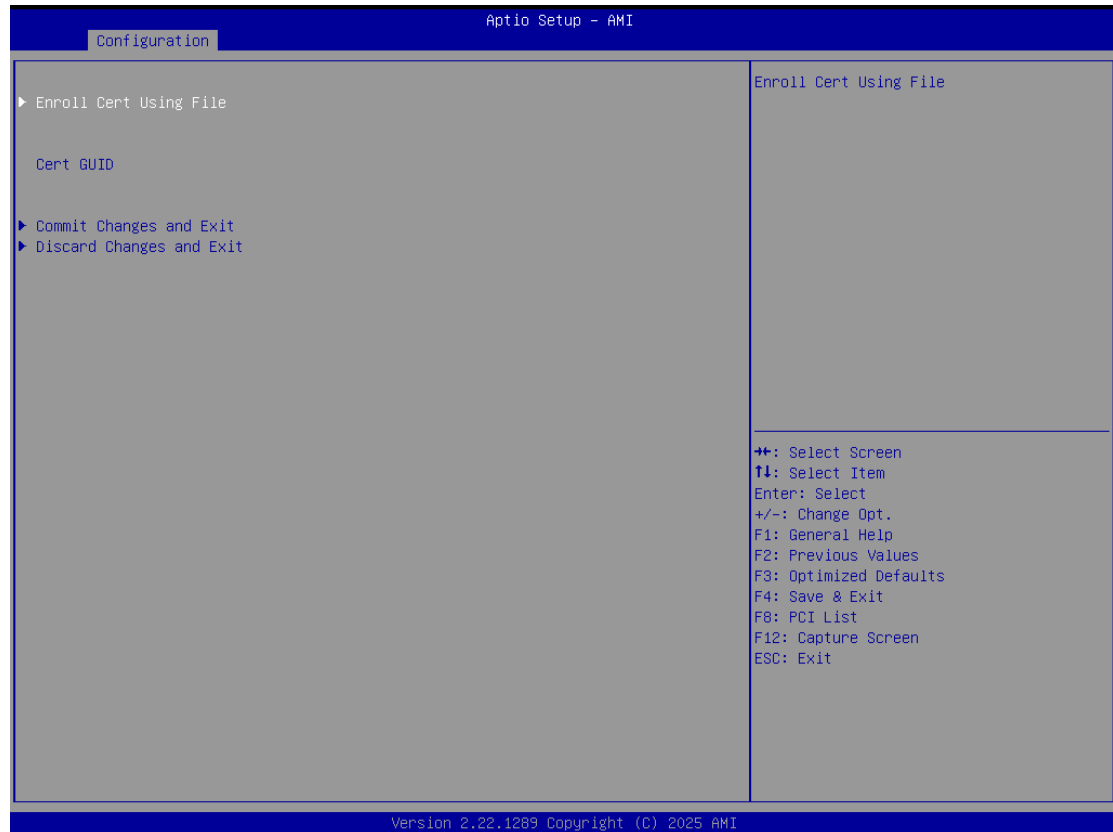
Enroll Cert

Press <Enter> to enroll cert.

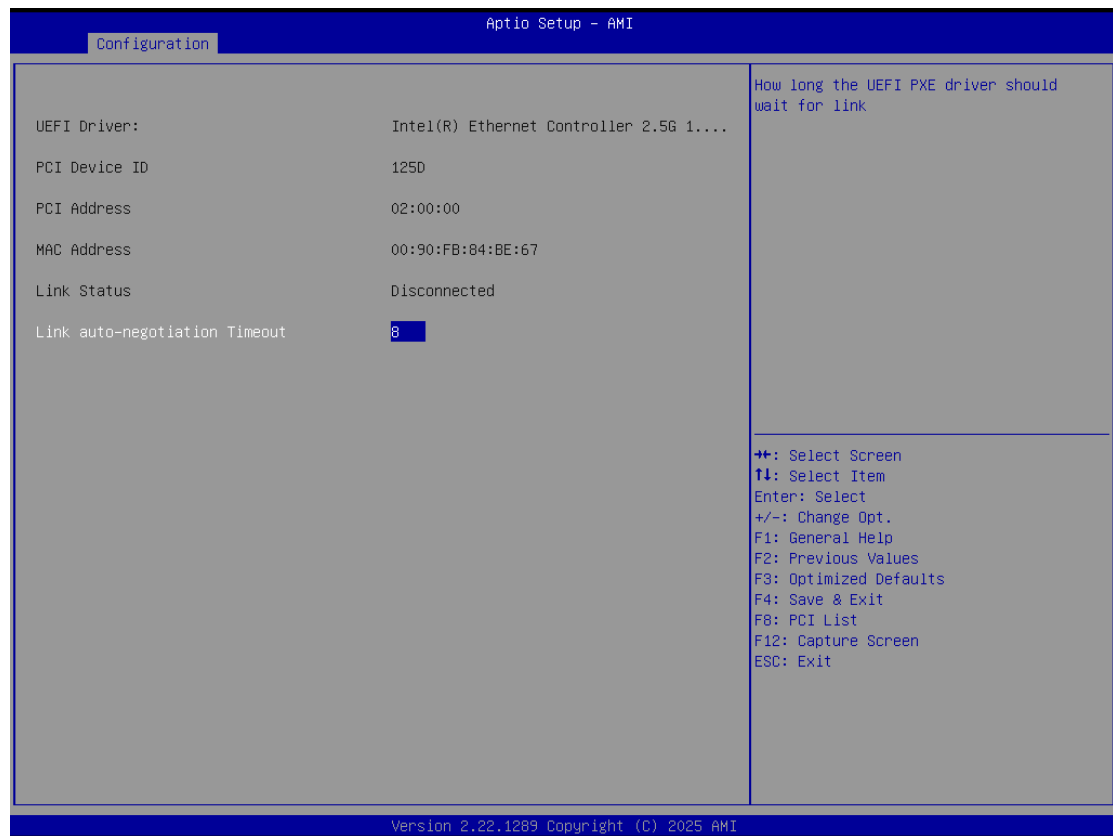


Enroll Cert Using File

Enroll Cert Using File.

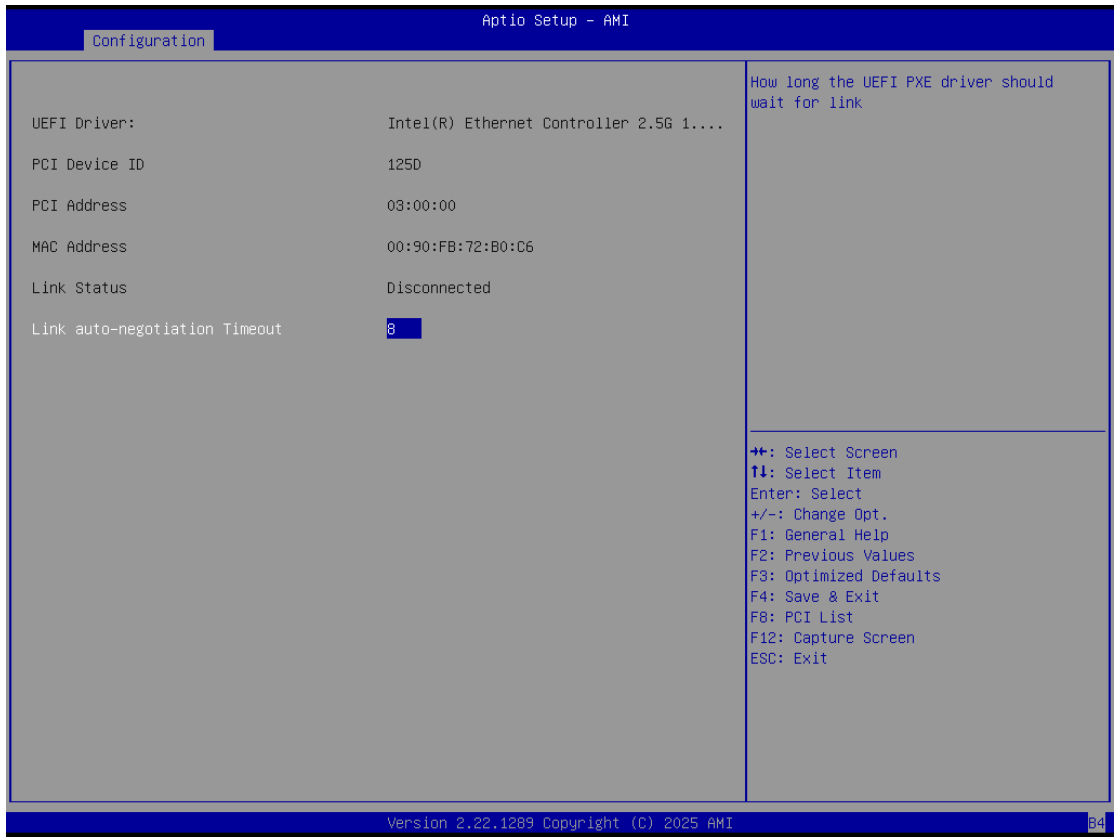


Intel (R) Ethernet Controller I226-IT – 00:90:FB:84:BE:67



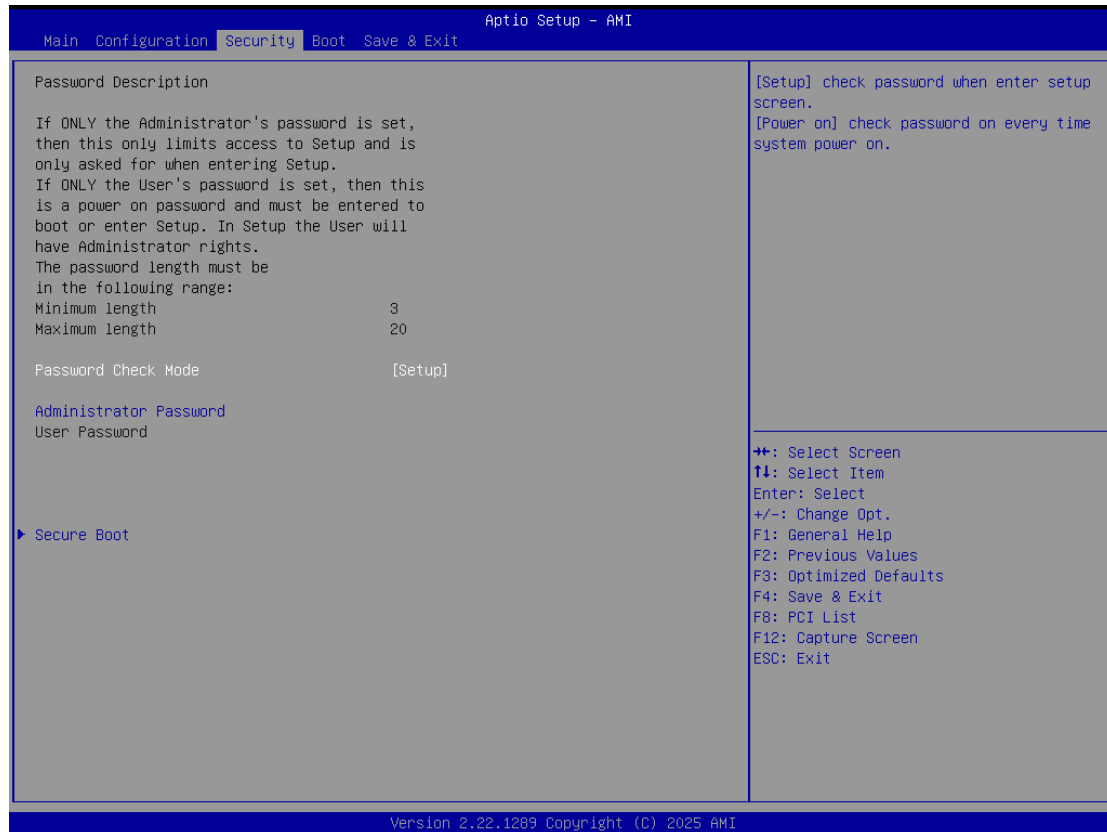
Feature	Description	Options
Link auto-negotiation Timeout	How long the UEFI PXE driver should wait for link.	★8

Intel (R) Ethernet Controller I226-IT – 00:90:FB:72:B0:C6



Feature	Description	Options
Link auto-negotiation Timeout	How long the UEFI PXE driver should wait for link.	★8

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	

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	★Custom, Standard
Restore Factory keys	Force System to User Mode. Install factory default Secure Boot key databases	Yes, No

Key Management

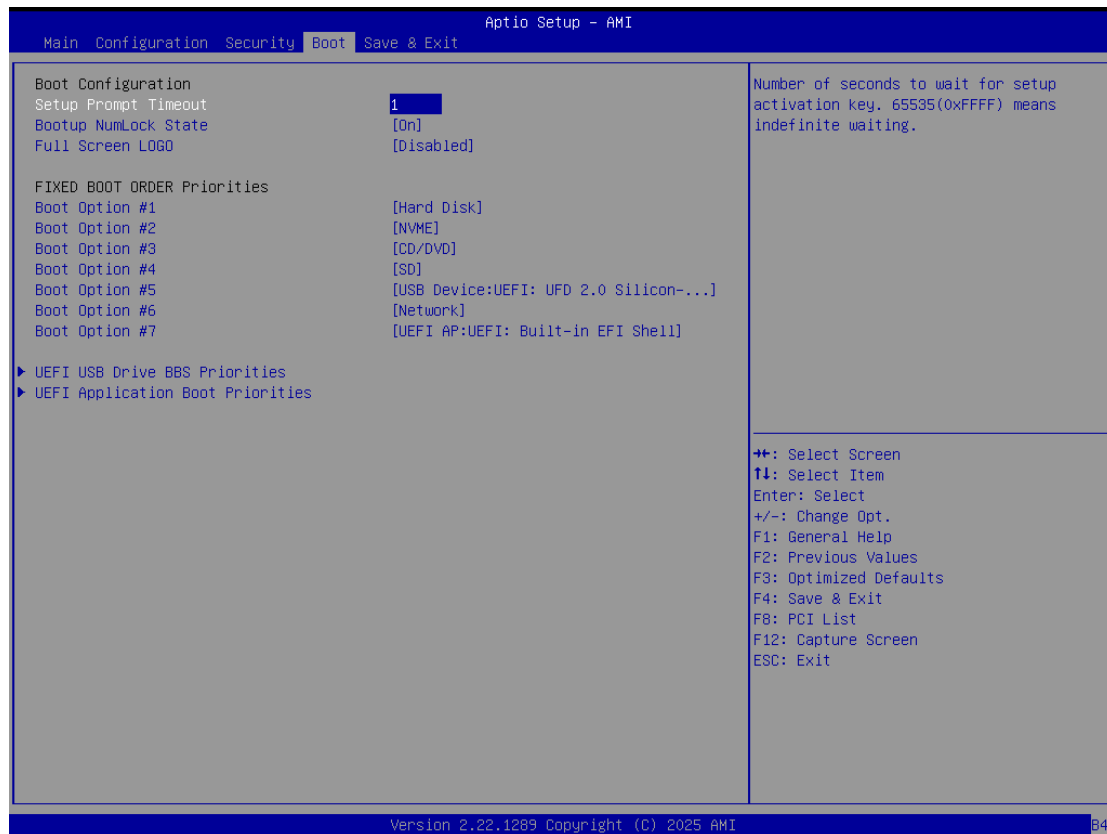
Enables expert users to modify Secure Boot Policy variables without variable authentication



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)	

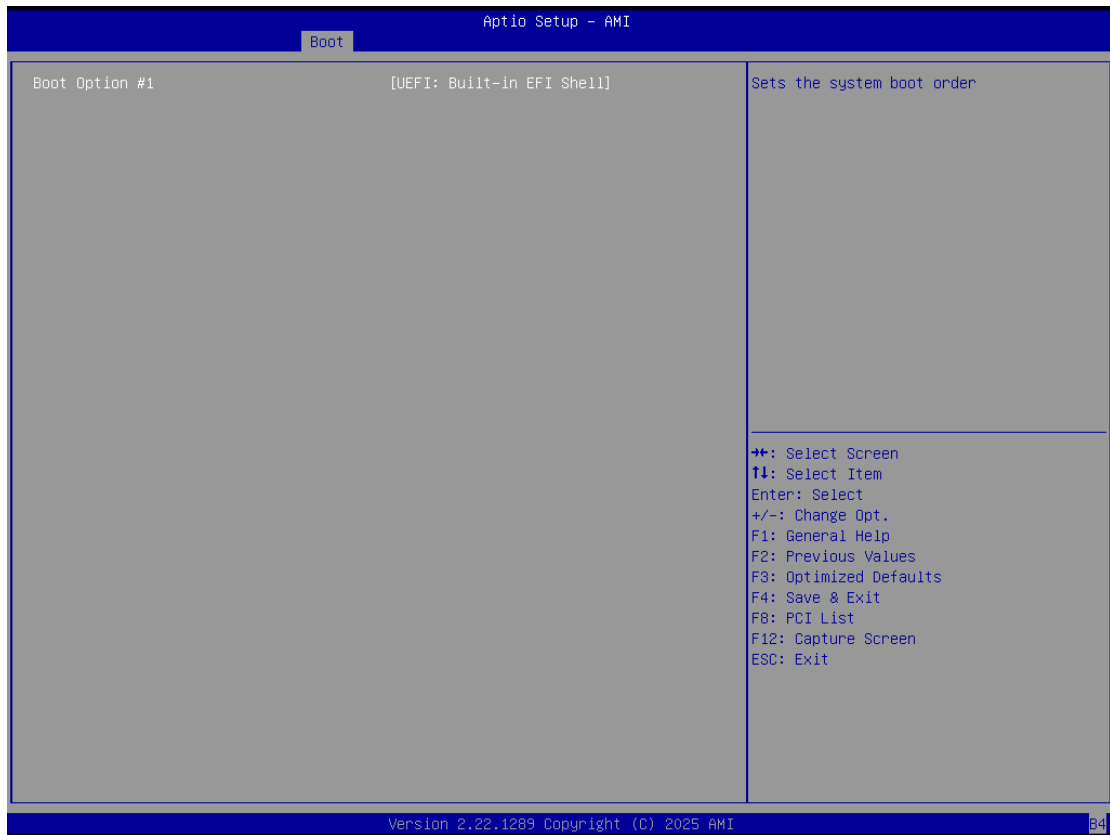
Feature	Description	Options
Platform Key(PK)	Enroll Factory Defaults or load certificates from a file: 1. Public Key Certificate: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048 (bin) d) EFI_CERT_SHAXXX 2. Authenticated UEFI Variable 3. EFI PE/COFF Image (SHA256) Key Source: Factory,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

4.5 Boot

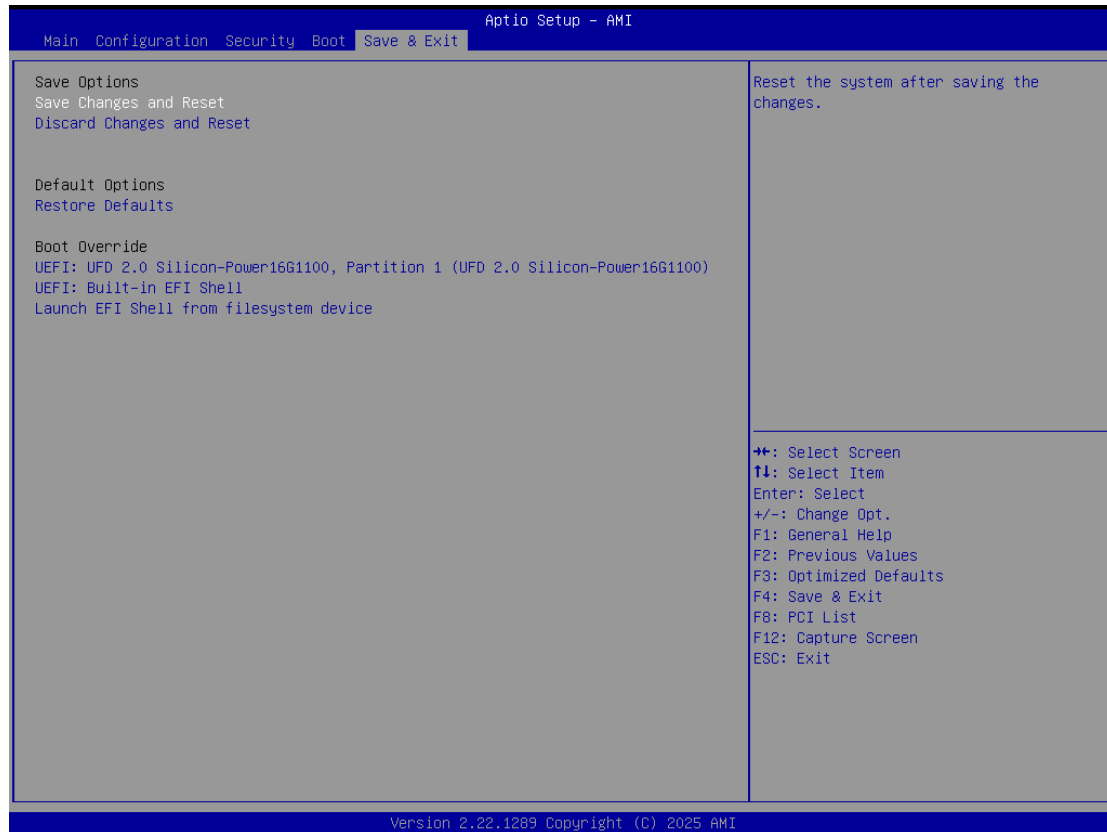


Feature	Description	Options
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.	★1
Bootup NumLock State	Select the keyboard NumLock state.	★On, Off
Full Screen LOGO	Enables or disables Quiet Boot option and Full screen Logo.	★Disabled, Enabled
Boot Option #1 ~ #7	Sets the system boot order	Hard Disk, NVME, CD/DVD, Network, USB Device; SD, 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



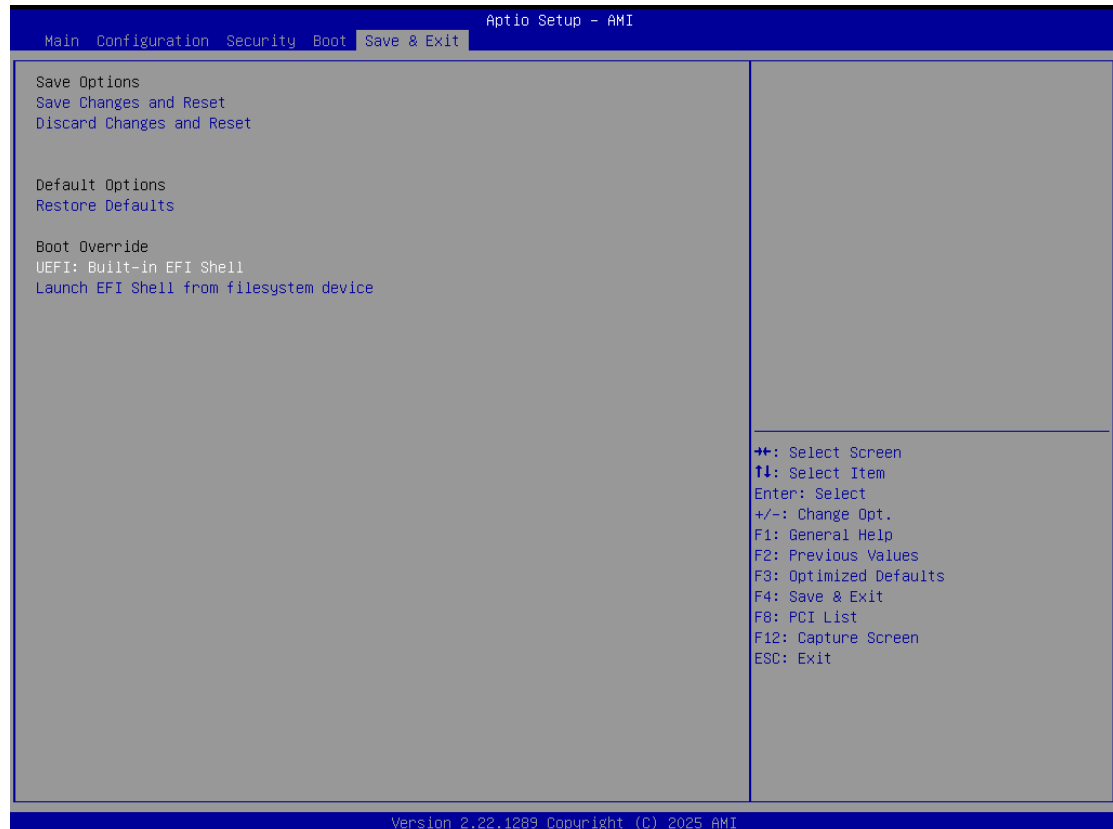
Feature	Description	Options
Save Changes and Reset	Reset the system after saving the changes.	
Discard Changes and Reset	Reset system setup without saving any changes.	
Restore Defaults	Restore/Load Default values all the setup options.	
UEFI: Built-in EFI Shell		
Launch EFI Shell from filesystem device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

LSMC-M1013 BIOS / EC 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.



Step4. Under the UEFI shell, direct to your USB DOK, below picture is an example using fs0. Then direct to the folder with BIOS / EC updated file and then enter command:” Update.efi” to start updating BIOS /EC.

```

UEFI Interactive Shell v2.2
EDK II
UEFI v2.80 (American Megatrends, 0x0005001A)
Mapping table
  FS0: Alias(s):HD0a0b:;BLK1:
        PciRoot(0x0)/Pci(0x14,0x0)/USB(0x0,0x0)/HD(1,MBR,0x006FD866,0x800,0x1E00800)
  BLK2: Alias(s):
        PciRoot(0x0)/Pci(0x1A,0x0)/eMMC(0x0)
  BLK0: Alias(s):
        PciRoot(0x0)/Pci(0x14,0x0)/USB(0x0,0x0)
Press ESC in 4 seconds to skip startup.nsh or any other key to continue.
Shell> fs0:
FS0:\> cd Update_M1013_0_0_8
FS0:\Update_M1013_0_0_8> ls
Directory of: FS0:\Update_M1013_0_0_8\
07/22/2025  16:43 <DIR>          8,192  .
07/22/2025  16:43 <DIR>           0      ..
07/08/2025  14:14              373    ReadMe.txt
07/08/2025  14:14       7,040,036    Update.efi
                2 File(s)      7,040,409 bytes
                2 Dir(s)
FS0:\Update_M1013_0_0_8> Update.efi_

```

```

UEFI Interactive Shell v2.2
EDK II
UEFI v2.80 (American Megatrends, 0x0005001A)
Mapping table
  FS0: Alias(s):HD0a0b:;BLK1:
        PciRoot(0x0)/Pci(0x14,0x0)/USB(0x0,0x0)/HD(1,MBR,0x006FD866,0x800,0x1E00800)
  BLK0: Alias(s):
        PciRoot(0x0)/Pci(0x14,0x0)/USB(0x0,0x0)
  BLK2: Alias(s):
        PciRoot(0x0)/Pci(0x1A,0x0)/eMMC(0x0)
Press ESC in 3 seconds to skip startup.nsh or any other key to continue.
Shell> fs0:
FS0:\> cd Update_EC_M1013_0_5
FS0:\Update_EC_M1013_0_5> ls
Directory of: FS0:\Update_EC_M1013_0_5\
07/23/2025  15:16 <DIR>          8,192  .
07/23/2025  15:16 <DIR>           0      ..
07/01/2025  14:31              377    ReadMe.txt
07/01/2025  14:31       72,961    Update.efi
                2 File(s)      73,338 bytes
                2 Dir(s)
FS0:\Update_EC_M1013_0_5> Update.efi_

```

(EC File Update)

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

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

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

```

UEFI Interactive Shell v2.2
EDK II
UEFI v2.80 (American Megatrends, 0x0005001A)
Mapping table
  FS0: Alias(s):HD0a0b:;BLK1:
        PciRoot(0x0)/Pci(0x14,0x0)/USB(0x0,0x0)/HD(1,MBR,0x006FD866,0x800,0x1E00800)
  BLK2: Alias(s):
        PciRoot(0x0)/Pci(0x1A,0x0)/eMMC(0x0)
  BLK0: Alias(s):
        PciRoot(0x0)/Pci(0x14,0x0)/USB(0x0,0x0)
Intel (R) Flash Programming Tool Version: 16.50.0.1215
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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.

FS0:\Update_M1013_0_0_8\> _

```

```

UEFI Interactive Shell v2.2
EDK II
UEFI v2.80 (American Megatrends, 0x0005001A)
Mapping table
  FS0: Alias(s):HD0a0b:;BLK1:
        PciRoot(0x0)/Pci(0x14,0x0)/USB(0x0,0x0)/HD(1,MBR,0x006FD866,0x800,0x1E00800)
  BLK0: Alias(s):
        PciRoot(0x0)/Pci(0x14,0x0)/USB(0x0,0x0)
  BLK2: Alias(s):
        PciRoot(0x0)/Pci(0x1A,0x0)/eMMC(0x0)
Current shell version is v2.x
ITE EC Flash Utility for UEFI Shell, Version : 1.4.0 (64)
<Re-Write by FoxYang .. 2021/12/22 >

[/NOKBC] support
!!Please don't use KB/MS during updating ...!!
Device ID       : EF 40 14 0
SPI Vendor      : Winbond
Eraseing...     : ██████████ -- Erase OK.

Erase Verify... : ██████████ -- Erase Verify OK.

Programing...   : ██████████ -- Programing OK.

Verify...       : ██████████ -- Verify OK.

Please turn off power(G3) by manual , let EC reload new image !!
FS0:\Update_EC_M1013_0_5\>

```

Chapter 5

BIOS Setup Items

- 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

5.1 Note Regarding 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 A

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

Portwell Software Service

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.

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

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



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