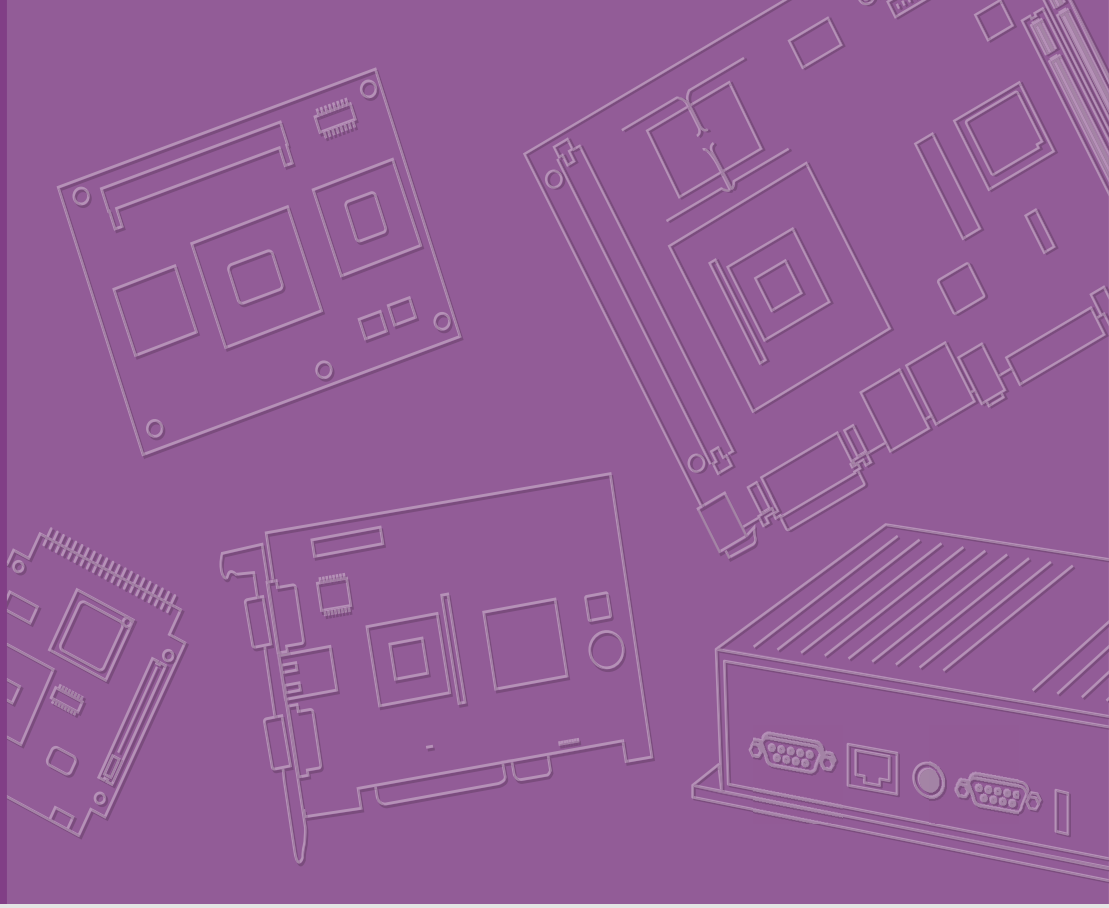

User Manual

ARK-1125

Fanless Embedded Box PC

ADVANTECH

Enabling an Intelligent Planet

Attention!

Please note this package contains a hard-copy user manual in Chinese for China CCC certification purposes. Please disregard the Chinese hard-copy user manual if the product is not to be sold and/or installed in China.

Attention!

Veuillez noter que ce paquet contient un manuel d'utilisation papier en chinois à des fins de certification China CCC. Veuillez ne pas tenir compte du manuel d'utilisation chinois sur papier si le produit ne doit pas être vendu et/ou installé en Chine.

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For technical support and service, please visit our support website at: http://support.advantech.com.tw/support

Part No. 2006112500 Edition 1

Printed in Taiwan April 2024

Product Warranty (2 Years)

Advantech warrants the original purchaser that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products that have been repaired or altered by persons other than repair personnel authorized by Advantech, or products that have been subject to misuse, abuse, accident, or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced free of charge during the warranty period. For out-of-warranty repairs, customers will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you believe your product is defective, follow the steps outlined below.

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages displayed when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain a return merchandise authorization (RMA) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a completed Repair and Replacement Order Card, and a proof of purchase date (such as a photocopy of your sales receipt) into a shippable container. Products returned without a proof of purchase date are not eligible for warranty service.
5. Write the RMA number clearly on the outside of the package and ship the package prepaid to your dealer.

Declaration of Conformity

FCC Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for assistance.

Technical Support and Assistance

1. Visit the Advantech website at http://support.advantech.comto obtain the latest product information.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before calling:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Warnings, Cautions and Notes

Warning! *Warnings indicate conditions, which if not observed, can cause personal injury!*

Les avertissements indiquent des conditions qui, si elles ne sont pas respectées, peuvent entra?ner des blessure!

Caution! *Cautions are included to help prevent hardware damage and data losses.*

Des précautions sont incluses pour vous aider à éviter d'endommager lematériel ou de perdre Les données.

Note! *Notes provide optional additional information.*

Les remarques fournissent des informations supplémentaires facultatives.

Packing List

Before system installation, check that the items listed below are included and in good condition. If any item does not accord with the list, contact your dealer immediately.

- 1 x ARK-1125 Unit
- 1 x User Manual (Simplified Chinese)
- 1 x China RoHS
- 1 x wrench for the top cover
- 1 x 4-pin terminal block for switch
- 1 x 6-pin terminal block for CAN Bus (for ARK-1125H)
- 1 x 60W 12V adapter

Ordering Information

Part Number	Description
ARK-1125C-S0A1	Intel® Atom® x7211E w/ COM, 4 x USB, 4 x HDMI, 1 x LAN
ARK-1125H-S0A1	Intel® N200 QC 1.0GHz w/HDMI, 2 x LAN, USB x4

Optional Items for Default SKU

Part Number	Description
1702002600	Power cable 3-pin 183 cm (6 ft), USA type
1702002605	Power cable 3-pin 183 cm (6 ft), EU type
1702031801	Power cable 3-pin 183 cm (6 ft), UK type
AMK-W001E	ARK-112X series wall mount kit
1700030518-01	CAN Bus Cable (option for ARK-1125C)

Safety Instructions

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Disconnect the equipment from all power outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
5. Protect the equipment from humidity.
6. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
7. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
8. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
9. All cautions and warnings on the equipment should be noted.
10. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.
11. Never pour liquid into an opening. This may cause fire or electrical shock.
12. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
13. If any of the following occurs, have the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated the equipment.
    - The equipment has been exposed to moisture.
    - The equipment is malfunctioning, or does not operate according to the user manual.
    - The equipment has been dropped and damaged.
    - The equipment shows obvious signs of breakage.
14. Do not leave the equipment in an environment with a storage temperature of below -40°C (-40°F) or above 85°C (185°F) as this may damage the components. The equipment should be kept in a controlled environment.

15. Any unverified components may cause unexpected damage. To ensure correct installation, always use the components (e.g., screws) provided in the accessory box.
16. CAUTION: The equipment is equipped with a battery-powered real-time clock circuit. There is a risk of explosion if a battery is incorrectly replaced. Replace only with the same or equivalent type as recommended by the manufacturer. Discard all used batteries according to the manufacturer's instructions.
17. Always disconnect the power cord from the chassis before manually handling the hardware. Do not implement connections or configuration changes while the device is powered on. Sudden power surges may damage sensitive electronic components.
18. In accordance with IEC 704-1:1982 specifications, the sound pressure level at the operator's position should not exceed 70 dB (A).
19. DISCLAIMER: These instructions are provided according to IEC 704-1 specifications. Advantech disclaims all responsibility for the accuracy of any statements contained herein.
20. Use a power cord connected to a socket-outlet with a grounded connection.
21. This product is intended to be supplied by a UL-Listed power supply suitable for use at minimum Tma 60°C (140°F) whose output is rated at 12Vdc, 5A. Please contact Advantech for further information.
22. RESTRICTED ACCESS AREA: The equipment should only be installed in a Restricted Access Area.

Consignes de Sécurité

1. Veuillez lire attentivement ces instructions de sécurité.
2. Veuillez conserver ce manuel de l'utilisateur pour référence ultérieure.
3. Veuillez débrancher cet équipement de la prise secteur avant le nettoyage. Utilisez un chiffon humide. Ne pas utiliser de détergent liquide ou pulvérisé pour le nettoyage. Utilisez une feuille ou un chiffon humide pour le nettoyage.
4. Pour les équipements enfichables, la prise de courant doit être à proximité de l'équipement et doit être facilement accessible.
5. S'il vous plaît garder cet équipement de l'humidité.
6. Posez cet équipement sur une surface fiable lors de l'installation. Une chute ou une chute pourrait causer des blessures.
7. Assurez-vous que la tension de la source d'alimentation est correcte avant de connecter l'équipement à la prise de courant.
8. Placez le cordon d'alimentation de sorte que personne ne puisse marcher dessus. Ne placez rien sur le cordon d'alimentation.
9. Tous les avertissements et mises en garde sur l'équipement doivent être notés.
10. Si l'appareil n'est pas utilisé pendant une longue période, débranchez-le du secteur pour ne pas être endommagé par une surtension transitoire.
11. Ne jamais verser de liquide dans les ouvertures de ventilation; Cela pourrait provoquer un incendie ou un choc électrique.
12. N'ouvrez jamais l'équipement. Pour des raisons de sécurité, seul le personnel de maintenance qualifié doit ouvrir l'équipement.
13. Si l'une des situations suivantes se présente, faites vérifier le matériel par le personnel de service:
    - Le cordon d'alimentation ou la fiche est endommagé.
    - Un liquide a pénétré dans l'appareil.
    - L'équipement a été exposé à l'humidité.

- L'équipement ne fonctionne pas bien ou vous ne pouvez pas le faire. fonctionner conformément au manuel d'utilisation.
- Equipment L'équipement est tombé et a été endommagé.
- Equipment L'équipement présente des signes évidents de rupture.

14. Ne laissez pas cet équipement dans un environnement où la température de stockage peut être inférieure à -40°C (-40°F) ou supérieure à 85°C (185°F). Cela pourrait endommager l'équipement. L'équipement doit être dans un environnement contrôlé.
15. Tout composant non vérifié peut causer des dommages inattendus. Pour garantir une installation correcte, veuillez toujours utiliser les composants (ex. Vis) fournis avec la boîte d'accessoires.
16. ATTENTION: L'ordinateur est équipé d'un circuit d'horloge temps réel alimenté par batterie. Il y a un risque d'explosion si la batterie est remplacée de manière incorrecte. Remplacez uniquement avec le même type ou un type équivalent recommandé par le fabricant. Jetez les piles usagées conformément aux instructions du fabricant.
17. Débranchez toujours complètement le cordon d'alimentation de votre châssis lorsque vous utilisez du matériel. Ne faites pas de connexion quand l'appareilest sous tension. Les composants électroniques sensibles peuvent être endommagés par des surtensions soudaines.
18. Niveau de pression acoustique au poste de l'opérateur selon la norme CEI 704-1: 1982 n'est pas supérieur à 70 dB (A).
19. AVERTISSEMENT: Cet ensemble d'instructions est donné conformément à la norme CEI 704-1. Advantech décline toute responsabilité quant à l'exactitude des déclarations contenues dans ce.
20. Au moyen d'un cordon d'alimentation connecté à une prise de courant avec mise à la terre.
21. Ce produit est destiné à être alimenté par une alimentation homologuée UL adaptée à une utilisation à une température minimale de Tma de 60°C (140°F) dont la sortie est nominale de 12 Vcc, 5 A. Veuillez contacter Advantech pour plus d'informations.
22. ZONE D'ACCÈS RESTREINT: L'équipement ne doit être installé que dans une zone d'accès restreint.

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Chapter 1

General Introduction

This chapter details background information on the ARK-1125 series.

1.1 Introduction

The ARK-1125 is a compact and versatile fanless embedded system. It serves as a ready-to-use platform equipped with ample I/O ports to cater to a wide variety of applications. Targeted markets include machine automation, equipment integration, kiosks, and edge computing.

Rugged Multi-Functional Design

The ARK-1125 is powered by an Intel® N200 QC SoC processor or an Intel® Atom™ x7211E DC SoC processor to offer high performance with low power consumption. Its palm-sized dimensions allow it to be installed in limited-space environments. The ARK-1125 provides a selection of I/O ports for different applications, depending on the model.

The ARK-1125H provides 2 x 4K2K HDMI displays, 2 x RS232/422/485, 2 x 10/100/1000/2500 Mbps LAN ports, 1x Mic-In and Line-Out, 1 x M.2 2230 E-Key (PCIe x1), 1 x M.2 2280 B-Key (SATA, PCIe x1), 2 x USB 3.2 (Gen 2), 2 x USB 2.0, 1 x DIO, and 2 x CAN bus signals in one port, suitable for kiosks or digital signage.

The ARK-1125C provides 1 x 4K2K HDMI display, 4 x RS232/422/485, 1 x 10/100/1000/2500 Mbps LAN port, 1 x Mic-In and Line-Out, 1 x M.2 2230 E-Key (PCIe x1), 1 x M.2 2280 B-Key (SATA, PCIe x1), 1 x M.2 2242 M-Key (SATA, PCIe x1), 2 x USB 3.2 (Gen 2), 2 x USB 2.0, and 1 x DIO, suitable for automation.

The ARK-1125 operates on 12V DC power input with a wide operating temperature range of -30 to 60°C. Additionally, it has obtained various worldwide certifications including CE, FCC Class B, CB, UL, CCC, BSMI, and UKCA.

Multiple Display Support

The ARK-1125H system provides 2 x 4K2K HDMI displays, which can be installed as dual independent displays with a maximum resolution of up to 4096 x 2160 @ 60Hz. Its graphics engines support DirectX 12.1, OpenGL 4.6, OpenCL 3.0, and up to 4K60 Decoding (8b AVC, 10b HEVC/VP9/SCC, AV1).

Built-In Intelligent Management Tools — Advantech SUSI API and DeviceOn

The Advantech SUSI API provides a valuable suite of programmable APIs, including features like multi-level watchdog, hardware monitoring, and other user-friendly interfaces.

The SUSI API is an intelligent self-management cross-platform tool that monitors system status for problems and takes action in the event of abnormalities. SUSI API makes the entire system more reliable and intelligent. Moreover, the ARK-1125 also supports Advantech's own WISE-DeviceOn, which provides easy remote management so users can monitor, configure, and control a large number of terminals, simplifying system maintenance tasks and recovery processes.

1.2 Product Features

1.2.1 General

- **CPU:**
  - Intel® N200 (Alder Lake-N) QC SoC, 1GHz boost up to 3.7 GHz
  - Intel® Atom™ 7211E DC SoC, 1.0GHz boost up to 3.2GHz
- **BIOS:** AMI EFI 256 Mbit
- **System Memory:** DDR5 4800Mhz up to 16GB
- **Watchdog Timer:** Single chip Watchdog 255-level interval timer, setup by software
- **Series Ports:**
  - ARK-1125H: 2 x RS-232/422/485
  - ARK-1125C: 4 x RS-232/422/485
- **USB:** 2 x USB 3.2 (2 x Gen 2), 2 x USB 2.0 compliant ports
- **Audio:** High Definition Audio (HD), Line-Out/Mic-In
- **Storage:**
  - ARK-1125H: 1 x M.2 2230 E-Key (PCIe x1) and 1 x M.2 2280 B-Key (SATA, PCIe x1, by jumper)
  - ARK-1125C: 1 x M.2 2230 E-Key (PCIe x1), 1 x M.2 2280 B-Key (SATA, PCIe x1, by jumper), 1 x M.2 2242 M-Key (SATA, PCIe x1, by auto-detect)
- **Expansion Interface:**
  - ARK-1125H: 1 x M.2 2230 E-Key (PCIe x1) and 1 x M.2 2280 B-Key (SATA, PCIe x1, by jumper)
  - ARK-1125C: 1 x M.2 2230 E-Key (PCIe x1), 1 x M.2 2280 B-Key (SATA, PCIe x1, by jumper), 1 x M.2 2242 M-Key (SATA, PCIe x1, by auto-detect)
  - GPIO: 8-bit Programmable DIO
- **TPM:** SLB9672 XU 2.0

1.2.2 Display

- **Controller:** Intel® UHD Graphics
- **Resolution:** supports up to 4096 x 2160 @ 60 Hz
- **DisplayPort:**
  - ARK-1125H: 2 x HDMI
  - ARK-1125C: 1 x HDMI

1.2.3 Ethernet

- **Chipset:**
  - ARK-1125H: LAN1 Intel® i226-LM, LAN2 Intel® i226-LM
  - ARK-1125C: LAN1 Intel® i226-LM
- **Speed:** 100/1000/2500 Mbps
- **Interface:** RJ-45
- **Standard:** Compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3bz, IEEE 802.ab

1.3 Chipset

1.3.1 Functional Specifications

1.3.1.1 Processor

Table 1.1: Processor	
Processor	Intel® Processor N-series N200 Intel® Atom® Processor x7211E
Memory	Supports DDR5 4800MHz up to 16GB 1 x 262-pin SODIMM socket type

1.3.1.2 Chipset

- **Internal Graphics Features:**
  - DirectX 12.1, OpenGL 4.6
  - HDMI + HDMI (supported by ARK-1125H)
- **Video Accelerator:**
  - HW accelerated video decoding: 4K60 8b 4:2:0 AVC, 4K60 10b 4:2:0, 4:4:4 HEVC/VP9/SCC, 4K60 10b 4:2:0 AV1
  - HW accelerated video encoding: 4K60 8b 4:2:0 AVC, 4K60 10b 4:2:0, 4:4:4 HEVC/VP9/SCC
- **SATA Interface:**
  - Supports several optional sections of Serial ATA III
  - Supports SATA data transfer rates of up to 6 Gb/s
- **USB Interface:**
  - USB host interface with support for up to 2 x USB 3.2 ports, 2 x USB 2.0 ports
  - All ports are high-Speed, full-Speed, and low-speed capable
- **BIOS:** UEFI 64-bit
- **Power Management:**
  - Supports ACPI
  - ACPI-defined power states (processor-driven C states)
  - ACPI Power Management Timer
  - SMI# generation

1.3.1.3 Others

- **Serial Ports:**
  - ARK-1125H supports 2 x serial ports, ARK-1125C supports 4 x serial ports
  - ARK-1125H: COM1, COM2: RS-232/422/485
  - ARK-1125C: COM1, COM2, COM3, COM4: RS-232/422/485
- **CAN Bus Port:**
  - ARK-1125H supports 2 signals within one CAN Bus port.
  - ARK-1125C supports 1 signal within one CAN Bus port.
- **GPIO:** 8-bit Programmable DIO
- **Ethernet:**
  - Chipset: Intel® i226 LM,
  - ARK-1125H supports 2 x LAN ports, ARK-1125C supports 1 x LAN port
  - ARK-1125H: LAN1, LAN2
  - ARK-1125C: LAN1
  - Supports 2.5GbE

  - LAN Connectors: Phone Jack RJ-45 8P 90D (F)
- **Audio:**
  - Audio Codec: ALC888S-VD2-GR
  - Compliant with HD Audio specifications
  - Supports 16-/20-/24-bit DAC and 16-/20-/24-bit ADC resolution
  - Supports: Line-Out, Mic-In
- **Battery Backup:** Battery 3V/210 mAh with wire x 1
- **TPM 2.0:** SLB9672 XU 2.0 FW15.22

1.3.2 SUSI 4.0

- SUSI API
- Sequence control supported
- GPIO 8-bit programmable DIO
- Watchdog timer: multi-level WDT
- Programmable 1-255 sec/min
- Hardware monitor CPU temperature /input current / input voltage
- System information running HR / boot record

1.4 Mechanical Specifications

1.4.1 ARK-1125H Dimensions

133 x 46.4 x 94.2 mm / 5.24 x 1.83 x 3.71 in (W x H x D)

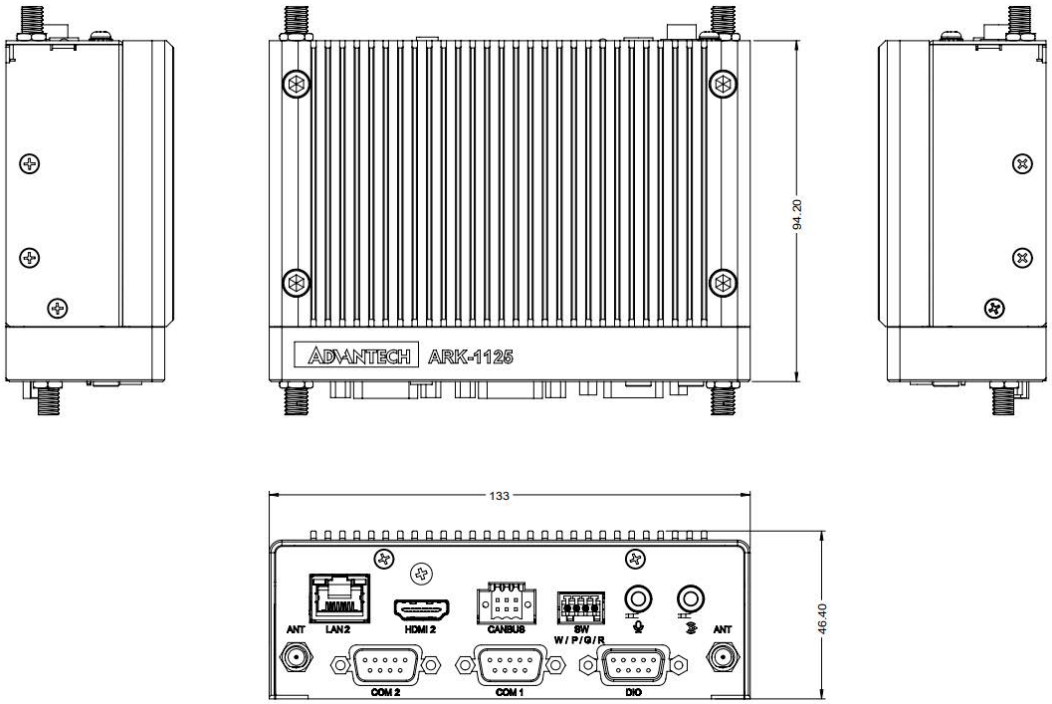


Figure 1.1 ARK-1125H Mechanical Dimensions

1.4.2 ARK-1125C Dimensions

133 x 46.4 x 94.2 mm / 5.24 x 1.83 x 3.71 in (W x H x D)

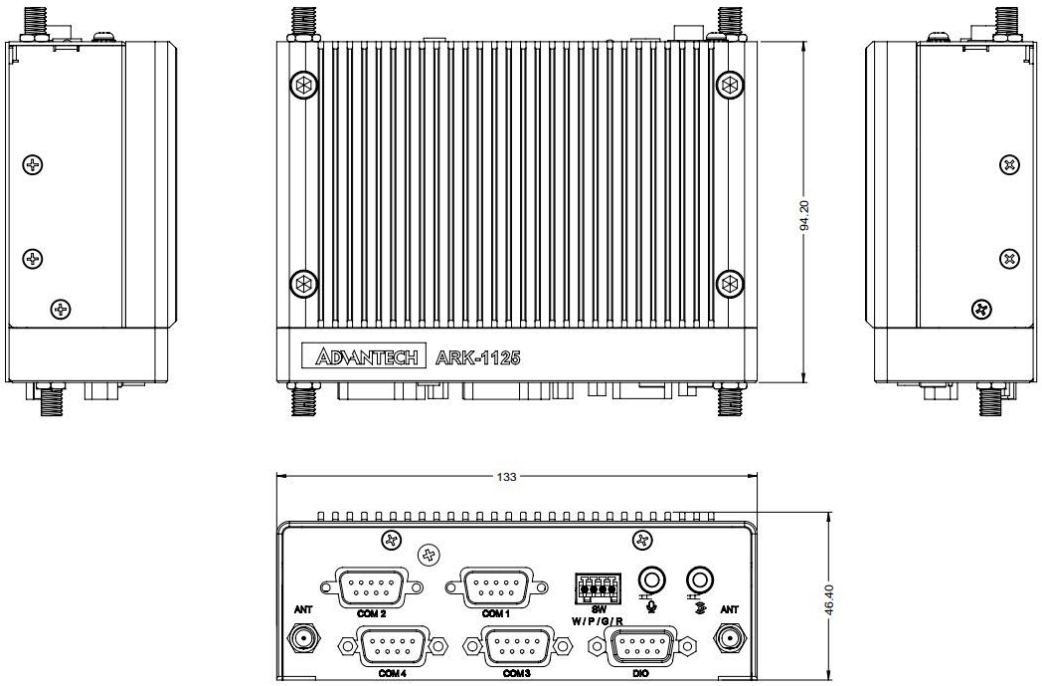


Figure 1.2 ARK-1125C Mechanical Dimensions

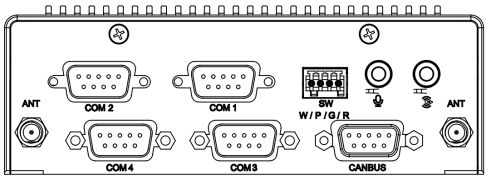


Figure 1.3 ARK-1125C Mechanical Dimensions with Optional CAN Bus

1.4.3 Weight

- **ARK-1125H:** net-weight 0.76 kg,1.51 kg with packing
- **ARK-1125C:** net-weight 0.76 kg,1.50 kg with packing

1.5 Power Requirement

1.5.1 System Power

- **Power Input:** 12 V_{DC}
- **Adapter:** 60W @ 12V/5A power adapter

1.6 Operating Environment Specifications

1.6.1 Operating Temperature

- **With extended peripherals:** -30 ~ 60°C (-22 ~ 140°F) with 0.7 m/s airflow (only up to 40°C when used with the adapter)

1.6.2 Relative Humidity

- 95% @ 40°C (104°F) (non-condensing)

1.6.3 Storage Temperature

- -40 ~ 85°C (-40 ~ 185°F)

1.6.4 EMC

- CE/FCC Class B, CCC, BSMI, UKCA

1.6.5 Safety

- CB, UL, CCC, BSMI, UKCA

Chapter 2

Configuration

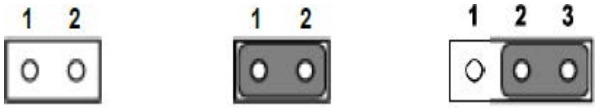
2.1 Introduction

The following sections show the internal jumper settings and the external connector pin assignments for different applications.

2.2 Jumpers

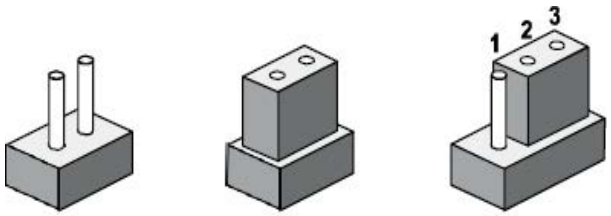
2.2.1 Jumper Description

You may configure ARK-1125 to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To close a jumper, you connect the pins with the clip. To open a jumper, remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



Open **Closed** **Closed 2-3**

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



Open **Closed** **Closed 2-3**

A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

2.2.2 Jumper List

Table 2.1: Jumper List

JCMOS1	Clear CMOS
M2_SEL1	M.2 B-Key device selection
ERP1	ERP mode setting
JPSON1	HW AT/ATX mode setting

2.2.3 Jumper Locations

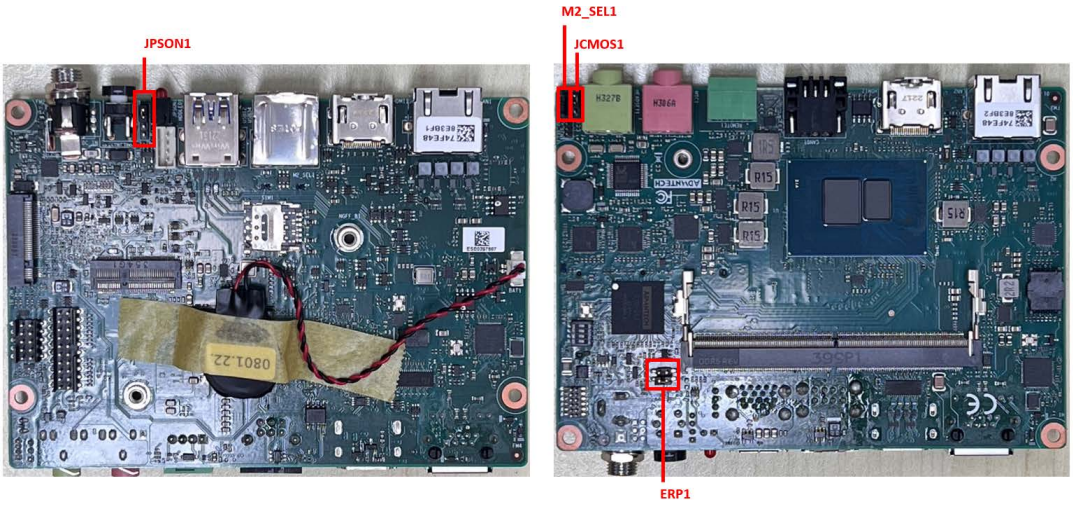


Figure 2.1 ARK-1125H Jumper Locations

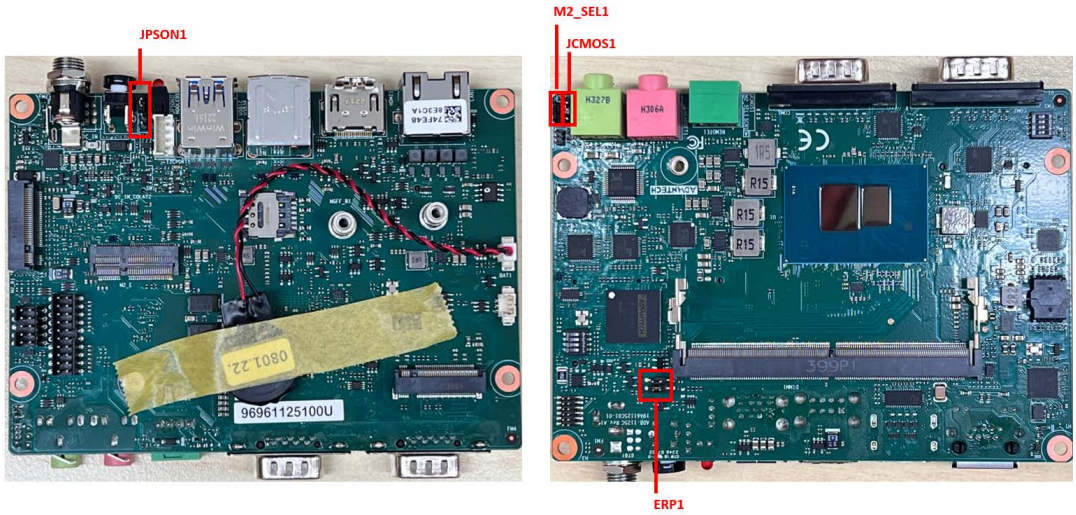
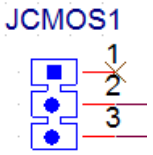


Figure 2.2 ARK-1125C Jumper Locations

2.2.4 Jumper Settings

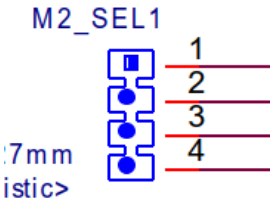
2.2.4.1 Clear CMOS (JCMOS1)

Table 2.2: JCMOS1 Clear CMOS	
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	Pin Header 3x1P 2.0mm 180D(M) DIP 2000-13-WS
Setting	**Function**
(1-2 Closed)	Normal operation (Default)
(2-3 Closed)	Clear CMOS



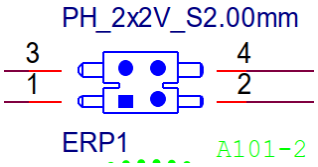
2.2.4.2 M.2 B-Key Device Selection (M2_SEL1)

Table 2.3: M2_SEL1 M.2 B-Key Device Selection	
Part Number	1653006615-01
Footprint	HD_4x1P_50_D_21N10240-04S10B
Description	PIN HEADER 1x4P 27mm/PA6T/M/VA/GFL/D/BK/H2.0mm/L2.6
Setting	**Function**
(1-2 Closed)	SSD (default)
(1-2 Open)	WWAN Card
(3-4 Closed)	SSD – SATA type
(3-4 Open)	SSD – PCIE type (default)



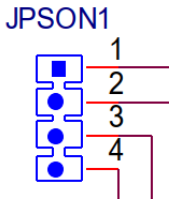
2.2.4.3 ERP Mode Setting (ERP1)

Table 2.4: ERP1 ERP Mode Setting	
Part Number	1653000014
Footprint	HD_2x2P_79
Description	Pin Header 2x2P 2.00mm 180D(M) SMD 21N22050
Setting	**Function**
(1-2 Closed)	Normal mode (default)
(3-4 Closed)	ERP mode



2.2.4.4 HW AT/ATX Mode Jumper (JPSON1)

Table 2.5: JPSON1 AT/ATX Mode Jumper	
Part Number	1653004101
Footprint	HD_4x1P_79_D
Description	PIN HEADER 4x1P 2.0mm 180D(M) DIP 21N12050
Setting	**Function**
(1-2 Closed)	ATX Mode (default)
(3-4 Closed)	AT Mode



2.3 Connectors

2.3.1 ARK-1125 External I/O Locations

2.3.1.1 ARK-1125H

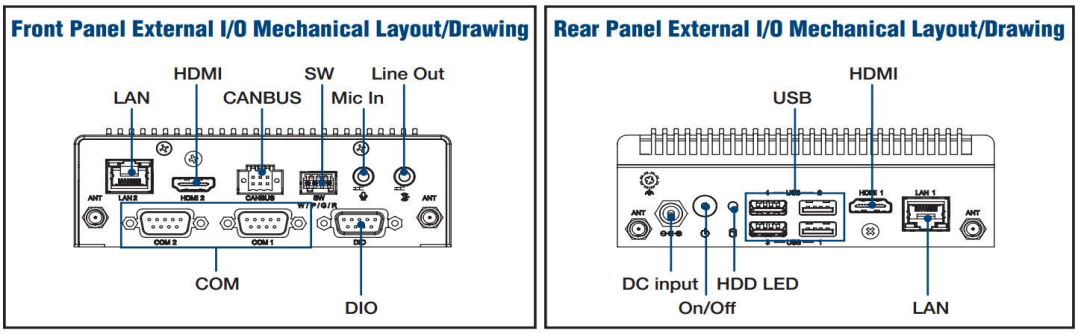


Figure 2.3 ARK-1125H Front and Rear I/O Connector Diagram

2.3.1.2 ARK-1125C

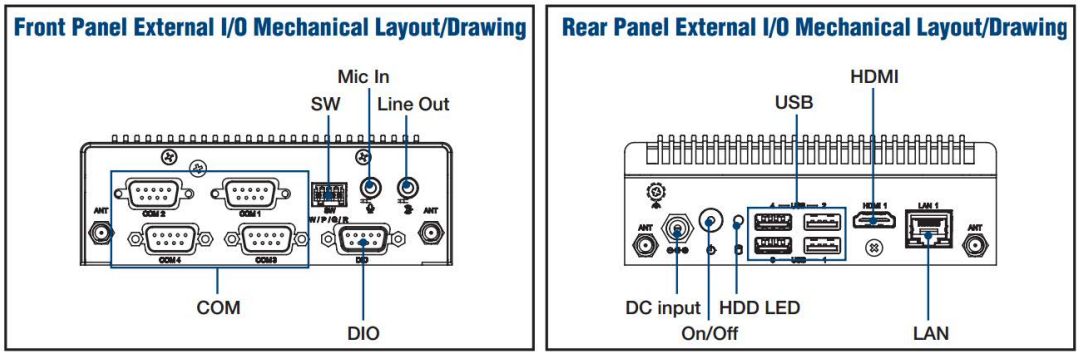


Figure 2.4 ARK-1125C Front and Rear I/O Connector Diagram

2.3.1.3 Power On/Off Button

ARK-1125 has a Power On/Off button with LED indicators that show the On status (Green LED). The Power button supports dual functions: Soft instant Power On/-Off.

Figure 2.5 Power On/Off Button

2.3.1.4 Power Input Connector

ARK-1125 comes with a DC-Jack header that carries 12VDC external power input.

Figure 2.6 Power Input Connector

2.3.1.5 M.2 B-Key LED Indicator

ARK-1125 provides one LED that indicates M.2 B-Key and compact flash disk status.

Figure 2.7 HDD LED Indicator

2.3.1.6 Antenna Hole

ARK-1125 reserves 4 antenna holes for wireless antenna installation. Each antenna hole is marked “ANT” for easy identification.

Figure 2.8 Antenna Hole

2.3.1.7 Audio Connector

ARK-1125 offers stereo audio ports through jack connectors for Line-Out and Mic-In. The audio chip is controlled by Realtek ALC888S, and it’s compliant with the Azalea standard.

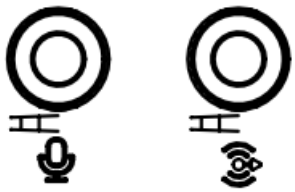


Figure 2.9 Audio Connector

2.3.1.8 DIO Connector

ARK-1125 provides 1 x DIO connector.

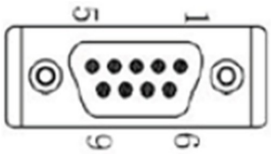


Figure 2.10 DIO Connector

Table 2.6: DIO Connector Pin Definitions

Pin	Signal Name
1	DIO bit 0
2	DIO bit 1
3	DIO bit 2
4	DIO bit 3
5	DIO bit 4
6	DIO bit 5
7	DIO bit 6
8	DIO bit 7
9	GND

2.3.1.9 COM Connector

ARK-1125 provides 2 x D-sub 9-pin connectors on ARK-1125H and 4 on ARK-1125C, which offer RS-232/422/485 serial communication interface ports. The default setting is RS-232. RS-422/485 for ARK-1125 are supported via the BIOS settings.

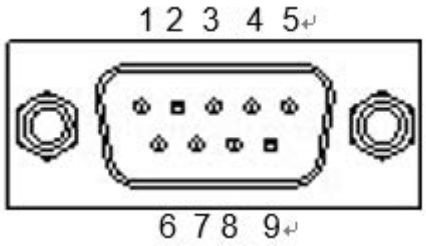


Figure 2.11 DIO Connector

Table 2.7: COM Connector Pin Definitions

	RS-232	RS-422	RS-485
Pin	**Signal Name**	**Signal Name**	**Signal Name**
1	DCD	Tx-	DATA-
2	RxD	Tx+	DATA+
3	TxD	Rx+	NC
4	DTR	Rx-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

Note! *NC represents "No Connection".*

2.3.1.10 Ethernet Connector (LAN)

ARK-1125 is equipped with 2 x Ethernet controllers on ARK-1125H and 1 on ARK-1125C that are fully compliant with IEEE 802.3u 100/1000/2500 Mbps. These Ethernet ports provide a standard RJ-45 jack connector with LED indicators. The left side LED shows link status (Green LED) and active status (flashing Green LED), and the right side LED shows Speed status (Green LED for 2.5Gbps/Orange LED for 1Gbps).

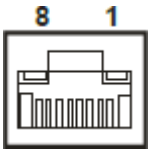


Figure 2.12 Ethernet Connector

Table 2.8: Ethernet Connector (LAN) Pin Definitions

Pin	10/100/1000/25000 BaseT Signal Name
1	TX+
2	TX-
3	RX+
4	MDI2+
5	MDI2-
6	RC-
7	MDI3+
8	MDI3-

2.3.1.11 HDMI Connector

ARK-1125 is equipped with 2 x Ethernet controllers on ARK-1125H and 1 on ARK-1125C. It is an integrated, 19-pin receptacle connector HDMI Type A interface. The HDMI link supports resolutions up to 4096 x 2160 @ 60 Hz.

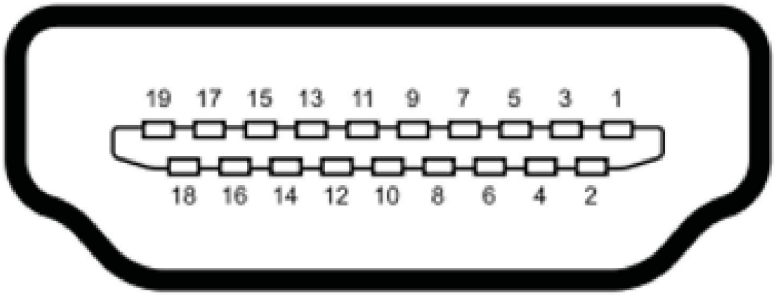


Figure 2.13 HDMI Receptacle Connector

Table 2.9: HDMI Connector Pin Definitions

Pin	Signal Name	Pin	Signal Name
1	TMDS Data 2+	2	TMDS Data 2 shield
3	TMDS Data 2-	4	TMDS Data 1+
5	TMDS Data 1 shield	6	TMDS Data 1-
7	TMDS Data 0+	8	TMDS Data 0 shield
9	TMDS Data 0-	10	TMDS clock+
11	TMDS clock shield	12	TMDS clock-
13	CEC	14	Reserved
15	SCL	16	SDA
17	DDC/CEC Ground	18	+5V
19	Hot Plug Detect		

2.3.1.12 USB 3.2 - Gen 2

ARK-1125 supports 2 x USB 3.2 (Gen 2, 10G), The USB interfaces comply with USB XHCI, Rev. 3.2 standards. USB 3.2 Gen2 connectors contain legacy pins to interface with USB 2.0 devices, and a new set of pins for USB 3.2 connectivity.

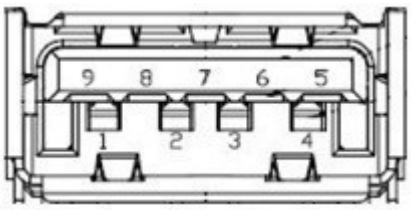


Figure 2.14 USB 3.2 Connector

Table 2.10: USB Connector Pin Definitions

Pin	Signal Name	Pin	Signal Name
1	+5V	2	USB_data-
3	USB_data+	4	GND
5	SSRX-	6	SSRX+
7	GND	8	SSTX-
9	SSTX+		

2.3.1.13 USB 2.0

ARK-1125 supports 2 x USB 2.0.

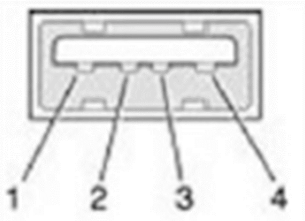


Figure 2.15 USB 2.0 Connector

Table 2.11: Ethernet Connector (LAN) Pin Definitions

Pin	Signal Name
1	VCC
2	D-
3	D+
4	GND

2.3.1.14 Remote Switch Connector

ARK-1125 provides the remote switch connector for power on/off. From the left to the right are WDT, Power Switch, GND, and Reset.

Figure 2.16 Remote Switch Connector

2.3.1.15 CAN Bus

ARK-1125H provides a CAN bus connector.

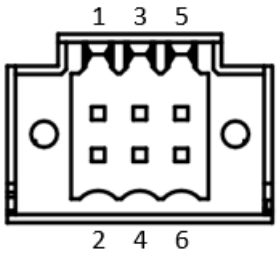


Figure 2.17 CAN Bus Connector

Table 2.12: Ethernet Connector (LAN) Pin Definitions	
Pin	**Signal Name**
1	CAN0_D-
2	CAN1_D+
3	GND
4	GND
5	CAN0_D+
6	CAN1_D-

Note! *NC represents "No Connection".*

2.3.1.16 CAN Bus

ARK-1125C provides an optional CAN bus connector.

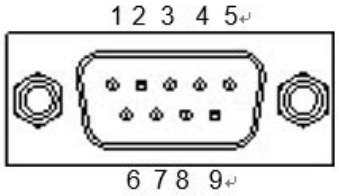


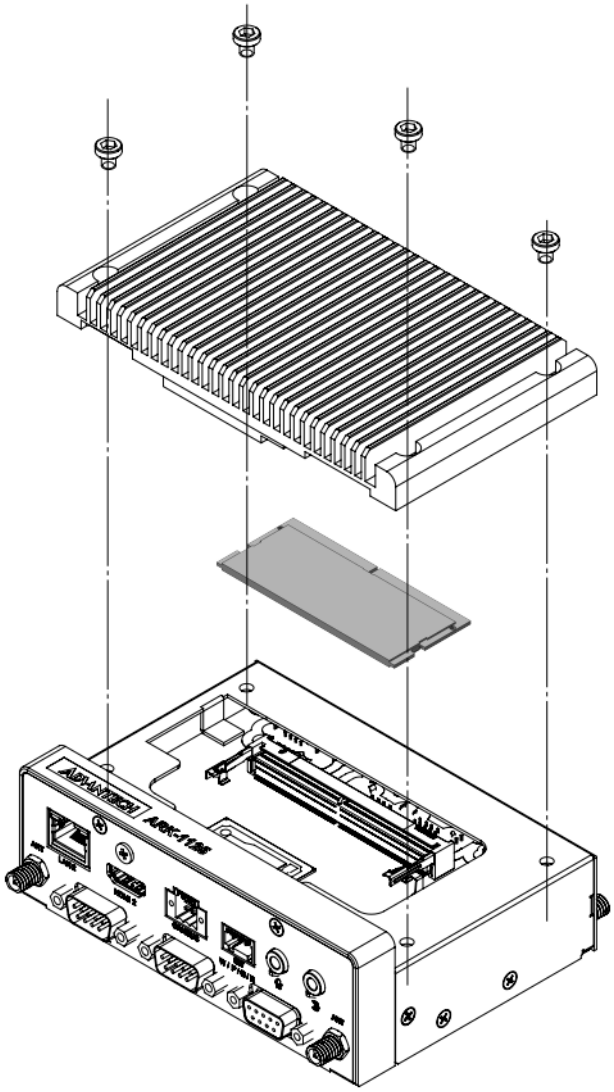
Table 2.13: CAN Bus Connector Pin Definitions			
Pin	**Signal Name**	**Pin**	**Signal Name**
1	NC	2	CAN_L
3	GND	4	NC
5	NC	6	NC
7	CAN_H	8	NC
9	NC		

2.4 Installation

2.4.1 Memory Installation

ARK-1125H and ARK-1125C share the same installation method.

1. Unscrew the 4 screws on the top cover, and remove the top cover.
2. Install the memory into the system carefully.
3. Replace the top cover.



2.4.2 M.2 Module Installation

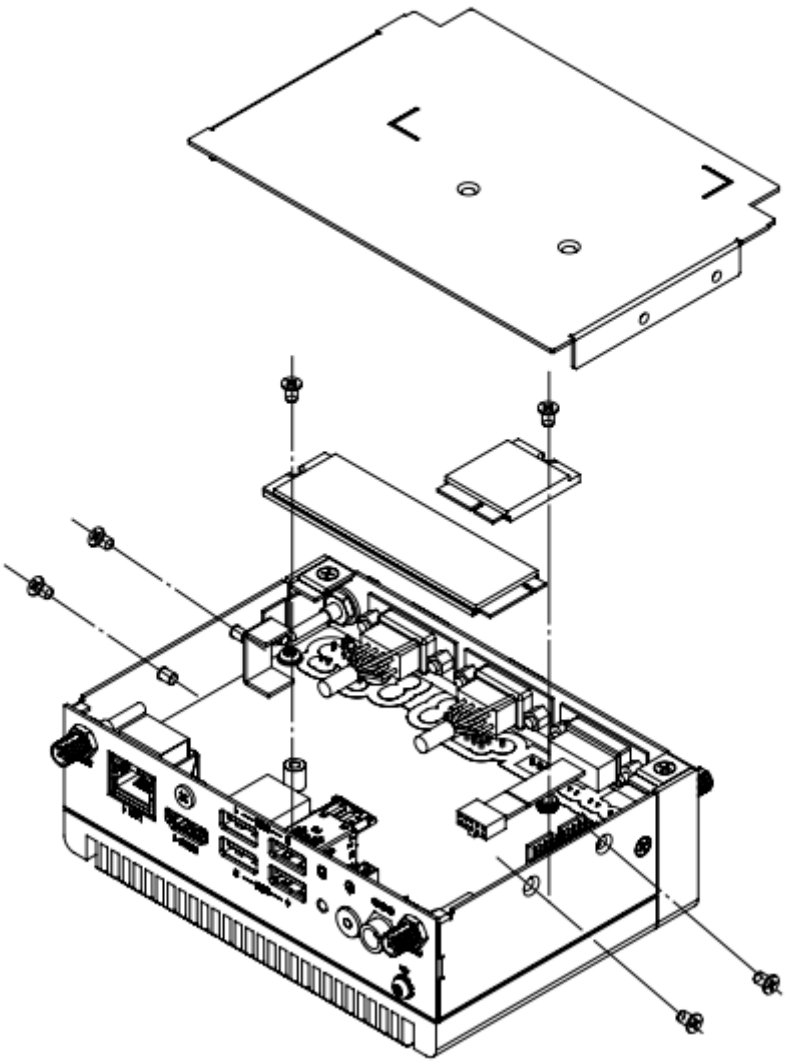
ARK-1125C and ARK-1125H follow the same installation method.

1. Unscrew the 4 screws on the side and remove the bottom cover
2. Install the M.2 SSD into the system carefully.
3. Replace the bottom cover.

Note! *When installing the M.2 E-Key module, unscrew the 2 screws for the DIO port, and remove the DIO cable first. Then replace the DIO cable after the module is installed.*

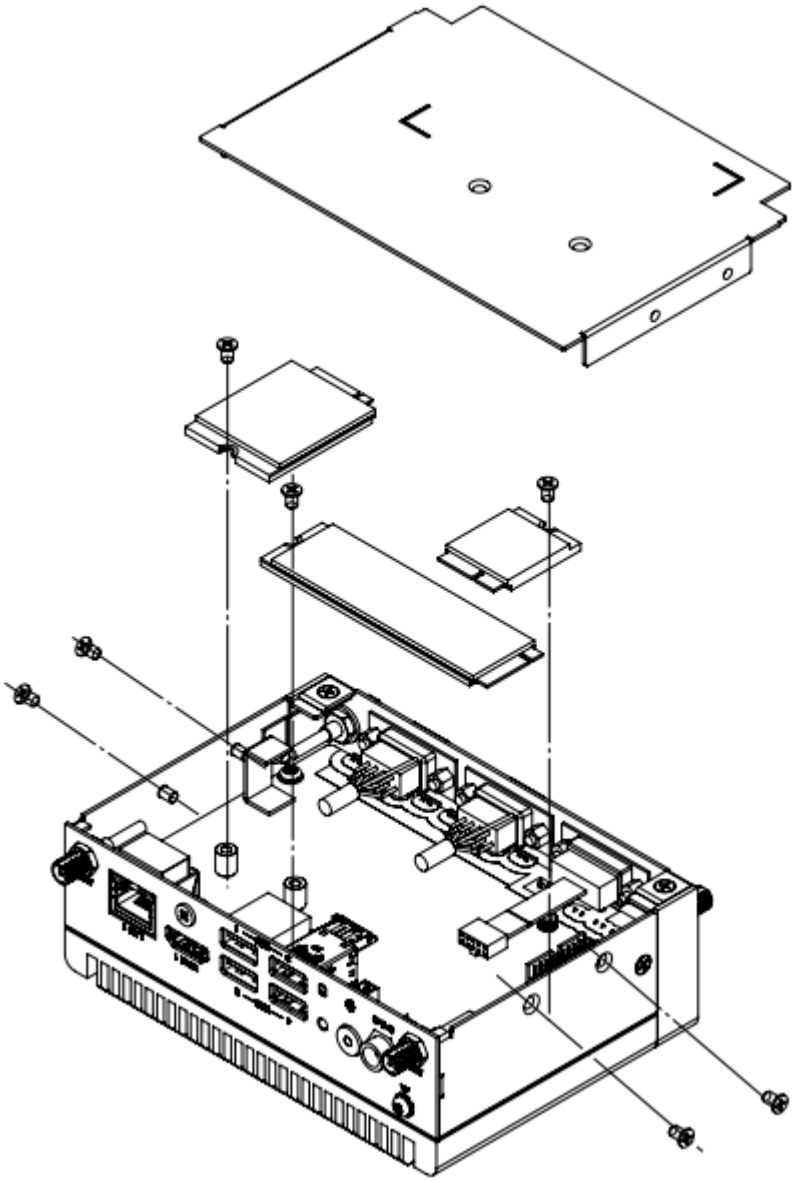
2.4.2.1 ARK-1125H

ARK-1125H provides 2 options for SSD: 1x M.2 2230 E-Key (PCIe x1) and 1 x M.2 2280 B-Key (SATA, PCIe x1).



2.4.2.2 ARK-1125C

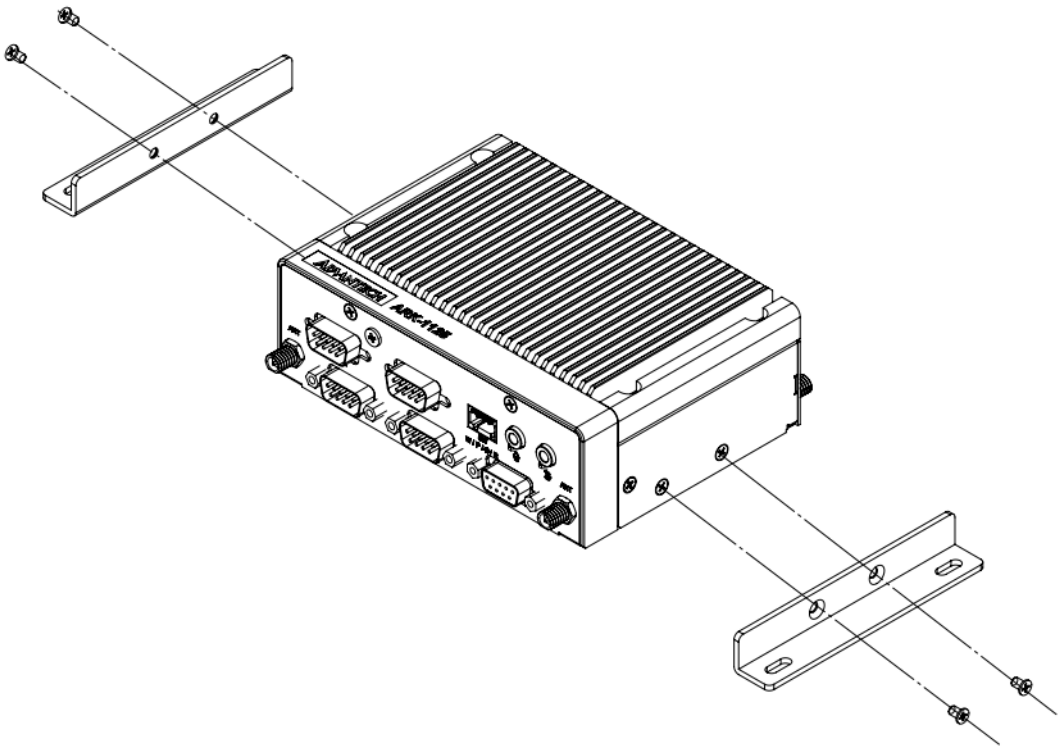
ARK-1125C provides 3 options for SSD: 1 x M.2 2230 E-Key (PCIe x1), 1 x M.2 2280 B-Key (SATA, PCIe x1), and 1x M.2 2242 M-Key (SATA, PCIe x1).



2.4.3 Wall Mount Installation

1. Unscrew the 4 x M3x5L screws on the side.
2. Install the wall mount brackets with the same screws.

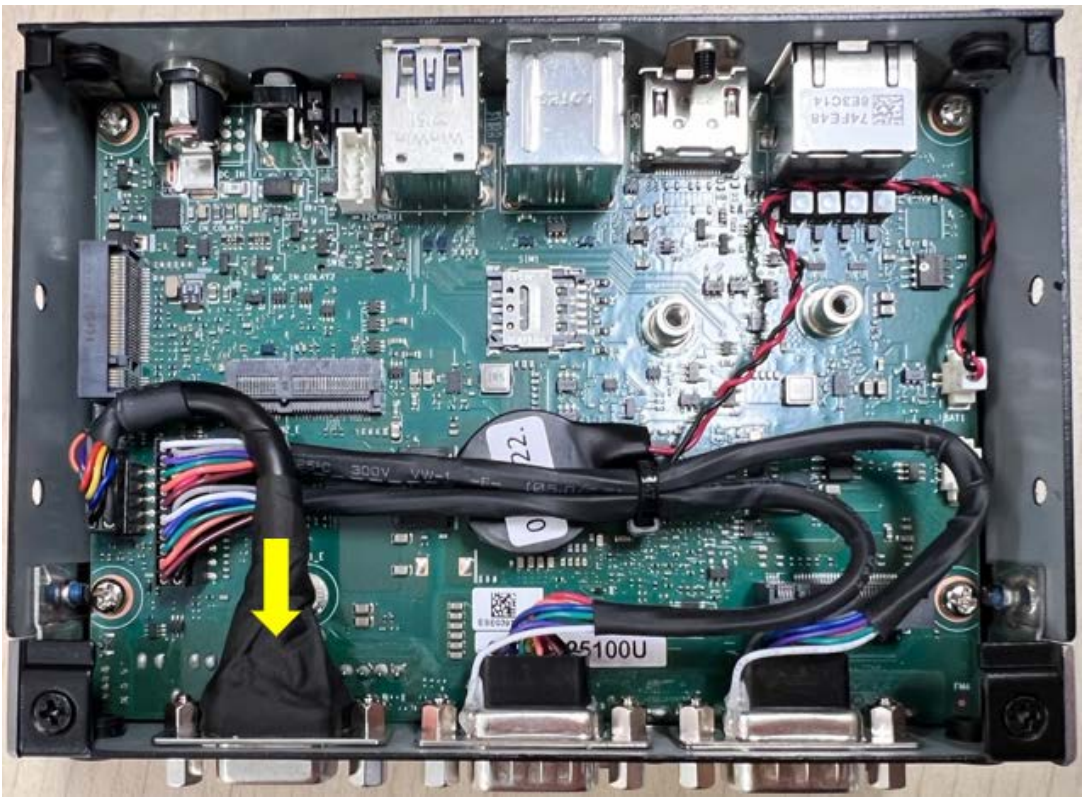
1. Dévissez les 4 vis M3x5L sur le côté
2. Installez les pièces du support mural avec les mêmes vis.



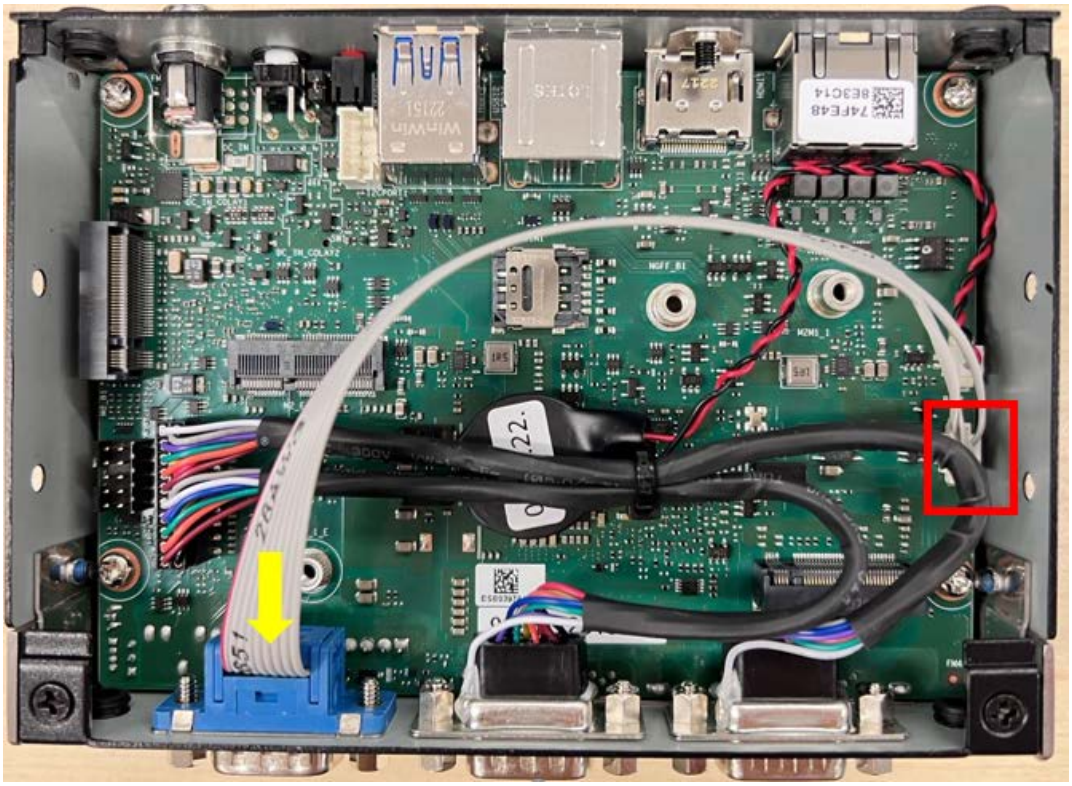
2.4.4 Optional CAN Bus Installation

1. Unscrew the 4 x M3x5L screws on the side and remove the bottom cover.

2. Unscrew the 2 screws for the DIO port, and remove the DIO cable.



3. Connect the CAN bus cable, and replace the bottom cover.



Chapter 3

BIOS Settings

This chapter details instructions for setting BIOS configuration data.

3.1 Introduction

The AMI BIOS ROM has a built-in setup program — the BIOS Setup Utility — that allows users to modify the basic system configuration. All configuration data is stored in battery-backed CMOS to ensure the setup information is retained when the power is turned off. This chapter describes the basic navigation of the ARK-1125 BIOS setup screens.

3.2 Entering BIOS Setup

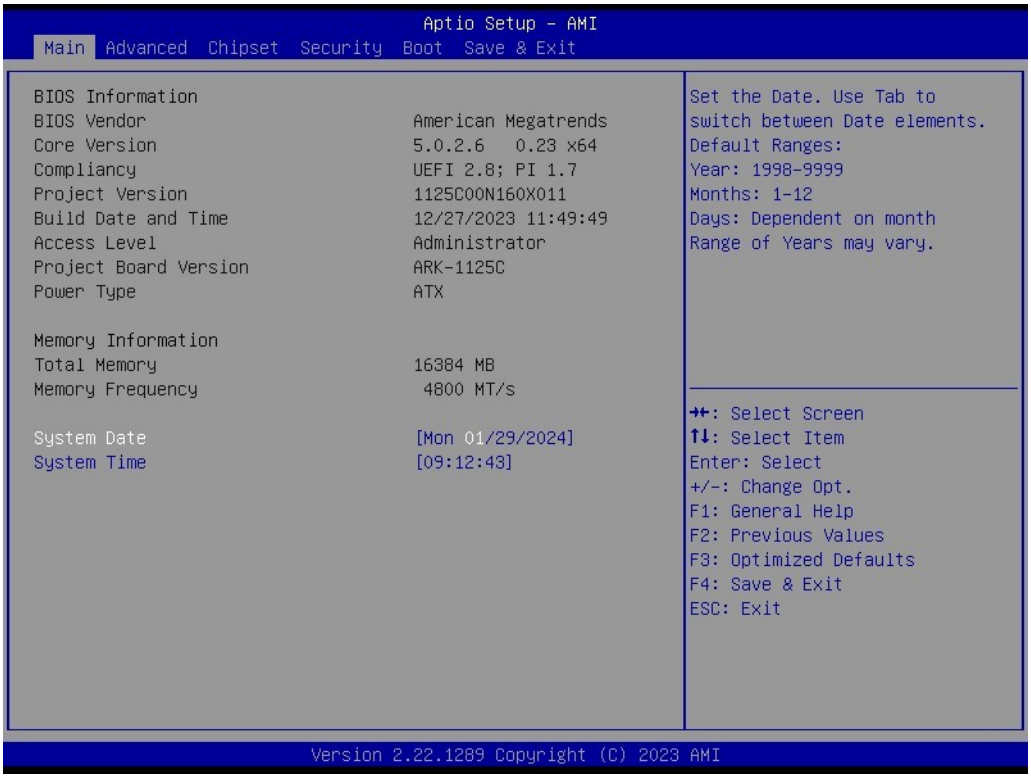
Turn on the computer and then press <ESC> or <DEL> to enter the BIOS Setup menu.

“Main Setup”, “iManager configuration-Serial Port Configuration”, “PCI-IO Configuration-LAN Controller”, “PCI Express Configuration-M.2 Key”, and “PCI-IO Configuration-SATA” are shown for ARK-1125H and ARK-1125C separately. All other settings are the same for ARK-1125C and ARK-1125H.

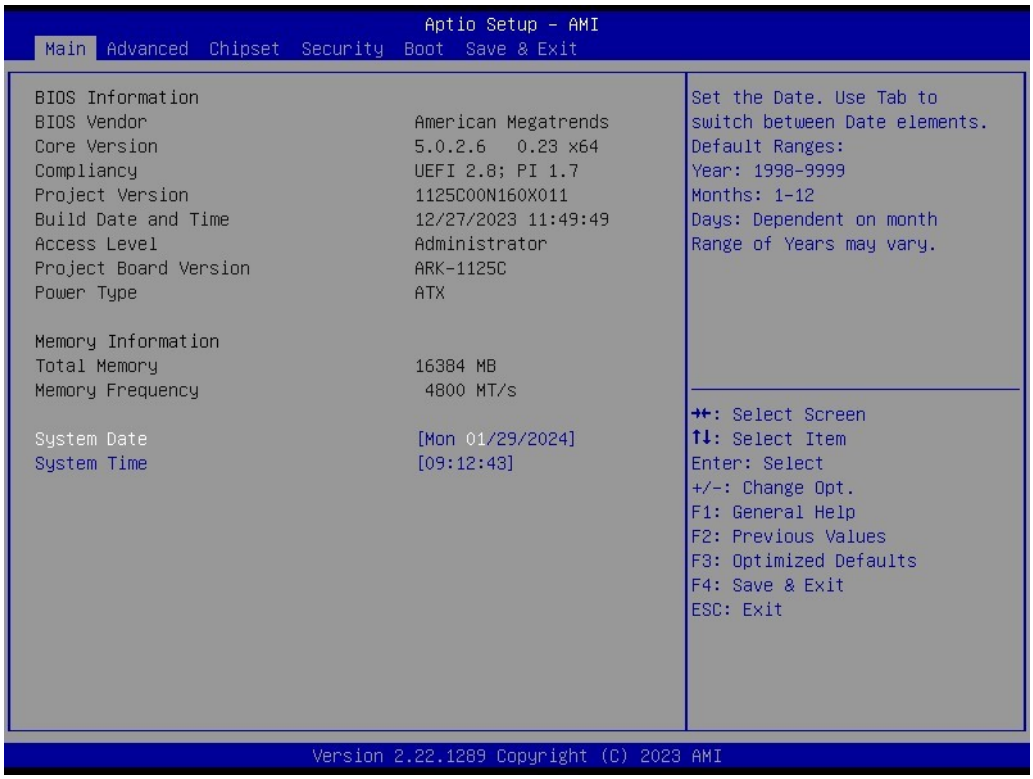
3.2.1 Main Setup

Upon accessing the BIOS Setup Utility, users are presented with the Main Setup page. Users can always return to the Main Setup page by selecting the Main tab. The Main BIOS Setup page is shown below.

ARK-1125H



ARK-1125C



The Main BIOS setup page has two main frames. The left frame displays all the items accessible on the Main page. Items that are grayed out cannot be configured, whereas items presented in blue text can be configured. The right frame displays the key legend.

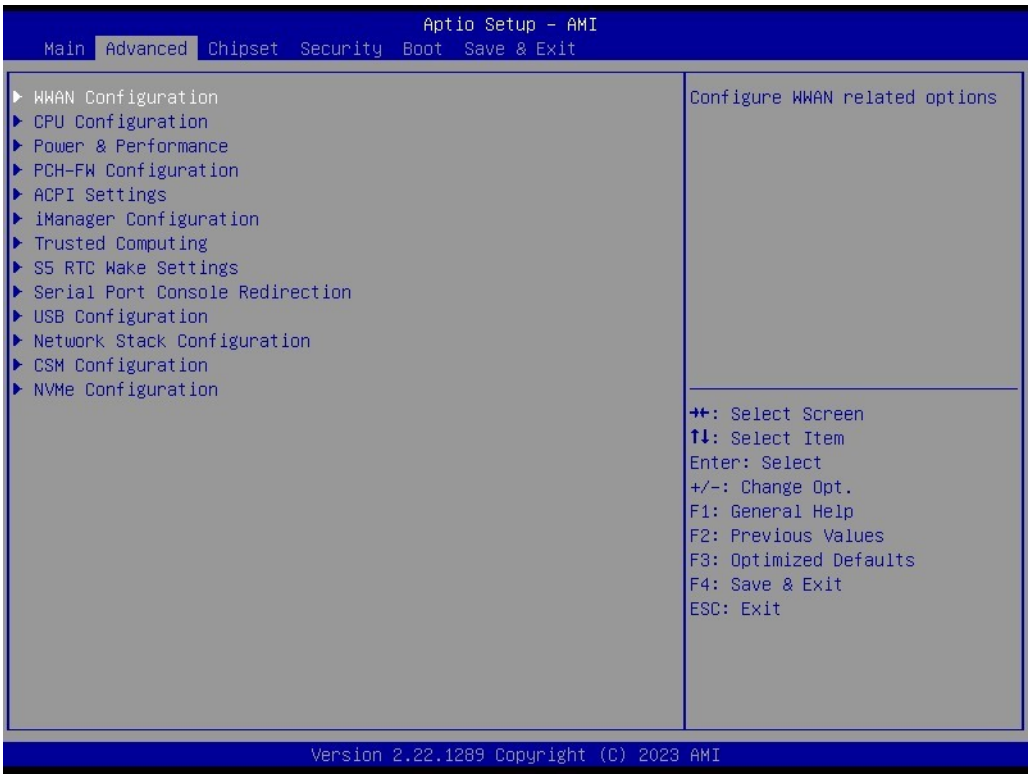
Located above the key legend is an area reserved for a text message. When an item is selected in the left frame, the item is presented in white text and often accompanied by a text message.

- **System Date / System Time**
  Use this option to change the system date and time. Highlight System Date or System Time using the <Arrow> keys. Enter new values via the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format, and the time must be entered in HH:MM:SS format.

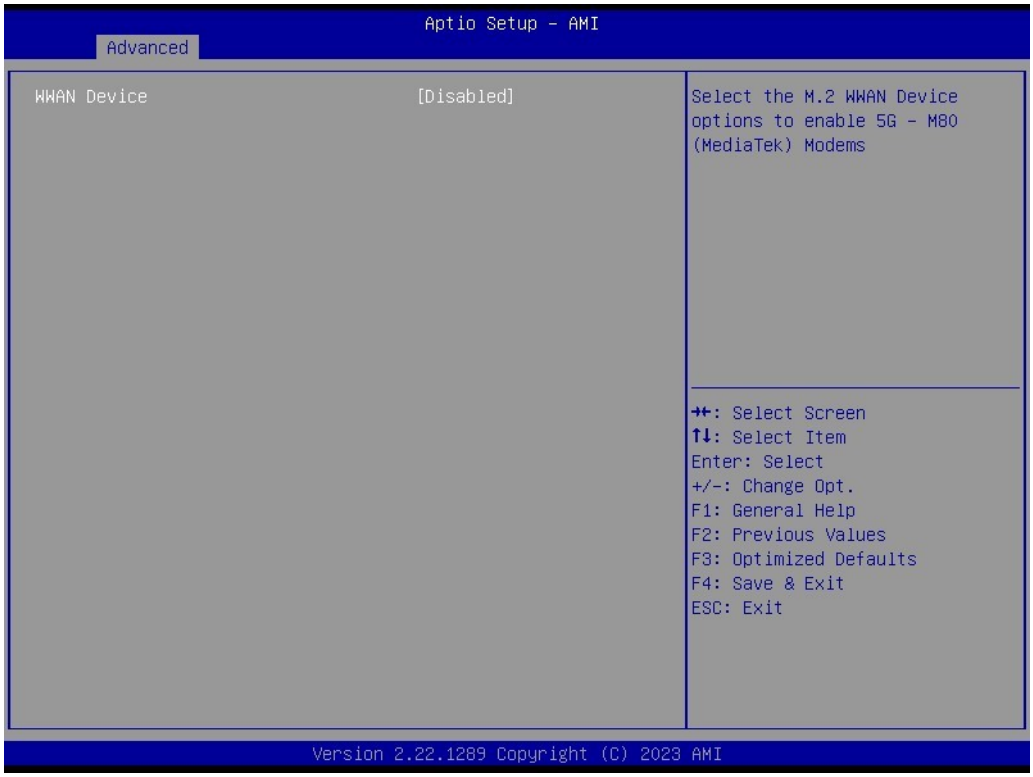
3.2.2 Advanced Setup

Select the Advanced tab from the BIOS Setup Utility to enter the Advanced BIOS Setup page. Select any of the items in the left frame of the screen, such as CPU Configuration, to access the sub-menu for that item. The options for any of the Advanced BIOS Setup items can be displayed by highlighting the item using the <Arrow> keys.

The Advanced BIOS Setup page is shown below:



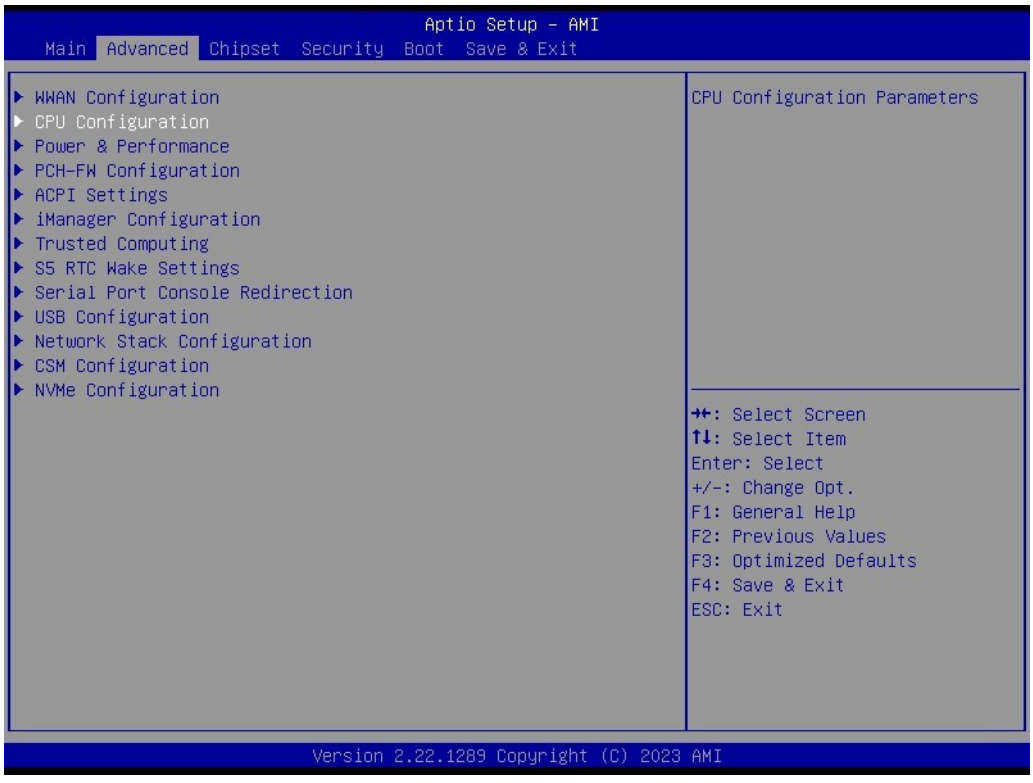
3.2.2.1 WWAN Configuration

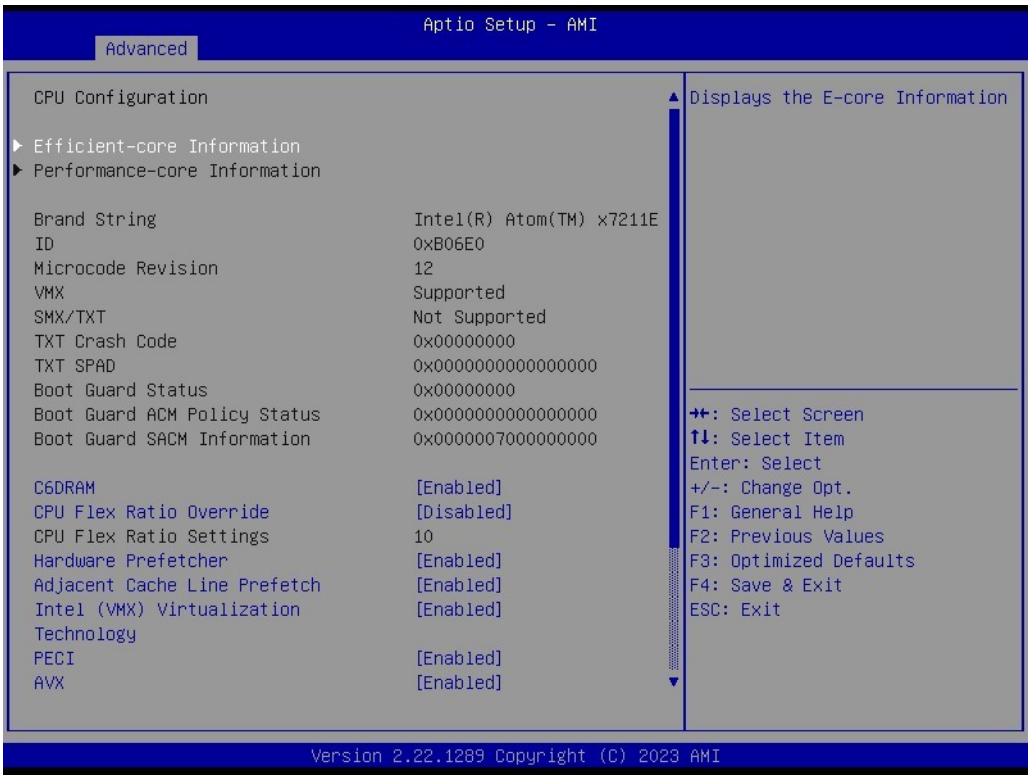


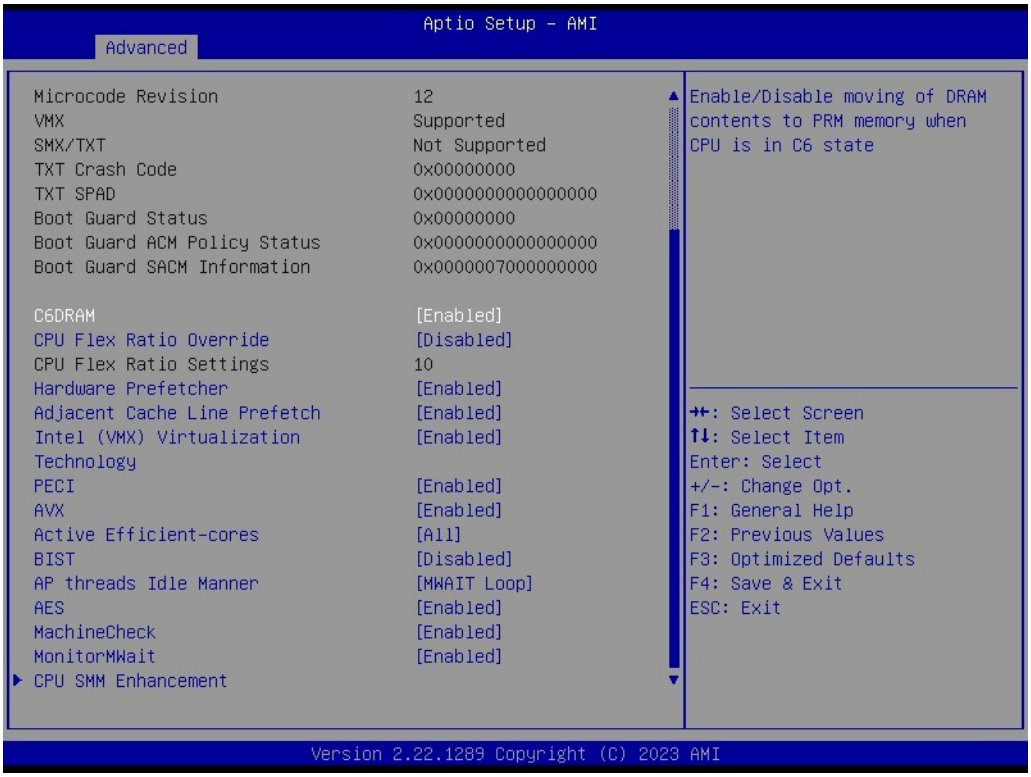
WWAN Configuration

- **WWAN Device**
  Enable/Disable M.2 WWAN Device.

3.2.2.2 CPU Configuration



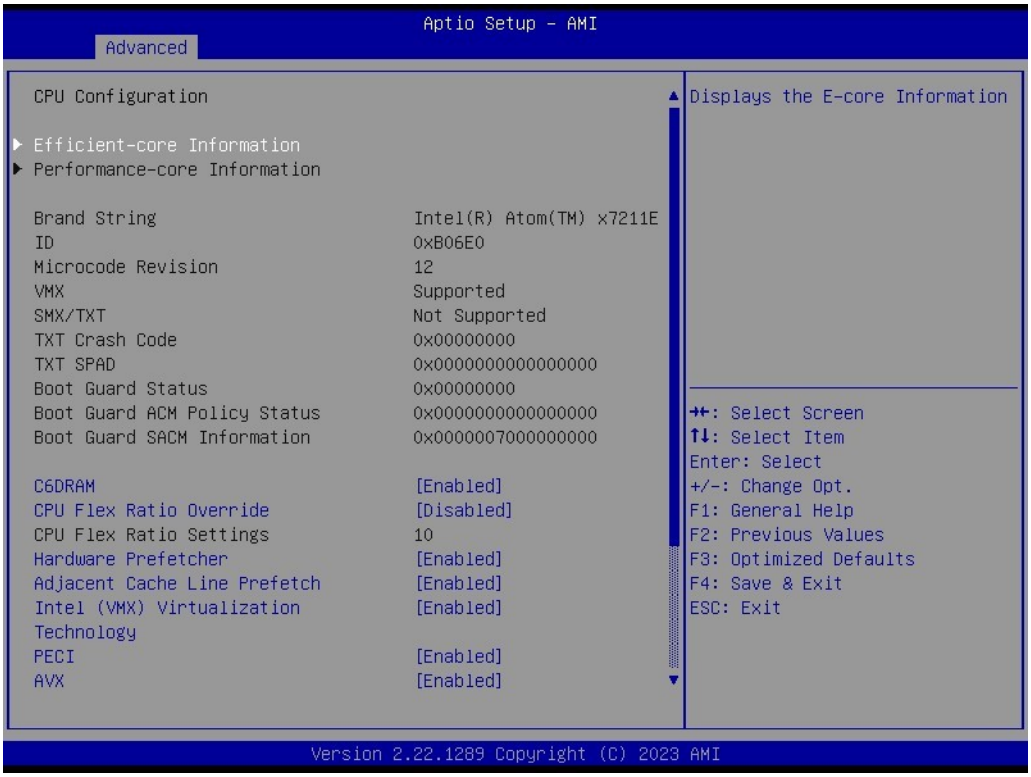


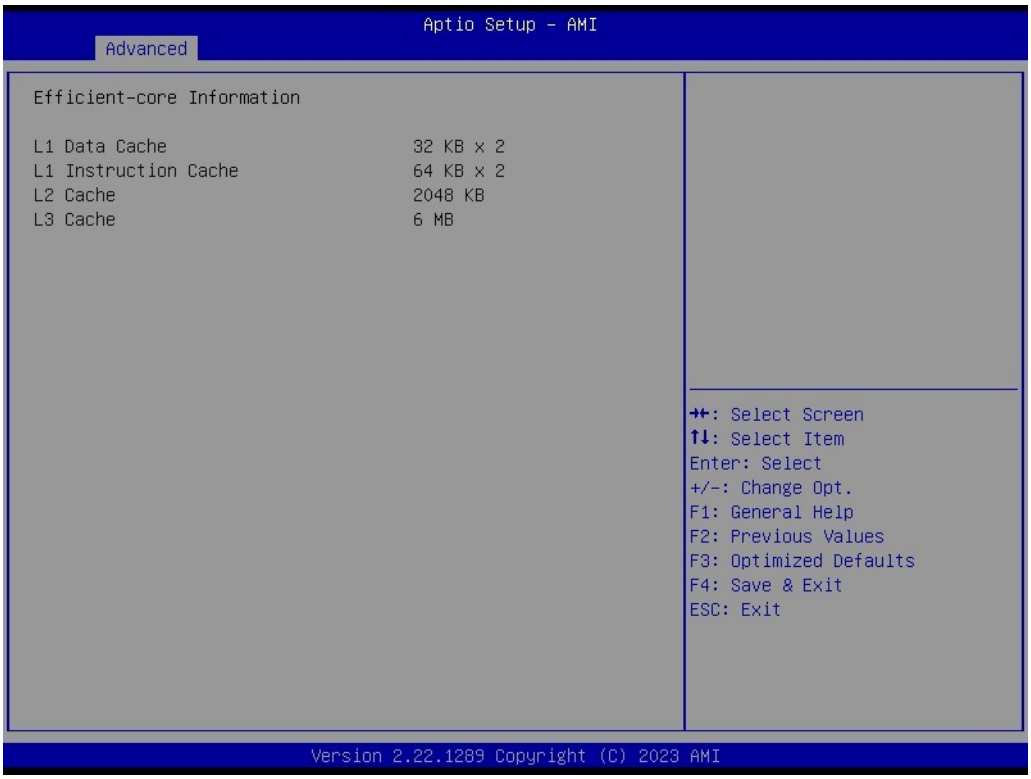


- **Efficient-core Information**
  Displays the Efficient-core Information.
- **Performance-core Information**
  Displays the P-core Information.

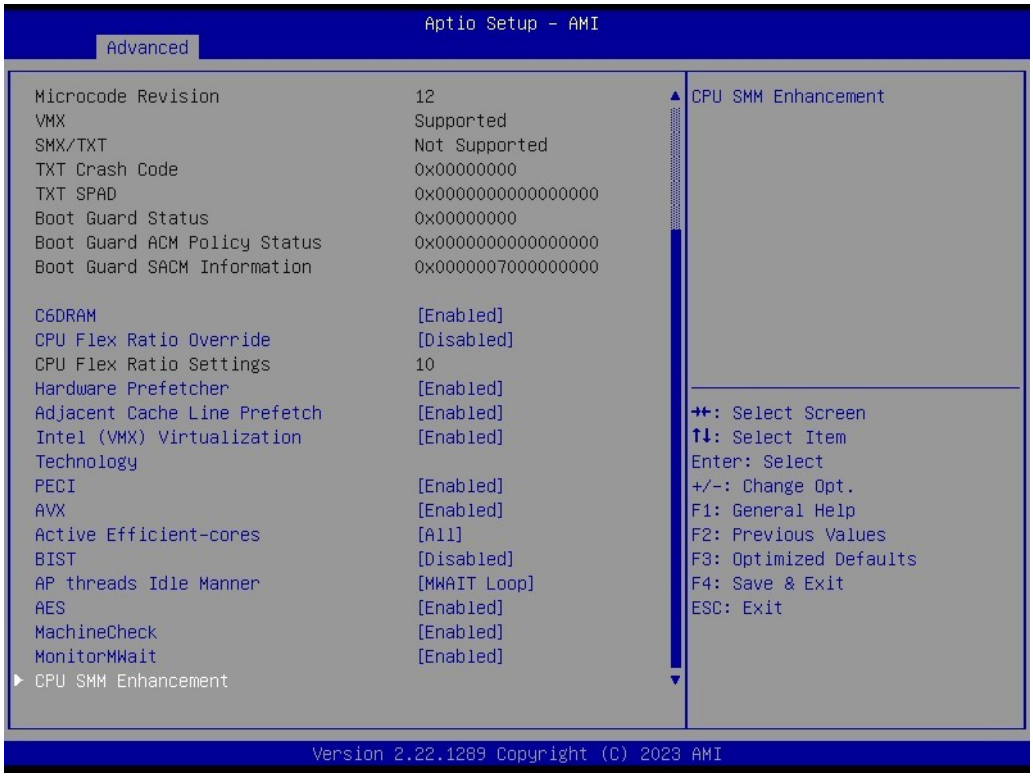
- **C60RAM**
  Enable/Disable moving of DRAM contents to PRM memory when the CPU is in C6 state. Enable/Disable C60RAM.
- **CPU Flex Ratio Override**
  Enable/Disable CPU Flex Ratio Programming.
- **CPU Flex Ratio Settings**
  This value must be between the Max Efficiency Ratio (LFM) and the Maximum non-turbo ratio set by hardware (HFM).
- **Hardware Prefetcher**
  To turn on/off the MLC streamer prefetcher.
- **Adjacent Cache Line Prefetch**
  To turn on/off prefetching of adjacent cache lines.
- **Intel® (VMX) Virtualization Technology**
  When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
- **PECI**
  Enable/Disable PECI.
- **AVX**
  Enable/Disable the Avx 2 Instructions. This is applicable for Performance-core only.
- **Active Efficient-cores**
  Enable/Disable Per Core Disable. When Per Core Disable Configuration is enabled, selection of Active Cores and Active Efficient-cores will be disabled.
- **BIST**
  Enable/Disable BIST (Built-in Self Test) on reset.
- **AP threads Idle Manner**
  AP threads Idle Manner for waiting signal to run.
- **AES**
  Enable/Disable AES. (Advanced Encryption Standard)
- **MachineCheck**
  Enable/Disable Machine Check.
- **MonitorMWait**
  Enable/Disable MonitorMWait. If Disabled, the AP threads Idle Manner should not be set to MWAIT Loop.

Efficient-core Information





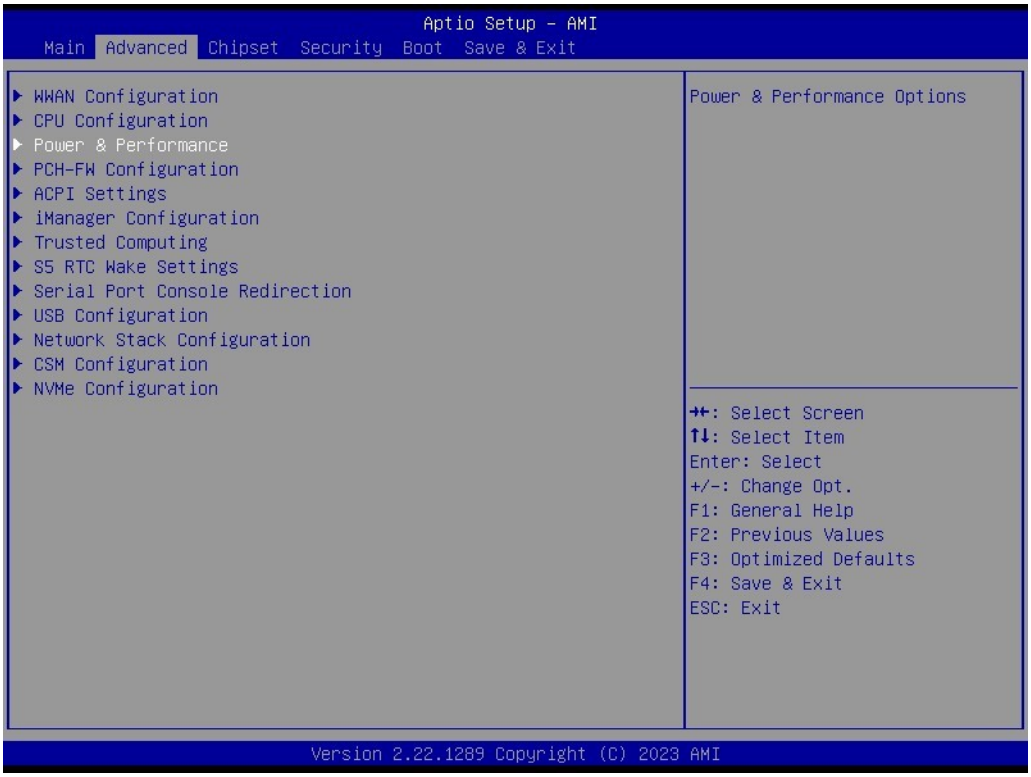
CPU SMM Enhancement



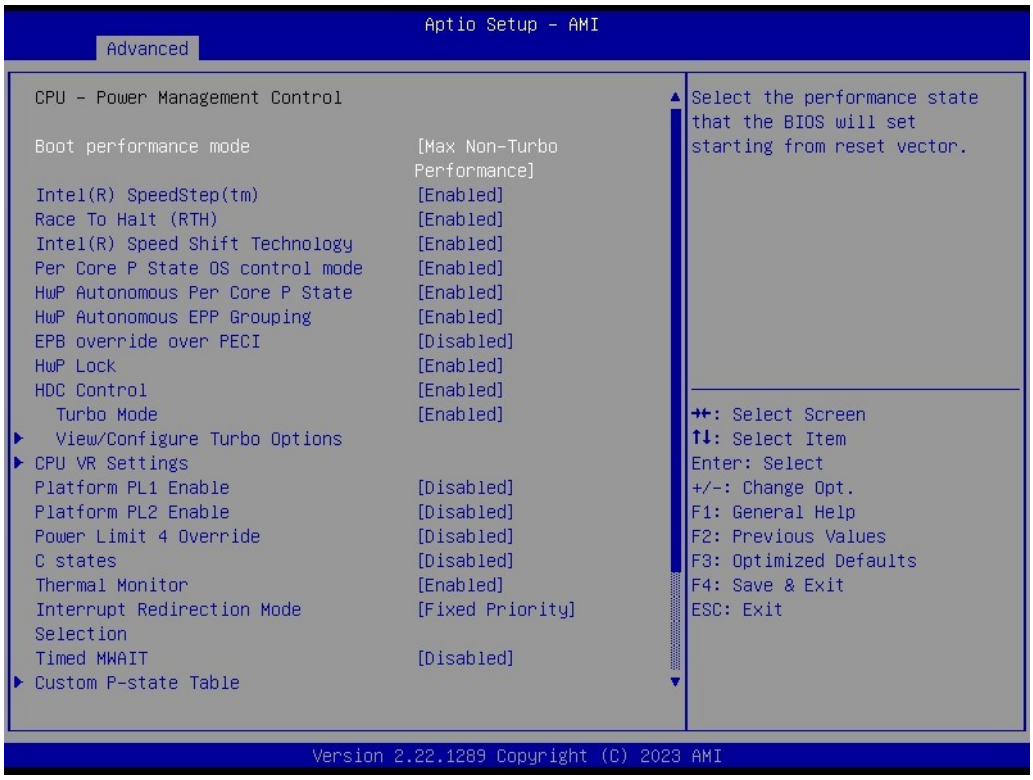
- **SMM Use Delay Indication**
  Enable/Disable usage of SMM_DELAYED MSR for MP sync in SMI.
- **SMM Use Block Indication**
  Enable/Disable usage of SMM_BLOCKED MSR for MP sync in SMI.

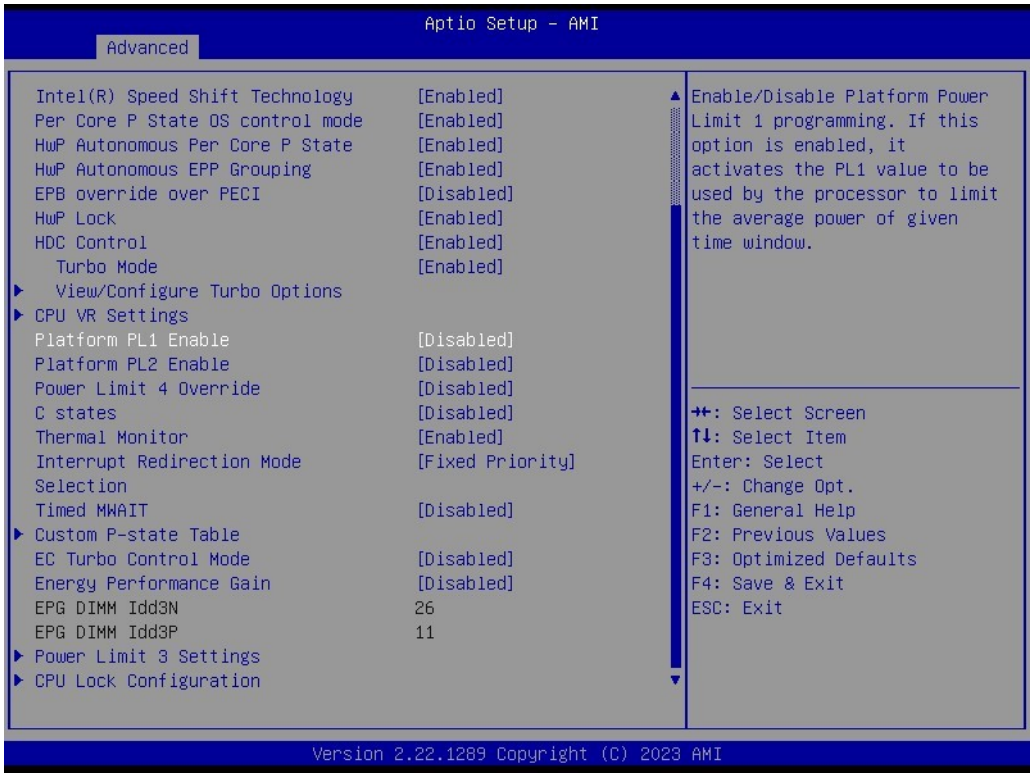
– **SMM Use SMM en-US Indication**
Enable/Disable usage of SMM_ENABLE MSR for MP sync in SMI.

3.2.2.3 Power & Performance – CPU Power Management Control



■ **CPU - Power Management Control**



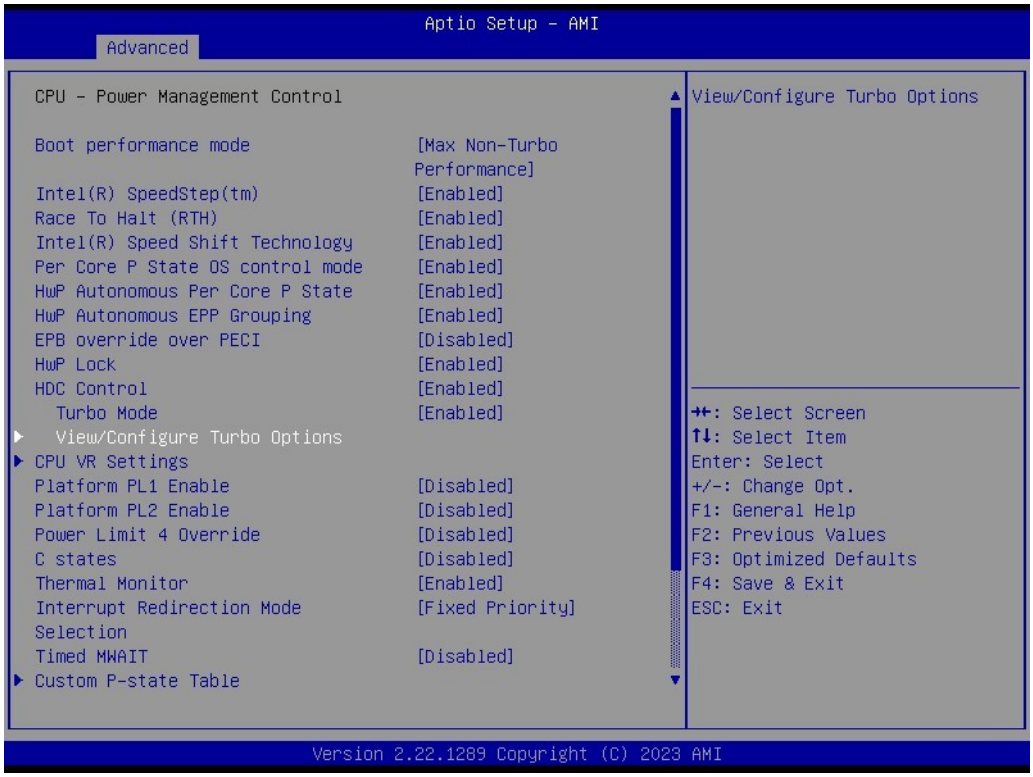


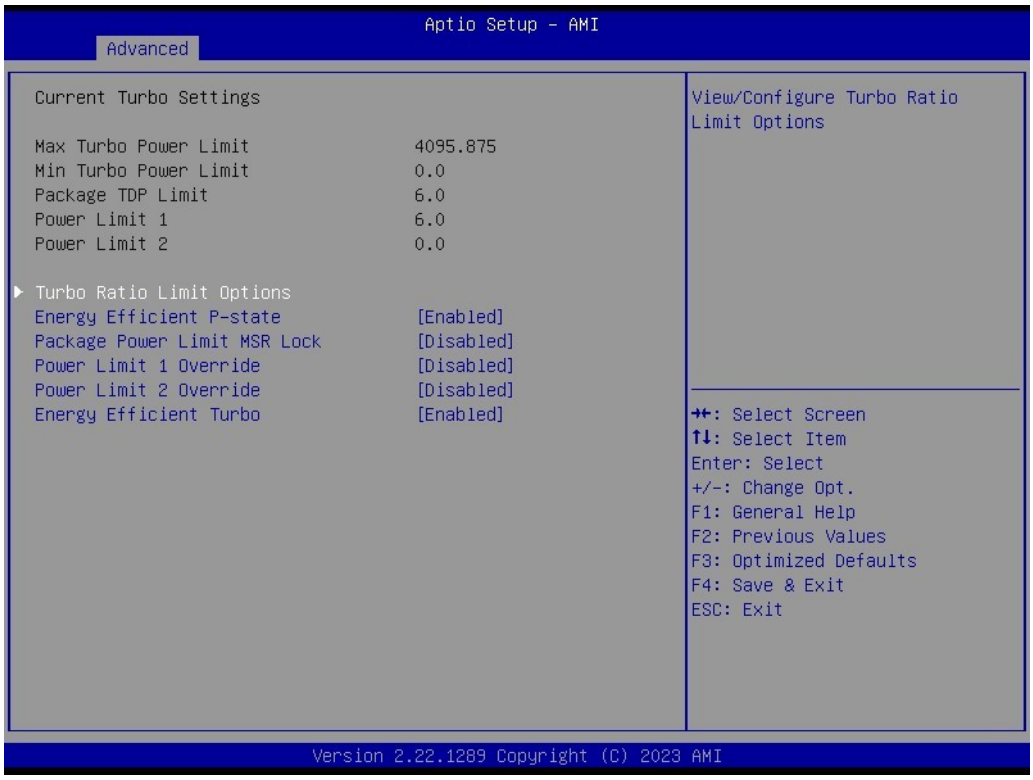
– **Boot performance mode**
  Select the performance state that the BIOS will set before OS hand-off.
– **Intel® Speedstep™**
  Allows more than two frequency ranges to be supported.
– **Race to Halt (RTH)**
  Enable/Disable Race To Halt feature. RTH will dynamically increase CPU fre-

quency in order to enter pkg C-State faster to reduce overall power. (RTH is controlled through MSR 1FC bit 20)

- **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.
- **Per core P state OS control mode**
  Enable/Disable Per Core P state OS control mode. Disabling will set Bit 31 = 1 command 0x06. When set, the highest core request is used for all other core requests.
- **Hwp Autonomous Per core P state**
  Disable Autonomous PCPS (Bit 30 = 1, command 0x11). Autonomous will request the same value for all cores all the time. Enable PCPS (default Bit 30 = 0, command 0x11)
- **Hwp Autonomous EPP grouping**
  Enable EPP grouping (default Bit 29 =0, command 0x11). Autonomous will request the same values for all cores with the same EPP. Disable EPP grouping (Bit 29 =1, command 0x11). Autonomous will not necessarily request the same values for all cores with the same EPP.
- **EPB override over PECI**
  Enable/Disable EPB override over PECI. Enable by sending pcode command 0x2b, subcommand 0x3 to 1. This will allow OOB EPB PECI override control.
- **HWP Lock**
  Enable/Disable HWP Lock support in Misc Power Management MSR.
- **HDC Control**
  This option allows HDC configuration.
- **Turbo Mode**
  Enable/Disable processor Turbo Mode (requires Intel SpeedStep® or Intel Speed Shift to be available and enabled).
- **Platform PL1 Enable**
  Enable/Disable Platform Power Limit 1 programming.
- **Platform PL2 Enable**
  Enable/Disable Platform Power Limit 2 programming.
- **Power Limit 4 Override**
  Enable/Disable Power Limit 4 override.
- **C states**
  Enable/Disable CPU Power Management.
- **Thermal Monitor**
  Enable/Disable Thermal Monitor.
- **Interrupt Redirection Mode Selection**
  Interrupt Redirection Mode Select for Logical Interrupts.
- **Timed MWAIT**
  Enable/Disable Timed MWAIT Support.
- **EC Turbo Control Mode**
  Enable/Disable EC Turbo Control mode.
- **Energy Performance Gain**
  Enable/disable Energy Performance Gain.

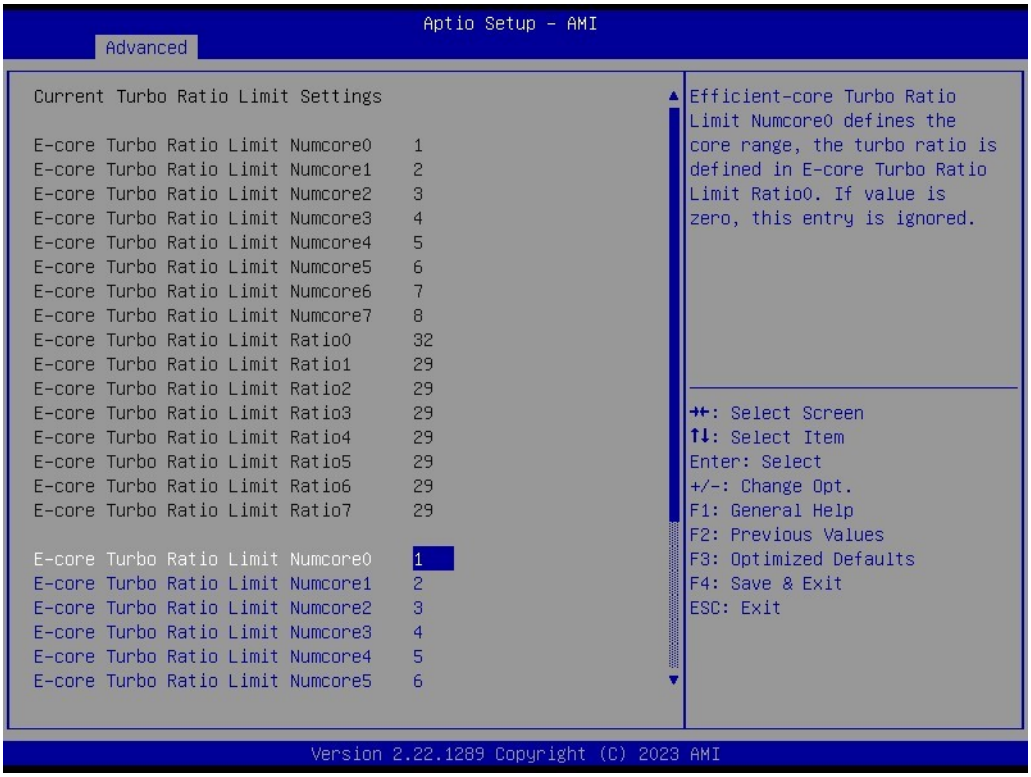
Turbo Ratio Limit Options

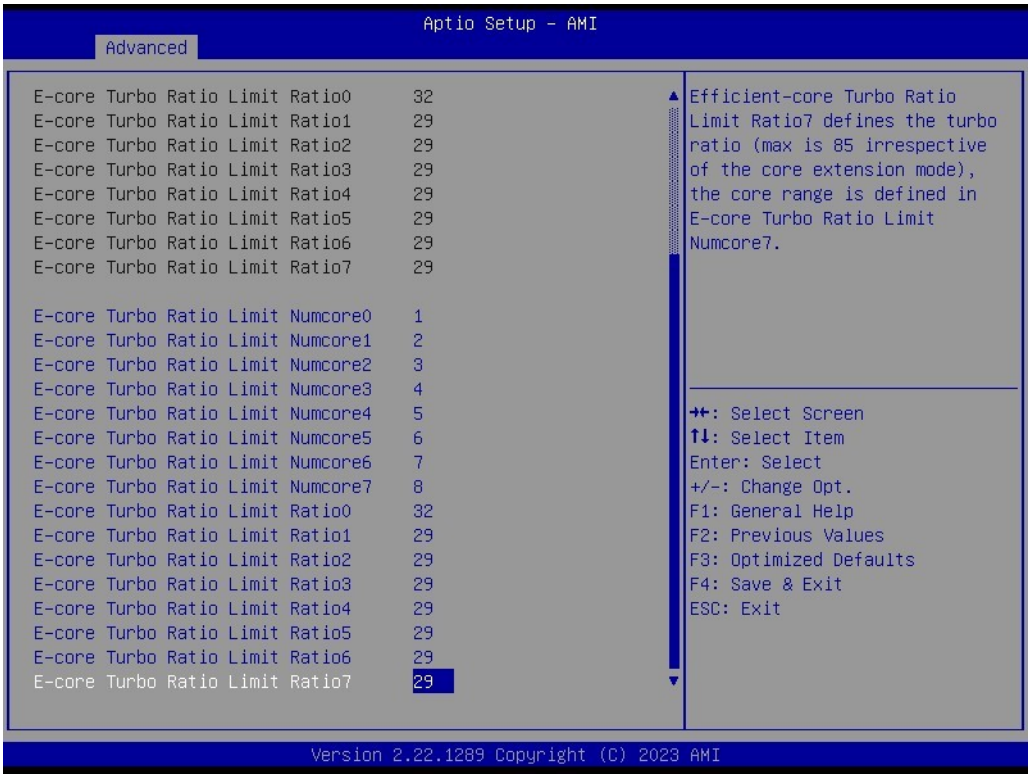




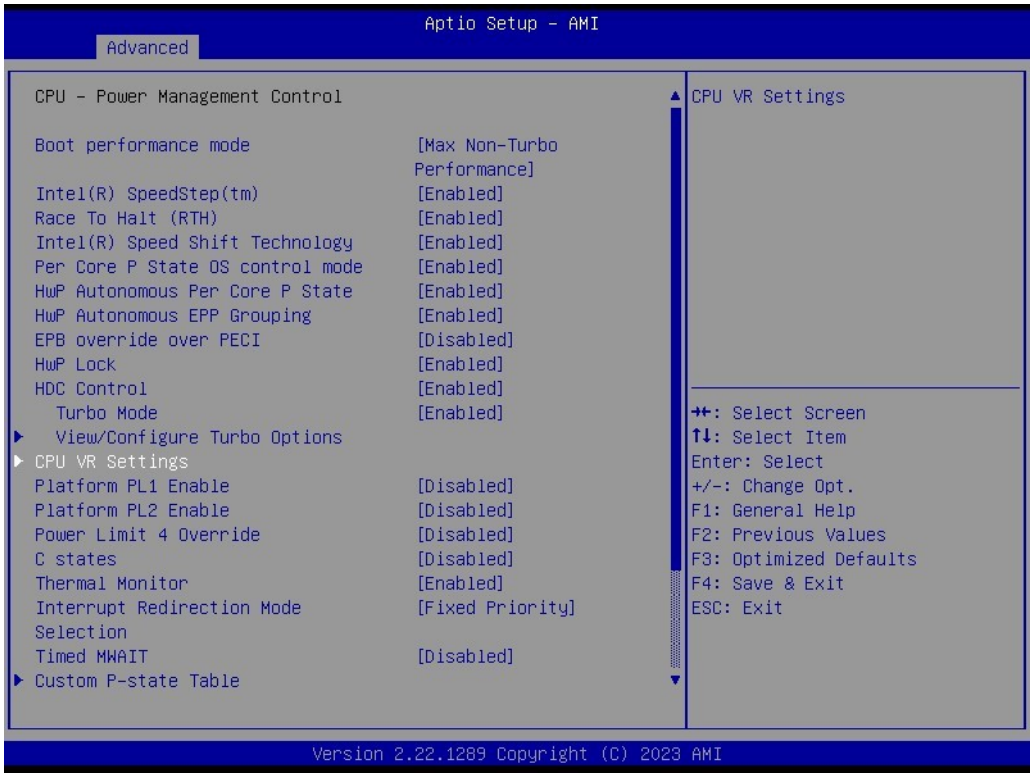
- **Energy Efficient P-state**
  Enable/Disable Energy Efficient P-state feature.
- **Package Power Limit MSR Lock**
  Enable/Disable locking of Package Power Limit settings.

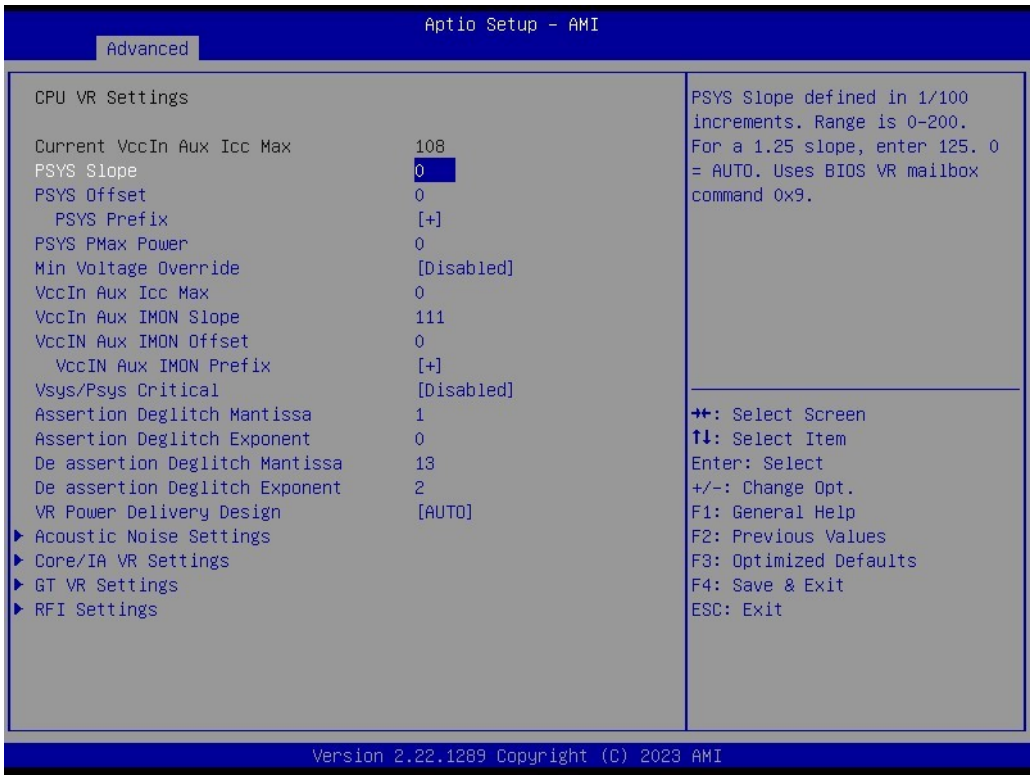
– **Power Limit 1 Override**
  Enable/Disable Power Limit 1 override.
– **Power Limit 2 Override**
  Enable/Disable Power Limit 2 override.
– **Energy Efficient Turbo**
  Enable/Disable Energy Efficient Turbo Feature. This feature will opportunistically lower the turbo frequency to increase efficiency.





CPU VR Settings

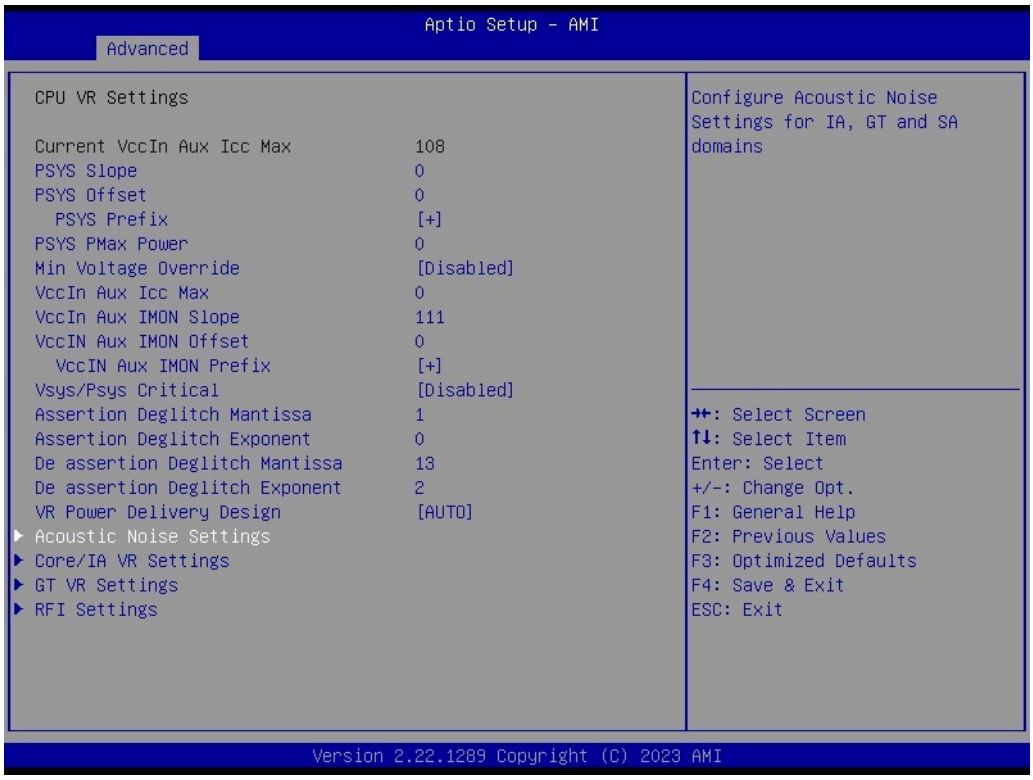


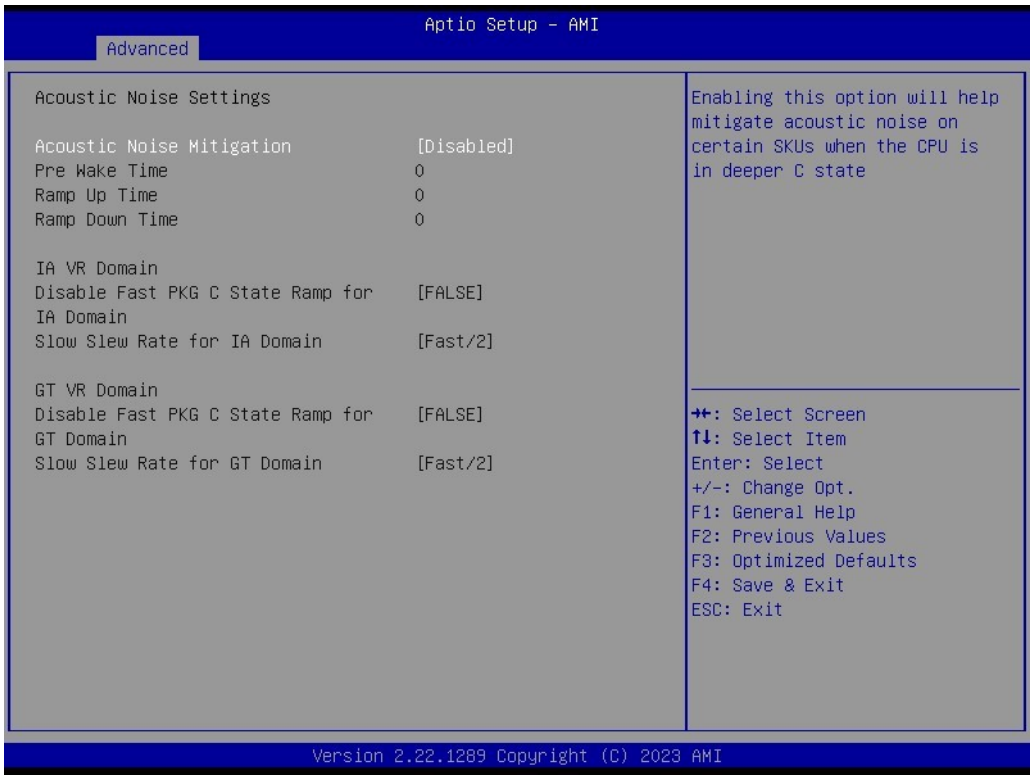


– **PSYS Slope**
PSYS Slope defined in 1/100 increments. Range is 0-200. For a 1.25 slope, enter 125. 0 = AUTO. Uses BIOS VR mailbox command 0x9.

- **PSYS Offset**
  PSYS Offset defined in 1/1000 increments. Range is 0-63999. For an offset of 25.348, enter 25348. PSYS Uses BIOS VR mailbox command 0x4.
- **PSYS prefix**
  Sets the offset value as positive or negative.
- **PSYS PMax Power**
  PSYS PMax power, defined in 1/8 Watt increments. Range 0-8191. For a PMax of 125W, enter 1000. 0 = AUTO. Uses BIOS VR mailbox command 0xB.
- **Min Voltage Override**
  Min Voltage Override. Enable to override minimum voltage for runtime and for C8.
- **VccIn Aux Icc Max**
  Sets the Max Icc VccIn Aux value defined in 1/4A increments. Range is 0-512. For an IccMax 32A, enter 128(32*4).
- **VccIn Aux IMON Slope**
  VccIN Aux IMON Slope defined in 1/100 increments. Range is 0-200. For a 1.25 slope, enter 125. 0 = AUTO. Uses BIOS VR mailbox command 0x18.
- **VccIn Aux IMON Offset**
  VccIN Aux IMON Offset defined in 1/1000 increments. Range is 0-63999. For an offset of 25.348, enter 25348. IMON Uses BIOS VR mailbox command 0x18.
- **VccIN Aux IMON Prefix**
  Sets the offset value as positive or negative.
- **Vsys/Psys Critical**
  Enable/Disable Vsys/Psys Critical.
- **VR Power Delivery Design**
  Specifies the ADL Desktop board design used for the VR settings override values. By default, BIOS will override the default Desktop VR settings based on the board design. A value of AUTO(0) will use the board ID to determine the board design. Any other value will override the board ID logic to provide a custom VR Power Delivery Design value. This is intended primarily for validation.

Acoustic Noise Settings



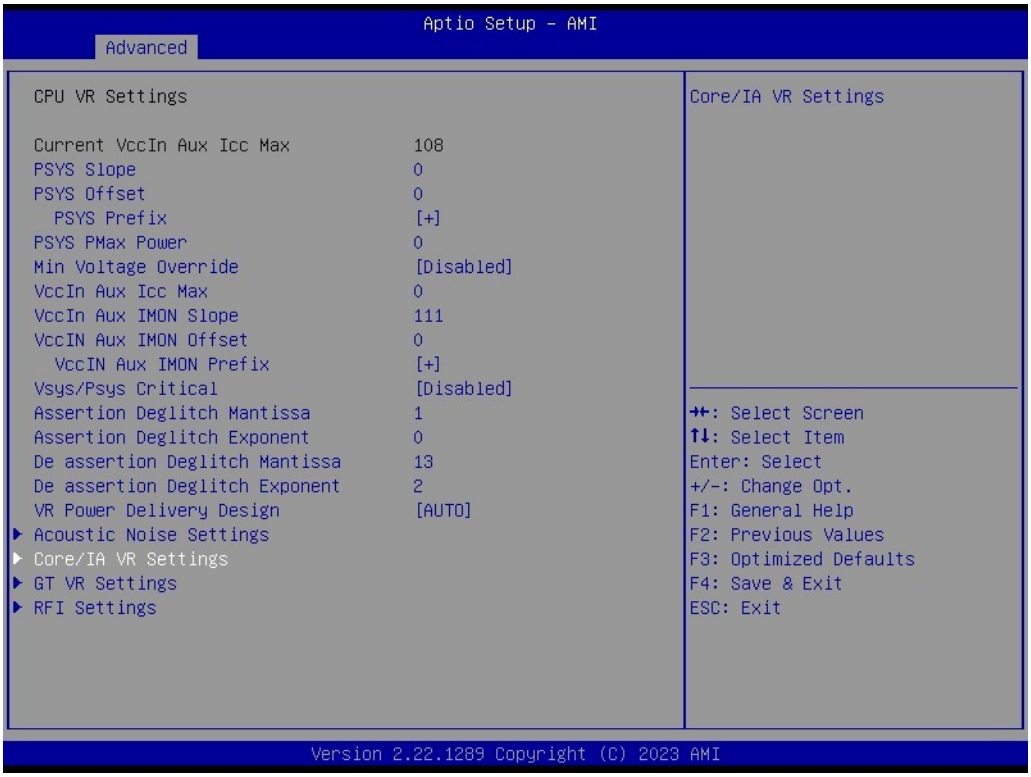


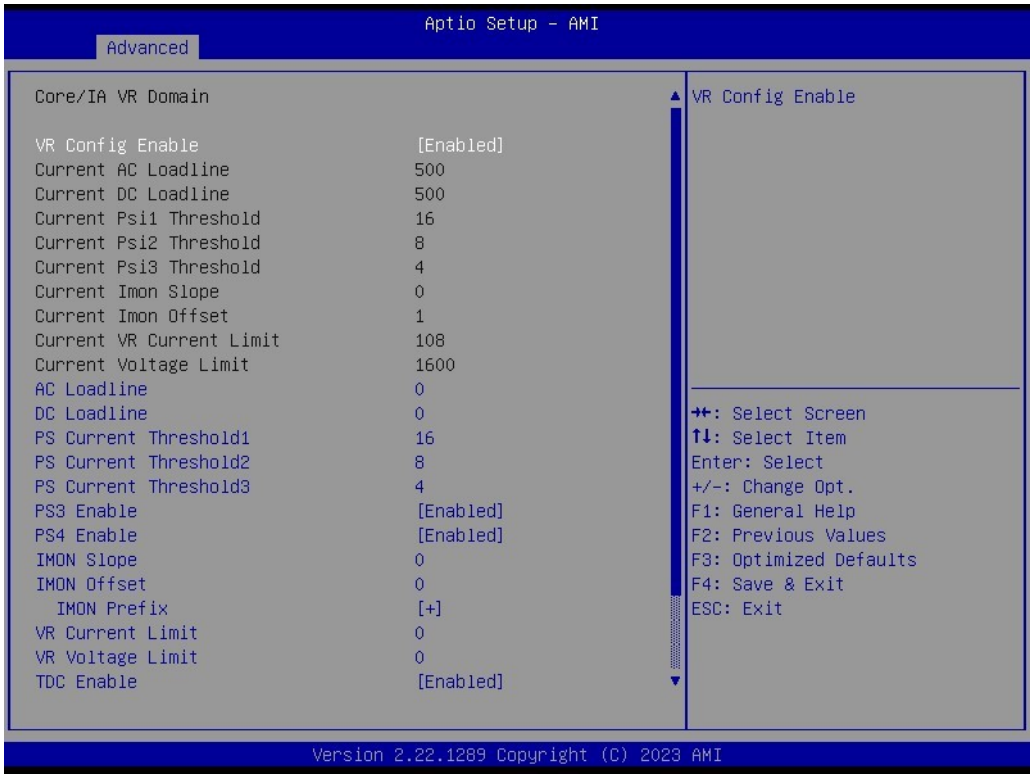
– **Acoustic Noise Mitigation**
  Enabling this option will help mitigate acoustic noise on certain SKUs when the CPU is in a deeper C state.
– **Pre Wake time**
  Set the maximum Pre Wake randomization time in micro ticks. The range is

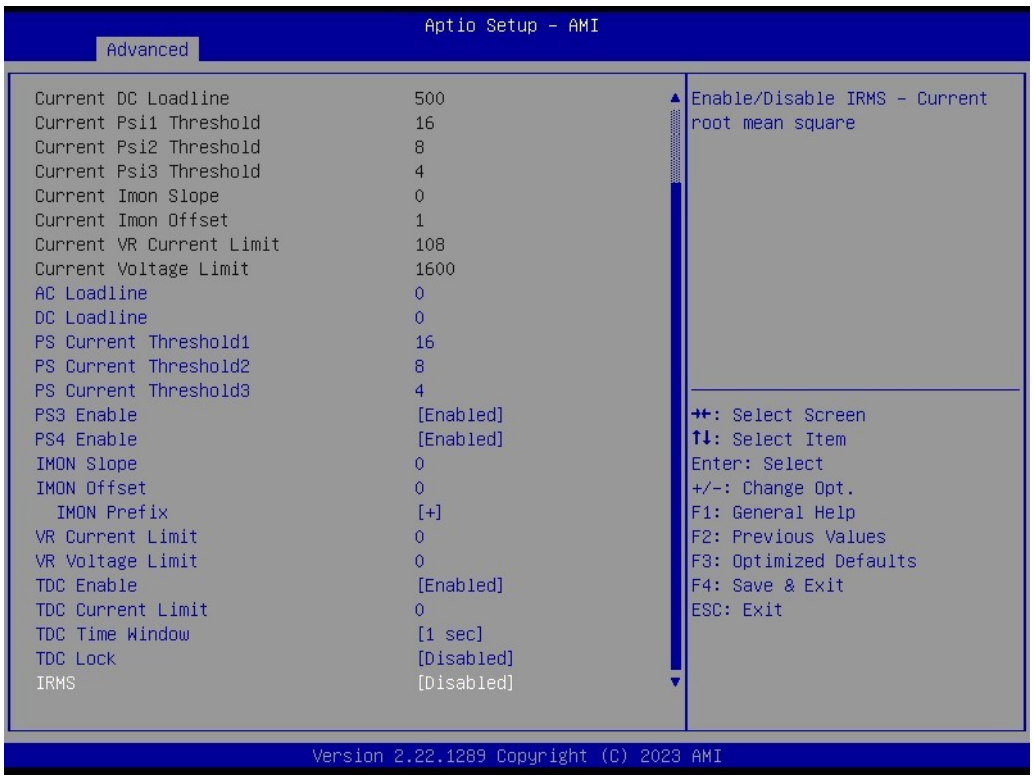
0-255. This is for acoustic noise mitigation Dynamic Perodicity Alteration (DPA) tuning.

- **Ramp Up Time**
  Set the maximum Ramp Up randomization time in micro ticks. The range is 0-255. This is for acoustic noise mitigation Dynamic Perodicity Alteration (DPA) tuning.
- **Ramp Down Time**
  Set the maximum Ramp Down randomization time in micro ticks. The range is 0-255. This is for acoustic noise mitigation Dynamic Perodicity Alteration (DPA) tuning.
- **Disable Fast PKG C State Ramp for IA Domain**
  This option needs to be configured to reduce acoustic noise during deeper C states. False: Don't disable Fast ramp during deeper C states; True: Disable Fast ramp during deeper C state.
- **Slow Slew Rate for IA Domain**
  Set VR IA Slow Slew Rate for Deep Package C State ramp time; Slow slew rate is equal to Fast divided by number; the number is 2, 4, 8, 16 to slow down the slew rate to help minimize acoustic noise.
- **Disable Fast PKG C State Ramp for GT Domain**
  This option needs to be configured to reduce acoustic noise during deeper C states. False: Don't disable Fast ramp during deeper C states; True: Disable Fast ramp during deeper C state.
- **Slow Slew Rate for GT Domain**
  Set VR GT Slow Slew Rate for Deep Package C State ramp time; Slow slew rate is equal to Fast divided by number; the number is 2, 4, 8 to slow down the slew rate to help minimize acoustic noise; divide by 16 is disabled.

Core/IA VR Settings



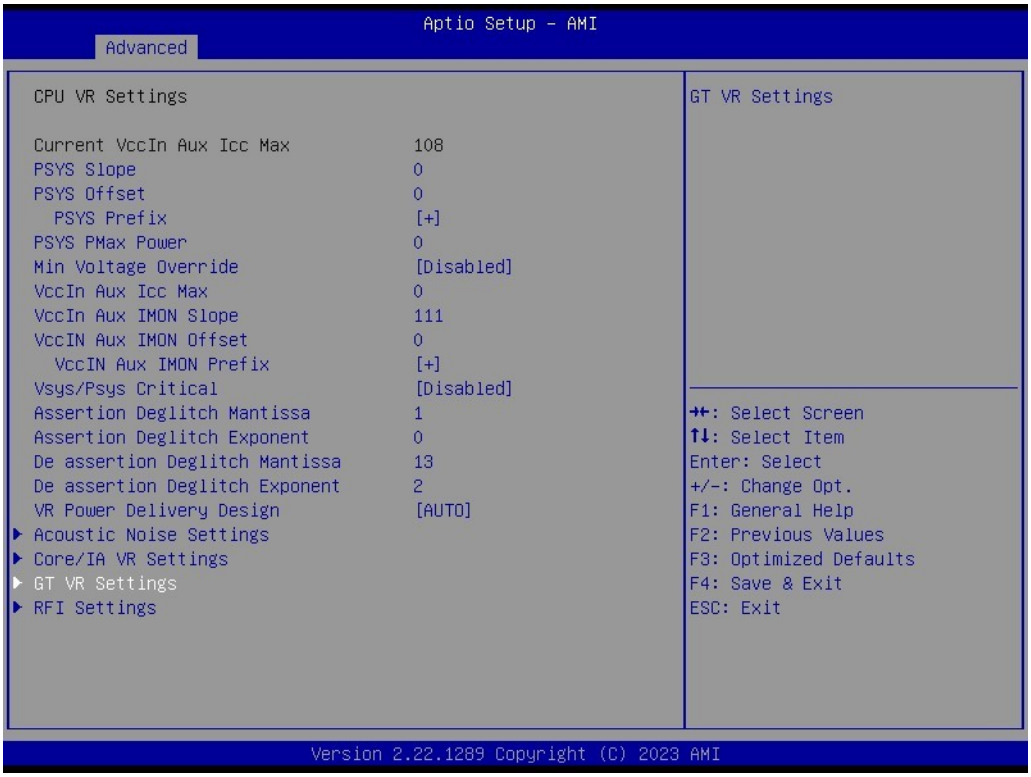


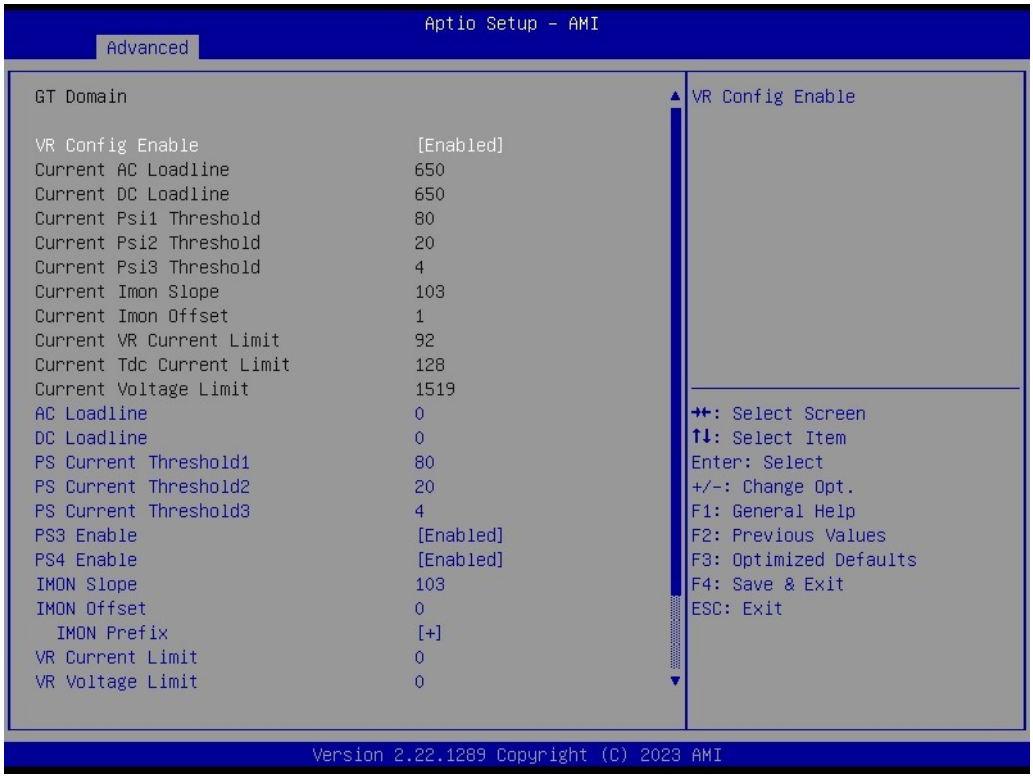


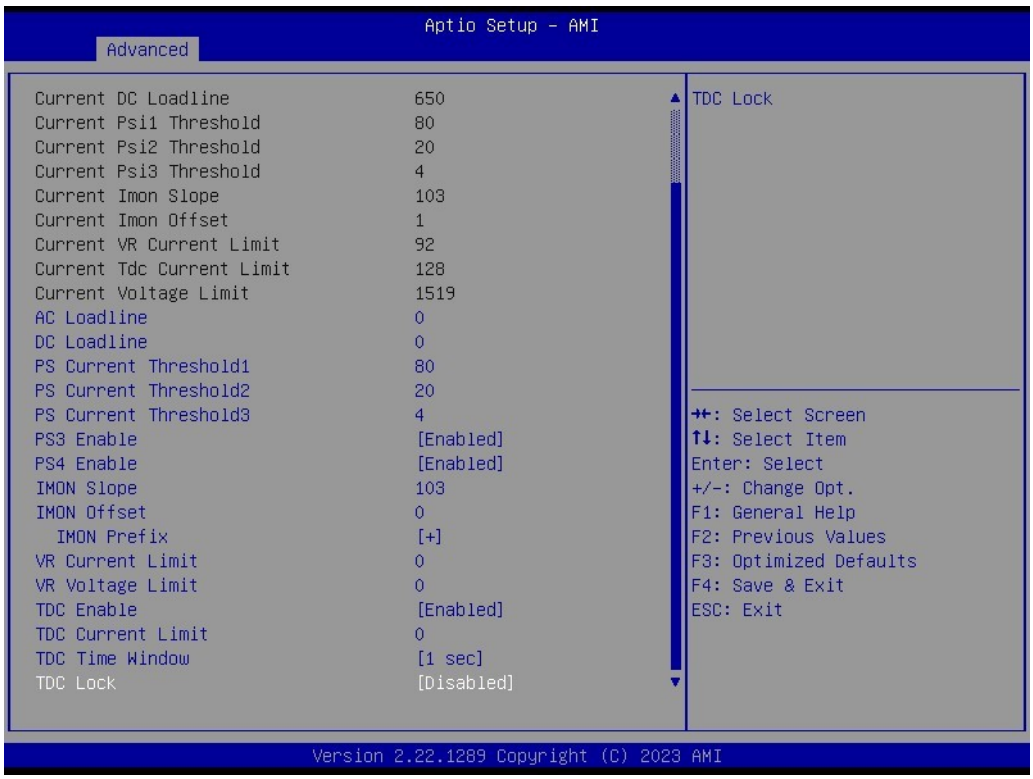
- **VR Config Enable**
  VR Config Enable.
- **PS3 Enable**
  PS3 Enable/Disable. 0 - Disabled, 1 - Enabled. Uses BIOS VR mailbox command 0x3.

- **PS4 Enable**
  PS4 Enable/Disable. 0 - Disabled, 1 - Enabled. Uses BIOS VR mailbox command 0x3.
- **IMON Prefix**
  Sets the offset value as positive or negative.
- **TDC Enable**
  TDC Enable. 0- Disable, 1 – Enable
- **TDC Time Window**
  VR TDC Time Window, value in seconds. 1s is default. Range from 1s to 448s.
- **TDC Lock**
  Enable/Disable TDC Lock.
- **IRMS**
  Enable/Disable IRMS - Current root mean square.

GT VR Settings



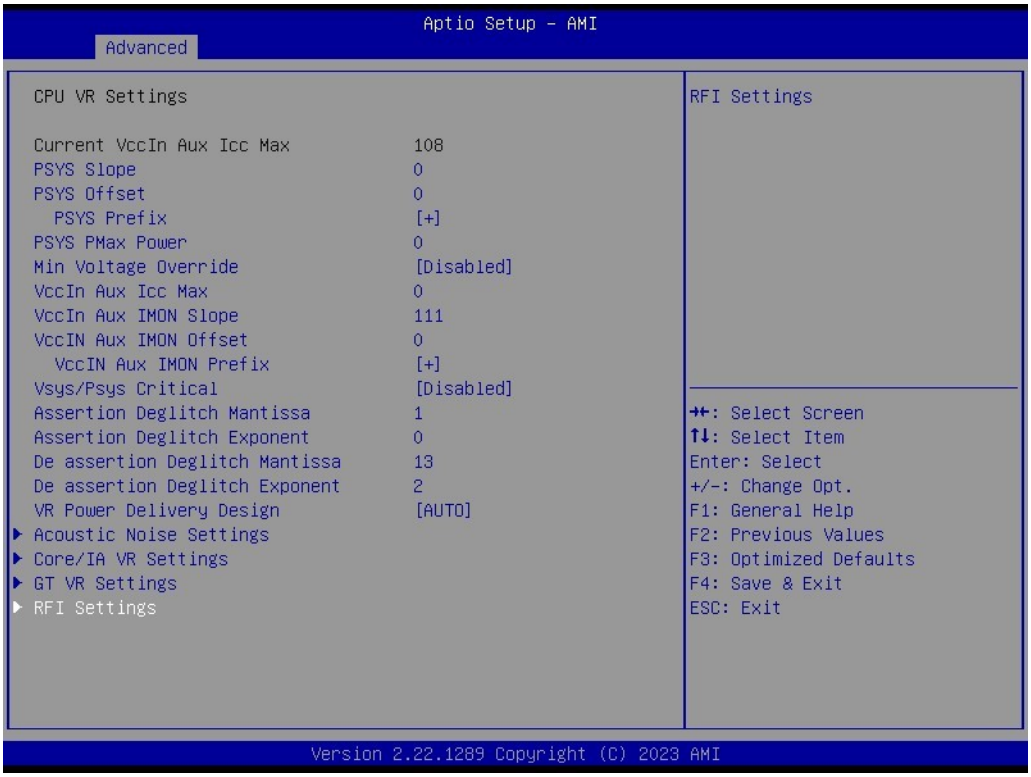


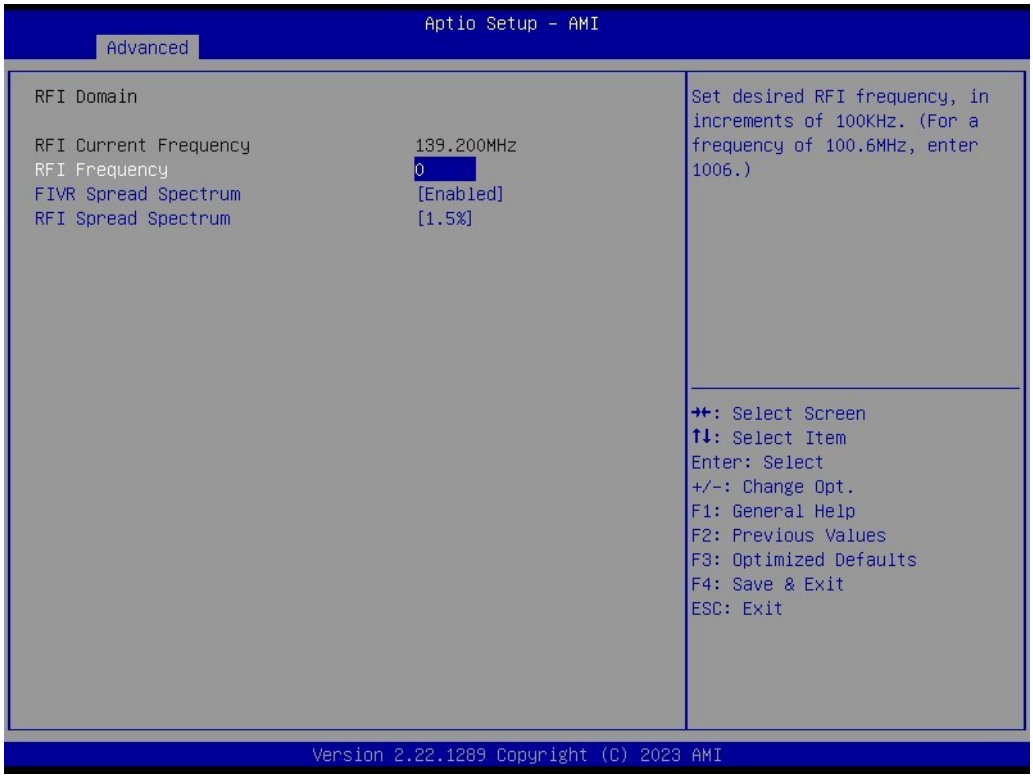


- **VR Config Enable**
  VR Config Enable.
- **PS3 Enable**
  PS3 Enable/Disable. 0 - Disabled, 1 - Enabled. Uses BIOS VR mailbox command 0x3.

- **PS4 Enable**
  PS4 Enable/Disable. 0 - Disabled, 1 - Enabled. Uses BIOS VR mailbox command 0x3.
- **IMON Prefix**
  Sets the offset value as positive or negative.
- **TDC Enable**
  TDC Enable. 0- Disable, 1 – Enable
- **TDC Time Window**
  VR TDC Time Window, value in seconds. 1s is default. Range from 1s to 448s.
- **TDC Lock**
  Enable/Disable TDC Lock.

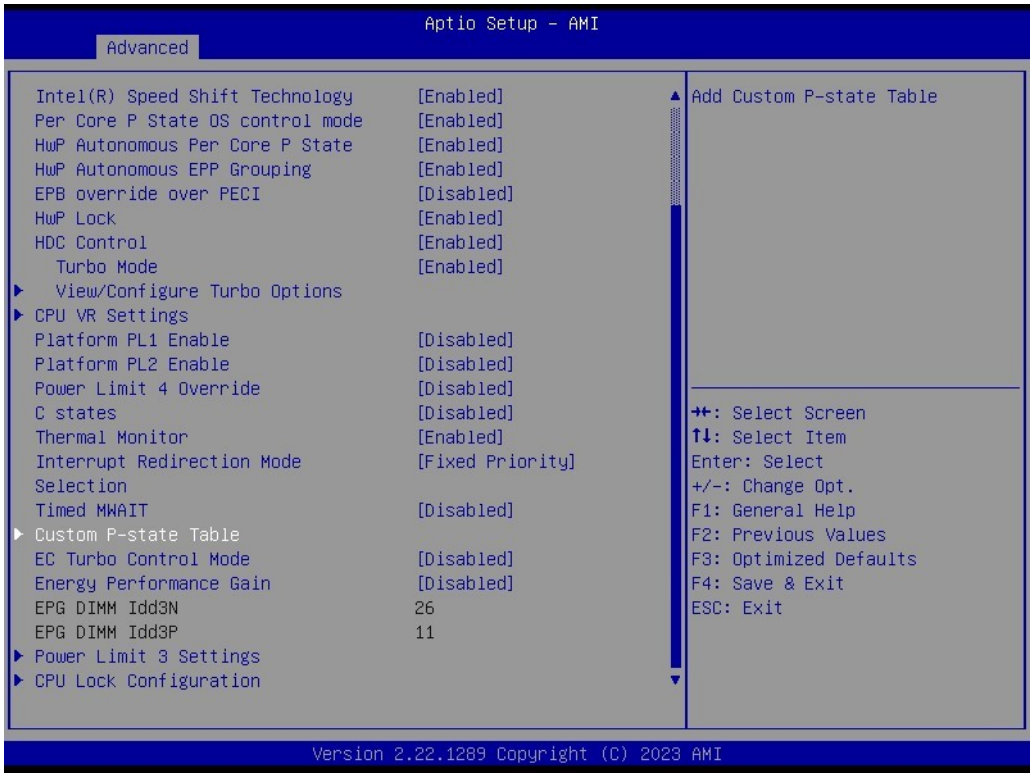
RFI Settings

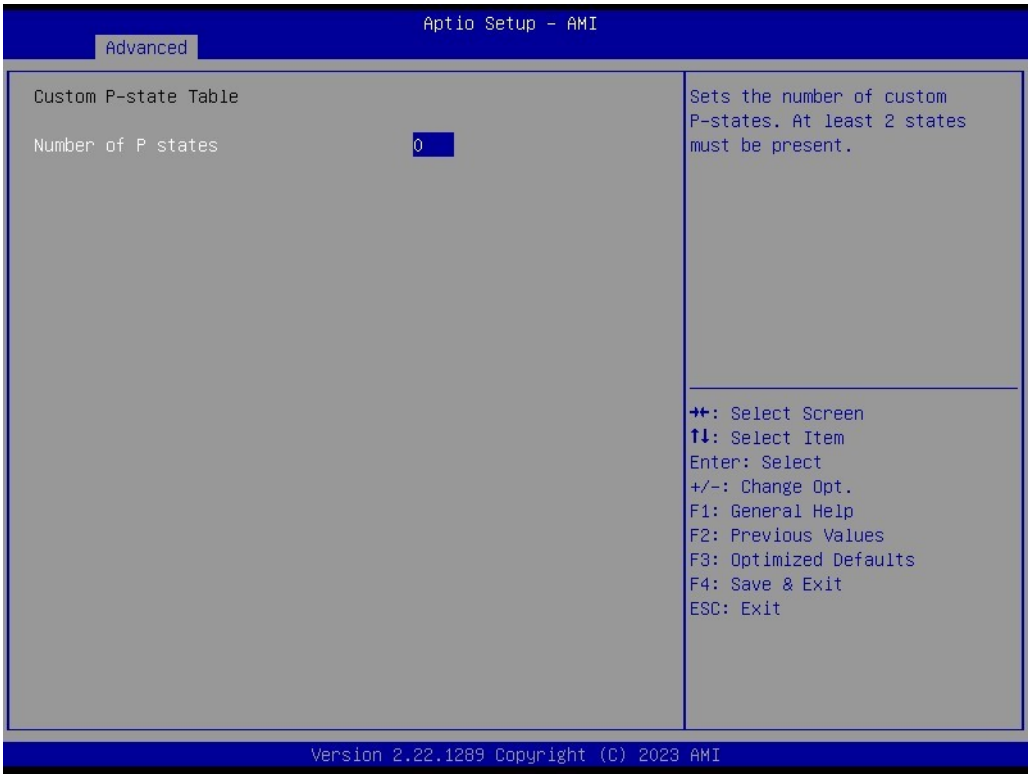




– **FIVR Spread Spectrum**
  Enable or Disable the FIVR Spread Spectrum.
– **RFI Spread Spectrum**
  Set the Spread Spectrum.

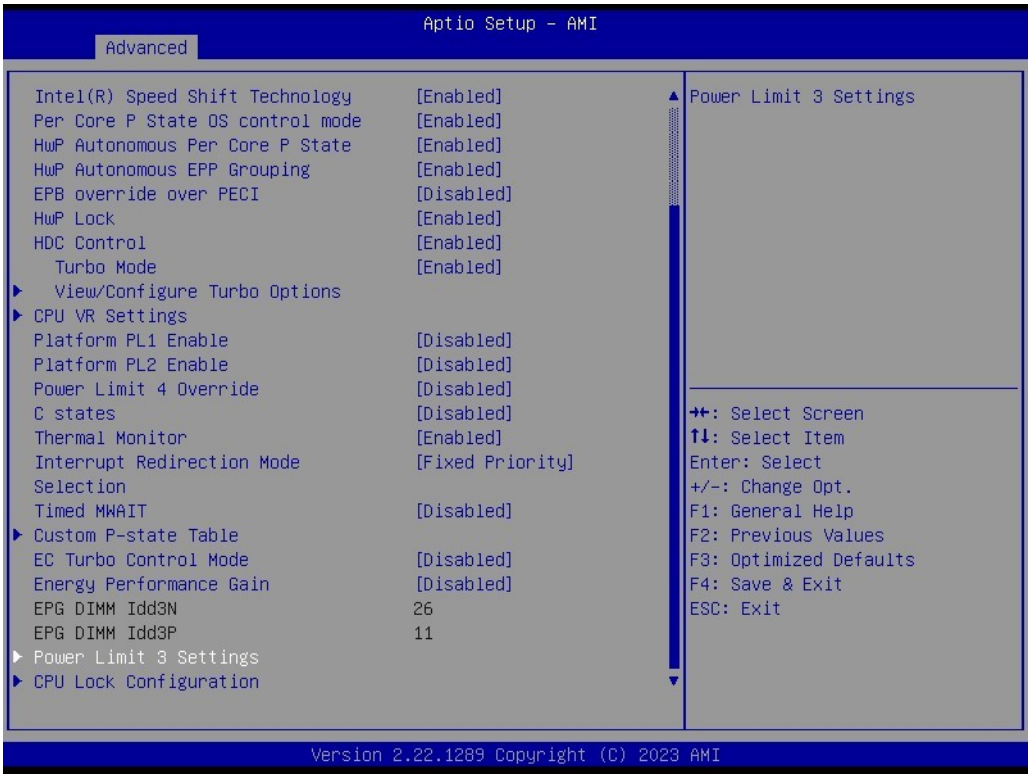
■ Custom P-state Table





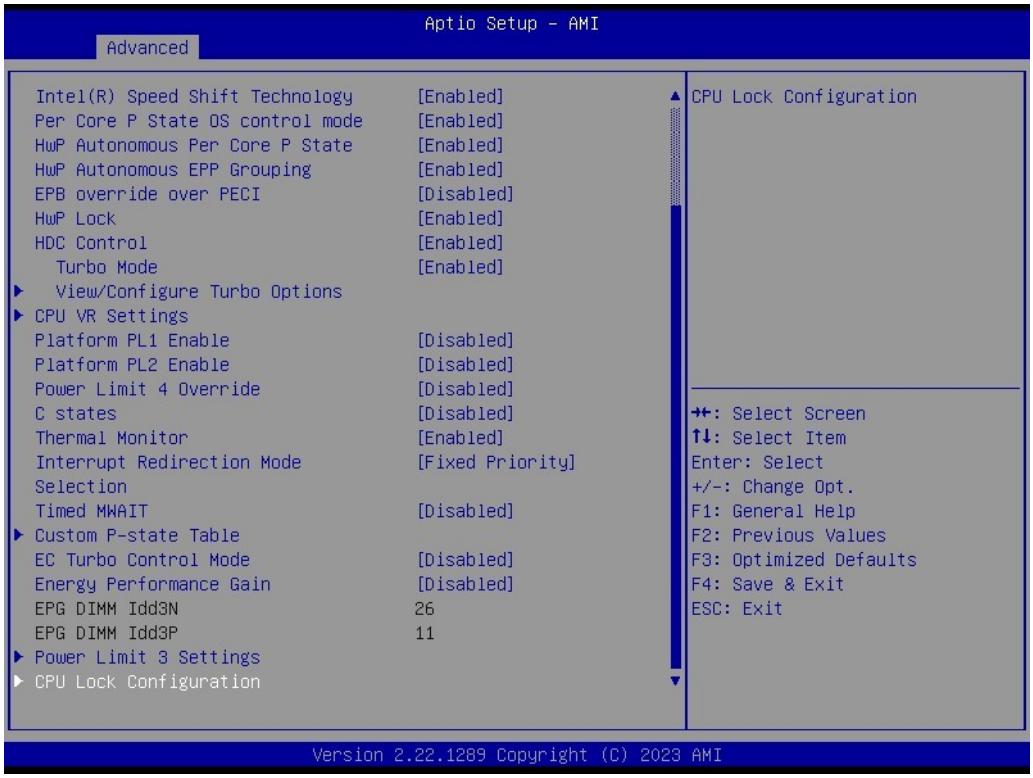
– **Number of P states**
  Sets the number of custom P-states. At least 2 states must be present.

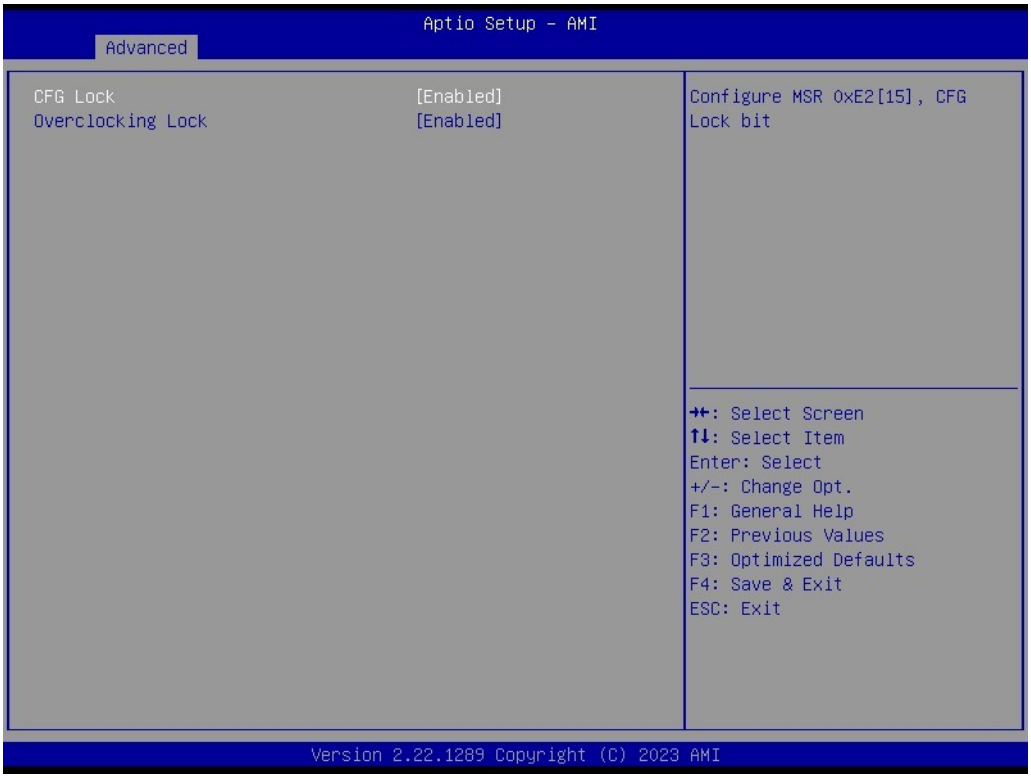
■ Power Limit 3 Settings



– **Power Limit 3 Override**
Enable/Disable Power Limit 3 override.

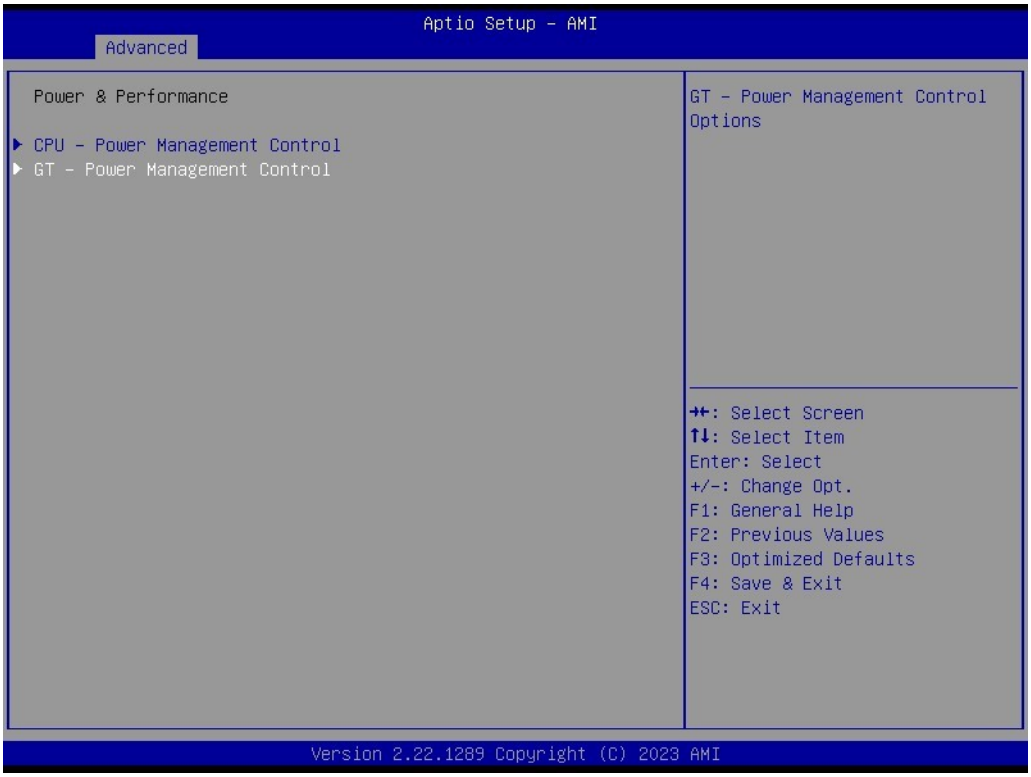
■ CPU Lock Configuration

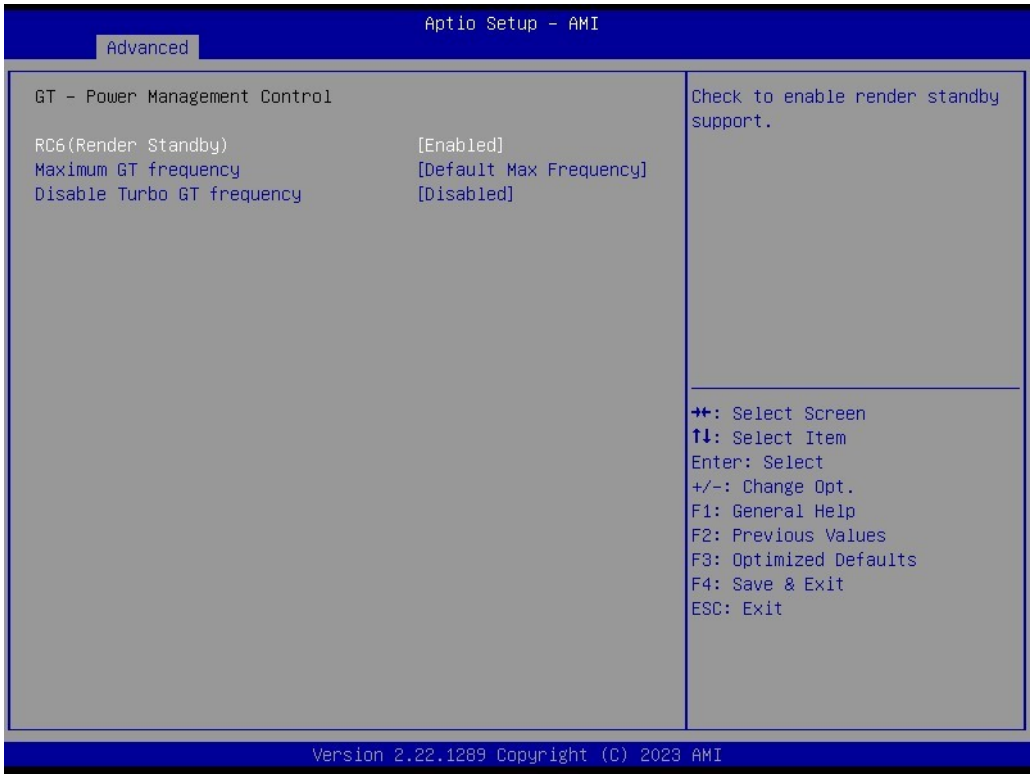




- **CFG Lock**
  Configure MSR 0xE2[15], CFG Lock bit.
- **Overclocking Lock**
  Enable/Disable Overclocking Lock (BIT 20) in FLEX_RATIO(194) MSR.

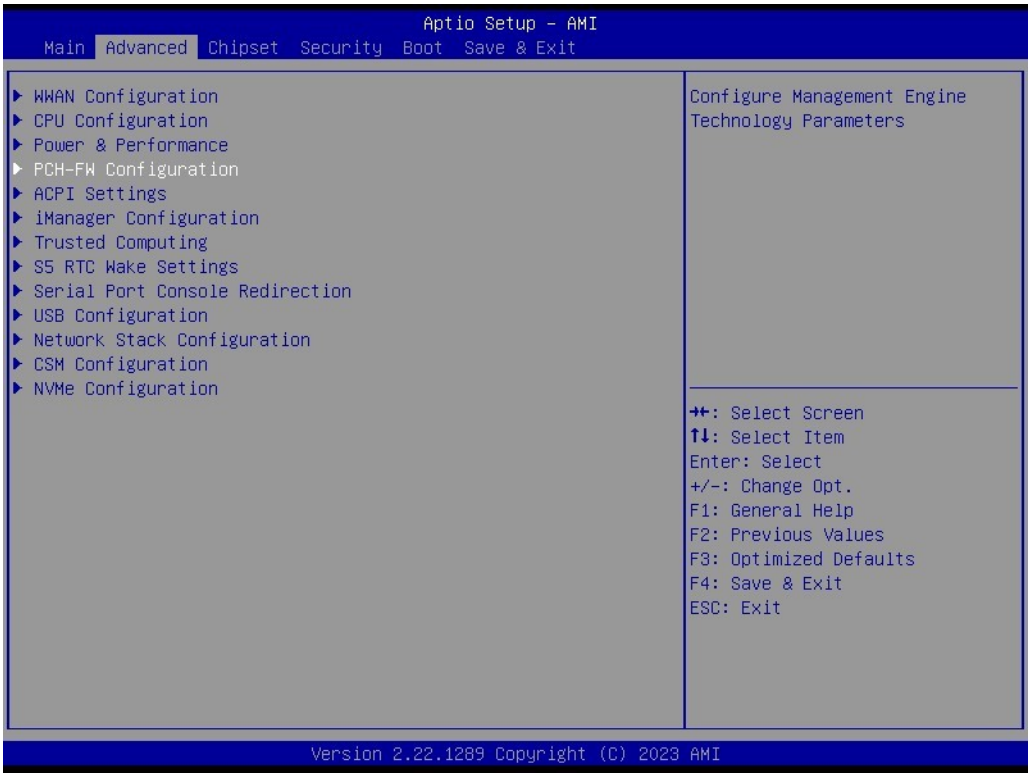
GT - Power Management Control

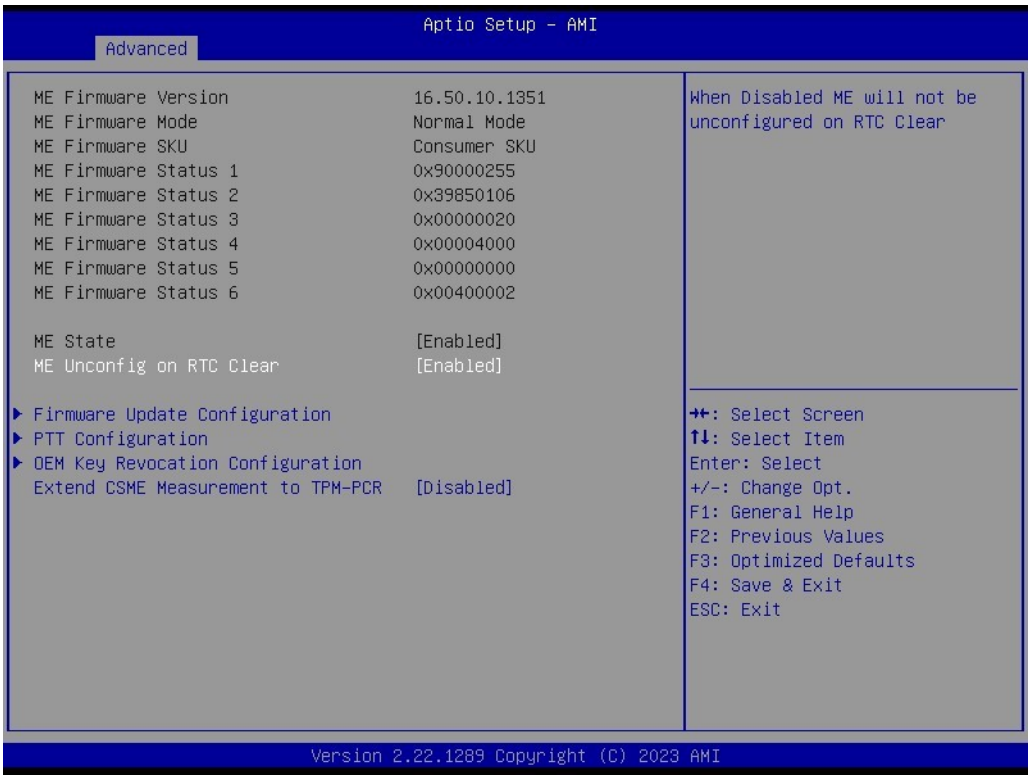




- **RC6 (Render Standby)**
  Check to enable render standby support.
- **Maximum GT frequency**
  Maximum GT frequency limited by the user.
- **Disable Turbo GT frequency**
  Enabled: Disables Turbo GT frequency. Disabled: GT frequency is not limited.

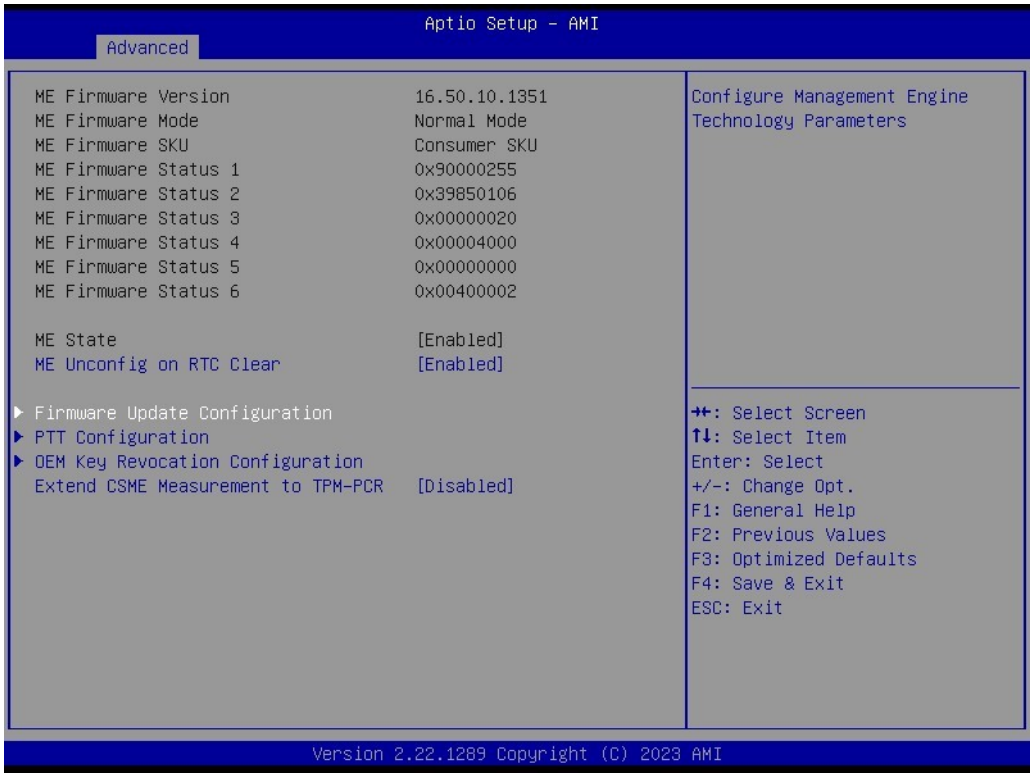
3.2.2.4 PCH-FW Configuration

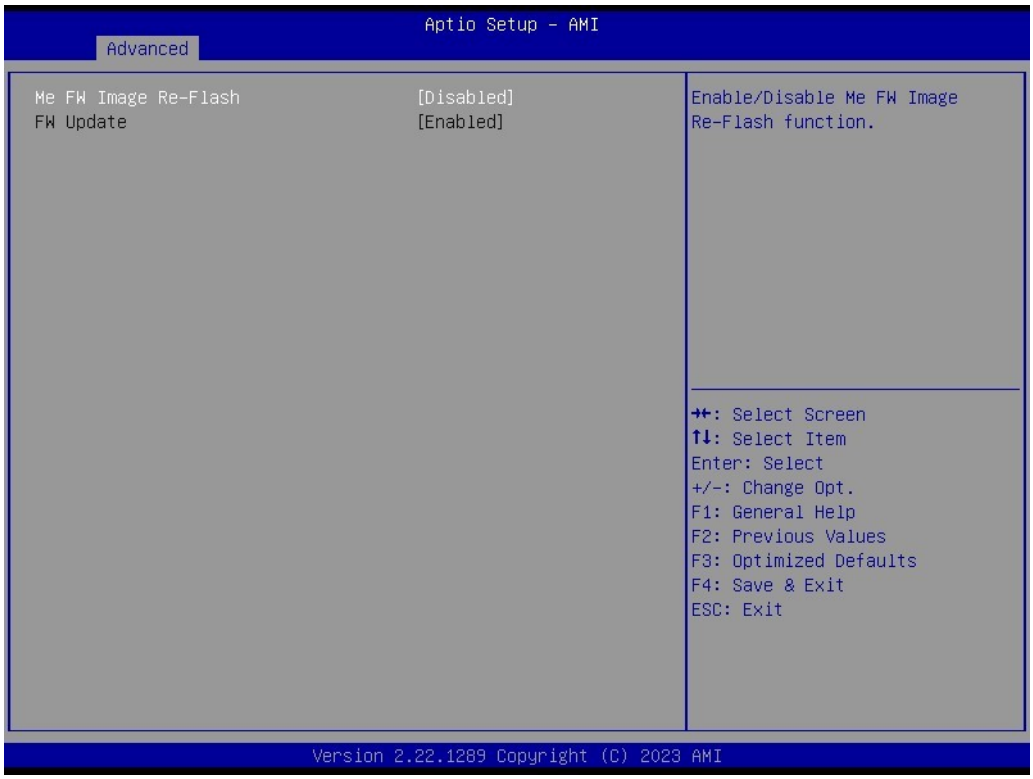




- **ME State**
  When Disabled, ME will be put into ME Temporarily Disabled Mode.
- **ME Unconfig on RTC Clear**
  When Disabled, ME will not be unconfigured on RTC Clear.

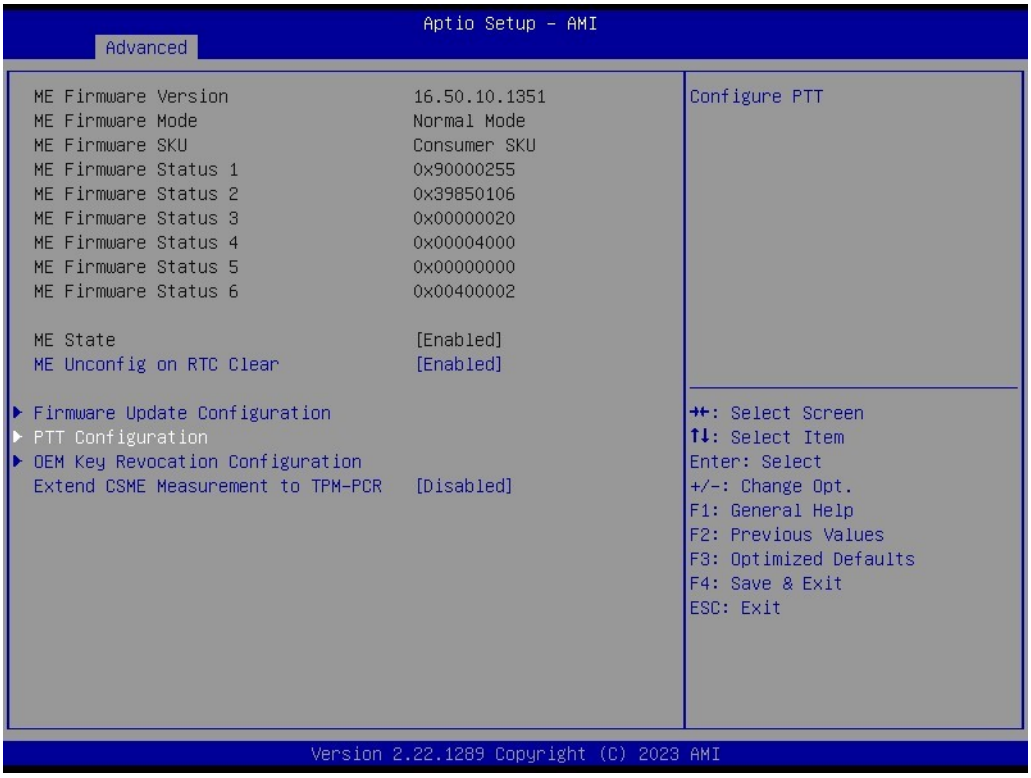
Firmware Update Configuration

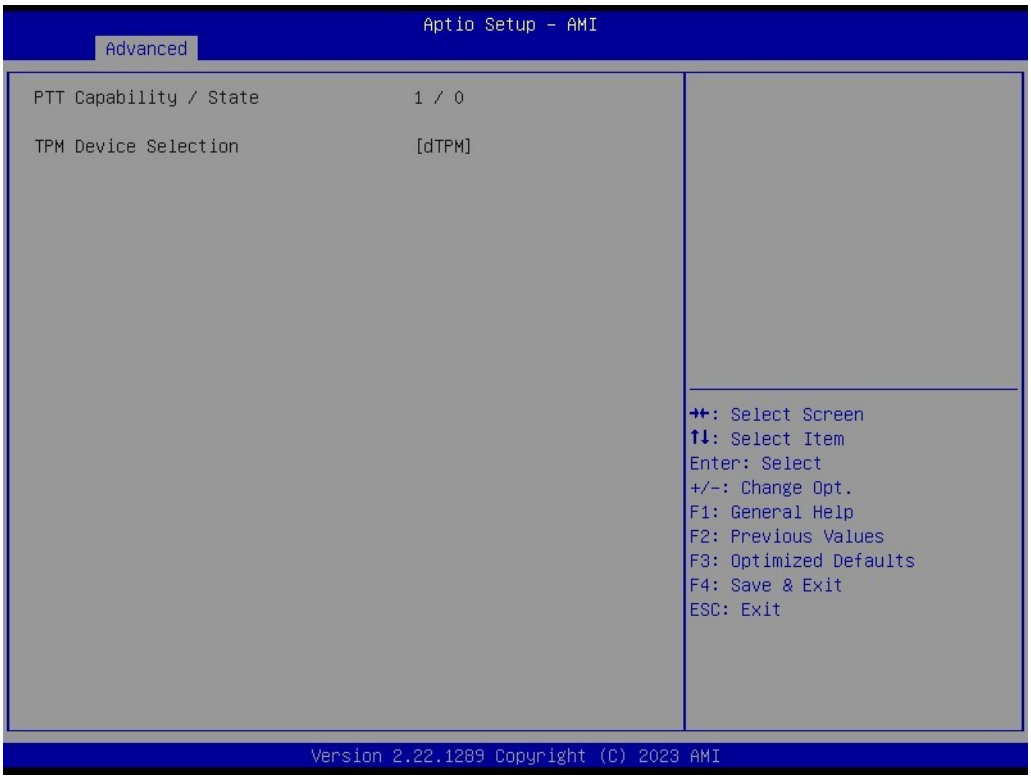




- **ME FW Image Re-Flash**
  Enable/Disable ME FW Image Re-Flash function.
- **FW Update**
  Enable/Disable ME FW Update function.

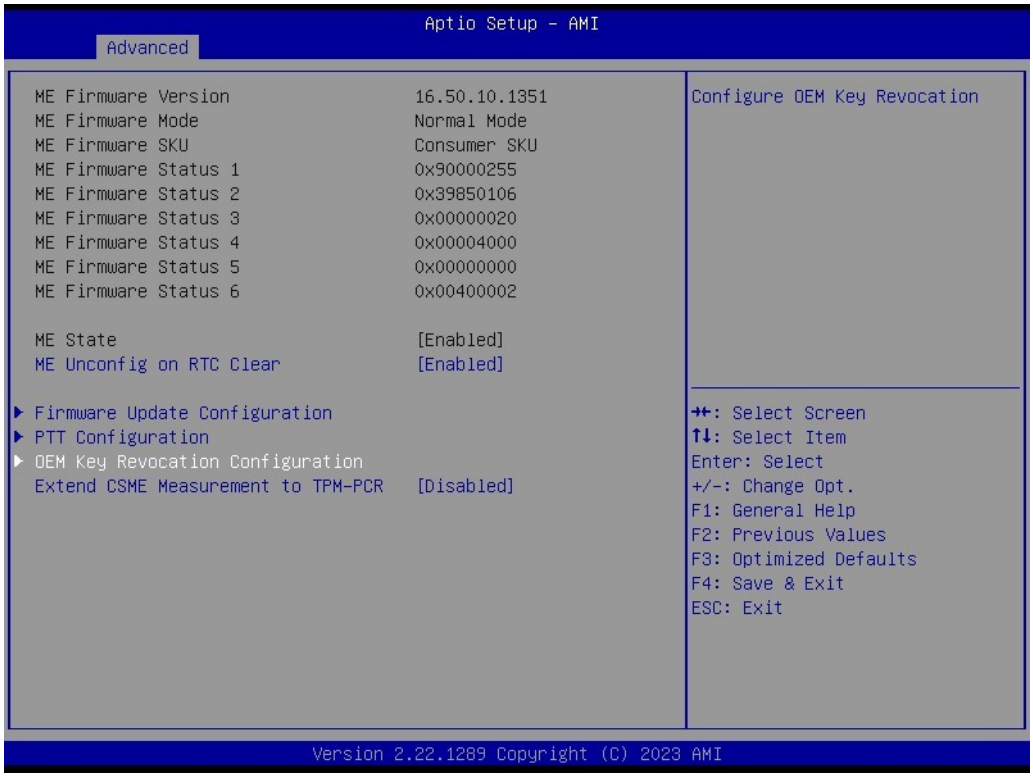
PTT Configuration

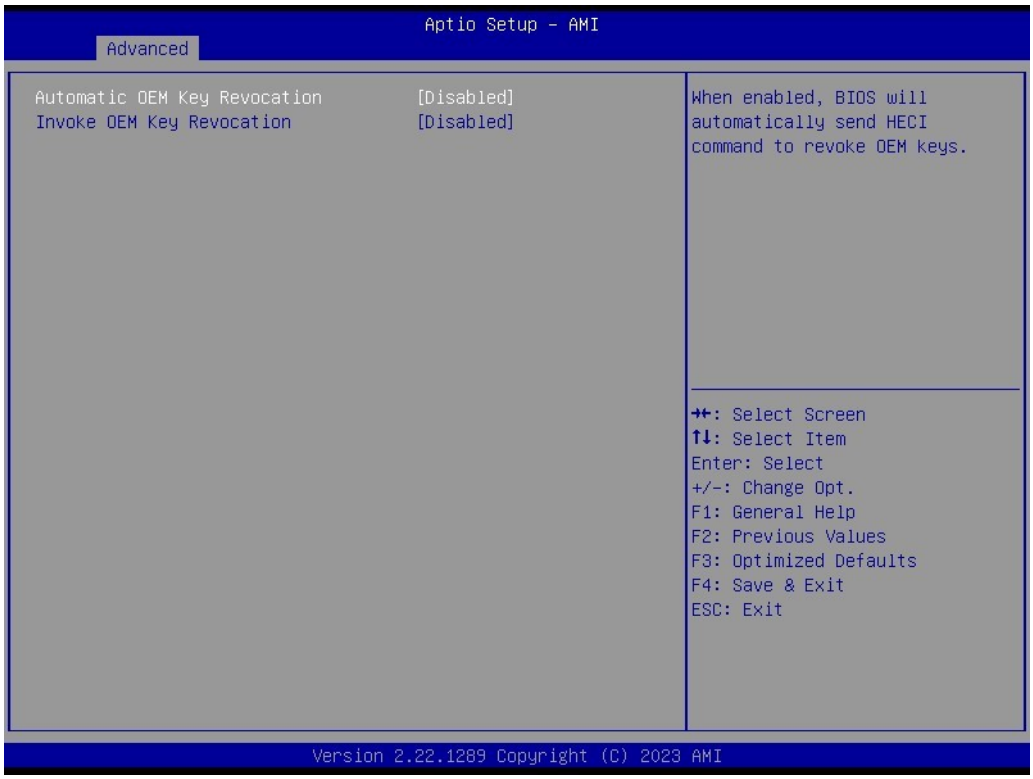




– **TPM Device Selection**
Configure TPM device.

OEM Key Revocation Configuration

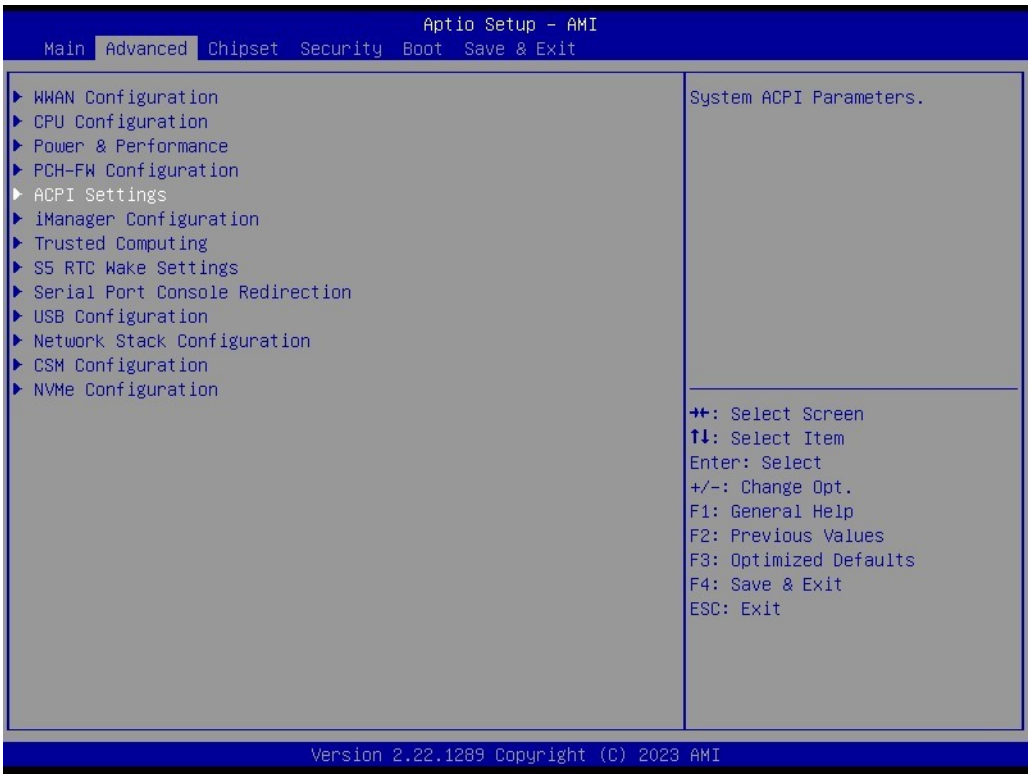


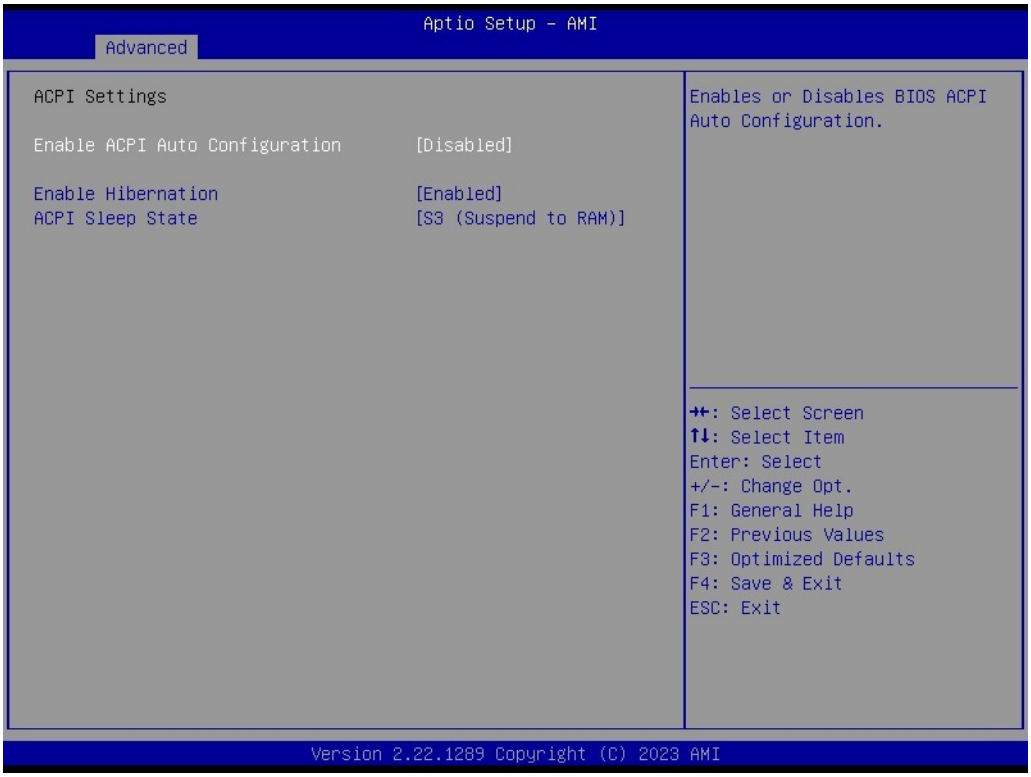


- **Automatic OEM Key Revocation**
  When enabled, the BIOS will automatically send an HECI command to revoke OEM keys.
- **Invoke OEM Key Revocation**
  An HECI command will be send to revoke the OEM key.

– **Extend CSME Measurement to TPM-PCR**
Enable/Disable Extend CSME Measurement to TPM-PCR[0] and AMT Config to TPM-PCR[1].

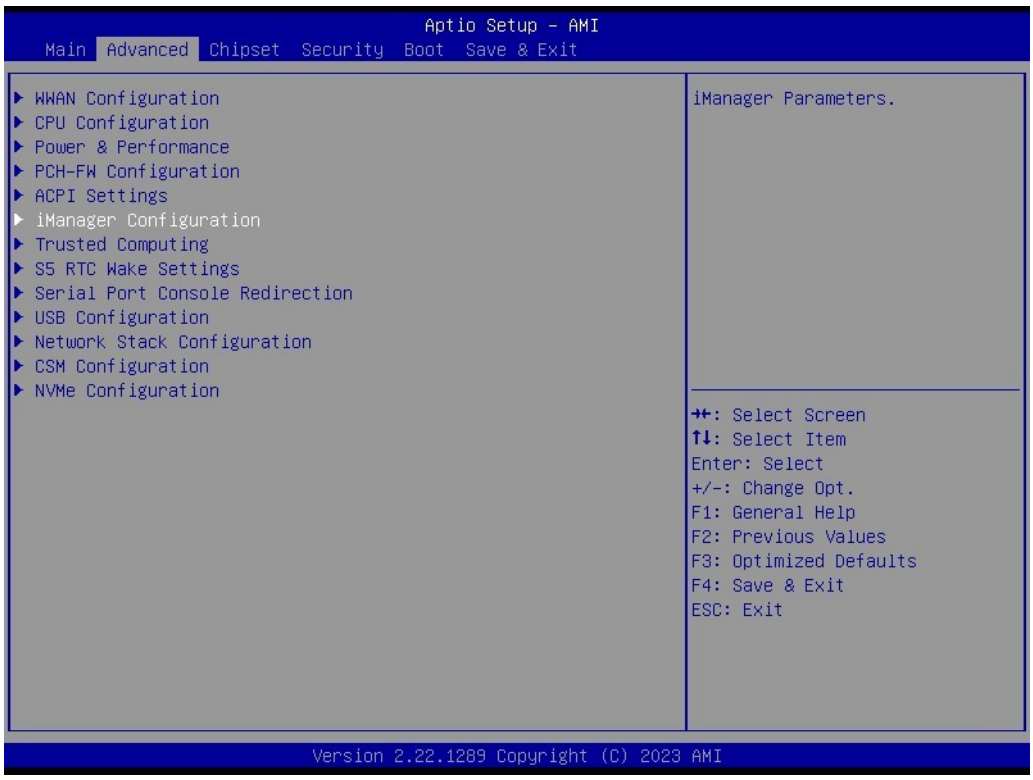
3.2.2.5 ACPI Setting



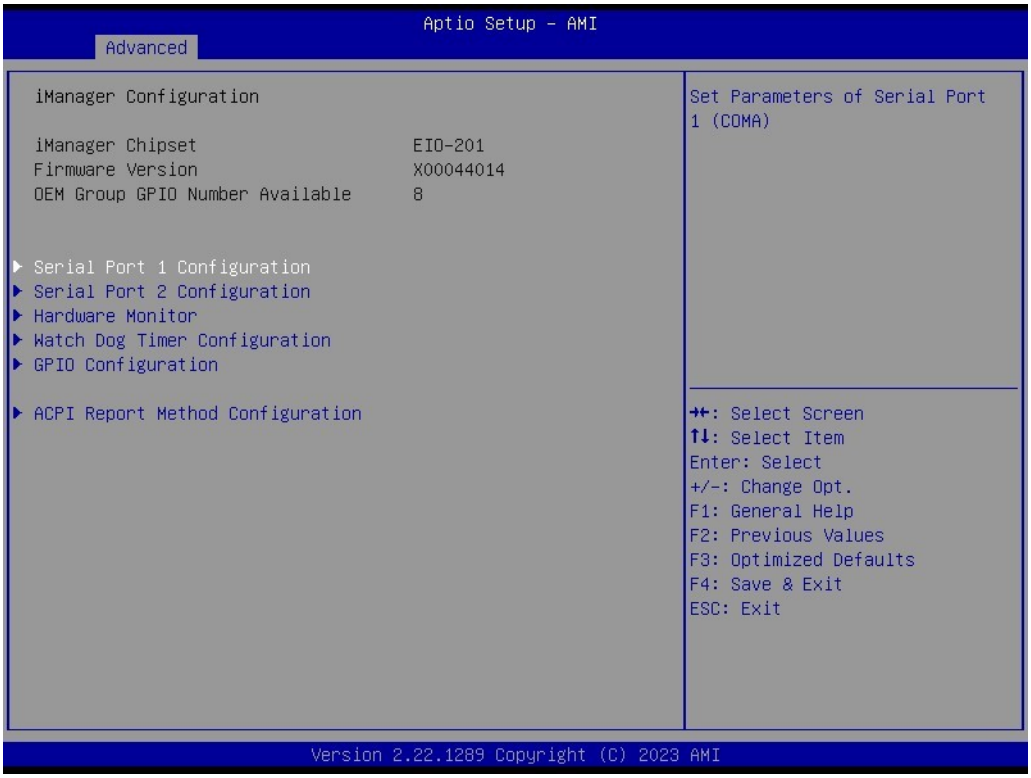


- **Enable ACPI Auto Configuration**
  Enables/Disable BIOS ACPI Auto Configuration.
- **Enable Hibernation**
  Enable/Disable the system's ability to hibernate (OS/S4 Sleep State).
- **ACPI Sleep State**
  Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

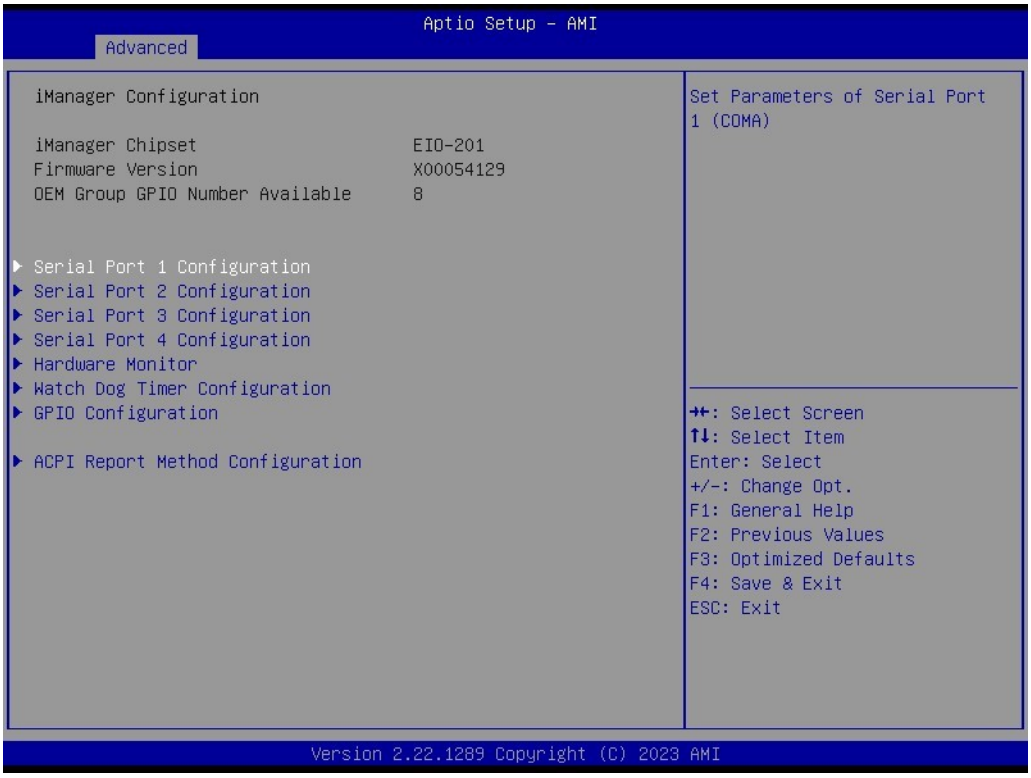
3.2.2.6 iManager Configuration



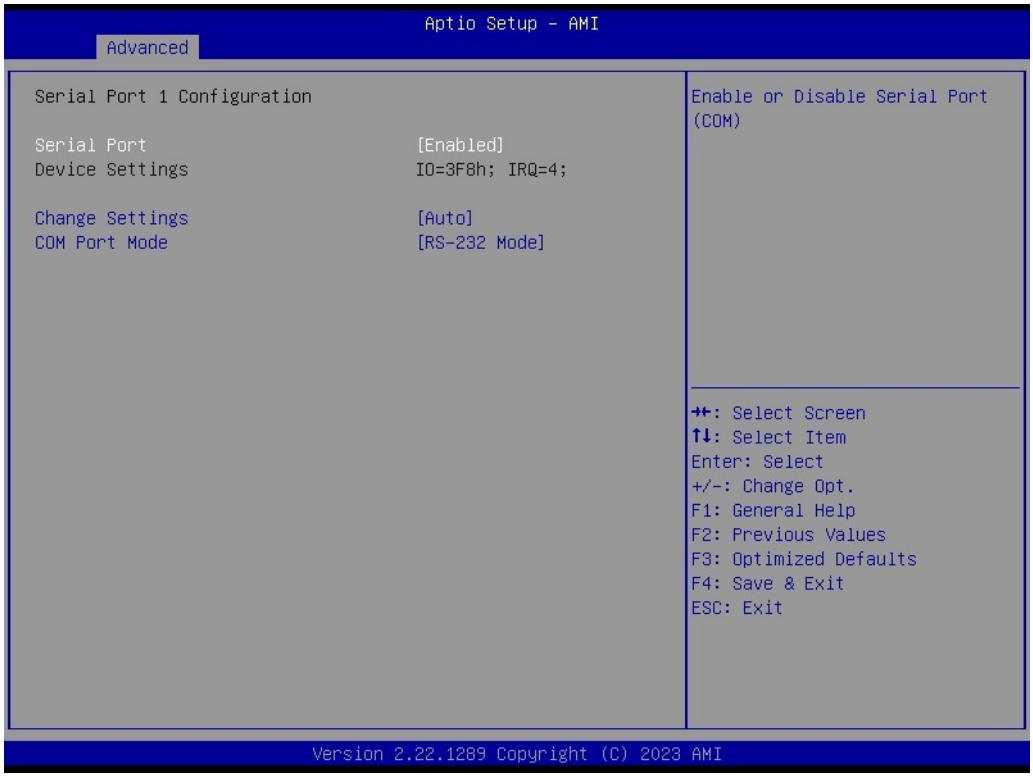
ARK-1125H



ARK-1125C

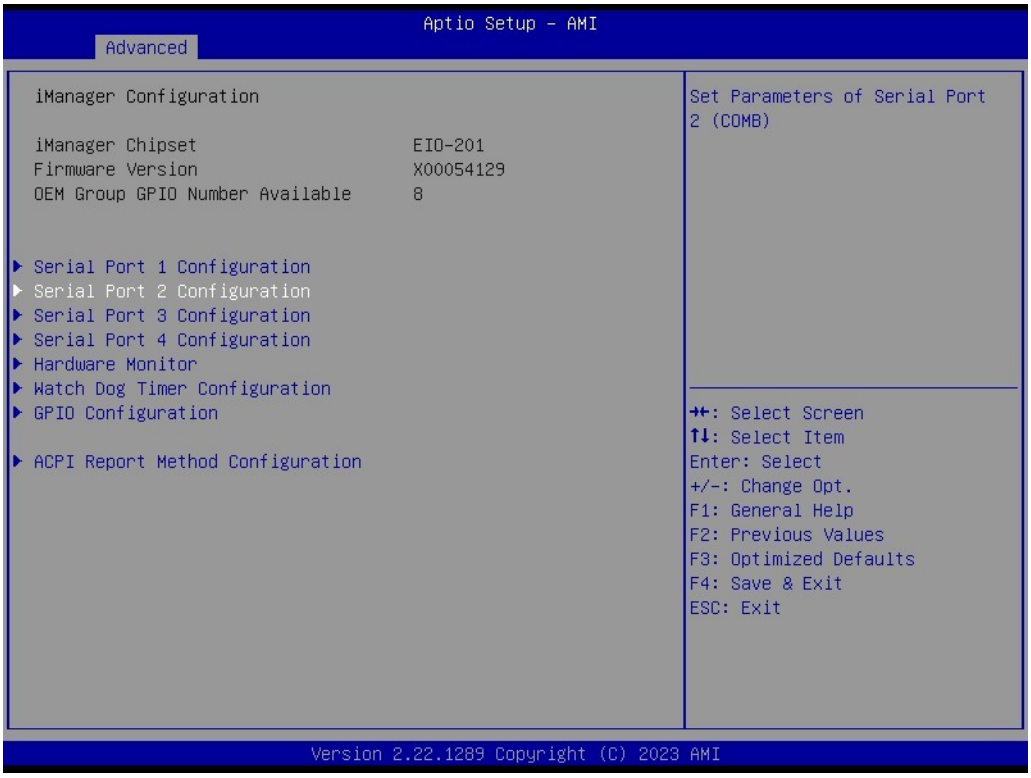


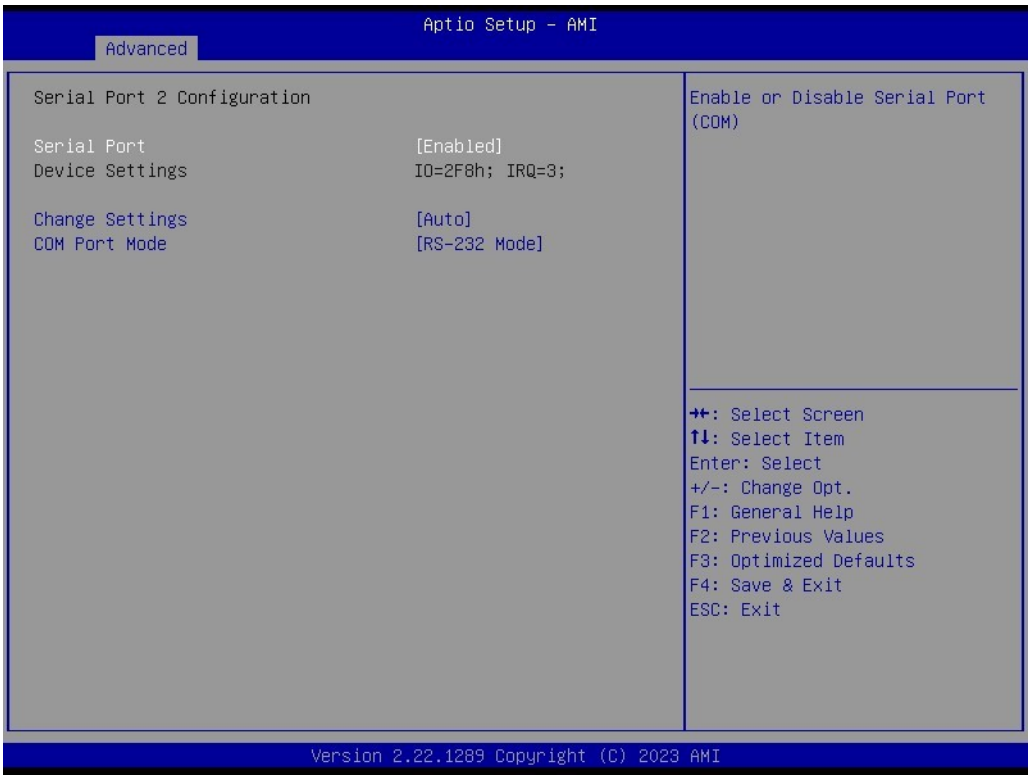
Serial Port 1 Configuration



- **Serial Port**
  Enable/Disable serial port.
- **Change Settings**
  Select optimal settings for a Super IO device.
- **COM port mode**
  COM Port Mode Select.

Serial Port 2 Configuration

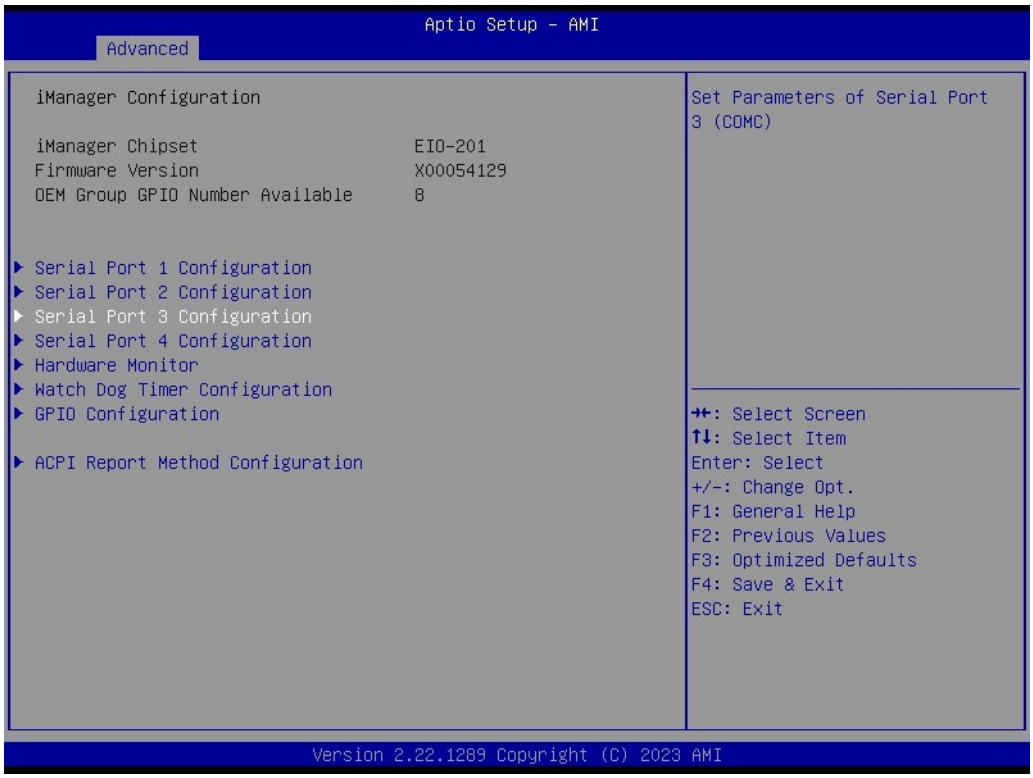


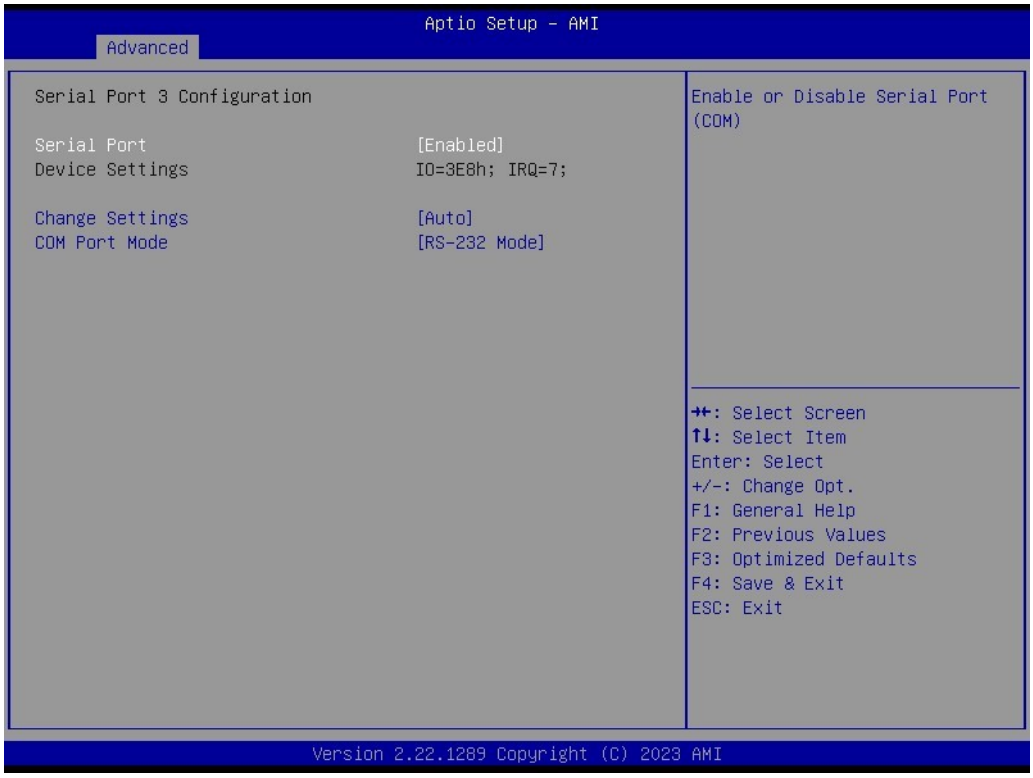


- **Serial Port**
  Enable/Disable serial port.
- **Change Settings**
  Select optimal settings for a Super IO device.

– **COM port mode**
COM Port Mode Select.

■ Serial Port 3 Configuration

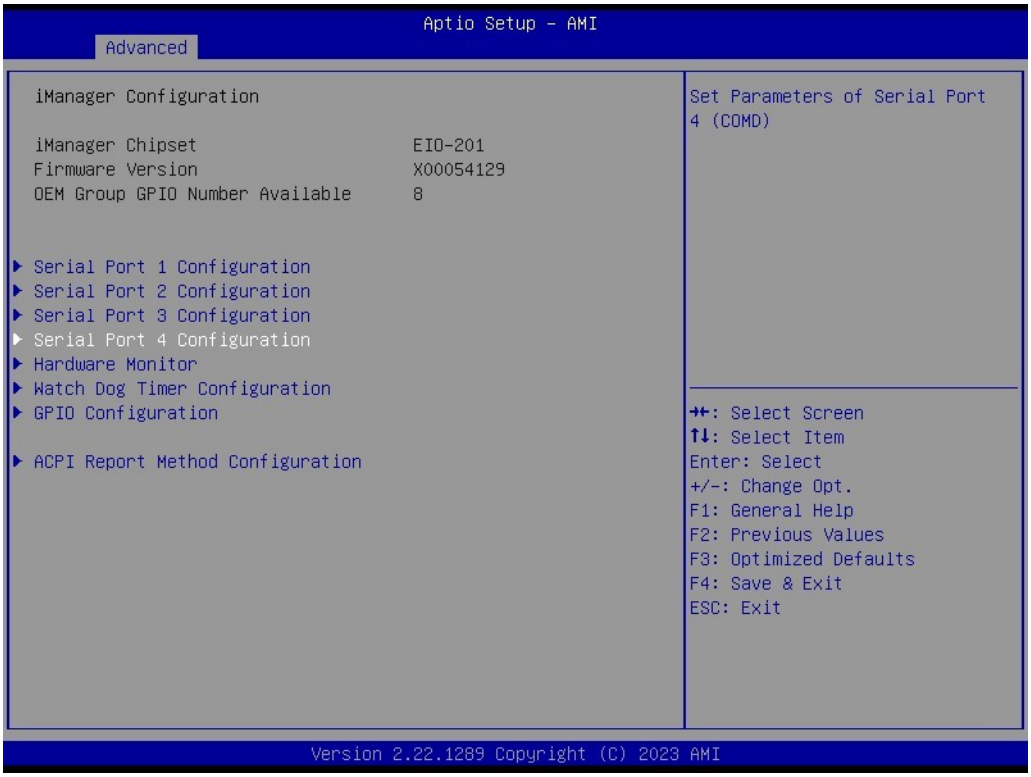


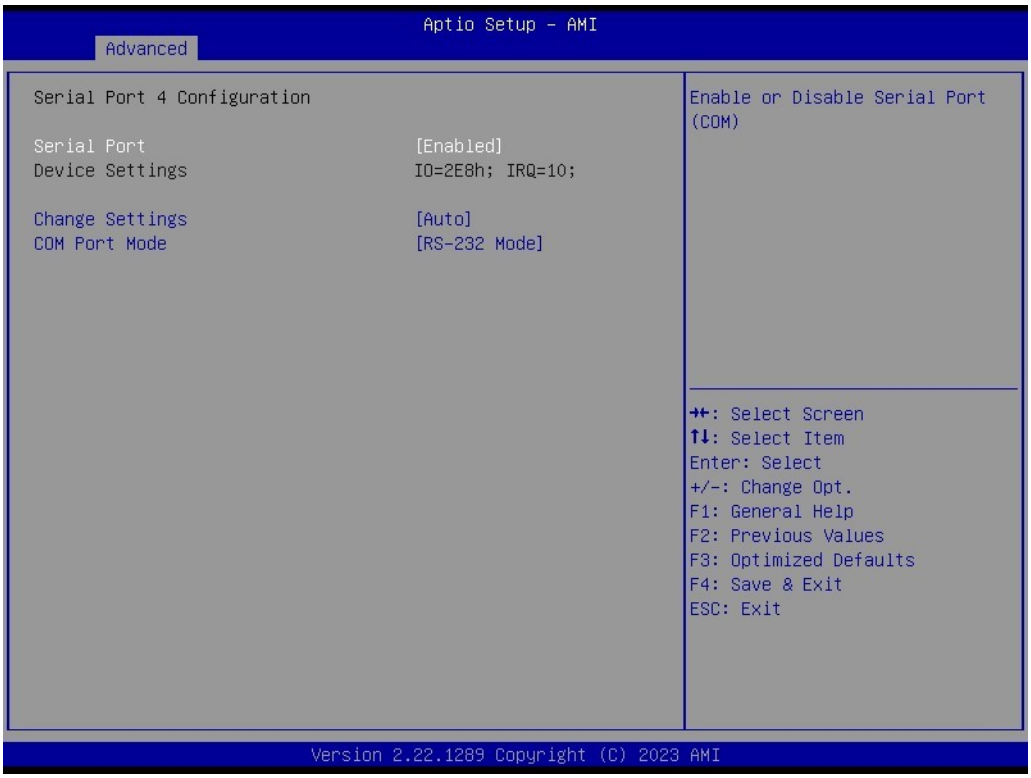


– **Serial Port**
Enable/Disable serial port.

– **Change Settings**
  Select optimal settings for a Super IO device.
– **COM port mode**
  COM Port Mode Select.

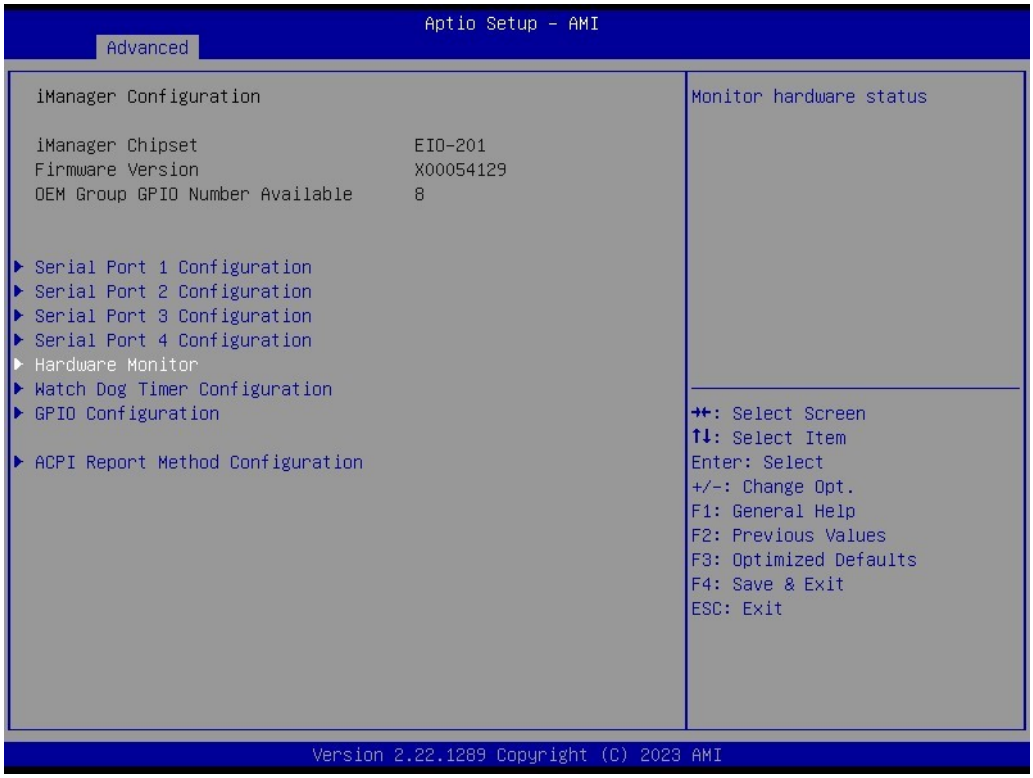
■ Serial Port 4 Configuration

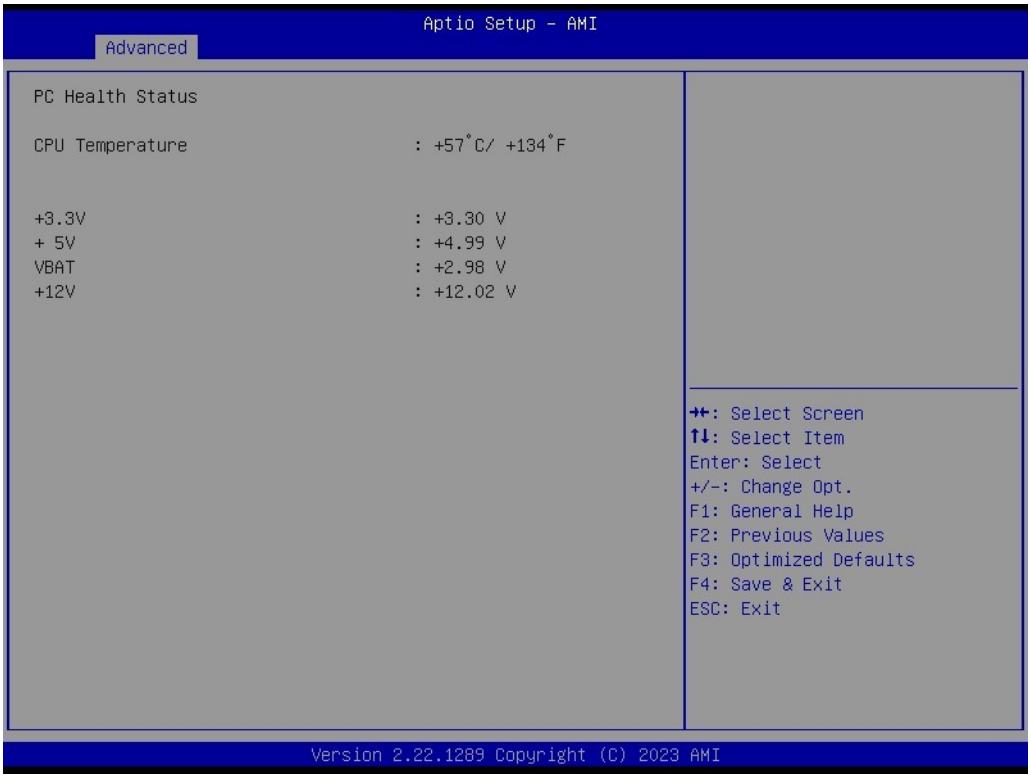




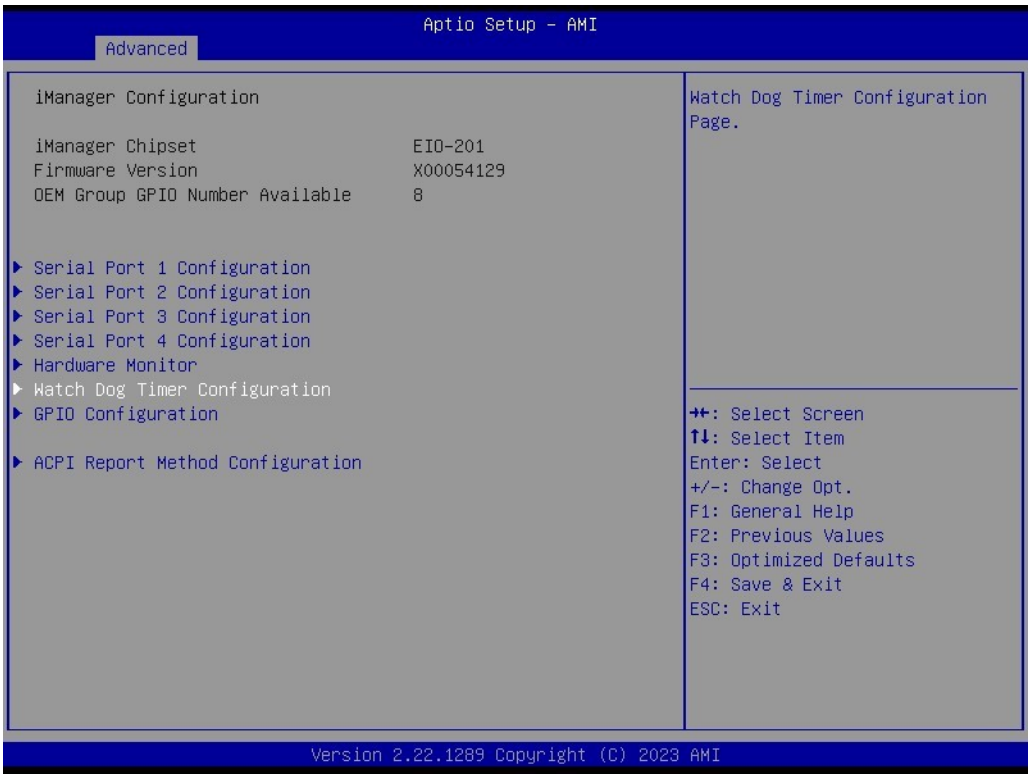
– **Serial Port**
  Enable/Disable serial port.
– **Change Settings**
  Select optimal settings for a Super IO device.
– **COM port mode**
  COM Port Mode Select.

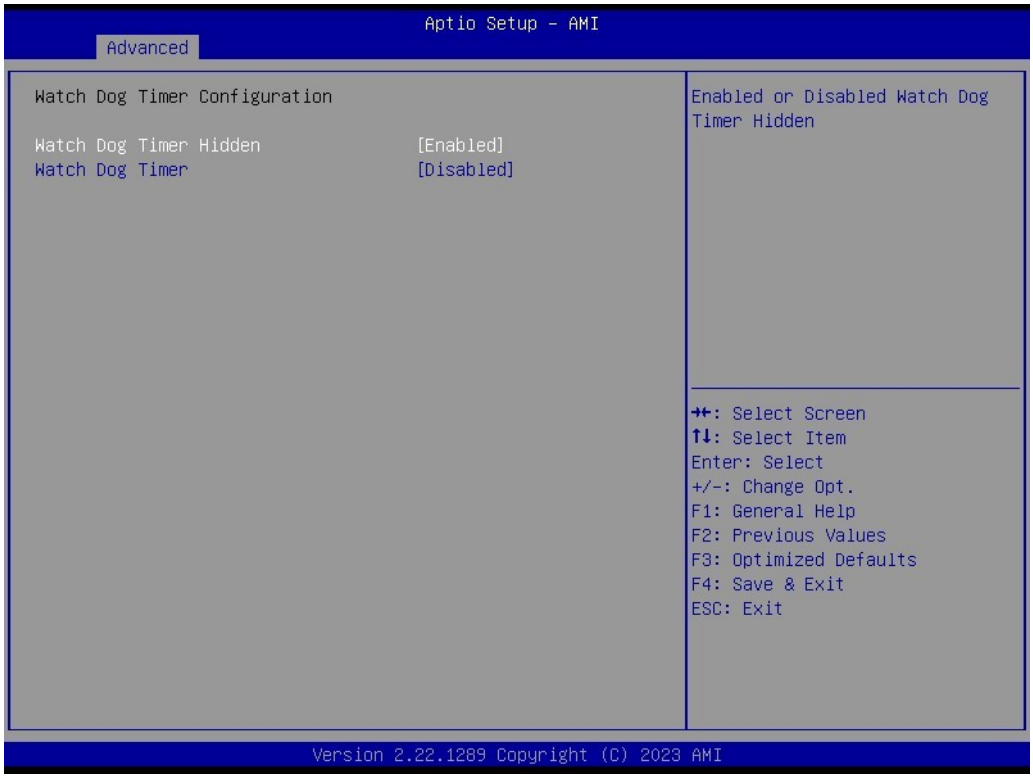
■ **Hardware Monitor**
Provides hardware monitoring information.





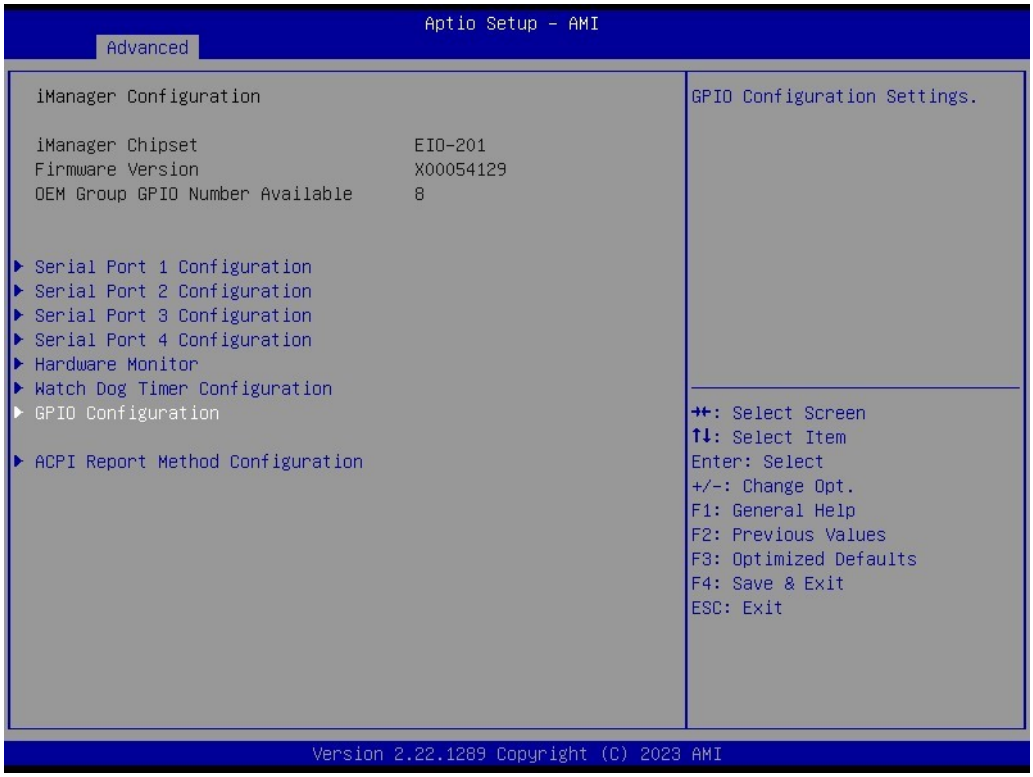
Watch Dog Timer Configuration





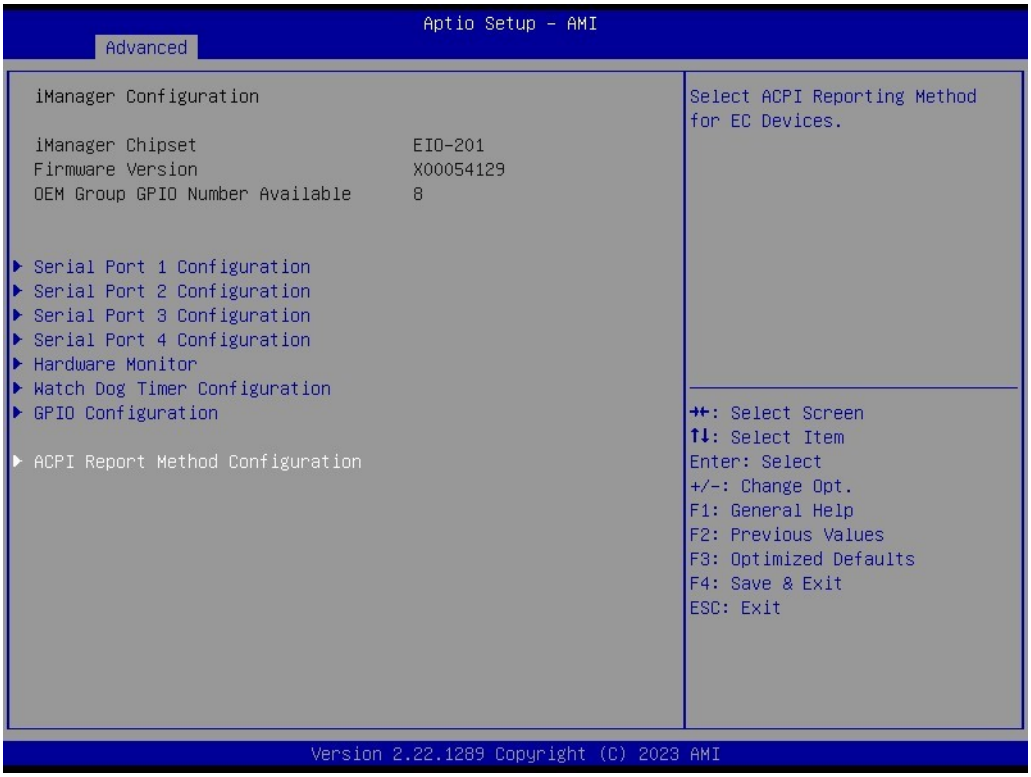
– **Watch Dog Timer Hidden**
  Enable/Disable Watch Dog Timer Hidden.
– **Watch Dog Timer**
  Enable/Disable the Watch Dog Timer function.

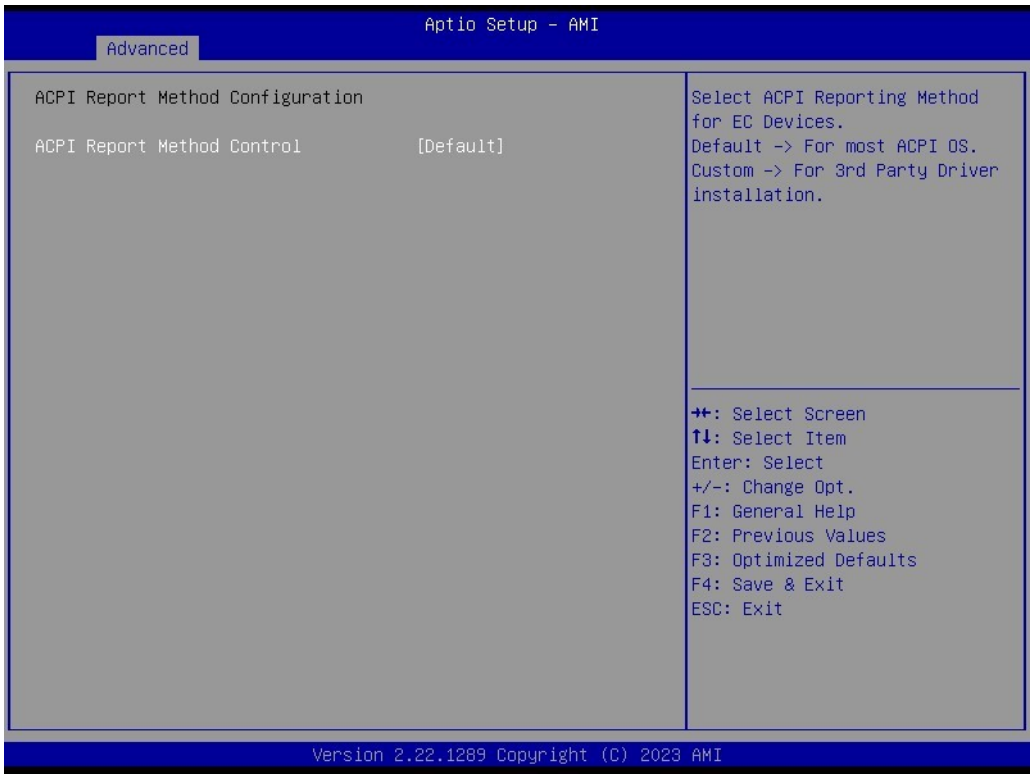
■ GPIO Configuration



– **GPIO Control Enable**
Select to control GPIO by EC or user override during the POST stage.

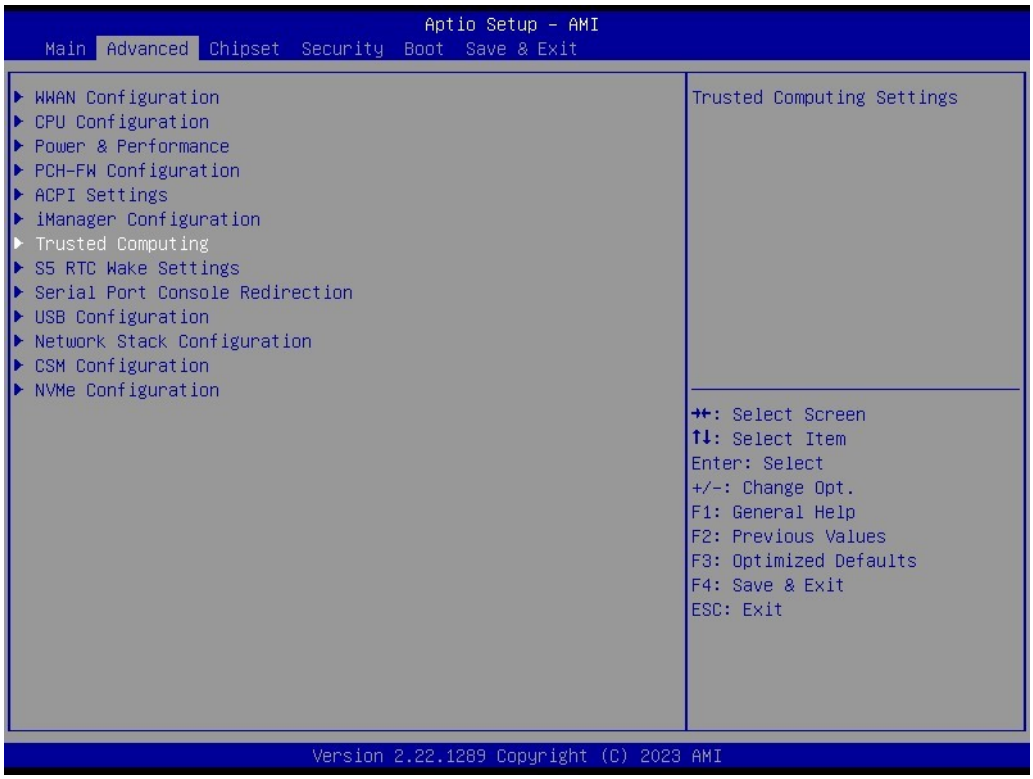
■ ACPI Report Method Configuration





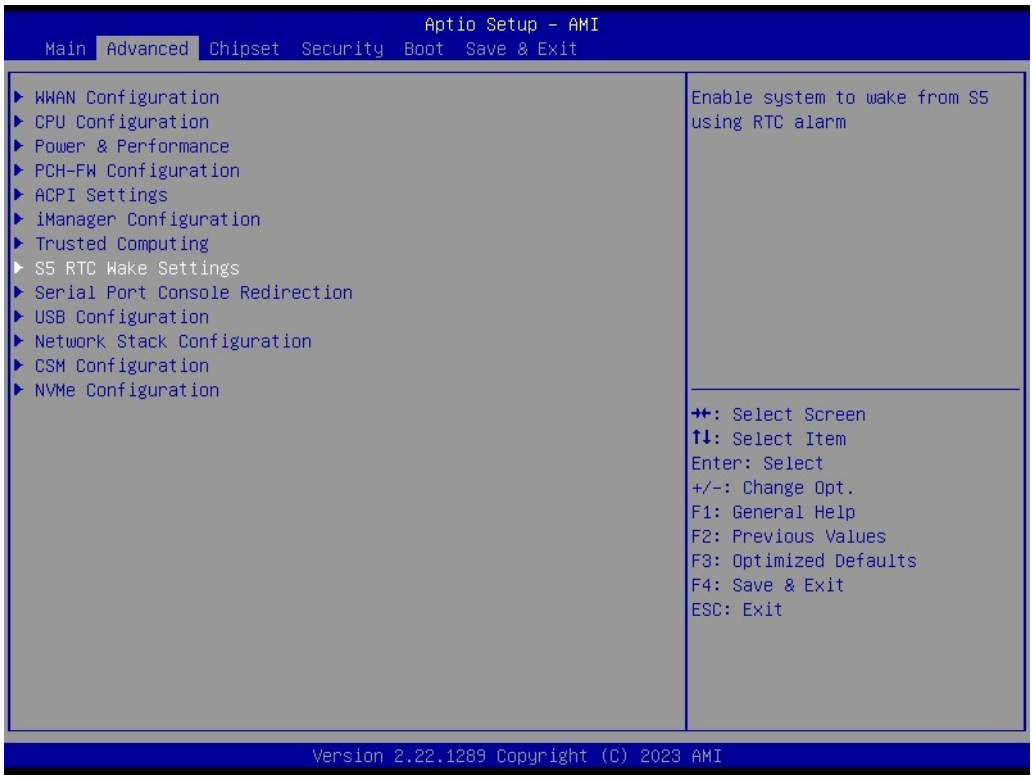
– **ACPI Report Method Control**
Select ACPI Reporting Method for EC Devices. Default -> For most ACPI OS; Custom -> For 3rd Party Driver installation.

3.2.2.7 Trusted Computing



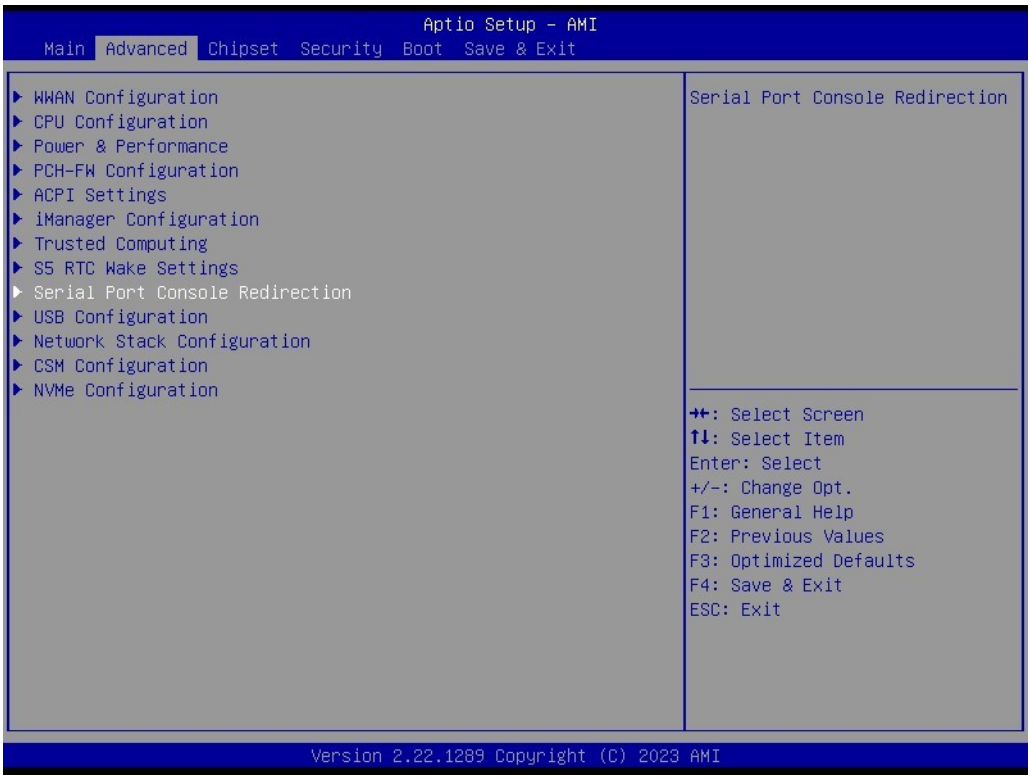
- **Security Device Support**
  Enables/Disables BIOS support for a security device.
- **SHA256 PCR Bank**
  Enable/Disable SHA256 PCR Bank.
- **SHA384 PCR Bank**
  Enable/Disable SHA384 PCR Bank.
- **Pending operation**
  Schedule an operation for the security device.
- **Platform Hierarchy**
  Enable/Disable Platform Hierarchy.
- **Storage Hierarchy**
  Enable/Disable Storage Hierarchy.
- **Endorsement Hierarchy**
  Enable/Disable Endorsement Hierarchy.
- **Physical Presence Spec Version**
  Select to tell the OS to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.
- **TPM 2.0 Interface Type**
  Select the Communication Interface to the TPM 2.0 Device.
- **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.

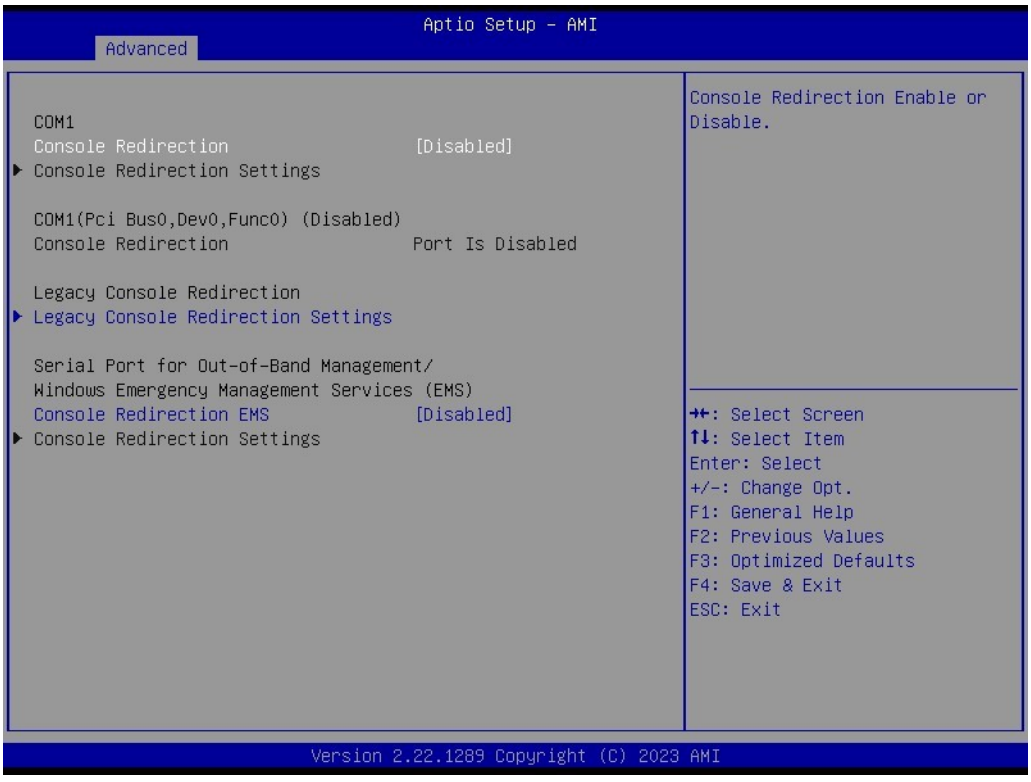
3.2.2.8 S5 RTC Wake Settings



- **Wake system from S5**
  Enable/Disable system wake on alarm event.

3.2.2.9 Serial Port Console Redirection

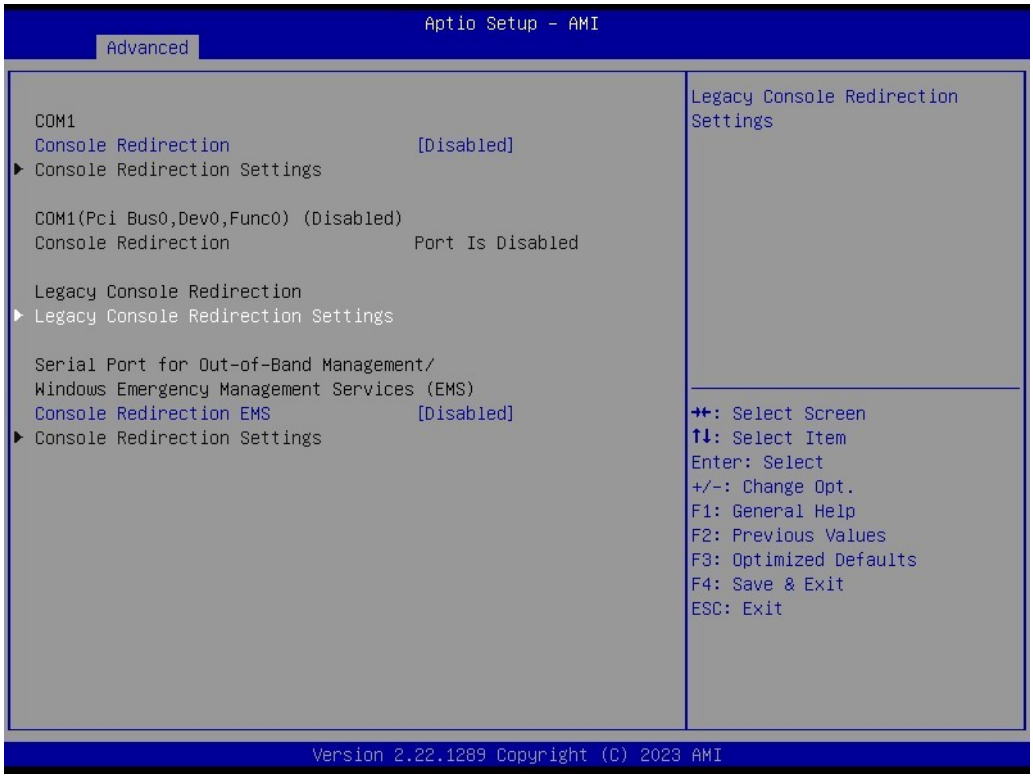


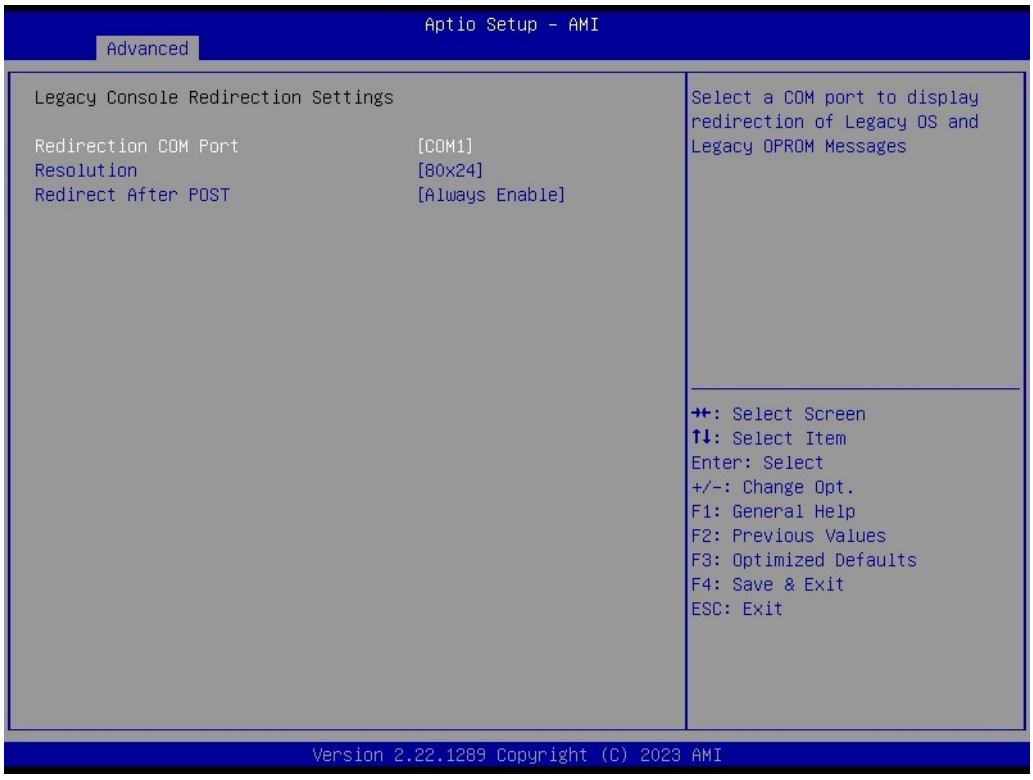


- **Console Redirection**
  Console Redirection Enable or Disable.
- **Legacy Console Redirection Settings**
  Legacy Console Redirection Settings.

- **Console Redirection EMS**
  Console Redirection Enable or Disable.

- **Legacy Console Redirection Settings**

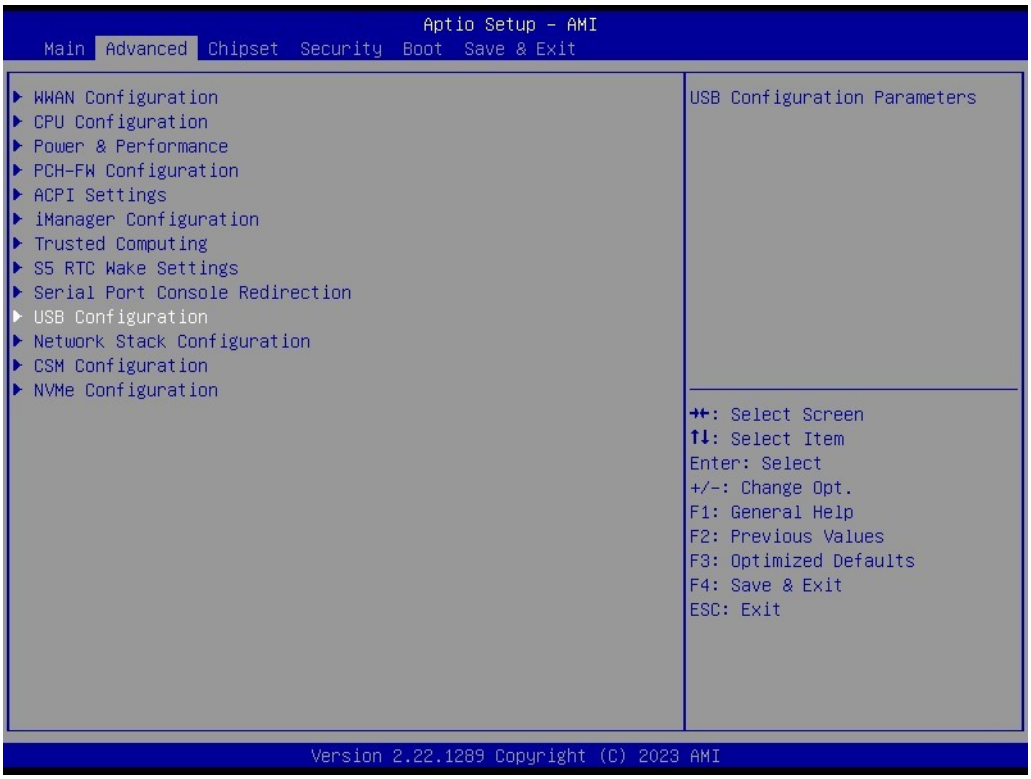


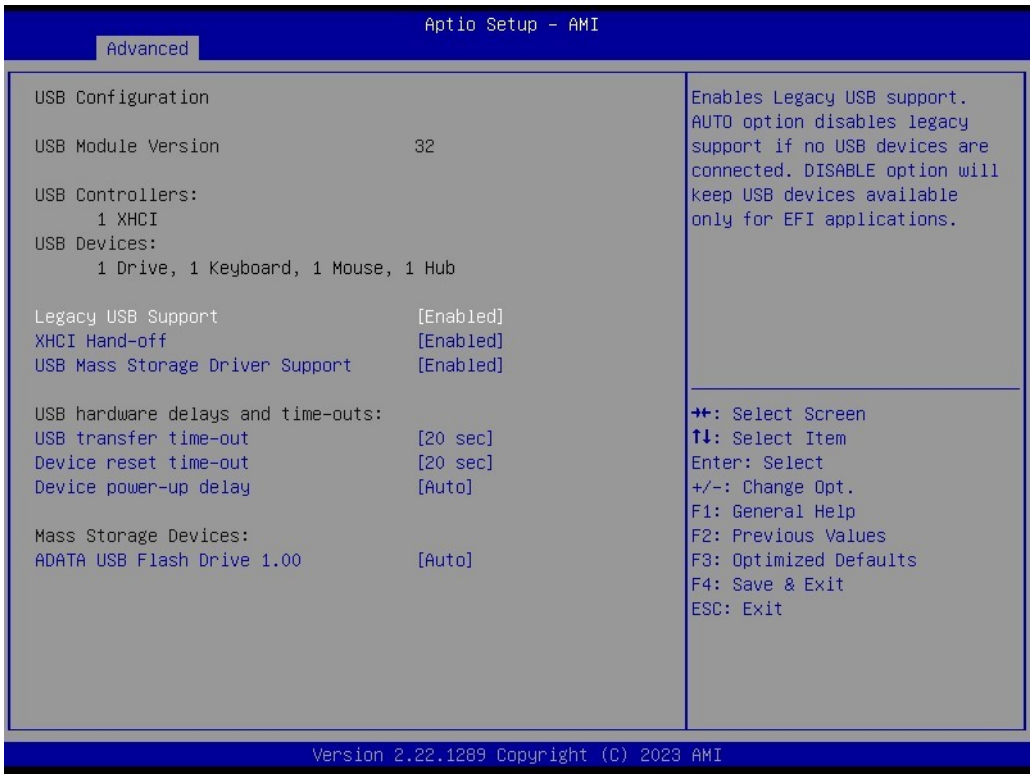


  – **Redirection COM Port**
    Select redirection COM port number.

- **Resolution**
  On Legacy OS, the Number of Rows and Columns supporting redirection.
- **Redirect After POST**
  When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable.

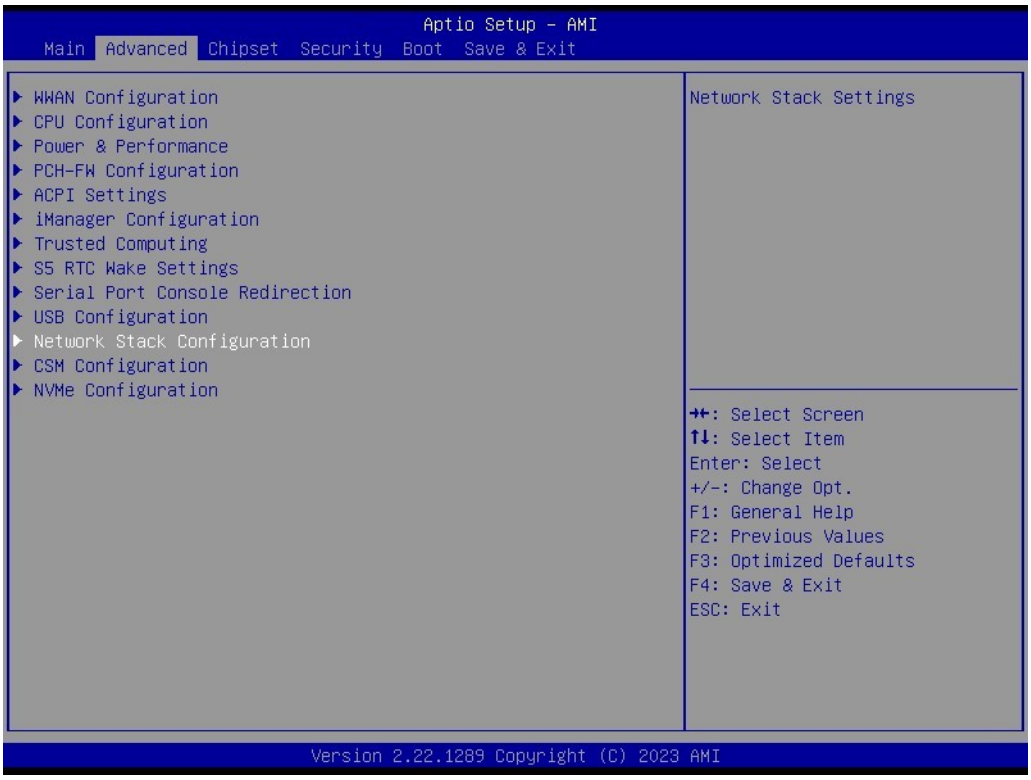
3.2.2.10 USB Configuration





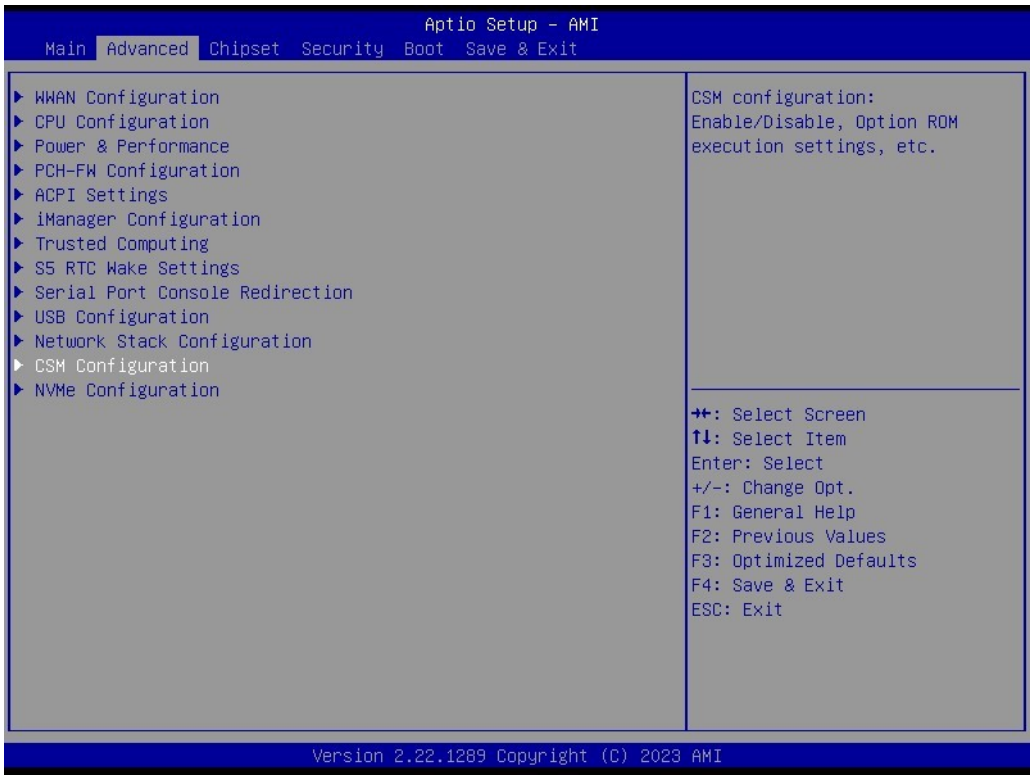
- **Legacy USB Support**
  Enables Legacy USB support.
- **XHCI Hand-Off**
  This is a workaround for OS without XHCI hand-off support.
- **USB Mass Storage Driver Support**
  Enable/Disable USB Mass Storage Driver Support.
- **USB transfer time-out**
  The time-out value for control, bulk, and interrupt transfers.
- **Device Reset time-out**
  USB mass storage device Start Unit command time-out.
- **Device power-up delay**
  Maximum time the device will take before it properly reports itself to the Host Controller.

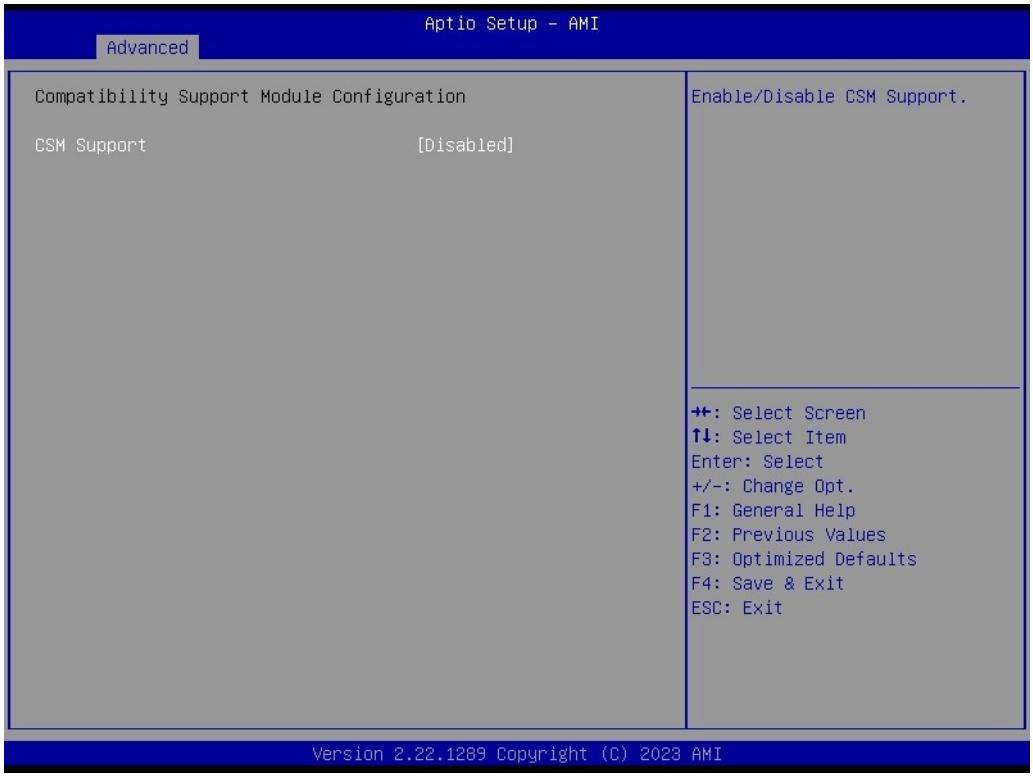
3.2.2.11 Network Stack Configuration



- **Network Stack**
  Enable/Disable UEFI Network Stack.

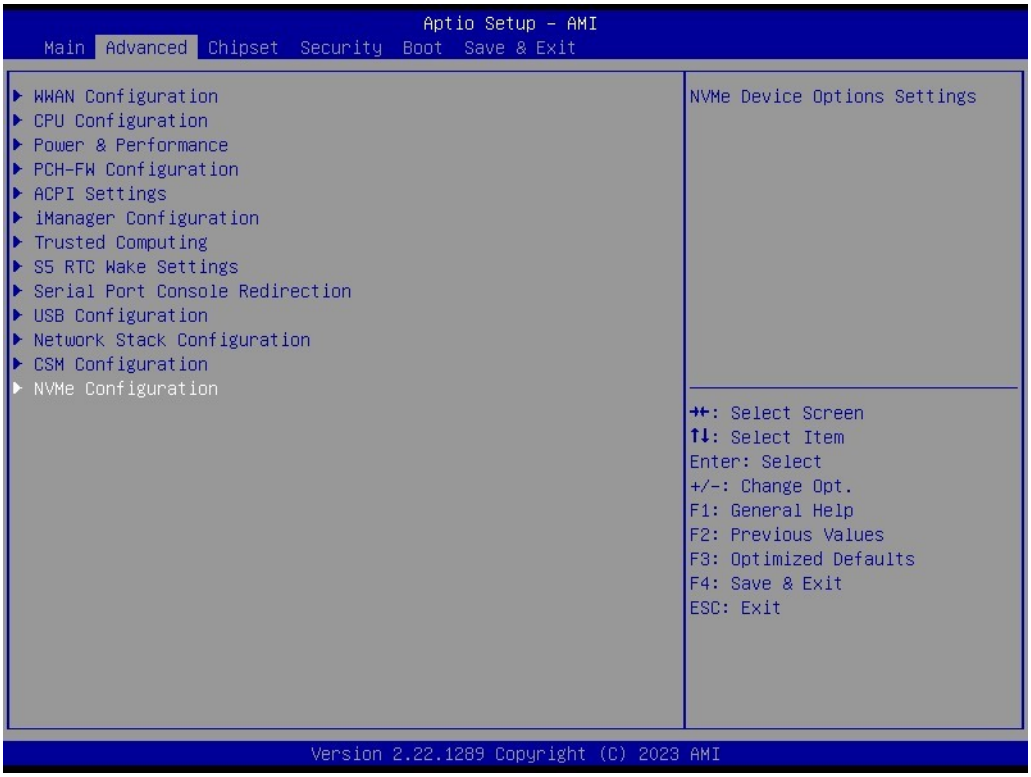
3.2.2.12 CSM Configuration

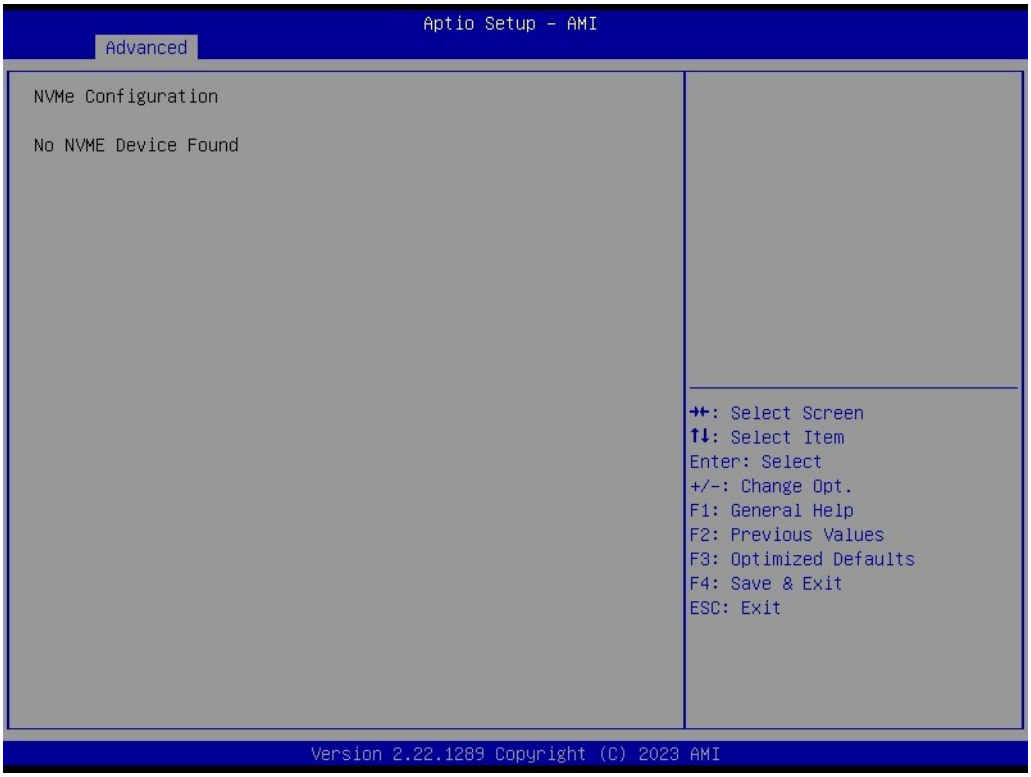




- **CSM Support**
  Enable/Disable CSM Support.

3.2.2.13 NCMe Configuration

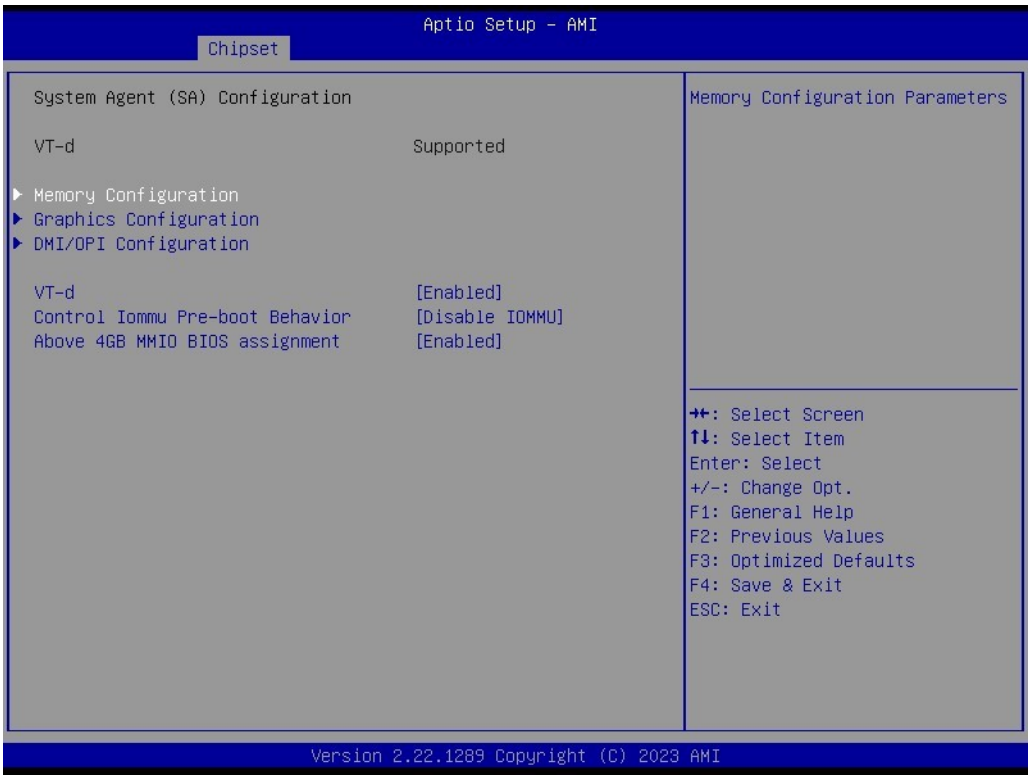




3.2.3 Chipset Configuration

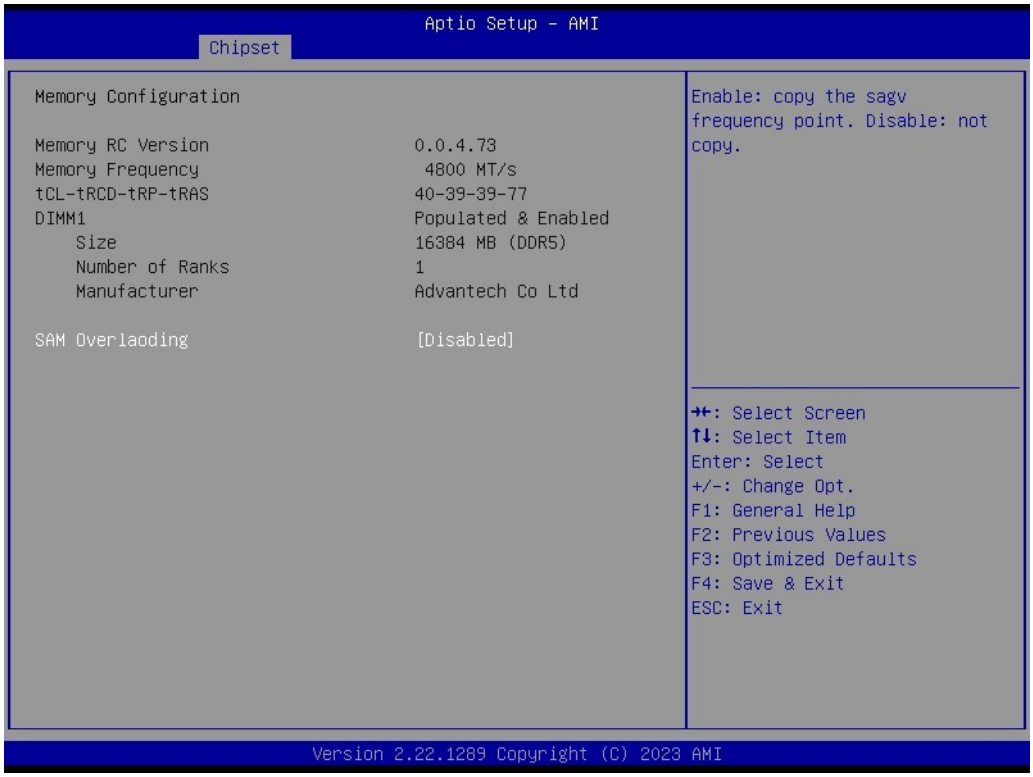
Select the Chipset tab from the ARK-1125 setup screen to enter the Chipset BIOS Setup screen. You can display a Chipset BIOS Setup option by highlighting it using the <Arrow> keys. All Plug-and-Play BIOS Setup options are described in this section. The Plug-and-Play BIOS Setup screen is shown below.

3.2.3.1 System Agent (SA) Configuration



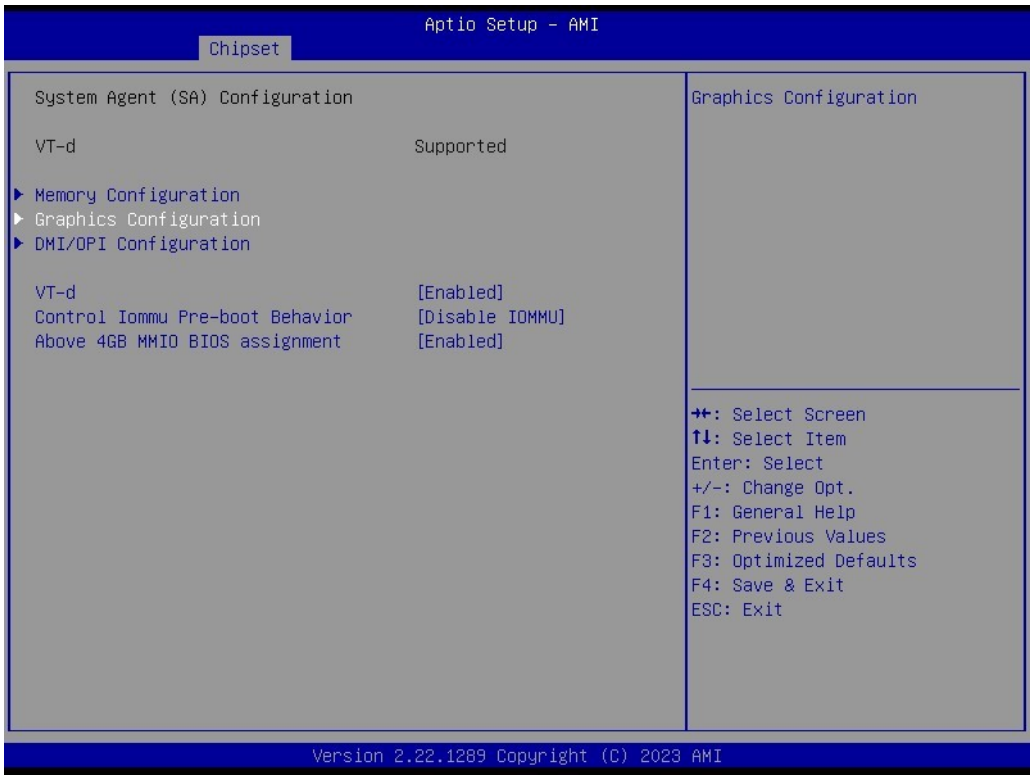
- **VT-d**
  VT-d capability.
- **Control Iommu Pre-boot Behavior**
- **Above 4GB MMIO BIOS assignment**
  Enable/Disable above 4GB Memory Mapped I/O BIOS assignment. This is enabled automatically when the Aperture Size is set to 2048MB.

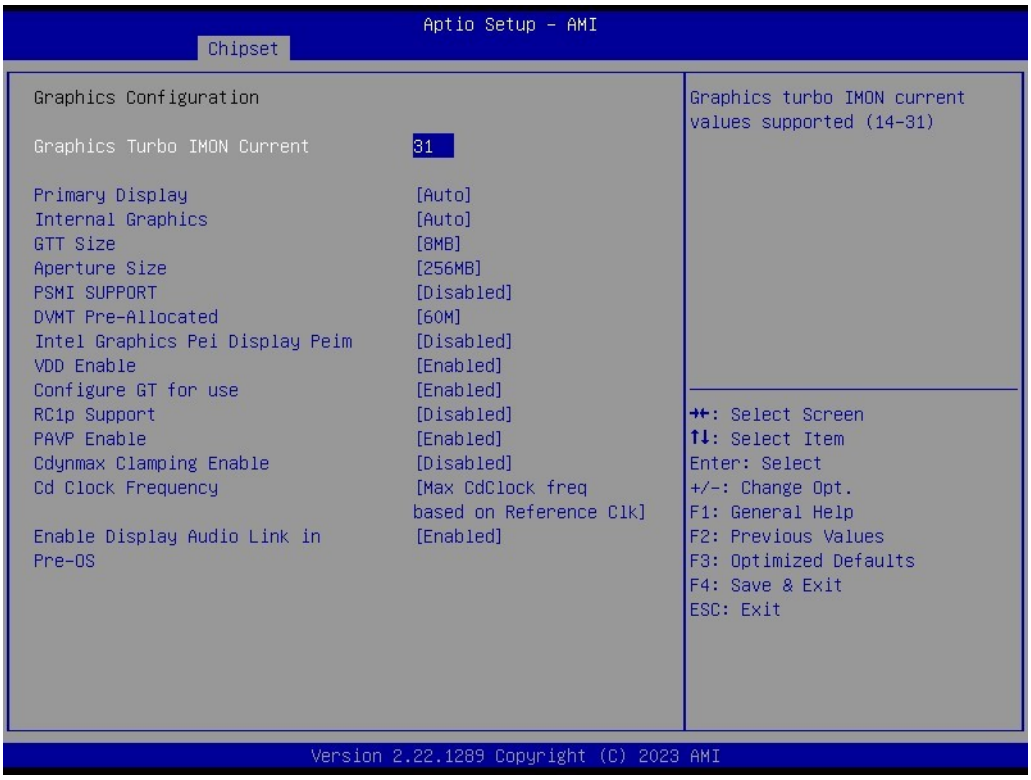
Memory Configuration



– **SAM Overloading**
Enable/Disable SAM Overloading.

Graphics Configuration

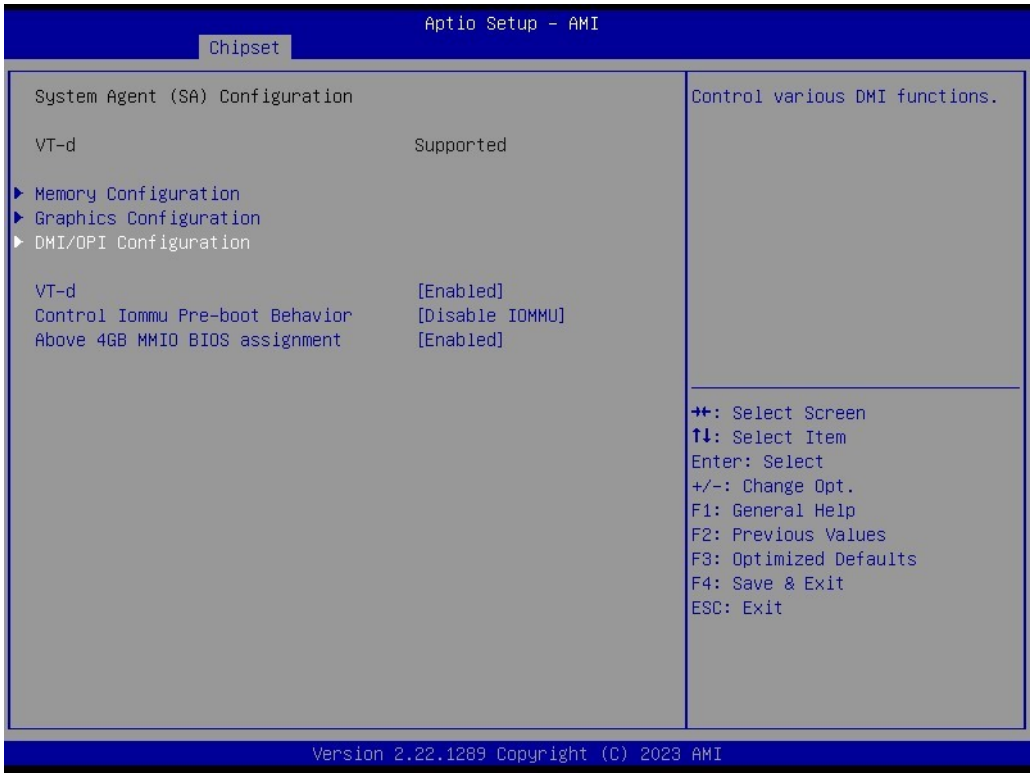




- **Graphics Turbo IMON current**
  Graphics turbo IMON current values supported (14-31).
- **Primary Display**
  Select from IGFX/PEG/PCI which graphics device should be the Primary Display or select SG for Switchable Gfx.
- **Internal Graphics**
  Keep IGFX enabled based on the setup options.
- **GTT Size**
  Select the GTT Size.
- **Aperture Size**
  Select the Aperture Size.
- **PSMI SUPPORT**
  PSMI Enable/Disable.
- **DVMT Pre-Allocated**
  Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
- **Intel Graphics Pei Display Peim**
  Enable/Disable Pei (Early) Display.
- **VDD Enable**
  Enable/Disable forcing of VDD in the BIOS.
- **Configure GT for use**
  Enable/Disable GT configuration in BIOS.
- **RC1p Support**
  Enable/Disable RC1p support. If RC1p is enabled, send a RC1p frequency request to PMA based on other conditions being met.
- **PAVP Enable**
  Enable/Disable PAVP.
- **Cdynmax Clamping Enable**
  Enable/Disable Cdynmax Clamping.

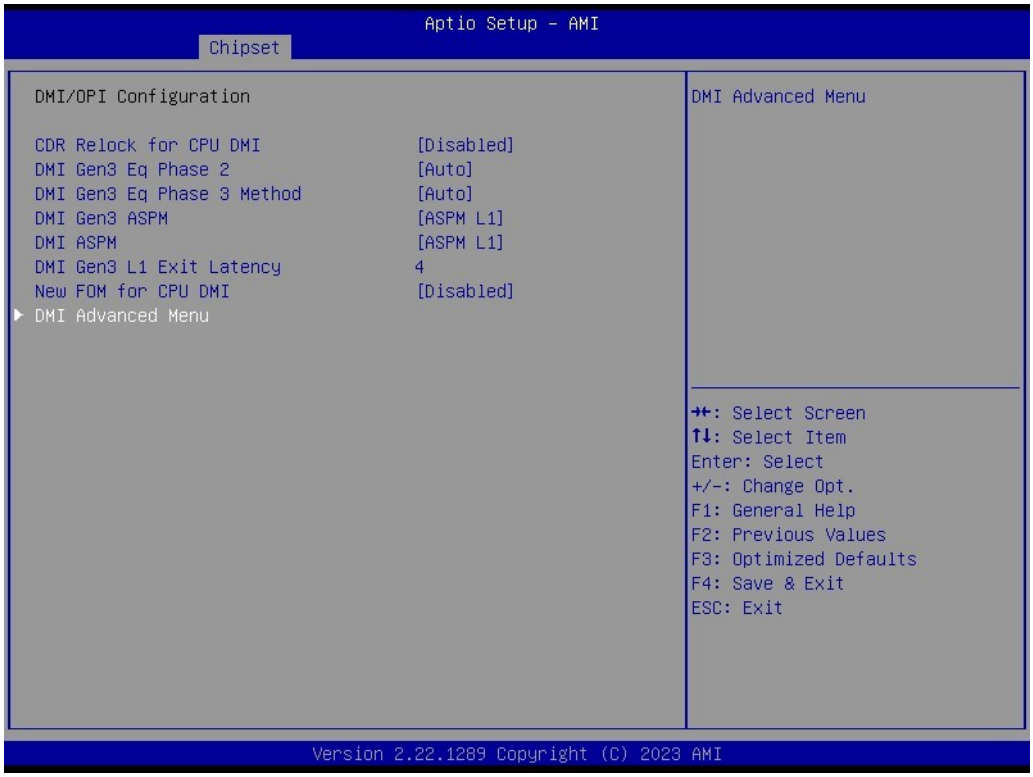
- **Cd Clock Frequency**
  Select the highest Cd Clock frequency supported by the platform.
- **Enable Display Audio Link in Pre-OS**
  Enable: Display Audio Link will be enabled in Pre-OS. Disabled: Display Audio Link will be disabled in Pre-OS.

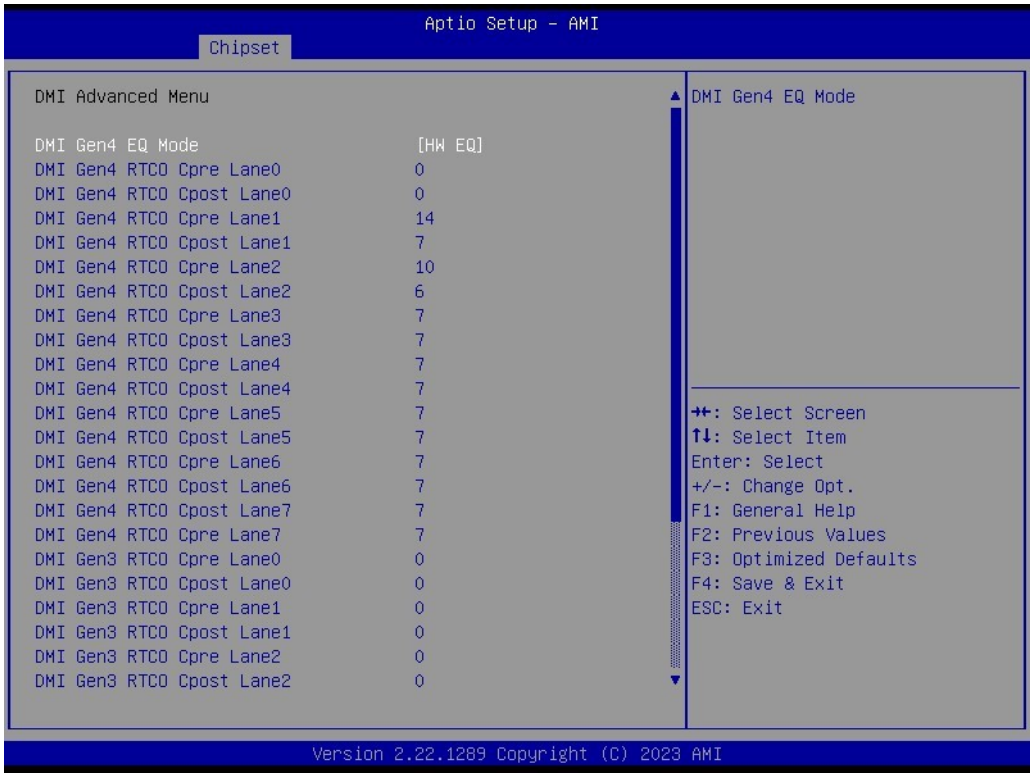
DMI/OPI Configuration

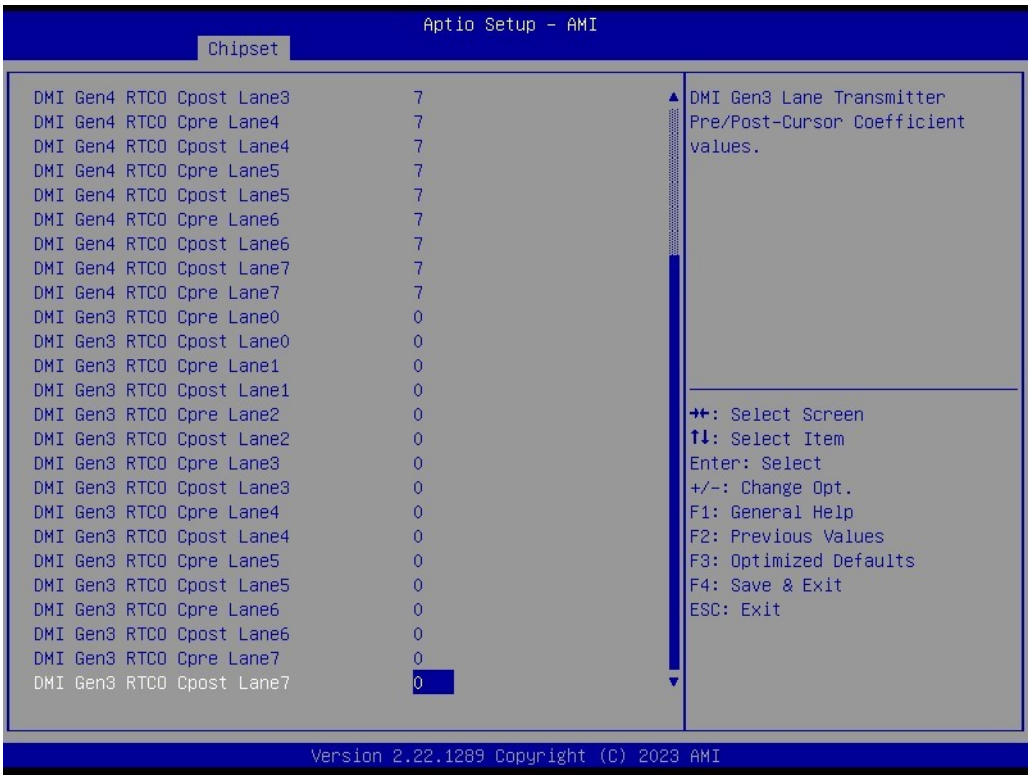


- **CDR Relock for CPU DMI**
  Enable/Disable CDR Relock.
- **DMI ASPM**
  DMI ASPM Support.
- **DMI Gen3 L1 Latency**
  DMI Gen3 L1 Exit Latency.
- **New FOM for CPU DMI**
  Enable/Disable New FOM.

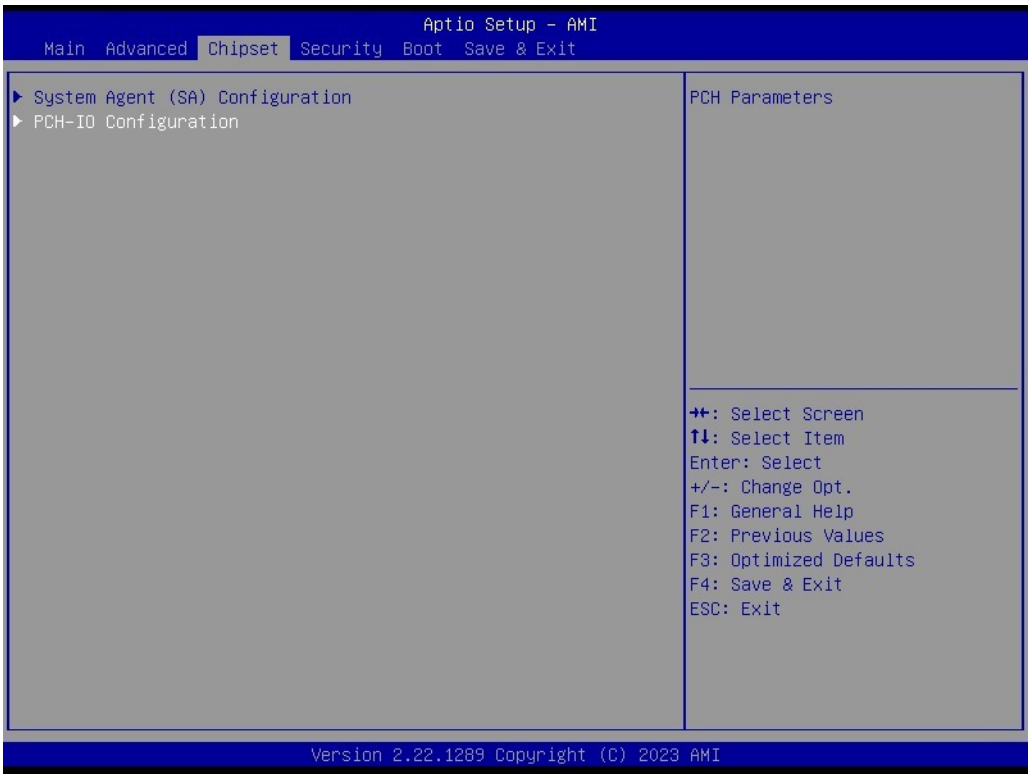
DMI Advanced Menu







3.2.3.2 PCI-IO Configuration



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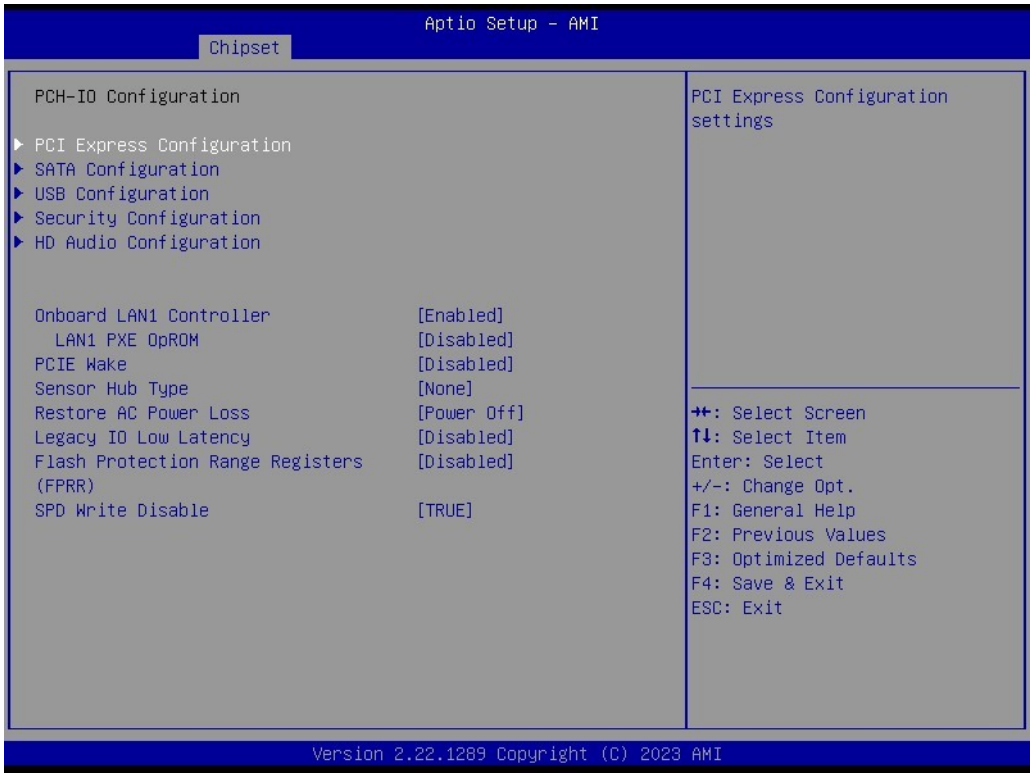
ARK-1125C

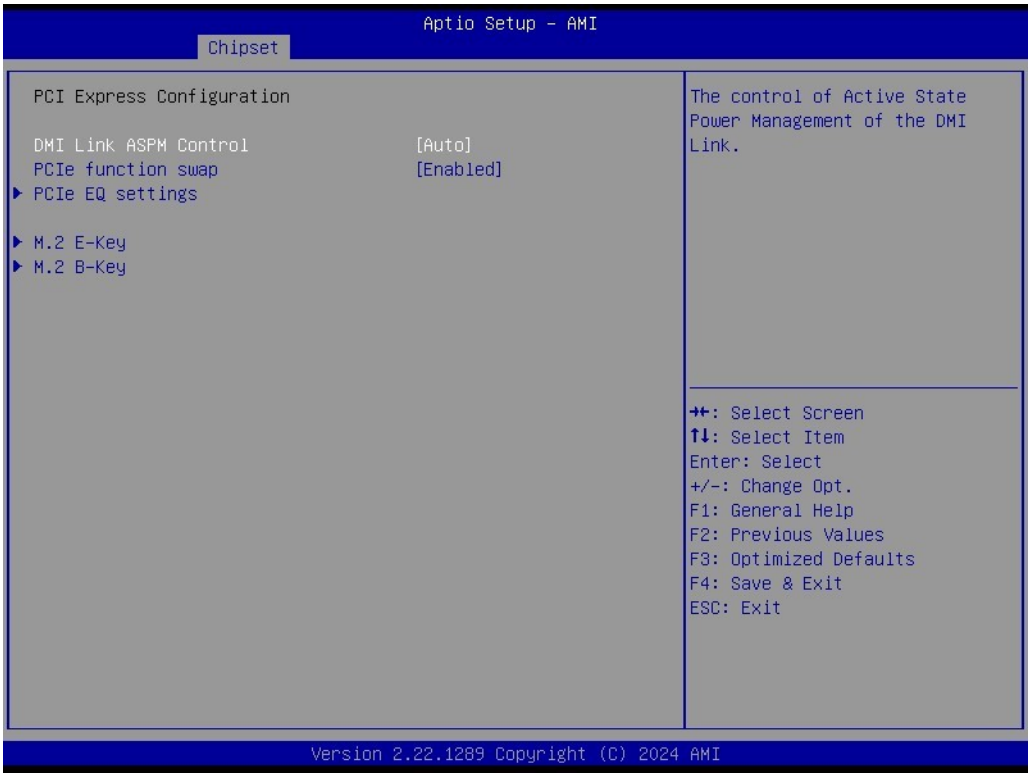


- **Onboard LAN1~2 Controller**
  Enable/Disable onboard NIC.
- **PCIE Wake**
  Enable or disable PCIE to wake the system from S5.

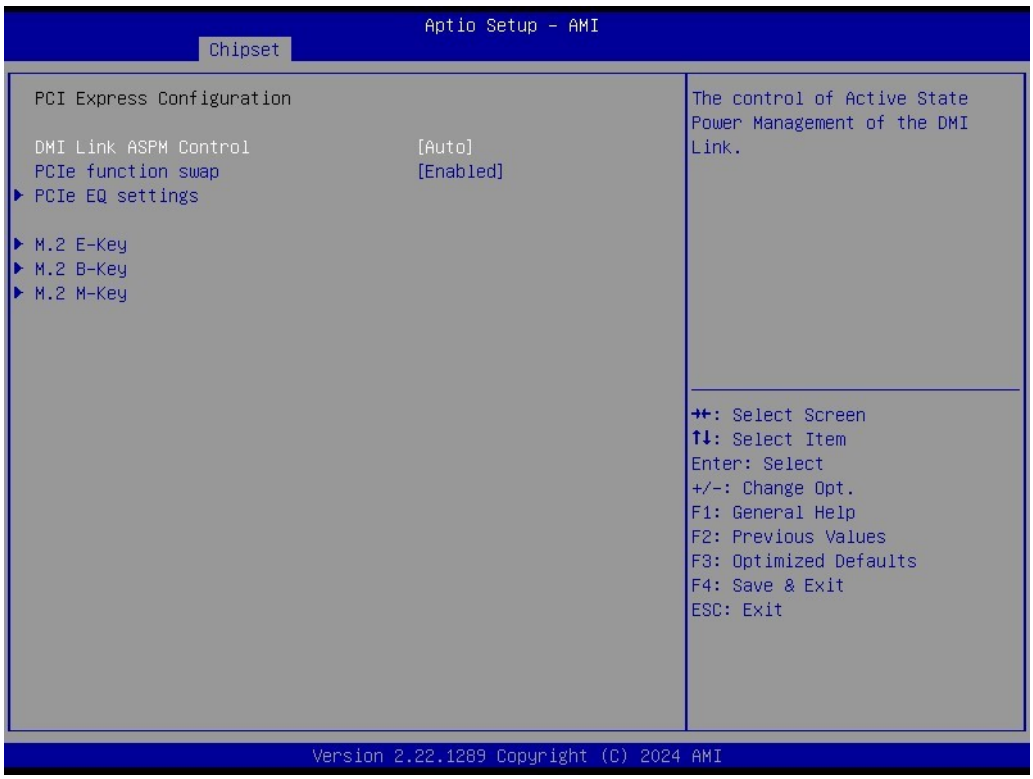
- **Sensor Hub Type**
  Choose the Sensor Hub Type; 'None' will Suppress 'I2C Sensor Hub' Setup Option','I2C' Will Suppress 'ALS' Setup Option and 'USB' will Suppress Both I2C and ALS.
- **Restore AC Power Loss**
  Specify what state to go to when power is re-applied after a power failure (G3 state).
- **Legacy IO Low Latency**
  Set to enable low latency of legacy IO. Some systems require lower IO latency irrespective of power. This is a tradeoff between power and IO latency.
- **Flash Protection Range Registers (FPRR)**
  Enable Flash Protection Range Registers.
- **SPD Write Disable**
  Enable/Disable setting SPD Write Disable. For security recommendations, SPD write disable bit must be set.

- **PCI Express Configuration**

ARK-1125H

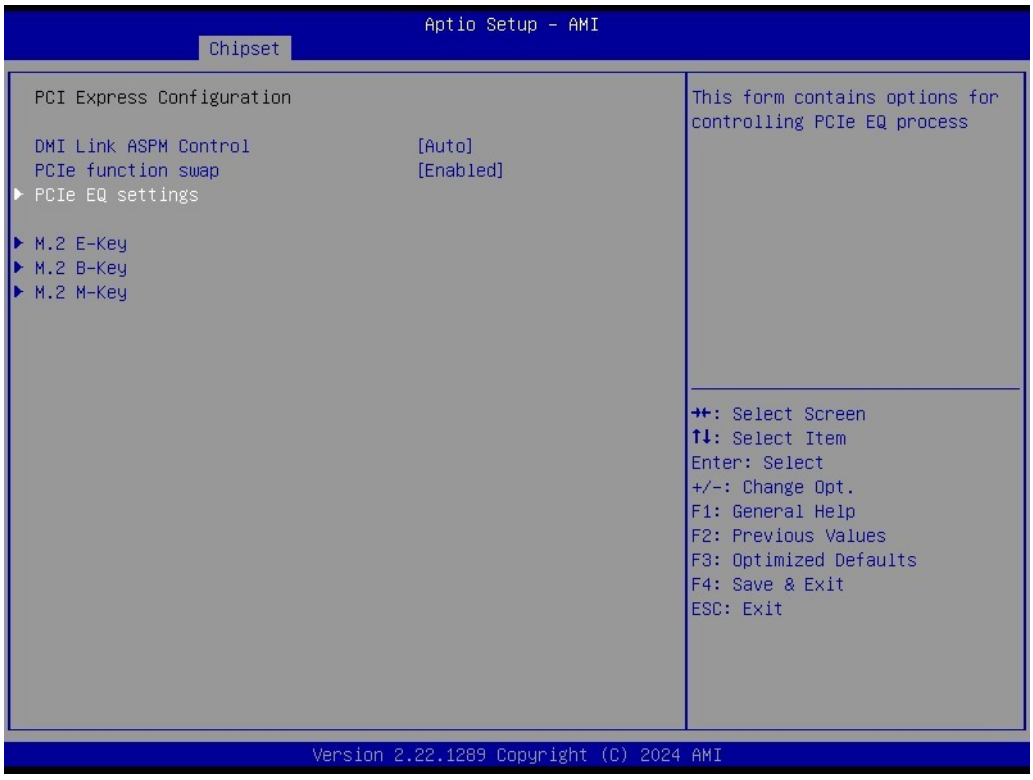


ARK-1125C



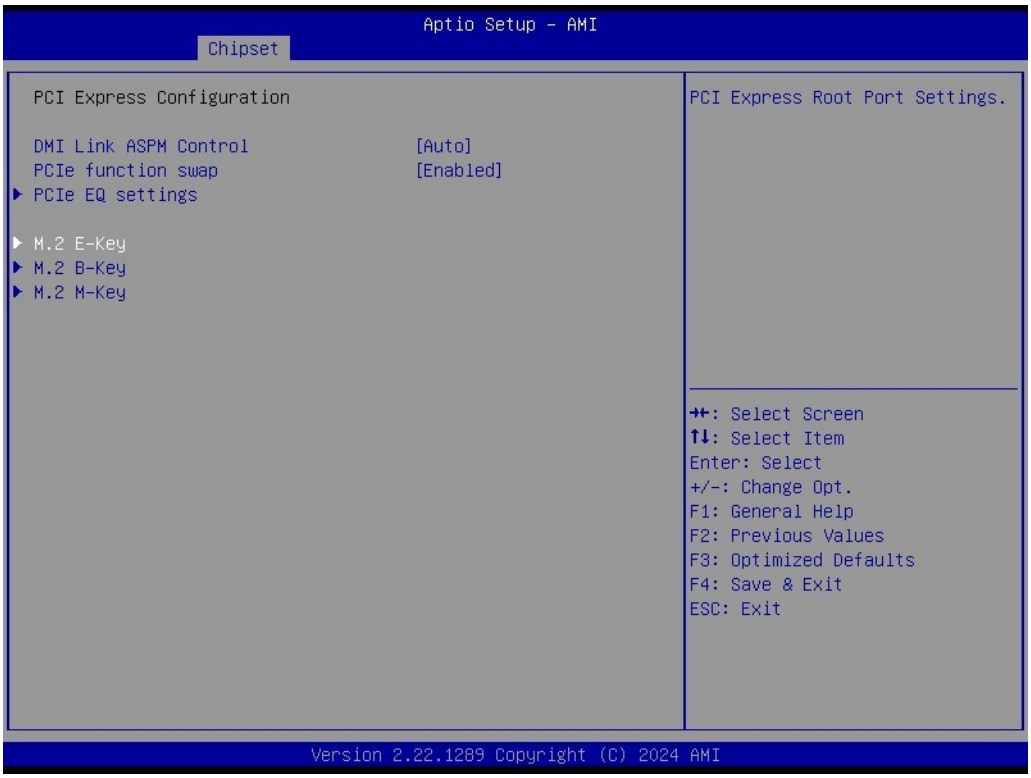
– **DMI Link ASPM Control**
The control of Active State Power Management of the DMI Link.
– **PCIe function swap**
Enable/Disable PCIe function swap.

■ **PCIe EQ settings**



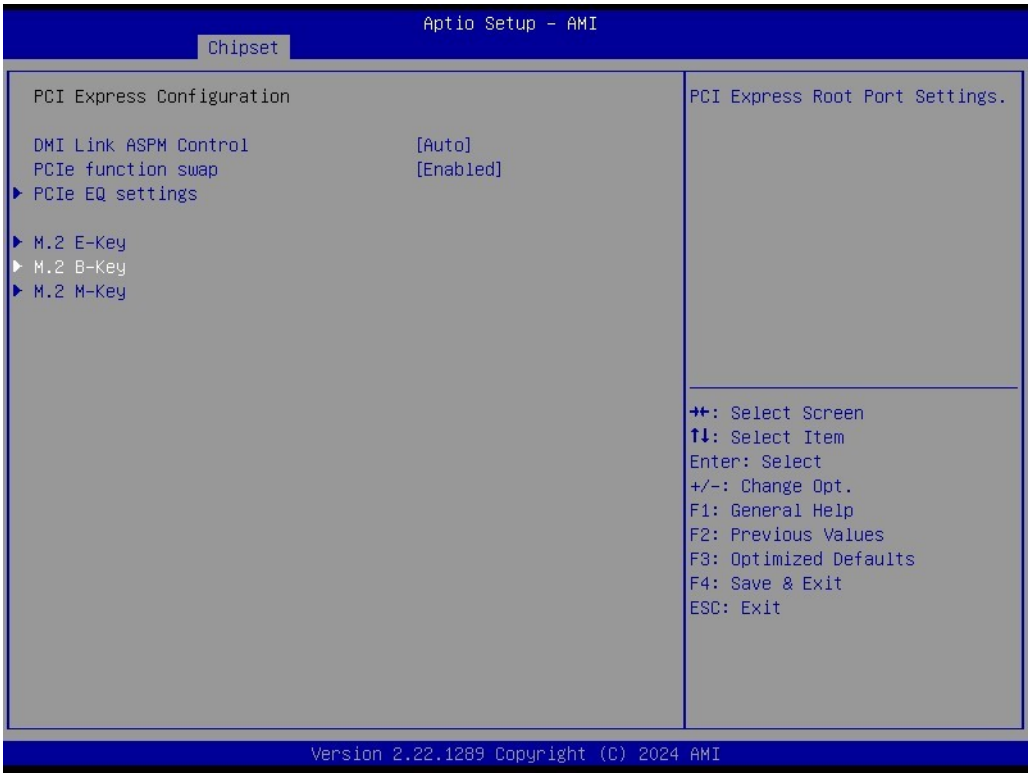
– **PCIe EQ override**
Choose your own PCIe EQ settings, only for users who have a thorough understanding of the equalization process.

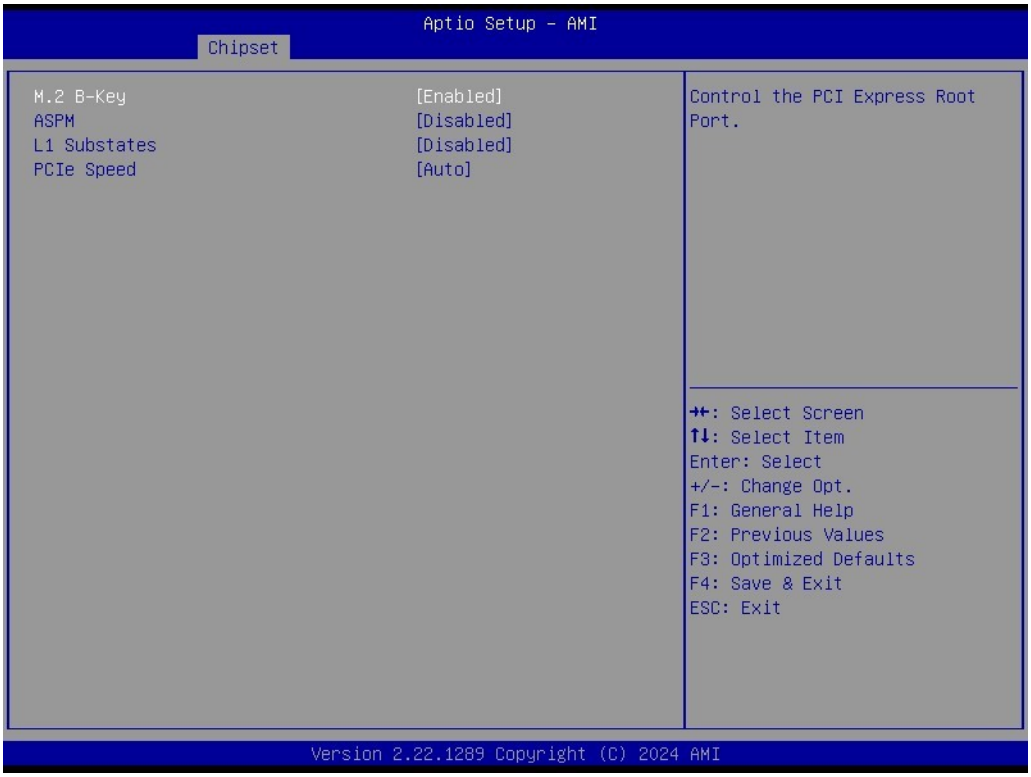
M.2 E-Key



- **ASPM**
  Set the ASPM Level: Force L0s - Force all links to L0s State. AUTO - BIOS auto configure. DISABLE - Disables ASPM.
- **L1 Substates**
  PCI Express L1 Substates settings.
- **PCIe Speed**
  Configure PCIe Speed.

M.2 B-Key

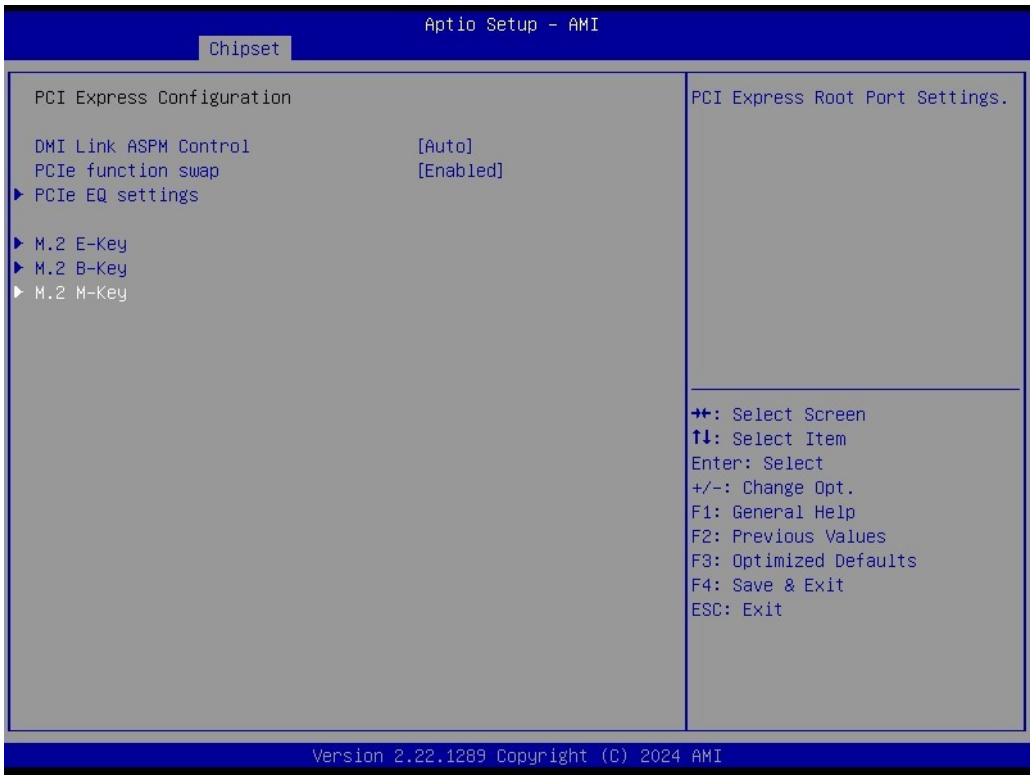


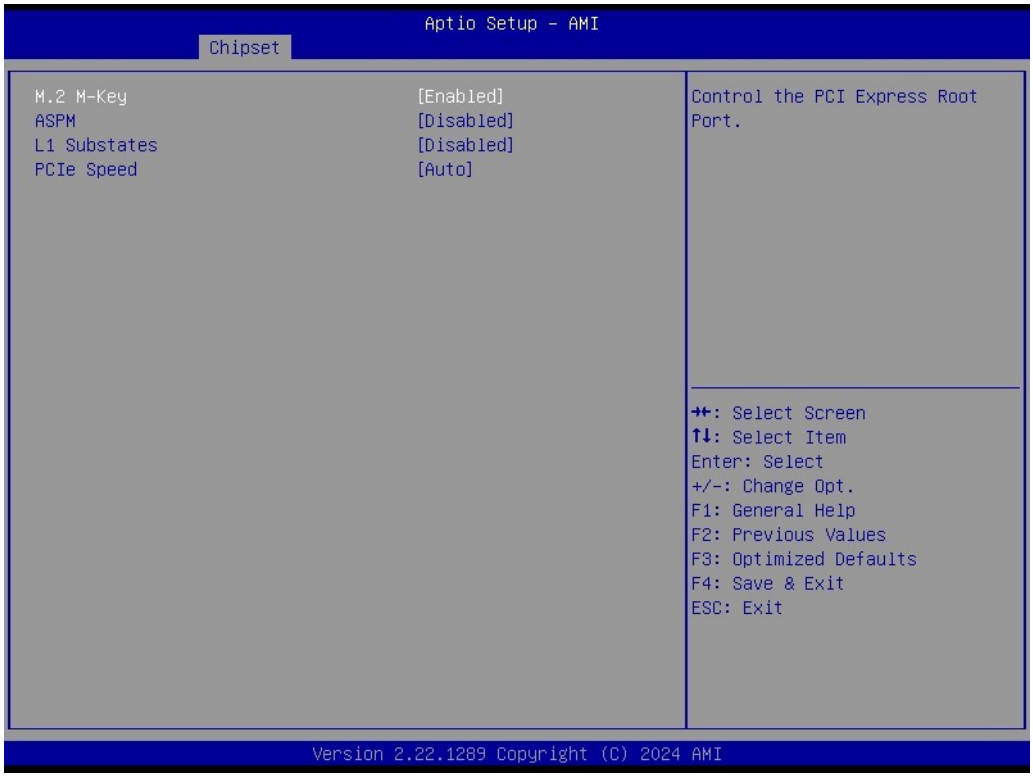


- **ASPM**
  Set the ASPM Level: Force L0s - Force all links to L0s State. AUTO - BIOS auto configure. DISABLE - Disables ASPM
- **L1 Substates**
  PCI Express L1 Substates settings.

– **PCIe Speed**
Configure PCIe Speed.

M.2 M-Key

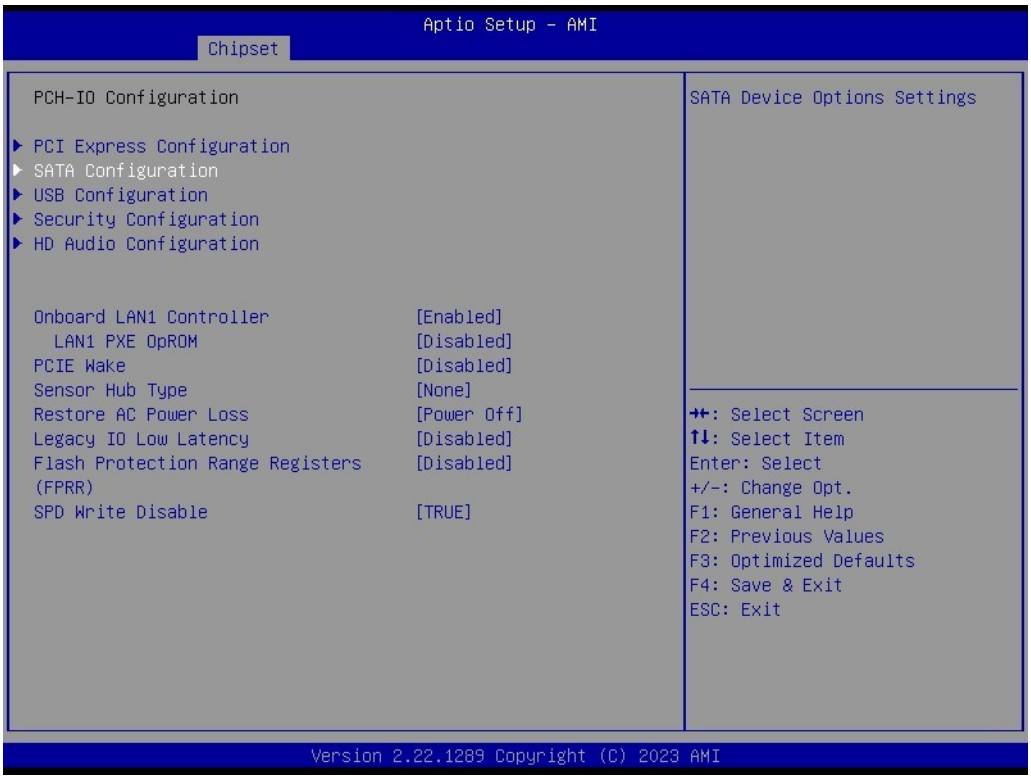




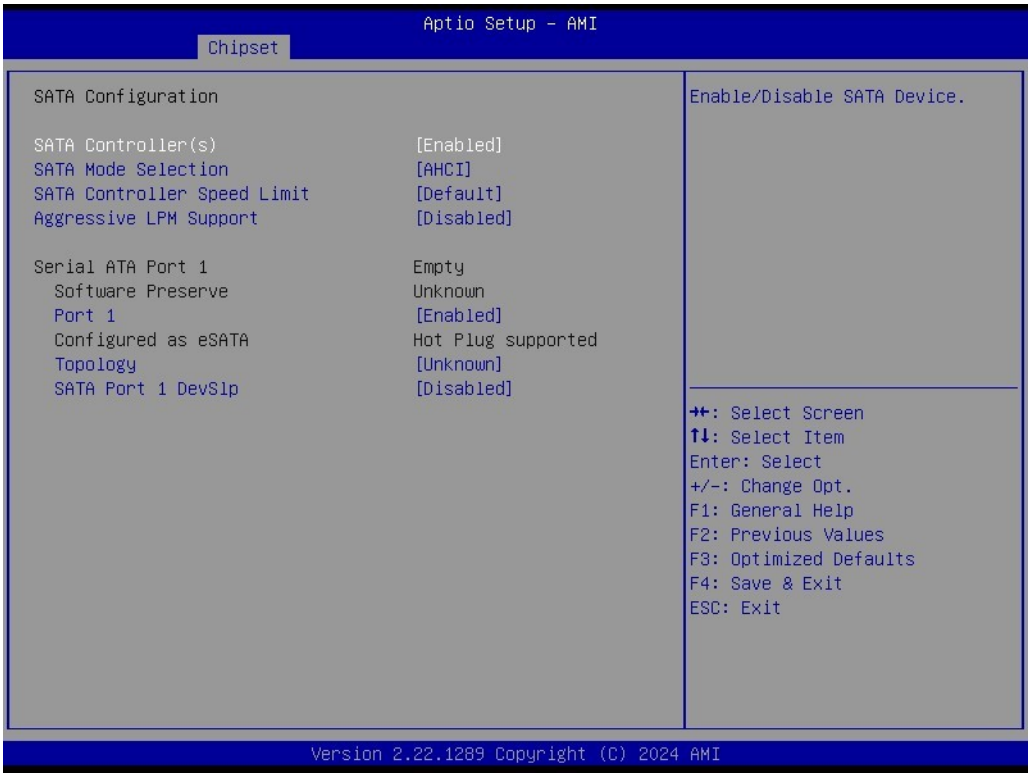
– **ASPM**
Set the ASPM Level: Force L0s - Force all links to L0s State. AUTO - BIOS auto configure. DISABLE - Disables ASPM

– **L1 Substates**
  PCI Express L1 Substates settings.
– **PCIe Speed**
  Configure PCIe Speed.

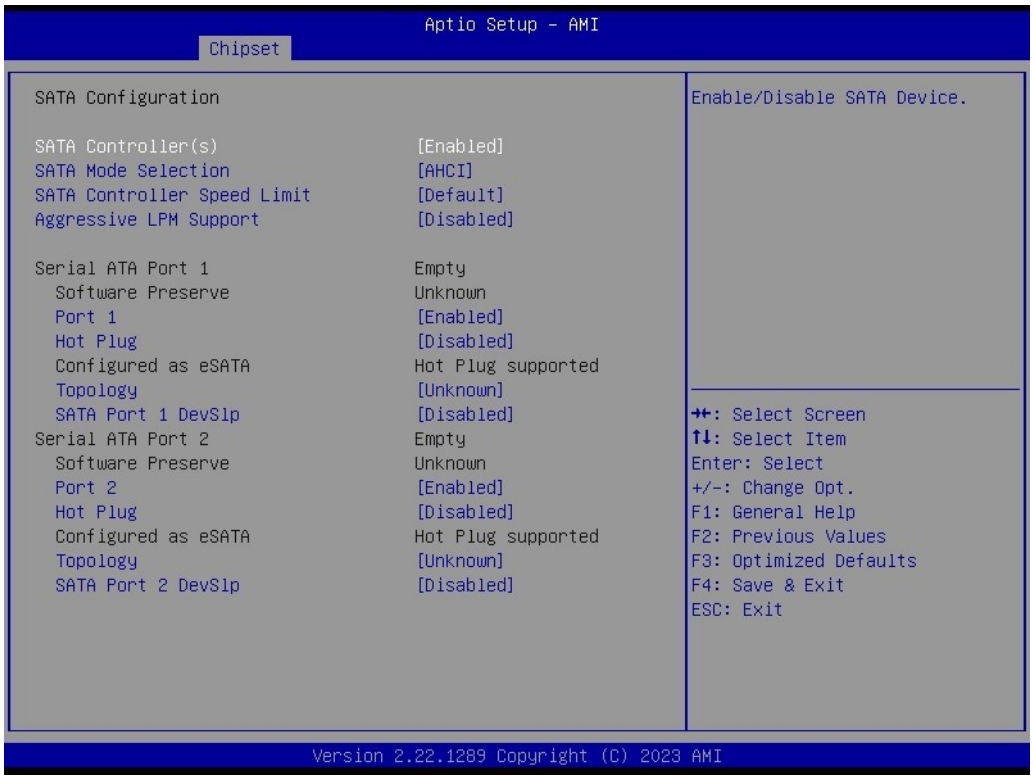
SATA Configuration



ARK-1125H

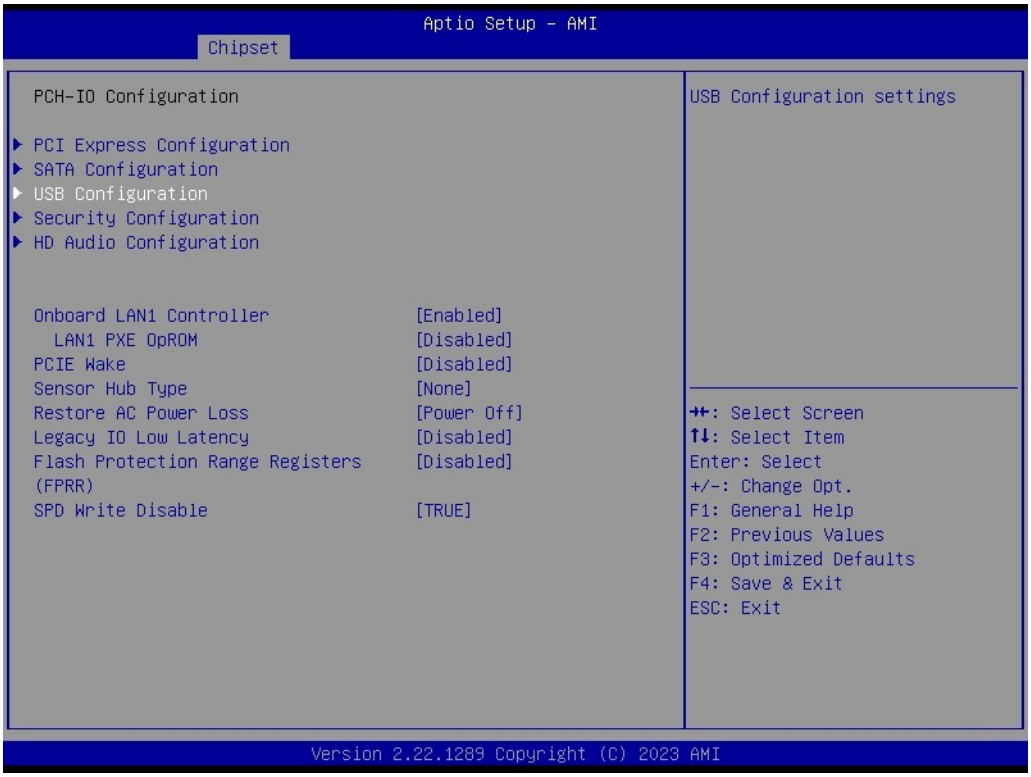


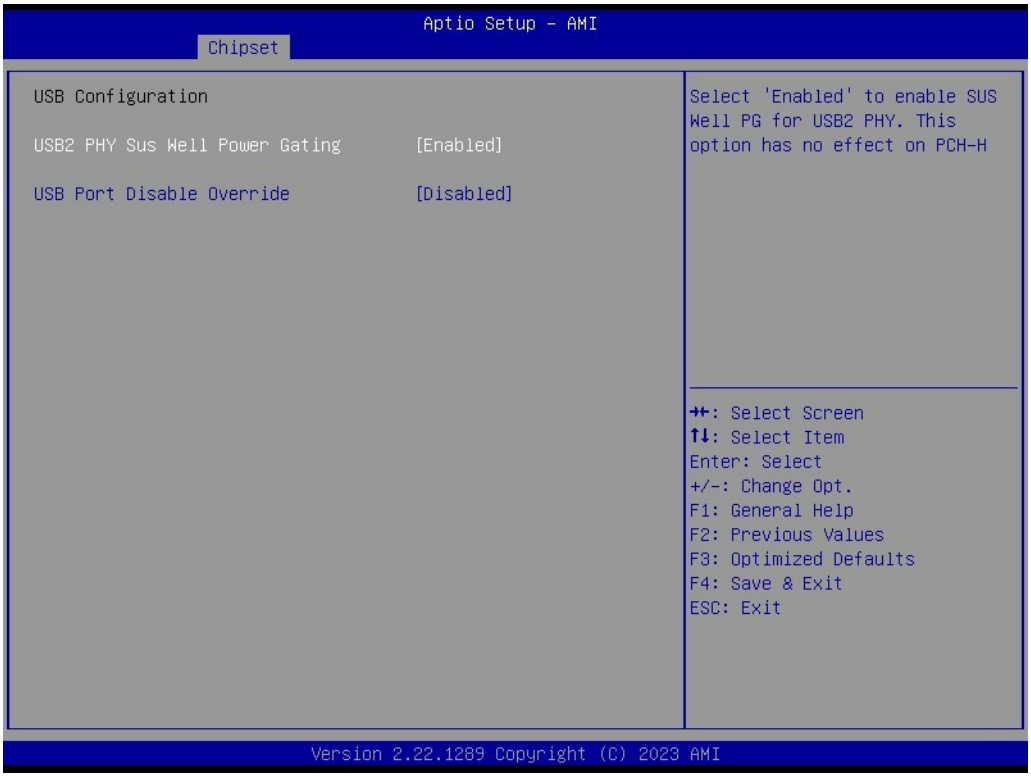
ARK-1125C



- **SATA Controller(s)**
  Enable/Disable SATA Device.
- **SATA Mode Selection**
  Determines how SATA controller(s) operate.
- **SATA Controller Speed Limit**
  Indicates the maximum speed the SATA controller can support.
- **Aggressive LPM Support**
  Disable/Enable PCH to aggressively enter link power state.
- **Port 1~2 SATA**
  Enable or Disable SATA/mSATA Port.
- **Hot Plug**
  SATA Hot Plug Enable/Disable.
- **SATA Port 1~2 DevSlp**
  Enable/Disable SATA Port 1~2 DevSlp. For DevSlp to work, both the hard drive and SATA port need to support the DevSlp function; otherwise an unexpected behavior might happen. Please check the board design before enabling it.

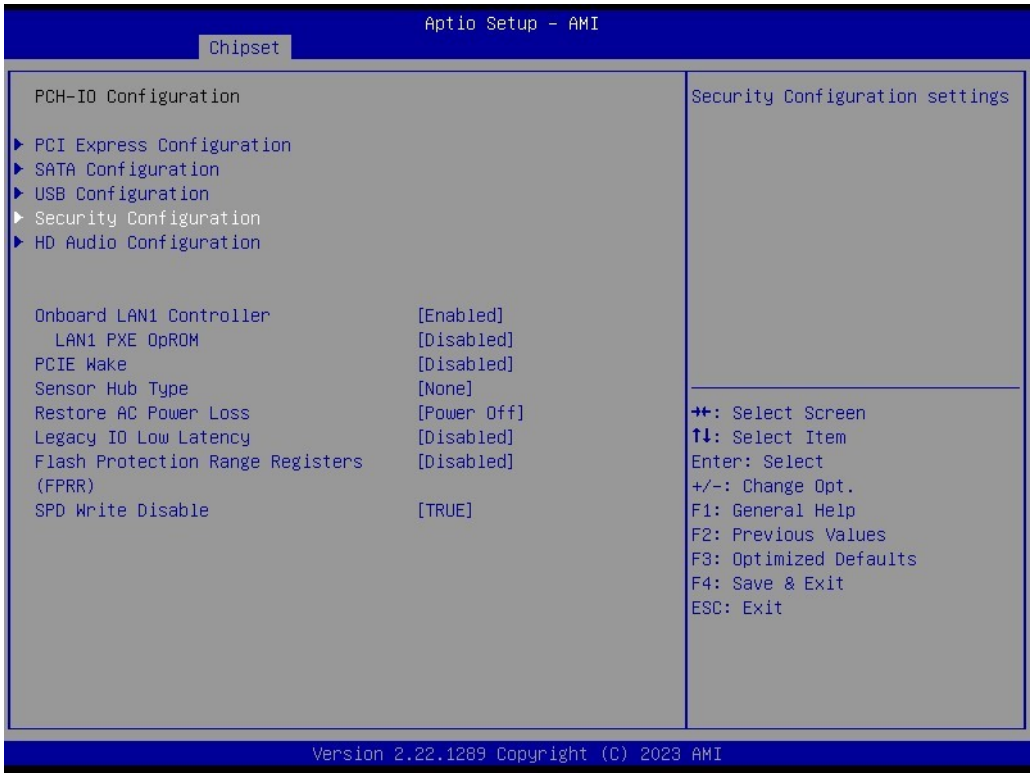
USB Configuration

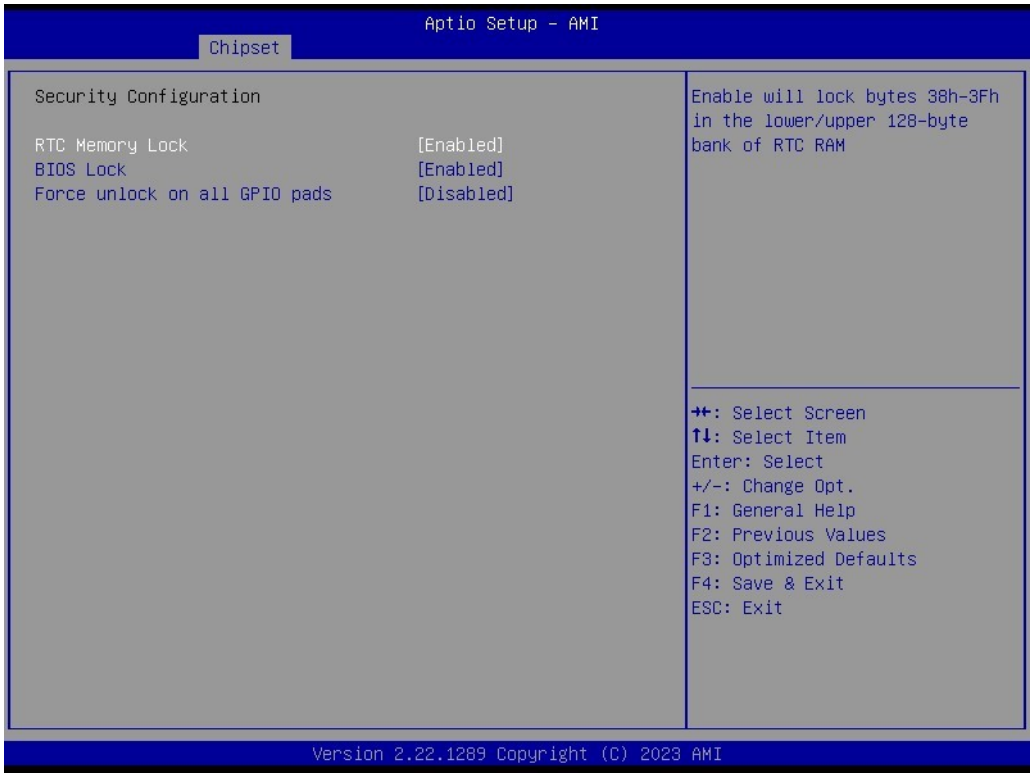




- **USB2 PHY Sus Well Power Gating**
  Select 'Enabled' to enable SUS Well PG for USB2 PHY. This option has no effect on PCH-H
- **USB Port Disable Override**
  Selectively Enable/Disable the corresponding USB port from reporting a Device Connection to the controller.

Security Configuration

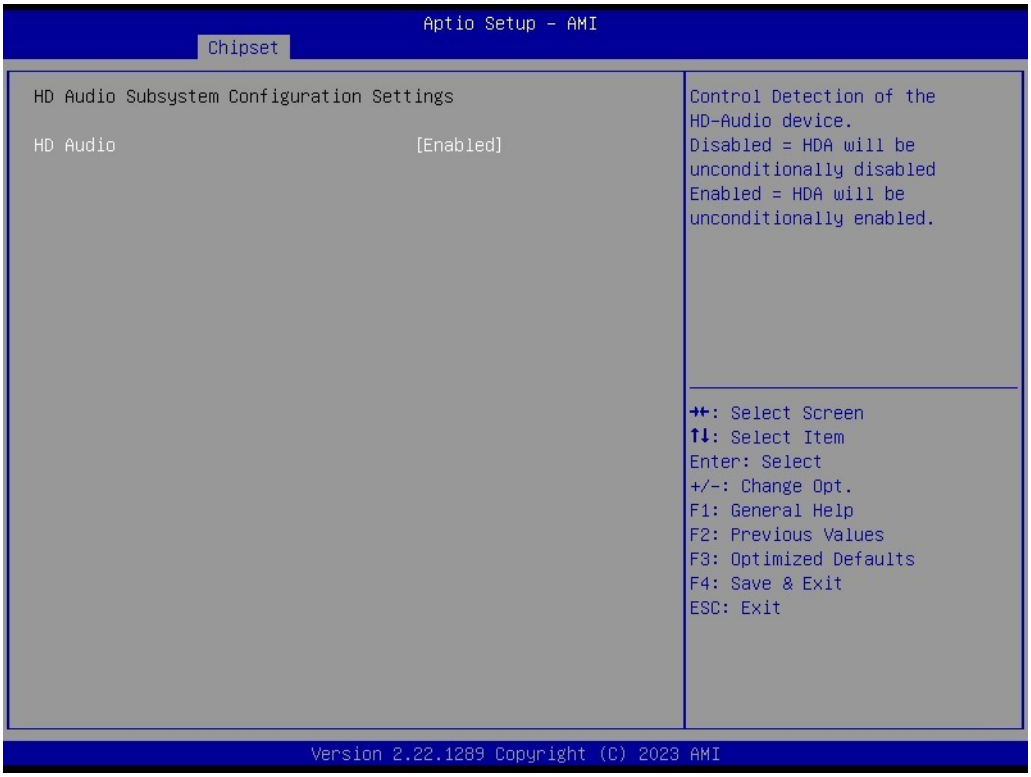




- **RTC Memory Lock**
  Enable will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM.
- **BIOS Lock**
  Enable/Disable the PCH BIOS Lock Enable feature. It is required to be enabled to ensure SMM protection of flash.

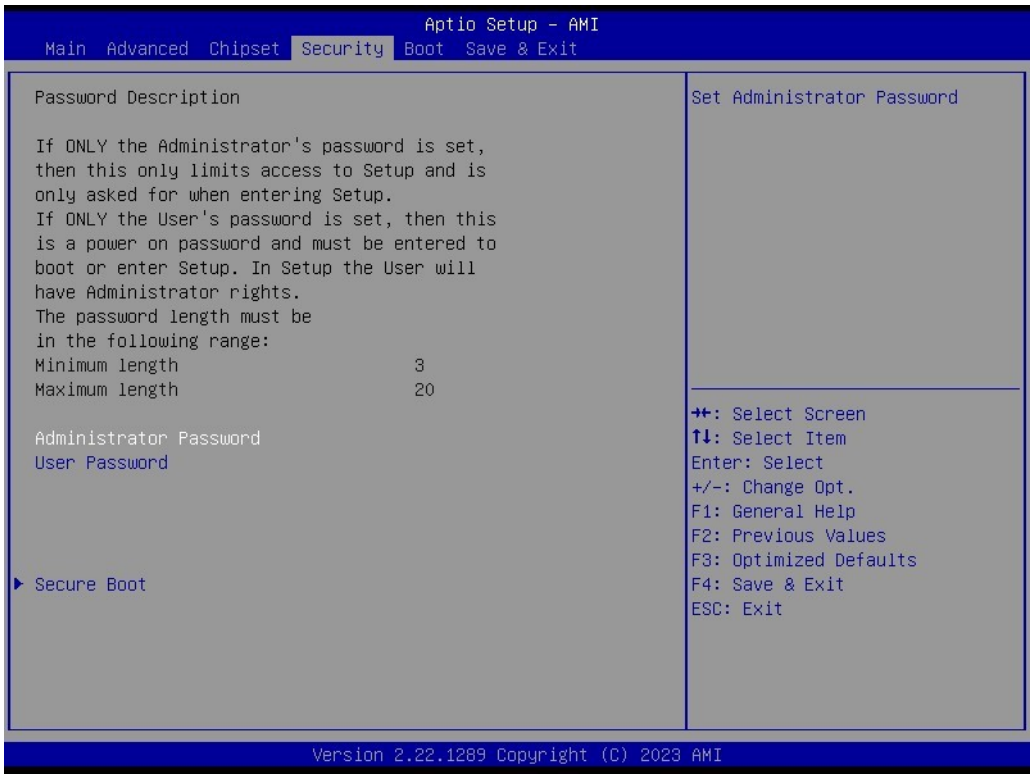
– **Force unlock on all GPIO pads**
If Enabled, the BIOS will force all GPIO pads to be in the unlocked state.

HD Audio Configuration



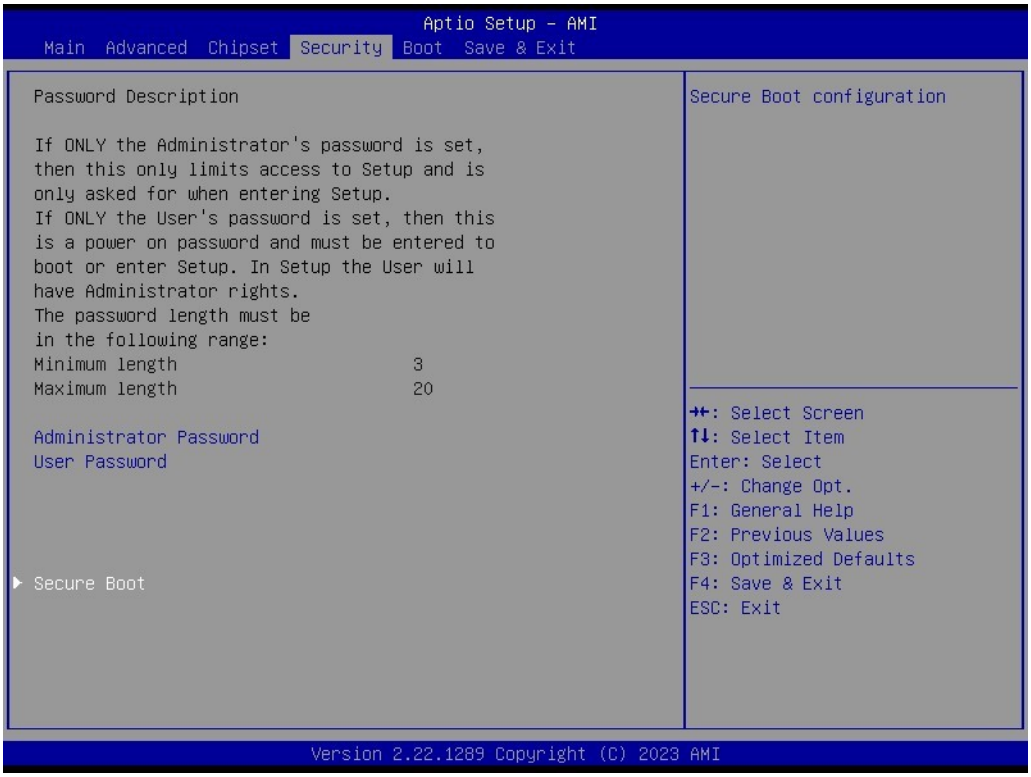
– **HD Audio**
Control Detection of the HD-Audio device.

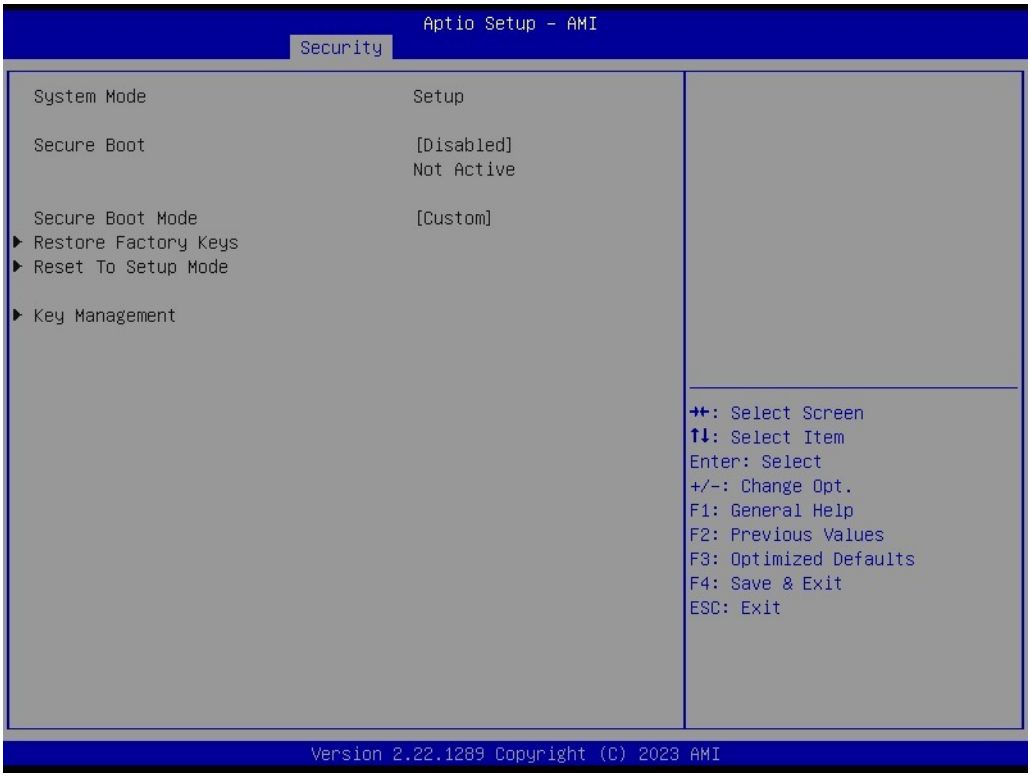
3.2.4 Security



- **Administrator Password**
  Set the Administrator Password.
- **User Password**
  Set the User Password.

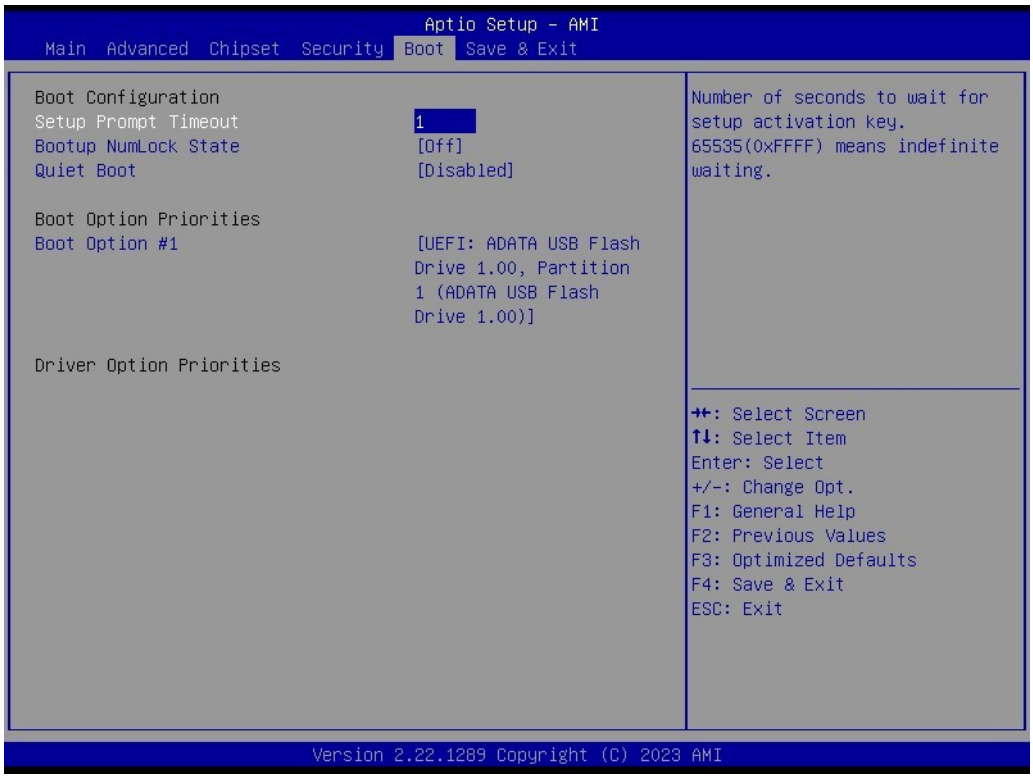
Secure Boot





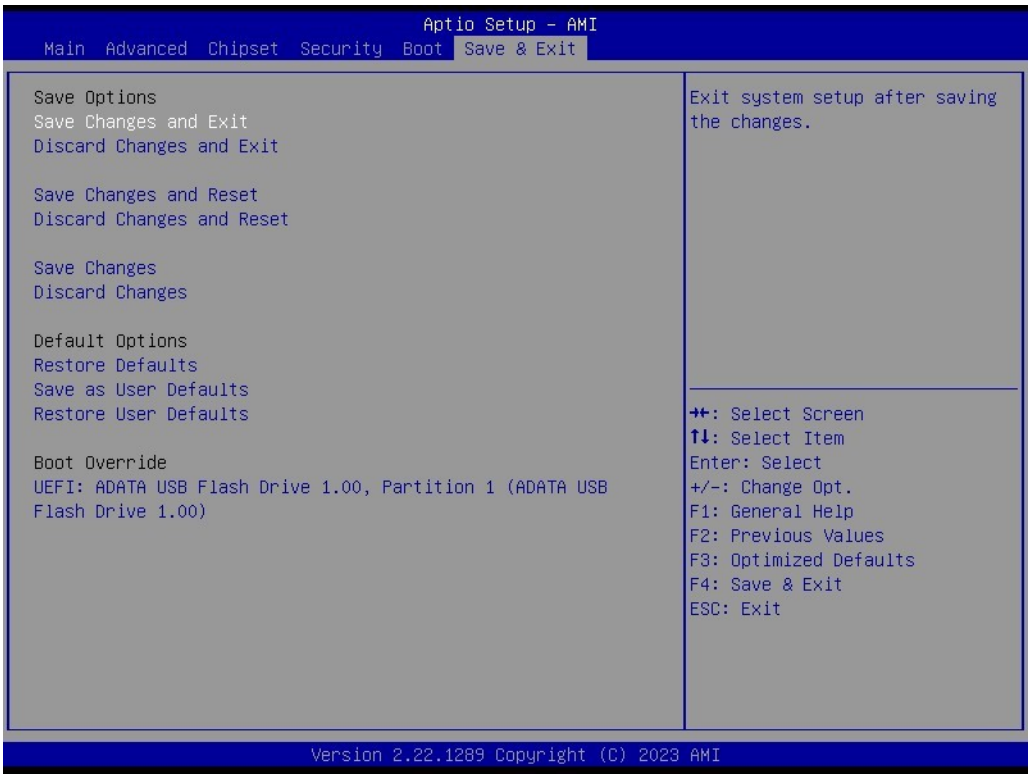
- **Secure Boot**
  The Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled, and the System is in User mode. The mode change requires a platform reset.
- **Secure Boot Mode**
  Secure Boot mode options: Standard or Custom.

3.2.5 Boot



- **Setup Prompt Timeout**
  Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
- **Bootup NumLock State**
  Select the keyboard NumLock state.
- **Quiet Boot**
  Enable/Disable the Quiet Boot option.

3.2.6 Save & Exit



- **Save Changes and Exit**
  Exit system setup after saving the changes.
- **Discard Changes and Exit**
  Exit system setup without saving any changes.
- **Save Changes and Reset**
  Reset the system after saving the changes.
- **Discard Changes and Reset**
  Reset system setup without saving any changes.
- **Save Changes**
  Save Changes done so far to any of the setup options.
  Discard Changes -> Discard Changes done so far to any of the setup options.
- **Restore Defaults**
  Restore/Load Default values for all the setup options.
- **Save as User Defaults**
  Save the changes done so far as User Defaults.
- **Restore User Defaults**
  Restore the User Defaults to all the setup options.

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Please verify specifications before quoting. This guide is intended for reference purposes only.