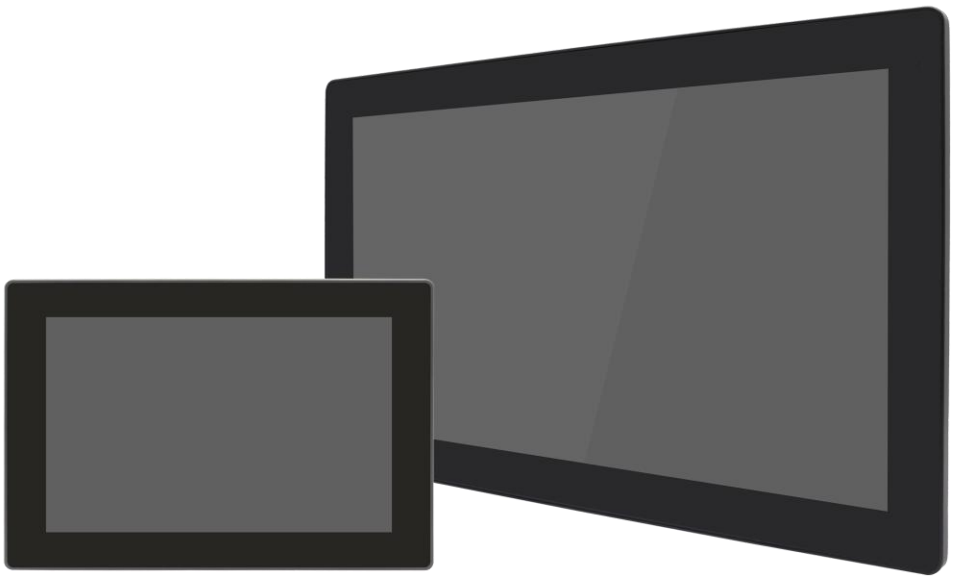


AiTRON-9XXDP(H)

12th/13th Gen. Intel® Core i3/i5/i7 Processors I® Core™

Fanless Industrial Narrow Edge Touch Panel PC

User Manual

Release Date	Revision
Sep.2026	V1.0

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Revision History

Reversion	Date	Description
1.0	2026/09/04	Initiation

Warning!_____

This equipment generates uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Electric Shock Hazard – Do not operate the machine with its back cover removed. There are dangerous high voltages inside.

Caution
Risk of explosion if the battery is replaced with an incorrect type.
Batteries should be recycled where possible. Disposal of used batteries must be in accordance with local environmental regulations.

Disclaimer
This information in this document is subject to change without notice. In no event shall Aplex Technology Inc. be liable for damages of any kind, whether incidental or consequential, arising from either the use or misuse of information in this document or in any related materials.

Safety Precautions

Follow the messages below to prevent your systems from damage:

- Avoid your system from static electricity on all occasions.
- Prevent electric shock. Don‘t touch any components of this card when the card is power-on. Always disconnect power when the system is not in use.
- Disconnect power when you change any hardware devices. For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

Table of Contents

Revision History **2**
Warning! **3**
Safety Precautions **4**
Chapter 1 System Product **7**
1.1 Features 7
1.2 Specifications 7
1.3 Display 10
1.4 Mechanical 10
1.5 Power Consumption 11
1.6 Dimensions 12
1.7 Brief Description of AiTRON-9XXD Series 15
1.8 Installation of Memory and Storage 16
1.9 VESA Mounting 18
1.10 Panel Mounting 19
1.11 Optional Panel Mount Dustproof Covers 21
1.12 SSD heatsink kit installation guide 22
Chapter 2 Hardware **23**
2.1 Motherboard Introduction 23
2.2 Specifications 23
2.3 Jumpers and Connectors Location 26
2.4 Jumpers Setting and Connectors 27
Chapter 3 BIOS Setup Description **35**
3.1 Operations after POST Screen 35
3.2 BIOS SETUP UTILITY 35
3.3 Main Settings 36
3.4 Password Support 37
3.5 Chip Settings 61
3.6 Security Settings 69
3.7 Boot Settings 71
3.8 Save & Exit 72
Chapter 4 Installation of Drivers **73**
4.1 Intel® Chipset 74
4.2 Intel® HD Graphics Chipset 76
4.3 Intel® HD Audio Chipset 78
4.4 LAN Driver 78
4.5 Intel® Management Engine Interface 80
4.6 Intel® Speed Select Technology 82

List of Figures

Figures

Figure 1 Dimensions of AiTRON-910DP(H) 12
Figure 2 Dimensions of AiTRON-912DP(H) 12
Figure 3 Dimensions of AiTRON-915DP(H) 13
Figure 4 Dimensions of AiTRON-916DP(H) 13
Figure 5 Dimensions of AiTRON-921DP(H) 14
Figure 6 Front View of AiTRON-916D 15
Figure 7 Rear View of AiTRON-916D 15
Figure 8 AiTRON-910D/912D/915D/916D/921D VESA Mounting 18
Figure 9 AiTRON-9XXD PANEL Mount Dustproof Cover 21

Chapter 1 System Product

1.1 Features

- 12/13th Gen. Intel® Core™ i3/i5/i7 processors
- 10.1”/12.1”/15”/15.6”/21.5” Industrial Narrow Edge Touch Panel PC
- IP66 Compliant Aluminum Front Bezel
- 2 x 260-pin SO-DIMM slots, DDR4-3200MHz (non-ECC) up to 64GB
- 2 x 1GbE LAN Ports
- Support Projected Capacitive Multi-Touch Screen
- LCD up to 1000nits and Auto-Dimming (TB-49/50) (for option)
- Support Multiple I/O Change
- Wide Range DC 9~36V Power Input
- Fanless Design

1.2 Specifications

	AiTRON-9XXD Series
System	
CPU	12/13th Gen. Intel® Core™ i5/i3 Processors for 10.1”~21.5” ● Intel® Core™ i3-1215U, 2P+4E, 1.2 GHz Base, TDP=15W ● Intel® Core™ i5-1235U, 2P+8E, 1.3GHz Base, TDP=15W ● Intel® Core™ i3-1315U, 2P+4E, 1.2GHz Base, TDP=15W ● Intel® Core™ i5-1335U, 2P+8E, 1.3GHz Base, TDP=15W 12/13th Gen. Intel® Core™ i7 Processors for 15.6”~21.5” ● Intel® Core™ i7-1255U, 2P+8E, 1.7GHz Base, TDP=15W ● Intel® Core™ i7-1365UE, 2P+8E, 1.7GHz Base, TDP=15W
CPU Turbo Mode	Disable Turbo Mode in BIOS
Chipset	SoC
BIOS	AMI UEFI BIOS
Memory	1 x 260-pin SO-DIMM slots, DDR4-3200MHz (non-ECC) up to 64GB
Graphic	Intel® UHD Graphics for 12th Gen. Intel® Processors (1100MHz) Intel® UHD Graphics for 13th Gen. Intel® Processors (1200MHz)
Display Output	1 x HDMI 2.1, resolution up to 4096 x 2304@ 60Hz
TPM	Support Intel PTT Onboard TPM2.0 IC
IO Port (Bottom)	
USB	2 x USB 3.2 Gen1 and USB2.0 Type-A connector; 2 x optional USB2.0 Type A (By cable via pin header)
LAN	2 x RJ45, support Intel® I219LM/210AT 1GbE LAN

<table>
<tr><td>Serial</td><td>1 x DB9, supports RS-232/422/485(COM1, BIOS selection, RS-232 is default)
1 x DB9, supports RS-232/422/485 (COM2, BIOS selection, RS-232 is default) (By cable via pin header COM 2), optional
1 x DB9, supports RS-232 (COM3) (By cable via pin header) (option)</td></tr>
<tr><td>HDMI</td><td>1 x HDMI port (no hole-cutting, no screen printing)</td></tr>
<tr><td>Power</td><td>1 x 3-Pin Terminal Block Type, DC 9-36V Power input (PB-323+ cable)</td></tr>
<tr><td colspan="2">Two I/O which extended from M/B, can be sustained as the following items:
(Configuration1/2/3, cables pull out from motherboard)
<table>
<tr><td>Configuration 1(Default):</td><td>COM2
RS-232/422/485</td><td>COM3
RS-232</td></tr>
<tr><td>Configuration 2:</td><td>COM2
RS-232/422/485</td><td>2 x USB2.0</td></tr>
</table></td></tr>
<tr><td colspan="2">Storage Space</td></tr>
<tr><td>Storage</td><td>1 x M.2 M-Key 2280 for SSD (PCIe4.0x4), must come with SSD heatsink kit</td></tr>
</table>

Expansion	
Expansion Slot	1 x M.2 2230 E-Key (USB2.0 + PCIe x1) for optional Wi-Fi/BT module 1 x M.2 3042/3052 B-Key (USB3.2 Gen1, PCIe x1) for optional LTE/5G module
Others	
Watchdog Timer	1 ~ 255 sec (system)
LED Indicator	Via LED Indicator board TB-55
Visual	Support Auto-Dimming (20% to 100% as default, PB-49/50) (optional by request) LED indicator board-TB-55
Antenna	
Antenna	2 x SMA-female connectors' holes for external antenna (2 for Wi-Fi 6e+BT5.3/LTE/5G)
Power	
Power Input	DC 9~36V
Mechanical	
Mechanical Construction	Aluminum die-casting chassis
Mounting	Panel Mount VESA 100 x 100 mm
IP Rating	IP66 Front Bezel Design
Operating System Support	
OS Support	Windows 10 IoT Enterprise 2021 LTSC or later Windows 11 IoT Enterprise 2024 LTSC or later Linux 24.04
Environmental	
Operating Temperature	10.1" ~15.6" LCD : Standard: -20~60°C (ambient w/ air flow and WT RAM/SSD) High Brightness: 0~50°C(ambient w/ air flow) 21.5" LCD : 0°C to 50°C(ambient w/ air flow)
Storage Temperature	-30~70°C
Humidity	10 to 95% @ 40°C, non-condensing
Certification	CE / FCC Class A

1.3 Display

1.3.1 Standard LCD

	AiTRON-910DP	AiTRON-912DP	AiTRON-915DP	AiTRON-916DP	AiTRON-921DP
Display Type	10.1” TFT LCD	12.1” TFT LCD	15” TFT LCD	15.6” TFT LCD	21.5” TFT LCD
Max. Resolution	1280 x 800	1024x768	1024x768	1920x1080	1920x1080
Max. Color	16.7M	16.2M	16.7M	16.7M	16.7M
Luminance(cd/m²)	350	450	350	500	250
Contrast Ratio	800:1	1,500:1	1,000:1	1,000:1	1,000:1
Viewing angle(H/V)	170/170	178 /178	178/178	178 /178	178/178
MTBF(Hrs)	30,000	50,000	50,000	50,000	50,000

1.3.2 High Brightness LCD

	AiTRON-910DPH	AiTRON-912DPH	AiTRON-915DPH	AiTRON-916DPH	AiTRON-921DPH
Display Type	10.1” TFT LCD	12.1” TFT LCD	15” TFT LCD	15.6” TFT LCD	21.5” TFT LCD
Max. Resolution	1280 x 800	1024x768	1024x768	1920x1080	1920 x 1080
Max. Color	16.7M	16.7M	16.7M	16.7M	16.7M
Luminance(cd/m²)	800	1,000	1,000	1,000	1,000
Contrast Ratio	1,200:1	1,000:1	1,200:1	1,000:1	1,000:1
Viewing angle(H/V)	178/178	178/178	178/178	170/170	178/178
MTBF(Hrs)	50,000	70,000	50,000	50,000	50,000

All product specifications are subject to change without notice, * identify as optional function

1.4 Mechanical

	AiTRON-910DP(H)	AiTRON-912DP(H)	AiTRON-915DP(H)	AiTRON-916DP(H)	AiTRON-921DP(H)
Mounting	Panel Mount VESA Mount: 100 x 100 mm				
Dimensions(mm)	270x184.9x66	291x230x64	350.7x274.7x64	396.4x245.5x63.8	529.8x321.5x65.6
Net Weight (Kg)	2.37	2.74	3.67	3.22	5.43

1.5 Power Consumption

Max power consumption of each model under Window 10

Model	Max Power Consumption(W)
AiTRON-910D	31.39
AiTRON-912D	42.44
AiTRON-915D	39.46
AiTRON-916D	61.56
AiTRON-921D	50.15

* To record power consumed when system has full loading with external devices attached.
* Power consumption may have 10% tolerance difference due to different MB, parts, test instrument, and so on.
* We suggest to use the adapter that APLEX approved. If you would like to adopt your own power supply or adapter, please add another 20-30% from the above power consumption to make sure the system can work stable.

1.6 Dimensions

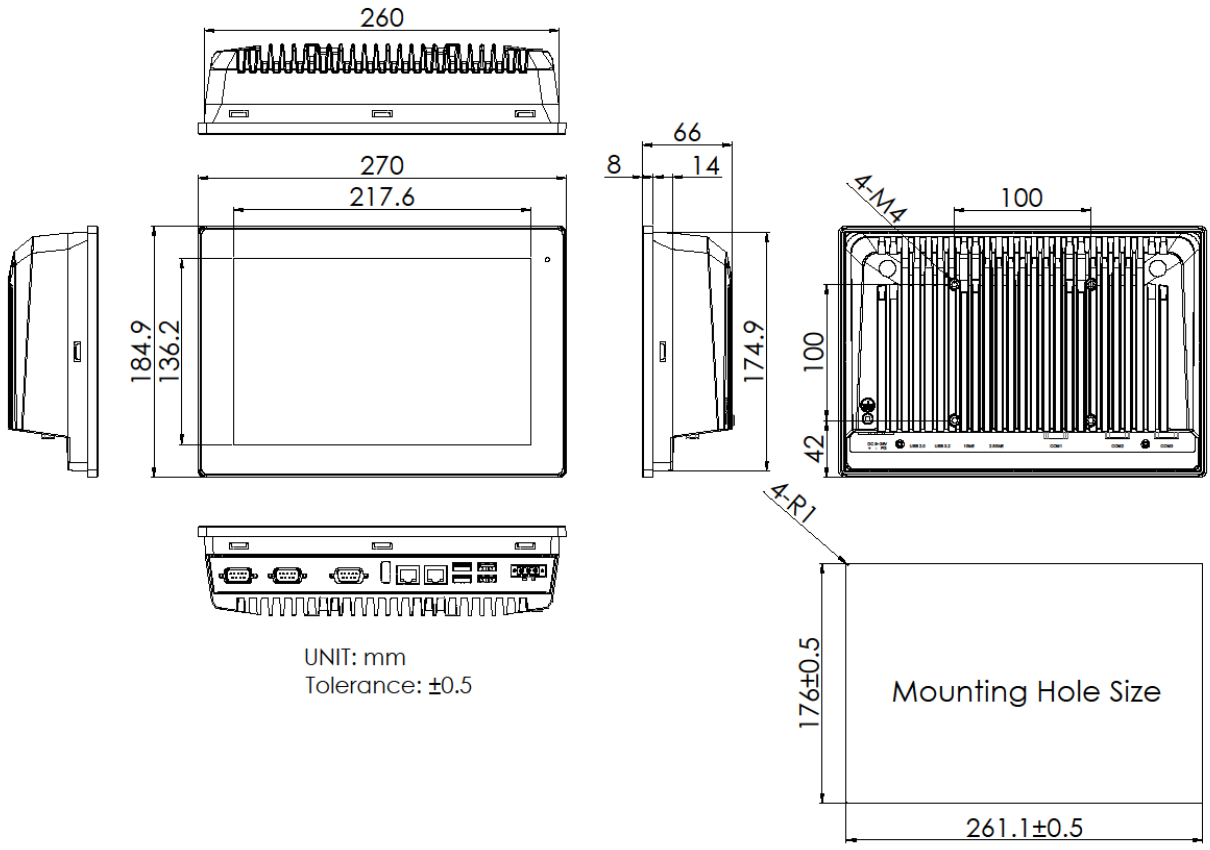


Figure 1 Dimensions of AiTRON-910DP(H)

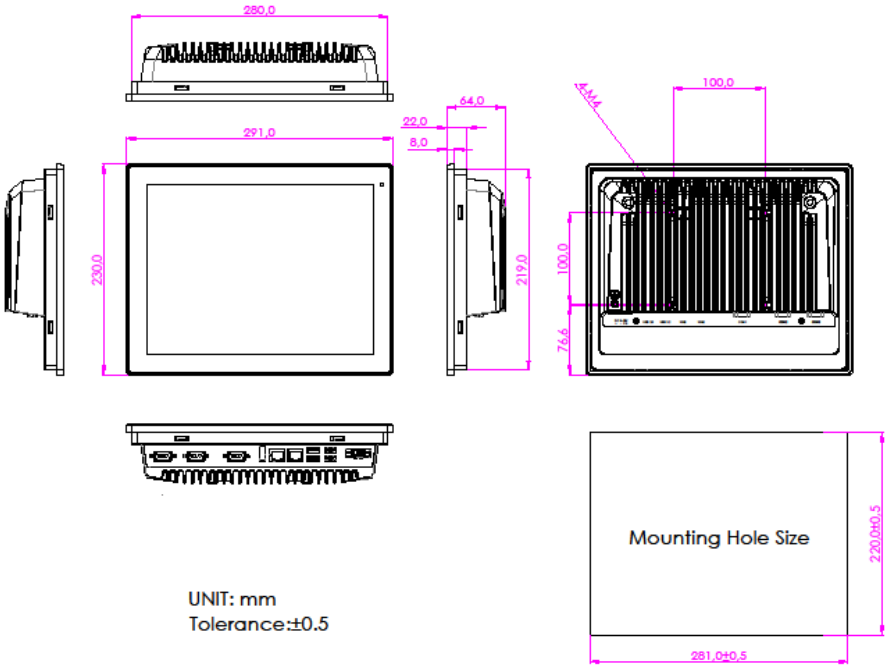


Figure 2 Dimensions of AiTRON-912DP(H)

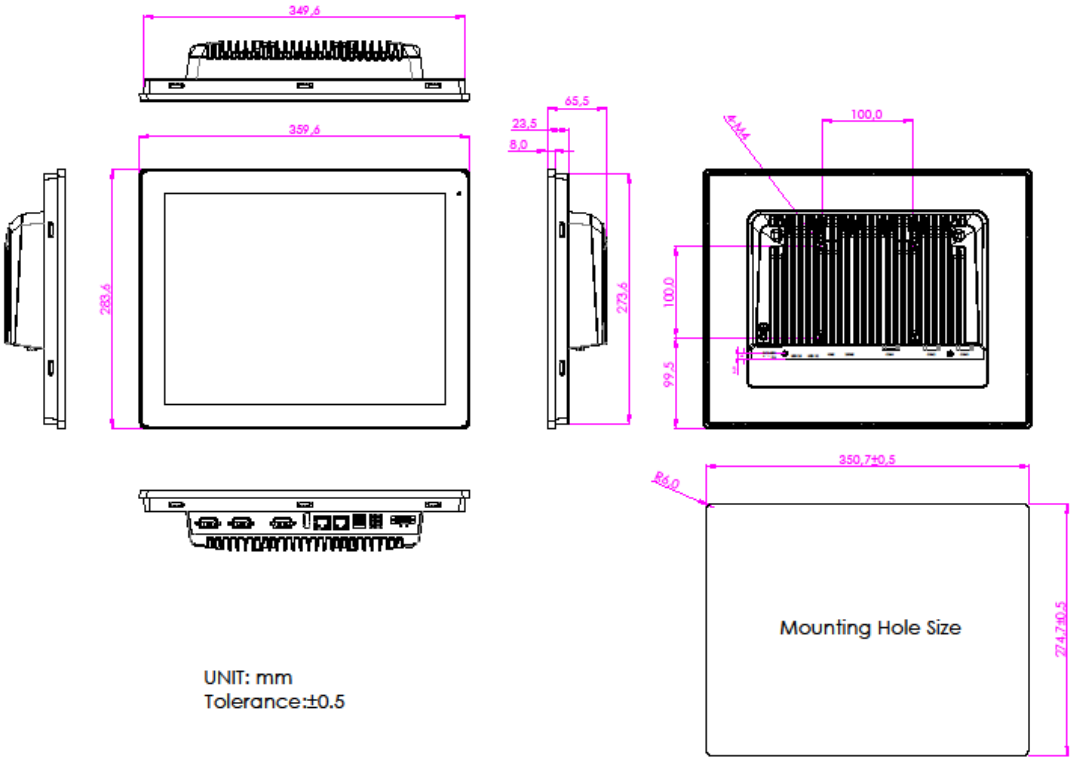


Figure 3 Dimensions of AiTRON-915DP(H)

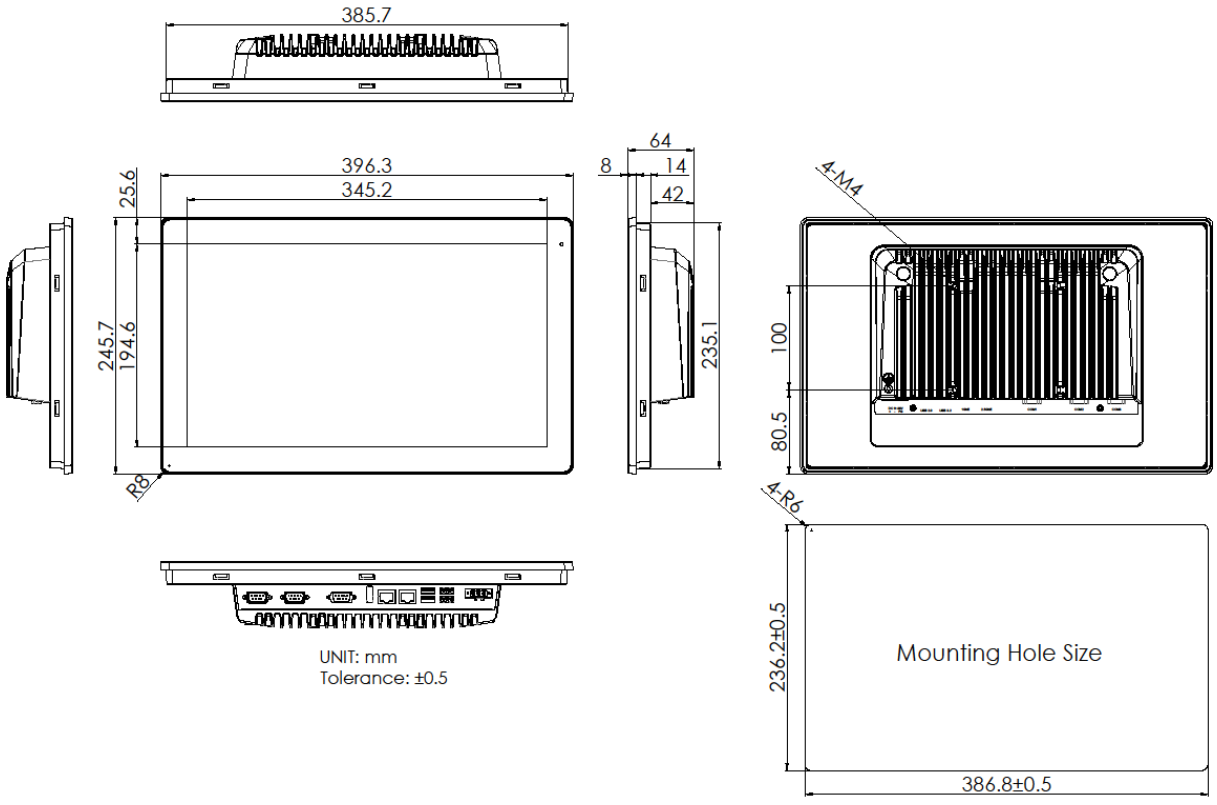


Figure 4 Dimensions of AiTRON-916DP(H)

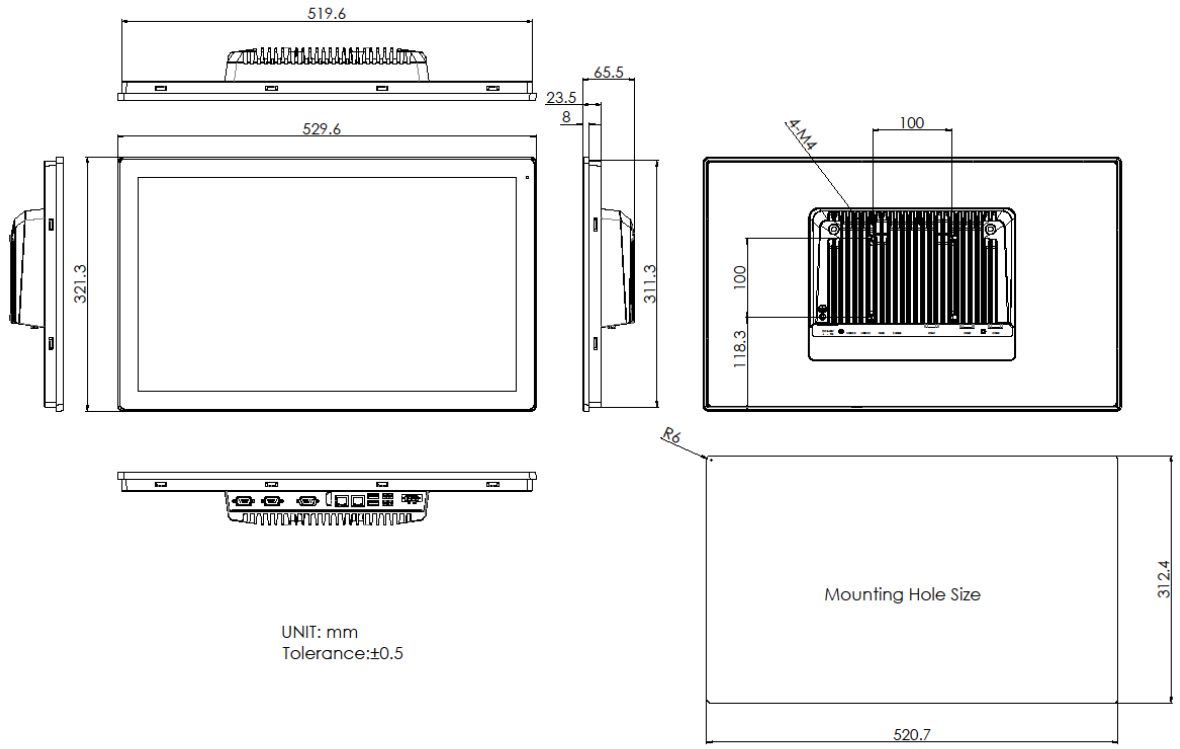


Figure 5 Dimensions of AiTRON-921DP(H)

1.7 Brief Description of AiTRON-9XXD Series

AiTRON-9XXD series products are a newly launched product line, ranging in size from 10.1” to 21.5”. They feature a fanless, low-power, and compact design, making them suitable for use as HMI and control panels in smart production lines and self-service kiosks. With a protective aluminum enclosure, full-plane projected capacitive multi-touchscreen technology, wireless capabilities, and multiple I/O options, the high-performance AiTRON-9XXD series devices can also be integrated with a wide range of optional peripherals and accessories according to specific application requirements.

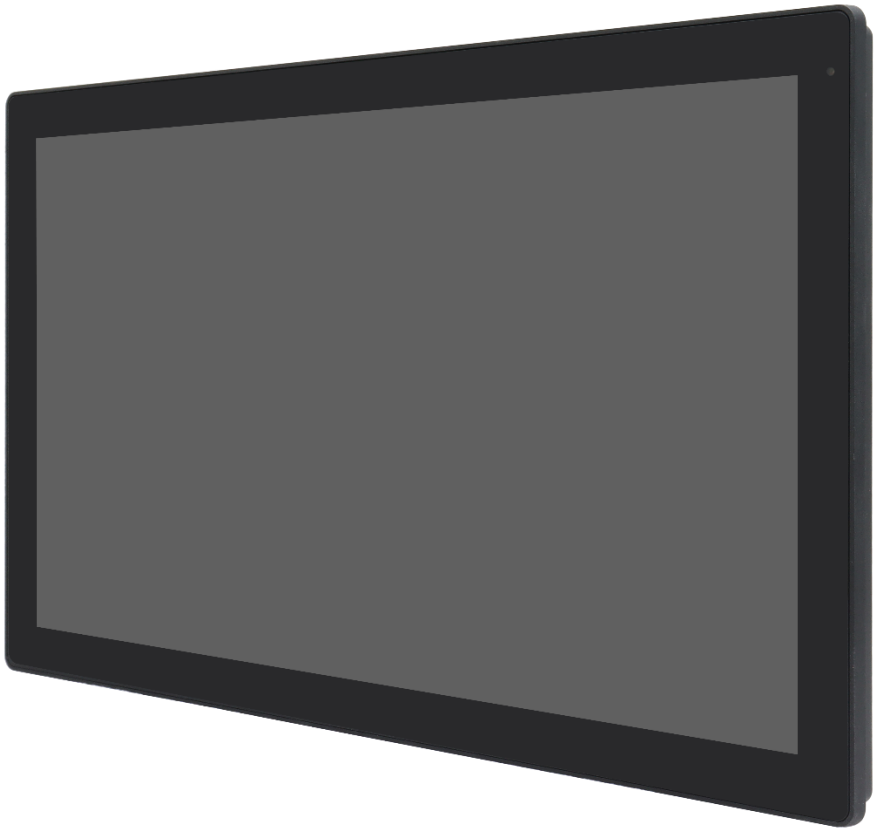


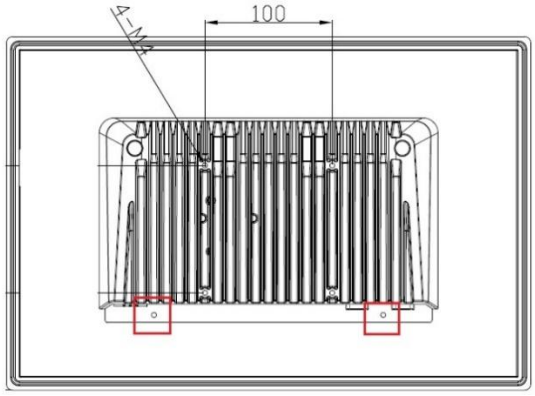
Figure 5 Front View of AiTRON-9D series



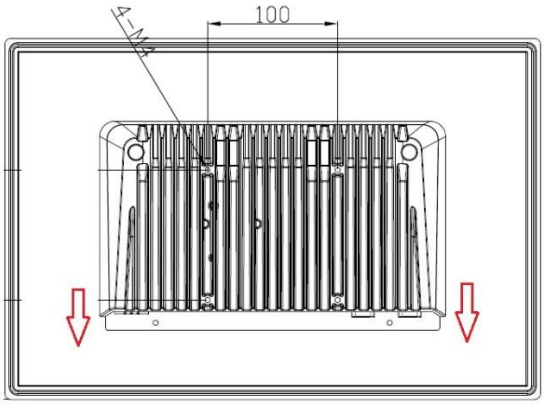
Figure 6 Rear View of AiTRON-9D series

1.8 Installation of Memory and Storage

Step 1: Loosen and remove two screws on bottom side of the back cover.



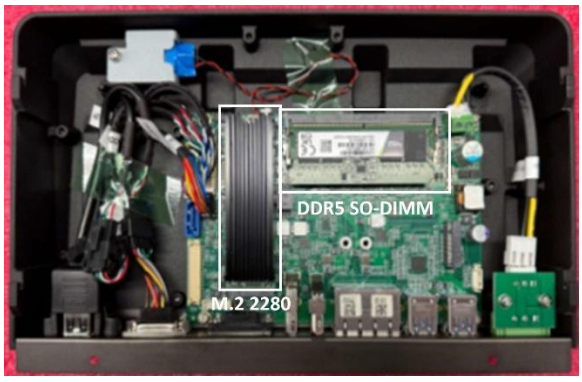
Step 2: Push down back cover from the rear chassis of Panel PC to open the back cover.



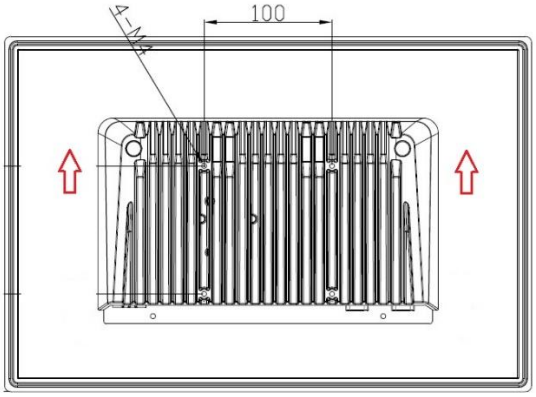
Step 3: After opening back cover, you can see the motherboard.

You can install memory module(DDR5 SO-DIMM) and M.2 M-Key 2280 for SSD (PCIe4.0x4) onto motherboard while you buy barebone.

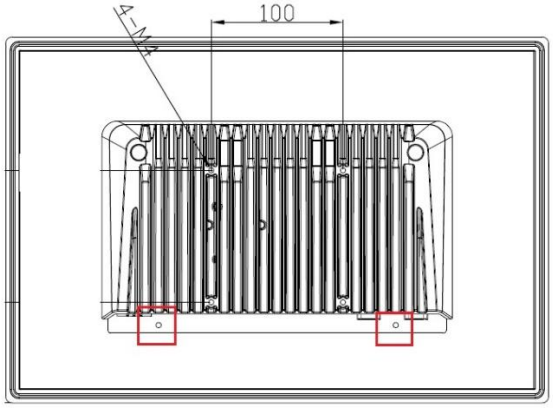
Please refer to 1.12 for the assembly steps to attach the heatsink to the M.2 2280 SSD.



Step 4 : Push the back cover latch into the sliding rail of rear chassis.



Step 5 : Tighten two screws of back cover to fix onto rear chassis .



1.9 VESA Mounting

AiTRON-910D/912D/915D/916D/921D : VESA 100, M3x4L screw x 4 PCs

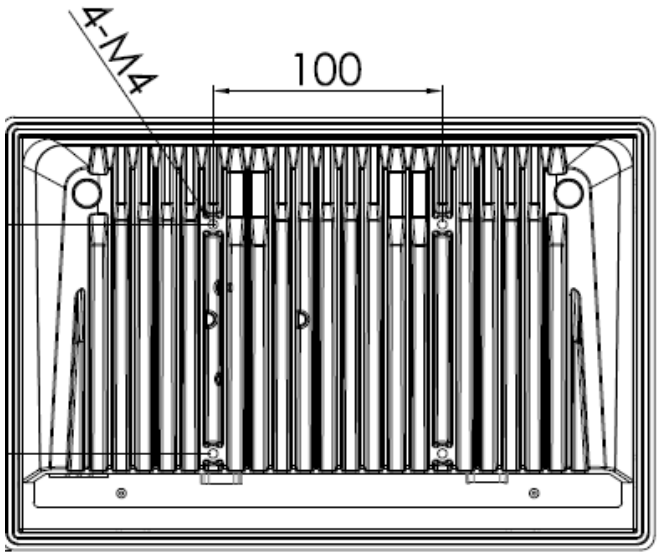


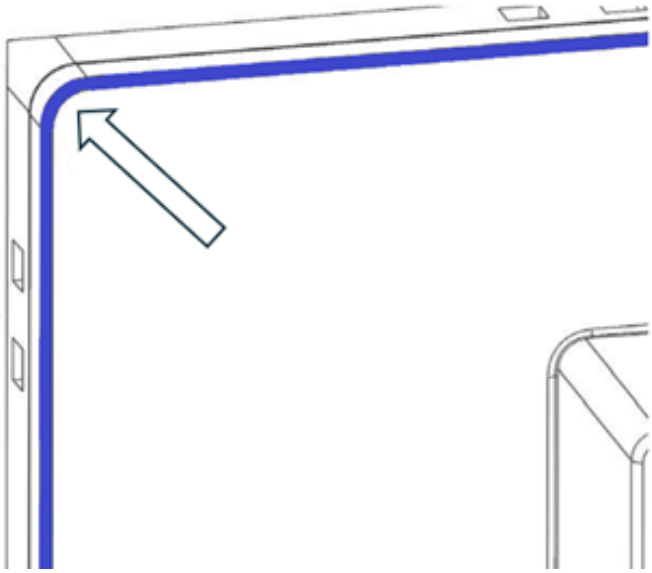
Figure 7 AiTRON-910D/912D/915D/916D/921D VESA Mounting

1.10 Panel Mounting

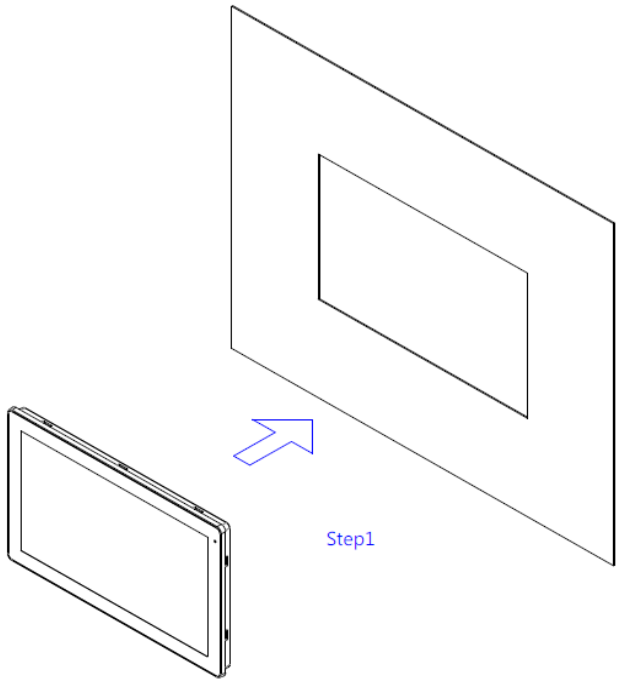
There are mounting holes located along the four sides of the HMI. Position the AiTRON panel pc against the panel mount and insert the mounting kit from the four sides and tighten them with screws.

Description	P/N#	Qty	Unit
Panel mounting kit for 10.1”, 12.1”	0144081630000302	8	PCS
Panel mounting kit for 15”, 15.6”	0144081630000302	10	PCS
Panel mounting kit for 21.5”	0144081630000302	12	PCS

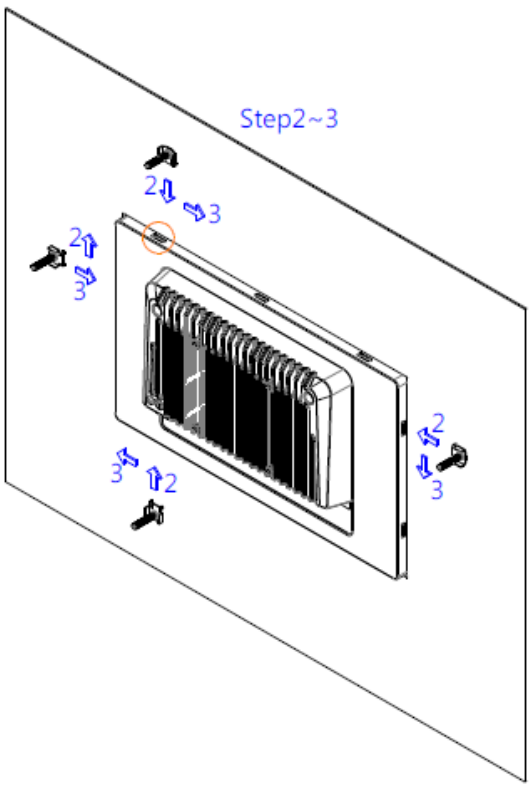
1. The front panel is equipped with a waterproof gasket strip with adhesive on it. Before installing the AiTRON-9XXE into the panel opening cover, please make sure that the waterproof gasket is fixed correctly.

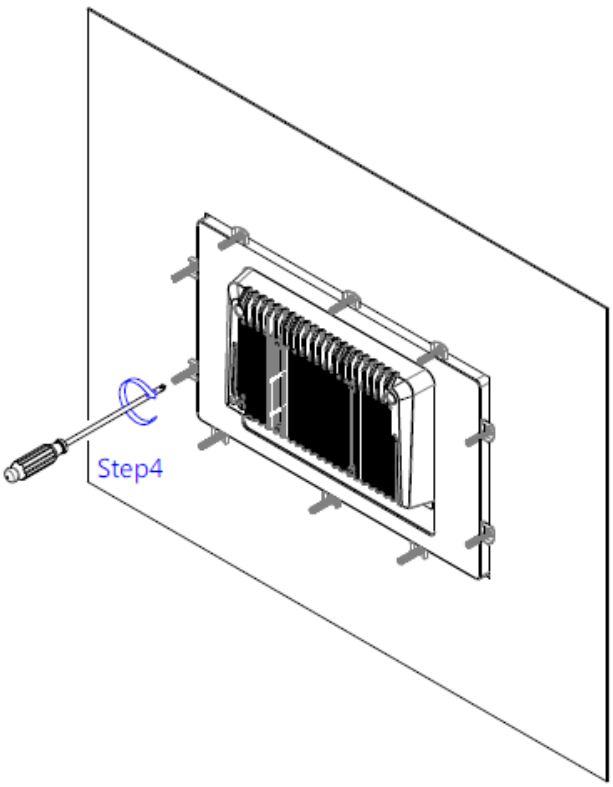


2. Place the AiTRON-9XXE into the panel opening cover.



3. Take out the panel mounting kits from the accessory partition and then attach them to the fixed holes around the rear chassis of AiTRON-9XXE. Tighten the screws of each fastening hook into position to clamp and secure the panel.





1.11 Optional Panel Mount Dustproof Covers

If the Panel PC is mounted using a VESA bracket and dust protection is required, dustproof covers can be installed over the rear panel mounting holes to protect the system.

Description	Qty	Unit
Panel Mount Dustproof Covers for 10.1”, 12.1”	8	PCS
Panel Mount Dustproof Covers for 15”, 15.6”	10	PCS
Panel Mount Dustproof Covers for 21.5”	12	PCS

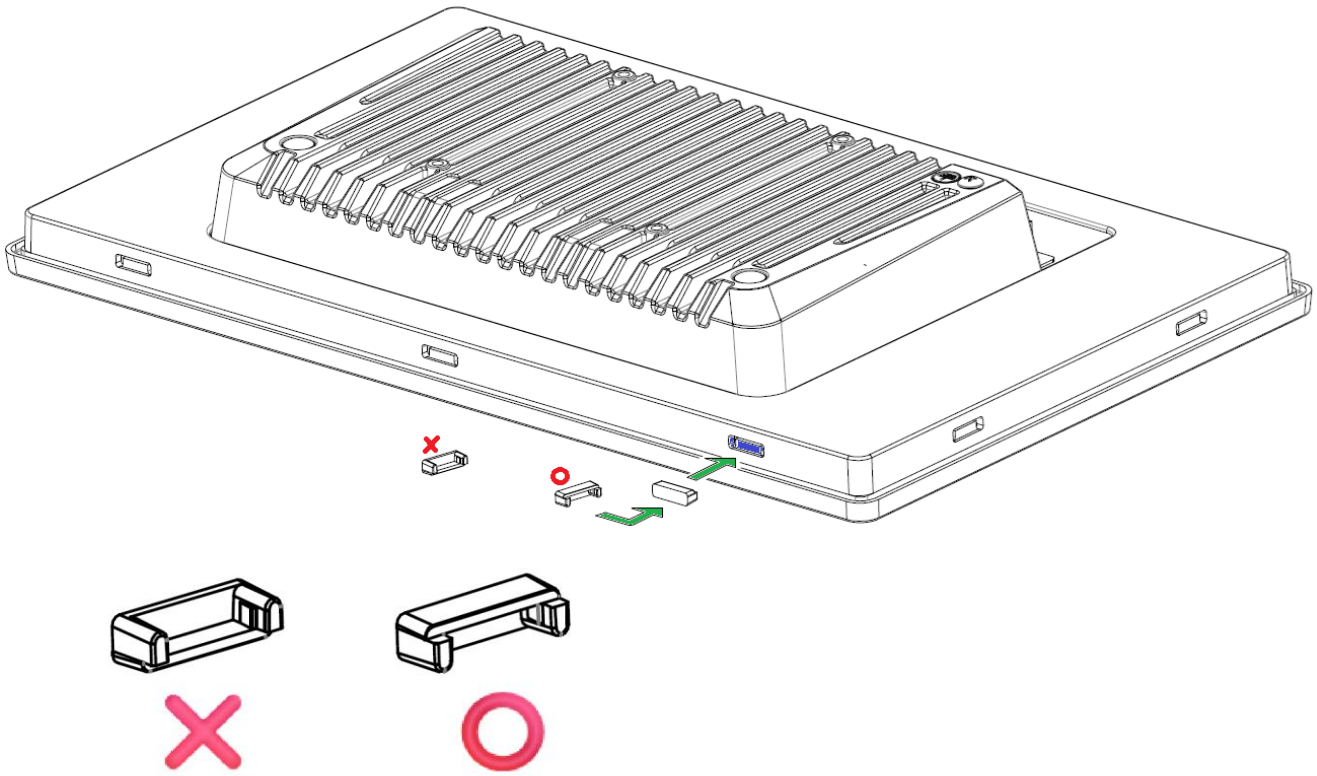


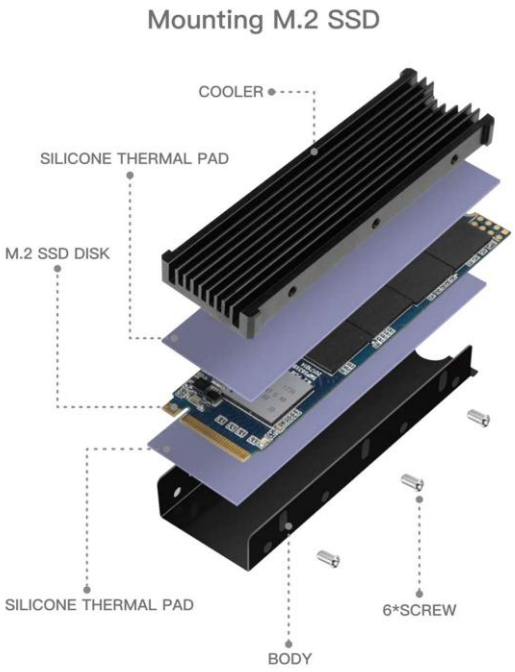
Figure 9 AiTRON-9XXD PANEL Mount Dustproof Cover

1.12 SSD heatsink kit installation guide

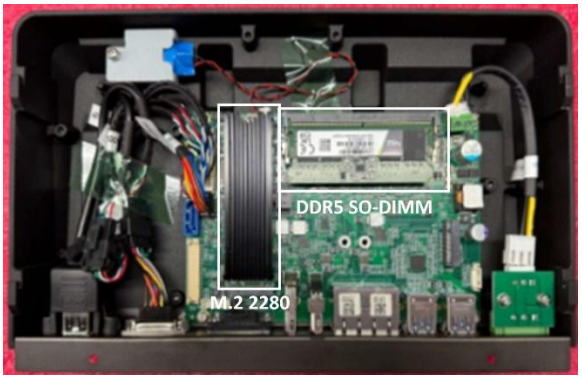
M.2 2280 heatsink dimension: 76 x 24 x 6.3mm

Notice:
It is recommended to install an SSD heatsink to prevent the M.2 SSD from overheating during high-speed operations, which could lead to reduced performance or instability.

Step 1：
Disassemble the SSD heatsink kit, then apply the thermal pad to both the top and bottom sides of the SSD. Secure the SSD to the thermal kit and tighten the screws.



Step 2：
Install the SSD with the thermal kit into the M.2 2280 slot on the motherboard.



Chapter 2 Hardware

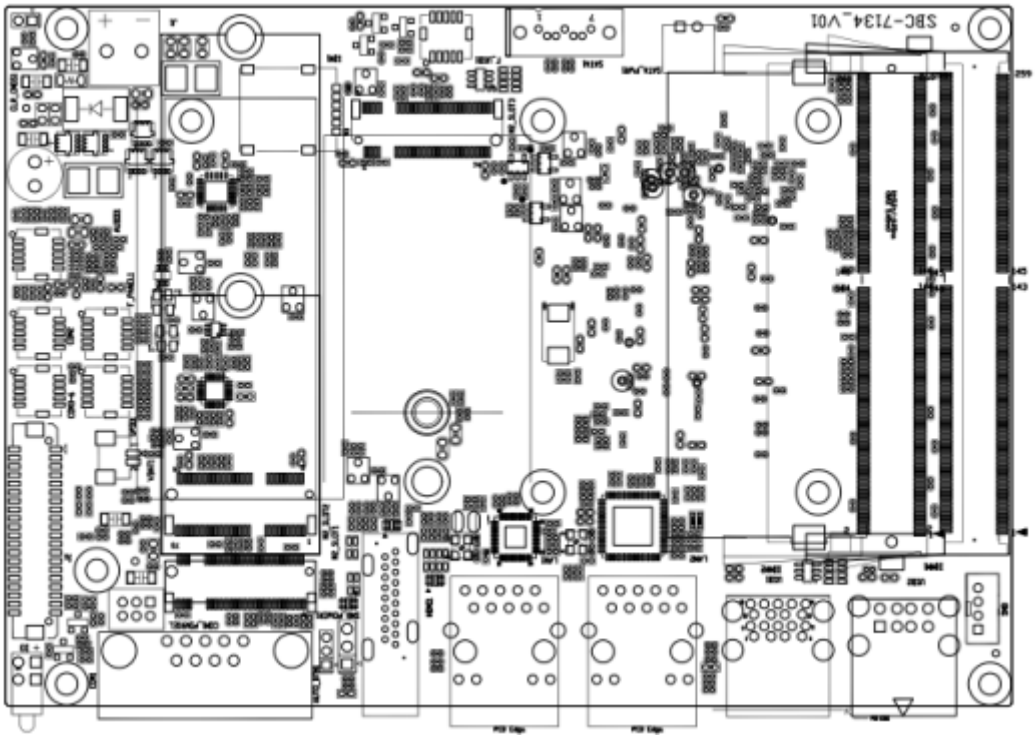
2.1 Motherboard Introduction

SBC-7134 is a 3.5" industrial motherboard developed on the basis of Intel Alder Lake which provides abundant peripheral interfaces to meet the needs of different customers.

2.2 Specifications

Specifications	
Board Size	146mm x 101.6mm
CPU Support	Intel Core™ i3-1215U,2C+4A,up to 4.4GHz(P-Core) 3.3GHz(E-Core),15W-55W Intel Core™ i5-1235U,2C+8A,up to 4.4GHz(P-Core) 3.3GHz(E-Core),15W-55W Intel Core™ i3-1215UE,2C+4A,up to 4.4GHz(P-Core) 3.3GHz(E-Core),15W-55W Intel Core™ i5-1245UE,2C+8A,up to 4.4GHz(P-Core) 3.3GHz(E-Core),15W-55W Intel Core™ i7-1265UE,2C+8A,up to 4.7GHz(P-Core) 3.5GHz(E-Core),15W-55W Intel Core™ i3-1315U,2C+4A,up to 4.5GHz(P-Core) 3.3GHz(E-Core),15W-55W Intel Core™ i5-1335U,2C+8A,up to 4.6GHz(P-Core) 3.4GHz(E-Core),15W-55W Intel Core™ i3-1315UE,2C+4A,up to 4.5GHz(P-Core) 3.3GHz(E-Core),15W-55W Intel Core™ i5-1335UE,2C+8A,up to 4.5GHz(P-Core) 3.3GHz(E-Core),15W-55W Intel Core™ i7-1365UE,2C+8A,up to 4.9GHz(P-Core) 3.7GHz(E-Core),15W-55W
Chipset	SOC
Memory Support	1x SO-DIMM (260pins), up to 48GB DDR5 3200MT/s
Graphics	Integrated Intel UHD Graphics
Display Mode	1 x HDMI 1.4b via HDMI Port 1 x LVDS (18/24-bit dual LVDS) / eDP (option by BOM selection)
Support Resolution	HDMI: support up to 1920 x 1080 @60Hz LVDS: support up to 1920 x 1200 @60Hz eDP: support up to 3840 x 2170 @60Hz
Super I/O	ITE IT8786E-I/HX
BIOS	AMI/UEFI BIOS
Storage	1 x SATAIII via 7pin SATA connector 1 x M.2 M-Key (PCIe 3.0 x4) 2280 for Storage 1 x M.2 B-Key (SATA/PCIE) 2242 for Storage (select by BOM)
Ethernet	1 x 10/100/1000M GbE LAN via intel® I210-AT controller (PXE/WOL) 1 x 10/100/1000M GbE LAN via intel® I219-V controller (PXE/WOL)
USB	2 x USB3.2 gen1/USB2.0, Type-A stack ports (USB1) 2 x USB2.0, Type-A stack ports (USB2) 2 x USB2.0 via SHD 1.25mm 2x5pin header (F_USB1) 1 x USB2.0 for M.2 B-Key

	1 x USB2.0 for M.2 E-Key
Serial	1 x RS-232(default)/422/485 signals select via BIOS (COM1), pin9 Rear I/O (default)/5V/12V select via COM1_PIN9SEL(DB9, COM1) 1 x RS-232(default)/422/485 via SHD 1.25mm 2x5pin header, signals select via BIOS, pin header (COM2) 4 x 2-wired RS-232 via SHD 1.25mm 2x5pin header (COM3-6)
GPIO	8-bit digital I/O by SHD 1.25mm 2x5pin header (GPIO1)
Audio	Support Audio via Realtek ALC887-VA2-CG HD audio codec Support Line-in, Line-out, MIC by SHD 1.25mm 2x5pin header
Expansion Slots	1 x M.2 B-Key (PCIex1, USB3.0, USB2.0), 3042/3052 for 4G / 5G module with nano SIM slot (SIM1) 1 x M.2 E-Key (PCIex1, USB2.0), 2230 for WiFi / BT module
Watchdog Timer	Software programmable 1–255 level
TPM	Onboard TPM IC Infineon_ SLB 9670AQ2.0 Support fTPM, select via BIOS
Switches and LED Indicators	Power button/reset button/power LED/HDD LED via SHD 1.25mm 2x5pin header (F_PANEL1)
Battery	Support 3V RTC Li-battery via 2pin wafer (VBAT1)
Power Management	Wide range DC 9~36V±10% power input via 2pin terminal block
Temperature	Operating: -30℃ to 70℃ Storage: -40℃ to 85℃
Humidity	10% - 90%, non-condensing, operating
Certifications	Meet CE/FCC class A UL RoHS2.0



Dimensions: 146mm x 101.6mm

Figure 2.1: Motherboard Dimensions

2.3 Jumpers and Connectors Location

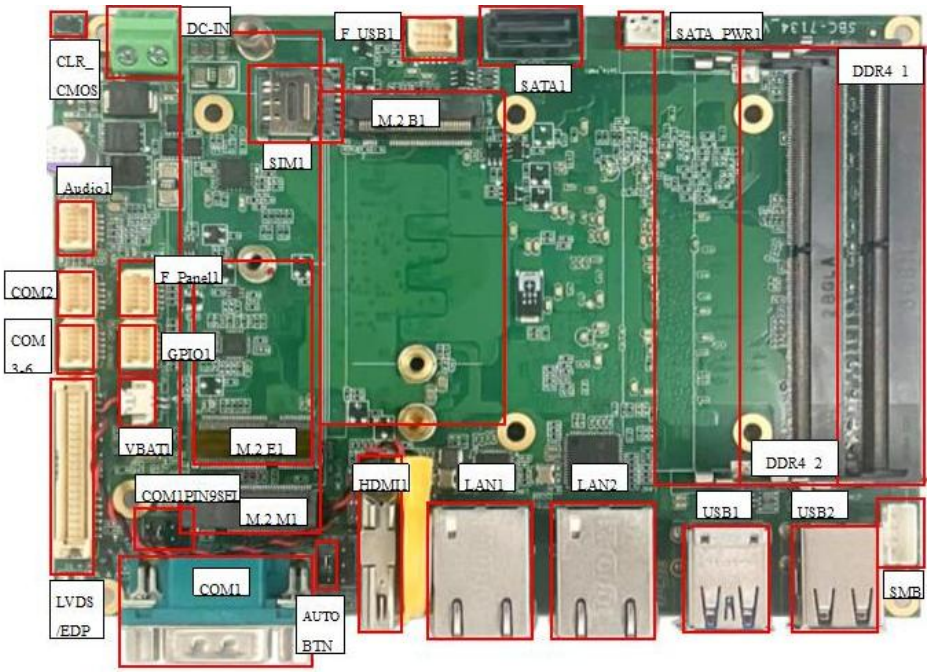
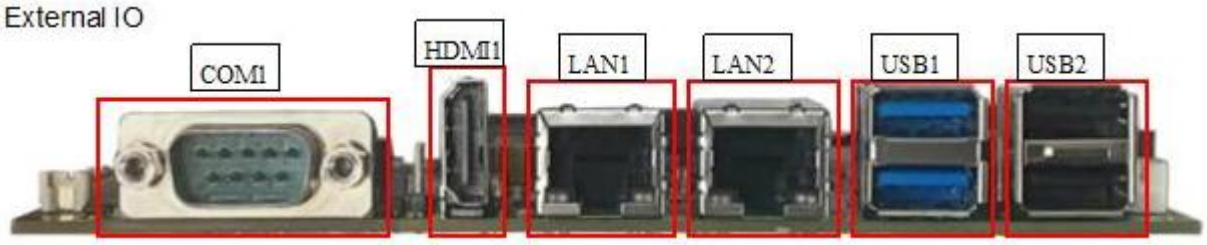


Figure 2.2: Jumpers and Connectors Location- Board Top



Figure 2.3: Jumpers and Connectors Location- Board Bottom



igure 2.3: Jumpers and Connectors Location- Board Bottom

2.4 Jumpers Setting and Connectors

1. CPU1:

(FCBGA1744) Onboard Intel Alder Lake SoC

Model	SoC				
	Number	PBF	Cores/ Threads	TDP	Remarks
SBC-7134-I3 1215U	1215U	Up to 4.4GHz(P-Core) 3.3GHz(E-Core)	2C+4A / 8	15W-55W	Default
SBC-7134-I5 1235U	1235U	Up to 4.4GHz(P-Core) 3.3GHz(E-Core)	2C+8A / 12	15W-55W	Option
SBC-7134-I3 1215UE	1215UE	Up to 4.4GHz(P-Core) 3.3GHz(E-Core)	2C+4A / 8	15W-55W	Option
SBC-7134-I5 1245UE	1245UE	Up to 4.4GHz(P-Core) 3.3GHz(E-Core)	2C+8A / 12	15W-55W	Option
SBC-7134-I7 1265UE	1265UE	Up to 4.7GHz(P-Core) 3.5GHz(E-Core)	2C+8A / 12	15W-55W	Option
SBC-7134-I3 1315U	1315U	Up to 4.5GHz(P-Core) 3.3GHz(E-Core)	2C+4A / 8	15W-55W	Option
SBC-7134-I5 1335U	1335U	Up to 4.6GHz(P-Core) 3.4GHz(E-Core)	2C+8A / 12	15W-55W	Option
SBC-7134-I3 1315UE	1315UE	Up to 4.5GHz(P-Core) 3.3GHz(E-Core)	2C+4A / 8	15W-55W	Option
SBC-7134-I5 1355UE	1355UE	Up to 4.5GHz(P-Core) 3.3GHz(E-Core)	2C+8A / 12	15W-55W	Option
SBC-7134-I7 1365UE	1365UE	Up to 4.9GHz(P-Core) 3.7GHz(E-Core)	2C+8A / 12	15W-55W	Option

2. DDR4_1, DDR4_2:

(SO-DIMM 260Pin slot) DDR4 memory socket, the socket is located at the top of the board and supports 260Pin 1.2V DDR4 SO-DIMM memory module up to 64GB.

Max Memory Size (dependent on memory type).

3. VBAT1:

(1.25mm Pitch 1x2 wafer Pin Header) 3.0V Li battery is embedded to provide power for CMOS.

Pin#	Signal Name
Pin1	VCC_RTC
Pin2	GND

4. CLR_CMOS1:

CMOS clear switch, CMOS clear operation will permanently reset old BIOS settings to factory defaults.



Procedures of CMOS clear:

a) Turn off the system and unplug the power cord from the power outlet.

b) To clear the CMOS settings, close Pin5-6 for 1 second

c) Power on the system again.

d) When entering the POST screen, press the <DEL> key to enter CMOS Setup Utility to load optimal defaults.

e) After the above operations, save changes and exit BIOS Setup.

5. CPU_FAN1:

(1.25mm Pitch 1x2 wafer Pin Header) Fan connector, cooling fans can be connected directly for use.

Pin#	Signal Name
1	DC_IN+ (DC+9V~36V)
2	DC_IN- (Ground)

6. DC_IN1:

(5.08mm Pitch 1x2Pin Connector) DC9~36V system power input connector.

Pin#	Signal Name
Pin1	DC_IN+ (DC+9V~36V)
Pin2	DC_IN-(Ground)

7. SMB:

(2.00mm Pitch 1x4 Pin Header) For SMBus Interface Device

Pin#	Signals
1	GND
2	Data
3	Clock
4	Vcc 3.3V

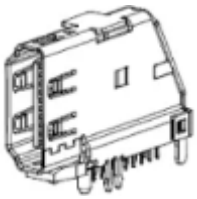
8. LVDS/EDP:

(1.25mm Pitch 2x20 DF13-40DP Female Header)

Function	Signal Name	Pin		Signal Name	Function
DC12V	12V_S0	1	2	12V_S0	DC12V
LVDS/eDP/Signals	BKLT_PWM_ONT	3	4	BKLT_EN	LVDS/eDP/Signals
	GND	5	6	GND	
	LVDS_VDD5	7	8	LVDS_VDD5	
	LVDS_VDD3.3	9	10	LVDS_VDD3.3	
	GND	11	12	GND	
	LA_D0-/EDP D0-	13	14	LA_D0+/EDP D0+	
	LA_D1-/EDP D1-	15	16	LA_D1+/EDP D1+	
	LA_D2-/EDP D2-	17	18	LA_D2+/EDP D2+	
	LA_D3-/EDP_D3-	19	20	LA_D3+/EDP_D3-	
	LA_CLK-/EDP AUX-	21	22	LA_CLK+/EDP AUX+	
	LB_D0-	23	24	LB_D0+	

	LB_D1-	25	26	LB_D1+	
	LB_D2-	27	28	LB_D2+	
	LB_D3-	29	30	LB_D3+	
	LB_CLK-	31	32	LB_CLK+	
USB3	GND	33	34	GND	USB3
	USB2 9D-	35	36	USB2 9D+	
SMbus	SMbus DAT	37	38	5V_S5	
	SMbus CLK	39	40	Power LED+	Power LED

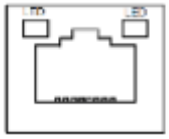
9. HDMI1:



(Vertical HDMI Connector) HDMI Interface connector

HDMI 1.4, Support resolution up to 1920 x 1080@60Hz

10. LAN1:



(RJ45 Connector) Provide 100/1000GbE LAN via Intel® I219-V

Status	Description
Green	100Mbps
Yellow	1Gbps

11. LAN2:



(RJ45 Connector) Provide 100/1000GbE LAN via Intel® I210-AT

Status	Description
Green	100Mbps
Yellow	1Gbps

12. F_AUDIO1:

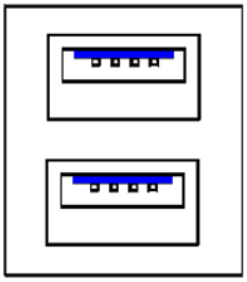
(SHD 1.25mm 2x5 Pin Header) Provide line-in/line-out/mic-in via onboard Realtek ALC897 codec.

Signal Name	Pin#	Pin#	Signal Name
LINE-OUT-R	1	2	GND_AUD
GND	3	4	LINE-OUT-R

MIC-IN-R	5	6	LINE_JD
GND	7	8	LINE-IN-R
LINE-IN-R	9	10	MIC-IN-R

13. USB1,USB2:

(Double stack USB Type-A) Rear USB3.2 connector, provides up to 2 USB3.2 gen1/USB2.0 ports, USB3.2 gen1 allows data transfers up to 5.0Gbps.



Each USB Type A Receptacle (2 Ports) Current limited value is 2A.

If the external USB device current exceeds 2.0A, please separate connectors into different Receptacle.

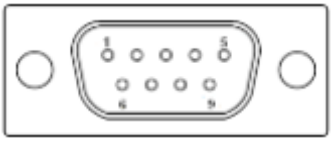
14. F_USB1:

(SHD 1.25mm 2x5pin header) Provide 2xUSB2.0 Signals.

Signal Name	Pin#	Pin#	Signal Name
5V_USB2,3	1	2	5V_USB2,3
USB2_N	3	4	USB3_N
USB2_P	5	6	USB3_P
GND	7	8	GND
GND	9	10	GND

15. COM1:

(DB9 connector) Provide serial RS232/422/485 via standard DB9 male connector. Default is set to RS232, RS422/485 can be selected via BIOS. Pin9 RI/5V/12V select via COM1_PIN9SEL.



RS232 (Default):	
Pin#	Signal Name
1	DCD# (Data Carrier Detect)
2	RXD (Received Data)
3	TXD (Transmit Data)
4	DTR (Data Terminal Ready)
5	GND
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear To Send)
9	JP3 select Setting (RI/5V/12V)
BIOS Setup：Serial Port 2 Configuration【RS-232】	

RS422 (option):	
Pin#	Signal Name
1	422_TX-
2	422_TX+
3	422_RX+
4	422_RX-
5	GND
6	NC
7	NC
8	NC
9	NC
BIOS Setup：Serial Port 2 Configuration【RS-422】	

RS485 (option):	
Pin#	Signal Name
1	485-
2	485+
3	NC
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC
BIOS Setup：Serial Port 2 Configuration【RS-485】	

16. COM1_PIN9SEL:

(2.0mm Pitch 2x3 Pin Header) For COM1 pin9 signal setting

JP1 Pin#	Function
Close 1-2	COM1 Pin9=+12V
Close 3-4	**COM1Pin9 RI (Ring Indicator, Default)**
Close 5-6	COM1 Pin9=+5V

17. COM2:

(SHD 1.25mm 2x5Pin Header) Provide RS-232(default)/422/485, select via BIOS.

Signal Name	Pin#	Pin#	Signal Name
DCD	1	2	RXD
TXD	3	4	DTR
GND	5	6	DSR
RTS	7	8	CTS
RI	9	10	NC

18. COM3-6:

(SHD 1.25mm 2x5Pin Header) Provide 4 x 2-wired RS-232(COM3/4/5/6)

Signal Name	Pin#	Pin#	Signal Name
COM3_RX	1	2	COM3_TX
COM4_RX	3	4	COM4_TX
COM5_RX	5	6	COM5_TX
COM6_RX	7	8	COM6_TX
GND	9	10	GND

19. GPIO1:

(SHD 1.25mm 2x5Pin Header) Provide 8xGPIO with 3.3V VCC

Signal Name	Pin#	Pin#	Signal Name
3.3V_GPIO	1	2	GND
GPIO0	3	4	GPIO1
GPIO2	5	6	GPIO3
GPIO4	7	8	GPIO5
GPIO6	9	10	GPIO7

20. F_Panel1:

(SHD 1.25mm 2x5Pin Header) Provide power button/reset button/power LED/HDD LED

Signal Name	Pin#	Pin#	Signal Name
HDD LED+	1	2	Power LED+
HDD LED-	3	4	Power LED-
Reset Button-	5	6	Power Button+

Reset Button+	7	8	Power Button-
NC	9	10	NC

21. SIM1:

(Nano-SOM slot) Support Nano SIM Card For COM2 pin9 signal setting.

Pin#	Signal Name
1	SIM_VCC
2	SIM_RST
3	SIM_CLK
4	GND
5	NC
6	SIM_DAT

22. M2_B1:

(M.2 B-Key Socket) Support 2242/3052 4G/5G module with Nano SIM slot and support NVMe/NGFF interface SSD.

23. M2_M1:

(M.2 M-Key Socket) Provide PCIex4, support M-Key 2280 NVMe interface SSD.

24. M2_E1:

(M.2 E-Key Socket) Provide USB2.0/PCIex1, support E-key 2230 Wi-Fi/BT expansion cards.

25. SATA1:

(SATA 7Pin) SATA connector provide SATA III signal for storage.

26. SATA_PWR1:

(2.0mm Pitch 1x2 Wafer Pin Header) 5V power supply for SATA1 port device.

Pin#	Signal Name
1	5V_S0
2	GND

Note:

Output current of the connector must not be above 1A.

27. AUTO_BTN:

The AUTO_BTN button allows you to select automatic power on after the motherboard is powered on.

(Default)

Status	Function
Pin1-2 short circuit	Forced AT mode (Auto Power ON)
Pin2-3 short circuit	AT (Auto Power ON)/ ATX (Manual Power ON) mode select via BIOS (Default: AT mode)
*Note: Compatible with BIOS version **03**	

(Option)

Status	Function
Pin1-2 short circuit	AT mode (Auto Power ON)
Pin2-3 short circuit	ATX (Manual Power ON) mode
*Note: Compatible with BIOS version **02**	

Chapter 3 BIOS Setup Description

3.1 Operations after POST Screen

After CMOS discharge or BIOS flashing operation. Press [Delete] key to enter CMOS Setup.

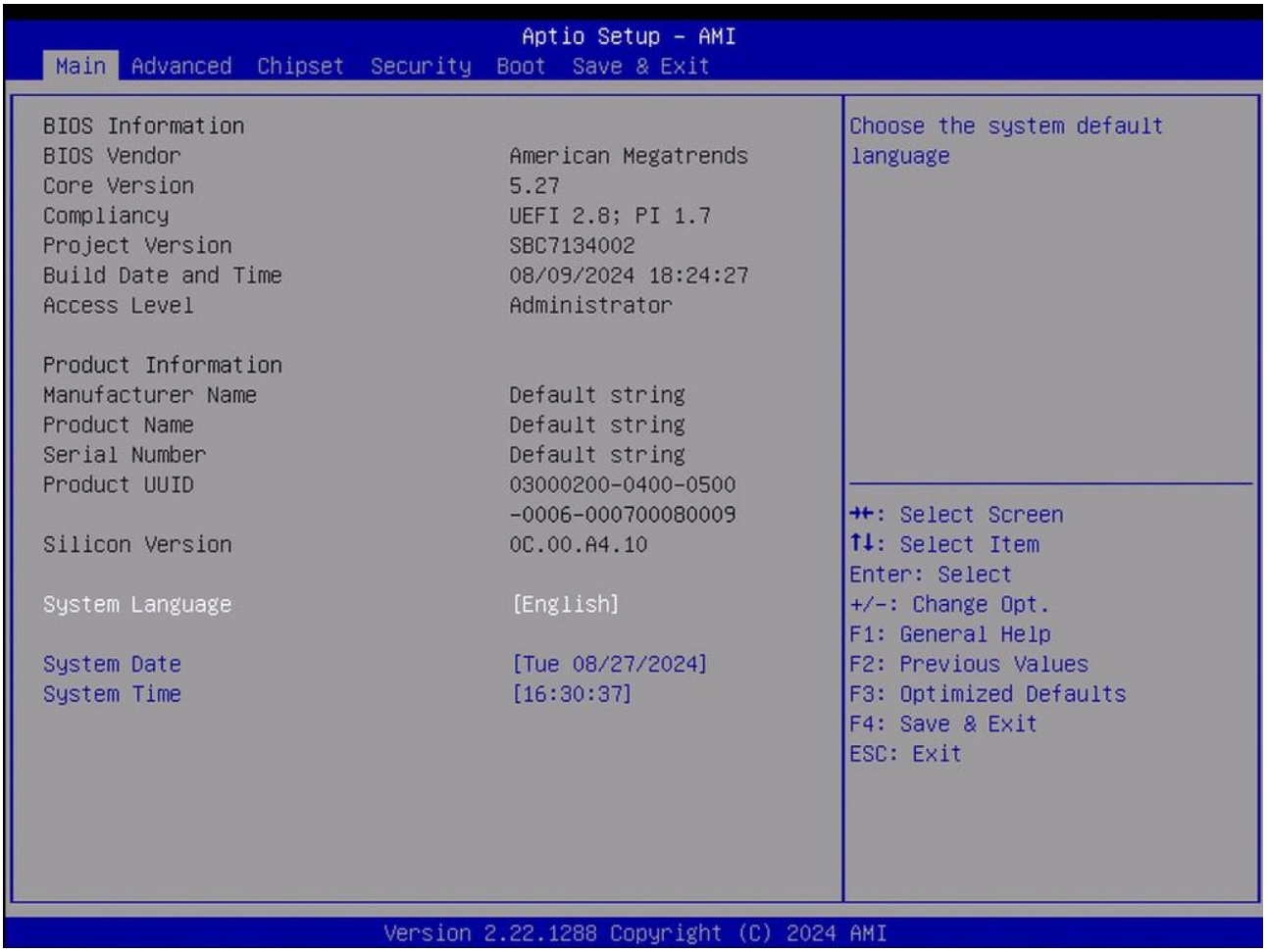


After optimizing and exiting CMOS Setup

3.2 BIOS SETUP UTILITY

Press [Delete] key to enter BIOS Setup utility during POST, and then a main menu containing system summary information will appear.

3.3 Main Settings



System Time:

Set the system time, the time format is:

Hour : 0 to 23

Minute : 0 to 59

Second : 0 to 59

System Date:

Set the system date, the date format is:

Day: Note that the 'Day' automatically changes when you set the date.

Month: 01 to 12

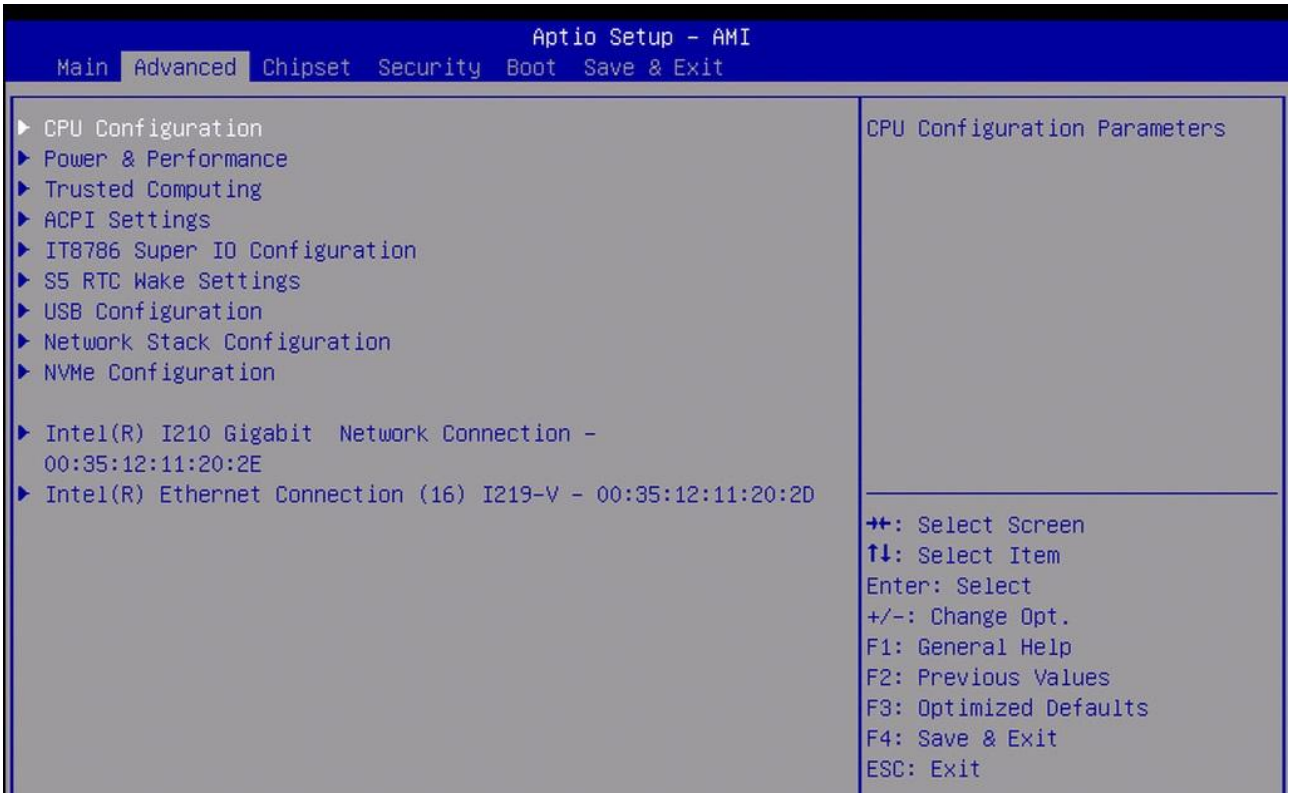
Date: 01 to 31

Year: 1998 to 2099

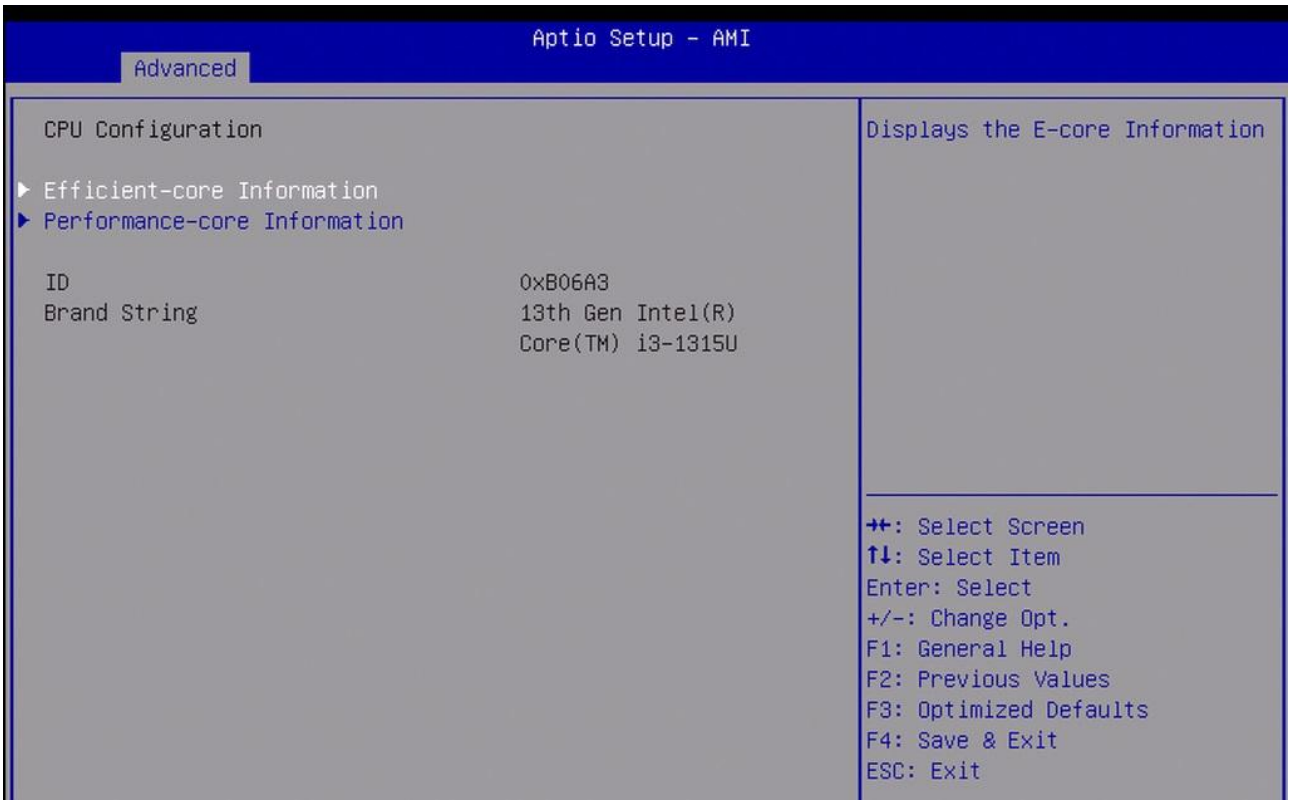
NOTE:

When all selectable items are not listed in the BIOS, it only has two options to "Enabled" or "Disabled".

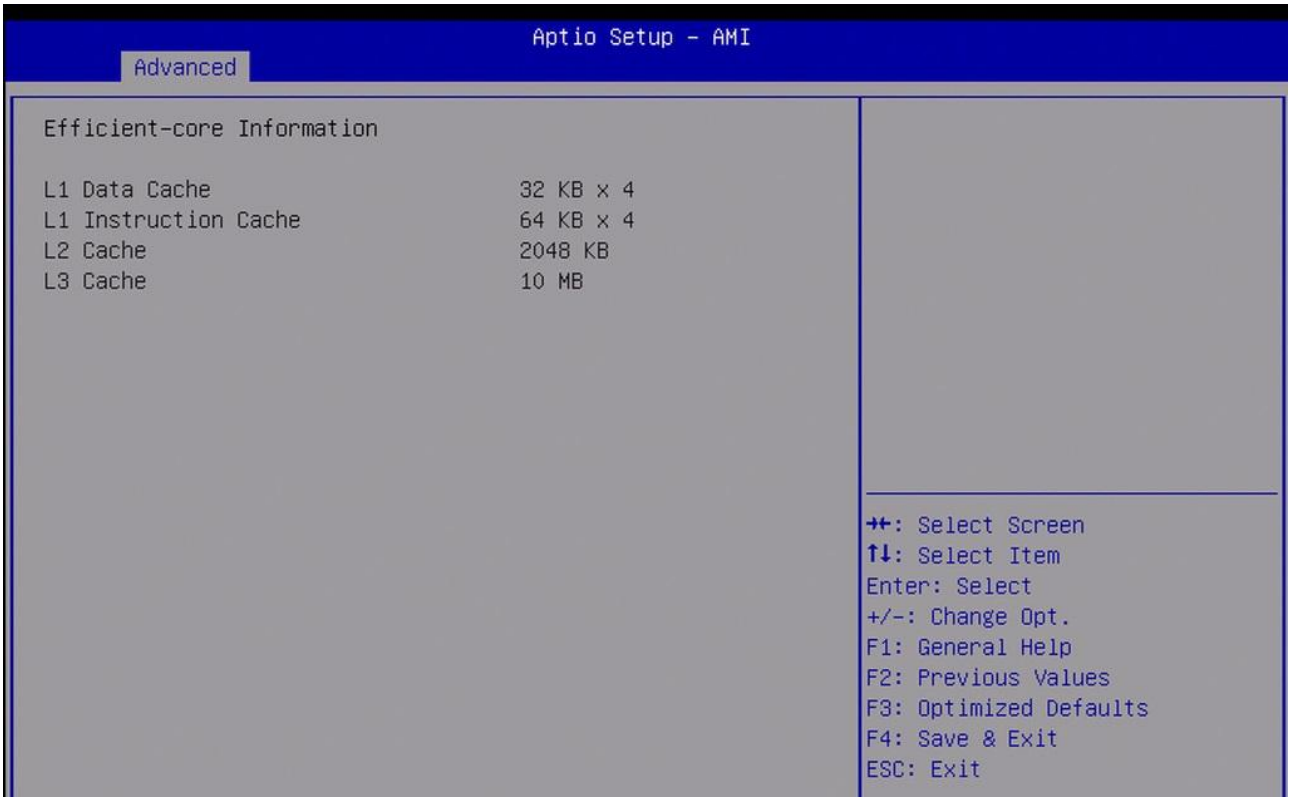
3.4 Advanced Settings



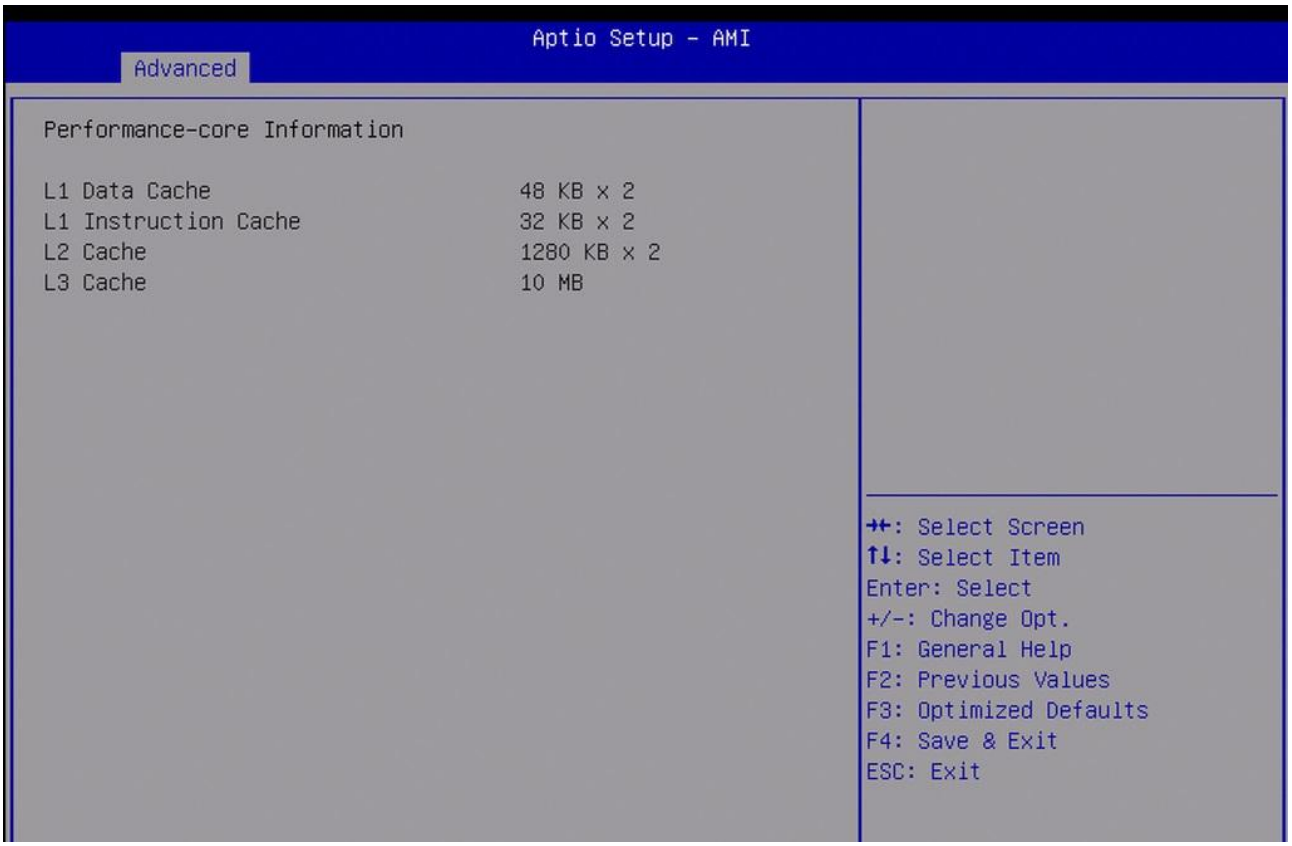
3.4.1 CPU Configuration



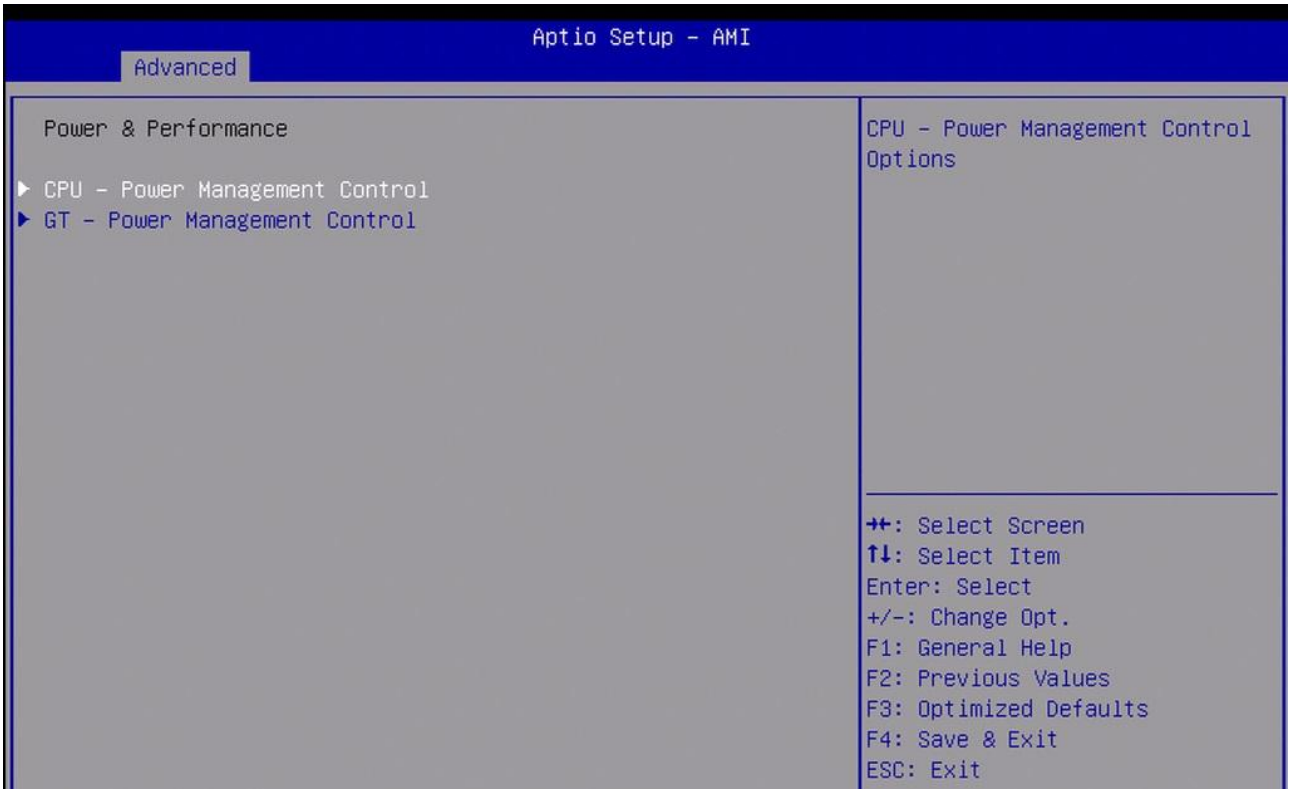
3.4.1.1 Efficient-core Information



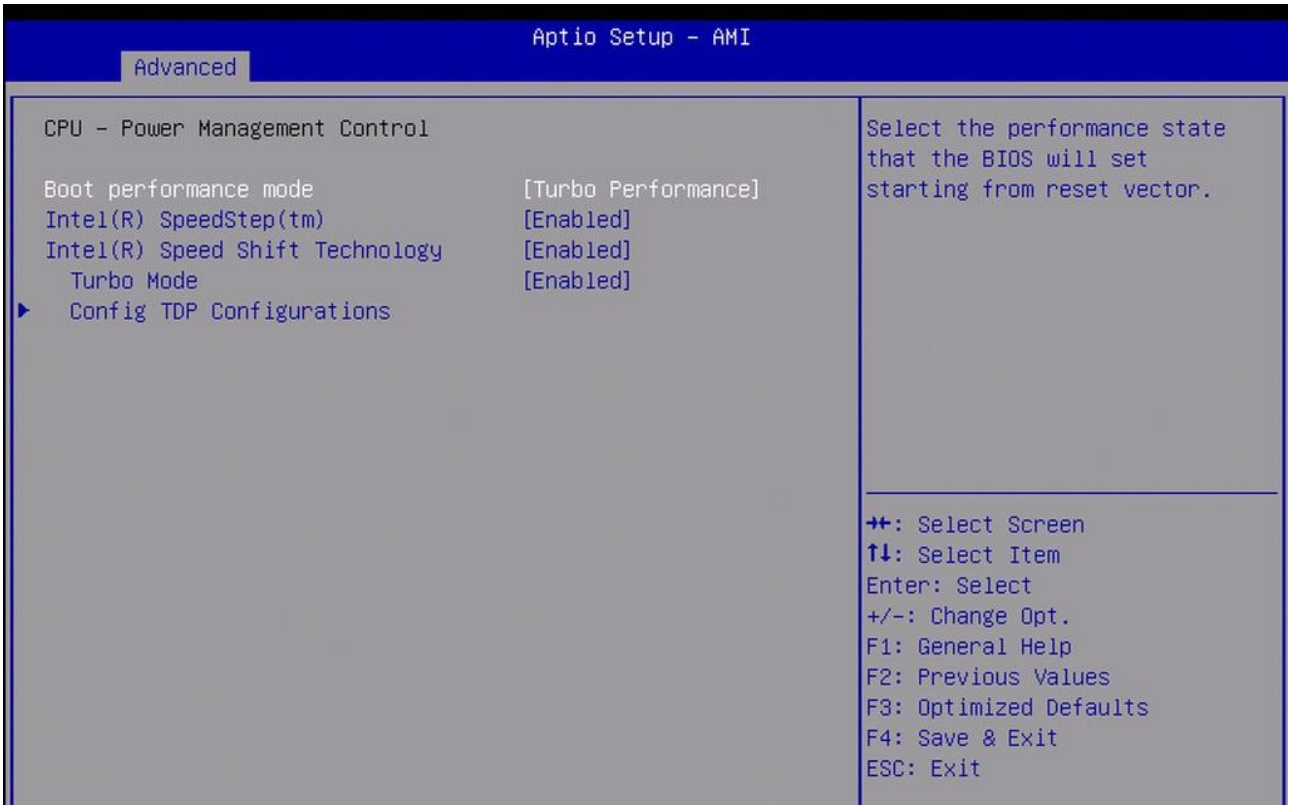
3.4.1.2 Performance-core Information



3.4.2 Power & Performance



3.4.2.1 CPU-Power Management Control



Boot performance mode:

Select the performance state that the BIOS will set starting from reset vector.

Intel® Speed Step™:

Allow more than two frequency ranges to be supported.

Intel® Speed Shift Technology:

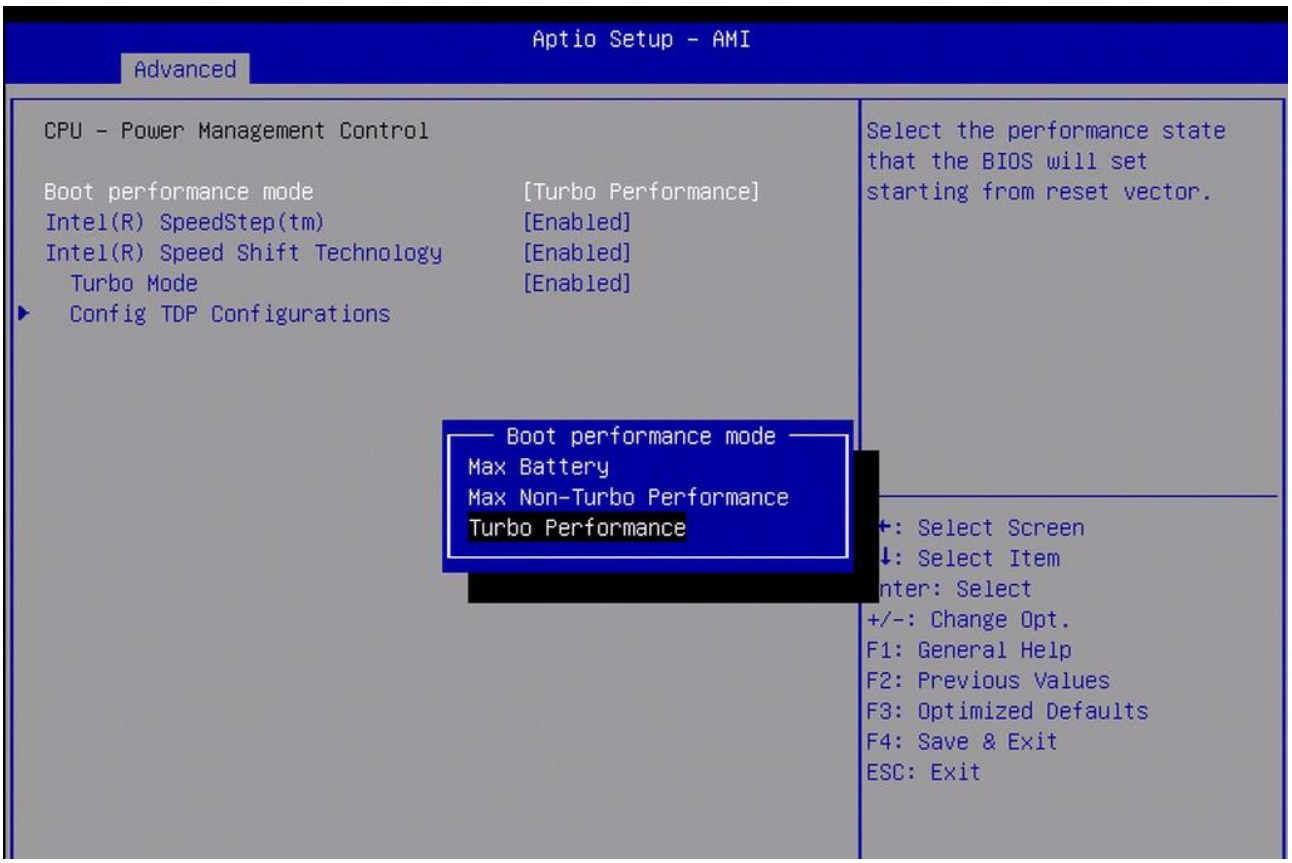
Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow

for hardware-controlled P-states.

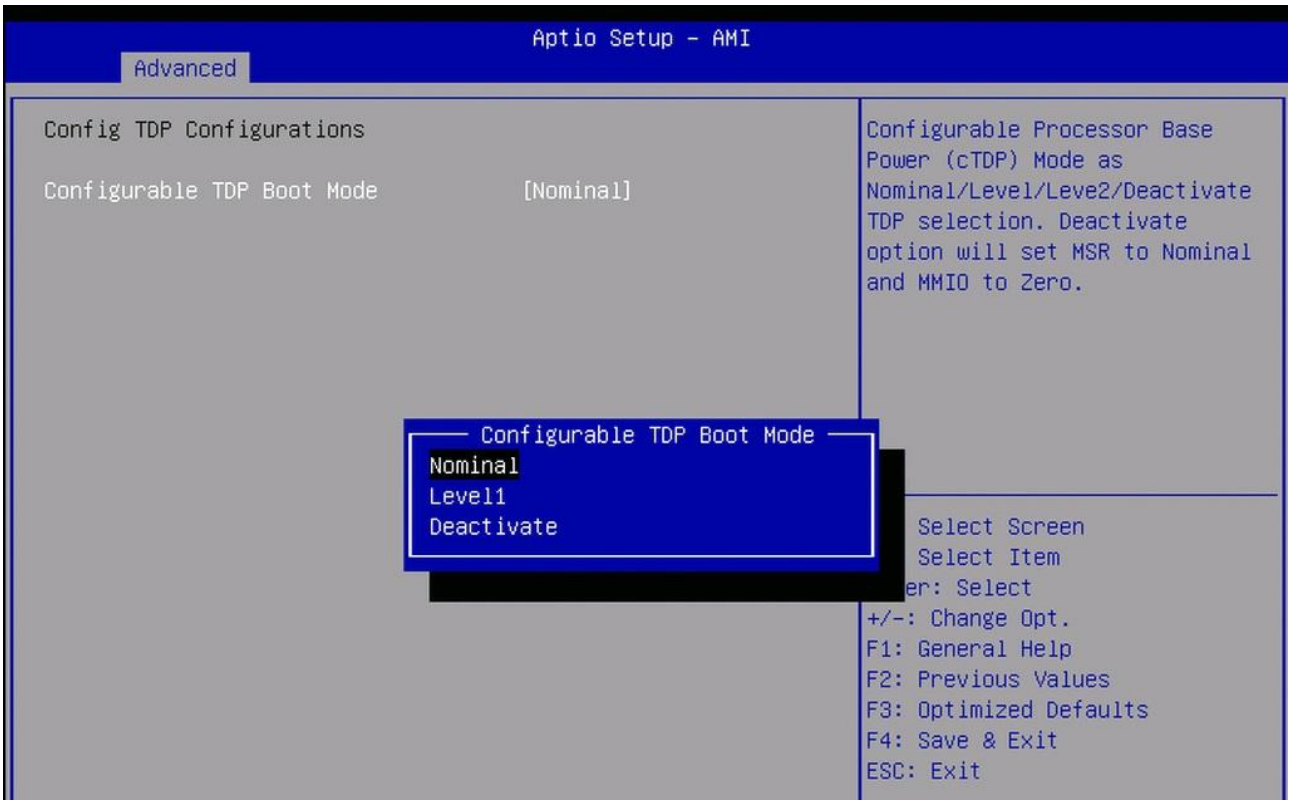
Turbo Mode:

Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.

3.4.2.1.1 Boot performance mode



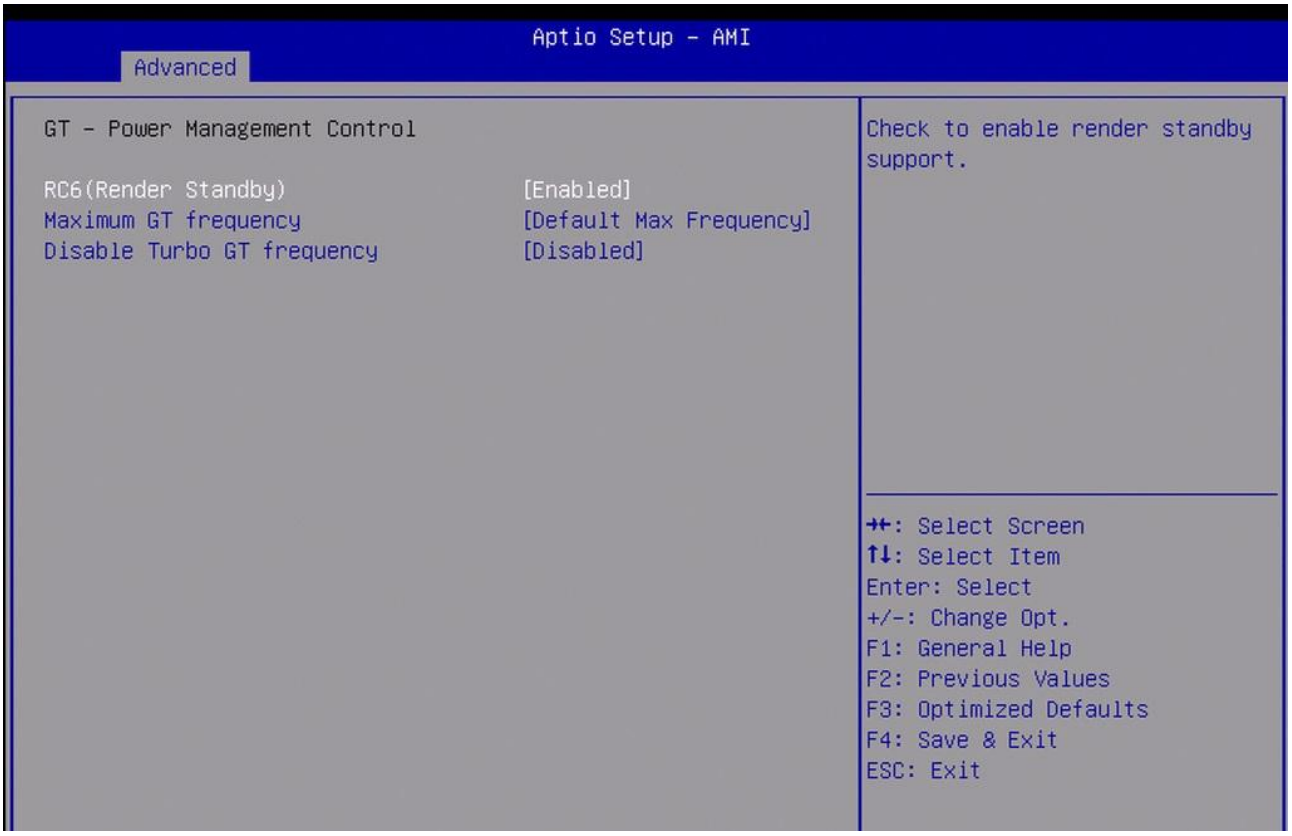
3.4.2.1.2 Config TDP Configurations



Configurable TDP Boot Mode:

Configurable Processor Base Power (cTDP) Mode as Nominal/Leve/Leve2/Deactivate TDP selection. Deactivate option will set MSR to Nominal and MMIO to Zero.

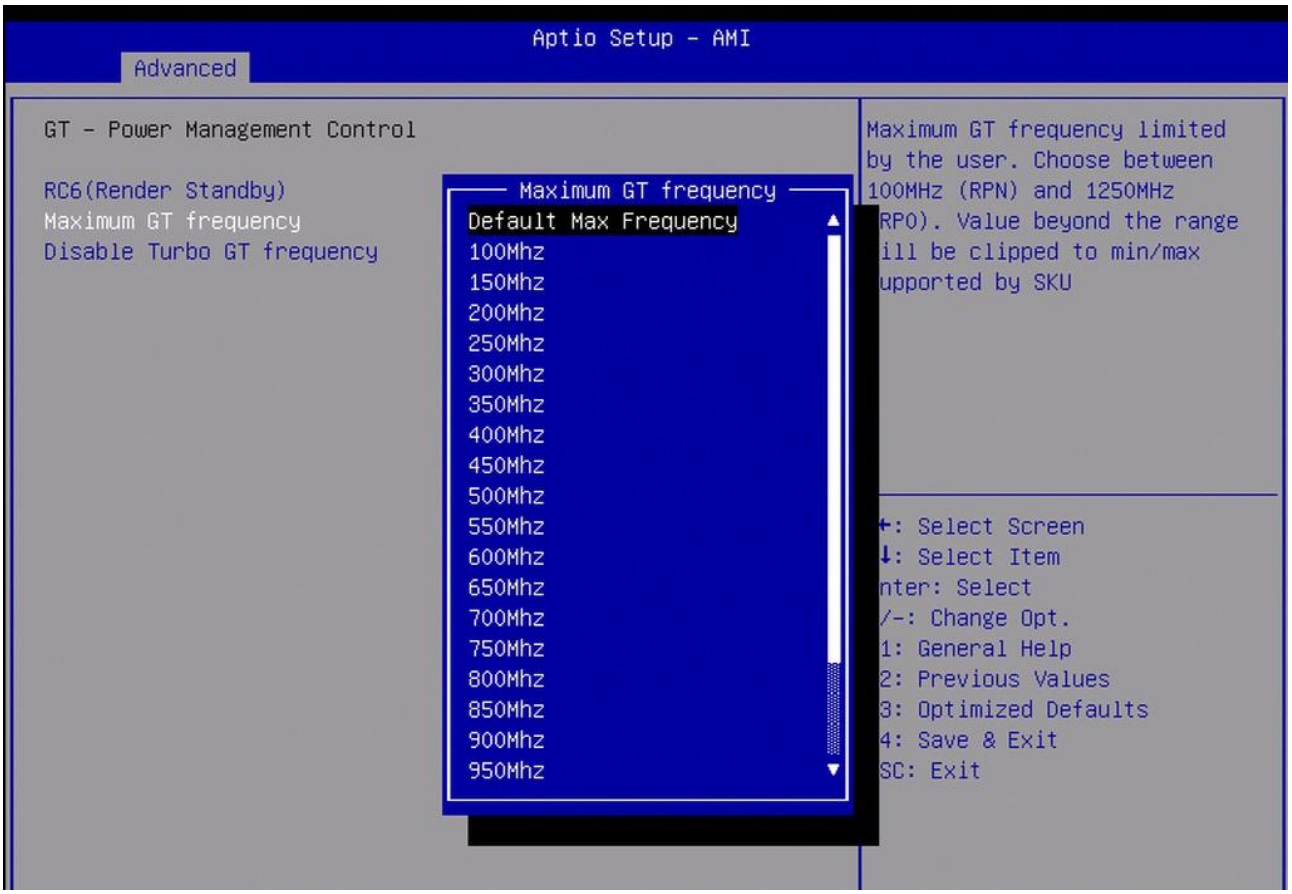
3.4.2.2 GT- Power Management Control



RC6(Render Standby):

Check to enable render standby support.

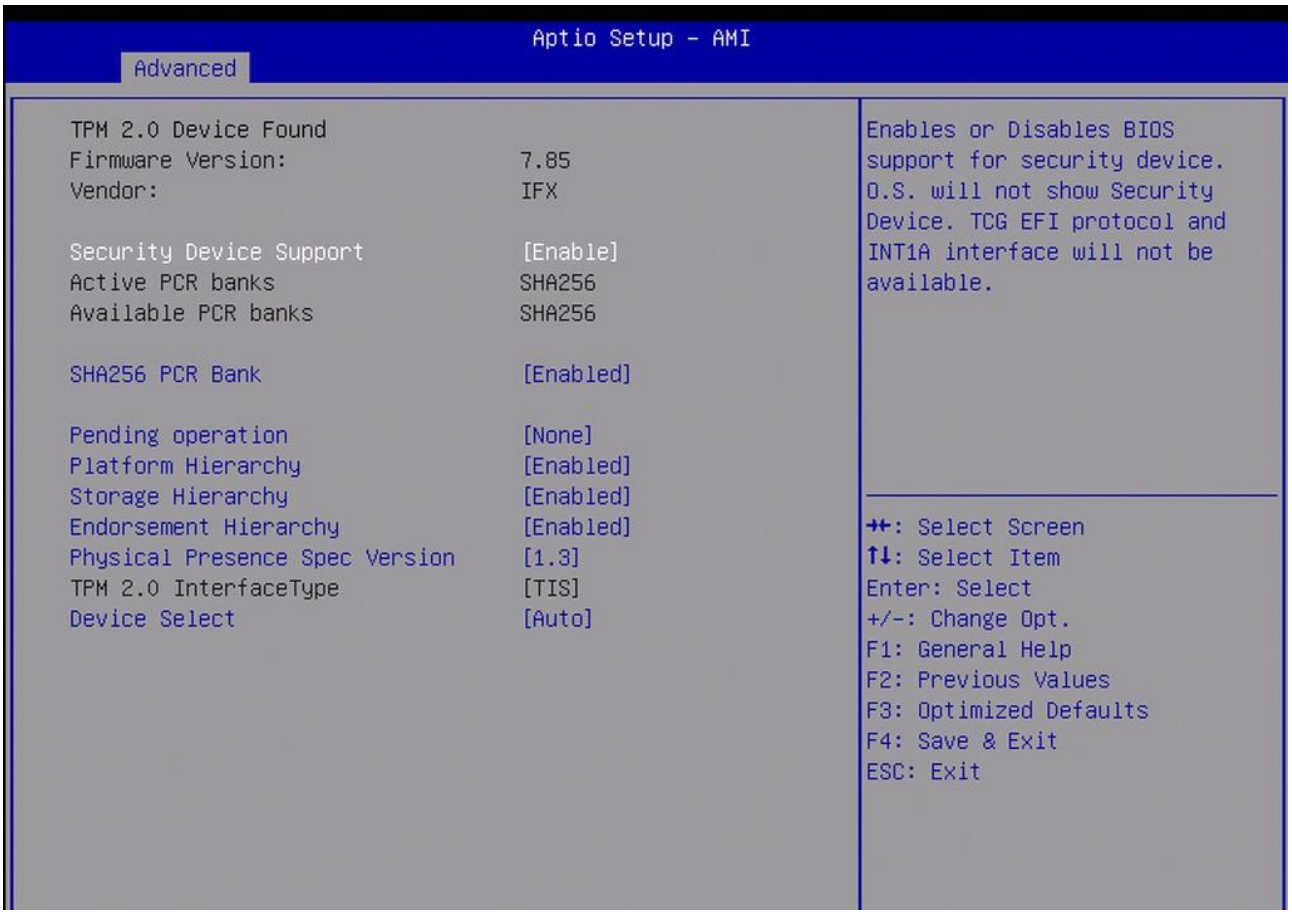
Maximum GT frequency:



Disable Turbo GT frequency:

Enabled: Disables Turbo GT frequency. Disabled: GT frequency is not limited

3.4.3 Trusted Computing



Security Device support:

Enables or Disables BlOS support for security device. O.S. will not show Security Device. TCG UEFl protocol and INT1A interface will not be available.

SHA256 PCR Bank:

Enable or Disable SHA256 PCR Bank

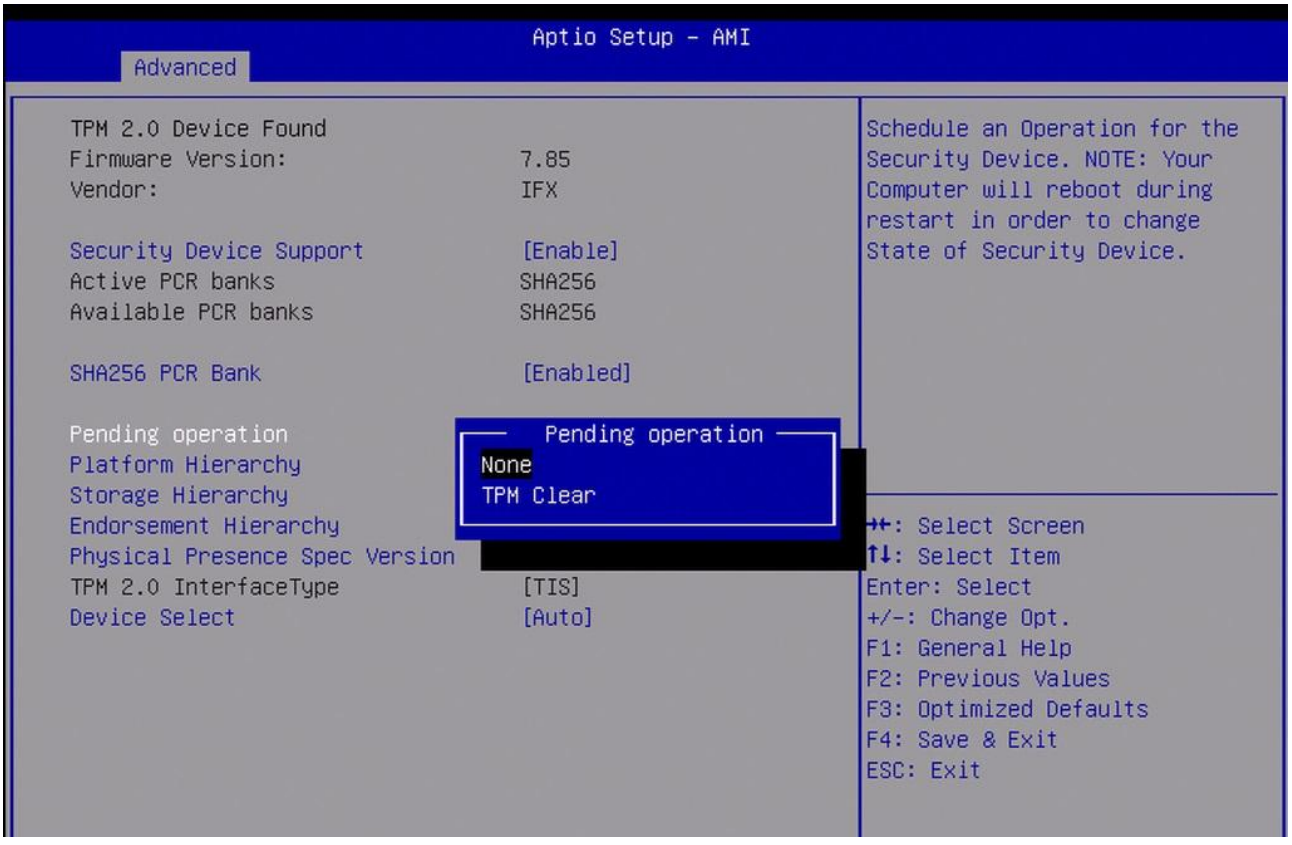
Pending operation:

Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.

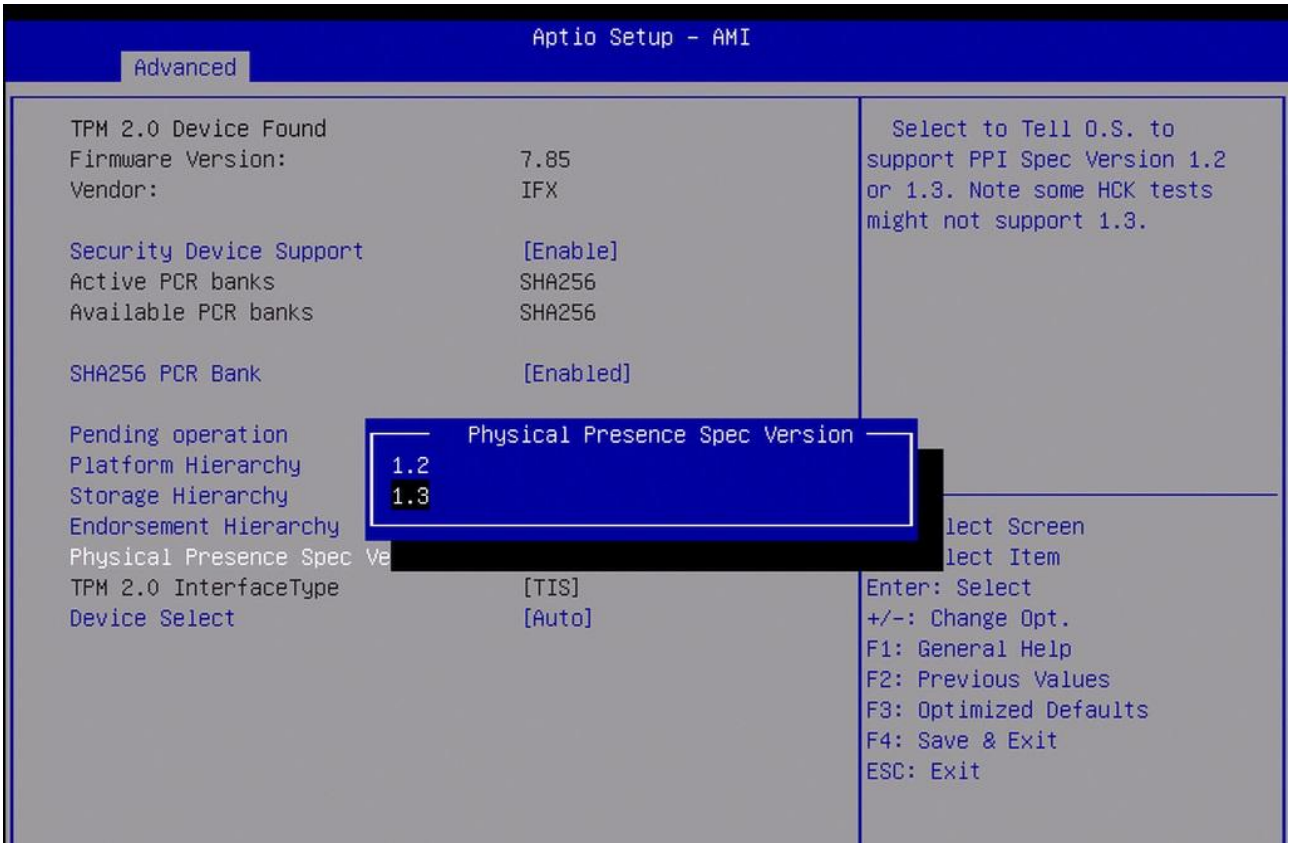
Device Select:

TPM1.2 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

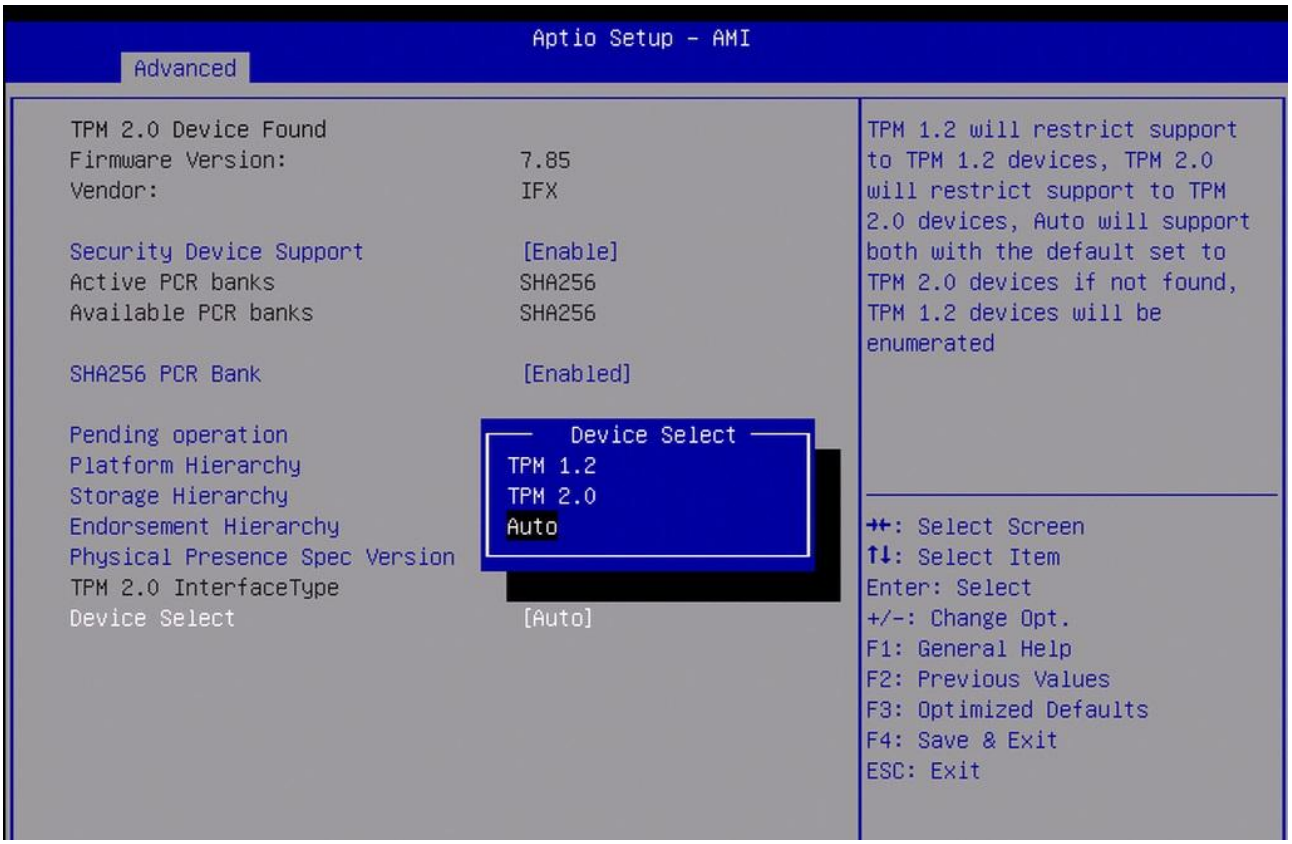
3.4.3.1 Pending operation



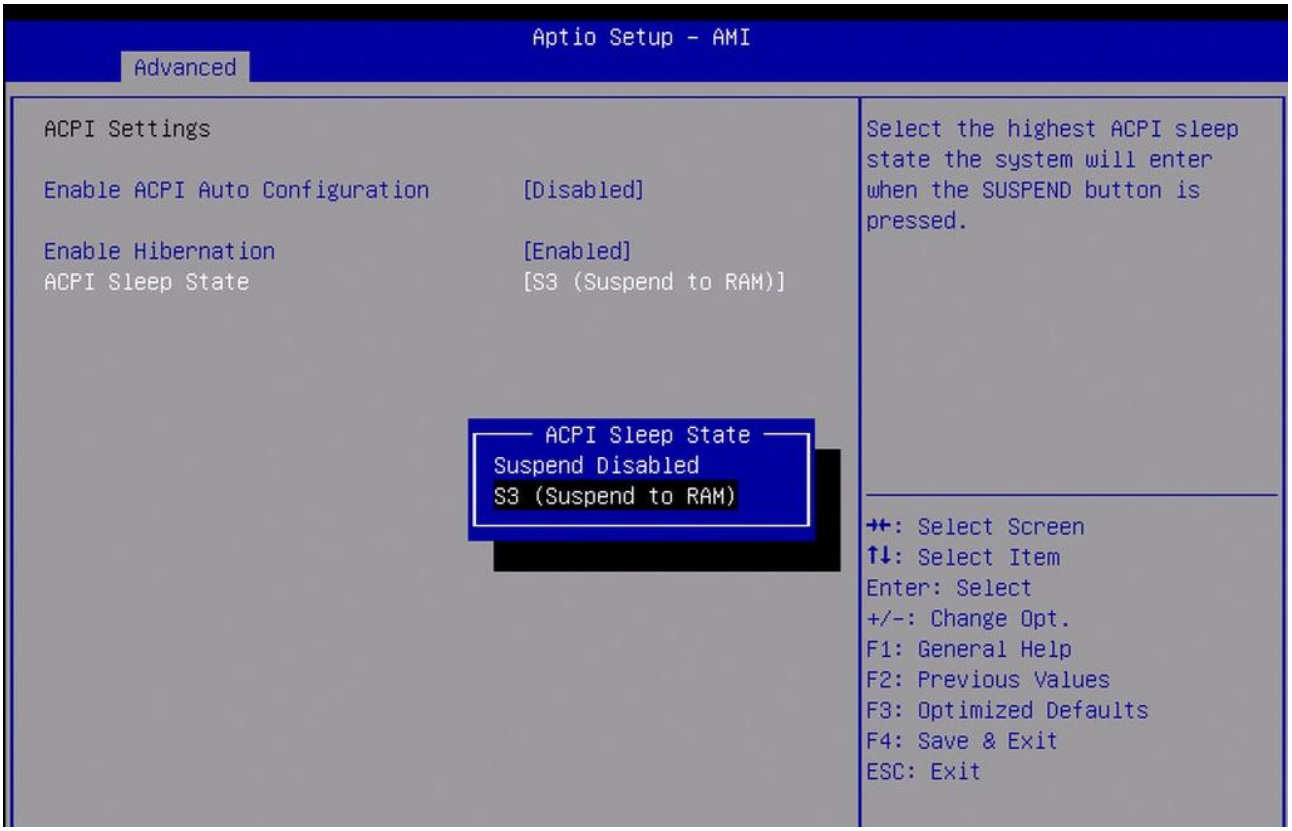
3.4.3.2 Physical Presence Spec Version



3.4.3.3 Device Select



3.4.4 ACPI Settings



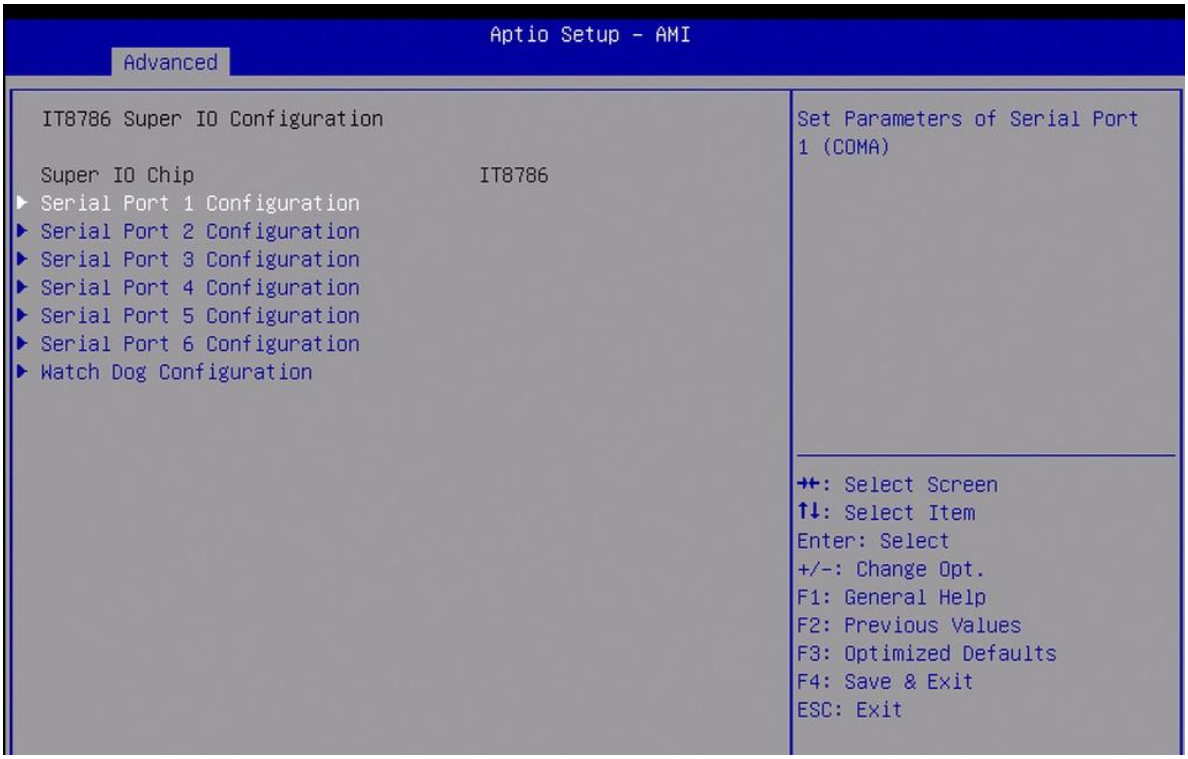
Enable Hibernation:

Enables or Disables System ability to Hibernate(OS/S4 Sleep State). This option may not be effective with some operating systems.

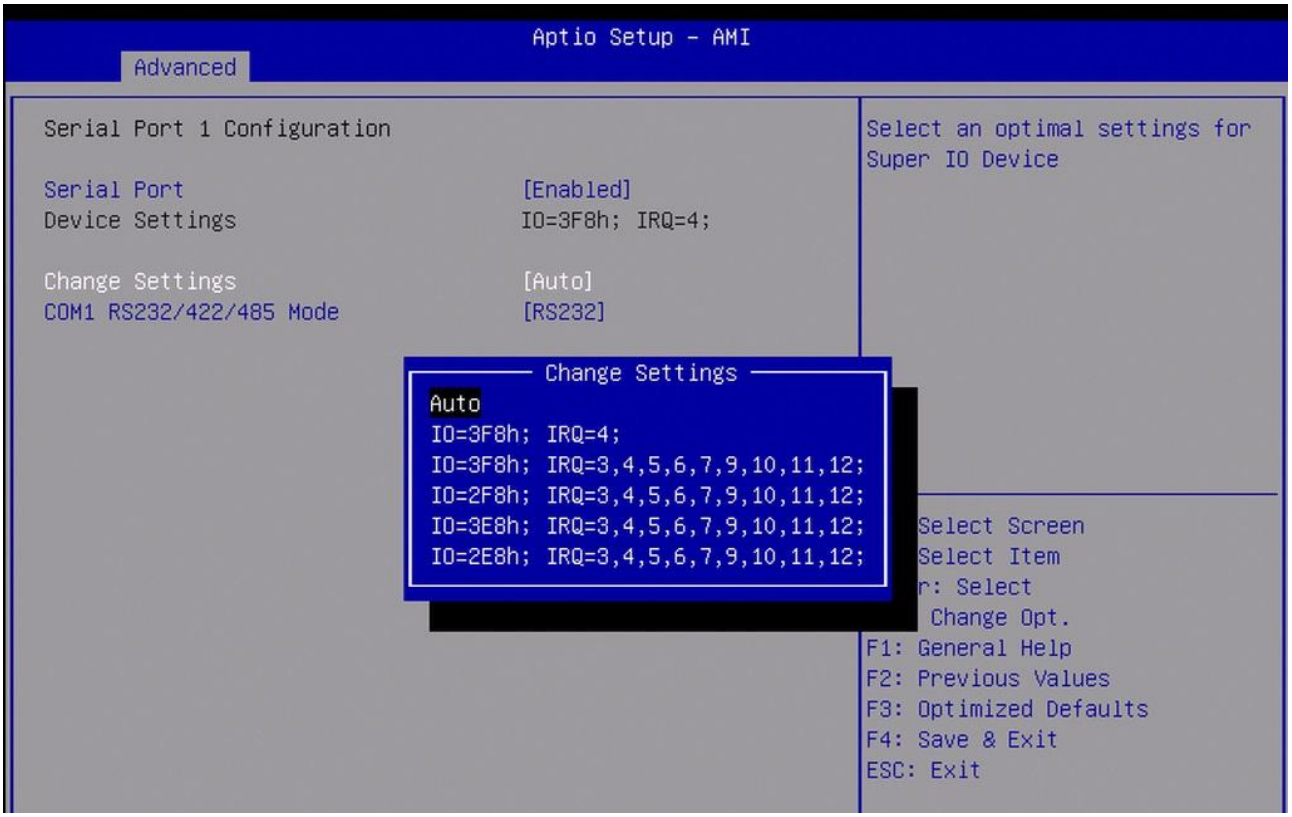
ACPI Sleep State:

Select the highest ACPl sleep state the system will enter when the SUSPEND button is pressed.

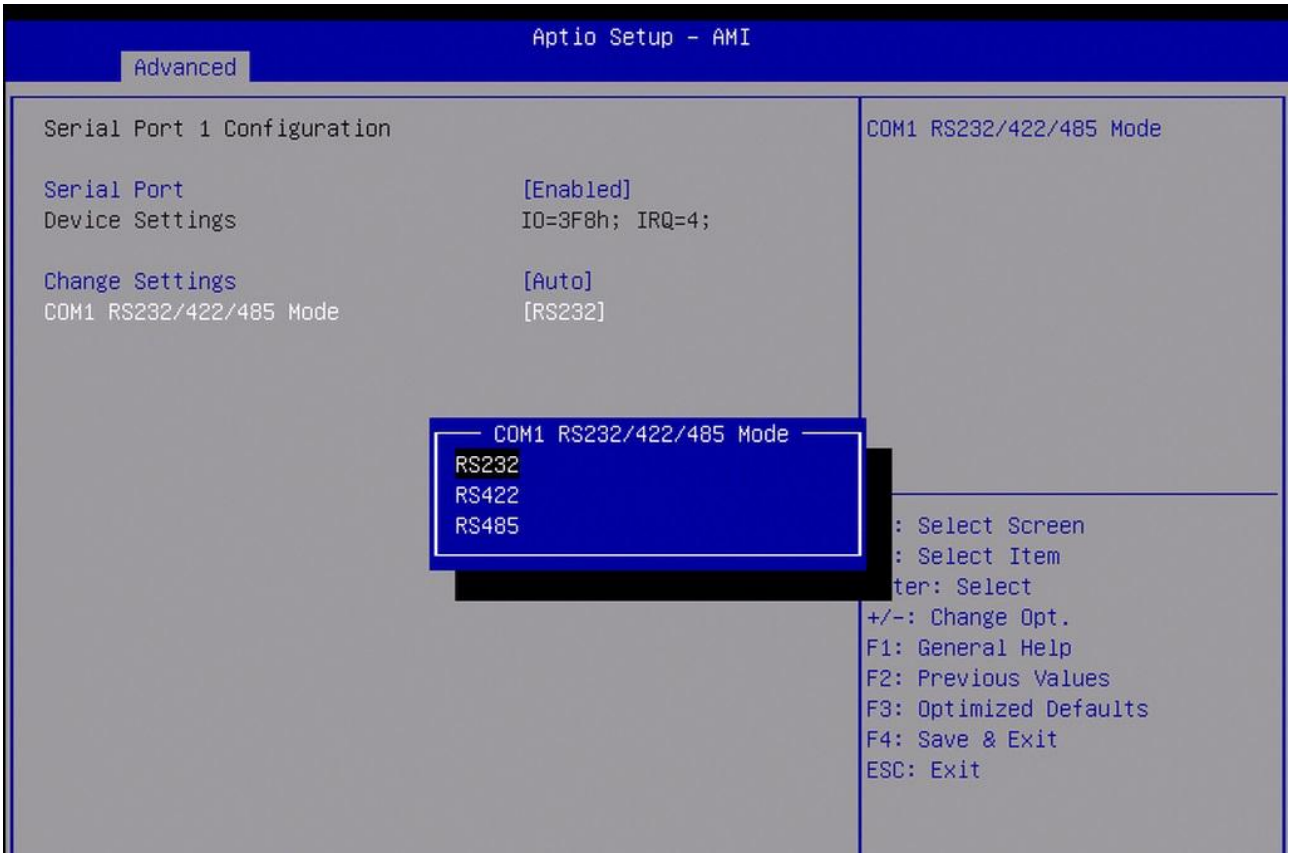
3.4.5 Super IO Configuration



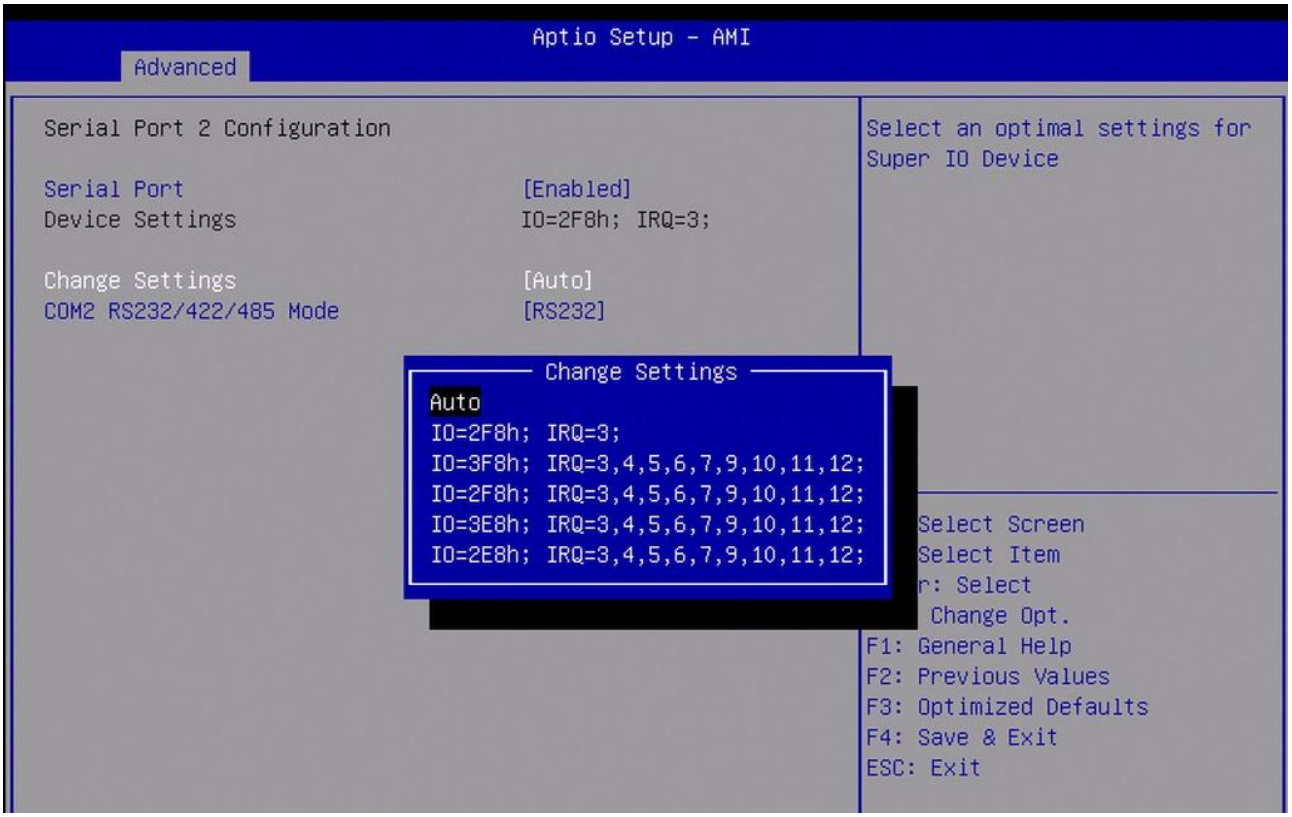
3.4.5.1 Serial Port 1 Configuration



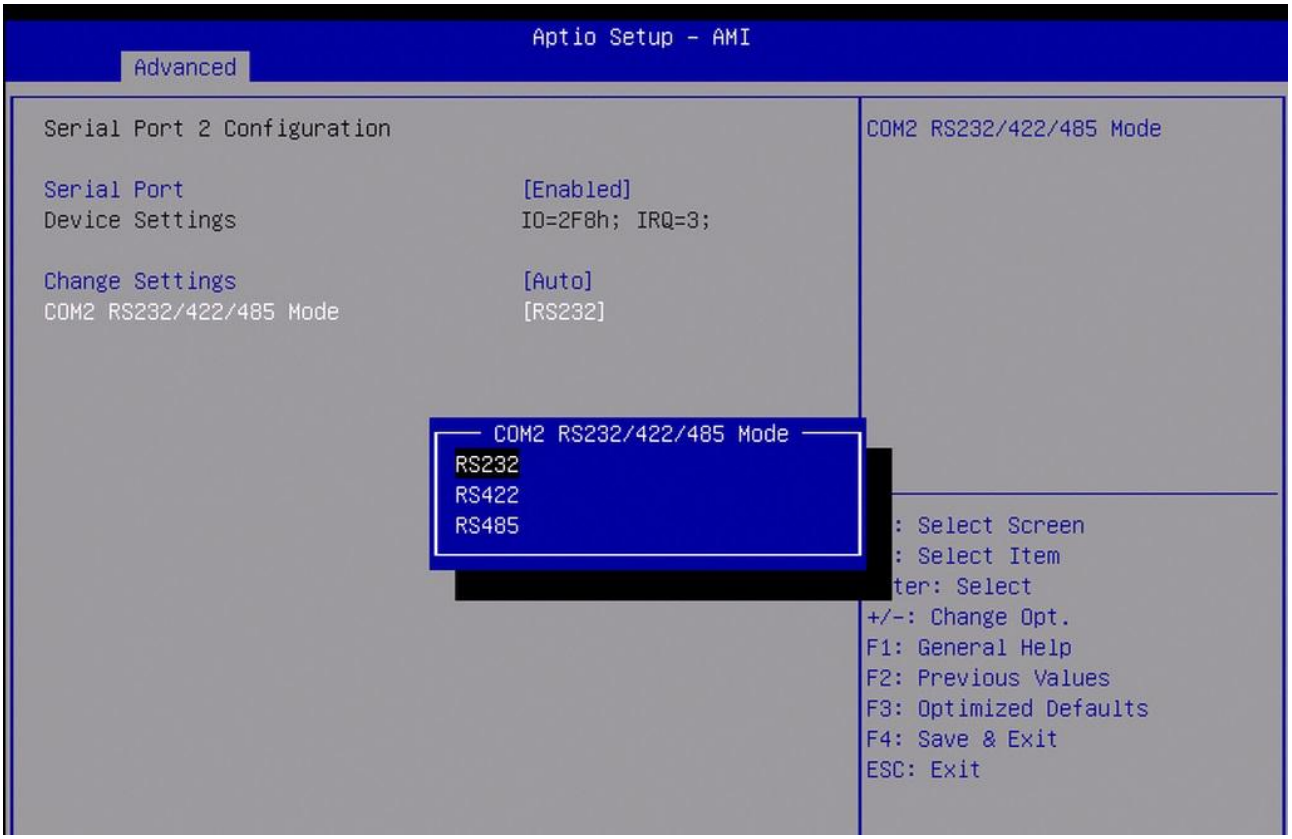
COM1 RS232/422/485 Mode



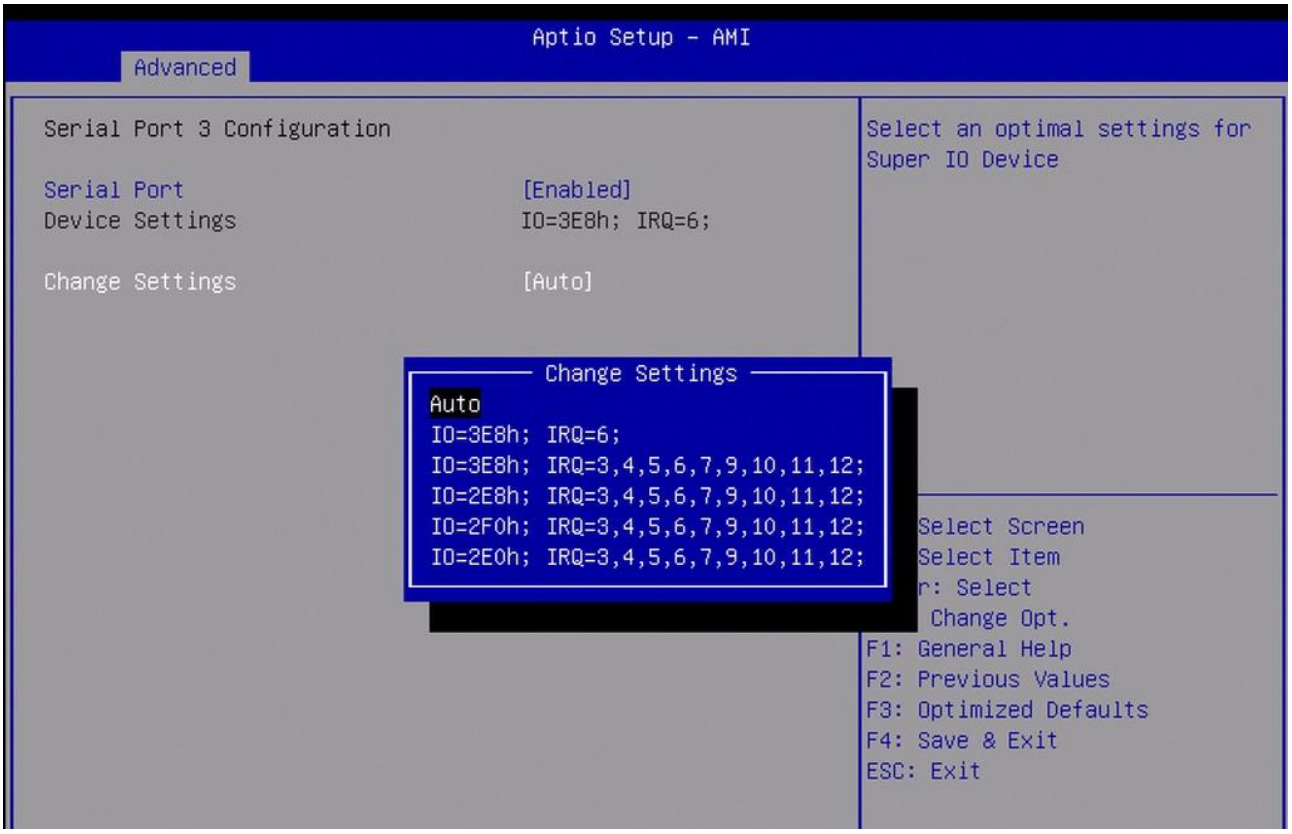
3.4.5.2 Serial Port 2 Configuration



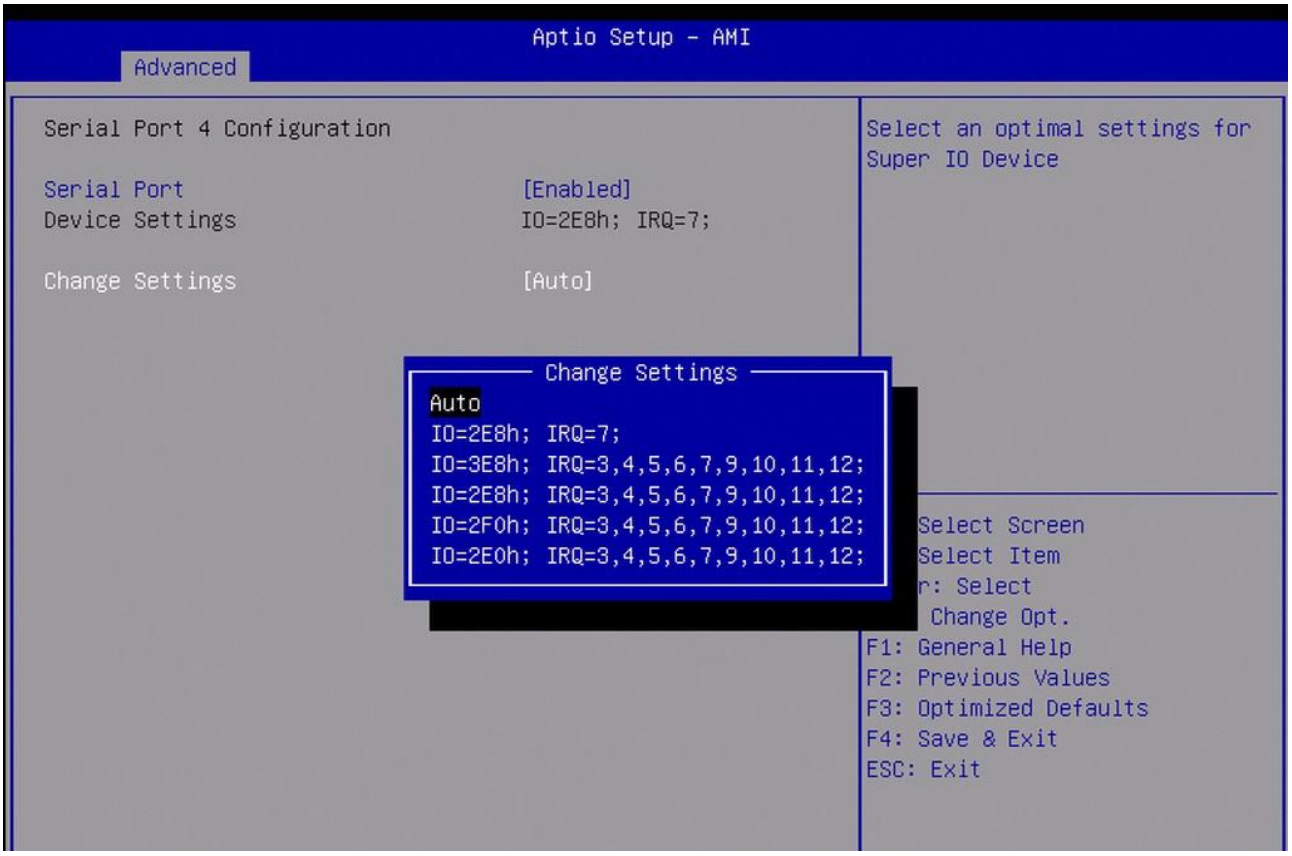
COM2 RS232/422/485 Mode



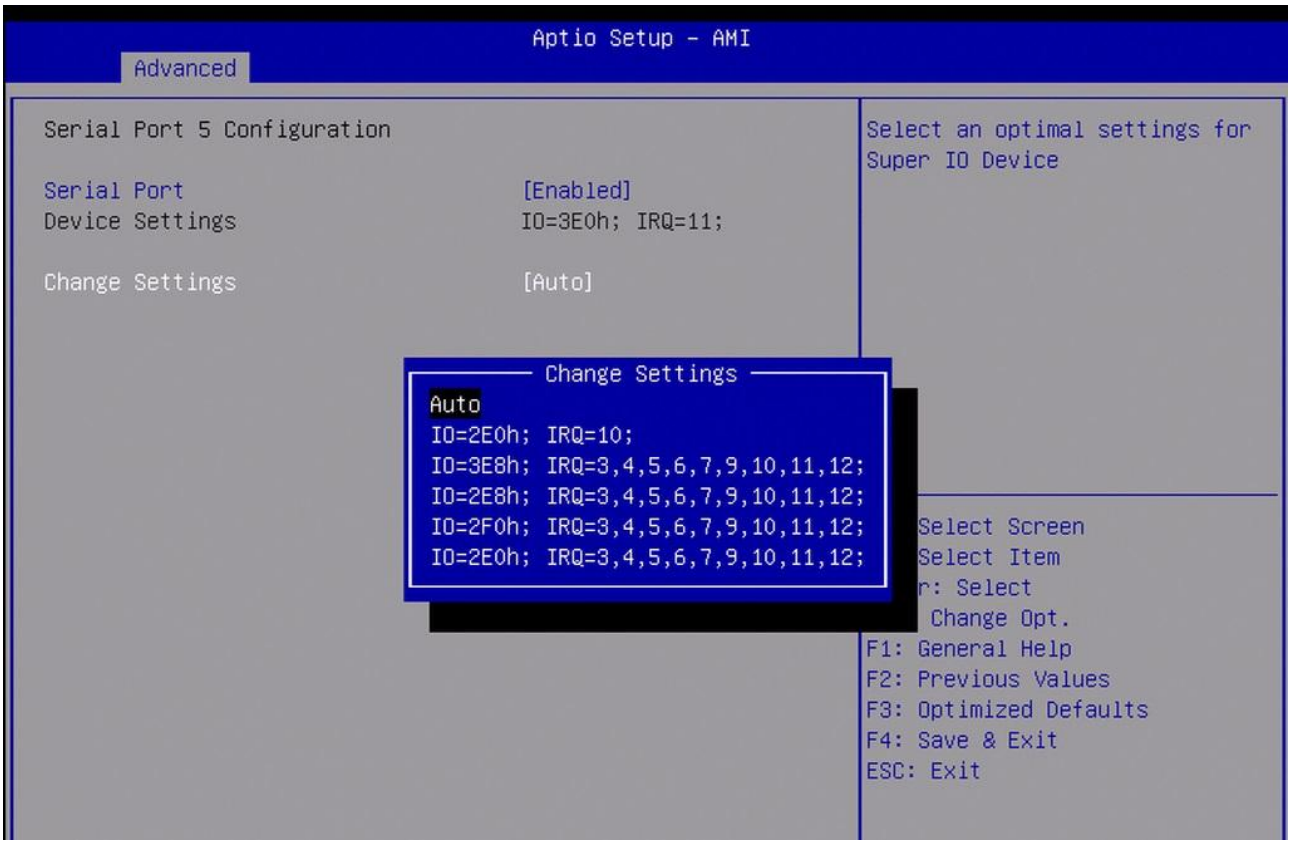
3.4.5.3 Serial Port 3 Configuration



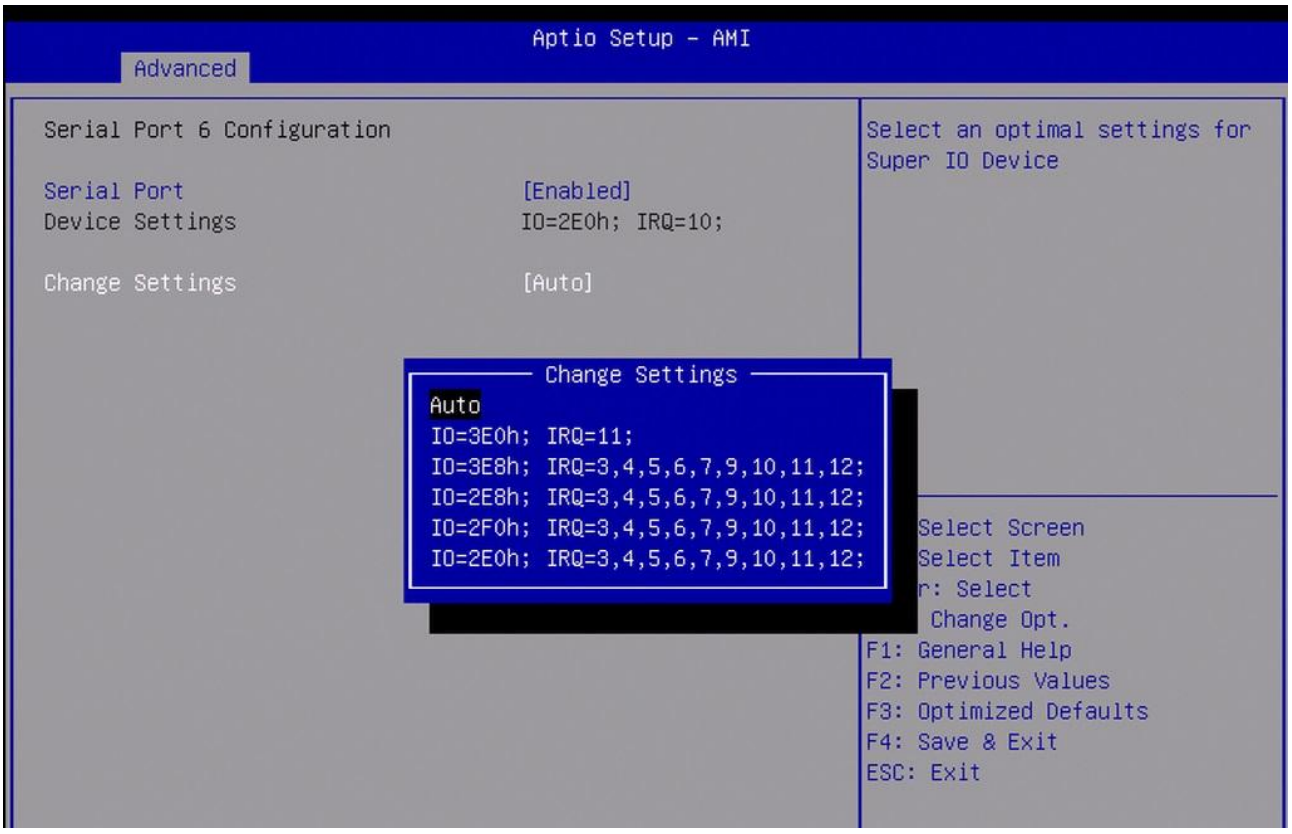
3.4.5.4 Serial Port 4 Configuration



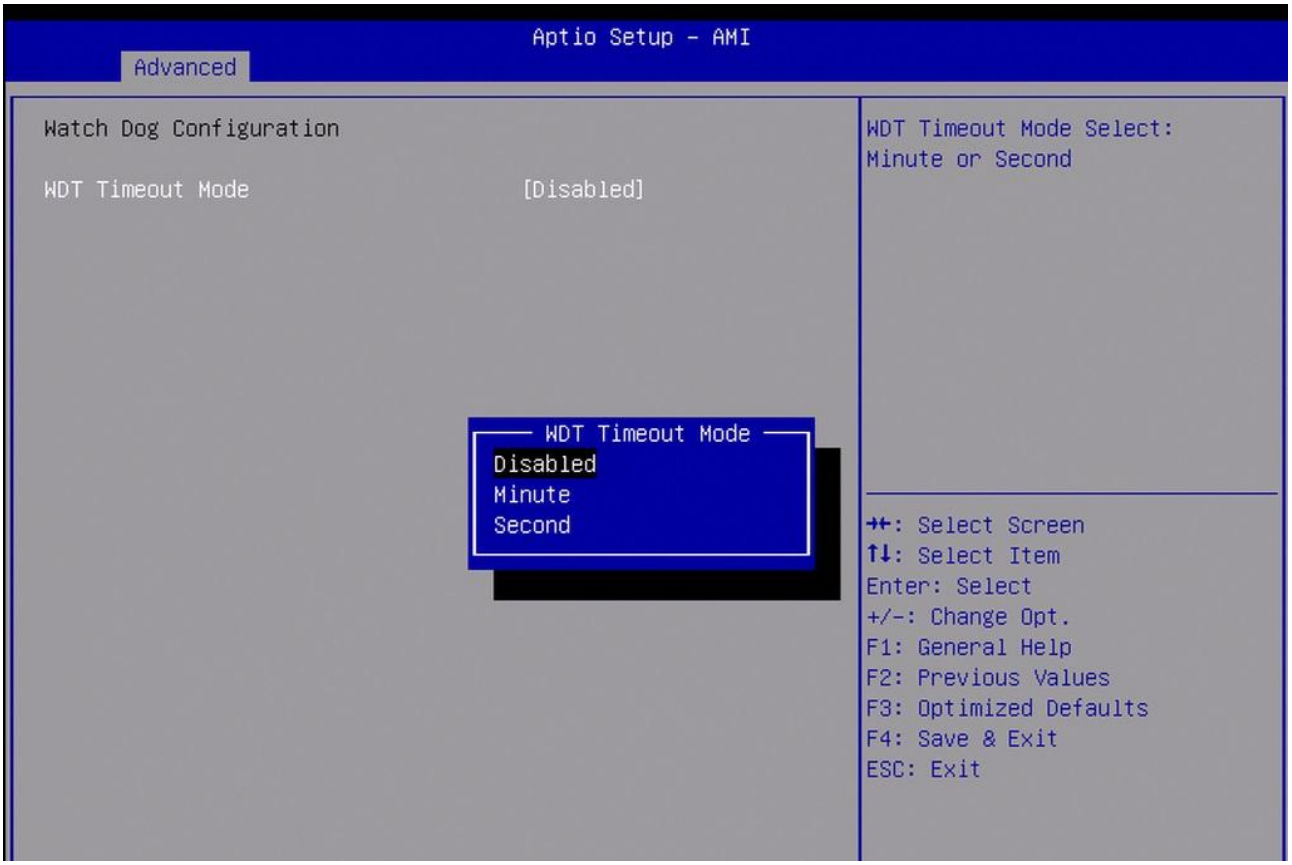
3.4.5.5 Serial Port 5 Configuration



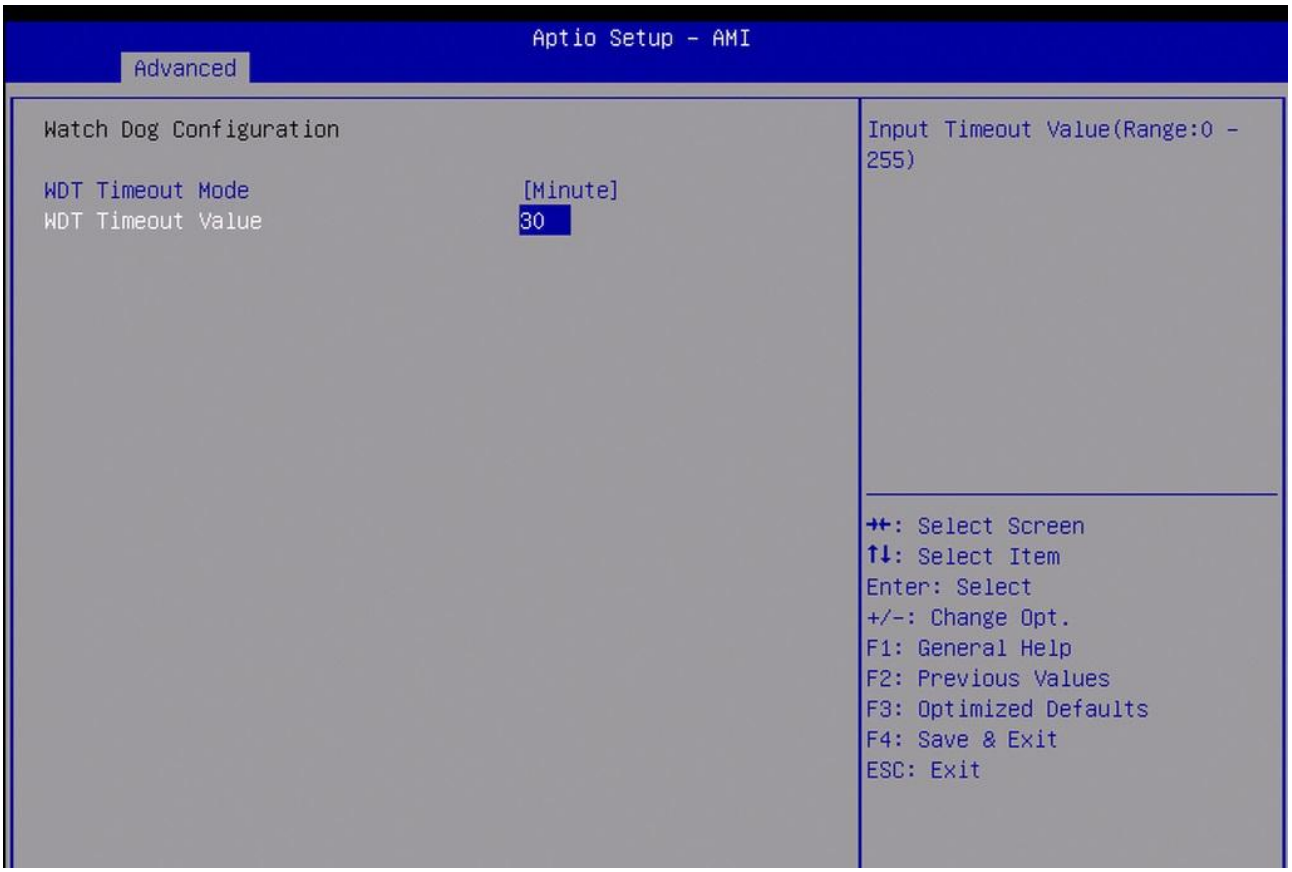
3.4.5.6 Serial Port 6 Configuration



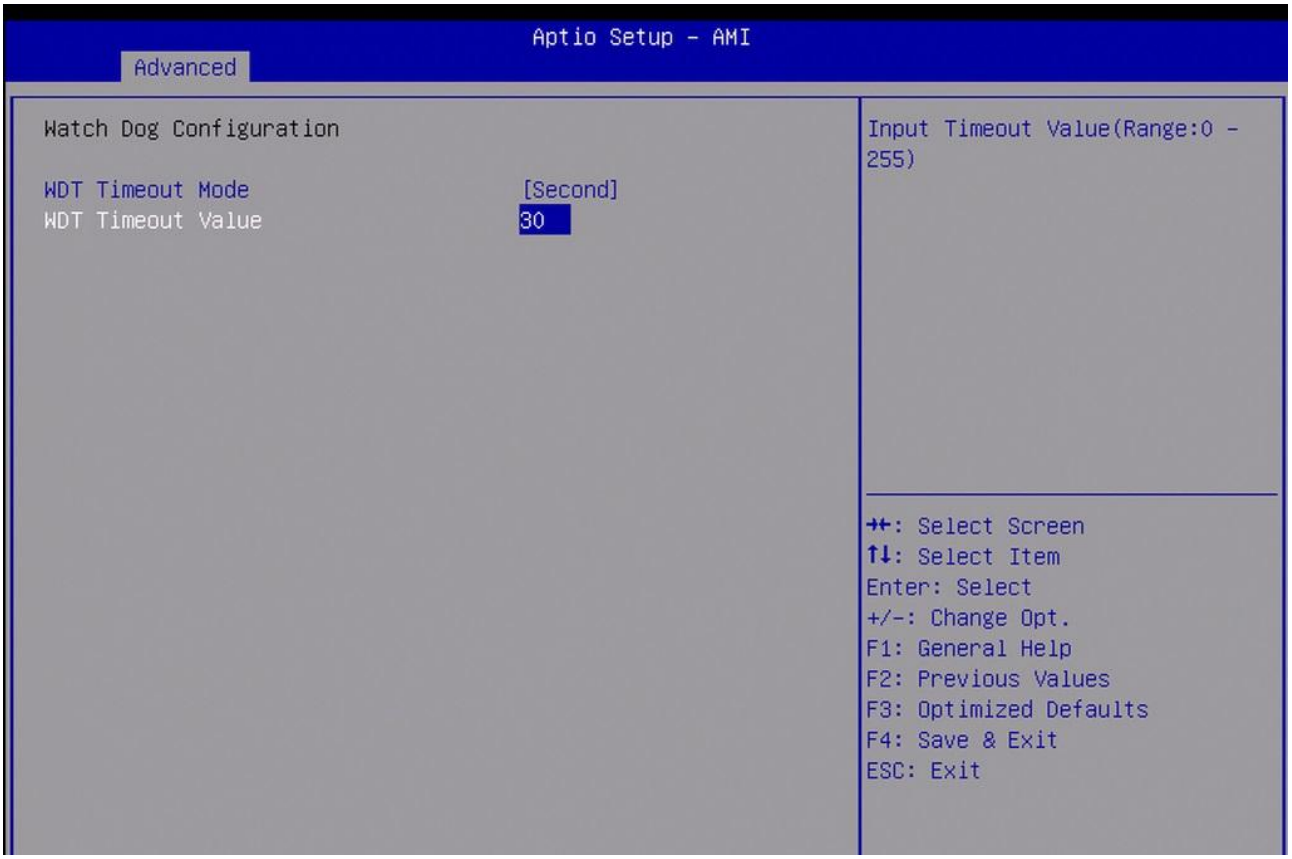
3.4.5.7 Watch Dog Configuration



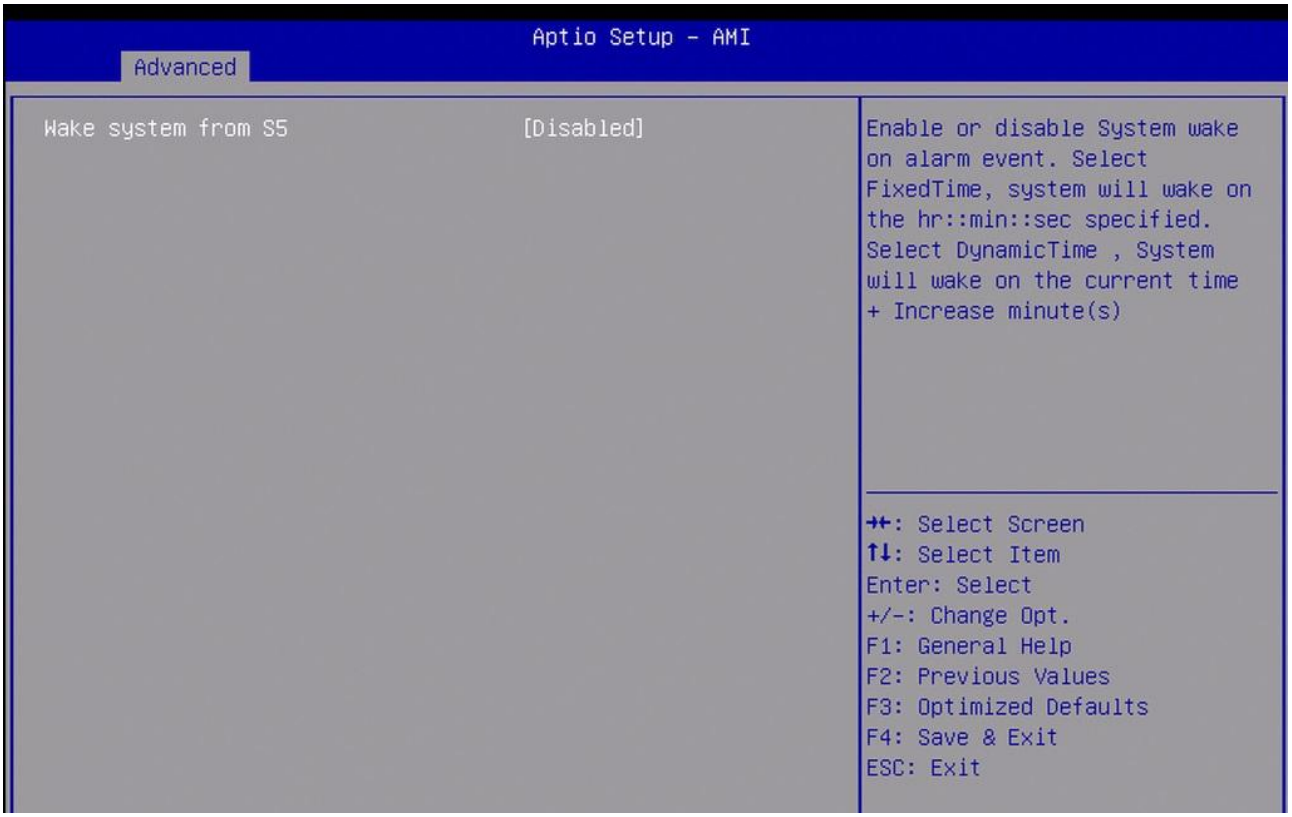
WDT Timeout Value:0~255 Minute



WDT Timeout Value:0~255 Second.



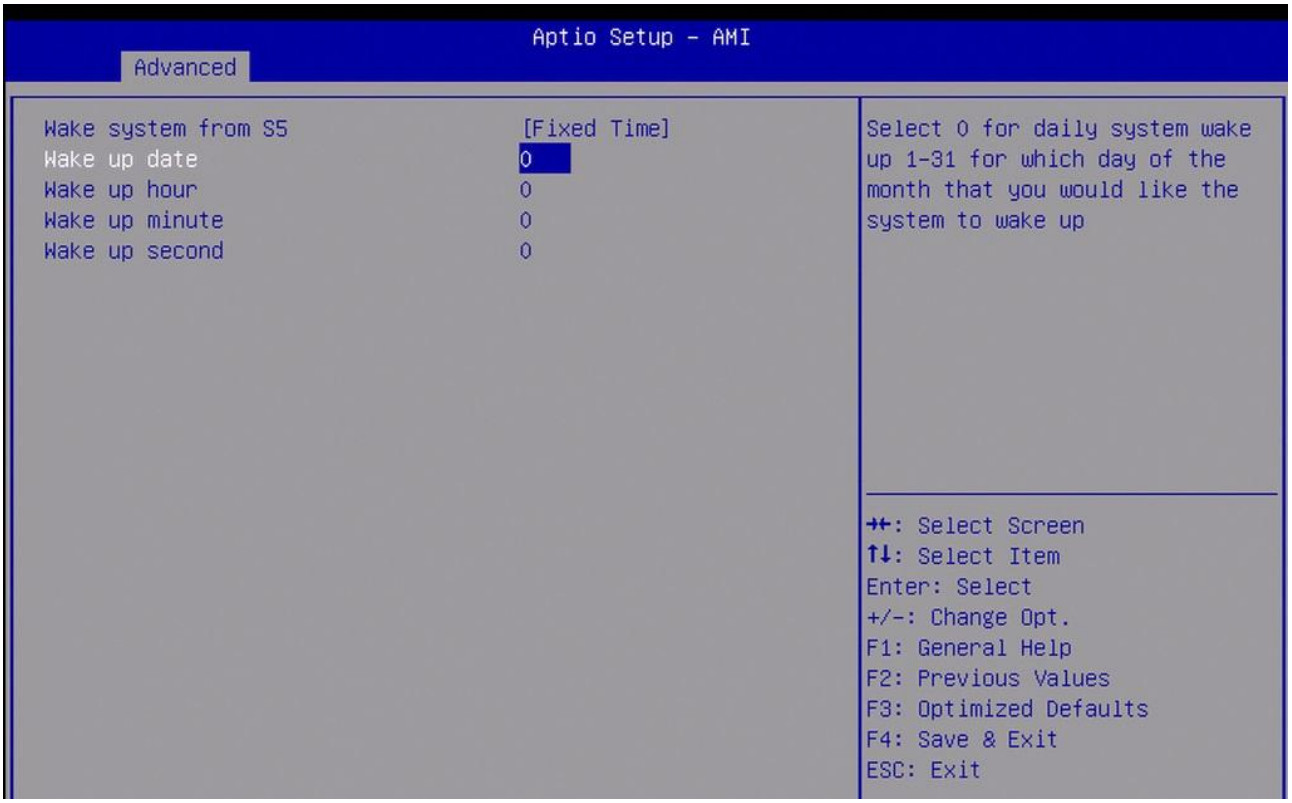
3.4.6 S5 RTC Wake Settings



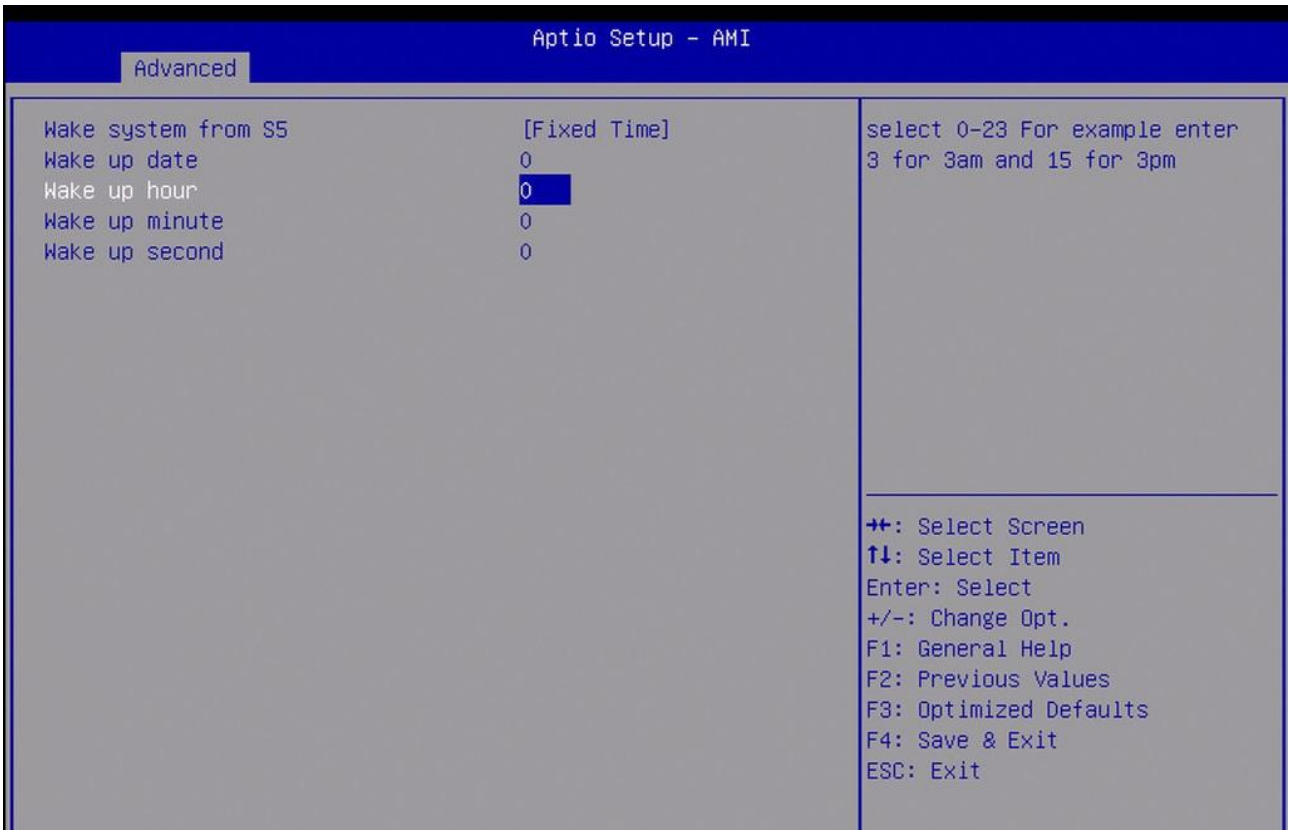
Wake system from S5:

Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr: min: sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s)

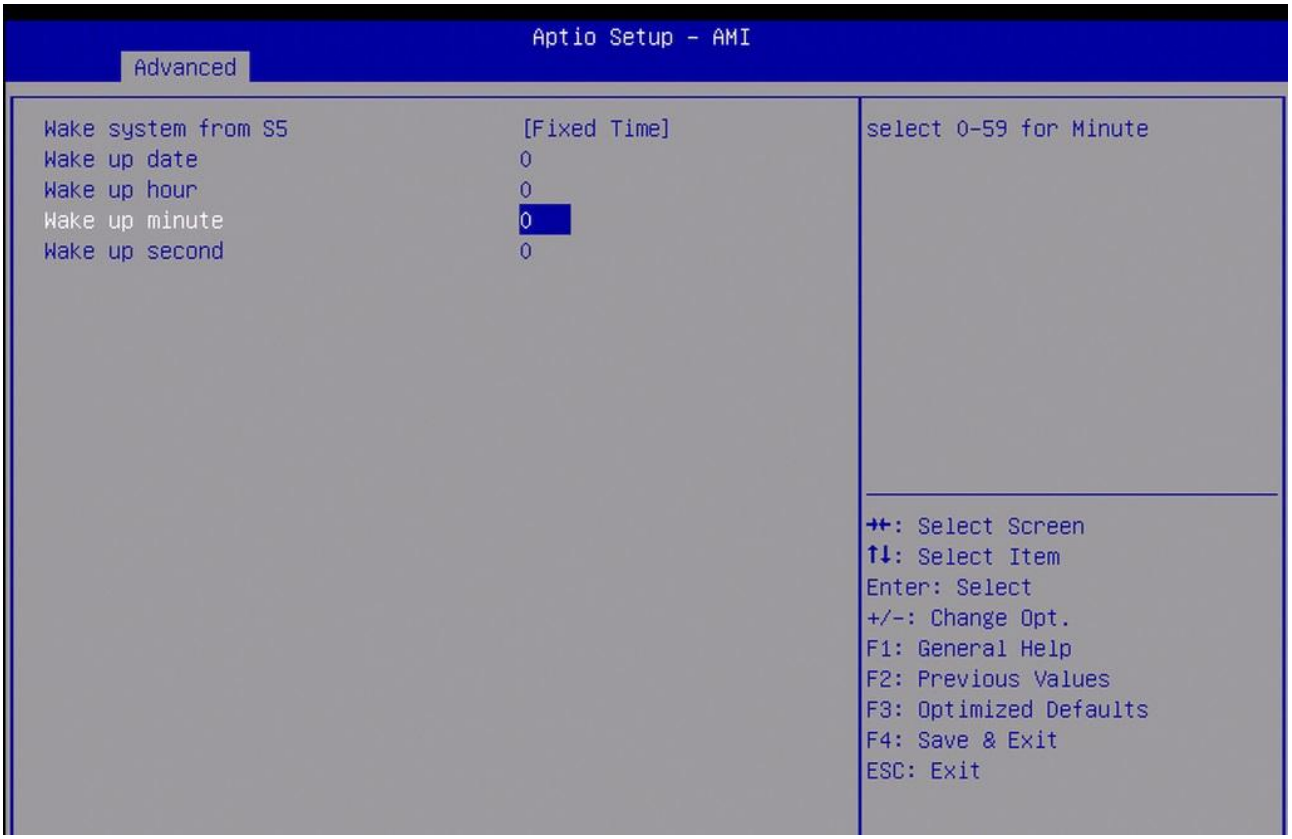
Wake up date: Select 0 for daily system wake up 1-31 for which day of the month that you would like the system to wake up



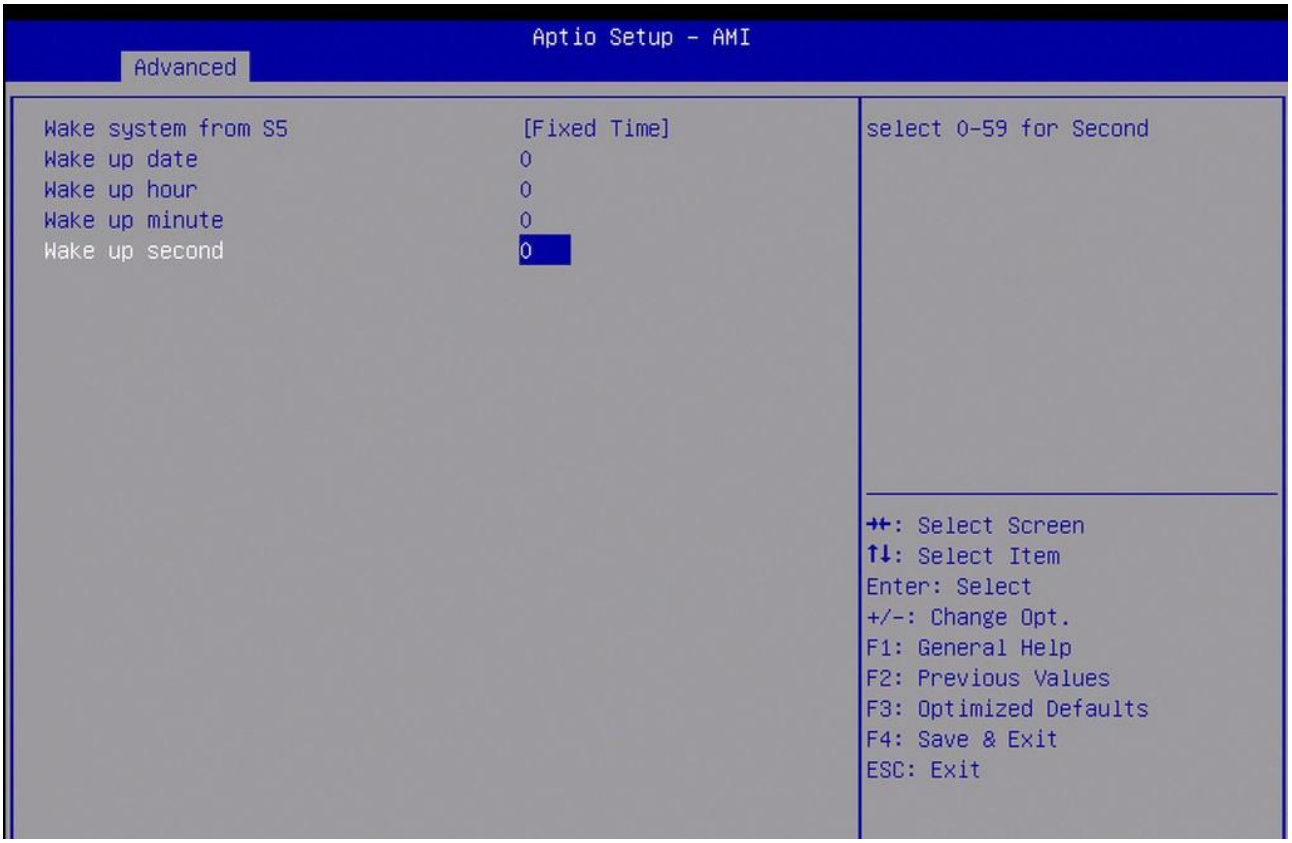
Select 0-23 For example enter 3 for 3am and 15 for 3pm



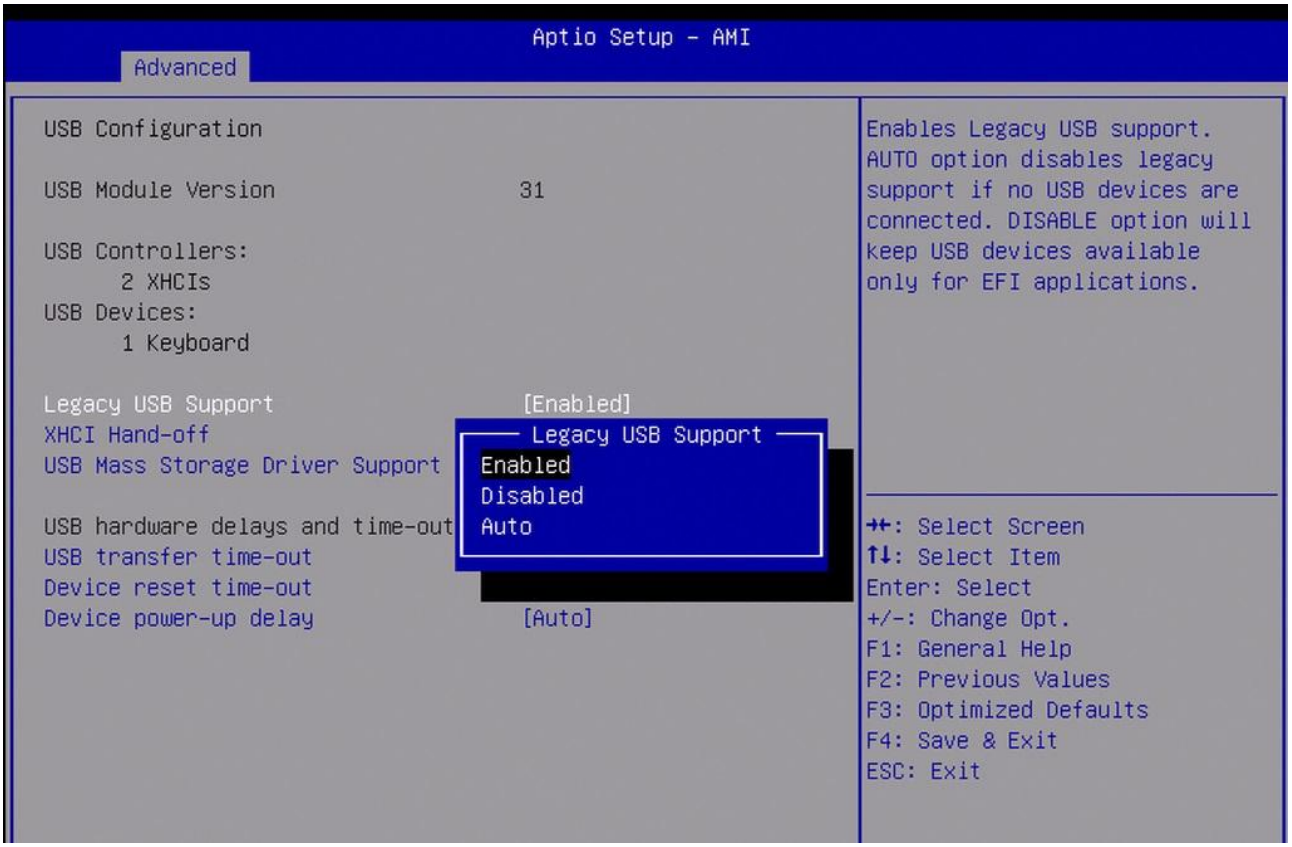
Select 0-59 for Minute



Select 0-59 for Second



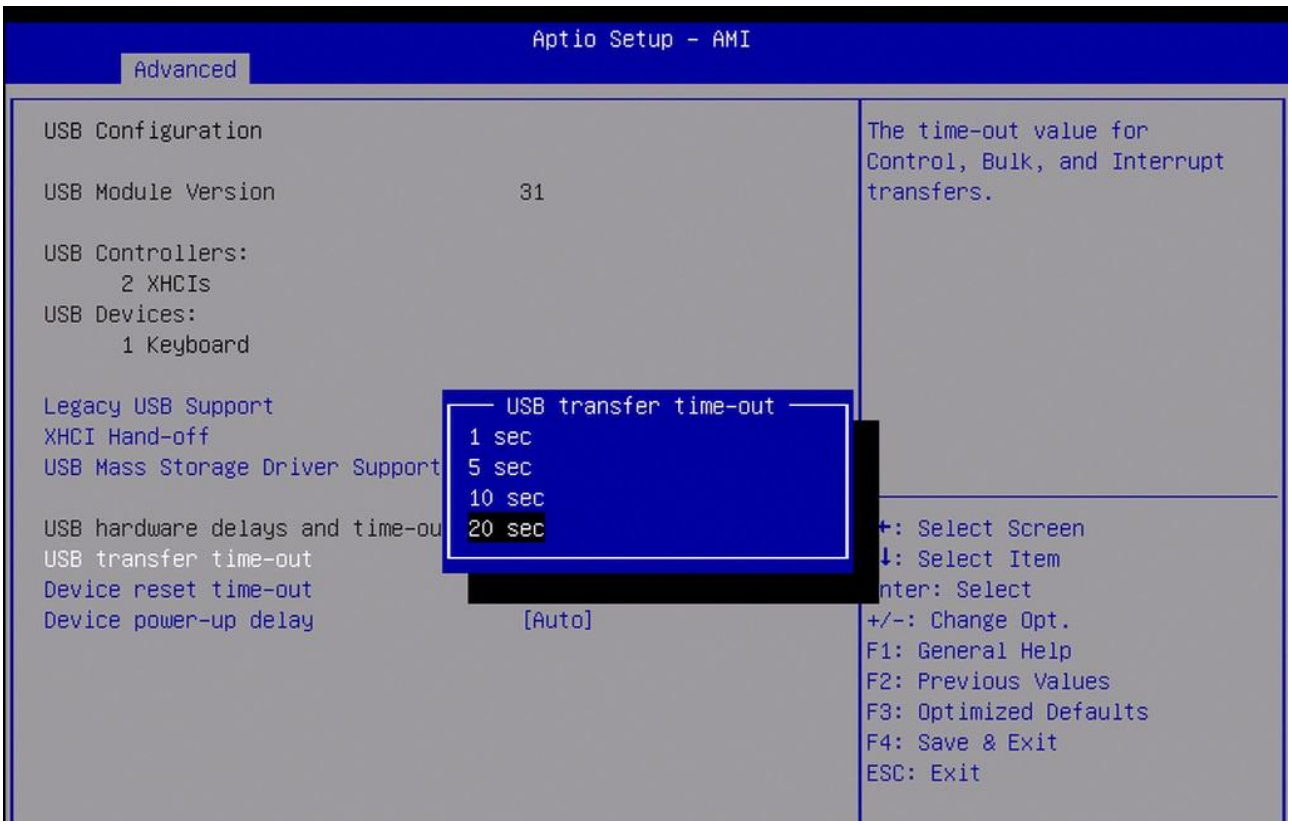
3.4.7 USB Configuration



Legacy USB Support:

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for UEFl applications.

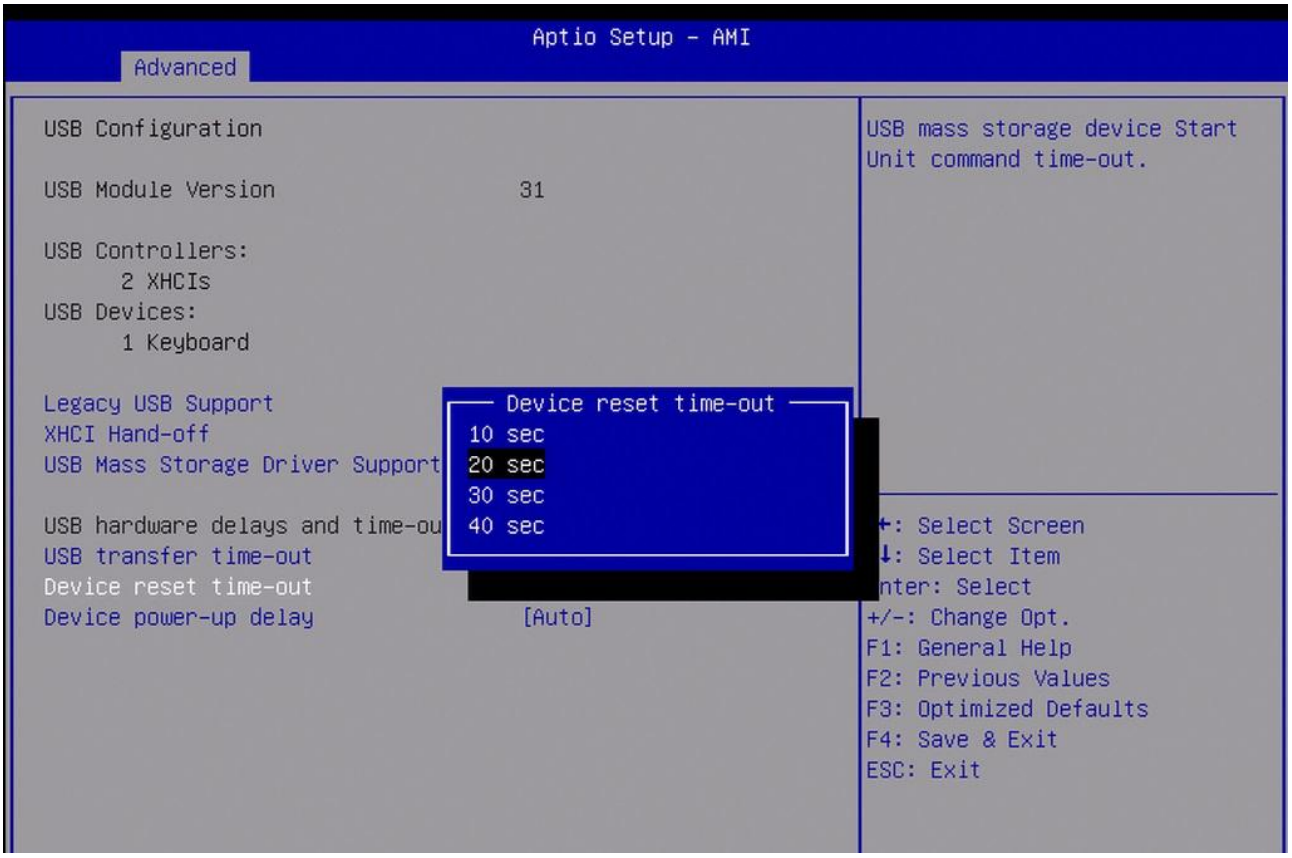
3.4.7.1 USB transfer time-out



USB transfer time-out:

The time-out value for Control, Bulk, and interrupt transfers.

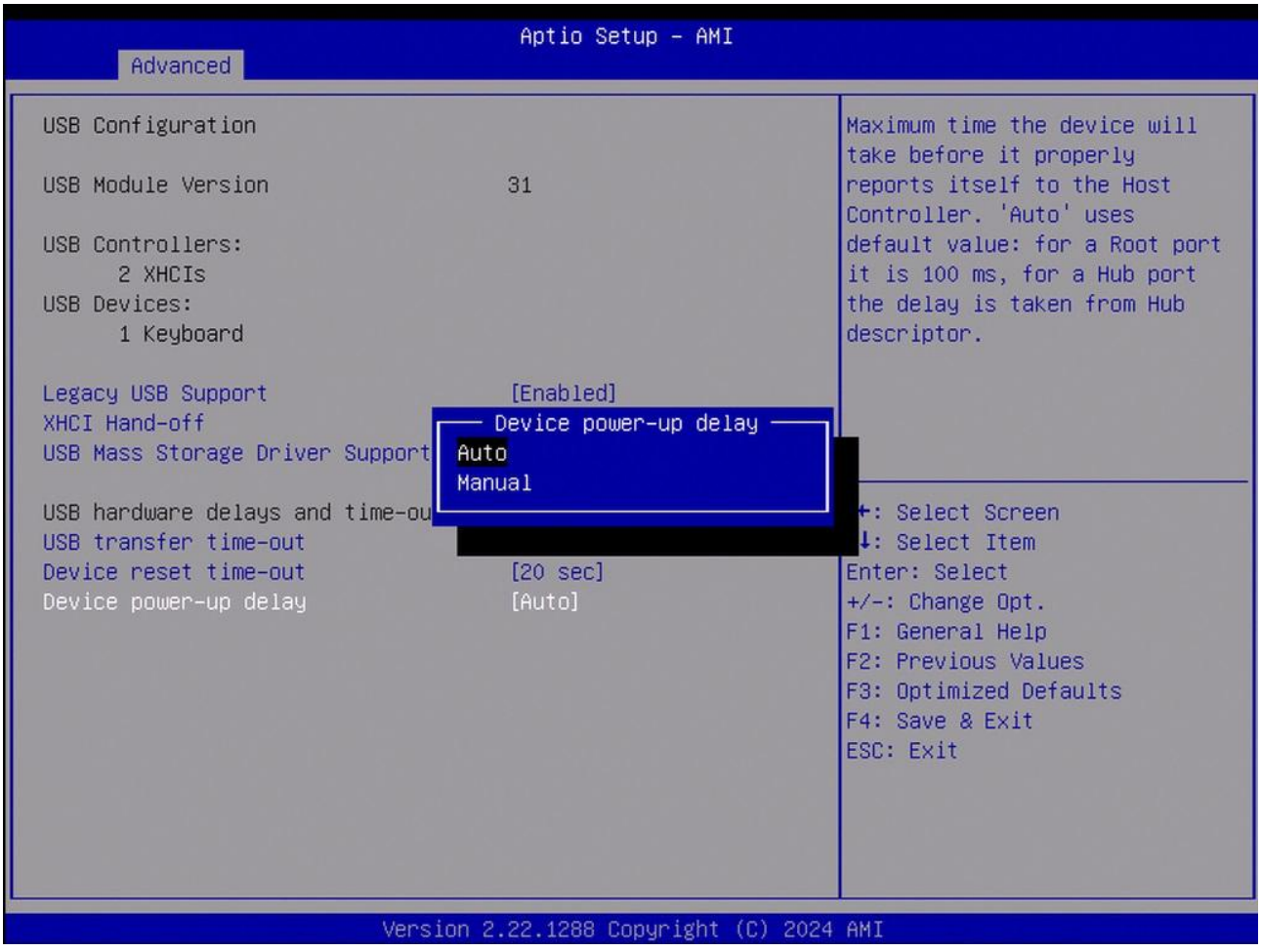
3.4.7.2 Device reset time-out



Device reset time-out:

USB mass storage device Start Unit command time-out.

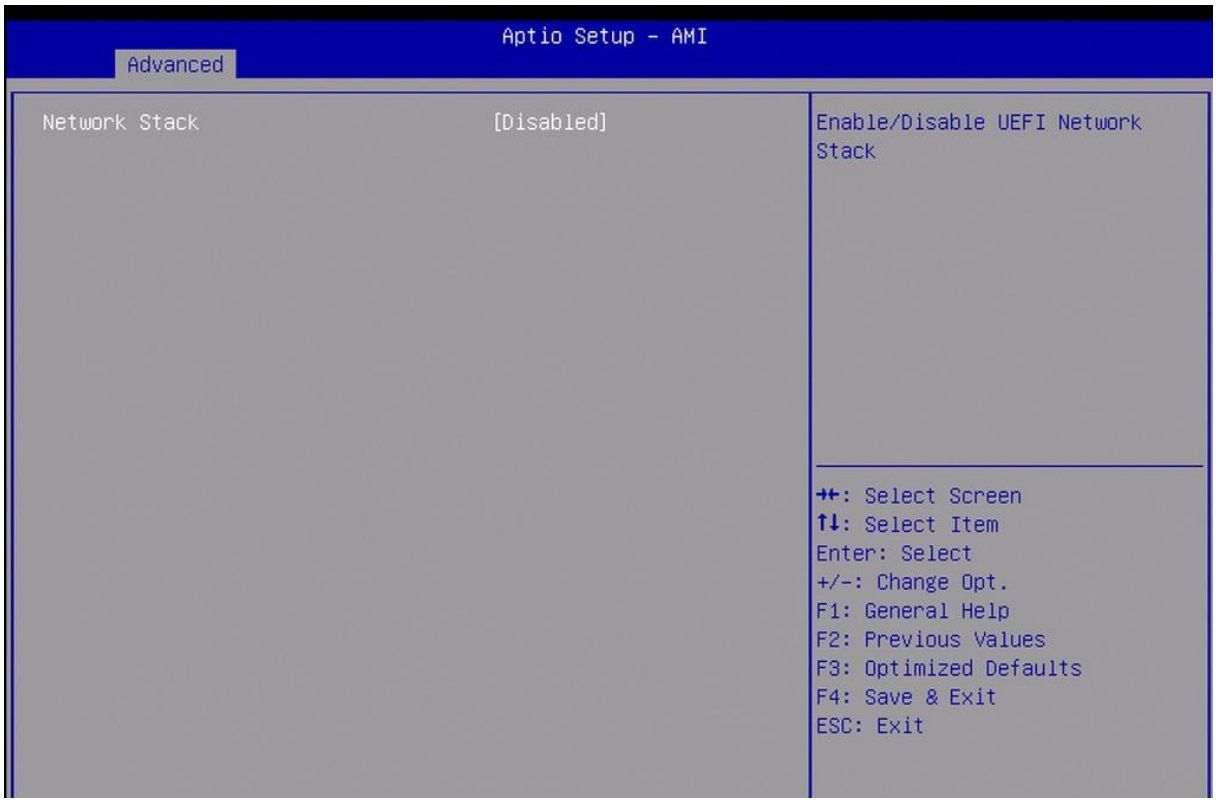
3.4.7.3 Device power-up delay



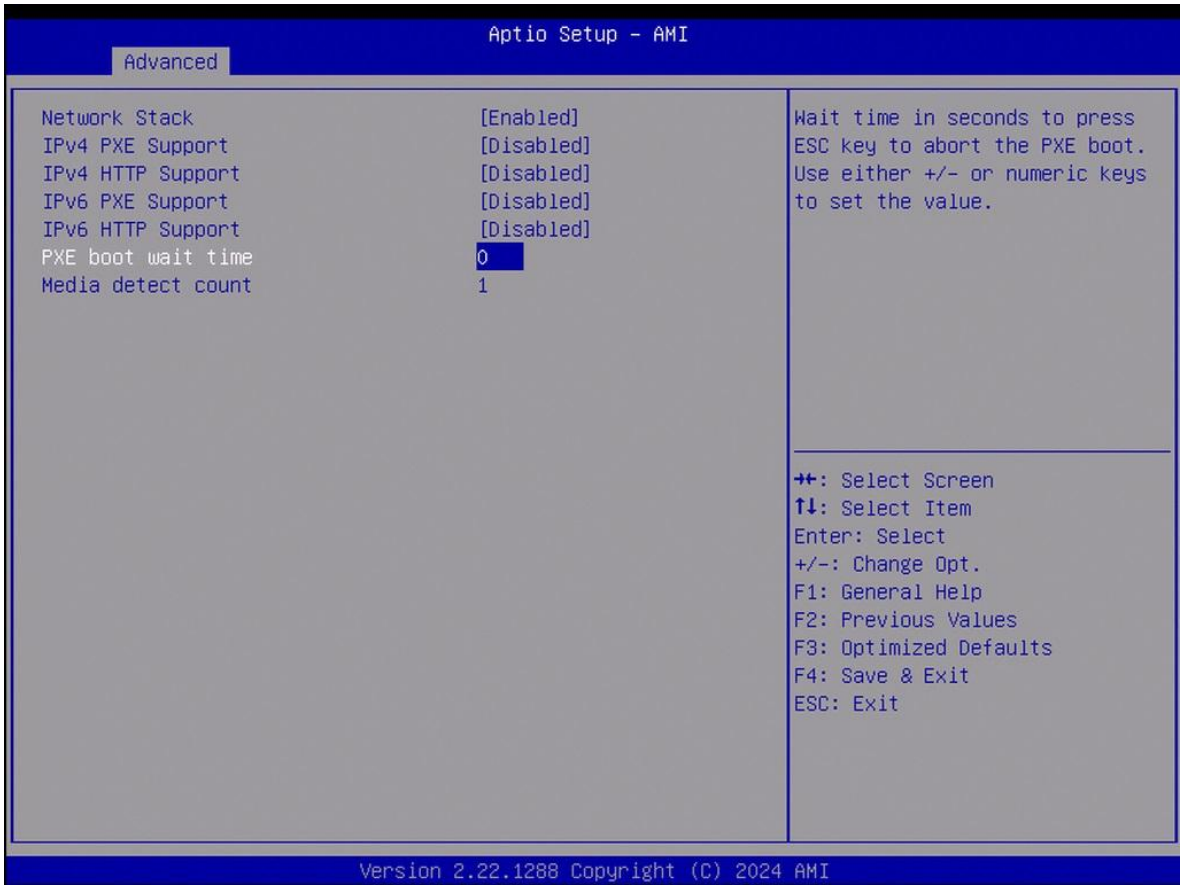
Device power-up delay:

Maximum time the device will take before it properly reports itself to the Host Controller. ‘Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

3.4.8 Network Stack Configuration



3.4.8.1 PXE boot wait time



IPV4 PXE Support:

Enable/Disable lPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.

IPV4 HTTP Support:

Enable/Disable lPv4 HTTP boot support. lf disabled, IPv4 HTTP boot support will not be available.

IPV6 PXE Support:

Enable/Disable lPv6 PXE boot support. lf disabled, IPv6 PXE boot support will not be available.

IPV6 HTTP Support:

Enable/Disable lPv6 HTTP boot support. If disabled,IPv6 HTTP boot support will not be available.

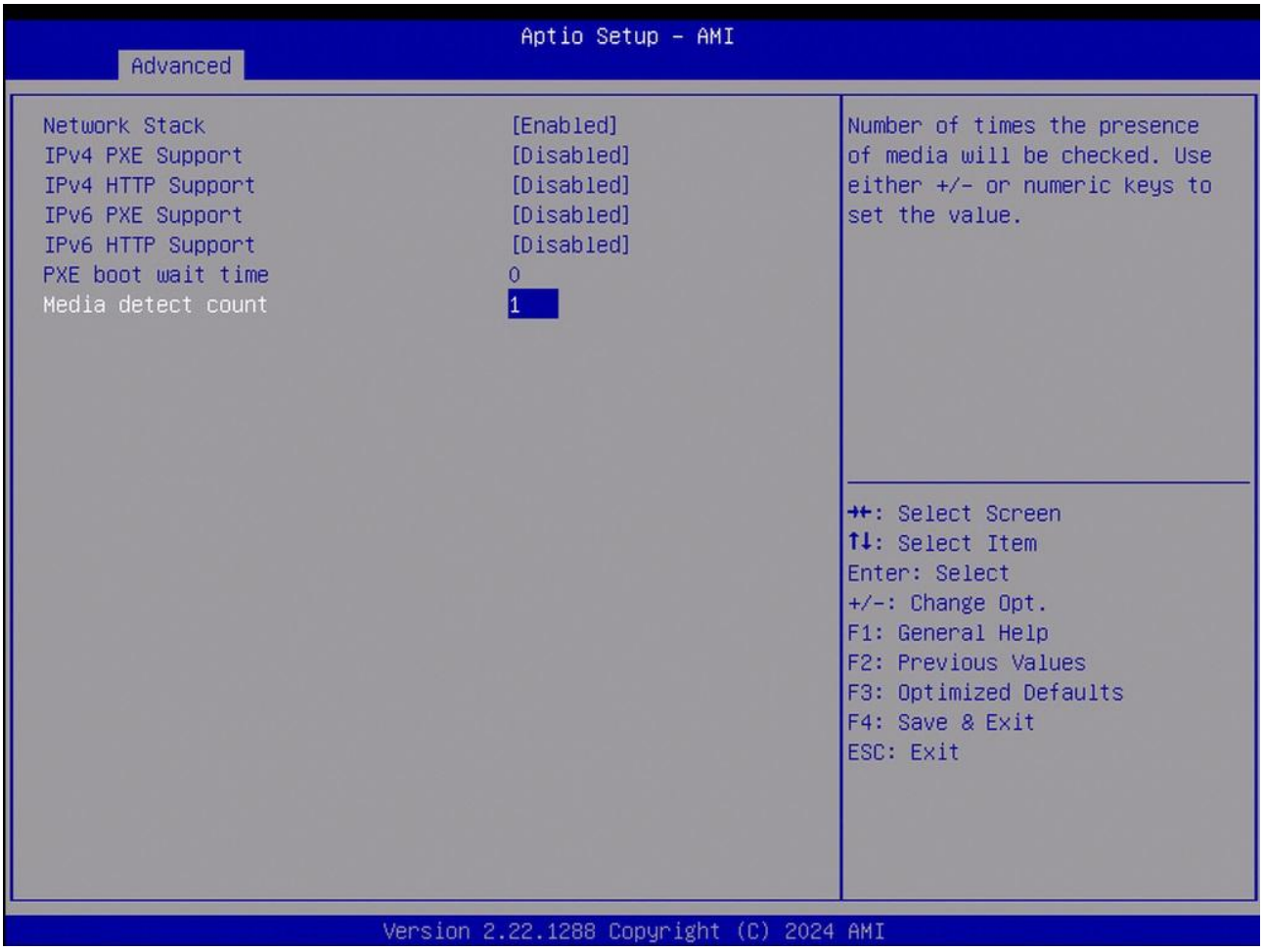
PXE Boot Wait Time:

Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value,

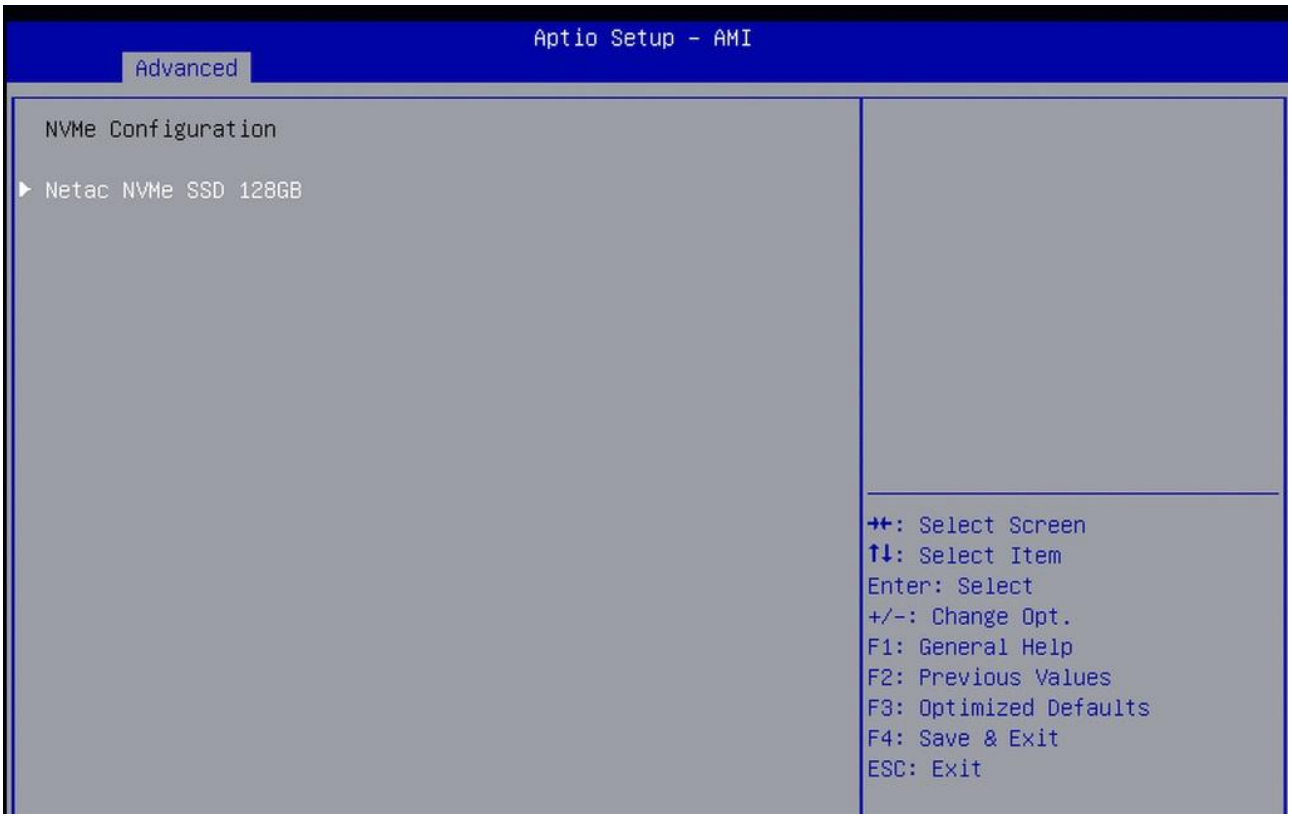
Media detect count:

Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

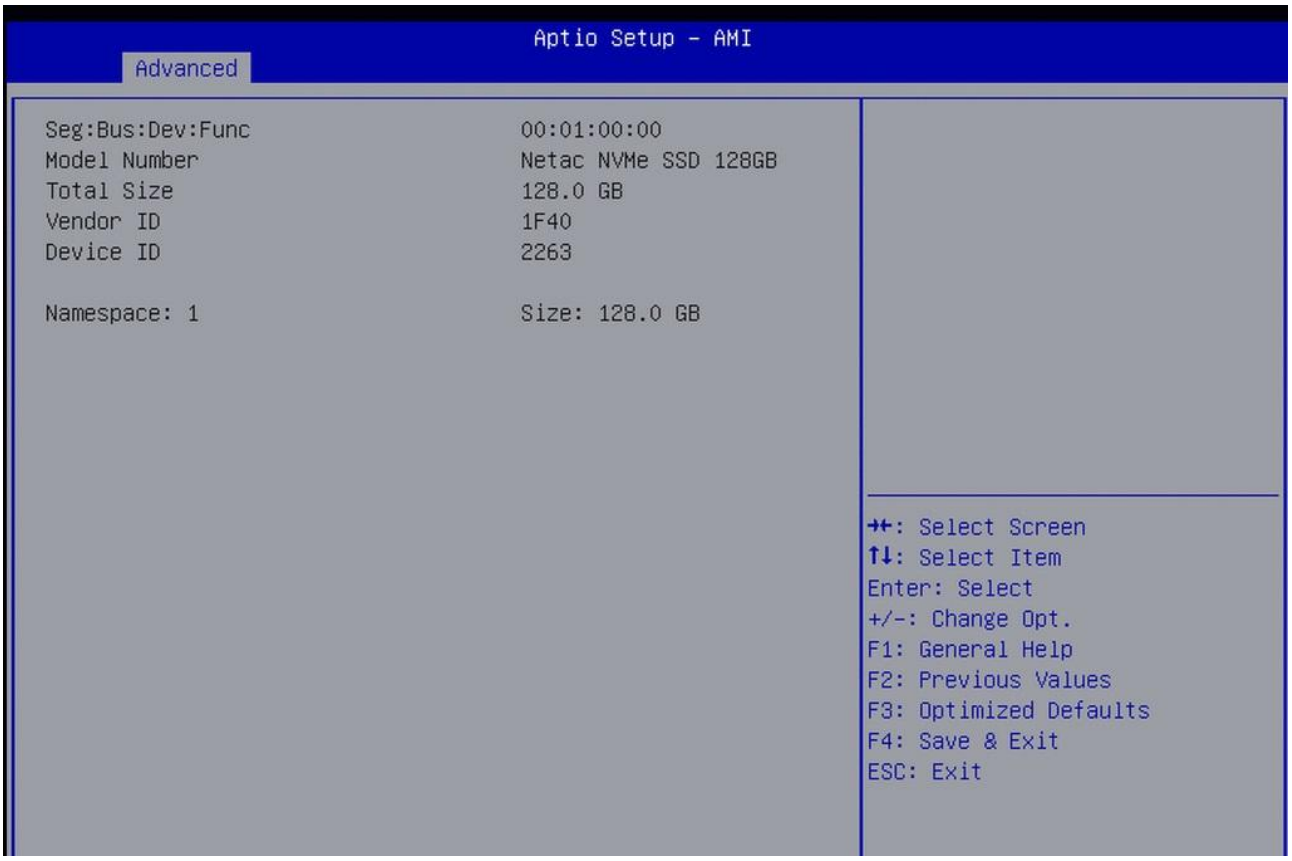
3.4.8.2 Media detect count



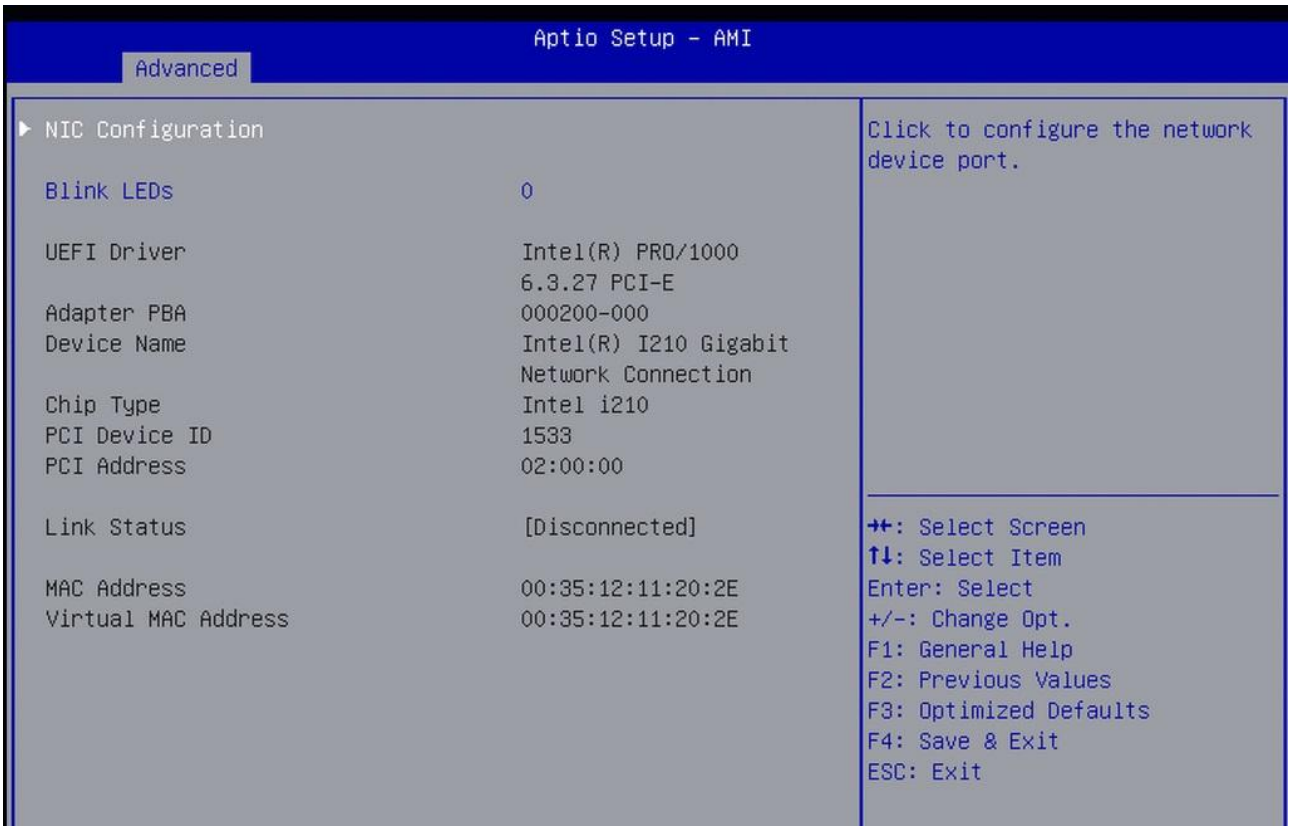
3.4.9 NVMe Configuration



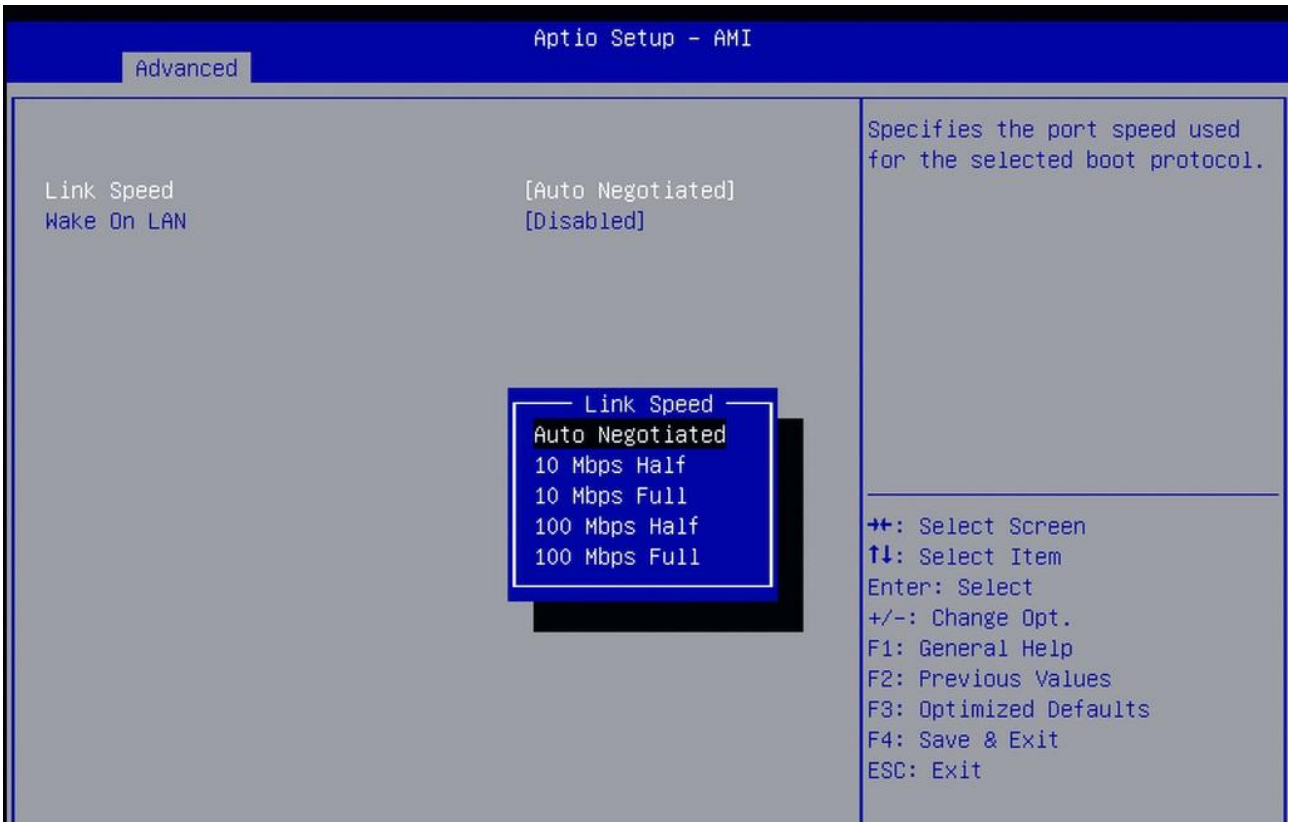
3.4.9.1 Netac NVME SSD 128GB information (This is a sample, and the information displayed by the user is subject to actual conditions)



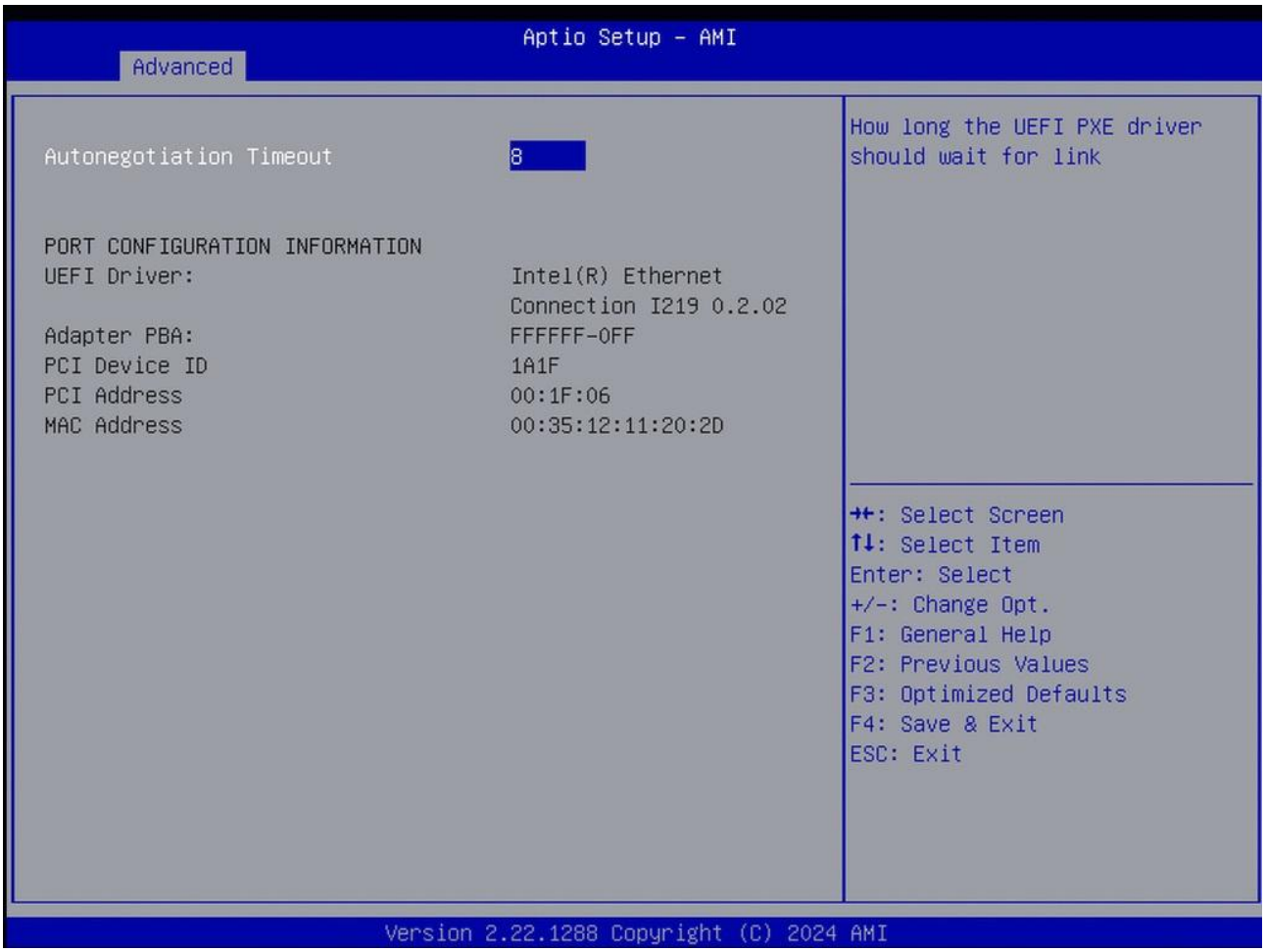
3.4.10 Intel®I210 Gigabit Network Connection



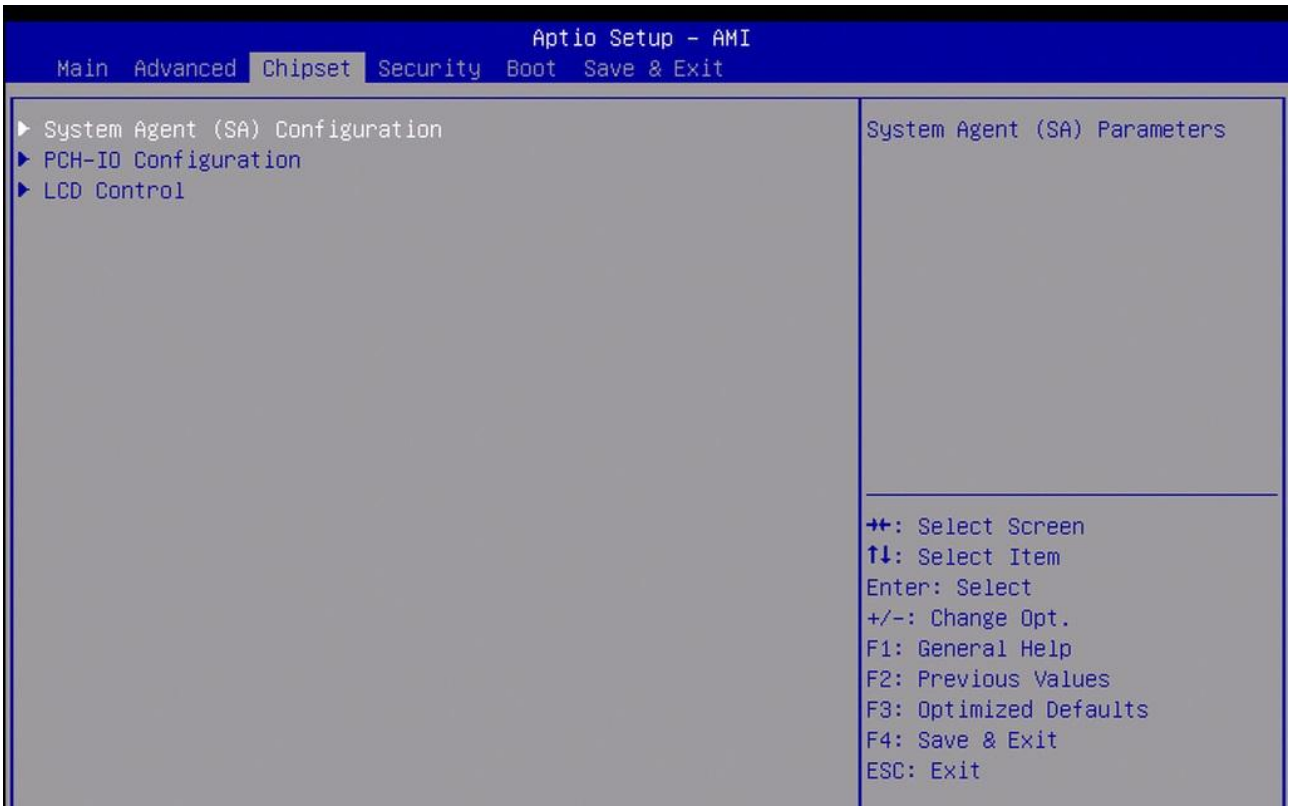
NIC Configuration



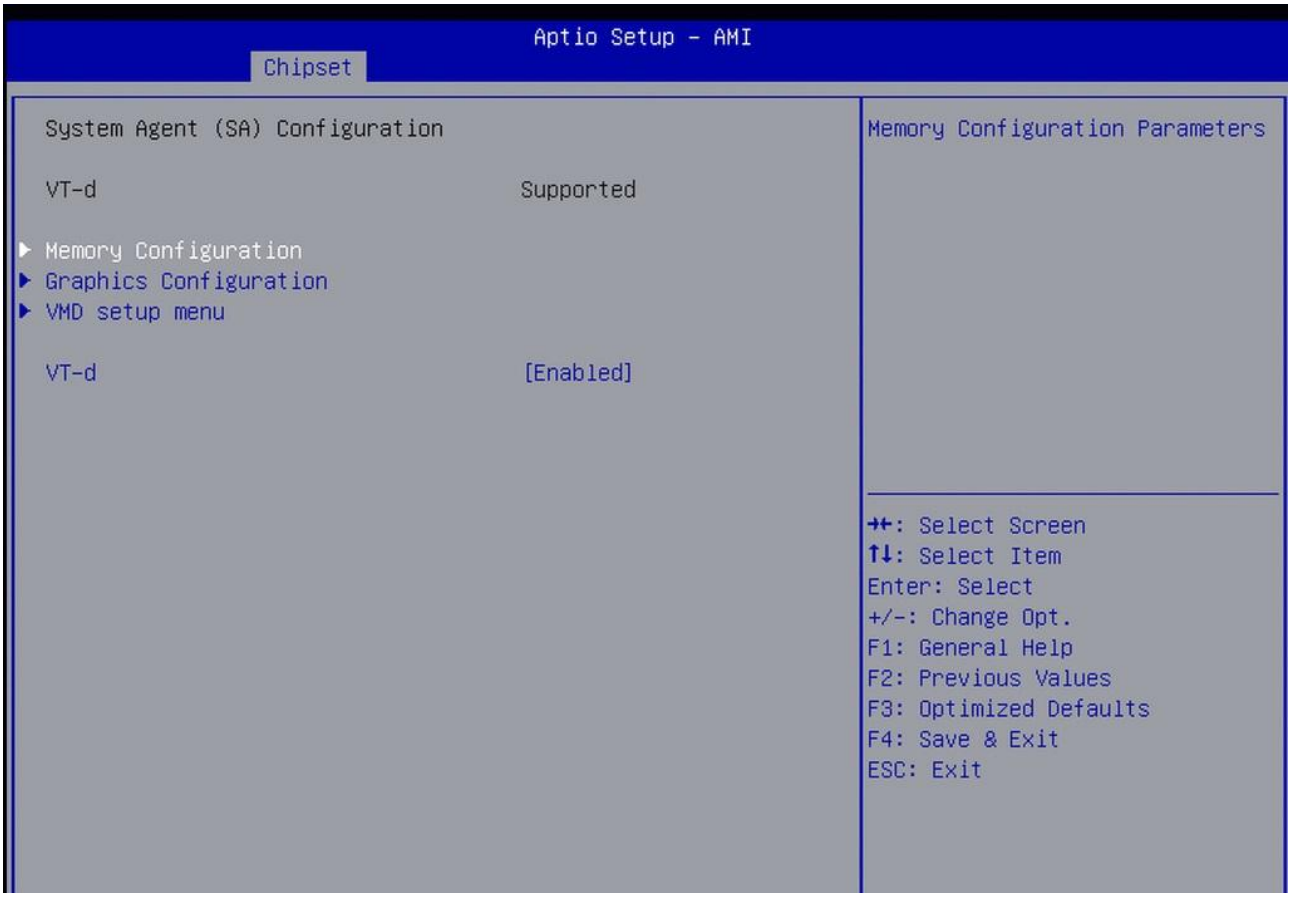
3.4.11 Intel® Ethernet Connection(16) I219-V



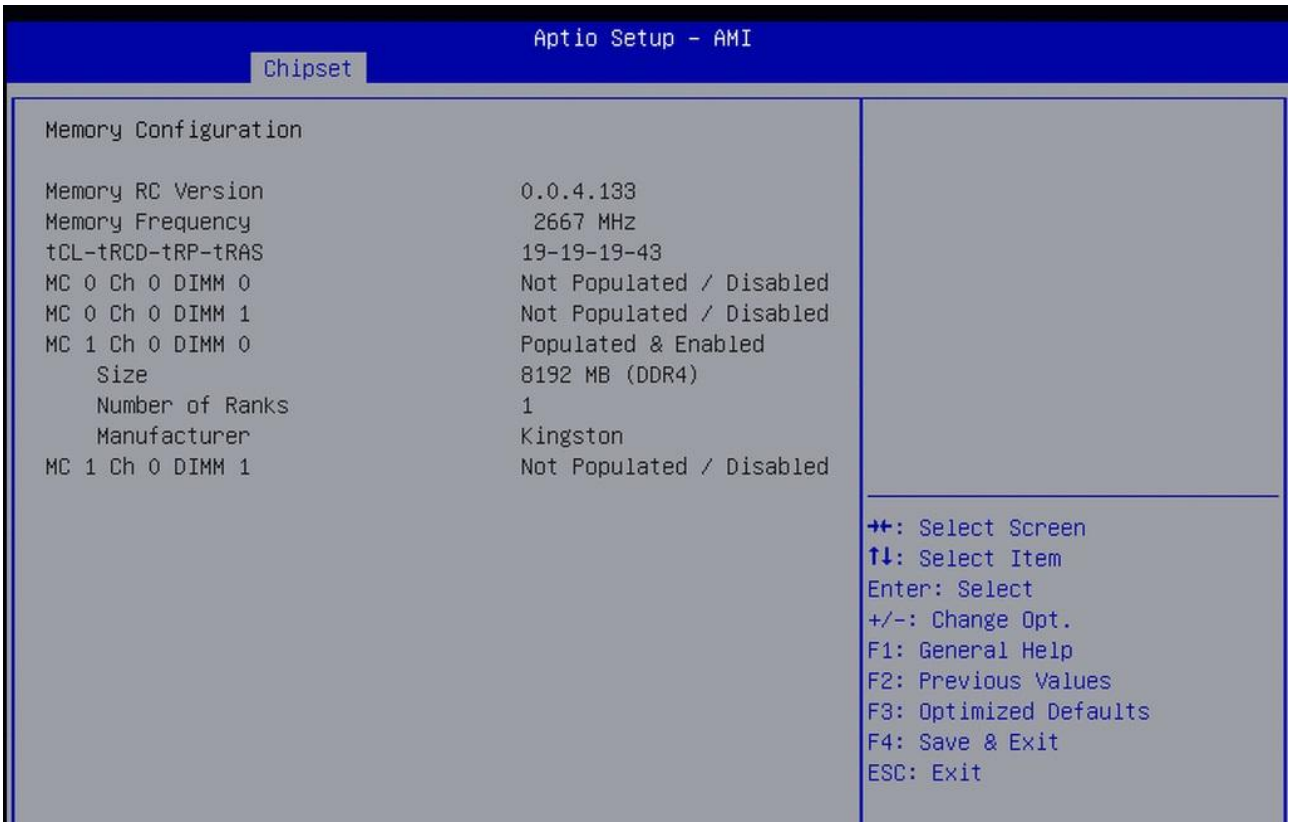
3.5 Chipset Settings



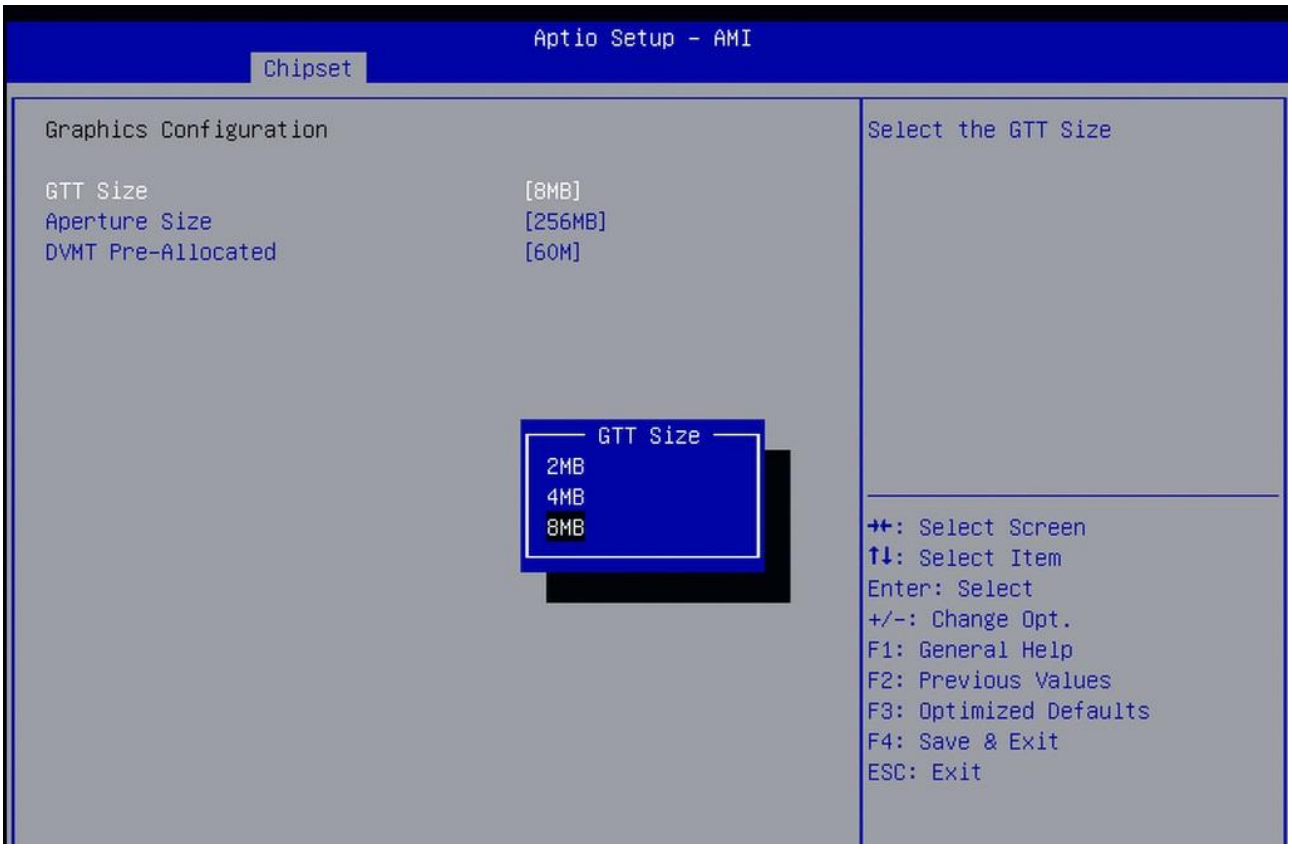
3.5.1 System Agent (SA) Configuration



3.5.1.1 Memory Configuration

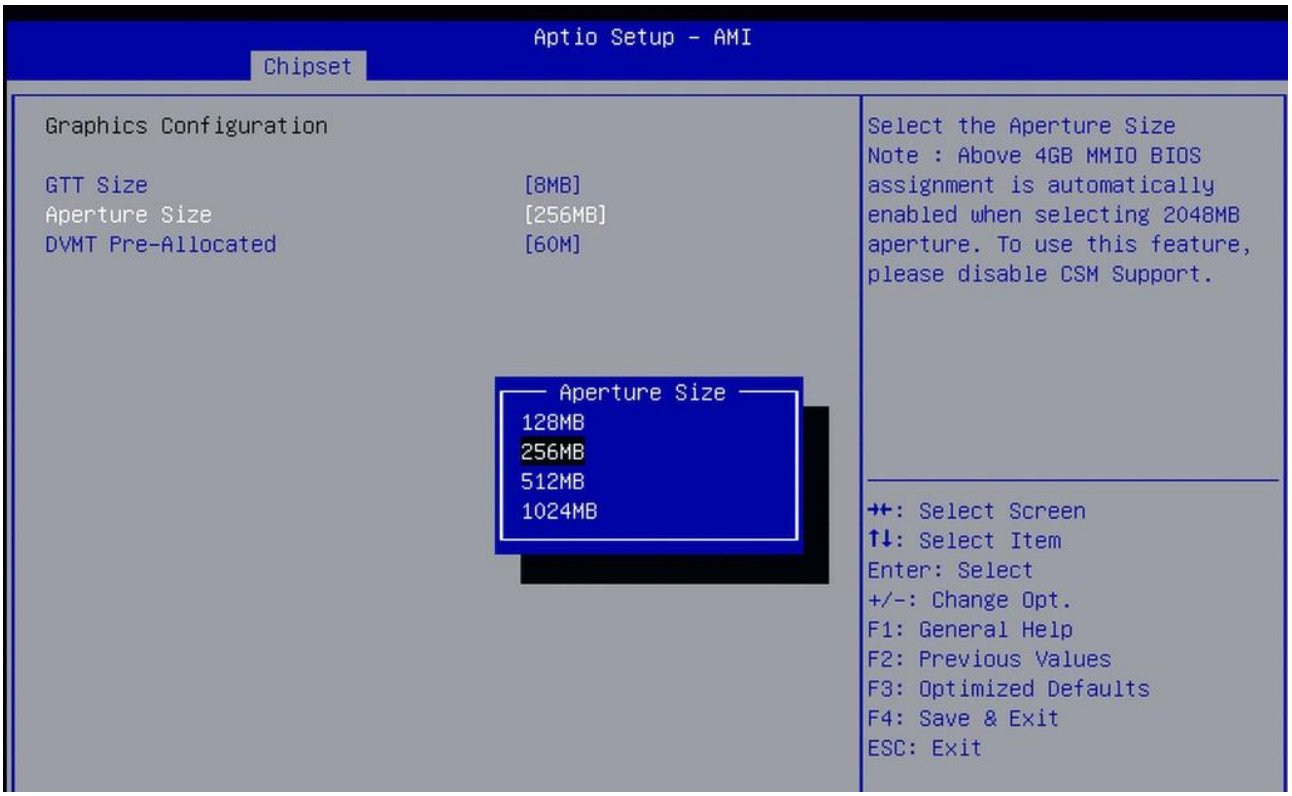


3.5.1.2 Graphics Configuration



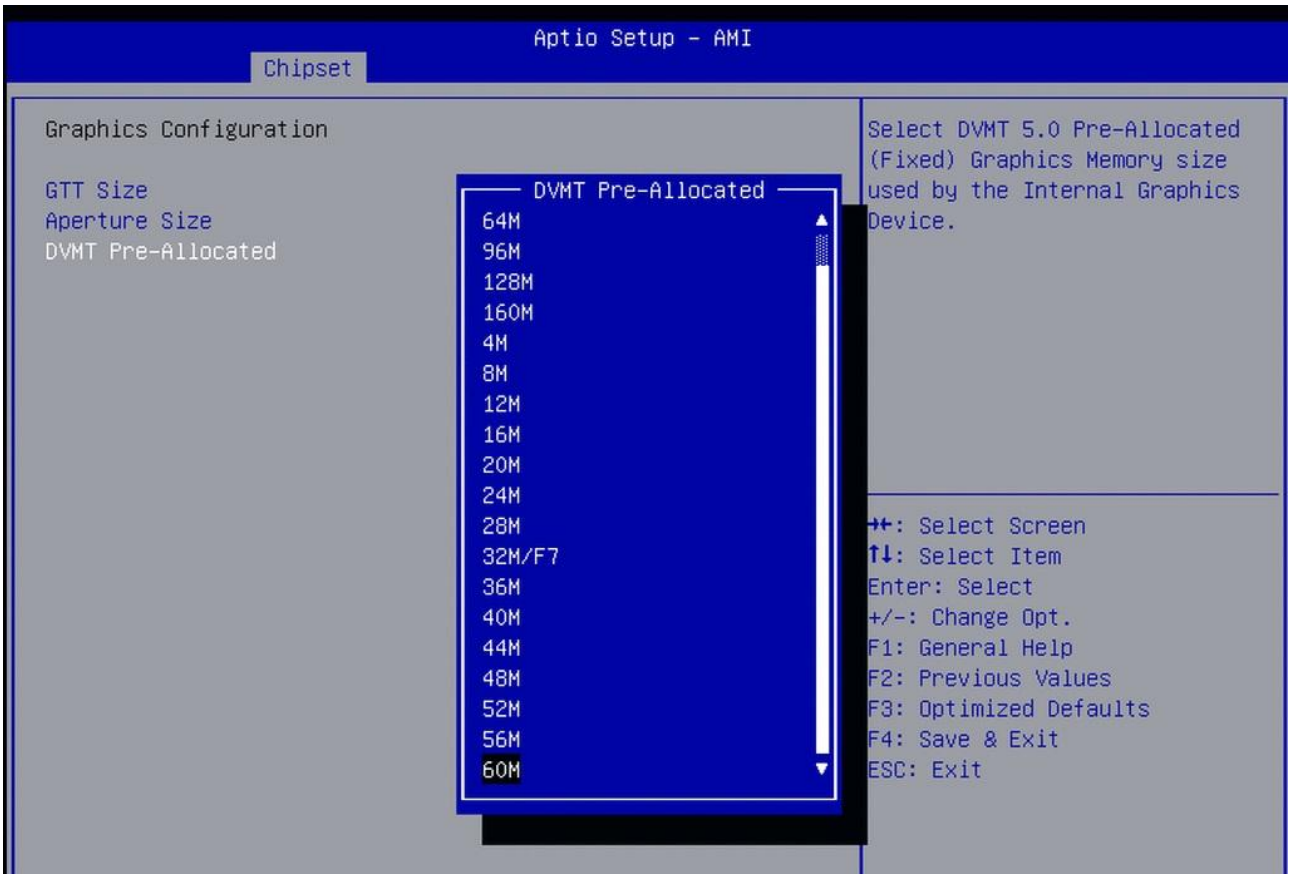
GTT Size:

Select the GTT Size



Aperture Size:

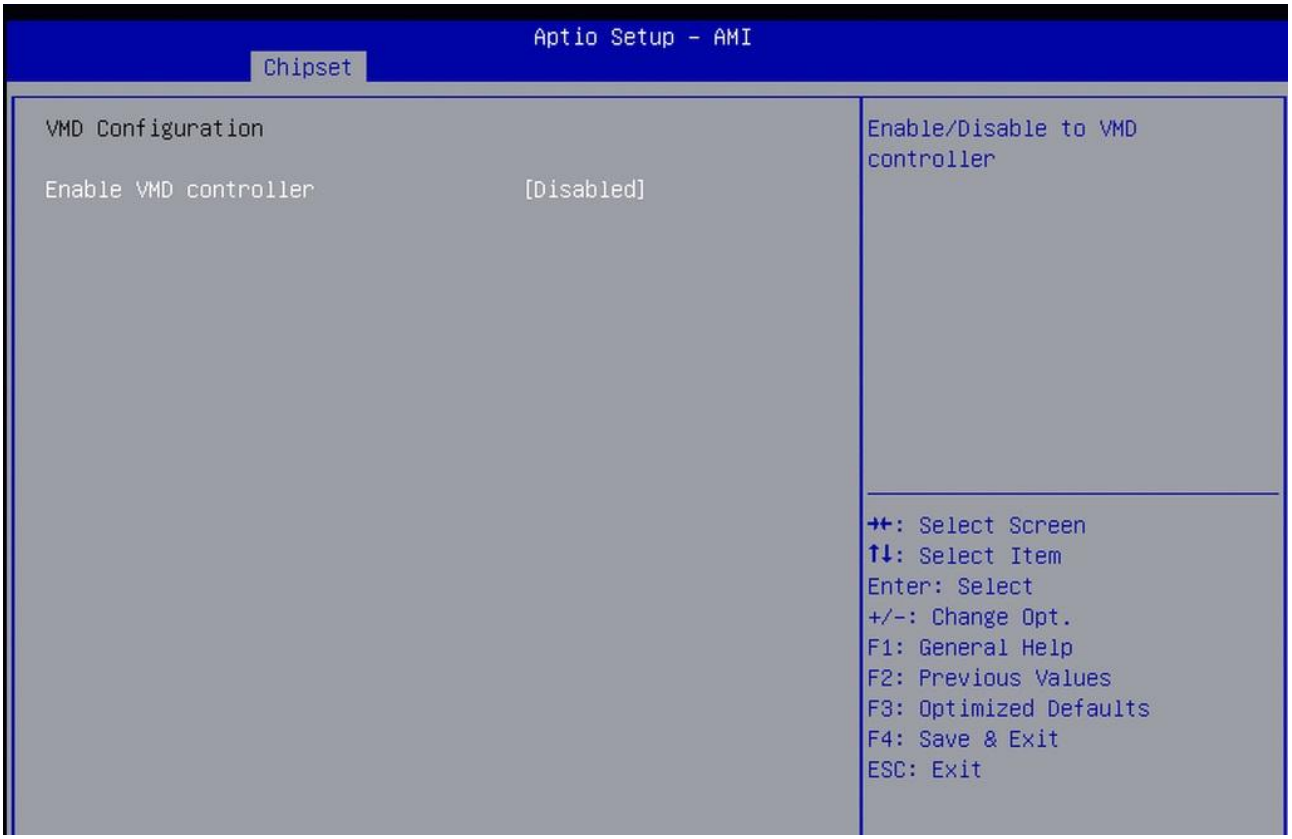
Select the Aperture Size Note: Above 4GB MMIo BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.



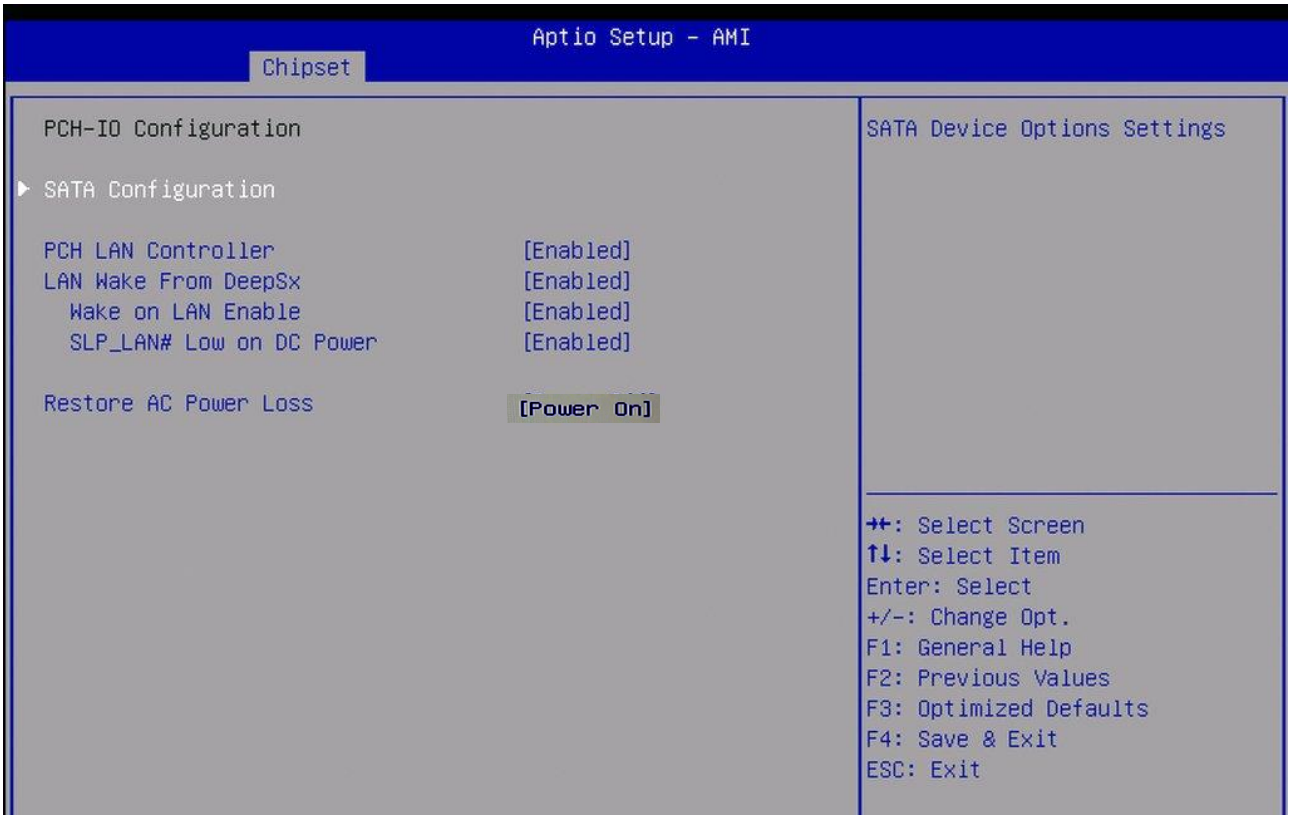
DVMT Pre-Allocated:

Select DVMT 5.0 Pre-Allocated (Fixed)Graphics Memory size used by the Internal Graphics Device.

3.5.1.3 VMD Configuration



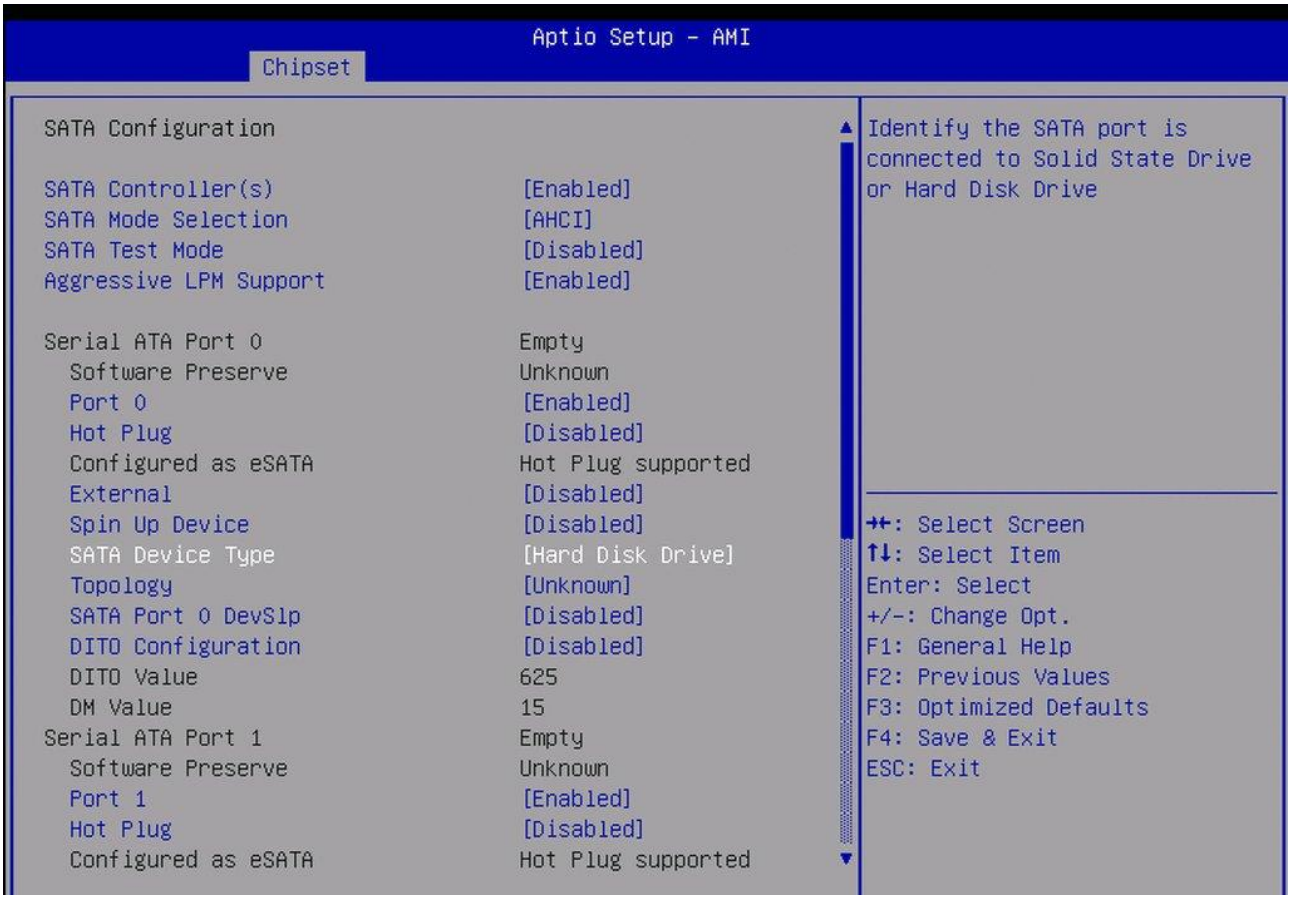
3.5.2 PCH-IO Configuration



Note:

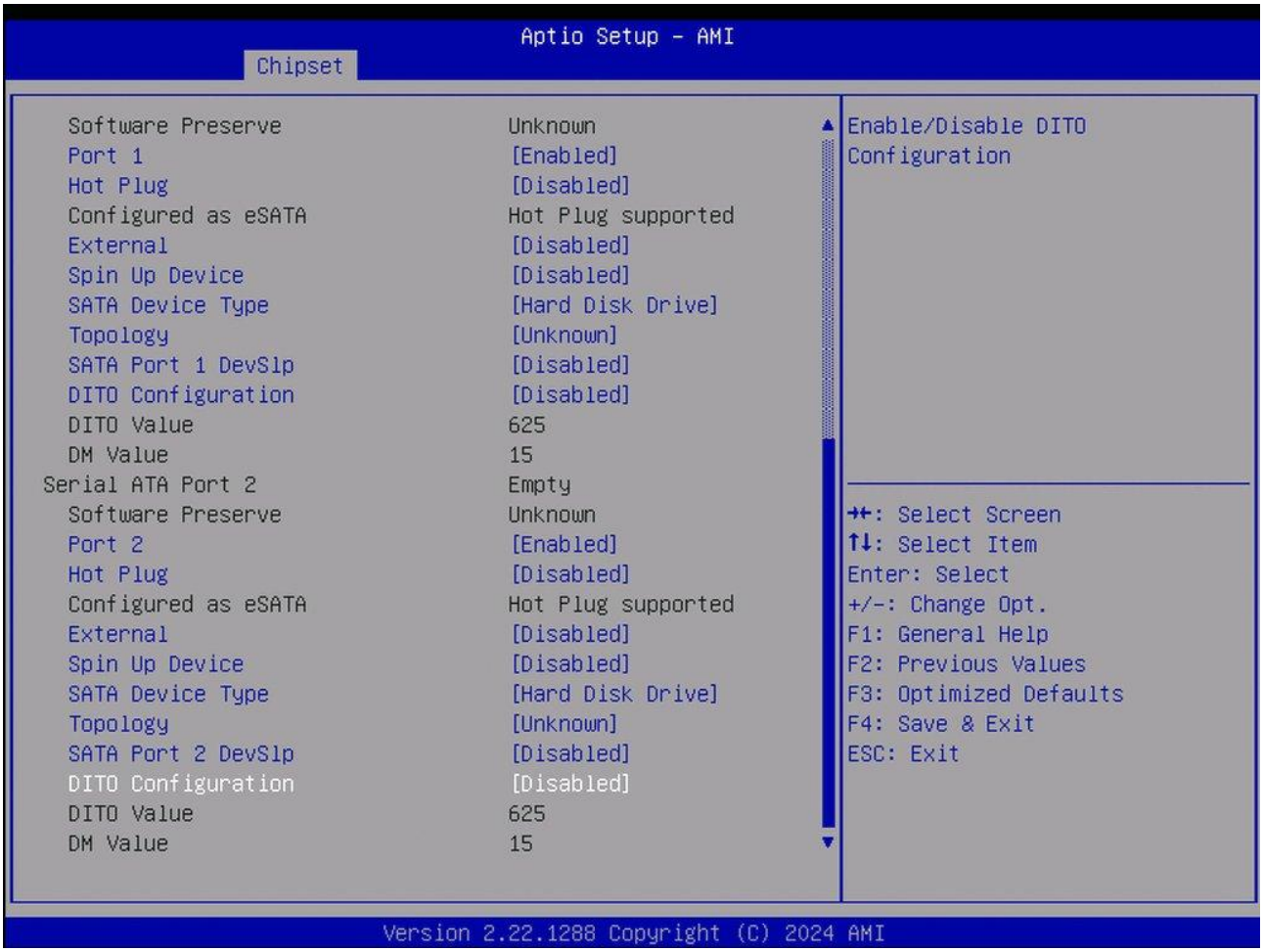
Restore AC Power Loss: Power ON(Default)

3.5.2.1 SATA Configuration

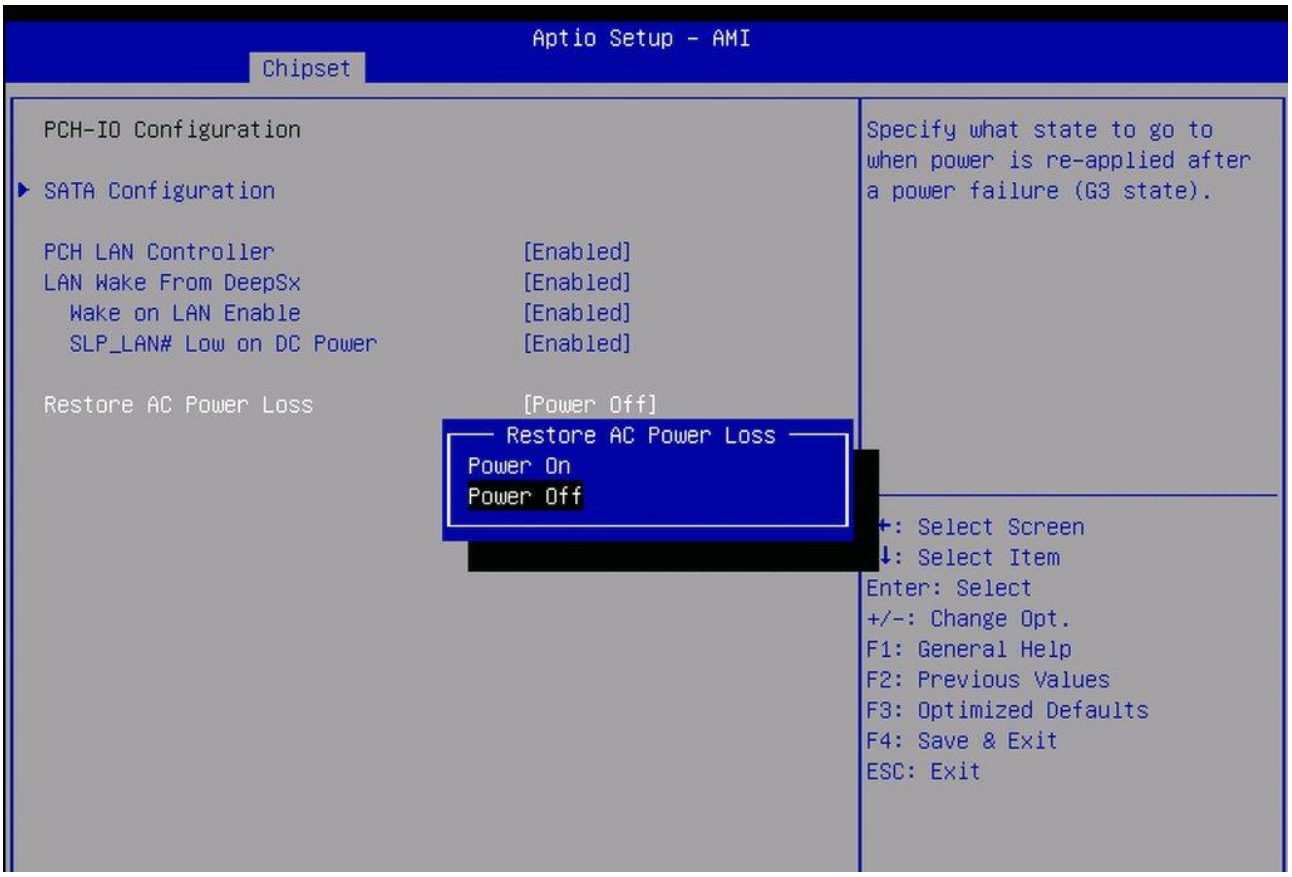


SATA Device Type:

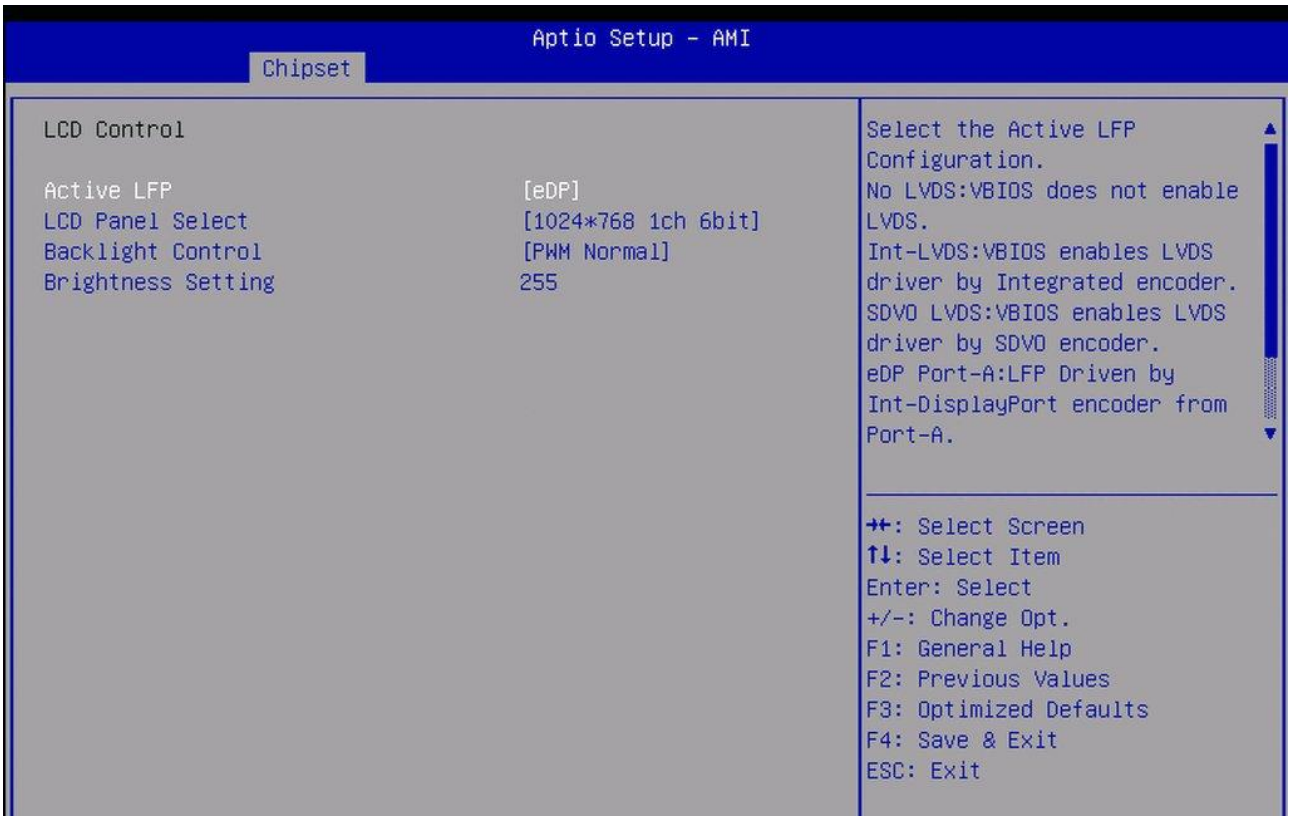
Identifying the SATA port is connected to Solid State Drive or Hard Disk Drive



3.5.2.2 Restore AC Power Loss



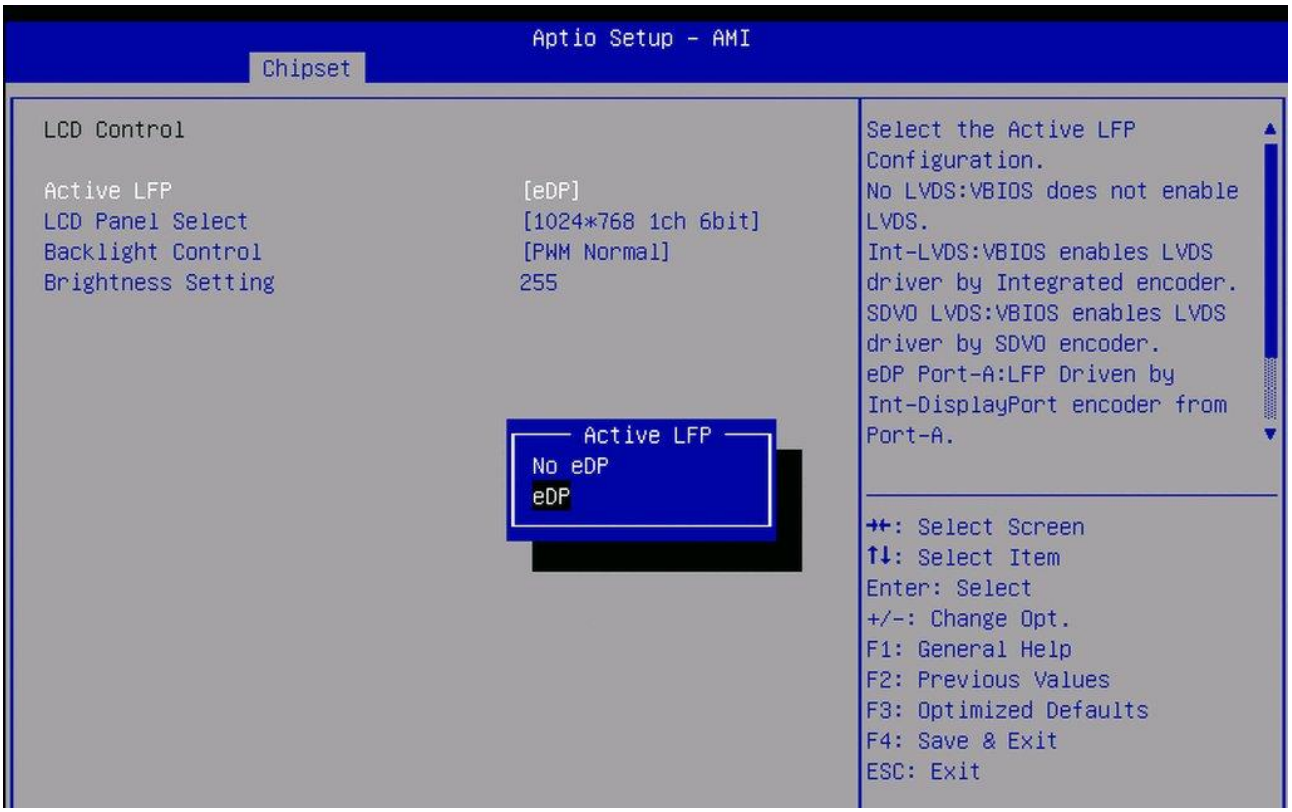
3.5.3 LCD Control



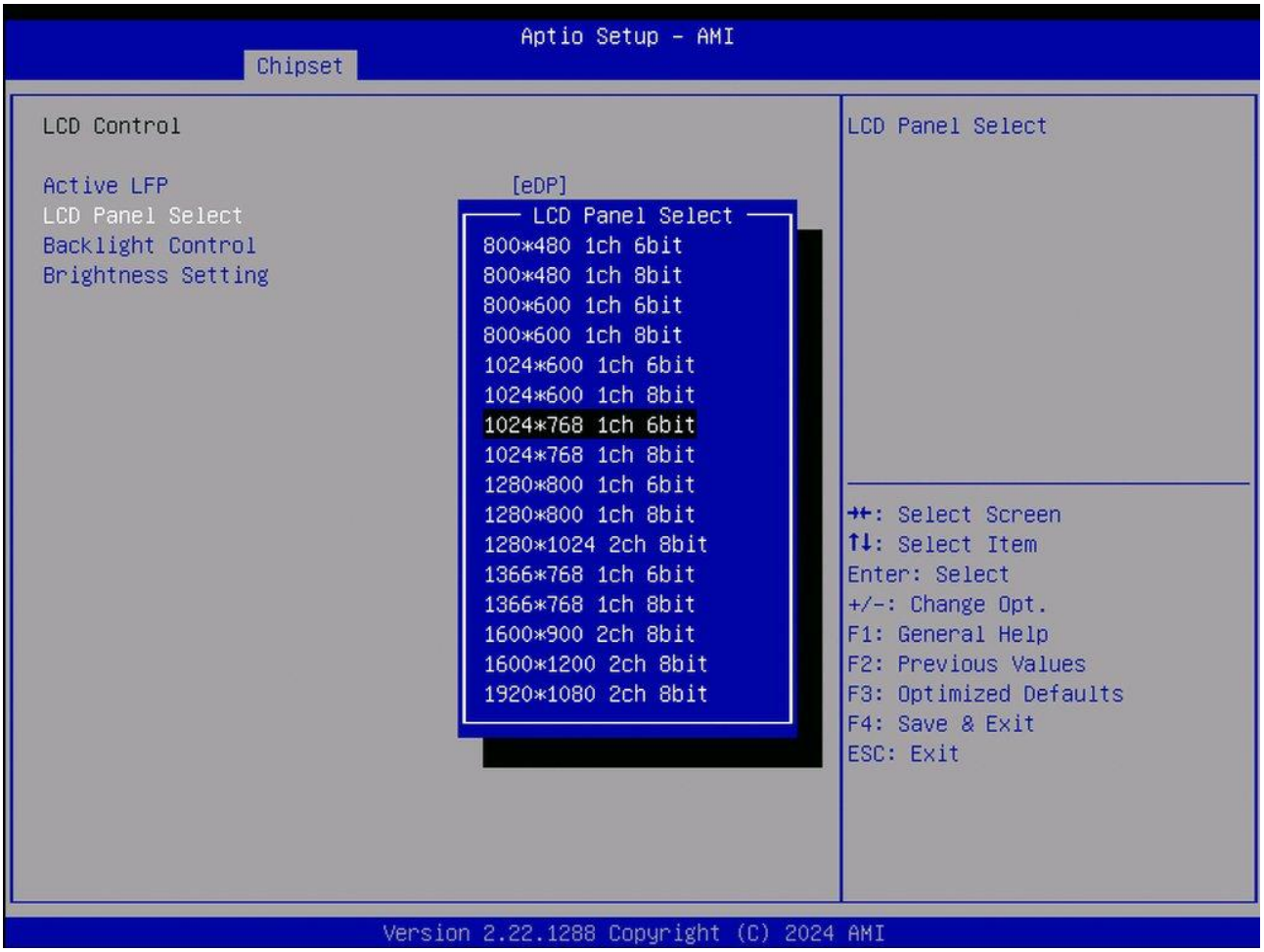
Active LFP:

Select the Active LFP Configuration. No eDP: VBIOS does not enable LVDS. eDP: VBIOS enables LVDS driver by integrated encoder. .

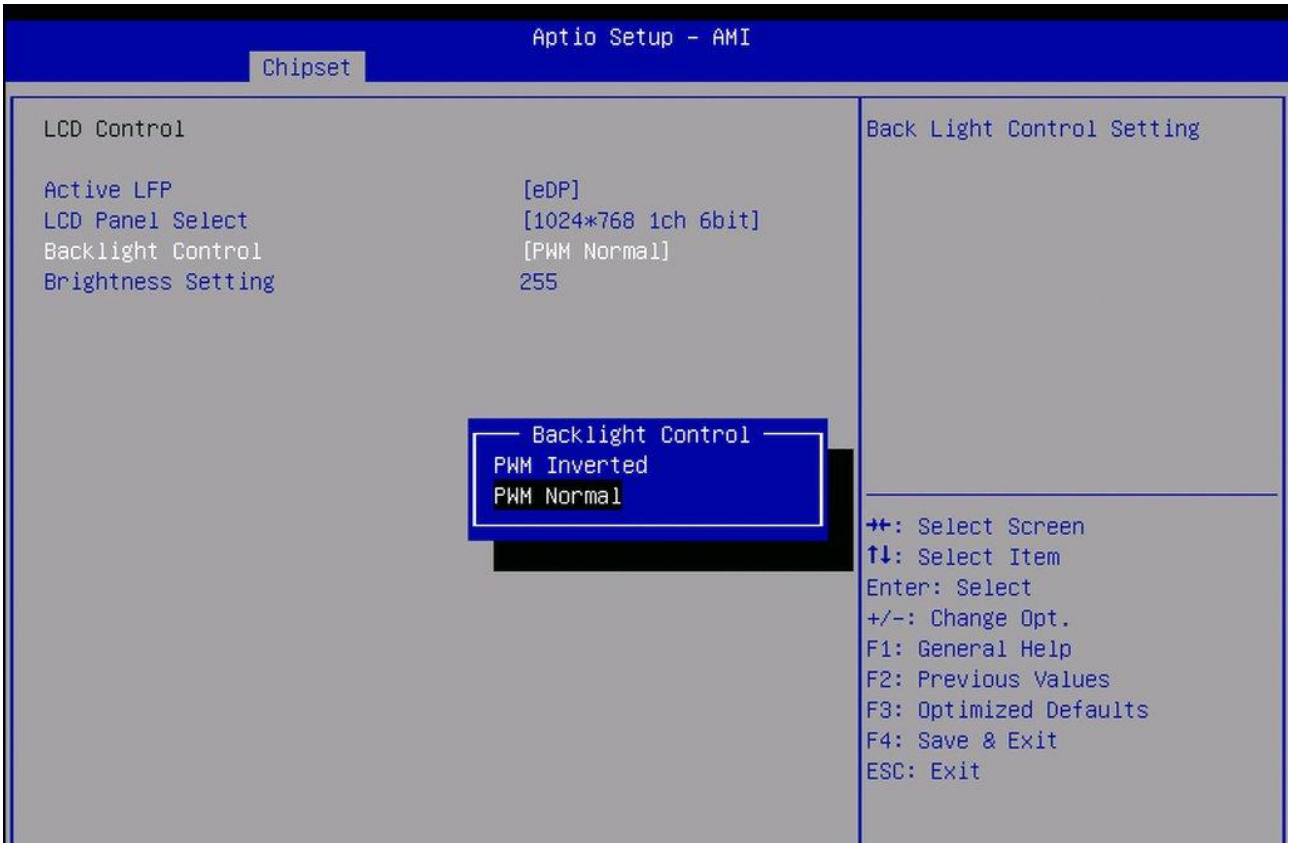
3.5.3.1 Active LFP



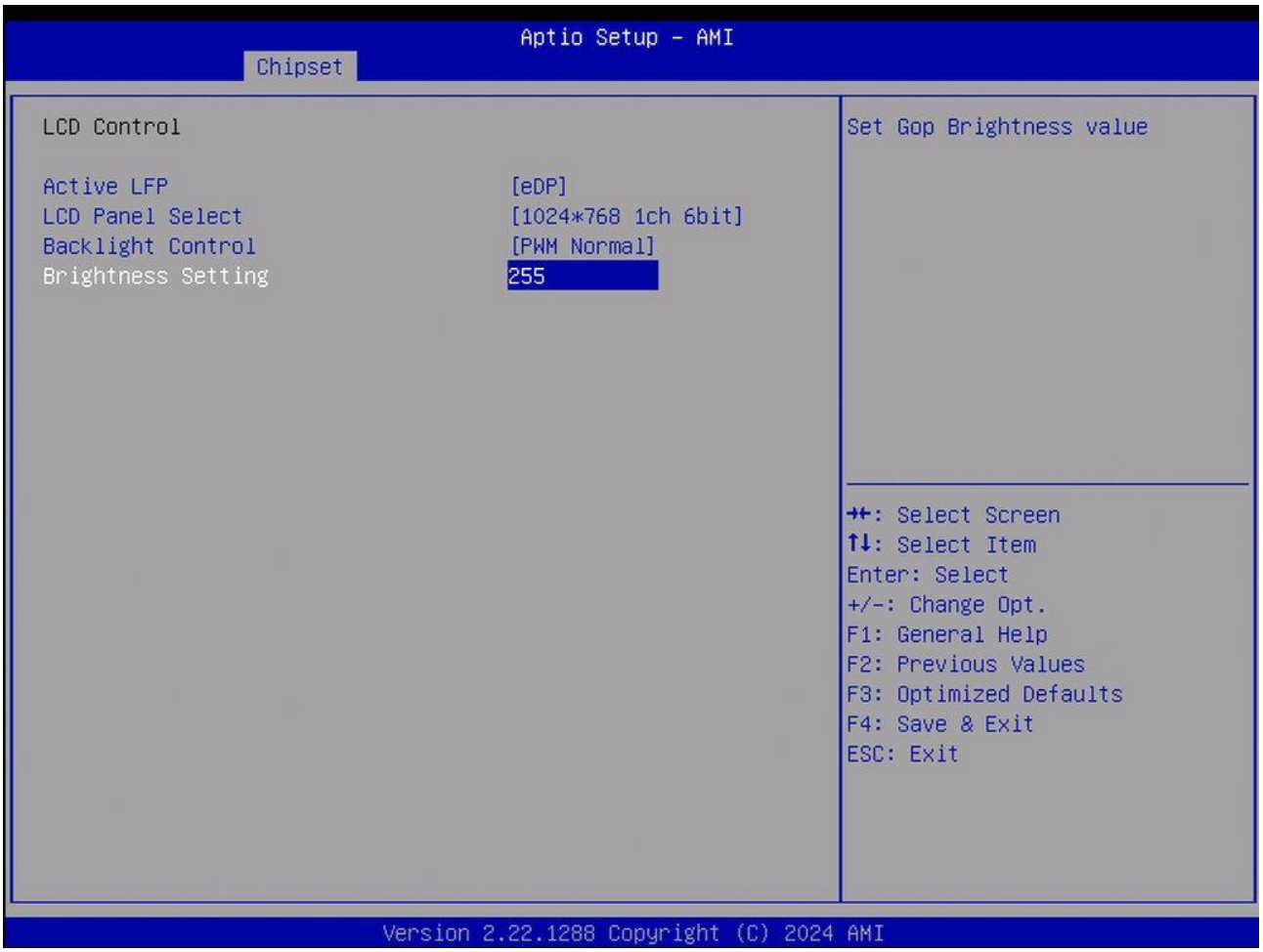
3.5.3.2 LCD Panel Select



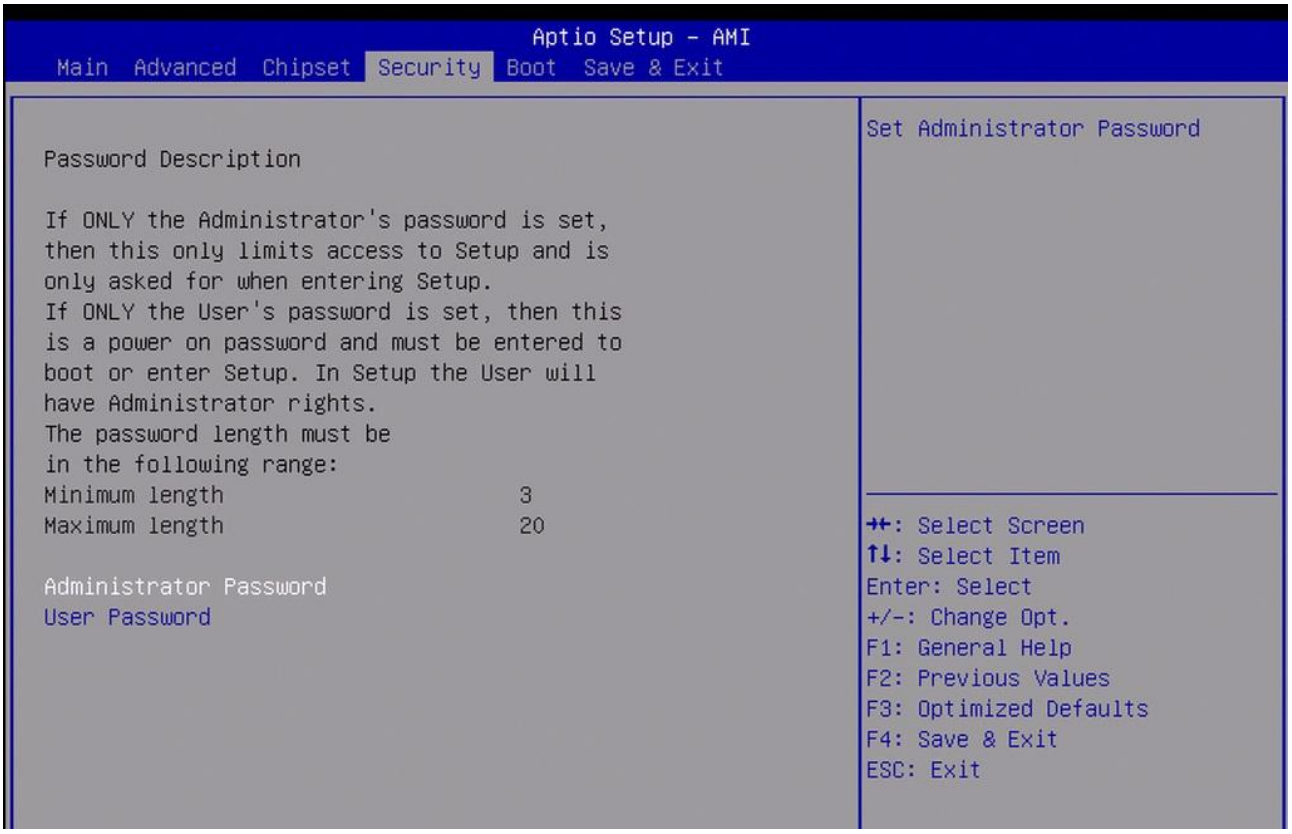
3.5.3.3 Backlight Control



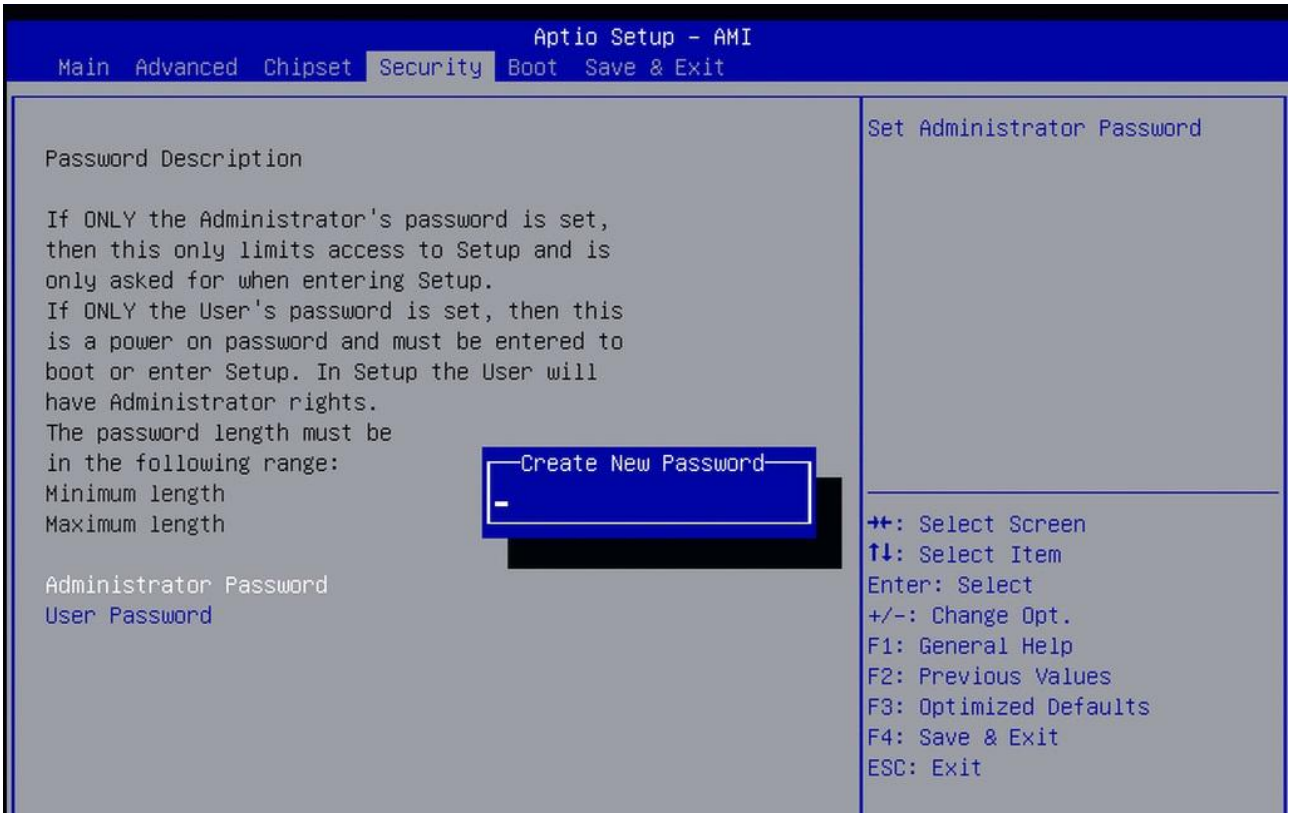
3.5.3.4 Brightness Setting



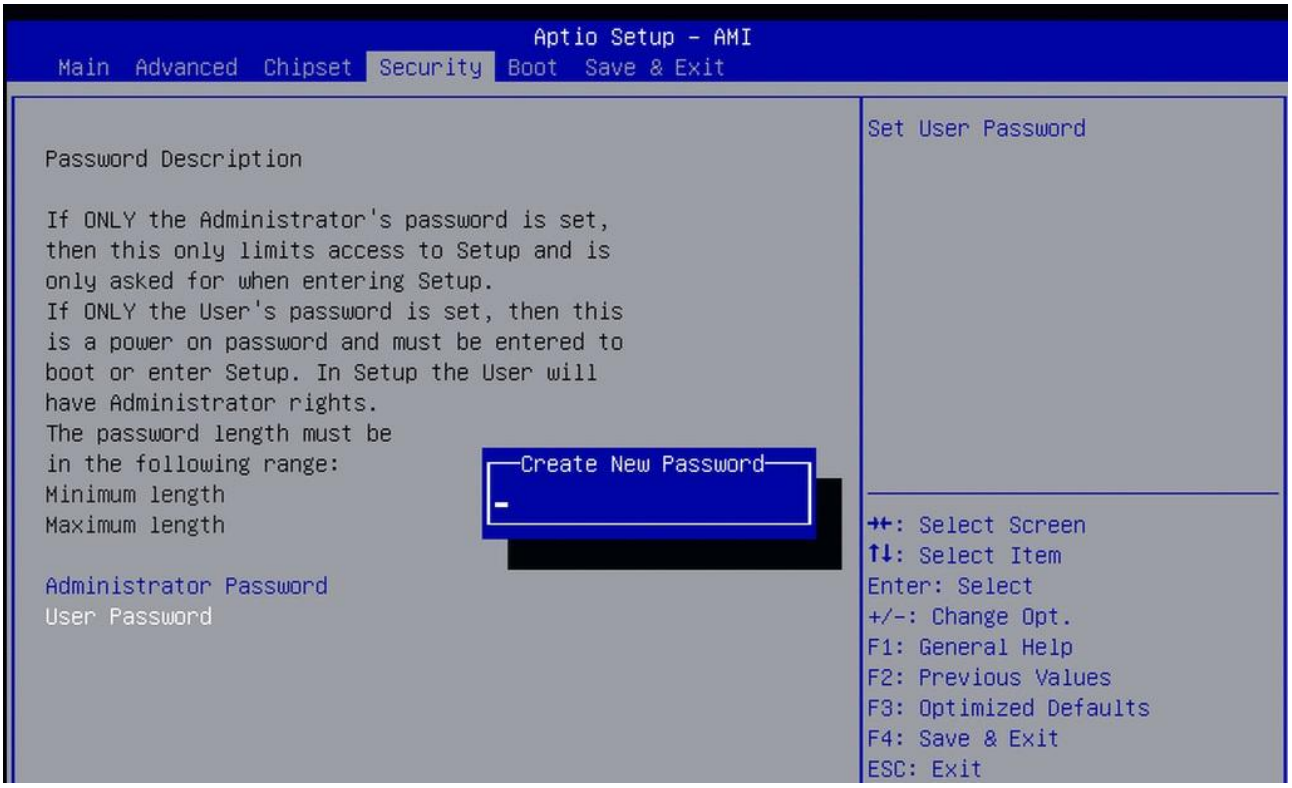
3.6 Security Settings



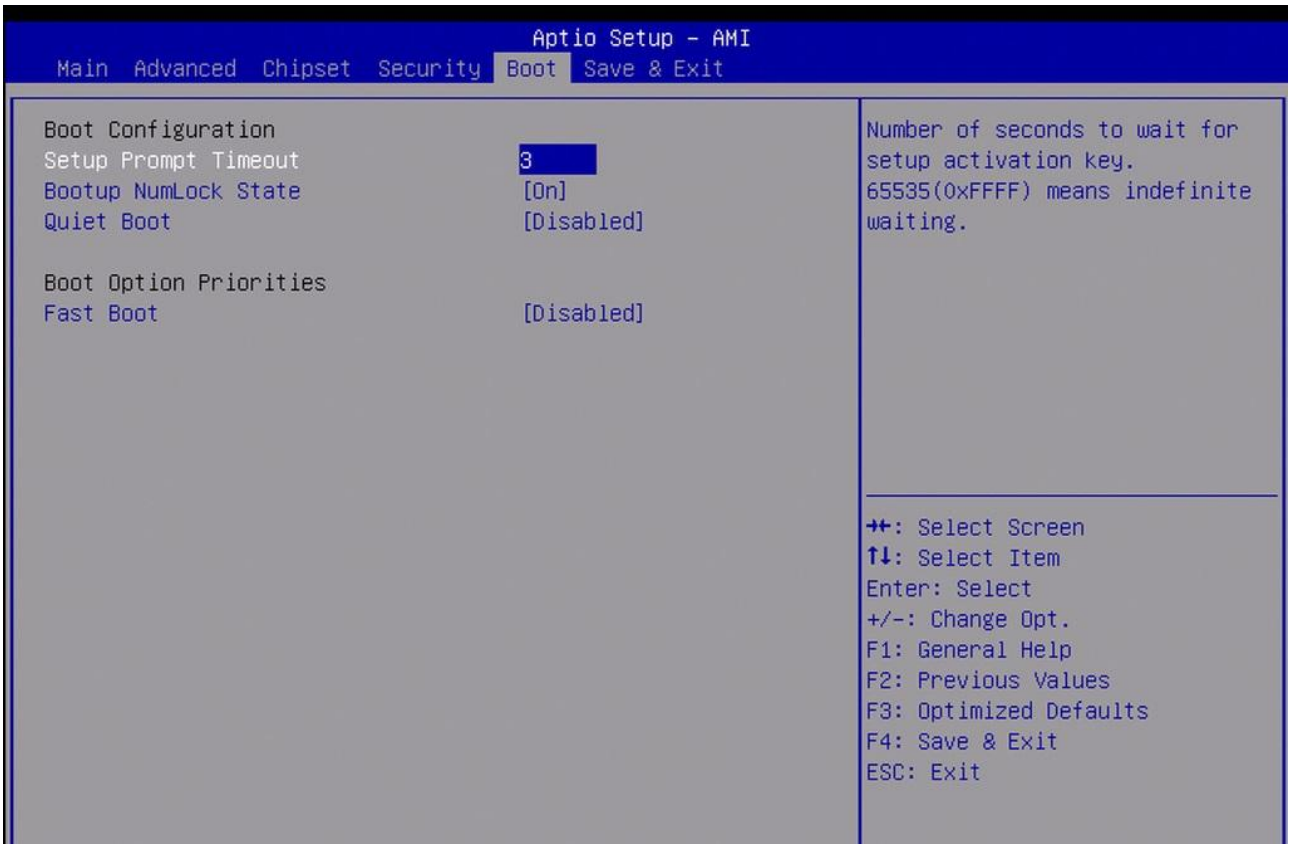
3.6.1 Administrator Password



3.6.2 User Password



3.7 Boot Settings



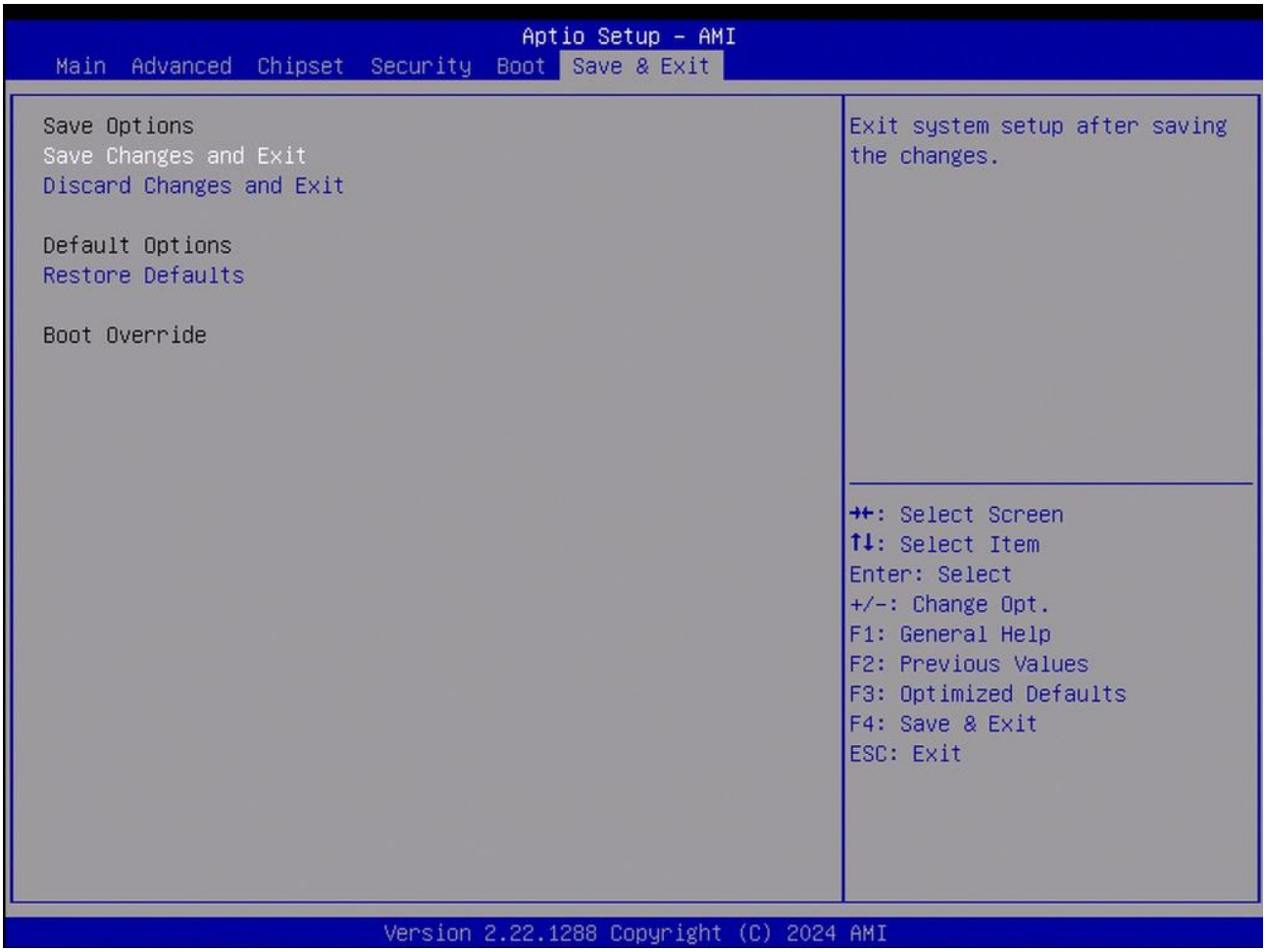
Setup Prompt Timeout:

Number of seconds to wait for setup activation key.65535(OxFFFF) means indefinite waiting.

Fast Boot:

Enables or disables boot with initialization of a minimal set of devices required to launch active boot option, it has no effect for BBS boot options.

3.8 Save & Exit Settings



Restore Defaults:

Restore/Load Default values for all the setup options.

Chapter 4 Installation of Drivers

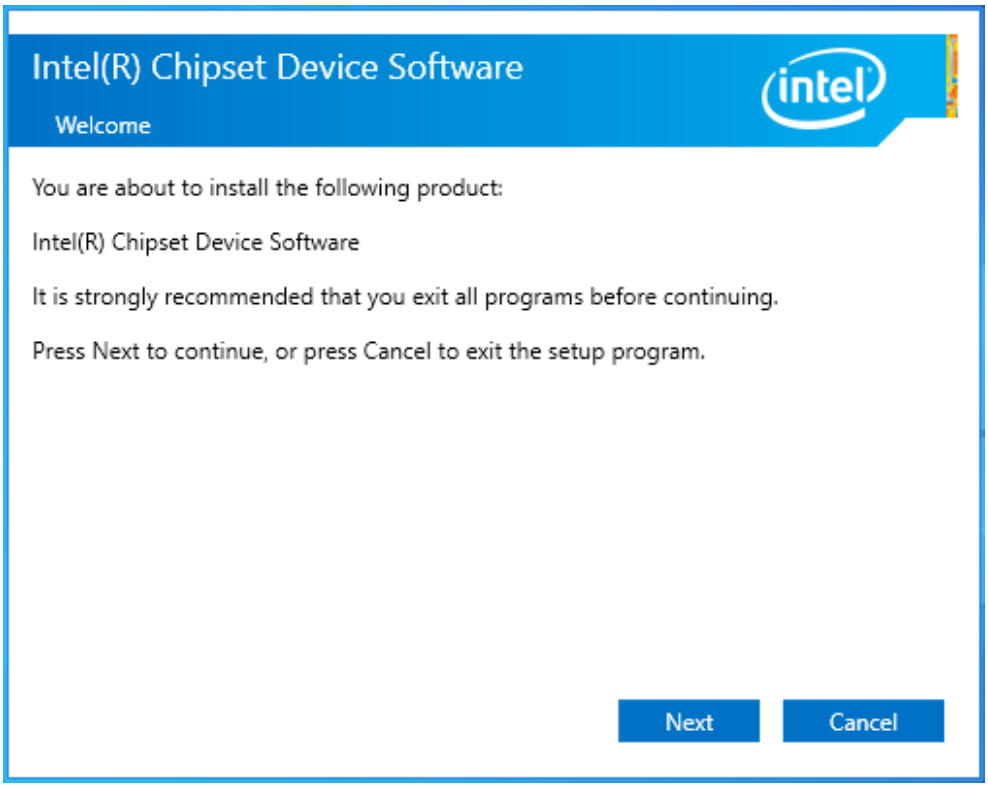
This chapter describes the installation procedures for software and drivers under the windows 10. The software and drivers are included with the motherboard. The contents include Intel Chipset, Graphics chipset driver, Audio driver, LAN driver and Intel® management engine interface. The instructions are as below.

Important Note:
After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the installation of drivers.

4.1 Intel® Chipset

To install the Intel chipset driver, please follow the steps below.

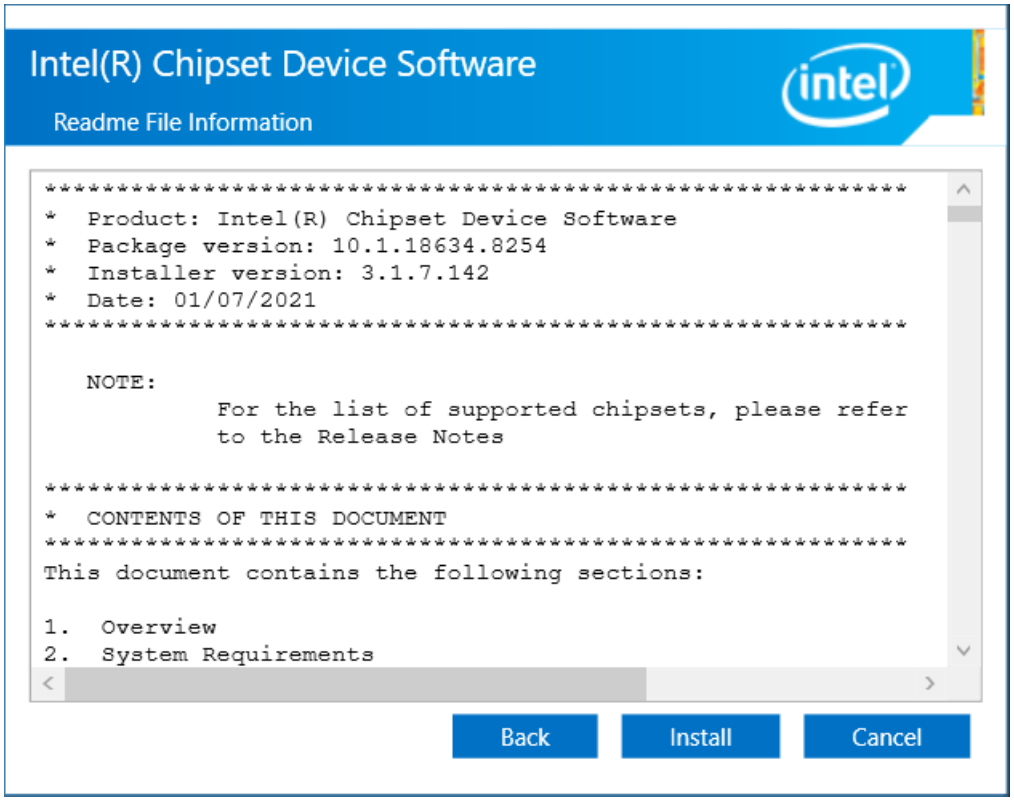
Step 1. Here is welcome page. Please make sure you save and exit all programs before installation. Click **Next**.



Step 2. Read the license agreement. Click **Accept** to accept all the terms of the license agreement.



Step 3. Click **Install** to begin the installation.



Step 4. Select **Restart Now** to reboot your computer for the changes to take effect.



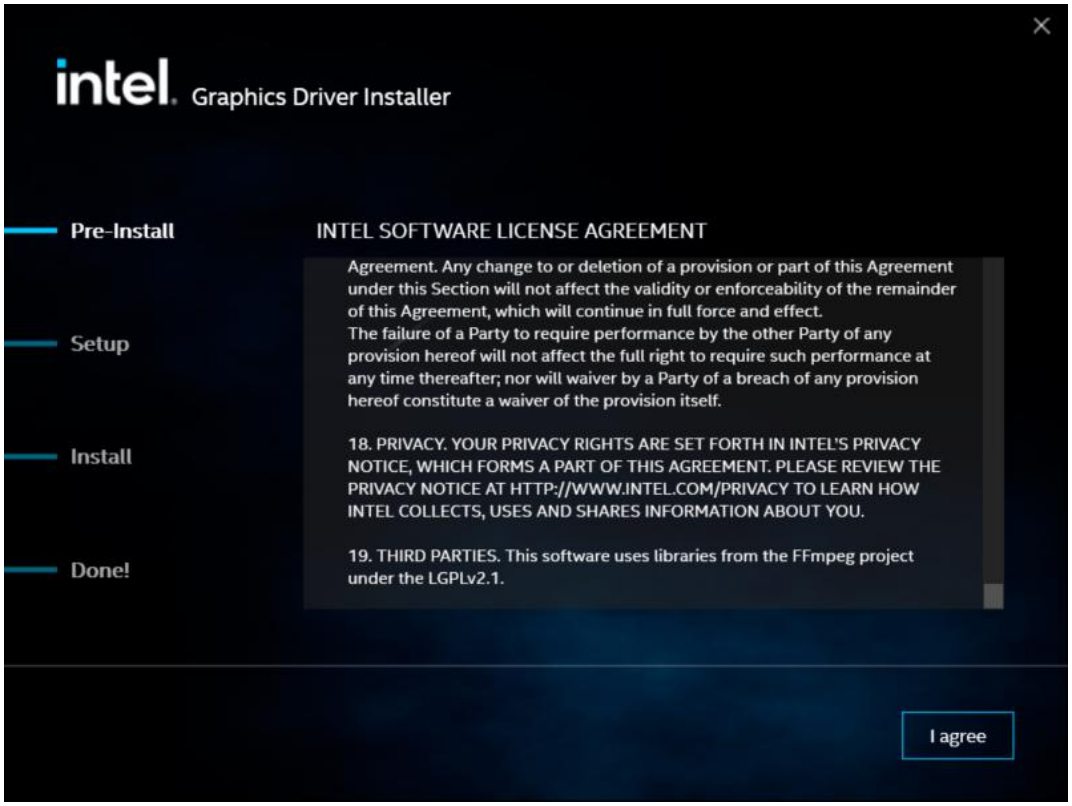
4.2 Intel® HD Graphics Chipset

To install the Intel® HD Graphics Chipset, please follow the steps below.

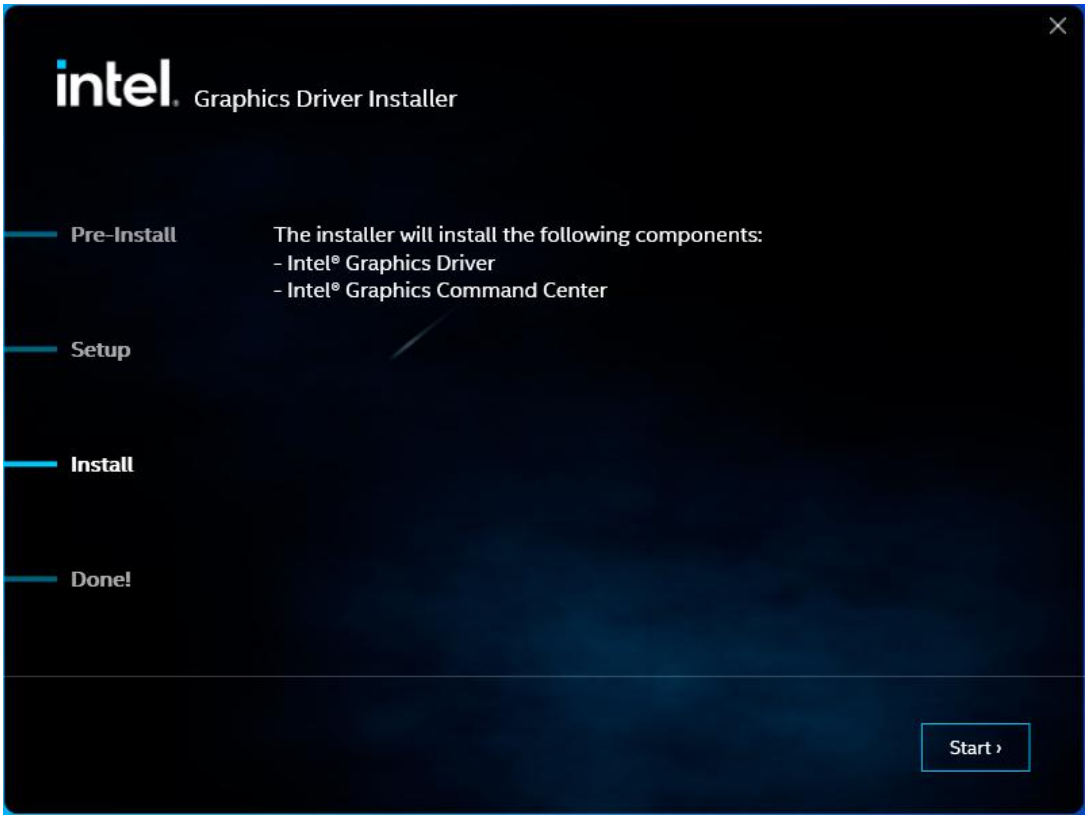
Step 1. Click **Begin installation.**



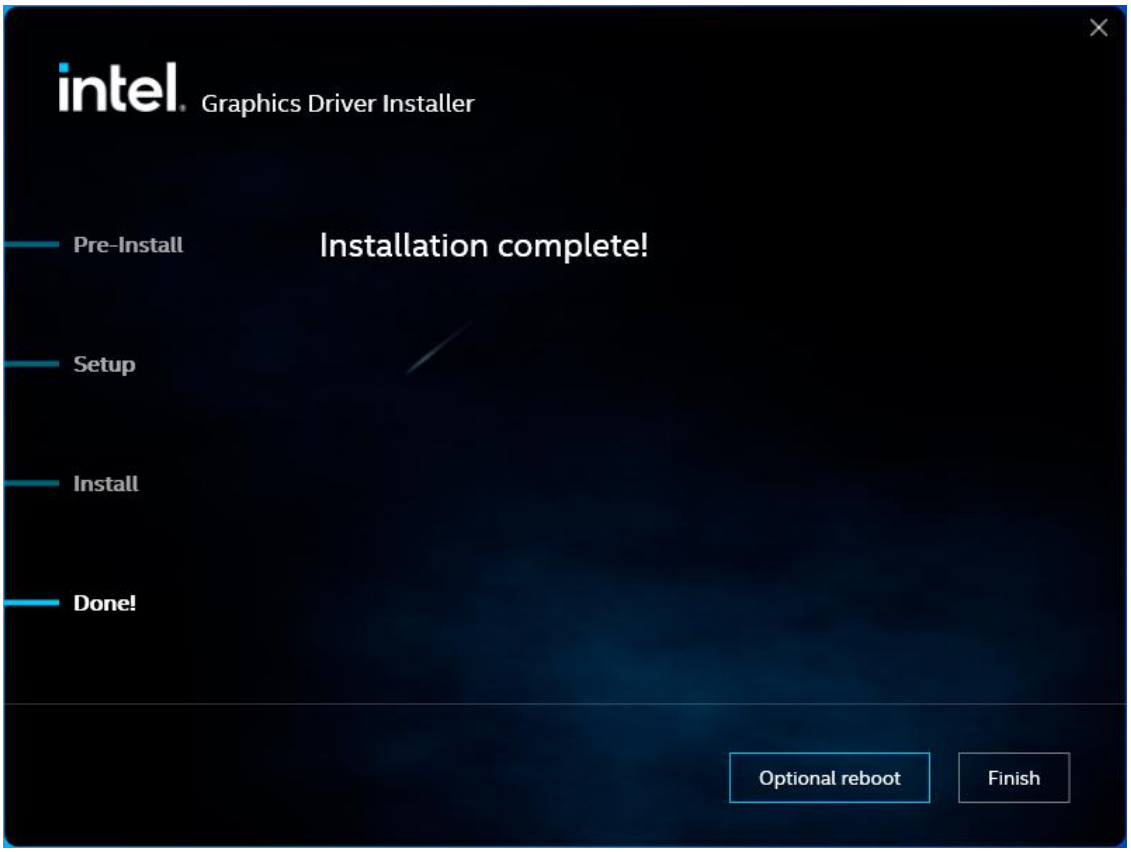
Step 2. Read the license agreement. Click **I agree** to accept all the terms of the license agreement.



Step 3. Choose **Install** function and Click **Start** to setup program.



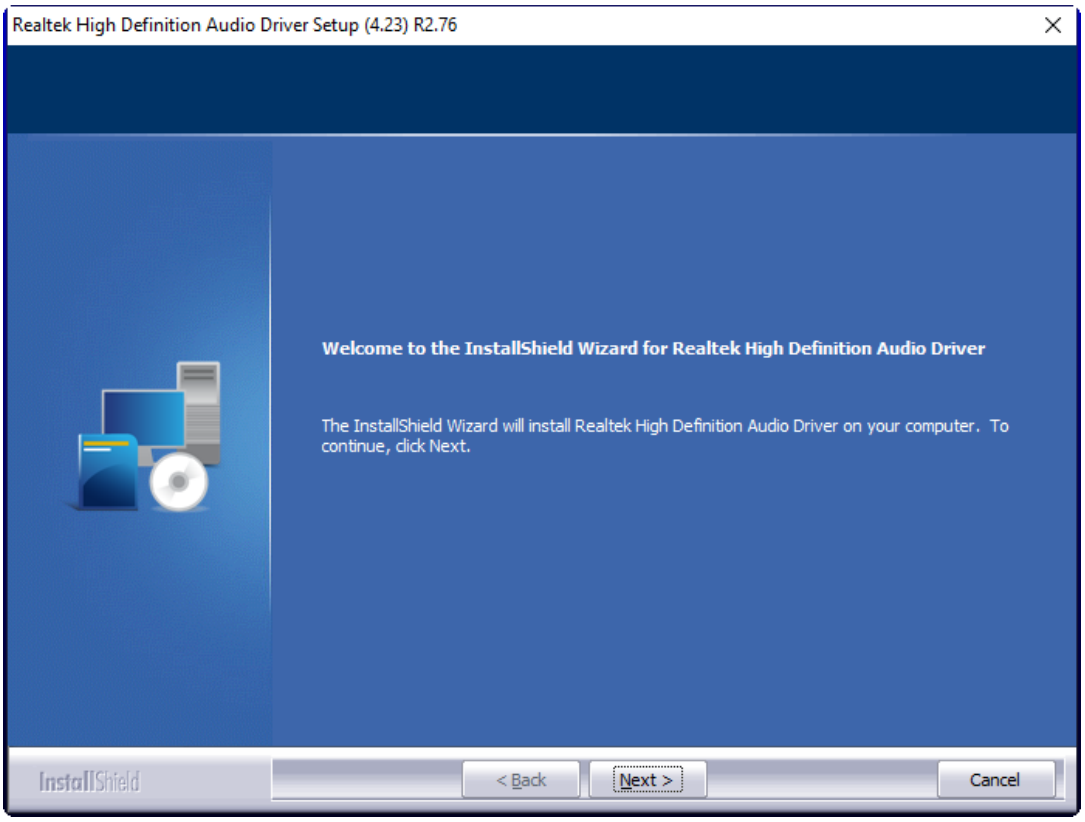
Step 4. Click **Finish** to complete installation.



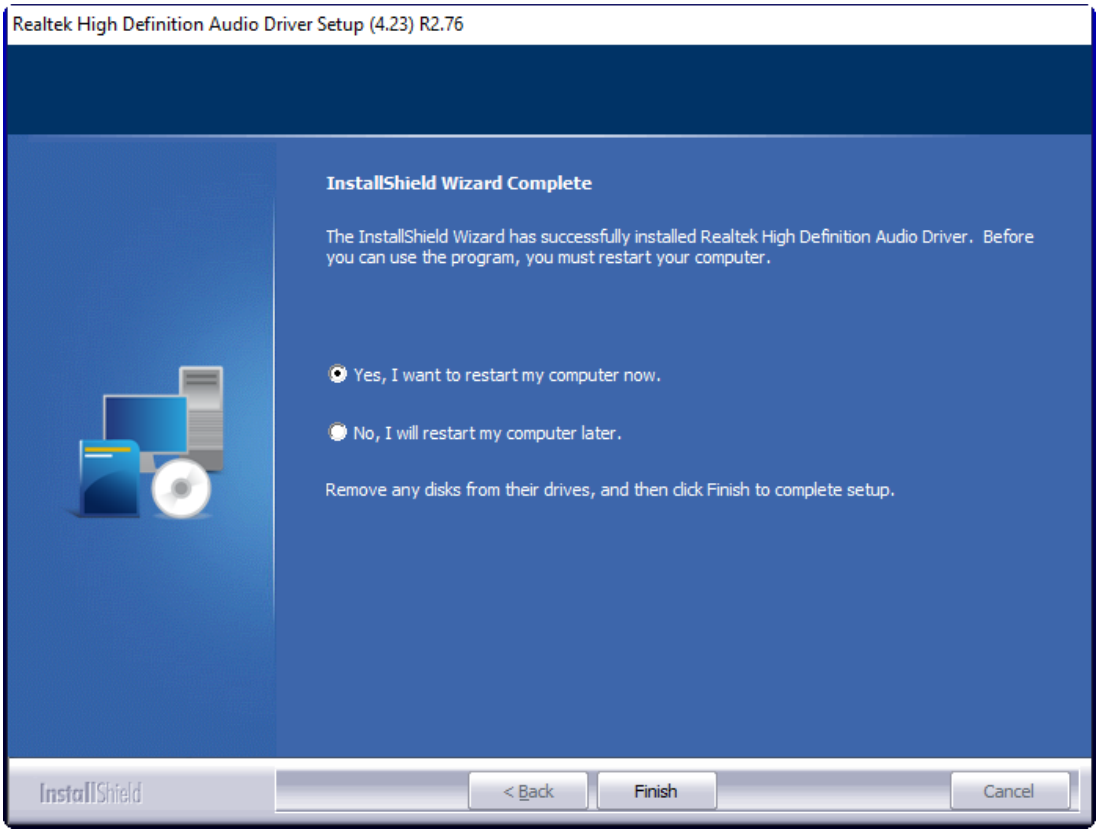
4.3 Intel® HD Audio Chipset

To install the Realtek HD Audio Driver, please follow the steps below.

Step 1. Click **Next** to continue.



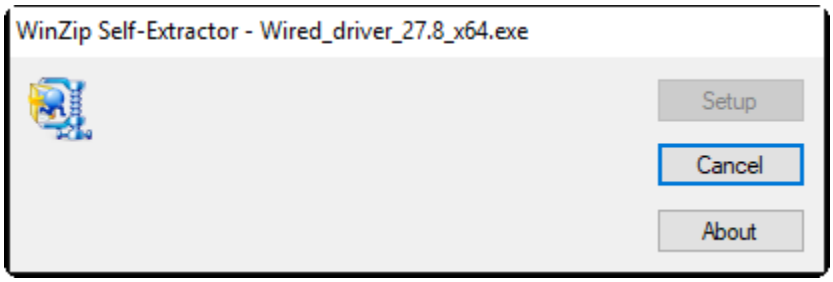
Step 2. Click **Yes, I want to restart my computer now**. Click **Finish** to complete the installation.



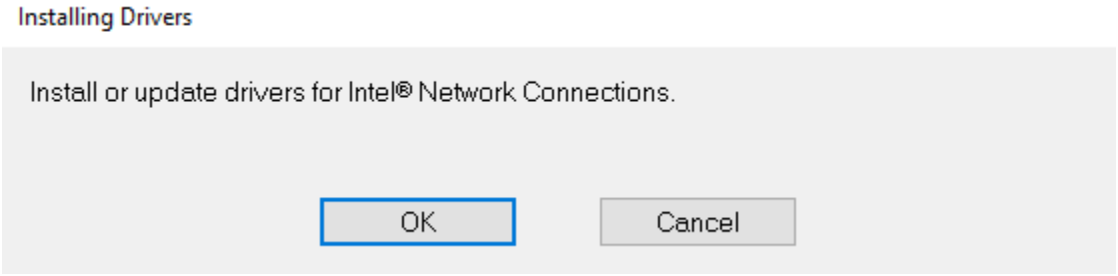
4.4 LAN Driver

To install the LAN driver, please follow the steps below.

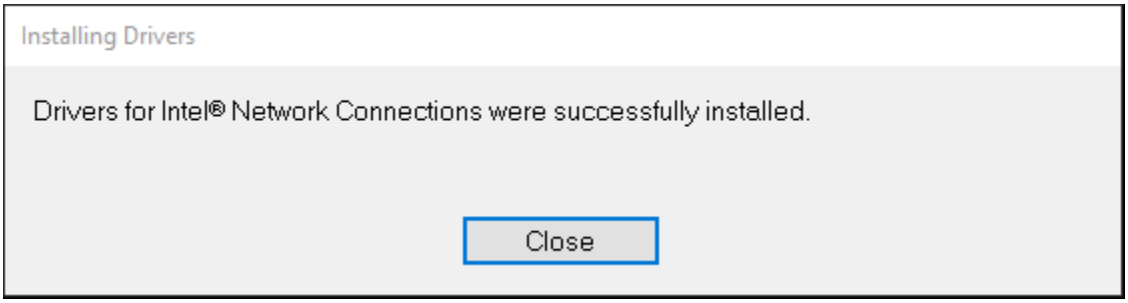
Step 1. Click **Zip File** to continue.



Step 2. Click **OK** to begin the installation.



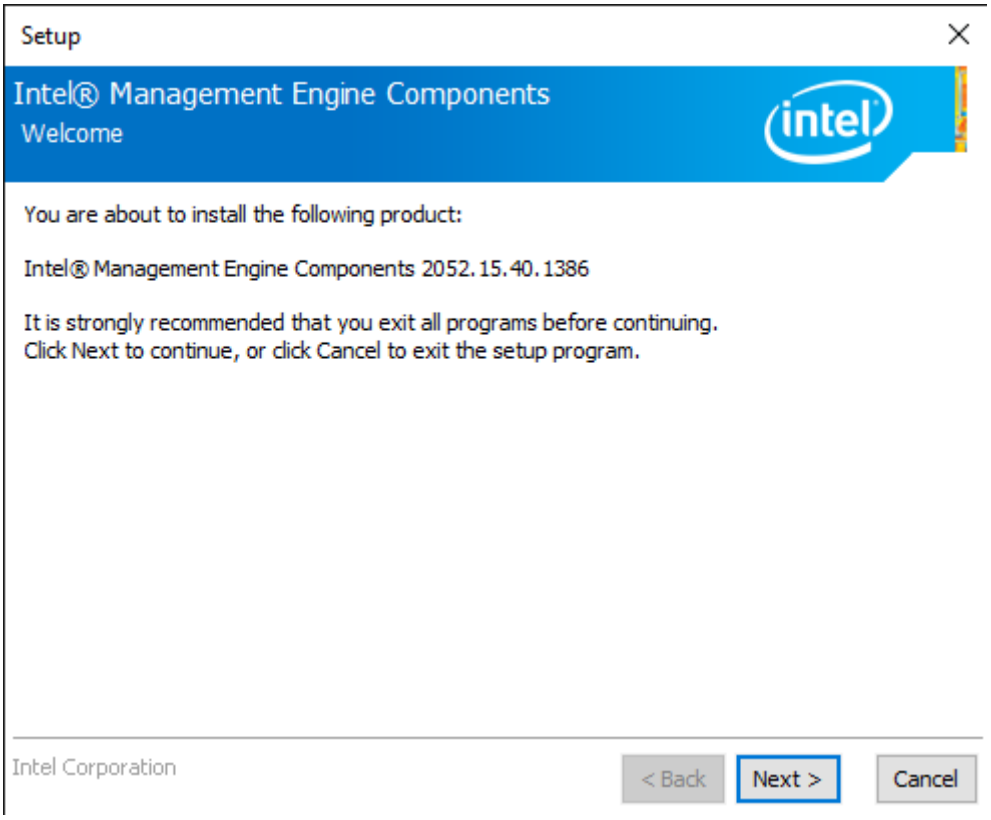
Step 3. Click **Close** to finish installation.



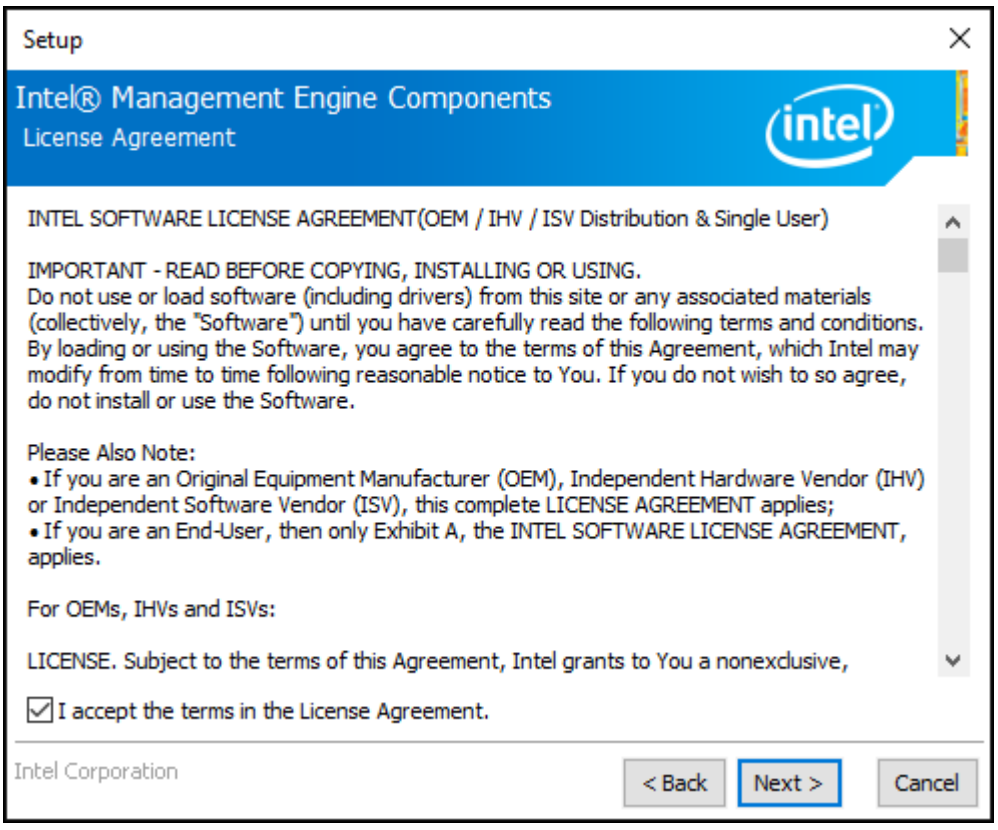
4.5 Intel® Management Engine Interface

To install the Intel® Management Engine Interface, please follow the steps below.

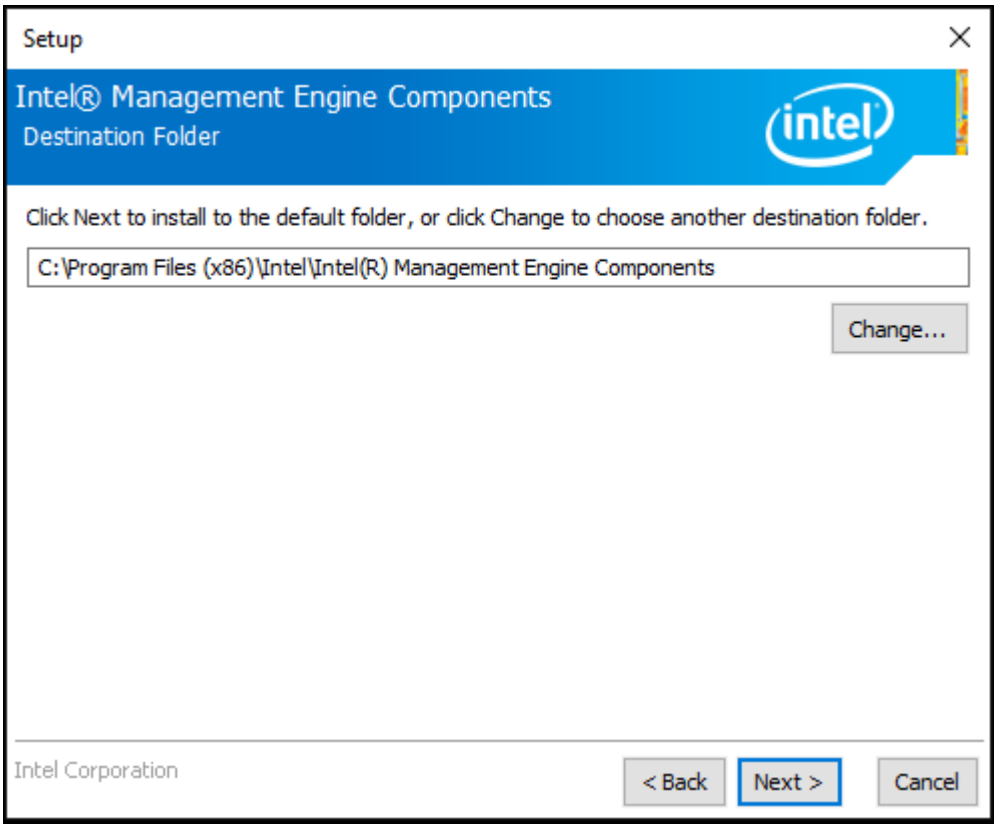
Step 1. Select setup language you need. Click **Next** to continue.



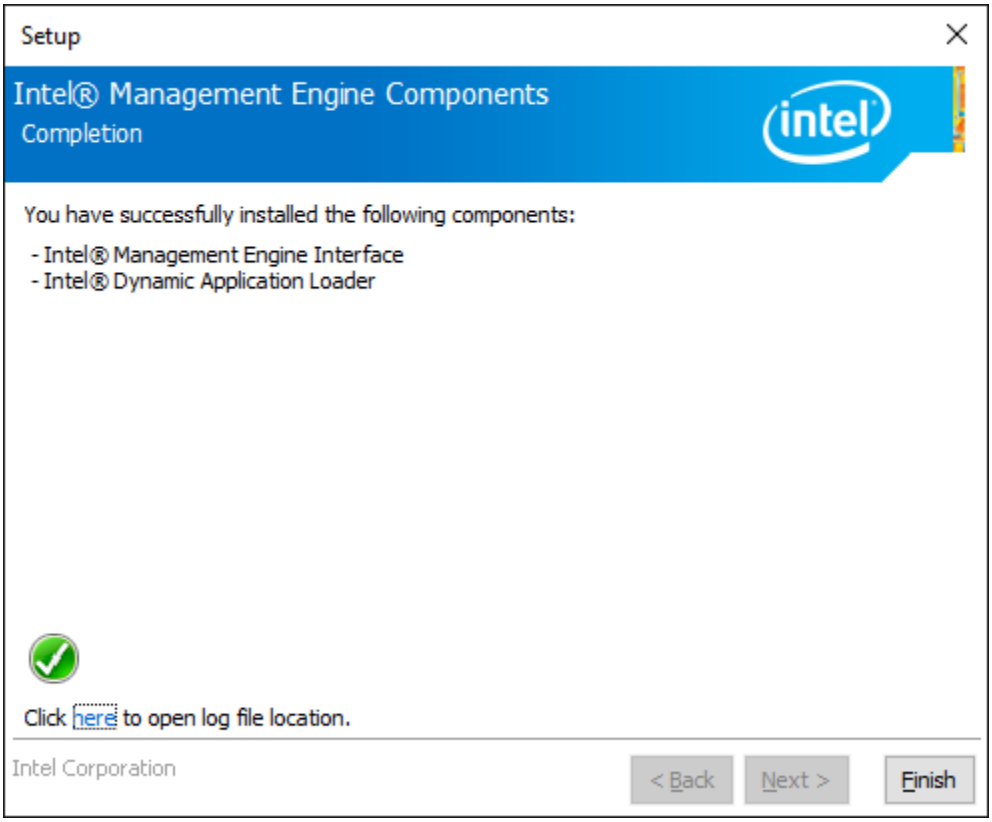
Step 2. Choose **I accept the terms in the License Agreement** and click **Next** to begin the installation.



Step 3. Click **Next** to continue.



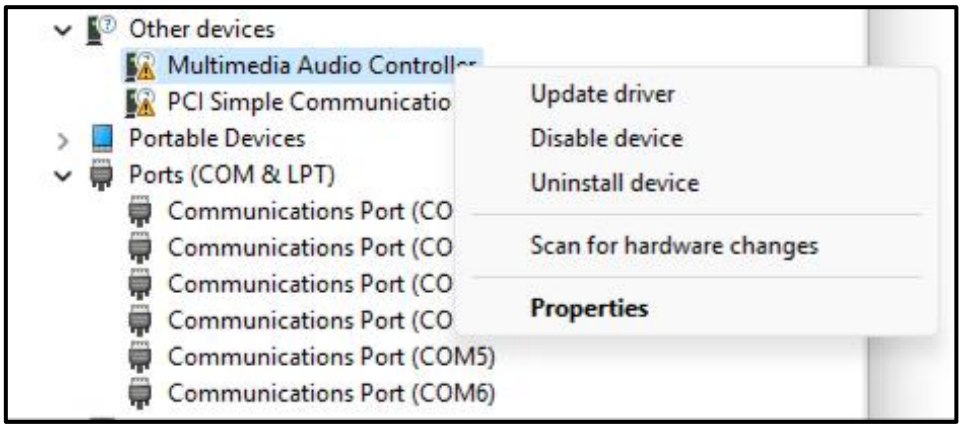
Step 4. Click **Finish** to complete the installation.



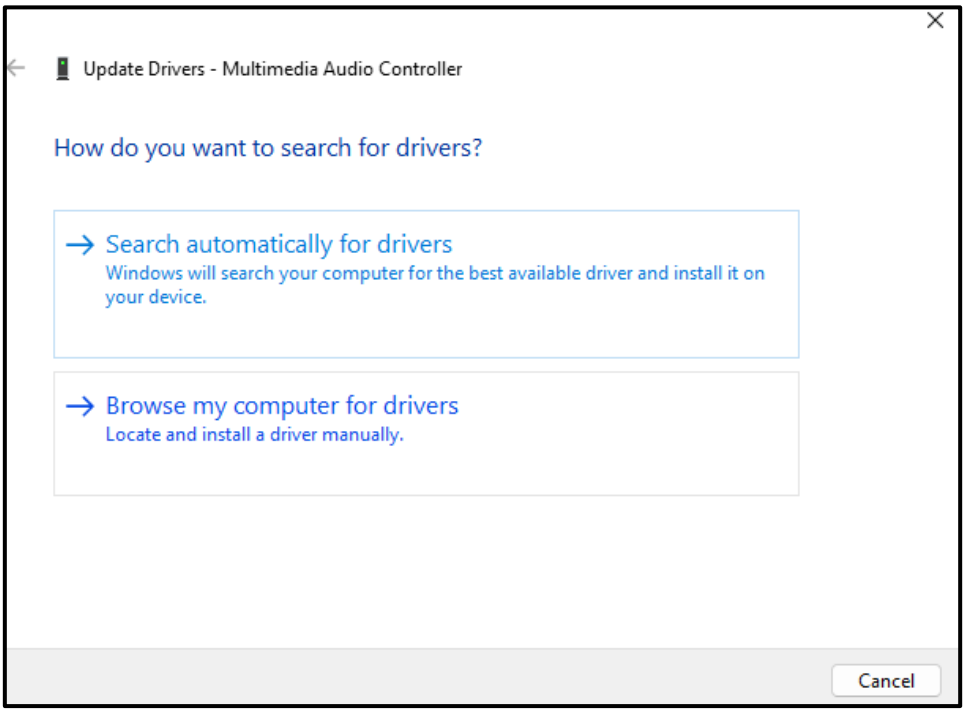
4.6 Intel® Speed Select Technology

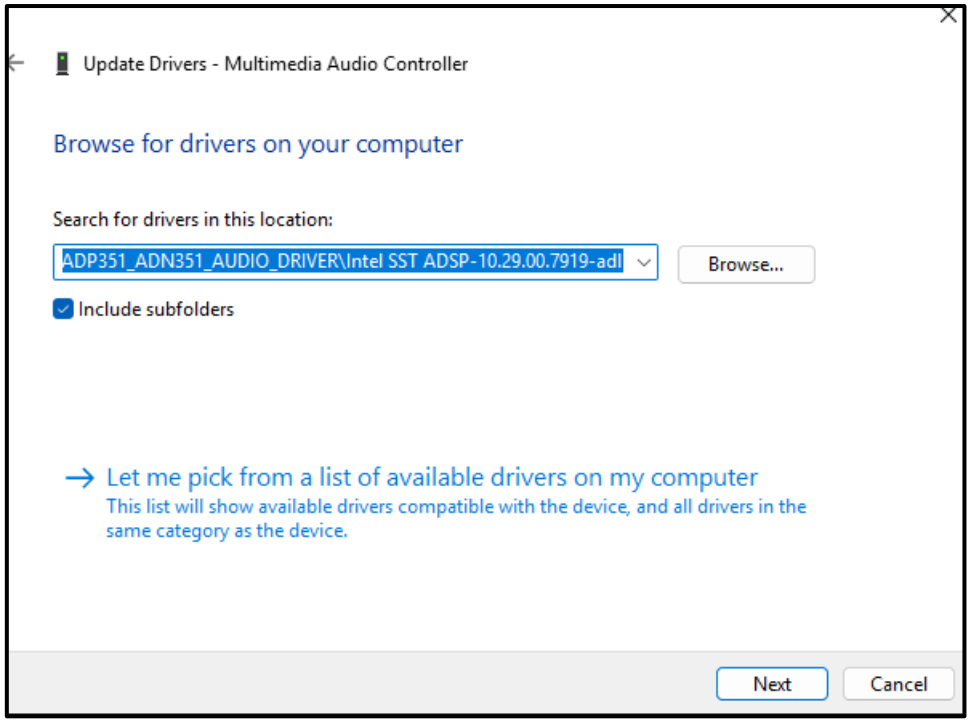
To install the Intel® Speed Select Technology, please follow the steps below.

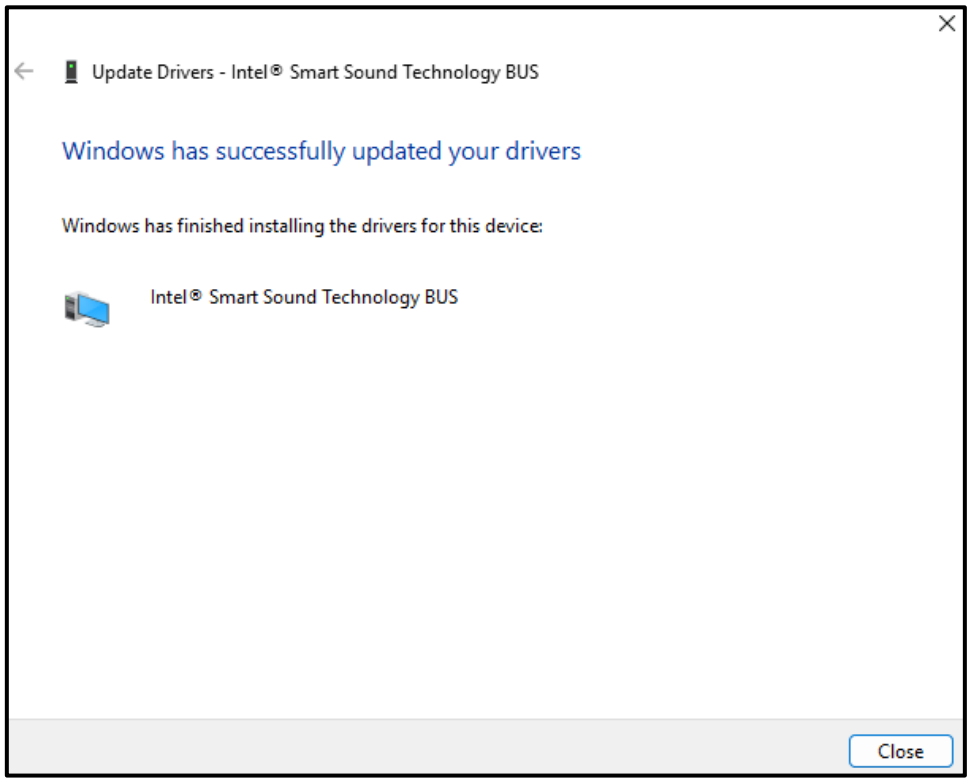
Step 1. Enable Device Manager under Window and you could see there are exclamation mark on Audio Control, please right click you mouse and pop up an property window, then select “update driver”



Step 2. Select “Browse my computer for drivers” then select driver from your driver folder then install it.




Update Drivers - Multimedia Audio Controller
Browse for drivers on your computer
Search for drivers in this location:
ADP351_ADN351_AUDIO_DRIVER\Intel SST ADSP-10.29.00.7919-adl
Browse...
Include subfolders
Let me pick from a list of available drivers on my computer
This list will show available drivers compatible with the device, and all drivers in the same category as the device.
Next
Cancel


Update Drivers - Intel® Smart Sound Technology BUS
Windows has successfully updated your drivers
Windows has finished installing the drivers for this device:
Intel® Smart Sound Technology BUS
Close