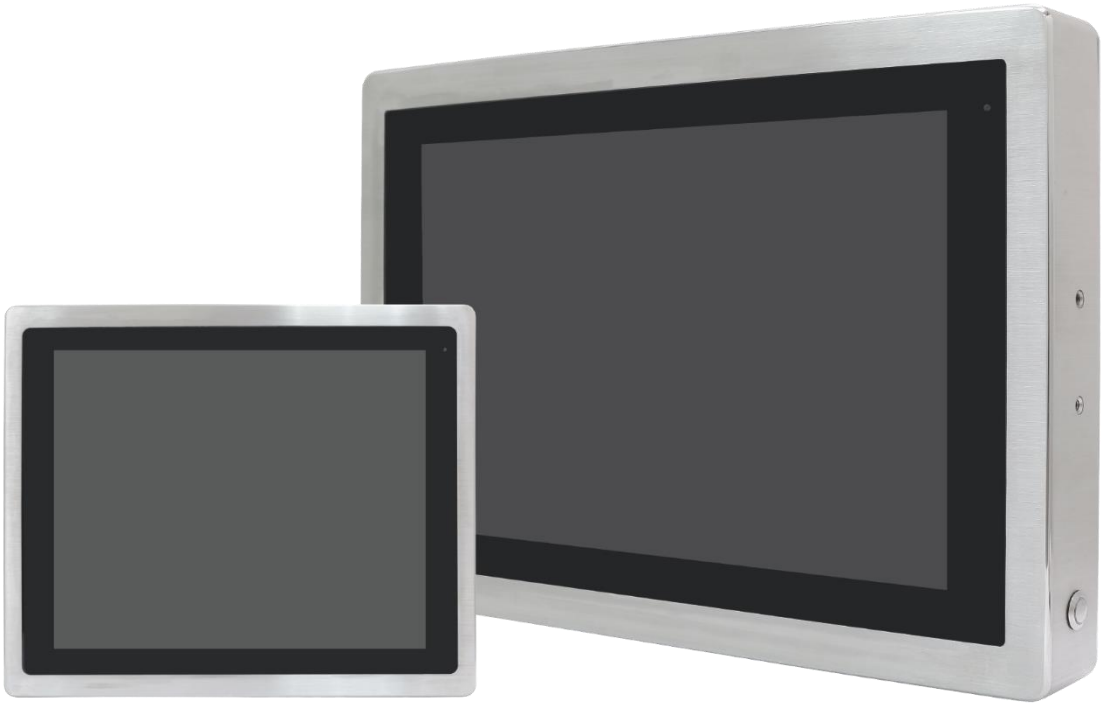


VITAM-9XXD Series

Fanless Stainless Steel Panel PC

User Manual

Release Date	Revision
Dec 2024	V1.0

®2024 Aplex Technology, Inc. All Rights Reserved. Published in Taiwan

Aplex Technology, Inc.
15F-1, No.186, Jian Yi Road, Zhonghe District, New Taipei City 235,Taiwan
Tel: 886-2-82262881 Fax: 886-2-82262883 URL: www.aplex.com

Revision History

Reversion	Date	Description
1.0	2024/12/13	Official Version

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.

Packing List

Accessories (as ticked) included in this package are:
☐ Adaptor ☐ Driver & manual CD disc ☐ Other._____(please specify)

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 CONTENT

Warning!_____ 2
Caution 2
Packing List....3
Safety Precautions 4
Figures 6
Chapter 1 Getting Started 7
1.1 Features 7
1.2 Specifications 7
1.3 Block Diagram....11
1.4 Dimensions 12
1.5 Brief Description of VITAM-9XXD Series 15
1.6 Yoke Mounting and VESA Mounting 16
Chapter 2 Hardware 17
2.1 Motherboard Introduction....17
2.2 Specifications & Dimensions....17
2.3 Jumpers and Connectors Location 19
2.4 Jumpers Setting and Connectors....20
Chapter 3 BIOS Setup 29
3.1 Operations after POST Screen....29
3.2 BIOS SETUP UTILITY....29
3.3 Main Settings....30
3.4 Advanced Settings....31
3.5 Chipset Settings....53
3.6 Security Settings....62
3.7 Boot Settings....63
3.8 Save & Exit Settings 64
Chapter 4 Installation of Drivers....65
4.1 Intel Chipset 66
4.2 Intel® HD Graphics Chipset 69
4.3 Audio Chipset 72
4.4 I LAN Driver 74
4.5 Intel® Management Engine Interface 75
4.6 Intel® Speed Select Technology 78
4.7 Resistive Touch Screen Installation 80

Figures

FIGURE 1. 1 DIMENSIONS OF VITAM-915DP/R(H) 12
FIGURE 1. 2 DIMENSIONS OF VITAM-916DP/R(H) 12
FIGURE 1. 3 DIMENSIONS OF VITAM-917DP/R(H) 13
FIGURE 1. 4 DIMENSIONS OF VITAM-919DP/R(H) 13
FIGURE 1. 5 DIMENSIONS OF VITAM-921DP/R(H) 14
FIGURE 1. 6 DIMENSIONS OF VITAM-924DP(H) 14
FIGURE 1. 7 FRONT VIEW AND TOUCH ON/OFF BUTTON OF VITAM-9XXD SERIES 15
FIGURE 1. 8 REAR VIEW OF VITAM-9XXD SERIES 15
FIGURE 1. 9 YOKE MOUNTING OF VITAM-9XXD SERIES 16
FIGURE 1. 10 VESA MOUNTING OF VITAM-9XXD SERIES 16

FIGURE 2. 1 MOTHERBOARD DIMENSIONS **19**
FIGURE 2. 2 JUMPERS AND CONNECTORS LOCATION- BOARD TOP **19**
FIGURE 2. 3 JUMPERS AND CONNECTORS LOCATION- BOARD BOTTOM **20**

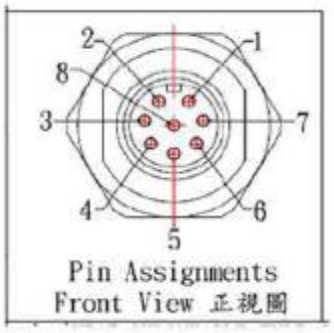
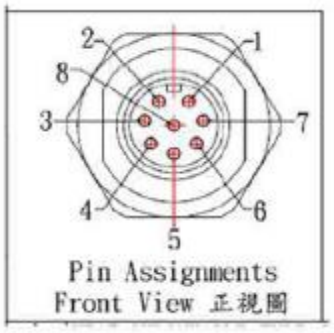
Chapter 1 Getting Started

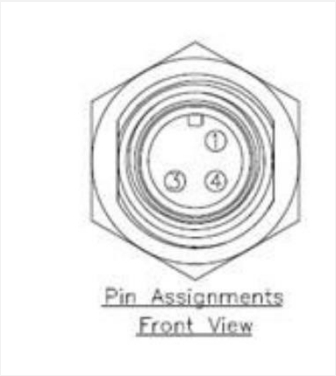
1.1 Features

- 15”~23.8” Fanless Stainless Steel Panel PC
- 12th /13th Gen. Intel® Core i3/i5 BGA type Processors
- True Flat Front Bezel Design and Grade 304 Stainless Steel Enclosure (Grade 316 for Option)
- Support Projective capacitive touch/Resistive touch window
- Touch on/off Button on the Side Edge for Hygienic Cleaning
- Totally IP66/IP69K for meet indoor/semi-outdoor waterproof applications
- M12 Connectors with waterproof caps
- 9~36V DC wide-ranging power input
- Support Ergonomic Versatile Mounting: Yoke Mounting / VESA Mounting

1.2 Specifications

<table>
<tr><th></th><th>VITAM-915
DP/R(H)</th><th>VITAM-916
DP/R(H)</th><th>VITAM-917
DP/R(H)</th><th>VITAM-919
DP/R(H)</th><th>VITAM-921
DP/R(H)</th><th>VITAM-924
DP(H)</th></tr>
<tr><td colspan="7">System</td></tr>
<tr><td>CPU</td><td colspan="6">12th /13th Gen. Intel® Core™ i5/i3 SoC :
Intel® Core™ i3-1215U, 2P+4E up to 4.4GHz(P-Core) 3.3GHz(E-Core), TDP=15W
Intel® Core™ i5-1235U, 2P+8E up to 4.4GHz(P-Core) 3.3GHz(E-Core), TDP=15W
Intel® Core™ i3-1315UE, 2P+4E, up to 4.5GHz(P-Core) 3.3GHz(E-Core), TDP=15W
Intel® Core™ i5-1335UE, 2P+8E, up to 4.5GHz(P-Core) 3.3GHz(E-Core), TDP=15W</td></tr>
<tr><td>Chipset</td><td colspan="6">SoC</td></tr>
<tr><td>Memory</td><td colspan="6">2 x DDR4-3200MHz SO-DIMM (Dual Channel ,Non-ECC) sockets, up to 64GB</td></tr>
<tr><td>Graphics</td><td colspan="6">Intel® UHD Graphics for 12th Gen. Intel® Processors (1100 MHz)
Intel® UHD Graphics for 13th Gen. Intel® Processors (1200 MHz)</td></tr>
<tr><td colspan="7">Outside IO Port – Standard M12 I/O Connector on the Rear Side</td></tr>
<tr><td>USB</td><td colspan="5">1 x M12 8-pin for 2x USB2.0 with waterproof cover and chain
USB1/2:
<table>
<tr><th>CN1</th><th>Pin Define</th></tr>
<tr><td>1</td><td>USB1 5V</td></tr>
<tr><td>3</td><td>D1-</td></tr>
<tr><td>4</td><td>D1+</td></tr>
</table></td><td></td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<tr><td>7</td><td>GND</td></tr>
<tr><td>2</td><td>USB2 5V</td></tr>
<tr><td>5</td><td>D2-</td></tr>
<tr><td>6</td><td>D2+</td></tr>
<tr><td>8</td><td>GND</td></tr>
</table>
</td><td> 
</td></tr>
<tr><td>Serial/Parallel</td><td>1 x M12 8-pin COM1, RS-232/422/485, Default RS-232,
with waterproof cover and chain
<table>
<tr><td></td><td>Pin Define</td></tr>
<tr><td>1</td><td>DCD</td></tr>
<tr><td>2</td><td>RXD</td></tr>
<tr><td>3</td><td>TXD</td></tr>
<tr><td>4</td><td>DTR</td></tr>
<tr><td>5</td><td>GND</td></tr>
<tr><td>6</td><td>DSR</td></tr>
<tr><td>7</td><td>RTS</td></tr>
<tr><td>8</td><td>CTS</td></tr>
</table>
</td><td>
</td></tr>
<tr><td>LAN</td><td>1 x M12 8-pin for LAN with waterproof cover and chain
LAN:
<table>
<tr><td></td><td>Pin Define</td></tr>
<tr><td>1</td><td>LAN1_0+</td></tr>
<tr><td>2</td><td>LAN1_0-</td></tr>
<tr><td>3</td><td>LAN1_1+</td></tr>
<tr><td>4</td><td>LAN1_1-</td></tr>
<tr><td>5</td><td>LAN1_2+</td></tr>
<tr><td>6</td><td>LAN1_2-</td></tr>
<tr><td>7</td><td>LAN1_3+</td></tr>
<tr><td>8</td><td>LAN1_3-</td></tr>
</table>
</td><td> 
</td></tr>
</table>

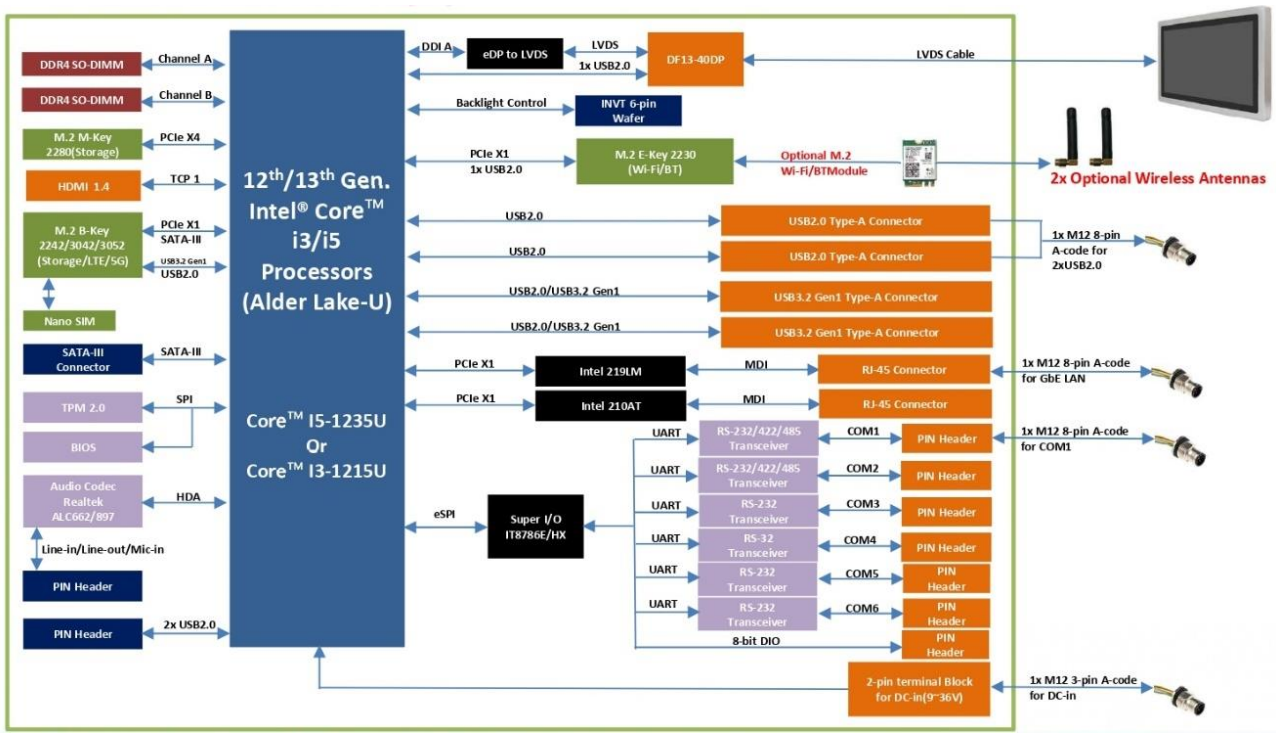
<table>
<tr><td>Power</td><td>1 x M12 3-pin for DC power with waterproof cover and chain
<table><tr><td></td><td>Pin Define</td></tr><tr><td>1</td><td>NC</td></tr><tr><td>3</td><td>VCC</td></tr><tr><td>4</td><td>GND</td></tr></table></td><td>  </td></tr>
<tr><td>Others</td><td colspan="2">1 x Power Switch on the rear
1 x Touch on/off button at the side (Touch on-default/Touch off-option: press downward)</td></tr>
<tr><td colspan="3">Option I/O Port (Either two)</td></tr>
<tr><td>Option
(Priority: COM,USB,LAN)</td><td colspan="2">2 x optional blank M12 connectors with waterproof cap for selecting two from the following options:
2 x USB2.0
1 x USB3.2 Gen1
1 x GbE LAN
1 x COM Port
1 x HDMI</td></tr>
<tr><td colspan="3">Storage Space</td></tr>
<tr><td>Storage</td><td colspan="2">1 x M.2 M-Key 2280 (PCIex4)</td></tr>
<tr><td colspan="3">Expansion</td></tr>
<tr><td>Expansion Slot</td><td colspan="2">1 x M.2 2230 E-Key (USB2.0, PCIe x1) for optional Wi-Fi/BT module
1 x M.2 3402/3052 B-key (PCIe x1, USB3.2 Gen1) for optional LTE/5G module
1 x SIM card</td></tr>
<tr><td>RFID module</td><td colspan="2">RFID module design on the front side (option)</td></tr>
<tr><td colspan="3">Display – Standard LCD</td></tr>
</table>

Display Type	15” TFT LCD	15.6” TFT LCD	17” TFT LCD	19” TFT LCD	21.5” TFT LCD	23.8” TFT LCD
Max. Resolution	1024 x 768	1366 x 768 1980 x 1080	1280 x 1024	1280 x 1024	1920 x 1080	1920 x 1080
Max. Color	16.2M	16.7M				
Luminance (cd/m^2)	300 350	400 500	350	350	250	250
Contrast Ratio	2000:1 1000:1	500:1 1000:1	800:1	1000:1	1000:1	3000 : 1
Viewing Angle(H/V)	176/176	178/178	170/160	170/160	178/178	178/178

	178/178					
Backlight Lifetime	70,000hrs 50,000hrs	50,000hrs	50,000hrs	50,000hrs	50,000hrs	30,000 hrs
Option	Optical bonding					
Display – High Brightness LCD (option)						
Display Type	15” TFT LCD	15.6” TFT LCD	17” TFT LCD	19” TFT LCD	21.5” TFT LCD	23.8”TFT LCD
Max. Resolution	1024 x 768	1366 x 768 1920 x 1080	1280 x1024	1280 x 1024	1920 x 1080	1920 x 1080
Max. Color	16.2M	16.7M	16.2M	16.7M		
Luminance (cd/m^2)	1000	1000	1000	1000	1500/1000	1000
Contrast Ratio	1000:1	500:1 1000:1	800:1	1000:1	1000:1	3000:1
Viewing Angle(H/V)	176/176	160/160 170/170	170/160	170/160	178/178	178/178
Backlight Lifetime	50,000hrs	50,000hrs	50,000hrs	50,000hrs	50,000hrs	30,000hrs
Option	Optical bonding					
Touch Screen						
Type	Resistive touch window (for R model) **(not available for 23.8”)** Projected capacitive touch screen (for P model)					
Interface	USB					
Light Transmission	Resistive touch window: over 80% Projected capacitive touch screen: over 90%					
Power						
Power Input	DC 9~36V					
Power Consumption	MAX:64.73W (915DP)	TBD	MAX:63.29W (917DR)	MAX:73.98W (919DP)	MAX:89.06W (921DP)	TBD
Mechanical						
Color	304 Stainless steel enclosure (default) 316 Stainless steel enclosure (option)					
Construction	Stainless steel enclosure					
Mounting	VESA mount 75 x 75, Yoke mount			VESA mount 100 x 100, Yoke mount		VESA mount 200 x 100, Yoke mount
IP Rating	IP66/IP69K					
Dimension (mm)	399 x 324 x	440 x 290 x	432 x 358 x	470 x 388.6 x	571 x 362 x	656 x 423 x

	52.8	55	55.3	60	55	53
Net Weight	6.9 Kgs	TBD kgs	7.9 kgs	9.5 Kgs	9.75 Kgs	TBD kgs
Environmental						
Operating temperature	0~50°C (-20~60°C for optional)				0~50°C	
Storage temperature	-30~70°C					
Storage humidity	10 to 90% @ 40°C, non- condensing					
Certification	CE / FCC Class A					
Operating System Support	Windows 10 IoT 2021 LTSC Windows 11 IoT 2024 LTSC/PRO					

1.3 Block Diagram



1.4 Dimensions

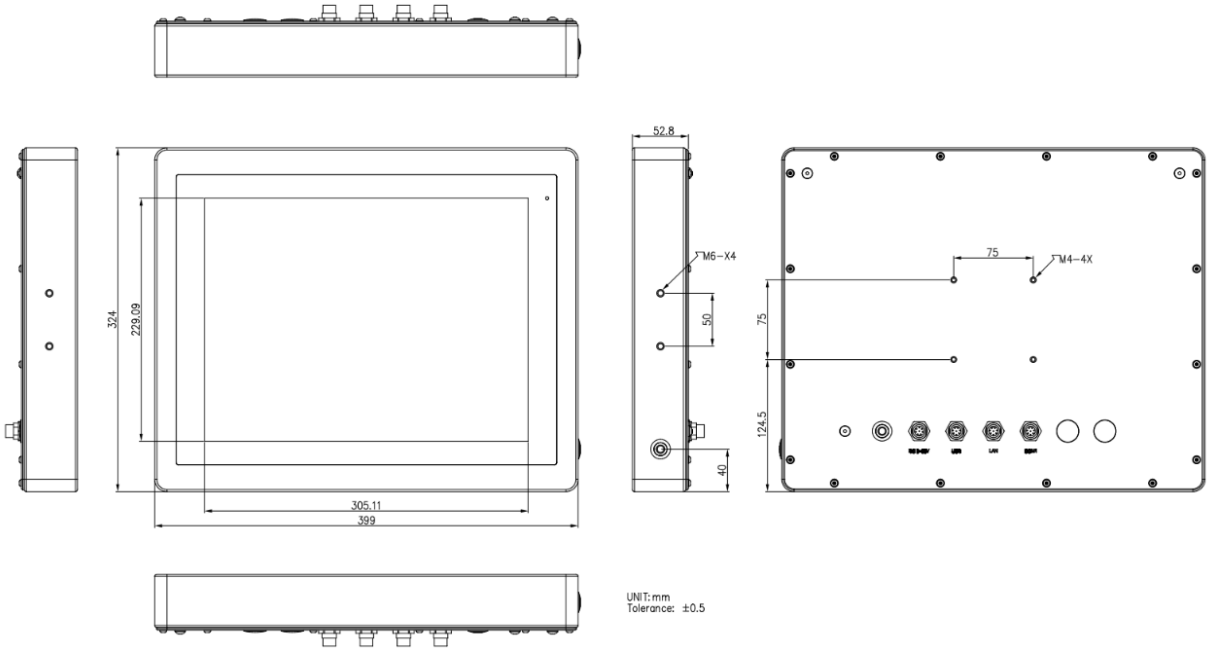


Figure 1. 1 Dimensions of VITAM-915DP/R(H)

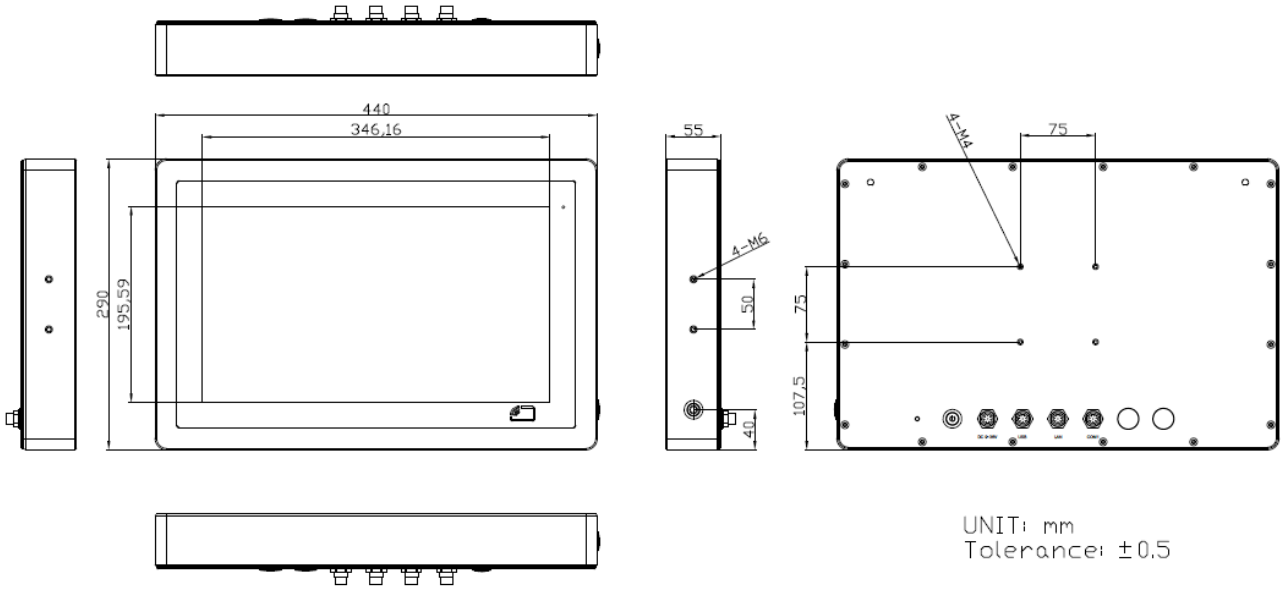


Figure 1. 2 Dimensions of VITAM-916DP/R(H)

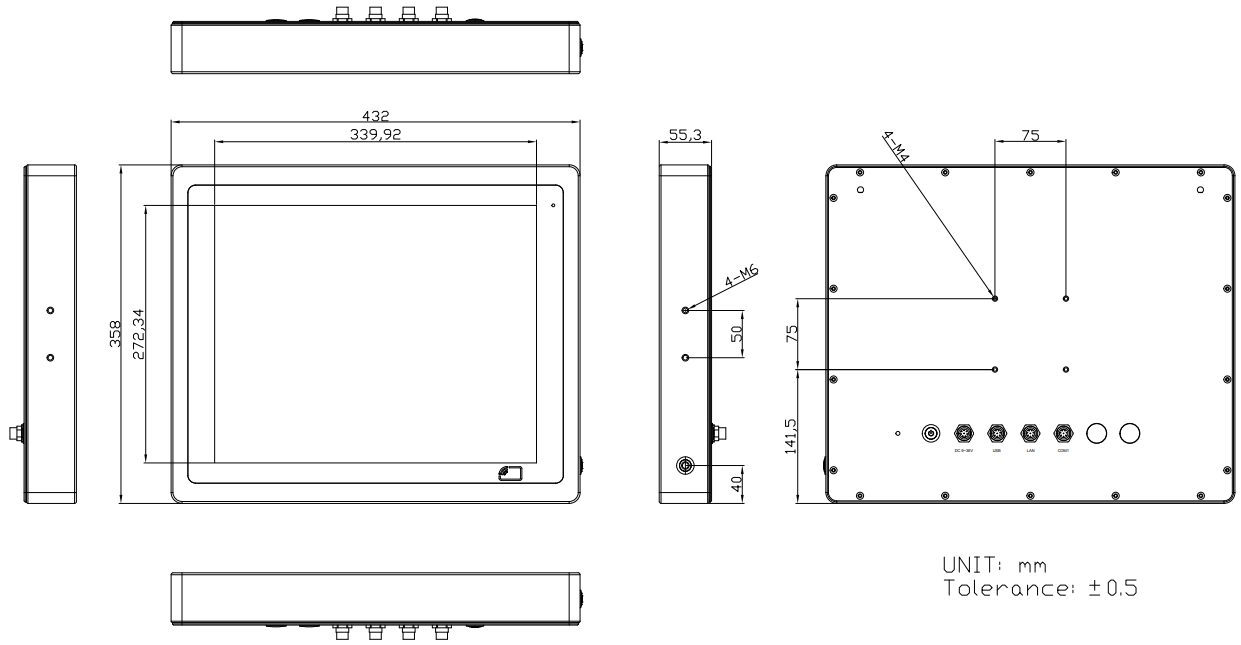


Figure 1. 3 Dimensions of VITAM-917DP/R(H)

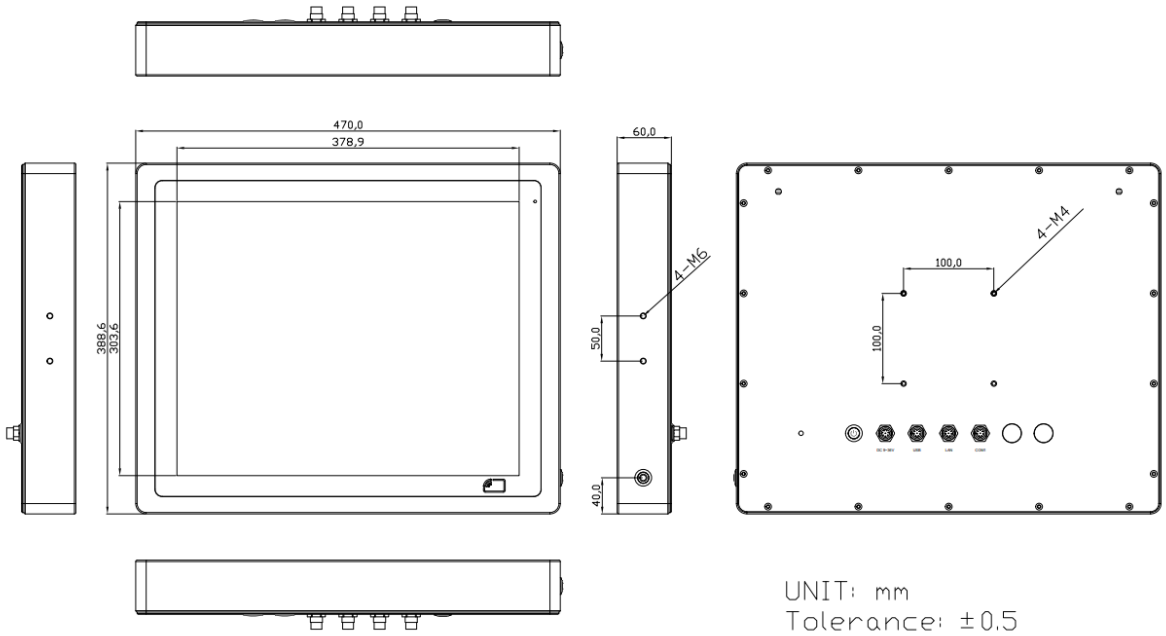


Figure 1. 4 Dimensions of VITAM-919DP/R(H)

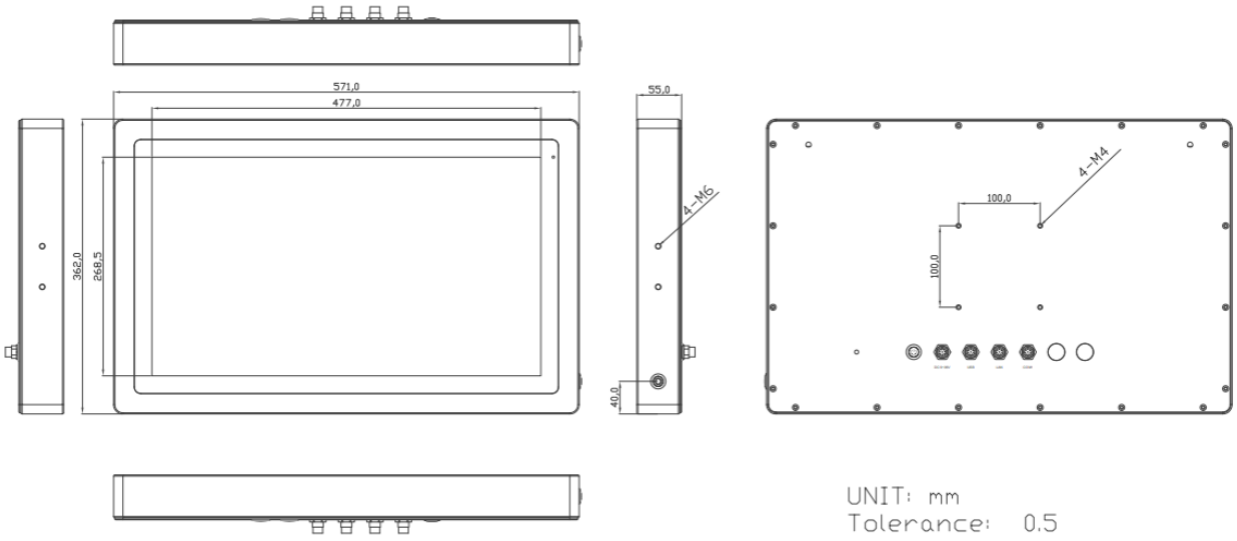


Figure 1. 5 Dimensions of VITAM-921DP/R(H)

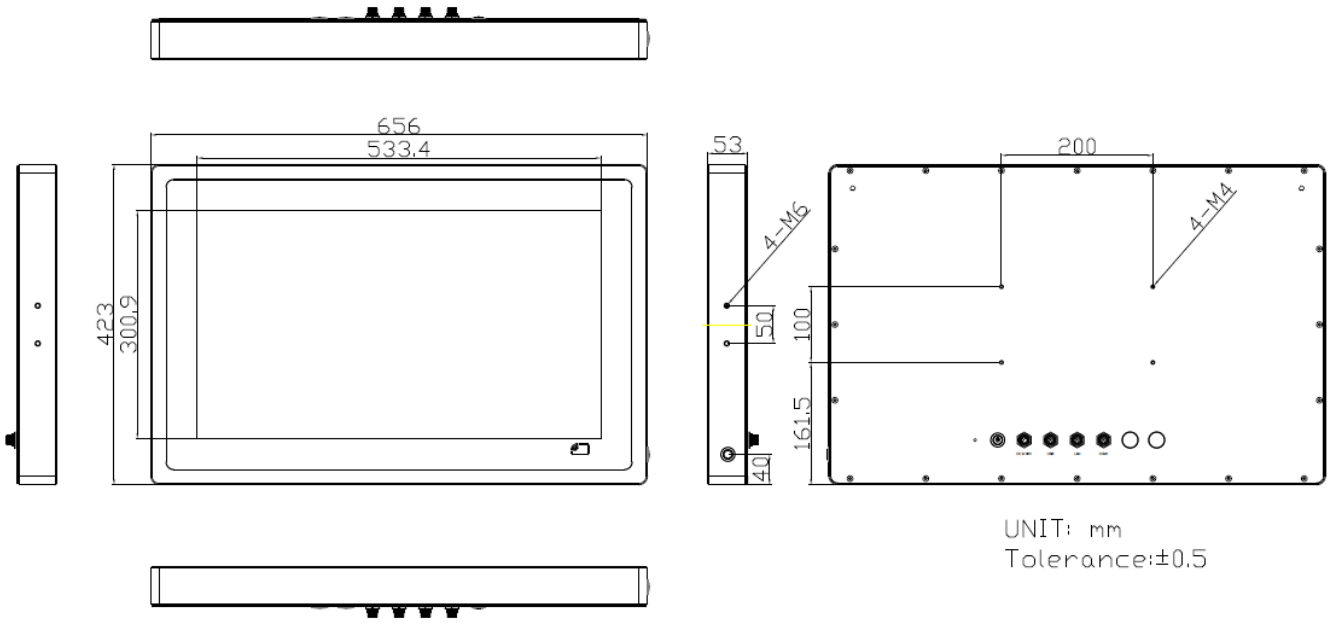


Figure 1. 6 Dimensions of VITAM-924DP(H)

1.5 Brief Description of VITAM-9XXD Series

There are 15”, 15.6”, 17”, 19”, 21.5”, and 23.8” new generation adopt the SUS304 grade stainless steel housing (SUS316 grade for option) panel PC in VITAM-9XXD series, which comes with 100% dust and waterproof guarantee, and the all-in-one fanless design. It is powered by 12th/13th Gen. Intel Core i3-1215U/i5-1235U and i3-1315UE/i5-1335UE processor, 2 x SO-DIMM up to 64GB DDR4 3200MHz memory, and 1 x M.2 M-Key 2280 space for storage. VITAM-9XXD series is wide range DC 9~36V power input and IP66/IP69K rated with M12 connectors. Furthermore, the models support resistive touch and projected capacitive touch for option, and can be high brightness LCD and optical bonding designed for option. It supports touch on/off button on the side edge for hygienic cleaning and ergonomic versatile mounting: Yoke mounting and space-saving VESA mounting.

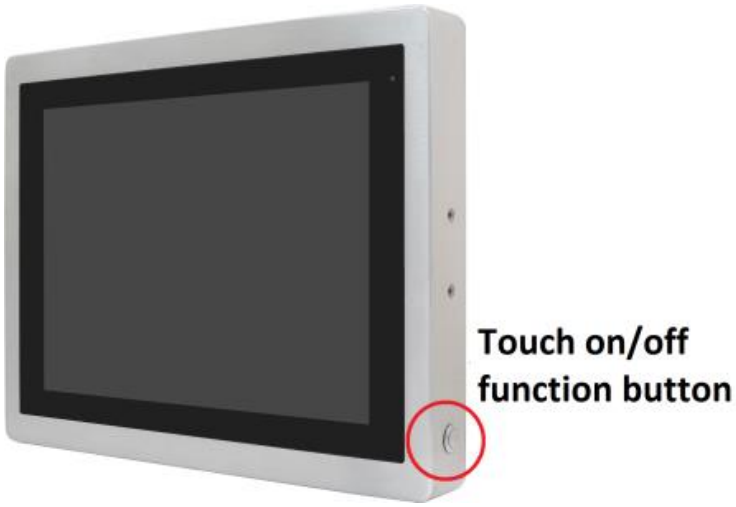


Figure 1. 7 Front View and Touch on/off Button of VITAM-9XXD Series

Figure 1. 8 Rear View of VITAM-9XXD Series

1.6 Yoke Mounting and VESA Mounting

The VITAM-9XXD Series model can be Yoke mounted and VESA mounted as shown in Picture below.

Figure 1. 9 Yoke mounting of VITAM-9XXD Series

Figure 1. 10 VESA mounting of VITAM-9XXD Series

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 & Dimensions

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™ i3-1315UE,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
Chipset	SOC
Memory Support	2x SO-DIMM (260pins), up to 64GB DDR4 3200MT/s
Graphics	Integrated Intel UHD Graphics
Display Mode	1 x HDMI1.4b via HDMI Port 1 x LVDS (18/24-bit dual LVDS)/Edp(option by BOM)
Support Resolution	HDMI: support up to 1920x1080@60Hz LVDS: support up to 1920x1200@60Hz eDP: support up to 3840x2160@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) 1x USB2.0 for M.2 B-Key 1x USB2.0 for M.2 E-Key
Serial	1 x RS-232(default)/422/485, signals select via BIOS (COM1), pin9 RI(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 (COM2) 4 x 2wired RS232 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
FAN	1x 2pin fan connector
Watchdog Timer	Software programmable 1–255 level
TPM	Onboard TPM IC Infineon_SLB9670AQ2.0
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% relatively, non-condensing, operating
Power Consumption	24V/1.6A (Intel i3-8145UE Processor with 16GB DDR4/HDD) 24V/2.0A (Intel i5-8365UE Processor with 16GB DDR4/HDD)
Certifications	Meet CE/FCC class A UL RoHS2.0

Dimensions: 146 x 101.6 (Unit: mm)

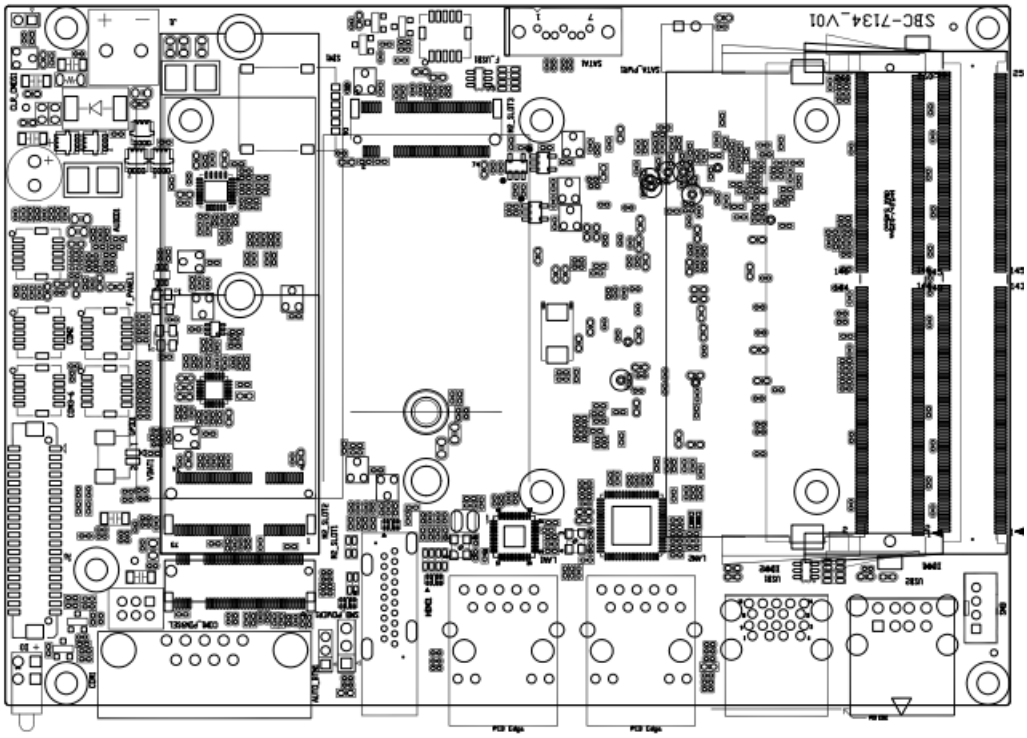


Figure 2. 1 Motherboard Dimensions

2.3 Jumpers and Connectors Location

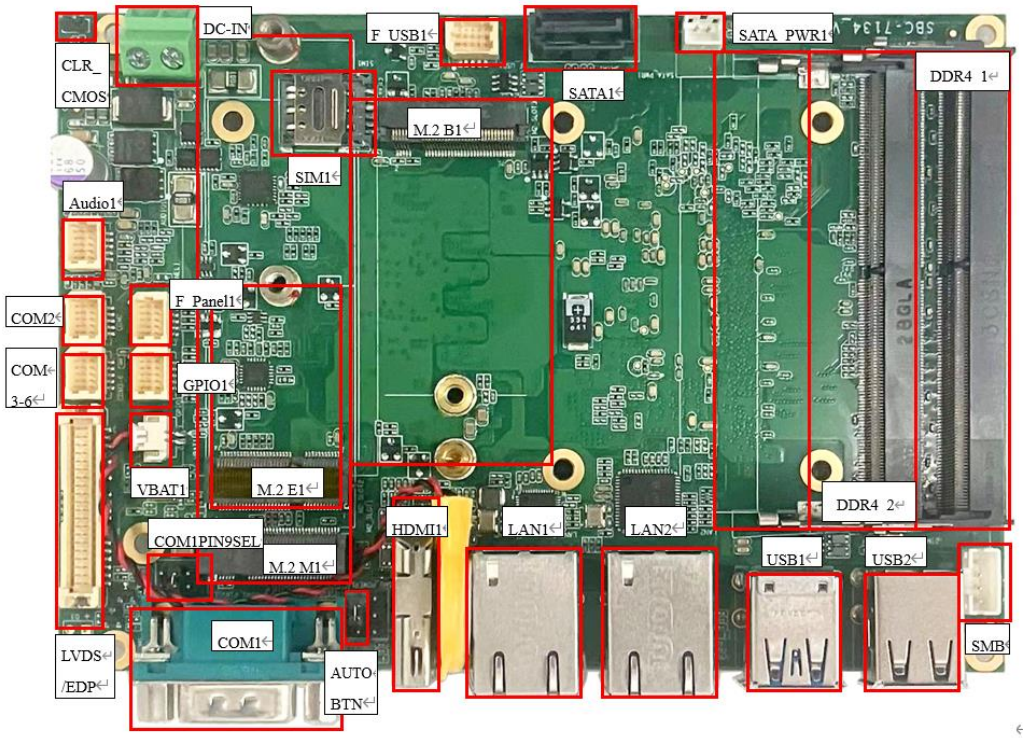


Figure 2. 2 Jumpers and Connectors Location- Board Top

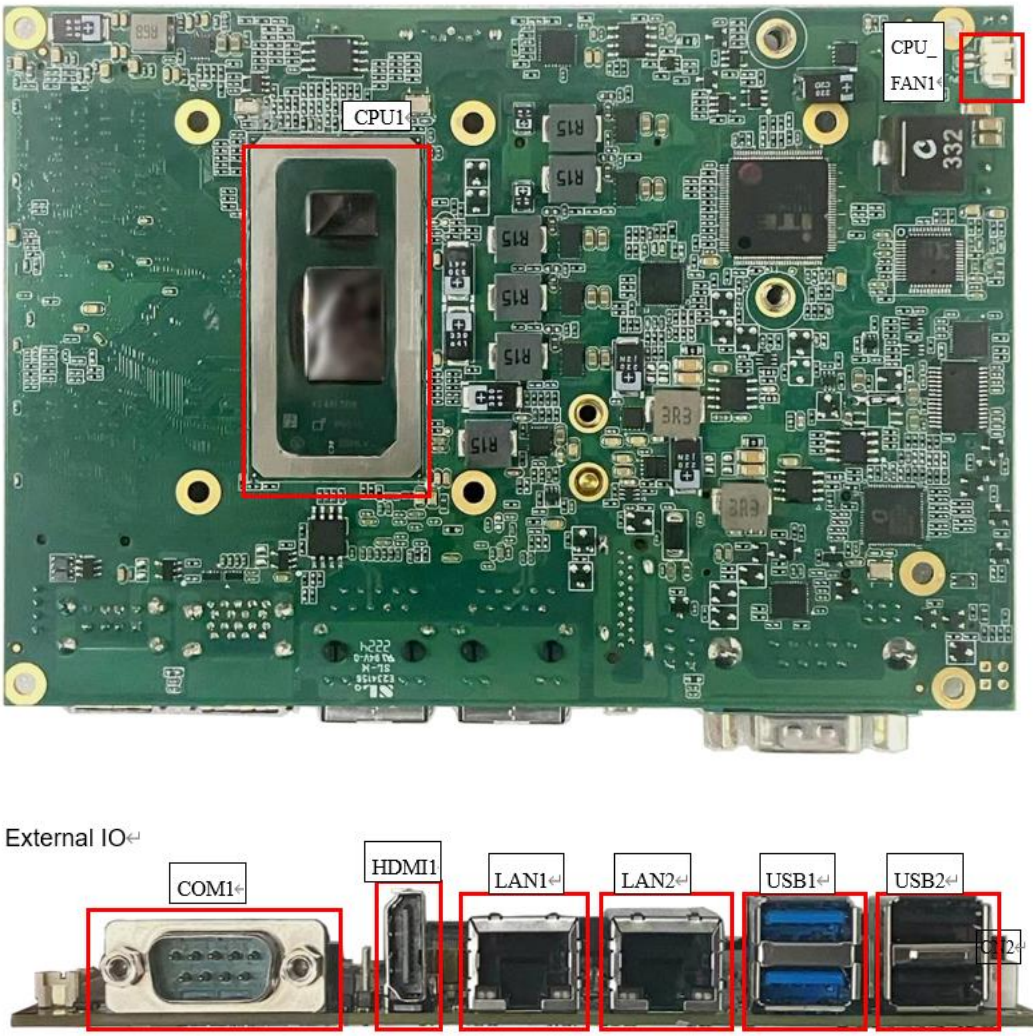


Figure 2. 3 Jumpers and Connectors Location- Board Bottom

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 CLR_CMOS1 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	GND
2	VCC(5V_S0)

Note:

Output power of cooling fan must be limited under 3W.

6. DC_IN1:

(5.08mm Pitch 1x2 Pin Connector) DC9~36V System power input connector.

Pin#	Power Input
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

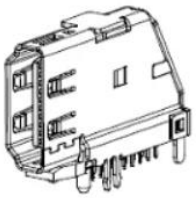
8. LVDS/EDP:

(1.25mm Pitch 2x20 Connector, DF13-40P) Support 18/24-bit LVDS interface LCM with USB2.0 signal for touch screen.

Function	Signal Name	Pin#		Signal Name	Function
DC12V	12V_S0	1	2	12V_S0	DC12V
LVDS/eDP Signals	BKLT_PWM_OUT	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	21	22	LA_CLK+/EDP	

	AUX-			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	SM bus DAT	37	38	5V_S5	
	SM bus CLK	39	40	Power LED+	Power LED

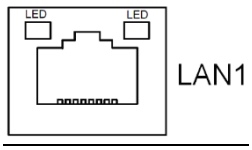
9. HDMI1:



(Vertical HDMI Connector) HDMI Interface connector.

HDMI 1.4, Support resolution up to 1920x1080@60Hz.

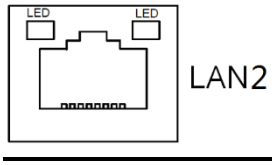
10. LAN1:



(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

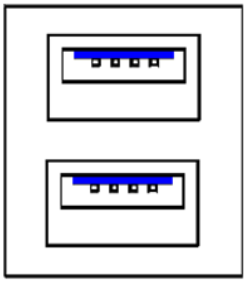
12. F_AUDIO1:

(SHD 1.25mm 2x5pin header) Provide line-in/line-out/mic-in via onboard Realtek ALC897 codec.

Signal Name	Pin#	Pin#	Signal Name
LINE-OUT-R	1	2	LINE-OUT-L
GND	3	4	GND
MIC-IN-R	5	6	MIC-IN-L
GND	7	8	GND
LINE-IN-R	9	10	LINE-IN-L

13. USB1、USB2:

(Double stack USB typeA) 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.

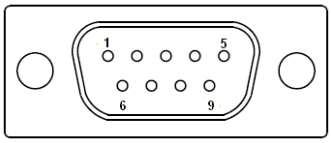
14. F_USB1:

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

Signal Name	Pin#	Pin#	Signal Name
5V_USB23	1	2	5V_USB23
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. Pin 9 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	JP1 select Setting (RI/5V/12V)
BIOS Setup：Serial Port 1 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 1 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 1 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	**COM1 Pin9 RI (Ring Indicator, Default)**
Close 5-6	COM1 Pin9 = +5V

17. COM2:

(SHD 1.25mm 2x5pin header) Provide RS232 RS422/485, Default is set to RS232, RS422/485 can be selected 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 4x2wired RS232(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-SIM Slot) Support Nano SIM card for M.2 B Key.

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

22. M2_B1:

(M.2 B-Key Socket) Support 3042/3052 4G/5G module with Nano SIM slot,and Support 2242 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 WiFi/BT expansion cards.

25. SATA1:

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

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.

state	function
Pin1-2 short circuit	Default: AT Mode (Auto Power ON)
Pin2-3 short circuit	ATX Mode (Manual Power ON)

Chapter 3 BIOS Setup

3.1 Operations after POST Screen

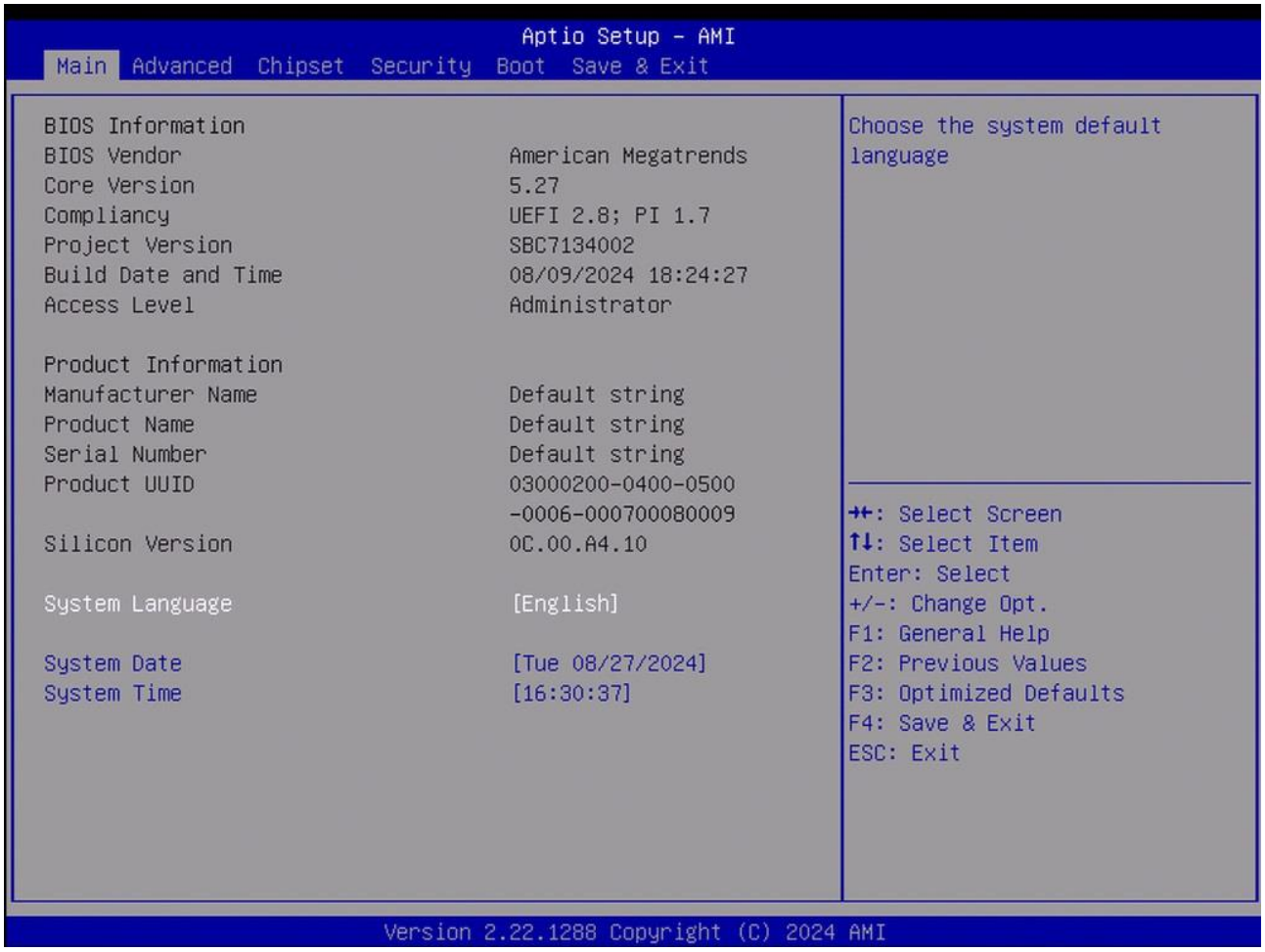
After CMOS discharge or BIOS flashing operation. Press [Delete] key to enter CMOS Setup.

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

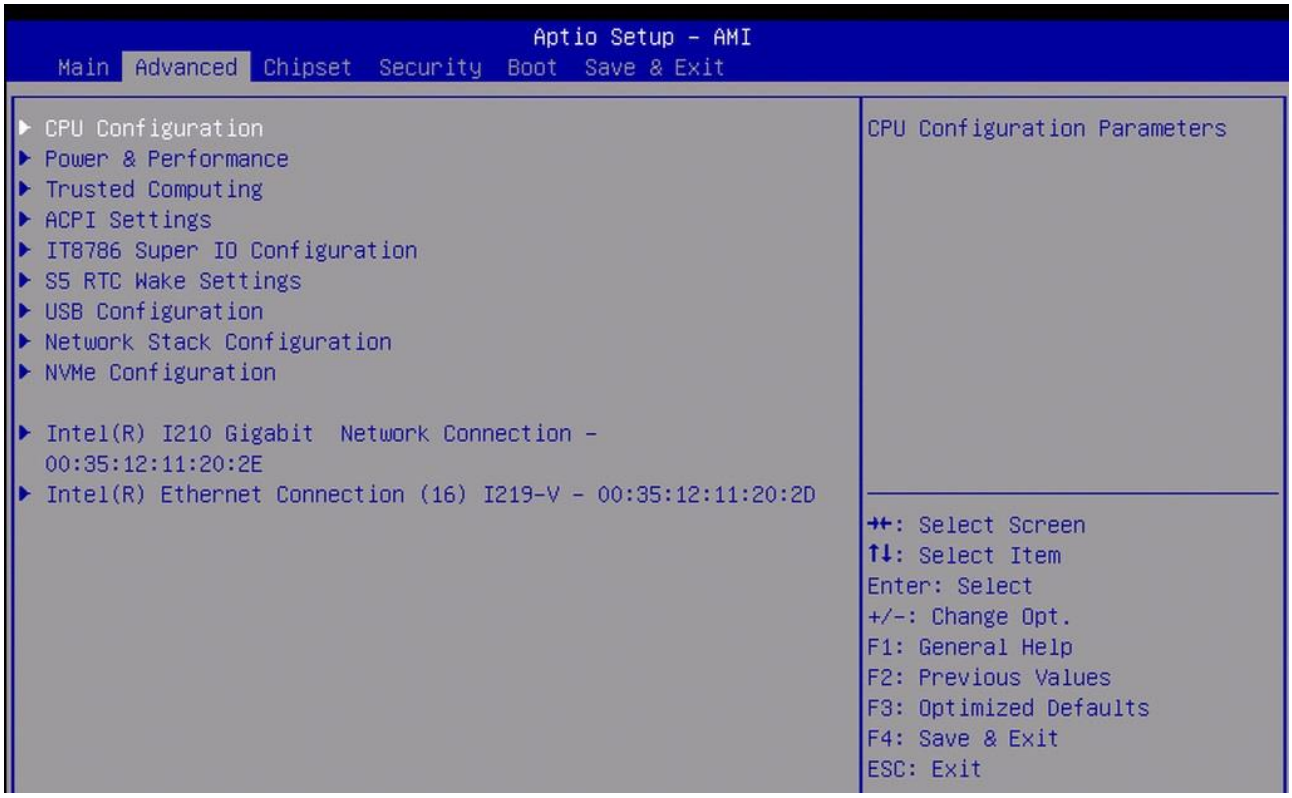
Date: 01 to 31

Year: 1998 to 2099

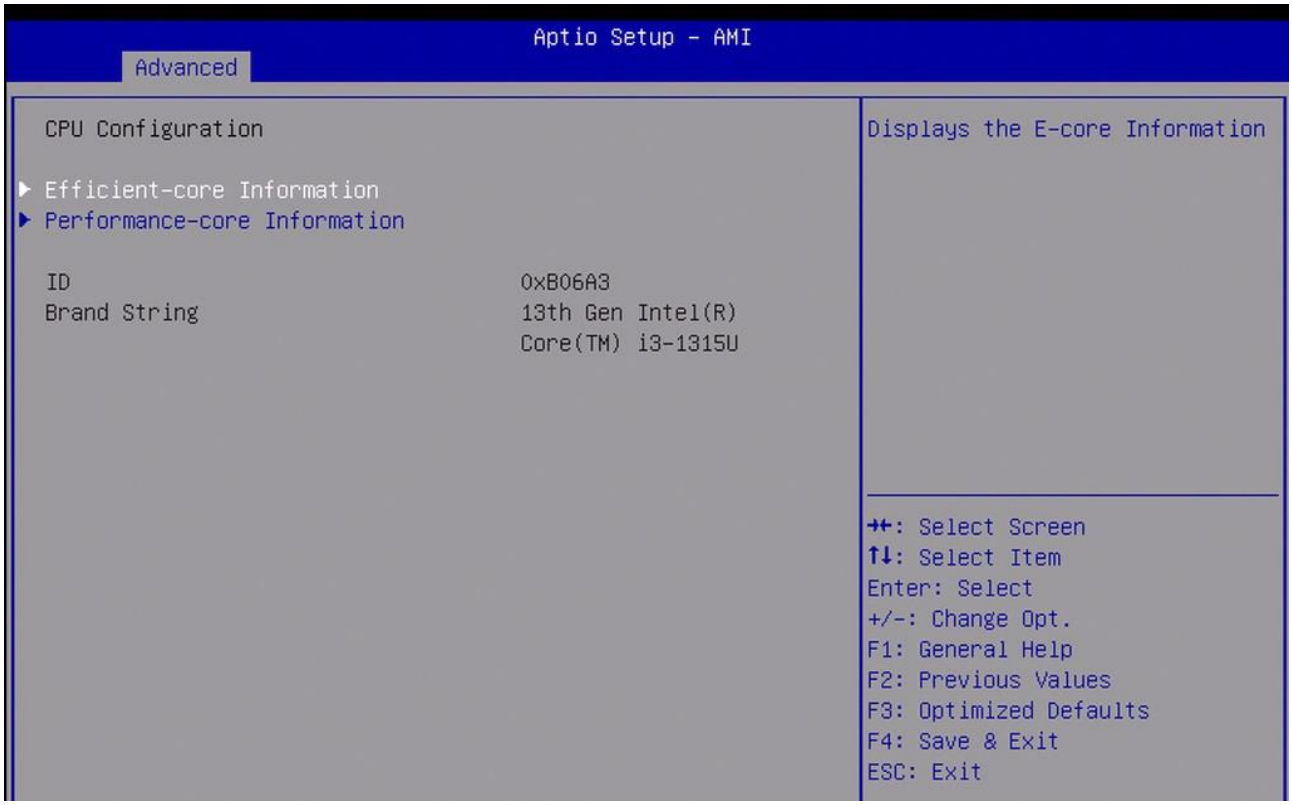
NOTE:

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

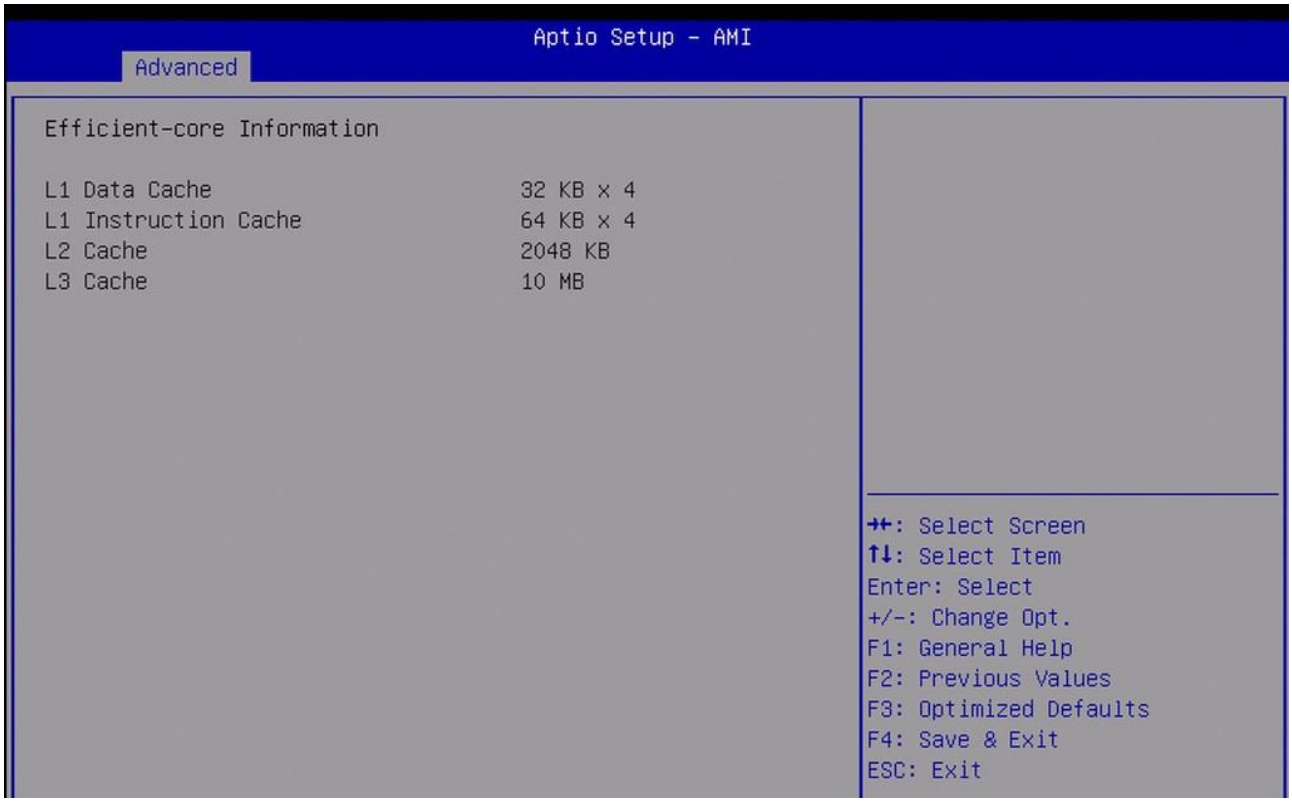
3.4 Advanced Settings



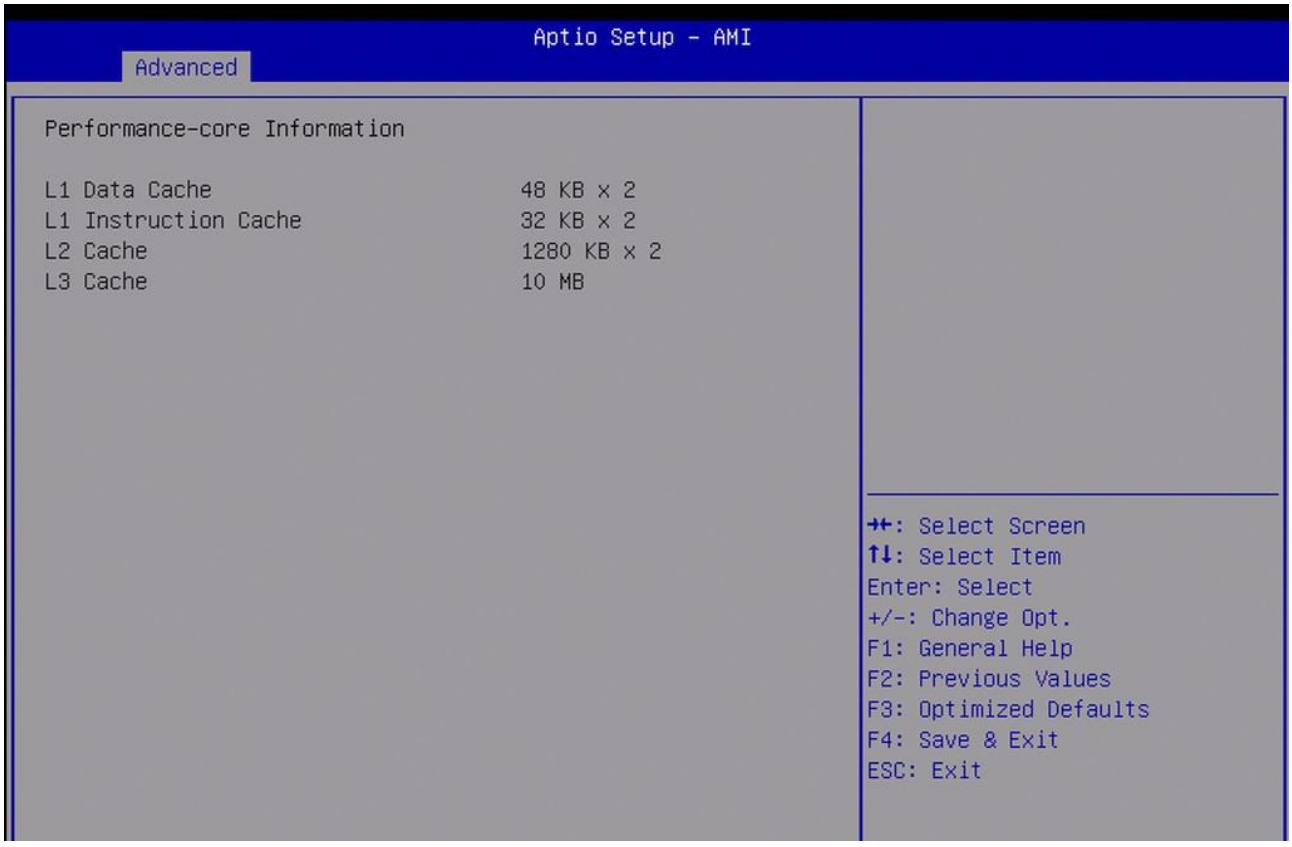
6.4.1 CPU Configuration



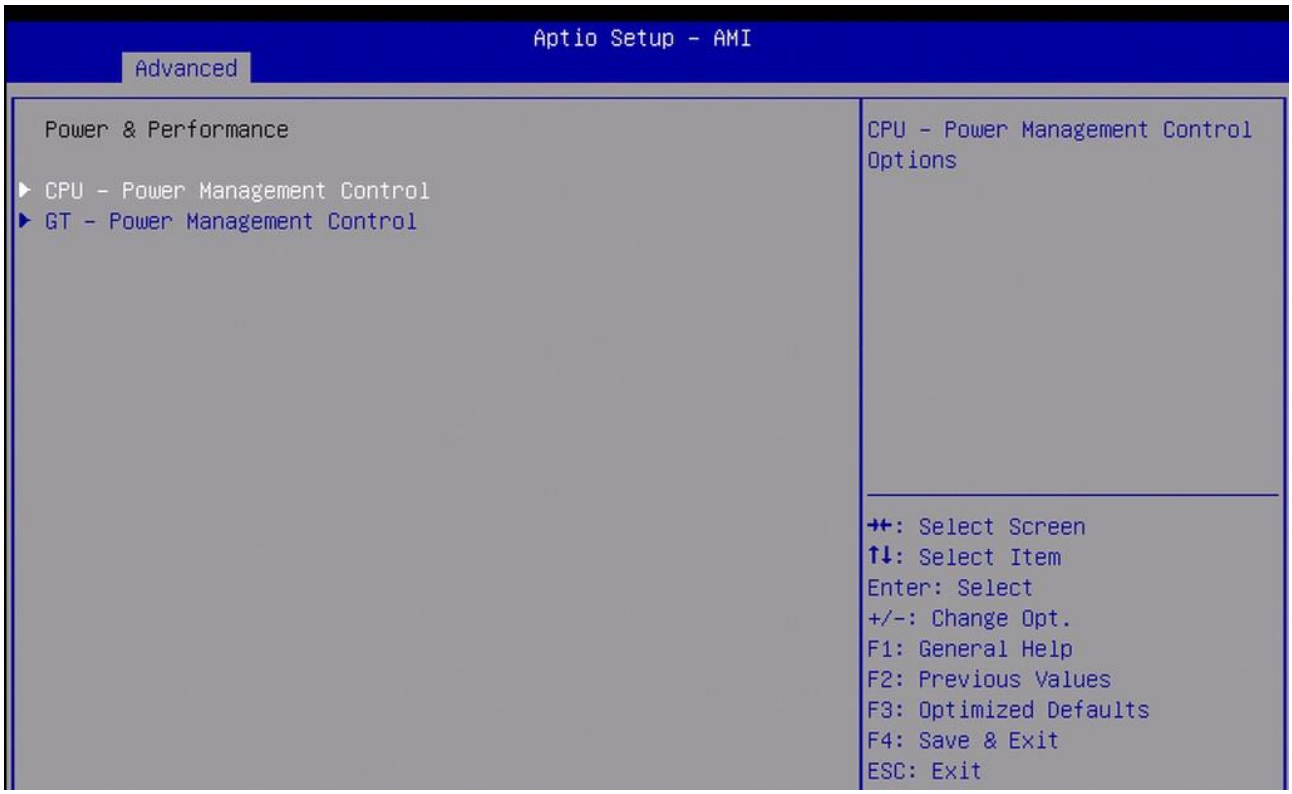
6.4.1.1 Efficient-core Information



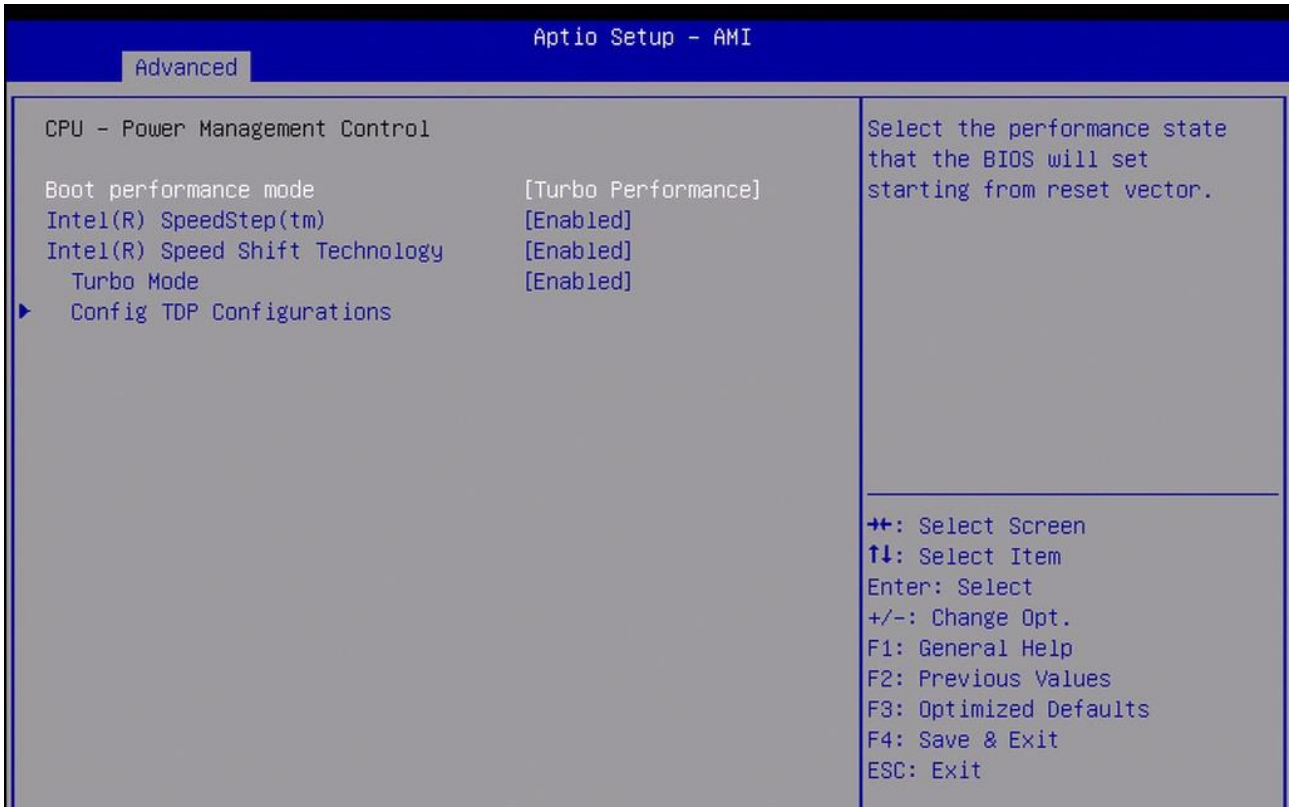
6.4.1.2 Performance-core Information



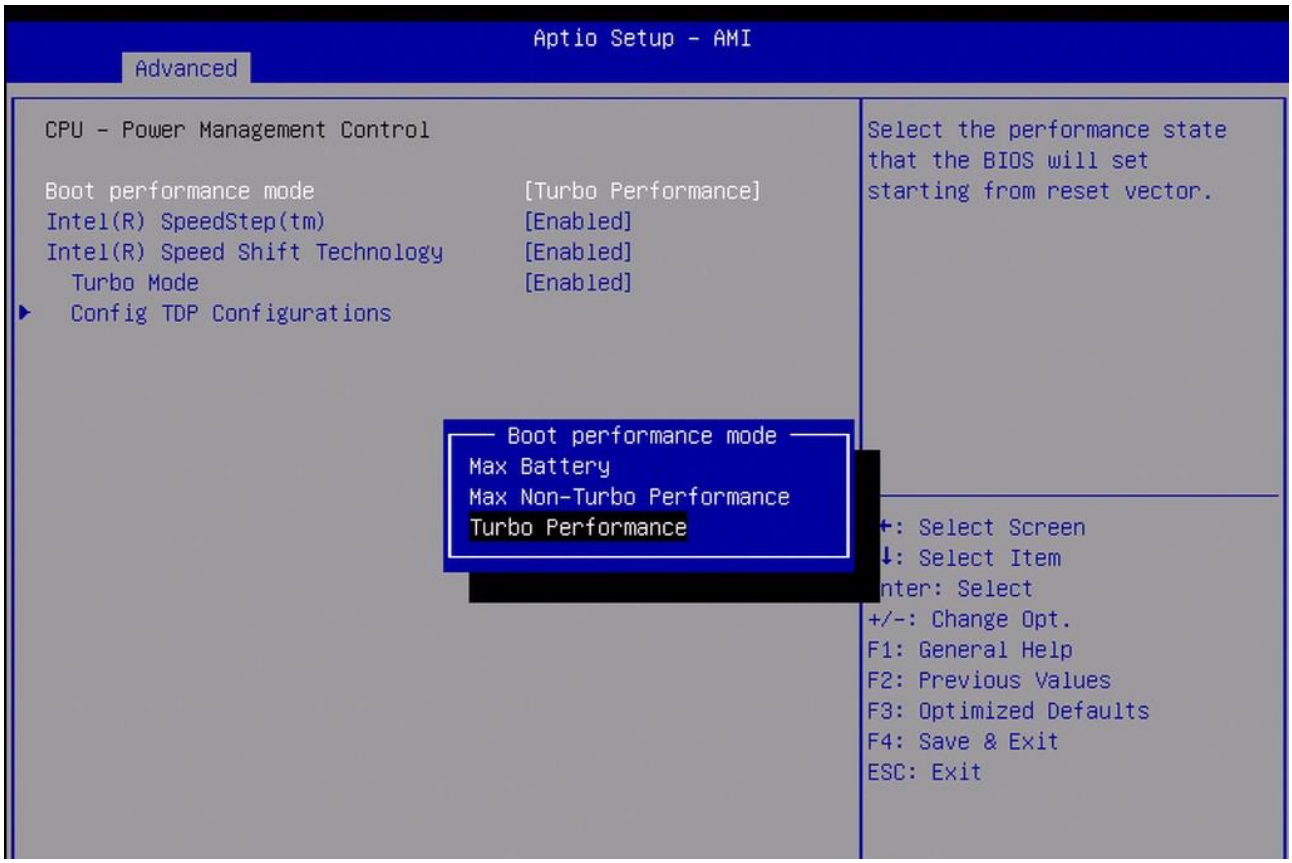
6.4.2 Power & Performance



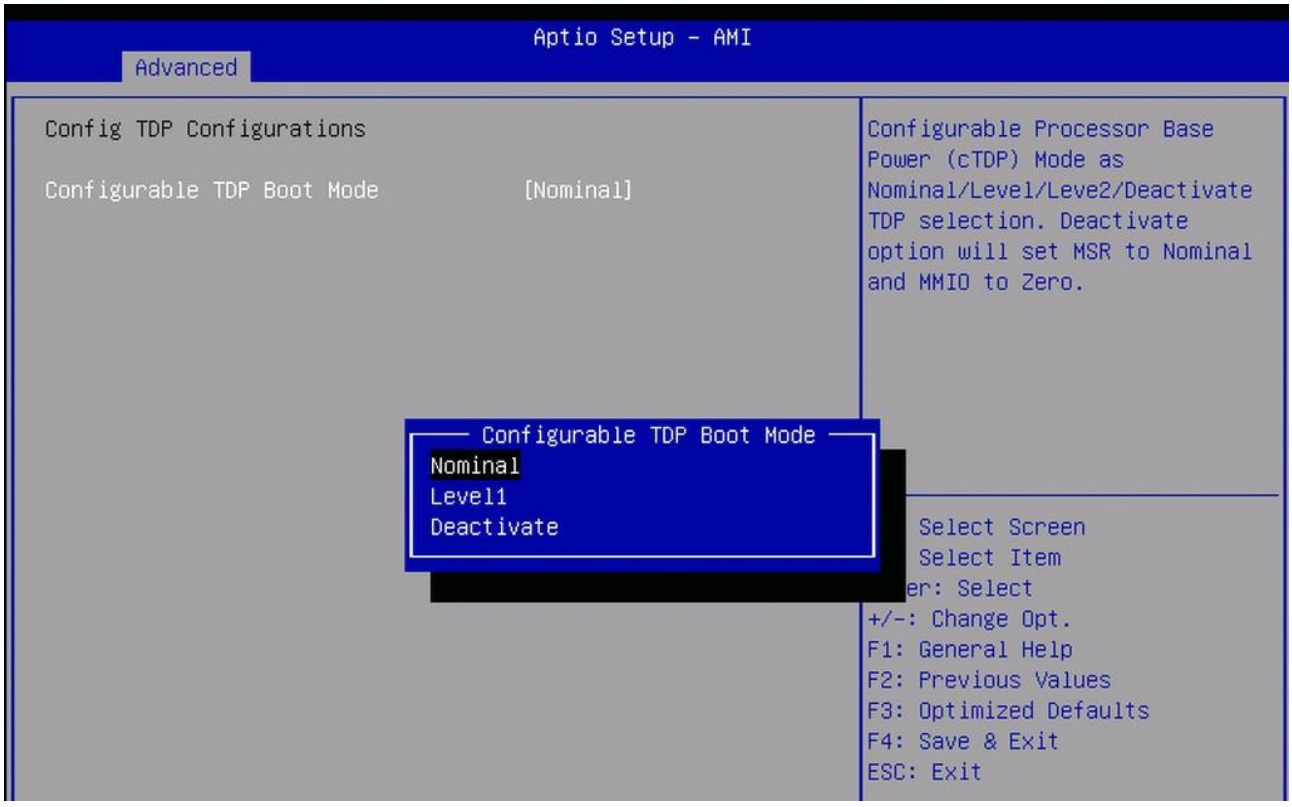
6.4.2.1 CPU-Power Management Control



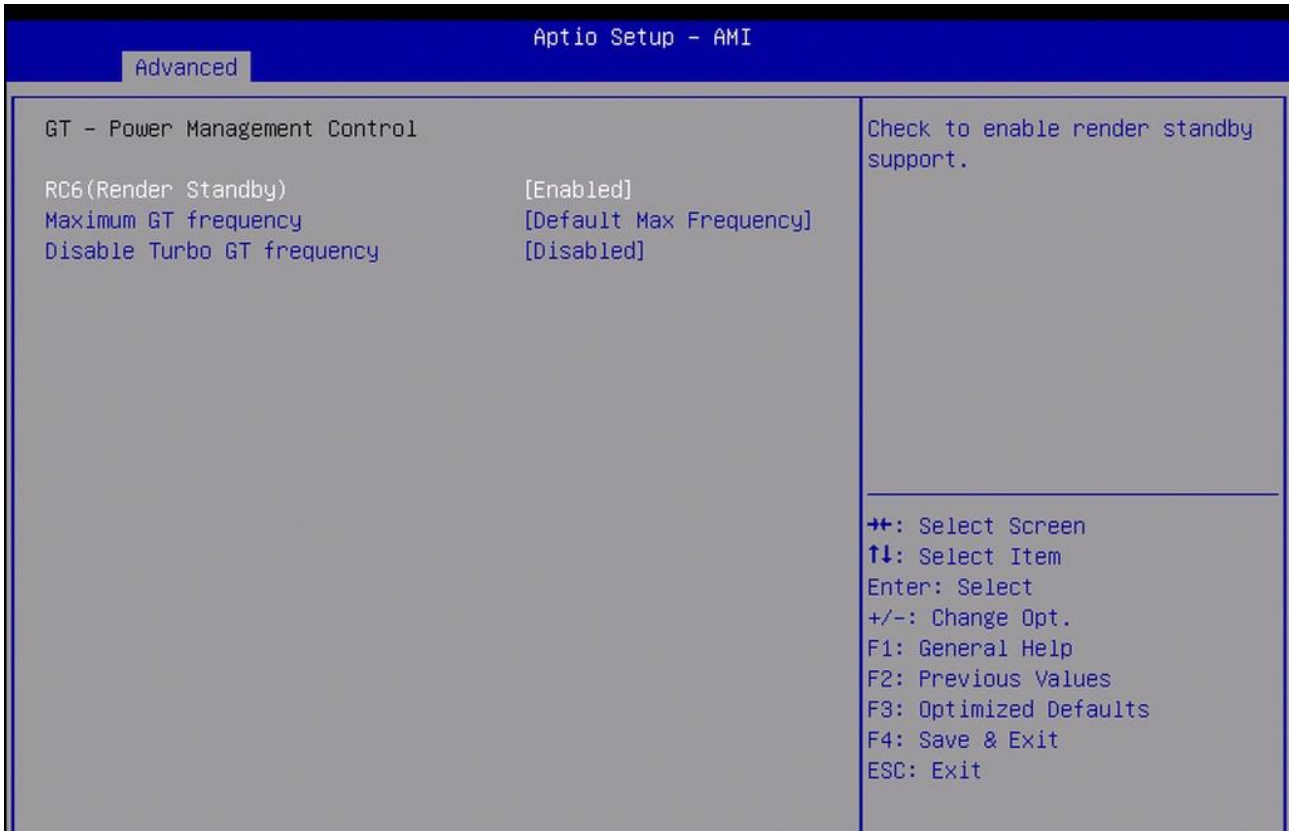
6.4.2.1.1 Boot performance mode



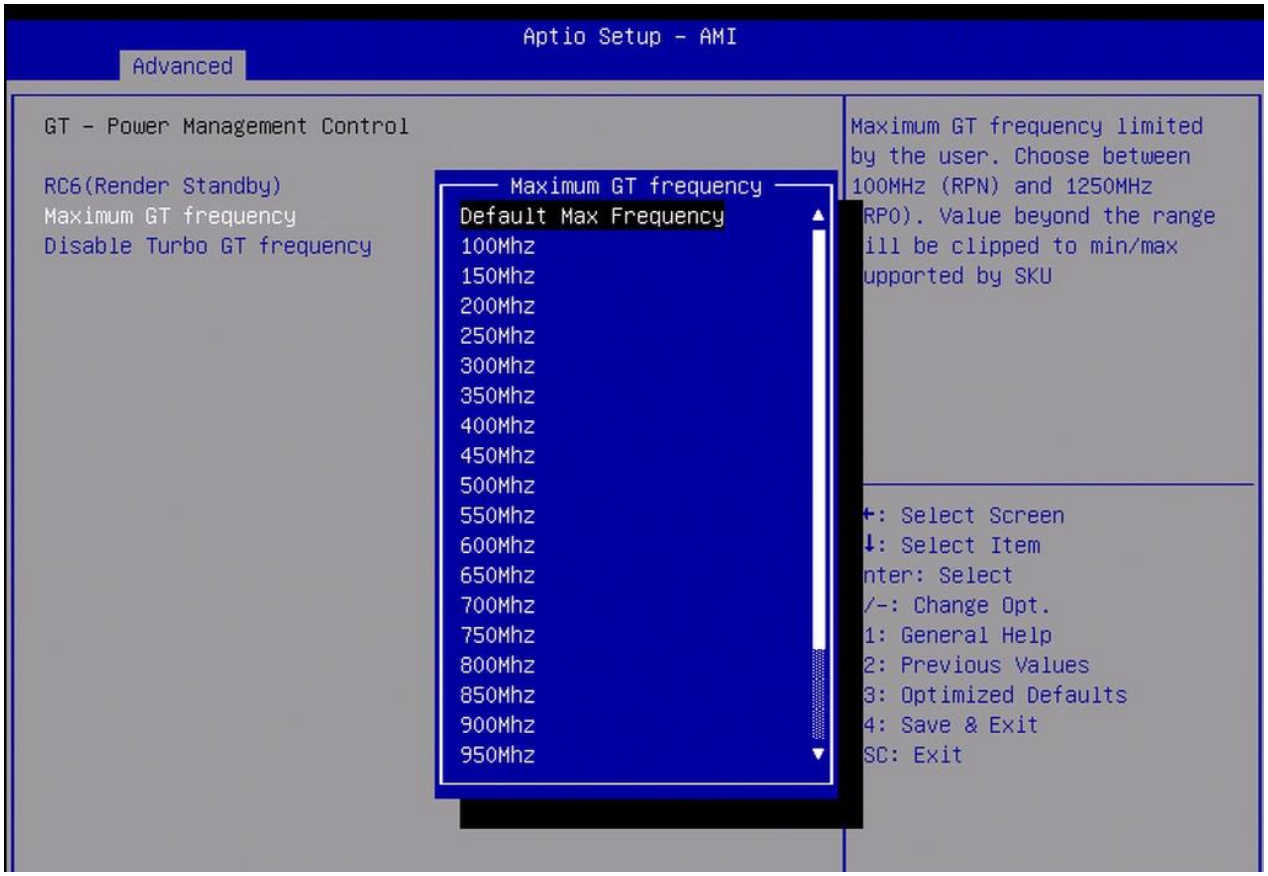
6.4.2.1.2 Config TDP Configurations



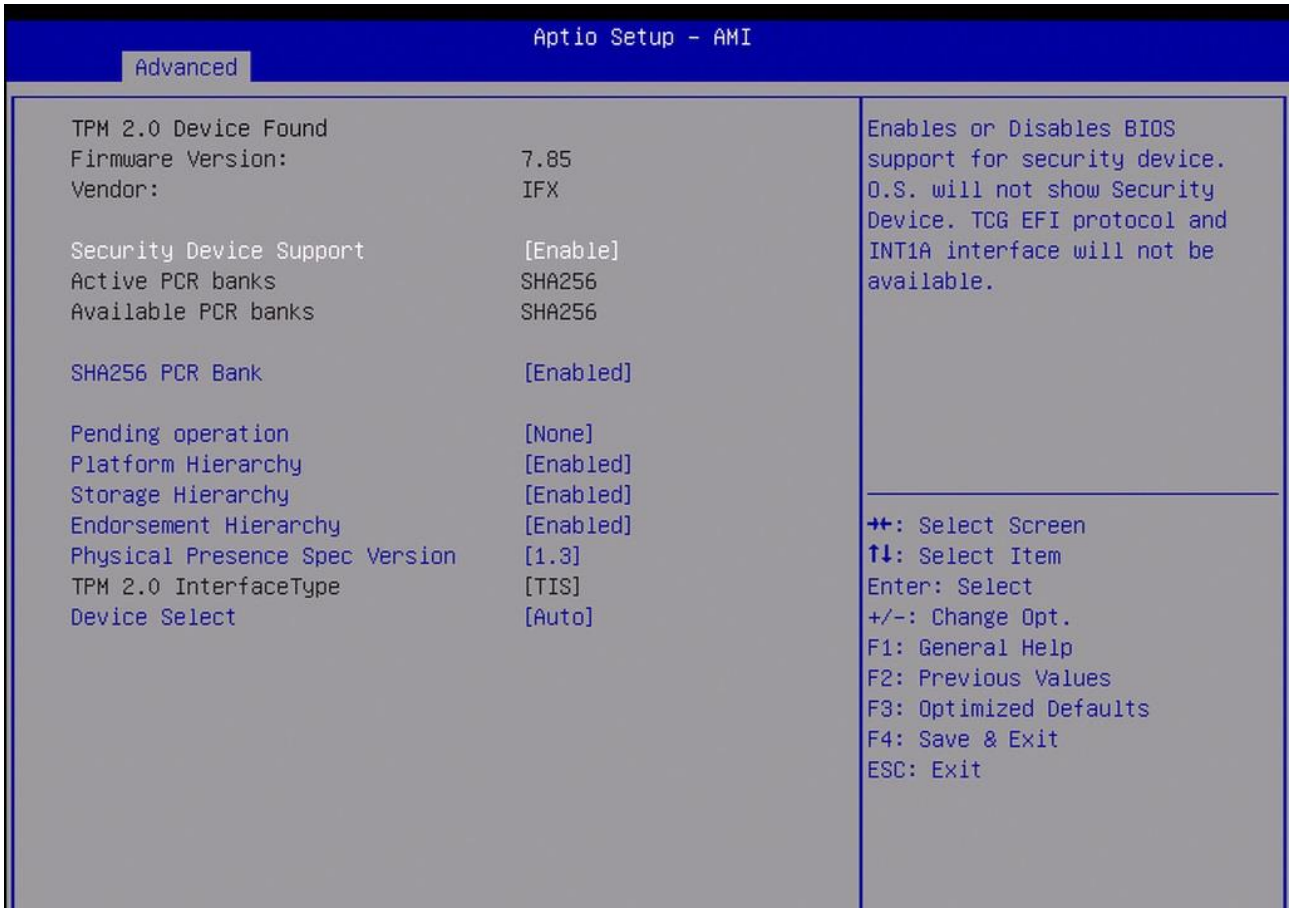
6.4.2.2 GT- Power Management Control



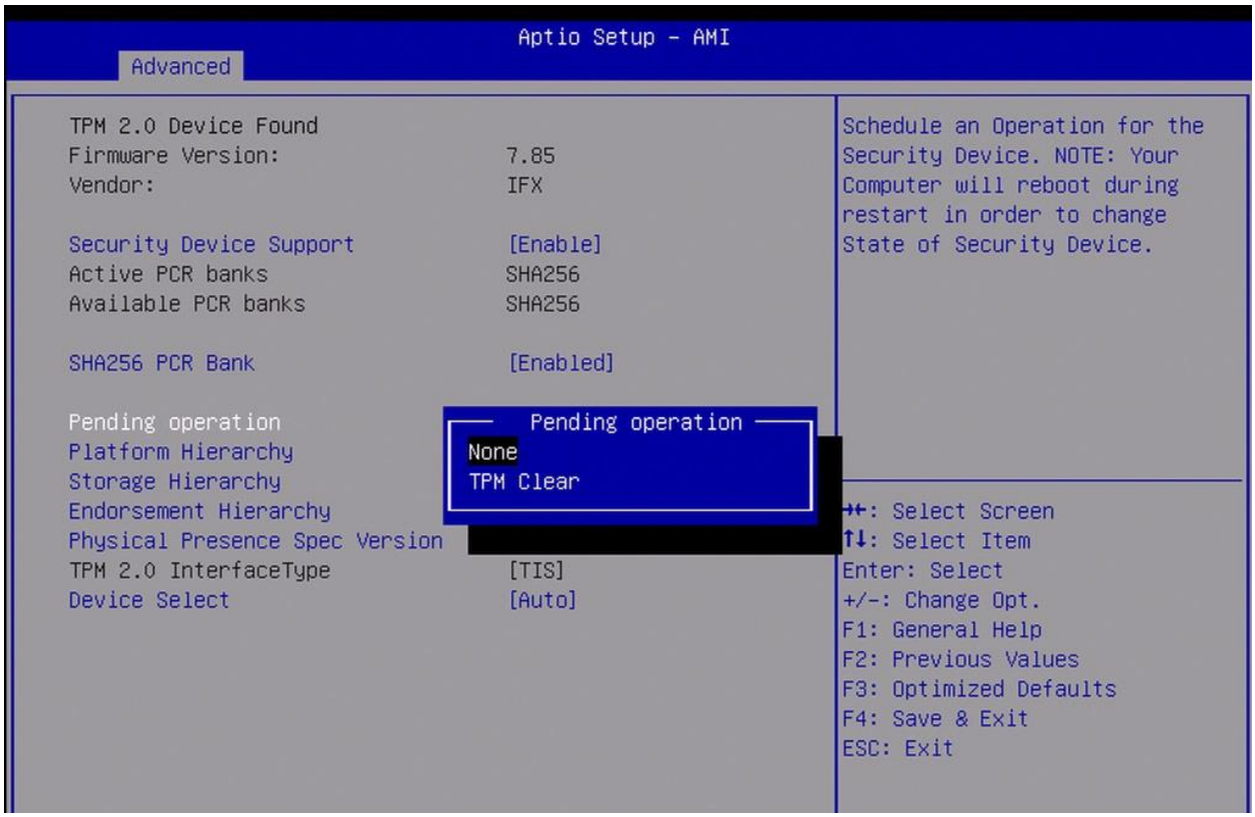
Maximum GT frequency



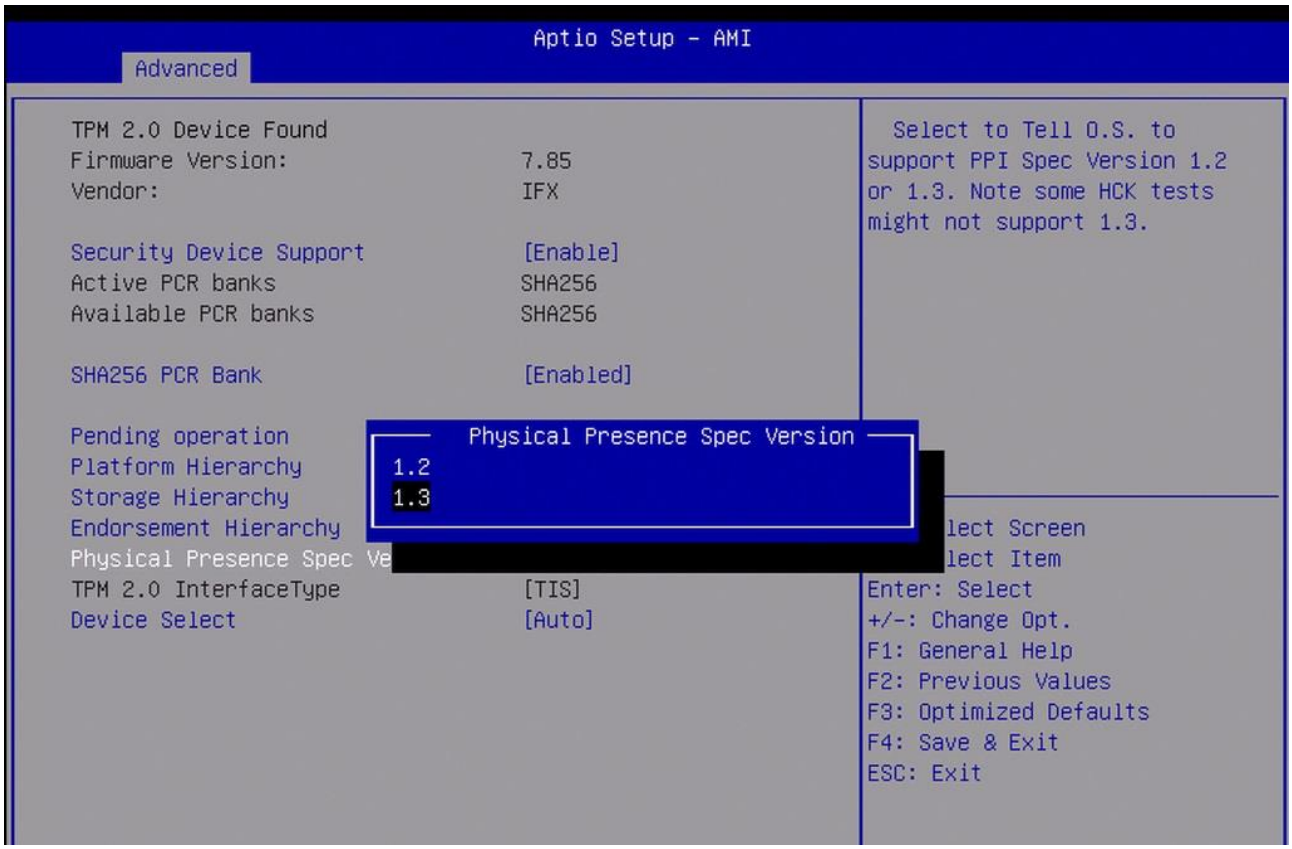
6.4.3 Trusted Computing



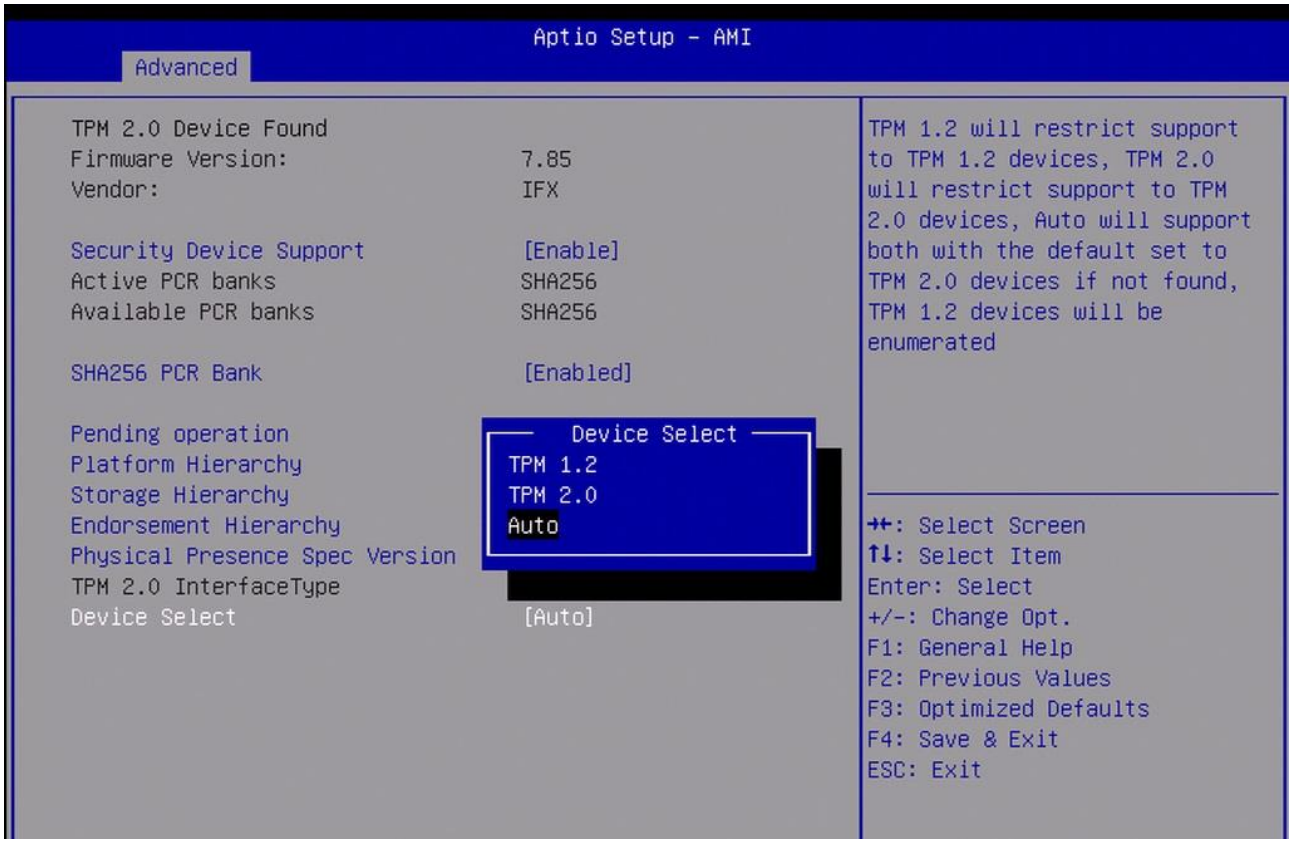
6.4.3.1 Pending operation



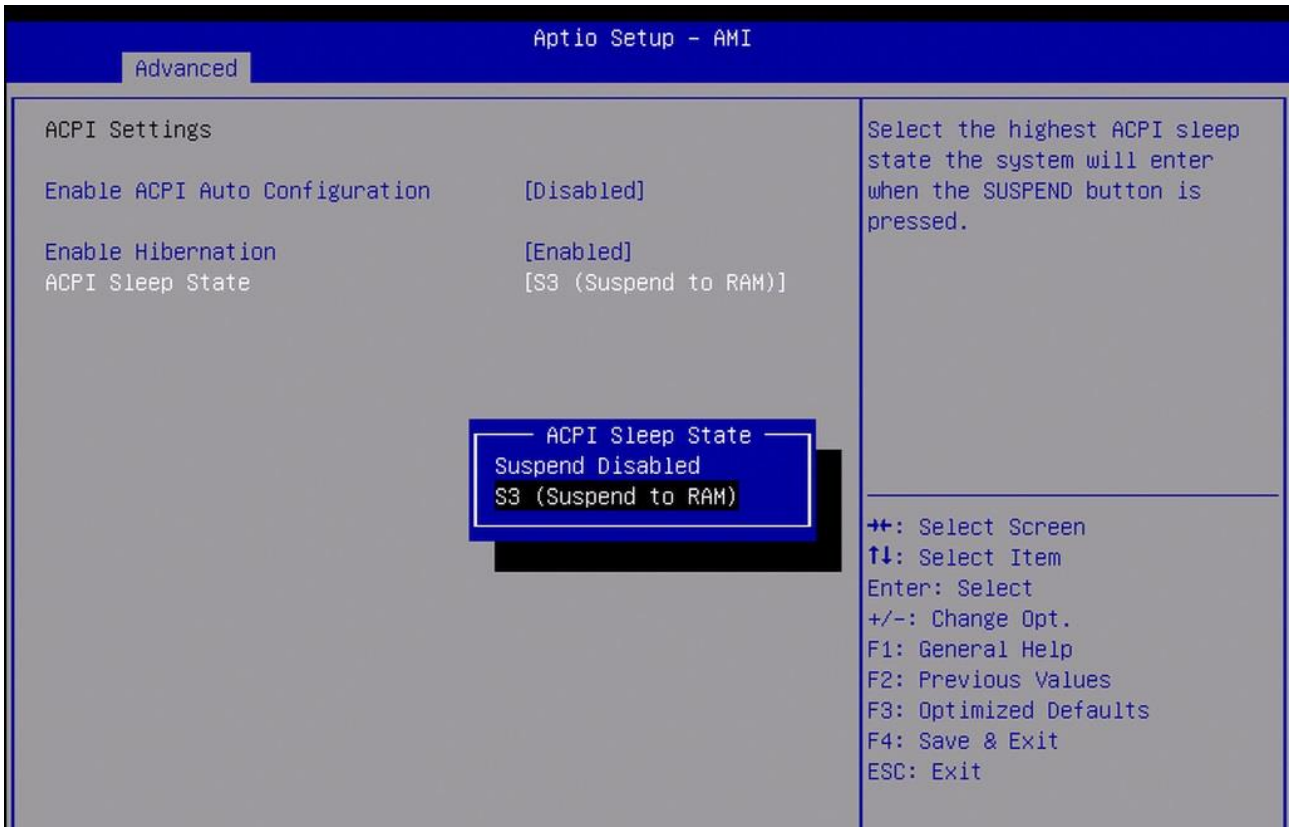
6.4.3.2 Physical Presence Spec Version



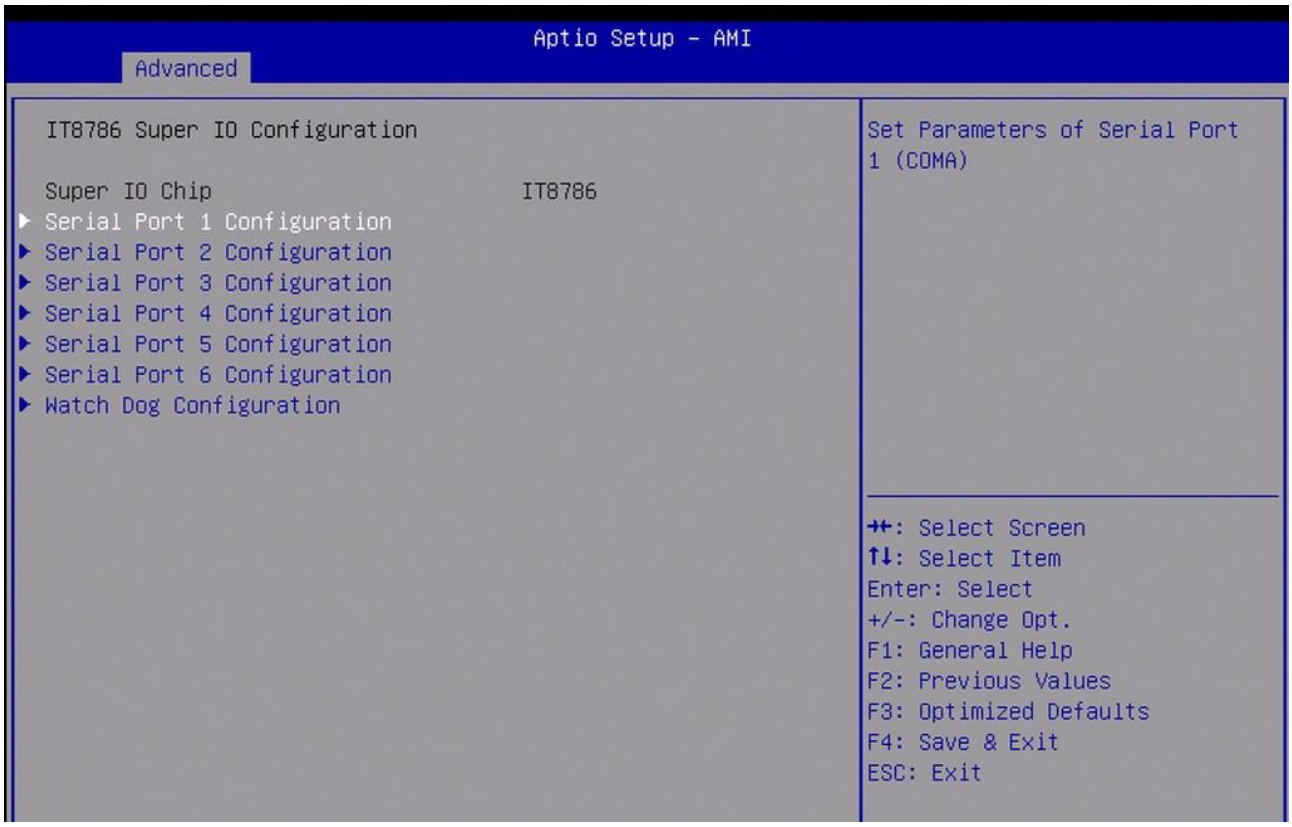
6.4.3.3 Device Select



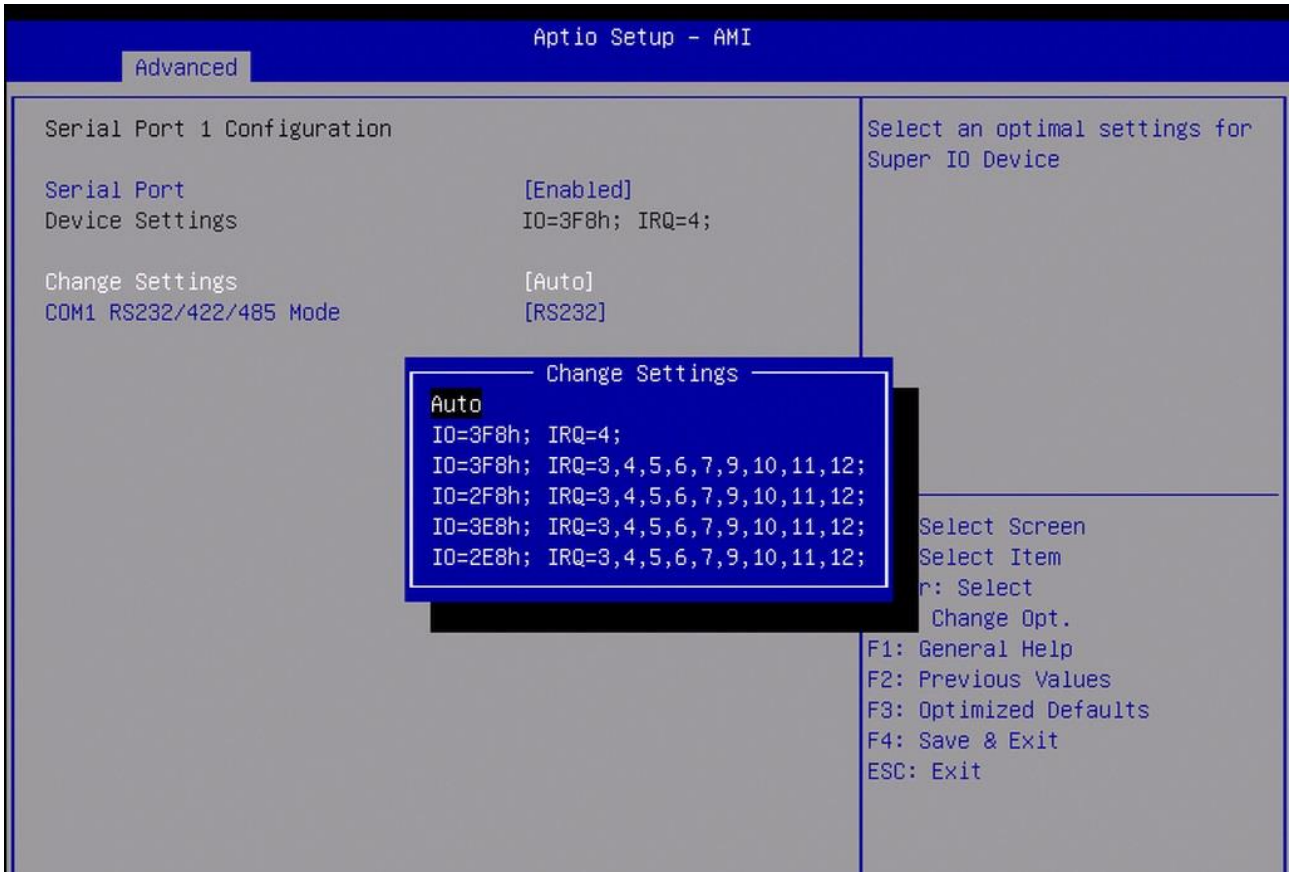
6.4.4 ACPI Settings



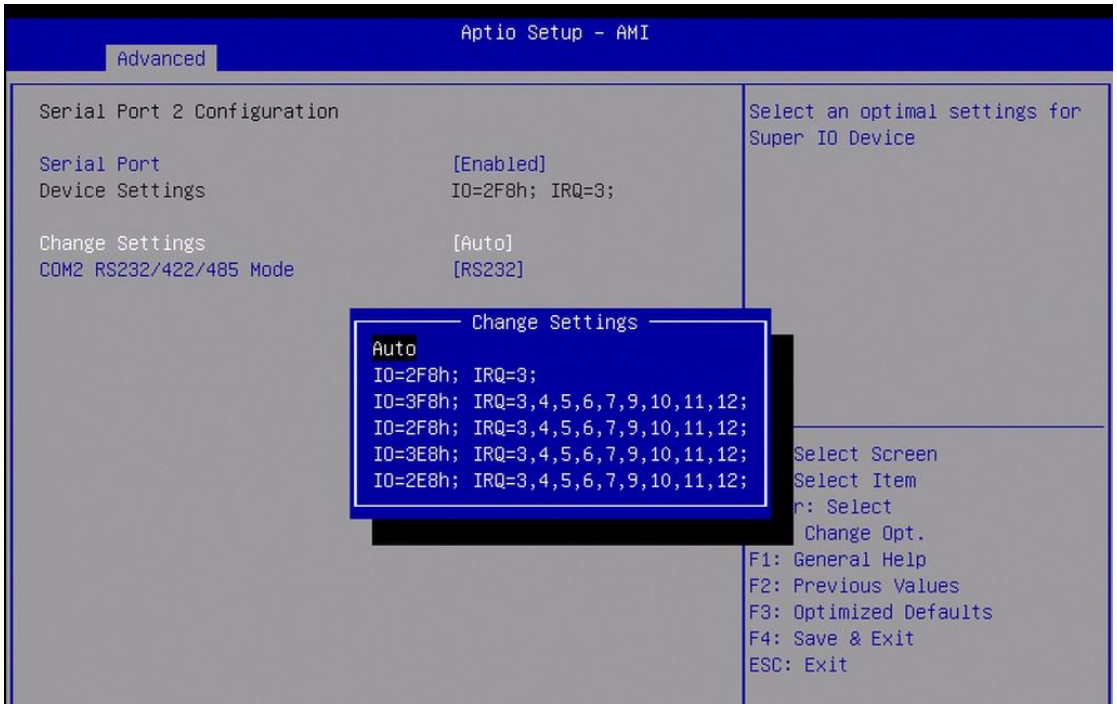
6.4.5 Super IO Configuration

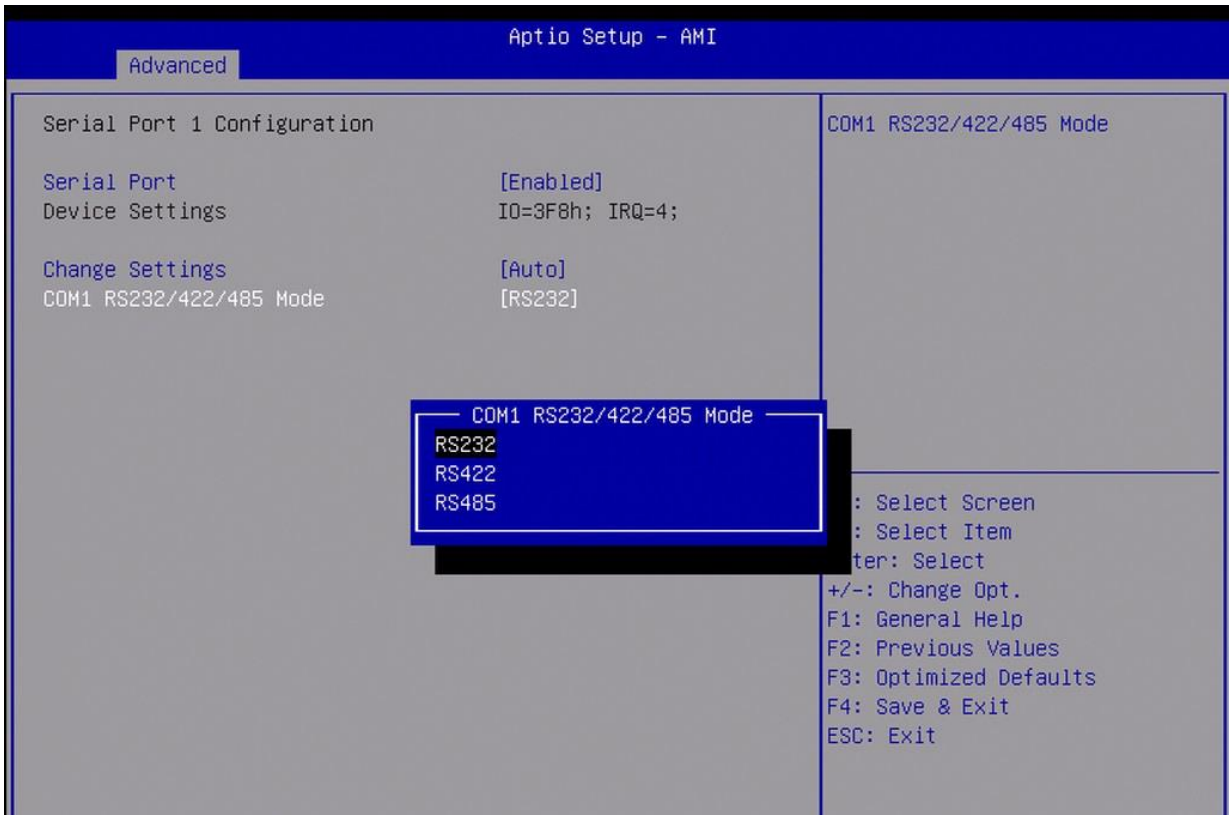


6.4.5.1 Serial Port 1 Configuration



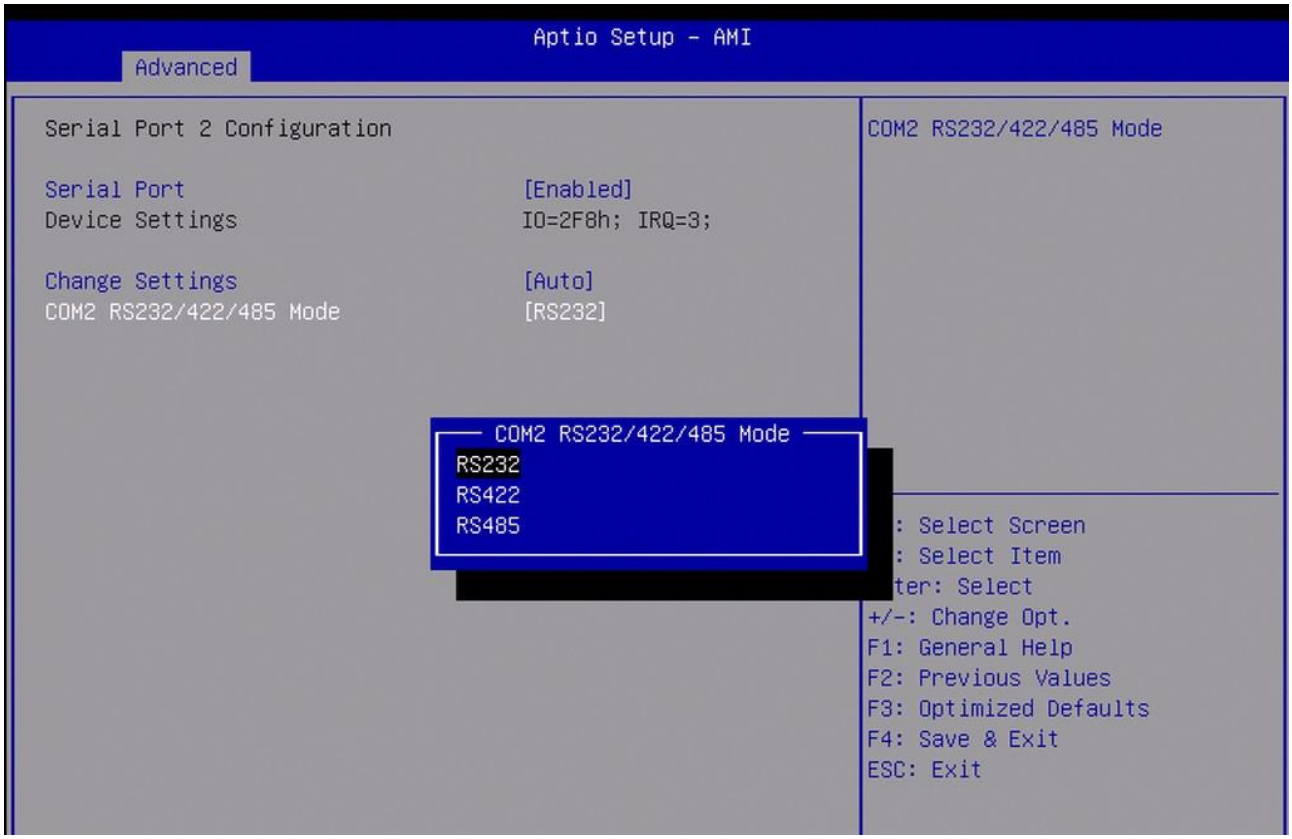
Com1 RS232/422/485 Mode



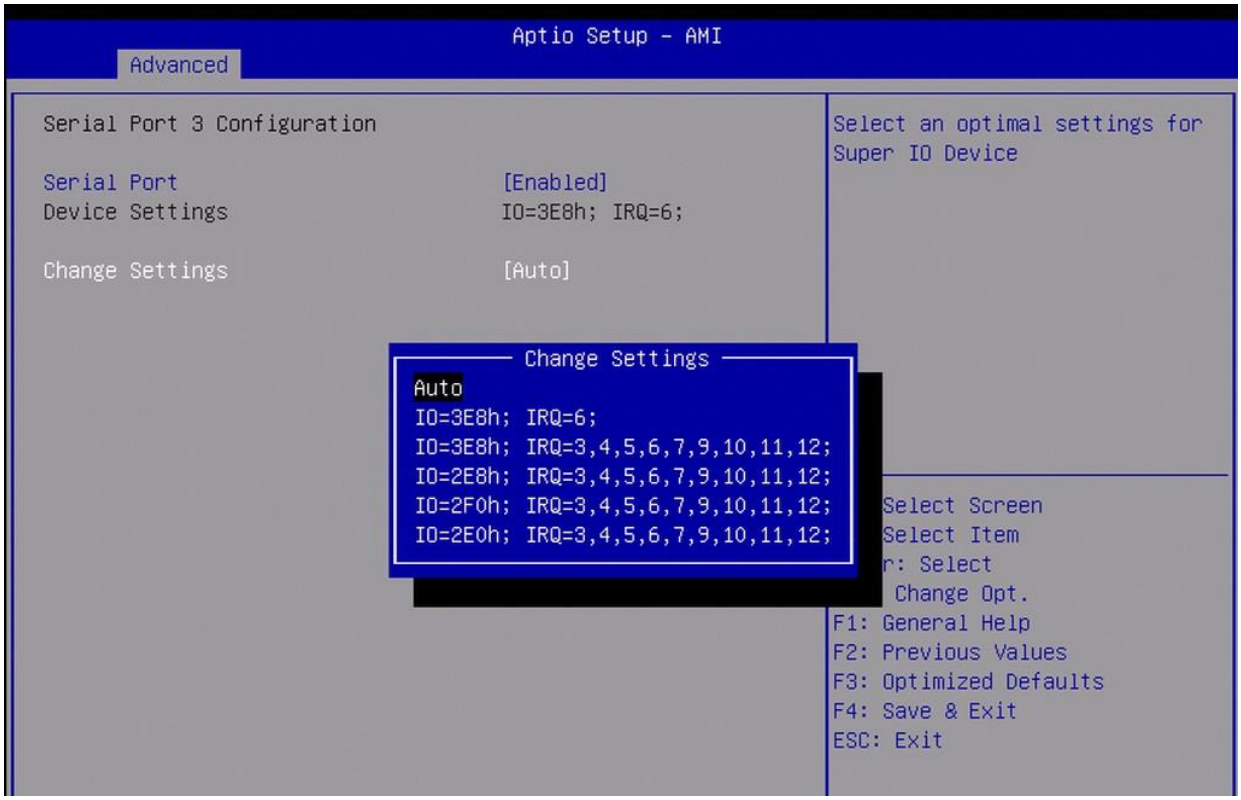


6.4.5.2 Serial Port 2 Configuration

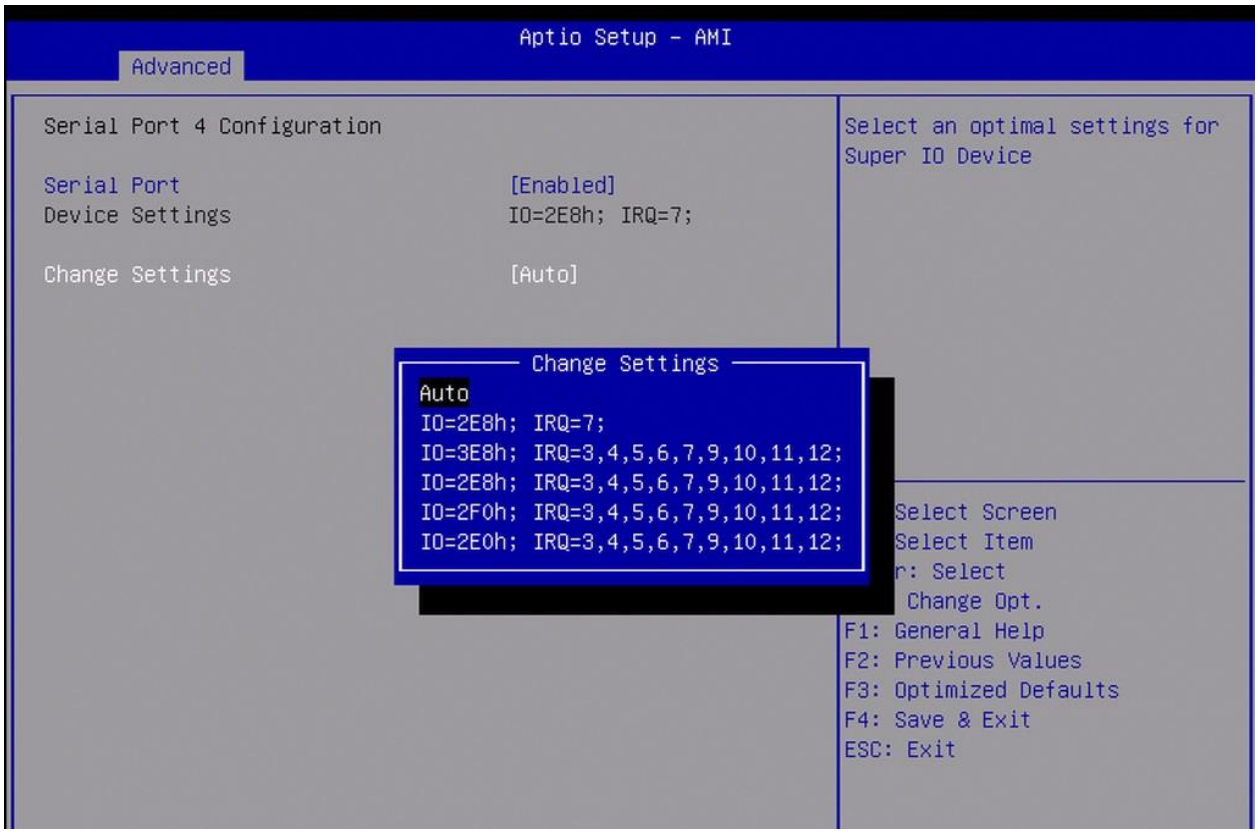
Com2 RS232/422/485 Mode



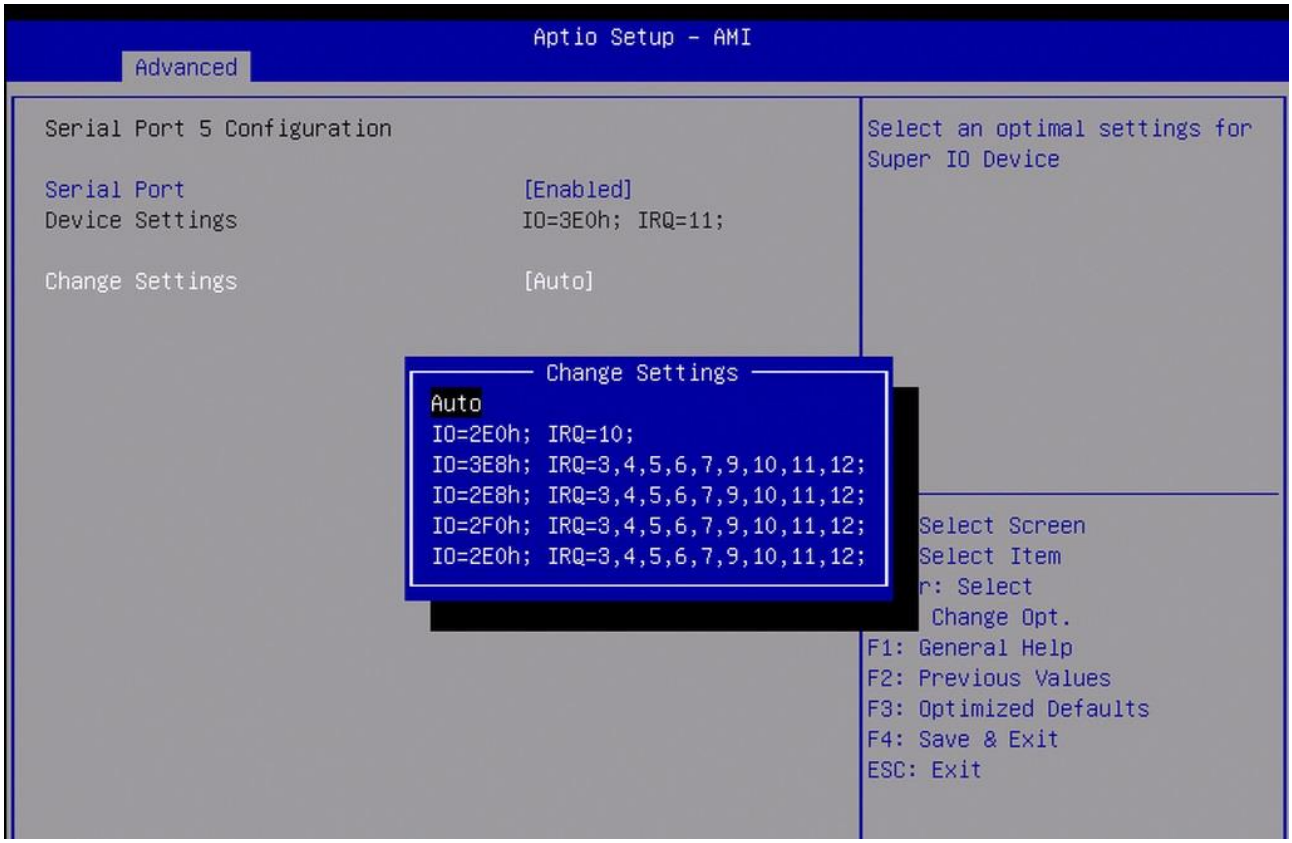
6.4.5.3 Serial Port 3 Configuration



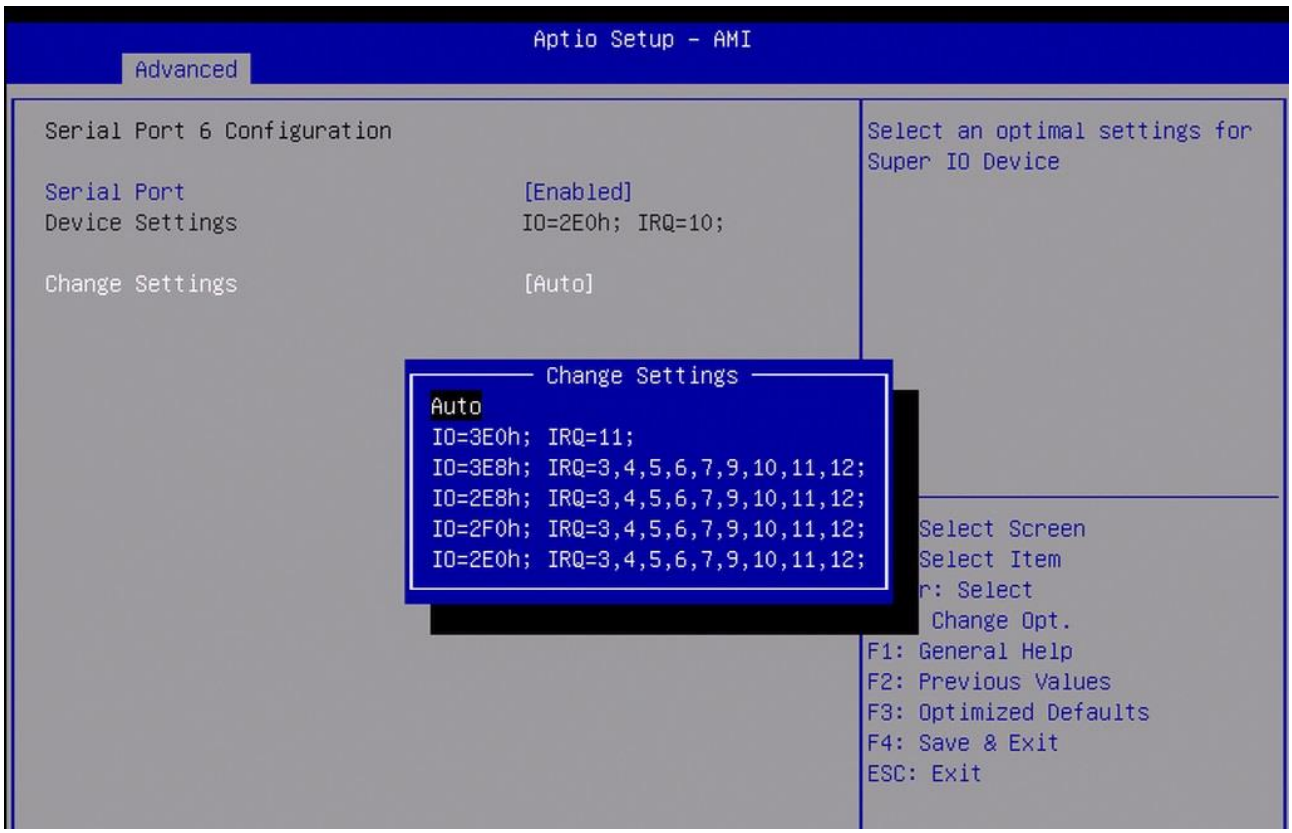
6.4.5.4 Serial Port 4 Configuration



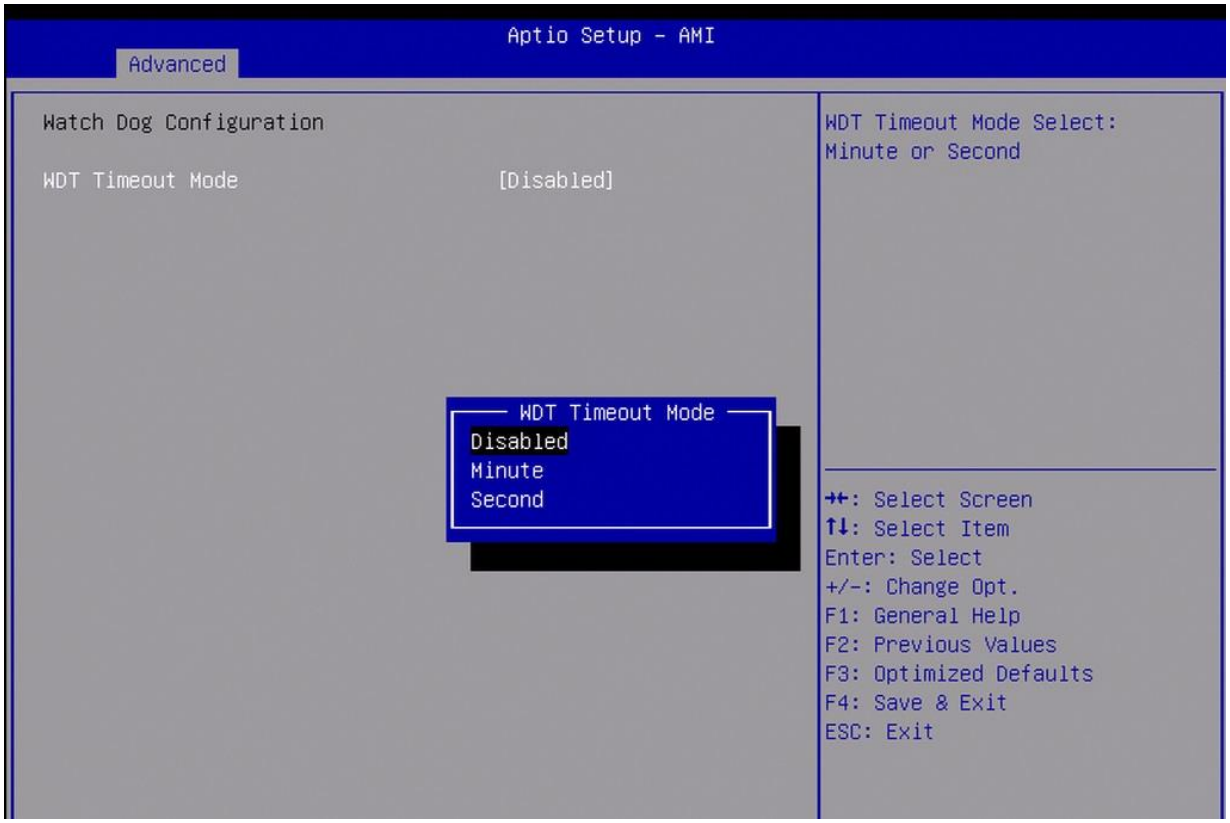
6.4.5.5 Serial Port 5 Configuration



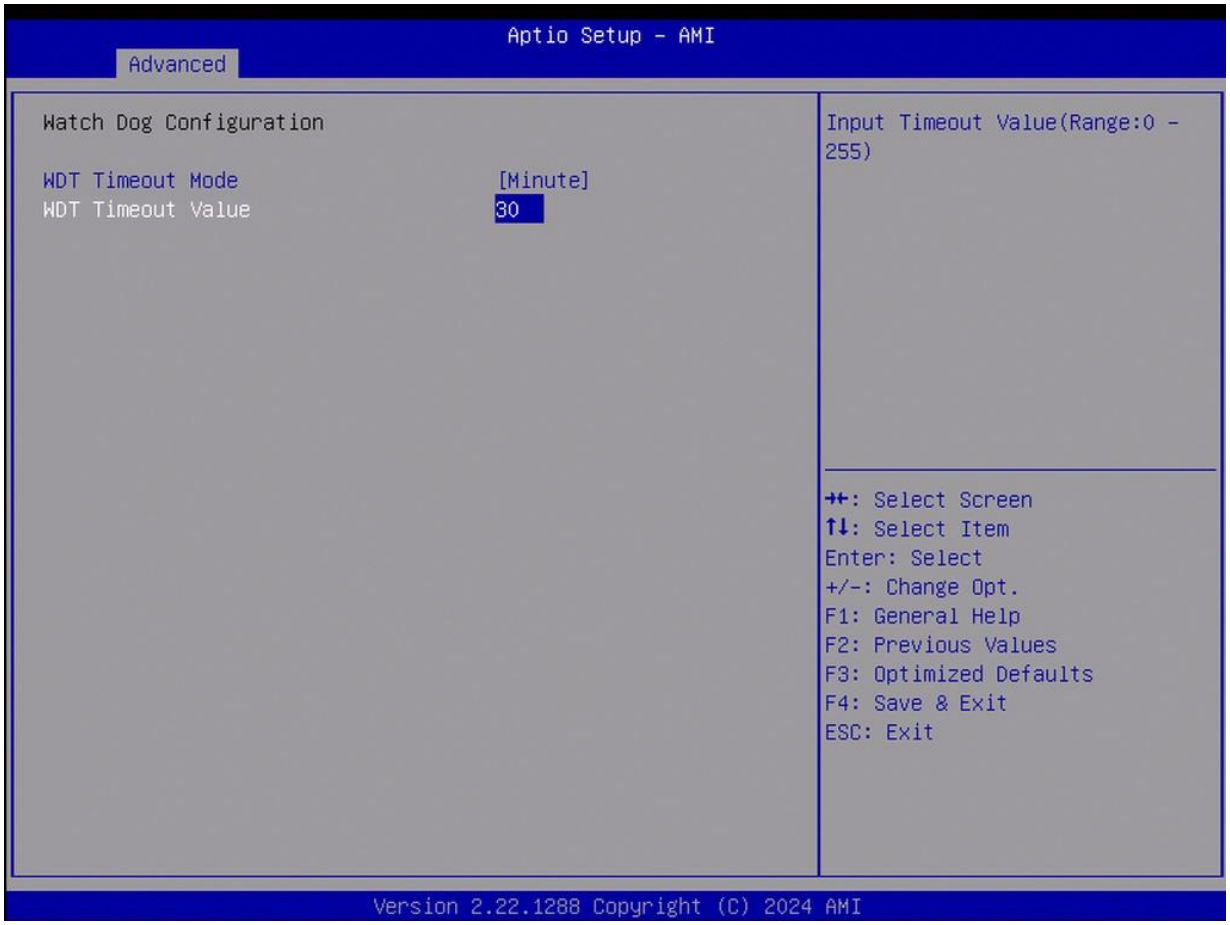
6.4.5.6 Serial Port 6 Configuration



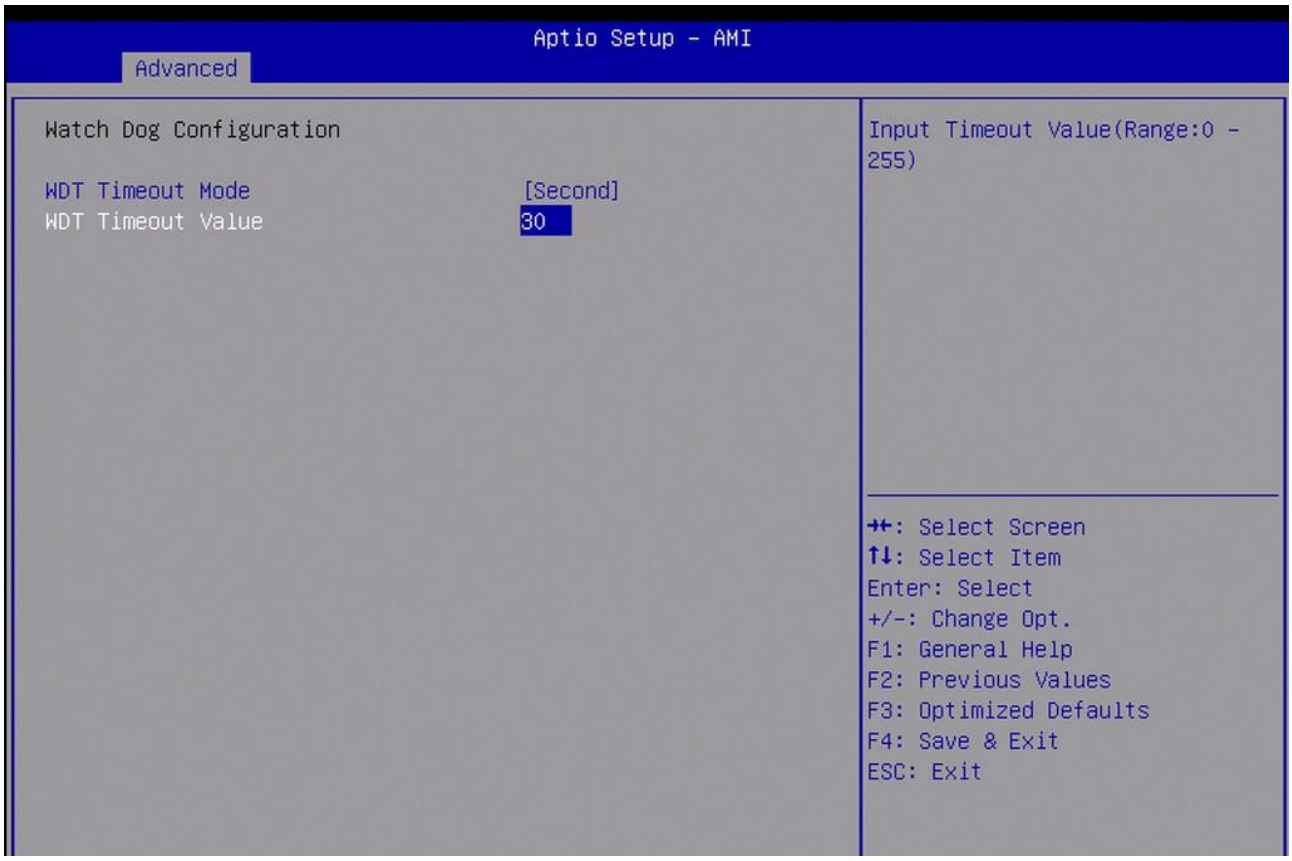
6.4.5.7 Watch Dog Configuration



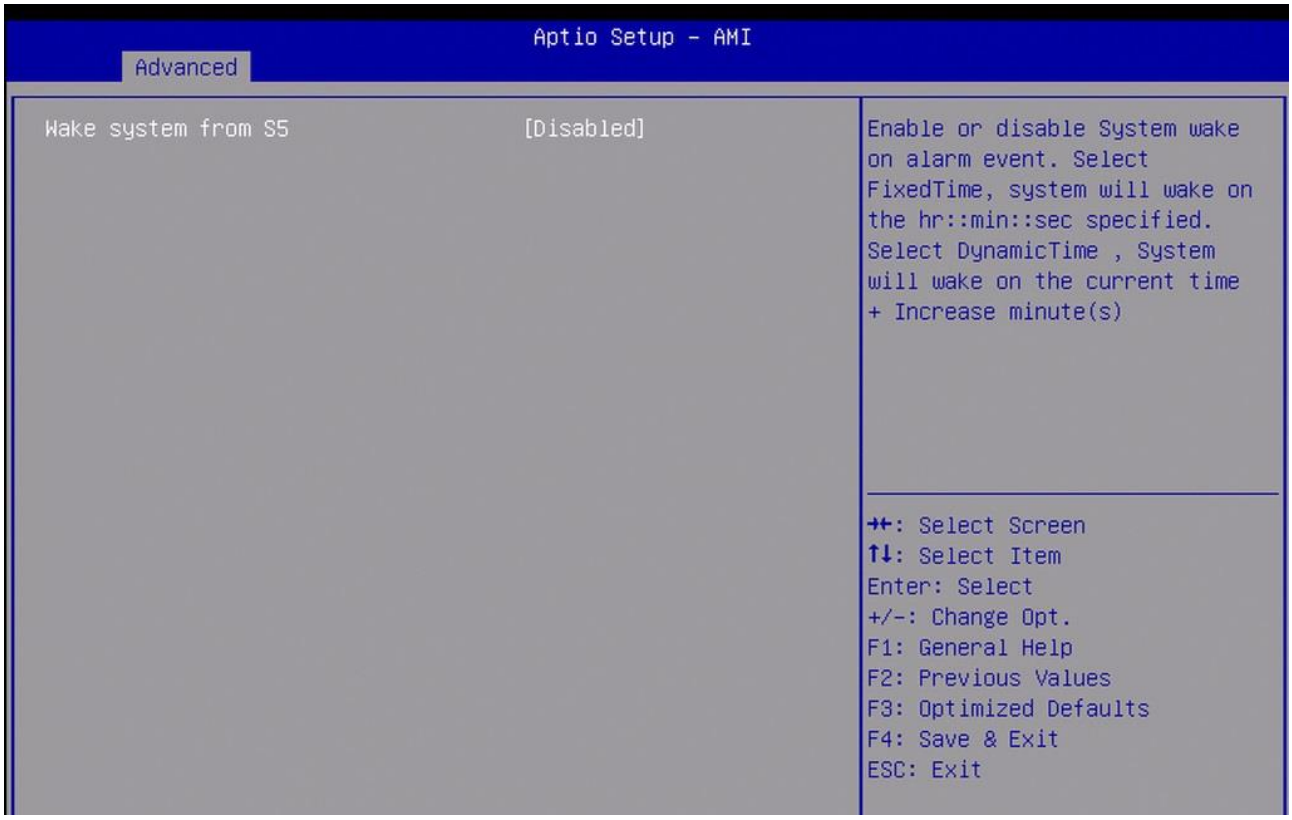
WDT Timeout Value:0~255 Miunte



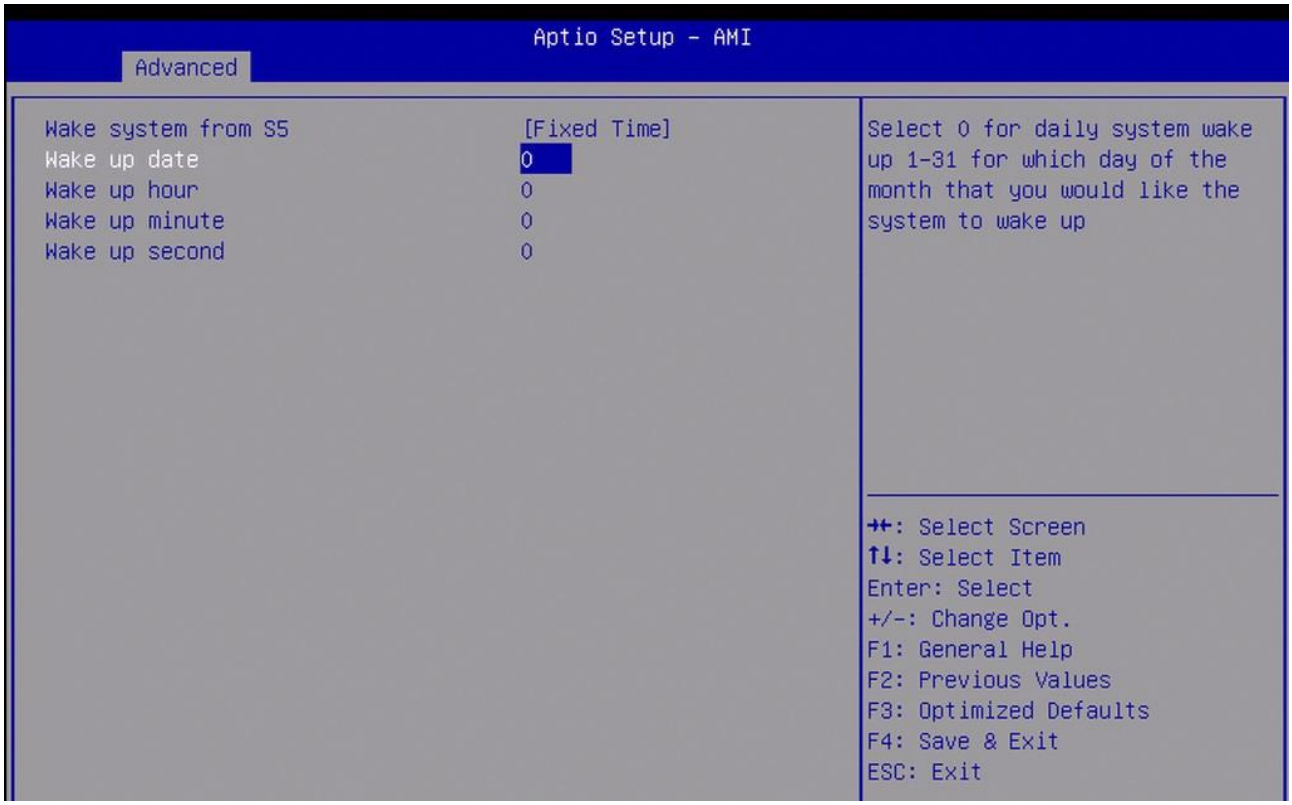
WDT Timeout Value:0~255 Second.



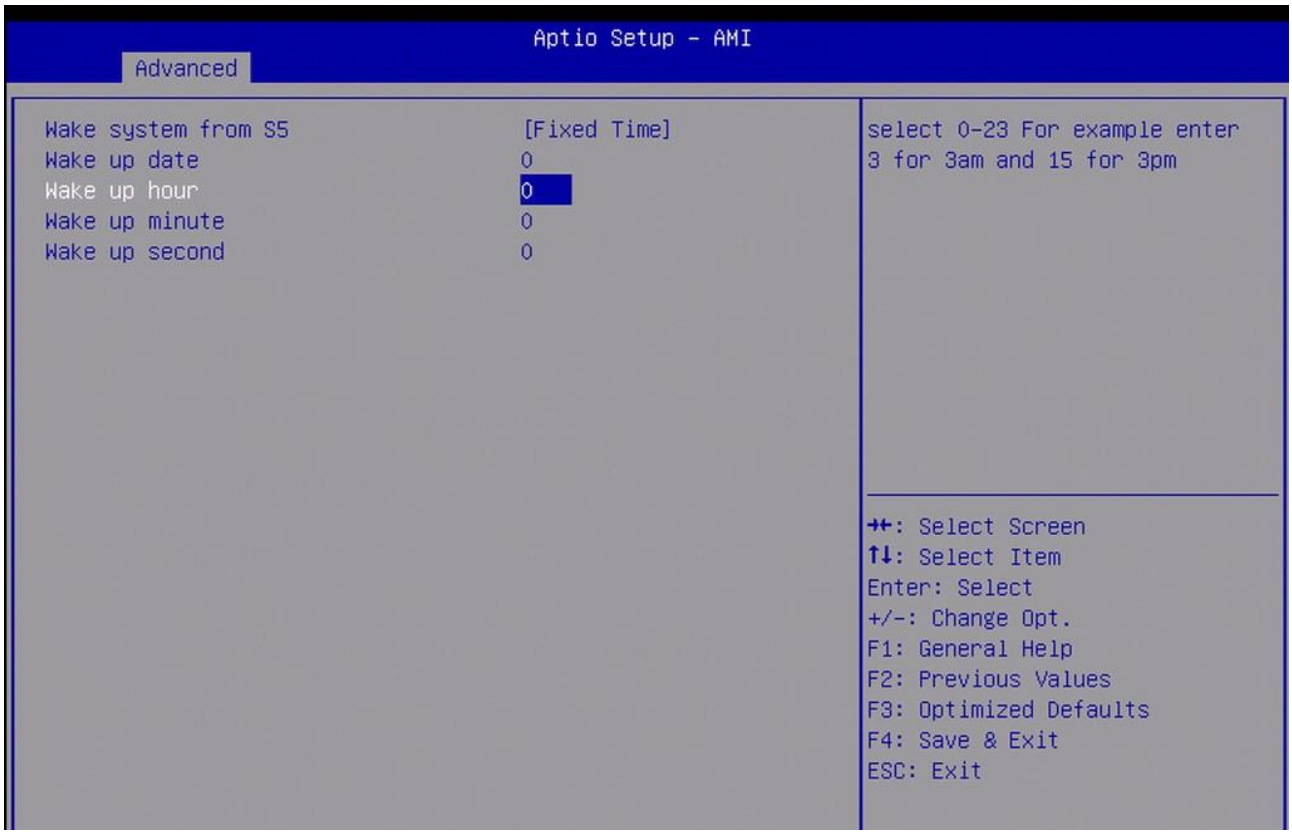
6.4.6 S5 RTC Wake Settings



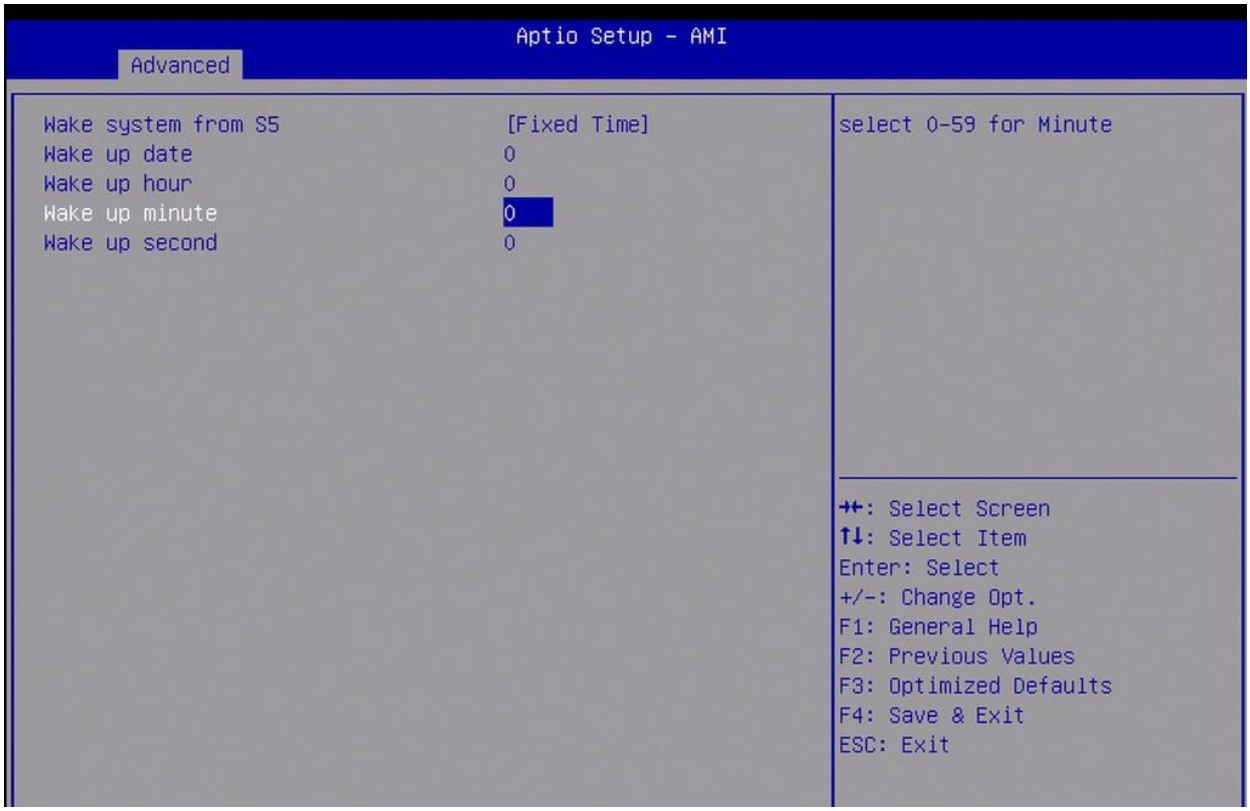
Wake up date: Select 0 for daily system wake up 1-31 for which day of the month that you would like the system to wake up



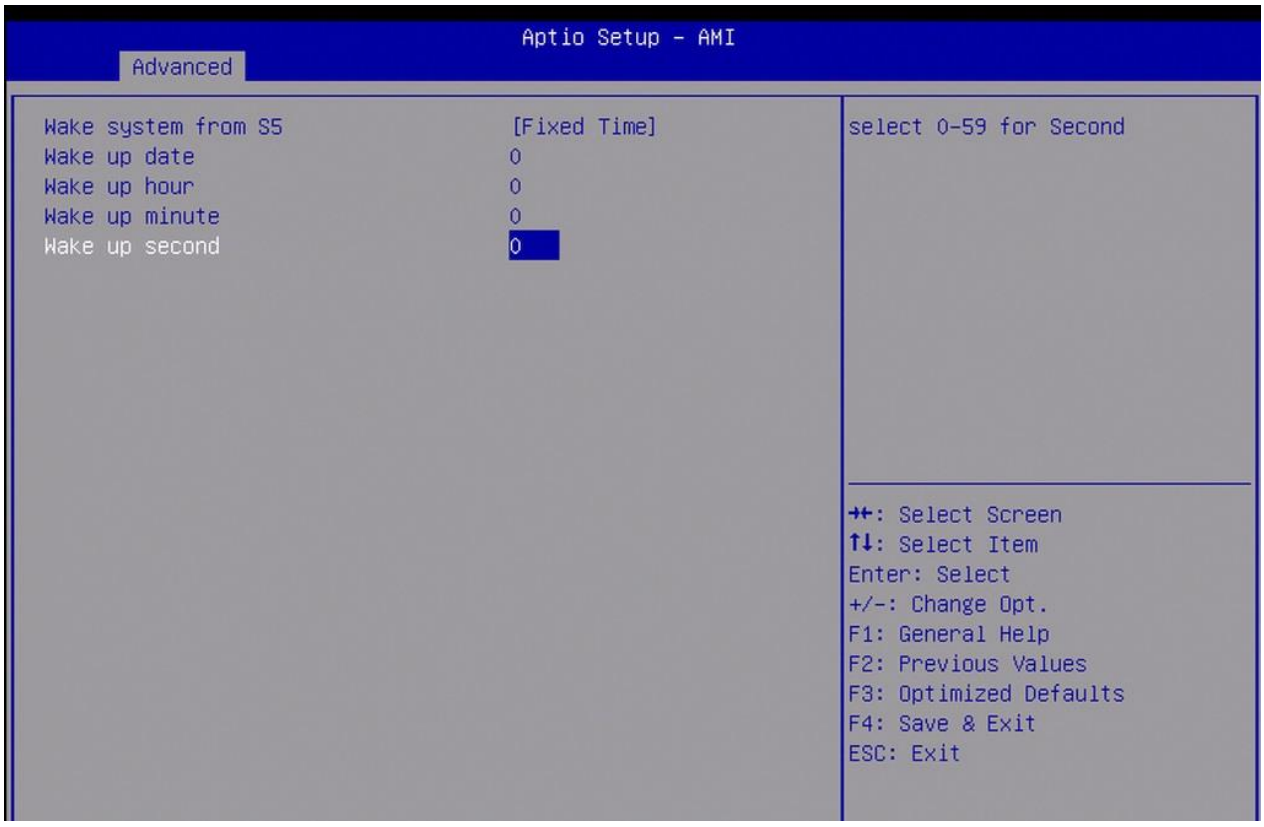
select 0-23 For example enter 3 for 3am and 15 for 3pm



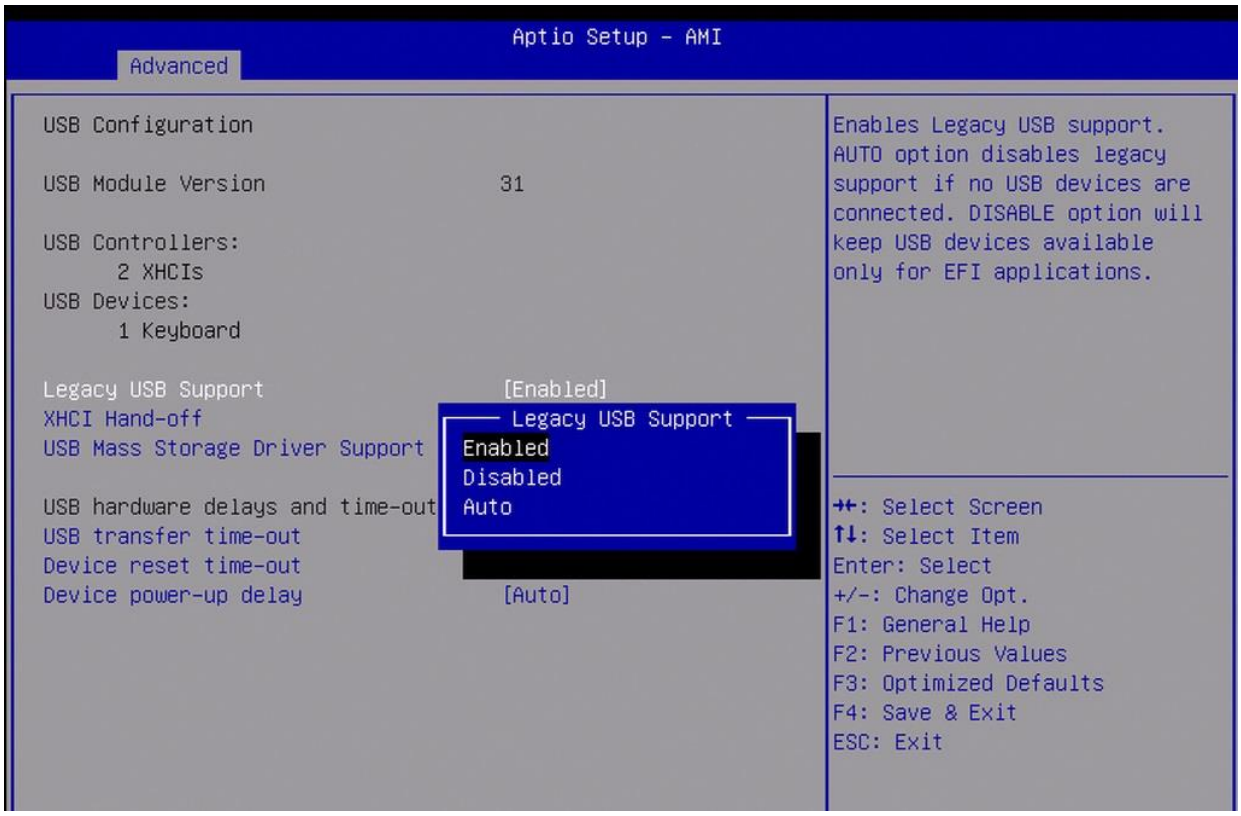
select 0-59 for Minute



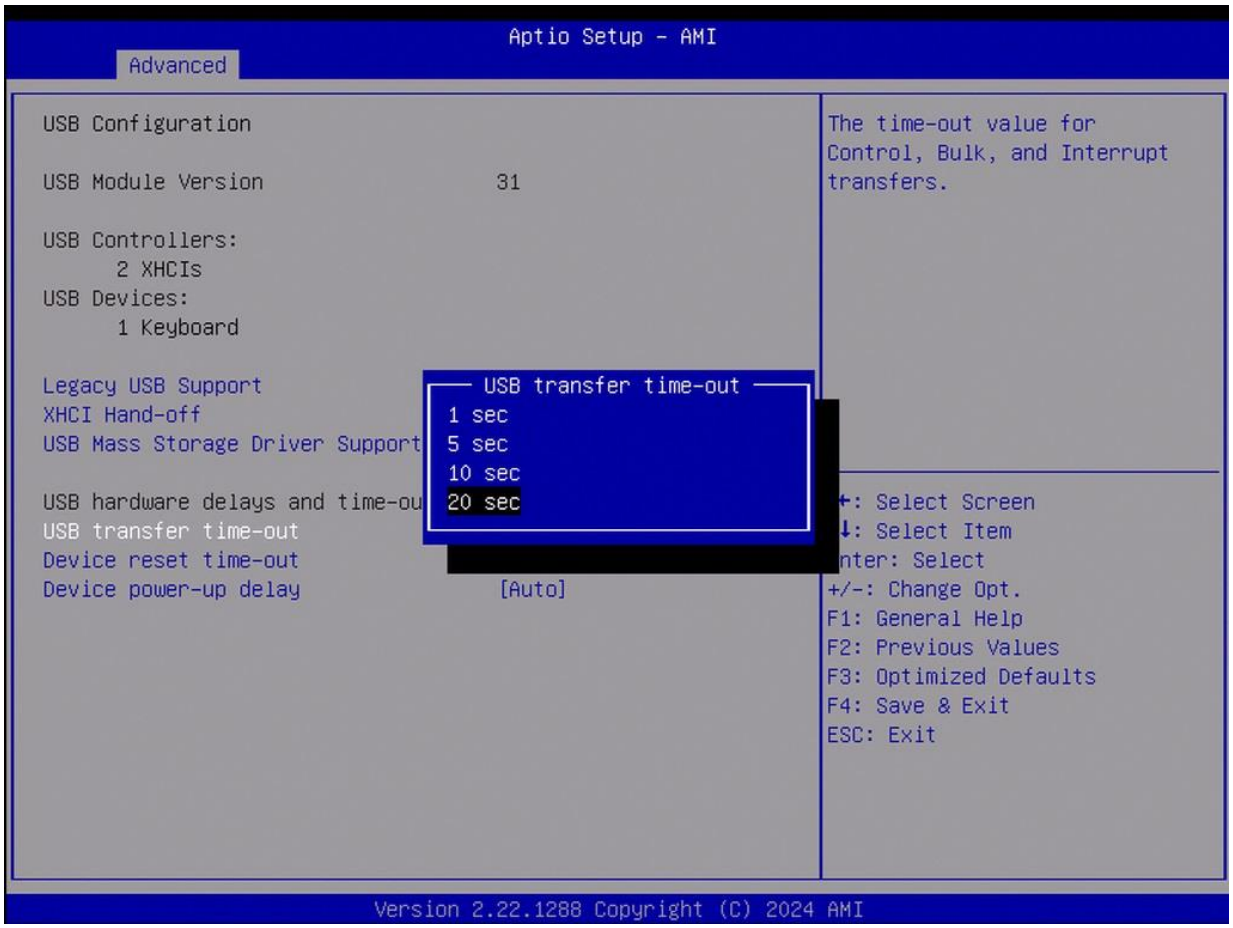
select 0-59 for Second



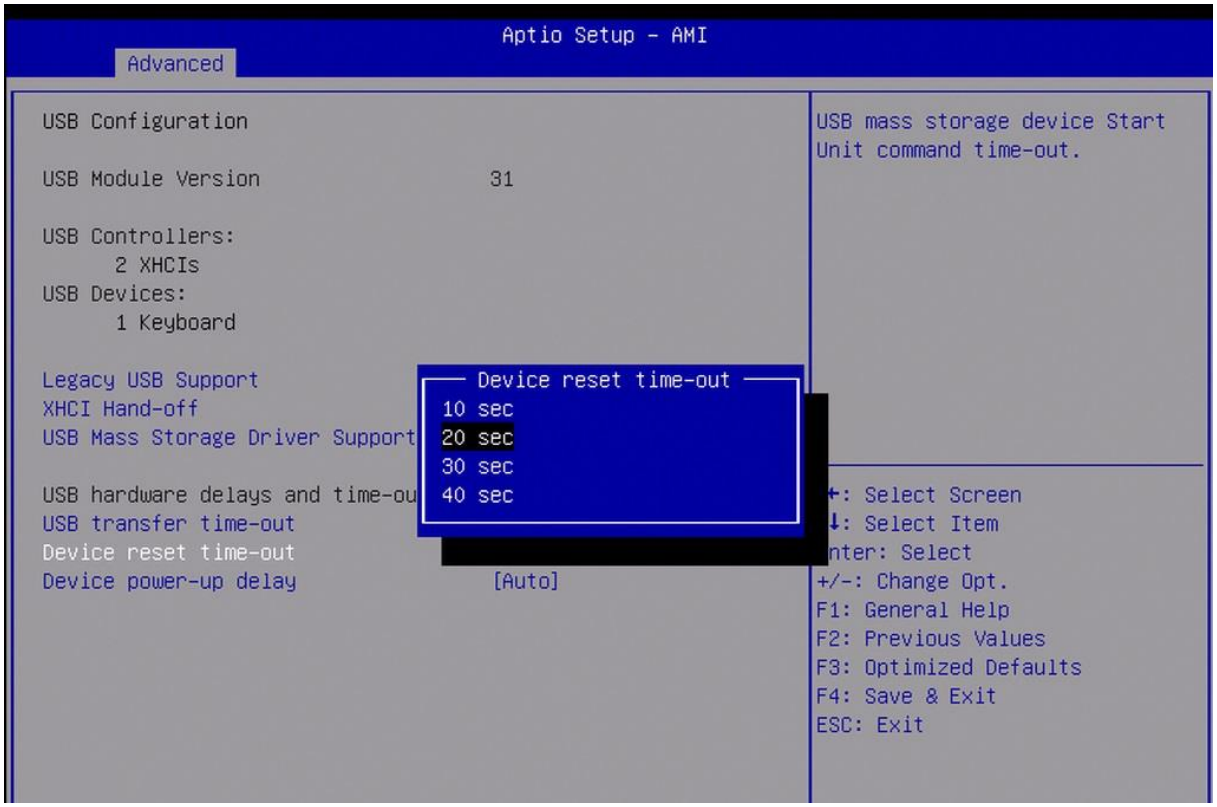
6.4.7 USB Confiruration



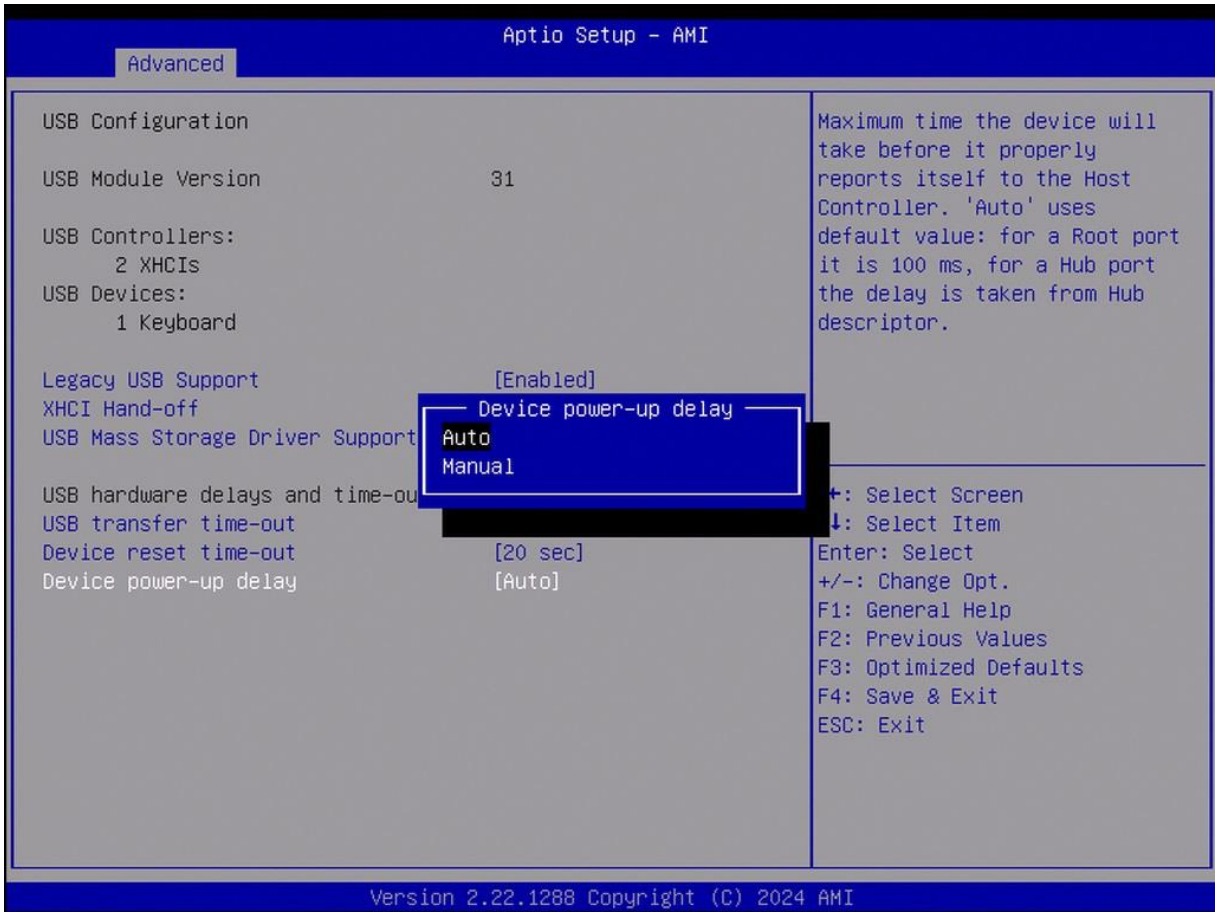
6.4.7.1 USB transfer time-out



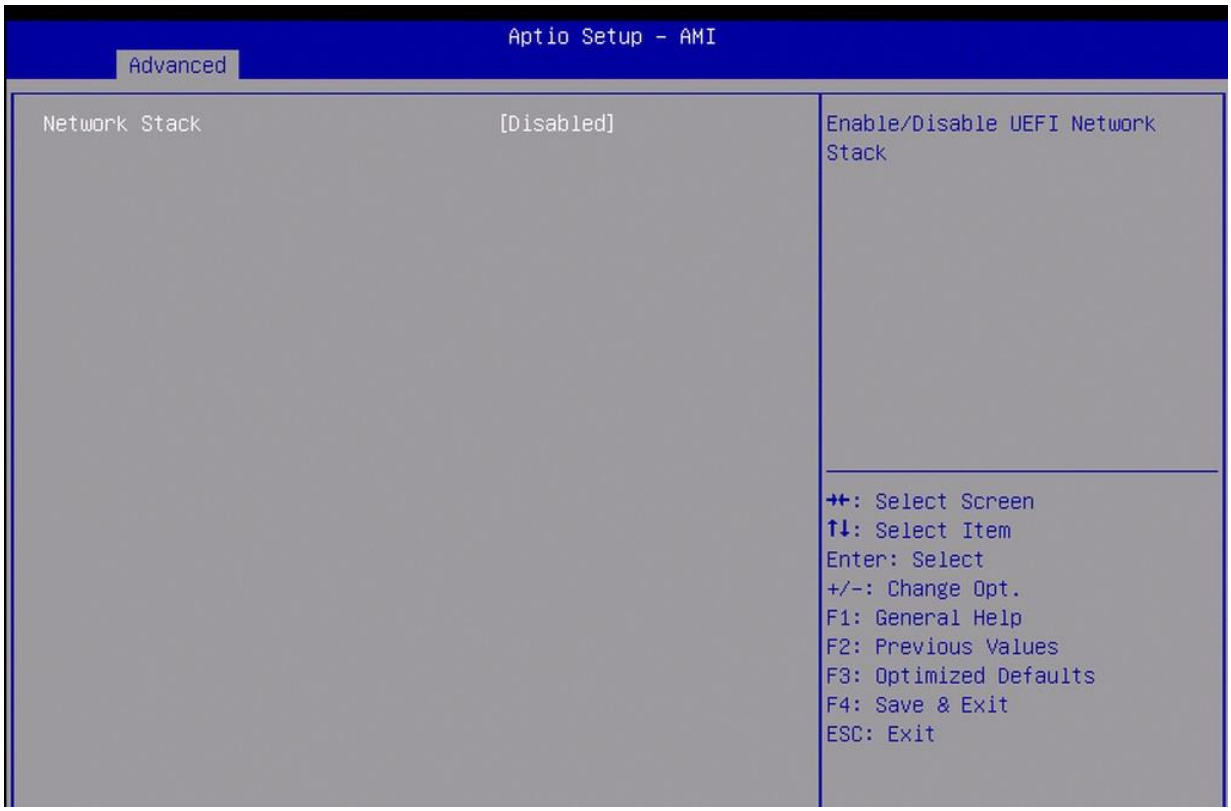
6.4.7.2 Device reset time-out



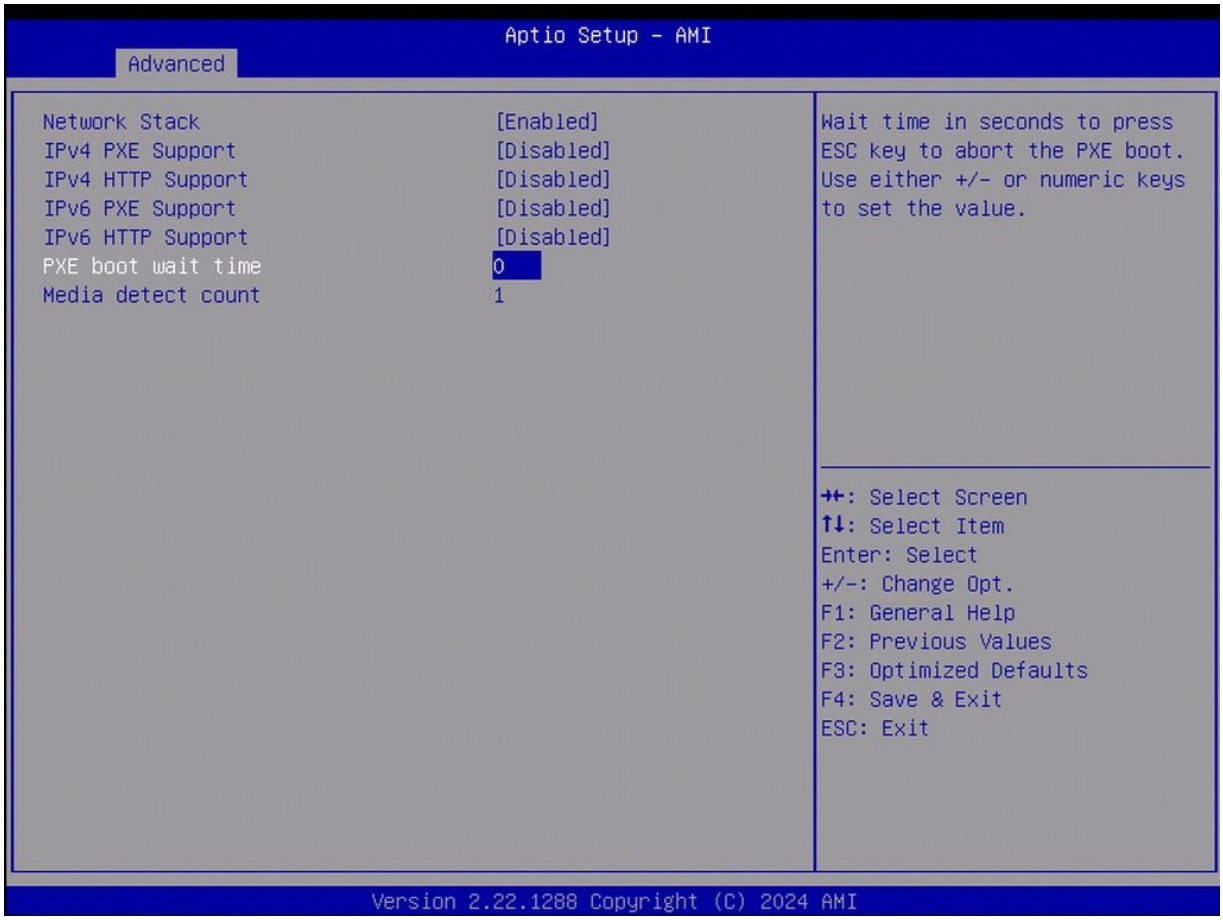
6.4.7.3 Device power-up delay



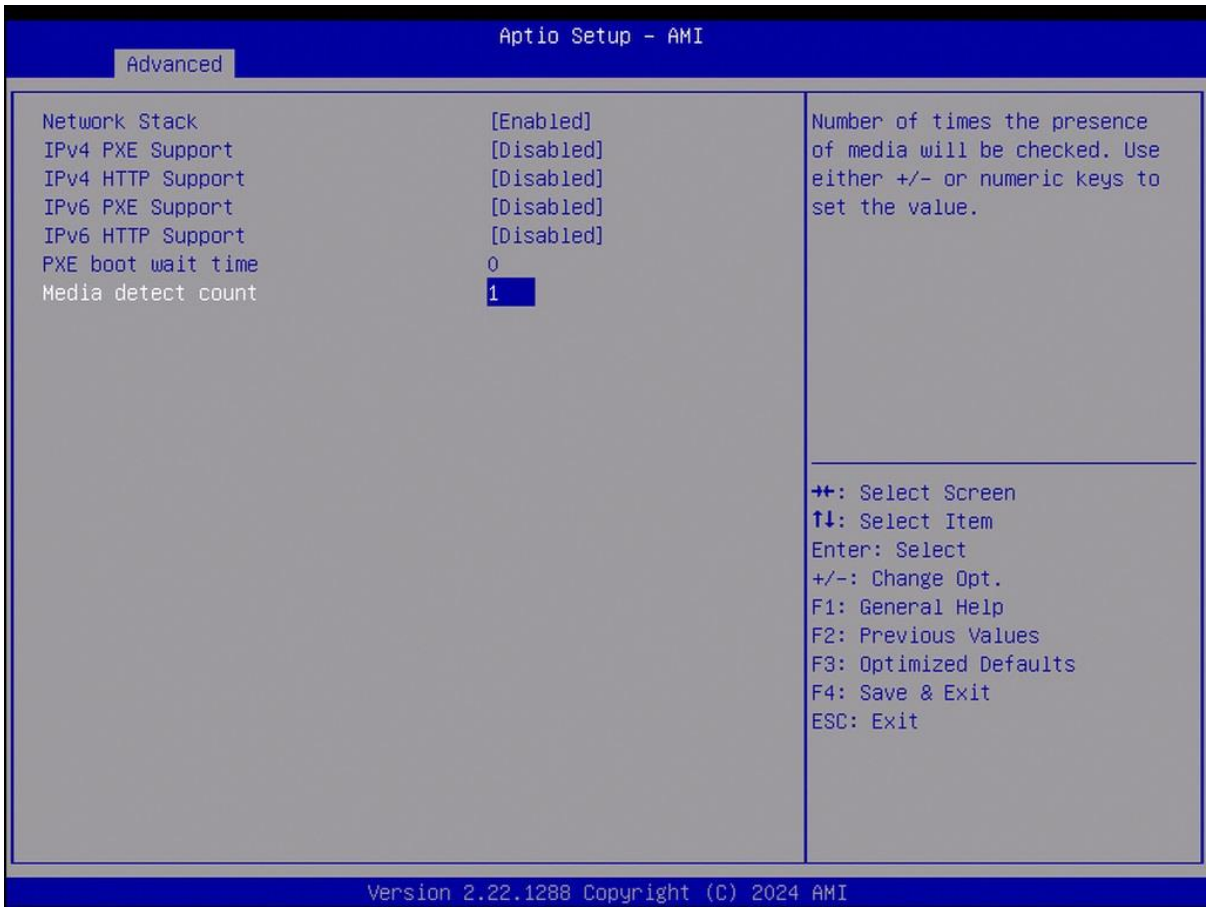
6.4.8 Network Stack Configuration



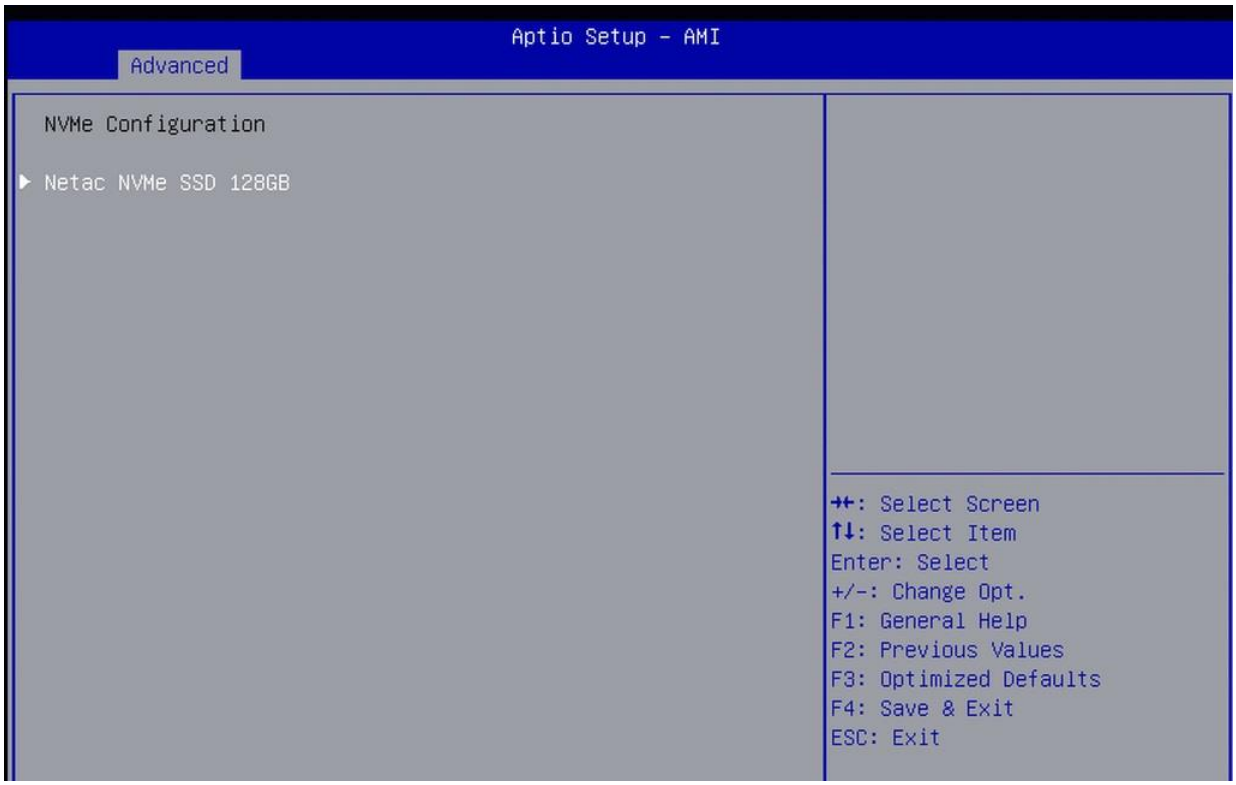
6.4.8.1 PXE boot wait time



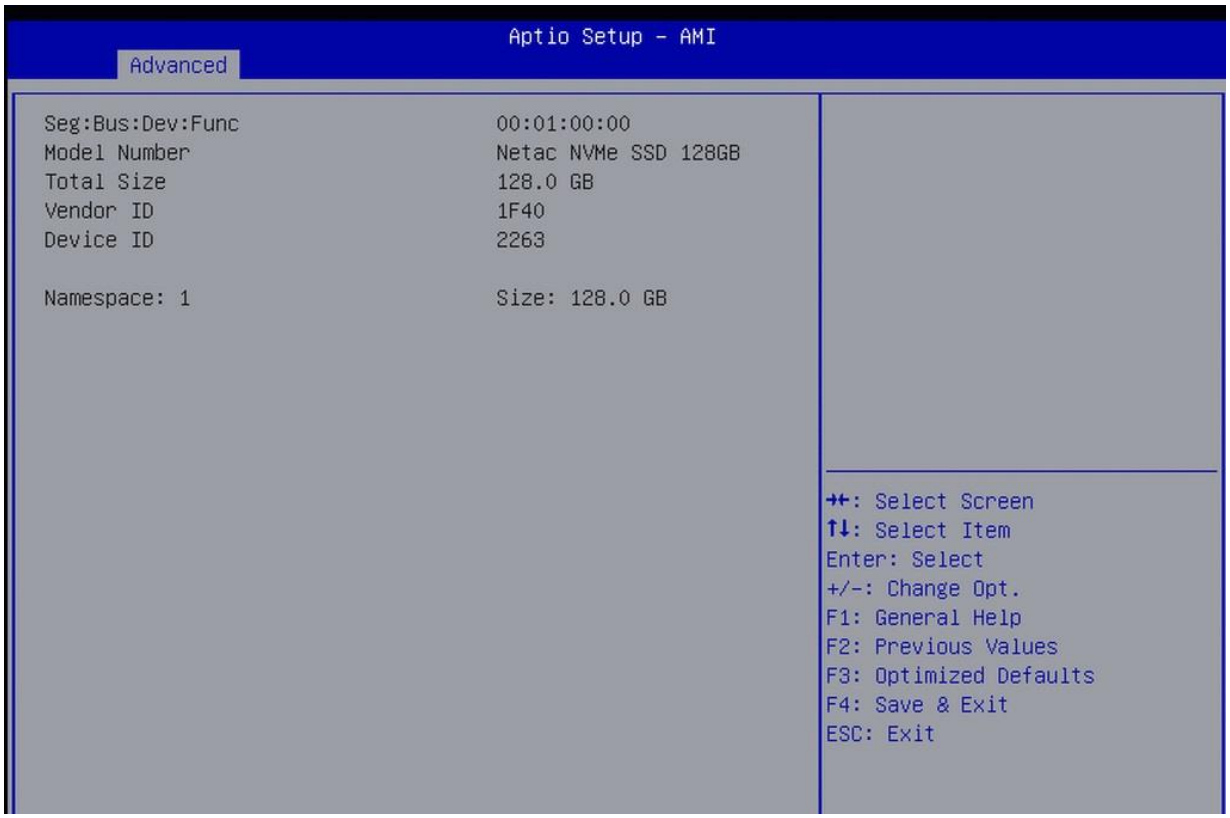
6.4.8.2 Media detect count



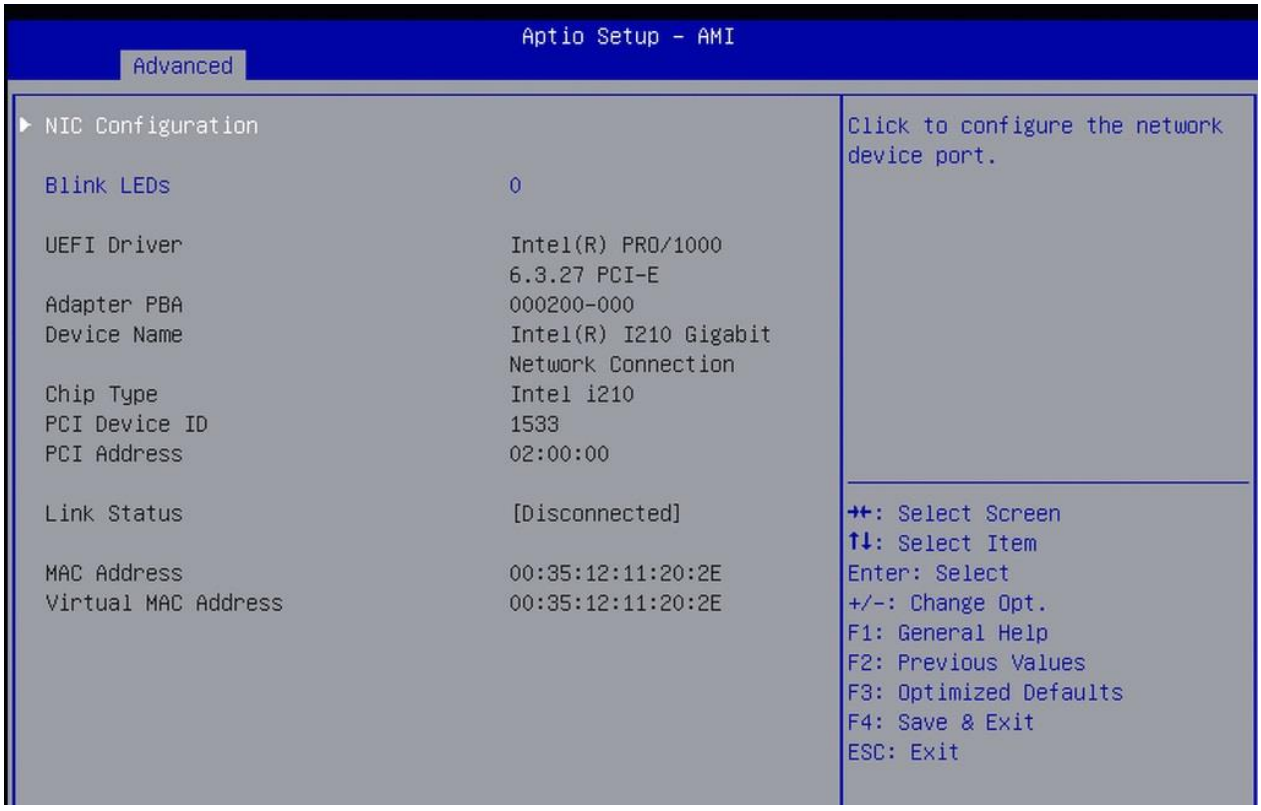
6.4.9 NVMe Configuration



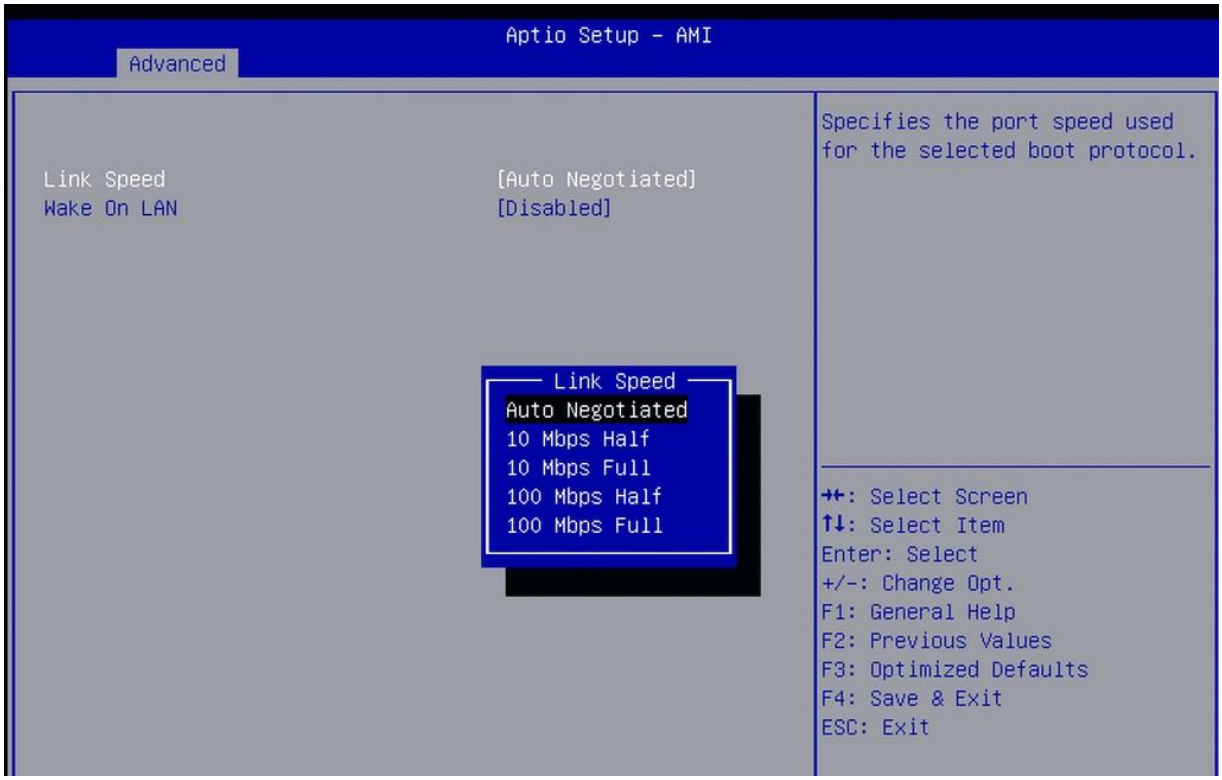
6.4.9.1 Netac NVME SSD 128GB information(This is a sample, and the information displayed by the user is subject to actual conditions)



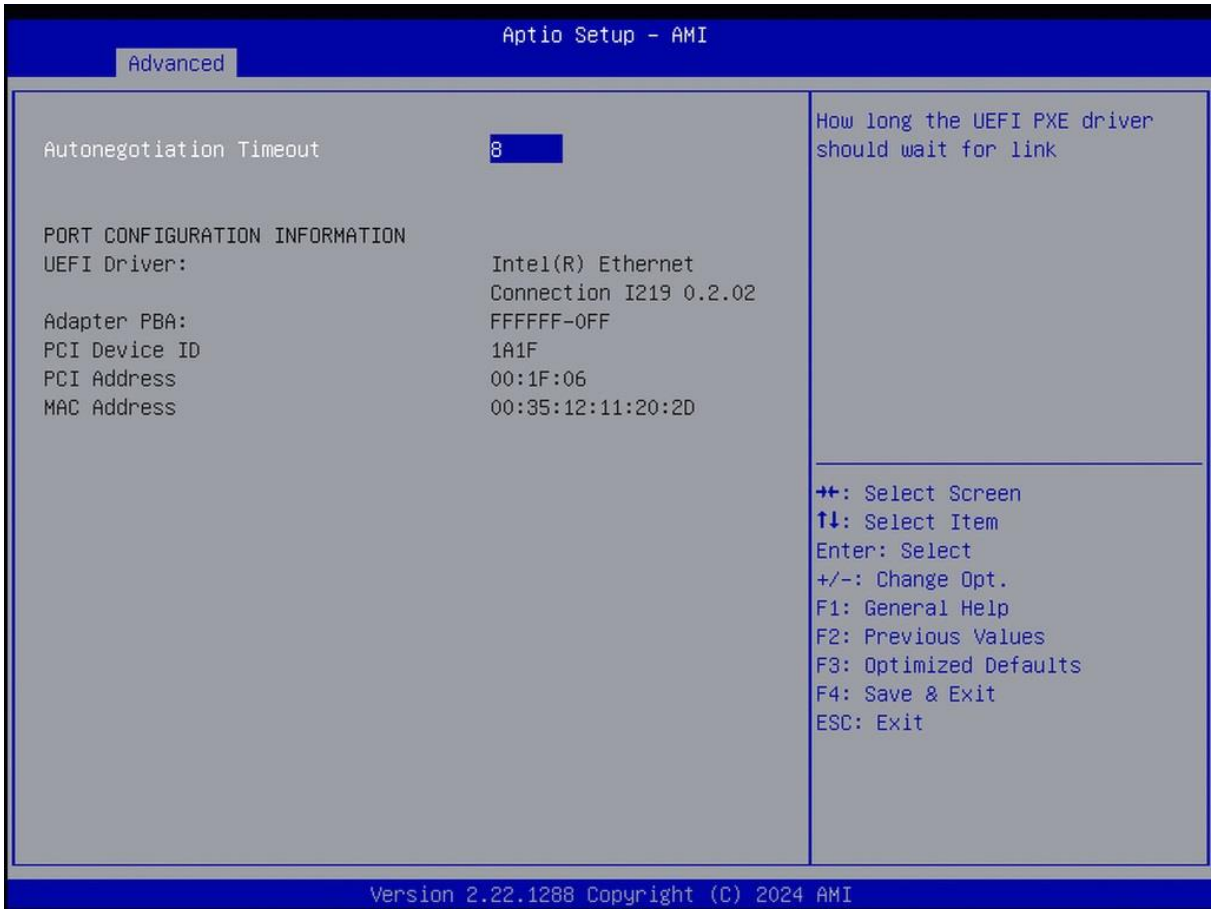
6.4.10 Intel(R)I210 Gigabit Network Connention



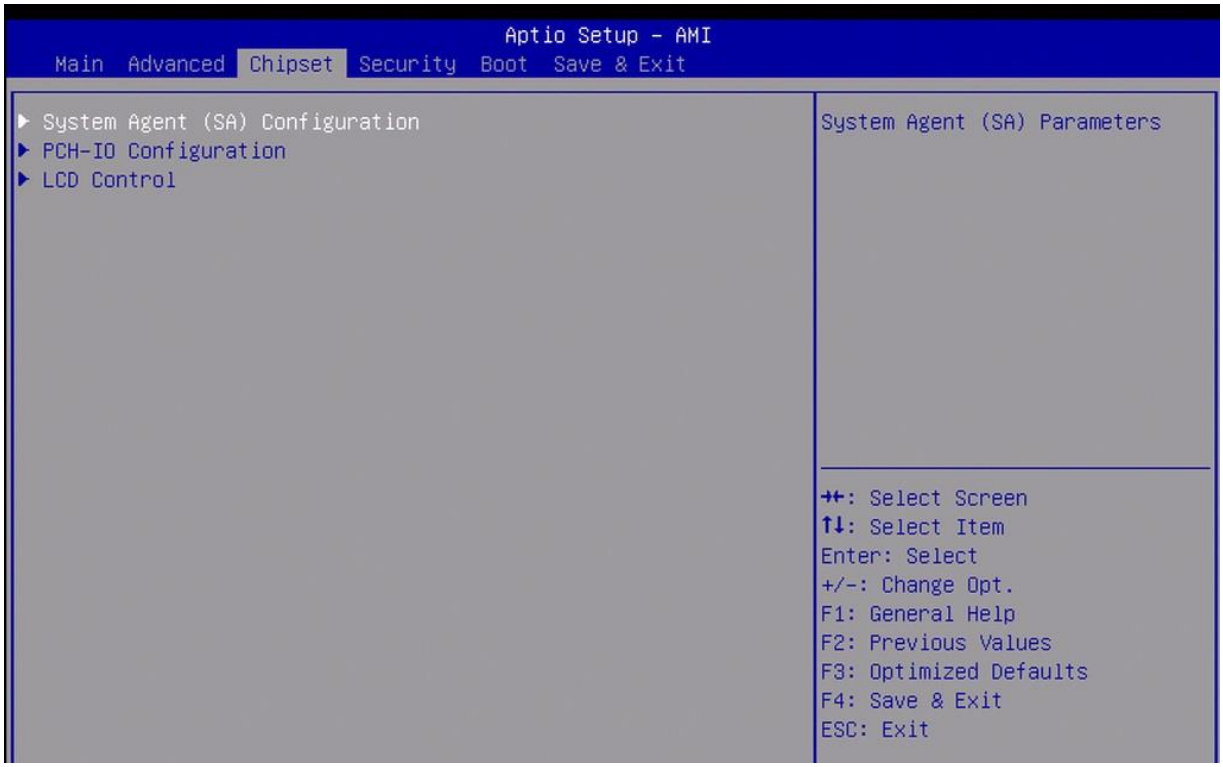
NIC Configuration



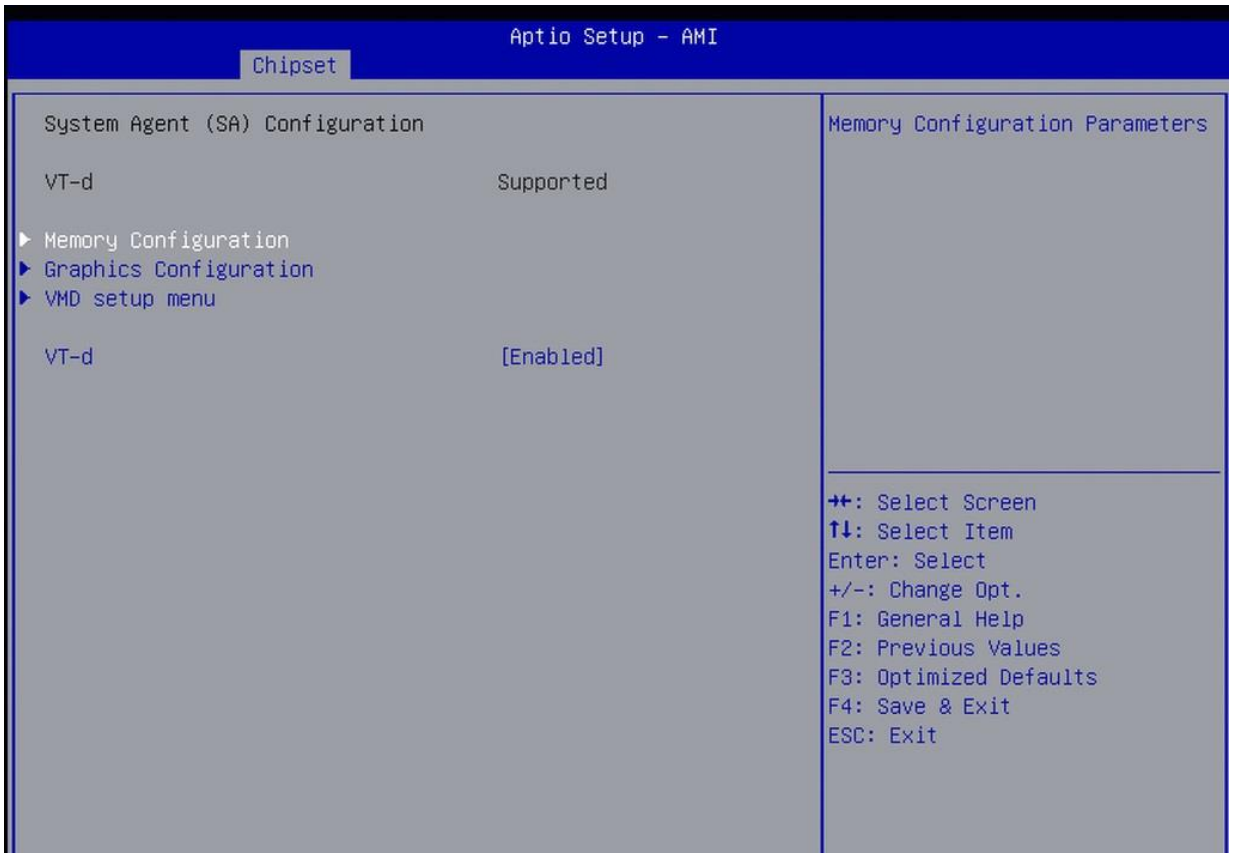
6.4.11 Intel(R) Ethernet Connention(16) I219-V



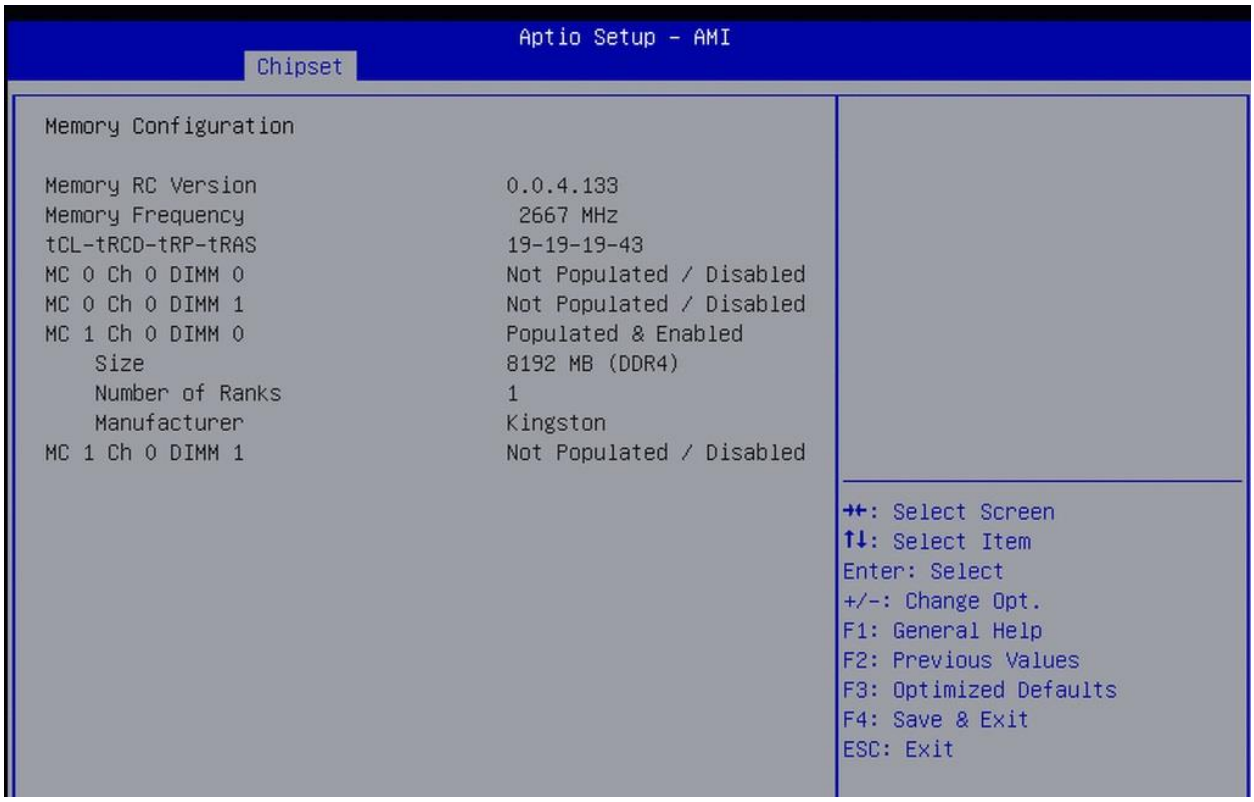
3.5 Chipset Settings



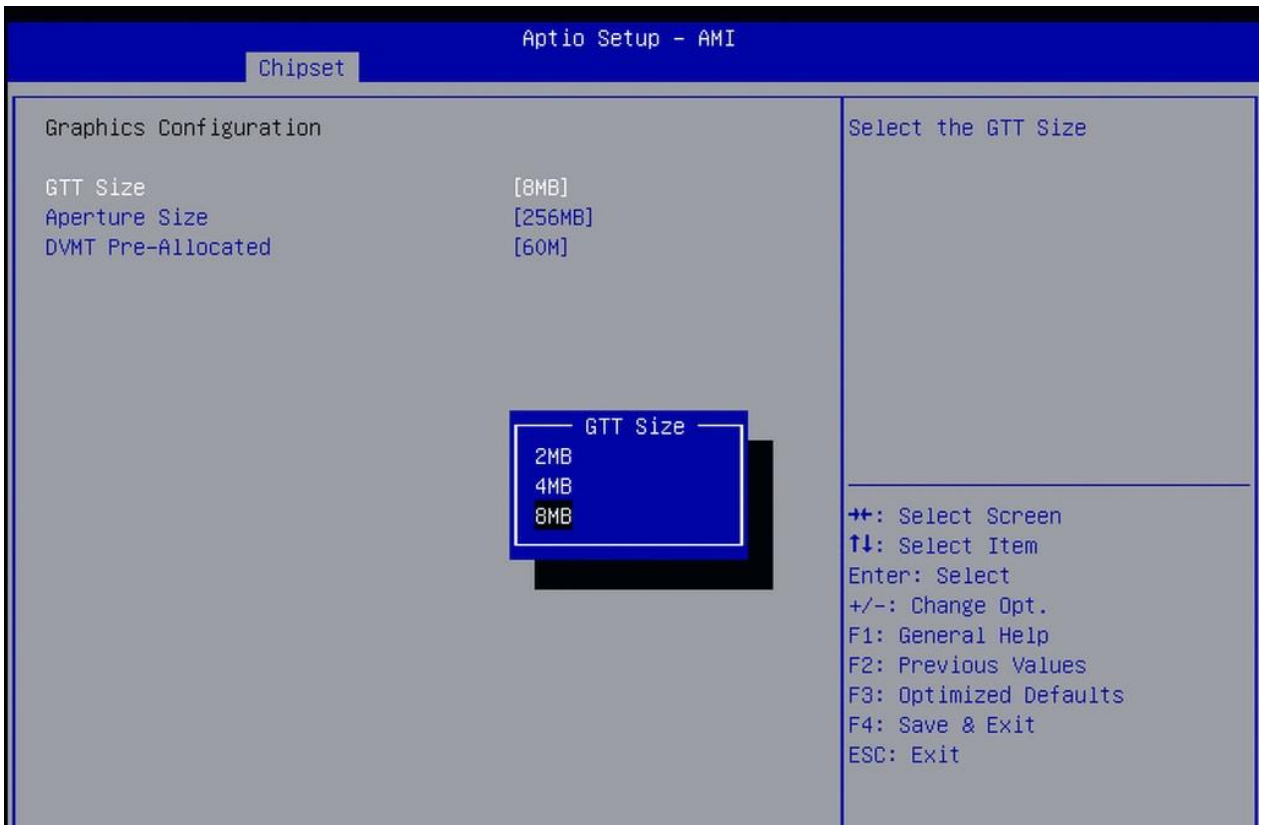
6.4.1 System Agent (SA) Configuration

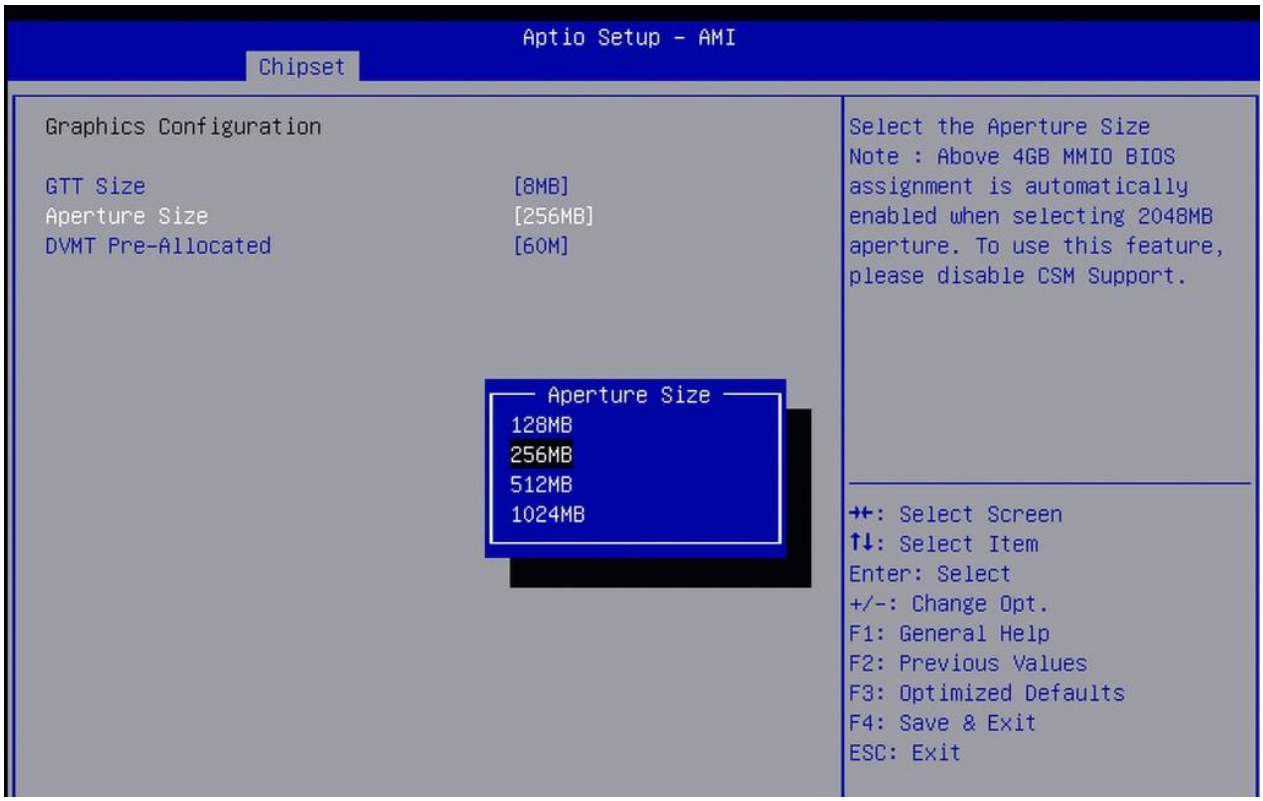


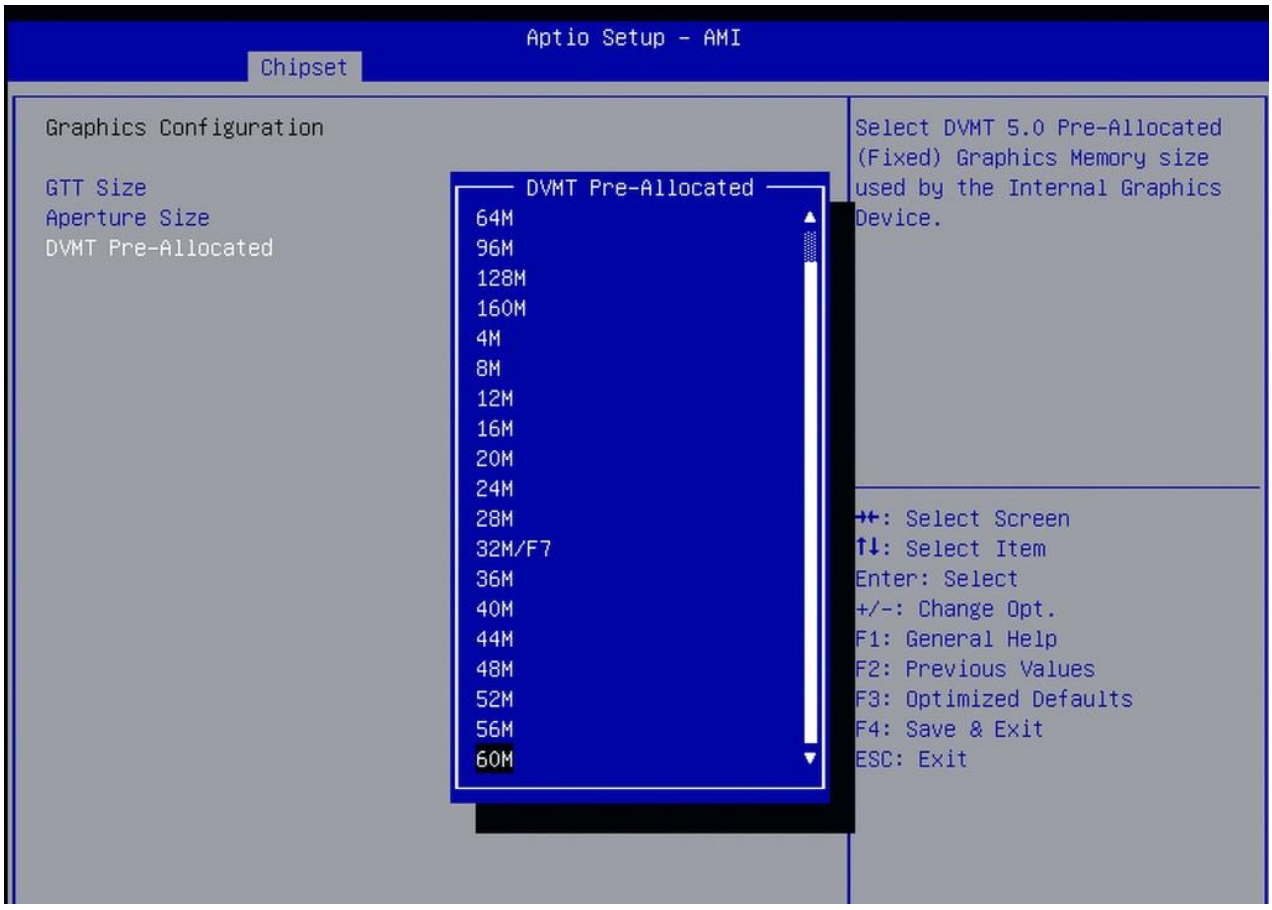
6.4.1.1 Memory Configuration



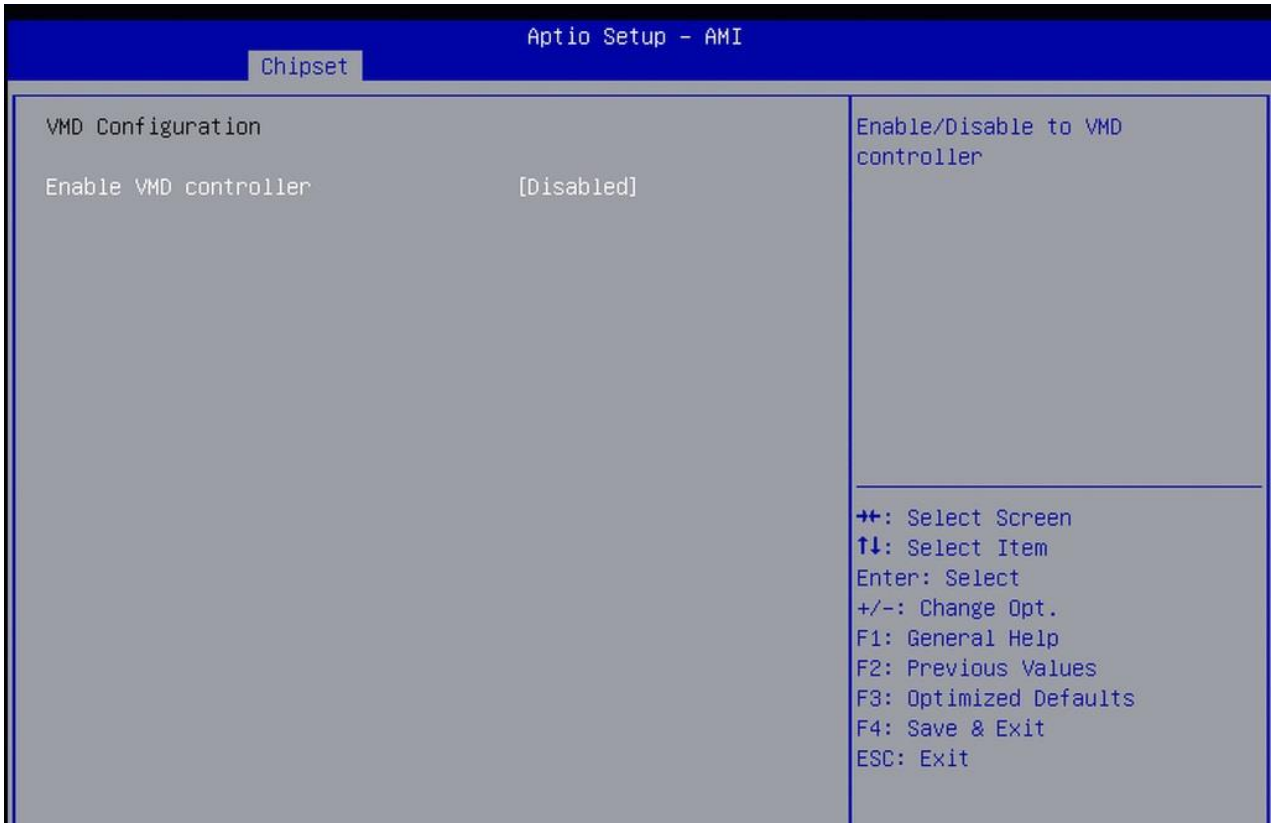
6.4.1.2 Graphics Configuration



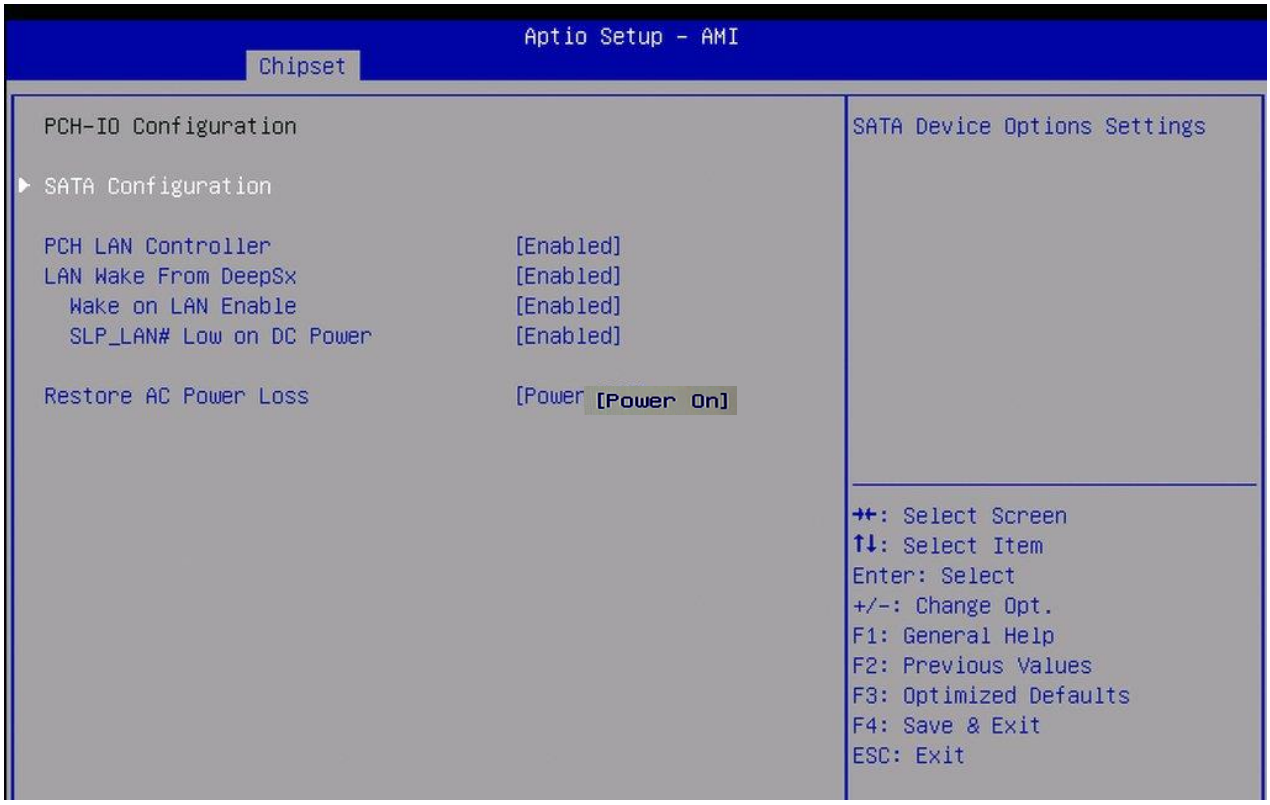

Aptio Setup – AMI
Chipset
Graphics Configuration
GTT Size [8MB]
Aperture Size [256MB]
DVMT Pre-Allocated [60M]
Aperture Size
128MB
256MB
512MB
1024MB
Select the Aperture Size
Note : Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit


Aptio Setup – AMI
Chipset
Graphics Configuration
GTT Size
Aperture Size
DVMT Pre-Allocated
DVMT Pre-Allocated
64M
96M
128M
160M
4M
8M
12M
16M
20M
24M
28M
32M/F7
36M
40M
44M
48M
52M
56M
60M
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

6.4.1.3 VMD Configuration



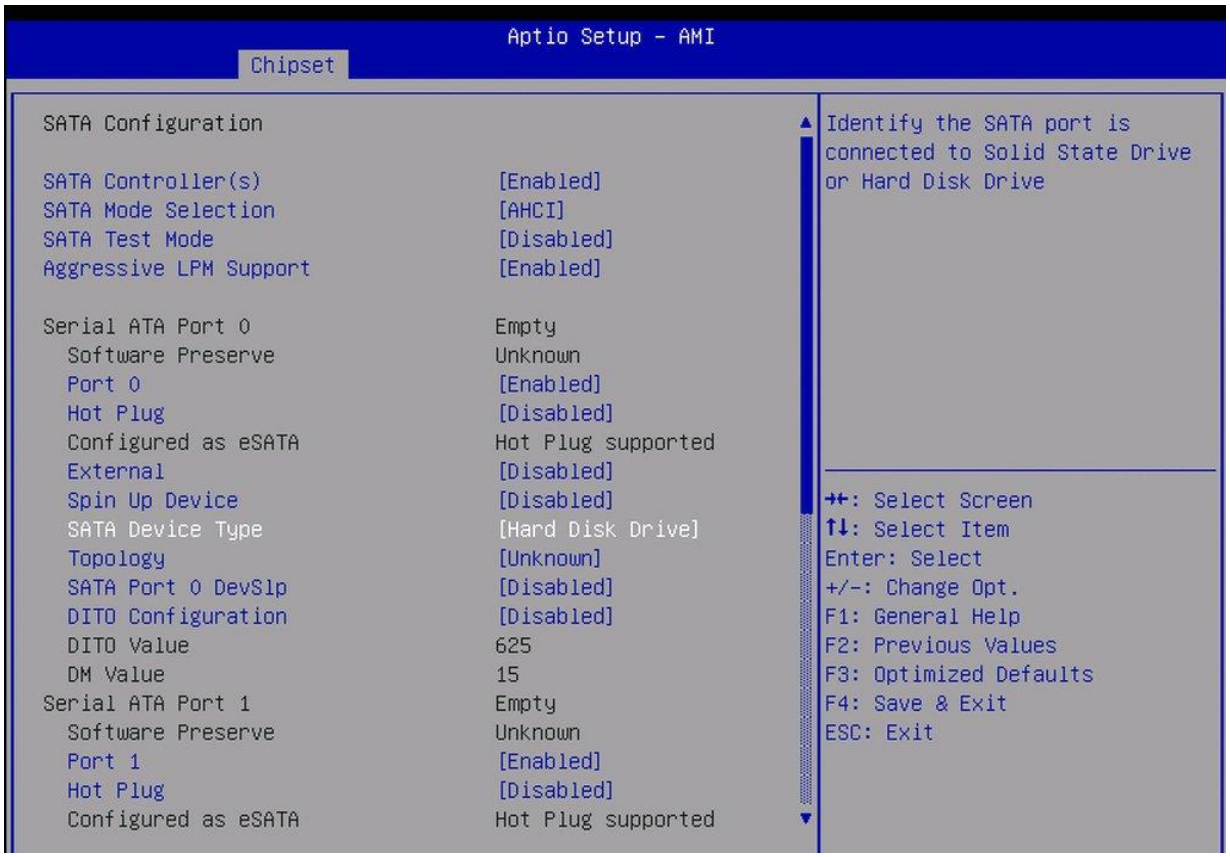
6.4.2 PCH-IO Configuration

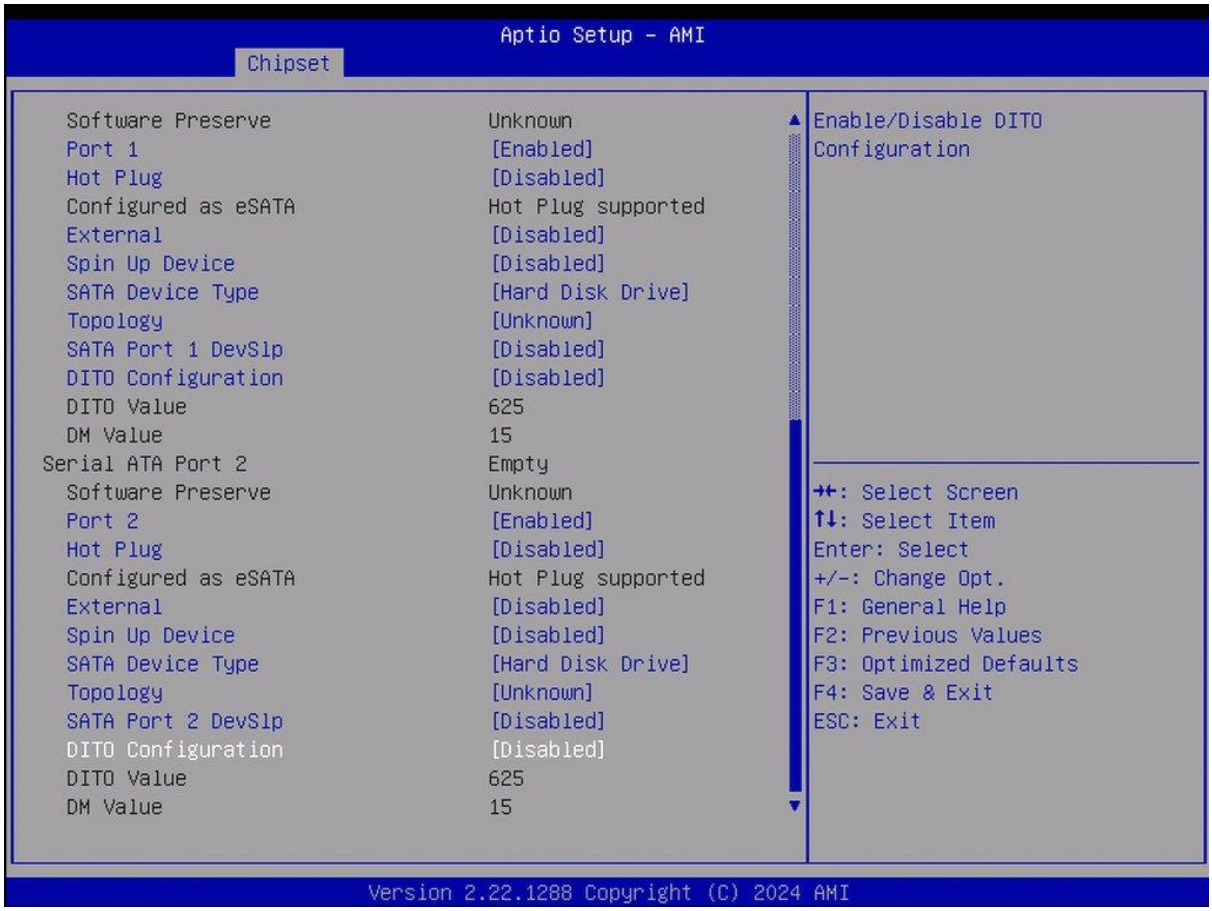


Note:

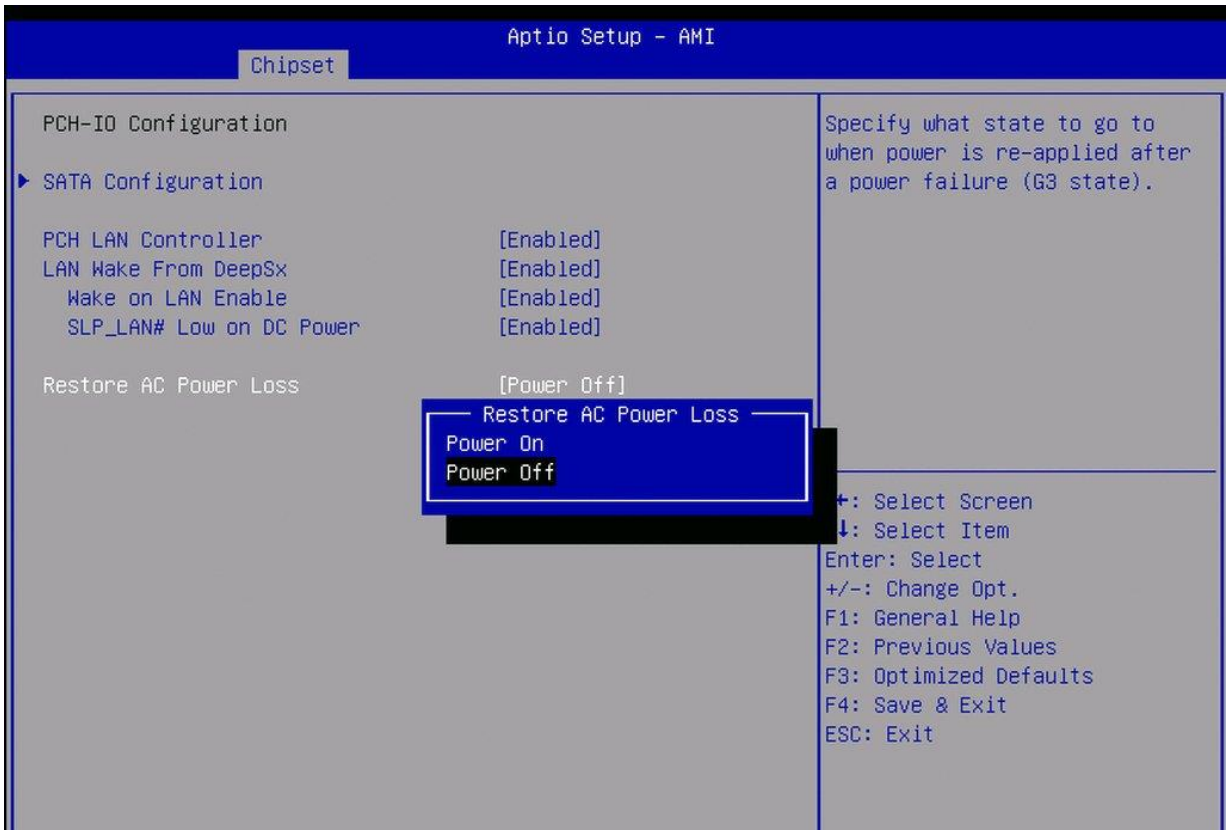
Restore AC Power Loss: Power ON(Default)

6.4.2.1 SATA Configuration

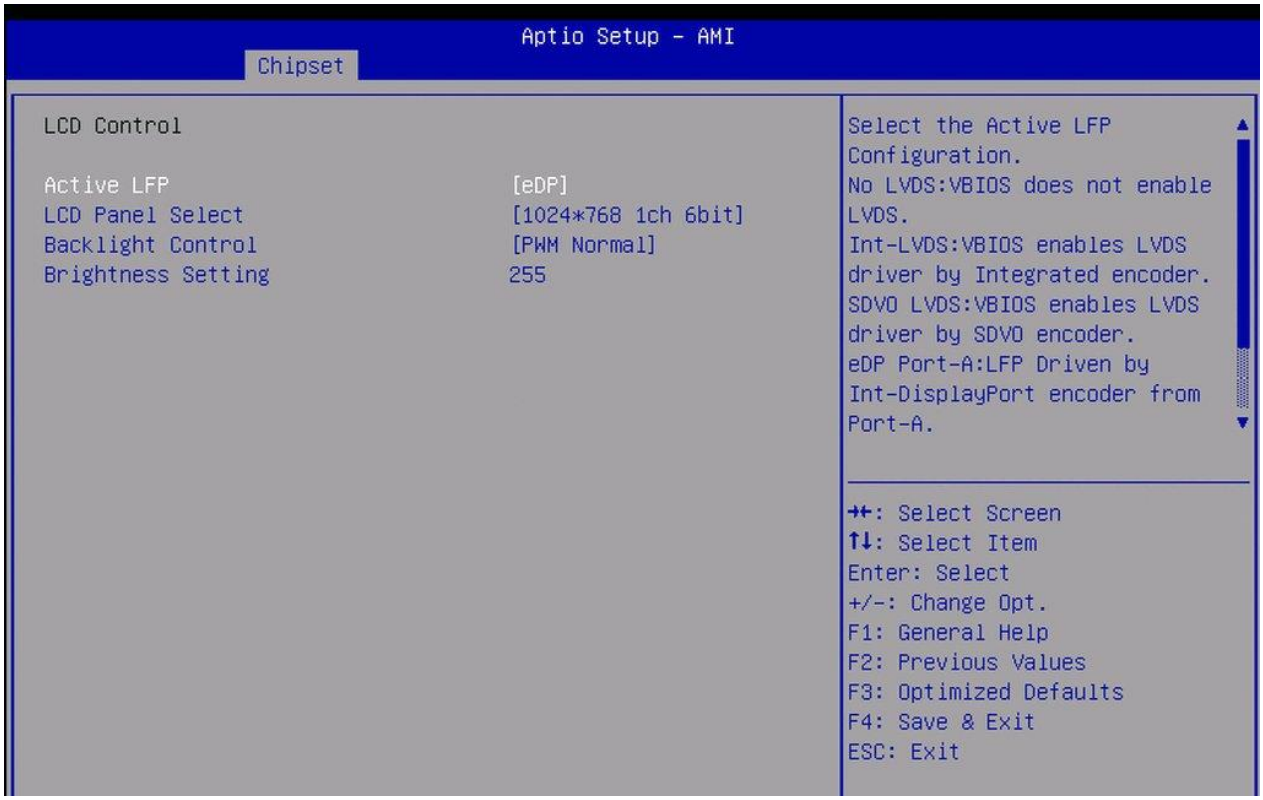




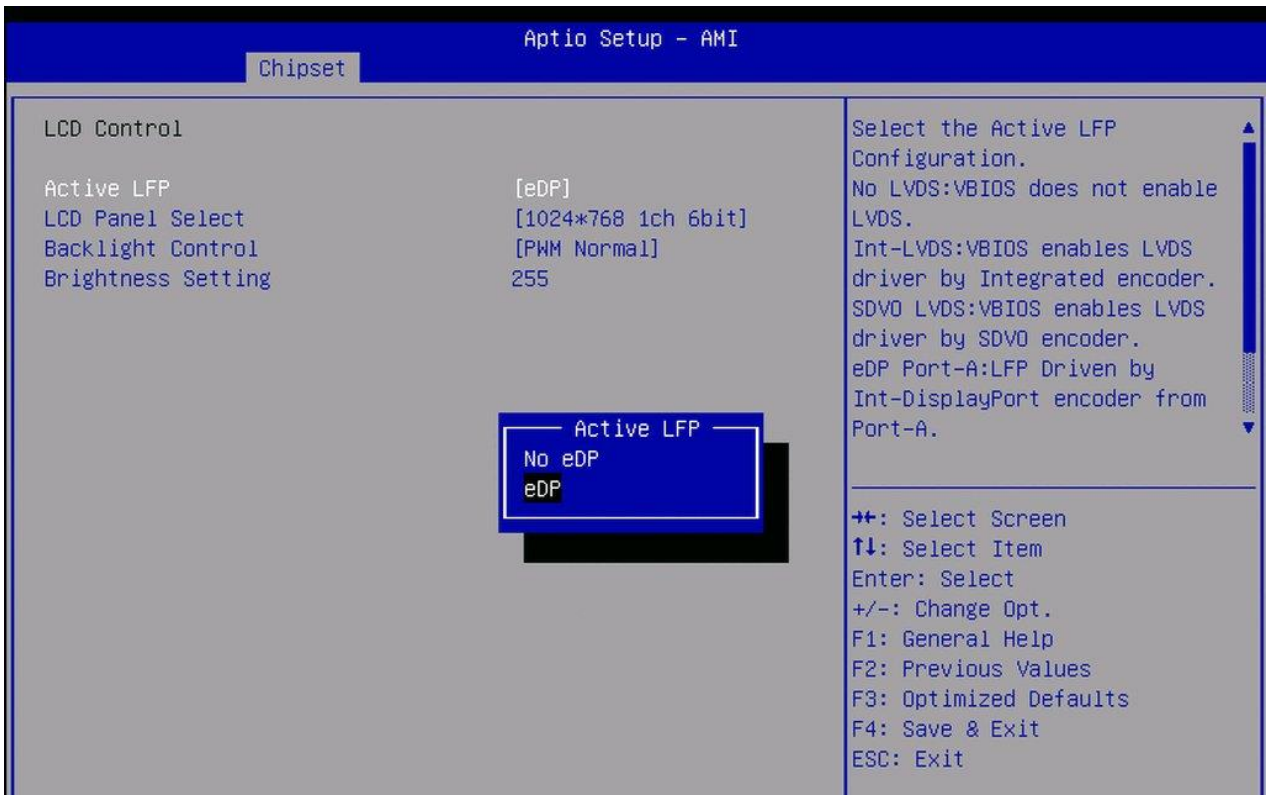
6.4.2.2 Restore AC Power Loss



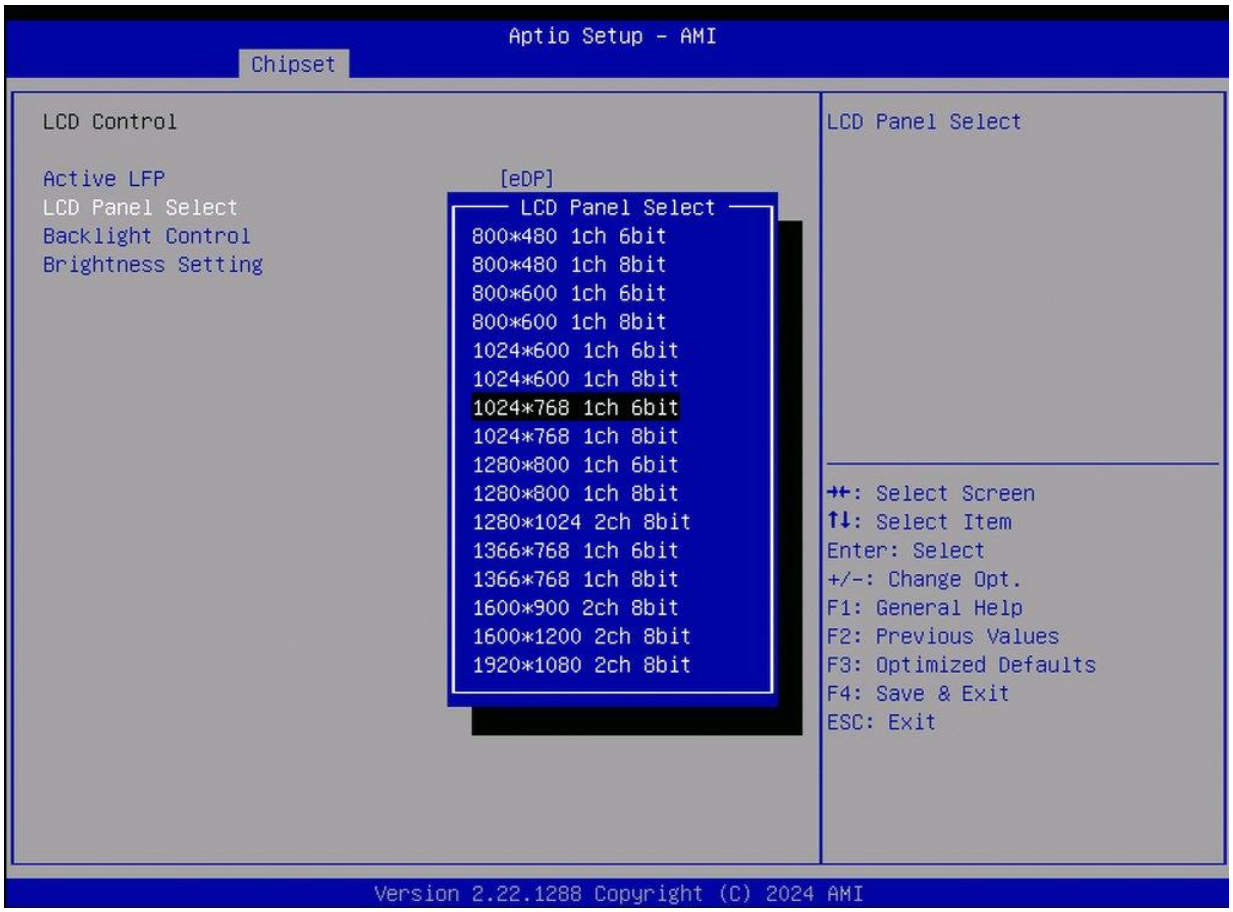
6.4.3 LCD Control



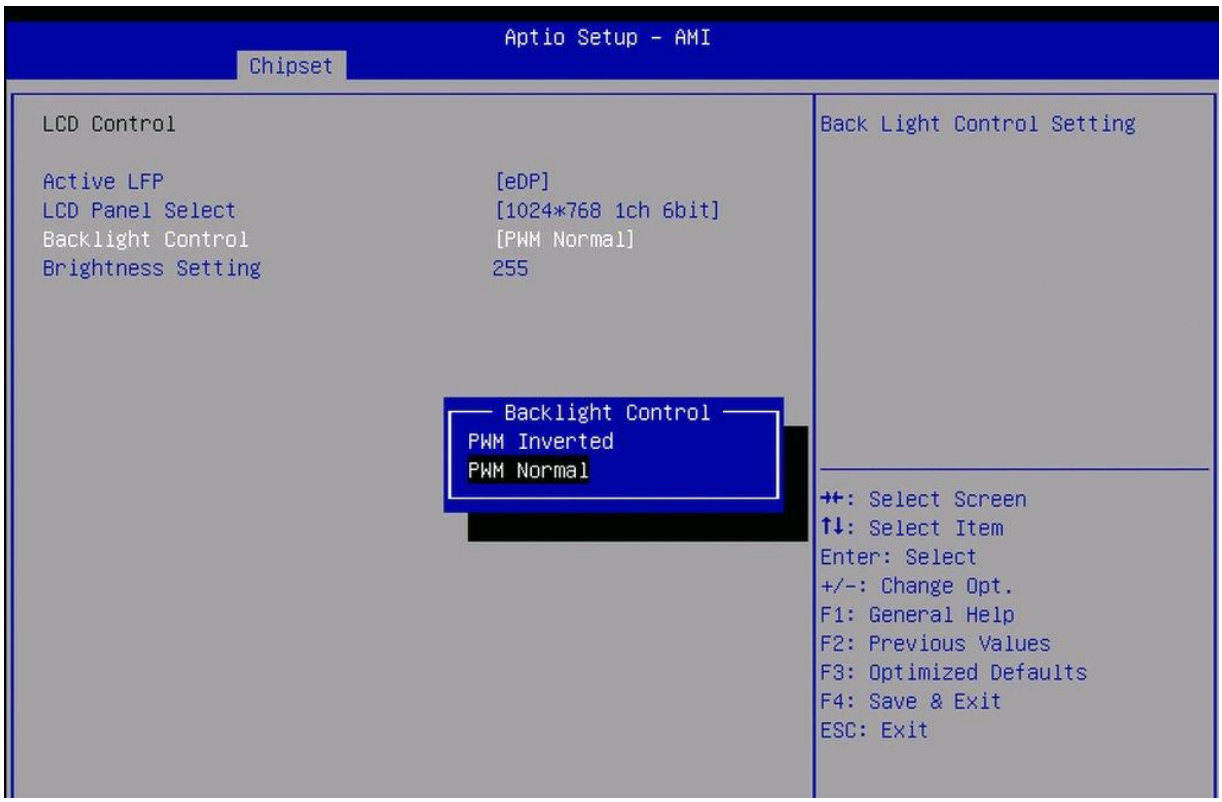
6.4.3.1 Active LFP



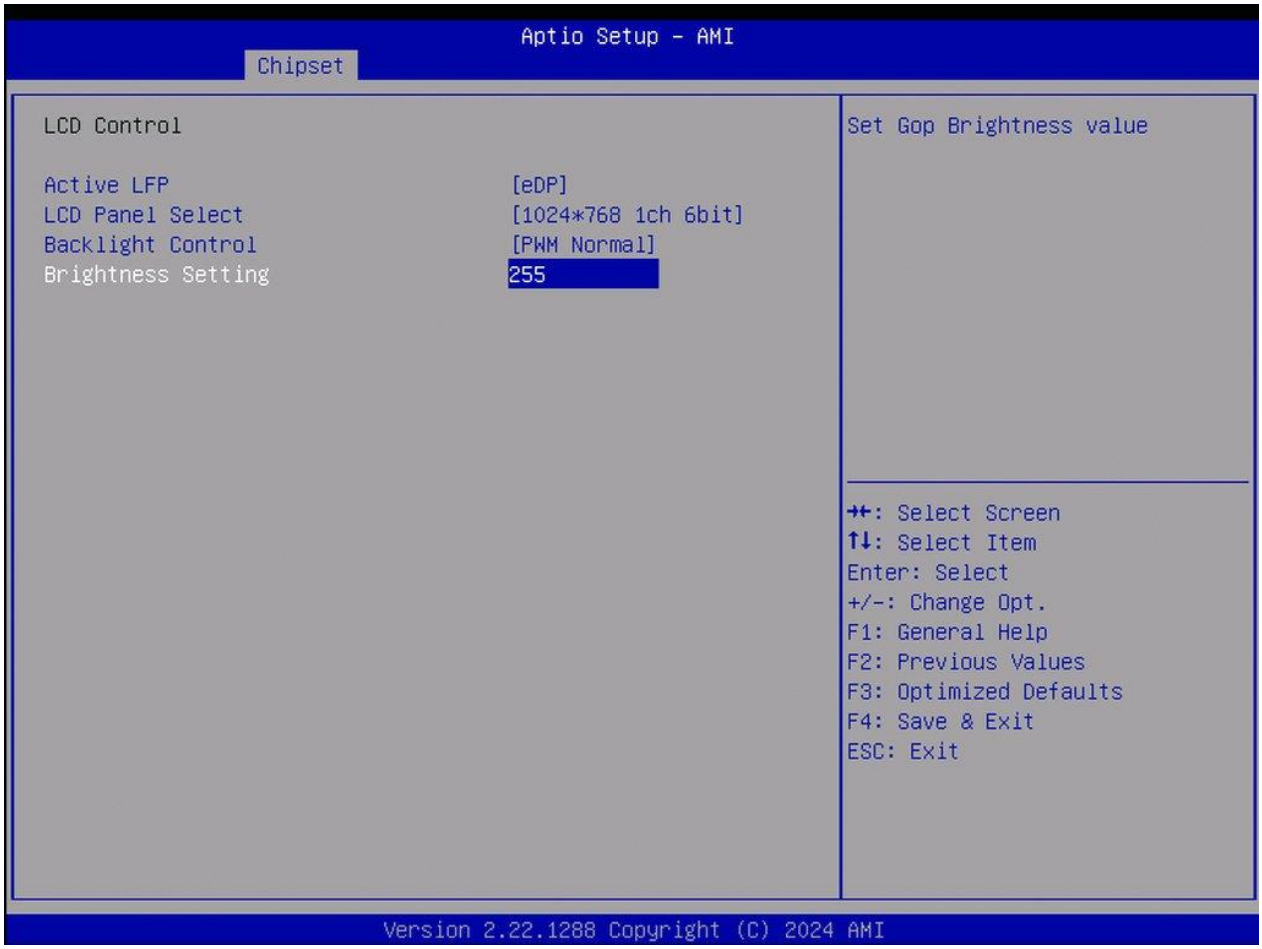
6.4.3.2 LCD Panel Select



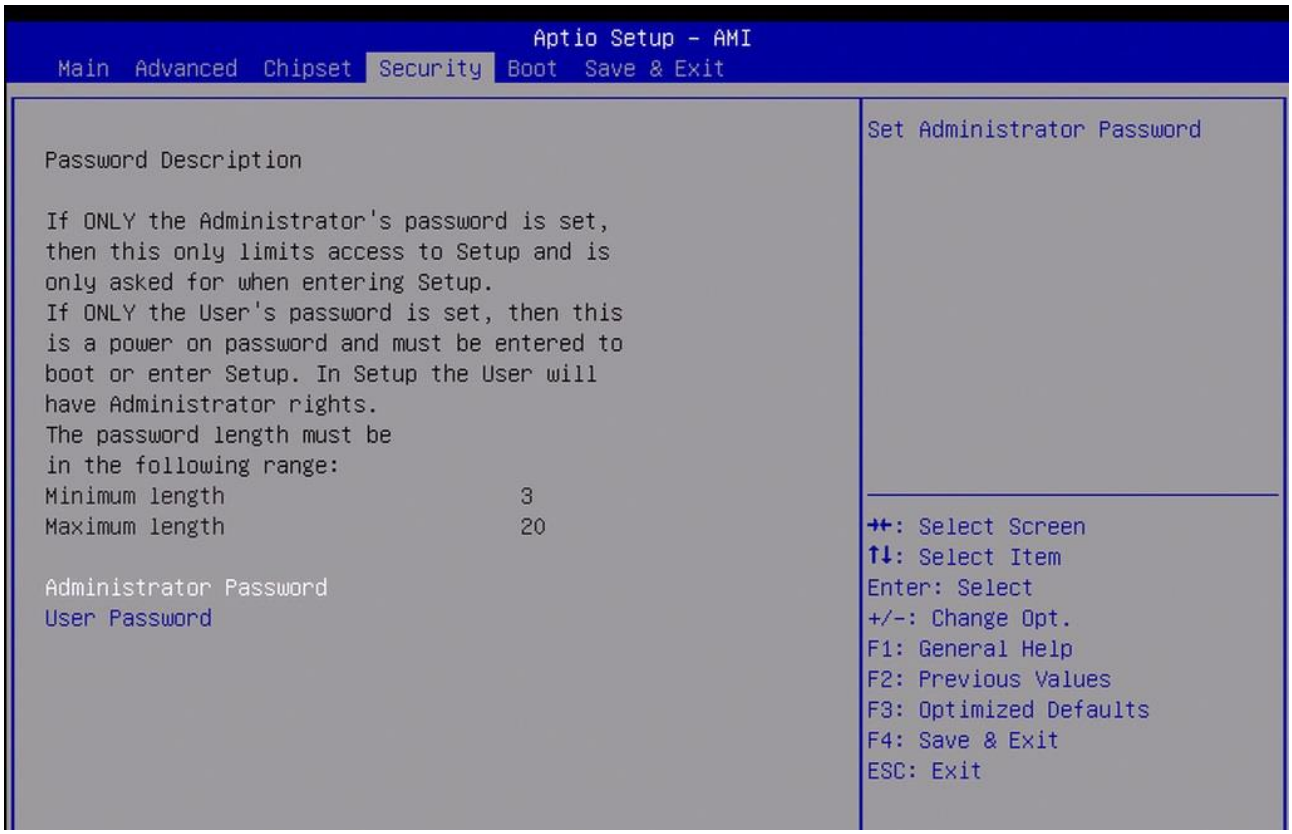
6.4.3.3 Backlight Control



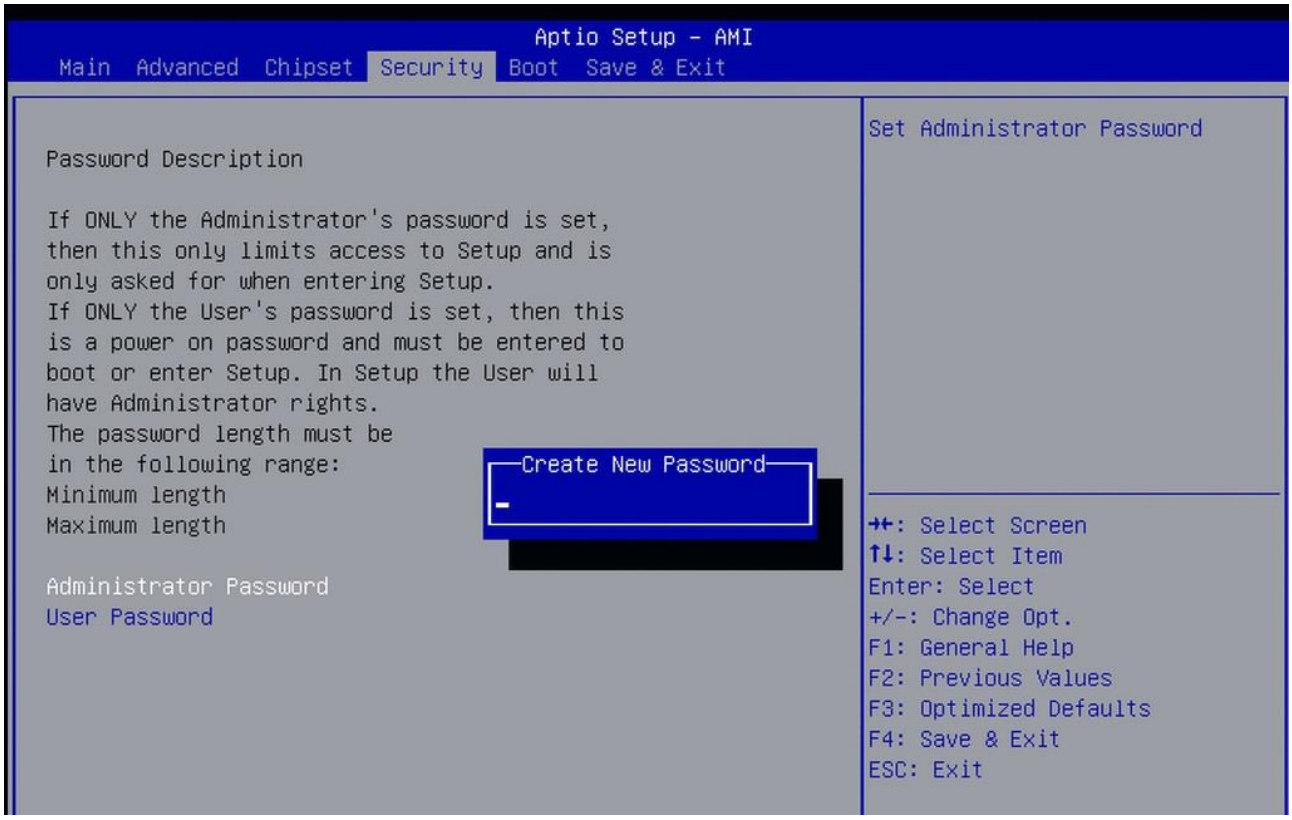
6.4.3.4 Brightness Setting



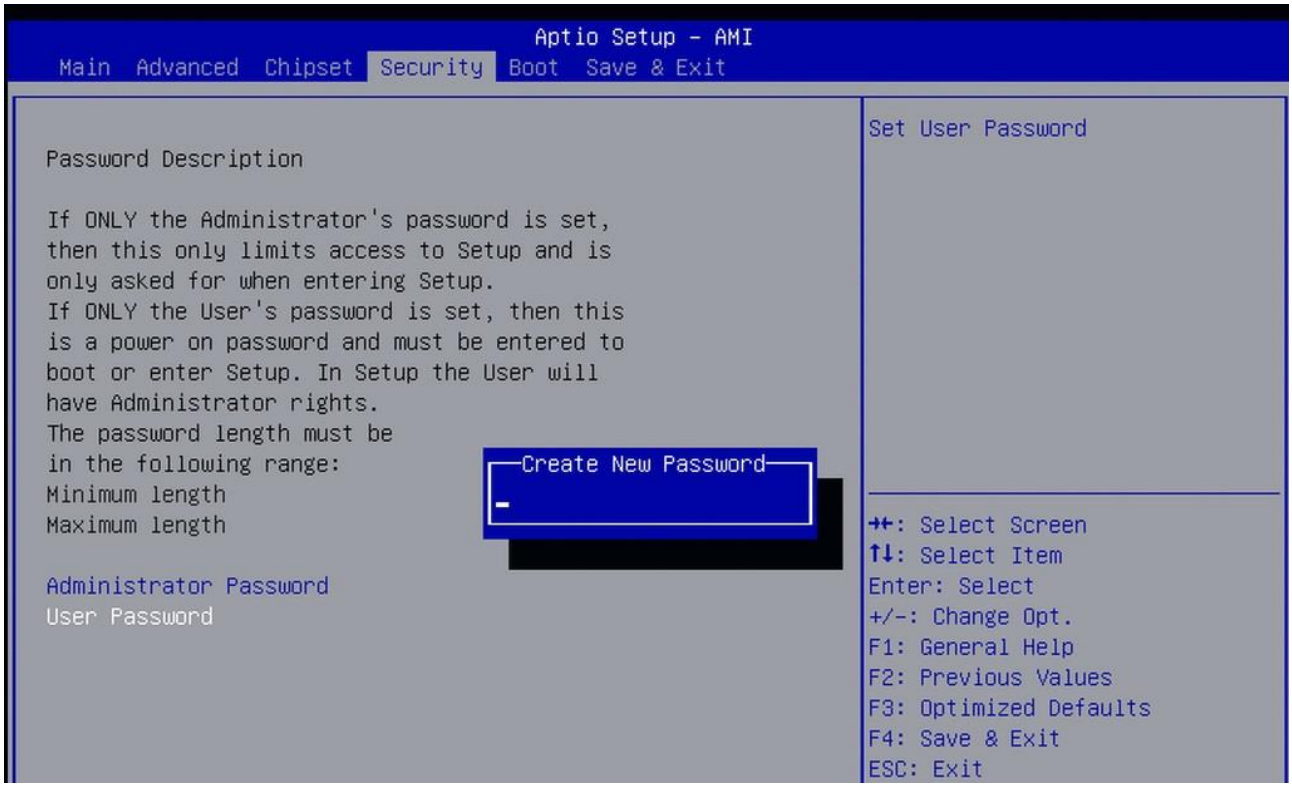
3.6 Security Settings



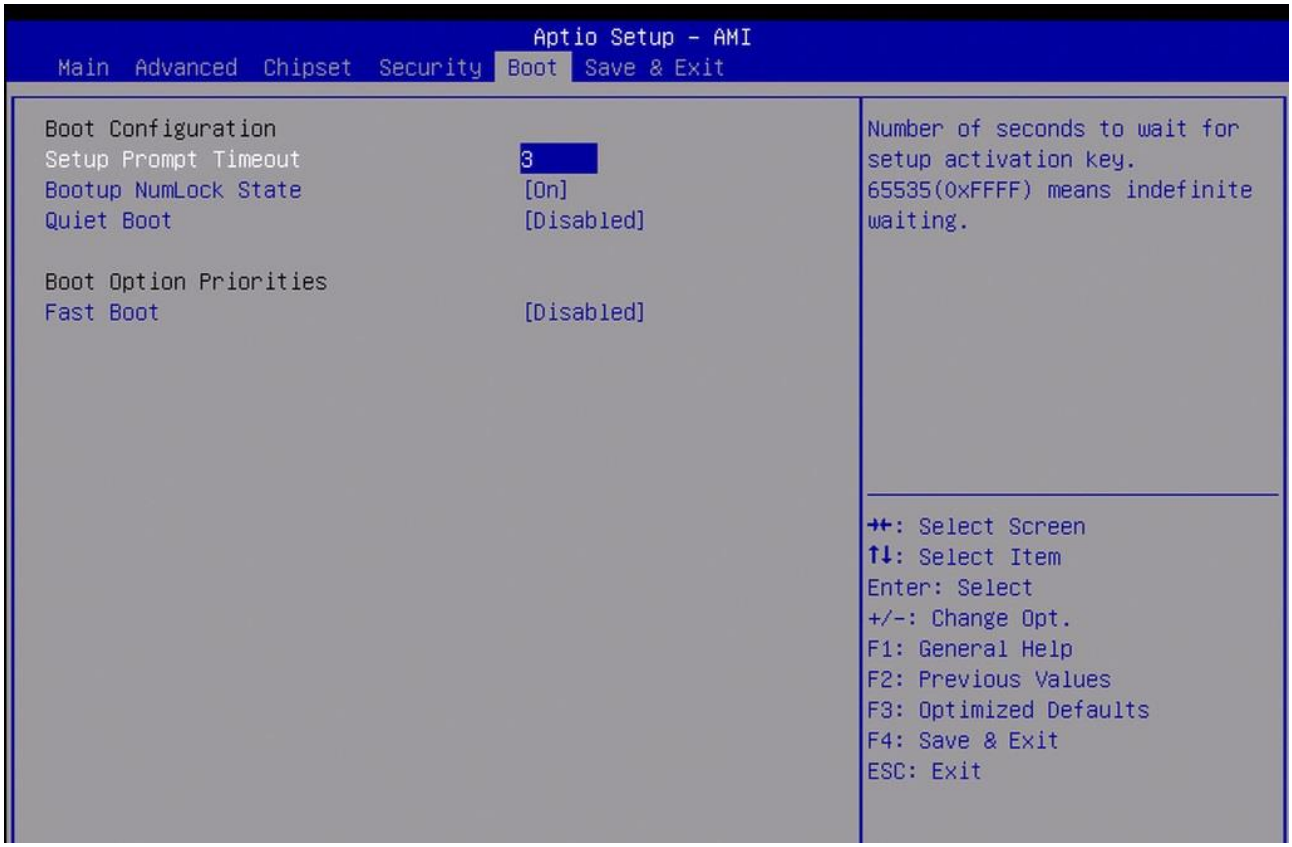
6.6.1 Administrator Password



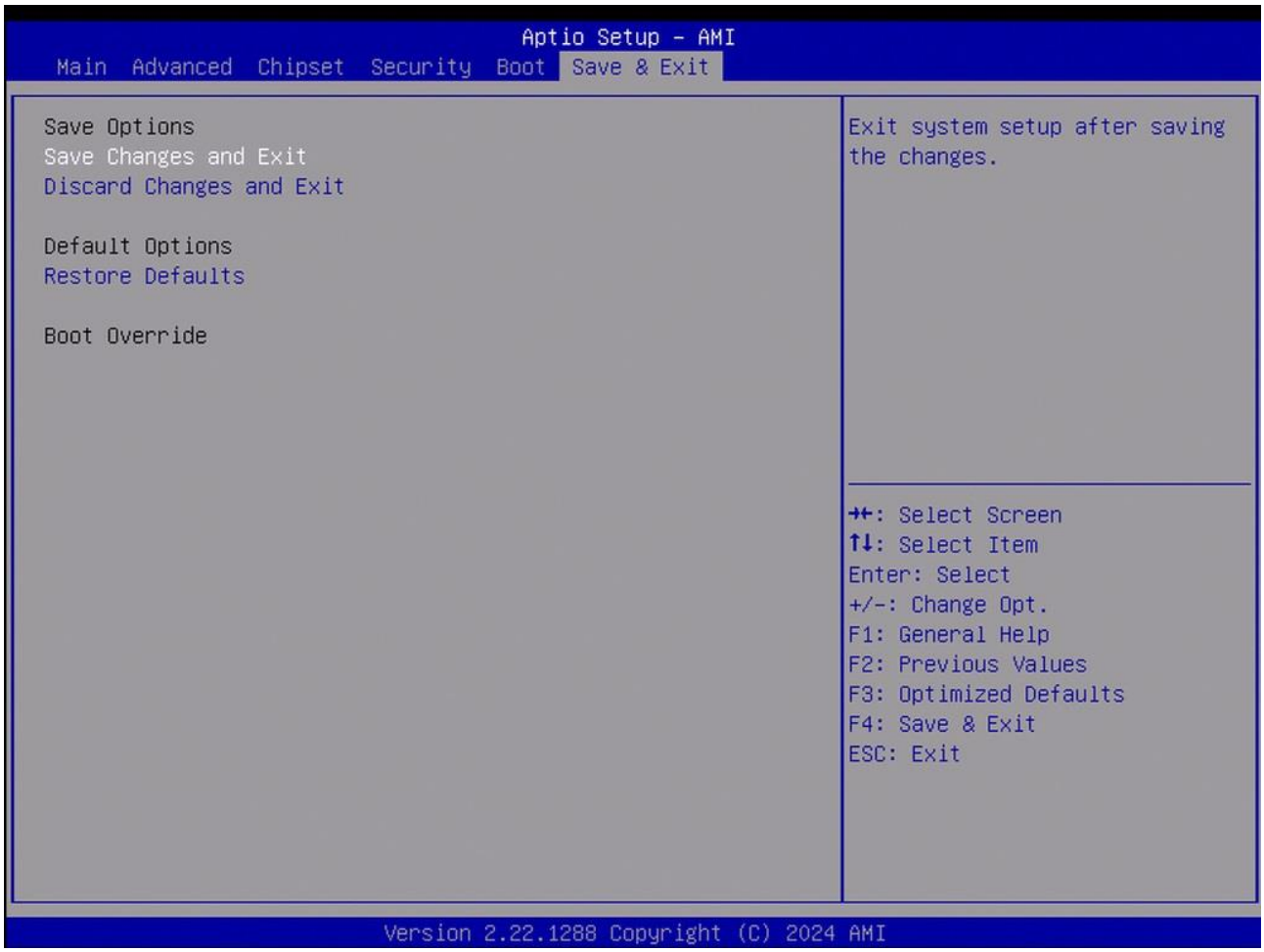
6.6.2 User Password



3.7 Boot Settings



3.8 Save & Exit Settings



Chapter 4 Installation of Drivers

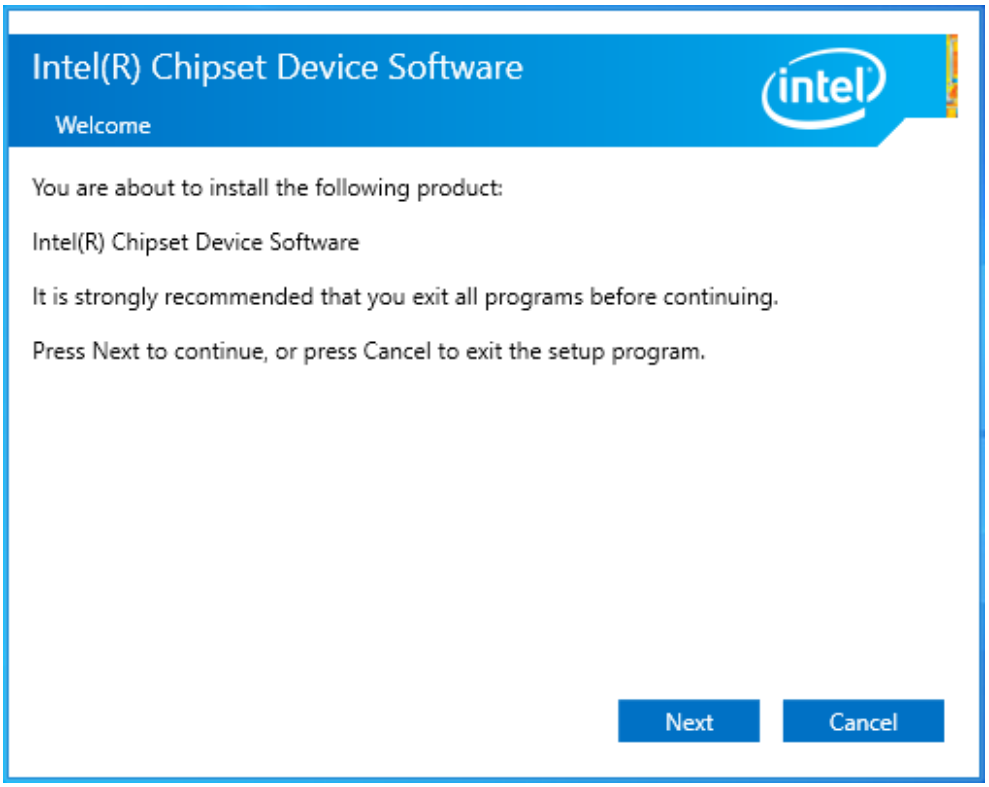
This chapter describes the installation procedures for software and drivers under the windows 10. The software and drivers are included with the motherboard. The contents include Intel Chipset, Graphics chipset driver, Audio driver, LAN driver and Intel® management engine interface. The instructions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

4.1 Intel Chipset

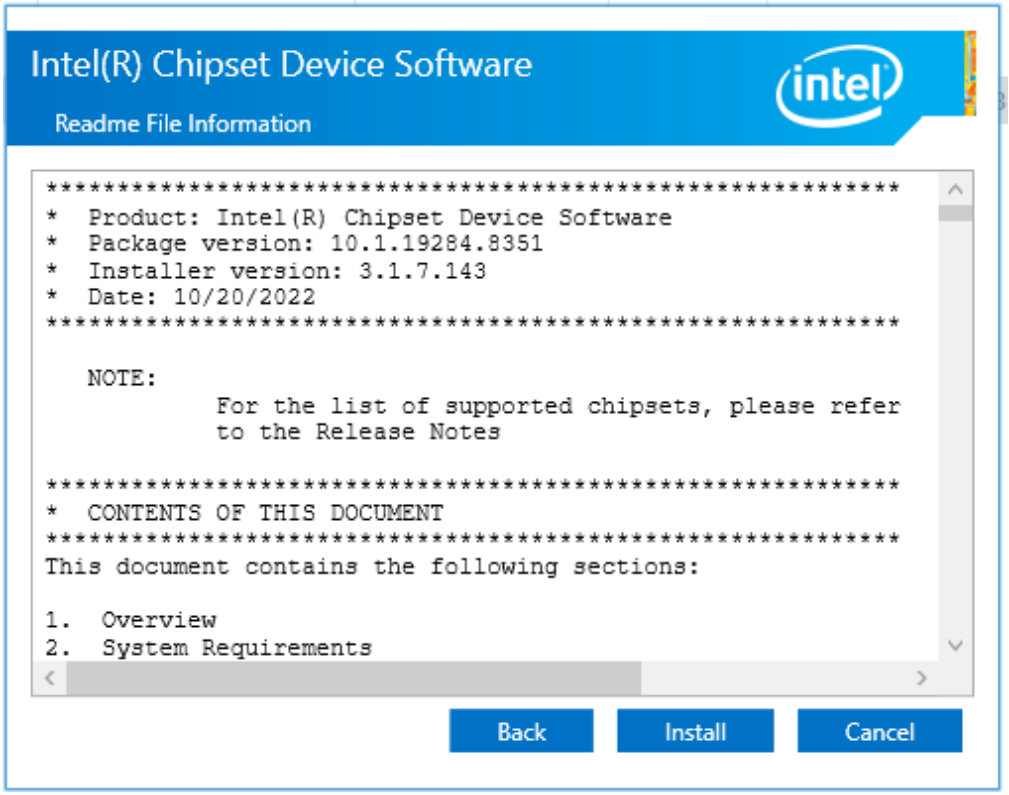
To install the Intel chipset driver, please follow the steps below.

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



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

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



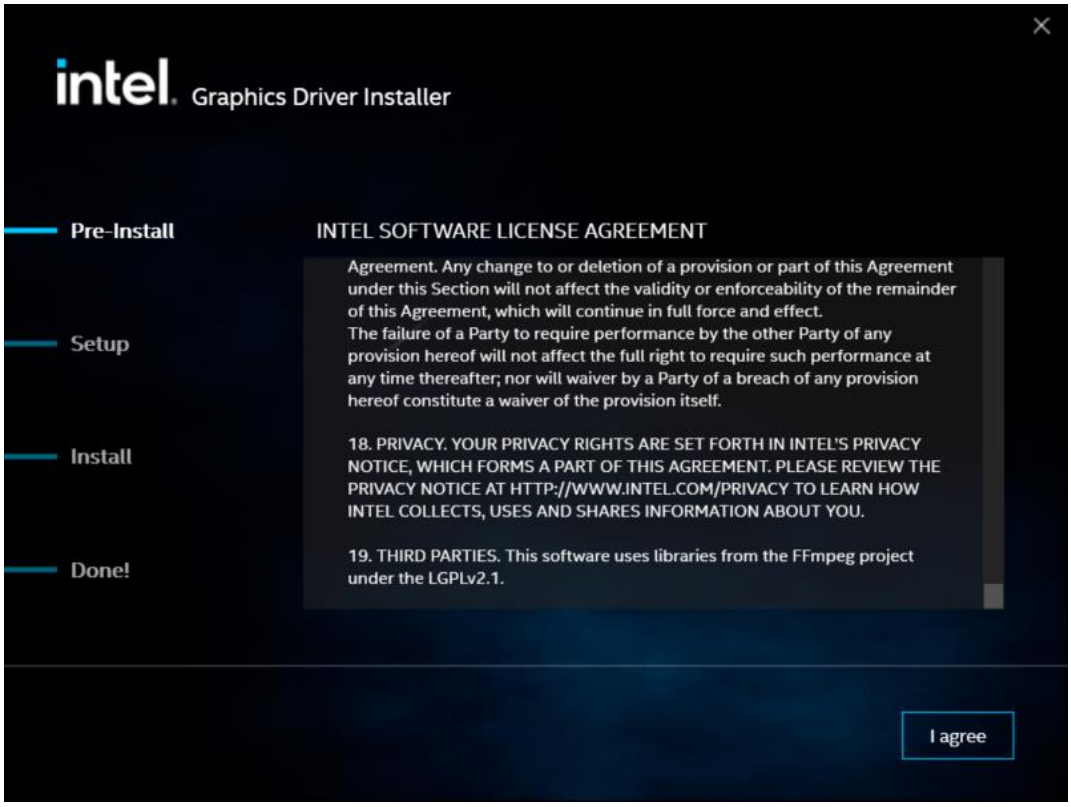
Step 4. Select **Restart Now** to reboot your computer for the changes to take effect.

4.2 Intel® HD Graphics Chipset

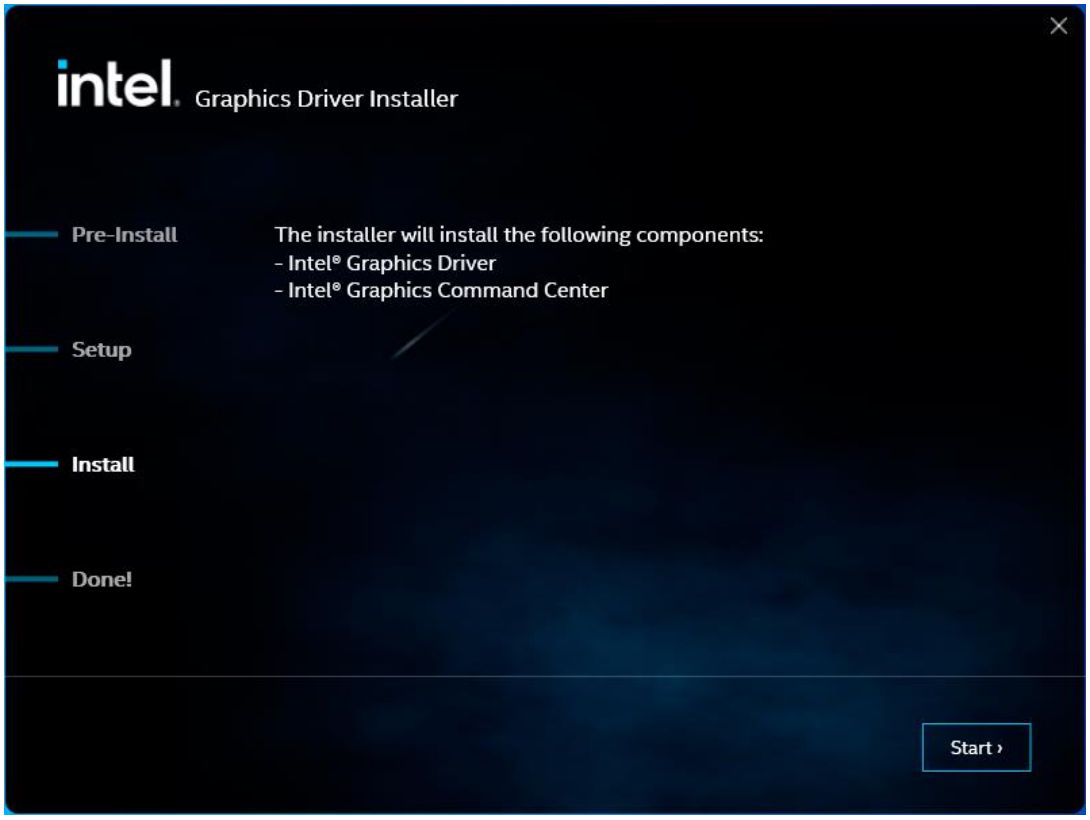
To install the Intel® HD Graphics Chipset, please follow the steps below.

Step 1. Click **Begin installation.**

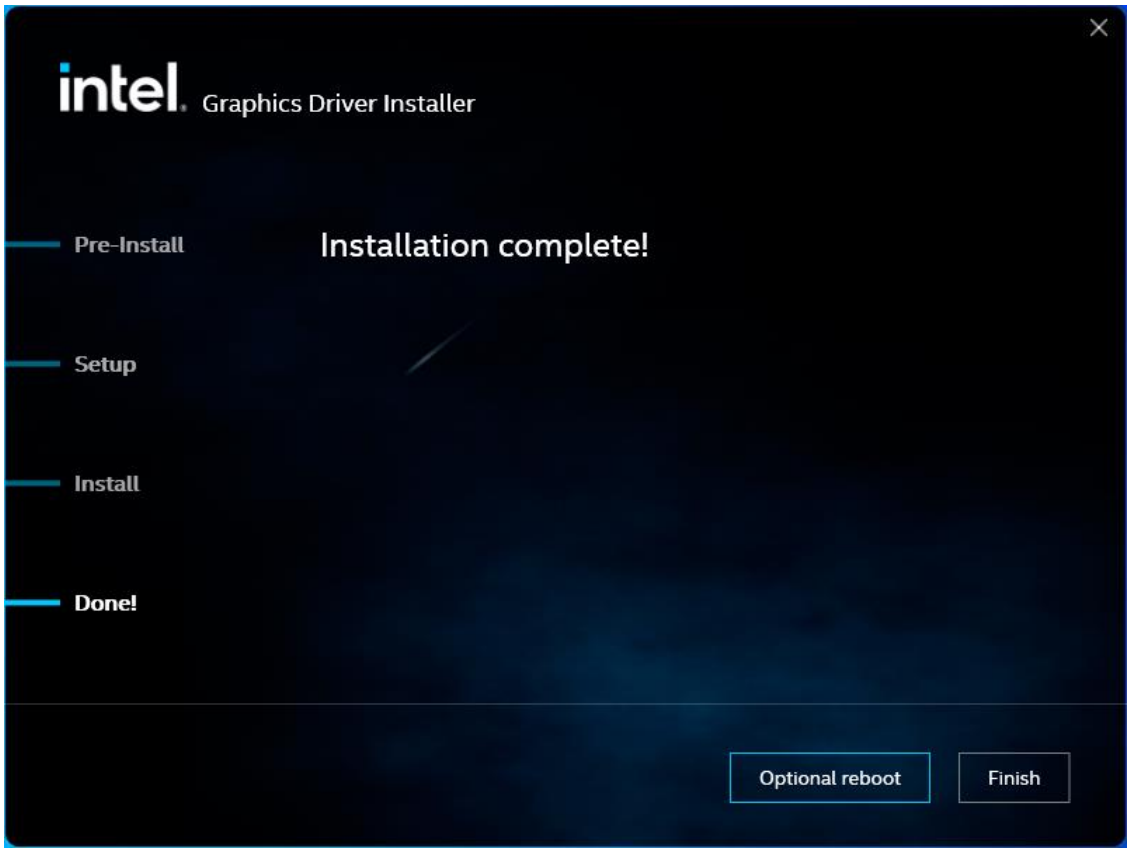
Step 2. Read the license agreement. Click **I agree** to accept all the terms of the license agreement.



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



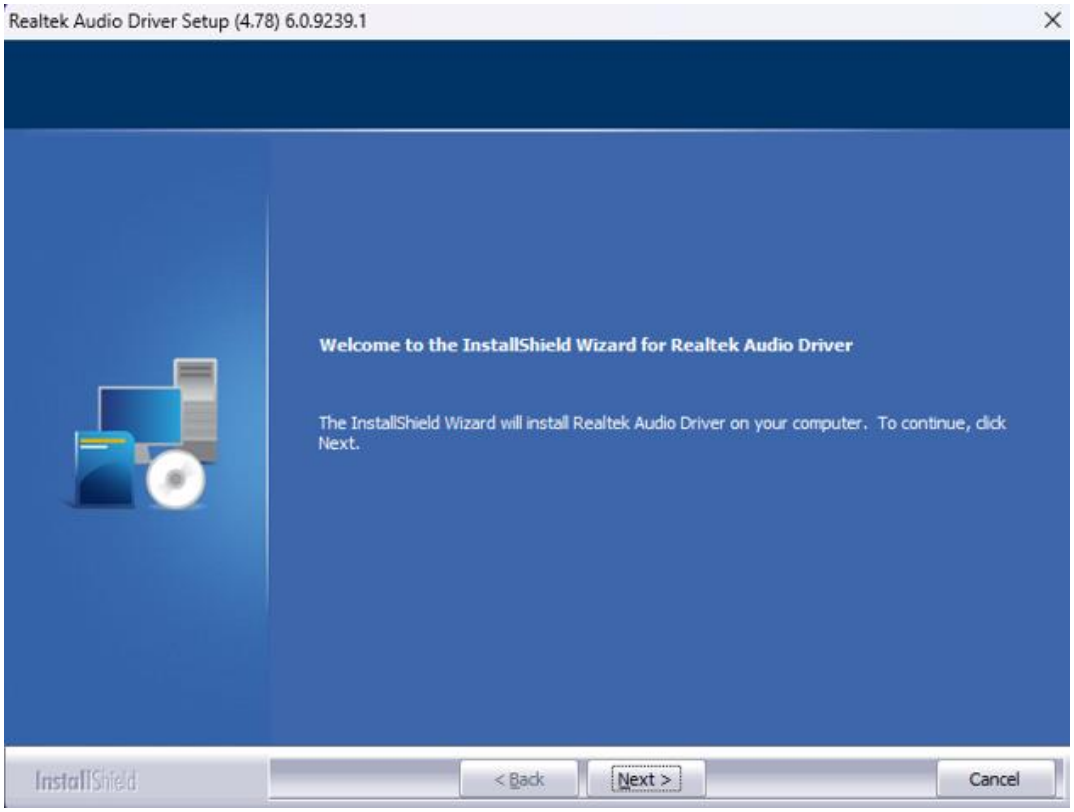
Step 4. Click **Finish** to complete installation.



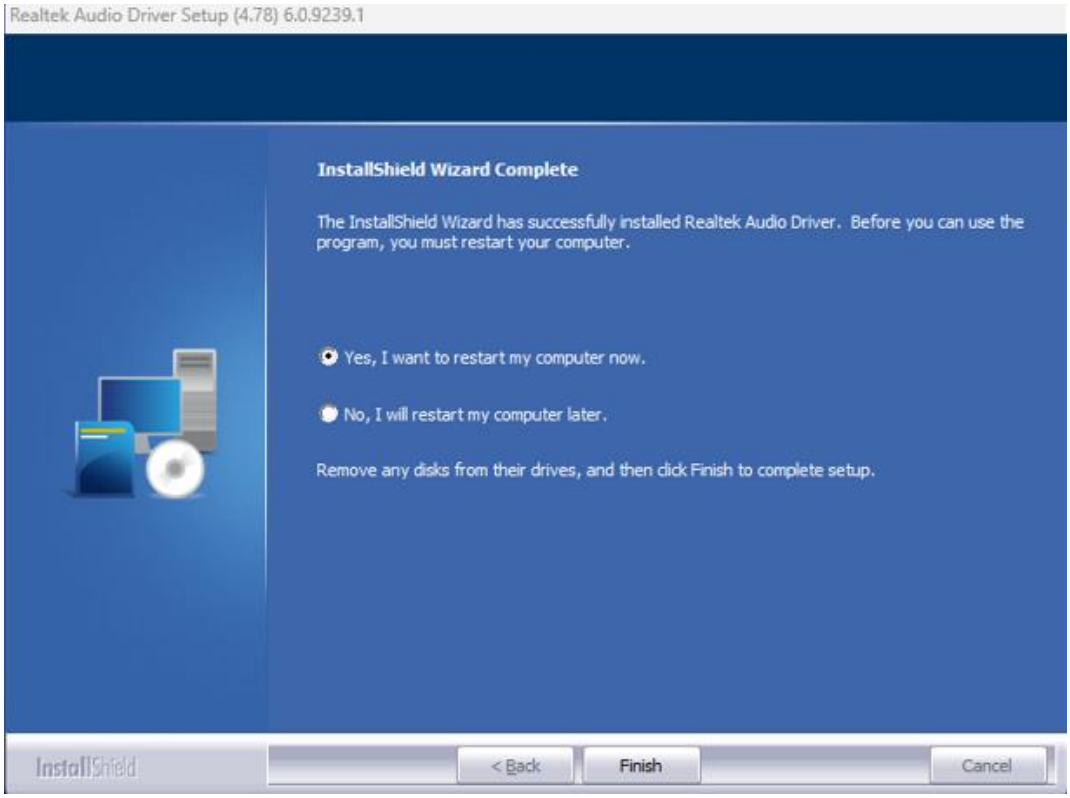
4.3 Audio Chipset

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.

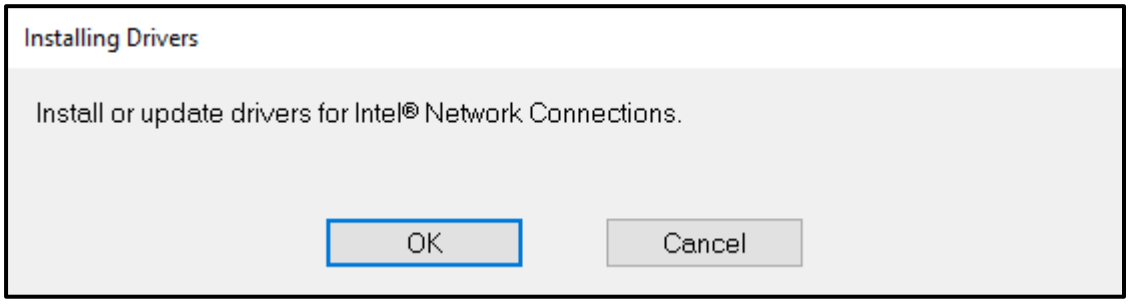

Realtek Audio Driver Setup (4.78) 6.0.9239.1
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed Realtek Audio Driver. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
InstallShield
< Back
Finish
Cancel

4.4 I LAN Driver

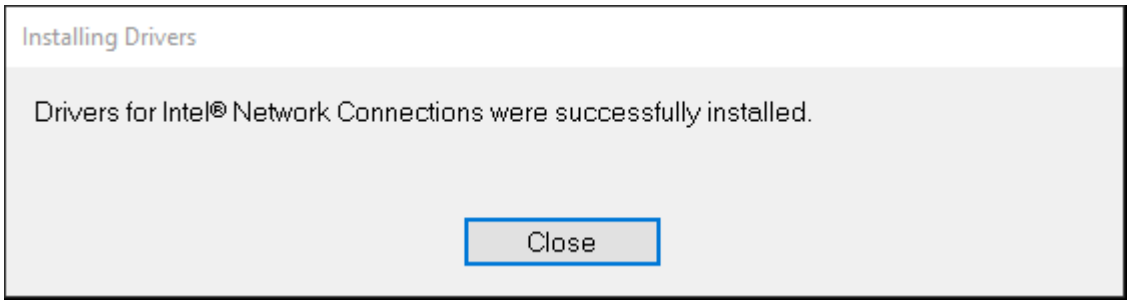
To install the LAN driver, please follow the steps below.

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

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



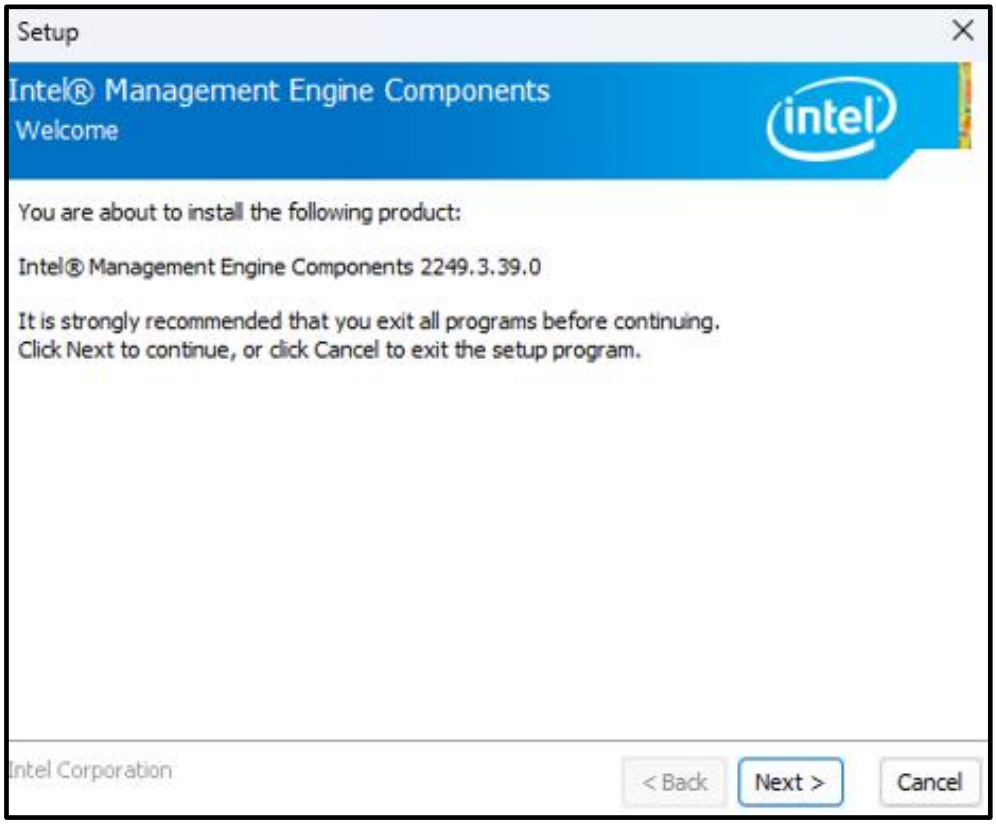
Step 3. Click **Close** to finish installation.



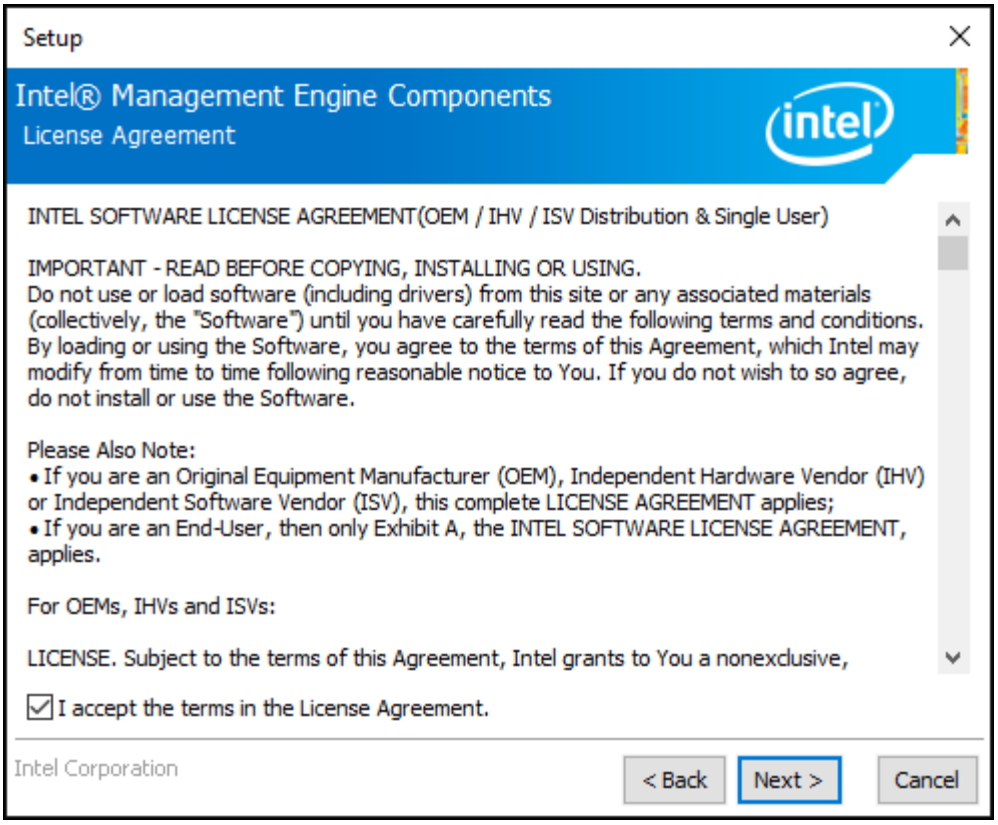
4.5 Intel® Management Engine Interface

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

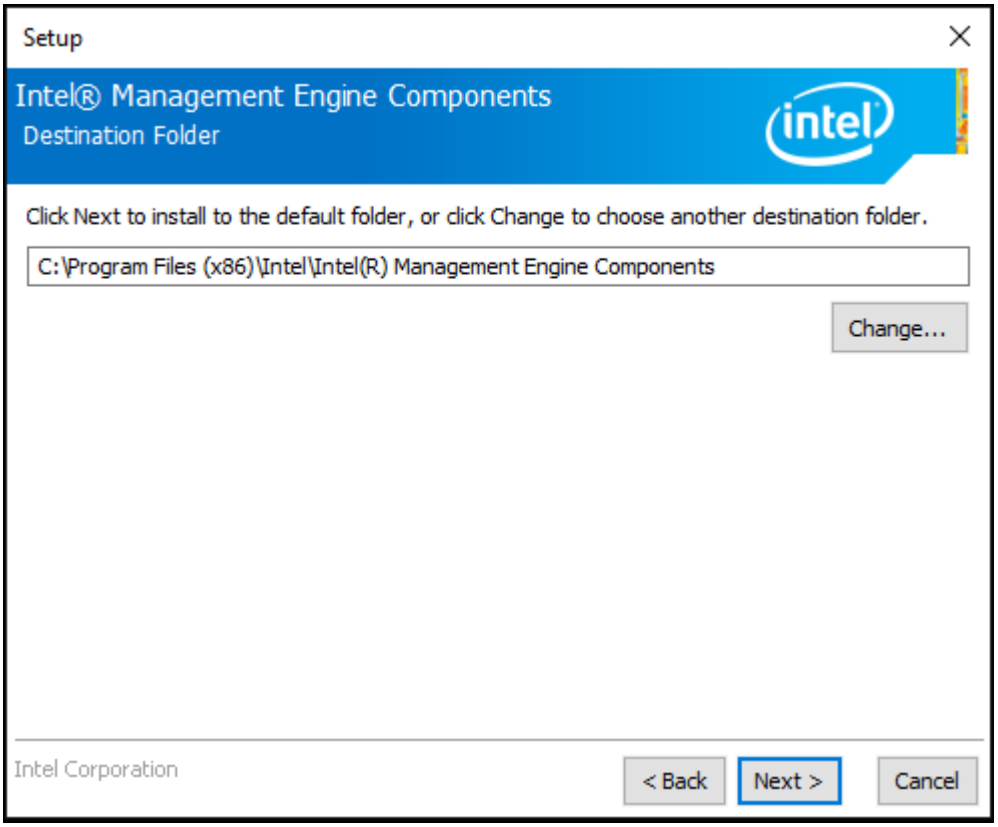
Step 1. Select setup language you need. Click **Next** to continue.



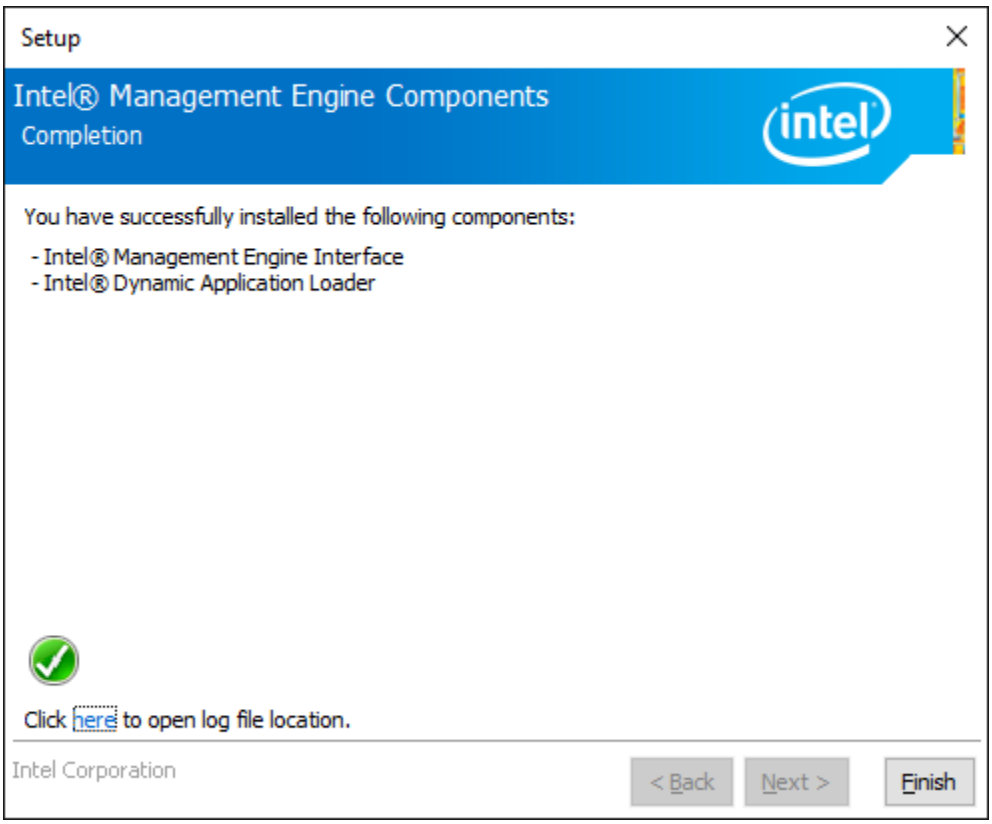
Step 2. Choose **I accept the terms in the License Agreement** and click **Next** to begin the installation.



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



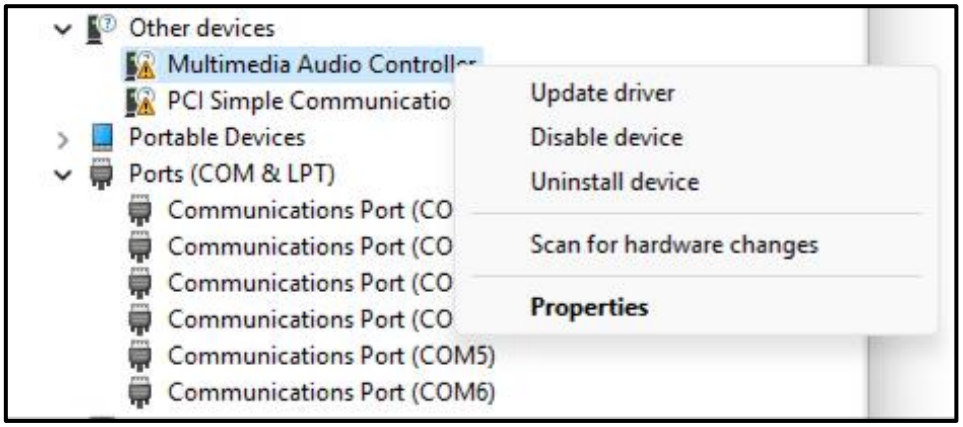
Step 4. Click **Finish** to complete the installation.



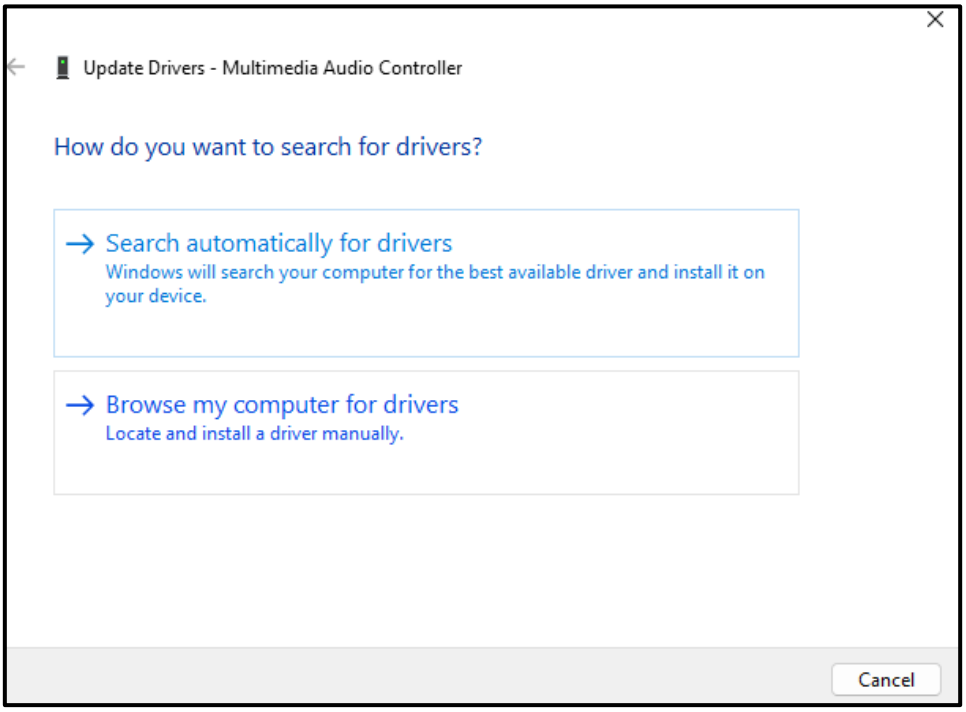
4.6 Intel® Speed Select Technology

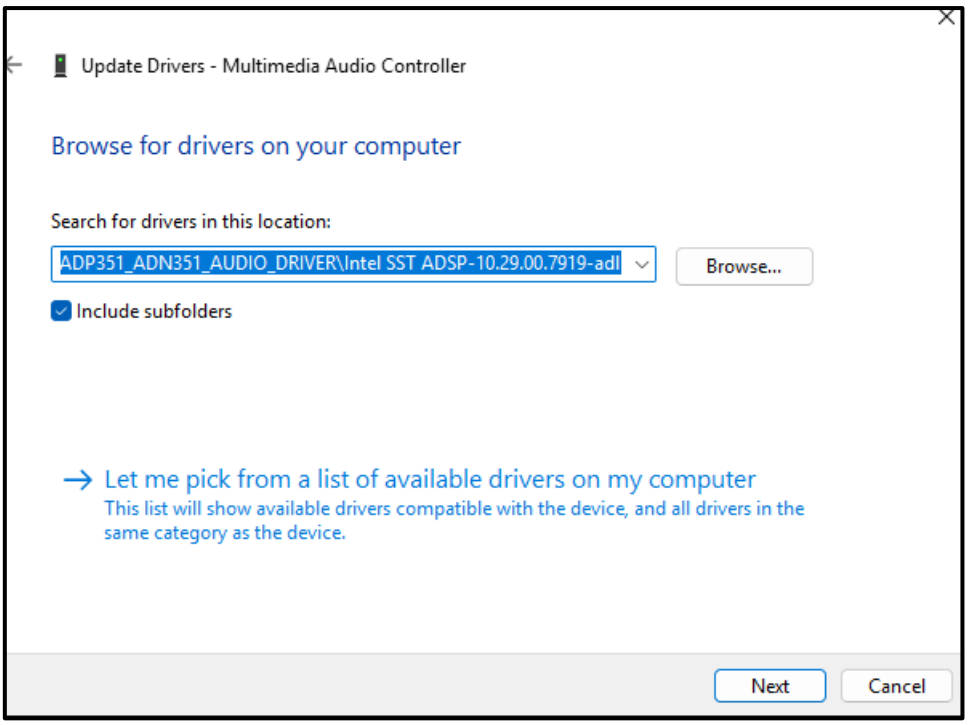
To install the Intel® Speed Select Technology, please follow the steps below.

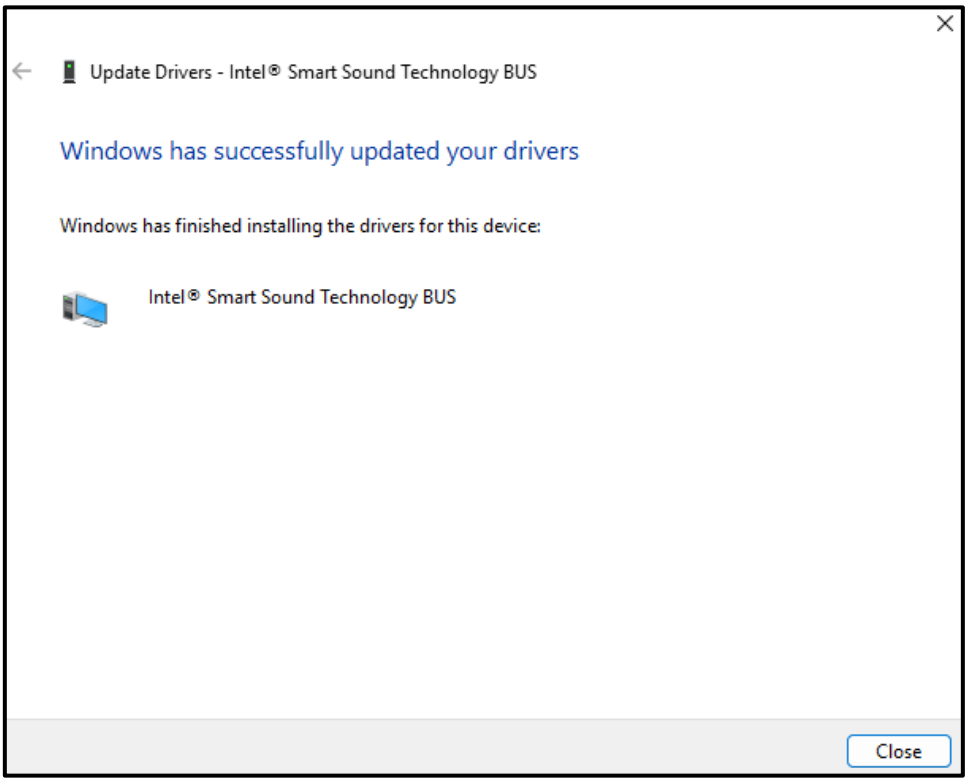
Step 1. Enable Device Manager under Window and you could see there are exclamation mark on Audio Control, please right click you mouse and pop up an property window, then select “update driver”



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

4.7 Resistive Touch Screen Installation

This chapter describes how to install drivers and other software that will allow your Resistive touch screen work with different operating systems.

4.7.1 Windows 10 Universal Driver Installation for PenMount 6000 Series

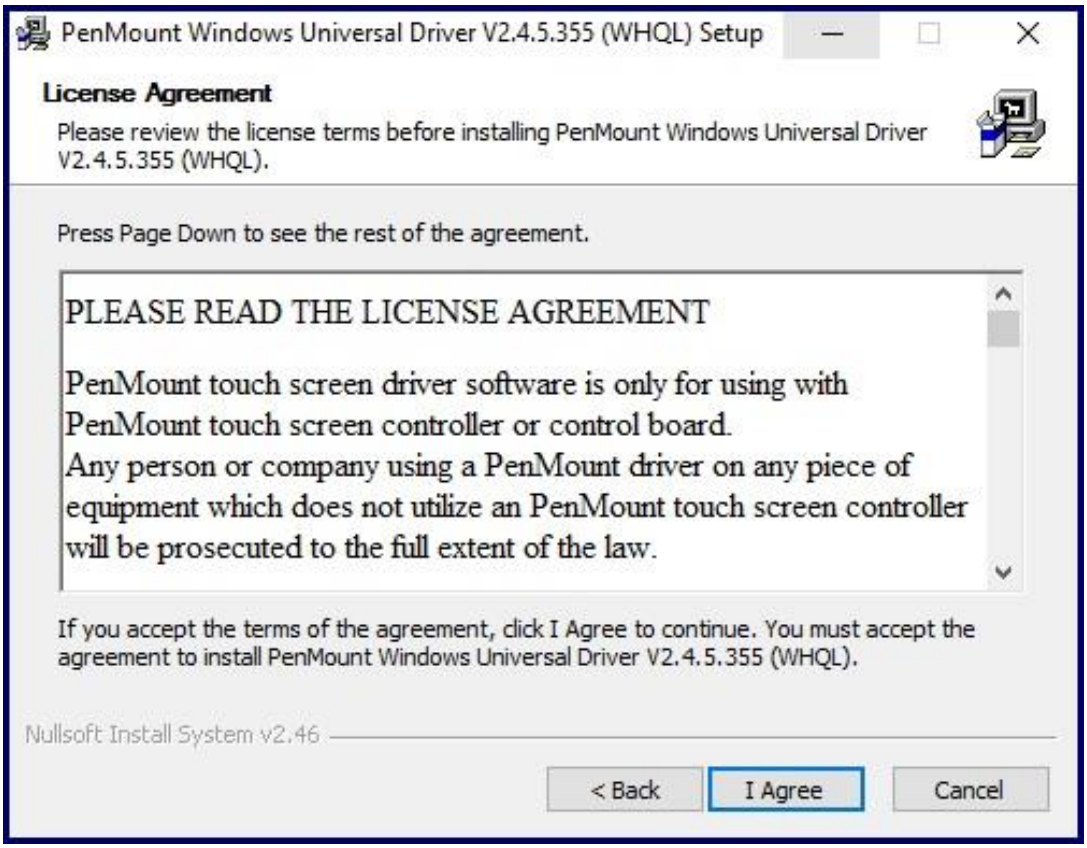
Before installing the Windows 10 driver software, you must have the Windows 10 system installed and running on your computer. You must also have one of the following PenMount 6000 series controller or control boards installed: PM6500, PM6300.

Resistive Touch

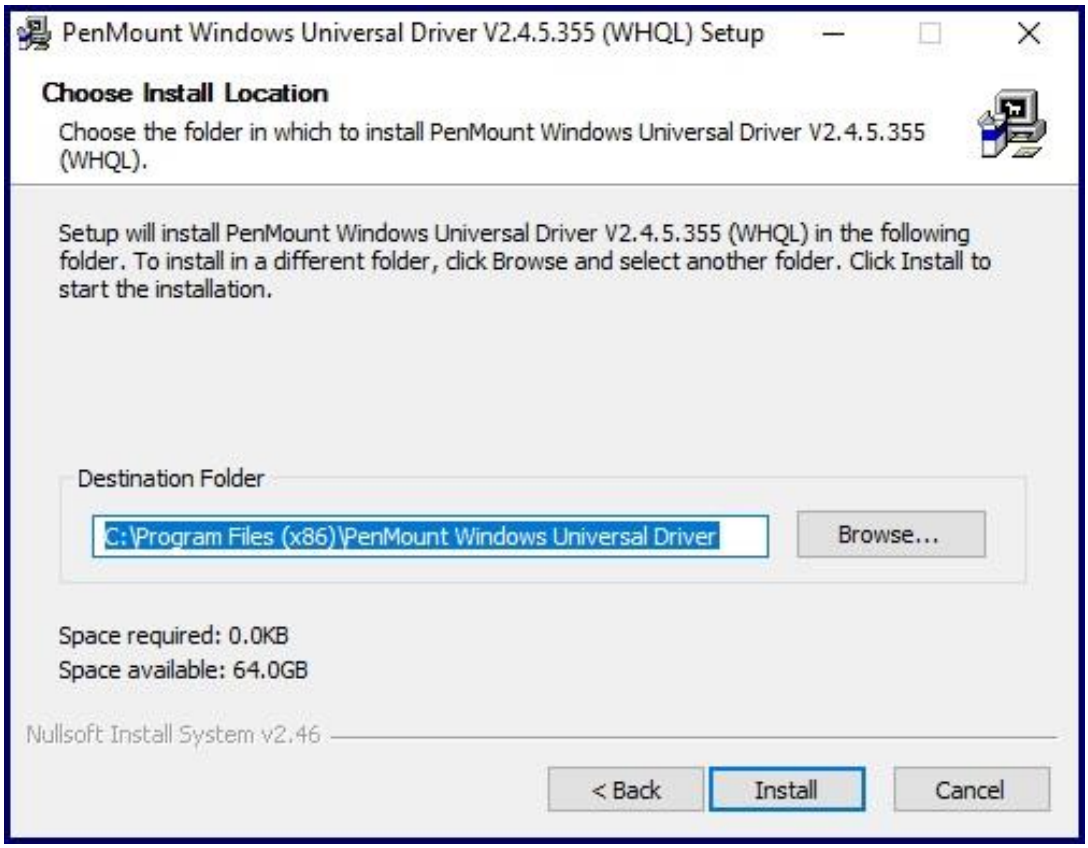
If you have an older version of the PenMount Windows 7 driver installed in your system, please remove it first. Follow the steps below to install the PenMount DMC6000 driver.

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

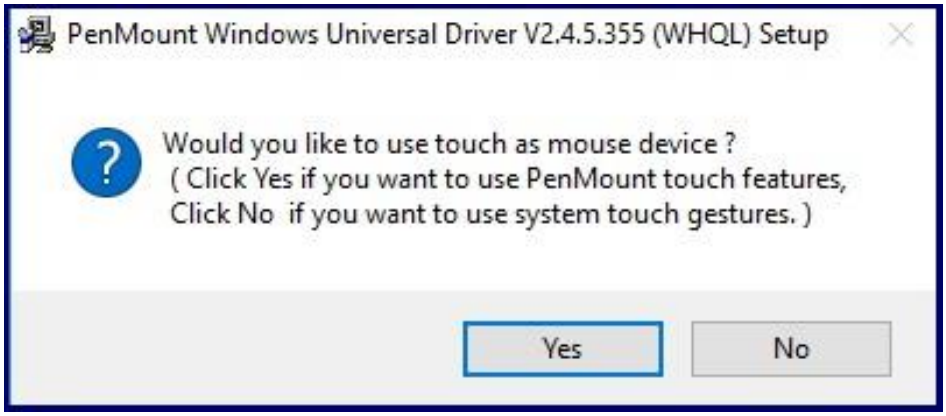
Step 2. Read the license agreement. Click **I Agree** to agree the license agreement.



Step 3. Choose the folder in which to install PenMount Windows Universal Driver. Click **Install** to start the installation.



Step 4. Click **Yes** to continue.



Step 5. Click **Finish** to complete installation.

4.7.2 Software Functions

Resistive Touch

Upon rebooting, the computer automatically finds the new 6000 controller board. The touch screen is connected but not calibrated. Follow the procedures below to carry out calibration.

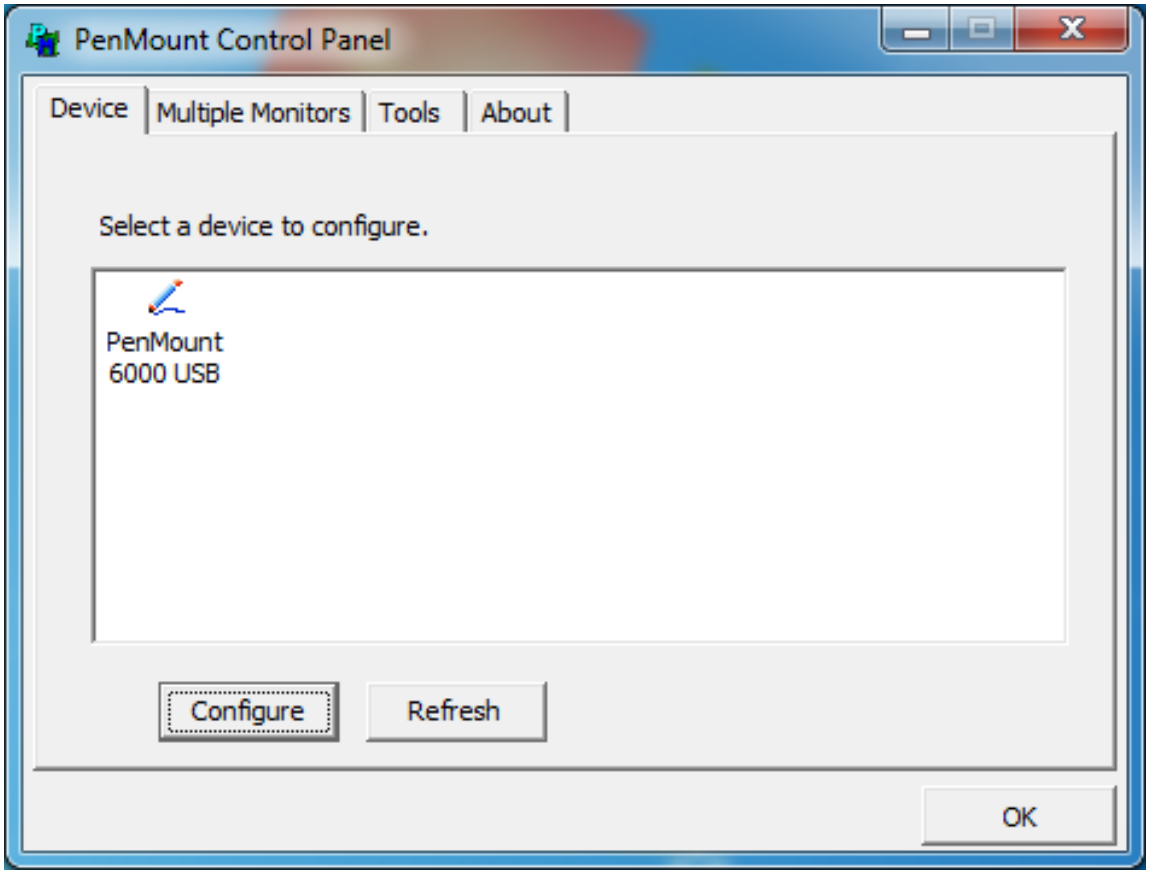
1. After installation, click the PenMount Monitor icon “PM” in the menu bar.
2. When the PenMount Control Panel appears, select a device to “Calibrate.”

PenMount Control Panel (Resistive Touch)

The functions of the PenMount Control Panel are **Device, Multiple Monitors** ,**Tools** and **About**, which are explained in the following sections.

Device

In this window, you can find out that how many devices be detected on your system.

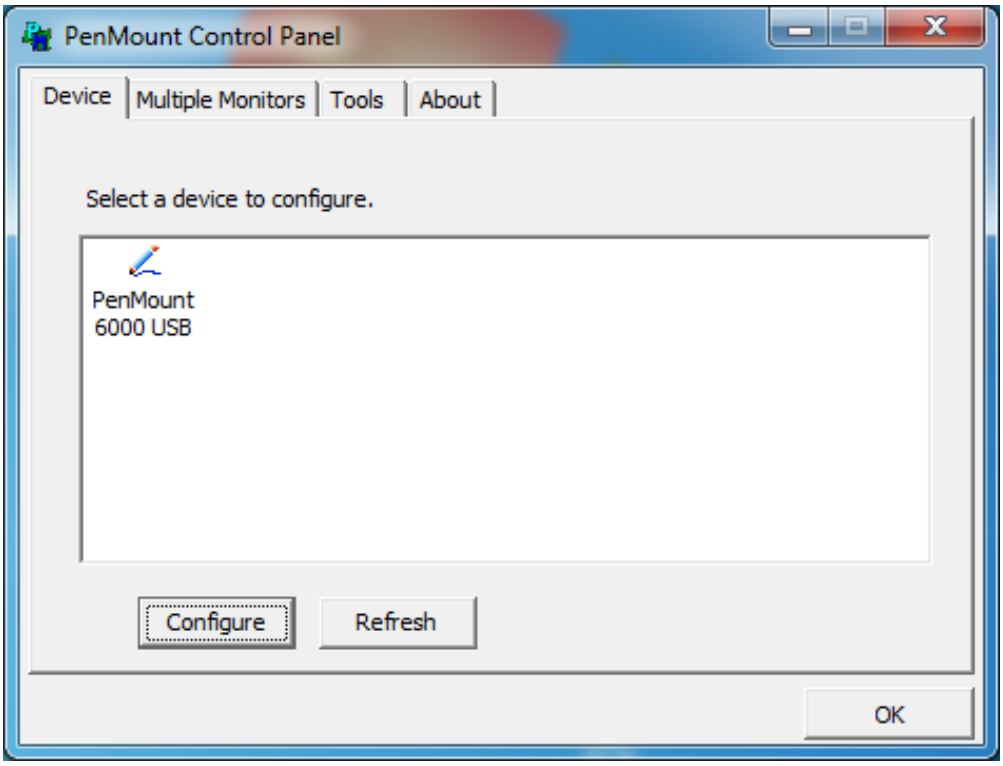


Calibrate

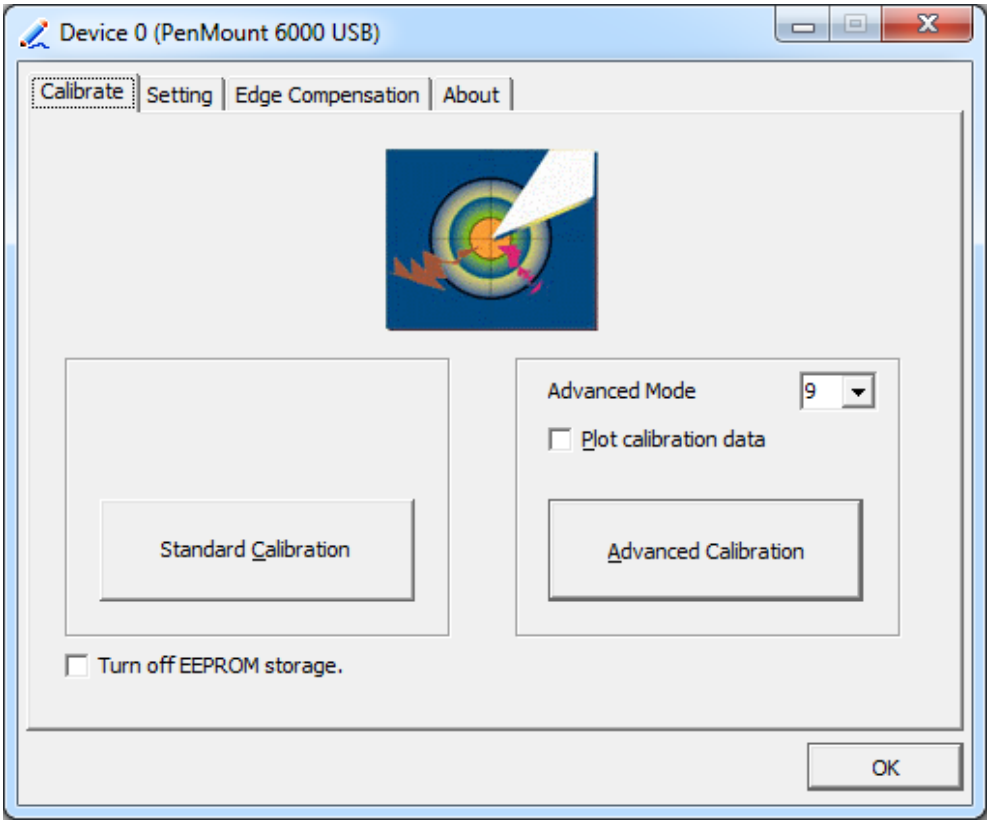
This function offers two ways to calibrate your touch screen. 'Standard Calibration' adjusts most touch screens. 'Advanced Calibration' adjusts aging touch screens.

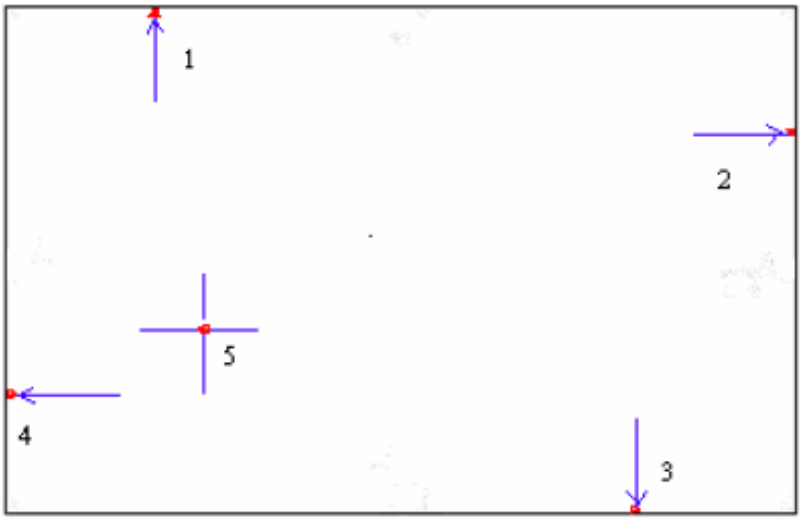
Standard Calibration	**Click this button and arrows appear pointing to red squares. Use your finger or stylus to touch the red squares in sequence. After the fifth red point calibration is complete. To skip, press 'ESC'.**
Advanced Calibration	**Advanced Calibration uses 4, 9, 16 or 25 points to effectively calibrate touch panel linearity of aged touch screens. Click this button and touch the red squares in sequence with a stylus. To skip, press ESC'.**

Step 1. Please select a device then click "Configure". You can also double click the device too.



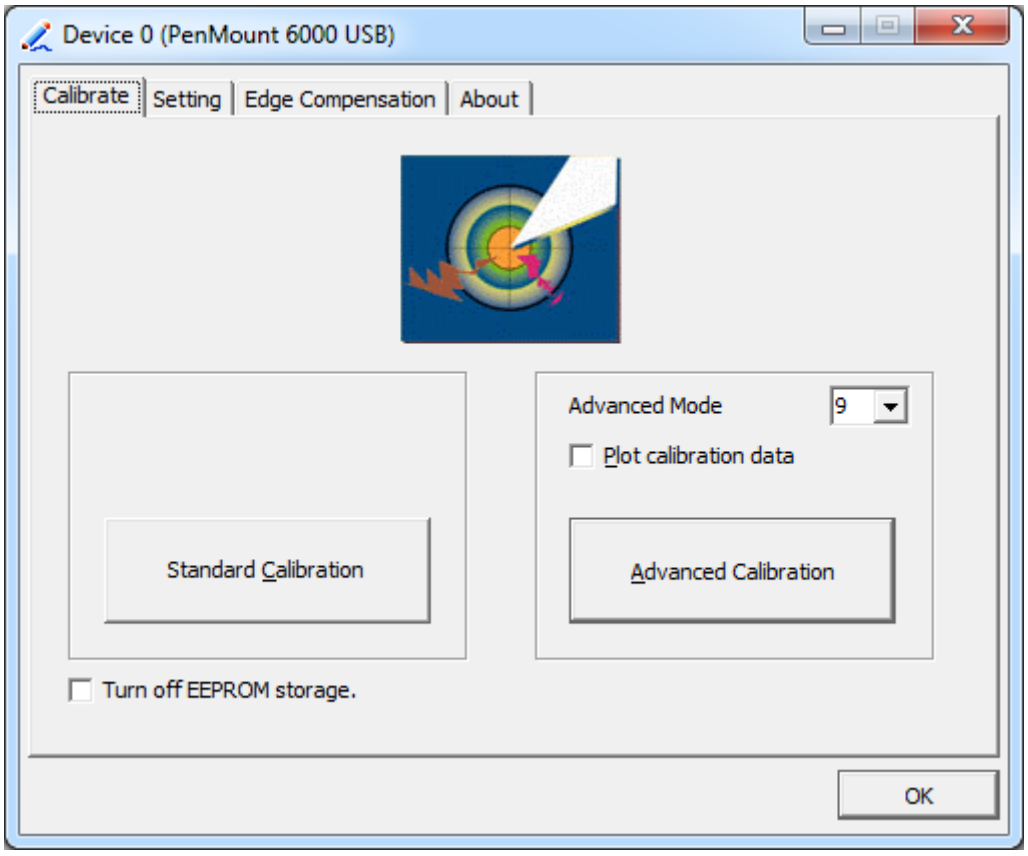
Step 2. Click "**Standard Calibration**" to start calibration procedure



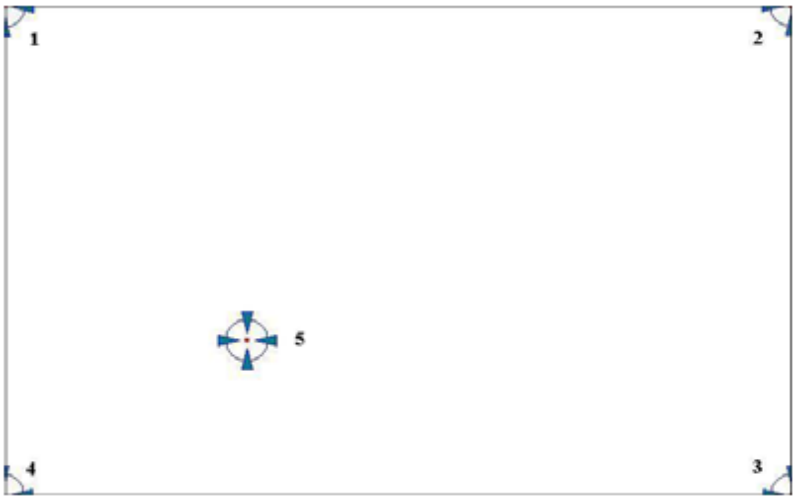


NOTE: The older the touch screen, the more Advanced Mode calibration points you need for an accurate calibration. Use a stylus during Advanced Calibration for greater accuracy. Please follow the step as below:

Step 3. Select **Device** to calibrate, then you can start to do **Advanced Calibration**.

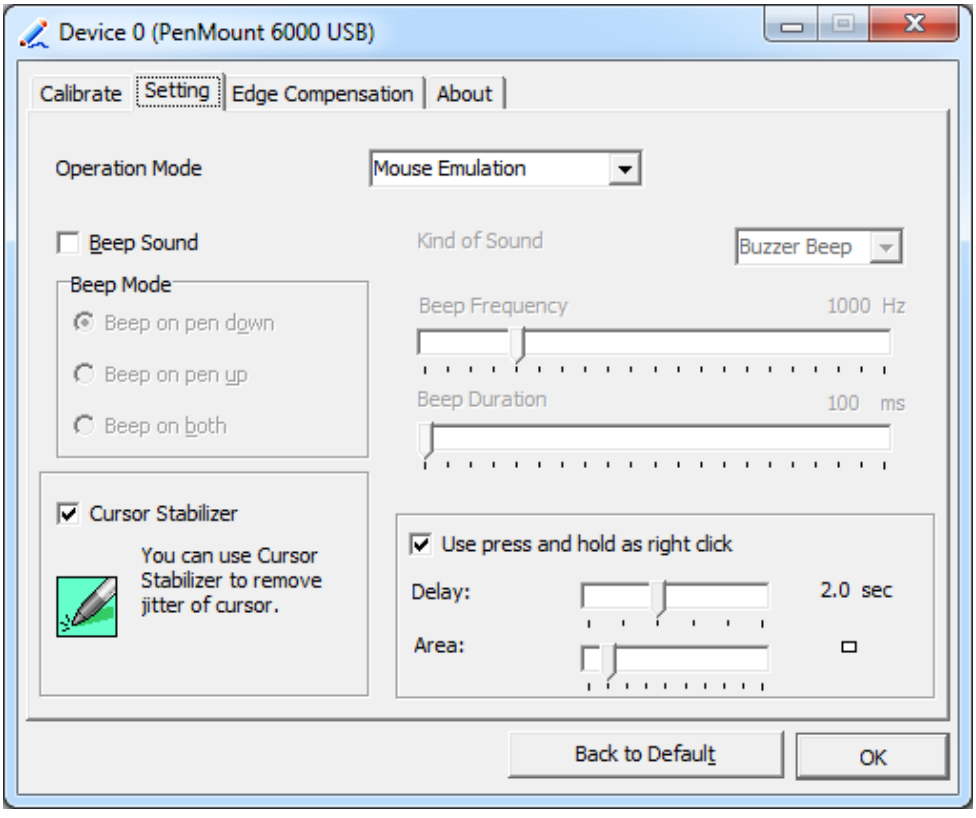


NOTE: Recommend to use a stylus during Advanced Calibration for greater accuracy.



Plot Calibration Data	**Check this function and a touch panel linearity comparison graph appears when you have finished Advanced Calibration. The blue lines show linearity before calibration and black lines show linearity after calibration.**
Turn off EEPROM storage	**The function disable for calibration data to write in Controller. The default setting is Enable.**

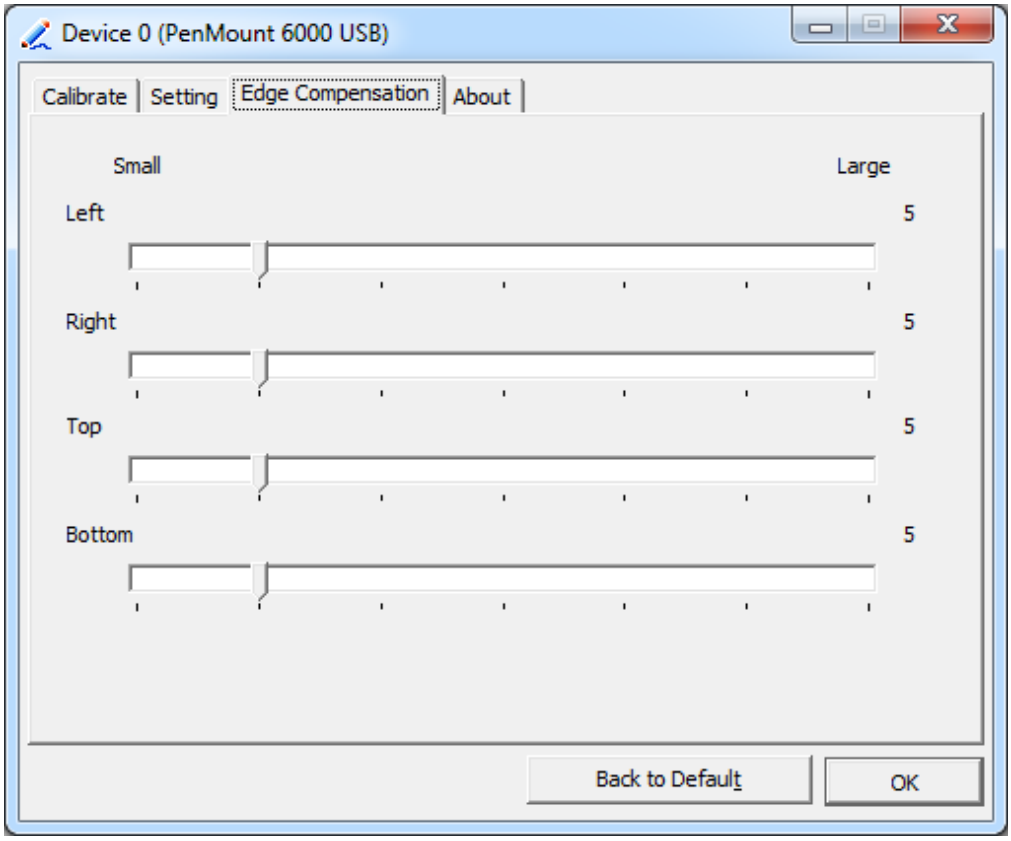
Setting



Touch Mode	**This mode enables and disables the mouse's ability to drag on-screen icons – useful for configuring POS terminals.** **Mouse Emulation – Select this mode and the mouse functions as normal and allows dragging of icons.** **Click on Touch – Select this mode and mouse only provides a click function, and dragging is disables.**
Beep Sound	**Enable Beep Sound – turns beep function on and off** **Beep on Pen Down – beep occurs when pen comes down** **Beep on Pen Up – beep occurs when pen is lifted up** **Beep on both – beep occurs when comes down and lifted up** **Beep Frequency – modifies sound frequency** **Beep Duration – modifies sound duration**
Cursor Stabilizer	**Enable the function support to prevent cursor shake.**
Use press and hold as right click	**You can set the time out and area for you need.**

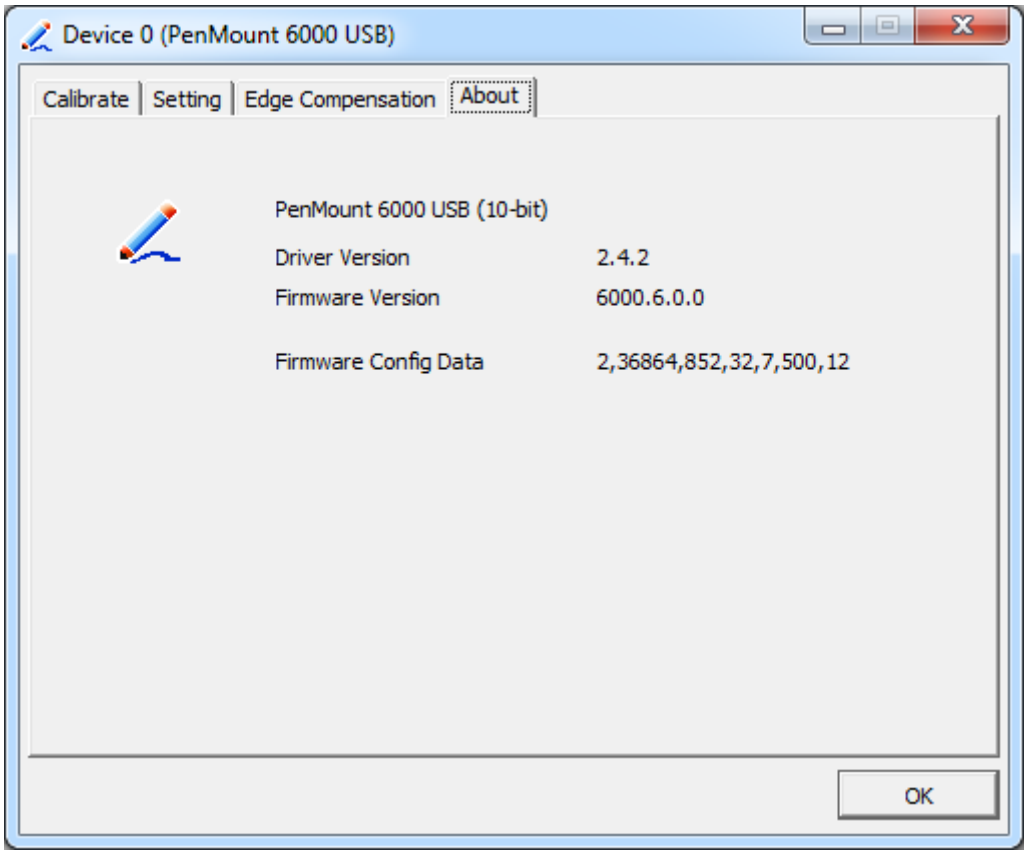
Edge Compensation

You can use Edge Compensation to calibrate more subtly.



About

This panel displays information about the PenMount controller and driver version.



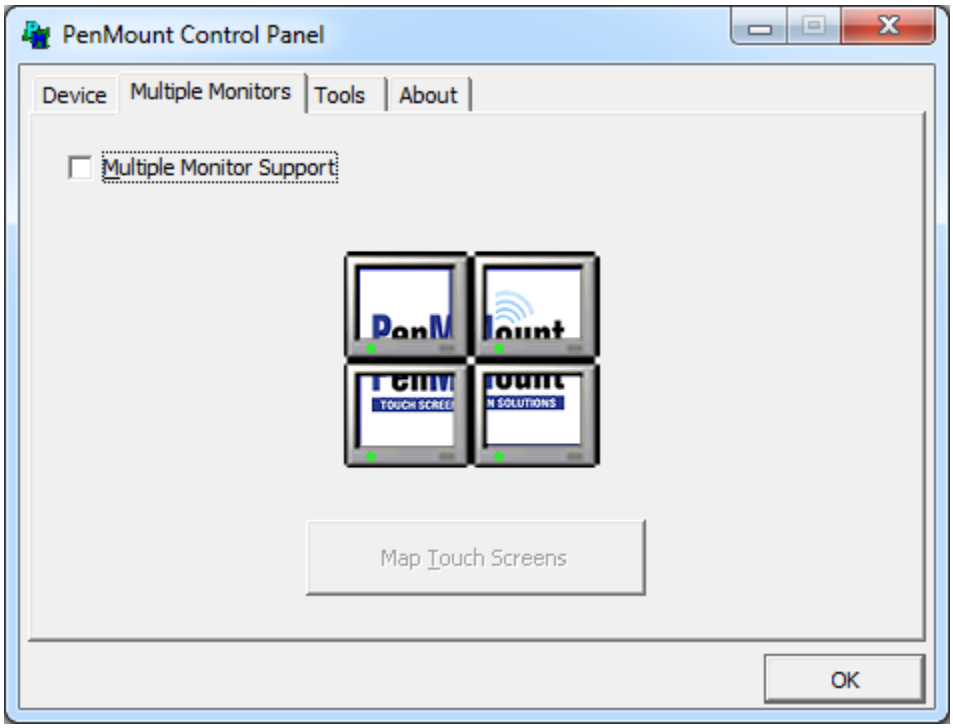
Multiple Monitors

Multiple Monitors support from two to six touch screen displays for one system. The PenMount drivers for Windows 7/8/8.1 support Multiple Monitors. This function supports from two to six touch screen displays for one system. Each monitor requires its own PenMount touch screen control board, either installed inside the display or in a central unit. The PenMount control boards must be connected to the computer COM ports via the USB interface. Driver installation procedures are the same as for a single monitor.
Multiple Monitors support the following modes:
Windows Extends Monitor Function
Matrox DualHead Multi-Screen Function
nVidia nView Function

NOTE: The Multiple Monitor function is for use with multiple displays only. Do not use this function if you have only one touch screen display. Please note once you turn on this function the rotating function is disabled.

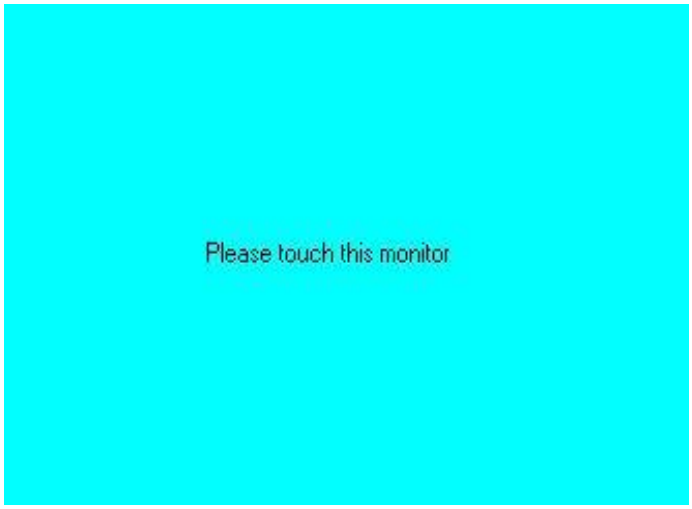
Enable the multiple display function as follows:

1. Check the **Enable Multiple Monitor Support** box; then click **Map Touch Screens** to assign touch controllers to displays.



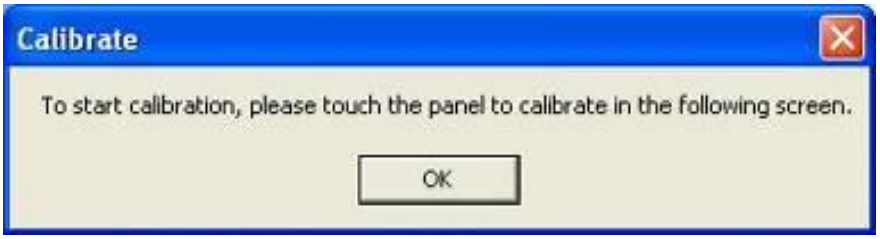
2. When the mapping screen message appears, click **OK.**

3. Touch each screen as it displays “Please touch this monitor”. Following this sequence and touching each screen is called **mapping the touch screens.**



4. Touching all screens completes the mapping and the desktop reappears on the monitors.

5. Select a display and execute the “Calibration” function. A message to start calibration appears. Click **OK.**



6. “Touch this screen to start its calibration” appears on one of the screens. Touch the screen.

7. “Touch the red square” messages appear. Touch the red squares in sequence.

8. Continue calibration for each monitor by clicking **Standard Calibration** and touching the red squares.

NOTES:

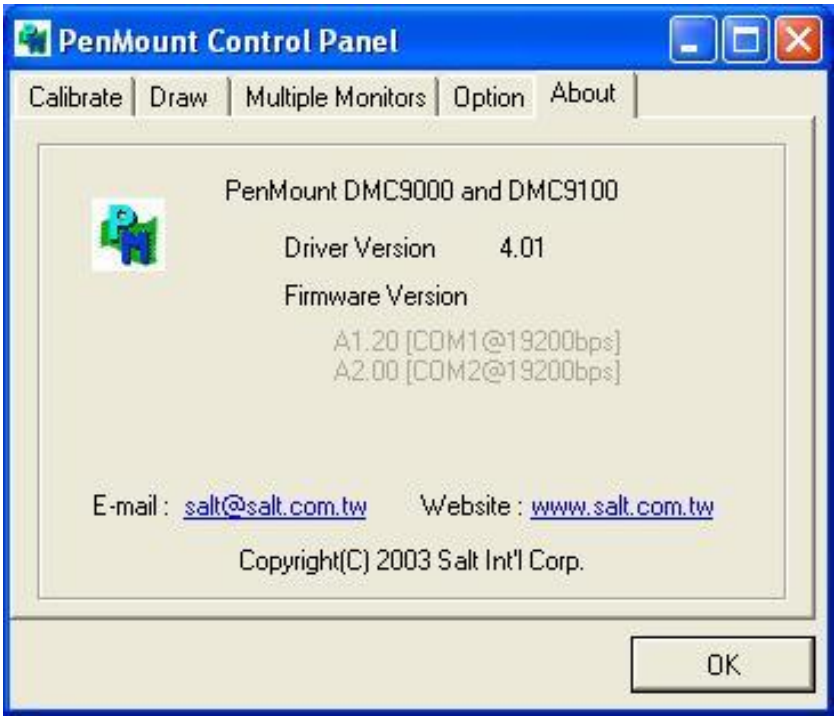
1. If you use a single VGA output for multiple monitors, please do not use the **Multiple Monitor** function. Just follow the regular procedure for calibration on each of your desktop monitors.

2. The Rotating function is disabled if you use the Multiple Monitor function.

3. If you change the resolution of display or screen address, you have to redo **Map Touch Screens,** so the system understands where the displays are.

About

This panel displays information about the PenMount controller and this driver version.



PenMount Monitor Menu Icon

The PenMount monitor icon (PM) appears in the menu bar of Windows 7/8/8.1 system when you turn on PenMount Monitor in PenMount Utilities.

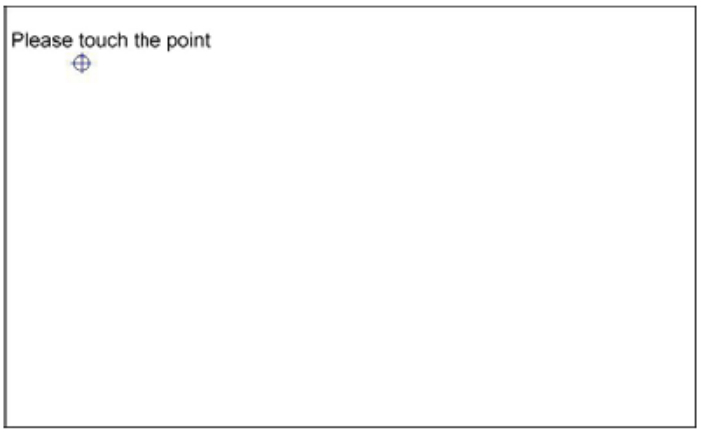
PenMount Monitor has the following function

Control Panel	**Open Control Panel Windows**
Beep	**Setting Beep function for each device**
Right Button	**When you select this function, a mouse icon appears in**

	the right-bottom of the screen. **Click this icon to switch between Right and Left Button functions.**
Exit	**Exits the PenMount Monitor function.**

Configuring the Rotate Function

1. Install the rotation software package.
2. Choose the rotate function (0°, 90°, 180°, 270°) in the 3rd party software. The calibration screen appears automatically. Touch this point and rotation is mapped.



NOTE: The Rotate function is disabled if you use Monitor Mapping