

BC680R

Intel® Core™ Processors (Series 2) and 12/13/14th Gen

Intel® Core™ i9/i7/i5/i3

ATX Motherboard with Intel® R680E Chipset

User's Manual

2nd Ed –17 June 2026

FCC Statement



THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

- (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.
- (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

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3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.
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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

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1. Getting Started

1.1 Safety Precautions

Warning!



Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

Before you begin installing your single board, please make sure that the following materials have been shipped:

- 1 x BC680R Motherboard
- 1 x I/O Shield



If any of the above items is damaged or missing, contact your retailer.

1.3 Document Amendment History

Revision	Date	By	Comment
1 st	November 2023	Avalue	Initial Release
2 nd	June 2026	Avalue	Avalue Update Setting Jumpers & Connectors & 71832-IA supports BTL-S Hybrid Series only

1.4 Manual Objectives

This manual describes in details Avalue Technology BC680R Single Board.

We have tried to include as much information as possible but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to set up BC680R or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors regarding this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

1.5 System Specifications

System	
CPU	Intel® 12/13/14th Gen Intel® Core™ i9/7/5/3 Processors, supports LGA 1700 CPU Up to 65W Max (71832-IA) Intel® Core™ Processors (Series 2) and 12/13/14th Gen Intel® Core™ i 9/7/5/3 Processors, supports LGA 1700 CPU Up to 65W Max (71833-IA, support BTL-S Hybrid Series only)
BIOS	AMI uEFI BIOS, 256Mbit SPI Flash ROM
System Chipset	Intel® R680E chipsets
I/O Chip	Nuvoton NCT6126D (eSPI super IO)
System Memory	4 x DIMM Up to 128GB Max Dual Channel DDR5 4400 MHz with ECC Support (Optional ECC Support depending on selected CPU)
Watchdog Timer	H/W Reset, 1~255 seconds/1~255 minutes
H/W Status Monitor	CPU temperature monitoring Voltages monitoring CPU fan speed control
RAID	Support RAID 0, 1, 5, 10
TPM	TPM 2.0
iAMT	Intel® AMT 16
Other	1 x Thunderbolt Header(optional)
Expansion Slot	
M.2	1 x M.2 2230 E Key with CNVi Support (PCIe x1 + USB 2.0)
PCIe	1 x Gen 5 PCIe x16 (x16 Physical Black) (Slot 2) 2 x Gen 4 PCIe x4 (x16 Physical Orange) (Slot 4 & 7) 1 x Gen 3 PCIe x4 (x16 Physical Yellow) (Slot 3) 1 x Gen 3 PCIe x1 (x16 Physical Yellow) (Slot 6) 2 x Gen 3 PCIe x1 Open Ended (Slot 1 & 5)
Storage	
M.2	1 x M.2 2242/2280/22110 M Key NVMe (PCIe x4 + SATA III) 1 x M.2 2242/2280/22110 M Key NVMe (PCIe x4 Only)
SATA	4 x SATA III
Edge I/O	
LAN	2 x 2.5 Gigabit Ethernet
USB 3.2	6 x USB 3.2 Gen 2x1 Type-A Connectors 1 x USB 3.2 Gen 2x2 Type-C Connector
DP	2 x DP++
HDMI	2 x HDMI 2.0b

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Audio	Line out, Mic in
Onboard I/O	
COM	COM1/2/4/5/6 support RS232 5 x 2 x 5 pin, pitch 2.00mm connector for COM1~2 and COM4~COM6 to support RS232 5 x 2 x 3 pin, pitch 2.00mm connector for COM1~2 and COM4~COM6 pin9 RI/5V/12V jumper select. <u>COM3: support RS232/422/485</u> 1 x 2 x 5 pin, pitch 2.00mm connector for COM3 to support RS232/RS422/RS485 by BIOS Selection 1 x 2 x 3 pin, pitch 2.00mm connector for COM3 pin9 RI/5V/12V jumper select.
USB 2.0	4 x 2 x 5 pin, pitch 2.54mm connector for 8 x USB 2.0
USB 3.2	1 x 2 x 10 pin, pitch 2.00mm connector for 2 x USB 3.2 Gen 2 ×1
GPIO	1 x 2 x 6 pin, pitch 2.00mm connector for GPIO: 8 bits
CPU/System FAN	1 x 1 x 4 pin, pitch 2.54mm CPU fan connector with smart fan function supported 1 x 1 x 4 pin, pitch 2.54mm Chassis fan connector with smart fan function supported 1 x 1 x 4 pin, pitch 2.54mm Chassis fan connector with smart fan function supported
Buzzer	Onboard Buzzer
Front Panel	1 x 2 x 5 pin, pitch 2.54mm connector for front panel
RTC Battery	1 x Horizontal type battery connector (CR2032 Coin Battery)
AT/ATX Selector	1 x 1 x 3 pin pitch 2.00mm connector for AT/ATX jumper 1 x 2 x 12 pin ATX power connector 1 x 2 x 4 pin ATX 12V power connector
Clear CMOS	1 x 1 x 3pin, pitch 2.00mm connector for CMOS Clear
I2C	1 x 1 x 4 pin, pitch 2.00mm connector for I2C
Chassis Intrusion	1 x 1 x 2 pin, pitch 2.54mm connector for Chassis Intrusion Switch
PS/2 KB&MS	1 x 1 x 6 pin, pitch 2.54mm connector for PS/2 KB&MS
LAN LED	1 x 2 x 5 pin, pitch 2.54mm connector for LAN LED status connector
BIOS SPI	1 x 2 x 4 pin, pitch 2.54mm connector for BIOS SPI
eSPI	1 x 2 x 5 pin, pitch 2.00mm connector for eSPI
SMBus	1 x 1 x 5 pin, pitch 2.00mm connector for SMBus
ME	1 x 1 x 3 pin, pitch 2.00mm connector for ME
Audio	1 x 2 x 5 pin, pitch 2.54mm connector for front Audio 1 x 1 x 4 pin, pitch 2.00mm connector for Amplifier
Display	
Graphic Chipset	Intel® Core™ Processors (Series 2) and 12/13/14th Gen CPU integrated
Spec. & Resolution	2 x HDMI 2.0b 4K@60Hz 2 x Dual Mode DisplayPort 1.4a 4K@60Hz

Multiple Display	4 Independent Displays
Ethernet	
LAN Chipset	2 x Intel® i225/i226-LM 2.5G Gigabit Controller
LAN Spec.	Intel® i225/i226-LM: 10/100/1000/2500 Base-Tx GbE compatible
Mechanical & Environmental Specification	
Power Requirement	+12V / +5V / 5VSB /+3.3V /-12V
ACPI	Single power ATX Support S0, S3, S4, S5
Power Mode	AT / ATX mode Switchable Through Jumper
Operating Temp.	0~60°C (32~140°F), 0.5m/s airflow **Note: Intel PTAT suggests** Turbo off Workload – IA 100% / GT 100% PL2(Power Limit) set as default
Storage Temp.	-20~ +80°C (-4 ~ 176°F)
Operating Humidity	40°C @ 5% to 90% Relative Humidity, Non-condensing
Size (L x W)	12" x 9.6" (304.8mm x 243.84mm)
Weight	1.85lbs (0.84kg)
Vibration Test	Package Vibration Test Reference IEC60068-2-64 Testing procedures Test Fh: Vibration broadband random Test 1. PSD: 0.026G²/Hz, 2.16 Grms 2. Non-operation mode 3. Test Frequency: 5-500Hz 4. Test Axis: X,Y and Z axis 5. 30 min. per each axis 6. IEC 60068-2-64 Test: Fh Random Vibration Operation Reference IEC60068-2-64 Testing procedures Test Fh : Vibration broadband random Test 1. PSD: 0.00202023G²/Hz 0.5 Grms 2. Operation mode 3. Test Frequency : 5-500Hz 4. Test Axis : X,Y and Z axis 5. 30 minutes per each axis 6. IEC 60068-2-64 Test:Fh Random Vibration Non Operation

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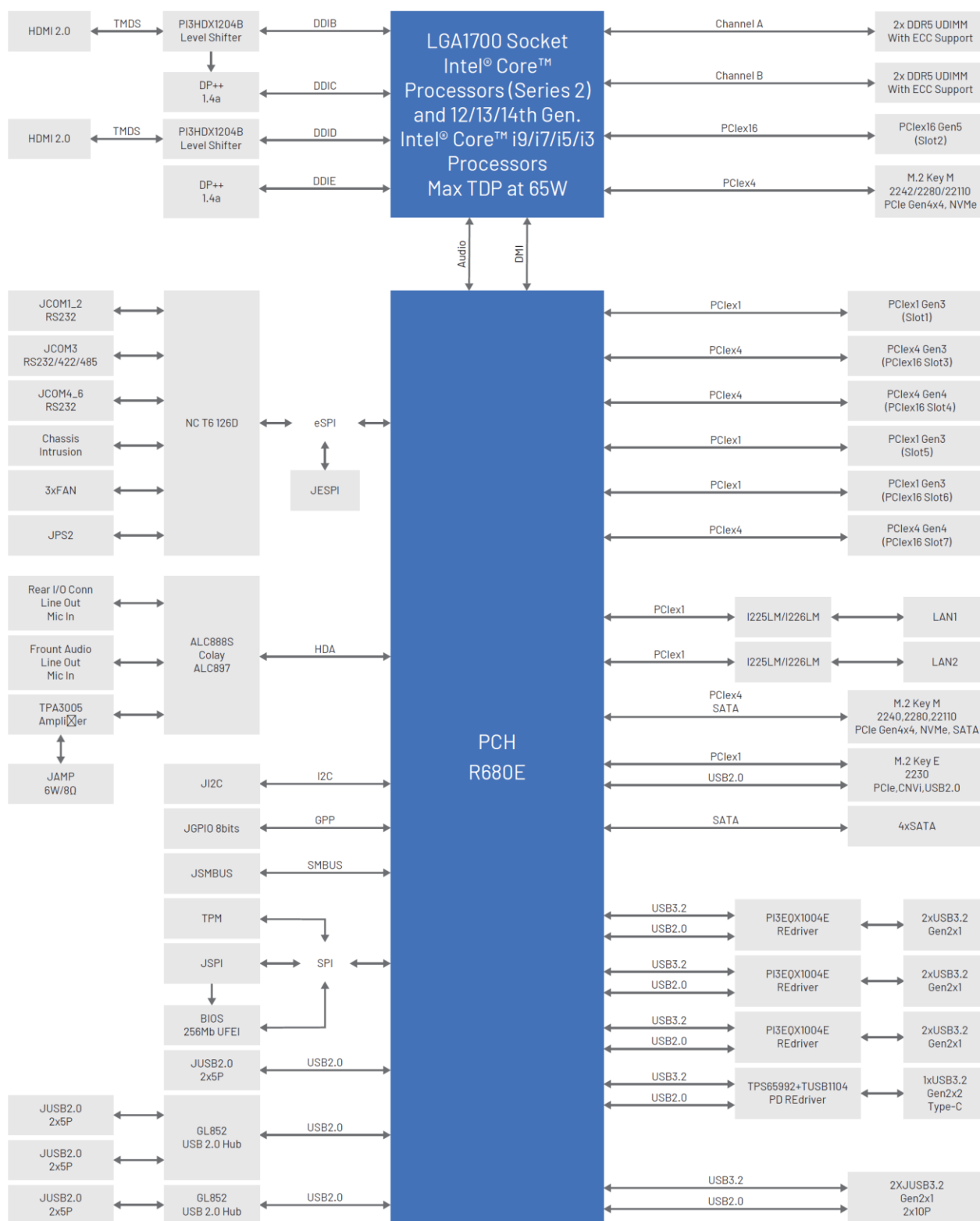
	Reference IEC60068-2-64 Testing procedures Test Fh : Vibration broadband random Test 1. PSD: 0.00202023G ² /Hz 0.5 Grms 2. Non Operation mode 3. Test Frequency : 5-500Hz 4. Test Axis : X,Y and Z axis 5. 30 minutes per each axis 6. IEC 60068-2-64 Test:Fh
Drop Test	Package Drop Reference ISTA 2A, Method : IEC-60068-2-32 Test: Ed Drop Test 1 One corner , three edges, six faces 2 ISTA 2A, IEC-60068-2-32 Test:Ed
OS Information	BIOS Support: Win11 64bit UEFI **Note: Windows 11 is not a LTSC release and will be supported on the Intel CCG Client roadmap. NEX Network & Edge customers may install non-LTSC releases(e.g. Win11) on NEX Network & Edge processors. ** Win10 64bit UEFI Linux



Note: Specifications are subject to change without notice.

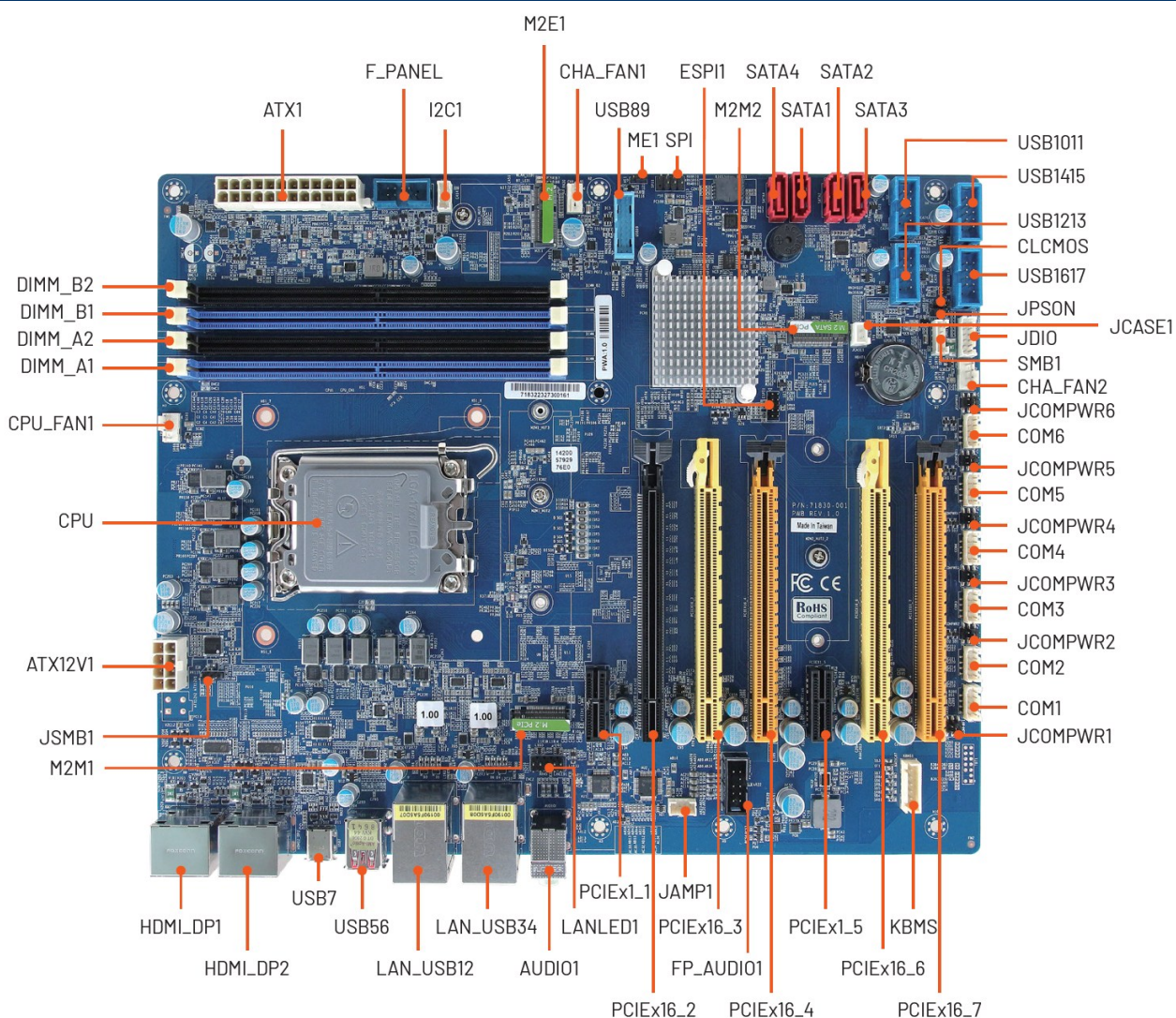
1.6 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of BC680R.



2. Hardware Configuration

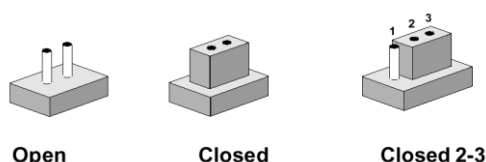
2.1 Product Overview



2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



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



A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following tables list the function of each of the board's jumpers and connectors.

Jumpers

Label	Function	Note
CLCMOS1	Clear CMOS	3 x 1 header, pitch 2.00mm
JPSON1	AT/ATX Power Mode Select	3 x 1 header, pitch 2.00mm
JCOMPWR1~6	COM1~6 pin9 power selector	3 x 2 header, pitch 2.00mm
ME1	ME Enable selector	3 x 1 header, pitch 2.00mm

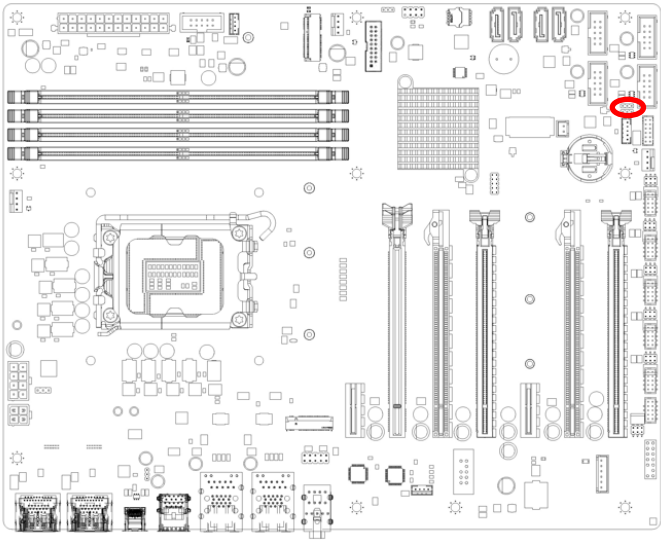
Connectors

Label	Function	Note
CPU_FAN1	CPU Fan connector	4 x 1 wafer, pitch 2.54mm
CHA_FAN1	Chassis Fan connector	4 x 1 wafer, pitch 2.54mm
CHA_FAN2	Chassis Fan connector	4 x 1 wafer, pitch 2.54mm
F_PANEL1	Front Panel connector	5 x 2 wafer, pitch 2.54mm

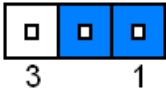
ATX1	ATX power connectors	12 x 2 wafer, pitch 4.20mm
ATX12V1	12V ATX power connectors	4 x 2 wafer, pitch 4.20mm
COM1~6	Serial Port 1~6 Connector	5 x 2 wafer, pitch 2.00mm
SATA1~4	Serial ATA 1~4 Connector	
FP_Audio1	Front Panel Audio Connector	5 x 2 wafer, pitch 2.54mm
JDIO1	Digital I/O Connector	6 x 2 wafer, pitch 2.00mm
I2C1	I2C connector	4 x 1 wafer, pitch 2.00mm
USB89	2 x USB3.2 Gen 2 connector	10 x 2 wafer, pitch 2.00mm
USB1011~USB1617	8 x USB2.0 connector	5 x 2 wafer, pitch 2.54mm
KBMS1	PS/2 Keyboard & Mouse interface	6 x 1 wafer, pitch 2.54mm
SMB1	SMB us connector	5 x 1 wafer, pitch 2.00mm
JAMP1	Amplifier Connector	4 x 1 wafer, pitch 2.00mm
JCASE1	Chassis Intrusion Header	2 x 1 wafer, pitch 2.50mm
LANLED1	LAN LED status connector	5 x 2 header, pitch 2.54mm
CPU1	LGA1700 socket	
DIMMA1~B2	4 x DDR5 UDIMM Slot	Dual channel. (2 DIMMs per channel)
PCIEX1_1/ PCIEX1_5	PCIe x1 Gen3	X1 open ended (Slot 1,5)
PCIEX16_2	PCIe x16 Gen5	X16 Physical black (Slot 2)
PCIEX16_3	PCIe x4 Gen3	X16 Physical yellow (Slot 3)
PCIEx16_4/ PCIEx16_7	PCIe x4 Gen4	X16 Physical orange (Slot 4,7)
PCIEx16_6	PCIe x1 Gen3	X16 Physical yellow (Slot 6)
HDMI1_DP1	HDMI x 1 + DP++ x 1 connector	
HDMI2_DP2	HDMI x 1 + DP++ x 1 connector	
USB56	USB 3.2 Type A Connector x 2	
USB7	USB 3.2 Type C Connector x 1	
LAN1_USB12/ LAN2_USB34	RJ-45 Ethernet Connector x 2 USB3.2 Type A Connector x 4	2.5 Gigabit Ethernet
AUDIO1	Audio phone jack	Line-out, Mic-in

2.3 Setting Jumpers & Connectors

2.3.1 Clear CMOS (CLCMOS1)



Normal*

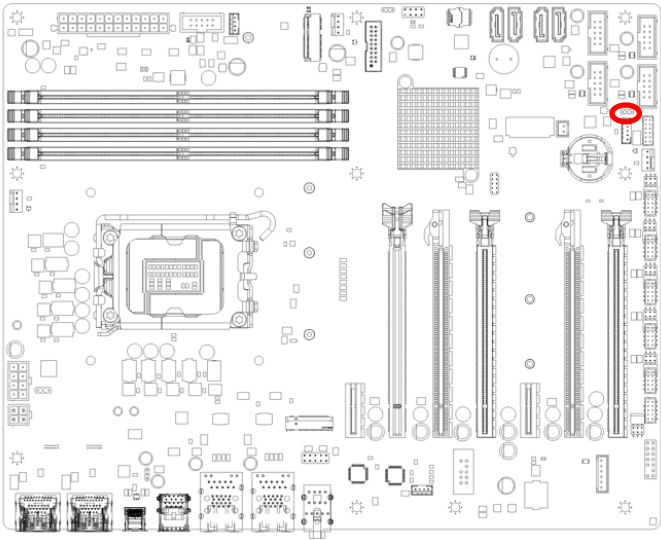


Clear CMOS



* Default

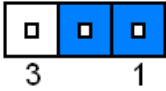
2.3.2 AT/ATX Power Mode Select (JPSON1)



ATX*

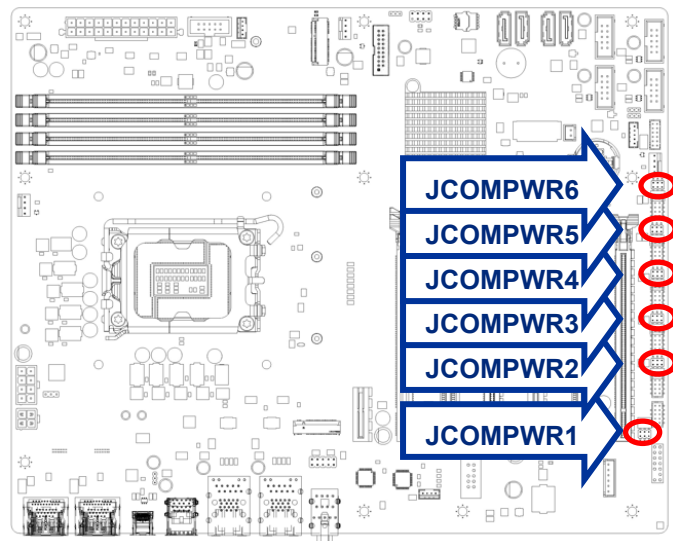


AT

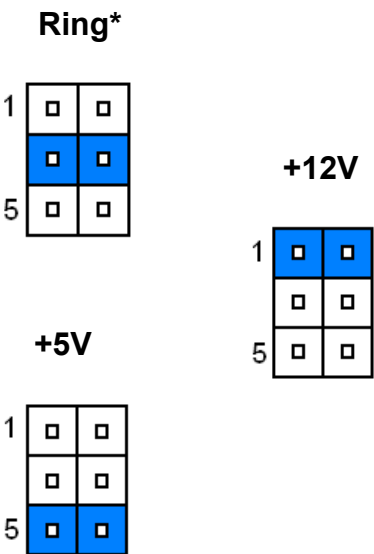


* Default

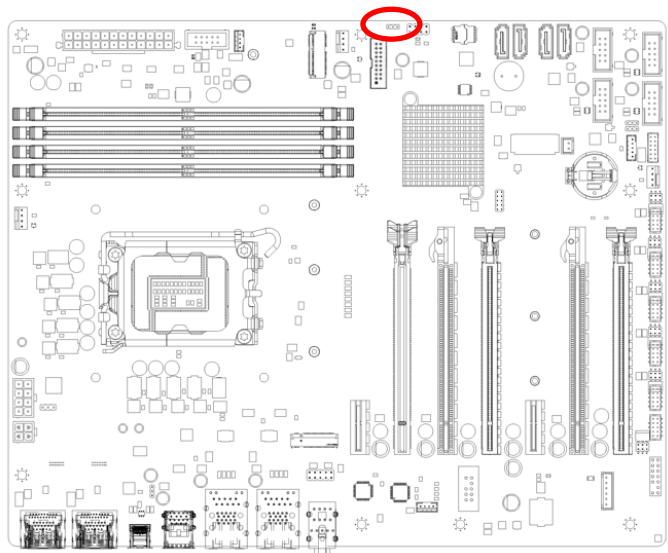
2.3.3 COM 1~6 pin9 power selector (JCOMPWR1~6)



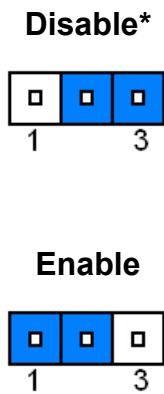
* Default



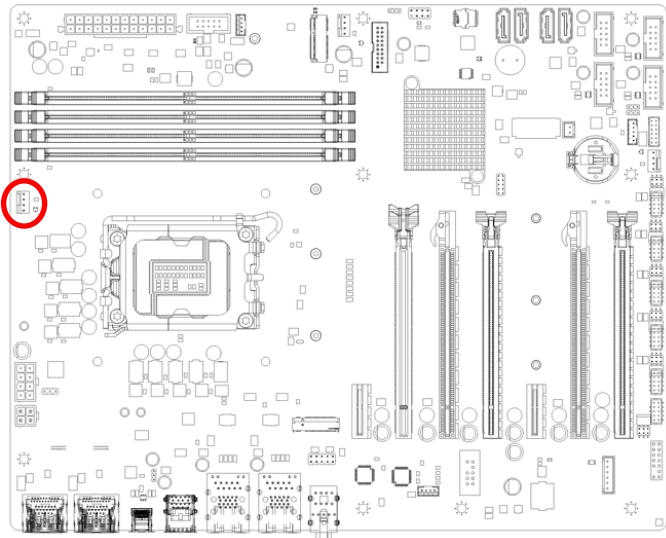
2.3.4 ME Enable selector (ME1)



* Default

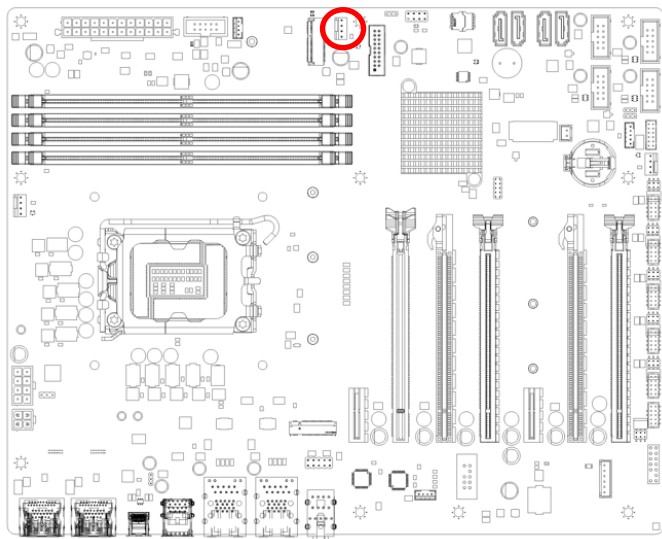


2.3.5 CPU fan connector (CPU_FAN1)



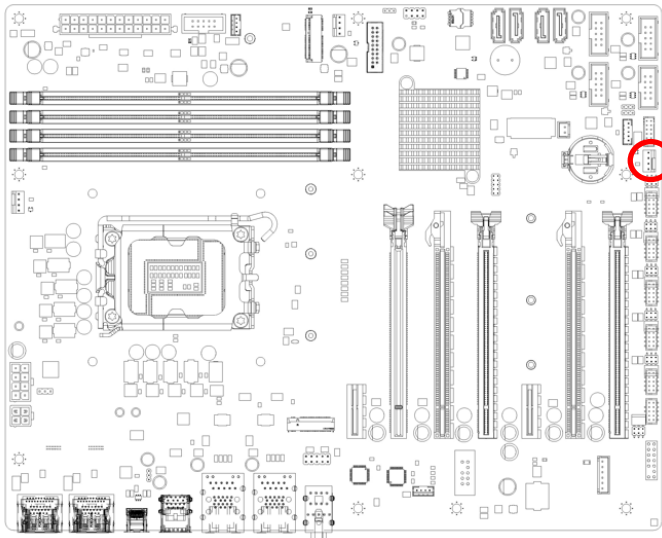
Signal	PIN
GND	1
+12V	2
TACH	3
PWM	4

2.3.6 Chassis Fan connector (CHA_FAN1)



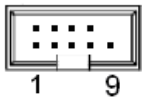
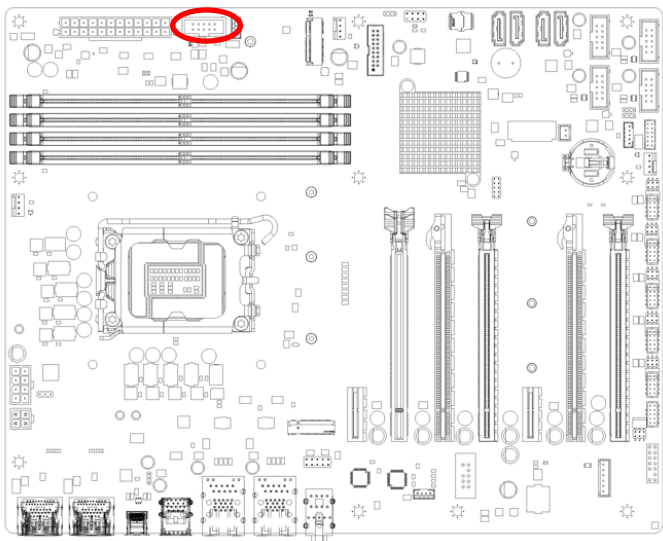
Signal	PIN
GND	1
+12V	2
TACH	3
PWM	4

2.3.7 Chassis Fan connector (CHA_FAN 2)



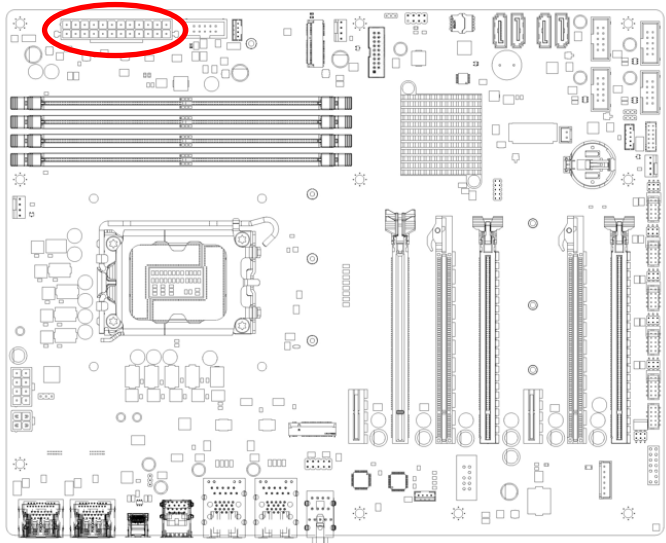
Signal	PIN
PWM	4
TACH	3
+12V	2
GND	1

2.3.8 Front Panel connector (F_PANEL1)



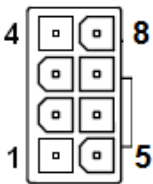
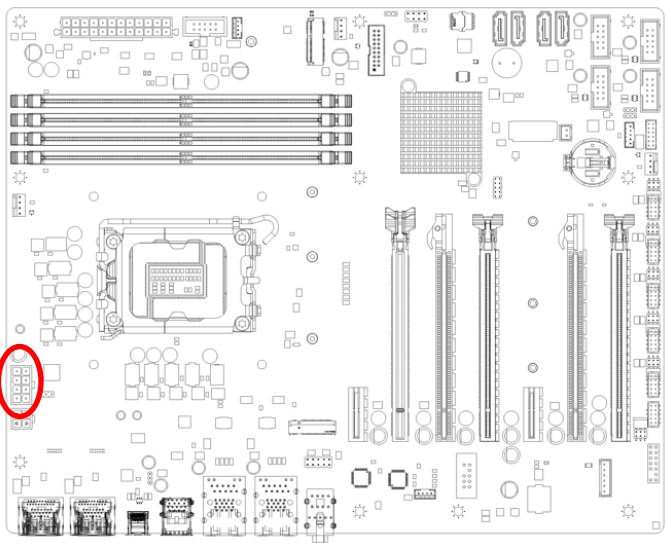
Function	Signal	PIN	PIN	Signal	Function
HDD LED	HDD_LED+	1	2	+5V	Power LED
	HDD_LED#	3	4	PWR LED#	
Reset button	GND	5	6	PANSWIN#	Power button
	RST	7	8	GND	
	NC	9			

2.3.9 ATX Power connector (ATX1)



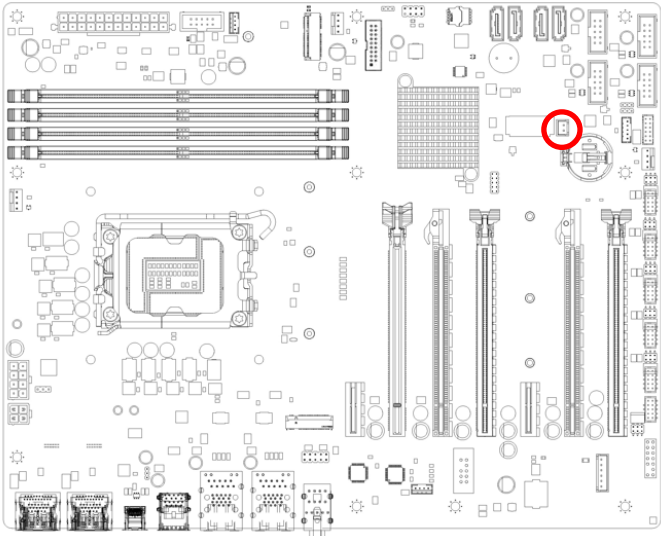
Signal	PIN	PIN	Signal
+3.3V	1	13	+3.3V
+3.3V	2	14	-12V
GND	3	15	GND
+5V	4	16	PS_ON
GND	5	17	GND
+5V	6	18	GND
GND	7	19	GND
POK	8	20	NC
+5VSB	9	21	+5V
+12V	10	22	+5V
+12V	11	23	+5V
+3.3V	12	24	GND

2.3.10 12V ATX power connectors (ATX12V1)



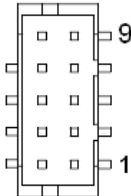
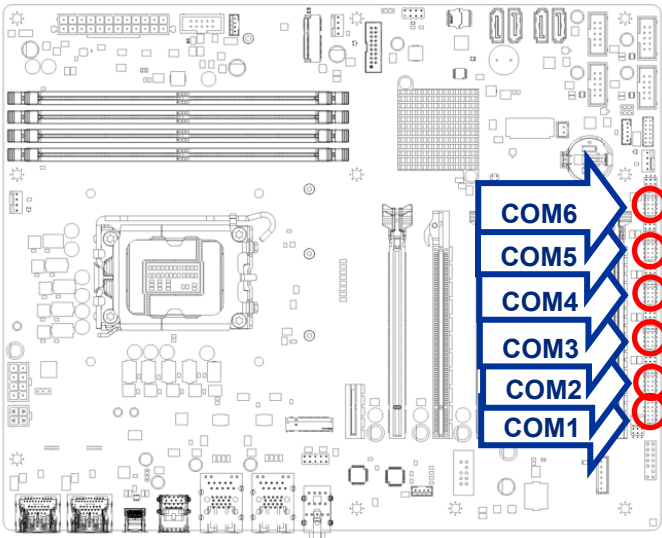
Signal	PIN	PIN	Signal
GND	4	8	+12V
GND	3	7	+12V
GND	2	6	+12V
GND	1	5	+12V

2.3.11 Chassis Intrusion Header (JCASE1)



PIN	Signal
1	SIO_CASEOPEN#
2	GND

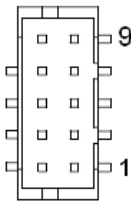
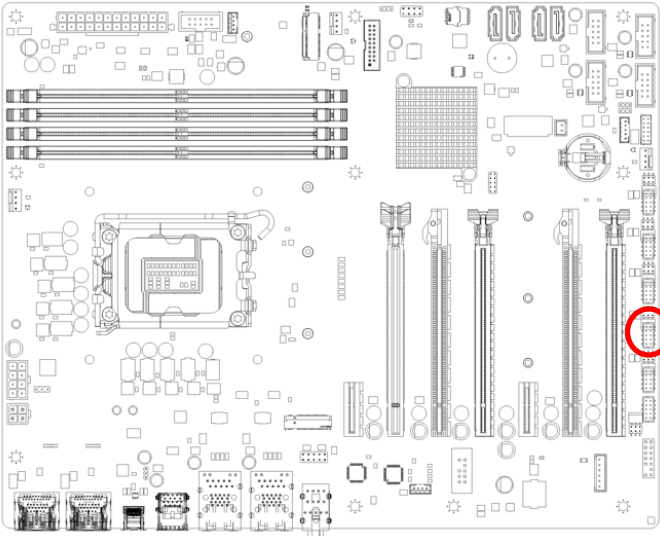
2.3.12 Serial Port 1~6 Connector (COM1~6)



Note: COM1~6 pin9 can be selected to RI(default)/+5V/+12V by jumper (JCOMPWR1~6)

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

2.3.13 Serial Port 3 Connector (COM3)



RS232*

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

RS422

Signal	PIN	PIN	Signal
		9	NC
NC	8	7	NC
NC	6	5	GND
RX-	4	3	RX+
TX+	2	1	TX-

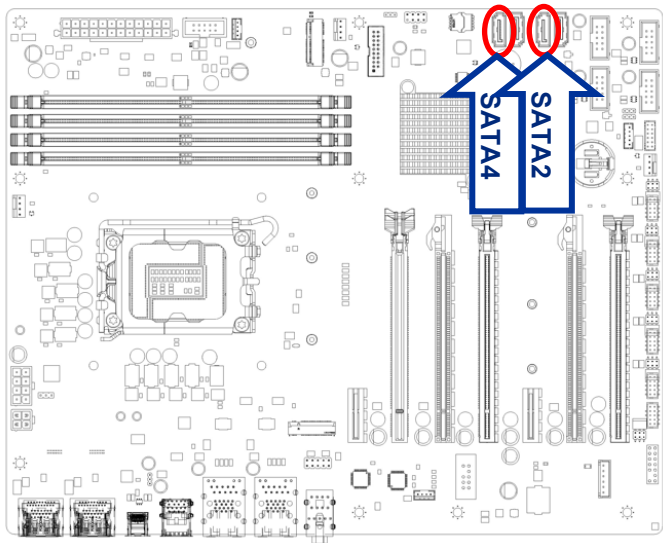
RS485

Signal	PIN	PIN	Signal
		9	NC
NC	8	7	NC
NC	6	5	GND
NC	4	3	NC
Data+	2	1	Data-

* Default

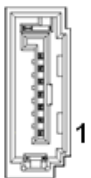
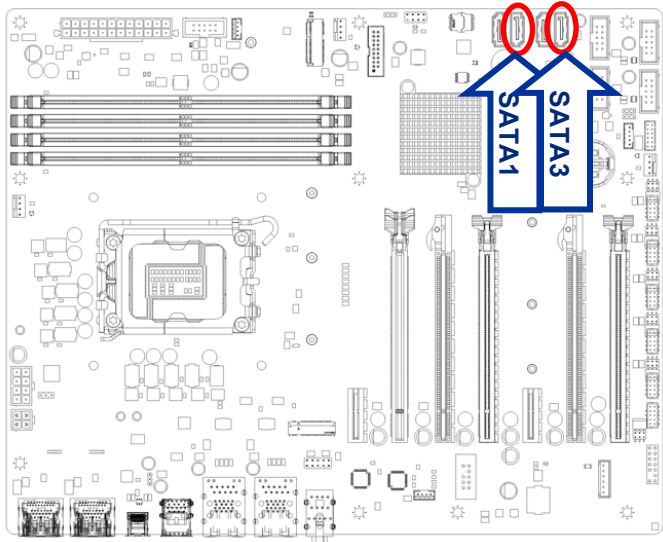
Note: COM3 can be RS232(default)/RS422/RS485 by BIOS selection

2.3.14 Serial ATA Connector (SATA2, SATA4)



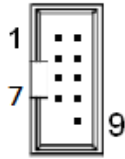
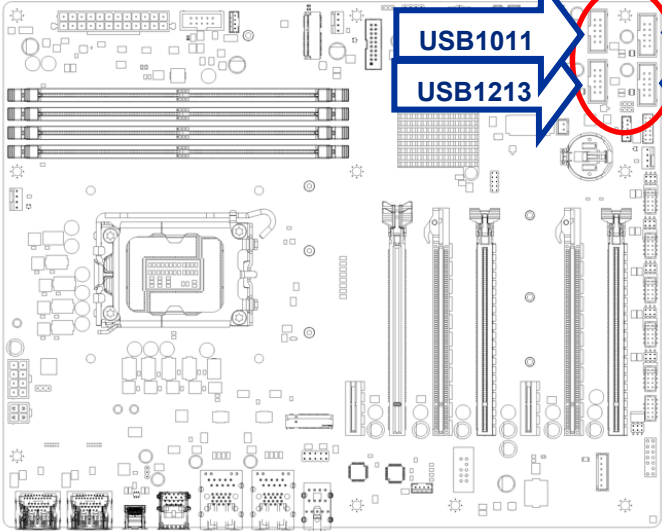
PIN	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

2.3.15 Serial ATA Connector (SATA1, SATA3)



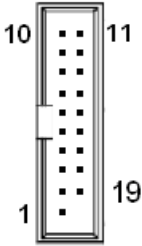
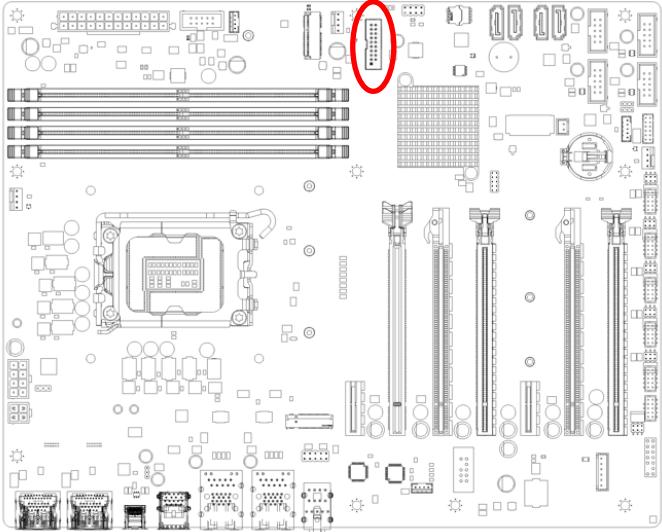
PIN	Signal
7	GND
6	RX+
5	RX-
4	GND
3	TX-
2	TX+
1	GND

2.3.16 USB2.0 connectors (USB1011, USB1213, USB1415, USB1617)



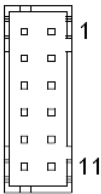
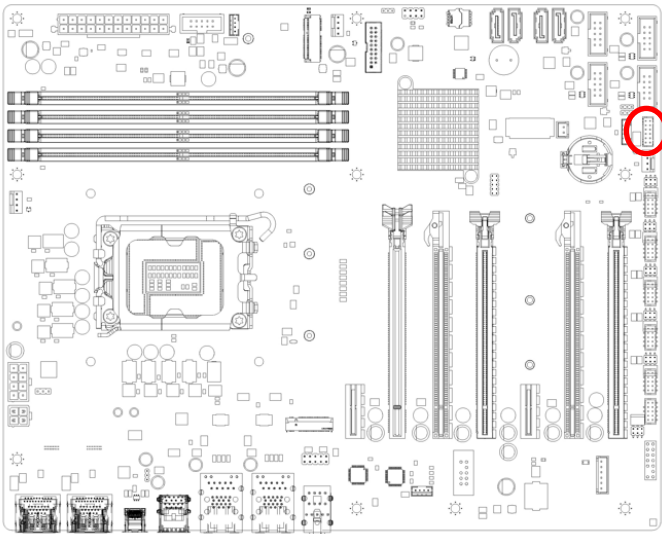
Signal	PIN	PIN	Signal
+5V	1	2	+5V
Data-	3	4	Data-
Data+	5	6	Data+
GND	7	8	GND
		9	NC

2.3.17 USB3.2 Gen 2 connector (USB89)



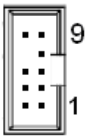
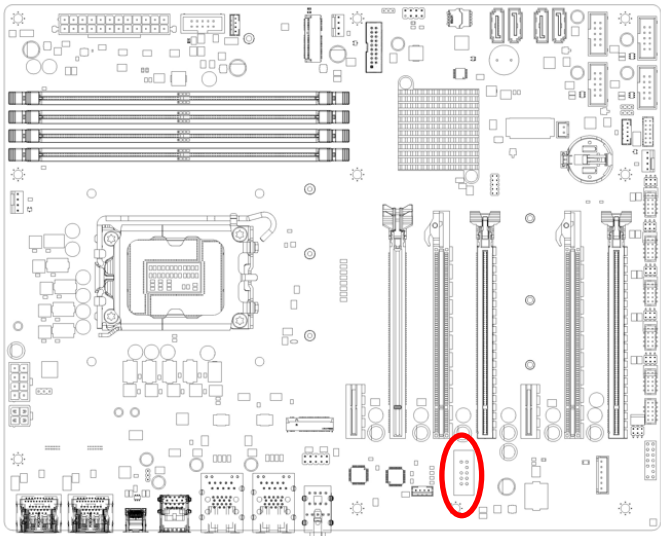
Signal	PIN	PIN	Signal
NC	10	11	DATA+
DATA+	9	12	DATA-
DATA-	8	13	GND
GND	7	14	StdA_SSTX+
StdA_SSTX+	6	15	StdA_SSTX-
StdA_SSTX-	5	16	GND
GND	4	17	StdA_SSRX+
StdA_SSRX+	3	18	StdA_SSRX-
StdA_SSRX-	2	19	+5V
+5V	1		

2.3.18 Digital I/O Connector (JDIO1)



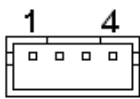
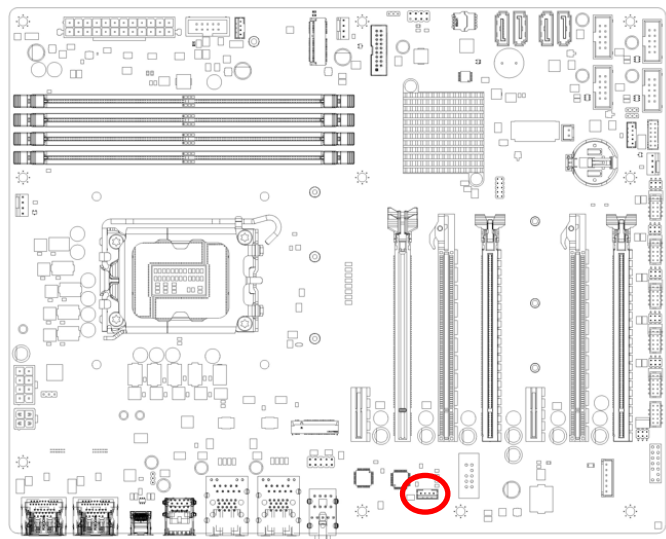
Signal	PIN	PIN	Signal
GPIO4	2	1	GPIO0
GPIO5	4	3	GPIO1
GPIO6	6	5	GPIO2
GPIO7	8	7	GPIO3
SMB_DAT_ RESUME	10	9	SMB_CLK_ RESUME
+3.3V	12	11	GND

2.3.19 Front Panel Audio Connector (FP_AUDIO1)



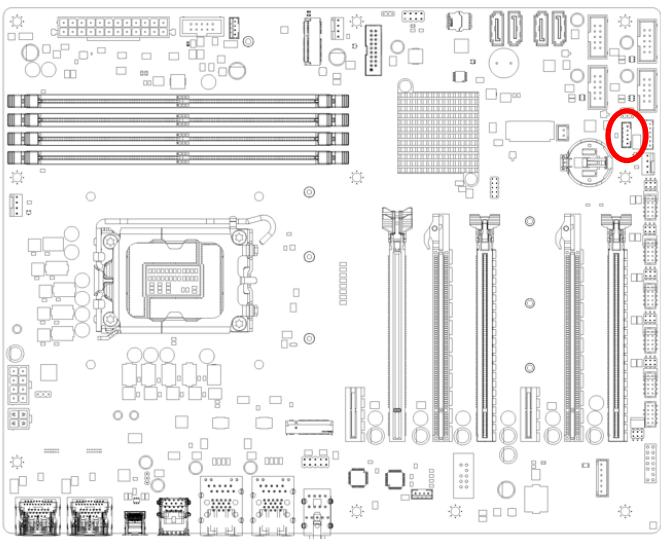
Signal	PIN	PIN	Signal
LINE2-JD	10	9	LINE2L
		7	SENSEB
MIC2-JD	6	5	LINE2R
AFP_PRESEN#	4	3	MIC2R
GND	2	1	MIC2L

2.3.20 Amplifier connector (JAMP1)



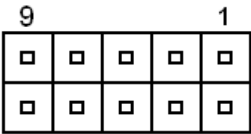
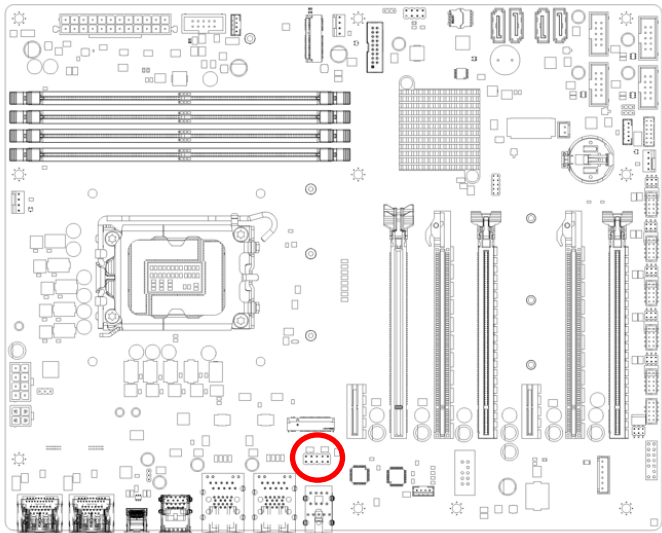
PIN	Signal
1	AMP_R-
2	AMP_R+
3	AMP_L-
4	AMP_L+

2.3.21 SM bus connector (SMB1)



PIN	Signal
1	SMB_CLK
2	SMB_DATA
3	SMB_ALT
4	GND
5	+3.3V

2.3.22 LAN LED status connector (LANLED1)



Signal	PIN	PIN	Signal
LAN1 LED+ 100M speed	1	2	LAN2 LED+ 100M speed
LAN1 LED speed GND	3	4	LAN2 LED speed GND
LAN1 LED+ 1000M speed	5	6	LAN2 LED+ 1000M speed
LAN1 Action LED-	7	8	LAN2 Action LED
LAN1 Action LED+	9	10	LAN2 Action LED+

3. BIOS Setup

3.1 Introduction

The BIOS setup program allows users to modify the basic system configuration. In this following chapter will describe how to access the BIOS setup program and the configuration options that may be changed.

3.2 Starting Setup

The AMI BIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the NVRAM and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

By pressing or <F2> immediately after switching the system on, or

By pressing the or <F2> key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

Press or <F2> to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to.

Press F1 to Continue, DEL to enter SETUP

3.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into NVRAM Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Previous Values.
F3 key	Optimized defaults
F4 key	Save & Exit Setup

- **Navigating Through The Menu Bar**

Use the left and right arrow keys to choose the menu you want to be in.



Note: Some of the navigation keys differ from one screen to another.

- **To Display a Sub Menu**

Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A “➤” pointer marks all sub menus.

3.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

3.5 In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AMI BIOS supports an override to the NVRAM settings which resets your system to its defaults.

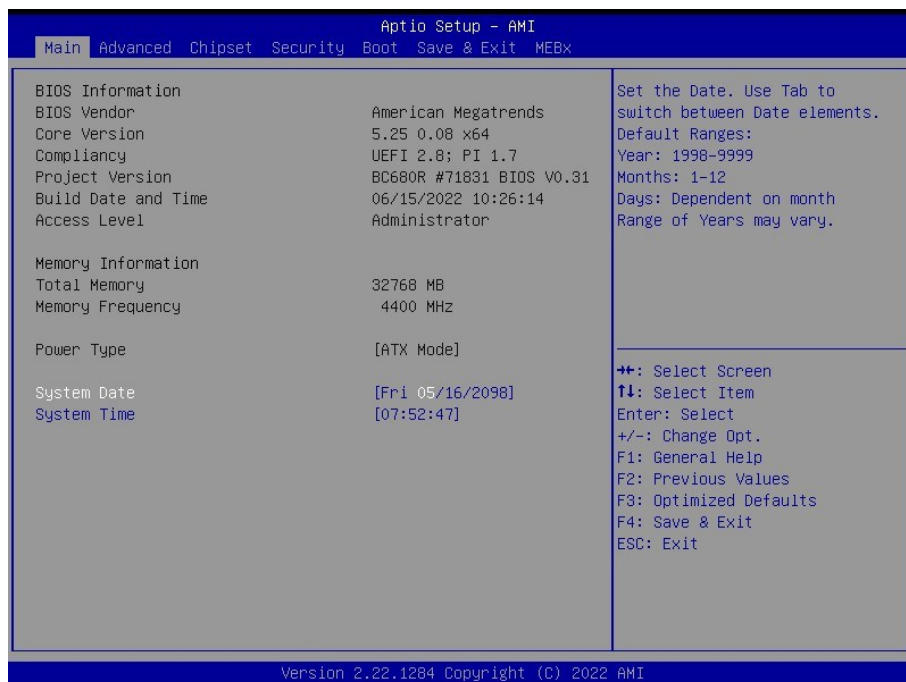
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

3.6 BIOS setup

Once you enter the Aptio Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

3.6.1 Main Menu

This section allows you to record some basic hardware configurations in your computer and set the system clock.



3.6.1.1 System Date

Use the system date option to set the system date. Manually enter the day, month and year.

3.6.1.2 System Time

Use the system time option to set the system time. Manually enter the hours, minutes and seconds.

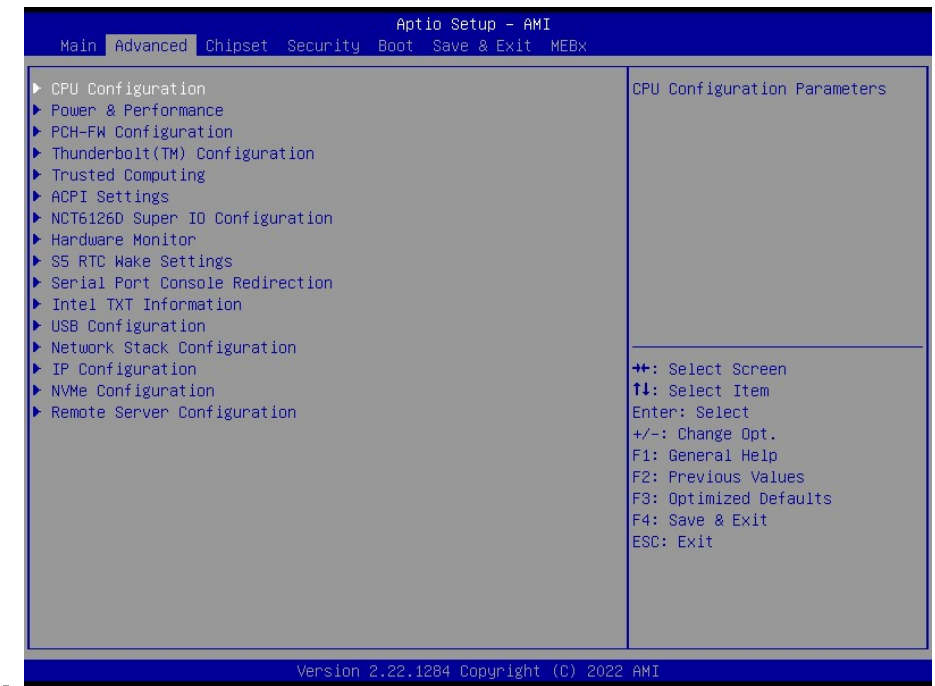


Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.

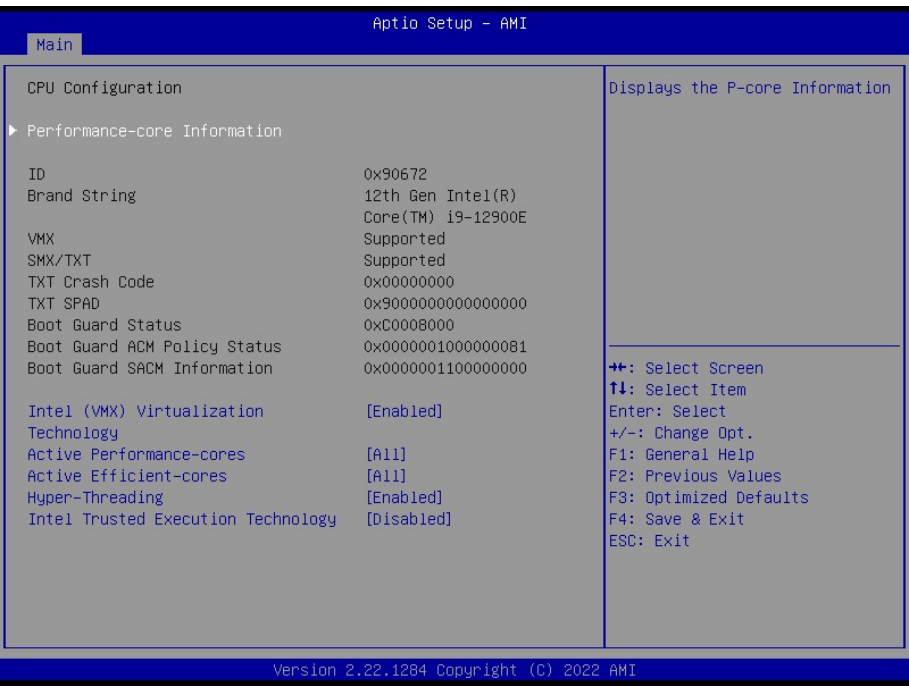
Visit the Avalue website (www.avalue.com) to download the latest product and BIOS information.

3.6.2 Advanced Menu

This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.



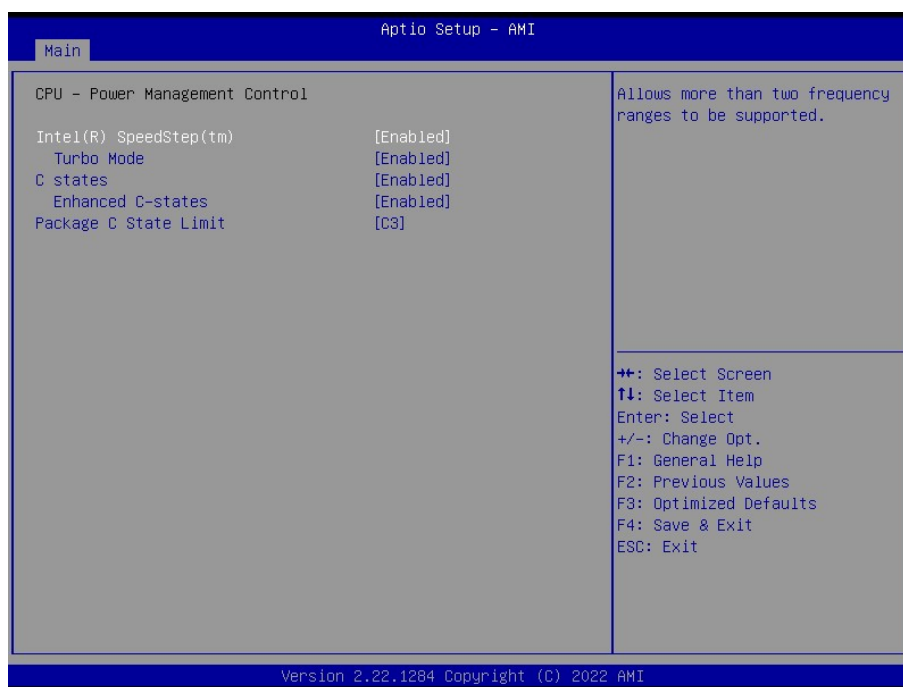
3.6.2.1 CPU Configuration



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Item	Options	Description
Intel (VMX) Virtualization Technology	Disabled Enabled [Default] ,	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Performance-cores	All [Default] , /7/6/5/4/3/2/1	Number of P-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.
Active Efficient-cores	All [Default] , 15/14/13/12/11/10 /9/8/7/6/5/4/3/2/1/0	Number of E-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.
Hyper-Threading	Disabled Enabled [Default] ,	Enable or Disable Hyper-Threading Technology.
Intel Trusted Execution Technology	Disabled [Default] , Enabled	Enabled utilization of additional hardware capabilities provided by Intel (R)Trusted Execution Technology. Changes require a full power cycle to take effect.

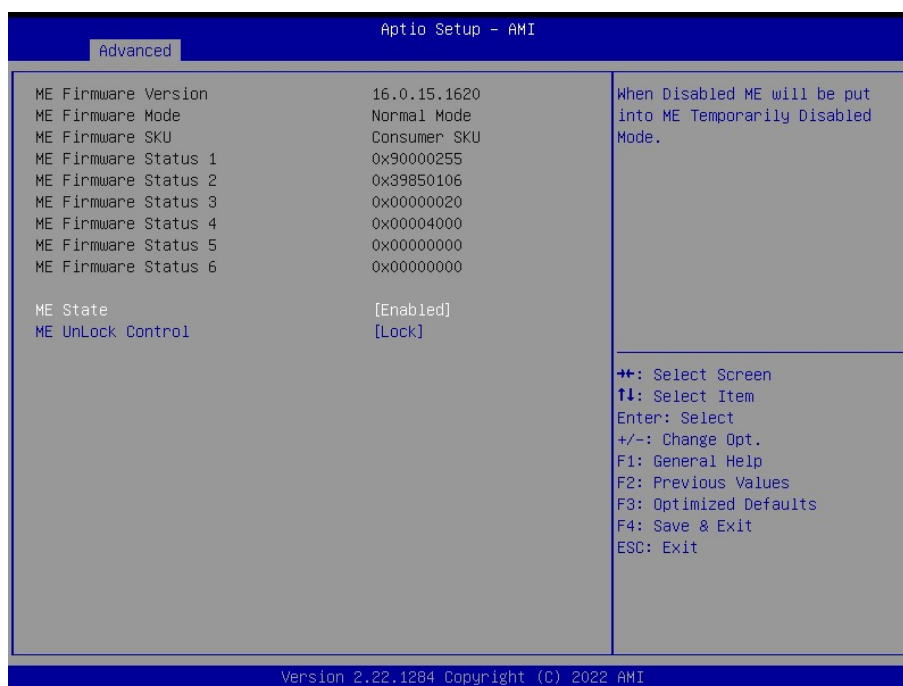
3.6.2.2 CPU - Power Management Control



Item	Options	Description
Intel(R) SpeedStep(tm)	Disabled Enabled [Default] ,	Allows more than two frequency ranges to be supported.

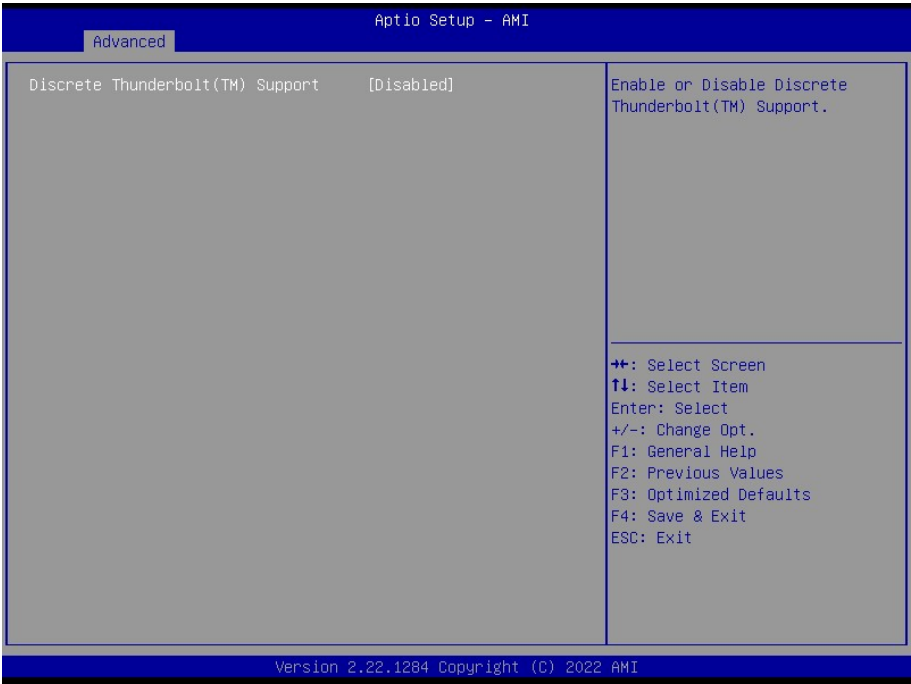
Turbo Mode	Disabled Enabled [Default] ,	Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.
C states	Disabled Enabled [Default] ,	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.
Enhanced C-states	Disabled Enabled [Default] ,	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-state.
Package C State Limit	C0/C1 C2 C3 [Default] , C6 C7 C8 C9 C10 Cpu Default	Maximum Package C State Limit Setting. Cpu Default: Leaves to Factory default value Auto: Initializes to deepest available Package C State Limit.

3.6.2.3 PCH-FW Configuration



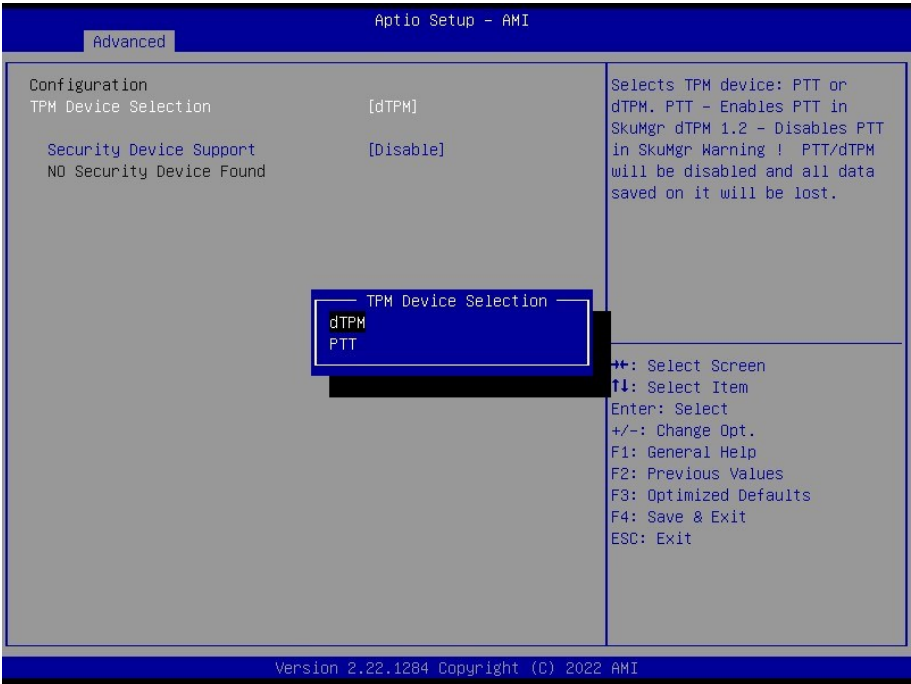
Item	Options	Description
ME State	Disabled Enabled [Default] ,	When Disabled ME will be put into ME Temporarily Disabled Mode.
ME UnLock Control	Lock [Default] , Unlock	ME UnLock control function. Set UnLock will system shutdown for active function.

3.6.2.4 Thunderbolt(TM) Configuration



Item	Option	Description
Discrete Thunderbolt(TM) Support	Disabled [Default] , Enabled	Enabled or Disabled Discrete Thunderbolt(TM) Support.

3.6.2.5 Trusted Computing



Item	Options	Description
TPM Device Selection	dTPM[Default], PTT	Selects TPM device: PTT or dTPM. PTT - Enables PTT in SkuMgr dTPM 1.2 - Disables PTT in SkuMgr Warning ! PTT/dTPM will be disabled and all data saved on it will be lost.
Security Device Support	Disabled[Default], Enabled	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not available.

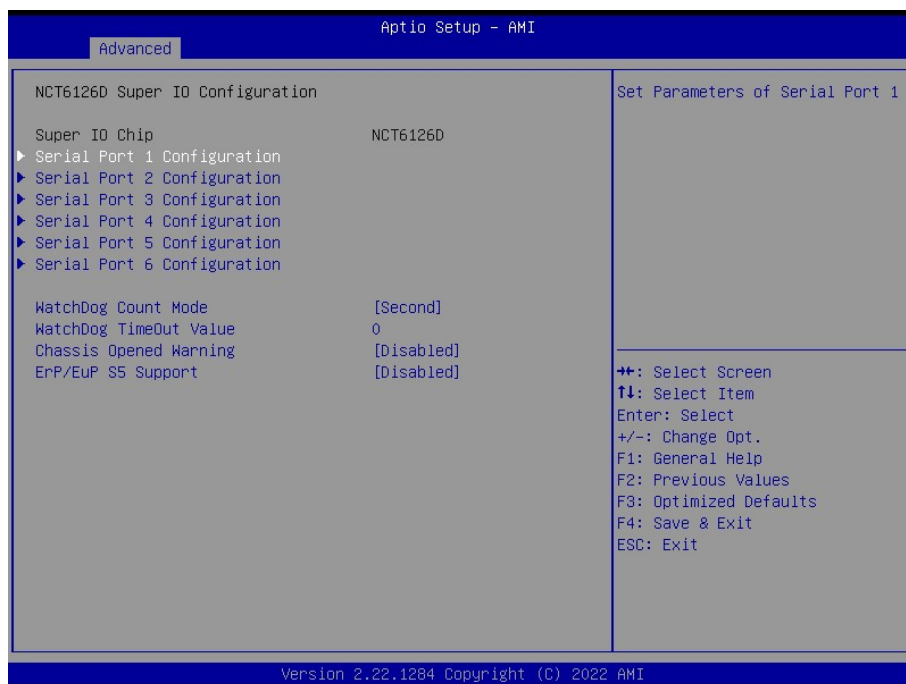
3.6.2.6 ACPI Settings



Item	Options	Description
Enable Hibernation	Disabled Enabled[Default],	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.
ACPI Sleep State	Suspend Disabled, S3 (Suspend to RAM)[Default]	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
S3 Video Repost	Disabled[Default], Enabled	Enable or disable S3 video repost
PCIE# Wake from S5	Disabled[Default], Enabled	Enable or disable PCIE to wake the system from S5.
Wake on Ring	Disabled[Default], Enabled	Enables/Disables wake on ring function under ACPI S3/S4/S5.

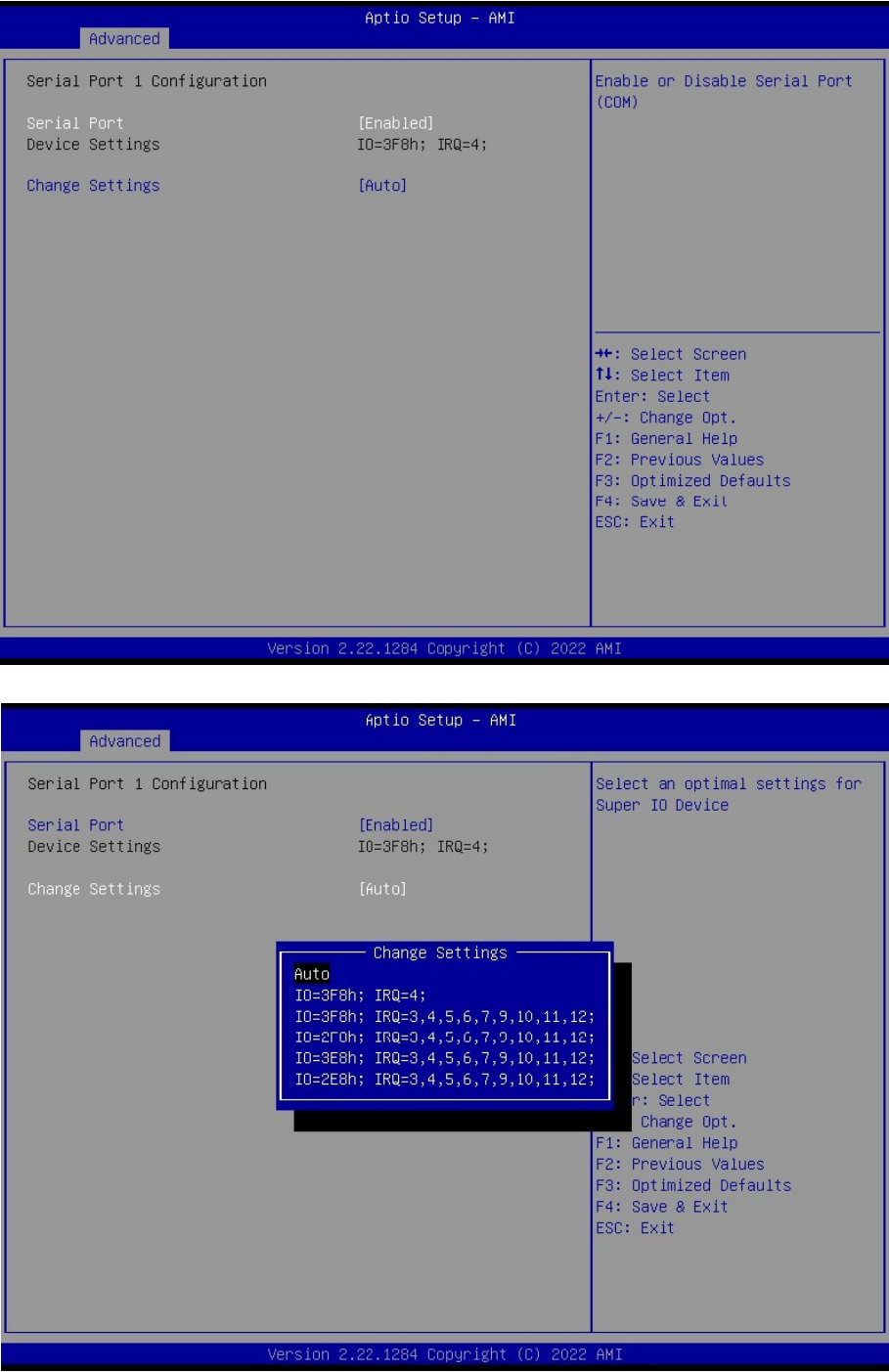
3.6.2.7 NCT6126D Super IO Configuration

You can use this item to set up or change the Super IO configuration for serial ports. Please refer to 3.6.2.7.1~ 3.6.2.7.6 for more information.



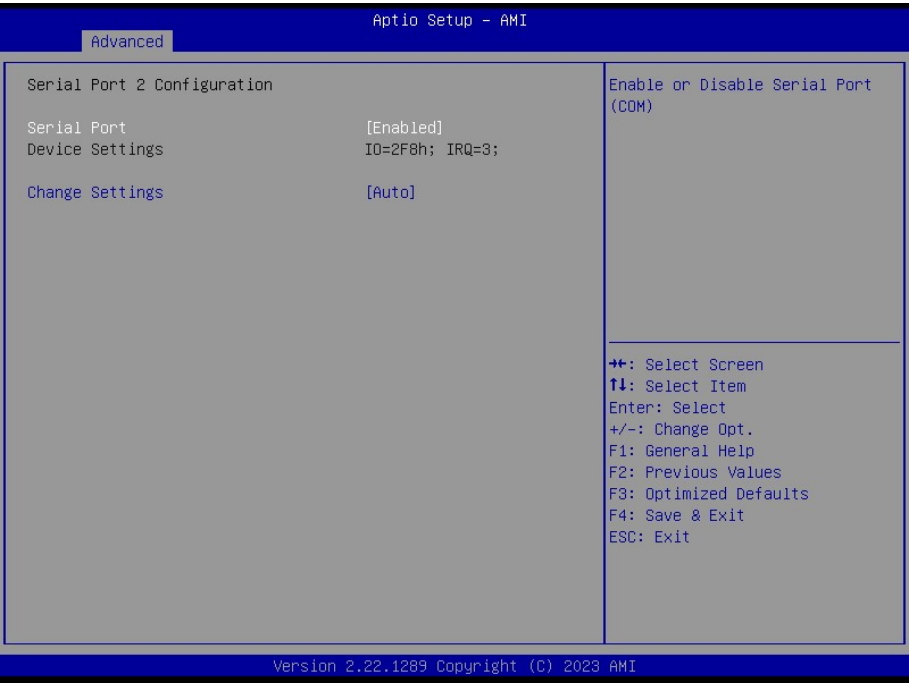
Item	Options	Description
WatchDog Count Mode	Second [Default] , Minute	Configure watchdog count mode.
WatchDog Timeout Value	0	Configure watchdog Timeout Value.
Chassis Opened Warning	Disabled [Default] , Enabled	Select whether to enable Chassis Intrusion Detection. Chassis Intrusion Detection is a utility that can tell whether someone has opened the case (intruded into the chassis). NOTE-If chassis tamper occurs, you can only enter setup to clear this error.
ErP/EuP S5 Support	Disabled [Default] , Enabled	Enable/Disable ErP/EuP S5 Support NOTE:When MEBx is enable Activate Network Access, this function can not set enable that will cause ME fail on next boot.
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).	
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).	
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).	
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).	
Serial Port 5 Configuration	Set Parameters of Serial Port 5 (COME).	
Serial Port 6 Configuration	Set Parameters of Serial Port 6 (COMF).	

3.6.2.7.1 Serial Port 1 Configuration



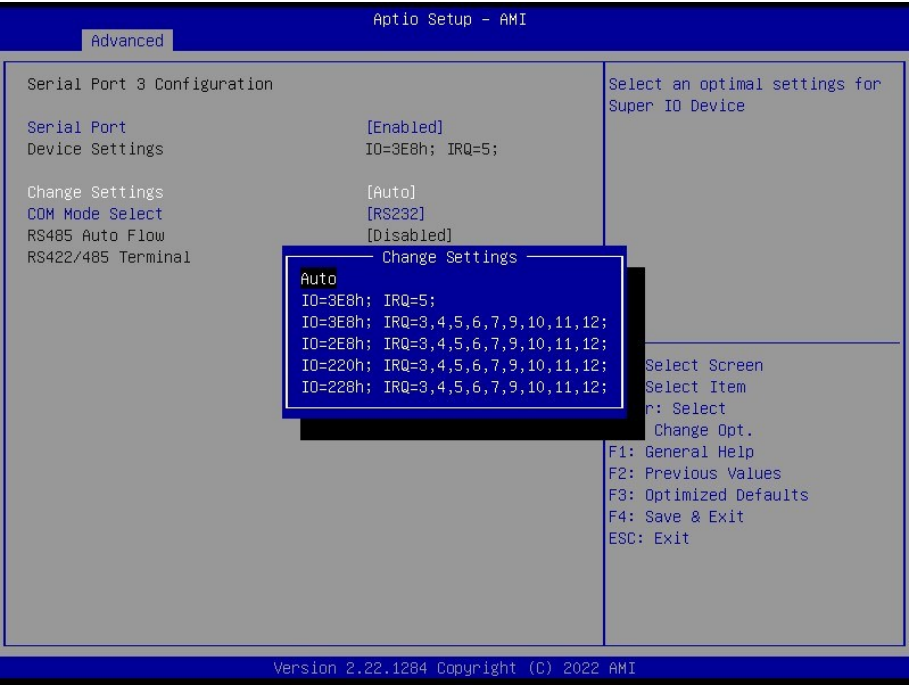
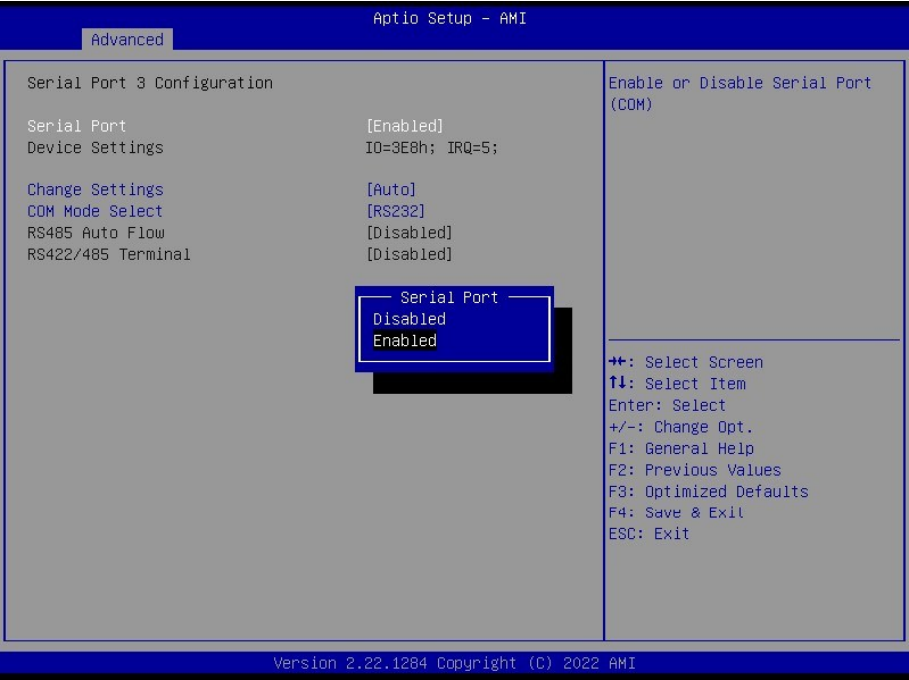
Item	Option	Description
Serial Port	Disabled Enabled[Default],	Enable or Disable Serial Port (COM)
Change Settings	Auto[Default], IO=3F8h; IRQ4; IO=3F8h; IRQ3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

3.6.2.7.2 Serial Port 2 Configuration



Item	Option	Description
Serial Port	Disabled Enabled [Default] ,	Enable or Disable Serial Port (COM)
Change Settings	Auto [Default] , IO=2F8h; IRQ3; IO=3F8h; IRQ3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

3.6.2.7.3 Serial Port 3 Configuration

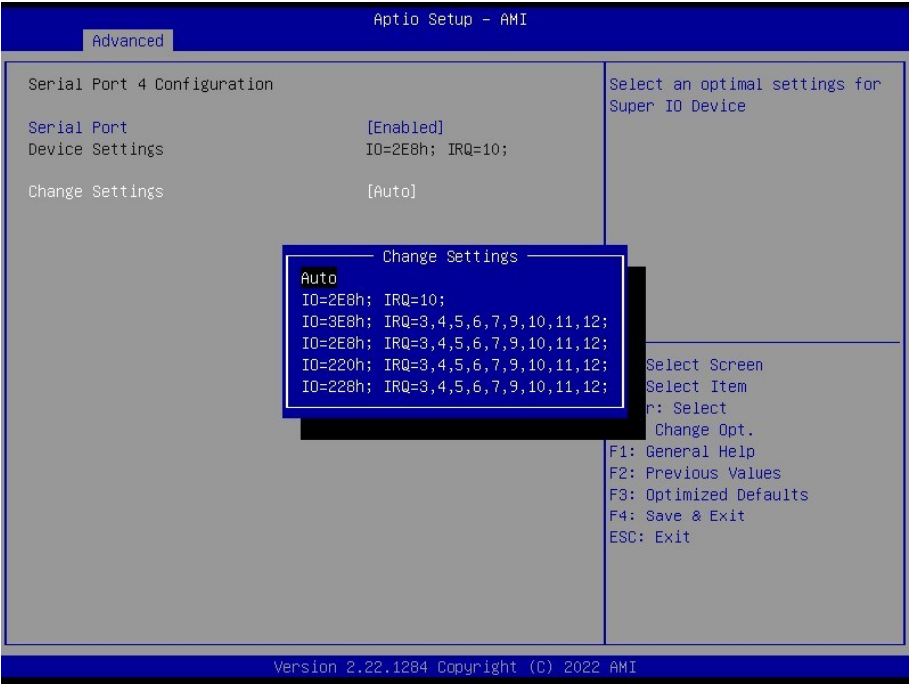


Item	Option	Description
Serial Port	Disabled Enabled[Default],	Enable or Disable Serial Port (COM)
Change Settings	Auto[Default], IO=3E8h; IRQ5; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; IO=220h; IRQ3,4,5,6,7,9,10,11,12; IO=228h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

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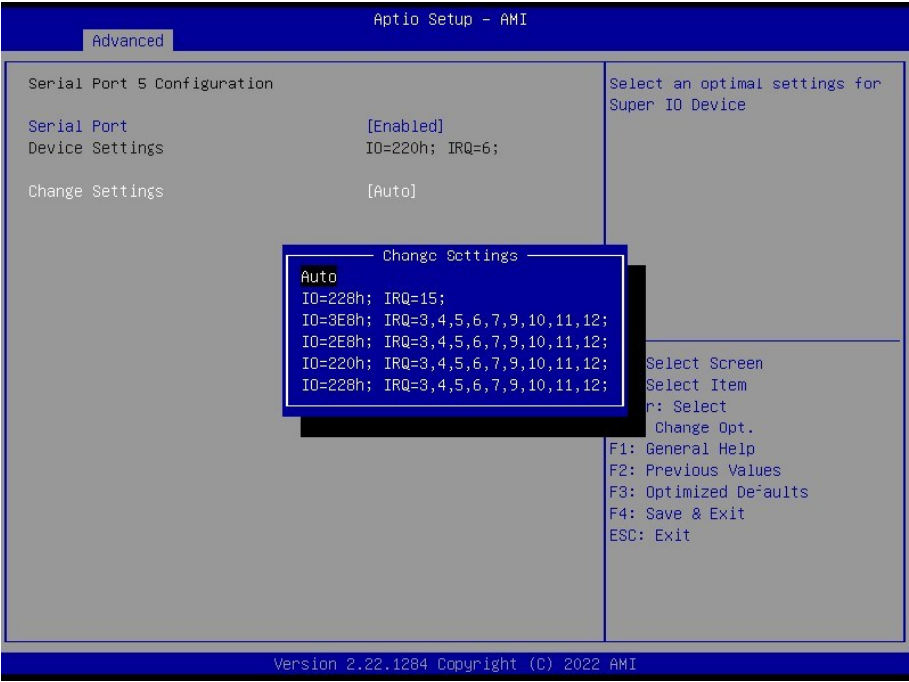
COM Mode Select	RS232[Default], RS485 Half Duplex RS422 Full Duplex	Configure the COM port Mode
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3.6.2.7.4 Serial Port 4 Configuration



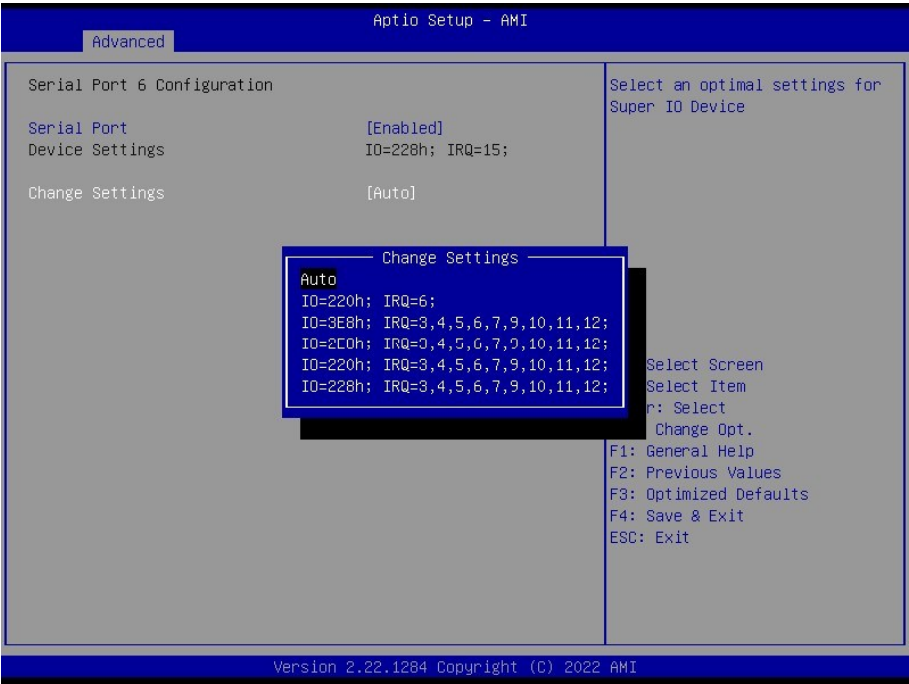
Item	Option	Description
Serial Port	Disabled Enabled[Default],	Enable or Disable Serial Port (COM)
Change Settings	Auto[Default], IO=2E8h; IRQ10; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; IO=220h; IRQ3,4,5,6,7,9,10,11,12; IO=228h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

3.6.2.7.5 Serial Port 5 Configuration



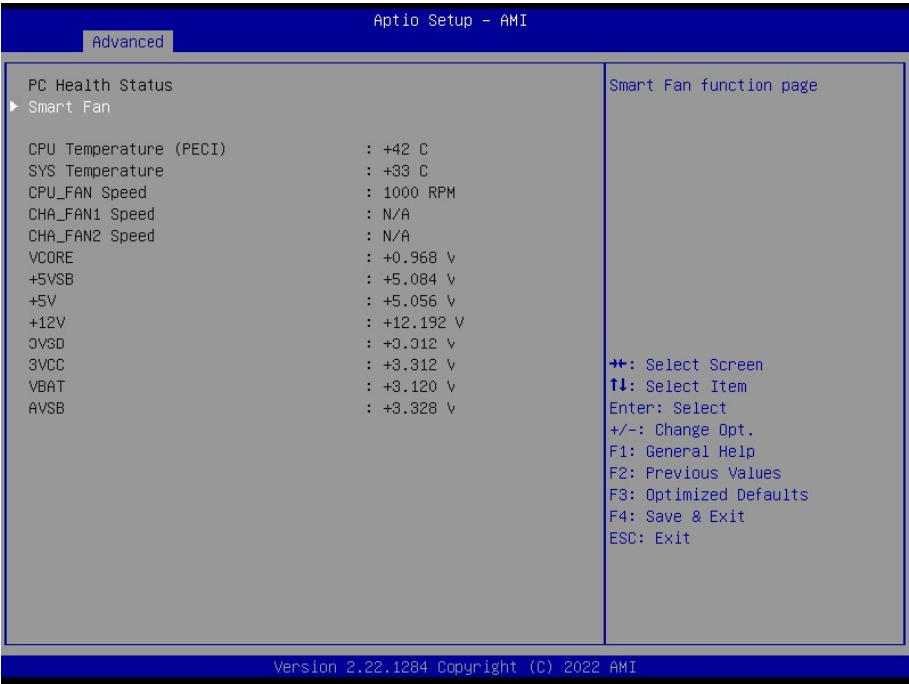
Item	Option	Description
Serial Port	Disabled Enabled [Default] ,	Enable or Disable Serial Port (COM)
Change Settings	Auto [Default] , IO=228h; IRQ=15; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; IO=220h; IRQ3,4,5,6,7,9,10,11,12; IO=228h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

3.6.2.7.6 Serial Port 6 Configuration

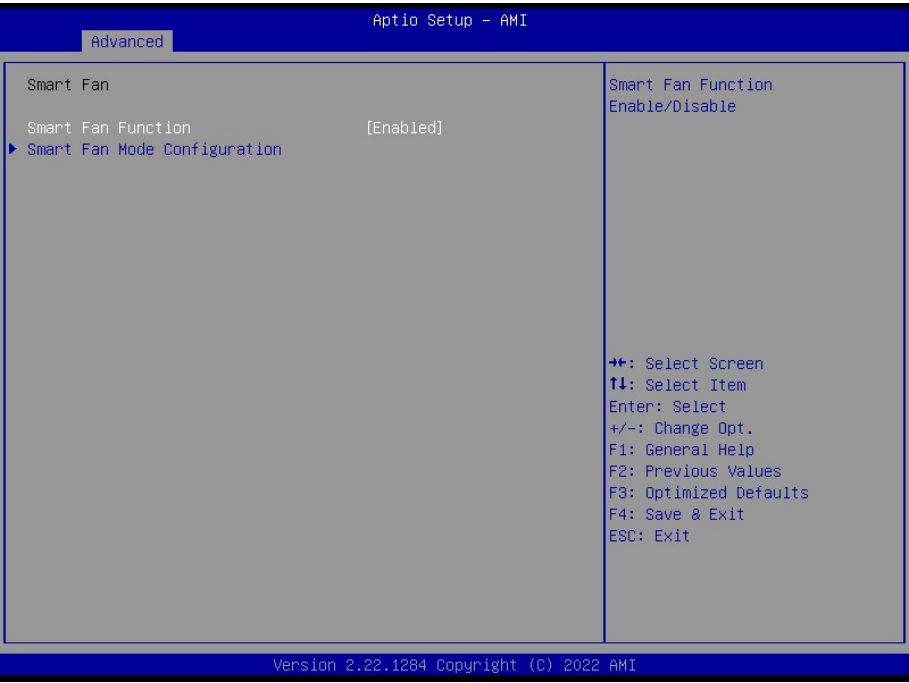


Item	Option	Description
Serial Port	Disabled Enabled [Default] ,	Enable or Disable Serial Port (COM).
Change Settings	Auto [Default] , IO=220h; IRQ=6; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; IO=220h; IRQ3,4,5,6,7,9,10,11,12; IO=228h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

3.6.2.8 Hardware Monitor

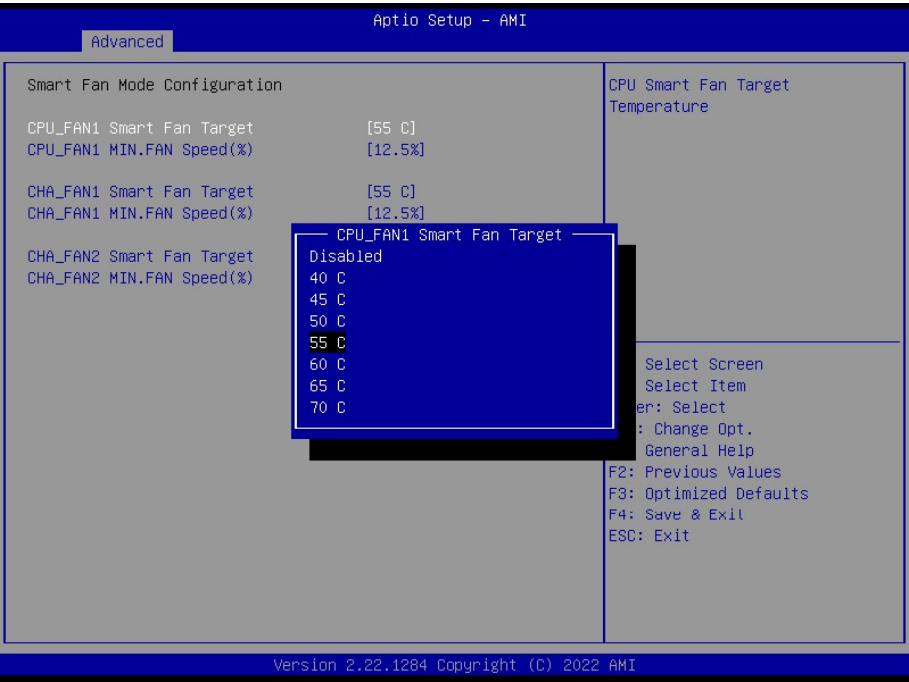


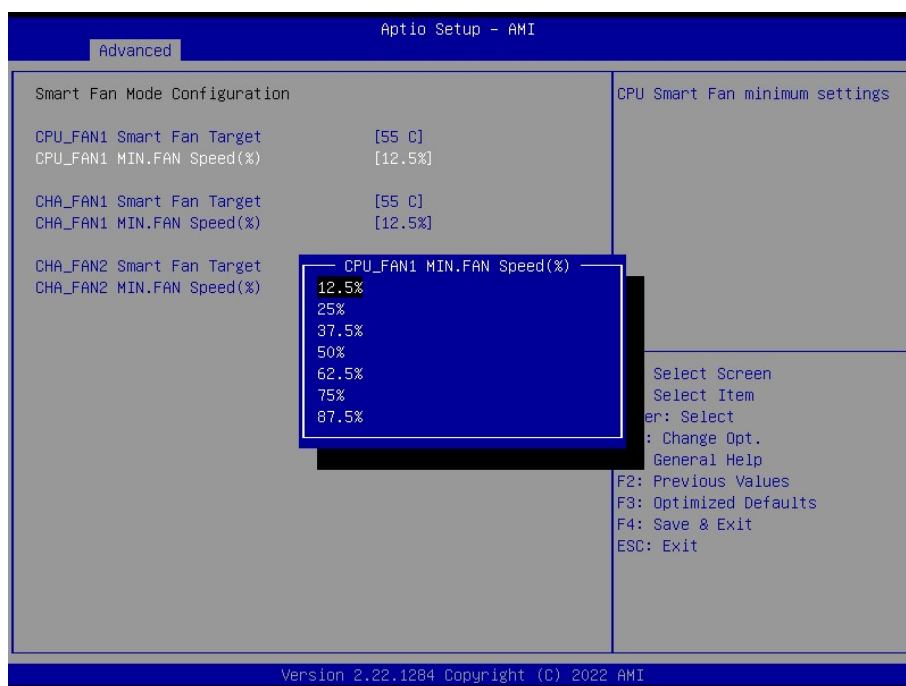
3.6.2.8.1 Hardware Monitor



Item	Options	Description
Smart Fan Function	Disabled Enabled[Default], Manual	Smart fan function Enable/Disabled

3.6.2.8.2 Smart Fan Function





Item	Options	Description
CPU_FAN1 Smart Fan Target	Disabled 40C 45C 50C 55C[Default], 60C 65C 70C	CPU Smart FAN Target Temperature
CPU_FAN1 MIN.FAN Speed(%)	12.5%[Default], 25% 37.5% 50% 62.5% 75% 87.5%	CPU Smart FAN minimum settings
CHA_FAN1 Smart Fan Target	Disabled 40C 45C 50C 55C[Default], 60C 65C 70C	Chassis Smart FAN Target Temperature

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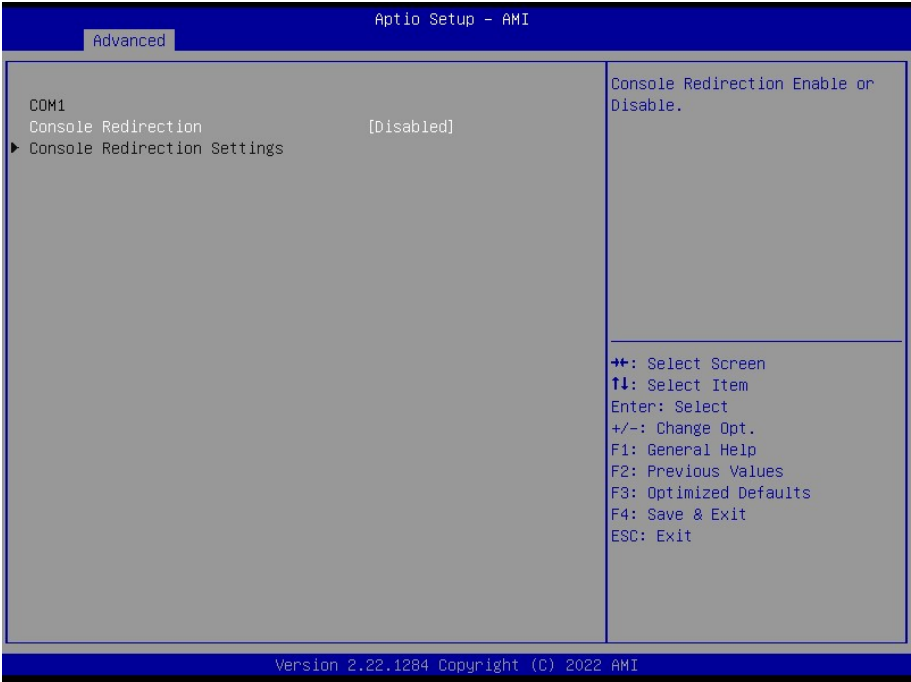
CHA_FAN1 MIN.FAN Speed(%)	12.5% [Default] , 25% 37.5% 50% 62.5% 75% 87.5%	Chassis Smart FAN minimum settings
CHA_FAN2 Smart Fan Target	Disabled 40C 45C 50C 55C [Default] , 60C 65C 70C	Chassis Smart FAN Target Temperature
CHA_FAN2 MIN.FAN Speed(%)	12.5% [Default] , 25% 37.5% 50% 62.5% 75% 87.5%	Chassis Smart FAN minimum settings

3.6.2.9 S5 RTC Wake Settings



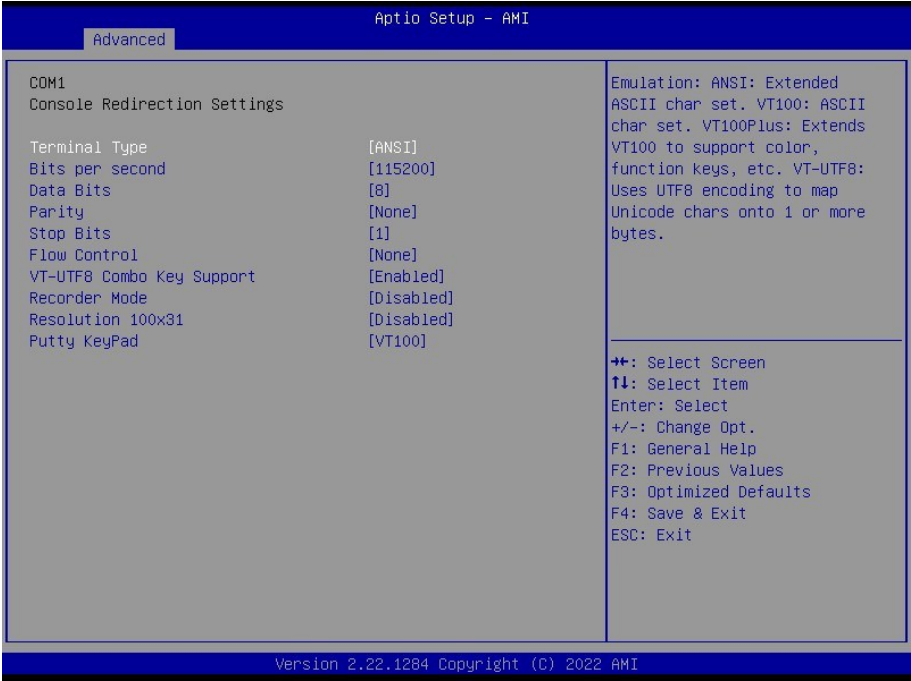
Item	Options	Description
Wake system from S5	Disabled [Default] , Fixed Time Dynamic Time	Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).

3.6.2.10 Serial Port Console Redirection



Item	Options	Description
Console Redirection	Disabled Enabled[Default],	Console Redirection Enabled or Disabled.

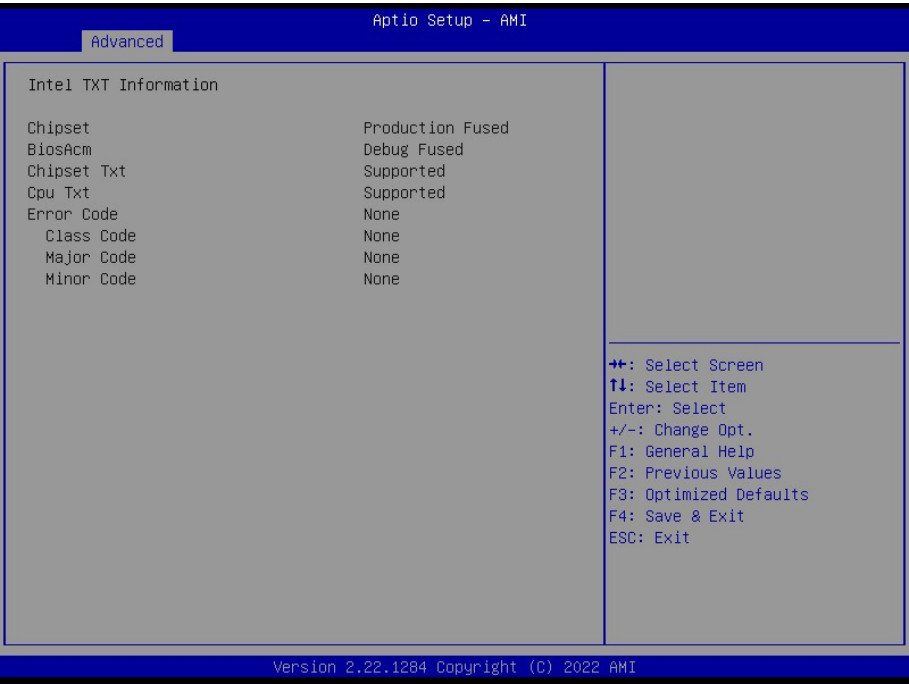
3.6.2.10.1 Console Redirection Settings



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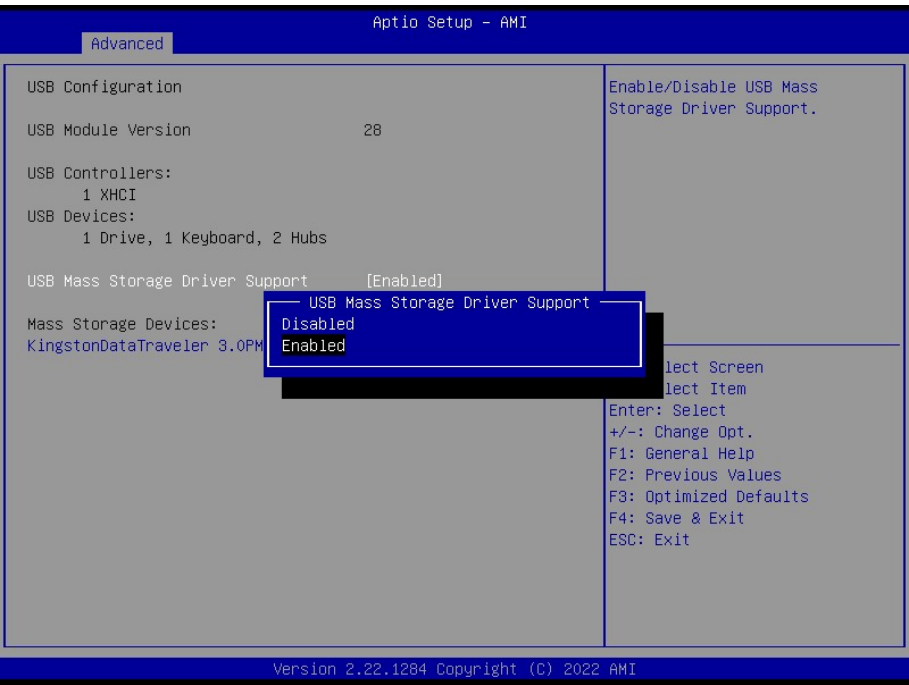
Item	Options	Description
Terminal Type	VT100 VT100Plus VT-UTF8 ANSI[Default],	Emulation: ANSI: Extended ASCII char set VT100: ASCII char set VT100Plus: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Bits per second	9600 19200 38400 57600 115200[Default],	Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Data Bits	7 8[Default],	Data Bits
Parity	None[Default], Even Odd Mark Space	A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark parity bit is always 1. Space: Parity bit is always 0. Mark and Space Parity do not allow for error detection.
Stop Bits	1[Default], 2	Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit
Flow Control	None[Default], Hardware RTS/CTS	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
VT-UTF8 Combo Key Support	Disabled Enabled[Default],	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled[Default],	With this mode enabled only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled[Default],	Enables or disables extended terminal resolution
Putty KeyPad	VT100[Default], LINUX XTERMR6 SCO ESCN VT400	Select FunctionKey and KeyPad on Putty.

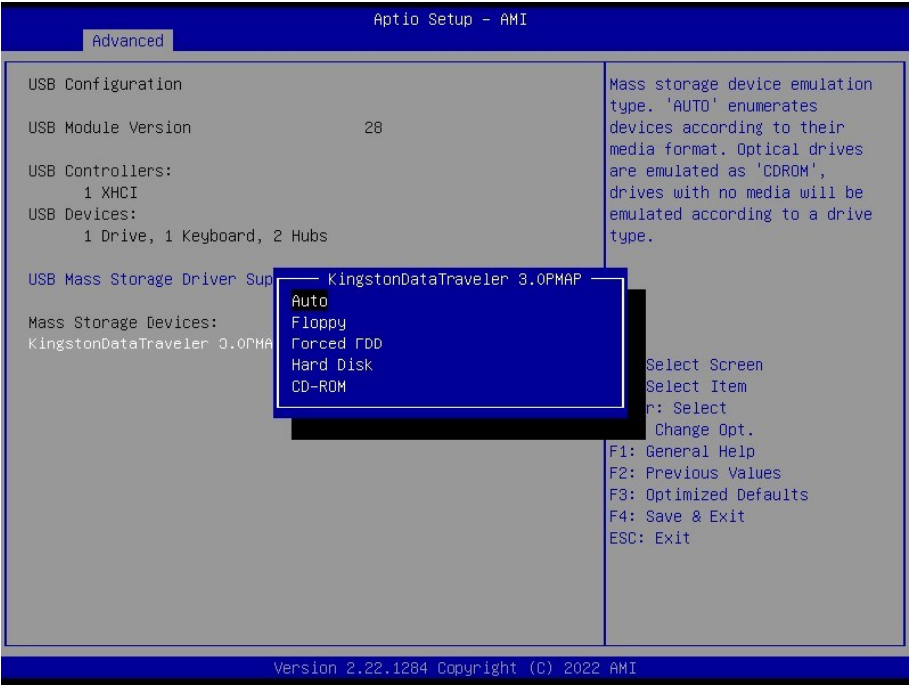
3.6.2.11 Intel TXT Information



3.6.2.12 USB Configuration

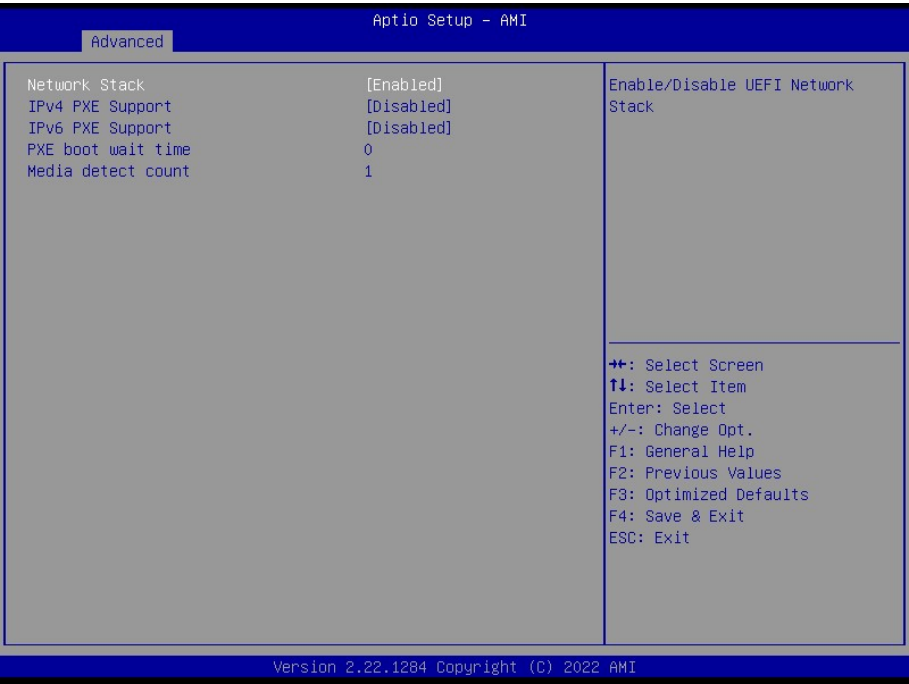
The USB Configuration menu helps read USB information and configures USB settings.





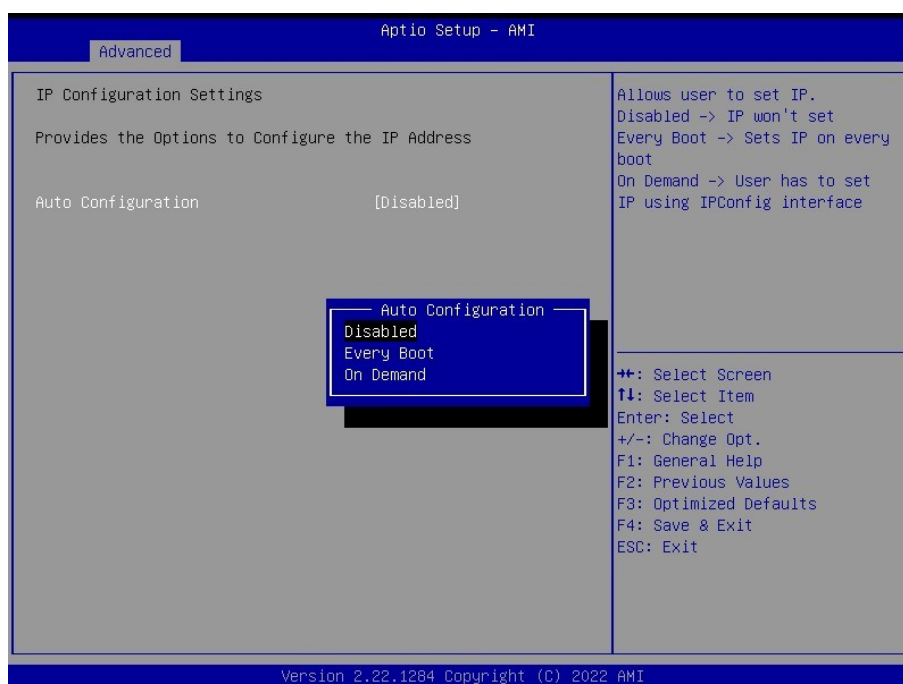
Item	Options	Description
USB Mass Storage Driver Support	Disabled Enabled[Default],	Enable/Disable USB Mass Storage Driver Support.
Mass Storage Devices	Auto[Default] Floppy Forced FDD Hard Disk CD-ROM	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.

3.6.2.13 Network Stack Configuration



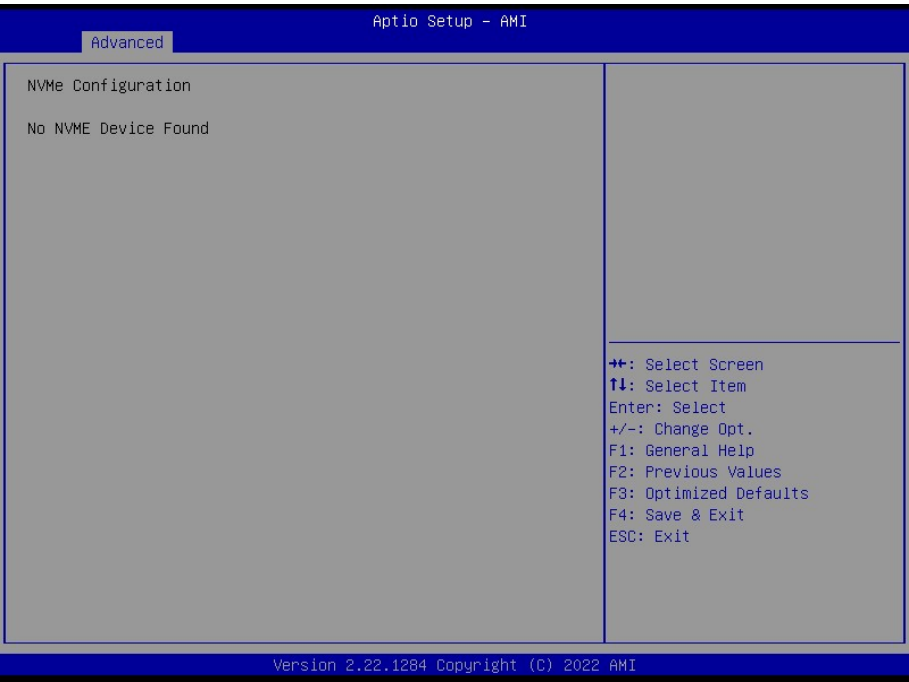
Item	Options	Description
Network stack	Disabled Enabled[Default],	Enable/Disable UEFI Network stack.
Ipv4 PXE Support	Disabled[Default], Enabled	Enable/Disable Ipv4 PXE Boot Support. If disabled, IPV4 PXE boot support will not be available.
Ipv6 PXE Support	Disabled[Default], Enabled	Enable/Disable Ipv6 PXE Boot Support. If disabled, IPV6 PXE boot support will not be available.
PXE boot wait time	0	Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys set the value.
Media detect count	1	Number of time the presence of media will be checked. Use either +/- or numeric keys set the value.

3.6.2.14 IP Configuration

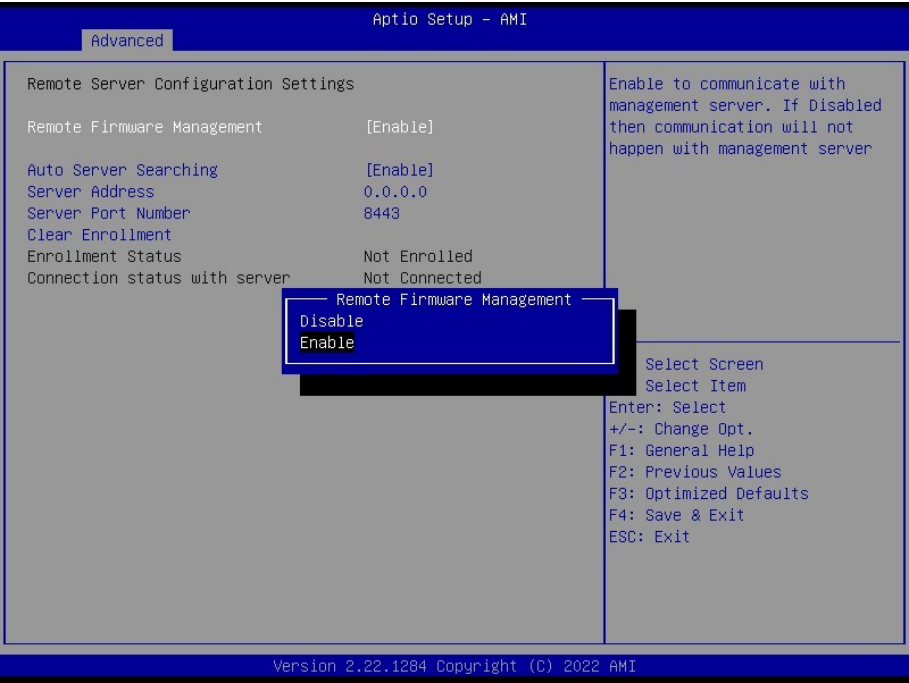


Item	Options	Description
Auto Configuration	Disabled[Default], Every Boot On demand	Enable/Disable UEFI Network stack.

3.6.2.15 NVMe Configuration



3.6.2.16 Remote Server Configuration



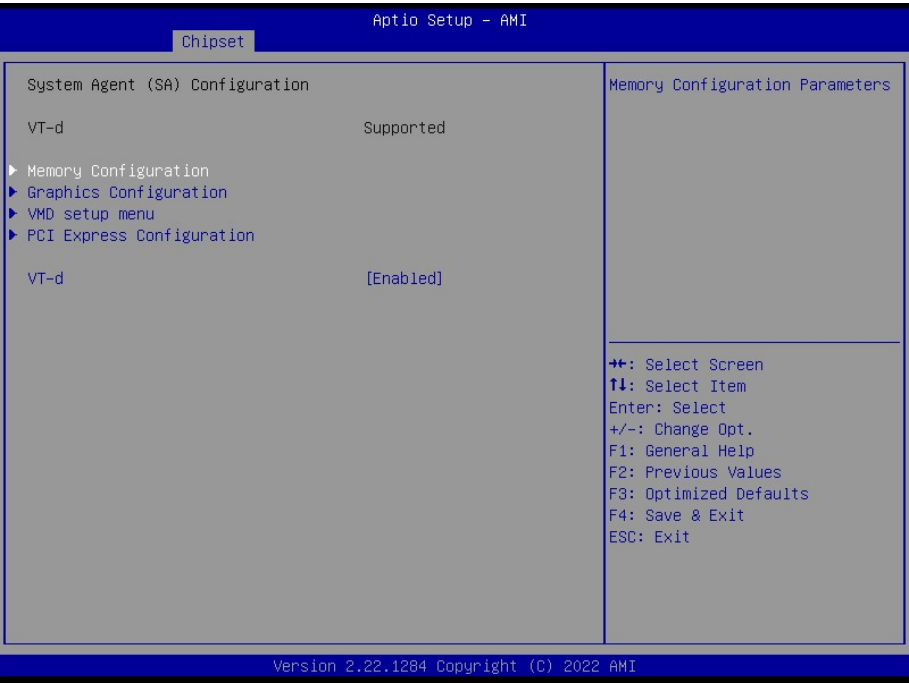
Item	Options	Description
Remote Firmware Management	Disable Enable[Default],	Enable to communicate with management server. If Disabled then communication will not happen with management server

Auto Server Searching	Disable Enable[Default],	Enable to Obtain DHCP Server IP automatically. Disable to provide Server IP manually. Need to do Clear Enrollment, if server is changed in DHCP
Server Port Number	8443	Provide the Management server PORT number
Server Address	Management server Address to be used if Auto Server Searching is either disabled or failed. If changed, need to do Clear Enrollment, if already enrolled with previous IP	
Clear Enrollment	Clear existing Enrollment information	

3.6.3 Chipset

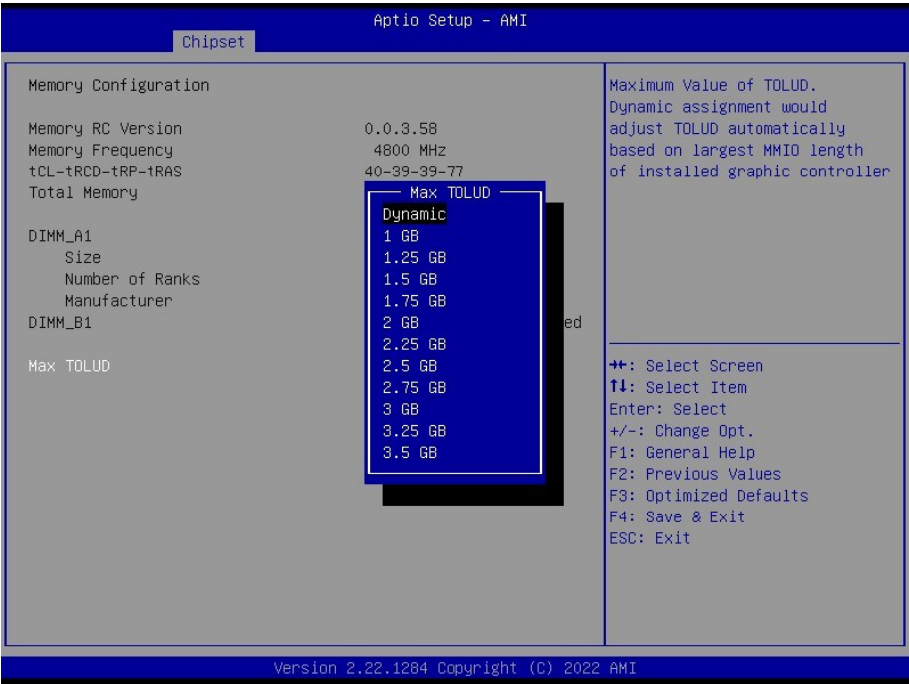


3.6.3.1 System Agent (SA) Configuration



Item	Options	Description
VT-d	Disabled Enabled[Default],	VT-d capability

3.6.3.1.1 Memory Configuration



Item	Options	Description
Max TOLUD	Dynamic[Default], 1 GB 1.25 GB 1.5 GB 1.75 GB 2 GB 2.25 GB 2.5 GB 2.75 GB 3 GB 3.25 GB 3.5 GB	Maximum Value of TOLUD, Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller

3.6.3.1.2 Graphics Configuration

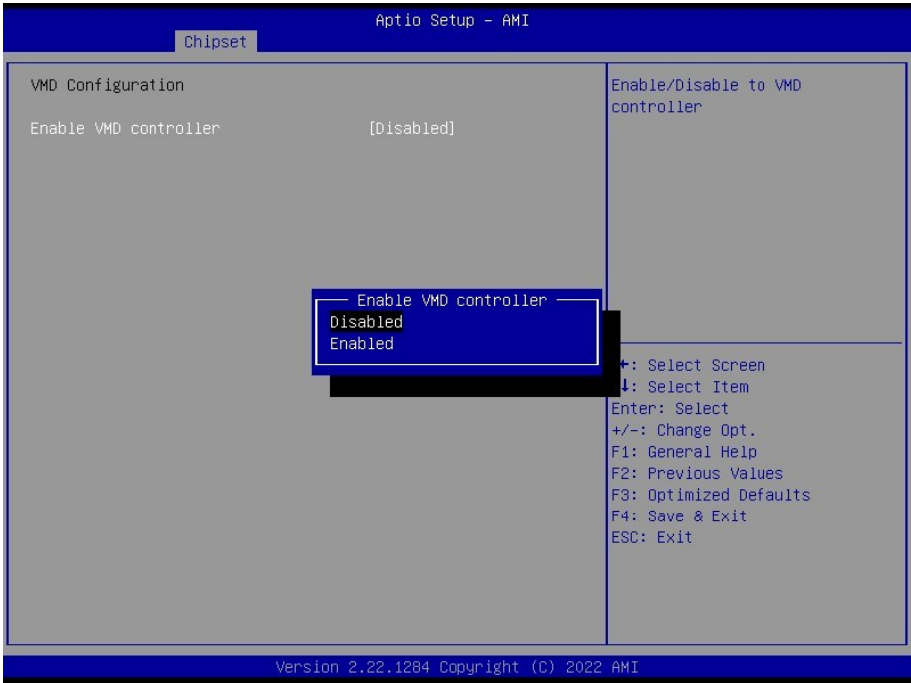


Item	Options	Description
Primary Display	Auto[Default], IGFX PEG Slot PCIE HG	Select which of IGFX/PEG/PCIE Graphics device should be Primary Display Or select HG for Hybrid Gfx.
Internal Graphics	Auto[Default], Disabled Enabled	Keep IGFX enabled based on the setup options.
PSMI SUPPORT	Disabled[Default], Enabled	PSMI Enable/Disable

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DVMT Pre-Allocated	0M	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
	32M	
	64M	
	96M	
	128M	
	160M	
	4M	
	8M	
	12M	
	16M	
	20M	
	24M	
	28M	
	32M/F7	
	36M	
	40M	
	44M	
	48M	
	52M	
	56M	
60M[Default],		

3.6.3.1.3 VMD setup menu



Item	Options	Description
Enabled VMD controller	Disabled[Default], Enabled	Enable/Disable to VMD controller

3.6.3.1.4 PCI Express Configuration



Item	Options	Description
Detect Non-Compliance Device	Disabled[Default], Enabled	Detect Non-Compliance PCI Express Device in PEG

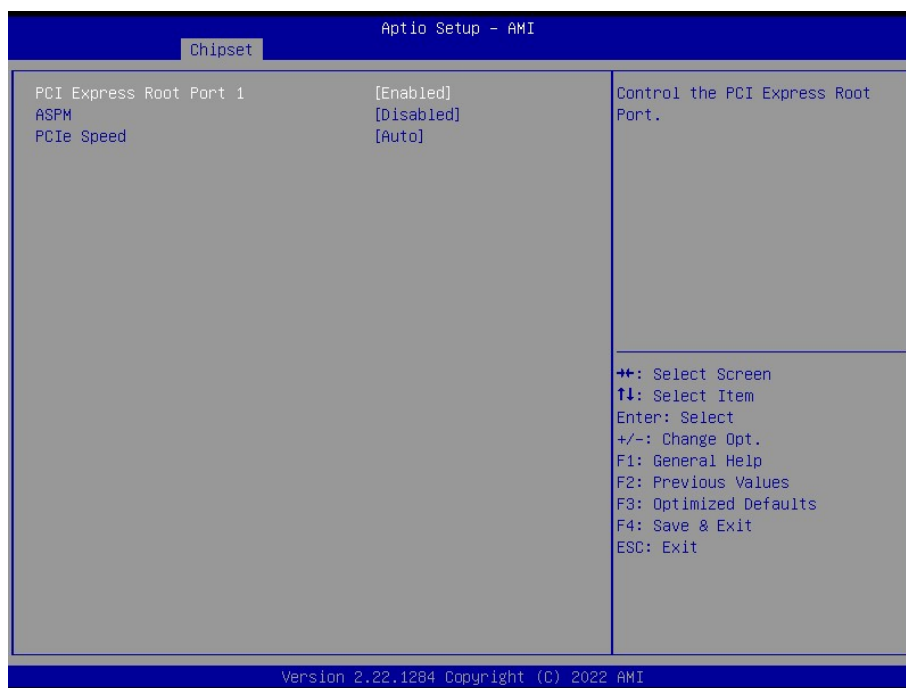
3.6.3.1.4.1 PCI Express Root Port 1



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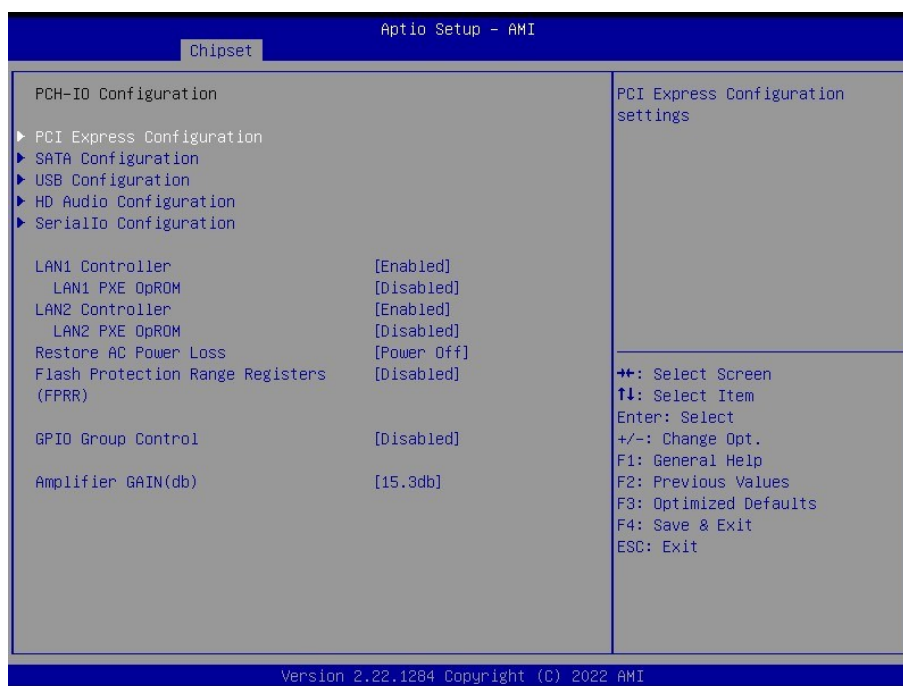
Item	Options	Description
PCI Express Root Port 1	Disabled Enabled [Default] ,	Control the PCI Express Root Port.
ASPM	Disabled [Default] , L0s L1 L0sL1	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto [Default] , Gen1 Gen2 Gen3 Gen4 Gen5	Configure PCIe Speed

3.6.3.1.4.2 PCI Express Root Port 1



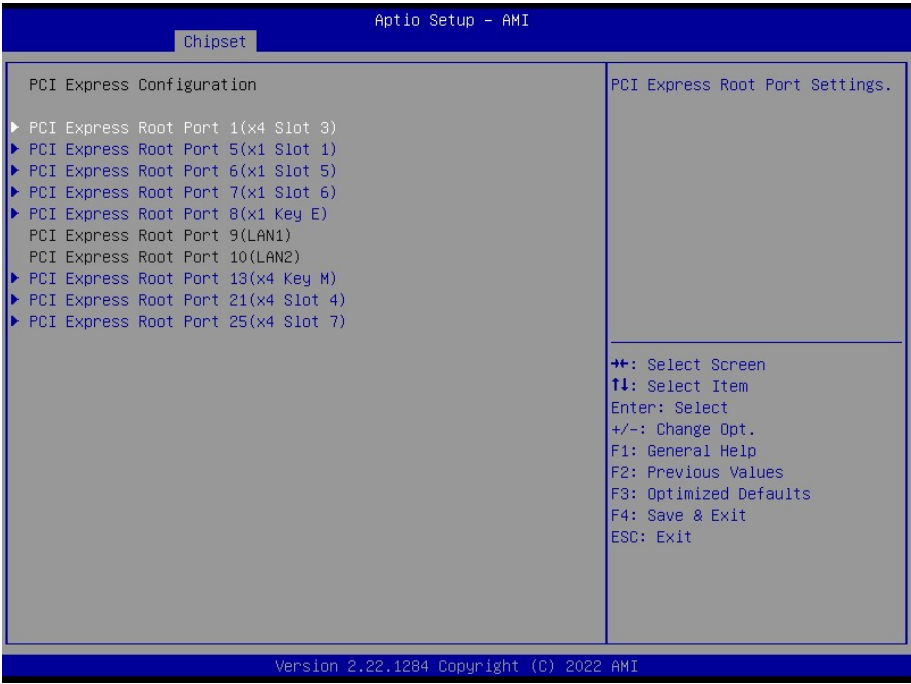
Item	Options	Description
PCI Express Root Port 2	Disabled Enabled [Default] ,	Control the PCI Express Root Port.
ASPM	Disabled [Default] , L0s L1 L0sL1	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto [Default] , Gen1 Gen2 Gen3 Gen4 Gen5	Configure PCIe Speed

3.6.3.2 PCH-IO Configuration



Item	Options	Description
LAN 1 Controller	Enabled[Default], Disabled	Enable or disable onboard NIC.
LAN1 PXE OpROM	Enabled[Default], Disabled	Enable or disable boot option for LAN1 Controller.
LAN 2 Controller	Disabled Enabled[Default],	Control the PCI Express Root Port.
LAN2 PXE OpROM	Enabled[Default], Disabled	Enable or disable boot option for LAN2 Controller.
Restore AC Power Loss	Power ON Power Off Last State[Default],	Specify what state to go to when power is re-applied after a power failure (G3 state).
Flash Protection Range Registers (FPRR)	Disabled Enabled[Default],	Enable Flash Protection Range Registers
GPIO Group Control	Enabled[Default], Disabled	Configure the digital GPIO pins
Amplifier GAIN(db)	15.3dp[Default], 21.2dp 27.2dp 31.8dp	Select Amplifier value

3.6.3.2.1 PCH-IO Configuration



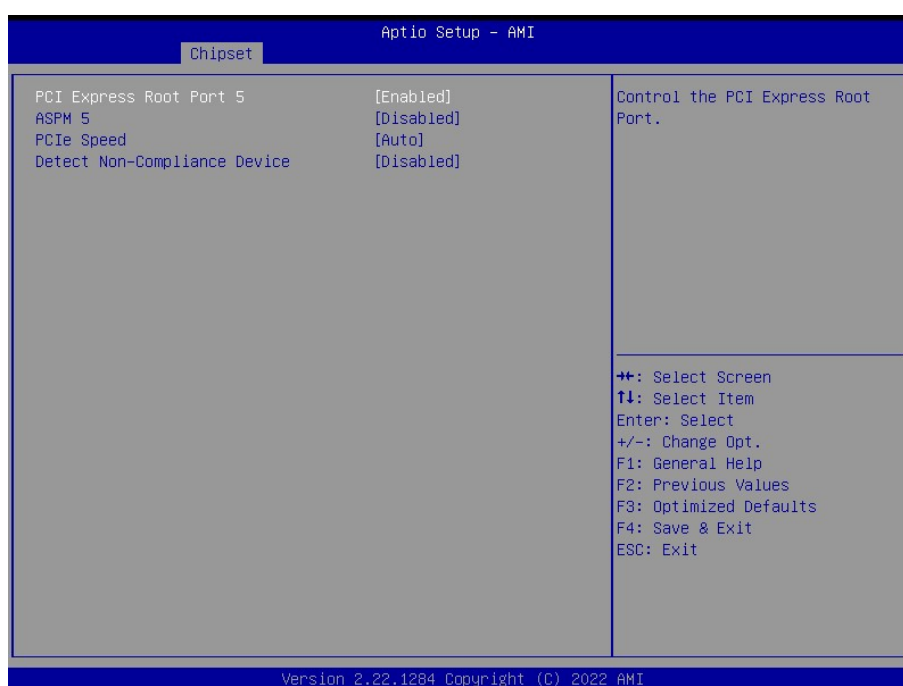
3.6.3.2.1.1 PCI Express Root Port 1(x4 Slot 3)



Item	Options	Description
PCI Express Root Port 1(x4 Slot 3)	Disabled Enabled [Default] ,	Control the PCI Express Root Port.

ASPM 1	Disabled [Default] , L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto [Default] , Gen1 Gen2 Gen3 Gen4	Configure PCIe Speed
Detect Non-Compliance Device	Disabled [Default] , Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.

3.6.3.2.1.2 PCI Express Root Port 5(x1 Slot 1)



Item	Options	Description
PCI Express Root Port 5(x1 Slot 1)	Disabled Enabled [Default] ,	Control the PCI Express Root Port.
ASPM 5	Disabled [Default] , L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto [Default] , Gen1 Gen2 Gen3 Gen4	Configure PCIe Speed
Detect Non-Compliance Device	Disabled [Default] , Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.

3.6.3.2.1.3 PCI Express Root Port 6(x1 Slot 5)



Item	Options	Description
PCI Express Root Port 6(x1 Slot 5)	Disabled Enabled [Default] ,	Control the PCI Express Root Port.
ASPM 6	Disabled [Default] , L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto [Default] , Gen1 Gen2 Gen3 Gen4	Configure PCIe Speed
Detect Non-Compliance Device	Disabled [Default] , Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.

3.6.3.2.1.4 PCI Express Root Port 7(x1 Slot 6)



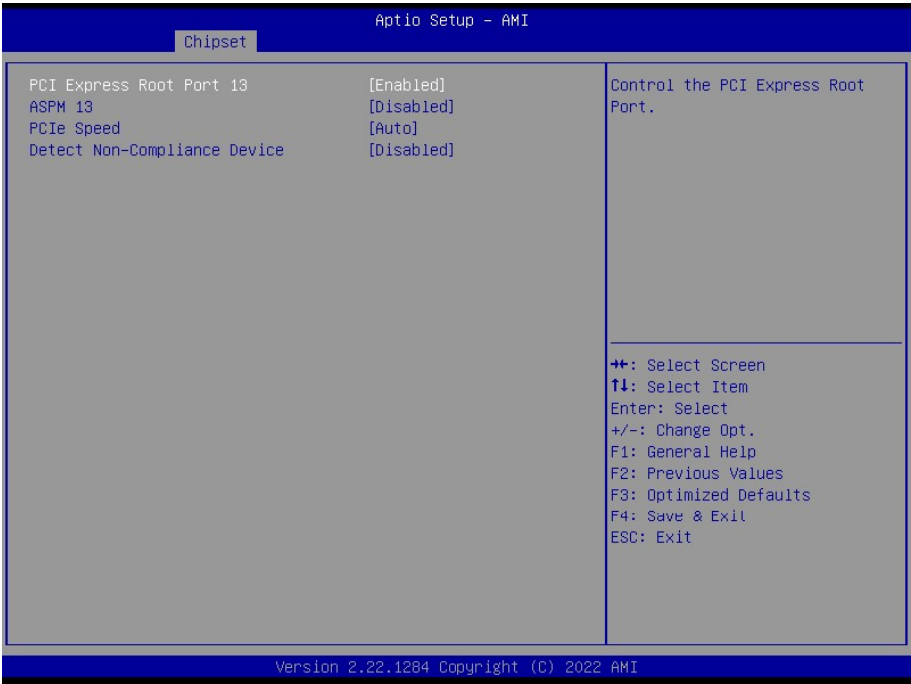
Item	Options	Description
PCI Express Root Port 7(x1 Slot 6)	Disabled Enabled [Default] ,	Control the PCI Express Root Port.
ASPM 7	Disabled [Default] , L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto [Default] , Gen1 Gen2 Gen3 Gen4	Configure PCIe Speed
Detect Non-Compliance Device	Disabled [Default] , Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.

3.6.3.2.1.5 PCI Express Root Port 8(x1 Key E)



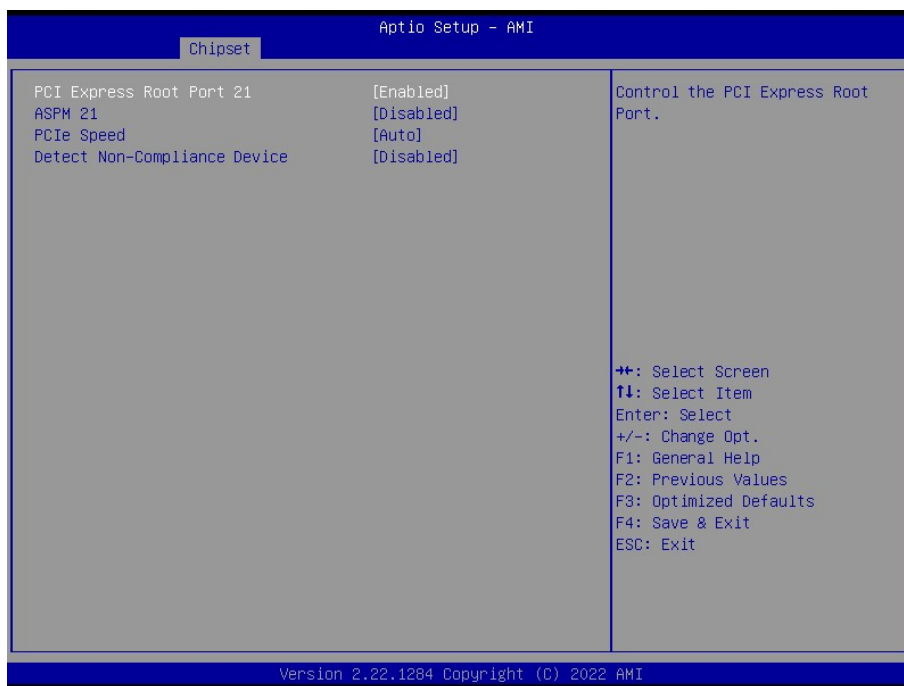
Item	Options	Description
PCI Express Root Port 8(x1 Key E)	Disabled Enabled [Default] ,	Control the PCI Express Root Port.
ASPM 8	Disabled [Default] , L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto [Default] , Gen1 Gen2 Gen3 Gen4	Configure PCIe Speed
Detect Non-Compliance Device	Disabled [Default] , Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.

3.6.3.2.1.6 PCI Express Root Port 13(x4 Key M)



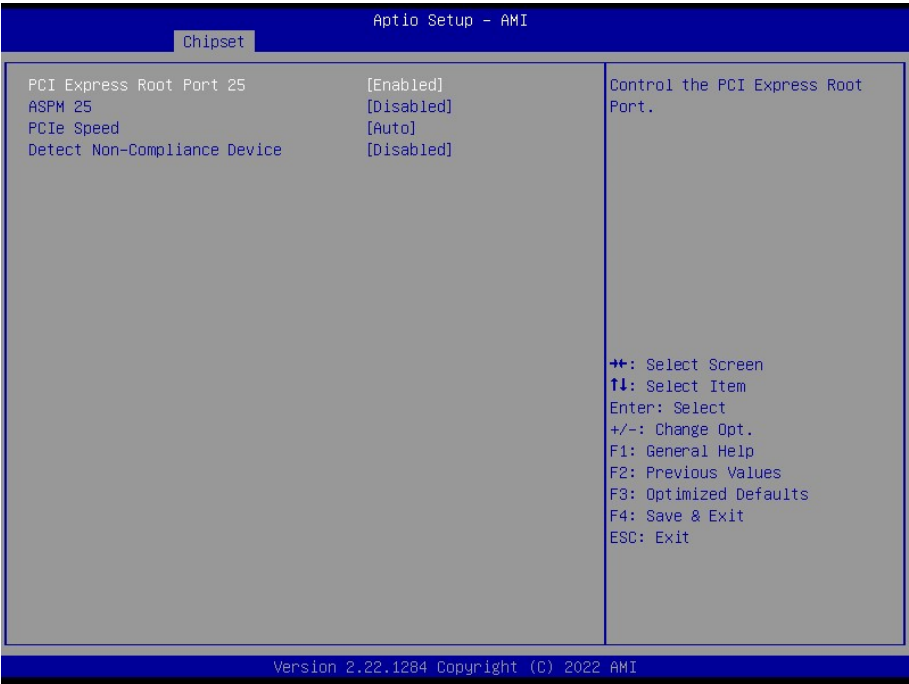
Item	Options	Description
PCI Express Root Port 13(x4 Key M)	Disabled Enabled [Default] ,	Control the PCI Express Root Port.
ASPM 13	Disabled [Default] , L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto [Default] , Gen1 Gen2 Gen3 Gen4	Configure PCIe Speed
Detect Non-Compliance Device	Disabled [Default] , Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.

3.6.3.2.1.7 PCI Express Root Port 21(x4 Slot 4)



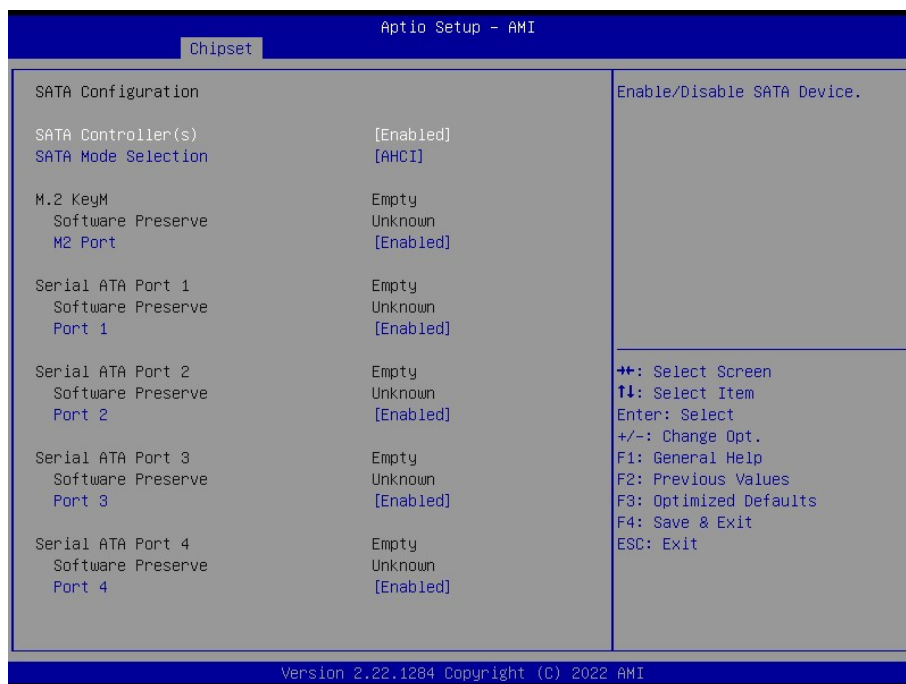
Item	Options	Description
PCI Express Root Port 21(x4 Slot 4)	Disabled Enabled [Default] ,	Control the PCI Express Root Port.
ASPM 21	Disabled [Default] , L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto [Default] , Gen1 Gen2 Gen3 Gen4	Configure PCIe Speed
Detect Non-Compliance Device	Disabled [Default] , Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.

3.6.3.2.1.8 PCI Express Root Port 25(x4 Slot 7)



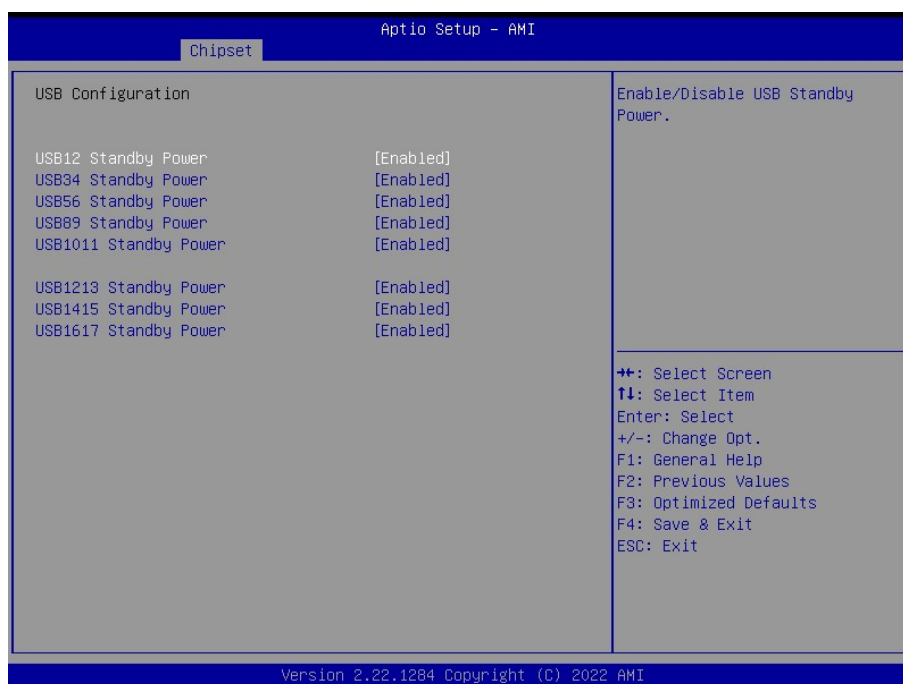
Item	Options	Description
PCI Express Root Port 25(x4 Slot 7)	Disabled Enabled [Default] ,	Control the PCI Express Root Port.
ASPM 25	Disabled [Default] , L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto [Default] , Gen1 Gen2 Gen3 Gen4	Configure PCIe Speed
Detect Non-Compliance Device	Disabled [Default] , Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.

3.6.3.2.2 SATA Configuration



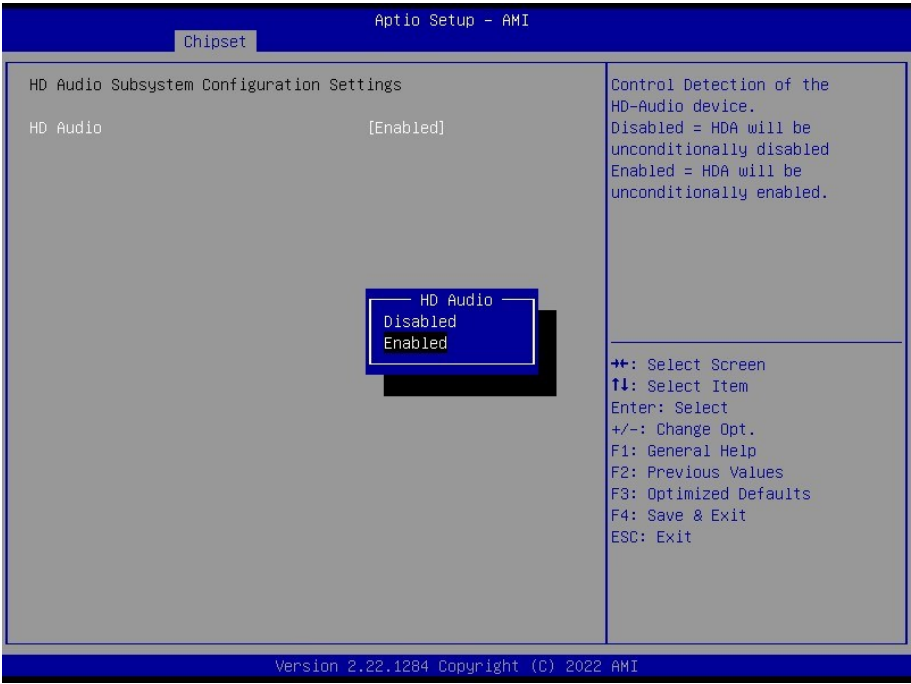
Item	Options	Description
SATA Controller(s)	Enabled[Default], Disabled	Enable/Disable SATA Device.
SATA Mode Selection	AHCI	Determines how SATA Controller(s) operate.
M2 Port	Disabled Enabled[Default],	Enable or Disable SATA Port
Port 1	Disabled Enabled[Default],	Enable or Disable SATA Port
Port 2	Disabled Enabled[Default],	Enable or Disable SATA Port
Port 3	Disabled Enabled[Default],	Enable or Disable SATA Port
Port 4	Disabled Enabled[Default],	Enable or Disable SATA Port

3.6.3.2.3 USB Configuration



Item	Options	Description
USB12 Standby Power	Disabled Enabled[Default],	Enable/Disable USB Standby Power
USB34 Standby Power	Disabled Enabled[Default],	Enable/Disable USB Standby Power
USB56 Standby Power	Disabled Enabled[Default],	Enable/Disable USB Standby Power
USB89 Standby Power	Disabled Enabled[Default],	Enable/Disable USB Standby Power
USB1011 Standby Power	Disabled Enabled[Default],	Enable/Disable USB Standby Power
USB1213 Standby Power	Disabled Enabled[Default],	Enable/Disable USB Standby Power
USB1415 Standby Power	Disabled Enabled[Default],	Enable/Disable USB Standby Power
USB1617 Standby Power	Disabled Enabled[Default],	Enable/Disable USB Standby Power

3.6.3.2.4 HD Audio Configuration



Item	Options	Description
HD Audio	Disabled Enabled [Default] ,	Control Detection of HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled

3.6.3.2.5 Seriallo Configuration



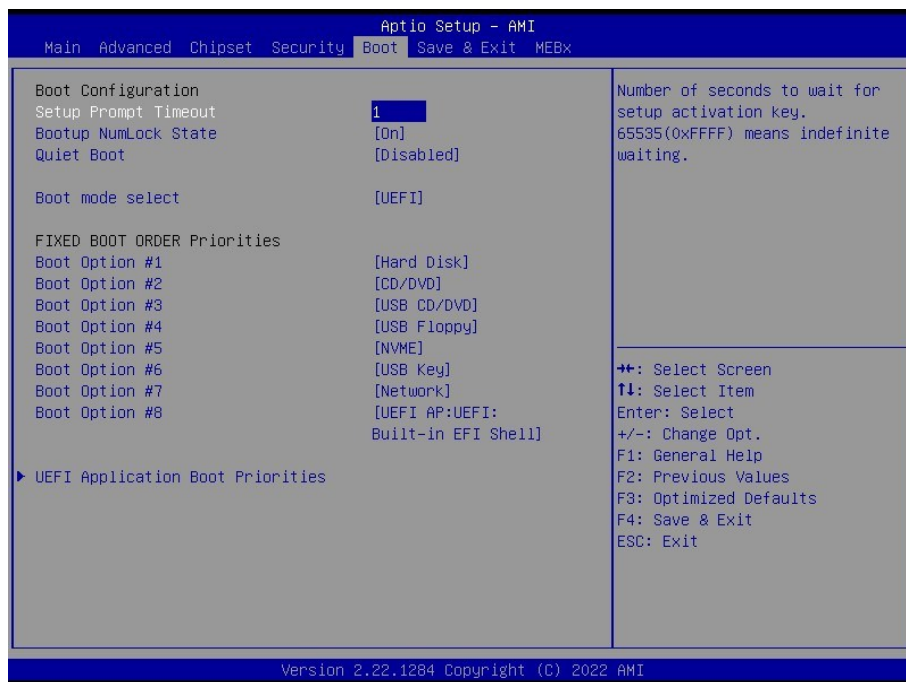
Item	Options	Description
I2C0 Controller	Disabled Enabled[Default], Post Code Only	Enables/Disables Seriallo Controller If given device is Function 0 PSF disabling is skipped. PSF default will remain and device PCI CFG Space will still be visible. This is needed to allow PCI enumerator access functions above 0 in a multifunction device. The following devices depend on each other: 12C0

3.6.4 Security



Item	Description
Administrator Password	Set Administrator Password
User Password	Set User Password

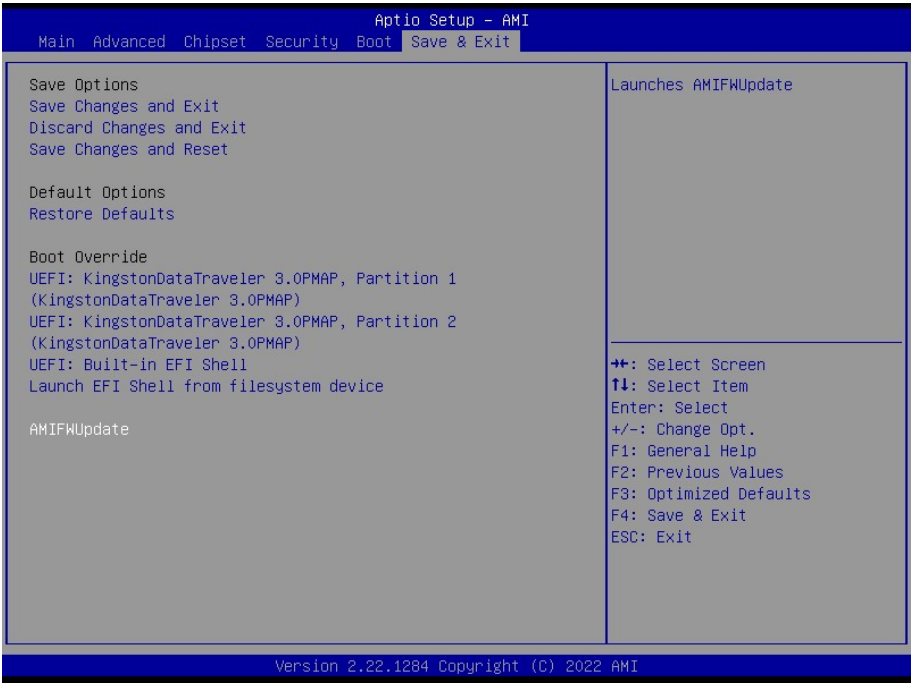
3.6.5 Boot



Item	Options	Description
Setup Prompt Timeout	1	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On[Default], Off	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled[Default],	Enables or disables Quiet Boot option
Boot mode select	LEGACY UEFI[Default],	Select boot mode LEGACY/UEFI
Boot Option #1	USB Key, CD/DVD, USB CD/DVD, USB Hard Disk, USB Floppy, NVME, Hard Disk[Default], Network, UEFI AP, Disabled	Sets the system boot order
Boot Option #2	USB Key, CD/DVD[Default], USB CD/DVD, USB Hard Disk, USB Floppy, NVME, Hard Disk, Network, UEFI AP, Disabled	Sets the system boot order

Boot Option #3	USB Key, CD/DVD, USB CD/DVD[Default], USB Hard Disk, USB Floppy, NVME, Hard Disk, Network, UEFI AP, Disabled	Sets the system boot order
Boot Option #4	USB Key, CD/DVD, USB CD/DVD, USB Hard Disk, USB Floppy[Default], NVME, Hard Disk, Network, UEFI AP, Disabled	Sets the system boot order
Boot Option #5	USB Key, CD/DVD, USB CD/DVD, USB Hard Disk, USB Floppy, NVME[Default], Hard Disk, Network, UEFI AP, Disabled	Sets the system boot order
Boot Option #6	USB Key[Default], CD/DVD, USB CD/DVD, USB Hard Disk, USB Floppy, NVME, Hard Disk, Network, UEFI AP, Disabled	Sets the system boot order
Boot Option #7	USB Key, CD/DVD, USB CD/DVD, USB Hard Disk, USB Floppy, NVME, Hard Disk, Network[Default], UEFI AP, Disabled	Sets the system boot order
Boot Option #8	USB Key, CD/DVD, USB CD/DVD, USB Hard Disk, USB Floppy, NVME, Hard Disk, Network, UEFI AP[Default], Disabled	Sets the system boot order

3.6.6 Save & Exit



3.6.6.1 Save Changes and Exit

Exit system setup after saving the changes.

3.6.6.2 Discard Changes and Exit

Exit system setup without saving the changes.

3.6.6.3 Save Changes and Reset

Reset the system after saving the changes.

3.6.6.4 Restore Defaults

Restore/Load default values for all the setup option.

3.6.6.5 Launch EFI Shell from filesystem device

Attempts to launch EFI shell application from one of the available filesystem devices.

3.6.6.6 AMIFWUpdate

Launches AMIFWUpdate.

4. Drivers Installation



Note: Installation procedures and screen shots in this section are for your reference and may not be exactly the same as shown on your screen.

4.1 Install Chipset Driver

All drivers can be found on the Avalue Official Website:

www.avalue.com



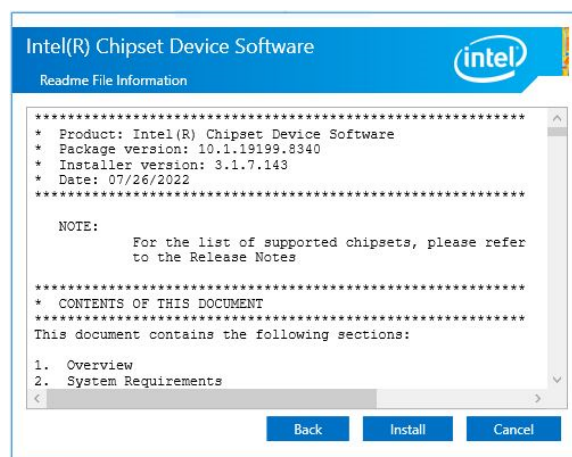
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.



Step1. Click Next.



Step 2. Click Accept.



Step 3. Click Install.



Step 4. Complete setup.

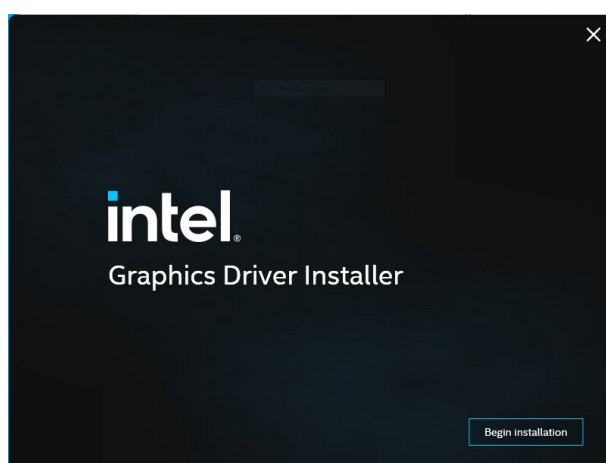
4.2 Install VGA Driver

All drivers can be found on the Avalue Official Website:

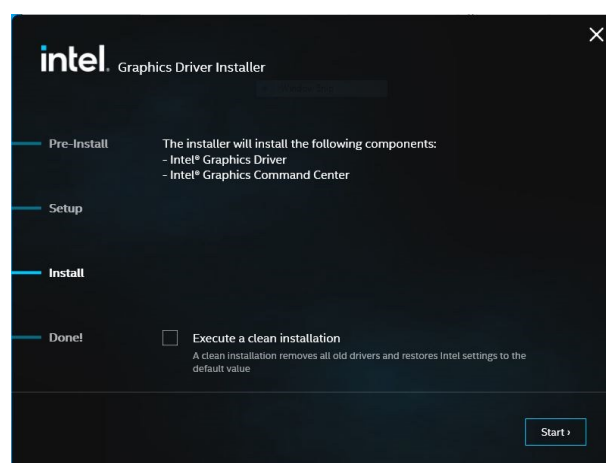
www.avalue.com



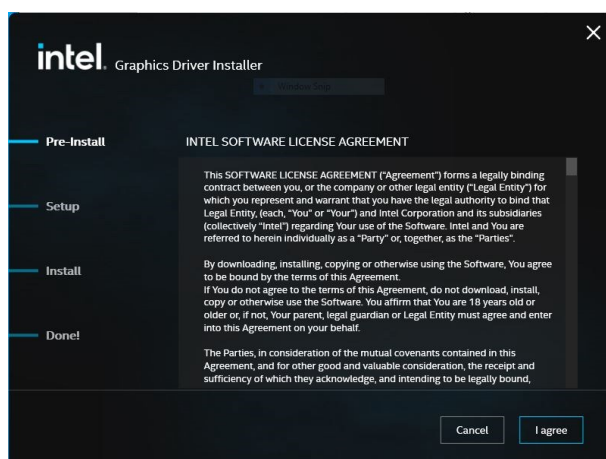
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



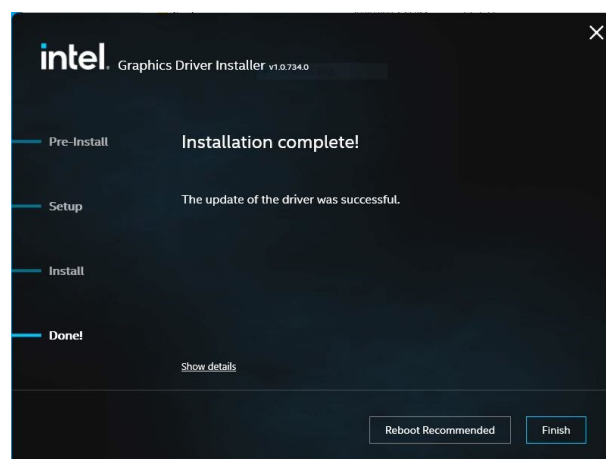
Step 1. Click **Begin installation**.



Step 3. Click **Start**.



Step 2. Click **I agree**.



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

4.3 Install ME Driver

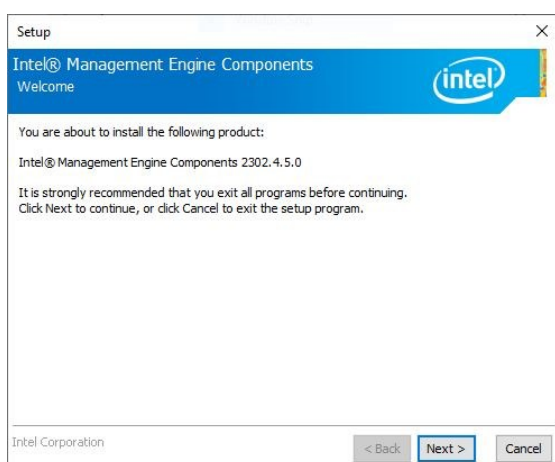
All drivers can be found on the Avalue

Official Website:

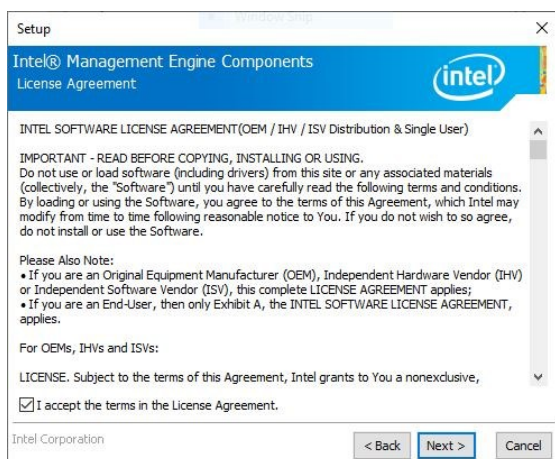
www.avalue.com



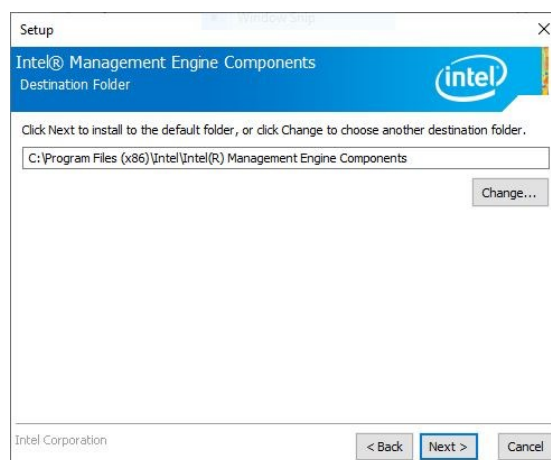
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



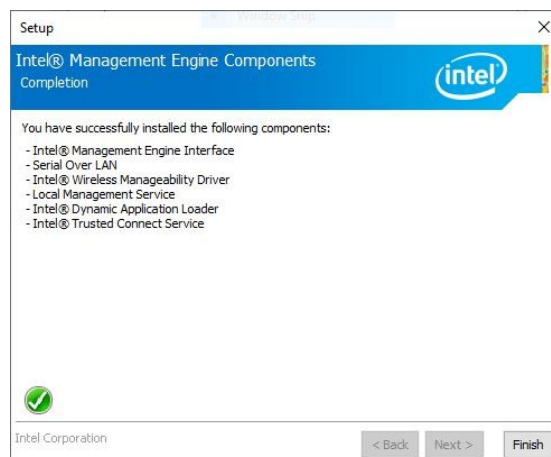
Step 1. Click **Next** to continue setup.



Step 2. Click **Next**.



Step 3. Click **Next**



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

4.4 Install Audio Driver (For Realtek ALC888S HD Audio)

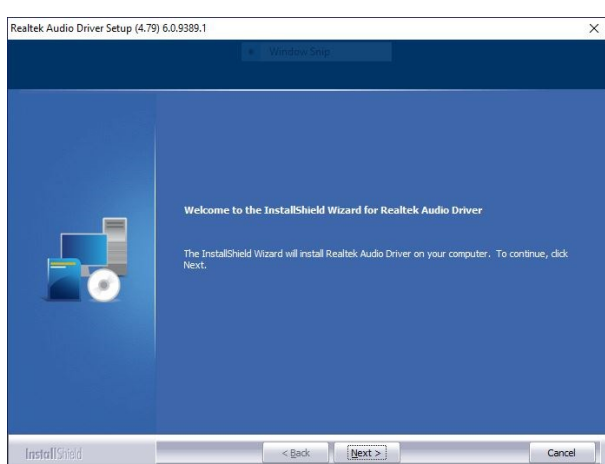
All drivers can be found on the Avalue

Official Website:

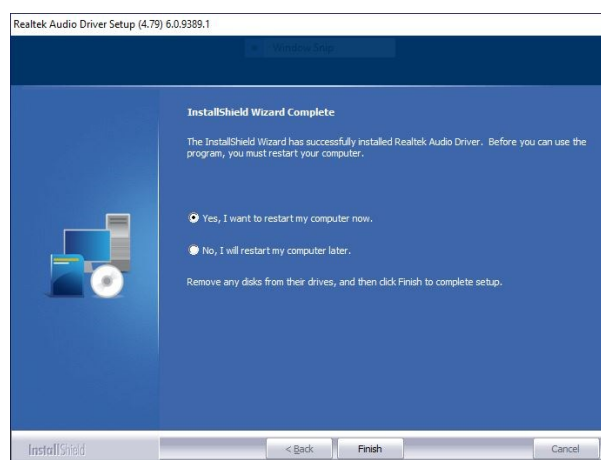
www.avalue.com



Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



Step 1. Click **Next** to Install.



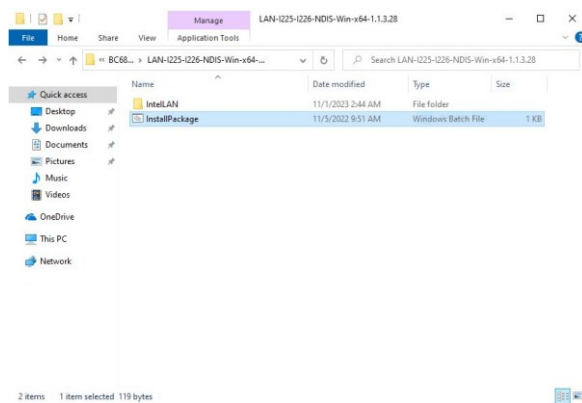
Step 2. Select **Finish** to complete Installation.

4.5 Install LAN Driver

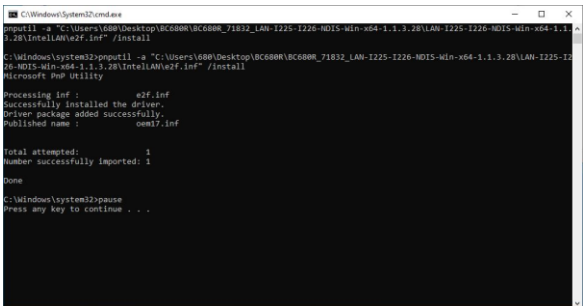
All drivers can be found on the Avalue
Official Website:
www.avalue.com



Note: The installation procedures and
screen shots in this section are
based on Windows 10 operation
system.



Step 1. Click InstallPackage.



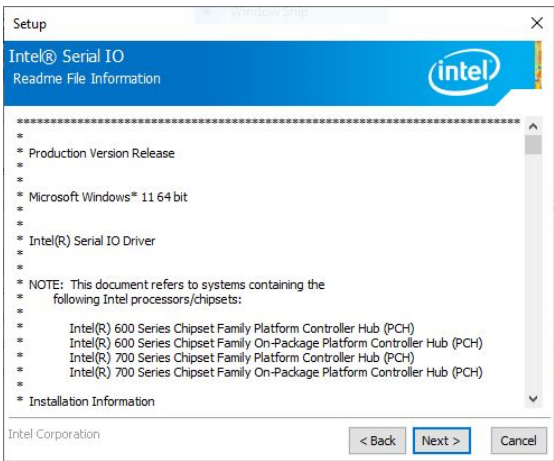
Step 2.

4.6 Install Serial IO Driver

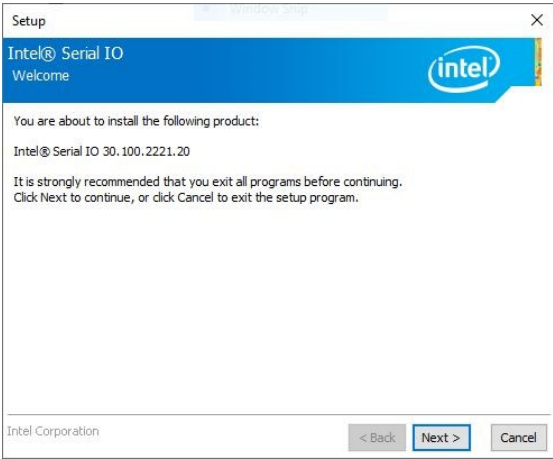
All drivers can be found on the Avalue Official Website:
www.avalue.com



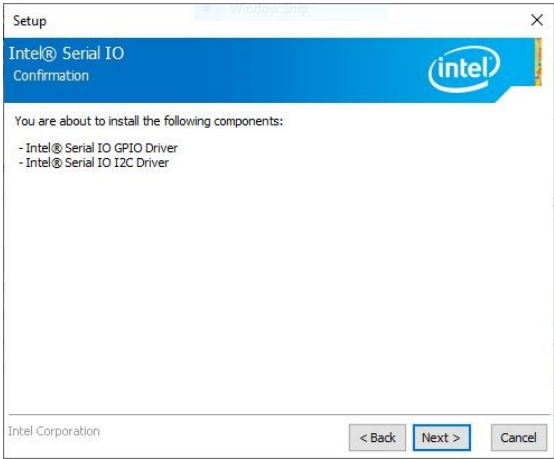
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



Step 3. Click Next.



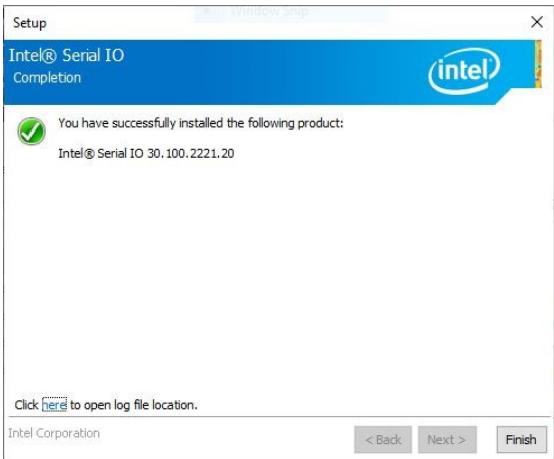
Step 1. Click Next to continue installation.



Step 4. Click Next.



Step 2. Click Next.



Step 5. Click Finish to complete setup.

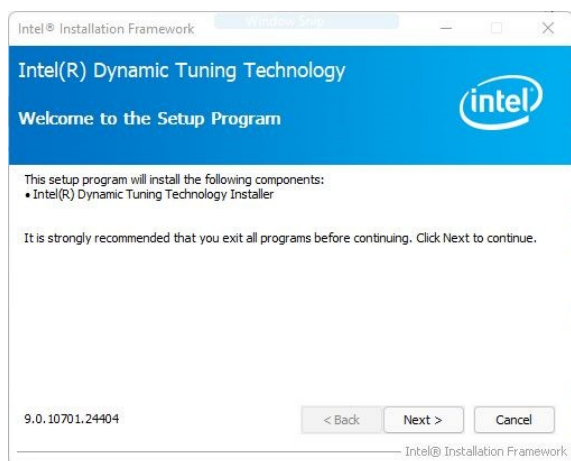
4.7 Install Intel_DTT

All drivers can be found on the Avalue Official Website:

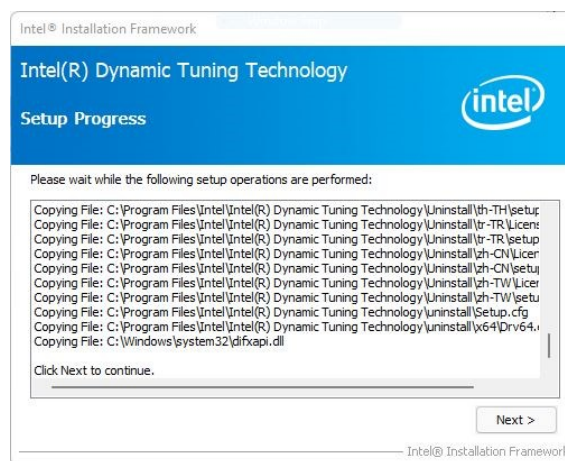
www.avalue.com



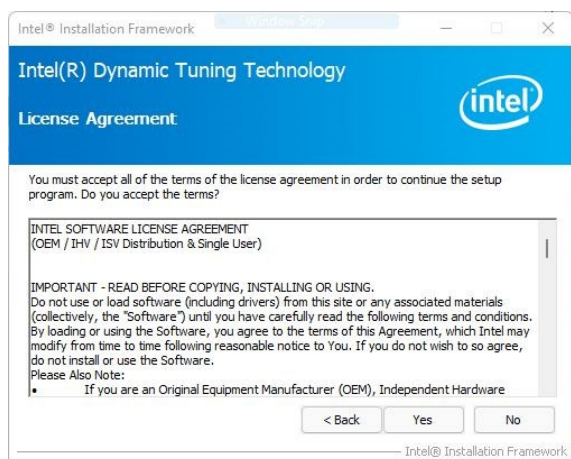
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



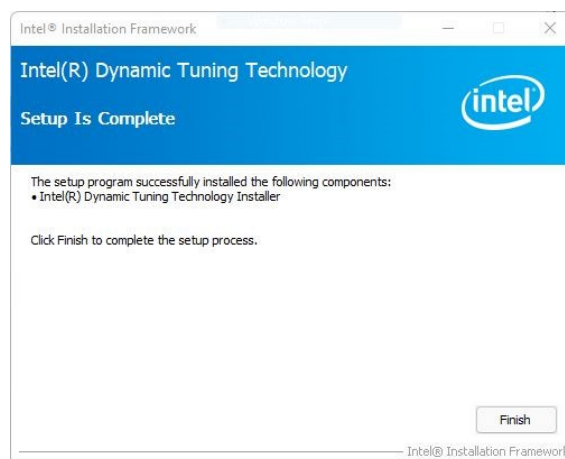
Step 1. Click **Next** to continue installation.



Step 3. Click **Next**.



Step 2. Click **Next**.



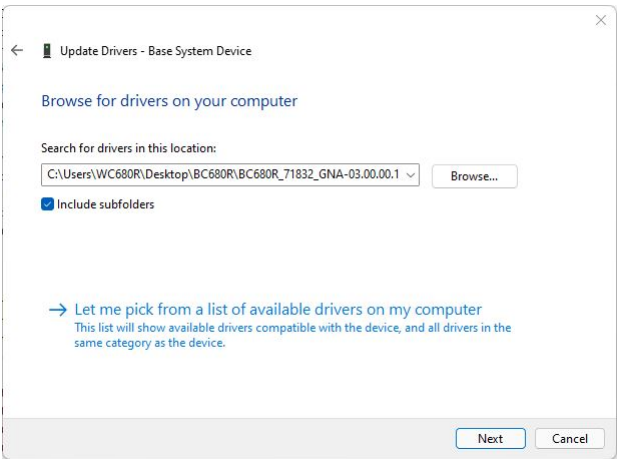
Step 4. Click **Finish** to complete setup.

4.8 Install GNA

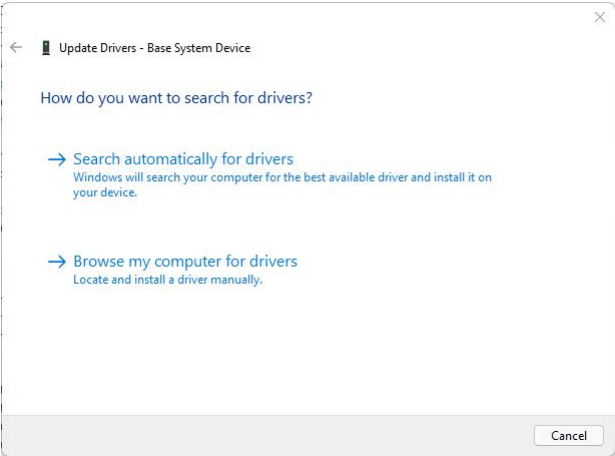
All drivers can be found on the Avalue Official Website:
www.avalue.com



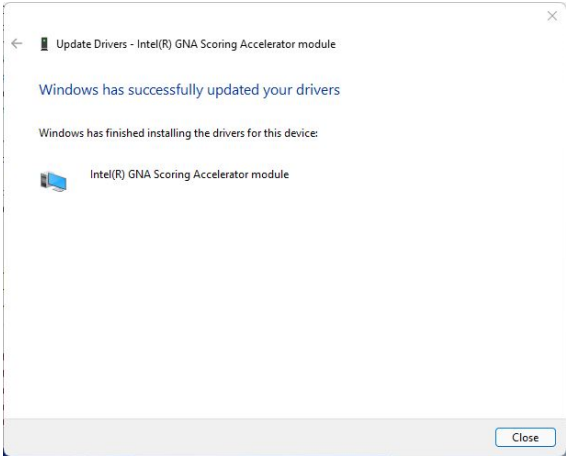
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



Step 2. Click **Next** to continue installation.



Step 1. Click **Browse my computer for drivers**.

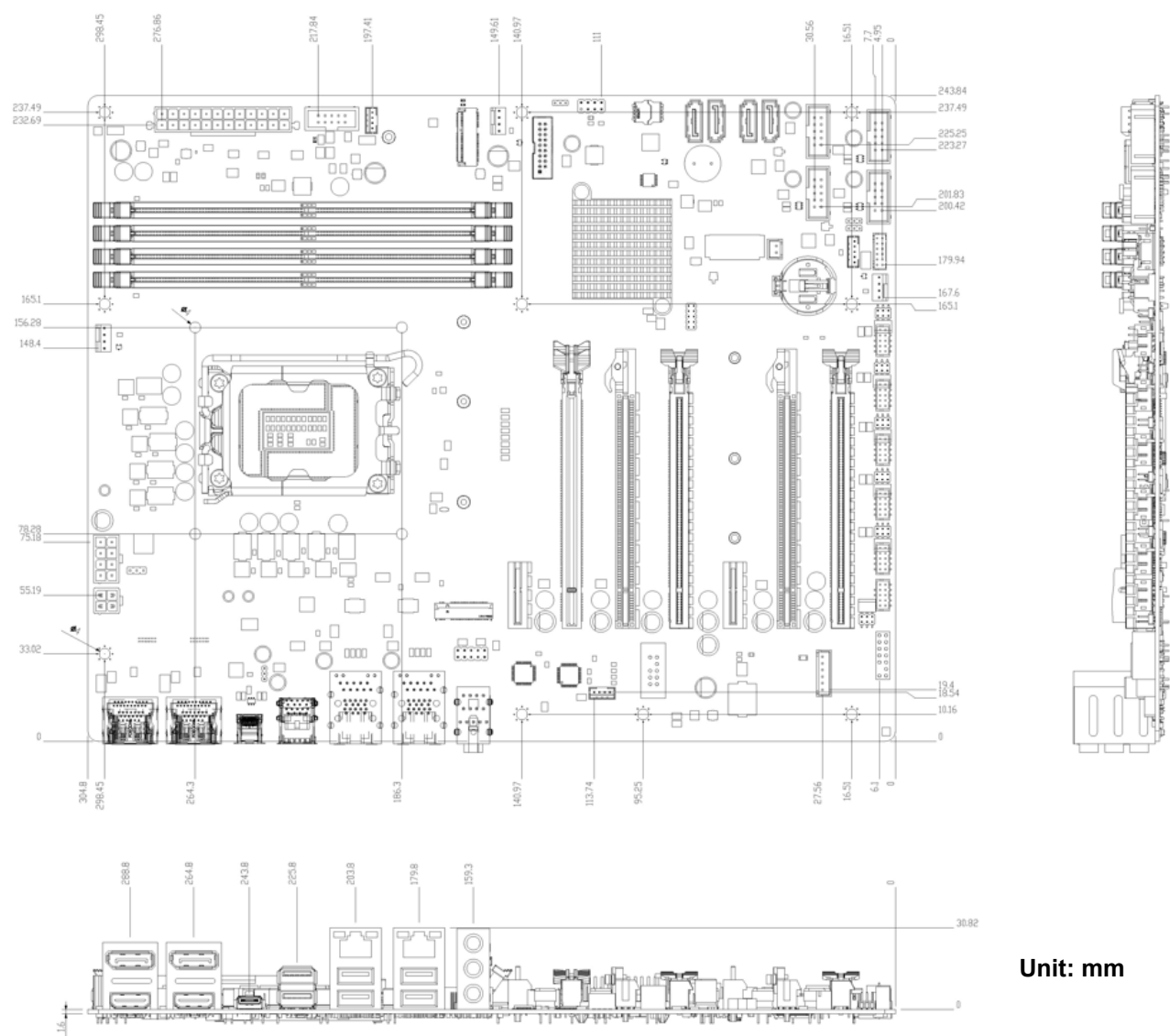


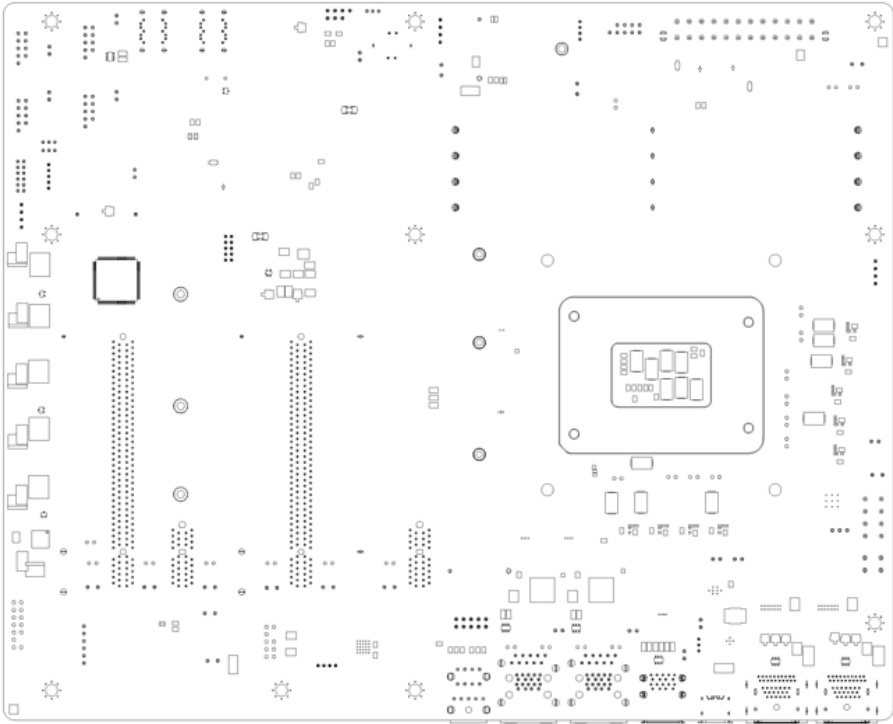
Step 3. Click **Finish** to complete setup.

5. Mechanical Drawing



5.1 Mechanical Drawing





Unit: mm

