BC680R

12th/13th Gen Intel® Core™ Processors ATX Motherboard with Intel® R680E Chipset

User's Manual

1st Ed –12 January 2024

Part No. E2047BC6R00R

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 UNDESIRED 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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We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone. So please consult the user's manual first.

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

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Avalue, or which have been subject to misuse, abuse, accident or improper installation. Avalue assumes no liability under the terms of this warranty as a consequence of such events. Because of Avalue's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If any of Avalue's products is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details. If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU type and speed, Avalue's products model name, hardware & BIOS revision number, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.
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.
4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Content

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
1st	November 2023	Avalue	Initial Release

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® 12/13th Gen Core™ i9/i7/i5/i3 Processor, supports LGA 1700 CPU Up to 65W Max
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, 5~255 seconds/5~255 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 Brown) (Slot 3) 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
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 2.54mm connector for COM1~2 and COM4~COM6 pin9 RI/5V/12V jumper select. COM3: support RS232/422/485 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 2.54mm 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 1×1
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 System fan connector with smart fan function supported 1 x 1 x 4 pin, pitch 2.54mm System 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
SMBus	1 x 1 x 5 pin, pitch 2.54mm connector for SMBus
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® 12th /13th Generation 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

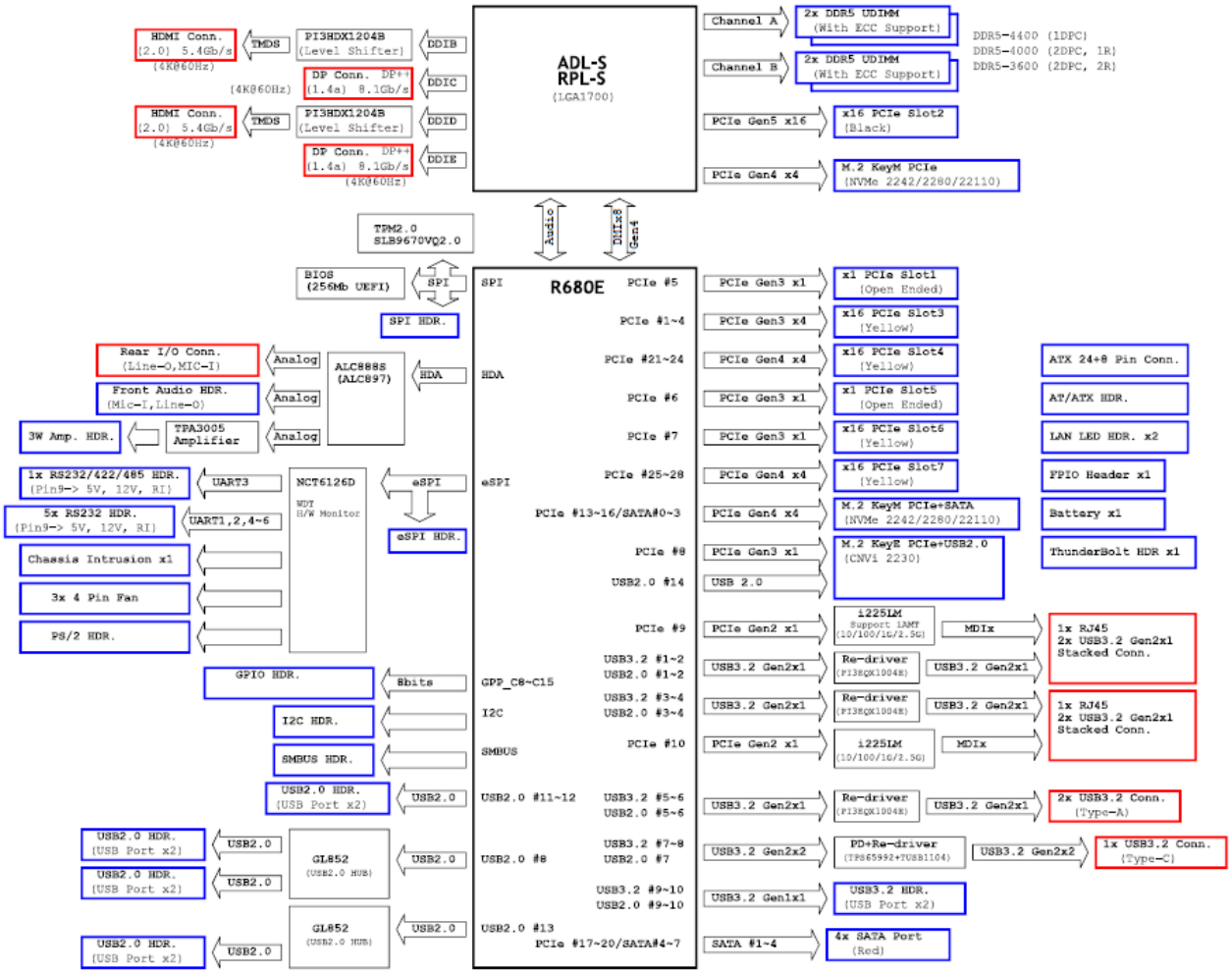
Ethernet	
LAN Chipset	2 x Intel® i225-LM 2.5G Gigabit Controller
LAN Spec.	Intel® i225-LM: 10/100/1000/2500 Base-Tx GbE compatible
Mechanical & Environmental Specification	
Power Requirement	+12V / +5V / 5VSB /+3.3V /-12V
ACPI	Single power ATX Support S0, S3, S4, S5
Power Mode	AT / ATX mode Switchable 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 Reference IEC60068-2-64 Testing procedures

	Test Fh : Vibration broadband random Test 1. PSD: 0.00202023G²/Hz 0.5 Grm 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.

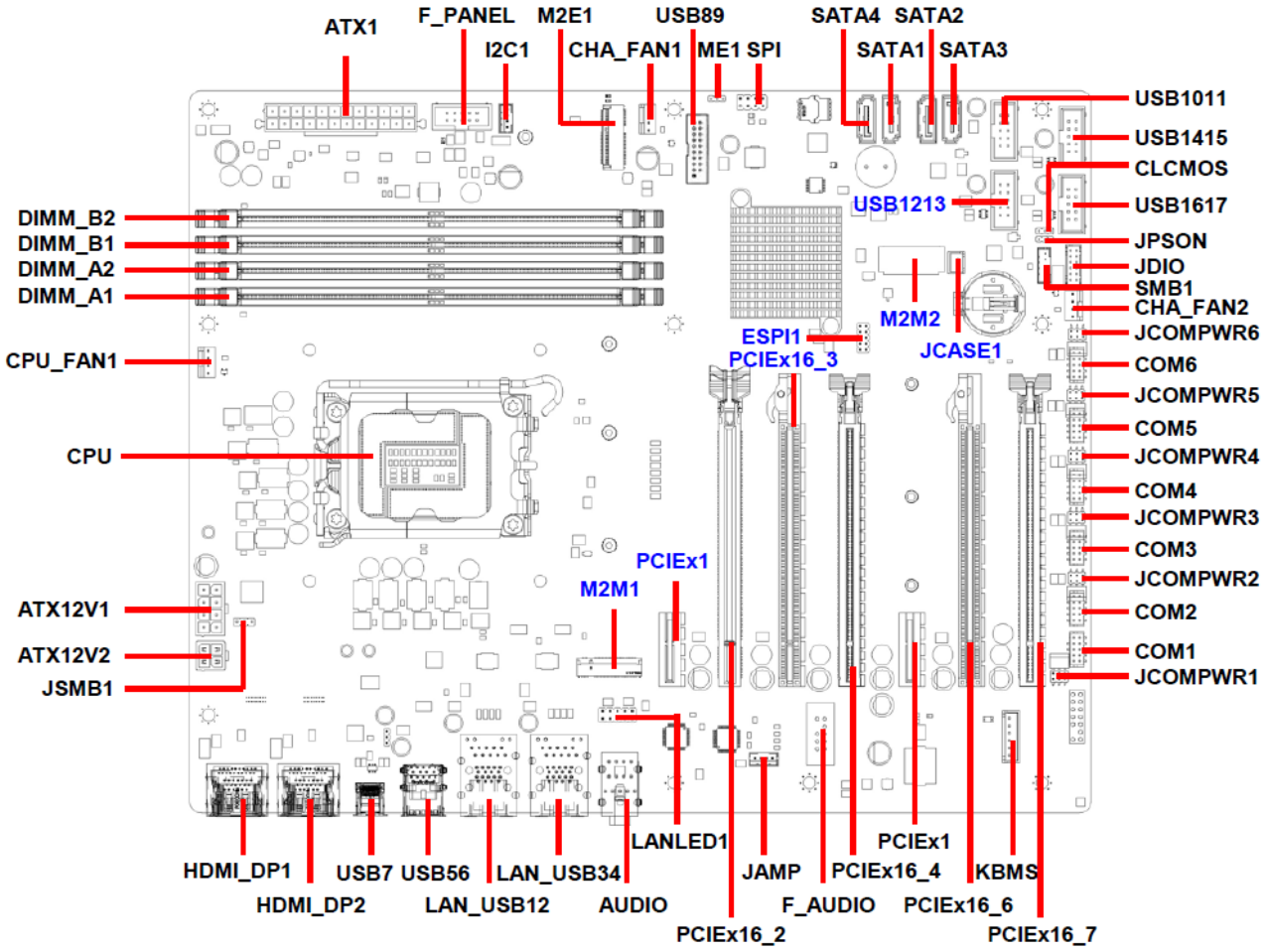
1.6 Architecture Overview—Block Diagram

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



2. Hardware Configuration

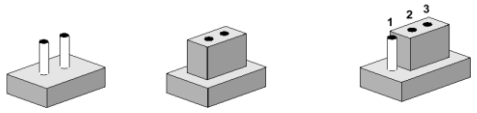
2.1 Product Overview



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.



Open Closed Closed 2-3

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

Open Closed Closed 2-3

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

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 Mode Select	3 x 1 header, pitch 2.00mm
JCOMPWR1~6	COM1~6 POWER SETTING	3 x 2 header, pitch 2.00mm

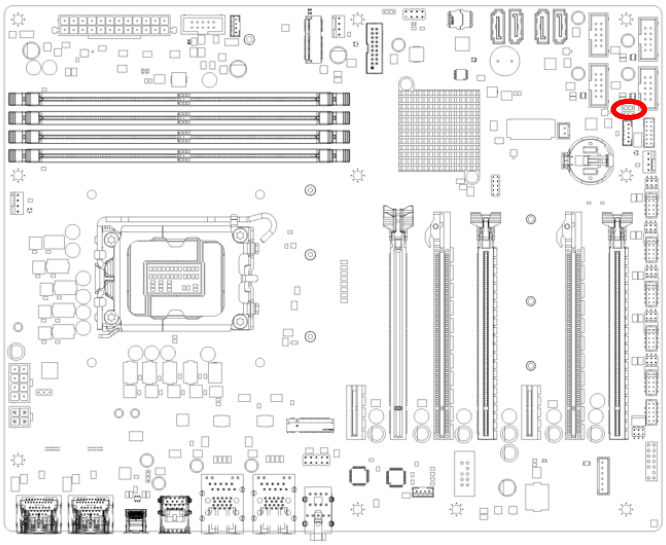
Connectors

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	Intel Front Panel connector	5 x 2 header, 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 Connector	5 x 2 header, pitch 2.00mm
SATA1~4	SATA Connector	Male connector (Red)
FP_ Audio	Front Panel Audio Connector	5 x 2 header, 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	Front USB 3.2 Header	10 x 2 header, pitch 2.00mm
USB1011~USB1617	Front USB 2.0 Headers	5 x 2 header, pitch 2.54mm
KBMS1	PS/2 Header	5 x 1 wafer, pitch 2.50mm
SMB1	SMBus 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 Header	5 x 2 header, pitch 2.54mm
CPU1	LGA1700 socket	
DIMMA1~B2	DDR5 UDIMM Slot	Dual channel. (2 DIMMs per channel)
PCIEX1_1/ PCIEX1_5	PCIe x1 Gen3	X1 (Slot 1,5)
PCIEX16_2	PCIe x16 Gen5	X16 (Slot 2)
PCIEX16_3	PCIe x4 Gen3	X16 Physical yellow (Slot 3)
PCIEx16_4/ PCIEx16_7	PCIe x4 Gen4	X16 Physical yellow (Slot 4,7)
PCIEx16_6	PCIe x1 Gen3	X16 Physical yellow (Slot 6)
HDMI1/2	HDMI port Connector x 2	
DP1/2	Display port connector x 2	
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 1 USB3.2 Type A Connector x 2	2.5 Gigabit Ethernet
AUDIO1	Audio phone jack	Line-out, Mic-in

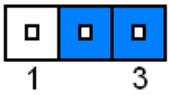
2.3 Setting Jumpers & Connectors

2.3.1 Clear CMOS (CLCMOS1)



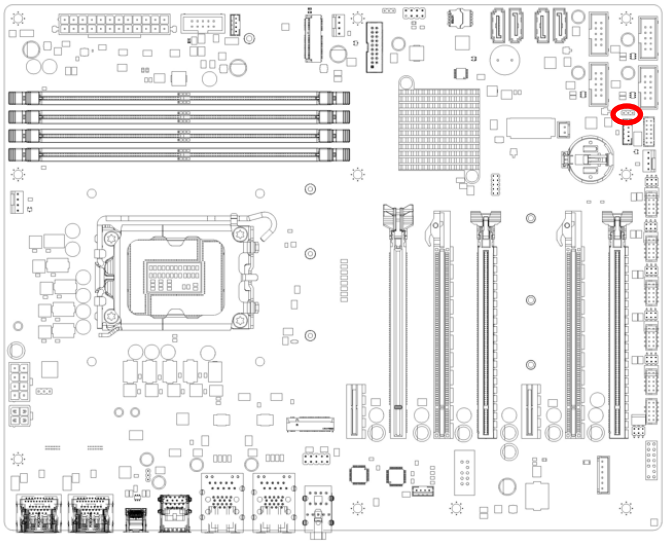
Normal*

Clear CMOS

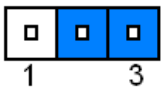


*** Default**

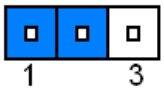
2.3.2 AT/ATX Power Mode Select (JPSON1)



ATX*

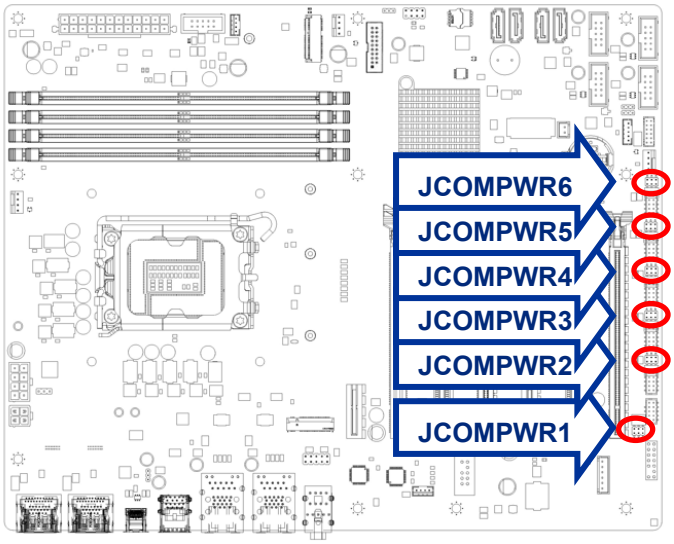


AT

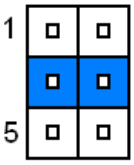


*** Default**

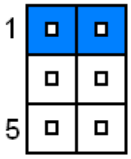
2.3.3 COM POWER SETTING (JCOMPWR1~6)



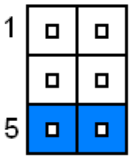
Ring*



+12V

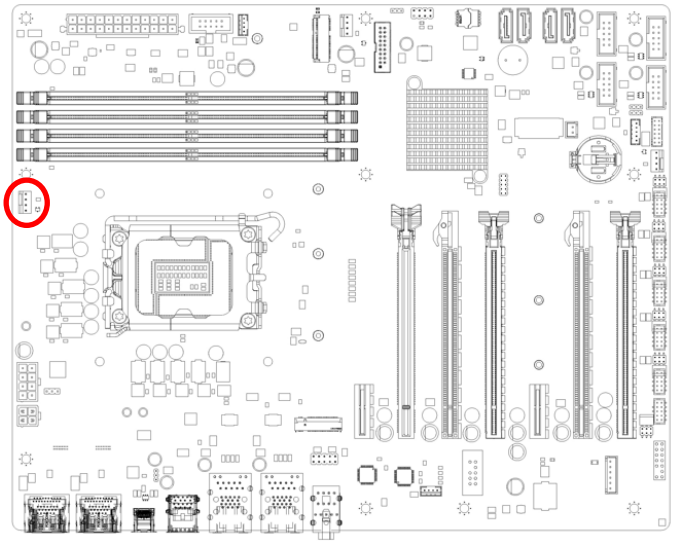


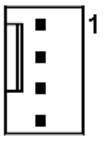
+5V



*** Default**

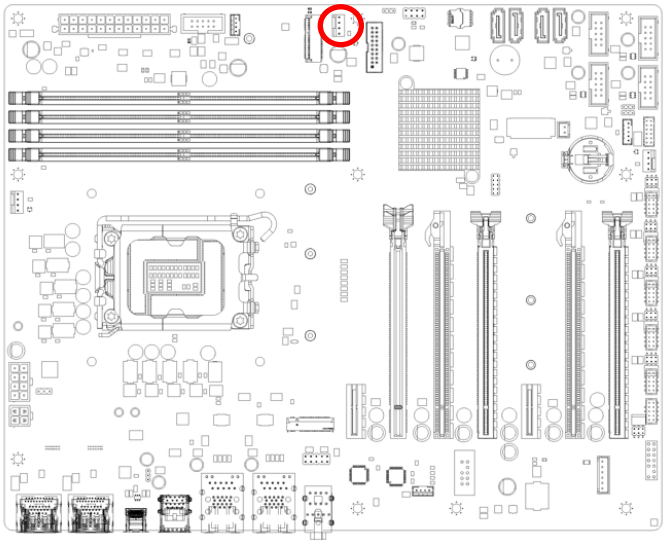
2.3.4 CPU fan connector (CPUFAN1)

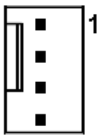




Signal	PIN
GND	1
+12V	2
FAN_SPEED2	3
FAN_PWM1	4

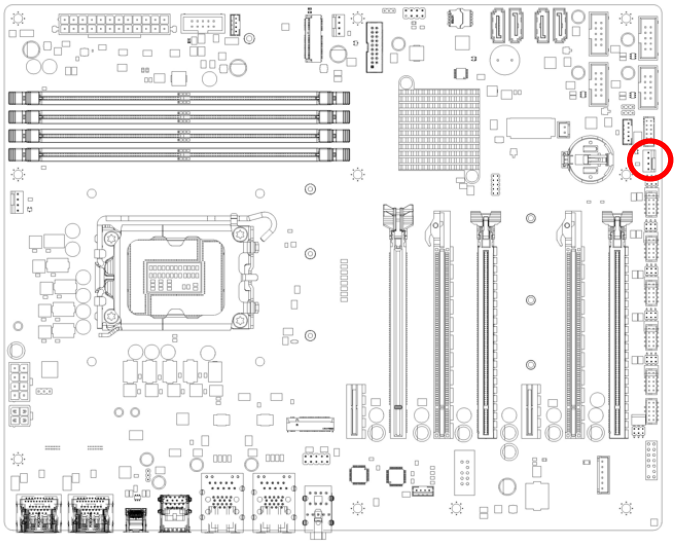
2.3.5 System fan connector (CHA_FAN 1)





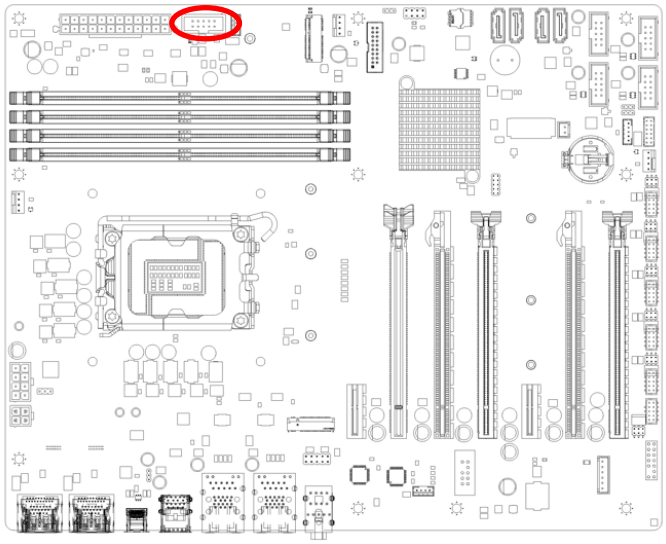
Signal	PIN
GND	1
+12V	2
FAN_SPEED2	3
FAN_PWM2	4

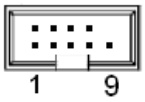
2.3.6 System fan connector (CHA_FAN 2)



Signal	PIN
FAN_PWM3	4
FAN_SPEED3	3
+12V	2
GND	1

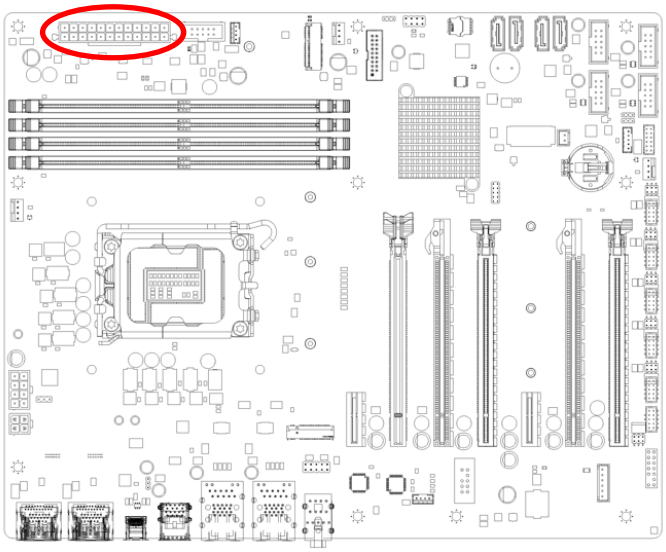
2.3.7 System Panel (F_PANEL)

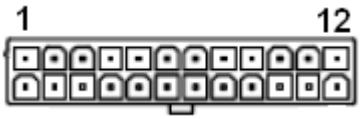




Signal	PIN	PIN	Signal
HHD LED+	1	2	+5VSB
HDD LED#	3	4	PWR LED#
GND	5	6	PANSWIN#
RST	7	8	GND
NC	9		

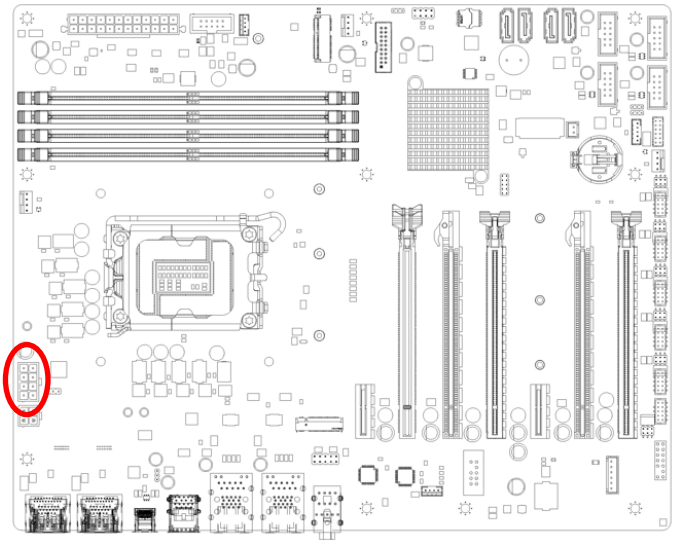
2.3.8 ATX Power connector (ATXPWR1)

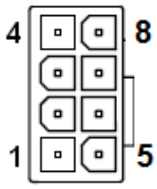




Signal	PIN	PIN	Signal
+3V	1	13	+3V
+3V	2	14	-12V
GND	3	15	GND
+5V	4	16	PS_ON
GND	5	17	GND
+5V	6	18	GND
GND	7	19	GND
PWRER OK	8	20	NC
+5VSB	9	21	+5V
+12V	10	22	+5V
+12V	11	23	+5V
+3V	12	24	GND

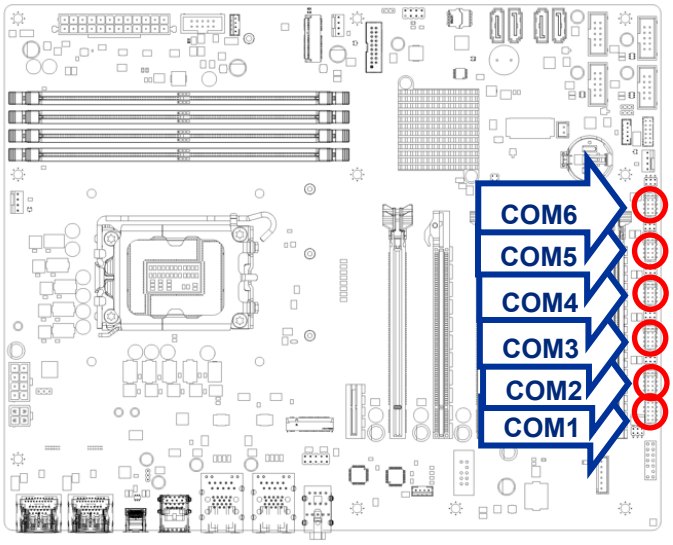
2.3.9 ATX Power connector (ATXPWR1)

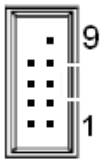




Signal	PIN	PIN	Signal
GND	4	8	+12V
GND	3	7	+12V
GND	2	6	+12V
GND	1	5	+12V

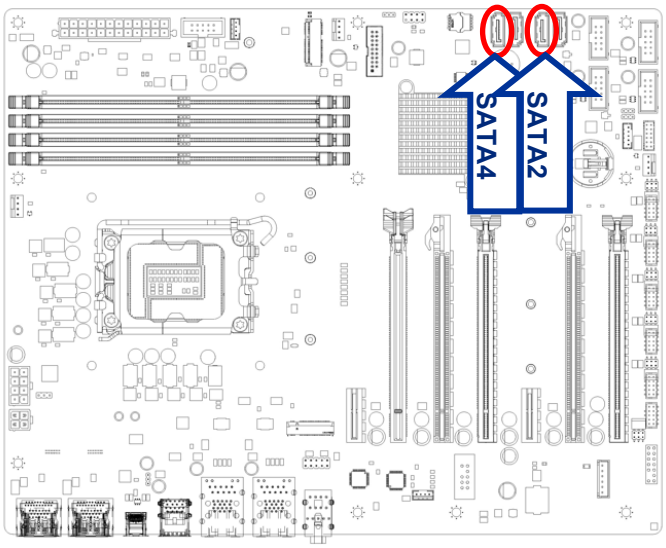
2.3.10 Serial Port connectors (COM1~6)

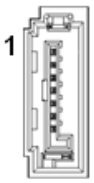




Signal	PIN	PIN	Signal
		9	RI3xPOWERxJMP
CTS#	8	7	RTS#
DSR#	6	5	GND
DTR#	4	3	TX
RX	2	1	DCD#

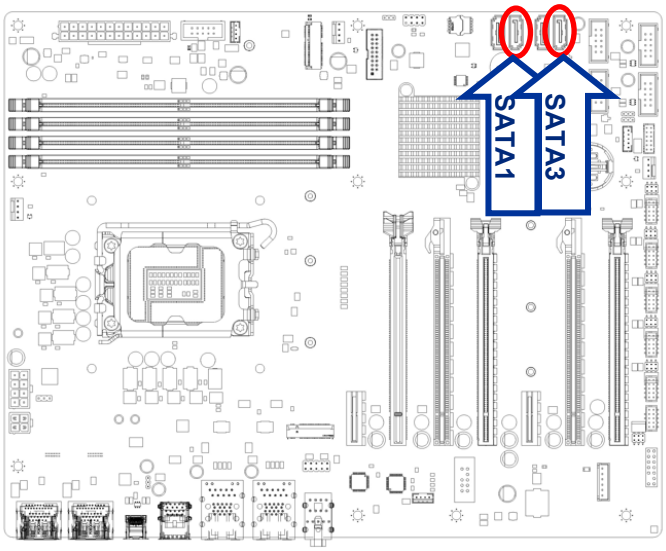
2.3.11 Serial ATA Connector (SATA2, SATA4)

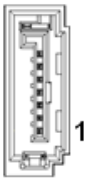




PIN	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

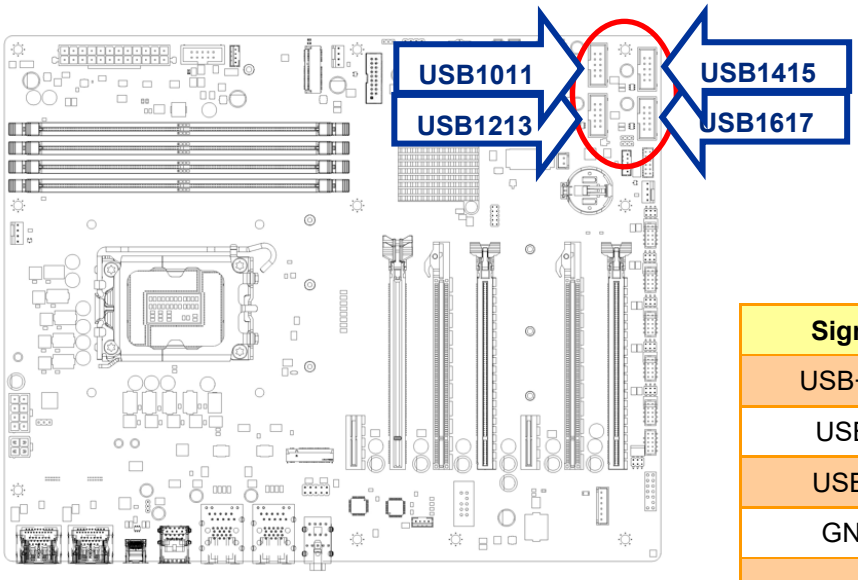
2.3.12 Serial ATA Connector (SATA1, SATA3)

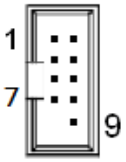




PIN	Signal
7	GND
6	RX+
5	RX-
4	GND
3	TX-
2	TX+
1	GND

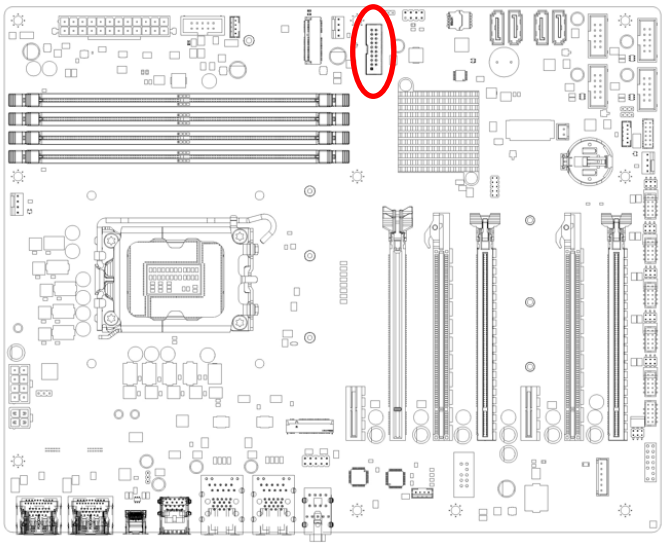
2.3.13 USB connectors (USB2_HR1, USB2_HR2, USB2_HR3, USB2_HR4)

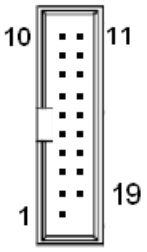




Signal	PIN	PIN	Signal
USB+5V	1	2	USB+5V
USB -	3	4	USB -
USB +	5	6	USB +
GND	7	8	GND
		9	NC

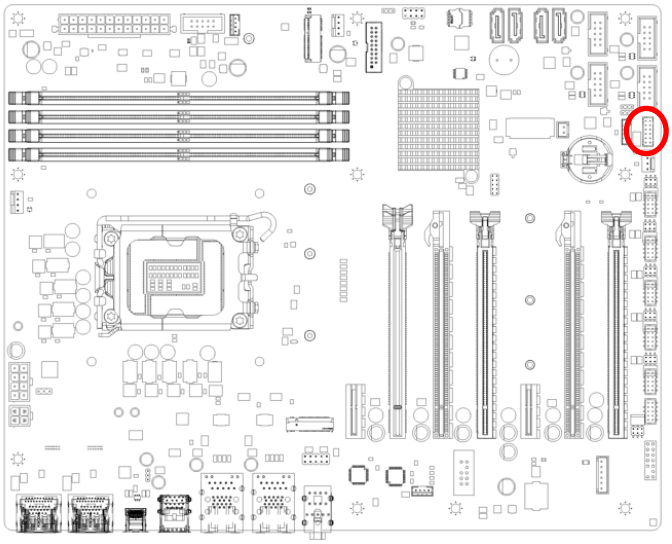
2.3.14 USB3.2 connector (USB89)

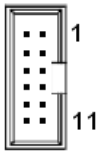




Signal	PIN	PIN	Signal
NC	10	11	USB+
USB+	9	12	USB-
USB-	8	13	GND
GND	7	14	USB3_TX+
USB3_TX+	6	15	USB3_TX-
USB3_TX-	5	16	GND
GND	4	17	USB3_RX+
USB3 RX+	3	18	USB3_RX-
USB3 RX-	2	19	+5V
+5V	1		

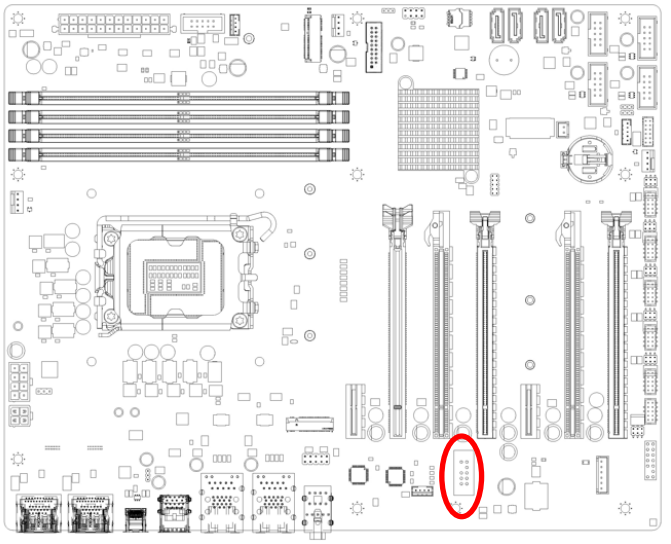
2.3.15 8 bit GPIO header (JDIO1)

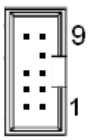




Signal	PIN	PIN	Signal
SIO_GPIO4	2	1	SIO_GPIO0
SIO_GPIO5	4	3	SIO_GPIO1
SIO_GPIO6	6	5	SIO_GPIO2
SIO_GPIO7	8	7	SIO_GPIO3
SMB_DATA_ RESUME	10	9	SMB_CLK_ RESUME
+5Vsb	12	11	GND

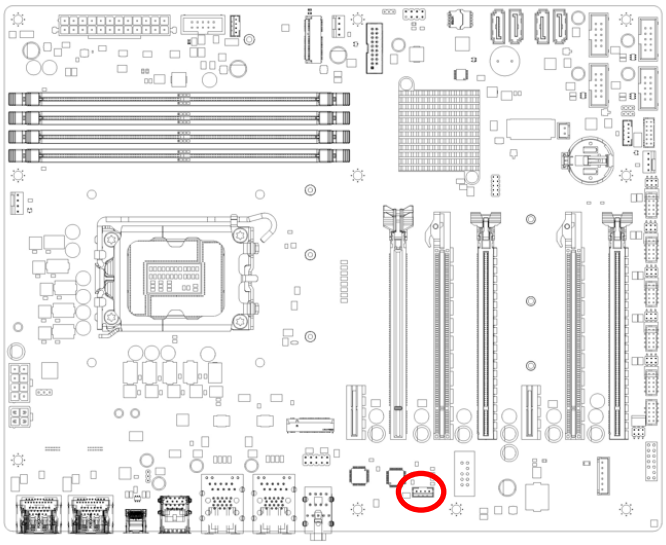
2.3.16 Front Audio connector (FP_AUDIO1)

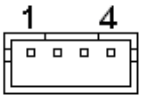




Signal	PIN	PIN	Signal
LINE2-JD	10	9	LINE2L
		7	SENSEB
MIC2-JD	6	5	LINE2R
+3.3V	4	3	MIC2R
GND	2	1	MIC2L

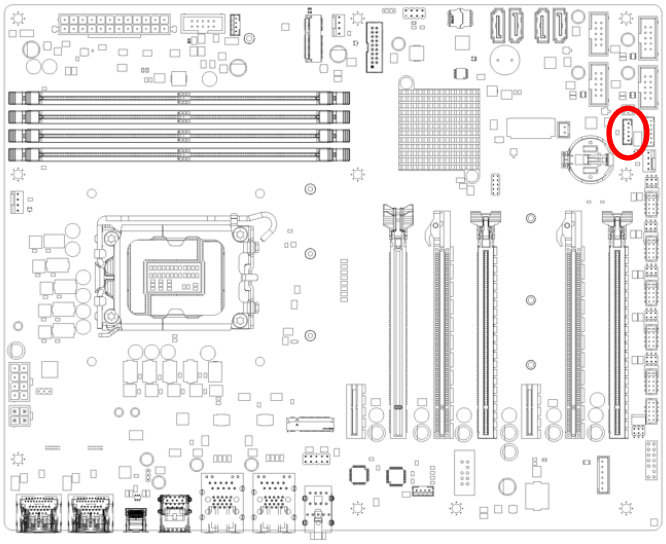
2.3.17 Amplifier connector (JAMP1)





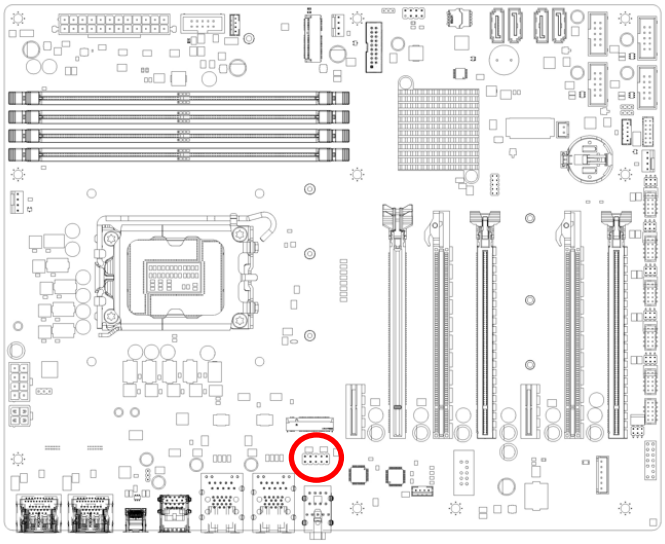
PIN	Signal
1	AMP_L-
2	AMP_L+
3	AMP_R-
4	AMP_R+

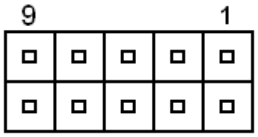
2.3.18 SM bus connector (SMB1)



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

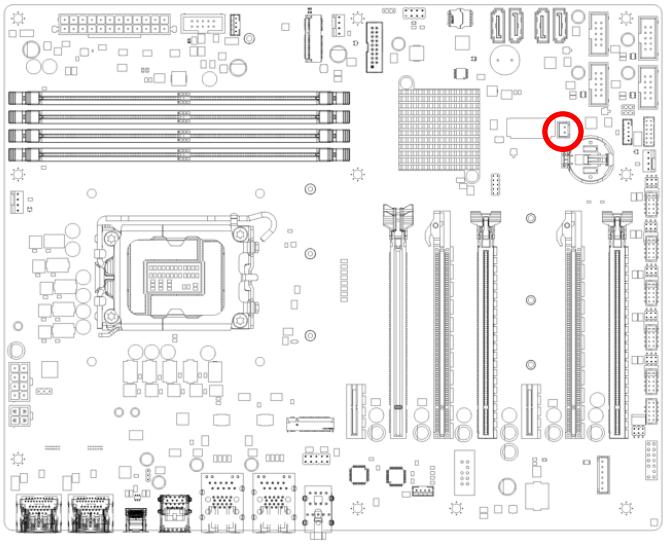
2.3.19 LAN LED status connector (LAN_LED1)





Signal	PIN	PIN	Signal
+3V_Dual	1	2	+3V_Dual
LAN1_LED	3	4	GND
+3V_Dual	5	6	+3V_Dual
GND	7	8	GND
+3V_Dual	9	10	+3V_Dual

2.3.20 Chassis intrusion connector (JCASE1)



PIN	Signal
1	SIO_CASEOPEN#
2	GND

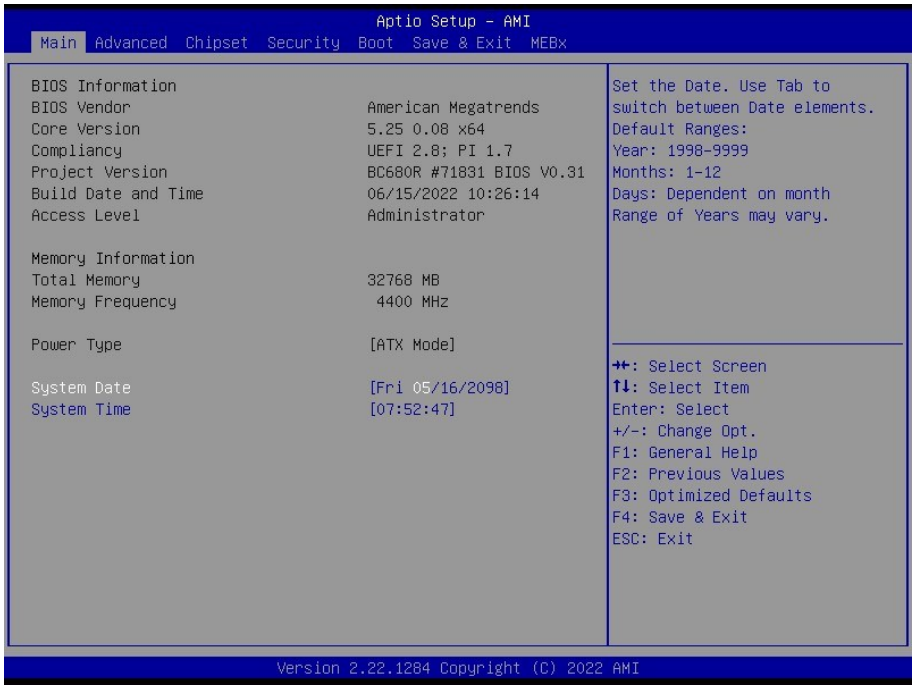
3.BIOS Setup

3.1 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.

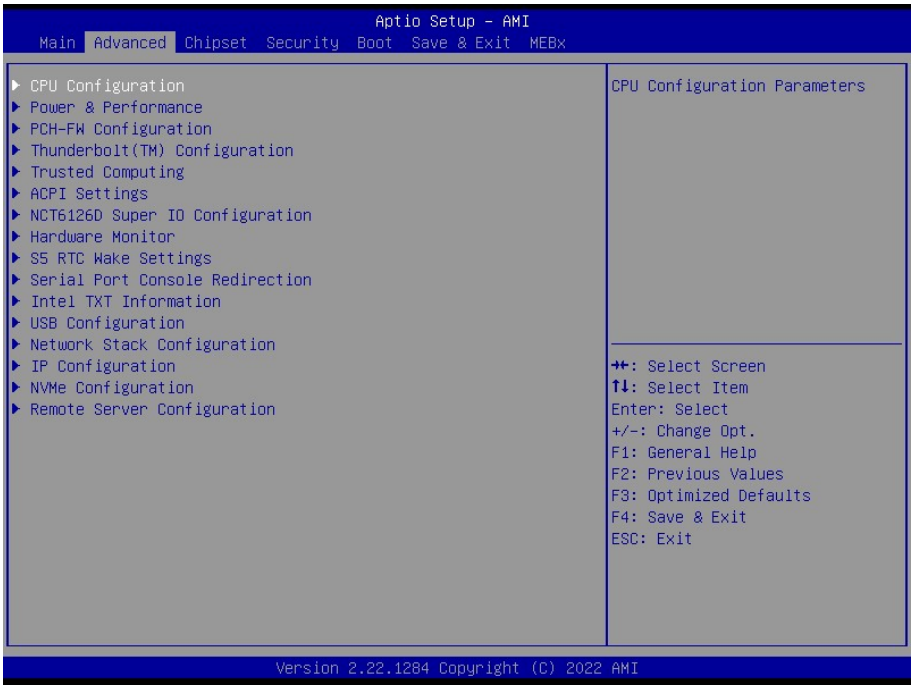
3.6.1.2 System Time

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

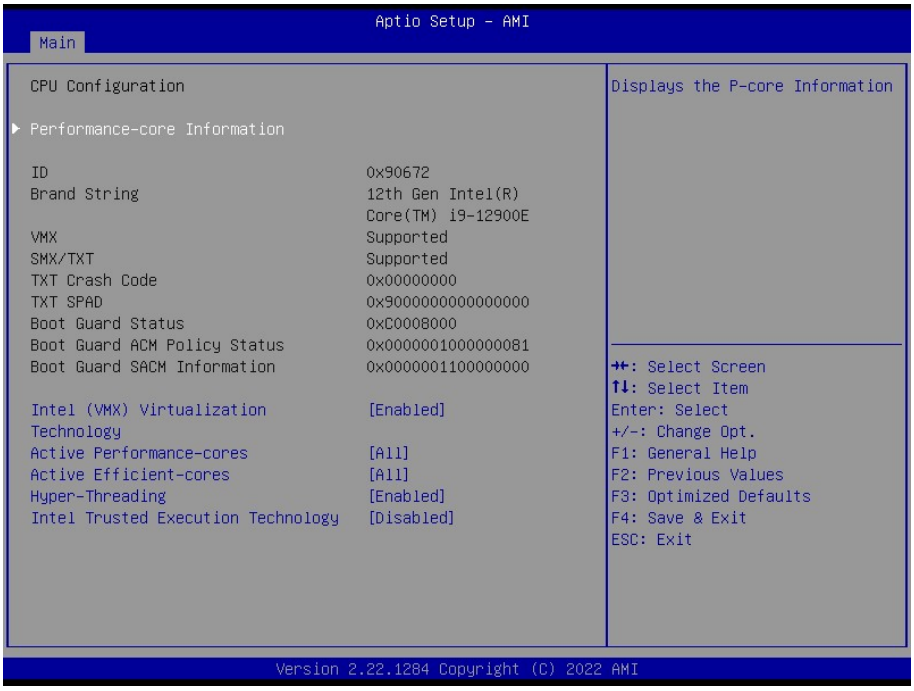
Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

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.

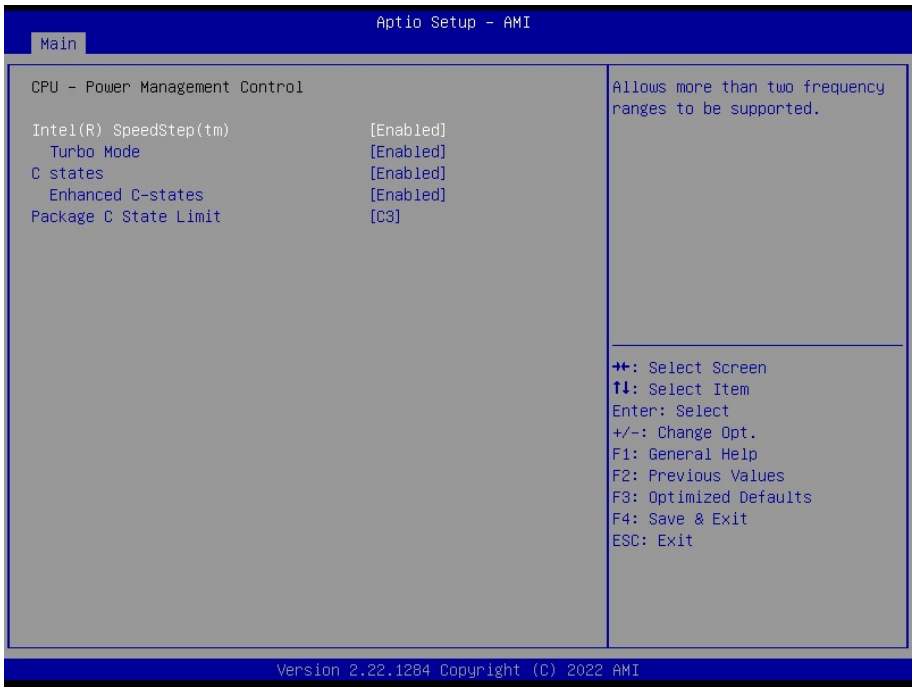


3.6.2.1 CPU Configuration



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.

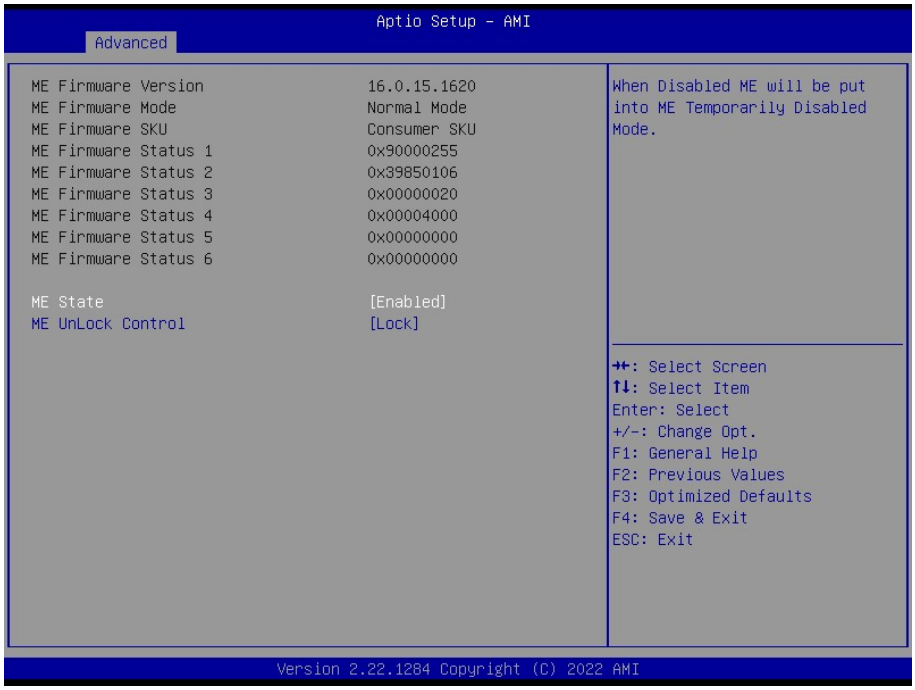
3.6.2.2 CPU - Power Management Control



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

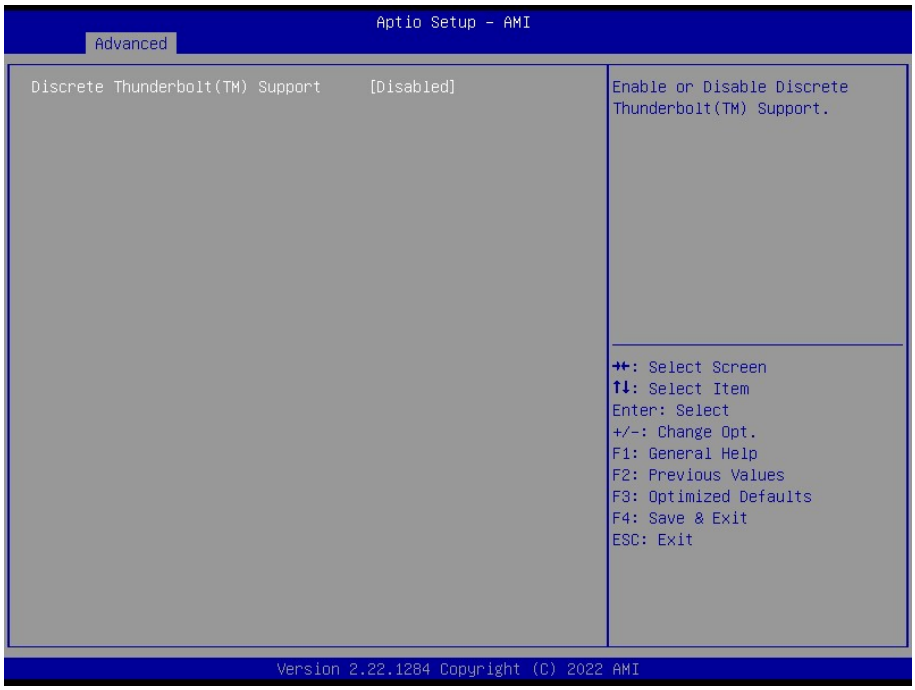
Turbo Mode	Disabled Enabled**[Default]**,	Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.
C states	Disabled Enabled**[Default]**,	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.
Enhanced C-states	Disabled Enabled**[Default]**,	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



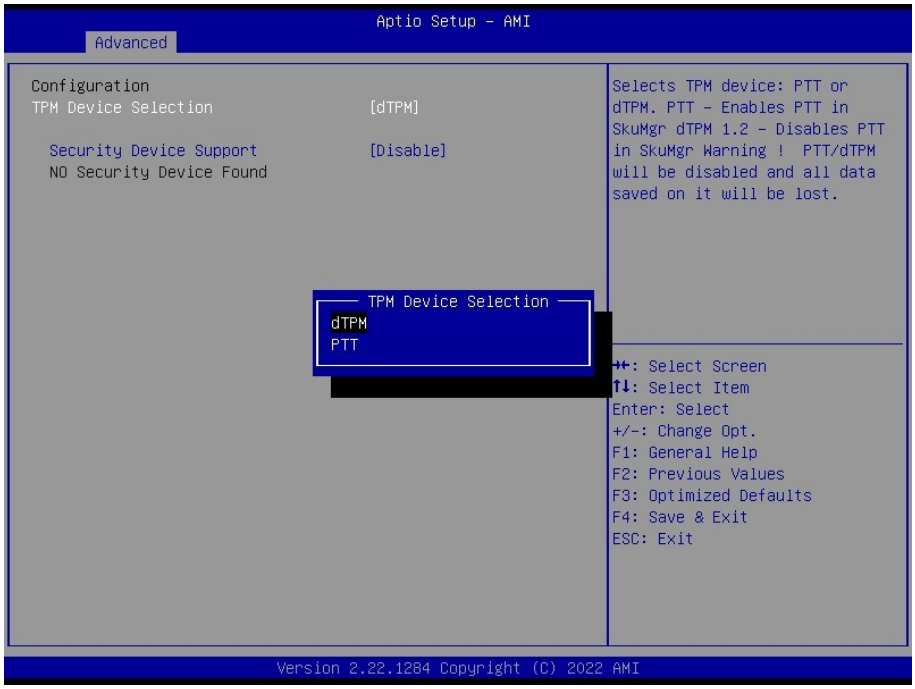
Item	Options	Description
ME State	Disabled Enabled**[Default]**,	When Disabled ME will be put into ME Temporarily Disabled Mode.
ME UnLock Control	Lock**[Default]**, Unlock	ME UnLock control function. Set UnLock will system shutdown for active function.

3.6.2.4 Thunderbolt(TM) Configuration



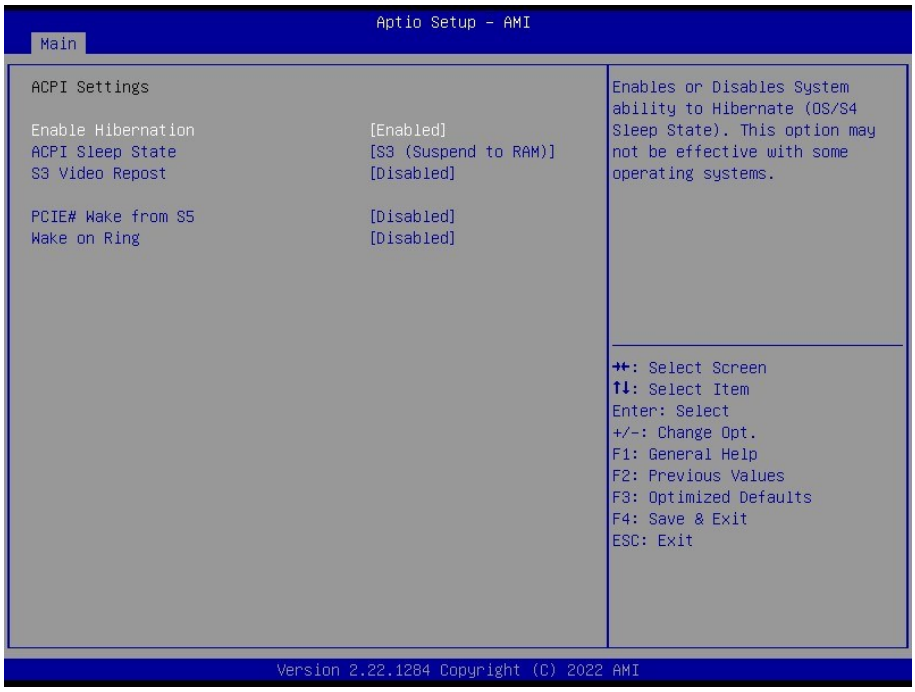
Item	Option	Description
Discrete Thunderbolt(TM) Support	Disabled**[Default]**, Enabled	Enabled or Disabled Discrete Thunderbolt(TM) Support.

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.

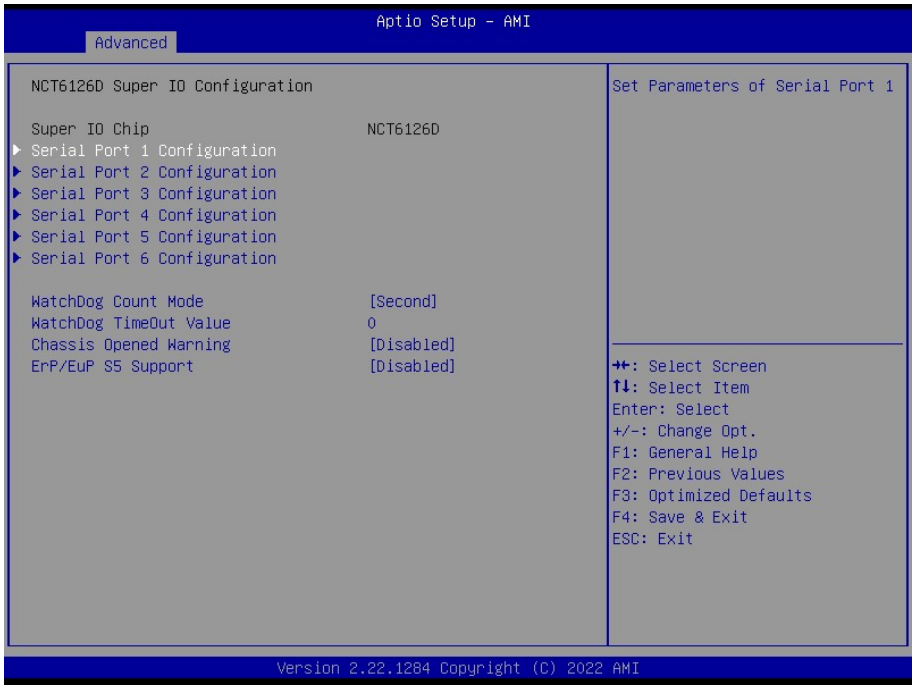
3.6.2.6 ACPI Settings



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.

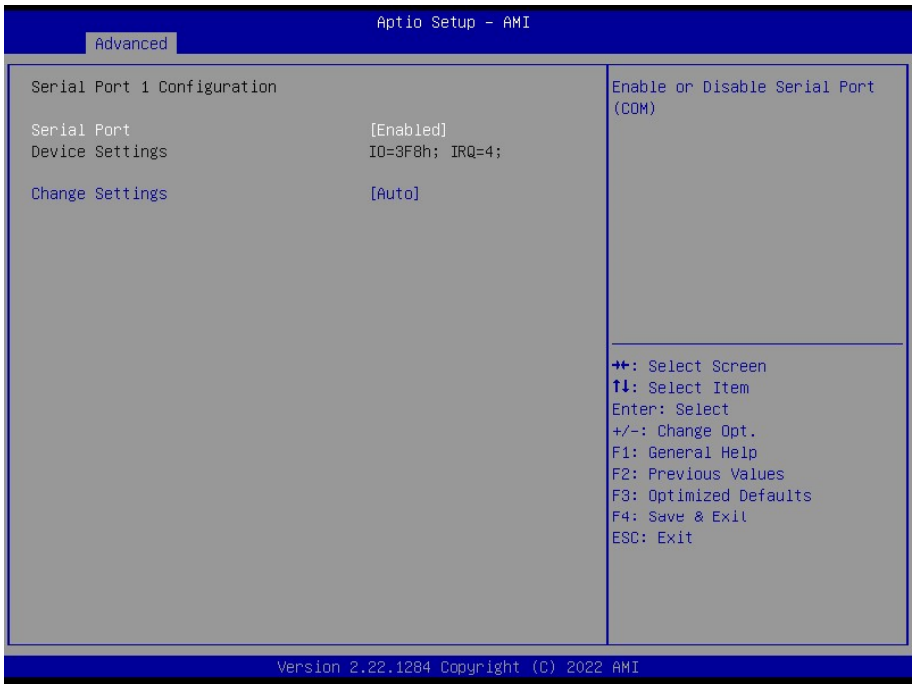
3.6.2.7 NCT6126D Super IO Configuration

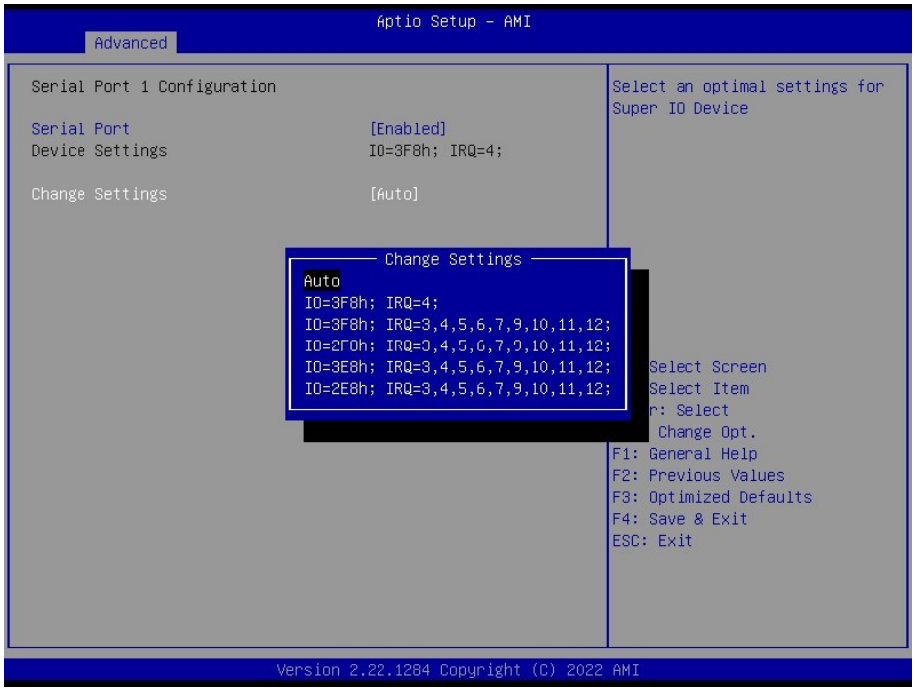
You can use this item to set up or change the Super IO configuration for serial ports. Please refer to 3.6.2.5.1~ 3.6.2.5.6 for more information.



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).	

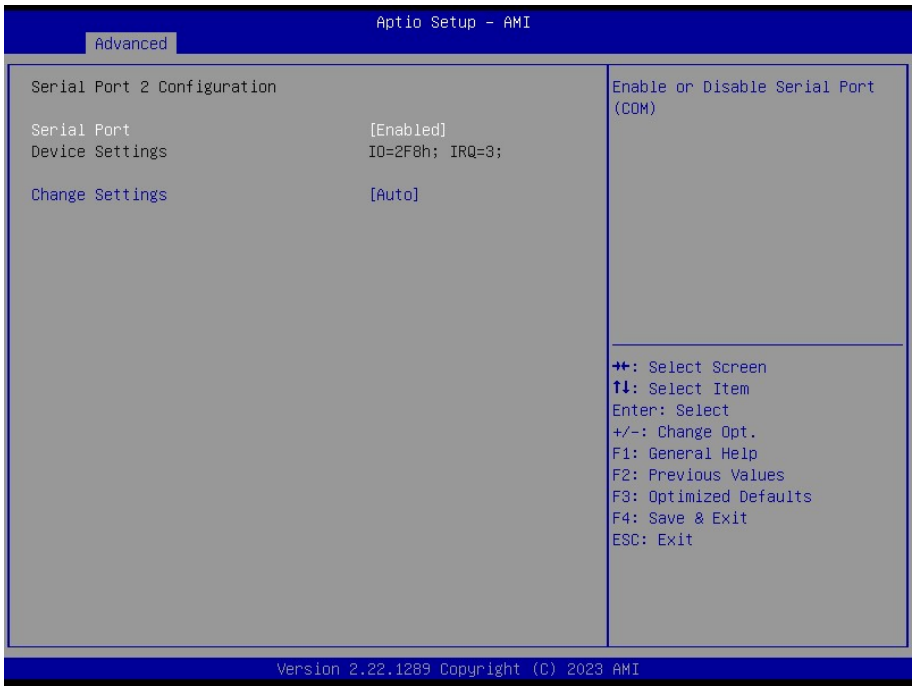
3.6.2.7.1 Serial Port 1 Configuration





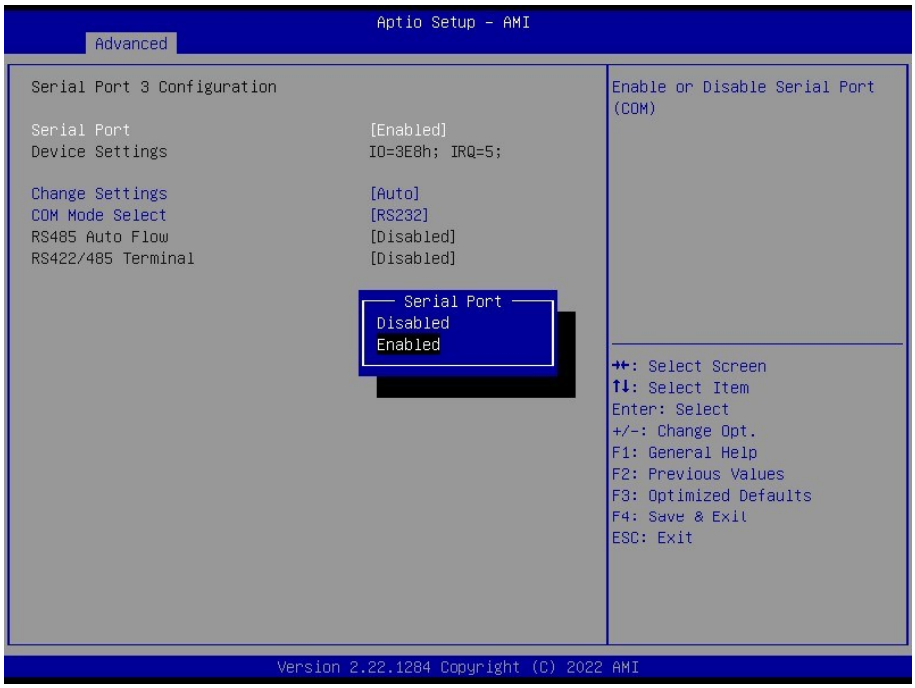
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM)
Change Settings	Auto**[Default]**, IO=3F8h; IRQ4; IO=3F8h; IRQ3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal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

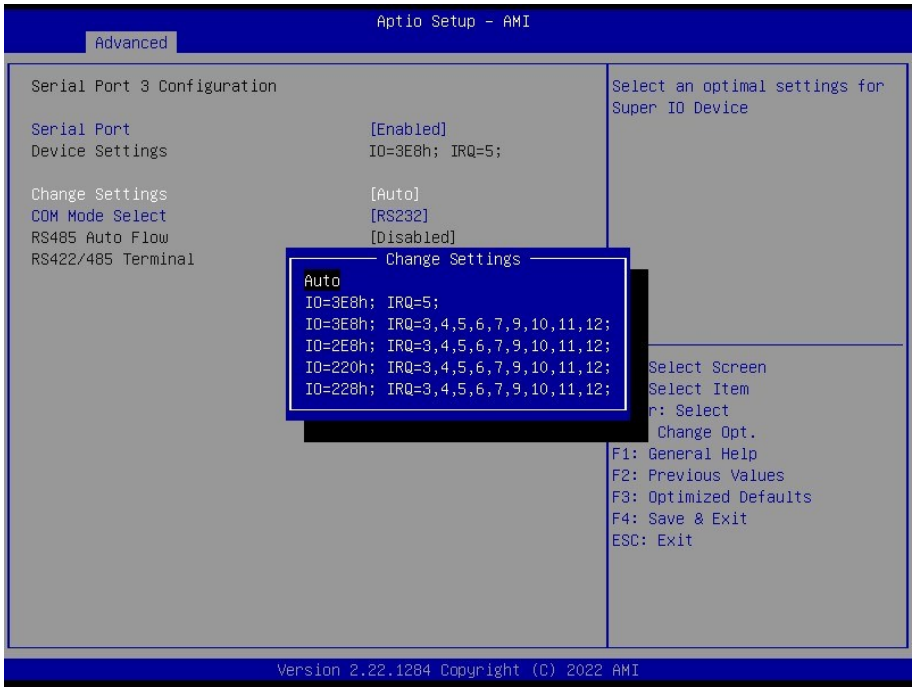
3.6.2.7.2 Serial Port 2 Configuration



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

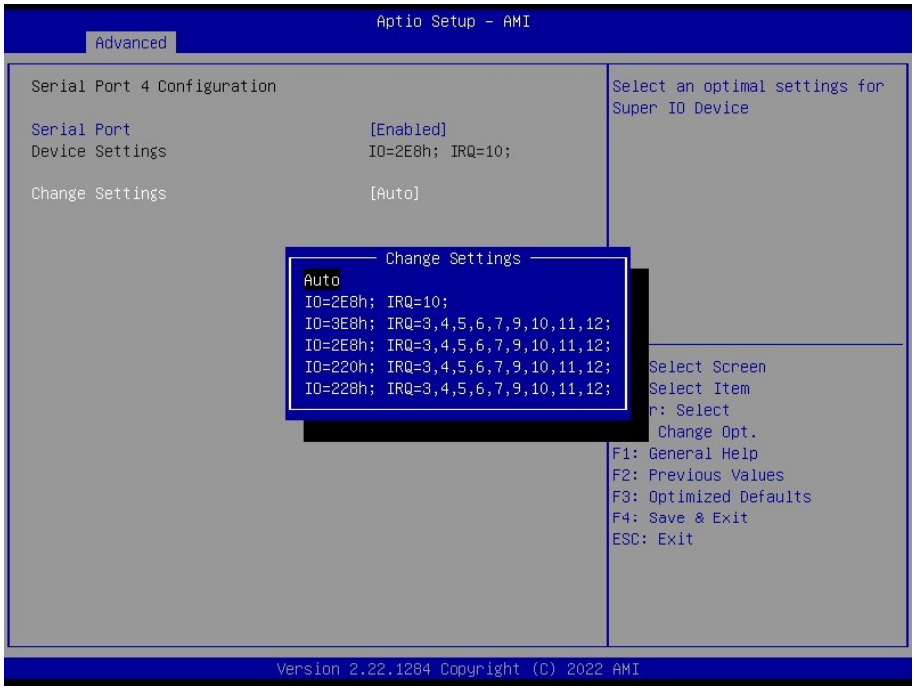




Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM)
Change Settings	Auto**[Default]**, IO=3E8h; IRQ5; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; IO=220h; IRQ3,4,5,6,7,9,10,11,12; IO=228h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal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

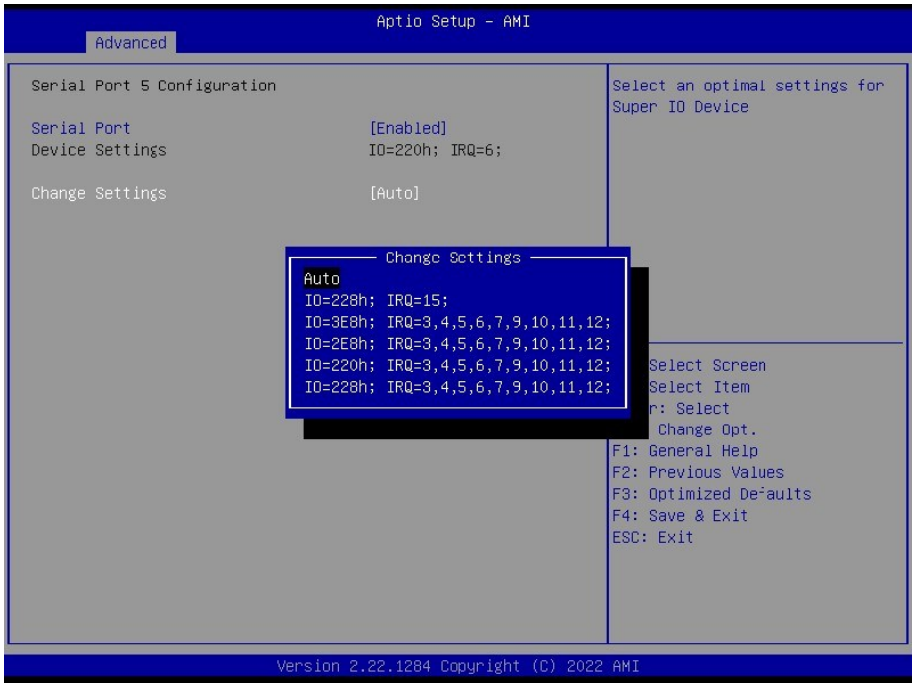
COM Mode Select	RS232**[Default]**, RS485 Half Duplex RS422 Full Duplex	Configure the COM port Mode

3.6.2.7.4 Serial Port 4 Configuration



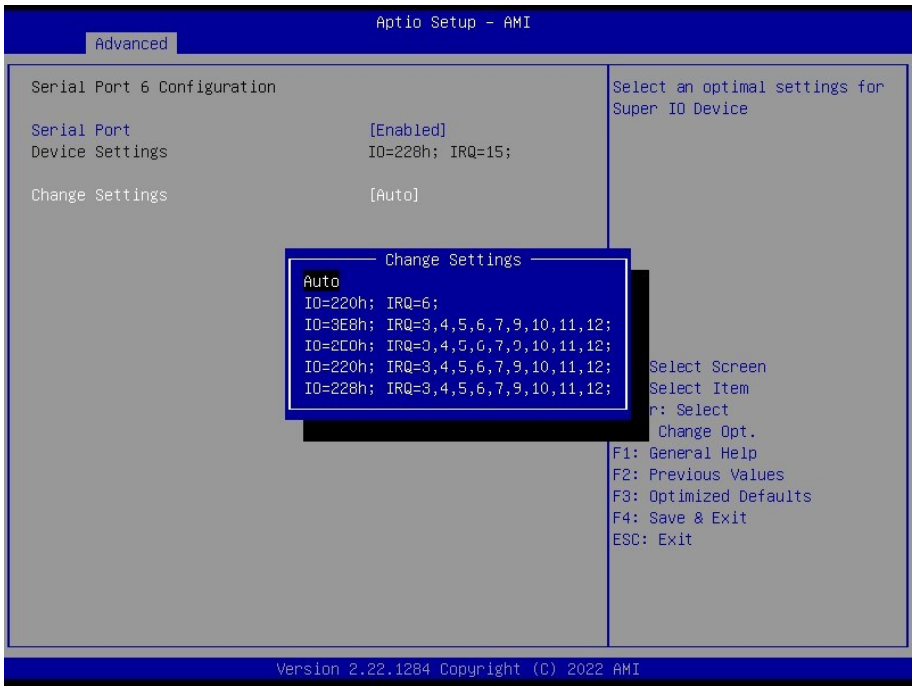
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM)
Change Settings	Auto**[Default]**, IO=2E8h; IRQ10; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; IO=220h; IRQ3,4,5,6,7,9,10,11,12; IO=228h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal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

3.6.2.7.5 Serial Port 5 Configuration



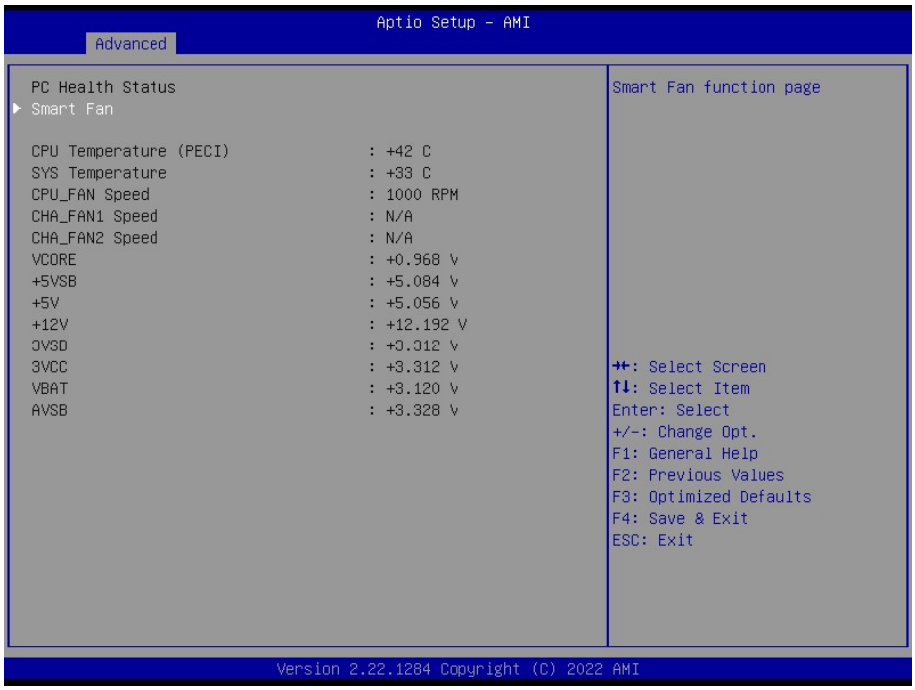
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM)
Change Settings	Auto**[Default]**, IO=228h; IRQ=15; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; IO=220h; IRQ3,4,5,6,7,9,10,11,12; IO=228h; IRQ3,4,5,6,7,9,10,11,12;	Select an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

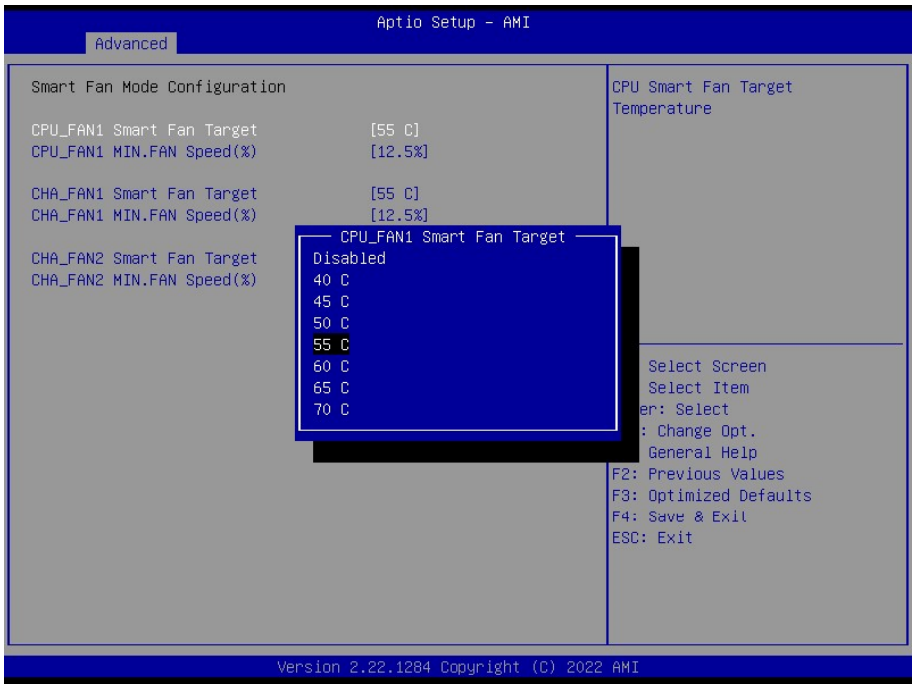
3.6.2.8 Hardware Monitor

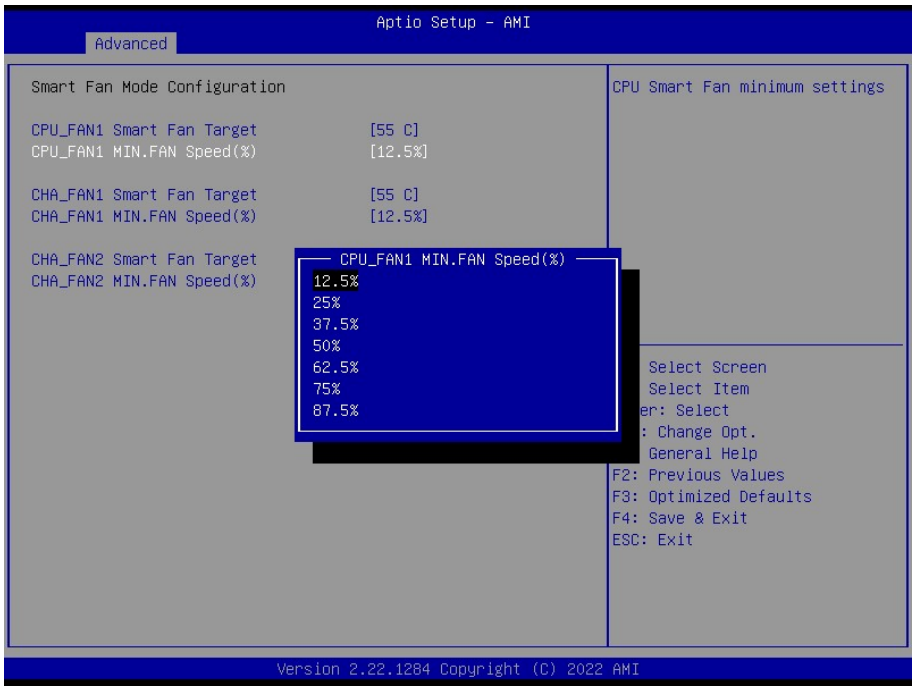


3.6.2.8.1 Hardware Monitor

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

3.6.2.8.2 Smart Fan Function





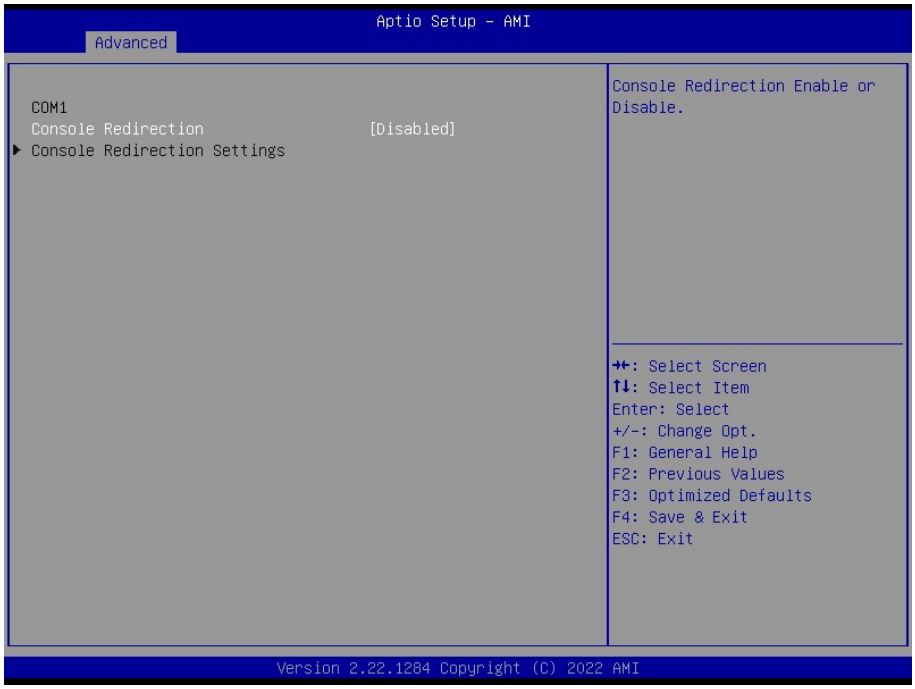
Item	Options	Description
CPU_FAN1 Smart Fan Target	Disabled 40C 45C 50C 55C**[Default]**, 60C 65C 70C	CPU Smart FAN Target Temperature
CPU_FAN1 MIN.FAN Speed(%)	12.5%**[Default]**, 25% 37.5% 50% 62.5% 75% 87.5%	CPU Smart FAN minimum settings
CHA_FAN1 Smart Fan Target	Disabled 40C 45C 50C 55C**[Default]**,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

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

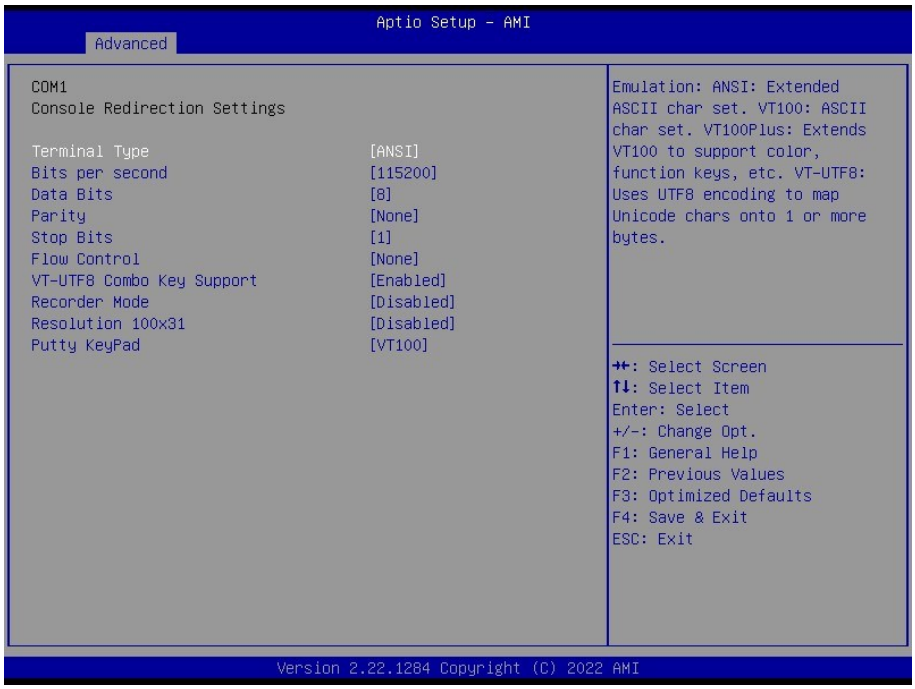
Item	Options	Description
Wake system from S5	Disabled**[Default]**, Fixed Time Dynamic Time	Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).

3.6.2.10 Serial Port Console Redirection



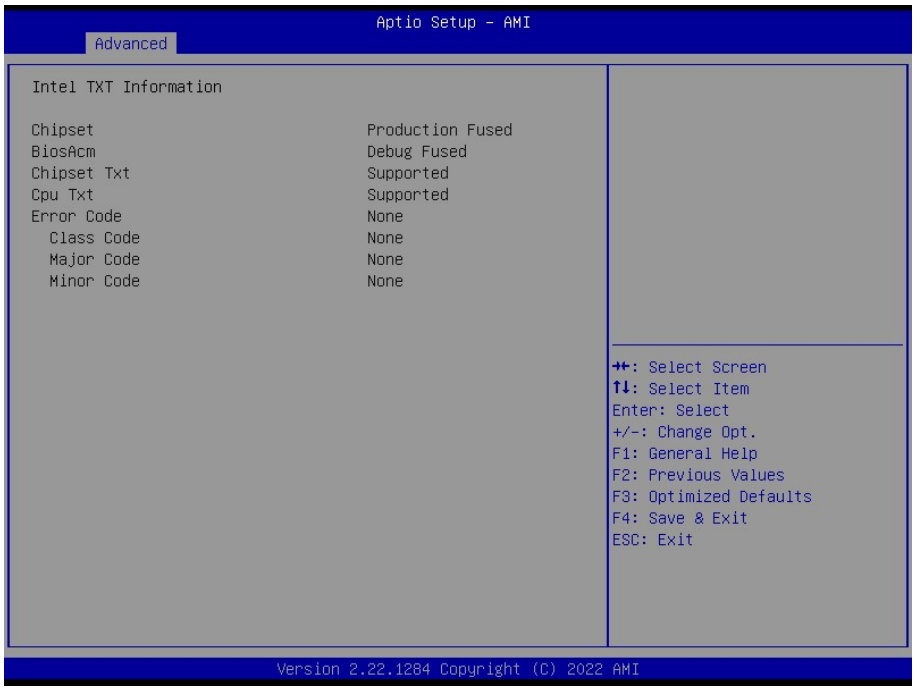
Item	Options	Description
Console Redirection	Disabled Enabled**[Default]**,	Console Redirection Enabled or Disabled.

3.6.2.10.1 Console Redirection Settings



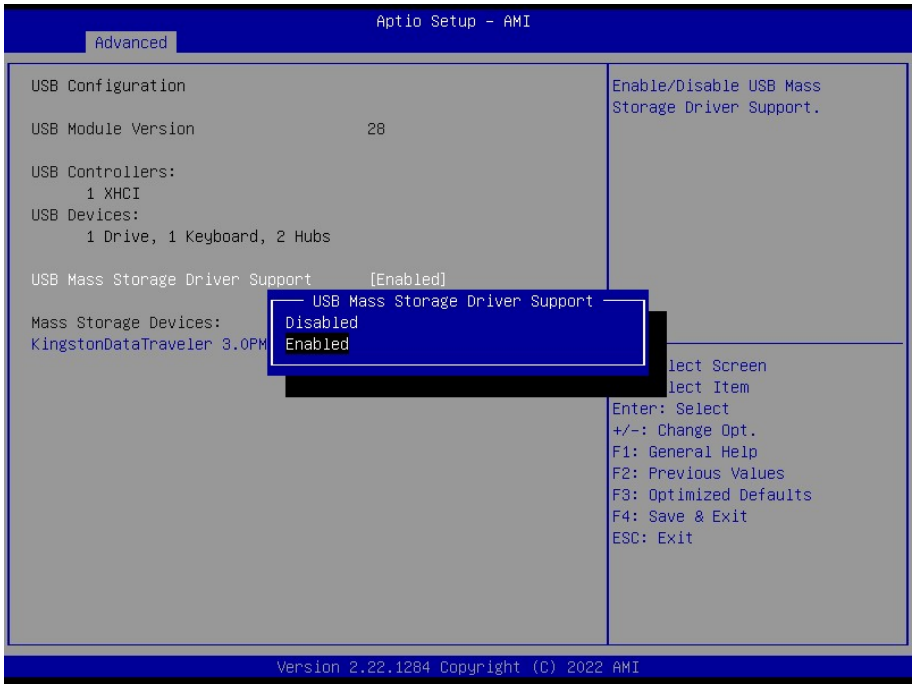
Item	Options	Description
Terminal Type	VT100 VT100Plus VT-UTF8 ANSI**[Default]**,	Emulation: ANSI: Extended ASCII char set VT100: ASCII char set VT100Plus: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Bits per second	9600 19200 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.

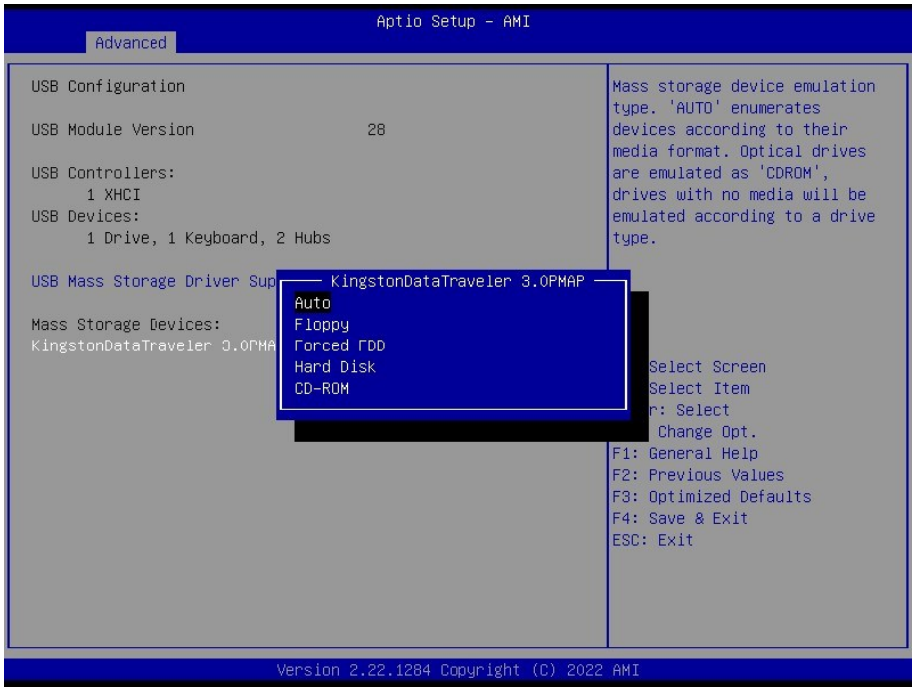
3.6.2.11 Intel TXT Information



3.6.2.12 USB Configuration

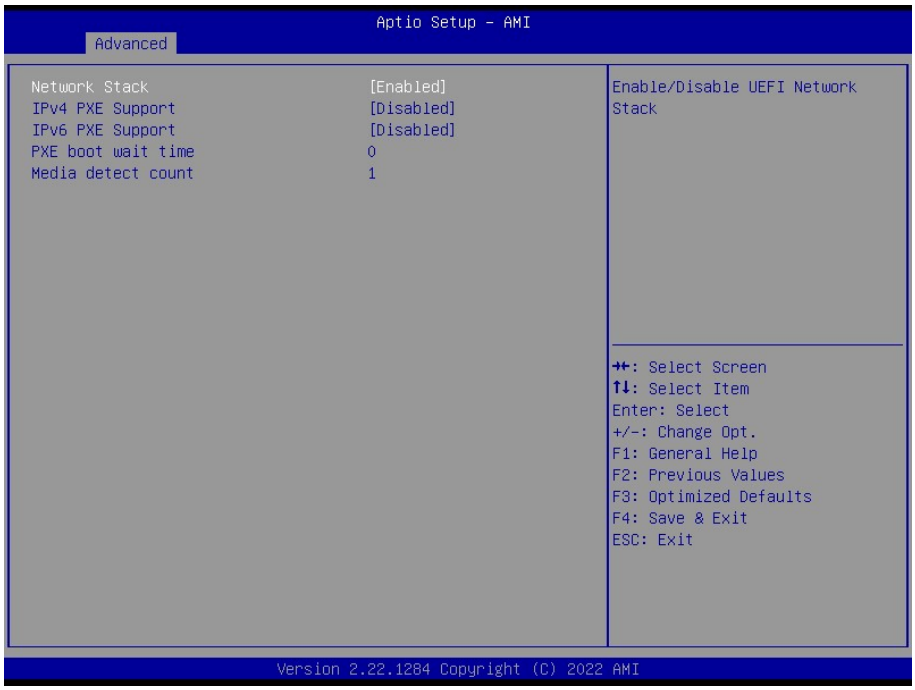
The USB Configuration menu helps read USB information and configures USB settings.





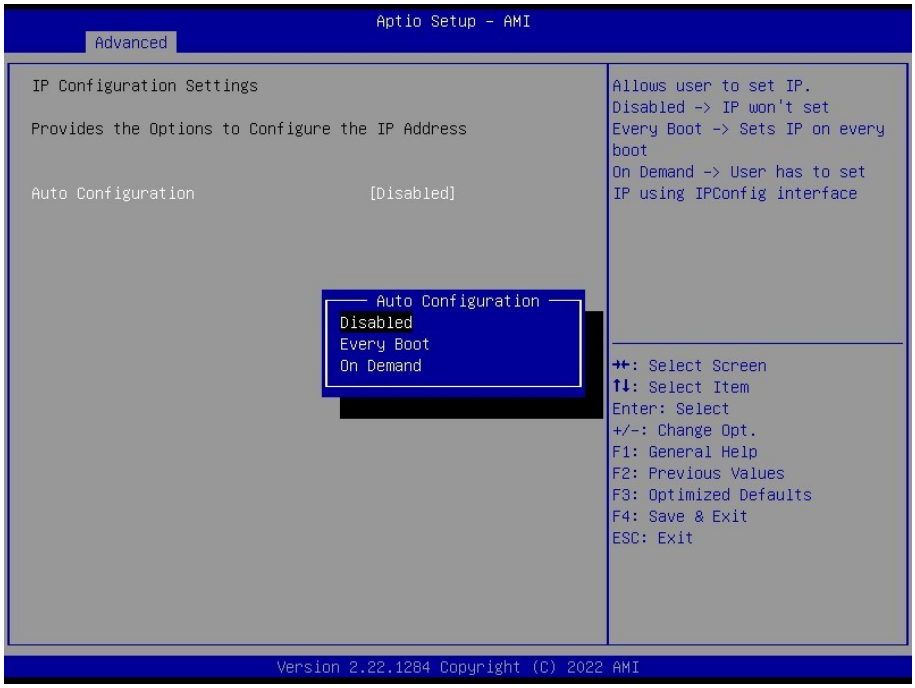
Item	Options	Description
USB Mass Storage Driver Support	Disabled Enabled**[Default]**,	Enable/Disable USB Mass Storage Driver Support.
Mass Storage Devices	Auto**[Default]** Floppy Forced FDD Hard Disk CD-ROM	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. 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



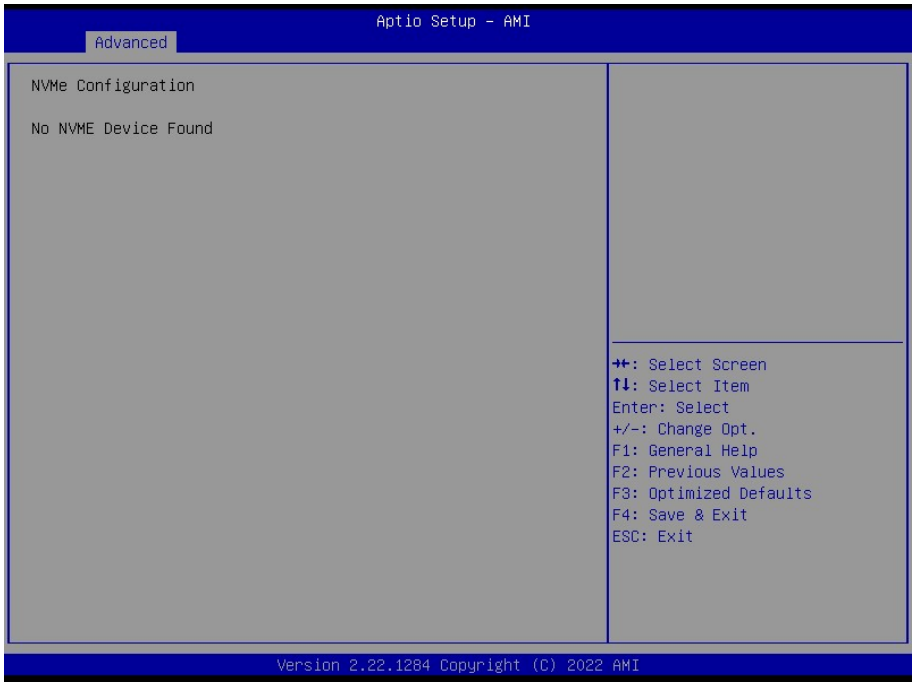
Item	Options	Description
Network stack	Disabled Enabled**[Default]**,	Enable/Disable UEFI Network stack.
Ipv4 PXE Support	Disabled**[Default]**, Enabled	Enable/Disable Ipv4 PXE Boot Support. If disabled, IPV4 PXE boot support will not be available.
Ipv6 PXE Support	Disabled**[Default]**, Enabled	Enable/Disable 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

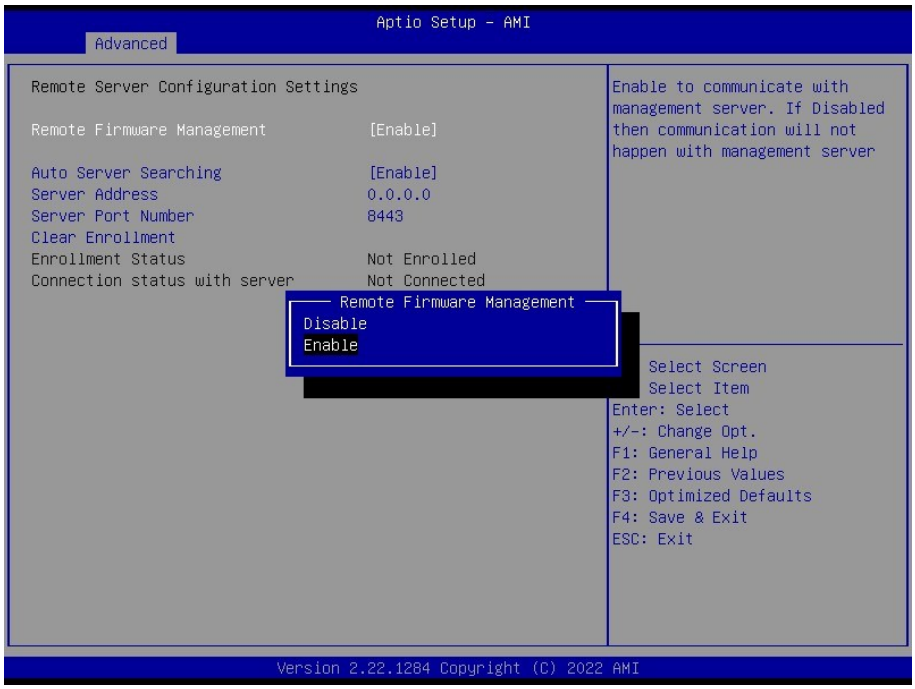


Item	Options	Description
Auto Configuration	Disabled**[Default]**, Every Boot On demand	Enable/Disable UEFI Network stack.

3.6.2.15 NVMe Configuration



3.6.2.16 Remote Server Configuration

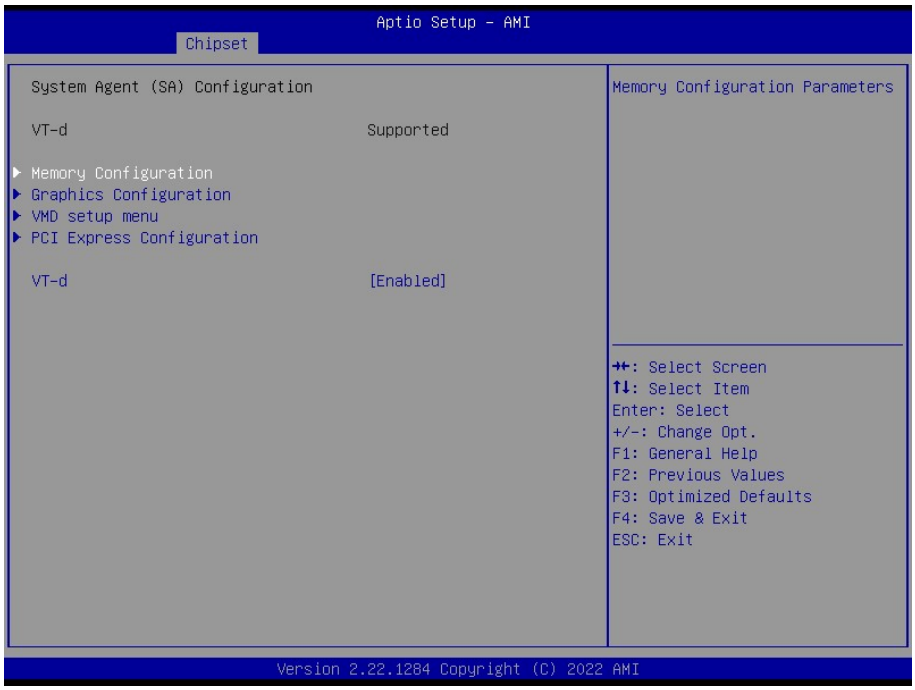


Item	Options	Description
Remote Firmware Management	Disable Enable**[Default]**,	Enable to communicate with management server. If Disabled then communication will not happen with management server

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	

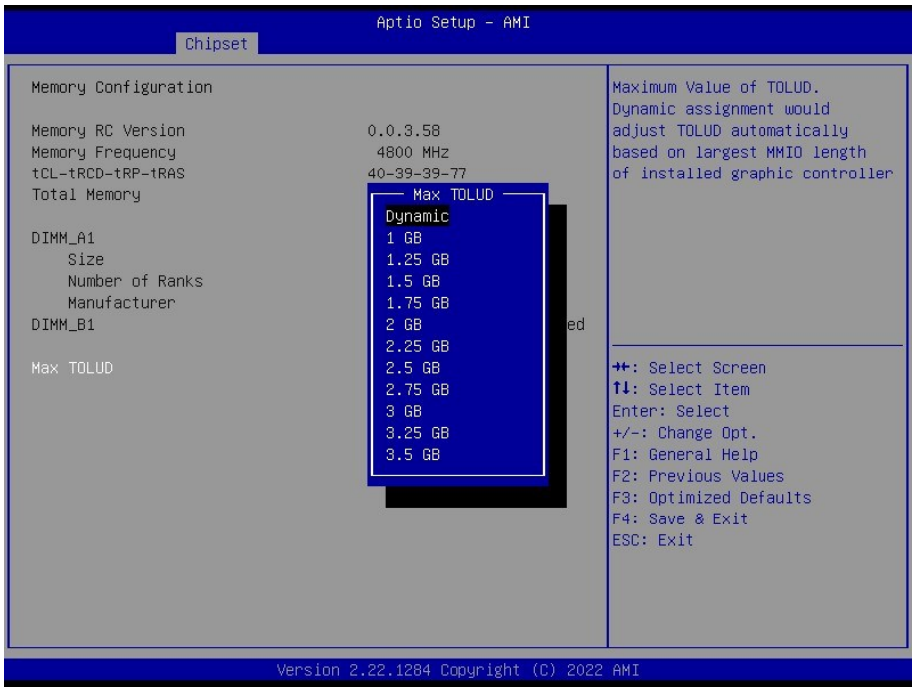
3.6.3 Chipset

3.6.3.1 System Agent (SA) Configuration



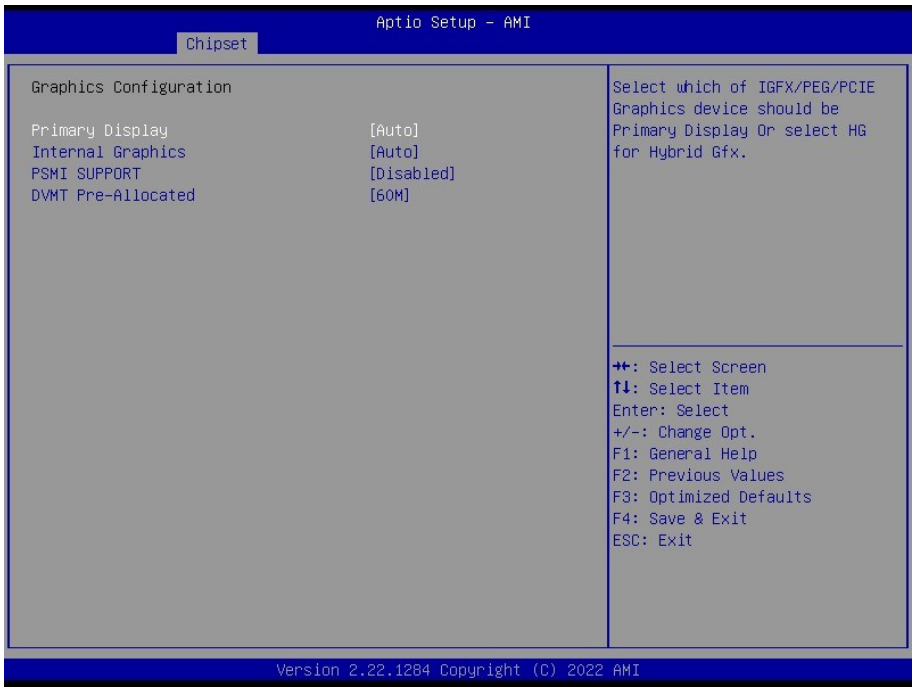
Item	Options	Description
VT-d	Disabled Enabled**[Default]**,	VT-d capability

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

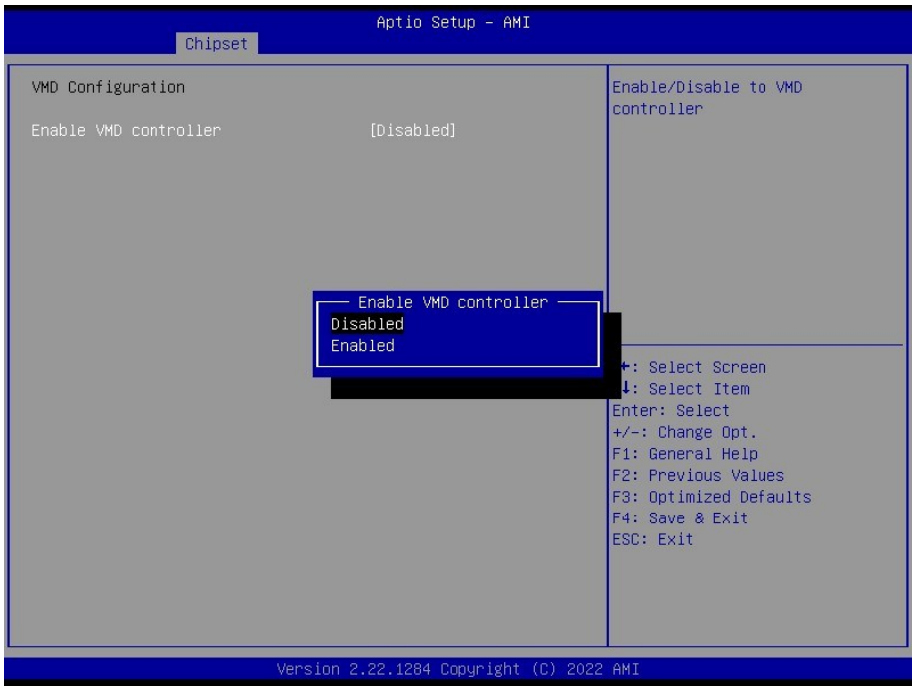
3.6.3.1.2 Graphics Configuration



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

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

3.6.3.1.3 VMD setup menu

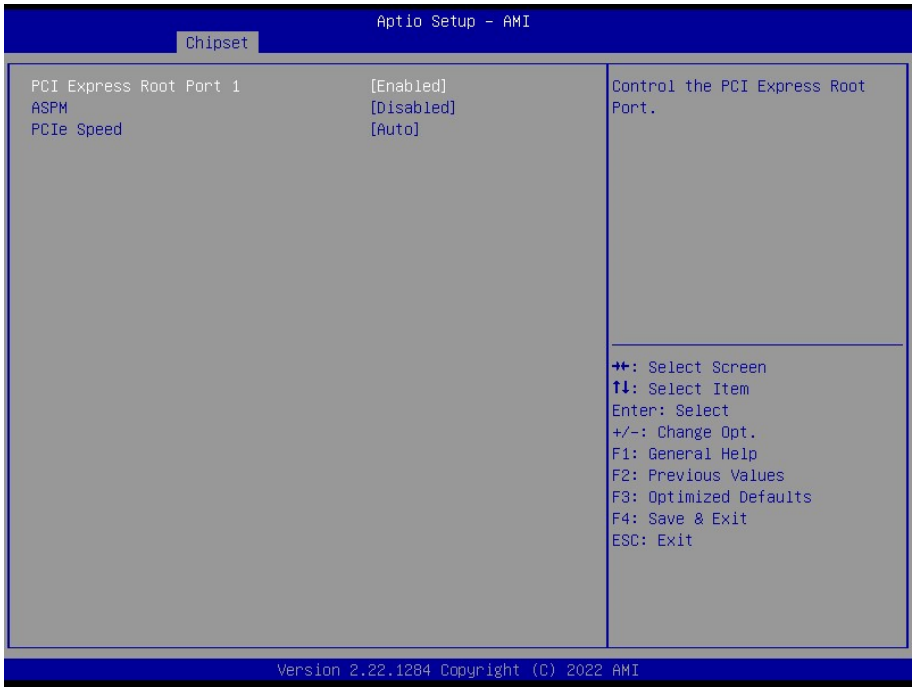


Item	Options	Description
Enabled VMD controller	Disabled**[Default]**, Enabled	Enable/Disable to VMD controller

3.6.3.1.4 PCI Express Configuration

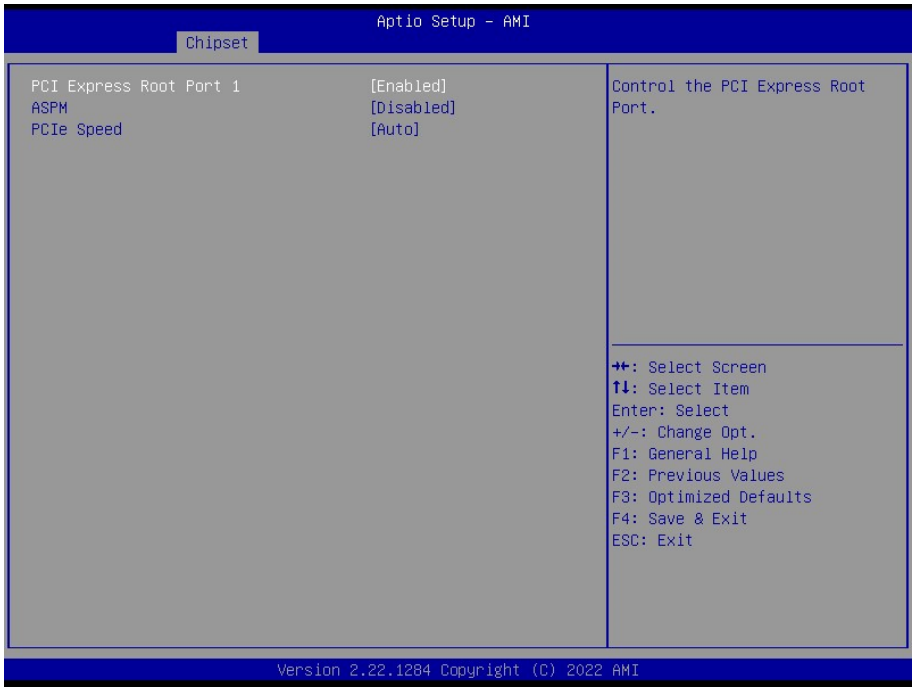
Item	Options	Description
Detect Non-Compliance Device	Disabled**[Default]**, Enabled	Detect Non-Compliance PCI Express Device in PEG

3.6.3.1.4.1 PCI Express Root Port 1



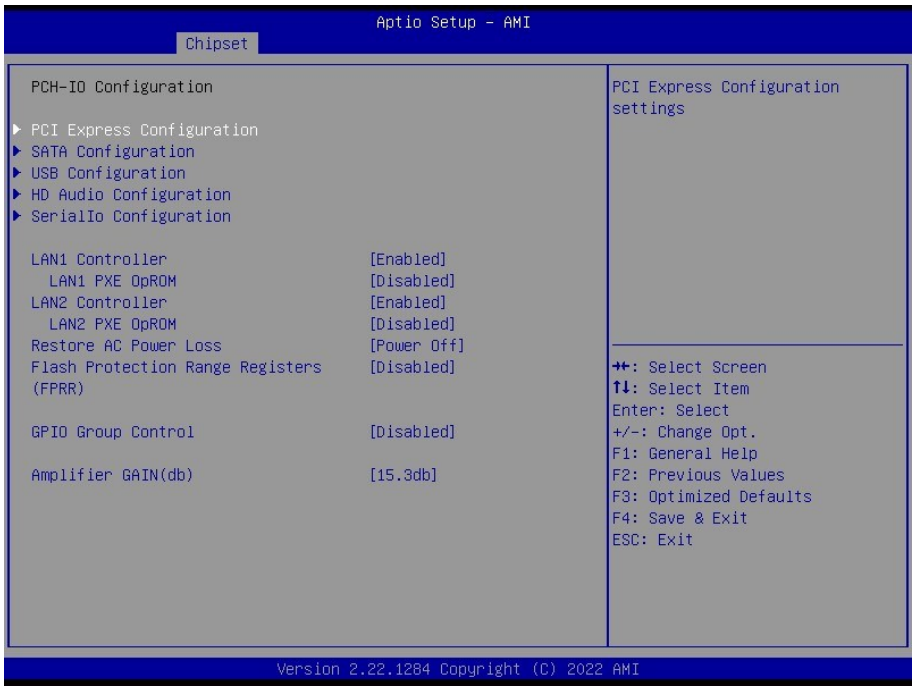
Item	Options	Description
PCI Express Root Port 1	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]**, L0s L1 L0sL1	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto**[Default]**, Gen1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

3.6.3.1.4.2 PCI Express Root Port 1



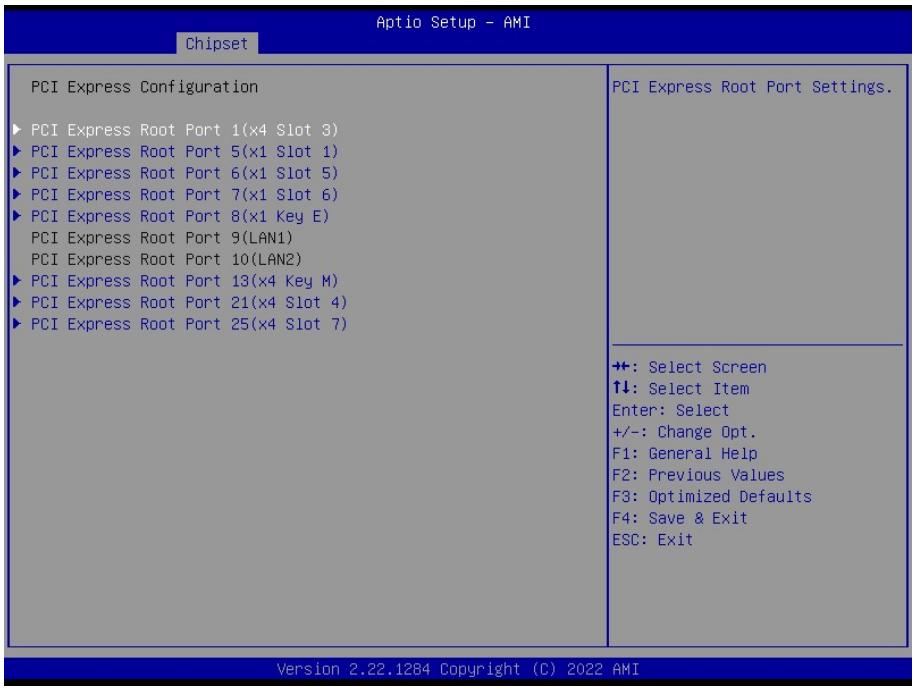
Item	Options	Description
PCI Express Root Port 2	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled**[Default]**, L0s L1 L0sL1	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto**[Default]**, Gen1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

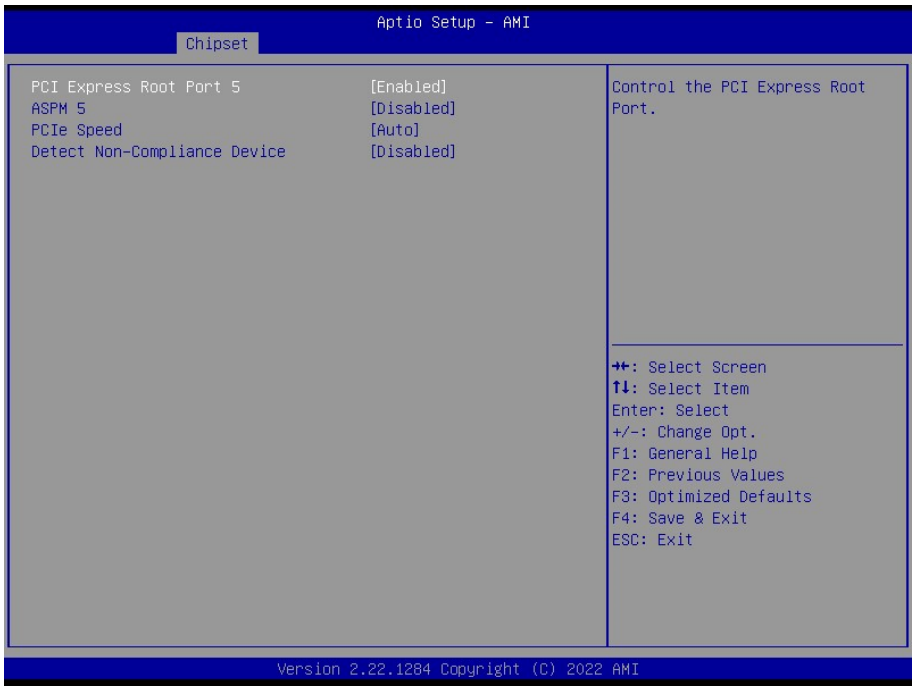


3.6.3.2.1.1 PCI Express Root Port 1(x4 Slot 3)

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)

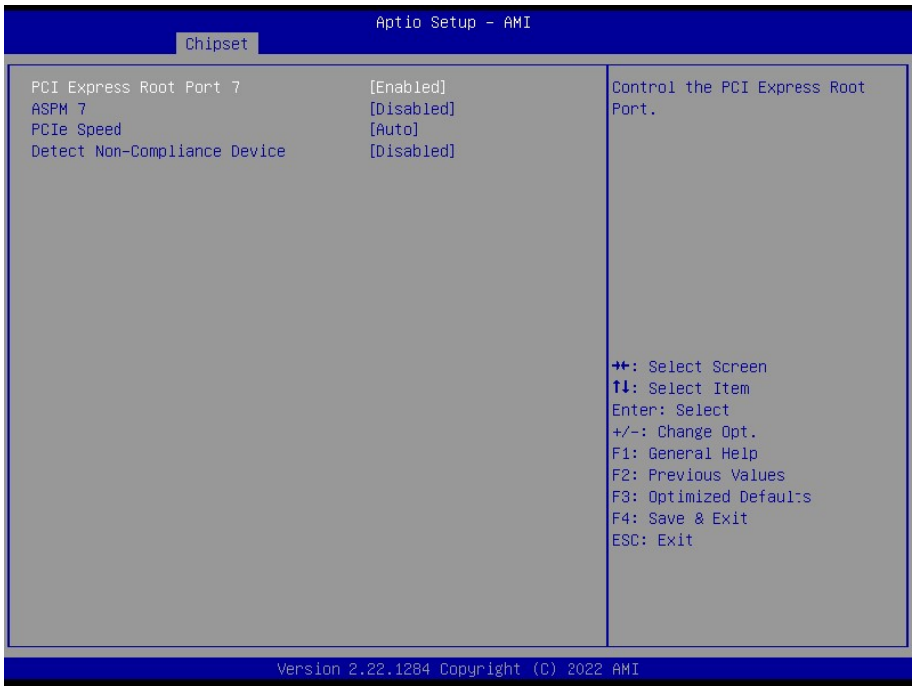


Item	Options	Description
PCI Express Root Port 5(x1 Slot 1)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 5	Disabled**[Default]**, L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto**[Default]**, 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)

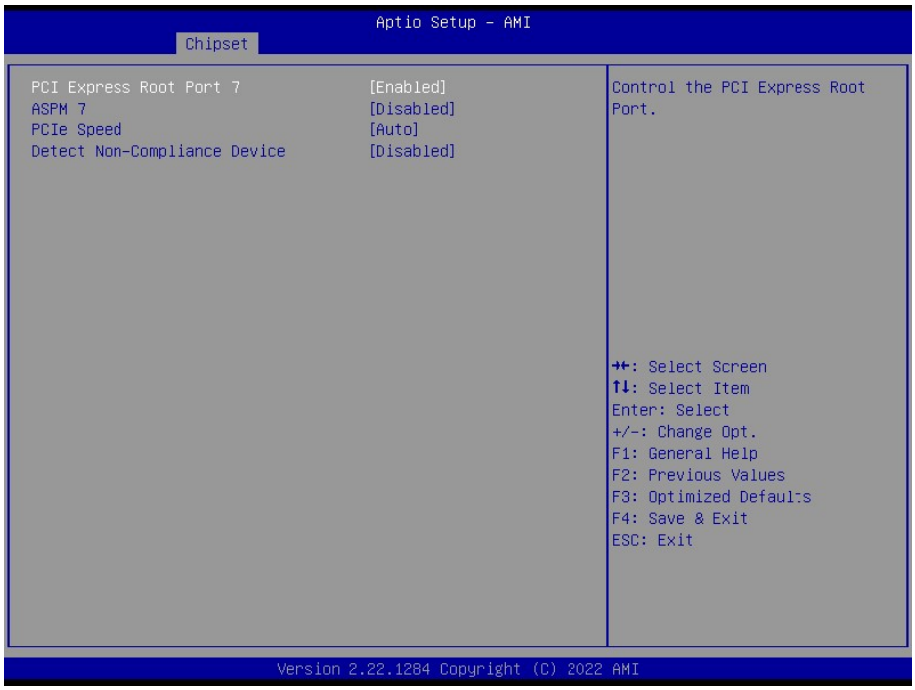
Item	Options	Description
PCI Express Root Port 6(x1 Slot 5)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 6	Disabled**[Default]**, L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto**[Default]**, 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)



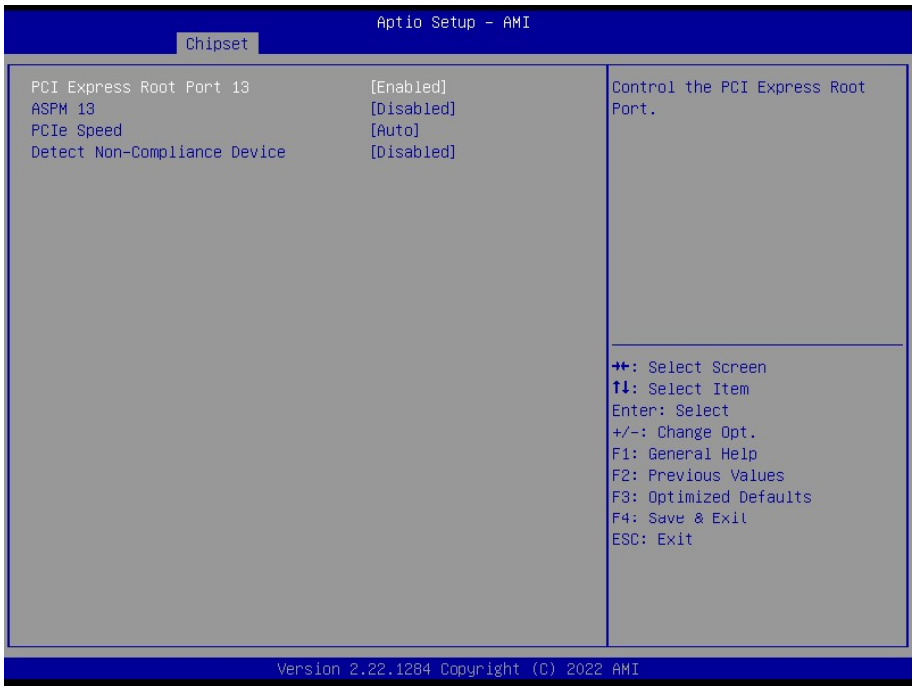
Item	Options	Description
PCI Express Root Port 7(x1 Slot 6)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 7	Disabled**[Default]**, L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto**[Default]**, 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)



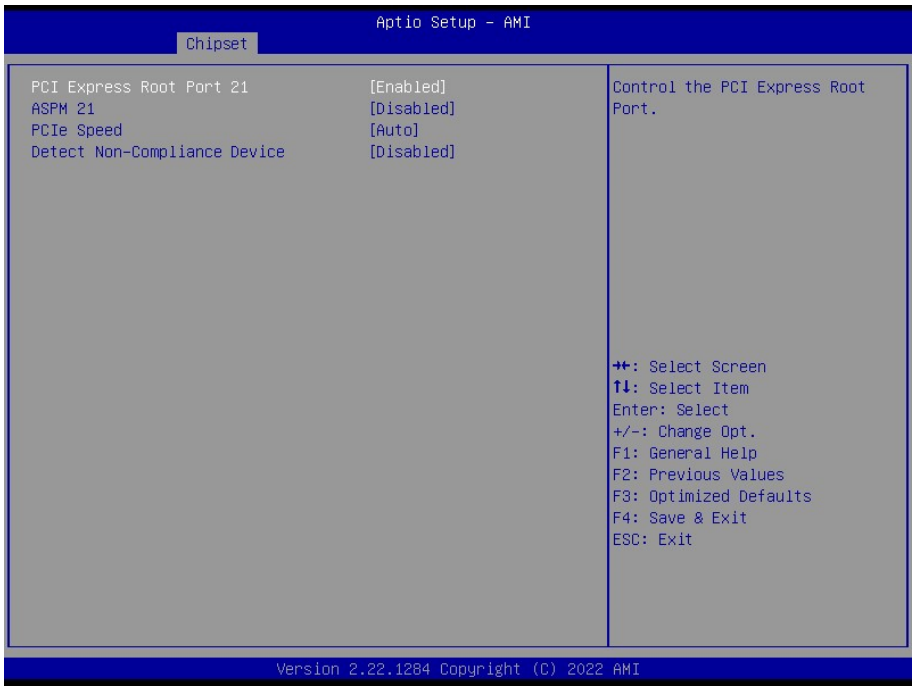
Item	Options	Description
PCI Express Root Port 8(x1 Key E)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 8	Disabled**[Default]**, L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto**[Default]**, 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)



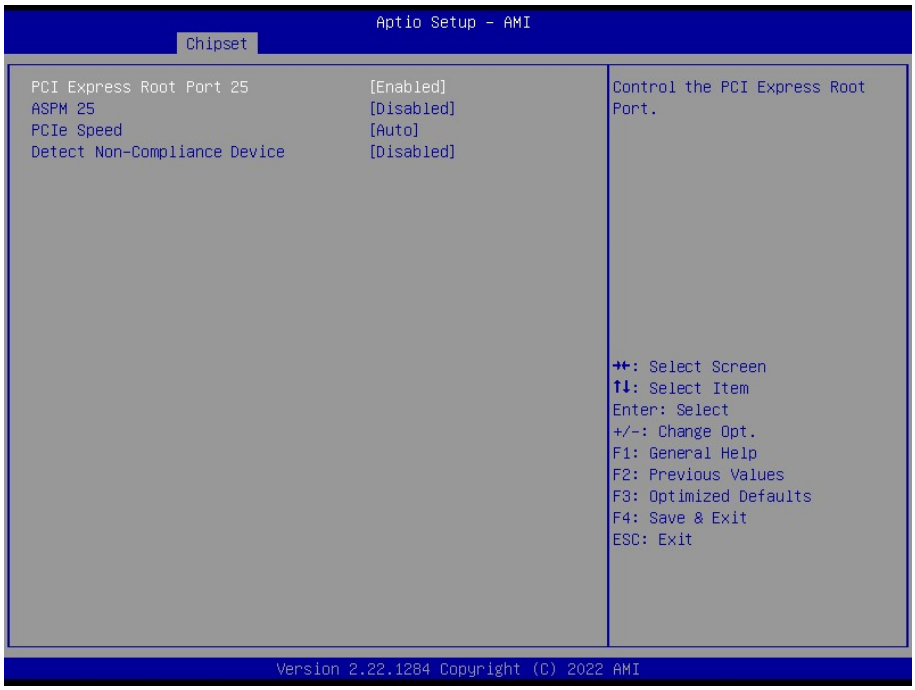
Item	Options	Description
PCI Express Root Port 13(x4 Key M)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 13	Disabled**[Default]**, L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto**[Default]**, 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)



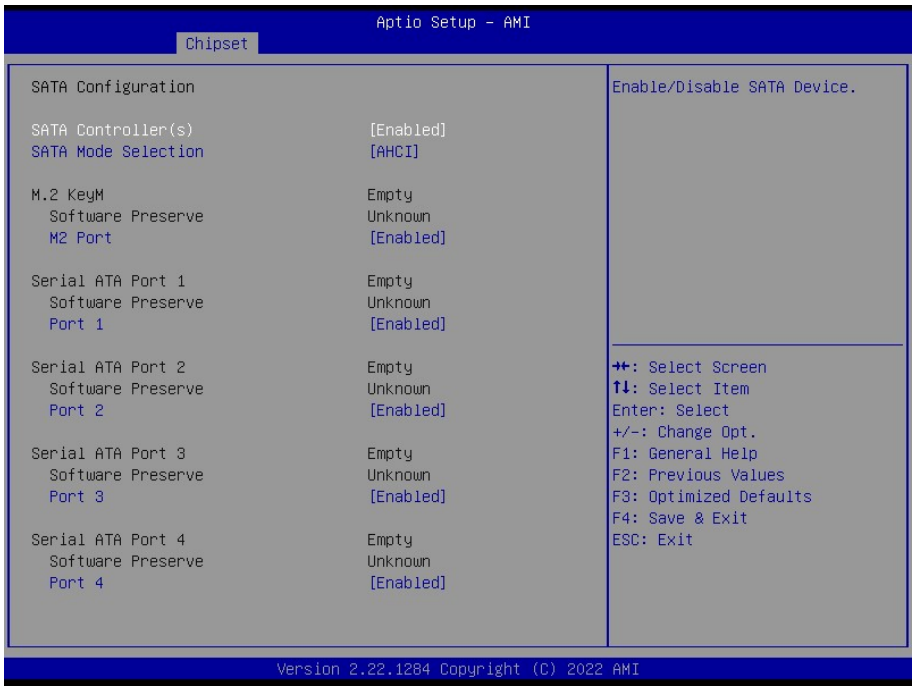
Item	Options	Description
PCI Express Root Port 21(x4 Slot 4)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 21	Disabled**[Default]**, L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto**[Default]**, 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)



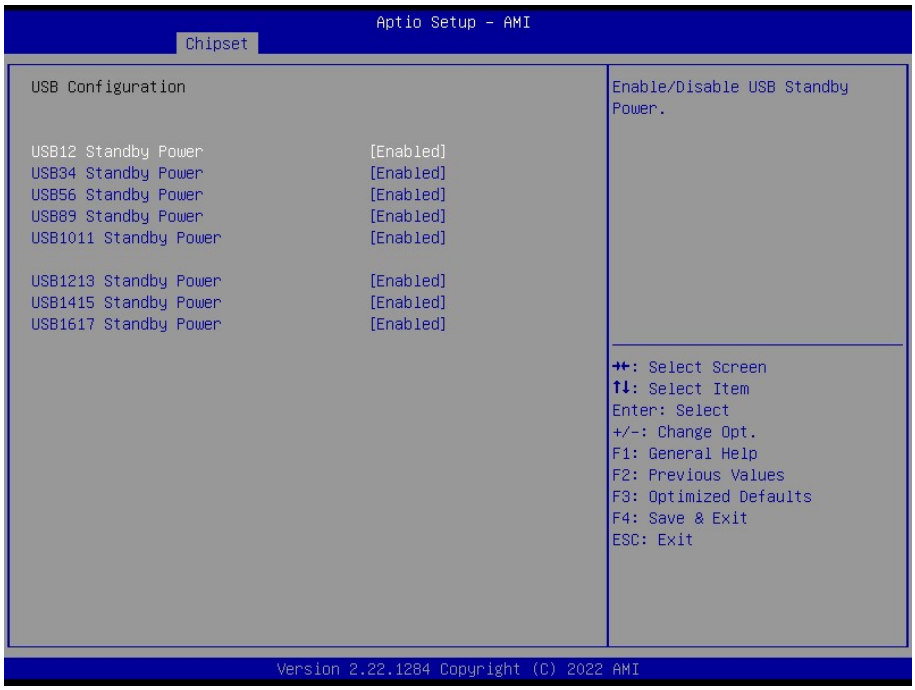
Item	Options	Description
PCI Express Root Port 25(x4 Slot 7)	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM 25	Disabled**[Default]**, L1 Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
PCIe Speed	Auto**[Default]**, 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



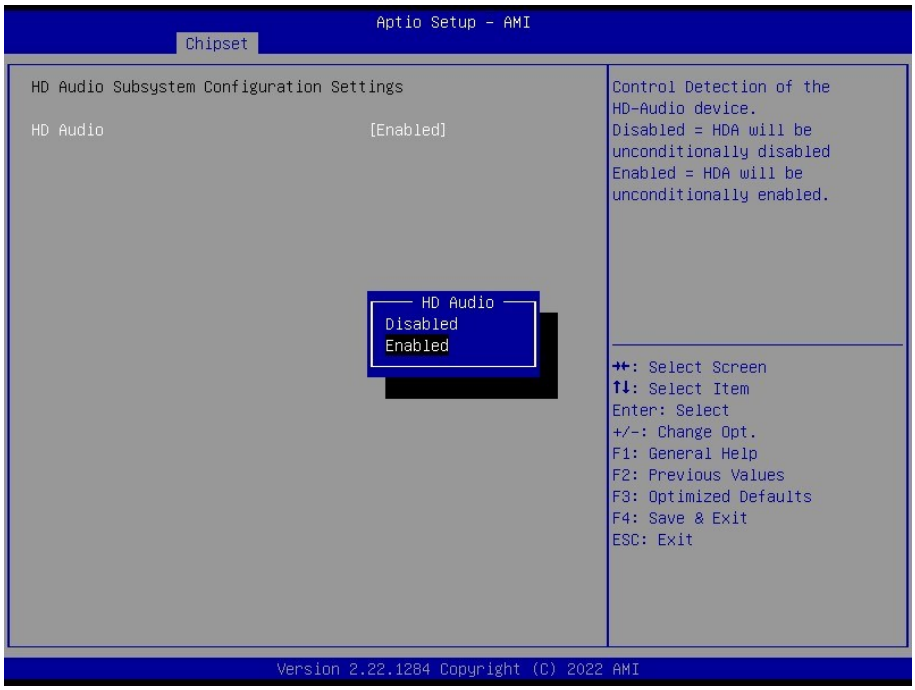
Item	Options	Description
SATA Controller(s)	Enabled**[Default]**, Disabled	Enable/Disable SATA Device.
SATA Mode Selection	AHCI	Determines how SATA Controller(s) operate.
M2 Port	Disabled Enabled**[Default]**,	Enable or Disable SATA Port
Port 1	Disabled Enabled**[Default]**,	Enable or Disable SATA Port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

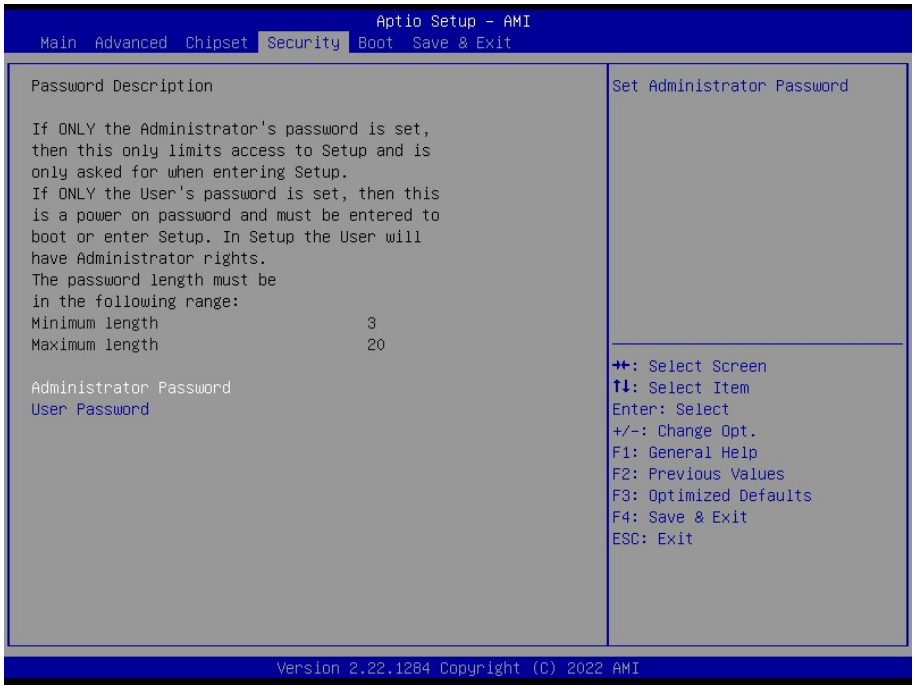


Item	Options	Description
HD Audio	Disabled Enabled**[Default]**,	Control Detection of HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled

3.6.3.2.5 Seriallo Configuration

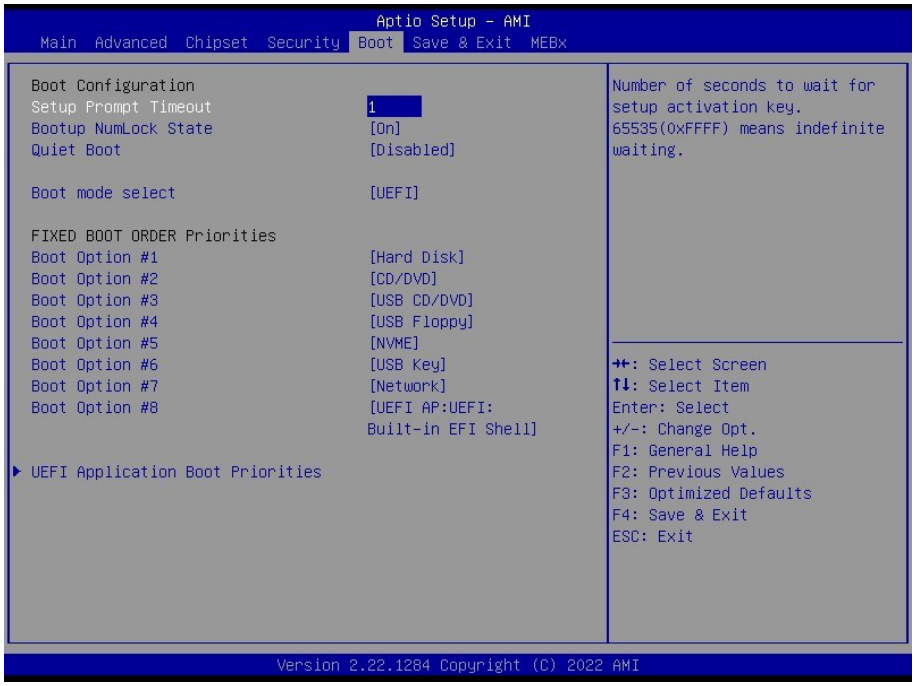
Item	Options	Description
I2C0 Controller	Disabled Enabled**[Default]**, Post Code Only	Enables/Disables Seriallo Controller If given device is Function 0 PSF disabling is skipped. PSF default will remain and device PCI CFG Space will still be visible. This is needed to allow PCI enumerator access functions 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

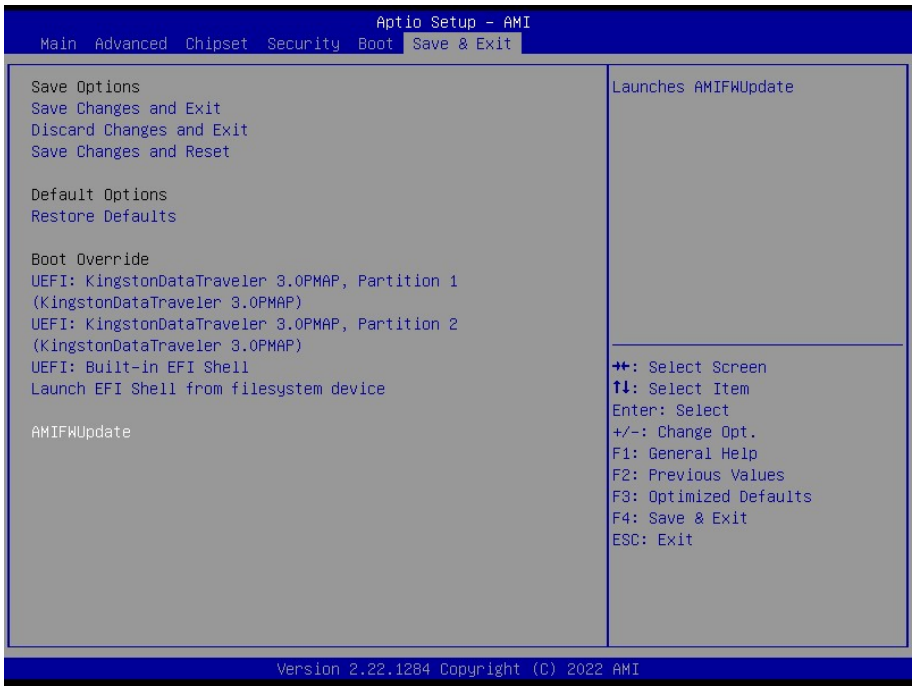
3.6.5 Boot



Item	Options	Description
Setup Prompt Timeout	1	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinit 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:
http://www.avalue.com.tw.

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**.

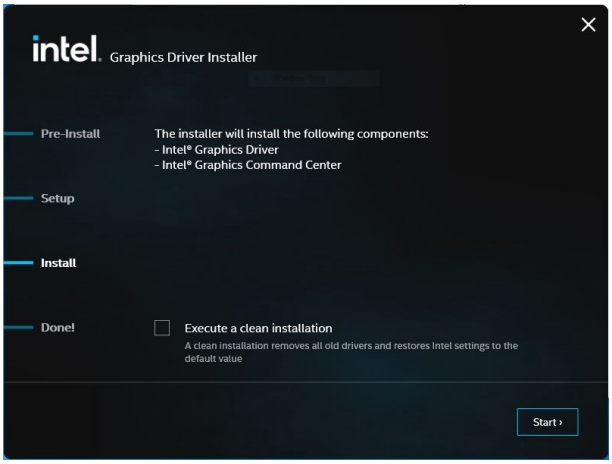
Step 4. Complete setup.

4.2 Install VGA Driver

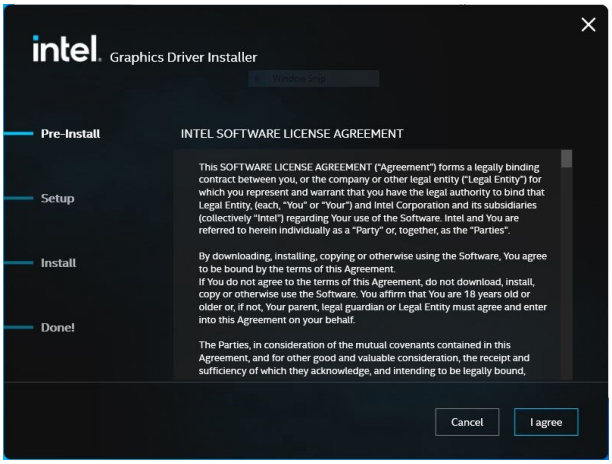
All drivers can be found on the Avalue Official Website: http://www.avalue.com.tw.

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

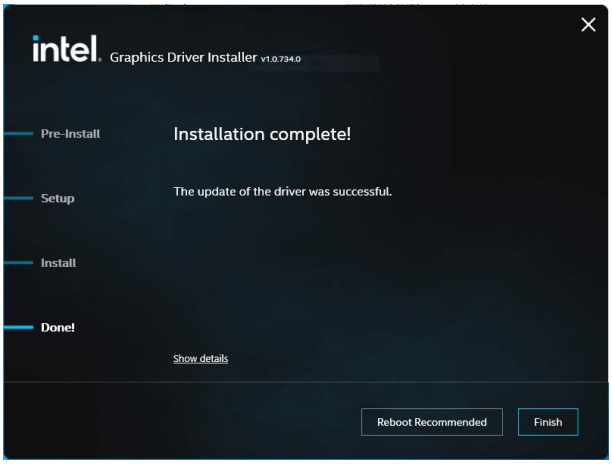
Step 1. Click **Begin installation**.



Step 3. Click **Start**.



Step 2. Click **I agree**.

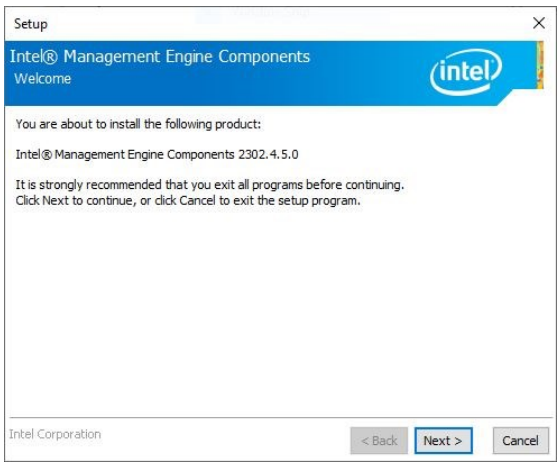


Step 4. Click **Finish** to complete setup.

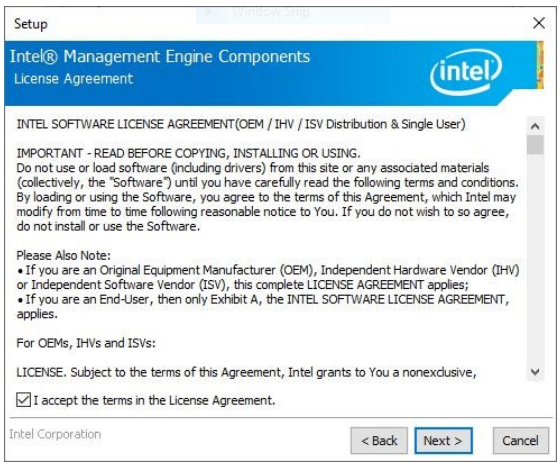
4.3 Install ME Driver

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

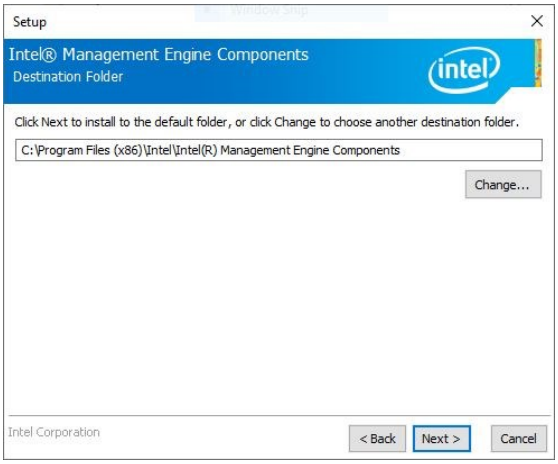
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



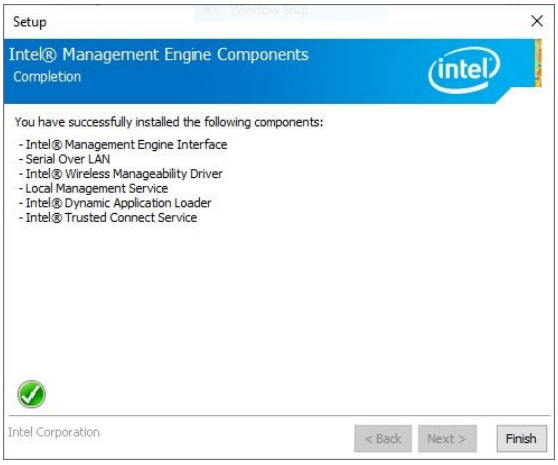
Step 1. Click **Next** to continue setup.



Step 2. Click **Next**.



Step 3. Click **Next**

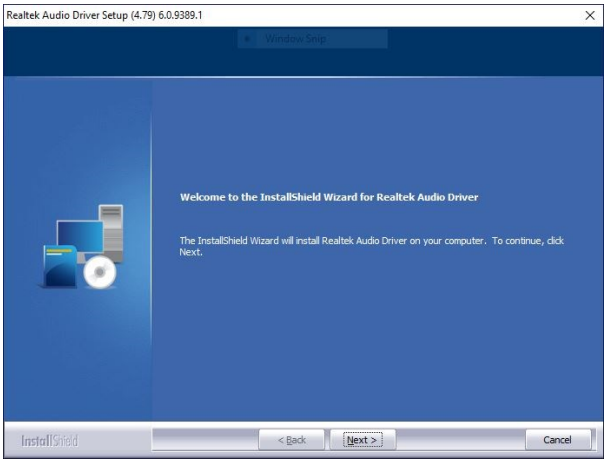


Step 4. Click **Finish** to complete the setup

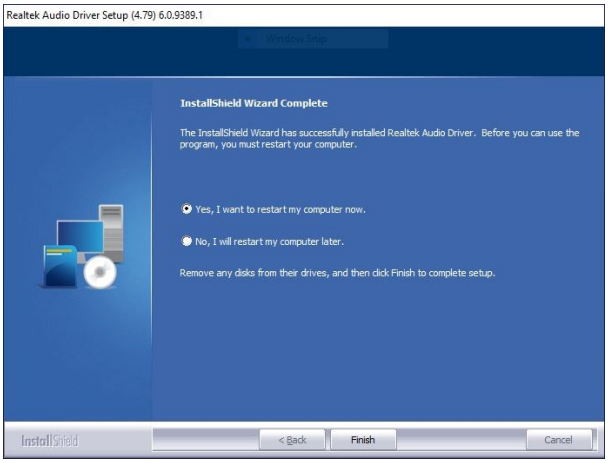
4.4 Install Audio Driver (For Realtek ALC888S HD Audio)

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

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



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

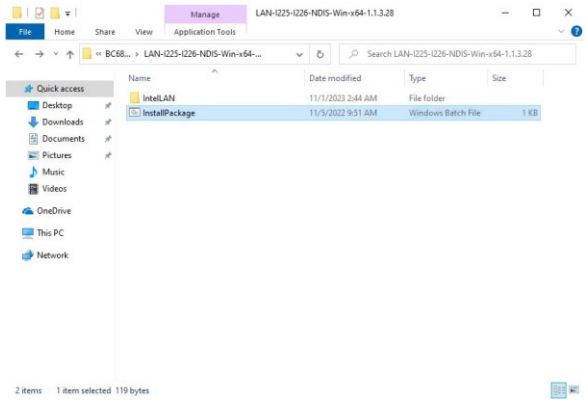


Step 2. Select **Finish** to complete Installation.

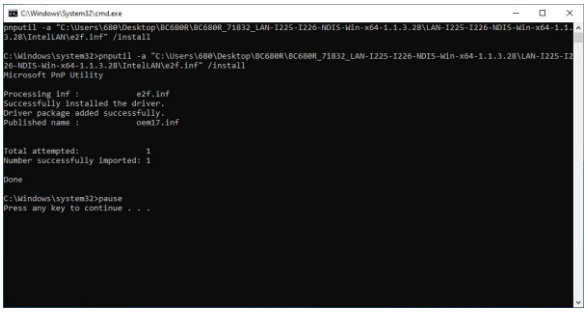
4.5 Install LAN Driver

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

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



Step 1. Click **InstallPackge.**

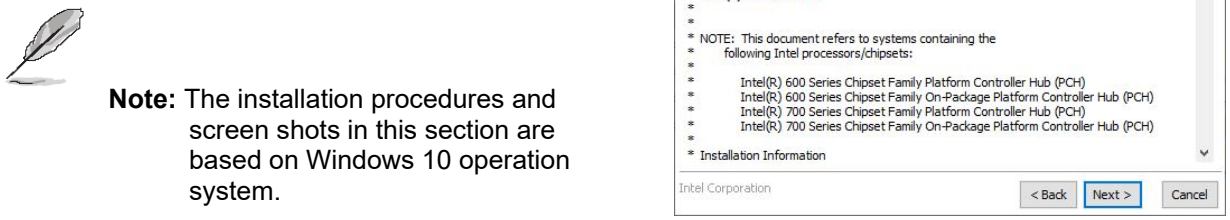


Step 2.

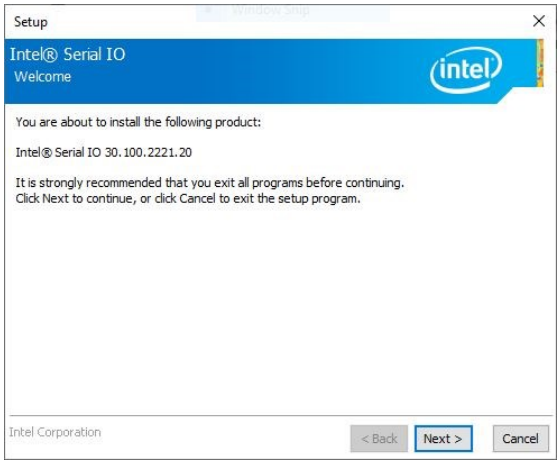
4.6 Install Serial IO Driver

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

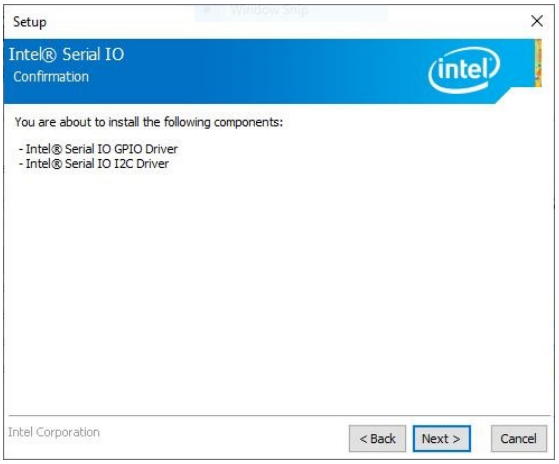
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



Step 3. Click **Next.**

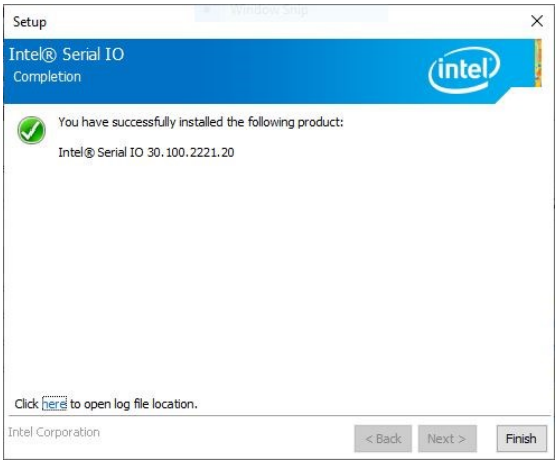


Step 1. Click **Next** to continue installation.



Step 4. Click **Next**.

Step 2. Click **Next**.

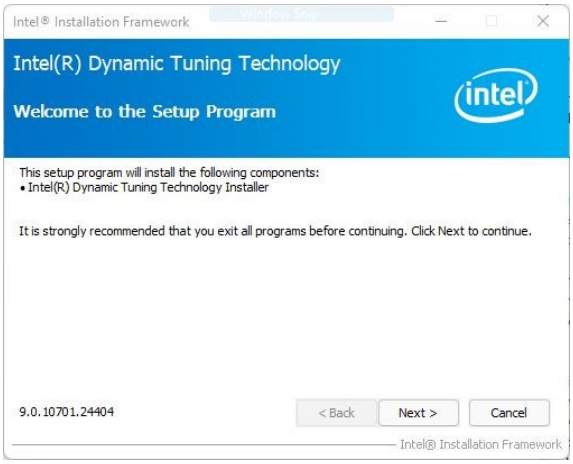


Step 5. Click **Finish** to complete setup.

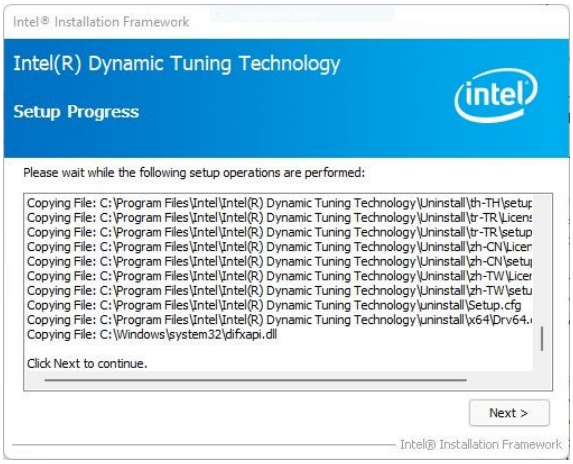
4.7 Install Intel_DTT

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

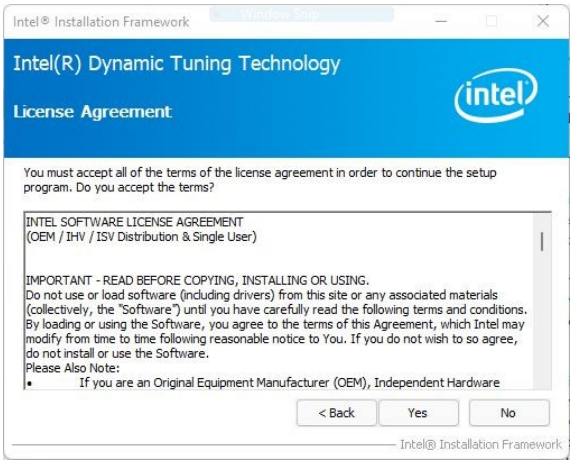
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



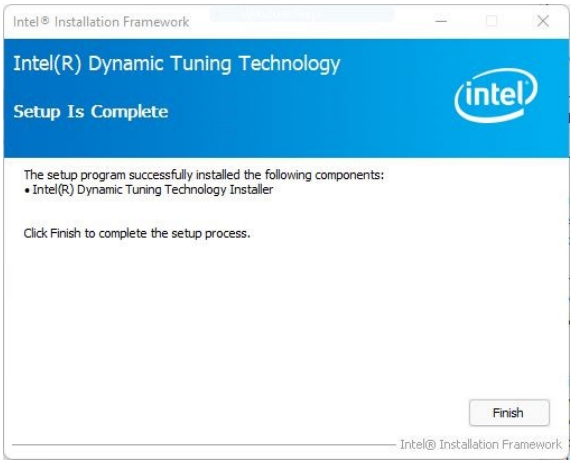
Step 1. Click **Next** to continue installation.



Step 3. Click **Next**.



Step 2. Click **Next**.

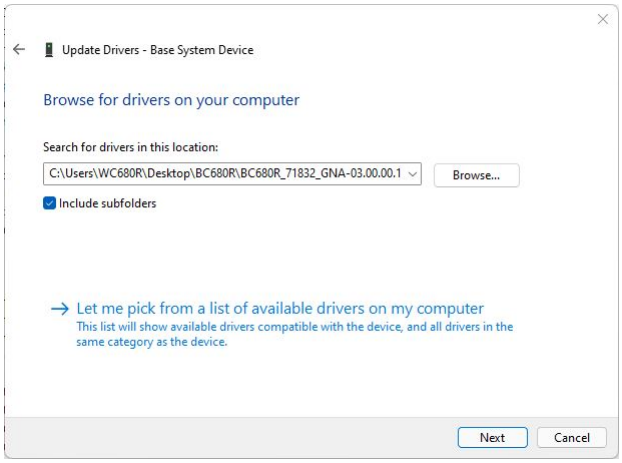


Step 4. Click **Finish** to complete setup.

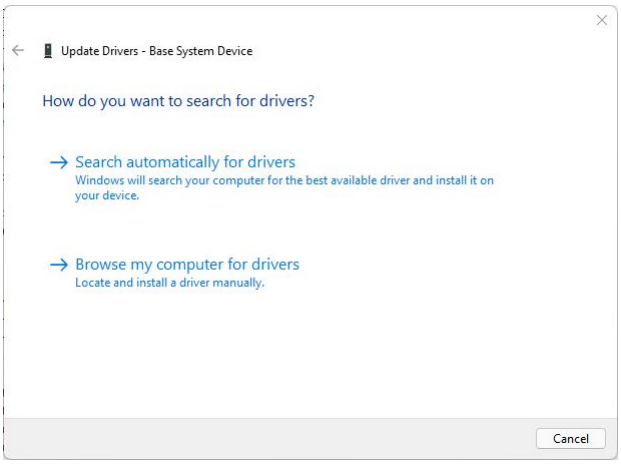
4.8 Install GNA

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

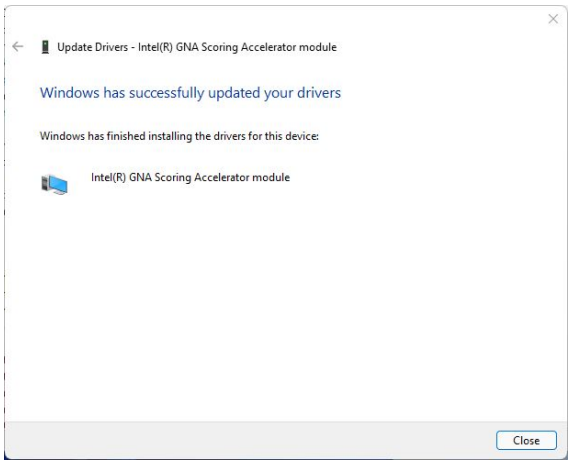
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



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



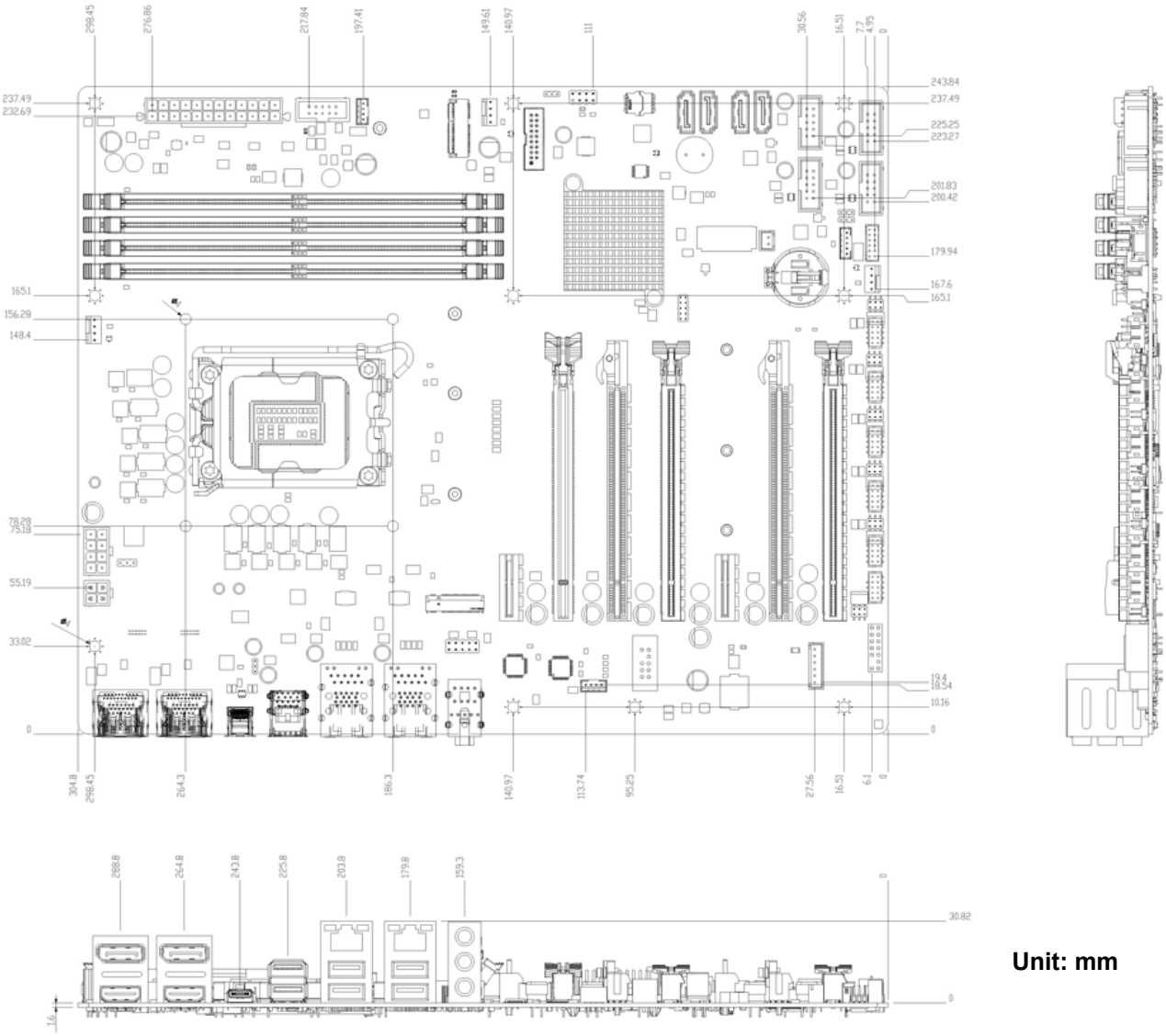
Step 1. Click **Browse my computer for drivers**.



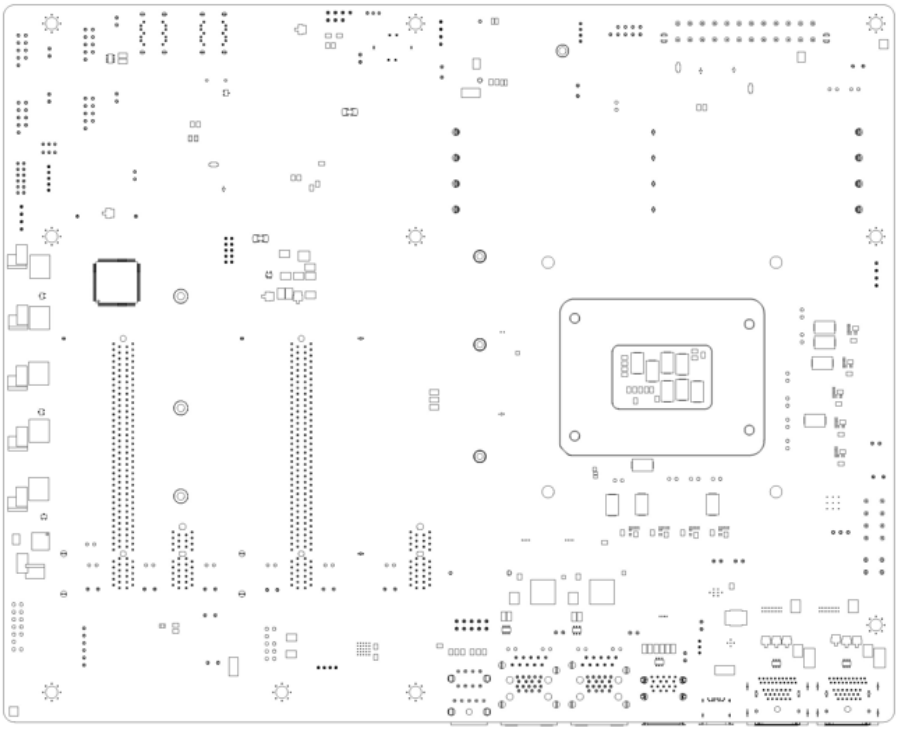
Step 3. Click **Finish** to complete setup.

5. Mechanical Drawing

5.1 Mechanical Drawing



Unit: mm



Unit: mm