

# MAB-T600

Barebone System with RX610H Chipset

## Quick Reference Guide

1<sup>st</sup> Ed –13 November 2023

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## 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.

## A Message to the Customer

### *Avalue Customer Services*

Each and every Avalue's product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Avalue device is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Avalue has come to be known.

Your satisfaction is our primary concern. Here is a guide to Avalue's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

### *Technical Support*

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.

To receive the latest version of the user's manual; please visit our Web site at:

[www.avalue.com](http://www.avalue.com)

## Cleaning and Disinfecting

During normal use of MAB-T600, the device may become dirty and should be regularly cleaned.

### Cleaning Instructions

1. Turn off the computer before starting clean up. This way, you can see any dirt on the screen; the brightness of the monitor may make you miss some areas.
2. Wet a soft, lint-free or microfiber cloth with cleaning agent per manufacturer's instructions or hospital protocol. Wipe the medical PC in a gentle motion to remove dust, oil, or fingerprint smudges.
3. Wipe any moisture excess with a dry lint-free cloth to finish cleaning before turning the computer back on.

### Cleaning Tools

Below is a list of some items that may be needed or used when cleaning the medical PC or medical PC peripherals.

Please keep in mind that some components in medical PC components may only be cleaned using a product designed for cleaning that component.

Cleaning agent list: chemical disinfectants which have been tested on the medical PC

#### No. Cleaning agent

1. Water
2. Alcohol
3. Alcohol 75%

#### Caution!



- *Do not immerse or rinse the MAB-T600 or its peripherals. If you accidentally spill liquid on the device, disconnect the unit from the power source. Contact your Biomed Department regarding the continued safety of the unit before placing it back in operation.*
- *Do not spray cleaning agent on the chassis.*
- *Do not use disinfectants that contain phenol. Do not autoclave or clean the MAB-T600 or its peripherals with strong aromatic, chlorinated, ketone, ether, or Esther solvents, sharp tools or abrasives. Never immerse electrical connectors in water or other liquids.*

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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

- 1 x MAB-T600 Barebone system
- Power cord



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

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## 1.3 System Specifications

| System                    |                                                                                                                                                                 |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor                 | LGA 1700 Socket supports Intel® Alder Lake Core™ i9, Core™ i7, Core™ i5, Core™ i3, Pentium, Celeron Processor up to 16 Cores 24 Threads Hybrid. Max TDP 65W     |
| Platform Controller Hub   | Intel® H610E PCH                                                                                                                                                |
| System Memory             | 2 x DIMM slots support Dual Channel DDR5 memory speed up to 4800MHz with UDIMM, up to 64GB                                                                      |
| BIOS Information          | Socket Type 256Mb SPI BIOS                                                                                                                                      |
| Watchdog Timer            | From Super I/O to drag RESETCON#<br>256 segments (10sec ~ 255min)                                                                                               |
| H/W Status Monitor        | CPU temperature monitoring Voltages monitoring CPU fan speed control                                                                                            |
| TPM                       | Support onboard TPM 2.0                                                                                                                                         |
| COOLER TYPE               | ACC-FAN-170-02R                                                                                                                                                 |
| SBC                       | RX610H                                                                                                                                                          |
| Expansion                 |                                                                                                                                                                 |
| M.2 (Key-X, Size, Signal) | 1 x M.2 E-Key (2230), supports CNVi with USB2.0 & PCIe x1 Gen4 interface                                                                                        |
| PCIe (Gen X, Lanes)       | 1 x Gen 5 PCIe x16 (x16 Physical Black) (Slot 1)<br>1 x Gen 3 PCIe x1 (x4 Physical Open Ended) (Slot 2)<br>2 x Gen 3 PCIe x1 (x16 Physical Yellow) (Slot 3 & 4) |
| Storage                   |                                                                                                                                                                 |
| M.2 (Key-X, Size, Signal) | 1 x M.2 M-Key 2242/2280/22110 NVMe (PCIe x4 + SATA III)<br>1 x M.2 E-Key 2230 with CNVi Support (PCIe x 1 share with slot4 + USB 2.0)                           |
| 2.5" Drive Bay (Height)   | 2 x 2.5" HDD/SSD Drive<br>(2 x 3.5" HDD/SSD Drive as option)                                                                                                    |
| Edge I/O (Rear)           |                                                                                                                                                                 |
| USB Port                  | 2 x USB 2.0 Type A<br>4 x USB 3.2 Gen 1 Type A                                                                                                                  |
| HDMI                      | 1 x HDMI 2.0b                                                                                                                                                   |
| DP                        | 2 x DP ++                                                                                                                                                       |
| Audio                     | Line-out, Mic-in                                                                                                                                                |
| RJ-45                     | 2 x RJ-45                                                                                                                                                       |
| Edge I/O (Front)          |                                                                                                                                                                 |
| USB Port                  | 2 x USB 2.0 (Front I/O)                                                                                                                                         |



|                                     |                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Power Button</b>                 | 1 x Power Button (with LED indicator)                                                                                                                                                                                                                                                                                                                                                             |
| <b>Display</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Graphic Chipset</b>              | Intel® Integrated UHD Graphic with Xe Architecture (CPU Dependent)                                                                                                                                                                                                                                                                                                                                |
| <b>Resolution</b>                   | DP Audio 1.4a (Max Resolution: 3840X2160@60Hz)<br>HDMI 2.0b (Max Resolution: 3840X2160@60Hz)                                                                                                                                                                                                                                                                                                      |
|                                     |                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Audio Codec</b>                  | Realtek HD Audio Codec                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Ethernet</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>LAN Chipset</b>                  | Intel® I219-V Gigabit Ethernet Controller<br>Intel® I225-LM 2.5 Gigabit Ethernet Controller                                                                                                                                                                                                                                                                                                       |
| <b>Power Requirement</b>            |                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Input</b>                        | 100-240 Vac, 8-4 A, 60-50 Hz                                                                                                                                                                                                                                                                                                                                                                      |
| <b>ACPI</b>                         | Single power ATX                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Power Mode</b>                   | AT/ATX Mode (Default: ATX mode)                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Power Supply Unit</b>            | FSP500M-80PA PSU 100-240V (power 500W)—Medical Grade                                                                                                                                                                                                                                                                                                                                              |
| <b>Mechanical &amp; Environment</b> |                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Power Type</b>                   | AT/ATX Mode (Default: ATX mode)                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Power Connector Type</b>         | AC in                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Dimension</b>                    | 107(H) X 372(W) X 307(D) (mm)                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Weight</b>                       | 6.4kg packed                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Color</b>                        | Black                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>OS Support</b>                   | Win10, Linux                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Reliability</b>                  |                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Operating Temp.</b>              | Operating Temperature 0°C ~ 40°C (32°F ~ 104°F) Air flow 0.5                                                                                                                                                                                                                                                                                                                                      |
| <b>Storage Temp.</b>                | -30°C ~ 70°C (-22 ~ 158°F)                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Operating Humidity</b>           | 40°C @ 95% Relative Humidity, Non-condensing                                                                                                                                                                                                                                                                                                                                                      |
| <b>Dimension (W*L*H)</b>            | 330*344*160mm (TBD)                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Weight</b>                       | 7 Kg                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Vibration Test</b>               | <p>Random Vibration Operation:</p> <ol style="list-style-type: none"> <li>1. Test PSD : 0.00050513G<sup>2</sup>/Hz , 0.5 Grms</li> <li>2. System condition : operation mode</li> <li>3. Test frequency : 5~500 Hz</li> <li>4. Test axis : X,Y and Z axis</li> <li>5. Test time : 30 minutes per each axis</li> <li>6. IEC60068-2-64 Test Fh</li> </ol> <p>Sine Vibration test (Non-operation)</p> |

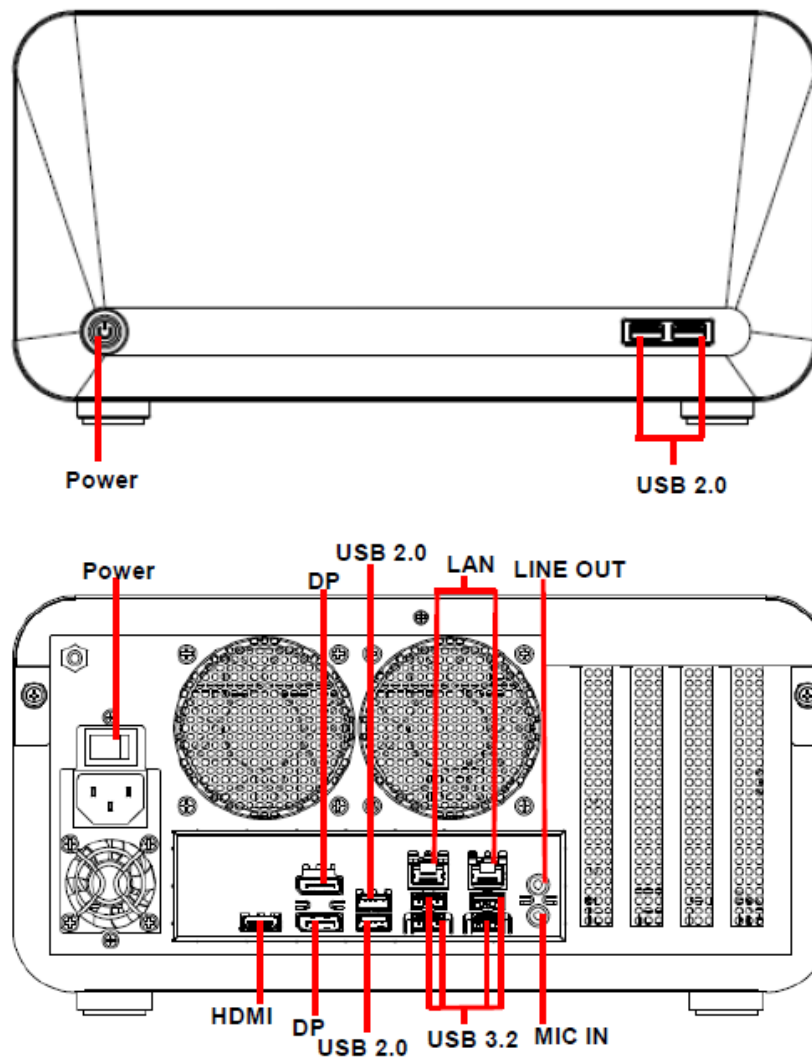
|                               |                                                                                                                                                                                                                                                                         |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | 1 Test Acceleration : 2G<br>2 Test frequency : 5~500 Hz<br>3 Sweep : 1 Oct/ per one minute. (logarithmic)<br>4 Test Axis : X,Y and Z axis<br>5 Test time :30 min. each axis<br>6 System condition : Non-Operating mode<br>7. Reference IEC 60068-2-6 Testing procedures |
| <b>Shock Test</b>             | 1. Wave form : Half Sine wave<br>2. Acceleration Rate : 10g<br>3. Duration Time : 11ms<br>4. No. of Shock : Z axis 300 times<br>5. Test Axis: Z axis<br>6. Operation mode<br>7. Reference IEC 60068-2-27 Testing procedures<br>Test Eb : Bump Test                      |
| <b>Package Vibration Test</b> | 1. Test PSD : 0.026G <sup>2</sup> /Hz , 2.16 Grms<br>2. Test frequency : 5~500 Hz<br>3. Test axis : X,Y and Z axis<br>4. Test time : 30 minutes per each axis<br>5. IEC 60068-2-64 Test Fh                                                                              |
| <b>Drop Test</b>              | Package drop test<br>Reference ISTA 2A, Method : IEC-60068-2-32 Test:Ed<br>Test Ea : Drop Test<br>1. Test phase : One corner, three edges, six faces<br>2. Test high : 96.5cm<br>3. Package weight : 5Kg<br>4. Test drawing                                             |
| <b>IP Rating</b>              | IPX1 Grade Protection                                                                                                                                                                                                                                                   |
| <b>Software Support</b>       |                                                                                                                                                                                                                                                                         |
| <b>OS Information</b>         | Windows 10, Windows 11, Linux                                                                                                                                                                                                                                           |



**Note:** Specifications are subject to change without notice.

## 1.4 System Overview

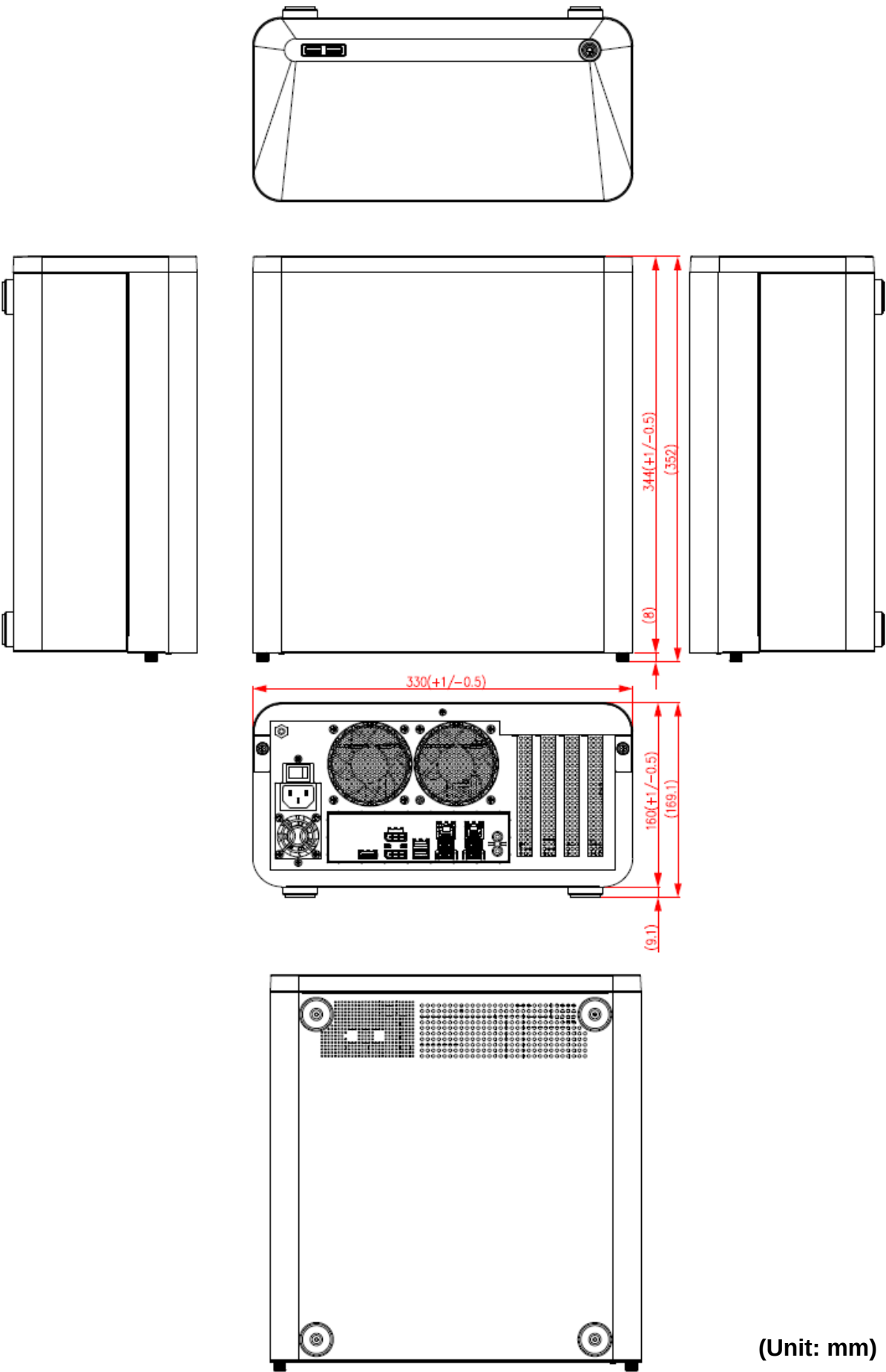
### 1.4.1 Front/Rear View



#### Connectors

| Label    | Function             | Note                                                     |
|----------|----------------------|----------------------------------------------------------|
| Power    | Power on button      |                                                          |
| USB 2.0  | 4 x USB2.0 connector |                                                          |
| USB 3.2  | 4 x USB3.2 connector |                                                          |
| LAN      | 2 x RJ-45 Ethernet   | suggest using shielded LAN cables to increase stability. |
| DP       | 2 x DP connector     |                                                          |
| HDMI     | HDMI connector       |                                                          |
| LINE OUT | Line-out audio jack  |                                                          |
| MIC IN   | Mic-in audio jack    |                                                          |
| Power    | Power switch         |                                                          |

1.5 System Dimensions



## 1.6 Operating Principle

(a) Installation:

- Take the device and accessories from package and put in the suitable place.
- Check the packing list (accessories).
- Connect the power cord to the device.
- Put the plug of power cord into receptacle of power source.
- Press power button "Power Icon" on the device to start the device.

(b) Installation for monitor:

- Plug in the monitor cable (HDMI or DP).

(c) Installation keyboard and mouse.

- Plug in mouse and keyboard.

(d) Operation for Turn ON the system

- Turn ON the system.
- Press the power ON/OFF icon firmly to turn power ON/OFF.
- The power ON/OFF LED will turn blue to indicate power is on.
- Check with the Icon behavior for power status.

## 2. Hardware Configuration

### Jumper and Connector Setting

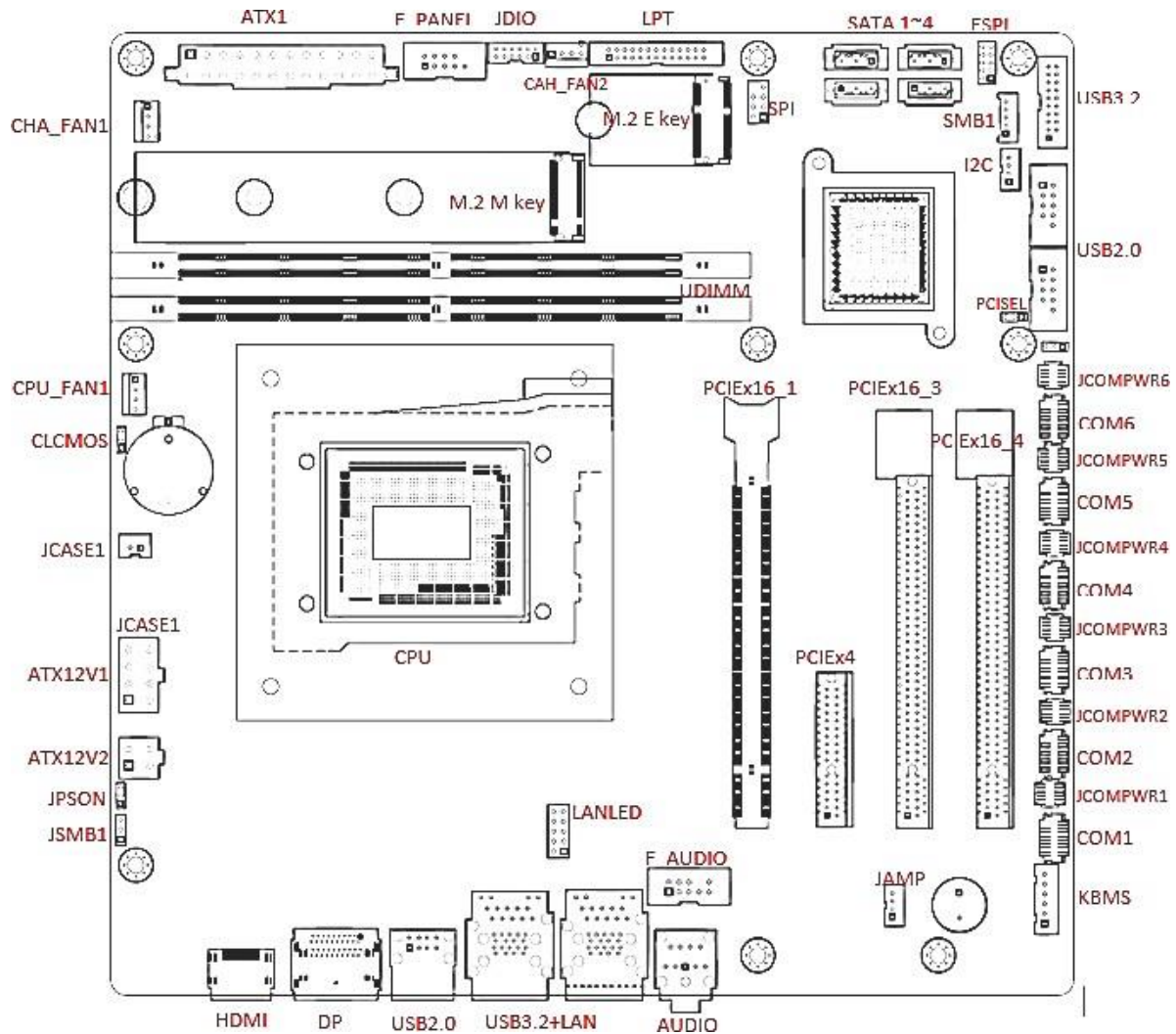
For advanced information, please refer to:

- 1- RX610H included in this manual.



**Note:** If you need more information, please visit our website: [www.avalue.com](http://www.avalue.com)

## 2.1 RX610H Overviews



## 2.2 RX610H Jumpers & Connectors list

### Jumpers

| Label      | Function             | Note                       |
|------------|----------------------|----------------------------|
| CLCMOS1    | Clear CMOS           | 1 x 3 header, pitch 2.00mm |
| JPSON1     | AT/ATX Mode Select   | 1 x 3 header, pitch 2.00mm |
| JCOMPWR1~6 | COM1~6 POWER SETTING | 2 x 3 header, pitch 2.00mm |
| JPCIESEL1  | PCI SELECTION        | 1 x 3 header, pitch 2.00mm |

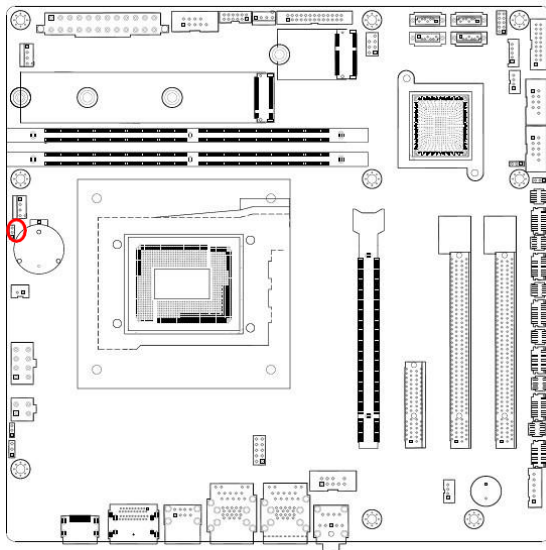
### Connectors

| Label       | Function                                                    | Note                           |
|-------------|-------------------------------------------------------------|--------------------------------|
| CPU1        | LGA1700 socket                                              |                                |
| DIMMA1~B1   | DDR5 UDIMM Slot                                             |                                |
| PCIEX16_1   | PCI-e Gen 5 x16                                             | Physical Black(Slot 1)         |
| PCIEX4_1    | PCI-e Gen 3 x1                                              | X4 Physical only(Slot 2)       |
| PCIEX16_3~4 | PCI-e Gen 3 x1                                              | X16 Physical only (Slot 3 & 4) |
| HDMI        | HDMI port Connector x 1                                     |                                |
| DP12        | Display port connector x 2                                  |                                |
| USB56       | USB2.0 Type A Connector x 1                                 |                                |
| LAN1_USB12  | RJ-45 Ethernet Connector x 1<br>USB3.2 Type A Connector x 2 | Gigabit Ethernet               |
| LAN2_USB34  | RJ-45 Ethernet Connector x 1<br>USB3.2 Type A Connector x 2 | 2.5 Gigabit Ethernet           |
| AUDIO1      | Audio phone jack                                            | Line-out, Mic-in               |
| CPU_FAN1    | CPU Fan Connector                                           | WAFER 1x4P, 2.54mm             |
| CHA_FAN1    | Chassis Fan Connector                                       | WAFER 1x4P, 2.54mm             |
| CHA_FAN2    | Chassis FAN connector                                       | WAFER 1x4P, 2.54mm             |
| F_PANEL1    | Intel Front Panel connector                                 | BOX header 2x5P, 2.54mm        |
| ATX1        | ATX power connectors                                        | PWR Conn 2x12P                 |
| ATX12V1     | 12V ATX power connectors                                    | PWR Conn 2x4P                  |

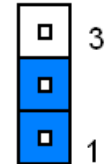


## 2.3 RX610H Jumpers & Connectors settings

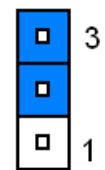
### 2.3.1 Clear CMOS (CLCMOS1)



Normal\*

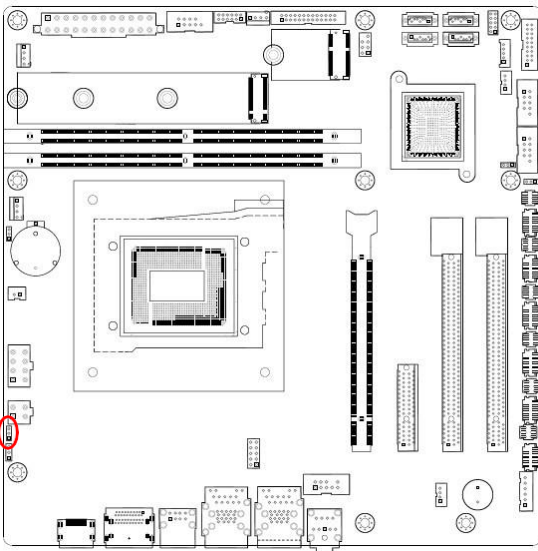


Clear CMOS

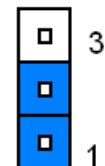


\* Default

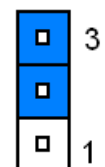
### 2.3.2 AT/ATX Power Mode Select (JPSON1)



AT mode

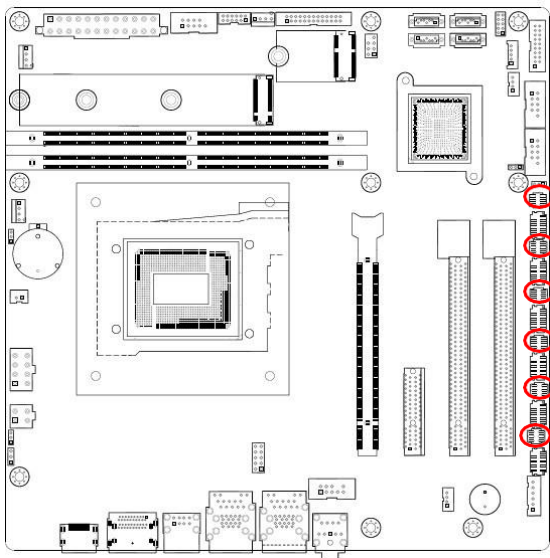


ATX mode\*

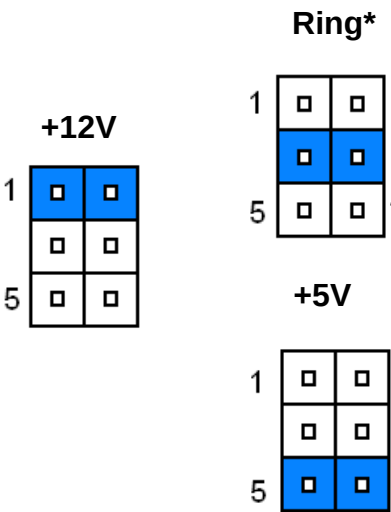


\* Default

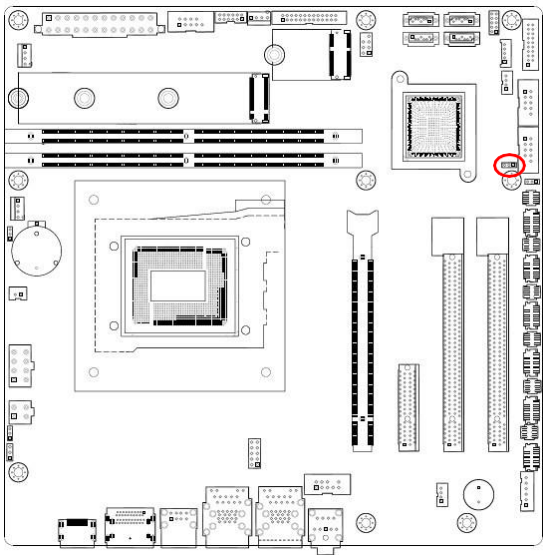
2.3.3 COM POWER SETTING (JCOMPWR1~6)



\* Default

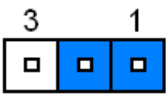


2.3.4 PCIe Selection (PCISEL)

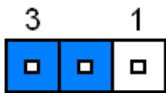


\* Default

For E key M.2

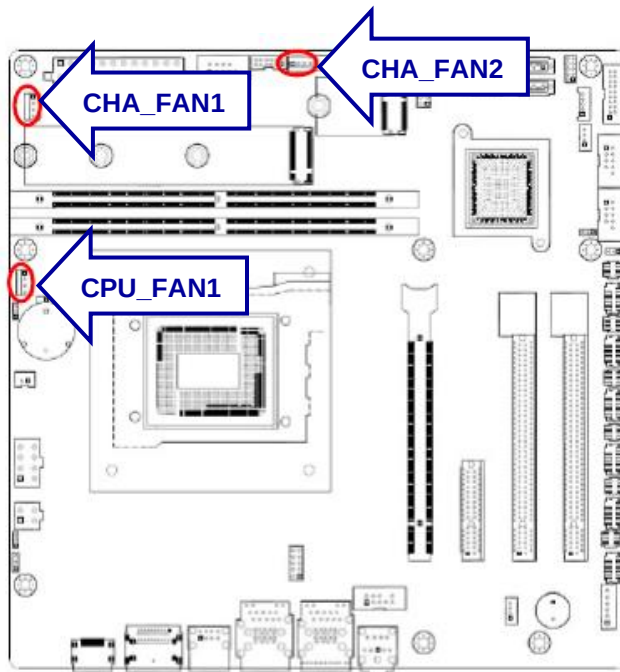


For PCIE slot\*



**Note:**  
PCIe x 1 slot4 share same PCIe x1 signal with M.2 E Key slot

### 2.3.5 CPU and System fan connectors (CPU\_FAN1, CHA\_FAN1, CHA\_FAN2)



#### CPU\_FAN1



- 1.GND
- 2.+V12
- 3.FAN\_SPEED1
- 4.FAN\_PWM1

#### CHA\_FAN1



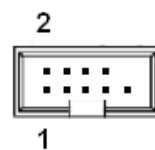
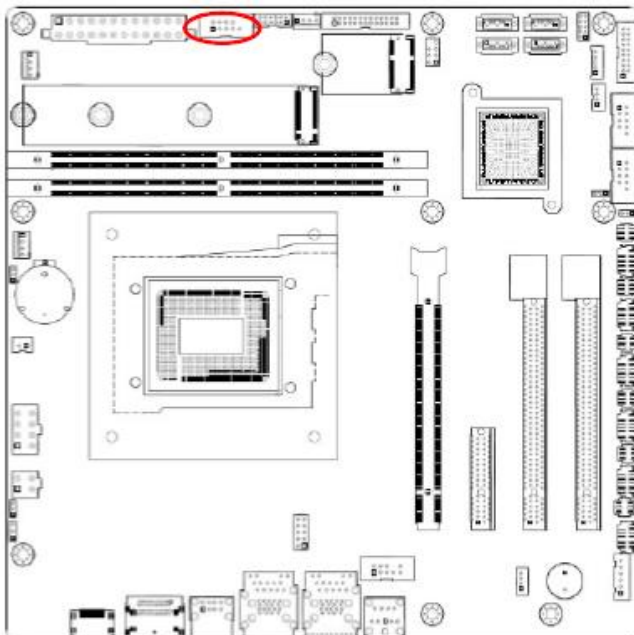
- 1.GND
- 2.+V12
- 3.FAN\_SPEED2
- 4.FAN\_PWM2

#### CHA\_FAN2



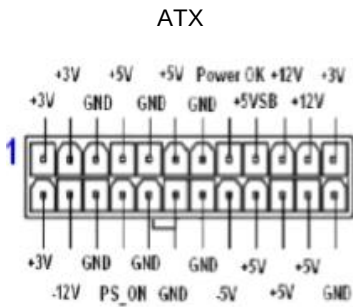
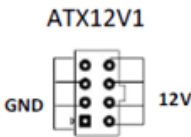
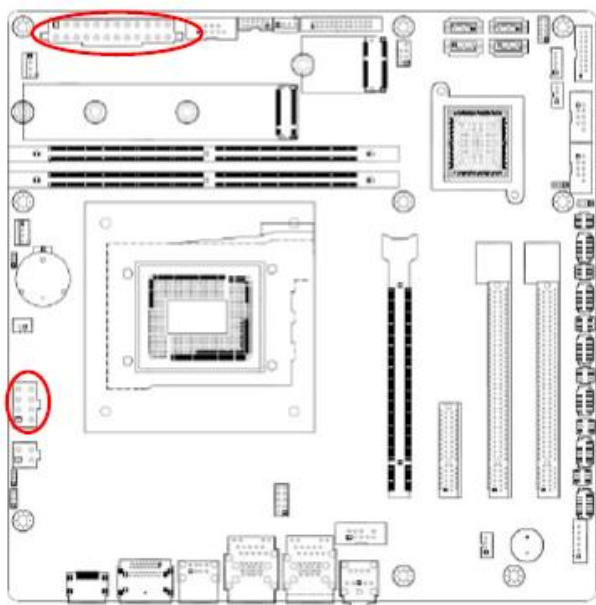
- 1.GND
- 2.+V12
- 3.FAN\_SPEED3
- 4.FAN\_PWM3

### 2.3.6 System Panel (F\_PANEL)

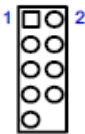
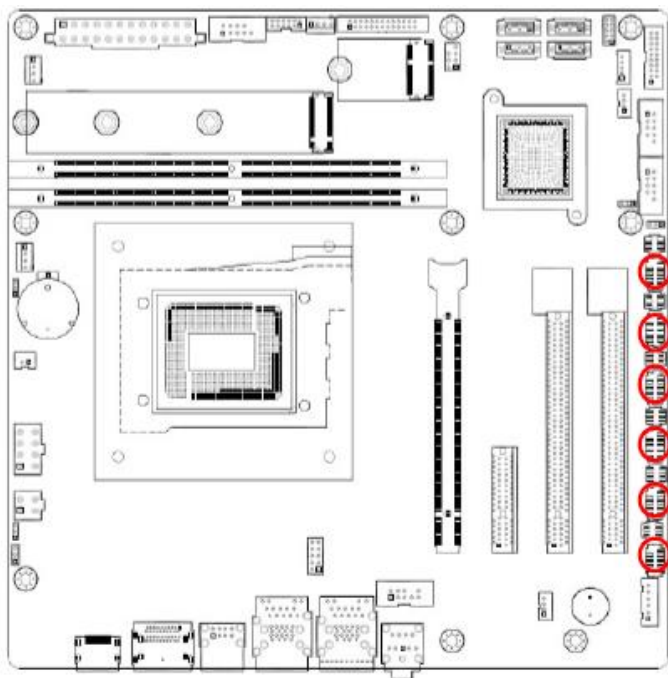


- |            |                |
|------------|----------------|
| 1.HDD LED+ | 2.PWR LED+     |
| 3.HDD LED- | 4.PWR LED-     |
| 5.GND      | 6.Power Button |
| 7.RST      | 8.GND          |
| 9.NA       |                |

2.3.7 ATX power connectors (EATXPWR1 & ATX12V1)

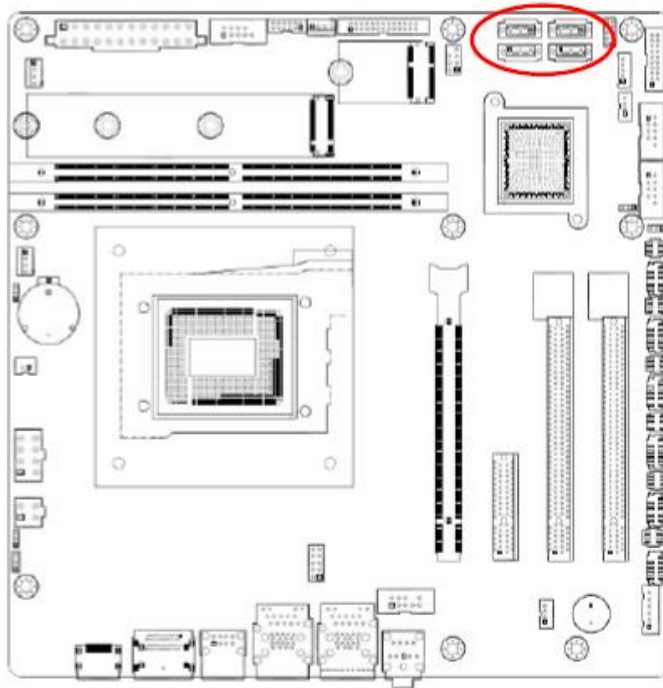


2.3.8 Serial Port connectors (COM1~6)



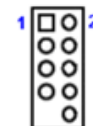
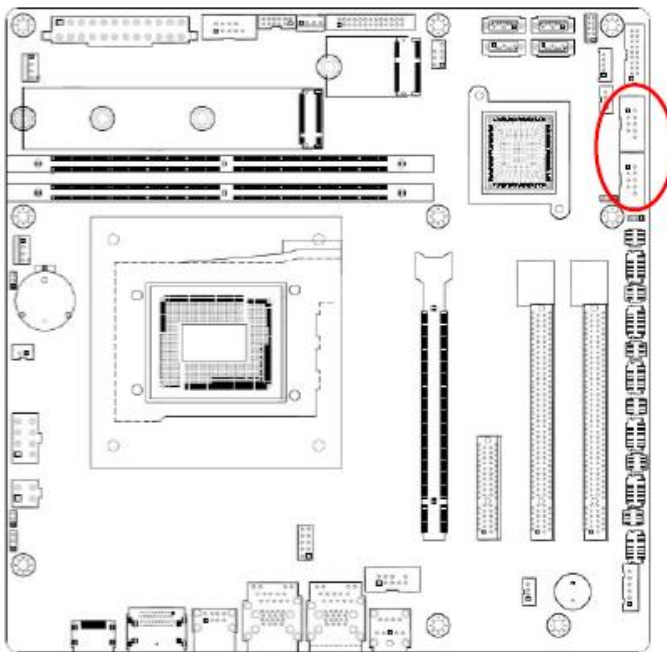
- |                  |         |
|------------------|---------|
| 1. DCD#          | 2. RX   |
| 3. TX            | 4. DTR# |
| 5. GND           | 6. DSR# |
| 7. RTS#          | 8. CTS# |
| 9. RI3xPOWERxJMP |         |

### 2.3.9 Serial ATA Connector (SATA1~4)



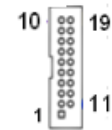
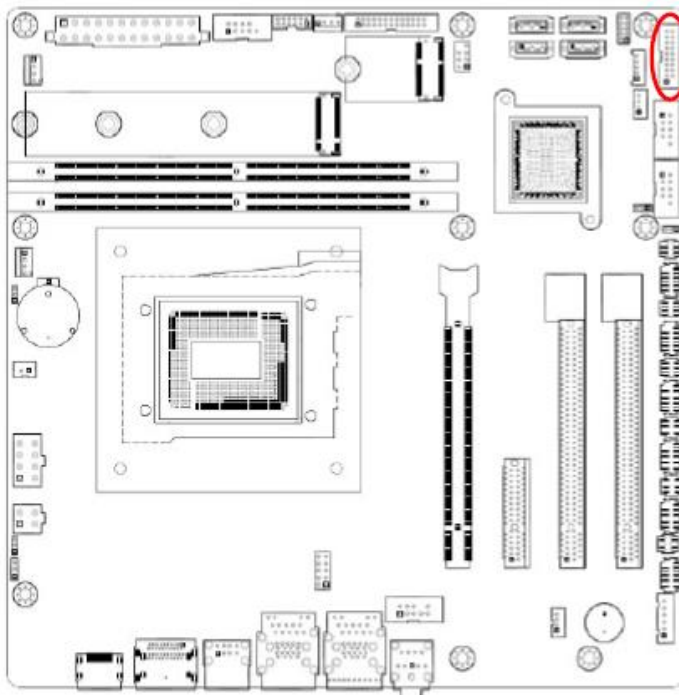
1. GND
2. TX+
3. TX-
4. GND
5. RX-
6. RX+
7. GND

### 2.3.10 USB connectors (USB910, USB1112)



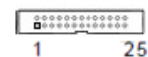
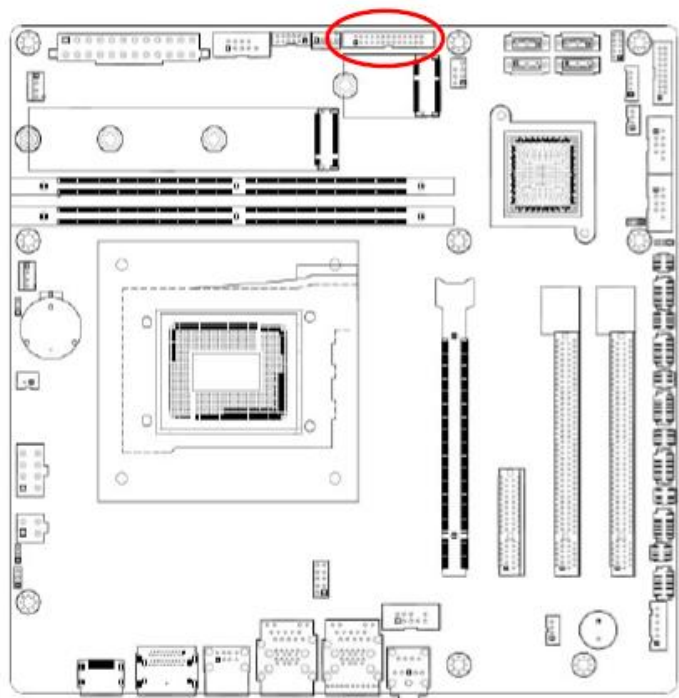
- |          |          |
|----------|----------|
| 1.USB+5V | 2.USB+5V |
| 3.USB-   | 4.USB-   |
| 5.USB+   | 6.USB+   |
| 7.GND    | 8.GND    |
|          | 10.NC    |

### 2.3.11 USB3.2 connector (USB78)



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

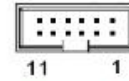
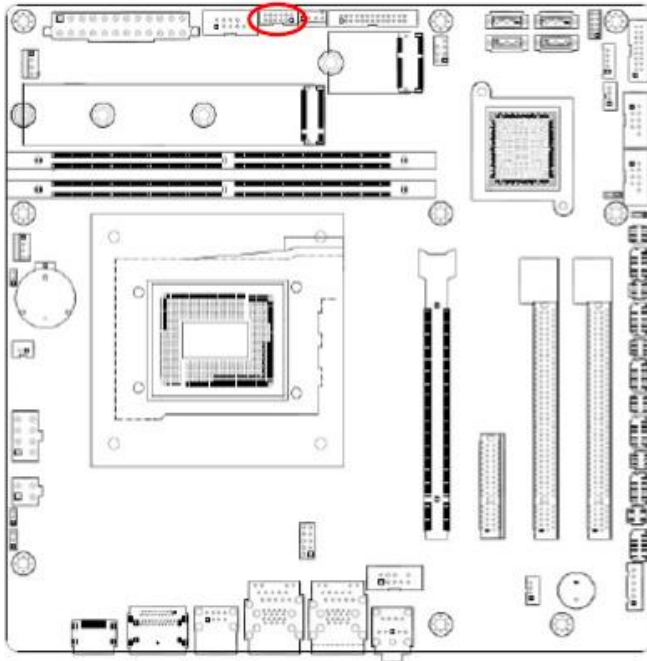
### 2.3.12 LPT Port Connector (LPT1)



|              |              |
|--------------|--------------|
| 1. LPT_STB#  | 2. LPT_AFD#  |
| 3. LPT_PD0   | 4. LPT_ERR#  |
| 5. LPT_PD1   | 6. LPT_INIT# |
| 7. LPT_PD2   | 8. LPT_SLIN# |
| 9. LPT_PD3   | 10. GND      |
| 11. LPT_PD4  | 12. GND      |
| 13. LPT_PD5  | 14. GND      |
| 15. LPT_PD6  | 16. GND      |
| 17. LPT_PD7  | 18. GND      |
| 19. LPT_ACK# | 20. GND      |
| 21. LPT_BUSY | 22. GND      |
| 23. LPT_PE   | 24. GND      |
| 25. LPT_SLCT | 26. NC       |

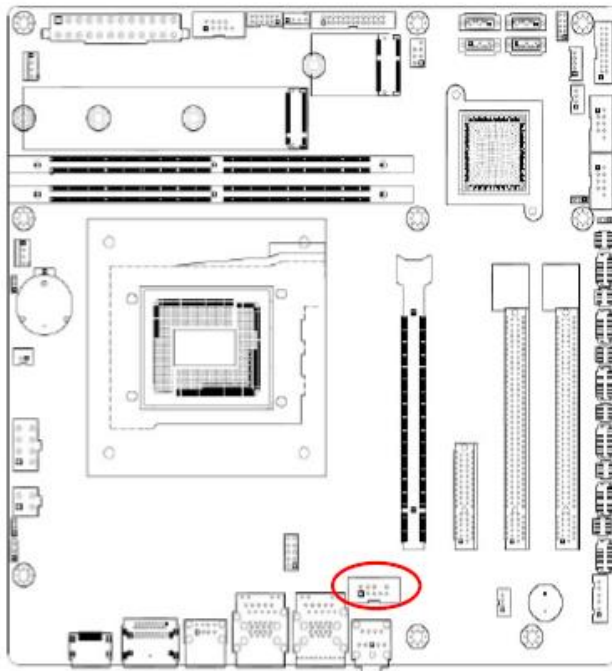


### 2.3.13 8-bit GPIO header (JDIO1)



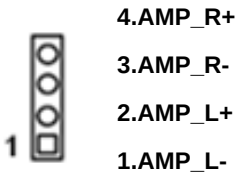
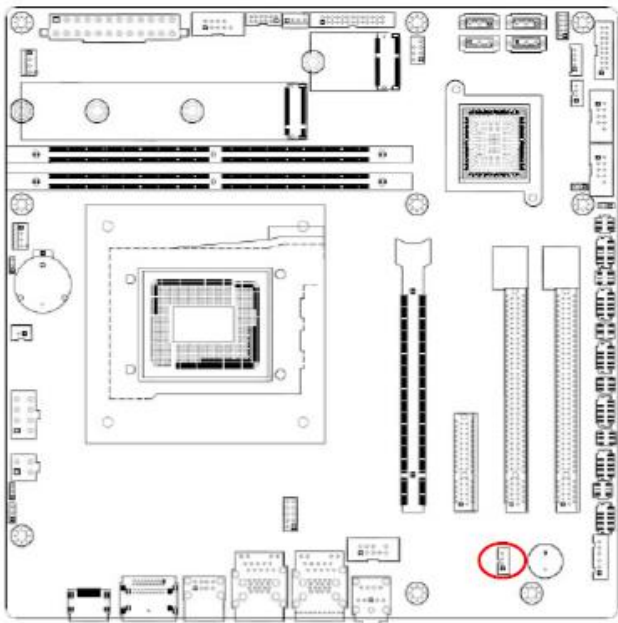
- |              |              |
|--------------|--------------|
| 1. SIO_GPIO0 | 2. SIO_GPIO4 |
| 3. SIO_GPIO1 | 4. SIO_GPIO5 |
| 5. SIO_GPIO2 | 6. SIO_GPIO6 |
| 7. SIO_GPIO3 | 8. SIO_GPIO7 |
| 9. SMB_CLK_  | 10. SMB_DATA |
| 11. GND      | 12. +5Vsb    |

### 2.3.14 Front Audio connector (FP\_AUDIO1)

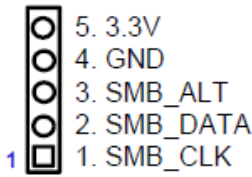
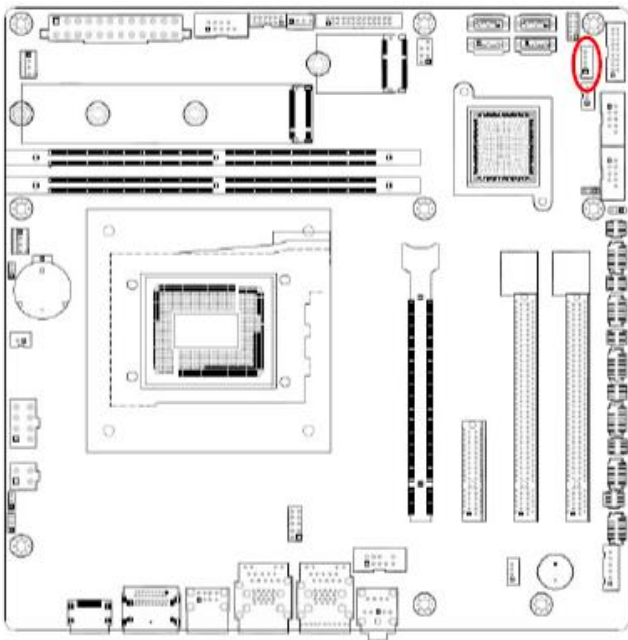


- |           |              |
|-----------|--------------|
| 1. MIC2L  | 2. GND       |
| 3. MIC2R  | 4. +3.3V     |
| 5. LINE2R | 6. MIC2-JD   |
| 7. SENSEB | 8. NC        |
| 9. LINE2L | 10. LINE2-JD |

2.3.15 Amplifier Connector (JAMP1)

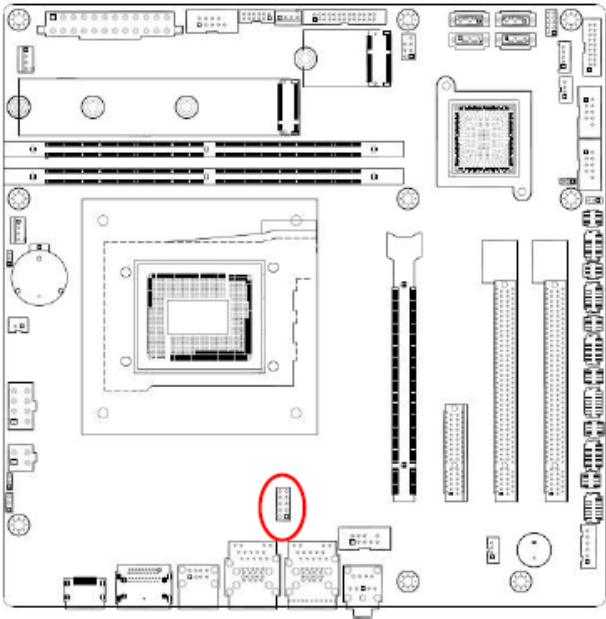


2.3.16 SM bus connector (SMB1)



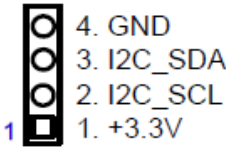
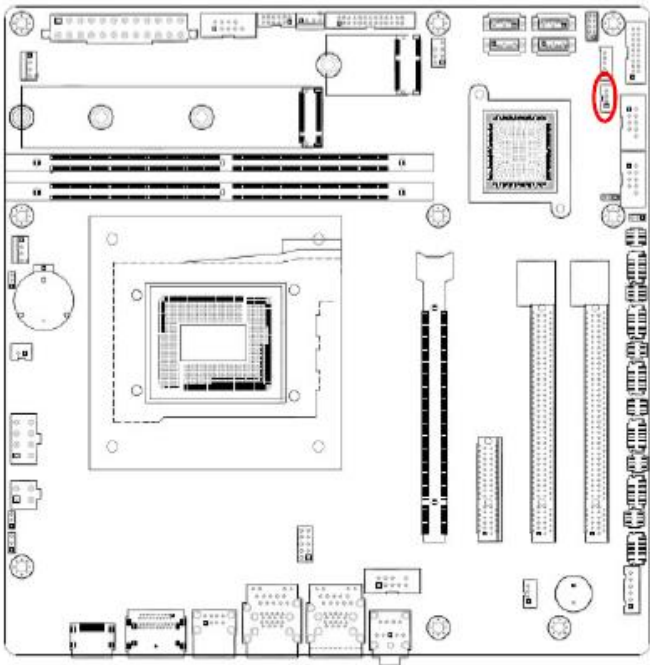


2.3.17 LAN LED status connector (LANLED1)



| LAN2 LED                                  |     | LAN1 LED |                                          |
|-------------------------------------------|-----|----------|------------------------------------------|
| Signal                                    | PIN | PIN      | Signal                                   |
| G+ (LED+ for Action)                      | 10  | 9        | G+ (LED+ for Action)                     |
| GND                                       | 8   | 7        | GND                                      |
| O+( Dual color LEDB2+<br>for Speed 2500M) | 6   | 5        | O+(Dual color LEDA2+<br>for Speed 1000M) |
| GND                                       | 4   | 3        | GND                                      |
| G+ (Dual color LEDB1+<br>for Speed 1000M) | 2   | 1        | G+ (Dual color LEDA1+<br>for Speed 100M) |

2.3.18 I2C header (I2C1)



## 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 <Del> or <F2> immediately after switching the system on, or

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

**Press <Del> 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<br>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

When you enter the BIOS, the following screen appears. The BIOS menu screen displays the items that allow you to make changes to the system configuration. To access the menu items, press the up/down/right/left arrow key on the keyboard until the desired item is highlighted, then press [Enter] to open the specific 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 Language

This option allows choosing the system default language.

#### 3.6.1.2 System Date

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

#### 3.6.1.3 System Time

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

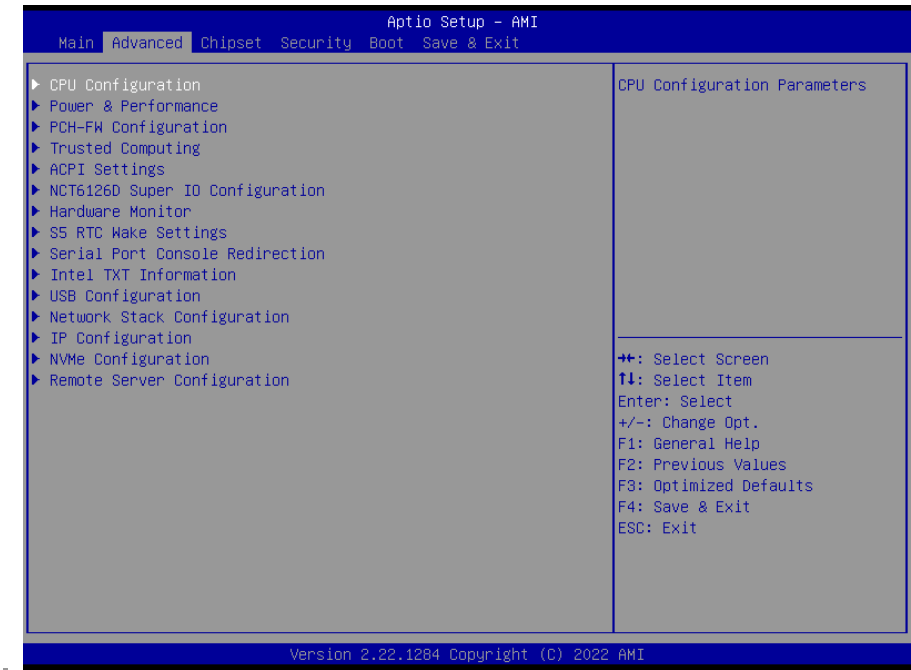


**Note:** The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.

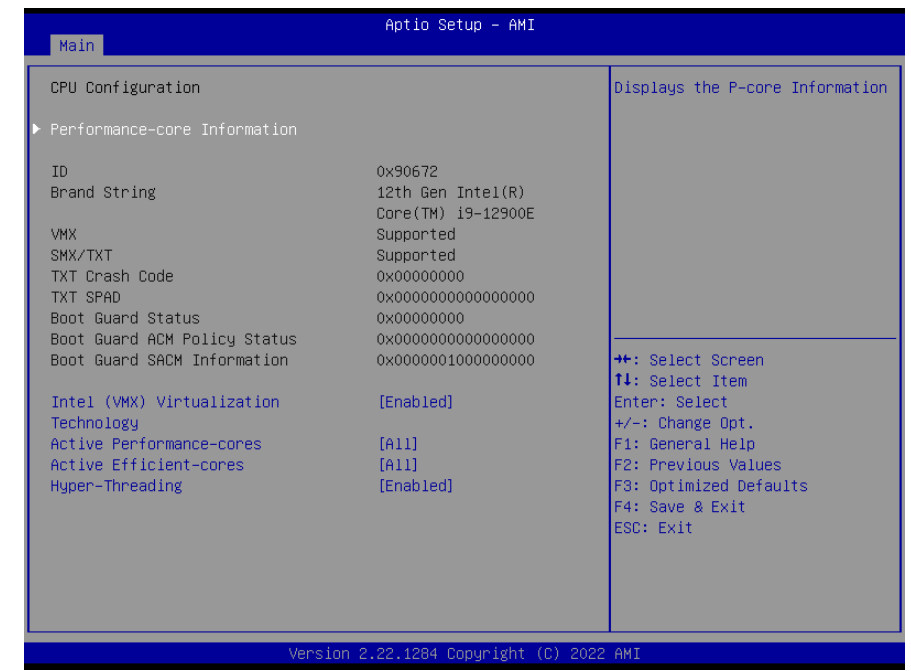
Visit the Avalue website ([www.avalue.com](http://www.avalue.com)) to download the latest product and BIOS information.

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



● Intel (VMX) Virtualization Technology[Enabled]

When enabled, a VMX can utilize the additional hardware compatibilities provided by Vanderpool Technology  
Configuration options: [Enable] [Disable]

● Active Performance –Cores



Number of P-core to enable in each processor package

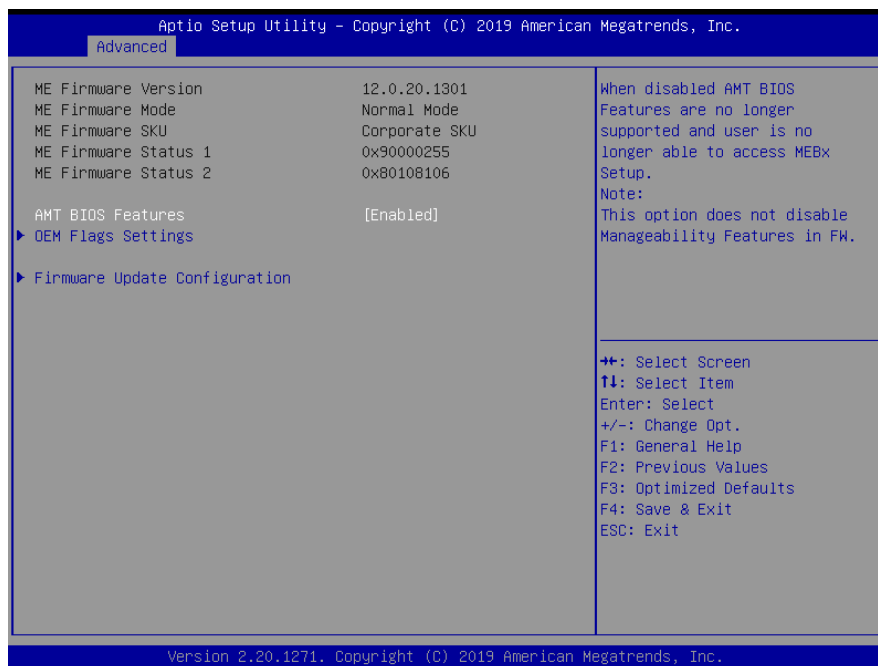
- **Active Efficient-cores**

Number of E-core to enable in each processor package

- **Hyper-Threading**

Enable or disable Hyper-Threading technology Configuration options:  
[Enable] [Disable]

### 3.6.2.2 Power & Performance



- **Intel® Speedstep™ [Enabled]**

Allow more than two frequency range to be supported Configuration options: [Enable] [Disable]

- **Turbo Mode**

Enable or Disable processor Turbo mode Configuration options:  
[Enable] [Disable]

- **C states**

Enable/Disable CPU power management. Allows CPU to go to C states when it's not 100% utilized

Configuration options: [Enable] [Disable]

- **Enhance C states**

When enabled, CPU will switch to minimum speed when all cores enter C state  
Configuration options: [Enable] [Disable]

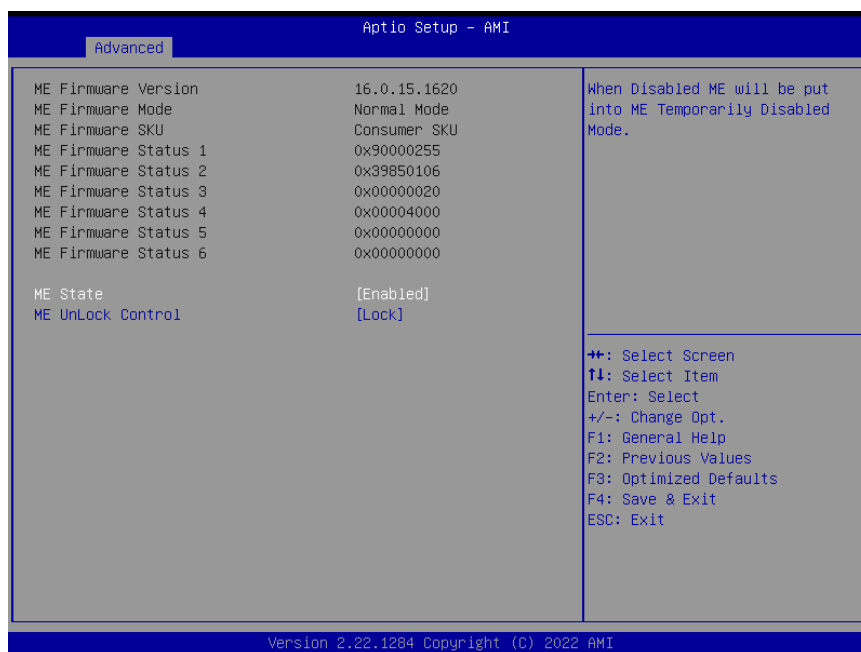
- **Package C state limit**

**Maximum package C state limit setting. CPU default: Leaves to factory default value**

Configuration options: [C0/C1] [C2] [C3]

### 3.6.2.3 PCH-FW configuration

Configure Management Engine Technology Parameters



- **ME State [Enabled]**

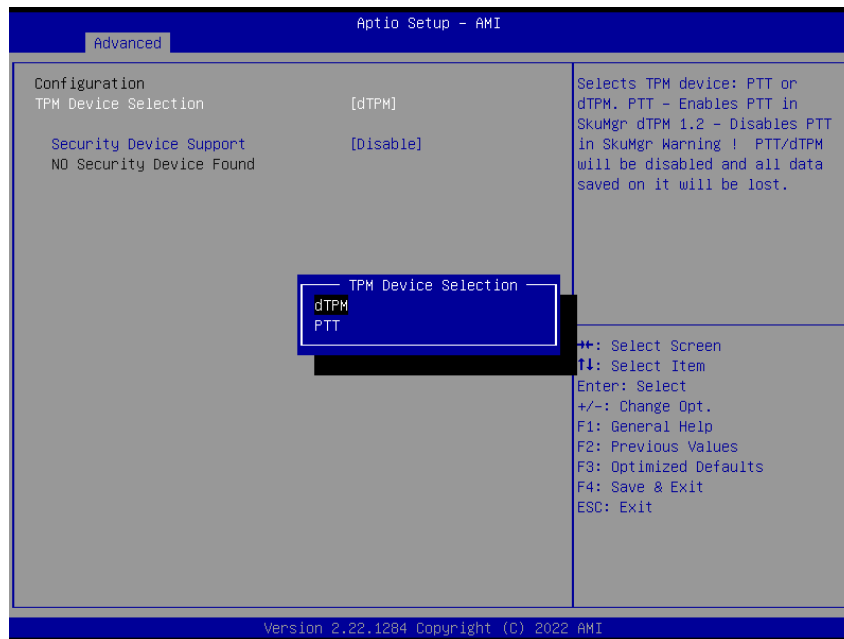
When disabled ME will be put into ME temporarily disabled mode  
Configuration options: [Enable] [Disable]

- **ME unlock control [Lock]**

When it is Set to unlock, system will shut down for active function  
Configuration options: [Lock] [Unlock]

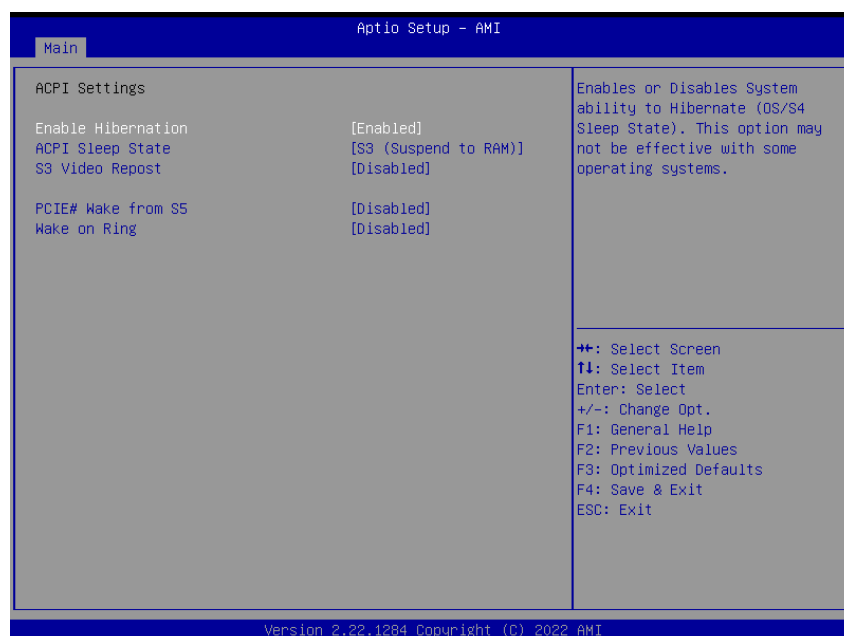
### 3.6.2.4 Trusted Computing

#### Security device settings



- **TPM Device Selection [dTPM]**  
Select TPM device  
Configuration options: [dTPM] [PTT]
- **Security Device support [Disabled]**  
Enable or Disable BIOS support security device  
Configuration options: [Enable] [Disable]

### 3.6.2.5 ACPI Settings



- **Enable Hibernation [Enable]**

Enable or Disable system ability to Hibernation.

Configuration options: [Enable] [Disable]

- **ACPI Sleep State [S3 only (Suspend to RAM)]**

Select the highest ACPI sleep state the system will enter the SUSPEND button is press.

Configuration options: [Suspend Disable] [S3 (suspend to RAM)]

- **S3 Video Repost [Disabled]**

Enable or disable S3 video repost

Configuration options: [Disabled] [Enabled]

- **PCIe# wake from S5 [Disabled]**

Enable or disable PCIe wake the system from S5.

Configuration options: [Disabled] [Enabled]

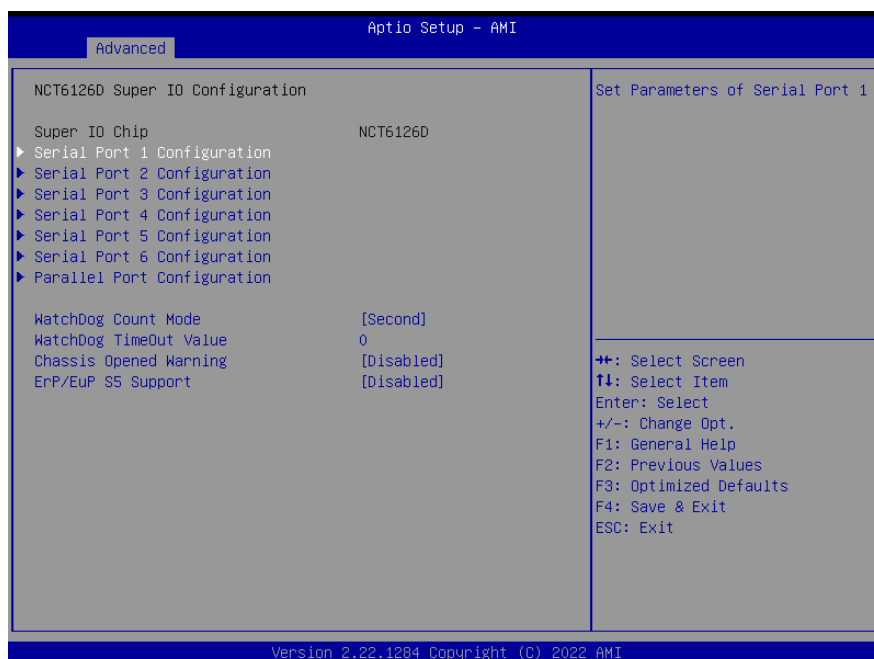
- **Wake on Ring [Disabled]**

Enable or disable wake on ring function under ACPI S3/S4/S5.

Configuration options: [Disabled] [Enabled]

### 3.6.2.6 NCT6126D Super IO configuration

Provide NCT6126D super IO configuration settings

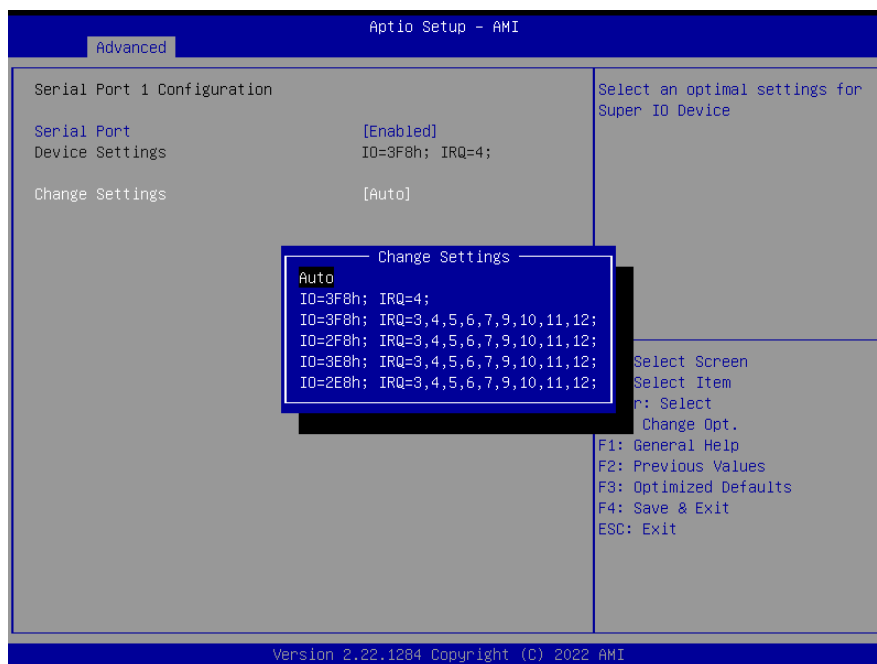


- **Enable Hibernation [Enable]**  
Enable or Disable system ability to Hibernation.
- **WatchDog count mode [Second]**  
WatchDog count mode Selection  
Configuration options: [Second] [Minute]
- **WatchDog Timeout value**  
Fill watchdog timeout value, 0 means disables
- **Chassis opened warning [Disabled]**  
Select chassis intrusion enabled to Disabled  
Configuration options: [Disabled] [Enabled]
- **ErP/EuP S5 Support [Disabled]**  
Configuration options: [Disabled] [Enabled]

#### 3.6.2.6.1 Serial Port 1 Configuration

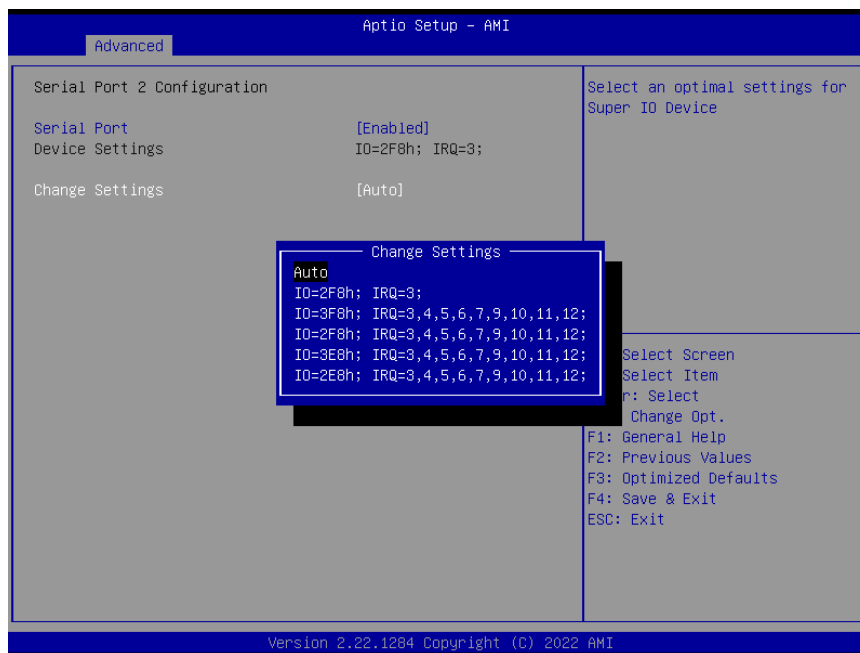


- **Serial Port [Enabled]**  
Enable or Disable serial Port (COM)  
Configuration options: [Disabled] [Enabled]
- **Change Setting [Auto]**  
Select an optimal settings for super IO device  
Configuration options: as below



### 3.6.2.6.2 Serial Port 2 Configuration

- **Serial Port [Enabled]**  
Enable or Disable serial Port (COM)  
Configuration options: [Disabled] [Enabled]
- **Change Setting [Auto]**  
Select an optimal settings for super IO device  
Configuration options: as below



### 3.6.2.6.3 Serial Port 3 Configuration

- **Serial Port [Enabled]**

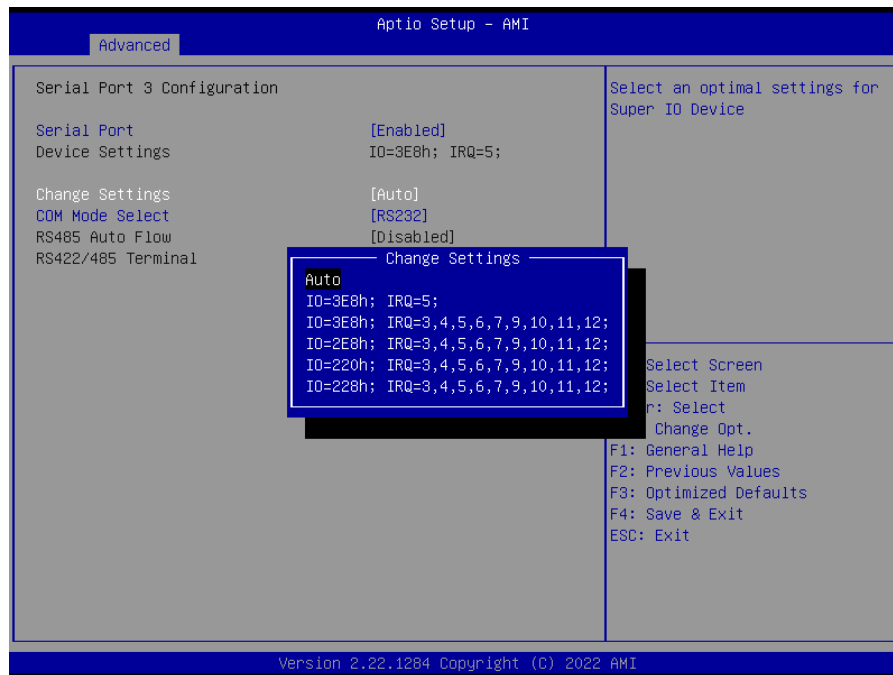
Enable or Disable serial Port (COM)

Configuration options: [Disabled] [Enabled]

- **Change Setting [Auto]**

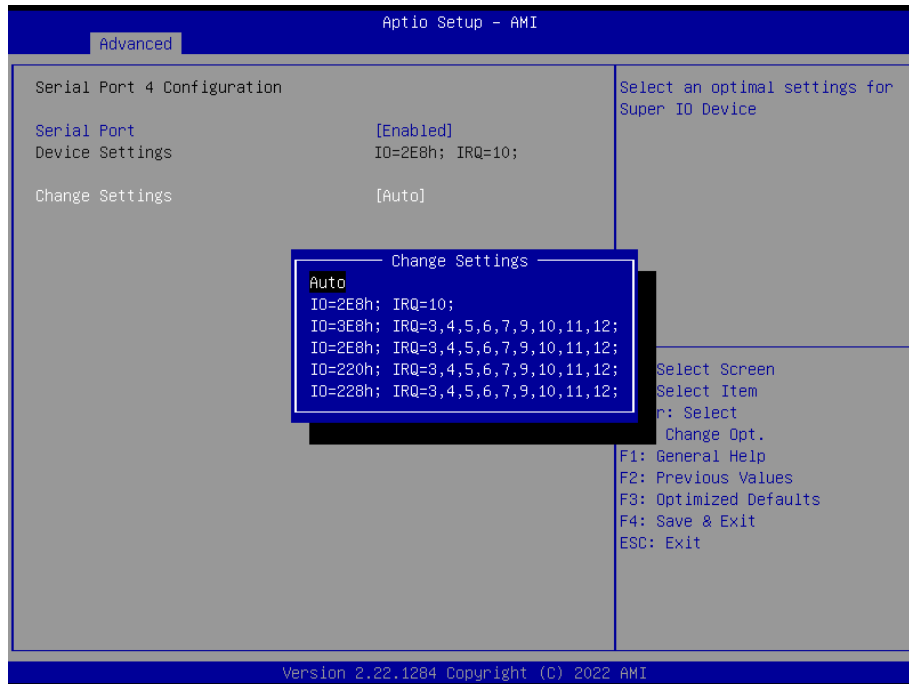
Select an optimal settings for super IO device

Configuration options: as below



### 3.6.2.6.4 Serial Port 4 Configuration

- **Serial Port [Enabled]**  
Enable or Disable serial Port (COM)  
Configuration options: [Disabled] [Enabled]
- **Change Setting [Auto]**  
Select an optimal settings for super IO device  
Configuration options: as below





### 3.6.2.6.5 Serial Port 5 Configuration

- **Serial Port [Enabled]**

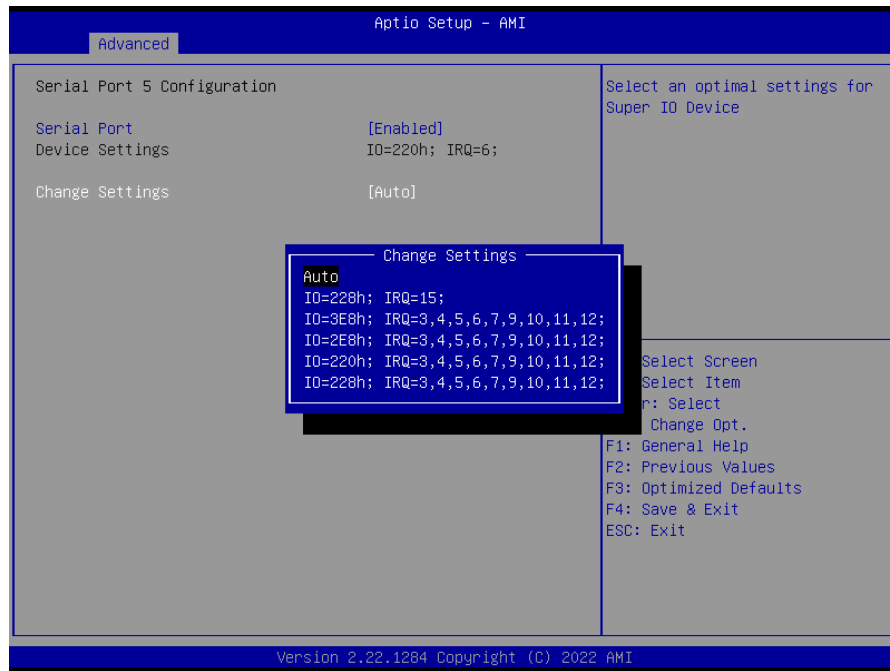
Enable or Disable serial Port (COM)

Configuration options: [Disabled] [Enabled]

- **Change Setting [Auto]**

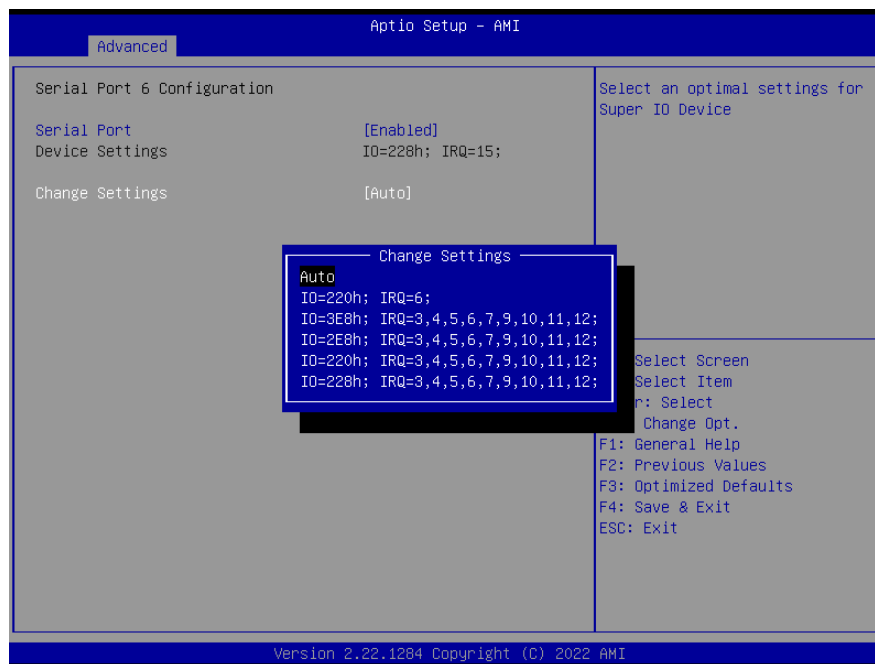
Select an optimal settings for super IO device

Configuration options: as below



### 3.6.2.6.6 Serial Port 6 Configuration

- **Serial Port [Enabled]**  
Enable or Disable serial Port (COM)  
Configuration options: [Disabled] [Enabled]
- **Change Setting [Auto]**  
Select an optimal settings for super IO device  
Configuration options: as below



### 3.6.2.6.7 Parallel Port Configuration

- **Parallel Port [Enabled]**

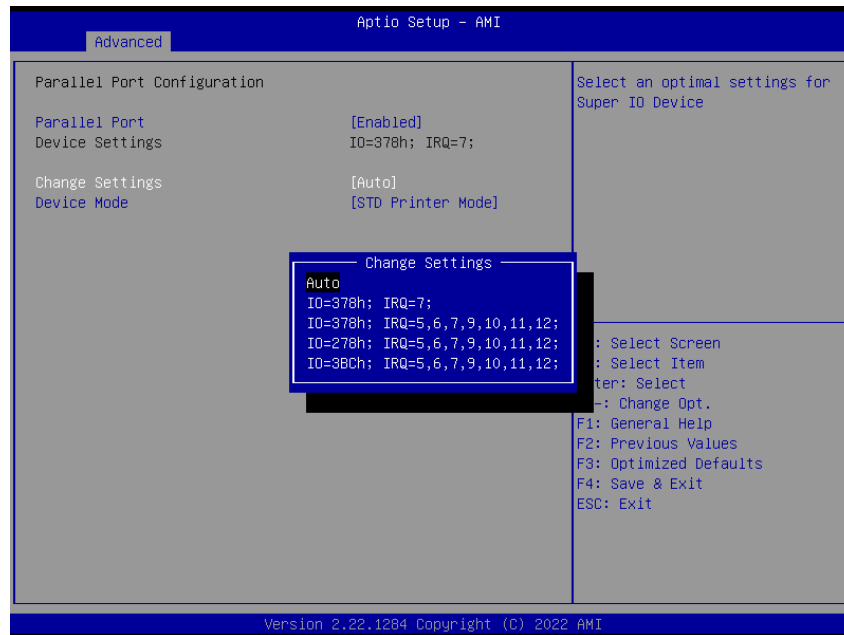
Enable or Disable parallel Port (LPT)

Configuration options: [Disabled] [Enabled]

- **Change Setting [Auto]**

Select an optimal settings for super IO device

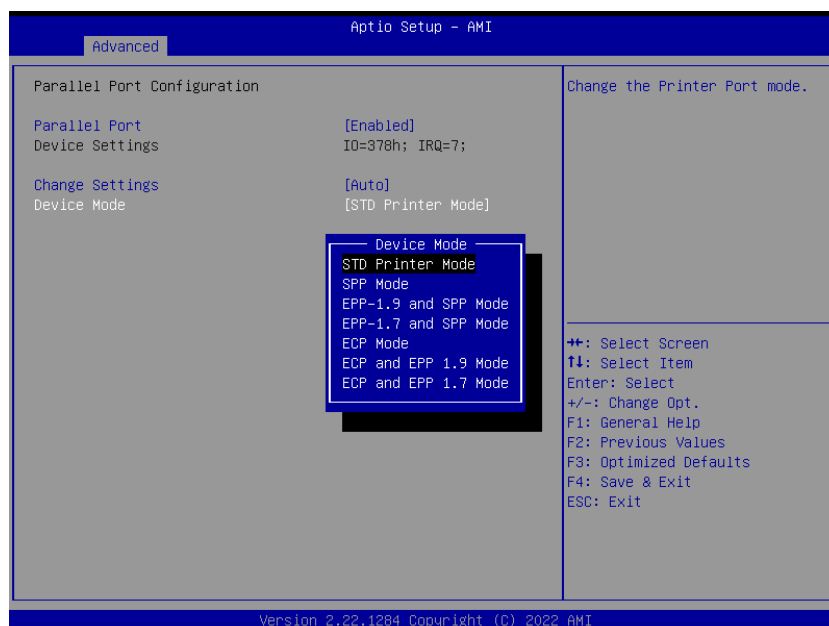
Configuration options: as below



- **Device mode [STD Printer Mode]**

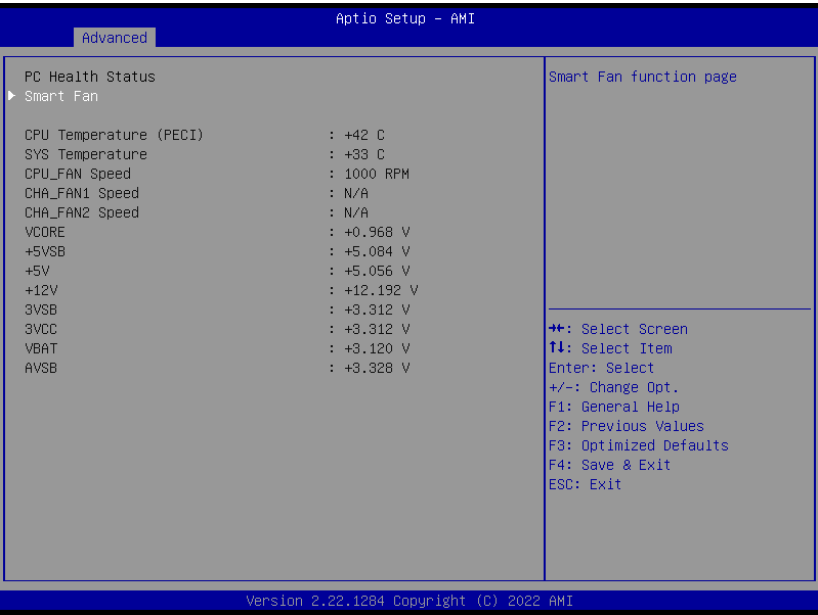
Change the printer port mode

Configuration options: as below

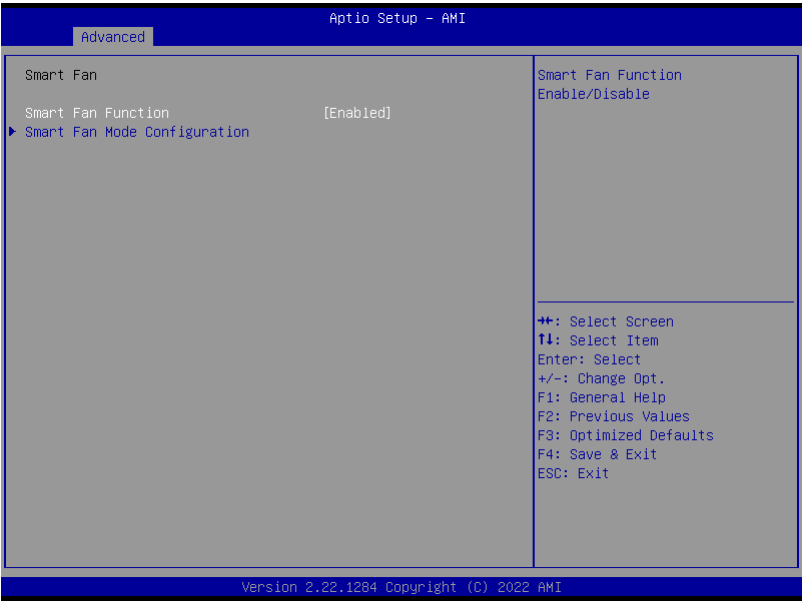


3.6.2.7 Hardware monitor

Display Hardware monitor information



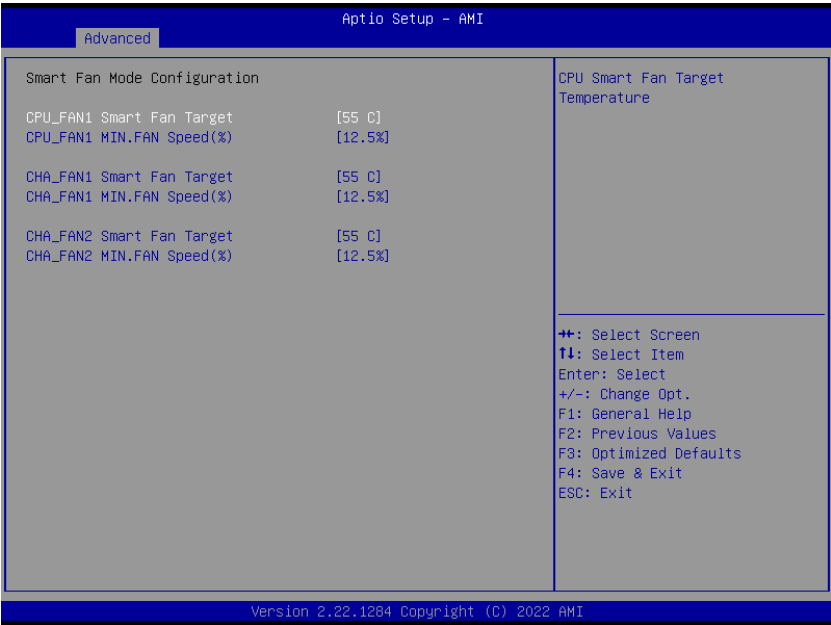
3.6.2.7.1 Smart FAN



- **Smart FAN Function [Enabled]**  
 Smart fan function Enable/Disabled  
 Configuration options: [Enabled] [Disabled][Manual]

3.6.2.7.1.1 Smart FAN mode Configuration

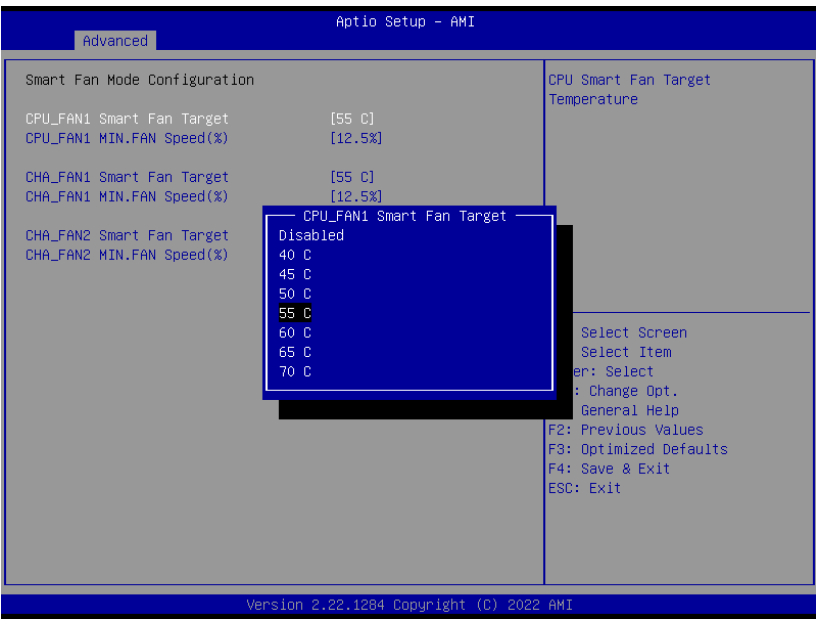
Setting different FAN on this motherboard



- **Smart FAN1/CPU\_FAN1/CHA\_FAN1 FAN Target**

Smart FAN target temperature

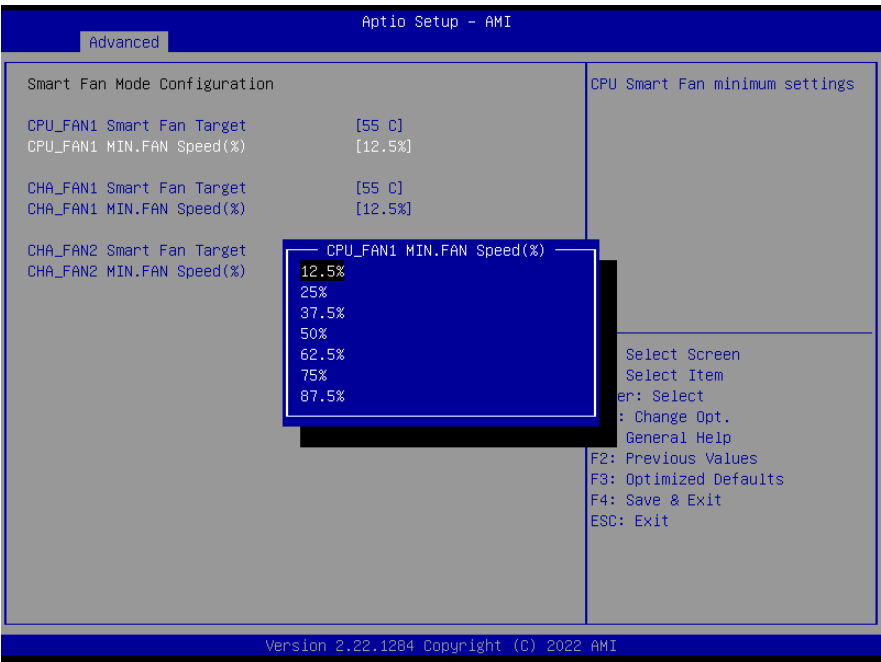
Configuration options: Please see below picture



- **CPU\_FAN1/CHA\_FAN1/CHA\_FAN2 MIN.FAN Speed (%)**

CPU or Chassis Smart FAN minimum settings

Configuration options: Please see below picture

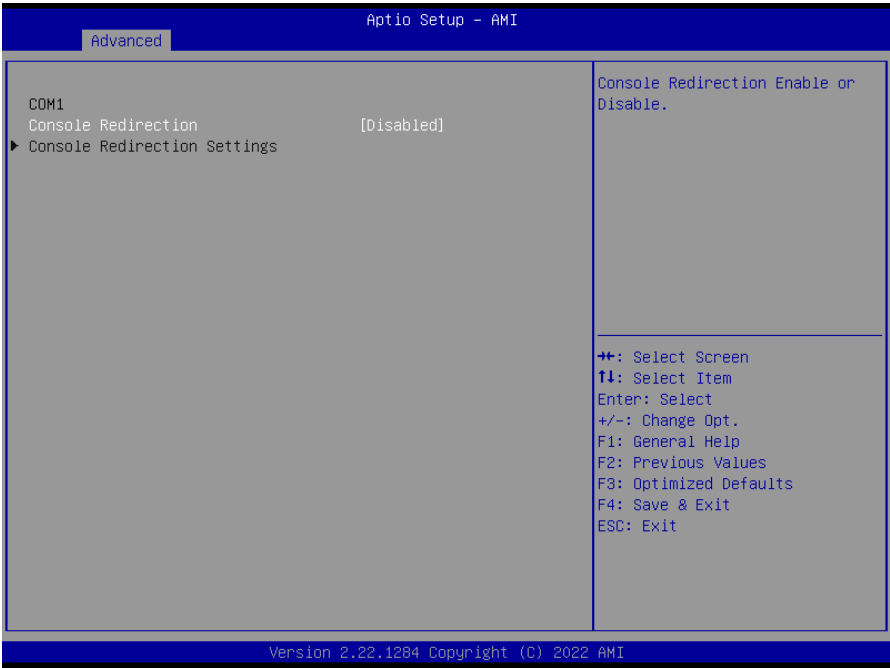


### 3.6.2.8 S5 RTC wake settings



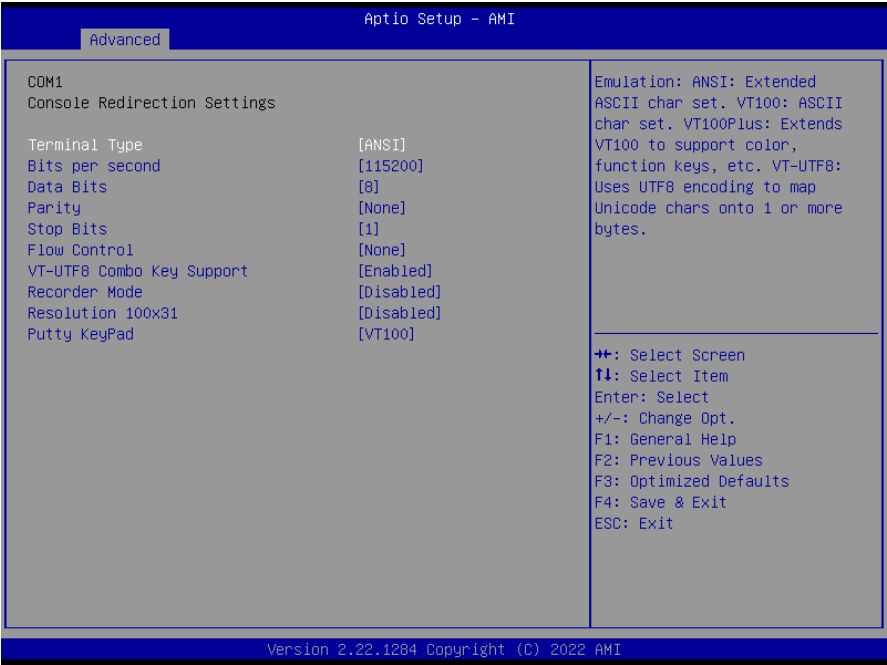
- Wake system from S5 [Disabled]**  
 Enabled or Disabled system wake on alarm event  
 Configuration options: [Enabled] [Disabled]

### 3.6.2.9 Serial Port Console Redirection



- **Console Redirection [Disabled]**  
Enabled or Disabled COM1 Console redirection  
Configuration options: [Disabled][Enabled]

#### 3.6.2.9.1 Console Redirection settings



- **Terminal Type[ANSI]**  
Select terminal type  
Configuration options: [VT100][VT100Plus][VT-UTF8][ANSI]
- **Bits per second[115200]**

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Select serial port transmission speed

Configuration options: [9600][19200][38400][57600][115200]

- **Bits per second[115200]** Select data bits

Configuration options: [7][8]

- **Parity[None]**

A parity bit can be sent with the data bits to detect some transmission errors

Configuration options: [None][Even][Odd][Mark][Space]

- **Stop Bits[1]**

Stop bits indicate the end of a serial data package

Configuration options: [1][2]

- **Flow Control[None]**

Flow control can prevent data loss from buffer overflow.

Configuration options: [None][Hardware RTS/CTS]

- **VT-UTF8 Combo key Support [Enabled]**

Enable VT-UTF8 combination key support for ANSI/VT100 terminals

Configuration options: [Enabled] [Disabled]

- **Recorder Mode [Disabled]**

With this mode enabled only text will be sent.

Configuration options: [Enabled] [Disabled]

- **Resolution 100x31 [Disabled]**

Enables or disables extended terminal resolution

Configuration options: [Enabled] [Disabled]

- **Putty Keypad [VT100]**

Selects function key and keypad on putty

Configuration options: [VT100] [LINUX][XTERMR6][SCO][ESCN][VT400]

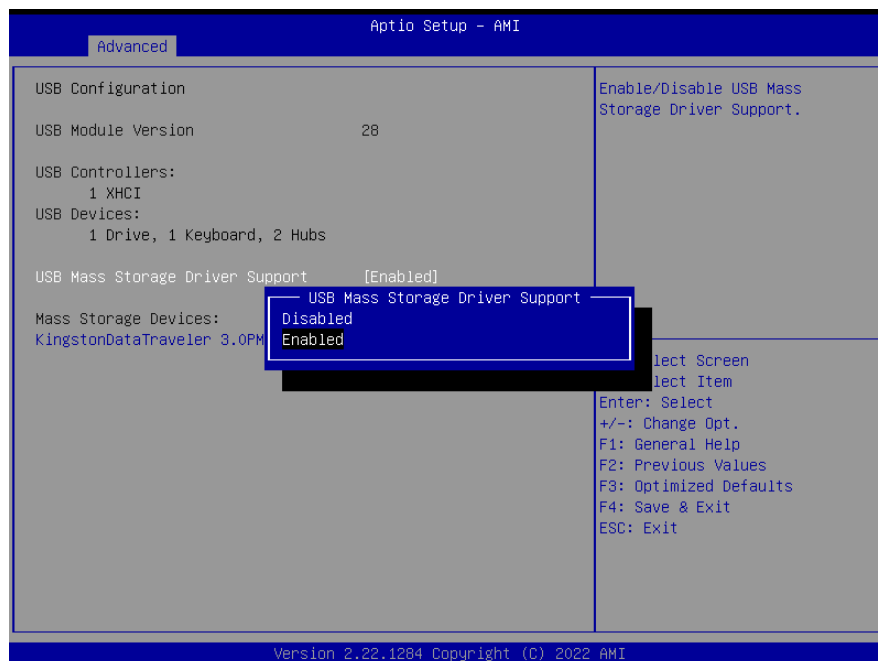


### 3.6.2.10 intel TXT information

Display Intel TXT information. This depends on CPU sku.



### 3.6.2.11 USB Configuration



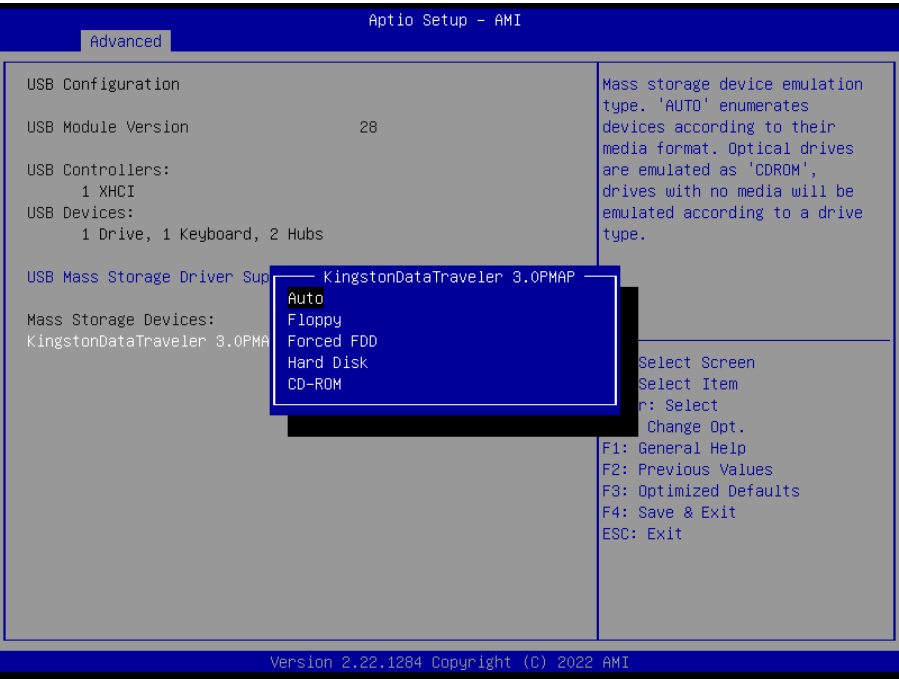
- **USB Mass Storage Driver Support [Enabled]**

Enable or Disable USB Mass Storage Driver Support

Configuration options: [Enabled][Disabled]

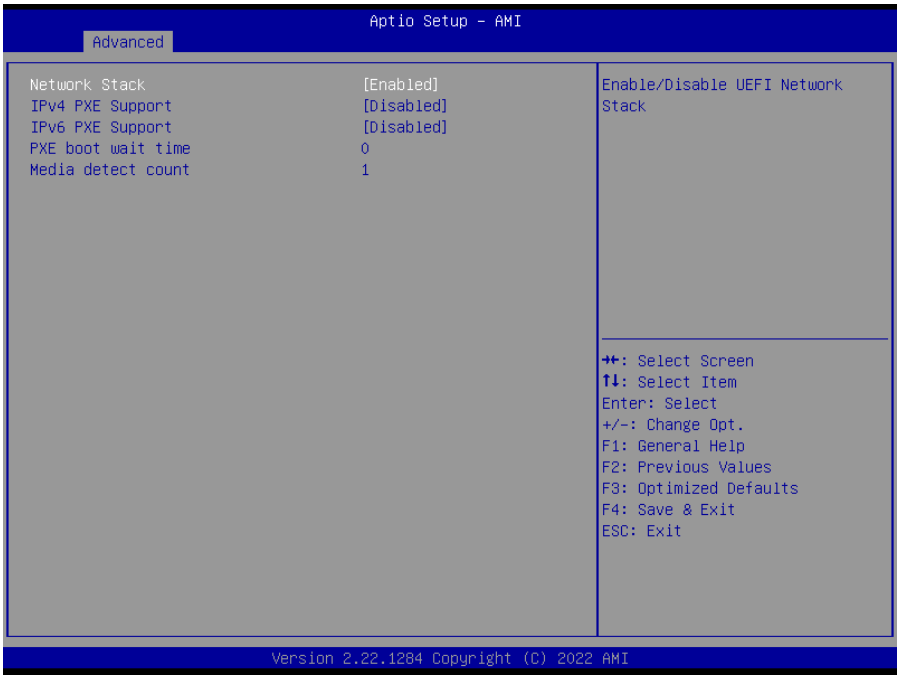
- **Mass Storage Devices [Auto]**

**Mass Storage device emulation Type. “Auto” enumerates device according to its media format**



### 3.6.2.12 Network Stack Configuration

#### Network Stack setting



- **Network Stack [Disabled]**  
Enabled/Disabled UEFI Network Stack  
Configuration options: [Enabled][Disabled]
- **IPv4 PXE Support [Disabled]**  
Enabled or disabled IPv4 PXE boot Support  
Configuration options: [Enabled][Disabled]

- **IPv6 PXE Support [Disabled]**

Enabled or disabled IPv6 PXE boot Support

Configuration options: [Enabled][Disabled]

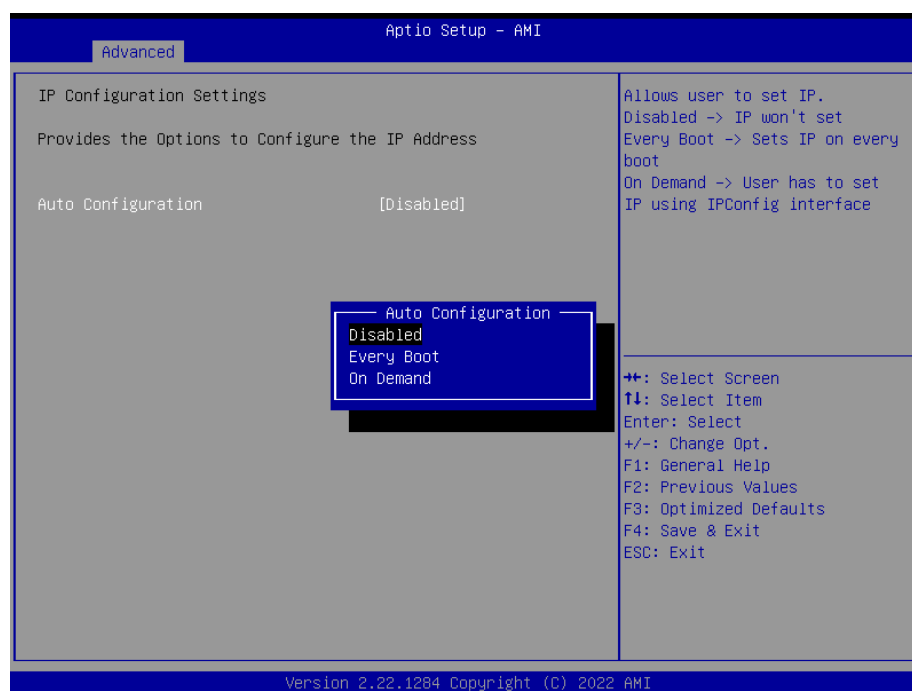
- **PXE boot wait time**

Wait time in seconds to press ESC key to abort the PXE boot.

- **Media detect count**

Number of time the presence of media will be checked

### 3.6.2.13 IP Configuration



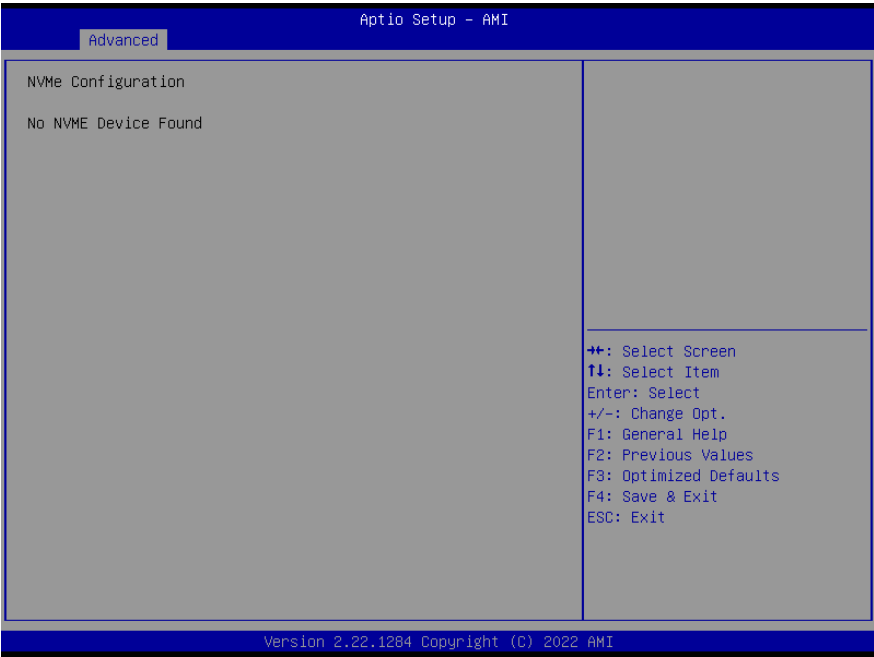
- **Auto Configuration[Disabled]**

Allow user to set IP. Disabled IP won't set Every Boot Sets IP on every boot

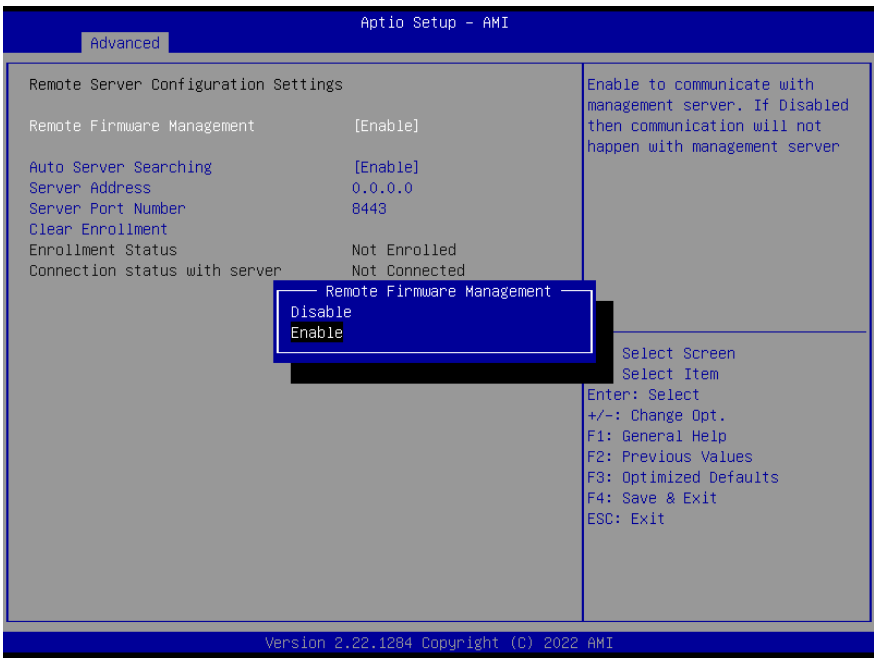
On demand User has to set IP using IPConfig interface.

3.6.2.14 NVMe Configuration

Display NVMe controller or Drive information



3.6.2.15 Remote Server Configuration



- **Remote Firmware Management [Enabled]**  
Enable to communicate with management server.  
Configuration options: [Disabled][Enabled]
- **Auto Server searching [Enabled]**  
Enabled to obtain DHCP server IP automatically. Disabled to provide Server IP manually. Need to do clear Enrolment, if server is changed to DHCP.  
Configuration options: [Disabled][Enabled]

3.6.3 Chipset



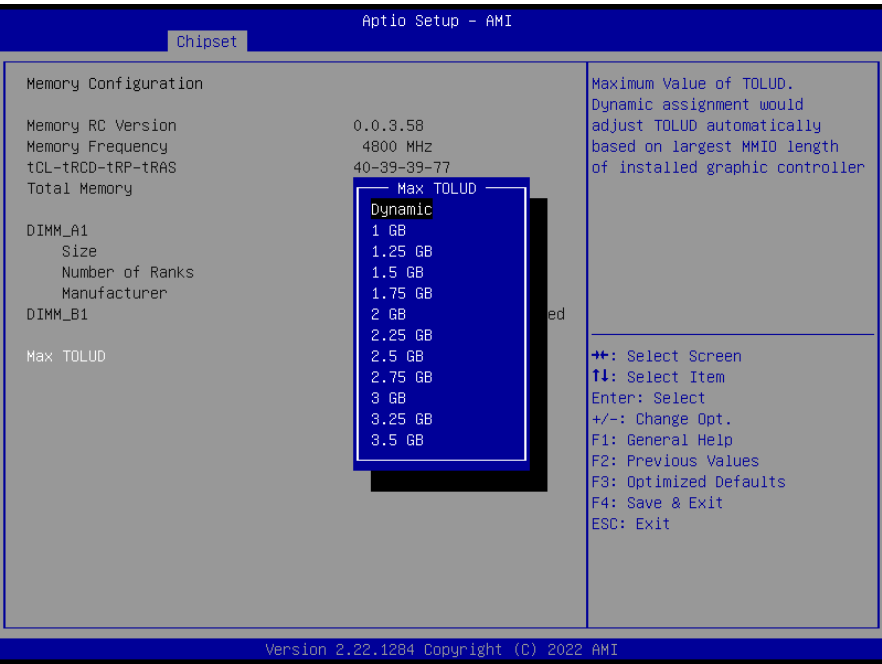
3.6.3.1 System Agent (SA) Configuration



- **VT-d [Enabled]**  
 VT-d capability  
 Configuration options: [Disabled] [Enabled]

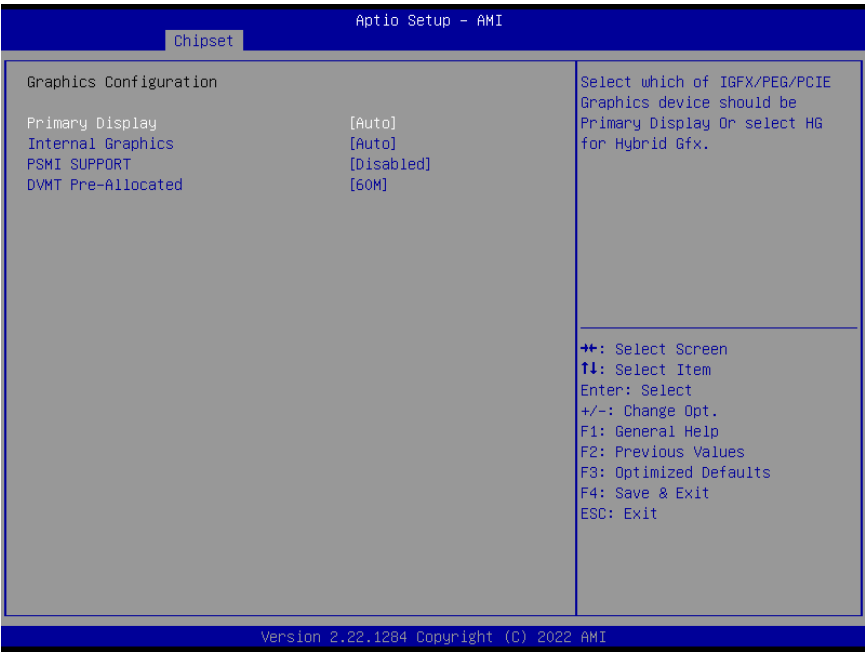
3.6.3.1.1 Memory Configuration

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

Graphic configuration settings



- **Primary Display [Auto]**

Select which of IGFX/PEG/PCIE graphic device should be primary display or select HG for Hybrid Gfx.

Configuration options: [Auto] [IGFX][PEG slot][PCIE]

- **Internal Graphics [Auto]**

Keep IGFX enabled based on the setup options

Configuration options: [Auto] [disabled][enabled]

- **PSMI Support [Disabled]**

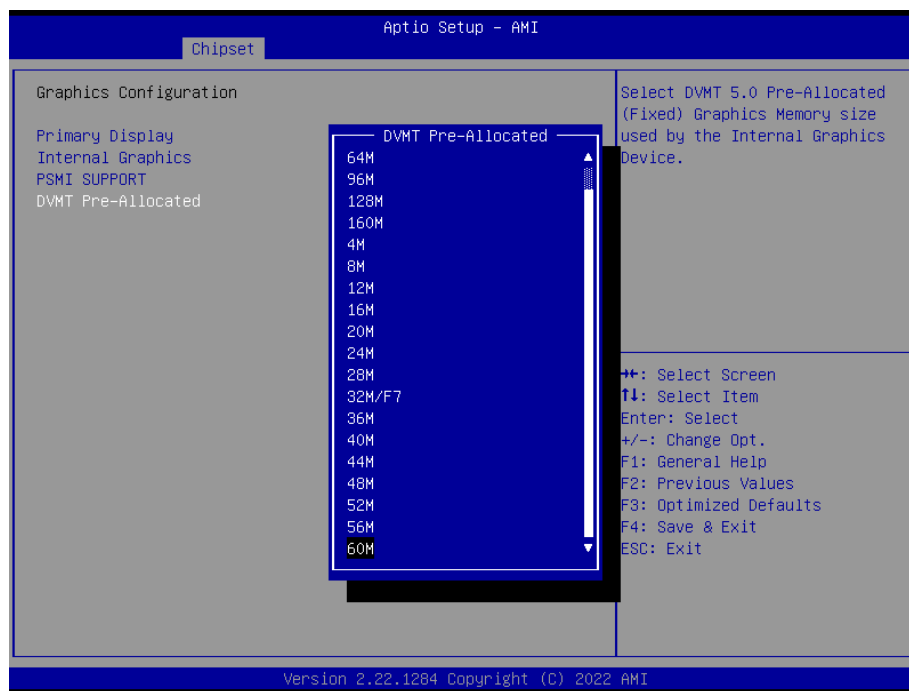
PSMI eabled/Disabled

Configuration options: [Disabled][Enabled]

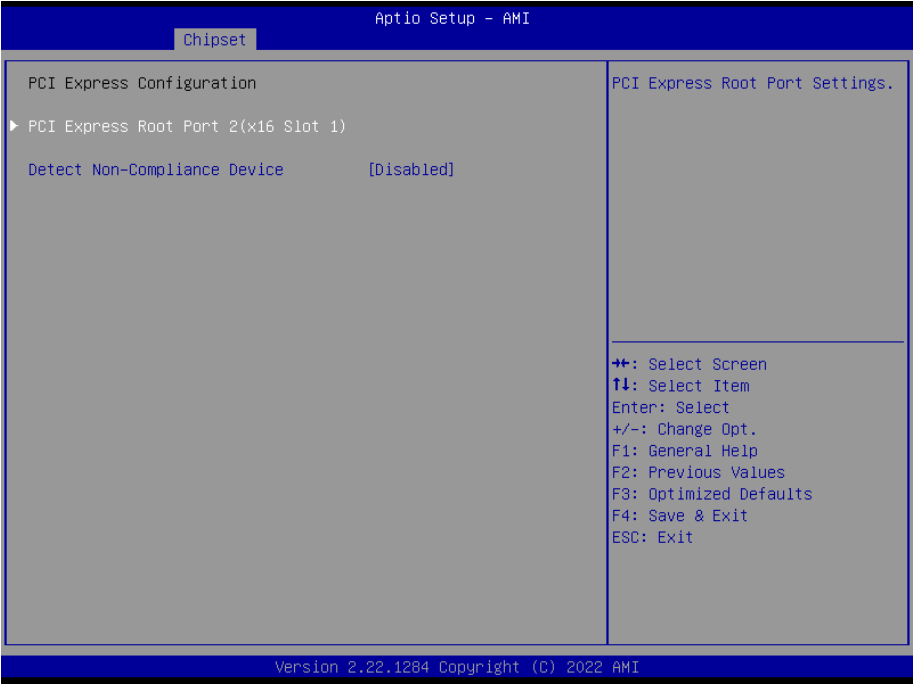
- **DVMT Pre-allocated [60M]**

Select DVMT 5.0 Pre-allocated (Fixed) Graphics memory size used by the internal graphics device.

Configuration options: As below picture



3.6.3.1.3 PCI Express Configuration

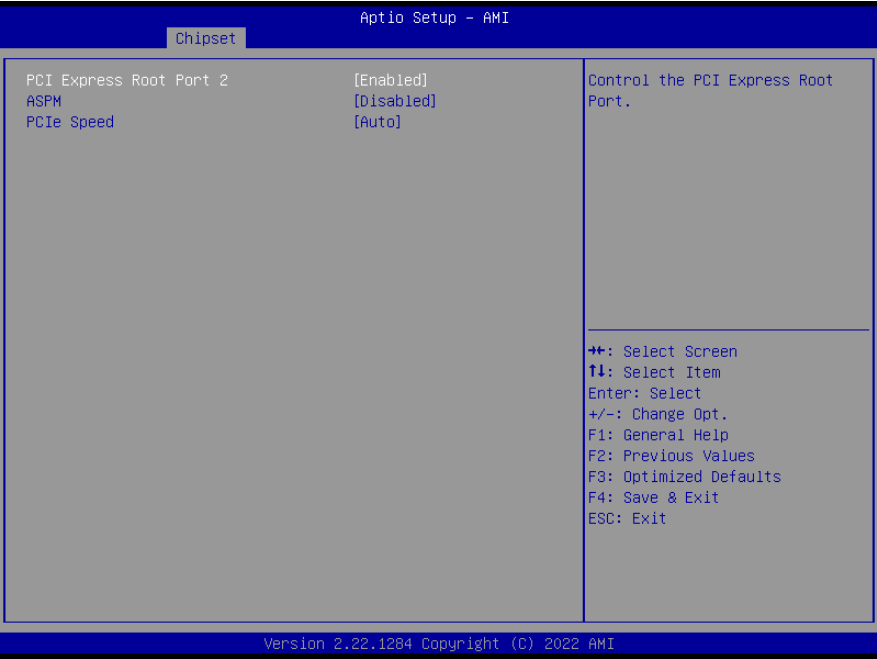


● Detect Non-compliance Device [Disabled]

Detect Non-compliance Device in PEG

Configuration options: [Disabled][Enabled]

3.6.3.1.3.1 PCI Express Root Port 2 (x16 slot1)





- **PCI Express Root Port 2[Enabled]**

Control the PCI express Root Port

Configuration options: [Disabled][Enabled]

- **ASPM [Disabled]**

Set the ASPM level

Configuration options: [Disaled] [L0S][L1][L0sL1]

- **PCIe Speed [Auto]**

Configure PCIe Speed

Configuration options: [Auto][Gen1][Gen2][Gen3][Gen4][Gen5]

### 3.6.3.2 PCH-IO Configuration



- **Lan1 Controller [Enabled]**

Enable or Disable onboard LAN1

Configuration options: [Disabled][Enabled]

- **Lan1 PXE OpROM [Disabled]**

Enabled or Disabled boot option for LAN1 controller

Configuration options: [Disabled][Enabled]

- **Wake on LAN Enabled [Disabled]**

Enable or Disable integrated LAN to wake the system

Configuration options: [Disabled][Enabled]

- **Lan2 Controller [Enabled]**

Enable or Disable onboard LAN2

Configuration options: [Disabled][Enabled]

- **Lan2 PXE OpROM [Disabled]**

Enabled or Disabled boot option for LAN2 controller

Configuration options: [Disabled][Enabled]

- **Flash Protection Range Registers(FPRR) [Disabled]**

Enabled Flash Protection Range Registers

Configuration options: [Disabled][Enabled]

- **GPIO Group Control [Disabled]**

Configure the digital GPIO pins

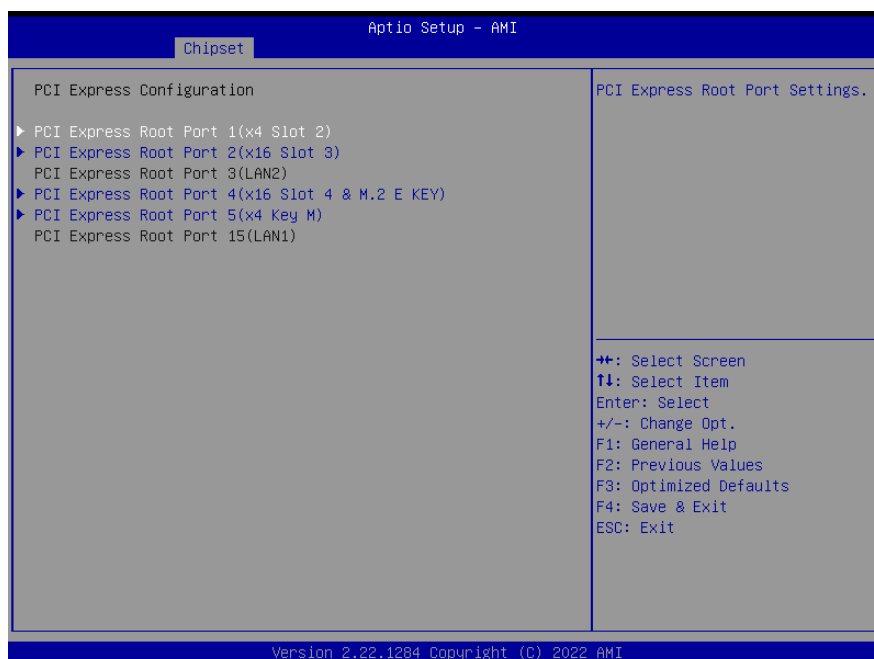
Configuration options: [Disabled][Enabled]

- **Amplifier GAIN(db) [15.3db]**

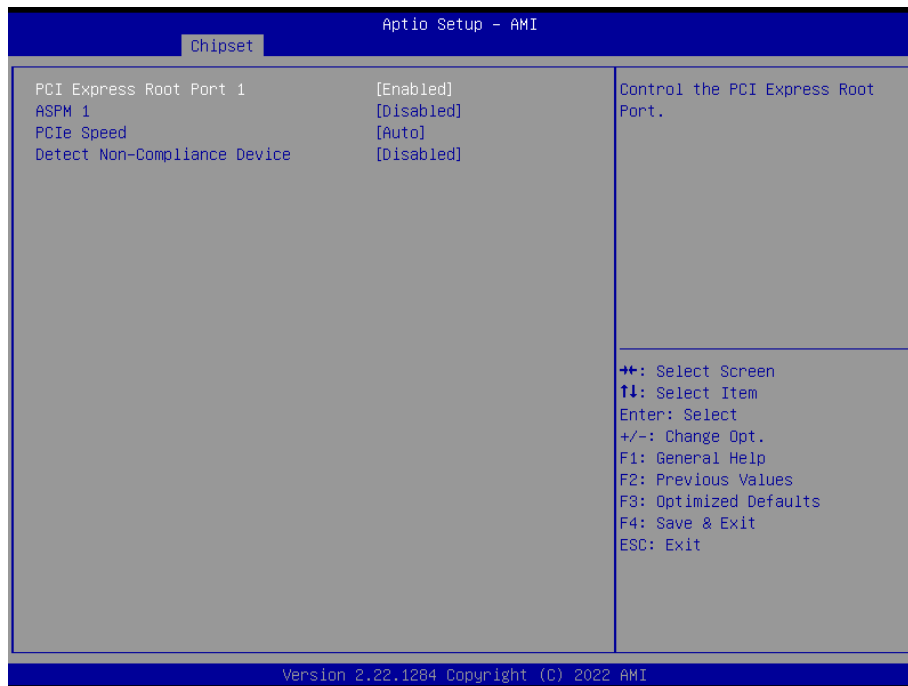
Select Amplifier GAIN value

Configuration options: [15.3db][21.2db][27.2db][31.8db]

### 3.6.3.2.1 PCI Express Configuration



### 3.6.3.2.1.1 PCI Express Root Port 1(x4 slot2)



- **PCI Express Root Port 1 [Enabled]**

Control the PCI Express Port

Configuration options: [Disabled][Enabled]

- **ASPM Support [Disabled]**

Set the ASPM level: Force L0s- Force all links to L0s State; Auto- BIOS auto configure; Disabled- Disables ASPM

Configuration options: [Disabled][L1][Auto]

- **PCIe Speed [Auto]**

Select PCI Express Port speed

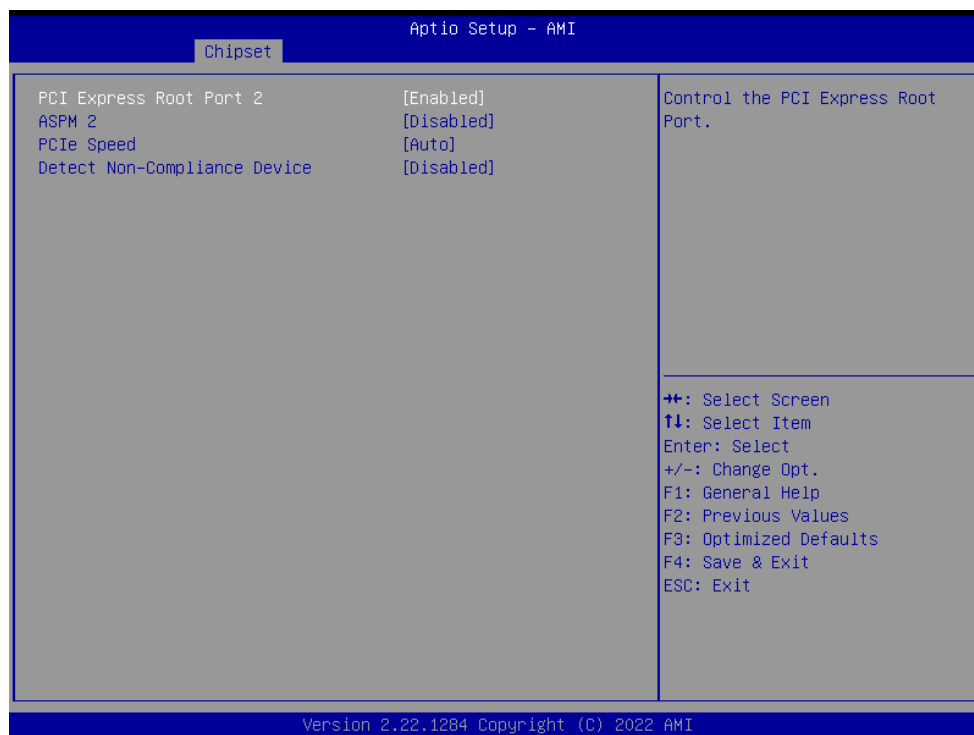
Configuration options: [Auto][Gen1][Gen2][Gen3] [Gen4]

- **Detect Non-compliance device [Disabled]**

Detect non-compliance PCI express Device, If enabled, it will take more time at Post time.

Configuration options: [Disabled][Enabled]

### 3.6.3.2.1.2 PCI Express Root Port 2(x16 slot3)



- **PCI Express Root Port 2 [Enabled]**

Control the PCI Express Port

Configuration options: [Disabled][Enabled]

- **ASPM 2 [Disabled]**

Set the ASPM level: Force L0s- Force all links to L0s State; Auto- BIOS auto configure; Disabled- Disables ASPM

Configuration options: [Disabled][L1][Auto]

- **PCIe Speed [Auto]**

Select PCI Express Port speed

Configuration options: [Auto][Gen1][Gen2][Gen3] [Gen4]

- **Detect Non-compliance device [Disabled]**

Detect non-compliance PCI express Device, If enabled, it will take more time at Post time.

Configuration options: [Disabled][Enabled]

### 3.6.3.2.1.3 PCI Express Root Port 4(x16 slot4 & M.2 E key)



- **PCI Express Root Port 4 [Enabled]**

Control the PCI Express Port

Configuration options: [Disabled][Enabled]

- **ASPM 4 [Disabled]**

Set the ASPM level: Force L0s- Force all links to L0s State; Auto- BIOS auto configure; Disabled- Disables ASPM

Configuration options: [Disabled][L1][Auto]

- **PCIe Speed [Auto]**

Select PCI Express Port speed

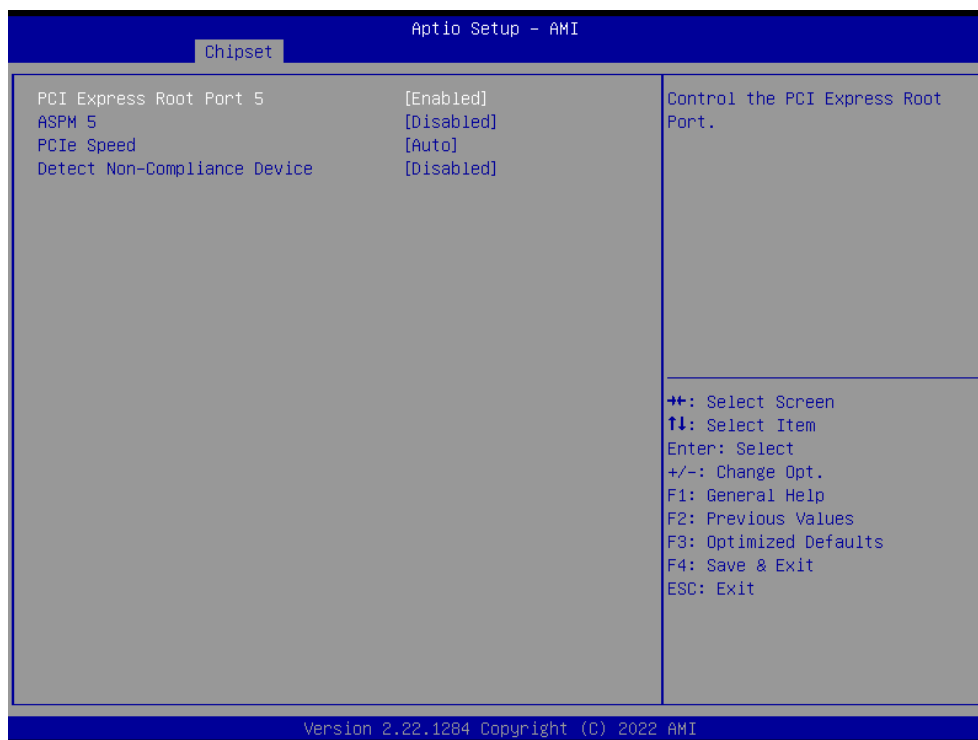
Configuration options: [Auto][Gen1][Gen2][Gen3] [Gen4]

- **Detect Non-compliance device [Disabled]**

Detect non-compliance PCI express Device, If enabled, it will take more time at Post time.

Configuration options: [Disabled][Enabled]

### 3.6.3.2.1.4 PCI Express Root Port 5(x4 Key M)



- **PCI Express Root Port 5 [Enabled]**

Control the PCI Express Port

Configuration options: [Disabled][Enabled]

- **ASPM 5 [Disabled]**

Set the ASPM level: Force L0s- Force all links to L0s State; Auto- BIOS auto configure; Disabled- Disables ASPM

Configuration options: [Disabled][L1][Auto]

- **PCIe Speed [Auto]**

Select PCI Express Port speed

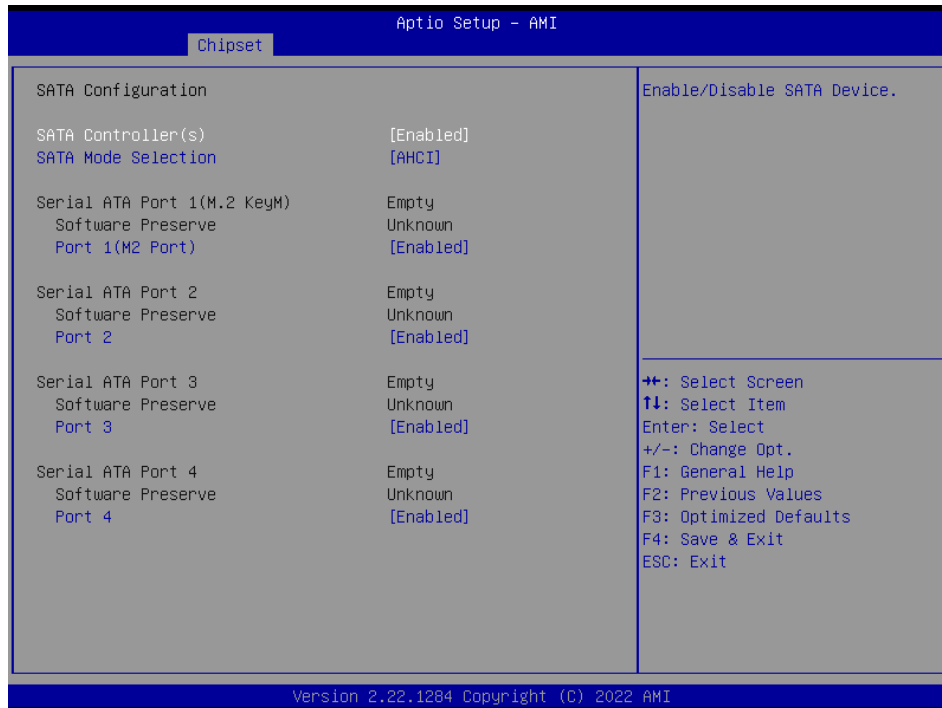
Configuration options: [Auto][Gen1][Gen2][Gen3] [Gen4]

- **Detect Non-compliance device [Disabled]**

Detect non-compliance PCI express Device, If enabled, it will take more time at Post time.

Configuration options: [Disabled][Enabled]

### 3.6.3.2.2 SATA Configuration



- **SATA Controller(s) [Enabled]**  
Enable or Disable SATA device  
Configuration options: [Enabled][Disabled]
- **SATA Mode Selection [AHCI]**  
Determines how SATA controller operate  
Configuration options: [AHCI]
- **Port 1(M2 Port) [Enabled]**  
Enable or Disable SATA port 1  
Configuration options: [Enabled][Disabled]
- **Port 2 [Enabled]**  
Enable or Disable SATA port 2  
Configuration options: [Enabled][Disabled]
- **Port 3 [Enabled]**  
Enable or Disable SATA port 3  
Configuration options: [Enabled][Disabled]
- **Port 4 [Enabled]**  
Enable or Disable SATA port 4  
Configuration options: [Enabled][Disabled]

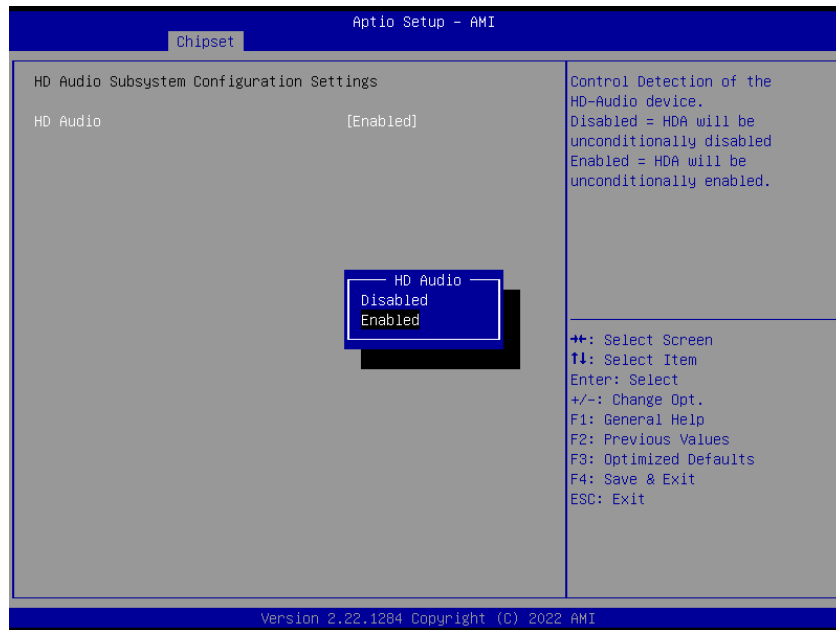
### 3.6.3.2.3 USB Configuration



- **USB12 Standby Power [Enabled]**  
Enable or Disable USB standby power  
Configuration options: [Disabled] [Enabled]
- **USB34 Standby Power [Enabled]**  
Enable or Disable USB standby power  
Configuration options: [Disabled] [Enabled]
- **USB56 Standby Power [Enabled]**  
Enable or Disable USB standby power  
Configuration options: [Disabled] [Enabled]
- **USB78 Standby Power [Enabled]**  
Enable or Disable USB standby power  
Configuration options: [Disabled] [Enabled]
- **USB910 Standby Power [Enabled]**  
Enable or Disable USB standby power  
Configuration options: [Disabled] [Enabled]
- **USB1112 Standby Power [Enabled]**  
Enable or Disable USB standby power  
Configuration options: [Disabled] [Enabled]



### 3.6.3.2.4 HD audio Configuration



- **HD audio [Enabled]**

Control Detection of the HD-Audio device.

Configuration options: [Disabled] [Enabled]

### 3.6.3.2.5 Serial IO Configuration



- **I2C0 Controller [Enabled]**

Enabled/Disabled Serial IO Controller

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Configuration options: [Disabled] [Enabled]

- **I2C2 Controller [Enabled]**

Enabled/Disabled Serial IO Controller

Configuration options: [Disabled] [Enabled]

### 3.6.4 Security



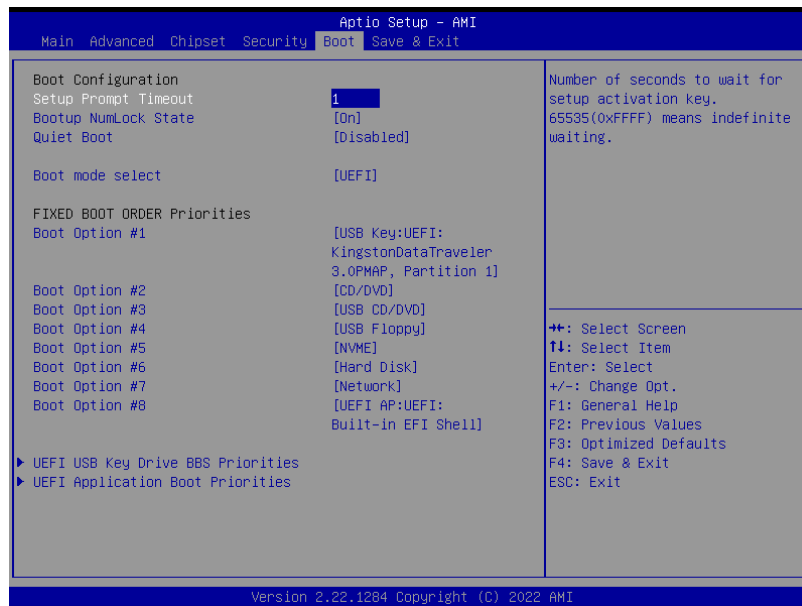
- **Administrator Password**

Set Administrator Password

- **User Password**

Set User Password

### 3.6.5 Boot



- **Setup Prompt Timeout [1]**

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

- **Bootup NumLock State [On]**

Select the keyboard NumLock state

Configuration options: [On] [Off]

- **Quick Boot [Disable]**

Enable or disable Quick Boot option

Configuration options: [Disabled] [Enabled]

- **Boot mode select [UEFI]**

Select boot mode LEGACY/UEFI

Configuration options: [LEGACY] [UEFI]

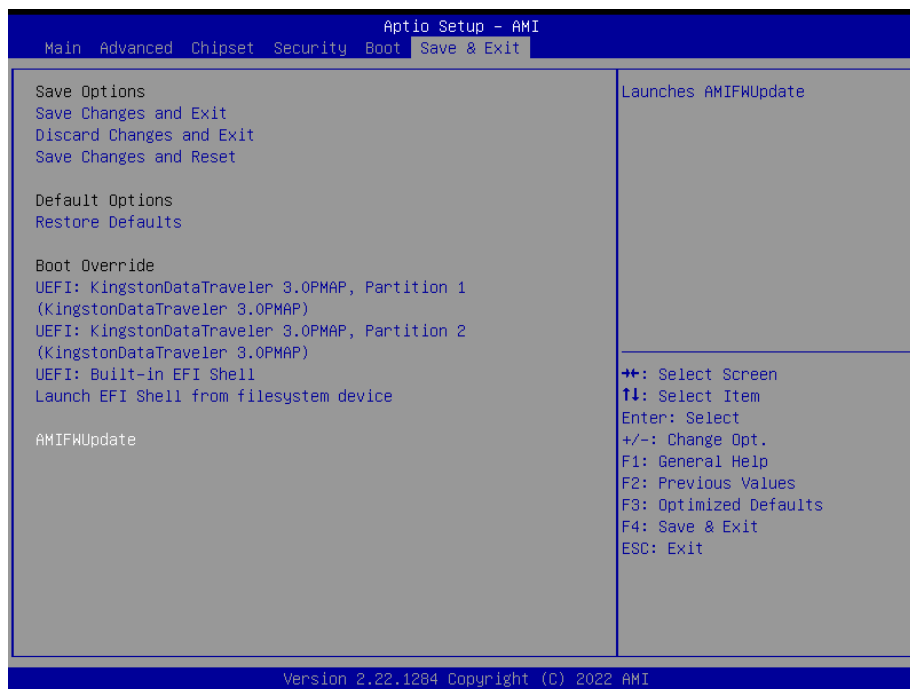
- **UEFI USB Key Drive BBS Priorities**

Specifies the boot device priority sequence from available UEFI USB key Drives.

- **UEFI Application Boot Priorities**

Specifies the boot device priority sequence from available UEFI Application.

### 3.6.6 Save & Exit



- **Save changes and Exit**  
Exit system setup after saving the changes.
- **Discard changes and Exit**  
Exit system setup without saving the changes.
- **Save changes and Reset**  
Reset the system after saving the changes.
- **Restore Defaults**  
Restore/Load default values for all the setup option.
- **Launch EFI Shell from filesystem device**  
Attempts to launch EFI shell application from one of the available filesystem devices.
- **AMIFWUpdate**  
Launches AMIFWUpdate.

