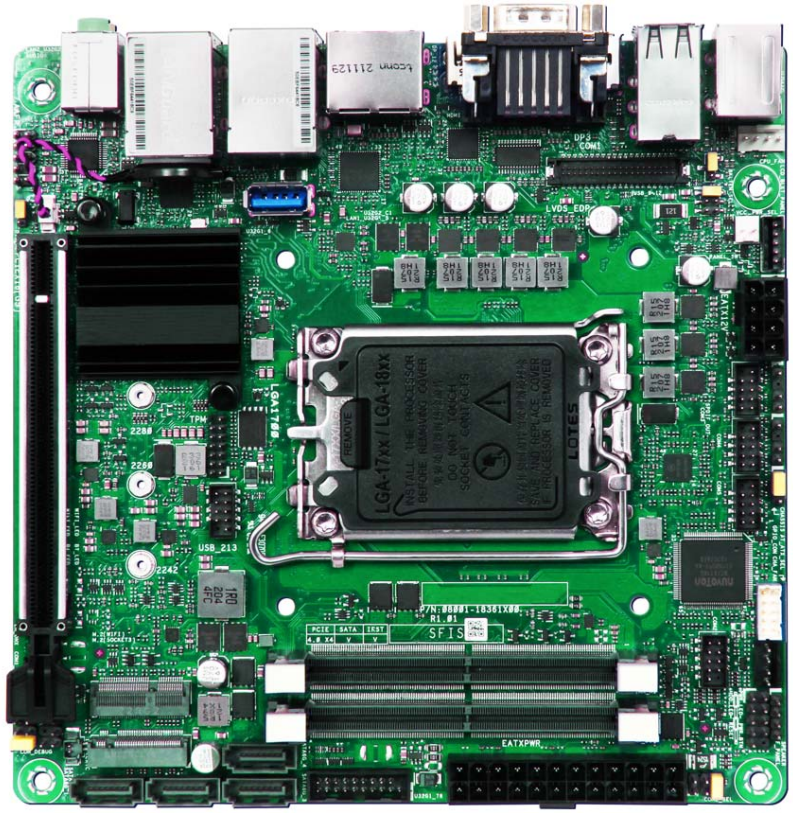
# WADE-8213-Q670E

## Industrial mini-ITX Board

Version 1.0



Revision History

| | |
|---|---|
| R1.0 | Preliminary |
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# Contents

## Preface

This user's guide provides information about the components, features, connectors and BIOS Setup menus available on the WADE-8213-Q670E. This document should be referred to when designing mini-ITX application. The other reference documents that should be used include the following:

- ✧Intel Alder Lake Design Guide
- ✧Intel Alder Lake Specification

Please contact Portwell Sales Representative for above documents.

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# 1 Introduction

WADE-8213-Q670E is based on the Intel® Core™ S Processor which offers 10nm process with Hybridtechnology. WADE-8213-Q670E supports dual channels DDR5SO-DIMM up to64GB.

Desktop solution is still popular in the market of DVR and Factory Automation which can fulfill most of these applications; therefore, with high performance and high-end specifications, WADE-8213-Q670E is our first generationAlder Lake -S chip architecture on mini-ITX line.

# 2 Specifications

| | |
|---|---|
| Main Processor | ◆Intel®Alder Lake -S Core™ i9 / i7 / i5 / i3,Pentium® and Celeron®Processors |
| System Chipset | ◆ Intel®Q670E Express chipset |
| System BIOS | ◆AMI UEFI BIOS |
| Main Memory | ◆Up to 64GB in 2 slots DDR5SO-DIMM sockets. Supports dual channel DDR54800 MHz |
| Graphics | ◆Controller: Intel® UHD 770 Graphics, support DirectX12,OpenGL 4.6<br>◆LVDS: Supports one LVDS up to resolution 1920 x 1200 (Support either eDP or LVDS; switch by BIOS)<br>◆DP: Supports three DP up to 8K<br>◆HDMI: Supports one HDMI port |
| Expansion Interface | ◆One M.2 (Key E_2230) for Wifi/BT device(PCIe x1/CNVi)<br>◆One M.2 (Key M_2242/2260/2280) for SSD(PCIe x4 / SATA)<br>◆One PCIe Gen5 x16 slot(1 x16 mode / 2 x8 mode) |
| SATA Interface | ◆FourSATA ports(SATA Gen3.06Gb/s), support RAID 0,1,5,10 |
| Input/Output | ◆COM Ports:Five Ports: 1x RS-232/422/485 on rear I/O &1x RS-232/422/485 on board header & 3x RS-232 on board header<br>◆USB Port:3x USB 3.2 Gen2 on rear I/O(2x type A, 1x Type C),1x USB 3.2 Gen1 on rear I/O(Type A), 1x Header support additional 2x USB3.2 Gen1 ports, 1x USB3.2 Gen1 vertical type Aconnector,4x USB2.0(Type A)&1x Header support additional 2x USB2.0 on board header<br>◆Audio Interface: Line-In / Line-Out |
| Ethernet | ◆Supports one 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 bus<br>◆Supports one 10/100/1000/2500 Mbps Ethernet port (s) via PCI Express x1 bus |
| High Drive GPIO | ◆One pin-header for GPIO(8bit GPIO ) |

| | |
|---|---|
| Mechanical and environmental specifications | ◆ Operating temperature: 0 ~ 60° C<br>◆ Storage temperature:-20 ~ 80° C<br>◆ Humidity: 5 ~ 95% non-condensing<br>◆ Power supply voltage: ATX<br>◆ Board size: 170mm x 170 mm |
| Safety | ◆ CE, FCC |

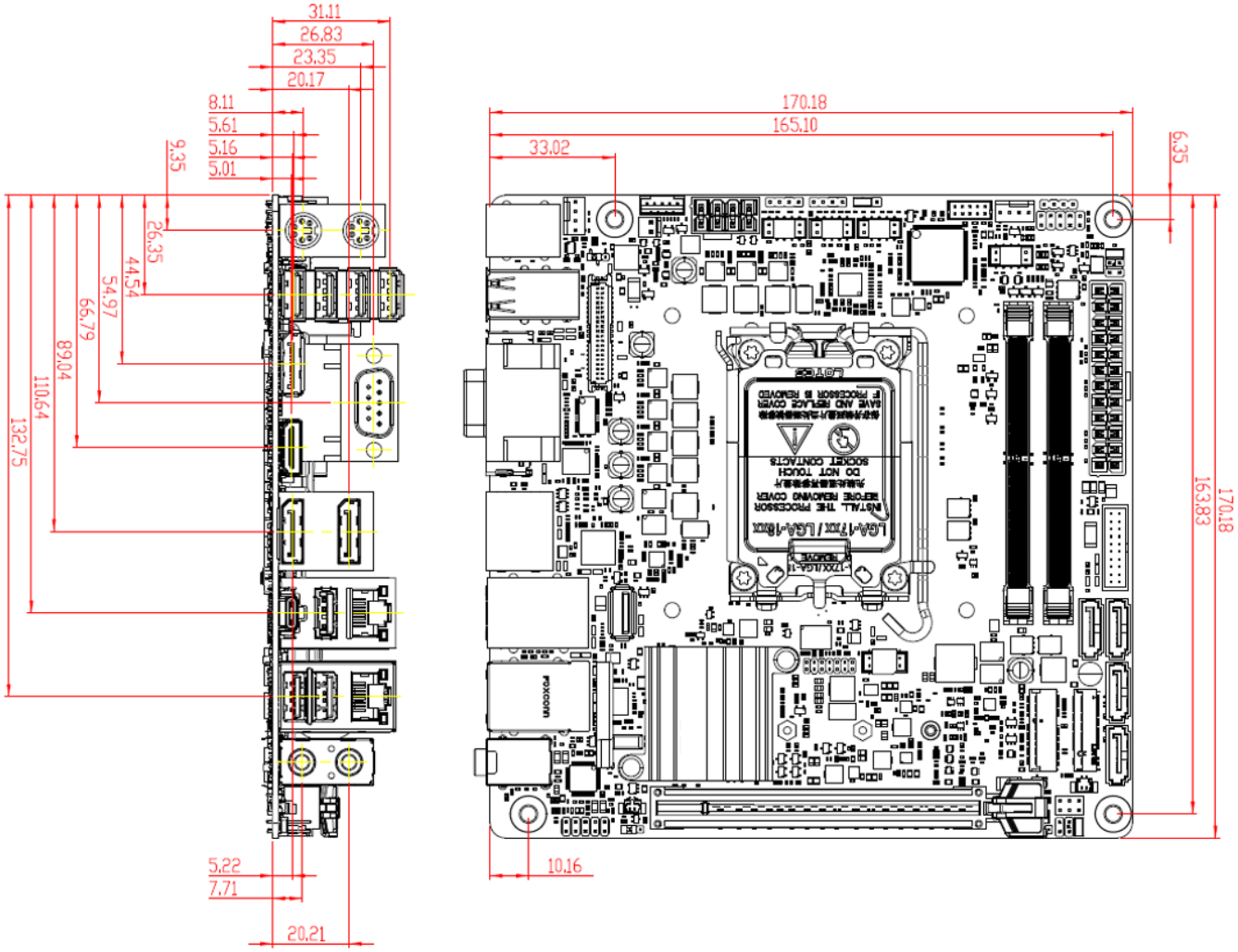
## 2.1 Supported Operating Systems

The WADE-8213-Q670E supports the following operating systems.

✧ Windows* 10 IOT Enterprise (64-bit)

✧ Ubuntu, Fedora Workstation, OpenSUSE

## 2.2 Mechanical Dimensions



## 2.3 Power Consumption

| Test Configuration | |
|---|---|
| CPU Type | Intel® Core™ i9-12900 CPU @ 1.8GHz |
| BIOS | 1.13.00.92 |
| Memory | Hynix/DDR5 4800 SO-DIMM 32G |
| VGA Card | Onboard Intel® UHD Graphics 770 driven by XeArchitecture |
| VGA Driver | Intel® Graphics Accelerator Driver V30.0.101.1002 |
| LAN Card | Onboard Intel® LAN I225 |
| LAN Driver | Intel® Ethernet Connection I225 Version: 1.0.2.14 |
| LAN Card #2 | Onboard Intel® I210AT Gigabit Network Connection |
| LAN Driver #2 | Intel® Ethernet Connection I210 Version: 12.18.11.1 |
| Audio Card | Onboard Realtek ALC897High Definition Audio |
| Audio Driver | Realtek ALC897High Definition Audio Version: 6.0.9285.1 |
| Chipset Driver | Intel® Alder lake-S Chipset Device Software Version:10.1.18838.8284 |
| USB 3.0 Driver | Intel® USB 3.0 eXtensible Host Controller-1.20(Microsoft) |
| SATA HDD | SK Hynix 512G |
| Power Supply | AXT PSU: 600W ATX PSU<br>12V DC IN: ASUS EMA-DCB-A (DC source) |

| Power consumption | | | | | |
|---|---|---|---|---|---|
| ATX: | | | | | |
| Source | Voltage | Minimum Load (A) | Max Voltage Tolerance | MB Capacitive Load (uf) | Mean Mean / Max. Mean MB Current w/o peripherals(A) |
| ATX PSU | +12V | 0.216 | ±5% | 1300 | 6.13 / 7.154 |
| | +5V | 0.292 | ±5% | 500 | 1.834 / 2.067 |
| | +3V | 0.169 | ±5% | 100 | 0.265 / 0.403 |
| | +5VSB_ATX | N/A | ±5% | 100 | 0.019 / 0.126 |
| 12V DC in | +12V | N/A | ±5% | 1300 | 7.484 / 8.43 |

## 2.4 Environmental Specifications

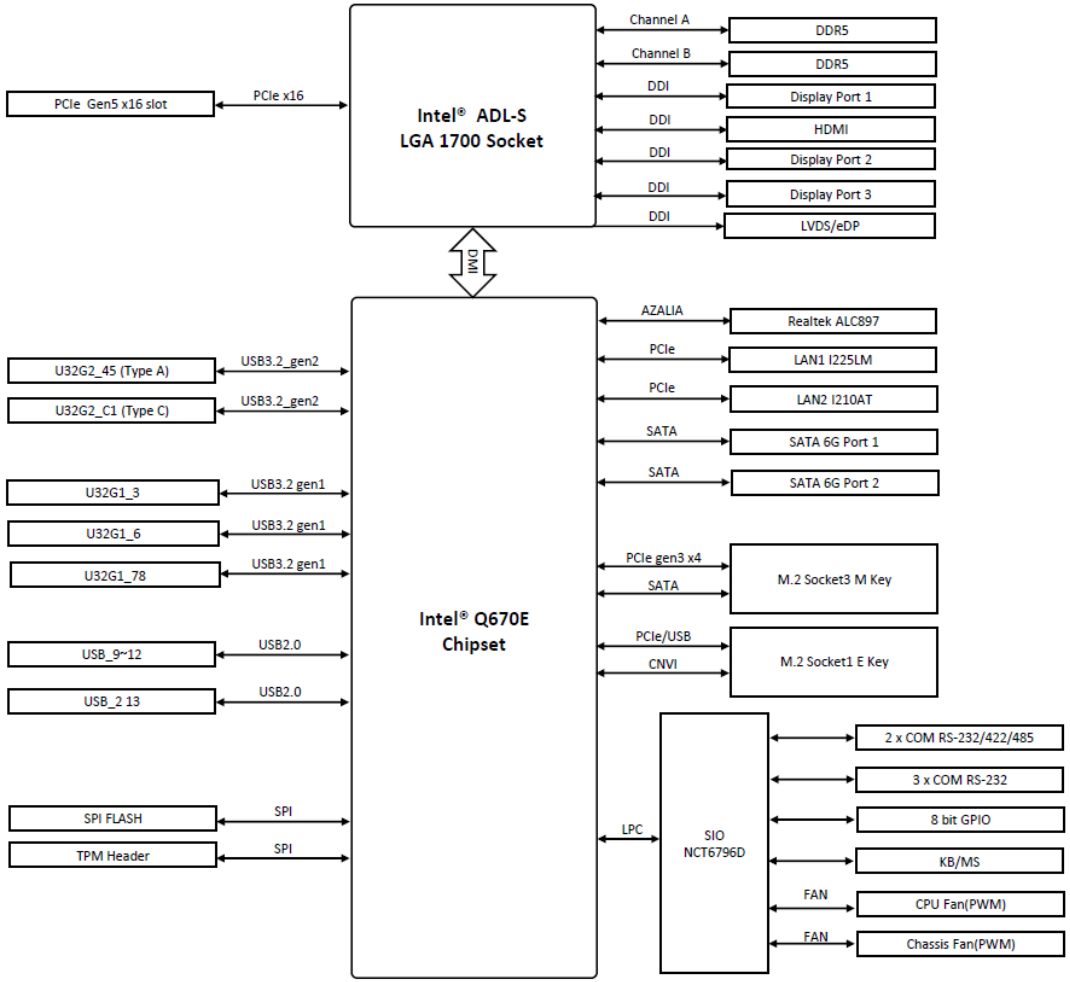
Storage Temperature: -20~80°C

Operation Temperature: 0~60°C

Storage Humidity: 5~95%

Operation Humidity: 10~90%

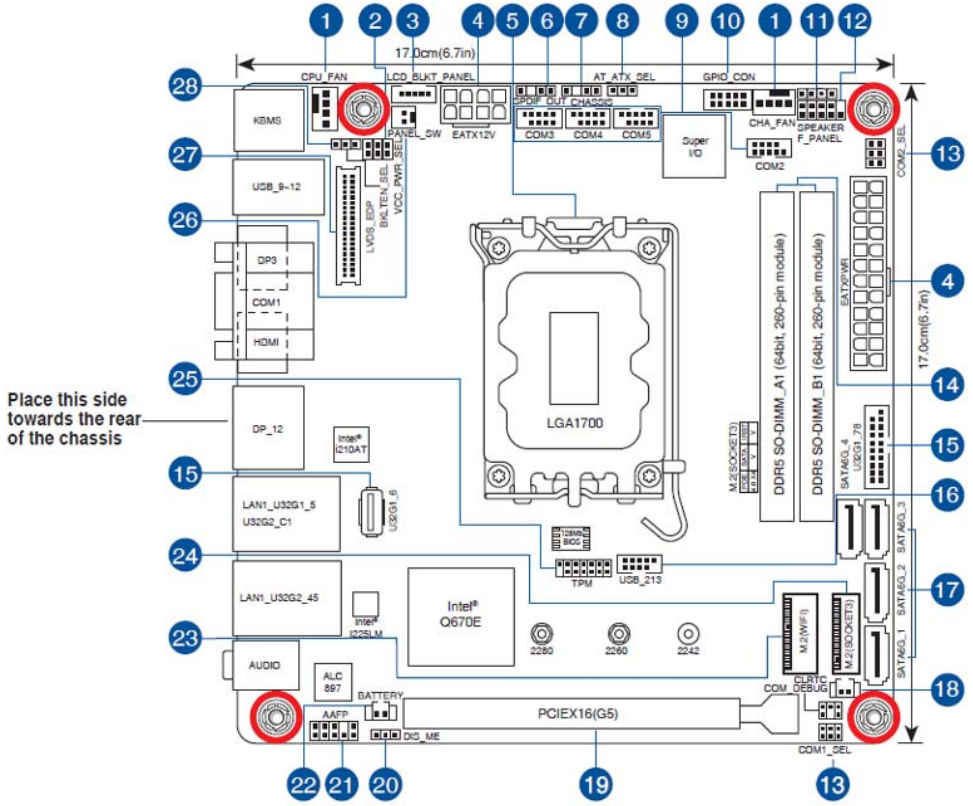
# 3 Block Diagram



# 4 Hardware Configuration

## 4.1 Jumpers and Connectors

This chapter indicates jumpers', headers' and connectors' locations. Users may find useful information related to hardware settings in this chapter.



## 4.2 Jumpers Settings

For users to customize WADE-8213-Q670E's features. In the following sections, Short means covering a jumper cap over jumper pins; Open or N/C (Not Connected) means removing a jumper cap from jumper pins. Users can refer to Figure 1 for the Jumper allocations.

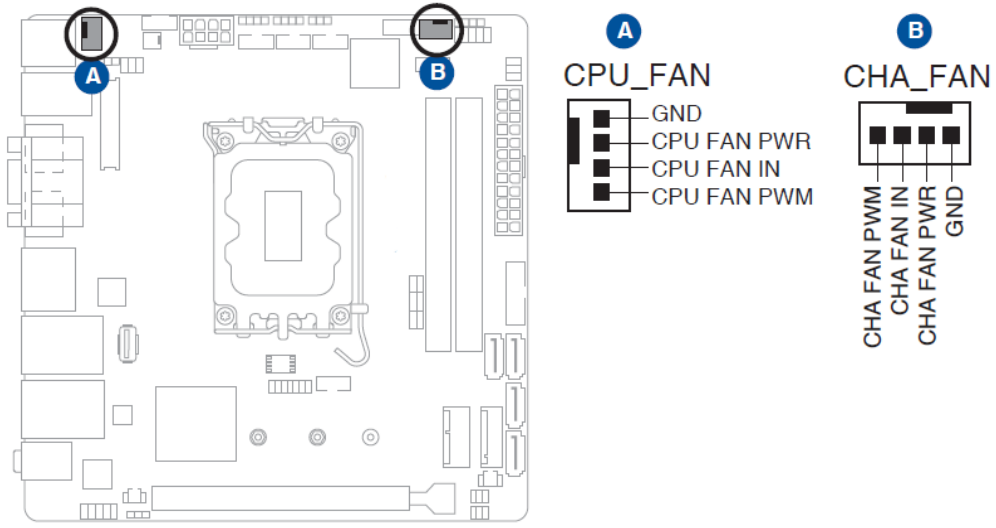
### Jumper Table

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

| Jumper Function List | |
|---|---|
| 1 | CPU and Chassis Fan headers (4-pin CPU_FAN, 4-pin CHA_FAN) |
| 2 | Display panel VCC power selection (6-pin VCC_PWR_SEL) |
| 3 | LVDS/eDP Backlight panel connector (5-pin LCD_BLKT_PANEL) |
| 4 | ATX Power connectors (24-pin EATXPWR, 8-pin EATX12V) |
| 5 | Intel LGA1700 CPU socket |
| 6 | Digital Audio header (4-1 pin SPDIF_OUT) |
| 7 | Chassis Intrude header (4-1 pin CHASSIS) |
| 8 | AT/ATX mode selection (3-pin AT_ATX_SEL) |
| 9 | Serial Port headers (10-1 pin COM2, COM3, COM4, COM5) |
| 10 | General purpose input/output connector (10-pin GPIO_CON) |
| 11 | Speaker header (4-pin SPEAKER) |
| 12 | System Panel header (10-1 pin F_PANEL) |
| 13 | COM1/2 Ring/+5V/+12V selection jumpers (6-pin COM1_SEL, COM2_SEL) |

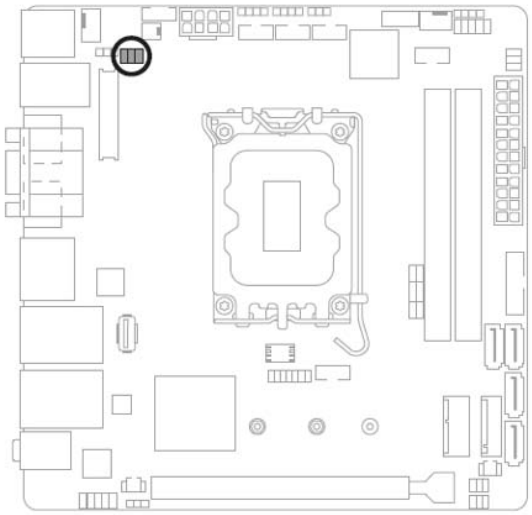
| | |
|---|---|
| 14 | DDR5 SO-DIMM slots |
| 15 | USB 3.2 Gen 1 connectors (20-1 pin U32G1_78)/ (U32G1_6) |
| 16 | USB 2.0 header (10-1 pin USB_213) |
| 17 | SATA 6.0Gb/s ports (7-pin SATA6G_1-4) |
| 18 | Clear CMOS header (2-pin CLRTC) |
| 19 | PCI Express 5.0 x16 slot |
| 20 | Disable ME jumper (3-pin DIS_ME) |
| 21 | Front Panel Audio header (10-1 pin AAFP) |
| 22 | RTC Battery header (2-pin BATTERY) |
| 23 | M.2 Wi-Fi |
| 24 | M.2 socket 3 |
| 25 | SPI TPM header (14-1 pin SPI_TPM) |
| 26 | LCD Panel Monitor Switch header (2-pin PANEL_SW) |
| 27 | LVDS/eDP Signal connector (LVDS_eDP) |
| 28 | LVDS/eDP Panel Enable Signal Selection header (3-pin BKLTEN_SEL) |

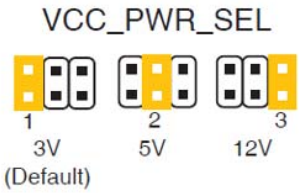
**1: CPU and Chassis Fan headers (4-pin CPU_FAN, 4-pin CHA_FAN)**




*Connector Type: 2.54mm pitch

**2: Display panel VCC power selection (6-pin VCC_PWR_SEL)**

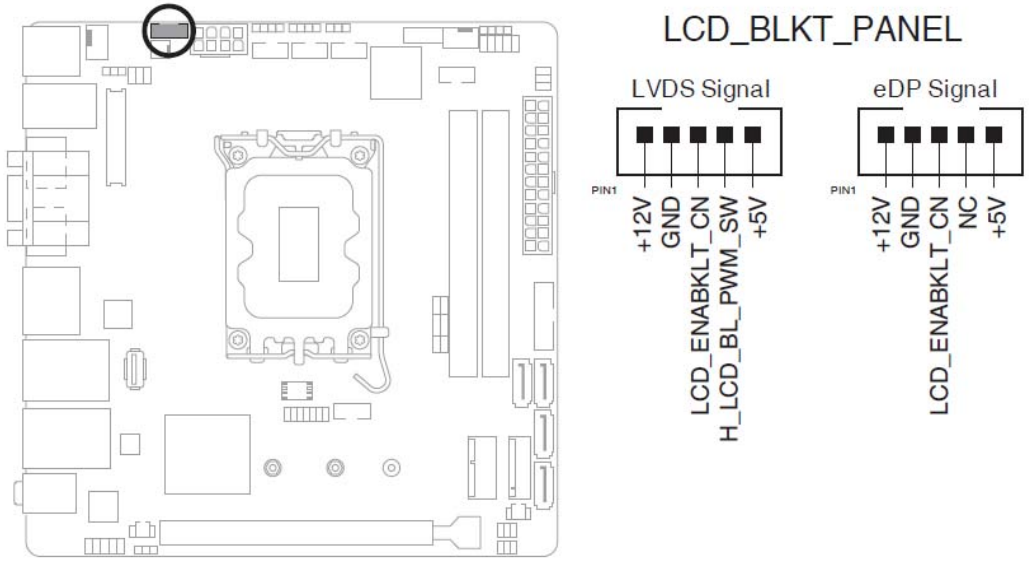





| PIN No. | Description |
|---|---|
| 1-2(Short) | 3V(Default) |
| 2-3(Short) | 5V |
| 5-6(Short) | 12V |

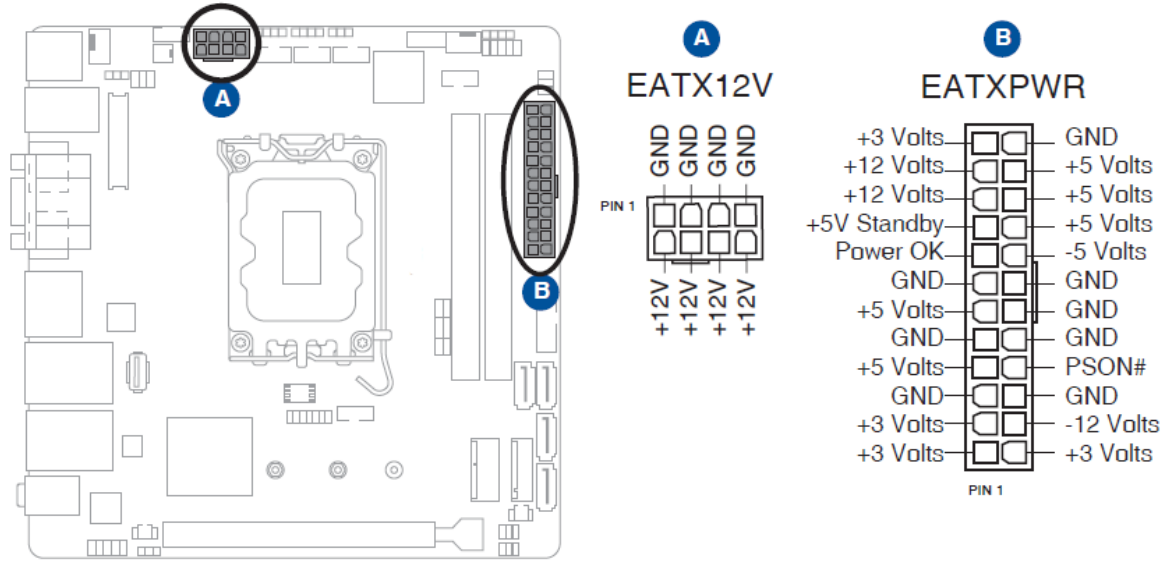
*Connector Type: 2.54mm pitch

**3: LVDS/eDP Backlight panel connector (5-pin LCD_BLKT_PANEL)**




*Connector Type: 2.0mm pitch

**4: ATX Power connectors (24-pin EATXPWR, 8-pin EATX12V)**



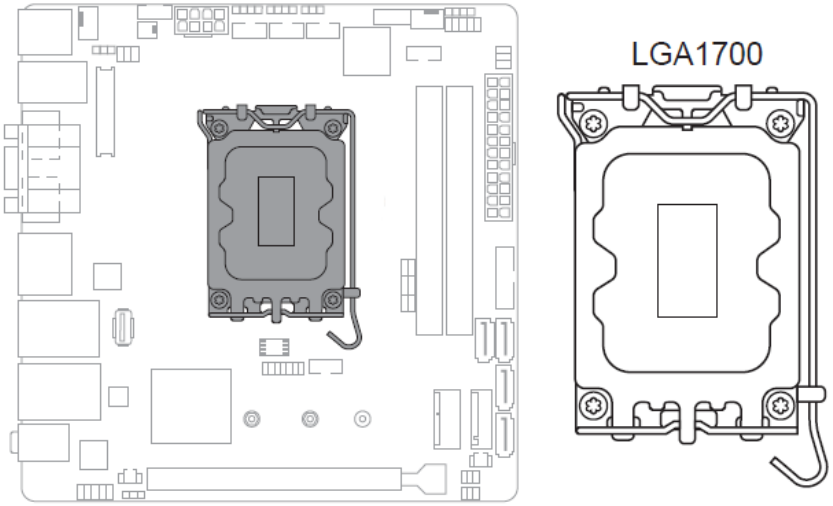

**DC Mode EATXPWR**

| PIN No. | Description | PIN No. | Description | PIN No. | Description | PIN No. | Description |
|---|---|---|---|---|---|---|---|
| 1 | +3.3V out | 7 | GND | 13 | +3.3V out | 19 | GND |
| 2 | +3.3V out | 8 | NC | 14 | NC | 20 | +12V out |
| 3 | GND | 9 | NC | 15 | GND | 21 | +5V out |
| 4 | +5V out | 10 | +12V in | 16 | PSON# | 22 | +5V out |
| 5 | GND | 11 | +12V in | 17 | GND | 23 | +5V out |
| 6 | +5V out | 12 | +3.3V out | 18 | GND | 24 | GND |

**DC Mode EATX12V**

| PIN No. | Description | PIN No. | Description |
|---|---|---|---|
| 1 | GND | 5 | +12V in |
| 2 | GND | 6 | +12V in |
| 3 | GND | 7 | +12V in |
| 4 | GND | 8 | +12V in |

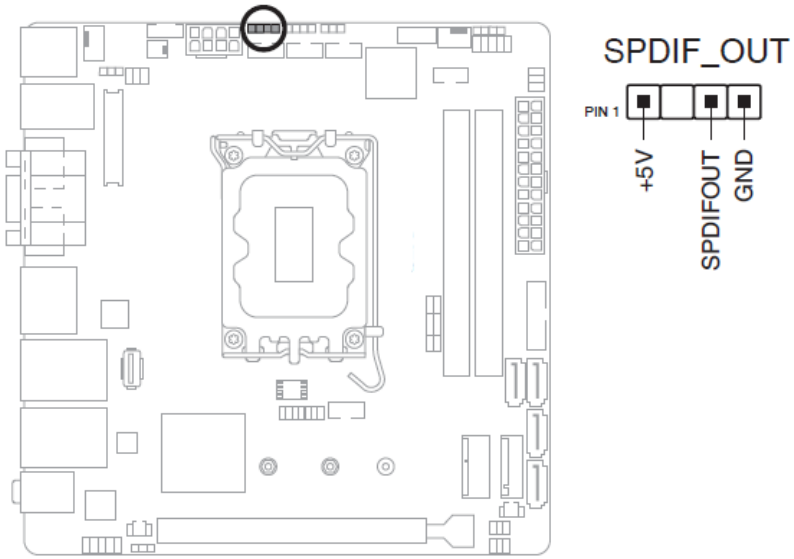
**5: Intel LGA1700 CPU socket**





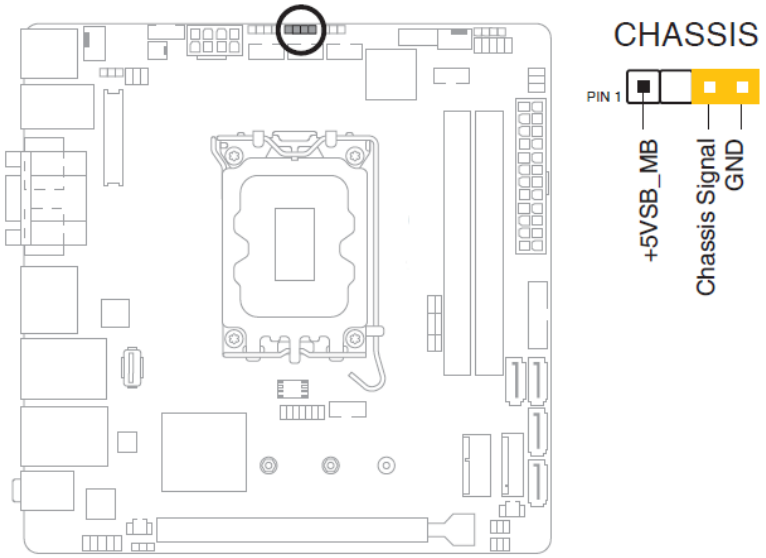

- Unplug all power cables before installing the CPU.

**6: Digital Audio header (4-1 pin SPDIF_OUT)**



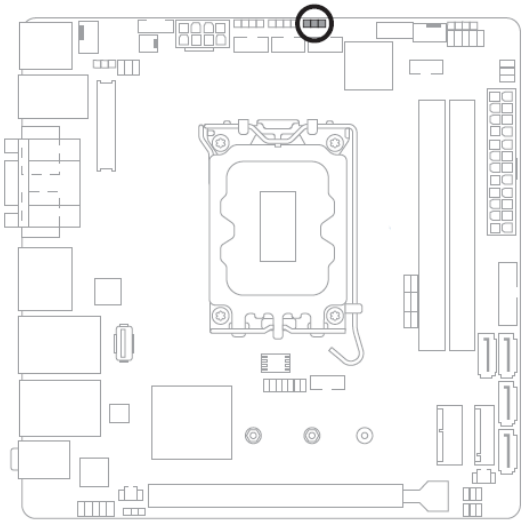

*Connector Type: 2.54mm pitch

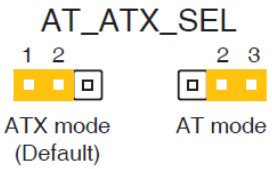
**7: Chassis Intrude header (4-1 pin CHASSIS)**




*Connector Type: 2.54mm pitch

**8: AT/ATX mode selection (3-pin AT_ATX_SEL)**

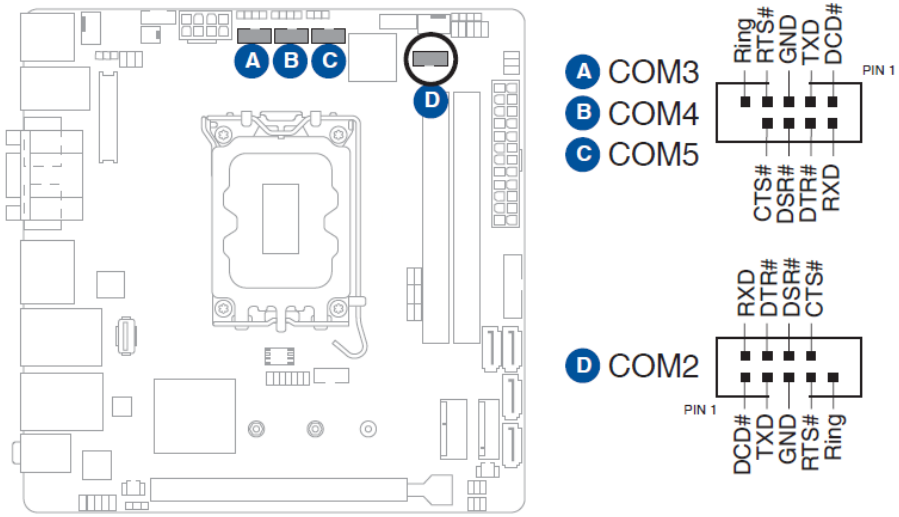





| PIN No. | Description |
|---|---|
| 1-2(Default) | ATX mode |
| 2-3 | AT mode |

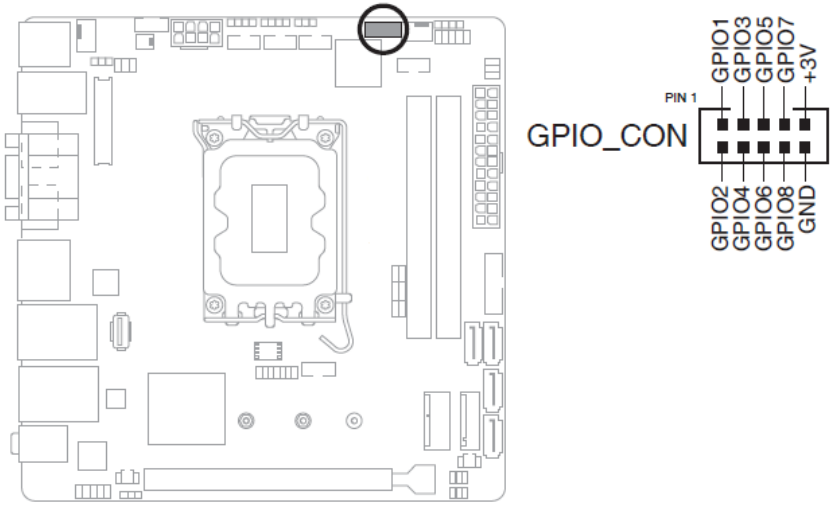
*Connector Type: 2.54mm pitch

**9: Serial Port headers (10-1 pin COM2, COM3, COM4, COM5)**



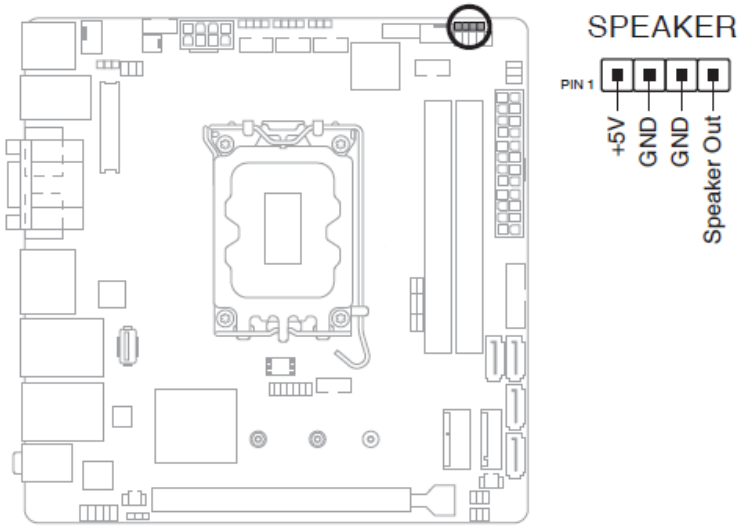

*Connector Type: 2.0mm pitch

**10: General purpose input/output connector (10-pin GPIO_CON)**



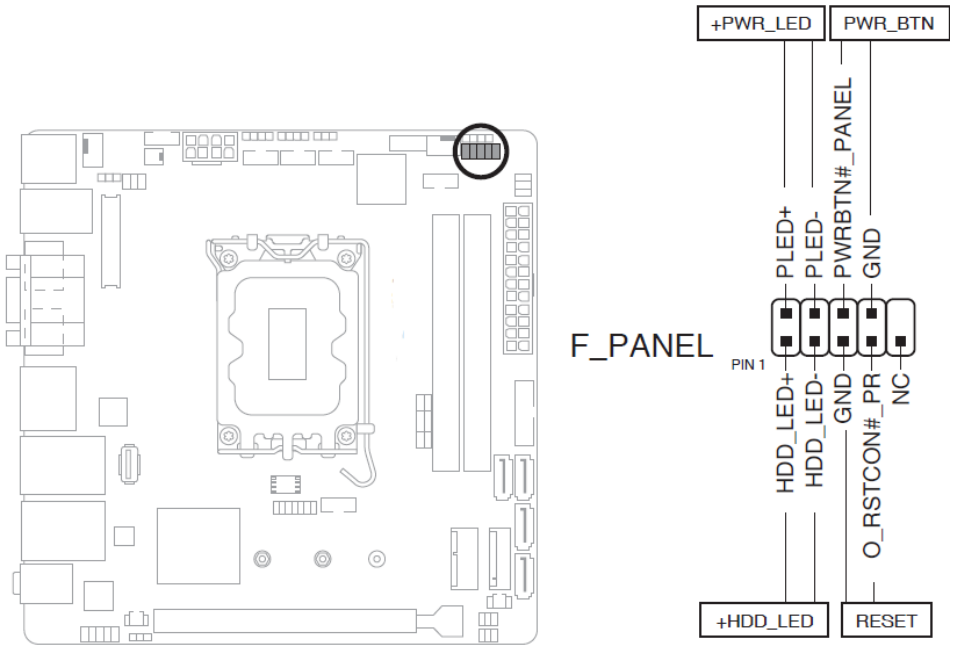

*Connector Type: 2.0mm pitch

**11: Speaker header (4-pin SPEAKER)**



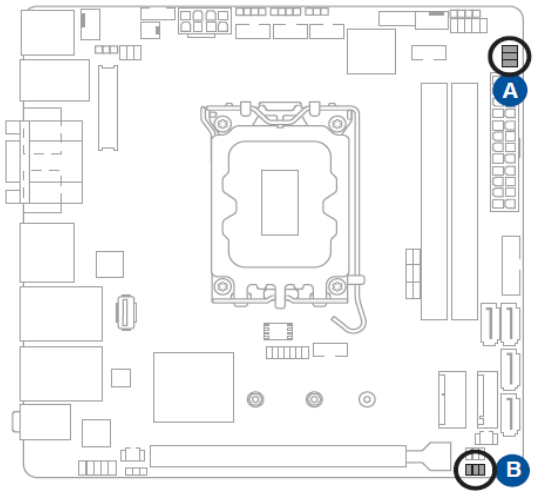

*Connector Type: 2.54mm pitch

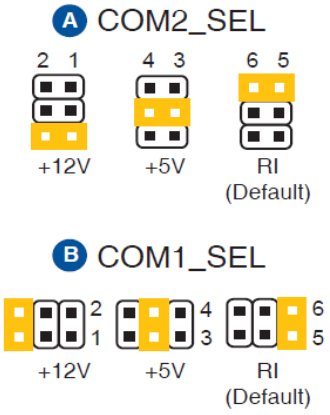
**12: System Panel header (10-1 pin F_PANEL)**




*Connector Type: 2.54mm pitch

**13: COM1/2 Ring/+5V/+12V selection jumpers (6-pin COM1_SEL, COM2_SEL)**

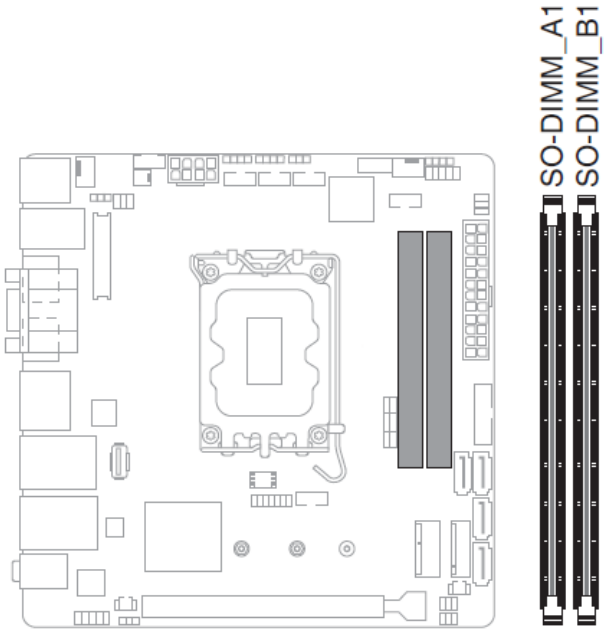



| PIN No. | Description |
|---|---|
| 1-2 | +12V |
| 3-4 | +5V |
| 5-6 | Ring(Default) |

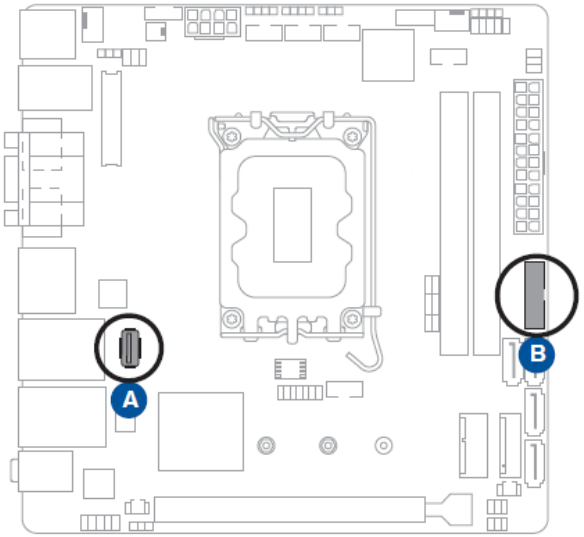
*Connector Type: 2.54mm pitch

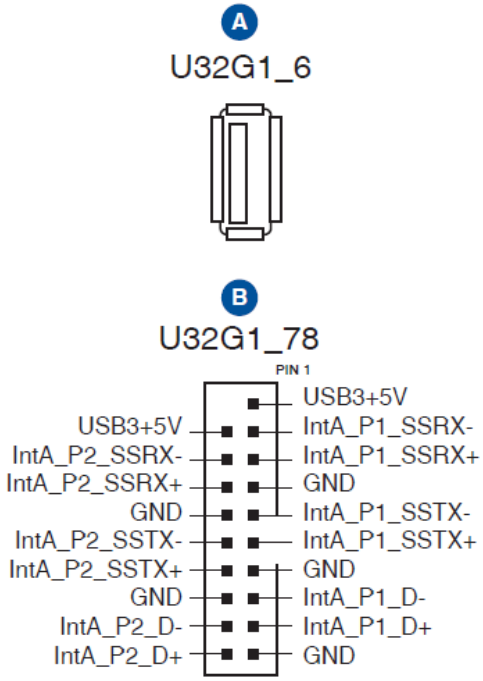
**14: DDR5 SO-DIMM slots**



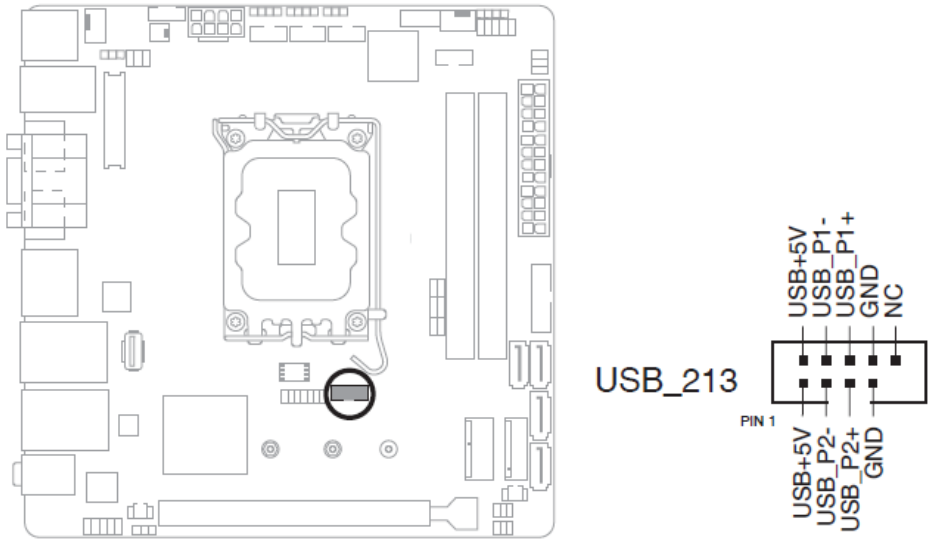

| Channel | Sockets |
|---|---|
| Channel A | SO-DIMM_B1 |
| Channel B | SO-DIMM_A1 |

**15: USB 3.2 Gen 1 connectors (20-1 pin U32G1_78)/ (U32G1_6)**



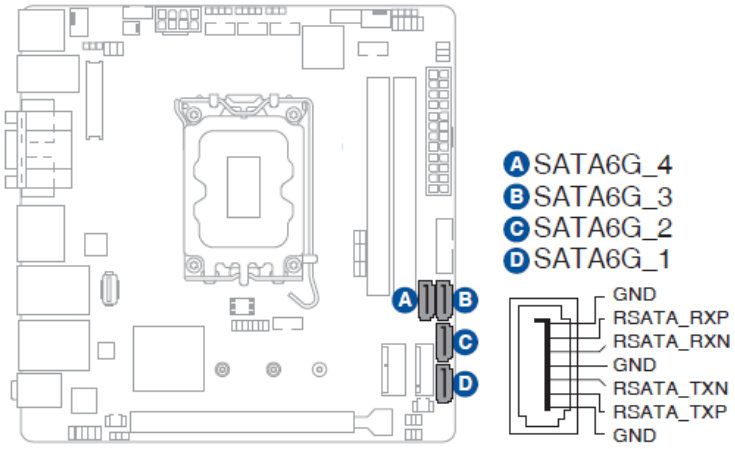



**16:USB 2.0 header (10-1 pin USB_213)**

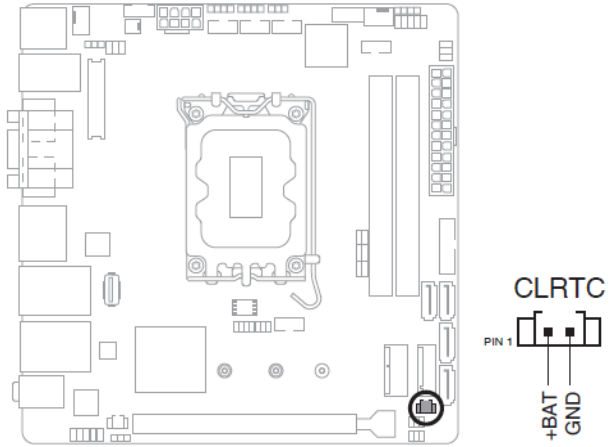



*Connector Type: 2.0mm pitch

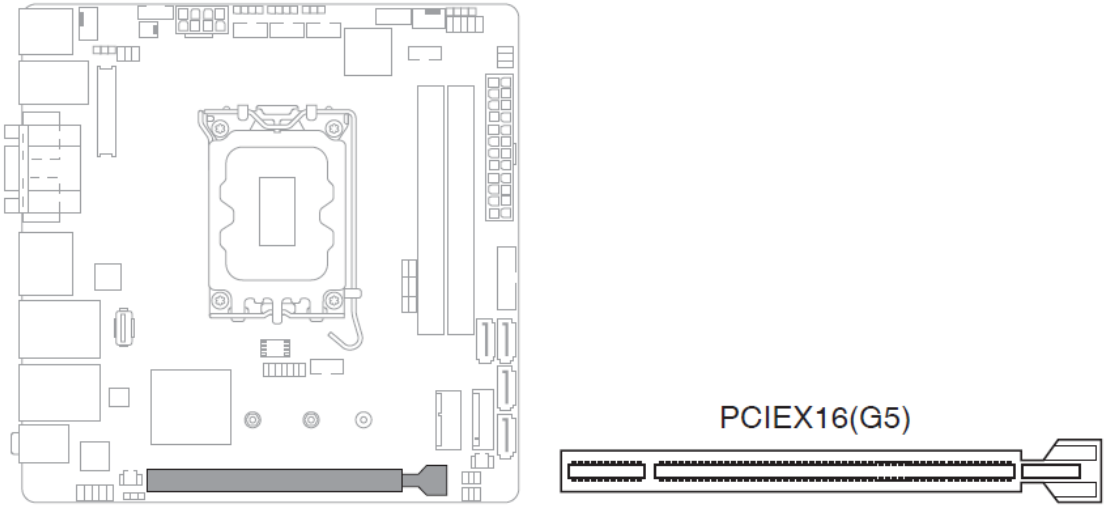
**17: SATA 6.0Gb/s ports (7-pin SATA6G_1-4)**



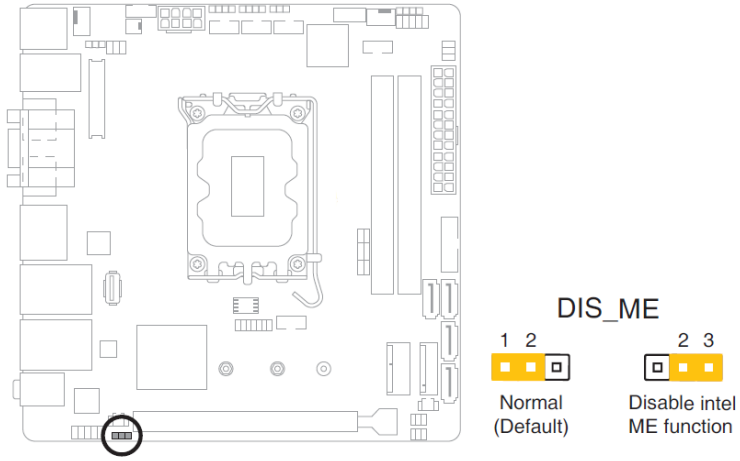

**18: Clear CMOS header (2-pin CLRTC)**



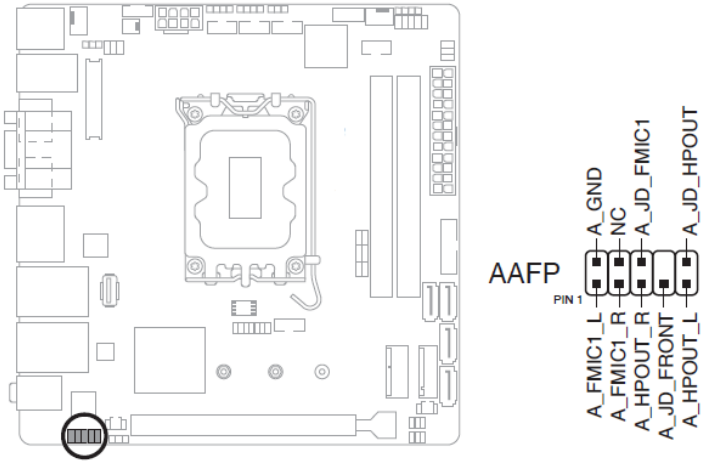
**19: PCI Express 5.0 x16 slot**



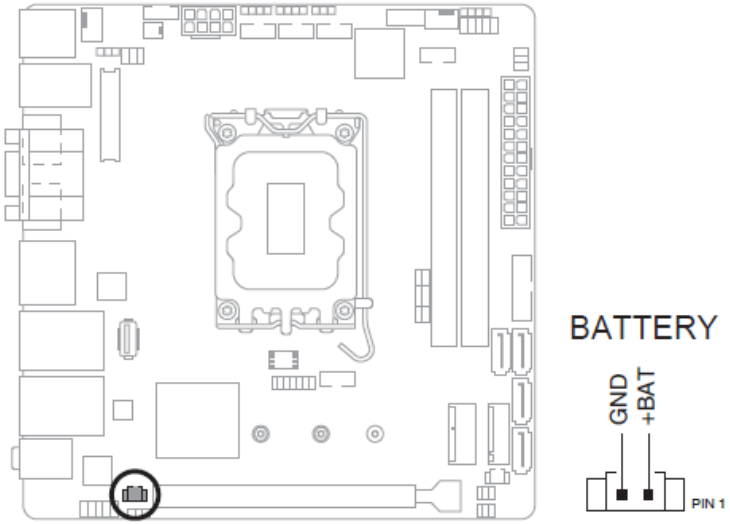
**20: Disable ME jumper (3-pin DIS_ME)**



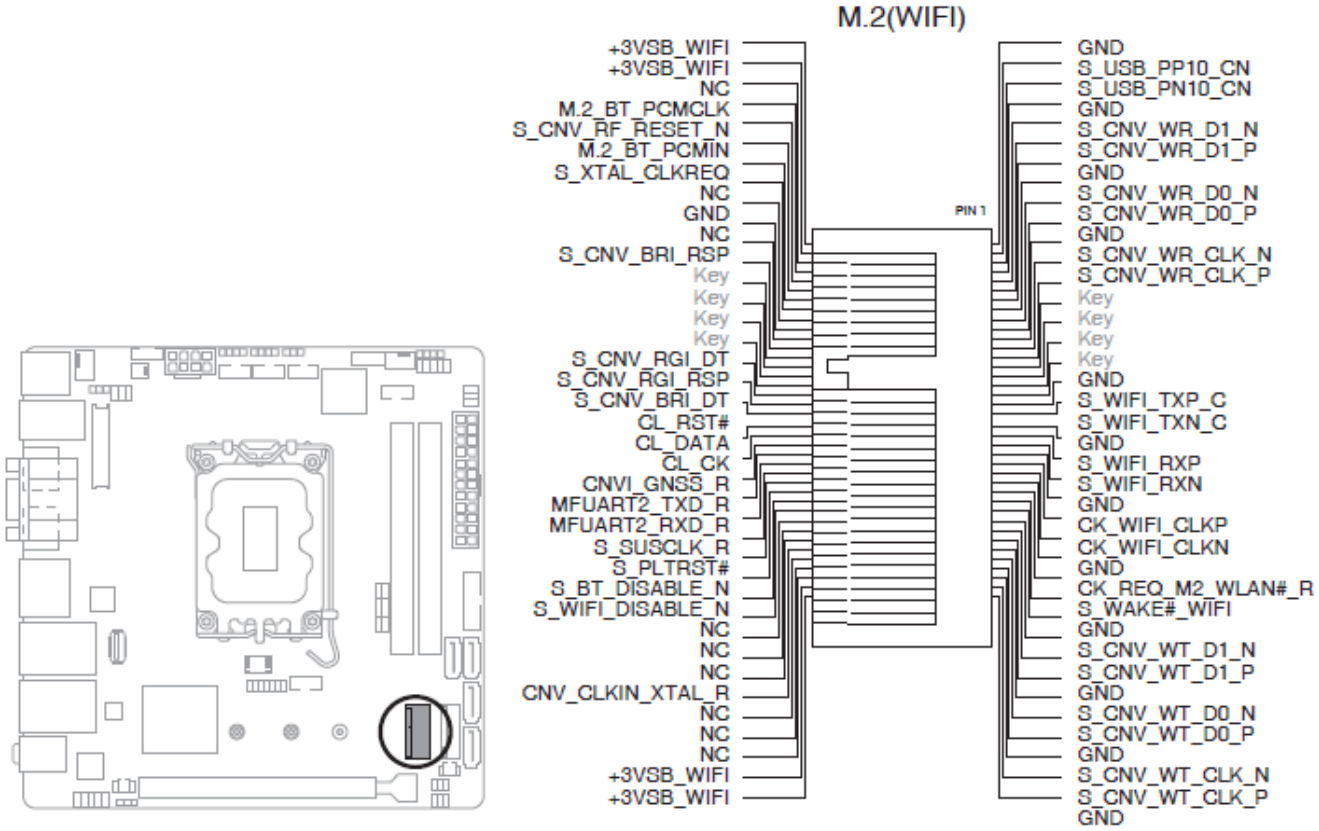

**21: Front Panel Audio header (10-1 pin AAFP)**



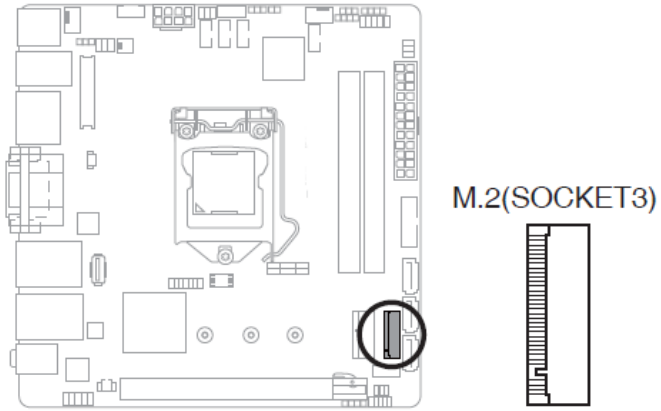
**22: RTC Battery header (2-pin BATTERY)**



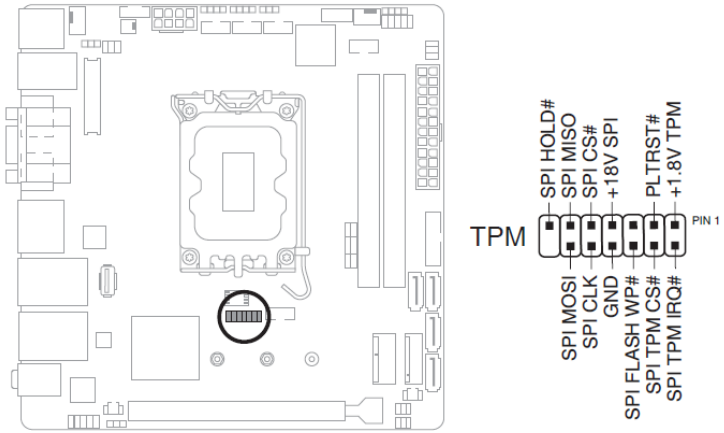
**23: M.2 Wi-Fi**


M.2(WIFI)
PIN 1
+3VSB_WIFI
+3VSB_WIFI
NC
M.2_BT_PCMCLK
S_CNV_RF_RESET_N
M.2_BT_PCMIN
S_XTAL_CLKREQ
NC
GND
NC
S_CNV_BRI_RSP
Key
Key
Key
Key
S_CNV_RGI_DT
S_CNV_RGI_RSP
S_CNV_BRI_DT
CL_RST#
CL_DATA
CL_CK
CNVI_GNSS_R
MFUART2_TXD_R
MFUART2_RXD_R
S_SUSCLK_R
S_PLTRST#
S_BT_DISABLE_N
S_WIFI_DISABLE_N
NC
NC
NC
CNV_CLKIN_XTAL_R
NC
NC
NC
+3VSB_WIFI
+3VSB_WIFI
GND
S_USB_PP10_CN
S_USB_PN10_CN
GND
S_CNV_WR_D1_N
S_CNV_WR_D1_P
GND
S_CNV_WR_D0_N
S_CNV_WR_D0_P
GND
S_CNV_WR_CLK_N
S_CNV_WR_CLK_P
Key
Key
Key
Key
GND
S_WIFI_TXP_C
S_WIFI_TXN_C
GND
S_WIFI_RXP
S_WIFI_RXN
GND
CK_WIFI_CLKP
CK_WIFI_CLKN
GND
CK_REQ_M2_WLAN#_R
S_WAKE#_WIFI
GND
S_CNV_WT_D1_N
S_CNV_WT_D1_P
GND
S_CNV_WT_D0_N
S_CNV_WT_D0_P
GND
S_CNV_WT_CLK_N
S_CNV_WT_CLK_P
GND

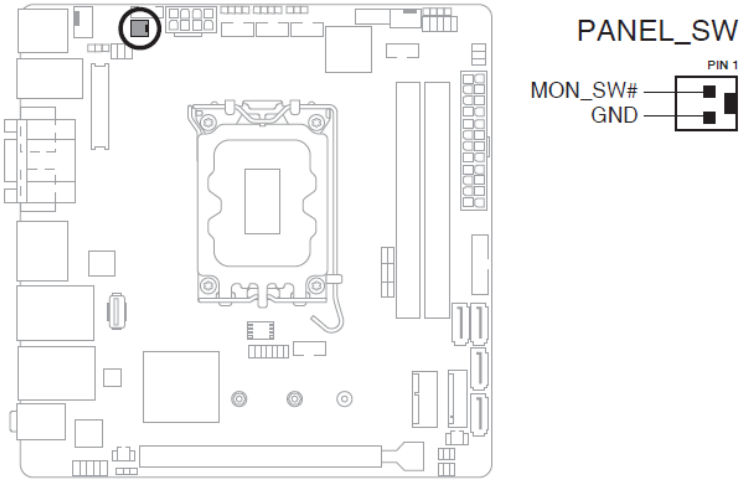
**24: M.2 socket 3**



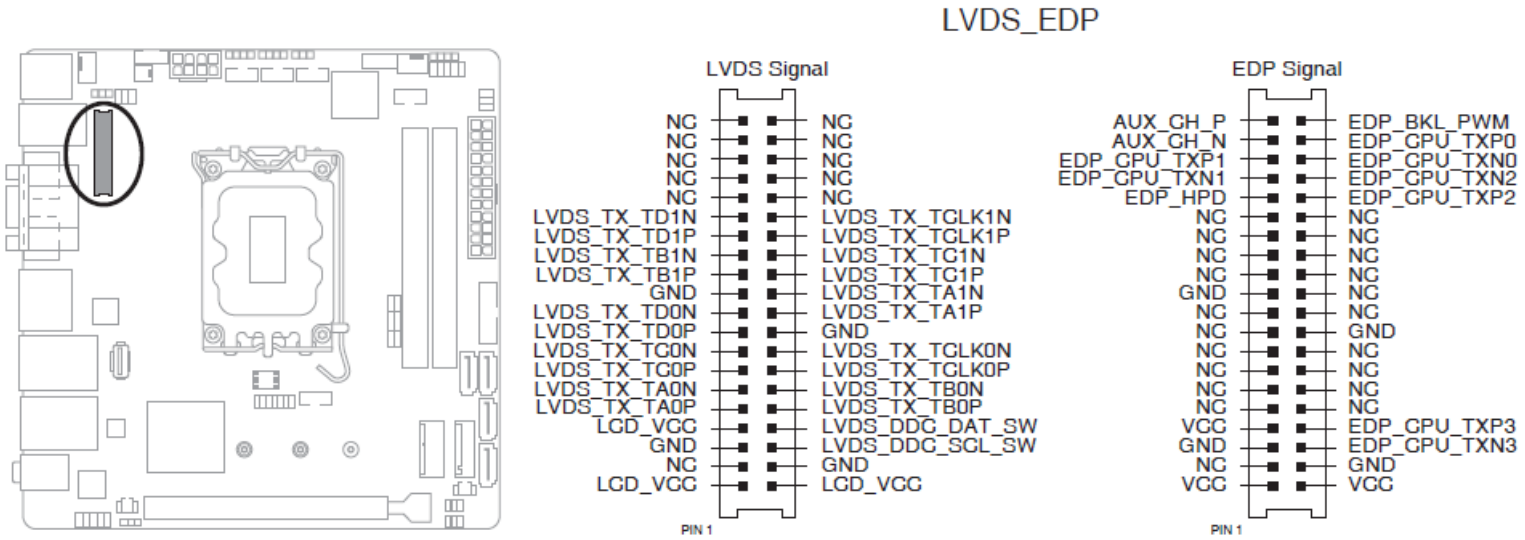

**25: SPI TPM header (14-1 pin SPI_TPM)**



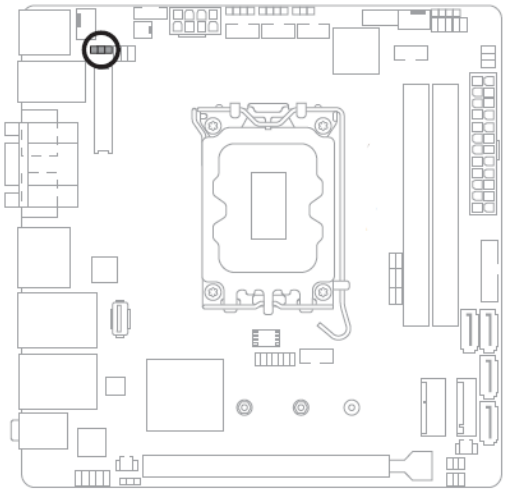
**26: LCD Panel Monitor Switch header (2-pin PANEL_SW)**

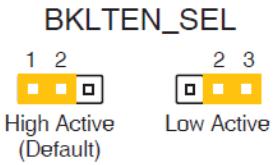


**27: LVDS/eDP Signal connector (LVDS_eDP)**



**28: LVDS/eDP Panel Enable Signal Selection header (3-pin BKLTEN_SEL)**






| PIN No. | Description |
|---|---|
| 1-2(Default) | High Active |
| 2-3 | Low Active |

*Connector Type: 2.54mm pitch

# 5 Signal Descriptions

## 5.1 Watch Dog Signal

WDT setting

SIO_INDEX_PORT is 0x2E
SIO_DATA_PORT is 0x2F

1. Set WDT Time Unit
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO

Outportb(SIO_INDEX_PORT, 0x07);
Outportb(SIO_DATA_PORT, 0x08);
Outportb(SIO_INDEX_PORT, 0xF0); //select WDT setting
val = Inportb(SIO_DATA_PORT) // Read current WDT setting

val = val | 0x08; // minute mode, val = val& 0xF7 if second mode
Outportb(SIO_INDEX_PORT, 0xF0); //select WDT setting
Outportb(SIO_DATA_PORT, val); // Write back WDT setting

Outportb(SIO_INDEX_PORT, 0xAA); // Lock SIO

2. Set WDT Time

```
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO

Outportb(SIO_INDEX_PORT, 0x07);
Outportb(SIO_DATA_PORT,    0x08);
Outportb(SIO_INDEX_PORT, 0xF1); //select time value
Outportb(SIO_DATA_PORT,    Time); // Write WDT time, value 1 to 255

Outportb(SIO_INDEX_PORT, 0xAA); // Lock SIO
```

3. Enable WDT

```
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO

Outportb(SIO_INDEX_PORT, 0x07); // select device
Outportb(SIO_DATA_PORT,    0x08); // device 8
Outportb(SIO_INDEX_PORT, 0x30); //select WDT status port
val = Inportb(SIO_DATA_PORT) // Read current WDT status

val = val | 0x01; // Enable WDT Timer
Outportb(SIO_INDEX_PORT, 0x30); //select WDT status port
```

Outportb(SIO_DATA_PORT,  val); // Write back WDT status

Outportb(SIO_INDEX_PORT, 0xAA); // Lock SIO

4. Disable WDT

```
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO

Outportb(SIO_INDEX_PORT, 0x07);
Outportb(SIO_DATA_PORT,  0x08);
Outportb(SIO_INDEX_PORT, 0xF1); //select time value
Outportb(SIO_DATA_PORT,  0x00); // Clear WDT time, it means WDT Time-Out disable
Outportb(SIO_INDEX_PORT, 0x30); //select WDT status port

val = Inportb(SIO_DATA_PORT) // Read current WDT status
val = val& 0xFE; // Disable WDT Timer
Outportb(SIO_INDEX_PORT, 0x30); //select WDT status port
Outportb(SIO_DATA_PORT,  val); // Write back WDT status

Outportb(SIO_INDEX_PORT, 0xAA); // Lock SIO
```

5. WADE-8213-Q670E SIO not support WDT Reset Flag judgement.

## 5.2 GPIO Signal

GPIO Setting

SIO_INDEX_PORT is 0x2E
SIO_DATA_PORT is 0x2F

1. Set GPIOn to GPI or GPO
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO

Outportb(SIO_INDEX_PORT, 0x07);
Outportb(SIO_DATA_PORT, 0x07);

Outportb(SIO_INDEX_PORT, 0x30);
val = Inportb(SIO_DATA_PORT)
val = val | 0x10;
Outportb(SIO_INDEX_PORT, 0x30);
Outportb(SIO_DATA_PORT, val); // Active GPIO

Outportb(SIO_INDEX_PORT, 0xF0);
val = Inportb(SIO_DATA_PORT) // Read current value
val = val | (0x01 <<GPIOn); // GPO, val = val&~(0x01 <<GPIOn); if GPI, GPIOn is value 0 to 7
Outportb(SIO_INDEX_PORT, 0xF0);

```
Outportb(SIO_DATA_PORT,    val);

Outportb(SIO_INDEX_PORT, 0xAA); // Lock SIO

2. Get GPIOn GPI value
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO

Outportb(SIO_INDEX_PORT, 0x07);
Outportb(SIO_DATA_PORT,    0x07);

Outportb(SIO_INDEX_PORT, 0x30);
val = Inportb(SIO_DATA_PORT)
val = val | 0x10;
Outportb(SIO_INDEX_PORT, 0x30);
Outportb(SIO_DATA_PORT,    val); // Active GPIO

Outportb(SIO_INDEX_PORT, 0xF1);
val = Inportb(SIO_DATA_PORT) // Read current value

Outportb(SIO_INDEX_PORT, 0xAA); // Lock SIO

   if (val& (0x01 <<GPIOn)) // Determine if GPIOn is High or Low; GPIOn is value 0 to 7
         return HIGH; //GPI High
```

```
    else
        return LOW; //GPI Low
```

3. Set GPIOn GPO value

```
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO
Outportb(SIO_INDEX_PORT, 0x87); // Unlock SIO

Outportb(SIO_INDEX_PORT, 0x07);
Outportb(SIO_DATA_PORT,    0x07);

Outportb(SIO_INDEX_PORT, 0x30);
val = Inportb(SIO_DATA_PORT)
val = val | 0x10;
Outportb(SIO_INDEX_PORT, 0x30);
Outportb(SIO_DATA_PORT,    val); // Active GPIO

Outportb(SIO_INDEX_PORT, 0xF1);
val = Inportb(SIO_DATA_PORT) // Read current value
val = val | (0x01 <<GPIOn); // GPO LOW, val = val&~(0x01 <<GPIOn); if GPO High, GPIOn is value 0 to 7
Outportb(SIO_INDEX_PORT, 0xF1);
Outportb(SIO_DATA_PORT,    val);

Outportb(SIO_INDEX_PORT, 0xAA); // Lock SIO
```

# 6 System Resources

## 6.1 Intel®Alder Lake -S PCH

Intel® Q670E Chipset

## 6.2 Main Memory

WADE-8213-Q670E provides2xSO-DIMM sockets. The maximum memory can be up to 64GB.
Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install memory module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

## 6.3 Installing the Single Board Computer

To install your WADE-8213-Q670E into standard chassis or proprietary environment, please perform the following:
Step 1 : Check all jumpers setting on proper position
Step 2 : Install and configure CPU,CPU cooling and memory module on right position
Step 3 : Place WADE-8213-Q670E into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

WARNING
Please ensure that mother board is properly inserted and fixed by mechanism.

Note:

Please refer to section 6.3.1 to 6.3.3 to install INF/Graphic/LAN

### 6.3.1 Chipset Component Driver

WADE-8213-Q670E is based on Intel® Q670E chipset and desktop processors including Core™ i9 / i7 / i5 / i3 sku . It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 10, please install its INF before any of other Drivers are installed.

### 6.3.2 Intel®UHD 770 Graphics

WADE-8213-Q670E has integrated Intel®UHD 770Graphics which supports DirectX 12、OpenGL 4.6. It is the most advanced design to gain an outstanding graphic performance. WADE-8213-Q670E supports DP,HDMI, eDP/LVDSdisplay output. This combination makes WADE-8213-Q670E an excellent performance hardware.

Drivers Support

Please find the Graphic driver in the WADE-8213-Q670E of Portwell download center. The driver supports Windows 10.

### 6.3.3 Intel LAN I225LM/I210AT Gigabit Ethernet Controller

- Intel I225 Gigabit Ethernet controller and 1x RJ45 connectors on rear I/O
- Intel I210 Gigabit Ethernet controller and 1x RJ45 connectors on rear I/O

Drivers Support

Please find Intel I225LM / I210AT LAN driver in the WADE-8213-Q670E of Portwell download center. The driver supports Windows 10.

# 7 BIOS Setup Items

## 7.1 Introduction

The following section describes the BIOS setup program. The BIOS setup program can be used to view and change the BIOS settings for the module. Only experienced users should change the default BIOS settings.

## 7.2 BIOS Setup

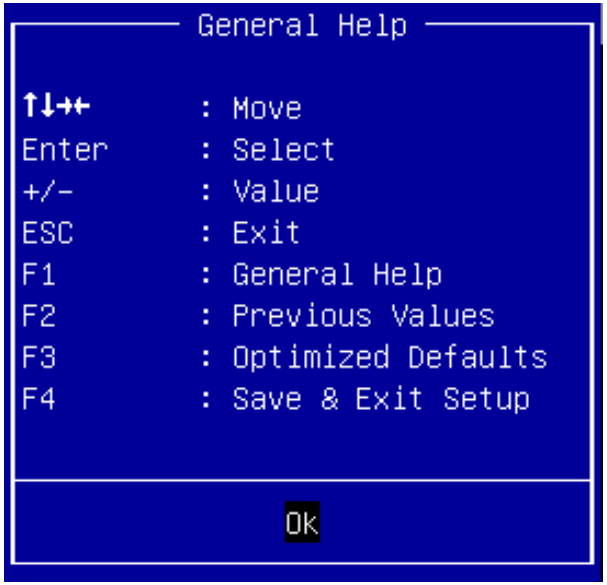
Power on the computer and the system will start POST (Power on Self Test) process. When the message below appears on the screen, press <Delete> or <ESC> key will enter BIOS setup screen.

Press<Delete> or <ESC> to enter SETUP

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

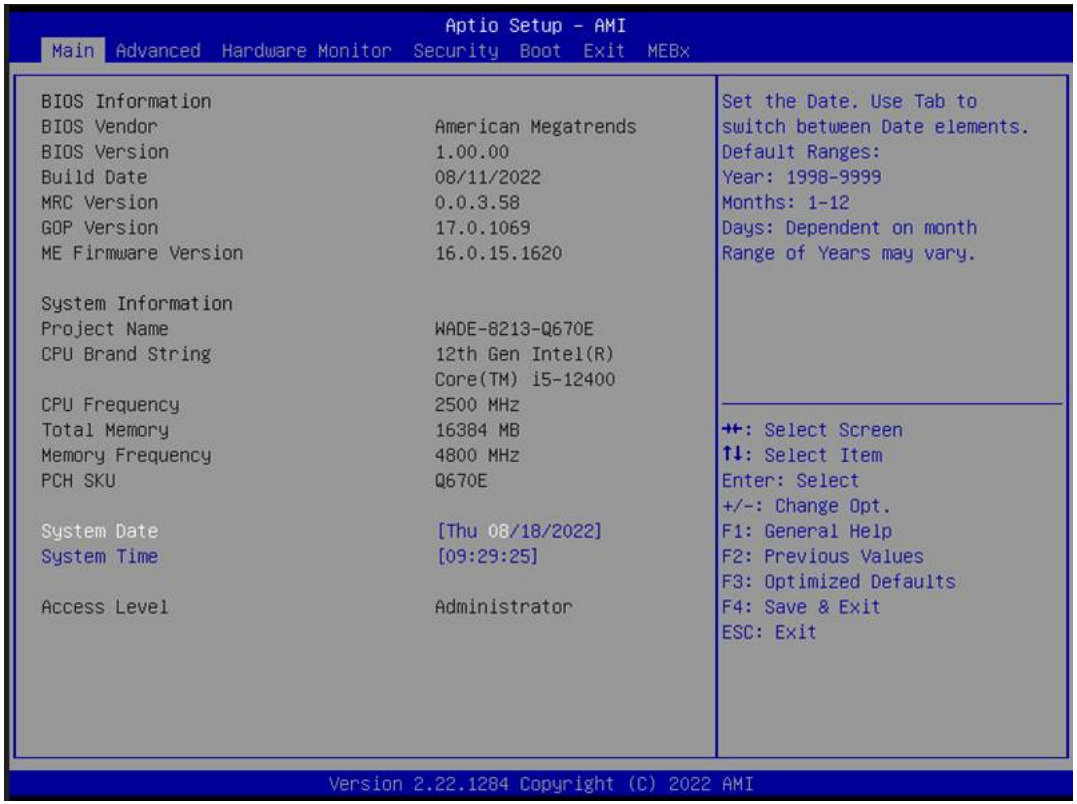
Press <F1> to Run General Help or Resume

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help Screen.


General Help
↑↓→←  : Move
Enter  : Select
+/-  : Value
ESC  : Exit
F1  : General Help
F2  : Previous Values
F3  : Optimized Defaults
F4  : Save & Exit Setup
Ok

### 7.2.1 Main

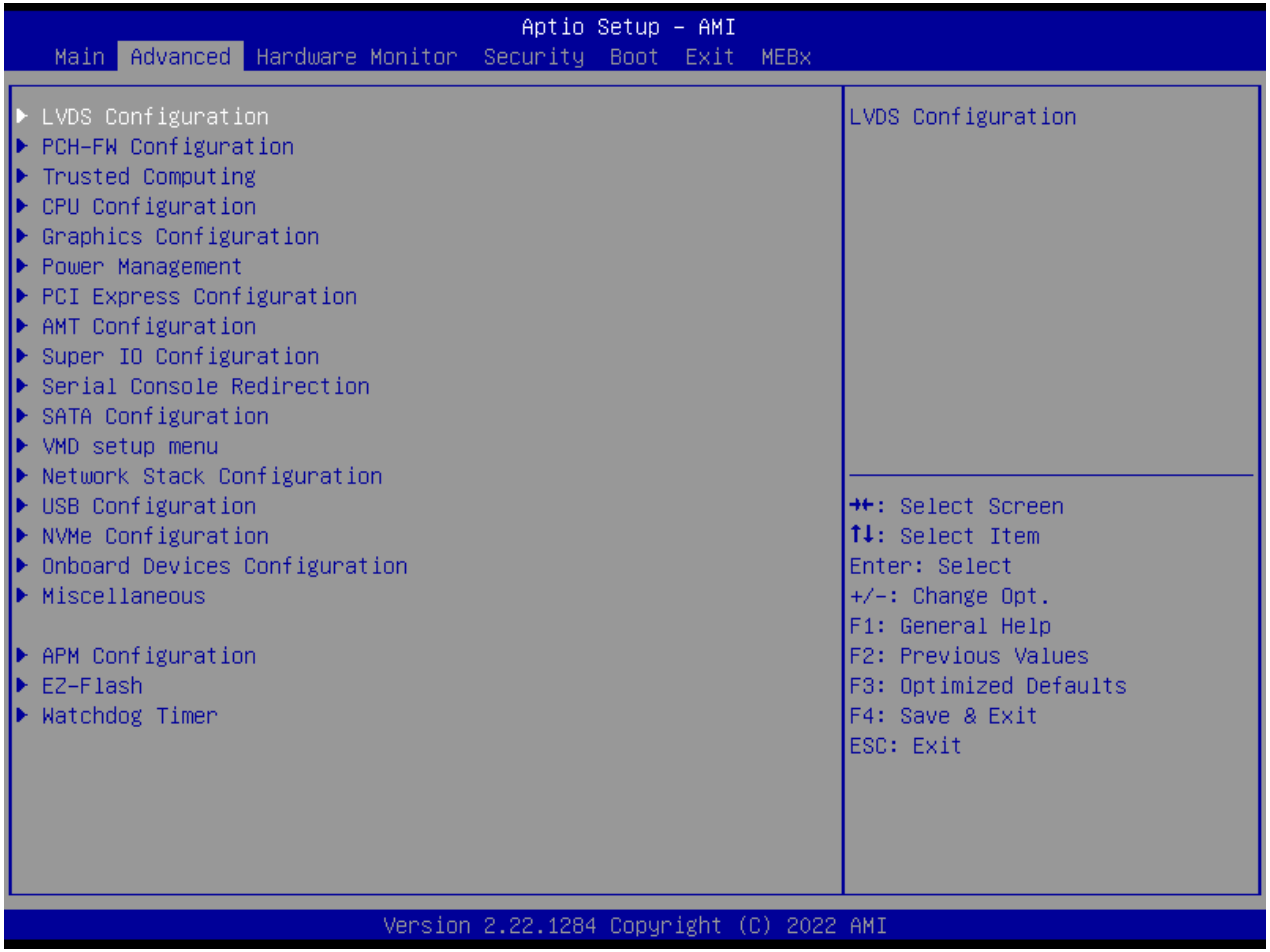
Use this menu for basic system configurations, such as time, date etc.




| Feature | Description | Options |
|---|---|---|
| System Date | The date format is <Day>, <Month><Date><Year>. Use [+] or [—] to configure system Date. | |
| System Time | The time format is <Hour><Minute><Second>. Use [+] or [—] to configure system Time. | |

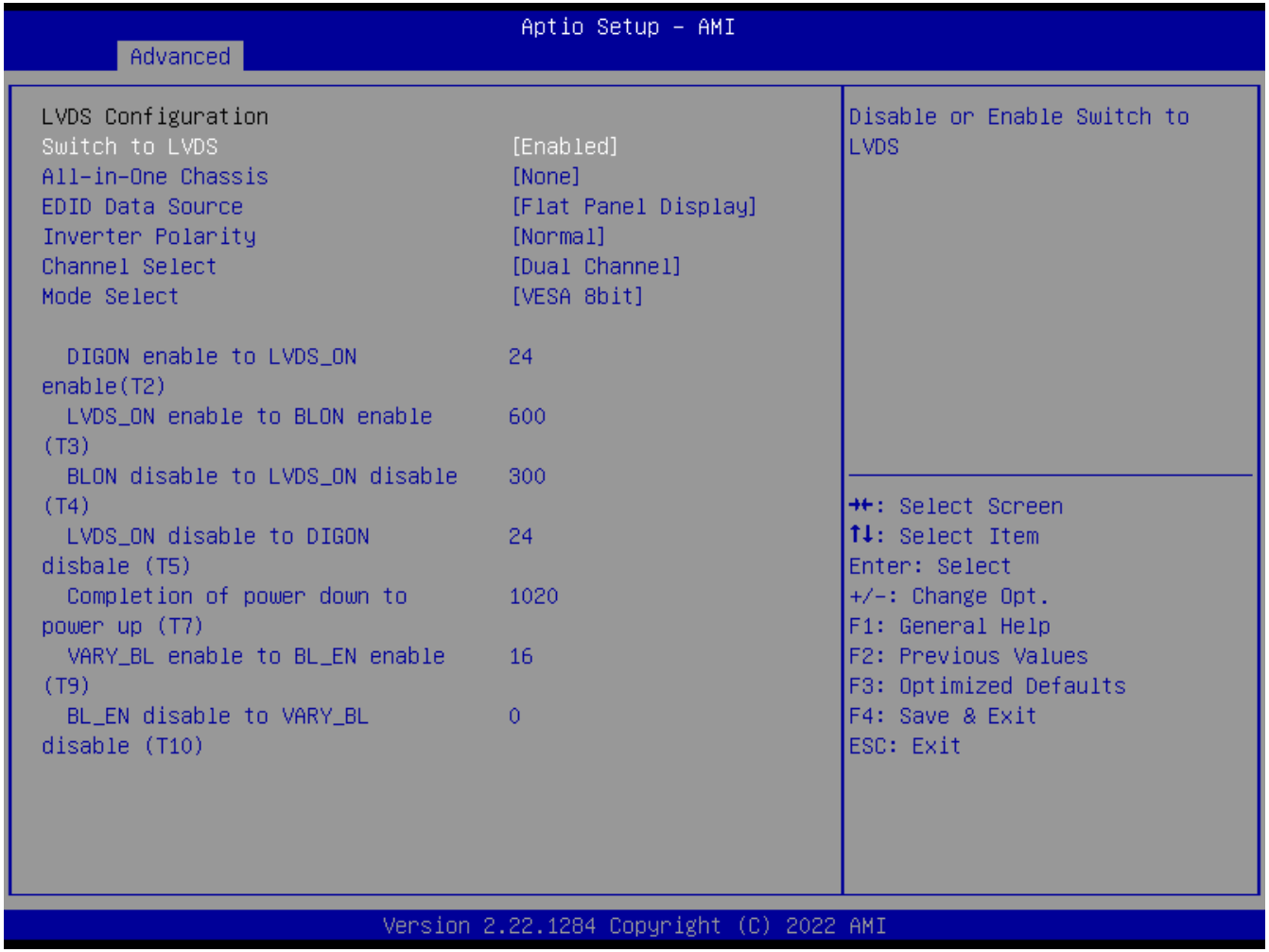
### 7.2.2Advanced

Use this menu to set up the items of special enhanced features



LVDS Configuration

LVDS Configuration



| Feature | Description | Options |
|---|---|---|
| Switch to LVDS | Disable or Enable Switch to LVDS | ★Disabled Link, Enabled |
| Switch to LVDS [Enable ] | | |
| All –in-One Chassis | Select All-in-One (AiO) Chassis (if applicable) for simplified AiO configuration.<br>Warning: Incorrect selection of AiO chassis may result in incorrect operation or potential damage to AiO chassis hardware. | ★None, 1920x1080 LVDS1, 1920x1080 LVDS2, 1920x1080 LVDS3, 1600x900 LVDS4, |
| EDID Data Source | EDID Data Source | ★Flat Panel Display, Pre-defined |
| Inverter Polarity | Inverter board polarity<br>Normal: PWM=0%(Dim)<br>Inverted: PWM=0%(Bright)<br>Consult inverter board specifications for proper value. | ★Normal, Inverted |
| Channel Select | Channel Select | ★Dual Channel, Single Channel |
| Mode Select | Mode Select | ★VESA 8bit, JEIDA,<br>VESA 6bit,VESA 10 bit |
| DIGON enable to LVDS_ON enable(T2) | Timing value from 0 to 1023ms | ★24 |
| LVDS_ON enable to BLON enable(T3) | Timing value from 0 to 1023ms | ★600 |
| BLON disable to LVDS_ON disable(T4) | Timing value from 0 to 1023ms | ★300 |
| LVDS_ON disable to DIGON disable(T5) | Timing value from 0 to 1023ms | ★24 |
| Completion of power down to power up(T7) | Timing value from 0 to 1023ms | ★1020 |
| VARY_BL enable to BL_EN enable(T9) | Timing value from 0 to 1023ms | ★16 |
| BL_EN disable to VARY_BL disable(T10) | Timing value from 0 to 1023ms | ★0 |

PCH-FW Configuration

Configure Management Engine Technology Parameters


| Feature | Description | Options |
|---|---|---|
| TPM Device Selection | Selects TPM device: PTT or dTPM. PTT-Enable PTT in SkuMgr dTPM1.2 –Disables PTT in SkuMgr Warning! PTT/ dTPM will be disabled and all data saved on it will be lost. | ★dTPM, PTT |

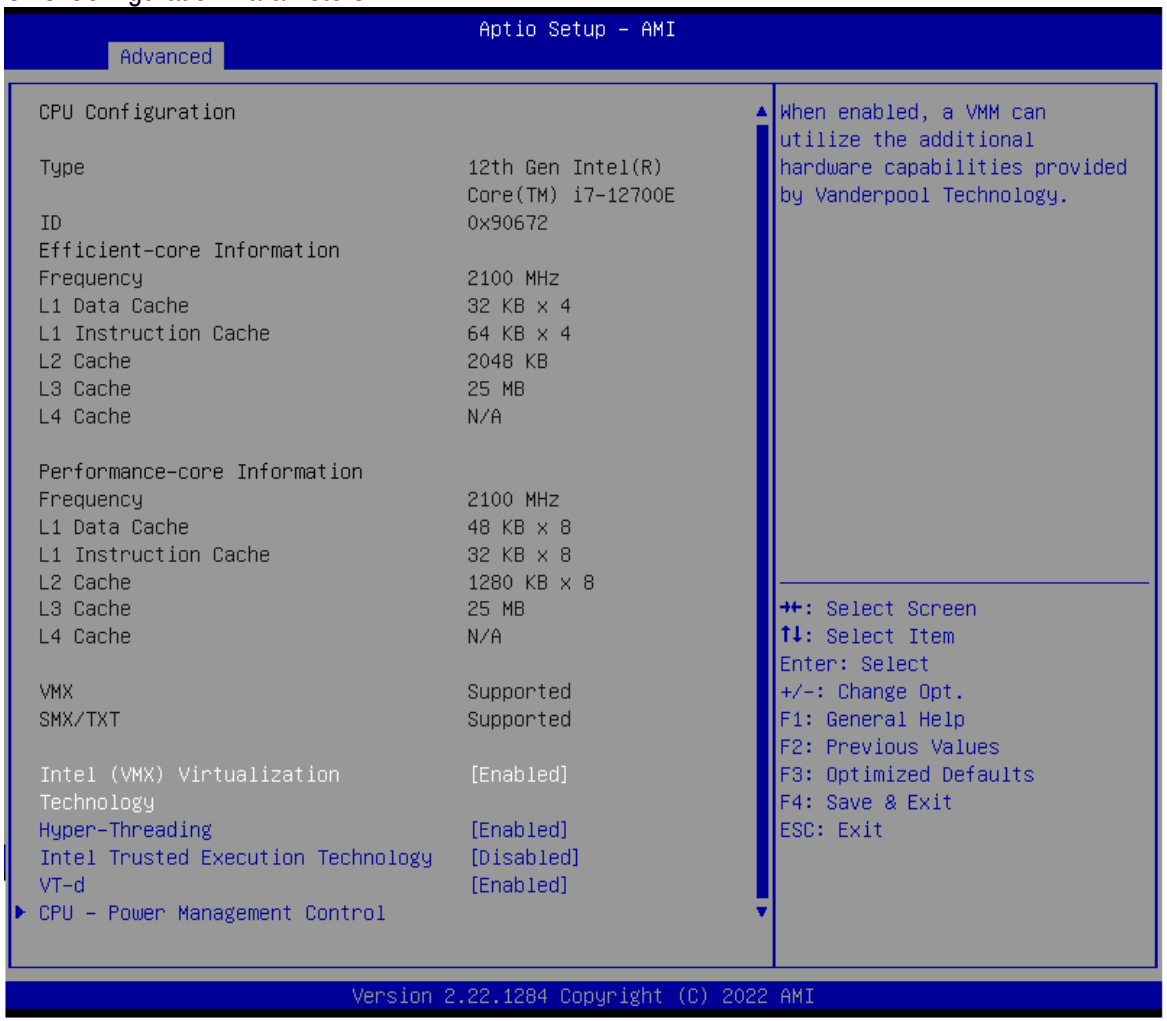
## Trusted Computing

Trusted Computing Settings


| Feature | Description | Options |
|---|---|---|
| Security Device Support | Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available. | ★Enable, Disable |

## CPU Configuration

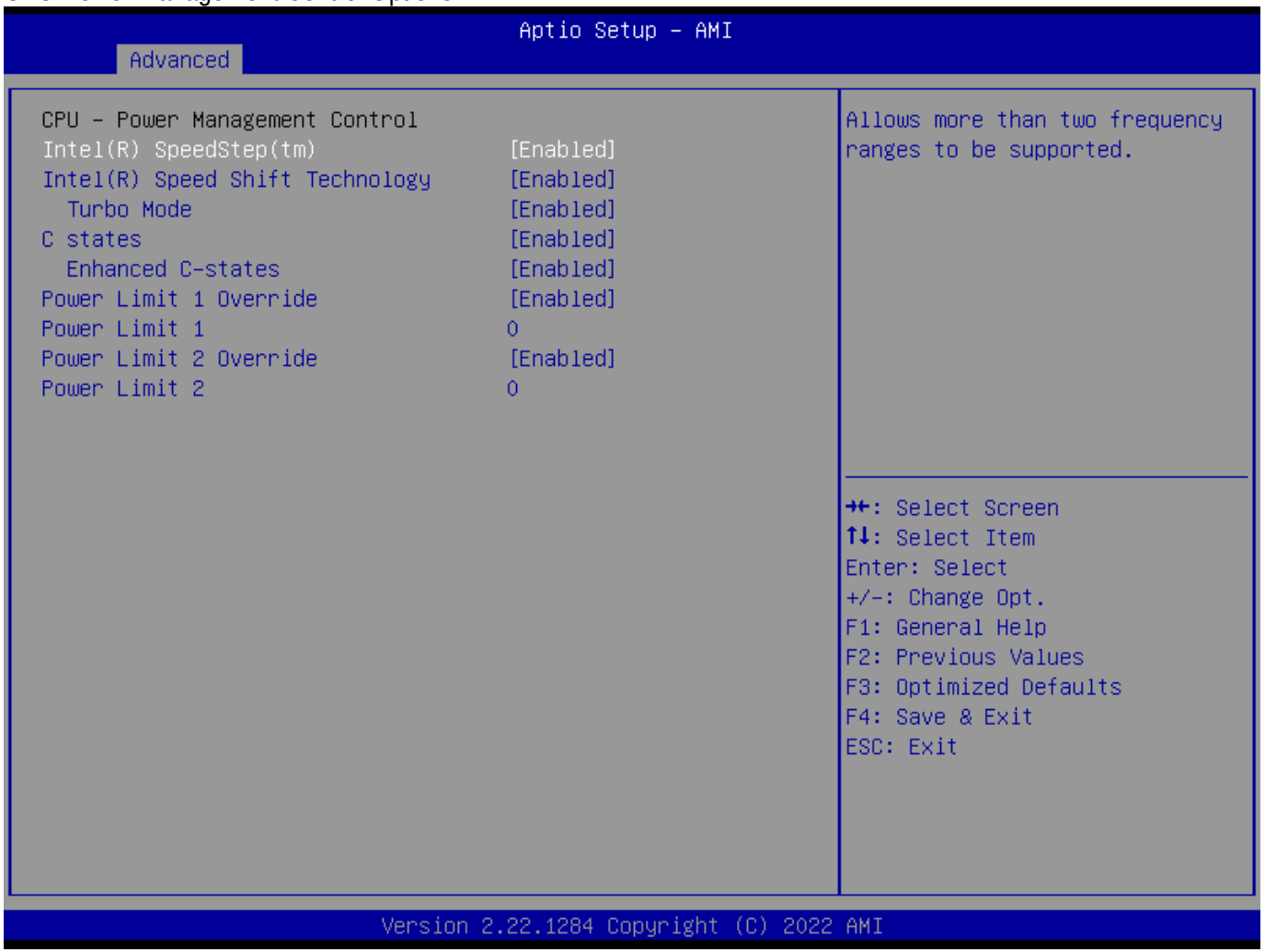
CPU Configuration Parameters



| Feature | Description | Options |
|---|---|---|
| Intel (VMX)Virtualization Technology | When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. | ★Enabled ,Disabled |
| Hyper-Threading | Enable or Disable Hyper-ThreadingTechnology. | ★Enabled ,Disabled |
| Intel Trusted Execution Technology | Enables utilization of additional hardware capabilities provided by Intel(R) Trusted Execution Technology. Changes require a full power cycle to take effect. | ★Disabled, Enabled |
| VT-d | VT-d capability | ★Enabled ,Disabled |

CPU- Power Management Control

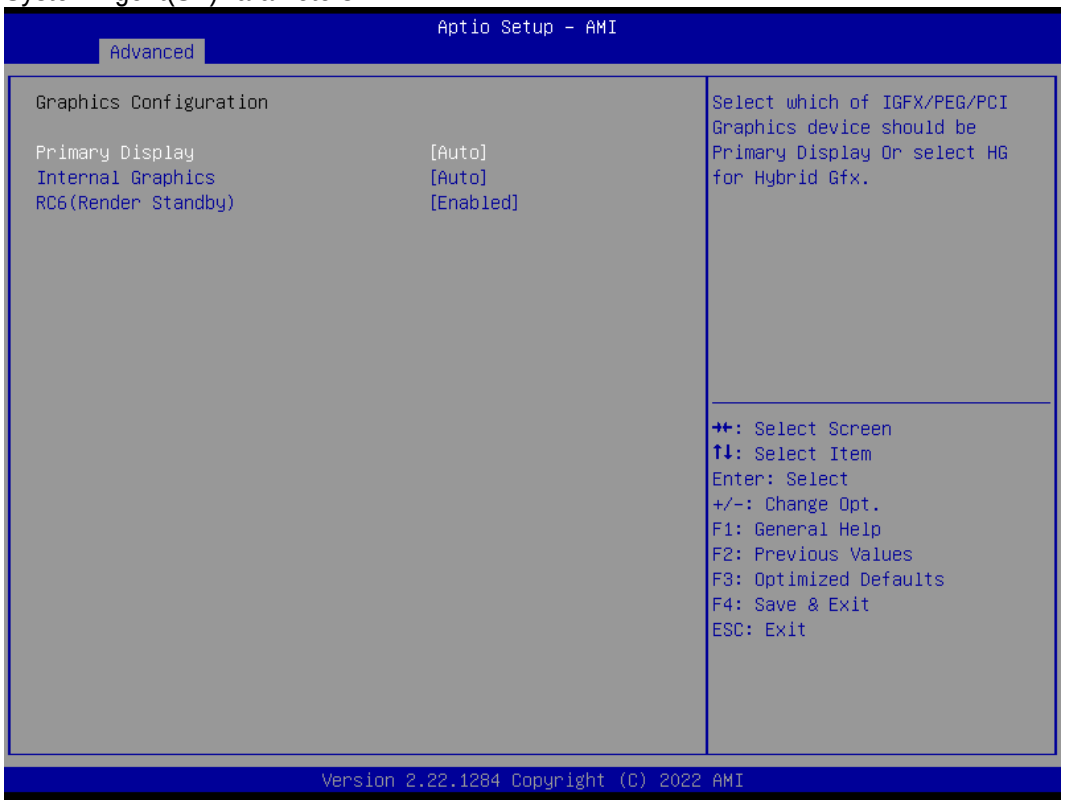
CPU-Power Management Control Options



| Feature | Description | Options |
|---|---|---|
| Intel(R) SpeedStep(tm) | Allows more than two frequency ranges to be supported. | ★Enabled ,Disabled |
| Intel(R) Speed Shift Technology | Enable/Disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states. | ★Enabled ,Disabled |
| Turbo Mode | Enable/Disable processor Turbo Mode(requires EMTTM enabled too).Auto means enabled | ★Enabled ,Disabled |
| C states | Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized. | ★Enabled ,Disabled |
| Enhanced C-states | Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State. | ★Enabled ,Disabled |
| Power Limit 1 Override | Enable/Disable Power Limit 1 override. If this option is disables, BIOS will program the default values for power Limit 1 and Power Limit 1 Time Window. | ★Disabled, Enabled |
| Power Limit 1 Override [Enable ] | | |
| Power Limit 1 | Power Limit 1 in Milli Wattts. BIOS will round to the nearest 1/8W when programming. 0=no custom override. For 12.50W, enter 12500. Overclocking SKU: Value must be between Max and Min Power Limits(specified by PACKAGE_POWER_SKU_MSR). Other SKUs: This value must be between Min Power Limit and Processor Base Power (TDP). | ★0 |
| Power Limit 2 Override | Enable/Disable Power Limit 1 override. If this option is disables, BIOS will program the default values for Power Limit 2 . | ★Enabled ,Disabled |
| Power Limit 2 | Power Limit 2 value in Milli Wattts. BIOS will round to the nearest 1/8W when programming. If value is 0, BIOS will program this value as 1.25*TDP. For 12.50w, enter 12500. Processor applies control policies such that the package power does not exceed this limit. | ★0 |

## Graphics Configuration

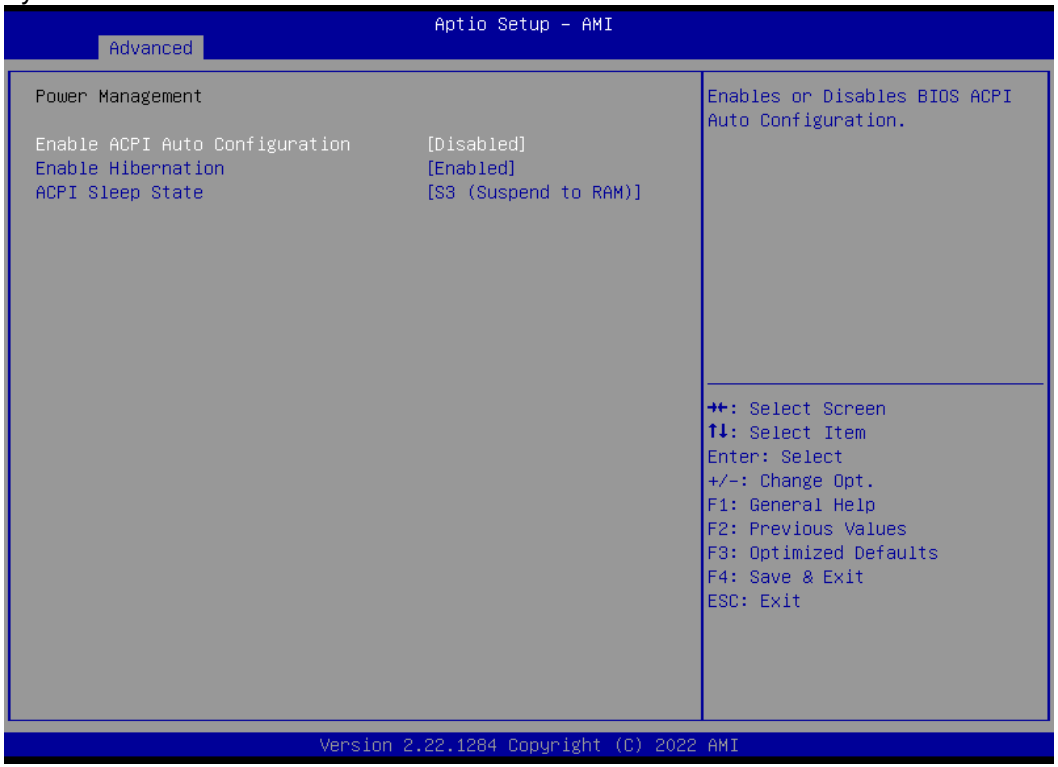
System Agent(SA)Parameters




| Feature | Description | Options |
|---|---|---|
| Primary Display | Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select HG for HybridGfx. | ★Auto, IGFX,PEG Slot |
| Internal Graphics | Keep IGFX enabled based on the setup options. | ★Auto,Disabled ,Enabled |
| RC6(Render Standby) | Check to enable render standby support. | ★Enabled ,Disabled |

## Power Management

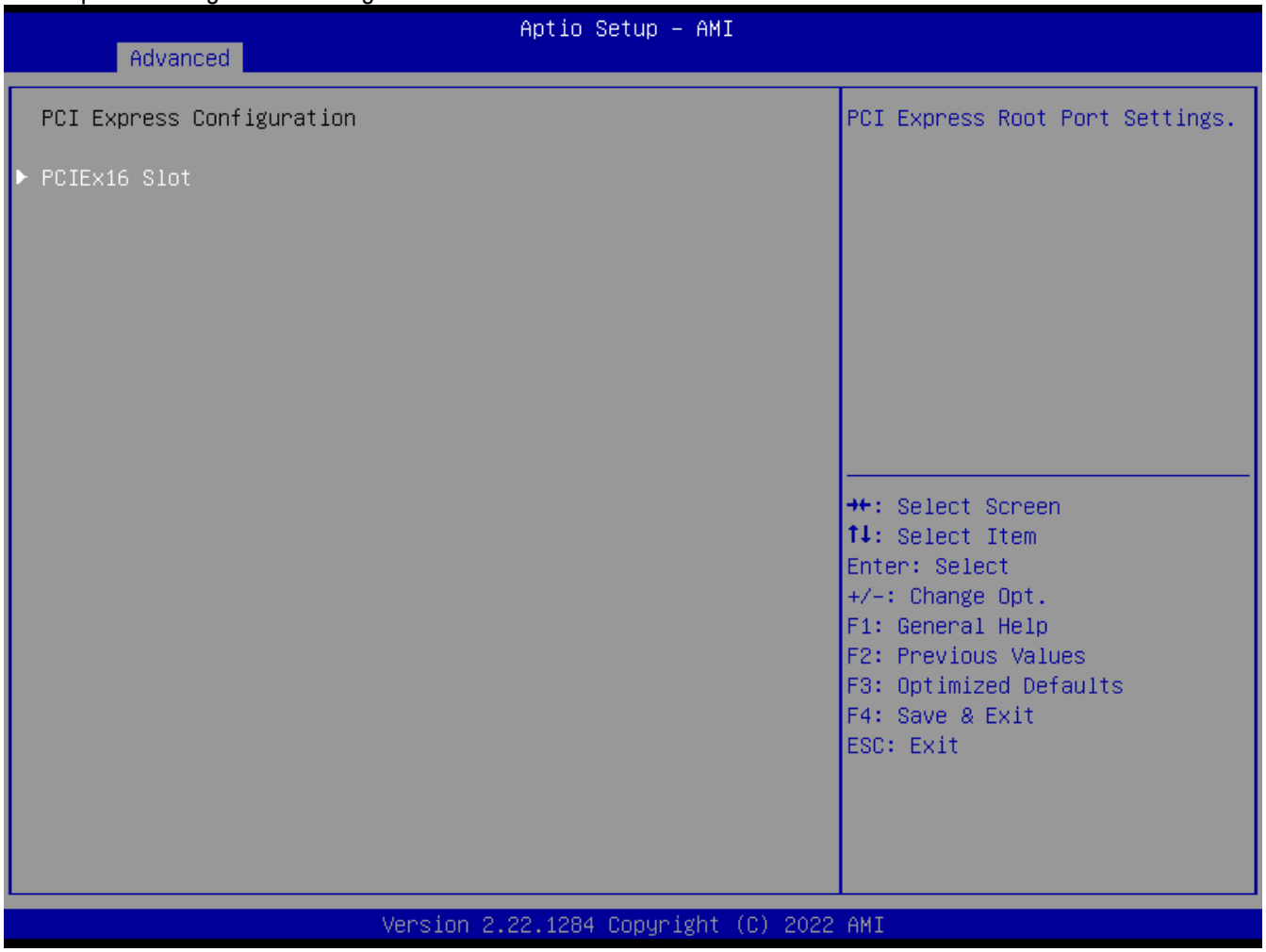
System ACPI Parameters




| Feature | Description | Options |
|---|---|---|
| Enable ACPI Auto Configuration | Enables or Disables BIOS ACPI Auto Configuration. | ★Disabled ,Enabled |
| Enable Hibernation | Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems. | ★Enabled, Disabled |
| ACPI Sleep State | Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed, | ★S3(Suspend to RAM), Suspend Disabled |

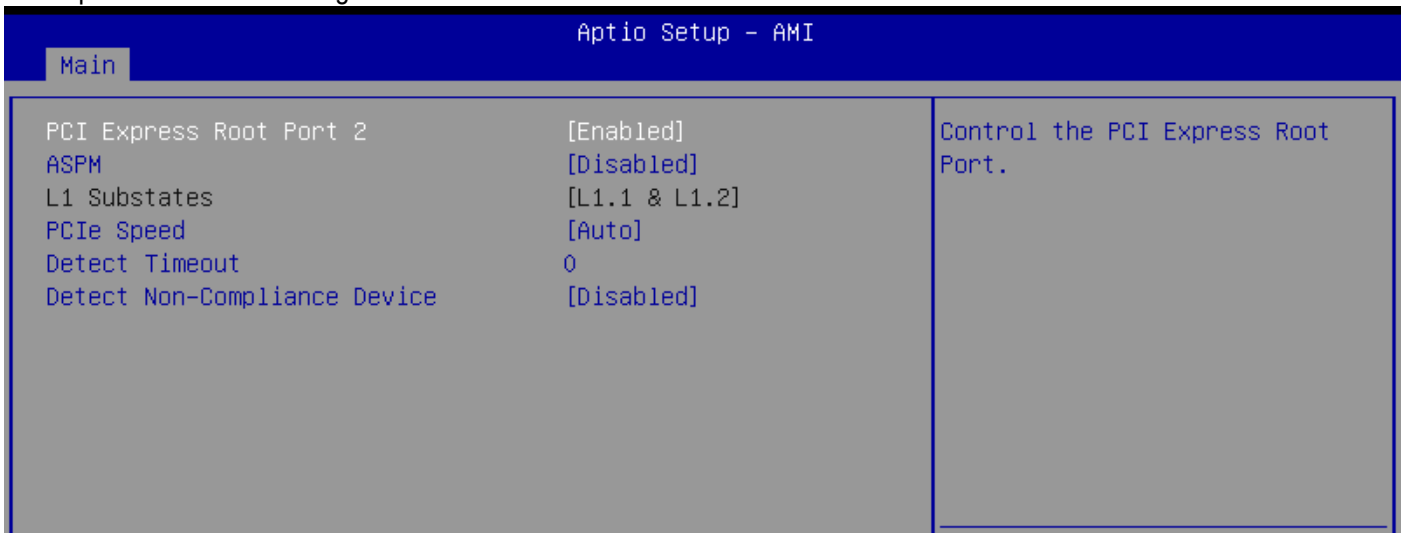
PCI Express Configuration

PCI Express Configuration settings



PCIE x16 Slot

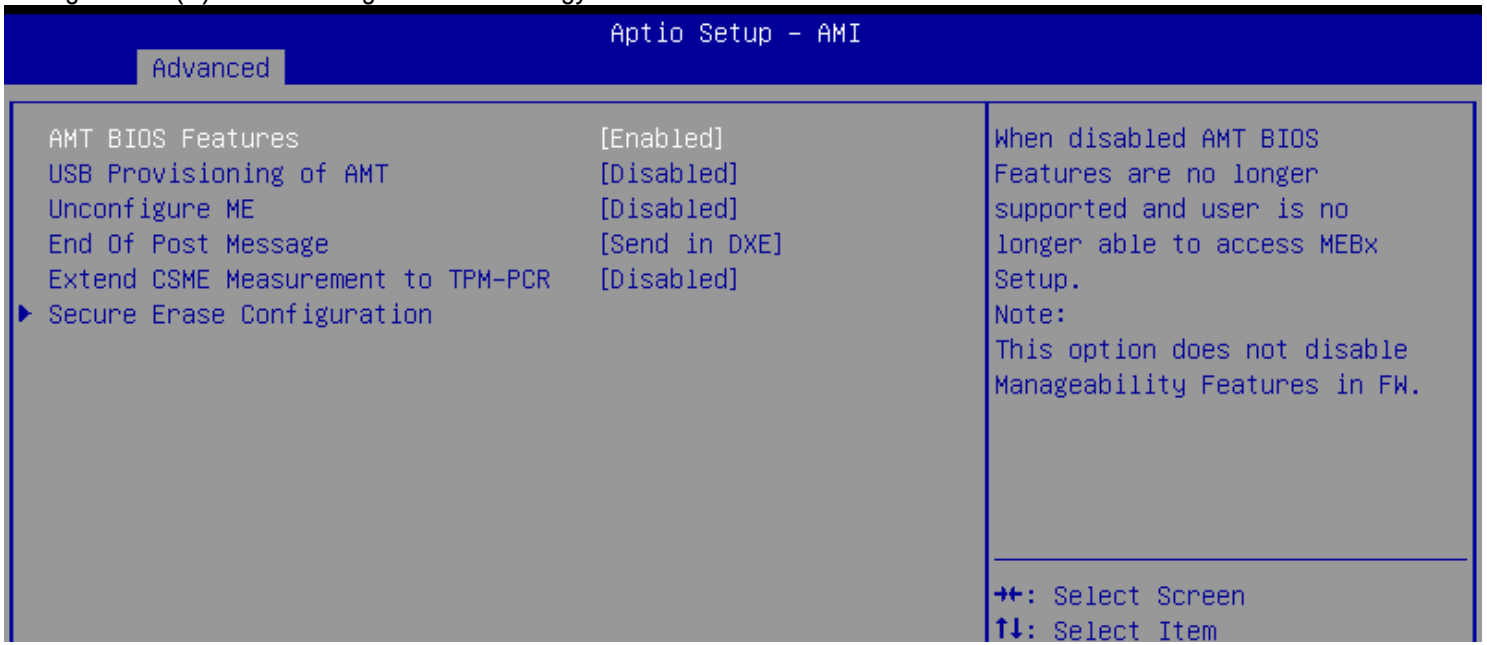
PCIExpress Root Port Settings




| Feature | Description | Options |
|---|---|---|
| PCI Express Root Port 2 | Control the PCI Express Root Port | ★Enabled, Disabled |
| ASPM | Set the ASPM Level:<br>Force L0s - Force all links to L0s State<br>Auto - BIOS auto configure<br>DISABLE - Disabled ASPM | ★Disabled, L0s, L1, L0sL1 |
| PCIE Speed | Configure PCIe Speed | ★Auto,Gen1,Gen2,Gen3,Gen4,Gen5 |
| Detect Timeout | The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port. | ★0 |
| Detect Non-Compliance Device | Enable when using Compliance Load Board | ★Disabled, Enabled |

AMT Configuration

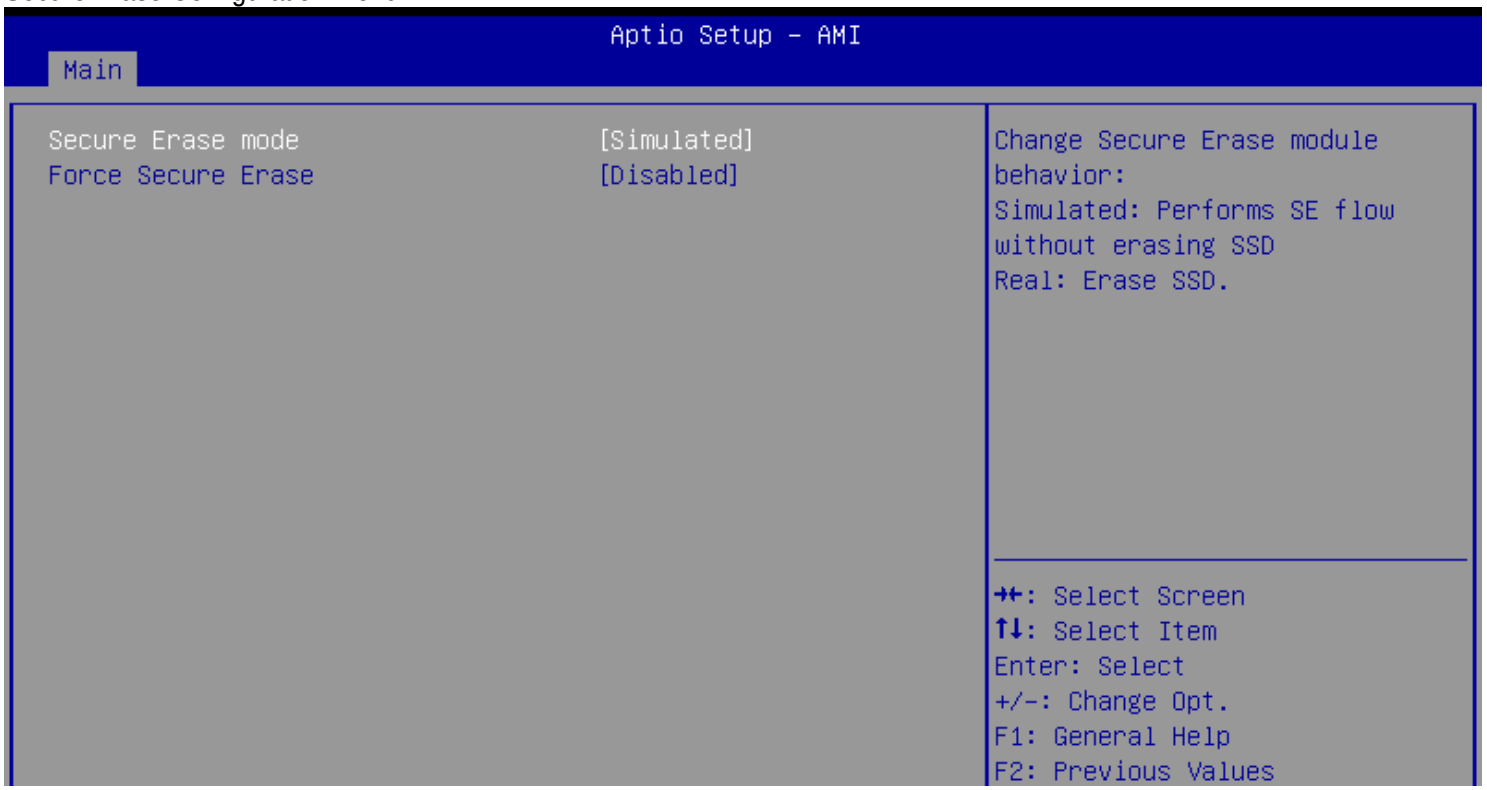
Configure Intel(R) Active Management Technology Parameters




| Feature | Description | Options |
|---|---|---|
| AMT BIOS Features | When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup.<br>Note: This option does not disable Manageability Features in FW. | ★Enabled,Disabled |
| USB Provisioning of AMT | Enable/Disable of AMT USB Provisioning. | ★Disabled, Enable |
| Unconfigure ME | Unconfigure ME with resetting MEBx password to default on next boot. | ★Disabled, Enable |
| End Of Post Message | Enable/Disable End of Post message sent to ME. | ★Send in DXE,Disabled |
| Extend CSME Measurement to TPM-PCR | Enable/Disable Extend CSME Measurement to TPM-PCR[0] and AMT Config to TPM-PCR[1] | ★Disabled, Enable |

Secure Erase Configuration

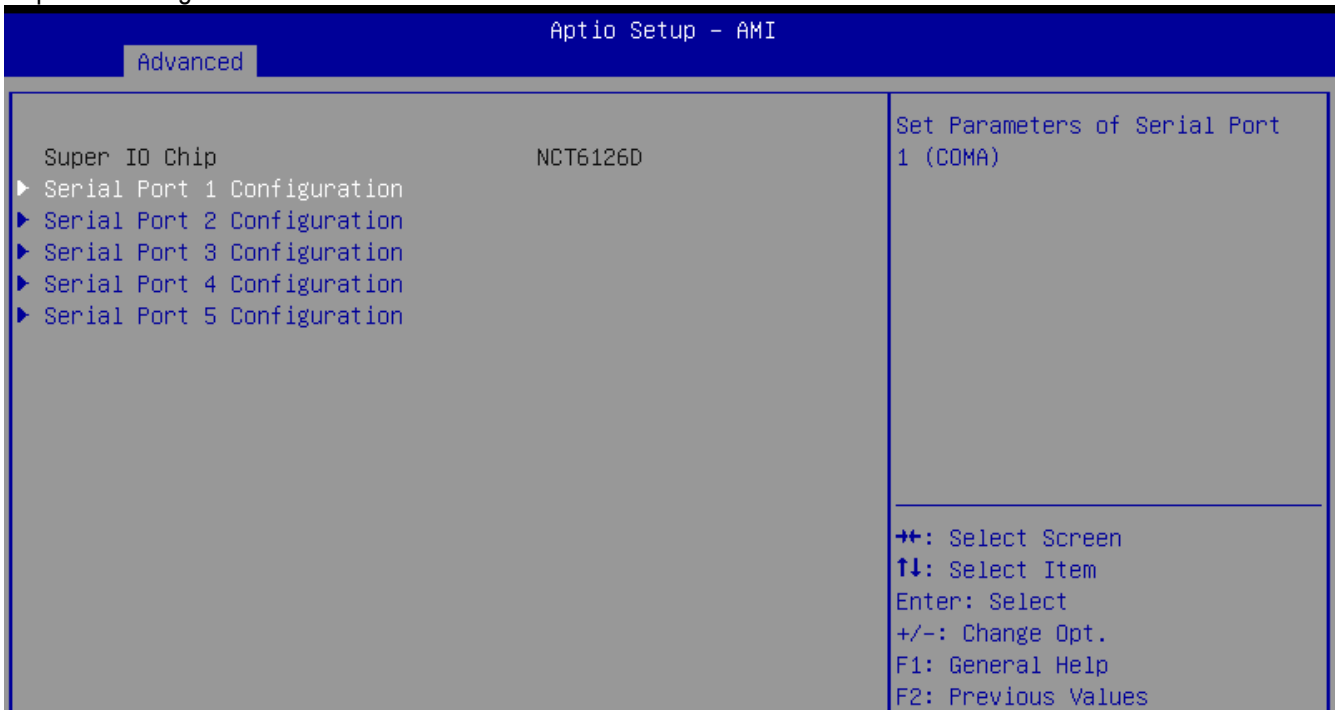
Secure Erase Configuration menu




| Feature | Description | Options |
|---|---|---|
| Secure Erase mode | Change Secure Erase module behavior:<br>Simulated: Performs SE flow without erasing SSD<br>Real: Erase SSD. | ★Simulation, Real |
| Force Secure Erase | Force Secure Erase on next boot | ★Disabled, Enable |

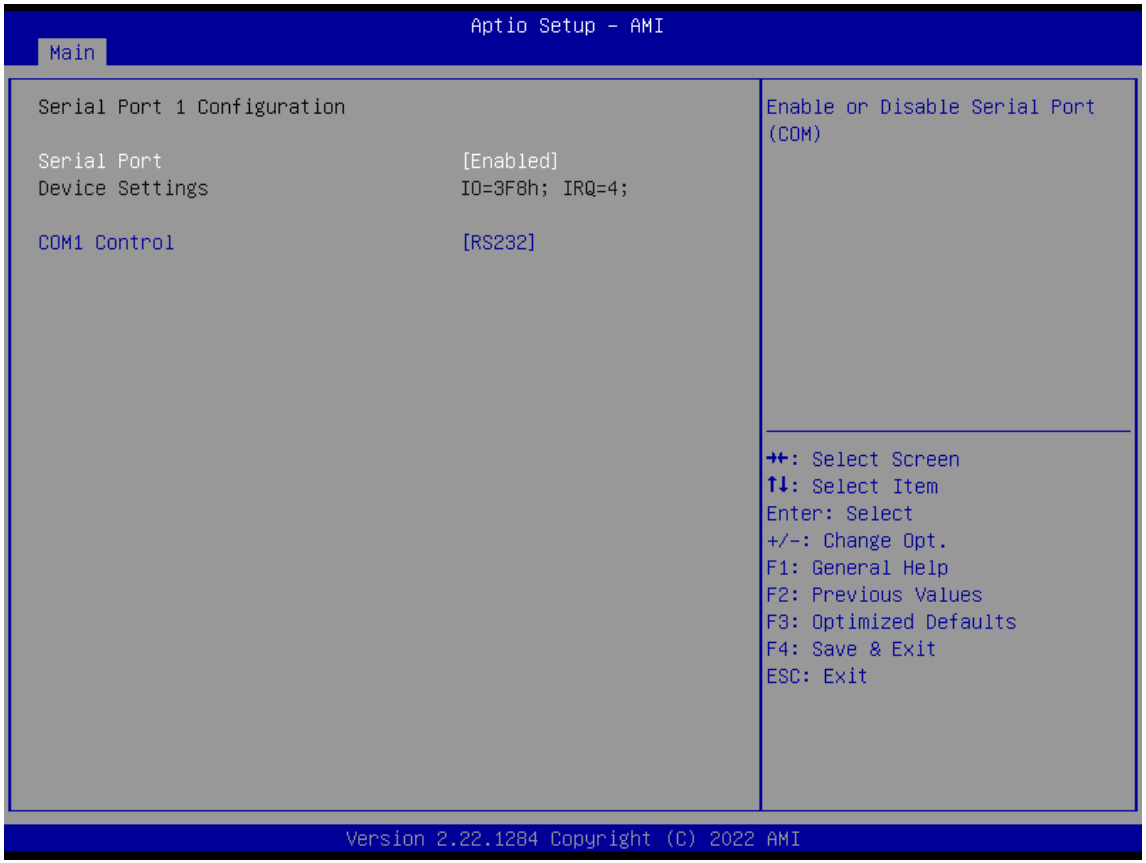
Super IO Configuration

Super IO Configuration



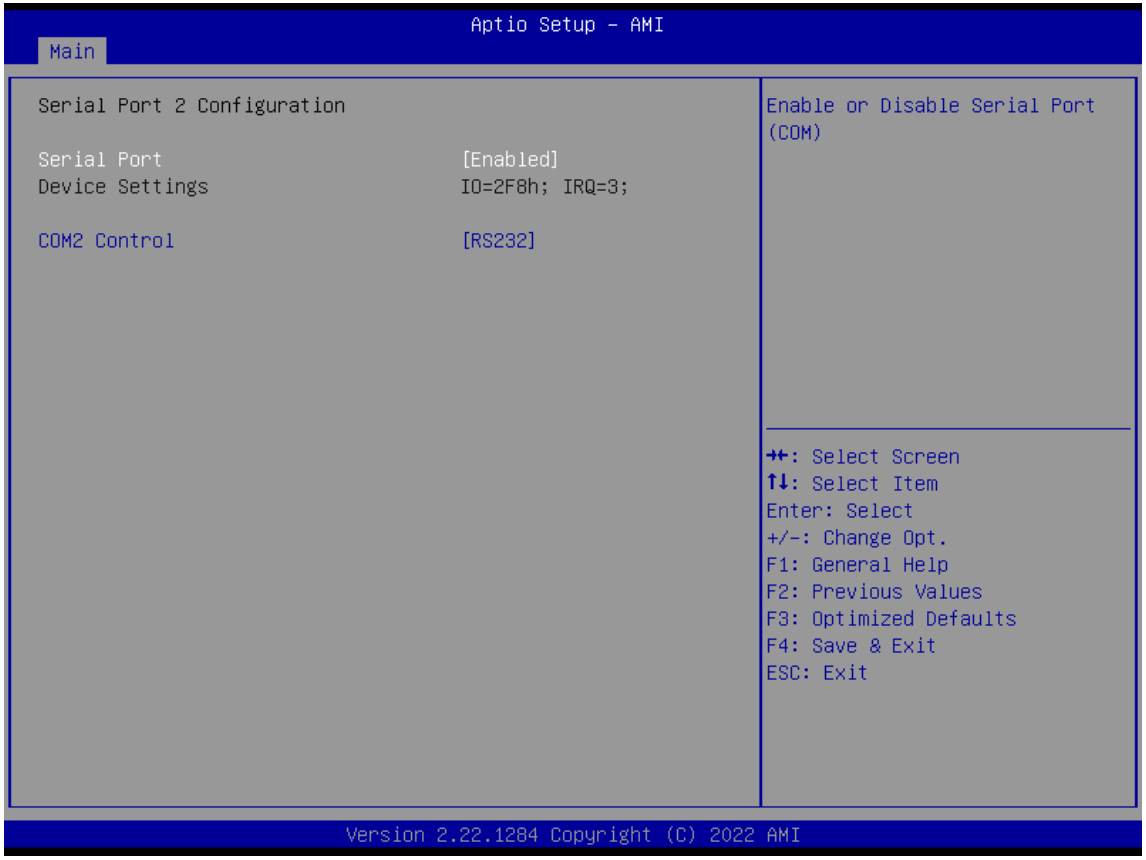

| Feature | Description | Options |
|---|---|---|
| Serial Port 1 Configuration | Set Parameters of Serial Port1(COMA) | |
| Serial Port 2 Configuration | Set Parameters of Serial Port2(COMB) | |
| Serial Port 3 Configuration | Set Parameters of Serial Port3(COMC) | |
| Serial Port 4 Configuration | Set Parameters of Serial Port4(COMD) | |
| Serial Port 5 Configuration | Set Parameters of Serial Port5(COME) | |

## Serial Port 1 Configuration



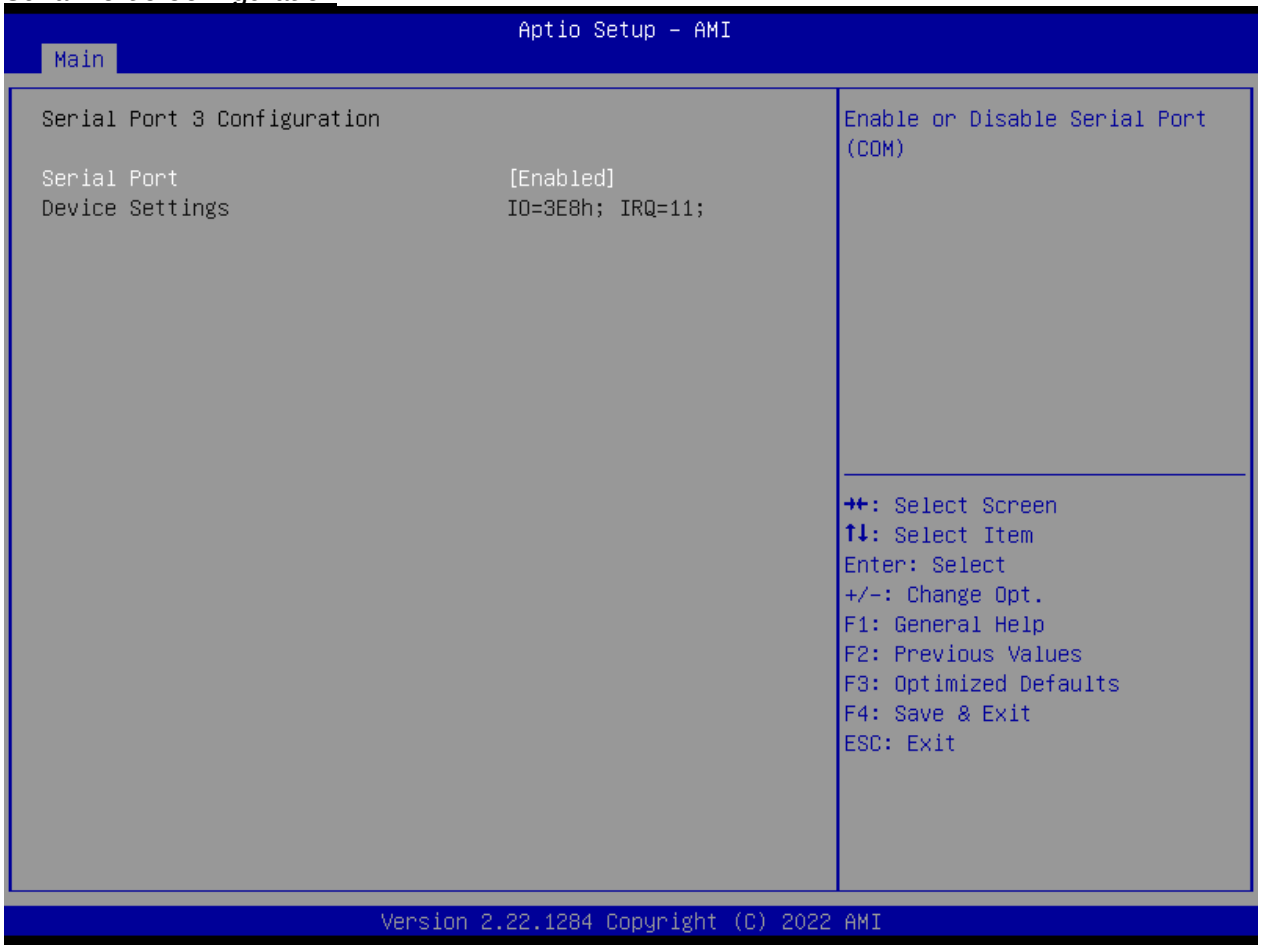

| Feature | Description | Options |
|---|---|---|
| Serial Port | Enable or Disable Serial Port (COM) | ★Enabled ,Disabled |
| COM1 Control | Select COM1 mode. RS232, RS422 or RS485 | ★RS232,RS422,RS485 |

## Serial Port 2 Configuration



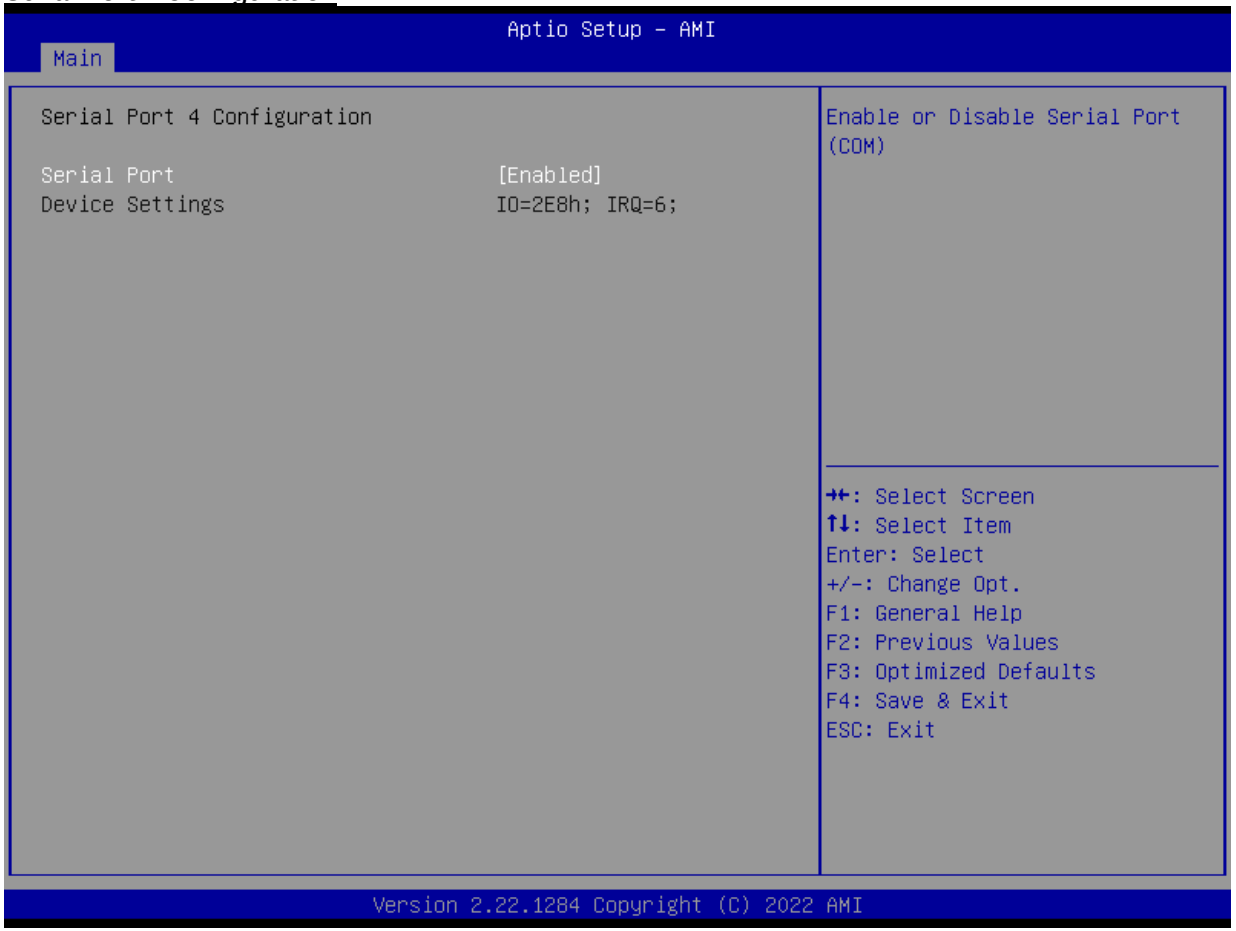

| Feature | Description | Options |
|---|---|---|
| Serial Port | Enable or Disable Serial Port (COM) | ★Enabled ,Disabled |
| COM2 Control | Select COM2 mode. RS232, RS422 or RS485 | ★RS232,RS422,RS485 |

Serial Port 3 Configuration



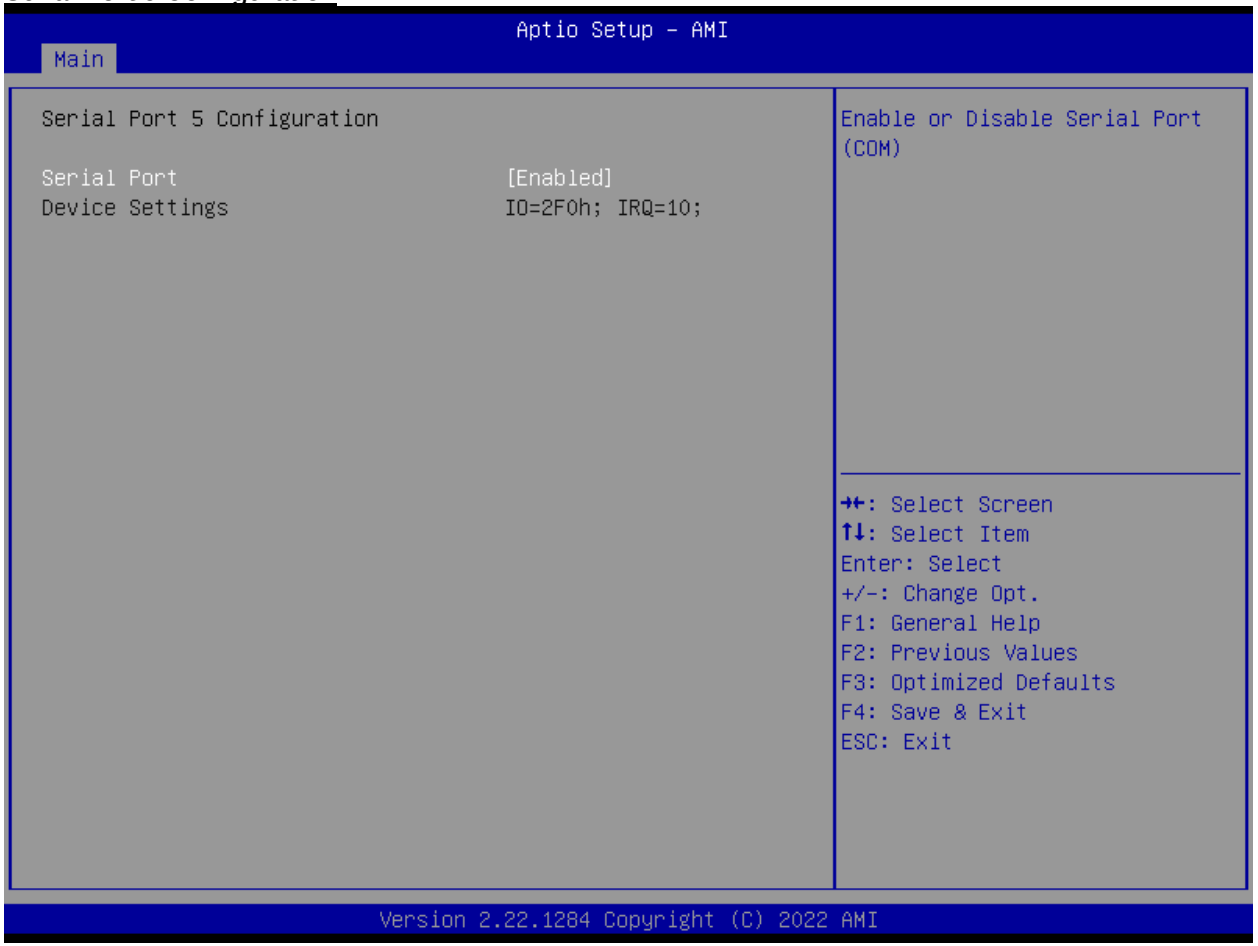

| Feature | Description | Options |
|---|---|---|
| Serial Port | Enable or Disable Serial Port (COM) | ★Enabled ,Disabled |

Serial Port 4 Configuration




| Feature | Description | Options |
|---|---|---|
| Serial Port | Enable or Disable Serial Port (COM) | ★Enabled ,Disabled |

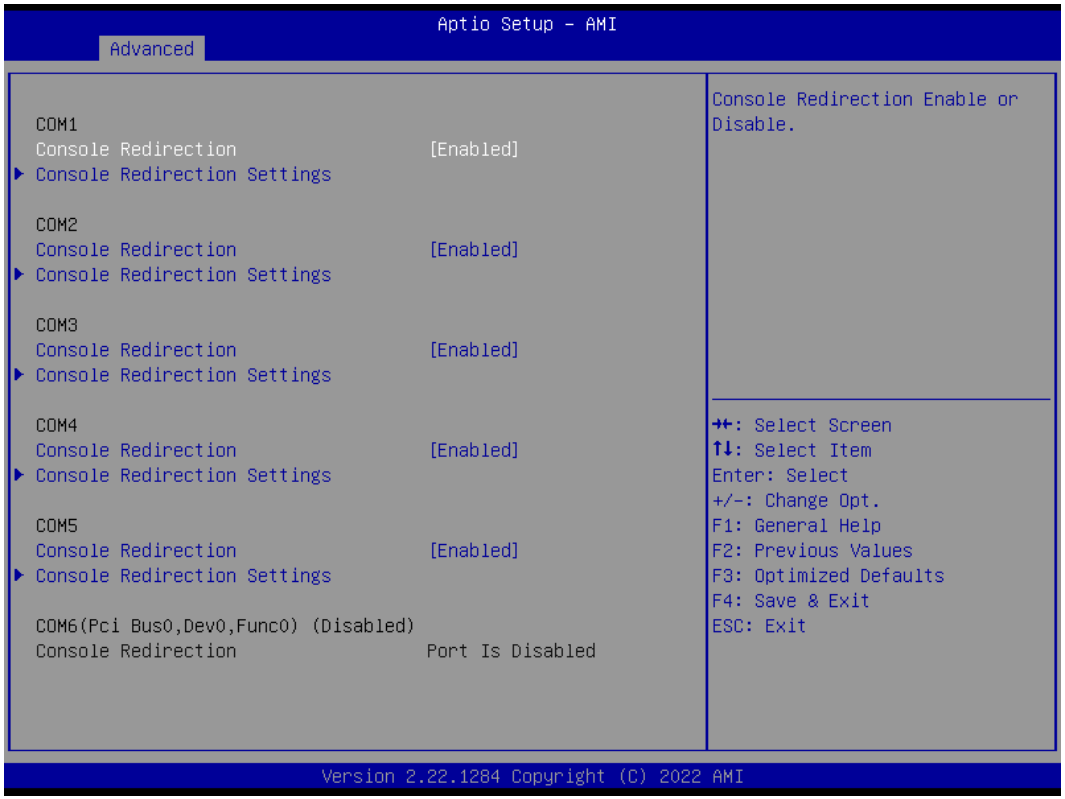
Serial Port 5 Configuration




| Feature | Description | Options |
|---|---|---|
| Serial Port | Enable or Disable Serial Port (COM) | ★Enabled ,Disabled |

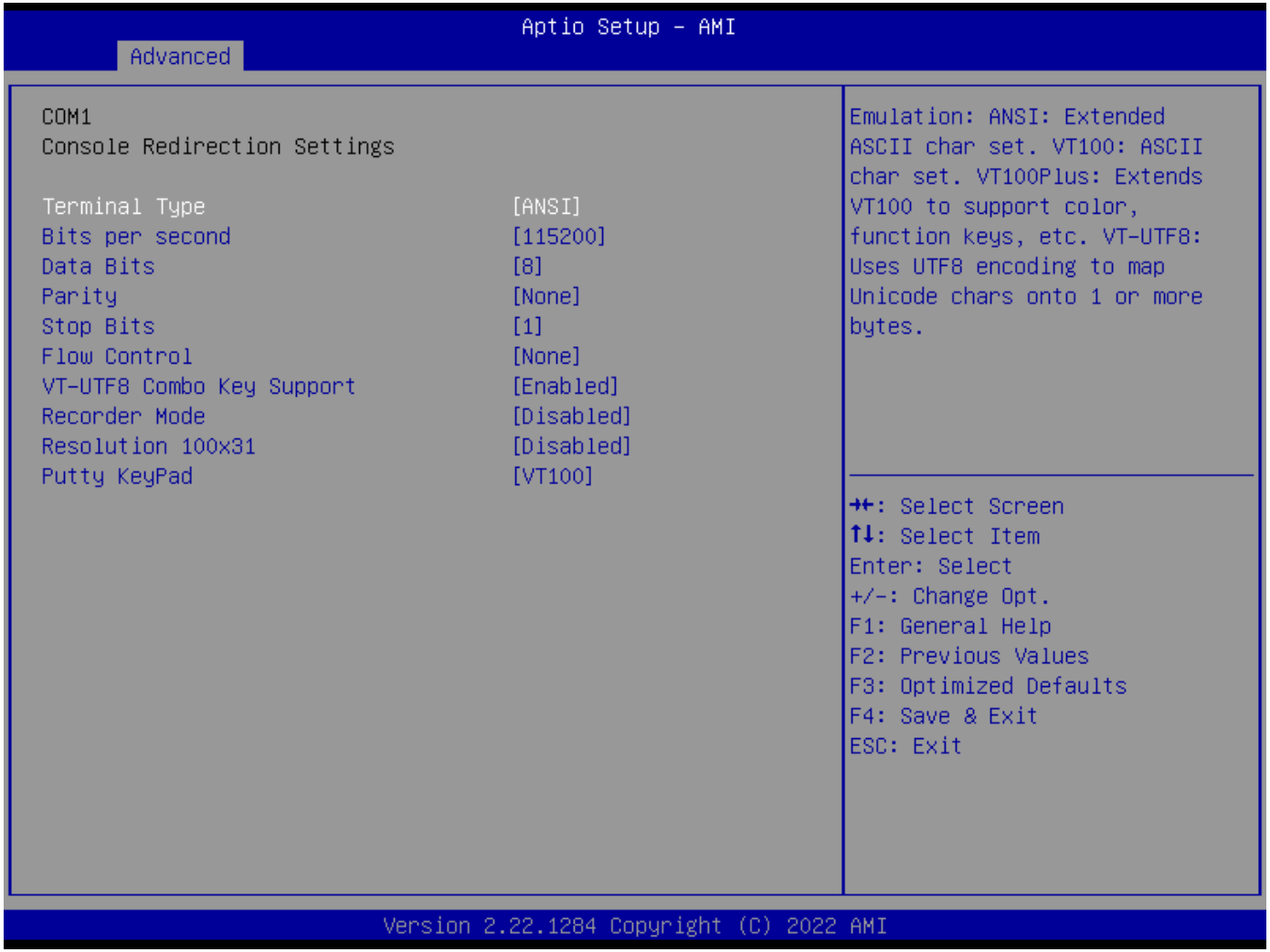
## Serial Console Redirection

Serial Console Redirection




| Feature | Description | Options |
|---|---|---|
| Console Redirection | Console Redirection Enable or Disable | ★Disabled, Enabled |
| Console Redirection [Enabled] | | |
| Console Redirection Settings | The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings. | |

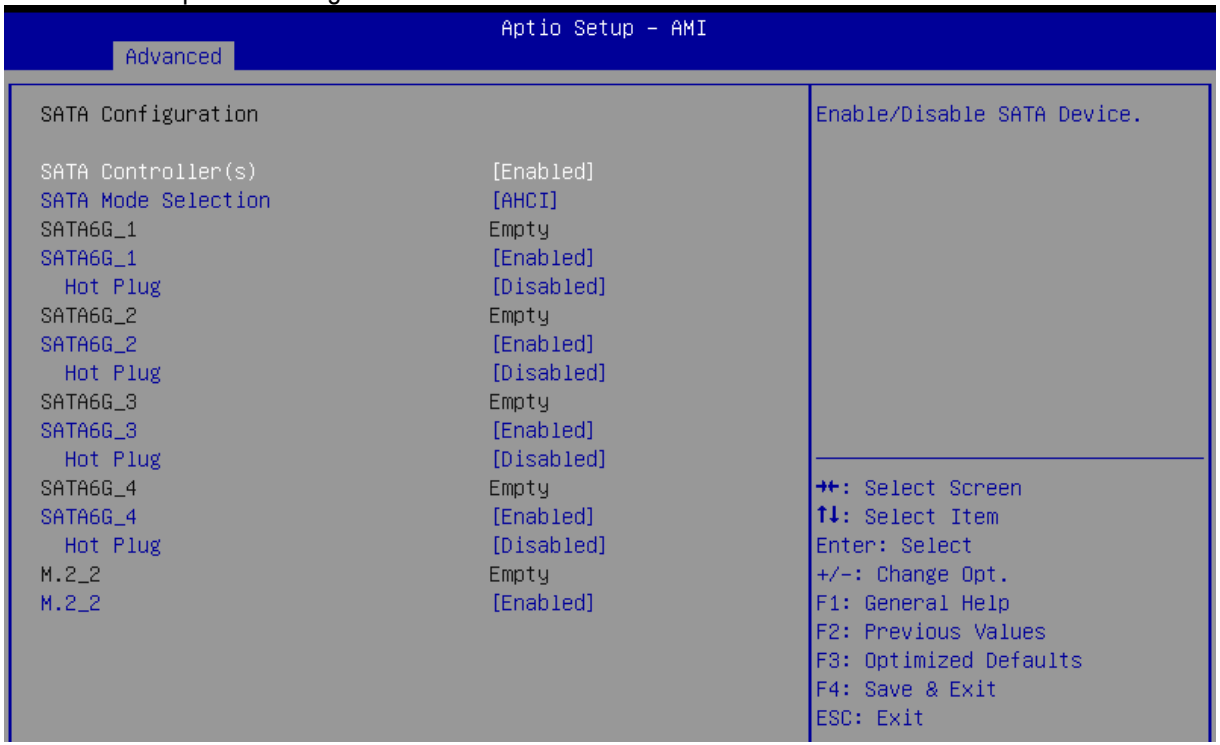
Console Redirection Settings



| Feature | Description | Options |
|---|---|---|
| Terminal Type | Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes. | ★ANSI, VT100, VT100Plus, VT-UTF8 |
| Bits per second | Select Serial port transmission speed. The speed must be matched on other side. Long or noisy lines may require lower speeds. | ★115200, 9600, 19200, 38400, 57600 |
| Data bits | Data bits | ★8, 7 |
| Parity | 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. They can be used as an additional data bit. | ★None, Even, Odd, Mark, Space |
| Stop Bits | 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. | ★1,2 |
| Flow Control | 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. | ★None, Hardware RTS/CTS |
| VT-UTFB Combo Key Support | Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals | ★Enabled, Disabled |
| Recorder Mode | With this mode enabled only text will be sent. This is to capture Terminal data. | ★Disabled, Enabled |
| Resolution 100x31 | Enables or disables extended terminal resolution | ★Disabled, Enabled |
| Putty KeyPad | Select FunctionKey and KeyPad on Putty | ★VT100, LINUX,XTERMR6, SCO, ESCN, VT400 |

SATA Configuration

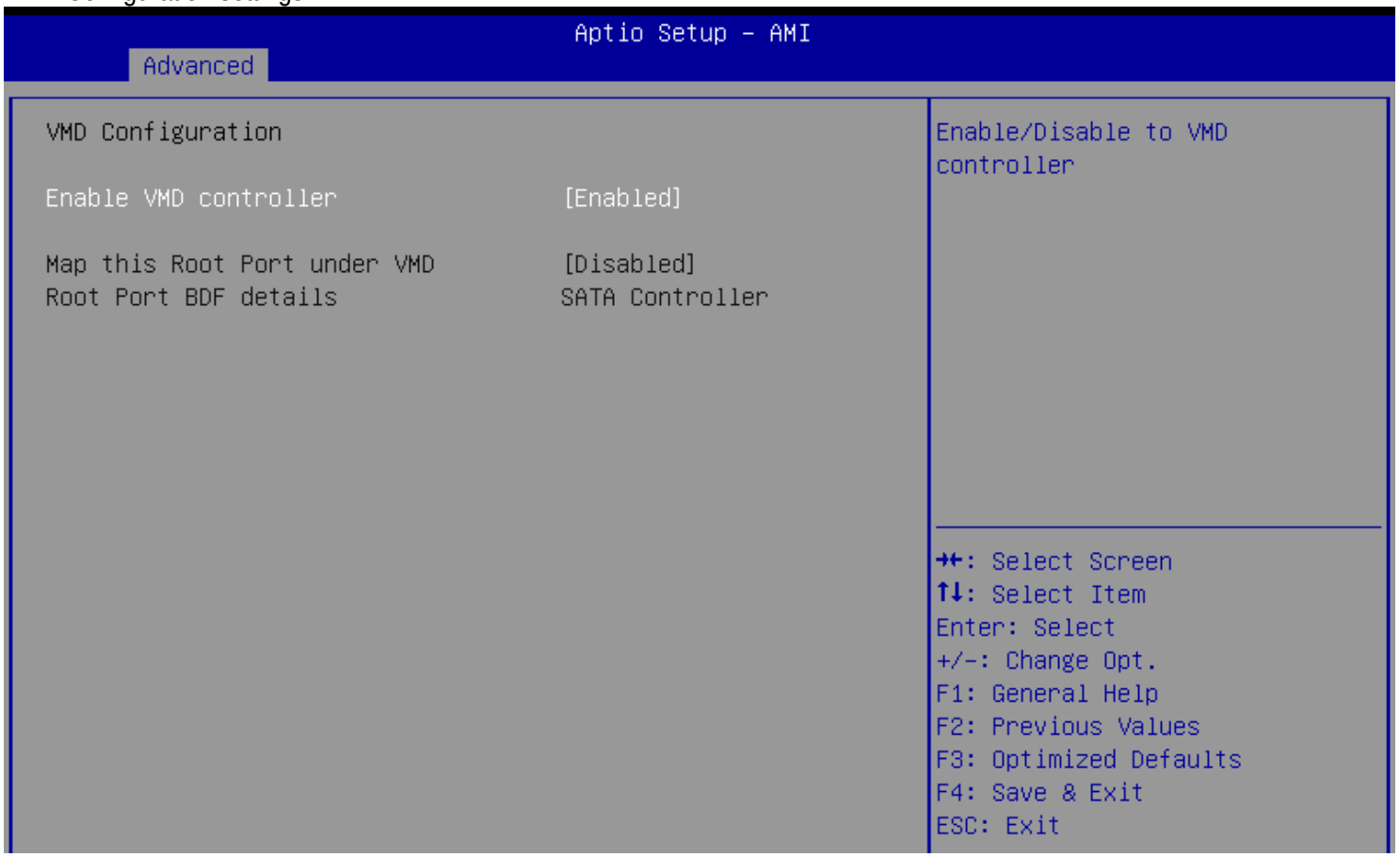
SATA Device Options Settings




| Feature | Description | Options |
|---|---|---|
| SATA Controller(s) | Enable/Disable SATA Device. | ★Enabled , Disabled |
| SATA Mode Selection | Determines how SATA controller(s) operate. | ★AHCI |
| SATA6G_1~ SATA6G_4 | Enable or Disable SATA Port. | ★Enabled, Disabled |
| Hot Plug | Designates this port as Hot Pluggable. | ★Disabled,Enabled |
| M.2_2 | Enable or Disable SATA Port. | ★Enabled, Disabled |

VMD setup menu

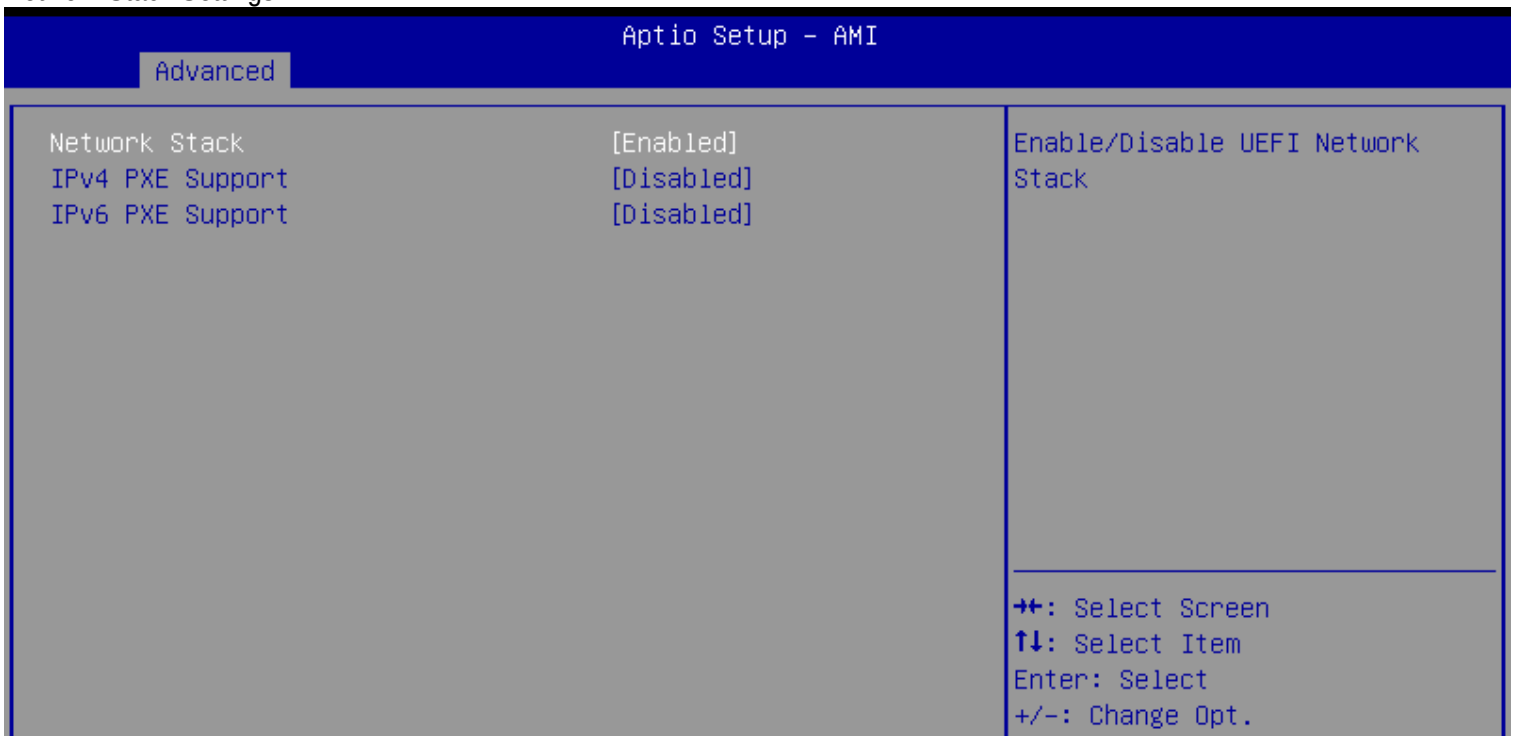
VMD Configuration settings




| Feature | Description | Options |
|---|---|---|
| Enable VND controller | Enable/Disableto VMD controller. | ★Disabled, Enabled |

Network Stack Configuration

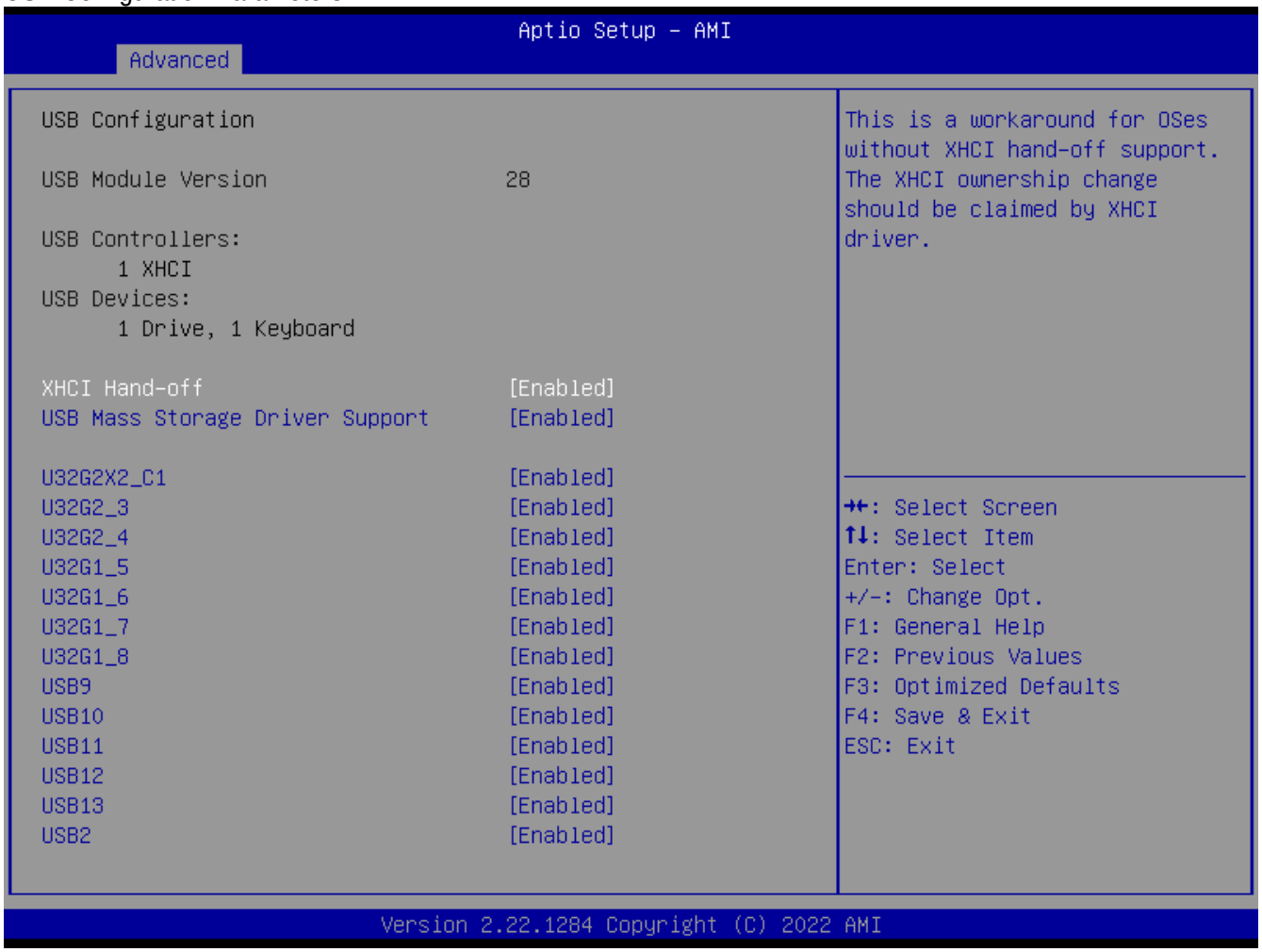
Network Stack Settings




| Feature | Description | Options |
|---|---|---|
| Network Stack | Enable/Disable UEFI Network Stack | ★Disabled, Enabled |
| Network Stack [Enabled] | | |
| Ipv4 PXE Support | Enable/Disable IPv4 PXE boot support. If disable, IPv4 PXE boot support will not be available. | ★Disabled, Enabled |
| Ipv6 PXE Support | Enable/Disable IPv6 PXE boot support. If disable, IPv6 PXE boot support will not be available. | ★Disabled, Enabled |

## USB Configuration

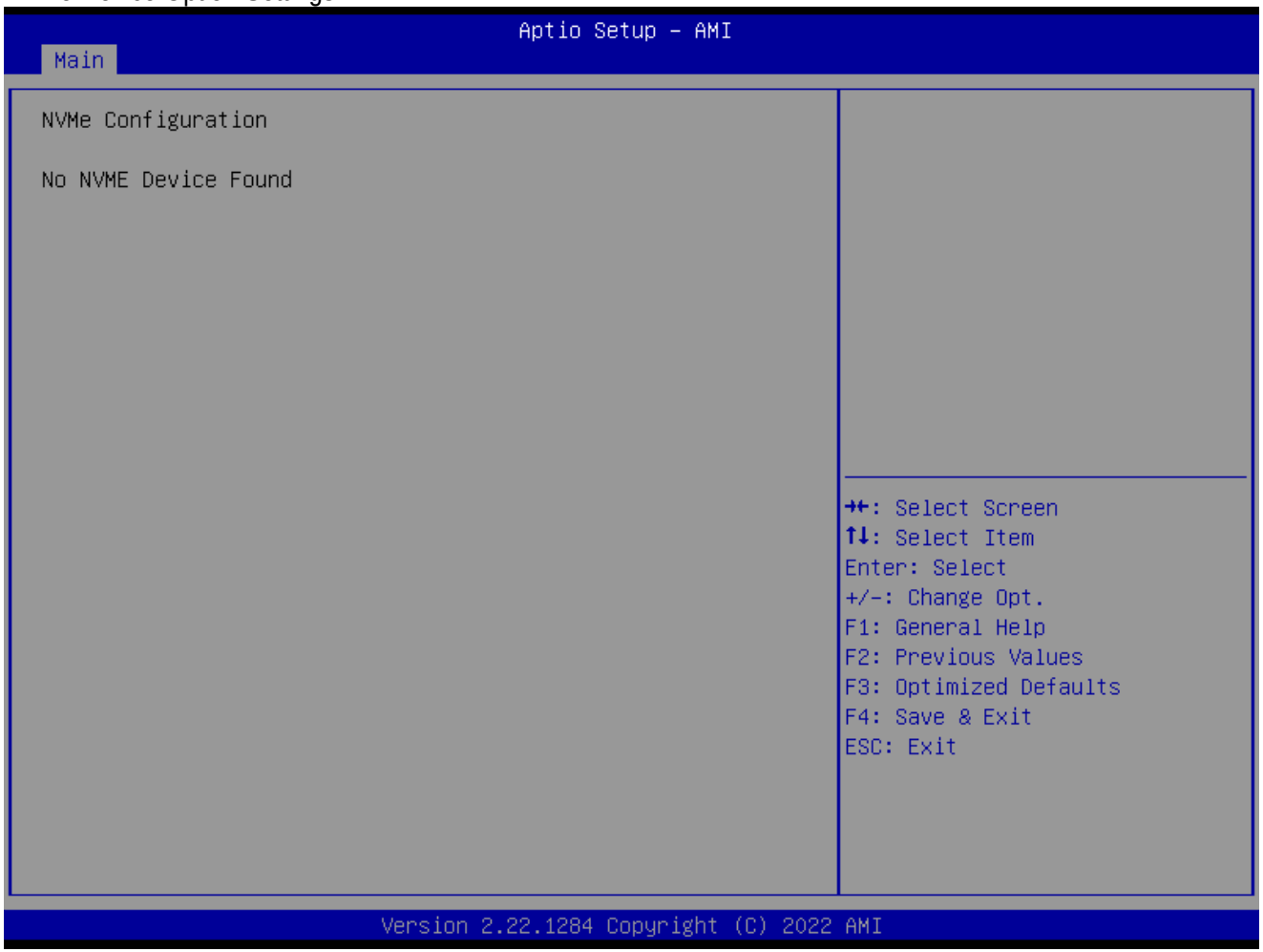
USB Configuration Parameters



| Feature | Description | Options |
|---|---|---|
| XHCI Hand-off | This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver | ★Enabled, Disabled |
| USB Mass Storage Driver Support | Enable/Disable USB Mass Storage Driver Support | ★Enabled, Disabled |
| U32G2X2_C1 | Enable/Disable U32G2X2_C1. | ★Enabled, Disabled |
| U32G2_3~ U32G2_4 | Enable/DisableU32G2_3~ U32G2_4. | ★Enabled, Disabled |
| U32G1_5~ U32G1_8 | Enable/Disable U32G1_5~ U32G1_8. | ★Enabled, Disabled |
| USB9~13 | Enable/DisableUSB9~13. | ★Enabled, Disabled |
| USB2 | Enable/DisableUSB2. | ★Enabled, Disabled |

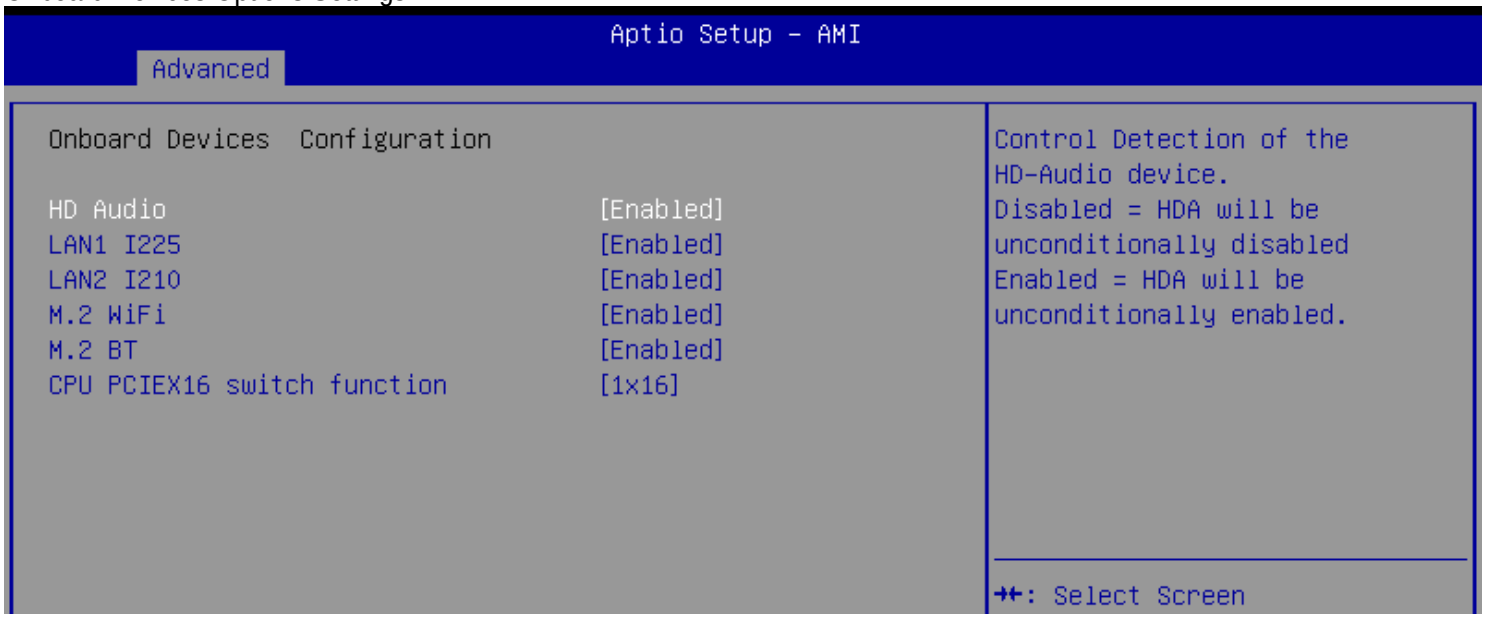
NVMe Configuration

NVMe Device Option Settings



Onboard Devices Configuration

Onboard Devices Options Settings

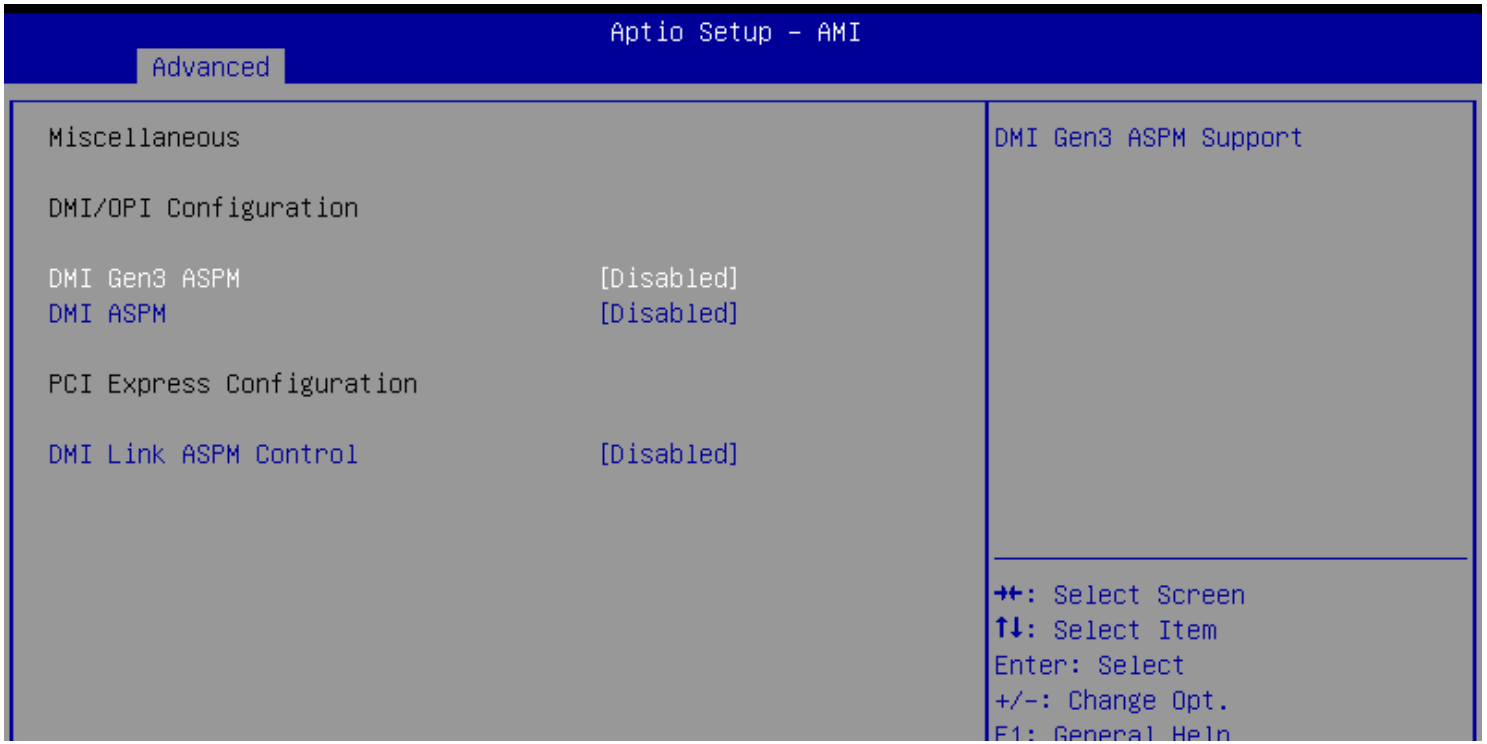



| Feature | Description | Options |
|---|---|---|
| HD Audio | Control Detection of the HD-Audio device.<br>Disabled= HDA will be unconditionally disabled.<br>Enabled= HDA will be unconditionally enabled. | ★Enabled, Disabled |
| LAN1 I225 | Enable/Disable LAN1 I225. | ★Enabled, Disabled |
| LAN2 I210 | Enable/Disable LAN2 I210. | ★Enabled, Disabled |
| M.2 WiFi | Enable/Disable M.2 WiFi. | ★Enabled, Disabled |
| M.2 BT | Enable/Disable M.2 BT. | ★Enabled, Disabled |

| | | |
|---|---|---|
| CPU PCIEX16 switch function | CPU PCIEX16 switch function1x16/2x8 | ★1x16,2x8 |

Miscellaneous

Miscellaneous

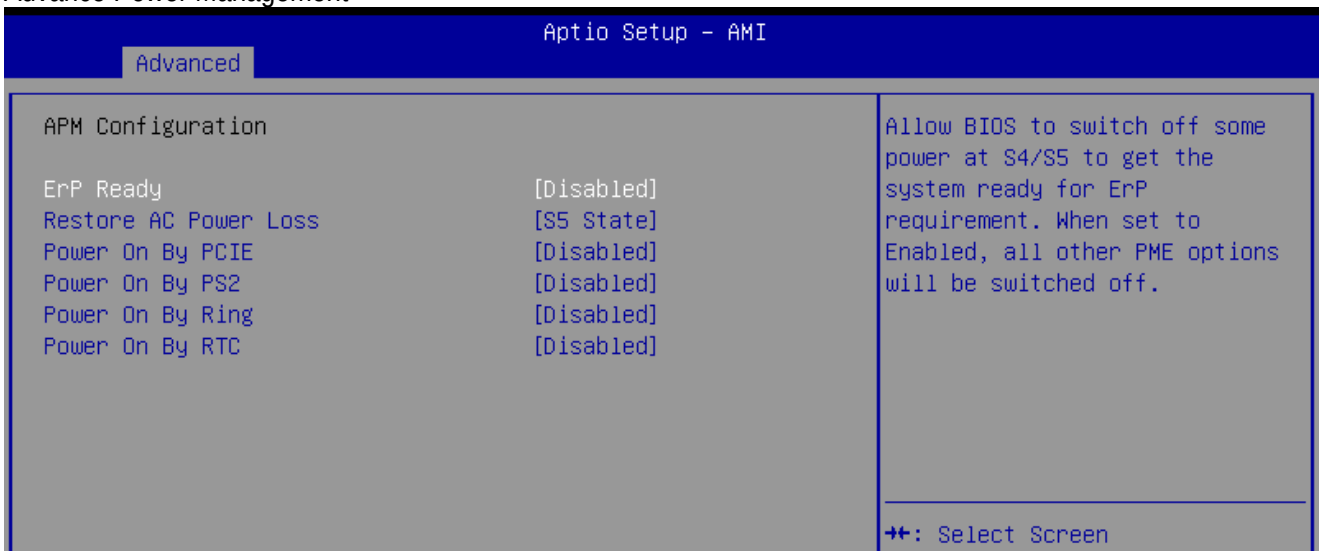



| Feature | Description | Options |
|---|---|---|
| DMI Gen3 ASPM | DMI Gen3 ASPM Support. | ★Disabled,Auto, ASPM L0s, ASPM L1,ASPM L0SL1 |
| DMI ASPM | DMI ASPM Support | ★Disabled,Auto, ASPM L0s, ASPM L1, ASPM L0SL1 |

| | | |
|---|---|---|
| DMI Link ASPM Control | The control of Active State Power Management of the DMI Link. | ★Disabled, L1, Auto |

APM Configuration

Advance Power Management

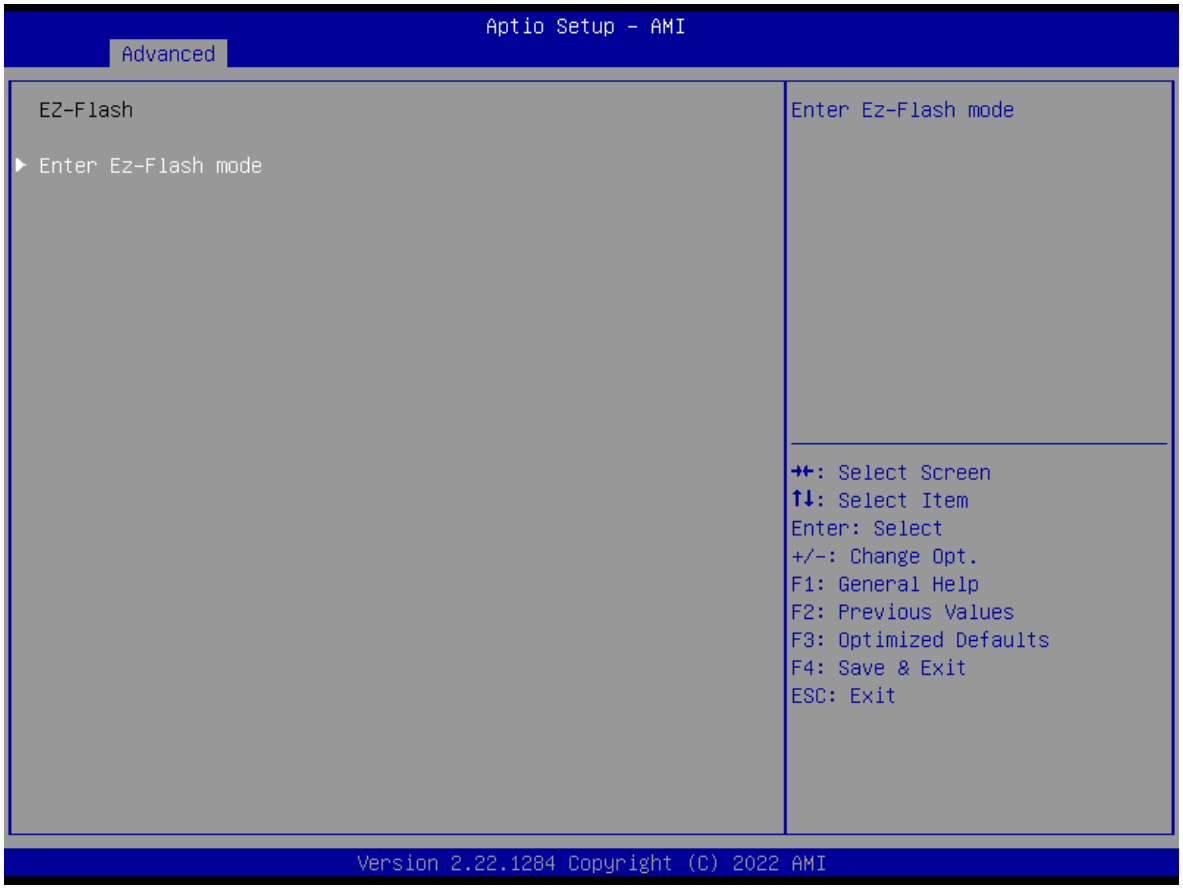



| Feature | Description | Options |
|---|---|---|
| ErP Ready | Allow BIOS to switch off some power at S4/S5 to get the system ready for ErP requirement. When set to Enabled, all other PME options will be switched off. | ★Disabled, Enabled |
| Restore AC Power Loss | Select AC power state when power is re-applied after a power failure. | ★S5 State, S0 State |
| Power On By PCIE | Enable or disable the Wake-on-LAN function of the onboard LAN controller or other installed PCIE LAN devices. | ★Disabled, Enabled |
| Power On By PS2 | Enable/disable resume from S5 via PS2. | ★Disabled, Enabled |
| Power On By Ring | Power On By Ring. | ★Disabled, Enabled |
| Power On By RTC | Select whether to enable Wake Up on Alarm, to turn on your system on a special day of the week or daily. | ★Disabled, Single event, Daily event, Weekly event, Monthly event |

| | | |
|---|---|---|
| | NOTE: Values in these fields may be overwritten by the operating system. | |

EZ-Flash

EZ-Flash

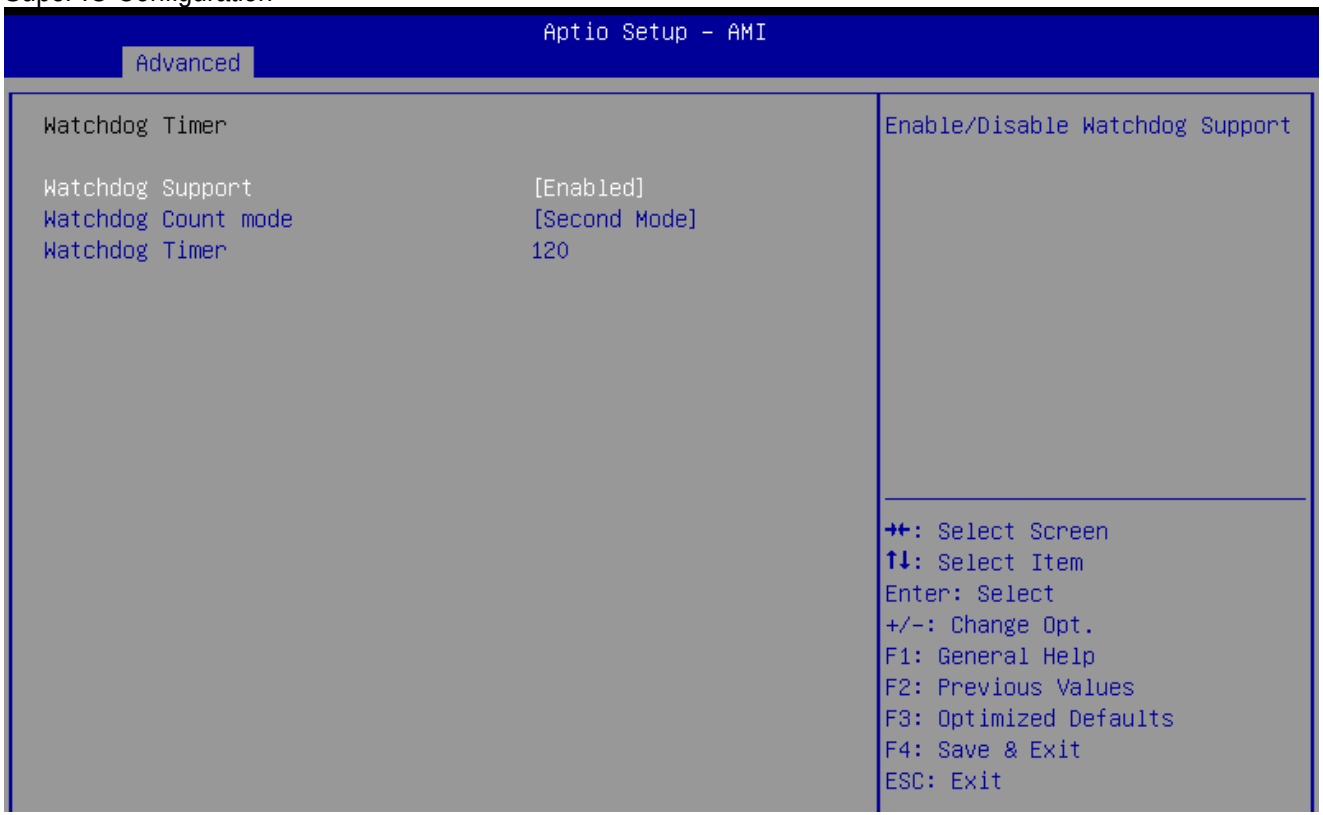



| Feature | Description | Options |
|---|---|---|

| | | |
|---|---|---|
| Enter Ez-Flash mode | Enter Ez-Flash mode | |

Watchdog Timer

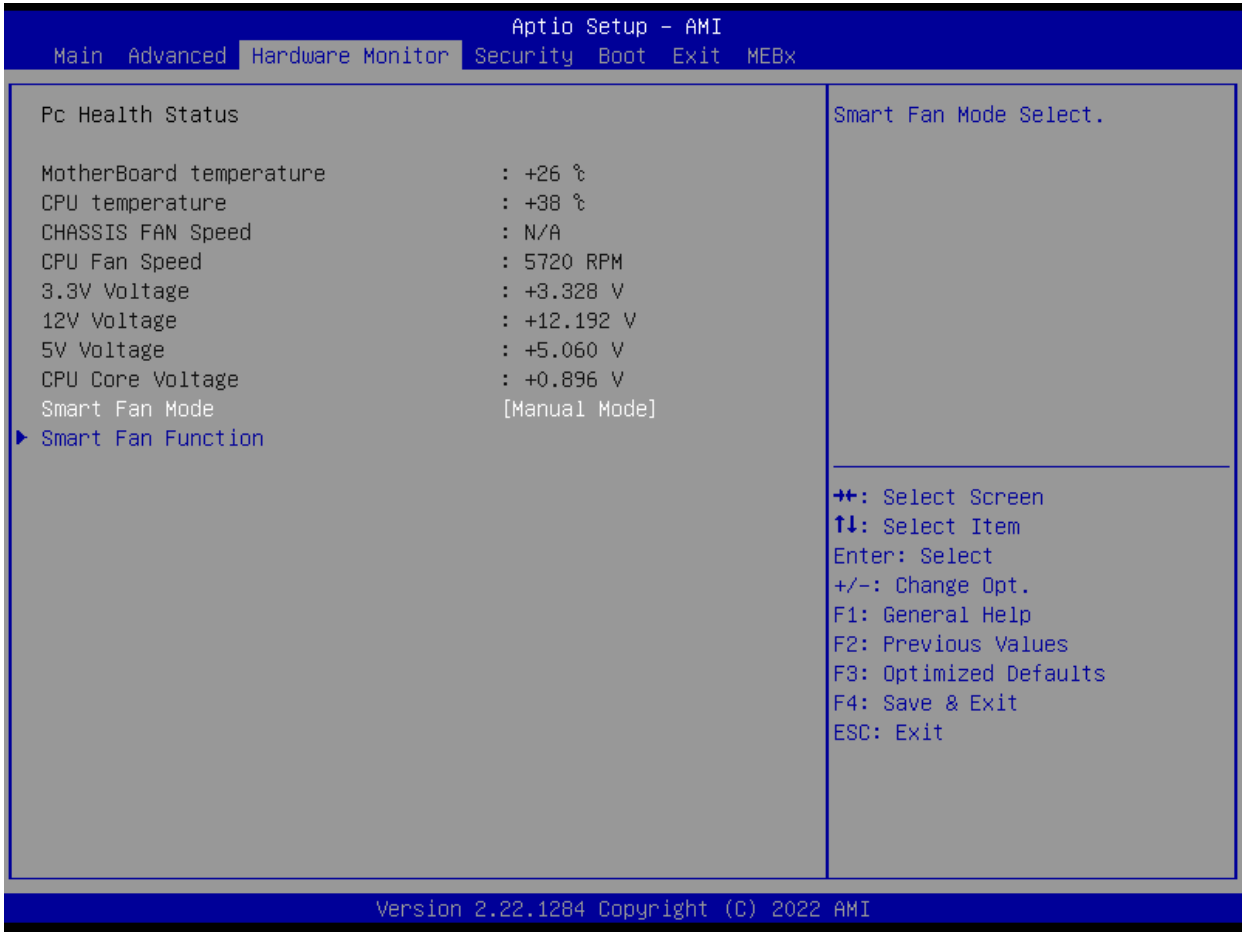
Super IO Configuration




| Feature | Description | Options |
|---|---|---|
| Watchdog Support | Enable/Disable Watchdog Support. | ★Enable, Disabled |
| Watchdog Count mode | Select Watchdog Timer I count mode. | ★Second Mode, Minute Mode |

| | | |
|---|---|---|
| Watchdog Timer | Watchdog Timer I Time-out value. | ★120 |

7.2.3H/W Monitor

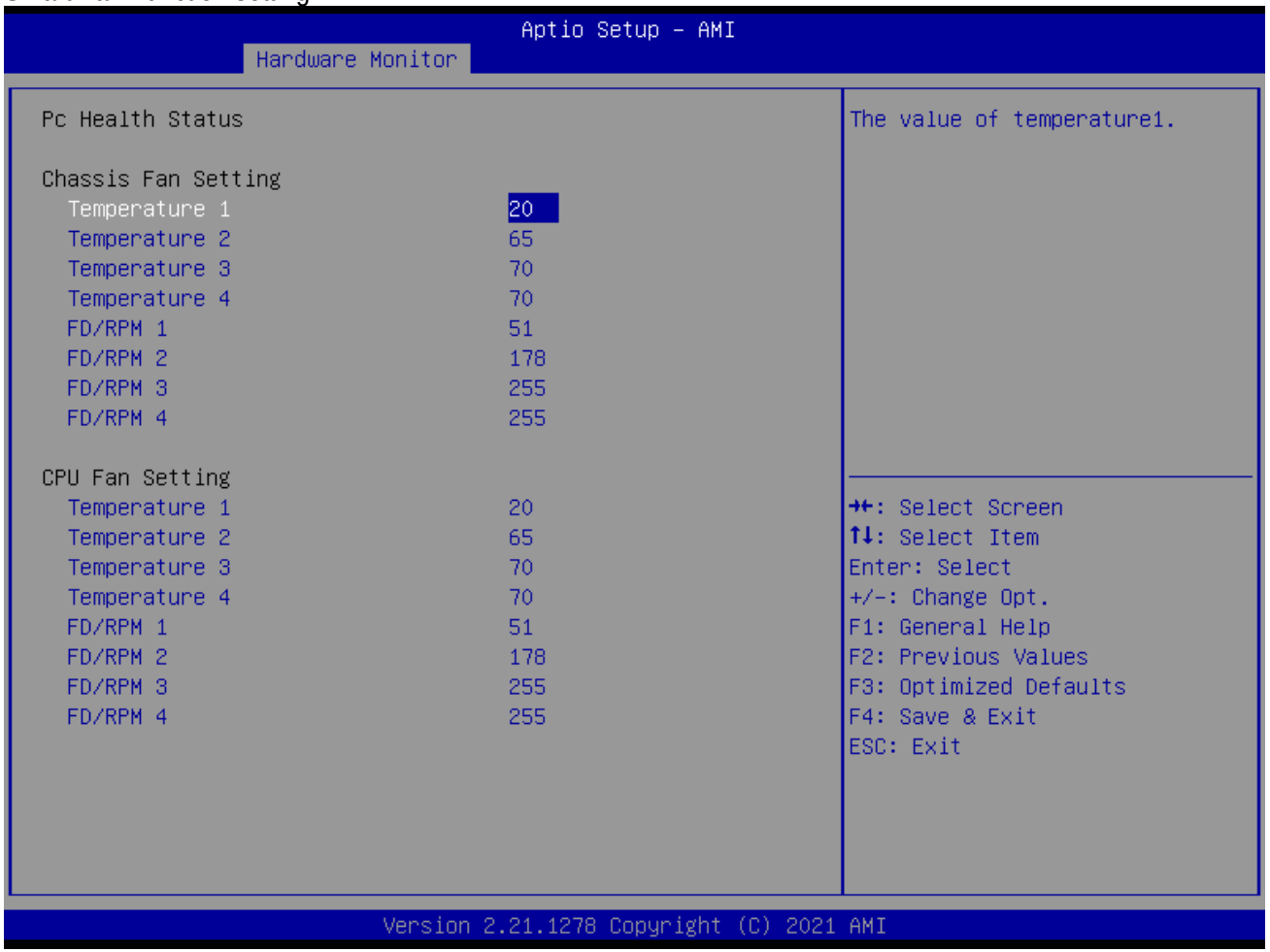



| Feature | Description | Options |
|---|---|---|

| | | |
|---|---|---|
| Smart Fan Mode | Smart Fan Mode Select | ★Normal, Disabled, Manual Mode |

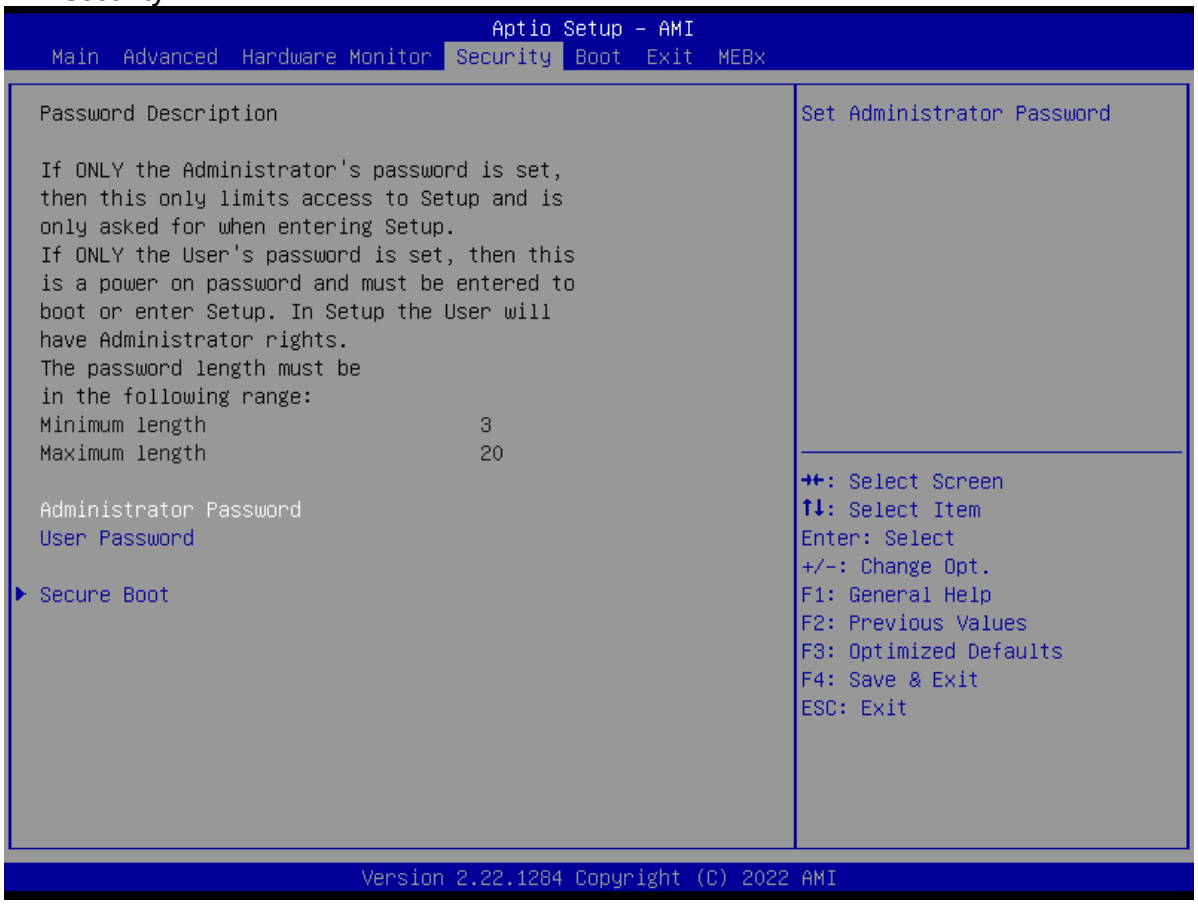
Smart Fan Function

Smart Fan Function setting



| Feature | Description | Options |
|---|---|---|
| System Fan Setting | | |
| Temperature 1 | The value of temperature 1. | ★20 |
| Temperature 2 | The value of temperature 2. | ★65 |
| Temperature 3 | The value of temperature 3. | ★70 |
| Temperature 4 | The value of temperature 4. | ★70 |
| FD/RPM 1 | The value of Fan Duty/RPM 1 when temperature isT1. | ★51 |
| FD/RPM 2 | The value of Fan Duty/RPM 2 when temperature isT2. | ★178 |
| FD/RPM 3 | The value of Fan Duty/RPM 3 when temperature isT3. | ★255 |
| FD/RPM 4 | The value of Fan Duty/RPM 4 when temperature isT4. | ★255 |
| CPU Fan Setting | | |
| Temperature 1 | The value of temperature 1. | ★20 |
| Temperature 2 | The value of temperature 2. | ★65 |
| Temperature 3 | The value of temperature 3. | ★70 |
| Temperature 4 | The value of temperature 4. | ★70 |
| FD/RPM 1 | The value of Fan Duty/RPM 1 when temperature isT1. | ★51 |
| FD/RPM 2 | The value of Fan Duty/RPM 2 when temperature isT2. | ★178 |
| FD/RPM 3 | The value of Fan Duty/RPM 3 when temperature isT3. | ★255 |
| FD/RPM 4 | The value of Fan Duty/RPM 4 when temperature isT4. | ★255 |

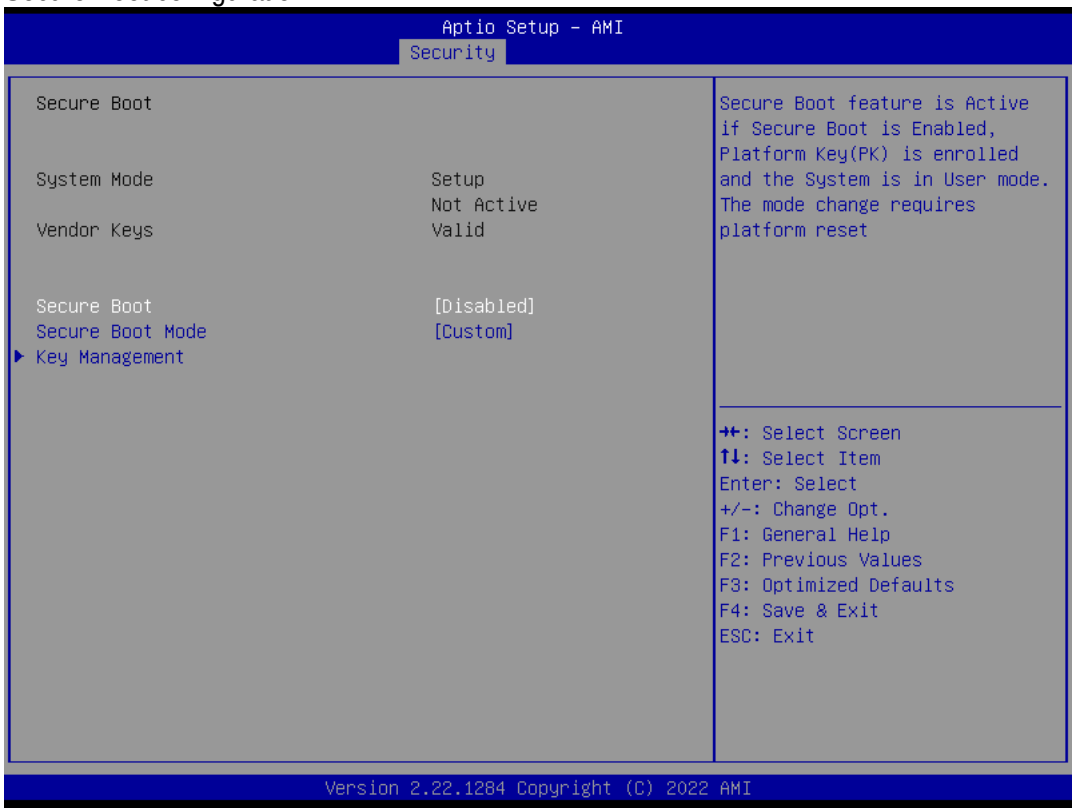
7.2.4Security




| Feature | Description | Options |
|---|---|---|
| Administrator Password | Set Administrator password. | |
| User Password | Set User Password | |

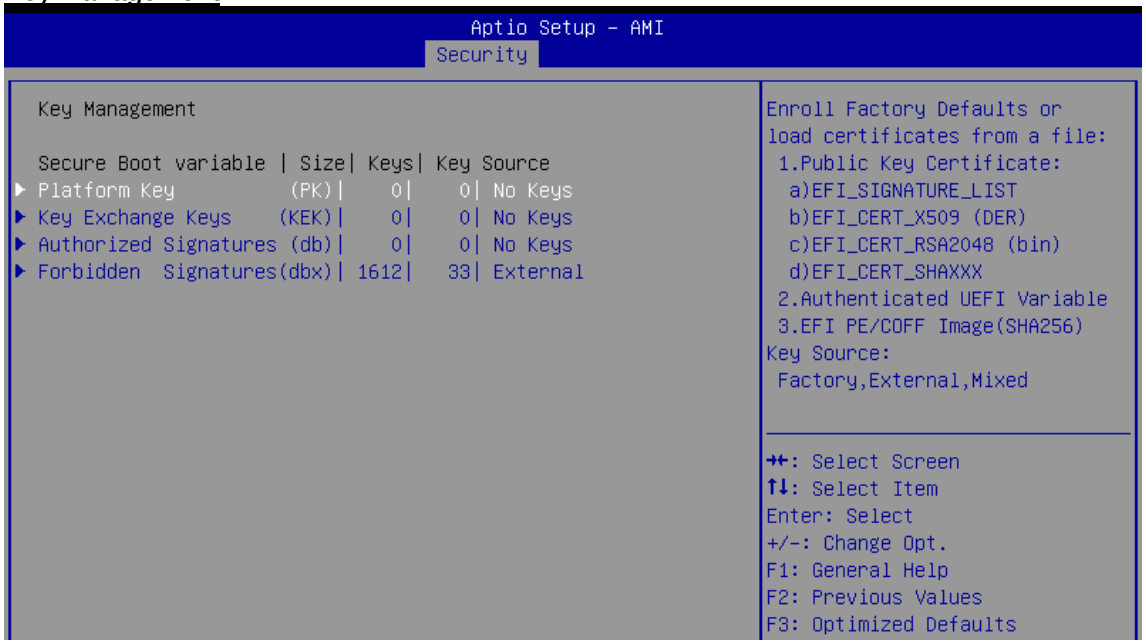
## Secure Boot

Secure Boot configuration



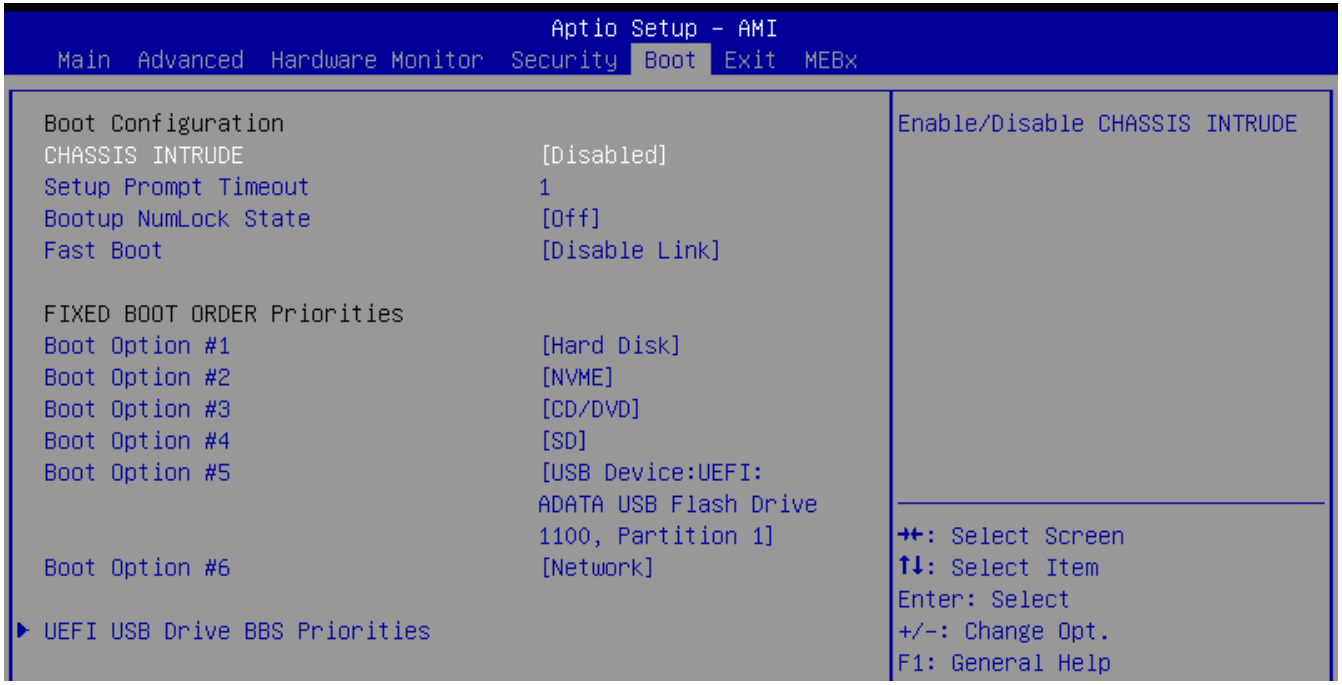

| Feature | Description | Options |
|---|---|---|
| Secure Boot | Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset. | ★Disabled,Enabled |
| Secure Boot Mode | Secure Boot Mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication | ★Custom ,Standard |

Key Management



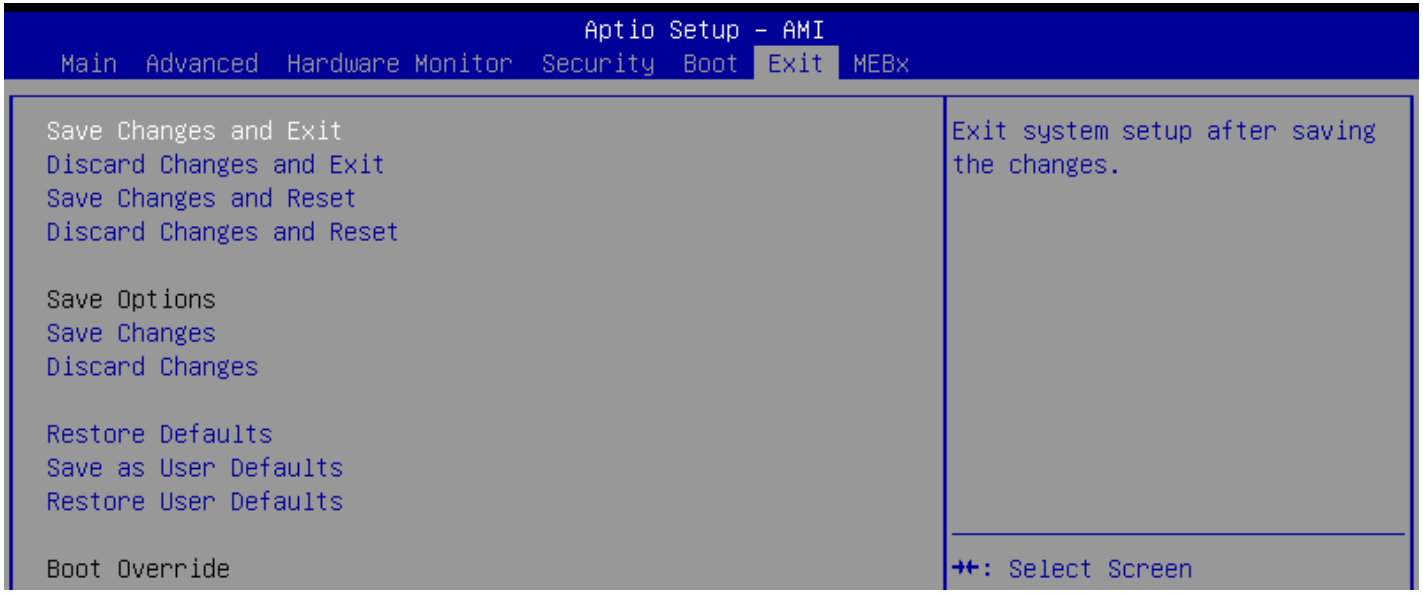

| Feature | Description | Options |
|---|---|---|
| Platform Key(PK)<br>Key Exchange Keys<br>Authorized Signatures<br>Forbidden Signatures | Enroll Factory Defaults or load certificates from a file:<br>1.Publuc Key Certificate:<br>a)EFI_SIGNATURE_LIST<br>b) EFI_CERT_X509 (DER)<br>c) EFI_CERT_RSA2048 (bin)<br>d)EFI_CERT_SHAXXX<br>2.Authenticated UEFI Variable<br>3.EFI PE/COFF Image(SHA256)<br>Key Source: Factory, External, Mixed | |

7.2.5 Boot




| Feature | Description | Options |
|---|---|---|
| CHASSIS INTRUDE | Enable/Disable CHASSIS INTRUDE | ★Disabled, Enabled |
| Setup Prompt Timeout | Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting. | ★1 |
| Bootup NumLock State | Select the keyboardNumLockstate | ★Off, On |
| Fast Boot | Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options. | ★Disabled Link, Enabled |
| Boot Option #1~#6 | Sets the system boot order | ★Hard Disk, NVME, CD/DVD,SD, USB Device, Network, Disabled |

7.2.6Exit




| Feature | Description | Options |
|---|---|---|
| Save Changes andExit | Exit system setup after saving the changes. | |
| Discard Changes and Exit | Exit system setup without saving any changes. | |
| Save Changes and Reset | Reset the system after saving the changes. | |
| Discard Changes and Reset | Rest system setup without saving any changes. | |
| Save Changes | Save Changes done so far to any of the setup options. | |
| Discard Changes | Discard Changes done so far to any of the setup options. | |
| Restore Defaults | Restore/Load Default values for all the setup options. | |
| Save as Use Defaults | Save the changes done so far as User Defaults | |
| Restore User Defaults | Restore the User Defaults to all the setup options. | |

7.2.7MEBx


| Feature | Description | Options |
|---|---|---|
| Intel® ME Password | MEBx Login. | |

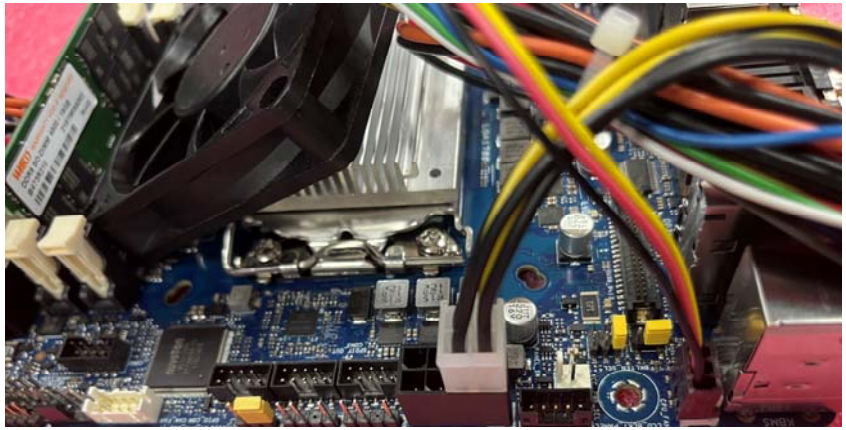
# 8 Troubleshooting

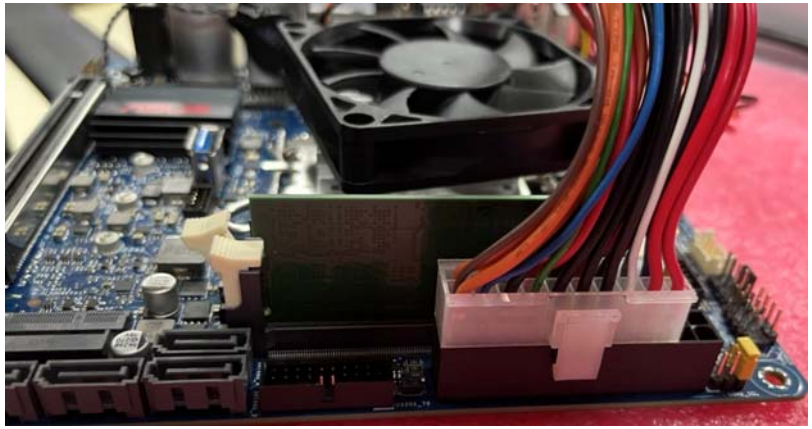
This section provides a few useful tips to quickly get WADE-8213-Q670Erunning with success. This section will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

## 8.1 Hardware Quick Installation

ATX Power Setting

Unlike other Single board computer, WADE-8213-Q670E supports ATX only. Therefore, there is no other setting that needs to be set up. However, there are only two connectors that must be connected—8-pin EATX12V & 24-pin EATXPW on the WADE-8213-Q670E board.

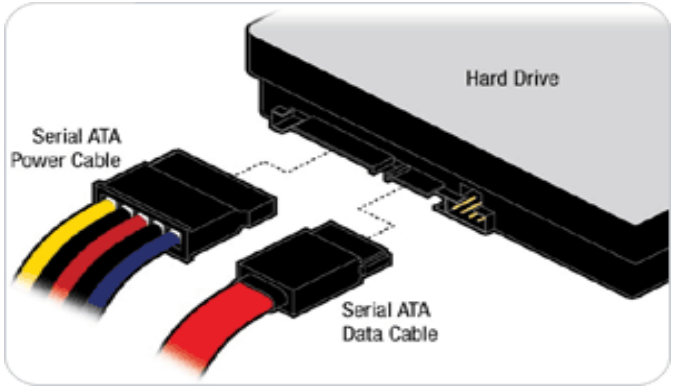




Serial ATA

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time;

The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation.




WADE-8213-Q670Ecan support four SATA interface (SATAIII, 6.0Gb/s) on board. It has SATA ports on board.

## 8.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. DDR5SO-DIMM Memory, keyboard, mouse, SATA hard disk, DP connector, power cable of the device, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with WADE-8213-Q670E, it is recommended, when going with the boot-up sequence, to hit "delete " or " Esc" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to “Restore Defaults”, press “Enter” and select “Yes” to load default optimal BIOS setup. This will force your BIOS setting back to the initial factory configurations. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting at any time when system appears to be unstable in boot up sequence.

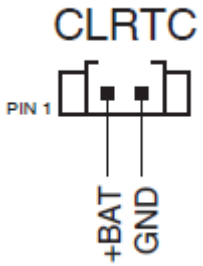
## 8.3 FAQ

Information & Support

Question: I forgot my password of system BIOS, what am I supposed to do?

Answer: You can switch off your power supply then find the 2-pin CLRTC on the WADE-8213board .Then Use a metal object such as a screwdriver to short the two pinsand wait 5 seconds to clean your password then to switch on your power supply.

Clear CMOS header (2-pin CLRTC)：CMOS Setting



Question: How to update the BIOS file of WADE-8213-Q670E?

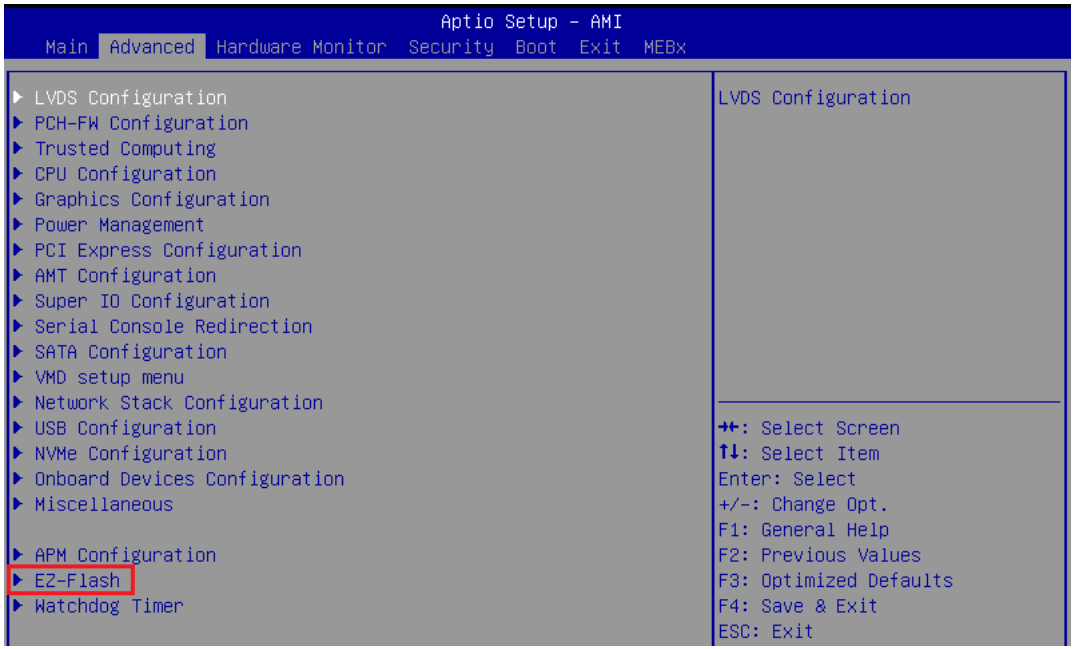
Answer: 1. Please visit web site of Portwell download centeras below hyperlink

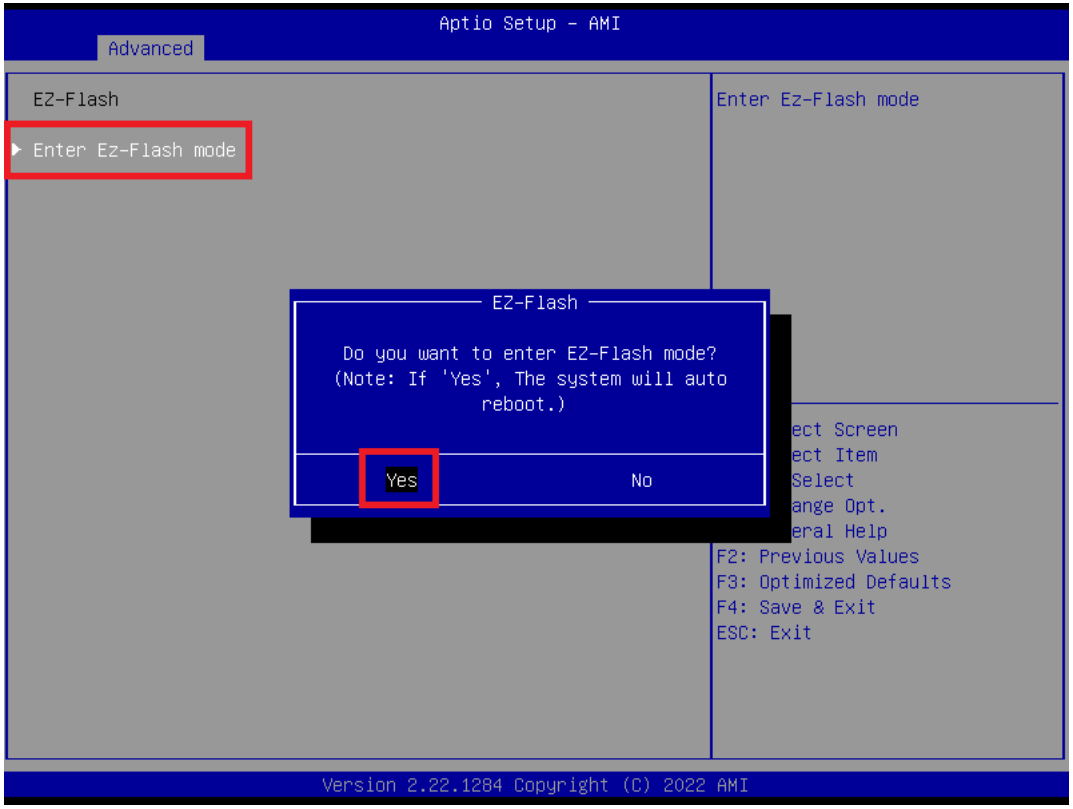
https://www.portwell.com.tw/support-center/download-center/

2. Select “Search download” and type the keyword “WADE-8213”.

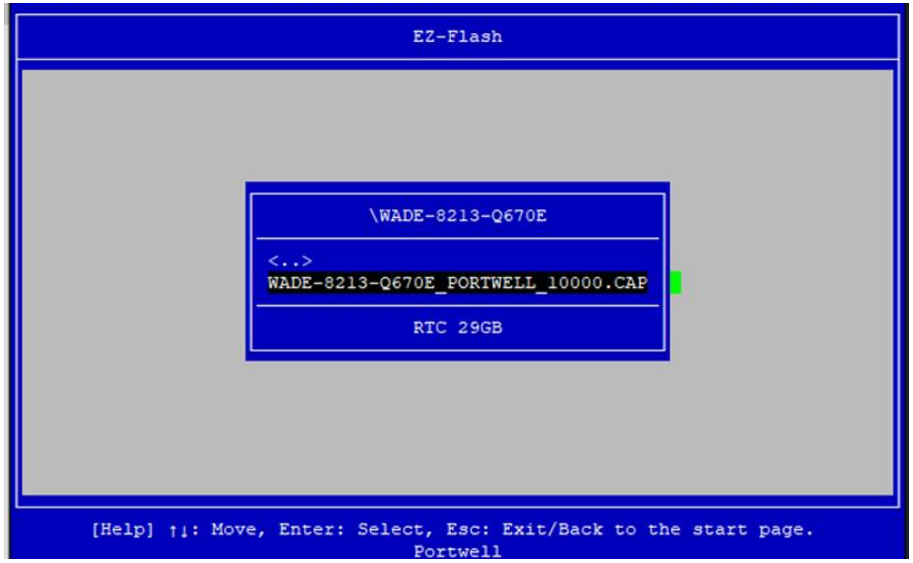
3. Find the “BIOS “page and download the ROM file and unzip file to USB flash drive(FAT 32 / 16 format).

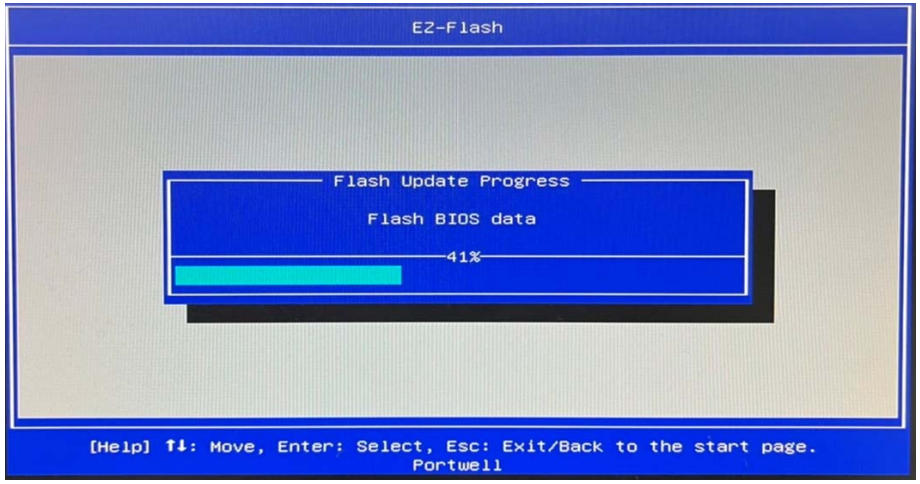
4. Boot into BIOS and switch to “Advanced” page then select”EZ-Flash”.



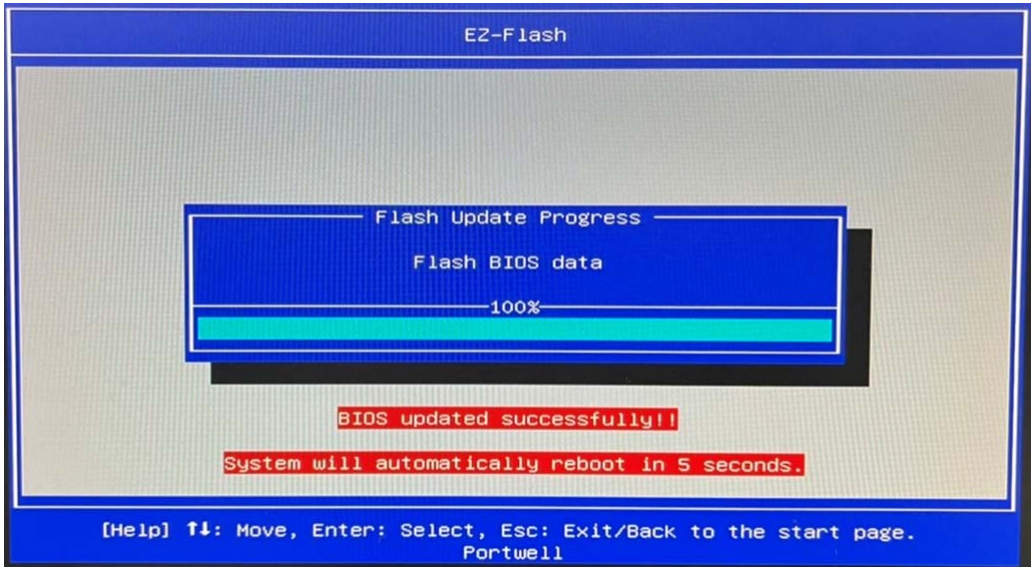

Aptio Setup – AMI
Advanced
EZ-Flash
Enter Ez-Flash mode
Enter Ez-Flash mode
EZ-Flash
Do you want to enter EZ-Flash mode?
(Note: If 'Yes', The system will auto reboot.)
Yes
No
ect Screen
ect Item
Select
ange Opt.
eral Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1284 Copyright (C) 2022 AMI

5. EnterEZ-Flash mode, Select the USB Drive and Click the BIOS file then start updating BIOS.



6. When you see the “BIOS updated successfully” message, which means the BIOS update processes finished.
   Please cut the AC power ofand wait for 10 seconds before powering on.



Question: What are the display options while using WADE-8213-Q670E board?

Answer: The WADE-8213-Q670EsupportsDP、HDMI、eDP/LVDSdisplay output.

Note:

Please visit our Download Center to get the Catalog, User manual, BIOS, and Driver files.

https://www.portwell.com.tw/support-center/download-center/

If you have other additional technical information or request which is not covered in this manual, please fill in the technical request form as below hyperlink.

https://www.portwell.com.tw/support-center/technical-request/

We will do our best to provide a suggestion or solution for you.

Thanks

# 9 Portwell Software Service

1. If you have customized requirements of BIOS, you can contact person of our company or branch.
2. If you have requirements of WDT、GPIO APP, you can contact our headquarter or branch, and we can render youassistance on developing.

| Portwell Worldwide: | |
|---|---|
| Portwell, Inc. | E-mail: info@portwell.com.tw |
| Shanghai Portwell | E-mail: info@portwell.com.cn |
| Portwell Japan, Inc | E-mail: info@portwell.co.jp |
| American Portwell Technology | E-mail: info@portwell.com |
| European Portwell Technology | E-mail: info@portwell.eu |
| Portwell UK Ltd. | E-mail: info@portwell.co.uk |
| Portwell Deutschland GmbH | E-mail: info@portwell.eu |
| Portwell India Technology | E-mail: info@portwell.in |
| Portwell Korea, Inc. | E-mail:info@portwell.co.kr |
| Portwell Latin America | E-mail: vendas@portwell.com.br |

# 10 Industry Specifications

## 10.1 Industry Specifications

The list below provides links to industry specifications that apply to Portwell modules.

Low Pin Count Interface Specification, Revision 1.0 (LPC)http://www.intel.com/design/chipsets/industry/lpc.htm
Universal Serial Bus (USB) Specification, Revision 2.0http://www.usb.org/home
PCI Specification, Revision 2.3 https://www.pcisig.com/specifications
Serial ATA Specification, Revision 3.0 http://www.serialata.org/
PCI Express Base Specification, Revision 2.0 https://www.pcisig.com/specifications