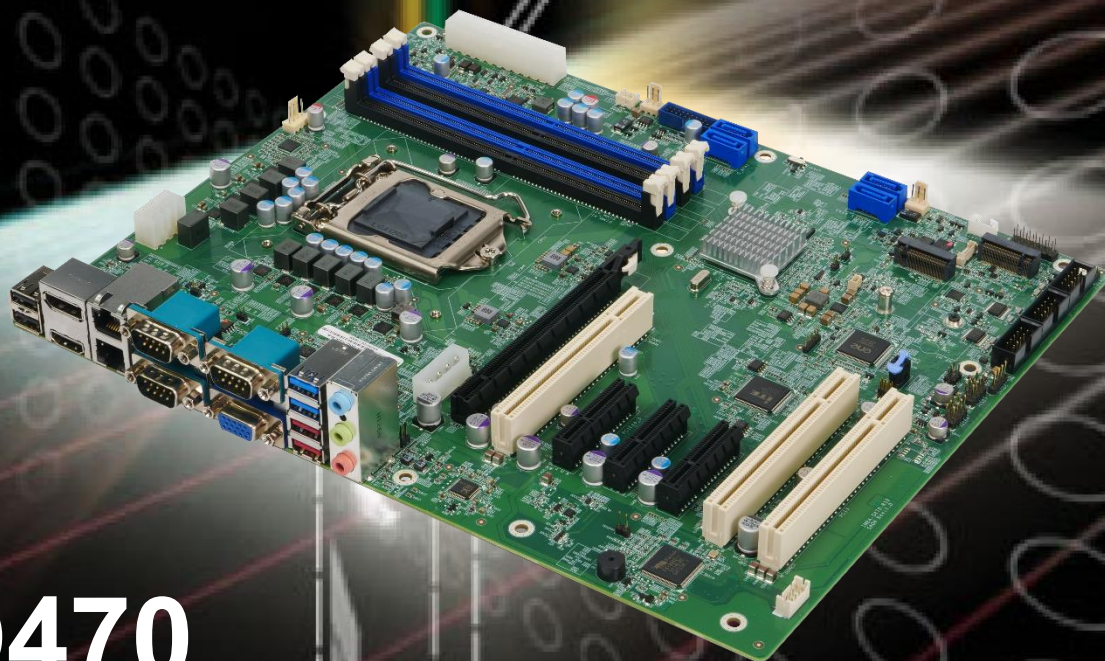




**MODEL:**  
**IMBA-Q470**

**ATX Motherboard Supports LGA1200 Intel® 10th/11th Generation Core™ i9/i7/i5/i3, Celeron® and Pentium® Processor, DDR4, Triple Independent Displays, Dual 2.5GbE LAN, M.2, USB 3.2, SATA 6Gb/s, HD Audio and RoHS**

# **User Manual**



# Revision



| Date             | Version | Changes                                                            |
|------------------|---------|--------------------------------------------------------------------|
| March 10, 2025   | 1.04    | Revise Section 3.3.4: clarify the difference between LAN1 and LAN2 |
| January 17, 2024 | 1.03    | M.2 change to stud screws                                          |
| January 31, 2023 | 1.02    | Remove the IAMT function                                           |
| July 27,2022     | 1.01    | 1.Update BIOS content<br>2.Add M.2 module install mode             |
| March 10, 2025   | 1.00    | Initial release                                                    |



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# Manual Conventions

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**WARNING**

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.

**CAUTION**

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.

**NOTE**

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.



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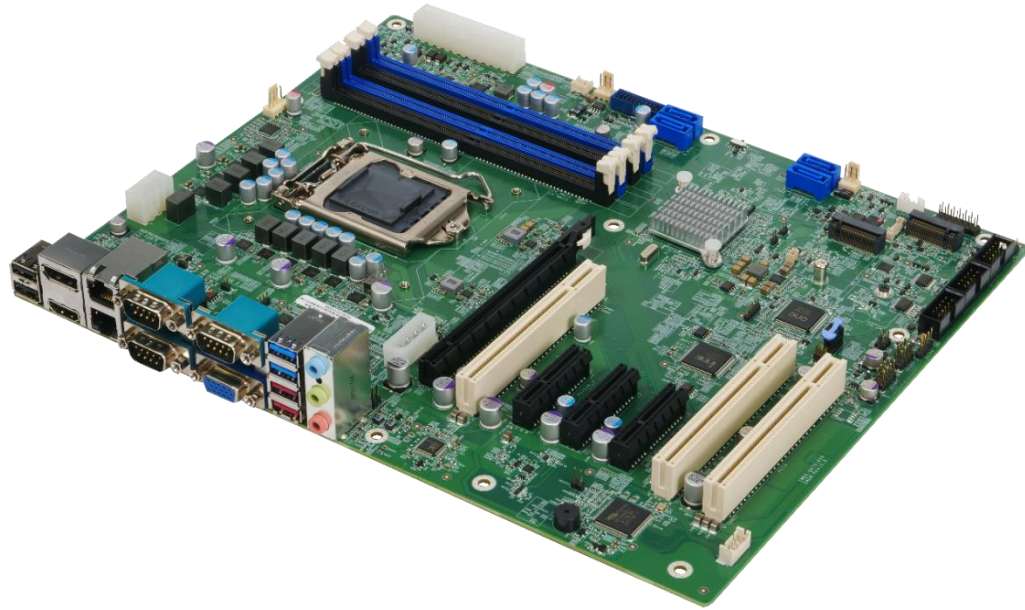
1

# Introduction

---



## **1.1 Introduction**



**Figure 1-1: IMBA-Q470**

The IMBA-Q470 is an ATX motherboard. It accepts a Socket LGA1200 Intel® 10/11th Generation Core™ i9/i7/i5/i3, Pentium® or Celeron® processor and supports four 288-pin 2933MHz dual-channel DDR4 SDRAM DIMM modules up to 128 GB. The integrated Intel® Q470/Q470E chipset supports four SATA 6Gb/s drives. Moreover, the IMBA-Q470 includes DP, HDMI and VGA interfaces for triple independent display.

The IMBA-Q470 provides two 2.5GbE interfaces through the Intel® I225-V/I226-V controllers. Expansion and I/O include three PCI slots, one PCIe x16 slot, three PCIe x4 slots, two M.2 slots, three COM ports, two USB 3.2 Gen 1, two USB 3.2 Gen 2 and two USB 2.0 on the rear panel, five USB 2.0 via internal pin headers, two USB 3.2 Gen 1 via internal box header and three COM ports via internal pin headers.



## IMBA-Q470 ATX Motherboard

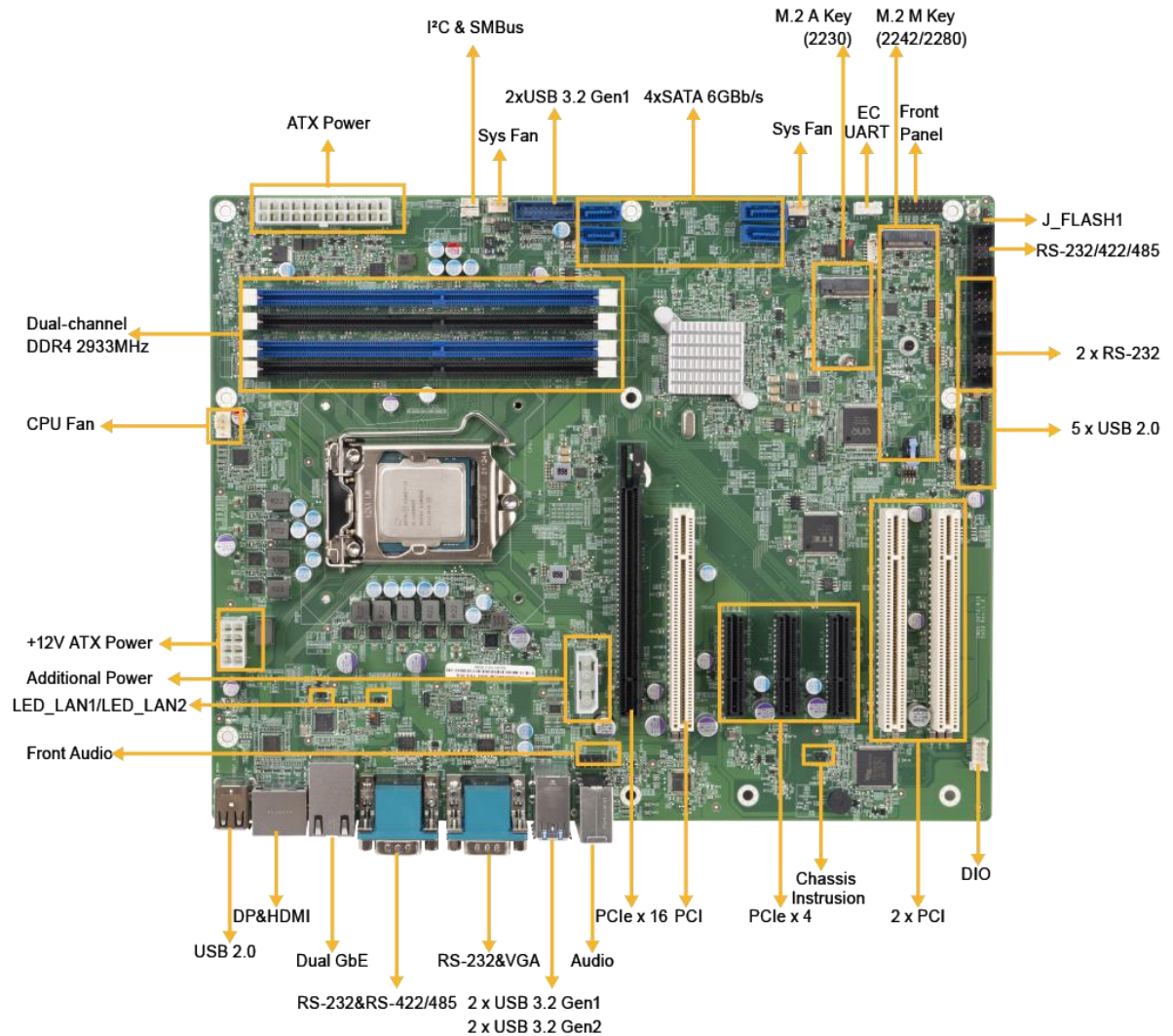
### 1.2 Features

Some of the IMBA-Q470 motherboard features are listed below:

- ATX form factor
- 10<sup>th</sup>/11<sup>th</sup> generation LGA1200 Intel® Core™ i9/i7/i5/i3, Pentium® or Celeron® processor supported
- Intel® Q470/Q470E chipset
- Four 288-pin 2933MHz dual-channel DDR4 DIMMs support up to 128 GB
- Two Intel® I225-V/I226-V 2.5GbE controller
- Supports PCI Express Generation 3.0
- Triple independent display by DP, HDMI and VGA interfaces
- Four SATA 6Gb/s connectors support RAID 0, 1, 5, 10
- Two USB 3.2 Gen 2 ports and two USB 3.2 Gen 1 ports on the rear panel
- One M.2 A-key slot for WLAN expansion; one M.2 M-key slot with PCIe x4 signal
- One PCIe x16 slots
- Three PCIe x4 slots
- Three PCI slots
- Six serial ports (three on rear panel, the others via internal pin header)
- The optional expansion cards provide more choices to meet user's demand
- TPM 2.0 security function supported by PTT (Platform Trust Technology), based on BIOS setting
- High Definition Audio
- RoHS compliant

## 1.3 Connectors

The connectors on the IMBA-Q470 are shown in the figure below.



**Figure 1-2: Connectors**



## IMBA-Q470 ATX Motherboard

### 1.4 Dimensions

The main dimensions of the IMBA-Q470 are shown in the diagram below.

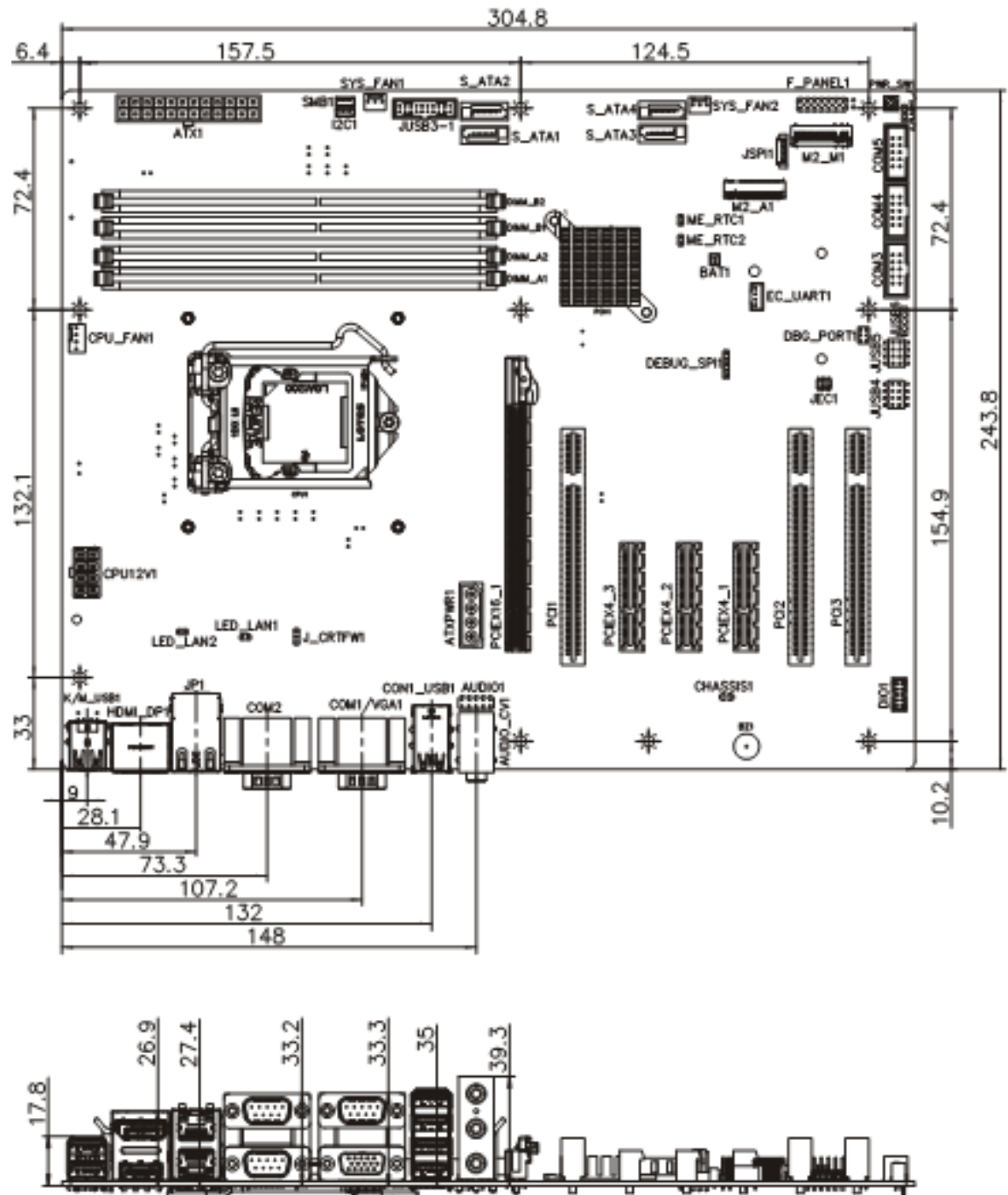


Figure 1-3: IMBA-Q470 Dimensions (mm)



1.5 Data Flow

Figure 1-4 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

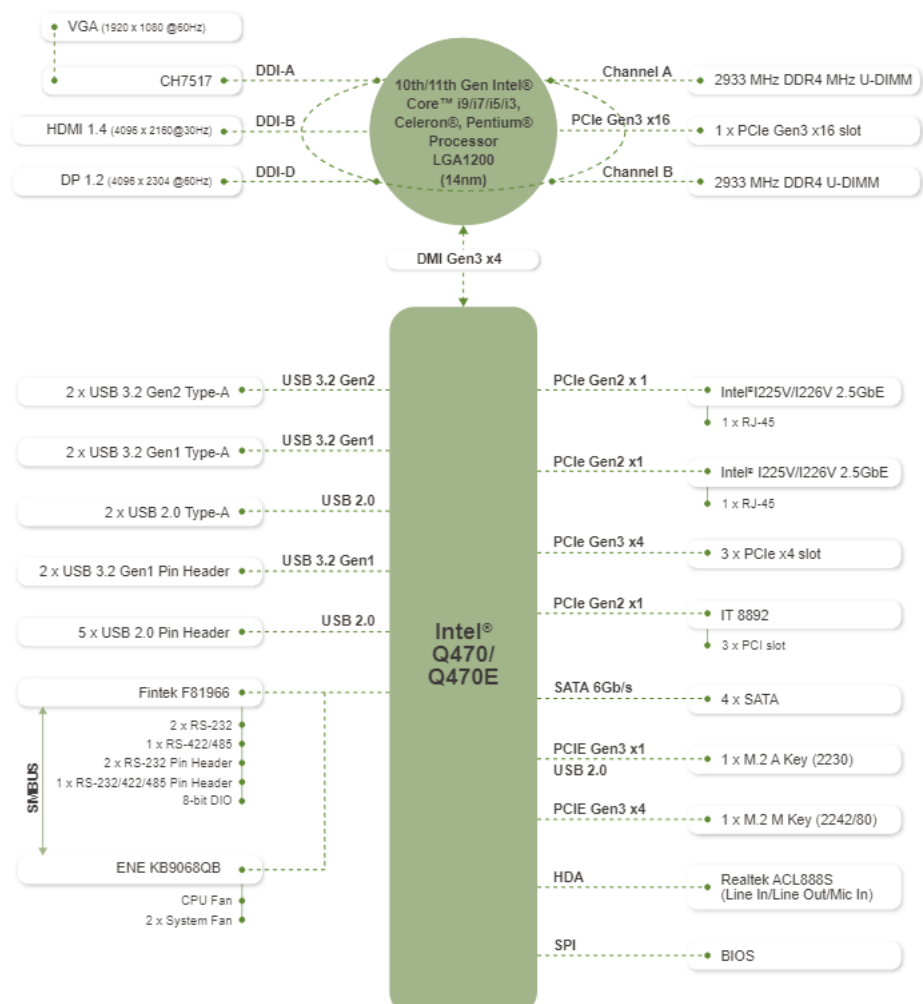


Figure 1-4: Data Flow Diagram

1.6 Technical Specifications

The IMBA-Q470 technical specifications are listed below.

|             |           |
|-------------|-----------|
| Model       | IMBA-Q470 |
| Form Factor | ATX       |

## IMBA-Q470 ATX Motherboard

|                                 |                                                                                                                                                          |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CPU Supported</b>            | 10 <sup>th</sup> /11 <sup>th</sup> generation LGA1200 Intel® Core™ i9/i7/i5/i3, Pentium® or Celeron® CPU                                                 |
| <b>Chipset</b>                  | Intel® Q470/Q470E                                                                                                                                        |
| <b>Memory</b>                   | Four 288-pin 2933 MHz dual-channel unbuffered DDR4 SDRAM DIMMs supported (system max. 128 GB)                                                            |
| <b>Graphics Engine</b>          | Up to Intel® UHD Graphics 630; Intel® HD Graphics Gen 9 Engines with 16 low-power execution units, supporting DX2015, OpenGL 5.x, OpenCL2.x and ES 2.0   |
| <b>Display Output</b>           | Triple independent display<br>One VGA (up to 1920x1200@60Hz)<br>One DP (up to 4096x2304@60Hz)<br>One HDMI (up to 4096x2160@30Hz)                         |
| <b>Ethernet Controllers</b>     | <b>LAN1:</b> Intel® I225-V/I226-V 2.5GbE controller<br><b>LAN2:</b> Intel® I225-V/I226-V 2.5GbE controller                                               |
| <b>Audio</b>                    | Realtek ALC888S HD Audio codec supports 7.1-channel                                                                                                      |
| <b>BIOS</b>                     | AMI UEFI BIOS                                                                                                                                            |
| <b>Super I/O Controller</b>     | Fintek F81966D                                                                                                                                           |
| <b>Watchdog Timer</b>           | Software programmable supports 1~255 sec. system reset                                                                                                   |
| <b>Expansions</b>               | 1 x PCIe x16 slot<br>3 x PCIe x4 slots<br>3 x PCI slots<br>1 x M.2 2242/2280 M-key (PCIe x4, support NVMe SSD)<br>1 x M.2 2230 A-key (PCIe x1 / USB 2.0) |
| <b>I/O Interface Connectors</b> |                                                                                                                                                          |
| <b>Audio Connectors</b>         | Line-in, line-out and mic-in audio jacks on rear panel<br>One internal front panel audio connector (10-pin header)                                       |
| <b>Chassis Intrusion</b>        | One 2-pin header                                                                                                                                         |
| <b>Digital I/O</b>              | 8-bit digital I/O                                                                                                                                        |
| <b>Ethernet</b>                 | Two RJ-45 GbE ports                                                                                                                                      |



**IMBA-Q470 ATX Motherboard**

|                                               |                                                                                                                                                                                                                                                                |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fan</b>                                    | One 4-pin CPU smart fan connector<br>One 3-pin system smart fan connector (SYS_FAN1)<br>One 3-pin system fan connector                                                                                                                                         |
| <b>Front Panel</b>                            | One 14-pin header (power LED, HDD LED, speaker, power button, reset button)                                                                                                                                                                                    |
| <b>I<sup>2</sup>C</b>                         | One 4-pin wafer connector                                                                                                                                                                                                                                      |
| <b>LAN LED</b>                                | Two 2-pin headers for LAN1 LED and LAN2 LED                                                                                                                                                                                                                    |
| <b>Serial ATA</b>                             | Four SATA 6Gb/s connectors (support RAID 0, 1, 5, 10)                                                                                                                                                                                                          |
| <b>Serial Ports</b>                           | Two RS-232 via DB-9<br>One RS-422/485 DB-9 (support Auto Flow Control over RS-485)<br>2 x RS-232 via internal box header<br>1 x RS-232/422/485 via internal box header (support Auto Flow Control over RS-485)                                                 |
| <b>SMBus</b>                                  | One 4-pin wafer connector                                                                                                                                                                                                                                      |
| <b>USB Ports</b>                              | Two USB 3.2 Gen 2 (10Gb/s) ports (Type A) on rear panel<br>Two USB 3.2 Gen 1 (5Gb/s) ports (Type A) on rear panel<br>Two USB 2.0 ports (Type A) on rear panel<br>Five USB 2.0 ports via internal pin header<br>Two USB 3.2 Gen 1 ports via internal box header |
| <b>Environmental and Power Specifications</b> |                                                                                                                                                                                                                                                                |
| <b>Power Supply</b>                           | AT/ATX power supply                                                                                                                                                                                                                                            |
| <b>Power Consumption</b>                      | 3.3V@1.36A, 5V@14.16A, 12V@7.5A<br>(Intel® Core™ i9-10900E CPU with four 32 GB 3200 MHz DDR4 memory)                                                                                                                                                           |
| <b>Operating Temperature</b>                  | 0°C ~ 60°C                                                                                                                                                                                                                                                     |
| <b>Storage Temperature</b>                    | -30°C ~ 70°C                                                                                                                                                                                                                                                   |
| <b>Operating Humidity</b>                     | 5% ~ 95% (non-condensing)                                                                                                                                                                                                                                      |



## IMBA-Q470 ATX Motherboard

| Physical Specifications |                 |
|-------------------------|-----------------|
| Dimensions              | 244 mm x 305 mm |
| Weight (GW/NW)          | 1200 g/700 g    |

Table 1-1: IMBA-Q470 Specifications



Chapter

2

# Packing List

---

## IMBA-Q470 ATX Motherboard

### 2.1 Anti-static Precautions



#### WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband:*** Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding:*** Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad:*** When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB:*** Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

### 2.2 Unpacking Precautions

When the IMBA-Q470 is unpacked, please do the following:

- Follow the anti-static guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.



### 2.3 Packing List



**NOTE:**

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the IMBA-Q470 was purchased from or contact an IEI sales representative directly by sending an email to [sales@ieiworld.com](mailto:sales@ieiworld.com).

The IMBA-Q470 is shipped with the following components:

| Quantity | Item and Part Number            | Image                                                                                 |
|----------|---------------------------------|---------------------------------------------------------------------------------------|
| 1        | IMBA-Q470 single board computer |   |
| 2        | SATA cable                      |  |
| 1        | I/O shielding                   |  |

Table 2-1: Packing List



## IMBA-Q470 ATX Motherboard

## 2.4 Optional Items

The following are optional components which may be separately purchased:

| Item and Part Number                                                                            | Image                                                                                 |
|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Dual-port USB cable with bracket<br>(P/N: CB-USB02-RS)                                          |    |
| USB 3.2 cable with bracket, 450 mm<br>(P/N: 19800-010500-200-RS)                                |    |
| SATA power cable<br>(P/N: 32102-000100-200-RS)                                                  |    |
| RS-232 cable, 230mm, P=2.54<br>(P/N: 19800-020100-100-RS)                                       |   |
| High-performance LGA1155/LGA1156 cooler kit (1U chassis compatible, 45W)<br>(P/N: CF-1156C-R20) |  |
| High-performance LGA1155/1156 cooler kit (1U chassis compatible, 73W)<br>(P/N: CF-115XA-R10)    |  |
| High-performance LGA1155/1156 cooler kit (1U chassis compatible, 65W)<br>(P/N: CF-1156D-R30)    |  |



| Item and Part Number                                                  | Image                                                                               |
|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| High-performance LGA1155/1156 cooler kit (95W)<br>(P/N: CF-115XE-R10) |  |

Table 2-2: Optional Items

Chapter

3

# Connectors

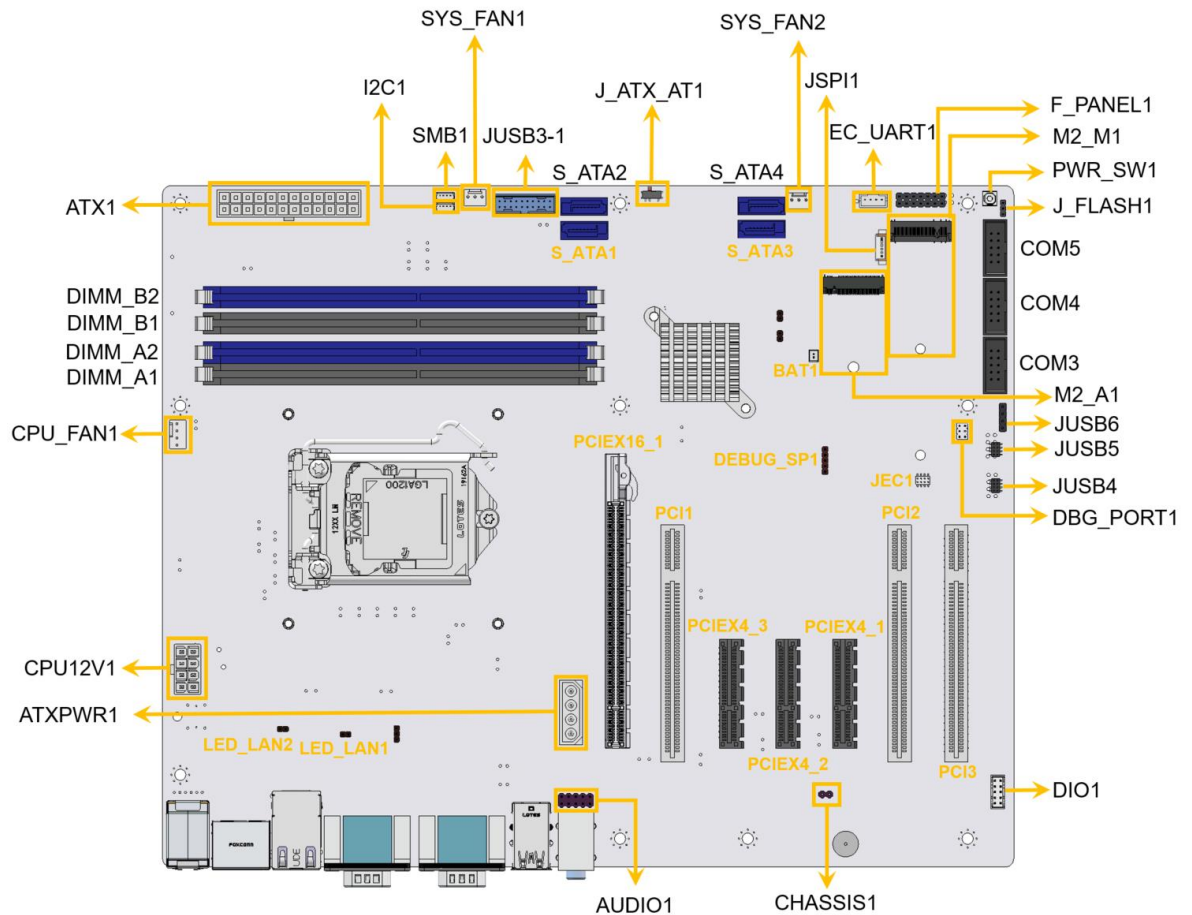
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## 3.1 Peripheral Interface Connectors

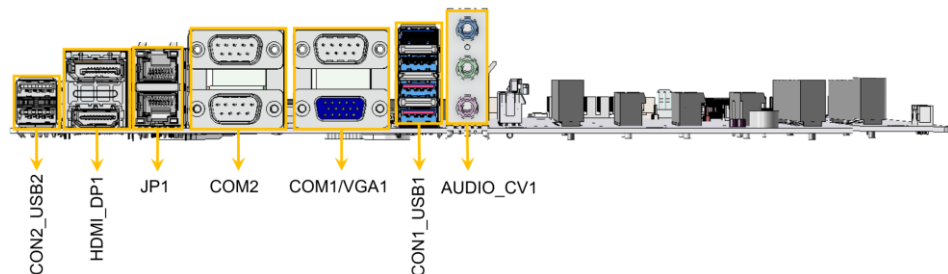
This chapter details all the peripheral interface connectors.

### 3.1.1 IMBA-Q470 Layout

The figures below show all the peripheral interface connectors.



**Figure 3-1: Peripheral Interface Connectors (1/2)**



**Figure 3-2: Peripheral Interface Connectors (2/2)**

## IMBA-Q470 ATX Motherboard

## 3.1.2 Internal Peripheral Connectors

The table below lists all the internal connectors on the board.

| Connector                                 | Type                        | Label                 |
|-------------------------------------------|-----------------------------|-----------------------|
| ATX CPU 12V power connector               | 8-pin Molex power connector | CPU12V1               |
| PCIe power connector                      | 4-pin connector             | ATXPWR1               |
| ATX power connector                       | 24-pin connector            | ATX1                  |
| Battery connector                         | 2-pin wafer                 | BAT1                  |
| Chassis intrusion connector               | 2-pin header                | CHASSIS1              |
| AT/ATX power mode setting                 | 3-pin switch                | J_ATX_AT1             |
| Digital I/O connector                     | 10-pin wafer                | DIO1                  |
| EC UART debug connector                   | 4-pin wafer                 | EC_UART1              |
| EC debug connector                        | 5-pin header                | DEBUG_SPI1            |
| Debug connector                           | 6-pin header                | DBG_PORT1             |
| Clear CMOS jumper                         | 2-pin header                | ME_RTC2               |
| Clear ME jumper                           | 2-pin header                | ME_RTC1               |
| Flash descriptor security override jumper | 3-pin header                | J_FLASH1              |
| Fan connector (CPU)                       | 4-pin wafer                 | CPU_FAN1              |
| Fan connectors (system)                   | 3-pin wafer                 | SYS_FAN1,<br>SYS_FAN2 |
| Front panel audio connector               | 10-pin header               | AUDIO1                |
| Front panel connector                     | 14-pin header               | F_PANEL1              |
| I <sup>2</sup> C connector                | 4-pin wafer                 | I2C1                  |
| SMBus connector                           | 4-pin wafer                 | SMB1                  |
| LAN1 link LED connector                   | 2-pin header                | LED_LAN1              |
| LAN2 link LED connector                   | 2-pin header                | LED_LAN2              |

| Connector                        | Type                 | Label                                       |
|----------------------------------|----------------------|---------------------------------------------|
| M.2 2230 A-key slot              | M.2 A-key slot       | M2_A1                                       |
| M.2 2280 M-key slot              | M.2 M-key slot       | M2_M1                                       |
| PCI slots                        | PCI slot             | PCI1, PCI2, PCI3                            |
| PCIe x4 slots                    | PCIe x4 slot         | PCIEX4_1,<br>PCIEX4_2,<br>PCIEX4_3          |
| PCIe x16 slot                    | PCIe x16 slot        | PCIEX16_1                                   |
| Onboard power button             | Push button          | PWR_SW1                                     |
| DDR4 DIMM sockets                | 288-pin socket       | DIMM_B2,<br>DIMM_B1,<br>DIMM_A2,<br>DIMM_A1 |
| SATA 6Gb/s connectors            | 7-pin SATA connector | S_ATA1, S_ATA2,<br>S_ATA3, S_ATA4           |
| Serial ports, RS-232             | 10-pin box header    | COM3, COM4                                  |
| Serial port, RS-232/422/485      | 10-pin box header    | COM5                                        |
| Flash SPI ROM connector          | 6-pin wafer          | JSPI1                                       |
| Flash EC ROM connector           | 8-pin header         | JEC1                                        |
| Internal USB 2.0 connectors      | 8-pin header         | JUSB4, JUSB5                                |
| Internal USB 2.0 connector       | 4-pin header         | JUSB6                                       |
| Internal USB 3.2 Gen 1 connector | 20-pin box header    | JUSB3-1                                     |

**Table 3-1: Peripheral Interface Connectors**

**3.1.3 External Interface Panel Connectors**

The table below lists the connectors on the external I/O panel.

| Connector              | Type        | Label     |
|------------------------|-------------|-----------|
| External HD Audio jack | Audio jacks | AUDIO_CV1 |



## IMBA-Q470 ATX Motherboard

| Connector                                                    | Type                                     | Label     |
|--------------------------------------------------------------|------------------------------------------|-----------|
| External USB 2.0 connectors                                  | USB 2.0                                  | CON2_USB2 |
| External HDMI and DP combo connector                         | DisplayPort, HDMI                        | HDMI_DP1  |
| External dual 2.5GbE RJ-45 connectors                        | Dual RJ45                                | JP1       |
| External RS-232 and RS-422/485 combo connectors              | Dual DB-9                                | COM2      |
| External RS-232 and VGA combo connector                      | DB-9 (9-pin male)<br>VGA (15-pin female) | COM1/VGA1 |
| External dual USB 3.2 Gen 1 and dual USB 3.2 Gen 2 connector | USB 3.2 Gen1&USB 3.2 Gen 2 Type A        | CON1_USB1 |

**Table 3-2: Rear Panel Connectors**

## 3.2 Internal Peripheral Connectors

The section describes all of the internal connectors on the IMBA-Q470.

### 3.2.1 CPU 12V Power Connector

|                     |                                      |
|---------------------|--------------------------------------|
| <b>CN Label:</b>    | <b>CPU12V1</b>                       |
| <b>CN Type:</b>     | 8-pin Molex power connector, p=4.2mm |
| <b>CN Location:</b> | See <b>Figure 3-3</b>                |
| <b>CN Pinouts:</b>  | See <b>Table 3-3</b>                 |

This connector connects to a 12V power supply for the CPU.

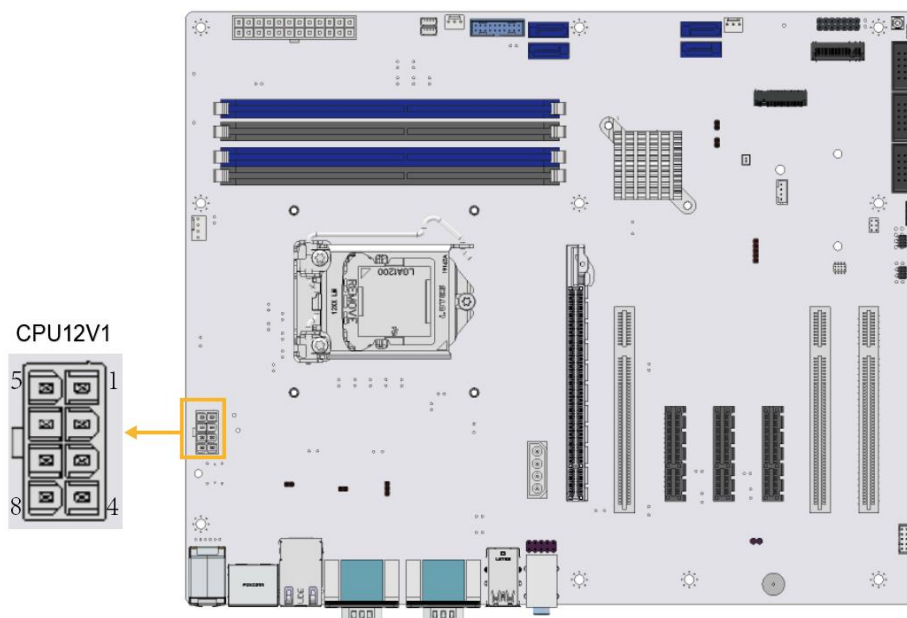


Figure 3-3: ATX CPU 12V Power Connector Location

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1       | GND         | 5       | +12V        |
| 2       | GND         | 6       | +12V        |
| 3       | GND         | 7       | +12V        |
| 4       | GND         | 8       | +12V        |

Table 3-3: ATX CPU 12V Power Connector Pinouts

### 3.2.2 PCIe Power Connector

- CN Label:

ATXPWR1
- CN Type:

4-pin connector, p=5.08 mm
- CN Location:

See Figure 3-4
- CN Pinouts:

See Table 3-4

The additional power connector provides extra +12V and +5V power to the system.

## IMBA-Q470 ATX Motherboard

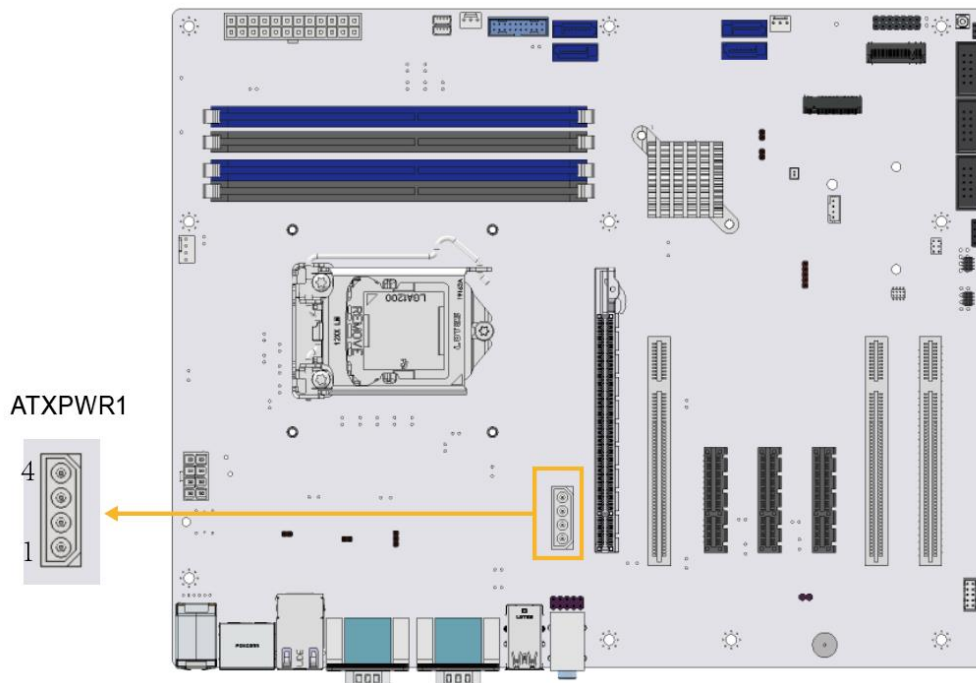


Figure 3-4: PCIe Power Connector Location

| Pin | Description |
|-----|-------------|
| 1   | +12V        |
| 2   | GND         |
| 3   | GND         |
| 4   | +5V         |

Table 3-4: PCIe Power Connector Pinouts

## 3.2.3 ATX Power Connector

- CN Label:** ATX1  
**CN Type:** 24-pin connector, p=4.2 mm  
**CN Location:** See Figure 3-5  
**CN Pinouts:** See Table 3-5

The ATX power connector connects to an ATX power supply.

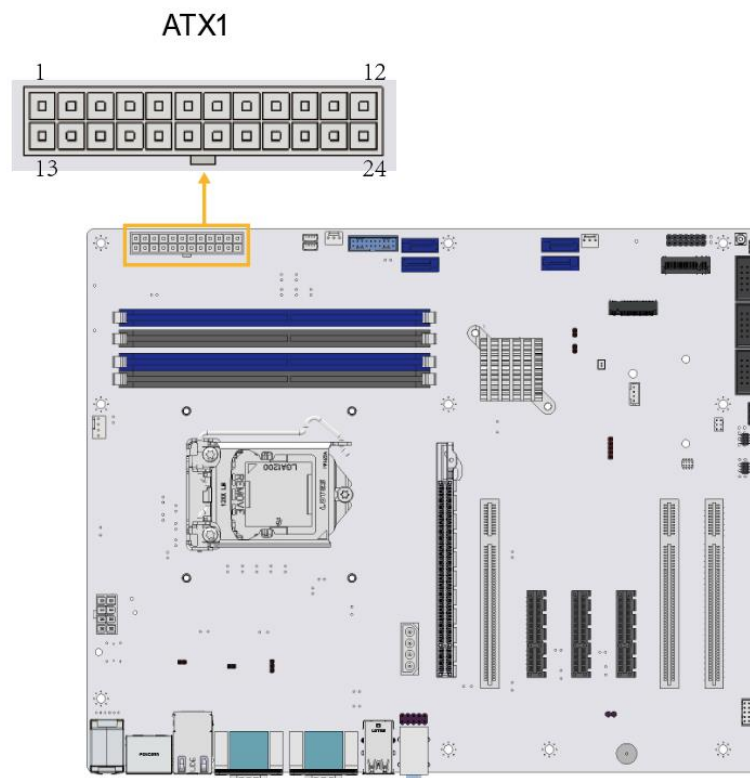


Figure 3-5: ATX Power Connector Location

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | +3.3V       | 13  | +3.3V       |
| 2   | +3.3V       | 14  | -12V        |
| 3   | GND         | 15  | GND         |
| 4   | +5V         | 16  | PS_ON       |
| 5   | GND         | 17  | GND         |
| 6   | +5V         | 18  | GND         |
| 7   | GND         | 19  | GND         |
| 8   | Power good  | 20  | -5V         |
| 9   | 5VSB        | 21  | +5V         |
| 10  | +12V        | 22  | +5V         |
| 11  | +12V        | 23  | +5V         |
| 12  | +3.3V       | 24  | GND         |

Table 3-5: ATX Power Connector Pinouts

## IMBA-Q470 ATX Motherboard

### 3.2.4 Battery Connector



#### CAUTION:

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.



#### NOTE:

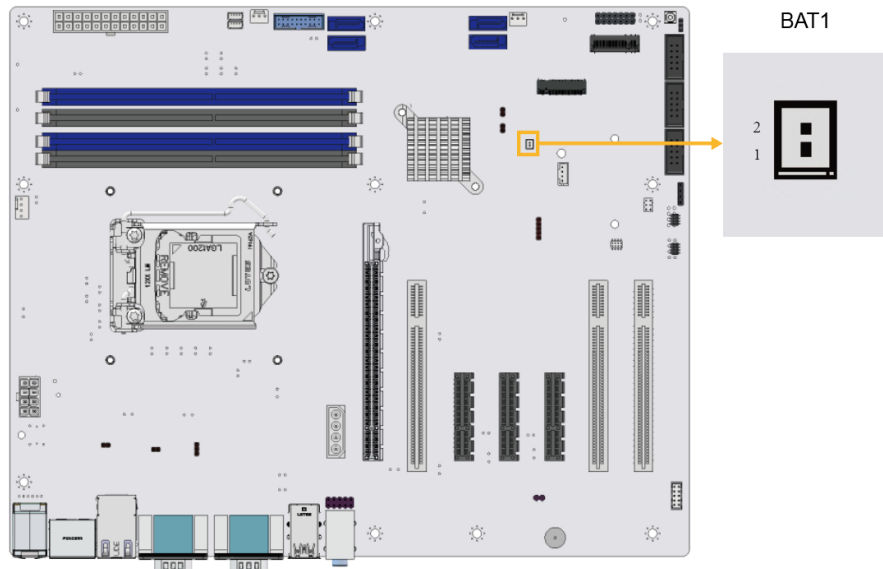
It is recommended to attach the RTC battery onto the system chassis in which the IMBA-Q470 is installed.

---

|                     |                       |
|---------------------|-----------------------|
| <b>CN Label:</b>    | <b>BAT1</b>           |
| <b>CN Type:</b>     | 2-pin wafer           |
| <b>CN Location:</b> | See <b>Figure 3-6</b> |

A system battery is placed in the battery holder. The battery provides power to the system clock to retain the time when power is turned off.





**Figure 3-6: Battery Connector Location**

### **3.2.5 Chassis Intrusion Connector**

|                     |                         |
|---------------------|-------------------------|
| <b>CN Label:</b>    | <b>CHASSIS1</b>         |
| <b>CN Type:</b>     | 2-pin header, p=2.54 mm |
| <b>CN Location:</b> | See <b>Figure 3-7</b>   |
| <b>CN Pinouts:</b>  | See <b>Table 3-6</b>    |

The chassis intrusion connector is for a chassis intrusion detection sensor or switch that detects if a chassis component is removed or replaced.

## IMBA-Q470 ATX Motherboard

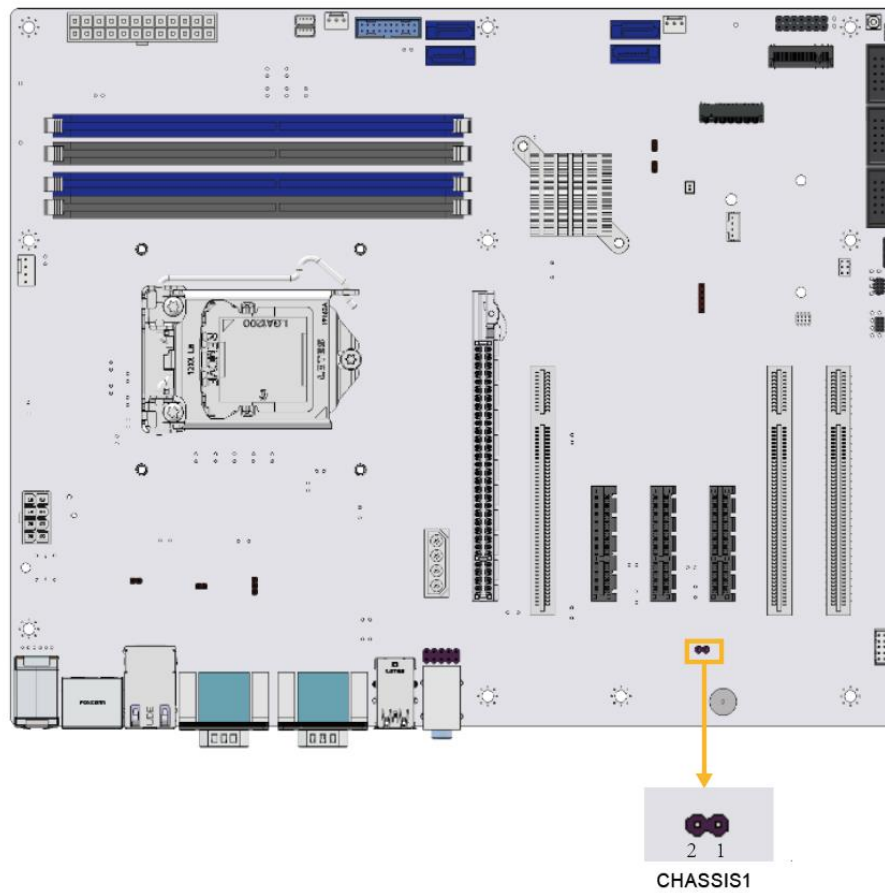


Figure 3-7: Chassis Intrusion Connector Location

| Pin | Description  |
|-----|--------------|
| 1   | +3.3VSB      |
| 2   | CHASSIS_OPEN |

Table 3-6: Chassis Intrusion Connector Pinouts

3.2.6 AT/ATX Power Mode Setting

- CN Label:

J\_ATX\_AT1
- CN Type:

3-pin switch
- CN Location:

See Figure 3-8
- CN Pinouts:

See Table 3-7

The AT/ATX power mode selection is made through the AT/ATX power mode switch.

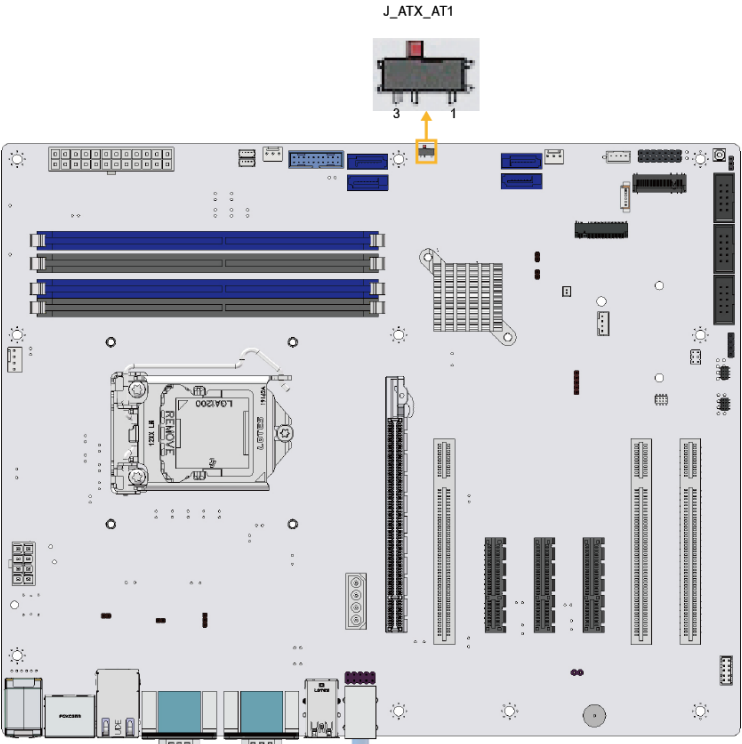


Figure 3-8: AT/ATX Power Mode Switch Locations

| Pin         | Description                 | Pin         | Description   |
|-------------|-----------------------------|-------------|---------------|
| Short 1 - 2 | ATX Power Mode<br>(default) | Short 2 - 3 | AT Power Mode |

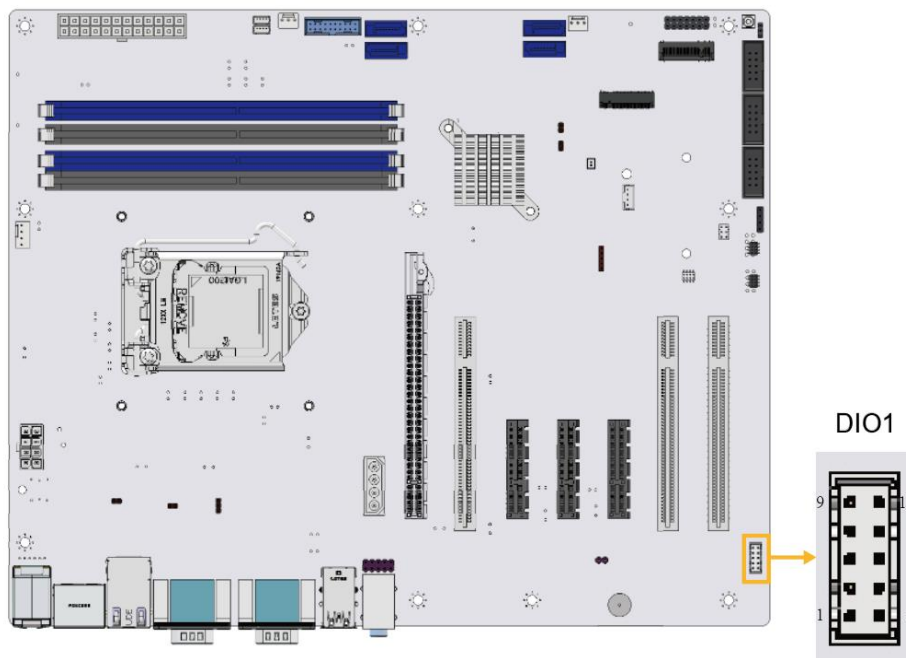
Table 3-7: AT/ATX Power Mode Switch Settings

## IMBA-Q470 ATX Motherboard

### 3.2.7 Digital I/O Connector

- CN Label:** DIO1
- CN Type:** 10-pin wafer, p=2.0 mm
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-8**

The digital I/O connector provides programmable input and output for external devices.



**Figure 3-9: Digital I/O Connector Location**

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | GND         | 2   | VCC         |
| 3   | Output 3    | 4   | Output 2    |
| 5   | Output 1    | 6   | Output 0    |
| 7   | Input 3     | 8   | Input 2     |
| 9   | Input 1     | 10  | Input 0     |

**Table 3-8: Digital I/O Connector Pinouts**

3.2.8 EC UART Debug Connector

- CN Label:

EC\_UART1
- CN Type:

4-pin wafer
- CN Location:

See Figure 3-10
- CN Pinouts:

See Table 3-9

The EC UART debug connector is used for EC debug (with UART protocol).

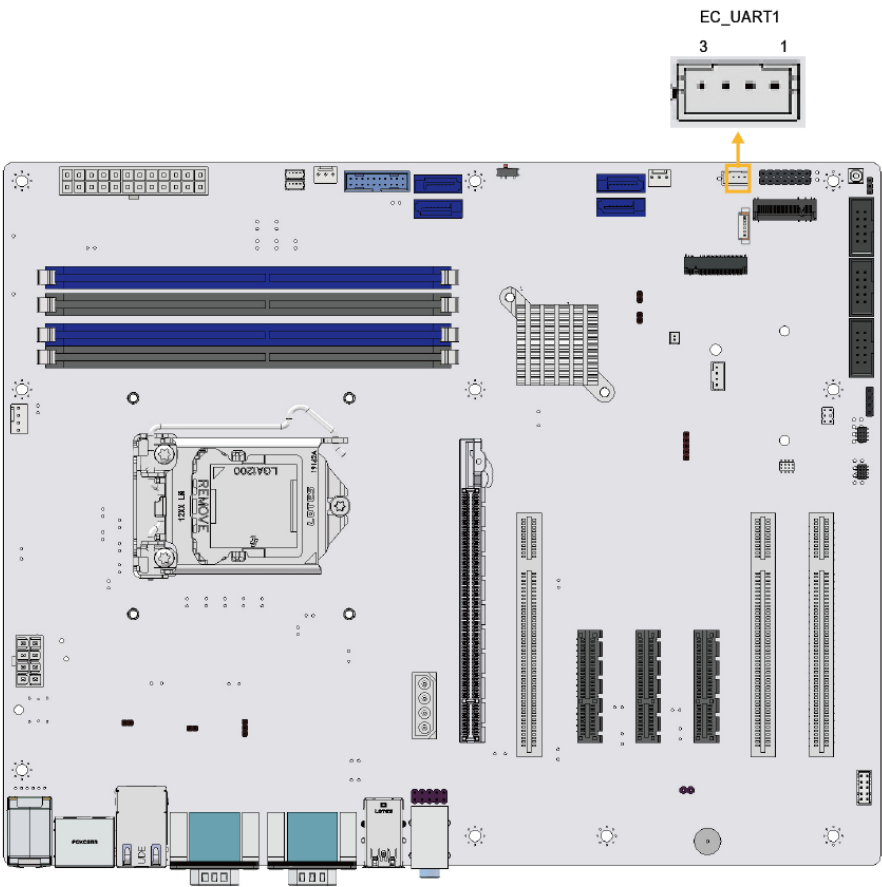


Figure 3-10: EC UART Debug Connector Location

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | UART_TX     | 2   | VCC3.3      |
| 3   | UART_RX     | 4   | GND         |

Table 3-9: EC UART Debug Connector Pinouts



## IMBA-Q470 ATX Motherboard

### 3.2.9 EC debug Connector

- CN Label:** DEBUG\_SPI1
- CN Type:** 5-pin header, p=2 mm
- CN Location:** See Figure 3-11
- CN Pinouts:** See Table 3-10

The DEBUG\_SPI1 connector is used for EC debug (with SPI protocol).

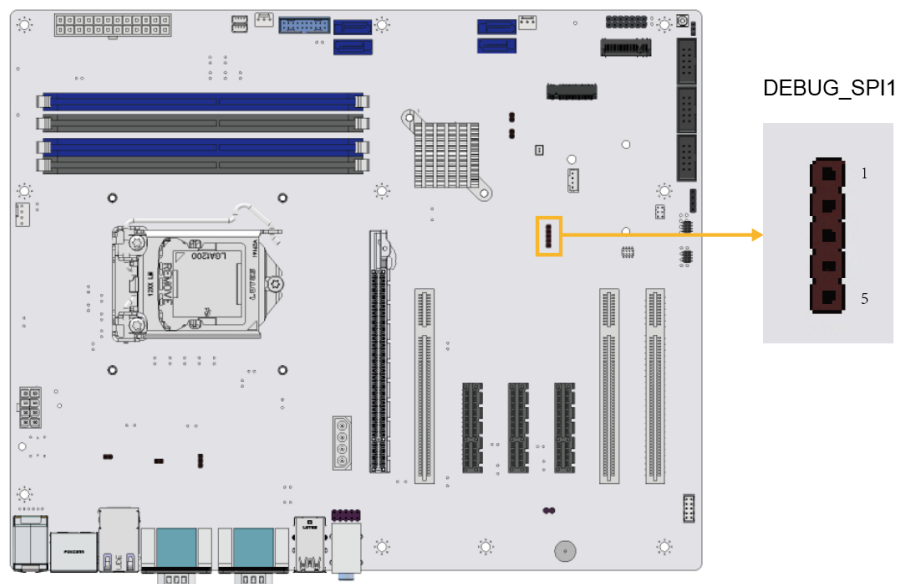


Figure 3-11: EC Debug Connector Location

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | GND         | 2   | EDICS       |
| 3   | EDICLK      | 4   | EDIDI       |
| 5   | EDIDO       |     |             |

Table 3-10: EC Debug Connector Pinouts

### 3.2.10 Debug Connector

- CN Label:** DBG\_PORT1
- CN Type:** 6-pin header, p=2 mm

CN Location: See Figure 3-12

CN Pinouts: See Table 3-11

The DBG\_PORT1 is used for monitoring the motherboard startup process with debug card.

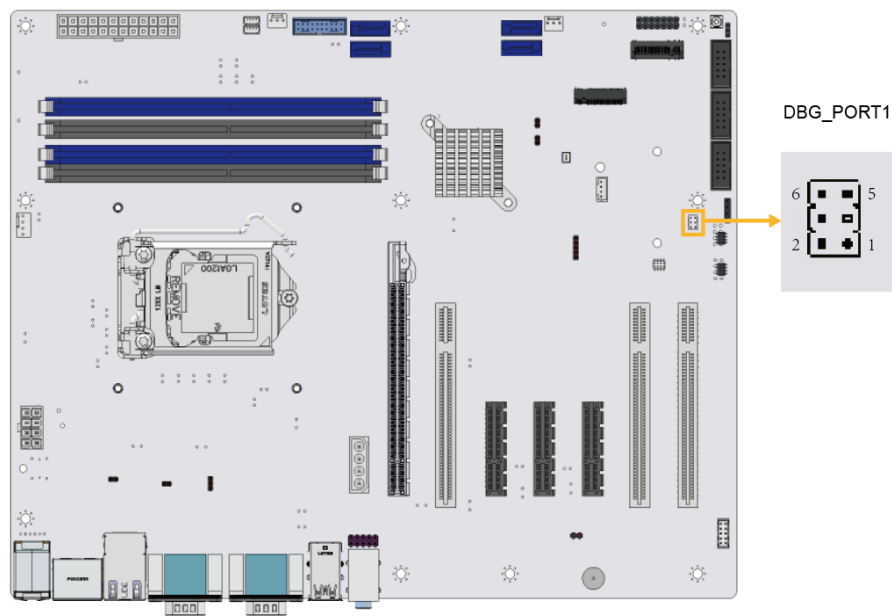


Figure 3-12: Debug Connector Location

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | +5V         | 2   | SMCLK1_EC   |
| 3   | NC          | 4   | SMDAT1_EC   |
| 5   | GND         | 6   | PLTRST_N    |

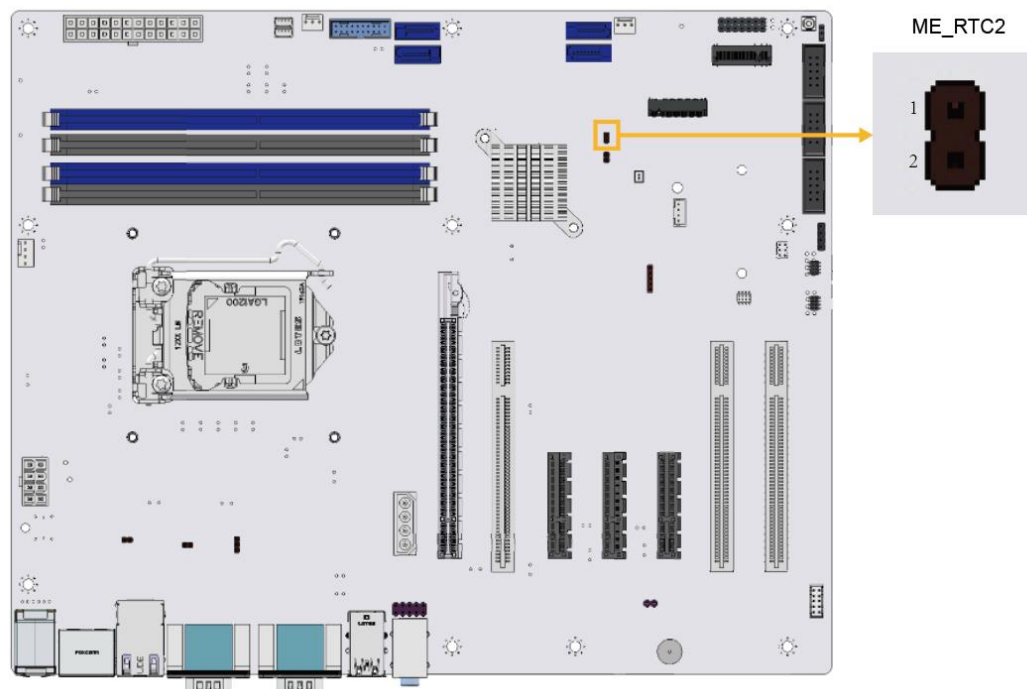
Table 3-11: Debug Connector Pinouts

## IMBA-Q470 ATX Motherboard

## 3.2.11 Clear CMOS Jumper

|                     |                        |
|---------------------|------------------------|
| <b>CN Label:</b>    | <b>ME_RTC2</b>         |
| <b>CN Type:</b>     | 2-pin wafer, P=2.00 mm |
| <b>CN Location:</b> | See <b>Figure 3-13</b> |
| <b>CN Pinouts:</b>  | See <b>Table 3-12</b>  |

The ME\_RTC2 is used for reset PCH registers in the RTC WELL to their default value.



**Figure 3-13: Clear CMOS Jumper Location**

| Pin            | Description                           |
|----------------|---------------------------------------|
| Open (default) | Keep CMOS Setup<br>(Normal Operation) |
| Short          | Clear CMOS Setup                      |

**Table 3-12: Clear CMOS Jumper Pinouts**

3.2.12 Clear ME Jumper

- CN Label:ME\_RTC1
- CN Type:2-pin wafer, p=2.00 mm
- CN Location:See Figure 3-14
- CN Pinouts:See Table 3-13

The ME\_RTC1 is used to reset the Intel Converged Security and Management Engine.

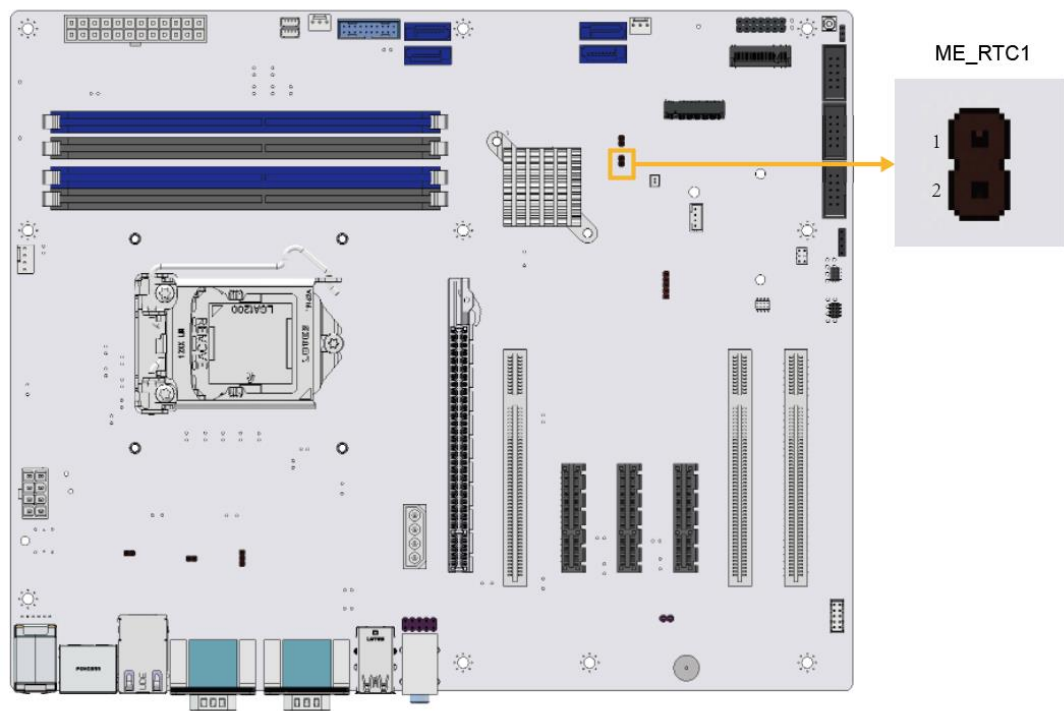


Figure 3-14: Clear ME Jumper Location

| Pin   | Description        |
|-------|--------------------|
| Open  | Keep RTC (default) |
| Short | Clear RTC          |

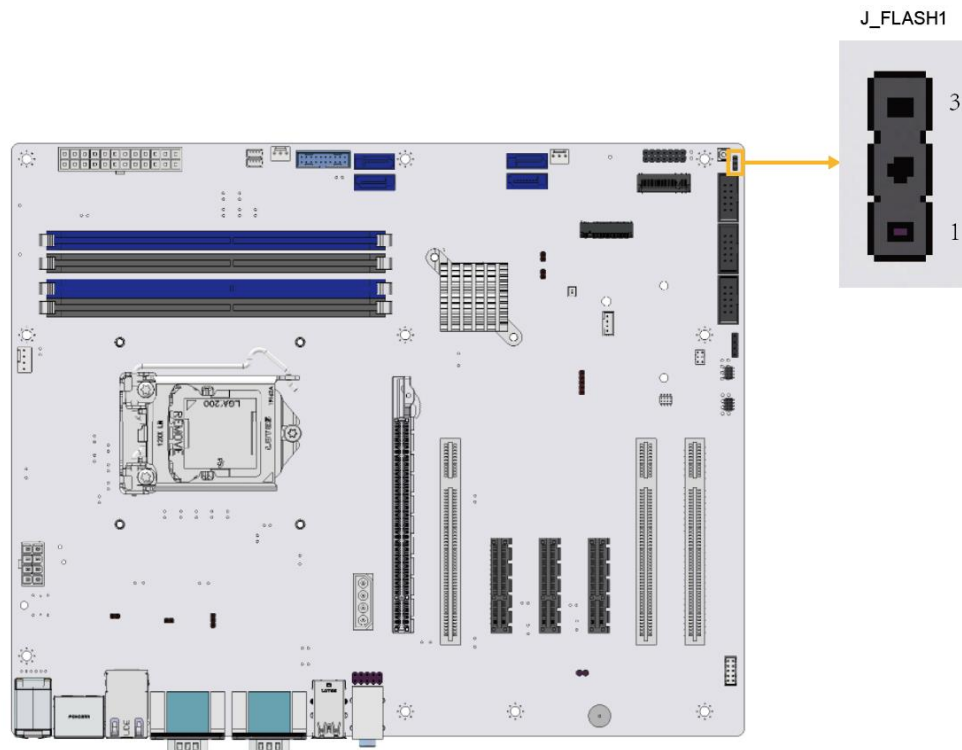
Table 3-13: Clear ME Jumper Pinouts

## IMBA-Q470 ATX Motherboard

## 3.2.13 Flash Descriptor Security Override Jumper

- CN Label:** J\_FLASH1
- CN Type:** 3-pin header, p=2.00 mm
- CN Location:** See Figure 3-15
- CN Pinouts:** See Table 3-14

The J\_FLASH1 connector is used for flash descriptor security override jumper.



**Figure 3-15: Flash Descriptor Security Override Jumper Location**

| Pin       | Description        |
|-----------|--------------------|
| Short 1-2 | Disabled (default) |
| Short 2-3 | Enabled            |

**Table 3-14: Flash Descriptor Security Override Jumper Pinouts**



To update the ME firmware, please follow the steps below.

- Step 1:** Before turning on the system power, short pin 2-3 of the flash descriptor security override jumper.
- Step 2:** Update the BIOS and ME firmware, and then turn off the system power.
- Step 3:** Remove the metal clip on the flash descriptor security override jumper or return to its default setting (short pin 1-2).
- Step 4:** Restart the system. The system will reboot 2 ~ 3 times to complete the ME firmware update.

### 3.2.14 Fan Connector (CPU)

|                     |                        |
|---------------------|------------------------|
| <b>CN Label:</b>    | <b>CPU_FAN1</b>        |
| <b>CN Type:</b>     | 4-pin wafer, p=2.54 mm |
| <b>CN Location:</b> | See <b>Figure 3-16</b> |
| <b>CN Pinouts:</b>  | See <b>Table 3-15</b>  |

The fan connector attaches to a CPU cooling fan.

## IMBA-Q470 ATX Motherboard

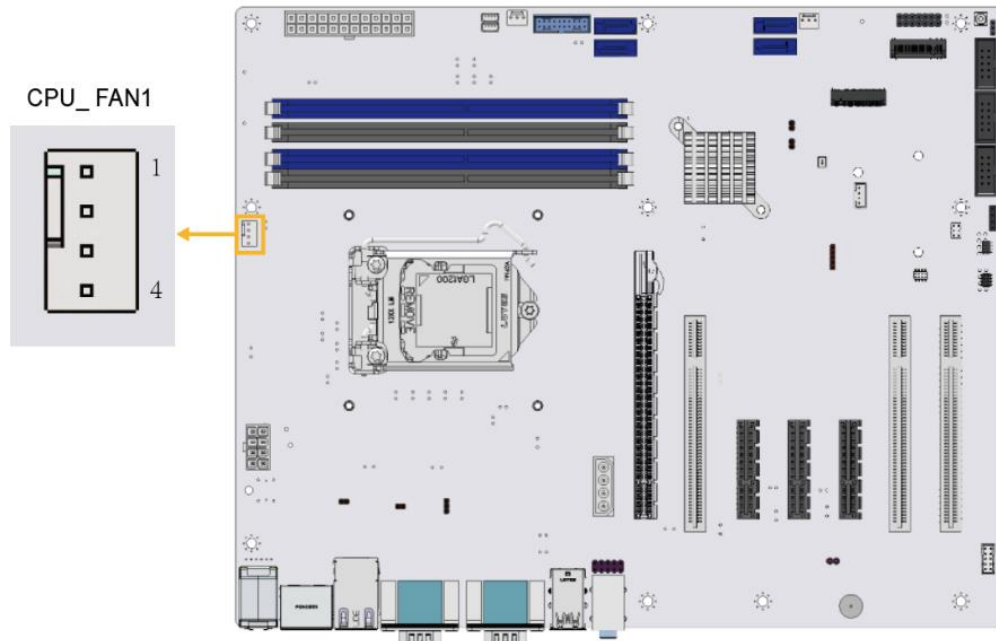


Figure 3-16: CPU Fan Connector Location

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | GND         | 3   | FANIO       |
| 2   | +12V        | 4   | PWM         |

Table 3-15: CPU Fan Connector Pinouts



3.2.15 Fan Connectors (System)

- CN Label:       SYS\_FAN1, SYS\_FAN2
- CN Type:        3-pin wafer, p=2.54 mm
- CN Location:    See Figure 3-17
- CN Pinouts:     See Table 3-16 and Table 3-17

Each fan connector attaches to a system cooling fan. The SYS\_FAN1 provides smart fan function.

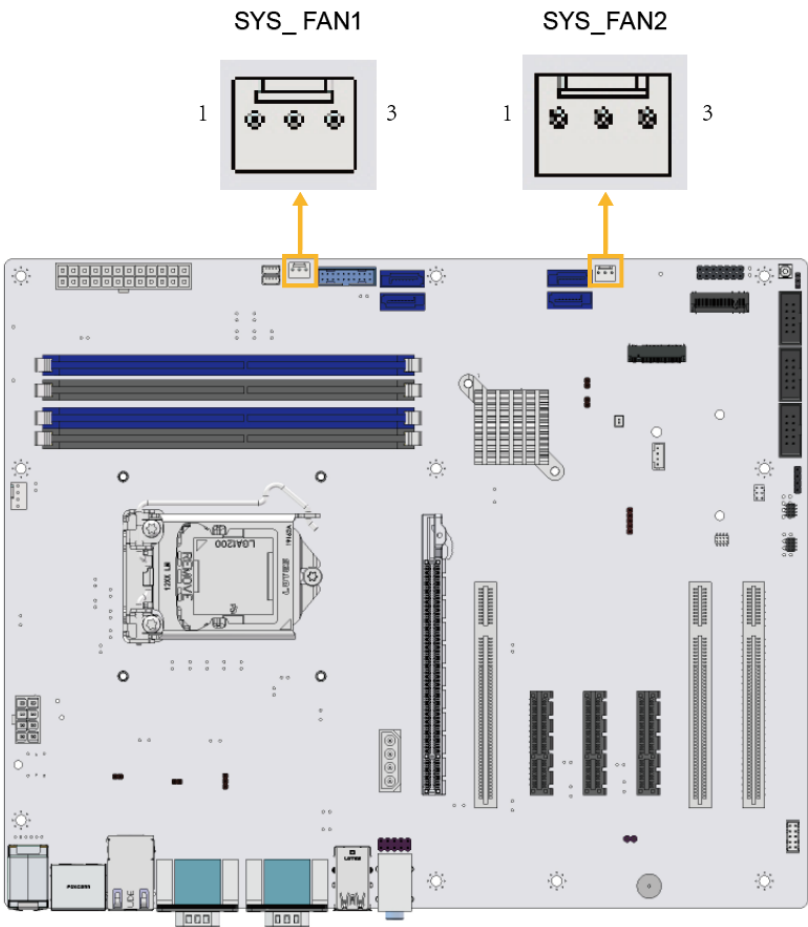


Figure 3-17: System Fan Connector Locations

**IMBA-Q470 ATX Motherboard**

| Pin | Description |
|-----|-------------|
| 1   | FANIO       |
| 2   | PWM         |
| 3   | GND         |

**Table 3-16: System Fan (SYS\_FAN1) Connector Pinouts**

| Pin | Description |
|-----|-------------|
| 1   | NC          |
| 2   | +12V        |
| 3   | GND         |

**Table 3-17: System Fan (SYS\_FAN2) Connector Pinouts**

3.2.16 Front Panel Audio Connector

- CN Label:

AUDIO1
- CN Type:

10-pin header, p=2.54 mm
- CN Location:

See Figure 3-18
- CN Pinouts:

See Table 3-18

This connector connects to speakers, a microphone and an audio input.

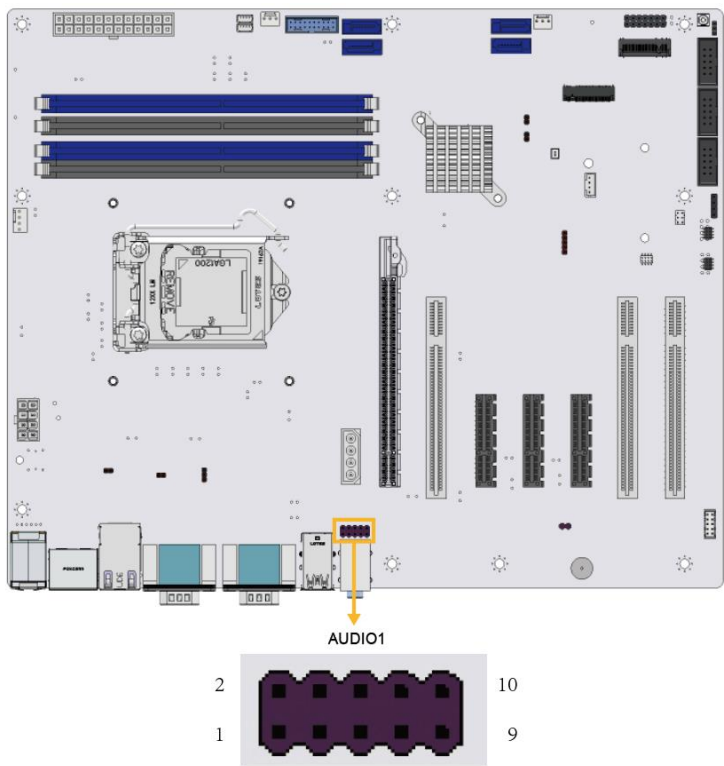


Figure 3-18: AUDIO1 Location

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | LMIC2-L     | 2   | AUD_GND     |
| 3   | LMIC2-R     | 4   | PRESENCE#   |
| 5   | LLINE2-R    | 6   | MIC2-JD     |
| 7   | FRONT-IO    | 8   | NC          |
| 9   | LLINE2-L    | 10  | LINE2-JD    |

Table 3-18: AUDIO1 Pinouts

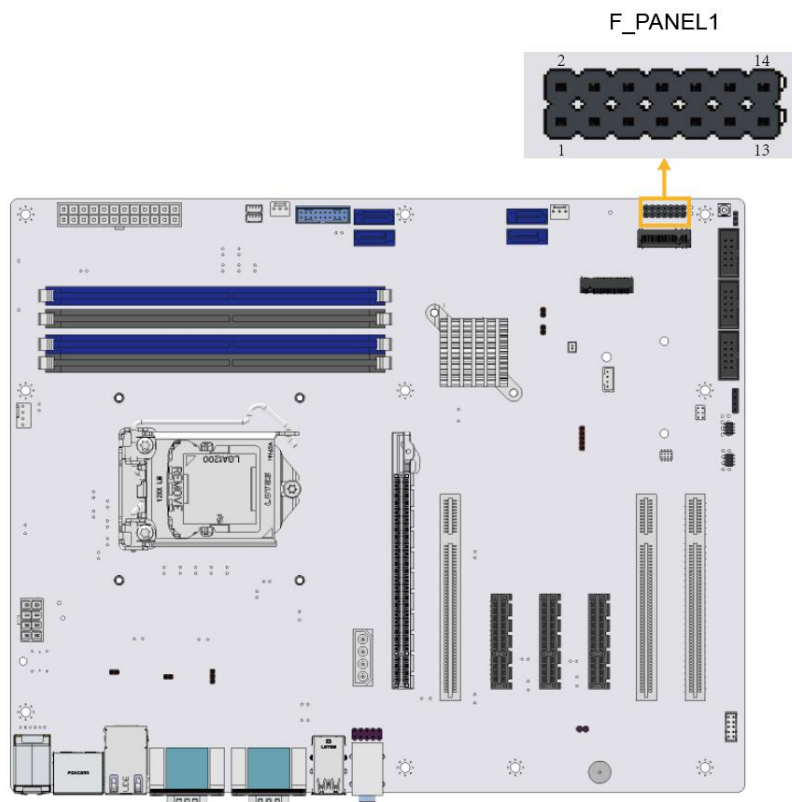


## IMBA-Q470 ATX Motherboard

### 3.2.17 Front Panel Connector

|                     |                          |
|---------------------|--------------------------|
| <b>CN Label:</b>    | <b>F_PANEL1</b>          |
| <b>CN Type:</b>     | 14-pin header, p=2.54 mm |
| <b>CN Location:</b> | See <b>Figure 3-19</b>   |
| <b>CN Pinouts:</b>  | See <b>Table 3-19</b>    |

The front panel connector connects to the indicator LEDs and buttons on the computer's front panel.



**Figure 3-19: Front Panel Connector Location**

| Function | Pin | Description | Pin | Description |       |
|----------|-----|-------------|-----|-------------|-------|
| PWR LED  | 1   | PWR_LED+    | 2   | BEEP_PWR    | SPKR  |
|          | 3   | NC          | 4   | NC          |       |
|          | 5   | PWR_LED-    | 6   | NC          |       |
| PWR BTN  | 7   | PWR_BTN+    | 8   | PC_BEEP     |       |
|          | 9   | PWR_BTN-    | 10  | NC          |       |
| HDD LED  | 11  | HDD_LED+    | 12  | RESET+      | RESET |
|          | 13  | HDD_LED-    | 14  | RESET-      |       |

Table 3-19: Front Panel Connector Pinouts

3.2.18 I<sup>2</sup>C Connector

- CN Label: I2C1
- CN Type: 4-pin wafer, p=1.25 mm
- CN Location: See Figure 3-20
- CN Pinouts: See Table 3-20

The I<sup>2</sup>C connector is used to connect I<sup>2</sup>C-bus devices to the mainboard.

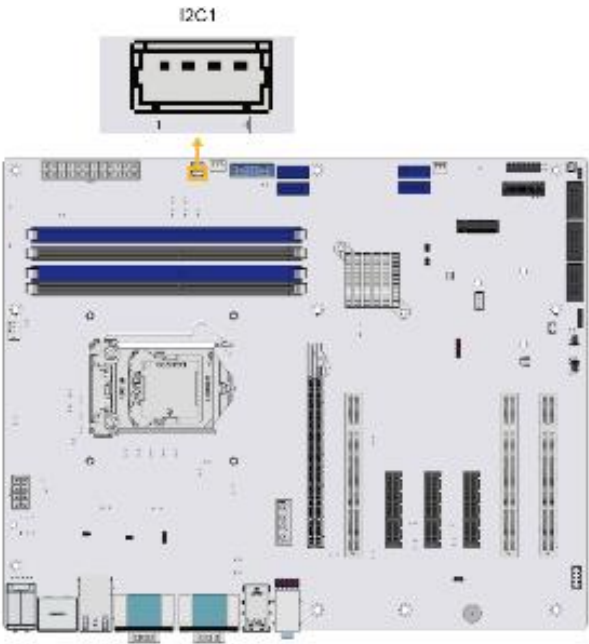


Figure 3-20: I<sup>2</sup>C Connector Location

## IMBA-Q470 ATX Motherboard

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | GND         | 3   | I2C_CLK     |
| 2   | I2C_DAT     | 4   | +5V         |

Table 3-20: I<sup>2</sup>C Connector Pinouts

## 3.2.19 SMBus Connector

- CN Label:** SMB1
- CN Type:** 4-pin wafer, p=1.25 mm
- CN Location:** See Figure 3-21
- CN Pinouts:** See Table 3-21

The SMBus (System Management Bus) connector provides low-speed system management communications.

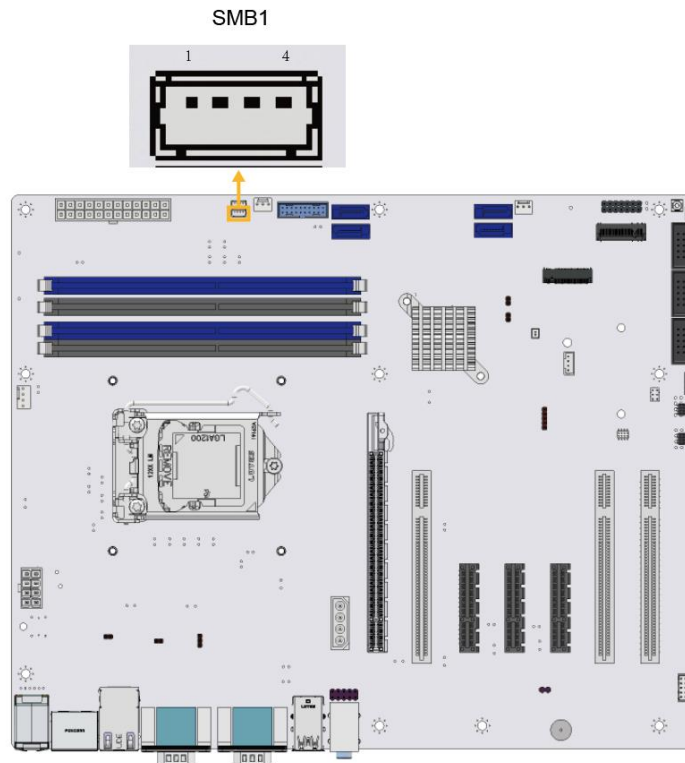


Figure 3-21: SMBus Connector Location

| Pin | Description |
|-----|-------------|
| 1   | GND         |
| 2   | SMB_DATA    |
| 3   | SMB_CLK     |
| 4   | +5V         |

Table 3-21: SMBus Connector Pinouts

3.2.20 LAN Link LED Connector

- CN Label:LED\_LAN1, LED\_LAN2
- CN Type:2-pin header, p=2.00 mm
- CN Location:See Figure 3-22
- CN Pinouts:See Table 3-22 and Table 3-23

The LAN LED connectors are used to connect to the LAN LED indicators on the chassis to indicate the link activities of the two LAN ports.

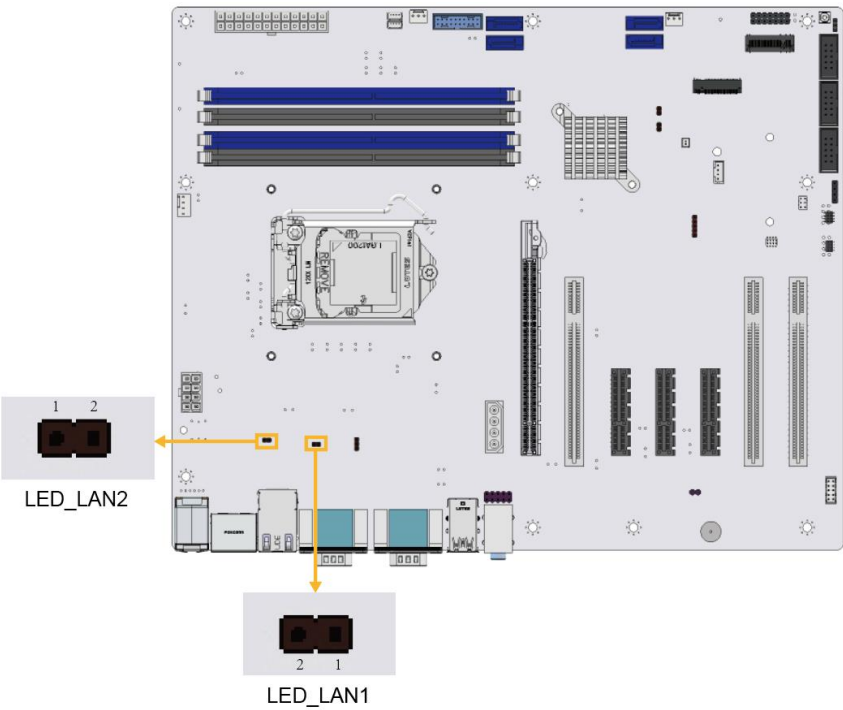


Figure 3-22: LAN LED Connector Locations

## IMBA-Q470 ATX Motherboard

| Pin | Description        |
|-----|--------------------|
| 1   | +3.3V              |
| 2   | LAN1_LED_LINK#_ACT |

**Table 3-22: LAN1 LED Connector (LED\_LAN1) Pinouts**

| Pin | Description        |
|-----|--------------------|
| 1   | +3.3V              |
| 2   | LAN2_LED_LINK#_ACT |

**Table 3-23: LAN2 LED Connector (LED\_LAN2) Pinouts**

### 3.2.21 M.2 2230 A-Key Slot

|                     |                        |
|---------------------|------------------------|
| <b>CN Label:</b>    | <b>M2_A1</b>           |
| <b>CN Type:</b>     | M.2 A-key slot         |
| <b>CN Location:</b> | See <b>Figure 3-23</b> |
| <b>CN Pinouts:</b>  | See <b>Table 3-24</b>  |

The M.2 2230 slot is keyed in the A position. The M.2 slot supports PCIe x1 and USB 2.0 interfaces.



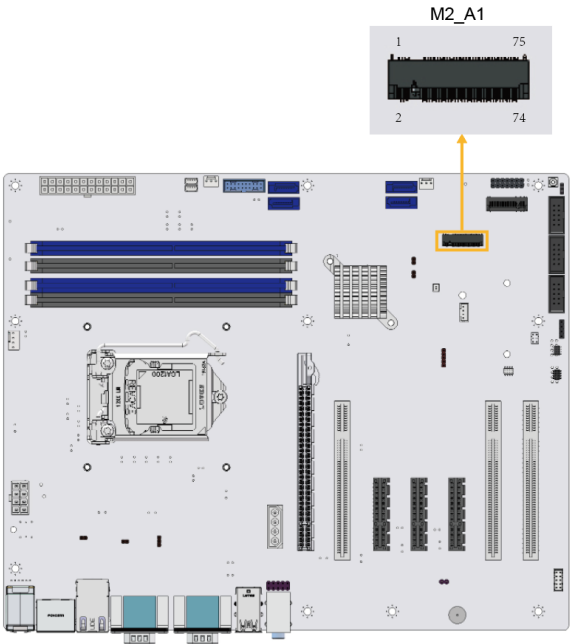


Figure 3-23: M.2 2230 A-Key Slot Location

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | GND         | 2   | +3.3V       |
| 3   | USB2_DP     | 4   | +3.3V       |
| 5   | USB2_DN     | 6   | NC          |
| 7   | GND         | 8   | Module Key  |
| 9   | Module Key  | 10  | Module Key  |
| 11  | Module Key  | 12  | Module Key  |
| 13  | Module Key  | 14  | Module Key  |
| 15  | Module Key  | 16  | NC          |
| 17  | NC          | 18  | GND         |
| 19  | NC          | 20  | NC          |
| 21  | NC          | 22  | NC          |
| 23  | GND         | 24  | GND         |
| 25  | NC          | 26  | NC          |
| 27  | NC          | 28  | NC          |
| 29  | GND         | 30  | GND         |
| 31  | NC          | 32  | NC          |
| 33  | GND         | 34  | NC          |

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|    |           |    |         |
|----|-----------|----|---------|
| 35 | PETP0     | 36 | GND     |
| 37 | PETN0     | 38 | NC      |
| 39 | GND       | 40 | NC      |
| 41 | PERP0     | 42 | NC      |
| 43 | PERN0     | 44 | NC      |
| 45 | GND       | 46 | NC      |
| 47 | PCIE_CLK+ | 48 | NC      |
| 49 | PCIE_CLK- | 50 | NC      |
| 51 | GND       | 52 | PLT_RST |
| 53 | CLKREQ0#  | 54 | Pull up |
| 55 | PCIE_WAKE | 56 | W_DIS   |
| 57 | GND       | 58 | I2C_DAT |
| 59 | NC        | 60 | I2C_CLK |
| 61 | NC        | 62 | NC      |
| 63 | GND       | 64 | NC      |
| 65 | NC        | 66 | NC      |
| 67 | NC        | 68 | NC      |
| 69 | GND       | 70 | +3.3V   |
| 71 | NC        | 72 | +3.3V   |
| 73 | NC        | 74 | +3.3V   |
| 75 | GND       |    |         |

Table 3-24: M.2 2230 A-Key Slot Pinouts

## 3.2.22 M.2 2280 M-Key Slot

|                     |                        |
|---------------------|------------------------|
| <b>CN Label:</b>    | <b>M2_M1</b>           |
| <b>CN Type:</b>     | M.2 M-key slot         |
| <b>CN Location:</b> | See <b>Figure 3-24</b> |
| <b>CN Pinouts:</b>  | See <b>Table 3-25</b>  |

The M.2 2280 slot is keyed in the M position. The M.2 slot supports PCIe x4 interfaces.

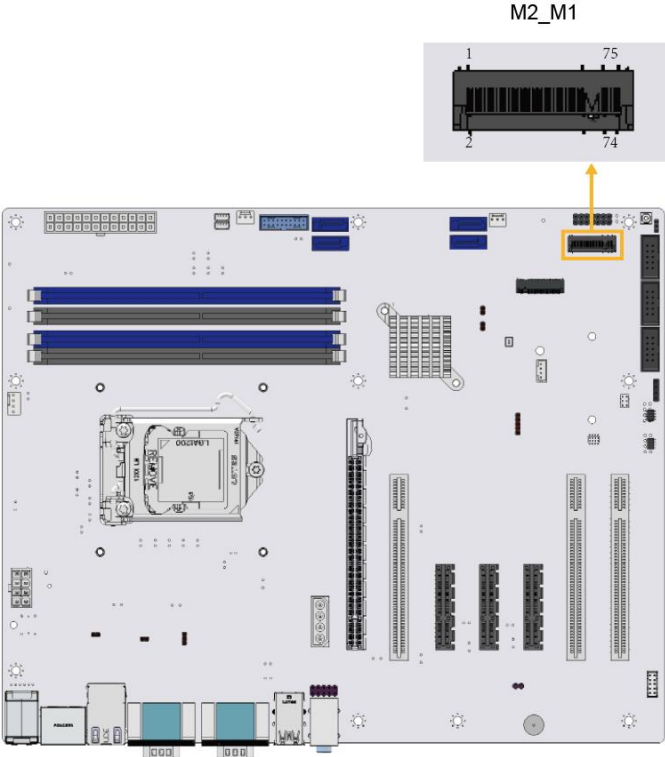


Figure 3-24: M.2 2280 M-Key Slot Location

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | GND         | 2   | +3.3V       |
| 3   | GND         | 4   | +3.3V       |
| 5   | PERN0       | 6   | NC          |
| 7   | PERP0       | 8   | NC          |
| 9   | GND         | 10  | DAS/DSS#    |
| 11  | PETN0       | 12  | +3.3V       |
| 13  | PETP0       | 14  | +3.3V       |
| 15  | GND         | 16  | +3.3V       |
| 17  | PERN1       | 18  | +3.3V       |
| 19  | PERP1       | 20  | NC          |
| 21  | GND         | 22  | NC          |
| 23  | PETN1       | 24  | NC          |
| 25  | PETP1       | 26  | NC          |
| 27  | GND         | 28  | NC          |

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| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 29  | PERN2       | 30  | NC          |
| 31  | PERP2       | 32  | NC          |
| 33  | GND         | 34  | NC          |
| 35  | PETN2       | 36  | NC          |
| 37  | PETP2       | 38  | DEVSLP      |
| 39  | GND         | 40  | NC          |
| 41  | PERN3       | 42  | NC          |
| 43  | PERP3       | 44  | NC          |
| 45  | GND         | 46  | NC          |
| 47  | PETN3       | 48  | NC          |
| 49  | PETP3       | 50  | PERST#      |
| 51  | GND         | 52  | CLKREQ      |
| 53  | PCIECLKN    | 54  | PEWAKE      |
| 55  | PCIECLKP    | 56  | NC          |
| 57  | GND         | 58  | NC          |
| 59  | Module Key  | 60  | Module Key  |
| 61  | Module Key  | 62  | Module Key  |
| 63  | Module Key  | 64  | Module Key  |
| 65  | Module Key  | 66  | Module Key  |
| 67  | NC          | 68  | NC          |
| 69  | PEDET       | 70  | +3.3V       |
| 71  | GND         | 72  | +3.3V       |
| 73  | GND         | 74  | +3.3V       |
| 75  | GND         |     |             |

Table 3-25: M.2 2280 M-Key Slot Pinouts

3.2.23 PCI Slots

- CN Label:

PCI1, PCI2, PCI3
- CN Type:

PCI Slot
- CN Location:

See Figure 3-25

The PCI slot enables a PCI expansion module to be connected to the board.

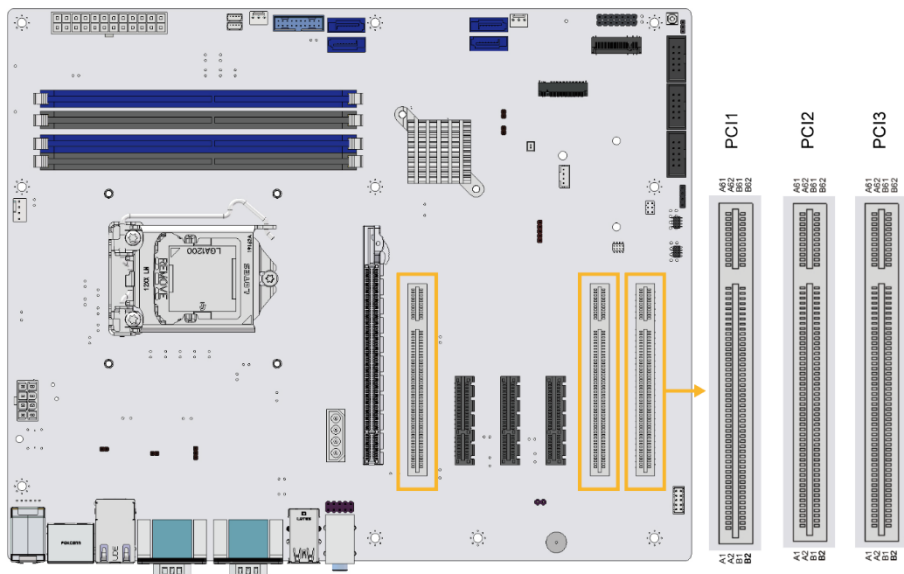


Figure 3-25: PCI Slots Locations

3.2.24 PCIe x4 Slots

- CN Label:

PCIEX4\_1, PCIEX4\_2, PCIEX4\_3
- CN Type:

PCIe x4 slot
- CN Location:

See Figure 3-26

The PCIe x4 expansion card slots are for PCIe x4 expansion cards.



## IMBA-Q470 ATX Motherboard

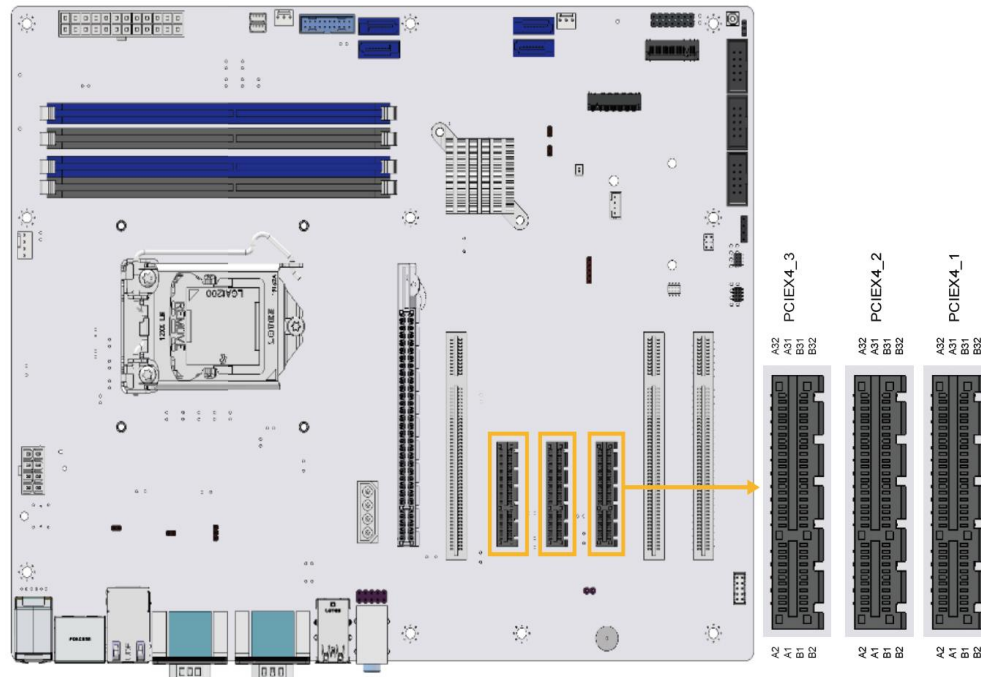


Figure 3-26: PCIe x4 Slot Locations

3.2.25 PCIe x16 slots

- CN Label:

PCIEX16\_1
- CN Type:

PCIe x16 slot
- CN Location:

See Figure 3-27

The PCIe x16 expansion card slot is for a PCIe x16 expansion card.

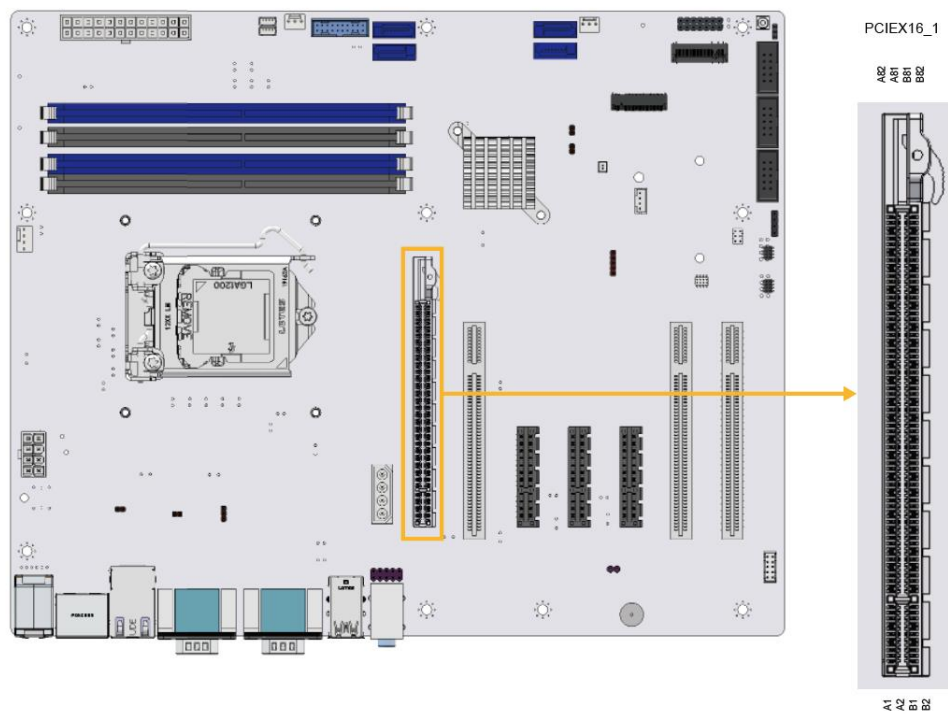


Figure 3-27: PCIe x16 Slot Locations

3.2.26 Onboard Power Button

- CN Label:

PWR\_SW1
- CN Type:

Push button
- CN Location:

See Figure 3-28

The on-board power button controls system power.

## IMBA-Q470 ATX Motherboard

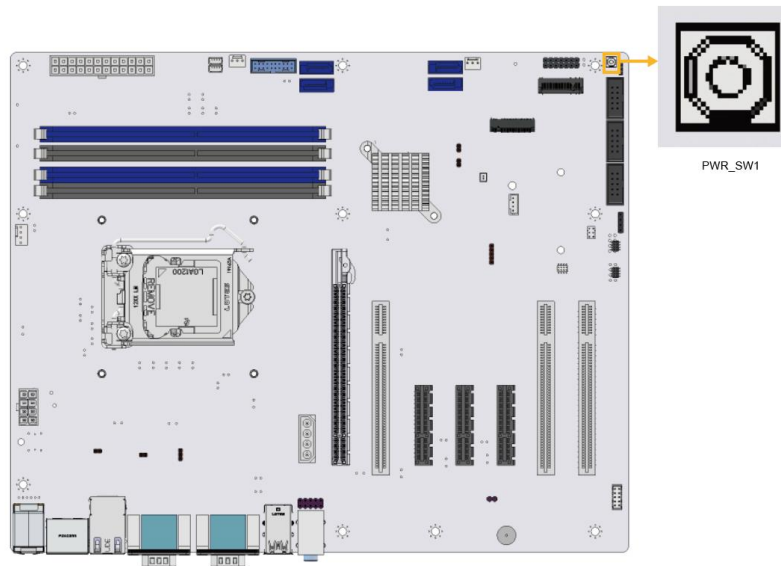


Figure 3-28: Power Button Location

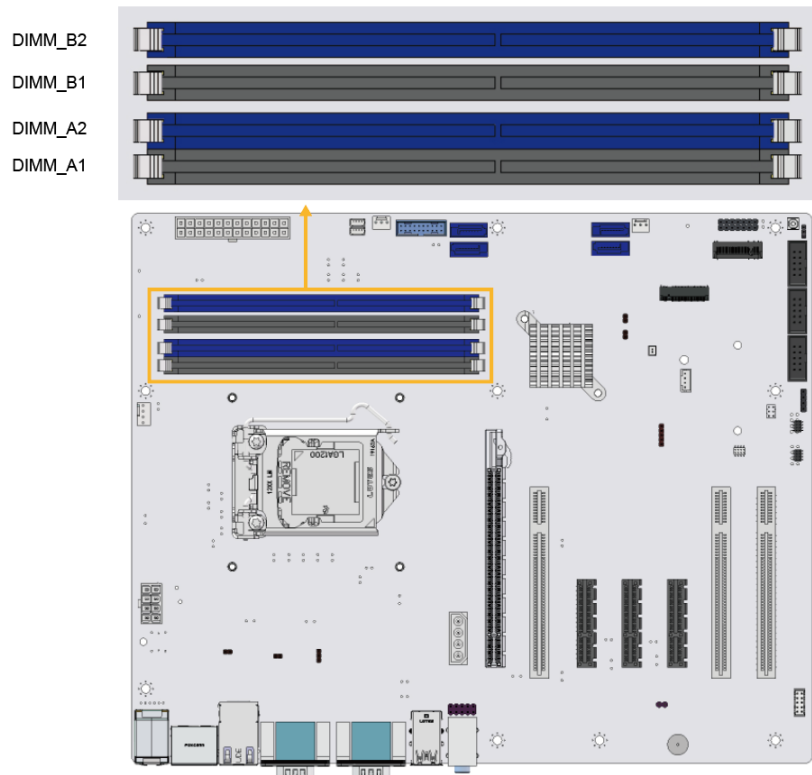
### 3.2.27 DDR4 DIMM Sockets

**CN Label:** DIMM\_B2, DIMM\_B1, DIMM\_A2, DIMM\_A1

**CN Type:** 288-pin socket

**CN Location:** See Figure 3-29

The DIMM slots are for DDR4 DIMM memory modules.



**Figure 3-29: DDR4 DIMM Sockets Location**

## IMBA-Q470 ATX Motherboard

### 3.2.28 SATA 6Gb/s Connectors

**CN Label:** S\_ATA1, S\_ATA2, S\_ATA3, S\_ATA4

**CN Type:** 7-pin SATA connector

**CN Location:** See Figure 3-30

**CN Pinouts:** See Table 3-26

The SATA drive connectors can be connected to SATA drives and support up to 6Gb/s data transfer rate.

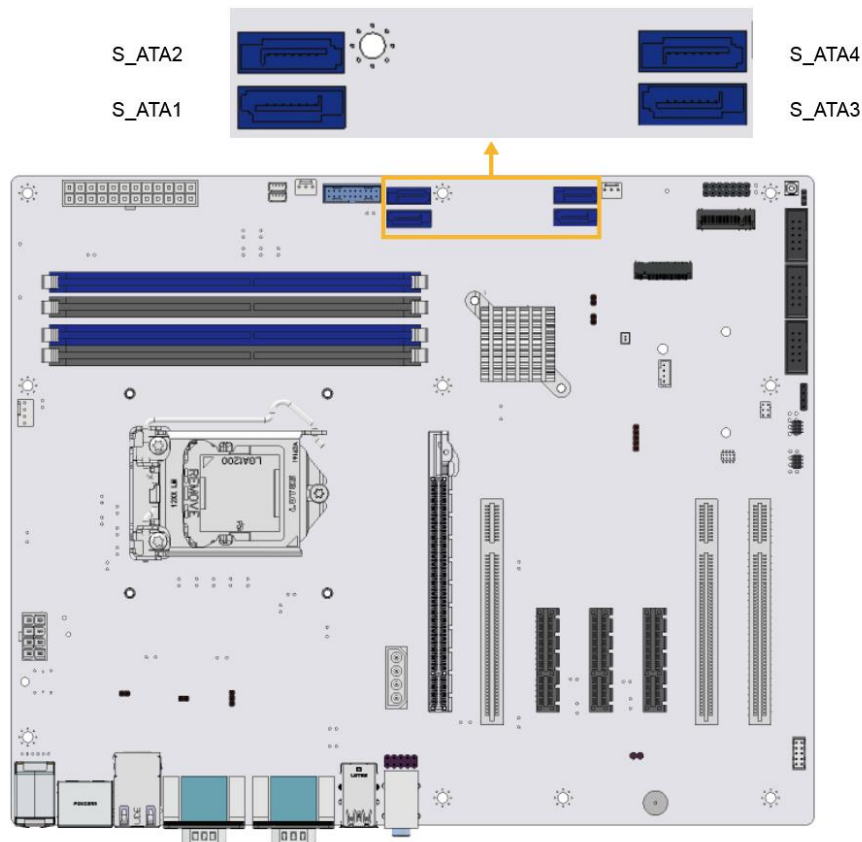


Figure 3-30: SATA 6Gb/s Connectors Locations





| Pin | Description |
|-----|-------------|
| 1   | GND         |
| 2   | SATA_TX+    |
| 3   | SATA_TX-    |
| 4   | GND         |
| 5   | SATA_RX-    |
| 6   | SATA_RX+    |
| 7   | GND         |
| 8   | N/C         |

Table 3-26: SATA 6Gb/s Connector Pinouts

3.2.29 Serial Ports, RS-232

- CN Label: COM3, COM4
- CN Type: 10-pin box header, p=2.54 mm
- CN Location: See Figure 3-31
- CN Pinouts: See Table 3-27

Each of these connectors provides RS-232 connections.



## IMBA-Q470 ATX Motherboard

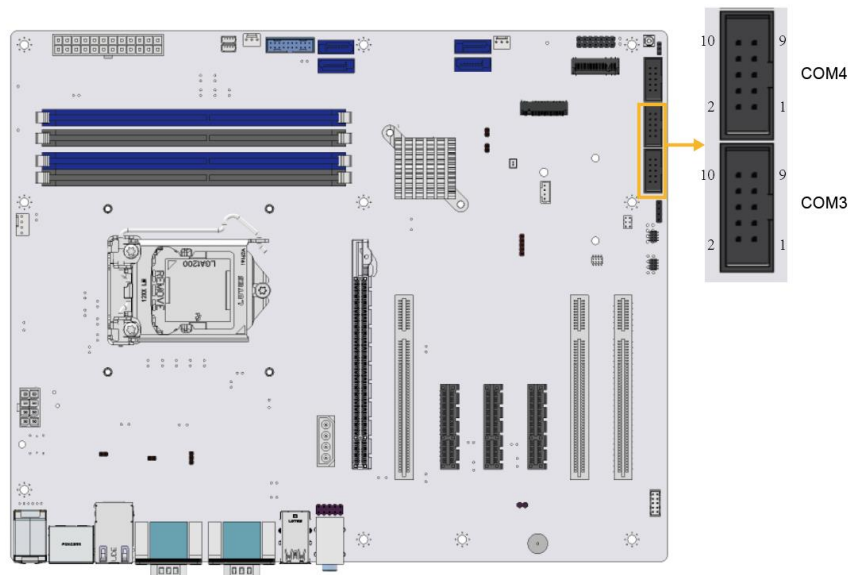


Figure 3-31: RS-232 Serial Port Connector Location

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | DCD         | 2   | DSR         |
| 3   | RXD         | 4   | RTS         |
| 5   | TXD         | 6   | CTS         |
| 7   | DTR         | 8   | RI          |
| 9   | GND         | 10  | GND         |

Table 3-27: RS-232 Serial Port Connector Pinouts

## 3.2.30 Serial Port, RS-232/422/485

- CN Label:** COM5
- CN Type:** 10-pin box header, p=2.54 mm
- CN Location:** See Figure 3-32
- CN Pinouts:** See Table 3-28 and Table 3-29

The connector provides RS-232, RS-422 or RS-485 communications.

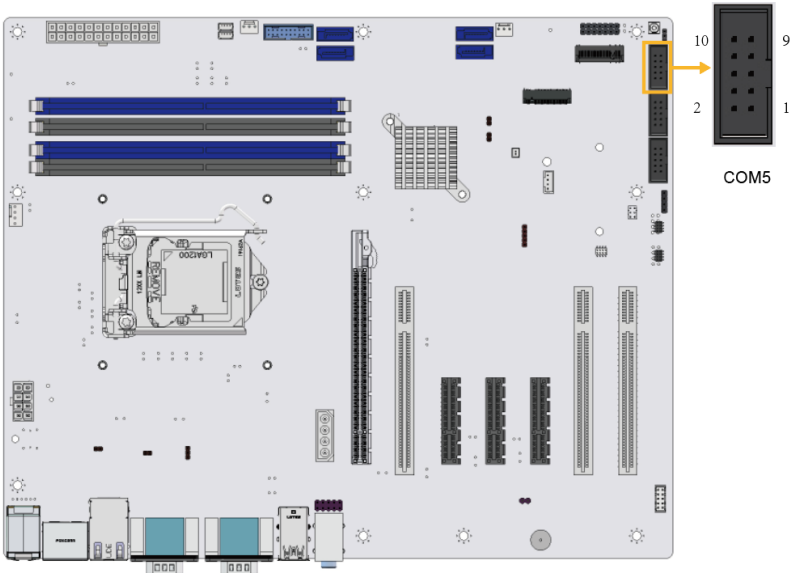


Figure 3-32: RS-232/422/485 Connector Location

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | DCD         | 2   | DSR         |
| 3   | RXD         | 4   | RTS         |
| 5   | TXD         | 6   | CTS         |
| 7   | DTR         | 8   | RI          |
| 9   | GND         | 10  | GND         |

Table 3-28: RS-232/422/485 Connector Pinouts

Use the optional RS-232/422/485 cable to connect to a serial device. The pinouts of the DB-9 connector are listed below.

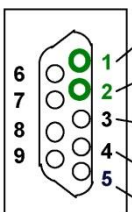
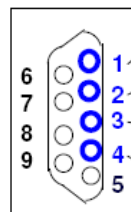
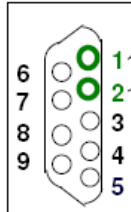
| RS-232 Pinouts                                                                                                                                                                                                                                                                                                                               | RS-422 Pinouts                                                                                                                                                                                                                                                                                                                                                                     | RS-485 Pinouts                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div> <div> <div>DSR(6)</div> <div>RTS(7)</div> <div>CTS(8)</div> <div>RI(9)</div> </div> <div>  <div> <div>DCD(1)</div> <div>SIN(2)</div> <div>SOUT(3)</div> <div>DTR(4)</div> <div>GND(5)</div> </div> </div> </div> <div>D-SUB 9PIN MALE MODE 01</div> | <div> <div> <div>TX- (TXD485#)</div> <div>TX+ (TXD485+)</div> <div>RX+ (RXD485+)</div> <div>RX- (RXD485#)</div> </div> <div>  <div> <div>TX- (TXD485#)</div> <div>TX+ (TXD485+)</div> <div>RX+ (RXD485+)</div> <div>RX- (RXD485#)</div> </div> </div> </div> <div>D-SUB 9PIN MALE MODE 00</div> | <div> <div> <div>TX- (TXD485#)</div> <div>TX+ (TXD485+)</div> </div> <div>  <div> <div>TX- (TXD485#)</div> <div>TX+ (TXD485+)</div> </div> </div> </div> <div>D-SUB 9PIN MALE MODE 10/11</div> |

Table 3-29: DB-9 RS-232/422/485 Pinouts

## IMBA-Q470 ATX Motherboard

### 3.2.31 Flash SPI ROM Connector

- CN Label:** JSPI1
- CN Type:** 6pin wafer, p=1.25 mm
- CN Location:** See Figure 3-33
- CN Pinouts:** See Table 3-30

The Flash SPI ROM connector is used to flash the SPI ROM.

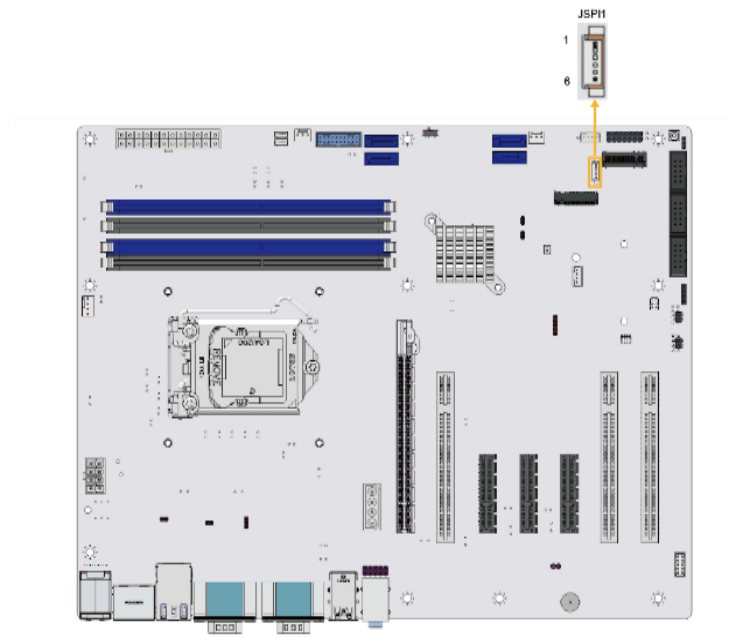


Figure 3-33: Flash SPI ROM Connector Location

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | +3.3V       | 4   | SPI_CLK     |
| 2   | SPI_CS#     | 5   | SPI_SI      |
| 3   | SPI_SO      | 6   | GND         |

Table 3-30: Flash SPI ROM Connector Pinouts

3.2.32 Flash EC ROM Connector

- CN Label: JEC1
- CN Type: 8-pin header, p=1.27 mm
- CN Location: See Figure 3-34
- CN Pinouts: See Table 3-31

The Flash EC ROM connector is used to flash the EC ROM.

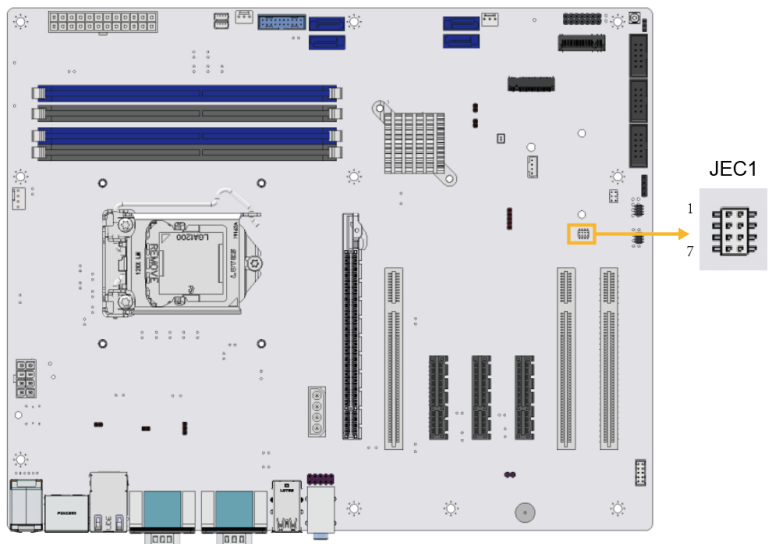


Figure 3-34: Flash EC ROM Connector Location

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | +3.3V       | 2   | GND         |
| 3   | SPI_CS      | 4   | SPI_CLK     |
| 5   | SPI_SO      | 6   | SPI_SI      |
| 7   | NC          | 8   | NC          |

Table 3-31: Flash EC ROM Connector Pinouts

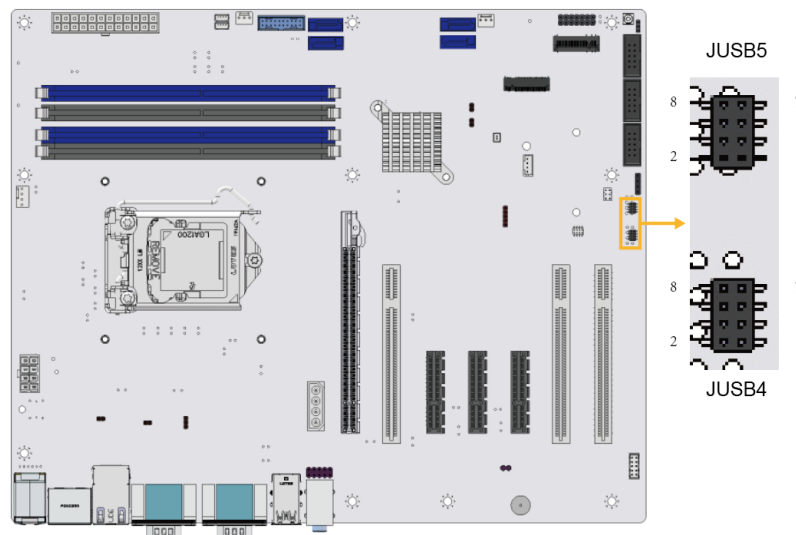


## IMBA-Q470 ATX Motherboard

### 3.2.33 Internal USB 2.0 Connectors

- CN Label:** JUSB4, JUSB5
- CN Type:** 8-pin header, p=2.54 mm
- CN Location:** See Figure 3-35
- CN Pinouts:** See Table 3-32

The internal USB 2.0 connectors connect to USB 2.0 devices. Each pin header provides two USB 2.0 ports.



**Figure 3-35: Internal USB 2.0 Connector Locations**

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | VCC         | 2   | GND         |
| 3   | USB_DATA-   | 4   | USB_DATA+   |
| 5   | USB_DATA+   | 6   | USB_DATA-   |
| 7   | GND         | 8   | VCC         |

**Table 3-32: Internal USB 2.0 Connector Pinouts**

3.2.34 Internal USB 2.0 Connector

- CN Label:JUSB6
- CN Type:4pin header, p=2.54 mm
- CN Location:See Figure 3-36
- CN Pinouts:See Table 3-33

The Internal USB 2.0 connector connects to USB 2.0 devices.

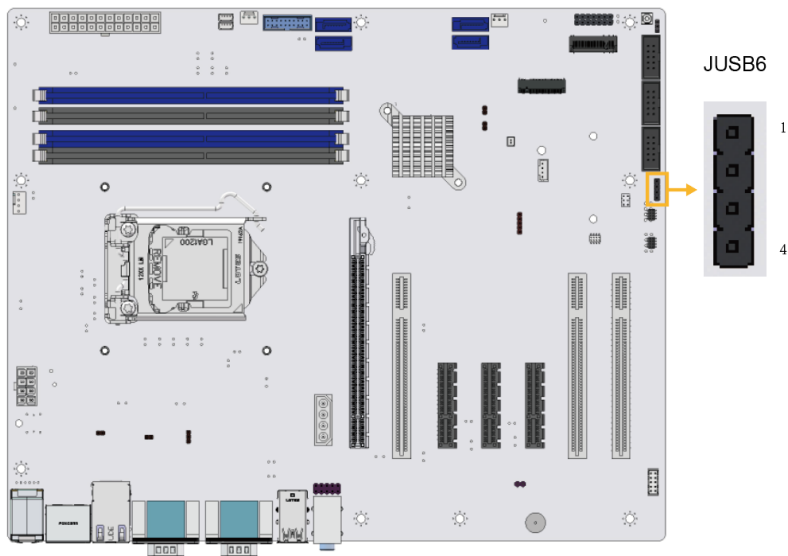


Figure 3-36: Internal USB 2.0 Connector Locations

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | VCC         | 3   | USB_DATA+   |
| 2   | USB_DATA-   | 4   | GND         |

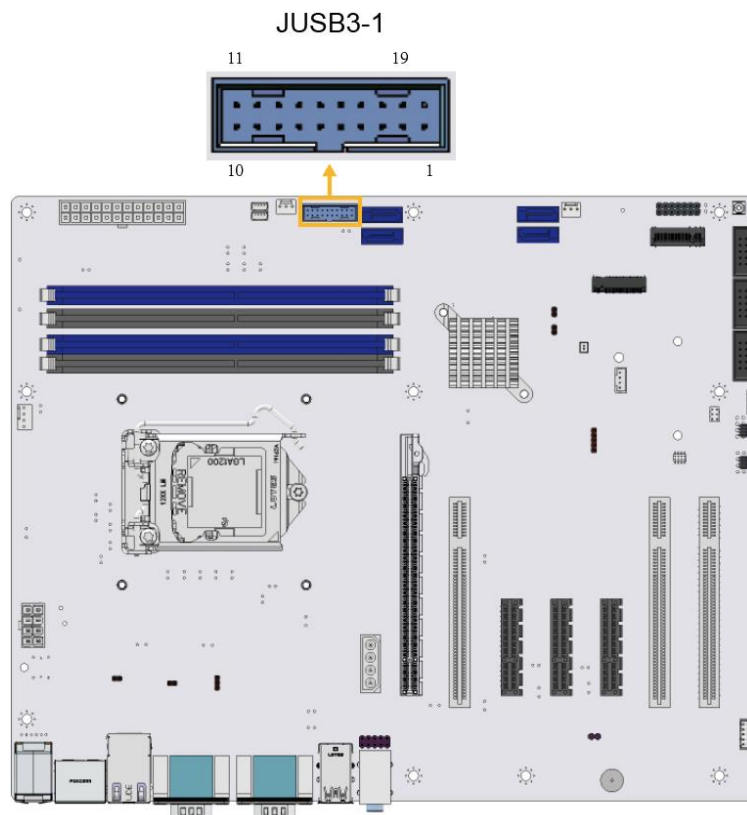
Table 3-33: Internal USB 2.0 Connector Pinouts

## IMBA-Q470 ATX Motherboard

## 3.2.35 Internal USB 3.2 Gen 1 Connector

- CN Label:** JUSB3-1
- CN Type:** 20-pin box header, p=2.00 mm
- CN Location:** See **Figure 3-37**
- CN Pinouts:** See **Table 3-34**

The Internal USB 3.2 Gen 1 connector connects to USB 3.2 devices. This connector provides two USB 3.2 Gen 1 (5Gb/s) ports.



**Figure 3-37: Internal USB 3.2 Gen 1 Connector Location**

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | VCC         | 11  | USB_DATA+   |
| 2   | USB_RX-     | 12  | USB_DATA-   |
| 3   | USB_RX+     | 13  | GND         |
| 4   | GND         | 14  | USB3_TX+    |

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 5   | USB3_TX-    | 15  | USB3_TX-    |
| 6   | USB3_TX+    | 16  | GND         |
| 7   | GND         | 17  | USB3_RX+    |
| 8   | USB3_DATA-  | 18  | USB3_RX-    |
| 9   | USB3_DATA+  | 19  | VCC         |
| 10  | NC          |     |             |

Table 3-34: Internal USB 3.2 Gen 1 Connector Pinouts

### 3.3 External Peripheral Interface Connector Panel

#### 3.3.1 External HD Audio Jack

- CN Label:       **AUDIO\_CV1**
- CN Type:         Audio jacks
- CN Location:    See **Figure 3-38**

The audio jacks connect to external audio devices.

- **Line in port (light blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Line out port (lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (pink):** Connects a microphone.



Figure 3-38: Audio Connectors

## IMBA-Q470 ATX Motherboard

### 3.3.2 External USB 2.0 Connector

|                     |                        |
|---------------------|------------------------|
| <b>CN Label:</b>    | <b>CON2_USB2</b>       |
| <b>CN Type:</b>     | USB 2.0                |
| <b>CN Location:</b> | See <b>Figure 3-39</b> |
| <b>CN Pinouts:</b>  | See <b>Table 3-35</b>  |

There are two external USB 2.0 connectors on the IMBA-Q470. The USB 2.0 connector can be connected to a USB 2.0 device.



**Figure 3-39: USB 2.0 Connector**

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | GND         | 5   | GND         |
| 2   | USB_DATA+   | 6   | USB_DATA+   |
| 3   | USB_DATA-   | 7   | USB_DATA-   |
| 4   | VCC         | 8   | VCC         |

**Table 3-35: USB 2.0 Port Pinouts**

### 3.3.3 External HDMI And DP Combo Connector

|                     |                                               |
|---------------------|-----------------------------------------------|
| <b>CN Label:</b>    | <b>HDMI_DP1</b>                               |
| <b>CN Type:</b>     | HDMI, DisplayPort                             |
| <b>CN Location:</b> | See <b>Figure 3-40</b> and <b>Figure 3-41</b> |
| <b>CN Pinouts:</b>  | See <b>Table 3-36</b> and <b>Table 3-37</b>   |

The HDMI connector can connect to an HDMI device.



| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 21  | HDMI_DATA2  | 31  | GND         |
| 22  | GND         | 32  | HDMI_CLK#   |
| 23  | HDMI_DATA2# | 33  | N/C         |
| 24  | HDMI_DATA1  | 34  | N/C         |
| 25  | GND         | 35  | HDMI_SCL    |
| 26  | HDMI_DATA1# | 36  | HDMI_SDA    |
| 27  | HDMI_DATA0  | 37  | GND         |
| 28  | GND         | 38  | +5V         |
| 29  | HDMI_DATA0# | 39  | HDMI_HPD    |
| 30  | HDMI_CLK    |     |             |

Table 3-36: HDMI Connector Pinouts



Figure 3-40: HDMI Connector

The DP++ connector connects to a display device with DisplayPort interface.

| Pin | Description | Pin | Description    |
|-----|-------------|-----|----------------|
| 1   | LANE0P      | 11  | GND            |
| 2   | GND         | 12  | LANE3N         |
| 3   | LANE0N      | 13  | AUX_CTRL_DET_C |
| 4   | LANE1P      | 14  | GND            |
| 5   | LANE1N      | 15  | AUXP           |
| 6   | GND         | 16  | GND            |
| 7   | LANE2P      | 17  | AUXN           |
| 8   | GND         | 18  | HPD            |
| 9   | LANE2N      | 19  | GND            |
| 10  | LANE3P      | 20  | +5V            |

Table 3-37: DP++ Connector Pinouts

## IMBA-Q470 ATX Motherboard

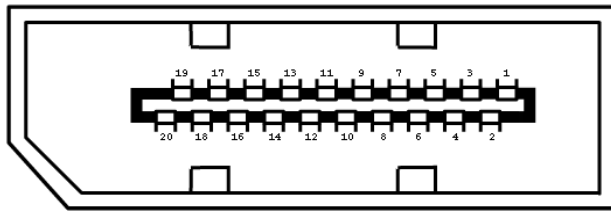


Figure 3-41: DP++ Connector

## 3.3.4 External Dual 2.5GbE RJ-45 Connectors

**CN Label:** JP1  
**CN Type:** Dual RJ45  
**CN Location:** See Figure 3-42  
**CN Pinouts:** See Table 3-38

The dual 2.5GbE RJ-45 connectors support 10/100/1000/2500Mb/s data rate.

| PIN | DESCRIPTION   | PIN | DESCRIPTION   |
|-----|---------------|-----|---------------|
| A1  | LAN2_MDI0P    | B1  | LAN1_MDI0P    |
| A2  | LAN2_MDI0N    | B2  | LAN1_MDI0N    |
| A3  | LAN2_MDI1P    | B3  | LAN1_MDI1P    |
| A4  | LAN2_MDI1N    | B4  | LAN1_MDI1N    |
| A5  | LAN2_MDI2P    | B5  | LAN1_MDI2P    |
| A6  | LAN2_MDI2N    | B6  | LAN1_MDI2N    |
| A7  | LAN2_MDI3P    | B7  | LAN1_MDI3P    |
| A8  | LAN2_MDI3N    | B8  | LAN1_MDI3N    |
| A9  | Connect 0.1uf | B9  | Connect 0.1uf |
| A10 | GND           | B10 | GND           |
| AL1 | 2.5G_LED      | BL1 | 2.5G_LED      |
| AL2 | 1G_LED        | BL2 | 1G_LED        |
| AL3 | ACT_LED       | BL3 | ACT_LED       |
| AL4 | +3.3V         | BL4 | +3.3V         |

Table 3-38: Dual RJ45 Pinouts

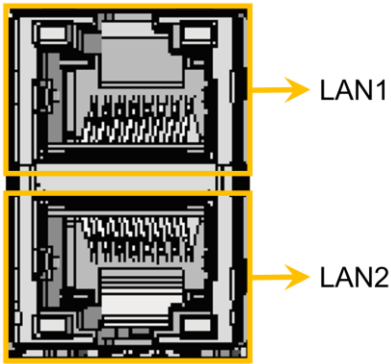


Figure 3-42: Dual RJ45 Connectors

3.3.5 VGA and RS-232 Connectors

- CN Label:

COM1/VGA1
- CN Type:

15-pin VGA and 9-pin COM
- CN Location:

See Figure 3-43 and Figure 3-44
- CN Pinouts:

See Table 3-39 and Table 3-40

The COM connector (COM1) connects to a serial device that supports RS-232 communication.

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | DCD1        | 6   | DSR1        |
| 2   | RXD1        | 7   | RTS1        |
| 3   | TXD1        | 8   | CTS1        |
| 4   | DTR1        | 9   | RI1         |
| 5   | GND1        |     |             |

Table 3-39: COM1 Connector Pinouts

## IMBA-Q470 ATX Motherboard

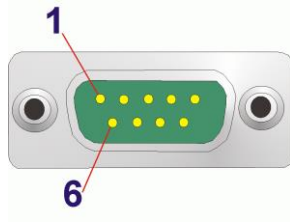


Figure 3-43: COM1 Serial Port Pinout Locations

The 15-pin VGA connector connects to a monitor that accepts a standard VGA input.

**NOTE:**

The user has to connect the VGA connector to the monitor before system booting as the VGA output function is supported via the eDP to VGA converter.

| Pin | Description | Pin | Description     |
|-----|-------------|-----|-----------------|
| V1  | RED         | V2  | GREEN           |
| V3  | BLUE        | V4  | NC              |
| V5  | GND         | V6  | Hot plug detect |
| V7  | GND         | V8  | GND             |
| V9  | VCC         | V10 | GND             |
| V11 | NC          | V12 | DDCDA           |
| V13 | HSYNC       | V14 | VSYNC           |
| V15 | DDCCLK      |     |                 |

Table 3-40: VGA Connector Pinouts

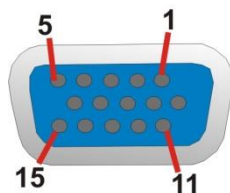


Figure 3-44: VGA Connector



3.3.6 External RS-232 and RS-422/485 Combo Connectors

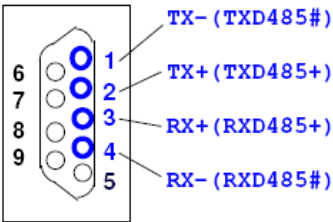
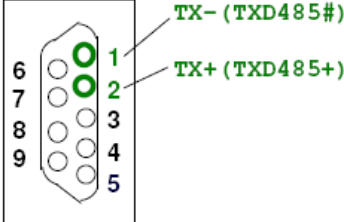
- CN Label: COM2
- CN Type: Dual DB-9
- CN Location: See Figure 3-45
- CN Pinouts: See Table 3-41 and Table 3-42

The upper COM connector connects to a serial device that supports RS-232 communication.

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|-----|-------------|-----|-------------|
| 1   | DCD1        | 6   | DSR1        |
| 2   | RXD1        | 7   | RTS1        |
| 3   | TXD1        | 8   | CTS1        |
| 4   | DTR1        | 9   | RI1         |
| 5   | GND1        |     |             |

Table 3-41: External RS-232 Connector Pinouts

The lower COM connector connects to a serial device that supports RS-422/485 communication.

| RS-422 Pinouts                                                                                                  | RS-485 Pinouts                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
|  <p>D-SUB 9PIN MALE MODE</p> |  <p>D-SUB 9PIN MALE MODE</p> |

| PIN | DESCRIPTION      | PIN | DESCRIPTION |
|-----|------------------|-----|-------------|
| 1   | RS422TX-/RS485D- | 6   | NC          |
| 2   | RS422TX+/RS485D+ | 7   | NC          |
| 3   | RS422RX+         | 8   | NC          |





## IMBA-Q470 ATX Motherboard

|   |          |   |    |
|---|----------|---|----|
| 4 | RS422RX- | 9 | NC |
| 5 | GND      |   |    |

Table 3-42: External RS-422/485 Connector Pinouts

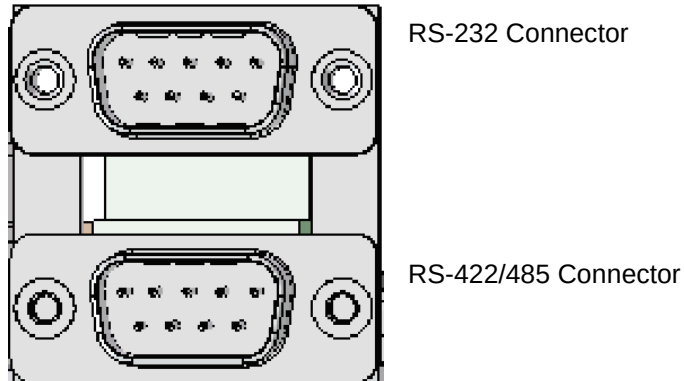


Figure 3-45: Dual DB-9

## 3.3.7 External Dual USB 3.2 Gen 1 and Dual USB 3.2 Gen 2 Connectors

- CN Label:** CON1\_USB1
- CN Type:** USB 3.2 Gen1&USB 3.2 Gen 2 Type A
- CN Location:** See Figure 3-46
- CN Pinouts:** See Table 3-43

There are four external USB 3.2 connectors on the IMBA-Q470. The CON1\_USB1 connector supports dual USB 3.2 Gen 2 (10Gb/s) and dual USB 3.2 Gen 1 (5Gb/s). The two red connectors are USB 3.2 Gen 2, and the two blue ones are USB 3.2 Gen1.



Figure 3-46: USB 3.2 Gen1&amp;USB 3.2 Gen 2 Type A



**IMBA-Q470 ATX Motherboard**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|-----|-------------|-----|-------------|
| A1  | VCC         | C1  | VCC         |
| A2  | USB_DATA-   | C2  | USB_DATA-   |
| A3  | USB_DATA+   | C3  | USB_DATA+   |
| A4  | GND         | C4  | GND         |
| A5  | USB3_RX-    | C5  | USB3_RX-    |
| A6  | USB3_RX+    | C6  | USB3_RX+    |
| A7  | GND         | C7  | GND         |
| A8  | USB3_TX-    | C8  | USB3_TX-    |
| A9  | USB3_TX+    | C9  | USB3_TX+    |
| B1  | VCC         | D1  | VCC         |
| B2  | USB_DATA-   | D2  | USB_DATA-   |
| B3  | USB_DATA+   | D3  | USB_DATA+   |
| B4  | GND         | D4  | GND         |
| B5  | USB3_RX-    | D5  | USB3_RX-    |
| B6  | USB3_RX+    | D6  | USB3_RX+    |
| B7  | GND         | D7  | GND         |
| B8  | USB3_TX-    | D8  | USB3_TX-    |
| B9  | USB3_TX+    | D9  | USB3_TX+    |

**Table 3-43: External Dual USB 3.2 Gen 1 and Dual USB 3.2 Gen 2 Connectors Pinouts**



Chapter

4

# Installation

---

## 4.1 Anti-static Precautions



### WARNING:

Failure to take ESD precautions during the installation of the IMBA-Q470 may result in permanent damage to the IMBA-Q470 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-Q470. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-Q470 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the IMBA-Q470, place it on an anti-static pad. This reduces the possibility of ESD damaging the IMBA-Q470.
- ***Only handle the edges of the PCB:-:*** When handling the PCB, hold the PCB by the edges.

## 4.2 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors.

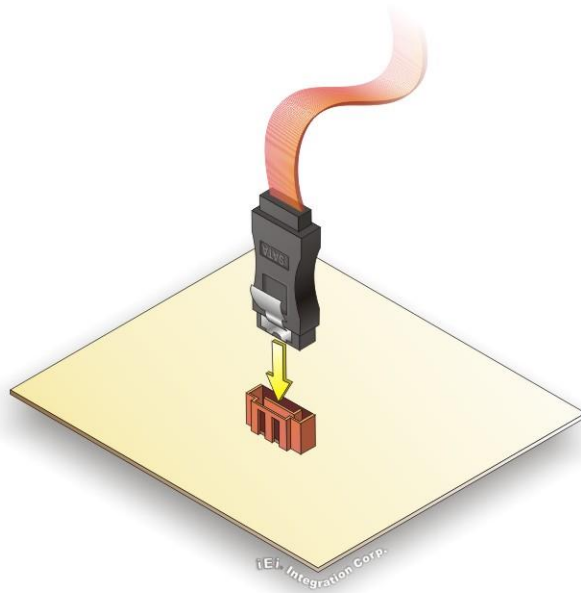
### 4.2.1 SATA Drive Connection

The IMBA-Q470 is shipped with two SATA drive cables. To connect the SATA drives to the connectors, please follow the steps below.

**Step 1: Locate the connectors.** The locations of the SATA drive connectors are shown in **Chapter 3**.

## IMBA-Q470 ATX Motherboard

**Step 2: Insert the cable connector.** Insert the cable connector into the on-board SATA drive connector until it clips into place. See **Figure 4-1**.

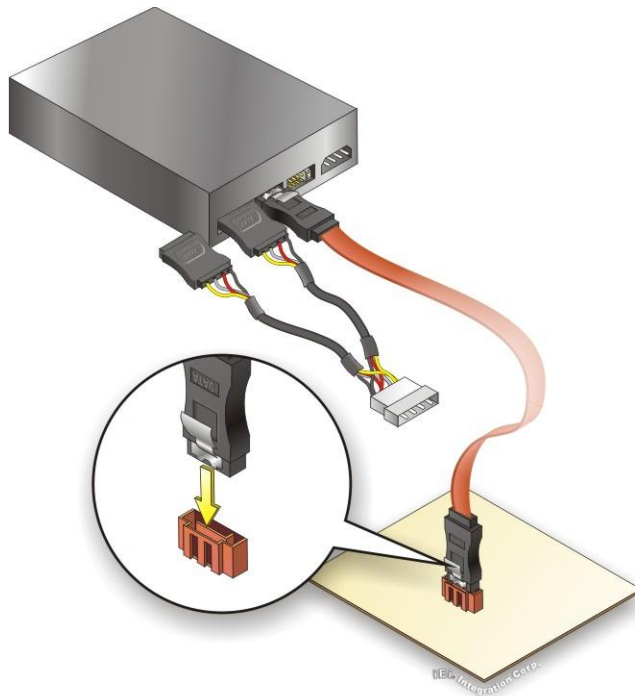


**Figure 4-1: SATA Drive Cable Connection**

**Step 3: Connect the cable to the SATA disk.** Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-2**.

**Step 4: Connect the SATA power cable.** Connect the SATA power connector to the back of the SATA drive. See **Figure 4-2**.





**Figure 4-2: SATA Power Drive Connection**

The SATA power cable can be bought from IEI. See Optional Items in Section 2.4.

## IMBA-Q470 ATX Motherboard

### 4.3 Installation Considerations

**NOTE:**

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

**WARNING:**

The installation instructions described in this manual should be carefully followed in order to prevent damage to the components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the IMBA-Q470 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the IMBA-Q470 on an anti-static pad:
  - When installing or configuring the motherboard, place it on an anti-static pad. This helps to prevent potential ESD damage.
- Turn all power to the IMBA-Q470 off:
  - When working with the IMBA-Q470, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the IMBA-Q470, **DO NOT**:

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

## 4.4 Socket LGA1200 CPU Installation

---



### WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

DO NOT touch the pins at the bottom of the CPU. When handling the CPU, only hold it on the sides.

---

To install the CPU, follow the steps below.

**Step 1:** **Disengage the load lever** by pressing the lever down and slightly outward to clear the retention tab. Fully open the lever. See **Figure 4-3**.

## IMBA-Q470 ATX Motherboard

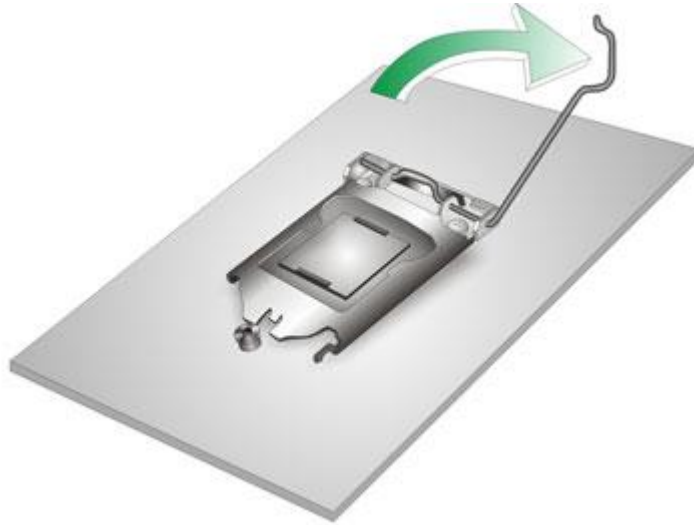


Figure 4-3: Disengage the CPU Socket Load Lever

**Step 2:** Open the socket and remove the protective cover. The black protective cover can be removed by pulling up on the tab labeled "Remove". See Figure 4-4.

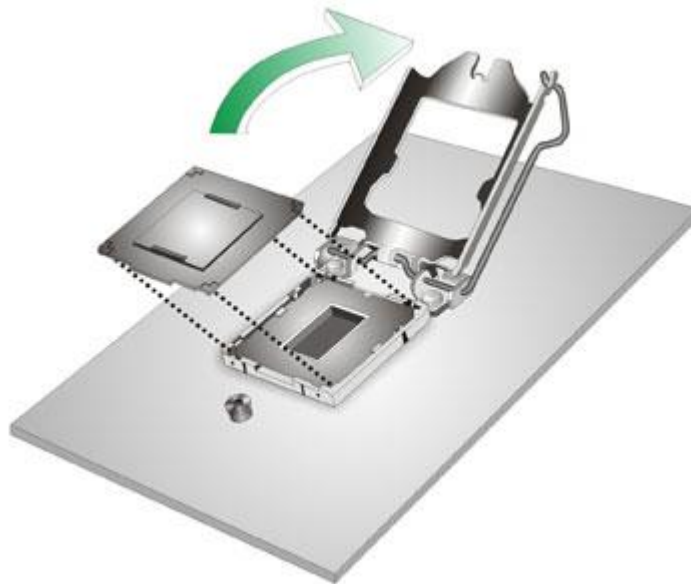


Figure 4-4: Remove Protective Cover

**Step 3:** Inspect the CPU socket. Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

**Step 4: Orientate the CPU properly.** The contact array should be facing the CPU socket.



**WARNING:**

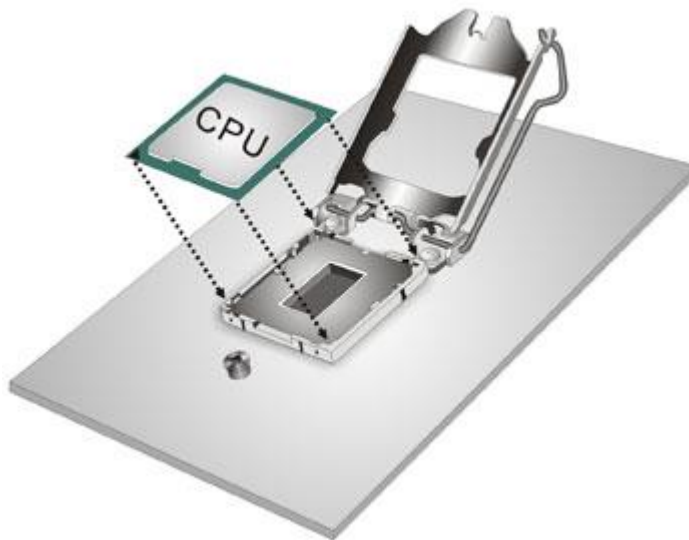
DO NOT touch the pins at the bottom of the CPU. When handling the CPU, only hold it on the sides.

---

**Step 5: Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.

**Step 6: Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

**Step 7: Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 4-5.**



**Figure 4-5: Insert the Socket LGA1200 CPU**



## IMBA-Q470 ATX Motherboard

**Step 8: Close the CPU socket.** Close the load plate and pull the load lever back a little to have the load plate be able to secure to the knob. Engage the load lever by pushing it back to its original position (**Figure 4-6**). There will be some resistance, but will not require extreme pressure.

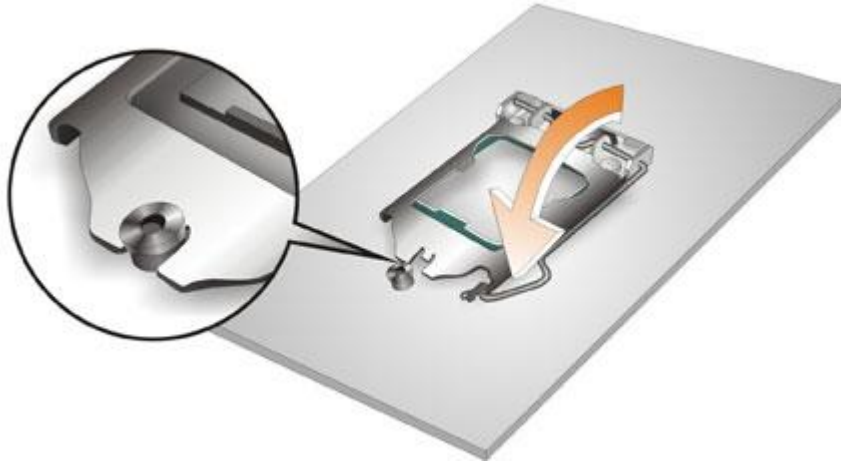


Figure 4-6: Close the Socket LGA1200

**Step 9: Connect the 12 V power to the board.** Connect the 12 V power from the power supply to the board.

### 4.5 Socket LGA1200 Cooling Kit Installation



#### **WARNING:**

**DO NOT** attempt to install a push-pin cooling fan.

The pre-installed support bracket prevents the board from bending and is **ONLY** compatible with captive screw type cooling fans.

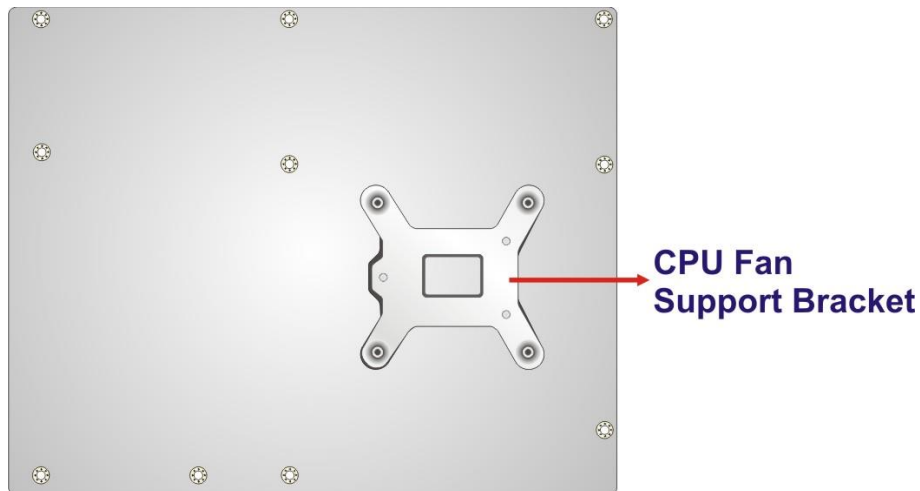
The cooling kit can be bought from IEI. The cooling kit has a heat sink and fan.

**WARNING:**

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, follow the instructions below.

**Step 1:** A cooling kit bracket is pre-installed on the rear of the motherboard. See **Figure 4-7**.



**Figure 4-7: Cooling Kit Support Bracket**

**Step 2:** Place the cooling kit onto the socket LGA1200 CPU. Make sure the CPU cable can be properly routed when the cooling kit is installed.

**Step 3:** Mount the cooling kit. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the holes of the cooling kit bracket.

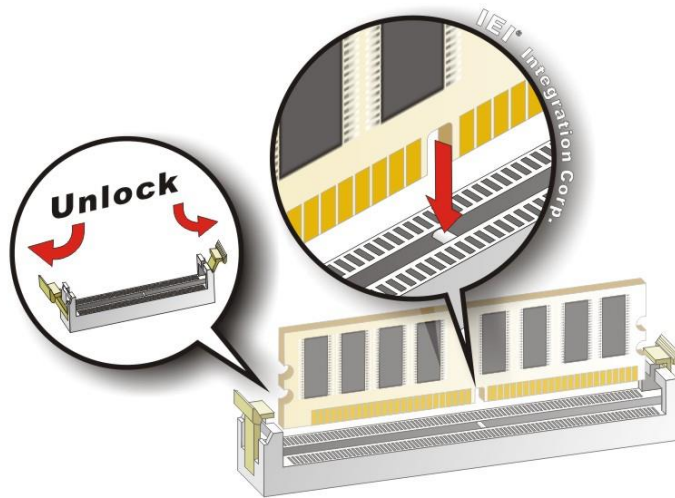
## IMBA-Q470 ATX Motherboard

**Step 4: Tighten the screws.** Use a screwdriver to tighten the four screws. In a diagonal pattern, tighten each screw a few turns then move to the next one, until they are all secured. Do not overtighten the screws.

**Step 5: Connect the fan cable.** Connect the cooling kit fan cable to the CPU fan connector on the IMBA-Q470. Carefully route the cable and avoid heat generating chips and fan blades.

### 4.6 DIMM Installation

To install a DIMM, please follow the steps below and refer to **Figure 4-8**.



**Figure 4-8: DIMM Installation**

**Step 1: Open the DIMM socket handles.** Open the two handles outwards as far as they can. See **Figure 4-8**.

**Step 2: Align the DIMM with the socket.** Align the DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-8**.

**Step 3: Insert the DIMM.** Once aligned, press down until the DIMM is properly seated. Clip the two handles into place. See **Figure 4-8**.

**Step 4: Removing a DIMM.** To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

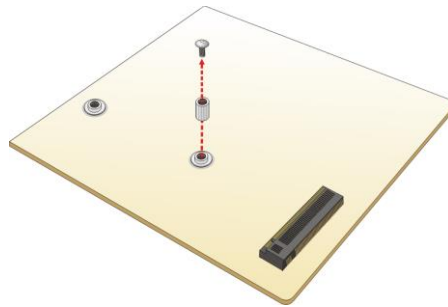
**CAUTION:**

For quad channel configuration, install four identical memory modules that feature the same capacity, timings, voltage, number of ranks and the same brand.

## 4.7 M.2 Module Installation

**CAUTION:**

The standoff and screw pre-installed for the M.2 2242 module must be removed before installing an M.2 2280 module. Failing to do so may cause short circuit or other damages to the motherboard.



To install an M.2 module, please follow the steps below.

- Step 1:** Locate the M.2 module slot. See **Chapter 3**.
- Step 2:** Remove the retention screw secured on the motherboard.
- Step 3:** Line up the notch on the module with the notch on the slot. Slide the M.2 module into the socket at an angle of about 20° (**Figure 4-9**).

## IMBA-Q470 ATX Motherboard

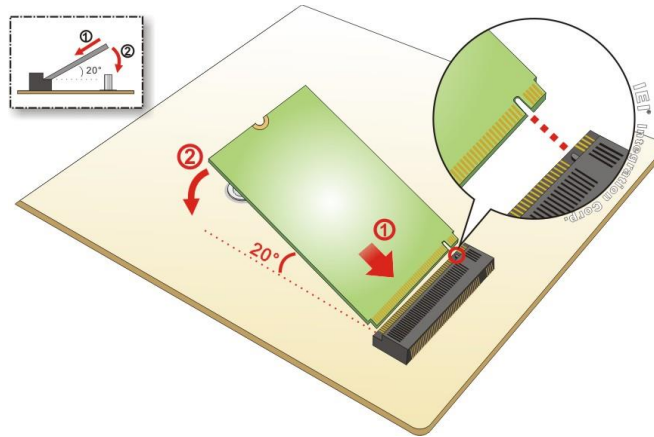


Figure 4-9: Inserting the M.2 Module into the Slot at an Angle

**Step 4:** Secure the M.2 module with the previously removed retention screw (Figure 4-10).

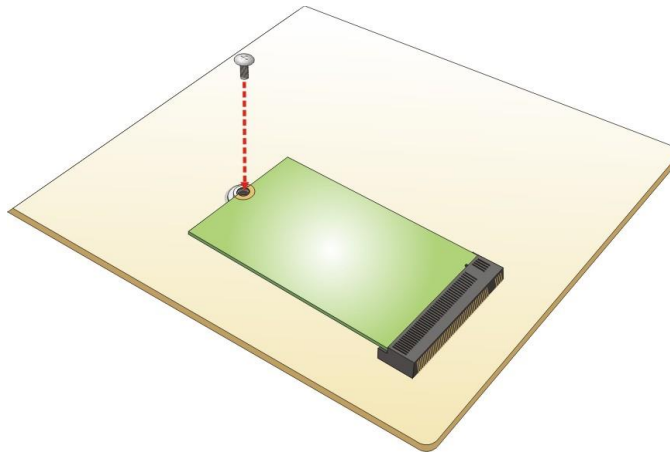


Figure 4-10: Securing the M.2 Module





## 4.8 Software Installation

All the drivers for the IMBA-Q470 are available on IEI Resource Download Center (<https://download.ieiworld.com>). Type IMBA-Q470 and press Enter to find all the relevant software, utilities, and documentation.

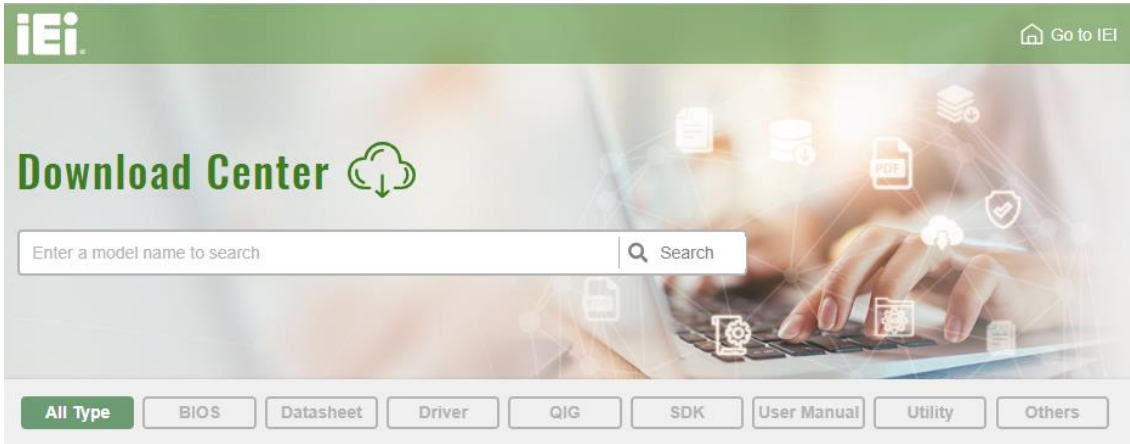
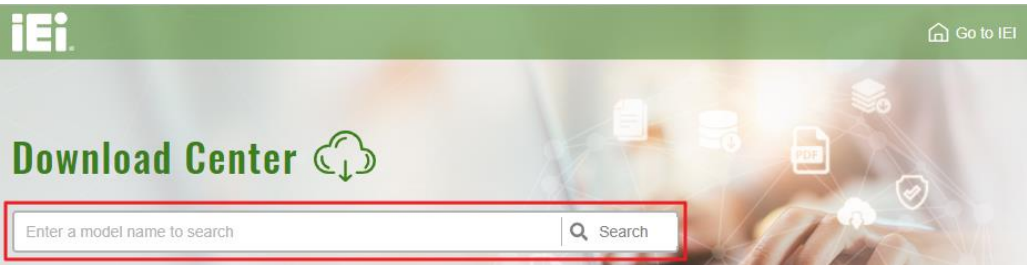


Figure 4-11: IEI Resource Download Center

## 4.9 Driver Download

To download drivers from IEI Resource Download Center, follow the steps below.

**Step 1:** Go to <https://download.ieiworld.com>. Type IMBA-Q470 and press Enter.



**Step 2:** All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.



## IMBA-Q470 ATX Motherboard

[All Type](#)
[BIOS](#)
[Datasheet](#)
[Driver](#)
[QIG](#)
[SDK](#)
[User Manual](#)
[Utility](#)
[Others](#)

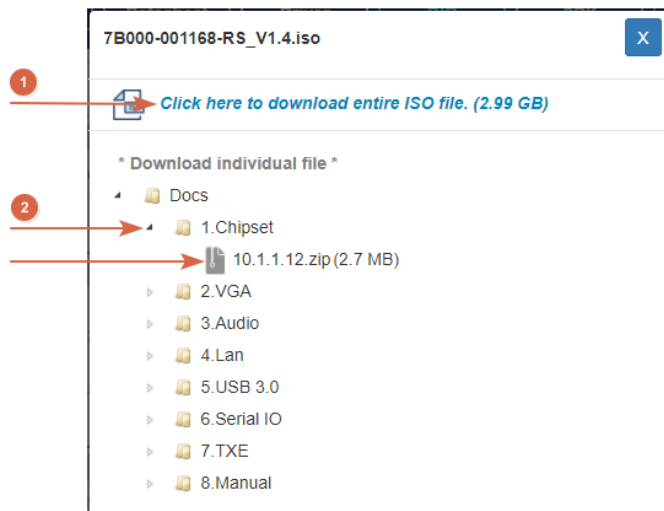
**WAFER-BT-i1** [Product Info](#)

[Embedded Computer](#) ▶ [Single Board Computer](#) ▶ [Embedded Board](#)  
 3.5" SBC with Intel® 22nm Atom™/Celeron® on-board SoC

**Driver**

| File Name                                                                                                                               | Published  | Version | File Checksum                    |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------|---------|----------------------------------|
| <a href="#">7B000-001033-RS V2.3.iso (2.23 GB)</a><br> | 2017/10/03 | 2.30    | 3B2DB1F792779A93A8F50DDBC3943E30 |

**Step 3:** Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (❶), or click the small arrow to find an individual driver and click the file name to download (❷).

**NOTE:**

To install software from the downloaded ISO image file in Windows 8, 8.1 or 10, double-click the ISO file to mount it as a virtual drive to view its content. On Windows 7 system, an additional tool (such as Virtual CD-ROM Control Panel from Microsoft) is needed to mount the file.

Chapter

5

# BIOS

---

## IMBA-Q470 ATX Motherboard

### 5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.



#### NOTE:

Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

#### 5.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. **Using keyboard:** Press the **DEL** or **F2** as soon as the system is turned on.
2. **Using touchscreen:** Press the **Setup** button on the upper right corner of the BIOS Starting Menu.

If the message disappears before the **DEL** or **F2** key is pressed, restart the computer and try again, then the BIOS Starting Menu will appear. Select "Setup" and press Enter to get into the BIOS Setup.

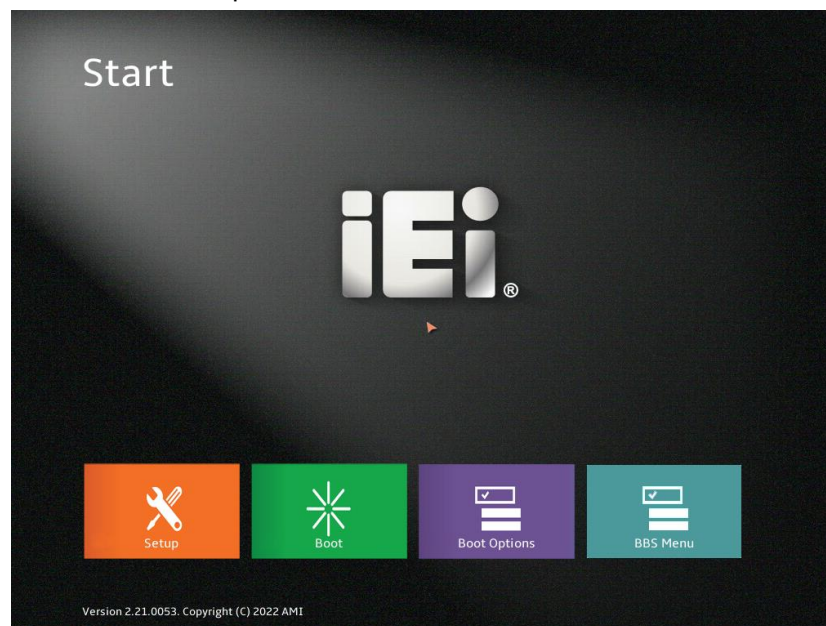


Figure 5-1: BIOS Starting Menu





5.1.2 Using Setup

The BIOS Setup menu can be navigated by using a keyboard or a touchscreen.

5.1.2.1 Keyboard Navigation

For keyboard navigation, use the navigation keys shown in **Table 5-1**.

| Key         | Function                                                                                                                                             |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Up arrow    | Move to previous item                                                                                                                                |
| Down arrow  | Move to next item                                                                                                                                    |
| Left arrow  | Move to the item on the left hand side                                                                                                               |
| Right arrow | Move to the item on the right hand side                                                                                                              |
| +           | Increase the numeric value or make changes                                                                                                           |
| -           | Decrease the numeric value or make changes                                                                                                           |
| Page Up     | Move to the previous page                                                                                                                            |
| Page Dn     | Move to the next page                                                                                                                                |
| Esc         | Main Menu – Quit and not save changes into CMOS<br>Status Page Setup Menu and Option Page Setup Menu --<br>Exit current page and return to Main Menu |
| F1          | General help, only for Status Page Setup Menu and<br>Option Page Setup Menu                                                                          |
| F2          | Load previous values                                                                                                                                 |
| F3          | Load optimized defaults                                                                                                                              |
| F4          | Save changes and Exit BIOS                                                                                                                           |
| <K>         | Scroll help area upwards                                                                                                                             |
| <M>         | Scroll help area downwards                                                                                                                           |

Table 5-1: BIOS Navigation Keys

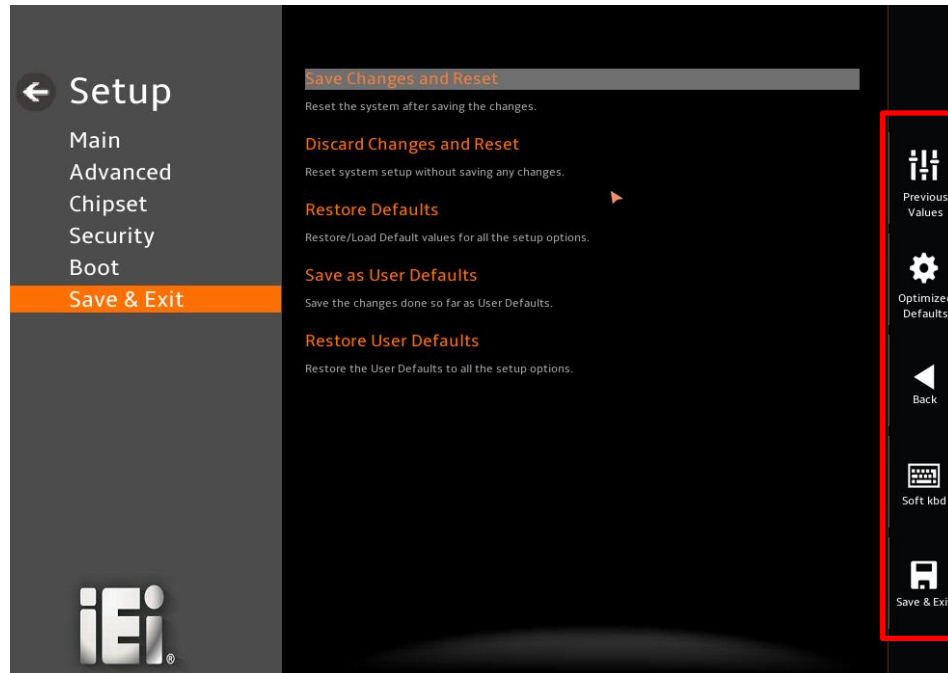




## IMBA-Q470 ATX Motherboard

## 5.1.2.2 Touch Navigation

For touchscreen navigation, use the on-screen navigation keys shown below.



| On-screen Button   | Function                                                                  |
|--------------------|---------------------------------------------------------------------------|
| Previous Values    | Load the last value you set.                                              |
| Optimized Defaults | Load the factory default values in order to achieve the best performance. |
| Back               | Return to the previous menu.                                              |
| Soft kbd           | Display the on-screen keyboard.                                           |
| Save & Exit        | Save the changes made to the BIOS options and reset the system.           |

Table 5-2: BIOS On-screen Navigation Keys

### 5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window, press the **Esc** key.

### 5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the clear CMOS button described in **Chapter 4**.

### 5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

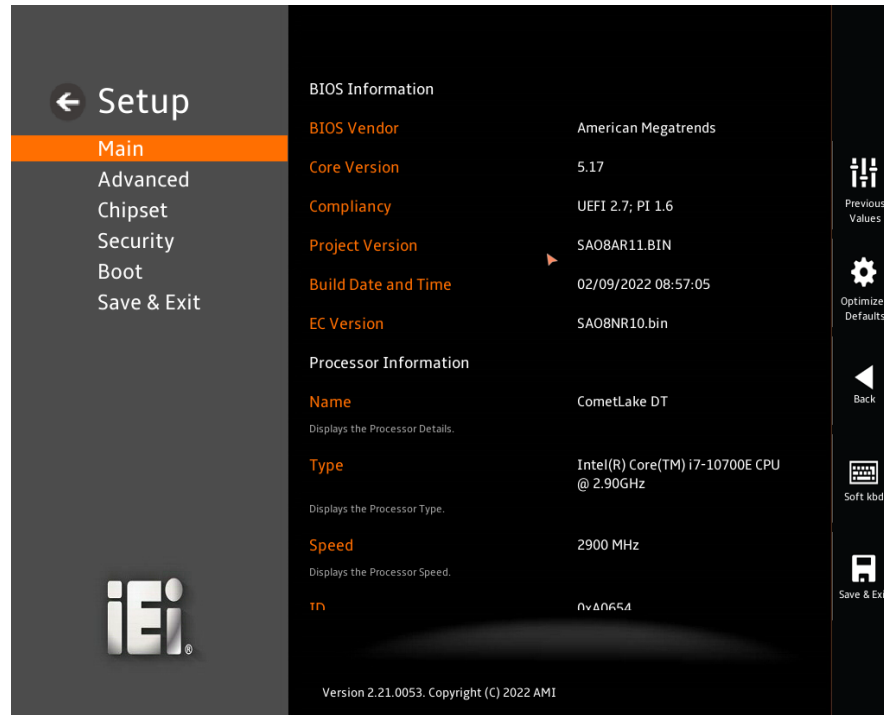
- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Security – Sets User and Supervisor Passwords.
- Boot – Changes the system boot configuration.
- Save & Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

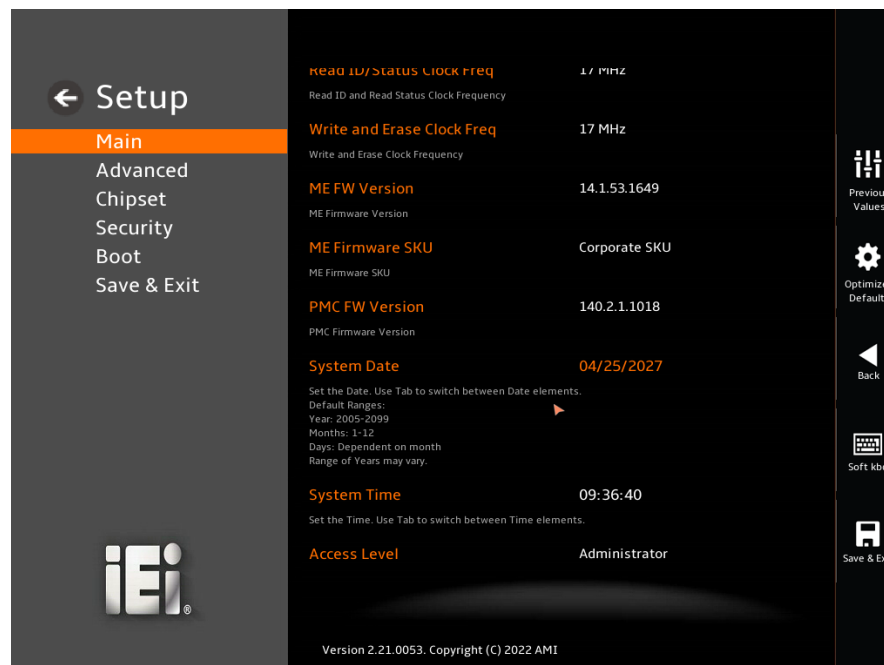
## IMBA-Q470 ATX Motherboard

### 5.2 Main

The **Main** BIOS menu (**BIOS Menu 1 & BIOS Menu 2**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main (1/2)



BIOS Menu 2: Main (2/2)

**→ BIOS Information**

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Compliance:** Current UEFI & PI version
- **Project Version:** the board version
- **Build Date:** Date the current BIOS version was made
- **EC Version:** Current EC version
- BIOS Information

**→ Processor Information**

The **Processor Information** lists a brief summary of the Processor. The fields in **Processor Information** cannot be changed. The items shown in the system overview include:

- **Name:** Displays the Processor Details
- **Type:** Displays the Processor Type
- **Speed:** Displays the Processor Speed
- **ID:** Displays the Processor ID
- **Stepping:** Displays the Processor Stepping
- **Package:** Displays the Processor Package
- **Number of Processors:** Displays number of CPU cores
- **Microcode Revision:** CPU Microcode Revision
- **GT Info:** Processor GT Info. Only valid if SNB stepping is D0 or above
- **IGFX GOP Version:** Displays the IGFX GOP Version
- **PCIe GEN4 Dekel FW Version:** Dekel Firmware Version used by PCIe Gen4 PHY
- **SAM Firmware Version:** System Agent Manage ability Engine FW Version
- **Memory RC Version:** Displays the Memory RC Version
- **Total Memory:** Total Memory in the System
- **Memory Frequency:** Displays the Frequency of Memory

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### ➔ PCH Information

The **PCH Information** lists a brief summary of the PCH. The fields in **PCH Information** cannot be changed. The items shown in the system overview include:

- **Name:** Displays the PCH Name
- **PCH SKU:** Displays the PCH SKU
- **Stepping:** Displays the PCH Stepping
- **Dual Output Fast Read support:** Displays the Processor Details
- **Read ID/Status Clock Freq:** Displays the Read ID and Read Status Clock Frequency
- **Write and Erase Clock Freq:** Displays the Write and Erase Clock Frequency
- **ME FW Version:** Displays the ME Firmware Version
- **ME Firmware SKU:** Displays the ME Firmware SKU
- **PMC FW Version:** Displays the PMC Firmware Version

The System Overview field also has two user configurable fields:

### ➔ System Date [xx/xx/xx]

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

### ➔ System Time [xx:xx:xx]

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



### 5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 3**) to configure the CPU and peripheral devices through the following sub-menus:



#### WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

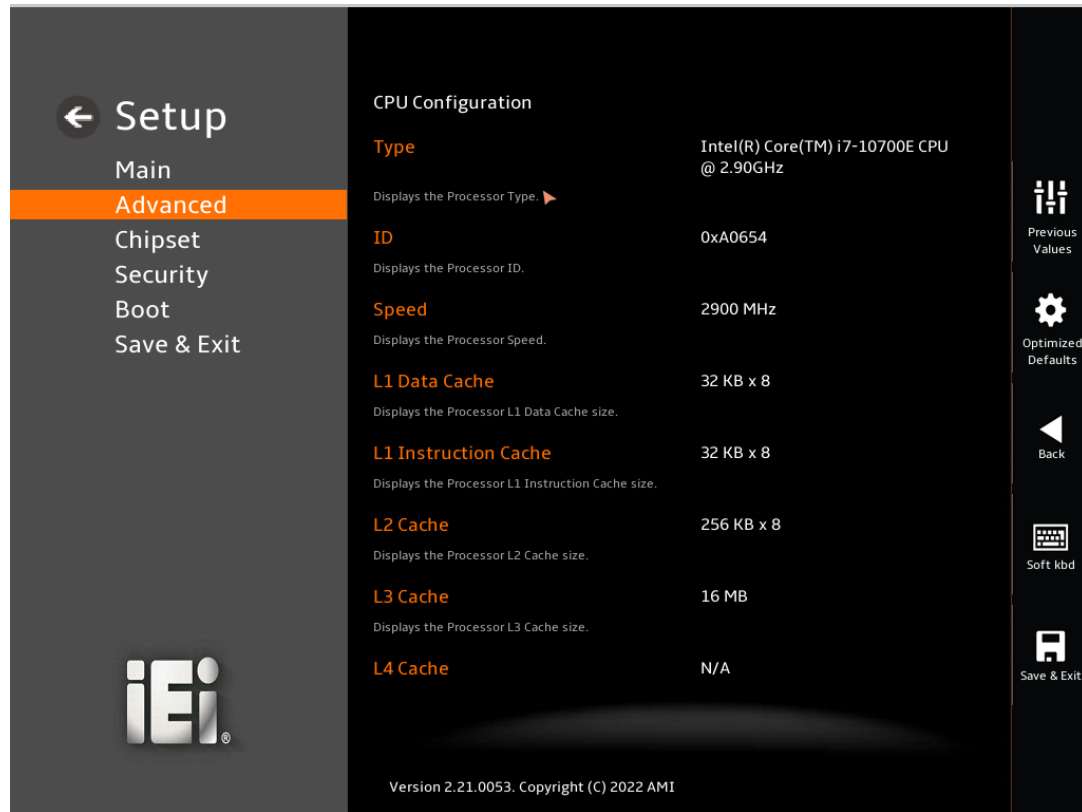


BIOS Menu 3: Advanced

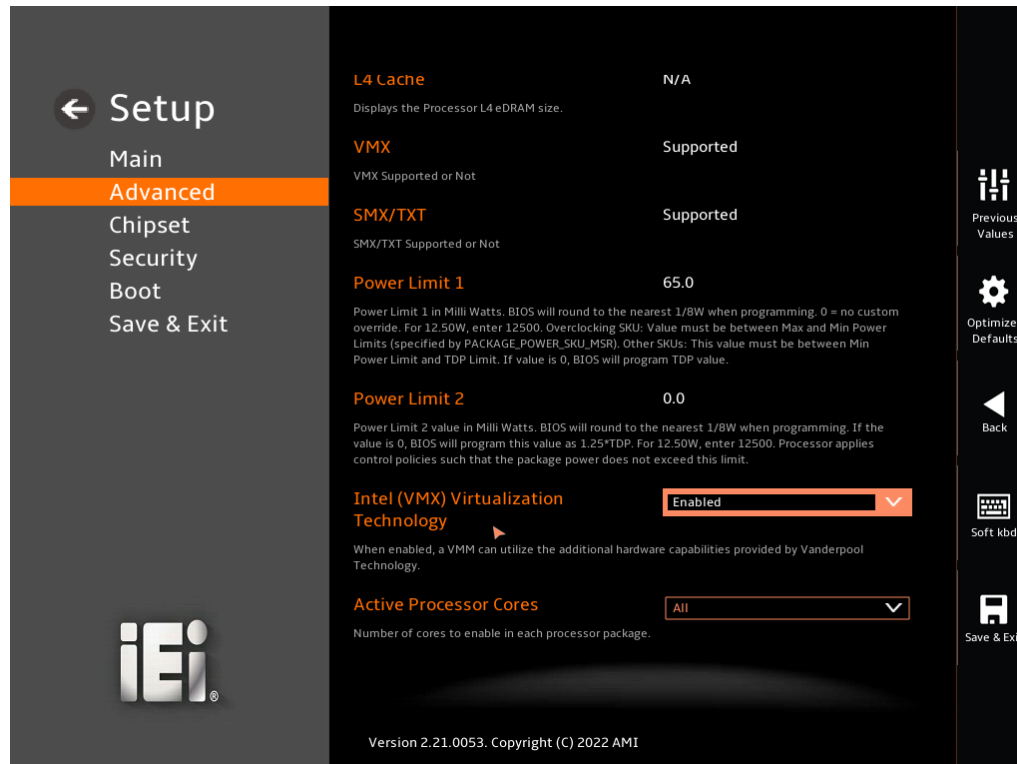
## IMBA-Q470 ATX Motherboard

### 5.3.1 CPU Configuration

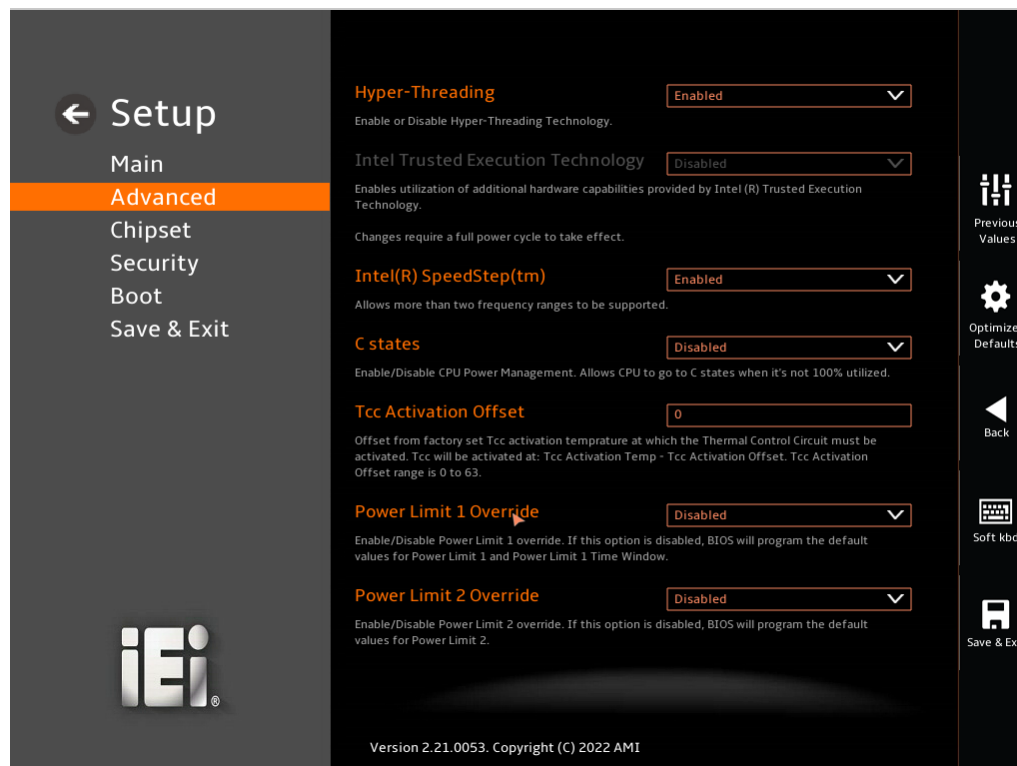
Use the **CPU Configuration** menu (**BIOS Menu 4 & BIOS Menu 5 & BIOS Menu 6**) to view detailed CPU specifications or enable the Intel Virtualization Technology.



BIOS Menu 4: CPU Configuration (1/3)



BIOS Menu 5: CPU Configuration (2/3)



BIOS Menu 6: CPU Configuration (3/3)

## IMBA-Q470 ATX Motherboard

### → Intel (VMX) Virtualization Technology [Disabled]

Use the **Intel (VMX) Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

- |   |                 |                |                                           |
|---|-----------------|----------------|-------------------------------------------|
| → | <b>Disabled</b> |                | Disables Intel Virtualization Technology. |
| → | <b>Enabled</b>  | <b>DEFAULT</b> | Enables Intel Virtualization Technology.  |

### → Active Processor Cores [All]

Use the **Active Processor Cores** BIOS option to enable numbers of cores in the processor package.

- |   |            |                |                                              |
|---|------------|----------------|----------------------------------------------|
| → | <b>All</b> | <b>DEFAULT</b> | Enable all cores in the processor package.   |
| → | <b>1</b>   |                | Enable one core in the processor package.    |
| → | <b>2</b>   |                | Enable two cores in the processor package.   |
| → | <b>3</b>   |                | Enable three cores in the processor package. |

### → Hyper-Threading [Enabled]

Use the **Hyper-Threading** option to enable or disable the **Hyper-Threading** Technology.

- |   |                 |                |                                     |
|---|-----------------|----------------|-------------------------------------|
| → | <b>Disabled</b> |                | Disables Hyper-Threading Technology |
| → | <b>Enabled</b>  | <b>DEFAULT</b> | Enables Hyper-Threading Technology  |

### → Intel(R) SpeedStep(tm) [Enabled]

Use the **Intel(R) SpeedStep(tm)** option to enable or disable the Intel® SpeedStep Technology which allows more than two frequency ranges to be supported.

- |   |                 |                |                                      |
|---|-----------------|----------------|--------------------------------------|
| → | <b>Disabled</b> |                | Disables Intel® SpeedStep Technology |
| → | <b>Enabled</b>  | <b>DEFAULT</b> | Enables Intel® SpeedStep Technology  |



➔ C states [Disabled]

Use the **C states** option to enable or disable CPU power management which allows CPU to go to C states when it is not 100% utilized.

- ➔ Disabled      DEFAULT      Disables CPU power management
- ➔ Enabled                      Enables CPU power management

➔ Tcc Activation Offset [Enabled]

Use the **Turbo Mode** option to enable or disable Turbo Mode which requires Intel Speed Step or Intel Speed Shift to be available and enabled.

- ➔ Disabled      DEFAULT      Disables Turbo Mode Technology
- ➔ Enabled                      Enables Turbo Mode Technology

➔ Power Limit 1 Override [Disabled]

Enable/Disable Power Limit 1 override. If this option is disabled. BIOS will program the default values for Limit 1 and Power Limit 1 Time Window.

➔ Power Limit 2 Override [Disabled]

Power Limit 1 in Milli Watts. BIOS will round to the nearest 1/8W when programming. 0 = no custom override. For 12.50W, enter 12500.

➔ Turbo Mode [Enabled]

Use the **Turbo Mode** option to enable or disable Turbo Mode which requires Intel Speed Step or Intel Speed Shift to be available and enabled.

- ➔ Disabled                      Disables Turbo Mode Technology
- ➔ Enabled      DEFAULT      Enables Turbo Mode Technology

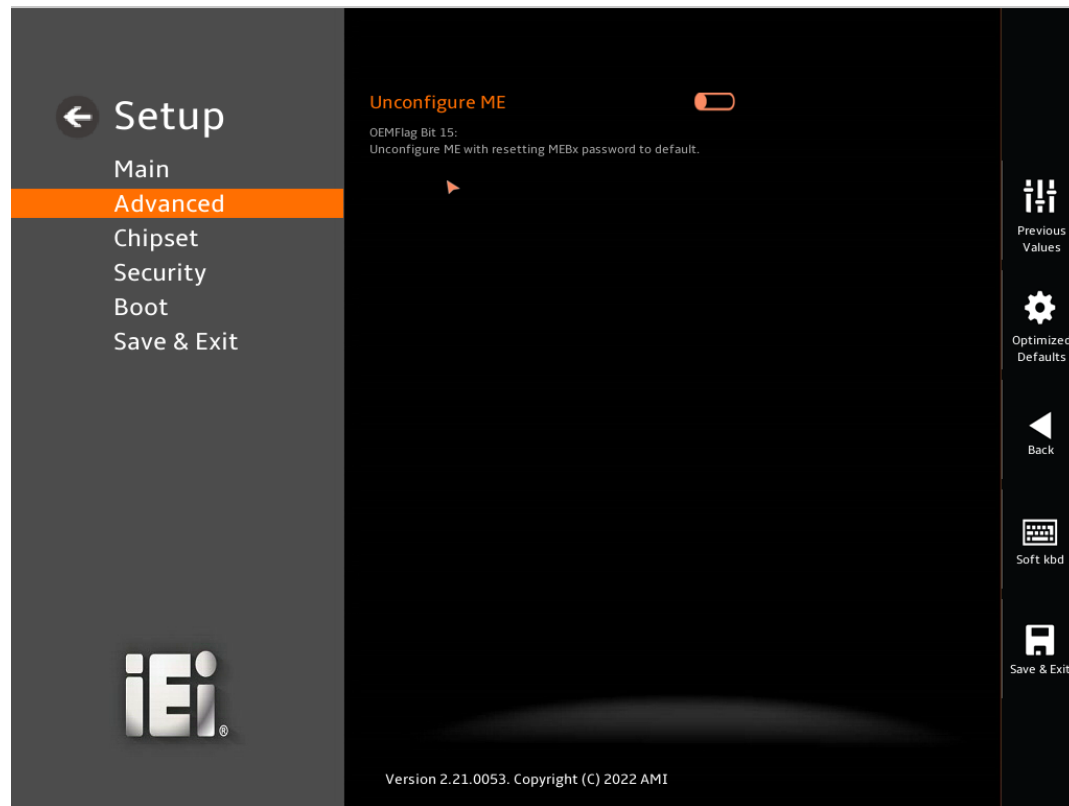




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### 5.3.2 PCH-FW Configuration

The **PCH-FW Configuration** menu (**BIOS Menu 7**) allows Intel® Active Management Technology (AMT) options to be configured.



#### BIOS Menu 7: PCH-FW Configuration

##### → Unconfigure ME [Disabled]

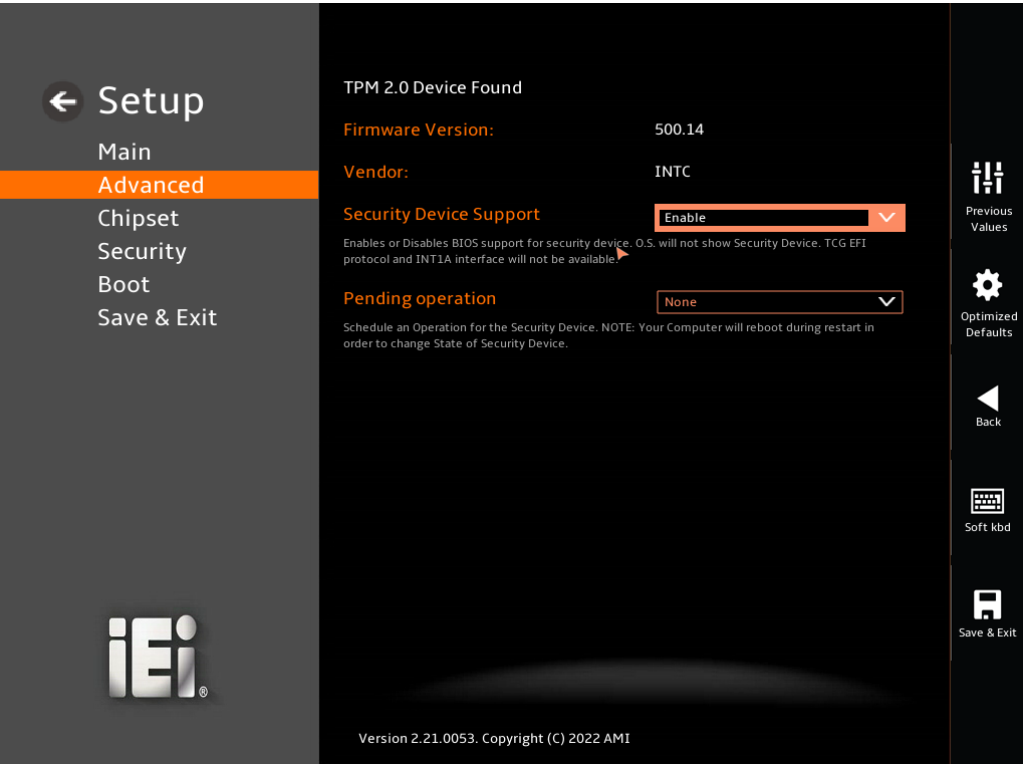
Use the **Unconfigure ME** option to unconfigure ME with resetting MEBx password to default.

- |   |                 |                |                                                            |
|---|-----------------|----------------|------------------------------------------------------------|
| → | <b>Disabled</b> | <b>DEFAULT</b> | Not unconfigure ME with resetting MEBx password to default |
| → | <b>Enabled</b>  |                | Unconfigure ME with resetting MEBx password to default     |



5.3.3 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 8**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 8: PCH-FW Configuration

➔ Security Device Support [Disable]

Use the **Security Device Support** option to configure support for the TPM.

- ➔ **Disable**                                  TPM support is disabled.
- ➔ **Enable**                                  **DEFAULT**                  TPM support is enabled.

➔ Pending Operation [None]

Use the **Pending Operation** option to schedule an operation for the security device.

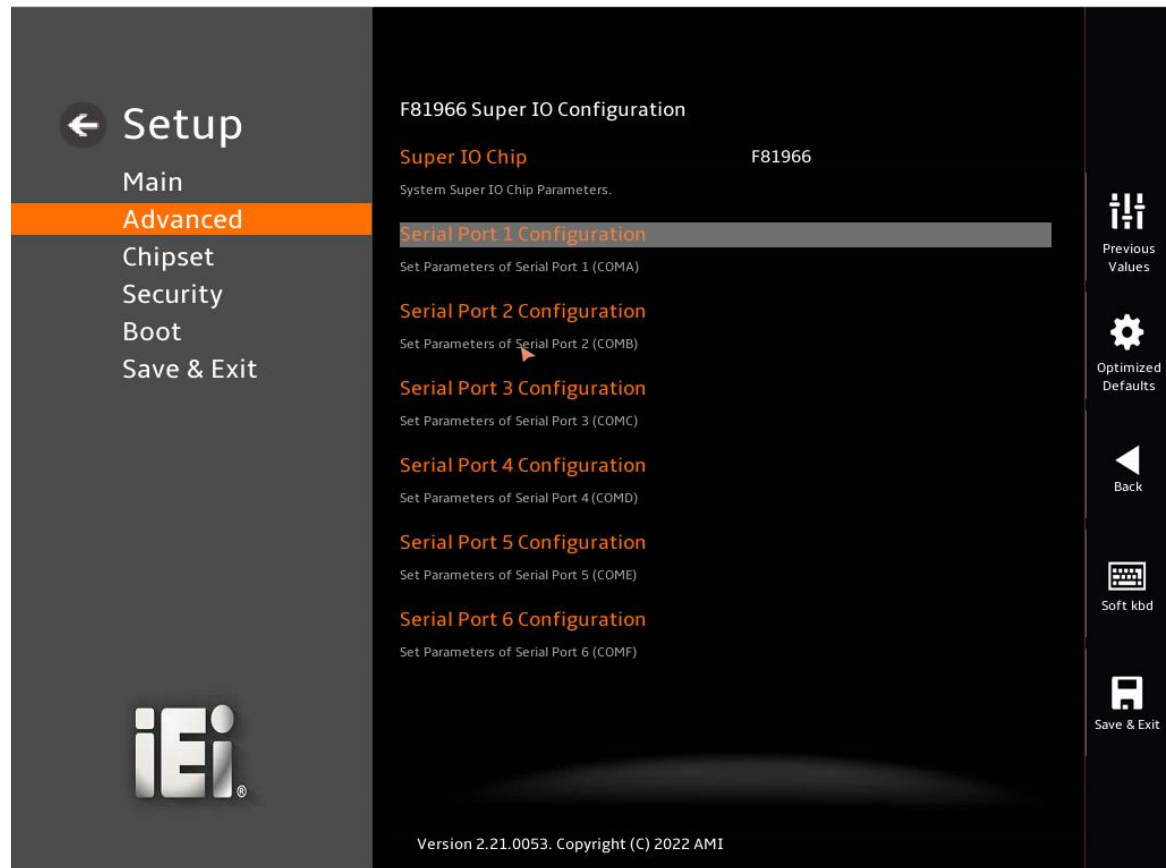
- ➔ **None**                                  **DEFAULT**                  TPM information is previous.S
- ➔ **TPM Clear**                                  TPM information is cleared



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### 5.3.4 F81966 Super IO Configuration

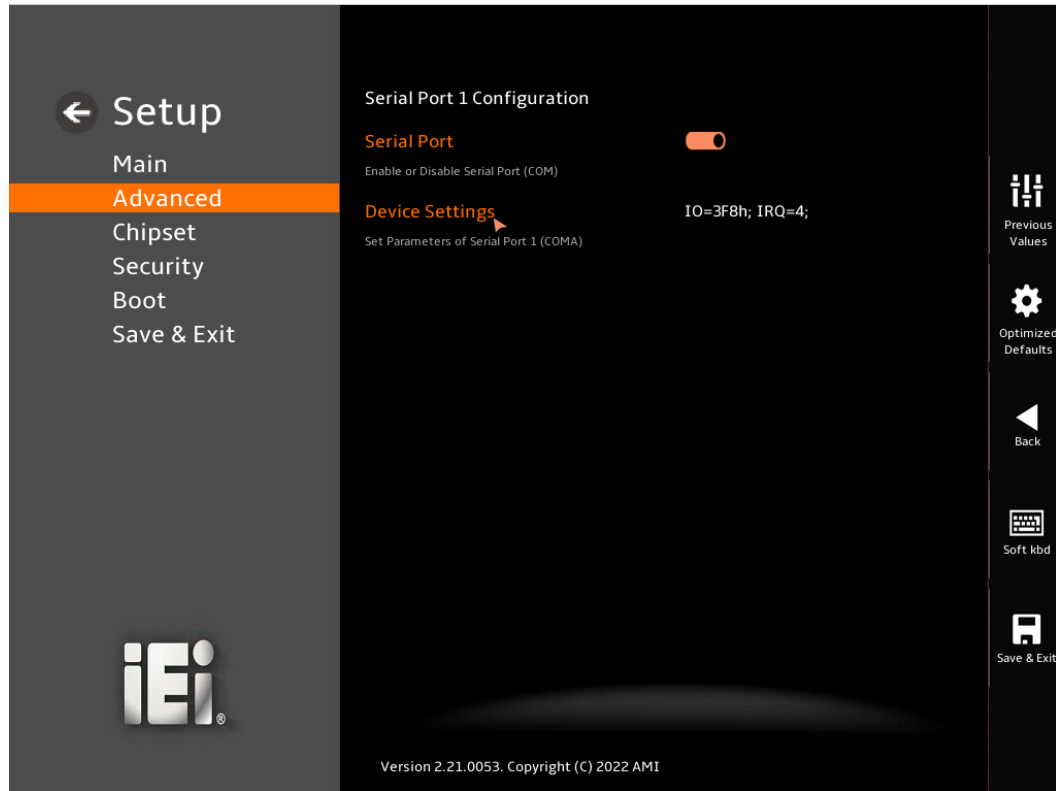
Use the **F81966 Super IO Configuration** menu (**BIOS Menu 9**) to set or change the configurations for the parallel ports and serial ports.



BIOS Menu 9: F81866 Super IO Configuration

### 5.3.4.1 Serial Port 1 Configuration

Use the **Serial Port 1 Configuration** menu (**BIOS Menu 10**) to configure the serial port n.



#### BIOS Menu 10: Serial Port 1 Configuration Menu

##### ➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled**                      Disable the serial port
- ➔ **Enabled**                      **DEFAULT**              Enable the serial port

##### ➔ Device Settings

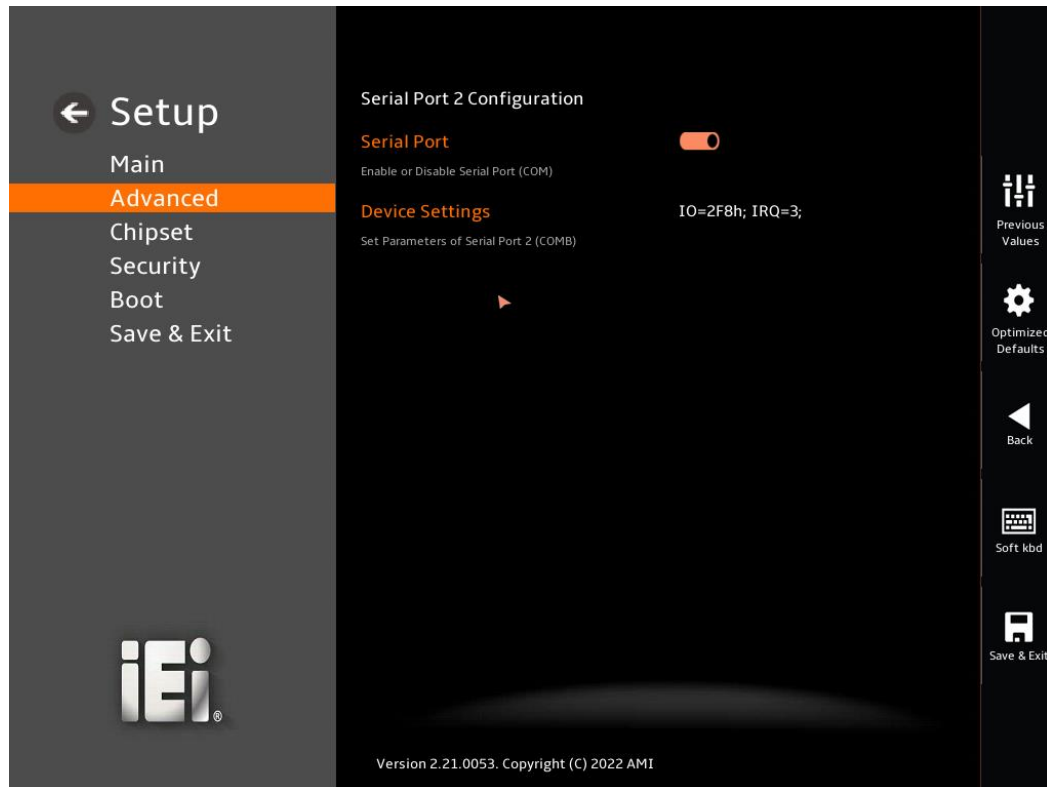
Use the **Device Settings** option to change the serial port IO port address and interrupt address.

- ➔ **IO=3F8h;**                      Serial Port I/O port address is 3F8h and the interrupt  
**IRQ=4**                              address is IRQ4

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## 5.3.4.2 Serial Port 2 Configuration

Use the **Serial Port 2 Configuration** menu (**BIOS Menu 11**) to configure the serial port n.



## BIOS Menu 11: Serial Port 2 Configuration Menu

## ➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled**                      Disable the serial port
- ➔ **Enabled**                      **DEFAULT**              Enable the serial port

## ➔ Device Settings

Use the **Device Settings** option to change the serial port IO port address and interrupt address.

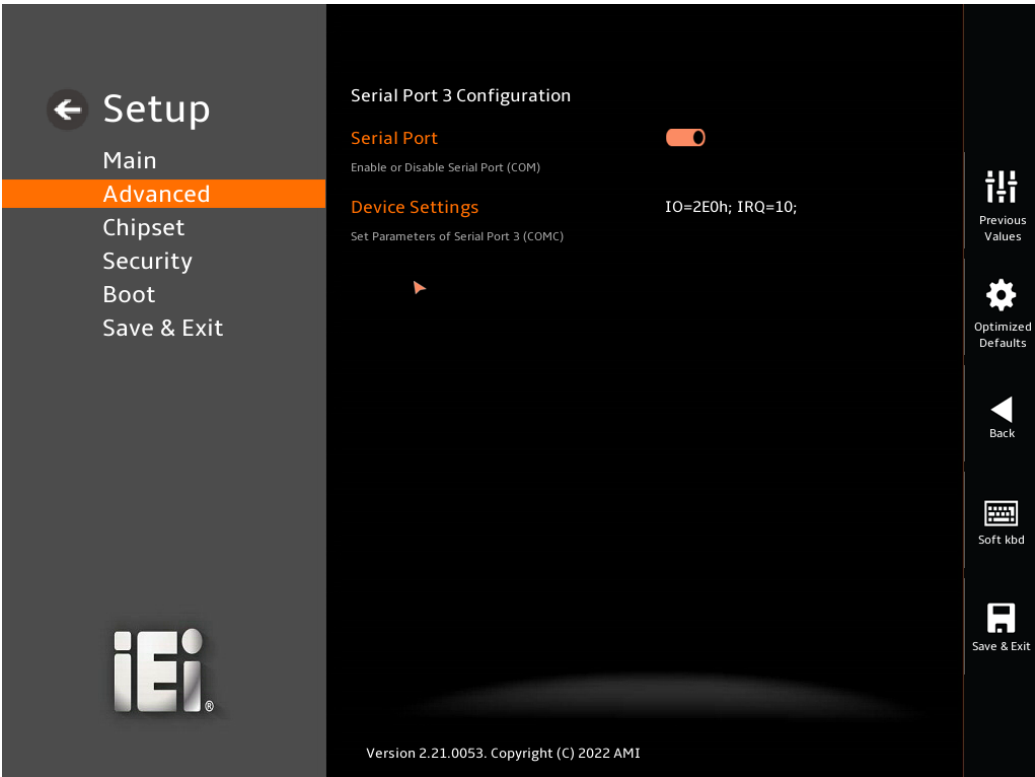
- ➔ **IO=2F8h;**                      Serial Port I/O port address is 2F8h and the interrupt  
**IRQ=3**                              address is IRQ3





5.3.4.3 Serial Port 3 Configuration

Use the **Serial Port 3 Configuration** menu (**BIOS Menu 12**) to configure the serial port 3.



BIOS Menu 12: Serial Port 3 Configuration Menu

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled**                      Disable the serial port
- ➔ **Enabled      DEFAULT**      Enable the serial port

➔ **Device Settings**

Use the **Device Settings** option to change the serial port IO port address and interrupt address.

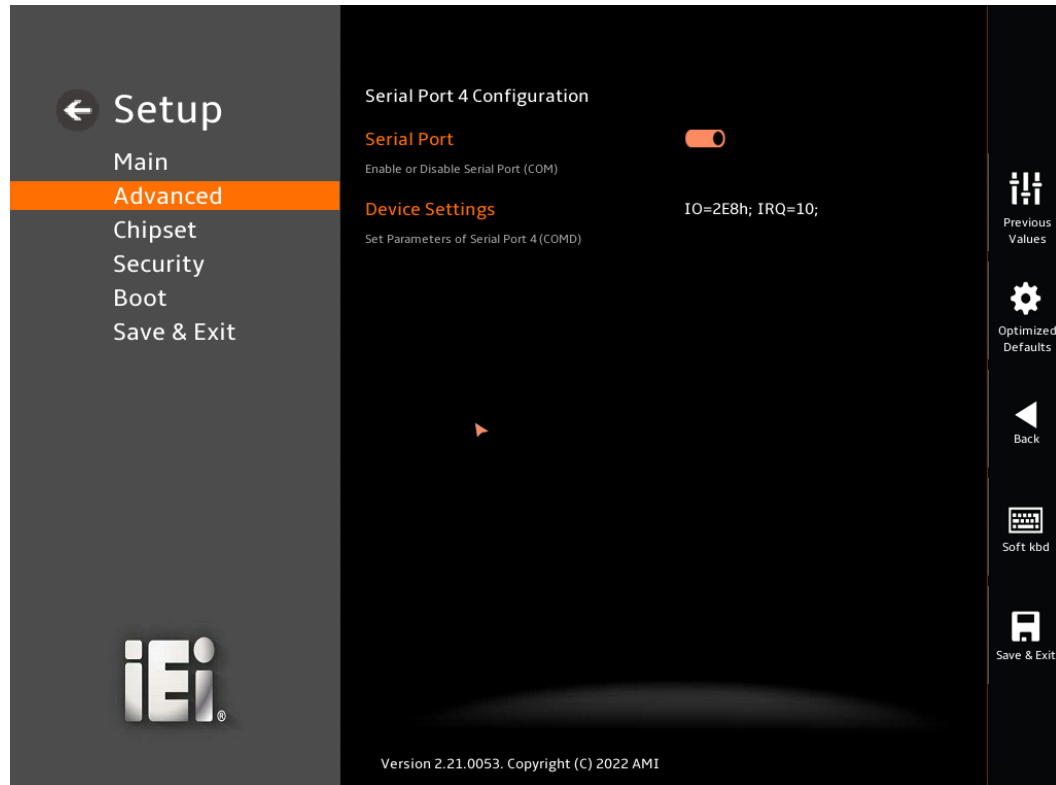
- ➔ **IO=2E0h;                      Serial Port I/O port address is 2E0h and the interrupt**  
**IRQ=10                      address is IRQ10**



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## 5.3.4.4 Serial Port 4 Configuration

Use the **Serial Port 4 Configuration** menu (**BIOS Menu 13**) to configure the serial port 4.



## BIOS Menu 13: Serial Port 4 Configuration Menu

## ➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled**                      Disable the serial port
- ➔ **Enabled**                      **DEFAULT**              Enable the serial port

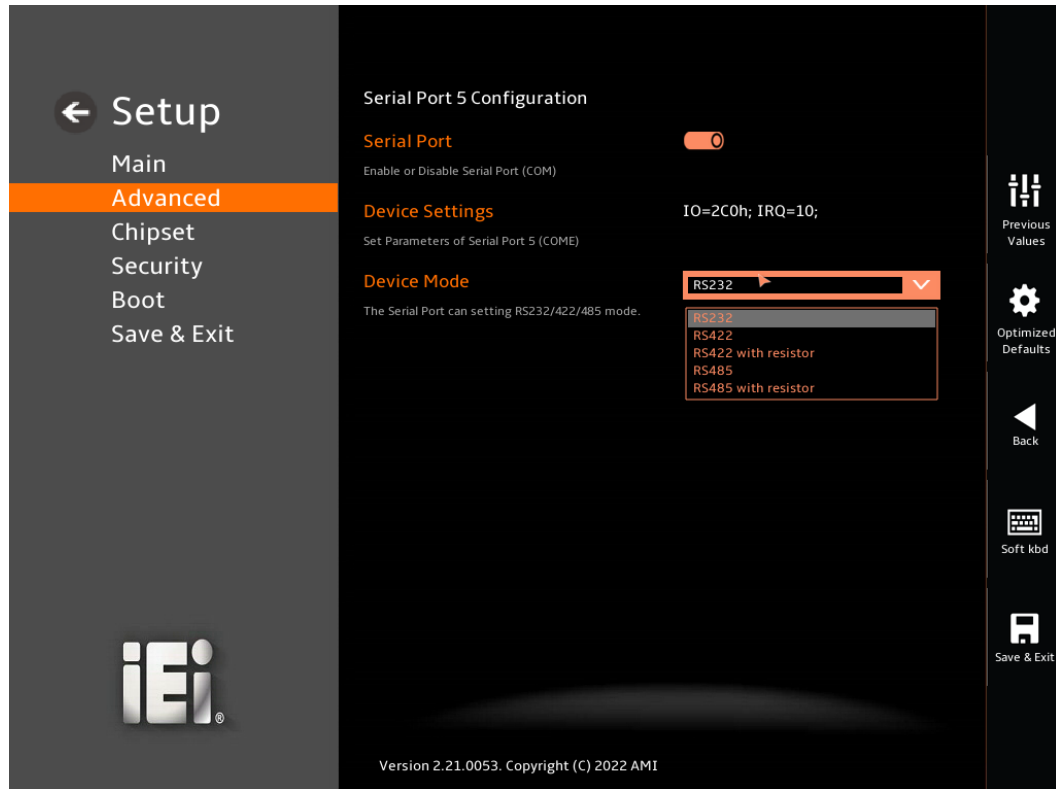
## ➔ Device Settings

Use the **Device Settings** option to change the serial port IO port address and interrupt address.

- ➔ **IO=2E8h;**                      Serial Port I/O port address is 2E8h and the interrupt  
**IRQ=10**                      address is IRQ10

### 5.3.4.5 Serial Port 5 Configuration

Use the **Serial Port 5 Configuration** menu (**BIOS Menu 14**) to configure the serial port 5.



#### BIOS Menu 14: Serial Port 5 Configuration Menu

##### ➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled**                      Disable the serial port
- ➔ **Enabled**                      **DEFAULT**              Enable the serial port

##### ➔ Device Settings

Use the **Device Settings** option to change the serial port IO port address and interrupt address.

- ➔ **IO=2C0h;**                      Serial Port I/O port address is 2C0h and the interrupt  
**IRQ=10**                      address is IRQ10

## IMBA-Q470 ATX Motherboard

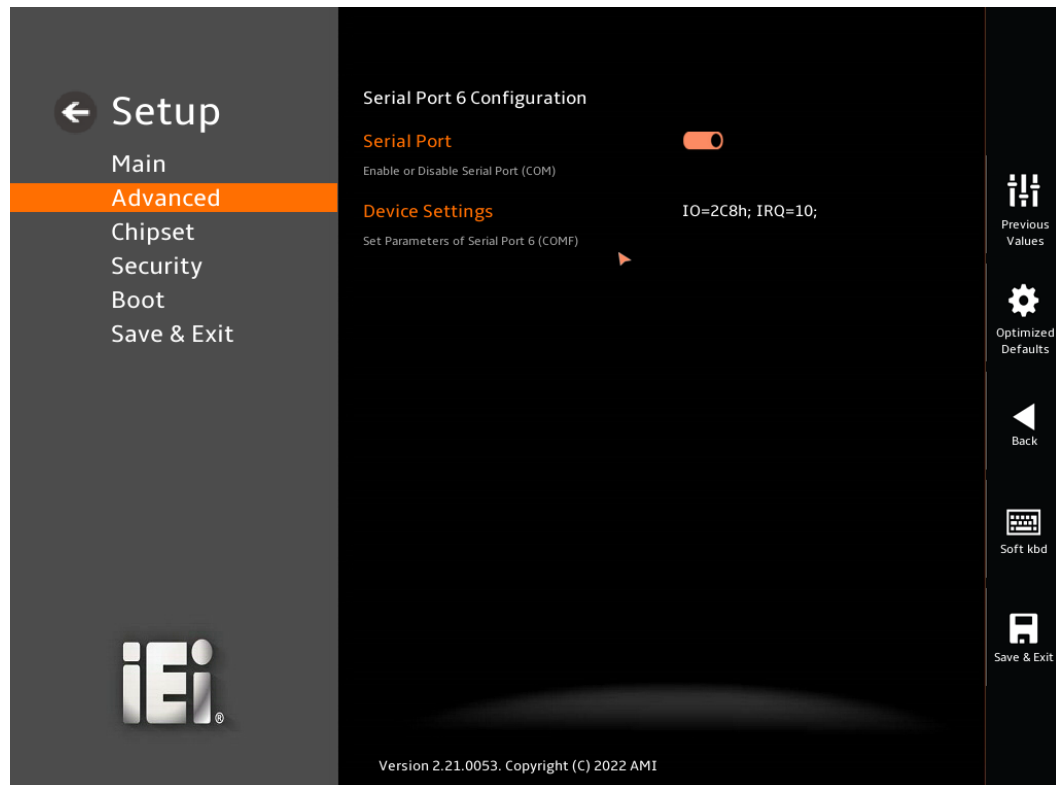
### → Device Mode [Printer Mode]

Use the **Device Mode** option to select the Serial Port 5 signaling mode. Configuration options are listed below.

- **RS232**      **DEFAULT**      Serial Port 5 signaling mode is RS-232
- **RS422**                      Serial Port 5 signaling mode is RS-422
- **RS422 with resistor**              Serial Port 5 signaling mode is RS-422 with resistor
- **RS485**                      Serial Port 5 signaling mode is RS-485
- **RS485 with resistor**              Serial Port 5 signaling mode is RS-485 with resistor

### 5.3.4.6 Serial Port 6 Configuration

Use the **Serial Port 6 Configuration** menu (**BIOS Menu 15**) to configure the serial port 6.



**BIOS Menu 15: Serial Port 6 Configuration Menu**

### → Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- **Disabled**                      Disable the serial port
- **Enabled**                      **DEFAULT**              Enable the serial port

### → Device Settings

Use the **Device Settings** option to change the serial port IO port address and interrupt address.

- **IO=2C8h;**                      Serial Port I/O port address is 2C8h and the interrupt  
**IRQ=10**                      address is IRQ10

## 5.3.5 ENE KB9068 Monitor

The ENE KB9068 Monitor menu (**BIOS Menu 16**) contains the smart fan mode configuration submenu and shows the state of H/W real-time operating temperature, fan speeds and system voltages.



**BIOS Menu 16: ENE KB9068 Monitor**



## IMBA-Q470 ATX Motherboard

### ➔ PC Health Status

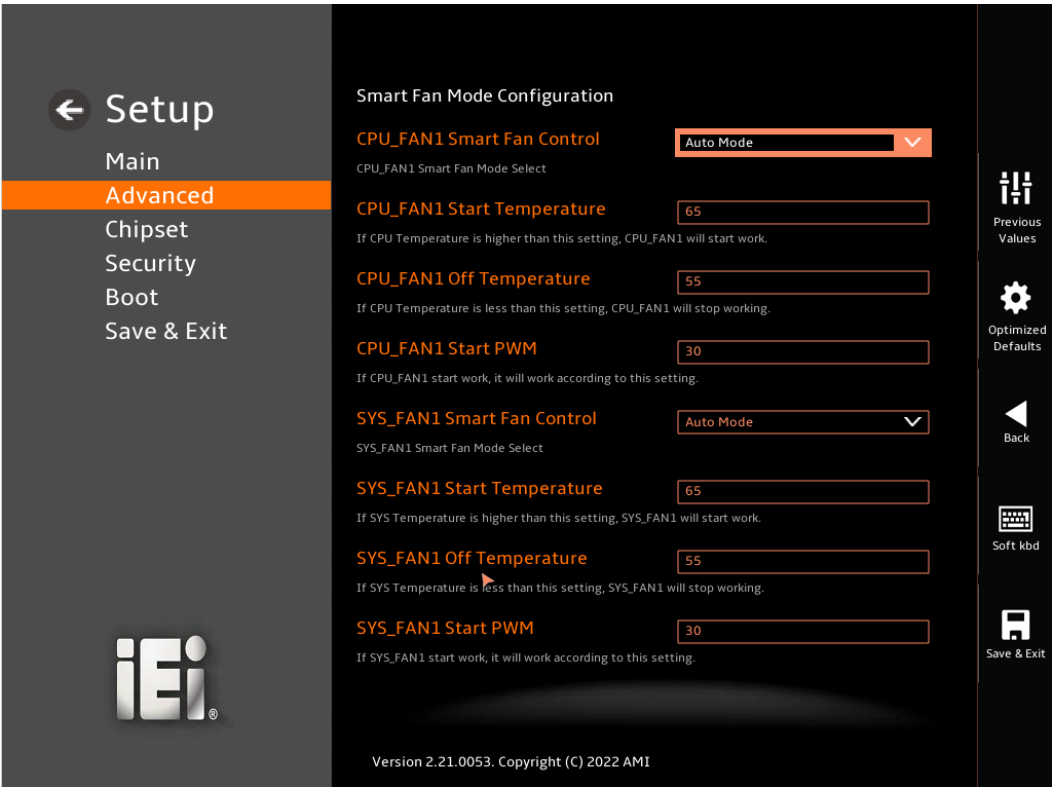
The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  - CPU Temperature
  - System Temperature
- Fan Speeds:
  - CPU Fan Speed
  - System Fan Speed
- Voltages:
  - CPU\_CORE
  - +5V
  - +12V
  - DDR
  - +5VSB
  - +3.3V
  - +3.3VSB



5.3.5.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 17**) to configure the CPU/system fan start/off temperature and control mode.



BIOS Menu 17: Smart Fan Mode Configuration

➔ CPU\_FAN1 Smart Fan Control [Auto Mode]

Use the **CPU\_FAN1 Smart Fan Control** option to configure the CPU Smart Fan.

- ➔ Manual Mode
- The fan spins at the speed set in Manual Mode settings.
- ➔ Auto Mode
- DEFAULT The fan adjusts its speed using Auto Mode settings.



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### → CPU\_FAN1 Start Temperature

If the CPU temperature is between **fan off** and **fan start**, the fan speed change to **fan start PWM**. To set a value, Use the + or – key to change the value or enter a decimal number between 1 and 100.

### → CPU\_FAN1 Off Temperature

If the CPU temperature is lower than the value set this option, the fan speed change to be lowest. To set a value, Use the + or – key to change the value or enter a decimal number between 1 and 100.

### → CPU\_FAN1 Start PWM

Use the **CPU\_FAN1 Start PWM** option to set the PWM start value. Use the + or – key to change the value or enter a decimal number between 1 and 100.

### → SYS\_FAN1 Smart Fan Control [Auto Mode]

Use the **SYS\_FAN1 Smart Fan Control** option to configure the System Smart Fan.

- |   |                    |                |                                                         |
|---|--------------------|----------------|---------------------------------------------------------|
| → | <b>Manual Mode</b> |                | The fan spins at the speed set in Manual Mode settings. |
| → | <b>Auto Mode</b>   | <b>DEFAULT</b> | The fan adjusts its speed using Auto Mode settings.     |

### → SYS\_FAN1 Start Temperature

If the System temperature is between **fan off** and **fan start**, the fan speed change to **fan start PWM**. To set a value, Use the + or – key to change the value or enter a decimal number between 1 and 100.

### → SYS\_FAN1 Off Temperature

If the System temperature is lower than the value set this option, the fan speed change to be lowest. To set a value, Use the + or – key to change the value or enter a decimal number between 1 and 100.

**→ SYS\_FAN1 Start PWM**

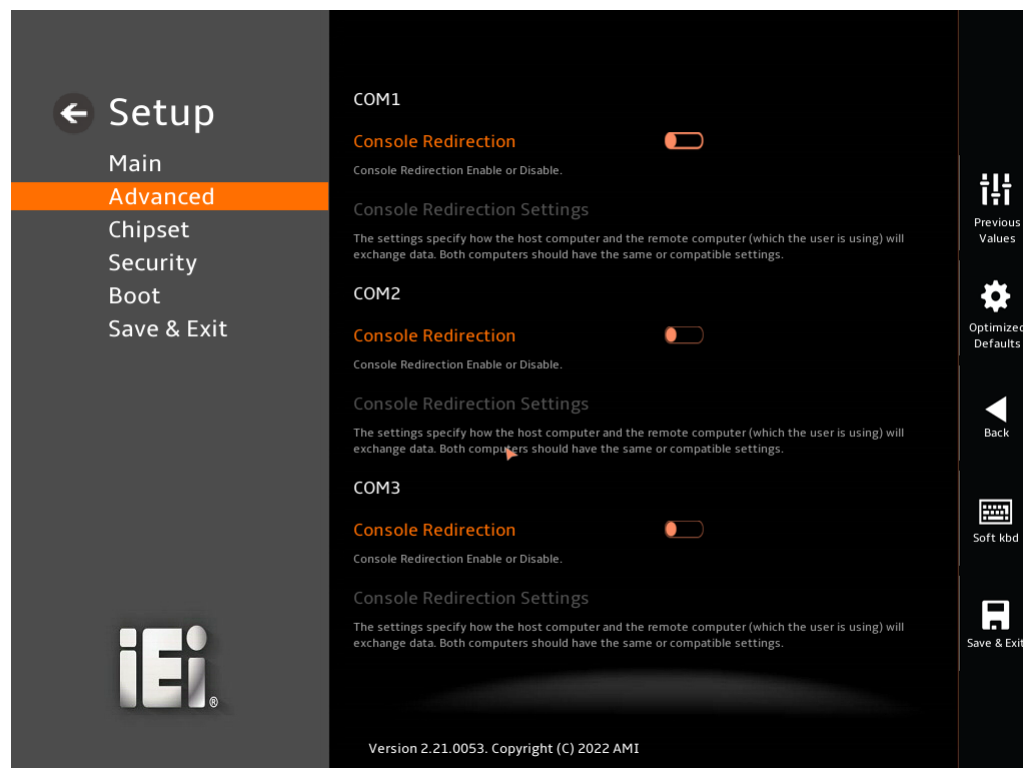
Use the **SYS\_Fan1 Start PWM** option to set the PWM start value. Use the + or – key to change the value or enter a decimal number between 1 and 100.

**→ Auto Mode Fan Slope PWM**

Use the **Auto Mode Fan Slope PWM** option to select the linear rate at which the PWM mode increases with respect to an increase in temperature. Use the + or – key to change the value or enter a decimal number between 1 and 8

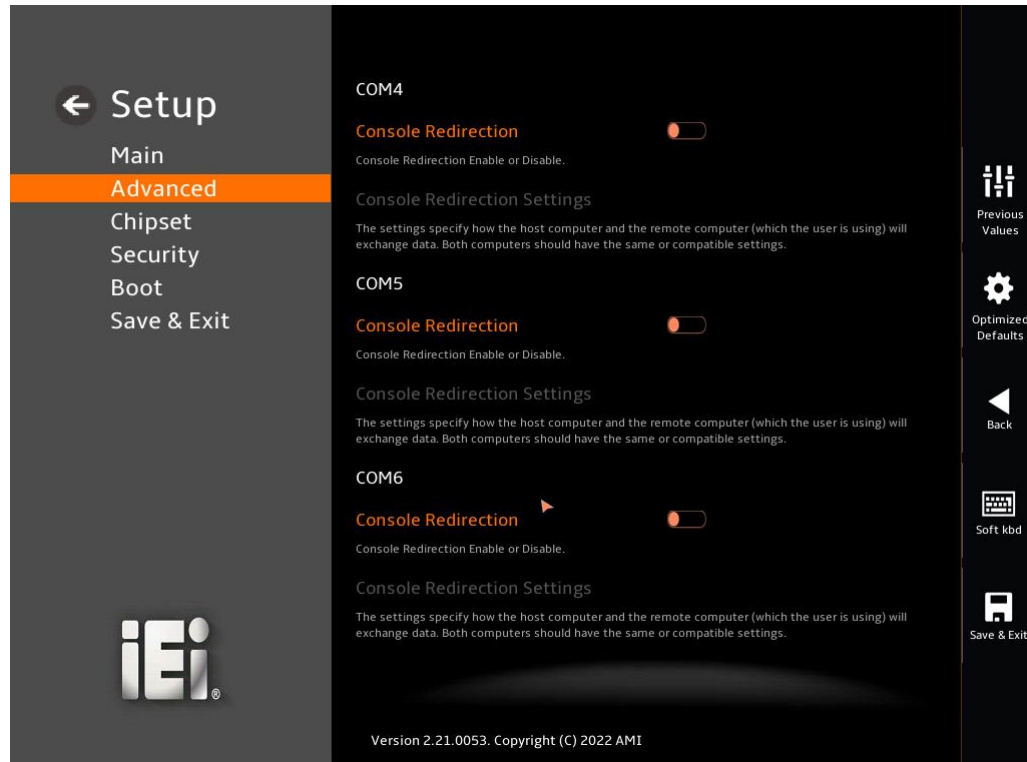
**5.3.6 Serial Port Console Redirection**

The **Serial Port Console Redirection** menu (**BIOS Menu 18 & BIOS Menu 19**) allows the console redirection options to be configured. Console Redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



**BIOS Menu 18: Serial Port Console Redirection (1/2)**

## IMBA-Q470 ATX Motherboard



BIOS Menu 19: Serial Port Console Redirection (2/2)

## → Console Redirection [Disabled]

Use **Console Redirection** option to enable or disable the console redirection function.

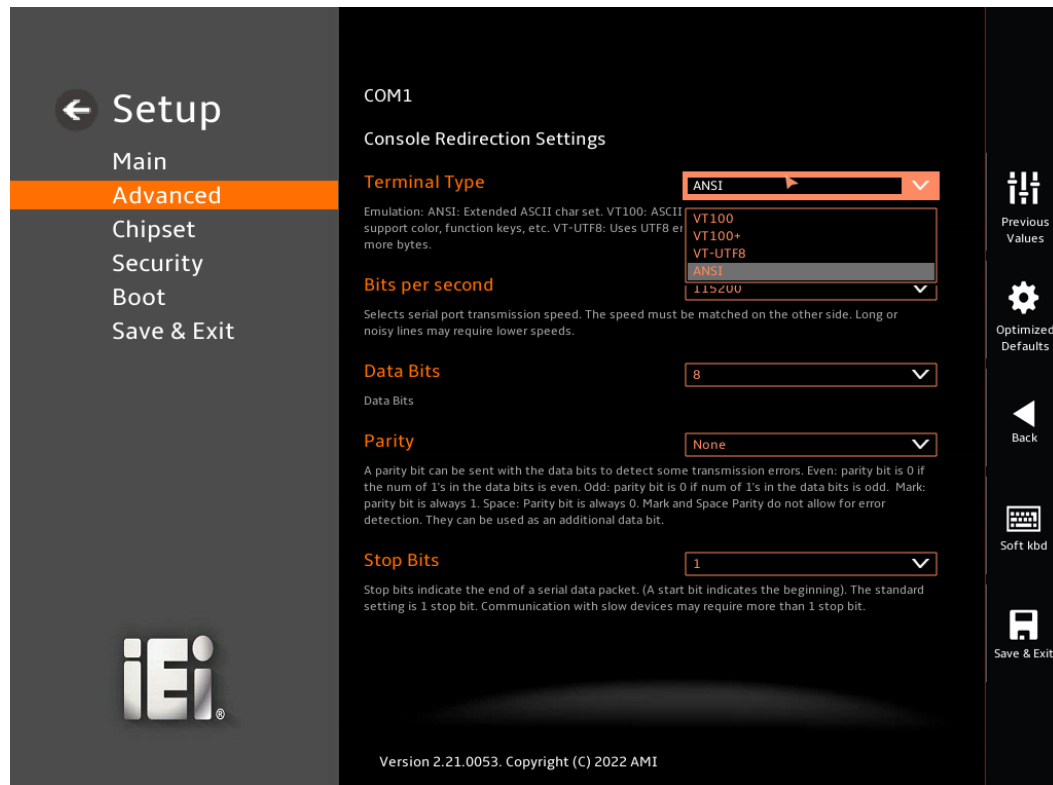
- **Disabled**      **DEFAULT**      Disabled the console redirection function
- **Enabled**                      Enabled the console redirection function

The **Console Redirection Settings** submenu will be available when the **Console Redirection** option is enabled.

## 5.3.6.1 Console Redirection Settings

The following options are available in the **Console Redirection Settings** submenu (BIOS Menu 20) when the **COM Console Redirection** (for COM1 to COM6) option is enabled.





### BIOS Menu 20: COM Console Redirection Settings

#### → Terminal Type [ANSI]

Use the **Terminal Type** option to specify the remote terminal type.

- **VT100**                      The target terminal type is VT100
- **VT100+**                      The target terminal type is VT100+
- **VT-UTF8**                      The target terminal type is VT-UTF8
- **ANSI**                      **DEFAULT**                      The target terminal type is ANSI

#### → Bits per second [115200]

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match on the other side. Long or noisy lines may require lower speeds.

- **9600**                      Sets the serial port transmission speed at 9600.

## IMBA-Q470 ATX Motherboard

- ➔ **19200** Sets the serial port transmission speed at 19200.
- ➔ **38400** Sets the serial port transmission speed at 38400.
- ➔ **57600** Sets the serial port transmission speed at 57600.
- ➔ **115200** **DEFAULT** Sets the serial port transmission speed at 115200.

➔ **Data Bits [8]**

Use the **Data Bits** option to specify the number of data bits.

- ➔ **7** Sets the data bits at 7.
- ➔ **8** **DEFAULT** Sets the data bits at 8.

➔ **Parity [None]**

Use the **Parity** option to specify the parity bit that can be sent with the data bits for detecting the transmission errors.

- ➔ **None** **DEFAULT** No parity bit is sent with the data bits.
- ➔ **Even** The parity bit is 0 if the number of ones in the data bits is even.
- ➔ **Odd** The parity bit is 0 if the number of ones in the data bits is odd.
- ➔ **Mark** The parity bit is always 1. This option does not allow for error detection.
- ➔ **Space** The parity bit is always 0. This option does not allow for error detection.

➔ **Stop Bits [1]**

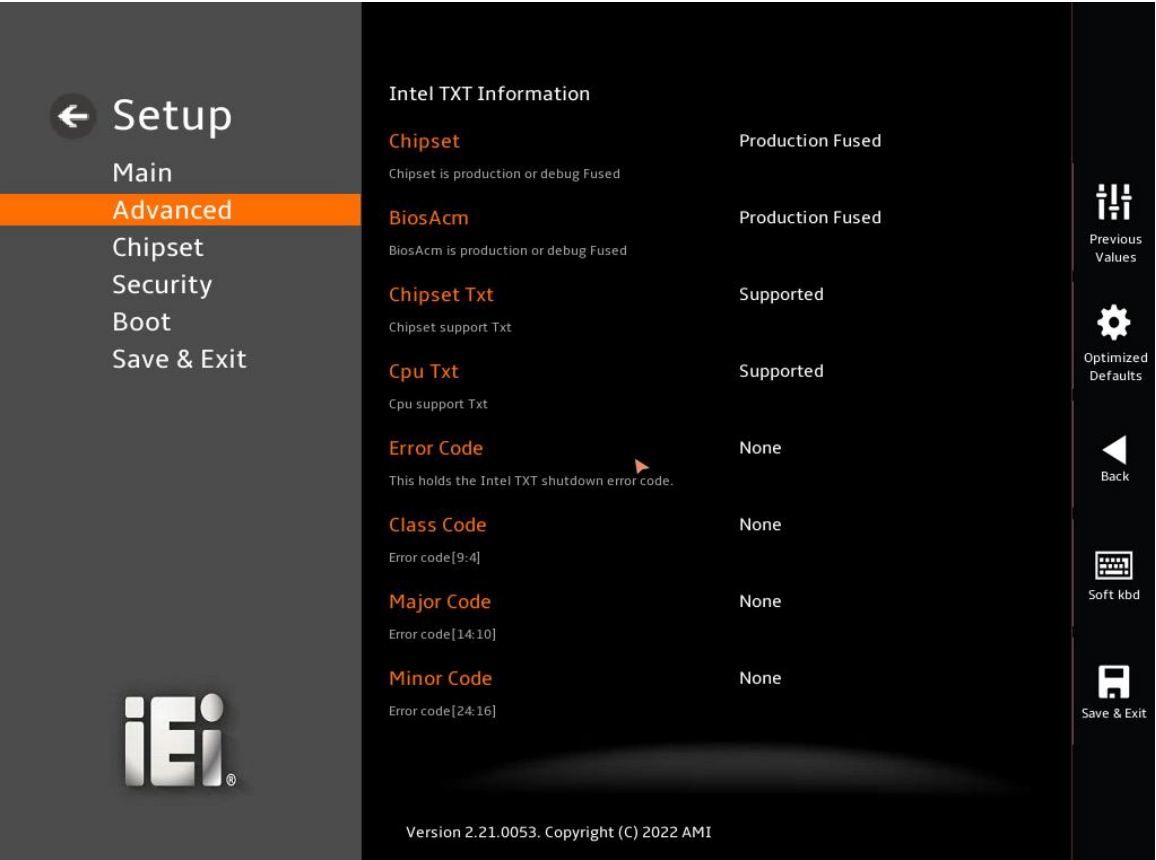
Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

- ➔ **1** **DEFAULT** Sets the number of stop bits at 1.
- ➔ **2** Sets the number of stop bits at 2.



5.3.7 Intel TXT Information

The **Intel TXT Information** menu (**BIOS Menu 21**) displays the Intel Trusted Execution Technology information and shows the Chipset .



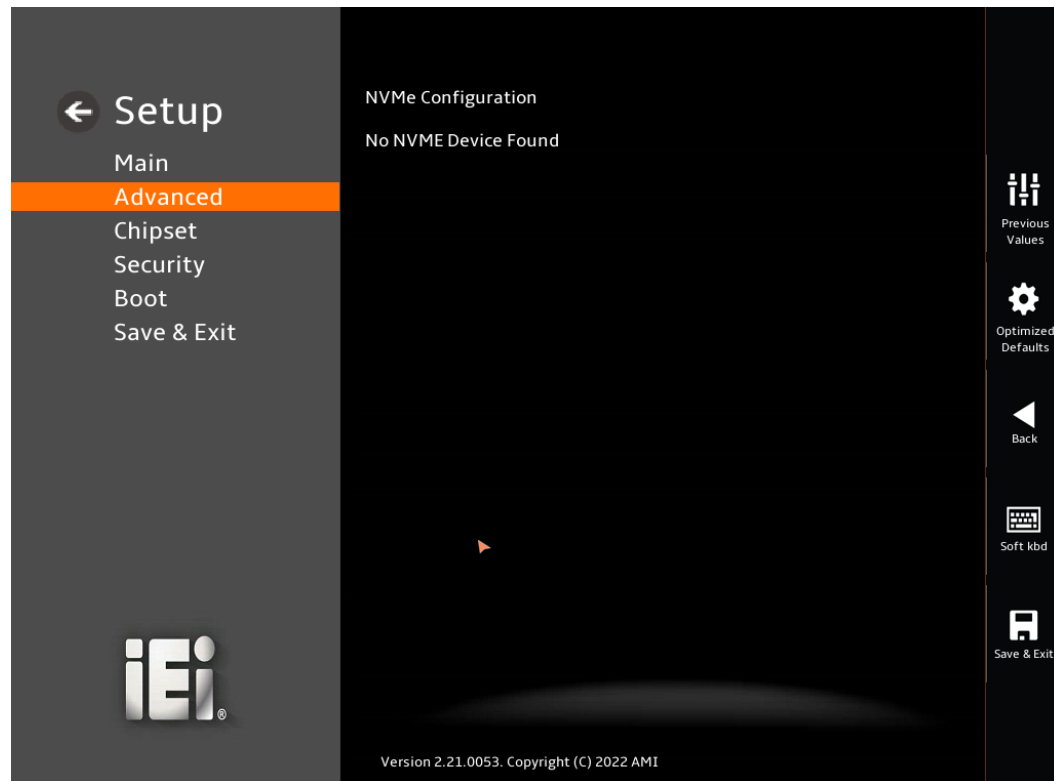
BIOS Menu 21: Intel TXT Information



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### 5.3.8 NVMe Configuration

Use the **NVMe Configuration (BIOS Menu 22)** menu to display the NVMe controller and device information.



**BIOS Menu 22: NVMe Configuration**

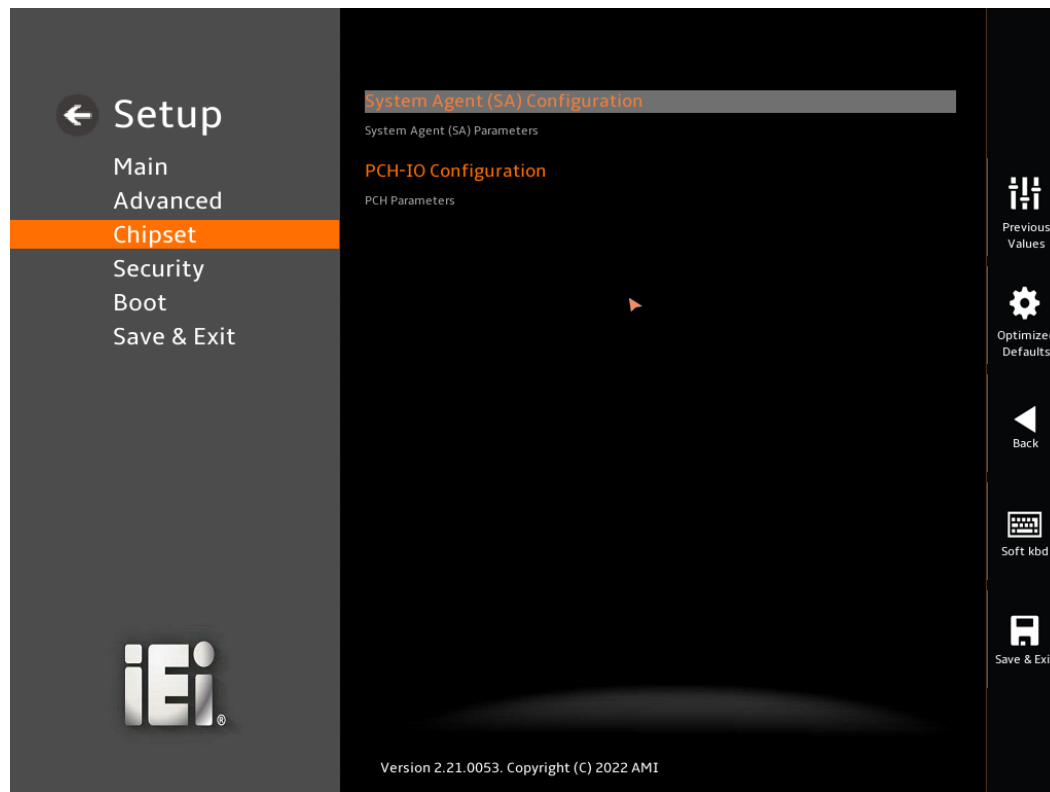
## 5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 23**) to access the PCH IO and System Agent (SA) configuration menus.



### WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



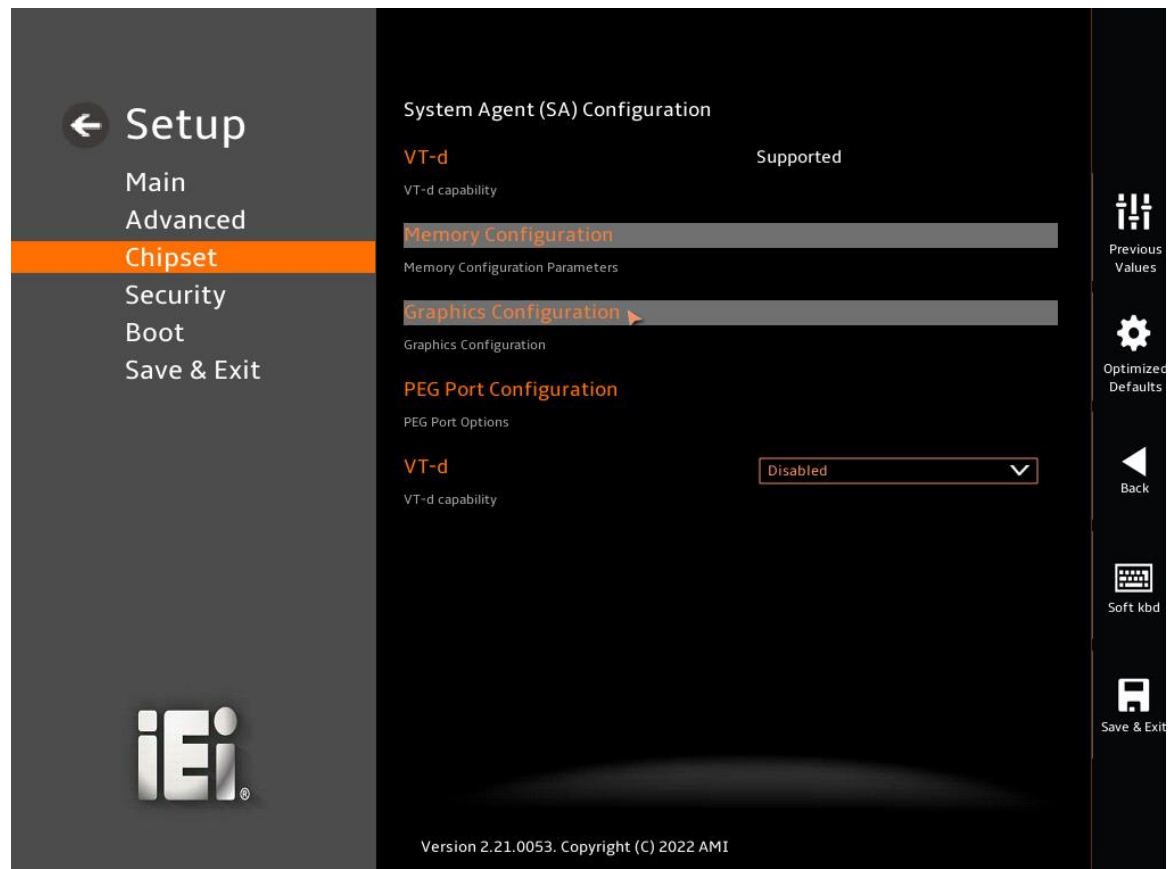
BIOS Menu 23: Chipset



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### 5.4.1 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 24**) to configure the System Agent (SA) parameters.



#### BIOS Menu 24: System Agent (SA) Configuration

##### → VT-d [Enabled]

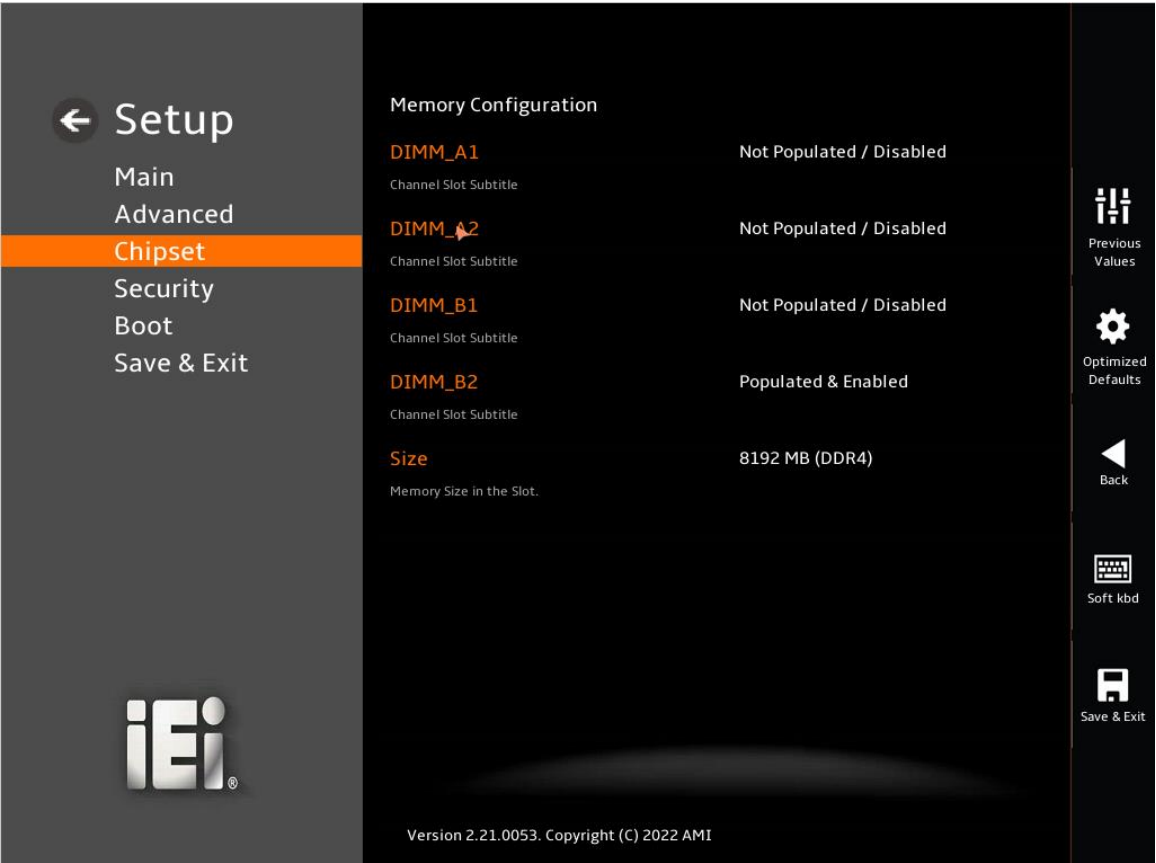
Use the **VT-d** option to enable or disable the VT-d capability.

- **Disabled**                      Disable the VT-d capability
- **Enabled**                      **DEFAULT**              Enable the VT-d capability



5.4.1.1 Memory Configuration

Use the **Memory Configuration** submenu (**BIOS Menu 25**) to view memory information.



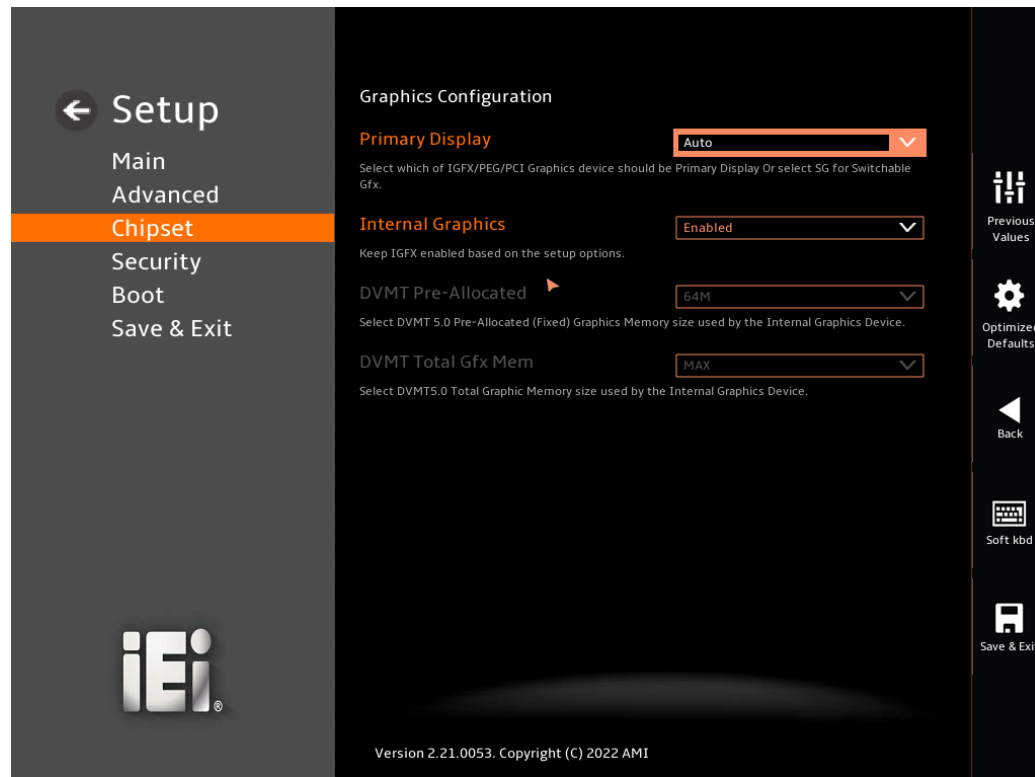
BIOS Menu 25: Memory Configuration



## IMBA-Q470 ATX Motherboard

## 5.4.1.2 Graphics Configuration

Use the **Graphics Configuration (BIOS Menu 26)** menu to configure the video device connected to the system.



## BIOS Menu 26: Graphics Configuration

## ➔ Primary Display [Auto]

Use the **Primary Display** option to select the primary graphics controller the system uses. The following options are available:

- Auto **Default**
- IGFX
- PEG
- PCI
- SG

## ➔ Internal Graphics [Enabled]

Use the **Internal Graphics** option to configure whether to keep IGFX enabled. If user wants to support dual display by internal graphics and external graphics, this Internal Graphics



option should be set to Enabled and the above Primary Display option should be set to IGFX.

- |   |          |         |                |
|---|----------|---------|----------------|
| ➔ | Auto     |         | Auto mode      |
| ➔ | Disabled |         | Disables IGFX. |
| ➔ | Enabled  | Default | Enables IGFX.  |

➔ DVMT Pre-Allocated [32M]

Use the **DVMT Pre-Allocated** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- |   |     |         |
|---|-----|---------|
| ▪ | 32M |         |
| ▪ | 64M | Default |

➔ DVMT Total Gfx Mem [256M]

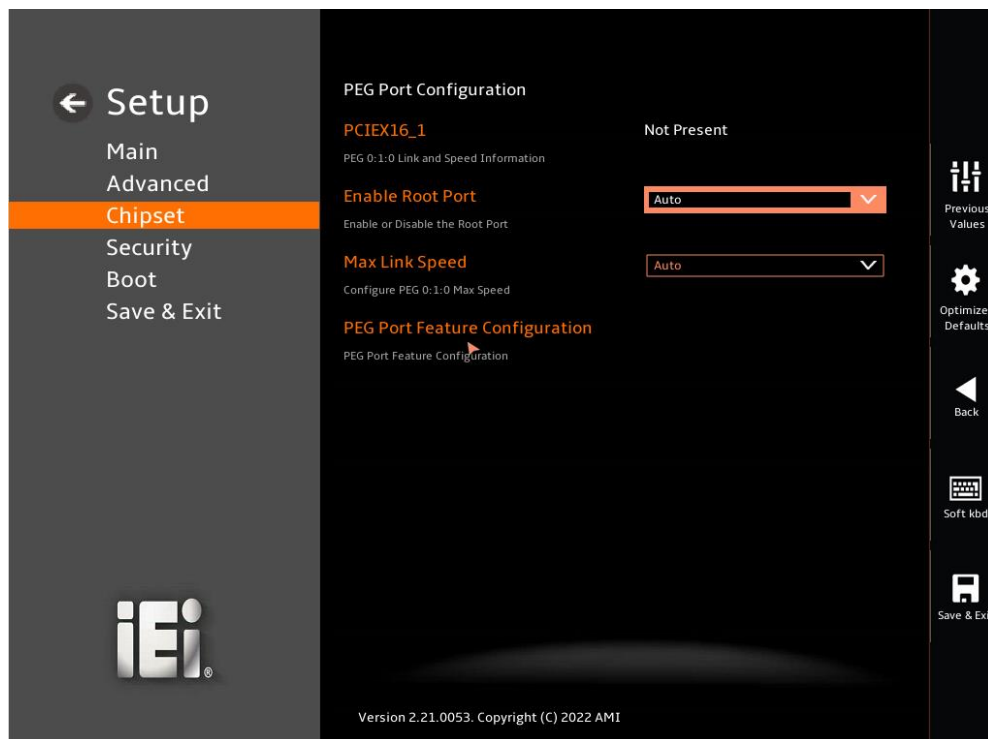
Use the **DVMT Total Gfx Mem** option to select DVMT5.0 total graphic memory size used by the internal graphic device. The following options are available:

- |   |      |         |
|---|------|---------|
| ▪ | 128M |         |
| ▪ | 256M |         |
| ▪ | MAX  | Default |



## IMBA-Q470 ATX Motherboard

## 5.4.1.3 PEG Port Configuration



## BIOS Menu 27: PEG Port Configuration

## ➔ Enable Root Port [Enabled]

Use the **Enable Root Port** option to enable or disable the PCI Express (PEG) controller.

- |   |                 |                |                                            |
|---|-----------------|----------------|--------------------------------------------|
| ➔ | <b>Disabled</b> |                | Disables the PCI Express (PEG) controller. |
| ➔ | <b>Enabled</b>  | <b>DEFAULT</b> | Enables the PCI Express (PEG) controller.  |

## ➔ Max Link Speed [Auto]

Use the **Max Link Speed** option to select the maximum link speed of the PCI Express slot.

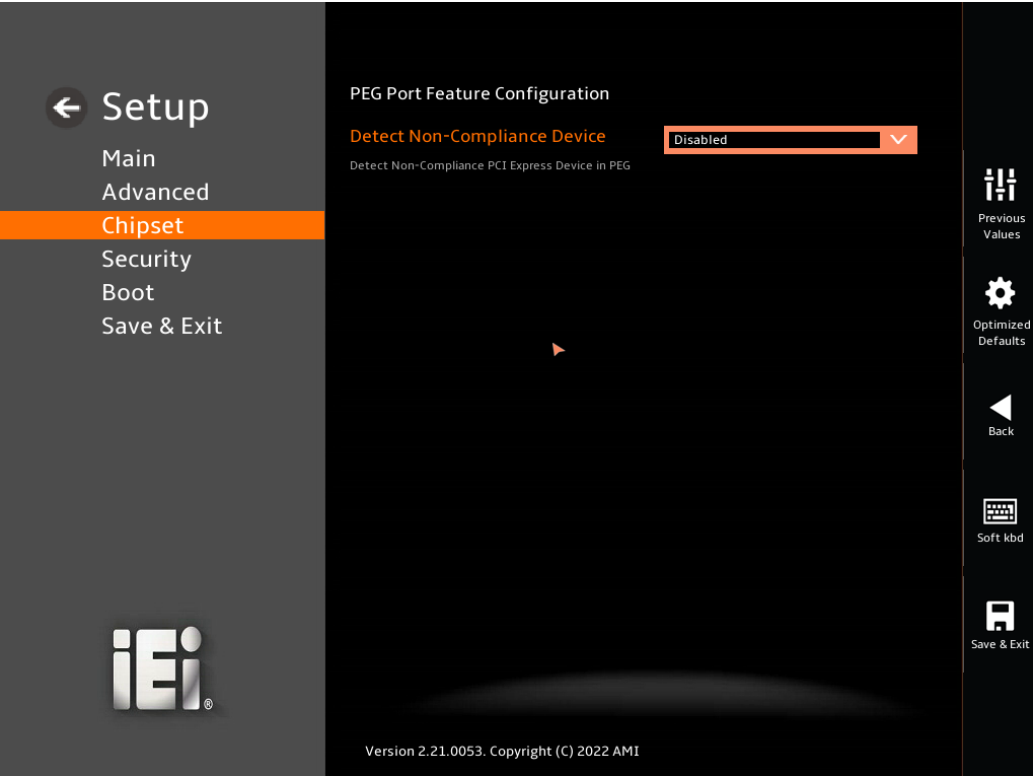
The following options are available:

- |   |      |                |
|---|------|----------------|
| ▪ | Auto | <b>Default</b> |
| ▪ | Gen1 |                |
| ▪ | Gen2 |                |
| ▪ | Gen3 |                |



5.4.1.3.1 PEG Port Feature Configuration

Use the **PEG Port Feature Configuration** submenu (**BIOS Menu 28**) to configure the SA PCIe settings.



BIOS Menu 28: PEG Port Feature Configuration

➔ Detect Non-Compliance Device [Disabled]

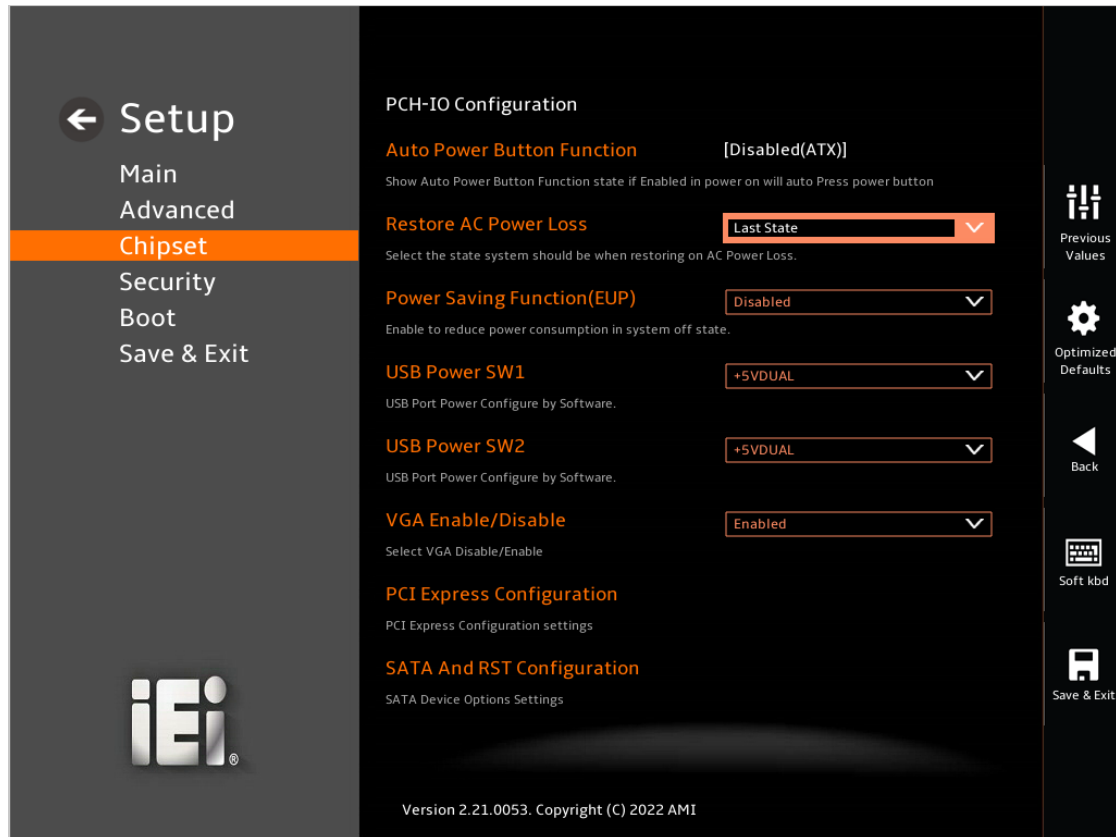
Use the **Detect Non-Compliance Device** option to detect non-compliance PCIe device in PEG.

- |   |          |         |                                                 |
|---|----------|---------|-------------------------------------------------|
| ➔ | Disabled | DEFAULT | Do not detect non-compliance PCIe device in PEG |
| ➔ | Enabled  |         | Detect non-compliance PCIe device in PEG        |

## IMBA-Q470 ATX Motherboard

## 5.4.2 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 29**) to configure the PCH parameters.



## BIOS Menu 29: PCH-IO Configuration

➔ **Auto Power Button Function [Enabled(AT)]**

Use the **Auto Power Button Function** BIOS option to show the power mode state. Use the **J\_ATX\_AT1** to switch the AT/ATX power mode.

- ➔ **Enabled (AT)**                      The system power mode is AT.
- ➔ **Disabled (ATX)**                      The system power mode is ATX.

➔ **Restore AC Power Loss [Last State]**

Use the **Restore AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system when the power mode is ATX.

- ➔ **Power Off**                      The system remains turned off
- ➔ **Power On**                      The system turns on
- ➔ **Last State      DEFAULT**      The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

### ➔ **Power Saving Function(EUP) [Disabled]**

Use the **Power Saving Function(EUP)** BIOS option to enable or disable the power saving function.

- ➔ **Disabled      DEFAULT**      Power saving function is disabled.
- ➔ **Enabled**                      Power saving function is enabled. It will reduce power consumption when the system is off.

### ➔ **VGA Enable/Disable [Enabled]**

Use the **VGA Enable/Disable** BIOS option to select VGA port Disable or enable

- ➔ **Disabled**                      VGA function is disabled.
- ➔ **Enabled      DEFAULT**      VGA function is enabled.

### ➔ **USB Power SW1 [+5V DUAL]**

Use the **USB Power SW1** BIOS option to configure the USB power source for the corresponding USB connectors (Table 5-3).

- ➔ **+5V DUAL      DEFAULT**      Sets the USB power source to +5V dual
- ➔ **+5V**                      Sets the USB power source to +5V

### ➔ **USB Power SW2 [+5V DUAL]**

Use the **USB Power SW2** BIOS option to configure the USB power source for the corresponding USB connectors (Table 5-3).

- ➔ **+5V DUAL      DEFAULT**      Sets the USB power source to +5V dual
- ➔ **+5V**                      Sets the USB power source to +5V

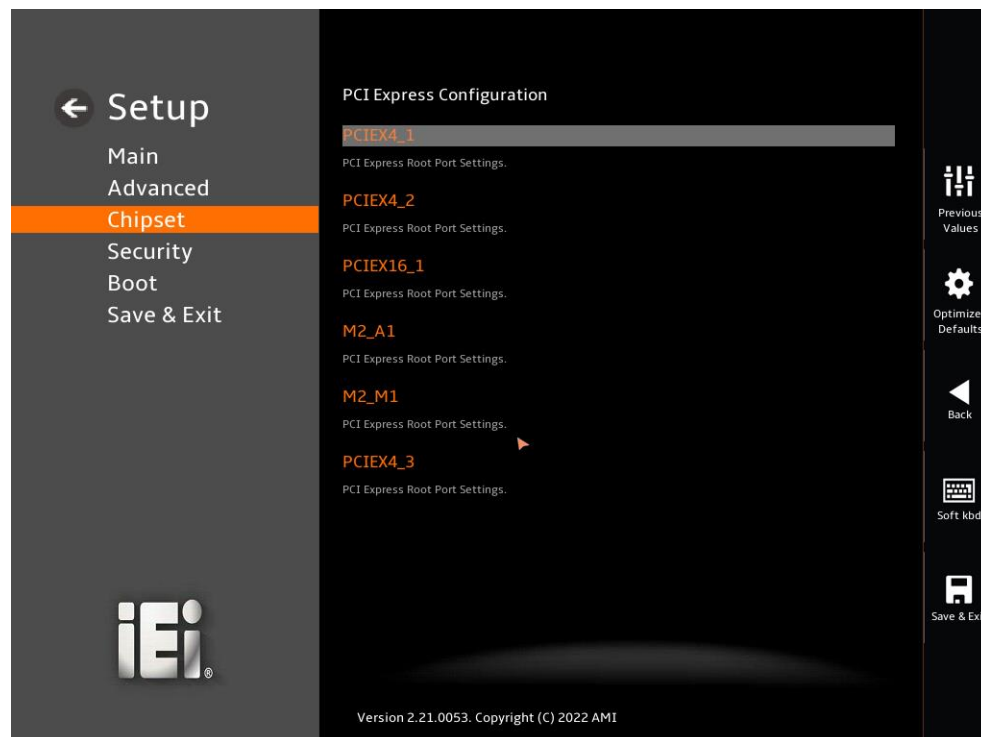
## IMBA-Q470 ATX Motherboard

| BIOS Options  | Configured USB Ports                                                                                                      |
|---------------|---------------------------------------------------------------------------------------------------------------------------|
| USB Power SW1 | K/M_USB1 (external USB 2.0 ports)<br>LAN1_USB1 (external USB 3.2 Gen 2 ports)<br>LAN2_USB2 (external USB 3.2 Gen 1 ports) |
| USB Power SW2 | USB1 (internal USB 2.0 ports)<br>USB2 (internal USB 2.0 ports)<br>USB3-1 (internal USB 3.2 Gen 1 ports)                   |

Table 5-3: BIOS Options and Configured USB Ports

## 5.4.2.1 PCI Express Configuration

Use the **PCI Express Configuration** submenu (**BIOS Menu 30**) to configure the PCI Express slots.



## BIOS Menu 30: PCI Express Configuration

## 5.4.2.1.1 PCIe Root Port Setting

Use the **PCIEX4\_1**, **PCIEX4\_2**, **PCIEX16\_1**, **M2\_A1**, **M2\_M1**, **PCIEX4\_3** submenu (**BIOS Menu 31**) to configure the PCI Root Port Setting.



## BIOS Menu 31: PCIe Slot Configuration Submenu

### → PCIe Speed [Auto]

Use the **PCIe Speed** option to specify the PCI Express port speed. Configuration options are listed below.

- |   |             |                |                               |
|---|-------------|----------------|-------------------------------|
| → | <b>Auto</b> | <b>DEFAULT</b> | Auto mode.                    |
| → | <b>Gen1</b> |                | Configure PCIe Speed to Gen1. |
| → | <b>Gen2</b> |                | Configure PCIe Speed to Gen2. |
| → | <b>Gen3</b> |                | Configure PCIe Speed to Gen3. |

### → Detect Non-Compliance Device [Disabled]

Use the **Detect Non-Compliance Device** option to configure whether to detect if a non-compliance PCI Express device is connected to the PCI Express port.

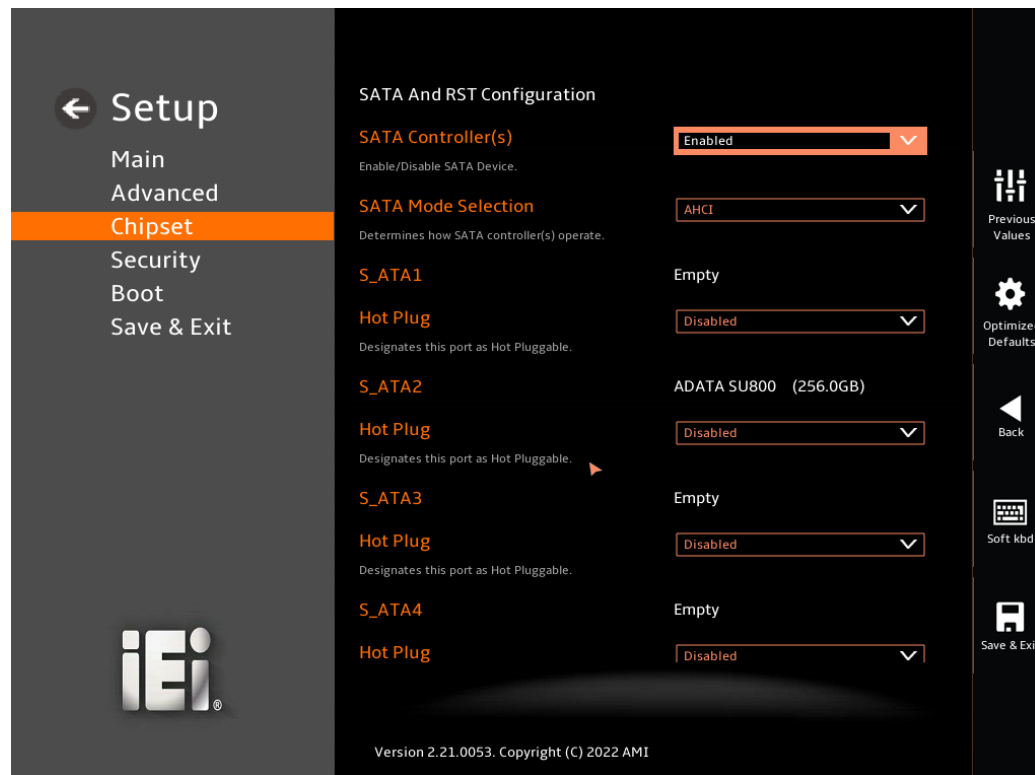
- |   |                 |                |                                                                                            |
|---|-----------------|----------------|--------------------------------------------------------------------------------------------|
| → | <b>Disabled</b> | <b>DEFAULT</b> | Do not detect if a non-compliance PCI Express device is connected to the PCI Express port. |
| → | <b>Enabled</b>  |                | Detect if a non-compliance PCI Express device is connected to the PCI Express port.        |



## IMBA-Q470 ATX Motherboard

## 5.4.2.2 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 32**) to change and/or set the configuration of the SATA devices installed in the system.



## BIOS Menu 32: SATA Configuration

➔ **SATA Controller(s) [Enabled]**

Use the **SATA Controller(s)** option to configure the SATA controller(s).

- ➔ **Enabled**      **DEFAULT**      Enables the on-board SATA controller(s).
- ➔ **Disabled**                      Disables the on-board SATA controller(s).

➔ **SATA Mode Selection [AHCI]**

Use the **SATA Mode Selection** option to determine how the SATA devices operate.

- ➔ **AHCI**      **DEFAULT**      Configures SATA devices as AHCI device.

➔ **Intel RST  
Premium  
With Intel  
Optane  
System  
Acceleration**

Configures SATA devices to the Intel RST Premium With Intel Optane System Acceleration mode.

➔ **Hot Plug [Disabled]**

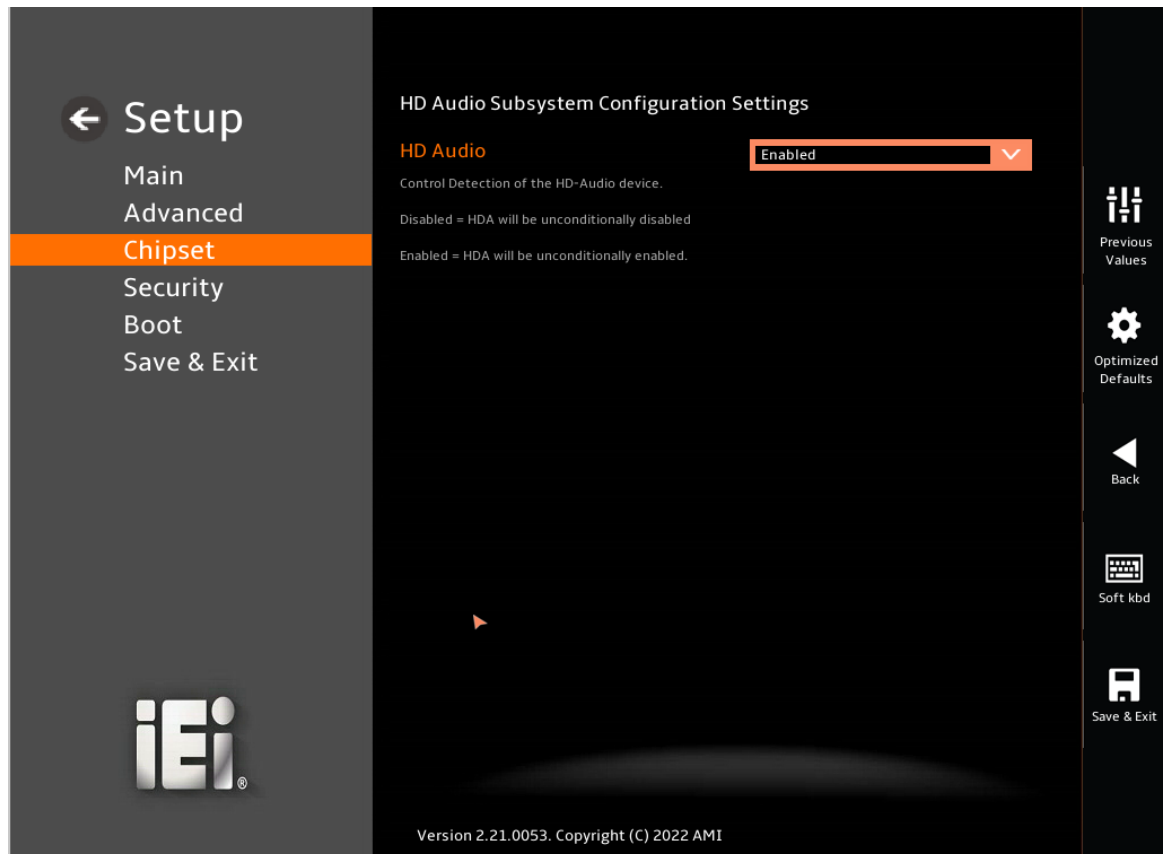
Use the **Hot Plug** option (for S\_ATA1 to S\_ATA4 and M2\_M1) to designate the correspondent port as hot-pluggable.

- |   |                 |                |                                                       |
|---|-----------------|----------------|-------------------------------------------------------|
| ➔ | <b>Disabled</b> | <b>DEFAULT</b> | Disables the hot-pluggable function of the SATA port. |
| ➔ | <b>Enabled</b>  |                | Designates the SATA port as hot-pluggable.            |

## IMBA-Q470 ATX Motherboard

## 5.4.2.3 HD Audio Configuration

Use the **HD Audio Configuration** menu (**BIOS Menu 33**) to configure the PCH Azalia settings.



## BIOS Menu 33: HD Audio Configuration

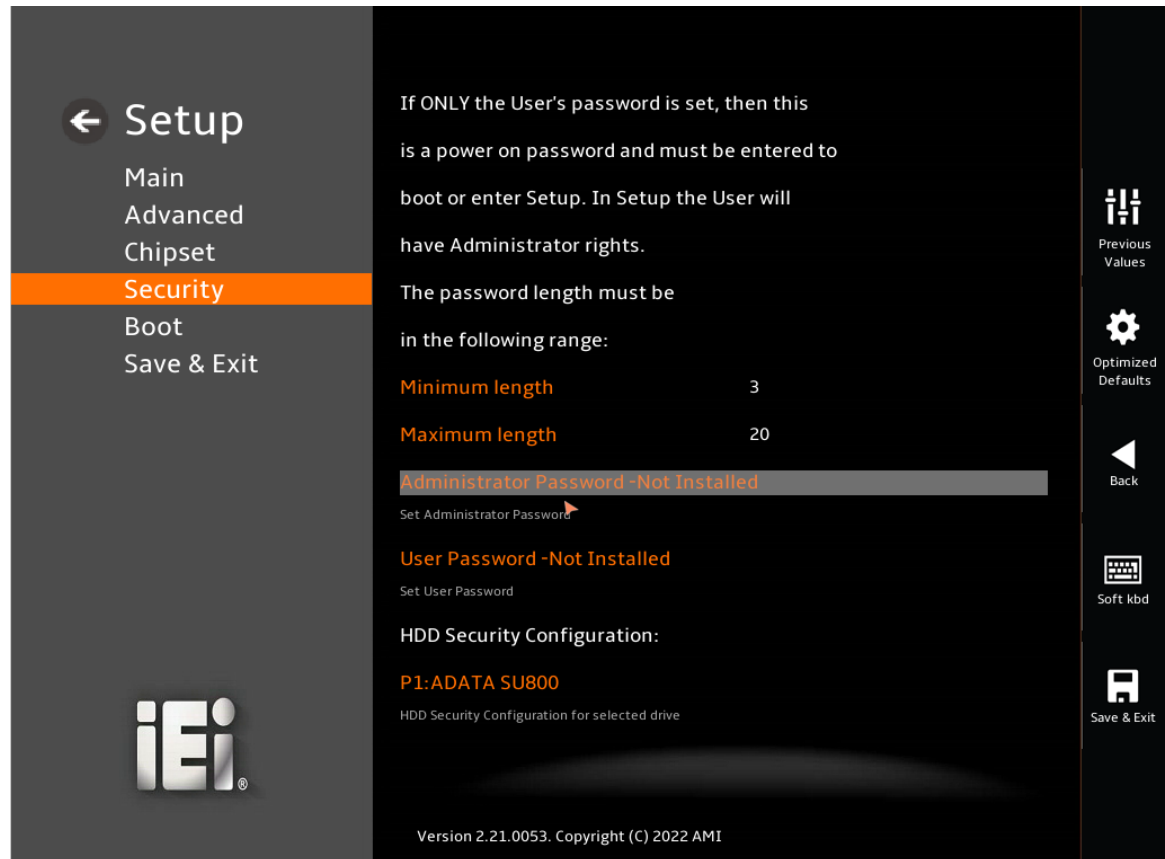
## → HD Audio [Auto]

Use the **HD Audio** option to enable or disable the High Definition Audio controller.

- **Disabled**                      The onboard High Definition Audio controller is disabled.
- **Enabled**    **DEFAULT**      The onboard High Definition Audio controller is enabled.

## 5.5 Security

Use the **Security** menu (**BIOS Menu 34**) to set system and user passwords.



### BIOS Menu 34: Security

#### → Administrator Password

Use the **Administrator Password** to set or change a administrator password.

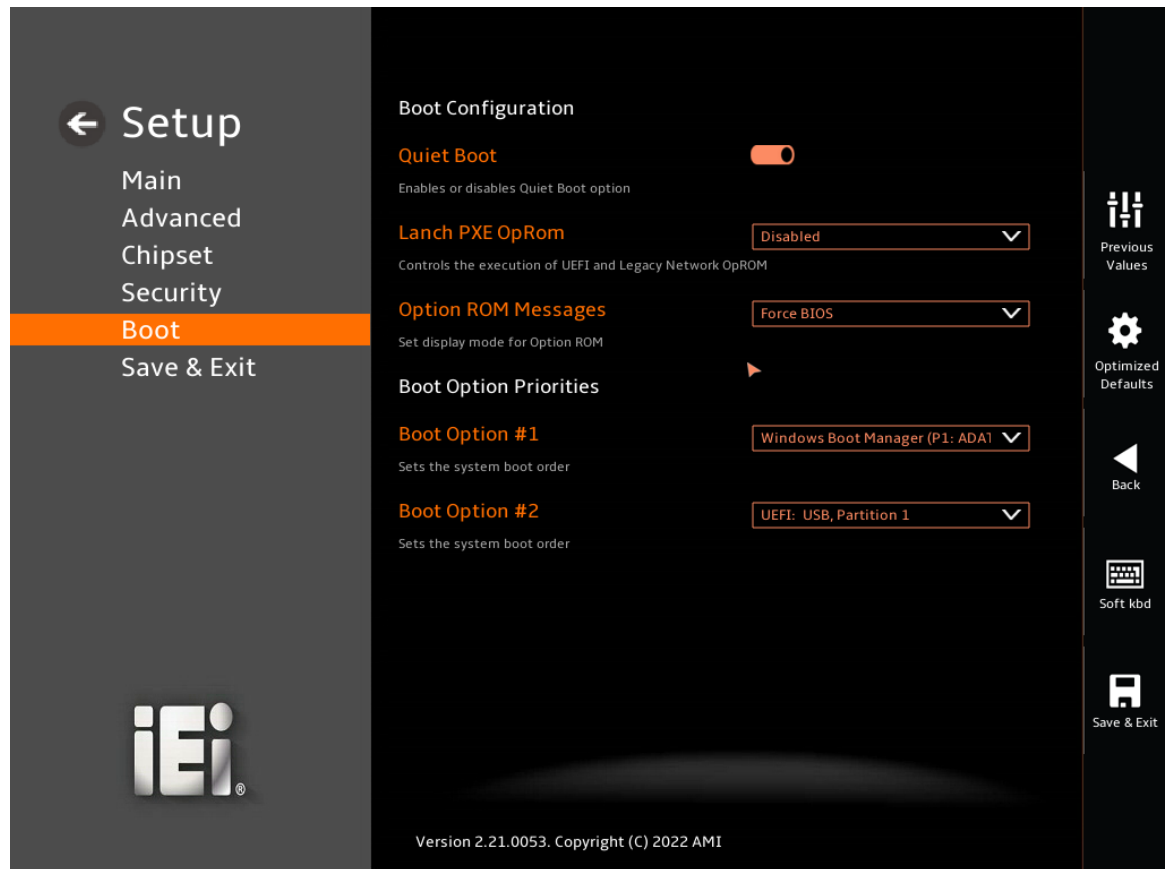
#### → User Password

Use the **User Password** to set or change a user password.

## IMBA-Q470 ATX Motherboard

## 5.6 Boot

Use the **Boot** menu (BIOS Menu 35) to configure system boot options.



## BIOS Menu 35: Boot

## 5.6.1 Boot Configuration

## → Quiet Boot [Enabled]

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

- |   |                 |                |                                             |
|---|-----------------|----------------|---------------------------------------------|
| → | <b>Disabled</b> |                | Normal POST messages displayed              |
| → | <b>Enabled</b>  | <b>DEFAULT</b> | OEM Logo displayed instead of POST messages |





➔ **Launch PXE OpROM [Disabled]**

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

- ➔ **Disabled**      **DEFAULT**      Ignore all PXE Option ROMs
- ➔ **Enabled**                      Load PXE Option ROMs.

➔ **Option ROM Messages [Force BIOS]**

Use the **Option ROM Messages** option to set the Option ROM display mode.

- ➔ **Force BIOS**      **DEFAULT**      Sets display mode to force BIOS.
- ➔ **Keep Current**                      Sets display mode to current.

**5.6.2 Boot Option Priorities**

Use the Boot Option # N to choose the system boots from the peripherals you selected. The following Boot Options are listed as an example.

➔ **Boot Option #1**

Sets the system boot order **ADATA SP580** as the first priority.

- ➔ **Windows Boot Manager (P1: ADATA SSD SP580 240GB)**
- ➔ **Disabled**

➔ **Boot Option #2**

Sets the system boot order **USB Partition 1** as the second priority.

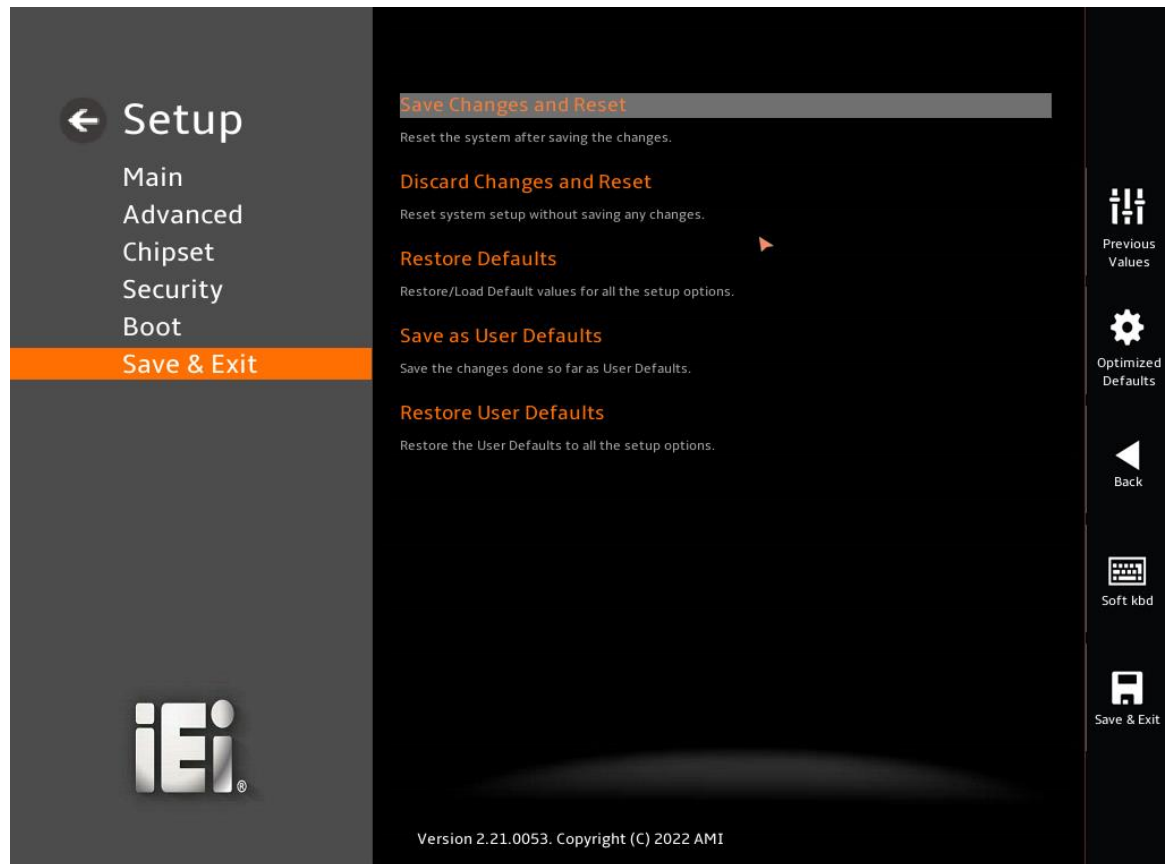
- ➔ **UEFI: USB, Partition 1**
- ➔ **Disabled**



## IMBA-Q470 ATX Motherboard

## 5.7 Save & Exit

Use the **Safe & Exit** menu (**BIOS Menu 36**) to load default BIOS values, optimal failsafe values and to save configuration changes.



### BIOS Menu 36: Save & Exit

#### → Save Changes and Reset

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

#### → Discard Changes and Reset

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

➔ **Restore Defaults**

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ **Save as User Defaults**

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ **Restore User Defaults**

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

**Appendix**

**A**

# **Regulatory Compliance**

---

**DECLARATION OF CONFORMITY**

This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

**FCC WARNING**

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



Appendix

**B**

# Product Disposal

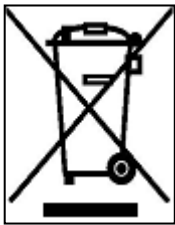
---

**CAUTION:**

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union–If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union–The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your device, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

Appendix

C

# BIOS Options

---



Below is a list of BIOS configuration options in the BIOS chapter.

- ➔ **BIOS Information .....92**
- ➔ **Processor Information.....92**
- ➔ **PCH Information.....93**
- ➔ **System Date [xx/xx/xx] .....93**
- ➔ **System Time [xx:xx:xx] .....93**
- ➔ **Intel (VMX) Virtualization Technology [Disabled] .....97**
- ➔ **Active Processor Cores [All] .....97**
- ➔ **Hyper-Threading [Enabled].....97**
- ➔ **Intel(R) SpeedStep(tm) [Enabled].....97**
- ➔ **C states [Disabled].....98**
- ➔ **Tcc Activation Offset [Enabled].....98**
- ➔ **Power Limit 1 Override [Disabled] .....98**
- ➔ **Power Limit 2 Override [Disabled] .....98**
- ➔ **Turbo Mode [Enabled] .....98**
- ➔ **Unconfigure ME [Disabled] .....99**
- ➔ **Security Device Support [Disable] .....100**
- ➔ **Pending Operation [None] .....100**
- Use the Pending Operation option to schedule an operation for the security device. ....100**
- ➔ **Serial Port [Enabled].....102**
- ➔ **Device Settings .....102**
- ➔ **Serial Port [Enabled].....103**
- ➔ **Device Settings .....103**
- ➔ **Serial Port [Enabled].....104**
- ➔ **Device Settings .....104**
- ➔ **Serial Port [Enabled].....105**
- ➔ **Device Settings .....105**
- ➔ **Serial Port [Enabled].....106**
- ➔ **Device Settings .....106**
- ➔ **Device Mode [Printer Mode].....107**
- ➔ **Serial Port [Enabled].....108**
- ➔ **Device Settings .....108**
- ➔ **PC Health Status .....109**
- ➔ **CPU\_FAN1 Smart Fan Control [Auto Mode] .....110**



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|                                                  |     |
|--------------------------------------------------|-----|
| ➔ CPU_FAN1 Start Temperature .....               | 111 |
| ➔ CPU_FAN1 Off Temperature .....                 | 111 |
| ➔ CPU_FAN1 Start PWM .....                       | 111 |
| ➔ SYS_FAN1 Smart Fan Control [Auto Mode] .....   | 111 |
| ➔ SYS_FAN1 Start Temperature .....               | 111 |
| ➔ SYS_FAN1 Off Temperature .....                 | 111 |
| ➔ SYS_FAN1 Start PWM .....                       | 112 |
| ➔ Auto Mode Fan Slope PWM .....                  | 112 |
| ➔ Console Redirection [Disabled] .....           | 113 |
| ➔ Terminal Type [ANSI] .....                     | 114 |
| ➔ Bits per second [115200] .....                 | 114 |
| ➔ Data Bits [8] .....                            | 115 |
| ➔ Parity [None] .....                            | 115 |
| ➔ Stop Bits [1] .....                            | 115 |
| ➔ VT-d [Enabled] .....                           | 119 |
| ➔ Primary Display [Auto] .....                   | 121 |
| ➔ Internal Graphics [Enabled] .....              | 121 |
| ➔ DVMT Pre-Allocated [32M] .....                 | 122 |
| ➔ DVMT Total Gfx Mem [256M] .....                | 122 |
| ➔ Enable Root Port [Enabled] .....               | 123 |
| ➔ Max Link Speed [Auto] .....                    | 123 |
| ➔ Detect Non-Compliance Device [Disabled] .....  | 124 |
| ➔ Auto Power Button Function [Enabled(AT)] ..... | 125 |
| ➔ Restore AC Power Loss [Last State] .....       | 125 |
| ➔ Power Saving Function(EUP) [Disabled] .....    | 126 |
| ➔ VGA Enable/Disable [Enabled] .....             | 126 |
| ➔ USB Power SW1 [+5V DUAL] .....                 | 126 |
| ➔ USB Power SW2 [+5V DUAL] .....                 | 126 |
| ➔ PCIe Speed [Auto] .....                        | 128 |
| ➔ Detect Non-Compliance Device [Disabled] .....  | 128 |
| ➔ SATA Controller(s) [Enabled] .....             | 129 |
| ➔ SATA Mode Selection [AHCI] .....               | 129 |
| ➔ Hot Plug [Disabled] .....                      | 130 |
| ➔ HD Audio [Auto] .....                          | 131 |
| ➔ Administrator Password .....                   | 132 |





|   |                                       |     |
|---|---------------------------------------|-----|
| ➔ | User Password .....                   | 132 |
| ➔ | Quiet Boot [Enabled] .....            | 133 |
| ➔ | Launch PXE OpROM [Disabled] .....     | 134 |
| ➔ | Option ROM Messages [Force BIOS]..... | 134 |
| ➔ | Boot Option #1 .....                  | 134 |
| ➔ | Boot Option #2 .....                  | 134 |
| ➔ | Save Changes and Reset .....          | 135 |
| ➔ | Discard Changes and Reset .....       | 135 |
| ➔ | Restore Defaults .....                | 136 |
| ➔ | Save as User Defaults .....           | 136 |
| ➔ | Restore User Defaults .....           | 136 |



Appendix

D

# Watchdog Timer

---

**NOTE:**

The following discussion applies to DOS environment. Contact IEI support or visit the IEI website for specific drivers for other operating systems.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

| AH – 6FH Sub-function: |                                                                                                       |
|------------------------|-------------------------------------------------------------------------------------------------------|
| AL – 2:                | Sets the Watchdog Timer's period.                                                                     |
| BL:                    | Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup). |

**Table D-1: AH-6FH Sub-function**

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

## IMBA-Q470 ATX Motherboard

**NOTE:**

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

**EXAMPLE PROGRAM:**

**; INITIAL TIMER PERIOD COUNTER**

;

**W\_LOOP:**

;

```

MOV      AX, 6F02H      ;setting the time-out value
MOV      BL, 30          ;time-out value is 48 seconds
INT      15H

```

;

**; ADD THE APPLICATION PROGRAM HERE**

;

```

CMP      EXIT_AP, 1      ;is the application over?
JNE      W_LOOP          ;No, restart the application

MOV      AX, 6F02H      ;disable Watchdog Timer
MOV      BL, 0           ;
INT      15H

```

;

**; EXIT ;**

**Appendix**

**E**

# Error Beep Code

---



## IMBA-Q470 ATX Motherboard

## E.1 PEI Beep Codes

| Number of Beeps | Description                                                                       |
|-----------------|-----------------------------------------------------------------------------------|
| 4               | Memory not Installed                                                              |
| 1               | Memory was installed twice<br>(InstallPeiMemory routine in PEI Core called twice) |
| 2               | Recovery started                                                                  |
| 3               | DXE IPL was not found                                                             |
| 3               | DXE Core Firmware Volume was not found                                            |
| 4               | Recovery failed                                                                   |
| 4               | S3 Resume failed                                                                  |
| 7               | Reset PPI is not available                                                        |

## E.2 DXE Beep Codes

| Number of Beeps | Description                                           |
|-----------------|-------------------------------------------------------|
| 1               | Invalid password                                      |
| 4               | Some of the Architectural Protocols are not available |
| 5               | No Console Output Devices are found                   |
| 5               | No Console Input Devices are found                    |
| 6               | Flash update is failed                                |
| 7               | Reset protocol is not available                       |
| 8               | Platform PCI resource requirements cannot be met      |

**NOTE:**

If you have any question, please contact IEI for further assistance.

**Appendix**

**F**

# **Hazardous Materials Disclosure**

---

## IMBA-Q470 ATX Motherboard

## F.1 RoHS Directive (2015/863/EU)

The details provided in this appendix are to ensure that the product is compliant with the RoHS Directive (2015/863/EU). The table below acknowledges the presences of small quantities of certain substances in the product, and is applicable to RoHS Directive (2015/863/EU).

Please refer to the following table.

| Part Name                                                                                                                                                                                                                                                                                                                                           | Toxic or Hazardous Substances and Elements |              |              |                              |                                |                                       |                                    |                              |                         |                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------|--------------|------------------------------|--------------------------------|---------------------------------------|------------------------------------|------------------------------|-------------------------|-----------------------------|
|                                                                                                                                                                                                                                                                                                                                                     | Lead (Pb)                                  | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (CR(VI)) | Polybrominated Biphenyls (PBB) | Polybrominated Diphenyl Ethers (PBDE) | Bis(2-ethylhexyl) phthalate (DEHP) | Butyl benzyl phthalate (BBP) | Dibutyl phthalate (DBP) | Diisobutyl phthalate (DIBP) |
| Housing                                                                                                                                                                                                                                                                                                                                             | O                                          | O            | O            | O                            | O                              | O                                     | O                                  | O                            | O                       | O                           |
| Printed Circuit Board                                                                                                                                                                                                                                                                                                                               | O                                          | O            | O            | O                            | O                              | O                                     | O                                  | O                            | O                       | O                           |
| Metal Fasteners                                                                                                                                                                                                                                                                                                                                     | O                                          | O            | O            | O                            | O                              | O                                     | O                                  | O                            | O                       | O                           |
| Cable Assembly                                                                                                                                                                                                                                                                                                                                      | O                                          | O            | O            | O                            | O                              | O                                     | O                                  | O                            | O                       | O                           |
| Fan Assembly                                                                                                                                                                                                                                                                                                                                        | O                                          | O            | O            | O                            | O                              | O                                     | O                                  | O                            | O                       | O                           |
| Power Supply Assemblies                                                                                                                                                                                                                                                                                                                             | O                                          | O            | O            | O                            | O                              | O                                     | O                                  | O                            | O                       | O                           |
| Battery                                                                                                                                                                                                                                                                                                                                             | O                                          | O            | O            | O                            | O                              | O                                     | O                                  | O                            | O                       | O                           |
| <p>O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in Directive (EU) 2015/863.</p> <p>X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in Directive (EU) 2015/863.</p> |                                            |              |              |                              |                                |                                       |                                    |                              |                         |                             |



F.2 China RoHS

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

| 部件名称                                                                                                                                                               | 有毒有害物质或元素 |        |        |              |            |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------|--------|--------------|------------|--------------|
|                                                                                                                                                                    | 铅 (Pb)    | 汞 (Hg) | 镉 (Cd) | 六价铬 (CR(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 壳体                                                                                                                                                                 | O         | O      | O      | O            | O          | O            |
| 印刷电路板                                                                                                                                                              | O         | O      | O      | O            | O          | O            |
| 金属螺帽                                                                                                                                                               | O         | O      | O      | O            | O          | O            |
| 电缆组装                                                                                                                                                               | O         | O      | O      | O            | O          | O            |
| 风扇组装                                                                                                                                                               | O         | O      | O      | O            | O          | O            |
| 电力供应组装                                                                                                                                                             | O         | O      | O      | O            | O          | O            |
| 电池                                                                                                                                                                 | O         | O      | O      | O            | O          | O            |
| <p>O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11364-2014 與 GB/T26572-2011 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11364-2014 與 GB/T26572-2011 标准规定的限量要求。</p> |           |        |        |              |            |              |

