



# IMB-1317

## User Manual

Version 1.1

Published December 16, 2025

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Version 1.0

Published December 10, 2025

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Please keep batteries out of sight or reach of children.

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## Button Battery Safety Notice

|  <b>WARNING</b>                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• <b>INGESTION HAZARD:</b> This product contains a button cell or coin battery.</li><li>• <b>DEATH</b> or serious injury can occur if ingested.</li><li>• A swallowed button cell or coin battery can cause <b>Internal Chemical Burns</b> in as little as <b>2 hours</b>.</li><li>• <b>KEEP</b> new and used batteries <b>OUT OF REACH of CHILDREN</b></li><li>• <b>Seek immediate medical attention</b> if a battery is suspected to be swallowed or inserted inside any part of the body.</li></ul> |  |

- Remove and immediately recycle or dispose of used batteries according to local regulations and keep away from children. Do NOT dispose of batteries in household trash or incinerate.
- Even used batteries may cause severe injury or death.
- Call a local poison control center for treatment information.
- Battery type: CR2032
- Battery voltage: 3V
- Non-rechargeable batteries are not to be recharged.
- Do not force discharge, recharge, disassemble, heat above (manufacturer's specified temperature rating) or incinerate. Doing so may result in injury due to venting, leakage or explosion resulting in chemical burns.
- This product contains an irreplaceable battery.
- This icon indicates that a swallowed button battery can cause serious injury or death. Please keep batteries out of sight or reach of children.

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# Chapter 1 Introduction

Thank you for purchasing ASRockInd **IMB-1317** motherboard, a reliable motherboard produced under ASRockInd's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRockInd's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 contains the configuration guide to BIOS setup.



*Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRockInd website without further notice. You may find the latest CPU support lists on ASRockInd website as well.*

*ASRockInd website <https://www.asrockind.com/IMB-1317>*

*If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.*

*<https://www.asrockind.com/zh-tw/technical-support>*

## 1.1 Package Contents

ASRockInd **IMB-1317** Motherboard (Micro-ATX (9.6-in x 9.6-in x 1.81-in, 24.4 cm x 24.4 cm x 4.61 cm))

ASRockInd **IMB-1317** Jumper Setting Instruction

### **Gift Package:**

2 x SATA Cable

1 x I/O Shield

3 x SCREW M3\*2.5

### **Bulk Package:**

2 x SATA Cable

3 x SCREW M3\*2.5

### **Option:**

2 x DIMM BRACKET (13G03P003000AI)

\*Please contact regional Sales for the inquiry.

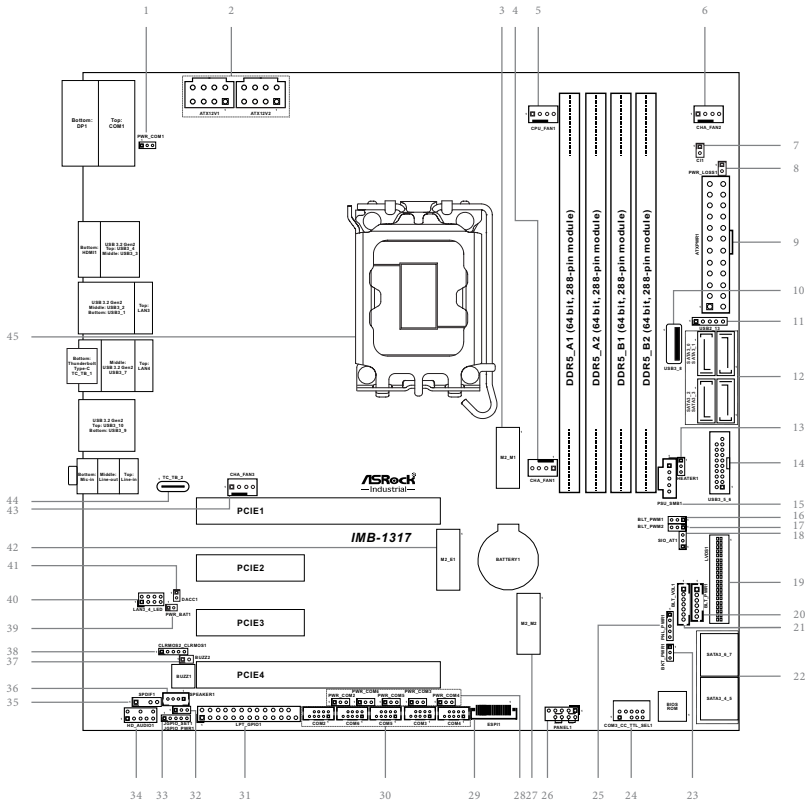
## 1.2 Specifications

|                  |                  |                                                                                                                                                |
|------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Form Factor      | Dimensions       | Micro-ATX (9.6-in x 9.6-in x 1.81-in, 24.4 cm x 24.4 cm x 4.61 cm)                                                                             |
| Processor System | CPU              | Intel® Core™ Ultra processors (Arrow Lake-S), up to 125W                                                                                       |
|                  | Chipset          | Q870                                                                                                                                           |
|                  | Socket           | LGA1851                                                                                                                                        |
|                  | BIOS             | AMI SPI 256 Mbit                                                                                                                               |
| Memory           | Technology       | Dual Channel DDR5 6400/5600 MHz                                                                                                                |
|                  | Capacity         | 256GB (64GB per DIMM)                                                                                                                          |
|                  | Socket           | 4 x 288-pin Long-DIMM                                                                                                                          |
| Graphics         | Controller       | Intel® X <sup>e</sup> LPG Graphics                                                                                                             |
|                  | HDMI             | HDMI 2.1<br>Max resolution up to 7680x4320@60Hz                                                                                                |
|                  | DisplayPort      | DisplayPort 2.1/1.4a, DP++<br>Max resolution up to 4096x2160@60Hz                                                                              |
|                  | LVDS             | Dual channel 24 bit up to 1920x1200@60Hz<br>(Connector shared with eDP)                                                                        |
|                  | eDP              | Max resolution up to 1920x1200@60Hz<br>(Connector shared with LVDS)                                                                            |
|                  | Multi Display    | Quad display (Included 2 output from Type-C)                                                                                                   |
| Expansion Slot   | PCIe             | 2 x PCIe Gen5 Slots (PCIe1/PCIe4:single at x16 (PCIe1); dual at x8 (PCIe1)/x8 (PCIe4)) (PCIe1: Support Riser card x8/x8)<br>2 x PCIe x4 (Gen4) |
|                  | M.2              | 1 x M.2 (Key E, 2230) with PCIe Gen4 x1, USB 2.0 and CNVio/CNVio2 for Wireless                                                                 |
| Audio            | Interface        | Realtek ALC897 HD, High Definition Audio. Line-In, Line-Out, Mic-In                                                                            |
| Ethernet         | Controller/Speed | LAN3: Intel® I219LM with 10/100/1000 Mbps, supports vPro<br>LAN4: Intel® I226V with 10/100/1000/2500 Mbps                                      |
|                  | Controller       | 2 x RJ-45                                                                                                                                      |

|                    |                    |                                                                                                                                                                                                                                                                      |
|--------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rear I/O           | HDMI               | 1 x HDMI 2.1                                                                                                                                                                                                                                                         |
|                    | DisplayPort        | 1 x DP 1.4a++                                                                                                                                                                                                                                                        |
|                    | Ethernet           | 1 x 1 Gigabit LAN<br>1 x 2.5 Gigabit LAN                                                                                                                                                                                                                             |
|                    | USB                | 7 x USB 3.2 Gen2<br>1 x USB4/Thunderbolt™4 (5V/3A, supports DP 2.1 display output)<br>* For Thunderbolt support, please refer to support list.                                                                                                                       |
|                    | Audio              | 3 (Mic-in, Line-in, Line-out)                                                                                                                                                                                                                                        |
|                    | COM                | COM1 (RS-232/422/485)                                                                                                                                                                                                                                                |
| Internal Connector | USB                | 1 x USB 2.0 (1 x 2.00 pitch header)<br>1 x USB 3.2 Gen2 vertical connector<br>2 x USB 3.2 Gen1 (1 x USB 3.2 header)<br>1 x USB4/Thunderbolt™4 vertical connector (5V/3A, supports DP 2.1 display output)<br>* For Thunderbolt support, please refer to support list. |
|                    | COM                | COM2 (RS-232/422/485)<br>COM3 (RS-232/TTL 5V/ccTalk) (Switch by Jumper setting)<br>COM4, COM5, COM6 (RS-232)                                                                                                                                                         |
|                    | Parallel           | 1 (shared with GPIO)                                                                                                                                                                                                                                                 |
|                    | GPIO               | 8 x GPI, 8 x GPO (shaerd with LPT header)                                                                                                                                                                                                                            |
|                    | LVDS               | 1 (Connector with LVDS/eDP signal, switch by BIOS)<br>*To use an eDP panel, set Active LVDS to [Enable] and Panel Type Selection to [eDP Bypass Mode] to enable output.                                                                                              |
|                    | Speaker Header     | 1                                                                                                                                                                                                                                                                    |
|                    | Thunderbolt header | 1                                                                                                                                                                                                                                                                    |
| Storage            | M.2                | 1 x M.2 (Key M, 2242/2280) with PCIe Gen5 x4 for SSD<br>1 x M.2 (Key M, 2242/2280) with PCIe Gen4 x4 for SSD                                                                                                                                                         |
|                    | SATA               | 8 x SATA3 (6Gb/s)                                                                                                                                                                                                                                                    |
|                    | RAID               | Intel® VMD RAID 0/1/5/10<br>**supported by identical interface (PCIe or SATA)<br>PCIe interface: 2 x M.2 Key M<br>SATA interface: SATA port                                                                                                                          |

|                    |                       |                                                                                                                         |
|--------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------|
| Security           | TPM                   | TPM 2.0 onboard IC                                                                                                      |
| Watchdog           | Output                | From Super I/O to drag RESETCON#                                                                                        |
| Timer              | Interval              | 256 Segments, 0, 1, 2, ...255 sec                                                                                       |
| Power Requirements | Input PWR             | ATX PWR (24+8+8-pin)                                                                                                    |
|                    | Power On              | AT/ATX Supported<br>- AT: Directly PWR on as power input ready<br>- ATX: Press button to PWR on after power input ready |
| Environment        | Operating Temperature | -20°C ~ 70°C                                                                                                            |
|                    | Storage Temperature   | -40°C ~ 85°C                                                                                                            |
|                    | Operating Humidity    | 5% ~ 90%                                                                                                                |
|                    | Storage Humidity      | 5% ~ 90%                                                                                                                |

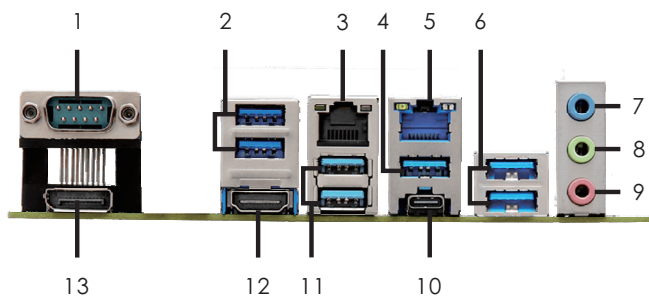
### 1.3 Motherboard Layout



- 1 : COM Port PWR Setting Jumper  
PWR\_COM1 (For COM Port1)
- 2 : 8-pin ATX 12V Power Connectors (ATX12V1, ATX12V2)
- 3 : M.2 Key-M Socket (M2\_M1)
- 4 : Chassis FAN Connector (+12V) (CHA\_FAN1)
- 5 : CPU FAN Connectors (+12V) (CPU\_FAN1)
- 6 : Chassis FAN Connector (+12V) (CHA\_FAN2)
- 7 : Chassis Intrusion Header (CI1)
- 8 : PWR LOSS Header (PWR\_LOSS1)
- 9 : 24-pin ATX Power Input Connector (ATXPWR1)
- 10 : USB 3.0 Type-A Port (Vertical) (USB3\_8)
- 11 : USB 2.0 Header (USB2\_13)
- 12 : SATA3 Connector (SATA3\_0~SATA3\_3)
- 13 : HEATER1 Header (HEATER1) (Preheat function)
- 14 : USB 3.2 Header (USB3\_5\_6)
- 15 : PSU\_SMB1
- 16 : Brightness Control Mode (BLT\_PWM1)
- 17 : Brightness Control Voltage Mode (BLT\_PWM2)
- 18 : ATX/AT Mode Jumper (SIO\_AT1)
- 19 : LVDS Panel Connector (LVDS1)
- 20 : Inverter Power Control Wafer (BLT\_PWR1)
- 21 : Backlight Volume Control (BLT\_VOL1)
- 22 : SATA3 Connector (SATA3\_4~SATA3\_7)
- 23 : Backlight Power Select (LCD\_BLT\_VCC) (BKT\_PWR1)
- 24 : COM3\_CC\_TTL\_SEL1
- 25 : Panel Power Select (PNL\_PWR1)
- 26 : System Panel Header (PANEL1)
- 27 : M.2 Key-M Socket (M2\_M2)
- 28 : COM Port PWR Setting Jumpers  
PWR\_COM2 (For COM Port2)  
PWR\_COM3 (For COM Port3)  
PWR\_COM4 (For COM Port4)  
PWR\_COM5 (For COM Port5)  
PWR\_COM6 (For COM Port6)
- 29 : ESPI Header (ESPI1)
- 30 : COM Port Headers  
COM2 (RS232/422/485)  
COM3~COM6 (RS232)
- 31 : Printer Port/GPIO Header (LPT\_GPIO1)
- 32 : Digital Input/Output Default Value Setting (JGPIO\_SET1)
- 33 : Digital Input/Output Power Select (JGPIO\_PWR) (JGPIO\_PWR1)

- 34 : Front Panel Audio Header (HD\_AUDIO1)
- 35 : SPDIF Header (SPDIF1)
- 36 : 3W Audio Output Wafer (SPEAKER1)
- 37 : Buzzer Header (BUZZ2)
- 38 : Clear CMOS Header (CLRMOS2\_CLRMOS1)
- 39 : PWR\_BAT1
- 40 : LAN LED Header
  - LAN3\_4\_LED (For LAN3, LAN4 Ports)
- 41 : DACC1
- 42 : M.2 Key-E Socket (M2\_E1)
- 43 : Chassis FAN Connector (+12V) (CHA\_FAN3)
- 44 : Thunderbolt Type-C Port (TC\_TB\_2)
- 45 : Socket LGA1851 RL-ILM
  - \*35LB thermal solution load required.

## 1.4 I/O Panel



- |   |                                                      |    |                                                     |
|---|------------------------------------------------------|----|-----------------------------------------------------|
| 1 | COM Port (COM1) (RS232/422/485)*                     | 7  | Audio Jack : Blue - Line In                         |
| 2 | USB 3.2 Gen2 Ports<br>Top: USB3_4<br>Bottom: USB3_3  | 8  | Audio Jack : Green - Line Out                       |
| 3 | RJ45 LAN Port (LAN3) (1G)**<br>(supports Vpro)       | 9  | Audio Jack : Pink - Mic In                          |
| 4 | USB 3.2 Gen2 Port (USB3_7)                           | 10 | Thunderbolt Type-C Port (TC_TB_1)                   |
| 5 | RJ45 LAN Port (LAN4) (2.5G)***                       | 11 | USB 3.2 Gen2 Ports<br>Top: USB3_2<br>Bottom: USB3_1 |
| 6 | USB 3.2 Gen2 Ports<br>Top: USB3_10<br>Bottom: USB3_9 | 12 | HDMI Port (HDMI1)                                   |
|   |                                                      | 13 | DisplayPort (DP1)                                   |

\* This motherboard supports RS232/422/485 on COM1 port. Please refer to the table below for the pin definition. In addition, COM1 port (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to our user manual for details.

#### COM1 Port Pin Definition

| Pin | RS232 | RS422 | RS485 |
|-----|-------|-------|-------|
| 1   | DCD   | TX-   | RTX-  |
| 2   | RXD   | TX+   | RTX+  |
| 3   | TXD   | RX+   | NA    |
| 4   | DTR   | RX-   | NA    |
| 5   | GND   | GND   | GND   |
| 6   | DSR   | NA    | NA    |
| 7   | RTS   | NA    | NA    |
| 8   | CTS   | NA    | NA    |
| 9   | PWR   | PWR   | PWR   |

\*\* There are two LEDs next to the LAN3 port. Please refer to the table below for the LAN3 port LED indications.

#### LAN3 Port LED Indications

| Activity/Link LED |               | SPEED LED |                     | ACT/LINK LED                                                                      | SPEED LED |
|-------------------|---------------|-----------|---------------------|-----------------------------------------------------------------------------------|-----------|
| Status            | Description   | Status    | Description         |                                                                                   |           |
| Off               | No Link       | Off       | 10 Mbps connection  |  |           |
| Blinking          | Data Activity | Orange    | 100 Mbps connection |                                                                                   |           |
| On                | Link          | Green     | 1 Gbps connection   |                                                                                   |           |

LAN3 Port

\*\*\* There are two LEDs next to the LAN4 port. Please refer to the table below for the LAN4 port LED indications.

#### LAN4 Port LED Indications

| Activity/Link LED |               | SPEED LED |                        | ACT/LINK LED                                                                        | SPEED LED |
|-------------------|---------------|-----------|------------------------|-------------------------------------------------------------------------------------|-----------|
| Status            | Description   | Status    | Description            |                                                                                     |           |
| Off               | No Link       | Off       | 10/100 Mbps connection |  |           |
| Blinking          | Data Activity | Orange    | 1 Gbps connection      |                                                                                     |           |
| On                | Link          | Green     | 2.5 Gbps connection    |                                                                                     |           |

LAN4 Port

The diagram illustrates the Intel Arrow Lake-S Processor LGA-1851 and its various interfaces and components. The processor is connected to several external devices and internal components via different protocols.

**Processor:** Intel Arrow Lake-S Processor LGA-1851

**Interfaces and Components:**

- Memory:**
  - Channel A: DDR5 6400MHz (UDIMM (A1), UDIMM (A2))
  - Channel B: DDR5 6400MHz (UDIMM (B1), UDIMM (B2))
  - Channel B: DDR5 6400MHz (PCIe Gen5 [1:16] - PCIe x16 or x8/x8 Slot)
  - Channel B: DDR5 6400MHz (PCIe Gen5 [21:24] - 1<sup>st</sup> M.2 Key M)
  - Channel B: DDR5 6400MHz (PCIe Gen4 [17:20] - PCIe x4 slot)
- Connectors:**
  - LVDS Connector
  - Display port Connector
  - HDMI Connector
  - Type-C Connector
  - Vertical Type-C Connector
- Internal Components:**
  - Chrontel CH7513A (DDI)
  - HBR (TCP0, TCP1)
- Storage and Expansion:**
  - 7 x USB 3.2 Gen2, 7 x USB 2.0
  - 2 x USB 3.2 Gen1, 2 x USB 2.0
  - 1 x USB 3.2 Gen2, 1 x USB 2.0
  - 1 x USB 2.0
  - Intel I226V (PCIe x1)
  - Intel I219LM (PCIe x1)
  - SATA x8
  - PCIe Gen4 x4 (2<sup>nd</sup> M.2 Key M)
  - PCIe Gen4 x4 (PCIe x4 slot)
  - PCIe x1, CNVio/CNVio2, USB 2.0 (M.2 Key E)
  - INFINTEON SLB9672/UY2.0 TPM
  - BIOS
- Audio and Networking:**
  - Realtek ALC897 (HDA)
  - Realtek ALC122 (GPIO x4)
  - Line Out, Line In/Mic In, Front Audio, SPDIF
  - 3W SPK
- Other Components:**
  - NUVOTON NUC121ZC2AE
  - NUVOTON NCT39615-P (2x CHA FAN)
  - FAN (CPU FAN, CHA FAN)
  - FINTeX F81968AB-1 (UART x2, UART x4)
  - SP339EERI-L/TR x2
  - SP3243EUEY-L/TR x4
  - LPT/DGIO header

## Chapter 2 Installation

This is a Micro-ATX (Micro-ATX (9.6-in x 9.6-in x 1.81-in, 24.4 cm x 24.4 cm x 4.61 cm)) form factor motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.



*Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.*

### 2.1 Screw Holes

Place screws into the holes to secure the motherboard to the chassis.



*Do not over-tighten the screws! Doing so may damage the motherboard.*

### 2.2 Pre-installation Precautions

Take note of the following precautions before you install motherboard components or change any motherboard settings.

1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component.
5. Heatsink (The thermal solution of whole system needs to be designed additionally.)



*Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.*

## 2.3 Installation of Memory Modules (LONG-DIMM)

**IMB-1317** provides four 288-pin DDR5 (Double Data Rate 5) Long-DIMM slots.



1. For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR5 DIMM pairs.
2. It is unable to activate Quad Channel Memory Technology with only one memory module installed.
3. It is not allowed to install a DDR, DDR2, DDR3 or DDR4 memory module into a DDR5 slot; otherwise, this motherboard and DIMM may be damaged.

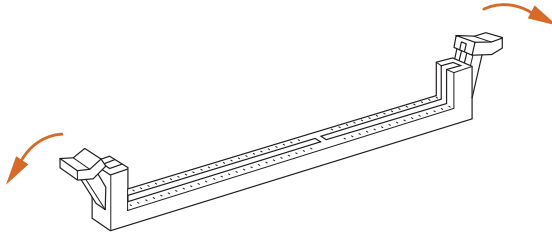


The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot in the incorrect orientation.

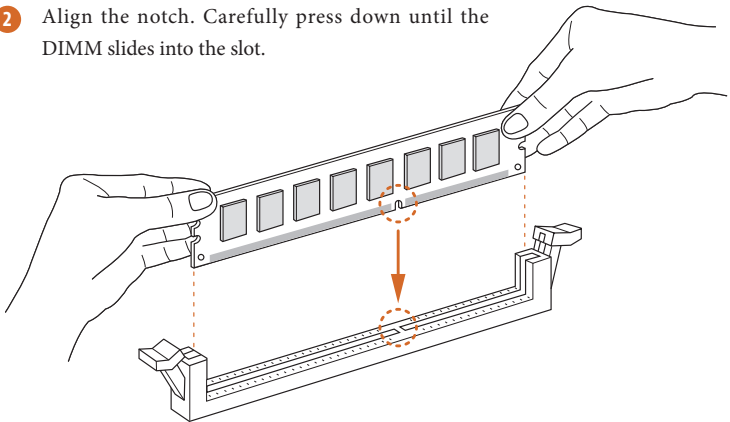
### Recommended Memory Configuration

| Priority | DDR5_A1   | DDR5_A2   | DDR5_B1   | DDR5_B2   |
|----------|-----------|-----------|-----------|-----------|
| 1        |           | Populated |           | Populated |
| 2        | Populated | Populated | Populated | Populated |

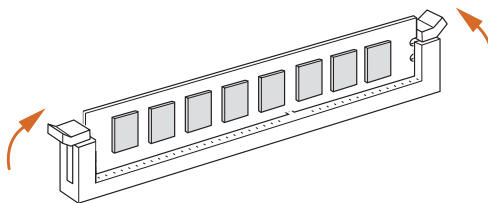
- 1 Open the DIMM slot latches.



- 2 Align the notch. Carefully press down until the DIMM slides into the slot.



- 3 The latches snap back into place.



## 2.4 Expansion Slots

There are four PCI Express slots and three M.2 sockets on this motherboard.

**PCIe slot:** 2 x PCIe Gen5 Slots (PCIe1/PCIe4:single at x16 (PCIe1); dual at x8 (PCIe1)/x8 (PCIe4)) (PCIe1: Support Riser cadr x8/x8)  
2 x PCIe x4 (Gen4)

**M.2 sockets:** 1 x M.2 (Key E, 2230) with PCIe Gen4 x1, USB 2.0 and CNVio/CNVio2 for Wireless  
1 x M.2 (Key M, 2242/2280) with PCIe Gen5 x4 for SSD  
1 x M.2 (Key M, 2242/2280) with PCIe Gen4 x4 for SSD

M.2 Key-E Socket  
(M2\_E1)

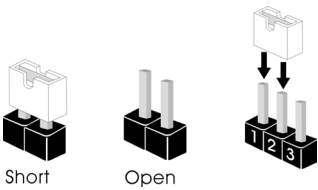
| Pin | Signal Name  | Signal Name     | Pin |
|-----|--------------|-----------------|-----|
| 1   | GND          | +3.3V           | 2   |
| 3   | USB_D+       | +3.3V           | 4   |
| 5   | USB_D-       | NA              | 6   |
| 7   | GND          | PCMCLK          | 8   |
| 9   | CNV_WGR_D1-  | CNV_RF_RESET    | 10  |
| 11  | CNV_WGR_D1+  | PCMIN           | 12  |
| 13  | GND          | MODEM_CLKREQ    | 14  |
| 15  | CNV_WGR_D0-  | NA              | 16  |
| 17  | CNV_WGR_D0+  | GND             | 18  |
| 19  | GND          | NA              | 20  |
| 21  | CNV_WGR_CLK- | CNV_BRI_RSP     | 22  |
| 23  | CNV_WGR_CLK+ |                 |     |
|     |              |                 |     |
|     |              | CNV_BGI_DT      | 32  |
| 33  | GND          | CNV_RGI_RSP     | 34  |
| 35  | PETp         | CNV_BRI_DT      | 36  |
| 37  | PETn         | CL_RST#         | 38  |
| 39  | GND          | CL_DATA         | 40  |
| 41  | PERp         | CL_CLK          | 42  |
| 43  | PERn         | CNV_PA_BLANKING | 44  |
| 45  | GND          | CNV_MFUART2_TXD | 46  |
| 47  | PEFCLKp      | CNV_MFUART2_RXD | 48  |
| 49  | PEFCLKn      | SUSCLK          | 50  |
| 51  | GND          | PERST0          | 52  |
| 53  | CLKREQ#      | BT_OFF#         | 54  |
| 55  | NA           | WIFI_OFF#       | 56  |
| 57  | GND          | SMB_DATA        | 58  |
| 59  | CNV_WT_D1-   | SMB_CLK         | 60  |
| 61  | CNV_WT_D1+   | NA              | 62  |
| 63  | GND          | NA              | 64  |
| 65  | CNV_WT_D0-   | NA              | 66  |
| 67  | CNV_WT_D0+   | NA              | 68  |
| 69  | GND          | NA              | 70  |
| 71  | CNV_WT_CLK-  | +3.3V           | 72  |
| 73  | CNV_WT_CLK+  | +3.3V           | 74  |
| 75  | GND          |                 |     |

M.2 Key-M Sockets  
(M2\_M1, M2\_M2)

| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1   | GND         | +3.3V       | 2   |
| 3   | GND         | +3.3V       | 4   |
| 5   | PERn3       | NA          | 6   |
| 7   | PERp3       | NA          | 8   |
| 9   | GND         | SATA_LED    | 10  |
| 11  | PETn3       | +3.3V       | 12  |
| 13  | PETp3       | +3.3V       | 14  |
| 15  | GND         | +3.3V       | 16  |
| 17  | PERn2       | +3.3V       | 18  |
| 19  | PERp2       | NA          | 20  |
| 21  | GND         | NA          | 22  |
| 23  | PETn2       | NA          | 24  |
| 25  | PETp2       | NA          | 26  |
| 27  | GND         | NA          | 28  |
| 29  | PERn1       | NA          | 30  |
| 31  | PERp1       | NA          | 32  |
| 33  | GND         | NA          | 34  |
| 35  | PETn1       | NA          | 36  |
| 37  | PETp1       | NA          | 38  |
| 39  | GND         | SMB_CLK     | 40  |
| 41  | PERn0       | SMB_DATA    | 42  |
| 43  | PERp0       | NA          | 44  |
| 45  | GND         | NA          | 46  |
| 47  | PETn0       | NA          | 48  |
| 49  | PETp0       | PERST#      | 50  |
| 51  | GND         | CLKREQ#     | 52  |
| 53  | PEFCLKn     | WAKE#       | 54  |
| 55  | PEFCLKp     | NA          | 56  |
| 57  | GND         | NA          | 58  |
|     |             |             |     |
| 67  | NA          | SUS_CLK     | 68  |
| 69  | PEDET       | +3.3V       | 70  |
| 71  | GND         | +3.3V       | 72  |
| 73  | GND         | +3.3V       | 74  |
| 75  | GND         |             |     |

## 2.5 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is “Short.” If no jumper cap is placed on pins, the jumper is “Open.” The illustration shows a 3-pin jumper whose pin1 and pin2 are “Short” when jumper cap is placed on these 2 pins.



### COM Port Pin9 PWR Setting Jumpers

(3-pin PWR\_COM1 (For COM Port1))  
(see p. 5, No. 1)



| Setting | Description   |
|---------|---------------|
| Open    | +0V           |
| 1-2     | +5V (Default) |
| 2-3     | +12V          |

(3-pin PWR\_COM2 (For COM Port2),  
PWR\_COM3 (For COM Port3),  
PWR\_COM4 (For COM Port4),  
PWR\_COM5 (For COM Port5),  
PWR\_COM6 (For COM Port6))  
(see p. 5, No. 28)

The maximum current for per port is 1A, and the power supply is either 5V or 12V. Use the jumpers to set the power for COM port pin 9.

### Chassis Intrusion Header

(2-pin CI1)  
(see p. 5, No. 7)



| Setting | Description      |
|---------|------------------|
| Open    | Normal (Default) |
| Short   | Active Case Open |

This motherboard supports CASE OPEN detection feature that detects if the chassis cover has been removed. This feature requires a chassis with chassis intrusion detection design.

### PWR LOSS Header

(2-pin PWR\_LOSS1)  
(see p. 5, No. 8)



| Setting | Description          |
|---------|----------------------|
| Open    | No Power Loss        |
| Short   | Power Loss (Default) |

### Brightness Control Mode

(3-pin BLT\_PWM1)

(see p. 5, No. 16)



| Setting | Description                              |
|---------|------------------------------------------|
| 1-2     | From eDP PWM to CON_LBKLT_CTL            |
| 2-3     | From LVDS PWM to CON_LBKLT_CTL (Default) |

Please set to 1-2 when adjusting brightness by Brightness Control bar under OS.

Please set to 2-3 when adjusting brightness by BLT\_VOL1.

### Brightness Control Voltage Mode

(3-pin BLT\_PWM2)

(see p. 5, No. 17)



| Setting | Description   |
|---------|---------------|
| 1-2     | +3V (Default) |
| 2-3     | +5V           |

### ATX/AT Mode Jumper

(3-pin SIO\_AT1)

(see p. 5, No. 18)



| Setting | Description        |
|---------|--------------------|
| 1-2     | AT Mode            |
| 2-3     | ATX Mode (Default) |

### Backlight Power Select (LCD\_BLT\_VCC)

(3-pin BKT\_PWR1)

(see p. 5, No. 23)



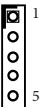
| Setting | Description                 |
|---------|-----------------------------|
| 1-2     | LCD_BLT_VCC : +5V (Default) |
| 2-3     | LCD_BLT_VCC : +12V          |

Use this header to set up the backlight power of the LVDS connector and the panel backlight power of BLT\_PWM1.

### Panel Power Select

(5-pin PNL\_PWR1)

(see p. 5, No. 25)



| Setting | Description   |
|---------|---------------|
| 1-2     | +3V (Default) |
| 2-3     | +5V           |
| 4-5     | +12V          |

Use this to set up the VDD power of the LVDS connector.

Digital Input/Output Power Select

(3-pin JGPIO\_SET1)

(see p. 5, No. 32)



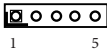
| Setting | Description         |
|---------|---------------------|
| 1-2     | Pull-High (Default) |
| 2-3     | Pull-Low            |

The header is used for GPIO default value setting for either pull high or pull low. Pulling the header to a high/low value means the voltage is anchored to VCC/GND, in a stable, non-floating state.

Digital Input/Output Power Select (JGPIOPWR)

(5-pin JGPIO\_PWR1)

(see p. 5, No. 33)



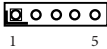
| Setting | Description   |
|---------|---------------|
| 1-2     | +12V          |
| 2-3     | +5V (Default) |
| 3-4     | +5V           |
| 4-5     | GND           |

The maximum current JGPIO\_PWR1 provides is 1A.

Clear CMOS Header

(5-pin CLRMOS2\_CLRMOS1)

(see p. 4, No. 38)



| Setting | Description                                                    |
|---------|----------------------------------------------------------------|
| 1-2     | Open : Normal (Default)<br>Short : Auto Clear CMOS (Power Off) |
| 3-4     | Normal (Default)                                               |
| 4-5     | Clear CMOS                                                     |

NOTE: CLRMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, and time will be cleared only if the CMOS battery is removed.

Note: CLRMOS2 allows you to clear the data in CMOS automatically when AC power on. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord, then use a jumper cap to short the pins on CLRMOS2.

PWR\_BAT1

(2-pin PWR\_BAT1)

(see p. 5, No. 39)



| Setting | Description      |
|---------|------------------|
| Open    | Normal (Default) |
| Short   | Charge Battery*  |

\*Only supported by chargeable battery.

DACC Jumper

(2-pin DACC1)

(see p. 5, No. 41)



| Setting | Description   |
|---------|---------------|
| Open    | No ACC        |
| Short   | ACC (Default) |

Auto clear CMOS when system boot improperly.

## 2.6 Onboard Headers and Connectors

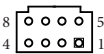


Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

### 8-Pin ATX 12V Power Connectors

(8-pin ATX12V1, ATX12V2)

(see p. 5, No. 2)



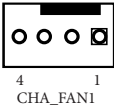
| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1   | GND         | ATX12V      | 2   |
| 3   | GND         | ATX12V      | 4   |
| 5   | GND         | ATX12V      | 6   |
| 7   | GND         | ATX12V      | 8   |

This motherboard provides an 8-pin ATX 12V power connector. To use a 4-pin ATX power supply, please plug it along Pin 1 and Pin 5.

### Chassis FAN Connector (+12V)

(4-pin CHA\_FAN1)

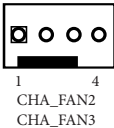
(see p. 5, No. 4)



| Pin | Signal Name       |
|-----|-------------------|
| 1   | GND               |
| 2   | +12V              |
| 3   | CHA_FAN_SPEED     |
| 4   | FAN_SPEED_CONTROL |

(4-pin CHA\_FAN2)

(see p. 5, No. 6)



(4-pin CHA\_FAN3)

(see p. 5, No. 43)

CHA\_FAN2  
CHA\_FAN3

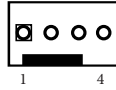


The board offers three 4-pin chassis fan (Smart Fan) connectors which are compatible with 3-pin chassis fan. If you connect a 3-pin chassis fan to the chassis fan connector on this motherboard, please connect it to pin 1-3. The maximum current is 1A.

### CPU FAN Connector (+12V)

(4-pin CPU\_FAN1)

(see p. 5, No. 5)



| Pin | Signal Name       |
|-----|-------------------|
| 1   | GND               |
| 2   | +12V              |
| 3   | CPU_FAN_SPEED     |
| 4   | FAN_SPEED_CONTROL |

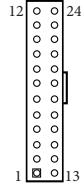


The board offers three 4-pin CPU fan (Smart Fan) connectors which are compatible with 3-pin CPU fan. If you connect a 3-pin CPU fan to the CPU fan connector on this motherboard, please connect it to pin 1-3. The maximum current is 1A.

### 24-pin ATX Power Input Connector

(24-pin ATXPWR1)

(see p. 5, No. 9)



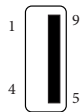
| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1   | +3V         | +3V         | 13  |
| 2   | +3V         | -12V        | 14  |
| 3   | GND         | GND         | 15  |
| 4   | +5V         | PSON#       | 16  |
| 5   | GND         | GND         | 17  |
| 6   | +5V         | GND         | 18  |
| 7   | GND         | GND         | 19  |
| 8   | PWROK_PS    | NA          | 20  |
| 9   | ATX+5VSB    | +5V         | 21  |
| 10  | +12V        | +5V         | 22  |
| 11  | +12V        | +5V         | 23  |
| 12  | +3V         | GND         | 24  |

This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.

### USB 3.0 Type-A Port (Vertical)

(9-pin USB3\_8)

(see p. 5, No. 10)



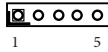
| Pin | Signal Name |
|-----|-------------|
| 1   | USB_PWR     |
| 2   | USB_D-      |
| 3   | USB_D+      |
| 4   | GND         |
| 5   | SSRX-       |
| 6   | SSRX+       |
| 7   | GND         |
| 8   | SSTX-       |
| 9   | SSTX+       |

The board provides one internal USB 3.0 header, which is Type-A vertical connector. The maximum current per port is 0.5A.

USB 2.0 Header

(5-pin USB2\_13)

(see p. 5, No. 11)



| Pin | Signal Name |
|-----|-------------|
| 1   | USB_PWR     |
| 2   | USB_D-      |
| 3   | USB_D+      |
| 4   | GND         |
| 5   | NC          |

The board provides one internal USB 2.0 header. The maximum current per port is 0.5A.

SATA3 Connectors

(7-pin SATA3\_0~SATA3\_3)

(see p. 5, No. 12)



| Pin | Signal Name |
|-----|-------------|
| 1   | GND         |
| 2   | SATA-A+     |
| 3   | SATA-A-     |
| 4   | GND         |
| 5   | SATA-B-     |
| 6   | SATA-B+     |
| 7   | GND         |

(7-pin SATA3\_4~SATA3\_7)

(see p. 5, No. 22)



The Serial ATA3 (SATA3) connector supports SATA data cables for internal storage devices. The current SATA3 interface allows up to 6.0 Gb/s data transfer rate.

HEATER1 Header (Preheat function)

(3-pin HEATER1)

(see p. 5, No. 13)



| Pin | Signal Name                                        |
|-----|----------------------------------------------------|
| 1   | Heater_PWR (5V/1A)                                 |
| 2   | GND                                                |
| 3   | NTC (Negative Temperature Coefficient) thermistors |

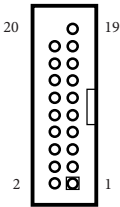
- \* The 10k Ohm NTC thermistors is suggested.
  - \* Deep mode is not supported when the preheat function is enabled.
- Refer to the following Preheat Targer Temperature list.

| Preheat         | Target Temperature |
|-----------------|--------------------|
| +20 °C / +68 °F |                    |
| +15 °C / +59 °F |                    |
| +10 °C / +50 °F |                    |
| + 5 °C / +41 °F |                    |
| 0 °C / +32 °F   |                    |
| - 5 °C / +23 °F |                    |
| -10 °C / +14 °F |                    |
| -15 °C / 5 °F   |                    |
| -20 °C / - 4 °F |                    |
| -25 °C / -13 °F |                    |
| -30 °C / -22 °F |                    |
| -35 °C / -31 °F |                    |
| -40 °C / -40 °F |                    |

USB 3.2 Header

(19-pin USB3\_5\_6)

(see p. 5, No. 14)



| Pin | Signal Name   | SiSignal Name | Pin |
|-----|---------------|---------------|-----|
| 1   | DUMMY         | IntA_PA_D+    | 2   |
| 3   | IntA_PB_D+    | IntA_PA_D-    | 4   |
| 5   | IntA_PB_D-    | GND           | 6   |
| 7   | GND           | IntA_PA_SSTX+ | 8   |
| 9   | IntA_PB_SSTX+ | IntA_PA_SSTX- | 10  |
| 11  | IntA_PB_SSTX- | GND           | 12  |
| 13  | GND           | IntA_PA_SSRX+ | 14  |
| 15  | IntA_PB_SSRX+ | IntA_PA_SSRX- | 16  |
| 17  | IntA_PB_SSRX- | Vbus          | 18  |
| 19  | Vbus          |               | 20  |
| 11  | +12V          | +5V           | 23  |
| 12  | +3V           | GND           | 24  |

There is one USB 3.2 connector on the motherboard. This header can support one USB 3.2 port with maximum power current 0.9A.

PSU\_SMB1

(5-pin PSU\_SMB1)

(see p. 5, No. 15)



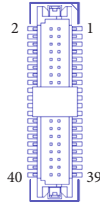
| Pin | Signal Name |
|-----|-------------|
| 1   | SMB_CLK     |
| 2   | SMB_DATA    |
| 3   | SMBALERT#   |
| 4   | GND         |
| 5   | +3V         |

The SMBus connector is for power supply unit.

### LVDS Panel Connector

(40-pin LVDS1)

(see p. 5, No. 19)



| Pin | Signal Name    | Signal Name          | Pin |
|-----|----------------|----------------------|-----|
| 1   | LCD_VCC        | LCD_VCC              | 2   |
| 3   | +3.3V          | N/A                  | 4   |
| 5   | N/A            | LVDS_A_ DATA0#       | 6   |
| 7   | LVDS_A_ DATA0  | PD (Panel Detection) | 8   |
| 9   | LVDS_A_ DATA1# | LVDS_A_ DATA1        | 10  |
| 11  | GND            | LVDS_A_ DATA2#       | 12  |
| 13  | LVDS_A_ DATA2  | GND                  | 14  |
| 15  | LVDS_A_ DATA3# | LVDS_A_ DATA3        | 16  |
| 17  | GND            | LVDS_A_ CLK#         | 18  |
| 19  | LVDS_A_ CLK    | GND                  | 20  |
| 21  | LVDS_B_ DATA0# | LVDS_B_ DATA0        | 22  |
| 23  | GND            | LVDS_B_ DATA1#       | 24  |
| 25  | LVDS_B_ DATA1  | GND                  | 26  |
| 27  | LVDS_B_ DATA2# | LVDS_B_ DATA2        | 28  |
| 29  | DPLVDD_EN      | LVDS_B_ DATA3#       | 30  |
| 31  | LVDS_B_ DATA3  | GND                  | 32  |
| 33  | LVDS_B_ CLK#   | LVDS_B_ CLK          | 34  |
| 35  | GND            | CON_LBKLT_ EN        | 36  |
| 37  | CON_LBKLT_ CTL | LCD_BLT_VCC          | 38  |
| 39  | LCD_BLT_VCC    | LCD_BLT_VCC          | 40  |

\* PD (Panel Detection): Connect this pin to LVDS Panel's Ground pin to detect Panel detection.

### Inverter Power Control Wafer

(6-pin BLT\_PWR1)

(see p. 5, No. 20)

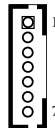


| Pin | Signal Name    |
|-----|----------------|
| 1   | GND            |
| 2   | GND            |
| 3   | CON_LBKLT_ CTL |
| 4   | CON_LBKLT_ EN  |
| 5   | LCD_BLT_VCC    |
| 6   | LCD_BLT_VCC    |

### Backlight Volume Control

(7-pin BLT\_VOL1)

(see p. 5, No. 21)

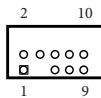


| Pin | Signal Name |
|-----|-------------|
| 1   | GPIO_VOL_UP |
| 2   | GPIO_VOL_DW |
| 3   | PWRDN       |
| 4   | BLT_UP      |
| 5   | BLT_DW      |
| 6   | GND         |
| 7   | GND         |

### COM3\_CC\_TTL\_SEL1

(9-pin COM3\_CC\_TTL\_SEL1)

(see p. 5, No. 24)



| Pin | Signal Name  | Signal Name  | Pin |
|-----|--------------|--------------|-----|
| 1   | +5V          | GND          | 2   |
| 3   |              | NA           | 4   |
| 5   | TTXD_3_TTL   | RRXD_3_TTL   | 6   |
| 7   | TTXD_3       | RRXD_3       | 8   |
| 9   | TTXD_3_RS232 | RRXD_3_RS232 | 10  |

COM\_CC\_TTL\_SEL1:79

COM\_CC\_TTL\_SEL1:80



MINI\_JUMPER



MINI\_JUMPER

Open: CCTALK function

- Supported by CCTALK Card (optional)

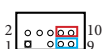
<https://www.asrockind.com/UART-CCTALK>

5-7 + 6-8: TTL function



7-9 + 8-10: COM (RS232)

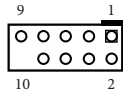
(Default)



### System Panel Header

(9-pin PANEL1)

(see p. 5, No. 26)



| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1   | HDLED+      | PLED+       | 2   |
| 3   | HDLED-      | PLED-       | 4   |
| 5   | GND         | PWRBTN#     | 6   |
| 7   | RESET#      | GND         | 8   |
| 9   | GND         |             | 10  |

This header accommodates several system front panel functions.



Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

#### PWRBTN (Power Switch):

Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

#### RESET (Reset Switch):

Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

#### PLED (System Power LED):

Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1 sleep state. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

#### HDLED (Hard Drive Activity LED):

Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assign-ments are matched correctly.

ESPI Header

(20-pin ESPI1)  
(see p. 5, No. 29)

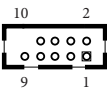


The header is reserved for Port 80 code.  
display and debugging purposes.

| Pin | Signal Name  |
|-----|--------------|
| 1   | GND          |
| 2   | ESPI_CLK     |
| 3   | NA           |
| 4   | ESPI_CS#     |
| 5   | ESPI_RESET#  |
| 6   | GND          |
| 7   | +3V          |
| 8   | ESPI_CS#1    |
| 9   | PLTRST#      |
| 10  | COM_RST#     |
| 11  | ESPI_IO0     |
| 12  | ESPI_IO1     |
| 13  | ESPI_IO2     |
| 14  | ESPI_IO3     |
| 15  | ALERT#1      |
| 16  | +3VSB        |
| 17  | Internal Use |
| 18  | +5VSB        |
| 19  | ESPI_ALERT#  |
| 20  | GND          |

COM Port Headers

(9-pin COM2 (RS232/422/485)\*  
COM3~6 (RS232))  
(see p. 5, No. 30)



| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1   | DDCD#       | RRXD        | 2   |
| 3   | TTXD        | DDTR#       | 4   |
| 5   | GND         | DDSR#       | 6   |
| 7   | RRTS#       | CCTS#       | 8   |
| 9   | PWR         |             | 10  |

There are five 2.00mm-pitch internal COM port headers (COM2~COM6), with COM3~COM6 only supporting RS-232, and with COM2 supporting RS232/422/485. The maximum current is 1A per port. The power supply of pin 9 is either 5V or 12V; use the COM Port Pin 9 PWR Setting Jumper to control it.



\* This motherboard supports RS232/422/485 on COM2 port. Please refer to the table below for the pin definition. In addition, COM2 port (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to our user manual for details.

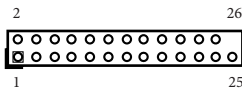
#### COM2 Port Pin Definition

| Pin | RS232 | RS422 | RS485 |
|-----|-------|-------|-------|
| 1   | DCD   | TX-   | RTX-  |
| 2   | RXD   | TX+   | RTX+  |
| 3   | TXD   | RX+   | NA    |
| 4   | DTR   | RX-   | NA    |
| 5   | GND   | GND   | GND   |
| 6   | DSR   | NA    | NA    |
| 7   | RTS   | NA    | NA    |
| 8   | CTS   | NA    | NA    |
| 9   | PWR   | PWR   | PWR   |

#### Printer Port/GPIO Header

(25-pin LPT\_GPIO1)

(see p. 5, No. 31)



#### Printer Port

| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1   | STB#        | AFD#        | 2   |
| 3   | SPD0        | ERROR#      | 4   |
| 5   | SPD1        | PINIT#      | 6   |
| 7   | SPD2        | SLIN#       | 8   |
| 9   | SPD3        | GND         | 10  |
| 11  | SPD4        | GND         | 12  |
| 13  | SPD5        | GND         | 14  |
| 15  | SPD6        | GND         | 16  |
| 17  | SPD7        | GND         | 18  |
| 19  | ACK#        | GND         | 20  |
| 21  | BUSY        | GND         | 22  |
| 23  | PE          | GND         | 24  |
| 25  | SLCT        |             |     |

#### GPIO

| Pin | Signal Name           | Signal Name | Pin |
|-----|-----------------------|-------------|-----|
| 1   | SIO_GP77              | SIO_GP76    | 2   |
| 3   | SIO_GP80              | SIO_GP75    | 4   |
| 5   | SIO_GP81              | SIO_GP74    | 6   |
| 7   | SIO_GP82              | SIO_GP73    | 8   |
| 9   | SIO_GP83              | JGPIOPWR    | 10  |
| 11  | SIO_GP84              | JGPIOPWR    | 12  |
| 13  | SIO_GP85              | GND         | 14  |
| 15  | SIO_GP86              | GND         | 16  |
| 17  | SIO_GP87/<br>GPP_SD01 | GND         | 18  |
| 19  | SIO_G72/<br>GPP_SD00  | GND         | 20  |
| 21  | SIO_G71/GPP_<br>I02   | GND         | 22  |
| 23  | SIO_G70/GPP_<br>I03   | GND         | 24  |
| 25  | NA                    | NC          | 24  |

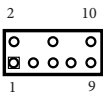
The header functions as printer port and GPIO. To use the printer port function, please short pin4 and pin5 on Digital Input/Output Power Select (JGPIO\_PWR1). This motherboard provides two SMI GPIO pins for interruption and two Timed GPIO pins for time synchronization purpose.

Pin 1-8 on GPIO are used for Input control while Pins 9, 11, 13, 15, 17, 19, 21 and 23 are used for Output control.

| Parameter                                                       | Range      |
|-----------------------------------------------------------------|------------|
| GPIO input Low voltage                                          | Max: 0.8 V |
| GPIO input High voltage                                         | Min: 2.4 V |
| GPIO output Low voltage                                         | Max: 0.4 V |
| GPIO output High voltage                                        | Min: 2.5 V |
| Note:<br>LPT_GPIO1 Pin 10, Pin12 - JGPIOPWR,<br>Current Max. 1A |            |

Front Panel Audio Header

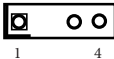
(9-pin HD\_AUDIO1)  
(see p. 5, No. 34)



| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1   | MIC2_L      | GND         | 2   |
| 3   | MIC2_R      |             | 4   |
| 5   | OUT2_R      | MIC_RET     | 6   |
| 7   | I_SENSE     |             | 8   |
| 9   | OUT2_L      | OUT_RET     | 10  |

SPDIF Header

(3-pin SPDIF1)  
(see p. 5, No. 35)

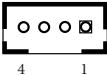


| Pin | Signal Name |
|-----|-------------|
| 1   | +5V         |
| 2   |             |
| 3   | SPDIF OUT   |
| 4   | GND         |

SPDIF header, providing SPDIF audio output to HDMI VGA card, allows the system to connect HDMI Digital TV/projector/LCD devices. Please connect the SPDIF connector of HDMI VGA card to this header.

3W Audio Output Wafer

(4-pin SPEAKER1)  
(see p. 5, No. 36)



| Pin | Signal Name |
|-----|-------------|
| 1   | OUTLN       |
| 2   | OUTLP       |
| 3   | OUTRP       |
| 4   | OUTRN       |

Buzzer Header

(2-pin BUZZ2)  
(see p. 5, No. 37)

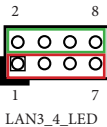


| Pin | Signal Name |
|-----|-------------|
| 1   | +5V         |
| 2   | BUZZ        |

This header provides additional external Buzzer for boot up debugging.

LAN LED Header

(8-pin LAN3\_4\_LED  
(For LAN3, LAN4 Ports))  
(see p. 5, No. 40)



| LAN4 LED |                    | LAN3 LED           |     |
|----------|--------------------|--------------------|-----|
| Pin      | Signal Name        | Signal Name        | Pin |
| 1        | LED_ACT+           | LED_ACT+           | 2   |
| 3        | LED_ACT-           | LED_ACT-           | 4   |
| 5        | LED_100-/LED_1000+ | LED_100-/LED_1000+ | 6   |
| 7        | LED_100+/LED_1000- | LED_100+/LED_1000- | 8   |

Thunderbolt Type-C Port

(TC\_TB\_2)  
(see p. 5, No. 44)



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## Chapter 3 UEFI SETUP UTILITY

### 3.1 Introduction

ASRock Industrial UEFI (Unified Extensible Firmware Interface) is a BIOS utility which offers tweak-friendly options in an advanced viewing interface. The UEFI system works with a USB mouse and offers users a faster, sleeker experience.

This BIOS utility can perform the Power-On Self-Test (POST) during system startup, record hardware parameters of the system, load operating system, and so on. The battery on the motherboard supplies the power needed to the CMOS when the system power is turned off, and the values configured in the UEFI utility are kept in the CMOS.

Please note that inadequate BIOS settings may cause system instability, malfunction or boot failure. We strongly recommend that you do not alter the UEFI default configurations or change the settings only with the assistance of a trained service person.

If the system becomes unstable or fails to boot after you change the setting, try to clear the CMOS values and reset the board to default values. See your motherboard manual for instructions.

#### 3.1.1 Entering BIOS Setup

You may run the UEFI SETUP UTILITY by pressing <F2> or <Delete> right after you power on the computer; otherwise, the Power-On-Self-Test (POST) will continue with its test routines. If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

This setup guide explains how to use the UEFI SETUP UTILITY to configure all the supported system. The screenshots in this manual are for reference only. UEFI Settings and options may vary owing to different BIOS release versions or CPU installed. Please refer to the actual BIOS version of the motherboard you purchased for detailed screens, settings and options.

### 3.1.2 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

|                    |                                                   |
|--------------------|---------------------------------------------------|
| <b>Main</b>        | For setting system time/date information          |
| <b>Advanced</b>    | For advanced system configurations                |
| <b>H/W Monitor</b> | Displays current hardware status                  |
| <b>Security</b>    | For security settings                             |
| <b>Boot</b>        | For configuring boot settings and boot priority   |
| <b>Exit</b>        | Exit the current screen or the UEFI Setup Utility |



*Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions for reference purpose only, and may vary from the latest BIOS and do not exactly match what you see on your screen.*

### 3.1.3 Navigation Keys

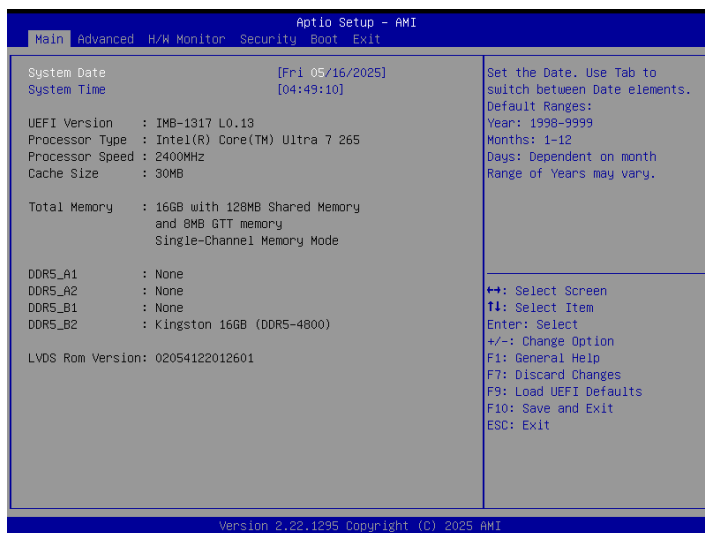
Use <←> key or <→> key to choose among the selections on the menu bar, and use <↑> key or <↓> key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

Please check the following table for the descriptions of each navigation key.

| Navigation Key(s) | Description                                        |
|-------------------|----------------------------------------------------|
| + / -             | To change option for the selected items            |
| <Tab>             | Switch to next function                            |
| <PGUP>            | Go to the previous page                            |
| <PGDN>            | Go to the next page                                |
| <HOME>            | Go to the top of the screen                        |
| <END>             | Go to the bottom of the screen                     |
| <F1>              | To display the General Help Screen                 |
| <F7>              | Discard changes and exit the SETUP UTILITY         |
| <F9>              | Load optimal default values for all the settings   |
| <F10>             | Save changes and exit the SETUP UTILITY            |
| <F12>             | Print screen                                       |
| <ESC>             | Jump to the Exit Screen or exit the current screen |

## 3.2 Main Screen

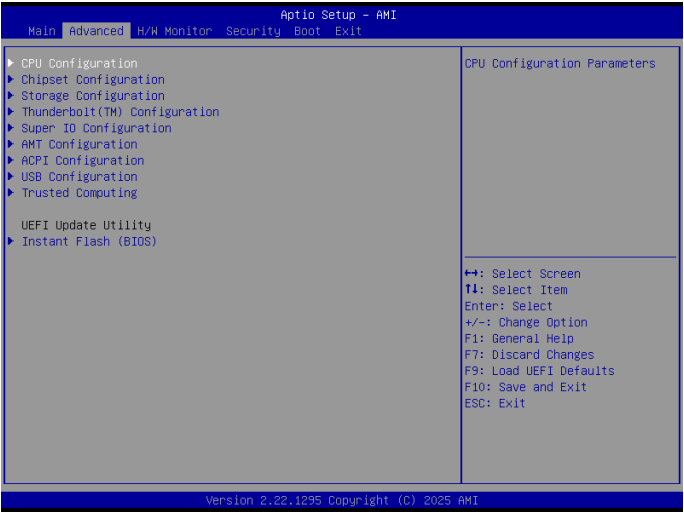
When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview.



*Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen. Options may also vary depending on the features of your motherboard.*

### 3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, Thunderbolt (TM) Configuration, Super IO Configuration, AMT Configuration, ACPI Configuration, USB Configuration, and Trusted Computing.

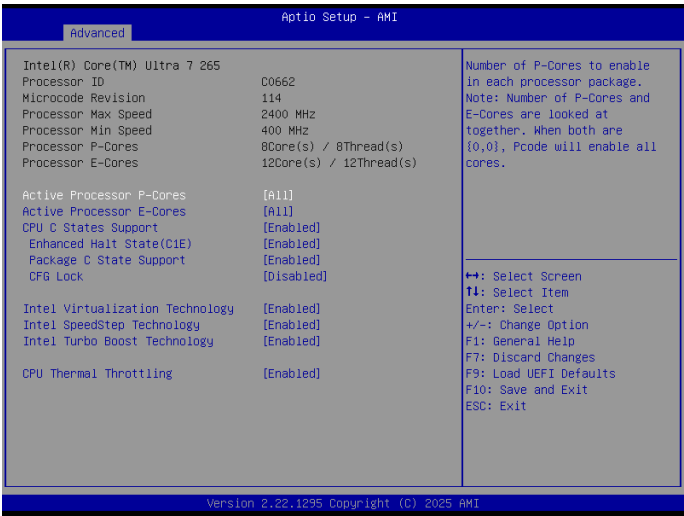


Setting wrong values in this section may cause the system to malfunction.

#### Instant Flash (BIOS)

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like Windows®. Just launch this tool and save the new UEFI file to your USB flash drive, floppy disk or hard drive, and then you can update your UEFI in only a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash (BIOS) utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after UEFI update process completes.

### 3.3.1 CPU Configuration



#### Active Processor P-Cores

This allows you to select the number of cores to enable in each processor package.

#### Active Processor E-Cores

Allows you to select the number of E-Cores to enable in each processor package. Note: Number of P-Cores and E-Cores are looked at together. When both are {0,0}, Pcode will enable all cores.

#### CPU C States Support

Allows you to enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

Configuration options: [Enabled] [Disabled]

#### Enhanced Halt State (C1E)

The option allows you to enable Enhanced Halt State (C1E) for lower power consumption.

Configuration options: [Enabled] [Disabled]

## Package C States Support

The option allows you to enable CPU, PCIe, Memory, Graphics C State Support for power-saving.

Configuration options: [Auto] [Enabled] [Disabled]

## CFG Lock

The option allows you to enable or disable the CFG Lock.

Configuration options: [Enabled] [Disabled]

## Intel Virtualization Technology

Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems.

Configuration options: [Enabled] [Disabled]

## Intel SpeedStep Technology

Intel SpeedStep technology allows processors to switch between multiple frequencies and voltage points for better power saving and heat dissipation. CPU turbo ratio can be fixed when Intel SpeedStep Technology is set to [Disabled].

Configuration options: [Enabled] [Disabled].

If you install Windows® 10 and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.



*Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.*

## Intel Turbo Boost Technology

Intel Turbo Boost Technology enables the processor to run above its base operating frequency when the operating system requests the highest performance state. The default value is [Enabled].

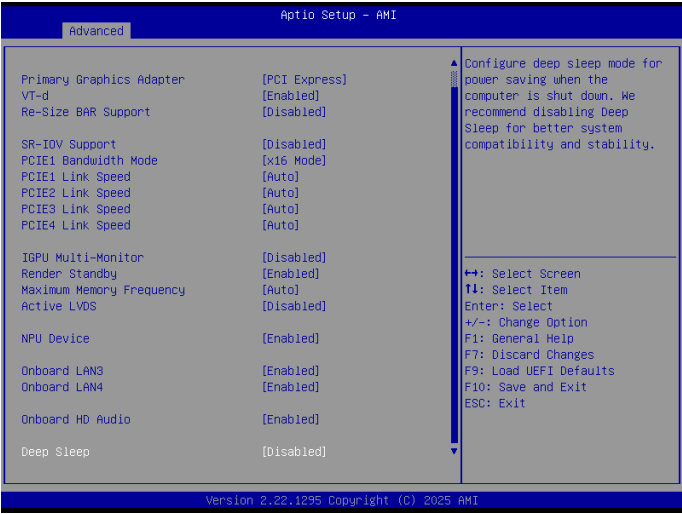
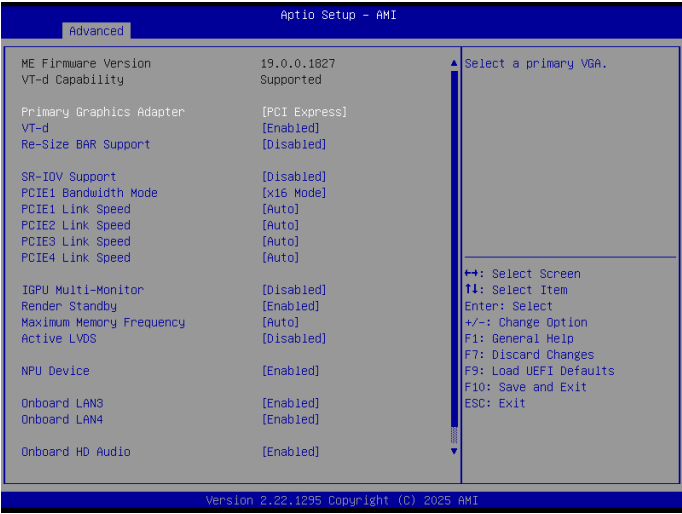
Configuration options: [Enabled] [Disabled]

## CPU Thermal Throttling

CPU Thermal Throttling allows you to enable CPU internal thermal control mechanisms to keep the CPU from overheating.

Configuration options: [Enabled] [Disabled]

### 3.3.2 Chipset Configuration



## Primary Graphics Adapter

The option allows you to select a primary VGA.

Configuration options: [Onboard] [PCI Express] (Options vary when you have installed a graphics card on your motherboard.)

## VT-d

Intel® Virtualization Technology for Directed I/O helps your virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance.

Configuration options: [Enabled] [Disabled]

## Re-Size BAR Support

If system has Resizable BAR capable PCIe Devices, this option enables or disables Resizable BAR Support.

## SR-IOV Support

If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.

Configuration options: [Enabled] [Disabled]

## PCIe1 Bandwidth Mode

Select PCIe1 Bandwidth. Select [PCIe4] when using PCIe4 slot. Select [x8 / x8 Mode]

when using Riser card on PCIe1 slot. (PCIe4 slot will be disabled)

## PCIe1 Link Speed

The option allows you to configure PCIe1 Slot Link Speed. Auto mode is optimizing for overclocking.

Configuration options: [Auto] [Gen1] [Gen2] [Gen3] [Gen4] [Gen5] (Options vary depending on your motherboard.)

## PCIe2 Link Speed

The option allows you to configure PCIe2 Slot Link Speed. Auto mode is optimizing for overclocking.

Configuration options: [Auto] [Gen1] [Gen2] [Gen3] (Options vary depending on your motherboard.)

## PCIE3 Link Speed

The option allows you to configure PCIE3 Slot Link Speed. Auto mode is optimizing for overclocking.

Configuration options: [Auto] [Gen1] [Gen2] [Gen3] (Options vary depending on your motherboard.)

## PCIE4 Link Speed

The option allows you to configure PCIE4 Slot Link Speed. Auto mode is optimizing for overclocking.

Configuration options: [Auto] [Gen1] [Gen2] [Gen3] (Options vary depending on your motherboard.)

## IGPU Multi-Monitor

Select [Disabled] to disable the integrated graphics when an external graphics card is installed. Select [Enabled] to keep the integrated graphics enabled at all times.

Configuration options: [Auto] [Enabled] [Disabled]

## Render Standby

Power down the render unit when the GPU is idle for lower power consumption.

## Maximum Memory Frequency

Selections in Mhz.

## Active LVDS

Use this to enable or disable the LVDS. The default value is [Disabled]. Set the item to [Enabled]. Then press <F10> to save the setting and restart the system. Now the default value of Active LVDS is changed to [Enabled] (F9 load default is also set to [Enabled]).

Change the setting from [Enabled] to [Disabled], and then press <F10> to save the setting and restart the system. Likewise, the default value of Active LVDS is changed to [Disabled] (F9 load default is also set to [Disabled]).

\*To use an eDP panel, set Active LVDS to [Enable] and Panel Type Selection to [eDP Bypass Mode] to enable output.

## NPU Device

This allows you to enable or disable NPU (Neural Processing Unit) Device.

Configuration options: [Enabled] [Disabled]

### Onboard LAN3

This allows you to enable or disable the Onboard LAN3 feature.

### Onboard LAN4

This allows you to enable or disable the Onboard LAN4 feature.

### Onboard HD Audio

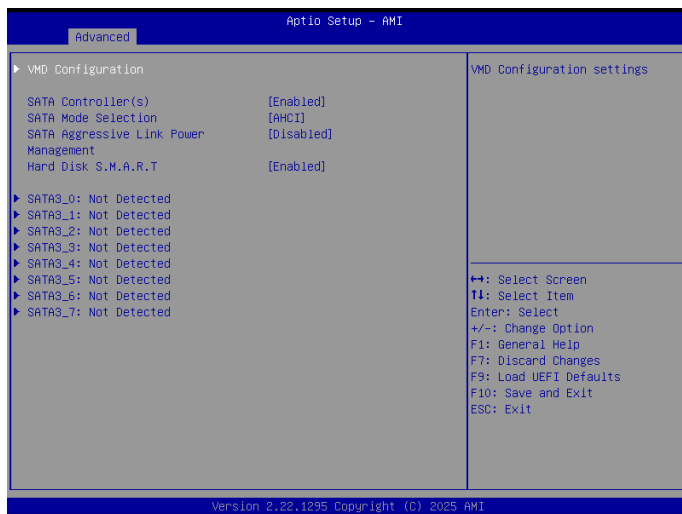
Onboard HD Audio allows you to enable or disable the onboard HD audio controller. Set this item to [Auto] to enable the onboard HD and automatically disable it when a sound card is installed.

Configuration options: [Auto] [Enabled] [Disabled]

### Deep Sleep

Configure deep sleep mode for power saving when the computer is shut down. We recommend disabling Deep Sleep for better system compatibility and stability.

### 3.3.3 Storage Configuration



#### VMD Configuration

This item allows you to enable or disable the Intel VMD support function.

#### SATA Controller(s)

Allows you to enable or disable the SATA controllers.

Configuration options: [Enabled] [Disabled]

#### SATA Mode Selection

AHCI: Supports new features that improve performance.

Configuration option: [AHCI]

#### SATA Aggressive Link Power Management

SATA Aggressive Link Power Management allows SATA devices to enter a low power state during periods of inactivity to save power. It is supported only by AHCI mode.

Configuration options: [Enabled] [Disabled]

#### Hard Disk S.M.A.R.T.

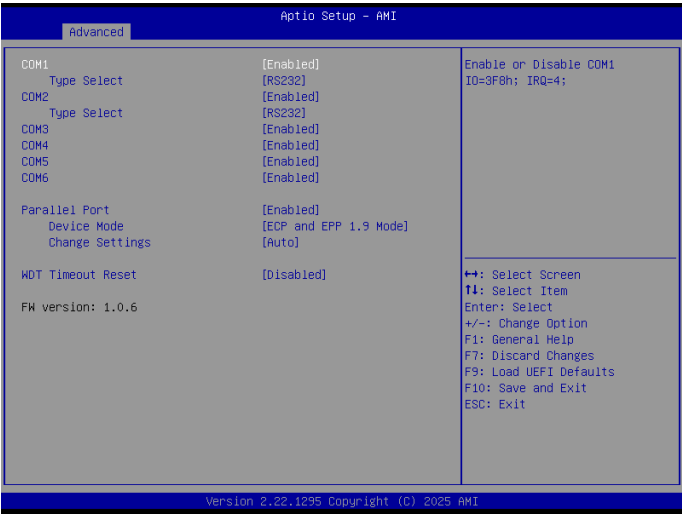
S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

Configuration options: [Enabled] [Disabled]

### 3.3.4 Thunderbolt (TM) Configuration



### 3.3.5 Super IO Configuration



#### COM1 Configuration

Use this to set parameters of COM1.

##### Type Select

Use this to select COM1 port type: [RS232], [RS422] or [RS485].

#### COM2 Configuration

Use this to set parameters of COM2.

##### Type Select

Use this to select COM2 port type: [RS232], [RS422] or [RS485].

#### COM3 Configuration

Use this to set parameters of COM3.

#### COM4 Configuration

Use this to set parameters of COM4.

#### COM5 Configuration

Use this to set parameters of COM5.

## COM6 Configuration

Use this to set parameters of COM6.

## Parallel Port

The option enables or disables the Parallel port.

## Device Mode

Select the device mode according to your connected device.

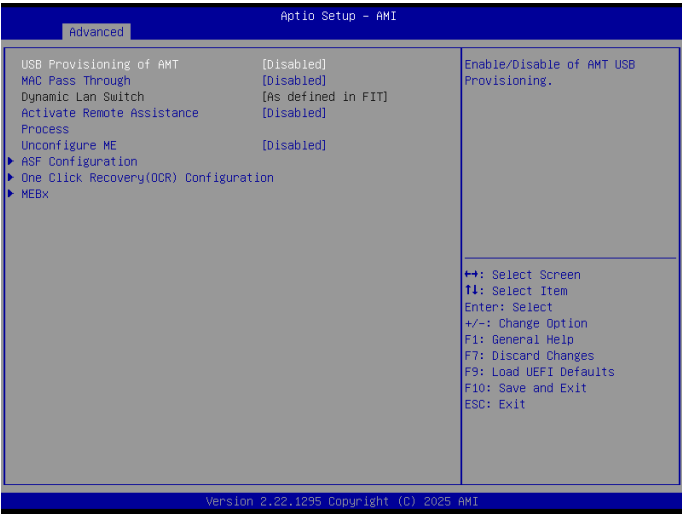
## Change Settings

Select the address of the Parallel port.

## WDT Timeout Reset

Use this to set the Watch Dog Timer.

### 3.3.6 AMT Configuration



#### USB Provisioning of AMT

Use this to enable or disable AMT USB Provisioning. The default is [Disabled].

#### MAC Pass Through

The option enables or disables MAC Pass Through function.

#### Dynamic Lan Switch

The option allows switching AMT support from Integrated LAN to Discrete LAN.

#### Activate Remote Assistance Process

Trigger CIRA boot. The default is [Disabled].

#### Un-Configure ME

Un-Configure ME without password. The default is [Disabled].

#### ASF Configuration

The option allows you to configure Alert Standard Format parameters.

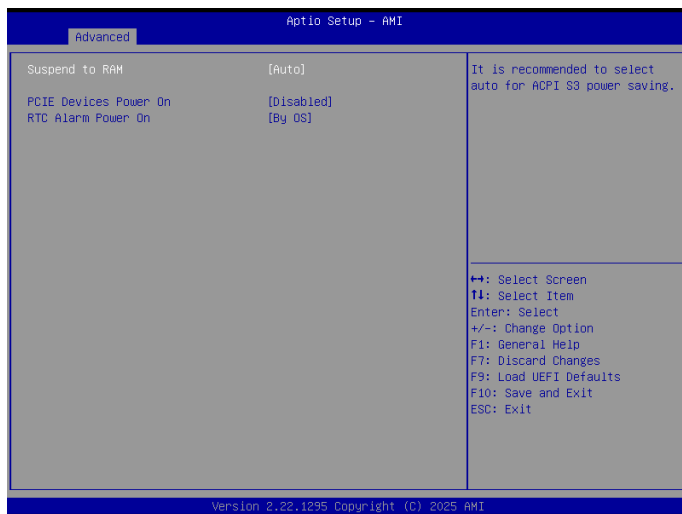
## One Click Recovery(OCR) Configuration

Configuration setting for One Click Recovery. This allows access for AMT to boot a recovery OS application

## MEBx

This Formset contains forms for configuring MEBx.

### 3.3.7 ACPI Configuration



#### Suspend to RAM

Suspend to RAM allows you to select [Disabled] for ACPI suspend type S1. It is recommended to select [Auto] for ACPI S3 power saving.

Configuration options: [Auto] [Disabled]

#### PCIE Devices Power On

Use this item to enable or disable PCIE devices to turn on the system from the power-soft-off mode.

#### RTC Alarm Power On

RTC Alarm Power On allows the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system.

Configuration options: [Enabled] [Disabled] [By OS]

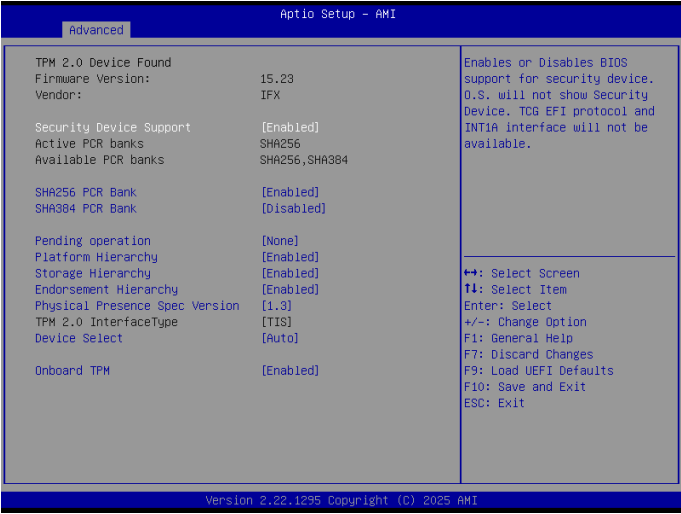
### 3.3.8 USB Configuration



#### USB Power Control

Use this option to control USB power.

### 3.3.9 Trusted Computing



NOTE: Options vary depending on the version of your connected TPM module.

#### Security Device Support

Security Device Support allows you to enable or disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

Configuration options: [Enabled] [Disabled]

#### Active PCR banks

This item displays active PCR Banks.

#### Available PCR Banks

This item displays available PCR Banks.

#### SHA256 PCR Bank

SHA256 PCR Bank allows you to enable or disable SHA256 PCR Bank.

Configuration options: [Enabled] [Disabled]

#### SHA384 PCR Bank

SHA384 PCR Bank allows you to enable or disable SHA384 PCR Bank.

Configuration options: [Enabled] [Disabled]

## Pending Operation

Pending Operation allows you to schedule an Operation for the Security Device.

NOTE: Your computer will reboot during restart in order to change State of the Device.

Configuration options: [None] [TPM Clear]

## Platform Hierarchy

This item allows you to enable or disable Platform Hierarchy.

Configuration options: [Enabled] [Disabled]

## Storage Hierarchy

This item allows you to enable or disable Storage Hierarchy.

Configuration options: [Enabled] [Disabled]

## Endorsement Hierarchy

This item allows you to enable or disable Endorsement Hierarchy.

Configuration options: [Enabled] [Disabled]

## Physical Presence Spec Version

Select this item to tell OS to support PPI spec version 1.2 or 1.3. Please note that some HCK tests might not support version 1.3.

Configuration options: [1.2] [1.3]

## TPM 2.0 InterfaceType

This item allows you to view the Communication Interface to TPM 2.0 Device: CRB or ITS.

## Device Select

This item allows you to select the TPM device to be supported.

[TPM 1.2] restricts support to TPM 1.2 devices.

[TPM 2.0] restricts support to TPM 2.0 devices.

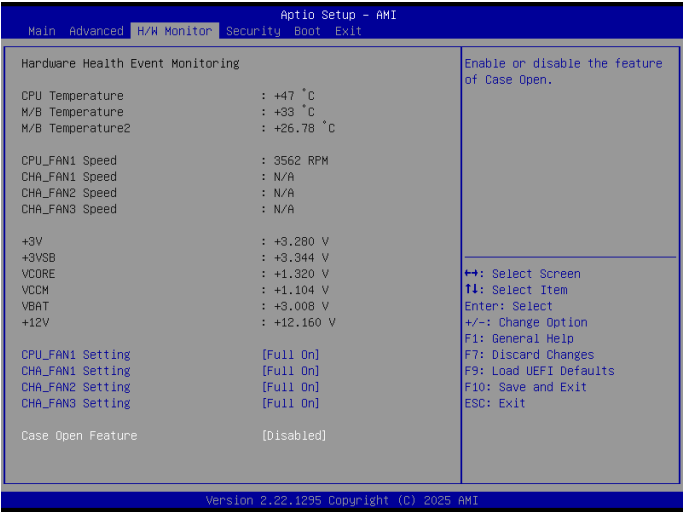
[Auto] supports both TPM 1.2 and TPM 2.0 devices with the default set to TPM 2.0 devices. If TPM 2.0 devices are not found, TPM 1.2 devices will be enumerated.

## Onboard TPM

Enable/disable Intel PTT in ME. Disable this option to use discrete TPM Module.

### 3.4 Hardware Health Event Monitoring Screen

This section allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed and the critical voltage.



NOTE: Options vary depending on the features of your motherboard.

#### CPU\_Fan 1 Setting

This item allows you to select a fan mode for CPU Fan 1. The default value is [Full On].

Configuration options: [Full On] [Automatic Mode]

#### CHA\_Fan 1 Setting

This allows you to set chassis fan 1's speed. The default value is [Full On].

Configuration options: [Full On] [Automatic Mode]

#### CHA\_Fan 2 Setting

This allows you to set chassis fan 2's speed. The default value is [Full On].

Configuration options: [Full On] [Automatic Mode]

#### CHA\_Fan 3 Setting

This allows you to set chassis fan 3's speed. The default value is [Full On].

Configuration options: [Full On] [Automatic Mode]

## Case Open Feature

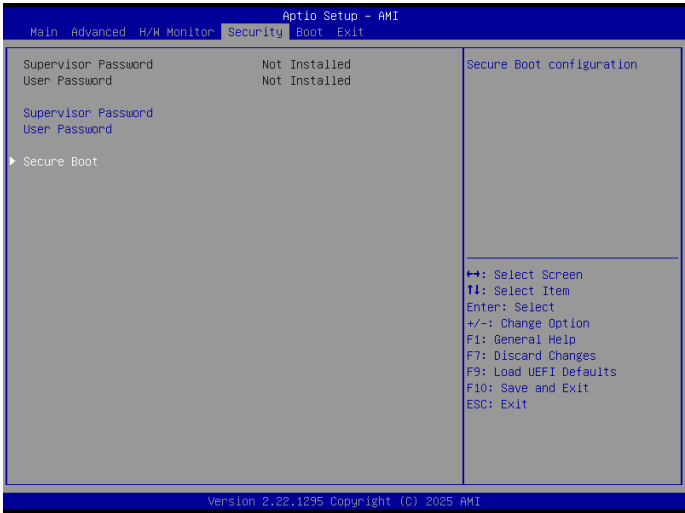
This item allows you to enable or disable case open detection feature. The default is value [Disabled].

## Clear Status

This option appears only when the case open has been detected. Use this option to keep or clear the record of previous chassis intrusion status.

### 3.5 Security Screen

In this section you may set or change the supervisor/user password for the system. You may also clear the user password.



#### Supervisor Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

#### User Password

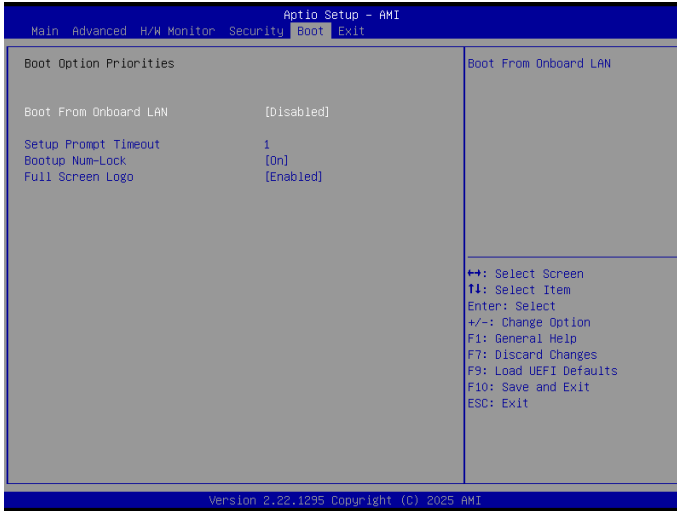
Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

#### Secure Boot

Press [Enter] to configure the Secure Boot Settings. The feature protects the system from unauthorized access and malwares during POST.

## 3.6 Boot Screen

This section displays the available devices on your system for you to configure the boot settings and the boot priority.



### Boot From Onboard LAN

The item allows the system to be waked up by the onboard LAN.

Configuration options: [Enabled] [Disabled]

### Setup Prompt Timeout

The item allows you to configure the number of seconds to wait for the UEFI setup utility.

Configuration options: [1] - [65535]

### Bootup Num-Lock

The item allows you to select whether Num Lock should be turned on or off when the system boots up.

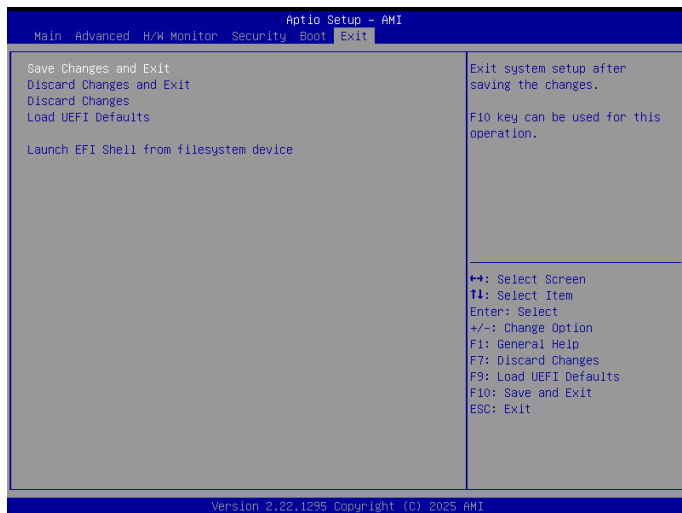
Configuration options: [On] [Off]

### Full Screen Logo

[Enabled] Select this item to display the boot logo.

[Disabled] Select this item to show normal POST messages.

## 3.7 Exit Screen



### Save Changes and Exit

When you select this option, the following message “Save configuration changes and exit setup?” will pop out. Press <F10> key or select [Yes] to save the changes and exit the UEFI SETUP UTILITY.

### Discard Changes and Exit

When you select this option, the following message “Discard changes and exit setup?” will pop out. Press <ESC> key or select [Yes] to exit the UEFI SETUP UTILITY without saving any changes.

### Discard Changes

When you select this option, the following message “Discard changes?” will pop out. Press <F7> key or select [Yes] to discard all changes.

### Load UEFI Defaults

Allows you to load UEFI default values for all options. The F9 key can be used for this operation.

### Launch EFI Shell from filesystem device

The item allows you to copy shellx64.efi to the root directory to launch EFI Shell.