# IMB-1005

# User Manual

**FC**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1)  this device may not cause harmful interference, and
(2)  this device must accept any interference received, including interference that may cause undesired operation.

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**HDMI®**
HIGH-DEFINITION MULTIMEDIA INTERFACE

## WARNING

**THIS PRODUCT CONTAINS A BUTTON BATTERY**
If swallowed, a button battery can cause serious injury or death.
Please keep batteries out of sight or reach of children.

## CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.

"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardous-waste/perchlorate"

## AUSTRALIA ONLY

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**UKCA**

ASRockInd INC. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of related UKCA Directives. Full text of UKCA declaration of conformity is available at: http://www.asrockind.com

**CE**

ASRockInd INC. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of related Directives. Full text of EU declaration of conformity is available at: http://www.asrockind.com

ASRockInd follows the green design concept to design and manufacture our products, and makes sure that each stage of the product life cycle of ASRockInd product is in line with global environmental regulations. In addition, ASRockInd disclose the relevant information based on regulation requirements.

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DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

# Contents

# Chapter 1  Introduction

Thank you for purchasing ASRockInd **IMB-1005** 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/*
>
> *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/support/index.asp*

## 1.1  Package Contents

ASRockInd **IMB-1005** Motherboard (Mini-ITX (6.7-in x 6.7-in x 1.6-in, 17.0 cm x 17.0 cm x 4.1 cm)

## 1.2 Specifications

| | | |
|---|---|---|
| **Form Factor** | Dimensions | Mini-ITX (6.7-in x 6.7-in x 1.6-in, 17.0 cm x 17.0 cm x 4.1 cm |
| **Processor System** | CPU | Intel® Alder Lake-N SoC Processors<br>IMB-1005J (N97, QC, Max Speed Up to 3.6GHz, 12W)<br>*For other CPU SKUs request, please contact regional Sales for availability |
| | Chipset | SoC |
| | BIOS | AMI SPI 256 Mbit |
| **Memory** | Technology | Single Channel DDR4 3200 MHz |
| | Capacity | 16GB |
| | Socket | 1 x 260-pin SO-DIMM |
| **Graphics** | Controller | Intel® UHD Graphics |
| | HDMI | HDMI 2.0b<br>Max resolution up to 4096 x 2160@60Hz |
| | VGA | Max resolution up to 1920 x 1200@60Hz |
| | LVDS | Dual channel 24 bit up to 1920 x 1200@60Hz<br>(connector shared with eDP) |
| | eDP | Max resolution up to 1920 x 1080@60Hz<br>(connector shared with LVDS) |
| | Multi Display | Triple display |
| **Expansion Slot** | PCIe | 1 x PCIex1 (Gen3) |
| | M.2 | 1 x M.2 (Key E, 2230) with PCIe x1, USB 2.0 and CNVi for Wireless<br>1 x M.2 (Key B, 3042/3052) with PCIe x1, USB 3.2 Gen1, USB 2.0 and SIM for 4G/5G |
| | SIM Socket | 1 x SIM socket connected to M.2 key B |
| **Audio** | Interface | Interface Realtek ALC662/ALC897 HD, High Definition Audio. Mic-in, Line-out |
| **Ethernet** | Controller/Speed | LAN1: Realtek RTL8125BG with 10/100/1000/2500 Mbps<br>LAN2: Realtek RTL8125BG with 10/100/1000/2500 Mbps |
| | Controller | 2 x RJ-45 |
| **Rear I/O** | HDMI | 2 x HDMI2.0b |
| | VGA | 1 |
| | Ethernet | 2 x 2.5 Gigabit LAN |
| | USB | 2 x USB 3.2 Gen1<br>2 x USB 2.0 |
| | Audio | 2 (Mic-In, Line-Out) |
| | COM | COM1, COM2, COM3 (RS-232/422/485) |

| | | |
|---|---|---|
| **Internal Connector** | USB | 2 x USB 3.2 Gen1 (1 x USB 3.2 header)<br>3 x USB 2.0 (1 x 2.54 pitch header, 1 x USB 2.0 Type-A vertical connector) |
| | COM | COM4 (RS-232)<br>COM5 (RS-232 or TTL (optional))<br>COM6 (RS-232 or ccTalk (optional)) |
| | GPIO | 4 x GPI, 4 x GPO |
| | TPM | TPM Header |
| | LVDS | 1 (connector with LVDS/eDP signal, switch by BIOS) |
| | SATA PWR Output | 1 |
| | Speaker Header | 1 |
| | MIPI Camera Header | 1 (optional) |
| **Storage** | M.2 | 1 x M.2 (Key M, 2242/2260/2280) with PCIe Gen3 x1 or SATA3 for SSD |
| | SATA | 1 x SATA3 (6Gb/s) |
| **Watchdog Timer** | Output | From Super I/O to drag RESETCON# |
| | Interval | 256 Segments, 0, 1, 2, ...255 Sec |
| **Power Requirements** | Input PWR | ATX-PWR (24+4-pin) and 12~28V DC-In co-design |
| | 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 Temp | -20ºC - 70ºC |
| | Storage Temp | -40ºC - 85ºC |
| | Operating Humidity | 5% - 90% |
| | Storage Humidity | 5% - 90% |

# 1.3 Motherboard Layout

**Top:**

**Back:**

39 —————— MIP11

38 —————— ESP11
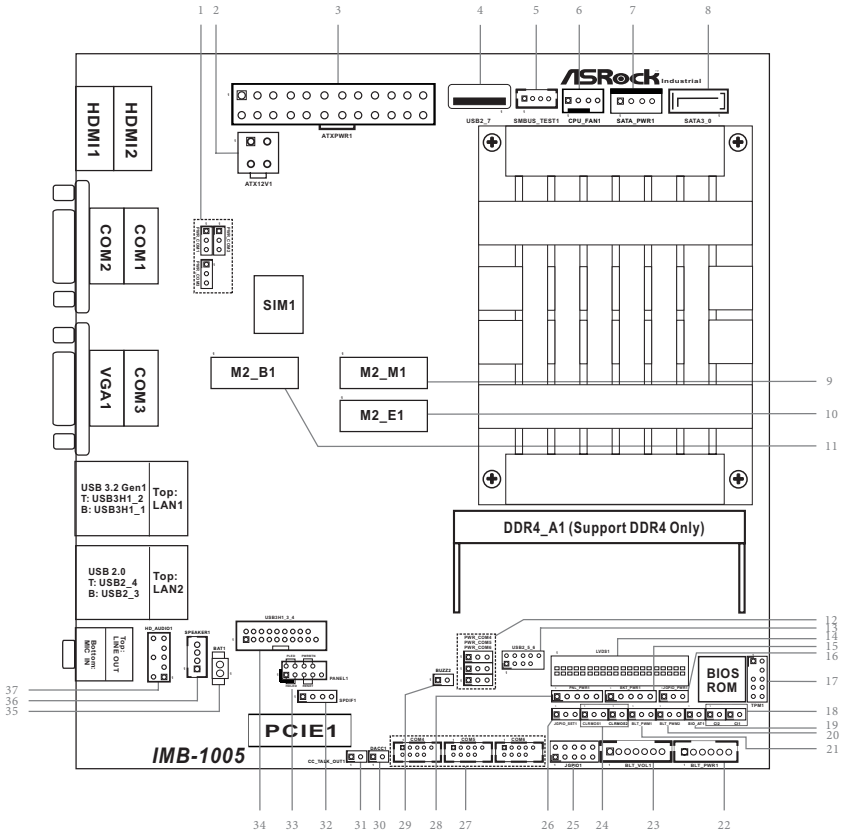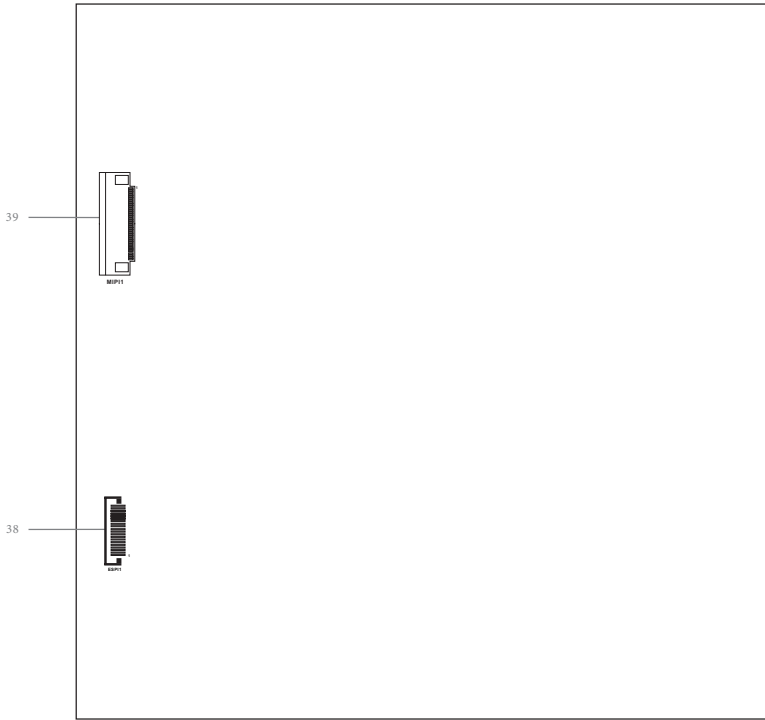
1 : COM Port PWR Setting Jumpers
   PWR_COM1 (For COM Port1)
   PWR_COM2 (For COM Port2)
   PWR_COM3 (For COM Port3)
2 : 4-pin Power Connector (ATX12V1)
3 : 24-pin ATX Power Input Connector (ATXPWR1)
4 : USB 2.0 Port (USB2_7)
5 : SMBUS_TEST1
6 : 4-Pin CPU FAN Connector (+12V) (CPU_FAN1)
7 : SATA Power Output Connector  (SATA_PWR1)
8 : SATA3 Connector (SATA3_0)
9 : M.2 Key-M Socket (M2_M1)
10 : M.2 Key-E Socket (M2_E1)
11 : M.2 Key-B Socket (M2_B1)
12 : COM Port PWR Setting Jumpers
    PWR_COM4 (For COM Port4)
    PWR_COM5 (For COM Port5)
    PWR_COM6 (For COM Port6)
13 : USB 2.0 Connector (USB2_5_6)
14 : LVDS Panel Connector (LVDS1)
15 : eDP and LVDS Backlight Power Select (LCD_BLT_VCC) (BKT_PWR1)
16 : Digital Input / Output Power Select (JGPIO_PWR) (JGPIO_PWR1)
17 : TPM Header (TPM1)
18 : Chassis Intrusion Headers (CI1, CI2)
19 : ATX/AT Mode Jumper (SIO_AT1)
20 : CON_LBKLT_CTL Voltage Level (BLT_PWM2)
21 : Brightness Control Mode (BLT_PWM1)
22 : Backlight Power Connector (BLT_PWR1)
23 : Backlight Volume Control (BLT_VOL1)
24 : Clear CMOS Jumpers (CLRMOS1, CLRMOS2)
25 : Digital Input/Output Pin Header (JGPIO1)
26 : Digital Input / Output Default Value Setting (JGPIO_SET1)
27 : Internal COM Port Headers (COM4, 5, 6) (RS232)
28 : eDP and LVDS Panel Power Select (LCD_VCC) (PNL_PWR1)
29 : Buzzer Header (BUZZ2)
30 : DACC Jumper (DACC1)
31 : CC_TALK_OUT1
    shared with COM6 (optional)
32 : SPDIF Header (SPDIF1)
33 : System Panel Header (PANEL1)
34 : USB 3.2 Gen1 Connector (USB3H1_3_4)

35 : Battery Connector (BAT1)
36 : 3W Audio AMP Output Wafer (SPEAKER1)
37 : Front Panel Audio Header (HD_AUDIO1)

**Back Side:**
38 : ESPI Header (ESPI1)
39 : MIPI1 Socket (MIPI1 (optional))

## 1.4 I/O Panel
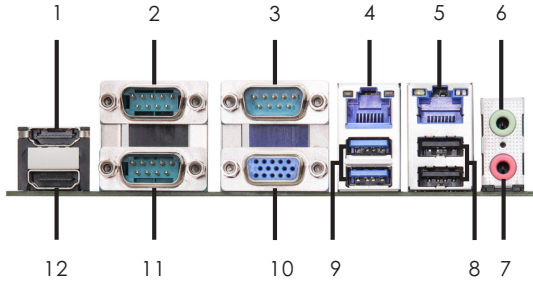


| | | | |
|---|---|---|---|
| 1 | HDMI Port (HDMI2) | 7 | Audio Output : Pink – Mic In |
| 2 | COM Port (COM1) (RS232/422/485)* | 8 | USB 2.0 Ports (USB2_3_4) |
| 3 | COM Port (COM3) (RS232/422/485)* | 9 | USB 3.2 Gen1 Ports (USB3H_1_2) |
| 4 | RJ45 LAN Port (LAN1)** | 10 | D-Sub Port (VGA1) |
| 5 | RJ45 LAN Port (LAN2)** | 11 | COM Port (COM2) (RS232/422/485)* |
| 6 | Audio Output : Green – Line Out | 12 | HDMI Port (HDMI1) |

* This motherboard supports RS232/422/485 on COM1, 2 and 3 ports. Please refer to the table below for the pin definition. In addition, COM1, 2 and 3 ports (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, 2, 3 Ports Pin Definition**

| Pin | RS232 | RS422 | RS485 |
|-----|-------|-------|-------|
| 1 | DCD | TX- | RTX- |
| 2 | RXD | TX+ | RTX+ |
| 3 | TXD | RX+ | N/A |
| 4 | DTR | RX- | N/A |
| 5 | GND | GND | GND |
| 6 | DSR | N/A | N/A |
| 7 | RTS | N/A | N/A |
| 8 | CTS | N/A | N/A |
| 9 | PWR | PWR | PWR |
| 10 | N/A | N/A | N/A |

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

**LAN Port LED Indications**

Activity/Link LED

| Status | Description |
|--------|-------------|
| Off | No Link |
| Blinking | Data Activity |
| On | Link |

SPEED LED

| Status | Description |
|--------|-------------|
| Off | 10Mbps connection |
| Orange | 100Mbps/1Gbs connection |
| Green | 2.5Gbps connection |



ACT/LINK LED    SPEED LED

**LAN Port**

# 1.5 Block Diagram

IMB-1005J
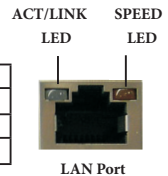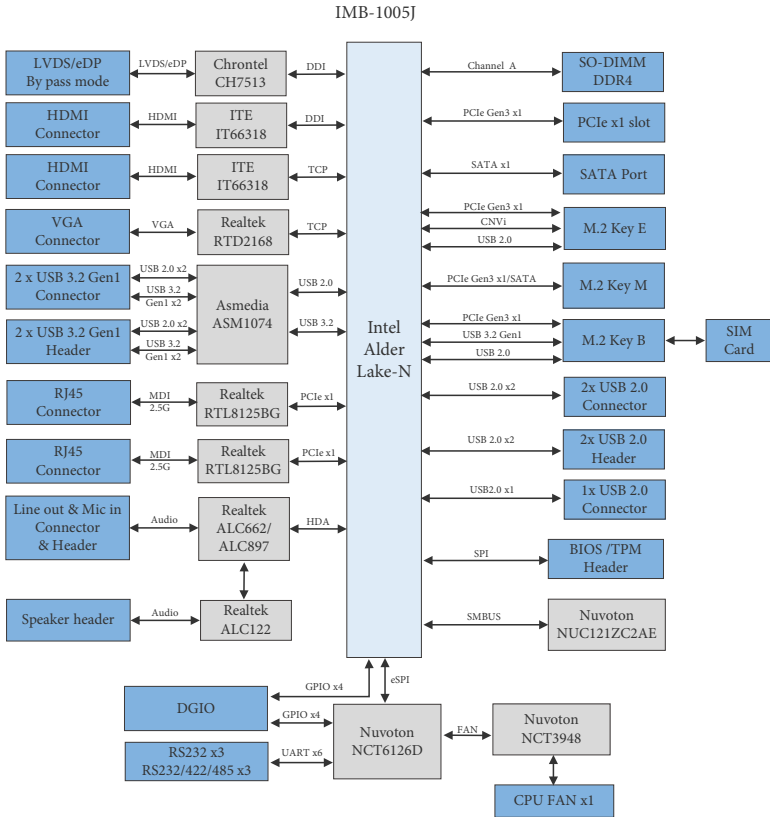
# Chapter 2  Installation

This is a Mini-ITX (6.7-in x 6.7-in x 1.6-in, 17.0 cm x 17.0 cm x 4.1 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

*IMB-1005* provides one 260-pin DDR4 (Double Data Rate 4) SO-DIMM slots, and supports Single Channel Memory Technology.

☆　　1.　*Please make sure to disconnect the power supply before adding or removing SO-DIMMs or the system components.*
　　　2.　*It is not allowed to install a DDR, DDR2, or DDR3 memory module into a DDR4 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.*

**Installing a SO-DIMM**

Step 1.　　Align a SO-DIMM on the slot such that the notch on the SO-DIMM matches the break on the slot.
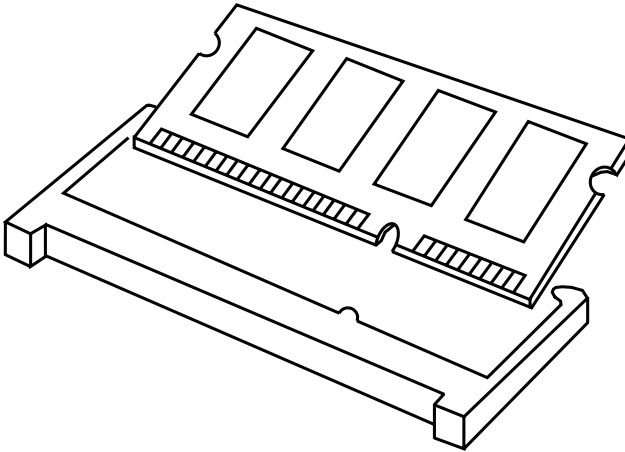


Step 2.　　Firmly insert the SO-DIMM into the slot until the retaining clips at both ends fully snap back in place and the SO-DIMM is properly seated.

## 2.4 Expansion Slots

There are 1 PCI Express Gen3 slot, 3 M.2 sockets and 1 SIM socket on this motherboard.

**PCIE slot:** PCIE1 (PCIe x1 slot) is used for PCIe Gen3 x1 lane width card.

**M.2 sockets:** 1 x M.2 (Key E, 2230) with PCIe x1, USB 2.0 and CNVi for Wireless

1 x M.2 (Key B, 3042/3052) with PCIe x1, USB 3.2 Gen1, USB 2.0 and SIM for 4G/5G

1 x M.2 (Key M, 2242/2260/2280) with PCIe Gen3 x1 or SATA3 for SSD

**SIM socket:** 1x SIM socket connected to M.2 key B

### M.2 Key-M Socket (M2_M1)

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

### M.2 Key-B Socket (M2_B1)

| Pin | Signal Name | Signal Name | Pin |
|---|---|---|---|
| 1 | NA | +3.3V | 2 |
| 3 | GND | +3.3V | 4 |
| 5 | GND | FuLL_Card_Power_off | 6 |
| 7 | USB_D+ | W_DISABLE1# | 8 |
| 9 | USB_D- | WWAN_LED# | 10 |
| 11 | GND | | |
| | | | |
| 21 | GND | NA | 20 |
| 23 | NA | NA | 22 |
| 25 | NA | NA | 24 |
| 27 | GND | W_DISABLE2# | 26 |
| 29 | USB3_RX- | NA | 28 |
| 31 | USB3_RX+ | UIM_RESET | 30 |
| 33 | GND | UIM_CLK | 32 |
| 35 | USB3_TX- | UIM_DATA | 34 |
| 37 | USB3_TX+ | UIM_PWR | 36 |
| 39 | GND | NA | 38 |
| 41 | PERn0 | NA | 40 |
| 43 | PERP0 | NA | 42 |
| 45 | GND | NA | 44 |
| 47 | PETn0 | NA | 46 |
| 49 | PETP0 | NA | 48 |
| 51 | GND | PERST# | 50 |
| 53 | PEFCLKn | CLKREQ# | 52 |
| 55 | PEFCLKp | NA | 54 |
| 57 | GND | NA | 56 |
| 59 | NA | NA | 58 |
| 61 | NA | NA | 60 |
| 63 | NA | NA | 62 |
| 65 | NA | NA | 64 |
| 67 | NA | NA | 66 |
| 69 | PEDET | NA | 68 |
| 71 | GND | +3.3V | 70 |
| 73 | GND | +3.3V | 72 |
| 75 | NA | +3.3V | 74 |

### 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 | NA | 8 |
| 9 | CNV_WGR_D1- | CNV_RF_RESET | 10 |
| 11 | CNV_WGR_D1+ | NA | 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+ | | |
| | | | |
| 33 | GND | CNV_BGI_DT | 32 |
| 35 | PETp | CNV_RGI_RSP | 34 |
| 37 | PETn | CNV_BRI_DT | 36 |
| 39 | GND | NA | 38 |
| 41 | PERp | NA | 40 |
| 43 | PERn | NA | 42 |
| 45 | GND | NA | 44 |
| 47 | PEFCLKp | NA | 46 |
| 49 | PEFCLKn | NA | 48 |
| 51 | GND | SUSCLK | 50 |
| 53 | CLKREQ# | PERST0# | 52 |
| 55 | NA | W_DISABLE1# | 54 |
| 57 | GND | W_DISABLE2# | 56 |
| 59 | CNV_WT_D1- | SMB_DATA | 58 |
| 61 | CNV_WT_D1+ | SMB_CLK | 60 |
| 63 | GND | NA | 62 |
| 65 | CNV_WT_D0- | NA | 64 |
| 67 | CNV_WT_D0+ | NA | 66 |
| 69 | GND | NA | 68 |
| 71 | CNV_WT_CLK- | NA | 70 |
| 73 | CNV_WT_CLK+ | +3.3V | 72 |
| 75 | GND | +3.3V | 74 |

## 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.

Short          Open
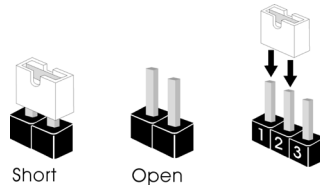
| Jumper | Setting | Description |
|--------|---------|-------------|

COM Port PWR Setting Jumpers
(3-pin PWR_COM1~3 (For COM Port1~3))
(see p. 4, No. 1)

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

(3-pin PWR_COM4~6 (For COM Port4~6))
(see p. 4, No. 12)

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

eDP and LVDS Backlight Power Select (LCD_BLT_VCC)
(5-pin BKT_PWR1)
(see p. 4, No. 15)

| Setting | Description |
|---------|-------------|
| 1-2 | LCD_BLT_VCC: +5V (Default) |
| 2-3 | LCD_BLT_VCC: +12V |
| 4-5 | LCD_BLT_VCC: DC Input |

Use this header to set up the backlight power of the LVDS connector and the panel backlight power of BLT_PWM1.

Digital Input / Output Power Select (JGPIO_PWR)
(3-pin JGPIO_PWR1)
(see p. 4, No. 16)

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

The maximum current JGPIO_PWR provides is 1A.

Chassis Intrusion Headers

(2-pin CI1, CI2)

(see p. 4, No. 18)

CI1

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

CI2

| Setting | Description |
|---------|-------------|
| Close | Normal (Default) |
| Open | 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.

ATX/AT Mode Jumper

(2-pin SIO_AT1)

(see p. 4, No. 19)

| Setting | Description |
|---------|-------------|
| Open | ATX Mode (Default) |
| Short | AT Mode |

The header provides auto boot function when AC power on. If you need the function, short SIO_AT1 pin 1 and pin 2.

CON_LBKLT_CTL Voltage Level

(3-pin BLT_PWM2)

(see p. 4, No. 20)

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

Brightness Control Mode

(3-pin BLT_PWM1)

(see p. 4, No. 21)

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

Note: 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.

Clear CMOS Jumpers

(see p. 4, No. 24)

(3-pin CLRMOS1)

| Setting | Description |
|---------|-------------|
| 1-2 | Normal (Default) |
| 2-3 | 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 pin 2 and pin 3 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 date, time, user default profile will be cleared only if the CMOS battery is removed.

(2-pin CLRMOS2)

| Setting | Description |
|---------|-------------|
| Open | Normal (Default) |
| Short | Auto clear CMOS when AC power on |

Note: CLRMOS2 allows you to clear the data in CMOS. 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.

Digital Input / Output Default Value Setting
(only setting for SIO_GPXX)
(3-pin JGPIO_SET1)
(see p. 4, No. 26)

| 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.

eDP and LVDS Panel Power Select (LCD_VCC)
(5-pin PNL_PWR1)
(see p. 4, No. 28)

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

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

DACC Jumper
(2-pin DACC1)
(see p. 4, No. 30)

| Setting | Description |
|---------|-------------|
| Open | Disable Auto Clear CMOS |
| Short | Enable Auto Clear CMOS (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 to the motherboard!*

**4-pin Power Connector**

(4-pin ATX12V1)

(see p. 4, No. 2)
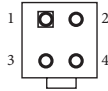
| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | GND | GND | 2 |
| 3 | DC Input | DC Input | 4 |

Please connect a DC +12V~28V power supply to this connector.

**24-pin ATX Power Input Connector**

(24-pin ATXPWR1)

(see p. 4, No. 3)
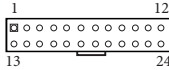
| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | +3V | +3V | 13 |
| 2 | +3V | -12V | 14 |
| 3 | GND | GND | 15 |
| 4 | +5V | PSON# | 16 |
| 5 | GND | GND | 17 |
| 6 | +5V | GND | 18 |
| 7 | GND | GND | 19 |
| 8 | PWROK_PS | NA | 20 |
| 9 | ATX+5VSB | +5V | 21 |
| 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, plug it along Pin 1 and Pin 13.

**USB 2.0 Port**

(4-pin USB2_7)

(see p. 4, No. 4)
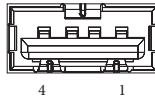
| Pin | Signal Name |
|-----|-------------|
| 1 | USB_PWR |
| 2 | USB_D- |
| 3 | USB_D+ |
| 4 | GND |

There is one USB 2.0 Type-A vertical connector on this motherboard, with the maximum power current 0.5A.

SMBUS_TEST1

(4-pin SMBUS_TEST1)

(see p. 4, No. 5)
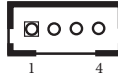
| Pin | Signal Name |
|-----|-------------|
| 1 | GPIO |
| 2 | SMB_CLK |
| 3 | SMB_DATA |
| 4 | GND |

CPU Fan Connector (+12V)

(4-pin CPU_FAN1)

(see p. 4, No. 6)
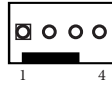
| Pin | Signal Name |
|-----|-------------|
| 1 | GND |
| 2 | +12V |
| 3 | CPU_FAN_SPEED |
| 4 | FAN_SPEED_CONTROL |

⚠️ *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.*

SATA Power Output Connector

(4-pin SATA_PWR1)

(see p. 4, No. 7)

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

Please connect a SATA power cable to this connector.

SATA3 Connector

(7-pin SATA3_0)

(see p. 4, No. 8)
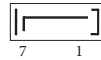
| Pin | Signal Name |
|-----|-------------|
| 1 | GND |
| 2 | SATA-A+ |
| 3 | SATA-A- |
| 4 | GND |
| 5 | SATA-B- |
| 6 | SATA-B+ |
| 7 | GND |

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.

USB 2.0 Connector

(9-pin USB2_5_6)

(see p. 4, No. 13)
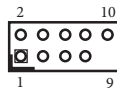
| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | USB_PWR | USB_PWR | 2 |
| 3 | P- | P- | 4 |
| 5 | P+ | P+ | 6 |
| 7 | GND | GND | 8 |
| 9 | | DUMMY | 10 |

The board provides one USB 2.0 header and it can support two USB 2.0 ports. The maximum current per port is 0.5A.

## LVDS Panel Connector

(40-pin LVDS1)

(see p. 4, No. 14)

*eDP pin definition (switch by BIOS):
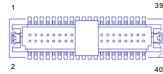
| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | LCD_VCC | LCD_VCC | 2 |
| 3 | +3.3V | NA | 4 |
| 5 | NA | LVDS_A_DATA0# | 6 |
| 7 | LVDS_A_DATA0 | GND | 8 |
| 9 | LVDS_A_DATA1# | LVDS_A_DATA1 | 10 |
| 11 | GND | LVDS_A_DATA2# | 12 |
| 13 | LVDS_A_DATA2 | GND | 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 |

| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | LCD_VCC | LCD_VCC | 2 |
| 3 | N/A | N/A | 4 |
| 5 | N/A | N/A | 6 |
| 7 | N/A | GND | 8 |
| 9 | EDP_TX1# | EDP_TX1 | 10 |
| 11 | GND | EDP_TX0# | 12 |
| 13 | EDP_TX0 | GND | 14 |
| 15 | N/A | N/A | 16 |
| 17 | GND | EDP_AUXN | 18 |
| 19 | EDP_AUXP | GND | 20 |
| 21 | N/A | N/A | 22 |
| 23 | GND | N/A | 24 |
| 25 | N/A | GND | 26 |
| 27 | N/A | N/A | 28 |
| 29 | DPLVDD_EN | N/A | 30 |
| 31 | N/A | GND | 32 |
| 33 | N/A | N/A | 34 |
| 35 | GND | CON_LBKLT_EN | 36 |
| 37 | CON_LBKLT_CTL | LCD_BLT_VCC | 38 |
| 39 | LCD_BLT_VCC | LCD_BLT_VCC | 40 |

## TPM Header

(9-pin TPM1)

(see p. 4, No. 17)
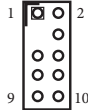
| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | TPM PWR | RST# | 2 |
| 3 | | CS# | 4 |
| 5 | IRA | MOSI | 6 |
| 7 | MISO | GND | 8 |
| 9 | CLK | GND | 10 |

## Backlight Power Connector

(6-pin BLT_PWR1)

(see p. 4, No. 22)

| 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. 4, No. 23)

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

Digital Input/Output Pin Header
(10-pin JGPIO1)
(see p. 4, No. 25)
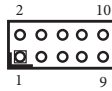
| Pin | Signal Name | Signal Name | Pin |
|---|---|---|---|
| 1 | SIO_GP34 | GPP_B15 | 2 |
| 3 | SIO_GP35 | GPP_E1 | 4 |
| 5 | SIO_GP36 | GPP_E2 | 6 |
| 7 | SIO_GP37 | GPP_E13 | 8 |
| 9 | JGPIO_PWR | GND | 10 |

Internal COM Port Headers (RS232)
(9-pin COM4~6)
(see p. 4, No. 27)
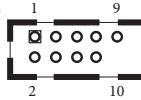
| Pin | Signal Name | Signal Name | Pin |
|---|---|---|---|
| 1 | DDCD#1 | RRXD | 2 |
| 3 | TTXD | DDTR# | 4 |
| 5 | GND | DDSR# | 6 |
| 7 | RRTS# | CCTS# | 8 |
| 9 | PWR | | 10 |

* COM5 (RS-232 or TTL (optional))
* COM6 (RS-232 or ccTalk (optional))

There are three 2.54mm-pitch COM port headers (COM4~COM6) supporting RS232. The maximum current for per port is 1A, and the power supply of pin 9 is either 5V or 12V. Use COM Port PWR Setting Jumper to set the power for COM port pin 9.

Buzzer Header
(2-pin BUZZ2)
(see p. 4, No. 29)

| Pin | Signal Name |
|---|---|
| 1 | Buzz+ |
| 2 | Buzz- |

This header provides additional external Buzzer to boot up debugging.

CC_TALK_OUT1 (shared with COM6 (optional))
(2-pin CC_TALK_OUT1)
(see p. 4, No. 31)

| Pin | Description |
|---|---|
| 1 | TX/RX |
| 2 | GND |

SPDIF Header
(3-pin SPDIF1)
(see p. 4, No. 32)
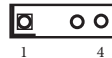
| Pin | Signal Name |
|---|---|
| 1 | +5V |
| 2 | |
| 3 | SPDIF OUT |
| 4 | GND |

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.

## System Panel Header

(9-pin PANEL1)

(see p. 4, No. 33)
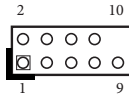
| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | HDLED+ | PLED+ | 2 |
| 3 | HDLED- | PLED- | 4 |
| 5 | GND | PWRBTN# | 6 |
| 7 | RESET# | GND | 8 |
| 9 | GND | | 10 |

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 sys-tem 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 assignments are matched correctly.

## USB 3.2 Gen1 Connector

(19-pin USB3H1_3_4)

(see p. 4, No. 34)
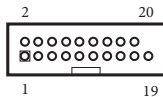
| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | DUMMY | IntA_P_D+ | 2 |
| 3 | IntA_P_D+ | IntA_P_D- | 4 |
| 5 | IntA_P_D- | GND | 6 |
| 7 | GND | IntA_P_SSTX+ | 8 |
| 9 | IntA_P_SSTX+ | IntA_P_SSTX- | 10 |
| 11 | IntA_P_SSTX- | GND | 12 |
| 13 | GND | IntA_P_SSRX+ | 14 |
| 15 | IntA_P_SSRX+ | IntA_P_SSRX- | 16 |
| 17 | IntA_P_SSRX- | Vbus | 18 |
| 19 | Vbus | | |

There is one USB 3.2 Gen1 connector on this motherboard. This header can support two USB 3.2 Gen1 ports with maximum power current 0.9A per port.

## Battery Connector

(BAT1)

(see p. 4, No. 35)

| Pin | Signal Name |
|-----|-------------|
| 1 | +BAT |
| 2 | GND |

**3W Audio AMP Output Wafer**

(4-pin SPEAKER1)

(see p. 4, No. 36)

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

**Front Panel Audio Header**

(8-pin HD_AUDIO1)

(see p. 4, No. 37)
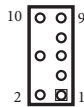
| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | MIC2_L | GND | 2 |
| 3 | MIC2_R | | 4 |
| 5 | OUT2_R | MIC_RET | 6 |
| 7 | J_SENSE | | 8 |
| 9 | OUT2_L | OUT_RET | 10 |

This is line out/microphone interface for front panel audio cable that allows jack detection, convenient connection and control of audio devices.

**Back Side:**

ESPI Header

(20-pin ESPI1)

(see p. 5, No. 38)

The header is reserved for Port 80 code display and debugging purposes.
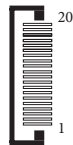
| Pin | Signal Name |
|-----|-------------|
| 1 | GND |
| 2 | ESPI_CLK |
| 3 | GND |
| 4 | ESPI_CS# |
| 5 | ESPI_RESET# |
| 6 | GND |
| 7 | +3V |
| 8 | GND |
| 9 | SMB_CLK |
| 10 | SMB_DATA |
| 11 | ESPI_IO0 |
| 12 | ESPI_IO1 |
| 13 | ESPI_IO2 |
| 14 | ESPI_IO3 |
| 15 | GND |
| 16 | +3VSB |
| 17 | Internal Use |
| 18 | Internal Use |
| 19 | ESPI_ALERT# |
| 20 | GND |

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**MIPI1 Socket**

(36-pin MIPI1)

(see p. 5, No. 39)
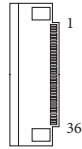
| Pin | Signal Name |
|-----|-------------|
| 1 | GND |
| 2 | CSI_B_DN2 |
| 3 | CSI_B_DP2 |
| 4 | GND |
| 5 | CSI_B_DN1 |
| 6 | CSI_B_DP1 |
| 7 | GND |
| 8 | CSI_B_CLK_N |
| 9 | CSI_B_CLK_P |
| 10 | GND |
| 11 | CSI_B_DN0 |
| 12 | CSI_B_DP0 |
| 13 | CSI_B_DN3 |
| 14 | CSI_B_DP3 |
| 15 | GND |
| 16 | GND |
| 17 | +2.8V |
| 18 | GND |
| 19 | +2.8V |
| 20 | +1.8V |
| 21 | +1.2V |
| 22 | GND |
| 23 | IMBCLKOUT0 |
| 24 | GND |
| 25 | I2C1_SCL |
| 26 | I2C1_SDA |
| 27 | N/C |
| 28 | BUF_PLT_RST_1.8_R_N |
| 29 | N/C |
| 30 | GND |
| 31 | N/C |
| 32 | +1.2V |
| 33 | GND |
| 34 | GPP_S1 |
| 35 | GPP_S2 |
| 36 | GPP_S3 |

# 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, mulfunction 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:

| | |
|---|---|
| **Main** | For setting system time/date information |
| **Advanced** | For advanced system configurations |
| **H/W Monitor** | Displays current hardware status |
| **Security** | For security settings |
| **Boot** | For configuring boot settings and boot priority |
| **Exit** | 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.
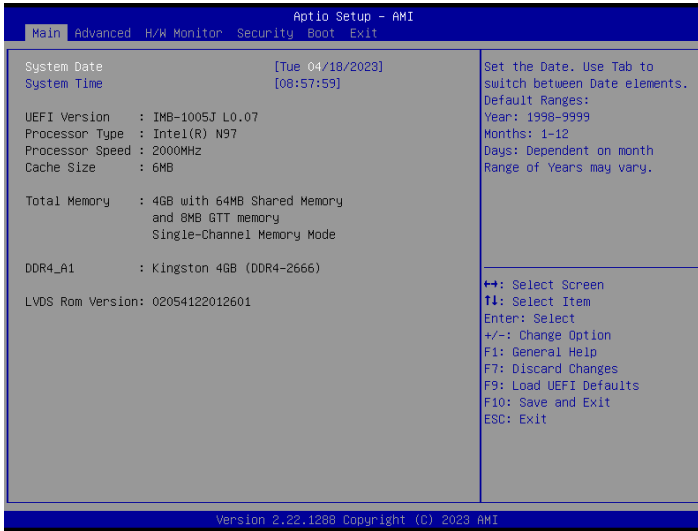
*Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen. Options may also vary depending on the features of your motherboard.*

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## 3.3 Advanced Screen

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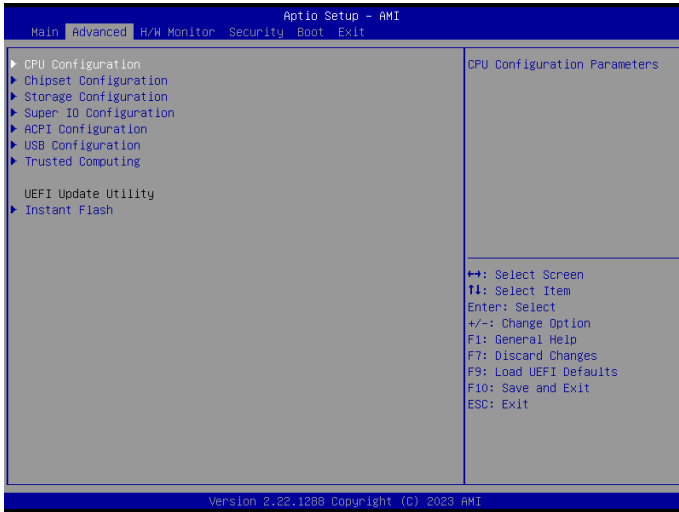


*Setting wrong values in this section may cause the system to malfunction.*

### Instant Flash

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 MS-DOS or 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 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

```
                        Aptio Setup - AMI
    ┌─────────────────────────────────────────────────────────────────────────┐
    │  Advanced                                                                 │
    ├─────────────────────────────────────────────────────────────────────────┤
    │ Intel(R) Atom(TM) x7425E                      Number of E-Cores to enable │
    │ Processor ID                B06E0             in each processor package.  │
    │ Microcode Revision          E                 Note: Number of P-Cores and │
    │ Processor Max Speed         1500 MHz          E-Cores are looked at       │
    │ Processor Min Speed         400 MHz           together. When both are     │
    │ Processor P-Cores           0Core(s) / 0Thread(s)  {0,0}, Pcode will enable all │
    │ Processor E-Cores           4Core(s) / 4Thread(s)  cores.                 │
    │                                                                           │
    │ Active Processor E-Cores    [All]                                         │
    │ CPU C States Support        [Enabled]                                     │
    │  Enhanced Halt State(C1E)   [Enabled]                                     │
    │  Package C State Support    [Disabled]                                    │
    │  CFG Lock                   [Disabled]                                    │
    │                                               ←→: Select Screen           │
    │ Intel Virtualization Technology  [Enabled]    ↑↓: Select Item             │
    │ Intel SpeedStep Technology  [Enabled]         Enter: Select               │
    │ Intel Turbo Boost Technology [Enabled]        +/-: Change Option          │
    │                                               F1: General Help            │
    │ CPU Thermal Throttling      [Enabled]         F7: Discard Changes         │
    │                                               F9: Load UEFI Defaults      │
    │ Power Limit 1               0                 F10: Save and Exit          │
    │ Power Limit 2               0                 ESC: Exit                   │
    │                                                                           │
    │                                                                           │
    ├─────────────────────────────────────────────────────────────────────────┤
    │            Version 2.22.1288 Copyright (C) 2023 AMI                       │
    └─────────────────────────────────────────────────────────────────────────┘
```

### Active Processor E-Cores

This 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

This 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 State Support

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

### 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] and Intel Turbo Boost Technology is set to [Enabled].

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]

## Power Limit 1

"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. Overclocking SKU: Value must be between Max and Min Power Limits (specified by PACKAGE_POWER_SKU_MSR). Other SKUs: This value must be between Min Power Limit and Processor Base Power (TDP) Limit. If value is 0, BIOS will program Processor Base Power (TDP) value."

## Power Limit 2

"Power Limit 2 value in Milli Watts. BIOS will round to the nearest 1/8W when programming. If the value is 0, BIOS will program this value as 1.25*Processor Base Power (TDP). For 12.50W, enter 12500. Processor applies control policies such that the package power does not exceed this limit."

## 3.3.2 Chipset Configuration

```
                              Aptio Setup - AMI
       Advanced

    ME Firmware Version          16.50.0.1146              VT-d Capability
    VT-d Capability              Supported

    VT-d                         [Enabled]
    Re-Size BAR Support          [Disabled]

    Share Memory                 [Auto]
    In-Band ECC Support          [Disabled]
    Render Standby               [Enabled]
    Active LVDS                  [Disabled]

    Onboard LAN1                 [Enabled]
    Onboard LAN2                 [Enabled]
                                                           ↔: Select Screen
    Onboard HD Audio             [Enabled]                 ↑↓: Select Item
                                                           Enter: Select
    Restore on AC/Power Loss     [Power Off]               +/-: Change Option
                                                           F1: General Help
                                                           F7: Discard Changes
                                                           F9: Load UEFI Defaults
                                                           F10: Save and Exit
                                                           ESC: Exit


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```

### 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.

### Share Memory

Share memory allows you to configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

Configuration options: [Auto] [32M] [64M] [128M] [256M] [512M]
Options vary depending on the memory you use on your motherboard.

### In-Band ECC Support

This allows you to enable or disable In-Band ECC.

Configuration options: [Enabled] [Disabled]

### Render Standby

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

### 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]).

### Onboard LAN1

This allows you to enable or disable the Onboard LAN1 feature.

### Onboard LAN2

This allows you to enable or disable the Onboard LAN2 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: [Enabled] [Disabled]

### Restore on AC/Power Loss

The option allows you to select the power state after a power failure.

[Power Off] sets the power to remain off when the power recovers.

[Power On] sets the system to start to boot up when the power recovers.

### 3.3.3 Storage Configuration
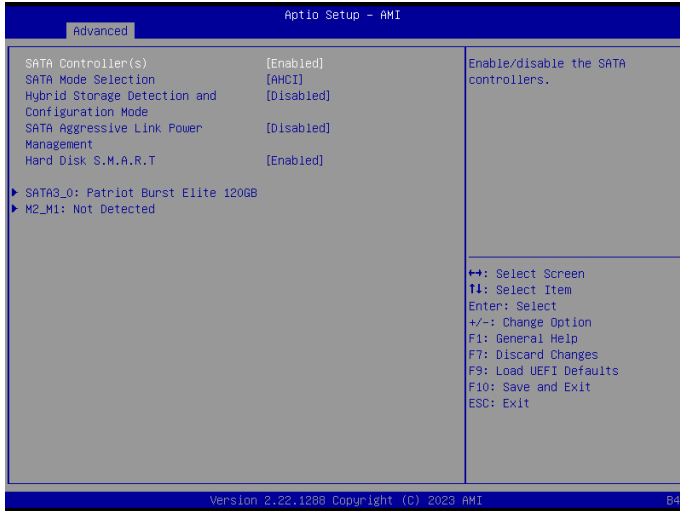


### SATA Controller(s)

The option 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]

### Hybrid Storage Detection and Configuration Mode

The option allows you to select Hybrid Storage Detection and Configuration Mode.

Configuration options: [Dynamic Configuration for Hybrid Storage Enable] [Disabled]

### 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 Super IO Configuration

```
                              Aptio Setup - AMI
        Advanced

COM1                          [Enabled]              Enable or Disable COM1
    Type Select               [RS232]                IO=3F8h; IRQ=4;
COM2                          [Enabled]
    Type Select               [RS232]
COM3                          [Enabled]
    Type Select               [RS232]
COM4                          [Enabled]
COM5                          [Enabled]
COM6                          [Enabled]

WDT Timeout Reset             [Disabled]


                                                     ↔: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Option
                                                     F1: General Help
                                                     F7: Discard Changes
                                                     F9: Load UEFI Defaults
                                                     F10: Save and Exit
                                                     ESC: Exit



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```

### 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.

### Type Select

Use this to select COM3 port type: [RS232], [RS422] or [RS485].

### 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.

### WDT Timeout Reset

Use this to set the Watch Dog Timer.

### 3.3.5 ACPI Configuration

```
                              Aptio Setup – AMI
        Advanced

   Suspend to RAM                     [Auto]               It is recommended to select
                                                           auto for ACPI S3 power saving.
   PCIE Devices Power On              [Disabled]
   RTC Alarm Power On                 [By OS]








                                                           ↔: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Option
                                                           F1: General Help
                                                           F7: Discard Changes
                                                           F9: Load UEFI Defaults
                                                           F10: Save and Exit
                                                           ESC: Exit


                         Version 2.22.1288 Copyright (C) 2023 AMI
```
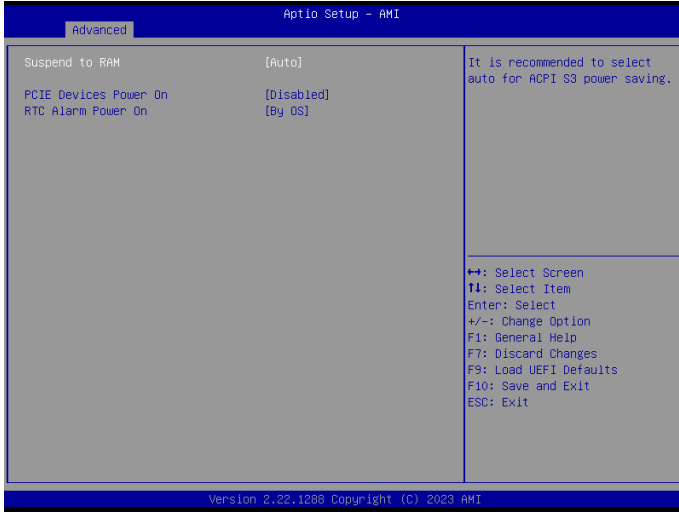
#### Suspend to RAM

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]

### 3.3.6 USB Configuration



### USB Power Control

Use this option to control USB power.

### M.2 Key_B USB Function

Enable or disable M.2 Key-B USB function.

### 3.3.7 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]

### SM3_256 PCR Bank

SM3_256 PCR Bank allows you to enable or disable SM3_256 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.

## 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,  and the critical voltage.

```
                          Aptio Setup - AMI
     Main  Advanced  H/W Monitor  Security  Boot  Exit

  Hardware Health Event Monitoring                    Quiet Fan Function Control

  CPU Temperature              : +38.0 °C
  M/B Temperature              : +37.0 °C

  CPU_FAN1 Speed               : 5018 RPM

  +3V                          : +3.424 V
  +3VSB                        : +3.440 V
  VBAT                         : +3.040 V
  +5V                          : +5.064 V
  VCORE                        : +0.848 V
  VCCM                         : +1.216 V
  DC_IN                        : N/A              ←→: Select Screen
                                                  ↑↓: Select Item
  CPU_FAN1 Setting             [Full On]          Enter: Select
                                                  +/-: Change Option
  Case Open Feature            [Disabled]         F1: General Help
                                                  F7: Discard Changes
                                                  F9: Load UEFI Defaults
                                                  F10: Save and Exit
                                                  ESC: Exit



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```

*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]

### Case Open Feature

This 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.

```
                           Aptio Setup - AMI
    Main   Advanced   H/W Monitor   Security   Boot   Exit

   Supervisor Password          Not Installed          Set or change the password
   User Password                Not Installed          for the administrator
                                                       account. Only the
   Supervisor Password                                 administrator has authority
   User Password                                       to change the settings in the
                                                       UEFI Setup Utility. Leave it
 ▶ Secure Boot                                         blank and press enter to
                                                       remove the password.
   Intel(R) Platform Trust      [Enabled]
   Technology

                                                       ↔: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Option
                                                       F1: General Help
                                                       F7: Discard Changes
                                                       F9: Load UEFI Defaults
                                                       F10: Save and Exit
                                                       ESC: Exit

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```

### Supervisor Password

Set or change the password for the administrator account. Only the administrator has the 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.
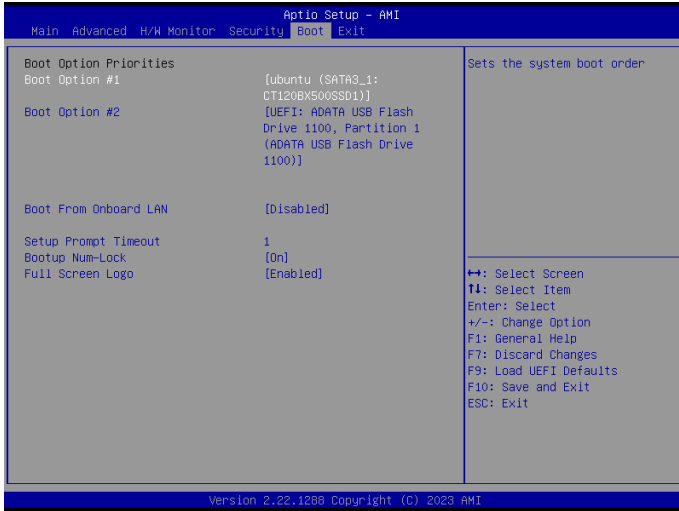
### Secure Boot

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

### Intel(R) Platform Trust Technology

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

## 3.6 Boot Screen

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

```
                              Aptio Setup - AMI
      Main  Advanced  H/W Monitor  Security  Boot  Exit

   Boot Option Priorities                               Sets the system boot order
   Boot Option #1              [ubuntu (SATA3_1:
                               CT120BX500SSD1)]

   Boot Option #2              [UEFI: ADATA USB Flash
                               Drive 1100, Partition 1
                               (ADATA USB Flash Drive
                               1100)]


   Boot From Onboard LAN       [Disabled]

   Setup Prompt Timeout        1
   Bootup Num-Lock             [On]                     ↔: Select Screen
   Full Screen Logo            [Enabled]                ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Option
                                                        F1: General Help
                                                        F7: Discard Changes
                                                        F9: Load UEFI Defaults
                                                        F10: Save and Exit
                                                        ESC: Exit



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```

### 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.
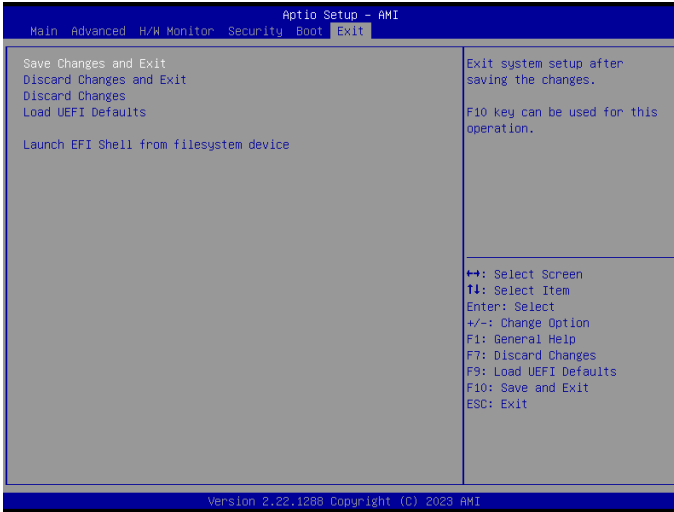
Configuration options: [On] [Off]

### 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. 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. 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. Select [Yes] to discard all the changes.

### Load UEFI Defaults

The item 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.