



**Q870I-IM-A**

# Industrial Motherboard

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# Contents

## Chapter 1      Product overview

|     |                        |     |
|-----|------------------------|-----|
| 1.1 | Package contents ..... | 1-1 |
| 1.2 | Features.....          | 1-1 |
| 1.3 | Specifications .....   | 1-2 |

## Chapter 2      Motherboard information

|       |                                                  |      |
|-------|--------------------------------------------------|------|
| 2.1   | Before you proceed.....                          | 2-1  |
| 2.2   | Motherboard layout.....                          | 2-2  |
| 2.3   | Central Processing Unit (CPU).....               | 2-4  |
| 2.3.1 | CPU installation .....                           | 2-5  |
| 2.3.2 | CPU heatsink and fan assembly installation ..... | 2-7  |
| 2.4   | System memory.....                               | 2-9  |
| 2.5   | Jumpers.....                                     | 2-10 |
| 2.6   | Connectors.....                                  | 2-14 |
| 2.6.1 | Rear panel connectors.....                       | 2-14 |
| 2.6.2 | Internal connectors.....                         | 2-16 |
| 2.7   | Slot.....                                        | 2-28 |

## Chapter 3      BIOS setup

|        |                                   |      |
|--------|-----------------------------------|------|
| 3.1    | BIOS Setup program.....           | 3-1  |
| 3.2    | Main menu .....                   | 3-2  |
| 3.2.1  | System Date [Day MM/DD/YYYY]..... | 3-2  |
| 3.2.2  | System Time [HH:MM:SS].....       | 3-2  |
| 3.3    | Advanced menu .....               | 3-2  |
| 3.3.1  | LVDS Configuration.....           | 3-2  |
| 3.3.2  | ASUS CONFIG LOCK.....             | 3-4  |
| 3.3.3  | ASUS AUTO RETRY .....             | 3-4  |
| 3.3.4  | PCH-FW Configuration .....        | 3-5  |
| 3.3.5  | Trusted Computing .....           | 3-5  |
| 3.3.6  | CPU Configuration .....           | 3-6  |
| 3.3.7  | Graphics Configuration.....       | 3-8  |
| 3.3.8  | PCI Express Configuration .....   | 3-8  |
| 3.3.9  | AMT Configuration.....            | 3-9  |
| 3.3.10 | Super IO Configuration .....      | 3-9  |
| 3.3.11 | Serial Console Redirection .....  | 3-10 |
| 3.3.12 | NVMe Configuration .....          | 3-12 |

|                     |                                     |             |
|---------------------|-------------------------------------|-------------|
| 3.3.13              | SATA Configuration .....            | 3-12        |
| 3.3.14              | VMD setup menu .....                | 3-12        |
| 3.3.15              | Network Stack Configuration .....   | 3-12        |
| 3.3.16              | USB Configuration .....             | 3-13        |
| 3.3.17              | Onboard Devices Configuration ..... | 3-13        |
| 3.3.18              | APM Configuration .....             | 3-14        |
| 3.3.19              | EZ-Flash .....                      | 3-15        |
| 3.3.20              | Preserve BIOS option method .....   | 3-15        |
| <b>3.5</b>          | <b>Hardware Monitor menu .....</b>  | <b>3-16</b> |
| 3.5.1               | Smart Fan Mode .....                | 3-16        |
| <b>3.6</b>          | <b>Security menu .....</b>          | <b>3-16</b> |
| 3.6.1               | Administrator Password .....        | 3-16        |
| 3.6.2               | User Password .....                 | 3-17        |
| 3.6.3               | Secure Boot .....                   | 3-17        |
| <b>3.7</b>          | <b>Boot menu .....</b>              | <b>3-18</b> |
| <b>3.8</b>          | <b>Exit menu .....</b>              | <b>3-19</b> |
| <b>3.9</b>          | <b>Event Logs menu .....</b>        | <b>3-20</b> |
| <b>3.10</b>         | <b>MEBx menu .....</b>              | <b>3-20</b> |
| <br><b>Appendix</b> |                                     |             |
|                     | <b>Notices .....</b>                | <b>A-1</b>  |
|                     | <b>Service and Support .....</b>    | <b>A-5</b>  |

# Chapter 1

## Product overview

### 1.1 Package contents

Check your industrial motherboard package for the following items.

- ☒ 1 x ASUS Q870I-IM-A Motherboard
- ☒ 1 x Serial ATA 6.0 Gb/s cable
- ☒ 1 x M.2 screw package
- ☒ 1 x ASUS I/O Shield



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**NOTE:** If any of the above items is damaged or missing, contact your distributor or sales representative immediately.

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### 1.2 Features

- Intel® socket 1851 for ARL-S Core™ Ultra Processors (Series 2)
- Two Dual Channel DDR5 6400 MHz SO-DIMMs up to 96GB
- 4 x SATA 6.0 Gb/s, 3 x USB 3.2 Gen 2, 7 x USB 3.2 Gen 1, 2 x USB 2.0, 5 x COM ports
- 1 x PCIe x16 slot, 1 x M.2 (Key E, 2230) for WiFi/BT devices, 1 x M.2 (Key M, 2280) with NVMe support
- Multi-display: 3 x DisplayPorts (one shared with USB 3.2 Gen 2x2 Type-C®), 1 x HDMI™ port, 1 x LVDS/eDP port

## 1.3 Specifications

|                             |                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CPU</b>                  | Intel® socket 1851 for ARL-S Core™ Ultra Processors (Series 2)<br>Supports up to 65W TDP                                                                                                                                                                                                                                                                                                  |
| <b>Chipset</b>              | Intel® Q870 Chipset                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Memory</b>               | 2 x SO-DIMM, max. 96GB, DDR5 6400 MHz                                                                                                                                                                                                                                                                                                                                                     |
| <b>Graphics</b>             | Integrated graphics processor - Intel® HD Graphics support<br>Multi-VGA output support: DP/HDMI™/eDP/LVDS ports<br>- Supports 2 x DisplayPort 1.4 outputs (DP++)<br>- Supports 1 x DisplayPort 1.4 output (colay with USB Type-C®) with a maximum resolution of 3840 x 2160 @ 60 Hz<br>- Supports HDMI™ output<br>- Supports either eDP or LVDS output (Switched by BIOS)                 |
| <b>Expansion slots</b>      | 1 x PCI Express 5.0 x16 slot*<br>1 x M.2 socket 1 (Key E, 2230) with PCIe and CNVi modes for WiFi/BT devices<br>1 x M.2 socket 3 (Key M, 2280) with NVMe support<br>* Supports PCIe bifurcation (16X; 8X+8X; 8X+4X+4X).                                                                                                                                                                   |
| <b>Storage</b>              | 4 x SATA 6.0 Gb/s ports                                                                                                                                                                                                                                                                                                                                                                   |
| <b>LAN</b>                  | Dual Intel® Lan: 1 x Intel® I210, 1 x Intel® I226LM (Intel vPro supported)                                                                                                                                                                                                                                                                                                                |
| <b>Audio</b>                | Realtek ALC897 High Definition Audio CODEC                                                                                                                                                                                                                                                                                                                                                |
| <b>Rear panel I/O ports</b> | 1 x HDMI™ port<br>2 x DisplayPorts<br>3 x USB 3.2 Gen 2 ports<br>1 x USB 3.2 Gen 2x2 Type-C® port<br>4 x USB 3.2 Gen 1 port<br>2 x LAN (RJ45) ports<br>1 x COM port (RS232/422/485)<br>2 x Audio jacks (Line-in, Line-out)                                                                                                                                                                |
| <b>Internal I/O ports</b>   | 4 x COM Port headers (1 x RS232/422/485, 3 x RS232)<br>1 x USB 3.2 Gen 1 connector supports additional 2 USB 3.2 Gen 1 ports<br>1 x USB 3.2 Gen 1 stick socket<br>1 x USB 2.0 header supports additional 2 USB 2.0 ports<br>1 x CPU Fan header with PWM mode<br>1 x Chassis Fan header with PWM mode<br>2 x Disable ME jumpers<br>1 x LVDS/eDP selection connector<br>1 x Panel SW header |

(continued on the next page)

|                                  |                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Internal I/O ports</b>        | 1 x Front Panel Audio header (AAFP)<br>1 x System Panel header<br>1 x S/PDIF header<br>1 x Chassis Intrude header<br>1 x Speaker header<br>1 x Clear CMOS header<br>1 x COM Debug header<br>1 x AT/ATX mode selection jumper<br>1 x 24-pin ATX Power connector<br>1 x 8-pin ATX Power connector<br>1 x SPI TPM header<br>1 x Power Limit selection jumper |
| <b>GPIO</b>                      | 1 x 8-bit GPIO header                                                                                                                                                                                                                                                                                                                                     |
| <b>Manageability</b>             | WfM 2.0, DMI 2.0, WOL by PME                                                                                                                                                                                                                                                                                                                              |
| <b>Watch dog timer</b>           | Yes                                                                                                                                                                                                                                                                                                                                                       |
| <b>Power requirement</b>         | ATX mode<br>12V DC-IN (Supported by an additional cable)                                                                                                                                                                                                                                                                                                  |
| <b>Operation Temperature</b>     | 0~60°C                                                                                                                                                                                                                                                                                                                                                    |
| <b>Non-Operation Temperature</b> | -40~85°C                                                                                                                                                                                                                                                                                                                                                  |
| <b>Relative Humidity</b>         | 5%~95%                                                                                                                                                                                                                                                                                                                                                    |
| <b>OS support</b>                | Windows 10 IoT Enterprise LTSC<br>Windows 11 IoT Enterprise LTSC<br>Ubuntu<br>RedHat Enterprise<br>Fedora Workstation<br>OpenSUSE                                                                                                                                                                                                                         |
| <b>Certification</b>             | CE, FCC                                                                                                                                                                                                                                                                                                                                                   |
| <b>Form Factor</b>               | Mini-ITX Form Factor, 6.7" x 6.7" (17.0cm x 17.0cm)                                                                                                                                                                                                                                                                                                       |



**NOTE:** Specifications are subject to change without notice. Please refer to the ASUS website for the latest specifications.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

# Chapter 2

## Motherboard information

### 2.1 Before you proceed

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



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**CAUTION!**

- Unplug the power cord from the wall socket before touching any component.
  - Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.
  - Hold components by the edges to avoid touching the ICs on them.
  - Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
  - Before you install or remove any component, always remove the AC power by unplugging the power cord from the power outlet. Failure to do so may cause severe damage to the motherboard, peripherals, or components.
-

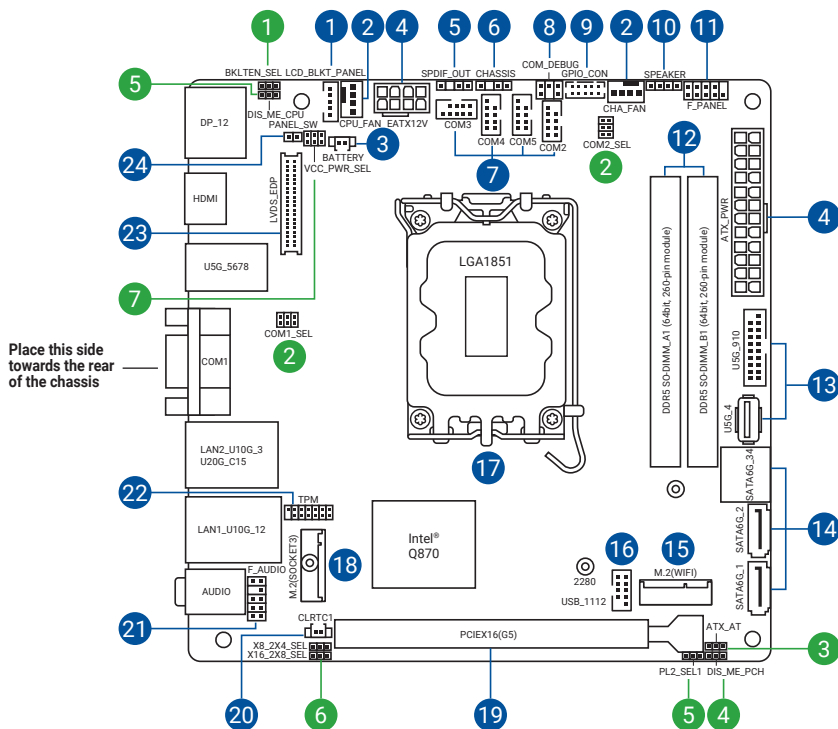
## 2.2 Motherboard layout



**NOTE:** Place four screws into the holes indicated by circles to secure the motherboard to the chassis.



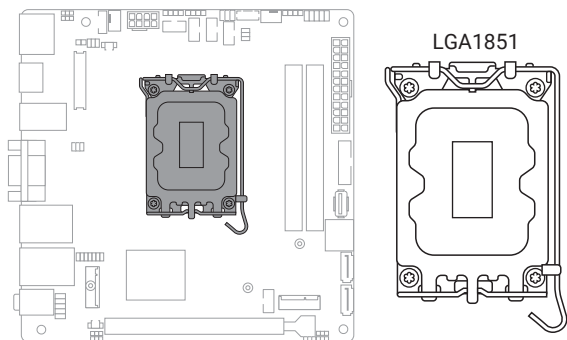
**CAUTION!** Do not overtighten the screws! Doing so can damage the motherboard.



| Connectors/Slots                                                              | Page        |
|-------------------------------------------------------------------------------|-------------|
| 1. LVDS/eDP Backlight panel connector (5-pin LCD_BLK_T_PANEL)                 | 2-23        |
| 2. CPU and Chassis Fan headers (4-pin CPU_FAN, 4-pin CHA_FAN)                 | 2-18        |
| 3. RTC Battery header (2-pin BATTERY)                                         | 2-21        |
| 4. ATX Power connectors (24-pin EATXPWR, 8-pin EATX12V)                       | 2-25        |
| 5. Digital Audio header (4-1 pin SPDIF_OUT)                                   | 2-23        |
| 6. Chassis Intrude header (4-1 pin CHASSIS)                                   | 2-26        |
| 7. Serial Port headers (10-1 pin COM2, COM3, COM4, COM5)                      | 2-22        |
| 8. COM Debug connector (6-1 pin COM_DEBUG)                                    | 2-26        |
| 9. General purpose input/output connector (10-pin GPIO_CON)                   | 2-17        |
| 10. Speaker header (4-pin SPEAKER)                                            | 2-20        |
| 11. System Panel header (10-1 pin F_PANEL)                                    | 2-19        |
| 12. DDR5 SO-DIMM slots                                                        | 2-9         |
| 13. USB 3.2 Gen 1 connectors (U5G_4 / U5G_910)                                | 2-16        |
| 14. SATA 6.0Gb/s ports (7-pin SATA6G_1-4)                                     | 2-20        |
| 15. M.2 Wi-Fi                                                                 | 2-22        |
| 16. USB 2.0 header (10-1 pin USB_1112)                                        | 2-17        |
| 17. Intel® LGA1851 CPU socket                                                 | 2-4         |
| 18. M.2 socket 3                                                              | 2-21        |
| 19. PCI Express 5.0 x16 slot                                                  | 2-28        |
| 20. Clear CMOS header (2-pin CLRRTC)                                          | 2-27        |
| 21. Front Panel Audio header (10-1 pin F_AUDIO)                               | 2-24        |
| 22. SPI TPM header (14-1 pin SPI_TPM)                                         | 2-18        |
| 23. LVDS/eDP Signal connector (LVDS_eDP)                                      | 2-20        |
| 24. LCD Panel Monitor Switch header (2-pin PANEL_SW)                          | 2-16        |
| <b>Jumpers</b>                                                                | <b>Page</b> |
| 1. LVDS/eDP Panel Enable Signal Selection header (3-pin BKLTEN_SEL)           | 2-12        |
| 2. COM1/2 Ring/+5V/+12V selection jumpers (6-pin COM1_SEL, COM2_SEL)          | 2-10        |
| 3. AT/ATX Mode selection jumper (3-pin AT_ATX)                                | 2-11        |
| 4. Disable ME jumper (3-pin DIS_ME_CPU, DIS_ME_PCH)                           | 2-11        |
| 5. Power Limit selection jumper (3-pin PL2_SEL1)                              | 2-12        |
| 6. Expansion slot bandwidth selection jumpers (3-pin X16_2X8_SEL, X8_2X4_SEL) | 2-13        |
| 7. Display panel VCC power selection (6-pin VCC_PWR_SEL)                      | 2-10        |

## 2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA1851 socket designed for ARL-S Core™ Ultra Processors (Series 2).



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**IMPORTANT!** Unplug all power cables before installing the CPU.

---

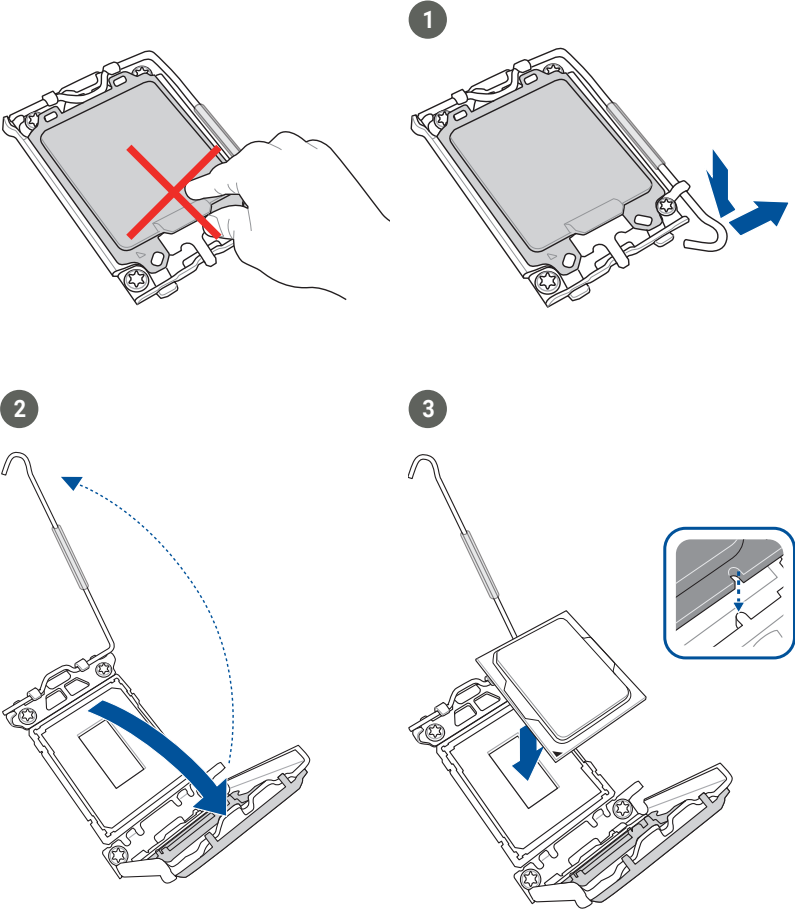


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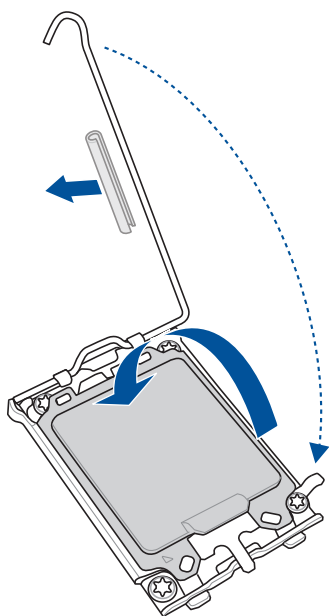
### CAUTION!

- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. The manufacturer will shoulder the cost of repair only if the damage is shipment/transit-related.
  - Keep the cap after installing the motherboard. The manufacturer will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the socket.
  - The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.
-

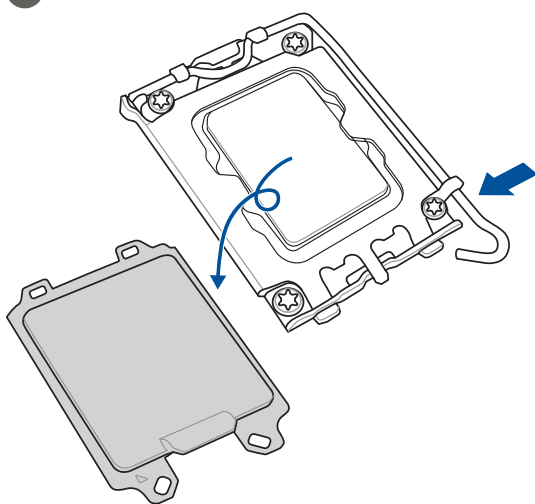
### 2.3.1 CPU installation



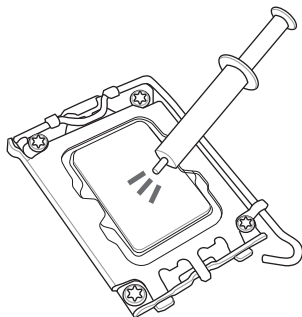
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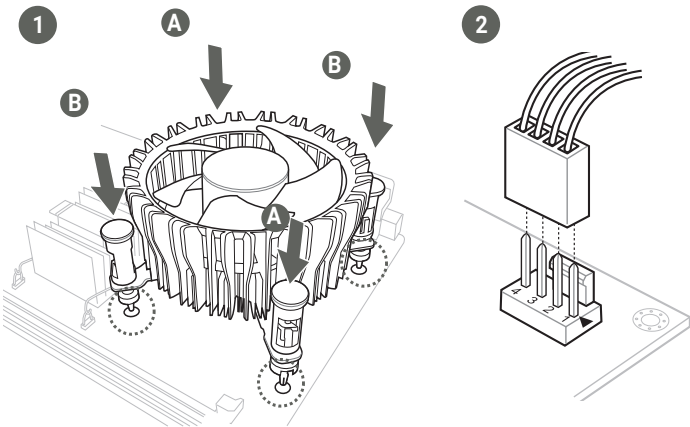


### 2.3.2 CPU heatsink and fan assembly installation

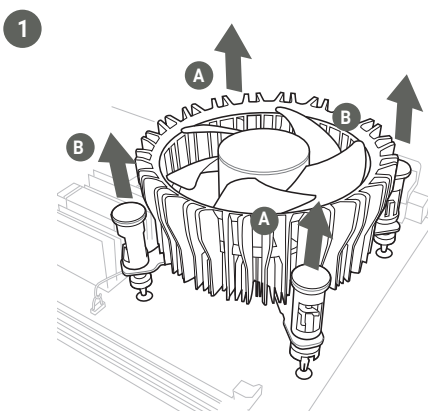


Apply Thermal Interface Material to the CPU cooling system and CPU before you install the cooling system, if necessary.

To install the CPU heatsink and fan assembly

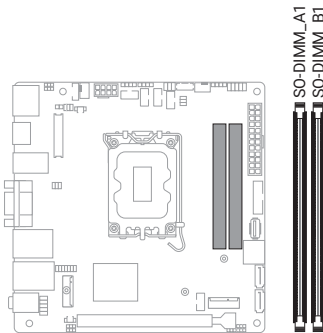


## To uninstall the CPU heatsink and fan assembly



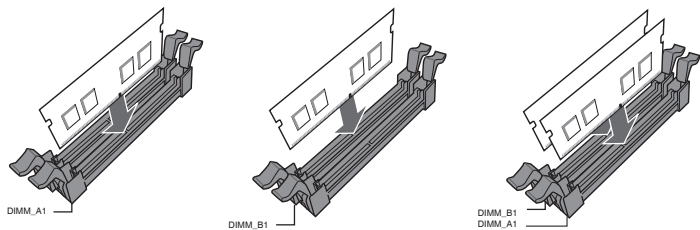
## 2.4 System memory

This motherboard comes with two Double Data Rate 5 (DDR5) Small Outline Dual Inline Memory Module (SO-DIMM) sockets. The figure below illustrates the location of the DDR5 SO-DIMM sockets:

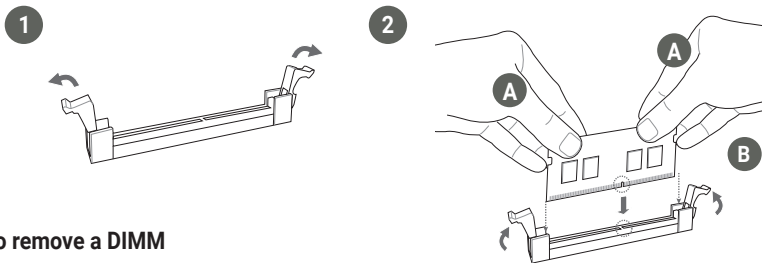


| Channel   | Sockets    |
|-----------|------------|
| Channel A | SO-DIMM_B1 |
| Channel B | SO-DIMM_A1 |

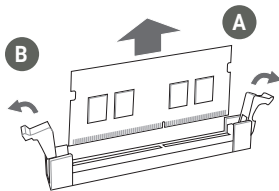
### Recommended memory configuration



### Installing a DIMM

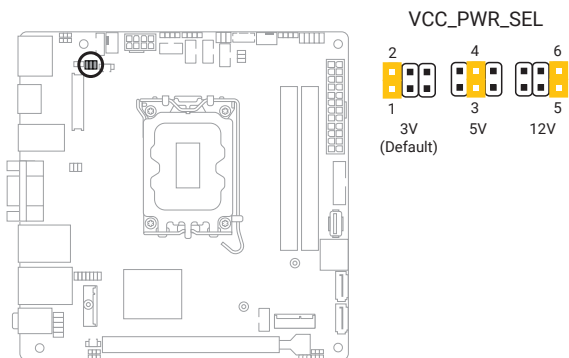


### To remove a DIMM



## 2.5 Jumpers

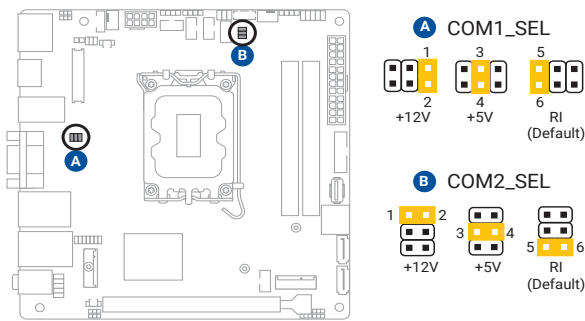
### 1. Display panel VCC power selection (6-pin VCC\_PWR\_SEL)



| Setting      | Pins |
|--------------|------|
| 3V (Default) | 1-2  |
| 5V           | 3-4  |
| 12V          | 5-6  |

Connector type    HEADER 2 x 3p, 2.00mm pitch, S/T

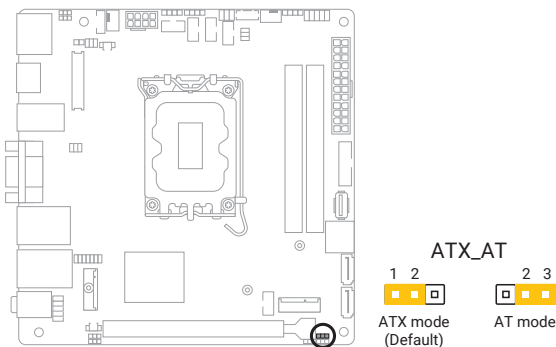
### 2. COM1/2 Ring/+5V/+12V selection (6-pin COM1\_SEL, COM2\_SEL)



| Setting        | Pins |
|----------------|------|
| +12V           | 1-2  |
| +5V            | 3-4  |
| Ring (Default) | 5-6  |

Connector type    HEADER 2x3p, 2.00mm pitch, S/T

3. AT/ATX mode selection jumper (3-pin AT\_ATX)

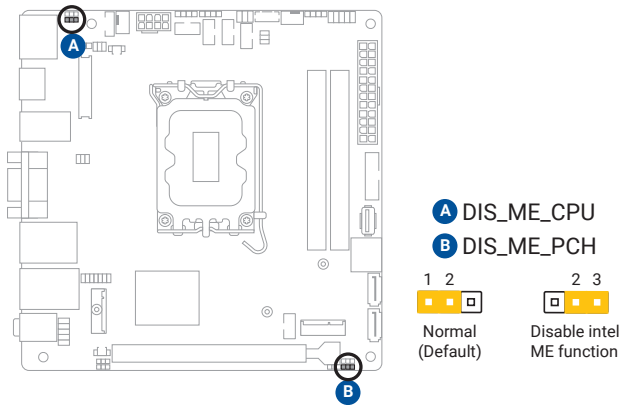


| Pins          |          |
|---------------|----------|
| 1-2 (Default) | ATX mode |
| 2-3           | AT mode  |

**Connector type** HEADER 1x3p, 2.00mm pitch, S/T

4. Disable ME jumper (3-pin DIS\_ME\_CPU, DIS\_ME\_PCH)

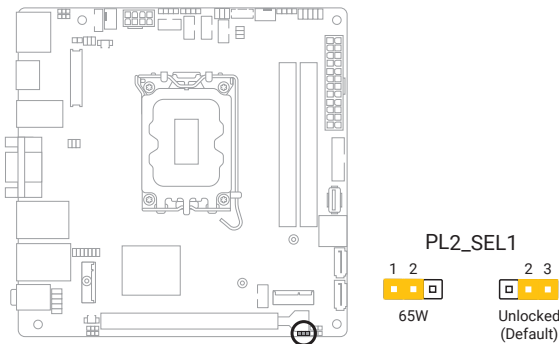
This jumper allows you to enable or disable the Intel® ME function. Set this jumper to pins 1-2 to enable (default) the Intel® ME function and to pins 2-3 to disable it.



**Connector type** HEADER 1x3p, 2.00mm pitch, S/T

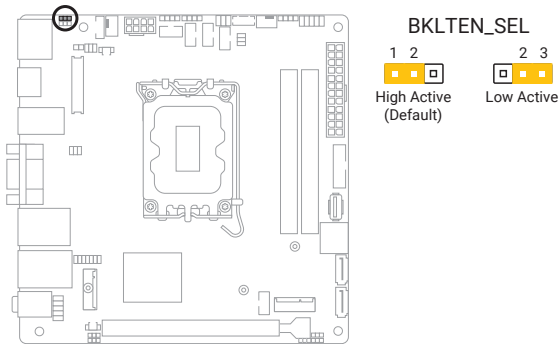
5. Power Limit selection jumpers (3-pin PL2\_SEL1)

These jumpers allow you to configure the power limit settings.



|                |                                |
|----------------|--------------------------------|
| Connector type | HEADER 1x3p, 2.00mm pitch, S/T |
|----------------|--------------------------------|

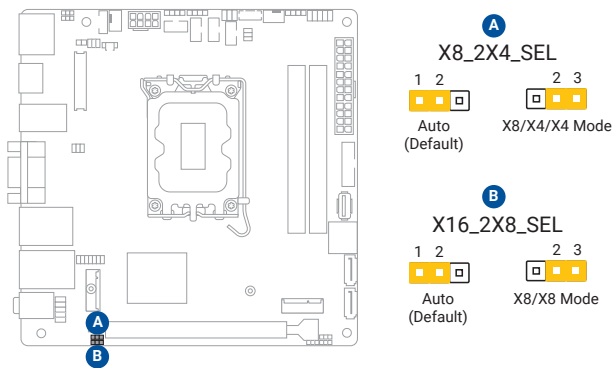
6. LVDS/EDP Panel Enable Signal Selection header (BKLTEN\_SEL)



| Pins          |             |
|---------------|-------------|
| 1-2 (Default) | High Active |
| 2-3           | Low Active  |

|                |                                |
|----------------|--------------------------------|
| Connector type | HEADER 1x3p, 2.00mm pitch, S/T |
|----------------|--------------------------------|

7. Expansion slot bandwidth selection jumpers (3-pin X16\_2X8\_SEL, X8\_2X4\_SEL)

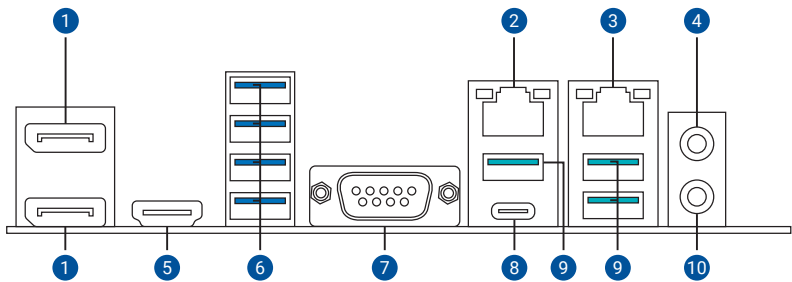


| Pins                     | PCIEX16(G5)_1                                                    | PCIEX16(G5)_2 |
|--------------------------|------------------------------------------------------------------|---------------|
| A: 1-2, B: 1-2 (Default) | x16 (if PCIEX16(G5)_2 is empty)<br>x8 (if PCIEX16(G5)_2 is used) | x8            |
| A: 2-3, B: 1-2           | x8                                                               | x8            |
| A: 2-3, B: 2-3           | x8                                                               | x4/x4         |

|                |                                |
|----------------|--------------------------------|
| Connector type | HEADER 1x3p, 2.00mm pitch, S/T |
|----------------|--------------------------------|

2.6 Connectors

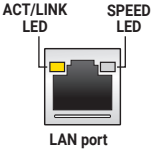
2.6.1 Rear panel connectors



- 1. **DisplayPorts.** These ports are for DisplayPort-compatible devices.
- 2. **LAN (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub.

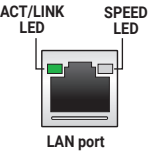
LAN port LED indications

| Activity/Link LED             |                               | Speed LED |                    |
|-------------------------------|-------------------------------|-----------|--------------------|
| Status                        | Description                   | Status    | Description        |
| Off                           | No link                       | OFF       | 10Mbps connection  |
| Orange                        | Linked                        | ORANGE    | 100Mbps connection |
| Orange (Blinking)             | Data activity                 | GREEN     | 1Gbps connection   |
| Orange (Blinking then steady) | Ready to wake up from S5 mode |           |                    |



- 3. **LAN (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub.

| Activity/Link LED            |                               | Speed LED |                           |
|------------------------------|-------------------------------|-----------|---------------------------|
| Status                       | Description                   | Status    | Description               |
| Off                          | No link                       | OFF       | 10Mbps/100Mbps connection |
| Green                        | Linked                        | ORANGE    | 1Gbps connection          |
| Green (Blinking)             | Data activity                 | GREEN     | 2.5Gbps connection        |
| Green (Blinking then steady) | Ready to wake up from S5 mode |           |                           |



- 4. **Line In port (light blue).** This port connects to the tape, CD, DVD player, or other audio sources.
- 5. **HDMI™ port.** This port is for a High-Definition Multimedia Interface (HDMI™) connector, and is HDCP compliant allowing playback of HD DVD, Blu-ray, and other protected content.

6. **USB 3.2 Gen 1 (up to 5Gbps) ports.** These 9-pin Universal Serial Bus (USB) ports are for USB 3.2 Gen 1 devices.



---

**NOTES:**

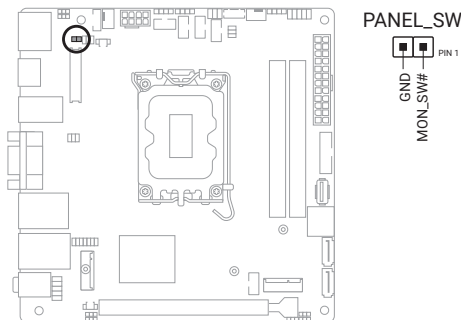
- USB 3.2 Gen 1 devices can only be used for data storage.
  - We strongly recommend that you connect USB 3.2 Gen 1 devices to USB 3.2 Gen 1 ports for faster and better performance from your USB 3.2 Gen 1 devices.
  - Due to the design of the Intel® 600 series chipset, all USB devices connected to the USB 2.0 and USB 3.2 Gen 1 ports are controlled by the xHCI controller. Some legacy USB devices must update their firmware for better compatibility.
- 

7. **Serial port (COM).** This port connects a modem or other device that conforms with serial specification.
8. **USB 3.2 Gen 2 (up to 20Gbps) port (USB Type-C®).** This Universal Serial Bus (USB) port is for a USB 3.2 Gen 2x2 Type-C® device.
9. **USB 3.2 Gen 2 (up to 10Gbps) ports (teal blue, Type-A).** These 9-pin Universal Serial Bus (USB) ports are for USB 3.2 Gen 2 devices.
10. **Line Out port (lime).** This port connects to a headphone or a speaker. In the 4 and 5.1 channel configurations, the function of this port becomes Front Speaker Out.

## 2.6.2 Internal connectors

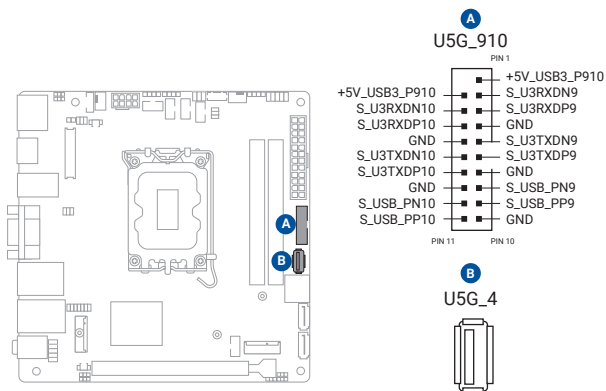
### 1. LCD panel monitor switch header (2-pin PANEL\_SW)

This 2-pin header is for connecting a monitor switch that can turn off the LCD panel display backlight.



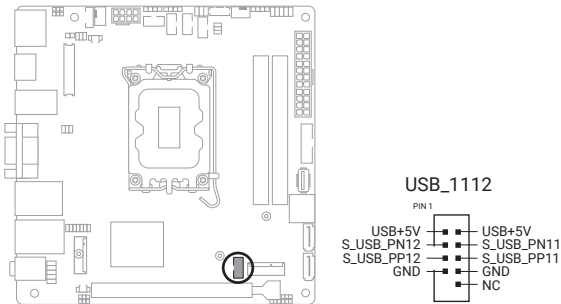
### 2. USB 3.2 Gen 1 connector (U5G\_4 / U5G\_910)

Connect a USB 3.2 Gen 1 module to any of these connectors for additional USB 3.2 Gen 1 front or rear panel ports. These connectors comply with USB 3.2 Gen 1 specifications and provide faster data transfer speeds of up to 5 Gbps, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0.



3. **USB 2.0 header (10-1 pin USB1112)**

This header is for an USB 2.0 port. Connect the USB cable to this header.  
This USB header complies with USB 2.0 specification that supports up to 480 Mbps connection speed.



**Connector type** Header 2x5p, K9, 2.0mm pitch



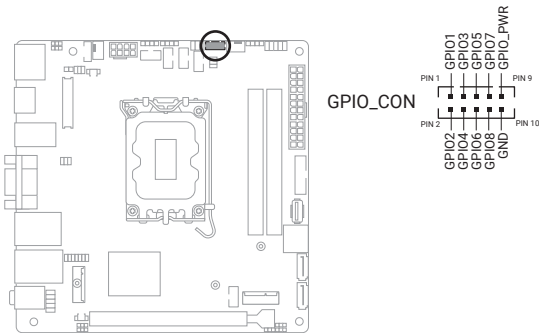
**CAUTION!** Never connect a 1394 cable to the USB connector. Doing so will damage the motherboard.



**NOTE:** The USB cable is purchased separately.

4. **General purpose input/output connector (10-pin GPIO\_CON)**

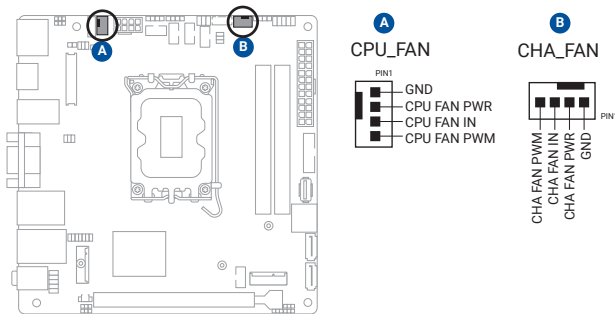
This connector is for a general purpose input/output module which allows you to customize the digital signal input/output.



**Connector type** WAFER HD 2x5p, 2.0mm pitch, S/T

5. CPU and Chassis Fan headers (4-pin CPU\_FAN, 4-pin CHA\_FAN)

Connect the fan cables to the fan headers on the motherboard, ensuring that the black wire of each cable matches the ground pin of the header.



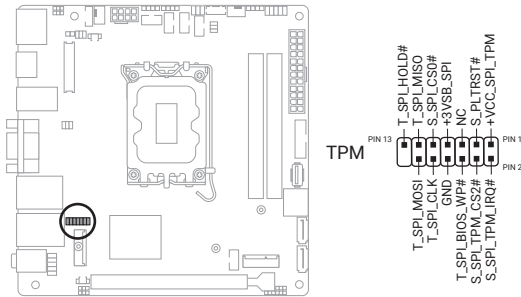
|                |                                |
|----------------|--------------------------------|
| Connector type | WAFER HD 4p, 2.54mm pitch, S/T |
|----------------|--------------------------------|



**CAUTION!** Do not forget to connect the fan cables to the fan headers. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan headers!

6. SPI TPM header (14-1 pin SPI\_TPM)

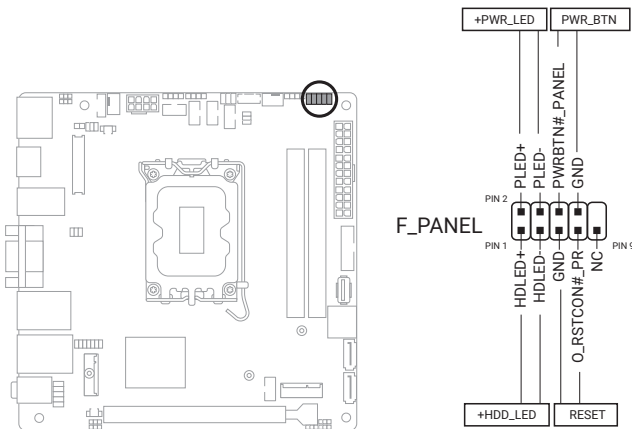
This header supports a Trusted Platform Module (TPM) system with a Serial Peripheral Interface (SPI), allowing you to securely store keys, digital certificates, passwords and data. A TPM system also enhances network security, protects digital identities, and ensures platform integrity.



|                |                               |
|----------------|-------------------------------|
| Connector type | Header 2x7p, K14, 2.0mm pitch |
|----------------|-------------------------------|

## 7. Front Panel System Panel header (10-1 pin F\_PANEL)

This header supports several chassis-mounted functions.



|                       |                                |
|-----------------------|--------------------------------|
| <b>Connector type</b> | Header 2x5p, K10, 2.54mm pitch |
|-----------------------|--------------------------------|

- **System power LED (2-pin +PWR\_LED)**

This 2-pin header is for the system power LED. Connect the chassis power LED cable to this header. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED (2-pin +HDD\_LED)**

This 2-pin header is for the HDD Activity LED. Connect the HDD Activity LED cable to this header. The IDE LED lights up or flashes when data is read from or written to the HDD.

- **ATX power button/soft-off button (2-pin PWR\_BTN)**

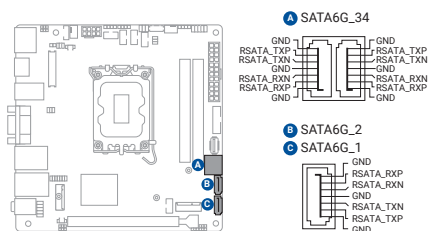
This 2-pin header is for the system power button.

- **Reset button (2-pin RESET)**

This 2-pin header is for the chassis-mounted reset button for system reboot without turning off the system power.

### 8. Serial ATA 6.0Gb/s ports (7-pin SATA6G\_1/2/3/4)

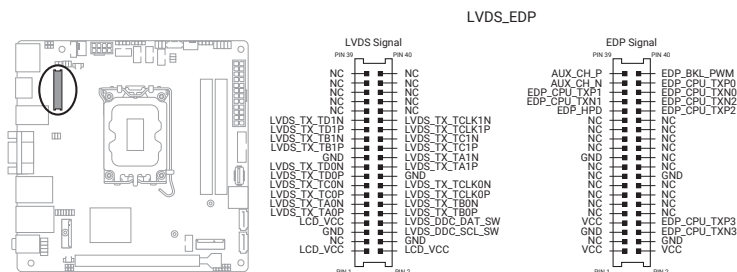
These ports connect to Serial ATA 6.0 Gb/s hard disk drives or an optical drive via Serial ATA 6.0 Gb/s signal cables.



|                |                           |
|----------------|---------------------------|
| Connector type | WAFER HD 7p, 1.27mm pitch |
|----------------|---------------------------|

## 9. LVDS/eDP Signal Connector (40-pin LVDS\_eDP)

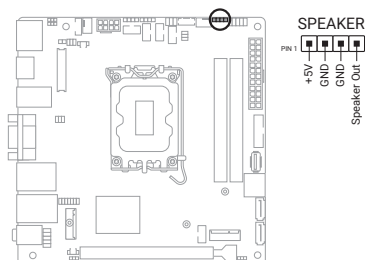
This header is for an LCD monitor that supports Low Voltage Differential Signaling (LVDS) interface or an internal embedded DisplayPort (eDP) connection.



|                |                              |
|----------------|------------------------------|
| Connector type | WAFER HD 2x20p, 1.25mm pitch |
|----------------|------------------------------|

## 10. Speaker header (4-pin SPEAKER)

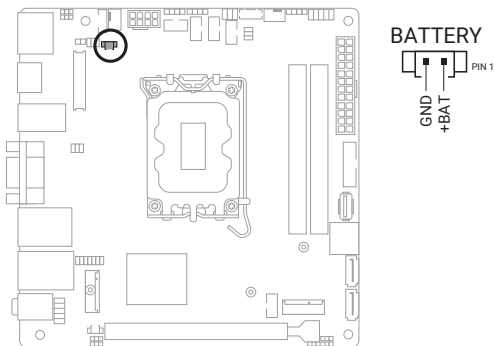
The 4-pin header is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.



|                |                                |
|----------------|--------------------------------|
| Connector type | HEADER 1x4p, 2.54mm pitch, S/T |
|----------------|--------------------------------|

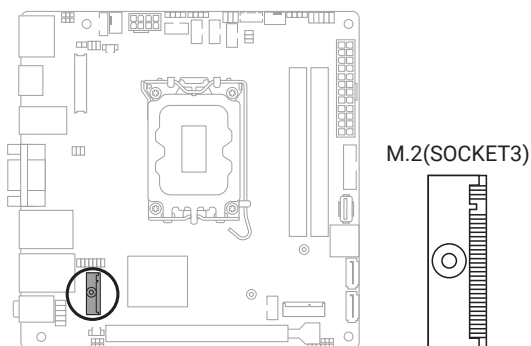
## 11. RTC Battery connector (2-pin BATTERY)

This connector is for the lithium CMOS battery.



## 12. M.2 socket 3

This socket allows you to install an M.2 SSD module.

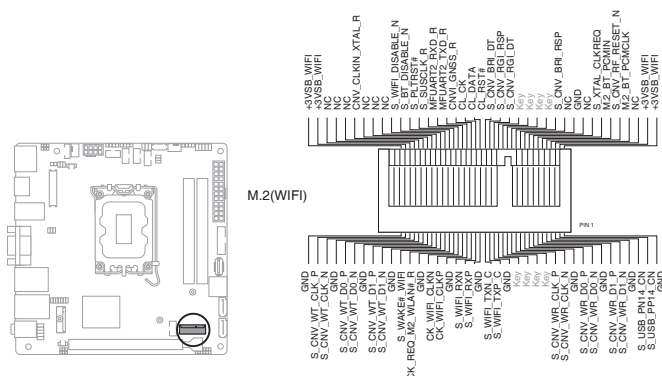


### NOTES:

- The M.2 SSD module is purchased separately.
- This socket supports M Key and 2280 storage devices.
- We recommend using a PH1 screwdriver with a torque of 2.0 +/- 0.2 kgf.cm when tightening the screw.

### 13. M.2 Wi-Fi

This socket connects to an M.2 Wi-Fi device.

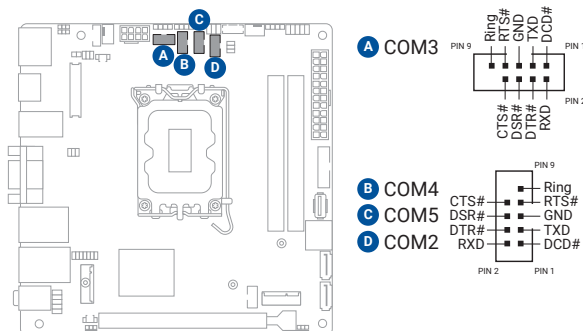


**NOTES:**

- The M.2 Wi-Fi module is purchased separately.
- We recommend using a PH1 screwdriver with a torque of 2.0 +/- 0.2 kgf.cm when tightening the screw.

#### 14. Serial Port headers (10-1 pin COM2, COM3, COM4, COM5)

These headers are for serial (COM) ports. Connect the serial port cables to these headers, then install the module to a slot opening at the back of the system chassis.



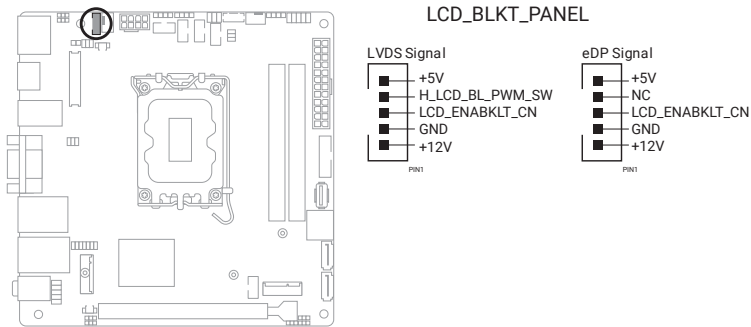
|                       |                                   |
|-----------------------|-----------------------------------|
| <b>Connector type</b> | BOX header 2x5p, K10, 2.0mm pitch |
|-----------------------|-----------------------------------|



**NOTE:** The serial port cables are purchased separately.

**15. Flat panel display brightness connector (5-pin LCD\_BLK\_T\_PANEL)**

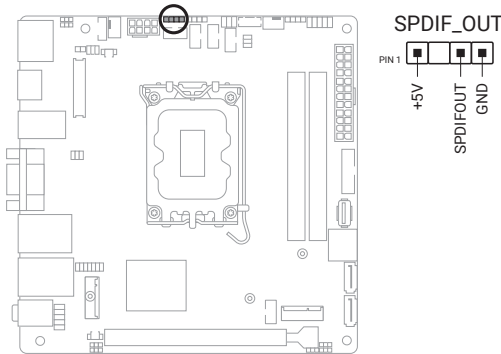
This connector is for the LVDS/eDP panel backlight voltage selection.



**Connector type**      WAFER 6p, 2.0mm pitch

**16. Digital Audio header (4-1 pin SPDIF\_OUT)**

This header is for an additional Sony/Philips Digital Interface (S/PDIF) port. Connect the S/PDIF Out module cable to this header, then install the module to a slot opening at the back of the system chassis.



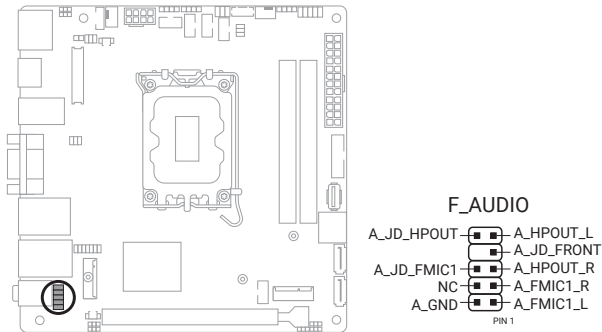
**Connector type**      HEADER 1x4p, K2, 2.54mm pitch



**NOTE:** The SPDIF Out module is purchased separately.

17. Front Panel Audio header (10-1 pin F\_AUDIO)

This header is for a chassis-mounted front panel audio I/O module that supports HD Audio standard. Connect one end of the front panel audio I/O module cable to this header.



|                |                               |
|----------------|-------------------------------|
| Connector type | HEADER 2x5p, K8, 2.54mm pitch |
|----------------|-------------------------------|

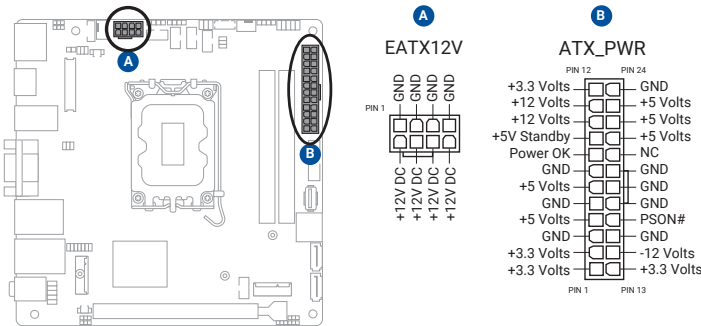


**IMPORTANT!**

- We recommend that you connect a high-definition front panel audio module to this header to avail of the motherboard's high-definition audio capability.
- If you want to connect a high-definition front panel audio module to this connector, set the HD Audio Controller item in the BIOS Setup to [Enabled].

18. ATX Power connectors (24-pin EATXPWR, 8-pin EATX12V)

Correctly orient the ATX power supply plugs into these connectors and push down firmly until the connectors completely fit.



DC Mode EATXPWR

| Pins | Signal    | Pins | Signal    |
|------|-----------|------|-----------|
| 1    | +3.3V out | 13   | +3.3V out |
| 2    | +3.3V out | 14   | NC        |
| 3    | GND       | 15   | GND       |
| 4    | +5V out   | 16   | PS-ON#    |
| 5    | GND       | 17   | GND       |
| 6    | +5V out   | 18   | GND       |
| 7    | GND       | 19   | GND       |
| 8    | NC        | 20   | +12V out  |
| 9    | NC        | 21   | +5V out   |
| 10   | +12V in   | 22   | +5V out   |
| 11   | +12V in   | 23   | +5V out   |
| 12   | +3.3V out | 24   | GND       |

DC Mode EATX12V

| Pins | Signal | Pins | Signal  |
|------|--------|------|---------|
| 1    | GND    | 5    | +12V in |
| 2    | GND    | 6    | +12V in |
| 3    | GND    | 7    | +12V in |
| 4    | GND    | 8    | +12V in |

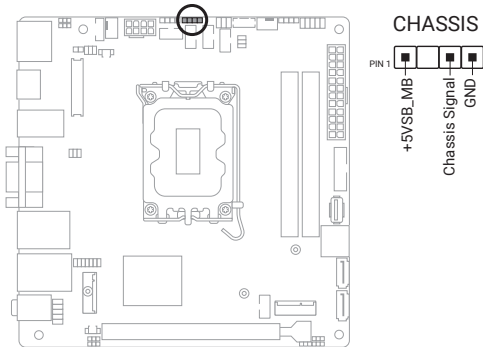


**IMPORTANT!** We recommend that you use a PSU with a higher power output when configuring a system with more power-consuming components. The system may become unstable or may not boot up if the power is inadequate.

19. Chassis intrusion header (4-1 pin CHASSIS)

This header is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

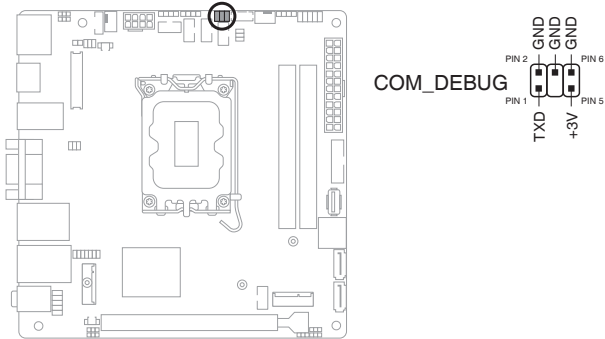
By default, the pin labeled “Chassis Signal” and “Ground” are shorted with jumper caps. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.



|                |                             |
|----------------|-----------------------------|
| Connector type | HEADER 4p, K2, 2.54mm pitch |
|----------------|-----------------------------|

20. COM Debug connector (6-1 pin COM\_DEBUG)

The COM Debug connector allows you to connect a COM debug card.



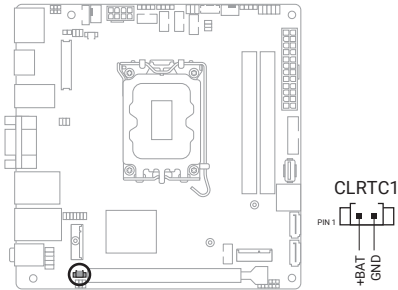
|                |                           |
|----------------|---------------------------|
| Connector type | Header 2x3p, 2.54mm pitch |
|----------------|---------------------------|



The COM debug card is purchased separately.

## 21. Clear CMOS header (2-pin CLRTC)

This header allows you to clear the CMOS RTC RAM data of the system setup information such as date, time, and system passwords.



### Connector type

HEADER 1x2p, 1.25mm pitch, S/T

### To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Use a metal object such as a screwdriver to short the two pins.
3. Plug the power cord and turn ON the computer.
4. Hold down the <Del> key during the boot process and enter BIOS Setup to re-enter data.

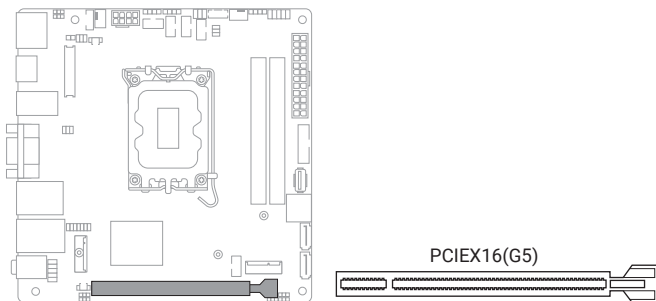


**NOTE:** If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After clearing the CMOS, reinstall the battery.

## 2.7 Slot

### 1. PCI Express slot

This slot supports a PCIe 5.0 x16 graphics card that complies with the PCI Express specification.



# Chapter 3

## BIOS setup



**IMPORTANT!** Scan the code to view the BIOS update guide.



### 3.1 BIOS Setup program

Use the BIOS Setup program to configure its parameters. The BIOS screens include navigation keys and brief online help to guide you in using the BIOS Setup program.

#### Entering BIOS Setup at startup

##### To enter BIOS Setup at startup:

Press <Delete> or <ESC> during the Power-On Self Test (POST). If you do not press <Delete> or <ESC>, POST continues with its routines.

#### Entering BIOS Setup after POST

##### To enter BIOS Setup after POST:

- Press <Ctrl>+<Alt>+<Del> simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on. Do this option only if you failed to enter BIOS Setup using the first two options.



**CAUTION!** Using the power button, reset button, or the <Ctrl>+<Alt>+<Del> keys to reboot a running operating system can cause damage to your data or system. Always shut down the system properly from the operating system.



##### **IMPORTANT!**

- Visit the ASUS website at [www.asus.com](http://www.asus.com) to download the latest BIOS file for this motherboard.
- The default BIOS settings for this motherboard apply to most working conditions and ensures optimal performance. If the system becomes unstable after changing any BIOS settings, load the default settings to regain system stability. Select the option **Restore Defaults** under the Exit menu or press hotkey <F3>.
- The BIOS Setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

## BIOS menu screen

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

|                         |                                                                                                |
|-------------------------|------------------------------------------------------------------------------------------------|
| <b>Main</b>             | For changing the basic system configuration.                                                   |
| <b>Advanced</b>         | For changing the advanced system settings.                                                     |
| <b>Hardware Monitor</b> | For displaying the system temperatures, fan and power status, and changing smart fan settings. |
| <b>Security</b>         | For configuring the system security settings.                                                  |
| <b>Boot</b>             | For changing the system boot configuration.                                                    |
| <b>Exit</b>             | For selecting the save options and default options.                                            |
| <b>Event Logs</b>       | For viewing or configuring the event logs.                                                     |

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

### 3.2 Main menu

The Main menu provides you with an overview of the basic system information, and allows you to set the system date and the system time.

#### 3.2.1 System Date [Day MM/DD/YYYY]

Allows you to set the system date.

#### 3.2.2 System Time [HH:MM:SS]

Allows you to set the system time.

### 3.3 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.



---

**NOTE:** Be cautious when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

---

#### 3.3.1 LVDS Configuration

##### Switch to LVDS

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



---

**NOTE:** The following item appears when you set **Switch to LVDS** to **[Enabled]**.

---

##### All-in-One Chassis

Allows you to select All-in-One (AiO) Chassis (if applicable) for simplified AiO configuration. Configuration options: [None] [1920\*1080 LVDS1] [1920\*1080 LVDS2] [1920\*1080 LVDS3] [1600\*900 LVDS4]

---

## NOTES:



- Be cautious when selecting AiO chassis. Incorrect selection of AiO chassis can cause incorrect operation or potential damage to AiO chassis hardware.
- The following items appear only when you set **All-in-One Chassis** to **[None]**.

---

## EDID Data Source

Configuration options: [Pre-Defined] [Flat Panel Display]



**NOTE:** The following item appears when you set **EDID Data Source** to **[Pre-Defined]**.

---

## LFP Panel Type

Allows you to select LFP panel used by Internal Graphics Device.

Configuration options: [VBIOS Default] [640x480] [800x600] [1024x768] [1280x1024] [1400x1050 LVDS1] [1400x1050 LVDS2] [1600x1200] [1366x768] [1680x1050] [1920x1200] [1440x900] [1600x900] [1024x768] [1280x800] [1920x1080] [2048x1536]

## Inverter Polarity

Configuration options: [Normal] [Inverted]

## Channel Select

Configuration options: [Dual Channel] [Single Channel]

## Mode Select

Configuration options: [JEIDA] [VESA 6bit] [VESA 8bit] [VESA 10bit]

## DIGON enable to LVDS\_ON enable(T2)

Configuration options: [0] ~[50]

## LVDS\_ON enable to BLON enable (T3)

Configuration options: [0] ~[1023]

## BLON disable to LVDS\_ON disable (T4)

Configuration options: [0] ~[1023]

## LVDS\_ON disable to DIGON disable (T5)

Configuration options: [0] ~[50]

## Completion of power down to power up (T7)

Configuration options: [0] ~[1023]

## VARY\_BL enable to BL\_EN enable (T9)

Configuration options: [0] ~[1023]

## BL\_EN disable to VARY\_BL disable (T10)

Configuration options: [0] ~[1023]

### 3.3.2 ASUS CONFIG LOCK

When this function is enabled and the configuration of a connected device is changed, users will get an alarm message. The function will be disabled by default when a port is not in use.

[Disabled] The system will boot normally without triggering any events due to device changes or modifications.

[Enabled] The current configuration of SATA, USB, and PCIe devices will be recorded.

During BIOS POST, the system will check for any changes or removals of recorded devices.

If a change or removal is detected, the BIOS will halt the boot process and display a message indicating that a device modification has been detected.



- When does ConfigLock trigger?

ConfigLock triggers if there are any changes or modifications to the recorded devices. The boot process will stop during BIOS POST and display a message indicating that a device change has been detected.

- How to enable ConfigLock:

1. Enter the BIOS Setup Menu and set an Admin Password.
2. Set **ConfigLock** to **Enabled** and select **Save & Reset**.

- How to disable ConfigLock:

Method 1: Press **F1**, enter the **Admin Password**, and set **ConfigLock** to **Disabled**.

Method 2: Clear the CMOS.

### 3.3.3 ASUS AUTO RETRY

#### ASUS Auto Retry

Allows you to enable or disable ASUS Auto Retry function.

[Enabled] If the system gets stuck during POST, it will automatically trigger the Auto Retry event and restart the system.

[Disabled] The Watchdog feature will be enabled, and the **Watchdog Count Mode** and **Watchdog Timer** options will be available.

#### Watchdog Count mode:

Allows you to select the time unit for the Watchdog Timer.

Configuration options: [Second Mode] [Minute Mode]

#### Watchdog Timer:

Allows you to set the timeout value for the Watchdog Timer.



- Once the system enters Shell or Windows OS, Auto Retry will be disabled, and the retry count will be cleared.
- Entering the BIOS Setup Menu will pause the Auto Retry function.
- If Auto Retry encounters two consecutive failures, it will clear the CMOS and load BIOS default settings.

### 3.3.4 PCH-FW Configuration

This item allows you to configure Management Engine Technology parameters.

#### TPM Device Selection

Allows you to select TPM device.

[PTT] Enables PTT in SkuMgr.

[dTPM] Disables PTT in SkuMgr.



**NOTE:** When PTT is disabled, all data saved on it will be lost.

### 3.3.5 Trusted Computing

#### Security Device Support

Allows you to enable or disable BIOS support for security device.

Configuration options: [Disabled] [Enabled]



**NOTE:** The following items appear when a TPM device is installed on your motherboard.

#### SHA256 PCR Bank

Configuration options: [Disabled] [Enabled]

#### SHA384 PCR Bank

Configuration options: [Disabled] [Enabled]

#### SM3\_256 PCR Bank

Configuration options: [Disabled] [Enabled]

#### Pending operation

Allows you to schedule an operation for security device.

Configuration options: [None] [TPM Clear]



**NOTE:** Your computer will reboot during restart in order to change the state of security device.

#### Platform Hierarchy

Configuration options: [Disabled] [Enabled]

#### Storage Hierarchy

Configuration options: [Disabled] [Enabled]

#### Endorsement Hierarchy

Configuration options: [Disabled] [Enabled]

### Physical Presence Spec Version

Allows you to select to tell O.S. to support PPI Spec Version 1.2 or 1.3.

Configuration options: [1.2] [1.3]



---

**NOTE:** Some HCK tests might not support 1.3.

---

### Disable Block Sid

Configuration options: [Disabled] [Enabled]

## 3.3.6 CPU Configuration

The items in this menu show CPU-related information the BIOS automatically detects.

### Intel (VMX) Virtualization Technology

This item, when set to [enabled], will allow a VMM to utilize the additional hardware capacities provided by Vanderpool Technology.

Configuration options: [Disabled] [Enabled]

### Intel Trusted Execution Technology

Configuration options: [Disabled] [Enabled]

### VT-d

Configuration options: [Disabled] [Enabled]

### Active Performance-cores

Allows you to select the number of CPU cores to activate in each processor package. Configuration options: [All] [7] [6] [5] [4] [3] [2] [1]

### Active Efficient-cores

Allows you to select the number of Efficient cores to activate in each processor package. Configuration options: [All] [11] [10] [9] [8] [7] [6] [5] [4] [3] [2] [1] [0]



---

Number of Cores and Efficient Cores are looked at together. When both are {0,0}, Pcode will enable all cores.

---

### Max TOLUD

Allows you to select the maximum memory size of TOLUD (Top of Low Usable DRAM). Configuration options: [Dynamic] [0.75 GB] [1 GB] [1.25 GB] [1.5 GB] [1.75 GB] [2 GB] [2.25 GB] [2.5 GB]

### CPU - Power Management Control

This item allows you to manage and configure the CPU's power.

#### Intel® SpeedStep™

Allows your system to support more than two frequency ranges.

Configuration options: [Disabled] [Enabled]

#### Intel® Speed Shift Technology

Allows you to enable or disable Intel® Speed Shift Technology support. When enabled, CPPC v2 interface allows hardware controlled P-state. Configuration options: [Disabled] [Enabled]



---

**NOTE:** The following item appears only when **Intel® SpeedStep** or **Intel® Speed Shift** is available and enabled.

---

### **Turbo Mode**

Configuration options: [Disabled] [Enabled]

### **C states**

Allows you to enable or disable CPU Power Management. Configuration options: [Disabled] [Enabled]



---

**NOTE:** The following item appears only when you set **C states** to **[Enabled]**.

---

### **Enhanced C-states**

Allows you to enable or disable C1E. CPU will switch to minimum speed when all cores enter C-state. Configuration options: [Disabled] [Enabled]

### **Power Limit 1 Override**

Allows you to enable or disable Power Limit 1 Override.

Configuration options: [Enabled] [Disabled]



---

**NOTE:** The following item appears only when you set **Power Limit 1 Override** to **[Enabled]**.

---

### **Power Limit 1**

Allows you to configure Power Limit 1 value in milliwatts.

### **Power Limit 2 Override**

Allows you to enable or disable Power Limit 2 Override.

Configuration options: [Enabled] [Disabled]



---

**NOTE:** The following item appears only when you set **Power Limit 2 Override** to **[Enabled]**.

---

### **Power Limit 2**

Allows you to configure Power Limit 2 value in milliwatts.

### **Max TOLUD [Dynamic]**

Configures the maximum value of TOLUD. Dynamic assignment will adjust TOLUD automatically based on the largest MMIO length of installed graphics controller. Configuration options: [Dynamic] [0.75 GB] [1 GB] ~ [2.5GB]

### 3.3.7 Graphics Configuration

This item allows you to select a primary display from IGFX and PEG graphical devices.

#### Primary Display

Allows you to select which of the IGFX/PEG Graphics devices should be the primary display or select SG for switchable Gfx.

Configuration options: [Auto] [IGFX] [PEG Slot]

#### Internal Graphics

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

[Auto] Keeps IGFX enabled base on the setup options.

[Disabled] Disables internal graphics.

[Enabled] Enables internal graphics.

#### RC6 (Render Standby)

Allows you to enable or disable render standby support.

Configuration options: [Disabled] [Enabled]

### 3.3.8 PCI Express Configuration

This item allows you to configure PCI Express settings.

#### PCH PCIE Clock Gating

Allows you to enable or disable PCH PCI Express clock gating for all ports.

Configuration options: [Disabled] [Enabled]

#### PCH PCIE Power Gating

Allows you to enable or disable PCH PCI Express power gating for all ports.

Configuration options: [Disabled] [Enabled]

#### PCIEX16(G5) Slot

Allows you to configure the PCI Express Root Port settings.

##### PCI Express Root Port PXPA1

Allows you to enable or disable the PCI Express Root Port.

Configuration options: [Disabled] [Enabled]

##### PCIe Speed

Allows you to configure the PCIe speed.

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

##### Detect Timeout

Allows you to set the time (milliseconds) of waiting for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port. Use the <+> and <-> keys to adjust the value or input the desired value.

##### Compliance Test Mode

This item allows you to enable specific settings for testing when using a Compliance Load Board. Configuration options: [Disabled] [Enabled]

**CPU PCIEX16 switch function**

Configuration options: [Auto] [2x8] [1x8+2x4]

### 3.3.9 AMT Configuration

This item allows you to configure Intel® Active Management Technology parameters.

**AMT BIOS Features**

Allows you to enable or disable AMT BIOS Features. When set to [Disabled], MEBx Setup will be inaccessible.

Configuration options: [Disabled] [Enabled]



---

**NOTE:** This item does not disable Manageability Features in FW.

---

**USB Provisioning of AMT**

Allows you to enable or disable AMT USB Provisioning.

Configuration options: [Disabled] [Enabled]

**Unconfigure ME**

Allows you to unconfigure ME by resetting the MEBx password to default.

Configuration options: [Disabled] [Enabled]

**End Of Post Message**

Allows you to enable or disable End of Post message sent to ME.

Configuration options: [Disabled] [Send in DXE]

**Extend CSME Measurement to TPM-PCR**

Allows you to enable or disable Extend CSME Measurements to TPM-PCR[0] and AMR Config to TPM-PCR[1].

Configuration options: [Disabled] [Enabled]

### 3.3.10 Super IO Configuration

**Serial Port 1 Configuration**

This item allows you to set parameters of Serial Port 1 (COMA).

**Serial Port**

Allows you to enable or disable the serial port (COM).

Configuration options: [Disabled] [Enabled]

**COM1 Control**

Allows you to select COM1 mode.

Configuration options: [RS232] [RS422] [RS485]

**Serial Port 2 Configuration**

This item allows you to set parameters of Serial Port 2 (COMB).

**Serial Port**

Allows you to enable or disable the serial port (COM).

Configuration options: [Disabled] [Enabled]

### **COM2 Control**

Allows you to select COM2 mode.

Configuration options: [RS232] [RS422] [RS485]

### **Serial Port 3 Configuration**

This item allows you to set parameters of Serial Port 3 (COMC).

#### **Serial Port**

Allows you to enable or disable the serial port (COM). Configuration options:  
[Disabled] [Enabled]

### **Serial Port 4 Configuration**

This item allows you to set parameters of Serial Port 4 (COMD).

#### **Serial Port**

Allows you to enable or disable the serial port (COM). Configuration options:  
[Disabled] [Enabled]

### **Serial Port 5 Configuration**

This item allows you to set parameters of Serial Port 5 (COME).

#### **Serial Port**

Allows you to enable or disable the serial port (COM). Configuration options:  
[Disabled] [Enabled]

## **3.3.11 Serial Console Redirection**

### **COM1(~5)**

#### **Console Redirection**

Allows you enable or disable the console redirection feature.

Configuration options: [Enabled] [Disabled]



---

**NOTE:** The following item is accessible when you set **Console Redirection** to **[Enabled]**.

---

#### **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

#### **Terminal Type**

Configuration options: [VT100] [VT100Plus] [VT-UTF8] [ANSI]

[VT100] ASCII char set.

[VT100Plus] Extends VT100 to support color, function keys, etc.

[VT-UTF8] Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.

[ANSI] Extended ASCII char set.

**Bits per second**

Allows you to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds. Configuration options: [9600] [19200] [38400] [57600] [115200]

**Data Bits**

Configuration options: [7] [8]

**Parity**

A parity bit can be sent with the data bits to detect some transmission errors. Configuration options: [None] [Even] [Odd] [Mark] [Space]

[None] Disables parity check.

[Even] Parity bit is 0 if the num of 1's in the data bits is even.

[Odd] Parity bit is 0 if the num of 1's in the data bits is odd.

[Mark] Parity bit is always 1.

[Space] Parity bit is always 0.



---

**NOTE:** Mark and Space Parity do not allow for error detection.

---

**Stop Bits**

Stop bits indicate the end of a serial data packet. The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit. Configuration options: [1] [2]

**Flow Control**

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals. Configuration options: [None] [Hardware RTS/CTS]

**VT-UTF8 Combo Key Support**

Allows you to enable or disable VT-UTF8 Combination Key Support for ANSI/VT100 terminals. Configuration options: [Disabled] [Enabled]

**Recorder Mode**

With this mode enabled only text will be sent. This is to capture Terminal data. Configuration options: [Disabled] [Enabled]

**Resolution 100x31**

Allows you to enable or disable extended terminal resolution. Configuration options: [Disabled] [Enabled]

**Putty KeyPad**

Allows you to select FunctionKey and KeyPad on Putty. Configuration options: [VT100] [LINUX] [XTERMR6] [SCO] [ESCN] [VT400]

### 3.3.12 NVMe Configuration

The NVMe Configuration menu displays the NVMe controller and drive information of the devices connected and allows you to configure NVMe device options settings.

### 3.3.13 SATA Configuration

This item allows you to configure SATA device options settings.

#### SATA Controller(s)

Allows you to enable or disable the onboard SATA device.

Configuration options: [Disabled] [Enabled]



---

**NOTE:** The following item appears only when you set **SATA Controller(s)** to [Enabled].

---

#### SATA Mode Selection

Allows you to determine how SATA controller(s) operate. Configuration options: [AHCI]

#### SATA6G\_1(~4)

##### Port 1(~4)

Allows you to enable or disable SATA Port.

Configuration options: [Disabled] [Enabled]

##### Hot Plug

Allows you to designate this port as Hot Pluggable.

Configuration options: [Disabled] [Enabled]

### 3.3.14 VMD setup menu

#### Enable VMD controller

This item allows you to disable or enable VMD controller.

Configuration options: [Disabled] [Enabled]

### 3.3.15 Network Stack Configuration

#### Network Stack

This item allows you to disable or enable the UEFI Network Stack.

Configuration options: [Disabled] [Enabled]



---

**NOTE:** The following items appear only when you set **Network Stack** to [Enabled].

---

#### IPv4 PXE Support

Allows you to enable or disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will be unavailable. Configuration options: [Disabled] [Enabled]

### **IPv6 PXE Support**

Allows you to enable or disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will be unavailable. Configuration options: [Disabled] [Enabled]

## **3.3.16 USB Configuration**

### **XHCI Hand-off**

This item functions as a workaround for OSES without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

Configuration options: [Enabled] [Disabled]

### **USB Mass Storage Driver Support**

Allows you to enable or disable USB Mass Storage Driver Support.

Configuration options: [Disabled] [Enabled]

### **U10G\_1(~3)**

Allows you to enable or disable USB port. Once set to [Disabled], any USB devices plugged into the connector will not be detected by BIOS or OS.

Configuration options: [Disabled] [Enabled]

### **U5G\_7(~10)**

Allows you to enable or disable USB port. Once set to [Disabled], any USB devices plugged into the connector will not be detected by BIOS or OS.

Configuration options: [Disabled] [Enabled]

### **USB\_11(~12)**

Allows you to enable or disable USB port. Once set to [Disabled], any USB devices plugged into the connector will not be detected by BIOS or OS.

Configuration options: [Disabled] [Enabled]

### **U20G\_C15**

Allows you to enable or disable USB port. Once set to [Disabled], any USB devices plugged into the connector will not be detected by BIOS or OS.

Configuration options: [Disabled] [Enabled]

## **3.3.17 Onboard Devices Configuration**

### **HD Audio**

Allows you to control detection of the HD-Audio device.

Configuration options: [Enabled] [Disabled]

[Enabled] Enables the HD Audio Device unconditionally.

[Disabled] Disables the HD Audio Device unconditionally.

### **LAN1 I226LM**

Configuration options: [Disabled] [Enabled]

### **LAN2 I210AT**

Configuration options: [Disabled] [Enabled]

## **NPU Device**

Configuration options: [Disabled] [Enabled]

## **M.2 WiFi**

Allows you to enable or disable M.2 WiFi. Configuration options: [Disabled] [Enabled]

## **M.2 BT**

Allows you to enable or disable M.2 BT.  
Configuration options: [Disabled] [Enabled]

## **CNVi Mode**

[Auto Detection] If Discrete Solution is discovered, it will be enabled by default. Otherwise Integrated Solution (CNVi) will be enabled.

[Disable Integrated] Disables Integrated Solution.

## **Wi-Fi Core**

Configuration options: [Disabled] [Enabled]

## **BT Core**

Configuration options: [Disabled] [Enabled]

## **3.3.18 APM Configuration**

This item allows you to configure APM (Advanced Power Management) settings.

### **ErP Ready**

Allows BIOS to switch off some power at S5 to get the system ready for ErP requirement. When set to [Enabled], all other PME options will be switched off.  
Configuration options: [Disabled] [Enabled]

### **Restore AC Power Loss**

Allows you to select AC power state when power is re-applied after a power failure.  
Configuration options: [S5 State] [S0 State]

### **Power On By PCIE**

Allows you to enable or disable the Wake-on-LAN function of the onboard LAN controller or other installed PCIe LAN cards.  
Configuration options: [Disabled] [Enabled]

### **Power On By Ring**

Configuration options: [Disabled] [Enabled]

### **Power On By RTC**

Configuration options: [Disabled] [Enabled]



---

**NOTE:** The following items appear when you set **Power On By RTC** to [Single event] or [Daily event].

---

### **Wake up hour**

Allows you to enter a natural number within 0-23 for hour. For example, enter 3 for 3:00 am and 15 for 3:00 pm.

### **Wake up minute**

Allows you to enter a natural number within 0-59 for minute.

### **Wake up second**

Allows you to enter a natural number within 0-59 for second.



---

**NOTE:** The following items appear when you set **Power On By RTC** to **[Weekly event]**.

---

### **Alarm day of Week**

Allows you to select the day of the week when the system is to wake up.  
Configuration options: [Sunday] [Monday] [Tuesday] [Wednesday] [Thursday] [Friday] [Saturday]

### **Wake up hour**

Allows you to enter a natural number within 0-23 for hour. For example, enter 3 for 3:00 am and 15 for 3:00 pm.

### **Wake up minute**

Allows you to enter a natural number within 0-59 for minute.

### **Wake up second**

Allows you to enter a natural number within 0-59 for second.



---

**NOTE:** The following items appear when you set **Power On By RTC** to **[Monthly event]**.

---

### **Day of the Month**

Allows you to select the day of the month when the system is to wake up.

### **Wake up hour**

Allows you to enter a natural number within 0-23 for hour. For example, enter 3 for 3:00 am and 15 for 3:00 pm.

### **Wake up minute**

Allows you to enter a natural number within 0-59 for minute.

### **Wake up second**

Allows you to enter a natural number within 0-59 for second.

## **3.3.19 EZ-Flash**

This item allows you to enter EZ-Flash mode. After you press <Enter>, a confirmation message appears. Use the left/right arrow key to select between [Yes] or [No], then press <Enter> to confirm your choice.

## **3.3.20 Preserve BIOS option method**

Allows you to enable or disable BIOS option after flash BIOS.

Configuration options: [Disabled] [Enabled]

## 3.5 Hardware Monitor menu

The Hardware Monitor menu displays the system temperatures, fan and power status, and allows you to configure the smart fan.

### 3.5.1 Smart Fan Mode

Allows you to select the smart fan mode.

|               |                                              |
|---------------|----------------------------------------------|
| [Full Speed]  | Fans run at 100% speed.                      |
| [Standard]    | Select the recommended fan speed mode.       |
| [Manual]      | Select the user-defined fan speed mode.      |
| [Silent]      | Select noise-optimized fan speed mode.       |
| [Performance] | Select performance optimized fan speed mode. |



---

**NOTE:** The following item appears only when you set **Smart Fan Mode** to **[Manual]**.

---

#### Smart Fan Function

##### Fan1 Setting

###### Temperature 1(~8)

Allows you to set the value of temperature1(~8).

###### FD/RPM 1(~8)

Allows you to set the value of Fan Duty/PRM 1(~8) when temperature is T1(~8).

## 3.6 Security menu

The Security menu allows a new password to be created or a current password to be changed. The menu also enables or disables the Secure Boot state and lets the user configure the System Mode state.

### 3.6.1 Administrator Password

If you have set an administrator password, we recommend that you enter the administrator password for accessing the system.

#### To set an administrator password:

1. Select the **Administrator Password** item and press <Enter>.
2. From the **Create New Password** box, key in a password, then press <Enter>.

#### To change an administrator password:

1. Select the **Administrator Password** item and press <Enter>.
2. From the **Enter Current Password** box, key in the current password, then press <Enter>.
3. From the **Create New Password box**, key in a new password, then press <Enter>.
4. Confirm the password when prompted.



---

**NOTE:** To clear the administrator password, follow the same steps as in changing an administrator password, but press <Enter> when prompted to create/confirm the password.

---

### 3.6.2 User Password

If you have set a user password, you must enter the user password for accessing the system.

#### To set a user password:

1. Select the **User Password** item and press <Enter>.
2. From the **Create New Password** box, key in a password, then press <Enter>.
3. Confirm the password when prompted.

#### To change a user password:

1. Select the **User Password** item and press <Enter>.
2. From the **Enter Current Password** box, key in the current password, then press <Enter>.
3. From the **Create New Password** box, key in a new password, then press <Enter>.
4. Confirm the password when prompted.

#### To clear a user password:

1. Select the **Clear User Password** item and press <Enter>.
2. Select **Yes** from the Warning message window then press <Enter>.

### 3.6.3 Secure Boot

Secure Boot feature is active when Secure Boot is set to [Enabled], Platform Key (PK) is enrolled and the system is running in User mode. Changing the mode requires platform reset. Configuration options: [Disabled] [Enabled]

#### Secure Boot Mode

Allows you to select Secure Boot Mode. When set to [Custom], Secure Boot Policy variables can be configured by a physically present user without full authentication. Configuration options: [Standard] [Custom]

#### Expert Key Management

Allows you to modify Secure Boot Policy variables without full authentication.

##### Platform Key (PK)

Configuration options: [Update]

##### Key Exchange Keys (KEK) / Authorized Signatures (db)

Configuration options: [Update] [Append]

##### Forbidden Signatures (dbx)

Configuration options: [Update] [Append]

## 3.7 Boot menu

The items in the Boot menu allow you to change the system boot options.

### Boot Configuration

#### CHASSIS INTRUDE

Allows you to enable or disable CHASSIS INTRUDE. Configuration options: [Disabled] [Enabled]

#### Setup Prompt Timeout

Allows you to set the number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

#### Bootup NumLock State

Allows you to select the keyboard NumLock state. Configuration options: [On] [Off]

#### Quiet Boot

Configuration options: [Disabled] [Enabled]

#### Fast Boot

Allows you to enable or disable boot with initialization of a minimal set of devices required to launch active boot option. This has no effect for BBS boot options. Configuration options: [Disable Link] [Enabled]

[Enabled] Select to accelerate the boot speed.

[Disable Link] Select to go back to normal boot speed.

#### Boot mode select

Configuration options: [UEFI]

### FIXED BOOT ORDER Priorities

#### Boot Option #1(~5)

Allows you to set the system boot order. Configuration options: [Hard Disk] [NVME] [CD/DVD] [USB Device] [Network] [Disabled]

### UEFI NVME Drive BBS Priorities

Specifies the Boot Device Priority sequence from available UEFI NVME Drives.

#### Boot Option #1

Configuration options: [Windows Boot Manager] [Disable]

## 3.8 Exit menu

The items in the Exit menu allow you to save or discard your changes to the BIOS items.

### **Save Changes and Exit**

Allows you to exit the system setup program after saving the changes.

### **Discard Changes and Exit**

Allows you to exit the system setup program without saving the changes you made. When you select this option or if you press <Esc>, a confirmation window appears. Select **Yes** to discard changes and exit.

### **Save Changes and Reset**

Allows you to reset the system setup after saving the changes.

### **Discard Changes and Reset**

Allows you to reset the system setup without saving the changes you made.

### **Save Options**

#### **Save Changes**

Allows you to save changes done so far to any of the setup options.

#### **Discard Changes**

Allows you to discard changes done so far to any of the setup options.

### **Restore Defaults**

Allows you to restore or load default values for all the setup options.

### **Save as User Defaults**

Allows you to save the changes done so far as User Defaults.

### **Restore User Defaults**

Allows you to restore the User Defaults to all the setup options.

## 3.9 Event Logs menu

The Event Logs menu items allow you to view or configure the Event Log.

### Change Smbios Event Log Settings

#### Enabling/Disabling Options

#### Smbios Event Log

Change this to enable or disable all features of Smbios Event Logging during boot. Configuration options: [Disabled] [Enabled]

---

The following item appears only when Smbios Event Log is set to **[Enabled]**.

---

#### Erasing Settings

#### When Log is Full

Choose options for reactions to a full Smbios Event Log. Configuration options: [Do Nothing] [Erase Immediately]

### View Smbios Event Log

Press <Enter> to view the Smbios Event Log records.

## 3.10 MEBx menu

The MEBx menu allows you to configure Intel(R) Management Engine (ME) features.

### Intel(R) ME Password

Allows you to login to access the Intel(R) MEBx configuration settings.



---

The default password is admin. After logging in with the default password, you must change the password before any features can be used.

---

# Appendix

## Notices

### FCC Compliance Information

Responsible Party: Asus Computer International

Address: 48720 Kato Rd., Fremont, CA 94538,  
USA

Phone / Fax No: (510)739-3777 / (510)608-4555

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.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

### HDMI Trademark Notice

The terms HDMI, HDMI High-Definition Multimedia Interface, HDMI trade dress and the HDMI Logos are trademarks or registered trademarks of HDMI Licensing Administrator, Inc.



## **Compliance Statement of Innovation, Science and Economic Development Canada (ISED)**

This device complies with Innovation, Science and Economic Development Canada licence exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

CAN ICES (B)/NMB (B)

## **Déclaration de conformité de Innovation, Sciences et Développement économique Canada (ISED)**

Le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

CAN ICES (B)/NMB (B)

## **VCCI: Japan Compliance Statement**

### **Class B ITE**

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としています。この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

VCCI-B

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**B급 기기 (가정용 방송통신기자재)**

이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

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Complying with the REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) regulatory framework, we published the chemical substances in our products at ASUS REACH website at <https://esg.asus.com/Compliance.htm>.



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.



DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

## ASUS Recycling/Takeback Services

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**Čeština** Společnost ASUSTeK Computer Inc. tímto prohlašuje, že toto zařízení splňuje základní požadavky a další příslušná ustanovení souvisejících směrnic. Plné znění prohlášení o shodě EU je k dispozici na adrese: [www.asus.com/support](http://www.asus.com/support)

**Dansk** ASUSTeK Computer Inc. erklærer hermed, at denne enhed er i overensstemmelse med hovedkravene og andre relevante bestemmelser i de relaterede direktiver. Hele EU-overensstemmelseserklæringen kan findes på: [www.asus.com/support](http://www.asus.com/support)

**Nederlands** ASUSTeK Computer Inc. verklaart hierbij dat dit apparaat voldoet aan de essentiële vereisten en andere relevante bepalingen van de verwante richtlijnen. De volledige tekst van de EU-verklaring van conformiteit is beschikbaar op: [www.asus.com/support](http://www.asus.com/support)

**Eesti** Käesolevaga kinnitab ASUSTeK Computer Inc. et see seade vastab asjakohaste direktiivide olulistele nõuetele ja teiste asjassepuutuvate sätetele. El vastavusdeklaratsiooni täielik tekst on saadaval järgmisel aadressil: [www.asus.com/support](http://www.asus.com/support)

**Suomi** ASUSTeK Computer Inc. ilmoittaa täten, että tämä laite on asiaankuuluvien direktiivien olennaisien vaatimusten ja muiden tätä koskevien säädösten mukainen. EU-yhdenmukaisuusilmoituksen koko teksti on luettavissa osoitteessa: [www.asus.com/support](http://www.asus.com/support)

**Ελληνικά** Με το παρόν, η ASUSTeK Computer Inc. δηλώνει ότι αυτή η συσκευή συμμορφώνεται με τις θεμελιώδεις απαιτήσεις και άλλες σχετικές διατάξεις των Οδηγιών της ΕΕ. Το πλήρες κείμενο της δήλωσης συμμόρφωσης είναι διαθέσιμο στη διεύθυνση: [www.asus.com/support](http://www.asus.com/support)

**Magyar** Az ASUSTeK Computer Inc. ezennel kijelenti, hogy ez az eszköz megfelel a kapcsolódó irányelvek lényeges követelményeinek és egyéb vonatkozó rendelkezéseinek. Az EU megfelelőségi nyilatkozat teljes szövege innen letölthető: [www.asus.com/support](http://www.asus.com/support)

**Latviski** ASUSTeK Computer Inc. ar šo paziņo, ka šī ierīce atbilst saisto Direktīvu būtiskajām prasībām un citiem citiem saistošajiem nosacījumiem. Pilns ES atbilstības paziņojuma teksts pieejams šeit: [www.asus.com/support](http://www.asus.com/support)

**Lietuviai** „ASUSTeK Computer Inc.“ šiuo tvirtina, kad šis įrenginys atitinka pagrindinius reikalavimus ir kitas svarbias susijusių direktyvų nuostatas. Visą ES atitikties deklaracijos tekstą galima rasti: [www.asus.com/support](http://www.asus.com/support)

**Norsk** ASUSTeK Computer Inc. erklærer herved at denne enheten er i samsvar med hovedsaklige krav og andre relevante forskrifter i relaterte direktiver. Fullstendig tekst for EU-samsvarserklæringen finnes på: [www.asus.com/support](http://www.asus.com/support)

**Polski** Firma ASUSTeK Computer Inc. niniejszym oświadcza, że urządzenie to jest zgodne z zasadniczymi wymogami i innymi właściwymi postanowieniami powiązanych dyrektyw. Pełny tekst deklaracji zgodności UE jest dostępny pod adresem: [www.asus.com/support](http://www.asus.com/support)

**Português** A ASUSTeK Computer Inc. declara que este dispositivo está em conformidade com os requisitos essenciais e outras disposições relevantes das Diretivas relacionadas. Texto integral da declaração da UE disponível em: [www.asus.com/support](http://www.asus.com/support)

**Română** ASUSTeK Computer Inc. declară că acest dispozitiv se conformează cerințelor esențiale și altor prevederi relevante ale directivelor conexe. Textul complet al declarației de conformitate a Uniunii Europene se găsește la: [www.asus.com/support](http://www.asus.com/support)

**Srpski** ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj u saglasnosti sa osnovnim zahtevima i drugim relevantnim odredbama povezanih Direktiva. Pun tekst EU deklaracije o usaglašenosti je dostupan da adres: [www.asus.com/support](http://www.asus.com/support)

**Slovensky** Spoločnosť ASUSTeK Computer Inc. týmto vyhlasuje, že toto zariadenie vyhovuje základným požiadavkám a ostatným príslušným ustanoveniam príslušných smerníc. Celý text vyhlásenia o zhode pre štáty EÚ je dostupný na adrese: [www.asus.com/support](http://www.asus.com/support)

**Slovenščina** ASUSTeK Computer Inc. izjavlja, da je ta naprava skladna z bistvenimi zahtevami in drugimi ustreznimi določbami povezanih direktiv. Celotno besedilo EU-izjave o skladnosti je na voljo na spletnem mestu: [www.asus.com/support](http://www.asus.com/support)

**Español** Por la presente, ASUSTeK Computer Inc. declara que este dispositivo cumple los requisitos básicos y otras disposiciones pertinentes de las directivas relacionadas. El texto completo de la declaración de la UE de conformidad está disponible en: [www.asus.com/support](http://www.asus.com/support)

**Svenska** ASUSTeK Computer Inc. förklarar härmed att denna enhet överensstämmer med de grundläggande kraven och andra relevanta föreskrifter i relaterade direktiv. Fulltext av EU-försäkran om överensstämmelse finns på: [www.asus.com/support](http://www.asus.com/support)

**Українська** ASUSTeK Computer Inc. заявляє, що цей пристрій відповідає основним вимогам та іншим відповідним положенням відповідних Директив. Повний текст декларації відповідності стандартам ЄС доступний на: [www.asus.com/support](http://www.asus.com/support)

**Türkçe** ASUSTeK Computer Inc., bu aygıtın temel gereksinimlerle ilişkili Yönergelerin diğer ilgili koşullarıyla uyumlu olduğunu beyan eder. AB uygunluk bildiriminin tam metni şu adreste bulunabilir: [www.asus.com/support](http://www.asus.com/support)

**Bosanski** ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj uskladen sa bitnim zahtjevima i ostalim odgovarajućim odredbama vezanih direktiva. Cijeli tekst EU izjave o uskladenosti dostupan je na: [www.asus.com/support](http://www.asus.com/support)

# Service and Support

Visit our multi-language website at <https://www.asus.com/support/>



|                                                    |                                                                                 |
|----------------------------------------------------|---------------------------------------------------------------------------------|
| <b>Manufacturer</b>                                | ASUSTek COMPUTER INC.                                                           |
| <b>Address, City</b>                               | 1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112                            |
| <b>Authorized Representative in Europe</b>         | ASUS COMPUTER GmbH                                                              |
| <b>Address</b>                                     | Harkortstrasse 21-23, 40880 Ratingen                                            |
| <b>Country</b>                                     | Germany                                                                         |
| <b>Authorized Representative in United Kingdom</b> | ASUSTEK (UK) LIMITED                                                            |
| <b>Address</b>                                     | 1st Floor, Sackville House, 143-149 Fenchurch Street, London, EC3M 6BL, England |
| <b>Country</b>                                     | United Kingdom                                                                  |