



Q870M-IM-A

Industrial Motherboard

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Chapter 1

Product overview

1.1 Package contents

Check your industrial motherboard package for the following items.

- ☒ 1 x ASUS Q870M-IM-A Motherboard
- ☒ 1 x Serial ATA 6.0 Gb/s cable
- ☒ 1 x M.2 screw package
- ☒ 1 x ASUS I/O Shield



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

1.2 Features

- Intel® socket 1851 for Intel® Core™ Ultra Processors (Series 2)
- Four Dual Channel DDR5 5600MT/s (SPC 0r2r) / 4400MT/s (2SPC 2r2r) DIMMs up to 192GB
- 4 x SATA 6.0 Gb/s, 2 x USB 3.2 Gen 2, 7 x USB 3.2 Gen 1, 2 x USB 2.0, 6 x COM (2 x RS232/422/485 + 4 x RS232) ports
- 2 x PCIe x16, 2 x PCIe x4 slots, 2 x M.2 (Key M) with NVMe support
- Multi-display: 2 x DisplayPort, 2 x HDMI™ ports

1.3 Specifications

CPU	Intel® socket 1851 for Intel® Core™ Ultra Processors (Series 2) Supports up to 125W TDP
Chipset	Intel® Q870 Chipset
Memory	4 x DIMM slots, max. 192GB, DDR5 5600MT/s (SPC 0r2r), 4400MT/s (2SPC 2r2r)
Graphics	Integrated graphics processor - Intel® HD Graphics support Multi-VGA output support: DP/HDMI™ ports - Supports 2 x DisplayPort 1.4 outputs (DP++) with a maximum resolution of up to 4096 x 2160 @ 60Hz - Supports 2 x HDMI™ 2.1 outputs with a maximum resolution of up to 4096 X 2160 @ 60Hz
Expansion slots	1 x PCIe 5.0 x16 slot (1 x16 mode/ 2 x8 mode) 1 x PCIe 4.0 x16 slot (x4 mode) 1 x PCIe 4.0 x4 slot (x4 mode) 1 x PCIe 4.0 x4 slot (x4 mode) 1 x M.2 socket 3 (Key M, 2242/2260/2280) (PCIe 4.0 x4 Mode) supports NVMe 1 x M.2 socket 3 (Key M, 2280) (PCIe 5.0 x4 Mode) supports NVMe
Storage	4 x SATA 6.0 Gb/s ports
LAN	1 x Intel® i210AT 1 x Intel® i226LM (Intel vPro supported)
Audio	Realtek ALC897 High Definition Audio CODEC
Rear panel I/O ports	2 x HDMI™ ports 2 x DisplayPort 2 x USB 3.2 Gen 2 ports (2 x Type A) 4 x USB 3.2 Gen 1 ports (4 x Type A) 2 x LAN (RJ45) ports 1 x COM port (RS232/422/485) 3 x Audio jacks (Line-Out, Mic in, Line-in)
Internal I/O ports	5 x COM Port headers (1 x RS232/422/485, 4 x RS232) 1 x USB 3.2 Gen 1 connector supports additional 2 USB 3.2 Gen 1 ports 1 x USB 3.2 Gen 1 vertical connector 1 x USB 2.0 header supports additional 2 USB 2.0 ports 1 x CPU Fan header with PWM mode 3 x Chassis Fan headers with PWM mode 2 x Disable ME jumpers 1 x Front Panel Audio header (AAFP) 1 x System Panel header

(continued on the next page)

Internal I/O ports	1 x S/PDIF header 1 x Chassis Intrude header 1 x Speaker header 1 x I2C Header 1 x Clear CMOS header 1 x COM Debug header 1 x LPT port header 1 x Buzzer 1 x PS/2 header 1 x AT/ATX mode selection jumper 1 x 24-pin ATX Power connector 1 x 8-pin ATX Power connector 1 x SPI TPM header 1 x USB G3 Power jumper 2 x COM1/2 Ring/+5V/+12V selection jumpers 2 x COM mode selection jumpers 2 x Expansion slot bandwidth selection jumpers 1 x LPT Power selection jumper 1 x Power Limit selection jumper 2 x PCIe SMBus Clock Connection jumpers 2 x PCIe SMBus Data Connection jumpers 1 x General Purpose Input/Output Power selection jumper
GPIO	1 x 8-bit GPIO header
Watch dog timer	Yes
Power requirement	AT mode/ ATX mode
Operation Temperature	0~60°C
Non-Operation Temperature	-40~85°C
Relative Humidity	40°C@10%~95%
OS support	Windows 10 (64bit) / Windows IoT enterprise Windows 11 IoT enterprise Ubuntu RedHat Enterprise Fedora Workstation OpenSUSE
Certification	CE, FCC, BSMI, VCCI, RCM CE-LVD
Form Factor	MATX Form Factor, 24.4cm x 24.4cm



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.



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.
-

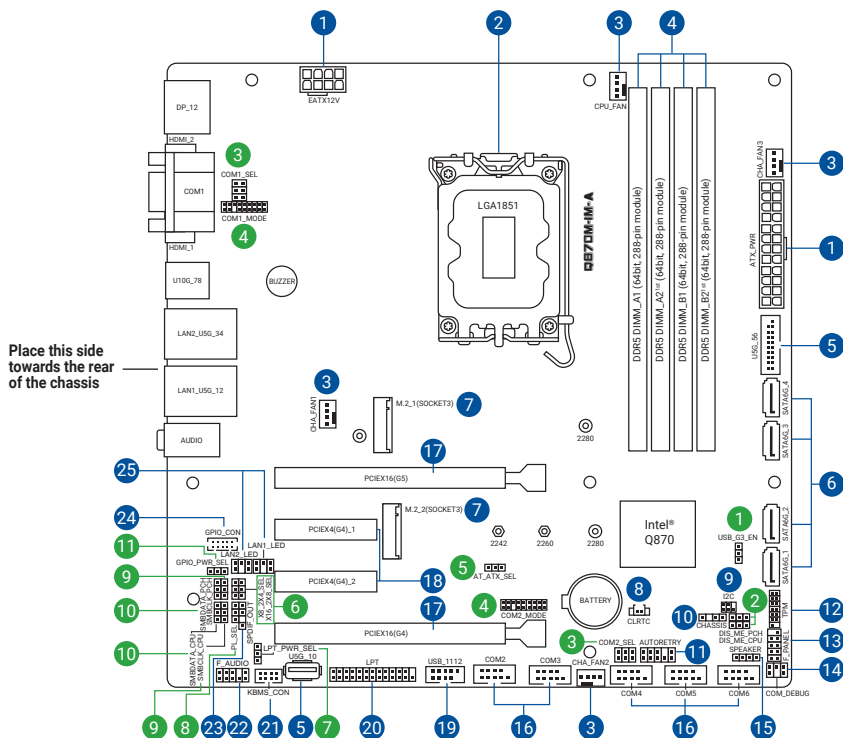
2.2 Motherboard layout



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



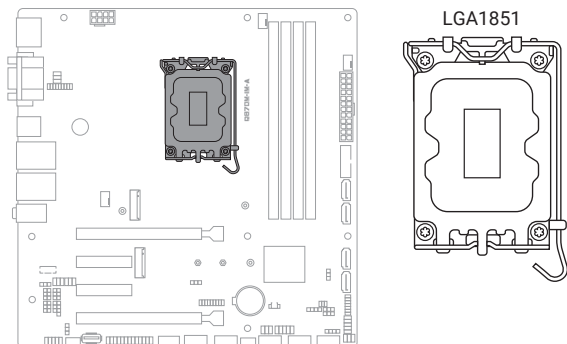
CAUTION! Do not overtighten the screws! Doing so can damage the motherboard.



Connectors/Slots	Page
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2. Intel® LGA1851 CPU socket	2-4
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9. PCIe SMBus Clock Connection jumpers (3-pin SMBCLK_CPU, SMBCLK_PCH)	2-15
10. PCIe SMBus Data Connection jumpers (3-pin SMBDATA_CPU, SMBDATA_PCH)	2-15
11. General Purpose Input/Output Power selection jumper (3-pin GPIO_PWR_SEL)	2-16

2.3 Central Processing Unit (CPU)

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



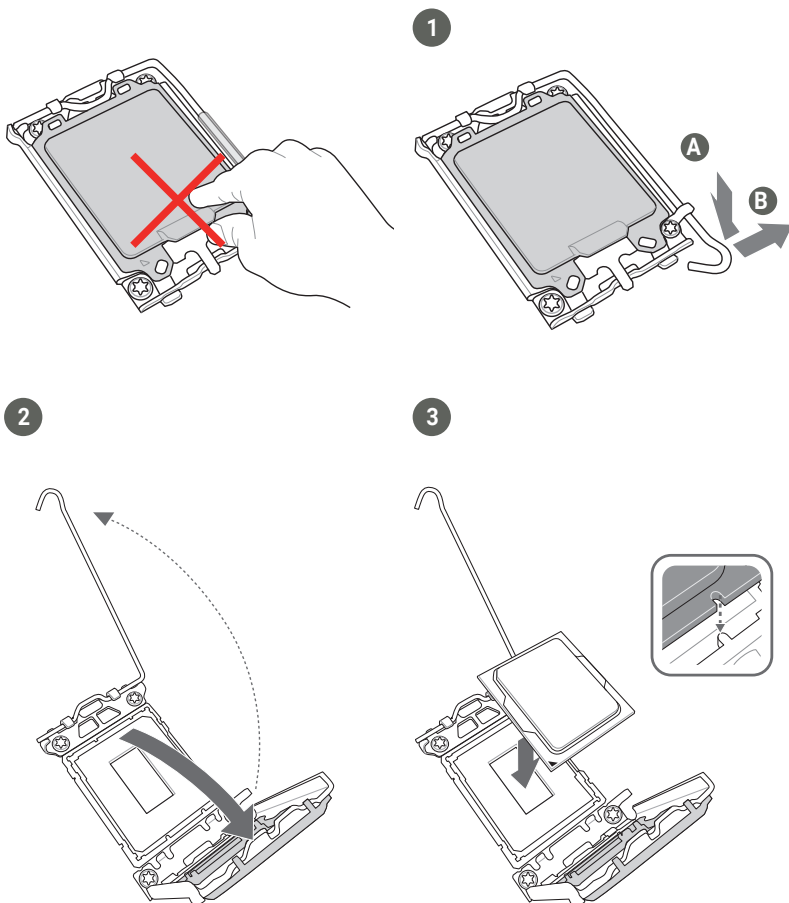
IMPORTANT! Unplug all power cables before installing the CPU.



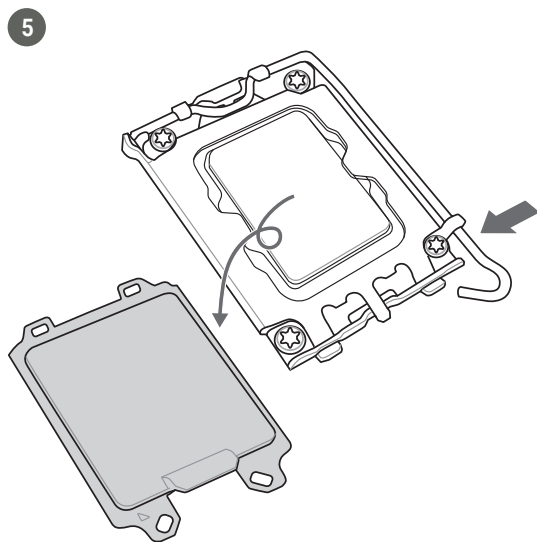
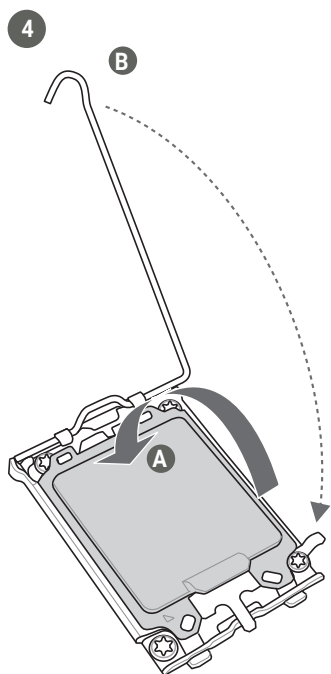
CAUTION!

- 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.
-

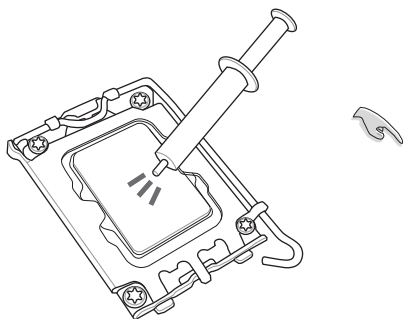
2.3.1 CPU installation



IMPORTANT! Ensure the notches on the CPU are properly aligned to the tabs in the CPU socket, and the triangle mark on the CPU is aligned to the same corner as the triangle mark on the socket.

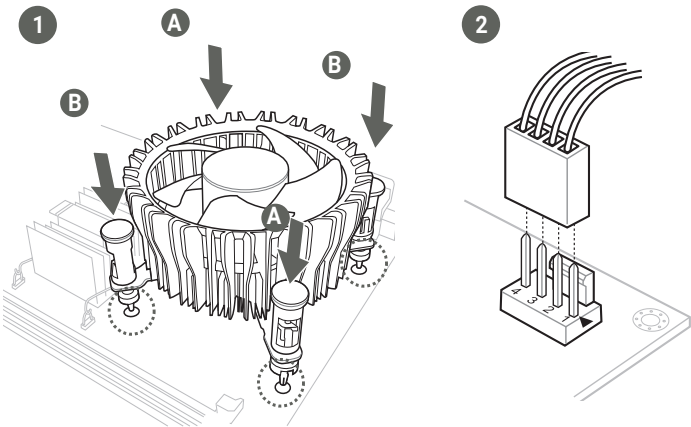


2.3.2 CPU heatsink and fan assembly installation

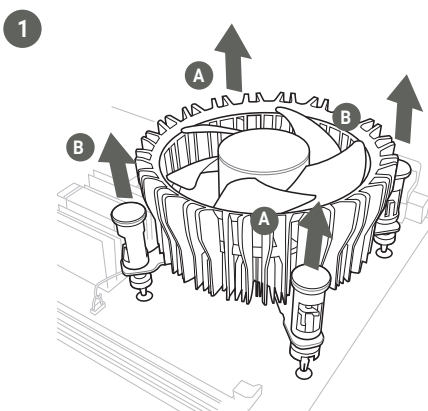


IMPORTANT! Apply Thermal Interface Material to the CPU cooling system and CPU before you install the cooling system, if necessary.

To install the CPU heatsink and fan assembly



To uninstall the CPU heatsink and fan assembly

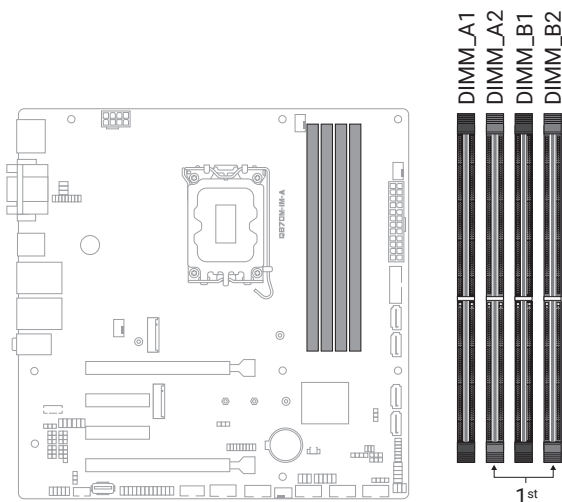


2.4 System memory

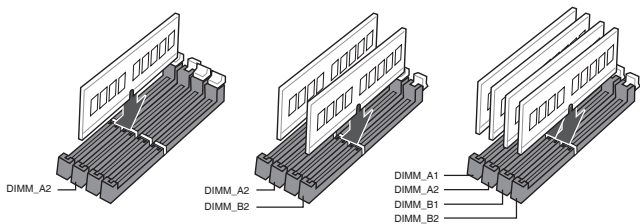
The motherboard comes with Dual Inline Memory Modules (DIMM) slots designed for DDR5 (Double Data Rate 5) memory modules.



CAUTION! A DDR5 memory module is notched differently from a DDR, DDR2, DDR3, or DDR4 module. DO NOT install a DDR, DDR2, DDR3, or DDR4 memory module to the DDR5 slot.



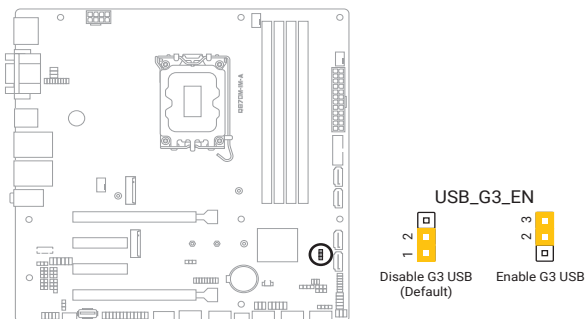
Recommended memory configuration



2.5 Jumpers

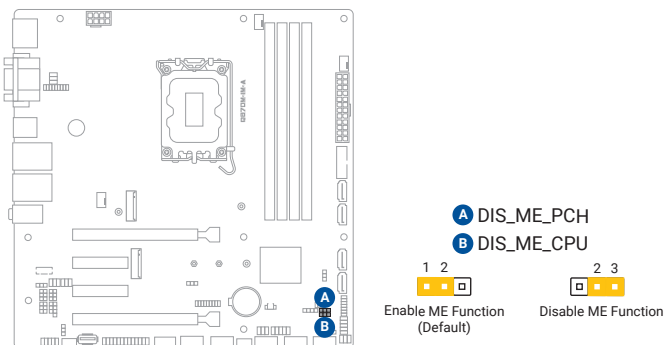
1. USB G3 Power jumper (3-pin USB_G3_EN)

This jumper allows you to enable or disable USB power in G3 (mechanical off) state.



2. Disable ME jumpers (3-pin DIS_ME_CPU, DIS_ME_PCH)

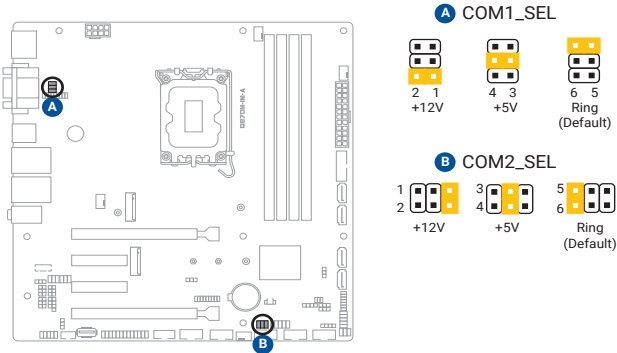
These jumpers allow you to enable or disable the Intel® ME function. Set these jumpers to pins 1-2 to enable (default) the Intel® ME function and to pins 2-3 to disable it.



Connector type	Header 1x3p, 2.54mm pitch, S/T
----------------	--------------------------------

3. COM Ring/+5V/+12V selection jumpers (6-pin COM1_SEL, COM2_SEL)

These jumpers allow you to select 5V or 12V depending on your COM device.

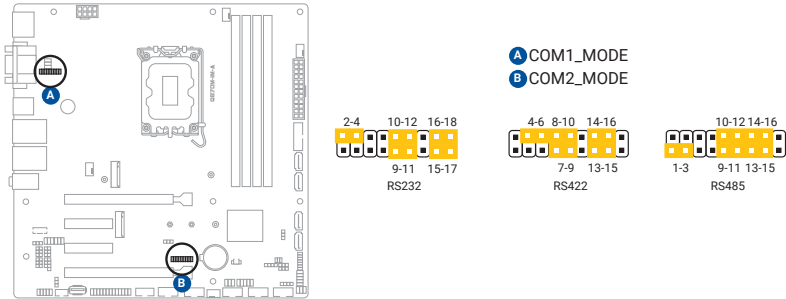


Setting	Pins
+12V	1-2
+5V	3-4
Ring (Default)	5-6

Connector type	Header 2x3p, 2.54mm pitch, S/T
----------------	--------------------------------

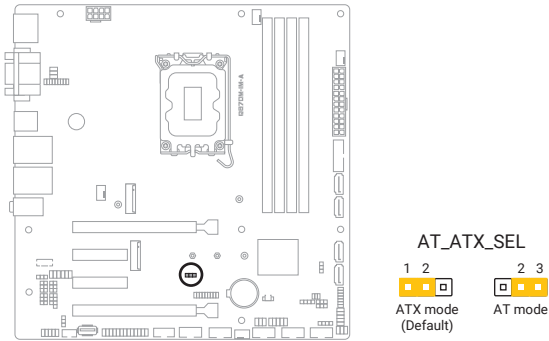
4. COM mode selection jumpers (18-1 pin COM1_MODE, COM2_MODE)

These jumpers allow you to configure COM1/2 for RS-232, RS-422, or RS-485 modes, depending on your serial device.



5. AT/ATX mode selection jumper (3-pin AT_ATX_SEL)

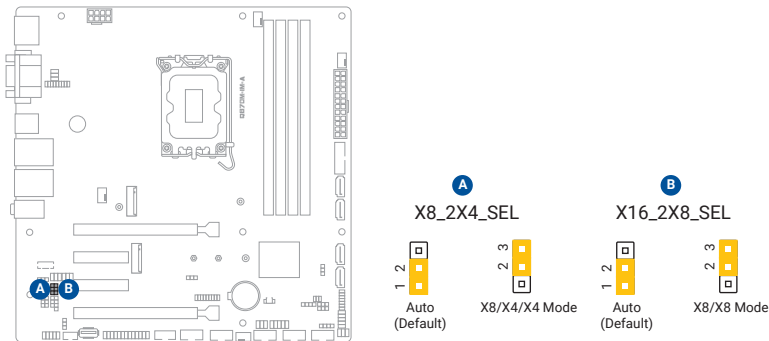
In ATX mode (default), you will need to manually press the power button to turn on the system power. In AT mode, the board will automatically turn on when system power is connected.



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

Connector type	Header 1x3p, 2.54mm pitch, S/T
----------------	--------------------------------

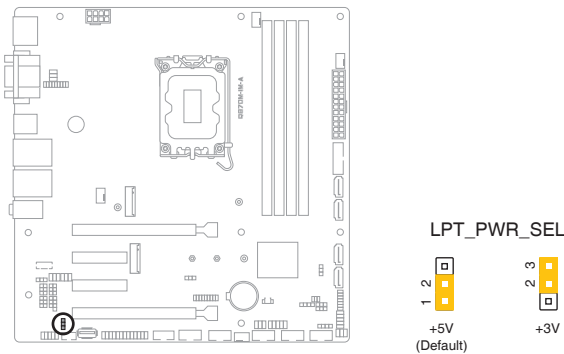
6. Expansion slot bandwidth selection jumpers (3-pin X16_2X8_SEL, X8_2X4_SEL)



Pins	PCIEX16(G5)
A: 1-2, B: 1-2 (Default)	x16
A: 1-2, B: 2-3	x8/x8
A: 2-3, B: 2-3	x8/x4/x4

7. LPT Power selection jumper (3-pin LPT_PWR_SEL)

This jumper allows you to select 3V or 5V for an LPT device depending on the mode.

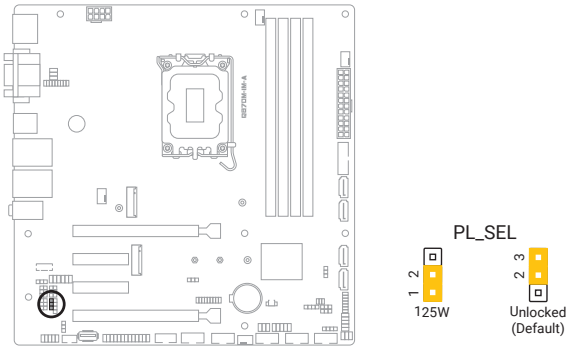


Setting	Pins
+5V (Default)	1-2
+3V	2-3

Connector type	Header 1x3p, 2.54mm pitch, S/T
----------------	--------------------------------

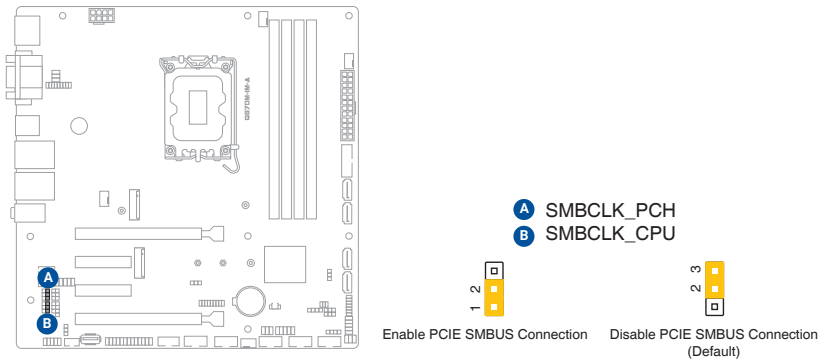
8. Power Limit selection jumper (3-pin PL_SEL)

This jumper allows you to configure the power limit settings.



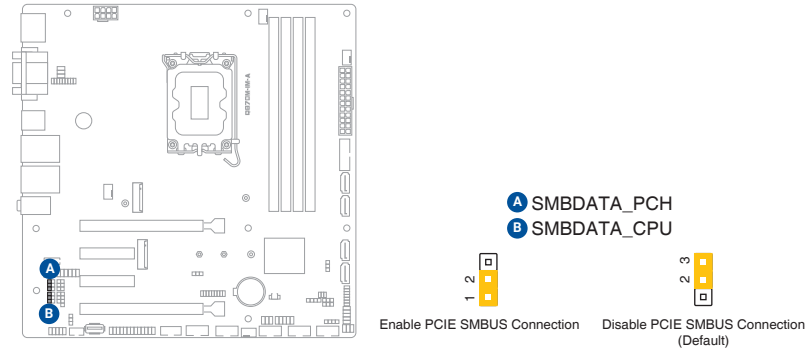
9. PCIe SMBus Clock Connection jumpers (3-pin SMBCLK_CPU, SMBCLK_PCH)

These jumpers allow you to enable or disable PCIe SMBus Clock Connection. Set these jumpers to pins 1-2 to enable PCIe SMBus Clock Connection and to pins 2-3 to disable it.



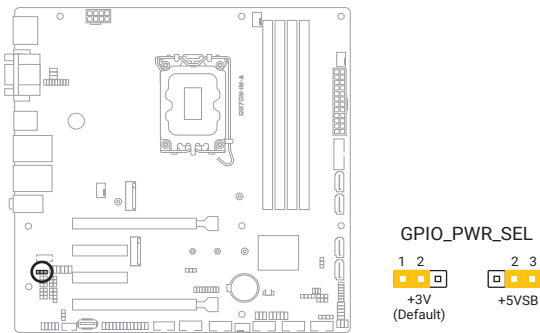
10. PCIe SMBus Data Connection jumpers (3-pin SMBDATA_CPU, SMBDATA_PCH)

These jumpers allow you to enable or disable PCIe SMBus Data Connection. Set these jumpers to pins 1-2 to enable PCIe SMBus Data Connection and to pins 2-3 to disable it.



11. General Purpose Input/Output Power selection jumper (3-pin GPIO_PWR_SEL)

This jumper allows you to select 3V or 5V for a general purpose input/output module.

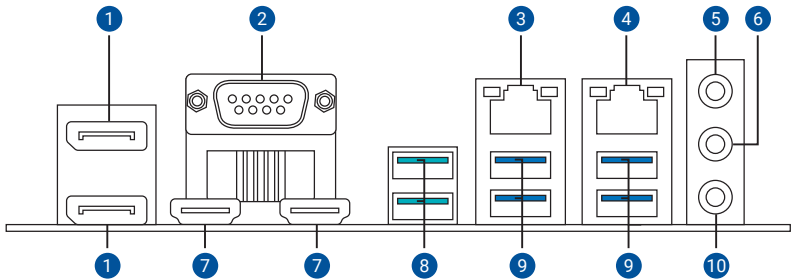


Setting	Pins
+3V (Default)	1-2
+5V	2-3

Connector type	Header 1x3p, 2.54mm pitch, S/T
----------------	--------------------------------

2.6 Connectors

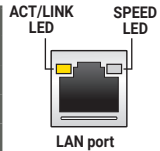
2.6.1 Rear panel connectors



1. **DisplayPorts.** These ports are for DisplayPort-compatible devices.
2. **Serial port (COM).** This port connects a modem or other device that conforms with serial specification.
3. **LAN (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub.

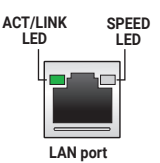
LAN port LED indications

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		



4. **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		



5. **Line In port (light blue).** This port connects to the tape, CD, DVD player, or other audio sources.

6. **Line Out port (lime).** This port connects to a headphone or a speaker. In the 4, 5.1 and 7.1 channel configurations, the function of this port becomes Front Speaker Out
7. **HDMI™ ports.** These ports are for a High-Definition Multimedia Interface (HDMI™) connectors, and are HDCP compliant allowing playback of HD DVD, Blu-ray, and other protected content.
8. **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.



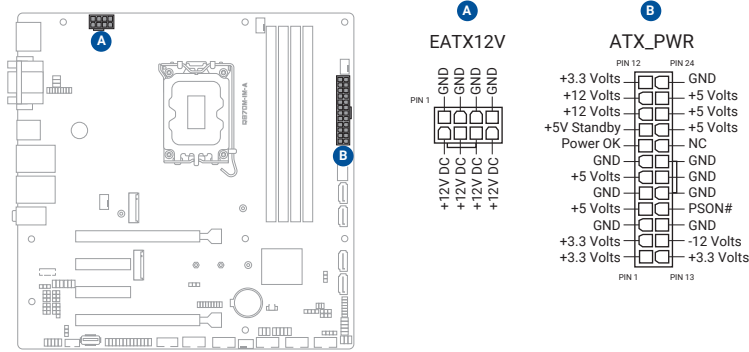
NOTE: We strongly recommend that you connect USB 3.2 Gen 2 devices to USB 3.2 Gen 2 ports for faster and better performance from your USB 3.2 Gen 2 devices.

9. **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.
10. **Microphone port (pink).** This port connects to a microphone.

2.6.2 Internal connectors

1. 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	PSON#
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

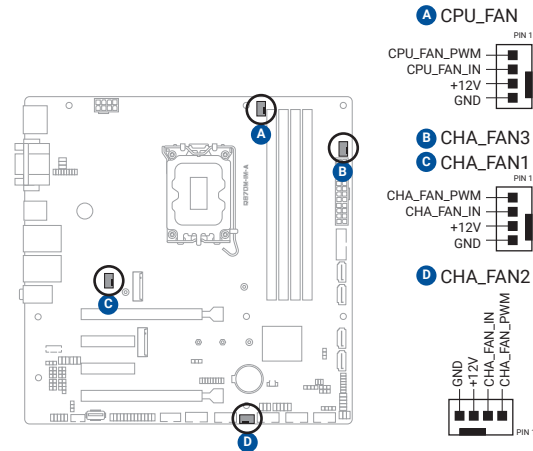
Pins	Signal	Pins	Signal
1	GND	5	+12V in
2	GND	6	+12V in
3	GND	7	+12V in
4	GND	8	+12V in



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.

2. CPU and Chassis Fan headers (4-pin CPU_FAN, 4-pin CHA_FAN1/2/3)

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.



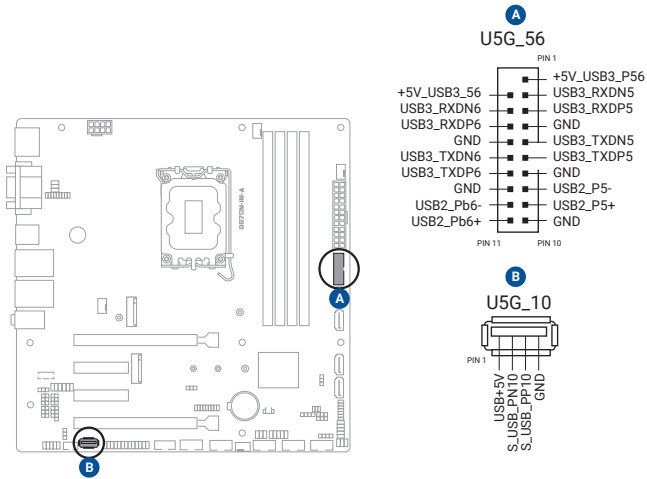
Connector type	WAFER HD 4p, 2.54mm pitch, S/T	
Reference mating connector	Vendor	JST
	P/N	S4B-XH-A



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!

3. **USB 3.2 Gen 1 connectors (U5G_56 / U5G_10)**

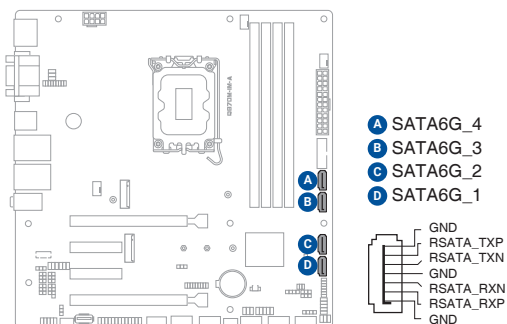
Connect a USB 3.2 Gen 1 module to any of these connectors for additional USB 3.2 Gen 1 front or rear panel ports. These connectors comply with USB 3.2 Gen 1 specifications and provide faster data transfer speeds of up to 5 Gbps, faster charging time for USB-chargeable devices, optimized power efficiency,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



Connector type (U5G_56)	BOX header 2x10p, K20, 2.0mm pitch
Reference mating connector	Vendor MOLEX
	P/N 511102052

4. 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.

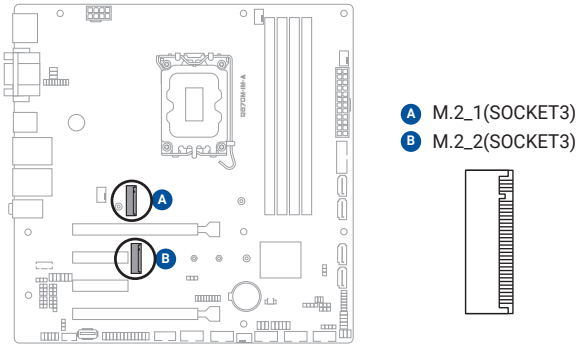


Connector type

WAFFER HD 7p, 1.27mm pitch

5. M.2 socket 3

These sockets allow you to install M.2 SSD modules.

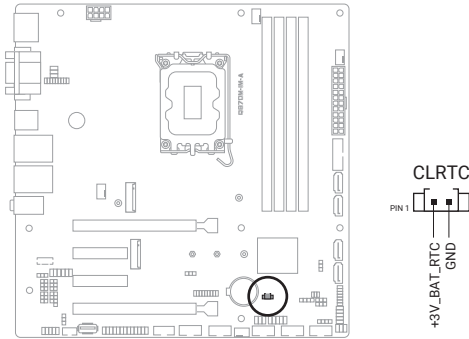


NOTES:

- The M.2 SSD module is purchased separately.
- M.2_1 M key, Type 2280 (PCIe 5.0 x4 mode) supports NVMe.
- M.2_2 M key, Type 2242/2260/2280 (PCIe 4.0 x4 mode) supports NVMe
- We recommend using a PH1 screwdriver with a torque of 2.0 +/- 0.2 kgf.cm when tightening the screw.

6. 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	
Reference mating connector	Vendor	MOLEX
	P/N	510210200

To erase the RTC RAM:

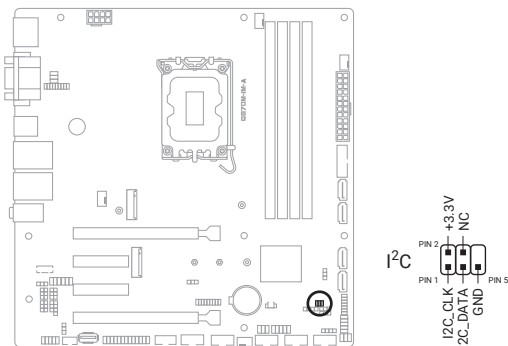
1. Turn OFF the computer and unplug the power cord.
2. Use a metal object such as a screwdriver to short the two pins.
3. Plug the power cord and turn ON the computer.
4. Hold down the key during the boot process and enter BIOS Setup to re-enter data.



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.

7. I²C header (6-1 pin I²C)

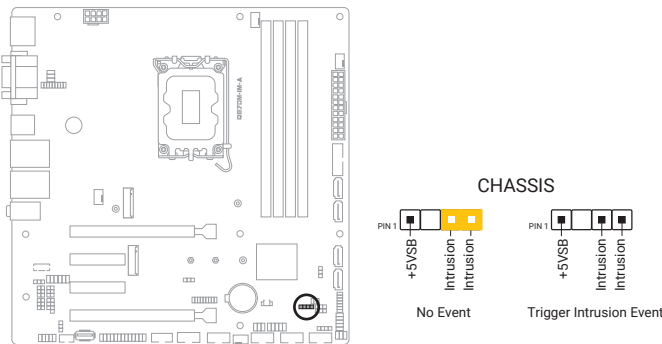
The I²C (Inter-Integrated Circuit) header allows you to connect an I²C compatible IoT security module.



Connector type	Header 2x3p, K6, 2.0mm pitch		
Reference mating connector	Vendor	MOLEX	
	P/N	511100660	

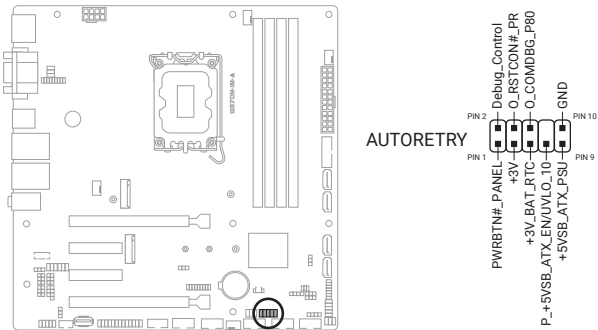
8. Chassis intrusion header (4-1 pin CHASSIS)

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 header when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.



Connector type	Header 4p, K2, 2.54mm pitch		
Reference mating connector	Vendor	JST	
	P/N	XHP-4	

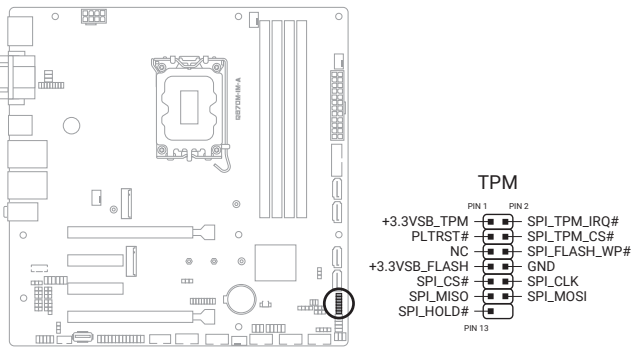
9. Autoretry header (10-1 pin AUTORETRY)



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

10. SPI TPM header (14-1 pin TPM)

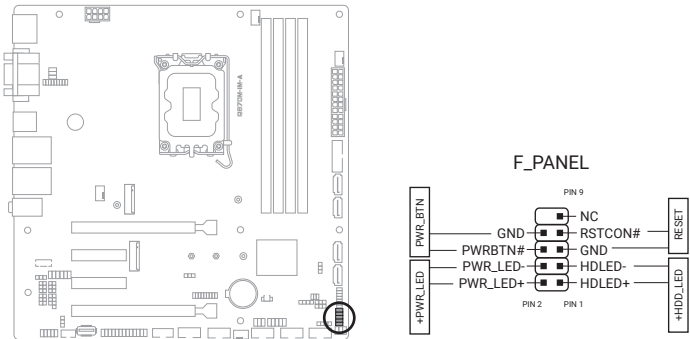
This header supports a Trusted Platform Module (TPM) system with a Serial Peripheral Interface (SPI), allowing you to securely store keys, digital certificates, passwords and data. A TPM system also enhances network security, protects digital identities, and ensures platform integrity.



Connector type	Header 2x7p, K14, 2.0mm pitch		
Reference mating connector	Vendor	MOLEX	
	P/N	511101452	

11. System Panel header (10-1 pin F_PANEL)

This header supports several chassis-mounted functions.



Connector type	Header 2x5p, K10, 2.54mm pitch
Reference mating connector	Vendor JST
	P/N RF-10

- **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)**

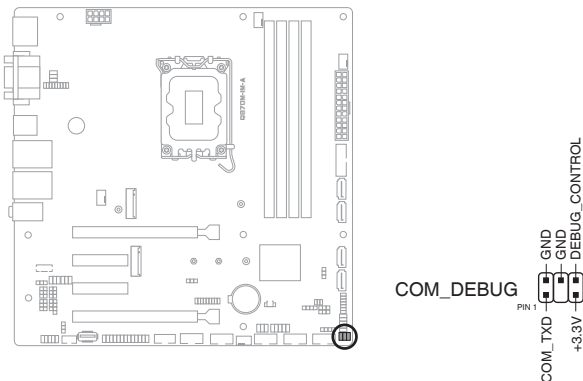
This 2-pin header is for the system power button.

- **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.

12. COM Debug connector (6-1 pin COM_DEBUG)

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



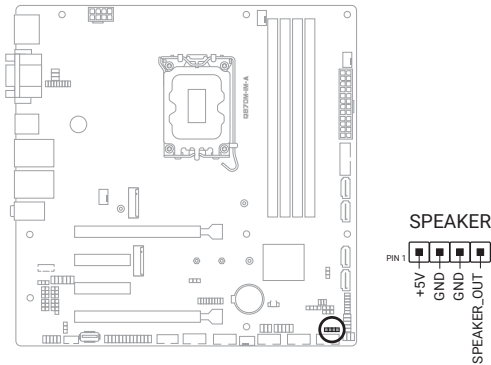
Connector type	Header 2x3p, 2.54mm pitch		
Reference mating connector	Vendor	JST	
	P/N	RF-6	



NOTE: The COM debug card is purchased separately.

13. **Speaker header (4-pin SPEAKER)**

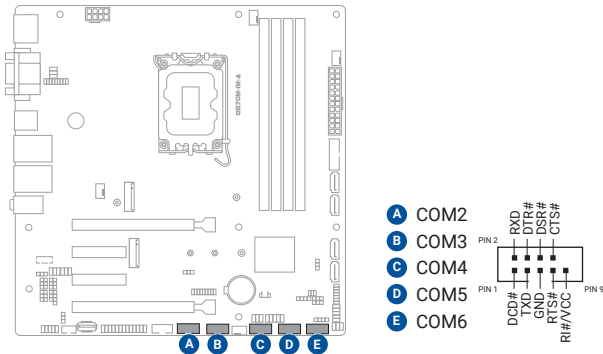
This header allows you to connect the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.



Connector type	HEADER 1x4p, 2.54mm pitch, S/T
Reference mating connector	Vendor JST
	P/N XHP-4

14. **Serial Port headers (10-1 pin COM2, COM3, COM4, COM5, COM6)**

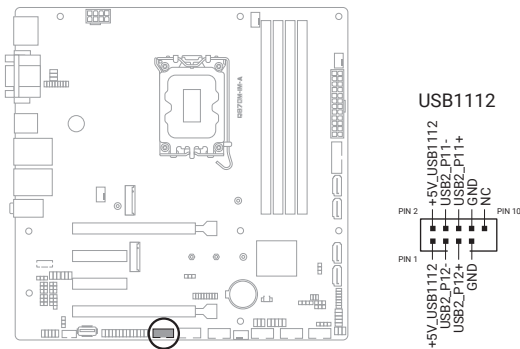
These headers are for serial (COM) modules. Connect the serial port cables to these headers, then install the module to a slot opening at the back of the system chassis.



Connector type	BOX header 2x5p, K10, 2.54mm pitch
Reference mating connector	Vendor JST
	P/N RF-10

15. USB 2.0 header (10-1 pin USB1112)

This header is for a USB 2.0 module. 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	BOX header 2x5p, K9, 2.54mm pitch
Reference mating connector	Vendor JST
	P/N RF-10



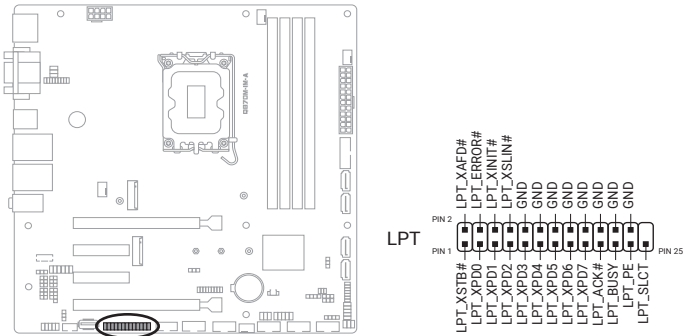
CAUTION! Never connect a 1394 cable to the USB connector. Doing so will damage the motherboard.



NOTE: The USB cable is purchased separately.

16. LPT header (26-1 pin LPT)

The LPT (Line Printing Terminal) connector supports devices such as a printer. LPT standardizes as IEEE 1284, which is the parallel port interface on IBM PC-compatible computers. This connector also supports a 16-bit GPIO multi-function mode and is tolerant to both +3V and +5V signals. You can select the signals by setting the LPT Power section jumper.



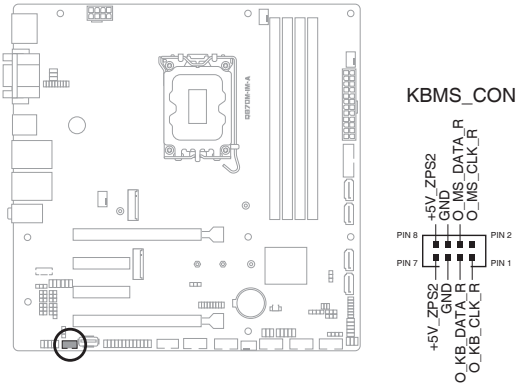
Connector type	HEADER 2x13p, K26, 2.54mm pitch, S/T	
Reference mating connector	Vendor	PINREX
	P/N	610-92-13GB00

GPIO multi-function mode:

Pins	Signal	Pins	Signal
1	GPIO9(GP47)	2	GPIO10(GP46)
3	GPIO11(GP42)	4	GPIO12(GP45)
5	GPIO13(GP41)	6	GPIO14(GP44)
7	GPIO15(GP40)	8	GPIO16(GP43)
9	GPIO17(GP37)	10	GND
11	GPIO18(GP36)	12	GND
13	GPIO19(GP35)	14	GND
15	GPIO20(GP34)	16	GND
17	GPIO21(GP33)	18	GND
19	GPIO22(GP32)	20	GND
21	GPIO23(GP31)	22	GND
23	GPIO24(GP30)	24	GND
25	Not Used	26	

17. Keyboard and Mouse Port connector (8-pin KBMS_CON)

The Keyboard and Mouse Port connector allows you to connect a PS/2 keyboard and mouse.

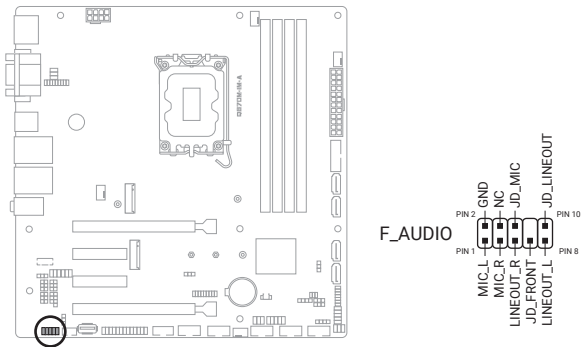


Pins	Signal	Pins	Signal
1	O_KB_CLK_R	2	O_MS_CLK_R
3	O_KB_DATA_R	4	O_MS_DATA_R
5	GND	6	GND
7	+5V_ZPS2	8	+5V_ZPS2

Connector type	WAFER HD 2x4P, 2.0mm pitch, S/T
Reference mating connector	Vendor JST
	P/N PHDR-08VS

18. 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
Reference mating connector	Vendor JST
	P/N RF-10

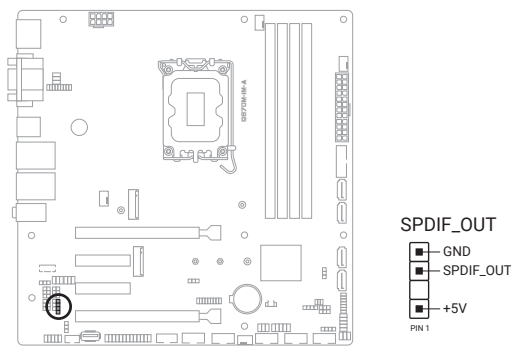


IMPORTANT!

- 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].

19. 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.



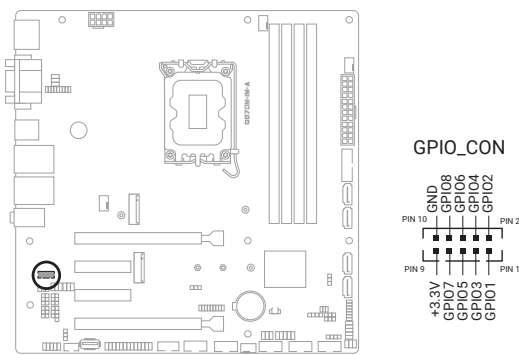
Connector type	HEADER 1x4p, K2, 2.54mm pitch
Reference mating connector	Vendor JST
	P/N XHP-4



NOTE: The SPDIF Out module is purchased separately.

20. General purpose input/output connector (10-pin GPIO_CON)

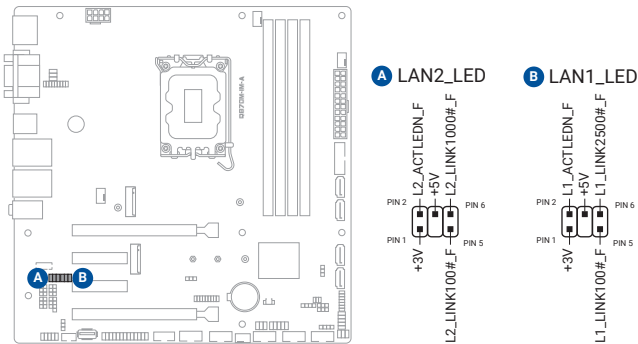
This connector is for a general purpose input/output module which allows you to customize the digital signal input/output.



Connector type	Wafer HD 2x5p, 2.0mm pitch, S/T
Reference mating connector	Vendor JST
	P/N PHDR-10VS

21. LAN activity LED connectors (6-1 pin LAN1/2_LED)

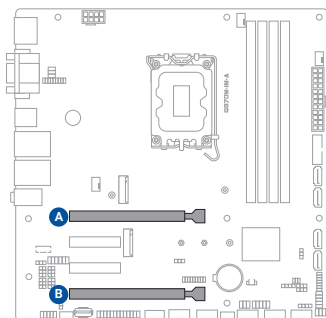
These connectors allow you to connect the Gigabit LAN Activity LED.



2.7 Slots

1. PCI Express slots

This motherboard supports two PCIe x16 graphics cards that comply with the PCI Express specification.



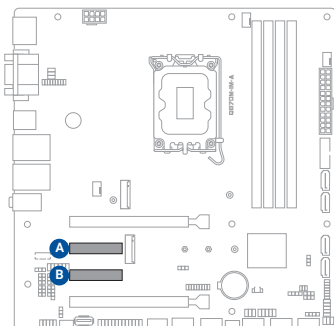
A PCIEX16(G5)

B PCIEX16(G4)



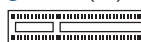
2. PCI Express x4 slots

This motherboard supports two PCIe x4 network cards, SCSI cards and other cards that comply with the PCI Express specification.



A PCIEX4(G4)_1

B PCIEX4(G4)_2



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>+ 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>+ 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 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:

Main	For changing the basic system configuration.
Advanced	For changing the advanced system settings.
Hardware Monitor	For displaying the system temperatures, fan and power status, and changing smart fan settings.
Security	For configuring the system security settings.
Boot	For changing the system boot configuration.
Exit	For selecting the save options and default options.
Event Logs	For viewing or configuring the event logs.
MEBx	For configuring Intel(R) Management Engine (ME) features.

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 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.



NOTE:

- 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.
-

3.3.2 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.

3.3.3 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.

PH Randomization

Allows you to enable or disables Platform Hierarchy randomization. Configuration options: [Disabled] [Enabled]



NOTE: Do not enable this question in production platforms. This is for development testing. OVERRIDE ChangePlatformAuth ELINK for production platforms supports TXT.

3.3.4 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]

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]

Maximum Memory Frequency

Allows you to select the maximum memory frequency in MHz. Configuration options: [Auto] [1067] [1333] ~ [12800]

3.3.5 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] [FORCE]



NOTE: The following item becomes unconfigurable when you set **Primary Display** to **[FORCE]**.

Internal Graphics

[Disabled] Disables internal graphics.

[Enabled] Enables internal graphics.

RC6 (Render Standby)

Allows you to enable or disable render standby support.

Configuration options: [Disabled] [Enabled]

3.3.6 PCI Express Configuration

This item allows you to configure PCI Express settings.

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]

PCIEx16(G4) Slot

Allows you to configure the PCI Express Root Port settings.

PCI Express Root Port SPD1

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]

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]

PCIEx4(G4)_1 Slot

Allows you to configure the PCI Express Root Port settings.

PCI Express Root Port SPF1

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]

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]

PCIEx4(G4)_2 Slot

Allows you to configure the PCI Express Root Port settings.

PCI Express Root Port SPB1

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]

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]

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]

Re-Size BAR Support

Configuration options: [Disabled] [Enabled]

3.3.7 Super IO Configuration

Super IO Configuration

Serial Port 1 Configuration

Serial Port

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



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

COM1 Control

Allows you to select the COM1 mode. Configuration options: [RS232] [RS422]
[RS485]

Serial Port 2 Configuration

Serial Port

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



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

COM2 Control

Allows you to select the COM2 mode. Configuration options: [RS232] [RS422]
[RS485]

Serial Port 3 Configuration

Serial Port

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

Serial Port 4 Configuration

Serial Port

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

Serial Port 5 Configuration

Serial Port

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

Serial Port 6 Configuration

Serial Port

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

Parallel Port Configuration

Parallel Port

Allows you to enable or disable the Parallel port (LPT/LPTE). Configuration options: [Disabled] [Enabled]



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

Device Mode

Allows you to select the Parallel Port mode. Configuration options: [STD Printer Mode] [SPP Mode] [EPP-1.9 and SPP Mode] [EPP-1.7 and SPP Mode] [ECP Mode] [ECP and EPP 1.9 Mode] [ECP and EPP 1.7 Mode]

3.3.8 Serial Console Redirection

COM1(~6)

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] [230400] [460800] [921600]

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]

COM7(Pci Bus0, Dev0, Func0) (Disabled)



NOTE: The following items can be configured only when AMT is provisioned.

Console Redirection Settings

Terminal Type

[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.

[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]

3.3.9 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]

3.3.10 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]

3.3.11 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]

U5G_1(~6)

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]

U10G_7(~8)

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_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]

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 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

[Enabled] Enables the Intel LAN1 controller.

[Disabled] Disables the controller.

LAN2 I210AT

[Enabled] Enables the Intel LAN2 controller.

[Disabled] Disables the controller.

I2C0 Controller

[Enabled] Enables the I2C controller.

[Disabled] Disables the I2C controller.

LPT Port Switch Function

[AUTO] Select the port function automatically by default.

[LPT] Force to switch the port function to LPT.

[GPIO] Force to switch the port function to GPIO.

NPU Device

[Enabled] Enables NPU (Neural Processing Unit) device.

[Disabled] Disables NPU (Neural Processing Unit) device.

3.3.14 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 PS2

Enables or disables the system to be powered on by a PS/2 keyboard or mouse.
Configuration options: [Disabled] [Enabled]

Power On By Ring

Configuration options: [Disabled] [Enabled]

Power On By RTC

Configuration options: [Disabled] [Single event] [Daily event] [Weekly event] [Monthly event]



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.

3.3.15 EZ-Flash

Enter Ez-Flash mode

This item allows you to run EzFlash utility. When 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.

ME Update Mode Select

[Secure ME Update]

Uses the Intel® Firmware Update tool to update the CSME.

[Full ME Block ME Update]

Performs a complete update of the ME region.



CAUTION! Selecting Full ME Block ME Update mode may cause all Intel® CSME settings to be cleared.

3.3.16 Watchdog Timer

Watchdog Support

This item allows you to enable or disable Watchdog timer. Configuration options: [Enabled] [Disabled]



NOTE: The following items appear when you set **Watchdog Support** to **[Enabled]**.

Watchdog Count mode

Allows you to select Watchdog Timer I count mode. Configuration options: [Second Mode] [Minute Mode]

Watchdog Timer

Use the <+> and <-> keys to adjust the value or input the desired value directly. The value ranges from 30 to 255.

3.3.17 Preserve BIOS option method

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

Configuration options: [Disabled] [Enabled]

3.4 Hardware Monitor menu

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

3.4.1 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

CPU Fan Setting

CPU Fan Temperature 1(~4)

Allows you to set the value of temperature1(~4).

CPU Fan FD/RPM 1(~4)

Allows you to set the value of Fan Duty/PRM 1(~4) when temperature is T1(~4).

Chassis Fan1/2/3 Setting

Chassis Fan 1/2/3 Temperature 1(~4)

Allows you to set the value of temperature1(~4).

Chassis Fan 1/2/3 FD/RPM 1(~4)

Allows you to set the value of Fan Duty/PRM 1(~4) when temperature is T1(~4).

3.5 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.

3.5.1 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.

3.5.2 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>.

3.5.3 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]

3.6 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.

Post Time Delay

Allows you to set the delay for specific situation needs. For example, HDD spin up time (Delay time = value * 500ms). Use the <+> and <-> keys to adjust the value or input the desired value.

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: [Disabled] [Enabled]

[Enabled] Select to accelerate the boot speed.

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

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]

3.7 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.

3.8 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]



NOTE: 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]



NOTE: All values changed here do not take effect until computer is restarted.

View Smbios Event Log

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

3.9 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.



NOTE: 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.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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CAN ICES (B)/NMB (B)

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

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CAN ICES (B)/NMB (B)

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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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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

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

Srpski ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj u saglasnosti sa osnovnim zahtjevima i drugim relevantnim odredbama povezanih Direktiva. Pun tekst EU deklaracije o usaglašenosti je dostupan da adresi: www.asus.com/support

Slovensky Spoločnosť ASUSTeK Computer Inc. týmto vyhlasuje, že toto zariadenie vyhovuje základným požiadavkám a ostatým príslušným ustanoveniam príslušných smerníc. Celý text vyhlásenia o zhode pre štáty EÚ je dostupný na adrese: 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

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

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

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

Türkçe AsusTek Computer Inc., bu aygıtın temel gereksinimlerle ve ilişkili Yönergelerin diğer ilgili koşullarıyla uyumlu olduğunu beyan eder. AB uygunluk bildiriminin tam metni şu adreste bulunabilir: www.asus.com/support

Bosanski ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj uskladan sa bitnim zahtjevima i ostalim odgovarajućim odredbama vezanih direktiva. Cijeli tekst EU izjave o usklađenosti dostupan je na: www.asus.com/support

Service and Support

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