



J6412T-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 J6412T-IM-A Motherboard
- 1 x SATA 6.0 Gb/s cable
- 1 x SATA power cable
- 2 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

- Built-in Intel® Celeron® Quad-core Processor J6412
- Two DDR4 3200/3000/2800/2666/2400/2133 MHz Non-ECC Un-buffered SO-DIMMs up to 32 GB
- 1 x SATA 6Gb/s, 3 x USB 3.2 Gen 2, 1 x USB 2.0, 6 x COM headers
- 1 x PCIe 3.0/2.0 x1 slot (colay with M.2 E Key), 1 x Full/Half-size PCIe mini card slot (w/SIM holder), 1 x M.2 Socket 1 with E key, 1 x M key, type 2242/2260/2280 (PCIe x2 / SATA mode) supports NVMe
- Multi-display: 1 x HDMI™ (colay with DP), 1 x DisplayPort, 1 x LVDS, 1 x Embedded DisplayPort (BOM colay with LVDS, optional), HDMI™ + DP + LVDS, HDMI™ (Default) + DP + eDP, DP + DP + LVDS, DP + DP + eDP

1.3 Specifications

CPU	Built-in Intel® J6412 SoC onboard Processor
Memory	2 x DDR4, max.32GB, DDR4 3200/3000/2800/2666/2400/2133 MHz Non-ECC, Unbuffered Memory
Graphics	<p>Integrated graphics processor - Intel® HD Graphics support</p> <ul style="list-style-type: none"> - Supports HDMI™ 1.4b output with a maximum resolution of 3840 x 2160 @ 30Hz - Supports DisplayPort ++1.2 output with a maximum resolution of 4096 x 2160 @ 60Hz - Supports DisplayPort ++1.2 output with a maximum resolution of 4096 x 2160 @ 60Hz (colay with HDMI™, optional) - Supports LVDS output with a maximum resolution of 1920 x 1200 @ 60Hz - Supports Embedded DisplayPort output with a maximum resolution of 4096 x 2160 @ 60Hz (colay with LVDS, optional) <p>Supports up to three displays simultaneously</p>
Expansion slots	<p>1 x PCI Express 3.0/2.0 x1 slot (colay with M.2 E Key)</p> <p>1 x Full/Half-size PCIe minicard slot (w/SIM holder)</p> <p>1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device (colay with PCIe)</p> <p>1 x M key, type 2242/2260/2280 (PCIe x2 / SATA mode) supports NVMe</p>
Storage	1 x SATA Gen 3.0 up to 6.0 Gb/s port
Ethernet	2 x Realtek® 8111H, supports WOL/PXE
Audio	Realtek® ALC897 High Definition Audio
Rear panel I/O ports	<p>1 x HDMI™ port</p> <p>1 x DisplayPort</p> <p>3 x USB 3.2 Gen 2 ports</p> <p>1 x USB 2.0 port</p> <p>2 x LAN (RJ45) ports</p> <p>1 x Audio jack</p> <p>1 x DC-IN jack</p>
Internal Connectors	<p>6 x Serial Port headers (5 x RS232, 1 x RS232/422/485)</p> <p>1 x Chassis Fan header (PWM Mode)</p> <p>1 x Chassis Intrusion header</p> <p>1 x Front Panel Audio header (AAFP)</p> <p>1 x System Panel header (10-1 pin)</p> <p>1 x Clear CMOS jumper</p>

(continued on the next page)

Internal Connectors	<ul style="list-style-type: none"> 2 x USB 2.0 headers support additional 4 USB 2.0 ports 1 x 8-bit GPIO header 1 x COM Debug header 1 x 4-pin ATX 12V power connector 1 x SATA power connector 1 x SATA port 1 x PS/2 port 1 x Speaker header 1 x eDP connector (optional) 1 x SPI TPM header 1 x AT/ATX selection header 1 x LVDS signal header 1 x LCD panel monitor switch header 1 x LVDS Panel VCC Power Selection jumper 1 x LVDS Panel Backlight Enable Signal Selection 1 x LVDS Backlight Panel header
Power requirement	12V DC-in (1x external DC jack; 1 x internal 4-pin power connector)
Operation Temperature	0~60°C
Non-Operation Temperature	-40~85°C
Relative Humidity	0%~85%
OS support	Windows® 10 (64bit) / Windows® 10 IoT Enterprise Ubuntu, RedHat Enterprise, OpenSUSE
Form Factor	Thin Mini-ITX Form Factor, 6.7" x 6.7" (17.0cm x 17.0cm)



NOTE: Specifications are subject to change without notice.

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.



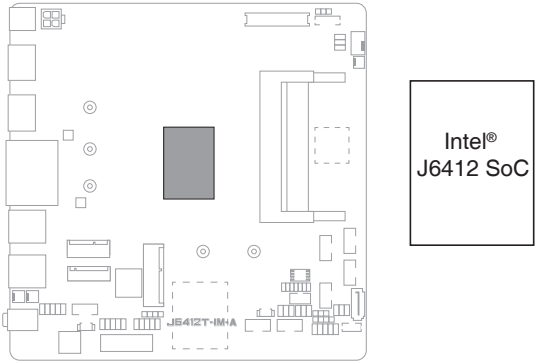
CAUTION!

- 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.
-

Connectors/Jumpers/Slots		Page
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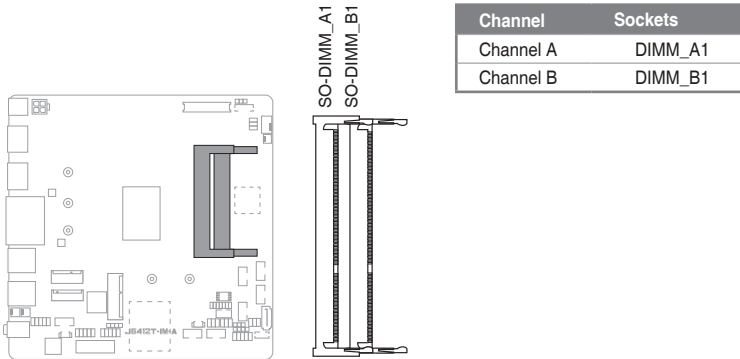
2.3 Central Processing Unit (CPU)

The motherboard comes with an onboard Intel® processor J6412.



2.4 System memory

This motherboard comes with two Double Data Rate 4 Low Voltage (DDR4L) Small Outline Dual Inline Memory Module (SO-DIMM) sockets. The figure illustrates the location of the DDR4L DIMM socket:



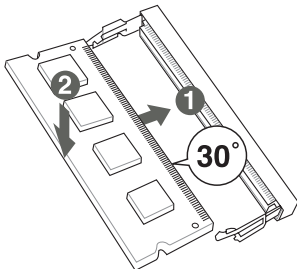
IMPORTANT!

- You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.
- Always install the DIMMS with the same CAS Latency. For an optimum compatibility, we recommend that you install memory modules of the same version or data code (D/C) from the same vendor. Check with the vendor to get the correct memory modules.
- According to Intel® CPU spec, DIMM voltage below 1.35V is recommended to protect the CPU.

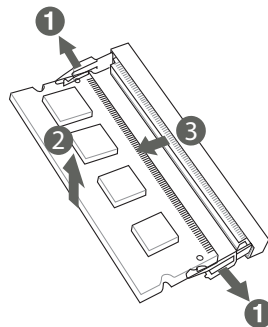


NOTE: Visit the ASUS website at www.asus.com for the latest QVL.

To install a SO-DIMM



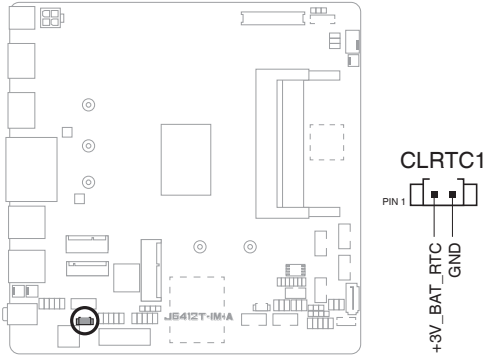
To remove a SO-DIMM



2.5 Jumpers

1. Clear RTC RAM (2-pin CLRRTC)

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, 2.54mm pitch, S/T
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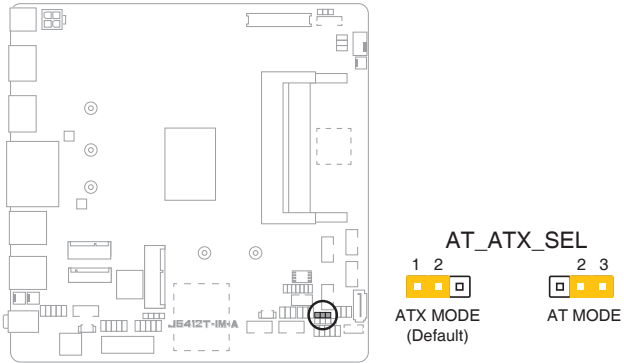
To erase the RTC RAM:

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.

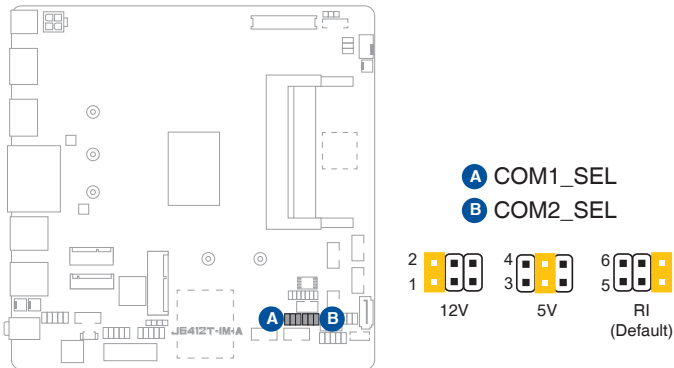
2. AT/ATX mode selection jumper (3-pin AT_ATX_SEL)



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

Connector type HEADER 1x3p, 2.54mm pitch, S/T

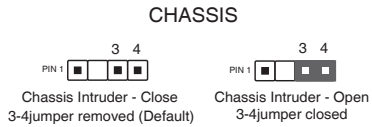
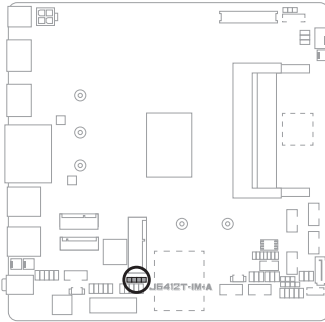
3. COM Ring/+5V/+12V selection jumpers (6-pin COM1_SEL, COM2_SEL)



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

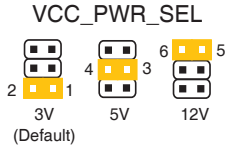
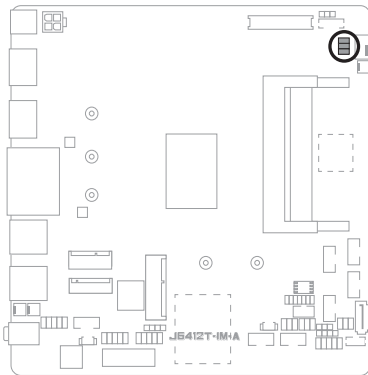
4. Chassis intrusion header (4-1 pin_CHASSIS)

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 low-level signal to this connector when a chassis component is installed. The signal is then generated as a chassis intrusion event.



Connector type	HEADER 4p, K2, 2.54mm pitch
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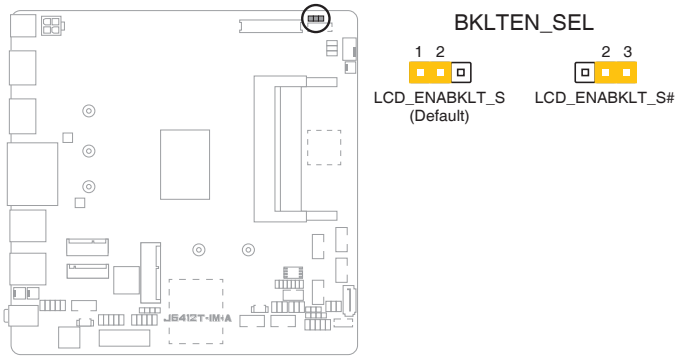
5. LVDS Panel VCC Power Selection jumper (6-pin VCC_PWR_SEL)



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

Connector type	HEADER 1 x 3p, 2.54mm pitch, S/T
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6. LVDS Panel Backlight Enable Signal Selection (BKLTEN_SEL)

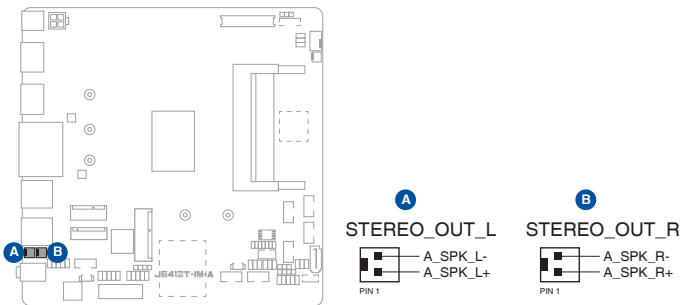


	Pins
12V (Default)	1-2
5V	2-3

Connector type HEADER 1x3p, 2.54mm pitch, S/T

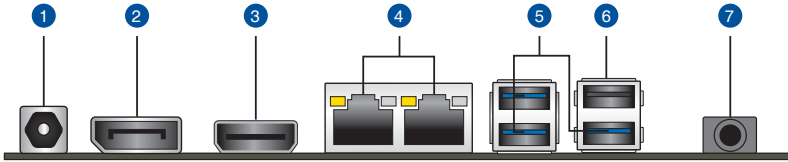
7. Internal Stereo Speaker header (2-pin STEREO_OUT_L, STEREO_OUT_R)

The internal mono speaker header allows connection to an internal, low-power speaker for basic system sound capability. The subsystem is capable of driving a speaker load of 4 Ohms at 3 Watts (rms).



2.6 Connectors

2.6.1 Rear panel connectors



1. **DC power connector.** Insert the power adapter into this port.



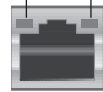
CAUTION! To avoid potential damage or system instability, do not connect both the DC power connector and the ATX power connector simultaneously.

2. **DisplayPort port.** This port connects a device with DisplayPort connector.
3. **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.
4. **LAN (RJ-45) ports.** These ports allow 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
Yellow	Linked	ORANGE	100Mbps connection
Yellow (Blinking)	Data activity	GREEN	1Gbps connection
Yellow (Blinking then steady)	Ready to wake up from S5 mode		

Activity Link LED Speed LED



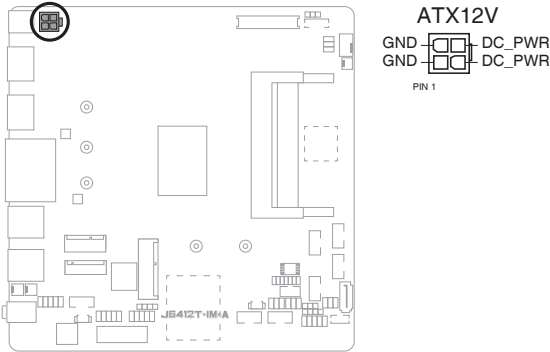
LAN port

5. **USB 3.2 Gen 2 (up to 10Gbps) ports.** These 9-pin Universal Serial Bus (USB) ports are for USB 3.2 Gen 2 devices.
6. **USB 2.0 port.** This Universal Serial Bus (USB) ports is for a USB 2.0 device.
7. **Audio port.** This port connects to an audio device.

2.6.2 Internal connectors

1. ATX power connector (4-pin ATX12V)

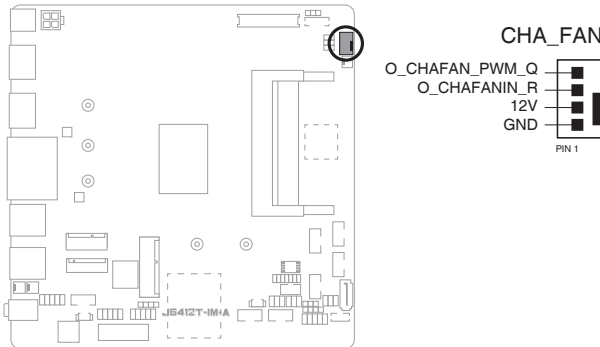
Correctly orient the ATX power supply plug into this connector and push down firmly until the connector completely fits.



CAUTION! To avoid potential damage or system instability, do not connect both the DC power connector and the ATX power connector simultaneously.

2. Chassis Fan header (4-pin CHA_FAN)

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



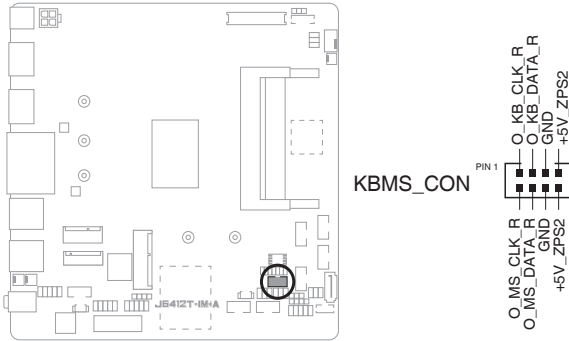
Connector type WAFER HD 4p, 2.54mm pitch, S/T



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!

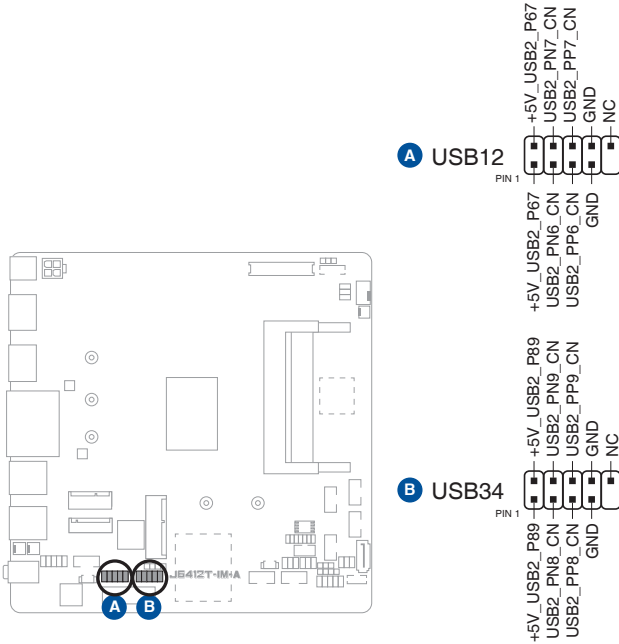
3. PS/2 Keyboard/mouse header (8-pin KBMS_CON)

This header is for an IBM PS/2-compatible keyboard or mouse.



4. USB 2.0 headers (10-pin USB_12, USB_34)

These headers are for USB 2.0 ports. Connect the USB cables to these headers. These USB headers comply with USB 2.0 specification that supports up to 480 Mbps connection speed.



Connector type	Header 2x5p, K9, 2.54mm pitch
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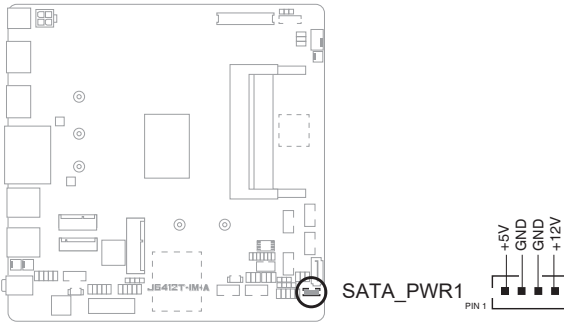
CAUTION! Never connect a 1394 cable to the USB headers. Doing so will damage the motherboard.



NOTE: The USB cables are purchased separately.

5. SATA power connector (4-pin SATA_PWR)

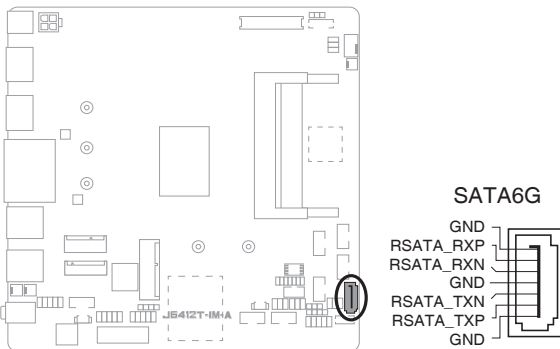
This connector is for the SATA power cable. The power cable plug is designed to fit this connector in only one orientation. Find the proper orientation and push down firmly until the connector completely fits.



IMPORTANT: The SATA power connector supports 1A current to the maximum.

6. SATA 6.0 Gb/s port (7-pin SATA6G)

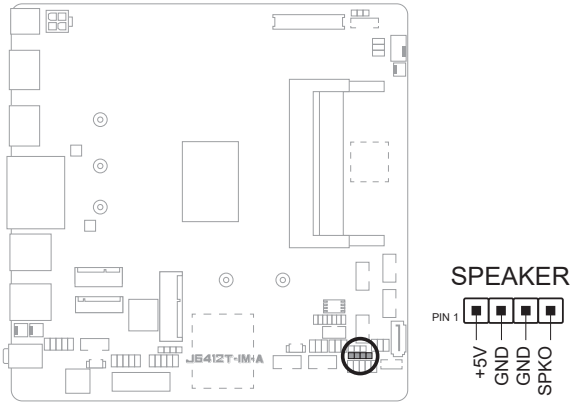
This port connects to a SATA 6.0 Gb/s hard disk drive or an optical drive via a SATA 6.0 Gb/s signal cable.



Connector type WAFER HD 7p, 1.27mm pitch

7. Speaker header (4-pin SPEAKER)

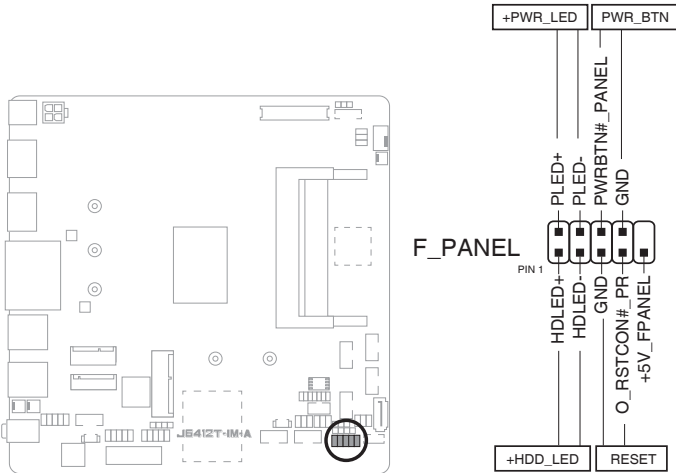
The 4-pin header is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.



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

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

This header supports several chassis-mounted functions.



Connector type 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)**

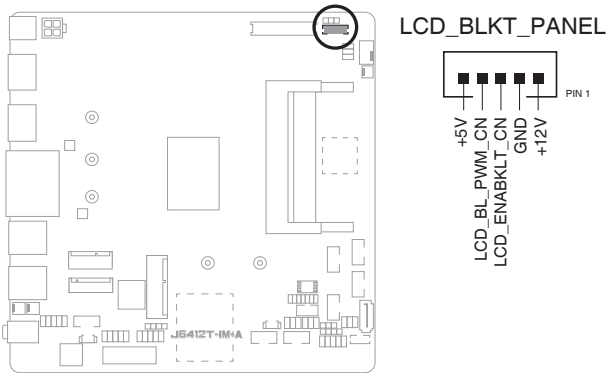
This 2-pin header is for the system power button.

- **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.

9. LVDS Backlight Panel header (5-pin LCD_BLKT_PANEL)

This header is for the LCD panel brightness controls.

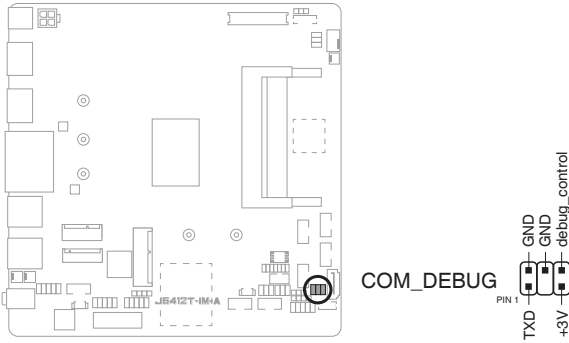


Connector type

WAFER 6p, 2.0mm pitch

10. COM Debug header

This header allows connection to a COM Debug card.



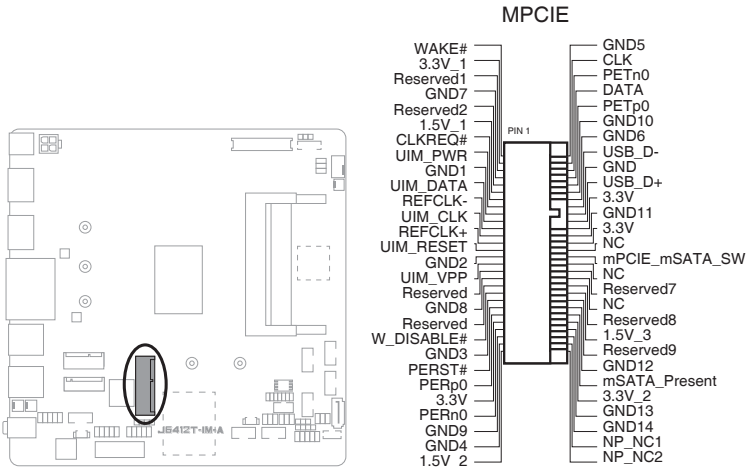
Connector type HEADER 2x3p, K3, 2.54mm pitch



NOTE: The COM Debug card is purchased separately.

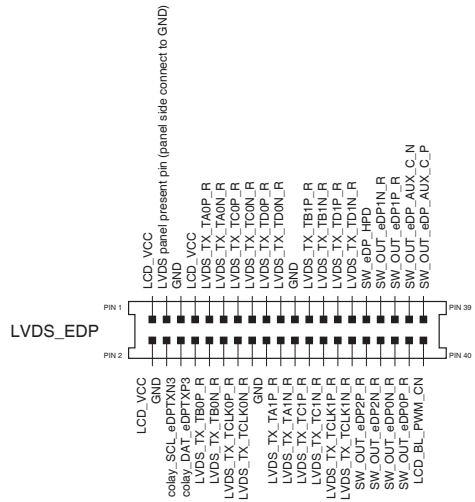
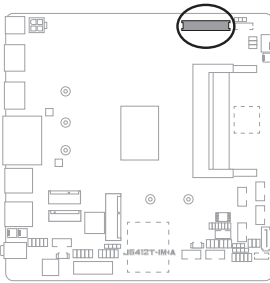
11. MPCIE slot (MPCIE)

This slot allows you to install a full length mini-PCIe card, providing you with expandability and connectivity solutions for an optimal system performance.



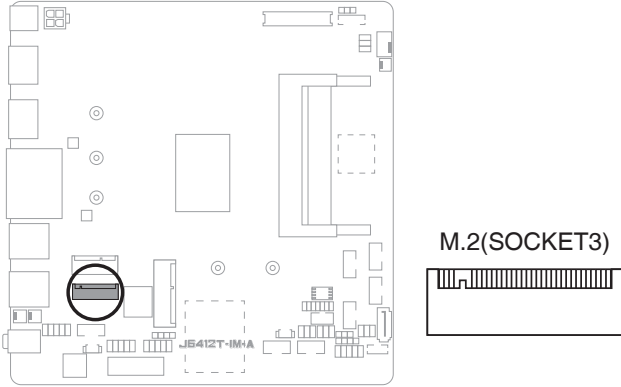
12. LVDS/EDP header (40-pin LVDS_EDP)

This header is for an internal LVDS or embedded DisplayPort connection.



13. M.2 socket 3 (M_2_SOCKET3)

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



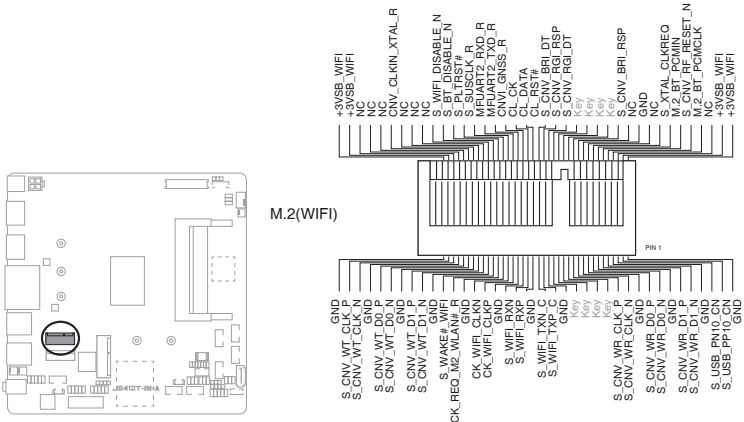
NOTES:



- The M.2 SSD module is purchased separately.
- This socket supports M Key and 2242/2260/2280 storage devices.

14. M.2 Wi-Fi slot

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

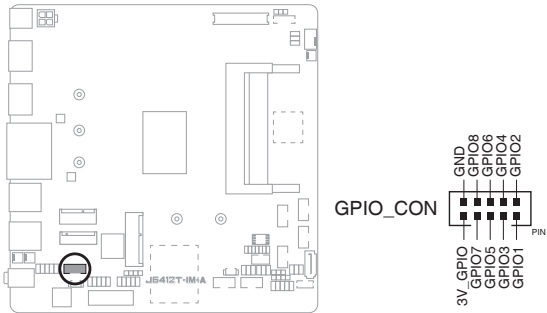


NOTE: The M.2 Wi-Fi module is purchased separately.



15. General Purpose Input/output header (GPIO_CON)

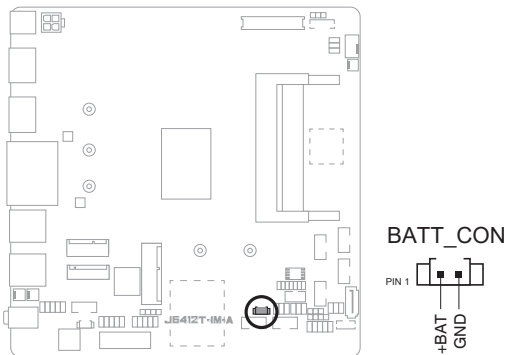
This header is for a general purpose input/output module which allows you to customize the digital signal input/output.



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

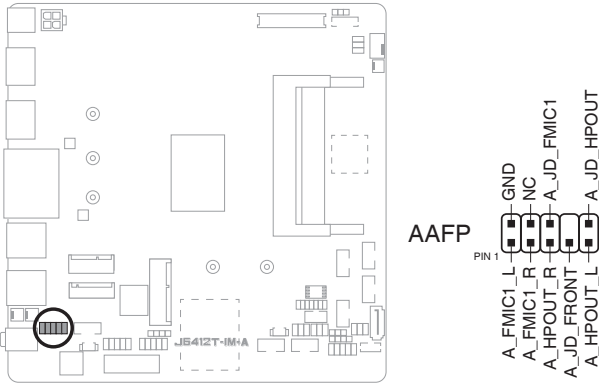
16. RTC Battery header (2-pin BATT_CON)

This header is for the lithium CMOS battery.



17. Front Panel Audio header (10-1 pin AAFP)

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
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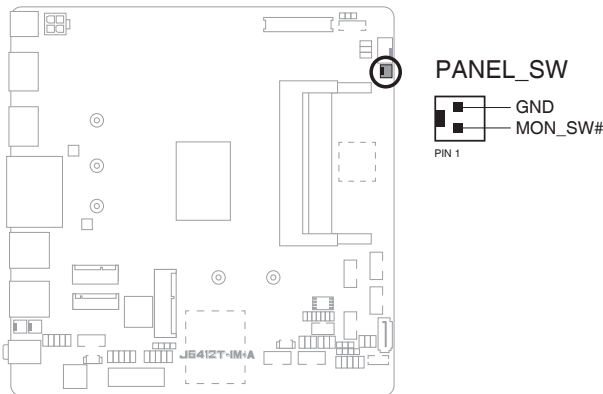


IMPORTANT!

- 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 header, set the HD Audio Controller item in the BIOS setup to [Enabled].

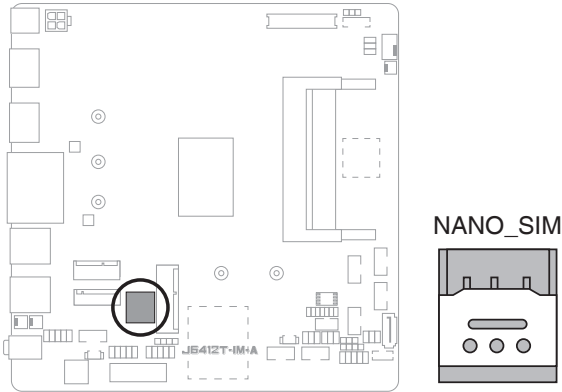
18. LCD Panel monitor switch header (2-pin PANEL_SW)

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



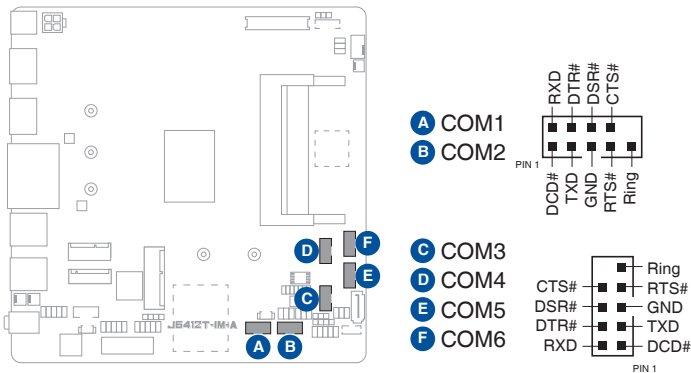
19. NANO SIM Card slot

This slot connects to a NANO SIM card.



20. COM Port headers (10-pin COM1~COM6)

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.



Connector type

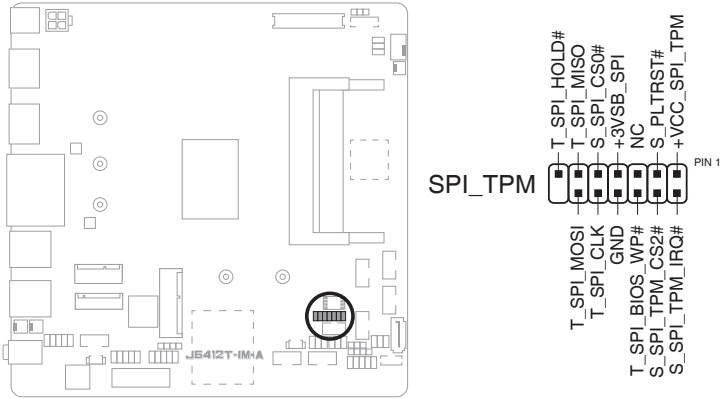
BOX header 2x5p, K10, 2.00mm pitch



NOTE: The serial port cables are purchased separately.

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

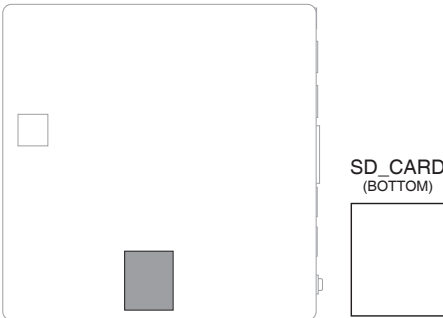
This header supports a Trusted Platform Module (TPM) system with a Serial Peripheral Interface (SPI), allowing you to securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.



Connector type Header 2x7p, K14, 2.0mm pitch

22. SD card slot (SD_CARD)

This SD card slot allows you to install an SD card.



Disconnect all power (including redundant PSUs) from the existing system before you add or remove a memory card, then reboot the system to access the memory card.



Some memory cards may not be compatible with your motherboard. Ensure that you use only compatible memory cards to prevent loss of data, damage to your device, or memory card, or both.

Chapter 3

BIOS setup



Scan the QR code to view the BIOS update guide.



3.1 BIOS setup program

Use the BIOS Setup program to update the BIOS or 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 <F2> during the Power-On Self Test (POST). If you do not press <Delete> or <F2>, 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.



NOTE: 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.

3.1.1 BIOS menu screen

Menu bar

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 temperature and changing the 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

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 an overview of the basic system information, and allows you to set the system date, time, language, and security settings.

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.



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

3.3.1 PCH-FW Configuration

TPM Device Selection

This item allows you to select the TPM device. Configuration options: [dTPM] [PTT]

3.3.2 Trusted Computing

Security Device Support

This item allows you to enable or disable BIOS support for security devices. Configuration options: [Disabled] [Enabled]

3.3.3 CPU Configuration

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



The items shown in the submenu may be different depending on the type of CPU installed.

Intel Virtualization Technology

When set to **[Enabled]**, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. Configuration options: [Disabled] [Enabled]

CPU — Power Management Control

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

Intel(R) SpeedStep(tm)

This item allows you to enable or disable Intel SpeedStep technology. Configuration options: [Disabled] [Enabled]

Intel(R) Speed Shift Technology

This item allows you to enable or disable Intel Speed Shift technology. Configuration options: [Disabled] [Enabled]

Turbo Mode

This item allows you to enable or disable Turbo Mode for your processor. Configuration options: [Disabled] [Enabled]

C states

[Disabled] Disables the CPU C states.

[Enabled] Enables the CPU C states.

Enhanced C-states

[Disabled] Disables enhanced C1E state.

[Enabled] Enables enhanced C1E state.

Power Limit 1 Override

[Disabled] Disables power limit 1 override.

[Enabled] Enables power limit 1 override.



The following item appears only when you set the previous item to [Enabled].

Power Limit 1

This item allows you to provide rapid protection when the package power exceeds Power Limit 1. Use <+> and <-> to adjust the value.

Power Limit 2 Override

[Disabled] Disables power limit 2 override.

[Enabled] Enables power limit 2 override.



The following item appears only when you set the previous item to [Enabled].

Power Limit 2

This item allows you to provide rapid protection when the package power exceeds Power Limit 2. Use <+> and <-> to adjust the value.

3.3.4 Graphics Configuration

RC6(Render Standby)

Allows you to enable to disable render standby support. RC6 should be enabled if S0ix is enabled. Configuration options: [Disabled] [Enabled]

3.3.5 PCI Express Configuration

PCIE_x1 Slot

PCIE_x1 Slot

This item allows you to control the PCI Express root port.
Configuration options: [Disabled] [Enabled]

ASPM

This item allows you to control the Active State Power Management on both NB (NorthBridge) side and SB (SouthBridge) side of the DMI Link.
Configuration options: [Disable] [L0s] [L1] [L0sL1] [Auto]

L1 Substates

This item allows you to select the PCI Express L1 Substate settings.
Configuration options: [Disabled] [L1.1] [L1.2] [L1.1 & L1.2]

PCIe Speed

Configures the speed of PCIEX16_2 slot. Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

Detect Timeout

This item allows you to set the number of milliseconds to wait before assuming there is no device and potentially disabling the port. Use <+> and <-> to adjust the value.

Hot Plug

These items allow you to enable/disable PCIEX16_2 slot Hot Plug support.
Configuration options: [Disabled] [Enabled]

Detect Non-Compliance Device

These items allow you to enable/disable detection of non-compliant PCI express devices. Configuration options: [Disabled] [Enable]

3.3.6 Super IO Configuration

NCT6126D Super IO Configuration

Serial Port 1 Configuration

Serial Port

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



The following items appear only when you set the previous item to [Enabled].

COM1 Control

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

Serial Port 2/3/4/5/6 Configuration

Serial Port

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

3.3.7 Serial Console Redirection

COM1~COM6

Console Redirection

Allows you enable or disable the console redirection feature. Configuration options: [Disabled] [Enabled]



The following item appears only when you set the previous item to [Enabled].

Console Redirection Settings

These items become configurable only when you enable the Console Redirection item. 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

Allows you to set the 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

Selects 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. [Mark] and [Space] parity do not allow for error detection.

- [None] None
- [Even] parity bit is 0 if the num of 1's in the data bits is even
- [Odd] parity bit is 0 if num of 1's in the data bits is odd
- [Mark] parity bit is always 1
- [Space] parity bit is always 0

Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning.) 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

This allows you to enable the 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

This allows you to set the number of rows and columns supported on the Legacy OS. Configuration options: [Disabled] [Enabled]

Putty Keypad

This allows you to select the FunctionKey and Keypad on Putty.

Configuration options: [VT100] [LINUX] [XTERMR6] [SCO] [ESCN] [VT400]

3.3.8 SATA Configuration

SATA Controller(s)

Allow you to enable/disable SATA device(s). Configuration options: [Enabled] [Disabled]

SATA Mode Selection

This item allows you to select what mode the controller uses for memory devices. Configuration options: [AHCI]

M.2 M-Key(SATA)

This item allows you to enable/disable the SATA port. Configuration options: [Disabled] [Enabled]

SATA 6G

This item allows you to enable/disable the SATA port. Configuration options: [Disabled] [Enabled]

3.3.9 Network Stack Configuration

Network Stack

This item allows user to disable or enable the UEFI network stack. Configuration options: [Disabled] [Enabled]



The following items appear only when you set the previous item to [Enabled].

Ipv4 PXE Support

This item allows user to disable or enable the Ipv4 PXE Boot support. Configuration options: [Disabled] [Enabled]

Ipv6 PXE Support

This item allows user to disable or enable the Ipv6 PXE Boot support. Configuration options: [Disabled] [Enabled]

3.3.10 USB Configuration

XHCI Hand-off

Allows you to enable or disable XHCI Hand-off. Set to **[Disabled]** to support operating systems without a built-in USB 3.0 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]

U32G2_1/2/3

Allows you to enable or disable the 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]

U2_4

Allows you to enable or disable the 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]

USB1/2/3/4

Allows you to enable or disable the 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]

3.3.11 NVMe Configuration

This page displays the NVMe controller and drive information.

3.3.12 Onboard Device Configuration

HD Audio

[Disabled] Disables the HD Audio Device.

[Enabled] Enables the HD Audio Device.

Realtek LAN 1 Controller

[Disabled] Disables Realtek LAN 1 Controller.

[Enabled] Enables Realtek LAN 1 Controller.

Realtek LAN 2 Controller

[Disabled] Disables Realtek LAN 2 Controller.

[Enabled] Enables Realtek LAN 2 Controller.

SD Card

[Disabled] Disables the SD card controller.

[Enabled] Enables the SD card controller.

M.2 M-Key(PCIE)

[Disabled] Disables the M.2 M-key (PCIE) controller.

[Enabled] Enables the M.2 M-key (PCIE) controller.

PCIE_x1/M.2(WiFi) Switch

Allow you to select the slot mode between M.2 and PCIe. Configuration options:

[M.2(WiFi)] [Auto]

M.2(WiFi) PCIE Port(WiFi)

[Disabled] Disables the M.2 WiFi (PCIE Port) controller.

[Enabled] Enables the M.2 WiFi (PCIE Port) controller.

M.2(WiFi) USB Port (BT)

Allows you to enable or disable M.2 (WiFi) USB port, which is also known as the BT controller of M.2 (WiFi) devices. Once set to **[Disabled]**, any USB devices plugged into the connector will not be detected by BIOS or OS.

Configuration options: [Disabled] [Enabled]

mPCIe_PCIE Port

[Disabled] Disables mPCIe's PCIe controller.

[Enabled] Enables mPCIe's PCIe controller.

mPCIe USB Port

Allows you to enable or disable miniPCIe USB port, which is also known as the BT controller of mPCIe devices. Once set to **[Disabled]**, any USB devices plugged into the connector will not be detected by BIOS or OS. Configuration options:

[Disable] [Enable]

3.3.13 APM Configuration

ErP Ready

Allows you 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

[S5 State] The system goes into off state after an AC power loss.

[S0 State] The system goes into on state after an AC power loss.

Power On By PCIE

This item 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

[Disabled] Disables the PS2 devices to generate a wake event.

[Enabled] Enables the PS2 devices to generate a wake event.

Power On By Ring

[Disabled] Disables the Ring devices to generate a wake event.

[Enabled] Enables the Ring devices to generate a wake event.

Power On By RTC

Allows you to set your system to power up to execute tasks on a set schedule or on a particular day. Configuration options: [Disabled] [Single event] [Daily event] [Weekly event] [Monthly event]

3.3.14 Watchdog Timer

Watchdog Support

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



The following items appear only when you set the previous item to [Enabled].

Watchdog Count Mode

This item allows you to select a Watchdog timer | 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 1 to 255.

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.

3.3.16 LVDS Configuration

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

IGD Flat Panel

Allows you to enable or disable IGD video output to the onboard LVDS. Configuration options: [Auto] [Enabled] [Disabled]

EDID Data Source

Allows you to select the EDID data source. Configuration options: [Pre-defined] [Flat Panel Display]



The following items appear only when you set the previous item to [Pre-defined].

Pre-defined LVDS Panel Type

Allow you to select the LVDS panel used by the internal graphics device by selecting the appropriate setup item. Configuration options: [VBIOS Default] [640x480] [800x600] [1024x768] [1280x1024] [1400x1050(RB) LVDS1] [1400x1050 LVDS2] [1600x1200 LVDS] [1366x768 LVDS] [1680x1050] [1920X1200] [1440x900 ;VDS] [1600X900 LVDS] [1024X768 LVDS2] [1280X800] [1920X1080 LVDS] [2048X1536 LVDS]

Inverter Polarity

Allows you to select the inverter board polarity. Configuration options: [Inverted] [Normal]

Channel Select

Allows you to select the channel. Configuration options: [Dual Channel] [Single Channel]

Mode Select

Allows you to select the mode. Configuration options: [JEIDA] [VESA 6bit] [VESA 8bit] [VESA 10bit]

3.4 Hardware Monitor menu

The items in this menu provide you an overview of system status including temperature, fan speed and voltage, and allow you to configure the smart fan.

Smart Fan Mode

Allows you to select the smart fan mode. Configuration options: [Disabled] [Normal] [Manual Mode]



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

Smart Fan Function

CHA FAN Setting

Temperature 1/2/3/4

Input value range: [0~255]

FD/RPM 1/2/3/4

Input value range: [0~255]

3.5 Security menu

This 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.

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>.
3. Confirm the password when prompted.

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.



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.

User Password

If you have set a user password, you must enter the user password for accessing the system. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

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>.

Secure Boot

Secure Boot

Secure Boot can be enabled if the system is running in User mode with enrolled platform Key (EPK) or if the CSM function is disabled. Configuration options: [Disabled] [Enabled]

Secure Boot Mode

In Custom mode, Secure Boot policy variables can be configured by a physically present user without full authentication. Configuration options: [Standard] [Custom]

Key Management

The Key Management item allows you to modify Secure Boot variables and set Key Management page.

Platform Key (PK)

Configuration options: [Update]

Key Exchange Keys / Authorized Signatures / Forbidden Signatures

Configuration options: [Update] [Append]

3.6 Boot menu

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

Boot Configuration

CHASSIS INTRUDE

Allows you to enable or disable the chassis intrusion detection function.

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. Configuration options: [1] - [65535]

Bootup NumLock State

[On] Set the power-on state of the NumLock to [On].

[Off] Set the power-on state of the NumLock to [Off].

Quiet Boot

Allows you to enable or disable the Quiet Boot option.

Configuration options: [Disabled] [Enabled]

Fast Boot

[Disabled] Select to go back to normal boot.

[Enabled] Select to accelerate the boot speed.

FIXED BOOT ORDER Priorities

Boot Option #1-#6

This item allows you to set the system boot order for available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

3.7 Exit menu

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

Save Changes & Exit

This option allows you to save your changes and exit the Setup program. When you select this option or if you press <Esc>, a confirmation window appears. Select **Yes** to save changes and exit.

Discard Changes & Exit

This option allows you to exit the Setup program without saving your changes.

When you select this option or if you press <Esc>, a confirmation window appears. Select **Yes** to discard changes and exit.

Save Changes & Reset

This option allows you to exit the Setup program after saving changes.

Discard Changes & Reset

This option allows you to exit the Setup program without saving changes.

Save Changes

This option allows you to save changes to any of the setup options you have made so far.

Discard Changes

This option allows you to discard changes to any of the setup options you have made so far.

Restore Defaults

Restore/load default values for all the setup options.

Save as User Defaults

This option allows you to save the changes you have made so far as user defaults.

Restore User Defaults

Restore the user defaults with all the setup options.

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.

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-003(B)/NMB-003(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-003(B)/NMB-003(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が、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

KC: Korea Warning Statement

B급 기기 (가정용 방송통신기자재)

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

HDMI Trademark Notice

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

Declaration of compliance for product environmental regulation

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

Please refer to <http://csr.asus.com/Compliance.htm> for information disclosure based on regulation requirements ASUS is complied with:

EU REACH and Article 33

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 <http://csr.asus.com/english/REACH.htm>.

EU RoHS

This product complies with the EU RoHS Directive. For more details, see <http://csr.asus.com/english/article.aspx?id=35>

India RoHS

This product complies with the “India E-Waste (Management) Rules, 2016” and prohibits use of lead, mercury, hexavalent chromium, polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs) in concentrations exceeding 0.1% by weight in homogenous materials and 0.01% by weight in homogenous materials for cadmium, except for the exemptions listed in Schedule II of the Rule.

Vietnam RoHS

ASUS products sold in Vietnam, on or after September 23, 2011, meet the requirements of the Vietnam Circular 30/2011/TT-BCT.

Các sản phẩm ASUS bán tại Việt Nam, vào ngày 23 tháng 9 năm 2011 trở về sau, đều phải đáp ứng các yêu cầu của Thông tư 30/2011/TT-BCT của Việt Nam.

Türkiye RoHS

AEEE Yönetmeliğine Uygundur

ASUS Recycling/Takeback Services

ASUS recycling and takeback programs come from our commitment to the highest standards for protecting our environment. We believe in providing solutions for you to be able to responsibly recycle our products, batteries, other components as well as the packaging materials. Please go to <http://csr.asus.com/english/Takeback.htm> for detailed recycling information in different regions.



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.

Service and Support

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



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