

D3051 MS-S3361

Server Motherboard User Guide

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Revision

V2.0, 2025/06

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Regulatory Notices

WEEE Statement

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2012/19/EU, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life.



CE Conformity

Hereby, Micro-Star International CO., LTD declares that this device is in compliance with the essential safety requirements and other relevant provisions set out in the European Directive.



FCC-A Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and AC power cord, if any, must be used in order to comply with the emission limits.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Chemical Substances Information

In compliance with chemical substances regulations, such as the EU REACH Regulation (Regulation EC No. 1907/2006 of the European Parliament and the Council), MSI provides the information of chemical substances in products at:

https://csr.msi.com/global/index

Battery Information

Please take special precautions if this product comes with a battery.

- Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
- Avoid disposal of a battery into fire or a hot oven, or mechanically crushing or cutting
 of a battery, which can result in an explosion.
- Avoid leaving a battery in an extremely high temperature or extremely low air pressure environment that can result in an explosion or the leakage of flammable liquid or gas.
- Do not ingest battery. If the coin/button cell battery is swallowed, it can cause severe internal burns and can lead to death. Keep new and used batteries away from children.

European Union:



Batteries, battery packs, and accumulators should not be disposed of as unsorted household waste. Please use the public collection system to return, recycle, or treat them in compliance with the local regulations.

BSMI:



廢電池請回收

For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

California, USA:



The button cell battery may contain perchlorate material and requires special handling when recycled or disposed of in California.

For further information please visit:

http://www.dtsc.ca.gov/hazardouswaste/perchlorate/

Environmental Policy

- The product has been designed to enable proper reuse of parts and recycling and should not be thrown away at its end of life.
- Users should contact the local authorized point of collection for recycling and disposing of their end-of-life products.



- Visit the MSI website and locate a nearby distributor for further recycling information.
- Users may also reach us at <u>gpcontdev@msi.com</u> for information regarding proper disposal, take-back, recycling, and disassembly of MSI products.
- Please visit <https://us.msi.com/page/recycling for information regarding the recycling of your product in the US.

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Technical Support

If a problem arises with your product and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please visit https://eps.msi.com/support for further guidance.

Safety Information

Please read and follow these safety instructions carefully before installing, operating or performing maintenance on the server.

General Safety Instructions

- Always read the safety instructions carefully.
- Keep this User Guide for future reference.
- Keep this equipment away from humidity.
- Lay the equipment on a stable, flat surface before setting it up.
- Do not cover the air openings to prevent overheating.
- Avoid spilling liquids into the equipment to prevent damage or electrical shock.
- Do not leave the equipment in an unconditioned environment. Storage temperatures above 60°C (140°F) may cause damage.

Electrical Safety

Power Setup and Protection

- Ensure the power source matches the equipment voltage before connection.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily
 accessible at all times. Do not disable the power cord grounding plug, as it is an
 important safety feature.
- Do not use a power adapter other than the one provided.
- Place the power cord to avoid being stepped on or crushed.
- Protect the server from power fluctuations and outages using a regulated uninterruptible power supply (UPS).

Handling Power Connections

- Unplug the power cord before inserting add-on cards or modules.
- Disconnect all power supplies before maintenance to avoid electrical shock. If the unit has more than one power supply, disconnect all of them.
- Unplug the power cord to fully disconnect the system. The front panel Power On/ Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC/DC power is removed.

Assembly and Installation

This equipment must be installed in restricted access areas by qualified personnel to comply with safety standards set by the NEC and IEC 62368-1, Third Edition, for Information Technology Equipment.

Lifting and Placement

- WARNING: This server is heavy.
- Follow occupational health and safety guidelines for manual material handling.
- A minimum of two people is required to lift or install the server. For installations above chest height, a third person may be needed for alignment.
- Exercise caution when installing or removing the server from the rack, as it may become unstable when not fastened to the rails.

Hot Surfaces

• Allow components like drives and power supplies to cool before touching.

Energy Pack Handling after Removal

To reduce the risk of fire or burns:

- Do not disassemble, crush, or puncture the energy pack.
- Avoid shorting external contacts.
- Do not dispose of the energy pack in fire or water.

Other Components

- Keep away from hazardous moving parts, such as fan blades, to prevent injury.
- Do not drop or jolt the system, as this may damage internal components or compromise safety.

General Precautions During Operation

- Avoid operating the server with the access panel open or removed for extended periods, as this disrupts airflow and may cause overheating.
- Do not insert incorrect connectors into ports to avoid damage to components or the risk of electrical hazards.
- This equipment is not suitable for use in locations where children are likely to be present.

When to Contact Service Personnel

Seek immediate assistance from qualified personnel if any of the following occurs:

- The power cord or plug is damaged.
- Liquid has entered the equipment.
- The equipment has been exposed to moisture.
- The equipment does not function as described in the User Guide.
- The equipment has been dropped or physically damaged.
- The equipment shows visible signs of breakage.

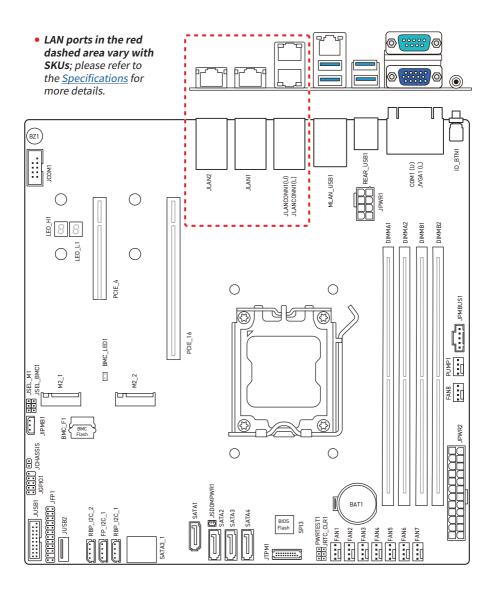
Specifications

Form factor Micro-ATX Dimensions 243.84 mm (9.6") x 243.84 mm (9.6") Processor Single AMD Ryzen™ 7000/9000 Series and EPYC™ 4004/4005 Series Processor, TDP up to 170W Socket 1 x AMD Socket AM5 Chipset AMD B650 Chipset • 4 x DDR5 DIMM slots, 2DPC, ECC/non-ECC UDIMM - Max Frequency: 5600 MT/s (1DPC) and 3600 MT/s (2DPC) - Max Capacity per DIMM: 48GB • 4 x SATA 3.0 ports (SATA1~4, w/ 1 x VCC) • 2 x SATA 2.0 ports (SATA3_1) • 2 x M.2 M-Key slots (PCle 4.0 x4, 22110/ 2280) - M2_1*: Choose either M2_1 or PCIE_4 for the desired function. - M2_2: Supports PCle 4.0 x4 *The M2_1 and PCIE_4 slots cannot operate simultaneously. You can use the JSEL_M1 jumper to select which one to enable. • 1 x PCle 5.0 x 16 slot (Gen 5 x 16 signal from CPU) (PCIE_16) Expansion • 1 x PCle 4.0 x 8 slot (Gen 4 x 4 signal from CPU) (PCIE_4*)
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Expansion • 1 x PCle 4.0 x 8 slot (Gen 4 x 4 signal from CPU) (PCIE_4*)
Slots
*The PCIE_4 and M2_1 slots cannot operate simultaneously. You can use the <u>JSEL_M1 jumper</u> to select which one to enable.
• 2 x 1GbE RJ45 ports (Intel® I210-AT)
- JLANCONN1 (L) support shared NIC* - JLAN1~2 support shared NIC* - JLANCONN1 (L) support shared NIC* shared NIC*
Networking • 2 x 10GbE RJ45 ports (Intel® X710-AT2)
- JLAN1~2 support shared NIC*
* Only one NCSI LAN port can be enabled at a time, JLAN1, JLAN2, or JLANCONN1 (lower).
Graphics 1 x VGA D-Sub port (from AST2600 BMC)
• 4 x USB 3.2 Gen 1 Type-A ports • 4 x USB 3.2 Gen 1 Type-A ports • 4 x USB 3.2 Gen 1 Type-A ports
• 2 x 10 GbE RJ45 ports • 2 x 10 GbE RJ45 ports • 2 x 1GbE RJ45 ports
• 2 x 1GbE RJ45 ports • 1 x GbE RJ45 ports (Mgmt.) • 1 x GbE RJ45 ports (Mgmt.)
Rear I/O • 1 x GbE RJ45 ports (Mgmt.) • 1 x COM port
• 1 x COM port
• 1 x VGA port • 1 x UID LED button • 1 x UID LED button
• 1 x UID LED button

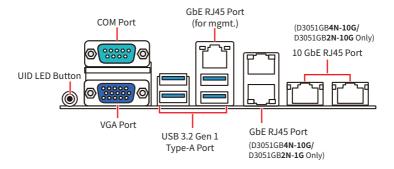
Continued on next column

SKUs	D3051GB4N-10G	D3051GB2N-10G	D3051GB2N-1G					
Internal USB	• 1 x USB 3.2 Gen 1 header							
Connectors	• 1 x USB 3.2 Gen 1 Type-A port							
	• 1 x Front panel header							
	• 1 x SPI TPM header							
	• 1 x GPIO header							
System	• 1 x PMbus header							
Connectors	• 1 x COM port header							
	• 3 x I2C headers							
	• 1 x Chassis intrusion header							
	• 1 x IPMB header							
Cooling Connectors	9 x 4-pin fan connectors (1 x for l	iquid cooling, PUMP1)						
	• 1 x 24-pin ATX power connecto	r						
Power Connectors	• 1x 8-pin 12V power connector							
Connectors	• 1 x 2-pin SATA DOM power connector							
	• 1 x M2_1 / PCIE_4 select jumper							
1	• 1 x CMOS clear jumper							
Jumpers	• 1 x BMC select jumper							
	• 1 x Power test jumper							
LED Features	• 1 x BMC heartbeat LED							
LED reatures	• 2 x Port 80 debug LEDs							
Security	1 x TPM header							
	• 1 x 1GbE RJ45 port for Mgmt. (Realtek® RTL8211FD-CG)							
Server Management	ASPEED AST2600 with AMI MegaRAC based firmware Supports IPMI 2.0 and DMTF Redfish® API							
	Single BIOS and single BMC							
	• Operating Temperature: 0°C ~	40°C						
Environment	Non-operating Temperature: -	20°C ~ 70°C						
	Non-operating Relative Humic	lity: 5% ~ 85% (non-condensing	:)					
Certifications	CE, FCC (Class A)							

Overview of Components



Rear I/O Panel



UID LED Button

The UID (Unit Identification) button help users identify and locate a system, especially in high-density rack environments.

COM Port

A COM port, also called a serial port or DB9 connector, is a communication interface for transferring data between a computer and external devices such as barcode scanners, printers, and credit card machines. It's commonly used for **initial system configuration and diagnostics** on server boards and for connecting legacy devices that lack modern interfaces. Users can connect a specially configured serial cable to establish a serial connection.

VGA Port

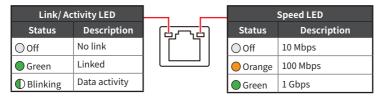
The DB15-pin female connector is provided for monitors.

USB 3.2 Gen 1 Type-A Port

The USB (Universal Serial Bus) port is used for connecting USB devices such as keyboards, mice, or other compatible peripherals. It supports data transfer rates up to **5 Gbps** and is backward-compatible with USB 2.0 devices.

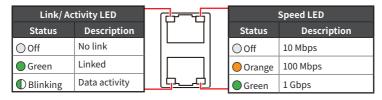
GbE RJ45 Port (for mgmt.)

Connect a specially configured RJ45 console cable to this jack for network routers/switches to communicate with the system through a serial connection.



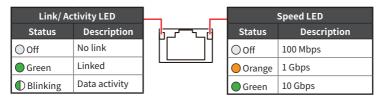
GbE RJ45 Port

The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it.

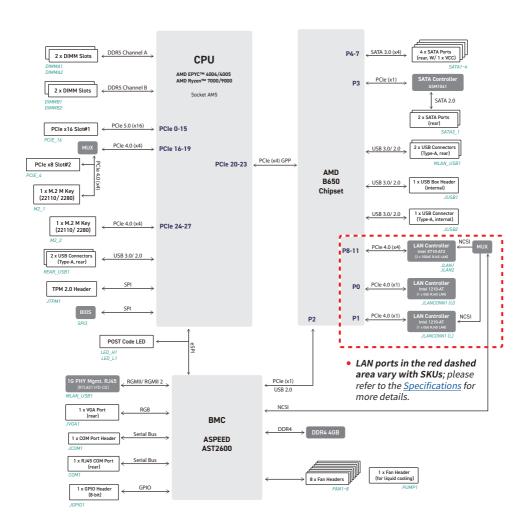


10 GbE RJ45 Port

The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it.



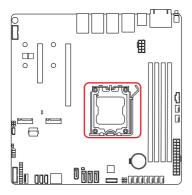
Block Diagram



Component Contents

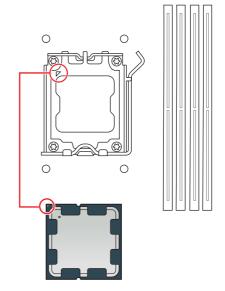
Component	Page					
CPU Socket	16					
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JGPIO1: GPIO Header						
JPMBUS1: PMBus Header	29					
JCOM1: COM Port Header	30					
FP_I2C_1, RBP_I2C_1~2: I2C Headers	30					
JCHASSIS: Chassis Intrusion Header						
JIPMB1: IPMB Header	31					
BAT1: CMOS Battery	32					
Jumpers	33					
Onboard LEDs	34					
BMC_LED1: BMC Heartbeat LED	34					
LED_H1, LED_L1: Port 80 Debug LEDs	34					

CPU Socket



Introduction to the AM5 CPU

The surface of the AM5 CPU has two **notches** and a **golden triangle** to assist in correctly lining up the CPU for motherboard placement. The golden triangle is the Pin 1 indicator.





Important

- Overheating will seriously damage the CPU and system. Always make sure the cooling fan can work properly to protect the CPU from overheating. Make sure that you apply an even layer of thermal paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.
- While replacing the CPU, always turn off the power supply or unplug the power supply's power cord from the grounded outlet first to ensure the safety of CPU.
- Confirm if your CPU cooler is firmly installed before turning on your system.
- Do not touch the CPU socket pins to avoid damage.
- Whenever CPU is not installed, always protect your CPU socket pins with the plastic cap covered.
- Please refer to the documentation in the CPU cooler package for more details about the CPU cooler installation.
- Read the CPU status in BIOS.

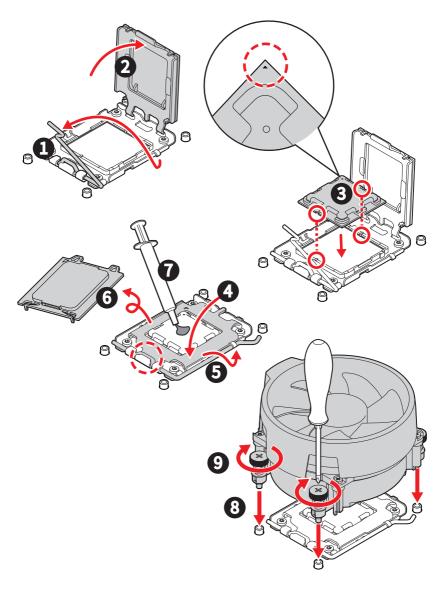
CPU & Heatsink Installation

Use appropriate ground straps, gloves and ESD mats to protect yourself from electrostatic discharge (ESD) while installing the processor.



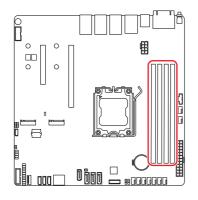
Important

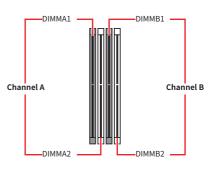
Images are for demonstration purposes only; actual parts may vary.



Memory Slots

DIMMA1~2, DIMMB1~2: DDR5 DIMM Slots





Recommended Memory Population

Quantity o	of DIMMs	1		2		3	3	4
Channal A	DIMMA1				V		V	V
Channel A	DIMMA2	V	V		V	V	V	V
Channal D	DIMMB1			V		V		V
Channel B	DIMMB2		V	V		V	V	V

^{**&}quot;V" indicates a populated DIMM slot. **

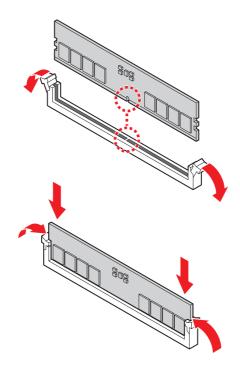


Important

- Only support **UDIMM**.
- There should be at least 1 DDR5 DIMM populated.
- Paired memory installation for Max performance.
- If only 1 DIMM is populated in a channel, then populate it in the DIMMA2 slot.
- Populate the same DIMM type in each channel, specifically: 1. Use the same DIMM size; 2. Use the same number of ranks per DIMM.
- We don't suggest other memory installation.

Installing Memory Modules

- 1. Open the side clips to unlock the DIMM slot.
- 2. Insert the DIMM vertically into the slot, ensuring that the off-center notch at the bottom aligns with the slot.
- 3. Push the DIMM firmly into the slot until it clicks and the side clips automatically close.
- **4.** Verify that the side clips have securely locked the DIMM in place.





Important

You can barely see the golden finger if the memory module is properly inserted in the DIMM slot.

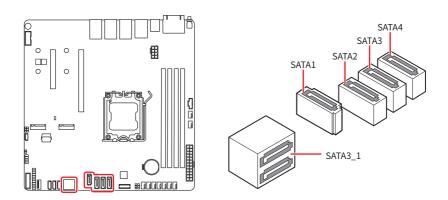
Storage Connectors

SATA1~4: SATA 3.0 6Gb/s Ports

These connectors are SATA 6Gb/s interface ports, it can connect to SATA devices.

SATA3_1: SATA 2.0 3Gb/s Ports

These connectors are SATA 3Gb/s interface ports, it can connect to SATA devices.



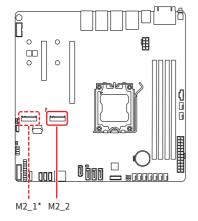


Important

- Please do not fold the SATA cable at a 90-degree angle. Data loss may result during transmission otherwise.
- SATA cables have identical plugs on either sides of the cable. However, it is recommended that the flat connector be connected to the motherboard for space saving purposes.

M2_1~2: M.2 Slots (M Key, PCIe 4.0, 22110/2280)

Please install the M.2 solid-state drive (SSD) into the M.2 slot as shown below.





Video Demonstration

Watch the video to learn how to Install M.2 SSD.

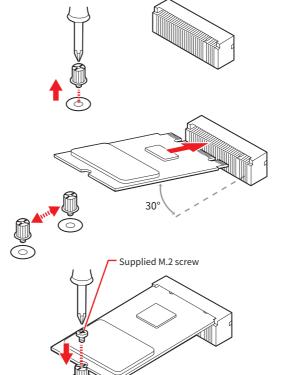


*M2_1: The M2_1 and PCIE_4 slots cannot operate simultaneously. You can use the <u>JSEL_M1 jumper</u> to select which one to enable.

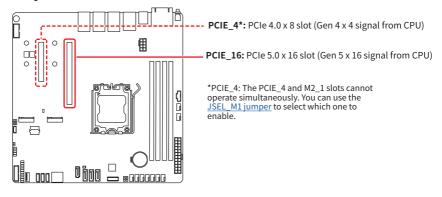
Installing M.2 SSD

1. Loosen the M.2 riser screw from the motherboard.

- 2. Set the M.2 riser screw at the appropriate location based on the length of your M.2 SSD.
- 3. Insert your M.2 SSD into the M.2 slot at a 30-degree angle.
- **4.** Secure the M.2 SSD in place with the supplied M.2 screw.



Expansion Slots



PCIE_4, PCIE_16: PCIe Expansion Slots

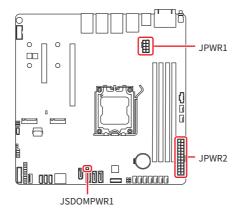
The PCI Express (Peripheral Component Interconnect Express) slots support PCIe interface expansion cards.



Important

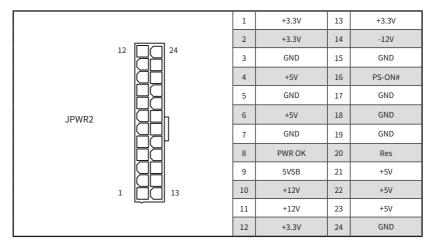
When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

Power Connectors



JPWR2: 24-pin Main Power Connector

This connector allows you to connect an ATX power supply.



JPWR1: 8-Pin 12V Power Connector

This connector allows you to connect an ATX power supply.

	5 1	1	GND	5	P12V
		2	GND	6	P12V
JPWR1 4 D D S 4		3	GND	7	P12V
	4	GND	8	P12V	

JSDOMPWR1: 2-pin SATA DOM Power Connector

This connector is used to provide power to SATA DOM devices.

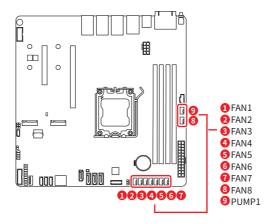
ICDOMDWD1	2 [T] 1	1	GND
JSDOMPWRI	- [2	P5V



⚠ Important

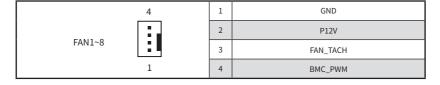
Make sure that all power connectors are securely connected to the power supply to ensure stable operation of the motherboard.

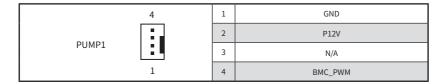
Cooling Connectors



FAN1~8, PUMP1: Fan Connectors

The fan power connector supports system cooling fans with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND.

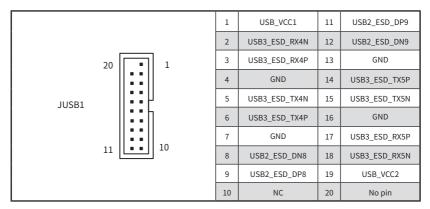




USB Connectors

JUSB1: USB 3.2 Gen 1 Header

This header is backward-compatible with USB 2.0 devices and supports data transfer rate up to **5 Gbps**.

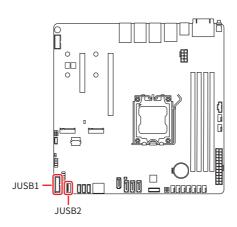


JUSB2: USB 3.2 Gen 1 Type-A Port

The USB (Universal Serial Bus) port is for attaching USB devices such as keyboards, mouse, or other USB-compatible devices. USB 3.2 Gen 1 supports data transfer rates up to **5 Gbps**.

JUSB2





Other Connectors and Components

JFP1: Front Panel Header

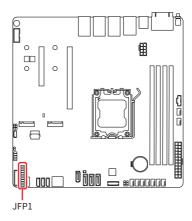
The front panel header is provided for electrical connection to the front panel switches and LEDs.

		1	PWR_LED+	2	FP_PWR	
		3	N/A	4	SYS_ID_LED+	
24 🔳 23	5	PWR_LED-	6	SYS_ID_LED-		
		7	HDD_ACT_LED+	8	SYS_FAULT_LED1-	
		9	HDD_ACT_LED-	10	SYS_FAULT_LED2-	
JFP1	11	PWR_BTN	12	NIC#1_ACT_LED+		
	13	PWR_BTN_GND	14	NIC#1_ACT_LED-		
	15	RST_BTN	16	SMB_SDA		
	2 • 1	2 1	2 • 1	17	RST_BTN_GND	18
		19	SYS_ID_BTN	20	CHASSIS_INTRUSION	
	21	WIRE_TEMP_SENSOR	22	NIC#2_ACT_LED+		
		23	NMI_BTN	24	NIC#2_ACT_LED-	

Λ

Important

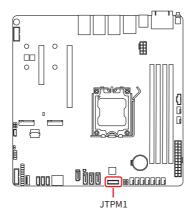
The server board is equipped with one or two types of NIC chips for different SKUs. The first type, **NIC#1**, is controlled by Intel® I210-AT and manages 1GbE RJ45 ports (JLANCONN1). The second type, **NIC#2**, is controlled by Intel® X710-AT2 and manages 10GbE RJ45 ports (JLAN1~2).



JTPM1: SPI TPM Header

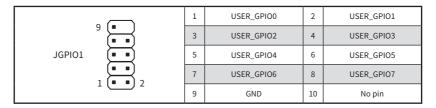
This header connects to a TPM (Trusted Platform Module) (optional). Please refer to the TPM security platform manual for more details.

	1	N/A	2	SPI_LOC_ROM_CS_N
	3	CPU_RSMEST_L	4	N/A
	5	GND	6	PVDD_P1V8_AUX
JTPM1	7	SPI_LOC_ROM_CLK	8	SPI_CPU0_WP_L
19 3 20 2	9	SPI_CPU0_HOLD_L	10	SPI_LOC_ROM_MISO
	11	N/A	12	SPI_LOC_ROM_MOSI
	13	CPU_SPI_TPM_CS_N	14	GND
	15	PVDD_P1V8_AUX	16	GND
	17	CPU_TPM_SPI_IRQ_N	18	PVDD_P1V8_AUX
	19	TPM_RESET_N	20	PVDD_P1V8_AUX



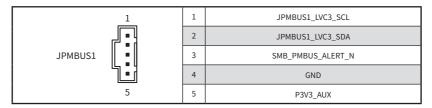
JGPIO1: GPIO Header

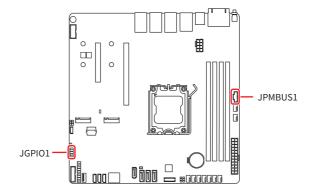
This header is provided for the General-Purpose Input/Output (GPIO) peripheral module.



JPMBUS1: PMBus Header

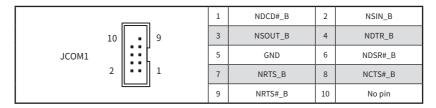
Power Management Bus (PMBus) is a variant of the System Management Bus (SMBus) which is targeted at digital management of power supplies.





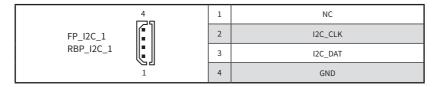
JCOM1: COM Port Header

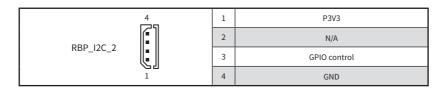
This header is a 16550A high speed communications port that sends/receives 16 bytes FIFOs. You can attach a serial device to it.

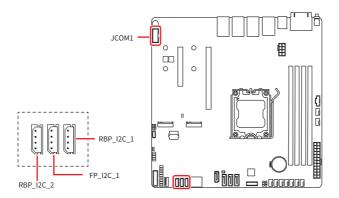


FP_I2C_1, RBP_I2C_1~2: I2C Headers

I2C headers connect to the System Management Bus (SMBus). FBP_I2C_1 is for the front HDD backplane, RBP_I2C_1 is for the rear HDD backplane, and RBP_I2C_2 is for the MSI liquid module leakage sensor solution (S1102-02).

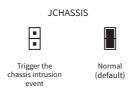






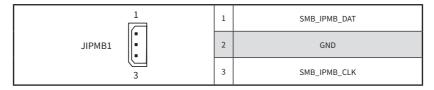
JCHASSIS: Chassis Intrusion Header

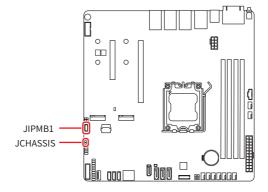
This header connects to the chassis intrusion switch cable. If the chassis is opened, the chassis intrusion mechanism will be activated. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.



JIPMB1: IPMB Header

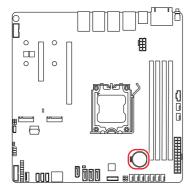
Intelligent Platform Management Bus (IPMB) header is used to connect various management components, such as Baseboard Management Controller (BMC).





BAT1: CMOS Battery

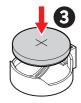
If the CMOS battery is out of charge, the time in the BIOS will be reset and the data of system configuration will be lost. In this case, you need to replace the CMOS battery.



Replacing CMOS battery

- 1. Push the retainer clip to free the battery.
- 2. Remove the battery from the socket.
- 3. Install the new CR2032 coin-cell battery with the + sign facing up. Ensure that the retainer holds the battery securely.







WARNING

KEEP OUT OF REACH OF CHILDREN



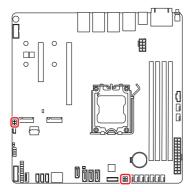
- Swallowing can cause chemical burns, perforation of soft tissue, and even death.
- Severe burns can occur within 2 hours of ingestion.
- If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.

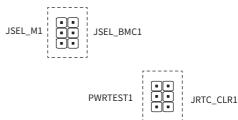
Jumpers



1 Important

Avoid adjusting jumpers when the system is on; it will damage the motherboard.



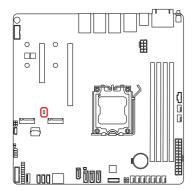


Jumper Name	Default Setting	Description
JSEL_M1	1	1-2: M.2_1 enabled, PCIE_4 disabled (Default) 2-3: PCIE_4 enabled, M.2_1 disabled
JSEL_BMC1	1	1-2: Using CPU (Default) 2-3: Using BMC
PWRTEST1	1	1-2: Normal (Default) 2-3: Power test
JRTC_CLR1	1	1-2: Normal (Default) 2-3: Clear CMOS

Onboard LEDs

BMC_LED1: BMC Heartbeat LED

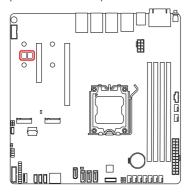
This LED indicates the BMC (Baseboard Management Controller) status.

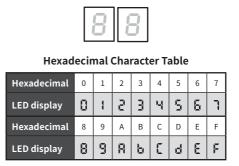


Status	Description
Off	BMC is not activated
Blinking	BMC is functioning normally

LED_H1, LED_L1: Port 80 Debug LEDs

The Port 80 Debug LEDs display progress and error codes during and after POST (Power-On Self Test).







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