D3051

MS-S3361

Server Motherboard

User Guide

Contents

Revision

V1.3, 2024/02

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.

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

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.

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/

Copyright and Trademarks Notice

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

- Always read the safety instructions carefully.
- Keep this User's Manual for future reference.
- Keep this equipment away from humidity.
- Lay this equipment on a reliable flat surface before setting it up.
- The openings on the enclosure are for air convection hence protects the equipment from overheating. **Do not cover the openings**.
- Make sure the voltage of the power source and adjust properly before connecting the equipment to the power inlet.
- Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
- Always unplug the power cord before inserting any add-on card or module.
- All cautions and warnings on the equipment should be noted.
- Never pour any liquid into the opening that could damage or cause electrical shock.
- If any of the following situations arises, get the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well or you can not get it work according to User's Manual.
    - The equipment has dropped and damaged.
    - The equipment has obvious sign of breakage.
- **Do not leave this equipment in an environment unconditioned, storage temperature above 60°C (140°F), it may damage the equipment.**

Specifications

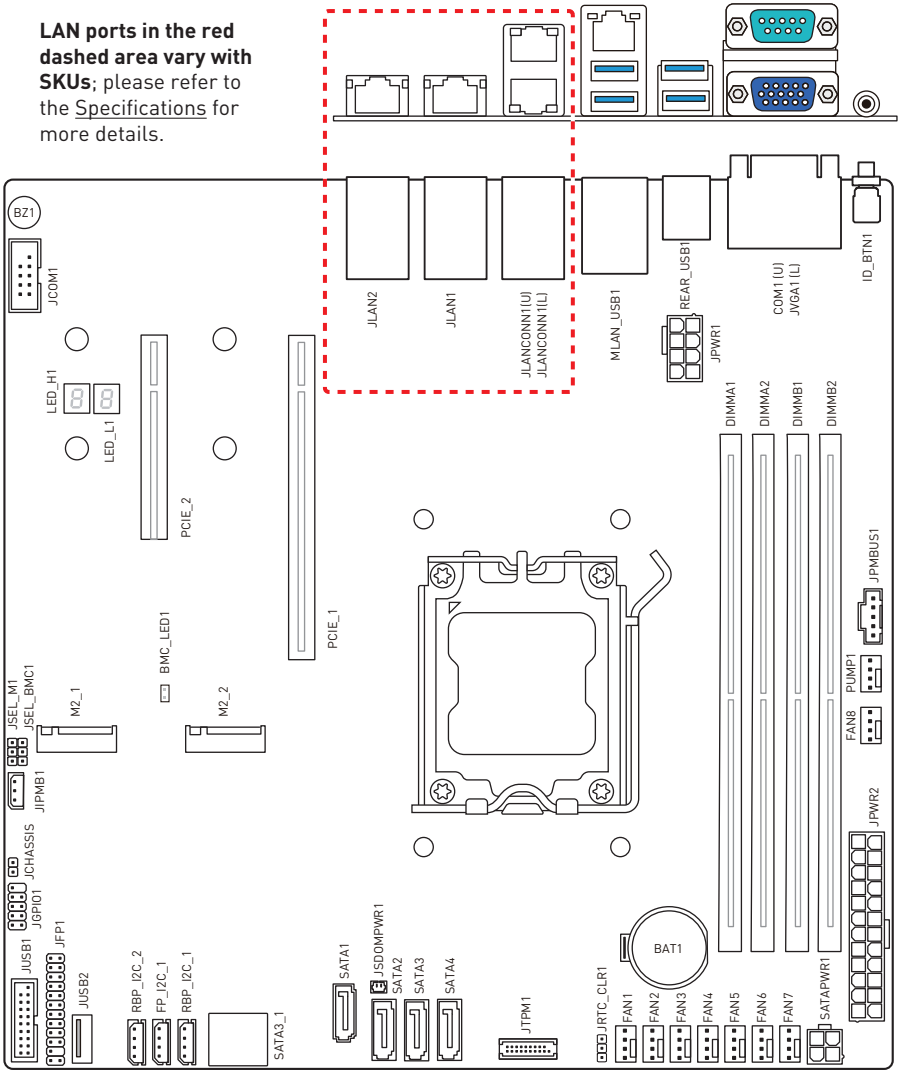
SKUs	D3051GB4N-10G	D3051GB2N-10G	D3051GB2N-1G
Form factor	Micro-ATX		
Dimensions	243.84mm (9.6") x 243.84mm (9.6")		
Processor	• 1 x AMD® Ryzen™ 7000 series Processors, TDP 170W - Processor socket AM5		
Memory	• 4 x DDR5 memory slots, supporting up to 128GB - Supports UDIMM 5200MT/s (2DPC), ECC/ non-ECC		
Networking	• 2 x 1GbE RJ45 ports - Intel® Ethernet controller I210-AT - JLANCONN1 (L) support shared NIC* • 2 x 10GbE RJ45 ports - Intel® Ethernet controller X710-AT2 - JLAN1 support shared NIC*	• 2 x 10GbE RJ45 ports - Intel® Ethernet controller X710-AT2 - JLAN1 support shared NIC	• 2 x 1GbE RJ45 ports - Intel® Ethernet controller I210-AT - JLANCONN1 (L) support shared NIC
	*Only one NIC LAN port can be enabled at a time, either JLAN1 or JLANCONN1 (Lower).		
Server Management	• Aspeed AST2600 IPMI 2.0 with iKVM support • 1 x GbE RJ45 port for Mgmt. (Realtek® RTL8211FD-CG-HF)		
Storage	• 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 (PCIe 4.0 x4, 22110/ 2280) - M2_1*: Choose either M2_1 or PCIE_2 for the desired function. - M2_2: Supports PCIe 4.0 x4 *The M2_1 and PCIE_2 slots cannot operate simultaneously. You can use the JSEL_M1 jumper to select which one to enable.		
Internal I/O	• 1 x Front panel connector • 1 x Chassis intrusion header • 1 x USB 2.0 Type-A connector • 1 x USB 3.2 port box connector • 1 x SPI TPM module box header • 1 x GPIO connector • 3 x I2C box headers • 1 x IPMB box header • 1x PMbus box header • 1 x COM port box header		

Continued on next column

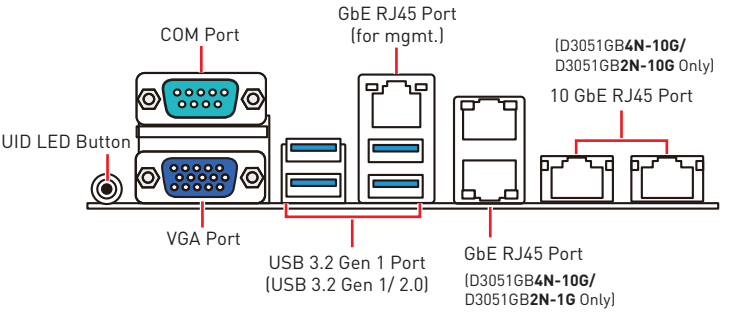
SKUs	D3051GB4N-10G	D3051GB2N-10G	D3051GB2N-1G
Rear I/O	• 4 x USB 3.2 Gen 1 Type-A ports (USB 3.2 Gen 1/ USB 2.0) • **2 x 1GbE RJ45 ports** • **2 x 10 GbE RJ45 ports** • 1 x GbE RJ45 ports (Mgmt.) • 1 x COM port • 1 x VGA port • 1 x UID LED button	• 4 x USB 3.2 Gen 1 Type-A ports (USB 3.2 Gen 1/ USB 2.0) • **2 x 10 GbE RJ45 ports** • 1 x GbE RJ45 ports (Mgmt.) • 1 x COM port • 1 x VGA port • 1 x UID LED button	• 4 x USB 3.2 Gen 1 Type-A ports (USB 3.2 Gen 1/ USB 2.0) • **2 x 1GbE RJ45 ports** • 1 x GbE RJ45 ports (Mgmt.) • 1 x COM port • 1 x VGA port • 1 x UID LED button
Expansion Slot	• 1 x PCIe 5.0 x 16 slot (Gen 5 x 16 signal from CPU) (PCIE_1) • 1 x PCIe 4.0 x 8 slot (Gen 4 x 4 signal from CPU) (PCIE_2*) *The PCIE_2 and M2_1 slots cannot operate simultaneously. You can use the JSEL_M1 jumper to select which one to enable.		
Security	1 x TPM header		
Cooling	9 x 4-pin fan headers (1 x for liquid cooling, PUMP1)		
Power Supply	• 1 x 24-pin ATX power connector • 1x 8-pin 12V power connector • 1 x 4-pin SATA power connector • 1 x 2-pin SATA DOM power connector		
Environmental	• Operating Temperature: 0°C to 45°C • Operating Humidity: 0% to 85% (non-condensing)		
Certifications	CE, FCC (Class A)		

Overview of Components

LAN ports in the red dashed area vary with SKUs; please refer to the Specifications for more details.



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.

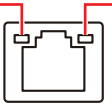
USB 3.2 Gen 1 Port (USB 3.2 Gen 1/ USB 2.0)

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** while USB 2.0 supports data transfer rates up to **480 Mbps**.

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.

Link/ Activity LED	
Status	Description
Off	No link
Green	Linked
Blinking	Data activity

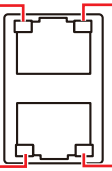


Speed LED	
Status	Description
Off	10 Mbps
Orange	100 Mbps
Green	1 Gbps

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.

Link/ Activity LED	
Status	Description
Off	No link
Green	Linked
Blinking	Data activity

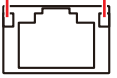


Speed LED	
Status	Description
Off	10 Mbps
Orange	100 Mbps
Green	1 Gbps

10 GbE RJ45 Port

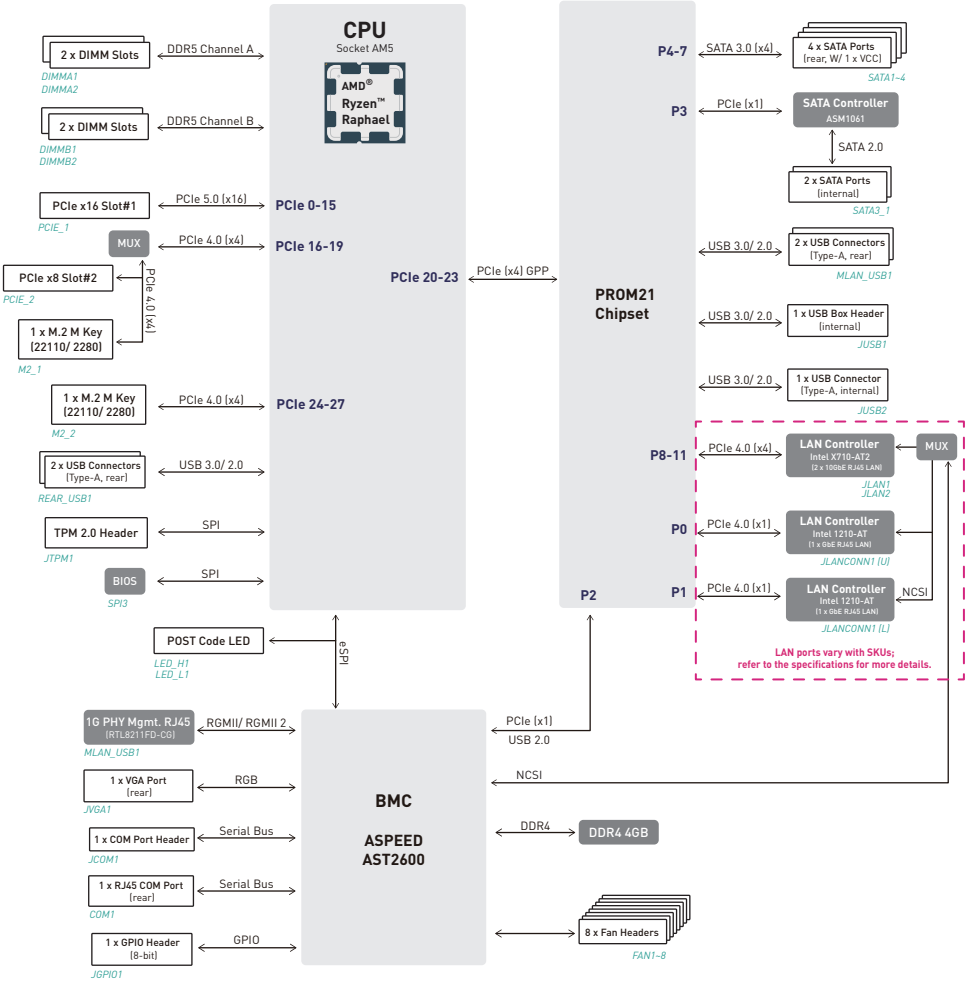
The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it.

Link/ Activity LED	
Status	Description
Off	No link
Green	Linked
Blinking	Data activity



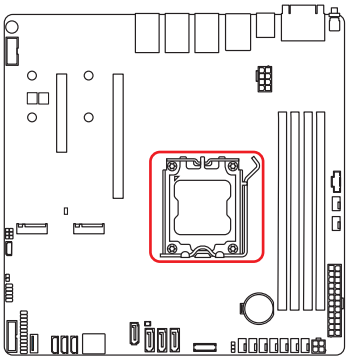
Speed LED	
Status	Description
Off	100 Mbps
Orange	1 Gbps
Green	10 Gbps

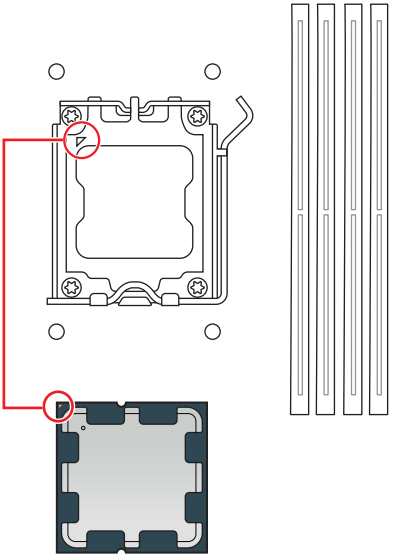
Block Diagram



Component Contents

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

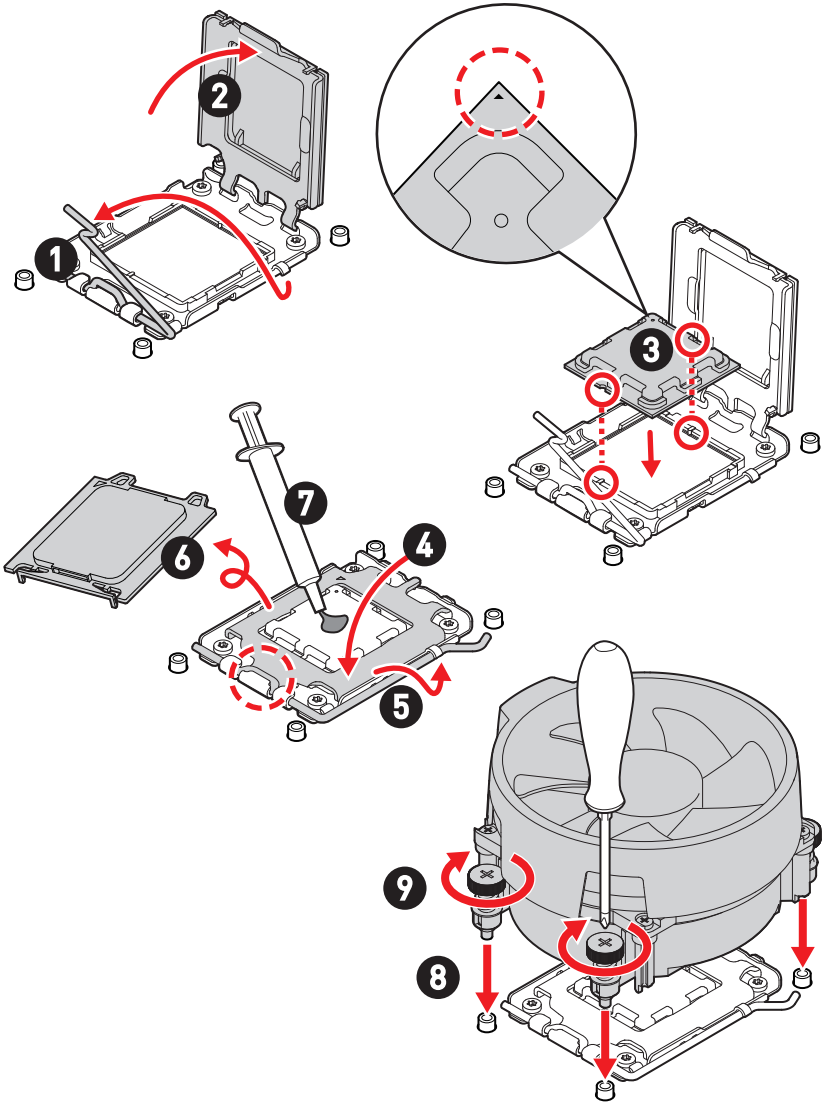
- ***Overheating*** *will seriously damage the CPU and system. Always make sure the cooling fan can work properly to protect the CPU from overheating. Make sure that you apply an even layer of thermal paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.*
- *While* ***replacing 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.

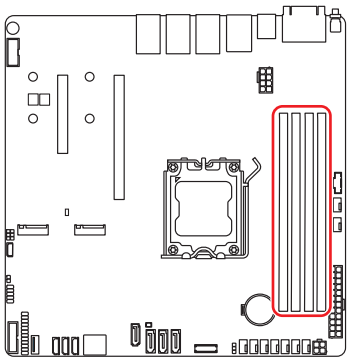
Important

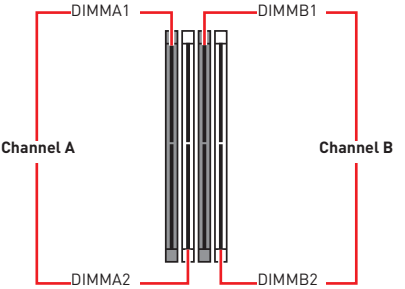
Images are for demonstration purposes only; actual parts may vary.



Memory

DIMMA1~2, DIMMB1~2: DDR5 DIMM Slots





Recommended Memory Population

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

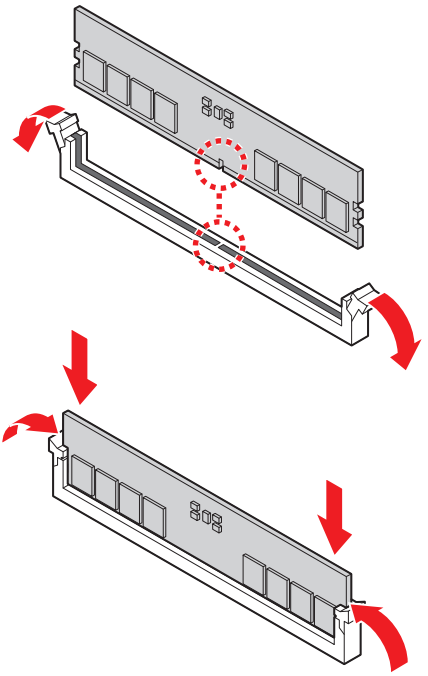
**"V" indicates a populated DIMM slot. **

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.

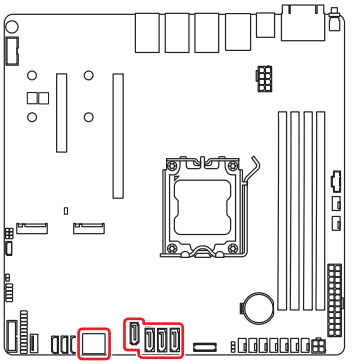
Storage

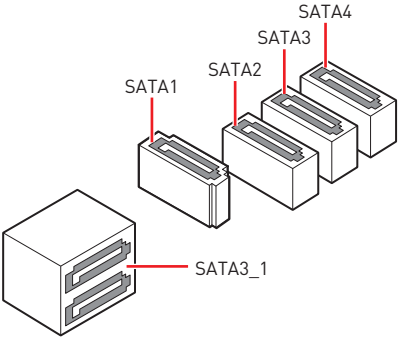
SATA1~4: SATA 3.0 6Gb/s Ports

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.



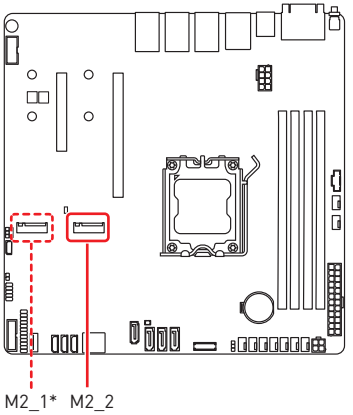


Important

- *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.



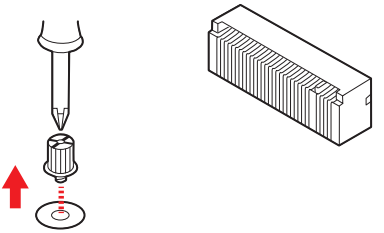
Video Demonstration

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

*M2_1: The M2_1 and PCIE_2 slots cannot operate simultaneously. You can use the JSEL_M1 jumper to select which one to enable.

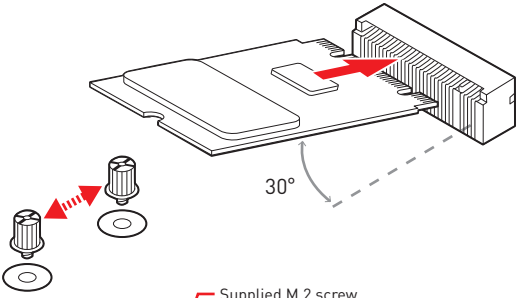
Installing M.2 SSD

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

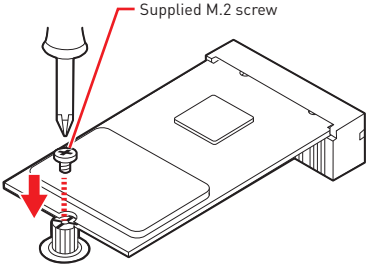


2. Set the M.2 riser screw at the appropriate location based on the length of your M.2 SSD.

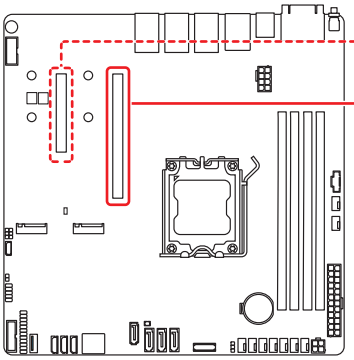
3. Insert your M.2 SSD into the M.2 slot at a 30-degree angle.



4. Secure the M.2 SSD in place with the supplied M.2 screw.



Expansion Slots



PCIE_2*: PCIe 4.0 x 8 slot (Gen 4 x 4 signal from CPU)

PCIE_1: PCIe 5.0 x 16 slot (Gen 5 x 16 signal from CPU)

*PCIE_2: The PCIE_2 and M2_1 slots cannot operate simultaneously. You can use the JSEL_M1 jumper to select which one to enable.

PCIE_1~2: PCIe Expansion Slots

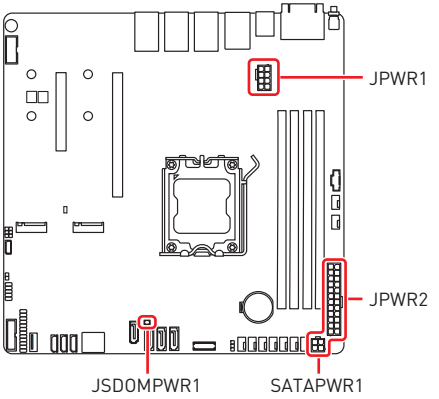
The PCI Express(Peripheral Component Interconnect Express) slots support PCIe interface expansion cards.

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.

Connectors

Power Connectors



SATAPWR1: SATA Power Connector

This connector is used to provide power to SATA devices.

SATAPWR1	4 3 2 1	1	GND	2	GND
		3	P12V	4	P5V

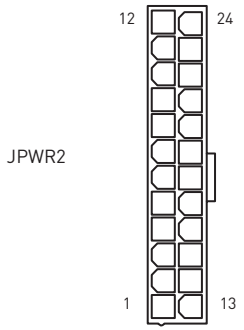
JPWR1: 12V Power Connector

This connector allows you to connect an ATX power supply.

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

JPWR2: Main Power Connector

This connector allows you to connect an ATX power supply.



1	+3.3V	2	+3.3V
3	GND	4	+5V
5	GND	6	+5V
7	GND	8	PWR OK
9	5VSB	10	+12V
11	+12V	12	+3.3V
13	+3.3V	14	-12V
15	GND	16	PS-ON#
17	GND	18	GND
19	GND	20	Res
21	+5V	22	+5V
23	+5V	24	GND

JSDOMPWR1: SATA DOM Power Connector

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

1	GND	2	P5V

Important

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

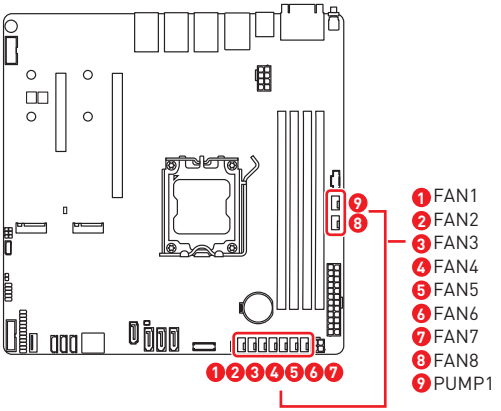
Cooling Connectors

FAN1~8, PUMP1: Fan Power 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.

FAN1~8 	1	GND	3	FAN_TACH
	2	P12V	4	BMC_PWM

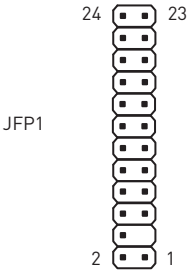
PUMP1 	1	GND	3	N/A
	2	P12V	4	BMC_PWM



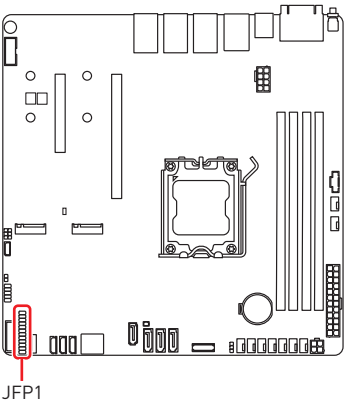
Other Connectors

JFP1: Front Panel Connector

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



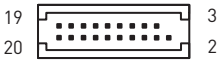
1	PWR_LED+	2	FP_PWR
3	N/A	4	SYS_ID_LED+
5	PWR_LED-	6	SYS_ID_LED-
7	HDD_ACT_LED+	8	SYS_FAULT_LED1-
9	HDD_ACT_LED-	10	SYS_FAULT_LED2-
11	PWR_BTN	12	NIC#1_ACT_LED+
13	PWR_BTN_GND	14	NIC#1_ACT_LED-
15	RST_BTN	16	SMB_SDA
17	RST_BTN_GND	18	SMB_SCL
19	SYS_ID_BTN	20	CHASSIS_INTRUSION
21	WIRE_TEMP_SENSOR	22	NIC#2_ACT_LED+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



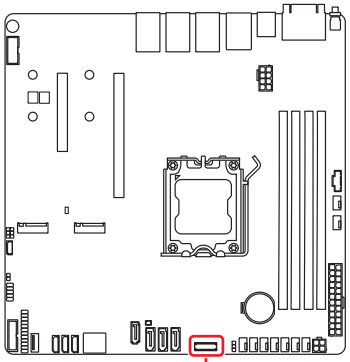
JTPM1: SPI TPM Module Box Header

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

JTPM1

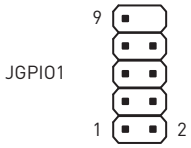


	1	N/A	2	SPI_LOC_ROM_CS_N
	3	CPU_RSMEST_L	4	N/A
	5	GND	6	PVDD_P1V8_AUX
	7	SPI_LOC_ROM_CLK	8	SPI_CPU0_WP_L
	9	SPI_CPU0_HOLD_L	10	SPI_LOC_ROM_MISO
	11	N/A	12	SPI_LOC_ROM_MOSI
	13	CPU_SPI_TPM_CS_N	14	GND
	15	PVDD_P1V8_AUX	16	GND
	17	CPU_TPM_SPI_IRQ_N	18	PVDD_P1V8_AUX
	19	TPM_RESET_N	20	PVDD_P1V8_AUX



JGPIO1: GPIO Header

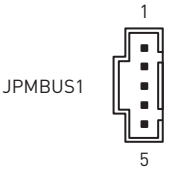
This connector is provided for the General-Purpose Input/Output (GPIO) peripheral module.



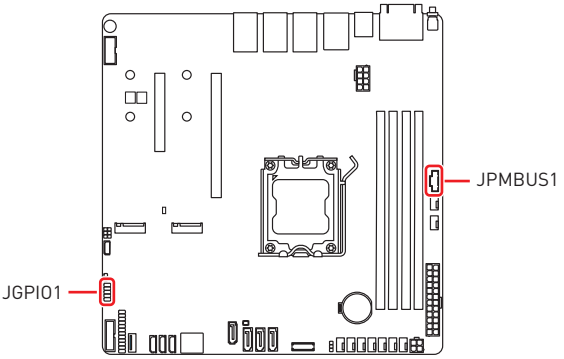
	1	USER_GPIO0	2	USER_GPIO1
	3	USER_GPIO2	4	USER_GPIO3
	5	USER_GPIO4	6	USER_GPIO5
	7	USER_GPIO6	8	USER_GPIO7
	9	GND	10	No pin

JPMBUS1: PMBus Box Header

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

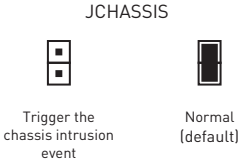


	1	JPMBUS1_LVC3_SCL	2	JPMBUS1_LVC3_SDA
	3	SMB_PMBUS_ALERT_N	4	GND
	5	P3V3_AUX		



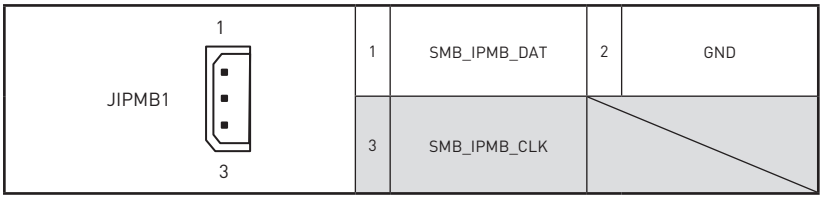
JCHASSIS: Chassis Intrusion Header

This connector 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.

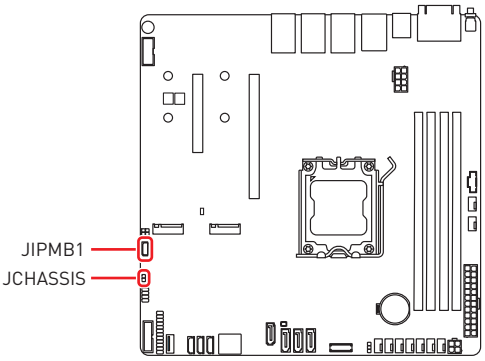


JIPMB1: IPMB Box Header

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

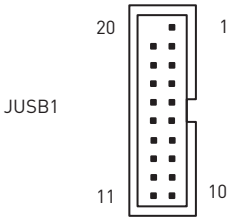


1	SMB_IPMB_DAT	2	GND
3	SMB_IPMB_CLK		



JUSB1: USB 3.2 Port Box Header

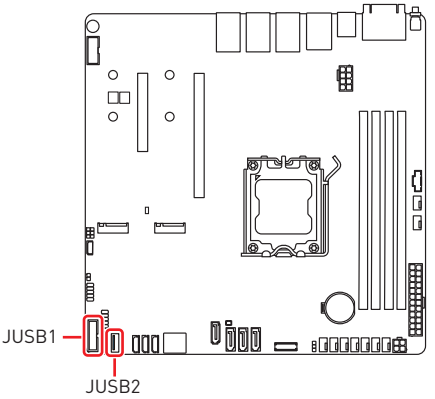
This port is backward-compatible with USB 2.0 devices and supports data transfer rate up to **5 Gbps**.



1	USB_VCC1	2	USB3_ESD_RX4N
3	USB3_ESD_RX4P	4	GND
5	USB3_ESD_TX4N	6	USB3_ESD_RX4P
7	GND	8	USB3_ESD_DN8
9	USB3_ESD_DP8	10	NC
11	USB2_ESD_DP9	12	USB2_ESD_DN9
13	GND	14	USB3_ESD_TX5P
15	USB3_ESD_TX5N	16	GND
17	USB3_ESD_RX5P	18	USB3_ESD_RX5N
19	USB_VCC2	20	No Pin

JUSB2: USB 2.0 Type-A Connector

The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices. It supports up to **480 Mbps** data transfer rate.



FP_I2C_1, RBP_I2C_1~2: I2C Box Headers

I2C connectors are used to connect to the System Management Bus (SMBus). FBP_I2C_1 is for front HDD backplane, and RBP_I2C_1, RBP_I2C_2 are for rear HDD backplanes.

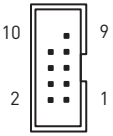
FP_I2C_1
RBP_I2C_1
RBP_I2C_2

1	NC	2	I2C_CLK
2	I2C_DAT	4	GND

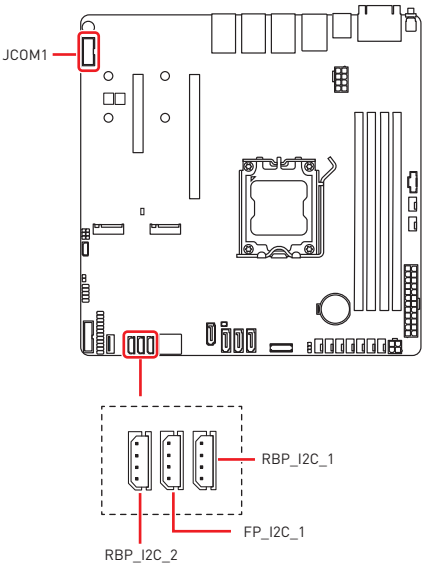
JCOM1: COM Port Box Header

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

JCOM1



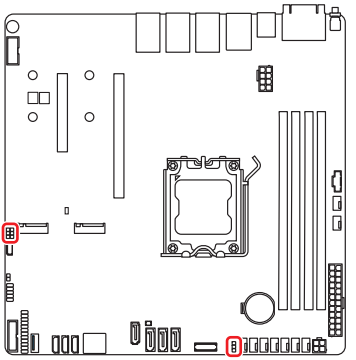
1	NDCD#_B	2	NSIN_B
3	NSOUT_B	4	NDTR_B
5	GND	6	NDSR#_B
7	NRTS_B	8	NCTS#_B
9	NRTS#_B	10	No pin

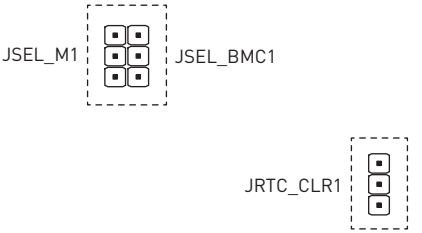


Jumpers

Important

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



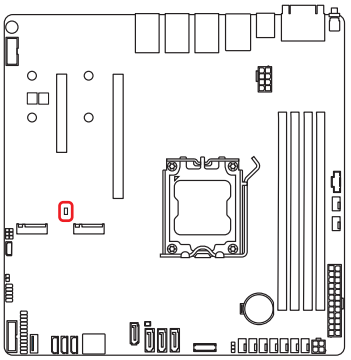


Jumper Name	Default Setting	Description
JSEL_M1	1	1-2: M.2_1 enabled, PCIE_2 disabled (Default) 2-3: PCIE_2 enabled, M.2_1 disabled
JSEL_BMC1	1	1-2: Using CPU (Default) 2-3: Using BMC
JRTC_CLR1	1	1-2: Normal (Default) 2-3: Clear CMOS

Onboard LEDs

BMC_LED1: BMC Heartbeat LED

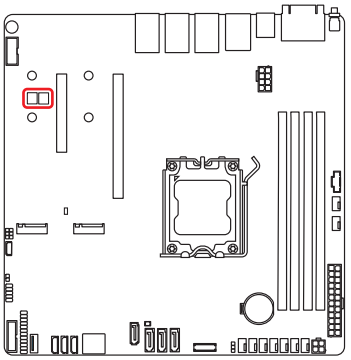
This LED indicates the BMC (Baseboard Management Controller) status.



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).



Hexadecimal Character Table

Hexadecimal	0	1	2	3	4	5	6	7
LED display	0	1	2	3	4	5	6	7
Hexadecimal	8	9	A	B	C	D	E	F
LED display	8	9	A	b	C	d	E	F

MSI.COM

EPS.MSI.COM