Technical Specification

2

This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.

2.1 Before you proceed

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

- Unplug the power cord from the wall socket before touching any component.
- Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components 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, ensure that the power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

2.2 Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

To optimize the features of your motherboard, we highly recommend that you install it in an ATX 2.2 compliant chassis.

> Ensure to unplug the chassis power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components!
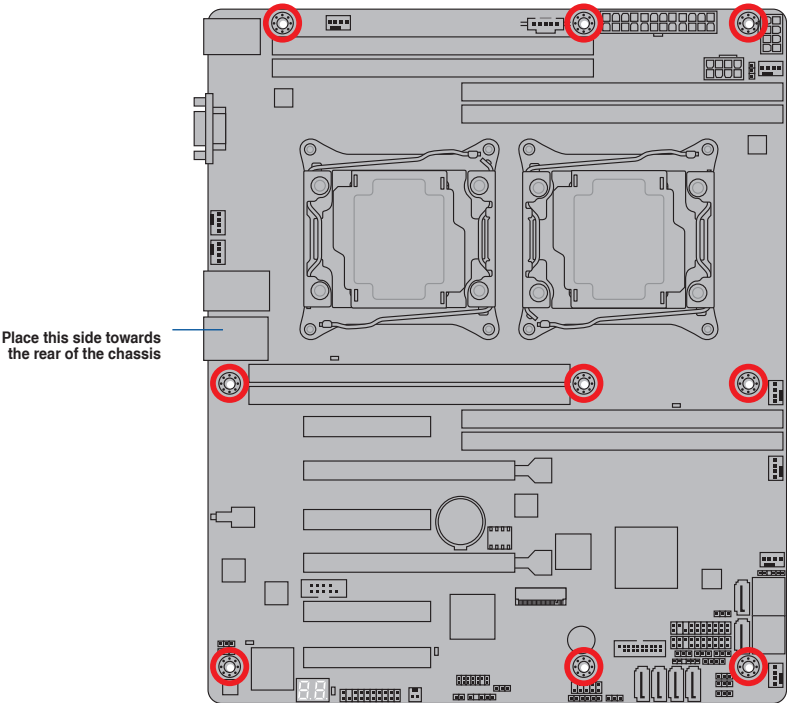
2.2.1 Placement direction

When installing the motherboard, ensure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.
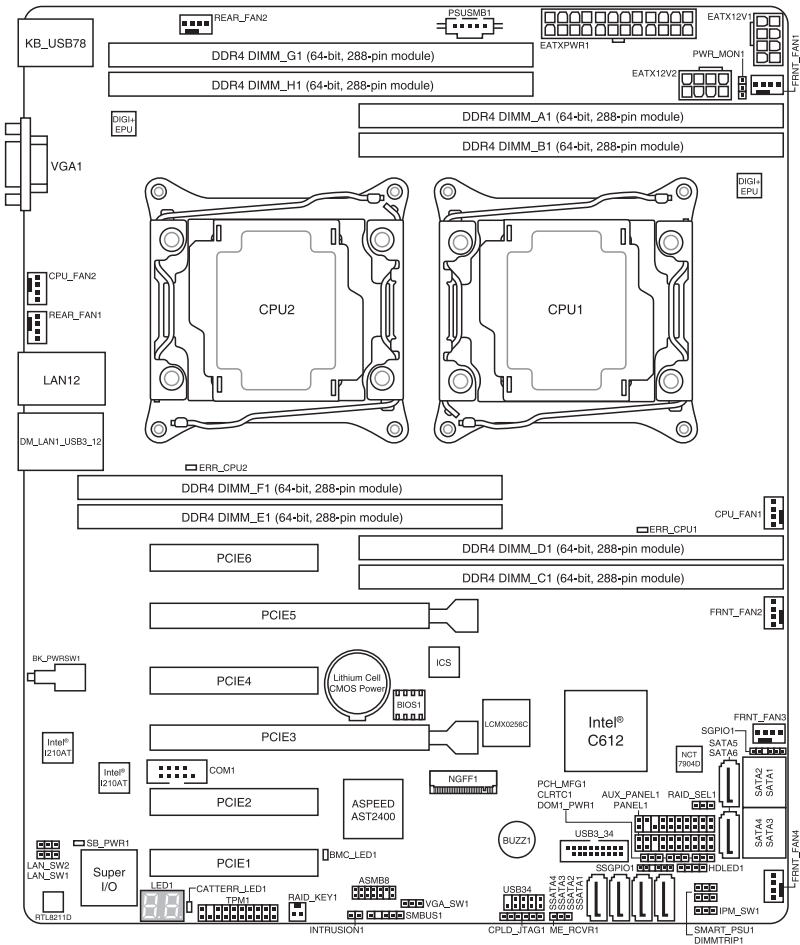
2.2.2 Screw holes

Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.
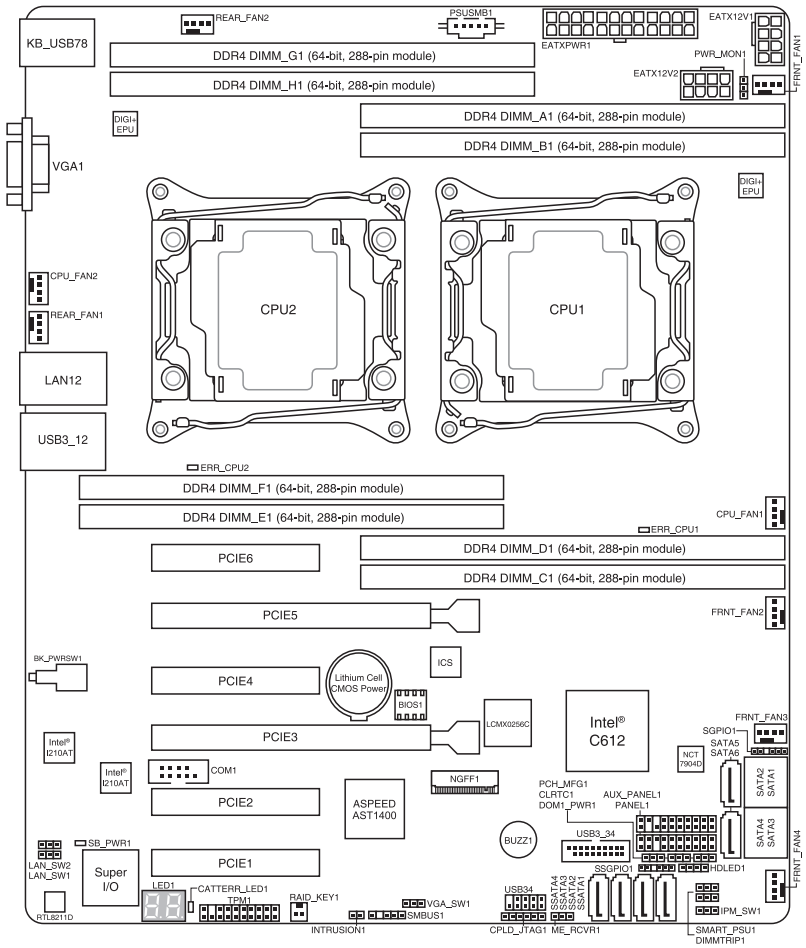
> DO NOT overtighten the screws! Doing so can damage the motherboard.

Place this side towards the rear of the chassis

2.2.3 Motherboard layout

REAR_FAN2

PSUSMB1

EATX12V1

EATXPWR1

PWR_MON1

KB_USB78

EATX12V2

FRNT_FAN1

DDR4 DIMM_G1 (64‑bit, 288‑pin module)

DDR4 DIMM_H1 (64‑bit, 288‑pin module)

DIGI+
EPU

DDR4 DIMM_A1 (64‑bit, 288‑pin module)

DDR4 DIMM_B1 (64‑bit, 288‑pin module)

VGA1

DIGI+
EPU

CPU_FAN2

REAR_FAN1

CPU2

CPU1

LAN12

DM_LAN1_USB3_12

ERR_CPU2

DDR4 DIMM_F1 (64‑bit, 288‑pin module)

DDR4 DIMM_E1 (64‑bit, 288‑pin module)

CPU_FAN1

ERR_CPU1

PCIE6

DDR4 DIMM_D1 (64‑bit, 288‑pin module)

DDR4 DIMM_C1 (64‑bit, 288‑pin module)

PCIE5

FRNT_FAN2

BK_PWRSW1

PCIE4

Lithium Cell
CMOS Power

ICS

BIOS1

Intel®
I210AT

LCMX0256C

Intel®
C612

FRNT_FAN3

SGPIO1

SATA5
SATA6

PCIE3

NCT
7904D

SATA2
SATA1

Intel®
I210AT

COM1

NGFF1

PCH_MFG1
CLRTC1
DOM1_PWR1

AUX_PANEL1
PANEL1

RAID_SEL1

PCIE2

ASPEED
AST2400

SATA4
SATA3

BUZZ1

USB3_34

SB_PWR1

BMC_LED1

LAN_SW2
LAN_SW1

Super
I/O

PCIE1

SSGPIO1

HDLED1

FRNT_FAN4

LED1

CATTERR_LED1

TPM1

ASMB8

RAID_KEY1

USB34

SSATA4
SSATA3
SSATA2
SSATA1

IPM_SW1

RTL8211D

VGA_SW1

SMBUS1

CPLD_JTAG1

ME_RCVR1

SMART_PSU1
DIMMTRIP1

INTRUSION1

Z10PA-D8C

KB_USB78

REAR_FAN2

PSUSMB1

EATXPWR1

EATX12V1

PWR_MON1

EATX12V2

DDR4 DIMM_G1 (64-bit, 288-pin module)

DDR4 DIMM_H1 (64-bit, 288-pin module)

FRNT_FAN1

DIGI+ EPU

VGA1

DDR4 DIMM_A1 (64-bit, 288-pin module)

DDR4 DIMM_B1 (64-bit, 288-pin module)

DIGI+ EPU

CPU_FAN2

REAR_FAN1

CPU2

CPU1

LAN12

USB3_12

ERR_CPU2

DDR4 DIMM_F1 (64-bit, 288-pin module)

DDR4 DIMM_E1 (64-bit, 288-pin module)

CPU_FAN1

ERR_CPU1

PCIE6

DDR4 DIMM_D1 (64-bit, 288-pin module)

DDR4 DIMM_C1 (64-bit, 288-pin module)

PCIE5

FRNT_FAN2

BK_PWRSW1

PCIE4

Lithium Cell CMOS Power

ICS

BIOS1

LCMX0256C

Intel® C612

FRNT_FAN3

SGPIO1

SATA5

SATA6

PCIE3

Intel® I210AT

Intel® I210AT

COM1

NGFF1

NCT 7904D

SATA2

SATA1

PCIE2

ASPEED AST1400

PCH_MFG1

CLRTC1

DOM1_PWR1

AUX_PANEL1

PANEL1

SATA4

SATA3

BUZZ1

USB3_34

SB_PWR1

LAN_SW2

LAN_SW1

PCIE1

USB34

SSGPIO1

SSGPIO1

HDLED1

FRNT_FAN4

Super I/O

LED1

CATERR_LED1

TPM1

RAID_KEY1

VGA_SW1

SMBUS1

USB34

SSATA4

SSATA3

SSATA2

SSATA1

IPM_SW1

RTL8211D

INTRUSION1

CPLD_JTAG1

ME_RCVR1

SMART_PSU1

DIMMTRIP1

2.2.4   Layout contents

Slots/Sockets	Page
1. CPU sockets	2-7
2. DDR4 sockets	2-12
3. PCI Express x16 / PCI Express x8	2-17

Onboard LEDs	Page
1. Standby Power LED (SB_PWR1)	2-18
2. Baseboard Management Controller LED (BMC_LED1)	2-18
3. CPU Warning LED (ERR_CPU1, ERR_CPU2)	2-19
4. CATT LED (CATTERR_LED1)	2-19
5. Q-Code LEDs (LED1)	2-20

Jumpers	Page
1. Clear RTC RAM (CLRTC1)	2-23
2. VGA controller setting (3-pin VGA_SW1)	2-24
3. LAN controller setting (3-pin LAN_SW1, LAN_SW2)	2-24
4. ME firmware force recovery setting (3-pin ME_RCVR1)	2-25
5. DDR4 thermal event setting (3-pin DIMMTRIP1)	2-25
6. RAID configuration utility selection (3-pin RAID_SEL1)	2-26
7. PMBus 1.2 PSU select jumper (3-pin SMART_PSU1)	2-26

Internal connectors	Page
1. Serial ATA 6.0 Gbps connectors (7-pin SATA1, SATA2, SATA3, SATA4, SATA5, SATA6 [Light Blue]); (7-pin SSATA1, SSATA2, SSATA3 [Gray], SSATA4 [Light Gray])	2-30
2. Power Supply SMBus connector (5-pin PSUSMB1)	2-31
3. USB 2.0 connector (10-1 pin USB34)	2-32
4. USB 3.0 connector (20-1 pin USB3_34)	2-32
5. CPU, front, and rear fan connectors (4-pin CPU_FAN1, CPU_FAN2, FRNT_FAN1, FRNT_FAN2, FRNT_FAN3, FRNT_FAN4, FRNT_FAN5, REAR_FAN1, REAR_FAN2)	2-33
6. Serial port connector (10-1 pin COM1)	2-33
7. Trusted Platform Module connector (20-1 pin TPM1)	2-34
8. ATX power connectors (24-pin EATXPWR1, 8-pin EATX12V1, 8-pin EATX12V2)	2-35
9. System panel connector (20-1 pin PANEL1)	2-36
10. Auxiliary panel connector (20-2 pin AUX_PANEL1)	2-37
11. Hard disk activity LED connector (4-pin HDLED1)	2-38
12. Chassis Intrusion connector (2-pin INTRUSION1)	2-38
13. M.2 (NGFF) connector (NGFF1)	2-31

2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA 2011-3 Socket designed for the Intel®
Xeon E5-2600 v3 processor family.

- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and
  the socket contacts are not bent. Contact your retailer immediately if the PnP cap
  is missing, or if you see any damage to the PnP cap/socket contacts/motherboard
  components. ASUS will shoulder the cost of repair only if the damage is shipment/
  transit-related.

- Keep the cap after installing the motherboard. ASUS will process Return Merchandise
  Authorization (RMA) requests only if the motherboard comes with the cap on the LGA
  2011-3 socket.

- The product warranty does not cover damage to the socket contacts resulting from
  incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP
  cap.

2.3.1 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.

CPU LGA2011-3 Socket
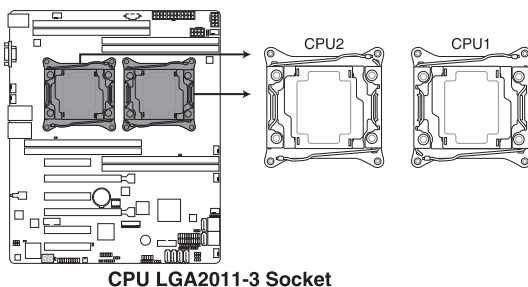
Before installing the CPU, ensure that the socket box is facing toward you and the triangle
mark is on the top-right position.

Triangle mark
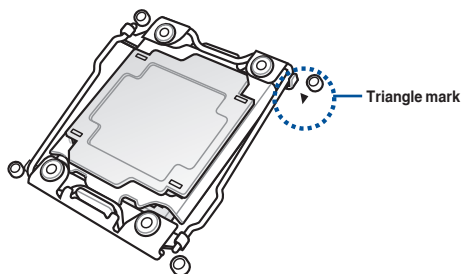
2.   Press the left load lever down with your thumb (A), move it to the right until it is released from the retention tab (B) then gently lift the load lever (C).

⚠️ To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.
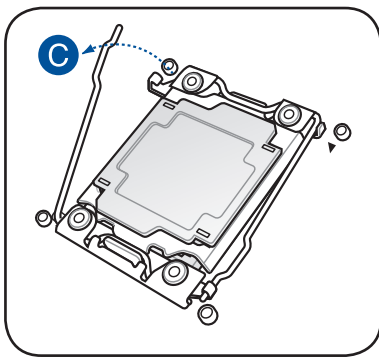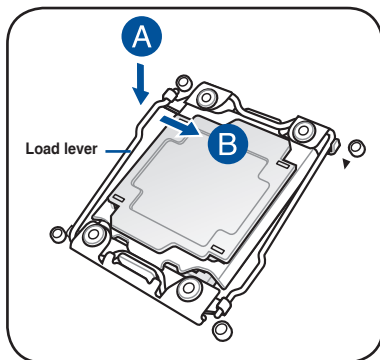
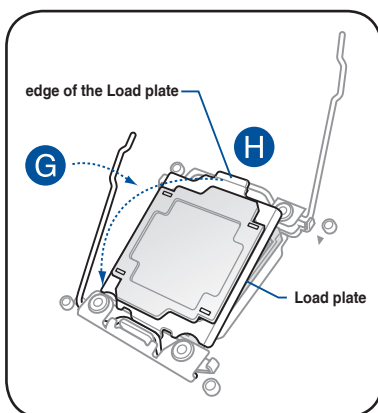3.   Press the right load lever with your thumb (D), move it to the left until it is released from then gently lift the load lever (F).
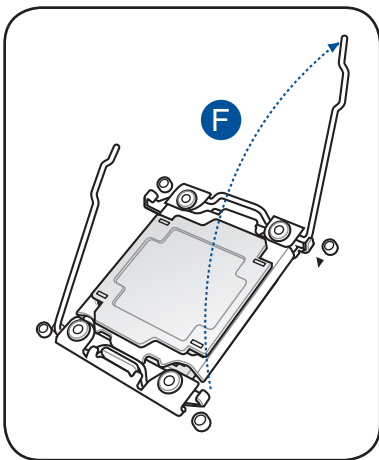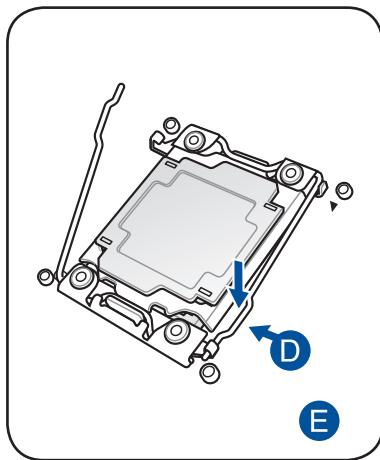
4. Push the left load lever to slightly lift the load plate (G).

    ✍ Do not insert the load lever into the retention tab.

5. Hold the edge then gently lift the load plate (H).

edge of the Load plate

G   H

Load plate

6. Get the CPU.

7. Align and position the CPU over the socket ensuring that the triangle mark on the CPU matches the triangle mark on the socket box.

8. Install the CPU into the slot.

    ✍ The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the CPU pins on the socket.

Triangle mark
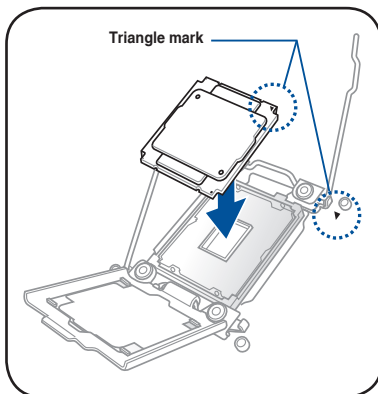
9. Gently push the load plate just enough to let it sit on top of the CPU.

    ⚠ Do not force to close the load plate as it may damage the CPU.
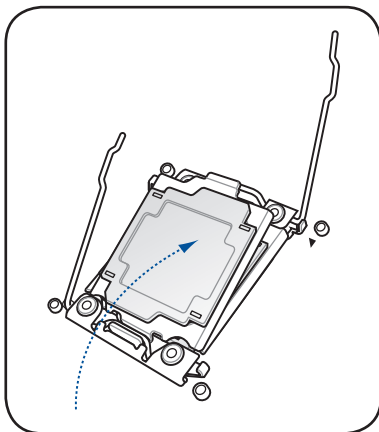
10. Push down the right load lever (I) ensuring that the edge of the load plate is fixed and tucked securely under the lever (J) then insert the right load lever under the retention tab (K).
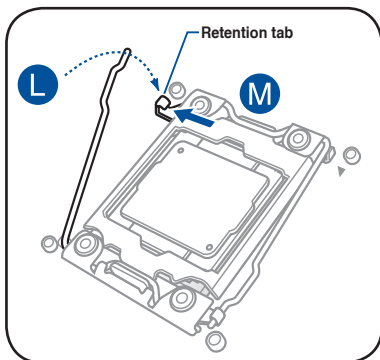
The PnP cap pops out of the load plate when the right load lever is inserted into the retention tab.

Keep the PnP cap. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the PnP cap on the LGA 2011 socket.
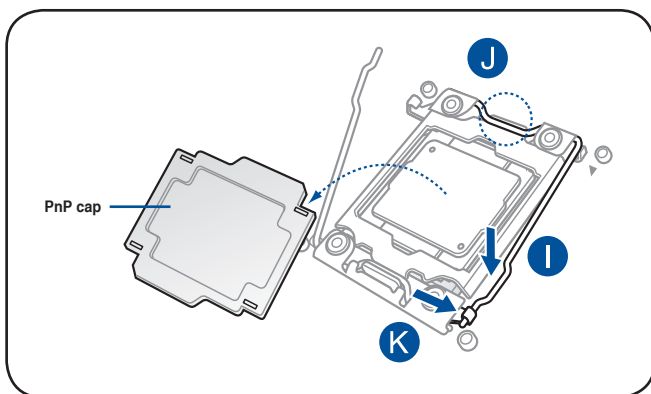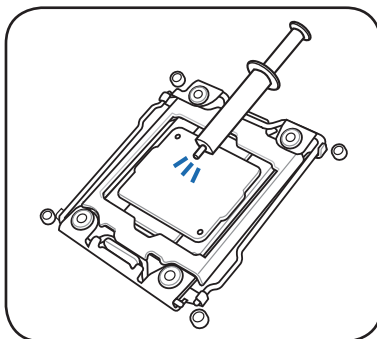

11. Push down the left load lever (L) then insert it under the retention tab (M).

12. Apply some Thermal Interface Material to the exposed area of the CPU that the heatsink will be in contact with.
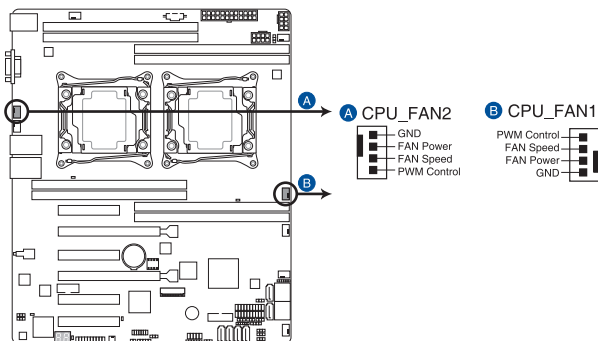
- Ensure that the Thermal Interface Material is spread in an even thin layer.

- Some heatsinks come with pre-applied Thermal Interface Material. If so, skip this step.

The Thermal Interface Material is toxic and inedible. DO NOT eat it. If it gets into your eyes or touches your skin, wash it off immediately, and seek professional medical help.

13. Connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN1 / CPU_FAN2.

A CPU_FAN2
GND
FAN Power
FAN Speed
PWM Control

B CPU_FAN1
PWM Control
FAN Speed
FAN Power
GND

CPU FAN connectors

DO NOT forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

2.4 System memory

2.4.1 Overview

The motherboard comes with eight (8) Double Data Rate 4 (DDR4) Dual Inline Memory Modules (DIMM) sockets.

The figure illustrates the location of the DDR4 DIMM sockets:

DIMM_G1
DIMM_H1

DIMM_A1
DIMM_B1

DIMM_F1
DIMM_E1

DIMM_D1
DIMM_C1

288-pin DDR4 DIMM sockets
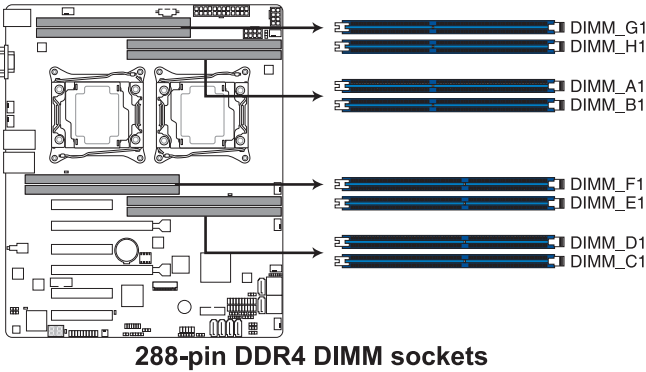
2.4.2 Memory Configurations

You may install 4 GB, 8 GB, 16 GB, and 32 GB RDIMMs or 32 GB and 64 GB LR-DIMMs into the DIMM sockets using the memory configurations in this section.

> • Refer to ASUS Server AVL for the updated list of compatible DIMMs.
>
> • When installing DIMMs, always start from slot A1 (CPU1) and E1 (CPU2).
>
> • Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.

Single CPU configuration

You can refer to the following recommended memory population for a single CPU configuration.

Single CPU configuration (must be installed on CPU1)				
	DIMM			
	A1	**B1**	**C1**	**D1**
1 DIMM	✓			
2 DIMMs	✓	✓		
4 DIMMs	✓	✓	✓	✓

Dual CPU configuration

You can refer to the following recommended memory population for a dual CPU configuration.

| Dual CPU configuration								
	DIMM							
	A1	**B1**	**C1**	**D1**	**E1**	**F1**	**G1**	**H1**
2 DIMMs	✓				✓			
4 DIMMs	✓	✓			✓	✓		
8 DIMMs	✓	✓	✓	✓	✓	✓	✓	✓

2.4.3   Installing a DIMM on a single clip DIMM socket

1.   Press the retaining clip outward to unlock the DIMM socket.

2.   Align a DIMM on the socket such that the notch on the DIMM matches the DIMM slot key on the socket.

DIMM notch

DIMM slot key   **Unlocked retaining clip**
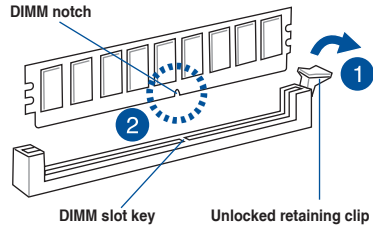
A DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket in the wrong direction to avoid damaging the DIMM.

3.   Hold the DIMM at both ends then insert the DIMM into the socket. Apply force to both ends of the DIMM simultaneously until the retaining clip clicks into place and the DIMM is seated securely in place.

Locked Retaining Clip
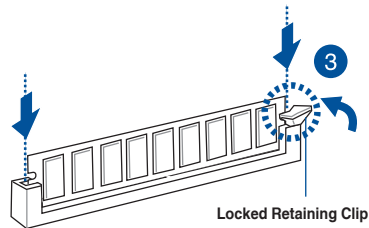
Always insert the DIMM into the socket VERTICALLY to prevent DIMM notch damage.

•   To install two or more DIMMs, refer to the user guide bundled with the motherboard package.

•   Refer to the user guide for qualified vendor lists of the memory modules.

Removing a DIMM from a single clip DIMM socket

1.   Press the retaining clip outward to unlock the DIMM.

2.   Remove the DIMM from the socket.
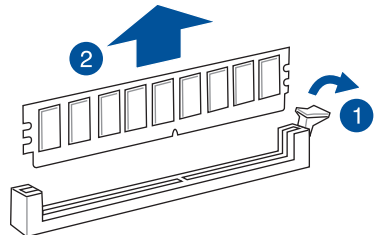
Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2.5 Expansion slots

In the future, you may need to install expansion cards. The following subsections describe the slots and the expansion cards that they support.

Ensure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

2.5.1 Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.

2. Remove the system unit cover (if your motherboard is already installed in a chassis).

3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.

4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.

5. Secure the card to the chassis with the screw you removed earlier.

6. Replace the system cover.

2.5.2 Configuring an expansion card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See **Chapter 4** for information on BIOS setup.

2. Assign an IRQ to the card.

Refer to the table **Standard Interrupt assignments** in section **Interrupt assignments** for more information.

3. Install the software drivers for the expansion card.

When using PCI cards on shared slots, ensure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Otherwise, conflicts may arise between the two PCI groups, making the system unstable and the card inoperable.

2.5.3 Interrupt assignments

Standard Interrupt assignments

IRQ	Priority	Standard function
0	1	System Timer
1	2	Keyboard Controller
2	-	Programmable Interrupt
3*	11	Communications Port (COM2)
4*	12	Communications Port (COM1)
5*	13	--
6	14	Floppy Disk Controller
7*	15	--
8	3	System CMOS/Real Time Clock
9*	4	ACPI Mode when used
10*	5	IRQ Holder for PCI Steering
11*	6	IRQ Holder for PCI Steering
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

* These IRQs are usually available for ISA or PCI devices.

2.5.4 PCI Express x16 slot (x16 link)

The onboard PCIE3 and PCIE5 slots provides one x16 Gen3 link to CPU1 and auto switches to x8 link if PCIE4/PCIE6 is occupied. This slot supports VGA cards and various server class high performance add-on cards.

2.5.5 PCI Express x8 slot (x8 link)

The onboard PCIE2 and PCIE4 slots provide one x8 Gen3 link to CPU1. These slots support VGA cards and various server class high performance add-on cards.

The onboard PCIE6 provide one x8 Gen3 link to CPU1 and supports MIO.

2.5.6 PCI Express x8 slot (x4 link)

The onboard PCIE1 slot provides one x4 Gen2 link to Intel C612 PCH chipset.This slot support various server class high performance add-on cards.
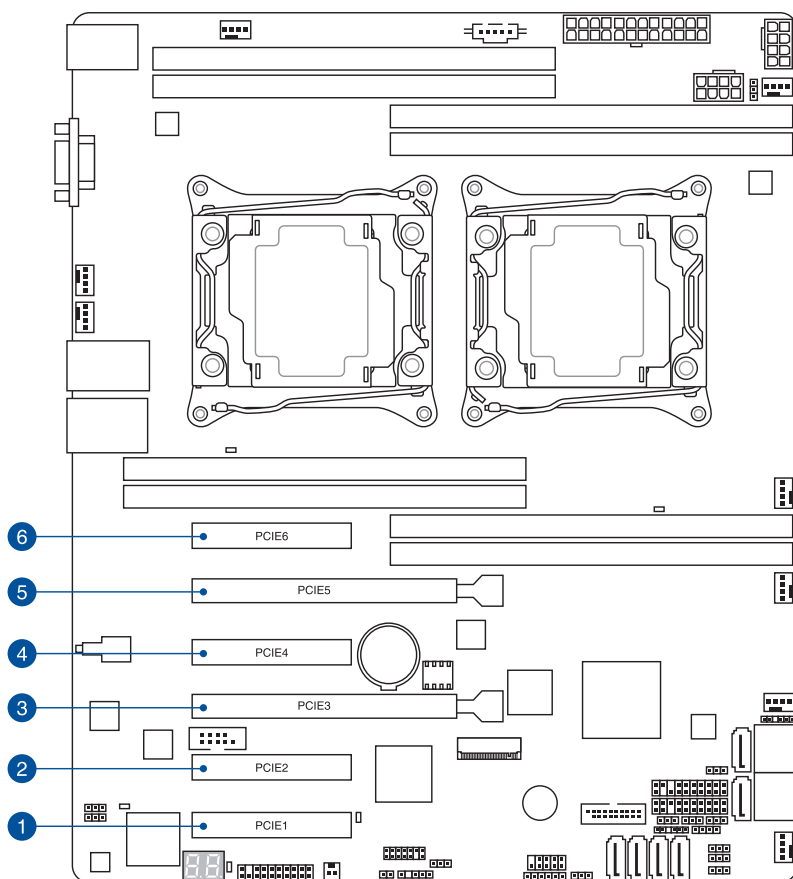
| No. (Slot location)		Short description
1	PCIE1	PCI-E x8 (x4 Gen2 link)
2	PCIE2	PCI-E x8 (x8 Gen3 link)
3	PCIE3	PCI-E x16 (x16 Gen3 link) (Auto switch to x8 Link if slot 4 is occupied.)
4	PCIE4	PCI-E x8 (x8 Gen3 link)
5	PCIE5	PCI-E x16 (x16 Gen3 link) (Auto switch to x8 Link if slot 6 is occupied.)
6	PCIE6	PCI-E x8 (x8 Gen3 link) ; MIO supported

The ASUS PIKE 3008, PIKE 3108, and PEM-FDR cards must be installed on PCIE slot 2/3/4/5.

2.5.7   Installing ASMB8 series management board

Follow the steps below to install an optional ASMB8 series management board on your motherboard.

1.   Locate the Baseboard Management
      Card header on the motherboard.
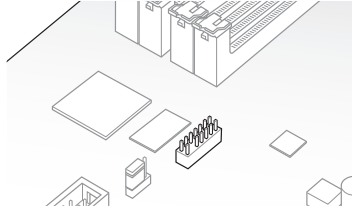
2.   Orient and press the Management Card
      in place.
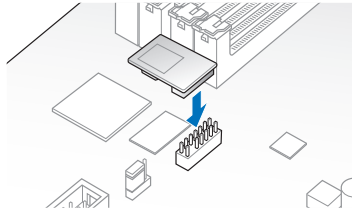
3.   Insert the LAN cable plug to the LAN port 3 (dedicated LAN) or LAN port (shared LAN)
   for server management.

2.6 Onboard LEDs

1. **Standby Power LED (SB_PWR1)**

   The motherboard comes with a standby power LED. The green LED lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.

SB_PWR1

ON
Standy Power

OFF
Powered Off

Onboard LED
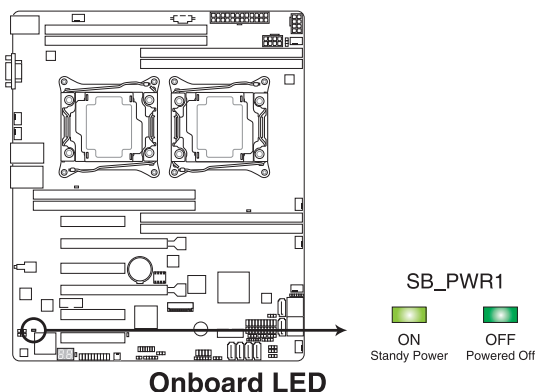
2. **Baseboard Management Controller LED (BMC_LED1)**

   The green heartbeat LED blinks per second to indicate that the ASMB8 is working normally.

BMC_LED1

BMC LED
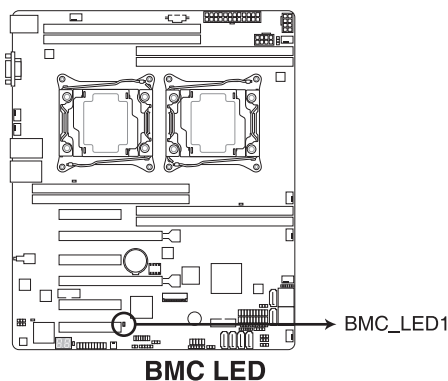
- The heartbeat LED functions only when you install the ASUS ASMB8.
- The Baseboard Management Controller is available to Z10PA-D8 SKU only.

3. **CPU Warning LED (ERR_CPU1, ERR_CPU2)**

   The CPU warning LEDs light up to indicate failure on either CPU1, CPU2, or both.

ERR_CPU2
ERR_CPU1

ERR CPU LED
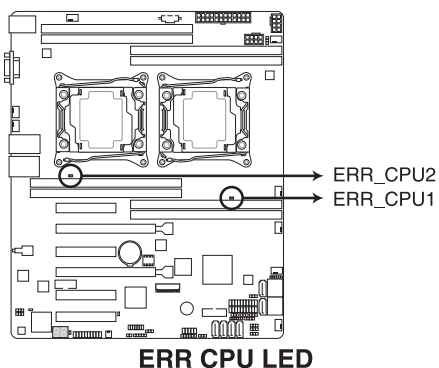
4. **CATT LED (CATTERR_LED1)**

   The CATT LED indicates that the system has experienced a fatal or catastrophic error and cannot continue to operate.

CATTERR_LED1

CATTERR LED
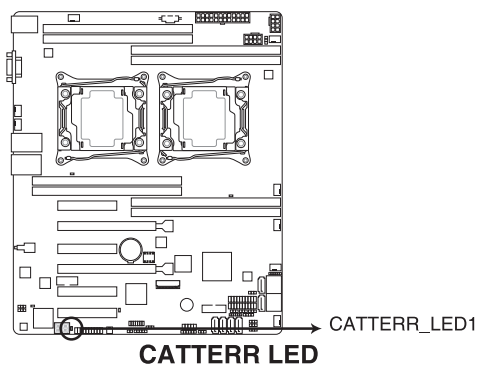
5. **Q-Code LEDs (LED1)**

The Q-Code LED provides a 2-digit display that shows the status of your system. Refer to the Q-Code table of this user guide for more information about the 2-digit codes.

Q-Code LED
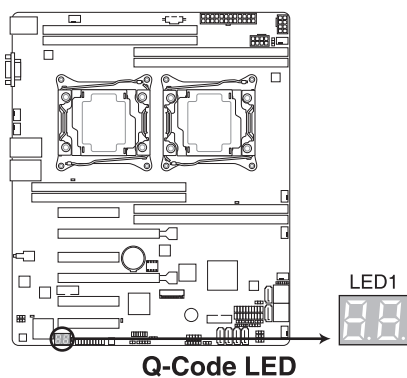
Q-Code table

Action	PHASE	POST CODE	TYPE	DESCRIPTIONz
Normal boot	Security Phase	01	Progress	First post code(POWER_ON_POST_CODE)
		02	Progress	Load BSP microcode(MICROCODE_POST_CODE)
		03	Progress	Set cache as ram for PEI phase(CACHE_ENABLED_POST_CODE)
		06	Progress	CPU Early init.(CPU_EARLY_INIT_POST_CODE)
		04	Progress	initializes South bridge for PEI preparation
	PEI(Pre-EFI initialization) phase	10	Progress	PEI Core Entry
		15	Progress	NB initialize before installed memory
		19	Progress	SB initialize before installed memory
		78–00	Progress	Wait BMC ready(duration: 120 seconds).
		A1	MRC Progress	QPI initialization
		A3	MRC Progress	QPI initialization
		A7	MRC Progress	QPI initialization
		A8	MRC Progress	QPI initialization
		A9	MRC Progress	QPI initialization
		AA	MRC Progress	QPI initialization
		AB	MRC Progress	QPI initialization
		AC	MRC Progress	QPI initialization
		AD	MRC Progress	QPI initialization
		AE	MRC Progress	QPI initialization
		AF	MRC Progress	QPI initialization Complete
		2F	Progress	Memory Init.
		B0	MRC Progress	Memory Init.
		B1	MRC Progress	Memory Init.
		AF	MRC Progress	RC Reset if require
		B4	MRC Progress	Memory Init.
		B2	MRC Progress	Memory Init.
		B3	MRC Progress	Memory Init.
		B5	MRC Progress	Memory Init.
		B6	MRC Progress	Memory Init.
		B7	MRC Progress	Memory Init.
		B8	MRC Progress	Memory Init.
		B9	MRC Progress	Memory Init.
		BA	MRC Progress	Memory Init.
		BB	MRC Progress	Memory Init.
		BC	MRC Progress	Memory Init.
		BF	MRC Progress	Memory Init. Done
		5A	MRC Progress	Other config. After RC end
		31	Progress	Memory already installed.
		32	Progress	CPU Init.
		34	Progress	CPU Init.
		36	Progress	CPU Init.
		4F	Progress	DXE Initial Program Load(IPL)

(continued on the next page)

Q-Code table

Action	PHASE	POST CODE	TYPE	DESCRIPTION
Normal boot	DXE(Driver Execution Environment) phase	60	Progress	DXE Core Started
		61	Progress	DXE NVRAM Init.
		62	Progress	SB run-time init.
		63	Progress	DXE CPU Init
		68	Progress	NB Init.
		69	Progress	NB Init.
		6A	Progress	NB Init.
		70	Progress	SB Init.
		71	Progress	SB Init.
		72	Progress	SB Init.
		78	Progress	ACPI Init.
		79	Progress	CSM Init.
	BDS(Boot Device Selection) phase	90	Progress	BDS started
		91	Progress	Connect device event
		92	Progress	PCI Bus Enumeration.
		93	Progress	PCI Bus Enumeration.
		94	Progress	PCI Bus Enumeration.
		95	Progress	PCI Bus Enumeration.
		96	Progress	PCI Bus Enumeration.
		97	Progress	Console outout connect event
		98	Progress	Console input connect event
		99	Progress	AMI Super IO start
		9A	Progress	AMI USB Driver Init.
		9B	Progress	AMI USB Driver Init.
		9C	Progress	AMI USB Driver Init.
		9D	Progress	AMI USB Driver Init.
		b2	Progress	Legacy Option ROM Init.
		b3	Progress	Reset system
		b4	Progress	USB hotplug
		b6	Progress	NVRAM clean up
		b7	Progress	NVRAM configuration reset
		A0	Progress	IDE, AHCI Init.
		A1	Progress	IDE, AHCI Init.
		A2	Progress	IDE, AHCI Init.
		A3	Progress	IDE, AHCI Init.
		A8	Progress	BIOS Setup Utility password verify
		A9	Progress	BIOS Setup Utility start
		AB	Progress	BIOS Setup Utility input wait
		AD	Progress	Ready to boot event
		AE	Progress	Legacy boot event
	Operating system phase	AA	Progress	APIC mode
		AC	Progress	PIC mode

2.7 Jumpers

1. **Clear RTC RAM (3-pin CLRTC1)**

   This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS which include system setup information such as system passwords.

   To erase the RTC RAM:

   1. Turn OFF the computer and unplug the power cord.

   2. Move the jumper cap from the default pins 1–2 to pins 2–3. Keep the cap on pins

      2–3 for about 5 to 10 seconds, then move the cap back to pins 1–2.

   3. Plug the power cord and turn ON the computer.

   4. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

   DO NOT remove the cap on CLRTC jumper default position except when clearing the RTC RAM. Removing the cap will cause system boot failure!

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


CLRTC1

1 2   2 3

Normal   Clear CMOS
(Default)

Clear RTC RAM
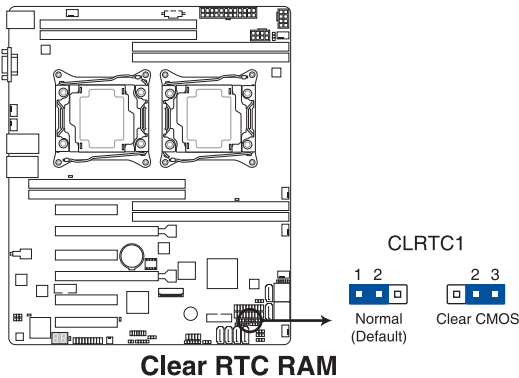
2.   **VGA controller setting (3-pin VGA_SW1)**

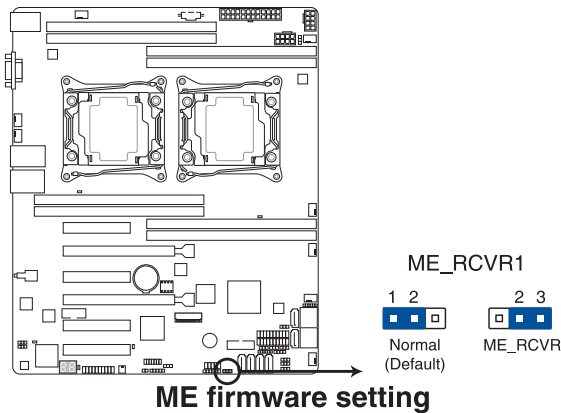This jumper allows you to enable or disable the onboard VGA controller. Set to pins 1–2 to activate the VGA feature.

VGA_SW1

Enable (Default) | Disable

VGA setting
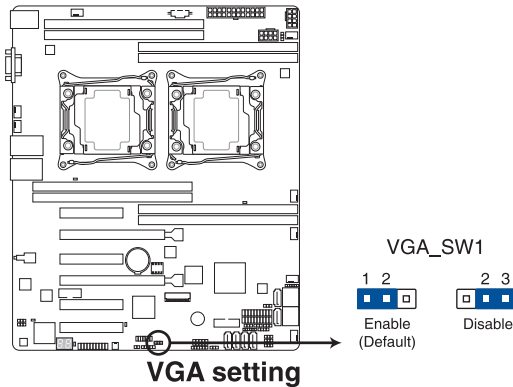
3.   **LAN controller setting (3-pin LAN_SW1, LAN_SW2)**

These jumpers allow you to enable or disable the onboard LAN_SW1 or LAN_SW2. Set to pins 1–2 to activate the Gigabit LAN feature.

LAN_SW2
LAN_SW1

Enable (Default) | Disable

LAN setting
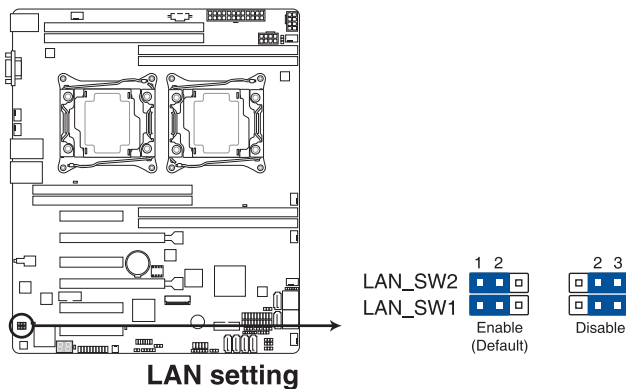
4. **ME firmware force recovery setting (3-pin ME_RCVR1)**

This jumper allows you to force Intel® Management Engine (ME) boot from recovery mode when ME becomes corrupted.

ME_RCVR1

| 1 | 2 | | 2 | 3 |

Normal (Default)　　ME_RCVR

ME firmware setting

5. **DDR4 thermal event setting (3-pin DIMMTRIP1)**

This jumper allows you to enable or disable DDR4 DIMM thermal sensing event pin.

DIMMTRIP1

| 1 | 2 | | 2 | 3 |

Enable (Default)　　Disable

DIMM Thermaltrip setting
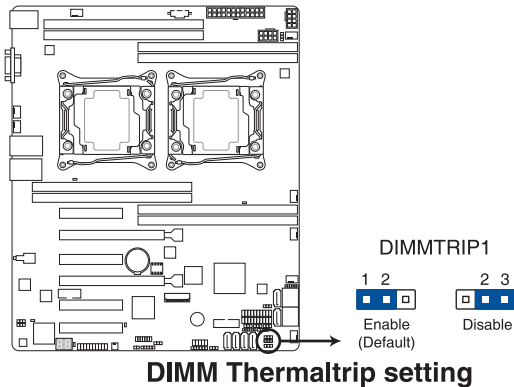
6.   **RAID configuration utility selection (3-pin RAID_SEL1)**

This jumper allows you to select the RAID configuration utility to use when you create disk arrays. Place the jumper caps over pins 1–2 to use the third party software LSI MegaRAID software RAID Configuration Utility; otherwise, place the jumper caps to pins 2–3 to use the Intel® Rapid Storage Technology enterprise SATA Option ROM Utility.
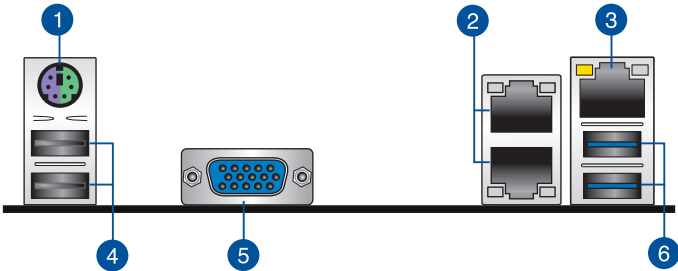

RAID setting
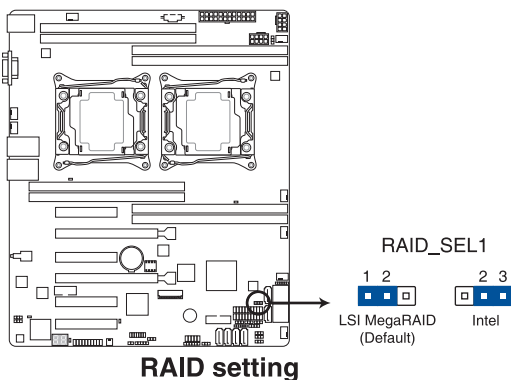
7.   **PMBus 1.2 PSU select jumper (3-pin SMART_PSU1)**

This jumper allows you to select PSU PMBus version. Set to pins 1–2 for PMBus, set to pins 2–3 for others.


PMBus 1.2 PSU setting
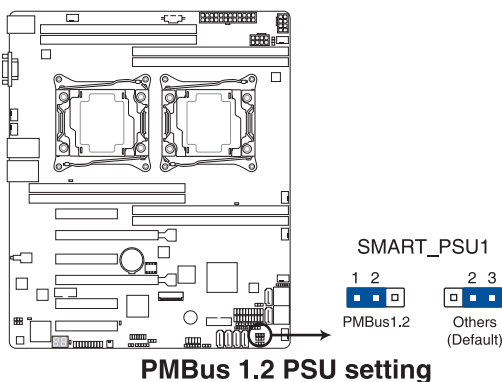
2.8 Connectors

2.8.1 Rear panel connectors

1. PS/2 keyboard/mouse port (purple/green). This port is for a PS/2 keyboard or mouse.

2. RJ-45 ports for LAN. These ports allows Gigabit connection to a LAN through a network hub. Refer to the **LAN port LED indications** table for more information.

3. RJ-45 port for iKVM. This RJ-45 port is available only on the Z10PA-D8 model and only functions when you enable the ASMB8 controller.

4. USB 2.0 ports 1 and 2. These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

5. Video Graphics Adapter (VGA) port. This port is for a VGA monitor or other VGA-compatible devices.

6. USB 3.0 ports 1 and 2. These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 3.0 devices.

LAN port LED indications

Activity/Link LED		Speed LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
GREEN	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection
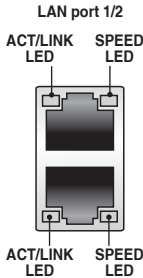
LAN port 1/2

Management LAN port LED indications

| Activity/Link LED		Speed LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
ORANGE	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection
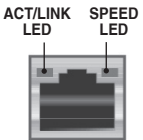
2.8.2   Internal connectors

1.   Serial ATA 6.0 Gbps connectors (7-pin SATA1, SATA2, SATA3, SATA4, SATA5, SATA6 [Light Blue]) (7-pin SSATA1, SSATA2, SSATA3 [Gray], SSATA4 [Light Gray])

Supported by the Intel® 612 Series chipset, this connector is for the Serial ATA signal cables for Serial ATA hard disk drives that allows up to 6 Gbps of data transfer rate.

If you installed Serial ATA hard disk drives, you can create a RAID 0, RAID 1, RAID 10, or RAID 5 configuration.
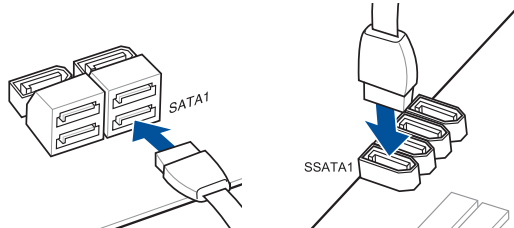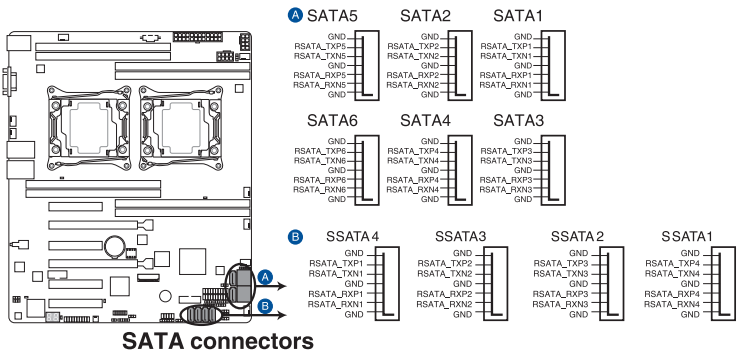
SATA connectors

• The actual data transfer rate depends on the speed of Serial ATA hard disks installed.

• The SSATA4 [Light Gray] will be automatically turned off if the M.2 connector (NGFF) is occupied.

2. **M.2 (NGFF) connector (NGFF1)**

This connector allows you to install an M.2 device.

NGFF1
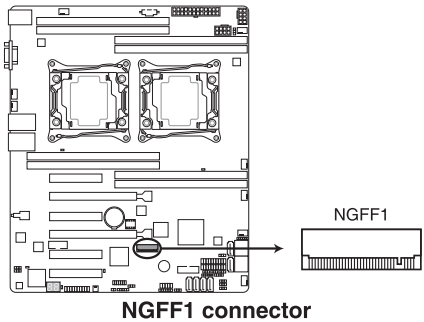
NGFF1 connector

This connector supports type 2242 devices on both PCI-E and SATA interface.

The M.2 (NGFF) device is purchased separately

3. **Power Supply SMBus connector (5-pin PSUSMB1)**

This connector allows you to connect SMBus (System Management Bus) to the PSU (power supply unit) to read PSU information. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.

PSUSMB1

I2C_7_CLK#
I2C_7_DATA#
Alert#
GND
+3.3V Remote Sense

Power supply SMBus connector
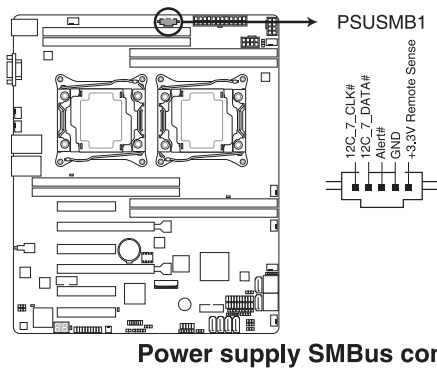
This connector functions only when you install the ASUS ASMB8.

Power supply is required to meet PMBus specification and customized BMC FW may be needed. Please contact ASUS if your need further support.

4. **USB 2.0 connector (10-1 pin USB34)**

   These connectors are for USB 2.0 ports. Connect the USB module cables to connectors USB56. These USB connectors comply with USB 2.0 specification that supports up to 480 Mb/s connection speed.
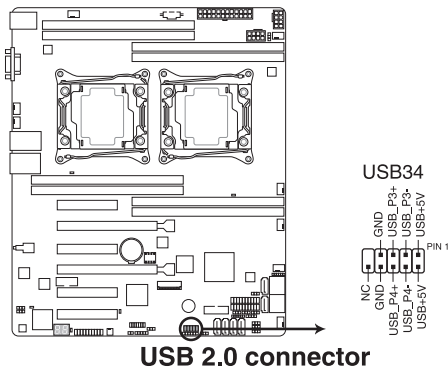
   USB 2.0 connector

5. **USB 3.0 connector (20-1 pin USB3_34)**

   This connector allows you to connect a USB 3.0 module for additional USB 3.0 front or rear panel ports. With an installed USB 3.0 module, you can enjoy all the benefits of USB 3.0 including faster data transfer speeds of up to 5Gbps, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0.


   USB 3.0 connector
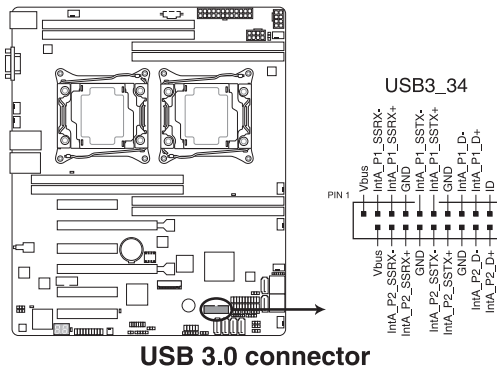
6. **CPU, front, and rear fan connectors (4-pin CPU_FAN1, CPU_FAN2, FRNT_FAN1, FRNT_FAN2, FRNT_FAN3, FRNT_FAN4, FRNT_FAN5, REAR_FAN1, REAR_FAN2)**

The fan connectors support cooling fans. Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.

⚠️

- DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components.

- These are not jumpers! DO NOT place jumper caps on the fan connectors!

- All fans feature the ASUS Smart Fan technology.
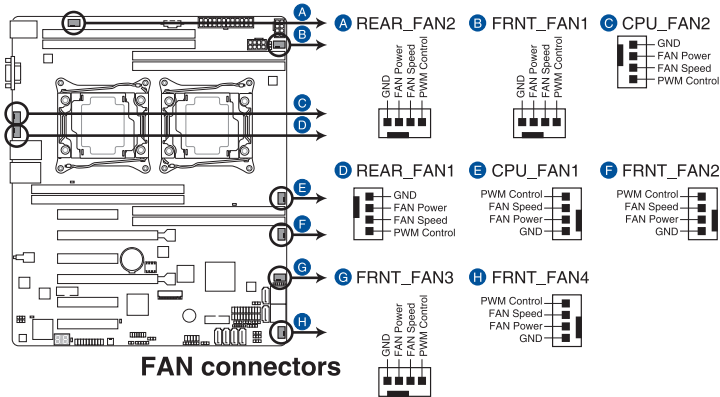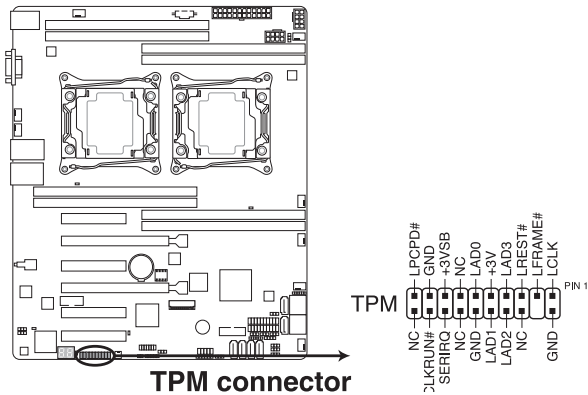

FAN connectors

7. **Serial port connector (10-1 pin COM1)**

This connector is for the serial COM port. Connect the serial port module cable to one of these connectors, then install the module to a slot opening at the back of the system chassis.

Serial port connector
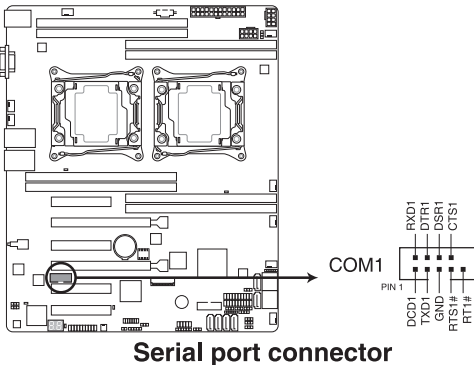
8. **Trusted Platform Module connector (20-1 pin TPM1)**

This connector supports a Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

TPM connector

9. **EATX power connectors (24-pin EATXPWR1, 8-pin EATX12V1, 8-pin EATX12V2)**

    These connectors are for the SSI or ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

    • DO NOT forget to connect the 24+8-pin power plugs when using 85W or below CPU; otherwise, the system will not boot up.

    • DO NOT forget to connect the 24+8+8-pin power plugs when using 105W or above CPU; otherwise, the system will not boot up.

    • Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

    • Ensure that your power supply unit (PSU) can provide at least the minimum power required by your system. Minimum requirement of ATX power supply 1) 500W 2) All+12V output > 20A.

ATX power connectors

10. System panel connector (20-1 pin PANEL1)

This connector supports several chassis-mounted functions.
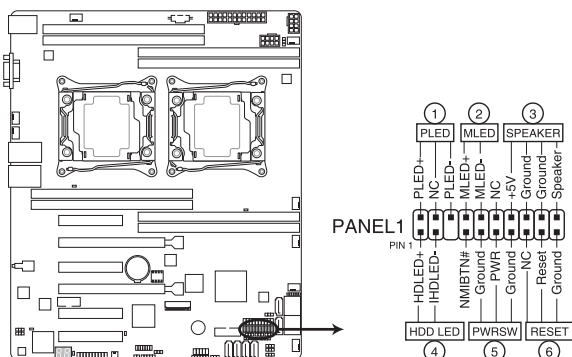
1. System power LED (3-pin PLED)

This 3-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

2. Message LED (2-pin MLED)

This 2-pin connector is for the message LED cable that connects to the front message LED. The message LED is controlled by Hardware monitor to indicate an abnormal event occurance.

3. System warning speaker (4-pin SPEAKER)

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

4. Hard disk drive activity LED (2-pin HDD LED)

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

**5. Power button/soft-off button (2-pin PWRSW)**

This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

6. Reset button (2-pin RESET)

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

11. Auxiliary panel connector (20-2 pin AUX_PANEL1)

This connector is for additional front panel features including front panel SMB, locator LED and switch, and LAN LEDs.

Auxiliary panel connector
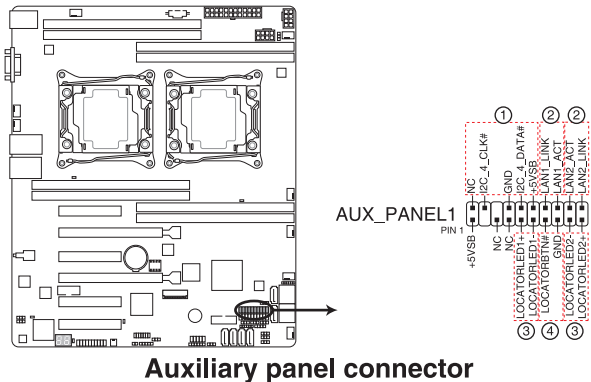
1. Front panel SMB (10-2 pin FPSMB)

These connectors are for the front panel SMBus cable.

2. LAN activity LED (2-pin LAN1_LINKACTLED, LAN2_LINKACTLED)

These connectors are for Gigabit LAN activity LEDs on the front panel.

3. Locator LED (2-pin LOCATORLED1, LOCATORLED2)

These connectors are for the locator LED1 and LED2 on the front panel. Connect the Locator LED cables to these 2-pin connector. The LEDs will light up when the Locator button is pressed.

4. Locator Button/Switch (2-pin LOCATORBTN#)

These connectors are for the locator button on the front panel. This button queries the state of the system locator.

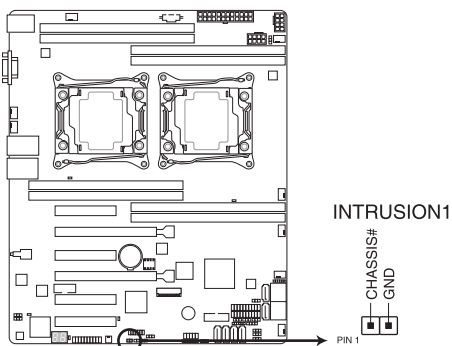**12.   Hard disk activity LED connector (4-pin HDLED1)**

This LED connector is for the storage add-on card cable connected to the SATA or SAS add-on card. The read or write activities of any device connected to the SATA or SAS add-on card causes the front panel LED to light up.

HDLED1
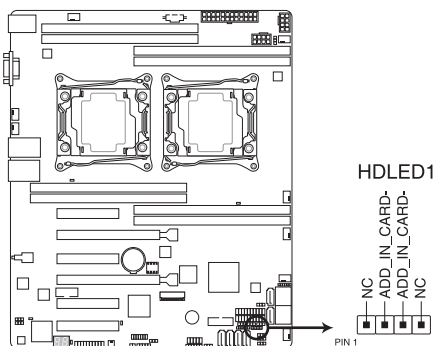
Storage card activity LED connector

13.   Chassis Intrusion (2-pin INTRUSION1)

These leads are for the intrusion detection feature for chassis with intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high level signal to these leads to record a chassis intrusion event. The default setting is short CHASSIS# and GND pin by jumper cap to disable the function.

INTRUSION1

INTRUSION connector