Technical Specification

Workstation W60 Rev5

Contents

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Ensure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, ensure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

Conventions used in this guide

To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Typography

Bold text	Indicates a menu or an item to select.
Italics	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.
	Example: <Enter> means that you must press the Enter or Return key.
<Key1> + <Key2> + <Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).

Series specifications summary

Model Name	
CPU	Dual Intel® Socket-P / LGA-3647 square for Xeon® Processor Scalable Family (205W)
	UPI 9.6, 10.4 GT/s
	Supports Intel® Hyper-Threading
	Supports Intel® Turbo Boost Technology
	* The Intel® Turbo Boost & Hyper-Threading Technology 2.0 support depends on the CPU types.
	** Refer to www..com for Intel® CPU support list
Chipset	Intel® C621 PCH
Memory	12 x DIMM (6-channel per CPU, 6 DIMM per CPU), Max. 768 GB DDR4 2666* / 2400 / 2133 RDIMM / LR-DIMM / RDIMM 3Ds / LR-DIMM 3Ds
	RDIMM: 4GB, 8GB, 16GB, 32GB
	LRDIMM: 32GB, 64GB
	* Maximum memory capacity support depends on CPU type
	** Refer to www..com for the Memory QVL (Qualified Vendors Lists).
Expansion slots	3 x PCIe 3.0 x 16 slots (@x16 link)
	2 x PCIe 3.0 x 16 slots (single @ x16, dual @ x8/x8 link)
	2 x PCIe 3.0 x 16 slot (@x8 link)
VGA	Aspeed AST2500 64MB
	VGA Port (with Bracket)
	Supports VGA with Max. Resolution 1920 x 1200 @ 60Hz
Multi-GPU support	Supports NVIDIA® 4-Way SLI® Technology
	Supports AMD® 4-Way CrossFireX™ Technology
	* Actual numbers of Multi-graphic supported differs per Vendors' Graphic cards. Please check with Vendor beforehand.
Storage	**Intel® C621 with Intel® RSTe(for Windows only; Support software RAID 0, 1, 10 &5)**
	8 x SATA 6Gb/s ports (gray)
	ASMedia® SATA RAID Controller*
	2 x SATA 6Gb/s ports
	4 x U.2 Connectors
	1 x M.2 Socket 3, supporting type 2242/2260/2280/22110 (PCIe Gen 3 x4 and SATA mode)
	Supports Intel® Virtual RAID on CPU (Intel® VROC)**
	* The functions will work depending on the CPU installed.
	** H/W Key to be purchased separately, functions will depend on H/W Key purchased
LAN	2 x Intel® i210-AT Gigabit LAN Controller

Series specifications summary

Model Name		
USB	**ASMedia USB 3.1 Controllers** - 1 x USB 3.1 Type A port at back panel - 1 x USB 3.1 Type-C™ port at back panel" **Intel® C621 Chipset** - 8 x USB 3.0 (4@ back panel, 4@ mid-board) - 4 x USB 2.0 Ports (2@ back panel, 2@ mid-board)"	
Audio	**Realtek® ALC S1220A 8-Channel High Definition Audio CODEC** - Impedance sense for front and rear headphone outputs - Supports : Jack-detection, Multi-streaming, front Panel MIC Jack-retasking - High quality 120 dB SNR stereo playback output and 113 dB SNR recording input (Line-in) - Front panel audio connector (AAFP) - Supports up to 32-Bit/192kHz playback* **Audio Feature:** - DTS Connect - DTS Headphone:X - Premium Japanese-made audio capacitors: Provide warm, natural - Unique de-pop circuit: Reduces start-up popping noise to audio outputs - Power pre-regulator: Reduces power input noise to ensure consistent performance *** Due to limitations in HDA bandwidth, 32-Bit/192kHz is not supported for 8-Channel audio. 32-Bit/192kHz is only available under Windows® 10.**	
Workstation Unique Features	- 7 x PCIe x16 slots - 10K hours Capacitors - ProCool Power Connector - Dr. Mos - USB BIOS Flashback - Beat Thermal Choke - Digi+ VRM - PIKE card (Optional)	- 7 x PCIe x16 slots - 10K hours Capacitors - ProCool Power Connector - Dr. Mos - USB BIOS Flashback - Beat Thermal Choke - Digi+ VRM - PIKE card (Optional) - BMC Remote Management

(continued on the next page)

specifications summary

Model Name	
Rear Panel I/O Ports	2 x USB 3.1 (1 x Type-C™ and 1 x Type-A) 4 x USB 3.0 ports (blue) 2 x USB 2.0 ports (1 x USB 2.0 port supports USB BIOS Flashback) 1 x USB BIOS Flashback button 1 x PS/2 KB port 2 x LAN (RJ45) ports (2 x Intel® LAN) 1 x Optical S/PDIF Out port 8-channel Audio I/O
Internal I/O Connectors	2 x USB 3.0 connectors support additional 4 x USB 3.0 ports (19-pin) 1 x USB 2.0 connectors support additional 2 x USB 2.0 ports 4 x U.2 connectors 1 x M.2 Socket 3 10 x SATA 6.0Gb/s connectors (Gray) 2 x CPU Fan connectors (4-pin) 7 x Chassis Fan connectors (4-pin) (5 x front, 2 x rear) 1 x Serial Port headers (COM port header) 1 x VROC key header 1 x VGA connector 1 x Front panel audio connector(AAFP) 1 x System Panel header (20 pin) 1 x AUX panel header 1 x SMBus header 1 x Clear CMOS header 1 x TPM connector (14-1 pin) 2 x 8-pin EATX 12V Power connectors 1 x 6-pin EATX 12V_3 Power connector 1 x Power button 1 x Reset button 1 x Chassis intrusion (2-pin)

specifications summary

Model Name		
Special Features	**CPU Power** - Digital 7 + 1 Phase Power Design **DRAM Power** - Digital 2 Phase Power Design **Dual Front Panel USB 3.0 Support** **Q-Design** - Q-Code (80 port) - Q-Shield - Q-Slot - Q-DIMM **EZ DIY** - CrashFree BIOS 3 - EZ Flash Utility - MyLogo 2 - Multi-language BIOS **TPM header** **UEFI BIOS** - Most advanced options with fast response time **SafeSlot Designed** - Protect your graphics card Investment	
BIOS Features	256 Mb Flash ROM, UEFI BIOS, PnP, WfM2.0, SMBIOS 2.6.1, ACPI 3.0, EZ Flash Utility, CrashFree Technology	
Manageability	WfM 2.0, DMI 2.0, WOL by PME, PXE	
Operating System	Windows® Server 2016 64-bit Windows® Server 2012 R2 64-bit Windows® Server 2012 64-bit Windows® 10 64-bit	
Form Factor	EEB Form Factor, 12"x 13"	

- Specifications are subject to change without notice.
- Visit the website for the software manual.

Package contents

Check your motherboard package for the following items.

Motherboard	Series
Cables	10 x Serial ATA 6Gb/s cables
	1 x VGA bracket cable
	1 X USB 2.0 bracket cable
Accessories	1 x M.2 screws kit
	1 x 4-Way SLI™ bridge 1 x
	3-Way SLI™ bridge 1 x SLI™
	bridge
	1 x COM port brackets
	1 X I/O Shield
Application DVD	Motherboard support DVD
Documentation	User manual

If any of the above items is damaged or missing, contact your retailer.

Installation tools and components
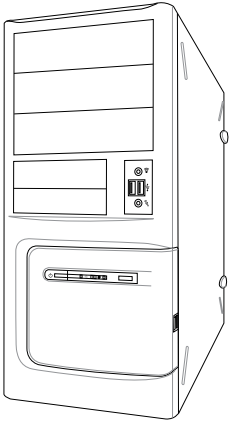
PC chassis
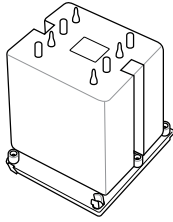
Intel® LGA3647 compatible CPU Fan
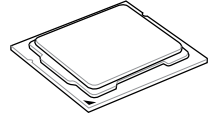
Intel® LGA3647 CPU
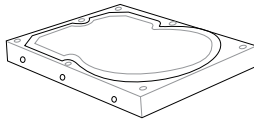
SATA hard disk drive

Phillips (cross) screwdriver
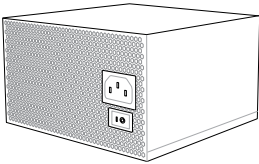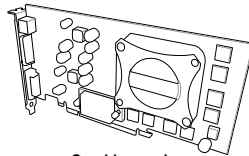
Power supply unit
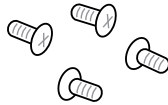
1 bag of screws
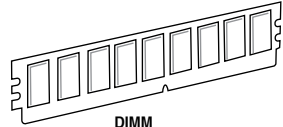
DIMM
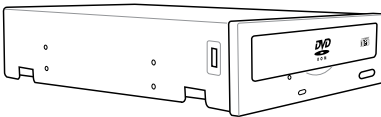
SATA optical disc drive (optional)

Graphics card

The tools and components in the table above are not included in the motherboard package.

# Product Introduction

1

1.1 Motherboard overview

1.1.1 Before you proceed

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

- Unplug the power cord from the wall socket before touching any component.

- Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.

- Hold components by the edges to avoid touching the ICs on them.

- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.

- Before you install or remove any component, ensure that the ATX 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, or components.
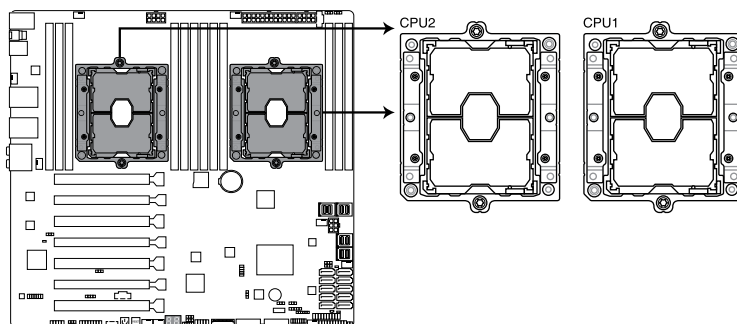
1.1.2 Motherboard layout
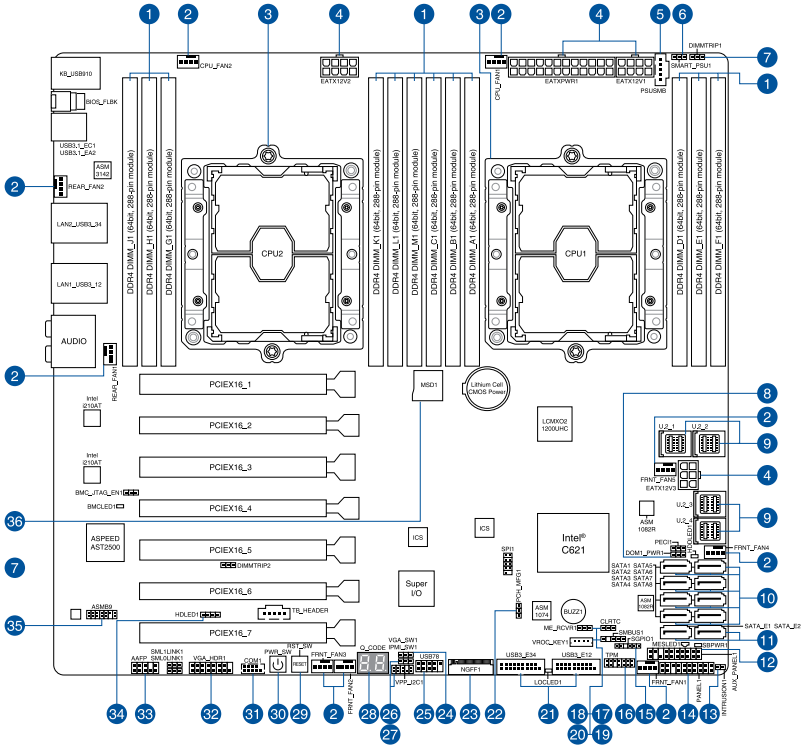
Refer to **1.1.9 Internal connectors** and **2.3.1 Rear I/O connection** for more information about rear panel connectors and internal connectors.

Layout contents

1.1.3   Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA 3647 socket designed for the Intel® Xeon® Skylake-SP product family series processors.

> Ensure that you install the correct CPU designed for LGA3647 socket only. DO NOT install a CPU designed for other sockets on the LGA3647 socket.

> • Ensure that all power cables are unplugged before installing the CPU.
>
> • 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. will shoulder the cost of repair only if the damage is shipment/transit-related.
>
> • Keep the cap after installing the motherboard. will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA3647 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.

1.1.4   System memory

The motherboard comes with twelve (12) DDR 4 (Double Data Rate 4) Dual Inline Memory Modules (DIMM) slots.

> ⚠️ A DDR4 module is notched differently from a DDR, DDR2 or DDR3 module. DO NOT install a DDR, DDR2 or DDR3 memory module to the DDR4 slot.
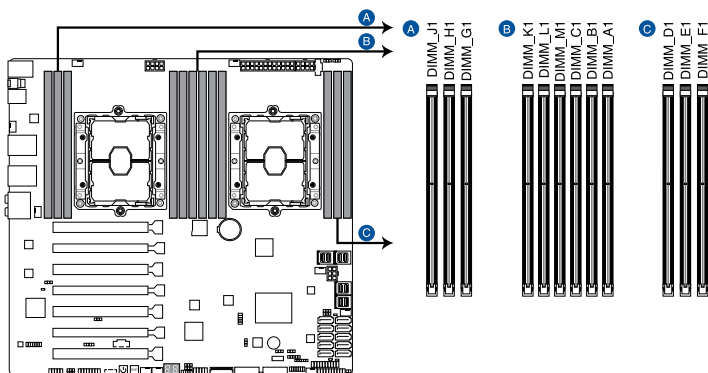
288-pin DDR4 DIMM sockets

Memory configurations

You may install 4 GB, 8 GB, 16 GB, and 32 GB RDIMMs; and 32 GB, and 64 GB LRDIMMs into the DIMM sockets.

> 🖉
> • For system stability, use a more efficient memory cooling system to support a full memory load (12 DIMMs) or overclocking condition.
>
> • Always install the DIMMS with the same CAS Latency. For an optimum compatibility, we recommend that you install memory modules of the same version or data code (D/C) from the same vendor. Check with the vendor to get the correct memory modules.
>
> • Visit the website for the latest QVL.

Single CPU configuration

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

Single CPU configuration (must be installed on CPU1)					
	A1	B1	C1	D1	E1	F1
1 DIMM	✓	-	-	-	-	-
2 DIMMs	✓	✓	-	-	-	-
4 DIMMs	✓	✓	-	✓	-	✓
6 DIMMs	✓	✓	✓	✓	✓	✓

Dual CPU configuration

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

Dual CPU configuration											
	A1	B1	C1	D1	E1	F1	G1	H1	J1	K1	L1	M1
2 DIMMs	✓	-	-	-	-	-	✓	-	-	-	-	-
4 DIMMs	✓	✓	-	-	-	-	✓	✓	-	-	-	-
6 DIMMs	✓	✓	✓	-	-	-	✓	✓	✓	-	-	-
8 DIMMs	✓	✓	-	✓	✓	-	✓	✓	-	✓	✓	-
12 DIMMs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

1.1.5 Expansion slots

Unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.
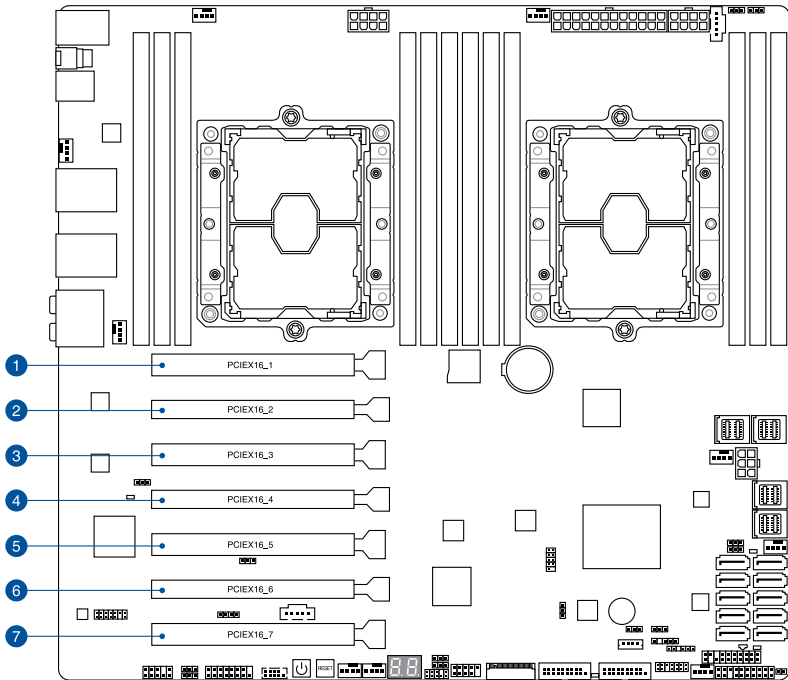
Slot No.	Slot Description
1	PCIe x16_1 slot
2	PCIe x16_2 slot
3	PCIe x16_3 slot
4	PCIe x16_4 slot (max. at x8 mode)
5	PCIe x16_5 slot
6	PCIe x16_6 slot
7	PCIe x16_7 slot

PCI Express 3.0 operating mode				
Slot No.	Single VGA	2-way SLI® / CrossFireX™	3-way SLI® / CrossFireX™	4-way SLI® / CrossFireX™
1	-	-	x16	x16
2	-	-	-	-
3	x16 (single VGA recommended)	x16	x16	x16
4	-	-	-	-
5	-	x16	x16	x16
6	-	-	-	-
7	-	-	-	x16

We recommend that you provide   power when running CrossFireX™ or SLI®
mode.

1.1.6   Onboard buttons and switches

Onboard buttons and switches allow you to   performance when working on a bare or open-case system. This is ideal for overclockers and gamers who continually change settings to enhance system performance.

1.   Power-on button

The motherboard comes with a power-on button that allows you to power up or wake up the system. The button also lights up when the system is plugged to a power source indicating that you should shut down the system and unplug the power cable before removing or installing any motherboard component.

PWR_SW
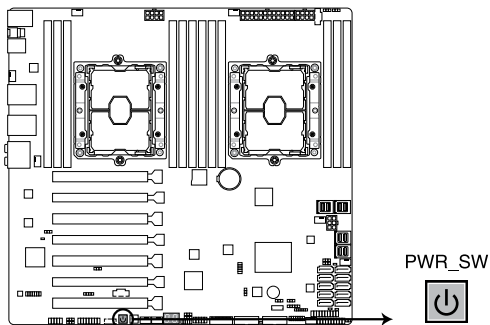
2.   Reset button

Press the reset button to reboot the system.

RST_SW
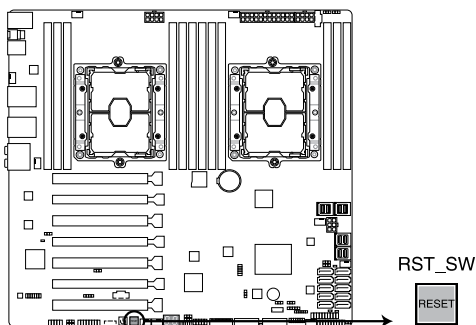
1.1.7 Jumpers

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 pins 1–2 (default) to pins 2–3. Keep the cap on pins 2–3 for about 5–10 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 reenter data.

Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!
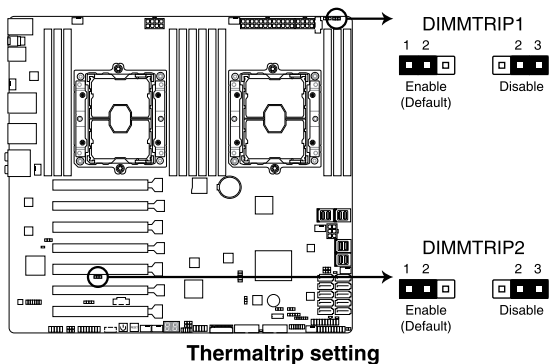
If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After the CMOS clearance, reinstall the battery.

CLRTC1

1 2   2 3

Normal   Clear CMOS
(Default)

Clear RTC RAM
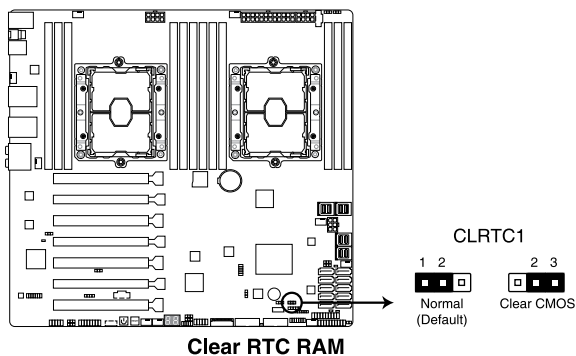
2. **DDR4 thermal event setting (3-pin DIMMTRIP1-2)**

   These jumpers allow you to enable or disable DDR4 DIMM thermal sensing event pin.


Thermaltrip setting

3. **SATADOM power setting (3-pin DOM1_PWR1)**

   This jumper allows SATA5 and SATA6 to support SATADOM which do not need external power connections. Set to pins 2-3 to activate the SATA8 support feature.

DOM1_PWR1 setting
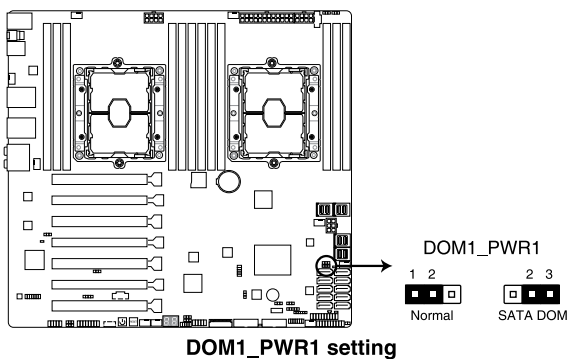
4.   **PMBus 1.2 PSU select jumper (3-pin SMART_PSU1)**

This jumper allows you to select PSU PMBus version. Set to pins 1–2 for PMBus, set to pins 2–3 for others.
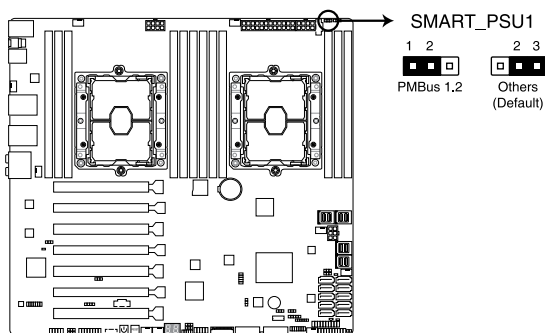
PMBus 1.2 PSU setting

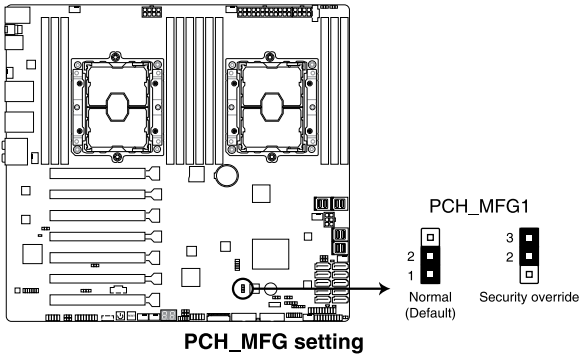5.   **ME firmware force recovery setting (3-pin ME_RCVR1)**

This jumper allows you to quickly recover the Intel Management Engine (ME) when it becomes corrupted.
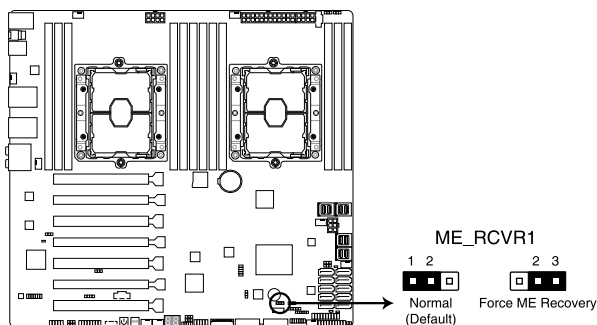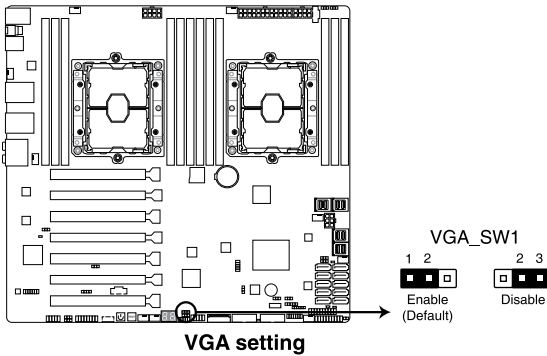

ME recovery setting

6.   PCH_MFG1 setting (3-pin PCH_MFG1)

This jumper allows you to update the BIOS ME block.

PCH_MFG setting

PCH_MFG1

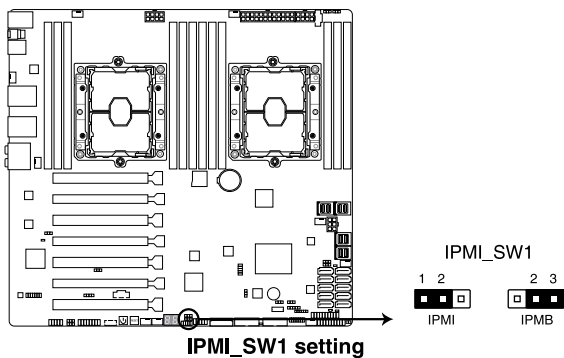Normal (Default)   Security override

7.   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 setting

VGA_SW1

Enable (Default)   Disable

8. **IPMI SW setting (3-pin IPMI_SW1)**

This jumper allows you to select which protocol in the GPU sensor to function.

IPMI_SW1 setting

1.1.8   Onboard LEDs

1.   Standby Power LED (SBPWR1)

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.


SBPWR1

ON
Standby Power

OFF
Powered Off

Standby Power LED
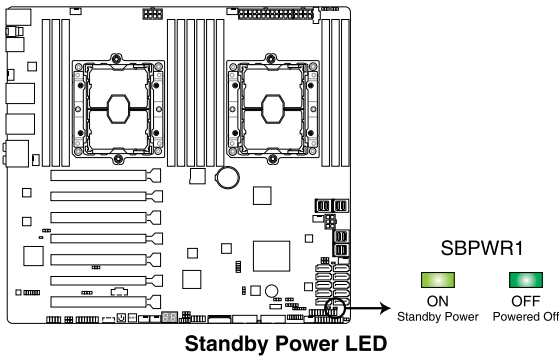
2.   Location LED (LOCLED1)

This onboard LED lights up when the Location button on the server is pressed or when triggered by a system management software. The Location LED helps visually locate and quickly identify the server in error on a server rack.


LOCLED1

Location LED
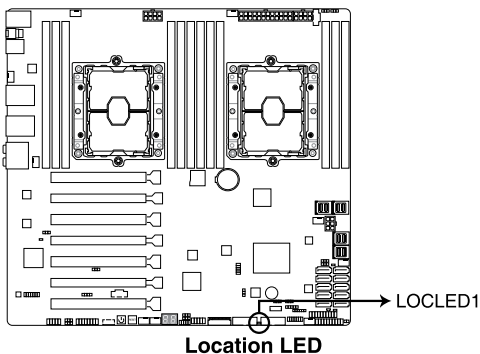
3. **Hard disk activity LED (HDDLED1)**

    This LED is for the storage devices connected to the onboard SATA, or SATA/SAS add-on card. The read or write activities of any device connected to the onboard SATA, or SATA/SAS add-on card causes the rear panel LED to light up.

    HDDLED1

    HDD LED
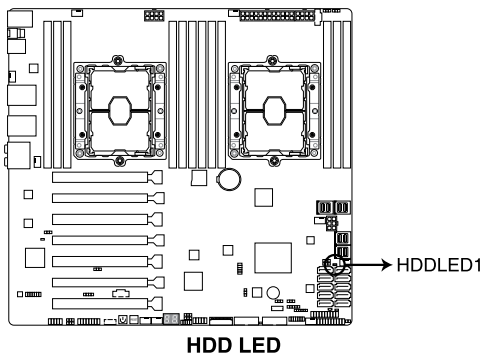
4. **Baseboard Management Controller LED (BMCLED1)**
   **(for (BMC) only)**

    The BMC LED works with the ASMB management device and indicates its initiation status. When the PSU is plugged and the system is OFF, ASMB management device starts system initiation for about one (1) minute. The BMC LED blinks after system initiation finishes.

    BMCLED1

    BMC LED
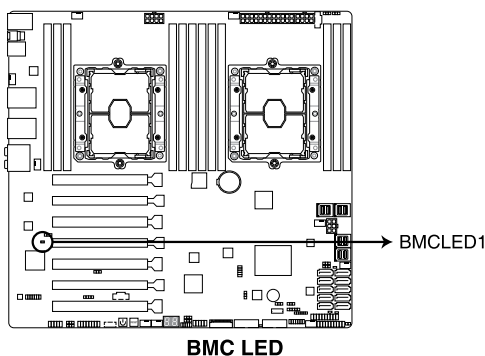
    This LED is only enabled for the (BMC) model.

5. Q-Code LEDs

The Q-Code LED design provides you with a 2-digit error code that displays the system status. Refer to the Q-Code table on the next page for details.
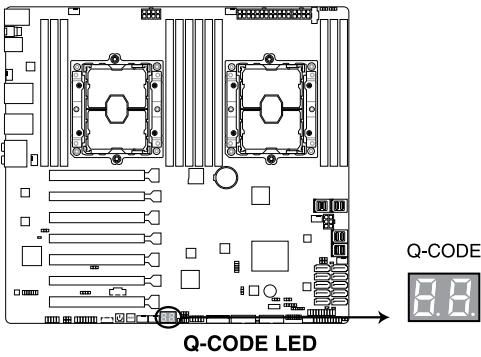
Q-CODE

Q-CODE LED

- The Q-Code LEDs provide the most probable cause of an error code as a starting point for troubleshooting. The actual cause may vary from case to case.
- Please refer to the Q-Code table in the **Appendix** section for more details.

1.1.9 Internal connectors

1. **Intel® C621 Serial ATA 6 Gb/s connectors (7-pin SATA1-8)**

   These connectors connect to Serial ATA 6 Gb/s hard disk drives via Serial ATA 6 Gb/s signal cables.

   If you installed Serial ATA hard disk drives, you can create a RAID 0, 1, 5, and 10 with the Intel® Rapid Storage Technology enterprise (Intel® RSTe) through the onboard Intel® C621 chipset.
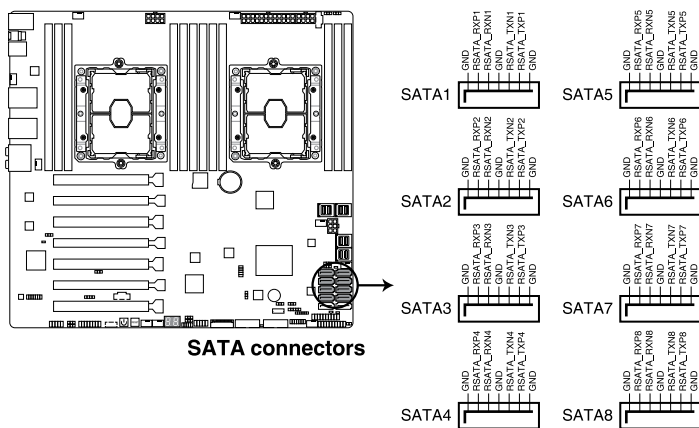
SATA connectors

> • These connectors are set to **[AHCI Mode]** by default. If you intend to create a Serial ATA RAID set using these connectors, set the SATA Mode item in the BIOS to **[Intel RST Premium With Intel Optane System Acceleration (RAID)]**.
>
> • These SATA ports are for data drives only.

2. **ASMedia® Serial ATA 6 Gb/s connectors (7-pin SATA_E1-2)**

   These connectors connect to Serial ATA 6 Gb/s hard disk drives via Serial ATA 6 Gb/s signal cables.

ASMedia® SATA 6 Gb/s connectors
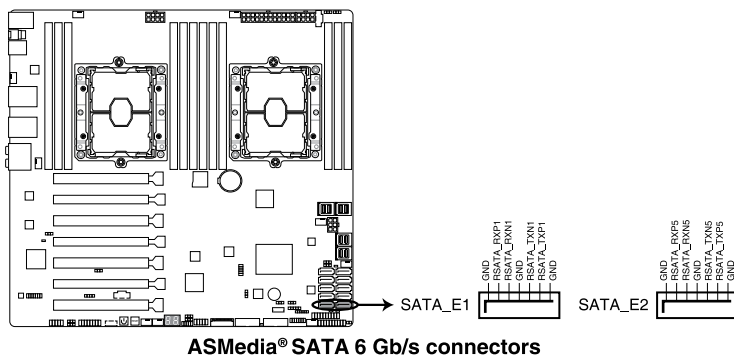
3. **Front panel audio connector (10-1 pin AAFP)**

    This connector is for a chassis-mounted front panel audio I/O module that supports HD Audio. Connect one end of the front panel audio I/O module cable to this connector.


Front panel audio connector
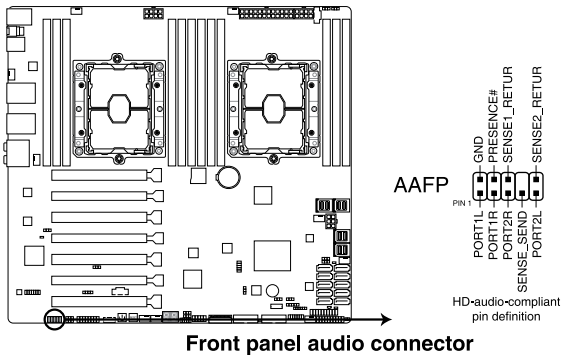
> We recommend that you connect a   front panel audio module to this
> connector to avail of the motherboard's   audio capability.

4. **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.


Hard disk activity LED connector
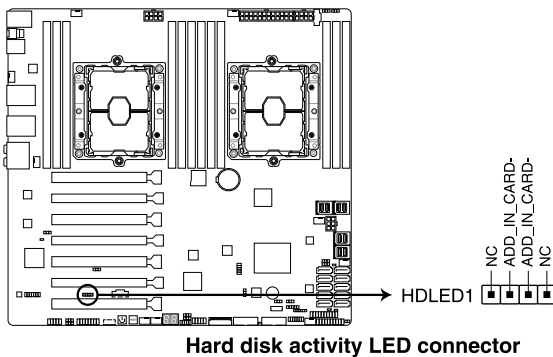
5.   **Chassis intrusion connector (2-pin INTRUSION1)**

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 to short the CHASSIS# and the GND pin by a jumper cap to disable the function.

Chassis Intrusion connector
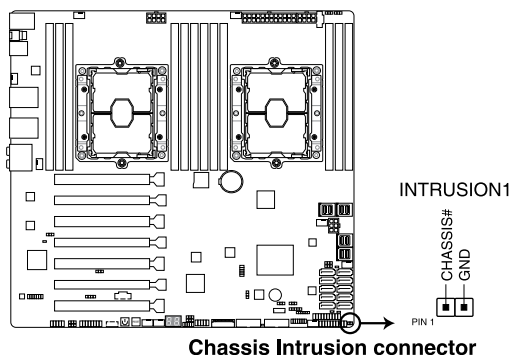
6.   **TPM connector (14-1 pin TPM1)**

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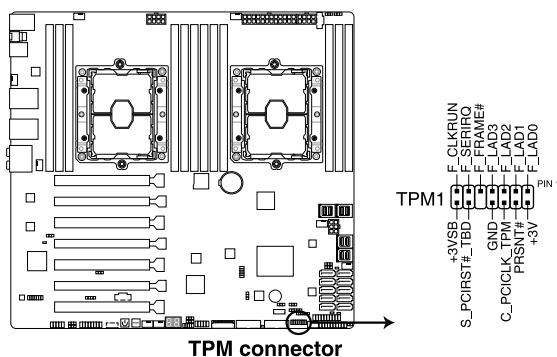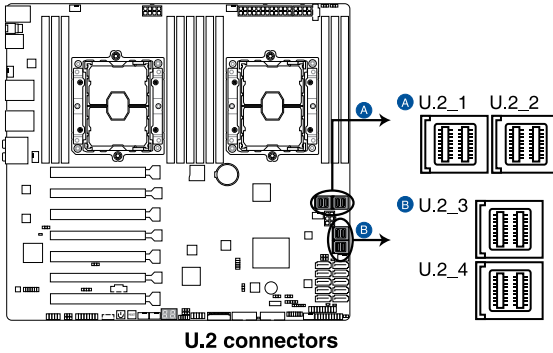

TPM connector

The TPM module is purchased separately.

7. **VGA connector (16-1 pin VGA_HDR1)**

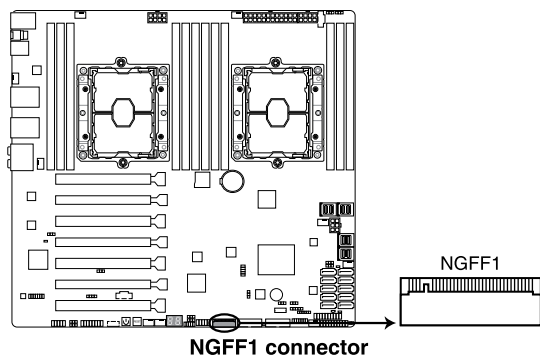This connector supports the VGA High Dynamic-Range interface.

Internal VGA connector
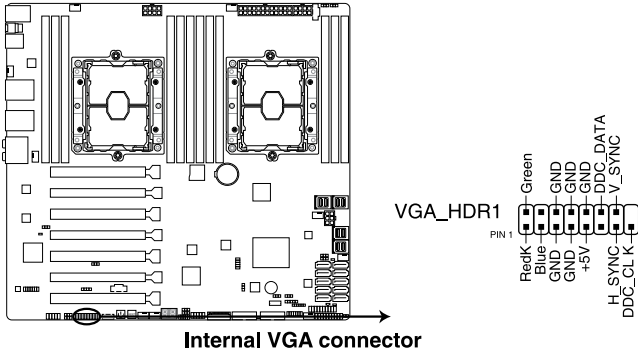
8. **U.2 connectors (U.2_1; U.2_2; U.2_3; U.2_4)**

This motherboard comes with U.2 connectors which support PCIe 3.0 x4 NVM Express storage.
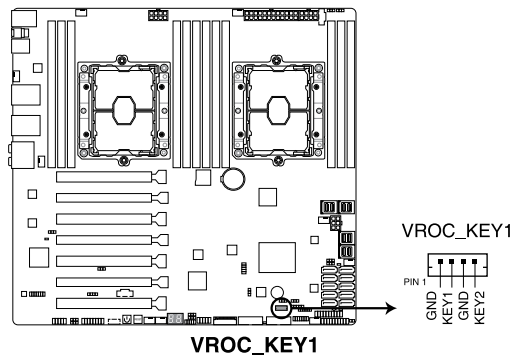

U.2 connectors

9. **M.2 (NGFF) connectors (NGFF1)**

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

NGFF1 connector

- This socket supports M Key and type 22110/2280/2260/2242 storage devices.
- This socket supports PCIe and SATA modes.
- The M.2 (NGFF) device is purchased separately.

10. **VROC_KEY connector (4-pin VROC_KEY1)**

This connector allows you to connect a KEY module to enable CPU RAID functions with Intel® CPU RSTe.

VROC_KEY1

The KEY module is purchased separately.

11. **USB 2.0 connector (10-1 pin USB78)**

These connectors are for USB 2.0 ports. Connect the USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0   that supports up to 480 Mbps connection speed.
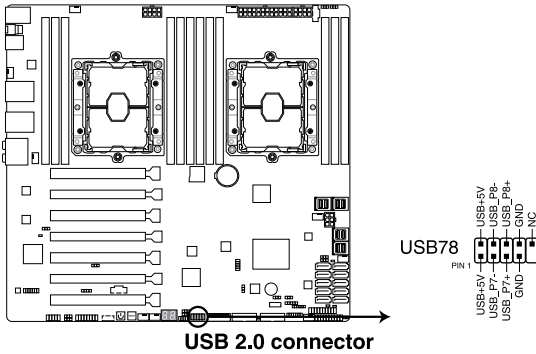
USB 2.0 connector

DO NOT connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

12.   USB 3.0 connector (20-1 pin USB3_E12; 20-1 pin USB3_E34)

These connectors allow 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   of USB 3.0 including faster data transfer speeds of up to 5 Gb/s, faster charging time for USB-chargeable devices, optimized power   and backward compatibility with USB 2.0.
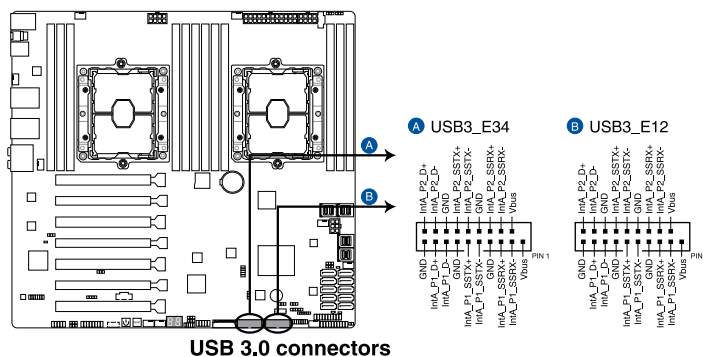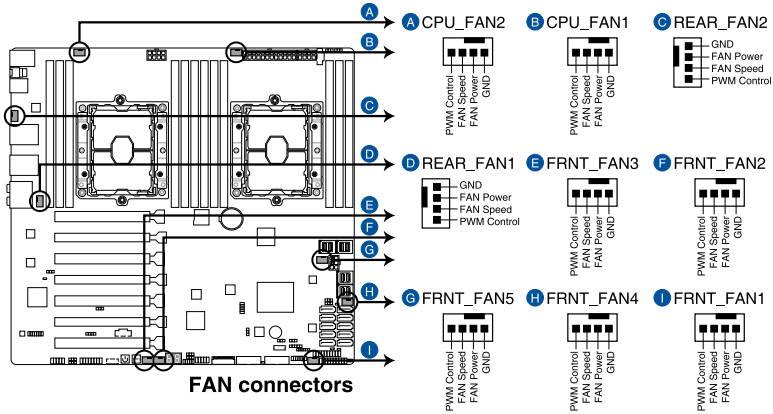

USB 3.0 connectors

The USB 3.0 module is purchased separately.

The plugged USB 3.0 device may run on xHCI or EHCI mode depending on the operating system's setting.

13. **CPU, front, and rear fan connectors (4-pin CPU_FAN1-2; 4-pin FRNT_FAN1-5; 4-pin REAR_FAN1-2)**

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.

FAN connectors

A CPU_FAN2   B CPU_FAN1   C REAR_FAN2

D REAR_FAN1   E FRNT_FAN3   F FRNT_FAN2

G FRNT_FAN5   H FRNT_FAN4   I FRNT_FAN1

- DO NOT forget to connect the fan cables to the fan connectors.   air inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!

- Ensure that the CPU fan cable is securely installed to the CPU fan connector.

The CPU_FAN connector supports the CPU fan of maximum 1A (12 W) fan power.

14. **System panel connector (20-1 pin PANEL1)**

This connector supports several chassis-mounted functions.

System panel connector
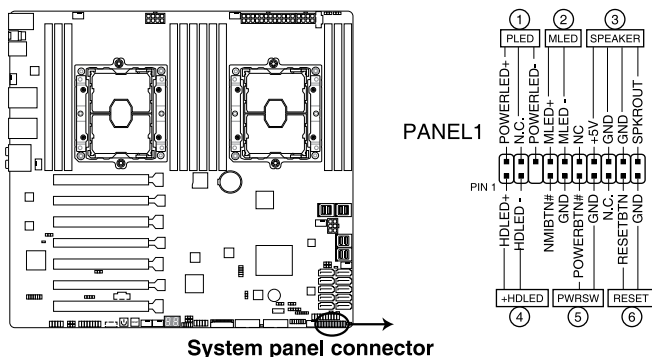
1. **System power LED (3-pin PLED)**

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 the BMC to indicate an abnormal event occurrence.

This connector may be disabled depending on the model.

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 HDLED)**

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

5. **ATX 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 operating system 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.

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

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

Auxiliary panel connector
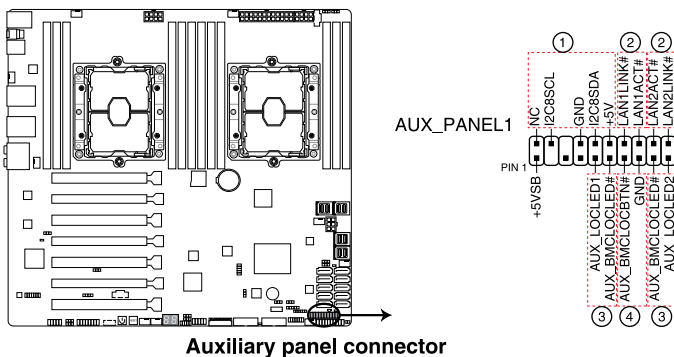
1.   Front panel SMB (6-1 pin FPSMB)

This connector connects the front panel SMBus cable.

2.   LAN activity LED (2-pin LAN1_LED, LAN2_LED)

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

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

This connector is for the locator button on the front panel. This button queries the state of the system locator.

16. **ATX power connectors (24-pin EATXPWR; 8-pin EATX12V1; 8-pin EATX12V2; 6-pin EATX12V3)**

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


ATX power connectors
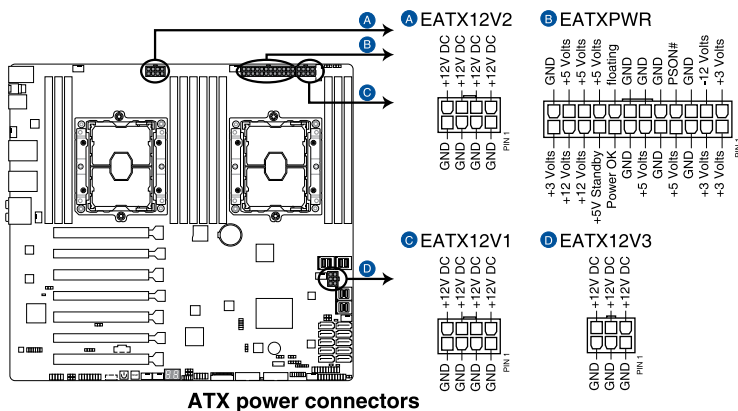
Ensure to connect the 8-pin power plug, or connect both the 8-pin and 6-pin power plugs.

- For a fully   system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V   2.0 (or later version) and provides a minimum power of 350 W.

- DO NOT forget to connect the 8-pin EATX12V1/EATX12V2 power plugs. Otherwise, the system will not boot.

- We recommend that you use a PSU with a higher power output when   a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

- If you want to use two or more high-end PCI Express x16 cards, use a PSU with 1000W power or above to ensure the system stability, and recommend connecting the 6-pin EATX12V3 power plug.

17. **Power Supply SMBus connector (5-pin PSUSMB)**

    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.
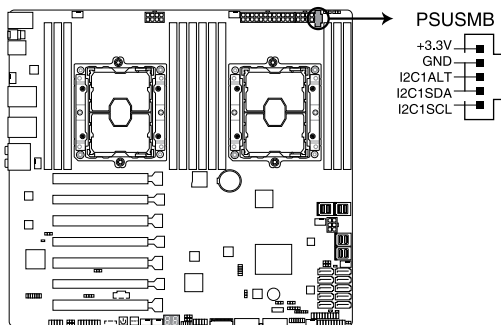

Power supply SMBus connector

This connector functions only when you enable the ASMB card.

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

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

    This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.
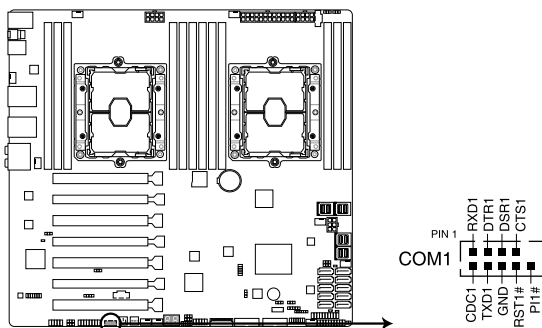
Serial port connector

The COM module is purchased separately.

19. **VPP_I2C1 connector (10-1 pin VPP_I2C1)**

    This connector is used for the Intel VMD function and sensor readings.

VPP_I2C1

VPP_I2C1 connector
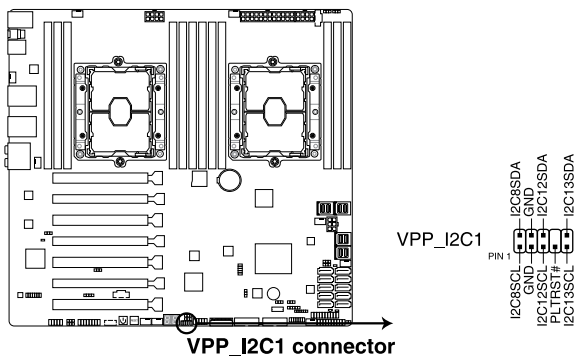
20. **System Management Bus (SMBUS) connector (5-1 pin SMBUS1)**

    This connector controls the system and power management-related tasks. This connector processes the messages to and from devices rather than tripping the individual control lines.

SMBUS1

SMBUS connector
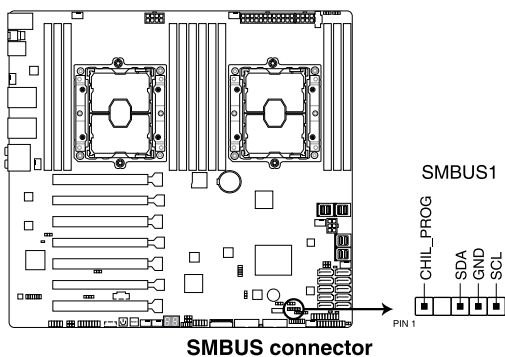
21. Serial General Purpose Input/Output connector (6-1 pin SGPIO1)

The SGPIO 1 connector is used for the Intel Rapid Storage Technology Enterprise SGPIO interface that controls the LED pattern generation, device information, and general purpose data.

SGPIO1 connector
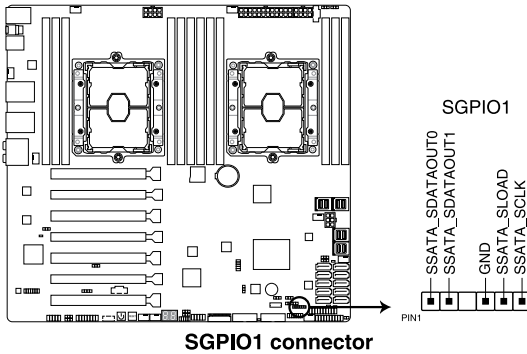
22. BMC connector (14-1 pin ASMB9) (for (BMC) only)
The BMC connector on the motherboard supports an ® Server Management Board card.
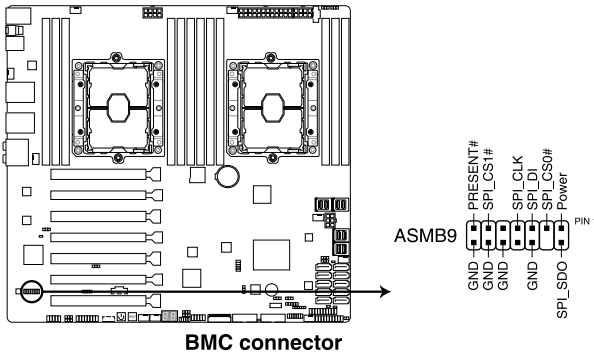
BMC connector

• This connector is only enabled for the (BMC) model.

• The Baseboard Management Card is only available with the (BMC) model.

The image shows a motherboard diagram with a micro SD card. The left margin has "Chapter 1" vertically.

23. Micro SD card slot (MSD1) (for (BMC) only)

Your motherboard supports SD Memory Card v2.00 (SDHC) / v3.00 (SDXC).

MSD1
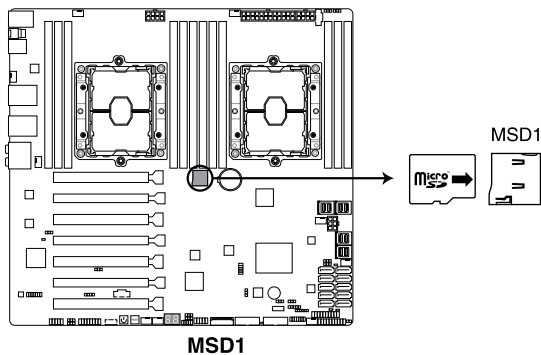
Some memory cards may not be compatible with your motherboard. Ensure that you use only compatible memory cards to prevent loss of data, damage to your device, or memory card, or both.

Basic Installation

2

2.1 Building your PC system

![note icon] The diagrams in this section are for reference only. The motherboard layout may vary with models, but the installation steps are the same for all models.

2.1.1 CPU and heatsink installation

![warning icon]
- Ensure that you install the correct CPU designed for LGA3647 socket only.

- 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. will shoulder the cost of repair only if the damage is shipment/transit-related.

- 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.

1

2

Triangle mark
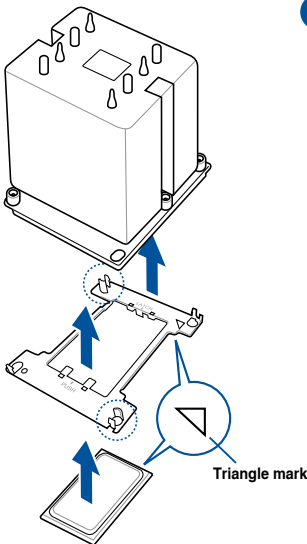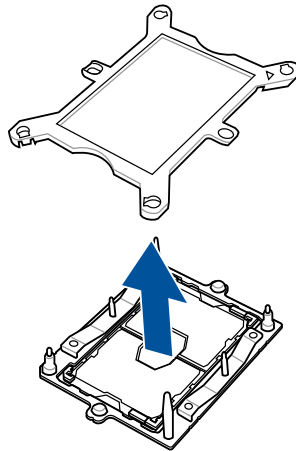
![warning icon] Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan, if necessary.
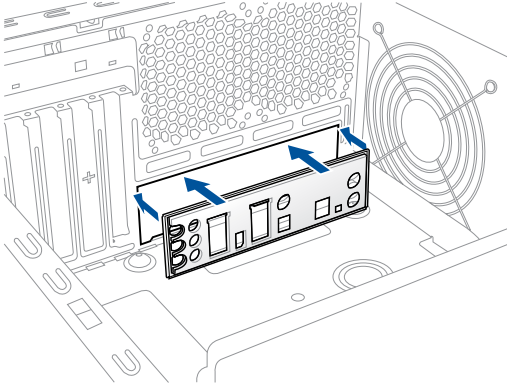
3
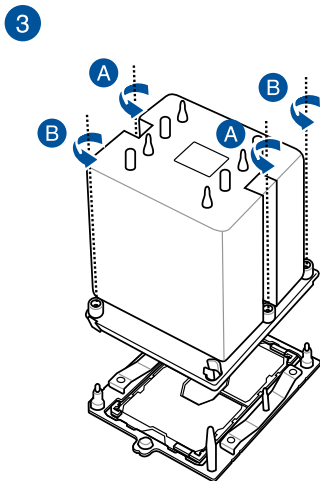
The CPU and heatsink assembly   in only one correct orientation. DO NOT force the CPU and heatsink assembly into the socket to prevent damaging the CPU pins on the socket.
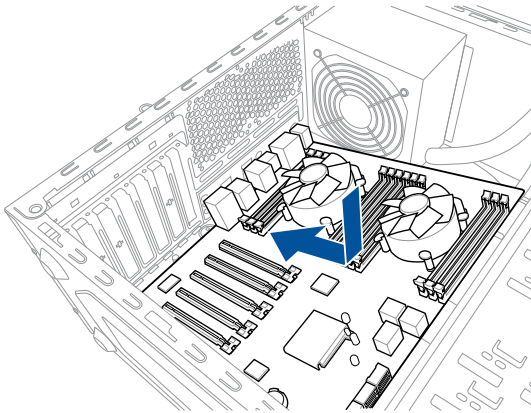
The heatsink screws are T30 models. A torque value of 12 inch-lbf is recommended.
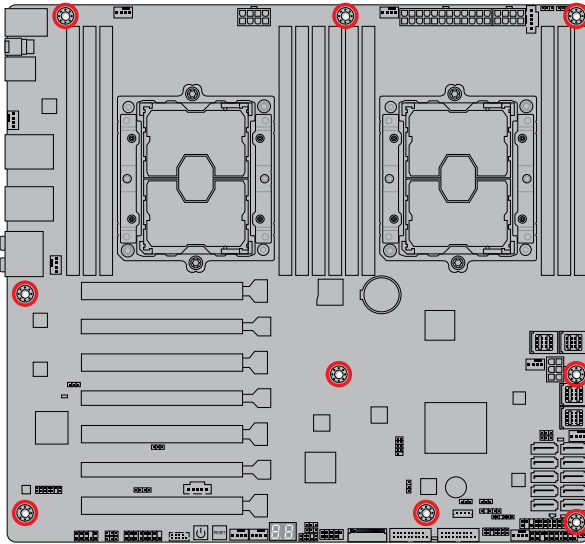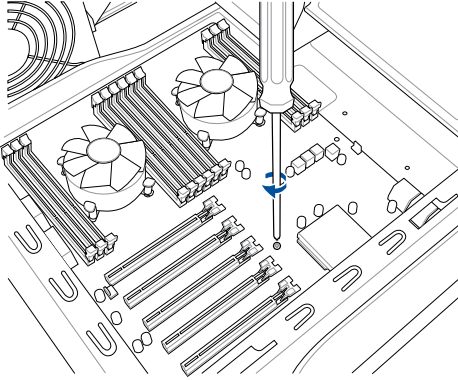
2.1.2 Motherboard installation

1. Install the Q-Shield to the chassis rear I/O panel.

2. Place the motherboard into the chassis, ensuring that its rear I/O ports are aligned to the chassis' rear I/O panel.
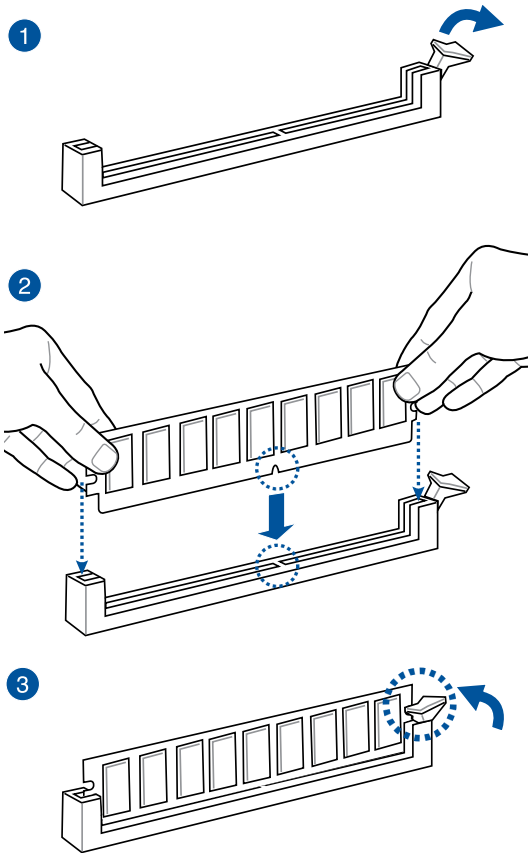
3.   Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.
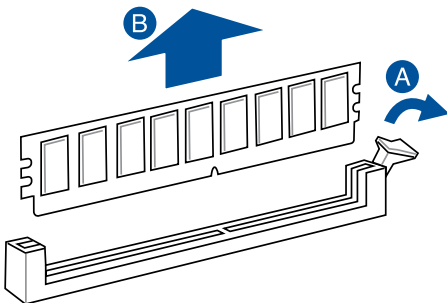

DO NOT overtighten the screws! Doing so can damage the motherboard.
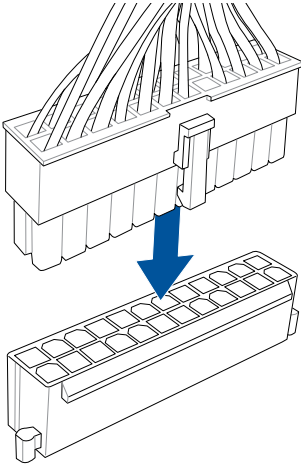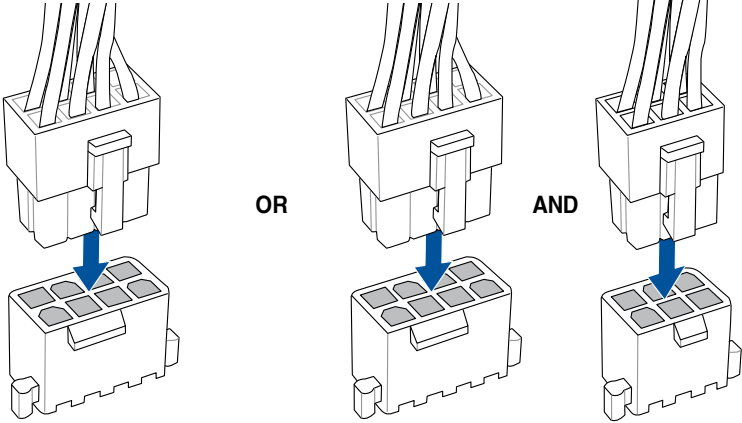
2.1.3   DIMM installation
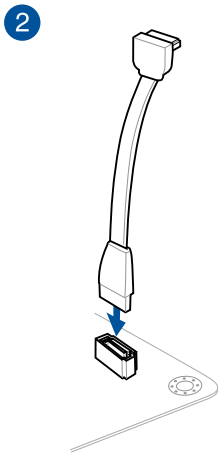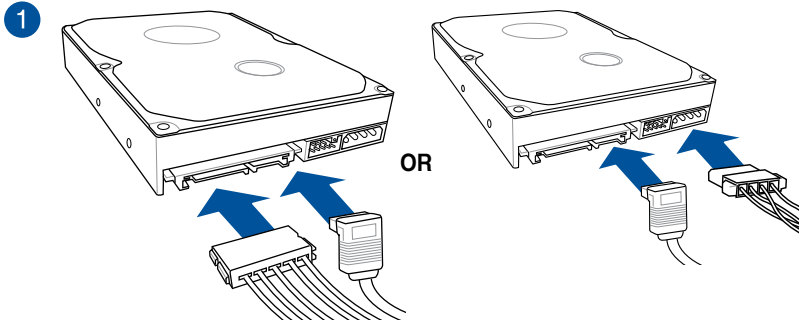

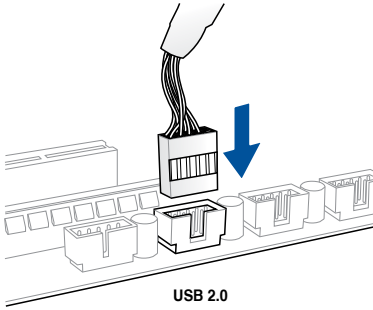**To remove a DIMM**

2.1.4 ATX power connection

- DO NOT connect the 6-pin power plug only, the motherboard may overheat under heavy usage.

- Ensure to connect the 8-pin power plug, or connect both the 8-pin and 6-pin power plugs.

2.1.5   SATA device connection

OR

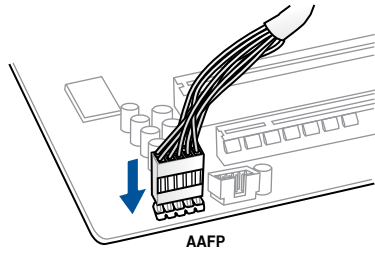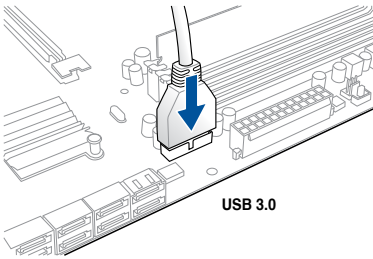### 2.1.6   Front I/O connector

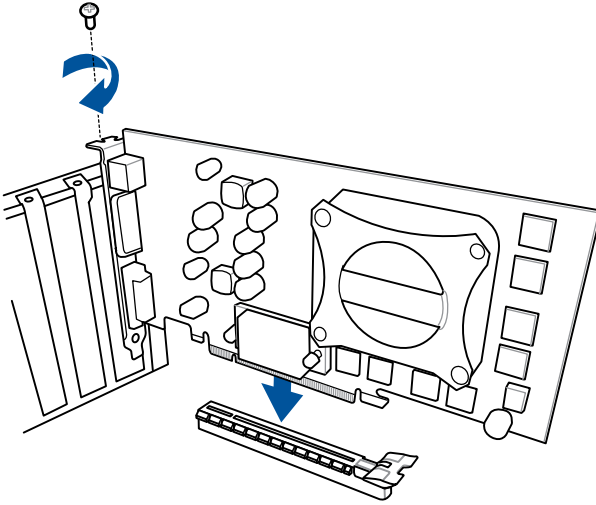**To install USB 2.0 connector**

To install front panel audio connector

USB 2.0

AAFP

To install USB 3.0 connector

USB 3.0

Chapter 2

2.1.7   Expansion card installation

To install PCIe x16 cards

2.2 BIOS update utility

USB BIOS Flashback

USB BIOS Flashback allows you to easily update the BIOS without entering the existing BIOS or operating system. Simply insert a USB storage device to the USB port (the USB port hole marked in green on the I/O shield) then press the USB BIOS Flashback button for three seconds to automatically update the BIOS.

To use USB BIOS Flashback:

1. Insert a USB storage device to the USB Flashback port.

> We recommend you to use a USB 2.0 storage device to save the latest BIOS version for better compatibility and stability.

2. Visit https://www..com/support/ and download the latest BIOS version for this motherboard.

3. Rename the file as **WSC621ES.CAP**, then copy it to your USB storage device.

4. Shut down your computer.

5. Press the BIOS Flashback button for three seconds until the Flashback LED blinks three times, indicating that the BIOS Flashback function is enabled.

USB BIOS Flashback port

USB BIOS Flashback button
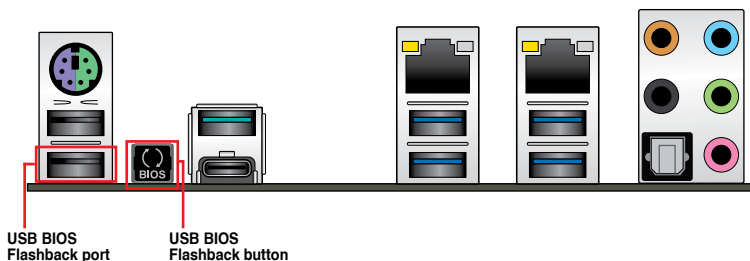
6. Wait until the light goes out, indicating that the BIOS updating process is completed.

> For more BIOS update utilities in BIOS setup, refer to the section **3.11 Updating BIOS** in Chapter 3.

> *   Do not unplug portable disk, power system, or press the CLR_CMOS button while BIOS update is ongoing, otherwise update will be interrupted. In case of interruption, please follow the steps again.
>
> *   If the light flashes for five seconds and turns into a solid light, this means that the BIOS Flashback is not operating properly. This may be caused by improper installation of the USB storage device and filename/file format error. If this scenario happens, please restart the system to turn off the light.
>
> *   Updating BIOS may have risks. If the BIOS program is damaged during the process and results to the system's failure to boot up, please contact your local Service Center.

2.3 Motherboard rear and audio connections

2.3.1 Rear I/O connection
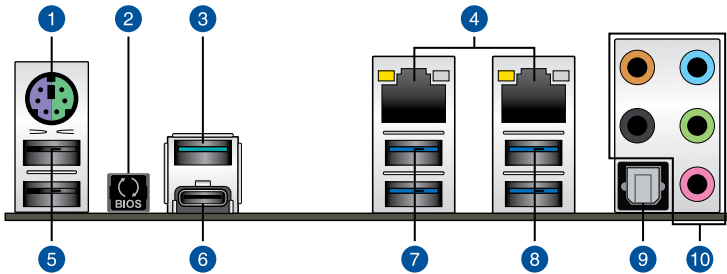
| Rear panel connectors |
| --- |
| 1. PS/2 and keyboard Mouse port |
| 2. USB BIOS Flashback button |
| 3. USB 3.1 Type-A port EA2 |
| 4. LAN (RJ-45) ports 1, 2* |
| 5. USB 2.0 ports 9, 10. Lower port supports USB BIOS Flashback function. |
| 6. USB 3.1 Type-C™ port EC1 |
| 7. USB 3.0 ports 3, 4 |
| 8. USB 3.0 ports 1, 2 |
| 9. Optical S/PDIF OUT port |
| 10.. Audio I/O ports** |

* and **: Refer to the tables on the next page for LAN port LEDs and audio port definitions.

- USB 3.0/3.1 devices can only be used as data storage only.

- We strongly recommend that you connect your devices to ports with matching data transfer rate. Please connect your USB 3.0 devices to USB 3.0 ports and your USB 3.1 devices to USB 3.1 ports for faster and better performance for your devices.

* LAN ports LED indications

| Activity Link LED		Speed LED	
Status	**Description**	**Status**	**Description**
Off	No link	Off	10 Mbps connection
Orange	Linked	Orange	100 Mbps connection
Orange (Blinking)	Data activity	Green	1 Gbps connection
Orange (Blinking then steady)	Ready to wake up from S5 mode		

ACT/LINK LED   SPEED LED

LAN port
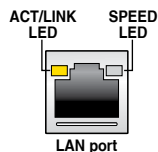
** Audio 2, 4, 6 or 8-channel configuration

| Port	Headset 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Side Speaker Out
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In	Mic In
Orange	–	–	Center/Sub woofer	Center/Sub woofer
Black	–	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out

2.3.2 Audio I/O connections
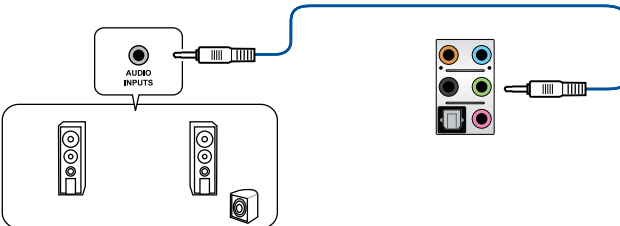
Audio I/O ports
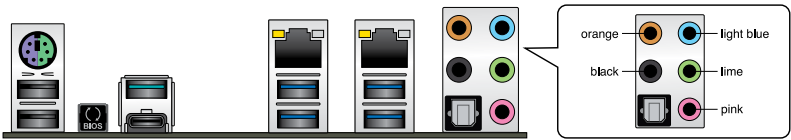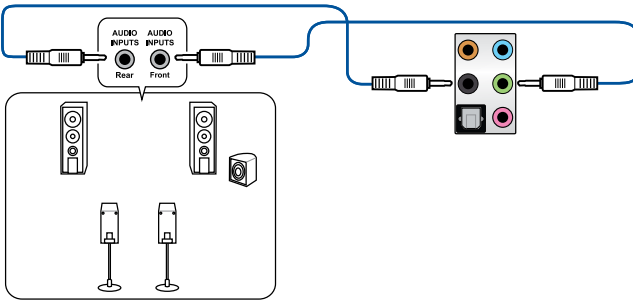

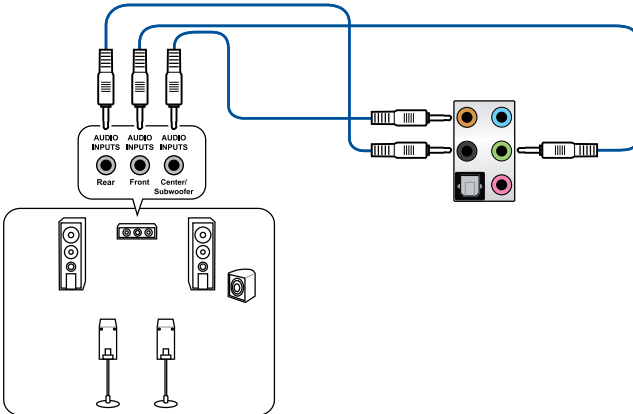**Connect to Headphone and Mic**
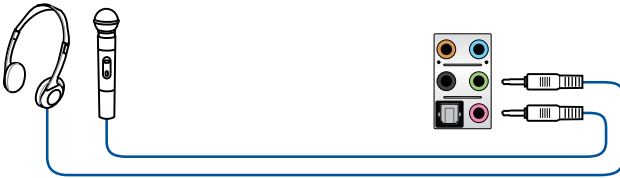
Connect to Stereo Speakers
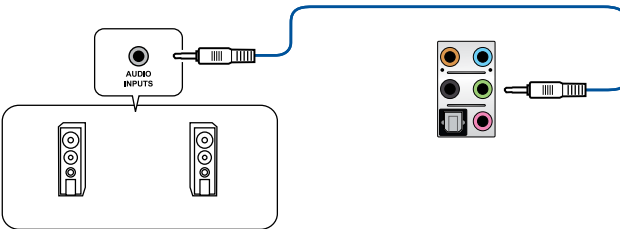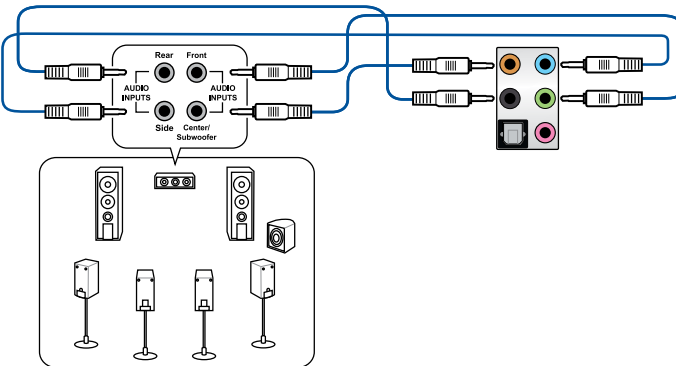

Connect to 2 Speakers

Connect to 4 Speakers

Connect to 6 Speakers

Connect to 8 Speakers

2.4　Starting up for the first time

1. After making all the connections, replace the system case cover.

2. Ensure that all switches are off.

3. Connect the power cord to the power connector at the back of the system chassis.

4. Connect the power cord to a power outlet that is equipped with a surge protector.

5. Turn on the devices in the following order:

    a. Monitor

    b. External storage devices (starting with the last device on the chain)

    c. System power

6. After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with the "green" standards or if it has a "power standby" feature, the monitor LED may light up or change from orange to green after the system LED turns on.

    The system then runs the power-on self tests (POST). While the tests are running, the BIOS beeps (refer to the BIOS beep codes table) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

BIOS Beep	Description
One short beep	VGA detected
	Quick boot set to disabled
	No keyboard detected
One continuous beep followed by two short beeps then a pause (repeated)	No memory detected
One continuous beep followed by three short beeps	No VGA detected
One continuous beep followed by four short beeps	Hardware component failure

7. At power on, hold down the <Delete> key to enter the BIOS Setup. Follow the instructions in Chapter 3.

2.5　Turning off the computer

While the system is ON, press the power button for less than four seconds to put the system on sleep mode or soft-off mode, depending on the BIOS setting. Press the power switch for more than four seconds to let the system enter the soft-off mode regardless of the BIOS setting.