ASRock Rack

X570D4U-2L2T

X570D4U

User Manual

Chapter 1 Introduction

Thank you for purchasing ASRock Rack **X570D4U-2L2T/ X570D4U** motherboard, a reliable motherboard produced under ASRock Rack's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock Rack's commitment to quality and endurance.

> ⚠️ *Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock Rack website without further notice. You may find the latest memory and CPU support lists on ASRock Rack website as well. ASRock Rack's Website: www.ASRockRack.com*
>
> *If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.*
> *http://www.asrockrack.com/support/*

1.1 Package Contents

- ASRock Rack X570D4U-2L2T / X570D4U Motherboard
  (micro-ATX Form Factor: 9.6-in x 9.6-in, 24.4 cm x 24.4 cm)
- Quick Installation Guide
- 1 x I/O Shield
- 1 x SATA3 Cable (60cm)
- 2 x Screws for M.2 Sockets

> ☆ *If any items are missing or appear damaged, contact your authorized dealer.*

English

1.2 Specifications

X570D4U-2L2T / X570D4U	
MB Physical Status	
Form Factor	micro-ATX
Dimension	9.6" x 9.6" (24.4 cm x 24.4 cm)
Processor System	
CPU	3rd generation AMD Ryzen™ and 2nd generation AMD Ryzen™ with Radeon™ Vega7 Graphics Processors
Socket	AM4 PGA 1331
Chipset	AMD X570
System Memory	
Capacity	- 4 x 288-pin DDR4 DIMM slots - Support up to 128GB DDR4 ECC/UDIMM
Type	- Dual Channel DDR4 memory technology - Support DDR4 ECC/UDIMM *Conditionally supports ECC error reporting function.*
DIMM Size Per DIMM	- ECC/UDIMM: 32GB, 16GB, 8GB
DIMM Frequency	- ECC/UDIMM: up to 3200MHz
Voltage	1.2V
Expansion Slot	
PCIe 3.0/4.0 x 16	**Matisse:** PCIE6: Gen4 x16 link, auto switch to x8 link if Slot 4 is occupied (Physical x16, EE x16/x8, shared with Slot 4) **Picasso:** PCIE6: Gen3 x8 link (Physical x16, EE x8)
PCIe 3.0/4.0 x 8	**Matisse:** PCIE4: Gen4 x8 link (Physical x8, EE x0/x8, shared with Slot 6) **Picasso:** PCIE4: N/A (not supported)
PCIe 3.0/4.0 x 1	**Matisse:** PCIE5: Gen4 x1 link **Picasso:** PCIE5: Gen3 x1 link
Storage	
SATA Controller	8 x SATA3 6.0 Gb/s (SATA0-7, SATA_0 supports SATA DOM), support RAID 0, 1, 10
M.2 Slot	2 (M2_1: 2242/2260/2280/22110, supports SATA3 (6.0 Gb/s) or PCIE4.0(x4)(Matisse) / PCIE3.0(Picasso)(x4) ; M2_2: 2242/2260/2280, supports SATA3 (6.0 Gb/s) or PCIE4.0(x4)(Matisse) / PCIE3.0(Picasso)(x4)

Ethernet	
Interface	**X570D4U-2L2T:** 10000/1000 /100 /10 Mbps **X570D4U:** 1000 /100 /10 Mbps
LAN Controller	**X570D4U-2L2T:** - 2 x RJ45 10G base-T by Intel® X550-AT2 - 2x RJ45 1G base-T by Intel® I210-AT - 1 x RJ45 Dedicated IPMI LAN port by RTL8211E - Supports Wake-On-LAN - Supports Energy Efficient Ethernet 802.3az - Supports Dual LAN with Teaming function - Supports PXE - LAN3 supports NCSI **X570D4U:** - 2x RJ45 1G base-T by Intel® I210-AT - 1 x RJ45 Dedicated IPMI LAN port by RTL8211E - Supports Wake-On-LAN - Supports Energy Efficient Ethernet 802.3az - Supports Dual LAN with Teaming function - Supports PXE - LAN1 supports NCSI
Management	
BMC Controller	ASPEED AST2500
IPMI Dedicated GLAN	1 x Realtek RTL8211E for dedicated management GLAN
Features	Watch Dog
Graphics	
Controller	ASPEED AST2500
VRAM	DDR4 16MB
Rear Panel I/O	
VGA Port	1 x D-Sub
Serial Port	1 x COM port
USB 3.1 (Gen2) Port	2
HDMI	1 (only supported for Picasso(APU))

LAN Port	**X570D4U-2L2T:**
	- 2 x RJ45 1 Gigabit Ethernet LAN ports
	- 2 x RJ45 10 Gigabit Ethernet LAN ports
	- 1 x RJ45 Dedicated IPMI LAN port
	- LAN Ports with LED (ACT/LINK LED and SPEED LED)
	X570D4U:
	- 2 x RJ45 1 Gigabit Ethernet LAN ports
	- 1 x RJ45 Dedicated IPMI LAN port
	- LAN Ports with LED (ACT/LINK LED and SPEED LED)
UID	1
Internal Connector	
Auxiliary Panel Header	1 (includes chassis intrusion, location button & LED, front LAN LED, system fault, and BMC alert)
Front Panel	1 (RST, PWRBTN, HDDLED, PWRLED)
TPM Header	1 (17-pin LPC TPM header, supports TPM 1.2/2.0)
SPI TPM Header	1 (13-pin SPI TPM header, supports TPM 2.0)
IPMB Header	1
Fan Header	3 (6-pin), 3 (4-pin)
ATX Power	1 x (24-pin) + 1 x (4-pin)
USB 3.1 Gen1 Header	1 (supports 2 USB 3.1 Gen1 ports)
M.2	2
SATA DOM	1
BMC_SMB1	1
PSU_SMB1	1
SPEAKER	1
TR1	1
Front VGA	1
Front LAN LED	**X570D4U-2L2T:** 1
	X570D4U: N/A
80 debug port LED	1
Buzzer	1
Clear CMOS	1 (short pad)
OH/FanFail LED	6
System BIOS	
BIOS Type	32MB AMI UEFI Legal BIOS
BIOS Features	- Plug and Play (PnP)
	- ACPI 2.0 Compliance Wake Up Events
	- SMBIOS 2.8 Support
	- ASRock Rack Instant Flash

Hardware Monitor	
Temperature	- CPU/FCH/DDR/LAN* Temperature Sensing
	- MB/Card Side Temperature Sensing
	LAN Temperature Sensing is supported for X570D4U-2L2T only.
Fan	- Fan Tachometer
	- Quiet Fan (Allow Chassis Fan Speed Auto-Adjust by CPU Temperature)
	- Fan Multi-Speed Control
Voltage	Voltage Monitoring: 3VSB, 5VSB, VCPU, VSOC, VCCM, APU VDDP, PM VDD CLDO, PM VDDCR S5, PM VDDCR, BAT, 3V, 5V, 12V
Support OS	
OS	Microsoft® Windows®:
	Windows 10 (64 bit)
	Linux®:
	- UBuntu 18.04 (64 bit)
	- RedHat Enterprise Linux Server 8.1 (64bit)
	* Please refer to our website for the latest OS support list.*
	* The Linux system doesn't support Raid mode.*
	* Supports UEFI BOOT only.*
Environment	
Temperature	Operation temperature: 10°C ~ 35°C / Non operation temperature: -40°C ~ 70°C

NOTE: Please refer to our website for the latest specifications.

⚠ *This motherboard supports Wake from on Board LAN. To use this function, please make sure that the "Wake on Magic Packet from power off state" is enabled in Device Manager > Intel® Ethernet Connection > Power Management. And the "PCI Devices Power On" is enabled in UEFI SETUP UTILITY > Advanced > ACPI Configuration. After that, onboard LAN3&4 can wake up S5 under OS.*

⚠ *If you install Intel® LAN utility or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If you install the drivers only, it will pass the WHQL tests.*

1.3 Unique Features

ASRock Rack Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows˚. With this utility, you can press the <F6> key during the POST or the <F2> key to enter into the BIOS setup menu to access ASRock Rack Instant Flash. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.

1.4 Motherboard Layout
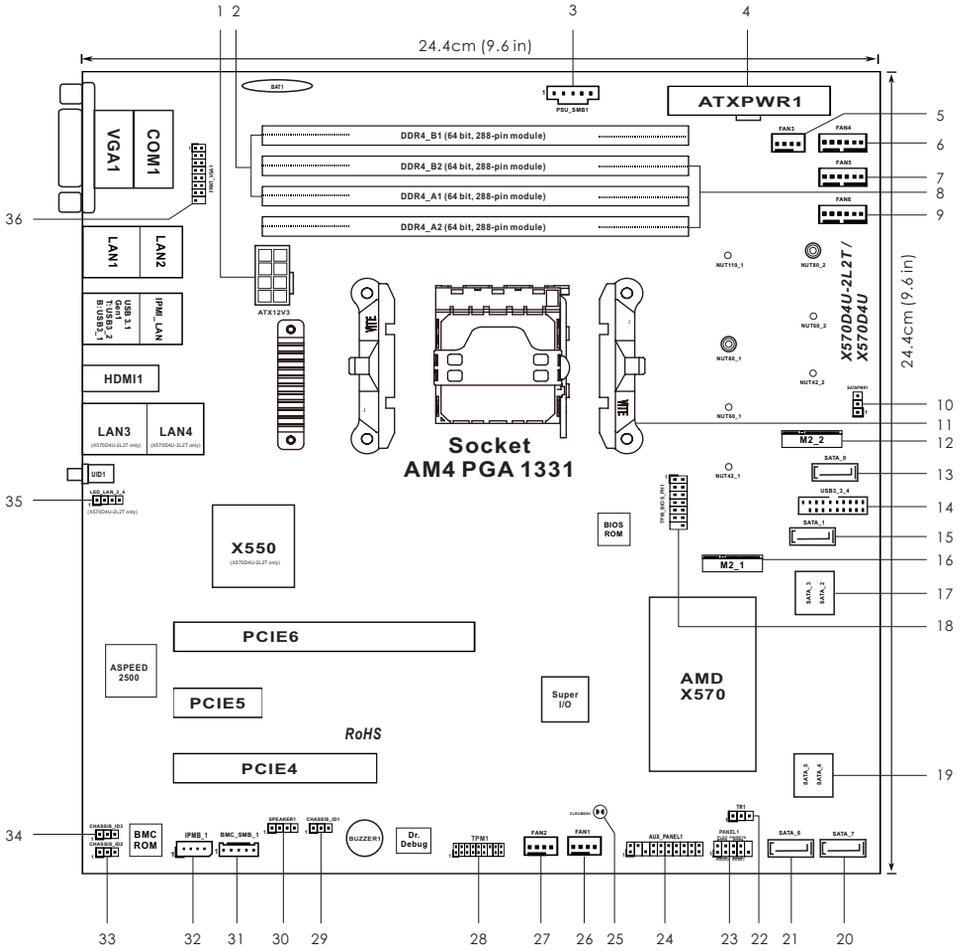
No.	Description
1	ATX 12V Power Connector (ATX12V3)
2	2 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_B1, Blue)*
3	PSU SMBus Header (PSU_SMB1)
4	ATX Power Connector (ATXPWR1)
5	System Fan Connector (4-pin) (FAN3)
6	System Fan Connector (6-pin) (FAN4)
7	System Fan Connector (6-pin) (FAN5)
8	2 x 288-pin DDR4 DIMM Slots (DDR4_A2, DDR4_B2, White)*
9	System Fan Connector (6-pin) (FAN6)
10	SATA DOM Power Connector (SATAPWR1)
11	AM4 PGA 1331 Socket
12	M.2 Socket (M2_2) (Type 2242 / 2260 / 2280)
13	SATA3 DOM Connector (SATA_0), Red
14	USB 3.1 Gen1 Header (USB3_3_4)
15	SATA3 Connector (SATA_1)
16	M.2 Socket (M2_1) (Type 2242 / 2260 / 2280 / 22110)
17	SATA3 Connector (SATA_3)(Upper), SATA3 Connector (SATA_2)(Lower)
18	TPM-SPI Header (TPM_BIOS_PH1)
19	SATA3 Connector (SATA_5)(Upper), SATA3 Connector (SATA_4)(Lower)
20	SATA3 Connector (SATA_7)
21	SATA3 Connector (SATA_6)
22	Thermal Sensor Header (TR1)
23	System Panel Header (PANEL1)
24	Auxiliary Panel Header (AUX_PANEL1)
25	Clear CMOS Pad (CLRMOS1)
26	System Fan Connector (4-pin) (FAN1)
27	System Fan Connector (4-pin) (FAN2)
28	TPM Header (TPM1)
29	Chassis ID1 Jumper (CHASSIS_ID1) *(Reserved for BOM option)*
30	Speaker Header (SPEAKER1)
31	BMC SMBus Header (BMC_SMB_1)
32	Intelligent Platform Management Bus Header (IPMB_1)
33	Chassis ID2 Jumper (CHASSIS_ID2) *(Reserved for BOM option)*

No.	Description
34	Chassis ID3 Jumper (CHASSIS_ID3) *(Reserved for BOM option)*
35	Front LAN LED Connector (LED_LAN_3_4) *(X570D4U-2L2T only)*
36	Front VGA Header (FRNT_VGA1)

*For DIMM installation and configuration instructions, please see p.21 (Installation of Memory Modules (DIMM)) for more details.

1.5 Onboard LED Indicators

ATXPWR1

DDR4_B1 (64 bit, 288-pin module)

DDR4_B2 (64 bit, 288-pin module)

DDR4_A1 (64 bit, 288-pin module)

DDR4_A2 (64 bit, 288-pin module)

ATX12V3

X570D4U-2L2T

FAN3 FAN4

FAN5

FAN6

Socket
AM4 PGA 1331

BIOS
ROM

ASPEED
2500

RoHS

PCIE4

**AMD
X570**

CHASSIS_ID3
CHASSIS_ID2

BMC
ROM

IPMB_1   BMC_SMB_1

FAN2 FAN1

1

2

3

4

5

8

7   6
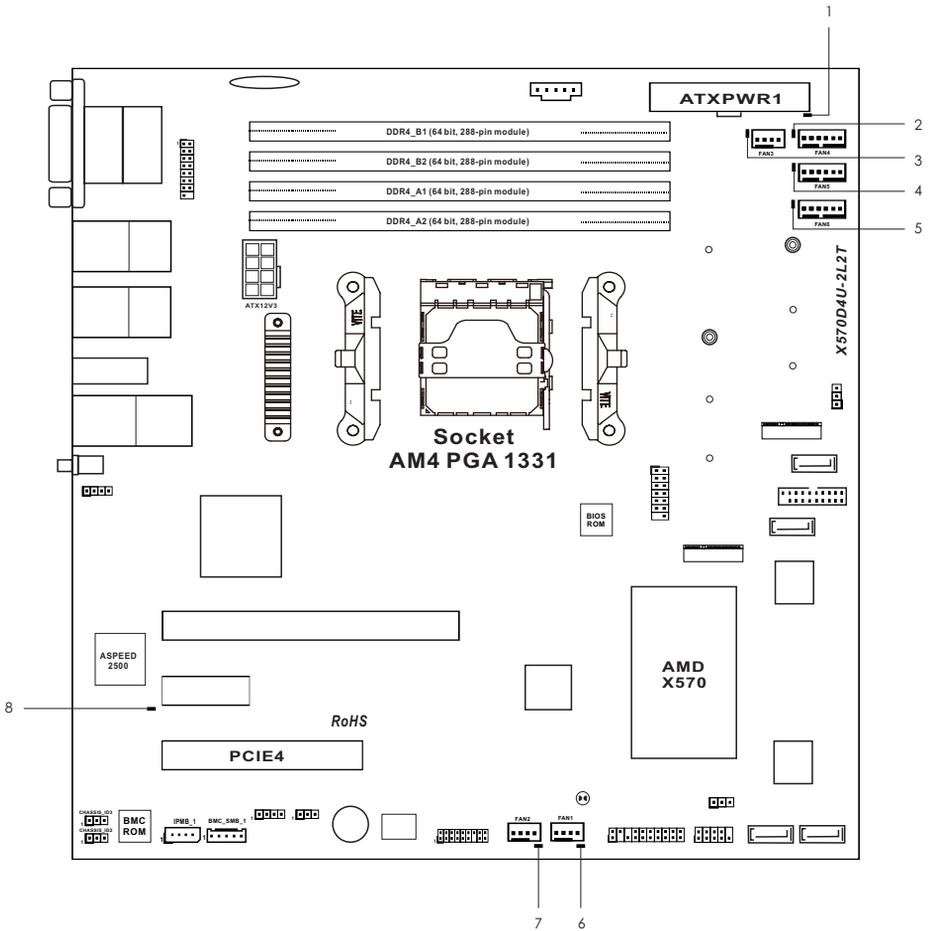
No.	Item	Status	Description
1	SB_PWR1	Green	STB PWR ready
2	FAN_LED3	Amber	FAN3 failed
3	FAN_LED4	Amber	FAN4 failed
4	FAN_LED5	Amber	FAN5 failed
5	FAN_LED6	Amber	FAN6 failed
6	FAN_LED1	Amber	FAN1 failed
7	FAN_LED2	Amber	FAN2 failed
8	BMC_LED1	Green	BMC heartbeat LED

1.6 I/O Panel
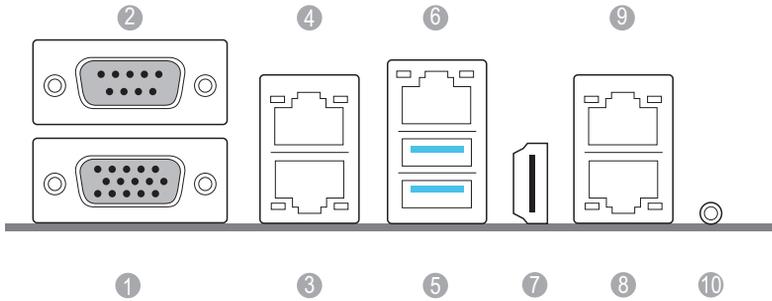
No.	Description	No.	Description
1	VGA Port (VGA1)	6	LAN RJ-45 Port (IPMI_LAN1)*
2	Serial Port (COM1)	7	HDMI Port
3	1G LAN RJ-45 Port (LAN1)	8	10G LAN RJ-45 Port (LAN3)** *(X570D4U-2L2T only)*
4	1G LAN RJ-45 Port (LAN2)	9	10G LAN RJ-45 Port (LAN4)** *(X570D4U-2L2T only)*
5	USB 3.1 Gen2 Ports (USB3_1_2)	10	UID Switch (UID1)

*There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.
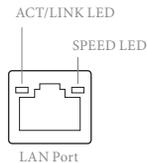
Dedicated IPMI LAN Port LED Indications

Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10M bps connection or no link
Blinking Yellow	Data Activity	Yellow	100M bps connection
On	Link	Green	1Gbps connection

**There are two LEDs on each LAN port. Please refer to the table below for the LAN port LED indications.

ACT/LINK LED —— SPEED LED

ACT/LINK LED —— SPEED LED
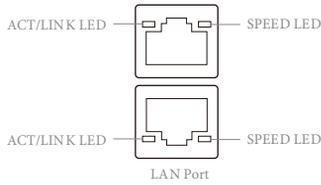
LAN Port

10G LAN Port (LAN3, LAN4) LED Indications *(X570D4U-2L2T only)*

Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10M/100Mbps connection or no link
Blinking Yellow	Data Activity	Orange	1Gbps connection
On	Link	Green	10Gbps connection

ACT/LINK LED —— SPEED LED

ACT/LINK LED —— SPEED LED
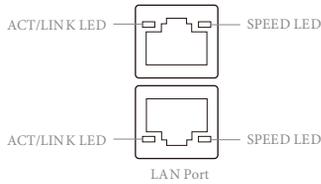
LAN Port

1G LAN Port (LAN1, LAN2) LED Indications

Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection or no link
Blinking Orange	Data Activity	Yellow	100Mbps connection
On	Link	Green	1Gbps connection

1.7 Block Diagram

X570D4U-2L2T:

X570D4U:
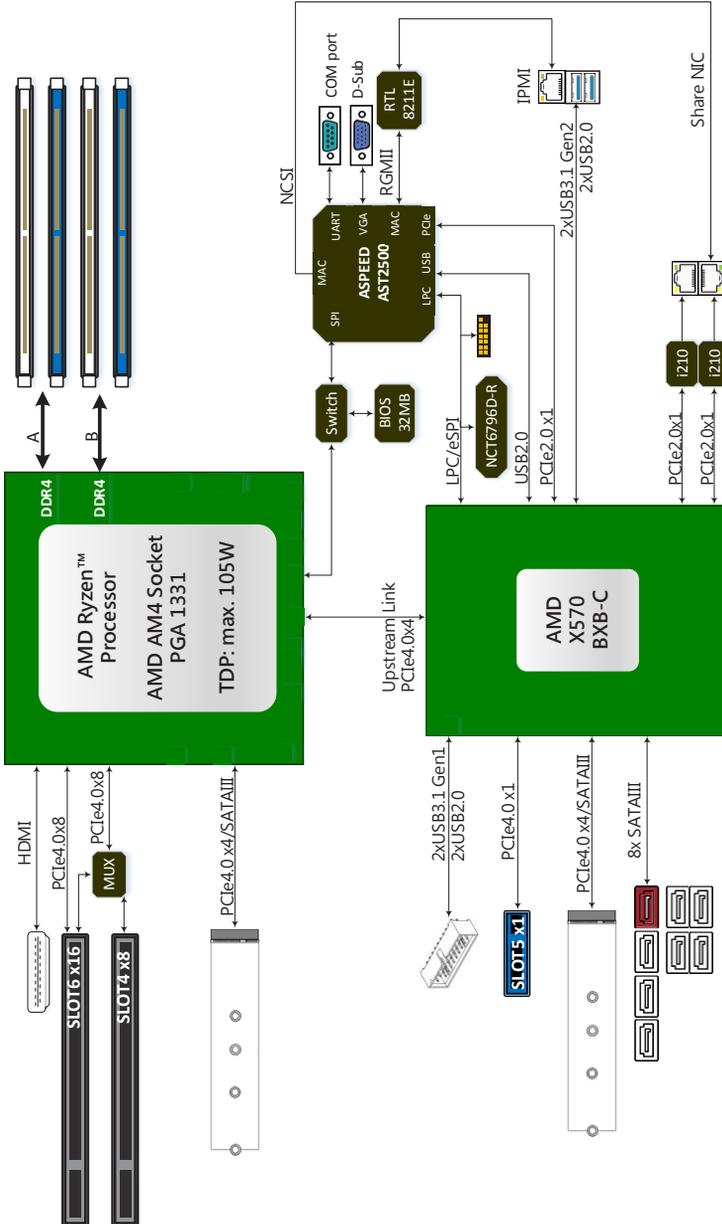
Chapter 2 Installation

This is a micro-ATX form factor (9.6" x 9.6", 24.4 cm x 24.4 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

⚠️ *Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.*

2.1 Screw Holes

Place screws into the holes indicated by circles to secure the motherboard to the chassis.

⚠️ *Attention! Before installing this motherboard, be sure to unscrew and remove the standoffs at the marked location, under the motherboard, from the chassis, in order to avoid electrical short circuit and damage to your motherboard.*

⚠️ *Do not over-tighten the screws! Doing so may damage the motherboard.*

2.2 Pre-installation Precautions

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

1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle the components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.
5. When placing screws into the screw holes to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

⚠️ *Before you install or remove any component, ensure that the power 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.*

2.3 Installing the CPU

Unplug all power cables before installing the CPU.

1

90°

2
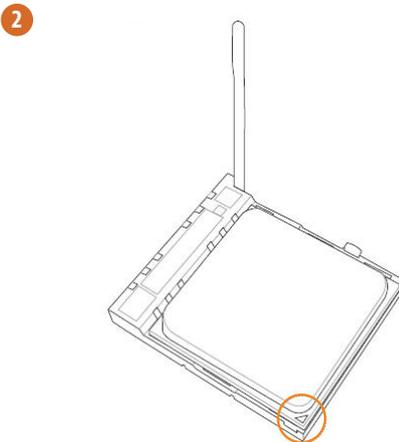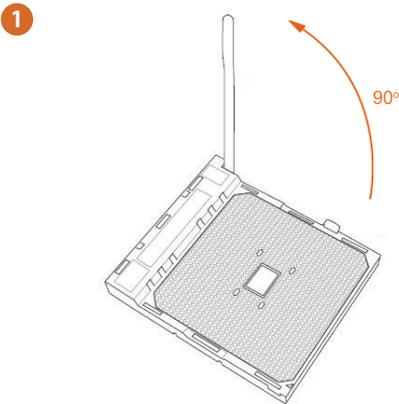
2.4 Installing the CPU Fan and Heatsink

After you install the CPU into this motherboard, it is necessary to install a larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good contact with each other.

⚠️ *Please be aware of the maximum dimensions of the heatsink to be used is 116 * 83.65mm.*

☆ *Please turn off the power or remove the power cord before changing a CPU or heatsink.*

Installing the CPU Box Cooler SR1
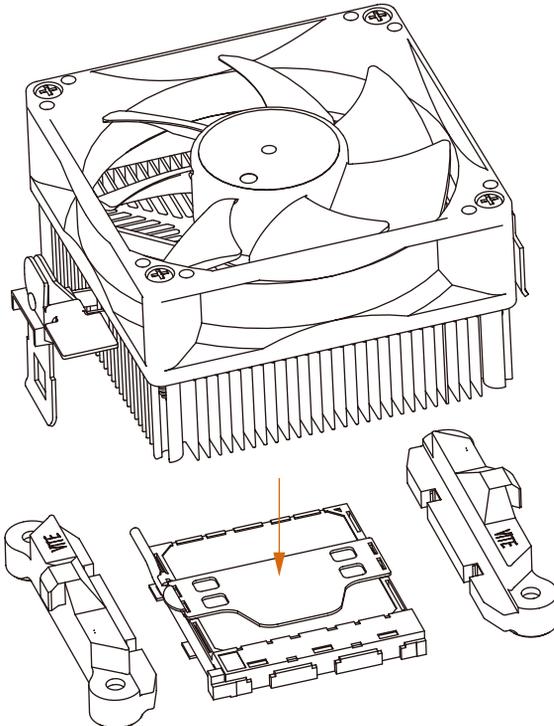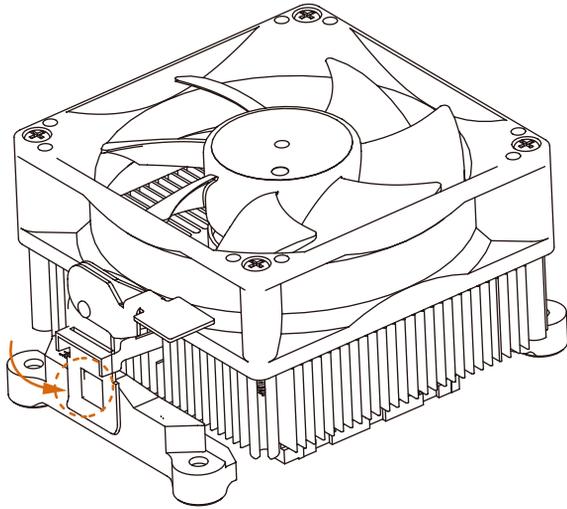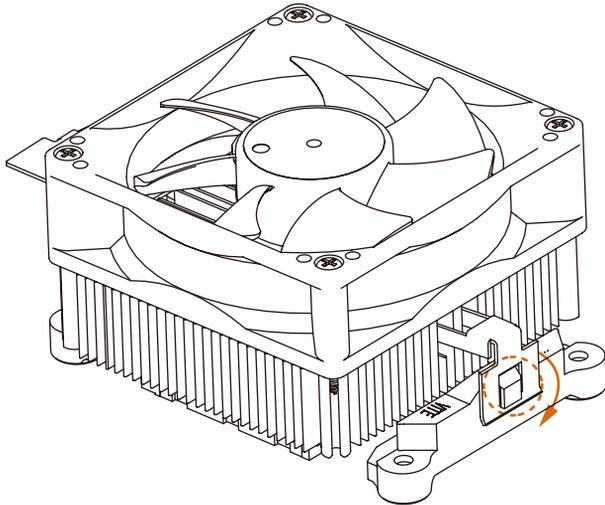
4
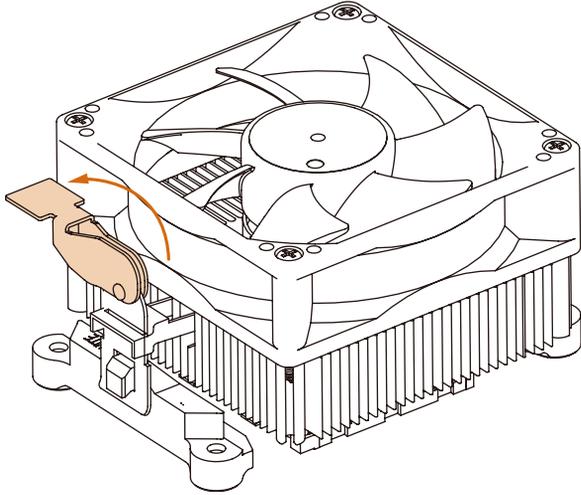
2.5 Installing Memory Modules (DIMM)

This motherboard provides four 288-pin DDR4 (Double Data Rate 4) DIMM slots, and supports Dual Channel Memory Technology.

> ☆ 1. For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR4 DIMM pairs.
> 2. It is unable to activate Dual Channel Memory Technology with only one or three memory module installed.
> 3. It is not allowed to install a DDR, DDR2 or DDR3 memory module into a DDR4 slot; otherwise, this motherboard and DIMM may be damaged.

DDR4 UDIMM Maximum Frequency Support

Ryzen Series CPUs

UDIMM Memory Slot				Picasso Ridge	Matisse Ridge
A2	A1	B2	B1	Freq (Mhz)	Freq (Mhz)
-	SR	-	-	2666	3200
-	DR	-	-	2400	3200
-	SR	-	SR	2666	3200
-	DR	-	DR	2400	3200
SR	SR	SR	SR	2133	2933
DR	DR	DR	DR	1866	2666
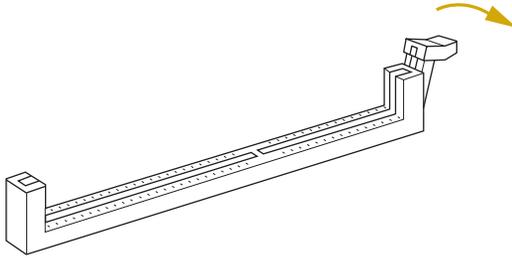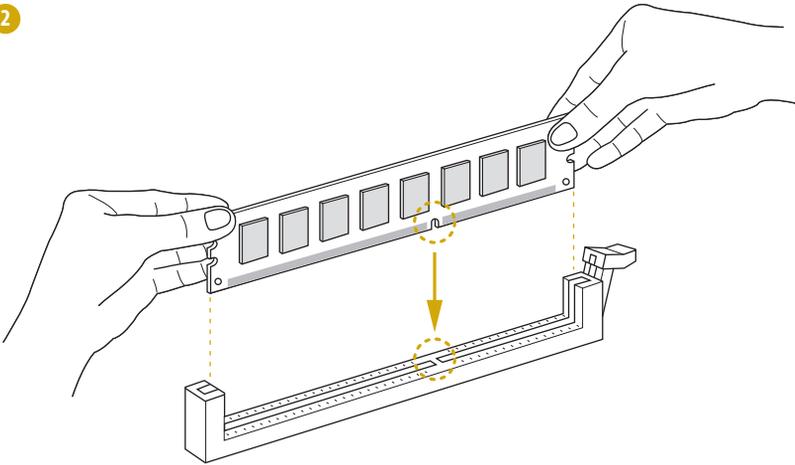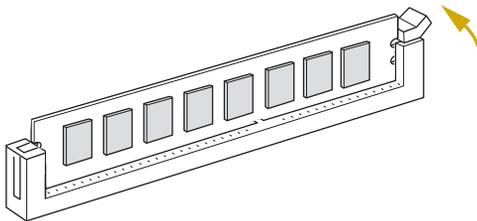
The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

2.6 Expansion Slots (PCI Express Slots)

There are 3 PCI Express slots on this motherboard.

PCIE slot:

Matisse:
PCIE4 (PCIE 4.0 x8 slot, from CPU) is used for PCI Express x8 lane width cards.
PCIE5 (PCIE 4.0 x1 slot, from Premium) is used for PCI Express x1 lane width cards.
PCIE6 (PCIE 4.0 x16 slot, from CPU) is used for PCI Express x16 lane width cards.

Slot	Generation	Mechanical	Electrical	Source
PCIE6	4.0	x16	x16	CPU
PCIE5	4.0	x1	x1	Premium
PCIE4	4.0	x8	x8	CPU

PCIe Slot Configurations

	PCIE4	PCIE6
Single PCIE Card	N/A	x16
Two PCIE Cards	x8	x8

Picasso:
PCIE4 is not supported.
PCIE5 (PCIE 3.0 x1 slot, from Premium) is used for PCI Express x1 lane width cards.
PCIE6 (PCIE 3.0 x16 slot, from CPU) is used for PCI Express x8 lane width cards.

Slot	Generation	Mechanical	Electrical	Source
PCIE6	3.0	x16	x8	CPU
PCIE5	3.0	x1	x1	Premium
PCIE4	N/A	x8	N/A	N/A

Installing an expansion card

Step 1.   Before installing an expansion card, please make sure that the power
           supply is switched off or the power cord is unplugged. Please read the
           documentation of the expansion card and make necessary hardware
           settings for the card before you start the installation.
Step 2.   Remove the system unit cover (if your motherboard is already installed
           in a chassis).
Step 3.   Remove the bracket facing the slot that you intend to use. Keep the
           screws for later use.
Step 4.   Align the card connector with the slot and press firmly until the card is
           completely seated on the slot.
Step 5.   Fasten the card to the chassis with screws.

Step 6.   Replace the system cover.

English

2.7 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on the pins, the jumper is "Short". If no jumper cap is placed on the pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when a jumper cap is placed on these 2 pins.
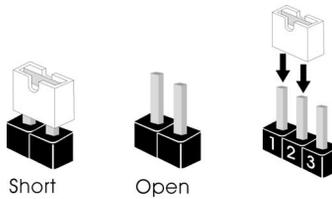
Short   Open

Reserved for BOM options:
Chassis ID1 Jumper
(3-pin CHASSIS_ID1)
(see p.7, No. 29)
Chassis ID2 Jumper
(3-pin CHASSIS_ID2)
(see p.7, No. 33)
Chassis ID3 Jumper
(3-pin CHASSIS_ID3)
(see p.7, No. 34)

Board Level SKU (Default)   Reserved for system level use

Reserved for BOM options:
Chassis ID1 Jumper
(3-pin CHASSIS_ID1)
(see p.7, No. 29)
Chassis ID2 Jumper
(3-pin CHASSIS_ID2)
(see p.7, No. 33)
Chassis ID3 Jumper
(3-pin CHASSIS_ID3)
(see p.7, No. 34)

Reserved for system level use   Reserved for system level use

	2_3 ⊙●●	**2_3** ⊙●●
Reserved for BOM options: Chassis ID1 Jumper (3-pin CHASSIS_ID1) (see p.7, No. 29)	**1_2** ●●⊙	**1_2** ●●⊙
Chassis ID2 Jumper (3-pin CHASSIS_ID2) (see p.7, No. 33)	**1_2** ●●⊙	**2_3** ⊙●●
Chassis ID3 Jumper (3-pin CHASSIS_ID3) (see p.7, No. 34)	Reserved for system level use	Reserved for system level use

	2_3 ⊙●●	**2_3** ⊙●●
Reserved for BOM options: Chassis ID1 Jumper (3-pin CHASSIS_ID1) (see p.7, No. 29)	**2_3** ⊙●●	**2_3** ⊙●●
Chassis ID2 Jumper (3-pin CHASSIS_ID2) (see p.7, No. 33)	**1_2** ●●⊙	**2_3** ⊙●●
Chassis ID3 Jumper (3-pin CHASSIS_ID3) (see p.7, No. 34)	Reserved for system level use	Reserved for system level use

English

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2.8 Onboard Headers and Connectors

⚠️ *Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage to the motherboard.*

System Panel Header
(9-pin PANEL1)
(see p.7, No. 23)

PLED+
PLED-
PWRBTN#
GND

1

GND
RESET#
GND
HDLED-
HDLED+
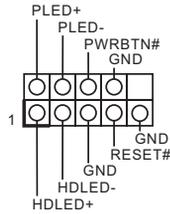
Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments. Particularly note the positive and negative pins before connecting the cables.

🔍 **PWRBTN (Power Switch):**
Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

PLED (System Power LED):
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED):
Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

Auxiliary Panel Header
(18-pin AUX_PANEL1)
(see p.7, No. 24)
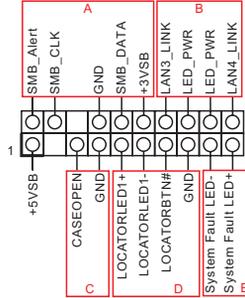
This header supports multiple functions on the front panel, including the front panel SMB, internet status indicator and chassis intrusion pin.

A
SMB_Alert
SMB_CLK
GND
SMB_DATA
+3VSB
LAN3_LINK
LED_PWR
LED_PWR
LAN4_LINK
B

1

+5VSB
CASEOPEN
GND
LOCATORLED1+
LOCATORLED1-
LOCATORBTN#
GND
System Fault LED-
System Fault LED+

C
LOCATORLED1+
LOCATORLED1-
D
System Fault LED-
System Fault LED+
E

A. Front panel SMBus connecting pin (6-1 pin FPSMB)
This header allows you to connect SMBus (System Management Bus) equipment. It can be used for communication between peripheral equipment in the system, which has slower transmission rates, and power management equipment.

B. Internet status indicator (2-pin LAN3_LED, LAN4_LED)
These two 2-pin headers allow you to use the Gigabit internet indicator cable to connect to the LAN status indicator. When this indicator flickers, it means that the internet is properly connected.

C. Chassis intrusion pin (2-pin CHASSIS)
This header is provided for host computer chassis with chassis intrusion detection designs. In addition, it must also work with external detection equipment, such as a chassis intrusion detection sensor or a microswitch. When this function is activated, if any chassis component movement occurs, the sensor will immediately detect it and send a signal to this header, and the system will then record this chassis intrusion event. The default setting is set to the CASEOPEN and GND pin; this function is off.

D. Locator LED (4-pin LOCATOR)
This header is for the locator switch and LED on the front panel.

E. System Fault LED (2-pin LOCATOR)
This header is for the Fault LED on the system.

Serial ATA3 DOM
Connector
(SATA_0)
(see p.7, No. 13)

SATA_0

The SATA3 DOM connector supports both a SATA DOM (Disk-On-Module) and a SATA data cable for internal storage device.

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Serial ATA3 Connectors
Vertical:
(SATA_0:
see p.7, No. 13)
(SATA_1:
see p.7, No. 15)
(SATA_6:
see p.7, No. 21)
(SATA_7:
see p.7, No. 20)

SATA_0

SATA_1

SATA_6

SATA_7

These connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

Right Angle:
(SATA_2:
see p.7, No. 17)(Lower)
(SATA_3:
see p.7, No. 17)(Upper)
(SATA_4:
see p.7, No. 19)(Lower)
(SATA_5:
see p.7, No. 19)(Upper)

SATA_3   SATA_2

SATA_5   SATA_4
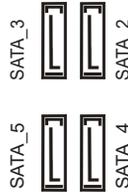
USB 3.1 Gen1 Header
(19-pin USB3_3_4)
(see p.7, No. 14)

ID
IntA_P_D +
IntA_P_D -
GN D
IntA_P_SSTX+
IntA_P_SSTX-
GN D
IntA_P_SSRX +
IntA_P_SSRX -
Vbu s

1

Vbu s
IntA_P_SSRX -
IntA_P_SSRX +
GN D
IntA_P_SSTX-
IntA_P_SSTX+
GN D
IntA_P_D -
IntA_P_D +
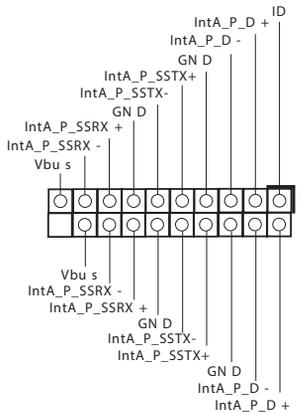
There is one USB 3.1 Gen1 header on this motherboard. This USB 3.1 Gen1 header can support two USB 3.1 Gen1 ports.

System Fan Connectors
(4-pin FAN1)
(see p.7, No. 26)
(4-pin FAN2)
(see p.7, No. 27)
(4-pin FAN3)
(see p.7, No. 5)

FAN_SPEED_CONTROL
FAN_SPEED
FAN_VOLTAGE
GND

1 2 3 4
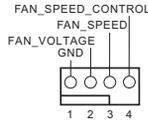
Please connect fan cables to the fan connectors and match the black wire to the ground pin. All fans support Fan Control.

(6-pin FAN4)
(see p.7, No. 6)
(6-pin FAN5)
(see p.7, No. 7)
(6-pin FAN6)
(see p.7, No. 9)

NC
SENSOR
FAN_SPEED_CONTROL
FAN_SPEED
FAN_VOLTAGE
GND

1 2 3 4 5 6
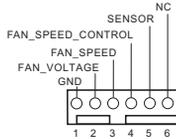
ATX Power Connector
(24-pin ATXPWR1)
(see p.7, No. 4)

3V
3V
GND
5V
GND
5V
GND
PWROK_PS
5VSB
12V
12V
3V

1   12

13   24

3V
-12V
GND
PSON#
GND
GND
GND
N/A
5V
5V
5V
GND
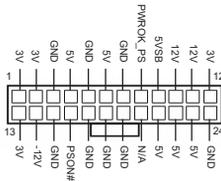
This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.

ATX 12V Power Connectors
(8-pin ATX12V3)
(see p.7, No. 1)

4   8

GND   12V

1   5
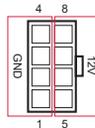
This motherboard provides one 8-pin ATX 12V power connector.

TPM Header
(17-pin TPM1)
(see p.7, No. 28)

SMB_DATA_MAIN
SMB_CLK_MAIN
SMB_DATA_MAIN
S_PWRDWN#
GND
LAD2_L
LAD1_L
GND
SERIRQ#
F_CLKRUN#

1

CK_33M_TPM
LFRAME#_L
TPM_RST#
LAD3_L
+3V
LAD0_L
+3VSB
GND
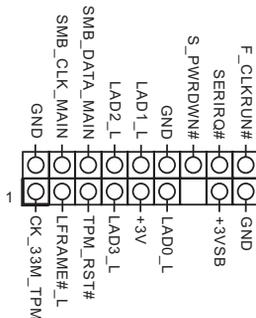
This connector supports Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

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PSU SMBus Header (5-pin PSU_SMB1) (see p.7, No. 3)	ALERT SMBCLK +3V 1 SMBDATA GND	PSU SMBus monitors the status of the power supply, fan and system temperature.
Intelligent Platform Management Bus Header (4-pin IPMB_1) (see p.7, No. 32)	IPMB_SDA IPMB_SCL GND No Connect	This 4-pin connector is used to provide a cabled base-board or front panel connection for value added features and 3rd-party add-in cards, such as Emergency Management cards, that provide management features using the IPMB.
Baseboard Management Controller SMBus Header (5-pin BMC_SMB_1) (see p.7, No. 31)	BMC_SMB_PRESENT_1_N Power BMC_SMBCLK GND BMC_SMBDATA	The header is used for the SMBUS devices.
Chassis Speaker Header (4-pin SPEAKER1) (see p.7, No. 30)	DUMMY SPEAKER 1 +5V DUMMY	Please connect the chassis speaker to this header.
SATA DOM Power Connector (3-pin SATAPWR1) (see p.7, No. 10)	N/C GND +5V	Please connect the power cable on the SATA DOM to this connector.
SPI TPM Header (13-pin TPM_BIOS_PH1) (see p.7, No. 18)	1 SPI_DQ2 SPI_DQ3 SPI_CS0 +3.3V SPI_MISO TPM_Present RSMRST# CLK GND SPI_MOSI SPI_TPM_CS# RST# TPM_PIRQ	This connector supports SPI 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.
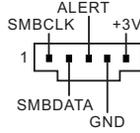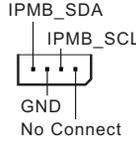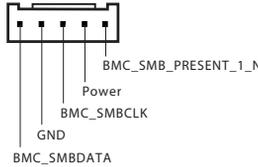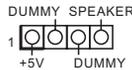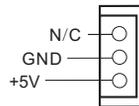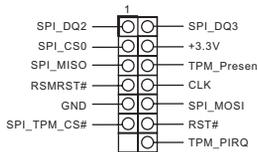
Thermal Sensor Header
(3-pin TR1)
(see p.7, No. 22)

TR1   TR1
1
GND

Please connect the thermal sensor cable to either pin 1-2 or pin 2-3 and the other end to the device which you wish to monitor its temperature.

Front VGA Header
(15-pin FRNT_VGA1)
(see p.7, No. 36)

1
Red — Green
Blue
GND — GND
GND — GND
+5V — GND
— DDC_DATA
H_SYNC — V_SYNC
DDC_CLK
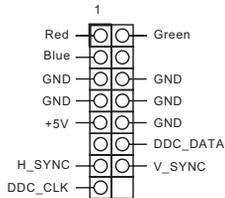
Please connect either end of VGA_2X8 cable to VGA header.

Front LAN LED
Connector
(LED_LAN_3_4)
(see p.7, No. 35)
(X570D4U-2L2T only)

LAN4_LINK
LED_PWR
1
LAN3_LINK
LED_PWR
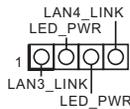
This 4-pin connector is used for the front LAN status indicator.

Clear CMOS Pad
(CLRCMOS1)
(see p.7, No. 25)

This allows you to clear the data in CMOS. To clear CMOS, take out the CMOS battery and short the Clear CMOS Pad.

2.9 Dr. Debug

Dr. Debug is used to provide code information, which makes troubleshooting even easier. Please see the diagrams below for reading the Dr. Debug codes.

Code	Description
0x10	PEI_CORE_STARTED
0x11	PEI_CAR_CPU_INIT
0x15	PEI_CAR_NB_INIT
0x19	PEI_CAR_SB_INIT
0x31	PEI_MEMORY_INSTALLED
0x32	PEI_CPU_INIT
0x33	PEI_CPU_CACHE_INIT
0x34	PEI_CPU_AP_INIT
0x35	PEI_CPU_BSP_SELECT
0x36	PEI_CPU_SMM_INIT
0x37	PEI_MEM_NB_INIT
0x3B	PEI_MEM_SB_INIT
0x4F	PEI_DXE_IPL_STARTED
0x60	DXE_CORE_STARTED
0x61	DXE_NVRAM_INIT
0x62	DXE_SBRUN_INIT

0x63	DXE_CPU_INIT
0x68	DXE_NB_HB_INIT
0x69	DXE_NB_INIT
0x6A	DXE_NB_SMM_INIT
0x70	DXE_SB_INIT
0x71	DXE_SB_SMM_INIT
0x72	DXE_SB_DEVICES_INIT
0x78	DXE_ACPI_INIT
0x79	DXE_CSM_INIT
0x90	DXE_BDS_STARTED
0x91	DXE_BDS_CONNECT_DRIVERS
0x92	DXE_PCI_BUS_BEGIN
0x93	DXE_PCI_BUS_HPC_INIT
0x94	DXE_PCI_BUS_ENUM
0x95	DXE_PCI_BUS_REQUEST_RESOURCES
0x96	DXE_PCI_BUS_ASSIGN_RESOURCES
0x97	DXE_CON_OUT_CONNECT
0x98	DXE_CON_IN_CONNECT

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0x99	DXE_SIO_INIT
0x9A	DXE_USB_BEGIN
0x9B	DXE_USB_RESET
0x9C	DXE_USB_DETECT
0x9D	DXE_USB_ENABLE
0xA0	DXE_IDE_BEGIN
0xA1	DXE_IDE_RESET
0xA2	DXE_IDE_DETECT
0xA3	DXE_IDE_ENABLE
0xA4	DXE_SCSI_BEGIN
0xA5	DXE_SCSI_RESET
0xA6	DXE_SCSI_DETECT
0xA7	DXE_SCSI_ENABLE
0xA8	DXE_SETUP_VERIFYING_PASSWORD
0xA9	DXE_SETUP_START
0xAB	DXE_SETUP_INPUT_WAIT
0xAD	DXE_READY_TO_BOOT
0xAE	DXE_LEGACY_BOOT

0xAF	DXE_EXIT_BOOT_SERVICES
0xB0	RT_SET_VIRTUAL_ADDRESS_MAP_BEGIN
0xB1	RT_SET_VIRTUAL_ADDRESS_MAP_END
0xB2	DXE_LEGACY_OPROM_INIT
0xB3	DXE_RESET_SYSTEM
0xB4	DXE_USB_HOTPLUG
0xB5	DXE_PCI_BUS_HOTPLUG
0xB6	DXE_NVRAM_CLEANUP
0xB7	DXE_CONFIGURATION_RESET
0xF0	PEI_RECOVERY_AUTO
0xF1	PEI_RECOVERY_USER
0xF2	PEI_RECOVERY_STARTED
0xF3	PEI_RECOVERY_CAPSULE_FOUND
0xF4	PEI_RECOVERY_CAPSULE_LOADED
0xE0	PEI_S3_STARTED
0xE1	PEI_S3_BOOT_SCRIPT
0xE2	PEI_S3_VIDEO_REPOST

0xE3	PEI_S3_OS_WAKE
0x50	PEI_MEMORY_INVALID_TYPE
0x53	PEI_MEMORY_NOT_DETECTED
0x55	PEI_MEMORY_NOT_INSTALLED
0x57	PEI_CPU_MISMATCH
0x58	PEI_CPU_SELF_TEST_FAILED
0x59	PEI_CPU_NO_MICROCODE
0x5A	PEI_CPU_ERROR
0x5B	PEI_RESET_NOT_AVAILABLE
0xD0	DXE_CPU_ERROR
0xD1	DXE_NB_ERROR
0xD2	DXE_SB_ERROR
0xD3	DXE_ARCH_PROTOCOL_NOT_AVAILABLE
0xD4	DXE_PCI_BUS_OUT_OF_RESOURCES
0xD5	DXE_LEGACY_OPROM_NO_SPACE
0xD6	DXE_NO_CON_OUT
0xD7	DXE_NO_CON_IN

0xD8	DXE_INVALID_PASSWORD
0xD9	DXE_BOOT_OPTION_LOAD_ERROR
0xDA	DXE_BOOT_OPTION_FAILED
0xDB	DXE_FLASH_UPDATE_FAILED
0xDC	DXE_RESET_NOT_AVAILABLE
0xE8	PEI_MEMORY_S3_RESUME_FAILED
0xE9	PEI_S3_RESUME_PPI_NOT_FOUND
0xEA	PEI_S3_BOOT_SCRIPT_ERROR
0xEB	PEI_S3_OS_WAKE_ERROR

English

2.10 Unit Identification purpose LED/Switch

With the UID button, You are able to locate the server you're working on from behind a rack of servers.

Unit Identification purpose LED/Switch (UID1)

When the UID button on the front or rear panel is pressed, the front/rear UID blue LED indicator will be truned on. Press the UID button again to turn off the indicator.

2.11 Driver Installation Guide

To install the drivers to your system, please insert the support CD to your optical drive first. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page. Please follow the order from top to bottom to install those required drivers. Therefore, the drivers you install can work properly.

2.12 M.2_SSD (NGFF) Module Installation Guide (M2_1)

The M.2, also known as the Next Generation Form Factor (NGFF), is a small size and versatile card edge connector that aims to replace mPCIe and mSATA. The M.2_SSD (NGFF) Socket 3 can accommodate either a M.2 SATA3 6.0 Gb/s module or a M.2 PCI Express module up to Gen4 x4 (64Gb/s) (Matisse) or Gen3 x4 (32Gb/s) (Picasso).

Installingg the M.2_SSD (NGFF) Module
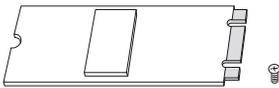
Step 1

Prepare a M.2_SSD (NGFF) module and the screw.
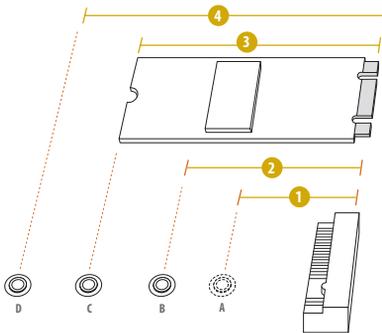
Step 2

Depending on the PCB type and length of your M.2_SSD (NGFF) module, find the corresponding nut location to be used.

No.	1	2	3	4
Nut Location	A	B	C	D
PCB Length	4.2cm	6cm	8cm	10cm
Module Type	Type 2242	Type2260	Type 2280	Type 22110
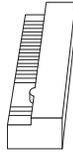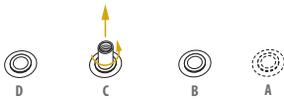
Step 3

Move the standoff based on the module type and length. The standoff is placed at the nut location C by default. Skip Step 3 and 4 and go straight to Step 5 if you are going to use the default nut. Otherwise, release the standoff by hand.
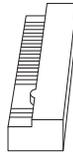
Step 4
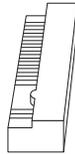
Peel off the yellow protective film on the nut to be used. Hand tighten the standoff into the desired nut location on the motherboard.

Step 5
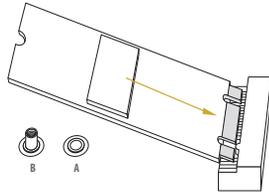
Align and gently insert the M.2 (NGFF) SSD module into the M.2 slot. Please be aware that the M.2 (NGFF) SSD module only fits in one orientation.
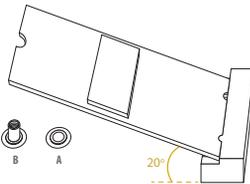
Step 6
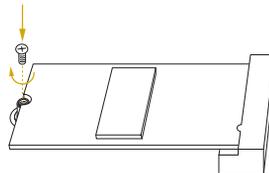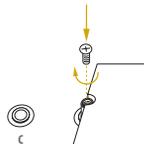
Tighten the screw with a screwdriver to secure the module into place. Please do not overtighten the screw as this might damage the module.

For the latest updates of M.2_SSD (NFGG) module support list, please visit our website for details: http://www.asrockrack.com

2.13 M.2_SSD (NGFF) Module Installation Guide (M2_2)

The M.2, also known as the Next Generation Form Factor (NGFF), is a small size and versatile card edge connector that aims to replace mPCIe and mSATA. The M.2_SSD (NGFF) Socket 3 can accommodate either a M.2 SATA3 6.0 Gb/s module or a M.2 PCI Express module up to Gen4 x4 (64Gb/s) (Matisse) or Gen3 x4 (32Gb/s) (Picasso).

Installingg the M.2_SSD (NGFF) Module

Step 1

Prepare a M.2_SSD (NGFF) module and the screw.

Step 2

Depending on the PCB type and length of your M.2_SSD (NGFF) module, find the corresponding nut location to be used.

No.	1	2	3
Nut Location	A	B	C
PCB Length	4.2cm	6cm	8cm
Module Type	Type 2242	Type2260	Type 2280

English

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Step 3

Move the standoff based on the module type and length.
The standoff is placed at the nut location C by default. Skip Step 3 and 4 and go straight to Step 5 if you are going to use the default nut. Otherwise, release the standoff by hand.

C   B   A

Step 4

Peel off the yellow protective film on the nut to be used. Hand tighten the standoff into the desired nut location on the motherboard.

C   B   A

Step 5

Align and gently insert the M.2 (NGFF) SSD module into the M.2 slot. Please be aware that the M.2 (NGFF) SSD module only fits in one orientation.

C   B   A

C   B   A   20°

Step 6

Tighten the screw with a screwdriver to secure the module into place. Please do not overtighten the screw as this might damage the module.

C

For the latest updates of M.2_SSD (NFGG) module support list, please visit our website for details: http://www.asrockrack.com