OPEN
Industry Standard, Flexible Architecture

GREEN
Less Heat, Less Power Consumption

STABLE
Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation
Motherboard

WRX80D8-2T
WRX80D8-NL

User Manual

English

Version 1.0
Published June 2022

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(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.
"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

ASRock Rack's Website: www.ASRockRack.com

Contact Information

If you need to contact ASRock Rack or want to know more about ASRock Rack, you're welcome to visit ASRock Rack's website at www.ASRockRack.com; or you may contact your dealer for further information.

ASRock Rack Incorporation

6F., No.37, Sec. 2, Jhongyang S. Rd., Beitou District,

Taipei City 112, Taiwan (R.O.C.)

Contents

Chapter 1 Introduction

Thank you for purchasing ASRock Rack ***WRX80D8-2T / WRX80D8-NL*** 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.

In this manual, chapter 1 and 2 contains introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contains the configuration guide to BIOS setup and driver installation.

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 WRX80D8-2T / WRX80D8-NL Motherboard
  (ATX Form Factor: 12.0-in x 9.6-in, 30.5 cm x 24.4 cm)
- Quick Installation Guide
- 1 x SATA3 Cable (60cm)
- 1 x Oculink to 4 SATA Cable (60cm)
- 2 x Screws for M.2 Sockets
- 1 x I/O Shield

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

English

1.2 Specifications

WRX80D8-2T / WRX80D8-NL	
MB Physical Status	
Form Factor	ATX
Dimension	12" x 9.6" (30.5 cm x 24.4 cm)
Processor System	
CPU	Supports AMD Ryzen™ Threadripper™ PRO 3000WX Supports AMD Ryzen™ Threadripper™ PRO 5000WX
Socket	Single Socket SP3 (LGA4094)
Chipset	AMD WRX80
System Memory	
Capacity	8 x 288-pin DDR4 DIMM slots (1DPC)
Type	- Eight Channel Memory Technology - Supports DDR4 288-pin ECC/non-ECC UDIMM, RDIMM, LRDIMM, RDIMM-3DS
Voltage	1.2V
DIMM Size per DIMM	- ECC/non-ECC UDIMM, RDIMM, LRDIMM: up to 128GB - RDIMM-3DS*: up to 256GB **RDIMM-3DS Max. memory capacity is to be validated*
DIMM Frequency	ECC/non-ECC UDIMM, RDIMM, LRDIMM, RDIMM-3DS*: max. 3200MHz **RDIMM-3DS Max. memory frequency is to be validated*
Voltage	1.2V
Expansion Slot	
PCIe 4.0 x 16	PCIE7: Gen4 x16 link [CPU] PCIE6: Gen4 x16 link [CPU] PCIE5: Gen4 x16 link [CPU] PCIE4: Gen4 x16 link [CPU] PCIE3: Gen4 x16 link [CPU] PCIE2: Gen4 x16 link [CPU] PCIE1: Gen4 x16 link [CPU]
Storage	
SATA Controller	AMD WRX80 (12 SATA 6Gb/s): 2 OCuLink, 4 SATA 7-pin
OCuLink for U.2	2 OCuLink (PCIe4.0 x4 or 4 SATA 6Gb/s) [FCH]
M.2	M2_1: 1x M-key (PCIe4.0 x4) support 2230/2242/2260/2280/22110 [FCH] M2_2: 1x M-key (PCIe4.0 x4) support 2230/2242/2260/2280/22110 [FCH]

Ethernet	
Interface	**WRX80D8-2T:** 10Gbps/1000 Mbps **WRX80D8-NL:** NA
LAN Controller	**WRX80D8-2T:** - 2 x RJ45 10GbpE by Intel® X710-AT2 - 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 **WRX80D8-NL:** - 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
Management	
BMC Controller	ASPEED AST2500 : IPMI (Intelligent Platform Management Interface) 2.0 with Ikvm and vMedia support
IPMI Dedicated GLAN	1 x Realtek RTL8211E for dedicated management
Features	NMI
Gracphics	
Controller	ASPEED AST2500
VRAM	DDR4 512MB
Rear Panel I/O	
VGA Port	1 x D-Sub
Serial Port	1
USB 3.2 Gen2 Port	2 (Type-A)
LAN Port	**WRX80D8-2T:** - 2 RJ45 (10GbE) - LAN Ports with LED (ACT/LINK LED and SPEED LED) **WRX80D8-NL:** NA
Dedicate LAN	1x IPMI dedicated LAN
UID Button/UID LED	1

Internal Connector	
Auxiliary Panel Header	1 (18-pin) (includes chassis intrusion, location button & LED, system fault LED, and front LAN LED)
TPM Header	1 (13-pin, SPI), 1 (17-pin, LPC)
Thermal Sensor Header	2
IPMB Header	1
PMBus CONN	1
Fan Header	7 (6-pin)
USB 3.2 (Gen1) Header	1 (19-pin, 2 USB3.2 Gen1)
USB 3.2 (Gen2) Header	1 (Type-C, 1 USB3.2 Gen2x2 (20 Gb/s))
NMI Header	1
System Panel	1 (9-pin): RSTBTN, PWRBTN, HDDLED, PWRLED
Speaker Header	1 (4-pin)
BMC_SMB Header	1
CPU HSBP	1
Power Connector	1 (24-pin, ATX main power), 2 (8-pin, ATX 12V)
Clear CMOS	1 (contact pads)
Onboard LED	
Standby PWR LED 5vsb	1
80 Debug Port LED	1
Fan Fail LED	7
BMC heartbeat LED	1
System BIOS	
BIOS Type	AMI 256 Mb SPI Flash ROM
BIOS Features	- Plug and Play (PnP) - ACPI 2.0 Compliance Wake Up Events - SMBIOS 2.8.0 Support - ASRock Rack Instant Flash
Hardware Monitor	
Temperature	- CPU Temperature Sensing - DRAM Temperature Sensing - MB Temperature Sensing - Card Side Temperature Sensing - Chipset Temperature Sensing

Fan	- CPU/Rear/Front Fan Tachometer - CPU Quiet Fan (Allow Chassis Fan Speed Auto-Adjust by CPU Temperature) - CPU/Rear/Front Fan Multi-Speed Control
Voltage	Voltage Monitoring: 3VSB, 5VSB, VCPU, VSOC, VCCM, APU VDDP, 1.05V_PROM_S5, 2.5V_PROM, 1.05V_PROM_RUN, BAT, 3V, 5V, 12V
Support OS	
OS	Microsoft® Windows®: - Windows 10 (64 bit) - Windows 11 (64 bit) Linux®: - RedHat Enterprise Linux Server 8.5 (64 bit) / 8.2 (64 bit) - CentOs 8.5 (64 bit) / 8.2 (64 bit) - UBuntu 18.04.5 (64 bit) / 20.04.3 (64 bit) / 21.04 (64 bit) Hypervisor: - VMWare ESXi 7.0 U3c / 7.0 U2a - vSphere 7.0 U3c / 7.0 U2a
	**On Windows 11, CPU supports AMD Ryzen™ Threadripper™ PRO 5000WX only.* **Raid Mode supports UEFI Boot only.* **Please refer to our website for the latest OS support list.*
Environment	
Temperature	Operation temperature: 10°C ~ 35°C / Non operation temperature: -40°C ~ 70°C
Humidity	Non operation humidity: 20% ~ 90% (Non condensing)

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 LAN1&2 can wake up S5 under OS.

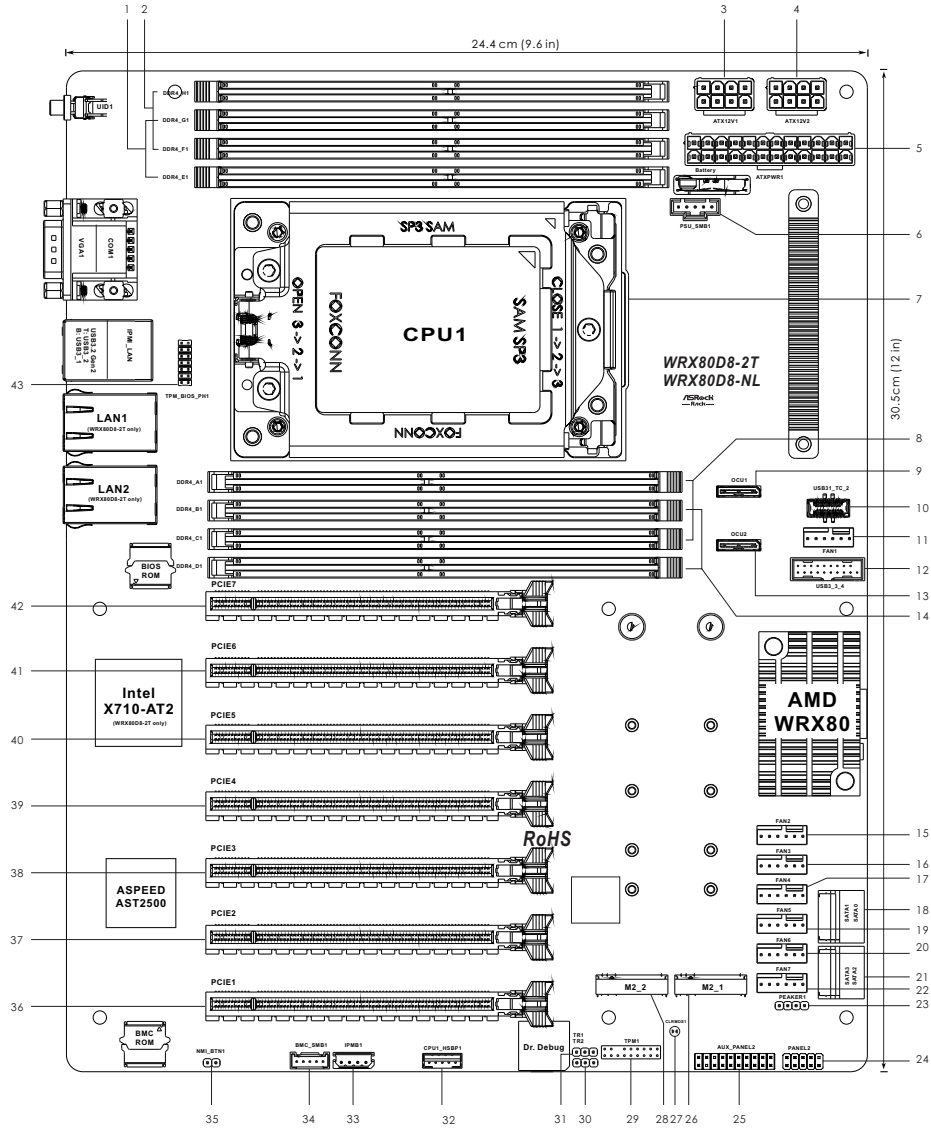
If you install Intel® LAN utility or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If you install the drivers only, it will pass the WHQL tests.

English

1.3 Unique Features

ASRock 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 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

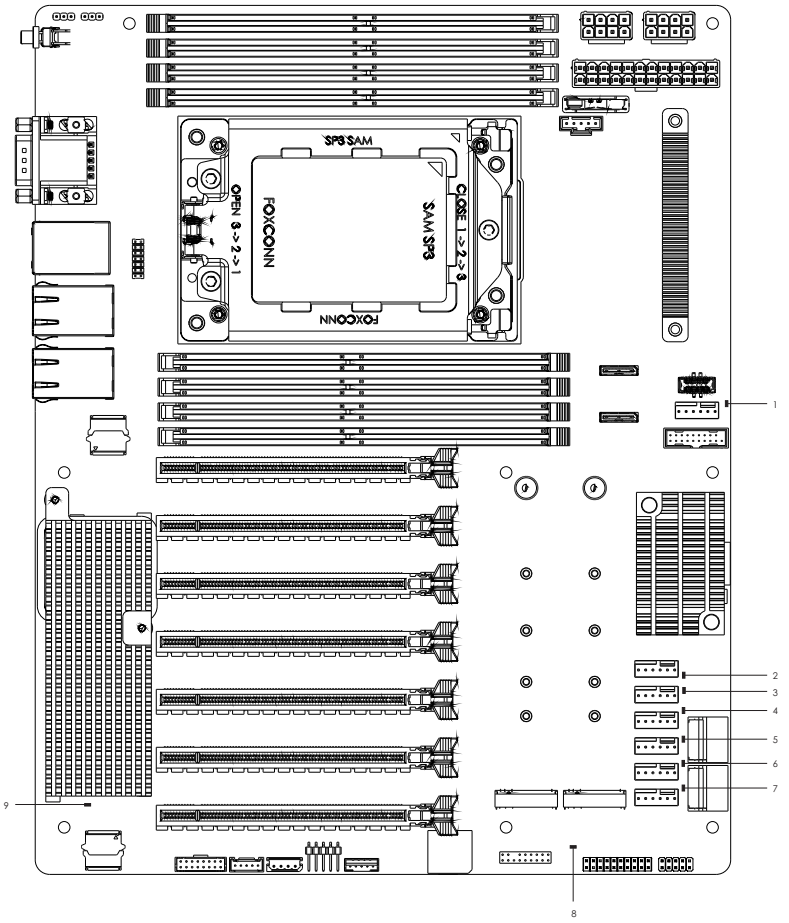


No.	Description
1	2 x 288-pin DDR4 DIMM Slots (DDR4_E1, DDR4_G1)
2	2 x 288-pin DDR4 DIMM Slots (DDR4_F1, DDR4_H1)
3	ATX 12V Power Connector (ATX12V1)
4	ATX 12V Power Connector (ATX12V2)
5	ATX Power Connector (ATXPWR1)
6	PSU SMBus (PSU_SMB1)
7	AMD Socket SP3 (LGA4094)
8	2 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_C1)
9	OCuLink x4 Connector (OCU1)
10	Type-C USB 3.2 Gen2x2 Header (USB31_TC_2)
11	System Fan Connector (FAN1)
12	USB 3.2 Gen1 Header (USB3_3_4)
13	OCuLink x4 Connector (OCU2)
14	2 x 288-pin DDR4 DIMM Slots (DDR4_B1, DDR4_D1)
15	System Fan Connector (FAN2)
16	System Fan Connector (FAN3)
17	System Fan Connector (FAN4)
18	SATA3 Connectors (SATA0)(Lower), (SATA1)(Upper)
19	System Fan Connector (FAN5)
20	System Fan Connector (FAN6)
21	SATA3 Connectors (SATA2)(Lower), (SATA3)(Upper)
22	System Fan Connector (FAN7)
23	Speaker Header (SPEAKER1)
24	System Panel Header (PANEL2)
25	Auxiliary Panel Header (AUX_PANEL2)
26	M.2 Socket (M2_1) (Type 2230/2242/2260/2280/22110)
27	Clear CMOS Pad (CLRMOS1)
28	M.2 Socket (M2_2) (Type 2230/2242/2260/2280/22110)
29	TPM Header (TPM1)
30	Thermal Sensor Header (TR2)
31	Thermal Sensor Header (TR1)
32	Backplane PCI Express Hot-Plug Connector (CPU1_HSBP1)
33	Intelligent Platform Management Bus Header (IPMB1)

No.	Description
34	BMC SMBus Header (BMC_SMB1)
35	Non Maskable Interrupt Button (NMI_BTN1)
36	PCI Express 4.0 x16 Slot (PCIE1)
37	PCI Express 4.0 x16 Slot (PCIE2)
38	PCI Express 4.0 x16 Slot (PCIE3)
39	PCI Express 4.0 x16 Slot (PCIE4)
40	PCI Express 4.0 x16 Slot (PCIE5)
41	PCI Express 4.0 x16 Slot (PCIE6)
42	PCI Express 4.0 x16 Slot (PCIE7)
43	TPM-SPI Header (TPM_BIOS_PH1)

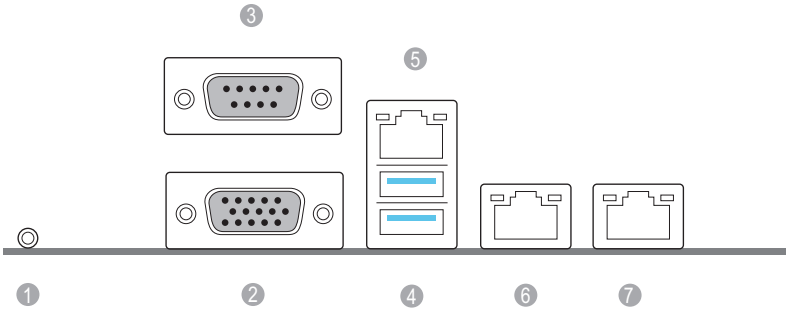
**For DIMM installation and configuration instructions, please see p.23 (Installation of Memory Modules (DIMM)) for more details.*

1.5 Onboard LED Indicators



No.	Status	Description
1	Amber	FAN1 failed
2	Amber	FAN2 failed
3	Amber	FAN3 failed
4	Amber	FAN4 failed
5	Amber	FAN5 failed
6	Amber	FAN6 failed
7	Amber	FAN7 failed
8	Green	STB PWR ready
9	Green	BMC heartbeat LED

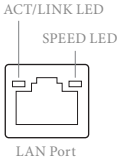
1.6 I/O Panel



No.	Description	No.	Description
1	UID Switch (UID1)	5	LAN RJ-45 Port (IPMI_LAN)**
2	VGA Port (VGA1)	6	LAN RJ-45 Port (LAN1)* *(WRX80D8-2T only)*
3	Serial Port (COM1)	7	LAN RJ-45 Port (LAN2)* *(WRX80D8-2T only)*
4	USB 3.2 Gen2 Type-A Ports (USB3_1_2)		

LAN Port LED Indications

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

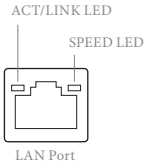


Dedicated IPMI LAN Port LED Indications

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	1G bps connection

English

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

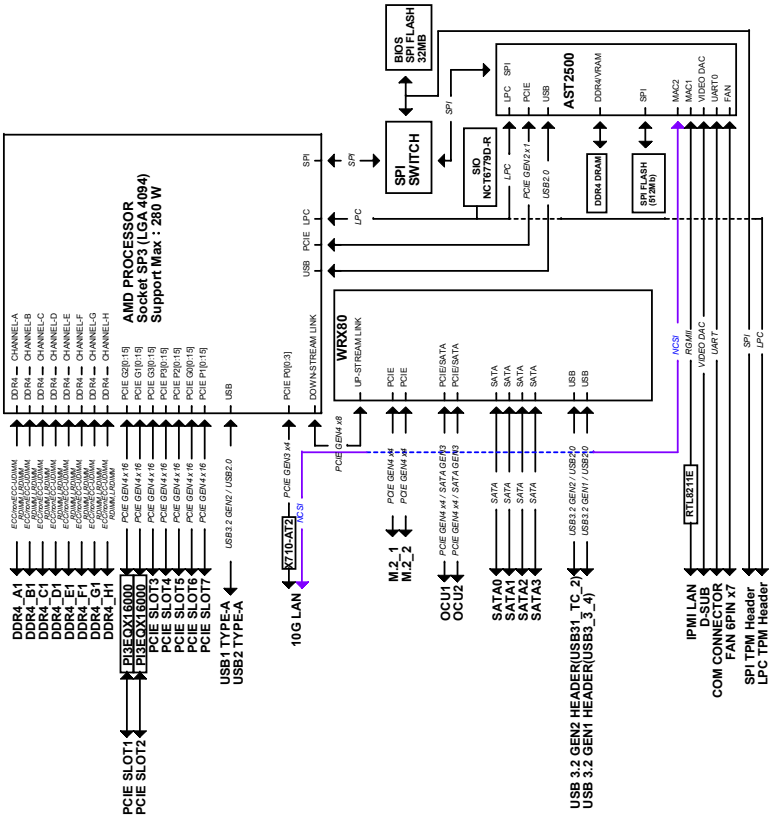


10G LAN Port (LAN1, LAN2) LED Indications *(WRX80D8-2T only)*

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

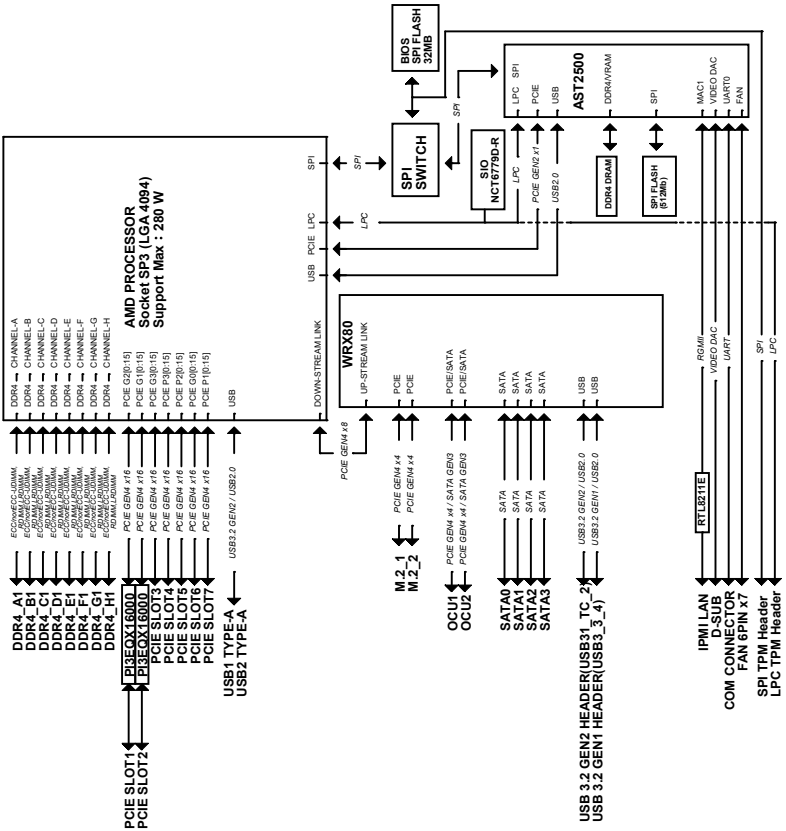
1.7 Block Diagram

WRX80D8-2T



English

WRX80D8-NL


AMD PROCESSOR
Socket SP3 (LGA 4094)
Support Max : 280 W
DDR4 CHANNEL-A
DDR4 CHANNEL-B
DDR4 CHANNEL-C
DDR4 CHANNEL-D
DDR4 CHANNEL-E
DDR4 CHANNEL-F
DDR4 CHANNEL-G
DDR4 CHANNEL-H
PCIE G32[0:15]
PCIE G16[0:15]
PCIE G32[0:15]
PCIE P32[0:15]
PCIE G0[0:15]
PCIE P16[0:15]
USB
DOWN-STREAM LINK
USB
PCIE
LPC
SPI
WRX80
UP-STREAM LINK
PCIE GEN4 x8
SPI SWITCH
SPI
LPC
BIOS SPI FLASH 32MB
SIO NCT6779D-R
LPC
PCIE GEN2 x1
USB2.0
AST2500
LPC
PCIE
USB
SPI
DDR4 DRAM
DDR4/VRAM
SPI FLASH (512Mb)
SPI
MAC1
VIDEO DAC
UART0
FAN
RGMII
VIDEO DAC
UART
SPI
LPC
RTL8211E
DDR4_A1
DDR4_B1
DDR4_C1
DDR4_D1
DDR4_E1
DDR4_F1
DDR4_G1
DDR4_H1
PCIE SLOT1
PCIE SLOT2
PLX PEX16000
PLX PEX16000
PCIE SLOT3
PCIE SLOT4
PCIE SLOT5
PCIE SLOT6
PCIE SLOT7
USB1 TYPE-A
USB2 TYPE-A
M.2_1
M.2_2
OCU1
OCU2
SATA0
SATA1
SATA2
SATA3
USB 3.2 GEN2 HEADER(USB31_TC_2)
USB 3.2 GEN1 HEADER(USB3_3_4)
IPMI LAN
D-SUB
COM CONNECTOR
FAN 6PIN x7
SPI TPM Header
LPC TPM Header

Chapter 2 Installation

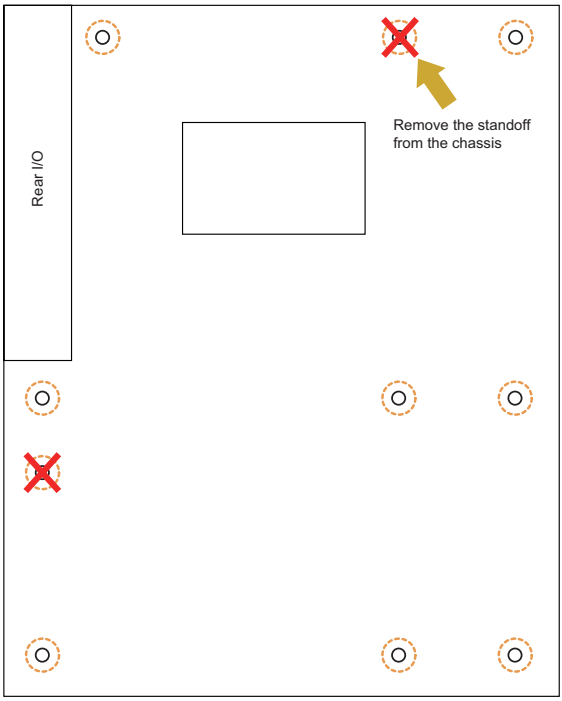
This is an ATX form factor (12" x 9.6", 30.5 cm x 24.4 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

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 standoff at the marked location, under the motherboard, from the chassis, in order to avoid electrical short circuit and damage to your motherboard.



2.2 Pre-installation Precautions

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

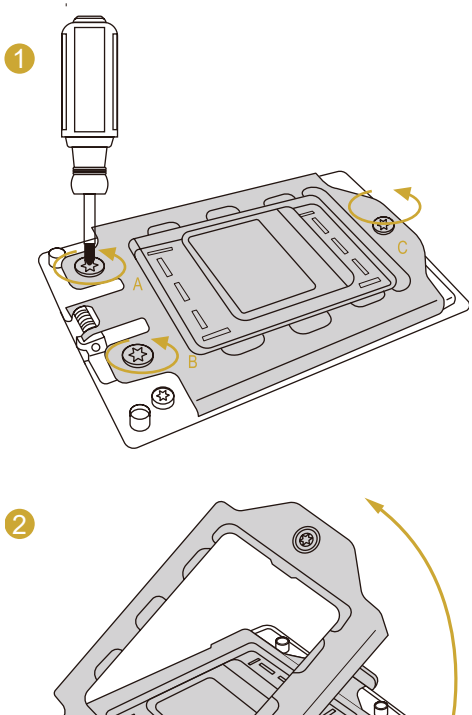
1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before 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.

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

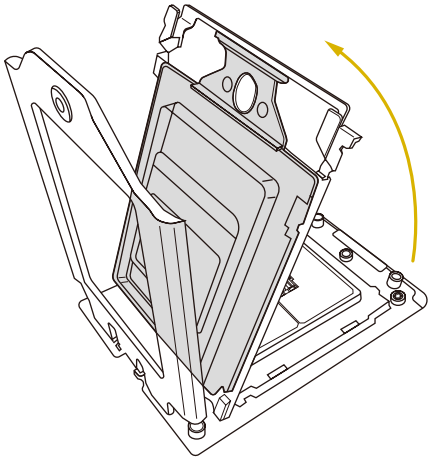
Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

2.3 Installing the CPU and Heatsink

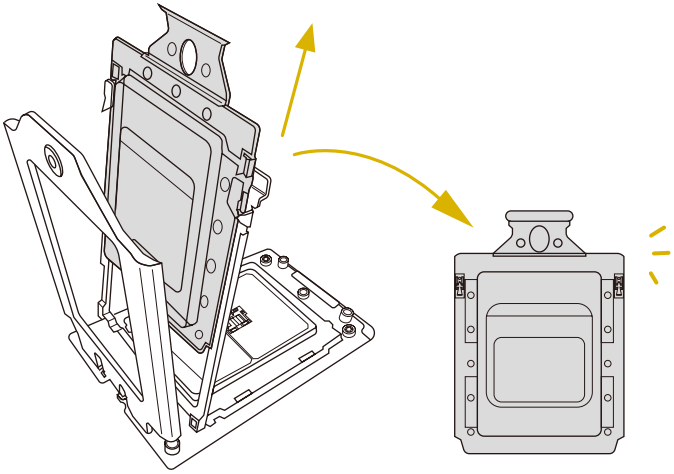
Unplug all power cables before installing the CPU.



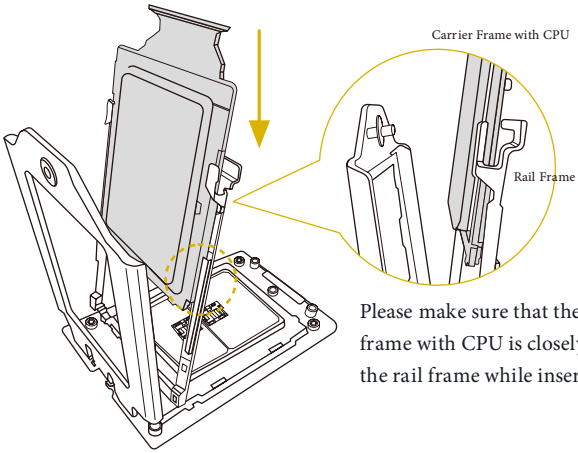
3



4



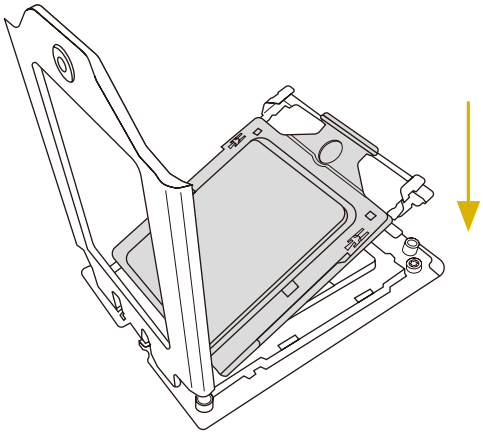
5



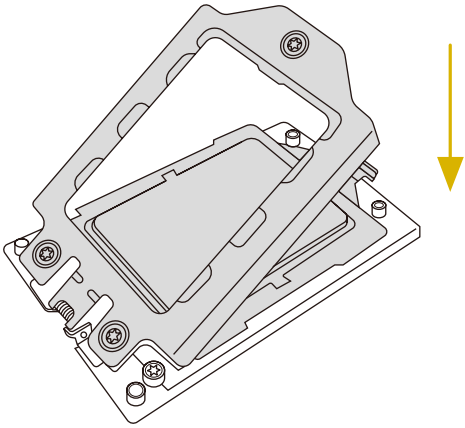
Please make sure that the carrier frame with CPU is closely attached to the rail frame while inserting it.

⚠ Install the orange carrier frame with CPU. Don't separate them.

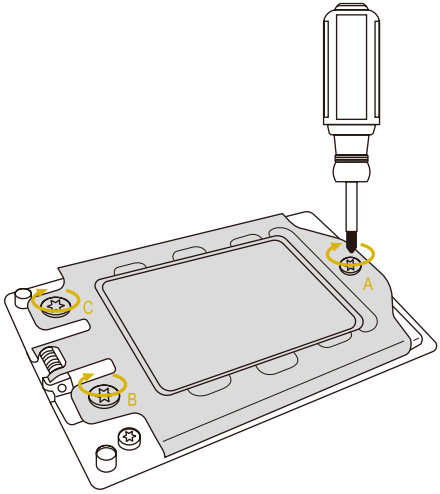
6



7



8

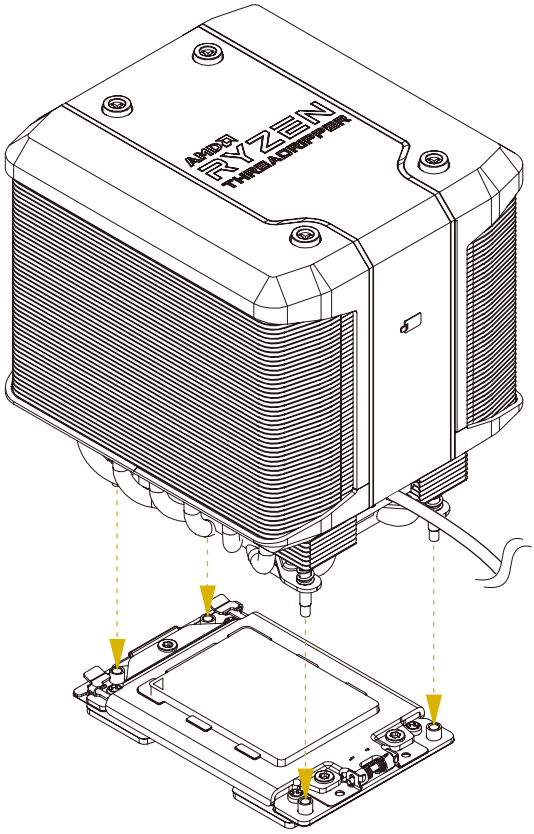


2.4 Installing the CPU Cooler

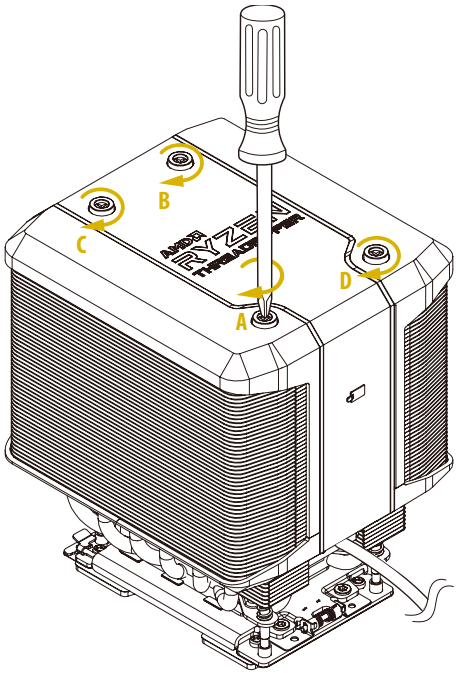
After you install the CPU into this motherboard, it is necessary to install a larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good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

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

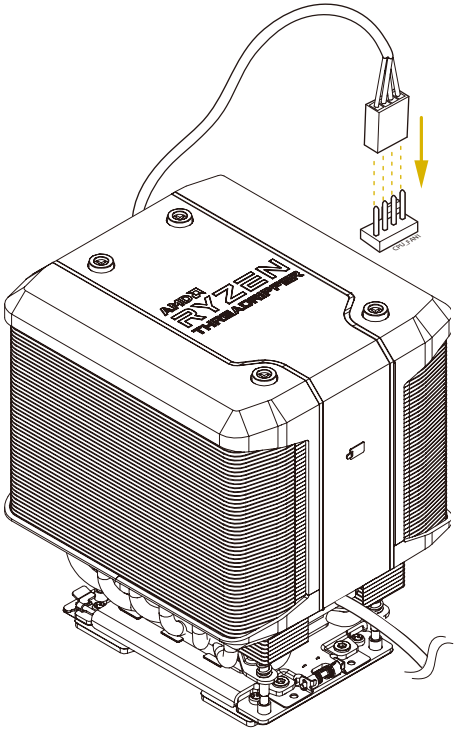
1



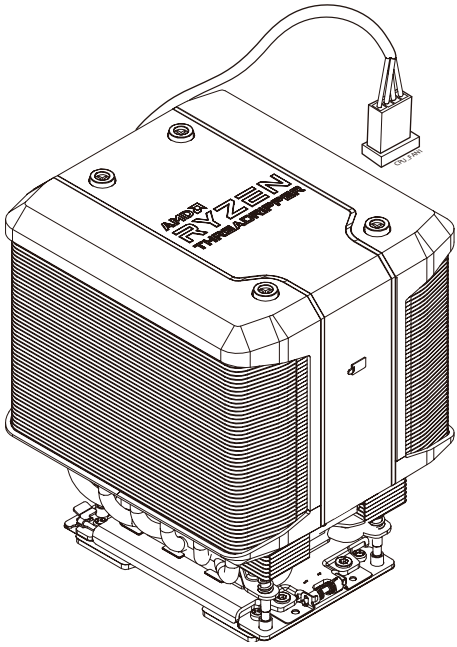
2



3



4



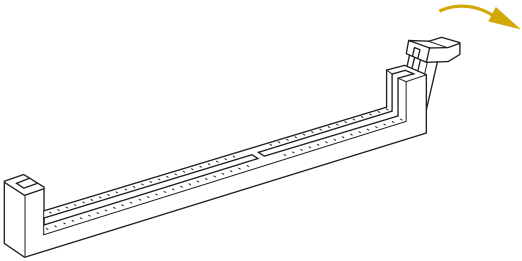
2.5 Installation of Memory Modules (DIMM)

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

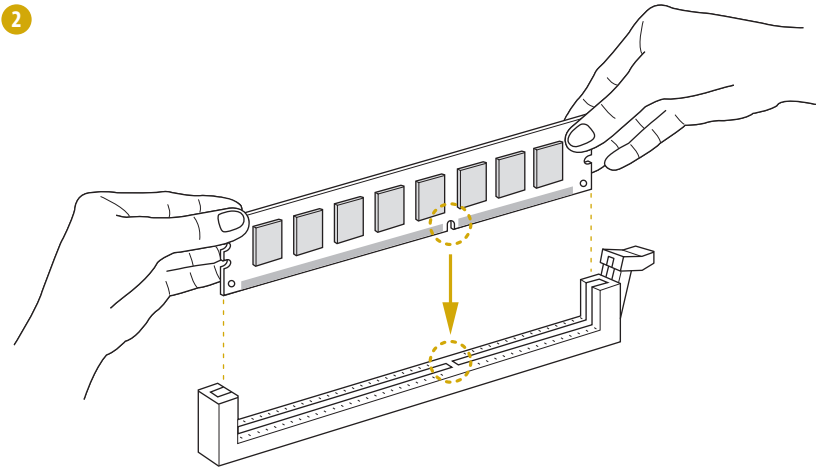
	CPU1							
	A1	B1	C1	D1	E1	F1	G1	H1
1 DIMM	#							
2 DIMMS	#		#					
4 DIMMS	#		#		#		#	
8 DIMMS	#	#	#	#	#	#	#	#

1. *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.*
2. *For eight channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR4 DIMM pairs.*
3. *It is unable to activate Eight Channel Memory Technology with less than eight memory module installed.*
4. *Some DDR4 1GB double-sided DIMMs with 16 chips may not work on this motherboard. It is not recommended to install them on this motherboard.*

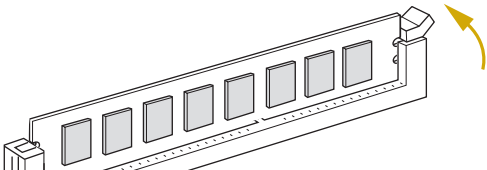
1



2



3



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 7 PCI Express slots on this motherboard.

PCIE slot:

PCIE1~PCIE7 (PCIE 4.0 x16 slot, from CPU) are used for PCI Express x16 lane width graphics cards.

Slot	Generation	Mechnical	Eletrical	Source
PCIE 1	4.0	x16	x16	CPU
PCIE 2	4.0	x16	x16	CPU
PCIE 3	4.0	x16	x16	CPU
PCIE 4	4.0	x16	x16	CPU
PCIE 5	4.0	x16	x16	CPU
PCIE 6	4.0	x16	x16	CPU
PCIE 7	4.0	x16	x16	CPU

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.

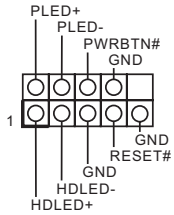
Step 5. Fasten the card to the chassis with screws.

Step 6. Replace the system cover.

2.7 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 PANEL2)
(see p.7, No. 24)



Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. 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.

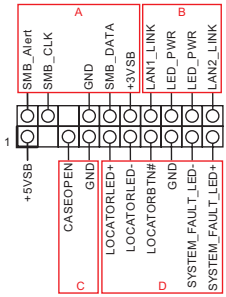
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

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 keeps blinking when the system is in S1/S3 sleep state. 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_PANEL2)
(see p.7, No. 25)



This header supports multiple functions on the front panel, including the front panel SMB, internet status indicator and chassis intrusion pin.

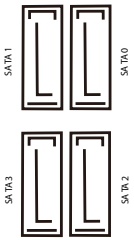
A. Front panel SMBus connecting pin (6-1 pin FPSMB)
This header allows you to connect SMBus (System Management Bus) equipment. It can be used for communication between peripheral equipment in the system, which has slower transmission rates, and power management equipment.

B. Internet status indicator (2-pin LAN1_LED, LAN2_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 (6-pin LOCATOR)
This header is for the locator switch and LED on the front panel.

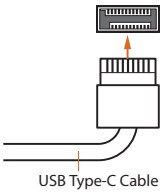
Serial ATA3 Connectors
Right Angle:
(SATA0: see p.7, No. 18)
(Lower)
(SATA1: see p.7, No. 18)
(Upper)
(SATA2: see p.7, No. 21)
(Lower)
(SATA3: see p.7, No. 21)
(Upper)



These four SATA3 connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

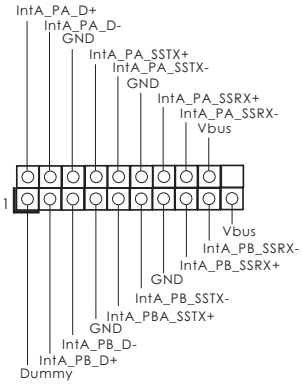
English

Front Panel Type C USB 3.2 Gen2x2 Header (20-pin USB31_TC_2) (see p.7, No. 10)



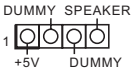
There is one Front Panel Type C USB 3.2 Gen2x2 Header on this motherboard. This header is used for connecting a USB 3.2 Gen2x2 module for additional USB 3.2 Gen2x2 ports.

USB 3.2 Gen1 Header (19-pin USB3_3_4) (see p.7, No. 12)



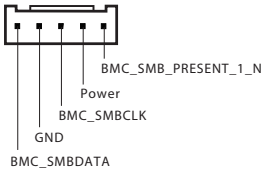
Besides two default USB 3.2 Gen1 ports on the I/O panel, there is one USB 3.2 Gen1 header on this motherboard. Each USB 3.2 Gen1 header can support two USB 3.2 Gen1 ports.

Chassis Speaker Header (4-pin SPEAKER1) (see p.7, No. 23)



Please connect the chassis speaker to this header.

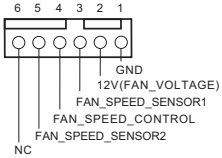
Baseboard Management Controller SMBus Header (5-pin BMC_SMB1) (see p.7, No. 34)



The header is used for the SM BUS devices.

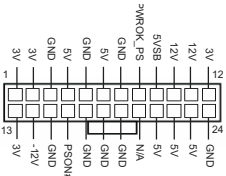
English

System Fan Connectors
(6-pin FAN1)
(see p.7, No. 11)
(6-pin FAN2)
(see p.7, No. 15)
(6-pin FAN3)
(see p.7, No. 16)
(6-pin FAN4)
(see p.7, No. 17)
(6-pin FAN5)
(see p.7, No. 19)
(6-pin FAN6)
(see p.7, No. 20)
(6-pin FAN7)
(see p.7, No. 22)



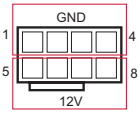
Please connect the fan cables to the fan connectors and match the black wire to the ground pin. All fans supports Fan Control.

ATX Power Connector
(24-pin ATXPWR1)
(see p.7, No. 5)



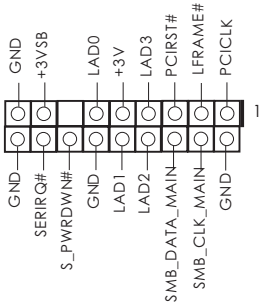
This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.

ATX 12V Power Connectors
(8-pin ATX12V1)
(see p.7, No. 3)
(8-pin ATX12V2)
(see p.7, No. 4)



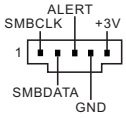
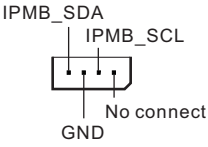
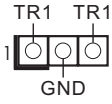
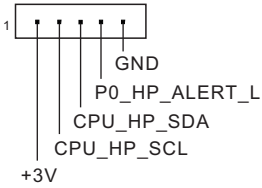
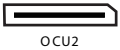
This motherboard provides two 8-pin ATX 12V power connectors.

TPM Header
(17-pin TPM1)
(see p.7, No. 29)



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.

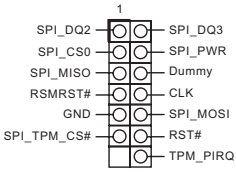
English

PSU SMBus (PSU_SMB1) (see p.7, No. 6)		PSU SMBus monitors the status of the power supply, fan and system temperature.
Non Maskable Interrupt Button Header (NMI_BTN1) (see p.7, No. 35)		Please connect a NMI device to this header.
Intelligent Platform Management Bus Header (4-pin IPMB1) (see p.7, No. 33)		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.
Thermal Sensor Headers (3-pin TR1) (see p.7, No. 31) (3-pin TR2) (see p.7, No. 30)		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.
Backplane PCI Express Hot-Plug Connector (5-pin CPU1_HSBP1) (see p.6, No. 32)		This header is used for the hot plug feature of HDDs on the backplane.
OCuLink Connectors (OCU1) (see p.6, No. 9) (OCU2) (see p.6, No. 13)	 	Please connect PCIE SSDs to the connector.

Clear CMOS Pad
(CLRMOS1)
(see p.7, No. 27)

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

SPI TPM Header
(13-pin TPM_BIOS_PH1)
(see p.7, No. 43)



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.

2.8 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

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

2.9 Unit Identification purpose LED/Switch

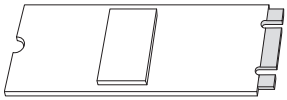
With the UID button, You are able to locate the server you're working on from behind a rack of servers.

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 turned on. Press the UID button again to turn off the indicator.

2.10 M.2 SSD Module Installation Guide

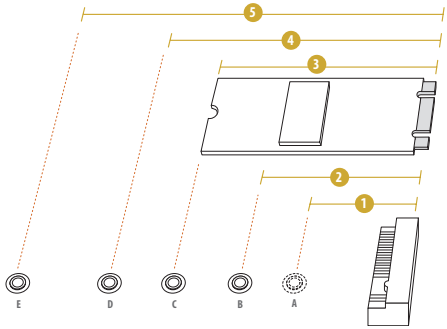
The Hyper M.2 Socket (M2_1, Key M) supports type 2230/2242/2260/2280/22110 M.2 PCI Express module up to Gen4 x4 (64Gb/s). The Hyper M.2 Socket (M2_2, Key M) supports type 2230/2242/2260/2280/22110 M.2 PCI Express module up to Gen4 x4 (64Gb/s).

Installing the M.2_SSD (NGFF) Module



Step 1

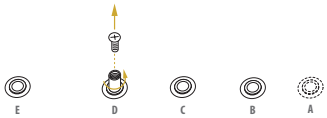
Prepare a M.2 SSD module and the screw.

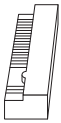


Step 2

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

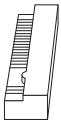
No.	1	2	3	4	5
Nut Location	A	B	C	D	E
PCB Length	3cm	4.2cm	6cm	8cm	11cm
Module Type	Type 2230	Type 2242	Type 2260	Type 2280	Type 22110





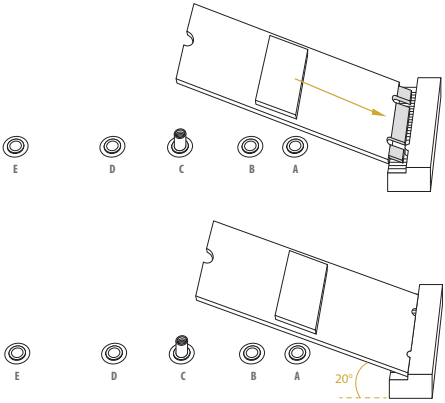
Step 3

Move the standoff based on the module type and length.
The standoff is placed at the nut location D 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.



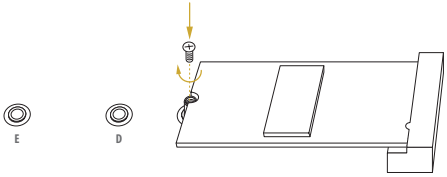
Step 4

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

Gently insert the M.2 SSD module into the M.2 slot. Please be aware that the M.2 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.

Chapter 3 UEFI Setup Utility

3.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. You may run the UEFI SETUP UTILITY when you start up the computer. Please press <F2> or <Del> during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY; otherwise, POST will continue with its test routines.

If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

3.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Item	Description
Main	To set up the system time/date information
Advanced	To set up the advanced UEFI features
Security	To set up the security features
Server Mgmt	To manage the server
Event Logs	For event log configuration
Boot	To set up the default system device to locate and load the Operating System
Exit	To exit the current screen or the UEFI SETUP UTILITY

Use <←→> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen.

English

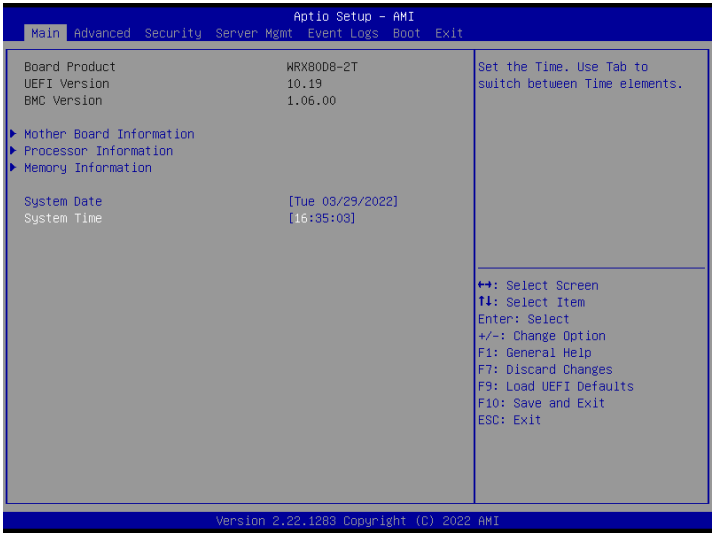
3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Tab>	Switch to next function
<Enter>	To bring up the selected screen
<PGUP>	Go to the previous page
<PGDN>	Go to the next page
<HOME>	Go to the top of the screen
<END>	Go to the bottom of the screen
<F1>	To display the General Help Screen
<F7>	Discard changes and exit the UEFI SETUP UTILITY
<F9>	Load optimal default values for all the settings
<F10>	Save changes and exit the UEFI SETUP UTILITY
<F12>	Print screen
<ESC>	Jump to the Exit Screen or exit the current screen

3.2 Main Screen

Once you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview. The Main screen provides system overview information and allows you to set the system time and date.



Mother Board Information

This displays the information of the motherboard, BIOS and platform.

Processor Information

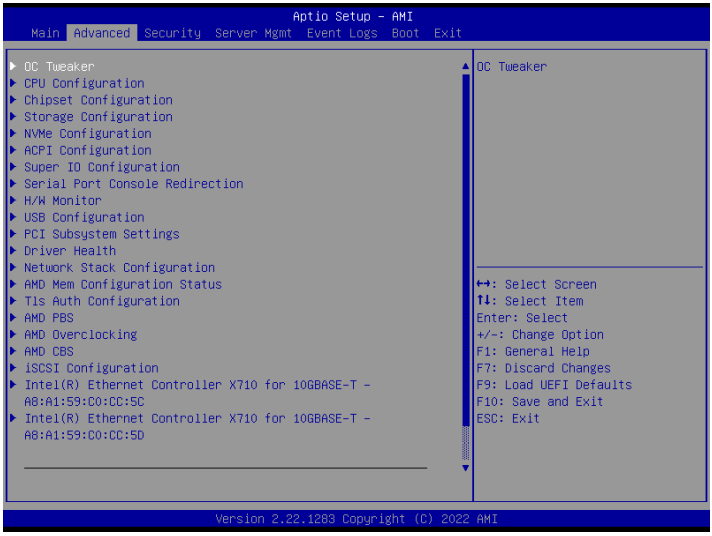
This displays the information of the processor, such as processot type, speed, and model.

Memory Information

This displays the information of memery, such as capacity, number, and channel mode.

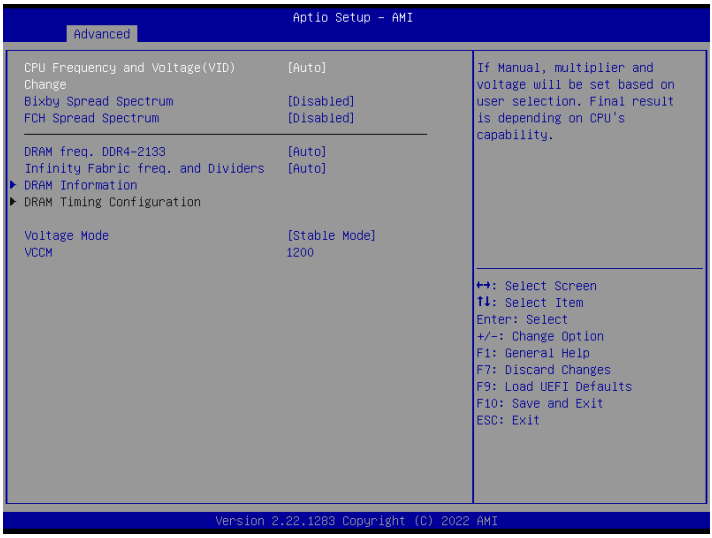
3.3 Advanced Screen

In this section, you may set the configurations for the following items: OC Tweaker, CPU Configuration, Chipset Configuration, Storage Configuration, NVMe Configuration, ACPI Configuration, Super IO Configuration, Serial Port Console Redirection, H/W Monitor, USB Configuration, PCI Subsystem Settings, Driver Health, Network Stack Configuration, AMD Mem Configuration Status, Tls Auth Configuration, AMD PBS, AMD Overclocking, AMD CBS, iSCSI Configuration and Instant Flash.



Setting wrong values in this section may cause the system to malfunction.

3.3.1 OC Tweaker



CPU Frequency and Voltage(VID) Change

If Manual, multiplier and voltgae will be set based on user selection. Final result is depending on CPU's capability.

Bixby Spread Spectrum

Enable/disable Bixby Spread Spectrum.

FCH Spread Spectrum

Enable/disable FCH Spread Spectrum.

DRAM freq. DDR4-2133 *(Name varies depending the module you installed)*

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically. Set DRAM Frequency can adjust DRAM timing.

Infinity Fabric freq. and Dividers

AMD Overclocking Setup Set Infinity Fabric frequency (FCLK) Auto: FCLK=MCLK. Manual: FCLK must be less than or equal to MCLK for best performance in most cases. Latency penalties are incurred if FCLK and MCLK are mismatched, but sufficiently high MCLK can negate or overcome this penalty.

DRAM Information

Browse the serila presence detect (SPD) for DDR4 modules.

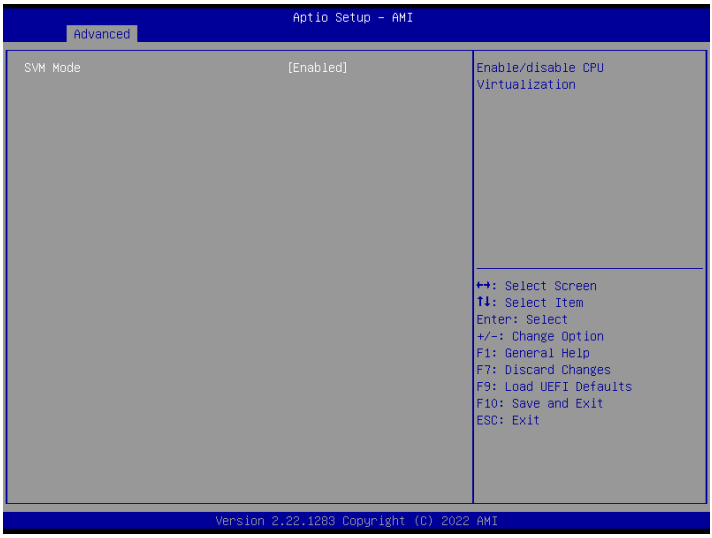
Voltage Mode

[OC]: Larger range ciktage for overclocking.
[Stable]: Smaller range voltage for stable system.

VCCM

Use this item to adjust VCCM voltage.

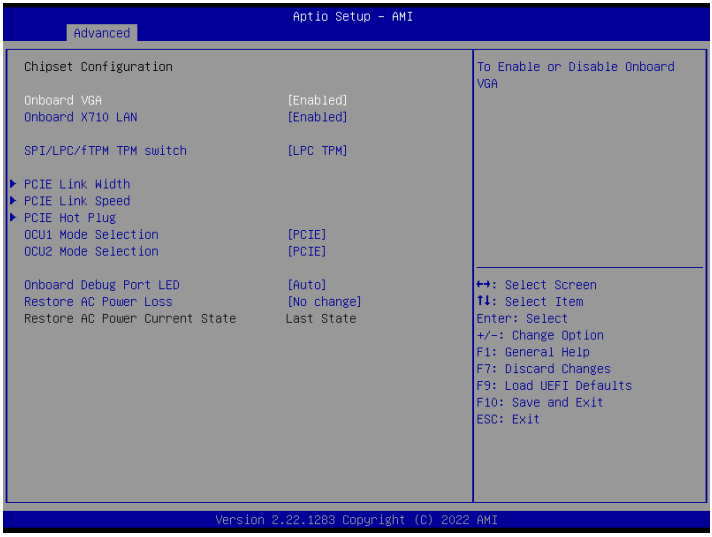
3.3.2 CPU Configuration



SVM Mode

Enable/disable CPU Virtualization.

3.3.3 Chipset Configuration



Onboard VGA

Enable/Disable Onboard VGA.

Onboard X710 LAN *(WRX80D8-2T only)*

Enable/Disable Onboard LAN.

SPI/LPC/fTPM TPM switch

To select. 0: AMD CPU fTPM. 1 - LPC TPM. 2 - SPI TPM

PCIE Link Width

This allows you to select PCIE Link Width. The default value is [x16].

PCIE Link Speed

This allows you to select PCIE Link Speed. The default value is [Auto].

PCIE Hot Plug

This allows you to enable or disable hot plug support.

OCU1 Mode Selection

This allows you to configure OCU1 PCIE(x4)/OCU1_SATA(0-3) Mode.

OCU2 Mode Selection

This allows you to configure OCU2 PCIE(x4)/OCU2_SATA(0-3) Mode.

Onboard Debug Port LED

Enable or disable the onboard Dr. Debug LED.

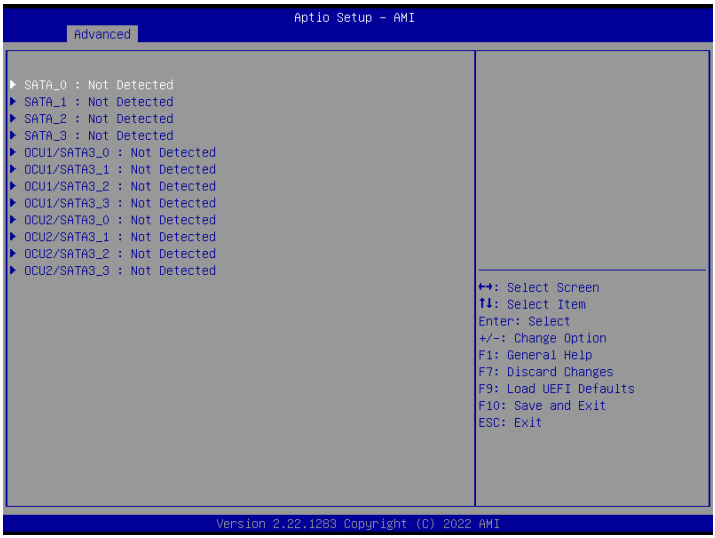
Restore AC Power Loss

Select the power state after a power failure. If [Power Off] is selected, the power will remain off when the power recovers. If [Power On] is selected, the system will start to boot up when the power recovers.

Restore AC Power Current State

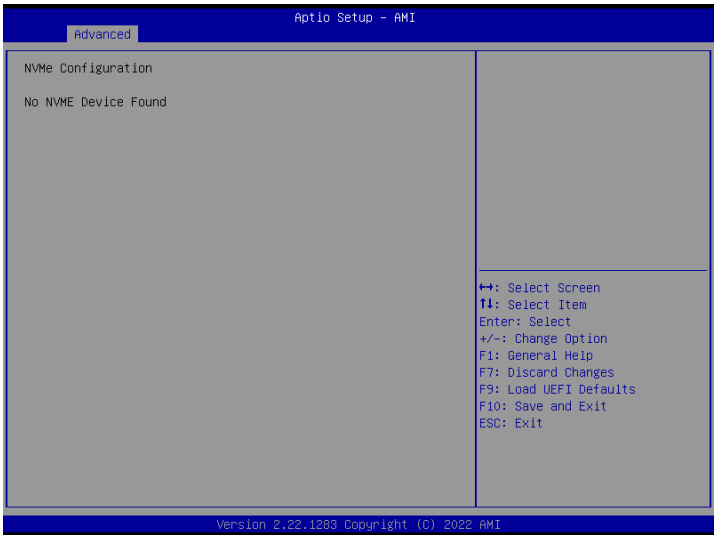
This allows you to restore AC Power Current State.

3.3.4 Storage Configuration



This page allows you to configure storage devices.

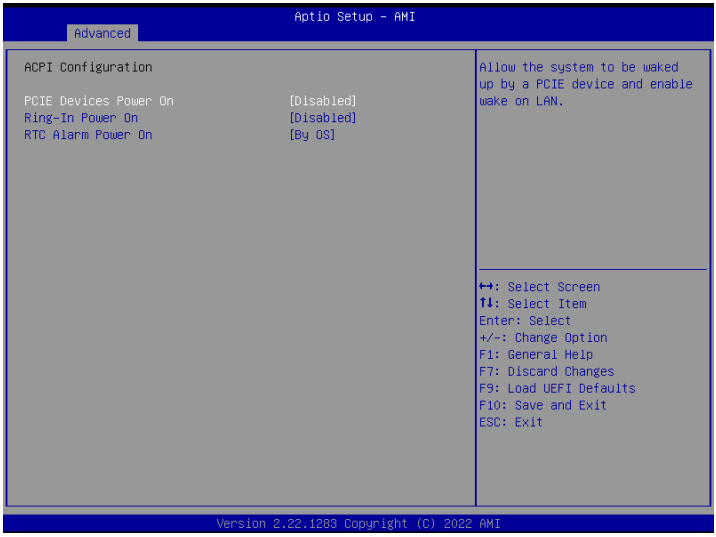
3.3.5 NVME Configuration



If there is a NVMe device installed on the motherboard, the NVMe Configuration page will display the relevant information of the NVMe device you are using.

Please note that the information and items shown here may vary depending on the NVMe device you use.

3.3.6 ACPI Configuration



PCIE Devices Power On

Allow the system to be waked up by a PCIE device and enable wake on LAN.

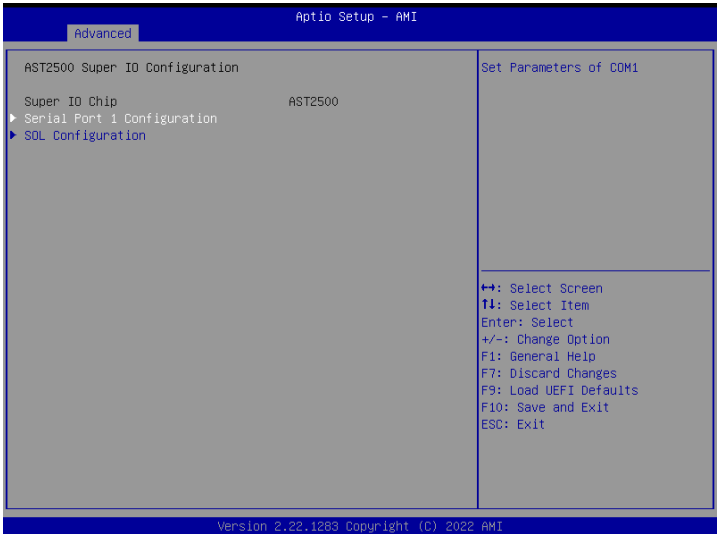
Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

RTC Alarm Power On

Allow the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system.

3.3.7 Super IO Configuration



Serial Port 1 Configuration

Use this item to set parameters of Serial Port 1 (COM1).

Serial Port

Use this item to enable or disable the serial port.

Serial Port Address

Use this item to select an optimal setting for Super IO device.

SOL Configuration

Use this item to set parameters of SOL.

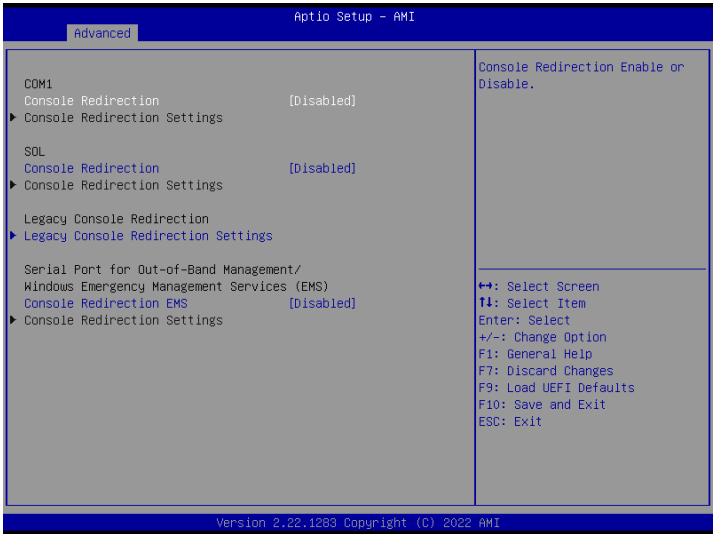
SOL Port

Use this item to enable or disable SOL Port.

Serial Port Address

Use this item to select an optimal setting for Super IO device.

3.3.8 Serial Port Console Redirection



COM1/SOL

Console Redirection

Use this option to enable or disable Console Redirection. If this item is set to Enabled, you can select a COM Port to be used for Console Redirection.

Console Redirection Settings

Use this option to configure Console Redirection Settings, and specify how your computer and the host computer to which you are connected exchange information. Both computers should have the same or compatible settings.

Terminal Type

Use this item to select the preferred terminal emulation type for out-of-band management. It is recommended to select [VT-UTF8].

Option	Description
VT100	ASCII character set
VT100+	Extended VT100 that supports color and function keys
VT-UTF8	UTF8 encoding is used to map Unicode chars onto 1 or more bytes
ANSI	Extended ASCII character set

Bits Per Second
Use this item to select the serial port transmission speed. The speed used in the host computer and the client computer must be the same. Long or noisy lines may require lower transmission speed. The options include [9600], [19200], [38400], [57600] and [115200].

Data Bits
Use this item to set the data transmission size. The options include [7] and [8] (Bits).

Parity
Use this item to select the parity bit. The options include [None], [Even], [Odd], [Mark] and [Space]. A parity bit can be sent with the data bits to detect some transmission errors.Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.
Even: parity bit is 0 if the num of 1's in the data bits is even.
Odd: parity bit is 0 if num of 1's in the data bits is odd.
Mark: parity bit is always 1.
Space: Parity bit is always 0.

Stop Bits
The item indicates the end of a serial data packet. The standard setting is [1] Stop Bit. Select [2] Stop Bits for slower devices.

Flow Control
Use this item to set the flow control to prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to restart the flow. Hardware flow uses two wires to send start/stop signals. The options include [None] and [Hardware RTS/CTS].

VT-UTF8 Combo Key Support
Use this item to enable or disable the VT-UTF8 Combo Key Support for ANSI/VT100 terminals.

Recorder Mode
Use this item to enable or disable Recorder Mode to capture terminal data and send it as text messages.

Resolution 100x31
Use this item to enable or disable extended terminal resolution support.

Putty Keypad
Use this item to select Function Key and Keypad on Putty.

Legacy Console Redirection

Legacy Console Redirection Settings

Use this option to configure Legacy Console Redirection Settings, and specify how your computer and the host computer to which you are connected exchange information.

Redirection COM Port
Use this item to select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

Resolution
On Legacy OS, the Number of Rows and Columns supported redirection.

Redirection After POST
If the [Bootloader] is selected, legacy console redirection is disabled before booting to legacy OS. If [Always Enable] is selected, legacy console redirection is enabled for legacy OS. The default value is [Always Enable].

Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

Console Redirection EMS

Use this option to enable or disable Console Redirection. If this item is set to Enabled, you can select a COM Port to be used for Console Redirection.

Console Redirection Settings

Use this option to configure Console Redirection Settings, and specify how your computer and the host computer to which you are connected exchange information.

Out-of-Band Mgmt Port
Microsof t Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.

Terminal Type EMS
Use this item to select the preferred terminal emulation type for out-of-band management. It is recommended to select [VT-UTF8].

Option	Description
VT100	ASCII character set
VT100+	Extended VT100 that supports color and function keys
VT-UTF8	UTF8 encoding is used to map Unicode chars onto 1 or more bytes
ANSI	Extended ASCII character set

Bits Per Second EMS
Use this item to select the serial port transmission speed. The speed used in the host computer and the client computer must be the same. Long or noisy lines may require lower transmission speed. The options include [9600], [19200], [57600] and [115200].

Flow Control EMS
Use this item to set the flow control to prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to restart the flow. Hardware flow uses two wires to send start/stop signals. The options include [None], [Hardware RTS/

CTS], and [Software Xon/Xoff].

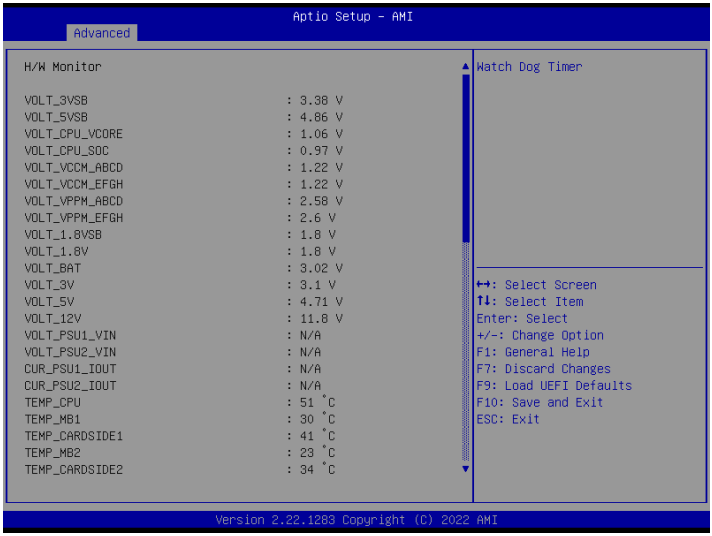
Data Bits EMS

Parity EMS

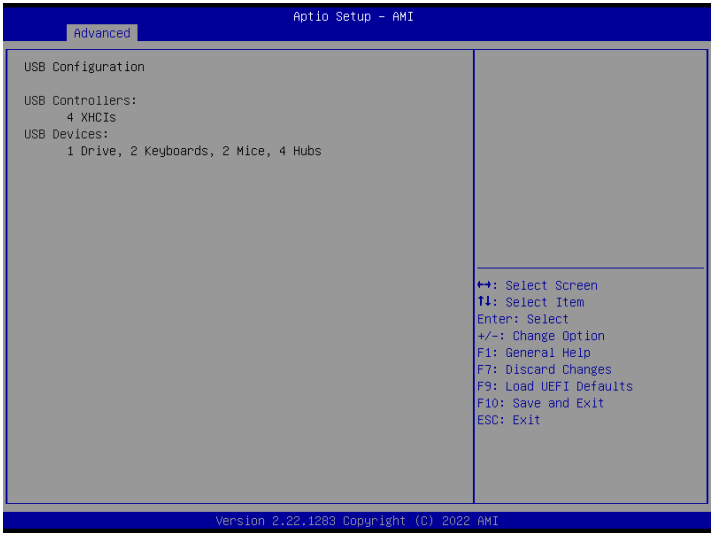
Stop Bits EMS

3.3.9 H/W Monitor

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.

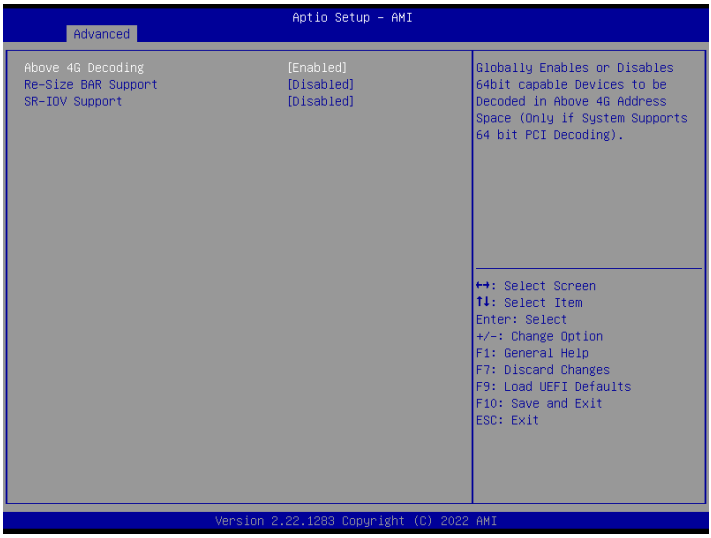


3.3.10 USB Configuration



This page displays the information of the USB Configuration, such as USB Controllers and USB devices.

3.3.11 PCI Subsystem Settings



Above 4G Decoding

Enable or disable 64bit capable Devices to be decoded in Above 4G Address Space (only if the system supports 64 bit PCI decoding).

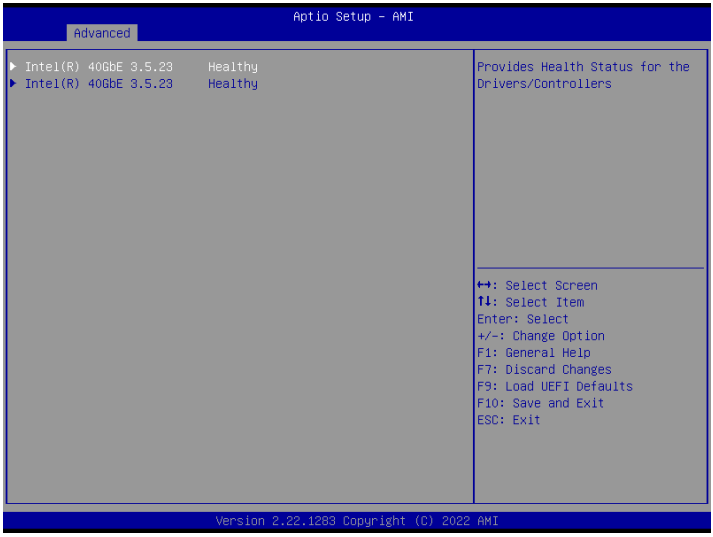
Re-Size BAR Support

If system has Resizable BAR capable PCIe Devices, this option Enables or Disables Resizable BAR Support.

SR-IOV Support

If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.

3.3.12 Driver Health



Note: Items shown on this page may vary depending on the device you use.

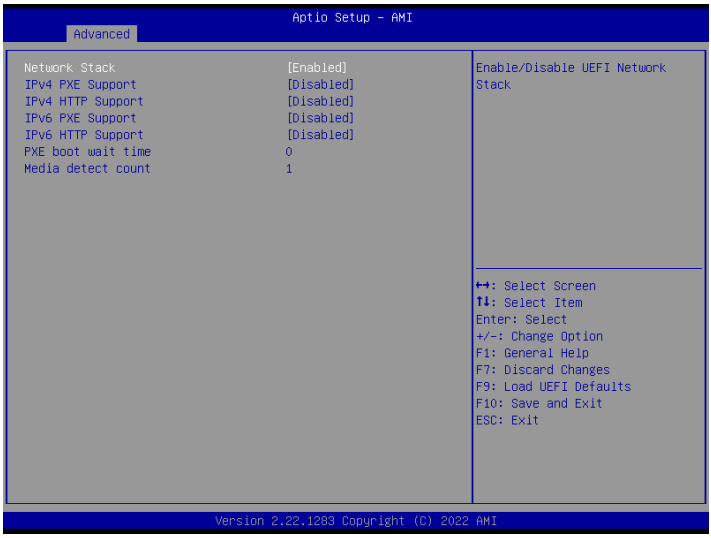
Intel(R) 40GbE 3.5.23

Provides Health Status for the Drivers/Controllers.

Intel(R) 40GbE 3.5.23

Provides Health Status for the Drivers/Controllers.

3.3.13 Network Stack Configuration



Network Stack

Use this item to enable or disable UEFI Network Stack.

Ipv4 PXE Support

Use this item to enable or disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.

Ipv4 HTTP Support

Use this item to enable or disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.

Ipv6 PXE Support

Use this item to enable or disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.

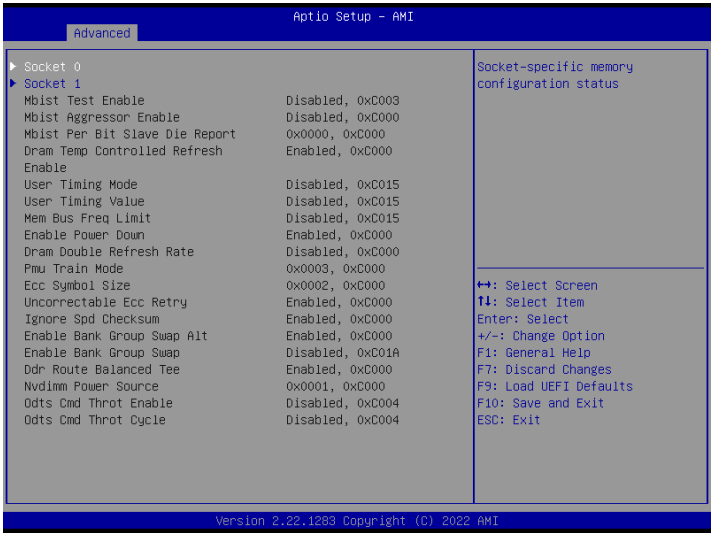
Ipv6 HTTP Support

Use this item to enable or disable IPv6 HTTP boot support. If disabled, IPv6 HTTP boot support will not be available.

Media detect count

Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

3.3.14 AMD Mem Configuration Status

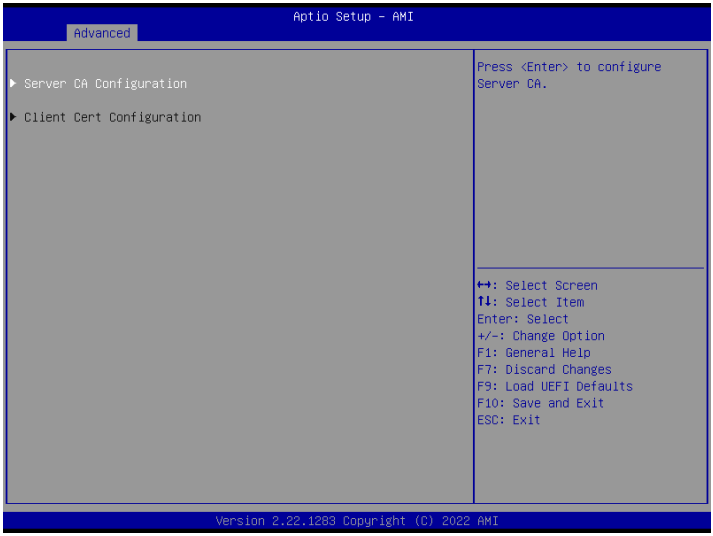


This displays memory configuration (initialized by ABL) status.

Socket 0 / Socket 1

This displays the Socket-specific memory configuration status.

3.3.15 Tls Auth Configuration



Server CA Configuration

Press <Enter> to configure Server CA.

Client Cert Configuration

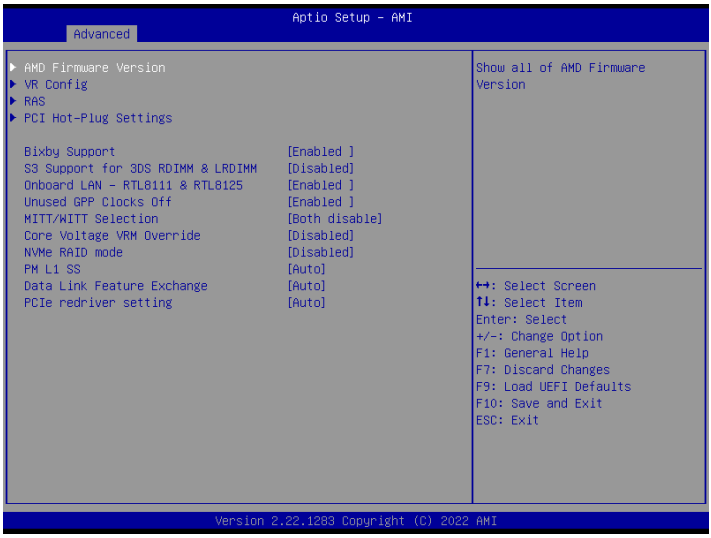
Enroll Cert

Press <Enter> to enroll cert.

Delete Cert

Press <Enter> to delete cert.

3.3.16 AMD PBS



Bixby Support

Disable/Enable Bixby for intenal test only.

S3 Support for 3DS RDIMM & LRDIMM

Disable/Enable S3 Support for 3DS RDIMM & LRDIMM.

Onboard LAN - RTL8111 & RTL8125

Control by Die 1 GPIO7_1, 1:Enabled, 0:Disabled

Unused GPP Clocks Off

Turn Unnused GPP Clocks off.

MITT/WITT Selection

Use this item to configure MITT/WITT Selection.

Core Voltage VRM Override

Adjust CPU VDDCR, stepping is 6.25mV. Range is from 1.55V(0x0F7) to 1.7v(0x10f).

NVMe RAID Mode

Enable or disable NVMe RAID mode.

PM L1 SS

Enable for PM L1 SS and ASPM L1 SS.

Data Link Feature Exchange

Enable or Disable Data Link Feature Exchange, try to disableit if any Legacy Endpoint cannot boot. [Auto] Disable DLF on all non x16 PCIe slots.

PCIe Redriver Setting

Configures PCIe redriver TX/RX Setting.

AMD Firmware Version

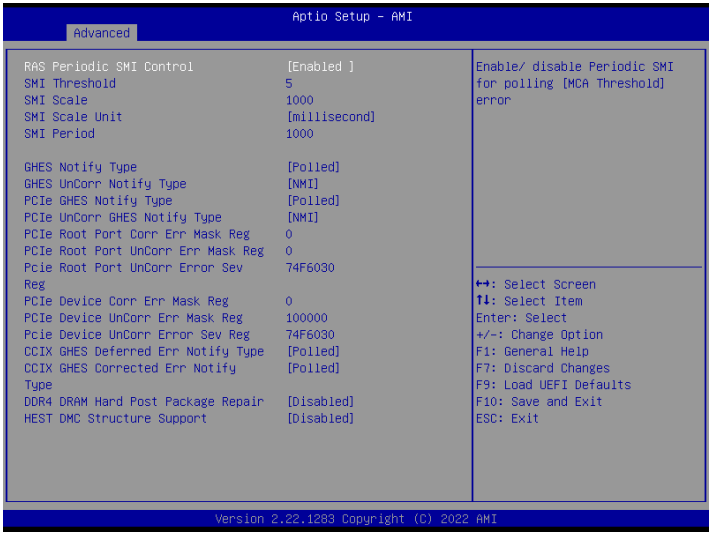
Show all of AMD Firmware Version.

VR Config

Show all of VR config files' version information.

RAS

Configures AMD CPM RAS related settings.



RAS Periodic SMI Control

Enable/Disable Periodic SMI for polling [MCA Threshold] error.

SMI Threshold

This [SMI Threshold] limits the number of [MCA Threshold and Deferred Error SMI source] per a Unit time (Defined by [SMI Scale]).

SMI Scale

The [SMI Scale] defines the time scale.

SMI Scale Unit

The [SMI Scale Unit] defines the unit of time scale.

SMI Period

The [SMI Priod] defines the poliing internal.

GHES Notify Type

Notification type for deferred/corrected errors.

GHES UnCorr Notify Type

Notification type for uncorrected errors.

PCIE GHES Notify Type

Notification type for PCIe corrected errors.

PCIe UnCorr GHES Notify Type

Notification type for PCIe uncorrected errors.

PCIe Root Port Corr Err Mask Reg

Initialize the PCIe AER Corrected Error Mask register of Root Port.

PCIe Root Port UnCorr Err Mask Reg

Initialize the PCIe AER Uncorrected Error Mask register of Root Port.

PCIe Root Port UnCorr Error Sev Reg

Initialize the PCIe AER Uncorrected Error Severity registers of Root Port.

PCIe Device Corr Err Mask Reg

Initialize the PCIe AER Corrected Error Mask register of PCIe Device.

PCIe Device UnCorr Err Mask Reg

Initialize the PCIe AER uncorrected Error Mask register of PCIe Device.

PCIe Device UnCorr Error Sev Reg

Initialize the PCIe AER uncorrected Error Severity registers of PCIe Device.

CCIX GHES Deferred Err Notify Type

Notification type for CCIX deferred error.

CCIX GHES Corrected Err Notify Type

Notification type for CCIX Corrected error.

DDR4 DRAM Hard Port Package Repair

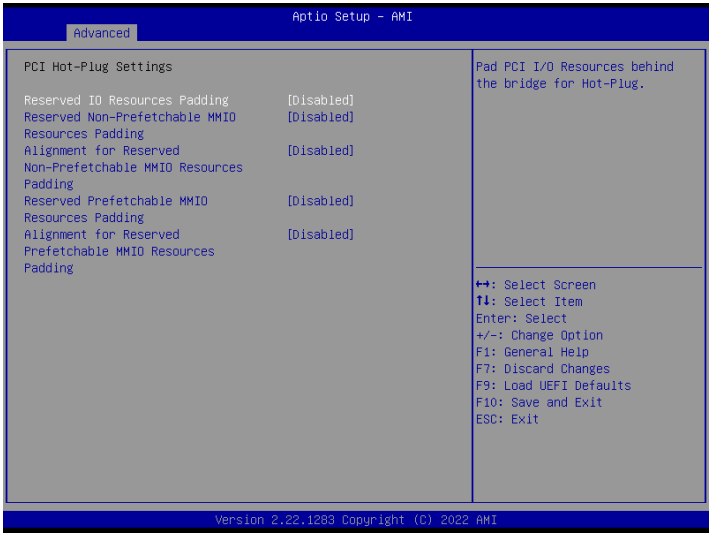
This feature allows spare DRAM rows to replace malfunctioning rows via an in-field repair mechanism.

HEST DMC Structure Support

HEST DMC(Deferred Machine Check) Structure Support.

PCI Hot-Plug Settings

Allow Changing Build time Defined Hot-Plug Settings.



Reserved IO Resources Padding

Pad PCI I/O Resources behind the bridge for Hot-Plug.

Reserved Non-Prefetchable MMIO Resources Padding

Pad PCI Reserved Non-Prefetchable MMIO Resources behind the bridge for Hot-Plug.

Alignment for Reserved Non-Prefetchable MMIO Resources Padding

Pad PCI Alignment for Reserved Non-Prefetchable MMIO Resources behind the bridge or Hot-Plug.

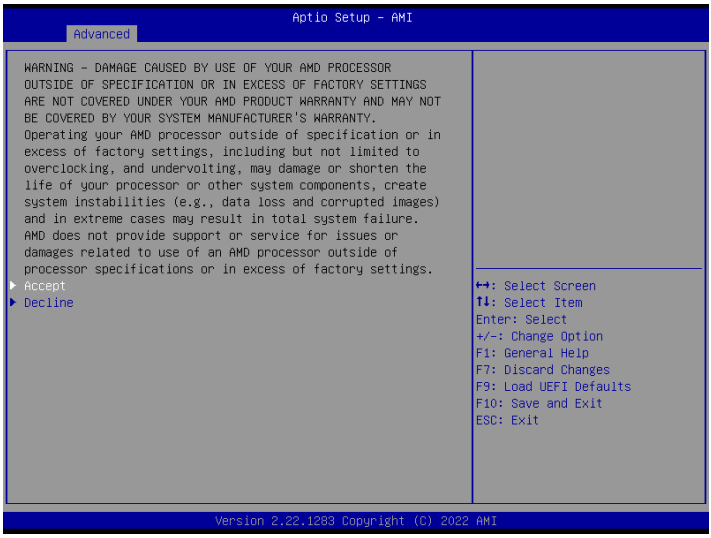
Reserved Prefetchable MMIO Resources Padding

Pad PCI Prefetchable MMIO Resources behind the bridge for Hot-Plug.

Alignment for Reserved Prefetchable MMIO Resources Padding

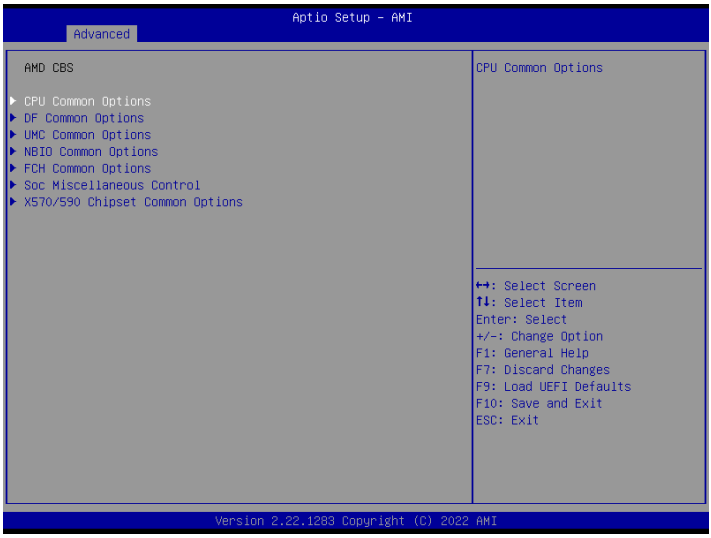
Pad PCI Alignment for Reserved Prefetchable MMIO Resources behind the bridge or Hot-Plug.

3.3.17 AMD Overclocking



The AMD Overclocking menu accesses options for configuring CPU frequency and voltage.

3.3.18 AMD CBS



CPU Common Options

Use this item to configure CPU Common options.

DF Common Options

Use this item to configure DF Common options.

UMC Common Options

Use this item to configure UMC Common options.

NBIO Common Options

Use this item to configure NBIO Common options.

FCH Common Options

Use this item to configure FCH Common options.

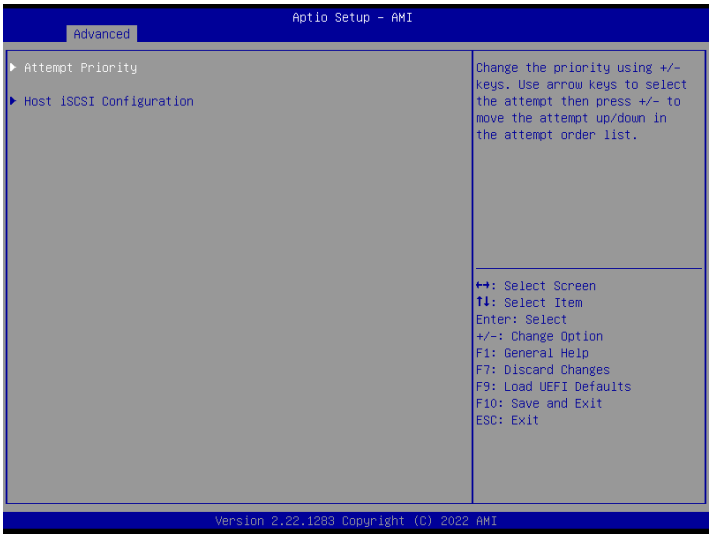
Soc Miscellaneous Control

Use this item to configure Soc Miscellaneous Control.

X570/590 Chipset Common Options

Use this item to configure X570/590 Chipset Common options.

3.3.19 iSCSI Configuration



Attempt Priority

Change the priority using +/- keys. Use arrows keys to select the attempt then press +/- to move the attempt up/down in the attempt order list.

iSCSI Initiator Name

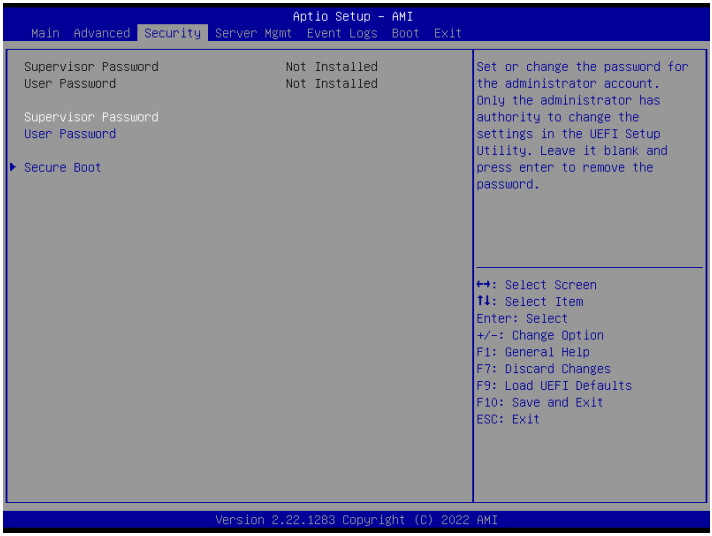
The worldwide unique name of iSCSI Initiator. Only IQN format is accepted. Range is fron 4 to 223.

3.3.20 Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows®. Just save the new UEFI file to your USB flash drive, floppy disk or hard drive and launch this tool, then you can update your UEFI 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. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after the UEFI update process is completed.

3.4 Security

In this section, you may set or change the supervisor/user password for the system. For the user password, you may also clear it.



Supervisor Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

User Password

Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

Secure Boot

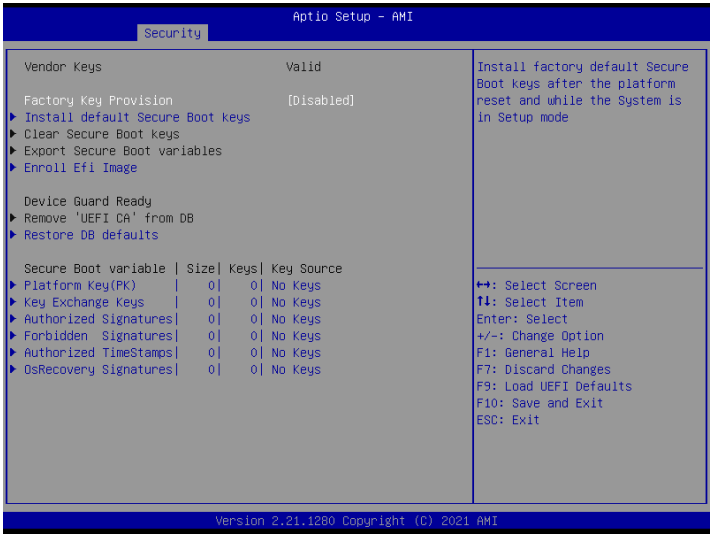
Use this to enable or disable Secure Boot Control. The default value is [Disabled]. Enable to support Windows 8 or later versions Secure Boot.

Secure Boot Mode

Secure Boot mode selector: Standard/Custom. In Custom mode Secure Boot Variables can be configured without authentication.

3.4.1 Key Management

In this section, expert users can modify Secure Boot Policy variables without full authentication.



Factory Key Provision

Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.

Install Default Secure Boot Keys

Please install default secure boot keys if it's the first time you use secure boot.

Clear Secure Boot keys

Force System to Setup Mode - clear all Secure Boot Variables. Change takes effect after reboot.

Export Secure Boot variables

Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.

Enroll Efi Image

Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).

Remove 'UEFI CA' from DB

Device Guard ready system must not list ‘Microsoft UEFI CA’ Certificate in Authorized Signature database (db).

Restore DB Defaults

Restore DB variable to factory defaults.

Platform Key(PK)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

Key Exchange Keys

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

Authorized Signatures

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

Forbidden Signatures

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

Authorized TimeStamps

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

OsRecovery Signatures

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

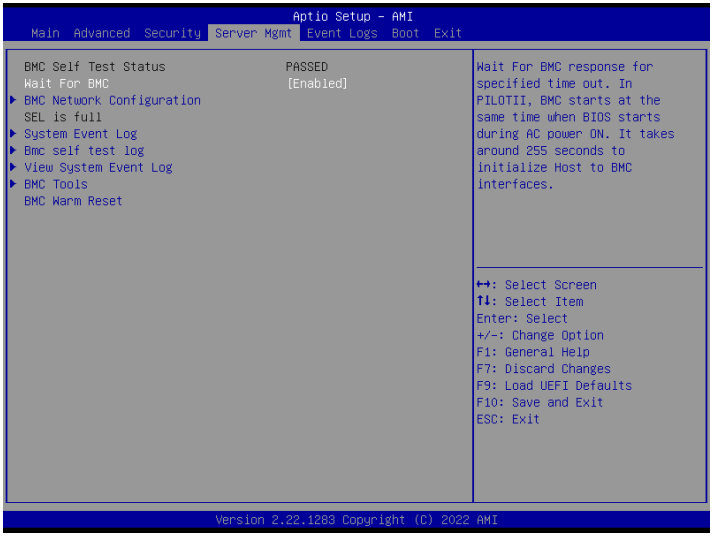
d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

3.5 Server Mgmt



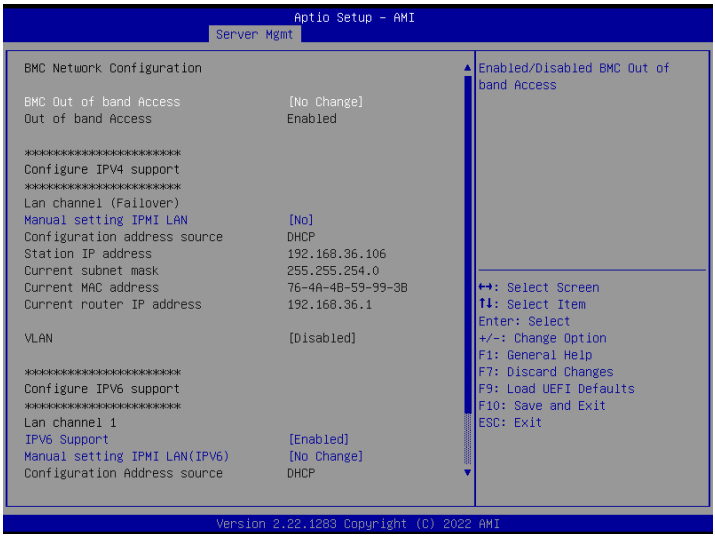
Wait For BMC

Wait For BMC response for specified time out. BMC starts at the same time when BIOS starts during AC power ON. It takes around 90 seconds to initialize Host to BMC interfaces.

BMC Warm Reset

Press <Enter> to do Warm Reset BMC.

3.5.1 BMC Network Configuration



BMC Out of Band Access

Enabled/Disabled BMC Out of band Access.

Manual Setting IPMI LAN

If [No] is selected, the IP address is assigned by DHCP. If you prefer using a static IP address, toggle to [Yes], and the changes take effect after the system reboots. The default value is [No].

Configuration Address Source

Select to configure BMC network parameters statically or dynamically(by BIOS or BMC). Configuration options: [Static] and [DHCP].

Static: Manually enter the IP Address, Subnet Mask and Gateway Address in the BIOS for BMC LAN channel configuration.
DHCP: IP address, Subnet Mask and Gateway Address are automatically assigned by the network's DHCP server.

When [DHCP] or [Static] is selected, do NOT modify the BMC network settings on the IPMI web page.

The default login information for the IPMI web interface is:
Username: admin
Password: admin

For more instructions on how to set up remote control environment and use the IPMI management platform, please refer to the IPMI Configuration User Guide or go to the Support website at: http://www.asrockrack.com/support/faq.asp

VLAN

Enabled/Disabled Virtual Local Area Network.
If [Enabled] is selected, configure the items below.

IPV6 Support

Enabled/Disable LAN1 IPV6 Support.

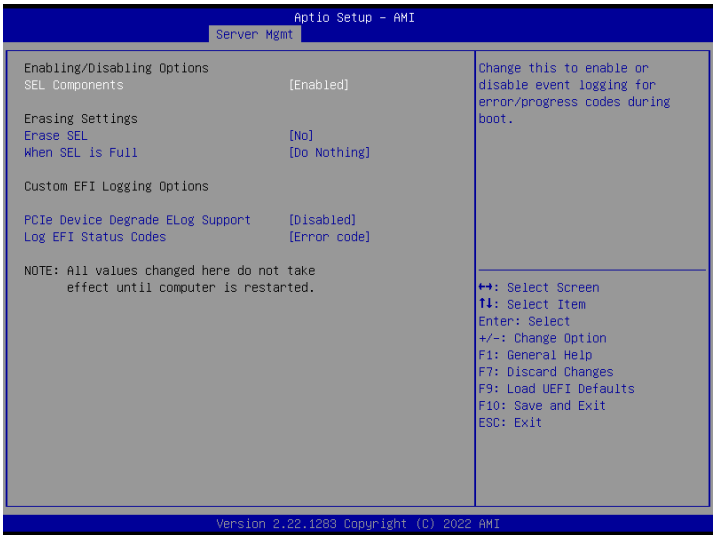
Manual Setting IPMI LAN(IPV6)

Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.

IPV6 Index

IPV6 Index - Set Selector for Static IP, range 0 to 15.

3.5.2 System Event Log



SEL Components

Change this to enable ro disable event logging for error/progress codes during boot.

Erase SEL

Use this to choose options for earsing SEL.

When SEL is Full

Use this to choose options for reactions to a full SEL.

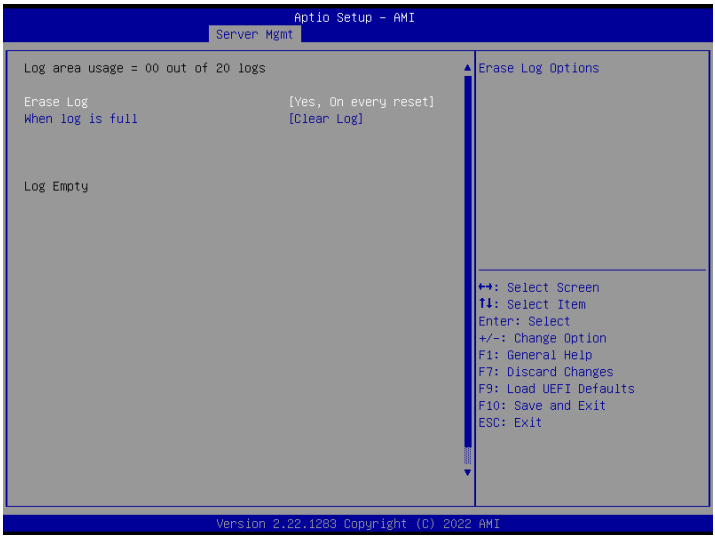
PCIE Device Degrade Elog Support

Use this item to enable or disable PCIe Device Degrade Error Logging Support.

Log EFI Status Codes

Use this item to disable the logging of EFI Status Codes or log only error code or only progress code or both.

3.5.3 Bmc Self Test Log



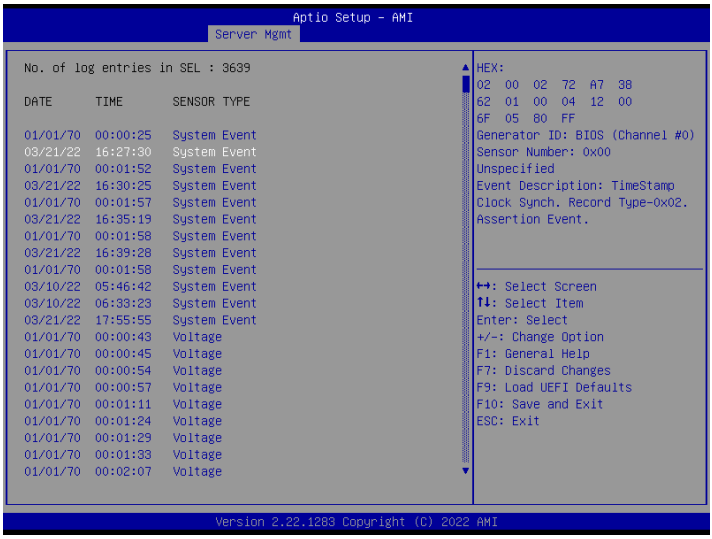
Erase Log

Erase Log Options.

When Log is Full

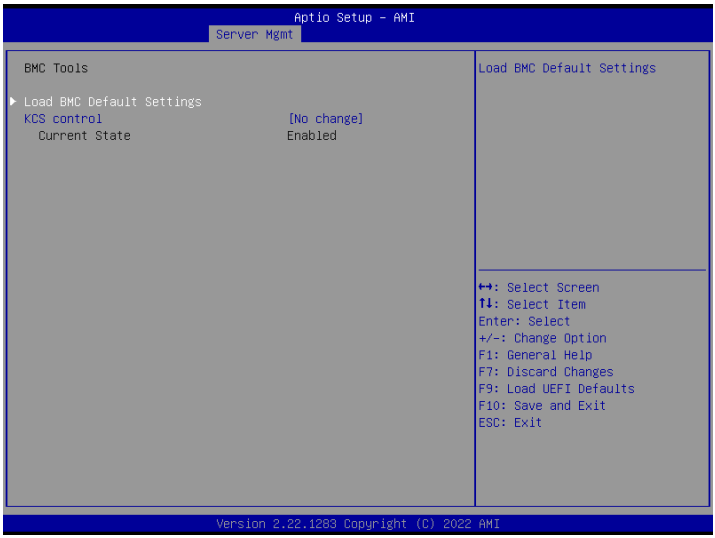
Use this item to choose options for reactions to a full Smbios Event Log. The optionsinclude [Do Nothing] and [Erase Immediately].

3.5.4 View System Event Log



This page display the information of the system event log.

3.5.5 BMC Tools



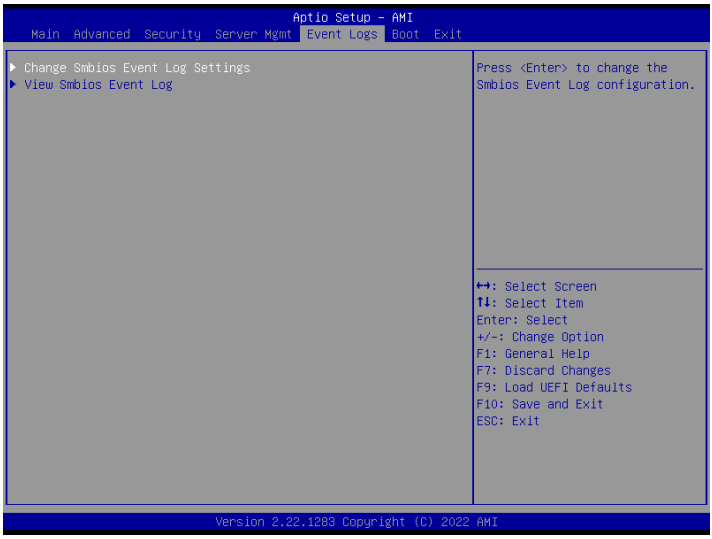
Load BMC Default Settings

Use this item to Load BMC Default Settings

KCS Control

Select this KCS interface state after POST end. If [Enabled] us selected, the BMC will remain KCS interface after POST stage. If [Disabled] is selected, the BMC will disable KCS interface after POST stage

3.6 Event Logs



Change Smbios Event Log Settings

This allows you to configure the Smbios Event Log Settings.

When entering the item, you will see the followings:

Smbios Event Log
Use this item to enable or disable all features of the SMBIOS Event Logging during system boot.

Erase Event Log
The options include [No], [Yes, Next reset] and [Yes, Every reset]. If Yes is selected, all logged events will be erased.

When Log is Full
Use this item to choose options for reactions to a full Smbios Event Log. The options include [Do Nothing] and [Erase Immediately].

Log System Boot Event
Choose option to enable/disable logging of System boot event.

MECI (Multiple Event Count Increment)
Use this item to enter the increment value for the multiple event counter. The valid range is from 1 to 255.

METW (Multiple Event Time Window)
Use this item to specify the number of minutes which must pass between duplicate log

entries which utilize a multiple-event counter. The value ranges from 0 to 99 minutes.

Log EFI Status Code

Enable or disable the logging of EFI Status Codes as OEM reserved type E0 (if not already converted to legacy).

Convert EFI Status Codes to Standard Smbios Type

Enable or disable the converting of EFI Status Codes to Standard Smbios Types (Not all may be translated).

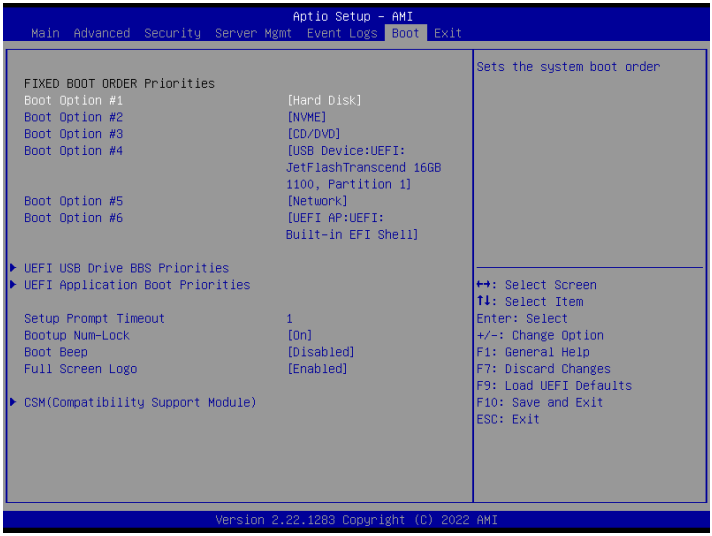
View Smbios Event Log

Press <Enter> to view the Smbios Event Log records.

All values changed here do not take effect until computer is restarted.

3.7 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



Boot Option #1~#6

Use this item to set the system boot order.

UEFI USB Drive BBS Priorities

Specifies the Boot Device Priority sequence from available UEFI USB Drives.

UEFI Application Boot Priorities

Specifies the Boot Device Priority sequence from available UEFI Application.

Setup Prompt Timeout

Configure the number of seconds to wait for the UEFI setup utility.

Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

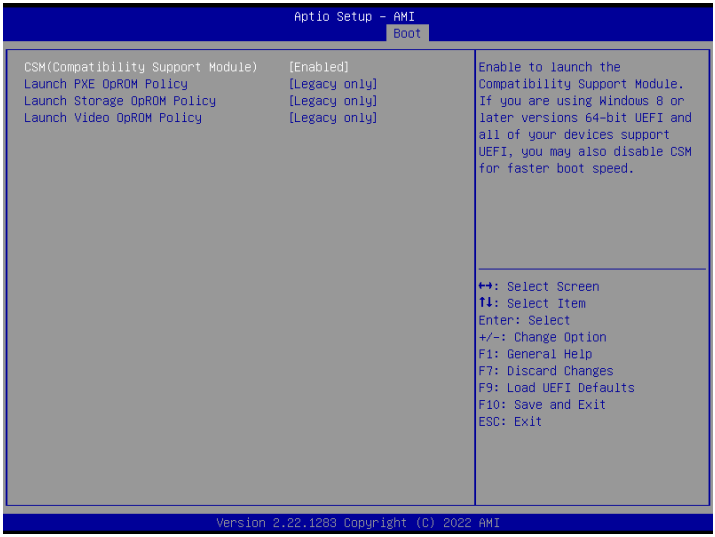
Boot Beep

Select whether the Boot Beep should be turned on or off when the system boots up. Please note that a buzzer is needed.

Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

3.7.1 CSM Parameters



CSM

Enable to launch the Compatibility Support Module. Please do not disable unless you're running a WHCK test. If you are using Windows Server 2012 R2 or later versions 64-bit UEFI and all of your devices support UEFI, you may also disable CSM for faster boot speed.

Launch PXE OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

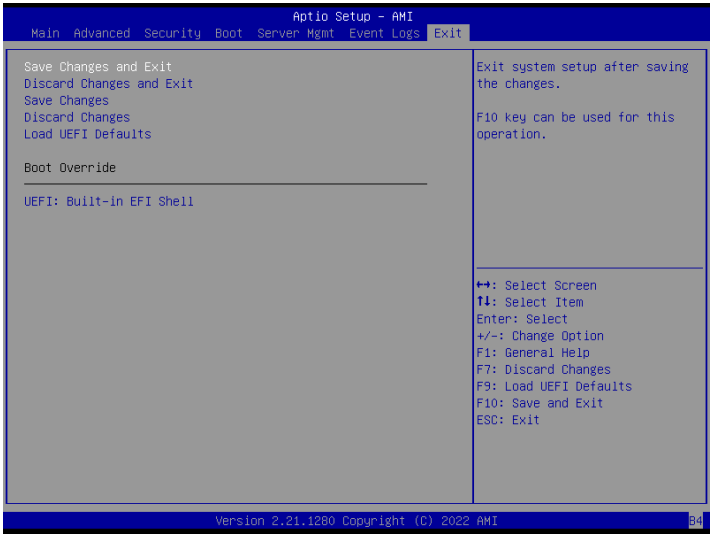
Launch Other Storage OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

Launch Video OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

3.8 Exit Screen



Save Changes and Exit

When you select this option, the following message "Save configuration changes and exit setup?" will pop-out. Press <F10> key or select [Yes] to save the changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

When you select this option, the following message "Discard changes and exit setup?" will pop-out. Press <ESC> key or select [Yes] to exit the UEFI SETUP UTILITY without saving any changes.

Save Changes

When you select this option, the following message "Save changes?" will pop-out. Select [Yes] to save changes done so far to any of the setup options.

Discard Changes

When you select this option, the following message "Discard changes?" will pop-out. Press <F7> key or select [Yes] to discard all changes.

Load UEFI Defaults

Load UEFI default values for all the setup questions. F9 key can be used for this operation.

Chapter 4 Software Support

After all the hardware has been installed, we suggest you go to our offical website at http://www.ASRockRack.com and make sure if there are any new updates of the BIOS / BMC firmware for your motherboard.

4.1 Download and Install Operating System

This motherboard supports various Microsoft® Windows® Server / Linux compliant operating systems. Please download the operating system from your OS manufacturer. Please refer to your OS documentation for more instructions.

**Please download the Intel® SATA Floppy Image driver from the ASRock Rack's website (www.asrockrack.com) to your USB drive while installing OS in SATA RAID mode.*

4.2 Download and Install Software Drivers

This motherboard supports various Microsoft® Windows® compliant drivers. Please download the required drivers from our website at http://www.ASRockRack.com.

To download necessary drivers, go the the product page, click on the "Download" tab, choose the operating system you use, and select the driver you need to be donwloaded.

4.3 Contact Information

If you need to contact ASRock Rack or want to know more about ASRock Rack, welcome to visit ASRock Rack's website at http://www.ASRockRack.com; or you may contact your dealer for further information.

Chapter 5 Troubleshooting

5.1 Troubleshooting Procedures

Follow the procedures below to troubleshoot your system.

Always unplug the power cord before adding, removing or changing any hardware components. Failure to do so may cause physical injuries to you and damages to motherboard components.

1. Disconnect the power cable and check whether the PWR LED is off.
2. Unplug all cables, connectors and remove all add-on cards from the motherboard. Make sure that the jumpers are set to default settings.
3. Confirm that there are no short circuits between the motherboard and the chassis.
4. Install a CPU and fan on the motherboard, then connect the chassis speaker and power LED.

If there is no power...

1. Confirm that there are no short circuits between the motherboard and the chassis.
2. Make sure that the jumpers are set to default settings.
3. Check the settings of the 115V/230V switch on the power supply.
4. Verify if the battery on the motherboard provides ~3VDC. Install a new battery if it does not.

If there is no video...

1. Try replugging the monitor cables and power cord.
2. Check for memory errors.

If there are memory errors...

1. Verify that the DIMM modules are properly seated in the slots.
2. Use recommended DDR4 ECC U-DIMMs.
3. If you have installed more than one DIMM modules, they should be identical with the same brand, speed, size and chip-type.
4. Try inserting different DIMM modules into different slots to identify faulty ones.
5. Check the settings of the 115V/230V switch on the power supply.

Unable to save system setup configurations...

1. Verify if the battery on the motherboard provides ~3VDC. Install a new battery if it does not.
2. Confirm whether your power supply provides adaquate and stable power.

Other problems...

1. Try searching keywords related to your problem on ASRock Rack's FAQ page: http://www.asrockrack.com/support

5.2 Technical Support Procedures

If you have tried the troubleshooting procedures mentioned above and the problems are still unsolved, please contact ASRock Rack's technical support with the following information:

1. Your contact information
2. Model name, BIOS version and problem type.
3. System configuration.
4. Problem description.

You may contact ASRock Rack's technical support at:
http://www.asrockrack.com/support/tsd.asp

5.3 Returning Merchandise for Service

For warranty service, the receipt or a copy of your invoice marked with the date of purchase is required. By calling your vendor or going to our RMA website (http://event.asrockrack.com/tsd.asp) you may obtain a Returned Merchandise Authorization (RMA) number.
The RMA number should be displayed on the outside of the shipping carton which is mailed prepaid or hand-carried when you return the motherboard to the manufacturer. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty does not cover damages incurred in shipping or from failure due to alteration, misuse, abuse or improper maintenance of products.

Contact your distributor first for any product related problems during the warranty period.