OPEN
Industry Standard, Flexible Architecture

GREEN
Less Heat, Less Power Consumption

STABLE
Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation
Motherboard

WC621D8A-2T

User Manual

English

Version 1.0
Published October 2019
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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

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Chapter 1 Introduction

Thank you for purchasing ASRock Rack ***WC621D8A-2T*** 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 information of the Support CD.

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 WC621D8A-2T Motherboard
  (CEB Form Factor: 12.0-in x 10.5-in, 30.5 cm x 26.7 cm)
- Quick Installation Guide
- 2 x Mini SAS HD to 4 SAS/SATA Cables (12G)
- 1 x GPU to ATX 8P Power Cable (150mm)
- 1 x CPU Non-Fabric Carrier
- 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

WC621D8A-2T	
MB Physical Status	
Form Factor	CEB
Dimension	12" x 10.5" (30.5 cm x 26.7 cm)
Processor System	
CPU	Intel® Xeon® Scalable Processors (Max 205W) and Intel® Xeon® W Processor (MAX 255W)
Socket	Single Socket P
Chipset	Intel® C621
System Memory	
Capacity	8 DIMM slots
Type	- Six Channel Memory Technology - Support DDR4 2933/2666/2400 RDIMM, LR DIMM and Intel Optane™ DC Persistent Memory in memory mode
Voltage	1.2V
Expansion Slot	
PCIe x 16	SLOT1: Gen3 x16 link* SLOT3: Gen3 x16 link, auto switch to x8 link if SLOT2 is occupied SLOT5: Gen3 x16 link, auto switch to x8 link if SLOT4 is occupied SLOT7: Gen3 x16 link, auto switch to x8 link if SLOT6 is occupied **PCIE1 is only supported for Intel® Xeon® W-3200 Processors.*
PCIe x 8	SLOT2: Gen3 x8 link SLOT4: Gen3 x8 link SLOT6: Gen3 x8 link
Storage	
SATA Controller	PCH : 10x SATA3 (2x mini-SAS HD, 2x M.2)
Ethernet	
Interface	10Gbps/1000Mbps/100Mbps
LAN Controller	-2 x RJ45 10GbE by Intel® X550-AT2 - 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	NMI

Gracphics	
Controller	ASPEED AST2500
VRAM	DDR4 256MB
Audio	
Audio code	Realtek ALC892
Rear Panel I/O	
PS/2 KB/mouse	1
VGA Port	1 x D-Sub
USB 3.1 Gen1 Port	3
USB 3.1 Gen2 Port	1 (type C)
LAN Port	-2 x RJ45: 2x 10GbE by Intel® X550-AT2 -1x IPMI dedicated LAN" -LAN Ports with LED (ACT/LINK LED and SPEED LED)
Audio	1 (5+1 jack)
UID Button/ LED	1
Internal Connector	
Auxiliary Panel Header	1 (includes chassis intrusion, location button & LED, front LAN LED)
TPM Header	1
IPMB Header	1
Fan Header	6x System Fans
ATX Power	1 (24-pin) + 3 (8-pin)
USB 3.1 Gen1 Header	2 (support 4 USB 3.1 Gen1 ports)
USB 3.1 Gen2 Type C Header	1 (supports 1 USB 3.1 Gen2 port)
Type A USB 2.0 Port	1
M.2	2 (up to 22110)
Front VGA Header	1
COM Header	1
SGPIO	2
Speaker	1(4-pin)
TR1	1
PSU SMB Header	1
NMI Button	1
Front Panel	1
BMC_SMB	1
RAID Key	1
ClearCMOS	1 (short pad)

Audio	1
OH/FanFail LED	6
System BIOS	
BIOS Type	256Mb 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 Temperature Sensing - System 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: +12V, +5V, +3.3V, CPU Vcore, DRAM, 1.05V_PCH, +BAT, 3VSB, 5VSB
Support OS	
OS	Microsoft® Windows® (Server OS) - Server 2012 R2 (64 bit) - Server 2016 (64 bit) - Server 2019 (64 bit) Microsoft® Windows® (Client OS) - Windows 10 (64 bit) Linux® - Red Hat Enterprise Linux Server 6.9 (64 bit) / 7.6 (64 bit) - CentOS 6.9 (64 bit) / 7.6 (64 bit) - SUSE Enterprise Linux Server 12 SP4 (64 bit) / 15 SP1 (64 bit) - FreeBSD 11.3 (64 bit) - Ubuntu 16.04 (64 bit) / 18.04 (64 bit) Virtual - VMWare® ESXi 6.5 u1/ vSphere 6.5 u1 - Citrix XenServer 7.5 - Win hyper-V Server 2016 **Please refer to our website for the latest OS support list.* **The SUSE Enterprise Linux Server 12 SP4 (64 bit) / 15 SP1 (64 bit) system only supports UEFI BOOT.* ** On the Ubuntu 16.04 (64bit) / 18.04 (64 bit), the Intel Raid mode only supports UEFI BOOT.* **Cascade lake CPU supports Red Hat 7.6 / CentOS 7.6.*

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.

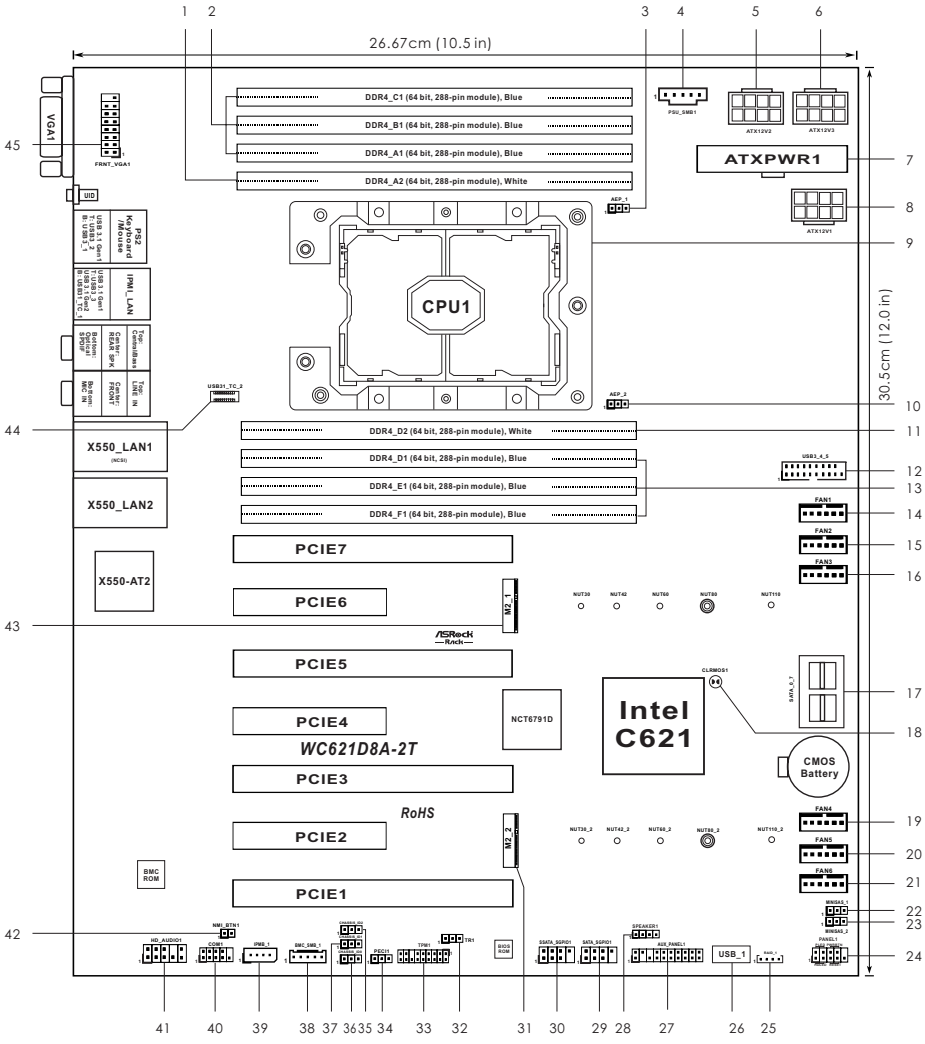
This motherboard supports Wake from on Board LAN. To use this function, please make sure that the "Wake on Magic Packet from power off state" is enabled in Device Manager > Intel® Ethernet Connection > Power Management. And the "PCI Devices Power On" is enabled in UEFI SETUP UTILITY > Advanced > ACPI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

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.

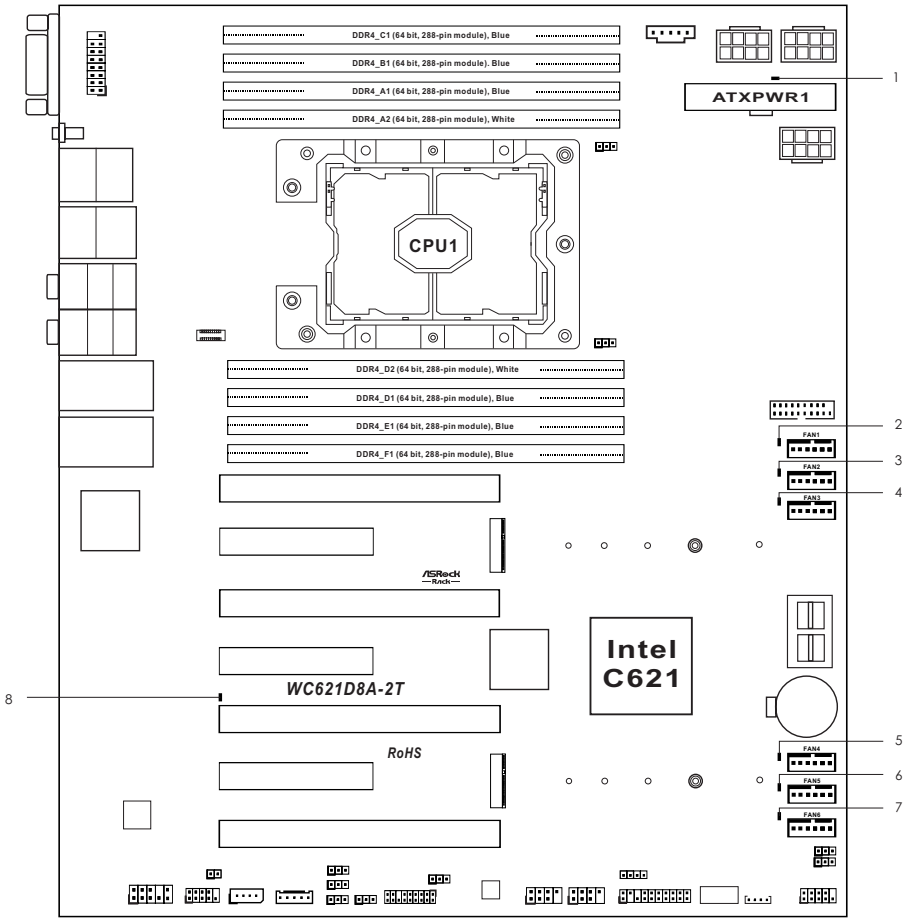
1.4 Motherboard Layout



No.	Description
1	1 x 288-pin DDR4 DIMM Slot (DDR4_A2, White)
2	3 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_B1, DDR4_C1, Blue)
3	Support NVDIMM Jumper (AEP_1)
4	PSU SMBus (PSU_SMB1)
5	ATX 12V Power Connector (ATX12V2)
6	ATX 12V Power Connector (ATX12V3)
7	ATX Power Connector (ATXPWR1)
8	ATX 12V Power Connector (ATX12V1)
9	LGA 3647 CPU Socket (CPU1)
10	Support NVDIMM Jumper (AEP_2)
11	1 x 288-pin DDR4 DIMM Slot (DDR4_D2, White)
12	USB 3.1 Gen1 Header (USB3_4_5)
13	3 x 288-pin DDR4 DIMM Slots (DDR4_D1, DDR4_E1, DDR4_F1, Blue)
14	System Fan Connector (FAN1)
15	System Fan Connector (FAN2)
16	System Fan Connector (FAN3)
17	MINI-SAS HD Connector (SATA_0_7)
18	Clear CMOS Pad (CLRMOS1)
19	System Fan Connector (FAN4)
20	System Fan Connector (FAN5)
21	System Fan Connector (FAN6)
22	SATA_0_3 SATA/PCIE Selection Jumper (MINISAS_1)
23	SATA_4_7 SATA/PCIE Selection Jumper (MINISAS_2)
24	System Panel Header (PANEL1)
25	Virtual RAID On CPU Header (RAID_1)
26	Vertical Type A USB 2.0 (USB_1)
27	Auxiliary Panel Header (AUX_PANEL1)
28	Speaker Header (SPEAKER1)
29	SATA SGPIO Connector (SATA_SGPIO1)
30	SATA SGPIO Connector (SSATA_SGPIO1)
31	M.2 Socket (M2_2) (Type 2230 / 2242 / 2260 / 2280 / 22110)
32	Thermal Sensor header (TR1)
33	TPM Header (TPM1)

No.	Description
34	CPU PECI Jumper (PECI1)
35	Chassis ID2 Jumper (CHASSIS_ID2)
36	Chassis ID0 Jumper (CHASSIS_ID0)
37	Chassis ID1 Jumper (CHASSIS_ID1)
38	BMC SMBus Header (BMC_SMB_1)
39	Intelligent Platform Management Bus header (IPMB_1)
40	COM Port Header (COM1)
41	Front Panel Audio Header (HD_AUDIO1)
42	Non Maskable Interrupt Button (NMI_BTN1)
43	M.2 Socket (M2_1) (Type 2230 / 2242 / 2260 / 2280 / 22110)
44	Front Panel Type C USB 3.1 Gen2 Header (USB31_TC_2)
45	Front VGA Header (FRNT_VGA1)

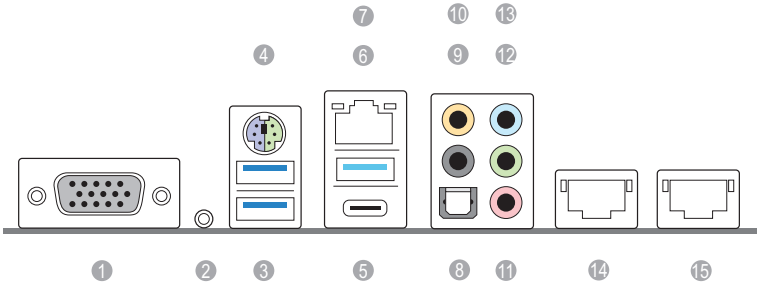
1.5 Onboard LED Indicators



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

English

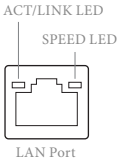
1.6 I/O Panel



No.	Description	No.	Description
1	VGA Port (VGA1)	9	Rear Speaker (Black)
2	UID Switch (UID1)	10	Central / Bass (Orange)
3	USB 3.1 Gen1 Ports (USB3_1_2)	11	Microphone (Pink)
4	PS/2 Mouse/Keyboard Port	12	Front Speaker (Lime)***
5	USB 3.1 Gen2 Port (USB31_TC_1)	13	Line In (Light Blue)
6	USB 3.1 Gen1 Port (USB31_TA_1)	14	LAN RJ-45 Port (X550_LAN1)*
7	LAN RJ-45 Port (IPMI_LAN)**	15	LAN RJ-45 Port (X550_LAN2)*
8	Optical SPDIF Out Port (SPDIF1)		

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.

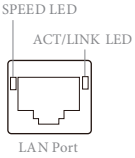


Dedicated IPMI LAN Port LED Indications

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.



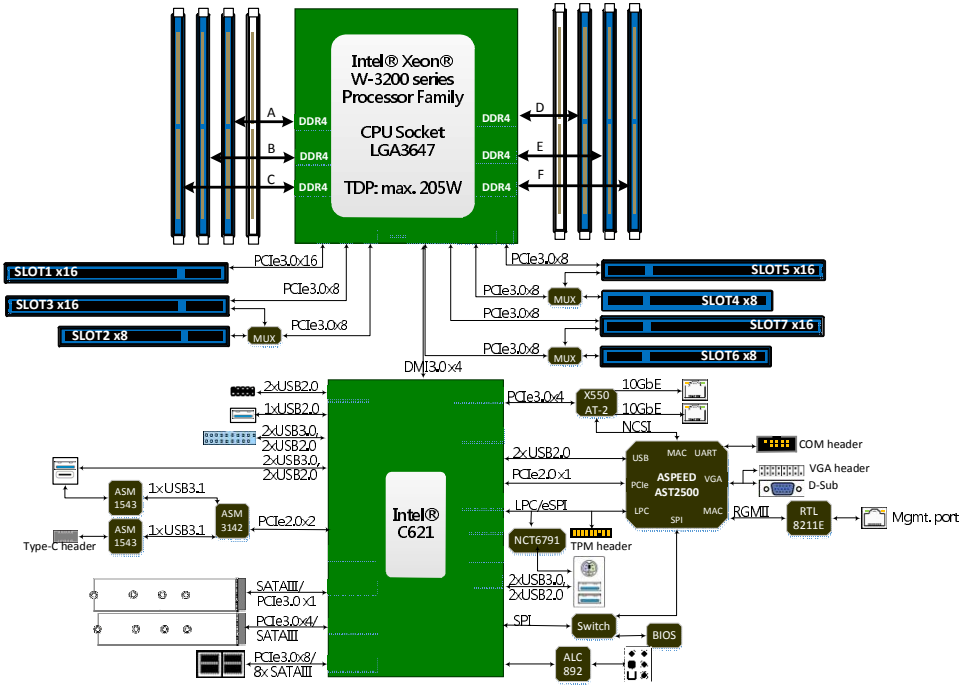
10G LAN Port (X550_LAN1, X550_LAN2) LED Indications

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

**** If you use a 2-channel speaker, please connect the speaker's plug into "Front Speaker Jack". See the table below for connection details in accordance with the type of speaker you use.*

Audio Output Channels	Front Speaker (No. 12)	Rear Speaker (No. 9)	Central / Bass (No. 10)	Line In (No. 13)
2	V	--	--	--
4	V	V	--	--
6	V	V	V	--
8	V	V	V	V

1.7 Block Diagram



Chapter 2 Installation

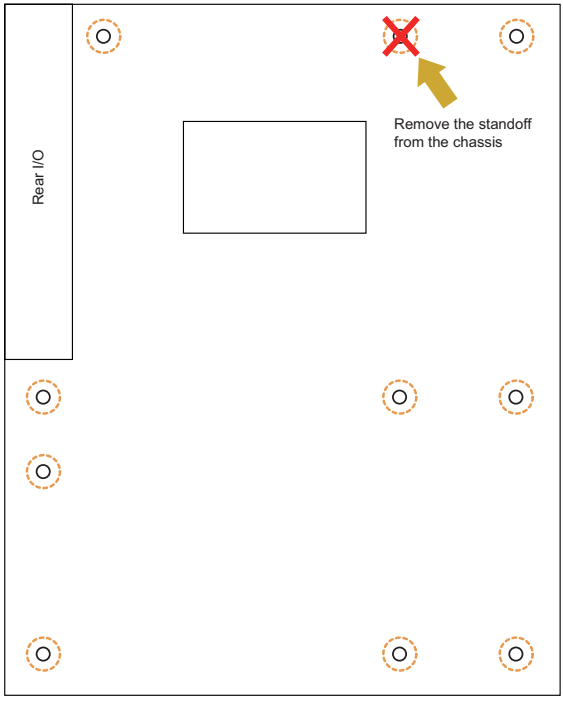
This is an CEB form factor (12" x 10.5", 30.5 cm x 26.67 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

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.

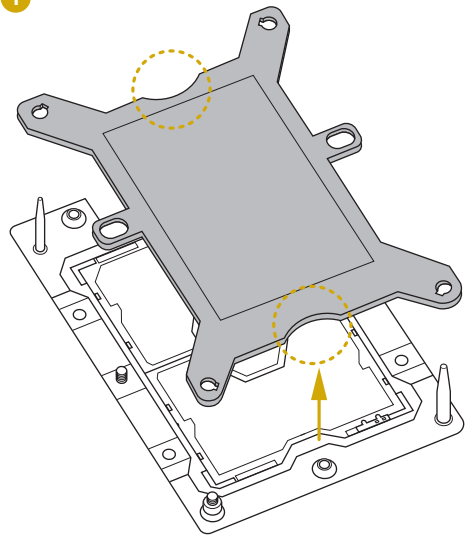
Do not over-tighten the screws! Doing so may damage the motherboard.

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.

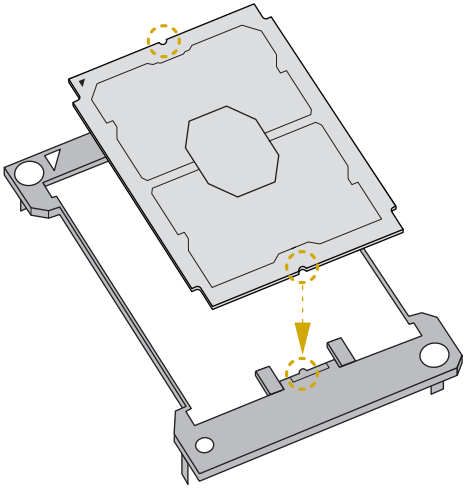
2.3 Installing the CPU and Heatsink

1. *Before you insert the CPU into the socket, please check if the PnP cap is on the socket, if the CPU surface is unclean, or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.*
2. *Unplug all power cables before installing the CPU.*

1



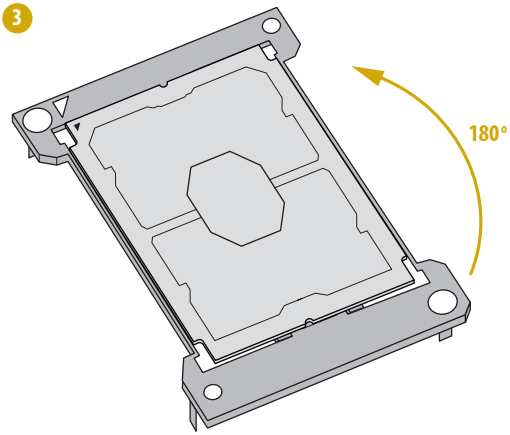
2



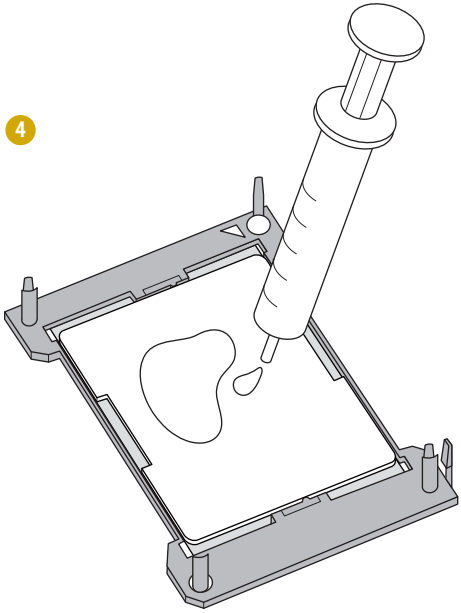
English

1. *Before you installed the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation.*
2. *Illustration in this documentation are examples only. Heatsink or fan cooler type may differ.*

3



4



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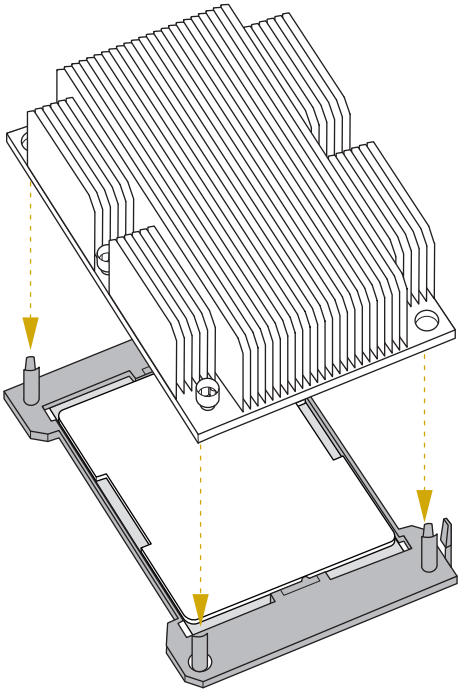

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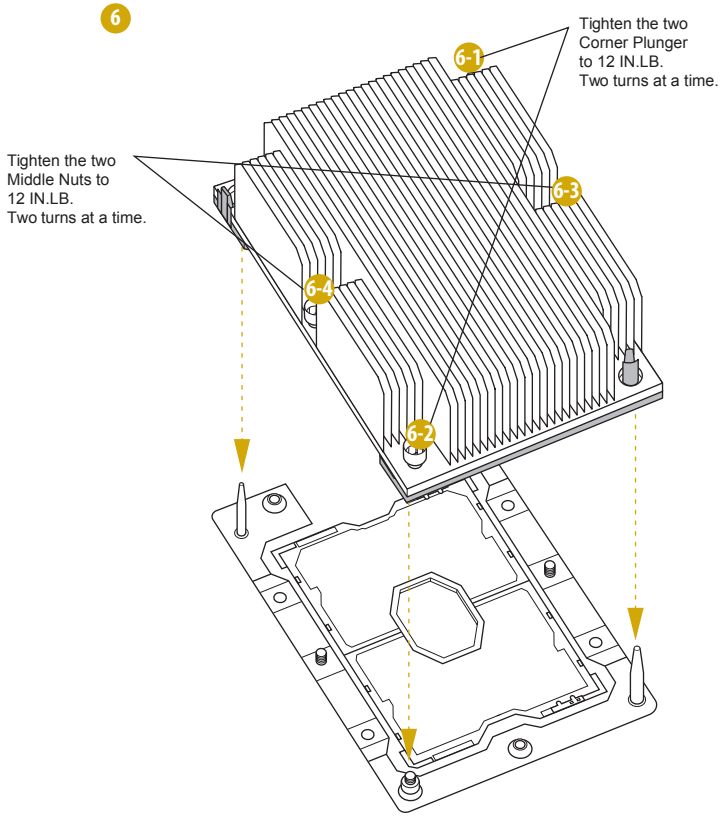
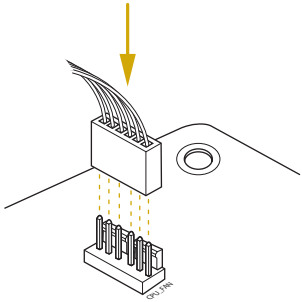

Tighten the two
Corner Plunger
to 12 IN.LB.
Two turns at a time.
6-1
Tighten the two
Middle Nuts to
12 IN.LB.
Two turns at a time.
6-3
6-4
6-2

7



2.4 Installation of Memory Modules (DIMM)

This motherboard provides eight 288-pin DDR4 (Double Data Rate 4) DIMM slots in two groups, and supports Six Channel Memory Technology.

A single memory module should be installed in the Blue socket.

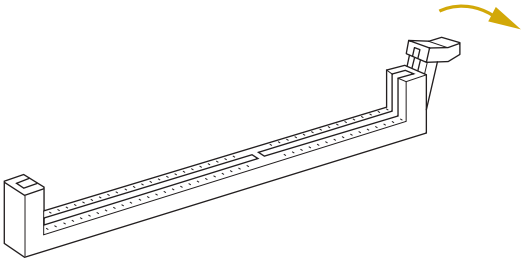
	CPU1							
	A1	A2	B1	C1	D1	D2	E1	F1
1 DIMM	#							
2 DIMMS	#				#			
4 DIMMS	#	#			#	#		
8 DIMMS	#	#	#	#	#	#	#	#

Dual Channel Memory Configuration

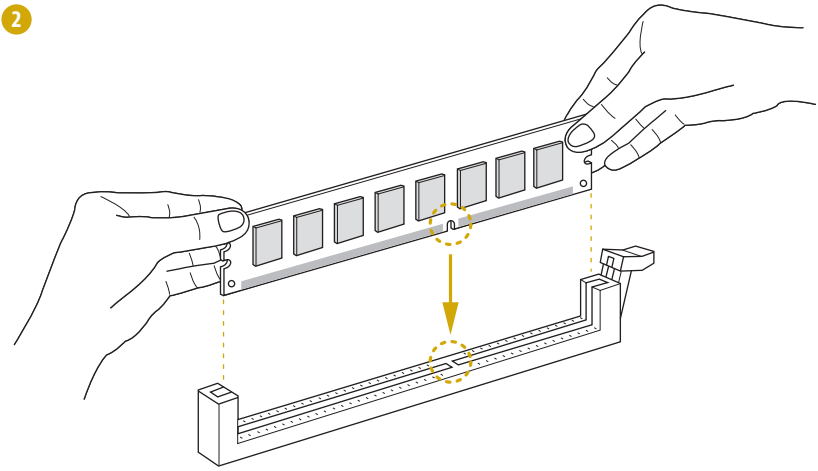
Priority	DDR4_A1	DDR4_A2	DDR4_D1	DDR4_D2
1	Populated		Populated	
2		Populated		Populated

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 dual 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 Dual Channel Memory Technology with only one or three 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.*

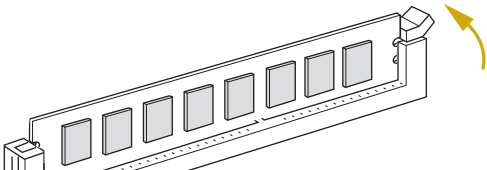
1



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.

2.5 Expansion Slots (PCI Express Slots)

There are 7 PCI Express slots on this motherboard.

PCIE slot:

PCIE1, PCIE3, PCIE5 and PCIE7 (PCIE 3.0 x16 slot, from CPU1) are used for PCI Express x16 lane width graphics cards.

PCIE2, PCIE4 and PCIE6 (PCIE 3.0 x8 slot, from CPU1) are used for PCI Express x8 lane width graphics cards.

Slot	Generation	Mechnical	Eletrical	Source
PCIE 1	3.0	x16	x16	CPU1
PCIE 2	3.0	x8	x8	CPU1
PCIE 3	3.0	x16	x16	CPU1
PCIE 4	3.0	x8	x8	CPU1
PCIE 5	3.0	x16	x16	CPU1
PCIE 6	3.0	x8	x8	CPU1
PCIE 6	3.0	x16	x16	CPU1

PCI Express Slot Configuration

No.	PCIE 2	PCIE 3
Single Graphics Card		x16
Two Graphics Cards	x8	x8

No.	PCIE 4	PCIE 5
Single Graphics Card		x16
Two Graphics Cards	x8	x8

No.	PCIE 6	PCIE 7
Single Graphics Card		x16
Two Graphics Cards	x8	x8

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.

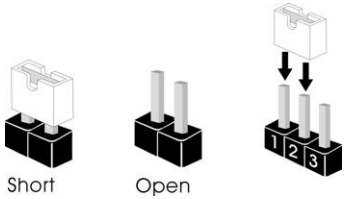
Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.

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

Step 6. Replace the system cover.

2.6 Jumper 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.



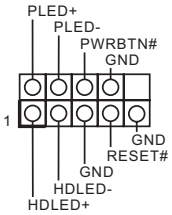
NVDIMM Support Jumpers (3-pin AEP_1) (see p.7, No. 3) (3-pin AEP_2) (see p.7, No. 10)	1_2 Disable Apache Pass supported (Default)	2_3 Enable Apache Pass supported
CPU PECI Mode Jumper (3-pin PECI1) (see p.7, No. 34)	1_2 CPU PECI connect to PCH	2_3 CPU PECI connect to BMC (Default)
SATA_0_3 SATA/PCIE Selection Jumper (3-pin MINISAS_1) (see p.7, No. 22)	1_2 MINISAS port 1 (SATA_0_3) is set to SATA[0:3] (Default)	2_3 MINISAS port 1 (SATA_0_3) is set to PCIEx4
SATA_4_7 SATA/PCIE Selection Jumper (3-pin MINISAS_1) (see p.7, No. 23)	1_2 MINISAS port 2 (SATA_4_7) is set to SATA[4:7]] (Default)	2_3 MINISAS port 2 (SATA_4_7) is set to PCIEx4

Chassis ID0 Jumper (3-pin CHASSIS_ID0) (see p.7, No. 36) Chassis ID1 Jumper (3-pin CHASSIS_ID1) (see p.7, No. 37) Chassis ID2 Jumper (3-pin CHASSIS_ID2) (see p.7, No. 35)	 Board Level SKU (Default)	 Reserved for system level use
Chassis ID0 Jumper (3-pin CHASSIS_ID0) (see p.7, No. 36) Chassis ID1 Jumper (3-pin CHASSIS_ID1) (see p.7, No. 37) Chassis ID2 Jumper (3-pin CHASSIS_ID2) (see p.7, No. 35)	 Reserved for system level use	 Reserved for system level use
Chassis ID0 Jumper (3-pin CHASSIS_ID0) (see p.7, No. 36) Chassis ID1 Jumper (3-pin CHASSIS_ID1) (see p.7, No. 37) Chassis ID2 Jumper (3-pin CHASSIS_ID2) (see p.7, No. 35)	 Reserved for system level use	 Reserved for system level use
Chassis ID0 Jumper (3-pin CHASSIS_ID0) (see p.7, No. 36) Chassis ID1 Jumper (3-pin CHASSIS_ID1) (see p.7, No. 37) Chassis ID2 Jumper (3-pin CHASSIS_ID2) (see p.7, No. 35)	 Reserved for system level use	 Reserved for system level use

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 PANEL1)
(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.

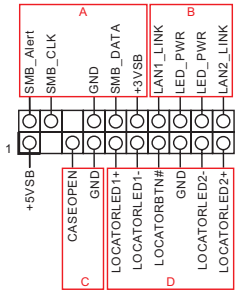
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

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 PANEL1)
(see p.7, No. 27)



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.

Mini-SAS HD Connector
(SATA_0_7)
(see p.7, No. 17)

The connector supports MiniSAS-to-SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

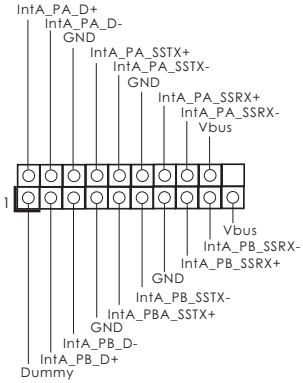
USB 2.0 Connector
(USB_1)
(see p.7, No. 26)

English

Front Panel Type C USB 3.1 Gen2 Header (20-pin USB31_TC_2) (see p.7, No. 44)

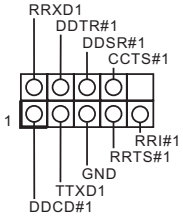
There is one Front Panel Type C USB 3.1 Gen2 Header on this motherboard. This header is used for connecting a USB 3.1 Gen2 module for additional USB 3.1 Gen2 ports.

USB 3.1 Gen1 Header (19-pin USB3_4_5) (see p.7, No. 12)



Besides two default USB 3.1 Gen1 ports on the I/O panel, there is one USB 3.1 Gen1 header on this motherboard. Each USB 3.1 Gen1 header can support two USB 3.1 Gen1 ports.

Serial Port Header (9-pin COM1) (see p.7, No. 40)



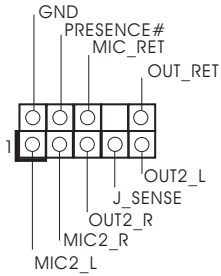
This COM header supports a serial port module.

Clear CMOS Pad (CLRMOS1) (see p.7, No. 18)

CLRMOS1 allows you to clear the data in CMOS. To clear CMOS, take out the CMOS battery and short the Clear CMOS Pad.

English

Front Panel Audio Header
(9-pin HD_AUDIO1)
(see p.7, No. 41)



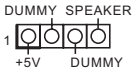
This is an interface for the front panel audio cable that allows convenient connection and control of audio devices.

1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.

2. If you use AC'97 audio panel, please install it to the front panel audio header as below:

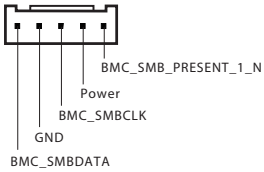
A. Connect Mic_IN (MIC) to MIC2_L.
B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
C. Connect Ground (GND) to Ground (GND).
D. MIC_RET and OUT_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.

Chassis Speaker Header
(4-pin SPEAKER1)
(see p.7, No. 28)



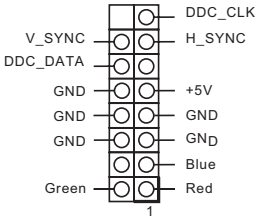
Please connect the chassis speaker to this header.

Baseboard Management Controller SMBus Header
(5-pin BMC_SMB_1)
(see p.7, No. 38)



The header is used for the SM BUS devices.

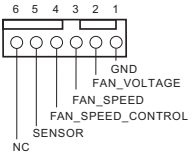
Front VGA Header
(15-pin FRNT_VGA1)
(see p.7, No. 45)



Please connect either end of VGA_2X8 cable to VGA header.

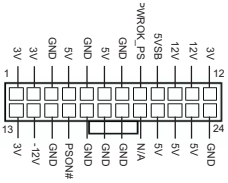
English

System Fan Connectors
(6-pin FAN1)
(see p.7, No. 14)
(6-pin FAN2)
(see p.7, No. 15)
(6-pin FAN3)
(see p.7, No. 16)
(6-pin FAN4)
(see p.7, No. 19)
(6-pin FAN5)
(see p.7, No. 20)
(6-pin FAN6)
(see p.7, No. 21)



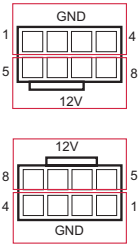
Please connect fan cables to the fan connectors and match the black wire to the ground pin. All fans support Fan Control.

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



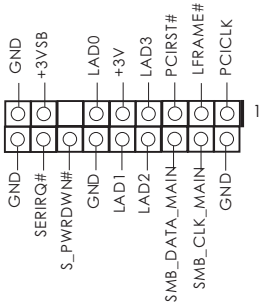
This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.

ATX 12V Power Connectors
(8-pin ATX12V1)
(see p.7, No. 8)
(8-pin ATX12V2)
(see p.7, No. 5)
(8-pin ATX12V3)
(see p.7, No. 6)

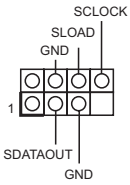
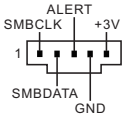
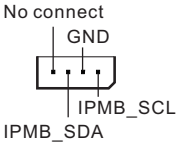
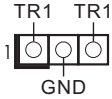


This motherboard provides three 8-pin ATX 12V power connectors.

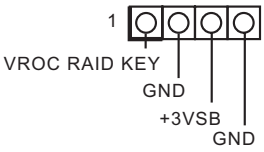
TPM Header
(17-pin TPM1)
(see p.7, No. 33)



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.

Serial General Purpose Input/Output Headers (7-pin SATA_SGPIO1) (see p.7, No. 29) (7-pin SSATA_SGPIO1) (see p.7, No. 30)		These headers support Serial Link interface for onboard SATA connections.
PSU SMBus (5-pin PSU_SMB1) (see p.7, No. 4)		PSU SMBus monitors the status of the power supply, fan and system temperature.
Non Maskable Interrupt Button Header (2-pin NMI_BTN1) (see p.7, No. 42)		Please connect a NMI device to this header.
Intelligent Platform Management Bus header (4-pin IPMB_1) (see p.7, No. 39)		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 Header (3-pin TR1) (see p.7, No. 32)		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.

Virtual RAID On CPU Header
(4-pin RAID_1)
(see p.7, No. 25)



This connector supports Intel® Virtual RAID on CPU and NVME/AHCI RAID on CPU PCIE.

With the introduction of the Intel VROC product, there are three modes of operation:

SKU	HW key required	Key features
Pass-thru	Not needed	• Pass-thru only (no RAID) • LED Management • Hot Plug Support • RAID 0 support for Intel Fultondale NVMe SSDs
Standard	VROCSTANMOD	• Pass-thru SKU features • RAID 0, 1, 10
Premium	VROCPREMMOD	• Standard SKU features • RAID 5 • RAID 5 Write Hole Closure
ISS	VROCISSDMOD	

*Only Intel SSDs are supported.
*For further details on VROC, please refer to the official information released by Intel.

2.8 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.

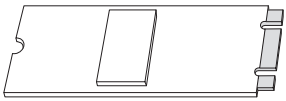
2.9 Driver Installation Guide

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.

2.10 M.2_SSD (NGFF) Module Installation Guide

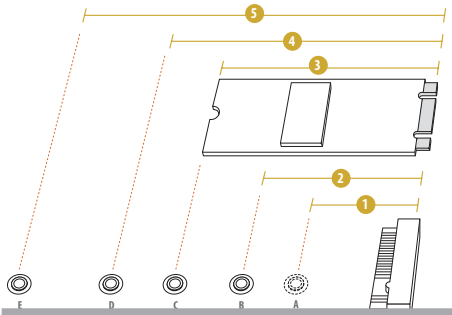
The M.2, also known as the Next Generation Form Factor (NGFF), is a small size and versatile card edge connector that aims to replace mPCIe and mSATA. The M.2_1 Socket supports M.2 SATA3 6.0 Gb/s module and M.2 PCI Express module up to Gen3 x4 (3.94 GB/s or 31.51 Gb/s). The M.2_2 Socket supports M.2 SATA3 6.0 Gb/s module and M.2 PCI Express module up to Gen3 x1 (985 MB/s or 7.88 Gb/s).

Installing the M.2_SSD (NGFF) Module



Step 1

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

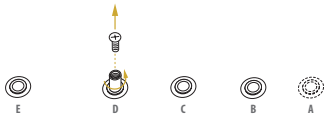


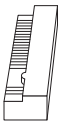
Step 2

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	5
Nut Location	A	B	C	D	E
PCB Length	3cm	4.2cm	6cm	8cm	11cm
Module Type	Type2230	Type 2242	Type2260	Type 2280	Type 22110

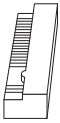
English





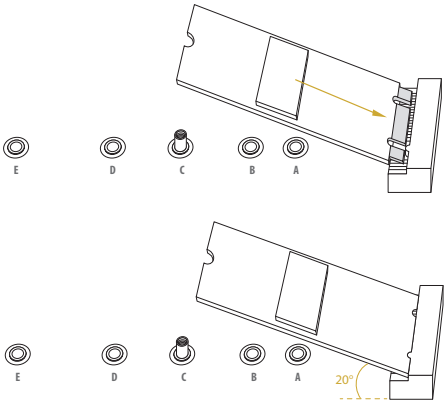
Step 3

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



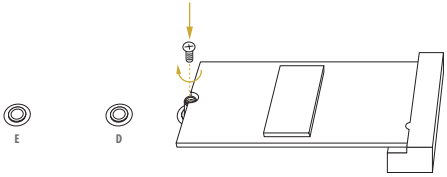
Step 4

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 (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.

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
OC Tweaker	
Advanced	To set up the advanced UEFI features
Security	To set up the security features
Boot	To set up the default system device to locate and load the Operating System
Event Logs	For event log configuration
Server Mgmt	To manage the server
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

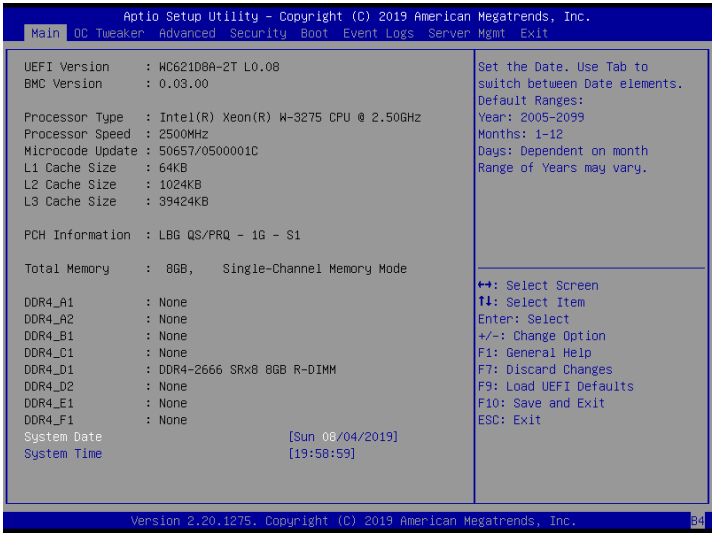
3.1.2 Navigation Keys

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

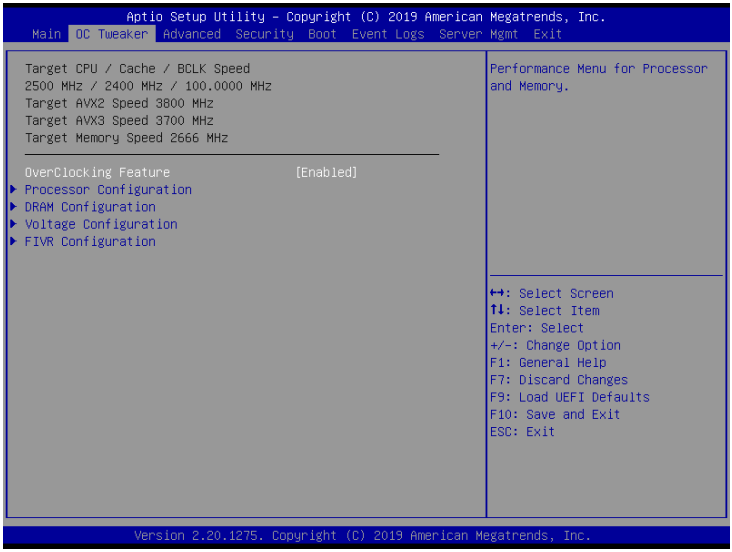
3.2 Main Screen

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.



3.3 OC Tweaker Screen

In the OC Tweaker screen, you can set up overclocking features.



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.

Overclocking Feature

Performance Menu for Processor and Memory.

Processor Configuration

CPU Ratio

The CPU speed is determined by the CPU Ratio multiplied with the BCLK. Increasing the CPU Ratio will increase the internal CPU clock speed without affecting the clock speed of other components.

CPU Mesh Max OC Ratio

The sets the maximum overclocking ratio for the CPU Mesh which is in OC Mailbox.

CPU Mesh Max Ratio

The sets the maximum ratio for the CPU Mesh.

CPU Mesh Min Ratio

The sets the minimum ratio for the CPU Mesh.

Boot Performance Mode

Select the performance state that the BIOS will set before OS hand off.

Intel Turbo Boost Technology

Intel Turbo Boost Technology enables the processor to run above its base operating frequency when the operating system requests the highest performance state.

Intel SpeedStep Technology

Intel SpeedStep technology allows processors to switch between multiple frequencies and voltage points for better power saving and heat dissipation.

Intel Speed Shift Technology

Enable/Disable Intel Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-sates.

Adjust Pll

Adjust the Pll for higher-BCLK ratio combination.

Pll Trim

Change Pll value between +63 to -63.

Pll Trim Prefix

Change PLL Trim prefix.

Pll Trim for Memory Controller

Change PLL Trim value for memory controller between +63 to -63.

Pll Trim Prefix for Memory Controller

Change PLL Trim prefix for memory controller.

CPU Tj Max

Set CPU Tj Max to adjust TCC Target Temperature. Default is 105° C.

AVX2 Negative Offset

AVX2 Negative Offset applied by Pcode OC mailbox read(0x1A)/Write(0x1B).

AVX3 Negative Offset

AVX3 Negative Offset applied by Pcode OC mailbox read(0x1A)/Write(0x1B).

Primary Plane Current Limit

Configure the current limit of the CPU under Turbo Mode in ampere. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

Primary Plane Current Limit

Configure the current limit of the CPU under Turbo Mode in ampere. A lower limit can protect the

Long Duration Power Limit

Configure Package Power Limit 1 in watts. When the limit is exceeded, the CPU ratio will be lowered after a period of time. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

Long Duration Maintained

Configure the period of time until the CPU ratio is lowered when the Long Duration Power Limit is exceeded.

Short Duration Power Limit

Configure Package Power Limit 2 in watts. When the limit is exceeded, the CPU ratio will be lowered immediately. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

DRAM Configuration

Enforce POR

Enable to enforce POR restrictions for DDR4 frequency and voltage programming.

IMC BCLK

If [Auto] is selected, it will be 100MHz or 133MHz.

Primary Timing

tCL

The time between sending a column address to the memory and the beginning of the data in response.

tRCD

The number of clock cycles required between the opening of a row of memory and accessing columns within it.

tRP

The number of clock cycles required between the issuing of the precharge command and opening the next row.

tRAS

The number of clock cycles required between a bank active command and issuing the precharge command.

CR

The delay between when a memory chip is selected and when the first active command can be issued.

Secondary Timing

tWR

The amount of delay that must elapse after the completion of a valid write operation, before an active bank can be precharged.

tRFC

The number of clocks from a Refresh command until the first Activate command to

the same rank.

tRRD

The number of clocks between two rows activated in different banks of the same rank.

tRRD_L

The number of clocks between two rows activated in different banks of the same rank.

tRTP

The number of clocks that are inserted between a read command to a row pre-charge command to the same rank.

tWTR

The number of clocks between the last valid write operation and the next read command to the same internal bank.

tWTR_L

The number of clocks between the last valid write operation and the next read command to the same internal bank.

tFAW

The time window in which four activates are allowed the same rank.

tCWL

Configure CAS Write Latency.

Third Timing

tREFI

Configure refresh cycles at an average periodic interval.

tCKE

Configure the period of time the DDR4 initiates a minimum of one refresh command internally once it enters Self-Refresh mode.

tCCD

Configure back to back CAS to CAS (i.e. READ to RAED or WRITE to WRITE) from same rank separation parameter.

tCCD_L

Configure back to back CAS to CAS (i.e. READ to RAED or WRITE to WRITE) from same rank separation parameter.

tCCD_WR_L

Configure back to back CAS to CAS (i.e. READ to RAED or WRITE to WRITE) from same rank separation parameter.

tRRDS

Configure Back to back READ to READ from different subranks within the same logical rank separation parameter for LRDIMM.

tRRDS_L

Configure Back to back READ to READ from different subranks within the same logical rank separation parameter for LRDIMM.

tRRDR

Configure Read to Read different rank dead cycle Back to back READ to WRITE from different DIMM separation parameter.

tRRDD

Configure Read to Read different DIMM dead cycle Back to back READ to WRITE from different DIMM separation parameter.

tRWSR

Configure READ to WRITE same rank dead cycle Back to back READ to WRITE from same rank separation parameter.

tRWDS

Configure Back to back READ to WRITE from different subranks within the same logical rank separation parameter for LRDIMM.

tRWDR

Configure Back to back READ to WRITE from different ranks separation

parameter.

tRWDD

Configure Back to back READ to WRITE from different dimm separation parameter.

tWRDS

Back to back WRITE to READ from different subranks within the same logical rank separation parameter for LRDIMM. Min: 1 Max: 31

tWRDR

Back to back WRITE to READ from different RANK separation parameter.

tWRDD

Configure Write to Read different DIMM dead cycle Back to back READ to WRITE from different DIMM separation parameter.

tWWDS

Configure Back to back WRITE to WRITE from different subranks within the same logical rank separation parameter for LRDIMM.

tWWDS_L

Configure Back to back WRITE to WRITE from different subranks within the same logical rank separation parameter for LRDIMM.

tWWDR

Configure Write to Write different rank dead cycle Back to back READ to WRITE from different rank separation parameter.

tWWDD

Configure Write to Write different DIMM dead cycle Back to back READ to WRITE from different DIMM separation parameter.

Fourth Timing

RTL_A1

Configure round trip latency.

RTL_A2

Configure round trip latency.

RTL_B1

Configure round trip latency.

RTL_C1

Configure round trip latency.

RTL_D1

Configure round trip latency.

RTL_D2

Configure round trip latency.\

RTL_E1

Configure round trip latency.

RTL_F1

Configure round trip latency.

IO-L_A1

Configure IO latency.

IO-L_A2

Configure IO latency.

IO-L _B1

Configure IO latency.

IO-L_C1

Configure IO latency.

IO-L_D1

Configure IO latency.

IO-L_D2

Configure IO latency.

IO-L_E1

Configure IO latency.

IO-L_F1

Configure IO latency.

Advanced Setting

ODT WR (A1)

Configure the memory on die termination resistors' WR for A1.

ODT WR (A2)

Configure the memory on die termination resistors' WR for A2.

ODT WR (B1)

Configure the memory on die termination resistors' WR for B1.

ODT WR (C1)

Configure the memory on die termination resistors' WR for C1.

ODT WR (D1)

Configure the memory on die termination resistors' WR for D1.

ODT WR (D2)

Configure the memory on die termination resistors' WR for D2.

ODT WR (E1)

Configure the memory on die termination resistors' WR for E1.

ODT WR (F1)

Configure the memory on die termination resistors' WR for F1.

ODT PARK (A1)

Configure the memory on die termination resistors' PARK for A1.

ODT PARK (A2)

Configure the memory on die termination resistors' PARK for B2.

ODT PARK (B1)

Configure the memory on die termination resistors' PARK for B1.

ODT PARK (C1)

Configure the memory on die termination resistors' PARK for C1.

ODT PARK (D1)

Configure the memory on die termination resistors' PARK for D1.

ODT PARK (D2)

Configure the memory on die termination resistors' PARK for D2.

ODT PARK (E1)

Configure the memory on die termination resistors' PARK for E1.

ODT PARK (F1)

Configure the memory on die termination resistors' PARK for F1.

ODT NOM (A1)

Use this to change ODT (A1) Auto/Manual settings. The default is [Auto].

ODT NOM (A2)

Use this to change ODT (A2) Auto/Manual settings. The default is [Auto].

ODT NOM (B1)

Use this to change ODT (B1) Auto/Manual settings. The default is [Auto].

ODT NOM (B2)

Use this to change ODT (B2) Auto/Manual settings. The default is [Auto].

ODT NOM (C1)

Use this to change ODT (C1) Auto/Manual settings. The default is [Auto].

ODT NOM (D1)

Use this to change ODT (D1) Auto/Manual settings. The default is [Auto].

ODT NOM (E1)

Use this to change ODT (E1) Auto/Manual settings. The default is [Auto].

ODT NOM (F1)

Use this to change ODT (F1) Auto/Manual settings. The default is [Auto].

C/A Parity Enable

[Enable] - Enables DDR4 Command Address Parity.
[Disable] - Disables this feature.
[Auto] - Sets it to the MRC default setting; current default is Disable.

Round Trip Latency Optimize

Configure the Round Trip Latency Optimize setting. The default is [Auto].

MRC Premote Warnings

Determines if MRC warnings are promoted to system level.

Premote Warnings

Determines if warnings are promoted to system level.

Halt on mem Training Error

Enable/Disable Halt on mem Training Error.

Memory Test

Enable/Disable memory test during normal boot.

MemTestLoops

Number of memory test loops during normal boot, set to 0 to run memtest infinitely.

Mem Test On Fast Boot

Enable/Disble memory test during fast boot.

Attempt Fast Boot

[Enable] - Protions of memory reference code will be skipped when possible to increase boot speed on warm boots.
[Disable] - Disable this feature.
[Audo] - Sets it to the MRC default setting; current default is Disable.

Attempt Fast Cold Boot

[Enable] - Protions of memory reference code will be skipped when possible to increase boot speed on cold boots.
[Disable] - Disable this feature.
[Audo] - Sets it to the MRC default setting; current default is Disable.

Voltage Configuration

CPU Core/Cache Voltage

Input voltage for the processor by the external voltage refulator.

CPU Load-Line Calibration

CPU Load-Line Calibration helps prevent CPU voltage droop when the system is under heavy loading.

CPU Current Reporting

Default is normal reporting. If current scale is 50%, the current reporting will be 50% of the normal one. And notice that all phase will be active when auto phase function is disabled.

CPU Protection

Vout OVP, UVP and OCP functions are enabled and disabled together.

VCCSA Mode

Use this item to select VCCSA mode. Options: auto / fixed mode / offset mode.

VCCIO Mode

Use this item to select VCCIO mode. Options: auto / fixed mode / offset mode.

VDDQ ABC Mode

Use this item to select VDDQ ABC mode. Options: auto / fixed mode / offset mode.

VPPM ABC Mode

Use this item to select VPPM ABC mode. Options: auto / fixed mode / offset mode.

VDDQ DEF Mode

Use this item to select VDDQ DEF mode. Options: auto / fixed mode / offset mode.

VPPM DEF Mode

Use this item to select VPPM DEF mode. Options: auto / fixed mode / offset mode.

FIVR Configuration

CPU Vcore Voltage Mode

Configure the amount of voltage fed to the cores fo the processor. Increase the voltage when increasing CPU Core Frequency.
Auto: For optimized settings.
Adaptive: Add voltage to the CPU when the system is under heavy loading.
Override: The voltage is fixed.

Vcore Adaptive Voltage

Configure the voltage added to the CPU when the system is under heavy load.

Vcore Voltage Additional Offset

Configure the dynamic Vcore voltage added to the Vcore. Max = 1.000V

Offset Prefix

Sets the offset value as positive or negative.

CPU Mesh Voltage Mode

Configure the amount of voltage fed to the UNCores fo the processor including its cache. Increase the voltage when increasing CPU Mesh Frequency.

Auto: For optimized settings.
Adaptive: Add voltage to the CPU Mesh when the system is under heavy loading.
Override: The voltage is fixed.

CPU Mesh Adaptive Voltage

Configure the voltage added to the CPU Mesh when the system is under heavy load.

CPU Mesh Voltage Offset

Configure the voltage for the CPU Mesh Voltage Offset(V).
Min = -1.000V
Max = 1.000V

Offset Prefix

Sets the offset value as positive or negative.

System Agent Voltage Offset

Configure the amount of voltage fed to the System Agent of the processor including its PCIe controller and Power control Unit (PCU). Setting the voltage higher may increase system stability when overclocking the memory.

Offset Prefix

Sets the offset value as positive or negative.

VCCU Voltage Offset

Configure the VCCU Voltage.

Offset Prefix

Sets the offset value as positive or negative.

CPU Integrated VR Faults

Disable FIVR Faults to raise the threshold to trigger CPU over current protection and over voltage protection for better overclocking capabilities

CPU Integrated VR Efficiency Mode

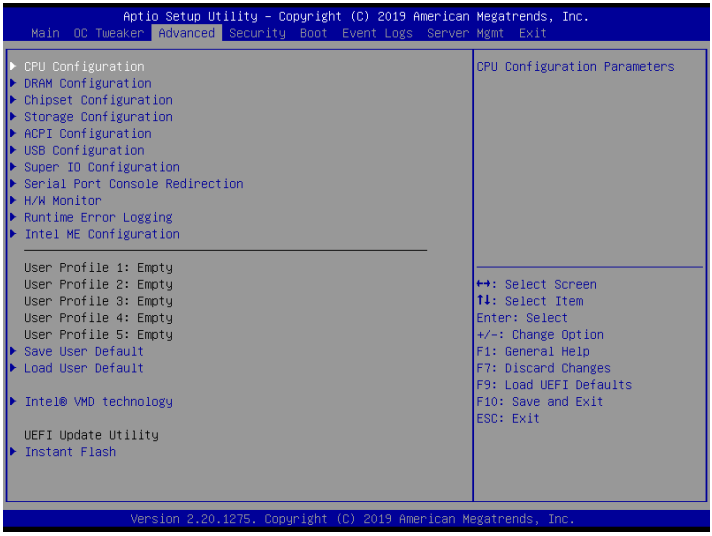
Enable FIVR Efficiency Management for power saving. Disable for better performance and overclocking capabilities.

SVID Support

Enable/Disable SVID. Disabling SVID disables input voltage overrides.

3.4 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, DRAM Configuration, Chipset Configuration, Storage Configuration, ACPI Configuration, USB Configuration, Super IO Configuration, Serial Port Console Redirection, H/W Monitor, Runtime Error Logging, Intel ME Configuration, Intel® VMD technology and Instant Flash.



Save User Default

Type a profile name and press enter to save your settings as user default.

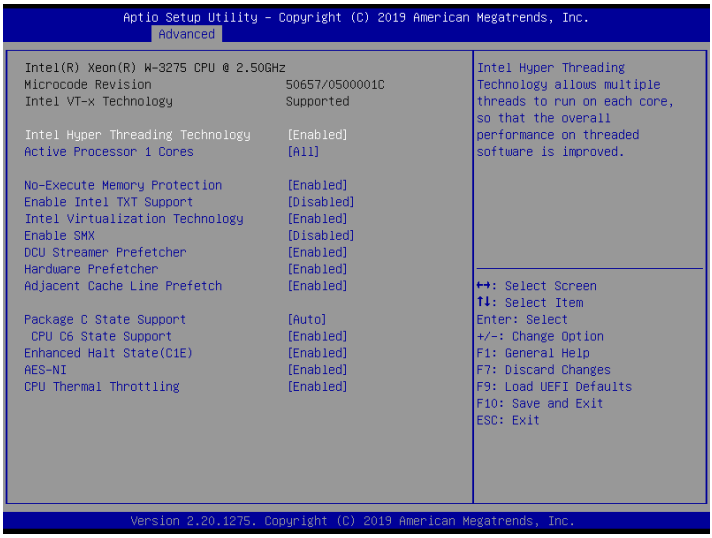
Load User Default

Load previously saved user defaults.

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

English

3.4.1 CPU Configuration



Intel Hyper Threading Technology

Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved.

Active Processor 1 Cores

Select the number of cores to enable in each processor package.

No-Execute Memory Protection

Processors with No-Execution Memory Protection Technology may prevent certain classes of malicious buffer overflow attacks.

Enable Intel TXT Support

Enables Intel Trusted Execution Technology Configuration.

Intel Virtualization Technology

Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems.

Enable SMX

Use this item to enable Safer Mode Extensions.

DCU Streamer Prefetcher

DCU streamer prefetcher is an L1 data cache prefetcher (MSR 1A4h [2]).

Hardware Prefetcher

Automatically prefetch data and code for the processor. Enable for better performance.

Adjacent Cache Line Prefetch

Automatically prefetch the subsequent cache line while retrieving the currently requested cache line. Enable for better performance.

Package C State Support

Enable CPU, PCIe, Memory, Graphics C State Support for power saving.

CPU C6 State Support

Enable C6 deep sleep state for lower power consumption.

Enhanced Halt State(C1E)

Enable Enhanced Halt State (C1E) for lower power consumption.

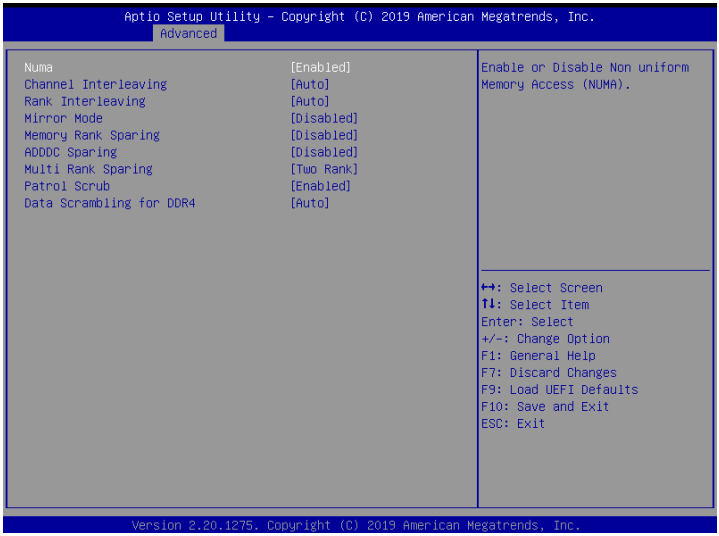
AES-NI

Use this item to enable or disable AES-NI support.

CPU Thermal Throttling

Enable CPU internal thermal control mechanisms to keep the CPU from overheating.

3.4.2 DRAM Configuration



Numa

Use this item to enable or disable Non Uniform Memory Access (NUMA).

Channel Interleaving

Select to configure Channel Interleaving settings.

Rank Interleaving

Select to configure Rank Interleaving settings.

Mirror Mode

Mirror Mode will set entire 1LM/2LM memory in system to be mirrored, consequently reducing the memory capacity by half. Mirror Enable will disable XPT Prefetch.

Memory Rank Sparing

Enable or disable Memory Rank Sparing.

ADDDC Sparing

Enable or disable Memory Rank Sparing.

Multi Rank Sparing

Set Multi Rank Sparing number. Default and the maximum is 2 ranks per channel.

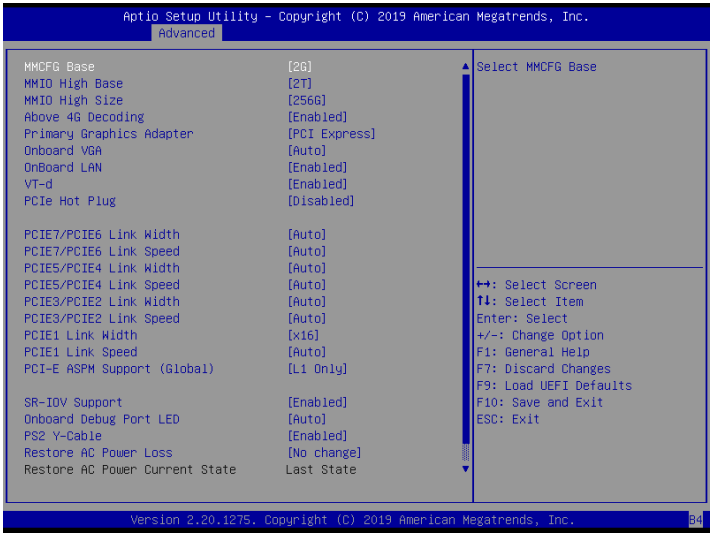
Patrol Scrub

Patrol Scrub is a background activity initiated by the processor to seek out and fix memory errors. The default value is [Enabled].

Data Scrambling for DDR4

Enable - Enables data scrambling for DDR4.
Disable - Disables this feature.
Auto - Sets it to the MRC default setting; current default is Enable.

3.4.3 Chipset Configuration



MMCFG Base

Use this item to select MMCFG Base.

MMIO High Base

Use this item to select MMIO High Base.

MMIO High Size

Use this item to select MMIO High Size.

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).

Primary Graphics Adapter

If PCI Express graphics card is installed on the motherboard, you may use this option to select PCI Express or Onboard VGA as the primary graphics adapter.

**If no PCI Express graphics card is installed, [Onboard VGA] is the default graphics adapter. There is no screen on monitor even if a HDMI display is connected. Select [Onboard Hdmi] instead to use HDMI as output source.*

Onboard VGA

Use this to enable or disable the Onboard VGA function. The default value is [Auto].

**This item is not available when the Primary Graphic Adapter is set to [Onboard VGA] or [Onboard Hdmi] .*

Onboard LAN

This allows you to enable or disable the Onboard LAN feature.

VT-d

Intel Virtualization Technology for Directed I/O helps your virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance.

PCIE Hot Plug

Use this item to enable or disable PCIe Hot Plug globally.

PCIE7/PCIE6 Link Width

This allows you to select PCIE7/PCIE6 Link Width. The default value is [x4].

PCIE7/PCIE6 Link Speed

This allows you to select PCIE7/PCIE6 Link Speed. The default value is [Auto].

PCIE5/PCIE4 Link Width

This allows you to select PCIE5/PCIE4 Link Width. The default value is [x8].

PCIE5/PCIE4 Link Speed

This allows you to select PCIE5/PCIE4 Link Speed. The default value is [Auto].

PCIE3/PCIE2 Link Width

This allows you to select PCIE3/PCIE2 Link Width. The default value is [Auto].

PCIE3/PCIE2 Link Speed

This allows you to select PCIE3/PCIE2Link Speed. The default value is [Auto].

PCIE1 Link Width

This allows you to select PCIE5/PCIE6 Link Width. The default value is [Auto].

PCIE1 Link Speed

This allows you to select PCIE5/PCIE6 Link Speed. The default value is [Auto].

PCI-E ASPM Support (Global)

This option enables / disables the ASPM support for all downstream devices.

SR-IOV Support

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

Onboard Debug Port LED

Enable/Disable the onboard Dr. Debug LED.

PS2 Y-Cable

Enable the PS2 Y-Cable or set this option to Auto.

Restore on 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.

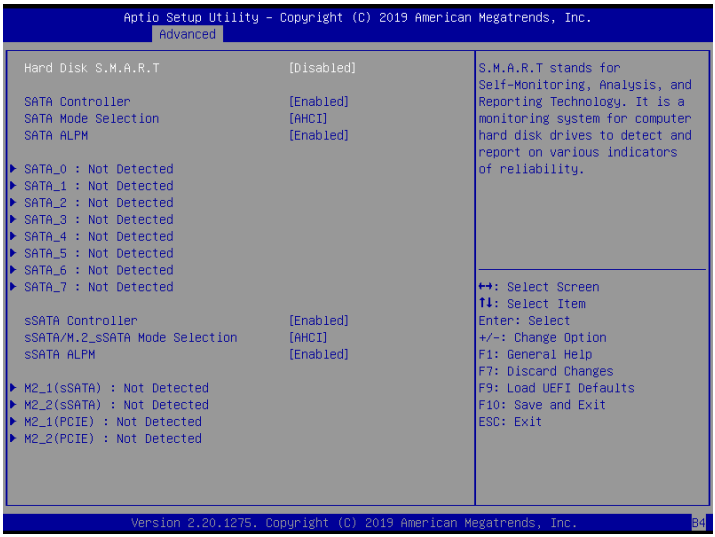
Onboard HD Audio

This allows you to enable or disable the Onboard HD Audio feature.

Front Panel

This allows you to select the front panel type.

3.4.4 Storage Configuration



Hard Disk S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled] and [Enabled].

SATA Storage Configuration

SATA Controller

Use this item to enable or disable SATA Controllers.

SATA Mode Selection

Identify the SATA/M.2_SATA port is connected to Solid State Drive or Hard Disk Drive. Press <Ctrl+I> to enter RAID ROM during UEFI POST process.

SATA ALPM

Use this item to enable or disable SALP.

sSATA Storage Configuration

sSATA Controller

Use this item to enable or disable SATA Controllers.

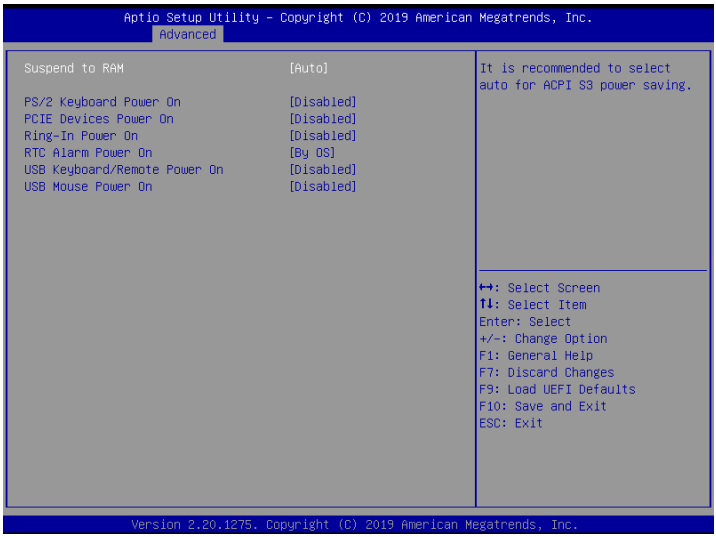
sSATA Mode Selection

Identify the sSATA port is connected to Solid State Drive or Hard Disk Drive. Press <Ctrl+I> to enter RAID ROM during UEFI POST process.

sSATA ALPM

Use this item to enable or disable SALP.

3.4.5 ACPI Configuration



Suspend to RAM

Select disable for ACPI suspend type S1. It is recommended to select auto for ACPI S3 power saving.

PS/2 Keyboard Power On

Allow the system to be waked up by a PS/2 Keyboard.

PCIE Devices Power On

Use this item to enable or disable PCIE devices to turn on the system from the power-soft-off mode.

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

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

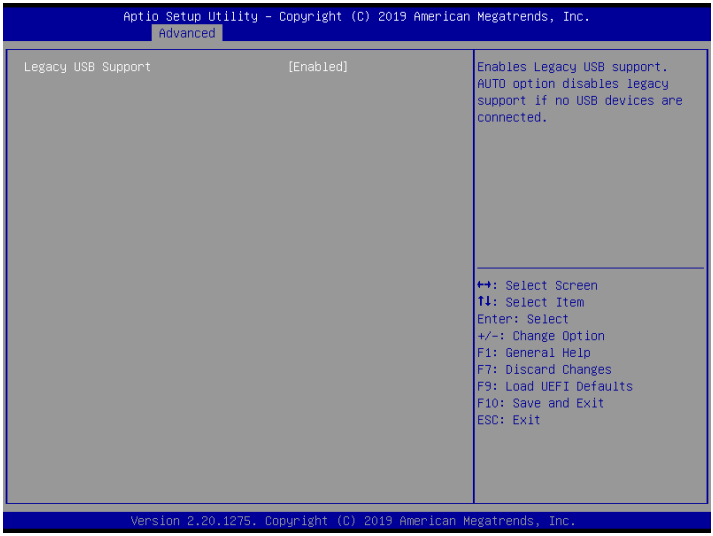
USB Keyboard/Remote Power On

Allow the system to be waked up by an USB keyboard or remote controller.

USB Mouse Power On

Allow the system to be waked up by an USB mouse.

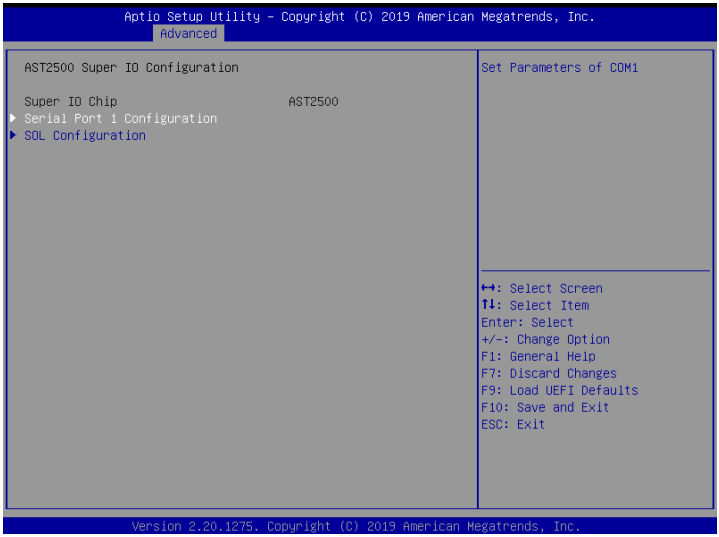
3.4.6 USB Configuration



Legacy USB Support

Use this option to enable or disable legacy support for USB devices. The default value is [Enabled].

3.4.7 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.

Change Settings

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

SOL Configuration

Use this item to set SOL configuration.

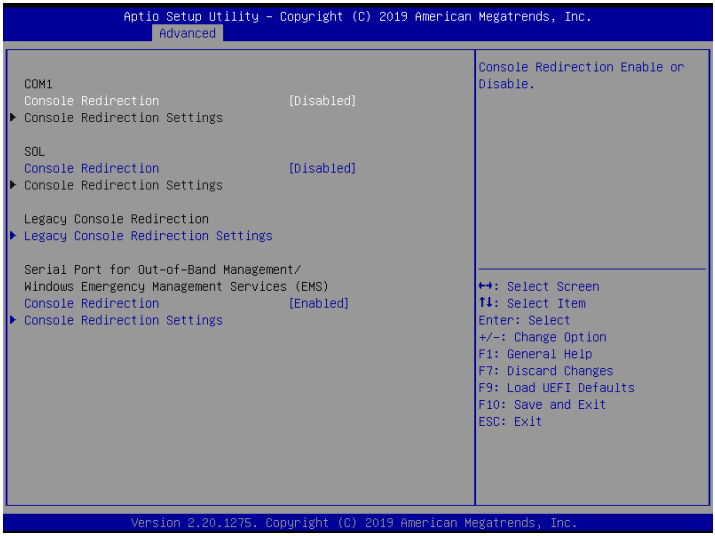
SOL Port

Use this item to enable or disable the SOL port.

Change Settings

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

3.4.8 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 hhave 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].

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.

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

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

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.

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

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], [57600] and [115200].

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], [Hardware RTS/CTS], and [Software Xon/Xoff].

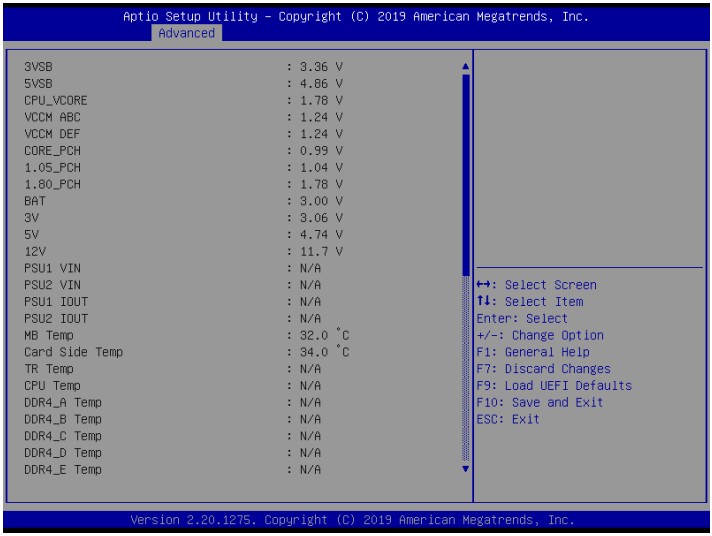
Data Bits

Parity

Stop Bits

3.4.9 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.



Fan Control

If [Auto] is selected, the fan speed will controlled by BMC.
If [Manual] is selected, configure the items below.

FAN1

This allows you to set the fan1's speed. The default value is [Smart Fan].

FAN2

This allows you to set the fan2's speed. The default value is [Smart Fan].

FAN3

This allows you to set the fan3's speed. The default value is [Smart Fan].

FAN4

This allows you to set the fan4's speed. The default value is [Smart Fan].

FAN5

This allows you to set the fan5's speed. The default value is [Smart Fan].

FAN6

This allows you to set the fan6's speed. The default value is [Smart Fan].

Smart Fan Control

This allows you to set the Smart fan's level speed.

Smart Fan Duty Control

Smart Fan Duty x (x means 1 to 11 stage)

This allows you to set duty cycle for each stage.

Smart Fan Temp Control

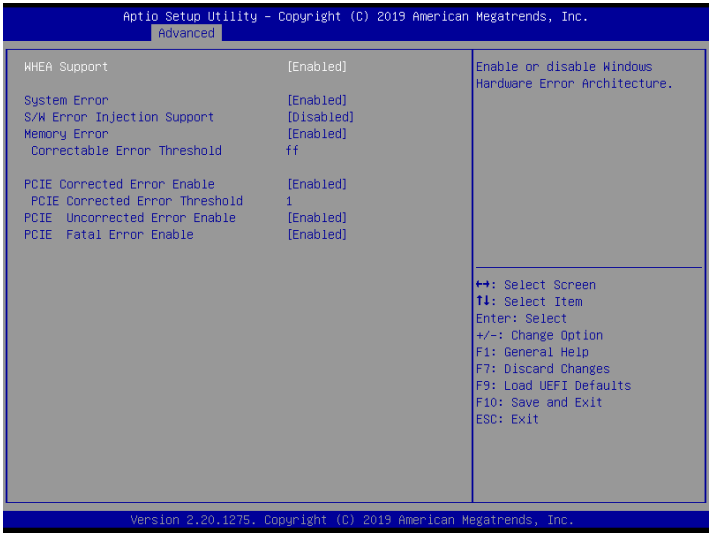
Smart Fan Temp x (x means 1 to 11 stage)

This allows you to set temperature for each stage.

Watch Dog Timer

This allows you to enable or disable the Watch Dog Timer. The default value is [Disabled].

3.4.10 Runtime Error Logging



WHEA Support

Use this item to enable or disable Windows Hardware Error Architecture.

System Error

Use this item to enable or disable System Error feature. When it is set to [Enabled], you can configure Memory Error and PCIE Error log features.

S/W Error Injection Support

When it is set to [Enabled], S/W Error Injection is supported by unlocking MSR Ox790.

Memory Error

Memory enabling and logging setup option.

Correctable Error Threshold

Correctable Error Threshold (0 - 0x7FFF) used for sparing, tagging, and leaky bucket.

PCIE Corrected Error Enable

Use this item to enable or disable PCIe Correctable errors.

PCIE Corrected Error Threshold

PCIE Correctable Error Threshold (0x01-0xFF) used for sparing, tagging, and leaky bucket.

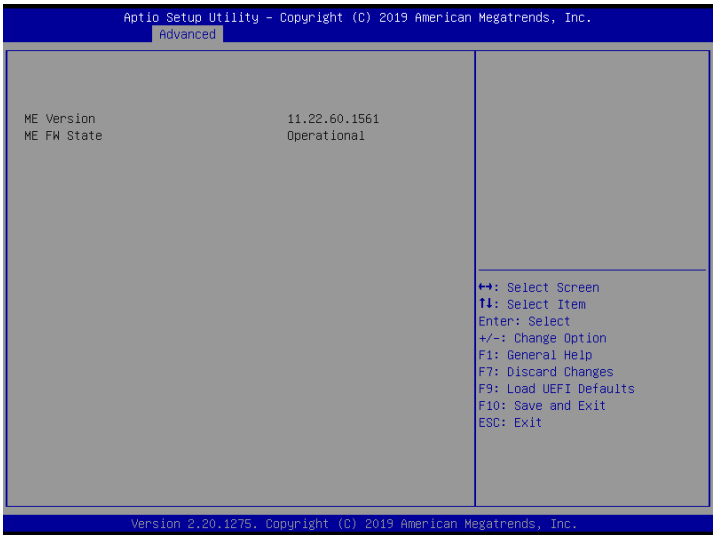
PCIE Uncorrected Error Enable

Use this item to enable or disable PCIe Uncorrectable errors.

PCIE Fatal Error Enable

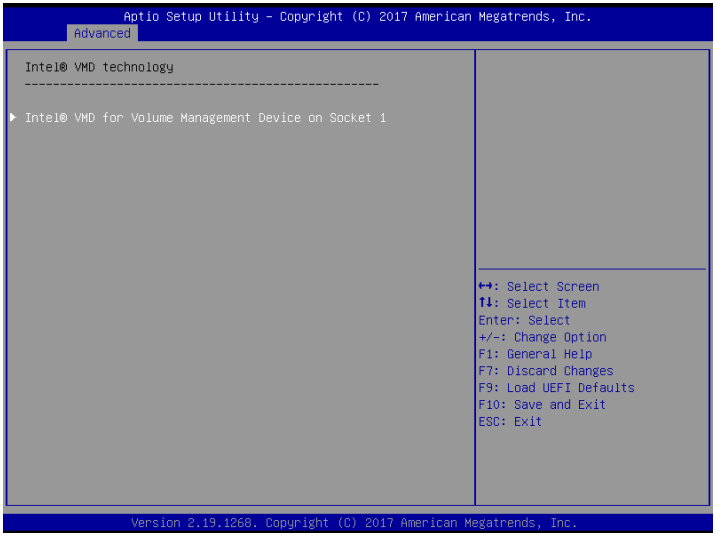
Use this item to enable or disable PCIe Ftal errors.

3.4.11 Intel ME Configuration



ME Subsystem screen displays the Intel ME Subsystem Configuration information, such as Operational Firmware Version and Firmware State.

3.4.12 Intel® VMD technology



Press <Enter> to bring up the Intel(R) VMD for Volume Management Device Configuration menu.

Intel(R) VMD for Volume Management Device on Socket 1

Intel(R) VMD for Volume Management Device Technology

Use this item to enable or disable Intel(R) Volume Management Device Technology in this Stack.
When [Enabled], users are allowed to configure the options below.

VMD port 1A

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port 1C

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port 1D

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

Hot Plug Capable

Enable/Disable Hot Plug for PCIe Root Ports 1A-1D.

Intel(R) VMD for Volume Management Device Technology

Use this item to enable or disable Intel(R) Volume Management Device Technology in this Stack.
When [Enabled], users are allowed to configure the options below.

VMD port 2A

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port 2B

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port 2C

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port 2D

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

Hot Plug Capable

Enable/Disable Hot Plug for PCIe Root Ports 2A-2D.

Intel(R) VMD for Volume Management Device Technology

Use this item to enable or disable Intel(R) Volume Management Device Technology in this Stack.
When [Enabled], users are allowed to configure the options below.

VMD port 3A

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port 3B

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port 3C

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port 3D

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

Hot Plug Capable

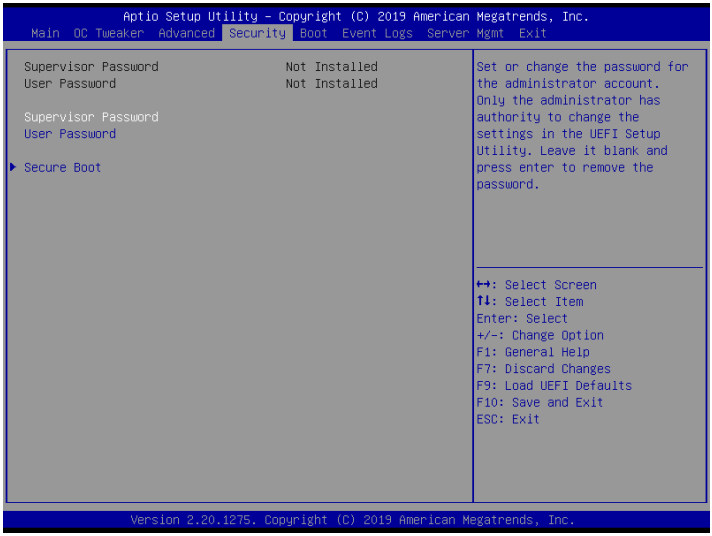
Use this item to enable or disable Hot Plug for PCIe Root Ports 3A-3D.

3.4.13 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.

3.5 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

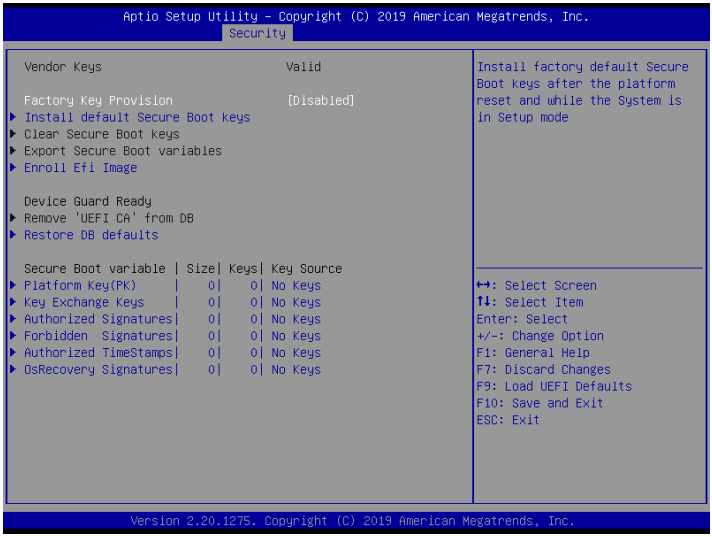
Use this to enable or disable Secure Boot Control. The default value is [Disabled].

Secure Boot Mode

Enable to support Windows 8 or later versions Secure Boot.

3.5.1 Key Management

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



Provision Factory Defaults

Allow to provision factory default Secure Boot keys when 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.

Enroll Efi Image

Allow the image to run in Secure Boot mode. Enroll SHA256 hash of the binary into Authorized Signature Database (db).

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 encoded)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHA256, 384, 512

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 encoded)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHA256, 384, 512

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 encoded)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHA256, 384, 512

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 encoded)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHA256, 384, 512

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 encoded)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHA256, 384, 512

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 encoded)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHA256, 384, 512

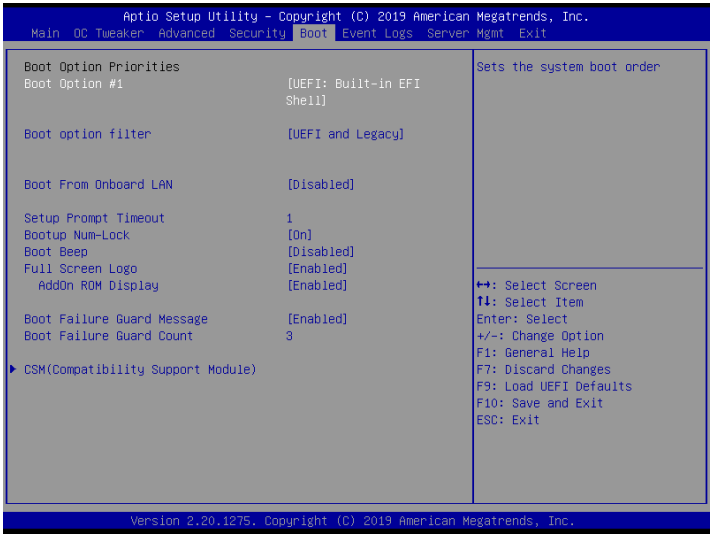
2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed, Test

3.6 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

Use this item to set the system boot order.

Boot Option Filter

This option controls Legacy/UEFI ROMs priority.

Boot From Onboard LAN

Use this item to enable or disable the Boot From Onboard LAN feature.

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].

AddOn ROM Display

Use this option to adjust AddOn ROM Display. If you enable the option “Full Screen Logo” but you want to see the AddOn ROM information when the system boots, please select [Enabled]. Configuration options: [Enabled] and [Disabled]. The default value is [Enabled].

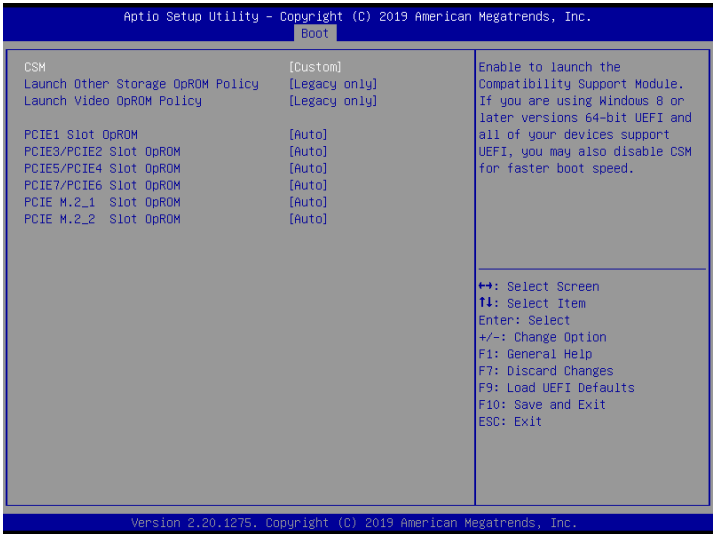
Boot Failure Guard Message

If the computer fails to boot for a number of times the system automatically restores the default settings.

Boot Failure Guard Count

Configure the number of attempts to boot until the system automatically restores the default settings.

3.6.1 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 10 64-bit and all of your devices support UEFI, you may also disable CSM for faster boot speed.

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.

PCIE1 Slot OpROM

This option controls Legacy/UEFI ROMs priority.

PCIE3/PCIE2 Slot OpROM

This option controls Legacy/UEFI ROMs priority.

PCIE5/PCIE4 Slot OpROM

This option controls Legacy/UEFI ROMs priority.

PCIE7/PCIE6 Slot OpROM

This option controls Legacy/UEFI ROMs priority.

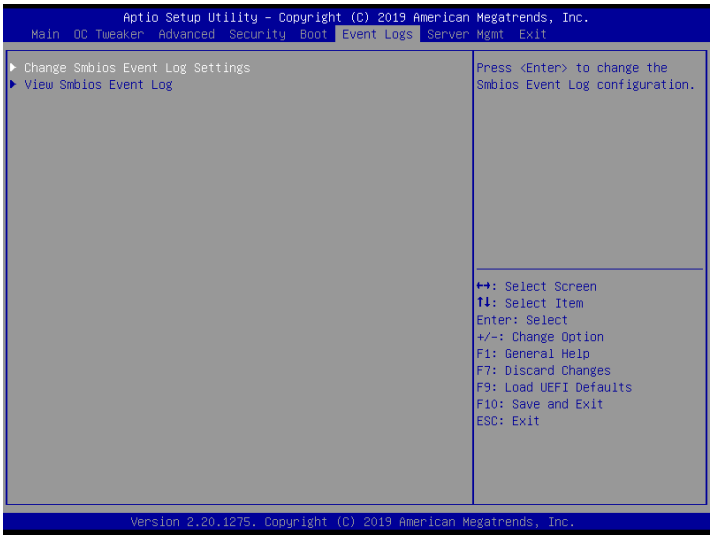
PCIE M.2_1 Slot OpROM

This option controls Legacy/UEFI ROMs priority.

PCIE M.2_2 Slot OpROM

This option controls Legacy/UEFI ROMs priority.

3.7 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

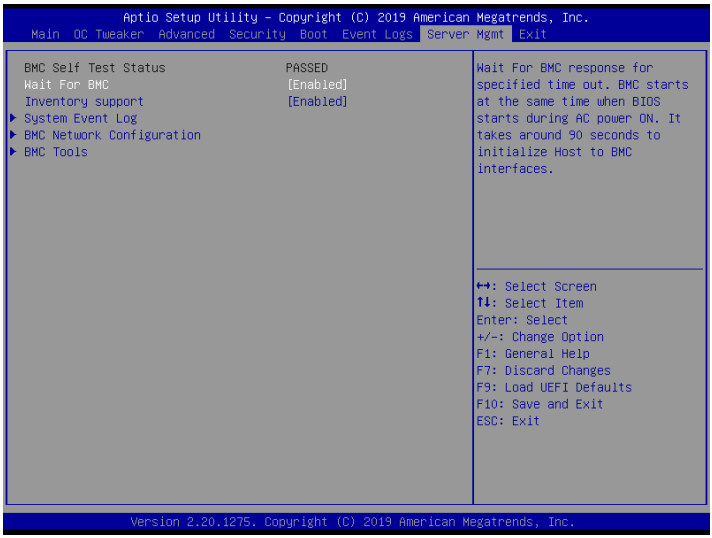
Choose option to enable/disable logging of System boot event.

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.

3.8 Server Mgmt



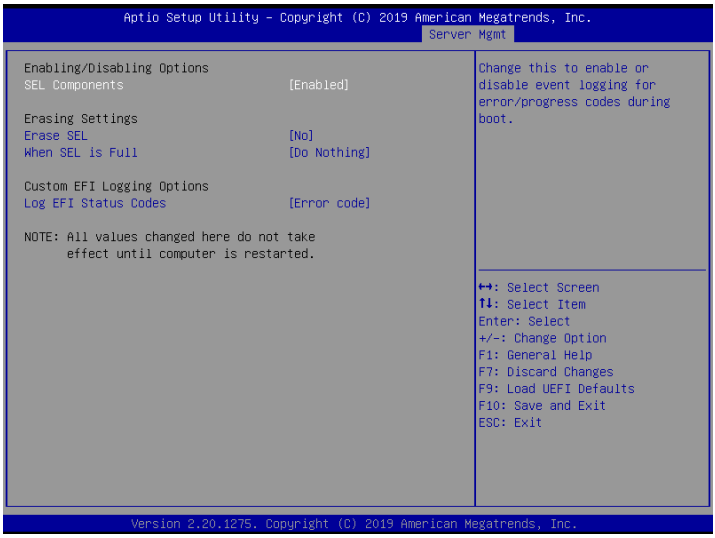
Wait For BMC

Wait For BMC response for specified time out. In PILOTII, BMC starts at the same time when BIOS starts during AC power ON. It takes around 30 seconds to initialize Host to BMC interfaces.

Inventory Support

This will execute inventory function for system. Enabling this item will take some time at system boot.

3.8.1 System Event Log



SEL Components

Change this to enable ro disable all features of System Event Logging during boot.

Erase SEL

Use this to choose options for earsing SEL.

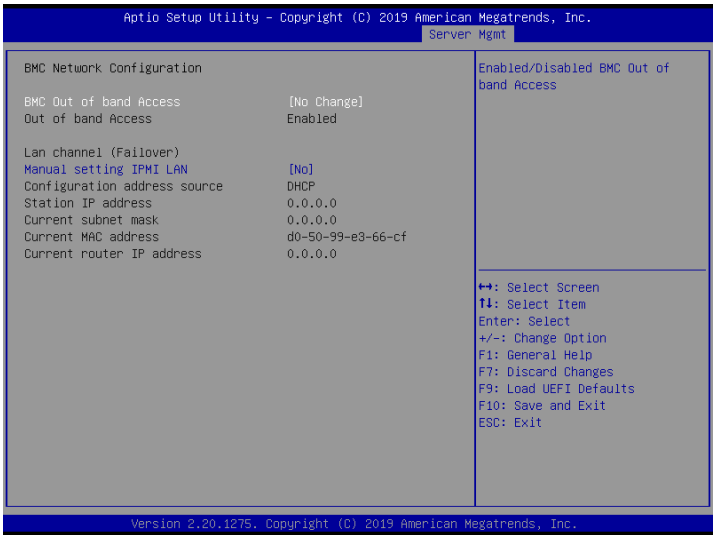
When SEL is Full

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

Log EFI Status Codes

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

3.8.2 BMC Network Configuration



BMC Out of Band Access

Enabled/Disabled BMC Out of band Access.

Lan Channel (Failover)

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.

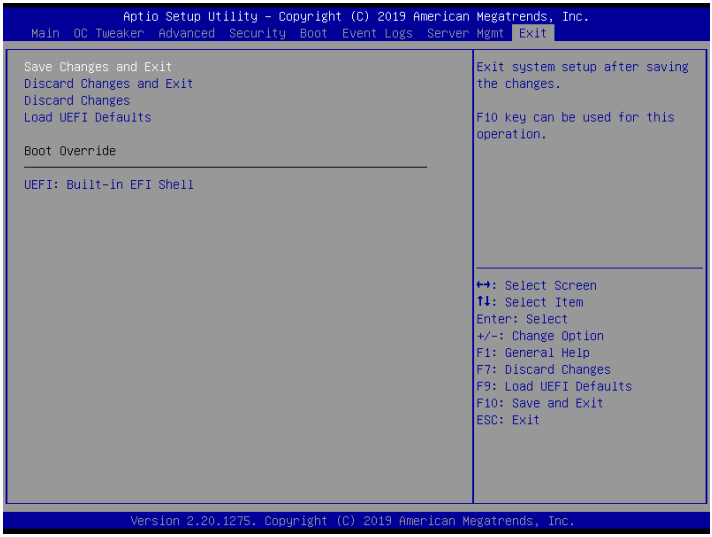
The default login information for the IPMI web interface is:
Username: admin
Password: admin
For more instructions on how to set up remote control environment and use the IPMI management platform, please refer to the IPMI Configuration User Guide or go to the Support website at: http://www.asrockrack.com/support/ipmi.asp

BMC Tools

Load BMC Default Settings

Use this item to load BMC default settings.

3.9 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.

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.

Boot Override

These items displays the available devices. Select an item to start booting from the selected device.

Chapter 4 Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® 10 / Server 2012 R2 / Server 2016 / Linux compliant. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

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

4.2 Support CD Information

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard's features.

4.2.1 Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu does not appear automatically, locate and double click on the file "ASRSetup.exe" from the root folder in the Support CD to display the menu.

4.2.2 Drivers Menu

The Drivers Menu shows the available device's drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

4.2.3 Utilities Menu

The Utilities Menu shows the application softwares that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

4.2.4 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 RDIMM, LR 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/

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.