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Stable and
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Server/Workstation
Motherboard

E3C246D4U2-2L2T
E3C246D4U2-2T
E3C242D4U2-2T

User Manual

English

Version 2.0
Published March 2023
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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following

measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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HIGH-DEFINITION MULTIMEDIA INTERFACE

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"

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Please refer to https://www.asrockrack.com/general/about.asp?cat=Responsibility for information disclosure based on regulation requirements ASRock Rack is complied with:

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Chapter 1 Introduction

Thank you for purchasing ASRock Rack ***E3C246D4U2-2L2T / E3C246D4U2-2T / E3C242D4U2-2T*** 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 software support.

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 E3C246D4U2-2L2T / E3C246D4U2-2T / E3C242D4U2-2T Motherboard (mATX Form Factor: 9.6-in x 9.6-in, 24.4 cm x24.4 cm)
- Quick Installation Guide
- 1 x SATA3 Cable (60cm)
- 1 x I/O Shield
- 1 x Screw for M.2 Socket

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

English

1.2 Specifications

E3C246D4U2-2L2T / E3C246D4U2-2T / E3C242D4U2-2T	
MB Physical Status	
Form Factor	mATX
Dimension	9.6" x 9.6" (24.4 cm x24.4 cm)
Processor System	
CPU	Supports Intel® Xeon® E-2100 Series Processors
Chipset	Intel® C246 / Intel® C242
System Memory	
Capacity	- 4 x 288-pin DDR4 DIMM slots - Support up to 128GB DDR4 ECC/non-ECC UDIMM **Future support for 32GB via a BIOS update in early 2019*
Type	- Dual Channel DDR4 memory technology - Supports DDR4 2666/2400 ECC/non-ECC U DIMM
DIMM Size Per DIMM	ECC and non-ECC UDIMM : 64GB, 32GB, 16GB, 8GB, 4GB
DIMM Frequency	- Non-ECC UDIMM: 2666/2400/2133 MHz - ECC UDIMM: 2666/2400/2133 MHz
Voltage	1.2V
Expansion Slot	
PCIe 3.0 x16	Slot 6: Gen3 x16 link, auto switch to x8 link if Slot 4 is occupied (Physical x16, EE x16/x8 (from CPU), shared with Slot 4)
PCIe 3.0 x8	Slot 4: Gen3 x8 link (Physical x8, EE x0/x8 (from CPU), shared with Slot 6)
PCIe 3.0 x4	Slot 5: Gen3 x4 link (Physical x4, EEx4 (from PCH))* **Only supported for E3C246D4U2-2L2T / E3C246D4U2-2T*
PCIe 3.0 x1	Slot 7: Gen3 x1 link (Physical x1, EEx1 (from PCH))
Storage	
SATA Controller	**E3C246D4U2-2L2T / E3C246D4U2-2T:** (1) 8 x SATA3 6Gb/s (SATA0-7, SATA_0 supports SATA DOM) (2) 7 x SATA3 6Gb/s (SATA1-7) and 1 x M.2 SSD SATA connected* **The M.2 slot (M2_1) is shared with the SATA_0 connector. When M2_1 is populated with a M.2 SATA3 module, the Pin 7 of SATA_0 is disabled.* **E3C242D4U2-2T:** (1) 6 x SATA3 6Gb/s (SATA0-5, SATA_0 supports SATA DOM) (2) 5 x SATA3 6Gb/s (SATA1-5) and 1 x M.2 SSD SATA connected* **The M.2 slot (M2_1) is shared with the SATA_0 connector. When M2_1 is populated with a M.2 SATA3 module, the Pin 7 of SATA_0 is disabled.*

Ethernet	
Interface	10000/1000 /100 Mbps
LAN	**E3C246D4U2-2L2T:** - 2 x RJ45 GLAN by Intel® i210 - 2 x RJ45 10G base-T by Intel® X550-AT2 **E3C242D4U2-2T / E3C246D4U2-2T:** - 2 x RJ45 10G base-T by Intel® X550-AT2 - 1 x RJ45 Dedicated IPMI LAN port by RTL8211E - Supports Wake-On-LAN - Supports Energy Efficient Ethernet 802.3az - Supports Dual LAN with Teaming function - Supports PXE - LAN1 supports NCSI
Management	
BMC Controller	ASPEED AST2500
IPMI Dedicated GLAN	1 x Realtek RTL8211E for dedicated management GLAN
Features	- Watch Dog - NMI
Graphics	
Controller	ASPEED AST2500
VRAM	DDR4 16MB
Rear Panel I/O	
VGA Port	1 x D-Sub
USB 3.1 Port	2 (Gen2), 2(Gen1)
HDMI Port	**E3C246D4U2-2L2T / E3C246D4U2-2T:** 1 **E3C242D4U2-2T:** N/A
LAN Port	**E3C246D4U2-2L2T:** - 4 +1 RJ45 Gigabit Ethernet LAN ports - LAN Ports with LED (ACT/LINK LED and SPEED LED) **E3C242D4U2-2T / E3C246D4U2-2T:** - 2 +1 RJ45 Gigabit Ethernet LAN ports - LAN Ports with LED (ACT/LINK LED and SPEED LED)
UID Button/ LED	1
Serial port	1
Internal Connector	
Auxiliary Panel Header	1 (includes chassis intrusion, location button & LED, and front LAN LED)
SATA DOM	1 (shared with M.2)
TPM Header	1
IPMB Header	1

Front Panel	1 (RST, PWRBTN, HDDLED, PWRLED)
Fan Header	6(1CPU/3Front/2Rear)
ATX Power	1x (24-pin) + 1x (8-pin)
TR1	1
Buzzer	1
USB 3.1 Gen1 Header	1 (supports 2 USB 3.1 Gen1 ports)
USB 2.0 Header	1 (supports 2 USB 2.0 ports)
M.2	(2230/2242/2260/2280, Supports PCIE3.0(X4)/SATA3)
ME/SPS Recovery	1
BMC_SMB1	1
PSU_SMB1	1
SGPIO	2
ClearCMOS	1 (header and short pin)
OH/FanFail LED	6 (Header)
System BIOS	
BIOS Type	256 Mb AMI UEFI Legal BIOS
BIOS Features	- Plug and Play (PnP) - ACPI 2.0 Compliance Wake Up Events - SMBIOS 2.8.0 Support - ASRock Rack Instant Flash
Hardware Monitor	
Temperature	- CPU/PCH/DDR/LAN/Storage Temperature Sensing - MB/Card side/TR1 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 2016 (64 bit) - Server 2019 (64 bit) Linux® - RedHat Enterprise Linux Server 6.9 (64 bit) / 7.4 (64 bit) - SUSE Enterprise Linux Server 12 SP1 (64 bit) / 12 SP3 (64 bit) - Ubuntu 15.10 (64 bit) / 16.04 (64 bit) Virtual - VMWare® ESXi 6.5 u1 - Win hyper-V Server 2016 ** HDMI port (E3C246D4U2-2L2T) OS installation on Linux is only supported for RedHat Enterprise Linux Server 6.9 (64 bit).* **Please refer to our website for the latest OS support list.*
Environment	
Temperature	Operation temperature: 10°C ~ 35°C / Non operation temperature: -40°C ~ 70°C

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.

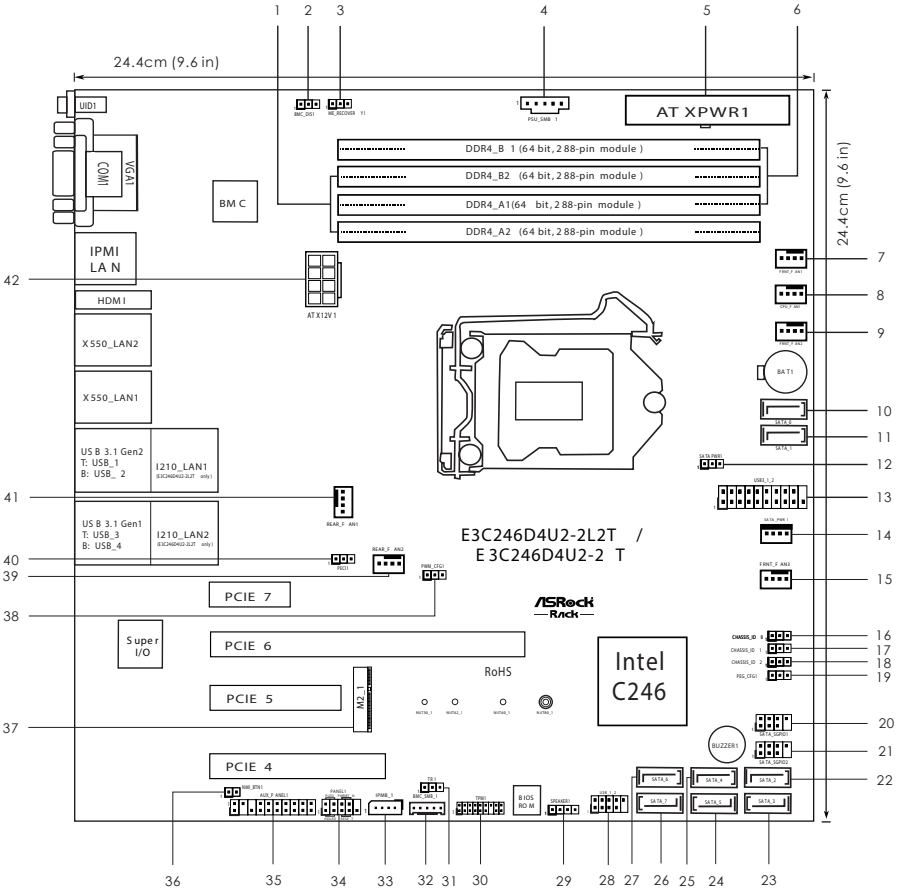
If you install Intel® LAN utility or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If you install the drivers only, it will pass the WHQL tests.

1.3 Unique Features

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

1.4 Motherboard Layout

E3C246D4U2-2L2T / E3C246D4U2-2T

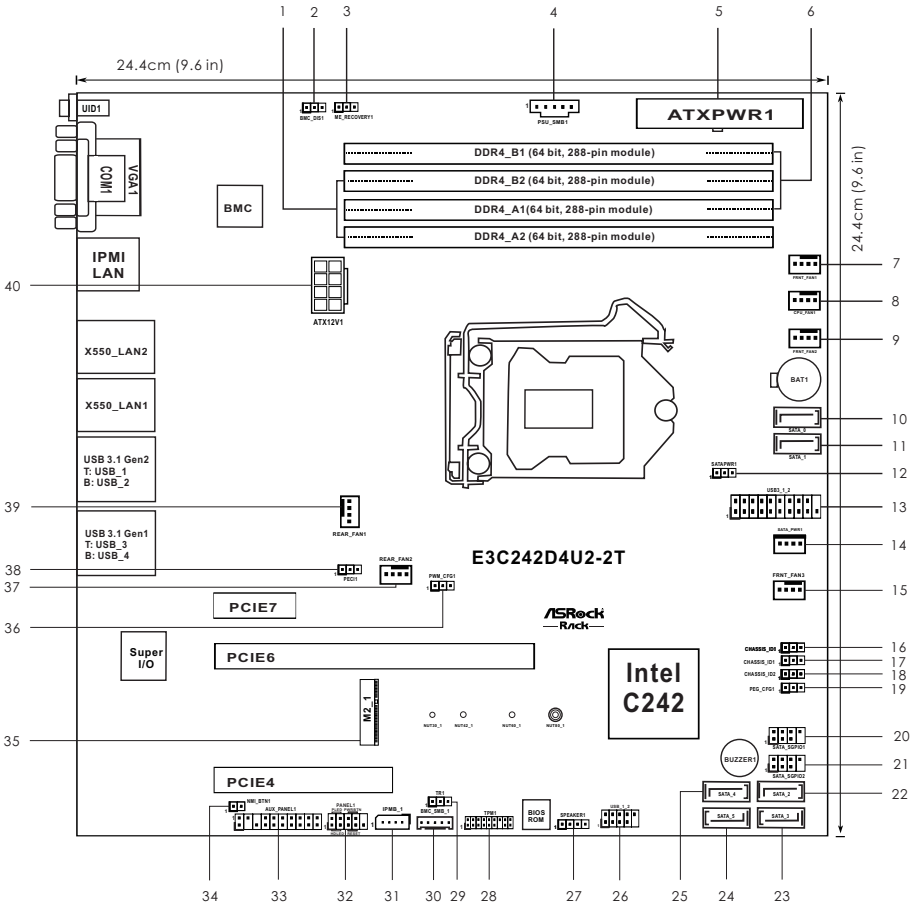


No.	Description
1	2 x 288-pin DDR4 DIMM Slots (DDR4_A2, DDR4_B2, White)
2	Enable/Disable BMC Jumper (BMC_DIS1)
3	ME Recovery Jumper (ME_RECOVERY1)
4	PSU SMBus (PSU_SMB1)
5	ATX Power Connector (ATXPWR1)
6	2 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_B1, Blue)
7	Front Fan Connector (FRNT_FAN1)
8	CPU Fan Connector (CPU_FAN1)
9	Front Fan Connector (FRNT_FAN2)
10	SATA3 DOM Connector (SATA_0), Red*
11	SATA3 Connector (SATA_1)
12	SATA DOM Power Jumper (SATAPWR1)
13	USB 3.0 Header (USB3_1_2)
14	SATA DOM Power Header (SATA_PWR1)
15	Front Fan Connector (FRNT_FAN3)
16	Chassis ID0 Jumper (CHASSIS_ID0)
17	Chassis ID1 Jumper (CHASSIS_ID1)
18	Chassis ID2 Jumper (CHASSIS_ID2)
19	PCI Express Graphics Configuration Jumper (PEG_CFG1)
20	SATA SGPIO Connector (SATA_SGPIO1)
21	SATA SGPIO Connector (SATA_SGPIO2)
22	SATA3 Connector (SATA_2)
23	SATA3 Connector (SATA_3)
24	SATA3 Connector (SATA_5)
25	SATA3 Connector (SATA_4)
26	SATA3 Connector (SATA_7)
27	SATA3 Connector (SATA_6)
28	USB 2.0 Header (USB_1_2)
29	Chassis Speaker Header (SPEAKER1)
30	TPM Header (TPM1)
31	Thermal Sensor Header (TR1)
32	BMC SMBus Header (BMC_SMB_1)
33	Intelligent Platform Management Bus Header (IPMB_1)

No.	Description
34	System Panel Header (PANEL1)
35	Auxiliary Panel Header (AUX_PANEL1)
36	Non Maskable Interrupt Button (NMI_BTN1)
37	M.2 Socket (M2_1) (Type 2230/2242/2260/2280)*
38	PWM Configuration Header (PWM_CFG1)
39	Rear Fan Connector (REAR_FAN2)
40	CPU PECI Mode Jumper (PECI1)
41	Rear Fan Connector (REAR_FAN1)
42	ATX 12V Power Connector (ATX12V1)

**The M.2 slot (M2_1) is shared with the SATA_0 connector. When M2_1 is populated with a M.2 SATA3 module, the Pin 7 of SATA_0 is disabled.*

E3C242D4U2-2T



No.	Description
1	2 x 288-pin DDR4 DIMM Slots (DDR4_A2, DDR4_B2, White)
2	Enable/Disable BMC Jumper (BMC_DIS1)
3	ME Recovery Jumper (ME_RECOVERY1)
4	PSU SMBus (PSU_SMB1)
5	ATX Power Connector (ATXPWR1)
6	2 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_B1, Blue)
7	Front Fan Connector (FRNT_FAN1)
8	CPU Fan Connector (CPU_FAN1)
9	Front Fan Connector (FRNT_FAN2)
10	SATA3 DOM Connector (SATA_0), Red*
11	SATA3 Connector (SATA_1)
12	SATA DOM Power Jumper (SATAPWR1)
13	USB 3.0 Header (USB3_1_2)
14	SATA DOM Power Header (SATA_PWR1)
15	Front Fan Connector (FRNT_FAN3)
16	Chassis ID0 Jumper (CHASSIS_ID0)
17	Chassis ID1 Jumper (CHASSIS_ID1)
18	Chassis ID2 Jumper (CHASSIS_ID2)
19	PCI Express Graphics Configuration Jumper (PEG_CFG1)
20	SATA SGPIO Connector (SATA_SGPIO1)
21	SATA SGPIO Connector (SATA_SGPIO2)
22	SATA3 Connector (SATA_2)
23	SATA3 Connector (SATA_3)
24	SATA3 Connector (SATA_5)
25	SATA3 Connector (SATA_4)
26	USB 2.0 Header (USB_1_2)
27	Chassis Speaker Header (SPEAKER1)
28	TPM Header (TPM1)
29	Thermal Sensor Header (TR1)
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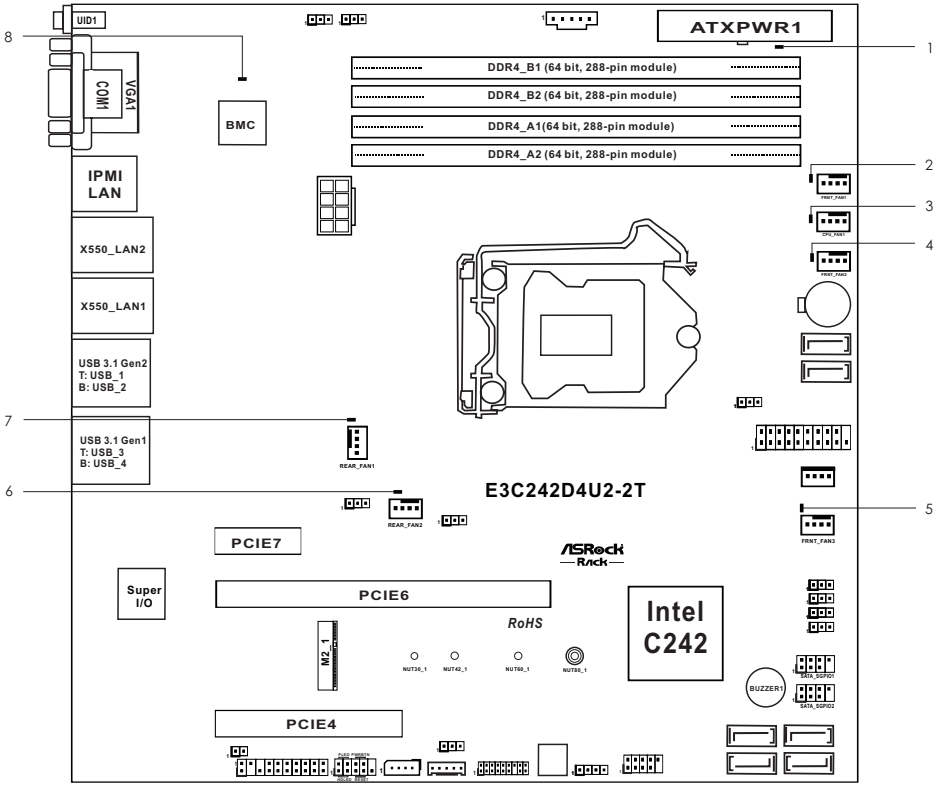
39	Rear Fan Connector (REAR_FAN1)
40	ATX 12V Power Connector (ATX12V1)

**The M.2 slot (M2_1) is shared with the SATA_0 connector. When M2_1 is populated with a M.2 SATA3 module, the Pin 7 of SATA_0 is disabled.*

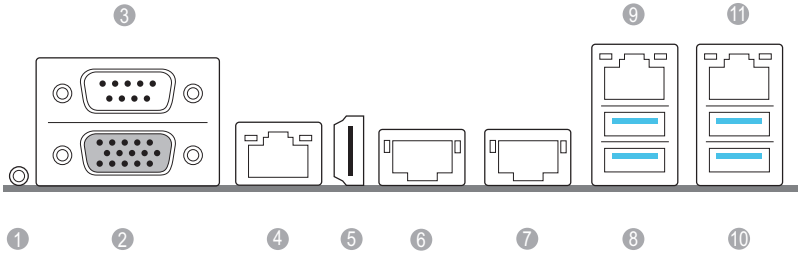
1.5 Onboard LED Indicators



No.	Item	Status	Description
1	SB_PWR1	Green	STB PWR ready
2	FRNT_FAN1_LED1	Amber	FRNT_FAN1 failed
3	CPU_FAN1_LED1	Amber	CPU_FAN1 failed
4	FRNT_FAN2_LED2	Amber	FRNT_FAN2 failed
5	FRNT_FAN3_LED3	Amber	FRNT_FAN3 failed
6	REAR_FAN2_LED2	Amber	REAR_FAN2 failed
7	REAR_FAN1_LED1	Amber	REAR_FAN1 failed
8	BMC_LED1	Green	BMC heartbeat LED

1.6 I/O Panel

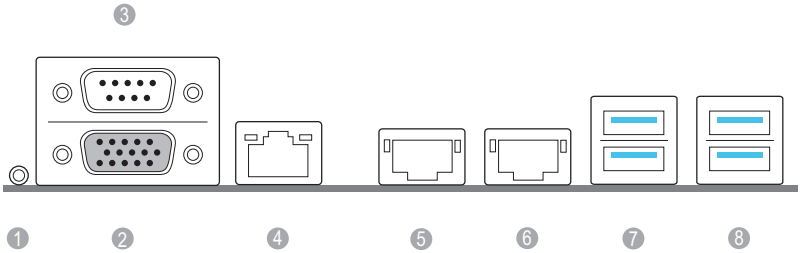
E3C246D4U2-2L2T / E3C246D4U2-2T



No.	Description	No.	Description
1	UID Switch (UID1)	7	10G LAN RJ-45 Port (X550_LAN1)**
2	VGA Port (VGA1)	8	USB 3.1 Gen2 Ports (USB31_1_2)
3	Serial Port (COM1)	9	1G LAN RJ-45 Port (I210_LAN1)*** *(E3C246D4U2-2L2T only)*
4	LAN RJ-45 Port (IPMI_LAN)*	10	USB 3.1 Gen1 Ports (USB31_3_4)
5	HDMI Port (HDMI)	11	1G LAN RJ-45 Port (I210_LAN2)*** *(E3C246D4U2-2L2T only)*
6	10G LAN RJ-45 Port (X550_LAN2)**		

Note: X550_LAN1 / I210_LAN1 supports NCSI.

E3C242D4U2-2T

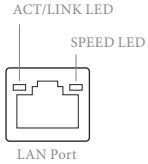


No.	Description	No.	Description
1	UID Switch (UID1)	5	10G LAN RJ-45 Port (X550_LAN2)**
2	VGA Port (VGA1)	6	10G LAN RJ-45 Port (X550_LAN1)**
3	Serial Port (COM1)	7	USB 3.1 Gen2 Ports (USB31_1_2)
4	LAN RJ-45 Port (IPMI_LAN)*	8	USB 3.1 Gen1 Ports (USB31_3_4)

Note: X550_LAN1 supports NCSI.

LAN Port LED Indications

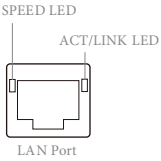
*There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.



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	1Gbps connection

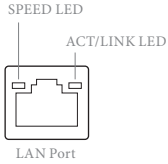
**There are two LEDs on each LAN port. Please refer to the table below for the LAN port LED indications.



10G LAN Port LED Indications

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

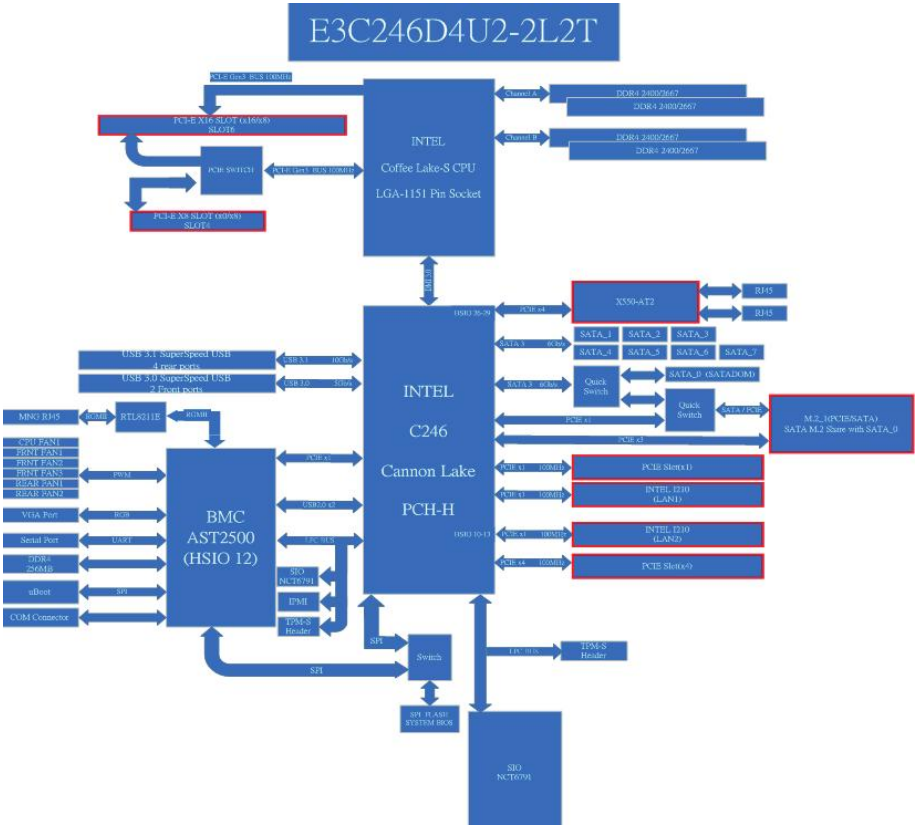
***There are two LEDs on each LAN port. Please refer to the table below for the LAN port LED indications.

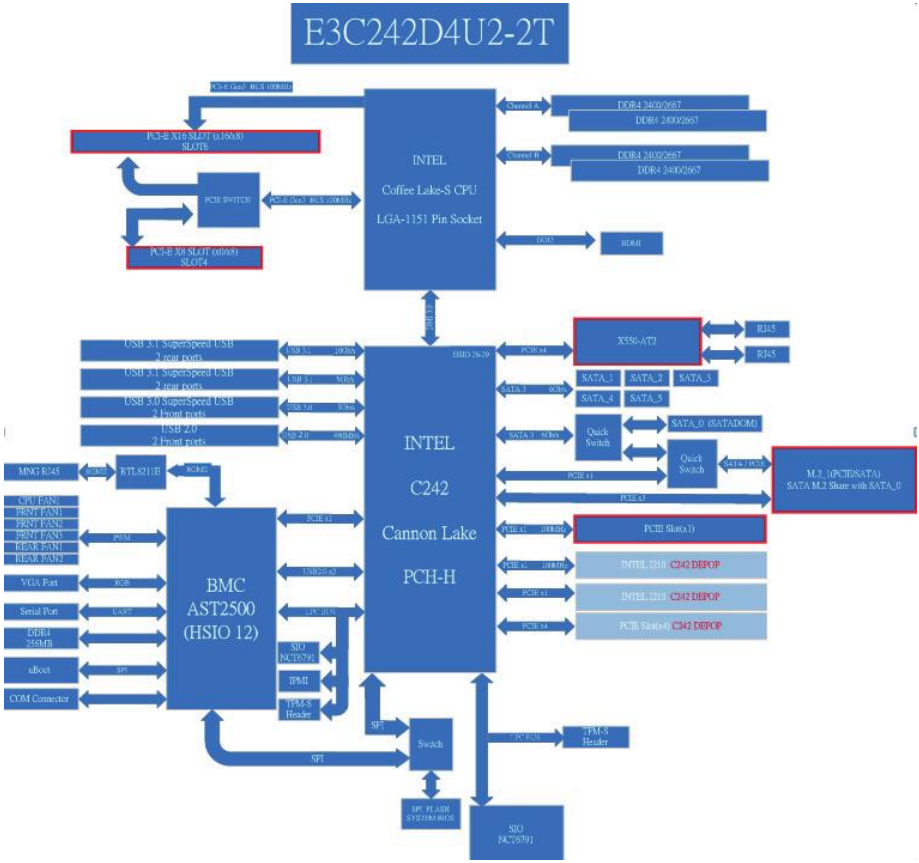


1G LAN Port LED Indications

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

1.7 Block Diagram




E3C242D4U2-2T
INTEL
Coffee Lake-S CPU
LGA-1151 Pin Socket
DDR4 2400/2667
DDR4 2400/2667
DDR4 2400/2667
DDR4 2400/2667
PCIE SWITCH
PCI-E X16 SLOT (x16/x8) SLOT6
PCI-E X8 SLOT (x8/x8) SLOT4
DMI3
INTEL
C242
Cannon Lake
PCH-H
X550-AT2
RJ45
RJ45
SATA_1
SATA_2
SATA_3
SATA_4
SATA_5
Quick Switch
SATA_0 (SATADOM)
Quick Switch
M.2_1(PCIE&SATA) SATA M.2 Share with SATA_0
PCIE Slot(x1)
INTEL I210 C242 DEPOP
INTEL I210 C242 DEPOP
PCIE Slot(x4) C242 DEPOP
USB 3.1 SuperSpeed USB 2 rear ports
USB 3.1 SuperSpeed USB 2 rear ports
USB 3.0 SuperSpeed USB 2 Front ports
USB 2.0 2 Front ports
MNG RJ45
RTL8211E
BMC
AST2500
(HSIO 12)
CPU FAN1
FRNT FAN1
FRNT FAN2
FRNT FAN3
REAR FAN1
REAR FAN2
VGA Port
Serial Port
DDR4 256Mb
uBoot
COM Connector
SIO NCT6791
IPMI
TPM-S Header
Switch
TPM-S Header
SPI FLASH SYSTEM BIOS
SIO NCT5791

Chapter 2 Installation

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

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

2.1 Screw Holes

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

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

2.2 Pre-installation Precautions

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

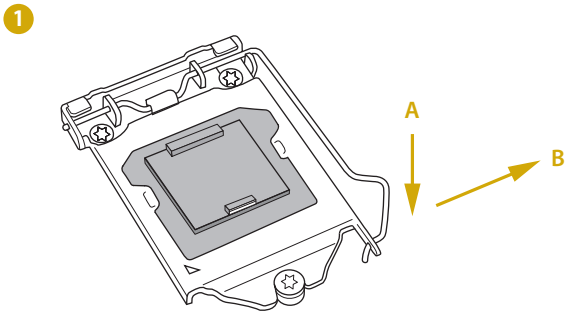
1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before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

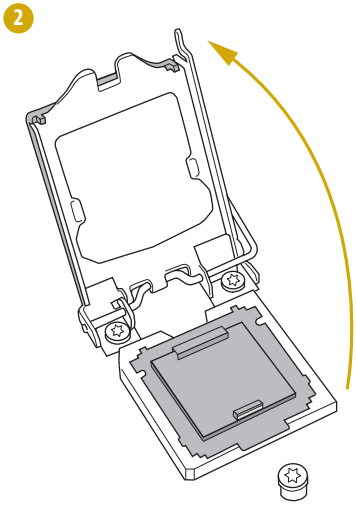
Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

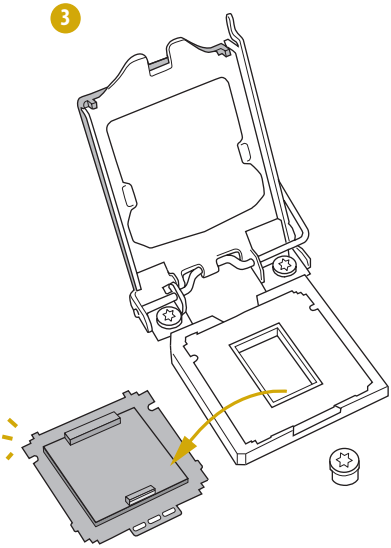
2.3 Installing the CPU

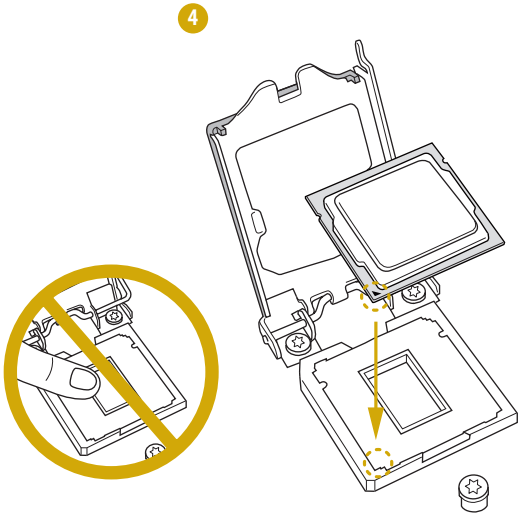
1. *Before you insert the 1151-Pin CPU into the socket, please check if the PnP cap is on the socket, if the CPU surface is unclean, or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.*
2. *Unplug all power cables before installing the CPU.*

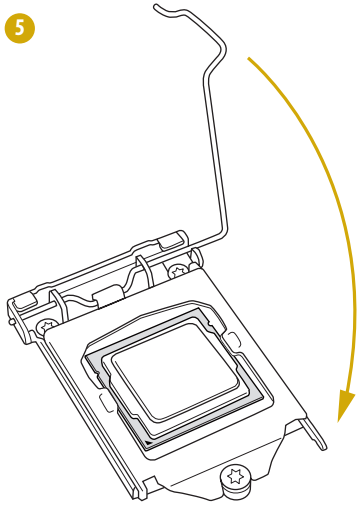
Illustrations in this User Manual are provided for reference only and may slightly differ from actual product appearances.

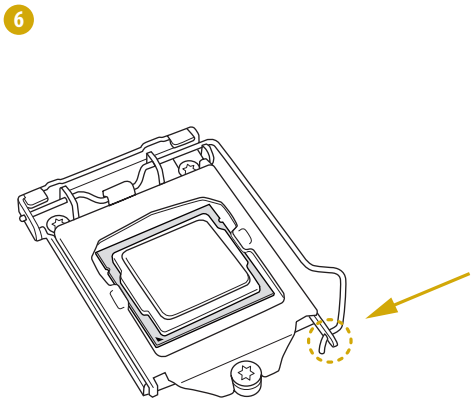






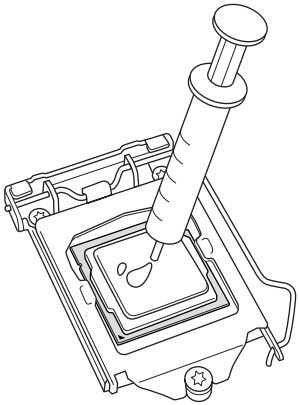


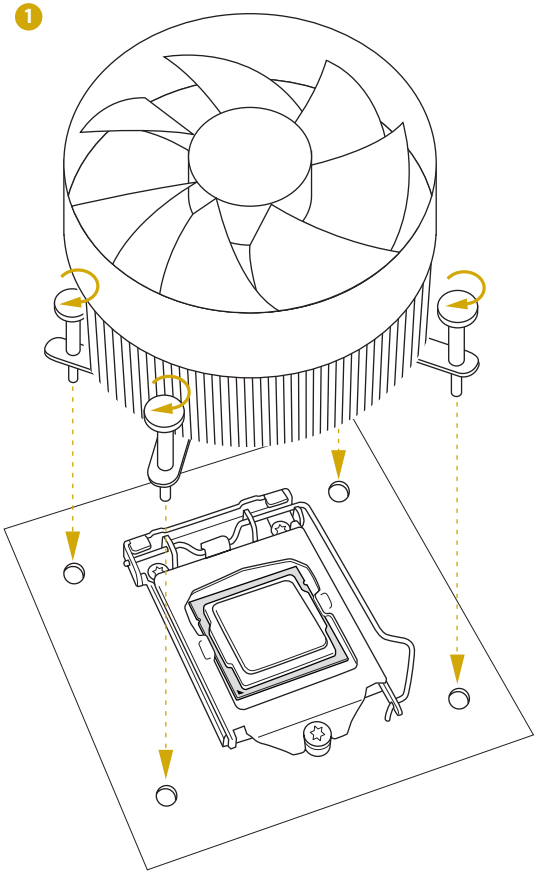


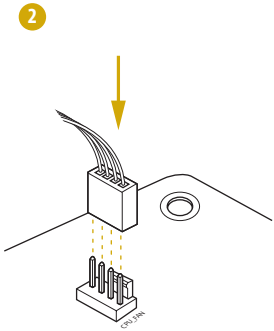


Please save and replace the cover if the processor is removed. The cover must be placed if you wish to return the motherboard for after service.

2.4 Installing the CPU Fan and Heatsink







2.5 Installation of Memory Modules (DIMM)

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

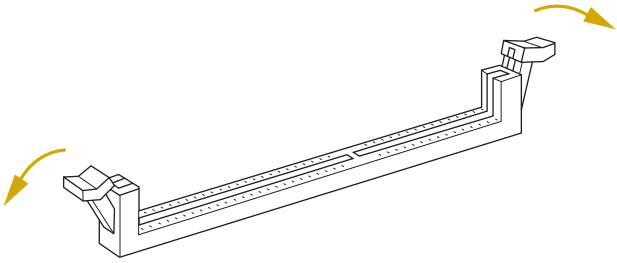
1. *For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR4 DIMM pairs.*
2. *It is unable to activate Dual Channel Memory Technology with only one or three memory module installed.*
3. *It is not allowed to install a DDR, DDR2 or DDR3 memory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

Dual Channel Memory Configuration

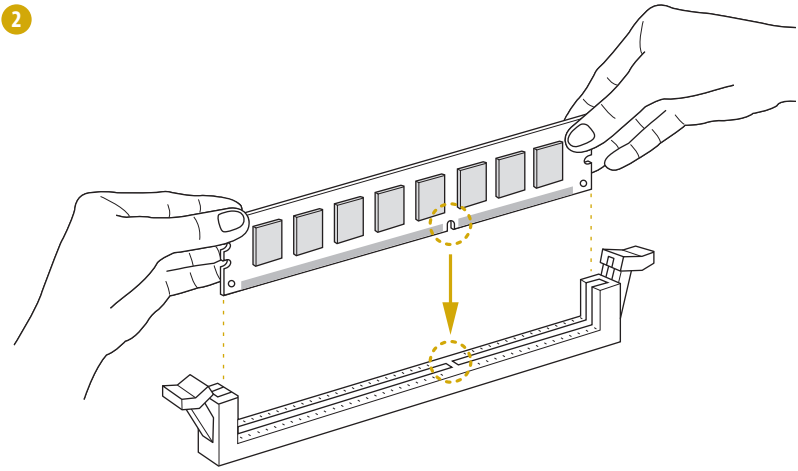
Priority	DDR4_A1	DDR4_A2	DDR4_B1	DDR4_B2
1		Populated		Populated
2	Populated		Populated	
3	Populated	Populated	Populated	Populated

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.

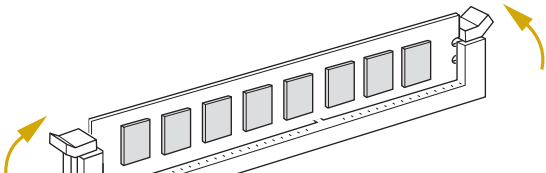
1



2



3



The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

2.6 Expansion Slots (PCI Express Slots)

There are 4 (E3C246D4U2-2L2T) / 3 (E3C242D4U2-2T) PCI Express slots on this motherboard.

PCIE slot:

PCIE4 (PCIe 3.0 x8 slot) is used for PCI Express x8 lane width cards.
PCIE5 (PCIe 3.0 x4 slot) is used for PCI Express x4 lane width cards. *(E3C246D4U2-2L2T only)*
PCIE6 (PCIe 3.0 x16 slot) is used for PCI Express x16 lane width cards.
PCIE7 (PCIe 3.0 x1 slot) is used for PCI Express x1 lane width cards.

Slot	Generation	Mechanical	Electrical	Source
PCIE 7	3.0	x1	x1	PCH
PCIE 6	3.0	x16	x16	CPU
PCIE 5*	3.0	x4	x4	PCH
PCIE 4	3.0	x8	x8	CPU

**Supports E3C246D4U2-2L2T only.*

PCI Express Slot Configuration

	PCIE 4	PCIE6
Single PCIE Card	x0	x16
Two PCIE 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.

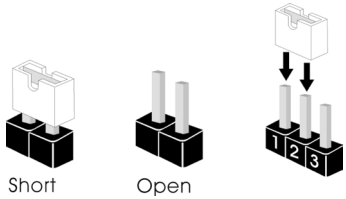
Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.

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

Step 6. Replace the system cover.

2.7 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.



ME Recovery Jumper (3-pin ME_RECOVERY1)	1_2 Normal Mode (Default)	2_3 ME force update
CPU PECI Mode Jumper (3-pin PECI1)	1_2 CPU PECI connected to PCH	2_3 CPU PECI connected to BMC (Default)
PCI Express Graphics Configuration Jumper (3-pin PEG_CFG1)	1_2 Normal Mode (Default)	2_3 PCIE6 force @ x8 x8 (CPU Lanes x8 x8)

English

Chassis ID0 Jumper (3-pin CHASSIS_ID0) Chassis ID1 Jumper (3-pin CHASSIS_ID1) Chassis ID2 Jumper (3-pin CHASSIS_ID2)	 Board Level SKU (Default)	 Reserved for system level use
Chassis ID0 Jumper (3-pin CHASSIS_ID0) Chassis ID1 Jumper (3-pin CHASSIS_ID1) Chassis ID2 Jumper (3-pin CHASSIS_ID2)	 Reserved for system level use	 Reserved for system level use
Chassis ID0 Jumper (3-pin CHASSIS_ID0) Chassis ID1 Jumper (3-pin CHASSIS_ID1) Chassis ID2 Jumper (3-pin CHASSIS_ID2)	 Reserved for system level use	 Reserved for system level use
Enable/Disable BMC Jumper (3-pin BMC_DIS1)	 Normal Mode (Default) BMC Enabled	 BMC Disabled

SATA DOM Power Jumper (3-pin SATAPWR1)	1_2 SATA DOM (SATA_0) requires 5V power supply	2_3 SATA DOM (SATA_0) does NOT require 5V power supply (Default)

Consult the documentation that comes with your SATA DOM and check whether or not Pin 7 requires 5V power supply.

If the connected SATA DOM requires 5V power supply, move the jumper caps placed on the SATA DOM Power Jumper (SATAPWR_SEL) from pins 2-3 (default) to pins 1-2.

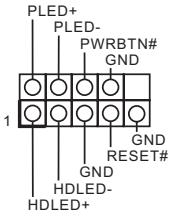
If the connected SATA DOM does NOT require 5V power supply, connect the SATA DOM power cable to the SATA DOM power header (SATA_PWR1) and there is no need to change the default jumper setting of the SATA DOM Power Jumper (pins 2-3).

Warning! Incorrect setting of the SATA DOM Power Jumper (SATAPWR1) may cause damage to the motherboard or your SATA DOM.

2.8 Onboard Headers and Connectors

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

System Panel Header
(9-pin PANEL1)



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

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

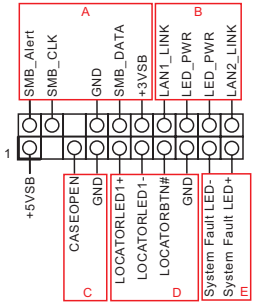
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

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

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

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

Auxiliary Panel Header
(18-pin AUX PANEL_1)



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.

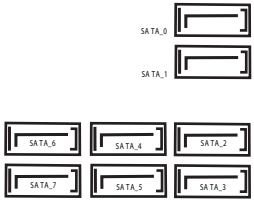
B. Internet status indicator (2-pin LAN1_LED, LAN2_LED)
These two 2-pin headers allow you to use the Gigabit internet indicator cable to connect to the LAN status indicator. When this indicator flickers, it means that the internet is properly connected.

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

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

Serial ATA3 Connectors
(SATA_0)
(SATA_1)
(SATA_2)
(SATA_3)
(SATA_4)
(SATA_5)



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

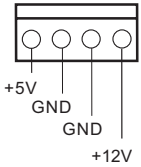
**The M.2 slot (M2_1) is shared with the SATA_0 connector. When M2_1 is populated with a M.2 SATA3 module, the Pin 7 of SATA_0 is disabled.*

E3C246D4U2-2L2T only:
(SATA_6)
(SATA_7)

Serial ATA3 DOM Connector
(SATA_0)

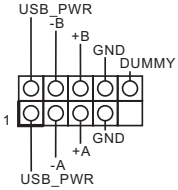
The SATA3 DOM connector supports both a SATA DOM (Disk-On-Module) and a SATA data cable for internal storage device.

SATA DOM Power Connector
(4-pin SATA_PWR1)



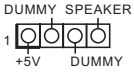
Please connect a SATA power cable to the SATA power connector.

USB 2.0 Header
(9-pin USB_1_2)



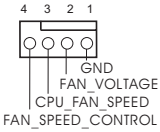
There is one USB 2.0 header on this motherboard. Each USB 2.0 header can support two ports.

Chassis Speaker Header
(4-pin SPEAKER1)



Please connect the chassis speaker to this header.

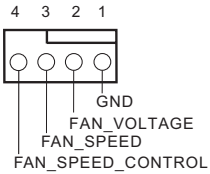
CPU Fan Connector
(4-pin CPU_FAN1)

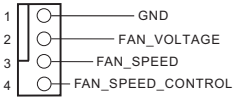


This motherboard provides one 4-Pin CPU fan (Quiet Fan) connectors. If you plan to connect a 3-Pin CPU fan, please connect it to Pin 1-3.

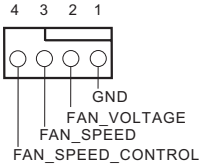
**For more details, please refer to the Cooler QVL list on the ASRock Rack website.*

Front and Rear Fan Connectors
(4-pin FRNT_FAN1
(4-pin FRNT_FAN2)
(4-pin FRNT_FAN3)
(4-pin REAR_FAN1)



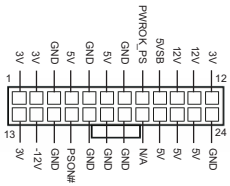


(4-pin REAR_FAN2)



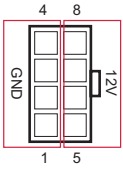
Please connect fan cables to the fan connectors and match the black wire to the ground pin. All fans support Fan Control.

ATX Power Connector
(24-pin ATXPWR1)



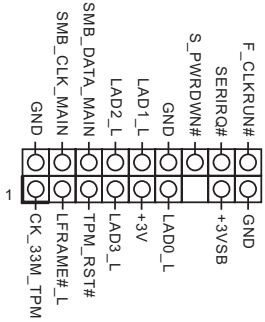
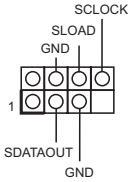
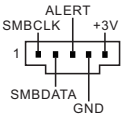
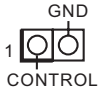
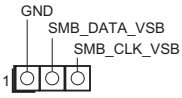
This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.

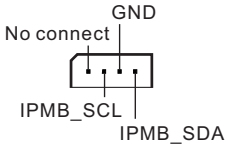
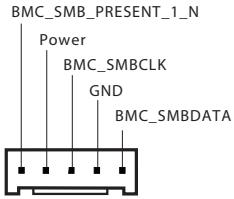
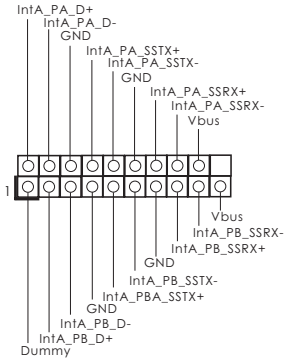
ATX 12V Power Connector
(8-pin ATX12V1)



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

English

TPM Header (17-pin TPM1)		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) (7-pin SATA_SGPIO2)		The headers support Serial Link interface for onboard SATA connections.
PSU SMBus (PSU_SMB1)		PSU SMBus monitors the status of the power supply, fan and system temperature.
Non Maskable Interrupt Button Header (NMI_BTN1)		Please connect a NMI device to this header.
PWM Configuration Header (3-pin PWM_CFG1)		This header is used for PWM configurations.

Intelligent Platform Management Bus Header (4-pin IPMB_1)		This 4-pin connector is used to provide a cabled base-board or front panel connection for value added features and 3rd-party add-in cards, such as Emergency Management cards, that provide management features using the IPMB.
Baseboard Management Controller SMBus Header (5-pin BMC_SMB_1)		The header is used for the SM BUS devices.
Thermal Sensor Header (3-pin TR1)		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.
USB 3.1 Gen1 Header (19-pin USB3_1_2)		Besides four default USB 3.1 ports on the I/O panel, there is one USB 3.1 header on this motherboard. This USB 3.1 header can support two USB 3.1 ports.

2.9 Unit Identification purpose LED/Switch

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

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

2.10 Dua LAN and Teaming Operation Guide

Dual LAN with Teaming enabled on this motherboard allows two single connections to act as one single connection(s) for twice the transmission bandwidth, making data transmission more effective and improving the quality of transmission of distant images. Fault tolerance on the dual LAN network prevents network downtime by transferring the workload from a failed port to a working port.

The speed of transmission is subject to the actual network environment or status even with Teaming enabled.

Before setting up Teaming, please make sure whether your Switch (or Router) supports Teaming (IEEE 802.3ad Link Aggregation). You can specify a preferred adapter in Intel PROSet. Under normal conditions, the Primary adapter handles all non-TCP/IP traffic. The Secondary adapter will receive fallback traffic if the primary fails. If the Preferred Primary adapter fails, but is later restored to an active status, control is automatically switched back to the Preferred Primary adapter.

Step 1

From **Device Manager**, open the properties of a team.

Step 2

Click the **Settings** tab.

Step 3

Click the **Modify Team** button.

Step 4

Select the adapter you want to be the primary adapter and click the **Set Primary** button.

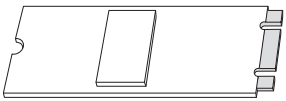
If you do not specify a preferred primary adapter, the software will choose an adapter of the highest capability (model and speed) to act as the default primary. If a failover occurs, another adapter becomes the primary. The adapter will, however, rejoin the team as a non-primary.

2.11 M.2_SSD Module Installation Guide

The M.2 Socket supports either a M.2 SATA3.6.0 Gb/s module or a M.2 PCI Express moduel up to Gen 3x4 (8Gb x4).

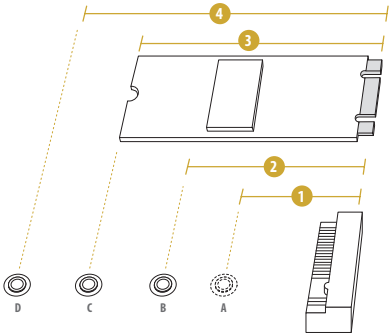
**The M.2 slot (M2_1) is shared with the SATA_0 connector. When M2_1 is populated with a M.2 SATA3 module, the Pin 7 of SATA_0 is disabled.*

Installingg the M.2_SSD Module



Step 1

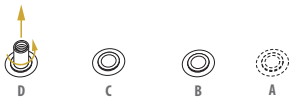
Prepare a M.2_SSD module and the screw.

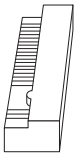


Step 2

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

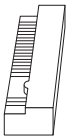
No.	1	2	3	4
Nut Location	A	B	C	D
PCB Length	3cm	4.2cm	6cm	8cm
Module Type	Type2230	Type 2242	Type2260	Type 2280





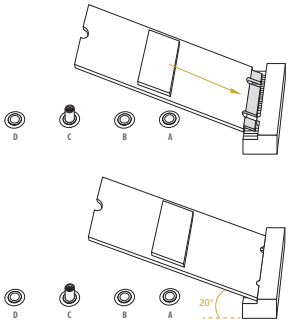
Step 3

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



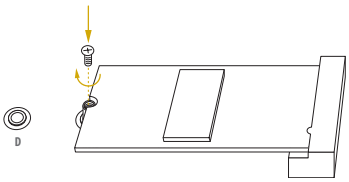
Step 4

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



Step 5

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



Step 6

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

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

Chapter 3 UEFI Setup Utility

3.1 Introduction

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

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

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

3.1.1 UEFI Menu Bar

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

Item	Description
Main	To set up the system time/date information
Advanced	To set up the advanced UEFI features
Server Mgmt	To manage the server
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
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

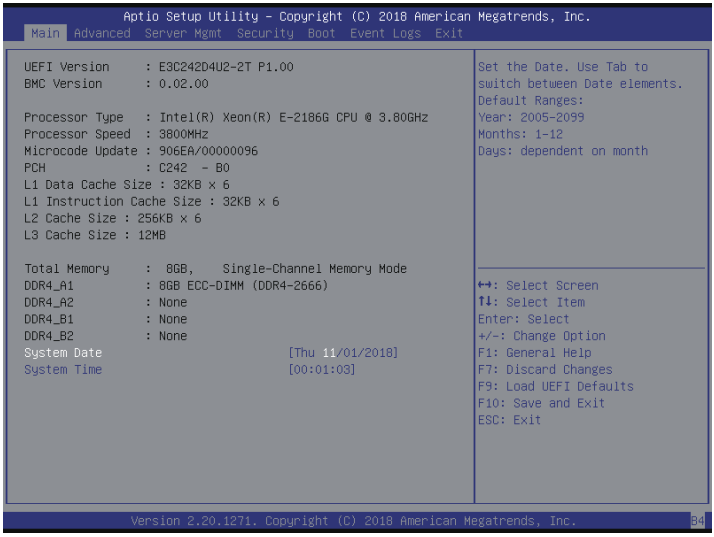
3.1.2 Navigation Keys

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

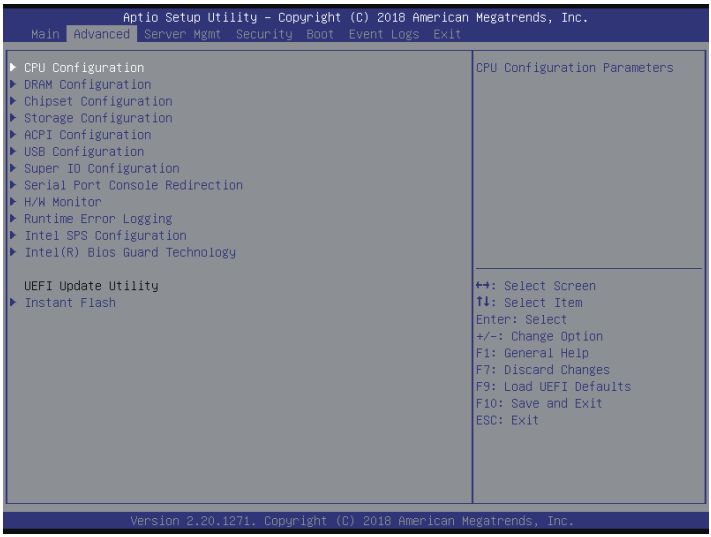
Once you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview. The Main screen provides system overview information and allows you to set the system time and date.



Note: The screenshots in this user manual are examples and for references only. The actual images may slightly vary depending on the model and the version you use.

3.3 Advanced Screen

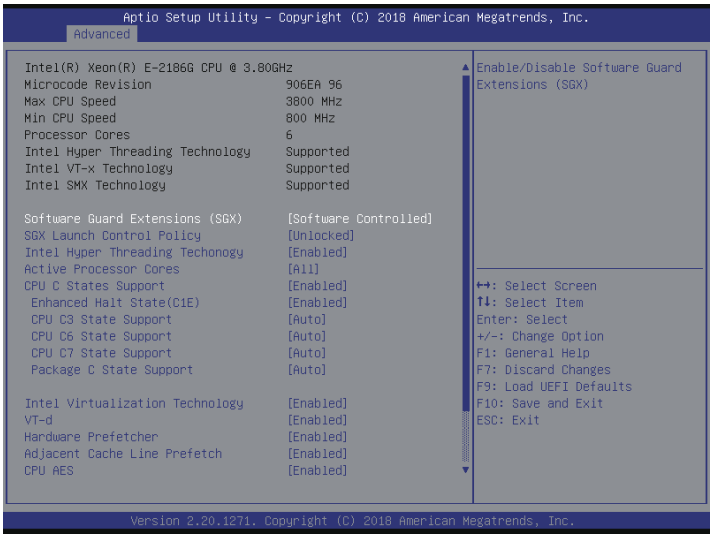
In this section, you may set the configurations for the following items: CPU Configuration, DRAM Configuration, Chipset Configuration, Storage Configuration, ACPI Configuration, USB Configuration, Super IO Configuration, Serial Port Console Redirection, H/W Monitor, Runtime Errpr Logging, Intel SPS Configuration, Intel(R) Bios Guard Technology and Instant Flash.



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

English

3.3.1 CPU Configuration



Software Guard Extensions (SGX)

Use this item to enable or disable Software Controlled Software Guard Extensions (SGX).

SGX Launch Control Policy

Software Guard Extensions (SGX) Launch Control Policy. Options are:
Intel Locked - Select Intel's Launch Enclave.
Unlocked - Enable OS/VMM configuration of Launch Enclave.
Locked - Allow owner to configure Launch Enclave.

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 Cores

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

CPU C States Support

Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

Enhanced Halt State (C1E)

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

CPU C3 State Support

Enable C3 deep sleep state for lower power consumption.

CPU C6 State Support

Enable C6 deep sleep state for lower power consumption.

CPU C7 State Support

Enable C7 deep sleep state for lower power consumption.

Package C State Support

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

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.

VT-d

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

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.

CPU AES

Use this to enable or disable CPU Advanced Encryption Standard instructions.

Intel SpeedStep Technology

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.

Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

Intel Turbo Boost Technology

Use this item to enable or disable Intel Turbo Boost Mode Technology. Turbo Boost Mode allows processor cores to run faster than marked frequency in specific conditions. The default value is [Enabled].

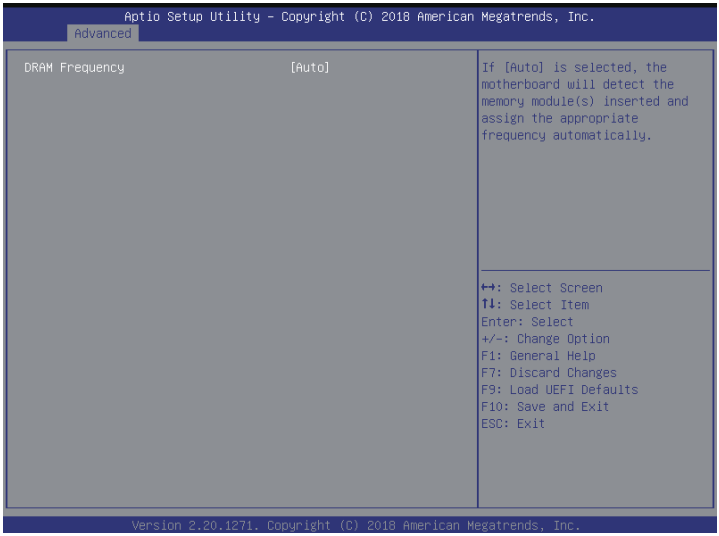
Enable Intel TXT Support

Enables Intel Trusted Execution Technology Configuration.

CPU Thermal Throttling

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

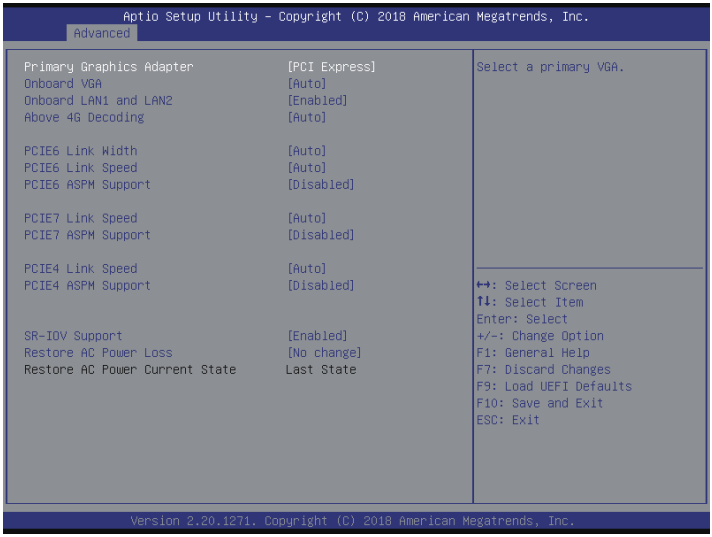
3.3.2 DRAM Configuration



DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically.

3.3.3 Chipset Configuration



Primary Graphics Adapter

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

Onboard VGA

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

Onboard LAN1 and LAN2

This allows you to enable or disable the Onboard LAN 1 and LAN2 feature.

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).

PCIE6 Link Width

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

PCIE6 Link Speed

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

PCIE6 ASPM Support

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

PCIE7 Link Speed

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

PCIE7 ASPM Support

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

PCIE4 Link Width

This allows you to select PCIE4 Link Width. The default value is [Auto].

PCIE4 Link Speed

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

PCIE4 ASPM Support

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

SR-IOV Support

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

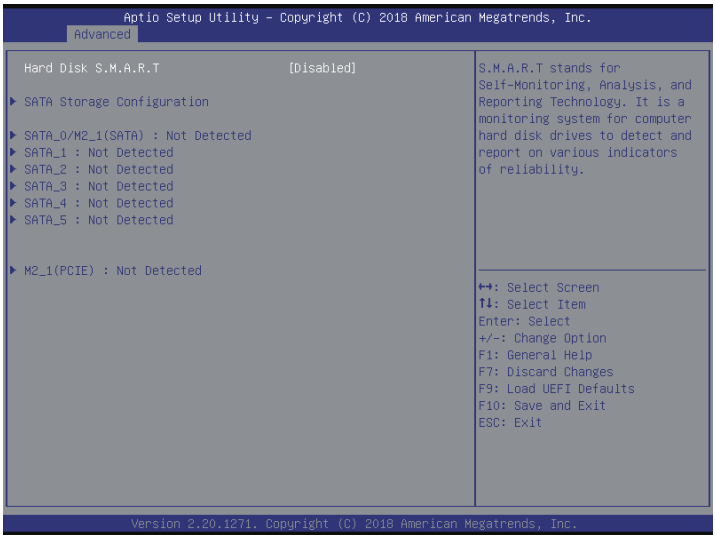
Restore AC Power Loss

This allows you to set the power state after an unexpected AC/power loss. If [Power Off] is selected, the AC/power remains off when the power recovers. If [Power On] is selected, the AC/power resumes and the system starts to boot up when the power recovers. If [Last State] is selected, it will recover to the state before AC/power loss.

Restore AC Power Current State

This allows you to restore AC Power Current State.

3.3.4 Storage Configuration



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

S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

SATA Storage Configuration

Use this item to enable or disable SATA Controllers.

SATA_0/M2_1(SATA)

Identify the SATA_0/M2_1(SATA) port is connected to Solid State Drive or Hard Disk Drive. Press <Ctrl+I> to enter RAID ROM during UEFI POST process.

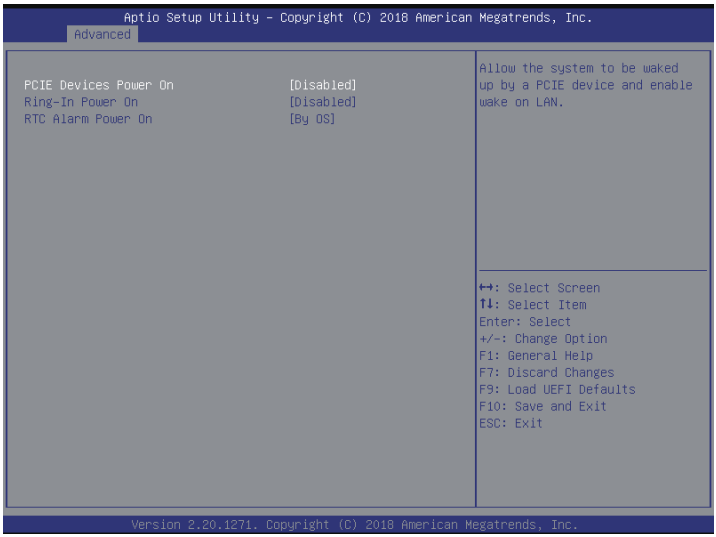
SATA_1 / SATA_2 / SATA_3 / SATA_4 / SATA_5

Identify the SATA_1 port is connected to Solid State Drive or Hard Disk Drive. Press <Ctrl+I> to enter RAID ROM during UEFI POST process.

M2_1(PCIE)

Identify the M2_1(PCIE) port is connected to Solid State Drive or Hard Disk Drive. Press <Ctrl+I> to enter RAID ROM during UEFI POST process.

3.3.5 ACPI Configuration



PCIE Devices Power On

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

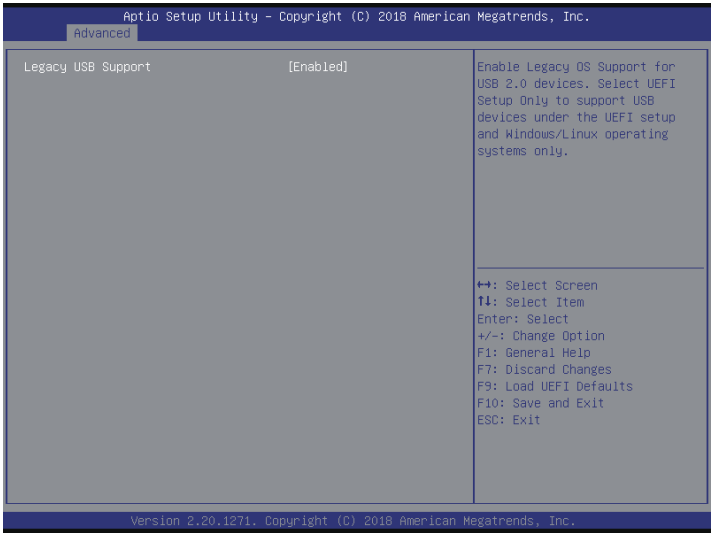
Ring-In Power On

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

RTC Alarm Power On

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

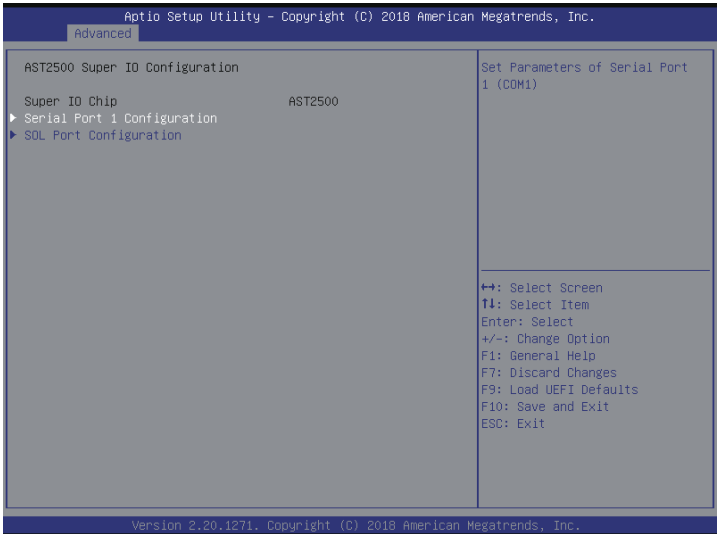
3.3.6 USB Configuration



Legacy USB Support

Enable or disable Legacy OS Support for USB 2.0 devices. If you encounter USB compatibility issues it is recommended to disable legacy USB support.
Select UEFI Setup Only to support USB devices under the UEFI setup and Windows/Linux operating systems only.

3.3.7 Super IO Configuration



Serial Port 1 Configuration

Use this item to set parameters of COM1.

Serial Port

Use this item to enable or disable the serial port (COM).

Change Settings

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

SOL Port Configuration

Use this item to set parameters of SOL.

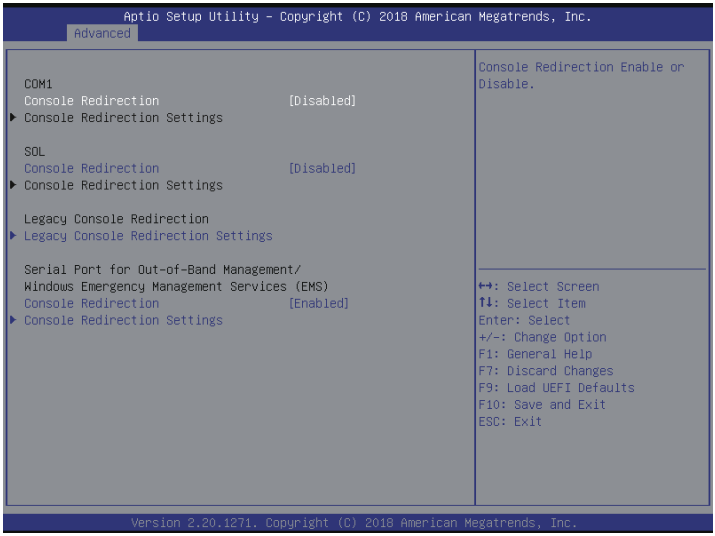
SOL Port Configuration

Use this item to enable or disable the SOL port.

SOL Port Address

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

3.3.8 Serial Port Console Redirection



COM1

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.

Terminal Type

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

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

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

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

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

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

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

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

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

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

Legacy OS Redirection Resolution
Use this item to select the number of rows and columns used in legacy OS redirection.

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

Legacy Console Redirection

Legacy Console Redirection Settings

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

Redirection COM Port
Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

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

Redirection After BIOS POST

If the [LoadBooster] is selected, legacy console redirection is disabled before booting to legacy OS. If [Always Enabled] is selected, legacy console redirection is enabled for legacy OS. The default value is [Always Enabled].

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
Microsoft 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].

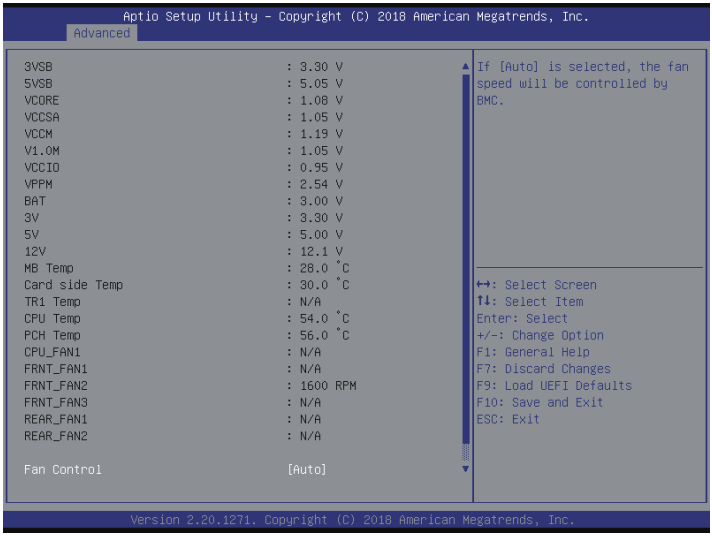
Data Bits

Parity

Stop Bits

3.3.9 H/W Monitor

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



Fan Control

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

CPU_FAN1

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

REAR_FAN 1

This allows you to set the rear fan 1's speed. The default value is [Smart Fan].

REAR_FAN 2

This allows you to set the rear fan 2's speed. The default value is [Smart Fan].

FRNT_FAN 1

This allows you to set the front fan 1's speed. The default value is [Smart Fan].

FRNT_FAN 2

This allows you to set the front fan 2's speed. The default value is [Smart Fan].

FRNT_FAN 3

This allows you to set the front fan 3'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

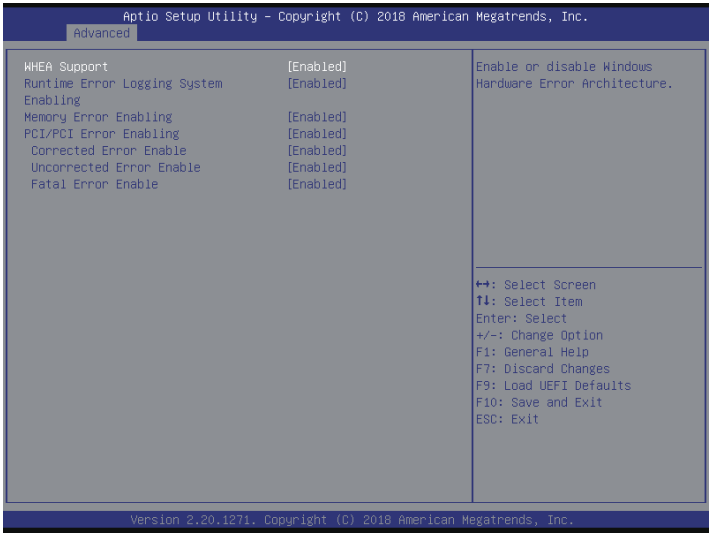
Smart Fan Temp x (x means 1 to 11 stage)

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].

3.3.10 Runtime Error Logging



WHEA Support

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

Runtime Error Logging System Enabling

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.

Memory Error Enabling

Memory enabling and logging setup option.

PCI/PCI Error Enabling

Use this item to enable or disable PCIe Correctable errors.

Corrected Error Enable

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

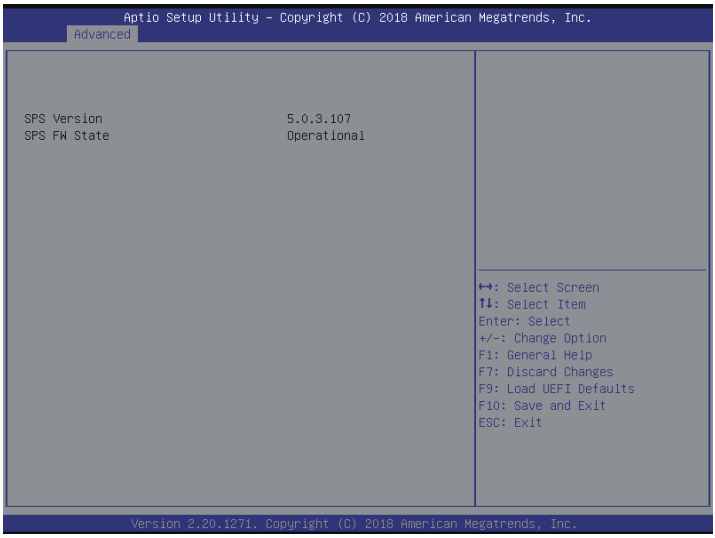
Uncorrected Error Enable

Use this item to enable or disable Uncorrectable errors.

Fatal Error Enable

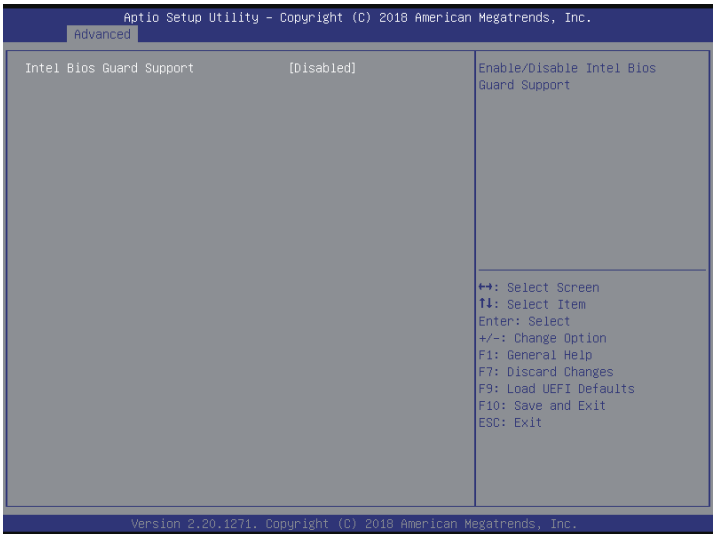
Use this item to enable or disable Fatal errors.

3.3.11 Intel SPS Configuration



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

3.3.12 Intel(R) Bios Guard Technology



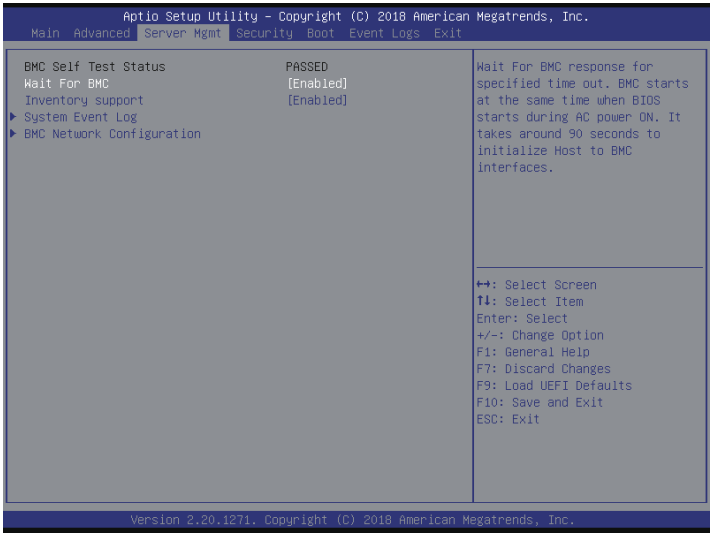
Intel Bios Guard Support

Use this item to enable or disable Intel Bios Guard Support.

3.3.13 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.

3.4 Server Mgmt



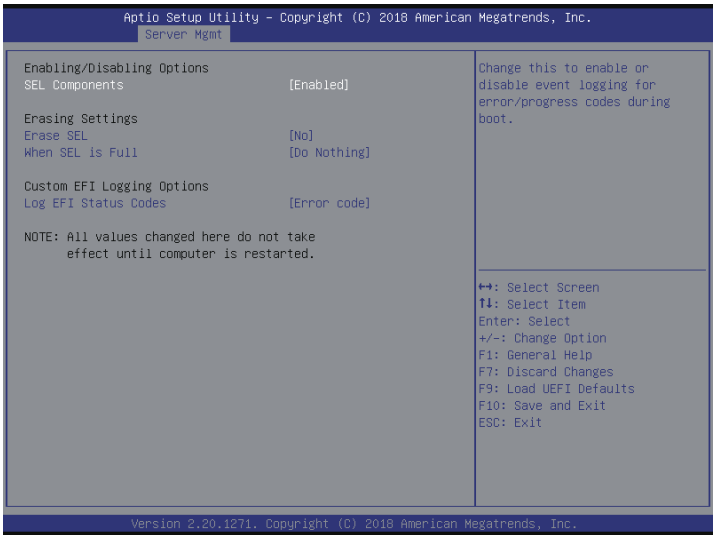
Wait For BMC

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

Use this item to execute inventory function for system. It will take more time at system boot when it is enabled.

3.4.1 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.

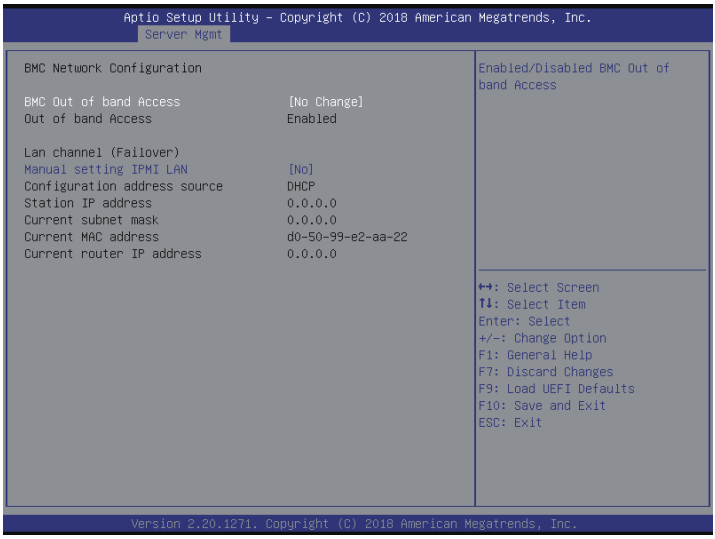
When SEL is Full

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.

3.4.2 BMC Network Configuration



BMC Out of Band Access

Use this item to enable or disable 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.

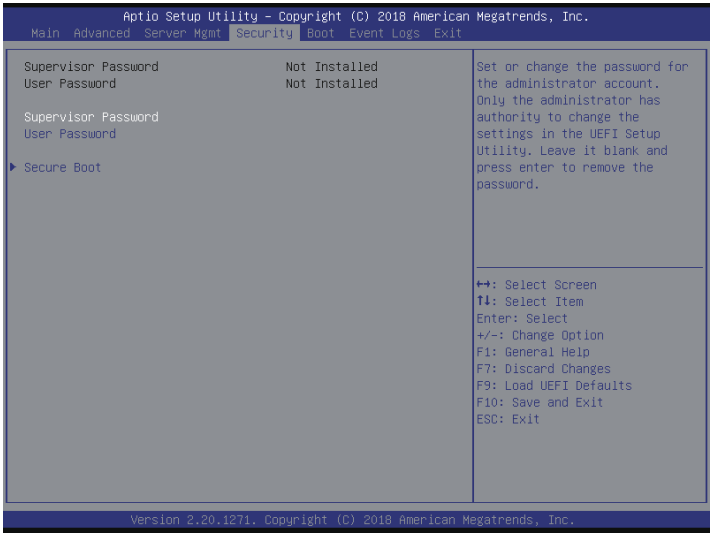
When [DHCP] or [Static] is selected, do NOT modify the BMC network settings on the IPMI web page.

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/faq.asp

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]. Enable to support Windows Server 2012 R2 or later versions Secure Boot.

Secure Boot Mode

Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

3.5.1 Key Management

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

Factory Key Provision

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

Install Default Secure Boot Keys

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

Clear Secure Boot keys

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

Export Secure Boot variables

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

Enroll Efi Image

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

Remove 'UEFI CA' from DB

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

Restore DB defaults

Restore DB variable to factory defaults.

Platform Key(PK)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHA256, 384, 512

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, External, Mixed

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: Factory, External, Mixed

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: Factory, External, Mixed

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: Factory, External, Mixed

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: Factory, External, Mixedt

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

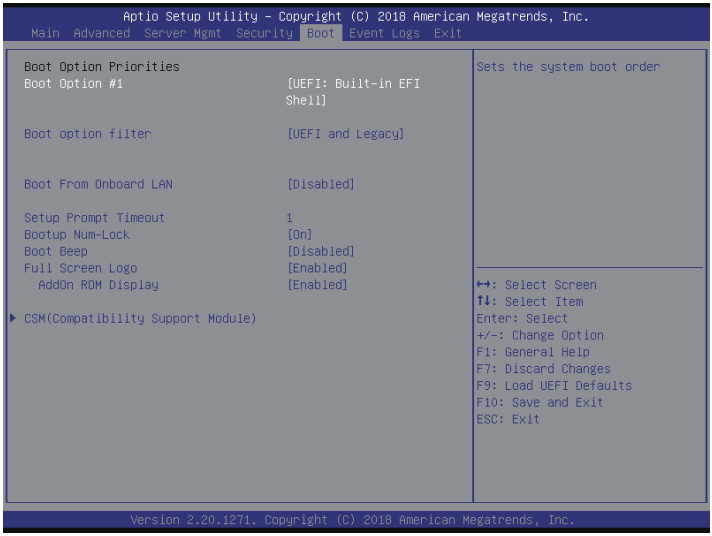
2. Authenticated UEFI Variable

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.

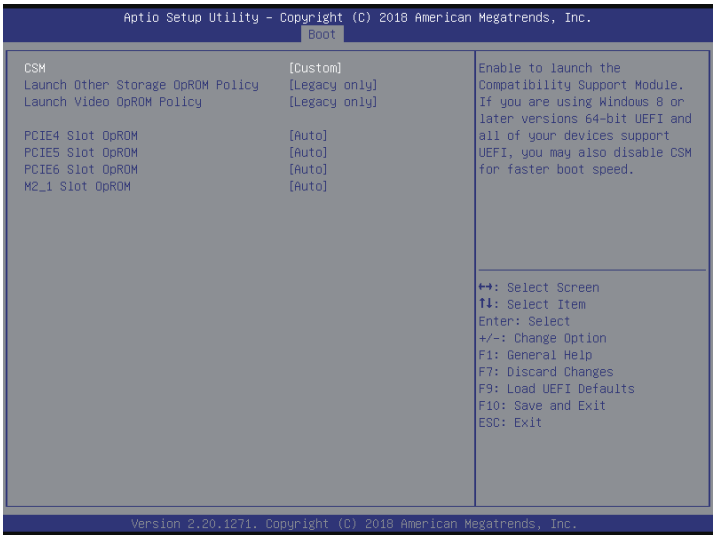
Full Screen Logo

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].

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 Server 2012 R2 or later versions 64-bit UEFI and all of your devices support UEFI, you may also disable CSM for faster boot speed.

Launch 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.

PCIE4 Slot OpROM

To select Slot Storage and Network Option ROM policy. In Auto option, the default is Disabled with NVMe device, but it is Legacy with other devices. (This item can't select Video Option ROM policy.)

PCIE5 Slot OpROM

To select Slot Storage and Network Option ROM policy. In Auto option, the default is Disabled with NVMe device, but it is Legacy with other devices. (This item can't select Video Option ROM policy.)

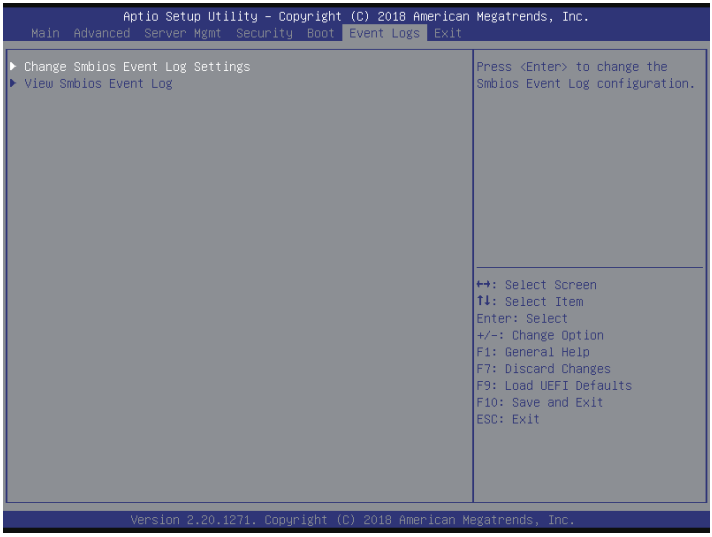
PCIE6 Slot OpROM

To select Slot Storage and Network Option ROM policy. In Auto option, the default is Disabled with NVMe device, but it is Legacy with other devices. (This item can't select Video Option ROM policy.)

M2_1 Slot OpROM

To select Slot Storage and Network Option ROM policy. In Auto option, the default is Disabled with NVMe device, but it is Legacy with other devices. (This item can't select Video Option ROM policy.)

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.

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

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

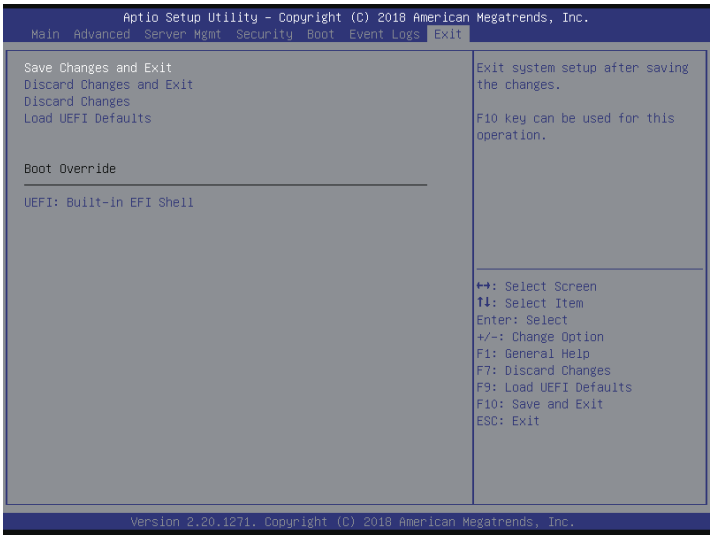
entries which utilize a multiple-event counter. The value ranges from 0 to 99 minutes.

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 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.

Chapter 4 Software Support

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

4.1 Download and Install Operating System

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

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

4.2 Download and Install Software Drivers

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

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

4.3 Contact Information

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

Chapter 5 Troubleshooting

5.1 Troubleshooting Procedures

Follow the procedures below to troubleshoot your system.

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

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

If there is no power...

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

If there is no video...

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

If there are memory errors...

1. Verify that the DIMM modules are properly seated in the slots.
2. Use recommended DDR4 2666/2400 UDIMMs.
3. If you have installed more than one DIMM modules, they should be identical with the same brand, speed, size and chip-type.
4. Try inserting different DIMM modules into different slots to identify faulty ones.
5. Check the settings of the 115V/230V switch on the power supply.

Unable to save system setup configurations...

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

Other problems...

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

5.2 Technical Support Procedures

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

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

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

5.3 Returning Merchandise for Service

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

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

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

Contact Information

If you need to contact ASRock Rack or want to know more about ASRock Rack, you're welcome to visit ASRock Rack's website at http://www.asrockrack.com; or you may contact your dealer for further information. For technical questions, please submit a support request form at https://event.asrockrack.com/tsd.asp

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