OPEN

Industry Standard, Flexible Architecture

GREEN

Less Heat, Less Power Consumption

STABLE

Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation

Motherboard

E3C256D4I-2T

User Manual

English

Version 1.10
Published Apr. 2026

Copyright Notice:

Disclaimer:

Specifications and information contained in this documentation are furnished for informational use only and subject to change without notice, and should not be constructed as a commitment by ASRock Rack. ASRock Rack assumes no responsibility for any errors or omissions that may appear in this documentation.

With respect to the contents of this documentation, ASRock Rack does not provide warranty of any kind, either expressed or implied, including but not limited to the implied warranties or conditions of merchantability or fitness for a particular purpose.

In no event shall ASRock Rack, its directors, officers, employees, or agents be liable for any indirect, special, incidental, or consequential damages (including damages for loss of profits, loss of business, loss of data, interruption of business and the like), even if ASRock Rack has been advised of the possibility of such damages arising from any defect or error in the documentation or product.

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.

INTEL END USER SOFTWARE LICENSE AGREEMENT
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.

LICENSE. Licensee has a license under Intel's copyrights to reproduce Intel's Software only in its unmodified and binary form, (with the accompanying documentation, the "Software") for Licensee's personal use only, and not commercial use, in connection with Intel-based products for which the Software has been provided, subject to the following conditions:

(a) Licensee may not disclose, distribute or transfer any part of the Software, and You agree to prevent unauthorized copying of the Software.

(b) Licensee may not reverse engineer, decompile, or disassemble the Software.

(c) Licensee may not sublicense the Software.

(d) The Software may contain the software and other intellectual property of third party suppliers, some of which may be identified in, and licensed in accordance with, an enclosed license.txt file or other text or file.

(e) Intel has no obligation to provide any support, technical assistance or updates for the Software.

OWNERSHIP OF SOFTWARE AND COPYRIGHTS. Title to all copies of the Software remains with Intel or its licensors or suppliers. The Software is copyrighted and protected by the laws of the United States and other countries, and international treaty provisions. Licensee may not remove any copyright notices from the Software. Except as otherwise expressly provided above, Intel grants no express or implied right under Intel patents, copyrights, trademarks, or other intellectual property rights. Transfer of the license terminates Licensee's right to use the Software.

DISCLAIMER OF WARRANTY. The Software is provided "AS IS" without warranty of any kind, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF LIABILITY. NEITHER INTEL NOR ITS LICENSORS OR SUPPLIERS WILL BE LIABLE FOR ANY LOSS OF PROFITS, LOSS OF USE, INTERRUPTION OF BUSINESS, OR INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY KIND WHETHER UNDER THIS AGREEMENT OR OTHERWISE, EVEN IF INTEL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

LICENSE TO USE COMMENTS AND SUGGESTIONS. This Agreement does NOT obligate Licensee to provide Intel with comments or suggestions regarding the Software. However, if Licensee provides Intel with comments or suggestions for the modification, correction, improvement or enhancement of (a) the Software or (b) Intel products or processes that work with the Software, Licensee grants to Intel a non-exclusive, worldwide, perpetual, irrevocable, transferable, royalty-free license, with the right to sublicense, under

Licensee's intellectual property rights, to incorporate or otherwise utilize those comments and suggestions.

TERMINATION OF THIS LICENSE. Intel or the sublicensor may terminate this license at any time if Licensee is in breach of any of its terms or conditions. Upon termination, Licensee will immediately destroy or return to Intel all copies of the Software.

THIRD PARTY BENEFICIARY. Intel is an intended beneficiary of the End User License Agreement and has the right to enforce all of its terms.

U.S. GOVERNMENT RESTRICTED RIGHTS. The Software is a commercial item (as defined in 48 C.F.R. 2.101) consisting of commercial computer software and commercial computer software documentation (as those terms are used in 48 C.F.R. 12.212), consistent with 48 C.F.R. 12.212 and 48 C.F.R 227.7202-1 through 227.7202-4. You will not provide the Software to the U.S. Government. Contractor or Manufacturer is Intel Corporation, 2200 Mission College Blvd., Santa Clara, CA 95054.

EXPORT LAWS. Licensee agrees that neither Licensee nor Licensee's subsidiaries will export/re-export the Software, directly or indirectly, to any country for which the U.S. Department of Commerce or any other agency or department of the U.S. Government or the foreign government from where it is shipping requires an export license, or other governmental approval, without first obtaining any such required license or approval. In the event the Software is exported from the U.S.A. or re-exported from a foreign destination by Licensee, Licensee will ensure that the distribution and export/re-export or import of the Software complies with all laws, regulations, orders, or other restrictions of the U.S. Export Administration Regulations and the appropriate foreign government.

APPLICABLE LAWS. This Agreement and any dispute arising out of or relating to it will be governed by the laws of the U.S.A. and Delaware, without regard to conflict of laws principles. The Parties to this Agreement exclude the application of the United Nations Convention on Contracts for the International Sale of Goods (1980). The state and federal courts sitting in Delaware, U.S.A. will have exclusive jurisdiction over any dispute arising out of or relating to this Agreement. The Parties consent to personal jurisdiction and venue in those courts. A Party that obtains a judgment against the other Party in the courts identified in this section may enforce that judgment in any court that has jurisdiction over the Parties.

Licensee's specific rights may vary from country to country.

WARNING

THIS PRODUCT CONTAINS A BUTTON BATTERY
If swallowed, a button battery can cause serious injury or death.
Please keep batteries out of sight or reach of children.

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"

AUSTRALIA ONLY

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage caused by our goods. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. If you require assistance please call ASRock Rack Tel : +886-2-55599600 ext.123 (Standard International call charges apply)

UK CA

ASRock Rack INC. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of related UKCA Directives. Full text of UKCA declaration of conformity is available at: http://www.asrockrack.com

CE

ASRock Rack INC. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of related Directives. Full text of EU declaration of conformity is available at: http://www.asrockrack.com

ASRock Rack follows the green design concept to design and manufacture our products, and makes sure that each stage of the product life cycle of ASRock Rack product is in line with global environmental regulations. In addition, ASRock Rack disclose the relevant information based on regulation requirements.

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

DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

Contents

Chapter 1 Introduction

Thank you for purchasing ASRock Rack ***E3C256D4I-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.

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

Please visit our website for specific information and technical support: http://www.asrockrack.com/support/

1.1 Package Contents

- ASRock Rack E3C256D4I-2T Motherboard
  (Mini ITX form factor: 6.7 in x 6.7 in, 170.2 mm x 170.2 mm)
- Quick installation guide
- 1 SATA power cable (80 cm)
- 1 ATX 4P to 24P power cable
- 1 Oculink to 4 SATA cable (60 cm)
- 1 Oculink to 4 SATA cable (60 cm) (Optional)
- 1 I/O shield
- 1 Screw for M.2 socket

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

English

1.2 Specifications

E3C256D4I-2T	
Physical Status	
Form Factor	mini-ITX
Dimension	6.7 in x 6.7 in
Processor System	
CPU	Supports Intel® Xeon® E-2300 and 10th Gen Intel® Pentium® series processors
Socket	Single Socket H5 (LGA 1200)
Thermal Design Power (TDP)	95W
Chipset	Intel® C256
System Memory	
Supported DIMM Quantity	4 DIMM slots (2DPC)
Supported Type	DDR4 288-pin ECC / non-ECC SODIMM
Max. Capacity per DIMM	ECC / non-ECC SODIMM: up to 32 GB
Max. Frequency	ECC / non-ECC SODIMM: max. 2933 MHz (1DPC) / max. 2133 MHz (2DPC) [TBD]
Voltage	1.2V
PCIe Expansion Slots (SLOT7 close to CPU)	
SLOT7	PCIe 4.0* x16 [CPU]
**SLOT7 supports PCIe3.0 only when installing 10th Gen Intel® Pentium® Series Processors*	
Other PCIe Expansion Connectors	
M.2	1 M-key* (PCIe 4.0 x4); support 2280 form factor [CPU]
OCuLink	2 OCuLink (PCIe 3.0 x4 or 4 SATA 6 Gb/s) [PCH]
**M.2 will not fuction when installing 10th Gen Intel® Pentium® Series Processors*	
SATA/SAS Storage	
PCH Built-in Storage	Intel® C256 (Up to 8 SATA 6 Gb/s; RAID 0/1/5/10): 2 OCuLink
Ethernet	
Additional Ethernet Controller	2 RJ45 (10 GbE) by Intel® X550
USB	
Connectors / Headers	External: 2 Type-A (USB 3.2 Gen1) Internal: 1 header (19-pin, 2 USB 3.2 Gen1)

Graphics	
Controller	ASPEED AST2500: 1 DB15 (VGA)
Security	
TPM	1 (13-pin, SPI)
Rear I/O	
UID Button/ LED	1 UID button w/ LED
Video Output	1 DB15 (VGA)
USB Port	2 Type A (USB 3.2 Gen1)
LAN Port	2 RJ45(10 GbE), 1 dedicated IPMI
Hardware Monitor	
Temperature	CPU, MB, TR temperature sensing
Fan	Fan tachometer CPU quiet fan (allow chassis fan speed auto-adjust by CPU temperature) Fan multi-speed control
Voltage	VCORE,VCCSA,VCCM,VCCST_SFR, 3.3V, 5V, 12V, +1.05V_PCH_AUX,+BAT, 3VSB, 5VSB,VCCIO,+2.5V_VPP
Server Management	
BMC Controller	ASPEED AST2500: iKVM, vMedia support
Dedicated IPMI LAN	1 RJ45 dedicated IPMI LAN port by Realtek RTL8211E
System BIOS	
BIOS Type	AMI 256Mb SPI Flash ROM
Features	Plug and Play, ACPI 6.2 (and above) compliance wake-up events, SMBIOS 3.3 and above, ASRock Rack Instant Flash
Internal Connectors / Headers	
Power Connector	1 (4-pin, ATX PSU signal) w/ ATX 24-pin adapter cable, 1 (8-pin, ATX 12V) support 12V DC-in
Other Power Connectors	1 (4-pin) for HDD power when using 12V DC-in power source
Auxiliary Panel Header	1 (9-pin): chassis intrusion, system fault LED, LAN activity LEDs, locate
System Panel Header	1 (9-pin): power switch, reset switch, system power LED, HDD activity LED
COM Header	1
Fan Header	3 (4-pin)
Thermal Sensor Header	1
TPM Header	1 (13-pin, SPI)
SGPIO Header	2
SMbus Header	1

PMbus Header	1
IPMB Header	1
Clear CMOS	1 (contact pads)
Others	1 NC-SI (9-pin)
LED Indicators	
Standby Power LED	1 (5VSB)
Fan Fail LED	3
BMC Heartbeat LED	1
Support OS	
OS	Microsoft® Windows® - Server 2019 (64 bit) - Server 2022 (64 bit) Linux® - RedHat Enterprise Linux Server 8.4 (64 bit) / Server 8.2 (64 bit) - CentOs 8.5 (64 bit) / 8.2 (64 bit) - Ubuntu 20.10 (64 bit) / Ubuntu 21.04 (64 bit) Hypervisor: - VMWare® ESXi 7.0U2a / vSphere 7.0U2b - VMWare® ESXi 7.0U3 / vSphere 7.0U3 ** Supports UEFI BOOT only.* ** Please refer to the website for the latest OS support list.*
Enviroment	
Temperature	Operating temperature: 10°C ~ 35°C Non-operating temperature: -40°C ~ 70°C
Humidity	Non-perating humidity: 20% ~ 90% (non-condensing)

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

This motherboard supports Wake from on Board LAN. To use this function, please make sure that the "Wake on Magic Packet from power off state" is enabled in Device Manager > Intel® Ethernet Connection > Power Management. And the "PCI Devices Power On" is enabled in UEFI SETUP UTILITY > Advanced > ACPI Configuration. After that, onboard LAN1&2 can wake up S5 under OS.

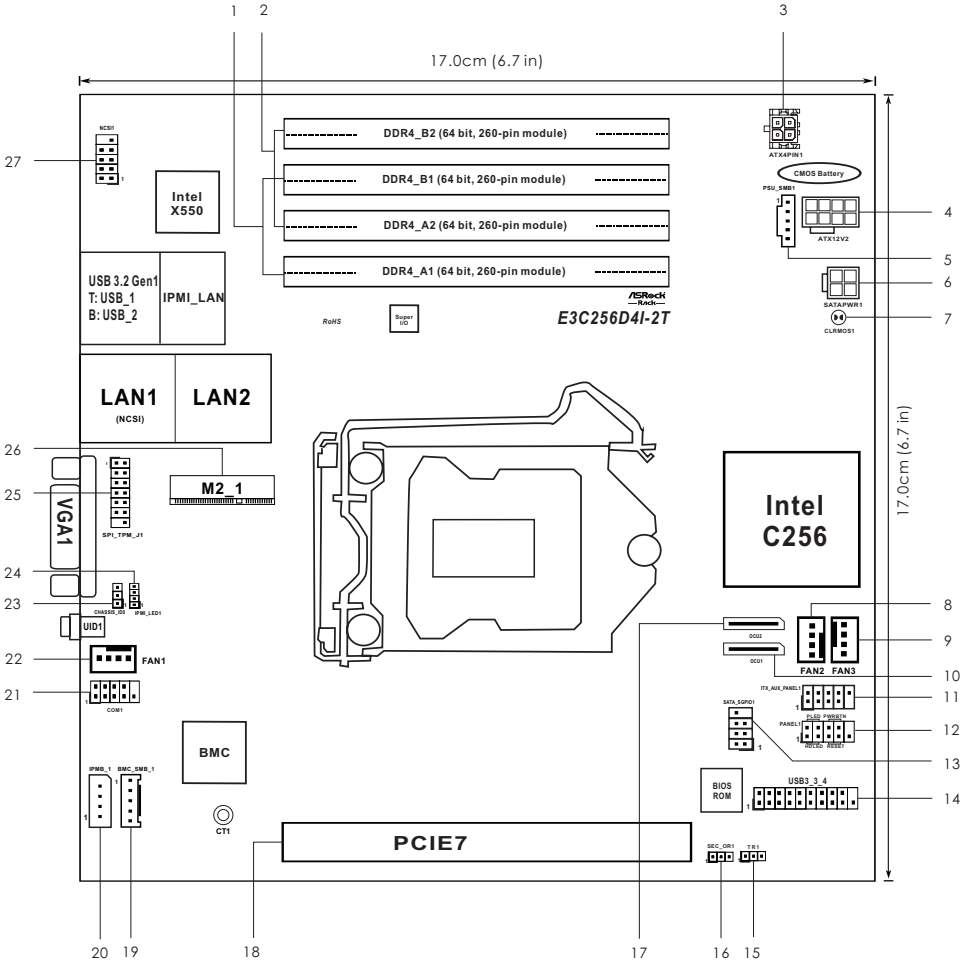
If you install Intel® LAN utility or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If you install the drivers only, it will pass the WHQL tests.

English

1.3 Unique Features

ASRock 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

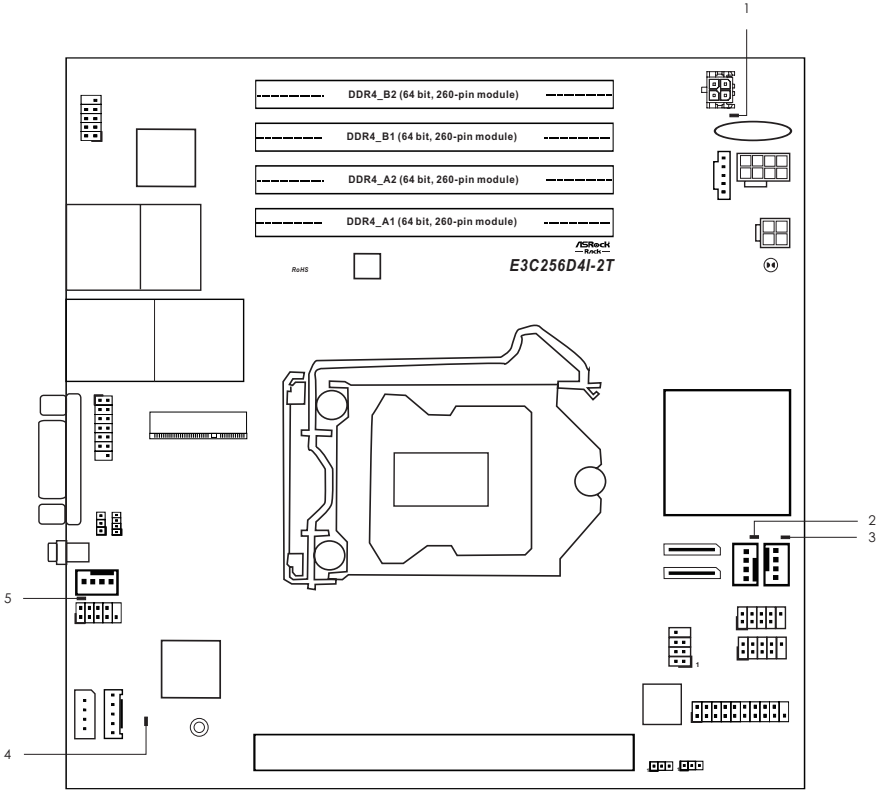


English

No.	Description
1	2 x 260-pin DDR4 SO-DIMM Slots (DDR4_A1, DDR4_B1)
2	2 x 260-pin DDR4 SO-DIMM Slots (DDR4_A2, DDR4_B2)
3	Micro-Fit Power Connector (ATX4PIN1)
4	ATX 12V Power Connector (ATX12V2)
5	PSU SMBus Header (PSU_SMB1)
6	SATA Power Connector (SATAPWR1)
7	Clear CMOS Pad (CLRMOS1)
8	System Fan Header (FAN2)
9	System Fan Header (FAN3)
10	OCuLink x4 Connector (OCU1)
11	Auxiliary Panel Header (ITX_AUX_PANEL1)
12	System Panel Header (PANEL1)
13	SATA SGPIO Connector (SATA_SGPIO1)
14	USB 3.2 Gen1 Header (USB3_3_4)
15	Thermal Sensor Header (TR1)
16	Security Override Jumper (SEC_OR1)
17	OCuLink x4 Connector (OCU2)
18	PCI Express 4.0 x16 Slot (PCIE7)
19	BMC SMBus Header (BMC_SMB_1)
20	Intelligent Platform Management Bus Header (IPMB_1)
21	COM Port Header (COM1)
22	System Fan Header (FAN1)
23	Chassis ID Jumper (CHASSIS_ID0)
24	IPMI LAN LED Header (IPMI_LED1)
25	SPI TPM Header (SPI_TPM_J1)
26	M.2 Socket (M2_1) (Type 2280)
27	NCSI Header (NCSI1)

**For DIMM installation and configuration instructions, please see p.16 (Installing the Memory Modules (DIMM)) for more details.*

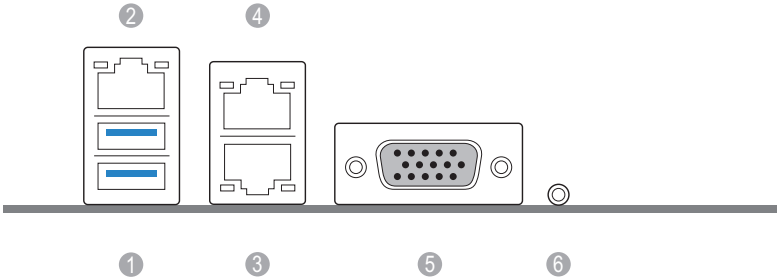
1.5 Onboard LED Indicators



No.	Item	Status	Description
1	SB_PWR1_LED	Green	STB PWR ready
2	FAN_LED2	Red	FAN2 failed
3	FAN_LED3	Red	FAN3 failed
4	BMC_LED1	Green	BMC heartbeat LED
5	FAN_LED1	Red	FAN1 failed

English

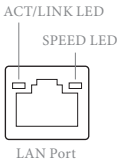
1.6 I/O Panel



No.	Description	No.	Description
1	USB 3.2 Gen1 Ports (USB3_1_2)	4	10G LAN RJ-45 Port (LAN_2)**
2	LAN RJ-45 Port (IPMI_LAN)*	5	VGA Port (VGA1)
3	10G LAN RJ-45 Port (LAN_1)**	6	UID Switch (UID1)

LAN Port LED Indications

*There are two LEDs on the LAN port specified for link activity and speed. Please refer to the table below for the LAN port LED indications.

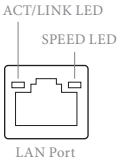


Dedicated IPMI LAN Port LED Indications

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

English

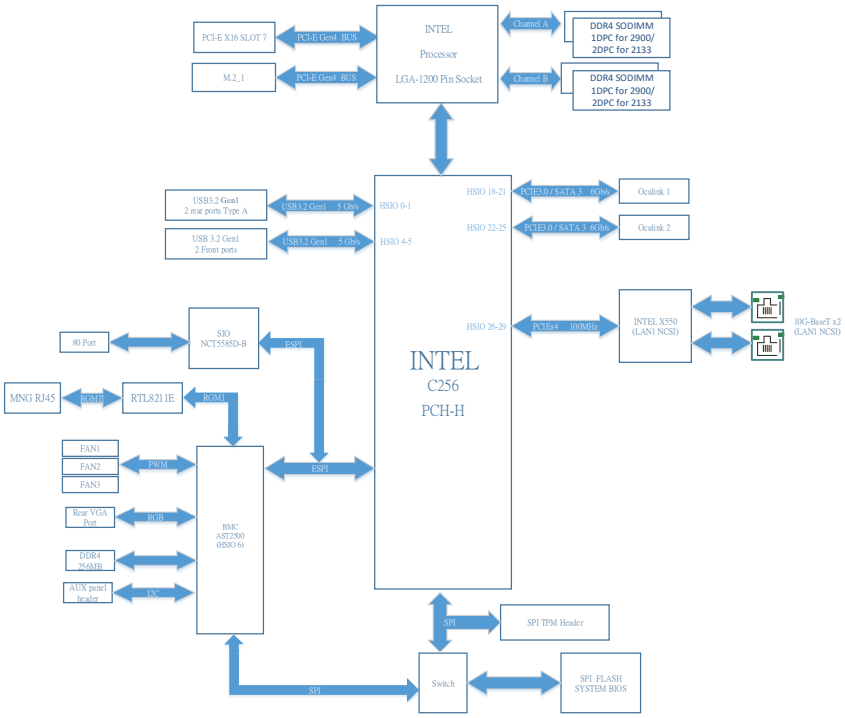
**There are two LEDs on the LAN port specified for link activity and speed. Please refer to the table below for the LAN port LED indications.



LAN Port LED Indications

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

1.7 Block Diagram



English

Chapter 2 Installation

This is a mini ITX form factor (170.2 mm x 170.2 mm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

1. *Ensure the motherboard battery is installed before unplugging the power cord or installing/removing the motherboard.*
2. *Before installing or removing any component, ensure that the power supply is 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.*

2.1 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

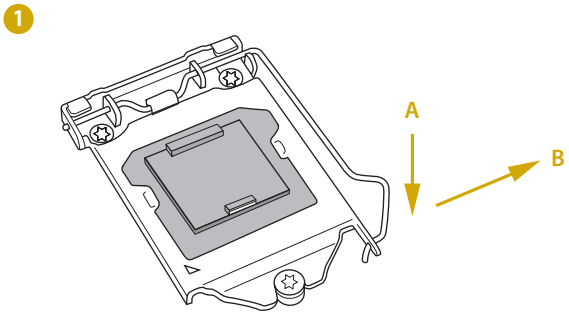
Take note of the following precautions before you install motherboard components or change any motherboard settings.

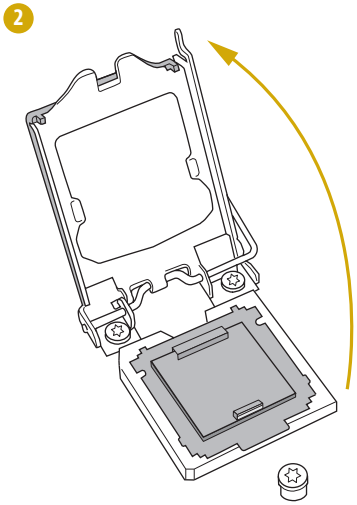
1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before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

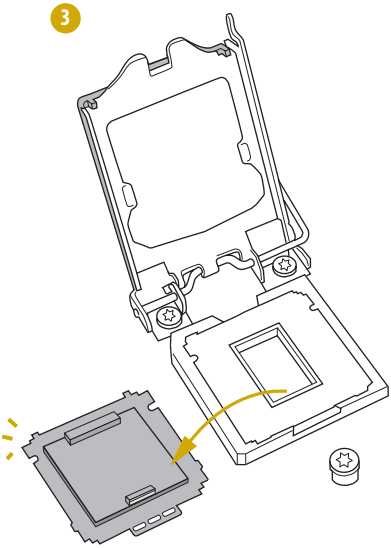
2.3 Installing the CPU

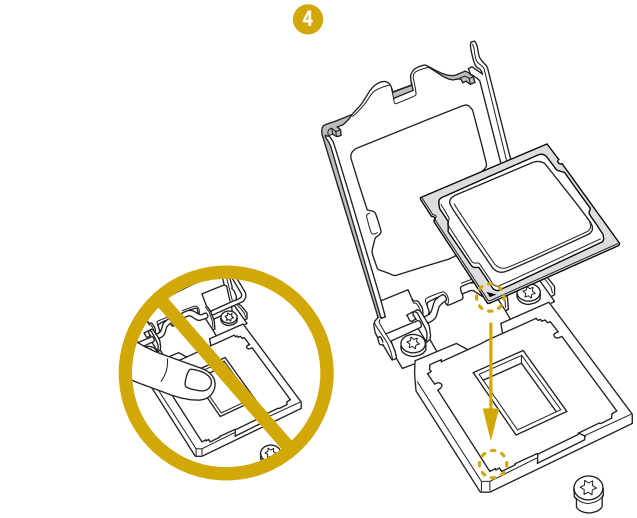
1. *Before you insert the 1151-Pin CPU into the socket, please check if the PnP cap is on the socket, if the CPU surface is unclean, or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.*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

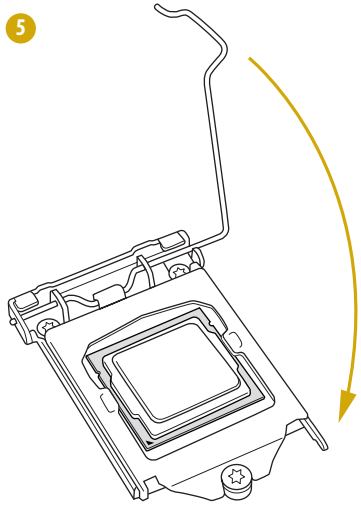
Illustrations in this User Manual are provided for reference only and may slightly differ from actual product appearances.

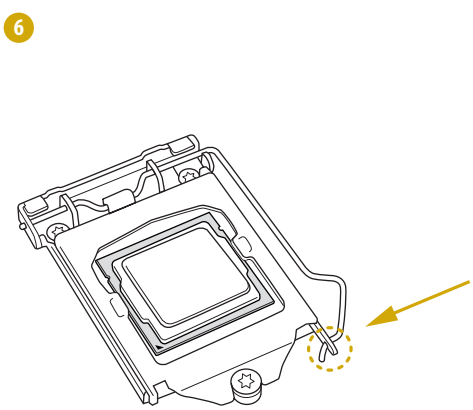








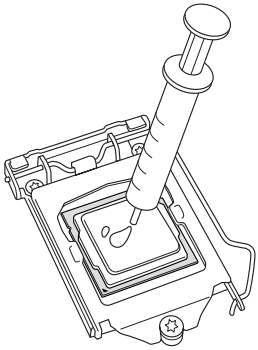


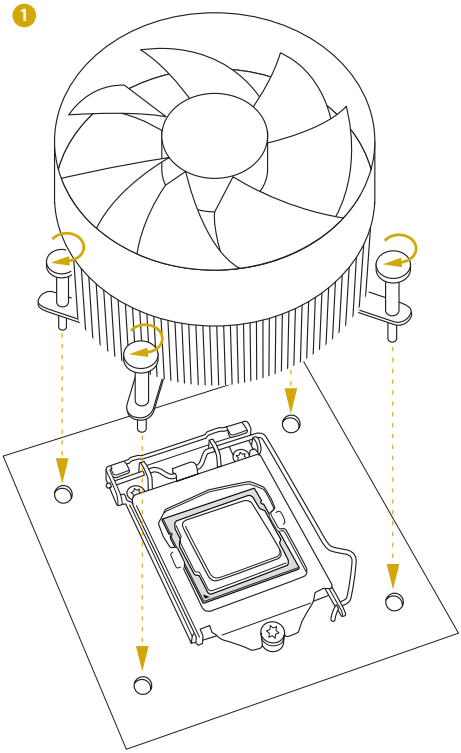


Please save and replace the cover if the processor is removed. The cover must be placed if you wish to return the motherboard for after service.

2.4 Installing the CPU Fan and Heatsink

Please avoid using push-pin type CPU coolers, as the PCB thickness may prevent proper installation. A screw-based mounting system is recommended for a secure and reliable fit.





2.5 Installing the Memory Modules (DIMM)

This motherboard provides four 260-pin DDR4 (Double Data Rate 4) DIMM slots.

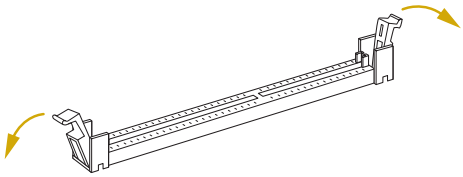
1. *It is not allowed to install a DDR, DDR2 or DDR3 memory module into a DDR4 slot; otherwise, this motherboard and DIMM may be damaged.*
2. *The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.*

Recommended Memory Configuration

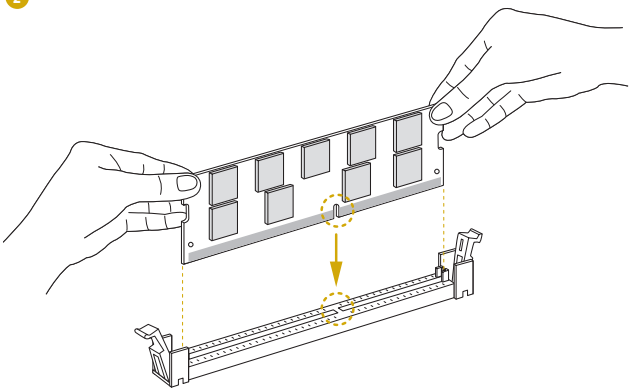
DIMM Number	DDR4_A1	DDR4_A2	DDR4_B1	DDR4_B2
1 DIMM				V
		V		
2 DIMMs		V		V
4 DIMMs (2133Hz)	V	V	V	V

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.

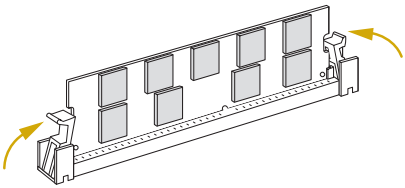
1



2



3



2.6 Expansion Slot (PCI Express Slot)

There is a PCI Express slot on this motherboard.

PCIE Slot:

PCIE7 (PCIe 4.0 x16 slot) is used for PCI Express x16 lane width cards.

Slot	Generation	Mechanical	Electrical	Source
PCIE 7	4.0	x16	x16	CPU

Installing an expansion card

Step 1. Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.

Step 2. Remove the system unit cover (if your motherboard is already installed in a chassis).

Step 3. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.

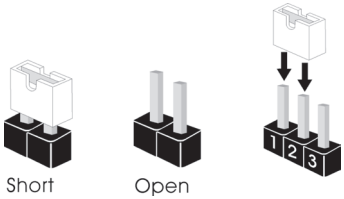
Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.

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

Step 6. Replace the system cover.

2.7 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.



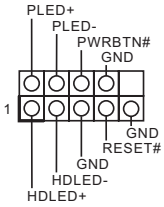
Security Override Jumper (3-pin SEC_OR1) (see p.6, No. 16)	1_2 Descriptor Security Override	2_3 Not override (Default)
CHASSIS ID Jumper (3-pin CHASSIS_ID0) (see p.6, No. 23)	1_2 Descriptor Security Override	2_3 Not override (Default)

English

2.8 Onboard Headers and Connectors

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

System Panel Header
(9-pin PANEL1)
(see p.6, No. 12)



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.

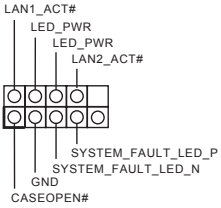
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

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.

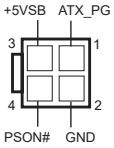
The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

Auxiliary Panel Header
(9-pin
ITX_AUX_PANEL1)
(see p.6, No. 11)



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

Micro-Fit Power Connector
(4-pin ATX4PIN1
(ATX 24pin-to-4pin))
(see p.6, No. 3)



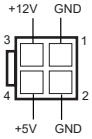
The motherboard provides one 4-pin power/signal connector which is a required input for ATX power source.

When using ATX power, it is necessary to use a 24pin-to-4pin power cable to connect between the 24pin power connector of PSU and the ATX4PIN1 connector on the motherboard for power supply and signal communication.

For DC-IN 12V application, it is not necessary to use this ATX 4-PIN power connector.

**Caution: Misconnection between the ATX4PIN1 and the SATAPWR1 connectors may permanently damage the motherboard.*

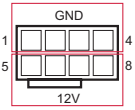
SATA Power Connector
(DC-IN Mode)
(4-pin SATAPWR1)
(see p.6, No. 6)



Please use a SATA power cable to connect this SATA Power Connector and your SATA HDD for supplying power from the motherboard, when using DC-IN mode without SATA power supply.

**Caution: Misconnection between the ATX4PIN1 and the SATAPWR1 connectors may permanently damage the motherboard.*

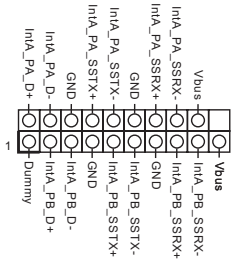
ATX 12V Power Connector
(8-pin ATX12V2)
(see p.6, No. 4)



The motherboard provides one 8-pin 12V power connector which is a required input for either DC-IN 12V or ATX +12V power source.

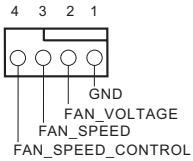
When using ATX power, it is necessary to use a 24pin-to-4pin power cable to connect between the 24pin power connector of PSU and the ATX4PIN1 connector on the motherboard for power supply and signal communication.

USB 3.2 Gen1 Header
(19-pin USB3_3_4)
(see p.6, No. 14)



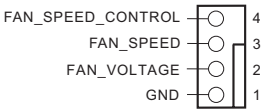
Besides two default USB 3.2 Gen1 ports on the I/O panel, there is one USB 3.2 Gen1 header on this motherboard. This USB 3.2 Gen1 header can support two USB 3.2 Gen1 ports.

System Fan Connectors
(4-pin FAN1)
(see p.6, No. 22)

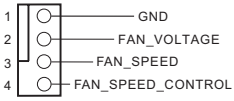


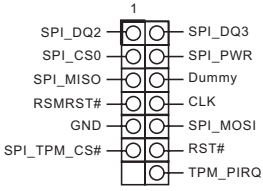
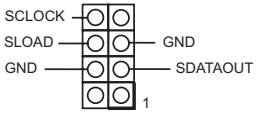
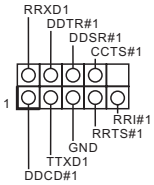
Please connect fan cables to the fan connector and match the black wire to the ground pin. All fans support Fan Control.

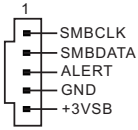
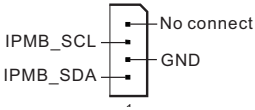
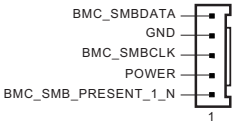
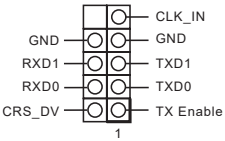
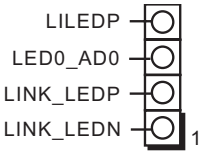
(4-pin FAN2)
(see p.6, No. 8)



(4-pin FAN3)
(see p.6, No. 9)



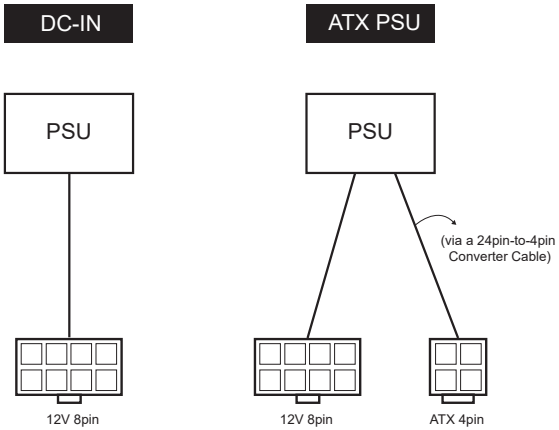
SPI TPM Header (13-pin SPI_TPM_J1) (see p.6, No. 25)		This connector supports Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.
Serial General Purpose Input/Output Header (7-pin SATA_SGPIO1) (see p.6, No. 13)		The header supports Serial Link interface for onboard SATA connections.
Thermal Sensor Header (3-pin TR1) (see p.6, No. 15)		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.
OCuLink Connectors (OCU1) (see p.6, No. 10) (OCU2) (see p.6, No. 17)		Please connect PCIE SSDs or OCulink-to-SATA x4 cable to the connectors.
Serial Port Header (9-pin COM1) (see p.6, No. 21)		This COM header supports a serial port module.

Clear CMOS Pad (CLRMOS1) (see p.6, No. 7)		CLRMOS1 allows you to clear the data in CMOS. To clear CMOS, take out the CMOS battery and short the Clear CMOS Pad.
PSU SMBus (PSU_SMB1) (see p.6, No. 5)		PSU SMBus monitors the status of the power supply, fan and system temperature.
Intelligent Platform Management Bus Header (4-pin IPMB_1) (see p.6, No. 20)		This 4-pin connector is used to provide a cabled base-board or front panel connection for value added features and 3rd-party add-in cards, such as Emergency Management cards, that provide management features using the IPMB.
Baseboard Management Controller SMBus Header (5-pin BMC_SMB_1) (see p.6, No. 19)		The header is used for the SM BUS devices.
NCSI Header (9-pin NCSI1) (see p.6, No. 27)		The onboard NCSI header is used for external connections.
IPMI LAN LED Header (4-pin IPMI_LED1) (see p.6, No. 24)		This header is used for IPMI LAN LED features.

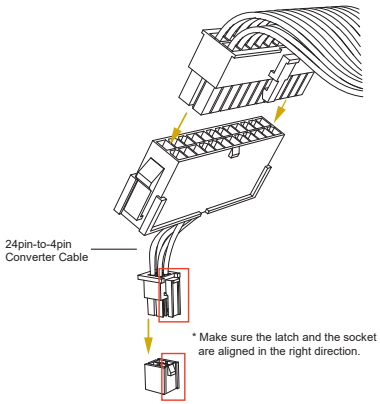
2.9 ATX PSU / DC-IN Power Connections

This motherboard supports both +12V DC and ATX power input. Please refer to the table below for the required connections between the motherboard and the power supply.

Connector	DC-IN	ATX PSU
12V 8pin	O	O
ATX 4pin	X	O *(with the bundled ATX 24pin-to-4pin converter cable)*



The following diagram illustrates how to connect the bundled ATX 24pin-to-4pin converter cable.



English

2.10 Unit Identification purpose LED/Switch

Use the UID button to locate the server working on 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.

2.11 Dual LAN and Teaming Operation Guide

Dual LAN with Teaming enabled on this motherboard allows two single connections to act as one single connection 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

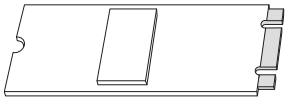
Select the adapter you want to be the primary adapter and click the **Set Primary** button.

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.

2.12 M.2 SSD Module Installation Guide (M2_1)

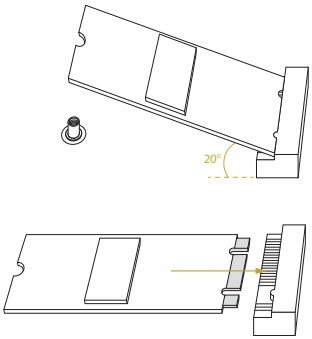
The M.2 Socket (M2_1, Key M) supports type 2280 M.2 PCI Express module up to Gen4 x4.

Installing the M.2 SSD Module



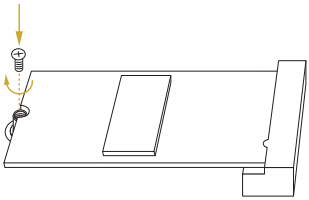
Step 1

Prepare a M.2 SSD module and the screw.



Step 2

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 3

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

Chapter 3 UEFI Setup Utility

3.1 Introduction

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

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

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

3.1.1 UEFI Menu Bar

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

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

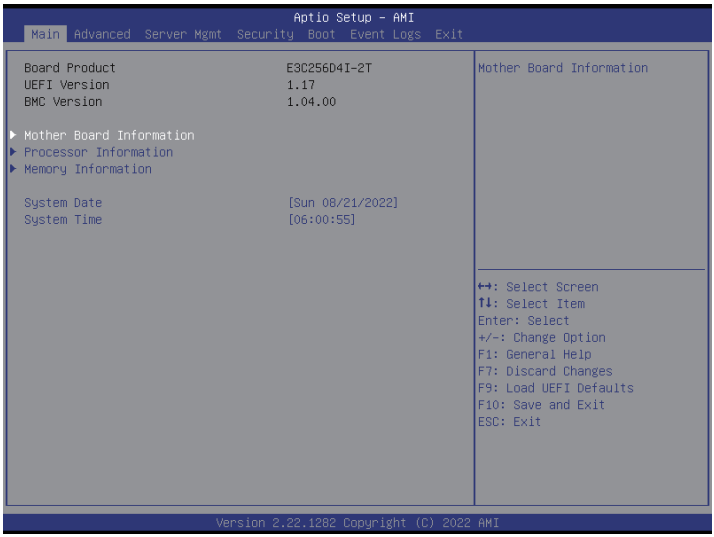
3.1.2 Navigation Keys

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

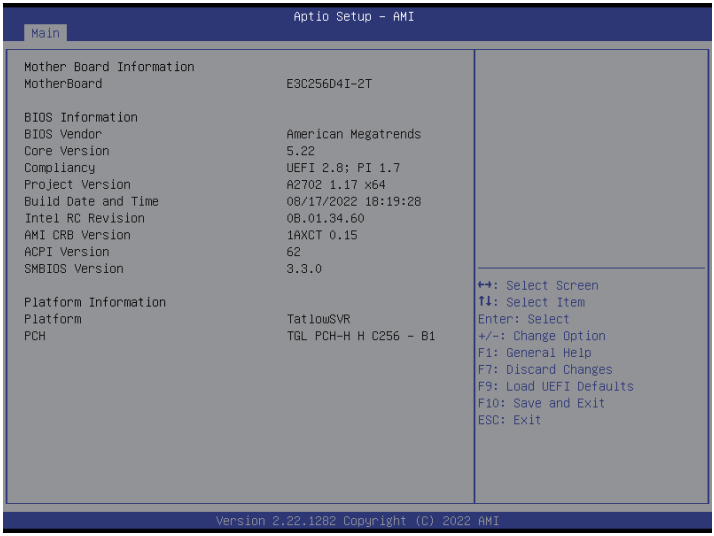
Once you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview. The Main screen provides system overview information and allows you to set the system time and date.



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

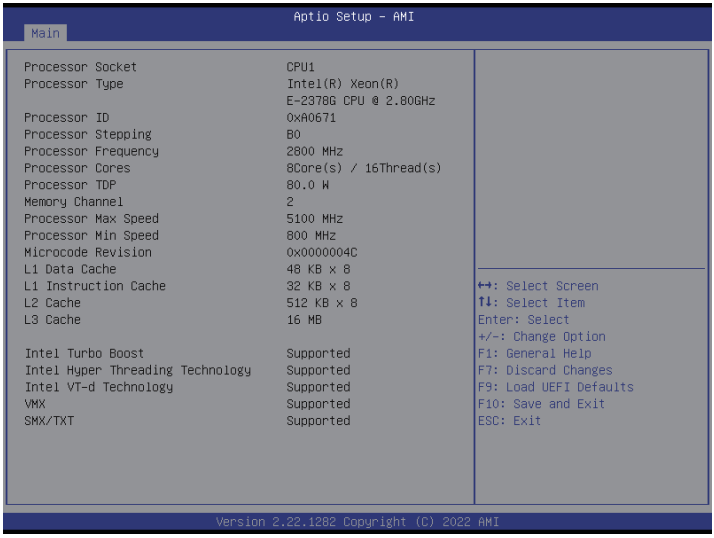
3.2.1 Motherboard Information

Press [Enter] to view the information of the motheboard.



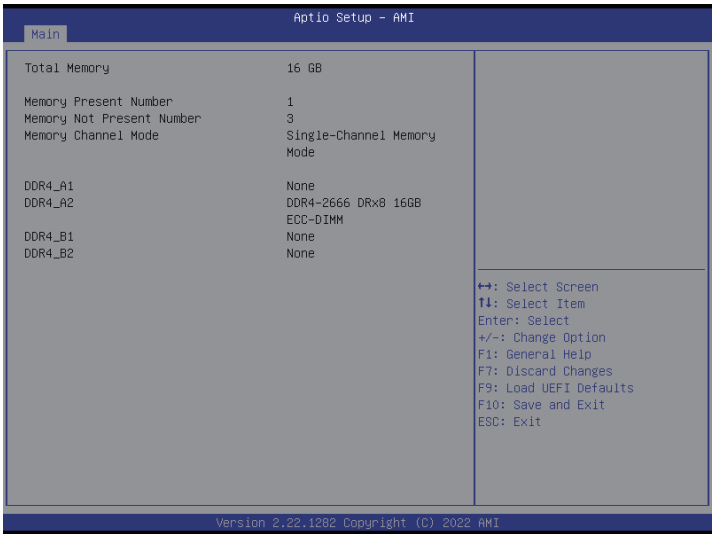
3.2.2 Processor Information

Press [Enter] to view the information of the processor.



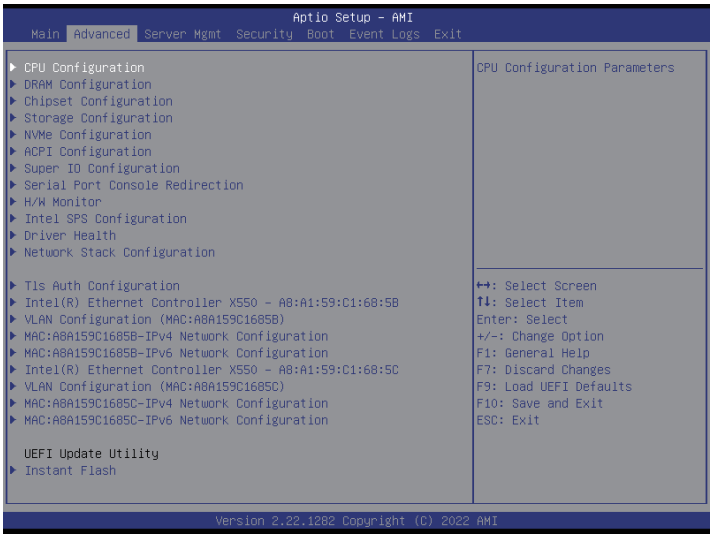
3.2.3 Memory Information

Press [Enter] to view the information of the memory.



3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, DRAM Configuration, Chipset Configuration, Storage Configuration, NVMe Configuration, ACPI Configuration, Super IO Configuration, Serial Port Console Redirection, H/W Monitor, Intel SPS Configuratio, Driver Health, Network Stack Configuration, Tls Auth Configuration and Instant Flash.



Save User Default

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

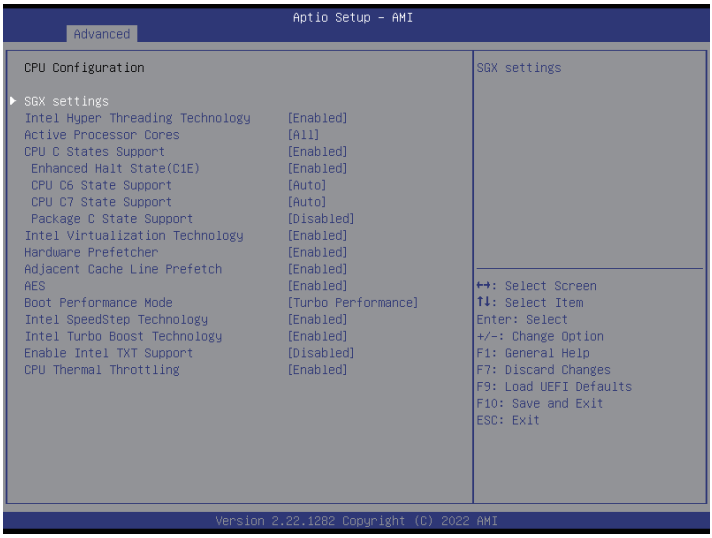
Load User Default

Load previously saved user defaults.

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

English

3.3.1 CPU Configuration



SGX settings

Use this item to configure SGX settings.

Software Guard Extensions (SGX)

Use this item to enable or disable Software Controlled Software Guard Extensions (SGX). When this is enabled, you will see the following items.

Select Owner EPOCH input type (SGX)

There are three Owner EPOCH modes (Each EPOCH is 64bit): no change in owner epoch, change to new random owner epoch and manually entered by user. After generating new epoch via 'Change to New Random Owner EPOCHs', the selection reverts back to 'No Change in Owner Epochs', this is to ensure Epoch stays same, across Sx states. After the user enters epoch values manually, the values will not be visible, for security reasons.

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.

PRMRR Size

Use this item to set the PRMRR Size (Decimal).
Optio

Enable/Disable SGX Debug Mode

SGX Debug Mode based on Debug Mode support in a CPU stepping. It can be configured only if Debug Interface is enabled and locked.

Intel Hyper Threading Technology *(Supported depending on your CPU)*

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 C6 and C7 all enabled for better power saving.

Enhanced Halt State (C1E)

Enable Enhanced Halt State (C1E) 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

When enabled, a VMM can utiliza the addiyional hardware capabilities provided by Vanderpool Technology.

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.

AES

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

Boot Performance Mode

Use this to item to select the performance state that the BIOS will set starting from reset vector.

Intel SpeedStep Technology

Intel SpeedStep technology allows processors to switch between multiple frequencies and voltage points for better power saving and heat dissipation. CPU turbo ratio can be fixed when Intel SpeedStep Technology is set to Disabled and Intel Turbo Boost Technology is set to Enabled.

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

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

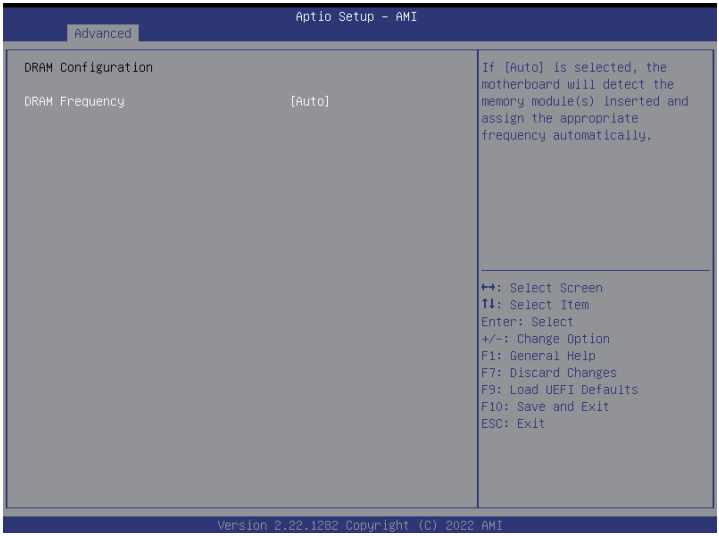
Enable Intel TXT Support

Use this to enable or disable Intel Trusted Execution Technology.

CPU Thermal Throttling

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

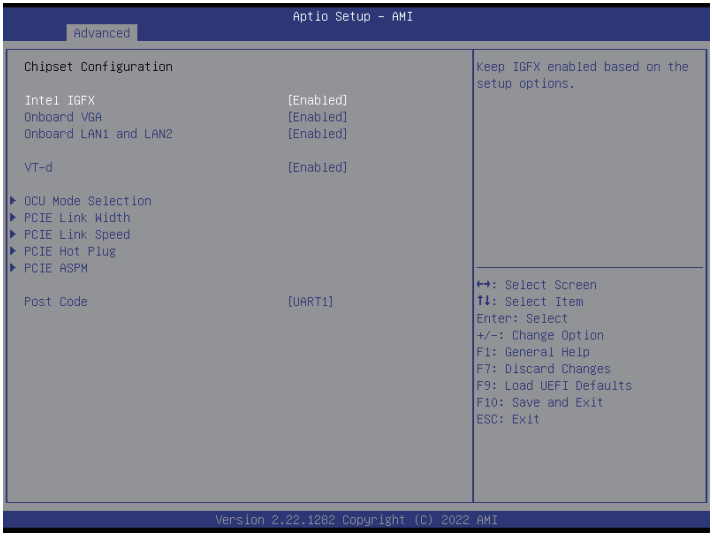
3.3.2 DRAM Configuration



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



Intel IGFX

Keep IGFX enabled based on the setup options.

Onboard VGA

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

Onboard LAN1 and LAN2

Use this to enable or disable the Onboard LAN1 and LAN2 function. The default value is [Enabled].

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.

OCU Mode Selection

OCU1 Mode Selection

Use this item to switch the OCUlink to PCIE/SATA.

OCU2 Mode Selection

Use this item to switch the OCUlink to PCIE/SATA.

PCIE Link Width

PCIE7 Link Width

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

PCIE Link Speed

PCIE7 Link Speed

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

OCU1 Link Speed

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

PCIE Hot Plug

PCIE7 Hot Plug

Use this item to enable or disable PCI Express Hot Plug.

OCU1 Hot Plug

Use this item to enable or disable PCI Express Hot Plug.

PCIE ASPM

PCI-E ASPM Support (Global)

This option enables or disables the ASPM support for all PCH downstream devices. The default value is [Auto].

PCIE7 ASPM Support

This option enables or disables the ASPM support for all PCH downstream devices. The default value is [Disabled].

OCU1 ASPM Support

This option enables or disables the ASPM support for all PCH downstream devices. The default value is [Disabled]

Post Code

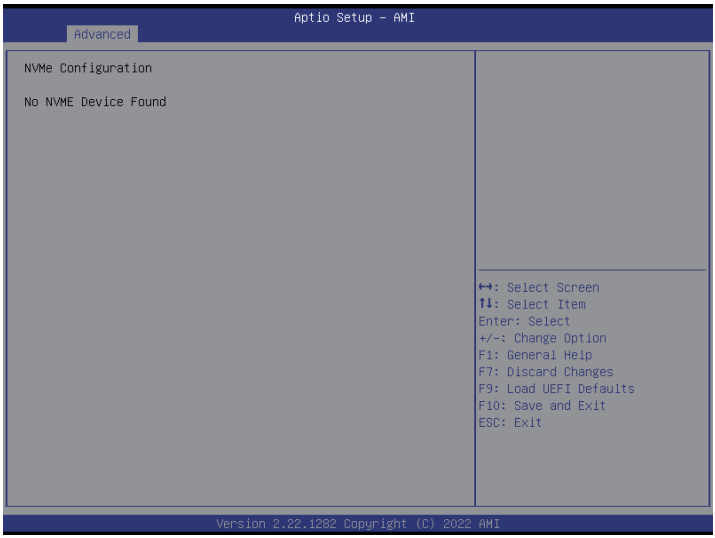
Use this item to display Post Code in UART1/BMC Post Snoop.

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 or reliability.

3.3.5 NVMe Configuration



The NVMe Configuration displays the NVMe controller and Drive information.

3.3.6 ACPI Configuration

PCIE Devices Power On

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

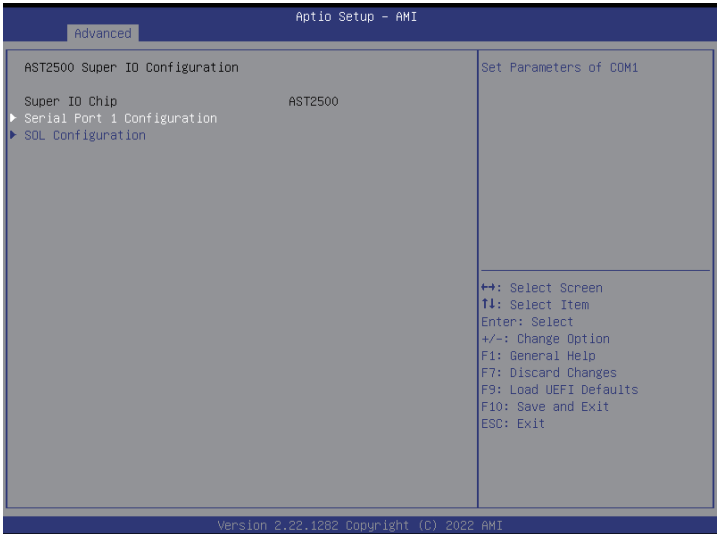
Ring-In Power On

This allows the system to be waked up by onboard COM port modem Ring-In signals.

RTC Alarm Power On

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

3.3.7 Super IO Configuration



Serial Port 1 Configuration

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

Serial Port

Use this item to enable or disable the serial port.

Change Settings

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

SOL Configuration

Use this item to set SOL configuration.

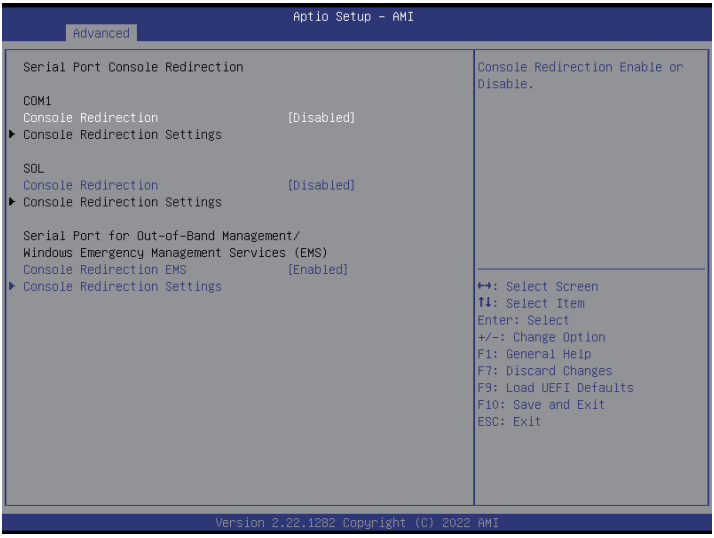
SOL Port

Use this item to enable or disable the SOL port.

Change Settings

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

3.3.8 Serial Port Console Redirection



COM1 / SOL

Console Redirection

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

Console Redirection Settings

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

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].

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.

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.

Redirect After POST

When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable.

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

Console Redirection EMS

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

Console Redirection Settings

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

Out-of-Band Mgmt Port

Microsoft Windows Emergency Mangement Services (EMS) allows for remote management of a Windows Server OS through a serial port.

Terminal Type EMS

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

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

Bits Per Second EMS

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

Flow Control EMS

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

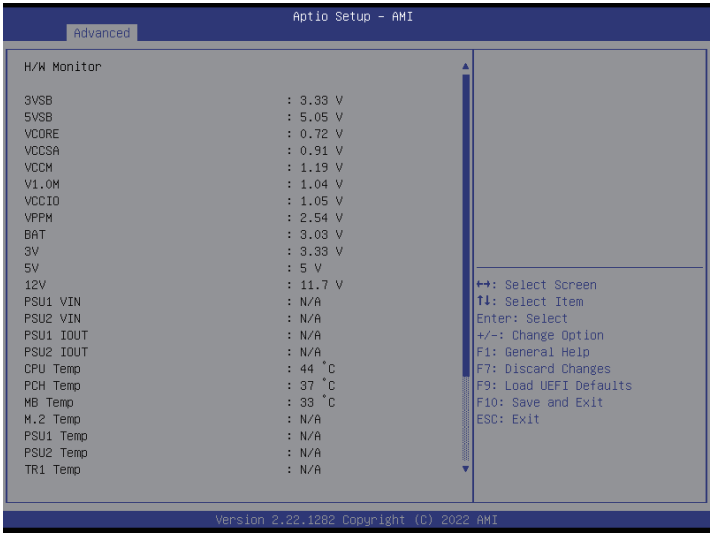
Data Bits EMS

Parity EMS

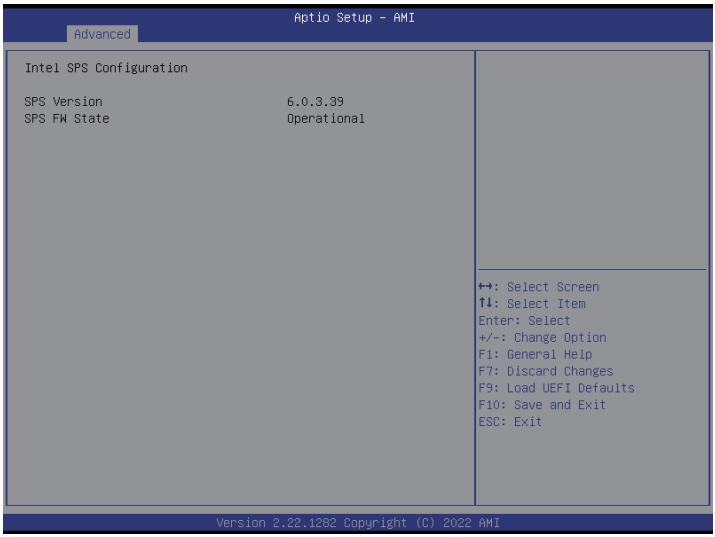
Stop Bits EMS

3.3.9 H/W Monitor

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

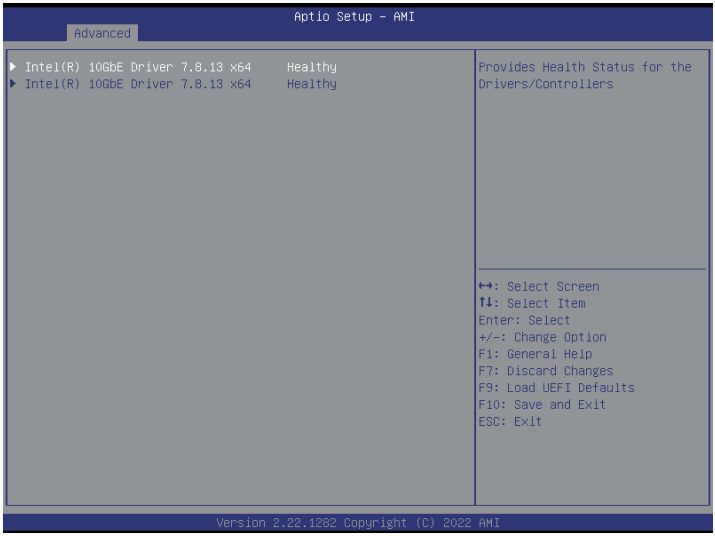


3.3.10 Intel SPS Configuration



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

3.3.11 Driver Health



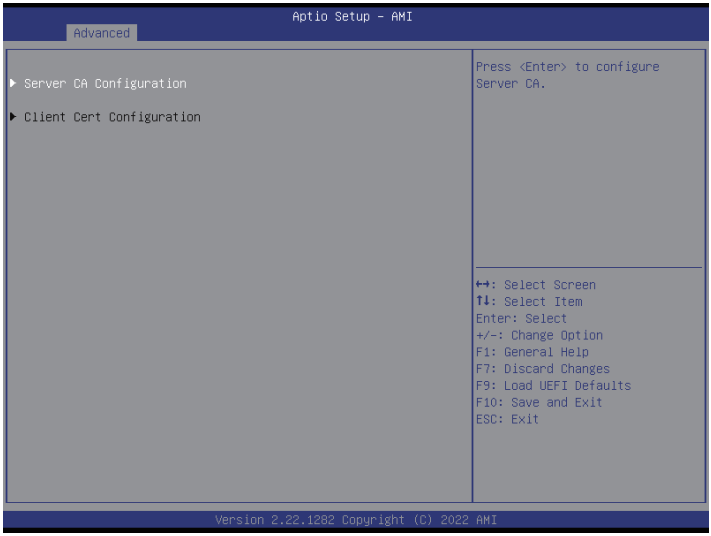
Intel(R) 10GbE Driver 7.8.13 x64 Healthy

This provides health status for the drivers/controllers.

Intel(R) 10GbE Driver 7.8.13 x64 Healthy

This provides health status for the drivers/controllers.

3.3.12 Tls Auth Configuration



Server CA Configuration

Press <Enter> to configure Server CA.

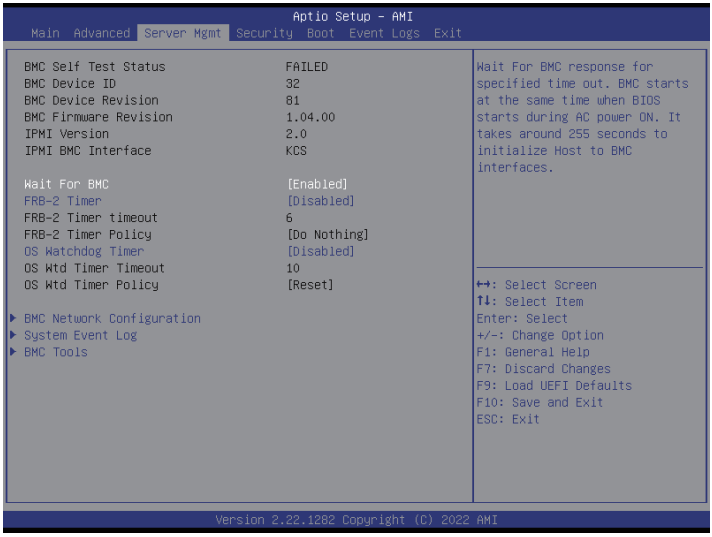
Client Cert Configuration

Press <Enter> to configure Client Cert.

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. BMC starts at the same time when BIOS starts during AC power ON. It takes around 90 seconds to initialize Host to BMC interfaces.

FRB-2 Timer

Use this item to enable or disable FRB-2 timer (POST timer).

FRB-2 Timer Timeout

Enter value between 1 to 30 min for FRB-2 Timer Expiration.

FRB-2 Timer Policy

Use this item to configure how the system should respond if the FRB-2 Timer expires. Not available if FRB-2 Timer is disabled.

OS Watchdog Timer

If enabled, starts a BIOS timer which can only be shut off by Management Software after the OS loads. Helps determine that the OS successfully loaded or follows the OS Boot Watchdog Timer policy.

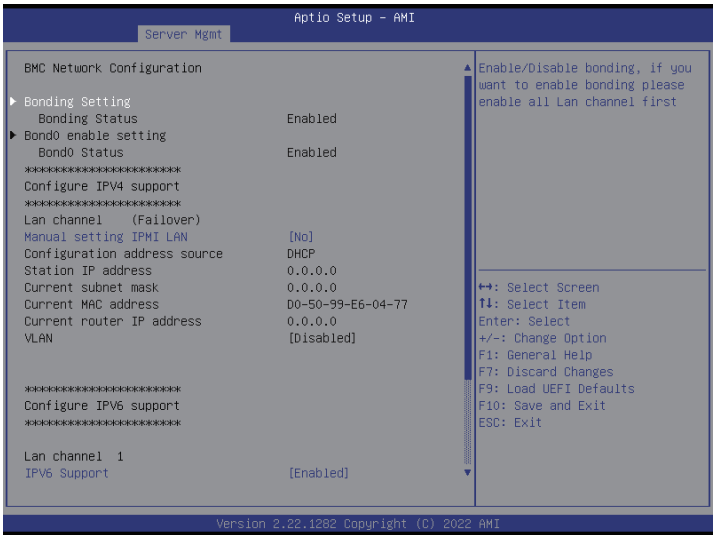
OS Wtd Timer Timeout

Enter the value Between 1 to 30 min for OS Boot Watchdog Timer Expiration. Not available if OS Boot Watchdog Timer is disabled.

OS Wtd Timer Policy

Configure how the system should respond if the OS Boot Watchdog Timer expires. Not available if OS Boot Watchdog Timer is disabled.

3.4.1 BMC Network Configuration



Bonding Setting

Use this item to enable or disable bonding. If you want to enable bonding, please enable all Lan channel first.

BMC Out of band Access

Use this item to enable or disable BMC Out of band Access.

Manual Setting IPMI LAN

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

Configuration Address Source

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

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

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

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

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

VLAN

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

IPV6 Support

Enabled/Disable LAN1 IPV6 Support.

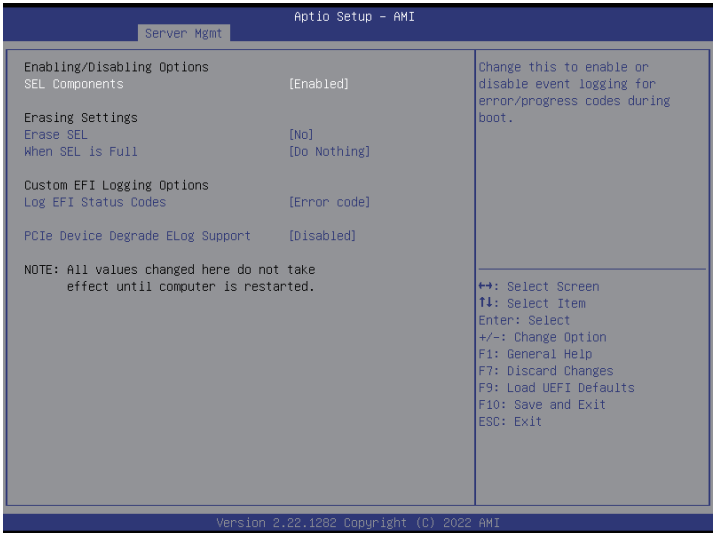
Manual Setting IPMI LAN(IPV6)

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

IPV6 Index

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

3.4.2 System Event Log



SEL Components

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

Erase SEL

Use this to choose options for earsing SEL.

When SEL is Full

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

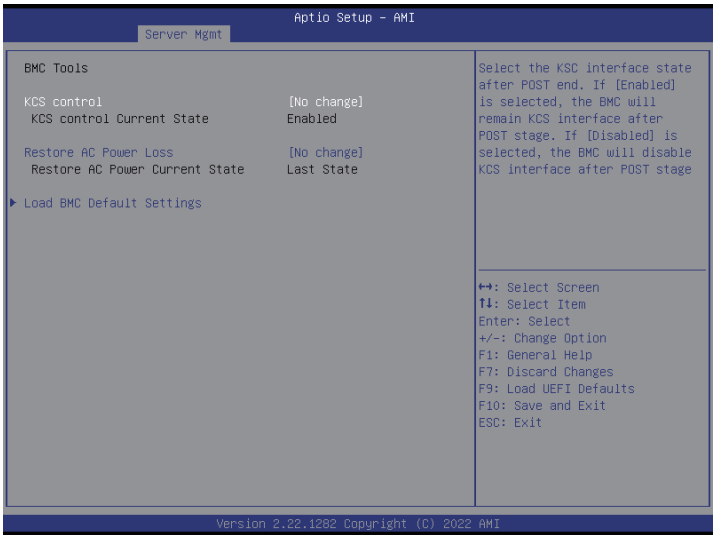
Log EFI Status Codes

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

PCIe Device Degrade ELog Support

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

3.4.4 BMC Tools



KCS Control

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

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.

Load BMC Default Settings

Use this item to Load BMC Default Settings

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

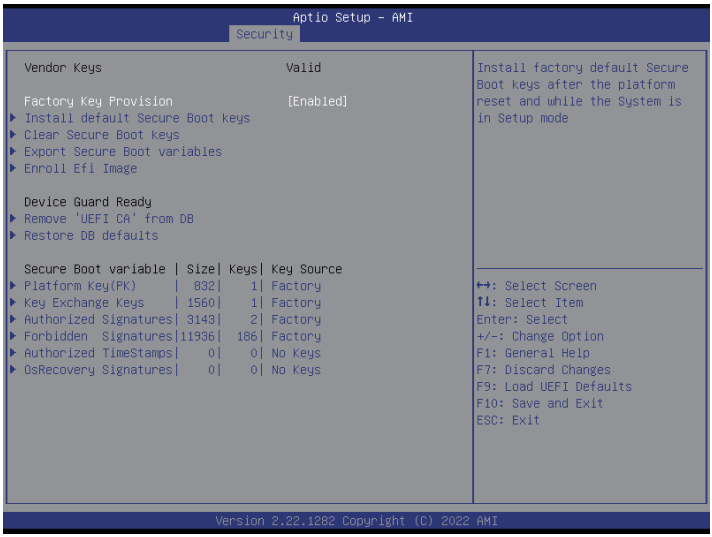
Use this to enable or disable Secure Boot Control. The default value is [Disabled]. Enable to support Windows Server 2012 R2 or later versions Secure Boot.

Secure Boot Mode

Secure Boot mode selector: Standard/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

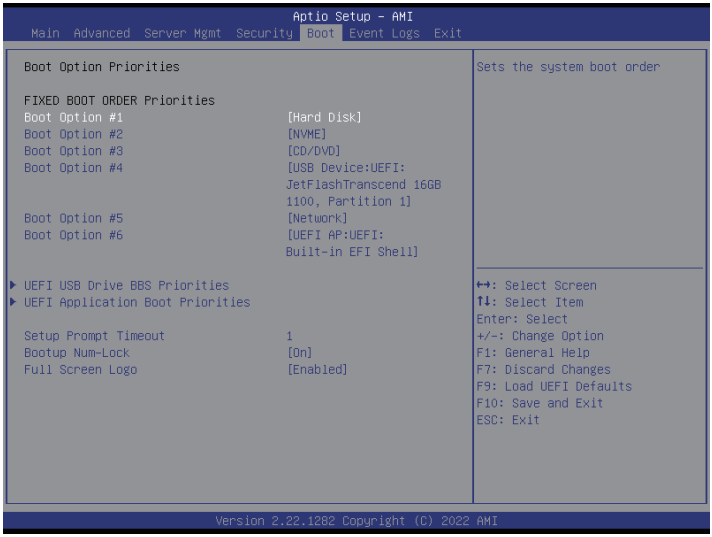
2. Authenticated UEFI Variable

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 #2

Use this item to set the system boot order.

Boot Option #3

Use this item to set the system boot order.

Boot Option #4

Use this item to set the system boot order.

Boot Option #5

Use this item to set the system boot order.

Boot Option #6

Use this item to set the system boot order.

UEFI USB Drive BBS Priorities *(This item appears when an USB device is installed.)*

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

UEFI NVME Drive BBS Priorities *(This item appears when a NVME device is installed.)*

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

UEFI Application Boot Priorities

Specifies the Boot Device Priority sequence from available UEFI Application.

Setup Prompt Timeout

This shows the number of seconds to wait for setup activation key. 65535(0XFFFF) means indefinite waiting.

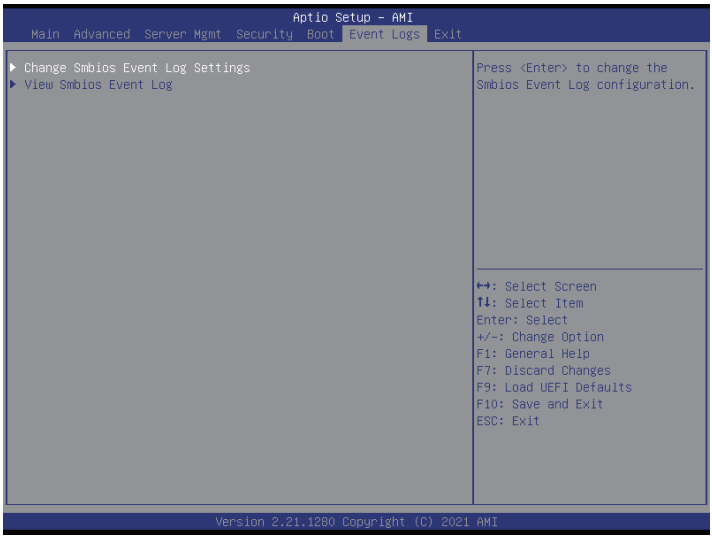
Bootup Num-Lock

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

Full Screen Logo

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

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].

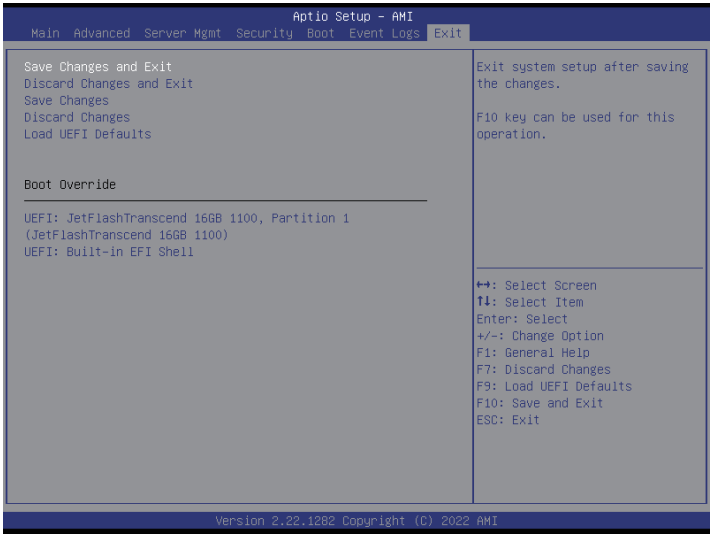
Log System Boot Event
Choose option to enable/disable logging of System boot event.

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 Exit Screen



Save Changes and Exit

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

Discard Changes and Exit

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

Save Changes

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

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.

Chapter 5 Troubleshooting

5.1 Troubleshooting Procedures

Follow the procedures below to troubleshoot your system.

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

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

If there is no power...

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

If there is no video...

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

If there are memory errors...

1. Verify that the DIMM modules are properly seated in the slots.
2. Use recommended DDR4 ECC / non-ECC SODIMM.
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

ASRock Rack Incorporation

e-mail: ASRockRack_sales@asrockrack.com

ASRock Rack Europe B.V.

Bijsterhuizen 11-11
6546 AR Nijmegen
The Netherlands
Phone: +31-24-345-44-33

ASRock Rack America, Inc.

4331 Eucalyptus Ave., Chino, CA 91710 U.S.A.
Phone: +1-909-590-8308
Fax: +1-909-590-1026