LV-C232/V

User Manual

Version 1.0
Published November 2019

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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.

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"

Contents

Chapter 1 Introduction

Thank you for purchasing ***LV-C232/V*** motherboard, a reliable motherboard produced under our consistently stringent quality control. It delivers excellent performance with robust design conforming to our 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.

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 the official website without further notice.

If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.

1.1 Package Contents

- LV-C232/V Motherboard
  (mATX Form Factor: 9.6-in x 9.6-in, 24.4 cm x24.4 cm)
- 1 x Screw for M.2 Socket

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

1.2 Specifications

LV-C232/V	
MB Physical Status	
Form Factor	mATX
Dimension	9.6'' x 9.6'' (24.4 cm x24.4 cm)
Processor System	
CPU	Intel® Xeon® E3-1200 v5/v6 Series Processors* **BIOS version 2.0 or above is required for v4 series.*
Chipset	Intel® C232
System Memory	
Capacity	4 x DDR4 DIMM slots
Type	- Dual Channel DDR4 memory technology - Supports DDR4 2400*/2133/1866/1600 ECC/non-ECC** UDIMM memory **Only E3-1200 v6 CPUs can support DDR4 2400* ***Non-ECC UDIMM support Client OS only.*
DIMM Size Per DIMM	ECC and non-EDD UDIMM : 16GB, 8GB, 4GB
Voltage	1.2V
Expansion Slot	
PCIe 3.0 x16	1 slot (PCIE4/6: x16/x0, x8/x8)
PCIe 3.0 x8	1 slot (PCIE4 /x8)
PCIe 3.0 x4	1 slot (PCIE7 : shared with M.2)
PCIe 3.0 x1	1 slot
Storage	
SATA Controller	6x SATA3 6Gb/s (support SATA DOM), support RAID 0, 1, 5, 10
Ethernet	
Interface	1000 /100 /10 Mbps
LAN	2 x RJ45 GLAN by Intel® i210 - 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 AST2400
IPMI Dedicated GLAN	1 x Realtek RTL8211E for dedicated management GLAN
Features	- Watch Dog - NMI

Graphics	
Controller	ASPEED AST2400
VRAM	DDR3 16MB
Rear Panel I/O	
VGA Port	1 x D-Sub
USB 3.0 Port	4
LAN Port	- RJ45: 2x GLAN(by Intel® i210) - LAN Ports with LED (ACT/LINK LED and SPEED LED)
Dedicated LAN	RT8211E
Serial Port	1 (COM1)
UID Button/ LED	1
Internal Connector	
Auxiliary Panel Header	1 (includes chassis intrusion, location button & LED, and front LAN LED)
M.2	1
SATA DOM	1 (Red)
Buzzer	1
Fan Header	4 (FAN1/FAN2/CPU_FAN/REAR_FAN)
ATX Power	1x (24-pin) + 1x (8-pin)
USB 3.0 Header	1 (2 port)
USB 2.0 Header	1 (2 port)
System BIOS	
BIOS Type	128 Mb AMI UEFI Legal BIOS
BIOS Features	- Plug and Play (PnP) - ACPI 2.0 Compliance Wake Up Events - SMBIOS 2.8.0 Support - Instant Flash
Hardware Monitor	
Temperature	- CPU Temperature Sensing - System Temperature Sensing - System Inlet Temperature Sensing
Fan	- CPU/Rear/Front Fan Tachometer - CPU Quiet Fan (Allow CPU Fan Speed Auto-Adjust by CPU Temperature) - CPU/Rear/Front Fan Multi-Speed Control
Voltage	Voltage Monitoring: +12V, +5V, +3.3V, CPU Vcore, DRAM, 1.0V_M, +BAT, 3VSB, 5VSB
Watchdog	Yes

Support OS	
OS	Microsoft® Windows® - Server 2008 R2 SP1 (64 bit) - Server 2012 (64 bit) - Server 2012 R2 (64 bit) - Server 2016 (64 bit) Linux® - RedHat Enterprise Linux Server 6.6 (32 / 64 bit) / 7.0 (64 bit) - CentOS 6.6 (32 / 64 bit) / 7.0 (64 bit) - SUSE Enterprise Linux Server 11 SP3 (32 / 64 bit) / 12.0 (64 bit) - Fedora core 22 (64 bit) - Ubuntu 15.04 (64 bit) / 15.10 (64 bit) (AHCI mode) *Please refer to our website for the latest OS support list. *Note: Server 2008 R2 installation media does not include native driver support for USB 3.0. Please update a Server 2008 R2 installation image to include USB 3.0 drivers when installing OS by Server 2008 R2 installation image.*
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.

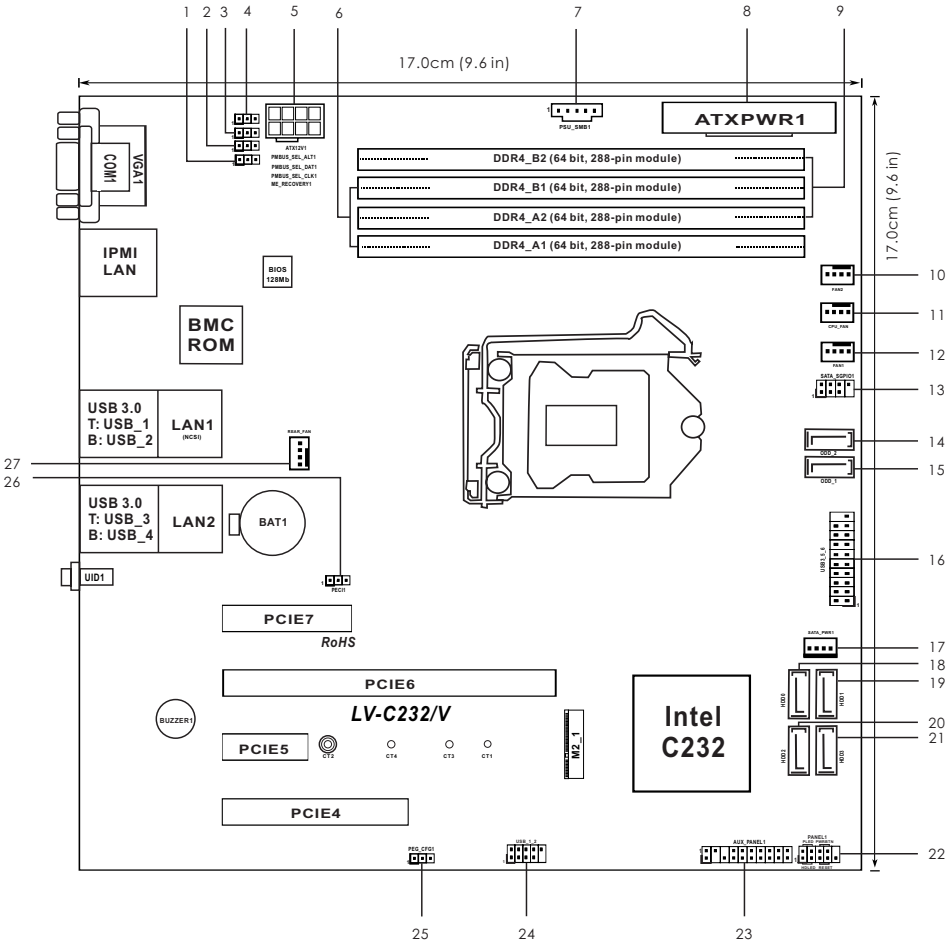
If you install Intel® LAN utility or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If you install the drivers only, it will pass the WHQL tests.

English

1.3 Unique Features

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 Instant Flash. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.

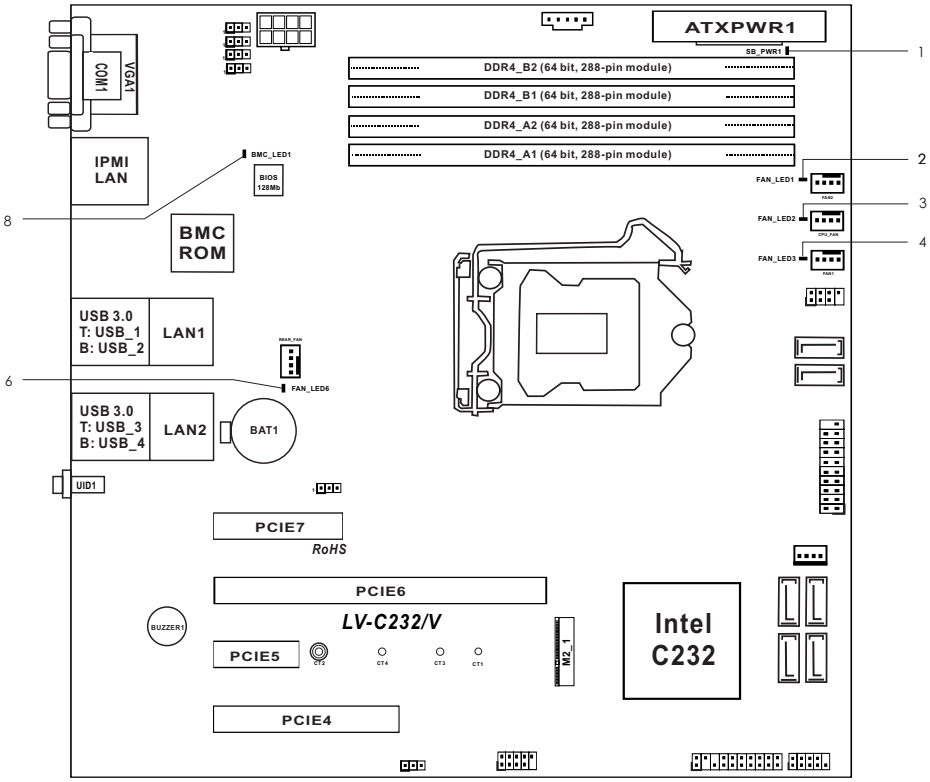
1.4 Motherboard Layout



No.	Description
1	ME Recovery Jumper (ME_RECOVERY1)
2	PMBUS Mode Jumper (PMBUS_SEL_CLK1)
3	PMBUS Mode Jumper (PMBUS_SEL_DAT1)
4	PMBUS Mode Jumper (PMBUS_SEL_ALT1)
5	ATX 12V Power Connector (ATX12V1)
6	2 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_B1, White)
7	PSU SMBus (PSU_SMB1)
8	ATX Power Connector (ATXPWR1)
9	2 x 288-pin DDR4 DIMM Slots (DDR4_A2, DDR4_B2, Blue)
10	Front Fan Connector (FAN2)
11	CPU Fan Connector (CPU_FAN)
12	Front Fan Connector (FAN1)
13	SATA SGPIO Connector (SATA_SGPIO1)
14	SATA3 DOM Connector (ODD_2), Red
15	SATA3 Connector (ODD_1)
16	USB 3.0 Header (USB3_5_6)
17	SATA DOM Power Header (SATA_PWR1)
18	SATA3 Connector (HDD0)
19	SATA3 Connector (HDD1)
20	SATA3 Connector (HDD2)
21	SATA3 Connector (HDD3)
22	System Panel Header (PANEL1)
23	Auxiliary Panel Header (AUX_PANEL1)
24	USB 2.0 Header (USB_1_2)
25	PCI Express Graphics Configuration Jumper (PEG_CFG1)
26	CPU PECI Mode Jumper (PECI1)
27	Rear Fan Connector (REAR_FAN)

For DIMM installation and configuration instructions, please see p.16 (Installation of Memory Modules (DIMM)) for more details.

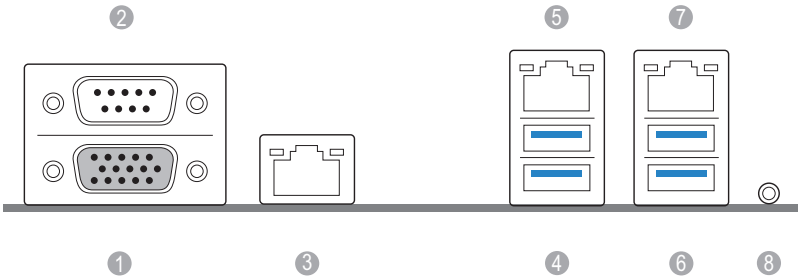
1.5 Onboard LED Indicators



No.	Status	Description
1	Green	STB PWR ready
2	Red	FAN2 failed
3	Red	CPU_FAN failed
4	Red	FAN1 failed
5	Red	REAR_FAN failed
6	Green	BMC heartbeat LED

English

1.6 I/O Panel

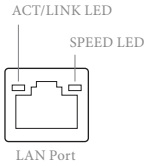


No.	Description	No.	Description
1	VGA Port (VGA1)	5	LAN RJ-45 Port (LAN1)**
2	Serial Port (COM1)	6	USB 3.0 Ports (USB3_3_4)
3	LAN RJ-45 Port (IPMI_LAN1)*	7	LAN RJ-45 Port (LAN2)**
4	USB 3.0 Ports (USB3_1_2)	8	UID Switch (UID1)

Note: 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.

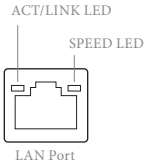


Dedicated IPMI LAN Port LED Indications

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

English

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



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 Amber	Data Activity
Green	1Gbps connection	On	Link

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.

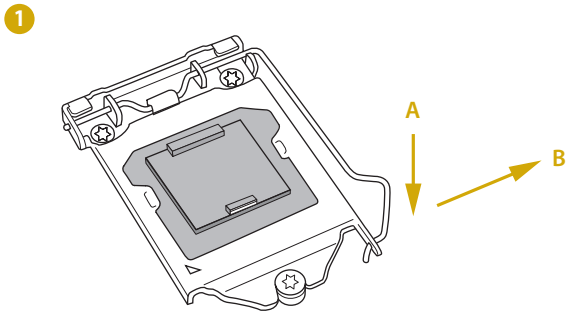
1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before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

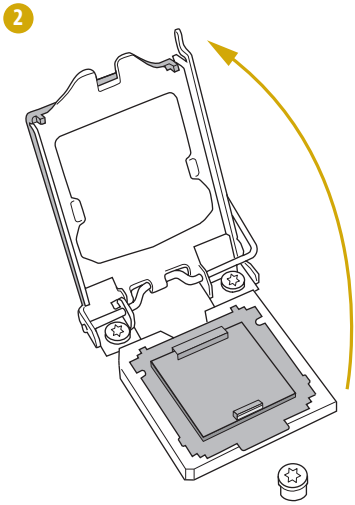
Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

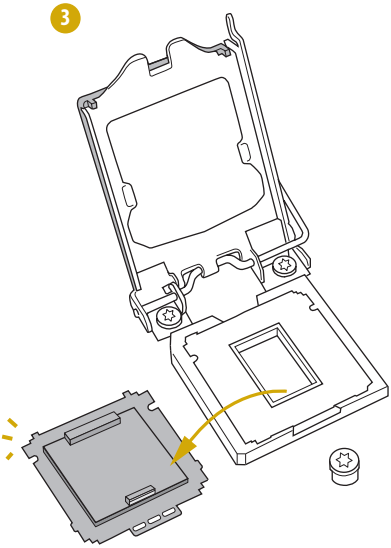
2.3 Installing the CPU

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.







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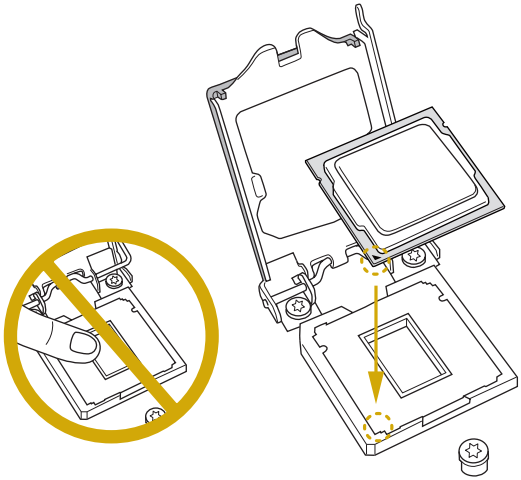

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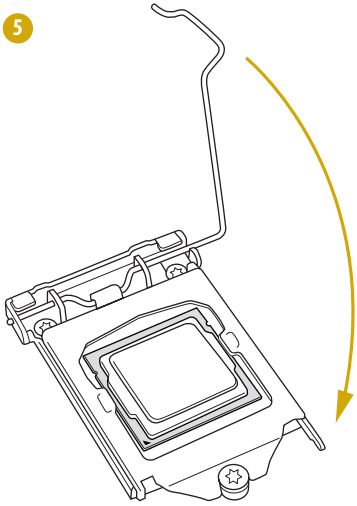

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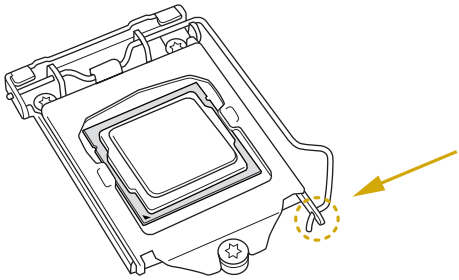
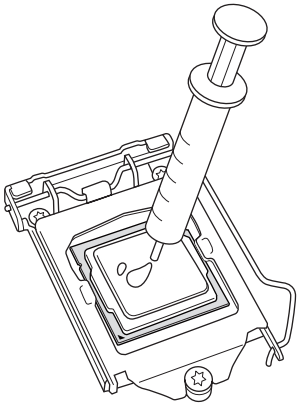
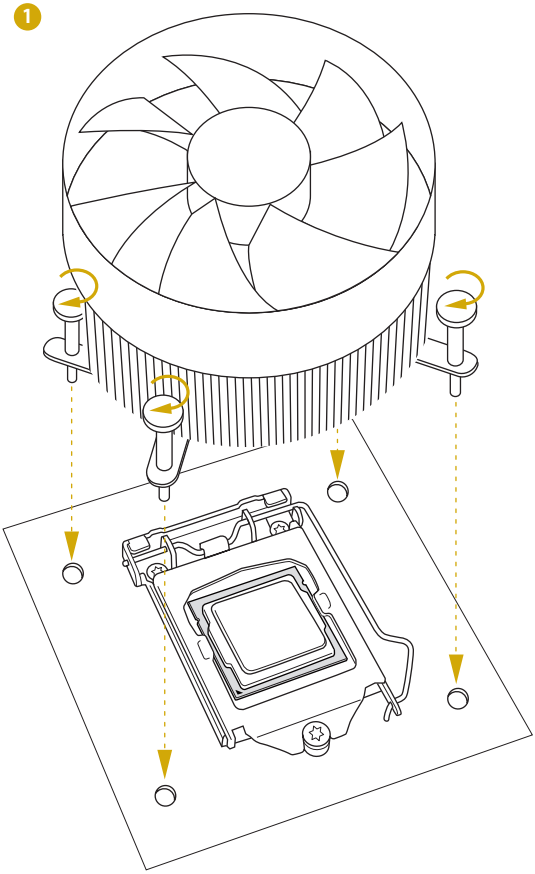
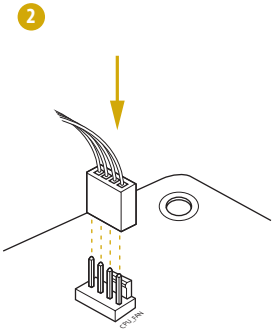


Please save and replace the cover if the processor is removed. The cover must be placed if you wish to return the motherboard for after service.

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.

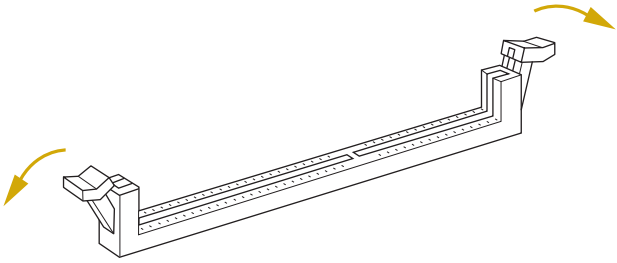
1. *For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR4 DIMM pairs.*
2. *It is unable to activate Dual Channel Memory Technology with only one or three memory module installed.*
3. *It is not allowed to install a DDR, DDR2 or DDR3 memory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

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

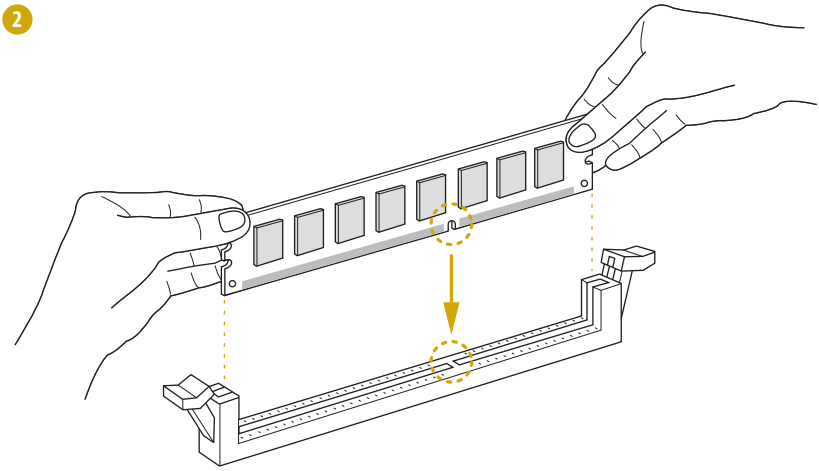
	CPU1			
	A1	A2	B1	B2
1 DIMM		#		
2 DIMMS		#		#
2 DIMMS	#		#	
4 DIMMS	#	#	#	#

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.

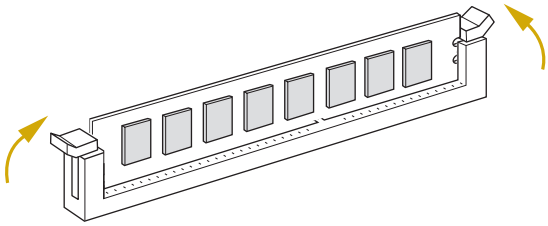
1



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 PCI Express slots on this motherboard.

PCIE slot:

PCIE4 (PCIe 3.0 x4 slot) is used for PCI Express x4 lane width cards.
PCIE5 (PCIe 3.0 x16 slot) is used for PCI Express x16 lane width cards.
PCIE6 (PCIe 3.0 x1 slot) is used for PCI Express x1 lane width cards.
PCIE7 (PCIe 3.0 x8 slot) is used for PCI Express x8 lane width cards.

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

**The M.2 slot (M2_1) is shared with the PCIE7 slot. When M2_1 is populated with a M.2 PCI Express module, PCIE7 is disabled.*

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.

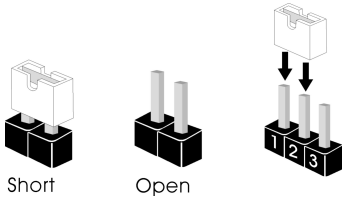
Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.

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.

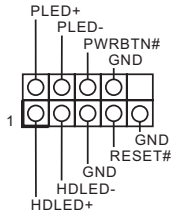


ME Recovery Jumper (3-pin ME_RECOVERY1) (see p.6, No. 1)	1_2 Normal Mode (Default)	2_3 ME Recovery Mode
CPU PECI Mode Jumper (3-pin PECI1) (see p.6, No. 26)	1_2 CPU PECI connect to PCH	2_3 CPU PECI connect to BMC (Default)
PMBUS Mode Jumper (3-pin PMBUS_SEL_ALT1) (see p.6, No. 4) (3-pin PMBUS_SEL_DAT1) (see p.6, No. 3) (3-pin PMBUS_SEL_CLK1) (see p.6, No. 2)	1_2 PMBus connected to BMC (Default)	2_3 PMBus connected to PCH
PCI Express Graphics Configuration Jumper (PEG_CFG1) (see p.6, No. 25)	1_2 Normal Mode (Default)	2_3 PCIE6 force @ x8 x8

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. 22)



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.

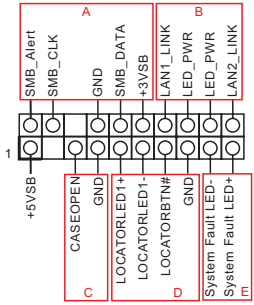
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

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)
(see p.6, No. 23)



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.

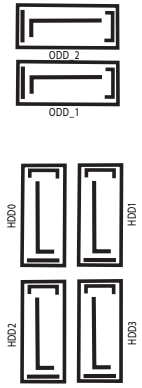
B. Internet status indicator (2-pin LAN1_LED, LAN2_LED)
These two 2-pin headers allow you to use the Gigabit internet indicator cable to connect to the LAN status indicator. When this indicator flickers, it means that the internet is properly connected.

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
(ODD_1)
(see p.6, No. 15)
(ODD_2)
(see p.6, No. 14)
(HDD0)
(see p.6, No. 18)
(HDD1)
(see p.6, No. 19)
(HDD2)
(see p.6, No. 20)
(HDD3)
(see p.6, No. 21)

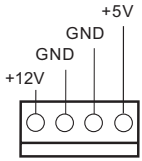


These SATA3 connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

Serial ATA3 DOM Connector
(ODD_2)
(see p.6, No. 14)

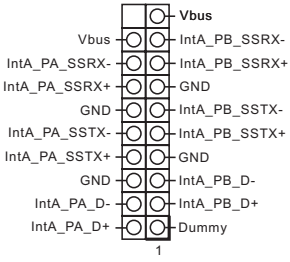
The SATA3 DOM connector supports both a SATA DOM (Disk-On-Module) and a SATA data cable for internal storage device.

SATA Power Connector
(4-pin SATA_PWR1)
(see p.6, No. 17)



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

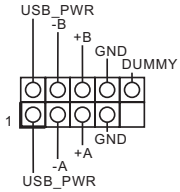
USB 3.0 Header
(19-pin USB3_5_6)
(see p.6, No. 16)



Besides four default USB 3.0 ports on the I/O panel, there is one USB 3.0 header on this motherboard. This USB 3.0 header can support two USB 3.0 ports.

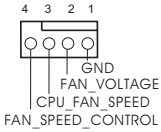
English

USB 2.0 Header
(9-pin USB_1_2)
(see p.6, No. 24)



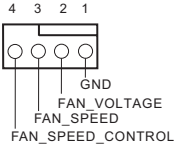
There is one USB 2.0 header on this motherboard. Each USB 2.0 header can support two ports.

CPU Fan Connector
(4-pin CPU_FAN)
(see p.6, No. 11)



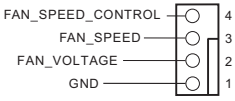
This motherboard provides one 4-Pin CPU fan (Quiet Fan) connectors. If you plan to connect a 3-Pin CPU fan, please connect it to Pin 1-3.

Front and Rear Fan Connectors
(4-pin FAN1)
(see p.6, No. 12)
(4-pin FAN2)
(see p.6, No. 010)

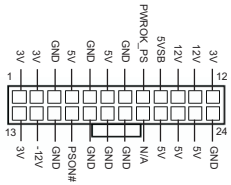


Please connect fan cables to the fan connectors and match the black wire to the ground pin. All fans support Fan Control.

(4-pin REAR_FAN)
(see p.6, No. 27)

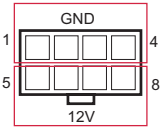
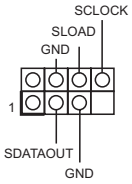
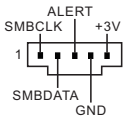


ATX Power Connector
(24-pin ATXPWR1)
(see p.6, No. 8)



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.

English

ATX 12V Power Connector (8-pin ATX12V1) (see p.6, No. 5)		This motherboard provides one 8-pin ATX 12V power connector.
Serial General Purpose Input/Output Header (7-pin SATA_SGPIO1) (see p.6, No. 13)		The headers support Serial Link interface for onboard SATA connections.
PSU SMBus (PSU_SMB1) (see p.6, No. 7)		PSU SMBus monitors the status of the power supply, fan and system temperature.

2.9 Unit Identification purpose LED/Switch

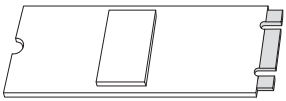
With the UID button, You are able to locate the server you're working on from behind a rack of servers.

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 M.2_SSD (NGFF) Module Installation Guide

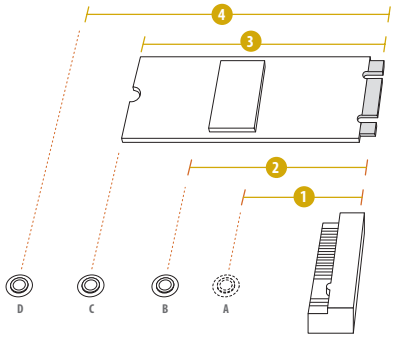
The M.2, also known as the Next Generation Form Factor (NGFF), is a small size and versatile card edge connector that aims to replace mPCIe and mSATA. The Ultra M.2 Socket (M2_1) supports a M.2 SATA3 6.0 Gb/s module or a M.2 PCI Express module up to Gen 3 x4 (32Gb/s).

Installing the M.2_SSD (NGFF) Module



Step 1

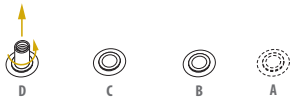
Prepare a M.2_SSD (NGFF) module and the screw.

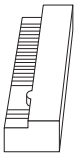


Step 2

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

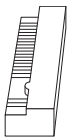
No.	1	2	3	4
Nut Location	A	B	C	D
PCB Length	3cm	4.2cm	6cm	8cm
Module Type	Type2230	Type 2242	Type2260	Type 2280





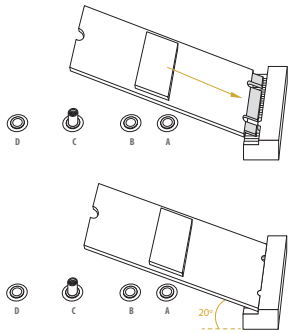
Step 3

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.



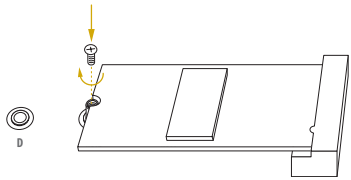
Step 4

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



Step 6

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

For the latest updates of M.2_SSD (NFGG) module support list, please visit our website for details.

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
Boot	To set up the default system device to locate and load the Operating System
Security	To set up the security features
Event Logs	For event log configuration
Server Mgmt	To manage the server
Exit	To exit the current screen or the UEFI SETUP UTILITY

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

English

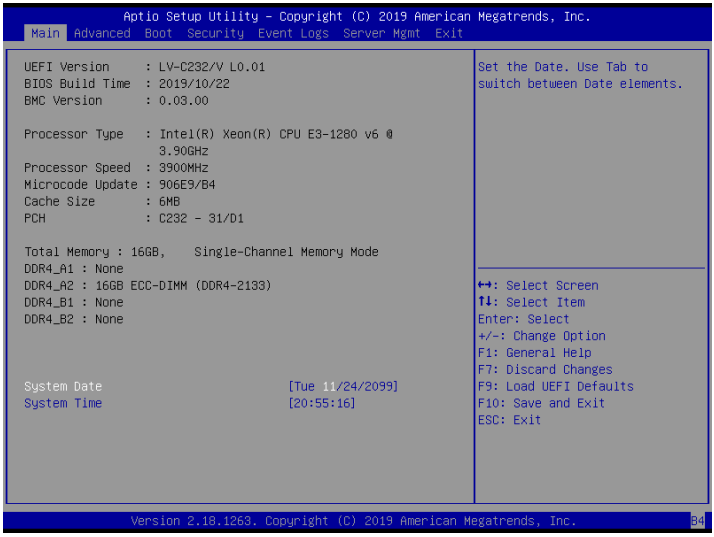
3.1.2 Navigation Keys

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

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

3.2 Main Screen

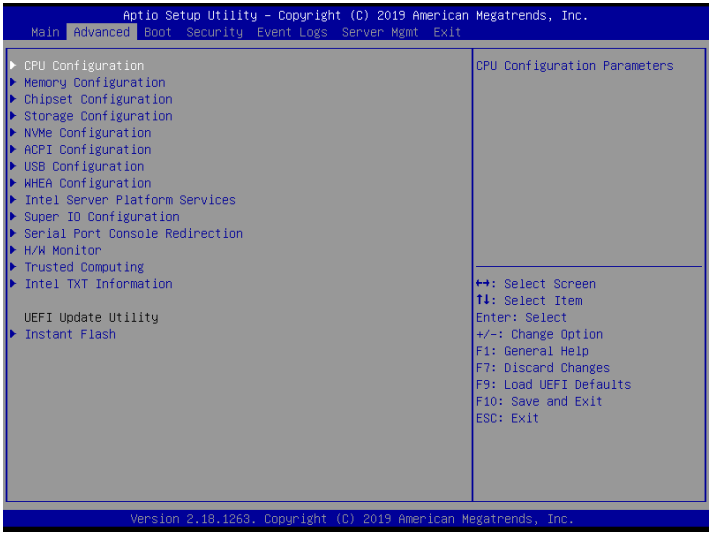
Once you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview. The Main screen provides system overview information and allows you to set the system time and date.



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.

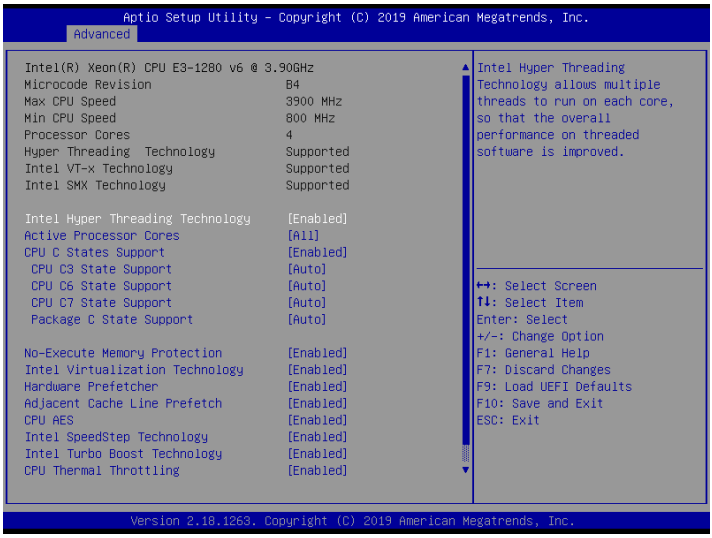
3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Memory Configuration, Chipset Configuration, Storage Configuration, NVMe Configuration, ACPI Configuration, USB Configuration, WHEA Configuration, Intel Server Platform Services, Super IO Configuration, Serial Port Console Redirection, H/W Monitor, Trusted Computing, Intel TXT Information and Instant Flash.



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

3.3.1 CPU Configuration



Intel Hyper Threading Technology

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

Active Processor 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.

CPU C3 State Support

Enable C3 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.

No-Execute Memory Protection

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

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.

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].

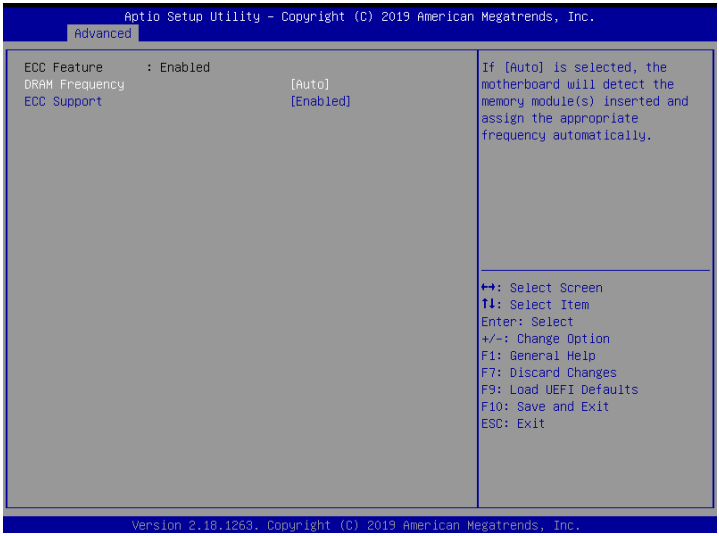
CPU Thermal Throttling

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

SW Guard Extension (SGX)

Intel SGX is a set of new CPU instructions that can be used by applications to set aside private regions of code and data.

3.3.2 Memory Configuration



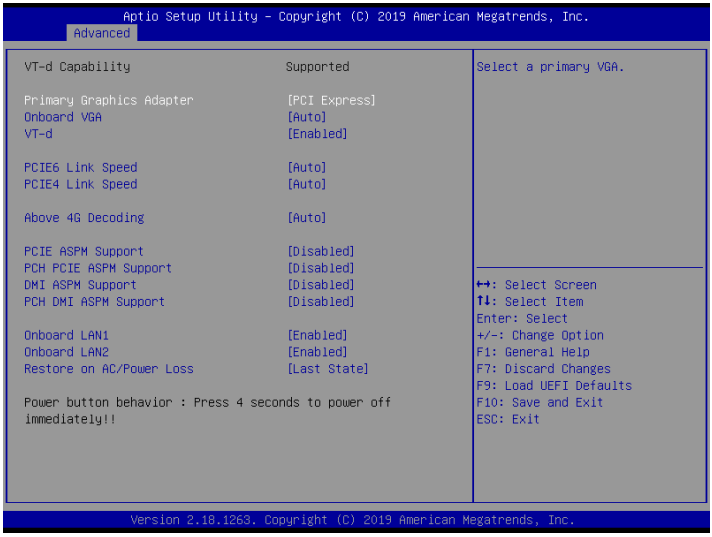
DRAM Frequency

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

ECC Support

Enable/disable DDR Ecc Support.

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].

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

VT-d

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

PCIE 6 Link Speed

This allows you to select PCIE 6 Link Speed. The default value is [Auto].

PCIE 4 Link Speed

This allows you to select PCIE 4 Link Speed. The default value is [Auto].

Above 4G Decoding

Enable/disable above 4GB MemoryMappedIO BIOS assignment. This is disabled automatically when Aperture Size is set to 2048MB.

PCIE ASPM Support

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

PCH PCIE ASPM Support

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

DMI ASPM Support

This option enables/disables the control of ASPM on CPU side of the DMI Link.

PCH DMI ASPM Support

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

Onboard LAN1

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

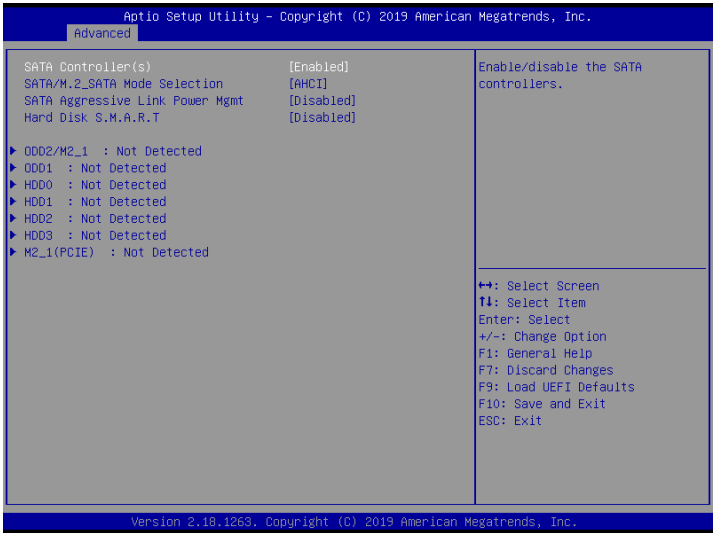
Onboard LAN2

This allows you to enable or disable the Onboard LAN 2 feature.

Restore on 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.

3.3.4 Storage Configuration



SATA Controller(s)

Use this item to enable or disable SATA Controllers.

SATA/M.2_SATA Mode Selection

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

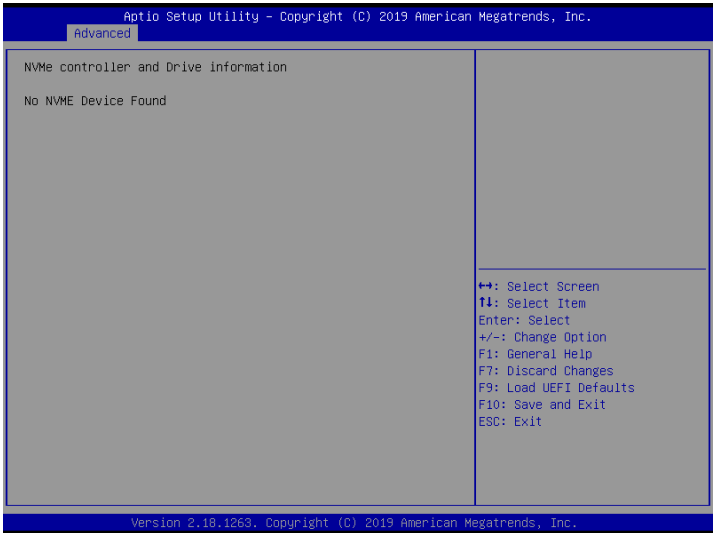
SATA Aggressive Link Power Mgmt

Use this item to enable or disable SALP.

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

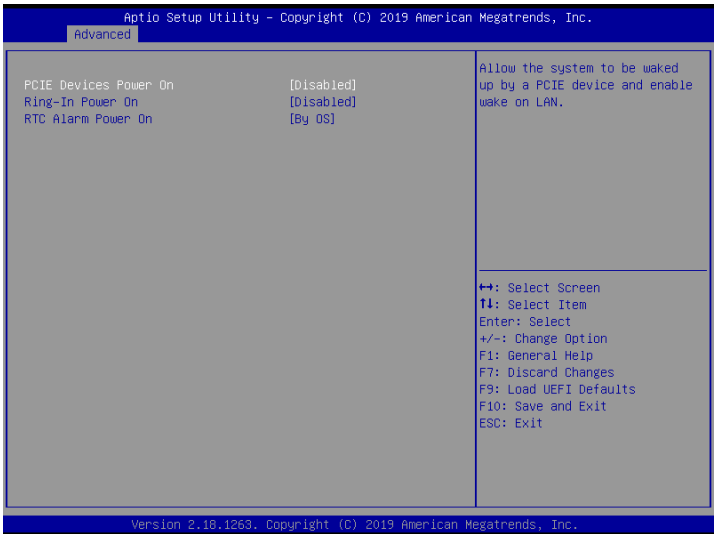
Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled] and [Enabled].

3.3.5 NVMe Configuration



The NVMe Configuration displays the NVMe controller and Drive information.

3.3.6 ACPI Configuration



PCIE Devices Power On

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

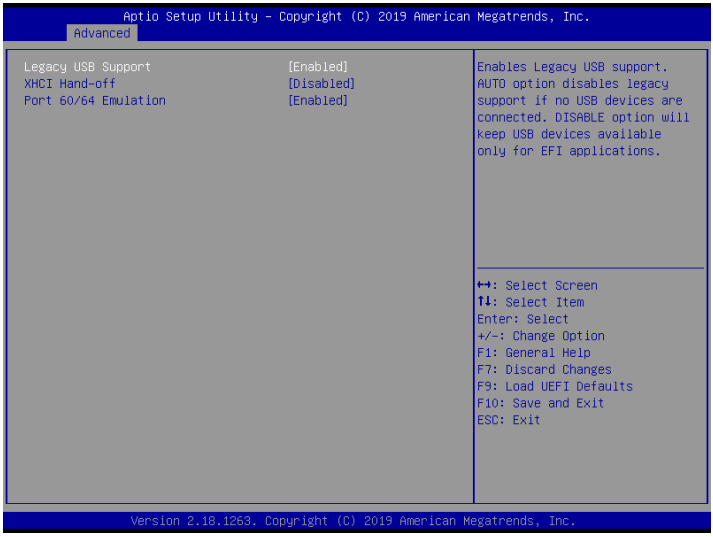
Ring-In Power On

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

RTC Alarm Power On

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

3.3.7 USB Configuration



Legacy USB Support

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

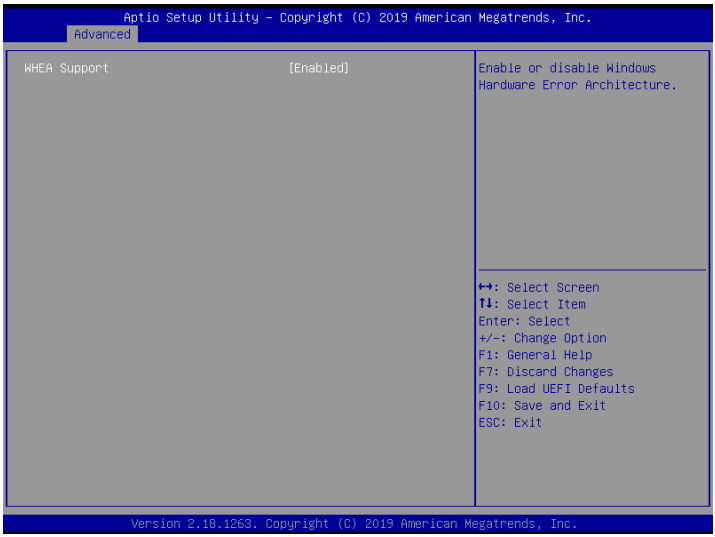
XHCI Hand-off

This is a workaround for 0Ses without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

Port 60/64 Emulation

Enable I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware 0Ses.

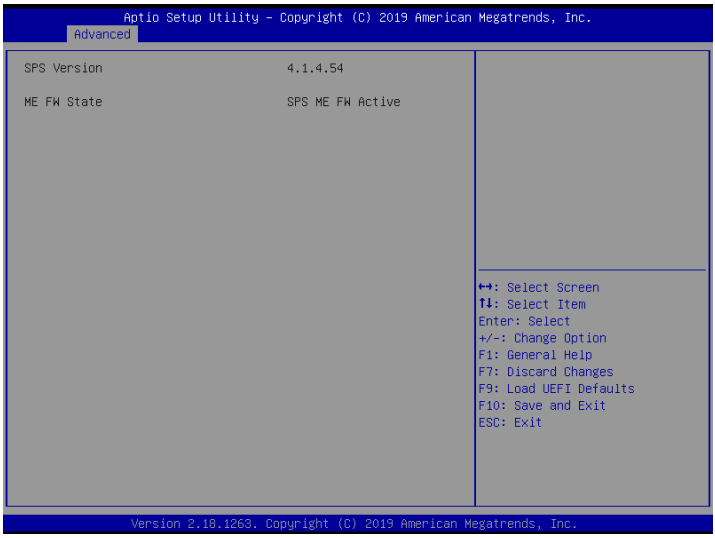
3.3.8 WHEA Configuration



WHEA Support

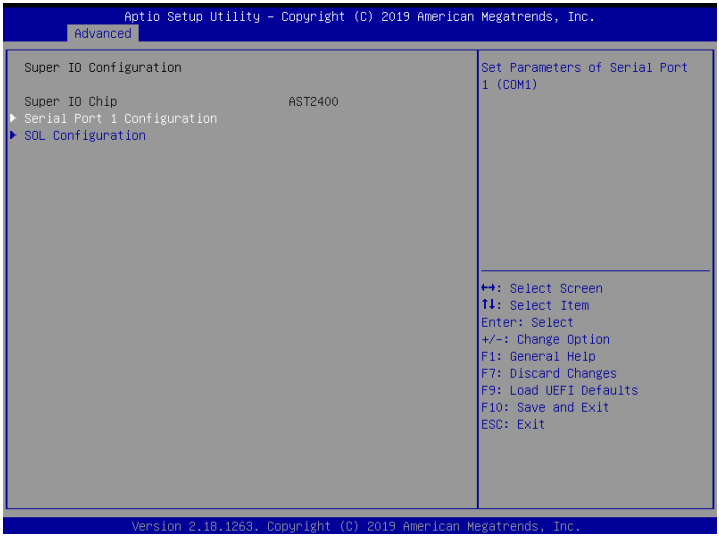
Use this item to enable or disable Windows Hardware Error Architecture.

3.3.9 Intel Server Platform Services



Displays the information of the Intel server platform services.

3.3.10 Super IO Configuration



Serial Port 1 Configuration

Use this item to configure the onboard serial port 1.

Select and enter the "Serial Port 1 Configuration" and you will see the followings:

Serial Port
Use this item to enable or disable the onboard serial port.

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

SOL Configuration

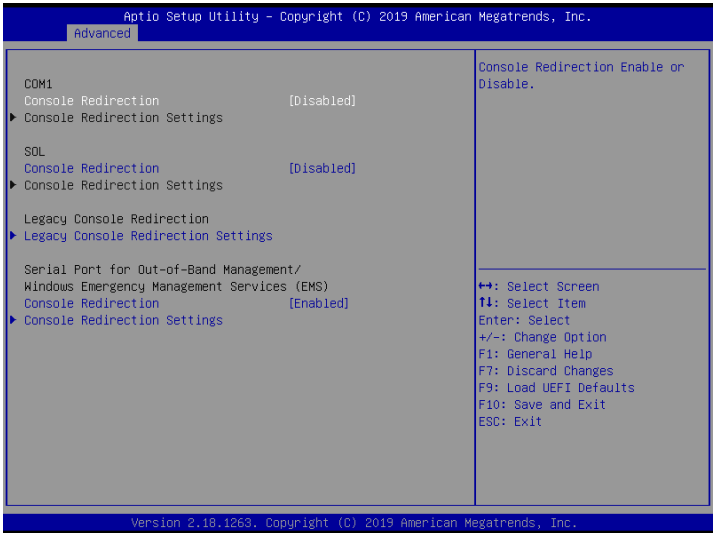
Use this item to set parameters of SOL.

Select and enter the ""SOL Configuration" and you will see the followings:

SOL Port
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.

3.3.11 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.

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.

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].

Legacy Console Redirection

Legacy Console Redirection Settings

Use this option to configure Legacy Console Redirection Settings, and specify how your

computer and the host computer to which you are connected exchange information.

Legacy Serial Redirection Port

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

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

Console Redirection

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

Console Redirection Settings

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

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

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

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

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

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

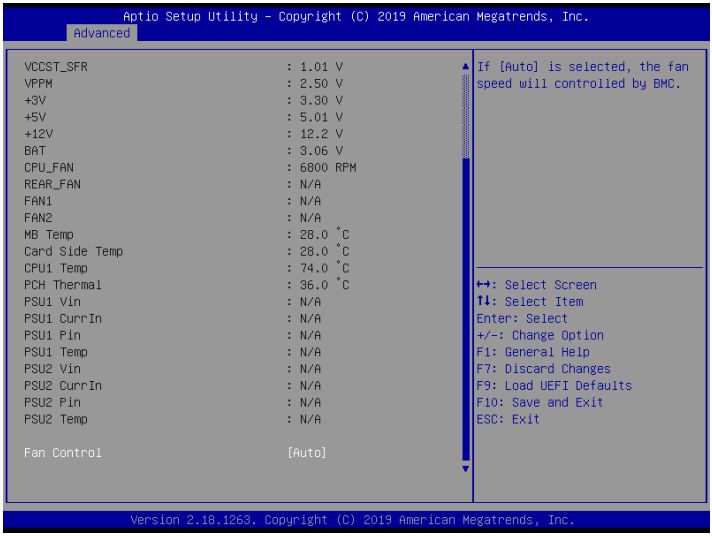
Data Bits

Parity

Stop Bits

3.3.12 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_FAN

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

REAR_FAN

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

FAN1

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

FAN2

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

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)

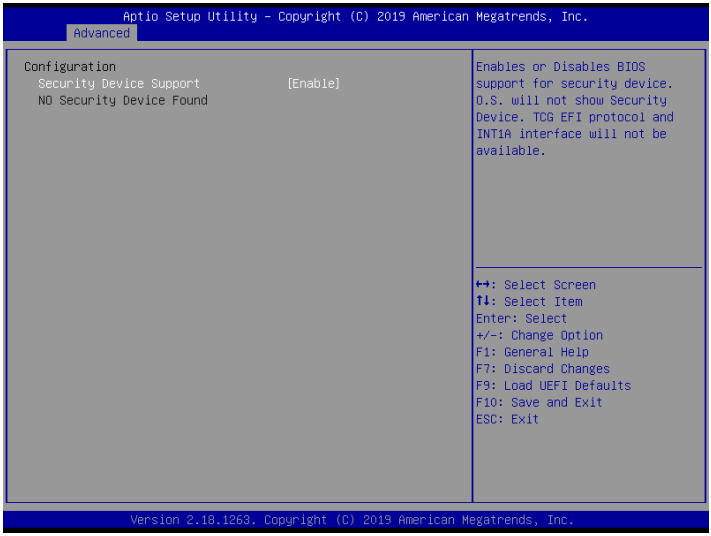
This allows you to set duty cycle for each stage.

Smart Fan Temp Control

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

This allows you to set temperature for each stage.

3.3.13 Trusted Computing

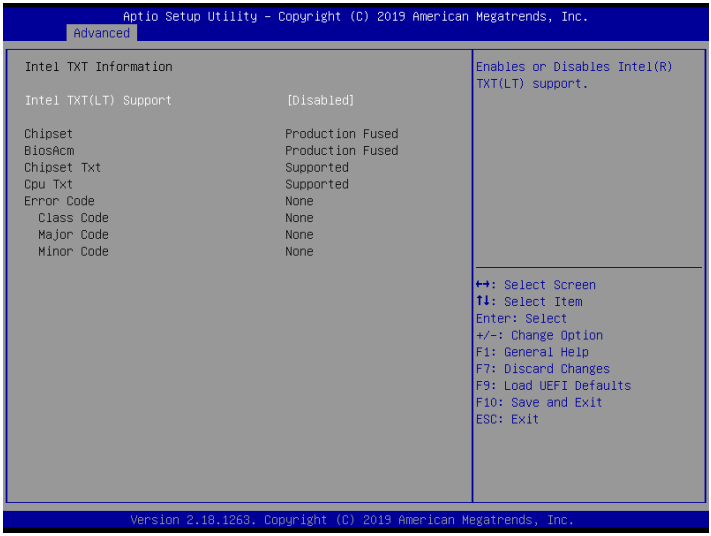


NOTE: Options vary depending on the version of your connected TPM module.

Security Device Support

Use this item to enable or disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

3.3.14 Intel TXT Information



Intel TXT(LT) Support

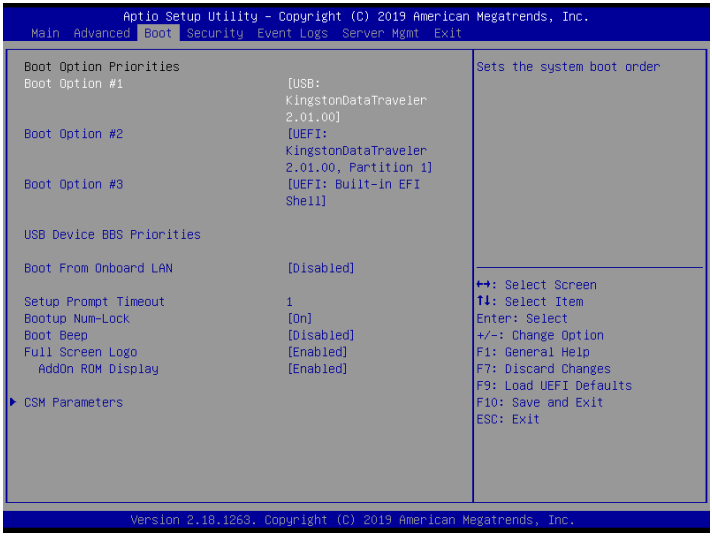
Use this item to enable or disable Intel(R) TXT(LT) support.

3.3.15 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 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.

USB Device BBS Priorities

Set the order of the legacy devices in this group.

Boot From Onboard LAN

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

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.

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.

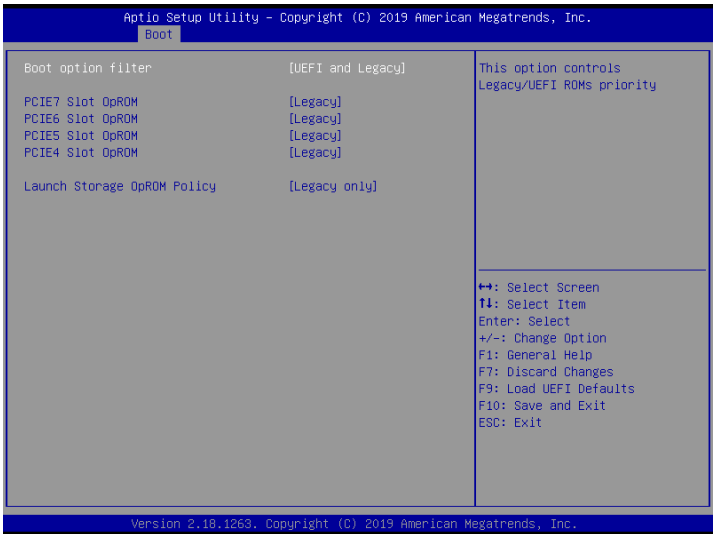
Full Screen Logo

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].

3.4.1 CSM Parameters



Boot Option Filter

This option controls Legacy/UEFI ROMs priority.

PCIE7 Slot OpROM

This option controls Legacy/UEFI ROMs priority.

PCIE6 Slot OpROM

This option controls Legacy/UEFI ROMs priority.

PCIE5 Slot OpROM

This option controls Legacy/UEFI ROMs priority.

PCIE4 Slot OpROM

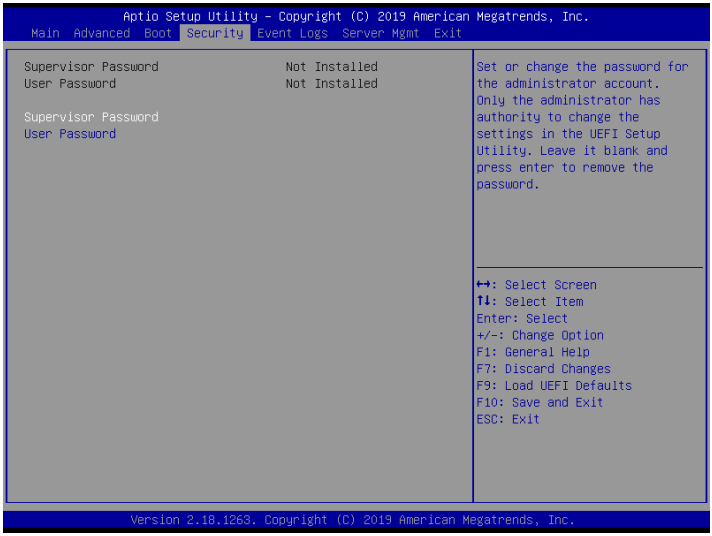
This option controls Legacy/UEFI ROMs priority.

Launch 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.

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.



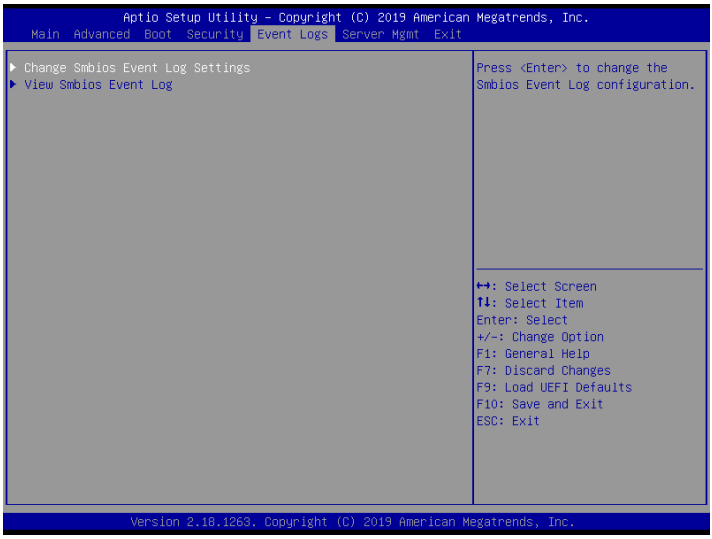
Supervisor Password

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.

3.6 Event Logs



Change Smbios Event Log Settings

This allows you to configure the Smbios Event Log Settings.

When entering the item, you will see the followings:

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

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

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

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.

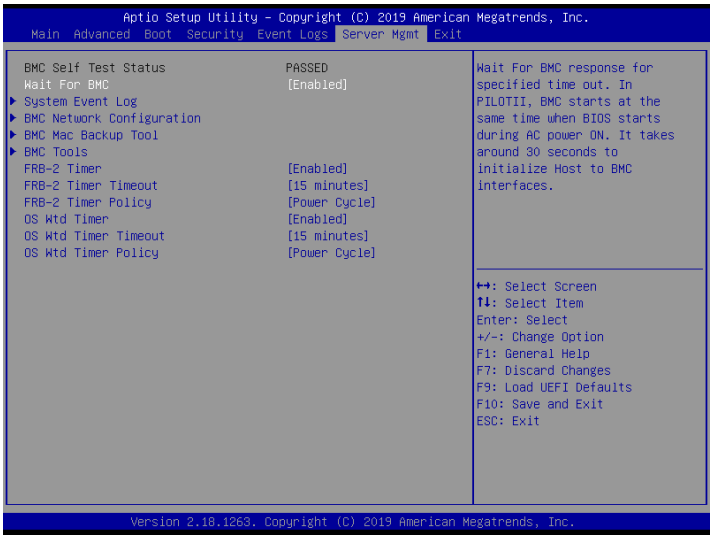
METW (Multiple Event Time Window)
Use this item to specify the number of minutes which must pass between duplicate log entries which utilize a multiple-event counter. The value ranges from 0 to 99 minutes.

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.

3.7 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.

FRB-2 Timer

Enable or Disable FRB-2 Timer(POST timer).

FRB-2 Timer Timeout

Enter a value between 3 to 6 mins for FRB-2 Timer expiration value.

FRB-2 Timer Policy

Configure how the system should respond if the FRB-2 Timer expires. Not available if FRB-2 Timer is disabled.

OS Wtd Timer

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

OS Wtd Timer Timeout

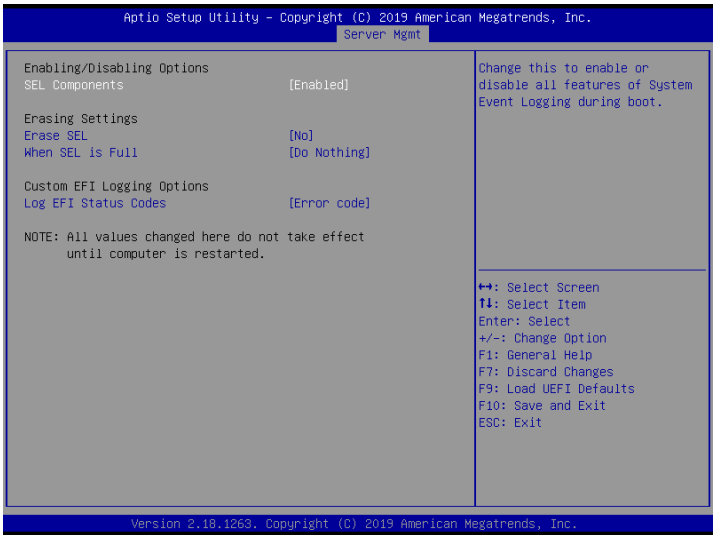
Configure the length of the OS Boot Watchdog Timer. Not available if OS Boot Watchdog

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.

3.7.1 System Event Log



SEL Components

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

Erase SEL

Use this to choose options for erasing SEL.

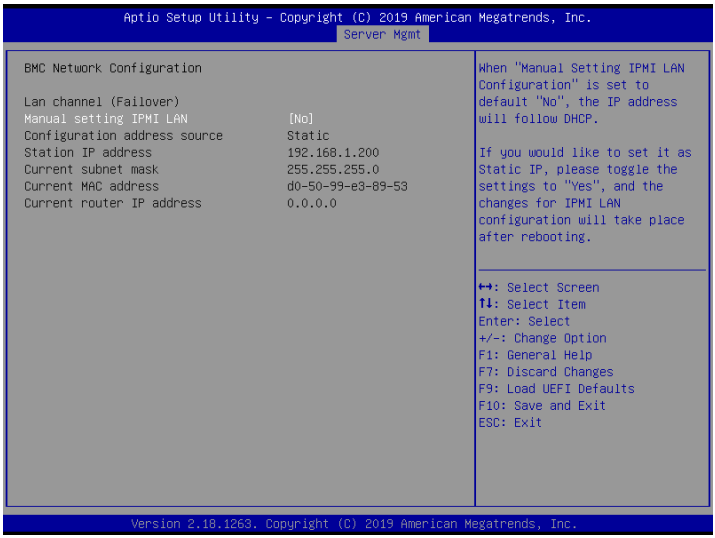
When SEL is Full

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.

3.7.2 BMC Network Configuration



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].

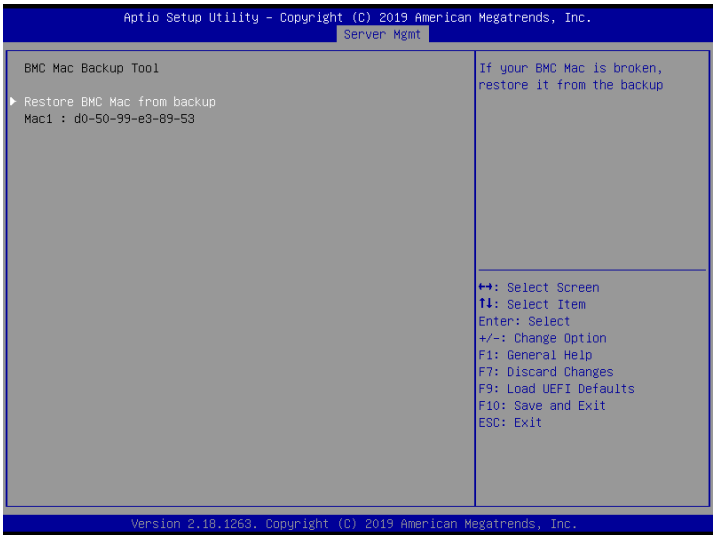
Configuration Address Source

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.

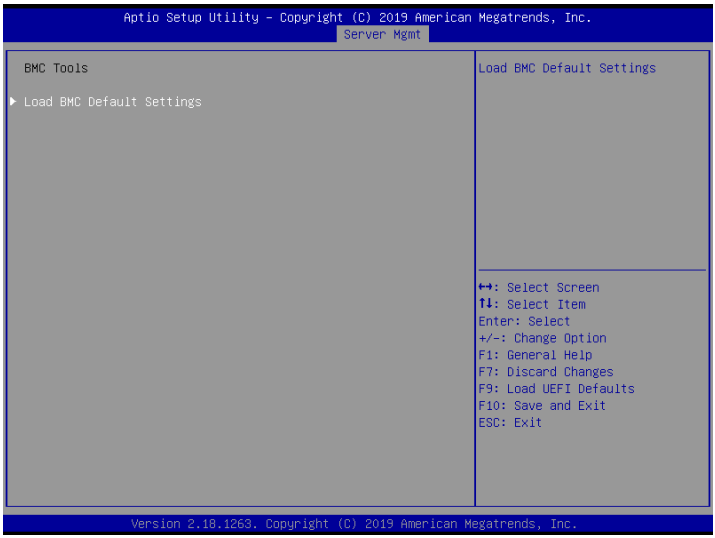
3.7.3 BMC Mac Backup Tool



Restore BMC Mac from backup

If your BMC Mac is broken, restore it from the backup.

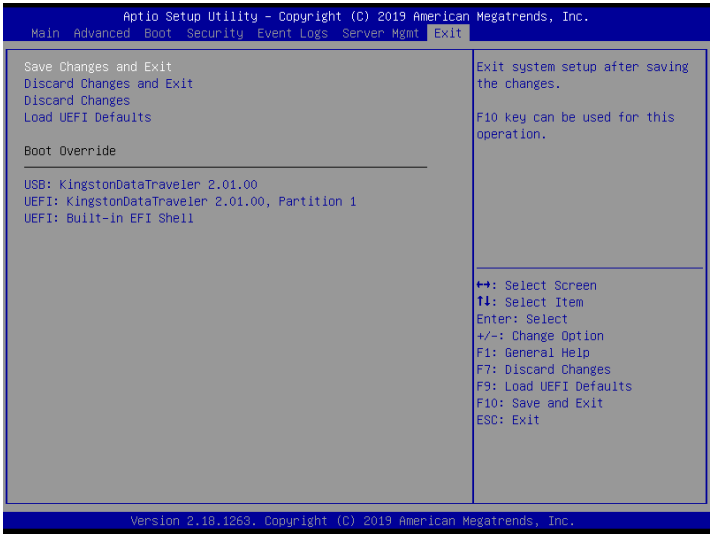
3.7.4 BMC Tools



Load BMC Default Settings

Use this item to load BMC Default Settings.

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

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® Server 2008 R2 SP1 / 2012 / 2012 R2 / 2016 / Linux compliant. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

4.2 Support CD Information

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

4.2.1 Running The Support CD

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

4.2.2 Drivers Menu

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

4.2.3 Utilities Menu

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

4.2.4 Contact Information

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 2133 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 the FAQ page.

5.2 Technical Support Procedures

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

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

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, 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.