P11C-E/4L

Motherboard

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Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.

- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.

- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.

- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.

- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.

- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.

- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.

- Place the product on a stable surface.

- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This user guide contains the following parts:

*   **Chapter 1: Product Introduction**

    This chapter describes the features of the motherboard and the new technologies it supports.

*   **Chapter 2: Hardware Information**

    This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.

*   **Chapter 3: Powering Up**

    This chapter describes the power up sequence and ways of shutting down the system.

*   **Chapter 4: BIOS Setup**

    This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

*   **Chapter 5: RAID Configuration**

    This chapter provides instructions for setting up, creating, and configuring RAID sets using the available utilities.

*   **Chapter 6: Driver Installation**

    This chapter provides instructions for installing the necessary drivers for different system components.

*   **Appendix: Reference Information**

    This appendix includes additional information that you may refer to when configuring the motherboard.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS websites**

    The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. **Optional documentation**

    Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Typography

Bold text	Indicates a menu or an item to select.
Italics	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.
	Example: <Enter> means that you must press the Enter or Return key.
<Key1> + <Key2> + <Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).
	Example: <Ctrl> + <Alt> + <Del>
`Command`	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets.
	Example: At DOS prompt, type the command line:
	`format A:/S`

P11C-E/4L specifications summary

Model Name		P11C-E/4L
Processor Support / System Bus		1 x Socket H4 (LGA1151)
		Intel® Xeon® processor E-21xx/E-22xx product family
		Intel® 8th/9th Generation Core™ i3 processors
		Intel® Pentium™ processors
		Intel® Celeron™ processors
Core Logic		Intel® C246 Chipset
Form Factor		ATX, 12" x 9.6"
ASUS Features	Fan Speed Control	✓
	ASUS Control Center	✓
Memory	Total Slots	4 (2 Channels)
	Voltage	1.2 V
	Capacity	Maximum up to 128GB
	Memory Type	DDR4 2666/2400 ECC/non-ECC UDIMM *** Refer to www.asus.com for the latest memory AVL update.**
	Memory Size	32GB, 16GB, 8GB, 4GB *** Refer to ASUS server AVL for the latest update**
Expansion Slots (follow SSI Location number)	Total PCI/ PCI-X / PCI-E Slots	4+1
	Slot Location 1	1 x PCI slot
	Slot Location 2	-
	Slot Location 3	-
	Slot Location 4	1 x PCI-E x8 slot (Gen3 x4 link)
	Slot Location 5	1 x PCI-E x8 slot (Gen3 x8 link)
	Slot Location 6	1 x PCI-E x16 slot (Gen3 x16/x8 link)
	Slot Location 7	1 x MIO slot for Audio Card with PCI-E x1 slot (Gen3 x1 link)
	Additional Slot 1	-
	Additional Slot 2	-
Networking	LAN	4 x Intel® I210-AT Gigabit LAN + 1 x Mgmt LAN
Graphic	VGA	Aspeed AST2500 64MB

P11C-E/4L specifications summary

Model Name		P11C-E/4L
Storage	**SATA Controller**	**Intel® C246:**
		8 x SATA 6Gb/s ports with 2 x M.2 (NGFF 22110 / 2280 / 2260 / 2242)
		Intel® RSTe (Windows & Linux)
		(Support software RAID 0, 1, 10 & 5)
	SAS Controller	Optional kits:
		ASUS PIKE II 3008-8i 8-port SAS 12Gb/s RAID card
		ASUS PIKE II 3108-8i/16PD/1G 8-port SAS 12Gb/s RAID card
		ASUS PIKE II 3108-8i/16PD/2G 8-port SAS 12Gb/s RAID card
Audio		Realtek® ALC892 8-Channel High Definition Audio CODEC
Onboard I/O Connectors	**TPM Header**	1
	PSU Connector	24-pin ATX power connector + 8-pin ATX 12V power connector
	USB Connector / Header	1 x USB 3.1 Ge n1 header (up to 2 devices)
		1 x USB 2.0 connector (up to 1 device)
		1 x USB 2.0 header (up to 2 devices)
	Fan Header	6 x 4 pin
	SMBus	1
	Chassis Intruder	1
	Front LAN LED	4
	Serial Port Header	2
	Device Power Connector	1
	VGA Header	1
	M.2 Connector	2
	Micro SD card	1
Rear I/O Connectors	**External USB Port**	2 x USB 3.1 Gen 2 ports
		2 x USB 3.1 Gen 1 ports
	VGA Port	1
	RJ-45	4 x GbE LAN
		1 x Management LAN
	Audio Jack(s)	3 (optional)
Management Solution	**Software**	ASUS Control Center
	Out of Band Remote Management	✓
Monitoring	**CPU Temperature**	✓
	FAN RPM	✓
Environment		**Operating temperature:** 10°C ~ 35°C
		Non operating temperature: -40°C ~ 70°C
		Non operating humidity: 20% ~ 90% (Non condensing)

* Specifications are subject to change without notice.

** Refer to www.asus.com for the complete list of supported PIKE cards.

Product Introduction

1

This chapter describes the motherboard features and the new technologies it supports.

1.1 Welcome!

Congratulations and thank you for buying an ASUS® P11C-E/4L motherboard!

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of ASUS quality motherboards!

Before you start installing the motherboard and hardware devices on it, check the items in your package with the list below.

1.2 Package contents

Check your motherboard package for the following items.

Items		Standard Bulk Pack
I/O Shield		10 pcs per carton
Cables	**SATA 6G cable**	--
	COM port cable	--
Application CD	**Support CD**	1 pc per carton
Others	**Metal Plate for LGA1151**	10 pcs per carton
	M.2 Screw Package	10 sets per carton
	User Manual	10 pcs per carton
Packaging Qty.		10 pcs per carton

If any of the above items is damaged or missing, contact your retailer.

Optional items	Description
PIKE II 3008	LSI 8-port SAS 12G RAID card
PIKE II 3108	LSI 8-port SAS 12G HW RAID card
ASMB9-iKVM	Remote management solution provides KVM over IP solution
PEB-10G/57840-2S	Dual port 10G SFP+ Ethernet Adapter
PEB-10G/57811-1S	Single port 10G SFP+ Ethernet Adapter
PEI-10G/82599-2S	10GbE SFP+ Network Adapter

The ASUS PIKE II 3008 and ASUS PIKE II 3108 cards must be installed on PCI-E slot 5 and 6.

1.3   Serial number label

Before requesting support from the ASUS Technical Support team, you must take note of the motherboard's serial number containing 12 characters xxS2xxxxxxx shown in the figure below. With the correct serial number of the product, ASUS Technical Support team members can then offer a quicker and satisfying solution to your problems.

P11C-E/4L
Made in China
合格

xxS2xxxxxxxx

1.4   Special features

1.4.1   Product highlights

Latest processor technology

This motherboard supports the latest Intel® Xeon® processor E-21xx/E-22xx product family/ Intel® 8th/9th Generation Core™ i3 processors in LGA1151 package, which has memory and PCI Express controller integrated to support 2-channel (4 DIMMs) DDR4 memory and 16 PCI Express 3.0 lanes. The Intel® Xeon® processor E-21xx/E-22xx product family has improved CPU performance and integrated voltage regulators making it one of the most powerful and energy efficient CPU in the world.

Intel® Turbo Boost

Intel® Turbo Boost automatically allows the processor to run faster than the marked frequency if the processor is operating below its power, current, and temperature specification limits. This technology increases performance of both multi-threaded and single-threaded workloads.

Intel® Hyper Threading

The thread-level parallelism on each processor makes more efficient use of the processor resources, higher processing throughout and improved performance on today's multithreaded software.

DDR4 memory support

The motherboard supports DDR4 memory that features faster clock frequencies and higher data transfer rates of 2400 MT/s to 2666 MT/s (million transfers per second). DDR4 offers a lower voltage standard of 1.2V that reduces memory power demand and provides improved performance.

Dual PCI-E 3.0 M.2 Support

With a 1 x PCI Express 3.0/2.0 bandwidth, dual M.2 sockets provide the flexibility to enable top-flight performance (RAID 0) or data redundancy (RAID 1) via SATA mode. It is a perfect choice for the operating system or application drive.

PCI Express 3.0

PCI Express 3.0 (PCIe 3.0) is the PCI Express bus standard that provides twice the performance and speed of PCIe 2.0. It provides an optimal graphics performance, unprecedented data speed, and seamless transition with its complete backward compatibility to PCIe 1.0/2.0 devices.

Intel® I210AT LAN Solution

The motherboard comes with two Gigabit LAN controllers and ports which provide a total solution for your networking needs. The onboard Intel® I210AT Gigabit LAN controllers use the PCI Express interface and could achieve network throughput close to Gigabit bandwidth.

Serial ATA III technology

The motherboard supports the Serial ATA III 6 Gb/s technology through the Serial ATA interface and Intel® C246 chipset. Get enhanced scalability, faster data retrieval, double the bandwidth of current bus systems with up to 6 Gb/s data transfer rates.

Integrated USB 3.1 Gen2 (10Gbps) Support

The motherboard implements the USB 3.1 connectivity built in for the very fastest USB data transfers - that's up to 10Gb/s, or twice as fast as USB 3.0. The next-generation standard is completely backward-compatible with your existing USB devices, and you'll be all set for USB 3.1's breakneck speeds.

Temperature, fan, and voltage monitoring

The CPU temperature is monitored to prevent overheating and damage. The system fan rotations per minute (RPM) is monitored for timely failure detection. The chip monitors the voltage levels to ensure stable supply of current for critical components.

1.4.2   Innovative ASUS features

ASUS Fan Speed technology

The ASUS Fan Speed technology smartly adjusts the fan speeds according to the system loading to ensure quiet, cool, and efficient operation.

ASUS MIO Audio card

The ASUS MIO audio card is a discrete 8-channel high definition audio (High Definition Audio previously codenamed Azalia) CODEC that enables the clearest high quality audio output. It has jack-sensing feature, retasking functions, and multi-streaming technology that simultaneously send different audio streams to different destinations for high-end sound quality.

Hardware Information

2

This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.

2.1 Before you proceed

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

- Unplug the power cord from the wall socket before touching any component.
- Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- Before you install or remove any component, ensure that the power supply 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.

2.2 Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

To optimize the features of your motherboard, we highly recommend that you install it in an ATX 2.2 compliant chassis.

Ensure to unplug the chassis power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components!

2.2.1 Placement direction

When installing the motherboard, ensure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

2.2.2 Screw holes

Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.

DO NOT overtighten the screws! Doing so can damage the motherboard.

Place this side towards the rear of the chassis

2.2.3 Motherboard layout

Layout contents

2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA 1151 socket designed for the Intel® Xeon® E-21xx/E-22xx; Intel® 8th/9th Generation Core™ i3; Intel® Pentium™; Intel® Celeron™ product family processor.

> Ensure that you install the correct CPU designed for LGA1151 socket only. DO NOT install a CPU designed for other sockets on the LGA1151 socket.

> • Ensure that all power cables are unplugged before installing the CPU.
>
> • Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.
>
> • The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

2.3.1 Installing the CPU

To install the CPU:

1. Locate the CPU socket on the motherboard.

P11C-E/4L CPU LGA1151
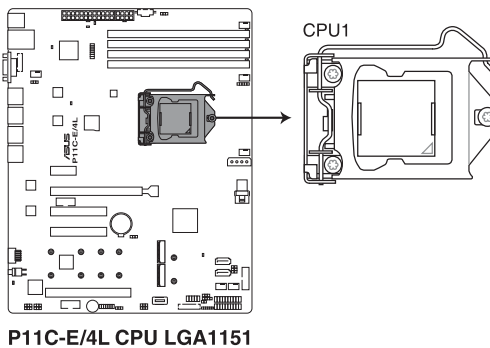
> Before installing the CPU, ensure that the socket box is facing toward you and the load lever is on your right.

2. Press the load lever with your thumb (A), then move it to the right (B) until it is released from the retention tab.

Do not remove the PnP cap yet from the CPU socket. Doing so may bend the pins of the socket.

Load lever

Retention tab
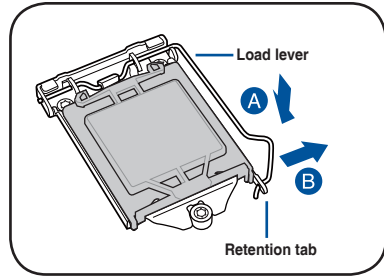
3. Lift the load lever until the load plate is completely lifted.

Load plate
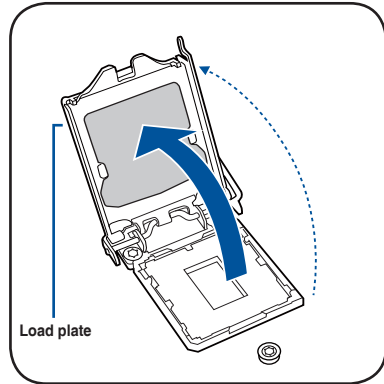
4. Position the CPU above the socket, ensuring that the gold triangle mark is on the bottom-left corner of the socket, then fit the CPU notches to the socket's alignment keys.

The CPU fits in only one orientation. DO NOT force the CPU into the socket to prevent bending the pins on the socket and damaging the CPU.

CPU notches

Gold triangle mark

Alignment key

Alignment key
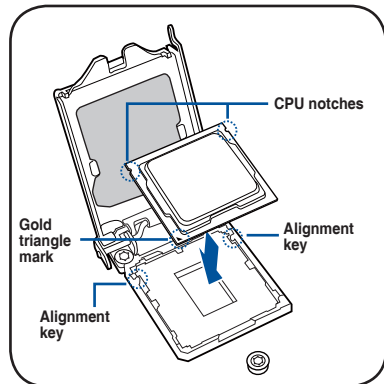
5. Close the load plate (A), ensuring that the front edge of the load plate slides under the retention lock (B) then push down the load lever (C).

Load lever

C

A

B
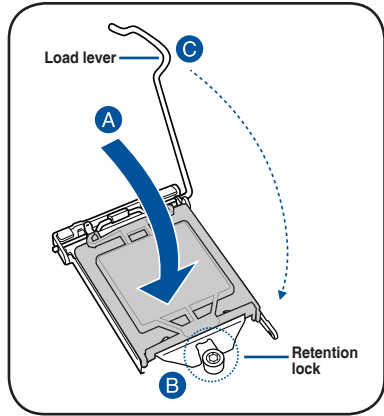
Retention lock

6. Insert the load lever under the retention tab to remove the PnP cap from the CPU socket.

Load lever

Retention tab
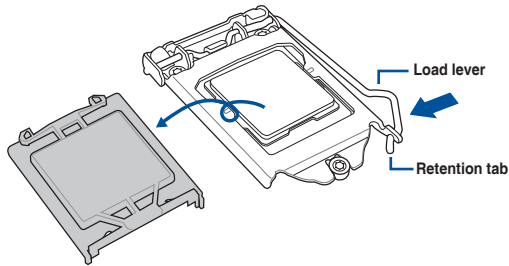
7. Apply some Thermal Interface Material to the exposed area of the CPU that the heatsink will be in contact with, ensuring that it is evenly spread in a thin layer.

Some heatsinks come with pre-applied Thermal Interface Material. If so, skip this step.

The Thermal Interface Material is toxic and inedible. DO NOT eat it. If it gets into your eyes or touches your skin, wash it off immediately and seek professional medical help.
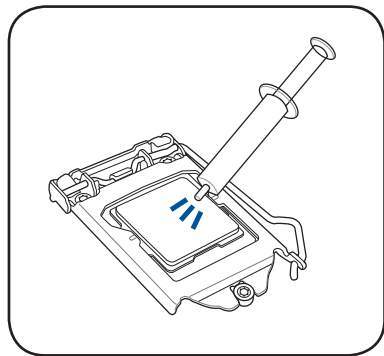
2.3.2   Installing the CPU heatsink

The Intel® LGA1151 processor requires a specially designed CPU heatsink to ensure optimum thermal condition and performance.

- When you buy a boxed Intel® processor, a specially designed CPU heatsink or a CPU heatsink with a CPU fan assembly is included depending on the package. If you buy a CPU separately, ensure that you use only Intel® certified multi-directional CPU heatsink or CPU heatsink with CPU fan.

- Use an LGA1151-compatible CPU heatsink and CPU fan assembly only. The LGA1151 socket is incompatible with the LGA775 and LGA1366 sockets in size and dimension.

If you purchased a separate CPU heatsink and fan assembly, ensure that the Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.

Ensure that you have installed the motherboard to the chassis before you install the CPU fan and heatsink assembly.

To install the CPU heatsink and fan:

1.   Place the heatsink on top of the installed CPU, making sure that the four fasteners match the holes on the motherboard.

2.   Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.
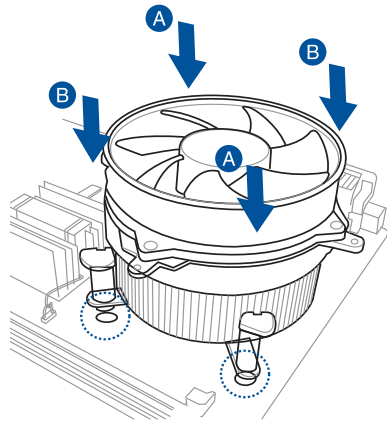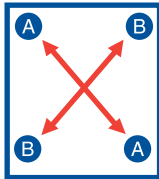
Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector.

3. Connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN1.
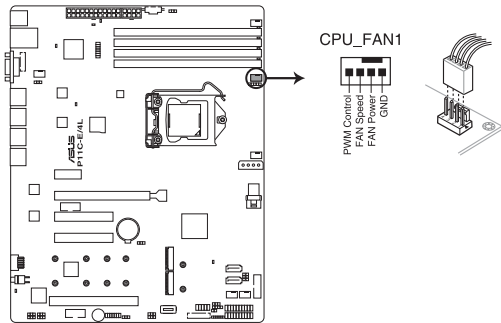
P11C-E/4L CPU fan connector

DO NOT forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

2.3.3 Uninstalling the CPU heatsink and fan

To uninstall the CPU heatsink and fan:

1. Disconnect the CPU fan cable from the connector on the motherboard.

2. Rotate each fastener counterclockwise.

3. Pull up two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the motherboard.
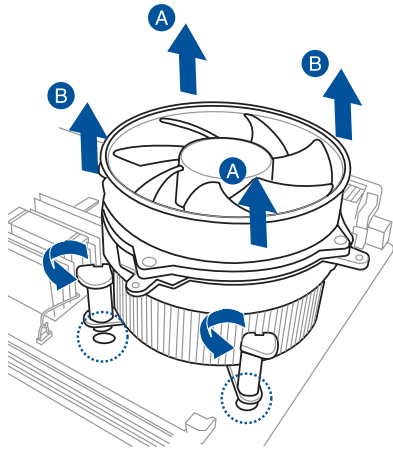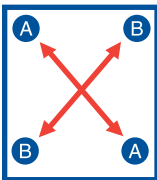
4. Carefully remove the heatsink and fan assembly from the motherboard.

2.3.4   Installing the CPU heatsink in rack

The Intel® LGA1151 processor requires a specially designed heatsink to ensure optimum thermal condition and performance.

✐
- Ensure that you use qualified heatsink assembly only.
- Ensure that you have applied the thermal interface material to the top of the CPU before installing the heatsink and fan.

1.   Peel off the sticker on the heatsink metal plate and affix the plate to the back of the motherboard, matching the standoffs to the heatsink screw holes.
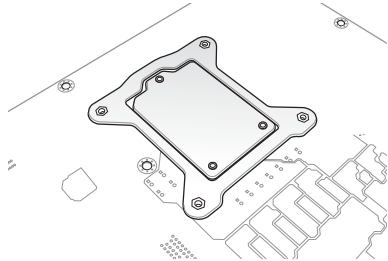
2.   Use a Phillips screwdriver to tighten the four heatsink screws using the recommended sequence below.
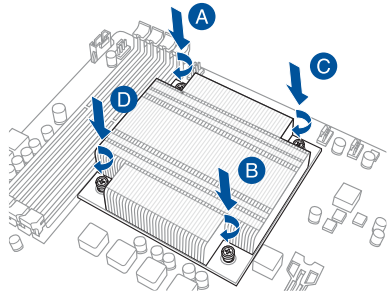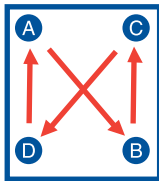
✐
1.   Ensure that the heatsink is not skewed or tilted, otherwise the CPU will overheat.
2.   Do not overtighten the screws. Doing so can damage the CPU.

2.4 System memory

2.4.1 Overview

The motherboard comes with four Double Data Rate 4 (DDR4) Dual Inline Memory Modules (DIMM) sockets.

A DDR4 module is notched differently from a DDR, DDR2, or DDR3 module. DO NOT install a DDR, DDR2, or DDR3 memory module to the DDR4 slot.

The figure illustrates the location of the DDR4 DIMM sockets:

DIMM_B2
DIMM_B1
DIMM_A2
DIMM_A1
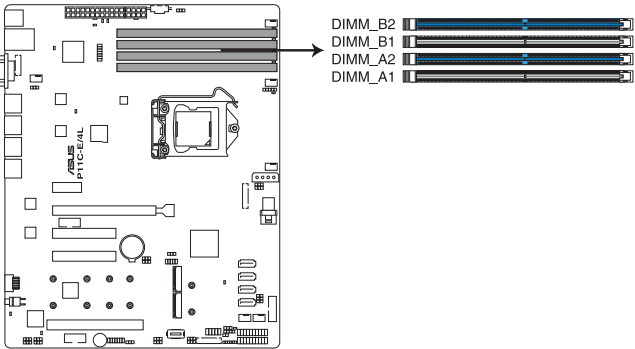
P11C-E/4L 288-pin DDR4 DIMM sockets

2.4.2 Memory configurations

You may install Unbuffered DDR4 DIMMs into the DIMM sockets using the memory configurations in this section.

UDIMM				
DIMM Slot Per Channel	**DIMM Populated per Channel**	**DIMM Type**	**Speed**	**Rank per DIMM**
2	1	Unbuffered DDR4	2666	Single Rank, Dual Rank
2	2	Unbuffered DDR4	2666	Single Rank, Dual Rank

- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- Start installing the DIMMs in slots A2 and B2 (Blue).

2.4.3   Installing a DIMM on a single clip DIMM socket

> Ensure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Unlock a DIMM socket by pressing the retaining clip outward.

2. Align a DIMM on the socket such that the notch on the DIMM matches the DIMM slot key on the socket.

DIMM notch

DIMM slot key   **Unlocked retaining clip**
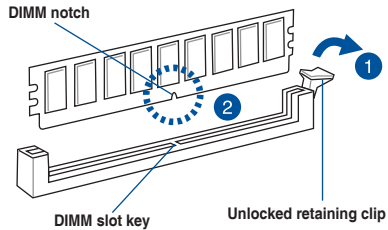
> A DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket in the wrong direction to avoid damaging the DIMM.

3. Hold the DIMM by both of its ends then insert the DIMM vertically into the socket. Apply force to both ends of the DIMM simultaneously until the retaining clip snaps back into place and the DIMM cannot be pushed in any further to ensure proper sitting of the DIMM.

Locked Retaining Clip
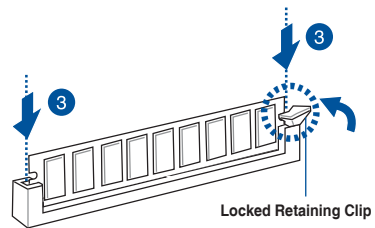
> Always insert the DIMM into the socket vertically to prevent DIMM notch damage.

Removing a DIMM from a single clip DIMM socket

1. Press the retaining clip outward to unlock the DIMM.

2. Remove the DIMM from the socket.
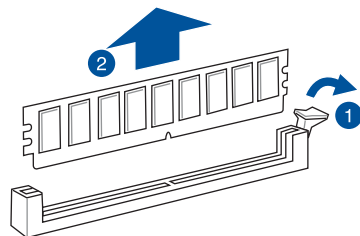
> Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2.5 Expansion slots

In the future, you may need to install expansion cards. The following subsections describe the slots and the expansion cards that they support.

Ensure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

2.5.1 Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.

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

3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.

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

5. Secure the card to the chassis with the screw you removed earlier.

6. Replace the system cover.

2.5.2 Configuring an expansion card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 4 for information on BIOS setup.

2. Assign an IRQ to the card. Refer to the tables on the next page.

3. Install the software drivers for the expansion card.

When using PCI cards on shared slots, ensure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

2.5.3   Interrupt assignments

Standard Interrupt assignments

IRQ	Priority	Standard function
0	1	System Timer
1	2	Keyboard Controller
2	-	Programmable Interrupt
3*	11	Communications Port (COM2)
4*	12	Communications Port (COM1)
5*	13	--
6	14	Floppy Disk Controller
7*	15	--
8	3	System CMOS/Real Time Clock
9*	4	ACPI Mode when used
10*	5	IRQ Holder for PCI Steering
11*	6	IRQ Holder for PCI Steering
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

* These IRQs are usually available for ISA or PCI devices.

2.5.4   PCI Express x16 slot (x16 Gen3 link)

The onboard PCIE6 slot provides one x16 Gen3 link and auto switches to x8 link if PCIE5 is occupied. This slot supports VGA cards and various server class high performance add-on cards.

2.5.5   PCI Express x8 slot (x8 Gen3 link)

The onboard PCIE4 and PCIE5 slots provide two x8 Gen3 link. These slots support VGA cards and various server class high performance add-on cards.

2.5.6   PCI slot

The PCI1 slot supports cards such as LAN, USB, and other cards that comply with PCI specifications.
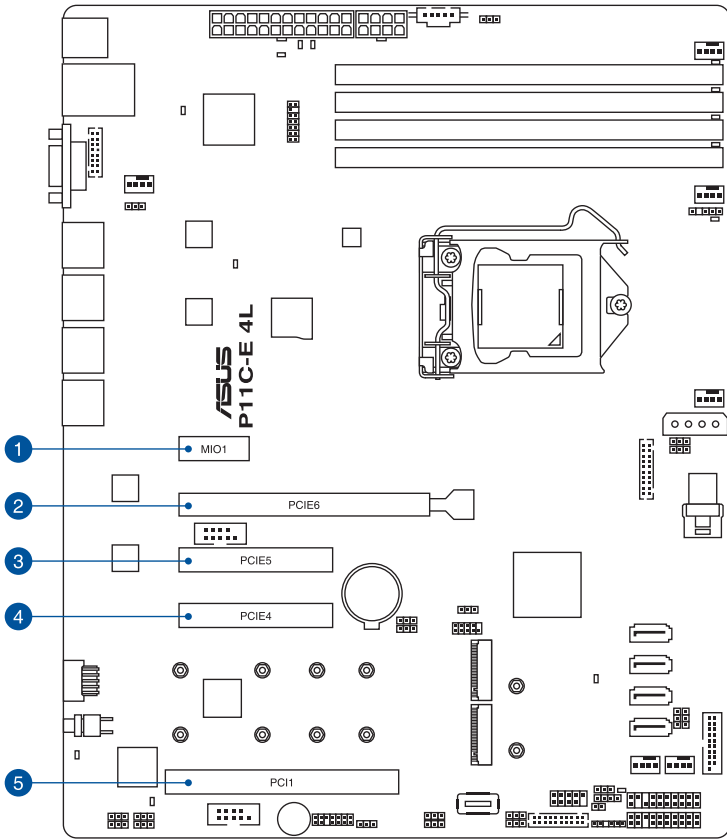
No.(Slot location)		Short Description
1 (slot 7)	MIO1	MIO slot
2 (slot 6)	PCIE6	PCI-E x16 (x16 Gen3 link) (Auto switch to x8 link if slot 5 is occupied)
3 (slot 5)	PCIE5	PCI-E x8 (x8 Gen3 link)
4 (slot 4)	PCIE4	PCI-E x8 (x8 Gen3 link)
5 (slot 1)	PCI1	PCI 32 bit / 33 MHz

2.5.7 Installing the Baseboard Management Card

Follow the steps below to install an optional ASMB9 management card on your motherboard.

1. Locate the Baseboard Management Card header on the motherboard.

ASMB9

PIN 1

Power	SPI_MOSI
SPI_CS0#	
SPI_MISO	GND
SPI_CLK	IKVMEN#
SOLEN#	GND
SPI_CS1#	GND
PRESENT#	GND

P11C-E 4L BMC connector
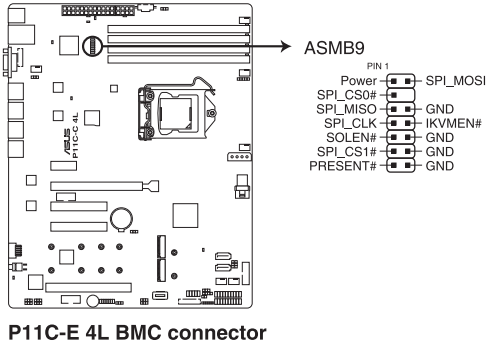
2. Orient and press the Management Card in place.
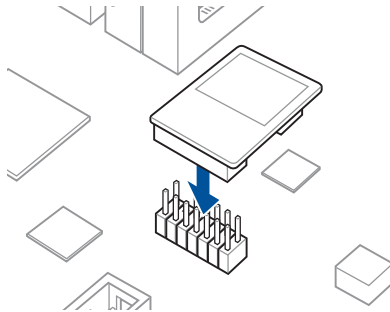
The motherboard illustration is for reference only. The motherboard layout and appearance may vary depending on the model, but the installation steps remain the same.

2.5.8 Installing the Audio card

1. Locate the MIO card slot on the motherboard and align the golden fingers of the audio card with the MIO card slot.

2. Insert the audio card into the MIO slot on the motherboard. Ensure that it is completely seated on the card slot.

3. Secure the audio card to the chassis with a screw.
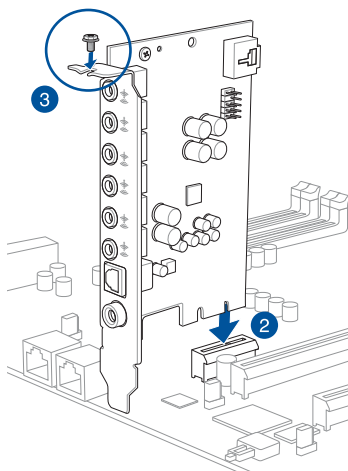
2.6   Jumpers

1.   **Clear RTC RAM (3-pin CLRTC1)**

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS which include system setup information such as system passwords.

To erase the RTC RAM:

1.   Turn OFF the computer and unplug the power cord.

2.   Move the jumper cap from the default pins 1–2 to pins 2–3. Keep the cap on pins 2–3 for about 5 to 10 seconds, then move the cap back to pins 1–2.

3.   Plug the power cord and turn ON the computer.

4.   Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

> DO NOT remove the cap on CLRTC jumper default position except when clearing the RTC RAM. Removing the cap will cause system boot failure!

> If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After the CMOS clearance, reinstall the battery.
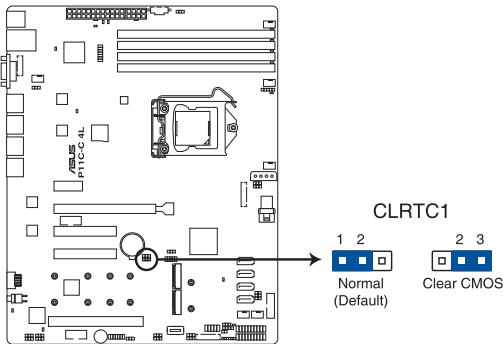
P11C-E 4L Clear RTC RAM

2. **VGA controller setting (3-pin VGA_SW1)**

This jumper allows you to enable or disable the onboard VGA controller. Set to pins 1–2 to activate the VGA feature.

P11C-E 4L VGA setting

VGA_SW1

1 2   2 3
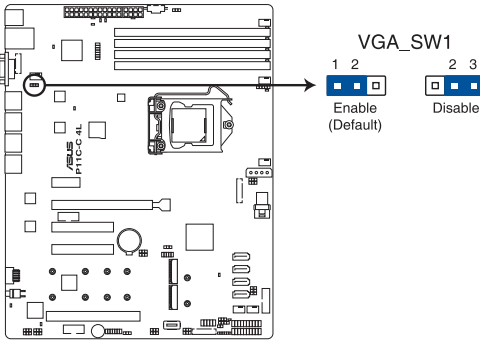
Enable   Disable
(Default)

3. **LAN controller setting (3-pin LAN_SW1-4)**

These jumpers allow you to enable or disable the onboard LAN_SW1-4. Set to pins 1-2 to activate the Gigabit LAN feature.

P11C-E 4L LAN setting

Ⓐ LAN_SW1
   LAN_SW2

1 2   2 3

Enable   Disable
(Default)

Ⓑ LAN_SW3
   LAN_SW4

1 2   2 3

Enable   Disable
(Default)
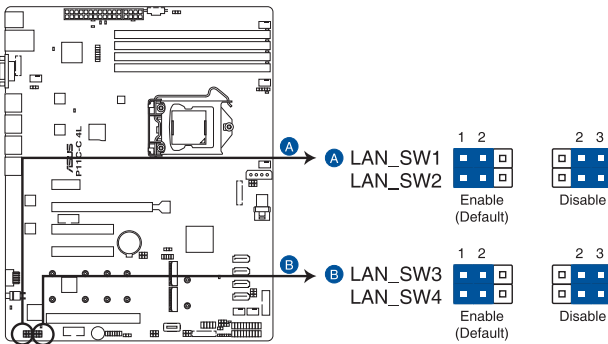
4. **ME firmware force recovery setting (3-pin ME_RCVR1)**

This jumper allows you to force Intel® Management Engine (ME) boot from recovery mode when ME becomes corrupted.

ME_RCVR1

1 2   2 3

Normal   ME force update
(Default)
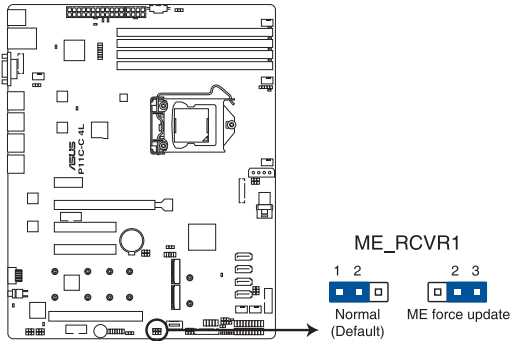
P11C-E 4L ME recovery setting

5. **PCH_MFG1 setting (3-pin PCH_MFG1)**

This jumper allows you to update the BIOS ME block.

PCH_MFG1

1 2   2 3

Normal   Security override
(Default)
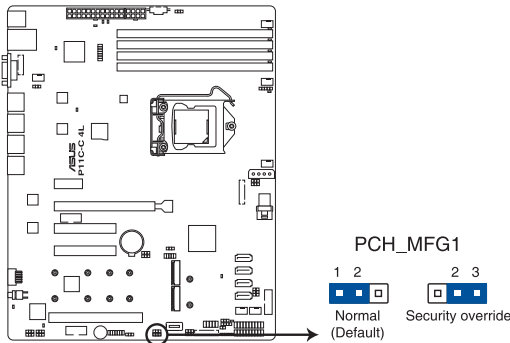
P11C-E 4L PCH_MFG1 setting

6. **SATA DOM power setting (3-pin DOM1_PWR1, DOM1_PWR2)**

   This jumper allows you to configure the DOM power setting.
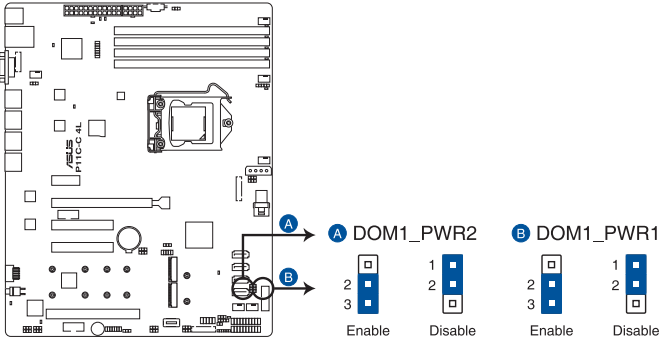
   P11C-E 4L DOM PWR setting

   - DOM1_PWR1 corresponds to the SATA5 connector.
   - DOM1_PWR2 corresponds to the SATA6 connector.

7. **Smart Ride Through (SmaRT) setting (3-pin SMART_PSU1)**

   This jumper allows you to enable or disable the Smart Ride Through (SmaRT) function. This feature is disabled by default. Set to pins 1-2 to enable it. When enabled, SmaRT allows uninterrupted operation of the system during an AC loss event.
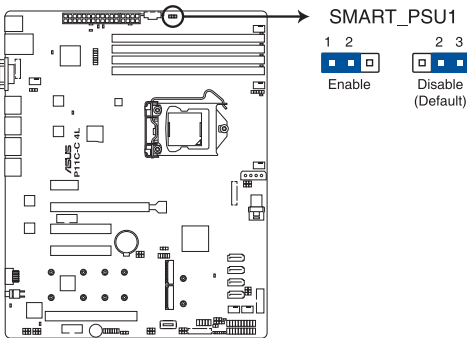
   P11C-E 4L Smart Ride Through setting

   This jumper functions only when you install the ASUS ASMB9 management card.

8. **DMLAN setting (3-pin DM_IP_SEL1)**

This jumper allows you to select the DMLAN setting. Set to pins 2-3 to force the DMLAN IP to static mode (IP=10.10.10.10, submask=255.255.255.0).
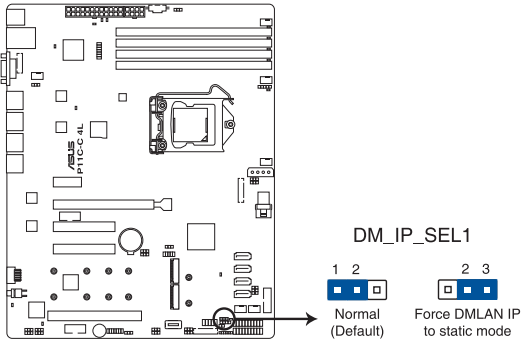
P11C-E 4L DM_IP_SEL1 setting

2.7 Onboard LEDs

1. **Standby Power LED (SBPWR1)**

The motherboard comes with a standby power LED. The green LED lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.
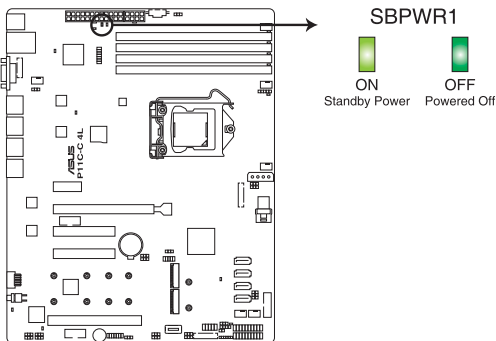
P11C-E 4L Standby Power LED

2.   **CPU Warning LED (ERRCPU1)**

The CPU warning LED lights up to indicate that a CPU error or failure has occurred.
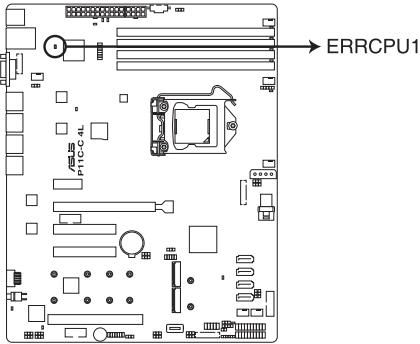
ERRCPU1

P11C-E 4L ERRCPU1 LED

The warning LED functions only when you install the ASUS ASMB9 management card.

3.   **Message LED (MLED1)**

This onboard LED lights up to red when there is a BMC event log is generated.
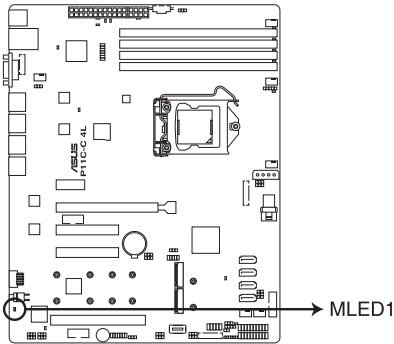
MLED1

P11C-E 4L MLED1

4. **BMC LED (BMCLED1)**

The BMC LED lights up to indicate that the on-board BMC is functional.
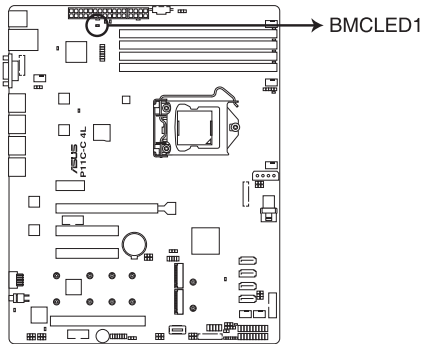
→ BMCLED1

P11C-E 4L BMC LED

5. **ME LED (MELED1)**

The ME LED is an onboard LED that blinks when the ME is operating properly.
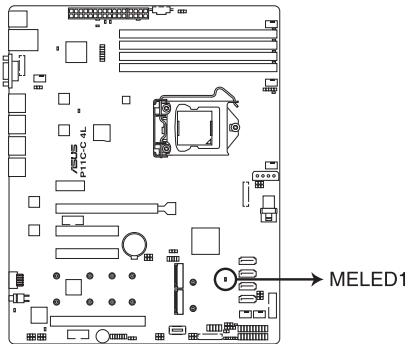
→ MELED1

P11C-E 4L MELED1

6.   **CATTERR LED (CATTERR1)**

The CATTERR LED indicates that the system has experienced a fatal or catastrophic error and cannot continue to operate.
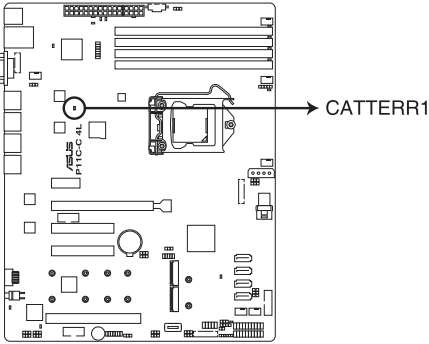
P11C-E 4L CATTERR1 LED

7.   **DIMM warning LED (MEMERRA1-2, MEMERRB1-2)**

The DIMM warning LEDs light up to indicate failure on the corresponding DIMMs.
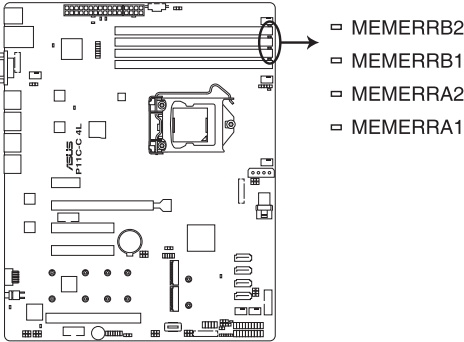
P11C-E 4L MEMERR LEDs

| | The warning LEDs only functions when you enable the ASUS ASMB9. |

2.8 Connectors

2.8.1 Rear panel connectors
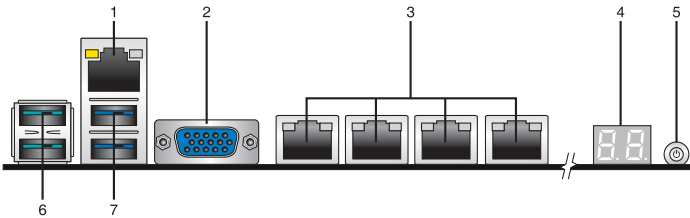
1. **RJ-45 port for iKVM:** This RJ-45 port functions only when you install ASMB9 management card.

2. **Video Graphics Adapter port:** This port is for a VGA monitor or other VGA-compatible devices.

3. **RJ-45 ports for LAN:** These ports allows Gigabit connection to a LAN (Local Area Network) through a network hub. Refer to the table below for the LAN port LED indications.

4. **Q-Code LED:** The Q-Code LED provides a 2-digit display that shows the status of your system. Refer to the **Q-Code table** of this user guide for more information about the 2-digit codes.

5. **Power-on Button:** Press this button to turn on the system.

6. **USB 3.1 Gen 2 ports 1 and 2:** These 4-pin USB (Universal Serial Bus) ports are available for connecting USB 3.1 Gen 2 devices.

7. **USB 3.1 Gen 1 ports 5 and 6:** These 4-pin USB (Universal Serial Bus) ports are available for connecting USB 3.1 Gen 1 devices.

LAN port LED indications

Activity/Link LED		Speed LED	
Status	**Description**	**Status**	**Description**
OFF	No link	OFF	10 Mbps connection
GREEN	Linked	YELLOW	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection
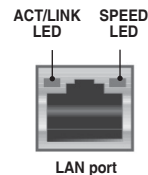
Dedicated Management LAN port (DM_LAN1) LED indications

Activity/Link LED		Speed LED	
Status	**Description**	**Status**	**Description**
OFF	No link	OFF	10 Mbps connection
YELLOW	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection
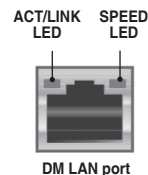
2.8.2 Internal connectors

1. Serial ATA 6.0Gb/s connectors (7-pin SATA5-8)

Supported by the Intel® C246 chipset, these connectors are for the Serial ATA signal cables for Serial ATA hard disk drives that allows up to 6Gb/s of data transfer rate.

If you installed Serial ATA hard disk drives, you can create a RAID 0, RAID 1, RAID 10, or RAID 5 configuration.
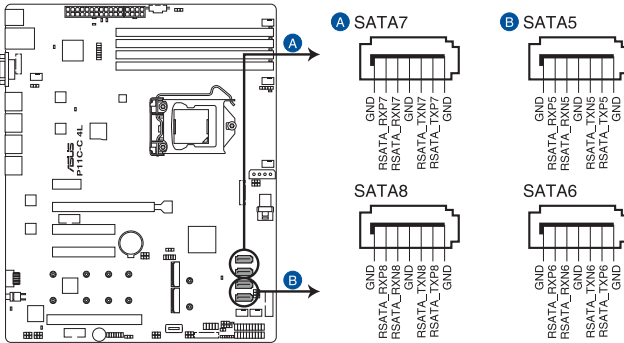
P11C-E 4L SATA connectors

- The actual data transfer rate depends on the speed of Serial ATA hard disks installed.
- When the M.2 connector is operating in SATA mode, SATA connector 5 and 6 (SATA 6 Gbps_5-6) will be disabled.

2. Mini-SAS HD connector (ISATA1)

This motherboard comes with a mini Serial Attached SCSI (SAS) HD connector, the storage technology that supports Serial ATA. The connector supports up to four devices.
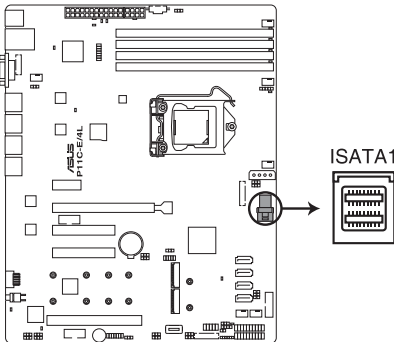
P11C-E/4L ISATA connector

3. **Hard disk activity LED connector (4-pin HDLED1)**

This LED connector is for the storage add-on card cable connected to the SATA or SAS add-on card. The read or write activities of any device connected to the SATA or SAS add-on card causes the front panel LED to light up.
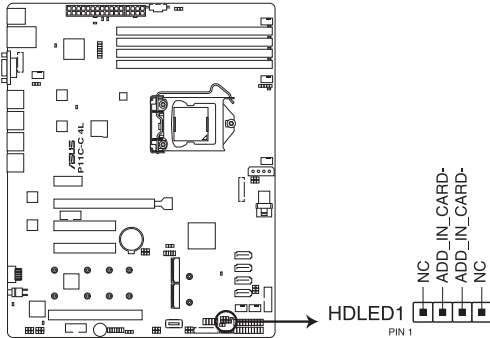
P11C-E 4L Storage device activity LED connector

4. **USB 2.0 connector (10-1 pin USB1114; 4-pin Type-A USB7)**

The 10-1 pin connector allows you to connect a USB 2.0 module for additional USB 2.0 front or rear panel ports. The 4-pin USB (Universal Serial Bus) Type-A port is available for connecting USB 2.0 devices. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.
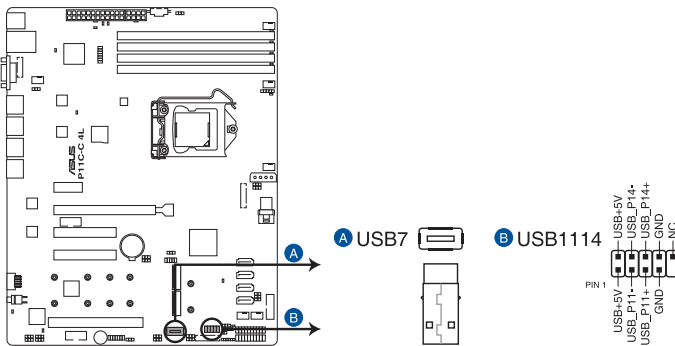
P11C-E 4L USB 2.0 connectors

5. **USB 3.0 connector (20-1 pin USB3_34)**

   This connector allows you to connect a USB 3.0 module for additional USB 3.0 front or rear panel ports. With an installed USB 3.0 module, you can enjoy all the benefits of USB 3.0 including faster data transfer speeds of up to 5 Gbps, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0.

   USB3_34

GND	IntA_P2_D+
IntA_P1_D+	IntA_P2_D-
IntA_P1_D-	GND
GND	IntA_P2_SSTX+
IntA_P1_SSTX+	IntA_P2_SSTX-
IntA_P1_SSTX-	GND
GND	IntA_P2_SSRX+
IntA_P1_SSRX+	IntA_P2_SSRX-
IntA_P1_SSRX-	Vbus
Vbus	

   PIN 1
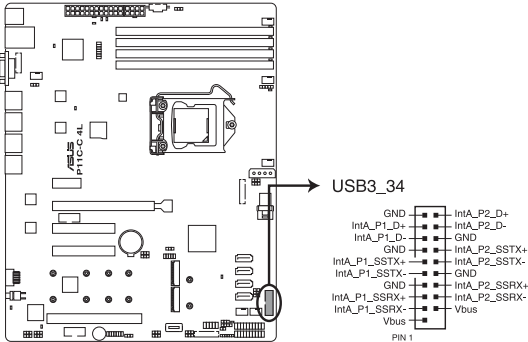
   P11C-E 4L USB 3.0 connector

6. **Serial General Purpose Input/Output connector (6-1 pin SGPIO1)**

   The SGPIO 1 connector is used for the Intel Rapid Storage Technology Enterprise SGPIO interface that controls the LED pattern generation, device information, and general purpose data.

   SGPIO1

   SSATA_SDATAOUT0
   SSATA_SDATAOUT1
   GND
   SSATA_SLOAD
   SSATA_SCLK

   PIN1
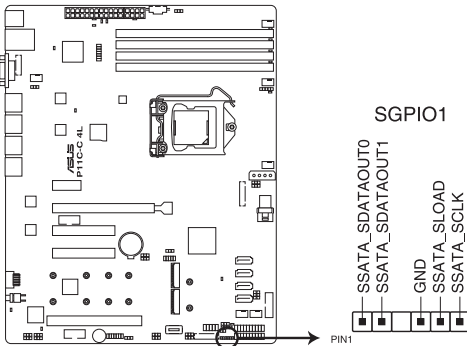
   P11C-E 4L SGPIO1 connector

7. CPU, front, and rear fan connectors

(4-pin FRNT_FAN1-4; REAR_FAN1; CPU_FAN1)

The fan connectors support cooling fans. Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.

⚠️ • DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components.

• These are not jumpers! DO NOT place jumper caps on the fan connectors!

• All fans feature the ASUS Smart Fan technology.
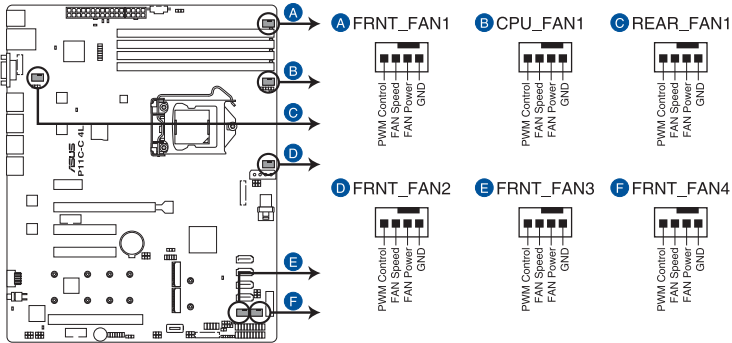
P11C-E 4L FAN connectors

8. Serial port connectors (10-1 pin COM1-2)

These connectors are for the serial COM ports. Connect the serial port module cable to one of these connectors, then install the module to a slot opening at the back of the system chassis.
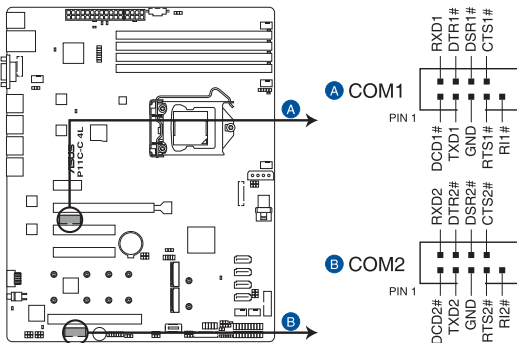
P11C-E 4L Serial port connectors

9.   Power Supply SMBus connector (5-pin PSUSMB1)

This connector allows you to connect SMBus (System Management Bus) to the power supply unit to read PSU information. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.
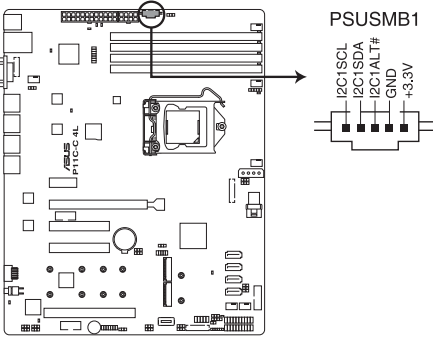
P11C-E 4L Power supply SMBus connector

This connector functions only when you install the ASUS ASMB9 management card.

10.   Trusted Platform Module connector (14-1 pin TPM1)

This connector supports a TPM (Trusted Platform Module) 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.
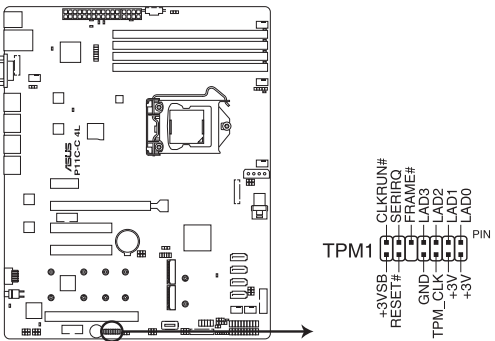
P11C-E 4L TPM connector

11.   SATA DOM power connector (4-pin PWR3)

This 4-pin connector is for 5V power of a certain SATA DOM (Disk on Module) device when using an appropriate cable.
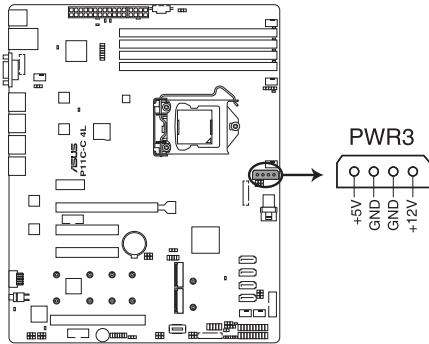
P11C-E 4L Power connector

> • The SATA DOM power connector is for output power only. It has a maximum output current of 1A.
>
> • Ensure that the power of the SATA DOM device that you will use is less than 1A.

12.   VGA connector (16 pin VGA_HDR1)

This connector supports the VGA High Dynamic-Range interface.
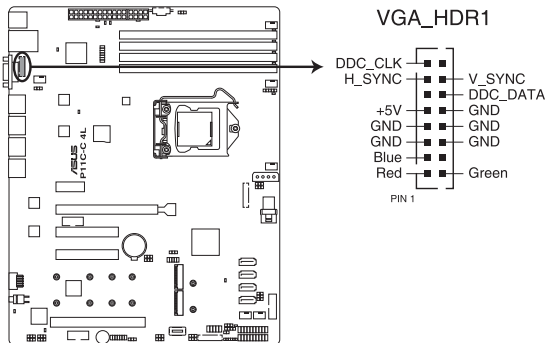
P11C-E 4L Internal VGA connector

13. **ATX power connectors (24-pin EATXPWR1; 8-pin EATX12V1)**

These connectors are for the ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

- DO NOT forget to connect the 24-pin and the 8-pin power plugs; otherwise, the system will not boot up.

- Use of a power supply unit (PSU) with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

- This motherboard supports ATX2.0 PSU or later version.

- Ensure that your PSU can provide at least the minimum power required by your system.
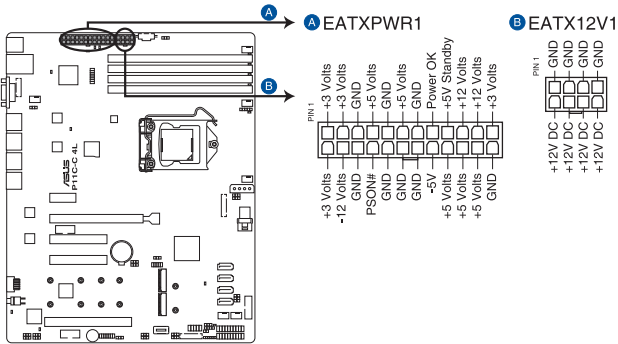
P11C-E 4L ATX power connectors

14. System panel connector (20-1 pin PANEL1)

This connector supports several chassis-mounted functions.
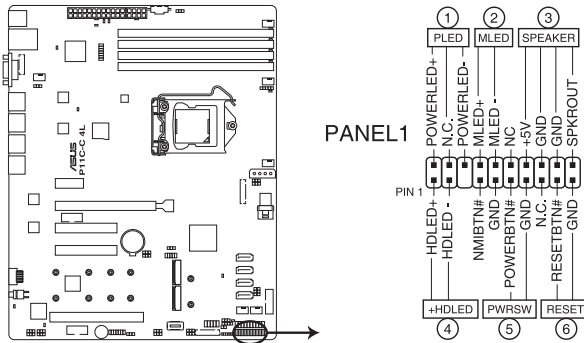
P11C-E 4L System panel connector

1. System power LED (3-pin PLED)

This 3-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

2. Message LED (2-pin MLED)

This 2-pin connector is for the message LED cable that connects to the front message LED. The message LED is controlled by the BMC to indicate an abnormal event occurrence.

3. System warning speaker (4-pin SPEAKER)

This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

4. Hard disk drive activity LED (2-pin HDLED)

This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The LED lights up or flashes when data is read from or written to the HDD.

5. ATX power button/soft-off button (2-pin PWRSW)

This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

6. Reset button (2-pin RESET)

This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

15. Auxiliary panel connector (20-2 pin AUX_PANEL1, 20-pin AUX_PANEL2)

This connector is for additional front panel features including front panel SMB, locator LED and switch, chassis intrusion, and LAN LEDs.
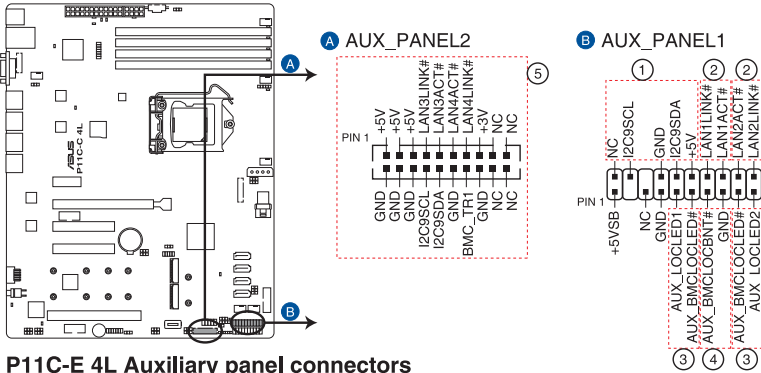
P11C-E 4L Auxiliary panel connectors

1.   Front panel SMB (6-1 pin FPSMB)

These leads connect the front panel SMBus cable.

2.   LAN activity LED (2-pin LAN1_LED, LAN2_LED)

These leads are for the Gigabit LAN activity LEDs on the front panel.

3.   Locator LED (2-pin LOCATORLED1, LOCATORLED2)

These leads are for the locator LED1 and LED2 on the front panel. Connect the Locator LED cables to these 2-pin connector. The LEDs will light up when the Locator button is pressed.

4.   Locator Button/Switch (2-pin LOCATORBTN)

These leads are for the locator button on the front panel. This button queries the state of the system locator.

5.   LAN activity LED and USB port (2-pin LAN3_LED, LAN4_LED, USB ports)

These leads are for the Gigabit LAN activity LEDs and USB ports on the front or rear panel.

16. **M.2 (NGFF) connector (NGFF1-2)**

These connectors allow you to install M.2 devices.
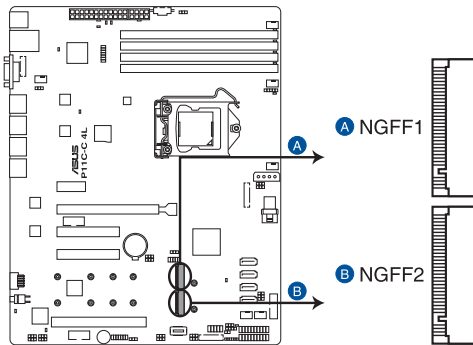
P11C-E 4L NGFF connectors

- This connector supports type 2242/2260/2280/22110 devices on both PCI-E and SATA interface.

- When the M.2 connector is operating in SATA mode, SATA connector 5 and 6 (SATA 6 Gbps_5-6) will be disabled.

The M.2 (NGFF) device is purchased separately.

17. **System Management Bus (SMBUS) connector (5-1 pin SMBUS1)**

This connector controls the system and power management-related tasks. This connector processes the messages to and from devices rather than tripping the individual control lines.
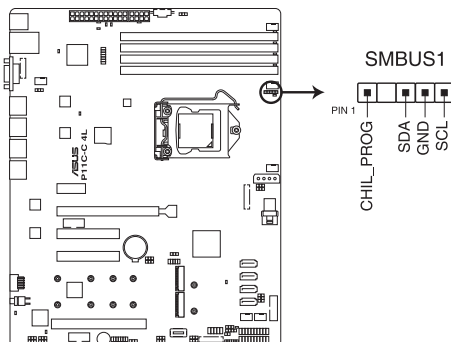
P11C-E 4L SMBUS connector

18. **Chassis intrusion connector (2-pin INTRUSION1)**

This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

By default, the pin labeled "Chassis Signal" and "Ground" are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.
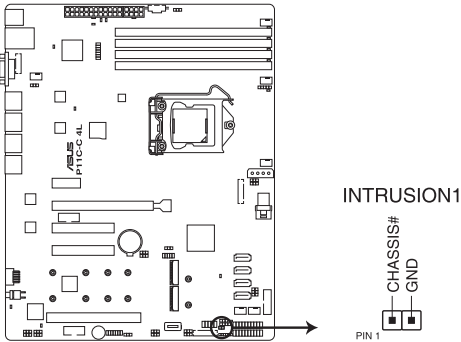
P11C-E 4L Chassis Intrusion connector

19. **Thermal sensor cable connector (3-pin TR1)**

This connector allows you to connect a thermal sensor cable that is used for monitoring temperature. Connect the thermal sensor cable to the connector and place its probe to the device that you want to monitor.
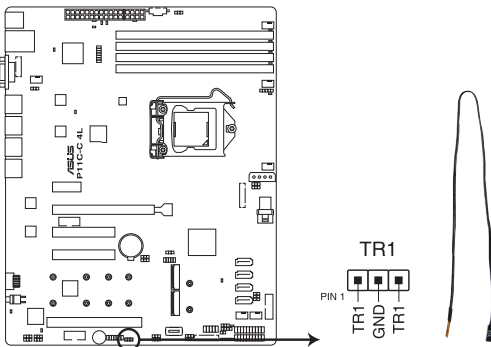
P11C-E 4L Thermal sensor cable connector

20. Micro SD card slot (MSD1)

Your motherboard supports SD Memory Card v2.00 (SDHC) / v3.00 (SDXC).
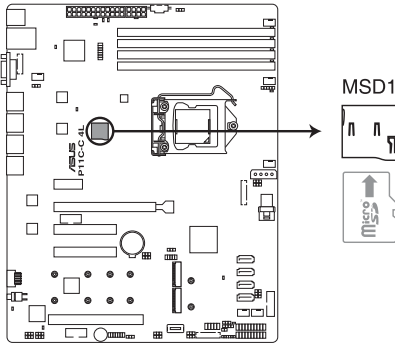
P11C-E 4L MSD1

![warning] Disconnect all power (including redundant PSUs) from the existing system before you add or remove a Memory Card, then reboot the system to access the Memory Card.

![note]
- This Micro SD card slot functions only when you install the ASUS ASMB9 management card.

- Some memory cards may not be compatible with your motherboard. Ensure that you use only compatible memory cards to prevent loss of data, damage to your device, or memory card, or both.

Powering Up

3

This chapter describes the power up sequence, and ways of shutting down the system.

3.1 Starting up for the first time

1. After making all the connections, replace the system case cover.

2. Be sure that all switches are off.

3. Connect the power cord to the power connector at the back of the system chassis.

4. Connect the power cord to a power outlet that is equipped with a surge protector.

5. Turn on the devices in the following order:

    a. Monitor

    b. External storage devices (starting with the last device on the chain)

    c. System power

6. After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with "green" standards or if it has a "power standby" feature, the monitor LED may light up or switch between orange and green after the system LED turns on.

    The system then runs the power-on self-test or POST. While the tests are running, the BIOS beeps or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

    The following shows the possible beep codes and its corresponding error condition

BIOS Beep codes	
Beep	**Error condition**
1 short	Power supply surges detected during the previous power on.
1 short	No Keyboard Detected.
1 short, 2 short	No DIMM Detected.
1 short, 8 short	No VGA Detected.
2 long	Chassis Intrusion.
2 long	BIOS-image Crash Detected.

7. At power on, hold down the <Del> key to enter the BIOS Setup. Follow the instructions in Chapter 4.

3.2 Powering off the computer

3.2.1 Using the OS shut down function

Using Windows® Server 2012 R2:

1. Press <Ctrl>+<Alt>+<Del>.

2. Click on the Power icon on the lower right side of the screen.

3. Select **Shut down**.

4. In the *Shutdown Event Tracker*, select the **Other (Planned)** option in the selection list. Otherwise, select the option that best describes why you want to shut down the computer.

5. Click **Continue**.

Using Windows® Server 2016:

1. Press <Alt>+<F4>.

2. In the *What do you want the computer to do?*, select **Shut down**.

3. In the *Shutdown Event Tracker*, select the **Other (Planned)** option in the selection list. Otherwise, select the option that best describes why you want to shut down the computer.

4. Click **OK**.

3.2.2 Using the dual function power switch

While the system is ON, press the power switch for less than four seconds to put the system to sleep mode or to soft-off mode, depending on the BIOS setting.

Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting.

BIOS Setup

4

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

4.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup:

1. **ASUS CrashFree BIOS 3**

    To recover the BIOS using a bootable USB flash disk drive when the BIOS file fails or gets corrupted.

2. **ASUS EzFlash**

    Updates the BIOS using a USB flash disk.

3. **BUPDATER**

    Updates the BIOS in DOS mode using a bootable USB flash disk drive.

Refer to the corresponding sections for details on these utilities.

> Save a copy of the original motherboard BIOS file to a bootable USB flash disk drive in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the BUPDATER utility.

4.1.1 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using a USB flash drive that contains the updated BIOS file.

> Prepare a USB flash drive containing the updated motherboard BIOS before using this utility.

> When downloading or updating the BIOS file, rename it as **P11CE4L.CAP** for this motherboard.

Recovering the BIOS from a USB flash drive
To recover the BIOS from a USB flash drive:

1. Insert the USB flash drive with the original or updated BIOS file to one USB port on the system.

2. The utility will automatically recover the BIOS. It resets the system when the BIOS recovery finished.

> DO NOT shut down or reset the system while recovering the BIOS! Doing so would cause system boot failure!

> The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website at www.asus.com to download the latest BIOS file.

4.1.2   ASUS EZ Flash Utility

The ASUS EZ Flash Utility feature allows you to update the BIOS using a USB flash disk without having to use a DOS-based utility.

Download the latest BIOS from the ASUS website at www.asus.com before using this utility.

The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be the same as shown.

To update the BIOS using EZ Flash Utility:

1.   Insert the USB flash disk that contains the latest BIOS file to the USB port.

2.   Enter the BIOS setup program. Go to the **Tool** menu then select **Start ASUS EzFlash** and press <Enter> to enable it.

```
                    ASUS Tek. EzFlash Utility

      Current Platform                 New Platform
Platform : P11C-E/4L           Platform : P11C-E/4L
Version :  0201                Version :  0204
Build Date :04/13/2018         Build Date :04/25/2018

FS0          System Volume Information          <DIR>
             P11C-E/4L BIOS                     <DIR>
             Windows                            <DIR>




[Up/Down/Left/Right]:Switch [Enter]:Choose [q]:Exit
```
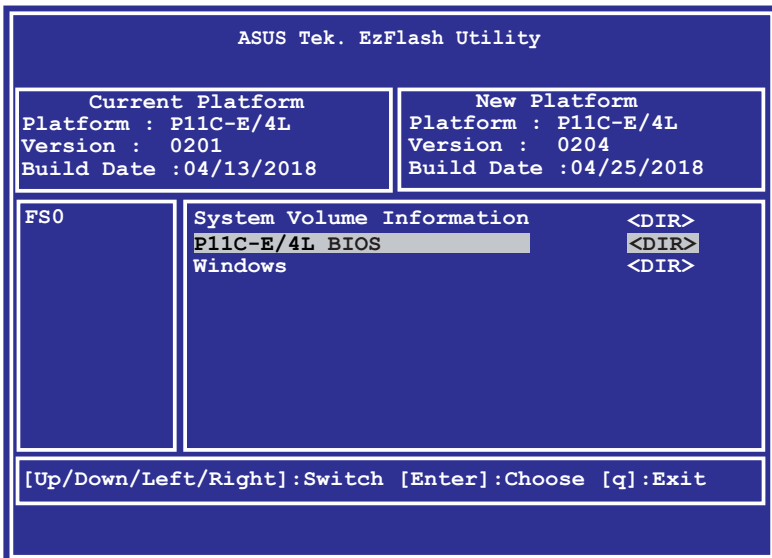
3.   Press <Tab> to switch to the **Drive** field.

4.   Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS then press <Enter>.

5.   Press <Tab> to switch to the **Folder Info** field.

6.   Press the Up/Down arrow keys to find the BIOS file then press <Enter>.

7.   Reboot the system when the update process is done.

- This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.

- DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

Ensure to load the BIOS default settings to ensure system compatibility and stability. Press <F5> and select **Yes** to load the BIOS default settings.

4.1.3 BUPDATER utility

The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be the same as shown.

The BUPDATER utility allows you to update the BIOS file in the DOS environment using a bootable USB flash disk drive with the updated BIOS file.

Updating the BIOS file

To update the BIOS file using the BUPDATER utility:

1. Visit the ASUS website at www.asus.com and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable USB flash disk drive.

2. Copy the BUPDATER utility (BUPDATER.exe) from the ASUS support website at support.asus.com to the bootable USB flash disk drive you created earlier.

3. Boot the system in DOS mode, then at the prompt, type:

    BUPDATER /i[filename].CAP

    where [filename] is the latest or the original BIOS file on the bootable USB flash disk drive, then press <Enter>.

    ```
    A:\>BUPDATER /i[file name].CAP
    ```

4. The utility verifies the file, then starts updating the BIOS file.

```
                    ASUS Tek. EzFlash Utility




       Current Platform                    New Platform
Platform  : P11C-E/4L              Platform  : P11C-E/4L
Version   : 0215                   Version   : 0217
Build date: 01/13/2016            Build date: 02/20/2016



       Start Programming Flash.  DO NOT SHUTDOWN THE SYSTEM!!!

          Write
          75%
```
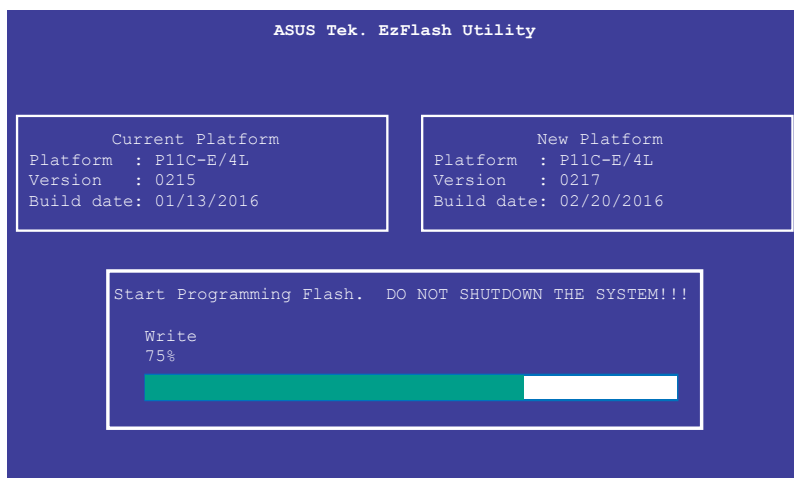
DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

```
The BIOS update is finished! Please restart your system.

C:\>
```
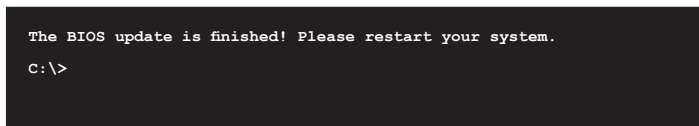
4.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section **4.1 Managing and updating your BIOS**.

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup." This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware chip.

The firmware chip on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl>+<Alt>+<Del>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Press <F5> and select **Yes** to load the BIOS default settings.

- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

- Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.

4.2.1   BIOS menu screen

Menu items   Menu bar   Configuration fields   General help

```
                  Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Monitor  Tool  Event Logs  Server Mgmt  Save & Exit

    Type                              Intel(R) Xeon(R) E-2124       Set the Time. Use Tab to
                                      CPU @ 3.30GHz                 switch between Time elements.
    Speed                             3300 MHz
    ID                                0x906EA
    Stepping                          U0
    Number of Processors              4Core(s) / 4Thread(s)
    Microcode Revision                84

    Memory RC Version                 0.7.1.64
    Total Memory                       4096 MB
    Memory Frequency                   2133 MHz

    PCH Information
    Name                              CNL PCH-H
    PCH SKU                           C246
    Stepping                          B0                            →←: Select Screen
    Hsio Revision                     7                             ↑↓: Select Item
    ME Reported Chipset Init CRC       F4AB                          Enter: Select
    TXT Capability of Platform/PCH     Supported                     +/-: Change Opt.
    Production Type                   Production                    F1: General Help
                                                                    F2: Previous Values
    System Language                   [English]                     F5: Optimized Defaults
                                                                    F10: Save & Reset
    System Date                       [Sun 06/10/2018]              F12: Print Screen
    System Time                       [19:31:30]                    ESC: Exit

                  Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

Navigation keys

4.2.2   Menu bar

The menu bar on top of the screen has the following main items:

Main	For changing the basic system configuration
Advanced	For changing the advanced system settings
Chipset	For changing the chipset settings
Security	For changing the security settings
Boot	For changing the system boot configuration
Monitor	For displaying the system temperature, power status, and changing the fan settings
Tool	For configuring options for special functions
Event Logs	For changing the event log settings
Server Mgmt	For changing the server mgmt settings
Save & Exit	For selecting the save & exit options

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

4.2.3   Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items. The other items (Advanced, Security, Boot, Monitor, Tool, Save & Exit, Server Mgmt, and Event Logs) on the menu bar have their respective menu items.

4.2.4   Submenu items

A solid triangle before each item on any menu screen means that the item has a submenu. To display the submenu, select the item and press <Enter>.

4.2.5   Navigation keys

At the bottom right corner of a menu screen are the navigation keys for the BIOS setup program. Use the navigation keys to select items in the menu and change the settings.

4.2.6   General help

At the top right corner of the menu screen is a brief description of the selected item.

4.2.7   Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it and press <Enter> to display a list of options.

4.2.8   Pop-up window

Select a menu item and press <Enter> to display a pop-up window with the configuration options for that item.

4.2.9   Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen.

4.3 Main menu

When you enter the BIOS Setup program, the Main menu screen appears. The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, and language.

```
                Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Monitor  Tool  Event Logs  Server Mgmt  Save & Exit

     Type                              Intel(R) Xeon(R) E-2124      Set the Time. Use Tab to
                                       CPU @ 3.30GHz                switch between Time elements.
     Speed                             3300 MHz
     ID                                0x906EA
     Stepping                          U0
     Number of Processors              4Core(s) / 4Thread(s)
     Microcode Revision                84

     Memory RC Version                 0.7.1.64
     Total Memory                       4096 MB
     Memory Frequency                   2133 MHz

     PCH Information
     Name                              CNL PCH-H                    ++: Select Screen
     PCH SKU                           C246                         ↑↓: Select Item
     Stepping                          B0                           Enter: Select
     Hsio Revision                     7                            +/-: Change Opt.
     ME Reported Chipset Init CRC      F4AB                         F1: General Help
     TXT Capability of Platform/PCH    Supported                    F2: Previous Values
     Production Type                   Production                   F5: Optimized Defaults
                                                                    F10: Save & Reset
     System Language                   [English]                    F12: Print Screen
                                                                    ESC: Exit
     System Date                       [Sun 06/10/2018]
     System Time                       [19:31:30]

                Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

Navigate to the second page of the screen to see the rest of items in this menu by pressing the Up or Down arrow keys.

To quickly go to the last item of the second page, press the **Page Down** button. Press the **Page Up** button to go back to the first item in the first page.

System Date [Day MM/DD/YYYY]

Allows you to set the system date.

System Time [HH:MM:SS]

Allows you to set the system time.

4.4 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.

> ⚠ Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

```
               Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
      Main  Advanced  Chipset  Security  Boot  Monitor  Tool  Event Logs  Server Mgmt  Save & Exit
  ┌──────────────────────────────────────────────┬─────────────────────────────────────┐
  │ ▶ Rework Configuration                        │ Board Rework Information             │
  │ ▶ CPU Configuration                           │                                     │
  │ ▶ Power & Performance                         │                                     │
  │ ▶ Server ME Configuration                     │                                     │
  │ ▶ Trusted Computing                           │                                     │
  │ ▶ APM Configuration                           │                                     │
  │ ▶ Runtime Error Logging Settings              │                                     │
  │ ▶ Onboard LAN Configuration                   │                                     │
  │ ▶ Serial Port Console Redirection             │                                     │
  │ ▶ Intel TXT Information                        │                                     │
  │ ▶ PCI Subsystem Settings                      │                                     │
  │ ▶ USB Configuration                           │                                     │
  │ ▶ Network Stack Configuration                 │ ⇄: Select Screen                    │
  │ ▶ CSM Configuration                           │ ↑↓: Select Item                     │
  │ ▶ NVMe Configuration                          │ Enter: Select                       │
  │ ▶ WHEA Configuration                          │ +/-: Change Opt.                    │
  │                                               │ F1: General Help                    │
  │ ▶ Tls Auth Configuration                      │ F2: Previous Values                 │
  │ ▶ iSCSI Configuration                         │ F5: Optimized Defaults              │
  │                                               │ F10: Save & Reset                   │
  │                                               │ F12: Print Screen                   │
  │                                               │ ESC: Exit                           │
  │                                               │                                     │
  └──────────────────────────────────────────────┴─────────────────────────────────────┘
               Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

4.4.1   Rework Configuration

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
        Advanced
 ┌──────────────────────────────────────────────────┬────────────────────────────────┐
 │                                                  │ To Enable/ Disable Board       │
 │  Rework Information                              │ Rework Complaince Suppport.     │
 │                                                  │                                │
 │  Board Rework Compliance            [Disabled]  │                                │
 │                                                  │                                │
 └──────────────────────────────────────────────────┴────────────────────────────────┘
```

Board Rework Compliance [Disabled]

This option allows you to enable or disable Board Rework Compliance Support.

Configuration options: [Enabled] [Disabled]

4.4.2   CPU Configuration

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
        Advanced
 ┌──────────────────────────────────────────────────┬────────────────────────────────┐
 │  CPU Configuration                            ▲  │ Enable/Disable Software Guard  │
 │                                                  │ Extensions (SGX)               │
 │  Type                     Intel(R) Xeon(R) E-2124│                                │
 │                           CPU @ 3.30GHz          │                                │
 │  ID                       0x906EA                │                                │
 │  Speed                    3300 MHz               │                                │
 │  L1 Data Cache            32 KB x 4              │                                │
 │  L1 Instruction Cache     32 KB x 4              │                                │
 │  L2 Cache                 256 KB x 4             │                                │
 │  L3 Cache                 8 MB                   │                                │
 │  L4 Cache                 N/A                    │                                │
 │  VMX                      Supported              │                                │
 │  SMX/TXT                  Supported              │ ++: Select Screen              │
 │                                                  │ ↑↓: Select Item                │
 │  Software Guard Extensions (SGX)  [Software Controlled]│ Enter: Select             │
 │  Select Owner EPOCH input type    [No Change in Owner │ +/-: Change Opt.           │
 │                                    EPOCHs]       │ F1: General Help               │
 │  SGX Launch Control Policy        [Unlocked]    │ F2: Previous Values            │
 │  CPU Flex Ratio Override          [Disabled]    │ F5: Optimized Defaults         │
 │  CPU Flex Ratio Settings          33            │ F10: Save & Reset              │
 │  Hardware Prefetcher              [Enabled]     │ F12: Print Screen              │
 │  Adjacent Cache Line Prefetch     [Enabled]     │ ESC: Exit                      │
 │  Intel (VMX) Virtualization       [Enabled]     │                                │
 │  Technology                                     │                                │
 │  Active Processor Cores           [All]       ▼ │                                │
 └──────────────────────────────────────────────────┴────────────────────────────────┘
              Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

Software Guard Extensions (SGX) [Software Controlled]
Allows you to select the behavior of Software Guard Extensions (SGX).
Configuration options: [Software Controlled] [Disabled] [Enabled]

> The following items appear only when you set **Software Guard Extensions (SGX)** to **[Enabled]** or **[Software Controlled]**.

Select Owner EPOCH input type [No change in Owner EPOCHs]
Allows you to select the behavior of EPOCH input type.
Configuration options: [No change in Owner EPOCHs] [Change to New Random EPOCHs] [Manual User Defined Owner EPOCHs]

SGX Launch Control Policy [Unlocked]
Allows you to select the behavior of SGX Launch Control Policy.
Configuration options: [Intel Locked] [Unlocked] [Locked]

> The following items appear only when you set **SGX Launch Control Policy** to **[Locked]**.

SGX LE Public Key Hash 0-3 [0]
Allows you to set the Bytes of the Software Guard Extensions (SGX) Launch Enclave Public Key Hash.

> The following item appears only when you set **Software Guard Extensions (SGX)** to **[Enabled]**.

PRMRR Size [128MB]
Allows you to set the PRMMR Size.
Configuration options: [32MB] [64MB] [128MB]

CPU Flex Ratio Override [Disabled]
Allows you to enable or disable CPU Flex Ratio Override.
Configuration options: [Disabled] [Enabled]

> The following item appears only when you set **CPU Flex Ratio Override** to **[Enabled]**.

CPU Flex Ratio Settings [33]
Allows you to set the CPU Flex Ratio.
This value must be between the Max Efficiency Ratio (LFM) and the Maximum non-turbo ratio set by the Hardware (HFW).

Hardware Prefetcher [Enabled]
This Item allows you to turn on/off the MLC streamer prefetcher.
Configuration options: [Disabled] [Enabled]

Adjacent Cache Prefetch [Enabled]
This Item allows you to turn on/off prefetching of adjacent cache lines.
Configuration options: [Disabled] [Enabled]

Intel (VMX) Virtualization Technology [Enabled]
Enable this item to allow a VMM to utilize the additional hardware capabilities provided by Vanderpool Technology.
Configuration options: [Disabled] [Enabled]

Active Processor Cores [All]
This item allows you to set the number of cores to enable in each processor package.
Configuration options: [All] [1] [2] [3]

BIST [Disabled]
Allows you to enable or disable BIST (Built-In Self Test) on reset.
Configuration options: [Disabled] [Enabled]

AES [Enabled]
Allows you to enable or disable AES (Advanced Encryption Standard).
Configuration options: [Disabled] [Enabled]

Intel Trusted Execution Technology [Disabled]
Allows you to enable or disable utilization of additional hardware capabilities provided by Intel(R) Trusted Execution Technology. Changes require a full power cycle to take effect.
Configuration options: [Disabled] [Enabled]

4.4.3   Power & Performance

```
            Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
        Advanced

    Power & Performance                             CPU - Power Management Control
                                                    Options
  ▶ CPU - Power Management Control
```
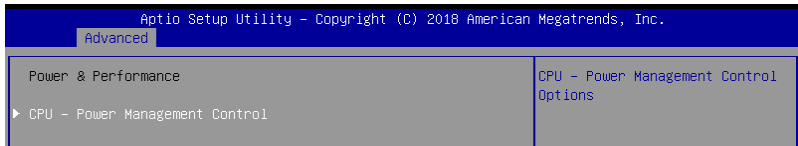
CPU - Power Management Control

Boot performance mode [Max Non-Turbo Performance]
This item allows you to select the performance state that the BIOS will set starting from reset vector.
Configuration options: [Max Battery] [Max Non-Turbo Performance] [Turbo Performance]

Intel(R) SpeedStep(tm) [Enabled]
Allows more than two frequency ranges to be supported.
Configuration options: [Disabled] [Enabled]

Race To Halt (RTH) [Enabled]

Allows you to enable or disable Race To Halt feature. RTH will dynamically increase CPU frequency in order to enter pkg C-State faster to reduce overall power. RTH is controlled through MSR 1FC bit 20.
Configuration options: [Disabled] [Enabled]

Intel(R) Speed Shift Technology [Disabled]

Allows you to enable or disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.
Configuration options: [Disabled] [Enabled]

HDC Control [Enabled]

[Disabled]   Disable HDC.

[Enabled]   Can be enable by OS if OS native support available.

Turbo Mode [Enabled]

Allows you to enable or disable processor turbo mode if EMTTM is also enabled.
Configuration options: [Disabled] [Enabled]

C-States [Enabled]

Allows you to enable or disable CPU power management, this allows the CPU to enter C-state when it is not 100% utilized.
Configuration options: [Disabled] [Enabled]

The following items appears only when you set **C-States** to **[Enabled]**.

Enhanced C-States [Enabled]
Allows you to enable or disable C1IE. Enable this item to allow the CPU to switch to minimum speed when all cores enter C-State.
Configuration options: [Disabled] [Enabled]

C-State Auto Demotion [C1 and C3]
This item allows you to configure the C-state auto demotion.
Configuration options: [Disabled] [C1] [C3] [C1 and C3]

C-State Un-demotion [C1 and C3]
This item allows you to configure the C-state Un-demotion.
Configuration options: [Disabled] [C1] [C3] [C1 and C3]

Package C-State Demotion [Disabled]
This item allows you to configure the Package C-State Demotion.
Configuration options: [Disabled] [Enabled]

Package C-State Un-demotion [Disabled]
This item allows you to configure the Package C-state Un-demotion.
Configuration options: [Disabled] [Enabled]

Package C-state Limit [Auto]
This item allows you to select the maximum package C-state limit setting.
Configuration options: [C0/C1] [C2] [C3] [C6] [C7] [C7S] [C8] [C9] [C10] [CPU Default] [Auto]

Thermal Monitor [Enabled]
Allows you to enable or disable Thermal Monitoring.
Configuration options: [Disabled] [Enabled]

4.4.4 Server ME Configuration

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
         Advanced

 Server ME Configuration                                    Selects TPM device: PTT or
 Operational Firmware Version      00:12.0.2.1088           dTPM. PTT - Enables PTT in
 Backup Firmware Version           00:12.0.2.1088           SkuMgr dTPM 1.2 - Disables PTT
 Recovery Firmware Version         00:12.0.2.1088           in SkuMgr Warning !  PTT/dTPM
 ME Firmware Features              N/A                      will be disabled and all data
 ME Firmware Status #1             0x90000255               saved on it will be lost.
 ME Firmware Status #2             0x8610810E
   Current State                   Operational
   Error Code                      No Error
 TPM Device Selection              [PTT]


                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F5: Optimized Defaults
                                                           F10: Save & Reset
                                                           F12: Print Screen
                                                           ESC: Exit
```

TPM Device Selection [PTT]
Allows you to select the TPM device.
Configuration options: [PTT] [dTPM]

4.4.5 Trusted Computing

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
         Advanced

 TPM20 Device Found                                         Enables or Disables BIOS
 Firmware Version:                 402.2                    support for security device.
 Vendor:                           INTC                     O.S. will not show Security
                                                            Device. TCG EFI protocol and
 Security Device Support           [Enable]                 INT1A interface will not be
 Active PCR banks                  SHA-1,SHA256             available.
 Available PCR banks               SHA-1,SHA256
```

Security Device Support [Enabled]
This item allows you to enable or disable Security Device Support.
Configuration options: [Disabled] [Enabled]

4.4.6   APM Configuration

ErP	[Enable(S5)]	ErP
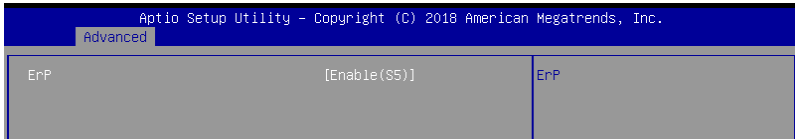
ErP [Enabled (S5)]
This item allows you to switch off some power at S4+S5 or S5 to get the systen ready for ErP requirement. When set to **[Enabled]**, all other PME options are switched off.
Configuration options: [Disabled] [Enabled (S4+S5)] [Enabled (S5)]

4.4.7   Runtime Error Logging Settings

Runtime Error Logging Settings		Runtime Error Logging System Enable/Disable
Runtime Error Logging System Enabling	[Enabled]	
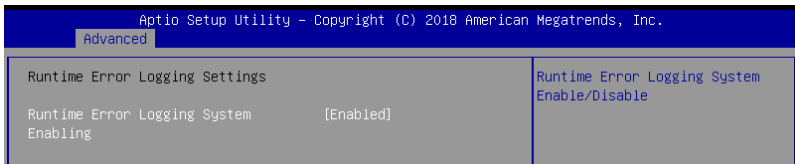
Runtime Error Logging System Enabling [Enabled]
This item allows you to enable or disable Runtime Error Logging System.
Configuration options: [Disabled] [Enabled]

4.4.8 Onboard LAN Configuration

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
          Advanced
─────────────────────────────────────────────────────────────────────────────────
▶ Onboard I210 LAN Configuration                        Onboard I210 LAN Enable/Disable
```
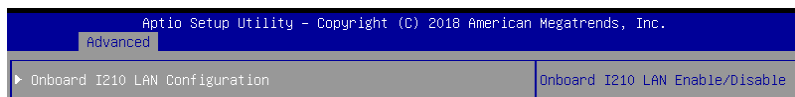
Onboard I210 LAN Configuration

Intel I210 LAN1

LAN Enable [Enabled]
Allows you to enable or disable the Intel LAN.
Configuration options: [Disabled] [Enabled]

> The following item appears only when you set **LAN Enable** to **[Enabled]**.

ROM Type [PXE]
Allows you to select the Intel LAN ROM type.
Configuration options: [Disabled] [PXE] [iSCSI]

> Due to Intel® limitations, both Intel LAN ROM Type options should be the same when **[PXE]** or **[iSCSI]** is selected.

Intel I210 LAN2-4

LAN Enable [Enabled]
Allows you to enable or disable the Intel LAN.
Configuration options: [Disabled] [Enabled]

> The following item appears only when you set Intel **LAN Enable** to **[Enabled]**.

ROM Type [Disabled]
Allows you to select the Intel LAN ROM type.
Configuration options: [Disabled] [PXE] [iSCSI]

> Due to Intel® limitations, both Intel LAN ROM Type options should be the same when **[PXE]** or **[iSCSI]** is selected.

4.4.9   Serial Port Console Redirection

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
        Advanced

                                                                  Console Redirection Enable or
                                                                  Disable.
      COM1
      Console Redirection               [Disabled]
    ▶ Console Redirection Settings

      COM2
      Console Redirection               [Disabled]
    ▶ Console Redirection Settings

      Legacy Console Redirection
    ▶ Legacy Console Redirection Settings

      Serial Port for Out-of-Band Management/
      Windows Emergency Management Services (EMS)                ➜←: Select Screen
      Console Redirection               [Disabled]              ↑↓: Select Item
    ▶ Console Redirection Settings                              Enter: Select
```

COM1/COM2

Console Redirection [Disabled]
Allows you to enable or disable the console redirection feature.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Console Redirection** to **[Enabled]**.

Console Redirection Settings
These items become configurable only when you enable the **Console Redirection** item. The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

Terminal Type [VT-UTF8]
Allows you to set the terminal type.

[VT100]   ASCII char set.
[VT100+]   Extends VT100 to support color, function keys, etc.
[VT-UTF8]   Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
[ANSI]   Extended ASCII char set.

Bits per second [57600]
Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Configuration options: [9600] [19200] [38400] [57600] [115200]

Data Bits [8]
Configuration options: [7] [8]

Parity [None]

A parity bit can be sent with the data bits to detect some transmission errors. [Mark] and [Space] parity do not allow for error detection.

[None]	None
[Even]	parity bit is 0 if the num of 1's in the data bits is even
[Odd]	parity bit is 0 if num of 1's in the data bits is odd
[Mark]	parity bit is always 1
[Space]	parity bit is always 0

Stop Bits [1]

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning.) The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.
Configuration options: [1] [2]

Flow Control [Hardware RTS/CTS]

Flow control can 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 re-start the flow. Hardware flow control uses two wires to send start/stop signals.
Configuration options: [None] [Hardware RTS/CTS]

VT -UTF8 Combo Key Support [Enabled]

This allows you to enable the VT -UTF8 Combination Key Support for ANSI/VT100 terminals.
Configuration options: [Disabled] [Enabled]

Recorder Mode [Disabled]

With this mode enabled only text will be sent. This is to capture Terminal data.
Configuration options: [Disabled] [Enabled]

Resolution 100x31 [Disabled]

This allows you to enable or disable extended terminal resolution.
Configuration options: [Disabled] [Enabled]

Putty Keypad [VT100]

This allows you to select the FunctionKey and Keypad on Putty.
Configuration options: [VT100] [LINUX] [XTERMR6] [SCO] [ESCN] [VT400]

Legacy Console Redirection Settings

Redirection COM Port [COM1]

Allows you to select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.
Configuration options: [COM1] [COM2]

Resolution [80x24]

Allows you to select a the number of rows and columns in supported redirection.
Configuration options: [80x24] [80x25]

Redirect After POST [Always Enable]

Allows you to select the redirection after POST.
Configuration options: [Always Enable] [BootLoader]

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

Console Redirection [Disabled]

Allows you to enable or disable the console redirection feature.
Configuration options: [Disabled] [Enabled]

> The following item appears only when you set **Console Redirection** to **[Enabled]**.

Console Redirection Settings

Out-of-Band Mgmt Port [COM1]
Microsoft Windows Emergency Management Services (EMS) allow for remote management of a Windows Server OS through a serial port.
Configuration options: [COM1] [COM2]

Terminal Type [VT-UTF8]
Microsoft Windows Emergency Management Services (EMS) allow for remote management of a Windows Server OS through a serial port.
Configuration options: [VT100] [VT100+] [VT-UTF8] [ANSI]

Bits per second [115200]
Microsoft Windows Emergency Management Services (EMS) allow for remote management of a Windows Server OS through a serial port.
Configuration options: [9600] [19200] [57600] [115200]

Flow Control [None]
Microsoft Windows Emergency Management Services (EMS) allow for remote management of a Windows Server OS through a serial port.
Configuration options: [None] [Hardware RTS/CTS] [Software Xon/Xoff]

4.4.10   Intel TXT Information

You may view the Intel TXT information in this menu.

4.4.11 PCI Subsystem Settings

Allows you to configure PCI, PCI-X, and PCI Express Settings.

```
                   Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
          Advanced

   AMI PCI Driver Version :   A5.01.17                    Globally Enables or Disables
                                                          64bit capable Devices to be
   PCI Settings Common for all Devices:                   Decoded in Above 4G Address
   Above 4G Decoding                [Disabled]            Space (Only if System Supports
   SR-IOV Support                   [Disabled]            64 bit PCI Decoding).
   BME DMA Mitigation               [Disabled]

   Change Settings of the Following PCI Devices:

   WARNING: Changing PCI Device(s) settings may
   have unwanted side effects! System may HANG!
   PROCEED WITH CAUTION.
```

Above 4G Decoding [Disabled]
Allows you to enable or disable 64-bit capable devices to be decoded in above 4G address space. It only works if the system supports 64-bit PCI decoding.
Configuration options: [Disabled] [Enabled]

SR-IOV Support [Disabled]
This allows you to enable or disable Single Root IO Virtualization Support, if your system has SR-IOV capable PCIe Devices.
Configuration options: [Disabled] [Enabled]

BME DMA Mitigation [Disabled]
This allows you to enable or disable re-enabling Bus Master Attribute disabled during Pci enumeration for PCI Bridges after SMM locked.
Configuration options: [Disabled] [Enabled]

4.4.12 USB Configuration

```
                 Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
        Advanced
    ──────────────────────────────────────────────────────────────────────────────────
    USB Configuration                                        Enables Legacy USB support.
                                                             AUTO option disables legacy
    USB Module Version              20                       support if no USB devices are
                                                             connected. DISABLE option will
    USB Controllers:                                         keep USB devices available
        1 XHCI                                               only for EFI applications.
    USB Devices:
        1 Drive, 1 Keyboard, 1 Mouse

    Legacy USB Support              [Enabled]
    XHCI Hand-off                   [Enabled]
    USB Mass Storage Driver Support [Enabled]
    Port 60/64 Emulation            [Enabled]
                                                        ──────────────────────────────────
    USB hardware delays and time-outs:                  ++: Select Screen
    USB transfer time-out           [20 sec]            ↑↓: Select Item
    Device reset time-out           [20 sec]            Enter: Select
    Device power-up delay           [Auto]              +/-: Change Opt.
                                                        F1: General Help
    Mass Storage Devices:                               F2: Previous Values
    JetFlashTranscend 4GB 8.07      [Auto]              F5: Optimized Defaults
                                                        F10: Save & Reset
                                                        F12: Print Screen
```

Legacy USB Support [Enabled]

[Disabled]   The USB devices can be used only for the BIOS setup program. It cannot be recognized in boot devices list.

[Enabled]   Enables the support for USB devices on legacy operating systems (OS).

[Auto]   Allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

XHCI Hand-off [Enabled]

Allows you to enable or disable workaround for OS(s) without XHCI hand-off support.
Configuration options: [Disabled] [Enabled]

USB Mass Storage Driver Support [Enabled]

Allows you to enable or disable USB Mass Storage driver support.
Configuration options: [Disabled] [Enabled]

Port 60/64 Emulation [Enabled]

Allows you to enable or disable Port 60/64 Emulation.
Configuration options: [Disabled] [Enabled]

USB hardware delays and time-outs

USB transfer time-out [20 sec]

Allows you to set the USB transfer time-out value.
Configuration options: [1 sec] [5 sec] [10 sec] [20 sec]

Device reset time-out [20 sec]

Allows you to set the device reset time-out value.
Configuration options: [10 sec] 20 sec] [30 sec] [40 sec]

Device power-up delay [Auto]
Allows you to set the maximum time the device takes before the device reports itself to the host controller properly.
Configuration options: [Auto] [Manual]

The following item appears only when you set **Device power-up delay** to **[Manual]**.

Device power-up delay in seconds [5]
Allows you to set the device power-up delay in seconds. Use the <+> or <-> to adjust the value. The values range from 1 to 40.

Mass Storage Devices
Allows you to select the mass storage device emulation type for devices connected.
Configuration options: [Auto] [Floppy] [Forced FDD] [Hard Disk] [CD-ROM]

4.4.13 Network Stack Configuration

Allows you to configure the network stack configuration.

```
            Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
      Advanced

 Network Stack                          [Disabled]                Enable/Disable UEFI Network
                                                                  Stack
```
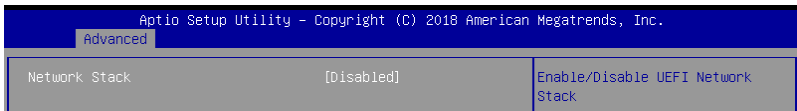
Network Stack [Disabled]
Allows you to enable or disable UEFI Network Stack.
Configuration options: [Disabled] [Enabled]

The following items appear only when you set **Network Stack** to **[Enabled]**.

Ipv4 PXE Support [Disabled]
Enables or disables the Ipv4 PXE Boot Support. If disabled, Ipv4 PXE boot option will not be created.
Configuration options: [Disabled] [Enabled]

Ipv4 HTTP Support [Disabled]
Enables or disables the Ipv4 HTTP Boot Support. If disabled, Ipv4 PXE boot option will not be created.
Configuration options: [Disabled] [Enabled]

Ipv6 PXE Support [Disabled]
Enables or disables the Ipv6 PXE Boot Support. If disabled, Ipv6 PXE boot option will not be created.
Configuration options: [Disabled] [Enabled]

Ipv6 HTTP Support [Disabled]
Enables or disables the Ipv6 HTTP Boot Support. If disabled, Ipv6 PXE boot option will not be created.
Configuration options: [Disabled] [Enabled]

IPSEC Certificate [Enabled]
Enables or disables support for IPSEC Certificate.
Configuration options: [Disabled] [Enabled]

PXE boot wait time [0]
Set the wait time to press ESC key to abort the PXE boot. Use the <+> or <-> to adjust the value. The values range from 0 to 5.

Media detect count [1]
Set the number of times presence of media will be checked. Use the <+> or <-> to adjust the value. The values range from 1 to 50.

4.4.14   CSM Configuration

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
       Advanced

   Compatibility Support Module Configuration                Enable/Disable CSM Support.

   CSM Support                          [Enabled]

   CSM16 Module Version                 07.82

   GateA20 Active                       [Upon Request]
   Option ROM Messages                  [Force BIOS]
   INT19 Trap Response                  [Immediate]
   HDD Connection Order                 [Adjust]

   Boot option filter                   [Legacy only]

   Option ROM execution
                                                            ++: Select Screen
   Network                              [Legacy]            ↑↓: Select Item
   Storage                              [Legacy]            Enter: Select
   Video                                [Legacy]            +/-: Change Opt.
   Other PCI devices                    [Legacy]            F1: General Help
                                                            F2: Previous Values
                                                            F5: Optimized Defaults
```

CSM Support [Enabled]
This option allows you to enable or disable CSM Support.
Configuration options: [Disabled] [Enabled]

The following items appear only when you set **CSM Support** to **[Enabled]**.

GateA20 Active [Upon Request]
This allows you to set the GA20 option.

[Upon Request]   GA20 can be disabled using BIOS services.
[Always]   Do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Option ROM Messages [Force BIOS]
This allows you to set the display mode for option ROM.
Configuration options: [Force BIOS] [Keep Current]

INT19 Trap Response [Immediate]
This option allows you to control the BIOS reaction on INT19 trapping by Option ROM.

[Immediate]   Execute the trap right away.
[Postponed]   Execute the trap during legacy boot.

HDD Connection Order [Adjust]
This option allows you to select the HDD Connection Order. Some OS require HDD handles to be adjusted.
Configuration options: [Adjust] [Keep]

Boot Option filter [Legacy only]
This option allows you to control the Legacy/UEFI ROMs priority.
Configuration options: [UEFI and Legacy] [Legacy only] [UEFI only]

Network / Storage / Video [Legacy]
This option allows you to control the execution of UEFI and Legacy PXE/ Storage/ Video OpROM.
Configuration options: [UEFI] [Legacy]

Other PCI devices [Legacy]
This item determines the OpROM execution policy for devices other than Network, Storage, or Video.
Configuration options: [UEFI] [Legacy]

4.4.15　NVMe Configuration

You may view the NVMe controller and Drive information if an NVMe device is connected.

```
            Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
        Advanced

 NVMe Configuration

 No NVME Device Found
```

4.4.16　WHEA Configuration

```
            Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
        Advanced

 WHEA Support                      [Enabled]          Enable or disable Windows
                                                      Hardware Error Architecture.
```
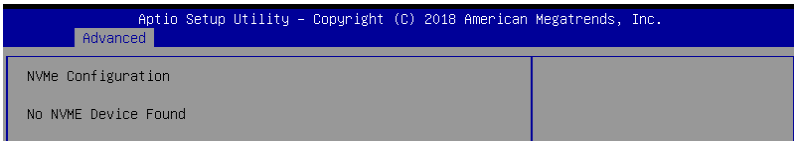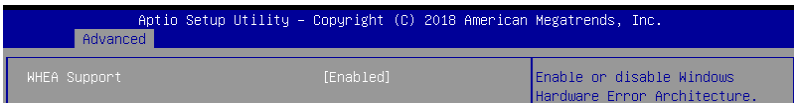
Whea Support [Enabled]
This item allows you to enable or disable the WHEA support.
Configuration options: [Disabled] [Enabled]

4.4.17　Tls Auth Configuration

Allows you to configure the Tls Auth.

```
            Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
        Advanced
                                                      Press <Enter> to configure
 ▶ Server CA Configuration                            Server CA.

 ▶ Client Cert Configuration
```
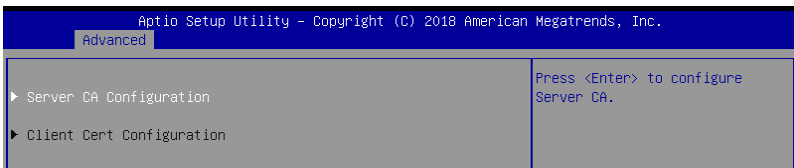
4.4.18   iSCSI Configuration

Allows you to configure the iSCSi parameters.

```
              Aptio Setup Utility — Copyright (C) 2018 American Megatrends, Inc.
       Advanced

     iSCSI Initiator Name                                      The worldwide unique name of
                                                               iSCSI Initiator. Only IQN
   ▶ Add an Attempt                                            format is accepted. Range is
                                                               from 4 to 223
   ▶ Delete Attempts

   ▶ Change Attempt Order
```
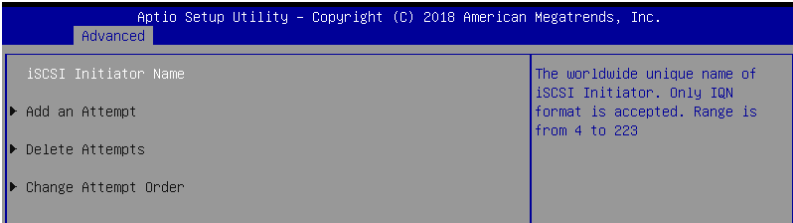
4.5   Chipset menu

The Chipset menu allows you to change the platform settings.

```
            Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Monitor  Tool  Event Logs  Server Mgmt  Save & Exit
 ▶ System Agent (SA) Configuration                         System Agent (SA) Parameters
 ▶ PCH-IO Configuration
```
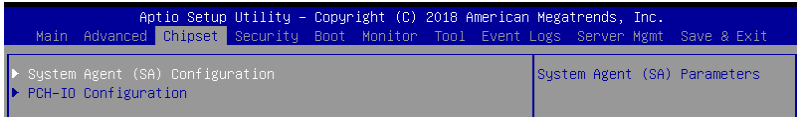
⚠ Take caution when changing the settings of the Chipset menu items. Incorrect field values can cause the system to malfunction.

4.5.1   System Agent (SA) Configuration

```
            Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
      Chipset

   System Agent (SA) Configuration                         Memory Configuration Parameters

   VT-d                          Supported

 ▶ Memory Configuration
 ▶ PEG Port Configuration
   VT-d                          [Enabled]
   CRID Support                  [Disabled]
   Above 4GB MMIO BIOS assignment  [Disabled]
   X2APIC Opt Out                [Disabled]
```
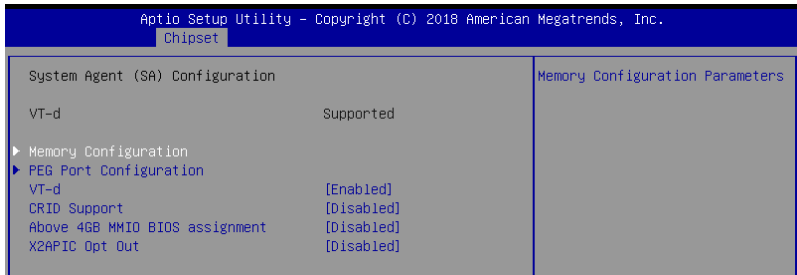
Memory Configuration

Memory Test on Warm Boot [Enabled]
Allows you to enable or disable the Base Memory Test Run on Warm Boot.
Configuration options: [Disabled] [Enabled]

Maximum Memory Frequency [Auto]
Allows you to select the maximum memory frequency setting.
Configuration options: [Auto] [2133] [2400] [2667]

ECC Support [Enabled]
Allows you to enable or disable the ECC support.
Configuration options: [Disabled] [Enabled]

Memory Scrambler [Enabled]
Allows you to enable or disable Memory Scrambler.
Configuration options: [Disabled] [Enabled]

Fast Boot [Disabled]
Allows you to enable or disable Fast Boot.
Configuration options: [Disabled] [Enabled]

PEG Port Configuration

PEG 0:1:0

Max Link Speed [Auto]
Allows you to set the Max Link Speed.
Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

PEG0 Slot Power Limit Value [75]
Set the upper limit on power supplied by slot. Use the <+> or <-> to adjust the value.
The values range from 0 to 255.

PEG0 Slot Power Limit Scale [1.0x]
Allows you to select the scale for the Slot Power Limit Value.
Configuration options: [1.0x] [0.1x] [0.01x] [0.001x]

PEG0 Physical Slot Number [1]
Allows you to set the physical slot number attached to this Port. The number has to be
globally unique within the chassis. Use the <+> or <-> to adjust the value. The values
range from 0 to 8191.

PEG 0:1:1

Max Link Speed [Auto]
Allows you to set the Max Link Speed.
Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

PEG1 Slot Power Limit Value [75]
Set the upper limit on power supplied by slot. Use the <+> or <-> to adjust the value.
The values range from 0 to 255.

PEG1 Slot Power Limit Scale [1.0x]
Allows you to select the scale for the Slot Power Limit Value.
Configuration options: [1.0x] [0.1x] [0.01x] [0.001x]

PEG1 Physical Slot Number [2]
Allows you to set the physical slot number attached to this Port. The number has to be
globally unique within the chassis. Use the <+> or <-> to adjust the value. The values
range from 0 to 8191.

PEG 0:1:2

Max Link Speed [Auto]
Allows you to set the Max Link Speed.
Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

PEG2 Slot Power Limit Value [75]
Set the upper limit on power supplied by slot. Use the <+> or <-> to adjust the value.
The values range from 0 to 255.

PEG2 Slot Power Limit Scale [1.0x]
Allows you to select the scale for the Slot Power Limit Value.
Configuration options: [1.0x] [0.1x] [0.01x] [0.001x]

PEG2 Physical Slot Number [3]
Allows you to set the physical slot number attached to this Port. The number has to be globally unique within the chassis. Use the <+> or <-> to adjust the value. The values range from 0 to 8191.

PEG3 Slot Power Limit Value [75]
Set the upper limit on power supplied by slot. Use the <+> or <-> to adjust the value. The values range from 0 to 255.

PEG3 Slot Power Limit Scale [1.0x]
Allows you to select the scale for the Slot Power Limit Value.
Configuration options: [1.0x] [0.1x] [0.01x] [0.001x]

PEG3 Physical Slot Number [3]
Allows you to set the physical slot number attached to this Port. The number has to be globally unique within the chassis. Use the <+> or <-> to adjust the value. The values range from 0 to 8191.

VT-d [Enabled]
Allows you to enable or disable VT-d capability.
Configuration options: [Disabled] [Enabled]

CRID Support [Disabled]
Allows you to enable or disable CRID control for Intel SIPP.
Configuration options: [Disabled] [Enabled]

Above 4GB MMIO BIOS Assignment [Disabled]
Allows you to enable or disable above 4 GB memory mapped IO BIOS assignment. This is enabled automatically if the aperture size is set to 2048MB.
Configuration options: [Disabled] [Enabled]

The following item is configurable only when you set **VT-d** to **[Enabled]**.

X2APIC Opt Out [Disabled]
Allows you to enable or disable X2APIC Opt Out.
Configuration options: [Disabled] [Enabled]

4.5.2   PCH-IO Configuration

```
          Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
                  Chipset

    PCH-IO Configuration                                  PCI Express Configuration
                                                          settings
  ▶ PCI Express Configuration
  ▶ SATA And RSTe Configuration
  ▶ HD Audio Configuration
```
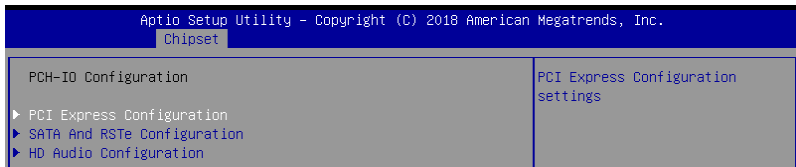
PCI Express Configuration

PCI Express Clock Gating [Enabled]
Allows you to enable or disable PCI Express clock gating for each root port.
Configuration options: [Disabled] [Enabled]

DMI Link ASPM Control [Auto]
Allows you to enable or disable control of active state power management of DMI link.
Configuration options: [Disabled] [L0s] [L1] [L0sL1] [Auto]

Port8xh Decode [Disabled]
Allows you to enable or PCI express port 8xh decode.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Port8xh Decode** to **[Enabled]**.

Port8xh Decode Port# [0]
Select PCI Express Port8xh Decode Root Port. User to ensure port availability.
Configuration options: [0] - [23]

SATA And RSTe Configuration

SATA Controller(s) [Enabled]
Allows you to enable or disable the SATA Controller.
Configuration options: [Disabled] [Enabled]

The following items appear only when you set **SATA Controller(s)** to **[Enabled]**.

SATA Mode Selection [AHCI]
Allows you to select the SATA controllers operation.
Configuration options: [AHCI] [RAID]

Serial ATA Port 1-8

Port 1-8 [Enabled]
Allows you to enable or disable the SATA port.
Configuration options: [Disabled] [Enabled]

Hot Plug [Enabled]
Allows you to enable or disable this port as hot pluggable.
Configuration options: [Disabled] [Enabled]

Spin Up Device [Disabled]
Allows you to enable or disable Spin Up Device.
Configuration options: [Disabled] [Enabled]

SATA Device Type [Hard Disk Drive]
Allows you to identify the SATA port is connected to a solid state drive or a hard disk drive
Configuration options: [Hard Disk Drive] [Solid State Drive]

HD Audio Configuration

HD Audio [Enabled]
Allows you to enable or disable the HD Audio.
Configuration options: [Disabled] [Enabled]

Audio DSP [Disabled]
Allows you to enable or disable the Audio DSP.
Configuration options: [Disabled] [Enabled]

Audio Link Mode [HD Audio Link]
Allows you to select the audio link mode.
Configuration options: [HD Audio Link] [SSP (I2S)] [Soundwire] [Advanced Link Config]

HDA-Link Codec Select [Platform Onboard]
Allows you to select the HDA-Link Codec.
Configuration options: [Platform Onboard] [External Kit]

HD Audio Advanced Configuration

iDisplay Audio Disconnect [Disabled]
Allows you to enable or disable iDisplay Audio Disconnect.
Configuration options: [Disabled] [Enabled]

Codec Sx Wake Capability [Disabled]
Allows you to enable or disable Codec Sx Wake Capability.
Configuration options: [Disabled] [Enabled]

PME Enable [Disabled]
Allows you to enable or disable PME wake of HD Audio controller during POST.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set the **Audio Link Mode** to **[Soundwire]**.

Soundwire Buffer RCOMP Setting [Non-ACT Topology]
This item allows you to select the Soundwire Buffer RCOMP Setting.
Configuration options: [Non-ACT Topology] [ACT Topology]

HD Audio Link Frequency [24 MHz]
Allows you to select the HD Audio Link Frequency.
Configuration options: [6 MHz] [12 MHz] [24 MHz]

iDisplay Audio Link Frequency [96 MHz]
Allows you to select the iDisplay Audio Link Frequency.
Configuration options: [48 MHz] [96 MHz]

iDisplay Audio Link T-Mode [2T Mode]
Allows you to select the iDisplay Audio Link T-Mode.
Configuration options: [1T Mode][2T Mode]

4.6   Security menu

This menu allows a new password to be created or a current password to be changed. The menu also enables or disables the Secure Boot state and lets the user configure the System Mode state.

```
                   Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
      Main   Advanced   Chipset   Security   Boot   Monitor   Tool   Event Logs   Server Mgmt   Save & Exit

      Password Description                                      Set Administrator Password

      If ONLY the Administrator's password is set,
      then this only limits access to Setup and is
      only asked for when entering Setup.
      If ONLY the User's password is set, then this
      is a power on password and must be entered to
      boot or enter Setup. In Setup the User will
      have Administrator rights.
      The password length must be
      in the following range:
      Minimum length                     3
      Maximum length                     20
                                                                →←: Select Screen
      Administrator Password                                    ↑↓: Select Item
      User Password                                             Enter: Select
                                                                +/-: Change Opt.
    ▶ Secure Boot                                               F1: General Help
                                                                F2: Previous Values
                                                                F5: Optimized Defaults
```

Administrator Password

To set an administrator password:

1. Select the Administrator Password item and press <Enter>.

2. From the Create New Administrator Password box, key in a password, then press <Enter>.

3. Confirm the password when prompted.

To change an administrator password:

1. Select the Administrator Password item and press <Enter>.

2. From the Enter Current Password box, key in the current password, then press <Enter>.

3. From the Create New Password box, key in a new password, then press <Enter>.

4. Confirm the password when prompted.

To clear the administrator password, follow the same steps as in changing an administrator password, but press <Enter> when prompted to create/confirm the password.

User Password

To set a user password:

1. Select the User Password item and press <Enter>.

2. From the Create New User Password box, key in a password, then press <Enter>.

3. Confirm the password when prompted.

To change a user password:

1. Select the User Password item and press <Enter>.

2. From the Enter Current Password box, key in the current password, then press <Enter>.

3. From the Create New Password box, key in a new password, then press <Enter>.

4. Confirm the password when prompted.

To clear a user password:

1. Select the Clear User Password item and press <Enter>.

2. Select Yes from the Warning message window then press <Enter>.

Secure Boot

This item allows you to customize the Secure Boot settings.
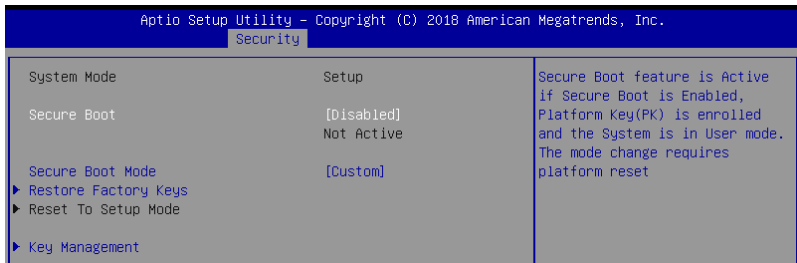
Secure Boot [Disabled]

Secure Boot can be enabled if the system is running in User mode with enrolled platform Key (EPK) or if the CSM function is disabled.
Configuration options: [Disabled] [Enabled]

Secure Boot Mode [Custom]

Allows you to set the Secure Boot selector.
Configuration options: [Custom] [Standard]

Restore Factory Keys

This option will force the system to User Mode, and install factory default Secure Boot key databases.

Key Management

This item only appears when the item **Secure Boot Mode** is set to **[Custom]**. The Key Management item allows you to modify Secure Boot variables and set Key Management page.

```
                 Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
                      Security

  Vendor Keys                     Valid                      Install factory default Secure
                                                             Boot keys after the platform
  Factory Key Provision           [Disabled]                 reset and while the System is
▶ Restore Factory Keys                                       in Setup mode
▶ Reset To Setup Mode
▶ Export Secure Boot variables
▶ Enroll Efi Image

  Device Guard Ready
▶ Remove 'UEFI CA' from DB
▶ Restore DB defaults

  Secure Boot variable | Size| Keys| Key Source
▶ Platform Key(PK)     |    0|    0| No Keys               →←: Select Screen
▶ Key Exchange Keys    |    0|    0| No Keys               ↑↓: Select Item
▶ Authorized Signatures|    0|    0| No Keys               Enter: Select
▶ Forbidden  Signatures|    0|    0| No Keys               +/-: Change Opt.
▶ Authorized TimeStamps|    0|    0| No Keys               F1: General Help
▶ OsRecovery Signatures|    0|    0| No Keys               F2: Previous Values
                                                           F5: Optimized Defaults
```

Factory Key Provision [Disabled]
Allows you to provision factory default Secure Boot keys when the system is in Setup Mode.
Configuration options: [Disabled] [Enabled]

Restore Factory keys
This item will install all Factory Default keys.

Reset to Setup Mode
This item appears only when you load the default Secure Boot keys. This item allows you to clear all default Secure Boot keys.

Export Secure Boot Variables
This item will ask you if you want to save all secure boot variables. Select Yes if you want to save all secure boot variables, otherwise select No.

Enroll Efi Image

This item will allow the image to run in Secure Boot mode.
Configuration options: [Set New] [Append]

Device Guard Ready

Remove 'UEFI CA' from DB

Remove Microsoft UEFI CA from Secure Boot DB.

Restore DB defaults

Restore DB variable to factory defaults.

Platform Key (PK)

Configuration options: [Details] [Export] [Update] [Delete]

Key Exchange Keys (KEK) / Authorized Signatures (DB) / Forbidden Signatures (DBX)

Configuration options: [Details] [Export] [Update] [Append] [Delete]

Authorized TimeStamps (DBT) / OsRecovery Signatures

Configuration options: [Update] [Append]

4.7   Boot menu

The Boot menu items allow you to change the system boot options.
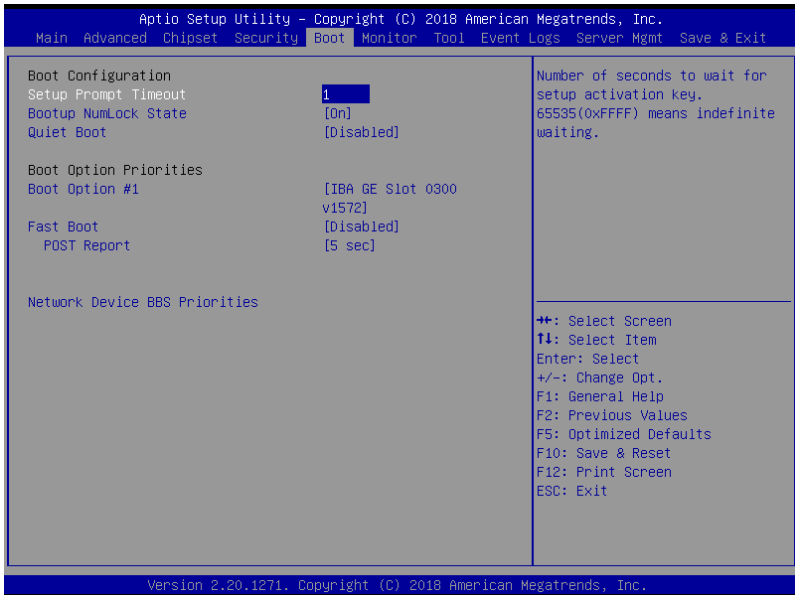
Setup Prompt Timeout [1]

Allows you to set the number of seconds that the firmware waits before initiating the original default boot selection. 65535(OxFFFF) means indefinite waiting. Use the <+> or <-> to adjust the value.

Bootup NumLock State [On]

Allows you to select the power-on state for the NumLock.
Configuration options: [Off] [On]

Quiet Boot [Disabled]
Allows you to enable or disable Quiet Boot option.
Configuration options: [Disabled] [Enabled]

Boot Option Priorities

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

- To select the boot device during system startup, press <F8> when ASUS Logo appears.

- To access Windows OS in Safe Mode, please press <F8> after POST.

Fast Boot [Disabled]
Allows you to enable or disable boot with initialization of a minimal set of devices required to launch active boot option. This has no effect for BBS boot options.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Fast Boot** to **[Enabled]**.

Sata Support [All Sata Devices]
[Last Boot HDD Only]   Only last booted HDD device will be available in POST.
[All Sata Devices]   All SATA devices will be available in OS and POST.

VGA Support [EFI Driver]
[Auto]   Only legacy OpRom with Legacy OS, and logo will NOT be shown during POST.
[EFI Driver]   Efi driver will still be installed with EFI OS.

USB Support [Full Intial]
[Disabled]   All USB devices will NOT be available until after OS boot.
[Partial Initial] USB Mass Storage and specific USB port/device will NOT be available before OS boot.
[Full Initial]   All USB devices will be available in OS and POST.

PS2 Devices Support [Enabled]
If this option is disabled, PS2 devices will be skipped.
Configuration options: [Disabled] [Enabled]

Network Stack Driver Support [Disabled]
If this option is disabled, Network Stack Driver will be skipped.
Configuration options: [Disabled] [Enabled]

Redirection Support [Disabled]
If this option is disabled, Redirection function will be disabled.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Quiet Boot** to **[Disabled]**.

POST Report [5 sec]
Allows you to set the desired POST Report waiting time from 1 to 10 seconds.
Configuration options: [1 sec] - [10 sec] [Until Press ESC]

Network Device BBS Priorities
This item allows you to set the booting order of the devices.

4.8   Monitor menu

This menu displays the system temperature, fan speed, and power status. You can also change the fan settings in this menu.

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Monitor  Tool  Event Logs  Server Mgmt  Save & Exit

    CPU1 Temperature              : +38°C                  Generic/High/Full/Manual Speed
    REAR_FAN1 Speed               : 1123 RPM               Mode
    CPU_FAN1 Speed                : 1505 RPM
    FRNT_FAN1 Speed               : N/A
    FRNT_FAN2 Speed               : 1198 RPM
    FRNT_FAN3 Speed               : N/A
    FRNT_FAN4 Speed               : N/A
    +VCORE1                       : +1.040 V
    +12V                          : +12.288 V
    +5V                           : +5.160 V
    +VDDQ_AB                      : +1.216 V
    +VCCIO                        : +0.960 V
    +VCCSA                        : +1.056 V
    +5VSB                         : +5.120 V                ++: Select Screen
    +VCCST                        : +1.080 V                ↑↓: Select Item
    +3.3V                         : +3.360 V                Enter: Select
    +3.3VSB                       : +3.360 V                +/-: Change Opt.
    VBAT                          : +3.168 V                F1: General Help
                                                            F2: Previous Values
    FAN Speed Control             [Generic Mode]            F5: Optimized Defaults
```

Fan Speed Control [Generic Mode]

Allows you to select the power-on state for the NumLock.
Configuration options: [Generic Mode] [High Speed Mode] [Full Speed Mode] [Manual Speed Mode]

REAR_FAN1 / CPU_FAN1 / FRNT_FAN1-4 Duty% [50]
Allows you to set the desired POST Report waiting time from 1 to 10 seconds. Use the <+> or <-> to adjust the value. The values range from 10 to 100.

4.9   Tool menu

```
             Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Monitor  Tool  Event Logs  Server Mgmt  Save & Exit

   Start ASUS EzFlash                                 Press ENTER to run the utility
                                                      to select and update BIOS.
```
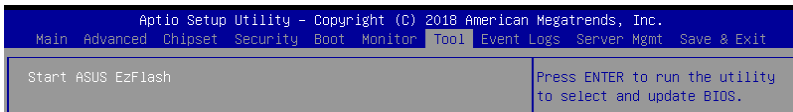
ASUS EZ Flash
Allows you to run ASUS EZ Flash BIOS ROM Utility when you press <Enter>. Refer to the ASUS EZ Flash Utility section for details.

4.10   Event Logs menu

The Event Logs menu items allow you to change the event log settings and view the system event logs.

```
             Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Monitor  Tool  Event Logs  Server Mgmt  Save & Exit

  ▶ Change Smbios Event Log Settings                  Press <Enter> to change the
  ▶ View Smbios Event Log                             Smbios Event Log configuration.
```
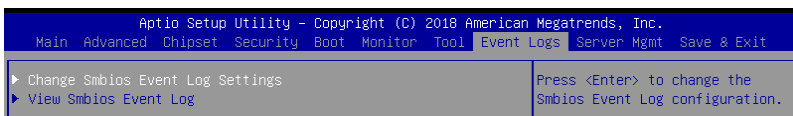
4.10.1   Change Smbios Event Log Settings

Press <Enter> to change the Smbios Event Log configuration.

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

Enabling/Disabling Options

Smbios Event Log [Enabled]
Change this to enable or disable all features of Smbios Event Logging during boot.
Configuration options: [Disabled] [Enabled]

The following items appear only when you set **Smbios Event Log** to **[Enabled]**.

Erasing Settings

Erase Event Log [No]
Choose options for erasing Smbios Event Log. Erasing is done prior to any logging activation during reset.
Configuration options: [No] [Yes, Next reset] [Yes, Every reset]

When Log is Full [Do Nothing]
Choose options for reacting to a full Smbios Event Log.
Configuration options: [Do Nothing] [Erase Immediately]

Smbios Event Log Standard Settings

Log System Boot Event [Enabled]
This option allows you to enable or disable logging System boot event.
Configuration options: [Disabled] [Enabled]

MECI [1]
This option allows you to set the number of occurrences of a duplicate event that must pass before the multiple-event counter of log entry is updated. Use the <+> or <-> to adjust the value. The values range from 1 to 255.

METW [60]
This option allows you to set the number of minutes which must pass between duplicate log entries which utilize a multiple-event counter. Use the <+> or <-> to adjust the value. The values range from 0 to 99.

Custom Options

Log EFI Status Code [Enabled]
This option allows you to enable or disable logging of the EFI Status Codes.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Log EFI Status Code** to **[Enabled]**.

Convert EFI Status Codes to Standard Smbios Type [Disabled]
This option allows you to enable or disable converting of EFI Status Codes to Standard Smbios Type (Not all may be translated).
Configuration options: [Disabled] [Enabled]

4.10.2   View Smbios Event Log

Press <Enter> to view all smbios event logs.

4.11 Server Mgmt menu

```
                    Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
       Main  Advanced  Chipset  Security  Boot  Monitor  Tool  Event Logs  Server Mgmt  Save & Exit

     BMC Self Test Status            PASSED              Enable/Disable interfaces to
     BMC Device ID                   32                  communicate with BMC
     BMC Device Revision             1
     BMC Firmware Revision           1.12
     IPMI Version                    2.0

     BMC Support                     [Enabled]
     Wait For BMC                    [Disabled]
     FRB-2 Timer                     [Enabled]
     FRB-2 Timer timeout             [6 minutes]
     FRB-2 Timer Policy              [Do Nothing]
     OS Watchdog Timer               [Disabled]
     OS Wtd Timer Timeout            [10 minutes]
     OS Wtd Timer Policy             [Reset]            ++: Select Screen
     Serial Mux                      [Disabled]         ↑↓: Select Item
   ▶ System Event Log                                   Enter: Select
   ▶ Bmc self test log                                  +/-: Change Opt.
   ▶ BMC network configuration                          F1: General Help
   ▶ View System Event Log                              F2: Previous Values
   ▶ BMC User Settings                                  F5: Optimized Defaults
     BMC Warm Reset                                     F10: Save & Reset
                                                        F12: Print Screen
                                                        ESC: Exit


                    Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

BMC Support [Enabled]
This item allows you to enable or disable interfaces to communicate with BMC.
Configuration options: [Disabled] [Enabled]

> The following items appear only when **BMC Support** is set to **[Enabled]**.

Wait for BMC [Disabled]
Allows you to enable or disable wait for BMC response for specified time out.
Configuration options: [Disabled] [Enabled]

FRB-2 Timer [Enabled]
Allows you to enable or disable FRB-2 timer (POST timer).
Configuration options: [Disabled] [Enabled]

FRB-2 Timer timeout [6 minutes]
Allows you to select the FRB-2 Timer Expiration value.
Configuration options: [3 minutes] [4 minutes] [5 minutes] [6 minutes]

FRB-2 Timer Policy [Do Nothing]
Allows you to select the how the system should respond in FRB-2 Timer expires.
Configuration options: [Do Nothing] [Reset] [Power Down] [Power Cycle]

OS Watchdog Timer [Disabled]
This item allows you to start a BIOS timer which can only be shut off by Management Software after the OS loads.
Configuration options: [Disabled] [Enabled]

> The following items are configurable only when **OS Watchdog Timer** is set to **[Enabled]**.

OS Wtd Timer Timeout [10 minutes]
Allows you to configure the length for the OS Boot Watchdog Timer.
Configuration options: [5 minutes] [10 minutes] [15 minutes] [20 minutes]

OS Wtd Timer Policy [Reset]
This item allows you to configure the how the system should respond if the OS Boot Watch Timer expires.
Configuration options: [Do Nothing] [Reset] [Power Down] [Power Cycle]

Serial Mux [Disabled]
Allows you to enable or disable Serial Mux configuration.
Configuration options: [Disabled] [Enabled]

BMC Warm Reset
This item allow you to perform a BMC warm reset.

4.11.1   System Event Log

Allows you to change the SEL event log configuration.

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
                                                          Server Mgmt

   Enabling/Disabling Options                            Change this to enable or
   SEL Components                  [Enabled]             disable event logging for
                                                         error/progress codes during
   Erasing Settings                                      boot.
   Erase SEL                       [No]
   When SEL is Full                [Do Nothing]

   Custom EFI Logging Options
   Log EFI Status Codes            [Error code]

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

Enabling/Disabling Options

SEL Components [Enabled]
Allows you to enable or disable event logging for error/progress codes during boot.
Configuration options: [No] [Yes, On next reset] [Yes, On every reset]

> • The following items are configurable only when **SEL Components** is set to **[Enabled]**.
>
> • All values changed here do not take effect until computer is restarted.

Erasing Settings

Erase SEL [No]
Allows you to choose options for erasing SEL.
Configuration options: [No] [Yes, On next reset] [Yes, On every reset]

When SEL is Full [Do Nothing]
Allows you to choose options for reactions to a full SEL.
Configuration options: [Do Nothing] [Erase Immediately]

Custom EFI Logging Options

Log EFI Status Codes [Error code]
Allows you to select which codes to log.
Configuration options: [Disabled] [Both] [Error code] [Progress code]

4.11.2   Bmc self test log

Allows you to change the SEL event log configuration.

```
          Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
                                                          Server Mgmt

 Log area usage = 00 out of 20 logs                  ▲ Erase Log Options

 Erase Log                        [Yes, On every reset]
 When log is full                 [Clear Log]



 Log Empty
```
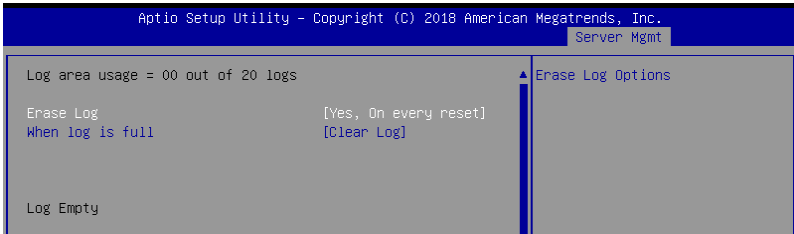
Erase Log [Yes, On every reset]
Choose options for erasing Smbios Event Log. Erasing is done prior to any logging activation during reset.
Configuration options: [No] [Yes, On every reset]

When Log is Full [Clear Log]
Allows you to choose options for reactions to a full Smbios Event Log.
Configuration options: [Clear Log] [Do not log any more]

4.11.3   BMC network configuration

The sub-items in this configuration allow you to configure the BMC network parameters.

```
            Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
                                                                  Server Mgmt

 --BMC network configuration--                          Select to configure LAN
 ****************************                            channel parameters statically
 Configure IPV4 support                                 or dynamically(by BIOS or
 ****************************                            BMC). Unspecified option will
                                                        not modify any BMC network
 DM_LAN1                                                parameters during BIOS phase
 Configuration Address source        [Unspecified]
 Current Configuration Address       DynamicAddressBmcDhcp
 source
 Station IP address                  0.0.0.0
 Subnet mask                         0.0.0.0
 Station MAC address                 00-e0-18-05-02-c0
 Router IP address                   0.0.0.0
 Router MAC address                  00-00-00-00-00-00       ++: Select Screen
                                                             ↑↓: Select Item
 Shared LAN                                                  Enter: Select
 Configuration Address source        [Unspecified]           +/-: Change Opt.
 Current Configuration Address       DynamicAddressBmcDhcp   F1: General Help
 source                                                      F2: Previous Values
 Station IP address                  0.0.0.0                 F5: Optimized Defaults
 Subnet mask                         0.0.0.0                 F10: Save & Reset
 Station MAC address                 00-e0-18-05-02-c1       F12: Print Screen
 Router IP address                   0.0.0.0                 ESC: Exit
 Router MAC address                  00-00-00-00-00-00
```

Navigate to the second page of the screen to see the rest of items in this menu by pressing the Up or Down arrow keys.

> To quickly go to the last item of the second page, press the **Page Down** button. Press the **Page Up** button to go back to the first item in the first page.

IPV4

DM_LAN1 / Shared LAN

Configuration Address source [Unspecified]
This item allows you to configure LAN channel parameters statistically or dynamically (by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.
Configuration options: [Unspecified] [Static] [DynamicBmcDhcp] [DynamicBmcNonDhcp]

IPV6

DM_LAN1

IPV6 Support [Enabled]
Allows you to enable or disable LAN1 IPV6 Support.
Configuration options: [Disabled] [Enabled]

Configuration Address source [Unspecified]
This item allows you to configure LAN channel parameters statistically or dynamically (by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.
Configuration options: [Unspecified] [Static] [DynamicBmcDhcp]

Shared LAN

IPV6 Support [Enabled]
Allows you to enable or disable LAN2 IPV6 Support.
Configuration options: [Disabled] [Enabled]

Configuration Address source [Unspecified]
This item allows you to configure LAN channel parameters statistically or dynamically (by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.
Configuration options: [Unspecified] [Static] [DynamicBmcDhcp]

4.11.4 View System Event Log

This item allows you to view the system event log records.

4.11.5 BMC User Settings

The sub-items in this configuration allow you to add, delete, or change BMC user settings.

```
           Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
                                                              Server Mgmt

     BMC User Settings                               Press <Enter> to Add a User.

   ▶ Add User

   ▶ Delete User

   ▶ Change User Settings
```
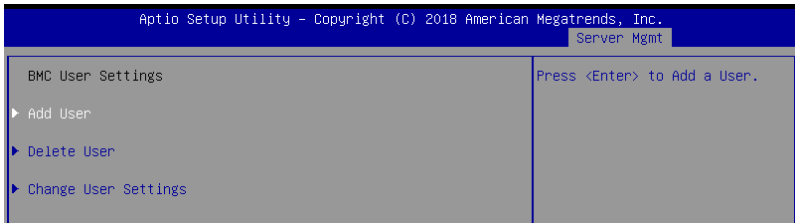
4.12   Save & Exit menu

The Exit menu items allow you to save or discard your changes to the BIOS items.

```
              Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
      Main   Advanced   Chipset   Security   Boot   Monitor   Tool   Event Logs   Server Mgmt   Save & Exit

      Save Options                                           Reset the system after saving
      Save Changes and Reset                                 the changes.
      Discard Changes and Reset
      Restore Defaults

      Boot Override
      IBA GE Slot 0200 v1572
      AMI Virtual CDROM0 1.00
      AMI Virtual HDisk0 1.00
      AMI Virtual HDisk1 1.00
      JetFlashTranscend 4GB 8.07
      AMI Virtual Floppy0 1.00
```

Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

Save Changes and Reset

Exit System setup after saving the changes.

Discard Changes and Reset

Exit System setup without saving any changes.

Restore Defaults

Restore/load default values for all the setup options.

Boot Override

These items displays the available devices. The device items that appears on the screen depends on the number of devices installed in the system. Click an item to start booting from the selected device.

RAID Configuration

5

This chapter provides instructions for setting up, creating, and configuring RAID sets using the available utilities.

5.1   Setting up RAID

The motherboard supports the **Intel® Rapid Storage Technology enterprise Option ROM Utility** with RAID 0, RAID 1, RAID 10, and RAID 5 support.

5.1.1   RAID definitions

RAID 0 *(Data striping)* optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

RAID 1 *(Data mirroring)* copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

RAID 10 is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 10 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

RAID 5 stripes both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.

> If you want to boot the system from a hard disk drive included in a created RAID set, copy first the RAID driver from the support DVD to a floppy disk before you install an operating system to the selected hard disk drive.

5.1.2   Installing hard disk drives

The motherboard supports Serial ATA for RAID set configuration. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SATA hard disks for RAID configuration:

1.   Install the SATA hard disks into the drive bays following the instructions in the system user guide.

2.   Connect a SATA signal cable to the signal connector at the back of each drive and to the SATA connector on the motherboard.

3.   Connect a SATA power cable to the power connector on each drive.

5.1.3   Setting the RAID item in BIOS

You must set the RAID item in the BIOS Setup before you can create a RAID set from SATA hard disk drives attached to the SATA connectors supported by Intel® C246 chipset.

To do this:

1.   Enter the BIOS Setup during POST.

2.   Go to the **Chipset** Menu > **PCH-IO Configuration** > **SATA And RSTe Configuration**, then press <Enter>.

3.   Set **SATA Mode Selection** to **[RAID]**.

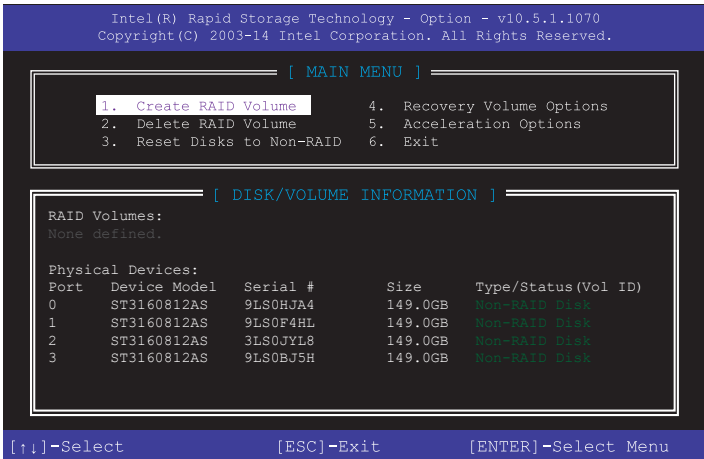4.   Press <F10> to save your changes and exit the BIOS Setup.

Refer to Chapter 4 for details on entering and navigating through the BIOS Setup.

5.1.4   Intel® Rapid Storage Technology Option ROM utility

To enter the Intel® Rapid Storage Technology Option ROM utility:

1.   Turn on the system.

2.   Go to the **Advanced** menu > **PCH Storage Configuration** > **SATA Mode Selection**, then set the item to **[Intel RST Premium With Intel Optane System Acceleration(RAID)]**.

3.   Go to the **Boot** menu > **CSM (Compatibility Support Module)** > **Launch CSM**, then set the item to **[Enabled]**. Make sure that **Boot from Storage Devices** is also set to **[Legacy only]**.

4.   Save your changes and exit the BIOS Setup. During POST, press <Ctrl> + <I> to display the utility main menu.

```
          Intel(R) Rapid Storage Technology - Option - v10.5.1.1070
          Copyright(C) 2003-14 Intel Corporation. All Rights Reserved.

  ═════════════════════════════ [ MAIN MENU ] ═════════════════════════════
       1.  Create RAID Volume          4.  Recovery Volume Options
       2.  Delete RAID Volume          5.  Acceleration Options
       3.  Reset Disks to Non-RAID     6.  Exit


  ════════════════════════ [ DISK/VOLUME INFORMATION ] ════════════════════
    RAID Volumes:
    None defined.

    Physical Devices:
    Port   Device Model   Serial #       Size       Type/Status(Vol ID)
    0      ST3160812AS    9LS0HJA4       149.0GB    Non-RAID Disk
    1      ST3160812AS    9LS0F4HL       149.0GB    Non-RAID Disk
    2      ST3160812AS    3LS0JYL8       149.0GB    Non-RAID Disk
    3      ST3160812AS    9LS0BJ5H       149.0GB    Non-RAID Disk



  [↑↓]-Select              [ESC]-Exit            [ENTER]-Select Menu
```

The navigation keys at the bottom of the screen allow you to move through the menus and select the menu options.

The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.
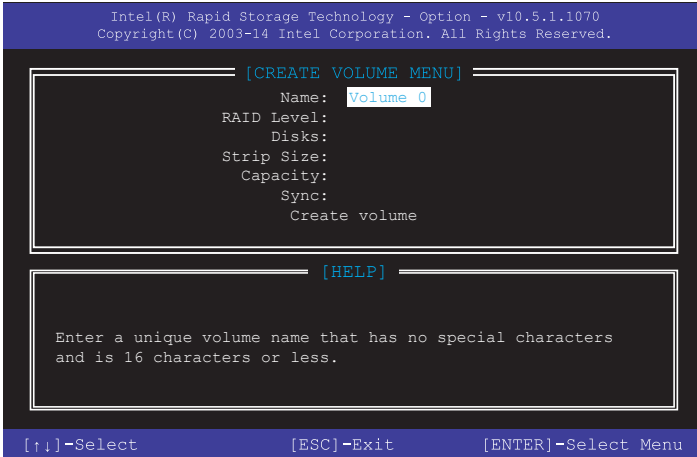
•   The Intel® Rapid Storage Technology Option ROM utility supports SATA devices only.

•   The utility supports maximum four hard disk drives for RAID configuration.
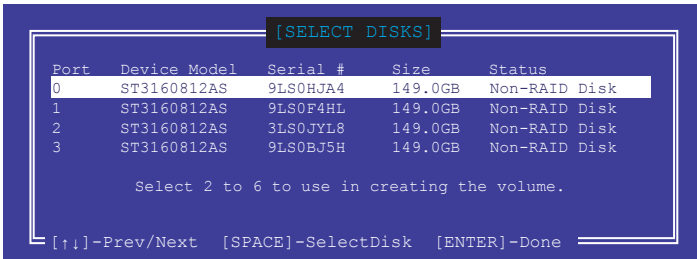
Creating a RAID set

To create a RAID set:

1. From the utility main menu, select **1. Create RAID Volume** and press <Enter>. The following screen appears:

```
        Intel(R) Rapid Storage Technology - Option - v10.5.1.1070
        Copyright(C) 2003-14 Intel Corporation. All Rights Reserved.

                        ═══[CREATE VOLUME MENU]═══
                         Name:  Volume 0
                    RAID Level:
                         Disks:
                    Strip Size:
                      Capacity:
                          Sync:
                          Create volume


                         ═══════[HELP]═══════


        Enter a unique volume name that has no special characters
        and is 16 characters or less.



    [↑↓]-Select            [ESC]-Exit           [ENTER]-Select Menu
```

2. Enter a name for the RAID set and press <Enter>.

3. When the RAID Level item is selected, press the up/down arrow key to select a RAID level to create, and then press <Enter>.

4. When the Disks item is selected, press <Enter> to select the hard disk drives you want to include in the RAID set. The SELECT DISKS screen appears:

```
                        ═══[SELECT DISKS]═══

    Port   Device Model   Serial #     Size      Status
    0      ST3160812AS    9LS0HJA4     149.0GB   Non-RAID Disk
    1      ST3160812AS    9LS0F4HL     149.0GB   Non-RAID Disk
    2      ST3160812AS    3LS0JYL8     149.0GB   Non-RAID Disk
    3      ST3160812AS    9LS0BJ5H     149.0GB   Non-RAID Disk

            Select 2 to 6 to use in creating the volume.


    ═[↑↓]-Prev/Next  [SPACE]-SelectDisk  [ENTER]-Done ═══
```

5. Use the up/down arrow key to select a drive, and then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection.

6. Use the up/down arrow key to select the strip size for the RAID array (for RAID 0, 10 and 5 only), and then press <Enter>. The available strip size values range from 4 KB to 128 KB. The following are typical values:

   - RAID 0: 128 KB

   - RAID 10: 64 KB

   - RAID 5: 64 KB

   We recommend a lower strip size for server systems, and a higher strip size for multimedia computer systems used mainly for audio and video editing.

7. When the **Capacity** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.

8. When the **Create Volume** item is selected, press <Enter>. The following warning message appears:

```
WARNING:  ALL DATA ON SELECTED DISKS WILL BE LOST.
Are you sure you want to create this volume? (Y/N)
```

9. Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the CREATE VOLUME menu.

Deleting a RAID set

⚠ Be cautious when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

1. From the utility main menu, select **2. Delete RAID Volume** and press <Enter>. The following screen appears:

```
                        ══ [DELETE VOLUME MENU] ══
   Name         Level          Drives   Capacity    Status     Bootable
   Volume0    RAID0 (Stripe)      2       298.0GB     Normal       Yes



                            ══ [HELP] ══

         Deleting a volume will reset the disks to non-RAID.

               WARNING:  ALL DISK DATA WILL BE DELETED.
               (This does not apply to Recovery volumes)



      [↑↓]-Select   [ESC]-Previous Menu   [DEL]-Delete Volume
```

2. Use the up/down arrow key to select the RAID set you want to delete, and then press <Delete>. The following warning message appears:

```
                  ══ [DELETE VOLUME VERIFICATION] ══
              ALL DATA IN THE VOLUME WILL BE LOST!
          (This does not apply to Recovery volumes)

      Are you sure you want to delete "Volume0"? (Y/N):
```

3. Press <Y> to delete the RAID set and return to the utility main menu, or press <N> to return to the DELETE VOLUME menu.

5.2.3   Resetting disks to Non-RAID

⚠️ Take caution before you reset a RAID volume hard disk drive to non-RAID. Resetting a RAID volume hard disk drive deletes all internal RAID structure on the drive.

To reset a RAID set:

1.   From the utility main menu, select **3. Reset Disks to Non-RAID** and press <Enter>.

2.   Press the up/down arrow keys to select the drive(s) or disks of the RAID set you want to reset, then press <Space>. A small triangle before the Port number marks the selected drive. Press <Enter> when you are done.

```
┌──────────────────────────[ RESET RAID DATA ]───────────────────────────┐
│          Resetting RAID disk will remove its RAID structures            │
│          and revert it to a non-RAID disk.                              │
│                                                                         │
│     WARNING: Resetting a disk causes all data on the disk to be lost.   │
│     (This does not apply to Recovery volumes)                           │
│                                                                         │
│     Port   Drive Model     Serial #            Size       Status        │
│     0      ST3300656SS     HWAS0000991753TR    279.3GB    Member Disk    │
│     1      ST3300656SS     37VN00009846RAJ1    279.3GB    Member Disk    │
│                                                                         │
│              Select the disks that should be reset.                     │
│                                                                         │
└═══ [↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete ═══════┘
```

3.   Press <Y> in the confirmation window to reset the drive(s) or press <N> to return to the utility main menu.

5.2.4 Exiting the Intel® Rapid Storage Technology Option ROM utility

To exit the utility:

1. From the utility main menu, select **4. Exit** then press <Enter>.

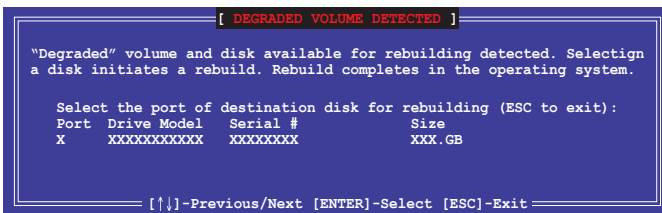2. Press <Y> to exit or press <N> to return to the utility main menu.

```
┌─────────────────[ CONFIRM EXIT ]─────────────────┐
│                                                   │
│         Are you sure you want to exit? (Y/N):     │
│                                                   │
└───────────────────────────────────────────────────┘
```

5.2.5 Rebuilding the RAID

This option is only for the RAID 1 set.

Rebuilding the RAID with other non-RAID disk

If any of the SATA hard disk drives included in the RAID 1 array failed, the system displays the status of the RAID volume as "**Degraded**" during POST. You can rebuild the RAID array with other installed non-RAID disks.

To rebuild the RAID with other non-RAID disk:

1. During POST, press <Ctrl>+<I> at the prompt to enter the Intel Rapid Storage Technology option ROM utility.

2. If there is a non-RAID SATA Hard Disk available, the utility will prompt you to rebuild the RAID. Press the up/down arrow keys to select the destination disk then Press <Enter> to start the rebuilding process, or press <ESC> to exit.

```
┌═════════════[ DEGRADED VOLUME DETECTED ]═════════════┐
│                                                       │
│  "Degraded" volume and disk available for rebuilding detected. Selectign │
│  a disk initiates a rebuild. Rebuild completes in the operating system.  │
│                                                       │
│    Select the port of destination disk for rebuilding (ESC to exit):     │
│    Port  Drive Model   Serial #            Size       │
│    X     XXXXXXXXXXX   XXXXXXXX            XXX.GB      │
│                                                       │
│          ═════[↑↓]-Previous/Next [ENTER]-Select [ESC]-Exit═════  │
└═══════════════════════════════════════════════════════┘
```

Select a destination disk with the same size as the original hard disk.

3. The utility immediately starts rebuilding after the disk is selected. When done, the status of the degraded RAID volume is changed to **"Rebuild"**.

```
Intel(R) Rapid Storage Technology enterprise - SATA Option ROM - 3.6.0.1023
        Copyright(C) 2003-12 Intel Corporation.  All Rights Reserved.
================================[ MAIN MENU ]================================
     1. Create RAID Volume              3. Reset Disks to Non-RAID
     2. Delete RAID Volume              4. Exit


=========================[ DISK/VOLUME INFORMATION]=========================
   RAID Volumes:                                    *=Data is Encrypted
   ID    Name       Level1         Strip        Size   Status    Bootable
   1     Volume0    RAID1(Mirror)  N/A        149.0GB   Rebuild   Yes

   Physical Devices:
   Port  Drive Model    Serial #          Size     Type/Status(Vol ID)
   1     ST3160812AS    9LS0F4HL        149.0GB    Member Disk(0)
   2     ST3160812AS    3LS0JYL8        149.0GB    Member Disk(0)



 Volumes with "Rebuild" status will be rebuilt within the operating system.

      [↑↓]-Select            [ESC]-Exit           [ENTER]-Select Menu
```

4. Press <Esc> to exit Intel Rapid Storage Technology and reboot the system.

5. Select **Start > Programs > Intel Rapid Storage > Intel Rapid Storage Console** or click the **Intel Rapid Storage Technology** tray icon to load the Intel Rapid Storage Manager utility.

6. From the **View** menu, select **Advanced Mode** to display the details of the Intel Rapid Storage Console.

7. From the **Volumes view** option, select **RAID volume** to view the rebuilding status. When finished, the status is changed to "**Normal**".

Rebuilding the RAID with a new hard disk

If any of the SATA hard disk drives included in the RAID array failed, the system displays the status of the RAID volume as "**Degraded**" during POST. You may replace the disk drive and rebuild the RAID array.

To rebuild the RAID with a new hard disk:

1. Remove the failed SATA hard disk and install a new SATA hard disk of the same specification into the same SATA Port.

> Select a destination disk with the same size as the original hard disk.

2. Reboot the system then follow the steps in section **Rebuilding the RAID with other non-RAID disk**.

5.2.6 Setting the Boot array in the BIOS Setup Utility

You can set the boot priority sequence in the BIOS for your RAID arrays when creating multi-RAID using the Intel® Rapid Storage Technology enterprise SATA Option ROM utility.

To set the boot array in the BIOS:

Set at least one of the arrays bootable to boot from the hard disk.

1.   Reboot the system and press <Del> to enter the BIOS setup utility during POST.

2.   Go to the **Boot** menu and select the boot option priority.

3.   Use up/down arrow keys to select the boot priority and press <Enter>. See the **Boot menu** section of Chapter 4 for more details.

4.   From the **Exit** menu, select **Save Changes & Exit**, then press <Enter>.

5.   When the confirmation window appears, select **Yes**, then press <Enter>.

5.3 Intel® Rapid Storage Technology enterprise (Windows)

The Intel® Rapid Storage Technology enterprise allows you to create RAID 0, RAID 1, RAID 10 (RAID 1+0), and RAID 5 set(s) from Serial ATA hard disk drives that are connected to the Serial ATA connectors supported by the Southbridge.

> You need to manually install the Intel® Rapid Storage Technology enterprise utility on a Windows® operating system. Please refer to the installation instructions in Chapter 6.

To enter the Intel® Rapid Storage Technology enterprise utility under Windows operating system:

1. Turn on the system and go to the windows desktop.

2. Click the **Intel® Rapid Storage Technology enterprise** icon to display the main menu.

   Your storage system is configured for data protection, increased performance and optimal data storage capacity. You can create additional volumes to further optimize your storage system.
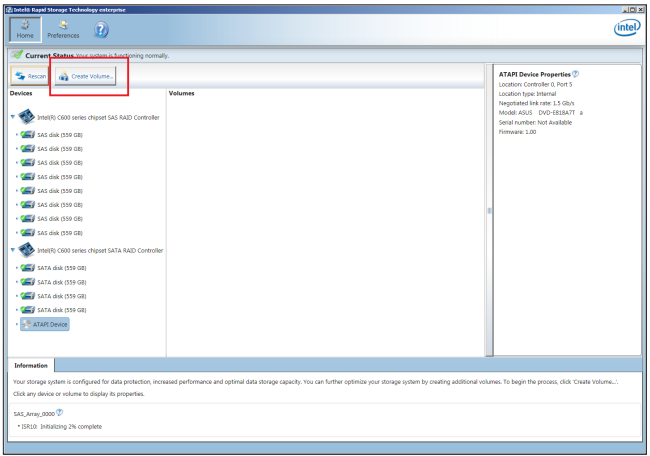
> You can click **Rescan** to re-scan any attached hard disks.

5.3.1 Creating a RAID set

To create a RAID set:

1. From the utility main menu, select **Create Volume** and select volume type.

2. Click **Next**.
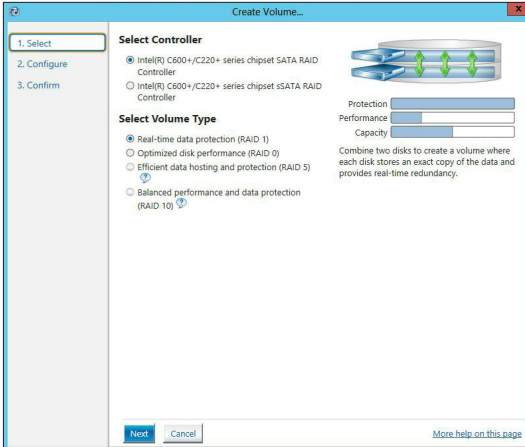
3. Enter a name for the RAID set, then select the array disks.

4. Select **Volume Size** tab, you can drag the bar to decide the volume size.

5. Click **Next**.
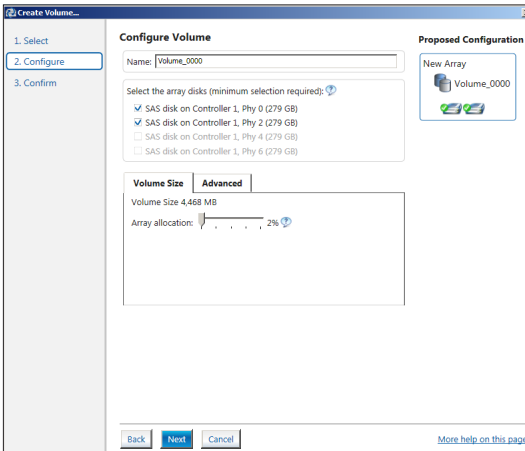
- If you do not want to keep the data on one of the selected disks, select **NO** when prompted.

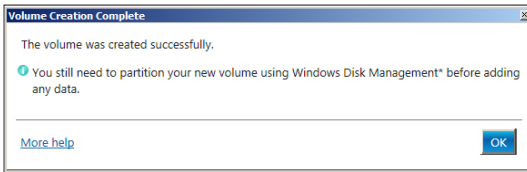- If you want to **Enable volume write-back cache** or **Initialize volume**, click **Advanced**.

6.   Confirm the volume creation, than click **Create Volume** to continue.

> This process could take a while depending on the number and size of the disks. You can continue using other applications during this time.
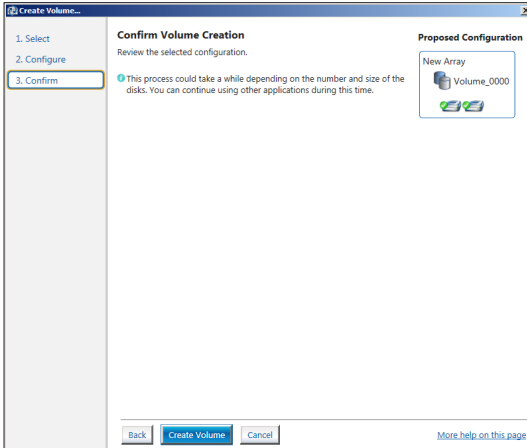
7.   Wait until the process is completed, then click **OK** when prompted.

> You still need to partition your new volume using Windows Disk Management before adding any data.

The RAID set is displayed in the **Volumes** list and you can change the settings in **Volume Properties**.
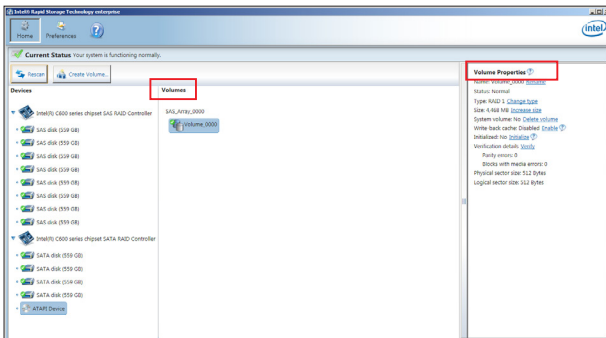
5.3.2 Changing a Volume Type

To change the volume type in **Volume Properties**:

1. Click the SATA array items you want to change in **Volumes** field.

2. From the **Volume Properties** field, select **Type:RAID 1 Change type**.
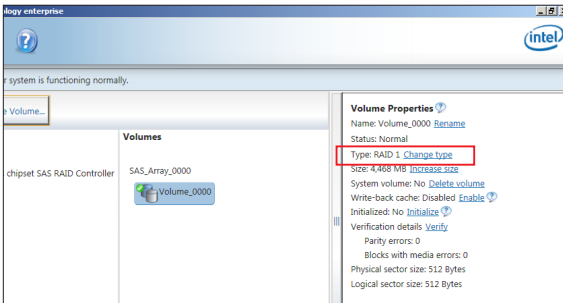
3. You can change the **Name**, **Select the new volume type**, and **Select additional disks to include in the new volume** if needed.

4. Select the **Data stripe size** for the RAID array (for RAID 0, 10 and 5 only), and click **OK**. The available stripe size values range from 4 KB to 128 KB. The following are typical values:
    RAID 0:   128KB
    RAID 10:   64KB
    RAID 5:   64KB
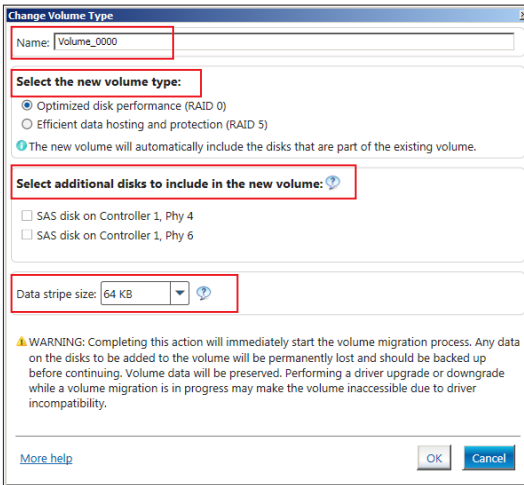
We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.
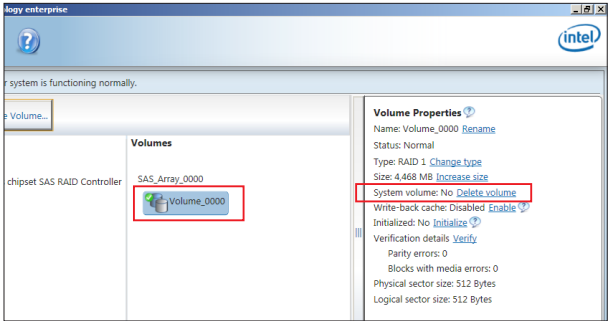
5.3.3   Deleting a volume

> ⚠️ Be cautious when deleting a volume. You will lose all data on the hard disk drives. Before you proceed, ensure that you back up all your important data from your hard drives.

To delete a volume:

1.   From the utility main menu, select the volume (exp. Volume_0000) in **Volumes** field you want to delete.

2.   Select **Delete volume** in **Volume Properties** field. The following screen appears.
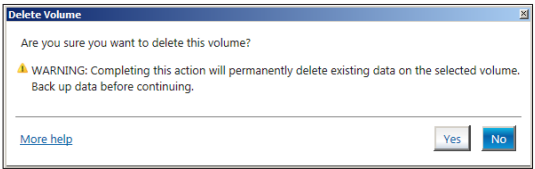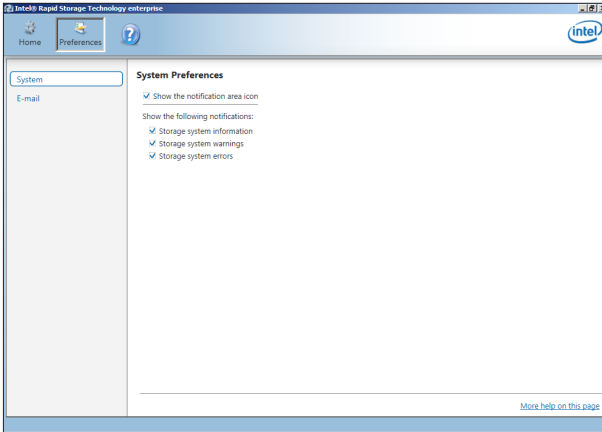

3.   Click **Yes** to delete the volume and return to the utility main menu, or click **No** to return to the main menu.

5.3.4   Preferences
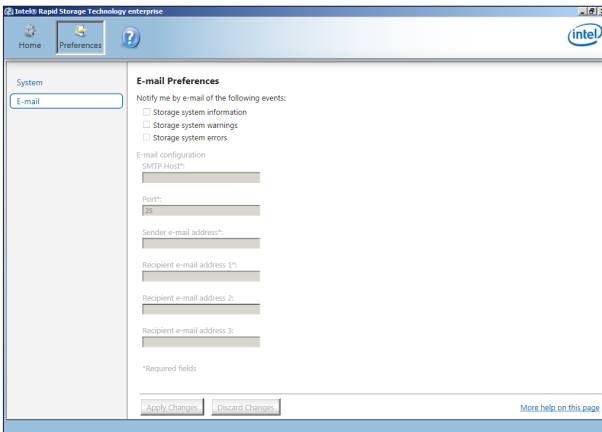
System Preferences

Allow you to set to show the notification area icon and show system information, warning, or errors here.

E-Mail Preferences

Allow you to set to sent e-mail of the following events:

- Storage system information

- Storage system warnings

- Storage system errors

Driver Installation

6

This chapter provides the instructions for installing the necessary drivers for different system components in both Linux® and Windows® Operating Systems.

6.1 RAID driver installation

After creating the RAID sets for your server system, you are now ready to install an operating system to the independent hard disk drive or bootable array. This part provides the instructions on how to install the RAID controller drivers during OS installation.

6.1.1 Creating a USB flash drive with RAID drive

When installing Windows® Server OS, you can load the RAID driver from a USB flash drive. You can create a USB flash drive with RAID driver in Windows by copying the files from the support DVD to the USB flash drive.

To copy the RAID driver to a USB flash drive in Windows environment:

1. Place the motherboard support DVD in the optical drive.

2. Connect a USB flash drive to your system.

3. Click on the optical drive to browse the contents of the support DVD.

4. Click **Drivers** > **C24x INTEL RAID** > **Driver** > **Windows** and then copy the RAID driver folder to the USB flash drive.

6.1.2 Installing the RAID controller driver

During Windows® Server 2012 R2 or 2016 OS installation

To install the RAID controller driver when installing Windows® Server OS:

1. Boot the computer using the Windows® Server installation disc. Follow the onscreen instructions to start installing Windows® Server.

2. When prompted to choose a type of installation, click **Custom: Install Windows only (advanced)**.
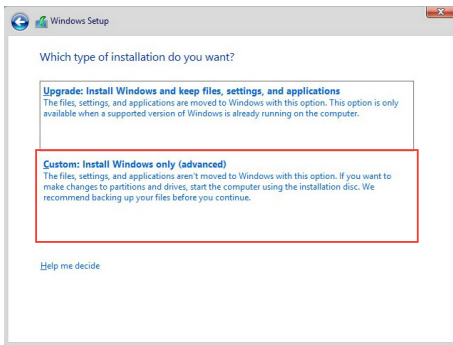
3. Click **Load Driver**.
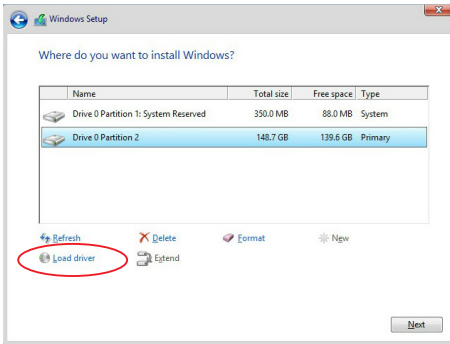
4. A message appears reminding you to insert the installation media containing the driver of the RAID controller driver (the installation media can be a CD, DVD, or USB flash drive).

   • If you have only one optical drive installed in your system, eject the Windows OS installation disc and replace with the motherboard Support DVD into the optical drive.

   • Or you may connect a USB flash drive containing the RAID controller driver.

   Click **Browse** to continue.
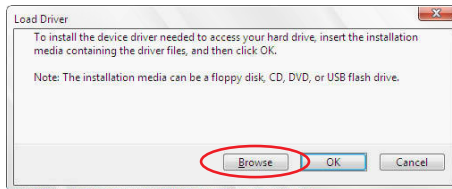
5. Locate the driver in the corresponding folder of the Support DVD or USB flash drive and then click **OK** to continue.

6. Select the RAID controller driver you need from the list and click **Next**.

7. When the system finishes loading the RAID driver,

   • Replace the motherboard Support DVD with the Windows Server installation disc.

   • Remove the USB flash drive.

   Select the drive to install Windows and click **Next**.
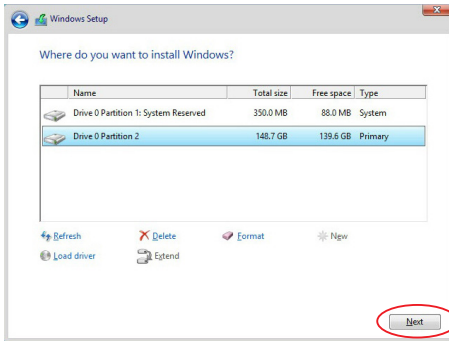
8. Setup then proceeds with the OS installation. Follow the onscreen instructions to continue.

6.2 Management applications and utilities installation

The support DVD that is bundled with your motherboard contains drivers, management applications, and utilities that you can install to maximize the features of your motherboard.

> • The contents of the support DVD are subject to change at any time without notice. Visit the ASUS website (www.asus.com) for the latest updates on software and utilities.
>
> • The support DVD is supported on Windows® Server 2012 R2 and Windows® Server 2016.

6.3 Running the Support DVD

When you place the support DVD into the optical drive, the DVD automatically displays the main screen if Autorun is enabled in your computer. By default, the Drivers tab is displayed.

> If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file **Setup.exe**. Double-click the **Setup.exe** to run the support DVD.
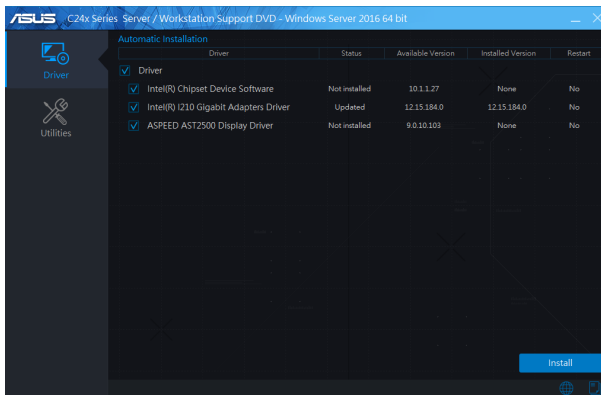
> Onscreen display and content vary depending on the motherboard and chipset. The screenshots are provided for reference only.

6.4   Installing the system drivers

This section provides the instructions on how to install the system drivers. You will need to manually install the system drivers on a Windows® operating system.

To install the system drivers:

1.   Restart the computer, and then log on with **Administrator** privileges.

2.   Insert the support DVD into the optical drive. The support DVD automatically displays the **Driver** menu if Autorun is enabled in your computer.

> If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file **Setup.exe**. Double-click the **Setup.exe** to run the support DVD.

3.   Check the drivers that you would like to install, then select **Install**.
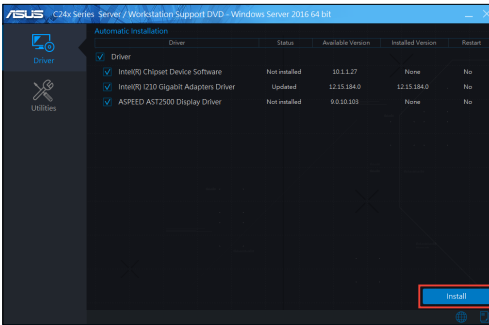
4.   The installation window appears.
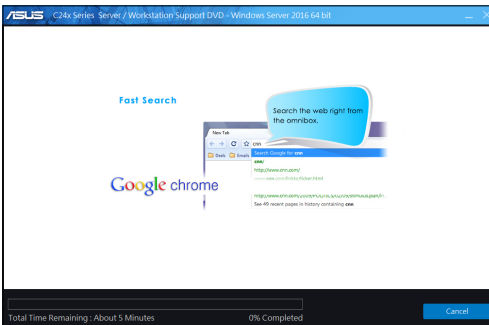
5. Follow the onscreen instructions to complete the installation.
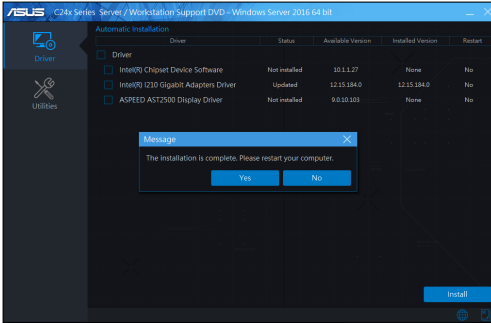
Appendix

A

This appendix includes additional information that you may refer to when configuring the motherboard.

P11C-E/4L block diagram

DDR4 UDIMM * 2	Channel A DDR4 2400/2666
DDR4 UDIMM * 2	Channel B DDR4 2400/2666
PCI-E x8 Slot5	
PCIE Quick Switch	PCI EXPRESS GEN3 x8
PCI-E x16 Slot6	PCI EXPRESS GEN3 x8

CPU

Coffee-Lake Processor
Socket RX (LGA1151)

DMI
GEN3 x4

PCI EXPRESS GEN3 x4	PCI-E x4 Slot4

PCI-E x1 Slot7 for MIO	PCIE EXPRESS Gen3 x1		
SATA III 8 ports	HDA		
	SATA III		
M.2 Card(NGFF1)	M.2 Card(NGFF2)		

PCIE Gen3 x2   PCIE Gen3 x1

Quick Switch	SATA III or PCIE Gen3 x4 and PCIE Gen3 x1	
SATA III 2 ports		
High-Speed USB 3 ports	USB 2.0	
Super High-Speed+ USB 2 ports	USB 3.1 Gen2	
Super High-Speed USB 4 ports	USB 3.1 Gen1	
SPI Flash 32Mbytes	SPI	

Cannon Lake PCH-H
C246

PCI EXPRESS GEN1 x1	ASM1083	PCI Bus	PCI Slot1
PCI EXPRESS GEN2 x1	I210 LAN4		
PCI EXPRESS GEN2 x1	I210 LAN3		
PCI EXPRESS GEN2 x1	I210 LAN2		
PCI EXPRESS GEN2 x1	I210 LAN1		
PCI EXPRESS GEN2 x1	BMC ASPEED AST2500 512Mbytes DDR4 SDRAM	NCSI RGMII	Realtek RTL8211E

LPC BUS

CPU Fan * 1 Front Fan * 4 Rear Fan * 1	FAN Control	Nuvoton NCT6796D Super IO
		TPM
COM	MISC HEADER	

Q-Code table

Code	Description
00	Not used
02	microcode
03	CACHE_ENABLED
04	PCH initialization
06	CPU_EARLY_INIT
10	PEI Core is started
11 – 14	Pre-memory CPU initialization is started
15 – 18	Pre-memory System Agent initialization is started
19 – 1C	Pre-memory PCH initialization is started
2B – 2F	Memory initialization
30	Reserved for ASL (see ASL Status Codes section below)
31	Memory Installed
32 – 36	CPU post-memory initialization
37 – 3A	Post-Memory System Agent initialization is started
3B – 3E	Post-Memory PCH initialization is started
4F	DXE IPL is started
50 – 53	Memory initialization error. Invalid memory type or incompatible memory speed
4F	DXE IPL is started
54	Unspecified memory initialization error
55	Memory not installed
56	Invalid CPU type or Speed
57	CPU mismatch
58	CPU self test failed or possible CPU cache error
59	CPU micro-code is not found or micro-code update is failed
5A	Internal CPU error
5B	Reset PPI is not available
5C – 5F	Reserved for future AMI error codes
E0	S3 Resume is stared (S3 Resume PPI is called by the DXE IPL)
E1	S3 Boot Script execution
E2	Video repost
E3	OS S3 wake vector call
E4 – E7	Reserved for future AMI progress codes
E8	S3 Resume Failed
E9	S3 Resume PPI not Found
EA	S3 Resume Boot Script Error
EB	S3 OS Wake Error
EC – EF	Reserved for future AMI error codes
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5 – F7	Reserved for future AMI progress codes
F8	Recovery PPI is not available
F9	Recovery capsule is not found

(continued on the next page)

Code	Description
FA	Invalid recovery capsule
FB – FF	Reserved for future AMI error codes
60	DXE Core is started
61	NVRAM initialization
62	Installation of the PCH Runtime Services
63 – 67	CPU DXE initialization is started
68	PCI host bridge initialization
69	System Agent DXE initialization is started
6A	System Agent DXE SMM initialization is started
6B – 6F	System Agent DXE initialization (System Agent module specific)
70	PCH DXE initialization is started
71	PCH DXE SMM initialization is started
72	PCH devices initialization
73 – 77	PCH DXE Initialization (PCH module specific)
78	ACPI module initialization
79	CSM initialization
7A – 7F	Reserved for future AMI DXE codes
90	Boot Device Selection (BDS) phase is started
91	Driver connecting is started
92	PCI Bus initialization is started
93	PCI Bus Hot Plug Controller Initialization
94	PCI Bus Enumeration
95	PCI Bus Request Resources
96	PCI Bus Assign Resources
97	Console Output devices connect
98	Console input devices connect
99	Super IO Initialization
9A	USB initialization is started
9B	USB Reset
9C	USB Detect
9D	USB Enable
9E – 9F	Reserved for future AMI codes
A0	IDE initialization is started
A1	IDE Reset
A2	IDE Detect
A3	IDE Enable
A4	SCSI initialization is started
A5	SCSI Reset
A6	SCSI Detect
A7	SCSI Enable
A8	Setup Verifying Password
A9	Start of Setup
AA	Reserved for ASL (see ASL Status Codes section below)
AB	Setup Input Wait

(continued on the next page)

Code	Description
AC	Reserved for ASL (see ASL Status Codes section below)
AD	Ready To Boot event
AE	Legacy Boot event
AF	Exit Boot Services event
B0	Runtime Set Virtual Address MAP Begin
B1	Runtime Set Virtual Address MAP End
B2	Legacy Option ROM Initialization
B3	System Reset
B4	USB hot plug
B5	PCI bus hot plug
B6	Clean-up of NVRAM
B7	Configuration Reset (reset of NVRAM settings)
B8– BF	Reserved for future AMI codes
D0	CPU initialization error
D1	System Agent initialization error
D2	PCH initialization error
D3	Some of the Architectural Protocols are not available
D4	PCI resource allocation error. Out of Resources
D5	No Space for Legacy Option ROM
D6	No Console Output Devices are found
D7	No Console Input Devices are found
D8	Invalid password
D9	Error loading Boot Option (LoadImage returned error)
DA	Boot Option is failed (StartImage returned error)
DB	Flash update is failed
DC	Reset protocol is not available

ACPI/ASL Checkpoints (under OS)

Code	Description
03	System is entering S3 sleep state
04	System is entering S4 sleep state
05	System is entering S5 sleep state
30	System is waking up from the S3 sleep state
40	System is waking up from the S4 sleep state
AC	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
AA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- 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 manufacturer's 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 to 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.

> The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Compliance Statement of Innovation, Science and Economic Development Canada (ISED)

This device complies with Innovation, Science and Economic Development Canada licence exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

CAN ICES-3(B)/NMB-3(B)

Déclaration de conformité de Innovation, Sciences et Développement économique Canada (ISED)

Le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

CAN ICES-3(B)/NMB-3(B)

Australia statement notice

From 1 January 2012 updated warranties apply to all ASUS products, consistent with the Australian Consumer Law. For the latest product warranty details please visit https://www.asus.com/support. 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. 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 ASUS Customer Service 1300 2787 88 or visit us at https://www.asus.com/support.

Declaration of compliance for product environmental regulation

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

Please refer to http://csr.asus.com/Compliance.htm for information disclosure based on regulation requirements ASUS is complied with:

EU REACH and Article 33
Complying with the REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) regulatory framework, we published the chemical substances in our products at ASUS REACH website at http://csr.asus.com/english/REACH.htm.

EU RoHS
This product complies with the EU RoHS Directive. For more details, see http://csr.asus.com/english/article.aspx?id=35

India RoHS
This product complies with the "India E-Waste (Management) Rules, 2016" and prohibits use of lead, mercury, hexavalent chromium, polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs) in concentrations exceeding 0.1% by weight in homogenous materials and 0.01% by weight in homogenous materials for cadmium, except for the exemptions listed in Schedule II of the Rule.

Vietnam RoHS
ASUS products sold in Vietnam, on or after September 23, 2011,meet the requirements of the Vietnam Circular 30/2011/TT-BCT.

Các sản phẩm ASUS bán tại Việt Nam, vào ngày 23 tháng 9 năm2011 trở về sau, đều phải đáp ứng các yêu cầu của Thông tư 30/2011/TT-BCT của Việt Nam.

Turkey RoHS
AEEE Yönetmeliğine Uygundur

ASUS Recycling/Takeback Services

ASUS recycling and takeback programs come from our commitment to the highest standards for protecting our environment. We believe in providing solutions for you to be able to responsibly recycle our products, batteries, other components as well as the packaging materials. Please go to http://csr.asus.com/english/Takeback.htm for detailed recycling information in different regions.

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.

DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

Simplified EU Declaration of Conformity

English ASUSTeK Computer 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: www.asus.com/support

Français AsusTek Computer Inc. déclare par la présente que cet appareil est conforme aux critères essentiels et autres clauses pertinentes des directives concernées. La déclaration de conformité de l'UE peut être téléchargée à partir du site Internet suivant : www.asus.com/support

Deutsch ASUSTeK Computer Inc. erklärt hiermit, dass dieses Gerät mit den wesentlichen Anforderungen und anderen relevanten Bestimmungen der zugehörigen Richtlinien übereinstimmt. Der gesamte Text der EU-Konformitätserklärung ist verfügbar unter: www.asus.com/support

Italiano ASUSTeK Computer Inc. con la presente dichiara che questo dispositivo è conforme ai requisiti essenziali e alle altre disposizioni pertinenti con le direttive correlate. Il testo completo della dichiarazione di conformità UE è disponibile all'indirizzo: www.asus.com/support

Русский Компания ASUS заявляет, что это устройство соответствует основным требованиям и другим соответствующим условиям соответствующих директив. Подробную информацию, пожалуйста, смотрите на www.asus.com/support

Български С настоящото ASUSTeK Computer Inc. декларира, че това устройство е в съответствие със съществените изисквания и другите приложими постановления на свързаните директиви. Пълният текст на декларацията за съответствие на ЕС е достъпна на адрес: www.asus.com/support

Hrvatski ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj sukladan s bitnim zahtjevima i ostalim odgovarajućim odredbama vezanih direktiva. Cijeli tekst EU izjave o sukladnosti dostupan je na: www.asus.com/support

Čeština Společnost ASUSTeK Computer Inc. tímto prohlašuje, že toto zařízení splňuje základní požadavky a další příslušná ustanovení souvisejících směrnic. Plné znění prohlášení o shodě EU je k dispozici na adrese: www.asus.com/support

Dansk ASUSTeK Computer Inc. erklærer hermed, at denne enhed er i overensstemmelse med hovedkravene og andre relevante bestemmelser i de relaterede direktiver. Hele EU-overensstemmelseserklæringen kan findes på: www.asus.com/support

Nederlands ASUSTeK Computer Inc. verklaart hierbij dat dit apparaat voldoet aan de essentiële vereisten en andere relevante bepalingen van de verwante richtlijnen. De volledige tekst van de EU-verklaring van conformiteit is beschikbaar op: www.asus.com/support

Eesti Käesolevaga kinnitab ASUSTeK Computer Inc, et see seade vastab asjakohaste direktiivide oluliste nõuetele ja teistele asjassepuutuvatele sätetele. EL vastavusdeklaratsiooni täielik tekst on saadaval järgmisel aadressil: www.asus.com/support

Suomi ASUSTeK Computer Inc. ilmoittaa täten, että tämä laite on asiaankuuluvien direktiivien olennaisten vaatimusten ja muiden tätä koskevien säädösten mukainen. EU-yhdenmukaisuusilmoituksen koko teksti on luettavissa osoitteessa: www.asus.com/support

Ελληνικά Με το παρόν, η AsusTek Computer Inc. δηλώνει ότι αυτή η συσκευή συμμορφώνεται με τις θεμελιώδεις απαιτήσεις και άλλες σχετικές διατάξεις των Οδηγιών της ΕΕ. Το πλήρες κείμενο της δήλωσης συμβατότητας είναι διαθέσιμο στη διεύθυνση: www.asus.com/support

Magyar Az ASUSTeK Computer Inc. ezennel kijelenti, hogy ez az eszköz megfelel a kapcsolódó Irányelvek lényeges követelményeinek és egyéb vonatkozó rendelkezéseinek. Az EU megfelelőségi nyilatkozat teljes szövege innen letölthető: www.asus.com/support

Latviski ASUSTeK Computer Inc. ar šo paziņo, ka šī ierīce atbilst saistīto Direktīvu būtiskajām prasībām un citiem citiem saistošajiem nosacījumiem. Pilns ES atbilstības paziņojuma teksts pieejams šeit: www.asus.com/support

Lietuvių „ASUSTeK Computer Inc." šiuo tvirtina, kad šis įrenginys atitinka pagrindinius reikalavimus ir kitas svarbias susijusių direktyvų nuostatas. Visą ES atitikties deklaracijos tekstą galima rasti: www.asus.com/support

Norsk ASUSTeK Computer Inc. erklærer herved at denne enheten er i samsvar med hovedsaklige krav og andre relevante forskrifter i relaterte direktiver. Fullstendig tekst for EU-samsvarserklæringen finnes på: www.asus.com/support

Polski Firma ASUSTeK Computer Inc. niniejszym oświadcza, że urządzenie to jest zgodne z zasadniczymi wymogami i innymi właściwymi postanowieniami powiązanych dyrektyw. Pełny tekst deklaracji zgodności UE jest dostępny pod adresem: www.asus.com/support

Português A ASUSTeK Computer Inc. declara que este dispositivo está em conformidade com os requisitos essenciais e outras disposições relevantes das Diretivas relacionadas. Texto integral da declaração da UE disponível em: www.asus.com/support

Română ASUSTeK Computer Inc. declară că acest dispozitiv se conformează cerinţelor esenţiale şi altor prevederi relevante ale directivelor conexe. Textul complet al declaraţiei de conformitate a Uniunii Europene se găseşte la: www.asus.com/support

Srpski ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj u saglasnosti sa osnovnim zahtevima i drugim relevantnim odredbama povezanih Direktiva. Pun tekst EU deklaracije o usaglašenosti je dostupan da adresi: www.asus.com/support

Slovensky Spoločnosť ASUSTeK Computer Inc. týmto vyhlasuje, že toto zariadenie vyhovuje základným požiadavkám a ostatým príslušným ustanoveniam príslušných smerníc. Celý text vyhlásenia o zhode pre štáty EÚ je dostupný na adrese: www.asus.com/support

Slovenščina ASUSTeK Computer Inc. izjavlja, da je ta naprava skladna z bistvenimi zahtevami in drugimi ustreznimi določbami povezanih direktiv. Celotno besedilo EU-izjave o skladnosti je na voljo na spletnem mestu: www.asus.com/support

Español Por la presente, ASUSTeK Computer Inc. declara que este dispositivo cumple los requisitos básicos y otras disposiciones pertinentes de las directivas relacionadas. El texto completo de la declaración de la UE de conformidad está disponible en: www.asus.com/support

Svenska ASUSTeK Computer Inc. förklarar härmed att denna enhet överensstämmer med de grundläggande kraven och andra relevanta föreskrifter i relaterade direktiv. Fulltext av EU-försäkran om överensstämmelse finns på: www.asus.com/support

Українська ASUSTeK Computer Inc. заявляє, що цей пристрій відповідає основним вимогам та іншим відповідним положенням відповідних Директив. Повний текст декларації відповідності стандартам ЄС доступний на: www.asus.com/support

Türkçe AsusTek Computer Inc., bu aygıtın temel gereksinimlerle ve ilişkili Yönergelerin diğer ilgili koşullarıyla uyumlu olduğunu beyan eder. AB uygunluk bildiriminin tam metni şu adreste bulunabilir: www.asus.com/support

Bosanski ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj usklađen sa bitnim zahtjevima i ostalim odgovarajućim odredbama vezanih direktiva. Cijeli tekst EU izjave o usklađenosti dostupan je na: www.asus.com/support

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Technical Support

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Online Support	https://www.asus.com/support/Product/ContactUs/Services/questionform/?lang=pl-pl

ASK-Service (Russia and CIS)

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FCC COMPLIANCE INFORMATION

Per FCC Part 2 Section 2.1077

FC

Responsible Party:	**Asus Computer International**
Address:	**48720 Kato Rd, Fremont, CA 94538**
Phone/Fax No:	**(510)739-3777/(510)608-4555**

hereby declares that the product

Product Name :	**Motherboard**
Model Number :	**P11C-E/4L**

compliance statement:

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.

Ver. 180125