P13R-M Series

Motherboard

Contents

Contents

Contents

Contents

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.

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 the command prompt, type the command line:
	`format A:/S`

Specifications summary

		P13R-M	P13R-M/10G-2T
Processor support / system bus		1 x Socket V1 (LGA 1700)	
		Intel® Xeon® E processors (up to 95W)	
		Intel® Pentium™ processors	
Core logic		Intel® C262 Chipset	
Form factor		Micro ATX, 9.6 in. x 9.6 in.	
ASUS features		Fan speed control, rack ready (rack and pedestal dual use), ASUS Control Center	
Memory	**Total slots**	4 (2 Channels)	
	Voltage	1.1V	
	Capacity	Maximum up to 128GB	
	Memory type	DDR5 4400/4000/3600 ECC UDIMM	
	Memory size	32GB, 16GB, 8GB	
Expansion slots (SSI location numbers)	**Total PCI/PCIe slots**	2	
	Slot location 1	-	
	Slot location 2	-	
	Slot location 3	-	
	Slot location 4	PCIe x8 slot, x4 Gen4 link	
	Slot location 5	-	
	Slot location 6	PCIe x16 slot, x16 Gen5 link	
	Slot location 7	-	
Storage	**SATA controller**	8 x SATA 6Gb/s ports (Intel® C262)	
	SAS controller	Optional kits: ASUS PIKE II 3108 8-port SAS HW 12Gb/s RAID card	
Networking	**LAN**	2 x Intel® I210-AT / 1 x Mgmt LAN	1 x Intel® LOM X710-AT2 / 1 x Mgmt LAN
Graphics		Aspeed AST2600 64MB	

(continued on the next page)

		P13R-M	P13R-M/10G-2T
Onboard I/O connectors	**TPM header**	1	
	PSU connector	24-pin ATX power connector	
		8-pin ATX 12V power connector	
	Management header	Onboard header for optional management card	
	USB connector/ header	2 x USB 3.2 Gen 2 (rear),	
		1 x USB 3.2 Gen 1 (header, 2 ports),	
		1 x USB 2.0 (header, 2 ports)	
	Fan header	6 x 4 pin headers	
	SMBus	1	
	Chassis intrusion	1	
	Front LAN LED	4	
	Serial port header	1	
	VGA header	1	
	M.2 connector	1	
Rear I/O connectors	**External USB port**	3 x USB 3.2 Gen 2 (rear)	
	VGA port	1	
	RJ-45	2 x GbE LAN	2 x 10GbE LAN
		1 x Mgmt LAN	1 x Mgmt LAN
Management solution	**Software**	ASUS Control Center	
	Out of Band remote management	Onboard ASMB11-iKVM for KVM-over-IP	
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.

Product Introduction

1

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

1.1   Welcome!

Thank you for buying an ASUS® P13R-M Series motherboard!

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

P13R-M

Items		Standard Gift Box Pack	Standard Bulk Pack
I/O Shield		1	1
Cables	2-in-1 SATA 6G cable	4	-
	COM port cable	1	-
Accessory	Metal Plate for LGA1700	1	1
Packaging Qty.		1 pc per carton	10 pcs per carton

P13R-M/10G-2T

Items		Standard Gift Box Pack	Standard Bulk Pack
I/O Shield		1	1
Cables	2-in-1 SATA 6G cable	2	-
	COM port cable	1	-
Accessory	Metal Plate for LGA1700	1	1
Packaging Qty.		1 pc per carton	10 pcs per carton

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

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 **xxSxxxxxxxxx** shown as 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.

P13R-M

xxSxxxxxxxxx

P13R-M/10G-2T

xxSxxxxxxxxx

1.4   Special features

1.4.1   Product highlights

Latest processor technology

This motherboard supports the latest Intel® Xeon® Processor E-24xx / Pentium™ in LGA1700 package, which has memory and PCI Express controller integrated to support 2-channel (4 DIMMs) DDR5 memory and PCI Express 5.0 lanes. The Intel® Xeon® E-24xx has improved CPU performance and integrated voltage regulators making it one of the most powerful and energy efficient CPUs in the world.

DMI Speed 4.0 x8

Improvement for a significant upgrade over traditional 4.0 x4.

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 multi-threaded software.

Intel® EM64T

The motherboard supports Intel® processors with the Intel® EM64T (Extended Memory 64 Technology). The Intel® EM64T feature allows your computer to run on 64-bit operating systems and access larger amounts of system memory for faster and more efficient computing.

DDR5 memory support

The motherboard supports DDR5 memory that features faster clock frequencies and higher data transfer rates of 4400 MT/s (million transfers per second). DDR5 offers a lower voltage standard of 1.1V that reduces memory power demand and provides improved performance.

PCI Express 5.0

PCI Express® 5.0 (PCIe 5.0) delivers 32 GT/s bandwidth, which is double the speed of PCIe 4.0, offering lower power consumption, better lane scalability and backwards compatibility. This motherboard is PCIe 5.0 ready to support a diverse array of graphics, storage and networking – enabling flexible scalability for demanding or increasing workloads.

PCI Express 4.0

PCI Express 4.0 (PCIe 4.0) is the PCI Express bus standard that provides twice the performance and speed of PCIe 3.0. It provides an optimal graphics performance, unprecedented data speed, and seamless transition with its complete backward compatibility with PCIe 1.0 to PCIe 3.0 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.

Intel® 10G LAN Solution

Dual Intel® 10G LAN offers increased data throughput and improved efficiency, making it ideal for large file transfers and backup. Featuring dual onboard 10G LAN ported by the cutting-edge Intel® LOM X710AT2 Ethernet Controller, this motherboard provides server-grade connectivity and supports high-density, high-bandwidth, low-latency access-layer networks to ensure faster transfers of large-size files used in data-intensive applications.

Enhanced Intel SpeedStep Technology (EIST)

The Enhanced Intel SpeedStep Technology (EIST) intelligently manages the CPU resources by automatically adjusting the CPU voltage and core frequency depending on the CPU loading and system speed or power requirement.

Serial ATA III technology

The motherboard supports the Serial ATA III 6 Gb/s technology through the Serial ATA interface and Intel® C262 chipset. Get enhanced scalability, faster data retrieval, double the bandwidth of current bus systems with up to 6Gbps data transfer rates.

USB 3.2 Gen 1 (5Gbps) / Gen 2 (10Gbps) technology

The motherboard implements the USB 3.2 Gen 1 / Gen 2 technology with data transfer speeds of up to 5Gbps or 10Gbps, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0.

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 intelligently adjusts the fan speeds according to the system loading to ensure quiet, cool, and efficient operation.

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 motherboard components 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 motherboard features, 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

Secure the motherboard to the chassis using the eight screws indicated in the illustration below.

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

P13R-M

Place this side towards the rear of the chassis

P13R-M/10G-2T

Place this side towards the rear of the chassis

2.2.3   Motherboard layout
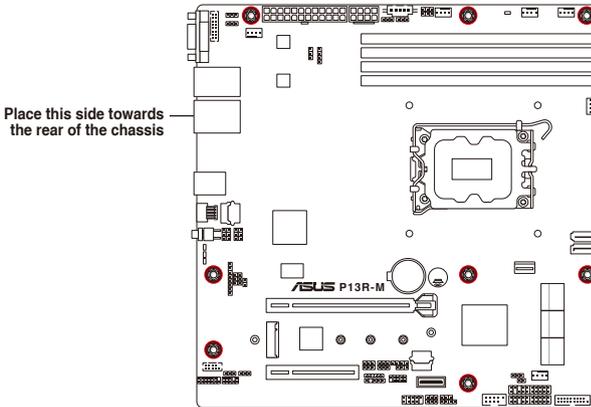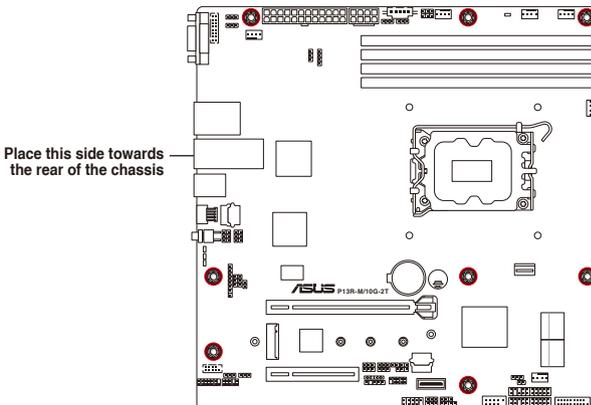
P13R-M

P13R-M/10G-2T
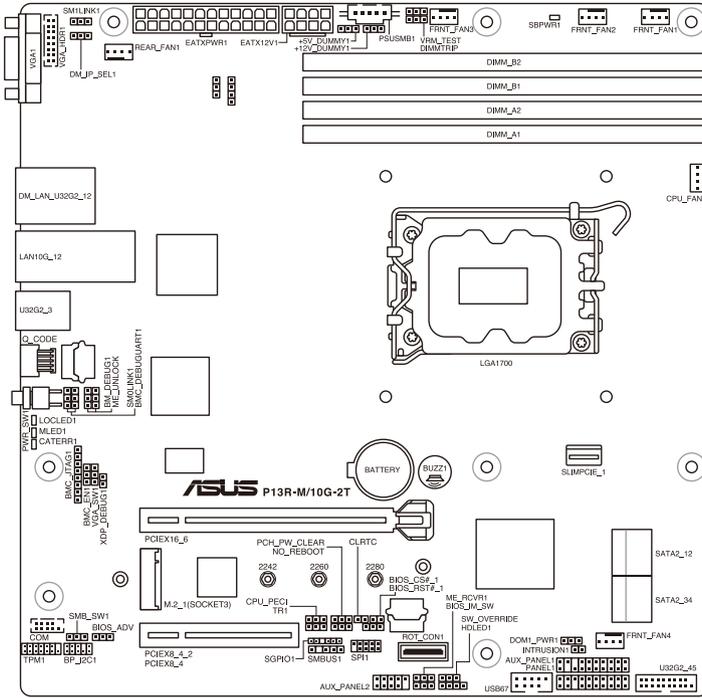
2.2.4   Layout contents

Slots/Sockets	Page
1. CPU socket	2-8
2. DIMM sockets	2-11
3. PCIe slots	2-13

Jumpers	Page
1. Clear RTC RAM (2-pin CLRTC)	2-18
2. VGA controller setting (3-pin VGA_SW1)	2-19
3. ME firmware force recovery setting (3-pin ME_RCVR1)	2-19
4. Smart Ride Through (SmaRT) setting (3-pin SMART_PSU1)	2-20
5. DMLAN setting (3-pin DM_IP_SEL1)	2-20
6. SATADOM power setting (3-pin DOM1_PWR1)	2-21
7. CPU PCIe configuration setting (4-pin CFG5)	2-21
8. PCIe SMBus Switcher setting (3-pin SMB_SW1)	2-22

Onboard LEDs	Page
1. Catastrophic error LED (CATERR1)	2-23
2. Location LED (LOCLED1)	2-23
3. Message LED (MLED1)	2-24

Rear panel connectors	Page
1. VGA port	2-25
2. LAN ports	2-25
3. Dedicated Management LAN port	2-25
4. USB 3.2 Gen 2 ports	2-25
5. Q-Code LED	2-25
6. Power button	2-25

Internal connectors	Page
1. SATA connectors (SATA1_1-2, SATA1_34, SATA2_12, SATA2_34)	2-28
2. Hard disk activity LED connector (4-pin HDLED1)	2-28
3. Serial General Purpose Input/Output connector (6-1 pin SGPIO1)	2-29
4. USB 2.0 connectors (10-1 pin USB67)	2-29
5. USB 3.2 Gen 1 connector (20-1 pin U32G2_45)	2-30
6. Trusted Platform Module connector (14-1 pin TPM1)	2-30
7. Fan connectors (4-pin CPU_FAN1, FRNT_FAN1-4, REAR_FAN1)	2-31
8. Serial port connector (10-1 pin COM)	2-32
9. Power Supply SMBus connector (5-pin PSUSMB1)	2-32
10. ATX power connectors (24-pin EATXPWR1, 8-pin EATX12V1)	2-33
11. System panel connector (20-1 pin PANEL1)	2-34
12. Auxiliary panel connectors (20-2 pin AUX_PANEL1)	2-35
13. Chassis intrusion connector (2-pin INTRUSION1)	2-36
14. System Management Bus (SMBUS) connector (5-1 pin SMBUS1)	2-36

2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA1700 socket designed for the Intel® Xeon® E processors (up to 95W) and Intel® Pentium™ processors.

- 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.

The motherboard illustration is for reference only. The location for the CPU socket is the same for all motherboards of this series.

2.3.1 Installing the CPU
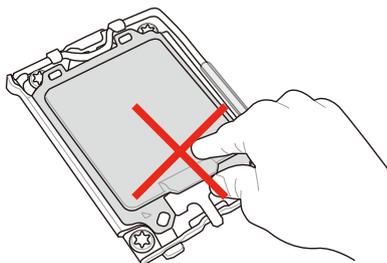
Do not remove the PnP cap yet from the CPU socket. Doing so may bend the pins of the socket.
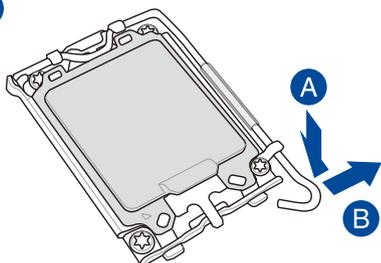
Take caution when lifting the load lever, ensure to hold onto the load lever when releasing the load lever. Letting go of the load lever immediately after releasing it may cause the load lever to spring back and cause damage to your motherboard.
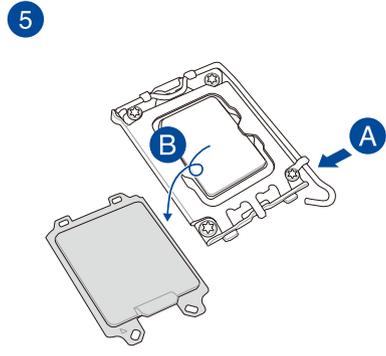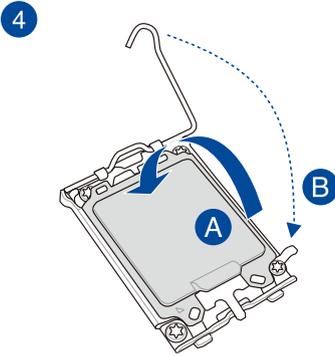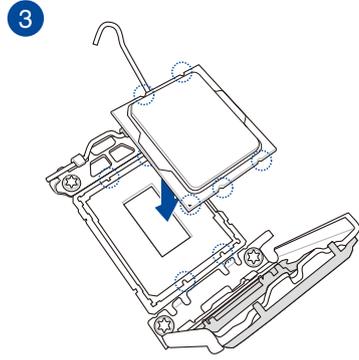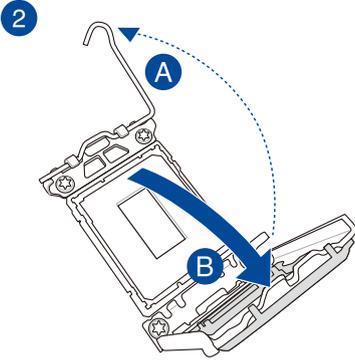
2.3.2 Installing the CPU heatsink

Ensure that you install the correct CPU designed for the LGA1700 socket only. DO NOT install a CPU designed for other sockets on the LGA1700 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.

- Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the socket.

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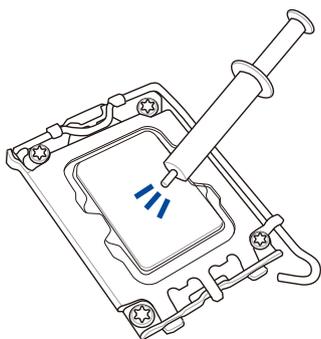
If you purchased a separate CPU heatsink and fan assembly, ensure that the Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.
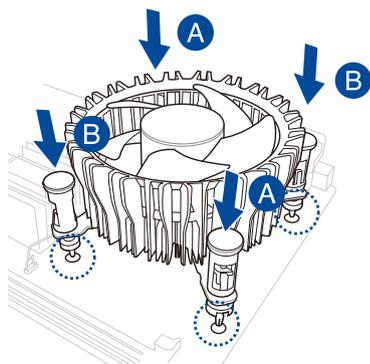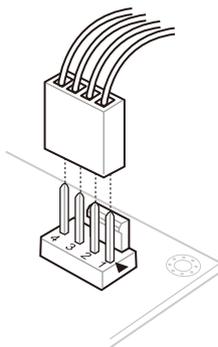
2.4 System memory

2.4.1 Overview

The motherboard comes with four Double Data Rate 5 (DDR5) Dual Inline Memory Modules (DIMM) sockets.

DIMM_B2
DIMM_B1
DIMM_A2
DIMM_A1
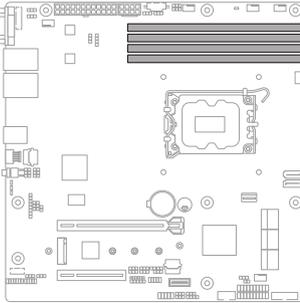
2.4.2 Memory configurations

This section provides recommended memory configurations when installing DIMMs.

- Refer to ASUS Server AVL for the updated list of compatible DIMMs.

- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.

Recommended configuration				
	A1	A2	B1	B2
1 DIMM		•		
2 DIMMs		•		•
4 DIMMs	•	•	•	•

2.4.3 Installing a DIMM

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.
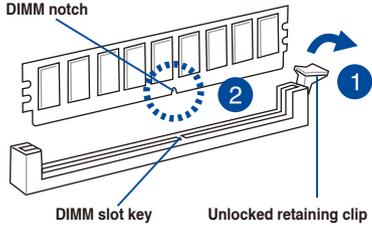
A DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket in the wrong direction to avoid damaging the DIMM.

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.
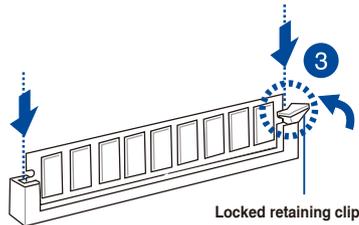
Always insert the DIMM into the socket vertically to prevent DIMM notch damage.

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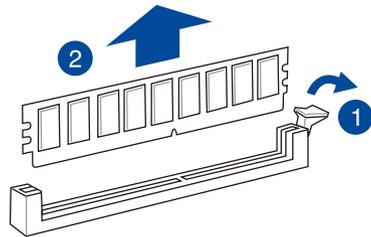
Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2.5   Expansion slots

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

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

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

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. Refer to the **BIOS Setup** chapter 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 slots
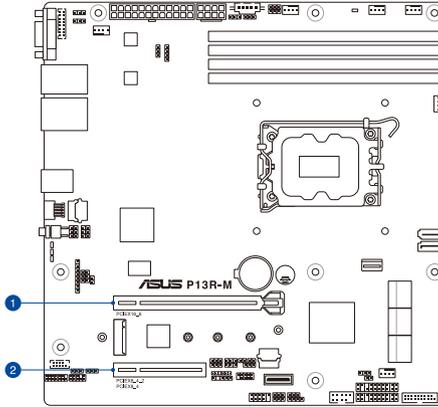
No. (Slot Location)	Short Description	
1 (Slot 6)	PCIEX16_6	PCIe x16 slot (Gen5 x16 link)
2 (Slot 4)	PCIEX8_4	PCIe x8 slot (Gen4 x4 link)

2.5.5   Installing an M.2 module

> • M.2 socket 1 (M.2_1) supports M.2 modules up to 2280.
>
> • M.2 modules are sold separately.
>
> • 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.

1.   Locate the M.2 socket (M.2_1) on the motherboard.
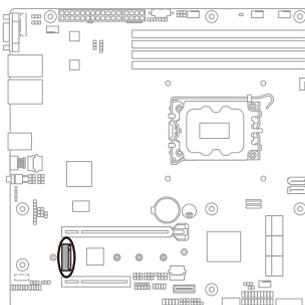
M.2_1(SOCKET3)

2242   2260   2280

2.   Install the stand screw into the hole corresponding to the M.2 module.

3.   Align and insert the M.2 module into the M.2 socket.

4.   Secure the M.2 module with the bundled M.2 screw.

2.5.6   Installing a PFR module (optional)

The optional PFR module will come pre-installed on your system and is connected to the PFR module connector on your motherboard.

> • The illustration below is for reference only.
>
> • For more information or assistance, please refer to www.asus.com.

1.   Locate the PFR module connector on your motherboard.

ROT_CON1
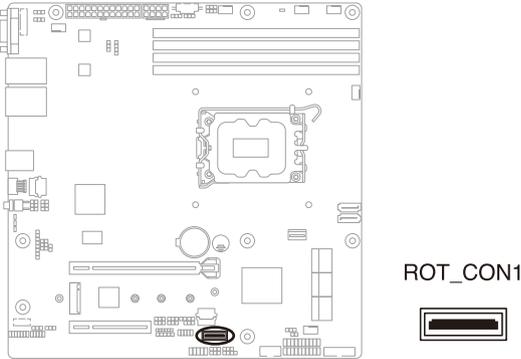
2.   Align and connect the PFR module to the PFR module connector.
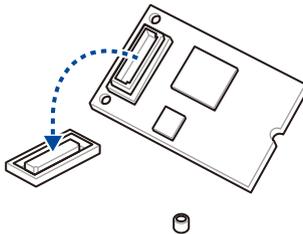
3.   Push the PFR module down so that it is seated securely on the PFR module connector, then secure it using a screw.
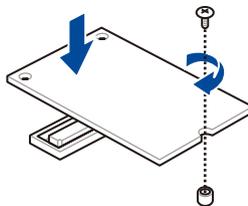
2.6 Jumpers

The motherboard illustration is for reference only. The motherboard layout and appearance may vary depending on the model, but the locations for these jumpers/LEDs/connectors remain the same.

1. Clear RTC RAM (2-pin CLRTC)

This jumper allows you to clear the CMOS memory system setup parameters by erasing the CMOS Real Time Clock (RTC) RAM data. The onboard button cell battery powers the RAM data in CMOS.

To erase the RTC RAM:

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

2. Short-circuit pin 1-2 with a metal object or jumper cap for about 5-10 seconds.

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 short-circuit the pins except when clearing the RTC RAM. Short-circuiting or placing a jumper cap will cause system boot failure!

• If the steps above do not help, remove the onboard battery and short the two pins again to clear the CMOS RTC RAM data. After clearing the CMOS, reinstall the battery.

• Due to chipset behavior, AC power off is required to enable C.P.R. function. You must turn off and on the power supply or unplug and plug the power cord before rebooting the system.

P13R-M CLRTC

CLRTC

+3V_BAT
GND

PIN 1
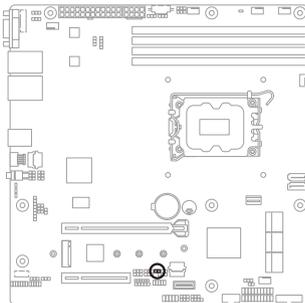
2. **VGA controller setting (3-pin VGA_SW1)**

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

P13R-M VGA_SW1

VGA_SW1

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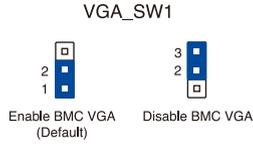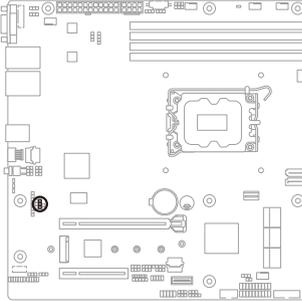
3. **ME firmware force recovery setting (3-pin ME_RCVR1)**

Set to pins 2-3 to force Intel® Management Engine (ME) to boot in recovery mode if the ME becomes corrupted.

P13R-M ME_RCVR1

ME_RCVR1

Normal (Default)   ME Force Update
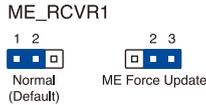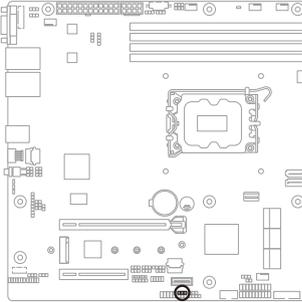
4. **Smart Ride Through (SmaRT) setting (3-pin SMART_PSU1)**

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.

P13R-M SMART_PSU1

SMART_PSU1

Enable
SMART_PSU

Disable
SMART_PSU
(Default)
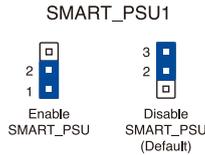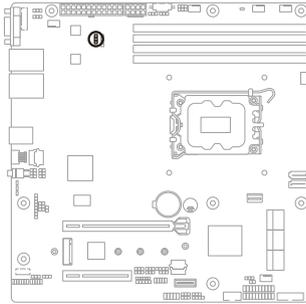
5. **DMLAN setting (3-pin DM_IP_SEL1)**

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).

P13R-M DM_IP_SEL1

DM_IP_SEL1

Enable DMLAN
(Default)

Disable DMLAN
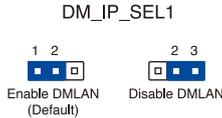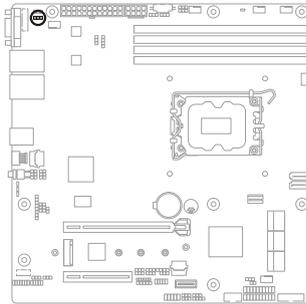
6. **SATADOM power setting (3-pin DOM1_PWR1)**

   This jumper allows SATA5 to support SATADOM which do not need external power connections. Set to pins 2-3 to activate the SATA5 support feature.

   P13R-M DOM1_PWR1

   DOM1_PWR1

   1 2   2 3

   Normal   Enable
   (Default)   SATA5 DOM
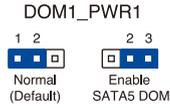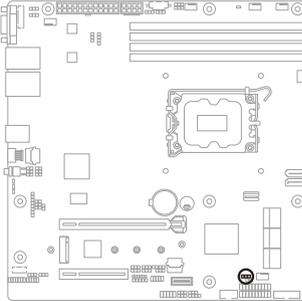
7. **CPU PCIe configuration setting (4-pin CFG5)**

   These jumpers allow you to configure the speed at which PCIEX16_6 will run at.

   P13R-M CFG5

   CFG5

   Auto (default)   x8, x8
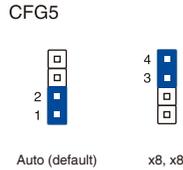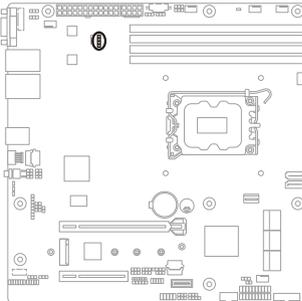
8.   **PCIe SMBus Switcher setting (3-pin SMB_SW1)**

This jumper toggles whether the SMBUS signal comes from BMC or PCH.

P13R-M SMB_SW1

SMB_SW1

1 2   2 3

PCH SMB   BMC SMB
(Default)
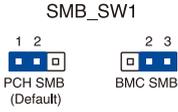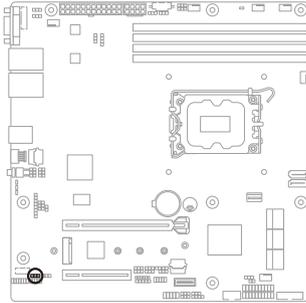
2.7 Onboard LEDs

The motherboard illustration is for reference only. The motherboard layout and appearance may vary depending on the model, but the locations for these jumpers/LEDs/connectors remain the same.

1. **Catastrophic Error LED (CATERR1)**

   The catastrophic error LED indicates that the system has experienced a fatal or catastrophic error and cannot continue to operate.

   P13R-M CATERR1
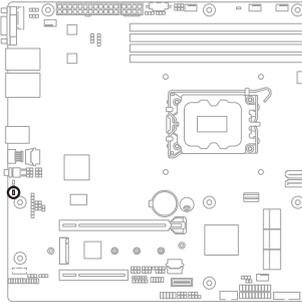
   CATERR1

2. **Location LED (LOCLED1)**

   This onboard LED lights up when the Location button on the server is pressed or when triggered by a system management software. The Location LED helps visually locate and quickly identify the server in error on a server rack.

   P13R-M LOCLED1
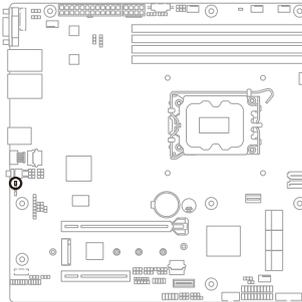
   LOCLED1

3. **Message LED (MLED1)**

   This onboard LED lights up to indicate that there is a temperature warning or a BMC event log is generated.

   P13R-M MLED1
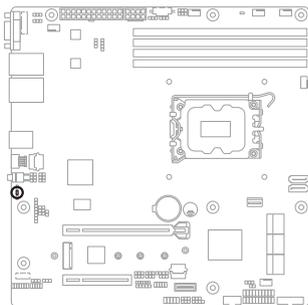
   MLED1

2.8 Connectors

2.8.1 Rear panel connectors

P13R-M
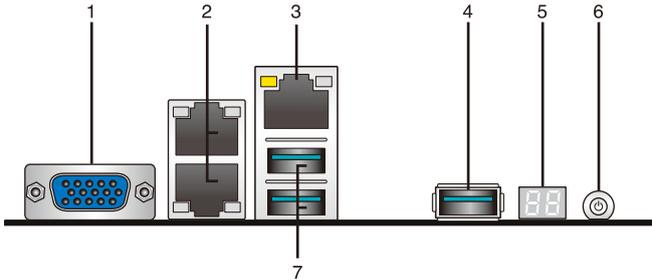
1. **VGA port:** This port is for a VGA monitor or other VGA-compatible devices.

2. **LAN ports:** These ports allows Gigabit connection to a Local Area Network (LAN) through a network hub.

3. **Dedicated Management LAN port (DM_LAN1):** This RJ-45 port functions only when you enable the ASMB11 Management card.

4. **USB 3.2 Gen 2 ports:** These USB ports are available for connecting USB devices.

5. **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.

6. **Power Button:** Press this button to turn the system on or off.

7. **USB 3.2 Gen 2 ports:** These USB ports are available for connecting USB devices.

P13R-M/10G-2T
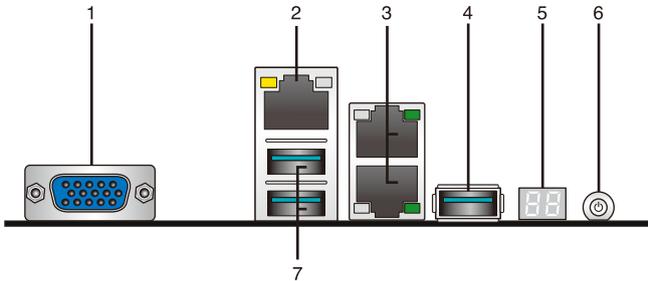
1. **VGA port:** This port is for a VGA monitor or other VGA-compatible devices.

2. **Dedicated Management LAN port (DM_LAN1):** This RJ-45 port functions only when you enable the ASMB11 Management card.

3. **LAN ports:** These ports allows Gigabit connection to a Local Area Network (LAN) through a network hub.

4. **USB 3.2 Gen 2 ports:** These USB ports are available for connecting USB devices.

5. **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.

6. **Power Button:** Press this button to turn the system on or off.

7. **USB 3.2 Gen 2 ports:** These USB ports are available for connecting USB devices.

Intel® I210 LAN port LED indications

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

ACT/LINK LED   SPEED LED

ACT/LINK LED   SPEED LED
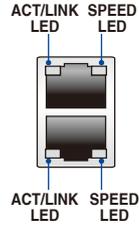
Intel® LOM X710AT LAN port LED indications

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

ACT/LINK LED   SPEED LED

ACT/LINK LED   SPEED LED
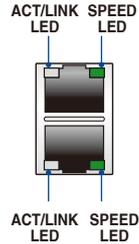
Dedicated Management LAN port (DM_LAN1) LED indications

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

ACT/LINK LED   SPEED LED
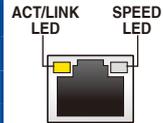
2.8.2 Internal connectors

1. SATA connectors (SATA1_1-2; SATA1_34; SATA2_12; SATA2_34)

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.

P13R-M SATA connectors
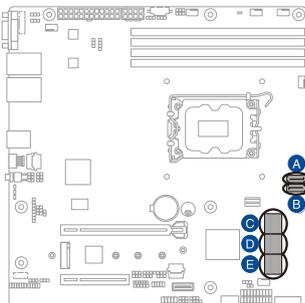
Ⓐ SATA1_1
Ⓑ SATA1_2
Ⓒ SATA1_34
Ⓓ SATA2_12
Ⓔ SATA2_34

The actual data transfer rate depends on the speed of Serial ATA hard disks installed.

2. 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.

P13R-M HDLED1

HDLED1

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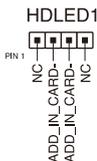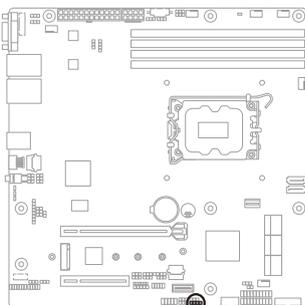
3. **Serial General Purpose Input/Output connector (6-1 pin SGPIO1)**

   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.

   P13R-M SGPIO1
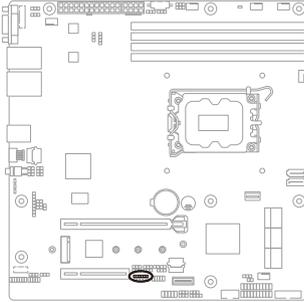
4. **USB 2.0 connectors (10-1 pin USB67)**

   This connector allows you to connect a USB 2.0 module for additional USB 2.0 front or rear panel ports. This USB connector provides data transfer speeds of up to 480 Mb/s connection speed.

   P13R-M USB67
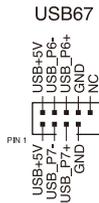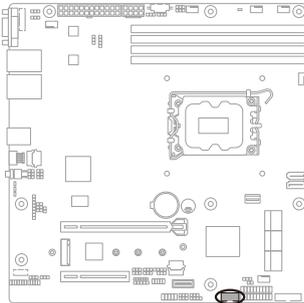
5. **USB 3.2 Gen 1 connector (20-1 pin U32G2_45)**

   This connector allows you to connect a USB 3.2 Gen 1 module for additional USB 3.2 Gen 1 front or rear panel ports. The USB 3.2 Gen 1 connector provides data transfer speeds of up to 5 Gb/s.

   P13R-M U32G2_45

   U32G2_45

   IntA_P2_D+
   IntA_P2_D-
   GND
   IntA_P2_SSTX+
   IntA_P2_SSTX-
   GND
   IntA_P2_SSRX+
   IntA_P2_SSRX-
   Vbus

   PIN 1

   GND
   IntA_P1_D+
   IntA_P1_D-
   IntA_P1_SSTX+
   IntA_P1_SSTX-
   GND
   IntA_P1_SSRX+
   IntA_P1_SSRX-
   Vbus
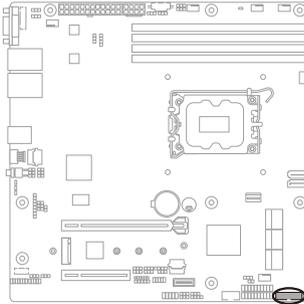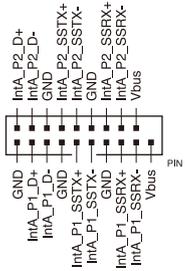
   The USB 3.2 Gen 1 module is purchased separately.

   The plugged USB 3.2 Gen 1 device may run on xHCI or EHCI mode depending on the operating system's setting.

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

   This connector supports a Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

   P13R-M TPM1

   TPM1

   CS#_TPM
   PIRQ#_TPM
   NC
   GND
   SCLK_TPM
   OSL_TPM

   PIN 1

   VCC
   RST#_TPM
   NC
   NC
   NC
   MISO_TPM
   NC
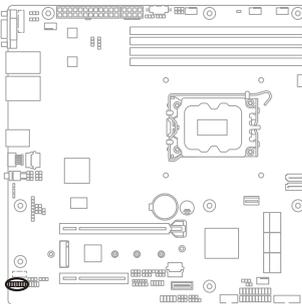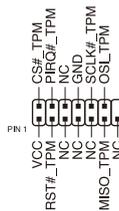
7. **Fan connectors (4-pin CPU_FAN1, FRNT_FAN1-4, REAR_FAN1)**

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.

P13R-M Fan connectors

B FRNT_FAN3
C FRNT_FAN2
D FRNT_FAN1
F FRNT_FAN4

FAN_PWM
FAN_IN
FAN_PWR
GND

E CPU_FAN1

FAN_PWM
FAN_IN
FAN_PWR
GND

A REAR_FAN1

GND
FAN_PWR
FAN_IN
FAN_PWM
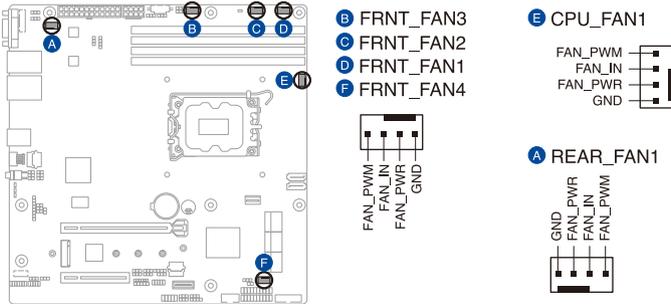
- DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components.

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

- All fans feature the ASUS Smart Fan technology.

8. Serial port connector (10-1 pin COM)

These connectors are for the serial (COM) ports. Connect the serial port module cable to the connector, then install the module to a slot opening at the back of the system chassis.

P13R-M COM

COM

RXD1 DTR1 DSR1 CTS1
PIN 1
CDC1 TXD1 GND RST1# PI1#
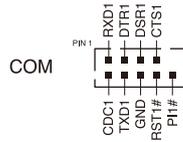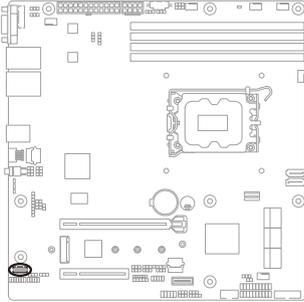
9. Power Supply SMBus connector (5-pin PSUSMB1)

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

P13R-M PSUSMB1

PSUSMB1

I2C1SCL I2C1SDA I2C1ALT GND +3.3V
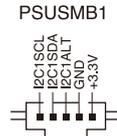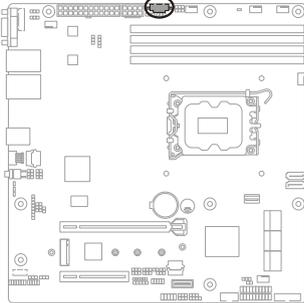
This connector functions only when you enable ASMB.

Power supply is required to meet PMBus specification and customized BMC FW may be needed. Please contact ASUS for additional information.

10. 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.

P13R-M ATX power connectors
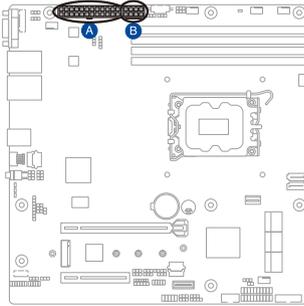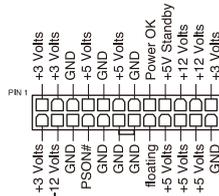
Ⓐ EATXPWR1   Ⓑ EATX12V1
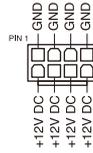
- DO NOT forget to connect the 24-pin and the 8-pin power plugs; otherwise, the system will not boot up.

- 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.

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

This connector supports several chassis-mounted functions.

P13R-M PANEL1
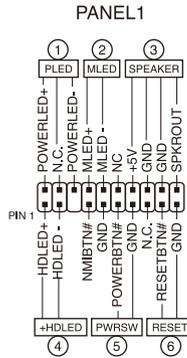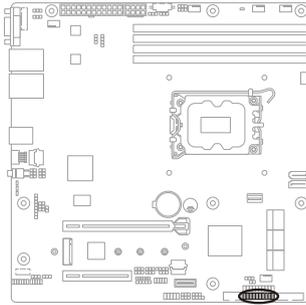
- **System power LED (3-pin PLED)**

  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.

- **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 Hardware monitor to indicate an abnormal event occurrence.

- **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.

- **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 IDE LED lights up or flashes when data is read from or written to the HDD.

- **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 (4) seconds while the system is ON turns the system OFF.

- **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.

12. **Auxiliary panel connectors (20-2 pin AUX_PANEL1)**

These connectors are for additional front panel features including front panel SMB, locator LED and switch, chassis intrusion, and LAN LEDs.

P13R-M AUX_PANEL1

AUX_PANEL1
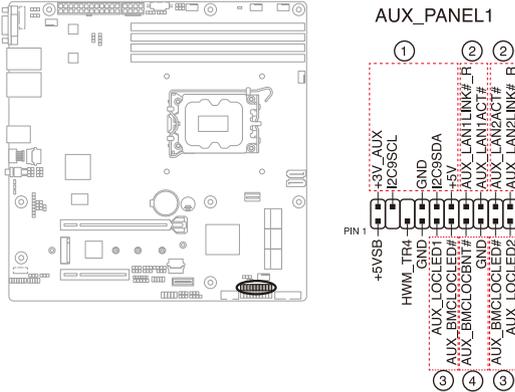
- **Front panel SMB (6-1 pin FPSMB)**

  This 6-1 pin connector is for the front panel SMBus cable.

- **LAN activity LED (2-pin AUX_LAN1-2)**

  This 2-pin connector is for the Gigabit LAN activity LEDs on the front panel.

- **Locator LED (2-pin AUX_LOCLED1-2)**

  This 2-pin connector is 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.

- **Locator Button/Switch (2-pin AUX_BMCLOCBNT)**

  This 2-pin connector is for the locator button on the front panel. This button queries the state of the system locator.

13. 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.
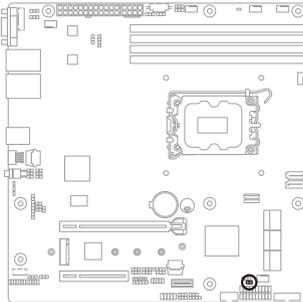
P13R-M INTRUSION1

14. 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.

P13R-M SMBUS1

3
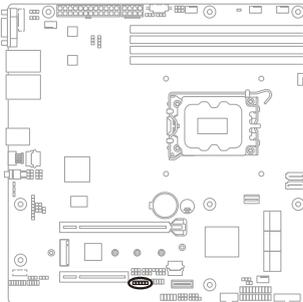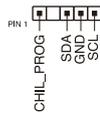
Powering Up

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 the **BIOS setup** chapter.

3.2 Powering off the computer

3.2.1 Using the OS shut down function

Using Windows® Server:

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 lists. Otherwise, select the option that best describes why you want to shut down the computer.

5. Click **Continue**.

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.
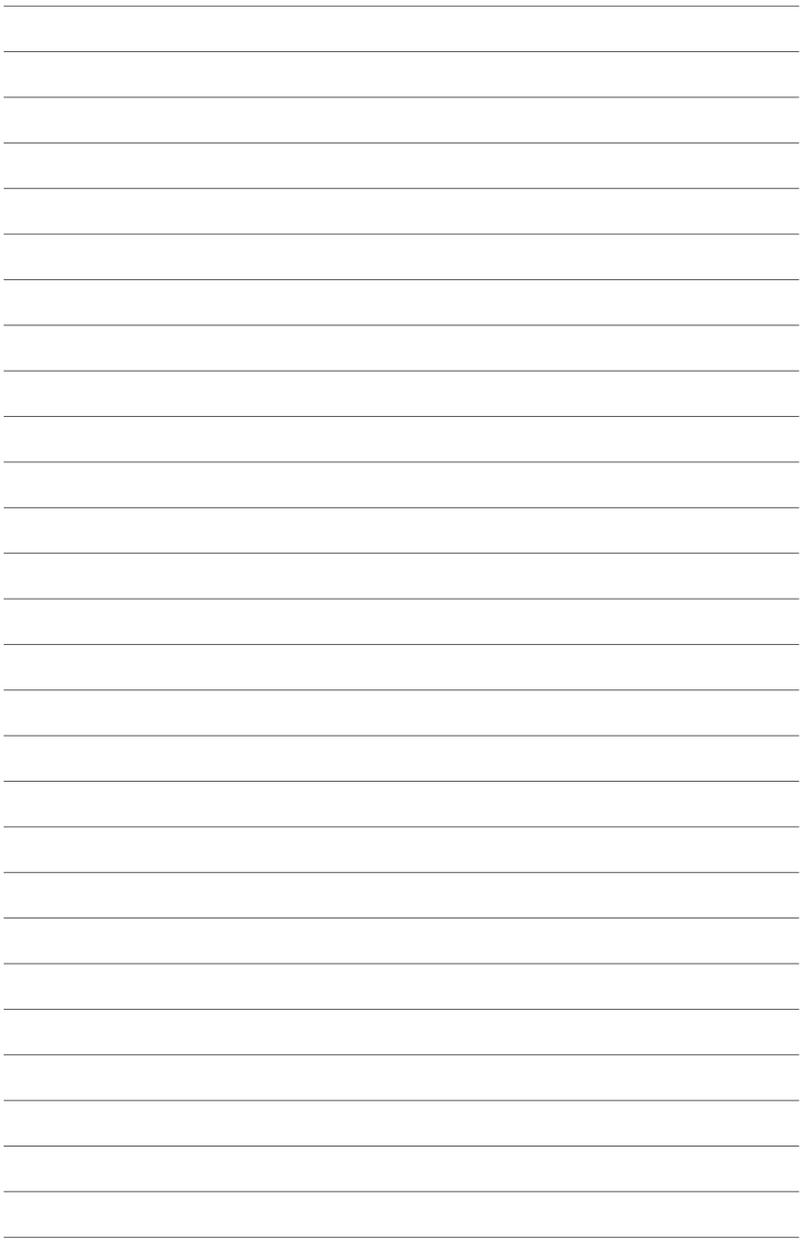
BIOS Setup

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.

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.

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 without having to use a DOS-based utility.

Before you start using this utility, download the latest BIOS from the ASUS website at www.asus.com.

To update the BIOS using EZ Flash Utility:

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

2. Enter the BIOS setup program. Go to the **Tool** menu, then select **Start ASUS EZ Flash**. Press <Enter>.

```
                    ASUSTek. EzFlash Utility

      Current Platform                New Platform
Platform : P13R-M                Platform : P13R-M
Version :  1989                  Version :  2357
Build Date :04/01/2023           Build Date :04/15/2023

FS0      System Volume Information         <DIR>
         P13R-M BIOS                       <DIR>
         Windows                           <DIR>




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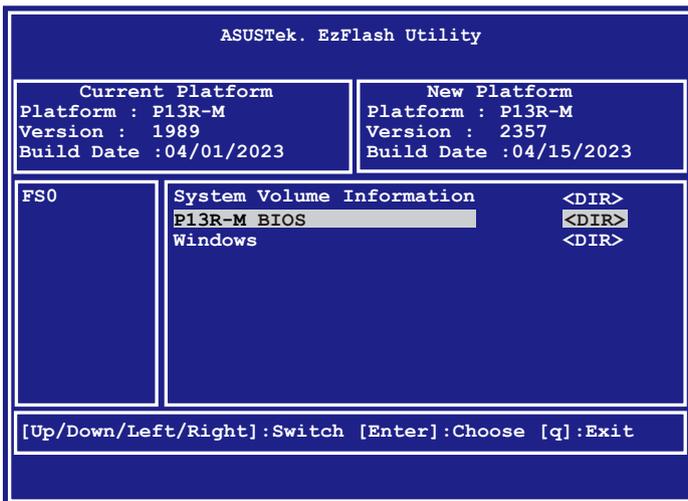
3. Press the Left/Right arrow keys to switch to the **Drive** field.

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

5. Press Left/Right arrow keys to switch to the **Folder Info** field.

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

4.2 BIOS setup program

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

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>+<Delete>, 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 - AMI
  Main  Performance Tuning  Advanced  Chipset  Security  Boot  Tool  Event Logs  Server Mgmt  ▶

  BIOS Information                                                  ▲
  BIOS Vendor            American Megatrends
  Core Version           5.27
  Compliancy             UEFI 2.8; PI 1.7
  BIOS Version           0203 x64
  Build Date             07/06/2023
  Access Level           Administrator

  Intel I210 LAN1 MAC    A0:36:BC:CC:0D:43
  Intel I210 LAN2 MAC    A0:36:BC:CC:0D:44

  FSP Information
  FSP version            0C.00.B3.50
  RC version             0C.00.6B.41
  Build Date
  FSP Mode               Dispatch Mode                             ▶◀: Select Screen
                                                                   ▲▼: Select Item
  Board Information                                                Enter: Select
  Board Name             P13R-M Series                             +/-: Change Opt.
  Board ID               N/A                                       F1: General Help
  Fab ID                 60SB0CD0-SB0A01                           F2: Previous Values
  LAN PHY Revision       N/A                                       F5: Optimized Defaults
  System UUID            8A000B2E-312D-43A5-B883-                  F10: Save Changes & Reset
                         A036BCCC0D43                              F12: Print Screen
                                                            ▼      ESC: Exit

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```

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

Security   For changing the security settings

Boot   For changing the system boot configuration

Tool   For configuring options for special functions

Event Logs   For changing the event log settings

Server Mgmt   For changing the Server Mgmt settings

Exit   For selecting the 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.

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 (such as Advanced) on the menu bar have their respective menu items.

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 then press <Enter>.

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.

General help

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

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.

Pop-up window

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

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 - AMI
    Main  Performance Tuning  Advanced  Chipset  Security  Boot  Tool  Event Logs  Server Mgmt ▶

    BIOS Information                                               ▲
    BIOS Vendor                      American Megatrends
    Core Version                     5.27
    Compliancy                       UEFI 2.8; PI 1.7
    BIOS Version                     0203 x64
    Build Date                       07/06/2023
    Access Level                     Administrator

    Intel I210 LAN1 MAC              A0:36:BC:CC:0D:43
    Intel I210 LAN2 MAC              A0:36:BC:CC:0D:44

    FSP Information
    FSP version                      0C.00.B3.50
    RC version                       0C.00.6B.41                   →←: Select Screen
    Build Date                                                     ↑↓: Select Item
    FSP Mode                         Dispatch Mode                 Enter: Select
                                                                   +/-: Change Opt.
    Board Information                                              F1: General Help
    Board Name                       P13R-M Series                 F2: Previous Values
    Board ID                         N/A                           F5: Optimized Defaults
    Fab ID                           60SB0CD0-SB0A01               F10: Save Changes & Reset
    LAN PHY Revision                 N/A                           F12: Print Screen
    System UUID                      8A000B2E-312D-43A5-B883-      ESC: Exit
                                     A036BCCC0D43                  ▼

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```

System Language

Allows you to set the system language.

System Date [MM/DD/YYYY]

Allows you to set the system date.

System Time [HH:MM:SS]

Allows you to set the system time.

4.4 Performance Tuning menu

The Performance Tuning menu items allow you to change performance related settings for different scenarios.

```
                              Aptio Setup - AMI
    Main  Performance Tuning  Advanced  Chipset  Security  Boot  Tool  Event Logs  Server Mgmt

    Optimized Performance Setting        [Default]          The following setting shows
    Core Optimizer                       [Disabled]         the recommended BIOS setting
    Engine Boost                         [Disabled]         to optimize for performance
                                                            includes those
                                                            performance-related BIOS
```
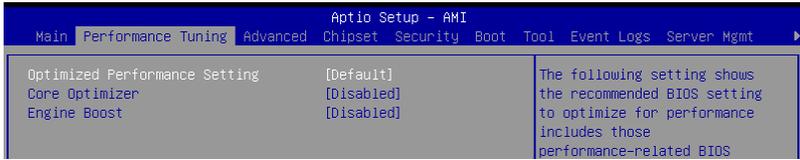
Optimized Performance Setting [Default]

Allows you to select performance settings for different scenarios.

[Default]   Default settings.

[By Benchmark]   Optimize for different kinds of benchmarks. Select this option, then select a benchmark type from the >> list.

> This function will reset some BIOS settings that you have changed back to their default values. Please check your BIOS settings again.

> The following item appears only when **Power Balancer** is set to **[Disabled]**, or if Optimized Performance Setting is set to **[Default]** or **[By Benchmark]**.

Core Optimizer [Disabled]

Allows you to keep the processor operating at the turbo highest frequency for the maximum performance.
Configuration options: [Disabled] [Enabled] [Manual]

> The following item appears only when you set **Core Optimizer** to **[Manual]**.

CPU Max frequency [XXXX]
The default value for this option will be the maximum supported frequency of the CPU installed and may vary between different CPUs.

> The following item appears only when **Optimized Performance Setting** is set to **[Default] or [By Benchmark]**.

Engine Boost [Disabled]

Enable this item to boost the CPU's frequency. Recommended operation at an ambient temperature of 25°C or below for optimized performance.
Configuration options: [Disabled] [Level1] [Level2] [Level3(Max)]

> Operate with an ambient temperature of 25°C or lower for optimized performance.

4.5   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 - AMI
     Main  Performance Tuning  Advanced  Chipset  Security  Boot  Tool  Event Logs  Server Mgmt

  ▶ RC ACPI Settings                              ▲   System ACPI Parameters.
  ▶ CPU Configuration
  ▶ Power & Performance
  ▶ System Agent (SA) Configuration
  ▶ PCH Configuration
  ▶ Server ME Configuration
  ▶ Server ME Debug Configuration
  ▶ Thermal Configuration
  ▶ Platform Settings
  ▶ BCLK Configuration
  ▶ System Event Log
  ▶ Debug Settings
  ▶ Debug Configuration                               →←: Select Screen
  ▶ Trusted Computing                                 ↑↓: Select Item
  ▶ ACPI Settings                                     Enter: Select
  ▶ Redfish Host Interface Settings                   +/-: Change Opt.
  ▶ SMART Settings                                    F1: General Help
  ▶ Onboard LAN Configuration                         F2: Previous Values
  ▶ UEFI Variables Protection                         F5: Optimized Defaults
  ▶ Serial Port Console Redirection                   F10: Save Changes & Reset
  ▶ Intel TXT Information                             F12: Print Screen
  ▶ Acoustic Management Configuration                 ESC: Exit
  ▶ AMI Graphic Output Protocol Policy
  ▶ SIO Common Setting
  ▶ SIO Configuration                             ▼

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```

4.5.1 RC ACPI Settings

```
                                            Aptio Setup – AMI
                              Advanced

    RC ACPI Settings                                               PTID Support will be loaded if
                                                                   enabled.
    PTID Support                          [Enabled]
    PECI Access Method                    [Direct I/O]
    PCI Express Native Power              [Enabled]
    Management
    Native ASPM                           [Auto]
    BDAT ACPI Table Support               [Disabled]

    ACPI Debug                            [Disabled]

    PCI Delay Optimization                [Disabled]
    MSI enabled                           [Enabled]
```

PTID Support [Enabled]

Configuration options: [Disabled] [Enabled]

PECI Access Method [Direct I/O]

Configuration options: [Direct I/O] [ACPI]

PTID Support [Enabled]

Configuration options: [Disabled] [Enabled]

PCI Express Native Power Management [Enabled]

Configuration options: [Disabled] [Enabled]

The following items are only available when **PCI Express Native Power Management** is set to **[Enabled]**.

Native ASPM [Auto]

Configuration options: [Auto] [Enabled] [Disabled]

BDAT ACPI Table Support [Disabled]

Configuration options: [Disabled] [Enabled]

ACPI Debug [Disabled]

Configuration options: [Disabled] [Enabled]

PCI Delay Optimization [Disabled]

Configuration options: [Disabled] [Enabled]

MSI Enabled [Enabled]

Configuration options: [Disabled] [Enabled]

4.5.2 CPU Configuration

```
                        Aptio Setup - AMI
         Advanced

  CPU Configuration                                 ▲  Displays the P-core Information

▶ Performance-core Information

  CPU Signature              0xB0671
  Brand String               Intel(R) Xeon(R) E
                             E-2414
  Intel SMX Technology       Supported
  TXT Crash Code             0x00000000
  TXT SPAD                   0x9840000080000000
  Boot Guard Status          0xC0008000
  Boot Guard ACM Policy Status   0x0000001020001EA1
  Boot Guard SACM Information     0x0000001300000051
                                                      �: Select Screen
  C6DRAM                     [Enabled]                ↑↓: Select Item
  CPU Flex Ratio Override    [Disabled]               Enter: Select
  CPU Flex Ratio Settings    26                       +/-: Change Opt.
  Hardware Prefetcher        [Enabled]                F1: General Help
  Adjacent Cache Line Prefetch [Enabled]              F2: Previous Values
  PECI                       [Enabled]                F5: Optimized Defaults
  AVX                        [Enabled]                F10: Save Changes & Reset
  Active Processor Cores     [All]                    F12: Print Screen
  BIST                       [Disabled]               ESC: Exit
  AP threads Idle Manner     [MWAIT Loop]
  AES                        [Enabled]             ▼

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```

Performance-core Information

Allows you to view performance-core information.

C6DRAM [Enabled]

Configuration options: [Disabled] [Enabled]

CPU Flex Ratio Override [Disabled]

Configuration options: [Disabled] [Enabled]

> 🖉 The following items are only available when **CPU Flex Ratio Override** is set to **[Enabled]**.

> **CPU Flex Ratio Settings [26]**
>
> Allows you to set the CPU Flex Ratio.

Hardware Prefetcher [Enabled]

Configuration options: [Disabled] [Enabled]

Adjacent Cache Line Prefetch [Enabled]

Configuration options: [Disabled] [Enabled]

PECI [Enabled]

Configuration options: [Disabled] [Enabled]

AVX [Enabled]

Configuration options: [Disabled] [Enabled]

Active Processor Cores [All]

Configuration options: [All] [1] [2] [3]

BIST [Disabled]

Configuration options: [Disabled] [Enabled]

AP Threads Idle Manner [MWAIT Loop]

Configuration options: [HALT Loop] [MWAIT Loop] [RUN Loop]

AES [Enabled]

Configuration options: [Disabled] [Enabled]

Machine Check [Enabled]

Configuration options: [Disabled] [Enabled]

MonitorMWait [Enabled]

Configuration options: [Disabled] [Enabled]

Intel Trusted Execution Technology [Disabled]

Configuration options: [Disabled] [Enabled]

> The following items are only available when **Intel Trusted Execution Technology** is set to **[Enabled]**.

Alias Check Request [Disabled]

Configuration options: [Disabled] [Enabled]

DPR Memory Size (MB)

Allows you to set the DPR memory size in MB.

CPU SMM Enhancement

Allows you to configure CPU SMM Enhancement options.

Total Memory Encryption [Enabled]

Configuration options: [Disabled] [Enabled]

4.5.3 Power & Performance

```
                              Aptio Setup — AMI
                    Advanced

  Power & Performance                              CPU — Power Management Control
                                                   Options
▶ CPU — Power Management Control
▶ GT — Power Management Control
```

CPU - Power Management Control

Boot performance mode [Turbo Performance]

Configuration options: [Max Battery] [Max Non-Turbo Performance] [Turbo Performance]

Intel(R) SpeedStep(tm) [Enabled]

Configuration options: [Disabled] [Enabled]

Race To Halt (RTH) [Enabled]

Configuration options: [Disabled] [Enabled]

Intel(R) Speed Shift Technology [Native Mode]

Configuration options: [Disabled] [Native Mode] [Out of Band Mode]

The following items are only available when **Intel(R) Speed Shift Technology** is set to **[Disabled]** or **[Native Mode]**.

Per Core P State OS control mode [Enabled]
Configuration options: [Disabled] [Enabled]

HwP Autonomous Per Core P State [Enabled]
Configuration options: [Disabled] [Enabled]

HwP Autonomous EPP Grouping [Enabled]
Configuration options: [Disabled] [Enabled]

EPB Override Over PECI [Enabled]
Configuration options: [Disabled] [Enabled]

HwP Fast MSR Support [Disabled]
Configuration options: [Disabled] [Enabled]

HwP Lock [Enabled]
Configuration options: [Disabled] [Enabled]

HDC Control [Enabled]

Configuration options: [Disabled] [Enabled]

Turbo Mode [Enabled]

Configuration options: [Disabled] [Enabled]

C-States [Enabled]

Configuration options: [Disabled] [Enabled]

View/Configure Turbo Options

Allows you to configure Turbo options.

CPU VR Settings

Allows you to configure CPU VR options.

Platform PL1 Enable [Disabled]

Configuration options: [Disabled] [Enabled]

The following items are only available when **Platform PL1 Enable** is set to **[Enabled]**.

Platform PL1 Power [0]
Allows you to set the Platform PL1 Power in milliwatts.

Platform PL1 Time Window [0]
Configuration options: [0-128]

Platform PL2 Enable [Disabled]

Configuration options: [Disabled] [Enabled]

The following items are only available when **Platform PL2 Enable** is set to **[Enabled]**.

Platform PL1 Power [0]
Allows you to set the Platform PL2 Power in milliwatts.

Power Limit 4 Override [Disabled]

Configuration options: [Disabled] [Enabled]

The following items are only available when **Power Limit 4 Override** is set to **[Enabled]**.

Power Limit 4 [0]
Allows you to set the Power Limit 4 in milliwatts.

Power Limit 4 Lock [Disabled]
Configuration options: [Disabled] [Enabled]

C-States [Enabled]

Configuration options: [Disabled] [Enabled]

The following items are only available when **C-States** is set to **[Enabled]**.

Enhanced C-States [Enabled]
Configuration options: [Disabled] [Enabled]

C-State Auto Demotion [C1]
Configuration options: [Disabled] [C1]

C-State Un-demotion [C1]
Configuration options: [Disabled] [C1]

Package C-State Demotion [Enabled]
Configuration options: [Disabled] [Enabled]

Package C-State Un-demotion [Enabled]
Configuration options: [Disabled] [Enabled]

C-State Pre-Wake [Enabled]
Configuration options: [Disabled] [Enabled]

IO MWAIT Redirection [Disabled]
Configuration options: [Disabled] [Enabled]

Package C-state Limit [Auto]
Configuration options: [C0/C1] [C2] [C3] [C6] [C7] [C7S] [C8] [C9] [C10] [CPU Default] [Auto]

C6/C7 Short Latency Control (MSR 0x60B)
Time Limit [1024 ns]
Configuration options: [1-33554432ns]

Latency [0]
Allows you to set the C6/C7 Short Latency Control (MSR 0x60B) latency.

C6/C7 Short Latency Control (MSR 0x60C)
Time Limit [1024 ns]
Configuration options: [1-33554432ns]

Latency [0]
Allows you to set the C6/C7 Short Latency Control (MSR 0x60B) latency.

Thermal Monitor [Enabled]

Configuration options: [Disabled] [Enabled]

Interrupt Redirection Mode Selection [Fixed Priority]

Configuration options: [Fixed Priority] [Round robin] [Hash vector] [No change]

Timed MWAIT [Disabled]

Configuration options: [Disabled] [Enabled]

Custom P-state Table

Allows you to configure Custom P-state Table options.

Energy Performance Gain [Disabled]

Configuration options: [Disabled] [Enabled]

The following items are only available when **Energy Performance Gain** is set to **[Enabled]**.

EPG DIMM Idd3N [26]
Allows you to set the EPG DIMM Idd3N in milliwatts.
EPG DIMM Idd3P [11]
Allows you to set the EPG DIMM Idd3P in milliwatts.

Power Limit 3 Settings

Allows you to configure Power Limit 3 options.

CPU Lock Configuration

Allows you to configure CPU Lock options.

GT - Power Management Control

RC6 (Render Standby) [Enabled]

Configuration options: [Disabled] [Enabled]

Maximum GT Frequency [Default Max Frequency]

Configuration options: [Default Max Frequency] [100-1200MHz]

Disable Turbo GT Frequency [Disabled]

Configuration options: [Disabled] [Enabled]

4.5.4 System Agent (SA) Configuration

```
                          Aptio Setup - AMI
                 Advanced

  System Agent (SA) Configuration                    Memory Configuration Parameters

  VT-d                            Supported

▶ Memory Configuration
▶ Graphics Configuration
▶ DMI/OPI Configuration
▶ PCI Express Configuration

  Stop Grant Configuration        [Auto]
  VT-d                            [Enabled]
  Control Iommu Pre-boot Behavior [Disable IOMMU]
  X2APIC Opt Out                  [Disabled]         ++: Select Screen
  DMA Control Guarantee           [Enabled]          ↑↓: Select Item
  Thermal Device (B0:D4:F0)       [Disabled]         Enter: Select
  Cpu CrashLog (Device 10)        [Disabled]         +/-: Change Opt.
  GNA Device (B0:D8:F0)           [Disabled]         F1: General Help
  CRID Support                    [Disabled]         F2: Previous Values
  Above 4G Decoding               [Enabled]          F5: Optimized Defaults
  Program Grant Count             [Disabled]         F10: Save Changes & Reset
                                                     F12: Print Screen
                                                     ESC: Exit



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```

Memory Configuration

Allows you to configure Memory options.

Graphics Configuration

Allows you to configure Graphics options.

DMI/OPI Configuration

Allows you to configure DMI/OPI options.

PCI Express Configuration

Allows you to configure PCI Express options.

Stop Grant Configuration [Auto]

Configuration options: [Auto] [Manual]

The following items are only available when **Stop Grant Configuration** is set to **[Manual]**.

Number of Stop Grant Cycles [1]

Allows you to set the number of stop grant cycles.

VT-d [Enabled]

Configuration options: [Disabled] [Enabled]

The following items are only available when **VT-d** is set to **[Enabled]**.

Control IOMMU Pre-boot Behavior [Disable IOMMU]

Configuration options: [Disable IOMMU] [Enable IOMMU during boot]

X2APIC Opt Out [Disabled]

Configuration options: [Disabled] [Enabled]

DMA Control Guarantee [Enabled]

Configuration options: [Disabled] [Enabled]

Thermal Device (B0:D4:F0) [Disabled]

Configuration options: [Disabled] [Enabled]

CPU Crash Log (Device 10) [Disabled]

Configuration options: [Disabled] [Enabled]

GNA Device (B0:D8:F0) [Disabled]

Configuration options: [Disabled] [Enabled]

CRID Support [Disabled]

Configuration options: [Disabled] [Enabled]

Above 4G Decoding [Enabled]

Configuration options: [Disabled] [Enabled]

Program Grant Count [Disabled]

Configuration options: [Disabled] [Enabled]

4.5.5   PCH Configuration

```
                            Aptio Setup - AMI
               Advanced

   PCH Configuration                               ▲  PCI Express Configuration
                                                      settings
 ▶ PCI Express Configuration
 ▶ PCH Storage Configuration
 ▶ USB Configuration
 ▶ Security Configuration
 ▶ SerialIo Configuration
 ▶ Pch Thermal Throttling Control
   Skip VCCIN_AUX Configuration       [Disabled]
 ▶ PMC Configuration

   DeepSx Power Policies              [Disabled]
   State After G3                     [Power On]      ↹↔: Select Screen
   Port 80h Redirection               [LPC Bus]       ↑↓: Select Item
   Enhance Port 80h LPC Decoding      [Enabled]       Enter: Select
   Compatible Revision ID             [Disabled]      +/-: Change Opt.
   Legacy IO Low Latency              [Disabled]      F1: General Help
   PCH Cross Throttling               [Enabled]       F2: Previous Values
   PCH Energy Reporting               [Enabled]       F5: Optimized Defaults
   C10 Dynamic threshold adjustment   [Disabled]      F10: Save Changes & Reset
   IEH Mode                           [Bypass Mode]   F12: Print Screen
   Enable TCO Timer                   [Disabled]      ESC: Exit
   Pcie Pll SSC                       [Auto]
   IOAPIC 24-119 Entries              [Enabled]
   Enable 8254 Clock Gate             [Disabled]   ▼

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```

PCI Express Configuration

Allows you to configure PCI Express options.

PCH Storage Configuration

Allows you to configure PCH Storage options.

USB Configuration

Allows you to configure USB options.

Security Configuration

Allows you to configure Security options.

Serial IO Configuration

Allows you to configure Serial IO options.

PCH Thermal Throttling Control

Allows you to configure PCH Thermal Throttling Control options.

Skip VCCIN_AUX Configuration [Disabled]

Configuration options: [Disabled] [Enabled]

PMC Configuration

Allows you to configure PMC options.

DeepSx Power Policies [Disabled]

Configuration options: [Disabled] [Enabled in S4-S5] [Enabled in S5]

State After G3 [Power On]

Configuration options: [Power On] [Power Off]

Port 80h Redirection [LPC Bus]

Configuration options: [LPC Bus] [PCIe Bus]

The following items are only available when **Port 80h Redirection** is set to **[LPC Bus]**.

Enhance Port 80h LPC Decoding [Enabled]

Configuration options: [Disabled] [Enabled]

Legacy IO Low Latency [Disabled]

Configuration options: [Disabled] [Enabled]

PCH Cross Throttling [Enabled]

Configuration options: [Disabled] [Enabled]

PCH Energy Reporting [Enabled]

Configuration options: [Disabled] [Enabled]

C10 Dynamic Threshold Adjustment [Disabled]

Configuration options: [Disabled] [Enabled]

IEH Mode [Bypass Mode]

Configuration options: [Bypass Mode] [Enabled]

Enable TCO Timer [Disabled]

Configuration options: [Disabled] [Enabled]

PCIe P11 SSC [Auto]

Configuration options: [Disabled] [Auto] [0.0-2.0%]

IOAPIC 24-119 Entries [Enabled]

Configuration options: [Disabled] [Enabled]

Enable 8254 Clock Gate [Disabled]

Configuration options: [Disabled] [Enabled] [Enabled In Runtime and S3 Resume]

Lock PCH Sideband Access [Enabled]

Configuration options: [Disabled] [Enabled]

Flash Protection Range Registers (FPRR) [Enabled]

Configuration options: [Disabled] [Enabled]

SPD Write Disable [TRUE]

Configuration options: [TRUE] [FALSE]

LGMR [Disabled]

Configuration options: [Disabled] [Enabled]

HOST_C10 Reporting to Target [Disabled]

Configuration options: [Disabled] [Enabled]

OS IDLE Mode [Disabled]

Configuration options: [Disabled] [Enabled]

S0ix Auto Demotion [Disabled]

Configuration options: [Disabled] [Enabled]

Extended BIOS Range Decode [Disabled]

Configuration options: [Disabled] [Enabled]

4.5.6   Server ME Configuration

Displays the Server ME Technology parameters on your system. Scroll using <Page Up> / <Page Down> keys to see more items.

```
                                Aptio Setup - AMI
                   Advanced

    General ME Configuration                                 ▲  The altitude of the platform
    Oper. Firmware Version           19:6.2.0.76                location above the sea level,
    Backup Firmware Version          N/A                        expressed in meters. The hex
    Recovery Firmware Version        19:6.2.0.76                number is decoded as 2's
    ME Firmware Status #1            0x00000355                 complement signed integer.
    ME Firmware Status #2            0x88500007                 Provide the 8000h value if the
      Current State                 Operational                altitude is unknown.
      Error Code                    No Error
      Recovery Cause                N/A
    Intel ME Target Image Boot      N/A
    Altitude                        8000
    MCTP Bus Owner                  0
    Server ME firmware features list
      SiEn                                                   ▶◀: Select Screen
      NodeManager                                            ▲▼: Select Item
      PECIProxy                                              Enter: Select
      ICC                                                    +/-: Change Opt.
      MeStorageServices                                      F1: General Help
      BootGuard                                              F2: Previous Values
      PmBusProxy                                             F5: Optimized Defaults
      HSIO                                                   F10: Save Changes & Reset
      PCHDebug                                               F12: Print Screen
      PowerThermalUtility                                    ESC: Exit
```

Altitude [8000]

Allows you to set the altitude of the platform location above the sea level, expressed in meters. The hex number is decoded as 2's complement signed integer. Provide the 8000h value if the altitude is unknown.

MCTP Bus Owner [0]

Allows you to enter the MCTP bus owner location on PCIe: [15:8] bus, [7:3] device, [2:0] function. If all zeros, sending bus owner will be disabled.

PSU #1-4

Allows you to enter the PMBus address (7-bit) that will be used to retrieve the status of the PSU. Set to 0 to disable the query..

4.5.7   Server ME Debug Configuration

```
                          Aptio Setup — AMI
              ┌─────────────┐
              │  Advanced   │
              └─────────────┘

▶ Server ME General Configuration          Server ME basic features
                                           configuration
▶ NM Configuration

▶ ME UEFI FW Health Status




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

Server ME General Configuration

Allows you to configure general Server ME options.

NM Configuration

Allows you to configure NM options.

ME UEFI FW Health Status

Allows you to view the ME UEFI FW health status.

4.5.8 Thermal Configuration

```
                          Aptio Setup - AMI
         Advanced

  Thermal Configuration                              Enable All Thermal Functions"
                                                     is Enabled it Enables 'Memory
  Enable All Thermal Functions      [Enabled]        Thermal Management','Active
▶ CPU Thermal Configuration                          Trip Points', 'Critical Trip
▶ Platform Thermal Configuration                     Points'.Set to disabled for
                                                     Manual Configuration




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

Enable All Thermal Functions [Enabled]

Configuration options: [Disabled] [Enable]

CPU Thermal Configuration

Allows you to configure CPU Thermal options.

Platform Thermal Configuration

Allows you to configure Platform Thermal options.

4.5.9   Platform Settings

```
                          Aptio Setup - AMI
              Advanced

 Platform Settings                              Firmware Configuration options.
                                                NOTE:Ignore Policy
 Firmware Configuration        [Test]           Update(STR_FW_CONFIG_DEFAULT_VA
                                                LUE) is to skip policy update
 Device password support       [Enabled]        and will ONLY WORK ON A
 Pmic Vcc IO Level             [Disable Link]   PLATFORM.
 Pmic Vddq Level               [Disable Link]
 Pmic SlpS0 VM Support         [Disabled]
 Power Sharing Manager         [Disabled]
 Enable FFU Support            [Disabled]
 System Time and Alarm Source  [ACPI Time and Alarm
                                Device]
 Enable PowerMeter             [Disabled]      ++: Select Screen
 Intel Trusted Device Setup Boot [Disabled]    ↑↓: Select Item
 ▶ TCSS Platform Setting                        Enter: Select
                                                +/-: Change Opt.
                                                F1: General Help
                                                F2: Previous Values
                                                F5: Optimized Defaults
                                                F10: Save Changes & Reset
                                                F12: Print Screen
                                                ESC: Exit
```

Firmware Configuration [Test]

Configuration options: [Test] [Ignore Policy Update] [Production]

Device Password Support [Enabled]

Configuration options: [Disabled] [Enabled]

Pmic Vcc IO Level [Disable Link]

Configuration options: [Disable Link] [1.05-0.950V]

Pmic Vddq Level [Disable Link]

Configuration options: [Disable Link] [0-7]

Pmic SlpS0 VM Support [Disabled]

Configuration options: [Disabled] [Enabled]

Power Sharing Manager [Disabled]

Configuration options: [Disabled] [Enabled]

> The following items are only available when **Power Sharing Manager** is set to **[Enabled]**.

Domain Type SPLC 1 [9]

Allows you to set the domain type.

Default Power Limit 1 SPLC [4,000]

Allows you to set the default power limit.

Default Time Window 1 SPLC [30,000]

Allows you to set the default time window.

Domain Type DPLC 1 [9]

Allows you to set the domain type.

Domain Preference DPLC 1 [9]

Allows you to set the domain preference.

Power Limit Index 1 DPLC [0]

Allows you to set the power limit index.

Default Power Limit 1 DPLC [1,200]

Allows you to set the default power limit.

Default Time Window 1 DPLC [30,000]

Allows you to set the default time window.

Minimum Power Limit 1 DPLC [1,200]

Allows you to set the minimum power limit.

Maximum Power Limit 1 DPLC [1,200]

Allows you to set the maximum power limit.

Maximum Time Window 1 DPLC [1,000]

Allows you to set the maximum time window.

Enable FFU Support [Disabled]

Configuration options: [Disabled] [Enabled]

System Time and Alarm Source [ACPI Time and Alarm Device]

Configuration options: [ACPI Time and Alarm Device] [Legacy RTC]

Enable PowerMeter [Disabled]

Configuration options: [Disabled] [Enabled]

Intel Trusted Device Setup Boot [Disabled]

Configuration options: [Disabled] [Enabled]

TCSS Platform Setting

Allows you to configure TCSS Platform options.

4.5.10   BCLK Configuration

```
                              Aptio Setup - AMI
          Advanced

 BCLK Source Config            [CPU BCLK]              CPU BCLK is only BCLK Source
                                                      for ADL.
 CPU - BCLK Clock Settings
 BCLK Frequency                100.00 MHz




                                                      ↔: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F5: Optimized Defaults
                                                      F10: Save Changes & Reset
                                                      F12: Print Screen
                                                      ESC: Exit
```
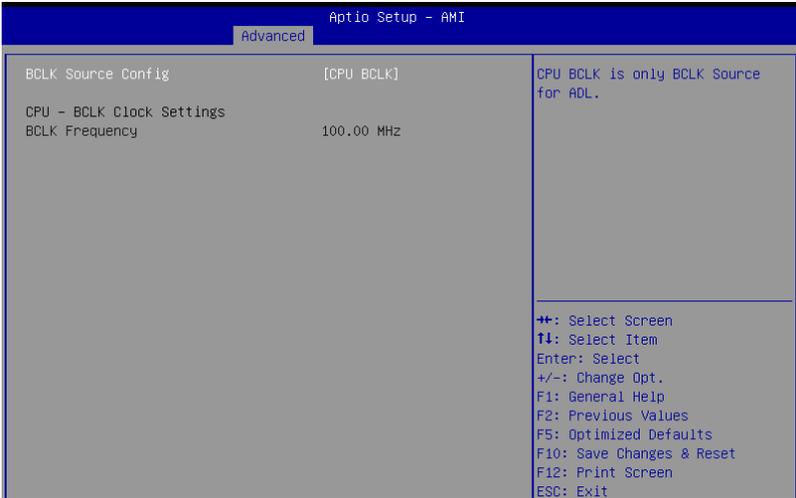
BCLK Source Config [CPU BCLK]

Configuration options: [CPU BCLK]

4.5.11   System Event Log

```
                              Aptio Setup - AMI
                  Advanced

System Errors                 [Disable Link]         System Error Enable/Disable
                                                     setup options.
```
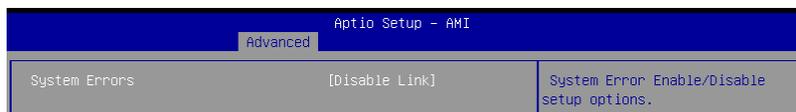
System Errors [Enabled]

Configuration options: [Disable Link] [Enabled]

> The following items are only available when **System Errors** is set to **[Enabled]**.

Whea Driver Support [Enabled]

Configuration options: [Disabled] [Enabled]

> The following items are only available when **Whea Driver Support** is set to **[Enabled]**.

Whea FFM Logging [Enabled]
Configuration options: [Disable Link] [Enabled]
WHEA/UEFI Record Format [UEFI 2.2]
Configuration options: [UEFI 2.2] [UEFI 2.3.1]

Memory Error Enabling

Allows you to configure Memory Error Enabling options.

PCH Error Enable [No]

Configuration options: [No] [Yes]

> The following items are only available when **PCH Error Enable** is set to **[Yes]**.

PCI/PCI Error Enabling

Allows you to configure PCI/PCI Error Enabling options.

4.5.12   Debug Settings

```
                              Aptio Setup - AMI
                      Advanced

  Debug Settings                                    Select Kernel Debug Port and
                                                    report in ACPI DBG2 table
  Kernel Debug Serial Port        [Legacy UART]
  Kernel Debug Patch              [Disabled]
  Platform Debug Consent          [Disabled]
▶ VT-d Debug Settings
▶ Advanced Debug Settings
```
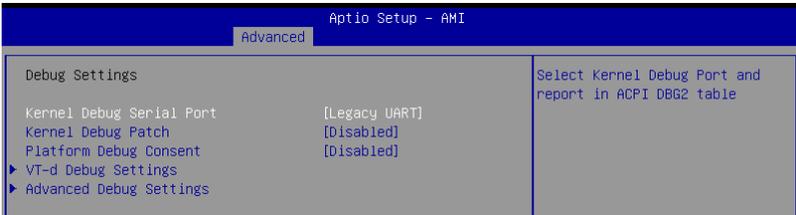
Kernel Debug Serial Port [Legacy UART]

Configuration options: [Legacy UART] [SERIALIO UART2]

> The following items are only available when **Kernel Debug Serial Port** is set to **[SERIALIO UART2]**.

Serial IO UART Debug Power Gating [Disabled]

Configuration options: [Disabled] [Enabled]

Kernel Debug Patch [Disabled]

Configuration options: [Disabled] [Enabled]

Platform Debug Consent [Disabled]

Configuration options: [Disabled] [Enabled (All Probes+TraceHub)] [Enabled (Low Power)] [Manual]

VT-d Debug Settings

Allows you to configure VT-d Debug options.

Advanced Debug Settings

Allows you to configure Advanced Debug options.

4.5.13 Debug Configuration

```
                               Aptio Setup – AMI
                    Advanced

Debug Configuration                                    Debug Messages Interface

RAM                                 [Disabled]
```
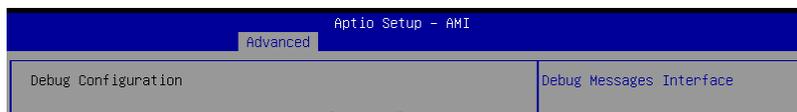
RAM [Disabled]

Configuration options: [Disabled] [Enabled]

Legacy UART [Enabled]

Configuration options: [Disabled] [Enabled]

USB3 [Disabled]

Configuration options: [Disabled] [Enabled]

Serial IO UART [Disabled]

Configuration options: [Disabled] [Enabled]

Trace Hub [Disabled]

Configuration options: [Disabled] [Enabled]

MRC Serial Debug Messages [Disabled]

Configuration options: [Disabled] [Error Only] [Error & Warnings] [Load, Error, Warnings & Info] [Load, Error, Warnings, Info & Event] [Load, Error, Warnings, Info & Verbose]

Serial Debug Messages [Load, Error, Warnings & Info]

Configuration options: [Disabled] [Error Only] [Error & Warnings] [Load, Error, Warnings & Info] [Load, Error, Warnings, Info & Event] [Load, Error, Warnings, Info & Verbose]

Serial Debug Message Baud Rate [115200]

Configuration options: [9600-115200]

> 📝 The following items are only available when **Serial IO UART** is set to **[Enabled]**.

Controller Number [Serial IO UART 2]

Configuration options: [Serial IO UART 0-2]

Baud Rate [115200]

Configuration options: [9600-6000000]

Stop Bits [1]

Configuration options: [Default] [1-2]

Parity Bits [None]

Configuration options: [Default] [None] [Even] [Odd]

Flow Control [Disabled]

Configuration options: [Disabled] [Enabled]

Word Length [8 BITS]

Configuration options: [5-8 BITS]

4.5.14   Trusted Computing

```
                          Aptio Setup - AMI
                  Advanced

 Configuration                                     Enables or Disables BIOS
   Security Device Support          [Enable]       support for security device.
   NO Security Device Found                        O.S. will not show Security
                                                   Device. TCG EFI protocol and
                                                   INT1A interface will not be
                                                   available.
```

Security Device Support [Enabled]

Configuration options: [Disabled] [Enabled]

4.5.15   ACPI Settings

```
                          Aptio Setup - AMI
                  Advanced

 ACPI Settings                                     Enables or Disables BIOS ACPI
                                                   Auto Configuration.
 Enable ACPI Auto Configuration    [Disabled]
```

Enable ACPI Auto Configuration [Disabled]

Configuration options: [Disabled] [Enabled]

4.5.16   Redfish Host Interface Settings

```
                        Aptio Setup - AMI
              Advanced

 Redfish Host Interface Settings               Enable/Disable AMI Redfish

 Redfish                         [Enabled]
```
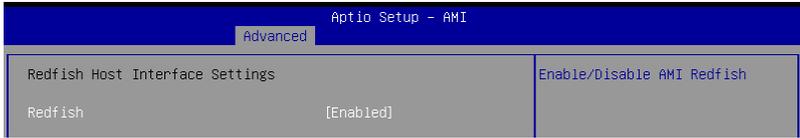
Redfish [Enabled]

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

> The following items are only available when **Redfish** is set to **[Enabled]**.

Authentication mode [Basic Authentication]

Configuration options: [Basic Authentication] [Session Authentication]

IP address

Enter the IP address.

IP Mask address

Enter the IP Mask address.

IP Port

Enter the IP Port.

4.5.17   SMART Settings

```
                        Aptio Setup - AMI
              Advanced

 SMART Settings                                The
                                               S.M.A.R.T.(self-monitoring,
 SMART Self Test                 [Disabled]    analysis and reporting
                                               technology) is a monitor
                                               system. Enable this item to
                                               show a warning message during
                                               the POST(power on self test)
```
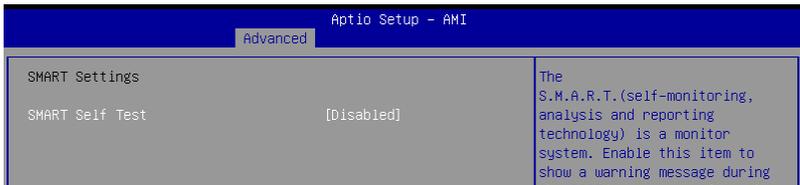
SMART Self Test [Disabled]

Configuration options: [Disabled] [Enabled]

4.5.18 Onboard LAN Configuration

P13R-M

```
                          Aptio Setup - AMI
        Advanced
 ▶ Onboard I210 LAN Configuration        Onboard I210 LAN Enable/Disable
```
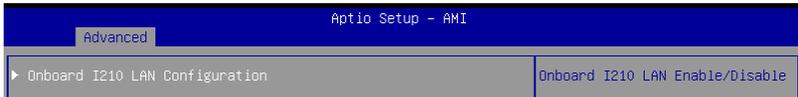
Onboard I210 LAN Configuration

Intel I210 LAN1-2

LAN Enable [Enabled]
Configuration options: [Disabled] [Enabled]

P13R-M/10G-2T

```
                          Aptio Setup - AMI
        Advanced
 ▶ Onboard X710 LAN Configuration        Onboard X710 LAN Enable/Disable
```
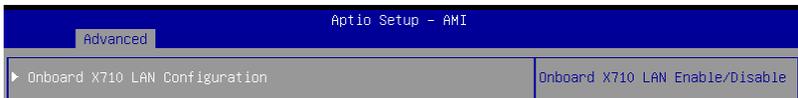
Onboard X710 LAN Configuration

Intel X710 LAN1-2

LAN Enable [Enabled]
Configuration options: [Disabled] [Enabled]

4.5.19 UEFI Variables Protection

```
                          Aptio Setup - AMI
                Advanced
 Password protection of Runtime      [Enable]        Control the NVRAM Runtime
 Variables                                           Variable protection through
                                                     System Admin Password
```
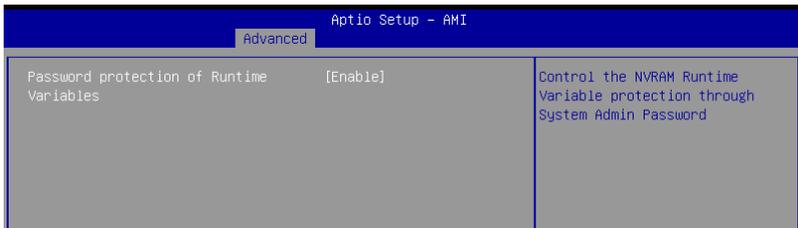
Password protection of Runtime Variables [Enabled]
Configuration options: [Disabled] [Enable]

4.5.20 Serial Port Console Redirection

```
                          Aptio Setup - AMI
              Advanced

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

  COM2
  Console Redirection            [Disabled]
▶ Console Redirection Settings


  Console Redirection            Port Is Disabled

  Serial Port for Out-of-Band Management/
  Windows Emergency Management Services (EMS)        ➡: Select Screen
  Console Redirection EMS        [Disabled]          ↑↓: Select Item
▶ Console Redirection Settings                       Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
```

COM1-2

Console Redirection [Disabled]

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

✎ The following items are only available when **Console Redirection** is set 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 [VT100Plus]

Allows you to set the terminal type.
[VT100]   ASCII char set.
[VT100Plus]   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 [115200]

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 [None]

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 [Enabled]

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]

Console Redirection EMS [Disabled]

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

The following items are only available when **Console Redirection EMS** is set 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 (Disabled)]

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]

4.5.21   Intel TXT Information

```
                              Aptio Setup – AMI
                 Advanced

  Intel TXT Information

  Chipset                          Production Fused
  BiosAcm                          Production Fused
  Chipset Txt                      Supported
  Cpu Txt                          Supported
  Error Code                       None
    Class Code                     None
```

4.5.22   Acoustic Management Configuration

```
                              Aptio Setup – AMI
                 Advanced

  Acoustic Management Configuration                    Option to Enable or Disable
                                                       Automatic Acoustic Management
  Acoustic Management Configuration     [Disabled]
▶ SATA Controller 0 – PCI Bus 00 Dev 17 Fun 00
```

Acoustic Management Configuration [Disabled]

Configuration options: [Disabled] [Enabled]

SATA Controller 0

Allows you to configure SATA controller settings.

4.5.23   AMI Graphic Output Protocol Policy

```
                              Aptio Setup – AMI
                 Advanced

  ASPEED Graphics PCI Adapter                          Output Interface
  ASPEED Graphics Driver
  Output Select                   [Unknown Device]
```

Output Select [Unknown Device]

Configuration options: [Unknown Device]

4.5.24   SIO Common Setting

```
                              Aptio Setup - AMI
                    Advanced

  SIO Common Setting                               Enables or Disables Lock of
                                                   Legacy Resources
  Lock Legacy Resources            [Disabled]
```

Lock Legacy Resources [Disabled]

Configuration options: [Disabled] [Enabled]

4.5.25   SIO Configuration
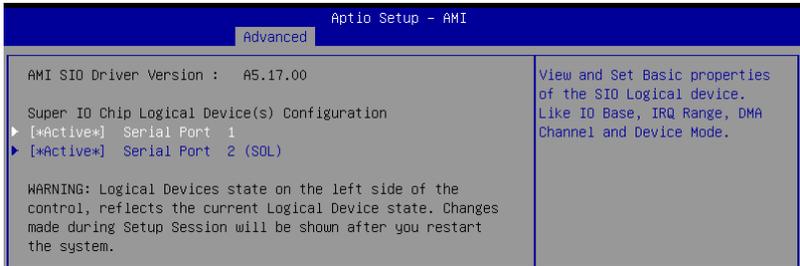
```
                              Aptio Setup - AMI
                    Advanced

  AMI SIO Driver Version :   A5.17.00              View and Set Basic properties
                                                   of the SIO Logical device.
  Super IO Chip Logical Device(s) Configuration    Like IO Base, IRQ Range, DMA
▶ [*Active*]  Serial Port  1                       Channel and Device Mode.
▶ [*Active*]  Serial Port  2 (SOL)

  WARNING: Logical Devices state on the left side of the
  control, reflects the current Logical Device state. Changes
  made during Setup Session will be shown after you restart
  the system.
```

> ⚡ Logical Devices state on the left side of the control, reflects the current Logical Device state. Changes made during Setup Session will be shown after you restart the system.

[*Active*] Serial Port 1 / [*Active*] Serial Port 2 (SOL)

Allows you to view and set basic properties of the SIO Logical device. Like IO Base, IRQ Range, DMA Channel, and Device Mode.

> **Use This Device [Enabled]**
>
> Allows you to enable or disable this Logical Device.
> Configuration options: [Disabled] [Enabled]

> 📝 The following items are only available when **Use This Device** is set to **[Enabled]**.

> ***Possible [Use Automatic Settings]***
> Configuration options: [Use Automatic Settings] [IO=3F8h; IRQ=4; DMA;]
> [IO=3F8h; IRQ=3, 4, 5, 7, 9, 10, 11, 12; DMA;] [IO=2F8h; IRQ=3, 4, 5, 7, 9, 10, 11, 12; DMA;] [IO=3E8h; IRQ=3, 4, 5, 7, 9, 10, 11, 12; DMA;] [IO=2E8h; IRQ=3, 4, 5, 7, 9, 10, 11, 12; DMA;]

4.5.26   PCI Subsystem Settings

```
                                    Aptio Setup – AMI
                        Advanced

     PCI Bus Driver Version          A5.01.30                Value to be programmed into
                                                             PCI Latency Timer Register.
     PCI Devices Common Settings:
     PCI Latency Timer               [32 PCI Bus Clocks]
     PCI-X Latency Timer             [64 PCI Bus Clocks]
     VGA Palette Snoop               [Disabled]
     PERR# Generation                [Disabled]
     SERR# Generation                [Disabled]
     Re-Size BAR Support             [Disabled]
     SR-IOV Support                  [Disabled]
     BME DMA Mitigation              [Disabled]

   ▶ PCI Express Settings                                    ++: Select Screen
                                                             ↑↓: Select Item
   ▶ PCI Express GEN 2 Settings
```

PCI Latency Timer [32 PCI Bus Clocks]

Configuration options: [32 PCI Bus Clocks] [64 PCI Bus Clocks] [96 PCI Bus Clocks] [128 PCI Bus Clocks] [160 PCI Bus Clocks] [192 PCI Bus Clocks] [224 PCI Bus Clocks] [248 PCI Bus Clocks]

PCI-X Latency Timer [64 PCI Bus Clocks]

Configuration options: [32 PCI Bus Clocks] [64 PCI Bus Clocks] [96 PCI Bus Clocks] [128 PCI Bus Clocks] [160 PCI Bus Clocks] [192 PCI Bus Clocks] [224 PCI Bus Clocks] [248 PCI Bus Clocks]

VGA Palette Snoop [Disabled]

Configuration options: [Disabled] [Enabled]

PERR# Generation [Disabled]

Configuration options: [Disabled] [Enabled]

SERR# Generation [Disabled]

Configuration options: [Disabled] [Enabled]

Re-Size BAR Support [Disabled]

Configuration options: [Disabled] [Auto]

SR-IOV Support [Disabled]

Configuration options: [Disabled] [Enabled]

BME DMA Mitigation [Disabled]

Configuration options: [Disabled] [Enabled]

PCI Express Settings

Allows you to configure PCI Express options.

PCI Express GEN 2 Settings

Allows you to configure PCI Express Gen 2 options.

4.5.27 USB Configuration

```
                                  Aptio Setup - AMI
                   Advanced

  USB Configuration

  USB Module Version               28

  USB Controllers:
       1 XHCI
  USB Devices:
       3 Drives, 2 Keyboards, 2 Mice, 1 Hub

  XHCI Hand-off                    [Enabled]
  USB Mass Storage Driver Support  [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
  AMI Virtual CDROM0 1.00          [Auto]         F10: Save Changes & Reset
```

XHCI Hand-off [Enabled]

Allows you to enable or disable workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
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]

USB hardware delays and time-outs

USB transfer time-out [20 sec]

Allows you to set the time-out value for Control, Bulk, and Interrupt transfers.
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. **[Auto]** uses default value; for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.
Configuration options: [Auto] [Manual]

The following item appears only when **Device power-up delay** is set 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]

4.5.28   Network Stack Configuration

```
                              Aptio Setup - AMI
                   Advanced

 Network Stack               [Enabled]            Enable/Disable UEFI Network
 IPv4 PXE Support            [Enabled]            Stack
 IPv4 HTTP Support           [Disabled]
 IPv6 PXE Support            [Disabled]
 IPv6 HTTP Support           [Disabled]
 PXE boot wait time          0
 Media detect count          1
```

Network Stack [Enabled]

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

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

Ipv4 PXE Support [Enabled]

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]

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.

4.5.29   NVMe Configuration

```
                              Aptio Setup — AMI
                 Advanced

  NVMe Configuration

  No NVME Device Found
```

4.5.30   APM Configuration

```
                              Aptio Setup — AMI
                 Advanced

  Restore AC Power Loss          [Last State]        Select AC power state when
  Power On By PCI-E              [Disabled]          power is re-applied after a
  Power On By RTC                [Disabled]          power failure.
```
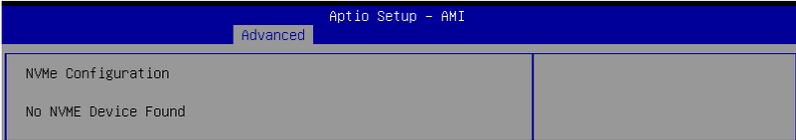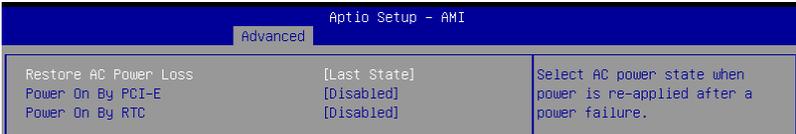
Restore AC Power Loss [Last State]

When set to **[Power Off]**, the system goes into off state after an AC power loss. When set to **[Power On]**, the system will reboot after an AC power loss. When set to **[Last State]**, the system goes into either off or on state, whatever the system state was before the AC power loss.
Configuration options: [Power Off] [Power On] [Last State]

Power On By PCI-E/PCI [Disabled]

[Disabled]   Disables the PCI/PCIe devices to generate a wake event.

[Enabled]   Enables the PCI/PCIe devices to generate a wake event.

Power On By RTC [Disabled]

[Disabled]   Disables RTC to generate a wake event.

[Enabled]   When set to [Enabled], the items **RTC Alarm Date (Days)** and **Hour/Minute/Second** will become user-configurable with set values.

4.5.31   Third-party UEFI driver configurations

Additional configuration options for third-party UEFI drivers installed to the system will appear in the section marked in red in the screenshot below.

```
                              Aptio Setup - AMI
      Main  Performance Tuning  Advanced  Chipset  Security  Boot  Tool  Event Logs  Server Mgmt      ▶

  ▶ SMART Settings                          ▲  Configure Gigabit Ethernet
  ▶ Onboard LAN Configuration                  device parameters
  ▶ UEFI Variables Protection
  ▶ Serial Port Console Redirection
  ▶ Intel TXT Information
  ▶ Acoustic Management Configuration
  ▶ AMI Graphic Output Protocol Policy
  ▶ SIO Common Setting
  ▶ SIO Configuration
  ▶ PCI Subsystem Settings
  ▶ USB Configuration
  ▶ Network Stack Configuration
  ▶ NVMe Configuration
  ▶ APM Configuration                          ▶←: Select Screen
                                               ↑↓: Select Item
  ▶ Intel(R) I210 Gigabit  Network Connection - Enter: Select
    A0:36:BC:CC:0D:43                          +/-: Change Opt.
  ▶ MAC:A036BCCC0D43-IPv4 Network Configuration F1: General Help
  ▶ MAC:A036BCCC0D43-IPv6 Network Configuration F2: Previous Values
  ▶ Intel(R) I210 Gigabit  Network Connection - F5: Optimized Defaults
    A0:36:BC:CC:0D:44                          F10: Save Changes & Reset
  ▶ MAC:A036BCCC0D44-IPv4 Network Configuration F12: Print Screen
  ▶ MAC:A036BCCC0D44-IPv6 Network Configuration ESC: Exit

  ▶ Driver Health                           ▼

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```

4.5.32   Driver Health

This page will display the driver and controller health status.

```
                              Aptio Setup - AMI
                                 Advanced

  ▶ Intel(R) Gigabit 0.2.01     Healthy        Provides Health Status for the
  ▶ Intel(R) PRO/1000 6.5.01 PCI-E    Healthy  Drivers/Controllers
  ▶ Intel(R) PRO/1000 6.5.01 PCI-E    Healthy
```
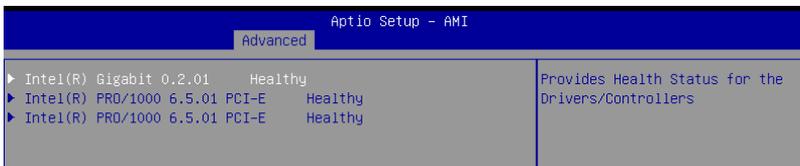
4.6   Security menu

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 - AMI
      Main  Performance Tuning  Advanced  Chipset  Security  Boot  Tool  Event Logs  Server Mgmt      ▶

                                                         ▲  To clear the administrator
   Password Description                                     password, key in the current
                                                            password in the Enter Current
   If ONLY the Administrator's password is set, then this only   Password box, and then press
   limits access to Setup and is only asked for when entering    <Enter> when prompted to
   Setup.                                                   create/confirm the password.
   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:
   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                             ▶+: Select Screen
   in the following range:                                 ↑↓: Select Item
   Minimum length                3                         Enter: Select
   Maximum length                20                        +/-: Change Opt.
                                                           F1: General Help
   Administrator Password                                  F2: Previous Values
   User Password                                           F5: Optimized Defaults
                                                           F10: Save Changes & Reset
                                                           F12: Print Screen
                                                        ▼  ESC: Exit

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```

Administrator Password

To set an administrator password:

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

2. From the Create New 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 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 [Disabled]

Secure Boot feature is Active if Secure Boot is set to **[Enabled]**, Platform Key (PK) is enrolled and the System is in User mode. Mode change requires a platform reset.
Configuration options: [Disabled] [Enabled]

Secure Boot Mode [Custom]

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

Install Default Secure Boot Keys

This option will load the default secure boot keys, including the PK (Platform key), KEK (key-exchange key), db (signature database), and dbx (revoked signature database). All the secure boot keys states will change from unloaded to loaded. Save changes and reset the system for the changes to take effect.

Clear Secure Boot Keys

This option will delete all previously applied secure boot keys, including the PK (Platform key), KEK (key-exchange key), db (signature database), and dbx (revoked signature database). All the secure boot keys states will change from unloaded to loaded. Save changes and reset the system for the changes to take effect.

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.

Factory Key Provision [Enabled]

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

Install Default Secure Boot Keys

This option will load the default secure boot keys, including the PK (Platform key), KEK (key-exchange key), db (signature database), and dbx (revoked signature database). All the secure boot keys states will change from unloaded to loaded. Save changes and reset the system for the changes to take effect.

Clear Secure Boot Keys

This option will delete all previously applied secure boot keys, including the PK (Platform key), KEK (key-exchange key), db (signature database), and dbx (revoked signature database). All the secure boot keys states will change from unloaded to loaded. Save changes and reset the system for the changes to take effect.

Save all Secure Boot Variables

This option will save NVRAM content of Secure Boot policy variables to the file (EFI_SIGNATURE_LIST data format) in root foler on a target file system device.

Enroll Efi Image

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

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.

PK Management

Configuration options: [Details] [Save To File] [Set New Key] [Delete key]

KEK Management / DB Management / DBX Management

Configuration options: [Details] [Save To File] [Set New Key] [Append Key] [Delete key]

Authorized TimeStamps / OsRecovery Signatures

Configuration options: [Set New Key] [Append Key]

4.7 Boot menu

The Boot menu items allow you to change the system boot options.

```
                          Aptio Setup - AMI
    Main  Performance Tuning  Advanced  Chipset  Security  Boot  Tool  Event Logs  Server Mgmt    ▶

    Boot Configuration                                        Number of seconds to wait for
    Setup Prompt Timeout              5                       setup activation key.
    Bootup NumLock State              [Off]                   65535(0xFFFF) means indefinite
    Boot Logo Display                 [Disabled]              waiting.

    Boot Option Priorities
    Boot Option #1                    [UEFI: 04:00:00 PXE
                                      IPv4 Intel(R) I210
                                      Gigabit  Network
                                      Connection]
    Boot Option #2                    [UEFI: 03:00:00 PXE
                                      IPv4 Intel(R) I210
                                      Gigabit  Network
                                      Connection]
    Boot Option #3                    [UEFI:                  ←→: Select Screen
                                      JetFlashTranscend 4GB   ↑↓: Select Item
                                      8.07, Partition 1       Enter: Select
                                      (4.0GB)]                +/-: Change Opt.
    Fast Boot                         [Disable Link]          F1: General Help
                                                              F2: Previous Values
    Driver Option Priorities                                  F5: Optimized Defaults
                                                              F10: Save Changes & Reset
                                                              F12: Print Screen
                                                              ESC: Exit


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```

Setup Prompt Timeout [5]

Allows you to set the number of seconds that the firmware waits before initiating the original default boot selection. 65535(0xFFFF) means indefinite waiting. Use the <+> or <-> to adjust the value.

Bootup NumLock State [Off]

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

Boot Logo Display [Disabled]

[Disabled]   Hide the logo during POST.

[Enabled]   Display the logo during POST.

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 [Disable Link]

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: [Disable Link] [Enabled]

> The following items appear only when **Fast Boot** is set to **[Enabled]**.

SATA Support [Last Boot SATA Devices Only]

Configuration options: [Last Boot SATA Devices Only] [All SATA Devices]

NVMe Support [Enabled]

Configuration options: [Disable Link] [Enabled]

USB Support [Full Intial]

Configuration options: [Disable Link] [Full Initial] [Partial Initial]

PS2 Devices Support [Enabled]

Configuration options: [Disable Link] [Enabled]

Network Stack Driver Support [Disable Link]

Configuration options: [Disable Link] [Enabled]

Redirection Support [Disable Link]

Configuration options: [Disable Link] [Enabled]

4.8   Tool menu

```
                          Aptio Setup – AMI
     Main   Performance Tuning   Advanced   Chipset   Security   Boot   Tool   Event Logs   Server Mgmt      ▶

    Start ASUS EzFlash                              Press ENTER to run the utility
    IPMI Hardware Monitor                           to select and update BIOS.
    ASUS SMBIOS Viewer
    ASUS Storage Viewer




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



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```

Start ASUS EzFlash

Allows you to start the ASUS EzFlash BIOS ROM Utility. Refer to the **ASUS EzFlash Utility** section for details.

IPMI Hardware Monitor

Allows you to start the IPMI hardware monitor.

ASUS SMBIOS Viewer

Allows you to start the ASUS SMBIOS Viewer.

ASUS Storage Viewer

Allows you to start the ASUS Storage Viewer.

4.9   Event Logs menu

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

```
                              Aptio Setup - AMI
      Main   Performance Tuning  Advanced  Chipset  Security  Boot  Tool  Event Logs  Server Mgmt    ▶
 ▶ Change Smbios Event Log Settings                          Press <Enter> to change the
 ▶ View Smbios Event Log                                     Smbios Event Log configuration.
```
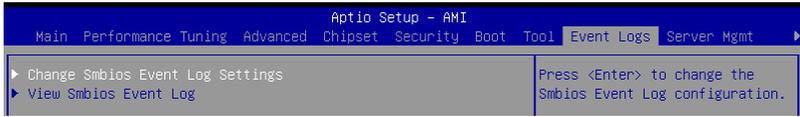
4.9.1   Change Smbios Event Log Settings

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

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

Smbios Event Log [Enabled]

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

> The following item appears only when **Smbios Event Log** is set to **[Enabled]**.

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 reactions to a full Smbios Event Log.
Configuration options: [Do Nothing] [Erase Immediately]

Log System Boot Event [Enabled]

Configuration options: [Disabled] [Enabled]

MECI [1]

Allows you to set the Multiple Event Count Increment.

MECI [60]

Allows you to set the Multiple Event Time Window.

Log EFI Status Code [Enabled]

Configuration options: [Disabled] [Enabled]

Convert EFI Status Codes to Standard Smbios Type [Disabled]

Configuration options: [Disabled] [Enabled]

4.9.2   View Smbios Event Log

Press <Enter> to view all Smbios event logs.

4.10 Server Mgmt menu

```
                              Aptio Setup - AMI
     Main  Performance Tuning  Advanced  Chipset  Security  Boot  Tool  Event Logs  Server Mgmt    ▶

   BMC Self Test Status            PASSED                 Enable/Disable interfaces to
   BMC Device ID                   32                     communicate with BMC
   BMC Device Revision             81
   BMC Firmware Revision           1.00.02
   IPMI Version                    2.0
   IPMI BMC Interface              KCS

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


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```

BMC Support [Enabled]

Configuration options: [Disabled] [Enabled]

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

IPMI Interface Type [KCS Interface]

Configuration options: [KCS Interface]

FRB-2 Timer [Enabled]

Configuration options: [Disabled] [Enabled]

> The following items appear only when **FRB-2 Timer** is set to **[Enabled]**.

FRB-2 Timer Timeout [6]
Allows you to set the FRB-2 timer timeout in minutes.

FRB-2 Timer Policy [Do Nothing]
Configuration options: [Do Nothing] [Reset] [Power Down] [Power Cycle]

OS Watchdog Timer [Disabled]

Configuration options: [Disabled] [Enabled]

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

OS Wtd Timer Timeout [10]
Allows you to set the OS watchdog timer timeout in minutes.

OS Wtd Timer Policy [Reset]
Configuration options: [Do Nothing] [Reset] [Power Down] [Power Cycle]

Serial Mux [Disabled]

Configuration options: [Disabled] [Enabled]

System Event Log

Allows you to configure System Event Log options.

View FRU Information

Allows you to view the FRU information.

BMC Self Test Log

Allows you to view the BMC Self Test log.

BMC Network Configuration

Allows you to configure BMC network options.

BMC User Settings

Allows you to configure BMC user options.

View System Event Log

Allows you to view the System Event log.

BMC Warm Reset

Allows you to initiate a warm reset of the BMC.

4.11   Exit menu

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

```
                          Aptio Setup - AMI
◄ Exit

  Save Options                                   Exit system setup after saving
  Save Changes and Exit                          the changes.
  Discard Changes & Exit

  Save Changes & Reset
  Discard Changes and Reset

  Save Changes
  Discard Changes
```

Save Changes and Exit

Exit system setup after saving any changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Save Changes

Save changes done so far to any of the setup options.

Discard Changes

Discard changes done so far to any of the setup options.

Load Optimized Defaults

Restore/load default values for all the setup options.

Save as User Defaults

Save current changes as user default values for all the setup options.

Restore User Defaults

Restore/load saved user 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.

Launch EFI Shell from filesystem device

This item allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available filesystem devices.

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 (for Windows OS and Linux).

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 the chipset.

To do this:

1. Enter the BIOS Setup during POST.

2. Go to the **Chipset** Menu > **PCH Configuration** > **PCH Storage Configuration**, then press <Enter>.

3. Set **SATA Mode Selection** to **[Intel RSTe Premium With Intel Optane System Acceleration]**.

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.

5.2 Intel® Virtual Raid on CPU in BIOS

This feature allows you to do CPU RAID functions with Intel® CPU RSTe.

1. Enter the BIOS Setup during POST.

2. Go to the **Advanced** menu **> Intel(R) VROC SATA Controller** then press <Enter> to display the Intel® Virtual Raid on CPU menu.

Refer to the **BIOS Setup** chapter for details on entering and navigating through the BIOS Setup.

```
                            Aptio Setup - AMI
        Advanced

   Intel(R) VROC 7.5.0.1152 SATA Driver          This page allows you to create
                                                 a RAID volume
 ▶ Create RAID Volume


   Non-RAID Physical Disks:
 ▶ Port 0, ST18000NM000J-2TV103 SN:ZR50B9EH, 16764.00GB
 ▶ Port 1, ST18000NM000J-2TV103 SN:ZR50B0LJ, 16764.00GB
 ▶ Port 2, ST18000NM000J-2TV103 SN:ZR50B0E3, 16764.00GB
 ▶ Port 3, ST18000NM000J-2TV103 SN:ZR50B999, 16764.00GB
```

5.2.1 Creating a RAID set

To create a RAID set:

1. From the Intel® Virtual Raid on CPU menu, select **Create RAID Volume** and press <Enter>. The following screen appears:

```
                           Aptio Setup - AMI
        Advanced

   Create RAID Volume                                    X - to Select Disk

   Name:                        Volume1
   RAID Level:                  [RAID0(Stripe)]

   Select Disks:
   Port 0, ST18000NM000J-2TV103    [X]
   SN:ZR50B0LJ, 16764.00GB
   Port 1, ST18000NM000J-2TV103    [X]
   SN:ZR50B9EH, 16764.00GB
   Port 2, ST18000NM000J-2TV103    [X]
   SN:ZR50B0E3, 16764.00GB
   Port 3, ST18000NM000J-2TV103    [X]
   SN:ZR50B999, 16764.00GB                             →←: Select Screen
                                                       ↑↓: Select Item
   Strip Size:                  [128KB]                Enter: Select
   Capacity (GB):               3185.15                +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
 ▶ Create Volume                                       F5: Optimized Defaults
                                                       F10: Save Changes & Reset
```

2. When the **Name** item is selected, enter a name for the RAID set and press <Enter>.

3. When the **RAID Level** item is selected, press <Enter> to select the RAID level to create, and then press <Enter>.

4. Under Select Disks, press <Enter> and select **X** for the disks you want to include in the RAID set.

5. When the **Strip Size** item is selected, press <Enter> to select 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 (GB)** 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> to create the RAID volume and return to the Intel® Rapid Storage Technology menu.

5.2.2   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 Intel® Virtual Raid on CPU menu, select the RAID volume you want to delete and press <Enter>. The following screen appears:

```
                                Aptio Setup – AMI
          Advanced

       RAID VOLUME INFO

       Volume Actions
     ▶ Delete

       Name:                         Volume0
       RAID Level:                   RAID0(Stripe)
       Strip Size:                   128KB
       Size:                         63703.18GB
       Status:                       Normal
       Bootable:                     Yes
       Block size:                   512

       RAID Member Disks:                                  ↔: Select Screen
     ▶ Port 0, ST18000NM000J-2TV103 SN:ZR50B9EH, 16764.00GB   ↑↓: Select Item
     ▶ Port 1, ST18000NM000J-2TV103 SN:ZR50B0LJ, 16764.00GB   Enter: Select
     ▶ Port 2, ST18000NM000J-2TV103 SN:ZR50B0E3, 16764.00GB   +/-: Change Opt.
     ▶ Port 3, ST18000NM000J-2TV103 SN:ZR50B999, 16764.00GB   F1: General Help
```

2.   When the **Delete** item is selected, press <Enter>, then select **Yes** to delete the RAID volume and return to the Intel® Virtual Raid on CPU menu, or select **No** to cancel.

```
                                Aptio Setup – AMI
          Advanced

       Delete                                             Deleting a volume will reset
                                                          the disks to non-RAID.
       Delete the RAID volume?
       ALL DATA ON VOLUME WILL BE LOST!


     ▶ Yes
     ▶ No
```
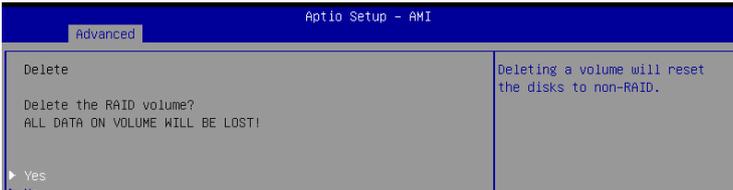
5.3 Intel® Rapid Storage Technology enterprise (Windows)

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 the **Driver Installation** chapter.

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(R) Virtual RAID on CPU** 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.
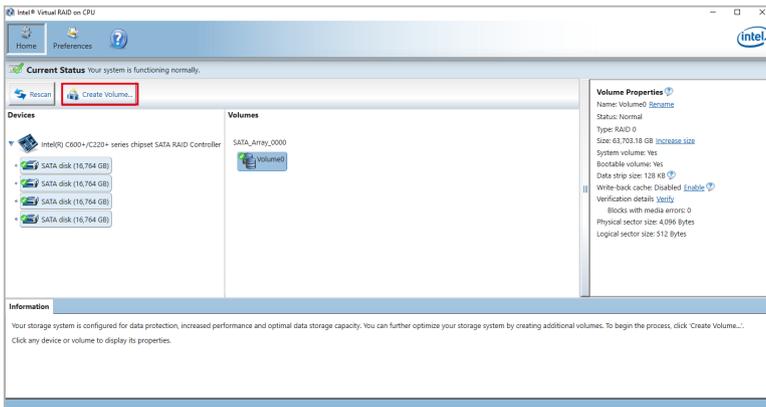
> You can click **Rescan** to re-scan any attached hard disks.

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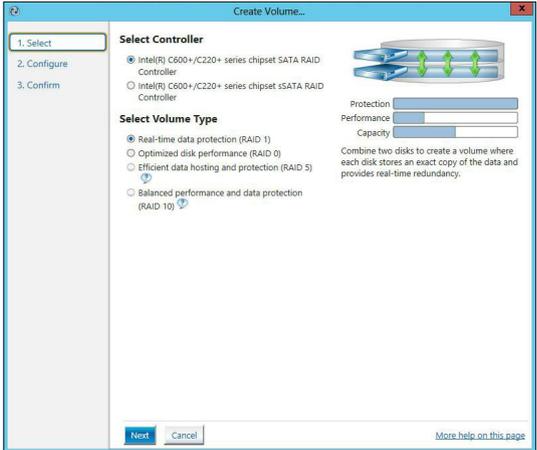
3.   Enter a name for the RAID set, then select the array disks.

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

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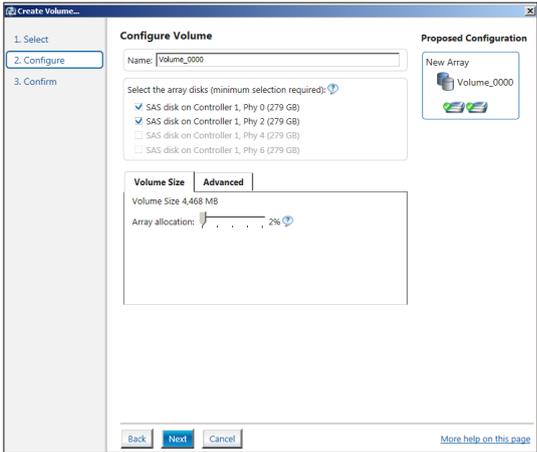
•   If you do not want to keep the data on one of the selected disks, select **NO** when prompted.

•   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.
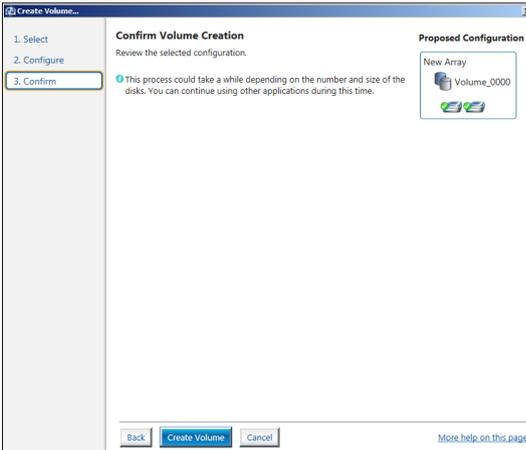
7. Wait until the process is completed, then click **OK** when prompted.
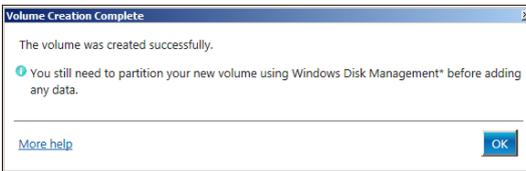
> You still need to partition your new volume using Windows Disk Management before adding any data.

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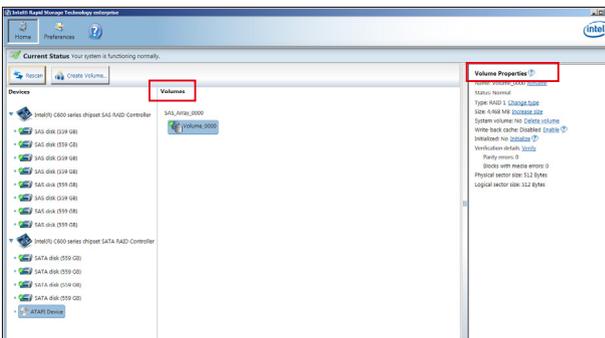
5.3.2   Changing a Volume Type

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**.
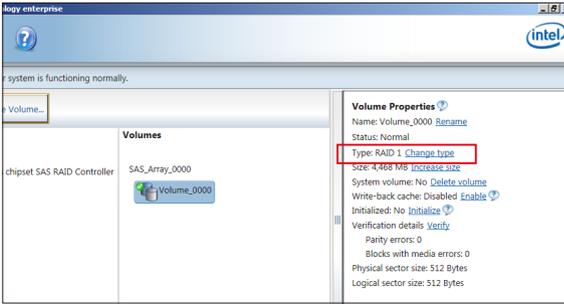
3.   You can change the **Name**, **Select the new volume type**, and **Select additional disks to include in the new volume** if needed.

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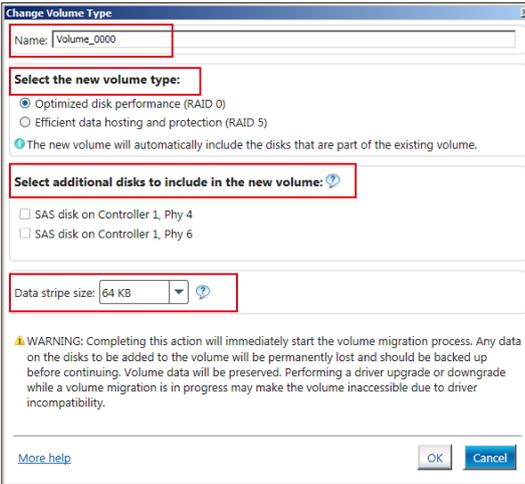
We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

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.
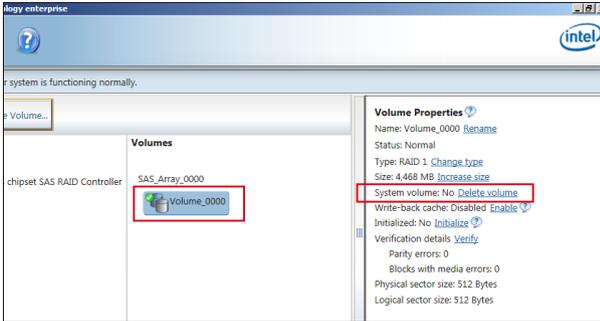
2.   Select **Delete volume** in **Volume Properties** field. The following screen appears.
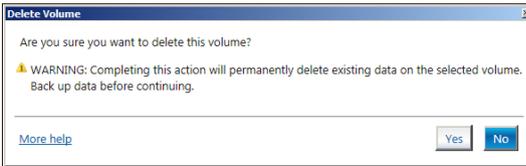
3.   Click **Yes** to delete the volume and return to the utility main menu, or click **No** to return to the main menu.

5.3.4 Preferences

System Preferences

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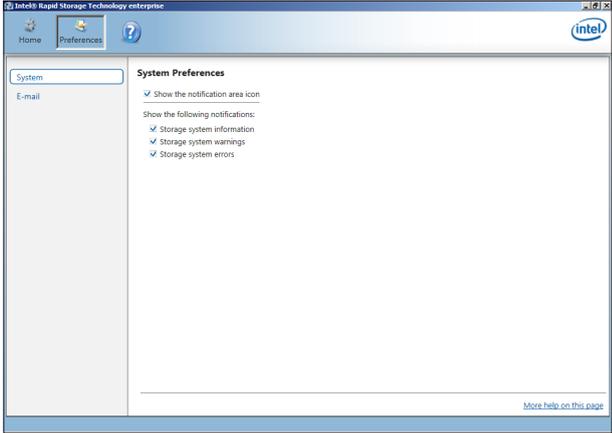
E-Mail Preferences

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

- Storage system information

- Storage system warnings

- Storage system errors
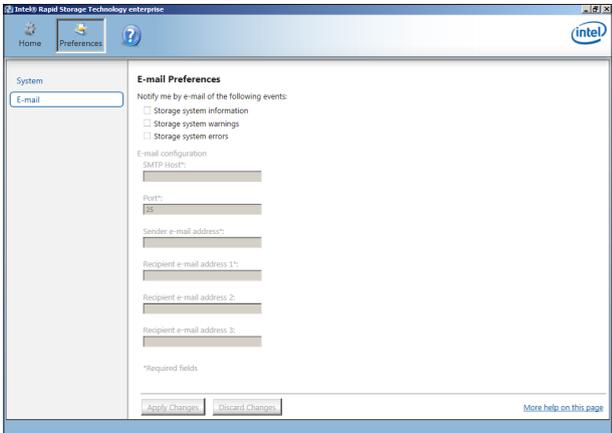
Driver Installation

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** > **C25x INTEL RAID** > **Windows**> **Driver** 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, 2016, or 2019 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)**.
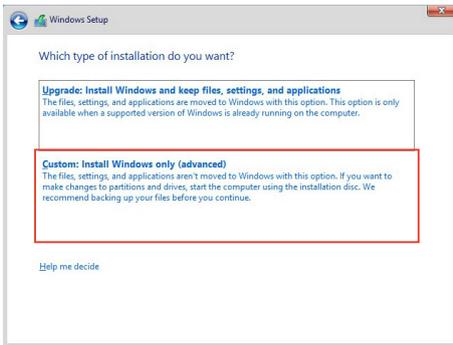
3.   Click **Load Driver**.
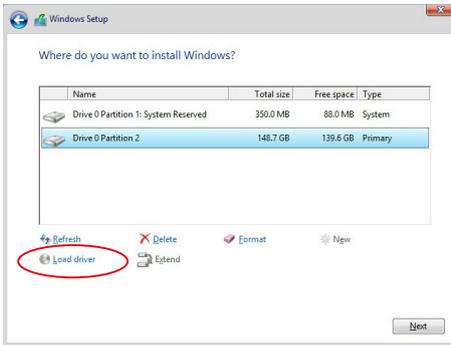
4.   A message appears reminding you to insert the installation media containing the driver of the RAID controller driver (the installation media can be a CD, DVD, or USB flash drive).

      •   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**.
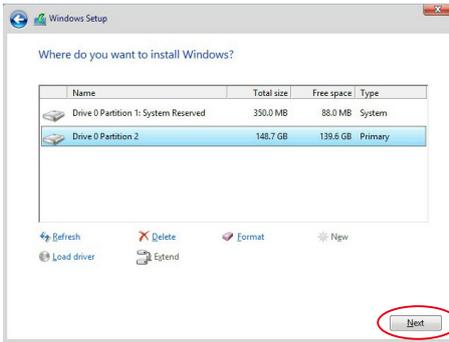
8. Setup then proceeds with the OS installation. Follow the onscreen instructions to continue.

6.2 Running the Support DVD

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 main screen of the Support DVD contains the following tabs:

1.   Drivers - Shows the available device drivers that the system detects.

2.   Utilities - Displays the software applications and utilities that the motherboard supports.

3.   Manual - Provides the link to the user guide(s).

> You need an internet browser installed in your OS to view the User Guide.

4.   Contact - Displays the ASUS contact information, e-mail addresses, and useful links if you need more information or technical support for your motherboard.

Appendix

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

Block diagram

Q-Code table

POST CODE	DESCRIPTION
0x10	PEI, core start
0x11	PEI, Pre-CPU initial
0x15	PEI, Pre-North bridge initial
0x19	PEI, Pre-South bridge initial
0x2B	PEI, Read memory SPD
0x2C	PEI, Detect memory
0x2D	PEI, Check memory timing
0x2E	PEI, Check memory configuration
0x2F	PEI, Memory initial
0x31	PEI, Memory installed
0x32	PEI, CPU initial
0x33	PEI, CPU cache initial
0x34	PEI, CPU AP initial
0x35	PEI, Check CPU BAP
0x36	PEI, CPU SMM initial
0x37	PEI, North bridge initial
0x3B	PEI, South bridge initial
0x4F	PEI, Prepare for DXE
0x60	DXE, core start
0x61	DXE, NVRAM initial
0x62	DXE, South bridge initial
0x63	DXE, CPU initial
0x68	DXE, North bridge Host Bridge initial
0x69	DXE, North bridge initial
0x6A	DXE, North bridge SMM initial
0x70	DXE, South bridge initial
0x71	DXE, South bridge SMM initial
0x72	DXE, South bridge devices initial
0x78	DXE, ACPI initial
0x79	DXE, CSM initial
0x90	DXE, BDS phase start
0x91	DXE, BDS connect drivers
0x92	DXE, PCI initial start
0x93 – 0x94	DXE, PCI initial
0x95	DXE, PCI check resource
0x96	DXE, PCI assign resource
0x97	DXE, Connect Console Out devices. (ex. VGA)
0x98	DXE, Connect Console In devices. (ex. Keyboard/Mouse)
0x99	DXE, Super IO initial
0x9A – 0x9D	DXE, USB initial
0xA0 – 0xA3	DXE, SATA initial
0xA4 – 0xA7	DXE, SCSI initial
0xA8	DXE, BIOS Setup verifying password
0xA9	DXE, BIOS Setup start
0xAB	DXE, BIOS Setup wait for input
0xAD	DXE, EFI ready to boot
0xAE	DXE, Legacy boot
0xAF	DXE, Exit boot services
0xB0	DXE, Set address map start
0xB1	DXE, Set address map end
0xB2	DXE, Legacy option ROM initial
0xB3	DXE, Reset system

(continued on the next page)

POST CODE	DESCRIPTION
0xB4	DXE, USB hot plug
0xB5	DXE, PCI hot plug
0xB6	DXE, NVRAM cleanup
0xB7	DXE, Configuration reset
0x50	PEI, Invalid memory type
0x50	PEI, Invalid memory speed
0x51	PEI, Check memory SPD fail
0x52	PEI, Invalid memory size
0x52	PEI, Memory mismatch
0x53	PEI, Memory not detected
0x53	PEI, Memory none useful
0x54	PEI, Memory error
0x55	PEI, Memory not installed
0x56	PEI, Invalid CPU type
0x56	PEI, Invalid CPU speed
0x57	PEI, CPU mismatch
0x58	PEI, CPU self-test failed
0x58	PEI, CPU cache error
0x59	PEI, CPU microcode update failed
0x59	PEI, CPU no microcode
0x5A	PEI, CPU internal error
0x5A	PEI, CPU error
0x5B	PEI, Reset not available
0xD0	DXE, CPU error
0xD1	DXE, North bridge error
0xD2	DXE, South bridge error
0xD3	DXE, ARCH protocol not available
0xD4	DXE, PCI out of resource
0xD5	DXE, Legacy option ROM no space
0xD6	DXE, No console out device
0xD7	DXE, No console in device
0xD8	DXE, Invalid password
0xD9	DXE, Boot option load error
0xDA	DXE, Boot option failed
0xDB	DXE, Flash update failed
0xDC	DXE, Reset not available

Notices

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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.

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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-003(B)/NMB-003(B)

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CAN ICES-003(B)/NMB-003(B)

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AEEE Yönetmeliğine Uygundur

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Japan JATE

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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 cerințelor esențiale și altor prevederi relevante ale directivelor conexe. Textul complet al declarației de conformitate a Uniunii Europene se găsește 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

Service and Support

Visit our multi-language website at https://www.asus.com/support.

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 : **P13R-M; P13R-M/10G-2T**

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. 180620