# **GIGABYTE**<sup>™</sup> R182-P91

Ampere® Altra® Max ARM Server - 1U 12-Bay Server

User Manual

Rev. 1.0

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#### **Documentation Classifications**

In order to assist in the use of this product, GIGABYTE provides the following types of documentation:

- User Manual: detailed information & steps about the installation, configuration and use of this product (e.g. motherboard, server barebones), covering hardware and BIOS.
- User Guide: detailed information about the installation & use of an add-on hardware or software component (e.g. BMC firmware, rail-kit) compatible with this product.
- Quick Installation Guide: a short guide with visual diagrams that you can reference easily for installation purposes of this product (e.g. motherboard, server barebones).

Please see the support section of the online product page to check the current availability of these documents.

#### For More Information

For related product specifications, the latest firmware and software, and other information please visit our website at http://www.gigabyte.com

For GIGABYTE distributors and resellers, additional sales & marketing materials are available from our reseller portal: http://reseller.b2b.gigabyte.com

For further technical assistance, please contact your GIGABYTE representative or visit https://esupport.gigabyte.com/ to create a new support ticket

For any general sales or marketing enquiries, you may also message GIGABYTE server directly by email: server.grp@gigabyte.com

#### Conventions

The following conventions are used in this user's guide:

E.	<b>NOTE!</b> Gives bits and pieces of additional information related to the current topic.		
	CAUTION! Gives precautionary measures to avoid possible hardware or software problems.		
	WARNING! Alerts you to any damage that might result from doing or not doing specific actions.		

#### Server Warnings and Cautions

Before installing a server, be sure that you understand the following warnings and cautions.

# WARNING!

#### To reduce the risk of electric shock or damage to the equipment:

- · Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Unplug all the power cords from the power supplies to disconnect power to the equipment.



- · Shock Hazard! Disconnect all power supply cords before servicing.
- · Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.

# WARNING!

To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



## WARNING!

This server is equipped with high speed fans. Keep away from hazardous moving fan blades during servicing.



This equipment is intended to be used in Restrict Access Location. The access can only be gained by Skilled person.

Only authorized by well trained professional person can access the restrict access location.



- Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.
- Danger of explosion if battery is incorrectly replaced.
- · Replace only with the same or equivalent type recommended by the manufacturer.
- · Dispose of used batteries according to the manufacturer's instructions.

#### Electrostatic Discharge (ESD)

# 

ESD CAN DAMAGE DRIVES, BOARDS, AND OTHER PARTS. WE RECOMMEND THAT YOU PERFORM ALL PROCEDURES AT AN ESD WORKSTATION. IF ONE IS NOT AVAILABLE, PROVIDE SOME ESD PROTECTION BY WEARING AN ANTI-STATIC WRIST STRAP AT-TACHED TO CHASSIS GROUND -- ANY UNPAINTED METAL SURFACE -- ON YOUR SERVER WHEN HANDLING PARTS.

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges without any component and pin touching. After removing a board from its protective wrapper or from the system, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

**System power on/off:** To remove power from system, you must remove the system from rack. Make sure the system is removed from the rack before opening the chassis, adding, or removing any non hot-plug components.

**Hazardous conditions, devices and cables:** Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the system and discon-nect the cables attached to the system before servicing it. Otherwise, personal injury or equipment damage can result.

**Electrostatic discharge (ESD) and ESD protection:** ESD can damage drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground (any unpainted metal surface on the server) when handling parts.

**ESD** and handling boards: Always handle boards carefully. They can be extremely sensi-tive to electrostatic discharge (ESD). Hold boards only by their edges. After removing a board from its protective wrapper or from the system, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

**Installing or removing jumpers:** A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that can be gripped with fin-gertips or with a pair of fine needle nosed pliers. If the jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can dam-age the contacts inside the jumper, causing intermittent problems with the function con-trolled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool used to remove a jumper, or the pins on the board may bend or break.



Risk of explosion if battery is replaced incorrectly or with an incorrect type. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

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# Chapter 1 Hardware Installation

### 1-1 Installation Precautions

The motherboard/system contain numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user manual and follow these procedures:

- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

# 1-2 Product Specifications



#### NOTE:

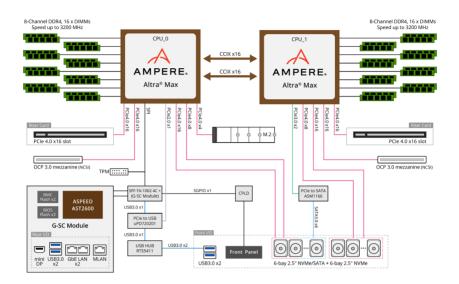
We reserve the right to make any changes to the product specifications and product-related information without prior notice.

System	<ul> <li>◆ 1U</li> </ul>
Dimension	<ul> <li>438 x 43.5 x 730 (W x H x D, mm)</li> </ul>
CPU	Ampere® Altra® Max Processor
	Dual processors, 7nm technology
	• LGA4926
	Up to 128-core per processor
	Note:
	If only 1 CPU is installed, some PCIe or memory functions might be unavailable
Chipset	System on Chip
Memory	32 x DIMM slots
	DDR4 memory supported only
	8-Channel memory architecture
	<ul> <li>RDIMM modules up to 256GB supported</li> </ul>
	<ul> <li>LRDIMM modules up to 256GB supported</li> </ul>
	<ul> <li>Up to 4TB of memory capacity supported per processor</li> </ul>
	Memory speed: Up to 3200 MHz
	Note: Only supports configurations with 1, 2, 4, 6, 8, 12, or 16 DIMMs
	<ul> <li>2 x 1GbE LAN ports (1 x Intel® I350-AM2)</li> </ul>
	NCSI function supported
	1 x 10/100/1000 Mbps management LAN
Video	Integrated in Aspeed® AST2600
	2D Video Graphic Adapter with PCIe bus interface
	<ul> <li>1920x1200@60Hz 32bpp, DDR4 SDRAM</li> </ul>
Storage	
	• 12 x 2.5" Gen4 NVMe hot-swappable bays
Expansion Slot	Riser Card CRS101J:
	- 1 x PCIe x16 slot (Gen4 x16), Full height half-length
	Riser Card CRS101K:
	<ul> <li>1 x PCle x16 slot (Gen4 x16), Full height half-length</li> </ul>
	2 x OCP 3.0 mezzanine slots
	<ul> <li>1 x M.2 slots:</li> </ul>
	- M-key
	- PCle Gen4 x4
	- Supports NGFF-2242/2260/2280/22110 cards

Internal I/O	<ul> <li>1 x M.2 slot</li> </ul>
	1 x TPM header
	1 x Front panel header
	1 x HDD/SSD backplane board header
	1 x PMBus connector
	1 x IPMB connector
	1 x Clear CMOS jumper
Front I/O	1 x USB 3.0
	<ul> <li>1 x Power button with LED</li> </ul>
	· · · · · · · · · · · · · · · · · · ·
	1 x ID button with LED
	1 x Reset button
	2 x LAN activity LEDs
	<ul> <li>1 x SSD activity LED</li> </ul>
	1 x System status LED
Rear I/O	• 2 x USB 3.0
	• 1 x mini-DP
	• 2 x RJ45
	◆ 1 x MLAN
Backplane I/O	Backplane P/N: 9CBP10C0NR-00
	<ul> <li>Speed and bandwidth: PCIe Gen4 x4 per port</li> </ul>
TPM	1 x TPM header with SPI interface
	Optional TPM2.0 kit: CTM010
Power Supply	1+1 80 PLUS Platinum 1300W redundant PSU
	AC Input:
	- 100-240V~/ 12-7A, 50-60Hz
	- 200-240V~/ 8A, 50-60Hz
	DC Input:
	240Vdc/ 6.5A
	DC Output:
	- Max 1000W/ 100-240V~
	+12V/ 80.5A
	+12Vsb/ 3A
	- Max 1300W/ 200-240V~ or 240Vdc Input
	+12V/ 105.4A
	+12Vsb/ 3A

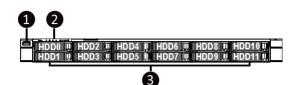
System Management	Aspeed® AST2600 management controller GIGABYTE Management Console (AMI MegaRAC SP-X) web interface
	<ul> <li>Dashboard</li> <li>HTML5 KVM</li> <li>Sensor Monitor (Voltage, RPM, Temperature, CPU Statusetc.)</li> <li>Sensor Reading History Data</li> <li>FRU Information</li> <li>SEL Log in Linear Storage / Circular Storage Policy</li> <li>Hardware Inventory</li> <li>Fan Profile</li> <li>System Firewall</li> </ul>
	<ul> <li>Power Consumption</li> <li>Power Control</li> </ul>
	<ul> <li>LDAP / AD / RADIUS Support</li> <li>Backup &amp; Restore Configuration</li> <li>Remote BIOS/BMC/CPLD Update</li> <li>Event Log Filter</li> </ul>
	<ul> <li>User Management</li> <li>Media Redirection Settings</li> <li>PAM Order Settings</li> <li>SSL Settings</li> <li>SMTP Settings</li> </ul>
Operating Properties	<ul> <li>Operating temperature: 10°C to 35°C</li> <li>Operating humidity: 8-80% (non-condensing)</li> <li>Non-operating temperature: -40°C to 60°C</li> <li>Non-operating humidity: 20%-95% (non-condensing)</li> </ul>

# 1-3 System Block Diagram



# Chapter 2 System Appearance

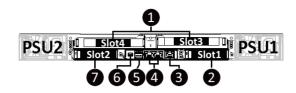
## 2-1 Front View



No.	Description
1.	Front USB 3.0 Port
2.	Front Panel LEDs and Buttons
3.	2.5" HDD Bays
	NOTE! Green HDD Latch Supports NVMe

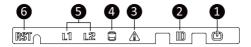


Go to the section 2-3 Front Panel Buttons and LEDs for detail description of function LEDs.



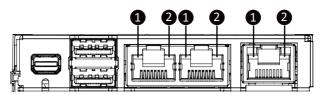
No.	Description	
1.	PCIe Card Slot x 2	
2.	Mezzanine Card Slot (Option/OCP 3.0/SFF)	
3.	Server Management LAN Port	
4.	GbE LAN Port x 2	
5.	USB 3.0 Port x 2	
6.	Mini DP Port	
7.	Mezzanine Card Slot (Option/OCP 3.0/SFF)	

# 2-3 Front Panel LED and Buttons



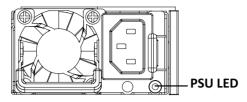
No.	Name	Color	Status	Description
		Green	On	System is powered on
	Power button	Green	Blink	System is in ACPI S1 state (sleep mode)
1.	with LED	N/A	Off	<ul> <li>System is not powered on or in ACPI S5 state (power off)</li> <li>System is in ACPI S4 state (hibernate mode)</li> </ul>
2.	ID Button			Press the button to activate system identification
		Green	Solid On	System is operating normally.
		Amber	Solid On	Critical condition, may indicate: System fan failure System temperature
3.	System Status LED		Blink	Non-critical condition, may indicate: Redundant power module failure Temperature and voltage issue Chassis intrusion
		N/A	Off	System is not ready, may indicate: POST error NMI error Processor or terminator missing
			On	HDD locate
		Green	Blink	HDD access
4.	HDD Status	Amber	On	HDD fault
	LED	Green/ Amber	Blink	HDD rebuilding
		N/A	Off	No HDD access or no HDD fault.
	LAN 1/2	Green	Solid On	Link between system and network or no access.
5.	Active/Link	Green	Blink	Data trasmission or receiving is occuring
	LEDs	N/A	Off	No data transmission or receiving is occuring
6.	Reset Button			Press the button to reset the system.

# 2-4 Rear System LAN LEDs



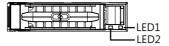
No.	Name	Color	Status	Description
		Yellow	On	1 Gbps data rate
1.	1GbE Speed LED	Green	On	100 Mbps data rate
	LLD	N/A	Off	10 Mbps data rate
		Green	On	Link between system and network or no access
	1GbE Link / Activity LED	Gleen	Blink	Data transmission or reception is occurring.
		N/A	Off	No data transmission or reception is occurring.

# 2-5 Power Supply Unit (PSU) LED



State	Description
OFF	No AC power to all power supplies
1Hz Green Blinking	AC present / only standby on / Cold redundant mode
2Hz Green Blinking	Power supply firmware updating mode
	AC cord unplugged or AC power lost; with a second power supply in parallel still with AC input power
Amber	Power supply critical event causing shut down: failure, OCP, OVP, fan failure and UVP
1Hz Amber Blinking	Power supply warning events where the power supply continues to operate: high temp, high power, high current and slow fan

## 2-6 Hard Disk Drive LEDs



RAID S	SKU	LED1	Locate	HDD Fault	Rebuilding	HDD Access	HDD Present (No Access)
	Disk LED (LED on	Green	ON(*1)	OFF		BLINK (*2)	OFF
	Back Panel)	Amber	OFF	OFF		OFF	OFF
	Removed HDD Slot	Green	ON(*1)	OFF			
	(LED on Back Panel)	Amber	OFF	OFF			
RAID configuration (via HW RAID Card or SW RAID Card)		Green	ON	OFF		BLINK (*2)	OFF
	Disk LED	Amber	OFF	ON	(Low Speed: 2 Hz)	OFF	OFF
	Daman d UDD Clat	Green	ON(*1)	OFF	(*3)		
	Removed HDD Slot	Amber	OFF	ON	(*3)		

LED 2	HDD Present	No HDD
Green	ON	OFF

NOTE:

\*1: Depends on HBA/Utility Spec.

\*2: Blink cycle depends on HDD's activity signal.

\*3: If HDD is pulled out during rebuilding, the disk status of this HDD is regarded as faulty.

# Chapter 3 System Hardware Installation



#### **Pre-installation Instructions**

Computer components and electronic circuit boards can be damaged by electrostatic discharge. Working on computers that are still connected to a power supply can be extremely dangerous. Follow the simple guidelines below to avoid damage to your computer or injury to yourself.

- Always disconnect the computer from the power outlet whenever you are working inside the computer case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal system of the computer case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Do not flex or stress the circuit board.
- Leave all components inside the static-proof packaging until you are ready to use the component for the installation.

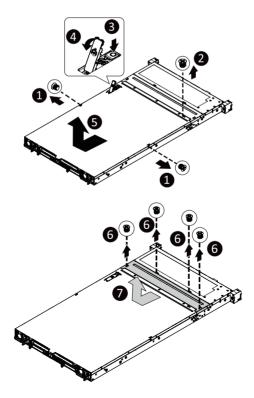
# 3-1 Removing and Installing the Chassis Cover



Before you remove or install the chassis top cover • Make sure the system is not turned on or connected to AC power.

#### Follow these instructions to remove/install the chassis cover:

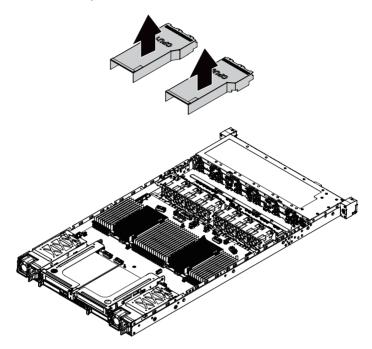
- 1. Remove the screws on both sides of the back chassis cover. (Note: For safe shipping, installation screws are added and should be removed before deployment/putting it in the server cabinet.)
- 2. Remove the screw securing the back chassis cover.
- 3. Push button to unlock the handle.
- 4. Pull the grip handle to open the panel cover.
- 5. Slide the back chassis cover towards the rear and remove the chassis cover in the direction indicated.
- 6. Remove the screw securing the middle chassis cover.
- 7. Slide the middle chassis cover towards the rear and remove the chassis cover in the direction indicated.
- 8. To reinstall the chassis cover reverse steps 2-7.



# 3-2 Removing and Installing the Fan Duct

#### Follow these instructions to remove/install the fan duct:

- 1. Lift up to remove the fan duct
- 2. To install the fan duct, align the fan duct with the guiding groove. Push down the fan duct into chassis until its firmly seat.



# 3-3 Removing and installing the Heat Sink



Read the following guidelines before you begin to remove/install the heat sink:

- Always turn off the computer and unplug the power cord from the power outlet before installing the heat sink to prevent hardware damage.
- · Unplug all cables from the power outlets.
- · Disconnect all telecommunication cables from their ports.
- Place the system unit on a flat and stable surface.
- · Open the system according to the instructions.

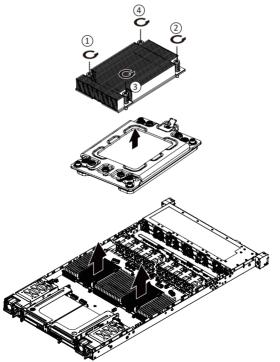


#### WARNING!

Failure to turn off the server before you start installing components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician.

#### Follow these instructions to remove/install the heat sink:

- 1. Loosen the captive screws securing the heat sink in place in reverse order  $(4 \rightarrow 3 \rightarrow 2 \rightarrow 1)$ .
- 2. Lift and remove the heat sink from the system.
- 3. To reinstall the heat sink reverse steps 1-2 while ensuring that you tighten the captive screws in sequential order  $(1\rightarrow 2\rightarrow 3\rightarrow 4)$  as seen in the image below.





When installing the heat sink to CPU, use PHILLIPS #2-Lobe driver to tighten 4 captive nuts in sequence as 1-4. The screw tightening torque:  $10 \pm 0.5$  kgf-cm.

# 3-4 Installing the CPU



Read the following guidelines before you begin to install the CPU:

- •Make sure that the motherboard supports the CPU.
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- •Unplug all cables from the power outlets.
- •Disconnect all telecommunication cables from their ports.
- •Place the system unit on a flat and stable surface.
- •Open the system according to the instructions.

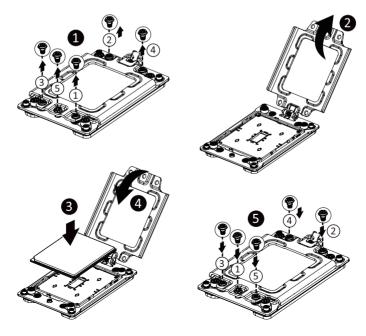


#### WARNING!

Failure to properly turn off the server before you start installing components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician.

#### Follow these instructions to install the CPU:

- 1. Loosen the three captive screws securing the CPU cover in sequential order  $(1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5)$ .
- 2. Flip open the CPU cover.
- 3. Install the CPU into place in the CPU socket.
- 4. Flip the CPU cover into place over the CPU socket.
- 5. Tighten the CPU cover screws in sequential order  $(1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5)$  to secure the CPU cover in place.
- 6. To remove the CPUs, follow steps 1-5 in reverse order.



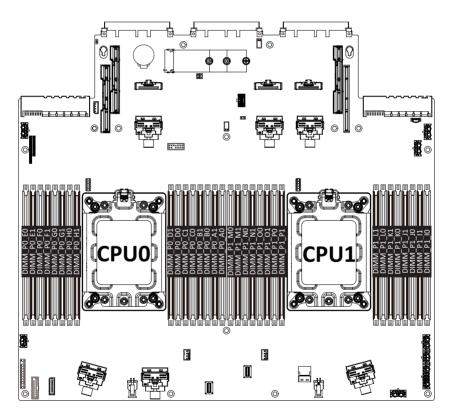


Read the following guidelines before you begin to install the memory:

- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

#### 3-5-1 Eight Channel Memory Configuration

This motherboard provides 32 DDR4 memory slots and supports Eight Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory.

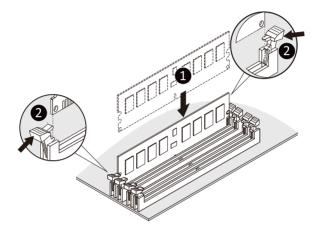


#### 3-5-2 Installing the Memory

Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module. Be sure to install DDR4 DIMMs on this motherboard.

#### Follow these instructions to install the Memory:

- 1. Insert the DIMM memory module vertically into the DIMM slot, and push it down.
- 2. Close the plastic clip at both edges of the DIMM slots to lock the DIMM module.
- 3. Reverse the installation steps when you want to remove the DIMM module.



#### 3-5-3 DIMM Population Table

		DIMM Capacity (GB)	Speed (MT/s); Voltage (V); Slots per Channel(SPC) and DIMM per Channel (DPC)							
Туре	Ranks Per DIMM and Data Width	Capacity (GB)	1 Slot per Channel	2 Slots per Channel						
		DIMM Density	1DPC	1DPC	2DPC					
		8Gb	1.2V	1.2V	1.2V					
RDIMM	SRx4	16GB	3200	3200	3200					
RDIMM	DRx8	16GB	5200	5200	5200					

# 3-5-4 Altra Platform DDR4 Suggest Configuration Table

Memory Q'ty		CPU0																		CPU1													
for each CPU	E0	E1	FO	F1	G0	G1	H0	H1	D1	D0	<b>C1</b>	<b>C0</b>	B1	B0	A1	A0	М0	M1	N0	N1	00	01	P0	P1	L1	LO	K1	к0	J1	10	11	10	
1 DIMM																v																v	
2 DIMM	v															v	v															v	
4 DIMM	v		v											v		v	v		v											v		v	
6 DIMM	v		v		v							v		v		v	v		v		v							v		v		v	
8 DIMM	v		v		v		v			v		v		v		v	v		v		v		v			v		v		v		v	
12 DIMM	v	v	v	v	v	v					v	v	v	v	v	v	v	v	v	v	v	v					v	v	v	v	v	v	
16 DIMM	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	

# 3-6 Installing the PCI Expansion Card



Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered-down and all power sources have been disconnected from the server prior to installing a PCIe card.

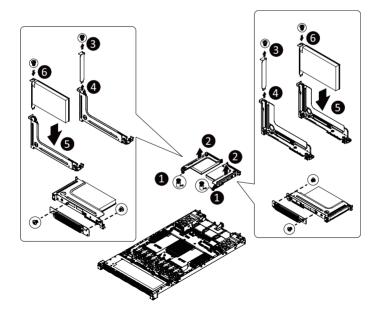
· Failure to observe these warnings could result in personal injury or damage to equipment.



The PCIe riser assembly does not include a riser card or any cabling as standard. To install a PCIe card, a riser card must be installed.

#### Follow these instructions to install the PCI Expansion card:

- 1. Loosen the thumbscrew securing the riser bracket.
- 2. Lift up the riser bracket out of system.
- 3. Remove the screw securing the slot cover from the riser bracket.
- 4. Remove the slot covers from the riser bracket.
- Orient the PCIe card with the riser guide slot and push in the direction of the arrow until the PCIe card sits in the PCIe card connector.
- 6. Secure the PCIe card with the screw.
- 7. Reverse the previous steps to install the riser bracket.



# 3-7 Installing the Mezzanine Card

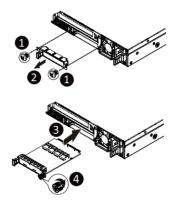
#### 3-7-1 OCP 3.0

Use of the following type of OCP 3.0 NIC is recommended:

- OCP 3.0 SFF with Pull Tab
  - OCP 3.0 SFF with Ejector Latch

#### Follow these instructions to install an OCP 3.0 mezzanine card:

- 1. Remove the two screws securing the mezzanine card slot cover.
- 2. Remove the slot cover from the system.
- 3. Insert the OCP 3.0 mezzanine card into the card slot ensuring that the card is firmly connected to the connector on the motherboard.
- 4. Tighten the thumbnail screw to secure the OCP 3.0 mezzanine card in place.
- 5. Reverse the previous steps to replace the OCP 3.0 mezzanine card.



# 3-8 Installing the Hard Disk Drive

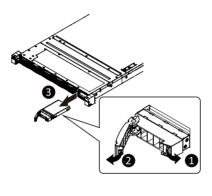


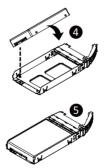
Read the following guidelines before you begin to install the hard disk drive:

- Take note of the drive tray orientation before sliding it out.
- The tray will not fit back into the bay if inserted incorrectly.
- Make sure that the hard disk drive is connected to the hard disk drive connector on the backplane.

#### Follow these instructions to install a 2.5" hard disk drive:

- 1. Press the release button.
- 2. Extend the locking lever.
- 3. Pull the locking lever in the direction indicated to remove the HDD tray.
- 4. Align the hard disk drive with the positioning stud on the HDD tray.
- 5. Slide the hard disk drive into the HDD tray.
- 6. Reinsert the HDD tray into the slot and close the locking lever.





# 3-9 Installing the M.2 Device and Heat Sink



#### WARNING:

Installation of the thermal pad over the M.2 device is required when installing an M.2 device. Lack of the thermal pad may result in the system overheating and throttle the system performance.



#### CAUTION

The position of the stand-off screw will depend on the size of the M.2 device. The stand-off screw is pre-installed for 22110 cards as standard. Refer to the size of the M.2 device and change the position of the stand-off screw accordingly.

#### Follow these instructions to install the M.2 device and heat sink:

- 1. Insert the M.2 device into the M.2 connector.
- 2. Press down on the M.2 device.
- 3. Install the thermal pad of the M.2 device to the M.2 device.
- 4. Press down on the thermal pad.
- 5. Secure the M.2 device and its thermal pad to the motherboard with a single screw.
- 6. Reverse steps 1-4 to remove the M.2 device.



# 3-10 Replacing the System Fan Module



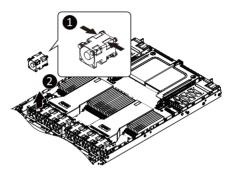
#### CAUTION!

Before you remove or install the system fans follow these steps:

- Make sure the system is not turned on or connected to AC power.
- Disconnect all necessary cable connections. Failure to observe these warnings could result in personal injury or damage to the equipment

#### Follow these instructions to replace the fan assembly:

- 1. Lift up the fan assembly from the chassis.
- 2. Reverse the previous steps to install the replacement fan assembly.



# 3-11 Removing and Installing the Power Supply

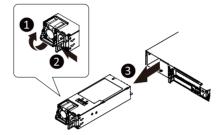


#### CAUTION!

 In order to reduce the risk of injury from electric shock, disconnect AC power from the power supply before removing the power supply from the system

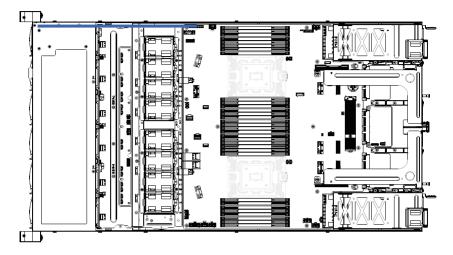
#### Follow these instructions to replace the power supply:

- 1. Flip and then grasp the power supply handle.
- 2. Press the retaining clip on the top side of the power supply in the direction indicated.
- 3. Pull out the power supply using the handle.
- 4. Insert the replacement power supply firmly into the chassis. Connect the AC power cord to the replacement power supply.

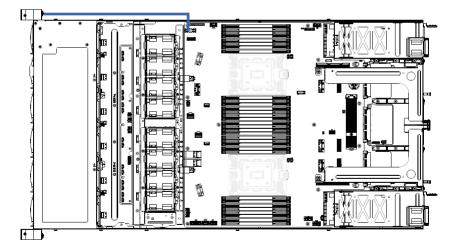


## 3-12 Cable Routing

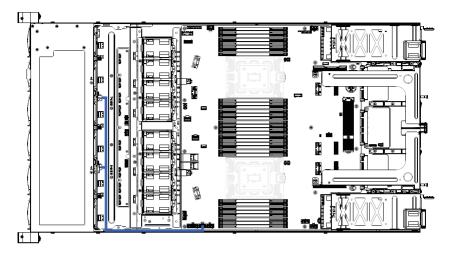
Front Switch Cable/Front LED Cable



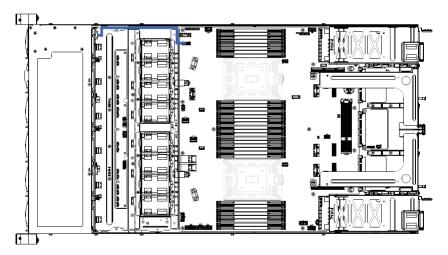
Front Panel USB 3.0 Cable



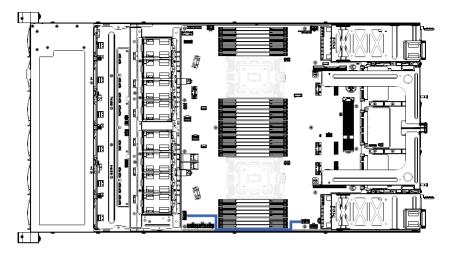
HDD Backplane Board Power Cable



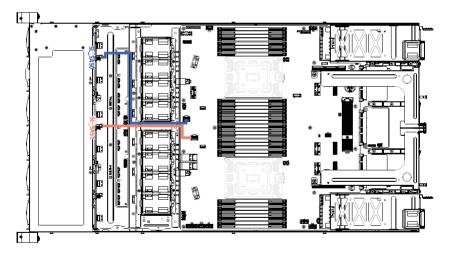
HDD Backplane Board Signal Cable



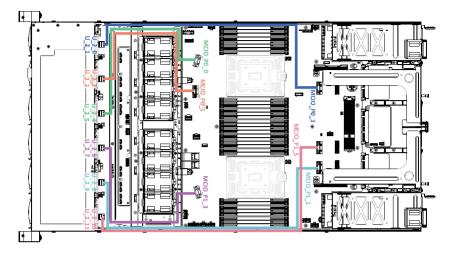
**ATX Power Cable** 



SlimLine SAS to SATA Cable

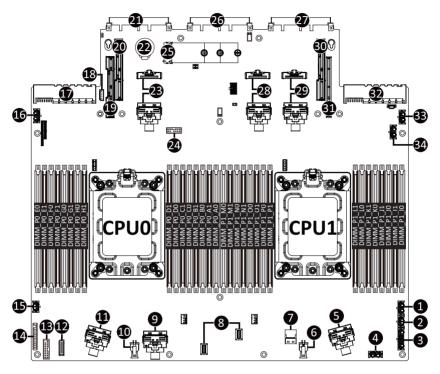


NVMe Cable



# Chapter 4 Motherboard Components

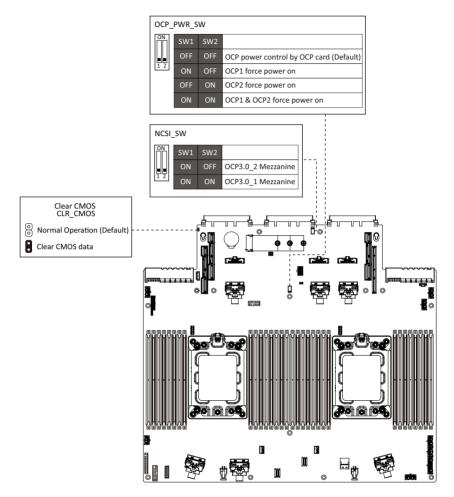
# 4-1 Motherboard Components



Item	Description
1	2 x 4 Pin P12V GPU Power Connector
2	2 x 3 Pin Power Connector
3	2 x 7 Pin Power Connector
4	2 x 4 Pin P12V Power Connector
5	MCIO Connector (MCIO_P1_3/PCIe Gen4)
6	2 x 2 Pin P12V Backplane Power Connector
7	SlimLine SAS Connector (MCIO_P1_22/PCIe Gen4)
8	SlimLine SAS Connectors
9	MCIO Connector (MCIO_P0_1/PCIe Gen4)
10	2 x 2 Pin P12V Backplane Power Connector
11	MCIO Connector (MCIO_P0_0/PCIe Gen4)
12	HDD Backplane Board Connector
13	Front Panel USB 3.0 Connector
14	Front Panel Header
15	2 x 3 Pin Power Connector
16	2 x 4 Pin P12V GPU Power Connector
17	Power Supply Connector#1 (Primary)

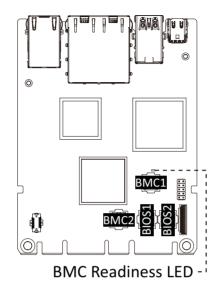
Item	Description			
18	IPMB Connector			
19	Riser Connector #1 (PCIe Gen4/x16 Slot)			
20	Riser Connector #2 (PCIe Gen4/x16 Slot)			
21	OCP Mezzanine Connector (OCP 3.0/SFF Type/Gen4 x16)			
22	RTC Battery			
23	MCIO Connectors (MCIO_P0_2/MCIO_P0_3/PCIe Gen4)			
24	TPM Module Connector (SPI Interface)			
25	M.2 Slot (PCIe Gen4 x4, Support NGFF-22110)			
26	G-SC Module Connector			
27	OCP Mezzanine Connector (OCP 3.0/SFF Type/Gen4 x16)			
28	MCIO Connectors (MCIO_P1_4/MCIO_P1_5/PCIe Gen4)			
29	MCIO Connectors (MCIO_P1_0/MCIO_P1_1/PCIe Gen4)			
30	Riser Connector #3 (PCIe Gen4/x16 Slot)			
31	Riser Connector #4 (PCIe Gen4/x16 Slot)			
32	Power Supply Connector#2 (Secondary)			
33	2 x 4 Pin P12V GPU Power Connector			
34	2 x 4 Pin P12V Power Connector			

# 4-2 Jumper Setting



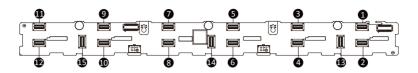
# 4-3 G-SC Module

### 4-3-1 DCR110



## 4-4 Backplane Board Storage Connector

4-4-1 CBP10C0



Item	Description		
1	SlimLine Connector (U_2_0)		
2	SlimLine Connector (U_2_1)		
3	SlimLine Connector (U_2_2)		
4	SlimLine Connector (U_2_3)		
5	SlimLine Connector (U_2_4)		
6	SlimLine Connector (U_2_5)		
7	SlimLine Connector (U_2_6)		
8	SlimLine Connector (U_2_7)		
9	SlimLine Connector (U_2_8)		
10	SlimLine Connector (U_2_9)		
11	SlimLine Connector (U_2_10)		
12	SlimLine Connector (U_2_11)		
13	SlimLine Connector (SL_SAS0)		
14	SlimLine Connector (SL_SAS1)		
15	SlimLine Connector (SL_SAS2)		

# Chapter 5 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the EFI on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters, loading the operating system etc. The BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features. When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <DEL> key during the POST when the power is turned on.



- BIOS flashing is potentially risky, if you do not encounter any problems when using the current BIOS version, it is recommended that you don't flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the Exit section in this chapter or introductions of the battery/clearing CMOS jumper in Chapter 4 for how to clear the CMOS values.)

#### **BIOS Setup Program Function Keys**

	•
<←><→>	Move the selection bar to select the screen
<↑><↓>	Move the selection bar to select an item
<+>	Increase the numeric value or make changes
<->	Decrease the numeric value or make changes
<enter></enter>	Execute command or enter the submenu
<esc></esc>	Main Menu: Exit the BIOS Setup program
	Submenus: Exit current submenu
<f1></f1>	Show descriptions of general help
<f3></f3>	Restore the previous BIOS settings for the current submenus
<f9></f9>	Load the Optimized BIOS default settings for the current submenus
<f10></f10>	Save all the changes and exit the BIOS Setup program

#### Main

This setup page includes all the items of the standard compatible BIOS.

#### Advanced

This setup page includes all the items of AMI BIOS special enhanced features.

(ex: Auto detect fan and temperature status, automatically configure hard disk parameters.)

#### Chipset

This setup page includes all the submenu options for configuring the function of processor, network, North Bridge, South Bridge, and System event logs.

#### Server Management

Server additional features enabled/disabled setup menus.

#### Security

Change, set, or disable supervisor and user password. Configuration supervisor password allows you to restrict access to the system and BIOS Setup.

A supervisor password allows you to make changes in BIOS Setup.

A user password only allows you to view the BIOS settings but not to make changes.

#### Boot

This setup page provides items for configuration of the boot sequence.

#### Save & Exit

Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.)

Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.)

# 5-1 The Main Menu

Once you enter the BIOS Setup program, the Main Menu (as shown below) appears on the screen. Use arrow keys to move among the items and press <Enter> to accept or enter other sub-menu.

#### Main Menu Help

The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

#### Submenu Help

While in a submenu, press <F1> to display a help screen (General Help) of function keys available for the menu. Press <Esc> to exit the help screen. Help for each item is in the Item Help block on the right side of the submenu.



When the system is not stable as usual, select the **Restore Defaults** item to set your system to its defaults.

The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.

Main Advanced Chipset	Aptio Setup – AMI Server Mgmt Security Boot Save & Exit	
BIDS Information Access Level System Product Name Project Name Project Version Build Date and Time	Administrator R182-P91-00 MP92-FS0-00 F21d 06/22/2022 16:08:18	Memory Slot Information.
BMC Information BMC Firmware Version	13.03.08	
Processor Information CPU 0 Brand String	Ampere(R) Altra(R) Max Processor M128-30	
CPU 1 Brand String	Ampere(R) Altra(R) Max Processor M128–30	↔: Select Screen ↑↓: Select Item
Processor Core Processor Speed	128 3000 MHz	Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults
Memory Information Total Memory Memory Frequency ▶ Memory Slot Information	51268 3200MHz	F10: Save & Exit ESC: Exit
	Version 2.22.1282 Copyright (C) 2022 AM	I B4

Main Advanced Chipset Serv	Aptio Setup – AMI ver Mgmt Security Boot Save & A	Exit
Project Version Build Date and Time	F21d 06/22/2022 16:08:18	<ul> <li>Set the Time. Use Tab to switch between Time elements.</li> </ul>
BMC Information		Ciemento.
BMC Firmware Version	13.03.08	
Processor Information		
CPU 0 Brand String	Ampere(R) Altra(R) Max Processor M128–30	
CPU 1 Brand String	Ampere(R) Altra(R) Max Processor M128–30	
Processor Core	128	
Processor Speed	3000 MHz	→+: Select Screen ↑↓: Select Item Enter: Select
Memory Information		+/-: Change Opt.
Total Memory	512GB	F1: General Help
Memory Frequency	3200MHz	F3: Previous Values
Memory Slot Information		F9: Optimized Defaults F10: Save & Exit
System Language	[English]	ESC: Exit
System Date	[Fri 06/24/2022]	
	[10:40:33]	
Ver	sion 2.22.1282 Copyright (C) 202;	2 AMI 84

Parameter	Description
BIOS Information	
Access Level	Displays the privileges level information.
System Project Name	Displays the system project name information.
Project Name	Displays the motherboard project name information
Project Version	Displays version number of the BIOS setup utility.
Build Date and Time	Displays the date and time when the BIOS setup utility was created.
BMC Information <sup>(Note1)</sup>	
BMC Firmware Version(Note1)	Displays BMC firmware version information.
Processor Information	
CPU Brand String / Processor Core/ Processor Speed	Displays the technical specifications for the installed processor.
Memory Information	
Total Memory <sup>(Note2)</sup>	Displays the total memory size of the installed memory.
Memory Frequency <sup>Note2)</sup>	Displays the frequency information of the installed memory.
Memory Slot Information	Press [Enter] to view installed memory slot information.

(Note1) Functions available on selected models.

(Note2) This section will display capacity and frequency information of the memory that the customer has installed.

Parameter	Description
System Language	Option: English.
System Date	Sets the date following the weekday-month-day-year format.
System Time	Sets the system time following the hour-minute-second format.

# 5-2 Advanced Menu

The Advanced Menu displays submenu options for configuring the function of various hardware components. Select a submenu item, then press <Enter> to access the related submenu screen.

Aptio Setup – AMI Main <mark>Advanced</mark> Chipset Server Mgmt Security Boot Save & Exit	
<ul> <li>Trusted Computing</li> <li>ACPI Settings</li> <li>ACPI Settings</li> <li>ACPI Settings</li> <li>ACPI Settings</li> <li>General Watchdog Timer</li> <li>X86 Emulator Configuration</li> <li>PCI Subsystem Settings</li> <li>Info Report Configuration</li> <li>USB Configuration</li> <li>Network Stack Configuration</li> <li>NVMe Configuration</li> <li>SATA Configuration</li> <li>SATA Configuration</li> <li>Graphic Output Configuration</li> <li>Intel(R) 1950 Gigabit Network Connection - 00:A0:C9:00:00:00</li> <li>MAC:00A0C900000-IPv4 Network Configuration</li> <li>Intel(R) 1350 Gigabit Network Configuration</li> <li>Intel(R) 1350 Gigabit Network Configuration</li> <li>MAC:00A0C900000-IPv4 Network Configuration</li> <li>MAC:00A0C9000001-IPv4 Network Configuration</li> <li>MAC:00A0C9000001-IPv6 Network Configuration</li> <li>MaC:00A0C9000001-IPv6 Network Configuration</li> <li>Driver Health</li> </ul>	Trusted Computing Settings +: Select Screen T4: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2.22.1282 Copyright (C) 2022 AMI	

### 5-2-1 Trusted Computing

Advanced	Aptio Setup – AMI	
Configuration Security Device Support Disable Block Sld NO Security Device Found	(Enable) [Disabled]	Enables or Disables BIOS support for security device. 0.S. will not show Security Device. TGS EFI protocol and INTIA interface will not be available.
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Vers.	ion 2.22.1282 Copyright (C) 20	22 AMI

Parameter	Description
Configuration	
Security Device Support	Enable/Disable BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available. Options available: Enable, Disable. Default setting is <b>Enable</b> .
Disable Block Sid	Override to allow SID authentication in TCG Storage device. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .

#### 5-2-2 ACPI Settings

Advanced	Aptio Setup – AMI	
ACPI Settings		Enables or Disables BIOS ACPI Auto Configuration.
		nori nato comigaración.
Enable CPPC Enable DVFS Mode Enable LPI Enable Max Performance	(Enabled) [Disabled] [Enabled] [Enabled]	
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save &amp; Exit ESC: Exit</pre>
Veesior	1 2.22.1282 Copyright (C) 20	22 AMT

Parameter	Description
ACPI Settings	
Enable ACPI Auto Configuration	Enable/Disable BIOS ACPI auto configuration. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Enable CPPC <sup>(Note)</sup>	Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Enable DVFS Mode	Default setting is <b>Disabled</b> .
Enable LPI <sup>(Note)</sup>	Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Enable Max Performance <sup>(Note)</sup>	Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .

This item is available when Enable ACPI Auto Configuration is set to Disabled. BIOS Setup (Note)

### 5-2-3 APEI Configuration

Advanced	Aptio Setup – AMI	
APEI Configuration		Enable/Disable ACPI Platform Error Interface
		support
		++: Select Screen
		↑↓: Select Item Enter: Select
		+/-: Change Opt. F1: General Help
		F3: Previous Values
		F9: Optimized Defaults F10: Save & Exit
		ESC: Exit
	/ersion 2.22.1282 Copyright (C)	2022 AMI

Parameter	Description
APEI Configuration	
APEI Enable	Enable/Disable ACPI platform Error Interface support. Options available: Disabled, Enabled. Default setting is <b>Disabled</b> .

# 5-2-4 General Watchdog Timer

General Watchdog Timer		Timeout when SCP will
Secure Watchdog Timeout BIOS Watchdog Timeout OS Watchdog Timeout	(Disable) (Disable) (Disable)	reset system if it doesn't receive response from ARMV8.
		++: Select Screen t1: Select Ttem Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit

Parameter	Description
General Watchdog Timer	
Secure Watchdog Timeout	Timeout when SCP will reset system if it doesn't receive response from ARMv8. Options available: Disable, 5 minutes, 6 minutes, 10 minutes, 15 minutes, 20 minutes. Default setting is <b>Disable</b> .
BIOS Watchdog Timeout	Options available: Disable, 5 minutes, 6 minutes, 10 minutes, 15 minutes, 20 minutes. Default setting is <b>Disable</b> .
OS Watchdog Timeout	Options available: Disable, 3 minutes, 4 minutes, 5 minutes, 6 minutes, 10 minutes, 15 minutes, 20 minutes. Default setting is <b>Disable</b> .

### 5-2-5 X86 Emulation Configuration

X86 Emulator Configuration	Enable/Disable X86
	Emulator support.
	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt.
	F1: General Help F3: Previous Values F3: Optimized Default F10: Save & Exit ESC: Exit

i urumeter	
X86 Emulator Configuration	1
X86 Emulator Enable	Enable/Disable X86 Emulator support.
	Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .

# 5-2-6 PCI Subsystem Settings

Aptio Setup - AMI Advanced	
AMI PCI Driver Version : A5.01.20 PCI Settings Common for all Devices: SR-IOV Support [Enabled] Change Settings of the Following PCI Devices: > Slot # 4 Occupied [Mass Storage Controller] > Slot # 5 Occupied [Mass Storage Controller] > Slot # 7 Occupied [Mass Storage Controller] > Slot # 7 Occupied [Mass Storage Controller]	▲ If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.
<ul> <li>Slot # 9 Occupied [Mass Storage Controller]</li> <li>Slot #16 Occupied [Bridge Device]</li> <li>Slot #26 Occupied [Mass Storage Controller]</li> <li>Slot #32 Occupied [Mass Storage Controller]</li> <li>Slot #33 Occupied [Mass Storage Controller]</li> <li>Slot #44 Occupied [Mass Storage Controller]</li> <li>Slot #45 Occupied [Mass Storage Controller]</li> <li>Slot #45 Occupied [Mass Storage Controller]</li> <li>Slot #50 Occupied [Mass Storage Controller]</li> <li>Slot #56 Occupied [Bridge Device]</li> <li>Slot #56 Occupied [Mass Storage Controller]</li> <li>Slot #56 Occupied [Mass Storage Controller]</li> <li>Slot #50 Occupied [Mass Storage Controller]</li> <li>Slot #57 Occupied [Mass Storage Controller]</li> <li>Slot #73 Occupied [Mass Storage Controller]</li> </ul>	<pre>+*: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save &amp; Exit ESC: Exit</pre>

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Aptio Setup Advanced	- AMI
Slot # 6 Occupied [Mass Storage Controller] Slot # 7 Occupied [Mass Storage Controller] Slot # 9 Occupied [Mass Storage Controller] Slot #16 Occupied [Mass Storage Controller] Slot #26 Occupied [Mass Storage Controller] Slot #32 Occupied [Mass Storage Controller] Slot #33 Occupied [Mass Storage Controller] Slot #43 Occupied [Mass Storage Controller] Slot #45 Occupied [Mass Storage Controller] Slot #50 Occupied [Mass Storage Controller] Slot #50 Occupied [Mass Storage Controller] Slot #50 Occupied [Mass Storage Controller]	▲ Change On Board PCI Device or PCI Slot Settings.
<ul> <li>Slot #51 Occupied (Hass storage Controller)</li> <li>Slot #64 Occupied (Hass Storage Controller)</li> <li>Slot #64 Occupied (Hass Storage Controller)</li> <li>Slot #72 Occupied (Hass Storage Controller)</li> <li>Slot #73 Occupied (Hass Storage Controller)</li> <li>OnBoard Device (Network Controller)</li> <li>OnBoard Device (Display Controller)</li> <li>OnBoard Device (Serial Bus Controller)</li> <li>OnBoard Device (Serial Bus Controller)</li> <li>MARNING: Changing PCI Device(s) settings may Have unwanted side effects! System may HANO!</li> </ul>	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
PROCEED WITH CAUTION. Version 2.22.1282 Copy	right (C) 2022 AMI

Parameter	Description
AMI PCI Driver Version	Displays the AMI PCI Bus Driver version information
PCI Settings Common for all Devices:	
SR-IOV Support	Enable/Disable Single Root IO virtualization support. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Change Settings of the following PCI Devices:	
Slot # Occupied OnBoard Device	<ul> <li>Press [Enter] to configure advanced items.</li> <li>PCI Latency Timer <ul> <li>Value to be programmed into PCI latency timer register.</li> <li>Options available: 32,64,96,128,160,192,224,248 PCI Bus Clocks. Default setting is 32 PCI Bus Clocks.</li> </ul> </li> <li>PCI-X Latency Timer <ul> <li>Value to be programmed into PCI latency timer register.</li> <li>Options available: 32,64,96,128,160,192,224,248 PCI Bus Clocks. Default setting is 64 PCI Bus Clocks.</li> </ul> </li> <li>VGA Palette Snoop <ul> <li>Enable/Disable VGA Palette Registers Snooping.</li> <li>Options available: Disabled, Enabled. Default setting is Disabled.</li> </ul> </li> <li>PERR# Generation <ul> <li>Enable/Disable PCI Device to Generate PERR#.</li> <li>Options available: Disabled, Enabled. Default setting is Disabled.</li> </ul> </li> <li>SERR# Generation <ul> <li>Enable/Disable PCI Device to Generate SERR#.</li> <li>Options available: Disabled, Enabled. Default setting is Enable/.</li> </ul> </li> <li>Disable PCI Inti <ul> <li>Disable PCI Inti</li> <li>Disable PCI Inti</li> <li>Disable BIOS built-in PCI Express initialization for currently selected and down stream PCI device(s).</li> <li>Options available: Disabled, Enabled. Default setting is Disabled.</li> </ul> </li> <li>Disable PCIe GEN2 <ul> <li>Disable BIOS built-in PCI Express GEN2 initialization for currently selected and down stream PCI device(s).</li> <li>Options available: Disabled, Enabled. Default setting is Disabled.</li> </ul> </li> <li>Disable BIOS built-in PCI Express GEN2 initialization for currently selected and down stream PCI device(s).</li> <li>Options available: Disabled, Enabled. Default setting is Disabled.</li> </ul> <li>PCI Express GEN 1 Settings <ul> <li>Press [Enter] to configure advanced items.</li> </ul> </li> <li>PCI Express GEN 2 Settings <ul> <li>Press [Enter] to configure advanced items.</li> </ul> </li>

### 5-2-6-1 PCI Express GEN 1 Settings

PCI Express GEN 1 Settings		Enables or Disables PCI
PCI Express Device Register Set Relaxed Ordering	tings [Enabled]	Express Device Relaxed Ordering.
Extended Tag No Snoop	[Disabled] [Disabled]	
Maximum Payload Maximum Read Request	(Auto) (Auto)	
PCI Express Link Register Setti	ngs	
Extended Synch	[Disabled]	
Clock Power Management	[Disabled]	
Link Training Retry	[5]	
Link Training Timeout (uS)	1000	++: Select Screen
Disable Empty Links	[Disabled]	↑↓: Select Item
		Enter: Select
WARNING: Enabling ASPM may caus		+/-: Change Opt.
PCI-E devices to fail!		F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit

Parameter	Description
PCI Express Device Register Settings	
Relaxd Ordering	Enable/disable PCI Express Device Relaxed Ordering. Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .
Extended Tag	If enabled, allows device to use 8-bit tag field as a requester. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
No Snoop	Enable/disable PCI Express Device No Snoop option. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
Maximum Payload	Set maximum payload of PCI express device or allow system BIOS to select the value. Options available: Auto, 128 Bytes, 256 Bytes, 512 Bytes. Default setting is <b>Auto</b> .
Maximum Read Request	Set maximum Read Request size of PCI express device or allow system BIOS to select the value. Options available: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes. Default setting is <b>Auto</b> .
PCI Express Link Register Settings	
Extended Synch	If enabled, allows generation of extended synchronization patterns. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .

Parameter	Description
Clock Power Management	If supported by hardware and set to "Enabled", the device is permitted to use CLKREQ# signal for power management of Link clock in accordance to protocol defined in appropriate form factor specification. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
Link Training Retry	Defines number of Retry attempts software will take to retrain the link if previous training attempt was unsuccessful. Options available: Disabled, 2, 3, 5. Default setting is <b>5</b> .
Link Training Timeout (uS)	Defines number of microseconds software will wait before polling 'Link Training' bit in link status register. Value range from 10 to 10000 uS.
Disable Empty Links	In order to save power, software will disable unpopulated PCI express links, if this option set to "Disable Link. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .

### 5-2-6-2 PCI Express GEN 2 Settings

Advanced	Aptio Setup – AMI	
PCI Express GEN 2 Settings		In device Functions that
PCI Express GEN2 Device Register	Settings	programmability, allows
Completion Timeout	[Default]	system software to modify
ARI Forwarding	[Disabled]	the Completion Timeout
AtomicOp Requester Enable	[Disabled]	value. 'Default' 50us to
AtomicOp Egress Blocking	[Disabled]	50ms. If 'Shorter' is
IDO Request Enable	[Disabled]	selected, software will
IDO Completion Enable	[Disabled]	use shorter timeout ranges
LTR Mechanism Enable	[Disabled]	supported by hardware. If
End-End TLP Prefix Blocking	[Disabled]	'Longer' is selected,
PCI Express GEN2 Link Register S	ettings	
Compliance SOS	[Disabled]	↔+: Select Screen
Hardware Autonomous Width	[Disabled]	14: Select Item
Hardware Autonomous Speed	[Disabled]	Enter: Select
		+/-: Change Opt.
		F1: General Help
		F3: Previous Values
		F9: Optimized Defaults
		F10: Save & Exit
		ESC: Exit
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Parameter	Description
PCI Express GEN2 Device Register Settings	
Completion Timeout	In device functions that support completion timeout programmability, allows system software to modify the completion timeout value. 'Default' 50us to 50ms. If 'Shorter' is selected, software will use shorter timeout ranges supported by hardware. If 'Longer' is selected, software will use longer timeout ranges. Options available: Default, Shorter, Longer, Disabled. Default setting is <b>Default</b> .
ARI Forwarding	If supported by hardware and set to 'Enabled', the Downstream Port disables its traditional Device Number field being 0 enforcement when turning a Type1 Configuration Request into a Type0 Configuration Request, permitting access to Extended Functions in an ARI Device immediately below the Port. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
AtomicOp Requester Enable	If supported by hardware and set to 'Enabled', this function initiates AtomicOp Requests only if Bus Master Enable bit is in the Command Register Set Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .

Parameter	Description
AtomicOp Egress Blocking	If supported by hardware and set to 'Enabled', outbound AtomicOp Requestsvia Egress Ports will be blocked. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
IDO Request Enable	If supported by hardware and set to 'Enabled', this permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
IDO Completion Enable	If supported by hardware and set to 'Enabled', this permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
LTR Mechanism Enable	If supported by hardware and set to 'Enabled', this enables the Latency Tolerance Reporting (LTR) Mechanism. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
End-End TLP Prefix Blocking	If supported by hardware and set to 'Enabled', this function will block forwarding of TLPs containing End-End TLP Prefixes. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
PCI Express GEN2 Link Register Settings	
Compliance SOS	If supported by hardware and set to 'Enabled', this will force LTSSM to send SKP Ordered Sets between sequences when sending Compliance Pattern or Modified Compliance Pattern. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
Hardware Autonomous Width	If supported by hardware and set to 'Disabled', this will disable the hardware's ability to change link width except width size reduction for the purpose of correcting unstable link operation. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
Hardware Autonomous Speed	If supported by hardware and set to 'Disabled', this will disable the hardware's ability to change link speed except speed rate reduction for the purpose of correcting unstable link operation. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .

### 5-2-7 Info Report Configuration

Info Report Configuration		Post Report Support Enabled/Disabled
Post Report		chabieu/bisabieu
Post Report		
Delay Time	[1]	
Error Message Report		
Info Error Message	[Enabled]	
		++: Select Screen
		<b>↑↓:</b> Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F3: Previous Values F9: Optimized Defaults
		F10: Save & Exit
		ESC: Exit

Parameter	Description
Post Report	
Post Report	Enable/disable post report support.
	Options available: Enabled, Disabled. Default setting is Enabled.
Delay Time	Options available: 0,1,2,3,4,5,6,7,8,9,10, Until Press ESC.
	Default setting is 1.
Error Message Report	
Info Error Message	Enable/disable Info error message support.
	Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .

### 5-2-8 USB Configuration

Advanced		
USB Configuration		This is a workaround for OSes without XHCI hand-off
USB Module Version	27	support. The XHCI
		ownership change should be
USB Controllers:		claimed by XHCI driver.
1 XHCI USB Devices:		
8 Drives, 1 Keyboard, 1 Mous	e. 5 Hubs	
	.,	
USB Mass Storage Driver Support	[Enabled]	
USB hardware delays and time-outs:		
bb hardware derags and time bats.		++: Select Screen
Mass Storage Devices:		<b>↑↓:</b> Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help F3: Previous Values
		F9: Optimized Defaults
		F10: Save & Exit
		ESC: Exit

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Parameter	Description
USB Configuration	
USB Module Version	Displays the USB module version information.
USB Controllers	Displays the supported USB controllers.
USB Devices:	Displays the USB devices connected to the system.
XHCI Hand-off	Enable/Disable the XHCI (USB 3.0) Hand-off support. Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .
USB Mass Storage Driver Support <sup>(Note)</sup>	Enable/Disable the USB Mass Storage Driver Support. Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .

#### (Note) This item is present only if you attach USB devices.

#### 5-2-9 Network Stack Configuration

Advanced	Aptio Setup – AMI	
Network Stack PXE Retry IPv4 PXE Support IPv6 PXE Support IPv6 PXE Support IPv6 HTTP Support PXE boot wait time Media detect count	[Enabled] [Disabled] [Enabled] [Disabled] [Disabled] [Disabled] 1	Enable∕Disable UEFI Network Stack
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
1	/ersion 2.22.1282 Copyright (C)	2022 AMI

Parameter	Description
Network Stack	Enable/Disable the UEFI network stack. Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .
PXE Retry <sup>(Note)</sup>	Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
Ipv4 PXE Support <sup>(Note)</sup>	Enable/Disable the Ipv4 PXE feature. Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .
Ipv4 HTTP Support <sup>(Note)</sup>	Enable/Disable the Ipv4 HTTP feature. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
Ipv6 PXE Support <sup>(Note)</sup>	Enable/Disable the Ipv6 PXE feature. Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .
Ipv6 HTTP Support <sup>(Note)</sup>	Enable/Disable the Ipv6 HTTP feature. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
PXE boot wait time <sup>(Note)</sup>	Wait time in seconds to press ESC key to abort the PXE boot. Press the <+> / <-> keys to increase or decrease the desired values.
Media detect count(Note)	Number of times the presence of media will be checked. Press the <+> / <-> keys to increase or decrease the desired values.

(Note) This item appears when Network Stack is set to Enabled.

|--|

#### 5-2-10 IP Configuration



Parameter	Description
IP Configuration Settings	
Provides the Options to Configure the IP Address	
Auto Configuration	Options available: Disabled, Every Boot, On Demand. Default setting is <b>Disabled</b> .

# 5-2-11 NVMe Configuration

Advanced	Aptio Setup — AMI	
NVMe controller and Drive inf	ormation	<b>_</b>
[NVME_00] PCI 2:3:0:0 Nvme Size / Serial Number	SAMSUNG MZQL2960HCJR-00A07 960.1GB / S64FNE0R908907	
[NVME_01] PCI 2:4:0:0 Nvme Size / Serial Number	SAMSUNG MZQL2960HCJR-00A07 960.1GB / S64FNE0R908925	
[NVME_02] PCI 5:1:0:0 Nvme Size / Serial Number	SAMSUNG MZQL2960HCJR-00A07 960.1GB / S64FNEOR908887	
[NVME_03] PCI 5:2:0:0 Nvme Size / Serial Number	SAMSUNG MZQL2960HCJR-00A07 960.16B / S64FNE0R908884	<pre>++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help</pre>
[NVME_04] PCI 5:3:0:0 Nvme Size / Serial Number	SAMSUNG MZQL2960HCJR-00A07 960.1GB / S64FNE0R908916	F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
	SAMSUNG MZQL2960HCJR-00A07 960.1GB / S64FNE0R908929	ESC: EXIT
Ve	rsion 2.22.1282 Copyright (C) 2022 A	MI

Parameter	Description
NVMe controller and Drive information	Displays the NVMe devices connected to the system

### 5-2-12 SATA Configuration

Advanced	Aptio Setup - AMI	
SATA Configuration		
SATA Controller (S:0 Port 0 Port 1 Port 2 Port 3 Port 4 Port 5	8 B:01 D:00 F:00) Not Present Not Present Not Present Not Present Not Present Not Present	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
	Version 2.22.1282 Copyright (C)	2022 AMI
eter	Description	

Parameter	Description
SATA Configuration	Displays the installed HDD devices information. System will automatically detect HDD type.

### 5-2-13 Graphic Output Configuration

Advanced	Aptio Setup – AMI	
Graphic Output Configuration		Select Output Device Type
Output Device Type OS graphics output	[Onboard Device] [Controlled by OS]	
		++: Select Screen 14: Select Item Enter: Select +/-: Change Oot. F1: General Help F3: Previous Values F3: Optimized Defaults F10: Save & Exit ESC: Exit
Versio	n 2.22.1282 Copyright (C) 20	022 AMI

Parameter	Description
Graphic Output Configuration	
Output Device Type	Selects output device type. Options available: First loaded Device, Onboard Device, External Device, Specific Device. Default setting is <b>Onboard Device</b> .
OS graphics output	Use Onboard graphics output under OS (BMC KVM requires onboard graphics output). Options available: Controlled by OS, Onboard VGA. Default setting is <b>Controlled by OS</b> .

### 5-2-14 Power Restore Configuration

	and the second state of th
Power Restore [Last State] Power restore needs to wait for BMC to be ready (about 1.5 minutes)	Specify what state when power is re-applied after a power failure (G3 state
	++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit

Parameter	Description
Power Restore	Specifies what state when power is re-applied after a power failure (G3 state). Options available: Power Off, Power On, Last State. Default setting is <b>Last State</b> .

### 5-2-15 Intel(R) I350 Gigabit Network Connection

Advanced	Aptio Setup — AMI	
▶ NIC Configuration		Click to configure the network device port.
Blink LEDs	0	network device port.
UEFI Driver	Intel(R) PRO/1000 Open Source 9.2.06 PCI-E	
Adapter PBA	106300-000	
Device Name	Intel(R) I350 Gigabit Network Connection	
Chip Type	Intel i350	
PCI Device ID	1521	
PCI Address	05:00:00	
Link Status	[Disconnected]	↔: Select Screen †↓: Select Item
MAC Address	00:A0:C9:00:00:00	Enter: Select
Virtual MAC Address	00:00:00:00:00:00	+/-: Change Opt.
		F1: General Help
		F3: Previous Values
		F9: Optimized Defaults
		F10: Save & Exit
		ESC: Exit
Ve	rsion 2.22.1282 Copyright (C) 2022	AMI

Advanced	Aptio Setup - AMI	
Link Speed Wake On LAN	[Auto Negotiated] [Enabled]	Specifies the port speed used for the selected boot protocol.
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
	Version 2.22.1282 Copyright (C) 2022	

Parameter	Description
NIC Configuration	<ul> <li>Press [Enter] to configure advanced items.</li> <li>Link Speed <ul> <li>Allows for automatic link speed adjustment.</li> <li>Options available: Auto Negotiated, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, 100 Mbps Full. Default setting is Auto Negotiated.</li> </ul> </li> <li>Wake On LAN <ul> <li>Enables power on of the system via LAN. Note that configuring Wake on LAN in the operating system does not change the value of this setting, but does override the behavior of Wake on LAN in OS controlled power states.</li> <li>Options available: Enabled, Disabled. Default setting is Enabled.</li> </ul> </li> </ul>
Blink LEDs	Identifies the physical network port by blinking the associated LED. Press the numeric keys to adjust desired values (up to 15 seconds).
UEFI Driver	Displays the technical specifications for the Network Interface Controller.
Adapter PBA	Displays the technical specifications for the Network Interface Controller.
Device Name	Displays the technical specifications for the Network Interface Controller.
Chip Type	Displays the technical specifications for the Network Interface Controller.
PCI Device ID	Displays the technical specifications for the Network Interface Controller.
PCI Address	Displays the technical specifications for the Network Interface Controller.
Link Status	Displays the technical specifications for the Network Interface Controller.
MAC Address	Displays the technical specifications for the Network Interface Controller.
Virtual MAC Address	Displays the technical specifications for the Network Interface Controller.

#### 5-2-16 MAC IPv4 Network Configuration



Parameter	Description
Configured	Indicates whether network address is configured successfully or not.
	Options available: Enabled, Disabled. Default setting is <b>Disabled.</b>
Enable DHCP <sup>(Note)</sup>	Options available: Enabled, Disabled. Default setting is <b>Enabled.</b>
Local IP Address <sup>(Note)</sup>	Press [Enter] to configure local IP address.
Local NetMask <sup>(Note)</sup>	Press [Enter] to configure local NetMask.
Local Gateway <sup>(Note)</sup>	Press [Enter] to configure local Gateway
Local DNS Servers <sup>(Note)</sup>	Press [Enter] to configure local DNS servers
Save Changes and Exit	Press [Enter] to save all configurations.

### 5-2-17 MAC IPv6 Network Configuration

Interface Name		eth0	The 64 bit alternative
Interface Type	-	Ethernet	interface ID for the
	-	08-C0-EB-19-12-34	device. The string is
lost addresses		00 00 28 19 12 04	colon separated. e.g.
1031 4441 5353		FE80::AC0:EBFF:FE19:1234/64	ff:dd:88:66:cc:1:2:3
Route Table		1200.000.2011.1219.1204/04	111001001001001001001
Nouce Table		FE80::/64 >>::	
Gateway addresse	is :		
DNS addresses			
Interface ID		A:C0:EB:FF:FE:19:12:34	
DAD Transmit Cou	int	1	
Policy		[automatic]	
Save Changes and	I Exit		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F3: Optimized Defaults F10: Save & Exit ESC: Exit

Parameter	Description
Enter Configuration Menu	<ul> <li>Press [Enter] to configure advanced items.</li> <li>Displays the MAC Address information.</li> <li>Interface ID <ul> <li>The 64 bit alternative interface ID for the device. The string is colon separated. e.g. ff:dd:88:66:cc:1:2:3.</li> </ul> </li> <li>DAD Transmit Count <ul> <li>The number of consecutive Neighbor solicitation messages sent while performing Duplicate Address Detection on a tentative address. A value of zero indicates that Duplicate Address Detection is not performed.</li> </ul> </li> <li>Policy <ul> <li>Options available: automatic, manual. Default setting is <b>automatic</b>.</li> </ul> </li> <li>Save Changes and Exit <ul> <li>Press [Enter] to save all configurations.</li> </ul> </li> </ul>

#### 5-2-18 Driver Health

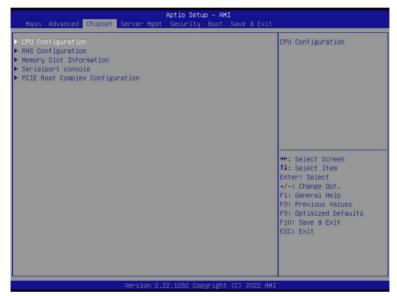
Advanced	Aptio Setup - AMI	
▶ Intel(R) PR0/10 ▶ AVAGO EFI SAS D	000 Open Source 9.2.06 PCI-E Healthy priver Healthy	Provides Health Status for the Drivers/Controllers
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save &amp; Exit ESC: Exit</pre>
	Version 2.22.1282 Copyright (C)	2022 AMI
ameter	Description	

Driver Health

Displays health status of the drivers/controllers if installed.

# 5-3 Chipset Setup Menu

Chipset Setup menu displays submenu options for configuring the function of North Bridge. Select a submenu item, then press <Enter> to access the related submenu screen.



Parameter	Description
CPU Configuration	Press [Enter] for configuration of advanced items.
Memory Slot Information	Press [Enter] for configuration of advanced items.
RAS Configuration	Press [Enter] for configuration of advanced items.
Serialport console	Press [Enter] for configuration of advanced items.
PCIE Root Complex Configuration	Press [Enter] for configuration of advanced items.

## 5-3-1 CPU Configuration

CPU Configuration			Control Link Speed for
Number of processors enabled	2		Inter Socket Connection
Number of cores enabled	256		
Inter Socket Connection: Link 0	Concernation of the second s	Speed 25 GT/s	
Inter Socket Connection: Link 1		Speed 25 GT/s	
Inter Socket Connection Speed	[Default]	Specia ES arro	
Configured			
Enable number of cores	[Default]		
ARM ERRATA 1542419 workaround	[Disable I-C	ache coherency]	
ANC mode	[Monolithic]		
Near atomic	[Enabled]		
SLC Replacement Policy	[Enhanced Le	ast Recently	
	Used]		↔+: Select Screen
L1/L2 Prefetch	[Enabled]		↑↓: Select Item
SLC as L3\$	[Disabled]		Enter: Select
			+/-: Change Opt.
	Socket 0		F1: General Help
L1C I/D	64 KB		F3: Previous Values
L2C		1 MB	F9: Optimized Defaults
SLC		16 MB	F10: Save & Exit
Warranty	1	1	ESC: Exit

Parameter	Description
CPU Configuration	
Number of processors/cores enabled	Displays the number of installed processor information.
Inter Socket Connection: Link0/1	Displays the Inter socket connection information.
Inter Socket Connection Speed Configured	Controls Link speed for Inter socket connection. Options available: Default, 16GT/s, 20GT/s, 25GT/s. Default setting is <b>Default.</b>
Enable number of cores	Enable number of cores for the system. Default setting is <b>Default</b> .
ARM ERRATA 1542419 workaround	Options available: Disable I-Cache coherency, Software solution, Disable. Default setting is <b>Disable I-Cache coherency.</b>
ANC mode	Options available: Monolithic, Hemisphere, Quadrant. Default setting is <b>Monolithic.</b>
Near atomic	Enable/Disable cacheable atomic instruction executed near in CPU. Options available: Enabled, Disabled. Default setting is <b>Enabled.</b>
SLC Replacement Policy	Options available: Enhanced Least Recently Used, Linear-Feedback Shift Register. Default setting is <b>Enhanced Least Recently Used.</b>

Parameter	Description
L1/L2 Prefetch	Enable/Disable L1/L2 Prefetch for each core. Options available: Enabled, Disabled. Default setting is <b>Enabled.</b>
SLC as L3\$	Enable/Disable PPTT to indicate SLC as L3\$. This is limited to only 1P Monolithic mode. Options available: Enabled, Disabled. Default setting is <b>Disabled.</b>
L1C I/D L2C SLC Warrenty	Displays the technical specifications for the installed processor

## 5-3-2 RAS Configuration

RAS Configuration		Enable hardware EINJ
		support, if disabled EINJ
DRAM EINJ No Trigger	[Disabled]	is software simulated
Enable AGDI	[Disabled]	
PCIe AER Firmware First	[Disabled]	
Processor OS-first	[Disabled]	
DDR CE Threshold	1	
2P CE Threshold	1	
Processor CE Threshold	1	
DDR Link Error Threshold	2	
		11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit

Parameter	Description
RAS Configuration	
Hardware EINJ	Options available: Disabled, Enabled. Default setting is <b>Disabled.</b>
DRAM EINJ No Trigger	Options available: Disabled, Enabled. Default setting is <b>Disabled.</b>
Enable AGDI	Options available: Disabled, Enabled. Default setting is <b>Disabled.</b>
PCIe AER Firmware First	Options available: Disabled, Enabled. Default setting is <b>Disabled.</b>
Processor OS-first	Options available: Disabled, Enabled. Default setting is <b>Disabled.</b>
DDR CE Threshold	Press '+" or "-" to configure the threshold.
2P CE Threshold	Press '+" or "-" to configure the threshold.
Processor CE Threshold	Press '+" or "-" to configure the threshold.
DDR Link Error Threshold	Press '+" or "-" to configure the threshold.

## 5-3-3 Memory Slot Information

Chipset	Aptio Setup — AMI	
Memory Configuration Total Memory Effective Memory Memory Speed Memory Operating Speed Selection Enable Slave 32bit memory region Fine Granularity Refresh (FGR) Memory RAS and Performance Configur NVDIMM-N Configuration DIMM Information DIMM_FO_A0: 16 GB RDIMM Installed DIMM_PO_A1: 16 GB RDIMM Installed	512 GB 510 GB 3200 MHz [Auto] [Disabled] [1x]	Force specific Memory Operating Speed or use Auto setting.
DIMM_PO_B0: 16 GB RDIMM Installed DIMM_PO_B1: 16 GB RDIMM Installed DIMM_PO_C0: 16 GB RDIMM Installed DIMM_PO_C0: 16 GB RDIMM Installed DIMM_PO_D1: 16 GB RDIMM Installed DIMM_PO_E0: 16 GB RDIMM Installed DIMM_PO_E0: 16 GB RDIMM Installed DIMM_PO_F1: 16 GB RDIMM Installed DIMM_PO_F1: 16 GB RDIMM Installed DIMM_PO_G1: 16 GB RDIMM Installed DIMM_PO_G1: 16 GB RDIMM Installed DIMM_PO_G1: 16 GB RDIMM Installed DIMM_PO_H0: 16 GB RDIMM Installed		<pre>+: Select Screen 14: Select Item Enter: Select +/-: Change Opt, F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save &amp; Exit ESC: Exit</pre>

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Aptio Setup - AMI Chioset	
DIMM_P0_D1: 16 GB RDIMM Installed	
DIMM_PO_EO: 16 GB RDIMM Installed	
DIMM_PO_E1: 16 GB RDIMM Installed	
DIMM_PO_FO: 16 GB RDIMM Installed	
DIMM_P0_F1: 16 GB RDIMM Installed	
DIMM_P0_G0: 16 GB RDIMM Installed	
DIMM_P0_G1: 16 GB RDIMM Installed	
DIMM_P0_H0: 16 GB RDIMM Installed	
DIMM_PO_H1: 16 GB RDIMM Installed	
DIMM_P1_IO: 16 GB RDIMM Installed	
DIMM_P1_I1: 16 GB RDIMM Installed	
DIMM_P1_JO: 16 GB RDIMM Installed	
DIMM_P1_J1: 16 GB RDIMM Installed	
DIMM_P1_K0: 16 GB RDIMM Installed	++: Select Screen
DIMM_P1_K1: 16 GB RDIMM Installed	14: Select Item
DIMM_P1_LO: 16 GB RDIMM Installed	Enter: Select
DIMM_P1_L1: 16 GB RDIMM Installed	+/-: Change Opt.
DIMM_P1_M0: 16 GB RDIMM Installed DIMM_P1_M1: 16 GB RDIMM Installed	F1: General Help
DIMM_P1_MI: 16 GB RDIMM INStalled DIMM_P1_NO: 16 GB RDIMM Installed	F3: Previous Values F9: Optimized Defaults
DIMM_F1_N0. 16 GB RDIMM Installed	F10: Save & Exit
DIMM_P1_O0: 16 GB RDIMM Installed	ESC: Exit
DIMM_F1_00: 16 GB RDIMM Installed	COO. LAIT
DIMM_P1_01. 16 GB RDIMM Installed	
DIMM_P1_P1: 16 GB RDIMM Installed	
VING LETT TO US NOTIFI INCUITED	
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Parameter	Description
Memory Configuration	
Total Memory/ Effective Memory/ Memory Speed	Displays the technical specifications for the installed memory module.
Memory Operating Speed Selection	Options available: Auto, 2133, 2400, 2666, 2933, 3200. Default setting is Auto.
Enable Slave 32bit memory region	Options available: Disabled, Enabled. Default setting is <b>Disabled</b> .
Fine Granularity Refresh (FGR)	Options available: 1x, 2x, 4x. Default setting is <b>1x.</b>
Memory RAS and Performance Configuration	<ul> <li>Press [Enter] to configure advanced items.</li> <li>ECC mode <ul> <li>Options available: Auto, Disabled, SECDED, Symbol. Default setting is Auto.</li> </ul> </li> <li>Defer uncorrectable read errors <ul> <li>Options available: Disabled, Enabled. Default setting is Enabled.</li> </ul> </li> <li>Fault handling interrupt <ul> <li>Options available: Disabled, Enabled. Default setting is Enabled.</li> </ul> </li> <li>Scrub Patrol duration (hour) <ul> <li>Options available: Disabled, I, 24. Default setting is 24.</li> </ul> </li> <li>Demand scrub <ul> <li>Options available: Disabled, Enabled. Default setting is Enabled.</li> </ul> </li> <li>Write CRC <ul> <li>Options available: Disabled, Enabled. Default setting is Disabled.</li> </ul> </li> <li>CVE-2020-10255 mitigation <ul> <li>Options available: Disabled, Enabled. Default setting is Disabled.</li> </ul> </li> </ul>
NVDIMM-N Configuration	<ul> <li>Press [Enter] to configure advanced items.</li> <li>Socket0/1 Configured Mode</li> <li>Mode Selection <ul> <li>Options available: Non-NVDIMM, Non-Hashed, Hashed, Auto.</li> <li>Default setting is Auto.</li> </ul> </li> </ul>
DIMM Information	Displays installed DIMM information.

### 5-3-4 Serialport console

Aptio Setup - AMI Chipset		
Serialport console		To Enable or Disable the Console Redirection for
		UARTO
Serialport console for UART2	[Enabled]	
		→+: Select Screen ↑↓: Select Item Enter: Select
		+/-: Change Opt. F1: General Help F3: Previous Values
		F9: Optimized Defaults F10: Save & Exit ESC: Exit
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Parameter	Description
Serialport console	
Serialport console for UART0 (COM1/SOL)	Options available: Disabled, Enabled. Default setting is <b>Enabled.</b>
Serialport console for UART2	Options available: Disabled, Enabled. Default setting is <b>Enabled.</b>

#### 5-3-5 PCIE Root Complex Configuration

PCIE Root Complex Configuration	1	Configure PCIe Lanes
		Bifurcation Mode
SMMU Pmu	[Disabled]	Default: Adjust according
On-board VGA	[Enabled]	to system settings. Manual: Adjust according
▶ Root Complex # 0 (CCIX)		to user settings.
Root Complex # 1 (CCIX)		
Root Complex # 2 (OCP1)		
Root Complex # 3 (SLOT_1)		
Root Complex # 4 (MCIO_PO_2, MCIO_PO_2, M	CIO_PO_3)	
Root Complex # 5 (SLOT_2)		
Root Complex # 6 (VGA/USB, M2/I	.AN)	
Root Complex # 7 (MCIO_PO_1, M	CIO_PO_O)	
Root Complex # 8 (CCIX)		++: Select Screen
Root Complex # 9 (CCIX)		↑↓: Select Item
Root Complex #10 (SLOT_4)		Enter: Select
Root Complex #11 (OCP2)		+/-: Change Opt.
<ul> <li>Root Complex #12 (SATA/MCIO_P1)</li> </ul>	_22, MCIO_P1_3)	F1: General Help
Root Complex #13 (SLOT_3)		F3: Previous Values
Root Complex #14 (MCIO_P1_5, MCIO_P1_5, M		F9: Optimized Defaults
Root Complex #15 (MCIO_P1_1, MCIO_P1_1, MCIO_P1_1)	CIO_P1_0)	F10: Save & Exit
		ESC: Exit

Parameter	Description
PCIE Root Complex Configuration	
PCIe Lanes Bifurcation Mode	Options available: Manual, Default. Default setting is Default.
SMMU Pmu	Options available: Disabled, Enabled. Default setting is Disabled.
On-board VGA	Options available: Disabled, Enabled. Default setting is Enabled.
Root Complex #(Note)	Press [Enter] to view advanced items.

(Note) This item is configurable when PCIe Lanes Bifurcation Mode is set to Manual.

# 5-4 Server Management Menu

Main Advanced Chipset Ser	Aptio Setup – AMI ver Mgmt Security Boot Sa	ave & Exit
BMC Self Test Status BMC Device ID BMC Device Revision BMC Firmware Revision IFMI Version BMC Interface(s) BMC Support System Event Log BMC self test log View FML information	PASSED 32 1 13.03.08 2.0 SSIF [Enabled]	Enable/Disable interfaces to communicate with BMC
▶ BMC network configuration		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F3: Optimized Defaults F10: Save & Exit ESC: Exit
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Parameter	Description
BMC Self Test Status/ BMC Device ID/ BMC Device Revision/ BMC Firmware Revision/ IPMI Version/ BMC Interface(s)	Displays the technical specification of the BMC controller.
BMC Support	Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .
System Event Log	Press [Enter] to configure advanced items.
Bmc self test log	Press [Enter] to configure advanced items.
View FRU Information	Press [Enter] to view the FRU information.
BMC network configuration	Press [Enter] to configure advanced items.

## 5-4-1 System Event Log

Enabling/Disabling Options		Change this to enable or
		disable event logging for
Erasing Settings		error/progress codes during boot.
Enase SEL	[No]	during boot.
When SEL is Full	[Do Nothing]	
Custom EFI Logging Options	[Error_code]	
Log EFI Status Codes	[Ennon Code]	
NOTE: All values changed here d	lo not take	
effect until computer is		
		++: Select Screen
		11: Select Item
		Enter: Select
		TENTER: SETECT
		+/-: Change Opt.
		+/−: Change Opt. F1: General Help
		+/-: Change Opt. F1: General Help F3: Previous Values
		+/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults
		+/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit
		+/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults
		+/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit

Parameter	Description
Enabling / Disabling Options	
SEL Components	Change this item to enable or disable all features of System Event Logging during boot. Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .
Erasing Settings	
Erase SEL	Choose options for erasing SEL. Options available: No/Yes, On next reset/Yes, On every reset. Default setting is <b>No</b> .
When SEL is Full	Choose options for reactions to a full SEL. Options available: Do Nothing, Erase Immediately, Delete Oldest Record. Default setting is <b>Do Nothing</b> .
Custom EFI Logging Options	
Log EFI Status Codes	Enable/Disable the logging of EFI Status Codes (if not already converted to legacy). Options available: Disabled, Both, Error code, Progress code. Default setting is <b>Error code</b> .

#### 5-4-2 Bmc self test log



Parameter	Description
Log area usage = 00 out of 20 logs	
Erase Log	Options available: Yes, On every reset/ No. Default setting is No.
When log is full	Options available: Clear Log, Do not log any more. Default setting is <b>Do</b> not log any more.

#### 5-4-3 View FRU Information

The FRU page is a simple display page for basic system ID information, as well as System product information. Items on this window are non-configurable.

FRU Information         System Manufacturer       GIGABYTE         System Product Name       R182-P91-00         System Serial Number       R182P91         Board Monufacturer       GIGABYTE         Board Product Name       MP92-FS0-00         Board Serial Number       0123456789AB         Board Serial Number       01234567890123456789AB         Chassis Version       01234567         Chassis Serial Number       R182P91         NOTE:No FRU information for fields indicate       #*: Select Screen         Information needs to be filled by 0.E.M       #*: Select Item         Enter: Select Item       File General Help         F3: Previous Values       F9: Optimized Defaults         F0: Save & Exit       ESC: Exit	Serv	Aptio Setup – AMI er Mgmt	
System Product Name       R182-P91-00         System Serial Number       R182P91         Board Manufacturer       GIGABVTE         Board Version       123456789AB         Board Serial Number       0123456780123456789AB         Chassis Wersion       012345677         Chassis Version       01234567         NOTE:No FRU information for fields indicate       #*: Select Screen         information needs to be filled by 0.E.M       #: Select Item         Enter: Select       +/-: Change Opt.         F1: General Help       F3: Previous Values         F3: Previous Values       F9: Optimized Defaults	FRU Information		
Information needs to be filled by O.E.M Enter: Select tem Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit	System Product Name System Serial Number Board Manufacturer Board Product Name Board Version Board Serial Number Chassis Manufacturer Chassis Version	R182-P91-00 R182P91 GIGABYTE MP32-FS0-00 123456789AB 0123456780123456789AB GIGABYTE 01234567	
	NOTE:No FRU information for fields indicate		14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit

## 5-4-4 BMC Network Configuration

BMC network configuration		Select to configure LAN channel parameters
Lan channel 1		statically or
		dynamically(by BIOS or
Station IP address	10.1.27.53	BMC). Unspecified option
Subnet mask	255.255.255.0	will not modify any BMC
Router IP address	10.1.27.253	network parameters during
Station MAC address	B4-2E-99-AF-F7-F6	BIOS phase
Real-time get BMC network addres	s	
xololololololololololololololololololok		
Configure IPv6 support		
жнононоконсконсконсконсконсконсконсконско		++: Select Screen
		↑↓: Select Item
Lan channel 1		Enter: Select
		+/-: Change Opt.
IPv6 Support	[Disabled]	F1: General Help F3: Previous Values
IPv6 Support is Disabled		F9: Optimized Defaults
IFV6 Support IS DISabled		F10: Save & Exit
		ESC: Exit
		LOOT LALC

Parameter	Description
BMC network configuration	
Lan Channel 1	
Configuration Address source	Selects to configure LAN channel parameters statically or dynamically (DHCP). Do nothing option will not modify any BMC network parameters during BIOS phase. Options available: Unspecified, Static, DynamicBmcDhcp. Default setting is <b>DynamicBmcDhcp</b> .
Station IP address	Displays IP Address information.
Subnet mask	Displays Subnet Mask information. Please note that the IP address must be in three digitals, for example, 192.168.000.001.
Router IP address	Displays the Router IP Address information.
Station MAC address	Displays the MAC Address information.
Real-time get BMC network address	Press [Enter] to synchronize the BMC network address.
IPv6 Support	Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .

## 5-5 Security Menu

The Security menu allows you to safeguard and protect the system from unauthorized use by setting up access passwords.

Main Advanced Chipse	Aptio Setup – AMI t Server Mgmt <mark>Security</mark> Boot Sav	e & Exit
Password Description		Set Administrator Password
If ONLY the Administrat then this only limits a only asked for when ent If ONLY the User's pass is a power on password boot or enter Setup. In have Administrator righ The password length mus in the following range: Minimum length	ccess to Setup and is ering Setup. word is set, then this and must be entered to Setup the User will ts.	
Maximum length Administrator Password User Password	20	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt.</pre>
▶ Media Sanitization ▶ Secure Boot		F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
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There are two types of passwords that you can set:

Administrator Password

Entering this password will allow the user to access and change all settings in the Setup Utility.

User Password

Entering this password will restrict a user's access to the Setup menus. To enable or disable this field, a Administrator Password must first be set. A user can only access and modify the System Time, System Date, and Set User Password fields.

Parameter	Description
Administrator Password	Press [Enter] to configure the administrator password.
User Password	Press [Enter] to configure the user password.
Media Sanitization	Press [Enter] to configure advanced items.
Secure Boot	Press [Enter] to configure advanced items.

## 5-5-1 Media Sanitization

Media Sanitization	Select the drive need to be sanitized
WD_BLACK SN750 SE 500GB	Clear: applies logical
WD BLACK SN750 SE 500GB	techniques to sanitize
WD_BLACK SN750 SE 500GB	data in all
WD_BLACK SN750 SE 500GB	user-addressable storage
SAMSUNG MZQL2960HCJR-00A07	locations through the
SAMSUNG MZQL2960HCJR-00A07	standard Read and Write
SAMSUNG MZ1LB960HAJQ-00007	commands to the storage
SAMSUNG MZQL2960HCJR-00A07	device
SAMSUNG MZQL2960HCJR-00A07	Purge: applies physical or
SAMSUNG MZQL2960HCJR-00A07	
SAMSUNG MZQL2960HCJR-00A07	
Kingmax PCIe SSD 1TB	++: Select Screen
Samsung SSD 980 PRO 500GB	↑↓: Select Item
WD_BLACK SN750 SE 500GB	Enter: Select
Samsung SSD 980 PRO 500GB	+/−: Change Opt.
SAMSUNG MZQL2960HCJR-00A07	F1: General Help
SAMSUNG MZQL2960HCJR-00A07	F3: Previous Values
SAMSUNG MZQL2960HCJR-00A07 SAMSUNG MZQL2960HCJR-00A07	F9: Optimized Defaults F10: Save & Exit
SAMSUNG MZQL2960HCJR-00A07	ESC: Exit
SAMSUNG MZQL2960HCJR-00A07	CSC. EXIC

Parameter	Description
Media Santitization	<ul> <li>Select the drive need to be sanitized.</li> <li>Device Name</li> <li>Method Type <ul> <li>Options available: Clear, Purge. Default setting is Clear.</li> </ul> </li> <li>Start This Device Sanitization <ul> <li>Start sanitizating this device with setup configsuraiton.</li> </ul> </li> </ul>

#### 5-5-2 Secure Boot

The Secure Boot submenu is applicable when your device is installed the Windows® 8 (or above) operating system.

System Mode	User	Secure Boot feature is Active if Secure Boot is
		Enabled,
	Not Active	Platform Key(PK) is enrolled and the System i
Secure Boot Mode	[Custom]	in User mode.
Restore Factory Keys		The mode change requires
Reset To Setup Mode		platform reset
Key Management		
		++: Select Screen
		↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help F3: Previous Values
		F9: Optimized Defaults
		F10: Save & Exit
		ESC: Exit
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Parameter	Description
System Mode	Displays if the system is in User mode or Setup mode.
Secure Boot	Enable/ Disable the Secure Boot function. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
Secure Boot Mode <sup>(Note)</sup>	Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates. This way, the system knows all files being loaded before Windows loads to the login screen have not been tampered with. When set to Standard, it will automatically load the Secure Boot keys form the BIOS databases. When set to Custom, you can customize the Secure Boot settings and manually load its keys from the BIOS database. Options available: Standard, Custom. Default setting is <b>Standard</b> .
Restore Factory Keys	Forces the system to user mode and installs factory default Secure Boot key database.
Reset To Setup Mode	Press [Enter] to reset the system mode to Setup mode.

(Note) Advanced items prompt when this item is set to Custom.

Parameter	Description
Key Management	<ul> <li>Press [Enter] to configure advanced items.</li> <li>Please note that this item is configurable when Secure Boot Mode is set to Custom.</li> <li>Factory Key Provision <ul> <li>Allows to provision factory default Secure Boot keys when system is in Setup Mode.</li> <li>Options available: Enabled, Disabled. Default setting is Disabled.</li> </ul> </li> <li>Restore Factory Keys <ul> <li>Installs all factory default keys. It will force the system in User Mode.</li> <li>Options available: Yes, No.</li> </ul> </li> <li>Reset the system mode to Setup mode. <ul> <li>Export Secure Boot variables</li> <li>Export Secure Boot Variables</li> <li>Enroll Efi Image</li> <li>Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db).</li> </ul> </li> <li>Device Guard Ready</li> <li>Remove 'UEFI CA' from DB.</li> <li>Restore DB defaults <ul> <li>Displays the current status of the variables used for secure boot.</li> </ul> </li> <li>Platform Key (PK) <ul> <li>Displays the current status of the Variables used for secure boot.</li> </ul> </li> <li>Platform Key (PK) <ul> <li>Displays the current status of the Key Exchange Key Database (KEK).</li> <li>Press [Enter] to configure a new PK.</li> <li>Options available: Update.</li> </ul> </li> <li>Key Exchange Keys (KEK) <ul> <li>Displays the current status of the Key Exchange Key Database (KEK).</li> <li>Press [Enter] to configure a new KEK or load additional KEK from storage devices.</li> <li>Options available: Update, Append.</li> </ul> </li> <li>Authorized Signatures (DB) <ul> <li>Displays the current status of the Authorized Signature Database.</li> <li>Press [Enter] to configure a new DB or load additional DB from storage devices.</li> <li>Options available: Update, Append.</li> </ul> </li> <li>Forbidden Signatures (DBX) <ul> <li>Displays the current status of the Forbidden Signature Database.</li> <li>Press [Enter] to configure a new DB or load additional DB from storage devices.</li> <li>Options available: Update, Append.</li> </ul> </li> </ul>

Parameter	Description
Key Management (continued)	<ul> <li>Authorized TimeStamps (DBT)         <ul> <li>Displays the current status of the Authorized TimeStamps Database.</li> <li>Press [Enter] to configure a new DBT or load additional DBT from storage devices.</li> <li>Options available: Update, Append.</li> </ul> </li> <li>OsRecovery Signatures         <ul> <li>Displays the current status of the OsRecovery Signature Database.</li> <li>Press [Enter] to configure a new OsRecovery Signature or load additional OsRecovery Signature from storage devices.</li> <li>Options available: Update, Append.</li> </ul> </li> </ul>

## 5-6 Boot Menu

The Boot menu allows you to set the drive priority during system boot-up. BIOS setup will display an error message if the legacy drive(s) specified is not bootable.

Main Advanced Chipset Server Mgm	Aptio Setup – AMI t Security <mark>Boot</mark> Save & Exit	
Boot Configuration Setup Prompt Timeout Bootup NumLock State Quiet Boot	5 [On] [Enabled]	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Dump full Setup Data Dump non-default Setup Data Restore Setup Data		
New UEFI OS Boot Option Policy	[Place First]	
FIXED BOOT ORDER Priorities		
Boot Option #1	[Hard Disk:CentOS (SAMSUNG MZQL2960HCJR-00A07)]	++: Select Screen
Boot Option #2	[CD/DVD]	↑↓: Select Item
Boot Option #3	[USB Device]	Enter: Select
Boot Option #4	[Network:UEFI: PXE IPv4 Intel(R) Network 00:A0:C9:00:00:00]	+/−: Change Opt. F1: General Help F3: Previous Values
Boot Option #5	[UEFI AP:UEFI: Built-in EFI Shell]	F9: Optimized Defaults F10: Save & Exit ESC: Exit
▶ UEFI Hard Disk Drive BBS Priorities		
▶ UEFI NETWORK Drive BBS Priorities		
▶ UEFI Application Boot Priorities		

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Parameter	Description
Boot Configuration	
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Press the numeric keys to input the desired values.
Bootup NumLock State	Enable/Disable the Bootup NumLock function. Options available: On, Off. Default setting is <b>On</b> .
Quiet Boot	Enable/Disable showing the logo during POST. Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .
Dump full Setup Data	Press [Enter] to dump full setup data to file.
Dump non-default Setup Data	Press [Enter] to dump non-default setup data to file.
Restore Setup Data	Press [Enter] to restore setup data from file (cJson format).
New UEFI OS Boot Option Policy	Controls the placement of newly detected UEFI boot options. Options available: Default, Place First, Place Last. Default setting is Place First.

Parameter	Description
FIXED BOOT ORDER Priorities	
Boot Option #1 / #2 / #3 / #4 / #5	Press [Enter] to configure the boot priority. By default, the server searches for boot devices in the following sequence: 1. Hard drive. 2. CD-COM/DVD drive. 3. USB device. 4. Network. 5. UEFI.
UEFI Network Drive BBS Priorities	Press [Enter] to configure the boot priority.
UEFI Application Boot Priorities	Press [Enter] to configure the boot priority.

## 5-7 Save & Exit Menu

The Save & Exit menu displays the various options to quit from the BIOS setup. Highlight any of the exit options then press <Enter>.

Aptio Setup – AMI Main Advanced Chipset Server Mgmt Security Boot <mark>Save &amp; Exit</mark>	
	Exit system setup after saving the changes.
Default Options Restore Defaults Save as User Defaults Restore User Defaults Boot Overnide CentOS Linux (SAMSUNG M2QL2960HCJR-00A07) ubuntu (Kingmax PCIe SSD 1TB) CentOS (SAMSUNG M2LB960HAJQ-0007) UEFI: PXE IPV4 Intel(R) Network 00:A0:C9:00:00:00 UEFI: PXE IPV4 Intel(R) Network 00:A0:C9:00:00:01	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save &amp; Exit ESC: Exit</pre>

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Parameter	Description
Save Options	
Save Changes and Exit	Saves changes made and closes the BIOS setup. Options available: Yes, No.
Discard Changes and Exit	Discards changes made and exits the BIOS setup. Options available: Yes, No.
Save Changes and Reset	Restarts the system after saving the changes made. Options available: Yes, No.
Discard Changes and Reset	Restarts the system without saving the changes made. Options available: Yes, No.
Save Changes	Saves changes done so far to any of the setup options. Options available: Yes, No.
Discard Changes	Options available: Yes, No.
Default Options	

Parameter	Description
Restore Defaults	Loads the default settings for all BIOS setup parameters. Setup Defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system might not function properly. Options available: Yes, No.
Save as User Defaults	Press [Enter] to save changes as the user defaults without exit BIOS setup.
Restore User Defaults	Press [Enter] to restore the user defaults .
Boot Override	Press [Enter] to configure the device as the boot-up drive.
Launch EFI Shell from filesystem device	Attempts to Launch EFI Shell application (Shell.efi) from one of the available file system devices.

## 5-8 BIOS POST Beep code (AMI standard)

## 5-8-1 PEI Beep Codes

# of Beeps	Description
1	Memory not Installed.
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called
	twice)
2	Recovery started
3	DXEIPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

#### 5-8-2 DXE Beep Codes

# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met