# GIGABYTE<sup>™</sup> MP72-HB0

Ampere® Altra® or Altra® Max ARM Server Motherboard

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 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

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# MP72-HB0 Motherboard Layout



Item	Code	Description
1	VGA1	VGA Port
2	SW_ID1	ID Button with LED
3	LAN2	10GbE LAN Port #2
4	LAN1	10GbE LAN Port #1
5	USB3_MLAN1	Server Management LAN Port (Top)/ USB3.0 Ports (Bottom)
6	DEBUG PORT	Debug Port
7	ATX1	2 x 12 Pin Main Power Connector
8	PMBUS1	PMBus Connector
9	P12V_1	2 x 4 Pin 12V Power Connector (for CPU0)
10	P12V_2	2 x 4 Pin 12V Power Connector (for CPU1)
11	CPU0_FAN	CPU0 Fan Connector
12	BAT1	Battery Socket
13	SATA1	Slimline Connector (SATAIII 6Gb/s Signal)
14	SATA3	SATAIII 6Gb/s Connector #3
15	SATA2	SATAIII 6Gb/s Connector #2
16	F_USB2	Front Panel USB 3.0 Connector
17	CPU1_FAN	CPU1 Fan Connector
18	SYS_FAN1	System Fan Connector #1
19	SYS_FAN0	System Fan Connector #0
20	F_USB1	USB 2.0 Header
21	FP_1	Front Panel Header
22	BP_1	HDD Back Plane Board Connector
23	IPMB1	IPMB Connector
24	CON1	TPM Connector
25	PCIE_1	PCIe x16 Slot #1 (Gen4 x8)
26	PCIE_2	PCIe x16 Slot #2 (Gen4 x16)
27	PCIE_3	PCIe x16 Slot #3 (Gen4 x16)
28	NVME_2	Slimline SAS 4i Connector (NVMe/PCle Gen4 x4)
29	NVME_1	Slimline SAS 4i Connector (NVMe/PCIe Gen4 x4)
30	PCIE_4	PCIe x16 Slot #4 (Gen4 x16)
31	P0_M2_SK1	M.2 slot (PCIe Gen4 x4, Support NGFF-2280/22110)
32	LED_BMC1	BMC Firmware Readiness LED

# **Block Diagram**



# Chapter 1 Hardware Installation

# 1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's 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.

Form Factor	<ul> <li>E-ATX</li> <li>305W x 330D (mm)</li> </ul>
CPU	<ul> <li>Ampere® Altra® or Altra® Max Processor</li> <li>Dual processors, 7nm technology, LGA4926</li> <li>Up to 128-core per processor, TDP 250W</li> <li>NOTE:</li> <li>If only 1 CPU is installed, some PCIe or memory functions might be unavailable</li> </ul>
Chipset	System on Chip
Memory	<ul> <li>16 x DIMM slots</li> <li>DDR4 memory supported only</li> <li>8-Channel memory architecture</li> <li>RDIMM modules up to 256GB supported</li> <li>Up to 4TB of memory capacity supported per processor</li> <li>Memory speed: Up to 3200 MHz</li> <li>NOTE: Only supports configurations with 1, 2, 4, 6, 8 DIMMs (1DPC)</li> </ul>
	<ul> <li>2 x 10Gb/s BASE-T LAN ports (Broadcom® BCM57416)</li> <li>1 x 10/100/1000 management LAN</li> </ul>
Onboard Graphics	<ul> <li>Integrated in Aspeed® AST2600</li> <li>2D Video Graphic Adapter with PCIe bus interface</li> <li>1920x1200@60Hz 32bpp, DDR4 SDRAM</li> </ul>
Storage Interface	<ul> <li>2 x 7-pin SATA 6Gb/s ports</li> <li>1 x SlimSAS with 4 x SATA 6Gb/s ports</li> </ul>
Expansion Slots	<ul> <li>Slot_4: 1 x PCle x16 (Gen4 x16 bus) slot, from CPU_0</li> <li>Slot_3: 1 x PCle x16 (Gen4 x16 bus) slot, from CPU_0</li> <li>Slot_2: 1 x PCle x16 (Gen4 x16 bus) slot, from CPU_1</li> <li>Slot_1: 1 x PCle x16 (Gen4 x8 bus) slot, from CPU_0</li> <li>2 x NVMe ports: <ul> <li>SlimSAS 4i type</li> <li>PCle Gen4 x4 per port</li> </ul> </li> <li>1 x M.2 slot: <ul> <li>M-key</li> <li>PCle Gen4 x4 per port</li> </ul> </li> </ul>
	- PCIe Gen4 x4 per slot - Supports NGFF-22110/2280 cards - From CPU_0

Internal I/O	1 x 24-pin ATX main power connector
Connectors	2 x 8-pin ATX 12V power connectors
	2 x SlimSAS connectors
	1 x SlimSAS vertical connector
	2 x 7-pin SATA connectors
	1 x M.2 slots
	1 x HDD back plane board header
	2 x CPU fan headers
	2 x System fan headers
	1 x USB 3.2 Gen1 header
	1 x USB 2.0 Gen1 header
	1 x TPM header
	1 x Front panel header
	1 x PMBus connector
	1 x IPMB connector
	1 x Clear CMOS jumper
	1 x BIOS recovery jumper
	1 x Case open header
Rear I/O	• 2 x USB 3.2 Gen1
Connectors	<ul> <li>1 x VGA</li> </ul>
	<ul> <li>1 x Debug port</li> </ul>
	• 2 x RJ45
	◆ 1 x MLAN
	1 x ID button with LED
ПП трм	1 x TPM header with SPI interface
	Optional TPM2.0 kit: CTM010

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

# 1-3 Installing and Removing 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 in sequential order  $(1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5)$  securing the CPU cover.
- 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.
- Lower and place the fan-sink onto the top of the CPU socket. Then tighten the scews in sequential order (1→2→3→4).
- 7. To remove the CPUs, follow steps 1-5 in reverse order.





# 1-4 Installing and Removing Memory



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.

# 1-4-1 8-Channel Memory Configuration

This motherboard provides 16 DDR4 memory slots and supports 8-Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory.



# 1-4-2 Installing and Removing the Memory Module



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 to this motherboard.

#### Follow these instructions to install a DIMM module:

1. Open the plastic latch of the memory slot, then place the memory module as pre-inserted vertically position.



 Hold it with both hands, insert the memory module into the movable end first, and then insert the memory module into the fixed end.



 Then use both hands to insert the memory module vertically into the DIMM slot and push it down. Close the plastic latch at the edge of the DIMM slots to lock the memory module.



4. Reverse the installation steps when you want to remove the memory module.

# 1-4-3 DIMM Population Table

		DIMM	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	3200	5200	

# 1-4-4 Altra Platform DDR4 Suggest Configuration Table

Memory Q'ty		CPU0							CPU1							
for each CPU	E0	F0	G0	H0	D0	<b>C0</b>	<b>B0</b>	A0	M0	N0	00	<b>P0</b>	LO	К0	JO	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

# 1-5 Installing and Removing the M.2 SSD Module

Follow the steps below to install an optional M.2 SSD module on your motherboard.

Step1. Insert the M.2 SSD module into the slot.

Step2. Secure it with the screw, tightening as necessary to fasten the M.2 SSD module in place.



# 1-6 Back Panel Connectors



#### Debug Port

Connects to USB-DB9 console for debug log.

#### 2 10/100/1000 Server Management LAN Port

The LAN port provides Internet connection with data transfer speeds of 10/100/1000Mbps. This port is the dedicated LAN port for Server Management.

#### **1** USB 3.2 Gen1 Ports

The USB port supports the USB 3.0 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive etc.

#### 10GBASE-T RJ-45 LAN Port #1

The 10 Gigabit Ethernet LAN port provides Internet connection at up to 10 Gbps data rate. See the section below for a description of the states of the LAN port LEDs.

#### 10GBASE-T RJ-45 LAN Port #2

The 10 Gigabit Ethernet LAN port provides Internet connection at up to 10 Gbps data rate. See the section below for a description of the states of the LAN port LEDs.

#### **6** ID button with LED

When the system identification is active, the ID LED on the front/ back panel glows blue.

#### VGA Port

Connects to a monitor device.

Link/Activity LED

#### LAN and ID Button LEDs

#### Speed LED

#### 10GbE LAN LED:



State	Description
Yellow On	5Gbps, 2.5Gbps, 1Gps data rate
Green On	10Gbps data rate
Off	100Mbps data rate

#### ID button/LED:

State	Description
Blue On	System identification is active
Off	System identification is disabled



 When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.

When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

10/100/1000 LAN LED-

Description

1Gbps data rate

100Mbps data rate

10Mbps data rate

State

Off

Yellow On

Green On

# 1-7 Internal Connectors





10)

PMBUS1

Read the following guidelines before connecting external devices:

- · First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.

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• After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

## 1/2/3) ATX1/P12V\_1/P12V\_2 (2x12 Main Power Connector and 2x4 12V Power Connector)

With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation. The 12V power connector mainly supplies power to the CPU. If the 12V power connector is not connected, the computer will not start.



To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.

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#### P12V\_1/ P12V\_2

Pin No.	Definition
1	GND
2	GND
3	GND
4	GND
5	+12V
6	+12V
7	+12V
8	+12V



#### ΑΤΧ

Pin No.	Definition	Pin No.	Definition
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power Good	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	3.3V	24	GND

## 4/5) SATA3/SATA2 (SATA 6Gb/s Connectors)

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s standard. Each SATA connector supports a single SATA device.



1	ſ	7

Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

## 6/7/8/9) CPU0\_FAN/CPU1\_FAN/SYS\_FAN0/SYS\_FAN1 (CPU FAN/System FAN Headers)

The motherboard has two 4-pin CPU fan headers and two 4-pin system fan headers. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.





Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control



Be sure to connect fan cables to the fan headers to prevent your system from overheating. Overheating may result in damage to the system may hang.

These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

#### **10) PMBus Connector**

The Power Management Bus (PMBus) is a variant of the System Management Bus (SMBus) which is targeted at digital management of power supplies.

1

5



Pin No.	Definition
1	PMBus Clock
2	PMBus Data
3	PMBus Alert
4	GND
5	3.3V Sense

# 11/12) F\_USB2/ F\_USB1 (USB 3.0 Connector/ 2.0 Header)

The connector/header conform to USB 2.0/ 3.0 specification. Each USB connector/header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.

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USB 2.0 Header

	Pin No.	Definition	Pin No.	Definition
1 2	1	Power (5V)	6	USB DY+
	2	Power (5V)	7	GND
	3	USB DX-	8	GND
	4	USB DY-	9	No Pin
9 10	5	USB DX+	10	No Connect

#### **USB 3.0 Connector**

	Pin No.	Definition	Pin No.	Definition
1	1	Power	11	IntA_P2_D+
	2	IntA_P1_SSRX-	12	IntA_P2_D-
1	3	IntA_P1_SSRX+	13	GND
	4	GND	14	IntA_P2_SSTX+
10	5	IntA_P1_SSTX-	15	IntA_P2_SSTX-
	6	IntA_P1_SSTX+	16	GND
	7	GND	17	IntA_P2_SSRX+
	8	IntA_P1_D-	18	IntA_P2_SSRX-
	9	IntA_P1_D+	19	Power
	10	NC	20	No Pin

## 13) FP\_1 (Front Panel Header)

Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

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•••

23.24



Pin No.	Definition	Pin No.	Definition
1	Power LED+	2	5V Standby
3	No Pin	4	ID LED+
5	Power LED-	6	ID LED-
7*	HDD LED+	8	System Status LED+
9*	HDD LED-	10	System Status LED-
11	Power Button	12	LAN1 Active LED+
13	GND	14	LAN1 Link LED-
15	Reset Button	16	SMBus Data
17	GND	18	SMBus Clock
19	ID Button	20	Case Open
21	GND	22	LAN2 Actve LED+
23	NMI Switch	24	LAN2 Link LED-

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

## 14) BP\_1 (HDD Backplane Board Header)





Pin No.	Definition	Pin No.	Definition
1	HP_ALERT_L	2	BPMI DIN/OUT
3	GND	4	BPMI DIN/IN
5	BPMI_LOAD	6	GND
7	BPMI_CLK	8	PLD_Program_EN
9	GLED_AMB_N	10	GLED_GRN_N
11	FAN_IRQ_N	12	Reserved
13	BP_SCL	14	GND
15	BP_SDA	16	BP_RST_N
17	SMB_U2_TMP_SCL	18	GND
19	SMB_U2_TMP_SDA	20	I2C_DEV_RST
21	PH_HP_SCL0	22	GND
23	PH_HP_SDA0	24	GND
25	PH_HP_SCL1	26	GND
27	PH_HP_SDA1	28	GND
15	P3V3_AUX	30	P3V3_AUX

## 15) CON1 (Trusted Platform Module Connector)

Trusted Platform Module (TPM) is an international standard for a secure cryptoprocessor, a dedicated microcontroller designed to secure hardware through integrated cryptographic keys.





Pin No.	Definition	Pin No.	Definition
1	Clock	8	NC
2	P_3V3_SOC_S0	9	NC
3	LPC_RST	10	No Pin
4	P_3V3_SOC_S0	11	NC
5	SPI_MISO	12	GND
6	IRQ_SPI	13	SPI_CS_N
7	SPI_MOSI	14	GND

# 16) IPMB (Intelligent Platform Management Bus) Connector

The Intelligent Platform Management Bus Communications Protocol defines a byte-level transport for transferring Intelligent Platform Management Interface Specification (IPMI) messages between intelligent I2C devices.



Pin No.	Definition
1	Clock
2	GND
3	Data
4	VCC

# 17) LED\_BMC1 (BMC Firmware Readiness LED)



State	Description
On	BMC firmware is initial
Blink	BMC firmware is ready
Off	AC loss

# 18) BAT (Battery Socket)

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.





- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- Used batteries must be handled in accordance with local environmental regulations.



# Chapter 2 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 1 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
Execute command or enter the submenu
Main Menu: Exit the BIOS Setup program
Submenus: Exit current submenu
Show descriptions of general help
Restore the previous BIOS settings for the current submenus
Load the Optimized BIOS default settings for the current submenus
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.)

# 2-1 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.

Aptio Setup – AMI Main, Advanced Chipset Server Mgmt Security Boot Save & Exit		
BIOS Information Access Level System Product Name Project Name Project Version Build Date and Time BMC Information	Administrator MP72-HBO-00 MP72-HBO-00 F01 01/25/2022 14:45:13	Memory Slot Information.
BMC Firmware Version Processor Information CPU 0 Brand String CPU 1 Brand String Processor Core	13.02.14 Ampere(R) Altra(R) Processor Q80-30 Ampere(R) Altra(R) Processor Q80-30 80	++: Select Screen 11: Select Item Enter: Select
Processor Speed Memory Information Total Memory Memory Frequency Memory Slot Information	2800 MHz 32GB 3200MHz	+/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
	Version 2.22.1282 Copyright (C) 2022 AMI	

Aptio Setup - AMI Main Advanced Chinset Server Mont Security Boot Save & Exit			
Project Version	F01	Set the Time lise Tab to	
Build Date and Time	01/25/2022 14:45:13	switch between Time elements.	
BMC Information			
BMC Firmware Version	13.02.14		
Processor Information			
CPU O Brand String	Ampere(R) Altra(R)		
CBU 1 Brond String	Processor Q80-30		
CFU I Brand String	Processor Q80-30		
Processor Core	80		
Processor Speed	2800 MHz		
		++: Select Screen	
		T4: Select Item	
Memory Information		Enter: Select	
Total Memory	32GB	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 11/12/2088]		
System Time	[01:57:50]		
L			

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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 <sup>(Note1)</sup>	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.

# 2-2 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 Advanced Chipset Server Mgmt Security Boot Save & Exit		
<ul> <li>Trusted Computing</li> <li>ACPI Settings</li> <li>APEI Configuration</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>IP Configuration</li> <li>NVMe Configuration</li> <li>SATA Configuration</li> </ul>	Provides Health Status for the Drivers∕Controllers	
<ul> <li>Graphic Dutput Configuration</li> <li>Power Restore Configuration</li> <li>Broadcom NetXtreme-E 2Px106BASE-T OCP 3.0 Ethernet - B4:2E:99:AF:F7:B6</li> <li>MAC:B42E99AFF786-IPv4 Network Configuration</li> <li>MAC:B42E99AFF786-IPv6 Network Configuration</li> <li>Broadcom NetXtreme-E 2Px106BASE-T OCP 3.0 Ethernet - B4:2E:99:AF:F7:B7</li> <li>MAC:B42E99AFF787-IPv4 Network Configuration</li> <li>MAC:B42E99AFF787-IPv6 Network Configuration</li> <li>MAC:B42E99AFF787-IPv6 Network Configuration</li> <li>Driver Health</li> </ul>	<pre>++: Select Screen ++: 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		

# 2-2-1 Trusted Computing

Advanced	Aptio Setup – AMI	
Configuration Security Device Support NO Security Device Found	(Enable)	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INTIA interface will not be available.
		<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>
Version 2	.22.1282 Copyright (C) 2022 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> .

# 2-2-2 ACPI Settings

Advanced	Aptio Setup – AMI	
ACPI Settings		Enables or Disables BIOS
Enable ACPI Auto Configuration		nori nuto conriguración.
Enable CPPC Enable DVFS Mode Enable LPI Enable Max Performance	[Enabled] [Disabled] [Enabled] [Enabled]	
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2	.22.1282 Conuright (C) 2022 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> .

# 2-2-3 APEI Configuration

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

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

# 2-2-4 General Watchdog Timer

Advanced	Aptio Setup – AMI	
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 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Vae	cier 2 22 4222 Conuniwht (0)	2000 AVIT

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> .
# 2-2-5 X86 Emulation Configuration

Advanced	Aptio Setup – AMI	
X86 Emulator Configuration		Enable/Disable X86
X86 Emulator Enable		
		++: Select Screen †4: Select Item Enter: Select +/-: Change Opt. F1: General Helo
		F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
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Parameter	Description
X86 Emulator Configuration	
X86 Emulator Enable	Enable/Disable X86 Emulator support.
	Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .

#### 2-2-6 PCI Subsystem Settings



Advanced	Aptio Setup – AMI	
Slot #36 Occupied [Network Controlle Location: S:05h]8:02h]D:00h]F:00h; VID:14E4]DID:1608 Supports: PCIe GENI[X]; GEN2[X]; GEN3[X]; GEN4[]; ARI	n] [X]: HP[]]	Value to be programmed into PCI Latency Timer Register.
PCI Latency Timer PCI-X Latency Timer VGA Palette Snoop PERR# Generation SERR# Generation Disable PCIE Init Disable PCIE DEN 2	[32 PCI Bus Clocks] [64 PCI Bus Clocks] [Disabled] [Enabled] [Disabled] [Disabled]	++: Select Screen
<ul> <li>PCI Express GEN 1 Settings</li> <li>PCI Express GEN 2 Settings</li> </ul>		11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F3: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2	.22.1282 Copyright (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 Enabled.</li> </ul> </li> <li>SERR# Generation <ul> <li>Enable/Disable PCI Device to Generate SERR#.</li> <li>Options available: Disabled, Enabled. Default setting is Enabled.</li> </ul> </li> <li>Disable PCI Init <ul> <li>Disable PCI enit</li> <li>Disable PCI enit</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 PCIe GEN2</li> <li>Disable PCIe GEN2</li> <li>Disable PCIe GEN2</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> </ul>
PCI Express GEN 1 Settings	Press [Enter] to configure advanced items.
PCI Express GEN 2 Settings	Press [Enter] to configure advanced items.

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

Advanced	Aptio Setup – AMI	
PCI Express GEN 1 Settings		Enables or Disables PCI Express Device Relaxed
PCI Express Device Register Settings		Ordering.
Relaxed Ordering		
Extended Tag	[Disabled]	
No Snoop	[Disabled]	
Maximum Payload	[Auto]	
Maximum Read Request	[Auto]	
PCI Express Link Register Settings		
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 cause som	е	+/-: Change Opt.
PCI-E devices to fail!		F1: General Help
		F3: Previous Values
		F9: Optimized Defaults
		F10: Save & Exit
		ESU: 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> .

# 2-2-6-2 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]	sustem 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 Se Compliance SOS Hardware Autonomous Width Hardware Autonomous Speed	ettings [Disabled] [Disabled] [Disabled]	++: Select Screen 14: 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
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> .

# 2-2-7 Info Report Configuration

Advanced	Aptio Setup – AMI	
Info Report Configuration		Post Report Support
Post Report		Endbled/Disubled
Post Report		
Delay Time	[1]	
Erron Massage Report		
Info Error Message	[Enabled]	
		++: Select Screen
		†↓: Select Item
		Enter: Select
		+/-: Change Upt.
		E3: Previous Values
		F9: Optimized Defaults
		F10: Save & Exit
		ESC: Exit
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Parameter	Description
Post Report	
Post Report	Enable/disable post report support.
	Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .
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 Enabled.

# 2-2-8 USB Configuration

Advanced	Aptio Setup – AMI	
USB Configuration		This is a workaround for OSes without YHCI band-off
USB Module Version	27	support. The XHCI ownership change should be
USB Controllers: 1 XHCI		claimed by XHCI driver.
USB Devices: 8 Drives, 1 Keyboard, 1 Mouse,	3 Hubs	
XHCI Hand-off		
USB Mass Storage Driver Support	[Enabled]	
USB hardware delays and time-outs:		
New Observe Devices		++: Select Screen
Mass Storage Devices:		I∔: Select Item Enter: Select
		+/-: Change Opt.
		F1: General Help
		F3: Previous Values
		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> .

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

Advanced	Aptio Setup – AMI	
Network Stack PXE Retry IPv4 PXE Support IPv4 HTTP Support IPv6 HTTP Support IPv6 HTTP Support PXE boot wait time Media detect count	[Enabled] [Disabled] [Enabled] [Disabled] [Disabled] [Disabled] 1 1	Enable/Disable UEFI Network Stack
		<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>
	Version 2.22.1282 Copyright (C) 2	

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 <sup>(Note)</sup>	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.

|--|

### 2-2-10 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> .

# 2-2-11 NVMe Configuration

Advanced	I
NVMe controller and Drive information No NVME Device Found	
	++: Select Screen 14: 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
NVMe controller and Drive information	Displays the NVMe devices connected to the system

# 2-2-12 SATA Configuration

Advanced	Aptio Setup – AMI	
SATA Configuration		4
SATA Controller (S:09 B:02 D:00	F:00)	
Port 0	Not Present	
Port 1	Not Present	
Port 2	Not Present	
Port 3	Not Present	
Port 4	Not Present	
Port 5	Not Present	
Port 6	Not Present	
Port 7	Not Present	
Port 8	Not Present	
Port 9	Not Present	
Port 10	Not Present	++: Select Screen
Port 11	Not Present	↑↓: Select Item
Port 12	Not Present	Enter: Select
Port 13	Not Present	+/-: Change Opt.
Port 14	Not Present	F1: General Help
Port 15	Not Present	F3: Previous Values
Port 16	Not Present	F9: Optimized Defaults
Port 17	Not Present	F10: Save & Exit
Port 18	Not Present	ESC: Exit
Port 19	Not Present	
Port 20	Not Present	
Port 21	Not Present	*
	ion 2 22 1282 Comunidat (8)	2022 AMT
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Parameter	Description
SATA Configuration	Displays the installed HDD devices information. System will automatically detect HDD type.

# 2-2-13 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]	
		<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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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> .

# 2-2-14 Power Restore Configuration

Advanced	Aptio Setup – AMI	
Power Restore Power restore needs to wai (about 1.5 minutes)	[Last State] t for BMC to be ready	Specify what state when power is re-applied after a power failure (GS state). +: Select Screen 1: 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
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> .

### 2-2-15 Broadcom NetXtreme-E 2Px10GBASE-T OCP 3.0 Ethernet

Advanced	Aptio Setup — AMI	
<ul> <li>Firmware Image Menu</li> <li>Device Configuration Menu</li> <li>MGA Configuration Menu</li> <li>BISCSI Boot Configuration Menu</li> <li>Blink LEDS</li> <li>Link Status</li> <li>Physical Link Speed</li> <li>Chip Type</li> <li>PCI Device ID</li> <li>Bus:Device:Function</li> <li>Permanent MAC Address</li> <li>Virtual MAC Address</li> <li>Restore Defaults</li> </ul>	0 [Disconnected] None BCM57416 B1 16D8 61:00:00 B4:2E:99:DC:CE:81 B4:2E:99:DC:CE:81	Firmware image information. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F9: Optimized Defaults F9: Soft Exit
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Parameter	Description	
Firmware Image Menu	Press [Enter] to view firmware image information.	
Device Configuration Menu	<ul> <li>Press [Enter] to configure advanced items.</li> <li>Multi-Function Mode <ul> <li>Configures the NIC Hardware Mode.</li> <li>Options available: SF, NPAR 1.0. Default setting is SF.</li> </ul> </li> <li>Number of VFs Per PF <ul> <li>Configures the number of Virtual Functions Per Physical Function in multiples of 8 (1-128). This field is only applicable when SR-IOV is enabled.</li> <li>Default setting is 8.</li> </ul> </li> <li>SR-IOV <ul> <li>Enable/Disable Single Root I/O Virtualization.</li> <li>Options available: Enabled, Disabled. Default setting is Disabled.</li> </ul> </li> <li>Number of MSI-X Vectors per VF <ul> <li>Configures the number of MSI-X Vectors per VF (0-128).</li> <li>Default setting is 16.</li> </ul> </li> <li>Maximum Number of PF MSI-X Vectors <ul> <li>Configures the maximum number of PF MSI-X Vectors (0-512 per controller).</li> <li>Default setting is 74</li> </ul> </li> </ul>	

Parameter	Description	
	Energy Efficient Ethernet     Enable/Disable Energy Efficient Ethernet operation.     Options queilable: Enabled Disabled Default activity is <b>Disabled</b>	
	Options available. Enabled, Disabled. Default setting is <b>Disabled</b> .	
	<ul> <li>Operational Link speed</li> <li>Configures the link speed setting to be used as the default link speed for the selected port.</li> <li>Default setting is AutoNeg</li> </ul>	
	Support RDMA	
	<ul> <li>Enable/Disable RDMA support for this port</li> </ul>	
	<ul> <li>Options available: Enabled Disabled Default setting is <b>Disabled</b></li> </ul>	
	DCB Protocol	
	<ul> <li>Enable/Disable DCB protocol.</li> </ul>	
Device Configuration Menu	<ul> <li>Options available: Disabled, Enabled (IEEE only), CEE (only), Both (IEEE preferred with fallback to CEE). Default setting is <b>Disabled</b>.</li> <li>LLDP nearest bridge</li> </ul>	
(continued)	<ul> <li>Enable/Disable LLDP nearest bridge state.</li> </ul>	
	- Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .	
	Default EVB Mode	
	<ul> <li>Configures the default Edge Virtual Bridging mode.</li> </ul>	
	- Options available: VEB, VEPA, None. Default setting is <b>VEB</b> .	
	Enable PME Capability     Enable /Dischla DME Capability support	
	- Enable/Disable PME Capability support.	
	- Options available. Enabled, Disabled. Default setting is Enabled.	
	Ontions available: Enabled Disabled Default setting is <b>Disabled</b>	
	<ul> <li>Live Firmware Upgrade</li> </ul>	
	- Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .	
	Adapter Error Recovery     Options successful Disabled Default actions is <b>Disabled</b>	
	- Options available. Enabled, Disabled. Default setting is <b>Disabled</b> .	
	Option ROM	
	– Enable/Disable Boot Option ROM.	
	<ul> <li>Options available: Enabled, Disabled. Default setting is Enabled.</li> </ul>	
	Legacy Boot Protocol	
	<ul> <li>Selects non-UEFI Boot Protocol: Preboot Execution Environment (PXEViSCS)</li> </ul>	
MBA Configuration Menu	Options available: PXF_iSCSL_NONE_Default setting is PXE	
	Boot Strap Type	
	<ul> <li>Selects the boot strap type. Options available: Auto Detect, BBS,</li> <li>Selects the boot strap type in the select strap type.</li> </ul>	
	Int 18h, Int 19h. Detault setting is Auto Detect.	
	Hide Setup Prompt     Configures whether the Setup Promot is displayed during DOM	
	<ul> <li>configures whether the Setup Prompt is displayed during ROM initialization.</li> </ul>	
	- Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .	

Parameter	Description		
MBA Configuration Menu (continued)	<ul> <li>Setup Key Stroke <ul> <li>Configures key strokes to invoke the configuration menu.</li> <li>Options available: Ctrl-S, Ctrl-B. Default setting is Ctrl-S.</li> </ul> </li> <li>Banner Message Timeout <ul> <li>Selects the timeout value. (0 defaults to 4 seconds, 15 is no delay, 1-14 is timeout value in seconds)</li> <li>Default setting is 5.</li> </ul> </li> <li>Pre-boot Wake On LAN <ul> <li>Configures Pre-boot Wake on LAN (WOL).</li> <li>Options available: Enabled, Disabled. Default setting is Enabled.</li> </ul> </li> <li>VLAN Mode <ul> <li>Configures the virtual LAN (VLAN) mode.</li> <li>Options available: Enabled, Disabled. Default setting is Disabled.</li> </ul> </li> <li>VLAN ID <ul> <li>Configures the VLAN ID (14094).</li> <li>This item is available only when VLAN Mode is Enabled.</li> </ul> </li> <li>Boot Retry Count <ul> <li>Selects the number of boot retries.</li> <li>Options available: No Retry, 1 Retry, 2 Retries, 3 Retries, 4 Retries, 5 Retries, 6 Retries, Indefinite Retries. Default setting is 5 Retries.</li> </ul> </li> </ul>		
iSCSI Boot Configuration Menu	Press [Enter] to configure advanced items.		
Blink LEDs	Identifies the physical network port by blinking the associated LED. Press the numeric keys to adjust desired values.		
Link Status	Specifies the link status of the port.		
Physical Link Speed	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.		
Bus:Device:Function	Displays the technical specifications for the Network Interface Controller.		
Permanent MAC Address	Displays the MAC address of the Ethernet controller.		
Virtual MAC Address	Displays the virtual MAC address of the Ethernet controller.		
Restore Defaults	Resets the adapter to factory defaults.		

# 2-2-15-1 iSCSI Boot Configuration Menu

Aptio Setup - AMI	
Broadcom NetXtreme-E 2Px10GBASE-T OCP 3.0 Ethernet - B4:2E:99:AF:F7:86 > ISOSI General Parameters > ISOSI First Target Parameters > ISOSI Second Target Parameters > Secondary Device	Configure ISCSI general boot parameters.
	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F3: Optimized Defaults F10: Save & Exit ESC: Exit
Vencion 2 22 1282 Conunidat (C) 2022 AMT	

Parameter	Description
	Press [Enter] to configure advanced items.
	TCP/IP Parameters via DHCP
	<ul> <li>Acquires TCP/IP Parameters via DHCP.</li> </ul>
	<ul> <li>Options available: Enabled, Disabled. Default setting is Enabled.</li> </ul>
	IP Autoconfiguration
	<ul> <li>Auto-configures the IP configuration.</li> </ul>
	<ul> <li>Options available: Enabled, Disabled. Default setting is Enabled.</li> </ul>
	<ul> <li>iSCSI Parameters via DHCP</li> </ul>
	<ul> <li>Acquires iSCSI Parameters via DHCP.</li> </ul>
	<ul> <li>Options available: Enabled, Disabled. Default setting is <b>Disabled</b>.</li> </ul>
iSCSI General Parameters	CHAP Authentication
	<ul> <li>Enable/Disable the CHAP authentication.</li> </ul>
	<ul> <li>Options available: Enabled, Disabled. Default setting is <b>Disabled</b>.</li> </ul>
	Boot to iSCSI Target
	<ul> <li>Enable/Disable booting to iSCSI target after log-on.</li> </ul>
	<ul> <li>Options available: Enabled, Disabled, One Time Disabled. Default</li> </ul>
	setting is Enabled.
	DHCP Vendor ID
	<ul> <li>Configures the DHCP vendor ID (up to 32 characters long).</li> </ul>
	Link Up Delay Time
	<ul> <li>Configures the link up delay time in seconds (0-225).</li> </ul>

Parameter	Description
iSCSI General Parameters (continued)	<ul> <li>Use TCP Timestamp         <ul> <li>Enable/Disable the TCP timestamp.</li> <li>Options available: Enabled, Disabled. Default setting is <b>Disabled</b>.</li> </ul> </li> <li>Target as First HDD         <ul> <li>Enable/Disable target appears as first hard disk drive (HDD) in the system.</li> <li>Options available: Enabled, Disabled. Default setting is <b>Disabled</b>.</li> </ul> </li> <li>LUN Busy Retry Count         <ul> <li>Configures the number of retries in 2 second intervals when LUN is busy (0-60).</li> <li>Default setting is <b>0</b>.</li> </ul> </li> <li>IP Version         <ul> <li>Displays the IP version supported. Modifying this parameter will reset all IP-related fields.</li> <li>Options available: IPv4, IPv6. Disabled. Default setting is <b>IPv4</b>.</li> </ul> </li> </ul>
iSCSI Initiator Parameters	<ul> <li>Press [Enter] to configure advanced items.</li> <li>IP Address <ul> <li>Configures the initiator IP address.</li> </ul> </li> <li>Subnet Mask <ul> <li>Configures the IP subnet mask.</li> </ul> </li> <li>Default Gateway <ul> <li>Configures the default gateway IP address.</li> </ul> </li> <li>Primary DNS <ul> <li>Configures the primary DNS IP address.</li> </ul> </li> <li>Secondary DNS <ul> <li>Configures the secondary DNS IP address.</li> </ul> </li> <li>Secondary DNS <ul> <li>Configures the secondary DNS IP address.</li> </ul> </li> <li>Secondary DNS <ul> <li>Configures the secondary DNS IP address.</li> </ul> </li> <li>SCSI Name <ul> <li>Configures the SCSI name.</li> </ul> </li> <li>CHAP ID <ul> <li>Configures the Challenge-Handshake Authentication Protocol (CHAP) ID (up to 128 characters in length).</li> </ul> </li> <li>CHAP Secret <ul> <li>Configure the Challenge-Handshake Authentication Protocol (CHAP) Secret (12 to 16 characters in length).</li> </ul> </li> </ul>
iSCSI First/Second Target Parameters	<ul> <li>Press [Enter] to configure advanced items.</li> <li>Connect <ul> <li>Enable/Disable the target establishment.</li> <li>Options available: Enabled, Disabled. Default setting is <b>Disabled</b>.</li> </ul> </li> <li>IP Address <ul> <li>Configures the Target IP address.</li> </ul> </li> <li>TCP Port <ul> <li>Configures the Target TCP port number (1-65535).</li> </ul> </li> </ul>

Parameter	Description
iSCSI First/Second Target Parameters (continued)	<ul> <li>Boot LUN         <ul> <li>Configures the Target boot LUN number (0-255).</li> <li>iSCSI Name                 <ul></ul></li></ul></li></ul>
Secondary Device	<ul> <li>Press [Enter] to configure advanced items.</li> <li>Secondary Device <ul> <li>Inputs the secondary device MAC address.</li> </ul> </li> <li>Use Independent Target Portal <ul> <li>Use Independent target portal when multipath I/O is enabled.</li> <li>Options available: Enabled, Disabled. Default setting is <b>Disabled</b>.</li> </ul> </li> <li>Use Independent target name when multipath I/O is enabled. <ul> <li>Use Independent target name when multipath I/O is enabled.</li> </ul> </li> </ul>

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

Advanced	Aptio Setup - AMI	
Configured	[Disabled]	Indicate whether network
Save Changes and Exit		successfully or not.
		++: Select Screen f4: 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
Configured	Indicates whether network address is configured successfully or not.
	Options available: Enabled, Disabled. Default setting is Disabled.
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(Note)	Press [Enter] to configure local DNS servers
Save Changes and Exit	Press [Enter] to save all configurations.

# 2-2-17 MAC IPv6 Network Configuration

Advanced		Aptio Setup – AMI	
Havanced Interface Name Interface Type MAC address Host addresses Route Table Gateway addresses Interface ID DAD Transmit Cou Policy Save Changes and	: : : s : : nt Exit	eth0 Ethernet B4-2E-99-AF-F7-B6 FE80::B62E:99FF:FEAF:F786/64 FE80::/64 >>:: B6:2E:99:FF:FE:AF:F7:B6 1 [autometic]	The 64 bit alternative interface ID for the device. The string is colon separated. e.g. ff:dd:88:66:cc:1:2:3
			Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: 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 automatic.</li> </ul> </li> <li>Save Changes and Exit <ul> <li>Press [Enter] to save all configurations.</li> </ul> </li> </ul>

#### 2-2-18 Driver Health

Advance	ed	Aptio Setup — AMI	
<ul> <li>Intel(R) PRO/I</li> <li>AVAGD EFI SAS</li> <li>Broadcom NXE E</li> <li>Broadcom NXE E</li> </ul>	1000 Open Source 9.2.06 F Driver Healthy Sigabit Ethernet Driver Sigabit Ethernet Driver	CI-E Healthy Healthy Healthy 2.1282 Copyright (C) 2022	Provides Health Status for the Drivers/Controllers +*: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F3: Optimized Defaults F10: Save 8 Exit ESC: Exit
ameter	Description		

Driver Health

Displays health status of the drivers/controllers if installed.

# 2-3 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.
RAS Configuration	Press [Enter] for configuration of advanced items.
Memory Slot Information	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.

# 2-3-1 CPU Configuration

ODU Oraș ( invest i an	Control Link Sneed for
Number of processors enabled 2 Number of cores enabled 160 Inter Socket Connection: Link 0 Width Inter Socket Connection: Link 1 Width Inter Socket Connection Speed [Defau Configured Enable number of cores [Defau ARM ERRATA 1542419 workaround [Disab	i / Speed 25 GT/s J-Cache coherency]
ANC mode [Monol Near atomic [Enabl SLC Replacement Policy [Enhan Used] L1/L2 Prefetch [Enabl	t Least Recently ++: Select Screen 11: Select Item Enter: Select
Sock L1C I/D 6 L2C SLC 3 Warranty	0  Socket 1 +/-: Change Opt. 68  64 KB F1: General Help 48  1 MB F3: Previous Values 48  32 M6 F9: Optimized Defaults 1  1 F10: Save & Exit 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> .
L1C I/D L2C SLC Warrenty	Displays the technical specifications for the installed processor

# 2-3-2 RAS Configuration

Chipset	Aptio Setup — AMI	
RAS Configuration Hardware EINJ DRAM EINJ No Trigger PCIE AER Firmware First Processor OS-first DDR CE Threshold 2P CE Threshold Processor CE Threshold DDR Link Error Threshold	[Disabled] [Disabled] [Disabled] [Disabled] 1 1 2	Enable hardware EINJ support, if disabled EINJ is software simulated
		<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>

Parameter	Description
RAS Configuration	
Hardware EINJ	Options available: Disabled, Enabled. Default setting is Disabled.
DRAM EINJ No Trigger	Options available: Disabled, Enabled. Default setting is Disabled.
PCIe AER Firmware First	Options available: Disabled, Enabled. Default setting is Disabled.
Processor OS-first	Options available: Disabled, Enabled. Default setting is Disabled.
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.

# 2-3-3 Memory Slot Information

Chipset	Aptio Setup - AMI	
Chipset Memory Configuration Total Memory Effective Memory Memory Speed Enable Slave 32bit memory region Fine Granularity Refresh (FGR) Memory RAS and Performance Configura NVDIMM-N Configuration DIMM_FO_80: Not Installed DIMM_FO_80: Not Installed DIMM_F1_10: 16 GB RDIMM Installed DIMM_F1_10: Not Installed DIMM_F1_N0: Not Installed DIMM_F1_N0: Not Installed DIMM_F1_N0: Not Installed DIMM_F1_N0: Not Installed DIMM_F1_N0: Not Installed DIMM_F1_N0: Not Installed DIMM_F1_P0: Not Installed	32 GB 30 GB 3200 MH2 [Disabled] [1x] tion	Enables 32bit memory region (16B) for slave socket **: Select Screen 11: 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	
Memory Configuration		
Total Memory/ Effective Memory/ Memory Speed	Displays the technical specifications for the installed memory module.	
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 1x.	
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, 1,, 24. Default setting is 24.</li> </ul> </li> <li>Demand scrub <ul> <li>Options available: Disabled, Enabled. Default setting is Enabled.</li> </ul> </li> </ul>	

Parameter	Description	
Memory RAS and Performance Configuration (continued)	<ul> <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>	

# 2-3-4 Serialport console

Chipset	Aptio Setup – AMI	
Serialport console		To Enable or Disable the Console Redirection for
Serialport console for UARTO (COM1 / SOL)		UARTO
Serialport console for UART2	[Enabled]	
		++: Select Screen
		Enter: Select
		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>

#### 2-3-5 PCIE Root Complex Configuration

Chipset	Aptio Setup — AMI	
PCIE Root Complex Configuration       PCIE Lanes Bifurcation Mode       SMMU Pmu       On-board VGA       ▶ Root Complex # 0 (CDIX)	(Default) [Disabled] [Enabled]	Configure PCIE Lanes Bifurcation Mode Default: Adjust according to system settings. Manual: Adjust according to user settings.
<ul> <li>Root Complex # 1 (CCIA)</li> <li>Root Complex # 3 (SLOT_3)</li> <li>Root Complex # 3 (SLOT_4)</li> <li>Root Complex # 4 (ist : SLOT_1, 2n)</li> <li>Root Complex # 5 (ist : SLSAS, 2n)</li> <li>Root Complex # 6 (ist : VGA/USB, 2n)</li> <li>Root Complex # 7 (ist : UNUSE, 2n)</li> <li>Root Complex # 7 (ist : UNUSE, 2n)</li> </ul>	d : UNUSE) d : UNUSE) d : M2) d : LAN)	+: Select Screen
<ul> <li>Root Complex # 9 (CCIX)</li> <li>Root Complex #10 (UNUSE)</li> <li>Root Complex #11 (SLOT_2)</li> <li>Root Complex #12 (UNUSE)</li> <li>Root Complex #13 (1st : UNUSE, 2m)</li> <li>Root Complex #14 (UNUSE)</li> <li>Root Complex #14 (UNUSE)</li> </ul>	d : SATA)	<pre>t4: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save &amp; Exit</pre>
Version :	2.22.1282 Copyright (C) 2022 AMI	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 <b>Disabled.</b>
On-board VGA	Options available: Disabled, Enabled. Default setting is <b>Enabled.</b>
Root Complex #(Note)	Press [Enter] to view advanced items.

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

# 2-4 Server Management Menu

Main Advanced Chipset	Aptio Setup – AMI Server Mgmt <u>Security</u> Boot Save & E>	kit
BMC Self Test Status BMC Device ID BMC Device Revision BMC Firmware Revision IPMI Version BMC Interface(s) BMC Support	PASSED 32 1 13.02.14 2.0 SSIF [Enabled]	Enable/Disable interfaces to communicate with BMC
<ul> <li>System Event Log</li> <li>Bac self test log</li> <li>View FRU information</li> <li>BMC network configuration</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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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.

# 2-4-1 System Event Log

Enabling/Disabling Options SEL Components [Enabled] Erasing Settings Erase SEL [N0] When SEL is Full [Do Nothing] Custom EFI Logging Options Log EFI Status Codes [Error code] NOTE: All values changed here do not take effect until computer is restarted. +*: Select Screen 14: Select Item Enter: Select F3: Previous Values F3: Optimized Defaults F10: Save & Exit ESC: Exit	Server M	Aptio Setup – AMI g <mark>mt</mark>	
SEL Components       [Enabled]       disable event logging for error/progress codes during boot.         Erase SEL       [No]         When SEL is Full       [Do Nothing]         Custom EFI Logging Options       [Error code]         NOTE: All values changed here do not take effect until computer is restarted.       +: Select Screen 11: Select Item Enter: Select +/-: Change Opt., Fi: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit	Enabling/Disabling Options		Change this to enable or
Erasing Settings Erase SEL [N0] When SEL is Full [D0 Nothing] Custom EFI Logging Options Log EFI Status Codes [Error code] NOTE: All values changed here do not take effect until computer is restarted. ++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit	SEL Components		disable event logging for error/progress codes
Erses SEL [N0] When SEL is Full [Do Nothing] Custom EFI Logging Options Log EFI Status Codes [Error code] NOTE: All values changed here do not take effect until computer is restarted. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit	Erasing Settings		during boot.
When SEL is Full     [Do Nothing]       Custom EFI Logging Options     [Error code]       NOTE: All values changed here do not take     effect until computer is restarted.       ++: Select Screen     14: Select Item       Enter: Select     +/-: Change Opt.       F1: General Help     F3: Previous Values       F3: Optimized Defaults     F10: Save & Exit       ESC: Exit     ESC: Exit	Enase SEL	[No]	
Custom EFI Logging Options Log EFI Status Codes [Error code] NOTE: All values changed here do not take effect until computer is restarted. +*: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit	When SEL is Full	[Do Nothing]	
Log EFI Status Codes [Error code] NOTE: All values changed here do not take effect until computer is restarted. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit	Custom EET Logging Ontions		
NOTE: All values changed here do not take effect until computer is restarted. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit	Log FFI Status Codes	[Error_code]	
NOTE: All values changed here do not take effect until computer is restarted. ++: Select Screen IL: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit			
effect until computer is restarted. ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit	NOTE: All values changed here do no	ot take	
++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F3: Optimized Defaults F10: Save & Exit ESC: Exit	effect until computer is res	tarted.	
14: Select Item Enter: Select +/-: Change Opt, F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit			the Calact Consen
Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit			11: Select Item
+/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit			Enter: Select
F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit			+/-: Change Opt.
F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit			F1: General Help
F9: Optimized Defaults F10: Save & Exit ESC: Exit			F3: Previous Values
F10: Save & Exit ESC: Exit			F9: Optimized Defaults
ESU: EXIT			F10: Save & Exit
			ESU: EXIL
	L	0.00.4000.00mm/skt. (0).0000.0M	÷

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> .

# 2-4-2 Bmc self test log

Aptio Setup – AMI Server Mgmt		
Log area usage = 00 out of 20 logs		Erase Log Options
Erase Log When log is full	[No] [Do not log any more]	
Log Empty		
	Ţ	<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	

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.

#### 2-4-3 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.

Server Mgm	Aptio Setup – AMI t	
FRU Information System Manufacturer System Serial Number Board Manufacturer Board Product Name Board Version Board Version Board Version Chassis Manufacturer Chassis Version Chassis Version Chassis Version	t GIGABYTE MP72-HB0-00 01234567890123456789AB GIGABYTE MP72-HB0-00 123456789AB 0123456789AB 01234567 01234567 01234567890123456789AB	
NOTE:No FRU information for fields i information needs to be filled by O.	ndicate E.M	<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	
#### 2-4-4 BMC Network Configuration

Server Mgm	Aptio Setup – AMI t	
BMC network configuration Lan channel 1 Configuration Address source Station IP address Subnet mask Router IP address Station MAC address Real-time get BMC network address	[DynamicBmcDhcp] 10.1.113.99 255.255.255.0 10.1.113.253 B4-2E-99-AF-F7-B8	Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase
*************************** Configure IPV6 support ************************************	(Disabled)	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help
IPv6 Support is Disabled		F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Version 2	.22.1282 Copyright (C) 2022 AMI	

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> .

# 2-5 Security Menu

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

Main Advanced Chipset S	Aptio Setup – AM erver Mgmt <mark>Security B</mark> oot	I Save & Exit	
Hain Advanced Chipset S Password Description If ONLY the Administrator's then this only limits acces only asked for when enterin If ONLY the User's password is a power on password and boot or enter Setup. In Set have Administrator rights. The password length must be in the following range: Minimum length	erver Mgmt Security Boot password is set, s to Setup and is g Setup. is set, then this must be entered to up the User will	<u>Save &amp; Exit</u>	Set Administrator Password
Maximum length Administrator Password User Password ▶ Secure Boot	20		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F3: Optimized Defaults F10: Save & Exit ESC: Exit
	Version 2,22,1282 Conuright	(C) 2022 AMT	

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.
Secure Boot	Press [Enter] to configure advanced items.

#### 2-5-1 Secure Boot

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

system houe	User	Secure Boot feature is
	[Disabled] Not Active	Active if Secure Boot is Enabled, Platform Key(PK) is encolled and the Sustem i
Secure Boot Mode	[Custom]	in User mode.
Restore Factory Keys		The mode change requires
Reset To Setup Mode		platform reset
		+: 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
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>Custom</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 to Setup Mode <ul> <li>Reset to Setup Mode</li> <li>Reset to Setup Mode</li> <li>Export Secure Boot keys and key variables.</li> </ul> </li> <li>Enroll Efi Image <ul> <li>Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db).</li> </ul> </li> <li>Device Guard Ready <ul> <li>Remove 'UEFI CA' from DB.</li> </ul> </li> <li>Restore DB defaults <ul> <li>Restore DB defaults</li> <li>Restore DB defaults</li> <li>Restore DB defaults</li> <li>Secure Boot variable</li> <li>Displays the current status of the Platform Key (PK).</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 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> <li>Forbidden Signatures (DBX) <ul> <li>Displays the current status of the Forbidden Signature Database.</li> <li>Press [Enter] to configure a new dbx or load additional dbx 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>	

### 2-6 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 Mg	Aptio Setup – AMI mt Security <mark>Boot</mark> Save & Exit	
Boot Configuration Setup Prompt Timeout Bootup NumLock State Quiet Boot	<mark>5</mark> [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 Boot Option #2 Boot Option #3 Boot Option #4 Boot Option #5	[Hard Disk] [DD/DVD] [USB Device] [Network:UEFI: PXE IPv4 Broadcom Network B4:2E:99:AF:F7:B6] [UEFI AP:UEFI: Bullt-in EFI Shell]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults
<ul> <li>▶ UEFI NETWORK Drive BBS Priorities</li> <li>▶ UEFI Application Boot Priorities</li> </ul>		F10: Save & Exit ESC: Exit

Parameter Description **Boot Configuration** Number of seconds to wait for setup activation key. 65535 (0xFFFF) Setup Prompt Timeout means indefinite waiting. Press the numeric keys to input the desired values. Enable/Disable the Bootup NumLock function. Bootup NumLock State Options available: On, Off. Default setting is On. Enable/Disable showing the logo during POST. Quiet Boot Options available: Enabled, Disabled. Default setting is Enabled. 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). Controls the placement of newly detected UEFI boot options. New UEFI OS Boot Option Options available: Default, Place First, Place Last. Default setting is Policy 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.	

# 2-7 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 Save & Exit	
Save Options Save Changes and Exit Discard Changes and Exit	Exit system setup after saving the changes.
Save Changes and Reset Discard Changes Save Changes Discard Changes	
Default Options Restore Defaults Save as User Defaults	
Restore User Defaults	++: Select Screen †4: Select Item Enter: Select
UEFI: PXE IPv4 Broadcom Network B4:2E:99:AF:F7:B6 UEFI: PXE IPv4 Broadcom Network B4:2E:99:AF:F7:B7 UEFI: Built-in EFI Shell	+/-: Change Opt. F1: General Help F3: Previous Values
Launch EFI Shell from filesystem device	F9: Optimized Defaults F10: Save & Exit ESC: Exit

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.

# 2-8 BIOS POST Beep code (AMI standard)

#### 2-8-1 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

#### 2-8-2 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