

GIGABYTE™

MW34-SP0

Motherboard - 14th/13th/12th Gen Intel® Core™

User Manual

Rev. 1.1

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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

For More Information

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

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

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

 **WARNING**

- **INGESTION HAZARD:** This product contains a button cell or coin battery.
- **DEATH** or serious injury can occur if ingested.
- A swallowed button cell or coin battery can cause **Internal Chemical Burns** in as little as **2 hours**.
- **KEEP** new and used batteries **OUT OF REACH OF CHILDREN**
- **Seek immediate medical attention** if a battery is suspected to be swallowed or inserted inside any part of the body.



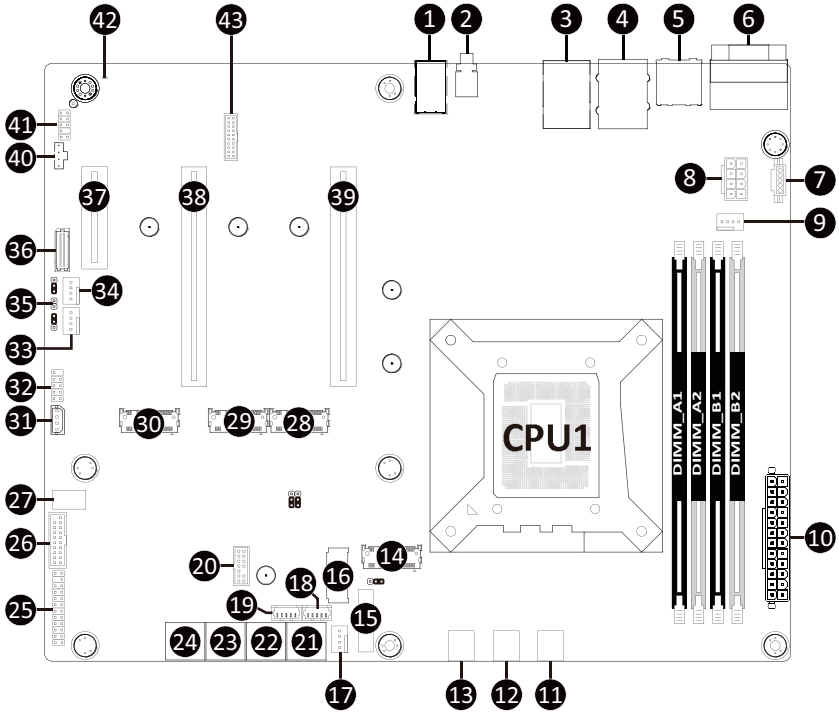
- Battery type: CR2032, voltage rating: +3VDC.
- Non-rechargeable batteries are not to be recharged.
- Remove and immediately recycle or dispose of used batteries, batteries from equipment not used for an extended period of time according to local regulations and keep away from children. Do NOT dispose of batteries in household trash or incinerate.
- Even used batteries may cause severe injury or death.
- Do not force discharge, recharge, disassemble, heat above (manufacturer's specified temperature rating) or incinerate. Doing so may result in injury due to venting, leakage or explosion resulting in chemical burns.
- For treatment information, call a local poison control center.
- The product contains non-replaceable batteries.

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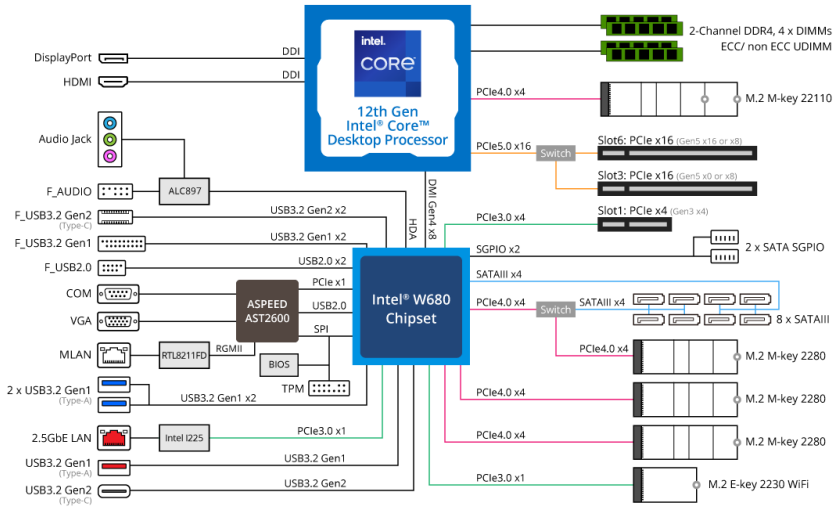
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MW34-SP0 Motherboard Layout



Item	Code	Description
1	Audio1	Audio Connectors
2	SW_ID	ID Button with LED
3	USB3_MLAN	Server Management LAN Port (Top)/USB 3.0 Ports (Bottom)
4	USB3_LAN3/USB32C	2.5GbE LAN Port (Top)/USB 3.2 Type A Port (Middle) USB 3.2 Type C Port (Bottom)
5	HDMI_DP	HDMI 2.1 Port (Top)/Display Port (Bottom)
6	COM/VGA	Serial Port (Top)/Display Port (Bottom)
7	PMBUS	PMBus Connector
8	P12V_CPU	2x4 Pin 12V Power Connector
9	CPU_FAN1	CPU Fan Connector
10	ATX	2x12 Pin Main Power Connector
11	SYS_FAN1	System Fan Connector #1
12	SYS_FAN6	System Fan Connector #6
13	SYS_FAN5	System Fan Connector #5
14	M2M_CPU	M.2 Slot (PCIe Gen4 x4, Support NGFF-2280/22110)
15	BAT1	Battery Socket
16	M2E	M.2 Slot (WiFi/BT Module, Support NGFF-2230)
17	SYS_FAN2	System Fan Connector #2
18	SATA_SGP2	SATA SGPIO Connector #2
19	SATA_SGP1	SATA SGPIO Connector #1
20	TPM	TPM Connector
21	SATA_6_7	SATA 6Gb/s Connector #6/#7
22	SATA_4_5	SATA 6Gb/s Connector #4/#5
23	SATA_2_3	SATA 6Gb/s Connector #2/#3
24	SATA_0_1	SATA 6Gb/s Connector #0/#1
25	FP_1	Front Panel Header
26	F_USB3_1	Front Panel USB 3.2 Connector
27	F_USB32C_1	Front Panel USB 3.2 Type C Connector
28	M2M_3	M.2 Slot (PCIe Gen4 x4, Support NGFF-2280)
29	M2M_2	M.2 Slot (PCIe Gen4 x4, Support NGFF-2280)
30	M2M_1	M.2 Slot (PCIe Gen4 x4, Support NGFF-2280)
31	IPMB	IPMB Connector
32	F_USB2_1	USB 2.0 Header
33	SYS_FAN4	System Fan Connector #4
34	SYS_FAN3	System Fan Connector #3
35	CASE_OPEN	Case Open Intrusion Alert Header
36	BP_1	HDD Back Plane Board Connector
37	PCIE_1	PCIe x4 Slot (Gen3 x4)
38	PCIE_3	PCIe x16 Slot (Gen5 x8)
39	PCIE_6	PCIe x16 Slot (Gen5 x16)
40	BMC_USB2B_1	USB 2.0 Connector
41	F_AUDIO1	Front Audio Header
42	LED_BMC	BMC Firmware Readiness LED
43	CN_NCSI	NCSI Connector

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.
- To avoid any potential short circuit of the DIMM slots, please remove any stand-offs from the chassis that will be located underneath the DIMM slots, before installing the motherboard into the chassis.

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 style="list-style-type: none"> ◆ ATX ◆ 305W x 244D mm
 CPU	<ul style="list-style-type: none"> ◆ 14th Gen Intel® Core™ Desktop Processor ◆ 13th Gen Intel® Core™ Desktop Processor ◆ 12th Gen Intel® Core™ Desktop Processor ◆ Single processor
 Socket	<ul style="list-style-type: none"> ◆ 1 x LGA 1700
 Chipset	<ul style="list-style-type: none"> ◆ Intel® W680
 Memory	<ul style="list-style-type: none"> ◆ 4 x DIMM slots ◆ Dual channel memory architecture ◆ Supports 1.2V DDR4 3200 MT/s memory ◆ Up to 128GB ECC UDIMM modules supported <p>NOTE: When installing memory modules, make sure to begin with the first socket of each channel, such as DIMM_P0_A0, DIMM_P0_B0, DIMM_P0_C0, DIMM_P0_D0.</p>
 LAN	<ul style="list-style-type: none"> ◆ 1 x 2.5GbE LAN port (Intel® I225) ◆ 1 x 10/100/1000 Mbps Management LAN (Realtek® RTL8211FD)
 Onboard Graphics	<ul style="list-style-type: none"> ◆ Integrated in Intel® Processor: <ul style="list-style-type: none"> - 1 x DisplayPort, supports DisplayPort 1.4a - 1 x HDMI port, supports for HDMI 2.0b ◆ Integrated in ASPEED® AST2600: <ul style="list-style-type: none"> - 1 x VGA Port
 Audio	<ul style="list-style-type: none"> ◆ Realtek® ALC897 controller ◆ Supports 2/4/5.1/7.1 channel configurations ◆ 3 ports Audio Jack (Audio in/Audio out/Mic)
 SATA	<ul style="list-style-type: none"> ◆ 8 x SATA 6Gb/s ports
 RAID	<ul style="list-style-type: none"> ◆ Intel® RAID 0/1/10/5
 Expansion Slots	<ul style="list-style-type: none"> ◆ Slot_6: 1 x PCIe x16 (Gen5 x16 or Gen5 x8 bus) slot, from CPU ◆ Slot_3: 1 x PCIe x16 (Gen5 x0 or Gen5 x8 bus) slot, from CPU, shared with slot_6 ◆ Slot_1: 1 x PCIe x4 (Gen3 x4 bus) slot, from PCH ◆ 1 x M.2 slot: <ul style="list-style-type: none"> - M-key - PCIe Gen4 x4, from CPU - Supports 2280/22110 cards



Expansion Slots

- ◆ 3 x M.2 slots:
 - M-key
 - PCIe Gen4 x4, from PCH
 - Support 2280 cards
- ◆ 1 x M.2 slot:
 - E-key
 - PCIe Gen3 x1, from PCH
 - Supports 2230 cards



Internal I/O Connectors

- ◆ 1 x 24-pin ATX main power connector
- ◆ 1 x 8-pin ATX 12V power connector
- ◆ 8 x SATA 6Gb/s ports
- ◆ 1 x USB3.2 gen2x2 Type-C® header
- ◆ 1 x USB3.2 gen1 header for 2 ports
- ◆ 2 x USB2.0 headers for 2 ports
- ◆ 1 x Front panel header
- ◆ 1 x TPM header
- ◆ 1 x CPU fan header
- ◆ 6 x System fan headers



Rear I/O Connectors

- ◆ 1 x VGA
- ◆ 1 x COM
- ◆ 1 x HDMI
- ◆ 1 x DP
- ◆ 1 x USB 3.2 gen2x2 Type-C®
- ◆ 3 x USB 3.2 gen1 Type-A
- ◆ 1 x MLAN
- ◆ 1 x 2.5G LAN
- ◆ 1 x ID Button
- ◆ 1 x 3 in 1 Audio jack



TPM

- ◆ 1 x TPM Header with SPI Interface
- ◆ Optional TPM2.0 kit: CTM010



Board Management

- ◆ ASPEED® AST2600



Operating Properties

- ◆ Operating temperature: 10°C to 40°C
- ◆ Operating humidity: 8-80% (non-condensing)
- ◆ Non-operating temperature: -40°C to 60°C
- ◆ Non-operating humidity: 20%-95% (non-condensing)

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.

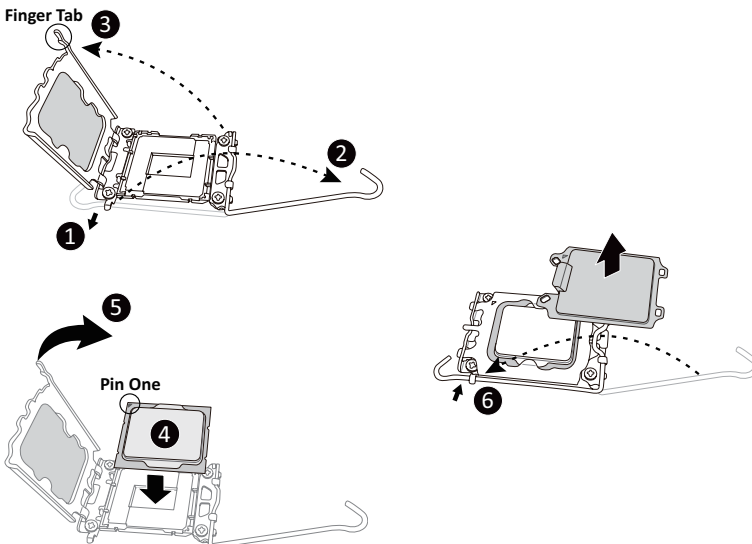


WARNING!

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. Gently press the CPU socket lever handle down to unclip it.
 2. Completely lift the CPU socket lever.
 3. Use the finger tab to lift open the metal load plate.
 4. Align the CPU pin one (triangle marking) with the pin one corner of the CPU socket (or you may align the CPU notches with the socket alignment keys). Gently insert the CPU into position.
 5. Once the CPU is properly inserted, carefully replace the load plate.
 6. The plastic protective cover will pop off. Then, remove the CPU cover.
- Note:** Save and replace the CPU cover if the processor is removed from its socket.
6. Secure the CPU socket lever.



1-4 Installing and Removing Memory

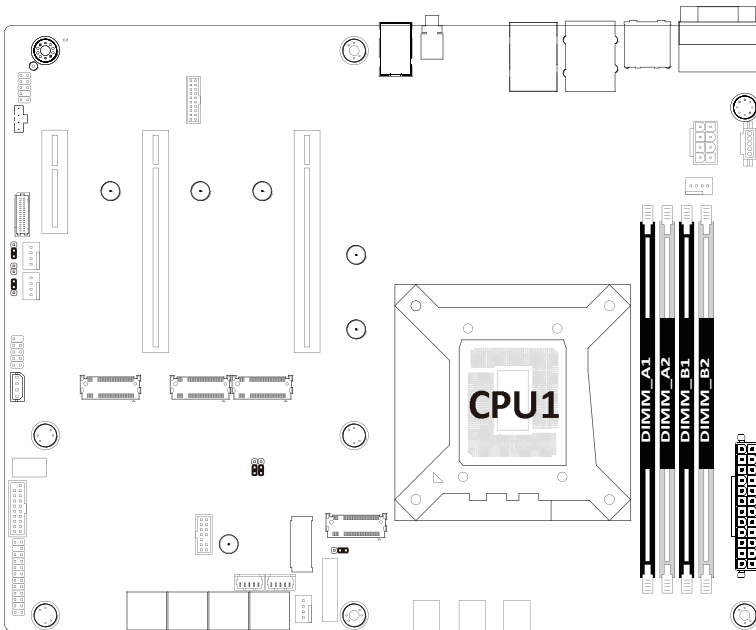


Read the following guidelines before you begin to install the memory:

- Make sure that the motherboard supports the memory. It is recommended to use memory of the same capacity, brand, speed, and chips.
- 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 2-Channel Memory Configuration

This motherboard provides 4 DDR4 memory slots and supports 2-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 a Memory Module

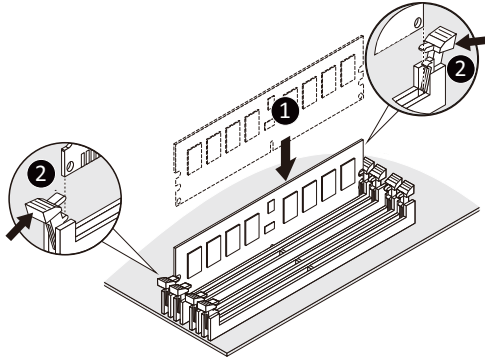


Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module.

Be sure to install DDR4 ECC UDIMMs on this motherboard.

Follow these instructions to install a UDIMM module:

1. Insert the UDIMM memory module vertically into the UDIMM slot and push it down.
2. Close the plastic clip at both edges of the UDIMM slots to lock the UDIMM module.
Note: For dual-channel operation, UDIMMs must be installed in matched pairs.
3. Reverse the installation steps when you want to remove the UDIMM module.



Note: DIMM must be populated in sequential alphabetic order, starting with bank A0.

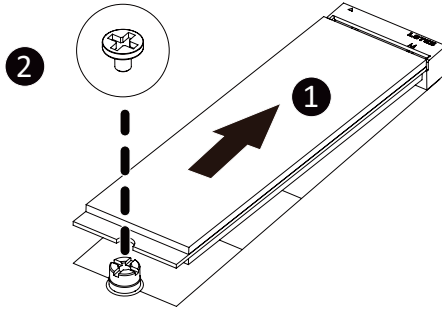
Memory Type	DDR4
Voltage (V)	1.2V
Connector	UDIMM
Speed (MT/s)	3200
ECC	Supported
Channels	2
DIMM Per Channel	1,2
DIMM Capacity (GB)	4,8,16,32

1-5 Installing the M.2 SSD Module

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

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

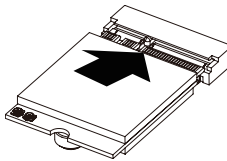
Step2. Secure it with the screw, tightening as necessary to fasten the M.2 SSD module in place.



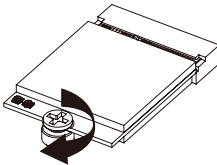
1-6 Installing and Removing the M.2 WiFi Module

Follow the steps below to install a M.2 WiFi module on your motherboard.

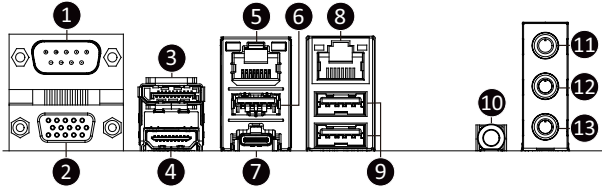
Step1. Carefully Insert the M.2 WiFi module into the slot.



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



1-7 Back Panel Connectors



1 Serial Port

Connect to serial-based mouse or data processing devices.

2 VGA Port

Connect to a monitor device.

3 Display Port

DisplayPort delivers high quality digital imaging and audio, supporting bi-directional audio transmission. Connect to a DisplayPort-supported monitor.

4 HDMI 2.1 Port

HDMI™ The HDMI port is HDCP 2.3 compliant and supports Dolby TrueHD and DTS HD Master Audio formats. It also supports up to 192KHz/24bit 7.1-channel LPCM audio output. You can use this port to connect your HDMI-supported monitor. The maximum supported resolution is 4096x2160@60 Hz, but the actual resolutions supported are dependent on the monitor being used.

5 2.5GbE LAN Port #1

The Gigabit Ethernet LAN port provides Internet connection at up to 2.5 Gbps data rate. See the section below for a description of the states of the LAN port LEDs.

6 USB 3.2 Type-A Port

The USB port supports the USB 3.2 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive etc.

7 USB 3.2 Type-C Port

The USB port supports the USB 3.2 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive etc.

8 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.

9 USB 3.2 Ports

The USB port supports the USB 3.2 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive etc.

10 ID button with LED

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

11 Line In Jack (Blue)

The default Line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc

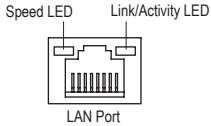
12 Line Out Jack (Green)

The default Line Out jack. Use this audio jack for a headphone or 2-channel speaker. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

13 Mic In Jack (Pink)

The default MIC In jack. A microphone can be connected to the MIC In jack.

LAN and ID Button LEDs



2.5GbE LAN LED:

State	Description
Yellow On	1Gbps data rate
Green On	2.5Gbps data rate
Off	100Mbps data rate

10/100/1000 LAN LED:

State	Description
Yellow On	1Gbps data rate
Green On	100Mbps data rate
Off	10Mbps data rate

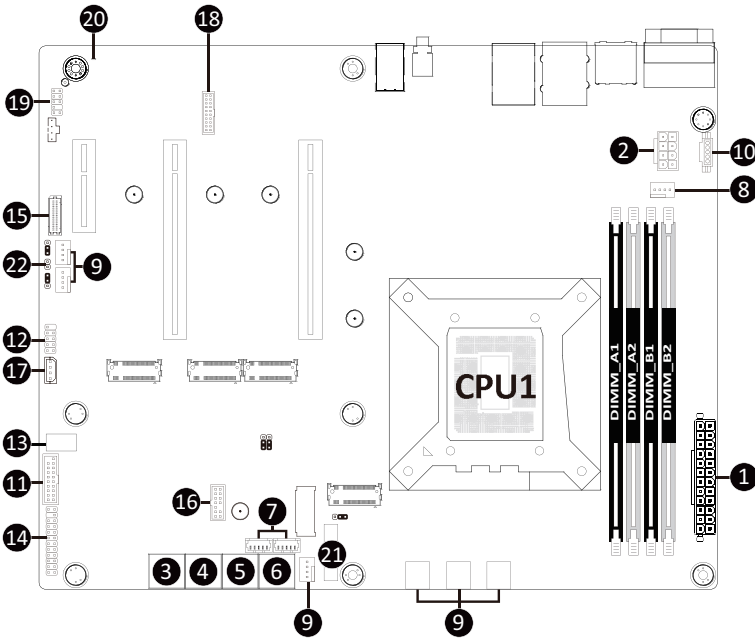
ID button/LED:

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.

1-8 Internal Connectors



1) ATX	12) F_USB2_1
2) P12V_CPU	13) F_USB32C_1
3) SATA_0_1	14) FP_1
4) SATA_2_3	15) BP_1
5) SATA_4_5	16) TPM
6) SATA_6_7	17) IPMB
7) SATA_SGP1/SATA_SGP2	18) CN_NCSI
8) CPU_FAN1	19) F_AUDIO1
9) SYS_FAN1/2/3/4/5/6	20) LED_BMC
10) PMBUS	21) BAT1
11) F_USB3_1	22) CASE_OPEN



Read the following guidelines before connecting external devices:

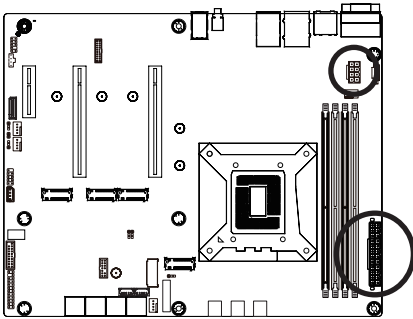
- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

1/2) ATX/P12V_CPU (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.



ATX_12V

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



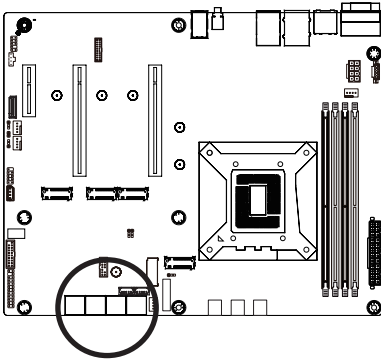
ATX

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



3/4/5/6) SATA_0_1/SATA_2_3/SATA_4_5/SATA_6_7 (SATA III 6Gb/s Connectors)

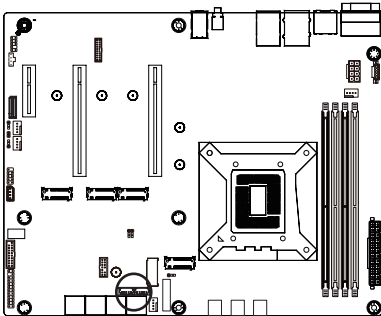
The SATA connectors conform to SATA III 6Gb/s standard and are compatible with SATA 3Gb/s standard. Each SATA connector supports a single SATA device.



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

7) SATA_SGP1/SATA_SGP2 (SATA SGPIO Connector)

Serial General Purpose Input/Output (SGPIO) is a communication method used between a host bus adapter (HBA) and a main board.

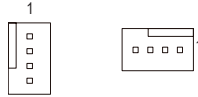
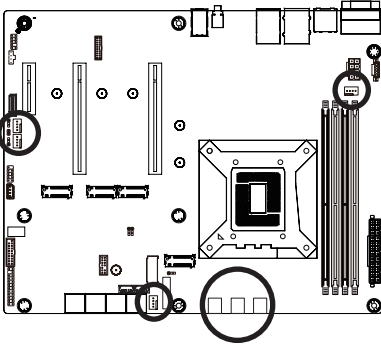


Pin No.	Definition
1	Data Out
2	GND
3	Data In
4	Load
5	Clock

8/9) CPU_FAN1/SYS_FAN1/SYS_FAN2/SYS_FAN3/SYS_FAN4/SYS_FAN5/SYS_FAN6

(Fan Headers)

The motherboard has one 4-pin CPU fan header (CPU_FAN), and six 4-pin (SYS_FAN) 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). The motherboard supports CPU fan speed control, which requires the use of a CPU fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.



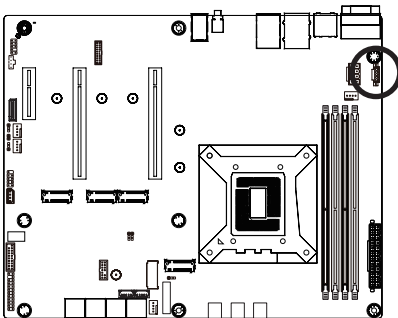
Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control



- Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

10) PMBus Connector

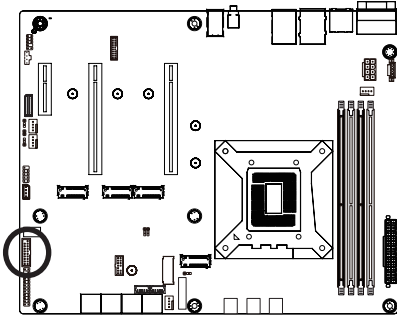
The Power Management Bus (PMBus) is a variant of the System Management Bus (SMBus) which is targeted at digital management of power supplies.



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

11/12) F_USB3_1/F_USB2_1 (Front Panel USB 3.2 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.



USB 2.0 Header



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

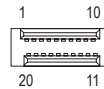
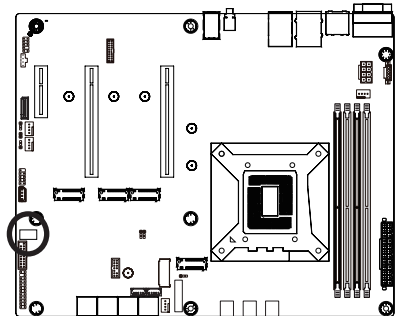
USB 3.0 Connector



Pin No.	Definition	Pin No.	Definition
1	Power	11	IntA_P2_D+
2	IntA_P1_SSRX-	12	IntA_P2_D-
3	IntA_P1_SSRX+	13	GND
4	GND	14	IntA_P2_SSTX+
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) F_U32C (USB Type-C® Header with USB 3.2 Gen 2 Support)

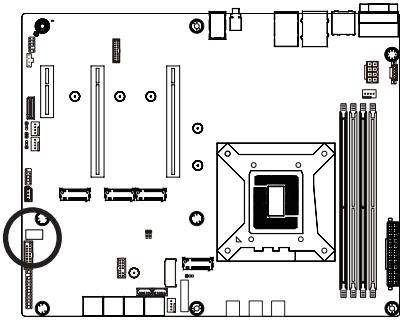
The header conforms to USB 3.2 Gen 2 specification and can provide one USB port.



Pin No.	Definition	Pin No.	Definition
1	VBUS	11	VBUS
2	TX1+	12	TX2+
3	TX1-	13	TX2-
4	GND	14	GND
5	RX1+	15	RX2+
6	RX1-	16	RX2-
7	VBUS	17	GND
8	CC1	18	D-
9	SBU1	19	D+
10	SBU2	20	CC2

14) 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.

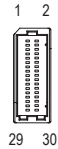
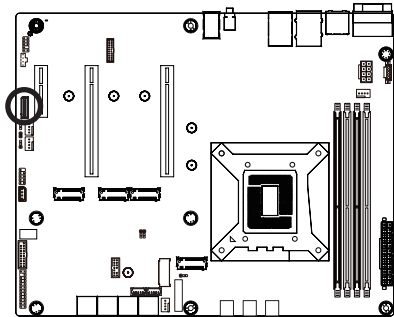


Pin No.	Definition	Pin No.	Definition
1	Power LED+	2	5V Standby
3	No Pin	4	ID LED+
5	Power LED-	6	ID LED-
7	HDD LED+	8	System Status LED+
9	HDD LED-	10	System Status LED -
11	Power Button	12	LAN1 Active LED+
13	GND	14	LAN1 Link LED-
15	Reset Button	16	SMBus Data
17	GND	18	SMBus Clock
19	ID Button	20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

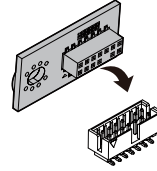
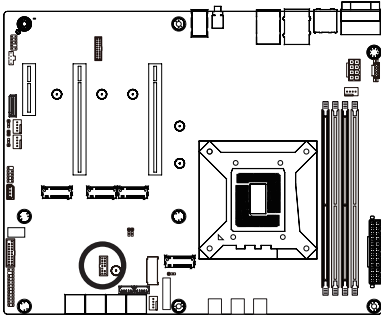
15) BP_1 (HDD Backplane Board Connector)



Pin No.	Definition	Pin No.	Definition
1	HP_ALERT_L	2	BPMI DIN/OUT
3	GND	4	BPMI DOUT/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	12C_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
29	P3V3_AUX	30	P3V3_AUX

16) TPM (Trusted Platform Module Connector)

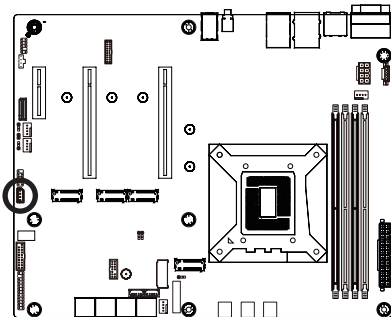
Trusted Platform Module (TPM) is an international standard for a secure cryptoprocessor, a dedicated microcontroller designed to secure hardware through integrated cryptographic keys.



Pin No.	Definition	Pin No.	Definition
1	Clock	8	NC
2	P_3V3_AUX	9	NC
3	LPC_RST	10	No Pin
4	NC	11	NC
5	SPL_MISO	12	GND
6	IRQ_SPI	13	SPL_CS_N
7	SPI_MOSI	14	GND

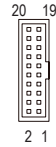
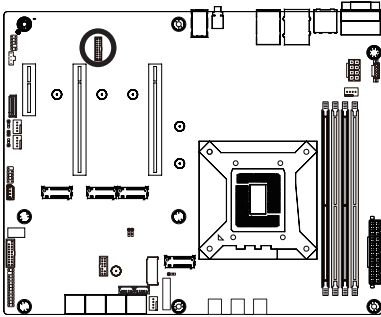
17) IPMB (Intelligent Platform Management Bus) Connector

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	Data
3	GND
4	VCC

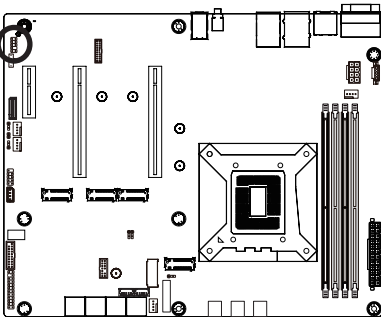
18) CN_NCSI (NCSI Connector)



Pin No.	Definition	Pin No.	Definition
1	NCSI_CLK	2	GND
3	NCSI_RX_D0	4	GND
5	NCSI_RX_D1	6	GND
7	NCSI_CR_S_DV	8	GND
9	NCSI_RX_ER	10	GND
11	P3V3_AUX	12	GND
13	NCSI_TX_D1	14	GND
15	NCSI_TX_D0	16	GND
17	NCSI_TX_EN	18	GND
19	NCSI_PRESENT	20	P3V3_AUX

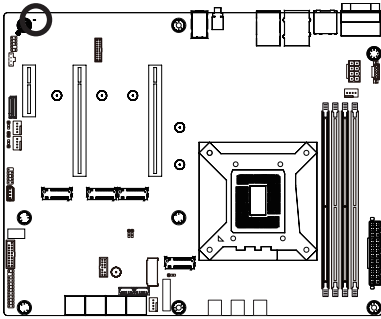
19) F_AUDIO1 (Front Panel Audio Header)

The front panel audio header supports Intel High Definition audio (HD). You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.



Pin No.	Definition
1	MIC_L
2	GND
3	MIC_R
4	Power (3.3V)
5	LINE_R
6	GND
7	AUDIO_JD
8	NA
9	LINE_L
10	GND

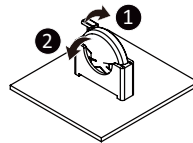
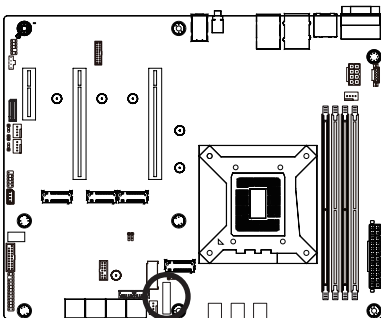
20) LED_BMC (BMC Firmware Readiness LED)



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

21) BAT1 (Battery Socket)

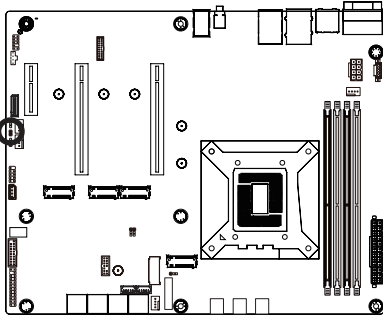
The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.



- 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.

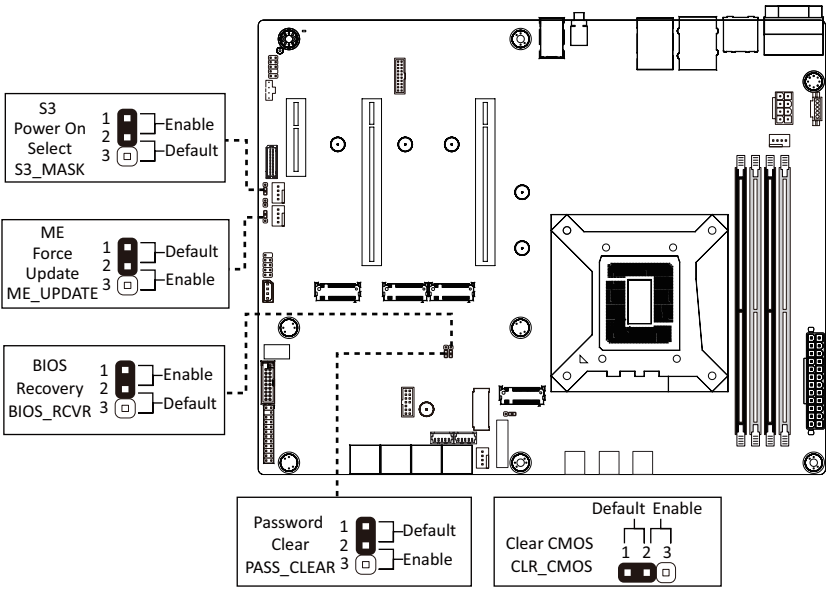
22) CASE_OPEN (Case Open Intrusion Alert Header)

This motherboard provides a chassis detection feature that detects if the chassis cover has been removed. This function requires a chassis with chassis intrusion detection design.



- Open: Normal Operation (Default)
- Closed: Active Chassis Intrusion Alert

1-9 Jumper Settings



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 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
<Enter>	Execute command or enter the submenu
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu
<F1>	Show descriptions of general help
<F3>	Restore the previous BIOS settings for the current submenus
<F9>	Load the Optimized BIOS default settings for the current submenus
<F10>	Save all the changes and exit the BIOS Setup program

■ **Main**

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

■ **Advanced**

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

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

■ **Chipset**

This setup page includes all the submenu options for configuring the functions of the Platform Controller Hub.

■ **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

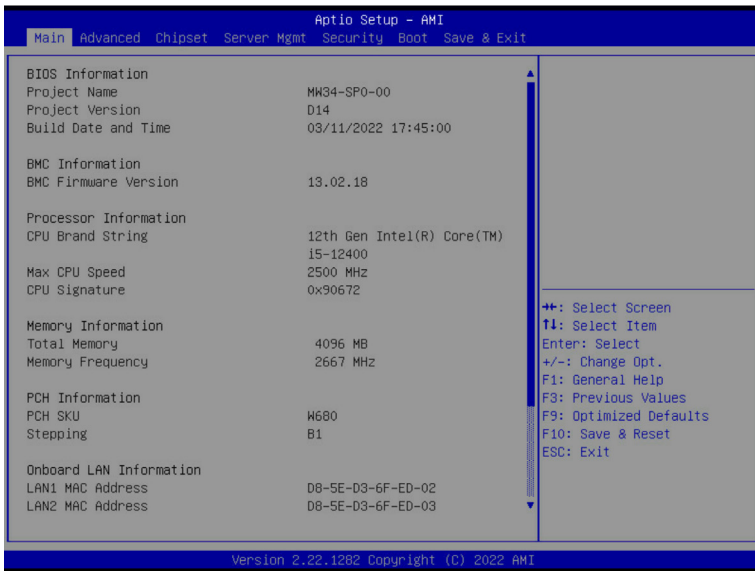
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

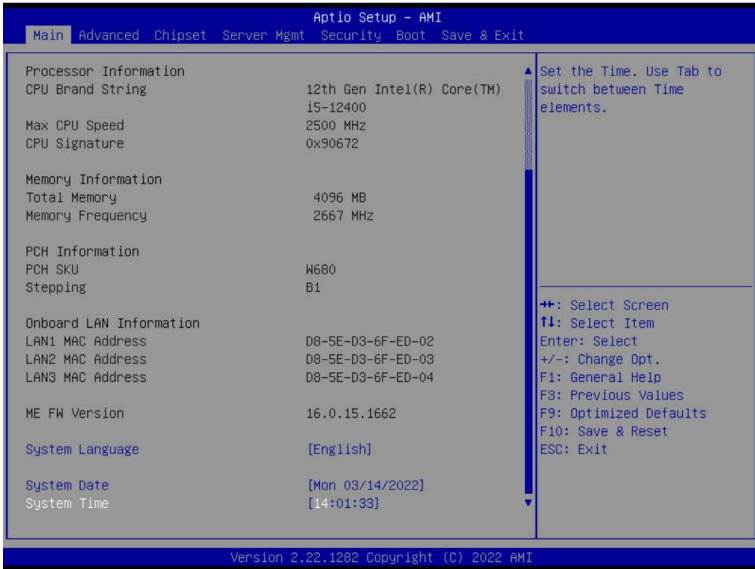
Submenu Help

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.





Parameter	Description
BIOS Information	
Project Name	Displays the 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 ^(Note1)	
BMC Firmware Version ^(Note1)	Displays BMC firmware version information.
Processor Information	
CPU Brand String/ Max CPU Speed / CPU Signature	Displays the technical information for the installed processor.
Memory Information	
Total Memory ^(Note2)	Displays the total memory size of the installed memory.
Memory Frequency ^(Note2)	Displays the frequency information of the installed memory.
PCH Information	
PCH SKU/Stepping	Displays the technical information for the installed Platform Controller Hub (PCH).

(Note1) Functions available on selected models..

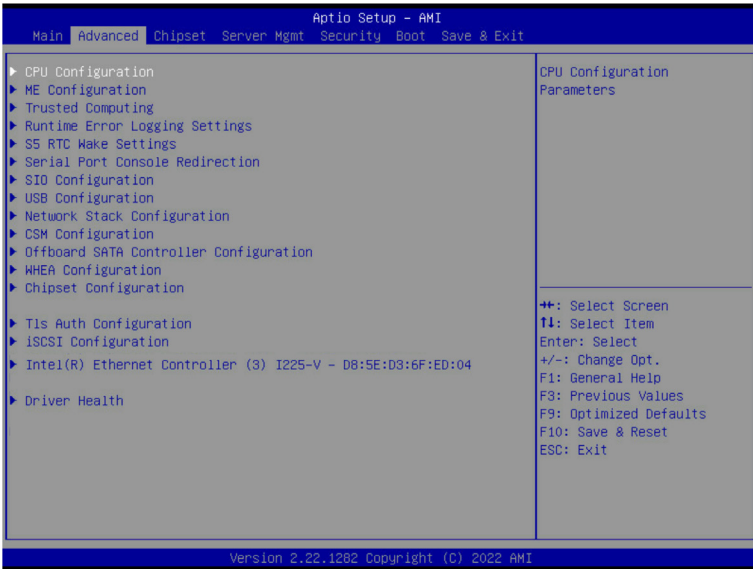
(Note2) This section will display capacity and frequency information of the memory that the customer has installed.

Parameter	Description
Onboard LAN Information	
LAN# MAC Address ^(Note)	Displays LAN MAC address information.
ME FW Version	Displays ME Firmware version.
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.

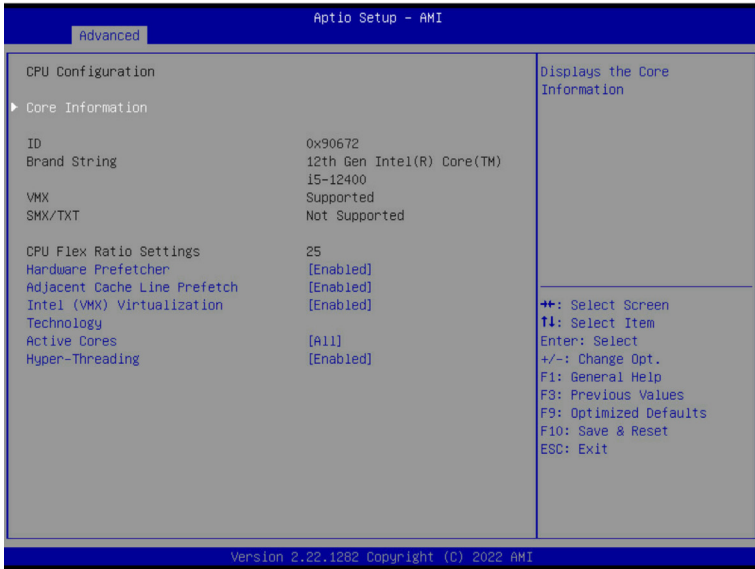
(Note) The number of LAN ports listed will depend on the motherboard / system model.

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.



2-2-1 CPU Configuration



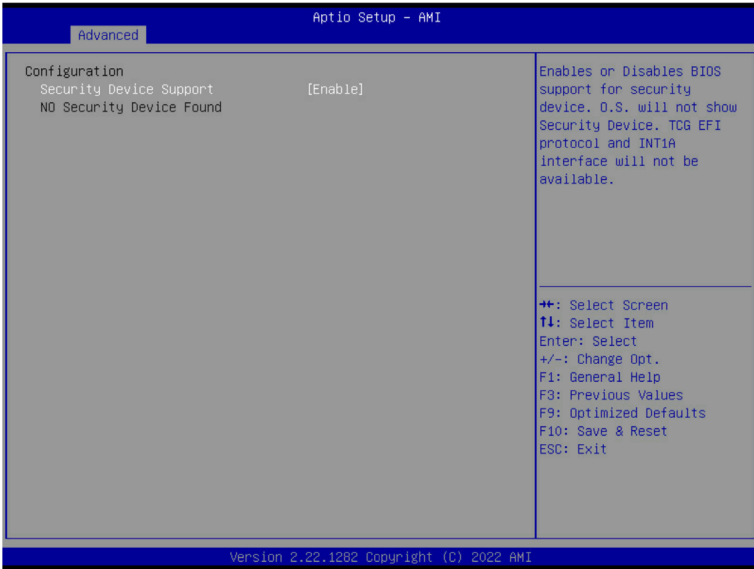
Parameter	Description
CPU Configuration	
Core Information	Displays the core information.
ID/Brand String/VMX/SMX/TXT/ CPU Flex Ratio Settings	Displays the technical information for the installed processor(s).
Hardware Prefetcher	Enable/Disable this item to turn on/off the MLC streamer prefetcher. Options available: Disabled, Enabled. Default setting is Enabled .
Adjacent Cache Line Prefetch	When enabled, cache lines are fetched in pairs. When disabled, only the required cache line is fetched. Options available: Disabled, Enabled. Default setting is Enabled .
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. Options available: Disabled, Enabled. Default setting is Enabled .
Active Cores	The Number of Cores to enable in each processor package. Options available: All, 1, 2, 3, 4, 5. Default setting is All .
Hyper-Threading	Enable/Disable the Hyper-Threading Technology. Options available: Disabled, Enabled. Default setting is Enabled .

2-2-2 ME Configuration



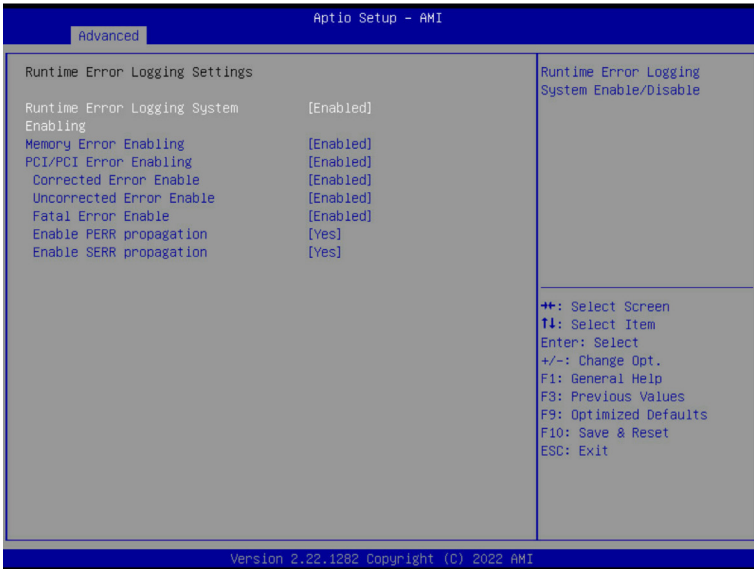
Parameter	Description
ME Firmware Version/ME Firmware Mode/ME Firmware SKU/ME State	Displays the ME firmware information.
Firmware Update Configuration	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ Me FW Image Re-Flash <ul style="list-style-type: none"> – Enable/Disable Me FW Image Re-Flash function. – Options available: Disabled, Enabled. Default setting is Disabled. ◆ FW Update <ul style="list-style-type: none"> – Function reserved.
PTT Configuration	Press [Enter] to configure advanced items.

2-2-3 Trusted Computing



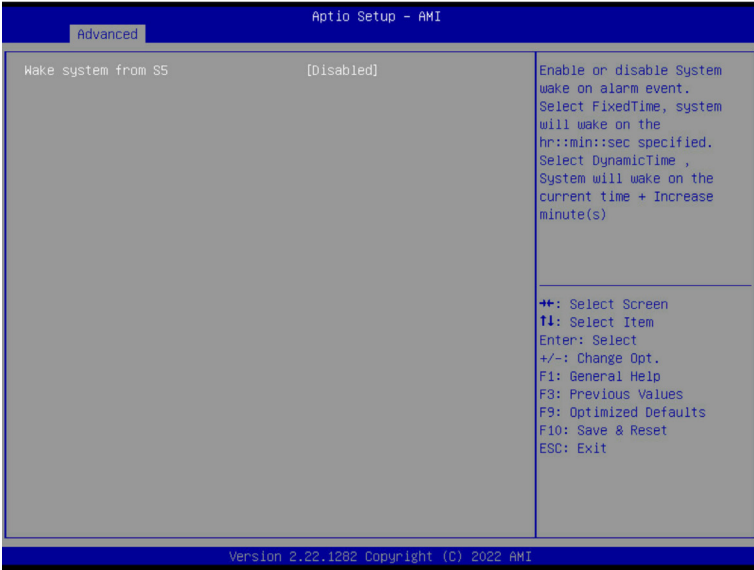
Parameter	Description
Configuration	
Security Device Support	<p>Enable/Disable BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available.</p> <p>Options available: Enable, Disable. Default setting is Enable.</p>

2-2-4 Runtime Error Logging Settings



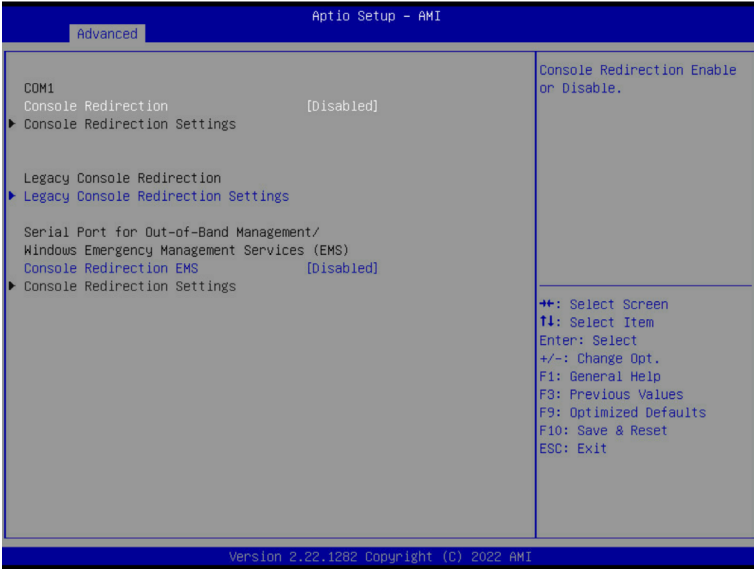
Parameter	Description
Runtime Error Logging Settings	
Runtime Error Logging System Enabling	Enable/Disable runtime error logging system. Options available: Enabled, Disabled. Default setting is Enabled .
Memory Error Enabling	Enable/Disable memory error enabling. Options available: Enabled, Disabled. Default setting is Enabled .
PCI/PCI Error Enabling	Enable/Disable PCI/PCI error enabling. Options available: Enabled, Disabled. Default setting is Enabled .
Corrected Error Enable	Enable/Disable corrected error. Options available: Enabled, Disabled. Default setting is Enabled .
Uncorrected Error Enable	Enable/Disable uncorrected error. Options available: Enabled, Disabled. Default setting is Enabled .
Fatal Error Enable	Enable/Disable fatal error. Options available: Enabled, Disabled. Default setting is Enabled .
Enable PERR propagation	Options available: Yes, No. Default setting is Yes .
Enable SERR propagation	Options available: Yes, No. Default setting is Yes .

2-2-5 S5 RTC Wake Settings



Parameter	Description
Wake System from S5	Enable/Disable system wake on alarm event. Options available: Disabled, Fixed Time. When Fixed Time is selected, system will wake on the hr::min::sec specified. Default setting is Disabled .

2-2-6 Serial Port Console Redirection



Parameter	Description
COM Console Redirection ^(Note)	<p>Console redirection enables the users to manage the system from a remote location.</p> <p>Options available: Enabled, Disabled. Default setting is Disabled.</p>
COM Console Redirection Settings	<p>Press [Enter] to configure advanced items.</p> <p>Please note that this item is configurable when COM Console Redirection is set to Enabled.</p> <ul style="list-style-type: none"> ◆ Terminal Type <ul style="list-style-type: none"> – Selects a terminal type to be used for console redirection. – Options available: VT100, VT100Plus, ANSI, VT-UTF8. Default setting is ANSI. ◆ Bits per second <ul style="list-style-type: none"> – Selects the transfer rate for console redirection. – Options available: 9600, 19200, 38400, 57600, 115200. Default setting is 115200. ◆ Data Bits <ul style="list-style-type: none"> – Selects the number of data bits used for console redirection. – Options available: 7, 8. Default setting is 8.

(Note) Advanced items prompt when this item is defined.

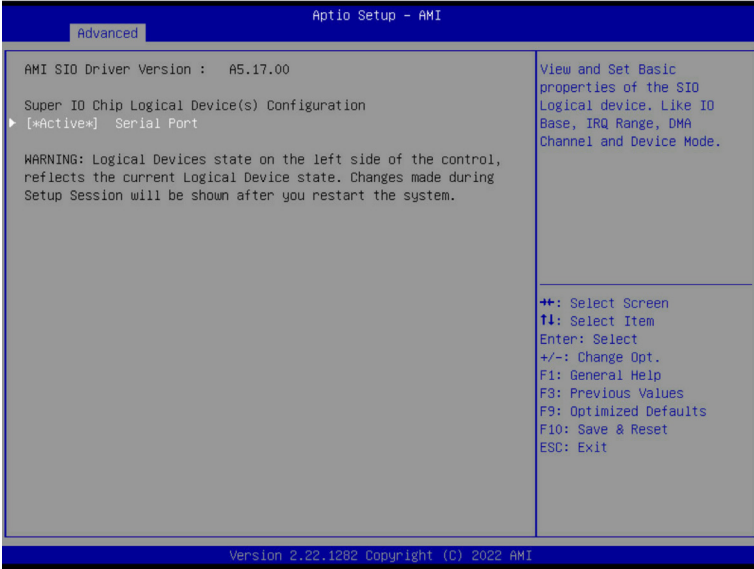
Parameter	Description
COM Console Redirection Settings (continued)	<ul style="list-style-type: none"> ◆ Parity <ul style="list-style-type: none"> – A parity bit can be sent with the data bits to detect some transmission errors. – Even: parity bit is 0 if the num of 1's in the data bits is even. – Odd: parity bit is 0 if num of 1's in the data bits is odd. – Mark: parity bit is always 1. Space: Parity bit is always 0. – Mark and Space Parity do not allow for error detection. – Options available: None, Even, Odd, Mark, Space. Default setting is None. ◆ Stop Bits <ul style="list-style-type: none"> – Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit. – Options available: 1, 2. Default setting is 1. ◆ Flow Control <ul style="list-style-type: none"> – Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals. – Options available: None, Hardware RTS/CTS. Default setting is None. ◆ VT-UTF8 Combo Key Support <ul style="list-style-type: none"> – Enable/Disable the VT-UTF8 Combo Key Support. – Options available: Enabled, Disabled. Default setting is Enabled. ◆ Recorder Mode <ul style="list-style-type: none"> – When this mode enabled, only texts will be send. This is to capture Terminal data. – Options available: Enabled, Disabled. Default setting is Disabled. ◆ Resolution 100x31 <ul style="list-style-type: none"> – Enable/Disable extended terminal resolution. – Options available: Enabled, Disabled. Default setting is Enabled. ◆ Putty Keypad <ul style="list-style-type: none"> – Selects FunctionKey and Keypad on Putty. – Options available: VT100, LINUX, XTERMR6, SC0, ESCN, VT400. Default setting is VT100.

Parameter	Description
Legacy Console Redirection	
Legacy Console Redirection Settings	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ Redirection COM Port <ul style="list-style-type: none"> – Selects a COM port for Legacy serial redirection. – Default setting is COM1. ◆ Resolution <ul style="list-style-type: none"> – Selects the number of rows and columns used in Console Redirection for legacy OS support. – Options available: 80x24, 80x25. Default setting is 80x24. ◆ Redirect After POST <ul style="list-style-type: none"> – When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. – Options available: Always Enable, BootLoader. Default setting is Always Enable.
Serial Port for Out-of-Band Management / Windows Emergency Management Services (EMS) Console Redirection ^(Note)	<p>EMS console redirection allows the user to configure Console Redirection Settings to support Out-of-Band Serial Port management.</p> <p>Options available: Enabled, Disabled. Default setting is Disabled.</p>
Serial Port for Out-of-Band EMS Console Redirection Settings	<p>Press [Enter] to configure advanced items.</p> <p>Please note that this item is configurable when Serial Port for Out-of-Band Management EMS Console Redirection is set to Enabled.</p> <ul style="list-style-type: none"> ◆ Out-of-Band Mgmt Port <ul style="list-style-type: none"> – Microsoft Windows Emergency Management Service (EMS) allows for remote management of a Windows Server OS through a serial port. – Default setting is COM1. ◆ Terminal Type EMS <ul style="list-style-type: none"> – Selects a terminal type to be used for console redirection. – Options available: VT100, VT100Plus, ANSI, VT-UTF8. Default setting is VT100+. ◆ Bits per second EMS <ul style="list-style-type: none"> – Selects the transfer rate for console redirection. – Options available: 9600, 19200, 57600, 115200. Default setting is 115200.

(Note) Advanced items prompt when this item is defined.

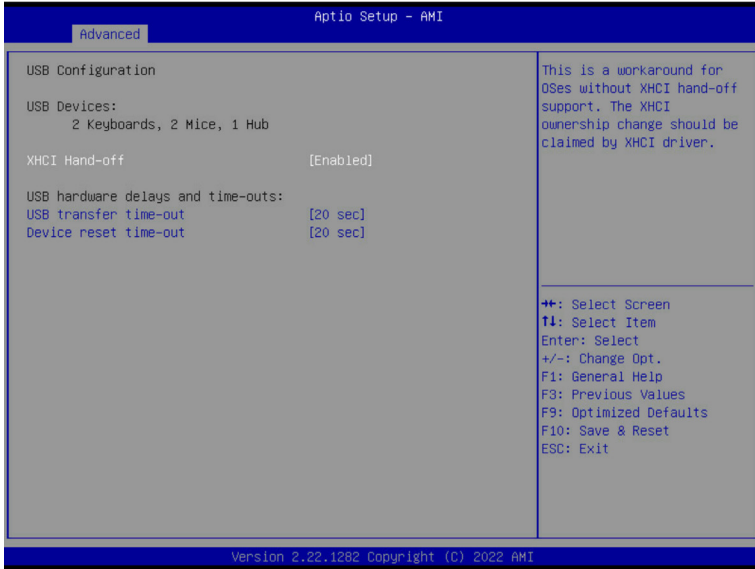
Parameter	Description
Serial Port for Out-of-Band EMS Console Redirection Settings(continued)	<ul style="list-style-type: none">◆ Flow Control EMS<ul style="list-style-type: none">– Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.– Options available: None, Hardware RTS/CTS, Software Xon/Xoff. Default setting is None.

2-2-7 SIO Configuration



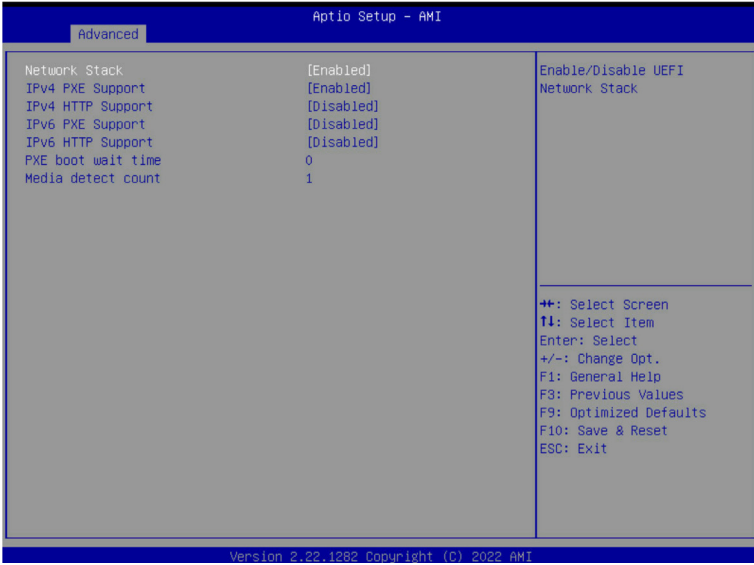
Parameter	Description
AMI SIO Driver Version	Displays the AMI SIO driver version information.
Super IO Chip Logical Device(s) Configuration	Press [Enter] to configure advanced items.
[*Active*] Serial Port	<ul style="list-style-type: none"> ◆ Use This Device <ul style="list-style-type: none"> – When set to Enabled allows you to configure the serial port settings. When set to Disabled, displays no configuration for the serial port. – Options available: Enabled, Disabled. Default setting is Enabled. ◆ Logical Device Settings./Current: <ul style="list-style-type: none"> – Displays the serial port base I/O address and IRQ. ◆ Possible: <ul style="list-style-type: none"> – Configures the serial port base I/O address and IRQ. <ul style="list-style-type: none"> Use Automatic Settings IO=3F8h; IRQ=4; DMA; IO=3F8h; IRQ=4; DMA; IO=2F8h; IRQ=4; DMA; IO=3E8h; IRQ=4; DMA; IO=2E8h; IRQ=4; DMA; Default setting is Use Automatic Settings.

2-2-8 USB Configuration



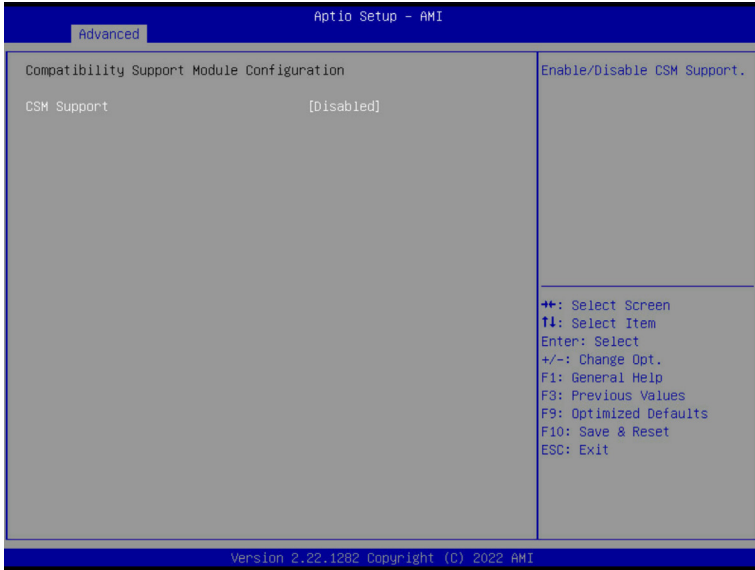
Parameter	Description
USB Configuration	
USB Devices:	Displays the USB devices connected to the system.
XHCI Hand-off	Enable/Disable the XHCI (USB 3.0) Hand-off support. Options available: Disabled, Enabled. Default setting is Enabled .
USB hardware delays and time-outs	
USB transfer time-out	Select the time-out value for USB Control/Bulk/Interrupt transfers. Options available: 1 sec, 5 sec, 10 sec, 20 sec. Default setting is 20 sec .
Device reset time-out	Select the time-out value during a USB mass storage device reset. Options available: 10 sec, 20 sec, 30 sec, 40 sec. Default setting is 20 sec .

2-2-9 Network Stack Configuration



Parameter	Description
Network Stack	Enable/Disable the UEFI network stack. Options available: Enabled, Disabled. Default setting is Enabled .
Ipv4 PXE Support	Enable/Disable the Ipv4 PXE feature. Options available: Enabled, Disabled. Default setting is Enabled .
Ipv4 HTTP Support	Enable/Disable the Ipv4 HTTP feature. Options available: Enabled, Disabled. Default setting is Disabled .
Ipv6 PXE Support	Enable/Disable the Ipv6 PXE feature. Options available: Enabled, Disabled. Default setting is Disabled .
Ipv6 HTTP Support	Enable/Disable the Ipv6 HTTP feature. Options available: Enabled, Disabled. Default setting is Disabled .
PXE boot wait time	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	Number of times the presence of media will be checked. Press the <+> / <-> keys to increase or decrease the desired values.

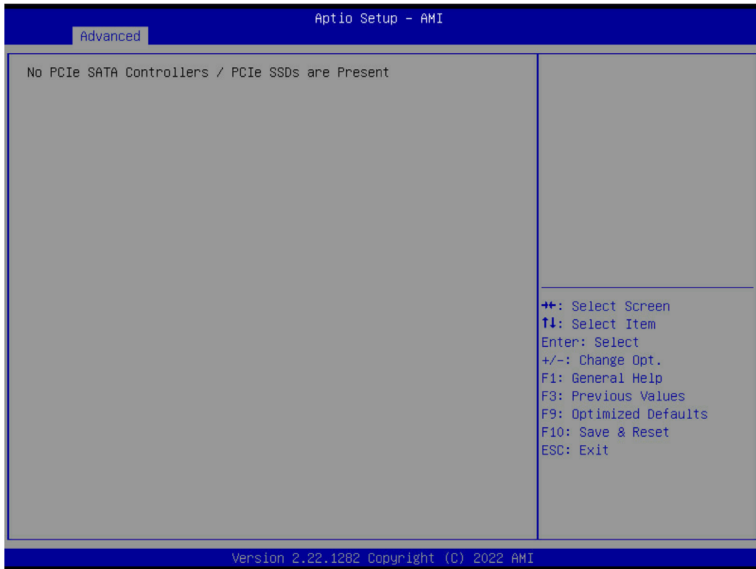
2-2-10 CSM Configuration



Parameter	Description
Compatibility Support Module Configuration	
CSM Support ^{†(Note)}	Options available: Enabled, Disabled. Default setting is Disabled .
Boot option filter	Options available: UEFI and Legacy, Legacy only, UEFI only. Default setting is UEFI and Legacy .
Option ROM execution - Network/Storage/Video/Other PCI devices	Options available: Do not launch, UEFI, Legacy.

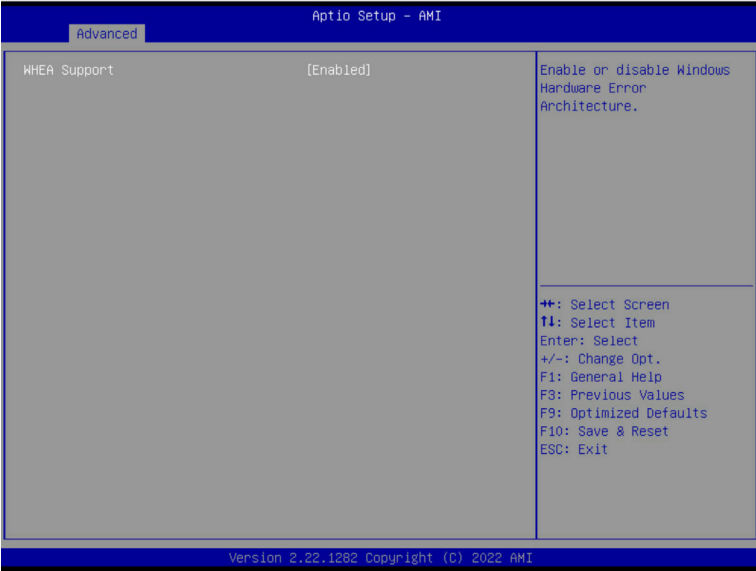
(Note) Advanced items prompt when this item is defined.

2-2-11 Offboard SATA Controller Configuration



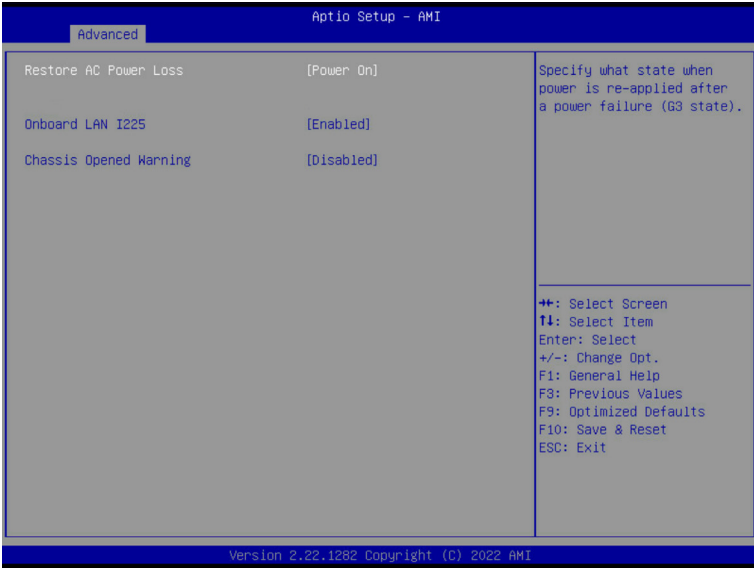
Parameter	Description
Offboard SATA Controller Configuration	Displays the information on your PCIe SATA controllers/ PCIe SSD if installed.

2-2-12 WHEA Configuration



Parameter	Description
WHEA Support	Enable/Disable Windows Hardware Error Architecture. Options available: Disabled, Enabled. Default setting is Enabled .

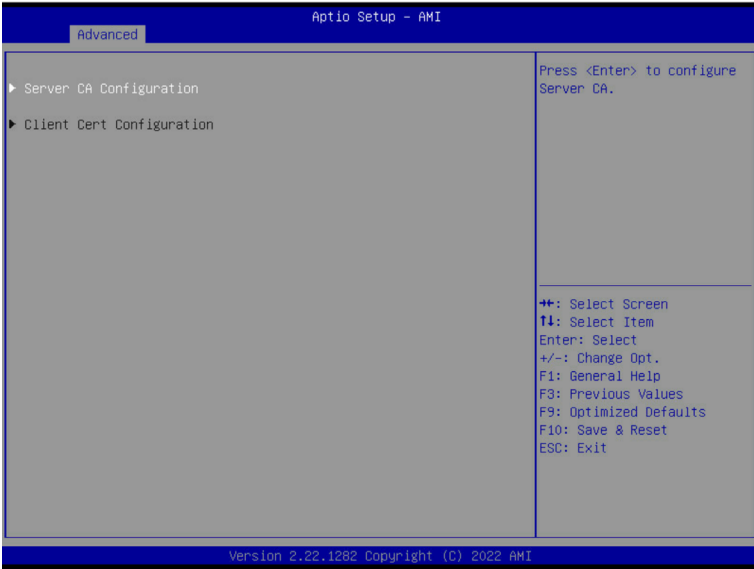
2-2-13 Chipset Configuration



Parameter	Description
Restore on AC Power Loss ^(Note)	Defines the power state to resume to after a system shutdown that is due to an interruption in AC power. When set to Last State, the system will return to the active power state prior to shutdown. When set to Power Off, the system remains off after power shutdown. Options available: Last State, Power Off, Power On, Unspecified. The default setting depends on the BMC setting.
Onboard LAN I225	Controls the PCI Express Root Port. Options available: Disabled, Enabled. Default setting is Enabled .
Chassis Opened Warning	Enable/Disable the chassis intrusion alert function. Options available: Disabled, Enabled, Clear. Default setting is Disabled .

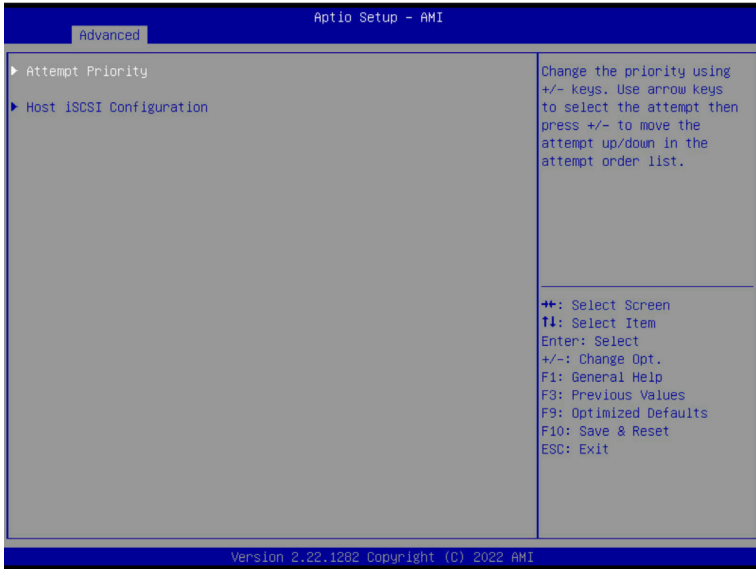
(Note) When the power policy is controlled by BMC, please wait for 15-20 seconds for BMC to save the last power state.

2-2-14 Tls Auth Configuration



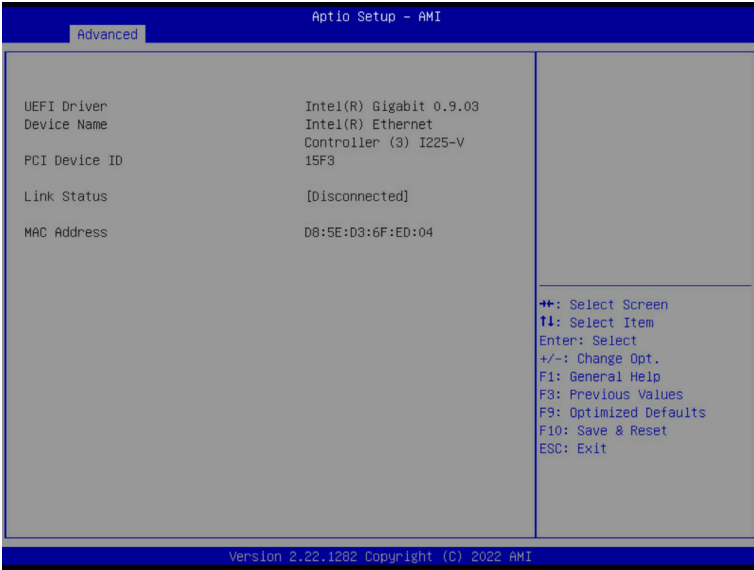
Parameter	Description
Server CA Configuration	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ Enroll Cert <ul style="list-style-type: none"> – Press [Enter] to enroll a certificate <ul style="list-style-type: none"> • Enroll Cert Using File • Cert GUID <p>Input digit character in 1111111-2222-3333-4444-1234567890ab format.</p> – Commit Changes and Exit – Discard Changes and Exit ◆ Delete Cert
Client Cert Configuration	<p>Press [Enter] for configuration of advanced items.</p>

2-2-15 iSCSI Configuration



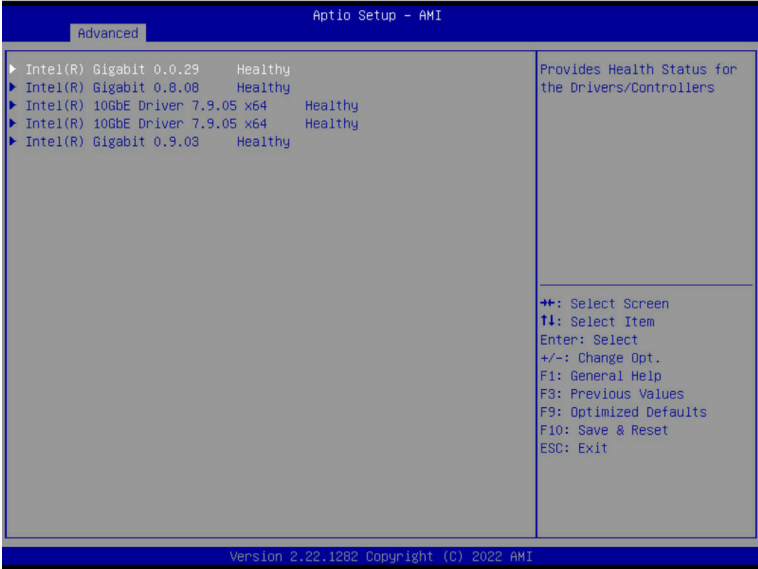
Parameter	Description
Attempt Priority	Press [Enter] configure advanced items. <ul style="list-style-type: none"> ◆ Attempt Priority <ul style="list-style-type: none"> – Options available: Host Attempt, Redfish Attempt. Default setting is Host Attempt. ◆ Commit Changes and Exit
Host iSCSI Configuration	Press [Enter] to configure advanced items. <ul style="list-style-type: none"> ◆ iSCSI Initiator Name <ul style="list-style-type: none"> – Only IQN format is accepted. Range: from 4 to 223 ◆ Add an Attempt ◆ Delete Attempts ◆ Change Attempt Order

2-2-16 Intel(R) Ethernet Controller I225-V



Parameter	Description
UEFI Driver	Displays the technical specifications for the Network Interface Controller.
Device Name	Displays the technical specifications for the Network Interface Controller.
PCI Device ID	Displays the technical specifications for the Network Interface Controller.
Link Status	Displays the technical specifications for the Network Interface Controller.
MAC Address	Displays the technical specifications for the Network Interface Controller.

2-2-17 Driver Health



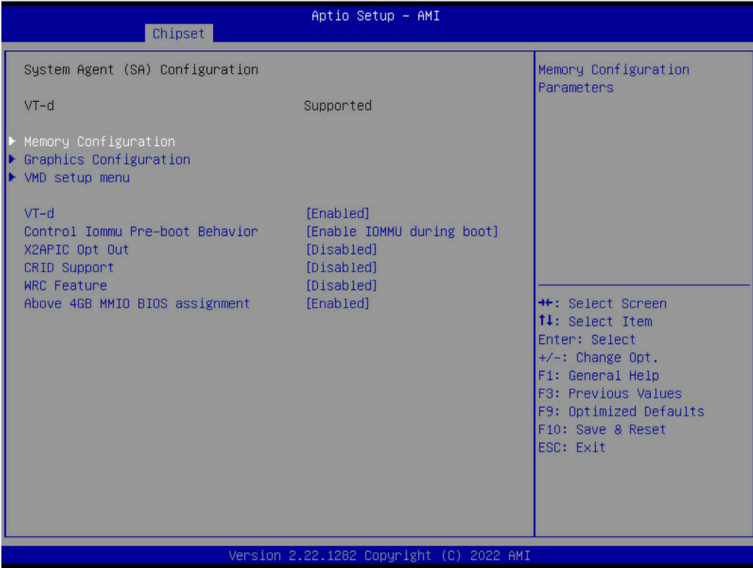
Parameter	Description
Driver Health	Displays driver health status of the devices/controllers if installed.

2-3 Chipset Menu

Chipset Setup menu displays submenu options for configuring the function of Platform Controller Hub(PCH). Select a submenu item, then press <Enter> to access the related submenu screen.



2-3-1 System Agent (SA) Configuration



Parameter	Description
Memory Configuration	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ Memory <ul style="list-style-type: none"> – Press [Enter] to view/configure memory overclocking menu. ◆ Memory Configuration ◆ Memory Frequency <ul style="list-style-type: none"> – Displays the frequency information of installed memory. ◆ Controller#Channel#slot# information of memory DIMMs. ◆ Maximum Memory Frequency <ul style="list-style-type: none"> – Default setting is Auto. ◆ Max TOLUD <ul style="list-style-type: none"> – Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller. – Default setting is Dynamic.
Graphics Configuration	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ Skip Scanning of External Gfx Card <ul style="list-style-type: none"> – Options available: Disabled, Enabled. Default setting is Enabled. ◆ Primary Display <ul style="list-style-type: none"> – Options available: Auto, IGFX, PEG Slot, PCH PCI, HG. Default setting is Auto.

Parameter	Description
Graphics Configuration (continued)	<ul style="list-style-type: none"> ◆ Internal Graphics <ul style="list-style-type: none"> – Options available: Auto, Disabled, Enabled. Default setting is Enabled. ◆ GTT Size <ul style="list-style-type: none"> – Options available: 2MB, 4MB, 8MB. Default setting is 8MB. ◆ Aperture Size <ul style="list-style-type: none"> – Options available: 128MB, 256MB, 512MB, 1024MB. Default setting is 256MB. ◆ PSMI SUPPORT <ul style="list-style-type: none"> – Options available: Disabled, Enabled. Default setting is Disabled. ◆ DVMT Pre-Allocated <ul style="list-style-type: none"> – Options available: 0M, 32M, 64M, 4M, 8M, 12M, 16M, 20M, 24M, 28M, 36M, 40M, 44M, 48M, 52M, 56M, 60M. Default setting is 60M. ◆ DVMT Total Gfx Mem <ul style="list-style-type: none"> – Options available: 128MB, 256MB, MAX. Default setting is 256MB.
VMD setup menu	<p data-bbox="399 694 739 718">Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ Enable VMD controller^(Note) <ul style="list-style-type: none"> – Options available: Disabled, Enabled. Default setting is Disabled. ◆ Enable VMD Global Mapping <ul style="list-style-type: none"> – Options available: Disabled, Enabled. Default setting is Enabled. ◆ Map this Root Port under VMD^(Note1) <ul style="list-style-type: none"> – Options available: Disabled, Enabled. Default setting is Disabled. ◆ RAID0/1/5/10 <ul style="list-style-type: none"> – Enable/Disable RAID support. – Options available: Disabled, Enabled. Default setting is Enabled. ◆ Intel Rapid Recovery Technology <ul style="list-style-type: none"> – Options available: Disabled, Enabled. Default setting is Enabled. ◆ RRT volumes can span internal and eSATA drives <ul style="list-style-type: none"> – Options available: Disabled, Enabled. Default setting is Enabled. ◆ Intel(R) Optane(TM) Memory <ul style="list-style-type: none"> – Options available: Disabled, Enabled. Default setting is Enabled.

(Note) Advanced items prompt when this item is defined.

(Note1) This item is configurable when **Enable VMD Global Mapping** is set to **Disabled**.

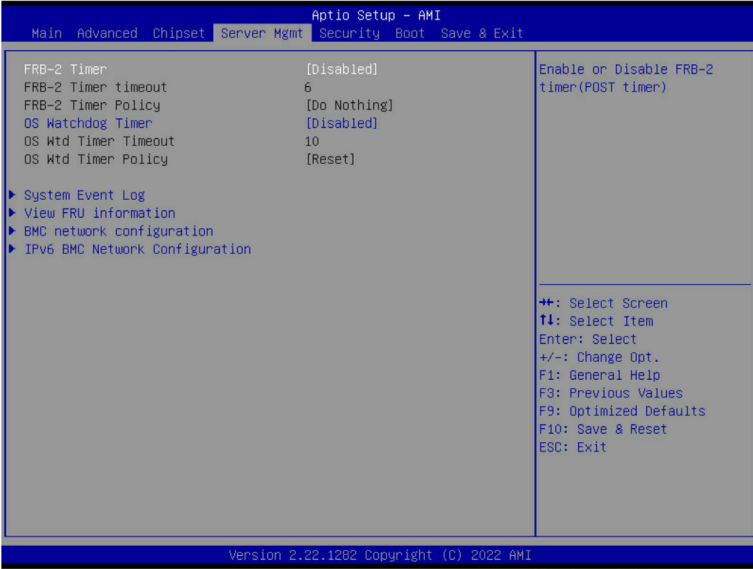
Parameter	Description
VT-d	Enable/Disable VT-d capability. Options available: Enabled, Disabled. Default setting is Enabled .
Control Iommu Pre-boot Behavior	Enable/Disable IOMMU in Pre-boot environment. Options available: Disable IOMMU, Enable IOMMU during boot. Default setting is Enable IOMMU during boot .
X2APIC Opt Out	Options available: Enabled, Disabled. Default setting is Disabled .
CRID Support	Enable/Disable SA CRID and TCSS CRID control for Intel SIPP. Options available: Enabled, Disabled. Default setting is Disabled .
WRC Feature	Enable/Disable SA WRC(Write Cache) feature of IOP. Options available: Enabled, Disabled. Default setting is Disabled .
Above 4GB MMIO BIOS assignment	Enable/Disable the Above 4G Memory Mapped IO BIOS Assignment. Options available: Enabled, Disabled. Default setting is Enabled

2-3-2 PCH-IO Configuration



Parameter	Description
SATA Configuration	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ SATA Controller(s) <ul style="list-style-type: none"> – Enable/Disable SATA device. – Options available: Enabled, Disabled. Default setting is Enabled. ◆ SATA Mode Selection <ul style="list-style-type: none"> – Default setting is AHCI. ◆ SATA Test Mode <ul style="list-style-type: none"> – Options available: Enabled, Disabled. Default setting is Disabled. ◆ Aggressive LPM Support <ul style="list-style-type: none"> – Options available: Enabled, Disabled. Default setting is Disabled.
Security Configuration	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ RTC Memory Lock <ul style="list-style-type: none"> – Options available: Disabled, Enabled. Default setting is Enabled. ◆ BIOS Lock <ul style="list-style-type: none"> – Enable/Disable the PCH BIOS Lock Enable feature. – Options available: Disabled, Enabled. Default setting is Enabled.
HD Audio Configuration	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ HD Audio <ul style="list-style-type: none"> – Options available: Disabled, Enabled. Default setting is Enabled. ◆ Audio DSP <ul style="list-style-type: none"> – Options available: Disabled, Enabled. Default setting is Disabled.

2-4 Server Management Menu



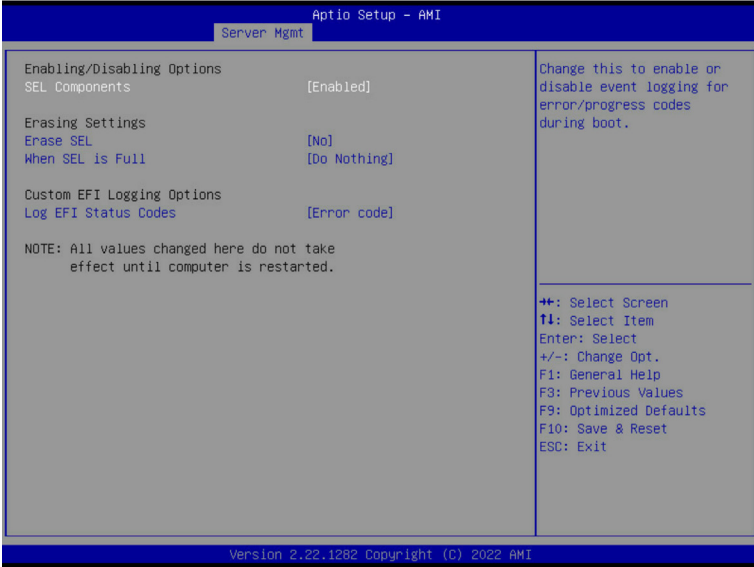
Parameter	Description
FRB-2 Timer	Enable/Disable FRB-2 timer (POST timer). Options available: Enabled, Disabled. Default setting is Disabled .
FRB-2 Timer timeout ^(Note1)	Configures the FRB2 Timer timeout. Options available: 3 minutes, 4 minutes, 5 minutes, 6 minutes. Default setting is 6 minutes .
FRB-2 Timer Policy ^(Note1)	Configures the FRB2 Timer policy. Options available: Do Nothing, Reset, Power Down, Power Cycle. Default setting is Do Nothing .
OS Watchdog Timer	Enable/Disable OS Watchdog Timer function. Options available: Enabled, Disabled. Default setting is Disabled .
OS Wtd Timer Timeout ^(Note2)	Configures OS Watchdog Timer. Options available: 5 minutes, 10 minutes, 15 minutes, 20 minutes. Default setting is 10 minutes .
OS Wtd Timer Policy ^(Note2)	Configure OS Watchdog Timer Policy. Options available: Reset, Do Nothing, Power Down, Power Cycle. Default setting is Reset .

(Note1) This item is configurable when **FRB-2 Timer** is set to **Enabled**.

(Note2) This item is configurable when **OS Watchdog Timer** is set to **Enabled**.

Parameter	Description
System Event 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.
IPv6 BMC Network Configuration	Press [Enter] to configure advanced items.

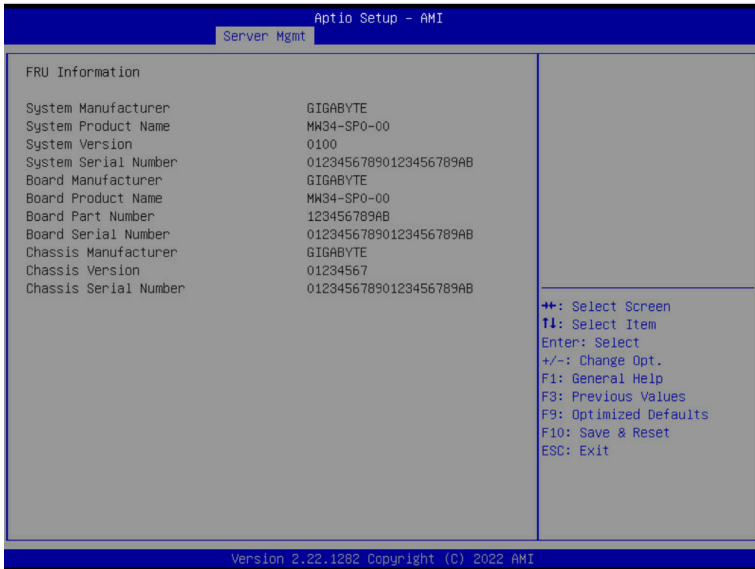
2-4-1 System Event Log



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 Enabled .
Erasing Settings	
Erase SEL	Choose options for erasing SEL. Options available: No Yes, On next reset Yes, On every reset. Default setting is No .
When SEL is Full	Choose options for reactions to a full SEL. Options available: Do Nothing, Erase Immediately, Delete Oldest Record. Default setting is Do Nothing .
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 Error code .

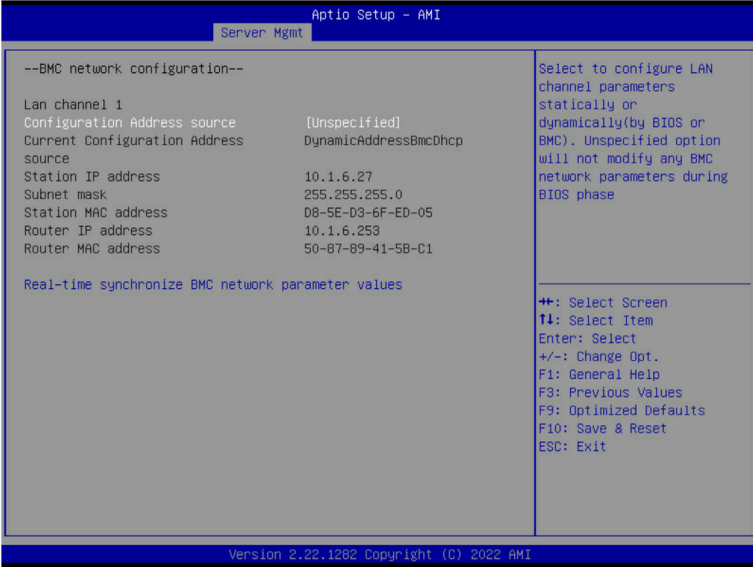
2-4-2 View FRU Information

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.



(Note) The model name will vary depends on the product you purchased

2-4-3 BMC Network Configuration



Parameter	Description
BMC network configuration	
Lan Channel 1	
Configuration Address source	Selects to configure LAN channel parameters statically or dynamically (by BIOS or BMC). Options available: Unspecified, Static, DynamicBmcDhcp, DynamicBmcNonDhcp. Default setting is Unspecified .
Current Configuration Address Source	Display the current configuration information.
Station IP address	Displays IP Address information.
Subnet mask	Displays Subnet Mask information.
Station MAC address	Displays the MAC Address information.
Router IP address	Displays the Router IP Address information.
Router MAC address	Displays the Router MAC Address information.
Real-time synchronize BMC network parameter values	Press [Enter] will set Address source(Static/DHCP) to BMC and then get Station IP address, Subnet mask and Router IP address from BMC.

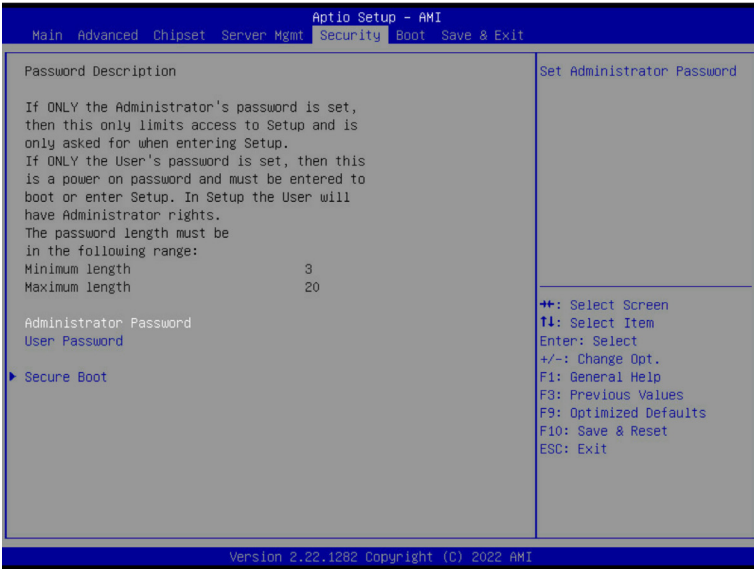
2-4-4 IPv6 BMC Network Configuration



Parameter	Description
IPv6 BMC network configuration	
IPv6 BMC Lan Channel 1	
IPv6 BMC Lan Option	Enable/Disable IPv6 BMC LAN channel function. When this item is disabled, the system will not modify any BMC network during BIOS phase. Options available: Unspecified, Disable, Enable. Default setting is Enable .
IPv6 BMC Lan IP Address Source	Selects to configure LAN channel parameters statically or dynamically (by BIOS or BMC). Options available: Unspecified, Static, Dynamic-Obtained by BMC running DHCP. Default setting is Dynamic-Obtained by BMC running DHCP .
IPv6 BMC Lan IP Address/Prefix Length	Check if the IPv6 BMC LAN IP address matches those displayed on the screen.

2-5 Security Menu

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



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.



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 Enabled .
Secure Boot Mode ^(Note)	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 Standard .
Restore Factory Keys	Forces the system to user mode and installs factory default Secure Boot key database.
Reset To Setup Mode	Reset the system to Setup Mode.

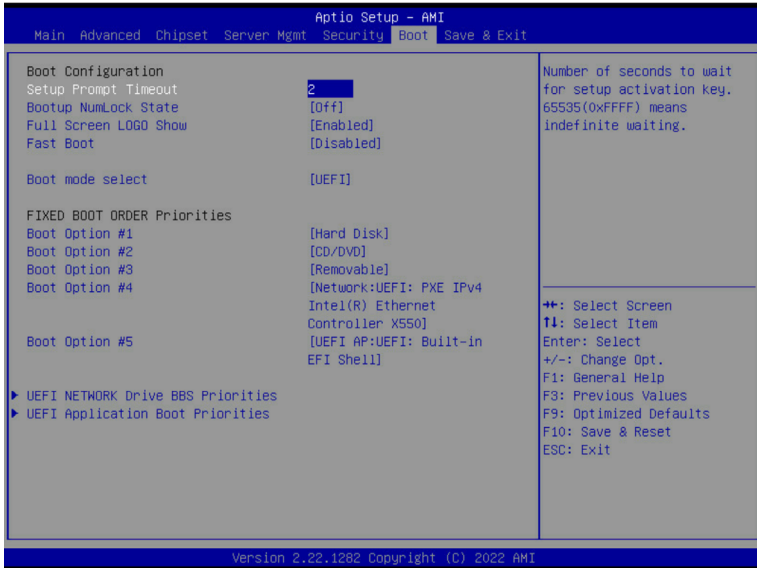
(Note) Advanced items prompt when this item is set to **Custom**.

Parameter	Description
Key Management	<p data-bbox="335 156 665 180">Press [Enter] to configure advanced items.</p> <p data-bbox="335 185 941 235">Please note that this item is configurable when Secure Boot Mode is set to Custom.</p> <ul style="list-style-type: none"> <li data-bbox="335 243 946 352">◆ Factory Key Provision <ul style="list-style-type: none"> <li data-bbox="367 266 946 321">– Allows to provision factory default Secure Boot keys when system is in Setup Mode. <li data-bbox="367 326 909 352">– Options available: Enabled, Disabled. Default setting is Disabled. <li data-bbox="335 357 931 431">◆ Restore Factory Keys <ul style="list-style-type: none"> <li data-bbox="367 381 931 404">– Installs all factory default keys. It will force the system in User Mode. <li data-bbox="367 409 611 431">– Options available: Yes, No. <li data-bbox="335 435 654 517">◆ Reset To Setup Mode <ul style="list-style-type: none"> <li data-bbox="367 459 654 482">– Reset the system to Setup Mode. <li data-bbox="367 487 611 517">– Options available: Yes, No. <li data-bbox="335 522 899 572">◆ Secure Boot variable <ul style="list-style-type: none"> <li data-bbox="367 545 899 572">– Displays the current status of the variables used for secure boot. <li data-bbox="335 577 803 682">◆ Platform Key (PK) <ul style="list-style-type: none"> <li data-bbox="367 600 803 624">– Displays the current status of the Platform Key (PK). <li data-bbox="367 628 680 652">– Press [Enter] to configure a new PK. <li data-bbox="367 656 601 682">– Options available: Update. <li data-bbox="335 686 941 823">◆ Key Exchange Keys (KEK) <ul style="list-style-type: none"> <li data-bbox="367 710 941 736">– Displays the current status of the Key Exchange Key Database (KEK). <li data-bbox="367 741 909 796">– Press [Enter] to configure a new KEK or load additional KEK from storage devices. <li data-bbox="367 801 675 823">– Options available: Update, Append. <li data-bbox="335 827 946 964">◆ Authorized Signatures (DB) <ul style="list-style-type: none"> <li data-bbox="367 851 909 874">– Displays the current status of the Authorized Signature Database. <li data-bbox="367 879 946 934">– Press [Enter] to configure a new DB or load additional DB from storage devices. <li data-bbox="367 939 675 964">– Options available: Update, Append. <li data-bbox="335 969 904 1105">◆ Forbidden Signatures (DBX) <ul style="list-style-type: none"> <li data-bbox="367 992 904 1016">– Displays the current status of the Forbidden Signature Database. <li data-bbox="367 1020 893 1075">– Press [Enter] to configure a new dbx or load additional dbx from storage devices. <li data-bbox="367 1080 675 1105">– Options available: Update, Append. <li data-bbox="335 1110 931 1246">◆ Authorized TimeStamps (DBT) <ul style="list-style-type: none"> <li data-bbox="367 1133 931 1157">– Displays the current status of the Authorized TimeStamps Database. <li data-bbox="367 1161 909 1216">– Press [Enter] to configure a new DBT or load additional DBT from storage devices. <li data-bbox="367 1221 675 1246">– Options available: Update, Append. <li data-bbox="335 1251 920 1387">◆ OsRecovery Signatures <ul style="list-style-type: none"> <li data-bbox="367 1274 920 1298">– Displays the current status of the OsRecovery Signature Database. <li data-bbox="367 1303 888 1357">– Press [Enter] to configure a new OsRecovery Signature or load additional OsRecovery Signature from storage devices. <li data-bbox="367 1362 675 1387">– Options available: Update, Append.

Parameter	Description
Key Management (continued)	<ul style="list-style-type: none"><li data-bbox="330 158 953 236">◆ Export Secure Boot variables<ul style="list-style-type: none"><li data-bbox="362 185 953 236">– Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.<li data-bbox="330 241 953 324">◆ Enroll Efi Image<ul style="list-style-type: none"><li data-bbox="362 268 953 324">– Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db).

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.

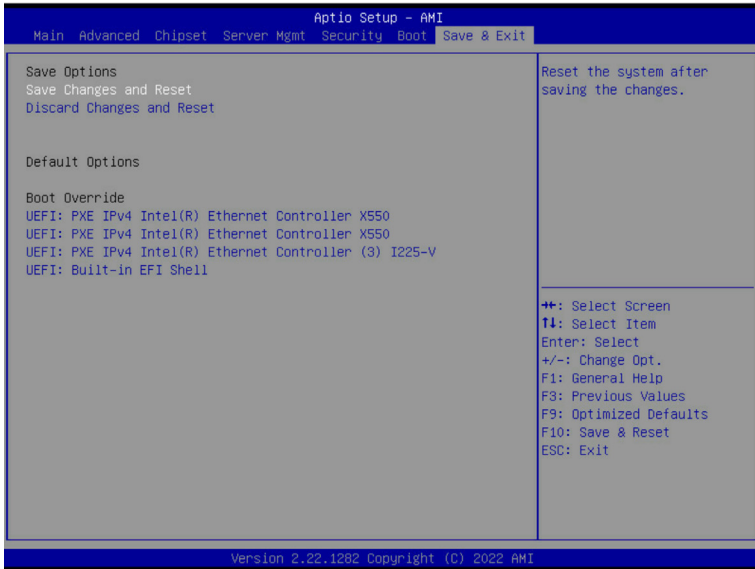


Parameter	Description
Boot Configuration	
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Press the numeric keys to input the desired values.
Bootup NumLock State	Enable/Disable the Bootup NumLock function. Options available: On, Off. Default setting is Off .
Full Screen LOGO Show	Enable/Disable showing the logo during POST. Options available: Enabled, Disabled. Default setting is Enabled .
Fast Boot	Enable/Disable Fast Boot to shorten the OS boot process. Options available: Enabled, Disabled. Default setting is Disabled .
Boot mode select	Selects the boot mode. Options available: LEGACY, UEFI. Default setting is UEFI .

Parameter	Description
FIXED BOOT ORDER Priorities	
Boot Option #1 / #2 / #3 / #4 / #5	<p data-bbox="399 203 728 227">Press [Enter] to configure the boot priority.</p> <p data-bbox="399 232 899 282">By default, the server searches for boot devices in the following sequence:</p> <ol data-bbox="436 290 643 431" style="list-style-type: none">1. Hard drive.2. CD-COM/DVD drive.3. USB device.4. Network.5. UEFI.

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>.



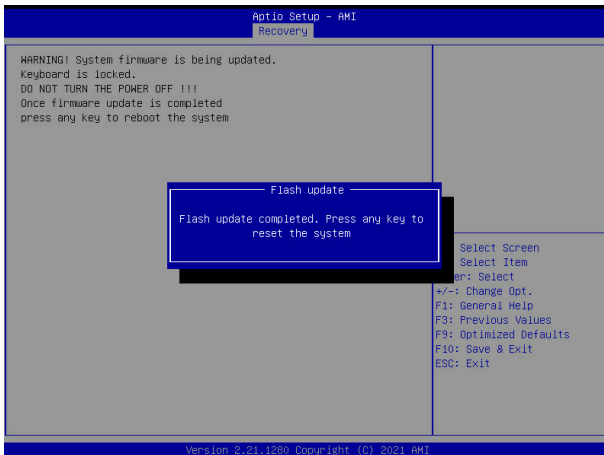
Parameter	Description
Save Options	
Save Changes and Reset	Restarts the system after saving the changes made. Options available: Yes, No.
Discard Changes and Reset	Restarts the system without saving any changes. Options available: Yes, No.
Default Options	
Boot Override	Press [Enter] to configure the device as the boot-up drive.

2-8 BIOS Recovery

The system has an embedded recovery technique. In the event that the BIOS becomes corrupt the boot block can be used to restore the BIOS to a working state. To restore your BIOS, please follow the instructions listed below:

Recovery Instruction:

1. Copy the XXX.rom to USB diskette.
2. Setting BIOS Recovery jump to enabled status.
3. Boot into BIOS recovery.
4. Run Proceed with flash update.
5. BIOS updated.



2-9 BIOS POST Beep code (AMI standard)

2-9-1 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	DXE IPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

2-9-2 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