GIGABYTE™

R262-ZA1
R262-ZA2

AMD EPYC™ 7003 UP Server System - 2U 14-Bay

User Manual
Rev. 1.0
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Documentation Classifications
In order to assist in the use of this product, GIGABYTE provides the following types of documentation:
- User Manual: detailed information & steps about the installation, configuration and use of this
  product (e.g. motherboard, server barebones), covering hardware and BIOS.
- User Guide: detailed information about the installation & use of an add-on hardware or
  software component (e.g. BMC firmware, rail-kit) compatible with this product.
- Quick Installation Guide: a short guide with visual diagrams that you can reference easily for
  installation purposes of this product (e.g. motherboard, server barebones).

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

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

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

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

For any general sales or marketing enquiries, you may also message GIGABYTE server directly by email:
server.grp@gigabyte.com
**Conventions**
The following conventions are used in this user's guide:

<table>
<thead>
<tr>
<th><strong>NOTE!</strong></th>
<th>Gives bits and pieces of additional information related to the current topic.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAUTION!</strong></td>
<td>Gives precautionary measures to avoid possible hardware or software problems.</td>
</tr>
<tr>
<td><strong>WARNING!</strong></td>
<td>Alerts you to any damage that might result from doing or not doing specific actions.</td>
</tr>
</tbody>
</table>
Server Warnings and Cautions
Before installing a server, be sure that you understand the following warnings and cautions.

⚠️ WARNING! ⚠️
To reduce the risk of electric shock or damage to the equipment:
• Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
• Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
• Unplug all the power cords from the power supplies to disconnect power to the equipment.
• Unplug the power cord from the power supply to disconnect power to the equipment.
• Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.

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

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

⚠️ WARNING! ⚠️
This equipment is intended to be used in Restrict Access Location. The access can only be gained by Skilled person. Only authorized by well trained professional person can access the restrict access location.

⚠️ CAUTION! ⚠️
• Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.
• Danger of explosion if battery is incorrectly replaced.
• Replace only with the same or equivalent type recommended by the manufacturer.
• Dispose of used batteries according to the manufacturer’s instructions.
**Electrostatic Discharge (ESD)**

**CAUTION!**

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

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

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

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

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

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

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

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

Chapter 1  Hardware Installation

1-1  Installation Precautions

The motherboard/system contain numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the service guide 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.
## Product Specifications

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

<table>
<thead>
<tr>
<th>System Dimension</th>
<th>2U</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>438mm (W) x 87.5mm (H) x 730mm (D)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU</th>
<th>AMD EPYC™ 7003 Series processors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single processor, 7nm technology</td>
</tr>
<tr>
<td></td>
<td>Up to 64-core, 128 threads per processor</td>
</tr>
<tr>
<td></td>
<td>cTDP up to 240W</td>
</tr>
</tbody>
</table>

Compatible with AMD EPYC™ 7002 Series processors

<table>
<thead>
<tr>
<th>Chipset</th>
<th>System on Chip</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Hardware-Level Root of Trust Support</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>NOTE!</strong> The system will take extra time to boot as it goes through RoT authentication.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Memory</th>
<th>16 x DIMM slots</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DDR4 memory supported only</td>
</tr>
<tr>
<td></td>
<td>8-Channel memory architecture</td>
</tr>
<tr>
<td></td>
<td>RDIMM modules up to 128GB supported</td>
</tr>
<tr>
<td></td>
<td>LRDIMM modules up to 128GB supported</td>
</tr>
<tr>
<td></td>
<td>3DS RDIMM/LRDIMM modules up to 256GB supported</td>
</tr>
<tr>
<td></td>
<td>Memory speed: Up to 3200*/ 2933 MHz</td>
</tr>
</tbody>
</table>

- Note: * Follow BIOS setting and memory QVL list if running 3200 Mhz with 2DPC

<table>
<thead>
<tr>
<th>LAN</th>
<th>2 x 1GbE LAN ports (1 x Intel® I350-AM2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 x 10/100/1000 management LAN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Video</th>
<th>Integrated in Aspeed® AST2500</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2D Video Graphic Adapter with PCIe bus interface</td>
</tr>
<tr>
<td></td>
<td>1920x1200@60Hz 32bpp</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage</th>
<th>Front Side: 12 x 3.5&quot; hot-swappable HDD/SSD bays</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>R262-ZA1</strong></td>
</tr>
<tr>
<td></td>
<td>- 12 x blue HDD/SSD trays compatible with SATA/SAS devices</td>
</tr>
<tr>
<td></td>
<td><strong>R262-ZA2</strong></td>
</tr>
<tr>
<td></td>
<td>- 4 x green HDD/SSD trays compatible with SATA/SAS/NVMe devices</td>
</tr>
<tr>
<td></td>
<td>- 8 x blue HDD/SSD trays compatible with SATA/SAS devices, enabled by optional SAS Card</td>
</tr>
</tbody>
</table>

| Rear Side: 2 x 2.5" SATA/SAS hot-swappable HDD/SSD bays |
| SAS card is required to enable the drive bays |
### Storage (continued)

- **Default Configuration supports:**
  - 4 x 3.5" SATA/SAS drives in front side
  - 2 x 2.5" SATA/SAS drives in rear side

- **Recommended 12Gb/s SAS cards:**
  - CRA4448
  - CRA3338

*NOTE: 8 x blue HDD/SSD trays are enabled by optional SAS Card*

### SAS

- Depends on SAS add-on card

### RAID

- Depends on SAS add-on card

### Expansion Slot

- **Riser Card CRS2027:**
  - 1 x PCIe x8 slot (Gen4 x8), Low profile half-length
  - 1 x PCIe x8 slot (Gen4 x8), Low profile half-length

- **Riser Card CRS2225:**
  - 1 x PCIe x16 slot (Gen4 x16 or x8), FHFL
  - 1 x PCIe x8 slot (Gen4 x0 or x8), FHFL
  - 1 x PCIe x16 slot (Gen4 x16), FHFL

- **Riser Card CRS2225:**
  - 1 x PCIe x16 slot (Gen4 x16 or x8), FHFL
  - 1 x PCIe x8 slot (Gen4 x0 or x8), FHFL
  - 1 x PCIe x16 slot (Gen3 x16 or x8, shared with OCP2.0 mezzanine slot), Full height half-length

- **Internal Riser Card CRS101H:**
  - **R262-ZA1**
    - 1 x PCIe x16 slot (Gen4 x16), Full height half-length
  - **R262-ZA2**
    - 1 x PCIe x16 slot (Gen4 x16), Full height half-length, occupied by CNV3134, 4 x NVMe Card

- 1 x OCP 3.0 mezzanine slot with PCIe Gen4 x16 bandwidth
- 1 x OCP 2.0 mezzanine slot with PCIe Gen3 x0 or x8 bandwidth, shared with CRS2225

- 1 x M.2 slot:
  - M-key
  - PCIe Gen4 x4
  - Supports NGFF-2280/22110 cards
### Internal I/O
- 1 x M.2 slot
- 1 x USB 3.0 header
- 1 x COM header
- 1 x TPM header
- 1 x OCP 3.0 mezzanine slot
- 1 x OCP 2.0 mezzanine slot
- 1 x Front panel header
- 1 x HDD back plane board header
- 1 x PMBus connector
- 1 x IPMB connector
- 1 x Clear CMOS jumper
- 1 x BIOS recovery jumper

### Front I/O
- 2 x USB 3.0
- 1 x Power button with LED
- 1 x ID button with LED
- 1 x NMI button
- 1 x Reset button
- 2 x LAN activity LEDs
- 1 x HDD activity LED
- 1 x System status LED

### Rear I/O
- 2 x USB 3.0
- 1 x VGA
- 2 x RJ45
- 1 x MLAN
- 1 x ID button with LED

### Backplane I/O
- **R262-ZA1**
  - Front side_CBP20C5: 12 x SATA/SAS ports
  - Rear side_CBP2022: 2 x SATA/SAS ports
  - Speed and bandwidth: SAS 12Gb/s, SATA 6Gb/s

- **R262-ZA2**
  - Front side_CBP20C5: 12 x SATA/SAS/NVMe ports
  - Rear side_CBP2022: 2 x SATA/SAS ports
  - Speed and bandwidth: SAS 12Gb/s, SATA 6Gb/s, PCIe Gen4 x4

### TPM
- 1 x TPM header with SPI interface
- Optional TPM2.0 kit: CTM010
<table>
<thead>
<tr>
<th>Hardware Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspeed® AST2500 management controller</td>
</tr>
<tr>
<td>GIGABYTE Management Console (AMI MegaRAC SP-X) web interface</td>
</tr>
<tr>
<td>Dashboard</td>
</tr>
<tr>
<td>JAVA Based Serial Over LAN</td>
</tr>
<tr>
<td>HTML5 KVM</td>
</tr>
<tr>
<td>Sensor Monitor (Voltage, RPM, Temperature, CPU Status …etc.)</td>
</tr>
<tr>
<td>Sensor Reading History Data</td>
</tr>
<tr>
<td>FRU Information</td>
</tr>
<tr>
<td>SEL Log in Linear Storage / Circular Storage Policy</td>
</tr>
<tr>
<td>Hardware Inventory</td>
</tr>
<tr>
<td>Fan Profile</td>
</tr>
<tr>
<td>System Firewall</td>
</tr>
<tr>
<td>Power Consumption</td>
</tr>
<tr>
<td>Power Control</td>
</tr>
<tr>
<td>LDAP / AD / RADIUS Support</td>
</tr>
<tr>
<td>Backup &amp; Restore Configuration</td>
</tr>
<tr>
<td>Remote BIOS/BMC/CPLD Update</td>
</tr>
<tr>
<td>Event Log Filter</td>
</tr>
<tr>
<td>User Management</td>
</tr>
<tr>
<td>Media Redirection Settings</td>
</tr>
<tr>
<td>PAM Order Settings</td>
</tr>
<tr>
<td>SSL Settings</td>
</tr>
<tr>
<td>SMTP Settings</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Supply R262-ZA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x 1200W redundant PSUs</td>
</tr>
<tr>
<td>80 PLUS Platinum</td>
</tr>
<tr>
<td>AC Input:</td>
</tr>
<tr>
<td>- 100-240V~/ 12-7A, 50-60Hz</td>
</tr>
<tr>
<td>DC Input:</td>
</tr>
<tr>
<td>- 240Vdc/ 6A</td>
</tr>
<tr>
<td>DC Output:</td>
</tr>
<tr>
<td>- Max 1000W/ 100-240V~</td>
</tr>
<tr>
<td>+12V/ 80.5A</td>
</tr>
<tr>
<td>+12Vsb/ 3A</td>
</tr>
<tr>
<td>- Max 1200W/ 200-240V~ or 240Vdc input</td>
</tr>
<tr>
<td>+12V/ 97A</td>
</tr>
<tr>
<td>+12Vsb/ 3A</td>
</tr>
</tbody>
</table>
Hardware Installation

Power Supply R262-ZA2
- 2 x 1600W redundant PSUs
- 80 PLUS Platinum

- AC Input:
  - 100-127V~/ 12A, 47-63Hz
  - 200-240V~/ 9.48A, 47-63Hz

- DC Output:
  - Max 1000W/ 100-127V
    +12V/ 82A
    +12Vsb/ 2.1A
  - Max 1600W/ 200-240V
    +12V/ 132A
    +12Vsb/ 2.1A

Operating Properties
- Operating temperature: 10°C to 35°C
- Operating humidity: 8-80% (non-condensing)
- Non-operating temperature: -40°C to 60°C
- Non-operating humidity: 20%-95% (non-condensing)
1-3 System Block Diagram

R262-ZA1

[Diagram showing system block diagram for AMD Milan "Zen3" Core Socket SP3, including components such as PCIe, USB, LAN, and other interfaces.]

- 17 - Hardware Installation
Chapter 2  System Appearance

2-1  Front View

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Front Panel LEDs and Buttons</td>
</tr>
<tr>
<td>2.</td>
<td>Front USB 3.0 Ports</td>
</tr>
<tr>
<td>3.</td>
<td>3.5”/2.5” HDD Bays</td>
</tr>
</tbody>
</table>

NOTE! Green Latches Support NVMe.

• Please Go to Chapter 2-3 Front Panel LEDs and Buttons for detail description of function LEDs.
## Rear View

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mezzanine Card Slot (Option/OCP 3.0/SFF)</td>
</tr>
<tr>
<td>2.</td>
<td>ID Button with LED</td>
</tr>
<tr>
<td>3.</td>
<td>10/100/1000 Server Management LAN Port</td>
</tr>
<tr>
<td>4.</td>
<td>1GbE LAN Port x 2</td>
</tr>
<tr>
<td>5.</td>
<td>USB 3.0 Port x 2</td>
</tr>
<tr>
<td>6.</td>
<td>Mezzanine Card Slot (Option/OCP 2.0)</td>
</tr>
<tr>
<td>7.</td>
<td>VGA Port</td>
</tr>
<tr>
<td>8.</td>
<td>Low-Profile PCIe Card Slot</td>
</tr>
<tr>
<td>9.</td>
<td>Full-Height PCIe Card Slot</td>
</tr>
<tr>
<td>10.</td>
<td>Full-Height PCIe Card Slot</td>
</tr>
</tbody>
</table>
## Front Panel LEDs and Buttons

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Color</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Reset Button</td>
<td></td>
<td></td>
<td>Press the button to reset the system.</td>
</tr>
<tr>
<td>2.</td>
<td>NMI button</td>
<td></td>
<td></td>
<td>Press the button server generates a NMI to the processor if the multiple-bit ECC errors occur, which effectively halt the server.</td>
</tr>
<tr>
<td>3.</td>
<td>Power button with LED</td>
<td>Green</td>
<td>On</td>
<td>System is powered on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green</td>
<td>Blink</td>
<td>System is in ACPI S1 state (sleep mode)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N/A</td>
<td>Off</td>
<td>• System is not powered on or in ACPI S5 state (power off)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• System is in ACPI S4 state (hibernate mode)</td>
</tr>
<tr>
<td>4.</td>
<td>ID Button(Note)</td>
<td>Green</td>
<td>On</td>
<td>Press the button to activate system identification</td>
</tr>
<tr>
<td>5.</td>
<td>HDD Status LED</td>
<td>Green</td>
<td>Blink</td>
<td>HDD locate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amber</td>
<td>On</td>
<td>HDD access</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green/Amer</td>
<td>Blink</td>
<td>HDD fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N/A</td>
<td>Off</td>
<td>No HDD access or no HDD fault.</td>
</tr>
<tr>
<td>6.</td>
<td>System Status LED(Note)</td>
<td>Green</td>
<td>Solid On</td>
<td>System is operating normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amber</td>
<td>Solid On</td>
<td>Critical condition, may indicate:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Blink</td>
<td>System fan failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>System temperature</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Non-critical condition, may indicate:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Redundant power module failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Temperature and voltage issue</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Chassis intrusion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N/A</td>
<td>Off</td>
<td>System is not ready, may indicate:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>POST error</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NMI error</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Processor or terminator missing</td>
</tr>
<tr>
<td>7/8.</td>
<td>LAN 1/2 Active/Link LEDs</td>
<td>Green</td>
<td>Solid On</td>
<td>Link between system and network or no access.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green</td>
<td>Blink</td>
<td>Data transmission or receiving is occurring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N/A</td>
<td>Off</td>
<td>No data transmission or receiving is occurring</td>
</tr>
</tbody>
</table>

(Note) If your server features RoT function, please see the following section for detail LED behavior.
## 2-3-1 RoT LEDs

<table>
<thead>
<tr>
<th>LED on Front panel (Note 5)</th>
<th>ID LED</th>
<th>Status LED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EC Firmware (FW) Authentication fail or not exit</strong></td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td><strong>EC FW is broken or not exit (Note 1)</strong></td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td><strong>Authenticating/Recovering BMC/BIOS Images</strong></td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td><strong>Authenticating Images</strong></td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td><strong>Recovering BMC Active Flash</strong></td>
<td>Blinks Blue 4 times per second</td>
<td>Blinks Green 4 times per second</td>
</tr>
<tr>
<td><strong>Recovering BIOS Active Flash</strong></td>
<td>Blinks Blue 4 times per second</td>
<td>Blinks Green 4 times per second</td>
</tr>
<tr>
<td><strong>Authentication (AUTH) Pass</strong></td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td><strong>Recovering BIOS Active Flash</strong></td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td><strong>BMC : AUTH pass after doing recovery</strong></td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td><strong>BIOS : AUTH pass after doing recovery</strong></td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td><strong>BMC : AUTH pass</strong></td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td><strong>BIOS : AUTH pass after doing recovery</strong></td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td><strong>Active Flash Authentication (AUTH) Fail</strong></td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td><strong>BMC : AUTH Fail (Note 2)</strong></td>
<td>Blinks Blue 1 time per second</td>
<td>Blinks Green 1 time per second</td>
</tr>
<tr>
<td>BIOS : AUTH fail&lt;sup&gt;Note2&lt;/sup&gt;</td>
<td>Blinks Blue 1 time per second</td>
<td>Blinks Amber 1 time per second</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>BMC : AUTH fail after doing recovery&lt;sup&gt;Note3&lt;/sup&gt;</td>
<td>Blinks Blue 2 times per second [ON OFF OFF]</td>
<td>Blinks Green 2 times per second [ON OFF OFF]</td>
</tr>
<tr>
<td>BIOS : AUTH fail after doing recovery&lt;sup&gt;Note3&lt;/sup&gt;</td>
<td>Blinks Blue 2 times per second [ON OFF OFF]</td>
<td>Blinks Amber 2 times per second [ON OFF OFF]</td>
</tr>
<tr>
<td>Backup Flash Authentication Fail&lt;sup&gt;Note4&lt;/sup&gt;</td>
<td>Blinks Blue 2 times per second</td>
<td>Blinks Green 2 times per second</td>
</tr>
<tr>
<td>BMC : AUTH fail</td>
<td>Blinks Blue 2 times per second [ON OFF OFF]</td>
<td>Blinks Green 2 times per second [ON OFF OFF]</td>
</tr>
<tr>
<td>BIOS : AUTH fail</td>
<td>Blinks Blue 2 times per second [ON OFF OFF]</td>
<td>Blinks Amber 2 times per second [ON OFF OFF]</td>
</tr>
</tbody>
</table>

**NOTE!**
1. EC FW is broken or not exited result in Microchip CEC1702 cannot load EC FW for authentication.
2. (1) Authentication fail include below scenarios
   - Configuration table is missing or modified
   - Public key is missing or modified
   - Protected area or signature is modified
   - Flash empty
3. If active flash is still authentication failed after recovery sequence, Microchip CEC1702 stop the process and showing LED behavior.
4. If backup flash authentication is failed cause by configuration table, public key or protected area is broken. Microchip CEC1702 stop the process and showing LED behavior.
5. Front panel LED is controlled by BMC or Microchip CEC1702. Once Microchip CEC1702 is working(Auth or recovery), the front panel LED is controlled by Microchip CEC1702 and vice versa.
## 2-4 Rear System LAN LEDs

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Color</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1GbE Speed LED</td>
<td>Yellow</td>
<td>On</td>
<td>1 Gbps data rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green</td>
<td>On</td>
<td>100 Mbps data rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N/A</td>
<td>Off</td>
<td>10 Mbps data rate</td>
</tr>
<tr>
<td>2.</td>
<td>1GbE Link/Activity LED</td>
<td>Green</td>
<td>On</td>
<td>Link between system and network or no access</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blink</td>
<td></td>
<td>Data transmission or receiving is occurring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N/A</td>
<td>Off</td>
<td>No data transmission or receiving is occurring</td>
</tr>
</tbody>
</table>
2-5 Power Supply Unit (PSU) LED

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>No AC power to all power supplies</td>
</tr>
<tr>
<td>0.5Hz Green Blinking</td>
<td>AC present / only standby on / Cold redundant mode</td>
</tr>
<tr>
<td>2Hz Green Blinking</td>
<td>Power supply firmware updating mode</td>
</tr>
<tr>
<td>Amber</td>
<td>AC cord unplugged or AC power lost; with a second power supply in parallel</td>
</tr>
<tr>
<td></td>
<td>still with AC input power</td>
</tr>
<tr>
<td></td>
<td>Power supply critical event causing shut down:</td>
</tr>
<tr>
<td></td>
<td>failure, OCP, OVP, fan failure and UVP</td>
</tr>
<tr>
<td>0.5Hz Amber Blinking</td>
<td>Power supply warning events where the power supply continues to operate:</td>
</tr>
<tr>
<td></td>
<td>high temp, high power, high current and slow fan</td>
</tr>
</tbody>
</table>
## 2-6 Hard Disk Drive LEDs

<table>
<thead>
<tr>
<th>RAID SKU</th>
<th>LED1</th>
<th>Locate</th>
<th>HDD Fault</th>
<th>Rebuilding</th>
<th>HDD Access</th>
<th>HDD Present (No Access)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No RAID configuration (via PCH, HBA)</td>
<td>Disk LED (LED on Back Panel)</td>
<td>Green</td>
<td>ON(*1)</td>
<td>OFF</td>
<td>BLINK (*2)</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amber</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>Removed HDD Slot (LED on Back Panel)</td>
<td>Green</td>
<td>ON(*1)</td>
<td>OFF</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amber</td>
<td>OFF</td>
<td>OFF</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>RAID configuration (via HW RAID Card or SW RAID Card)</td>
<td>Disk LED</td>
<td>Green</td>
<td>ON</td>
<td>OFF</td>
<td>BLINK (*2)</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>Amber</td>
<td>OFF</td>
<td>ON</td>
<td>(Low Speed: 2 Hz)</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>Removed HDD Slot</td>
<td>Green</td>
<td>ON(*1)</td>
<td>OFF</td>
<td>(*3)</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amber</td>
<td>OFF</td>
<td>ON</td>
<td>(*3)</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LED 2</th>
<th>HDD Present</th>
<th>No HDD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>ON</td>
<td>OFF</td>
</tr>
</tbody>
</table>

NOTE:

*1: Depends on HBA/Utility Spec.

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

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

Pre-installation Instructions

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

• Always disconnect the computer from the power outlet whenever you are working inside the computer case.

• If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal system of the computer case, or the bare metal body of any other grounded appliance.

• Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Do not flex or stress the circuit board.

• Leave all components inside the static-proof packaging until you are ready to use the component for the installation.
3-1 Removing Chassis Cover

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

Follow these instructions to remove the chassis cover:

1. Remove the screw securing the chassis cover.
2. Loosen the thumbscrew securing the chassis cover.
3. Push down the indentations located on the sides of the chassis cover.
4. Slide the cover forward towards the rear of the system and then remove the cover in the direction indicated by the arrow.
5. To reinstall the chassis cover reverse steps 1-4.
3-2 Removing and Installing the Fan Duct
R262-ZA1

Follow these instructions to remove the fan duct:
1. Lift up to remove the fan duct.

Follow these instructions to install the fan duct:
1. Tilt the fan duct, align the fan duct with the guiding groove and fix the front side of fan duct in the flange under the fan wall.
2. Push down the fan duct into chassis until its firmly seat.
R262-ZA2

Follow these instructions to remove the fan duct:

1. Lift up to remove the fan duct.
2. To install the fan duct, align the fan duct with the guiding groove. Push down the fan duct into chassis until its firmly seat.
3-3 Removing the Heat Sink

R262-ZA1

Follow these instructions to remove/install the fan duct:

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

When installing the heatsink to CPU, use PHILLIPS #2-Lobe driver to tighten 4 captive nuts in sequence as 1-4. The screw tightening torque: $10 \pm 0.5$ kgf-cm.
Follow these instructions to remove/install the fan duct:

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

When installing the heatsink to CPU, use PHILLIPS #2-Lobe driver to tighten 4 captive nuts in sequence as 1-4. The screw tightening torque: 10 ± 0.5 kgf-cm.
3-4 Installing the CPU

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

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

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

Follow these instructions to install the CPU:

1. Loosen the three captive screws securing the CPU cover in sequential order (1 → 2 → 3).
2. Flip open the CPU cover.
3. Remove the CPU carrier from the CPU frame using the handle on the CPU carrier.
4. Using the handle on the CPU carrier insert the new CPU carrier with CPU installed into the CPU frame.
   **NOTE:** Ensure the CPU is installed in the CPU carrier in the correct orientation, with the triangle on the CPU aligned to the top left corner of the CPU carrier.
5. Flip the CPU frame with CPU installed into place in the CPU socket.
6. Flip the CPU cover into place over the CPU socket.
7. Tighten the CPU cover screws in sequential order (1 → 2 → 3) to secure the CPU cover in place.
NOTE!
- Tighten the CPU cover screws, use T20-Lobe driver to tighten 3 captive nuts in sequence as 1-3.
- The screw tightening torque: 16.1 ± 1.2 kgf-cm.
3-5 Installing the 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.

3-5-1 Eight Channel Memory Configuration

This motherboard provides 16 DDR4 memory slots and supports Eight Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory.
3-5-2 Installing the Memory

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

Be sure to install DDR4 DIMMs on this motherboard.

Follow these instructions to install the Memory:

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

---

3-5-3 Processor and Memory Module Matrix Table

<table>
<thead>
<tr>
<th>Processor and Memory Module Matrix Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU#</td>
</tr>
<tr>
<td>8 DIMMs</td>
</tr>
<tr>
<td>CPU0</td>
</tr>
<tr>
<td>16 DIMMs</td>
</tr>
<tr>
<td>CPU0</td>
</tr>
<tr>
<td>CPU1</td>
</tr>
<tr>
<td>32 DIMMs</td>
</tr>
<tr>
<td>CPU0</td>
</tr>
<tr>
<td>CPU1</td>
</tr>
</tbody>
</table>
### 3-5-4 DIMM Population Table

EPYC Memory Speed based on DIMM Population (One DIMM per Channel)

<table>
<thead>
<tr>
<th>DIMM Type</th>
<th>DIMM Population</th>
<th>Max EPYC 7003 DDR Frequency (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DIMM 0</td>
<td></td>
</tr>
<tr>
<td>RDIMM</td>
<td>1R (1 Rank)</td>
<td>3200</td>
</tr>
<tr>
<td></td>
<td>2R or 2DR (2 Ranks)</td>
<td>3200</td>
</tr>
<tr>
<td>LRDIMM</td>
<td>4DR (4 Ranks)</td>
<td>3200</td>
</tr>
<tr>
<td></td>
<td>2S2R (4 Ranks)</td>
<td>3200</td>
</tr>
<tr>
<td></td>
<td>2S4R (8 Ranks)</td>
<td>3200</td>
</tr>
<tr>
<td>3DS</td>
<td>2S2R (4 Ranks)</td>
<td>3200</td>
</tr>
<tr>
<td></td>
<td>2S4R (8 Ranks)</td>
<td>3200</td>
</tr>
</tbody>
</table>

EPYC Memory Speed based on DIMM Population (Two DIMM per Channel)

<table>
<thead>
<tr>
<th>DIMM Type</th>
<th>DIMM Population</th>
<th>Max EPYC 7003 DDR Frequency (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DIMM 0</td>
<td>DIMM 1</td>
</tr>
<tr>
<td>RDIMM</td>
<td>--</td>
<td>1R</td>
</tr>
<tr>
<td></td>
<td>1R</td>
<td>1R</td>
</tr>
<tr>
<td></td>
<td>--</td>
<td>2R or 2DR</td>
</tr>
<tr>
<td></td>
<td>1R</td>
<td>2R or 2DR</td>
</tr>
<tr>
<td></td>
<td>2R or 2DR</td>
<td>2R or 2DR</td>
</tr>
<tr>
<td>LRDIMM</td>
<td>--</td>
<td>4DR</td>
</tr>
<tr>
<td></td>
<td>4DR</td>
<td>4DR</td>
</tr>
<tr>
<td></td>
<td>--</td>
<td>2S2R (4 Ranks)</td>
</tr>
<tr>
<td></td>
<td>--</td>
<td>2S4R (8 Ranks)</td>
</tr>
<tr>
<td></td>
<td>2S2R (4 Ranks)</td>
<td>2S2R (4 Ranks)</td>
</tr>
<tr>
<td></td>
<td>2S4R (8 Ranks)</td>
<td>2S4R (8 Ranks)</td>
</tr>
<tr>
<td>3DS</td>
<td>--</td>
<td>2S2R (4 Ranks)</td>
</tr>
<tr>
<td></td>
<td>2S2R (4 Ranks)</td>
<td>2S2R (4 Ranks)</td>
</tr>
<tr>
<td></td>
<td>--</td>
<td>2S4R (8 Ranks)</td>
</tr>
<tr>
<td></td>
<td>2S4R (8 Ranks)</td>
<td>2S4R (8 Ranks)</td>
</tr>
</tbody>
</table>

**Note:**
- When only one DIMM is used, it must be populated in memory slot DIMM1.
3-6 Installing the PCI Expansion Card

- Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered-down and all power sources have been disconnected from the server prior to installing a PCIe card.
- Failure to observe these warnings could result in personal injury or damage to equipment.
- The PCIe riser assembly does not include a riser card or any cabling as standard. To install a PCIe card, a riser card must be installed.

R262-ZA1

Follow these instructions to PCI Expansion card:
1. Loosen the thumbscrew on the back cover.
2. Loosen the thumbscrew securing the riser bracket.
3. Lift up the riser bracket out of system.
4. Remove the screw securing the slot cover from the riser bracket.
5. Remove the slot covers from the riser bracket.
6. Orient the PCIe card with the riser guide slot and push in the direction of the arrow until the PCIe card sits in the PCIe card connector.
7. Secure the PCIe card with the screw.
8. Reverse the previous steps to install the riser bracket.
Follow these instructions to PCI Expansion card:
1. Loosen the thumbscrew on the back cover.
2. Loosen the thumbscrew securing the riser bracket.
3. Lift up the riser bracket out of system.
4. Remove the screw securing the slot cover from the riser bracket.
5. Remove the slot covers from the riser bracket.
6. Orient the PCIe card with the riser guide slot and push in the direction of the arrow until the PCIe card sits in the PCIe card connector.
7. Secure the PCIe card with the screw.
8. Reverse the previous steps to install the riser bracket.

NOTE! Please remove the fan duct before removing this PCIe riser card.
3-7 Installing the Mezzanine Card

3-7-1 OCP 3.0

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

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

Follow these instructions to install an OCP 3.0 mezzanine card:

1. Remove the two screws securing the mezzanine card slot cover.
2. Remove the slot cover from the system.
3. Insert the OCP 3.0 mezzanine card into the card slot ensuring that the card is firmly connected to the connector on the motherboard.
4. Tighten the thumbnail screw to secure the OCP 3.0 mezzanine card in place.
5. Reverse the previous steps to replace the OCP 3.0 mezzanine card.
3-7-2 OCP 2.0

Follow these instructions to install an OCP 2.0 mezzanine card:

1. Remove the screw securing the mezzanine card slot cover.
2. Remove the slot cover from the system.
3. Install the OCP 2.0 slot cover to the system.
4. Secure the OCP 2.0 slot cover with the screw.
5. Insert the OCP 2.0 mezzanine card into the compartment ensuring that the card is firmly connected to the connector on the motherboard.
6. Secure the OCP 2.0 mezzanine card into the system with three screws.
7. Reverse previous steps to replace the OCP 2.0 mezzanine card.
3-8 Installing the Hard Disk Drive

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

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

Follow these instructions to install a 3.5" HDD:

1. Press the release button.
2. Extend the locking lever.
3. Pull the locking lever in the direction indicated to remove the HDD tray.
4. Slide the hard disk drive into the HDD tray.
5. Reinsert the HDD tray into the slot and close the locking lever.
Follow these instructions to install a 2.5" Hard disk drive into 3.5" HDD Tray:

1. Press the release button.
2. Extend the locking lever.
3. Pull the locking lever in the direction indicated to remove the 2.5" HDD tray.
4. Align the hard disk drive with the positioning screw on the HDD tray.
5. Secure the hard disk drive with five screws.
6. Reinsert the HDD tray into the slot and close the locking lever.
3-9 Installing the M.2 Device and Heat Sink

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

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

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

1. Insert the M.2 device into the M.2 connector.
2. Press down on the M.2 device.
3. Install the thermal pad of the M.2 device to the M.2 device.
4. Press down on the thermal pad.
5. Secure the M.2 device and its thermal pad to the motherboard with a single screw.
6. Reverse steps 1-4 to remove the M.2 device.
3-10 Replacing the Fan Assembly

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

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

Follow these instructions to replace the fan assembly:

1. Pull outward the fan ear.
2. Lift up the fan assembly from the chassis.
3. Reverse the previous steps to install the replacement fan assembly.
3-11 Replacing the Power Supply

Follow these instructions to replace the power supply:

1. Press the retaining clip on the right side of the power supply along the direction of the arrow.
2. Pull out the power supply handle at the same time and pull out the power supply.
3. Insert the replacement power supply firmly into the chassis. Connect the AC power cord to the replacement power supply.
3-12 Cable Routing
Front Switch Cable/Front LED Cable

Front Panel USB 3.0 Cable
Front HDD Backplane Board Power Cable

Front HDD Backplane Board Signal Cable
Rear HDD Backplane Board Power Cable

Rear HDD Backplane Board Signal Cable
ATX Power Cable
GPU Card#1 Power Cable (for R262-ZA2 only)

GPU Card#2 Power Cable (for R262-ZA2 only)
Slimline SAS Cable #0/#1

Slimline SAS to SATA Cable #2/#3
Slimline SAS to NVMe Card #0 - #1 (for R262-ZA2 only)

Slimline SAS to NVMe Card #2 - #3 (for R262-ZA2 only)
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front Panel USB 3.0 Connector</td>
</tr>
<tr>
<td>2</td>
<td>Front Panel Connector</td>
</tr>
<tr>
<td>3</td>
<td>HDD Back Plane Board Connector</td>
</tr>
<tr>
<td>4</td>
<td>TPM Module Connector (SPI Interface)</td>
</tr>
<tr>
<td>5</td>
<td>2 x 2 Pin P12V Power Connector</td>
</tr>
<tr>
<td>6</td>
<td>IPMB Connector</td>
</tr>
<tr>
<td>7</td>
<td>Serial Port Cable Connector</td>
</tr>
<tr>
<td>8</td>
<td>BMC Firmware Readiness LED</td>
</tr>
<tr>
<td>9</td>
<td>OCP Mezzanine Connector (OCP 3.0/SFF Type/Gen4 x16)</td>
</tr>
<tr>
<td>10</td>
<td>Riser Connector #1 (PCIe Gen4/x32 Slot)</td>
</tr>
<tr>
<td>11</td>
<td>GbE LAN Cable Connector</td>
</tr>
<tr>
<td>12</td>
<td>OCP Mezzanine Connector (OCP 2.0/Gen3 x8)</td>
</tr>
<tr>
<td>13</td>
<td>2 x 5 Pin P12V Power Connector</td>
</tr>
<tr>
<td>14</td>
<td>System Battery</td>
</tr>
<tr>
<td>15</td>
<td>Riser Connector #2 (PCIe Gen4/x32 Slot)</td>
</tr>
<tr>
<td>16</td>
<td>Riser Connector #3 (PCIe Gen4/x16 Slot)</td>
</tr>
<tr>
<td>17</td>
<td>2 x 6 Pin Power Connector</td>
</tr>
<tr>
<td>18</td>
<td>Riser Connector #4 (PCIe Gen4/x16 Slot)</td>
</tr>
<tr>
<td>19</td>
<td>SlimLine SAS Connector (SLSAS_0/PCIe/SATA/Defined by SKUs)</td>
</tr>
<tr>
<td>20</td>
<td>SlimLine SAS Connector (SLSAS_1/PCIe/SATA/Defined by SKUs)</td>
</tr>
<tr>
<td>21</td>
<td>M.2 Connector (PCIe Gen4 x4, Supports NGFF-22110)</td>
</tr>
</tbody>
</table>
### 4-2 Jumper Setting

#### Jumper Settings

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Setting</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>J2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>HOST_SMBUS_SEL</td>
<td>BIOS defined</td>
</tr>
<tr>
<td>2</td>
<td>PMBUS_SEL</td>
<td>BIOS defined</td>
</tr>
<tr>
<td>3</td>
<td>BIOS_PWD</td>
<td>Clear supervisor password</td>
</tr>
<tr>
<td>4</td>
<td>BIOS_RCVR</td>
<td>BIOS recovery mode</td>
</tr>
</tbody>
</table>

#### NCSI Switch

<table>
<thead>
<tr>
<th>SW1</th>
<th>SW2</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>Onboard LAN</td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>OCP 2.0 Mezzanine</td>
</tr>
<tr>
<td>ON</td>
<td>ON</td>
<td>OCP 3.0 Mezzanine</td>
</tr>
</tbody>
</table>

---

Motherboard Components
Chapter 5 BIOS Setup

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

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

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

### BIOS Setup Program Function Keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>←→</td>
<td>Move the selection bar to select the screen</td>
</tr>
<tr>
<td>↑↓</td>
<td>Move the selection bar to select an item</td>
</tr>
<tr>
<td>↔</td>
<td>Increase the numeric value or make changes</td>
</tr>
<tr>
<td>&lt; &gt;</td>
<td>Decrease the numeric value or make changes</td>
</tr>
<tr>
<td>&lt;Enter&gt;</td>
<td>Execute command or enter the submenu</td>
</tr>
<tr>
<td>F1</td>
<td>Show descriptions of general help</td>
</tr>
<tr>
<td>F3</td>
<td>Restore the previous BIOS settings for the current submenus</td>
</tr>
<tr>
<td>F9</td>
<td>Load the Optimized BIOS default settings for the current submenus</td>
</tr>
<tr>
<td>F10</td>
<td>Save all the changes and exit the BIOS Setup program</td>
</tr>
</tbody>
</table>
- **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.)

- **AMD CBS**
  This setup page includes the common items for configuration of AMD motherboard-related information.

- **AMD PBS Option**
  This setup page includes the common items for configuration of AMD CPM RAS related settings.

- **Chipset**
  This setup page includes all the submenu options for configuring the functions of the North Bridge.

- **Server Management**
  Server additional features enabled/disabled setup menus.

- **Security**
  Change, set, or disable supervisor and user password. Configuration supervisor password allows you to restrict access to the system and BIOS Setup.
  A supervisor password allows you to make changes in BIOS Setup.
  A user password only allows you to view the BIOS settings but not to make changes.

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

- **Save & Exit**
  Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.)
  Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.)
5-1 The Main Menu

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

Main Menu Help

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

Submenu Help

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

- When the system is not stable as usual, select the Restore Defaults item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.
### BIOS Setup

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS Information</td>
<td></td>
</tr>
<tr>
<td>Project Name</td>
<td>Displays the project name information.</td>
</tr>
<tr>
<td>Project Version</td>
<td>Displays version number of the BIOS setup utility.</td>
</tr>
<tr>
<td>Build Date and Time</td>
<td>Displays the date and time when the BIOS setup utility was created.</td>
</tr>
<tr>
<td>BMC Information (Note1)</td>
<td></td>
</tr>
<tr>
<td>BMC Firmware Version (Note1)</td>
<td>Displays BMC firmware version information.</td>
</tr>
<tr>
<td>Processor Information</td>
<td></td>
</tr>
<tr>
<td>CPU Brand String / CPU Speed / Processor Core / Microcode Patch</td>
<td>Displays the technical specifications for the installed processor(s).</td>
</tr>
<tr>
<td>Total Memory (Note2)</td>
<td>Displays the total memory size of the installed memory.</td>
</tr>
<tr>
<td>Memory Speed (Note2)</td>
<td>Displays the frequency information of the installed memory.</td>
</tr>
<tr>
<td>VR Information Version</td>
<td>Displays VR version information.</td>
</tr>
<tr>
<td>AGESA PI Version</td>
<td></td>
</tr>
<tr>
<td>PI Version</td>
<td>Displays AGESA PI version information.</td>
</tr>
</tbody>
</table>

(Note1) Functions available on selected models.
(Note2) This section will display capacity and frequency information of the memory that the customer has installed.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onboard LAN Information</td>
<td></td>
</tr>
<tr>
<td>LAN1 MAC Address(^{(\text{Note})})</td>
<td>Displays LAN MAC address information.</td>
</tr>
<tr>
<td>LAN2 MAC Address(^{(\text{Note})})</td>
<td>Displays LAN MAC address information.</td>
</tr>
<tr>
<td>System Date</td>
<td>Sets the date following the weekday-month-day-year format.</td>
</tr>
<tr>
<td>System Time</td>
<td>Sets the system time following the hour-minute-second format.</td>
</tr>
</tbody>
</table>

\(^{(\text{Note})}\) The number of LAN ports listed will depend on the motherboard / system model.
5-2 Advanced Menu

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

When Boot Mode Select is set to UEFI (Default)
When "Boot Mode Select" is set to Legacy in the Boot > Boot Mode Select section
## Trusted Computing

### BIOS Setup

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration</td>
<td><strong>Security Device Support</strong> 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 <strong>Enable</strong>.</td>
</tr>
<tr>
<td>SPI TPM Support</td>
<td>Select Enable to activate TPM support feature. Options available: Enabled, Disabled. Default setting is <strong>Disabled</strong>.</td>
</tr>
</tbody>
</table>
5-2-2 PSP Firmware Versions

The PSP Firmware Versions page displays the basic PSP firmware version information. Items on this window are non-configurable.
## 5-2-3 Legacy Video Select

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OnBrd/Ext VGA Select</td>
<td>Selects between onboard or external VGA support.</td>
</tr>
<tr>
<td></td>
<td>Options available: Auto, Onboard, External. Default setting is <strong>Onboard</strong>.</td>
</tr>
</tbody>
</table>
## AST2500 Super IO Configuration

### Parameter | Description
--- | ---
AST2500 Super IO Configuration | Displays the super IO chip information
Super IO Chip | Displays the super IO chip information
Serial Port 1 Configuration | Press [Enter] for configuration of advanced items.
## 5-2-4-1 Serial Port 1 Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial Port 1 Configuration</td>
<td>Enable/Disable the Serial Port (COM). When set to Enabled allows you to configure the Serial port 1 settings. When set to Disabled, displays no configuration for the serial port. Options available: Enabled, Disabled. Default setting is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>Serial Port <em>(Note1)</em></td>
<td></td>
</tr>
<tr>
<td>Devices Settings <em>(Note2)</em></td>
<td>Displays the Serial Port 1 device settings.</td>
</tr>
</tbody>
</table>
| Change Settings *(Note2)* | Select an optimal settings for Super IO Device. Options available for Serial Port 1:  
- Auto  
- IO=3F8h; IRQ=4;  
- IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;  
- IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;  
- IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;  
- IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;  
Default setting is **Auto**.  
**Please note that this item is configurable when Serial Port is set to Enabled.** |

*(Note1)* Advanced items prompt when this item is defined.  
*(Note2)* This item appears when **Serial Port** is set to **Enabled**.
**5-2-5 Serial Port Console Redirection**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM1/Serial Over LAN Console Redirection (Note)</td>
<td>Select whether to enable console redirection for specified device. Console redirection enables the users to manage the system from a remote location. Options available: Enabled, Disabled. Default setting is <strong>Disabled</strong>.</td>
</tr>
<tr>
<td>COM1/Serial Over LAN Console Redirection Settings</td>
<td>Press [Enter] to configure advanced items. Please note that this item is configurable when COM1/Serial Over LAN Console Redirection is set to Enabled.</td>
</tr>
<tr>
<td></td>
<td>- Terminal Type</td>
</tr>
<tr>
<td></td>
<td>-- Selects a terminal type to be used for console redirection. Options available: VT100, VT100+, ANSI, VT-UTF8. Default setting is <strong>ANSI</strong>.</td>
</tr>
<tr>
<td></td>
<td>- Bits per second</td>
</tr>
<tr>
<td></td>
<td>-- Selects the transfer rate for console redirection. Options available: 9600, 19200, 38400, 57600, 115200. Default setting is <strong>115200</strong>.</td>
</tr>
<tr>
<td></td>
<td>- Data Bits</td>
</tr>
<tr>
<td></td>
<td>-- Selects the number of data bits used for console redirection. Options available: 7, 8. Default setting is <strong>8</strong>.</td>
</tr>
</tbody>
</table>

(Note) Advanced items prompt when this item is defined.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| Parity    | 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 | 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 | 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 | Enable/Disable the VT-UTF8 Combo Key Support.  
- Options available: Enabled, Disabled. Default setting is Enabled. |
| Recorder Mode(Nota) | 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(Nota) | Enable/Disable extended terminal resolution.  
- Options available: Enabled, Disabled. Default setting is Enabled. |
| Putty KeyPad(Nota) | Selects Function Key and KeyPad on Putty.  
- Options available: VT100, LINUX, XTERMR6, SC0, ESCN, VT400. Default setting is VT100. |
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| Legacy Console Redirection | Press [Enter] to configure advanced items.  
- Redirection COM Port  
  - Selects a COM port for Legacy serial redirection.  
  - Options available: COM1/SOL. Default setting is **COM1/SOL**.  
- Resolution  
  - 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  
  - 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 | EMS console redirection allows the user to configure Console Redirection Settings to support Out-of-Band Serial Port management. Options available: Enabled, Disabled. Default setting is **Disabled**. |
| Serial Port for Out-of-Band EMS Console Redirection | Press [Enter] to configure advanced items. **Please note that this item is configurable when Serial Port for Out-of-Band Management EMS Console Redirection is set to Enabled.**  
- Out-of-Band Mgmt Port  
  - Microsoft Windows Emergency Management Service (EMS) allows for remote management of a Windows Server OS through a serial port.  
  - Options available: COM1/SOL. Default setting is **COM1/SOL**.  
- Terminal Type  
  - Selects a terminal type to be used for console redirection.  
  - Options available: VT100, VT100+, ANSI, VT-UTF8. Default setting is **ANSI**.  
- Bits per second  
  - Selects the transfer rate for console redirection.  
  - Options available: 9600, 19200, 38400, 57600, 115200. Default setting is **115200**. |

(Note) Advanced items prompt when this item is defined.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial Port for Out-of-Band EMS Console Redirection Settings (continued)</td>
<td><strong>Flow Control</strong></td>
</tr>
<tr>
<td></td>
<td>- 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.</td>
</tr>
<tr>
<td></td>
<td>- Options available: None, Hardware RTS/CTS, Software Xon/Xoff. Default setting is <strong>None</strong>.</td>
</tr>
</tbody>
</table>
## CPU Configuration

### Parameter Table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVM Mode</td>
<td>Enable/Disable the CPU Virtualization. Options available: Enabled, Disabled. Default setting is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>CPU 0 Information</td>
<td>Press [Enter] to view the memory information related to CPU 0.</td>
</tr>
</tbody>
</table>
## 5-2-7 PCI Subsystem Settings

### PCI Bus Driver Version
- A5.01.24

### PCI Subsystem Settings

<table>
<thead>
<tr>
<th>Component</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLOT1_FRONT Lanes</td>
<td>[Auto]</td>
</tr>
<tr>
<td>SLOT1_FRONT I/O ROM</td>
<td>[Enabled]</td>
</tr>
<tr>
<td>SLOT1_FRONT Max Link Speed</td>
<td>[Auto]</td>
</tr>
<tr>
<td>SLOT1_REAR Lanes</td>
<td>[Auto]</td>
</tr>
<tr>
<td>SLOT1_REAR I/O ROM</td>
<td>[Enabled]</td>
</tr>
<tr>
<td>SLOT1_REAR Max Link Speed</td>
<td>[Auto]</td>
</tr>
<tr>
<td>SLOT2_FRONT Lanes</td>
<td>[Auto]</td>
</tr>
<tr>
<td>SLOT2_FRONT I/O ROM</td>
<td>[Enabled]</td>
</tr>
<tr>
<td>SLOT2_FRONT Max Link Speed</td>
<td>[Auto]</td>
</tr>
<tr>
<td>SLOT2_REAR Lanes</td>
<td>[Auto]</td>
</tr>
<tr>
<td>SLOT2_REAR I/O ROM</td>
<td>[Enabled]</td>
</tr>
<tr>
<td>SLOT2_REAR Max Link Speed</td>
<td>[Auto]</td>
</tr>
<tr>
<td>SLOT3 Lanes</td>
<td>[Auto]</td>
</tr>
<tr>
<td>SLOT3 I/O ROM</td>
<td>[Enabled]</td>
</tr>
<tr>
<td>SLOT3 Max Link Speed</td>
<td>[Auto]</td>
</tr>
<tr>
<td>OCP1 Lanes</td>
<td>[Auto]</td>
</tr>
<tr>
<td>OCP1 I/O ROM</td>
<td>[Enabled]</td>
</tr>
<tr>
<td>OCP1 Max Link Speed</td>
<td>[Auto]</td>
</tr>
</tbody>
</table>

If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.

### Above 4G Decoding
- [Enabled]

### SR-IOV Support
- [Enabled]
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI Bus Driver Version</td>
<td>Displays the PCI Bus Driver version information.</td>
</tr>
<tr>
<td>SLOT#_Lanes Configuration(Note1)</td>
<td>Change the PCIe lanes. Options available: Disabled, Auto, x8, x4x4, x16, x8x8, x8x4x4, x4x4x8, x4x4x4x4. Default setting is Auto.</td>
</tr>
<tr>
<td>SLOT #_I/O ROM(Note1)</td>
<td>When enabled, this setting will initialize the device expansion ROM for the related PCI-E slot. Options available: Enabled, Disabled. Default setting is Enabled.</td>
</tr>
<tr>
<td>SLOT #_Max Link Speed(Note1)</td>
<td>Configure PCIe max link speed. Options available: Auto, Maximum, Gen1, Gen2, Gen3, Gen4. Default setting is Auto.</td>
</tr>
<tr>
<td>OCP# Lanes(Note2)</td>
<td>Change mezzanine PCIe lanes. Options available: Auto, x16, x8x8, x8x4x4, x4x4x8, x4x4x4x4, Disabled. Default setting is Auto.</td>
</tr>
<tr>
<td>OCP# I/O ROM(Note2)</td>
<td>When enabled, this setting will initialize the device expansion ROM for the related devices. Options available: Enabled, Disabled. Default setting is Enabled.</td>
</tr>
<tr>
<td>OCP# Max Link Speed(Note2)</td>
<td>Configure mezzanine OCP max link speed. Options available: Auto, Maximum, Gen1, Gen2, Gen3, Gen4. Default setting is Auto.</td>
</tr>
<tr>
<td>Onboard LAN Controller(Note3)</td>
<td>Enable/Disable the onboard LAN devices. Options available: Enabled, Disabled. Default setting is Enabled.</td>
</tr>
<tr>
<td>Onboard LAN# I/O ROM(Note3)</td>
<td>Enable/Disable the onboard LAN devices, and initializes device expansion ROM. Options available: Enabled, Disabled. Default setting is Enabled.</td>
</tr>
<tr>
<td>PCI Devices Common Settings</td>
<td></td>
</tr>
<tr>
<td>Above 4G Decoding</td>
<td>Enable/Disable memory mapped I/O to 4GB or greater address space (Above 4G Decoding). Options available: Enabled, Disabled. Default setting is Enabled.</td>
</tr>
<tr>
<td>SR-IOV Support</td>
<td>If the system has SR-IOV capable PCIe devices, this item Enable/Disable Single Root IO Virtualization Support. Options available: Enabled, Disabled. Default setting is Enabled.</td>
</tr>
</tbody>
</table>

(Note1) This section is dependent on the available PCIe Slot.
(Note2) This section is dependent on the available OCP connector.
(Note3) This section is dependent on the available LAN controller.
5-2-8  USB Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB Configuration</td>
<td></td>
</tr>
<tr>
<td>USB Module Version</td>
<td>Displays the USB module version information.</td>
</tr>
<tr>
<td>USB Controllers</td>
<td>Displays the supported USB controllers.</td>
</tr>
<tr>
<td>USB Devices:</td>
<td>Displays the USB devices connected to the system.</td>
</tr>
<tr>
<td>Legacy USB Support</td>
<td>Enable/Disable the Legacy USB support function. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications. Options available: Auto, Enabled, Disabled. Default setting is Enabled.</td>
</tr>
<tr>
<td>XHCI Hand-off</td>
<td>Enable/Disable the XHCI (USB 3.0) Hand-off support. Options available: Enabled, Disabled. Default setting is Enabled.</td>
</tr>
</tbody>
</table>

(Note) This item is present only if you attach USB devices.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB hardware delays and time-outs</td>
<td>Selects the time-out value for USB Control/Bulk/Interrupt transfers.</td>
</tr>
<tr>
<td>USB transfer time-out</td>
<td>Options available: 1 sec, 5 sec, 10 sec, 20 sec. Default setting is 20 sec.</td>
</tr>
<tr>
<td>Device reset time-out</td>
<td>Selects the time-out value during a USB mass storage device reset.</td>
</tr>
<tr>
<td>Device power-up delay</td>
<td>Maximum time the device will take before it properly reports itself</td>
</tr>
<tr>
<td>Mass Storage Devices</td>
<td>Displays the mass storage devices available on the system.</td>
</tr>
</tbody>
</table>
### Network Stack Configuration

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

(Note) This item appears when **Network Stack** is set to **Enabled**.
## 5-2-10 NVMe Configuration

![NVMe Configuration Screen](image)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVMe Configuration</td>
<td>Displays the NVMe devices connected to the system.</td>
</tr>
</tbody>
</table>
### SATA Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATA Configuration</td>
<td>Displays the installed HDD devices information. System will automatically detect HDD type.</td>
</tr>
</tbody>
</table>
## 5-2-12 Graphic Output Configuration

### Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Device Type</td>
<td>Selects output device type. Options available: First loaded Device, Onboard Device, External Device, Specific Device. Default setting is <strong>Onboard Device</strong>.</td>
</tr>
</tbody>
</table>
### 5-2-13  AMD Mem Configuration Status

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU 0</td>
<td>Press [Enter] to view the memory configuration status related to CPU 0.</td>
</tr>
</tbody>
</table>
**Parameter** | **Description**
--- | ---
Server CA Configuration | Press [Enter] for configuration of advanced items.
  - Enroll Cert
    - Press [Enter] to enroll a certificate
      • Enroll Cert Using File
      • Cert GUID
        Input digit character in 1111111-2222-3333-4444-1234567890ab format.
    - Commit Changes and Exit
    - Discard Changes and Exit
  - Delete Cert
Client Cert Configuration | Press [Enter] for configuration of advanced items.
5-2-15 iSCSI Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>iSCSI Initiator Name</td>
<td>Press [Enter] and name iSCSI Initiator. Only IQN format is accepted. Range: from 4 to 223</td>
</tr>
<tr>
<td>Add an Attempt</td>
<td>Press [Enter] to configure advanced items.</td>
</tr>
<tr>
<td>Delete Attempts</td>
<td>Press [Enter] to configure advanced items.</td>
</tr>
<tr>
<td>Change Attempt Order</td>
<td>Press [Enter] to configure advanced items.</td>
</tr>
</tbody>
</table>
5-2-16 Intel(R) I350 Gigabit Network Connection

Advanced

NIC Configuration

Blink LEDs: 0
UEFI Driver: Intel(R) PRO/1000 8.5.21
Adapter PBA: 140422-008
Device Name: Intel(R) I350 Gigabit Network Connection
Chip Type: Intel i350
PCI Device ID: 1521
PCI Address: C5:00:00
Link Status: [Disconnected]
MAC Address: 18:CD:4D:BD:24:E0
Virtual MAC Address: 00:00:00:00:00:00

Click to configure the network device port.

++: Select Screen
11: Select Item
Enter: Select
+-/: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

Advanced

Link Speed: [Auto Negotiated]
Wake On LAN: [Enabled]

Specifies the port speed used for the selected boot protocol.

++: Select Screen
11: Select Item
Enter: Select
+-/: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

Version 2.21.1279 Copyright (C) 2021 AMI
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIC Configuration</td>
<td>Press [Enter] to configure advanced items.</td>
</tr>
<tr>
<td></td>
<td>• Link Speed</td>
</tr>
<tr>
<td></td>
<td>– Allows for automatic link speed adjustment.</td>
</tr>
<tr>
<td></td>
<td>– Options available: Auto Negotiated, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, 100 Mbps Full. Default setting is <strong>Auto Negotiated</strong>.</td>
</tr>
<tr>
<td></td>
<td>• Wake On LAN</td>
</tr>
<tr>
<td></td>
<td>– Enables power on of the system via LAN. Note that configuring Wake on LAN in the operating system does not change the value of this setting, but does override the behavior of Wake on LAN in OS controlled power states.</td>
</tr>
<tr>
<td></td>
<td>– Options available: Enabled, Disabled. Default setting is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>Blink LEDs</td>
<td>Identifies the physical network port by blinking the associated LED. Press the numeric keys to adjust desired values.</td>
</tr>
<tr>
<td>UEFI Driver</td>
<td>Displays the technical specifications for the Network Interface Controller.</td>
</tr>
<tr>
<td>Adapter PBA</td>
<td>Displays the technical specifications for the Network Interface Controller.</td>
</tr>
<tr>
<td>Device Name</td>
<td>Displays the technical specifications for the Network Interface Controller.</td>
</tr>
<tr>
<td>Chip Type</td>
<td>Displays the technical specifications for the Network Interface Controller.</td>
</tr>
<tr>
<td>PCI Device ID</td>
<td>Displays the technical specifications for the Network Interface Controller.</td>
</tr>
<tr>
<td>PCI Address</td>
<td>Displays the technical specifications for the Network Interface Controller.</td>
</tr>
<tr>
<td>Link Status</td>
<td>Displays the technical specifications for the Network Interface Controller.</td>
</tr>
<tr>
<td>MAC Address</td>
<td>Displays the technical specifications for the Network Interface Controller.</td>
</tr>
<tr>
<td>Virtual MAC Address</td>
<td>Displays the technical specifications for the Network Interface Controller.</td>
</tr>
</tbody>
</table>
5-2-17 VLAN Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| Enter Configuration Menu | Press [Enter] to configure advanced items.  
|                      | • Create new VLAN  
|                      | • VLAN ID  
|                      | – Sets VLAN ID for a new VLAN or an existing VLAN.  
|                      | – Press the <+> / <-> keys to increase or decrease the desired values.  
|                      | – The valid range is from 0 to 4094.  
|                      | • Priority  
|                      | – Sets 802.1Q Priority for a new VLAN or an existing VLAN.  
|                      | – Press the <+> / <-> keys to increase or decrease the desired values.  
|                      | – The valid range is from 0 to 7.  
|                      | • Add VLAN  
|                      | – Press [Enter] to create a new VLAN or update an existing VLAN.  
|                      | • Configured VLAN List  
|                      | • Remove VLAN  
|                      | – Press [Enter] to remove an existing VLAN.  

Press [Enter] to configure advanced items.  
• Create new VLAN  
• VLAN ID  
  – Sets VLAN ID for a new VLAN or an existing VLAN.  
  – Press the <+> / <-> keys to increase or decrease the desired values.  
  – The valid range is from 0 to 4094.  
• Priority  
  – Sets 802.1Q Priority for a new VLAN or an existing VLAN.  
  – Press the <+> / <-> keys to increase or decrease the desired values.  
  – The valid range is from 0 to 7.  
• Add VLAN  
  – Press [Enter] to create a new VLAN or update an existing VLAN.  
• Configured VLAN List  
• Remove VLAN  
  – Press [Enter] to remove an existing VLAN.
**5-2-18 MAC IPv4 Network Configuration**

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

(Note) This item appears when **Configured** is set to **Enabled**.
# 5-2-19 MAC IPv6 Network Configuration

## Enter Configuration Menu

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press [Enter] to configure advanced items.</td>
<td></td>
</tr>
<tr>
<td>- Displays the MAC Address information.</td>
<td></td>
</tr>
<tr>
<td>- Interface ID</td>
<td>The 64 bit alternative interface ID for the device. The string is colon separated. e.g. ff:dd:66:cc:1:2:3.</td>
</tr>
<tr>
<td>- DAD Transmit Count</td>
<td>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.</td>
</tr>
<tr>
<td>- Policy</td>
<td>Options available: automatic, manual. Default setting is <strong>automatic</strong>.</td>
</tr>
<tr>
<td>- Save Changes and Exit</td>
<td>Press [Enter] to save all configurations.</td>
</tr>
</tbody>
</table>
5-3 AMD CBS Menu

AMD CBS menu displays submenu options for configuring the CPU-related information that the BIOS automatically sets. Select a submenu item, then press [Enter] to access the related submenu screen.
5-3-1 CPU Common Options

- RedirectForReturn0Is [Auto]
- Platform First Error Handling [Auto]
- Core Performance Boost [Auto]
- Global C-state Control [Auto]
- Power Supply Idle Control [Auto]
- SEV ASID Count [Auto]
- SEV-ES ASID Space Limit Control [Auto]
- Streaming Stores Control [Auto]
- Local APIC Mode [Auto]
- ACPI _CST C1 Declaration [Auto]
- MCA error thresh enable [Auto]
- SMU and PSP Debug Mode [Auto]
- Xtrig7 Workaround [Auto]
- PPIN Opt-in [Auto]
- SNP Memory (RMP Table) Coverage [Auto]
- SMEE [Auto]
- Action on BIST Failure [Auto]
- Fast Short REP MOVSB [Enabled]
- Enhanced REP MOVSB/STOSB [Enabled]
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Common Options</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>Prefetcher settings</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>Core Watchdog</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>RedirectForReturnDis</td>
<td>From a workaround for GCC/C000005 issue for XV Core on CZ A0, setting MSRC001_1029 Decode Configuration (DE_CFG) bit 14 [DecfgNoRdrctForReturns] to 1. Options available: Auto, 1, 0. Default setting is Auto.</td>
</tr>
<tr>
<td>Platform First Error Handling</td>
<td>Enable/Disable PFEH, cloak individual banks, and mask deferred error interrupts from each bank. Options available: Auto, Enabled, Disabled. Default setting is Auto.</td>
</tr>
<tr>
<td>Core Performance Boost</td>
<td>Enable/Disable the Core Performance Boost function. Options available: Auto, Disabled. Default setting is Auto.</td>
</tr>
<tr>
<td>Global C-State Control</td>
<td>Controls the IO based C-state generation and DF C-states. Options available: Auto, Enabled, Disabled. Default setting is Auto.</td>
</tr>
<tr>
<td>SEV ASID Count</td>
<td>Specifies the maximum valid ASID, which affects the maximum system physical address space. Options available: Auto, 253 ASIDs, 509 ASIDs. Default setting is Auto.</td>
</tr>
<tr>
<td>SEV-ES ASID Space Limit Control</td>
<td>Space limit control for SEV-ES ASIDs. Options available: Auto. Default setting is Auto.</td>
</tr>
<tr>
<td>Local APIC Mode</td>
<td>Sets the Local APIC Mode. Options available: Auto, xAPIC, x2APIC. Default setting is Auto.</td>
</tr>
<tr>
<td>ACPI_CST C1 Declaration</td>
<td>Determines whether or not to declare the C1 state to the OS.. Options available: Auto, Enabled, Disabled. Default setting is Auto.</td>
</tr>
<tr>
<td>MCA error thresh enable</td>
<td>Enable MCA error thresholding. Options available: Auto, False, True. Default setting is Auto.</td>
</tr>
<tr>
<td>SMU and PSP Debug Mode</td>
<td>When this option is enabled, specific uncorrected errors detected by the PSP FW or SMU FW will hand and not reset the system. Options available: Auto, Enabled, Disabled. Default setting is Auto.</td>
</tr>
<tr>
<td>Xtrig7 Workaround</td>
<td>Options available: Auto, No Workaround, Bronze Workaround, Sliver Workaround. Default setting is Auto.</td>
</tr>
<tr>
<td>SNP Memory (RMP Table) Coverage</td>
<td>Enabled: Enter system memory is covered. Options available: Disabled, Enabled, Custom, Auto. Default setting is Auto.</td>
</tr>
<tr>
<td>SMEE</td>
<td>Controls the Secure Memory Encryption Enable (SMEE) function. Options available: Disable, Enable, Auto. Default setting is Auto.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Action on BIST Failure</strong></td>
<td>Action to take when a CCD BIST failure is detected. Options available: Do nothing, Down-CCD, Auto. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td><strong>Fast short REP MOVSB</strong></td>
<td>Default is 1, can be set to zero for analysis purpose as long as OS supports it. Options available: Disabled, Enabled. Default setting is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td><strong>Enhanced REP MOVSB/STOSB</strong></td>
<td>Default is 1, can be set to zero for analysis purpose as long as OS supports it. Options available: Disabled, Enabled. Default setting is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td><strong>REP-MOV/STOS Streaming</strong></td>
<td>Allows REP-MOVS/STOS to use non-caching streaming stores for large sizes. Options available: Disabled, Enabled. Default setting is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td><strong>X3D</strong></td>
<td>Override of X3D technology. Options available: Auto, Disable, 1 stack, 2 stacks, 4 stacks. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td><strong>IBS hardware workaround</strong></td>
<td>Sets if using IBS execution sampling without software workaround for erratum 1,285. May impact performance. Options available: Auto, Enabled. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
## 5-3-1-1 Performance

### BIOS Setup

![BIOS Setup - AMI](image)

### Performance

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC Mode (Note)</td>
<td>Options available: Normal Operation, Customized. Default setting is <strong>Normal Operation</strong>.</td>
</tr>
<tr>
<td>Custom Core Pstates</td>
<td>Allows you to accept or decline enabling Custom Core Pstates. When accepted, you can disable or customize core pstates.</td>
</tr>
<tr>
<td>CCD/Core/Thread Enablement</td>
<td>Allows you to accept or decline enabling CCDs, processor cores and threads. When accepted, you can control the number of CCDs to be used, and the number of cores to be used.</td>
</tr>
</tbody>
</table>
|                         | - CCD Control<br>  
|                         |   - Options available: Auto, 2 CCDs, 3 CCDs, 4 CCDs, 6 CCDs. Default setting is **Auto**. |
|                         | - Core Control<br>  
|                         |   - Options available: Auto, ONE(1+0), TWO(2+0), THREE(3+0), FOUR(4+0), FIVE(5+0), SIX(6+0), SEVEN(7+0). |
|                         |   - Default setting is **Auto**. |
| SMT Control              | Can be used to disable symmetric multithreading. To re-enable SMT, a POWER CYCLE is needed after select the ‘Enable’ option. Select ‘Auto’ base on BIOS PCD. (PcdAmdSmtMode) default setting. Options available: Disable, Enable, Auto. Default setting is **Enable**. |

(Note) Advanced items are configurable when this item is defined.
## 5-3-1-2 Prefetcher Settings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 Stream HW Prefetcher</td>
<td>Enable/Disable L1 Stream HW Prefetcher. Options available: Auto, Enable, Disable. Default setting is <strong>Enable</strong>.</td>
</tr>
<tr>
<td>L1 Stride Prefetcher</td>
<td>Use memory access history of individual instructions to fetch additional lines when each access is a constant distance from the previous. Enable/Disable L1 Stride Prefetcher. Options available: Auto, Enable, Disable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>L1 Region Prefetcher</td>
<td>Use memory access history to fetch additional lines when the data access for a given instruction tends to be followed by other data accesses. Enable/Disable L1 Region Prefetcher. Options available: Auto, Enable, Disable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>L2 Stream HW Prefetcher</td>
<td>Enable/Disable L2 Stream HW Prefetcher. Options available: Auto, Enable, Disable. Default setting is <strong>Enable</strong>.</td>
</tr>
<tr>
<td>L2 Up/Down Prefetcher</td>
<td>Use memory access history to determine whether to fetch the next or previous line for all memory accesses. Enable/Disable L2 Up/Down Prefetcher. Options available: Auto, Enable, Disable. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
5-3-1-3 Core Watchdog

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Watchdog</td>
<td></td>
</tr>
<tr>
<td>Core Watchdog Timer Enable</td>
<td>Enable/Disable CPU Watchdog Timer. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
## 5-3-2 DF Common Options

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DF Common Options</strong></td>
<td></td>
</tr>
<tr>
<td>Scrubber</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>Memory Addressing</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>ACPI</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>Link</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>Disable DF to external IP sync flood propagation</td>
<td>Enable/Disable Sync Flood to UMC &amp; downstream slaves. Options available: Auto, Sync flood disabled, Sync flood enabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Disable DF sync flood propagation</td>
<td>Enable/Disable DF Sync Flood propagation. Options available: Auto, Sync flood disabled, Sync flood enabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Freeze DF module queues on error</td>
<td>Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>CC6 memory region encryption</td>
<td>Controls whether or not the CC6 save/restor memory is encrypted. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>System probe filter</td>
<td>Enable/Disable System probe filter. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Memory Clear</td>
<td>Enable/Disable the Memory Clear feature. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>PSP error injection support</td>
<td>Enable/Disable PSP error injection support. Options available: False, True. Default setting is <strong>False</strong>.</td>
</tr>
</tbody>
</table>
### 5-3-2-1 Scrubber

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scrubber</strong></td>
<td></td>
</tr>
<tr>
<td>DRAM scrub time</td>
<td>Provide a value that is the number of hours to scrub memory. Options available: Auto, Disabled, 1 hour, 4 hours, 8 hours, 16 hours, 24 hours, 48 hours. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Poison scrubber control</td>
<td>Enable/Disable the Poison scrubber control feature. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Redirect scrubber control</td>
<td>Enable/Disable the Redirect scrubber control feature. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Redirect scrubber limit</td>
<td>Sets the redirect scrubber limit. Options available: Auto, 2, 4, 8, Infinite. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Periodic Directory Rinse</td>
<td>Controls the Periodic Directory Rinse mode. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
## 5-3-2-2 Memory Addressing

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMA nodes per socket</td>
<td>Specifies the number of desired NUMA nodes per socket. Options available: Auto, NPS0, NPS1, NPS2, NPS4. Default setting is <strong>NPS4</strong>.</td>
</tr>
<tr>
<td>Memory interleaving</td>
<td>Enable/Disable the Memory interleaving feature. Options available: Auto, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Memory interleaving size</td>
<td>Controls the memory interleaving size. This determines the starting address of the interleave (bit 8, 9, 10 or 11). Options available: Auto, 256Bytes, 512Bytes, 1KB, 2KB. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>1TB remap</td>
<td>Enable/Disable to remap DRAM out of the space just below the 1TB boundary. The ability to remap depends on DRAM configuration, NPS, and interleaving selection, and may not always be possible. Options available: Auto, Do not remap, Attempt to remap. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>DRAM map inversion</td>
<td>Enable/Disable the DRAM map inversion function. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Location of private memory regions</td>
<td>Controls whether or not the private memory regions (PSP, SMU and CC6) are at the top of DRAM or distributed. Options available: Auto, Distributed, Consolidated. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
## 5-3-2-3 ACPI

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACPI SRAT L3 Cache As NUMA Domain</td>
<td>Enable/Disable report each L3 cache as a NUMA Domain to the OS. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>ACPI SLIT Distance Control</td>
<td>Determines how the SLIT distances are declared. Options available: Auto, Manual. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>ACPI SLIT remote relative distance</td>
<td>Sets the remote socket distance for 2P systems as near (2.8) or far (3.2). Options available: Auto, Near, Far. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
## 5-3-2-4 Link

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Link</strong></td>
<td></td>
</tr>
<tr>
<td>GMI encryption control</td>
<td>Enable/Disable GMI link encryption. Options available: Auto, Enabled, Disabled. Default setting is Auto.</td>
</tr>
<tr>
<td>xGMI encryption control</td>
<td>Enable/Disable xGMI link encryption. Options available: Auto, Enabled, Disabled. Default setting is Auto.</td>
</tr>
<tr>
<td>CAKE CRC perf bounds Control</td>
<td>Options available: Auto, Manual. Default setting is Auto.</td>
</tr>
<tr>
<td>xGMI Link Configuration</td>
<td>Configures the number of xGMI2 links used on a multi-socket system. Options available: Auto, 2 xGMI Links, 3 xGMI Links, 4 xGMI Links. Default setting is Auto.</td>
</tr>
<tr>
<td>4-link xGMI max speed</td>
<td>Specifies the max speed of 4-link xGMI. Options available: Auto, 10.667Gbps, 13Gbps, 16Gbps, 18Gbps. Default setting is 10.667Gbps.</td>
</tr>
<tr>
<td>3-link xGMI max speed</td>
<td>Specifies the max speed of 3-link xGMI. Options available: Auto, 10.667Gbps, 13Gbps, 16Gbps, 18Gbps. Default setting is 10.667Gbps.</td>
</tr>
<tr>
<td>xGMI TXEQ Mode</td>
<td>Configures xGMI TXEQ/RX vetting Mode. Options available: Auto, TXEQ_Disabled, TXEQ_Lane, TXEQ_Link, TXEQ_RX_Vet. Default setting is Auto.</td>
</tr>
<tr>
<td>xGMI 18GACOFC</td>
<td>Configures xGMI 18GACOFC. Options available: Auto, Enable, Disable. Default setting is Auto.</td>
</tr>
</tbody>
</table>
### UMC Common Options

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UMC Common Options</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>DDR4 Common Options</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>DRAM Memory Mapping</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>NVDIMM</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>Memory MBIST</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
</tbody>
</table>
5-3-3-1 DDR4 Common Options

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDR4 Common Options</td>
<td>Press [Enter] to configure the Plan of Record (POR) to enable / disable restrictions for DDR4 frequency and voltage programming. Memory speeds will be capped at AMD guidelines.</td>
</tr>
<tr>
<td>Enforce POR</td>
<td>Press [Enter] to configure the Plan of Record (POR) to enable / disable restrictions for DDR4 frequency and voltage programming. Memory speeds will be capped at AMD guidelines.</td>
</tr>
<tr>
<td>Common RAS</td>
<td>Press [Enter] to configure Common RAS.</td>
</tr>
<tr>
<td>DRAM Controller Configuration</td>
<td>Press [Enter] to configure DRAM Controller Configuration.</td>
</tr>
<tr>
<td>CAD Bus Configuration</td>
<td>Press [Enter] to configure CAD Bus Configuration.</td>
</tr>
<tr>
<td>Data Bus Configuration</td>
<td>Press [Enter] to configure Data Bus Configuration.</td>
</tr>
</tbody>
</table>

**Note:** To enable 2 DIMMs per Channel at 3200MHz function, select [Accept] at warning message, change Overclock from [Auto] to [Enabled], and then set memory speed to 3200MHz.
5-3-3-1-1 DRAM Controller Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| DRAM Controller Configuration | Press [Enter] to configure DRAM Power Options.  
  - Power Down Enable  
    - Enable/Disable DDR power down mode.  
    - Options available: Auto, Enabled, Disabled. Default setting is Auto. |
### 5-3-3-1-2 CAD Bus Configuration

![Aptio Setup - AMI](image)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAD Bus Configuration</td>
<td></td>
</tr>
<tr>
<td>CAD Bus Timing User Controls</td>
<td>Setup time on CAD bus signals to Auto or Manual. Options available: Auto, Manual. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>CAD Bus Drive Strength User Controls</td>
<td>Drive Strength on CAD bus signals to Auto or Manual. Options available: Auto, Manual. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
## 5-3-3-1-3 Data Bus Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Bus Configuration User Controls</td>
<td>Specifies the mode for drive strength to Auto or Manual. Options available: Auto, Manual. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
### BIOS Setup

#### 5-3-3-1-4 Common RAS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common RAS</strong></td>
<td></td>
</tr>
<tr>
<td>Data Poisoning</td>
<td>Enable/Disable the Data Poisoning function.</td>
</tr>
<tr>
<td>DRAM Post Package Repair</td>
<td>Enable/Disable the DRAM Post Package Repair function.</td>
</tr>
<tr>
<td>RCD Parity</td>
<td>Enable/Disable the RCD Parity function.</td>
</tr>
<tr>
<td>DRAM Address Command Parity Retry</td>
<td>Enable/Disable the DRAM Address Command Parity Retry function.</td>
</tr>
<tr>
<td>Max Parity Error Replay</td>
<td>Configures the Max Parity Error Replay. (0~0x3f)</td>
</tr>
<tr>
<td>Write CRC Enable</td>
<td>Enable/Disable the Write CRC function.</td>
</tr>
<tr>
<td>DRAM Write CRC Enable and Retry Limit</td>
<td>Enable/Disable DRAM Write CRC Enable and Retry Limit.</td>
</tr>
<tr>
<td>Max Write CRC Error Replay</td>
<td>Configures the Max Write CRC Error Replay. (0~0x3f)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Enable/Disable Data Poisoning</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UMC_CH::EccCtrl[UcFatsIEn]</td>
<td>Should be enabled/disabled together.</td>
</tr>
<tr>
<td>UMC_CH::EccCtrl[WrEccEn]</td>
<td></td>
</tr>
</tbody>
</table>

**Please note that this item is configurable when DRAM Address Command Parity Retry is set to Enabled.**

**Please note that this item is configurable when DRAM Write CRC Enable and Retry Limit is set to Enabled.**
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disable Memory Error Injection</td>
<td>Options available: False, True. Default setting is <strong>True</strong>.</td>
</tr>
<tr>
<td><strong>ECC Configuration</strong></td>
<td>Press [Enter] to configure advanced items.</td>
</tr>
<tr>
<td></td>
<td>• DRAM ECC Symbol Size</td>
</tr>
<tr>
<td></td>
<td>– Configures the DRAM ECC Symbol Size.</td>
</tr>
<tr>
<td></td>
<td>– Options available: Auto, x4, x8, x16. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td></td>
<td>• DRAM ECC Enable</td>
</tr>
<tr>
<td></td>
<td>– Enable/Disable DRAM ECC. When set to Auto, it will set ECC to enable.</td>
</tr>
<tr>
<td></td>
<td>– Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td></td>
<td>• DRAM UECC Retry</td>
</tr>
<tr>
<td></td>
<td>– Enable/Disable DRAM UECC Retry.</td>
</tr>
<tr>
<td></td>
<td>– Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
## 5-3-3-1-5 Security

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security</td>
<td>Enable/Disable transparent secure memory encryption. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>TSME</td>
<td>Enable/Disable transparent secure memory encryption. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Data Scramble</td>
<td>Enable/Disable Data Scrambling. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
## 5-3-3-1-6 Phy Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phy Configuration</td>
<td>Press [Enter] to configure PMU Training.</td>
</tr>
<tr>
<td></td>
<td>- DFE Read Training</td>
</tr>
<tr>
<td></td>
<td>- Perform 2D Read Training with DFE on.</td>
</tr>
<tr>
<td></td>
<td>- Options available: Auto, Enable, Disable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td></td>
<td>- FFE Write Training</td>
</tr>
<tr>
<td></td>
<td>- Perform 2D Write Training with FFE on.</td>
</tr>
<tr>
<td></td>
<td>- Options available: Auto, Enable, Disable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td></td>
<td>- PMU Pattern Bits Controls</td>
</tr>
<tr>
<td></td>
<td>- Options available: Auto, Manual. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
## 5-3-3-2 DRAM Memory Mapping

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRAM Memory Mapping</td>
<td>Interleave memory blocks across the DRAM chip selects for node 0. Options available: Auto, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Chipselect Interleaving</td>
<td>Interleave memory blocks across the DRAM chip selects for node 0. Options available: Auto, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>BankGroupSwap</td>
<td>Configures the BankGroupSwap. BankGroupSwap (BGS) is a new memory mapping option in AGESA that alters how applications get assigned to physical locations within the memory modules. When this option sets to Auto, it is null: No help string. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>BankGroupSwapAlt</td>
<td>Configures the BankGroupSwapAlt. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Address Hash Bank</td>
<td>Enable/Disable bank address hashing. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Address Hash CS</td>
<td>Enable/Disable CS address hashing. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Address Hash Rm</td>
<td>Enable/Disable RM address hashing. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>SPD Read Optimization</td>
<td>Enable/Disable SPD Read Optimization. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
### 5-3-3-3 NVDIMM

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVDIMM</td>
<td>Displays the information of the devices/controllers if installed</td>
</tr>
<tr>
<td>Disable NVDIMM-N Feature</td>
<td>Enable/Disable NVDIMM-N feature for memory margin tool. Options available: No, Yes. Default setting is <strong>NO</strong>.</td>
</tr>
</tbody>
</table>
## 5-3-3-4 Memory MBIST

### Memory MBIST

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBIST Enable</td>
<td>Enable/Disable the Memory MBIST function. Options available: Enabled, Disabled. Default setting is <strong>Disabled</strong>.</td>
</tr>
<tr>
<td>MBIST Test Mode</td>
<td>Selects MBIST Test Mode. <strong>Interface Mode</strong> tests Single and Multiple CS transactions and Basic Connectivity. <strong>Data Eye Mode</strong> measures Voltage vs. Timing. Options available: Auto, Both, Interface Mode, Data Eye Mode. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>MBIST Aggressors</td>
<td>Enable/Disable MBIST Aggressor test. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>MBIST Per Bit Slave Die Reporting</td>
<td>Enable/Disable to report 2D data eye results in ABL log for each DQ, Chipselect, and Channel. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Data Eye</td>
<td>Press [Enter] to configure advanced items.</td>
</tr>
<tr>
<td>Memory Healing BIST</td>
<td>Enable/Disable memory healing BIST. Options available: Disabled, BIOS Mem BIST, Self-Healing Mem BIST, BIOS and Self-Healing Mem BIST. Default setting is <strong>Disabled</strong>.</td>
</tr>
</tbody>
</table>

*(Note) This item is available when **MBIST Enable** is set to **Enabled**.*
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mem BIST Test Select(Note1)</td>
<td>Selects the Vendor specific tests to use with BIOS memory healing BIST.</td>
</tr>
<tr>
<td></td>
<td>Options available: Vendor Tests Enabled, Vendor Tests Disabled, All Tests -</td>
</tr>
<tr>
<td></td>
<td>All Vendors. Default setting is <strong>Vendor Tests Enabled</strong>.</td>
</tr>
<tr>
<td>Mem BIST Post Package Repair Type(Note1)</td>
<td>Selects the repair type for dram errors found in the BIOS memory BIST.</td>
</tr>
<tr>
<td></td>
<td>Options available: Soft Repair, Hard Repair, No Repairs - Test only.</td>
</tr>
<tr>
<td></td>
<td>Default setting is <strong>Soft Repair</strong>.</td>
</tr>
</tbody>
</table>

(Note1) This item is available when Memory Healing BIST is set to BIOS Mem BIST.
## 5-3-3-4-1 Data Eye

### Parameter | Description
--- | ---
Data Eye | Options available: PRBS, SSO, Both. Default setting is **PRBS**.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pattern Select</td>
<td>Determines the pattern length. The possible options are N=3,...,12.</td>
</tr>
<tr>
<td>Pattern Length</td>
<td>Options available: 1, 3, 5, 7, 9, 11, 13, PRBS. Default setting is <strong>1</strong>.</td>
</tr>
<tr>
<td>Aggressor Channel</td>
<td>Options available: Disabled, 1 Aggressor Channel, 3 Aggressor Channels, 7 Aggressor Channels. Default setting is <strong>1 Aggressor Channel</strong>.</td>
</tr>
<tr>
<td>Aggressor Static Lane Control</td>
<td>Enable/Disable the Aggressor Static Lane Control function. Options available: Enabled, Disabled. Default setting is <strong>Disabled</strong>.</td>
</tr>
<tr>
<td>Aggressor Static Lane Select Upper 32 bits</td>
<td>This item is configurable when <strong>Aggressor Static Lane Control</strong> is set to <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>Aggressor Static Lane Select Lower 32 bits</td>
<td>This item is configurable when <strong>Aggressor Static Lane Control</strong> is set to <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>Aggressor Static Lane Select ECC</td>
<td>This item is configurable when <strong>Aggressor Static Lane Control</strong> is set to <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>Aggressor Static Lane Value</td>
<td>This item is configurable when <strong>Aggressor Static Lane Control</strong> is set to <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>Target Static Lane Control</td>
<td>Enable/Disable the Target Static Lane Control function. Options available: Enabled, Disabled. Default setting is <strong>Disabled</strong>.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Target Static Lane Select Upper 32 bits</td>
<td>This item is configurable when Target Static Lane Control is set to Enabled.</td>
</tr>
<tr>
<td>Target Static Lane Select Lower 32 bits</td>
<td>This item is configurable when Target Static Lane Control is set to Enabled.</td>
</tr>
<tr>
<td>Target Static Lane Select ECC</td>
<td>This item is configurable when Target Static Lane Control is set to Enabled.</td>
</tr>
<tr>
<td>Target Static Lane Value</td>
<td>This item is configurable when Target Static Lane Control is set to Enabled.</td>
</tr>
<tr>
<td>Worst Case Margin Granularity</td>
<td>Configures Worst Case Margin Granularity. Options available: Per Chip Select, Per Nibble. Default setting is Per Chip Select.</td>
</tr>
<tr>
<td>Read Voltage Sweep Step Size</td>
<td>Configures the step size for read Data Eye voltage sweep. Options available: 1, 2, 4. Default setting is 1.</td>
</tr>
<tr>
<td>Read Timing Sweep Step Size</td>
<td>Configures the step size for read Data Eye timing sweep. Options available: 1, 2, 4. Default setting is 1.</td>
</tr>
<tr>
<td>Write Voltage Sweep Step Size</td>
<td>Configures the step size for write Data Eye voltage sweep. Options available: 1, 2, 4. Default setting is 1.</td>
</tr>
<tr>
<td>Write Timing Sweep Step Size</td>
<td>Configures the step size for write Data Eye timing sweep. Options available: 1, 2, 4. Default setting is 1.</td>
</tr>
</tbody>
</table>
## NBIO Common Options

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IOMMU</strong></td>
<td>Enable/Disable the IOMMU function. Options available: Enabled, Disabled. Default setting is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td><strong>DMAr Support</strong></td>
<td>Enable/Disable DMAr system protection during POST. Options available: Enabled, Disabled, Auto. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td><strong>DRTM Virtual Device Support</strong></td>
<td>Enable/Disable DRTM ACPI virtual device. Options available: Enabled, Disabled, Auto. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td><strong>PCIe ARI Support</strong></td>
<td>Enable/Disable Alternative Routing-ID Interpretation. Options available: Auto, Enable, Disable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td><strong>PCIe ARI Enumeration</strong></td>
<td>ARI Forwarding Enable for each downstream port. Options available: Auto, Enable, Disable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td><strong>PCIe Ten Bit Tag Support</strong></td>
<td>Enable/Disable PCIe ten bit tags for supported devices. (Auto=Disabled) Options available: Auto, Enable, Disable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td><strong>SMU Common Options</strong></td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td><strong>NBIO RAS Common Options</strong></td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td><strong>Enable AER Cap</strong></td>
<td>Enable/Disable Advanced Error Reporting Capability. Options available: Auto, Enable, Disable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Early Link Speed</td>
<td>Configures Early Link Speed. Options available: Auto, Gen1, Gen2. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Hot Plug Handling mode</td>
<td>Controls the Hot Plug Handling mode. Options available: Auto, OS First, Firmware First. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Presence Detect Select mode</td>
<td>Controls the Presence Detect Select mode. Options available: Auto, OR, AND. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Preferred IO</td>
<td>Preferred IO select type. Options available: Auto, Bus. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Data Link Feature Cap</td>
<td>Enable/Disable the data link feature capability. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>CV test</td>
<td>Enable/Disable the running PCIE CV tool support. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>SEV-SNP Support</td>
<td>Enable/Disable the SEV-SNP support. Options available: Enable, Disable. Default setting is <strong>Disable</strong>.</td>
</tr>
<tr>
<td>SRIS</td>
<td>Options available: Auto, Enable, Disable. Default setting is <strong>Disable</strong>.</td>
</tr>
</tbody>
</table>
### 5-3-4-1 SMU Common Options

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SMU Common Options</strong></td>
<td></td>
</tr>
<tr>
<td>Power Policy Quick Setting</td>
<td>Options available: Standard, Best Performance, Energy Efficient. Default setting is <strong>Standard</strong>.</td>
</tr>
<tr>
<td>Determinism Control</td>
<td>Selects use the fused Determinism or set customized Determinism. Options available: Auto, Manual. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Determinism Slider</td>
<td>Options available: Auto, Power, Performance. Default setting is <strong>Power</strong>.</td>
</tr>
<tr>
<td>cTDP Control</td>
<td>Selects use the fused TDP or set customized TDP. <strong>TDP is used to define the RC thermal model only</strong>. Options available: Auto, Manual. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>cTDP</td>
<td>Display cTDP information.</td>
</tr>
<tr>
<td>EfficiencyModeEn</td>
<td>Options available: Auto, Enabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Package Power Limit Control</td>
<td>Selects use the fused PPT or set customized PPT. <strong>PPT will be used as the ASIC power limit</strong>. Options available: Auto, Manual. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Package Power Limit</td>
<td>Display Package Power Limit information.</td>
</tr>
<tr>
<td>xGMI Link Width Control</td>
<td>Options available: Auto, Manual. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>APBDIS</td>
<td>Options available: Auto, 0, 1. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>DF Cstates</td>
<td>Enable/Disable DF C-states. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>CPPC</td>
<td>Enable/Disable the CPPC feature. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>HSMP Support</td>
<td>Enable/Disable the HSMP support. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>DLWM Support</td>
<td>Enable/Disable the DLWM support. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>BoostFmaxEn</td>
<td>Options available: Auto, Manual. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>EDC Current Tracking</td>
<td>Options available: Enable, Disable. Default setting is <strong>Disable</strong>.</td>
</tr>
<tr>
<td>LCLK Frequency Control</td>
<td>Press [Enter] for advanced configuration.</td>
</tr>
<tr>
<td>DF PSTATE Mode Select</td>
<td>Selects the DF PState Mode. Option available: Normal, limit Highest, Limit All, Auto. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>EDC Control</td>
<td>Options available: Auto, Manual. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
## 5-3-4-2 NBIOS RAS Common Options

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NBIOS RAS Common Options</strong></td>
<td></td>
</tr>
<tr>
<td><strong>NBIOS RAS Control</strong></td>
<td>Options available: Disabled, MCA, Legacy, Auto. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td><strong>Egress Poison Severity High</strong></td>
<td>Configures the Egress Poison High Severity. Each bit set to 1 enables High severity on the associated IOHC egress port. A bit of 0 indicates LOW severity.</td>
</tr>
<tr>
<td><strong>Egress Poison Severity Low</strong></td>
<td>Configures the Egress Poison Low Severity. Each bit set to 1 enables High severity on the associated IOHC egress port. A bit of 0 indicates LOW severity.</td>
</tr>
<tr>
<td><strong>NBIOS SyncFlood Generation</strong></td>
<td>The value may be used to mask SyncFlood caused by NBIOS RAS options. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td><strong>NBIOS SyncFlood Reporting</strong></td>
<td>The value may be used to enable SyncFlood reporting to APML. Options available: Enabled, Disabled. Default setting is <strong>Disabled</strong>.</td>
</tr>
<tr>
<td><strong>Egress Poison Mask High</strong></td>
<td>Enables mask for masking of errors logged in EGRESS_POISON_STATUS. For each bit set to 1, errors are masked. For each bit set to 0, errors trigger response actions.</td>
</tr>
<tr>
<td><strong>Egress Poison Mask Low</strong></td>
<td>Enables mask for masking of errors logged in EGRESS_POISON_STATUS. For each bit set to 1, errors are masked. For each bit set to 0, errors trigger response actions.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Uncorrected Converted to Poison Enable Mask High</td>
<td>Enables mask for masking of uncorrectable parity errors on internal arrays.</td>
</tr>
<tr>
<td>Uncorrected Converted to Poison Enable Mask Low</td>
<td>Enables mask for masking of uncorrectable parity errors on internal arrays.</td>
</tr>
<tr>
<td>System Hub Watchdog Timer</td>
<td>Specifies the timer interval of the SYSHUB Watchdog timer in milliseconds.</td>
</tr>
<tr>
<td>SLINK Read Response OK</td>
<td>This item specifies whether SLINK read response errors are converted to an Okay response. Options available: Enabled, Disabled. Default setting is Disabled.</td>
</tr>
<tr>
<td>SLINK Read Response Error Handling</td>
<td>Options available: Enabled, Trigger MCOMMIT Error, Log Errors in MCA. Default setting is Log Errors in MCA.</td>
</tr>
<tr>
<td>Log Poison Data from SLINK</td>
<td>Enable/Disable the Log Poison Data from SLINK feature. Options available: Enabled, Disabled. Default setting is Disabled.</td>
</tr>
<tr>
<td>PCIe Aer Reporting Mechanism</td>
<td>Selects the method of reporting AER errors from PCI Express. Options available: Auto, Firmware First, OS First. Default setting is Auto.</td>
</tr>
<tr>
<td>Edpc Control</td>
<td>Options available: Auto, Enabled, Disabled. Default setting is Disabled.</td>
</tr>
<tr>
<td>NBIO Poison Consumption</td>
<td>Options available: Auto, Enabled, Disabled. Default setting is Auto.</td>
</tr>
<tr>
<td>Sync Flood on PCIe Fatal Error</td>
<td>Options available: Auto, True, False. Default setting is Auto.</td>
</tr>
</tbody>
</table>
## FCH Common Options

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCH Common Options</td>
<td></td>
</tr>
<tr>
<td>AC Power Loss Options</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>FCH RAS Options</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>Miscellaneous Options</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
</tbody>
</table>
### 5-3-5-1 AC Power Loss Options

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Power Loss Options</td>
<td>Selects the AC Loss Control Method. Options available: Power Off, Power On, Last State. Default setting is <strong>Last State</strong>.</td>
</tr>
</tbody>
</table>
5-3-5-2 FCH RAS Options

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>FCH RAS Options</strong></td>
</tr>
<tr>
<td>ALink RAS Support</td>
<td>Enable/Disable the ALink RAS Support. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Reset after sync flood</td>
<td>Enables AB to forward downstream sync-flood message to system controller. Options available: Auto, Enable, Disable. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
### 5-3-5-3 Miscellaneous Options

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscellaneous Options</td>
<td></td>
</tr>
<tr>
<td>Boot Timer Enable</td>
<td>Enable/Disable Boot Timer. Options available: Auto, Enabled, Disabled. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
### NTB Common Options

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTB Common Options</td>
<td>Options available: Auto, Enable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Socket-0 P0 NTB Enable</td>
<td>Options available: Auto, Enable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Socket-0 P1 NTB Enable</td>
<td>Options available: Auto, Enable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Socket-0 P2 NTB Enable</td>
<td>Options available: Auto, Enable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>Socket-0 P3 NTB Enable</td>
<td>Options available: Auto, Enable. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>
## 5-3-7 SOC Miscellaneous Control

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SOC Miscellaneous Control</strong></td>
<td></td>
</tr>
<tr>
<td>ABL Console Out Control</td>
<td>Enable/Disable the ConsoleOut function for ABL.</td>
</tr>
<tr>
<td></td>
<td>Options available: Auto, Enable, Disable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>ABL Basic Console Out Control</td>
<td>Enable/Disable the Basic ConsoleOut function for ABL.</td>
</tr>
<tr>
<td></td>
<td>Options available: Auto, Enable, Disable. Default setting is <strong>Auto</strong>.</td>
</tr>
<tr>
<td>ABL PMU message Control</td>
<td>To Control the total number of PMU debug messages.</td>
</tr>
<tr>
<td></td>
<td>Options available: Auto, Detailed debug message, Coarse debug message, Stage</td>
</tr>
<tr>
<td></td>
<td>completion, Firmware completion message only. Default setting is <strong>Auto</strong>.</td>
</tr>
</tbody>
</table>

*(Note)* This item is configurable when **ABL Console Out Control** is set to **Enable**.
## 5-3-8 Workload Tuning

![Workload Tuning Interface](image)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workload Tuning</td>
<td><strong>Description</strong> Select the profile for different workloads. Default setting is Auto.</td>
</tr>
<tr>
<td>Workload Profile</td>
<td>Select the profile for different workloads. Default setting is Auto.</td>
</tr>
<tr>
<td>Performance Tracing</td>
<td>Enable to allow capturing performance traces. Options available: Auto, Enabled, Disabled. Default setting is Auto.</td>
</tr>
</tbody>
</table>
5-4  AMD PBS Menu

AMD PBS Option menu displays submenu options for configuring the function of AMD PBS. Select a
submenu item, then press [Enter] to access the related submenu screen.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAS</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
<tr>
<td>iLA TraceMemoryEn</td>
<td>Reserved 1M bytes MMIO space on 1M boundary when iLA TraceMemoryEn enabled.</td>
</tr>
<tr>
<td></td>
<td>Options available: Enabled, Disabled. Default setting is Disabled.</td>
</tr>
<tr>
<td>iLA TraceMemoryEn reserved MMIO</td>
<td>Reserved function.</td>
</tr>
<tr>
<td>SRIS mode debug</td>
<td>Control SRIS mode debug. Options available: Auto, Enabled, Disabled. Default setting is Auto.</td>
</tr>
<tr>
<td>SRIS Autodetect</td>
<td>Control SRIS Auto detect. Options available: Auto, Enabled, Disabled. Default setting is Auto.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>RAS Periodic SMI Control</td>
<td>Enable/Disable the Periodic SMI for polling [MCA Threshold] error. Options available: Enabled, Disabled. Default setting is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>SMI Threshold</td>
<td>Configures the SMI Threshold value.</td>
</tr>
<tr>
<td>SMI Scale</td>
<td>Configures the SMI Scale value.</td>
</tr>
<tr>
<td>SMI Scale Unit</td>
<td>Defines the unit of time scale.</td>
</tr>
<tr>
<td></td>
<td>Options available: millisecond, second, minute. Default setting is <strong>millisecond</strong>.</td>
</tr>
<tr>
<td>SMI Period</td>
<td>Configures the SMI Period.</td>
</tr>
<tr>
<td>GHES Notify Type</td>
<td>Selects the Notification type for deferred/ corrected errors. Options available: Polled, SCI. Default setting is <strong>Polled</strong>.</td>
</tr>
<tr>
<td>GHES UnCorr Notify Type</td>
<td>Selects the Notification type for uncorrected errors. Options available: Polled, NMI. Default setting is <strong>NMI</strong>.</td>
</tr>
<tr>
<td>PCIe GHES Notify Type</td>
<td>Selects the Notification type for PCIe corrected errors. Options available: Polled, SCI. Default setting is <strong>Polled</strong>.</td>
</tr>
<tr>
<td>PCIe UnCorr GHES Notify Type</td>
<td>Selects the Notification type for PCIe uncorrected errors. Options available: Polled, NMI. Default setting is <strong>NMI</strong>.</td>
</tr>
<tr>
<td>PCIe Root Port Corr Err Mask Reg</td>
<td>Initialize the PCIe AER Corrected Error Mask register of Root Port.</td>
</tr>
</tbody>
</table>

**BIOS Setup**

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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCIe Root Port UnCorr Err Mask Reg</td>
<td>Initialize the PCIe AER Uncorrected Error Mask register of Root Port.</td>
</tr>
<tr>
<td>PCIe Root Port UnCorr Err Sev Reg</td>
<td>Initialize the PCIe AER Uncorrected Error Severity register of Root Port.</td>
</tr>
<tr>
<td>PCIe Device Corr Err Mask Reg</td>
<td>Initialize the PCIe AER Corrected Error Mask register of PCIe device.</td>
</tr>
<tr>
<td>PCIe Device UnCorr Err Mask Reg</td>
<td>Initialize the PCIe AER Uncorrected Error Mask register of PCIe device.</td>
</tr>
<tr>
<td>PCIe Device UnCorr Err Sev Reg</td>
<td>Initialize the PCIe AER Uncorrected Error Severity register of PCIe device.</td>
</tr>
<tr>
<td>CCIX GHES Deferred ERR Notify Type</td>
<td>Selects the Notification type for CCIX deferred error. Options available: Polled, SCI. Default setting is <strong>Polled</strong>.</td>
</tr>
<tr>
<td>CCIX GHES Corrected Err Notify Type</td>
<td>Selects the Notification type for CCIX corrected error. Options available: Polled, SCI. Default setting is <strong>Polled</strong>.</td>
</tr>
<tr>
<td>DDR4 DRAM Hard Post Package Repair</td>
<td>This feature allows spare DRAM rows to replace malfunctioning rows via an in-field repair mechanism. Options available: Enabled, Disabled. Default setting is <strong>Disabled</strong>.</td>
</tr>
<tr>
<td>HEST DMC Structure Support</td>
<td>HEST DMC (Deferred Machine Check) Structure Support. Options available: Enabled, Disabled. Default setting is <strong>Disabled</strong>.</td>
</tr>
<tr>
<td>RAS EINJ Mode</td>
<td>BIOS: Send APEI EINJ actions to PSP via CPM EINJ SMI callback; PSP: Send APEI EINJ actions to RSP via PSP Mailbox. Option available: BIOS, PSP. Default setting is <strong>PSP</strong>.</td>
</tr>
</tbody>
</table>
5-5 Chipset Setup Menu

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCIe Compliance Mode</td>
<td>Options available: On, Off. Default setting is Off.</td>
</tr>
<tr>
<td>Program All VR</td>
<td>Enable/Disable program all VR on MB. Options available: Enabled, Disabled. Default setting is Enabled.</td>
</tr>
<tr>
<td>North Bridge</td>
<td>Press [Enter] for configuration of advanced items.</td>
</tr>
</tbody>
</table>
5-5-1 North Bridge

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Bridge Configuration</td>
<td></td>
</tr>
<tr>
<td>Memory Information</td>
<td></td>
</tr>
<tr>
<td>Total Memory</td>
<td>Displays the total memory information.</td>
</tr>
<tr>
<td>CPU 0 Information</td>
<td>Press [Enter] to view information related to CPU 0.</td>
</tr>
</tbody>
</table>
## 5-5-2 Fabric Resource

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabric Resource</td>
<td></td>
</tr>
<tr>
<td>CPU 0 NBIO_# PCIe Bus Number</td>
<td>Change CPU 0 NBIO_# PCIe Bus Number.</td>
</tr>
</tbody>
</table>
## Server Management Menu

### Parameter Description

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRB-2 Timer</td>
<td>Enable/Disable FRB-2 timer (POST timer). Options available: Enabled, Disabled. Default setting is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>FRB-2 Timer timeout</td>
<td>Configures the FRB2 Timer timeout. Options available: 3 minutes, 4 minutes, 5 minutes, 6 minutes. Default setting is <strong>6 minutes</strong>.</td>
</tr>
<tr>
<td>FRB-2 Timer Policy</td>
<td>Configures the FRB2 Timer policy. Options available: Do Nothing, Reset, Power Down. Default setting is <strong>Do Nothing</strong>.</td>
</tr>
<tr>
<td>OS Watchdog Timer</td>
<td>Enable/Disable OS Watchdog Timer function. Options available: Enabled, Disabled. Default setting is <strong>Disabled</strong>.</td>
</tr>
<tr>
<td>OS Wtd Timer Timeout</td>
<td>Configures OS Watchdog Timer. Options available: 5 minutes, 10 minutes, 15 minutes, 20 minutes. Default setting is <strong>10 minutes</strong>.</td>
</tr>
<tr>
<td>OS Wtd Timer Policy</td>
<td>Configure OS Watchdog Timer Policy. Options available: Reset, Do Nothing, Power Down. Default setting is <strong>Reset</strong>.</td>
</tr>
<tr>
<td>Wait BMC Ready</td>
<td>Post wait BMC ready and reboot system. Options available: Disabled, 2 minutes, 4 minutes, 6 minutes. Default setting is <strong>2 minutes</strong>.</td>
</tr>
</tbody>
</table>

(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**.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Event Log</td>
<td>Press [Enter] to configure advanced items.</td>
</tr>
<tr>
<td>View FRU Information</td>
<td>Press [Enter] to view the FRU information.</td>
</tr>
<tr>
<td>BMC network configuration</td>
<td>Press [Enter] to configure advanced items.</td>
</tr>
<tr>
<td>IPv6 BMC Network Configuration</td>
<td>Press [Enter] to configure advanced items.</td>
</tr>
</tbody>
</table>
## System Event Log

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enabling / Disabling Options</td>
<td>Change this item to enable or disable all features of System Event Logging during boot. Options available: Enabled, Disabled. Default setting is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>SEL Components</td>
<td>Change this to enable or disable all features of System Event Logging during boot. Options available: Enabled, Disabled. Default setting is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>Erasing Settings</td>
<td>Choose options for erasing SEL. Options available: No/Yes, On next reset/Yes, On every reset. Default setting is <strong>No</strong>.</td>
</tr>
<tr>
<td>Erase SEL</td>
<td>Choose options for reactions to a full SEL. Options available: Do Nothing, Erase Immediately. Default setting is <strong>Do Nothing</strong>.</td>
</tr>
<tr>
<td>When SEL is Full</td>
<td>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 <strong>Error code</strong>.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>++</td>
<td>Select Screen</td>
</tr>
<tr>
<td>↑↓</td>
<td>Select Item</td>
</tr>
<tr>
<td>Enter</td>
<td>Select</td>
</tr>
<tr>
<td>+/-</td>
<td>Change Opt.</td>
</tr>
<tr>
<td>F1</td>
<td>General Help</td>
</tr>
<tr>
<td>F3</td>
<td>Previous Values</td>
</tr>
<tr>
<td>F9</td>
<td>Optimized Defaults</td>
</tr>
<tr>
<td>F10</td>
<td>Save &amp; Exit</td>
</tr>
<tr>
<td>ESC</td>
<td>Exit</td>
</tr>
</tbody>
</table>

NOTE: All values changed here do not take effect until computer is restarted.
5-6-2 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
## BMC Network Configuration

### --BMC network configuration--

**Lan channel 1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration Address source</td>
<td>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 <strong>DynamicBmcDhcp</strong>.</td>
</tr>
<tr>
<td>Station IP address</td>
<td>Displays IP Address information.</td>
</tr>
<tr>
<td>Subnet mask</td>
<td>Displays Subnet Mask information. Please note that the IP address must be in three digits, for example, 192.168.000.001.</td>
</tr>
<tr>
<td>Router IP address</td>
<td>Displays the Router IP Address information.</td>
</tr>
<tr>
<td>Station MAC address</td>
<td>Displays the MAC Address information.</td>
</tr>
<tr>
<td>VLAN Support</td>
<td>Set BMC to enable/disable VLAN support. Options available: Enabled, Disabled. Default setting is <strong>Disabled</strong>.</td>
</tr>
<tr>
<td>Real-time synchronize BMC</td>
<td>Press [Enter] will set Address source(Static/DHCP) to BMC and then get Station IP address, Subnet mask and Router IP address from BMC.</td>
</tr>
</tbody>
</table>
### IPv6 BMC Network Configuration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPv6 BMC network configuration</td>
<td></td>
</tr>
<tr>
<td>IPv6 BMC Lan Channel 1</td>
<td></td>
</tr>
<tr>
<td>IPv6 BMC Lan Option</td>
<td>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.</td>
</tr>
<tr>
<td>IPv6 BMC Lan IP Address Source</td>
<td>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.</td>
</tr>
<tr>
<td>IPv6 BMC Lan IP Address/Prefix Length</td>
<td>Check if the IPv6 BMC LAN IP address matches those displayed on the screen.</td>
</tr>
</tbody>
</table>
5-7 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator Password</td>
<td>Press [Enter] to configure the administrator password.</td>
</tr>
<tr>
<td>User Password</td>
<td>Press [Enter] to configure the user password.</td>
</tr>
<tr>
<td>Secure Boot</td>
<td>Press [Enter] to configure advanced items.</td>
</tr>
</tbody>
</table>
## 5-7-1 Secure Boot

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Mode</td>
<td>Displays if the system is in User mode or Setup mode.</td>
</tr>
<tr>
<td>Secure Boot Mode</td>
<td>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.</td>
</tr>
<tr>
<td>Restore Factory Keys</td>
<td>Forces the system to user mode and installs factory default Secure Boot key database.</td>
</tr>
<tr>
<td>Reset To Setup Mode</td>
<td>Press [Enter] to reset the system mode to Setup mode.</td>
</tr>
<tr>
<td>Enter Audit Mode</td>
<td>Press [Enter] to set the system mode to audit mode.</td>
</tr>
<tr>
<td>Enter Deployed Mode</td>
<td>Press [Enter] to set the system mode to deployed mode.</td>
</tr>
</tbody>
</table>

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

Press [Enter] to configure advanced items.

Please note that this item is configurable when Secure Boot Mode is set to Custom.

- Factory Key Provision
  - Allows to provision factory default Secure Boot keys when system is in Setup Mode.
  - Options available: Enabled, Disabled. Default setting is Disabled.

- Restore Factory Keys
  - Installs all factory default keys. It will force the system in User Mode.
  - Options available: Yes, No.

- Enroll Efi Image
  - Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db).

- Restore DB defaults
  - Restore DB variable to factory defaults.

- Secure Boot variable
  - Displays the current status of the variables used for secure boot.

- Platform Key (PK)
  - Displays the current status of the Platform Key (PK).
  - Press [Enter] to configure a new PK.
  - Options available: Update.

- Key Exchange Keys (KEK)
  - Displays the current status of the Key Exchange Key Database (KEK).
  - Press [Enter] to configure a new KEK or load additional KEK from storage devices.
  - Options available: Update, Append.

- Authorized Signatures (DB)
  - Displays the current status of the Authorized Signature Database.
  - Press [Enter] to configure a new DB or load additional DB from storage devices.
  - Options available: Update, Append.

- Forbidden Signatures (DBX)
  - Displays the current status of the Forbidden Signature Database.
  - Press [Enter] to configure a new dbx or load additional dbx from storage devices.
  - Options available: Update, Append.

- Authorized TimeStamps (DBT)
  - Displays the current status of the Authorized TimeStamps Database.
  - Press [Enter] to configure a new DBT or load additional DBT from storage devices.
  - Options available: Update, Append.

- OsRecovery Signatures
  - Displays the current status of the OsRecovery Signature Database.
  - Press [Enter] to configure a new OsRecovery Signature or load additional OsRecovery Signature from storage devices.
  - Options available: Update, Append.
5-8  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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boot Configuration</td>
<td></td>
</tr>
<tr>
<td>Setup Prompt Timeout</td>
<td>Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Press the numeric keys to input the desired values.</td>
</tr>
<tr>
<td>Bootup NumLock State</td>
<td>Enable/Disable the Bootup NumLock function. Options available: On, Off. Default setting is On.</td>
</tr>
<tr>
<td>Quiet Boot</td>
<td>Enable/Disable showing the logo during POST. Options available: Enabled, Disabled. Default setting is Enabled.</td>
</tr>
<tr>
<td>Boot mode select</td>
<td>Selects the boot mode. Options available: LEGACY, UEFI. Default setting is UEFI.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>FIXED BOOT ORDER Priorities</td>
<td>Press [Enter] to configure the boot priority. By default, the server searches for boot devices in the following sequence: 1. Hard drive. 2. CD-ROM/DVD drive. 3. USB device. 4. Network. 5. UEFI.</td>
</tr>
<tr>
<td>Boot Option #1 / #2 / #3 / #4 / #5</td>
<td>Press [Enter] to configure the boot priority.</td>
</tr>
<tr>
<td>UEFI Network Drive BBS Priorities</td>
<td>Press [Enter] to configure the boot priority.</td>
</tr>
<tr>
<td>UEFI Application Boot Priorities</td>
<td>Press [Enter] to configure the boot priority.</td>
</tr>
</tbody>
</table>
5-9  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>.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save Options</td>
<td>Saves changes made and closes the BIOS setup. Options available: Yes, No.</td>
</tr>
<tr>
<td>Save Changes and Exit</td>
<td>Discards changes made and exits the BIOS setup. Options available: Yes, No.</td>
</tr>
<tr>
<td>Discard Changes and Exit</td>
<td>Saves changes done so far to any of the setup options. Options available: Yes, No.</td>
</tr>
<tr>
<td>Default Options</td>
<td>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.</td>
</tr>
<tr>
<td>Restore Defaults</td>
<td>Press [Enter] to configure the device as the boot-up drive.</td>
</tr>
<tr>
<td>Launch EFI Shell from</td>
<td>Attempts to Launch EFI Shell application (Shell.efi) from one of the available file system devices.</td>
</tr>
<tr>
<td>filesystem device</td>
<td></td>
</tr>
</tbody>
</table>
## 5-10  BIOS POST Beep code (AMI standard)

### 5-10-1  PEI Beep Codes

<table>
<thead>
<tr>
<th># of Beeps</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Memory not Installed.</td>
</tr>
<tr>
<td>1</td>
<td>Memory was installed twice (InstallPciMemory routine in PEI Core called twice)</td>
</tr>
<tr>
<td>2</td>
<td>Recovery started</td>
</tr>
<tr>
<td>3</td>
<td>DXE IPL was not found</td>
</tr>
<tr>
<td>3</td>
<td>DXE Core Firmware Volume was not found</td>
</tr>
<tr>
<td>4</td>
<td>Recovery failed</td>
</tr>
<tr>
<td>4</td>
<td>S3 Resume failed</td>
</tr>
<tr>
<td>7</td>
<td>Reset PPI is not available</td>
</tr>
</tbody>
</table>

### 5-10-2  DXE Beep Codes

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