# FT83A-B7129

# Service Engineer's Manual

# PREFACE

## Copyright



Version 1.0f

## Disclaimer

Information contained in this document is furnished by MiTAC Computer Corporation and has been reviewed for accuracy and reliability prior to printing. TYAN® assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TYAN® products including liability or warranties relating to fitness for a particular purpose or merchantability. TYAN® retains the right to make changes to produce descriptions and/or specifications at any time, without notice. In no event will TYAN® be held liable for any direct or indirect, incidental or consequential damage, loss of use, loss of data or other malady resulting from errors or inaccuracies of information contained in this document.

## Trademark Recognition

All registered and unregistered trademarks and company names contained in this manual are property of their respective owners including, but not limited to the following.

TYAN® is a trademark of MITAC COMPUTING TECHNOLOGY CORPORATION.
Intel® is a trademark of Intel® Corporation.
AMI®, AMIBIOS® and combinations thereof are trademarks of AMI Technologies.
Microsoft®, Windows® are trademarks of Microsoft Corporation.
IBM®, PC®, AT® and PS/2® are trademarks of IBM Corporation.
Winbond® is a trademark of Winbond Electronics Corporation.

## FCC Declaration

**Notice for the USA**

Compliance Information Statement (Declaration of Conformity Procedure) DoC FCC Part 15: This device complies with part 15 of the FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

·This device may not cause harmful interference.

·This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**Notice for Canada**

This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

## • Notice for Europe (CE Mark)

This product is in conformity with the Council Directive 2014/30/EU and 2014/35/EU.

**Warning**

This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

This equipment is not suitable for use in locations where children are likely to be present.

**CAUTION**

Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. There will be danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

### The elements of the instructional safeguard shall be as follows:

-element 1a:  IEC 60417-6056 (2011-05) for moving fan blades or
IEC 60417-6057 (2011-05) for other moving parts

-element 2:"Moving parts" or "Moving fan blade" as applicable, or equivalent text

-element 3: optional

-element 4: Keep body parts away from moving parts" or "Keep body parts away from fan blades" or "Keep body parts out of the motion path" as applicable, or equivalent text

## • VCCI-A

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

## • Safety: IEC/EN 62368-1

This equipment is compliant with CB/LVD of Safety: IEC/EN 62368-1:2014.

警告使用者:

此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。

警告：為避免電磁干擾，本產品不應安裝或使用於住宅環境。

警告：如果更換錯誤電池會產生爆炸，請以相同或同型電池更換使用。

連絡方式

製造商 ： 神雲科技股份有限公司

地址 ： 桃園市龜山區文化二路 200 號

**注意：內部沒有使用可維修的元件**
**請交由合格的技術人員進行維修**

**維修前需切斷所有電源**

# Taiwan BSMI RoHS Declaration

設備名稱：伺服器　/　型號（型式）：　FT83A-B7129

Equipment Name：Server　/ Type：FT83A-B7129

| 單位<br>Unit | 限用物質及其化學符號<br>Restricted substances and its chemical symbols | | | | | |
|---|---|---|---|---|---|---|
| | 鉛<br>Lead<br>(Pb) | 汞<br>Mercury<br>(Hg) | 鎘<br>Cadmium<br>(Cd) | 六價鉻<br>Hexavalent Chromium<br>($Cr^{6+}$) | 多溴聯苯<br>Polybrominated biphenyls<br>(PBB) | 多溴二苯醚<br>Polybrominated diphenyl ethers<br>(PBDE) |
| 印刷電路板總成<br>Printed Circuit Board Assembly | – | O | O | O | O | O |
| 機械組件<br>Mechanical Assemblies | – | O | O | O | O | O |
| 風扇<br>Fans | – | O | O | O | O | O |
| 散熱器<br>Heatsink | O | O | O | O | O | O |
| 電源線<br>Power Cord | O | O | O | O | O | O |
| 電源供應器<br>Power Supply | – | O | O | O | O | O |

備考1.〝○〞係指該項限用物質之百分比含量未超出百分比含量基準值。

Note1.　〝○〞indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考2.〝－〞係指該項限用物質為排除項目。

Note2.　〝－〞indicates that the restricted substance corresponds to the exemption.

**About this Manual**
This Manual is intended for trained service technician/personnel with hardware knowledge of personal computers. It is aimed to provide you with instructions on installing your TYAN FT83A-B7129.

**How this guide is organized**
This guide contains the following parts:

**Chapter 1: Overview**
This chapter give an introduction to the FT83A-B7129 barebones, standard parts list, and accessories. Describes the external components, gives a table of key

**Chapter2: Setting Up**
This chapter Covers procedures on installing the CPU, memory modules, add on card and hard drives. Give an overview about the FT83A-B7129 barebone from an overall angle.

**Chapter 3: Replacing the Pre-installed Components**
This chapter covers the removal and replacement procedures for pre-installed components.

**Chapter 4: Motherboard Information**
This chapter lists the hardware setup procedures that you need to abide by when installing system components. It includes description of the jumpers and connectors on the motherboard.

**Chapter5: BIOS Setup**
This chapter tells how to change system settings through the BIOS setup menu. Detailed descriptions of the BIOS parameters are also provided.

**Chapter 6: Diagnostics**
This chapter introduces some BIOS codes and technical terms to provide better service for the customers.

**Appendix:**
This Chapter Describes the Fan and Temp sensors location; list the cable connection and FRU part tables for reference of system setup and technical support in case a problem arises with your system.

## Safety and Compliance Information

Before installing and using TYAN FT83A-B7129, take note of the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Do not block the slots and opening on the unit, which are provided for ventilation.
- Only use the power source indicated on the marking label. If you are not sure, contact the power company.
- The unit uses a three-wire ground cable, which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.
- Do not place anything on the power cord. Place the power cord where it will not be in the way of foot traffic.
- Follow all warnings and cautions in this manual and on the unit case.
- Do not push objects in the ventilation slots as they may touch high voltage components and result in shock and damage to the components.
- When replacing parts, ensure that you use parts specified by the manufacturer.
- When service or repairs have been done, perform routine safety checks to verify that the system is operating correctly.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- Cover the unit when not in use.

## Safety Information

Retain and follow all product safety and operating instructions provided with your equipment. In the event of a conflict between the instructions in this guide and the instructions in equipment documentation, follow the guidelines in the equipment documentation.

Observe all warnings on the product and in the operating instructions. To reduce the risk of bodily injury, electric shock, fire and damage to the equipment, observe all precautions included in this guide.

You must become familiar with the safety information in this guide before you install, operate, or service TYAN products.

### Symbols on Equipment

| | |
|---|---|
|  | **Caution**. This symbol indicates a potential hazard. The potential for injury exists if cautions are not observed. Consult equipment documentation for specific details. |
|  | **Caution.** Slide-mounted equipment is not to be used as a shelf or a work space. |
|  | **Warning.** This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel. |
|  | **Warning**. This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.<br>To reduce risk of injury from a hot component, allow the surface to cool before touching. |
|  | **CAUTION:** Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.<br>**ATTENTION:** Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebus les batteries usagées selon les instructions. |
|  | **Multiple power connections.** Prior to servicing, disconnect all power cords.<br>**Raccordements de puissance multiples.** Avant l'entretien, vous devez débranchez tous les cordons d'alimentation. |

## General Precautions

- Follow all caution and warning instructions marked on the equipment and explained in the accompanying equipment documentation.

## Machine Room Environment

- Make sure that the area in which you install the system is properly ventilated and climate-controlled.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the electrical rating label of the equipment.
- Do not install the system in or near a plenum, air duct, radiator, or heat register.
- Never use the product in a wet location.

## Equipment Chassis

- Do not block or cover the openings to the system.
- Never push objects of any kind through openings in the equipment. Dangerous voltages might be present.
- Conductive foreign objects can produce a short circuit and cause fire, electric shock, or damage to your equipment.
- Lift equipment using both hands and with your knees bent.

## Equipment Racks

To avoid injury or damage to the equipment:

- Observe local occupational health and safety requirements and guidelines for manual materials handling.
- Do not attempt to move a rack by yourself; a minimum of two people are needed to move a rack.
- Do not attempt to move a fully loaded rack. Remove equipment from the rack before moving it.
- Do not attempt to move a rack on an incline that is greater than 10 degrees from the horizontal.

- Make sure the rack is properly secured to the floor or ceiling.
- Make sure the stabilizing feet are attached to the rack if it is a single-rack installation.
- Make sure racks are coupled together if it is a multiple-rack installation.
- Make sure the rack is level and stable before installing an appliance in the rack.
- Make sure the leveling jacks are extended to the floor.
- Make sure the full weight of the rack rests on the leveling jacks.
- Always load the rack from the bottom up. Load the heaviest component in the rack first.
- Make sure the rack is level and stable before pulling a component out of the rack.
- Make sure only one component is extended at a time. A rack might become unstable if more than one component is extended.

**To avoid damage to the equipment:**

- The rack width and depth must allow for proper serviceability and cable management.
- Ensure that there is adequate airflow in the rack. Improper installation or restricted airflow can damage the equipment.
- The rack cannot have solid or restricted airflow doors. You must use a mesh door on the front and back of the rack or remove the doors to ensure adequate air flow to the system.
- If you install the Model in a rack, do not place equipment on top of the unit. It will cause restricted airflow and might cause damage to the equipment.
- Make sure the product is properly matted with the rails. Products that are improperly matted with the rails might be unstable.
- Verify that the AC power supply branch circuit that provides power to the rack is not overloaded. This will reduce the risk of personal injury, fire, or damage to the equipment. The total rack load should not exceed 80 percent of the branch circuit rating. Consult the electrical authority having jurisdiction over your facility wiring and installation requirements.

## Equipment Power Cords

- Use only the power cords and power supply units provided with your system. The system might have one or more power cords.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- In all European electrical environments, you must ground the Green/Yellow tab on the power cord. If you do not ground the Green/Yellow tab, it can cause an electrical shock due to high leakage currents.
- Do not place objects on AC power cords or cables. Arrange them so that no one might accidentally step on or trip over them.
- Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.
- To reduce the risk of electrical shock, disconnect all power cords before servicing the appliance.

## Equipment Batteries

- The system battery contains lithium manganese dioxide. If the battery pack is not handled properly, there is risk of fire and burns.
- Do not disassemble, crush, puncture, short external contacts, or dispose of the battery in fire or water.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- The system battery is not replaceable. If the battery is replaced by an incorrect type, there is danger of explosion. Replace the battery only with a spare designated for your product.
- Do not attempt to recharge the battery.
- Dispose of used batteries according to the instructions of the manufacturer. Do not dispose of batteries with the general household waste. To forward them to recycling or proper disposal, use the public collection system or return them to TYAN, your authorized TYAN partner, or their agents.

## Equipment Modifications

- Do not make mechanical modifications to the system. TYAN is not responsible for the regulatory compliance of TYAN equipment that has been modified.

## Equipment Repairs and Servicing

• The installation of internal options and routine maintenance and service of this product should be performed by trained service technicians/personnel who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy levels.

• Do not exceed the level of repair specified in the procedures in the product documentation. Improper repairs can create a safety hazard.

• Allow the product to cool before removing covers and touching internal components.

• Remove all watches, rings, or loose jewelry when working before removing covers and touching internal components.

• Do not use conductive tools that could bridge live parts.

• Use gloves when you remove or replace system components; they can become hot to the touch.

• If the product sustains damage requiring service, disconnect the product from the AC electrical outlet and refer servicing to an authorized service provider. Examples of damage requiring service include:

– The power cord, extension cord, or plug has been damaged.

– Liquid has been spilled on the product or an object has fallen into the product.

– The product has been exposed to rain or water.

– The product has been dropped or damaged.

– The product does not operate normally when you follow the operating instructions.

## Instructional safeguard requirement

An instructional safeguard shall be provided to reduced the likelihood of unintentional contact with a moving part in accordance with Clause F.5 except that element 3 is optional.

# Table of Contents

# Chapter 1: Overview

## 1.1 About the TYAN FT83A-B7129

Congratulations on your purchase of the TYAN® FT83A-B7129, a highly optimized rack-mountable 4U barebone system. FT83A-B7129 is designed to support dual Intel® Xeon® Scalable Processor Families and up to 2,048GB RDIMM, 4,096GB LRDIMM 3DS, providing a rich feature set and incredible performance. Leveraging advanced technology from Intel®, FT83A-B7129 server system is capable of offering scalable 32 and 64-bit computing, high-bandwidth memory design, and lightning-fast PCIE bus implementation.FT83A-B7129 not only enpowers your company in today's demanding IT environment but also offers a smooth path for future application usage.

TYAN® also offers the FT83A-B7129 in a version that can support up to twelve (12) 2.5"/3.5" hot-swap SAS/SATA HDDs and (2) hot-swap 2.5" SATA HDD, (8) hot-swap 2.5" NVMe HDD. FT83A-B7129 uses rack-mountable 4U chassis featuring a robust structure and a solid mechanical enclosure. All of this provides FT83A-B7129 the power and flexibility to meet the needs of nearly any server application.

## 1.2 Product Models

The system board within the Tyan Barebone is defined by the following models:

- **B7129F83AV8E4HR-N:** Intel-based platform
- **B7129F83AV14E8HR-N:** Intel-based platform

## 1.3 Features

### B7129F83AV8E4HR-N Specifications

| | | |
|---|---|---|
| System | Form Factor | 4U Rackmount |
| | Chassis Model | FT83 |
| | Chassis Dimension (D x W x H) | 32.68" x 17.26" x 6.9" (830 x 438.4 x 176mm) |
| | Motherboard Name | S7129GMRE# |
| | Motherboard Notification | # The motherboard not sold separately |
| | Gross Weight | 46 kg (101.4 lbs) |
| | Net weight | 39.3 kg (86.6 lbs) |
| Front Panel | Buttons | (1) UID / (1) PWR w/ LED / (1) RST |
| | LEDs | (1) HDD / (1) ID / (1) System Event / (2) LAN activity |
| | I/O Ports | (2) USB 3.0 ports / (1) COM Port / (1) VGA port |
| External Drive Bay | Q'ty / Type | (12) 3.5"/2.5" Hot-Swap HDD/SSDs w/ (4) NVMe |
| | HDD Backplane Support | (12) SATA 6Gb/s with (4) NVMe ports |
| | Supported HDD Interface | SAS 12Gb/s /SATA 6Gb/s /NVMe |
| System Cooling Configuration | FAN | (8) hot-swappable 8cm fans |
| Power Supply | Type | CRPS |
| | Input Range | AC 100-127V/13A / AC 200-240V/9.5A |
| | Frequency | 50-60 Hz |
| | Output Watts | 3,000 Watts (100-127Vac input) / 4,800 Watts (200-240Vac input) |
| | Efficiency | 80 plus Platinum |
| | Redundancy | 3+1 |
| Processor | Q'ty / Socket Type | (2) LGA4189 |
| | Supported CPU Series | 3rd Gen Intel Xeon Scalable Processor |
| | Thermal Design Power Wattage | Max up to 270W (TDP) |
| | System Bus | Up to 11.2/10.4 GT/s with Intel UltraPath Interconnect (UPI) support |
| Chipset | PCH | Intel C621A |
| | Switch IC | (2) PLX PEX88096 |
| CPU-GPU Link Topology | Dual-root | All GPU connected to CPUs evenly |

| | | |
|---|---|---|
| **Memory** | **Supported DIMM Qty** | (16)+(16) DIMM slots |
| | **DIMM Type / Speed** | DDR4 ECC RDIMM/RDIMM 3DS/LRDIMM/LRDIMM 3DS 3200 |
| | **Capacity** | Up to 4,096GB RDIMM/ 8,192GB LRDIMM/ 8,192GB RDIMM 3DS/LRDIMM 3DS *Follow latest Intel DDR4 Memory POR |
| | **Memory channel** | 8 Channels per CPU, 2 DIMM slots per Channel |
| | **Memory voltage** | 1.2V |
| **Expansion Slots** | **PCI-E** | (3) PCIe Gen.4 x16 slots (FH/HL) / (10) PCIe Gen.4 x16 (FH/10.5"L/DW ) |
| | **Pre-installed TYAN Riser Card (PCI-E Gen.4)** | (2) M7129F83A-L16 riser card for (2) PCIe Gen.4 x16 slots (left) |
| | **Others** | (1) PCIe Gen.4 x16 OCP 3.0 slot for mezz. w/ pull tab |
| | **Physical Dimension Abbreviation** | FH/FL (Full-height / Full-length): 4.4" x 12.3" (111.2 x 312mm) |
| **LAN** | **Q'ty / Port** | (1) GbE dedicated for IPMI |
| | **PHY** | Realtek RTL8211E |
| **Storage SATA** | **Connector** | (3) SFF-8643 for (12) front SATA ports |
| | **Controller** | Intel C621A |
| | **Speed** | 6Gb/s |
| | **RAID** | RAID 0/1/10/5 (Intel RSTe) |
| **Storage NVMe** | **Connector(U.2)** | (2) SFF-8654 for (4) NVMe ports |
| | **Connector (M.2)** | (1) 2280 (by PCIe 3.0 x4) M.2 slot on MB / (1) 2280 (by PCIe 4.0 x2) M.2 slot on PCIe I/O board |
| **Graphic** | **Connector type** | D-Sub 15-pin |
| | **Resolution** | Up to 1920x1200 |
| | **Chipset** | Aspeed AST2600 |
| **I/O Ports** | **USB** | (2) USB3.0 ports (@ front) / (2) USB3.0 ports (@ rear) (from M7129F83A-RIO) |
| | **COM** | (1) DB-9 COM port |
| | **VGA** | (1) D-Sub 15-pin port |
| | **RJ-45** | (1) GbE port dedicated for IPMI (from M7129F83A-RIO) |
| **TPM (Optional)** | **TPM Support** | Please refer to our TPM supported list. |
| **System Monitoring** | **Chipset** | Aspeed AST2600 |
| | **Temperature** | Monitors temperature for CPU & memory & system environment |

| | | |
|---|---|---|
| | **Voltage** | Monitors voltage for CPU, memory, chipset & power supply |
| | **LED** | Over temperature warning indicator, Fan & PSU fail LED indicator |
| | **Others** | Watchdog timer support |
| **Server Management** | **Onboard Chipset** | Onboard Aspeed AST2600 |
| | **AST2600 iKVM Feature** | 24-bit high quality video compression / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub |
| | **AST2600 IPMI Feature** | IPMI 2.0 compliant baseboard management controller (BMC) / 10/100/1000 Mb/s MAC interface |
| **BIOS** | **Brand / ROM size** | AMI, 32MB |
| | **Feature** | Hardware Monitor / Boot from USB device/PXE via LAN/Storage / Console Redirection / User Configurable FAN PWM Duty Cycle / SMBIOS 3.0/PnP/Wake on LAN / ACPI 6.1 / ACPI sleeping states S4,S5 |
| **Operating System** | **OS supported list** | Please refer to our AVL support lists. |
| **Regulation** | **FCC (SDoC)** | Class A |
| | **CE (DoC)** | Class A |
| | **CB/LVD** | Yes |
| | **VCCI** | Class A |
| | **C-Tick** | Class A |
| **Operating Environment** | **Operating Temp.** | 10° C ~ 35° C (50° F~ 95° F) |
| | **Non-operating Temp.** | - 40° C ~ 70° C (-40° F ~ 158° F) |
| | **In/Non-operating Humidity90** | 90%, non-condensing at 35° C |
| | **Note** | Please refer to the TYAN NVIDIA Compatibility List for the operating temperature while GPGPU deployed |
| **RoHS** | **RoHS 6/6 Compliant** | Yes |
| **Package Contains** | **Barebone** | (1) FT83A-B7129 Barebone |
| | **Manual** | (1) Quick Installation Guide |

## B7129F83AV14E8HR-N Specifications

| | | |
|---|---|---|
| System | Form Factor | 4U Rackmount |
| | Chassis Model | FT83 |
| | Chassis Dimension (D x W x H) | 32.68" x 17.26" x 6.9" (830 x 438.4 x 176mm) |
| | Motherboard Name | S7129GMRE# |
| | Motherboard Notification | # The motherboard not sold separately |
| | Gross Weight | 46 kg (101.4 lbs) |
| | Net weight | 39.3 kg (86.6 lbs) |
| Front Panel | Buttons | (1) UID / (1) PWR w/ LED / (1) RST |
| | LEDs | (1) HDD / (1) ID / (1) System Event / (2) LAN activity |
| | I/O Ports | (2) USB 3.0 ports / (1) COM Port / (1) VGA port |
| External Drive Bay | Q'ty / Type | (2) 2.5" Hot-Swap HDD/SSDs / (8) NVMe / (12) 3.5" Hot-Swap HDD/SSDs |
| | Front Drive Bay Interface | (2) SATA 6Gb/s / (8) NVMe / (12) SATA 6Gb/s / SAS 12Gb/s |
| | Front HDD Backplane Support | NVMe / SATA 6Gb/s |
| System Cooling Configuration | FAN | (8) hot-swappable 8cm fans |
| Power Supply | Type | CRPS |
| | Input Range | AC 100-127V/13A / AC 200-240V/9.5A |
| | Frequency | 50-60 Hz |
| | Output Watts | 3,000 Watts (100-127Vac input) / 4,800 Watts (200-240Vac input) |
| | Efficiency | 80 plus Platinum |
| | Redundancy | 3+1 |
| Processor | Q'ty / Socket Type | (2) LGA4189 |
| | Supported CPU Series | 3rd Gen Intel Xeon Scalable Processor |
| | Thermal Design Power (TDP) Wattage | Max up to 270W(TDP) |
| | System Bus | Up to 11.2/10.4 GT/s with Intel UltraPath Interconnect (UPI) support |
| Chipset | PCH | Intel C621A |
| | Switch IC | (2) PLX PEX88096 |
| CPU-GPU Link Topology | Dual-root | All GPU connected to CPUs evenly |
| Memory | Supported DIMM Qty | (16)+(16) DIMM slots |

| | | |
|---|---|---|
| | **DIMM Type / Speed** | DDR4 ECC RDIMM/RDIMM 3DS/LRDIMM/LRDIMM 3DS 3200 |
| | **Capacity** | Up to 4,096GB RDIMM/ 8,192GB LRDIMM/ 8,192GB RDIMM 3DS/LRDIMM 3DS *Follow latest Intel DDR4 Memory POR |
| | **Memory channel** | 8 Channels per CPU, 2 DIMM slots per Channel |
| | **Memory voltage** | 1.2V |
| **Expansion Slots** | **PCI-E** | (1) PCIe Gen.4 x16 slot (FH/HL) / (10) PCIe Gen.4 x16 (FH/10.5"L/DW ) |
| | **Pre-installed TYAN Riser Card (PCI-E Gen.3)** | (2) M7129F83A-L16 riser card for (2) PCI-E Gen4 x16 slot (left) |
| | **Pre-installed TYAN Mezz. Card (PCI-E Gen.3)** | F7129F83A-RIO |
| | **Others** | (1) PCIe Gen.4 x16 OCP 3.0 slot for mezz. w/ pull tab |
| | **Physical Dimension Abbreviation** | FH/FL (Full-height, Full-length): 4.4" x 12.3" (111.2 x 312mm) |
| **LAN** | **Q'ty / Port** | (1) GbE dedicated for IPMI |
| | **PHY** | Realtek RTL8211E |
| **Storage SATA** | **Connector** | (3) SFF-8643 for (12) front SATA drives |
| | **Controller** | Intel C621A |
| | **Speed** | 6Gb/s |
| | **RAID** | RAID 0/1/10/5 (Intel RSTe) |
| **Stotage sSATA** | **RAID** | RAID 0/1 (Intel RSTe) |
| **Storage NVMe** | **Connector (M.2)** | (1) 2280 (by PCIe 3.0 x4) M.2 slot on MB / (1) 2280 (by PCIe 4.0 x2) M.2 slot on PCIe I/O board |
| | **Connector (U.2)** | (2) SFF-8654 for (4) NVMe ports |
| **Graphic** | **Connector type** | D-Sub 15-pin |
| | **Resolution** | Up to 1920x1200 |
| | **Chipset** | Aspeed AST2600 |
| **I/O Ports** | **USB** | (2) USB3.0 ports (@ front) / (2) USB3.0 ports (@ rear) |
| | **COM** | (1) DB-9 COM port |
| | **VGA** | (1) D-Sub 15-pin port |
| | **RJ-45** | (1) GbE port dedicated for IPMI |
| **TPM (Optional)** | **TPM Support** | Please refer to our TPM supported list. |
| **System Monitoring** | **Chipset** | Aspeed AST2600 |
| | **Temperature** | Monitors temperature for CPU & memory & system environment |
| | **Voltage** | Monitors voltage for CPU, memory, chipset & |

| | | |
|---|---|---|
| | | power supply |
| | **LED** | Over temperature warning indicator, Fan & PSU fail LED indicator |
| | **Others** | Watchdog timer support |
| **Server Management** | **Onboard Chipset** | Onboard Aspeed AST2600 |
| | **AST2600 iKVM Feature** | 24-bit high quality video compression / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub |
| | **AST2600 IPMI Feature** | IPMI 2.0 compliant baseboard management controller (BMC) / 10/100/1000 Mb/s MAC interface |
| **BIOS** | **Brand / ROM size** | AMI, 32MB |
| | **Feature** | Hardware Monitor / Boot from USB device/PXE via LAN/Storage / Console Redirection / User Configurable FAN PWM Duty Cycle / SMBIOS 3.0/PnP/Wake on LAN / ACPI 6.1 / ACPI sleeping states S4,S5 |
| **Operating System** | **OS supported list** | Please refer to our AVL support lists. |
| **Regulation** | **FCC (SDoC)** | Class A |
| | **CE (DoC)** | Class A |
| | **CB/LVD** | Yes |
| | **VCCI** | Class A |
| | **C-Tick** | Class A |
| **Operating Environment** | **Operating Temp.** | 10° C ~ 35° C (50° F~ 95° F) |
| | **Non-operating Temp.** | - 40° C ~ 70° C (-40° F ~ 158° F) |
| | **In/Non-operating Humidity 90** | 90%, non-condensing at 35° C |
| **RoHS** | **RoHS 6/6 Compliant** | Yes |
| **Package Contains** | **Barebone** | (1) FT83A-B7129 Barebone |
| | **Manual** | (1) Quick Installation Guide |

**NOTE:**

1. The specifications are subject to change without prior notice.
2. Please visit our website for the latest specifications.

## 1.4 Standard Parts List

This section describes FT83A-B7129 package contents and accessories. Open the box carefully and ensure that all components are present and undamaged. The product should arrive packaged as illustrated below.

### 1.4.1 Box Contents

**FT83A-B7129 Chassis Kit**

- 4U chassis*1
- (3+1) 4,800W (80+ Platinum) power Supply
- (8) hot-swap 8038 Fans
- (1) TYAN® S7129GMRE Mother Board
- (1) M1718T65-FPB Front Panel Board
- (1) M1717T65-USB Front USB Board
- (2) M7129F83A-L16
- (1) M7129F83A-FB Fan Board
- (1) M7129F83A-IO PCIE board
- (1) M7129F83A-RIO Rear IO board
- (1) M1297T65-BP12E-12 (B7129F83AV8E4HR-2T-N sku)
- (1) M1315F83A-BP12E-10 (B7129F83AV14E8HR-2T-N sku)

### 1.4.2 Accessories

If any items are missing or appear damaged, contract your retailer or browse to TYAN®'s website for service: **http://www.tyan.com.**

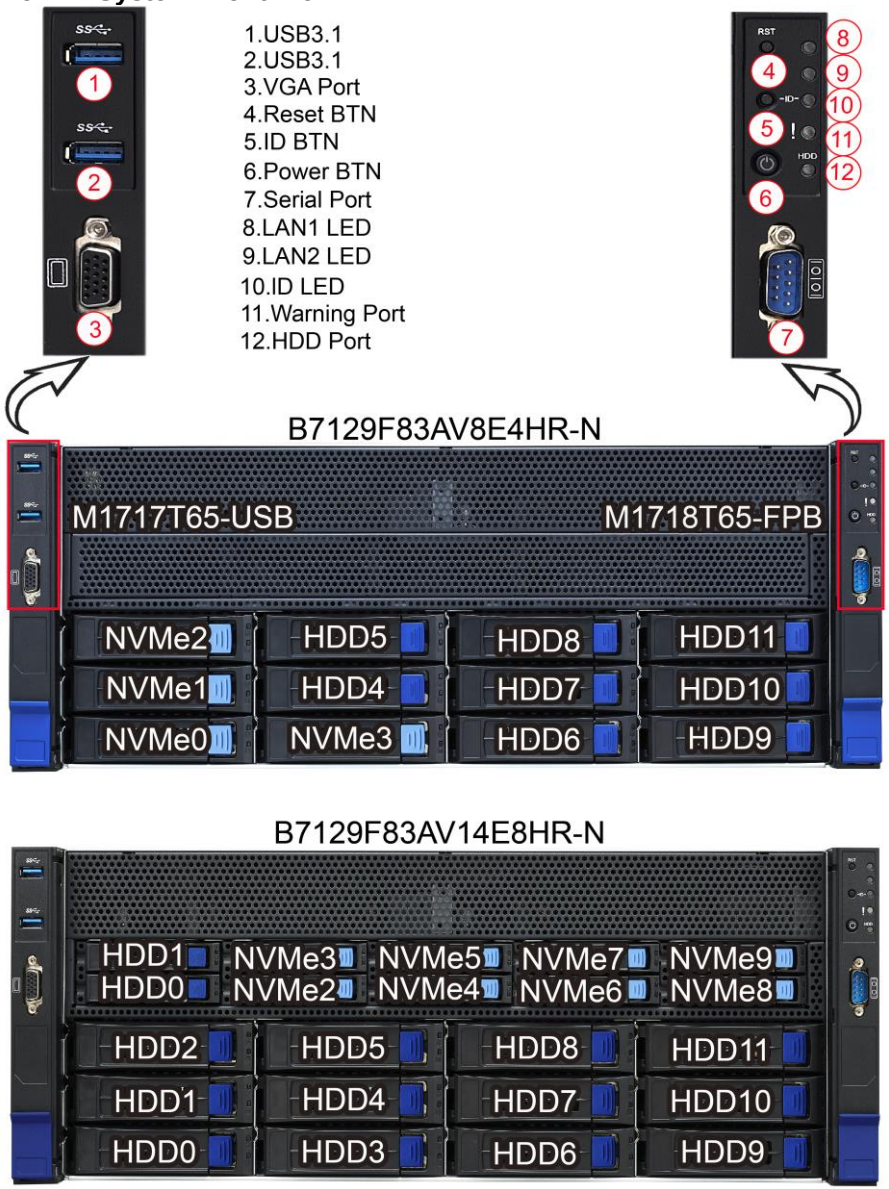
**FT83A-B7129 Accessory Kit**

- (2) CPU Heatsink
- (1) Rail Kit
- (2) Screw pack (PCI_E BKT)
- (2) Screw pack (M.2)
- (1) Quick Installation Guide
- (4) AC Power code (US)
- (4) AC Power code (EU)
- (1) Air duct
- (10) 200 mm,2*4P(M),P4.2/ 2*4P(M) Power Cable
- (10) 250mm,2*4P(M), P4.2/2*3P+2*1P(M)*2pcs,GPU Power Cable

## 1.5 About the Product

The following views show you the product.

### 1.5.1 System Front View



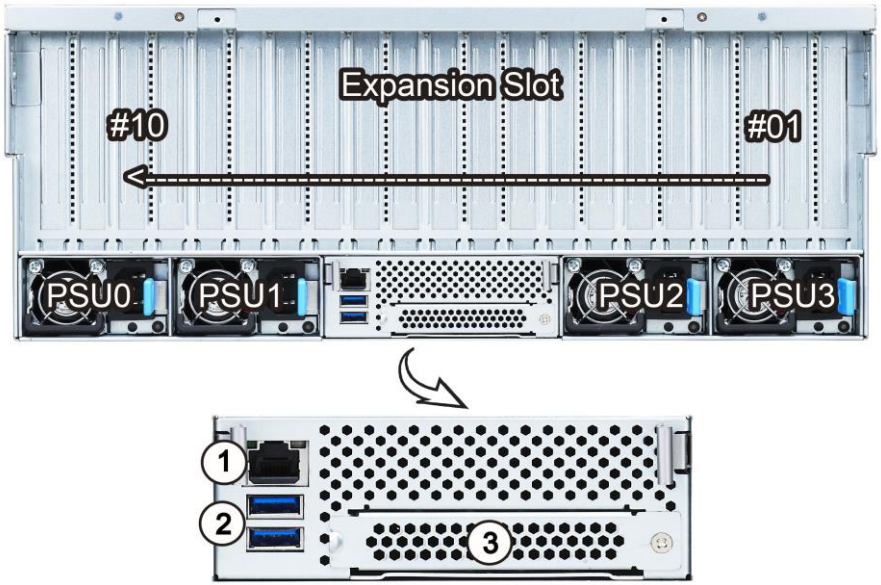
## M1718T65-FPB Front Panel LED Control Board

Switch and LED Indication

| Field | QTY | Color | Behavior |
|---|---|---|---|
| Power | 1 | Green | System Power off / off<br>System Power On / solid on |
| Onboard LAN | 2 | NO Function | |
| ID | 1 | Blue | Normal / Off<br>Located / Solid on |
| Warning | 1 | Red/Green/Blue | System normal /All off<br>Memory warning / Green blinking<br>PSU warning / Blue solid on<br>FAN warning / Blue blinking<br>System fault / Red solid on |
| Onboard HDD LED | 1 | Green/Red | HDD present / Green solid on<br>HDD activity / Green blinking<br>HDD fail / Red solid on |


| DRIVE STATE | Active LED (Green) | Status LED (Red) |
|---|---|---|
| Drive Present, No Active | Solid on | Off |
| Drive Present with Active | Blinking | Off |
| Drive Failure | Don't care | Solid on |
| RAID Rebuild | Don't care | Blinking @4 Hz |
| Drive Locate Identifier | Don't care | Blinking @1 Hz |

### 1.5.2 System Rear View



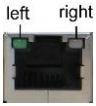

1. LAN1: from Realtek RTL8211E PHY for IPMI
2. USB 3.1 x 2
3. OCP Card Area (OCP 3.0 LAN mezzanine slot)

**NOTE:**

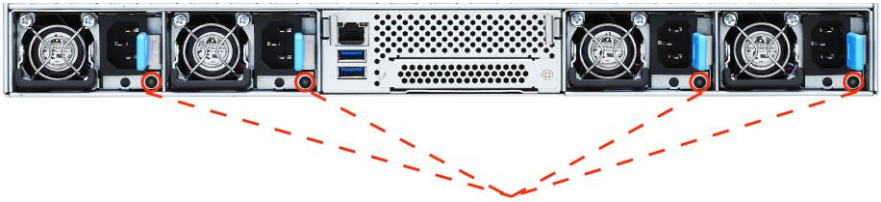
1. M7129F83A-RIO Rear IO board is pre-installed.

### 1.5.3 LED Definitions

**1Gbps LAN Port LAN Indication**

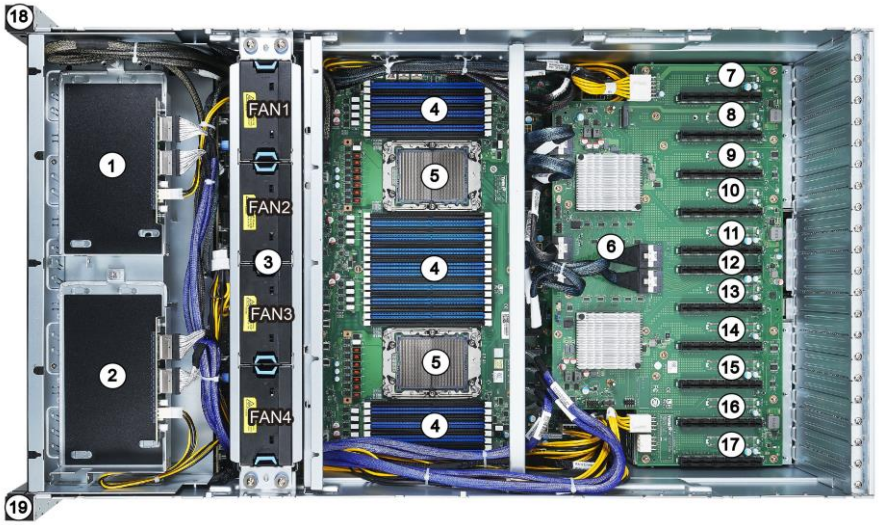
| 1Gbps LAN Link/Activity LED Scheme | | | |
|---|---|---|---|
|  | | **Left LED (Link/Activity) LED Color: Green** | **Right LED (Speed) LED Color: Amber** |
| **No Link** | | OFF | OFF |
| **10 Mbps** | **Link** | Green Solid On | OFF |
| | **Active** | Green Blinking | OFF |
| **100 Mbps** | **Link** | Green Solid On | Green Solid On |
| | **Active** | Green Blinking | Green Solid On |
| **1000 Mbps (1Gbps)** | **Link** | Green Solid On | Amber Solid On |
| | **Active** | Green Blinking | Amber Solid On |

**NOTE:** "Left" and "Right" are viewed from the rear panel.



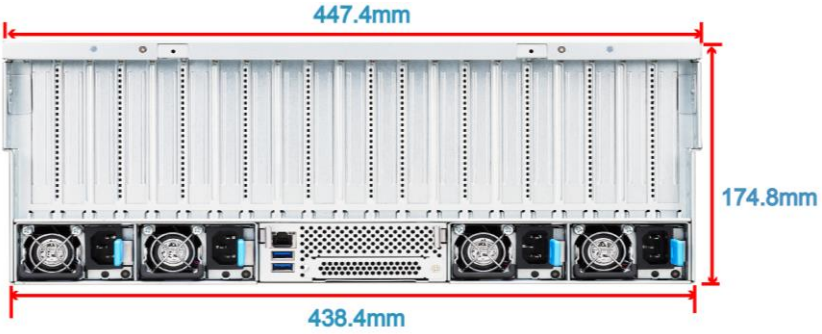

| PSU LED Definitions | Dual-color | |
|---|---|---|
| **Power Supply Condition** | **Green LED** | **Amber LED** |
| No AC power to all power supplies | **OFF** | **OFF** |
| Power supply critical event causing a shutdown failure, OCP, OVP, Fan Fail, OTP, UVP | **OFF** | **AMBER** |
| Power supply warning events where the power supply continues to operate; high temp( inlet temperature>54 deg (PMBus reading), or hot spot temperature>105deg (PMBus reading), high power, high current, slow fan(<1200rpm). | **OFF** | **0.5Hz Blink AMBER** |
| AC present Only 12VSB on(PS off) or PS in Smart Redundant state | **1Hz Blink GREEN** | **OFF** |
| Output ON and OK | **ON** | **OFF** |
| AC cord unplugged or AC power lost, with a second power supply in parallel still with AC input power. | **OFF** | **AMBER** |
| FW update mode | **2Hz Blink GREEN** | **OFF** |

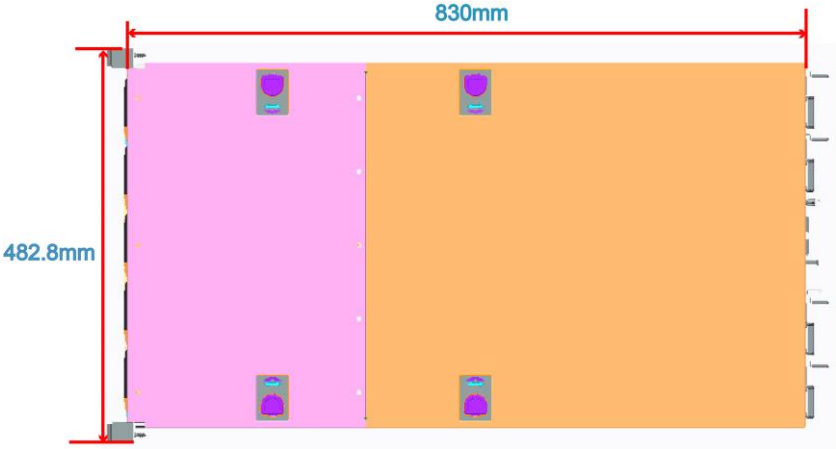
### 1.5.4 Internal View




| NO. | Explanation |
|---|---|
| 1. | Riser Bracket1 with M7129F83A-L16<br>(10) U.2 NVMe or (2) SATA (MAX.) + (8) U.2 NVMe<br>w/M1315F83A-BP12E-10 HDD BP Board (pre-installed)<br>(12) 3.5” HDDs/SSDs (HDD0 ~ HDD11)<br>w/M1297T65-BP12E-12 HDD BP Board (pre-installed)<br>or M1313F83A-BP12E-12 HDD BP Board (pre-installed) |
| 2 | Riser Bracket2 with M7129F83A-L16<br>(10) U.2 NVMe or (2) SATA (MAX.) + (8) U.2 NVMe<br>w/M1315F83A-BP12E-10 HDD BP Board (pre-installed)<br>(12) 3.5” HDDs/SSDs (HDD0 ~ HDD11)<br>w/M1297T65-BP12E-12 HDD BP Board (pre-installed)<br>or M1313F83A-BP12E-12 HDD BP Board (pre-installed) |
| 3 | System Fan with M7129F83A-Fan Board(pre-installed) |
| 4 | Memory Slot |
| 5 | CPU Socket |
| 6 | M7129FT83A-IO PCIE Board |
| 7~11 | PCIE Gen4 x16 Slots (FH/FL, GPU#1 ~ GPU#5) |
| 12 | PCIE Gen4 x16 Slots (FH/FL) |
| 13~17 | PCIE Gen4 x16 Slots (FH/FL, GPU#6 ~ GPU#10) |

### 1.5.5 Chassis Dimensions



### 2.0.1 Before you Begin

This chapter explains how to install the CPUs, CPU heatsinks, memory modules, and hard drives. Instructions on inserting add on cards are also given.

### 2.0.2 Work Area

Make sure you have a stable, clean working environment. Dust and dirt can get into components and cause malfunctions. Use containers to keep small components separated. Putting all small components in separate containers prevents them from becoming lost. Adequate lighting and proper tools can prevent you from accidentally damaging the internal components.

### 2.0.3 Tools

The following procedures require only a few tools, including the following:

- A cross head (Phillips) screwdriver
- A grounding strap or an anti-static pad

Most of the electrical and mechanical connections can be disconnected using your fingers. It is recommended that you do not use needle nosed pliers to remove connectors as these can damage the soft metal or plastic parts of the connectors.

**Caution!**

1. To avoid damaging the motherboard and associated components, do not use torque force greater than 7kgf/cm (6.09 lb/in) on each mounting screw for motherboard installation.
2. Do not apply power to the board if it has been damaged.

### 2.0.4 Precautions

Components and electronic circuit boards can be damaged by discharges of static electricity. Working on a system that is connected to a power supply can be extremely dangerous. Follow the guidelines below to avoid damage to FT83A-B7129 or injury to yourself.

- Ground yourself properly before removing the top cover of the system. Unplug the power from the power supply and then touch a safely grounded object to release static charge (i.e. power supply case). If available, wear a grounded wrist strap. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- 
- Avoid touching motherboard components, IC chips, connectors, memory modules, and leads.

- The motherboard is pre-installed in the system. When removing the motherboard, always place it on a grounded anti-static surface until you are ready to reinstall it.

- 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 circuit boards.

- Leave all components inside the static-proof packaging that they ship with until they are ready for installation.

- After replacing optional devices, make sure all screws, springs, or other small parts are in place and are not left loose inside the case. Metallic parts or metal flakes can cause electrical shorts.

## 2.1 Installing Motherboard Components

This section describes how to install components on to the motherboard, including CPUs, memory modules and Add-on cards.

### 2.1.1 Removing the Chassis Cover

Follow these instructions to remove FT83A-B7129 chassis cover.

1. Remove the screw from the back side of the cover.

2. Press the two latch to pull the back cover in the direction of the arrow to remove the top cover.


3. Remove the screw from the front top cover.

4. Press the button to remove the back top cover from the chassis.


### 2.1.2 Installing the CPU, Heat sink and Air Duct

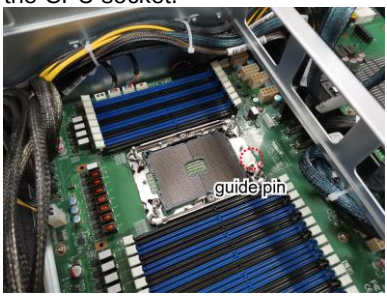
Follow the steps below on installing the processor, heatsink and air duct.

1. Align the triangle edge of the carrier with the notch on the edge of the heatsink. Then install the carrier on the bottom of the heatsink and make sure the latches are snapped under the edge of the heatsink.

2. Align and install the processor on the carrier. Make sure the gold arrow is located in the correct direction.

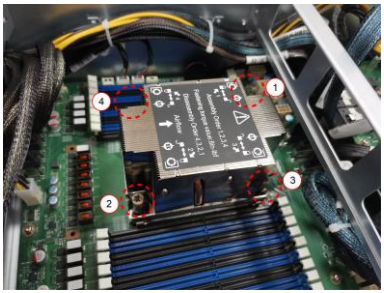
3. Remove the CPU cover.

4. Carefully flip the heatsink assembly. Align the heatsink with the CPU socket by the guide pins. Make sure also that the triangle edge of the carrier is aligned correctly with the triangle mark on the CPU socket. Then place the heatsink assembly onto the top of the CPU socket.




5. Press down on the retention clips to fix the heatsink assembly to the CPU socket.
6. To secure the heatsink assembly, use a T30 Security Torx to tighten the screws in a sequential order (1→2→3→4).

**NOTE:** When disassembling the heatsink, loosen the screws in reverse order (4→3→2→1).



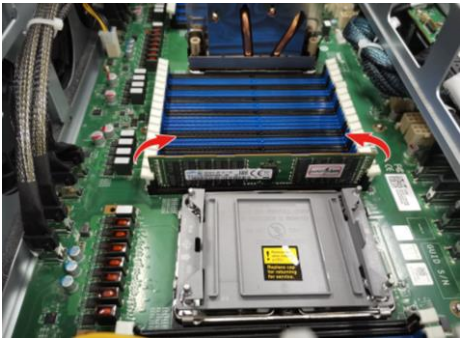

7. Repeat the procedures described earlier to install the second processor and heatsink.
8. Place the air duct on top of the heatsink and screw it to the chassis.

### 2.1.3 Installing the Memory

Follow these instructions to install the memory modules onto the motherboard.

1. Press the memory slot locking levers in the direction of the arrows as shown in the following illustration.

2. Align the memory module with the slot. When inserted properly, the memory slot locking levers lock automatically onto the indentations at the ends of the module.

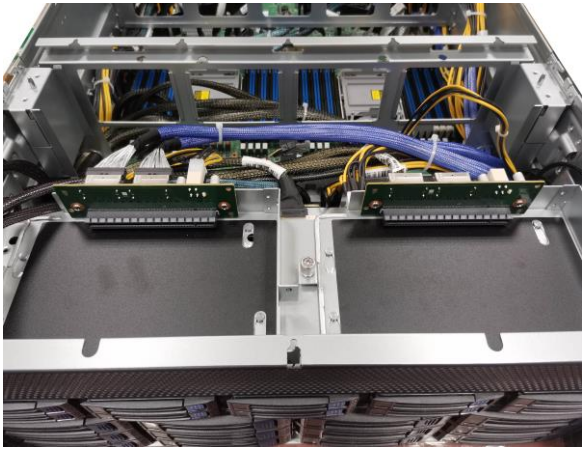


### 2.1.4 Installing the Expansion Card (PCIE Board)

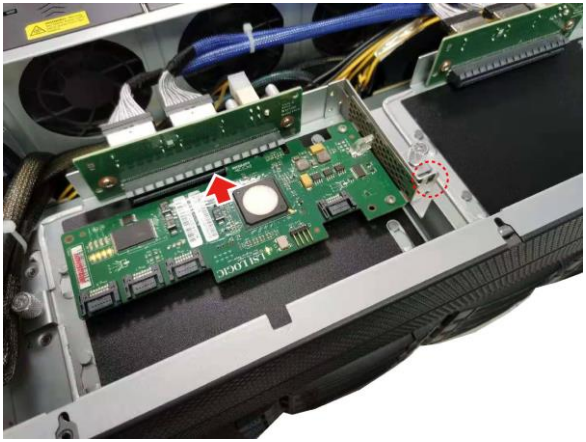
Follow these instructions to install the PCIE cards.

**Installing Expansion Cards**

1. Locate the PCIE Bracket.



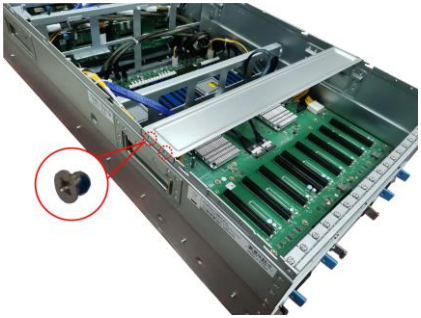
2. Insert the riser card to the PCIE x16 slot. Secure the card to the bracket with a screw.

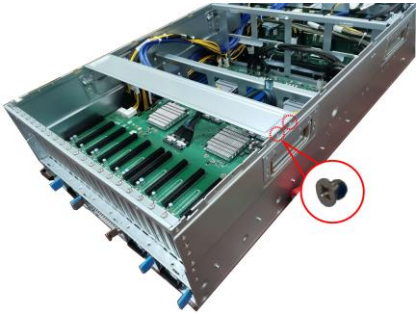


**Installing GPU Card**

Follow the instructions to install the expansion cards with card brackets or card guides.

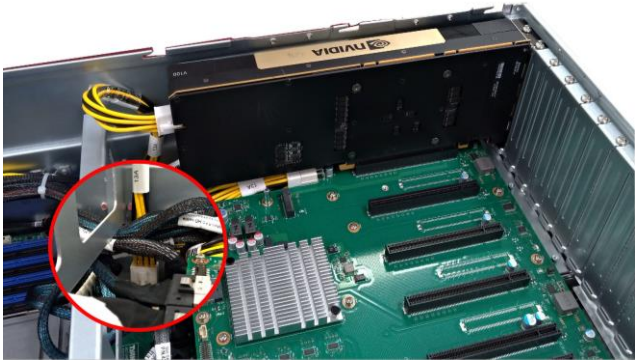
1. Unscrew to remove the Linkbar.



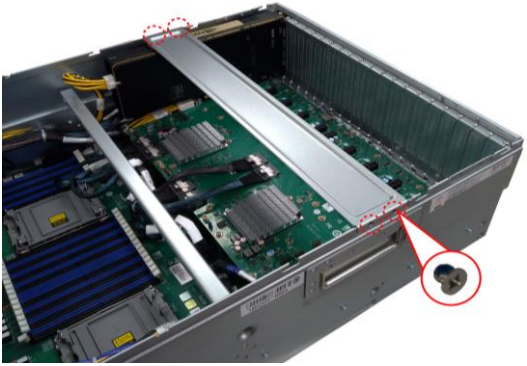


2. Locate the PCIE Gen.4 x16 slot on the motherboard. Unscrew to take out the dummy brackets.

3. Insert the GPU card into the PCIE Gen. 4 slot and screw the GPU card to the chassis. Connect the GPU PWR cable to the GPU card and motherboard.



4. Secure the GPU Bracket to the chassis with 4 screws.



### 2.1.5 Installing Hard Drives

The FT83A-B7129 supports ten 2.5” Hard Drives and twelve 3.5”/2.5” Hard Drives. Follow these instructions to install a hard drive.

**Installing 3.5”/2.5” HDD**

1. Press Locking lever to release the 3.5” HDD tray.

2. Pull the 3.5”HDD tray out of the chassis.

3. Pull open the locking lever to install the 3.5” hard disk drive into the HDD tray and lock the tray lever to secure HDD.

4. Reinsert the HDD tray into the chassis.

## Installing 2.5” HDD

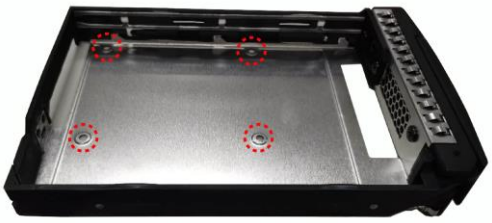
Follow these instructions to install a 2.5” HDD/SSD.

Warning!!! Always install the hard disk drive to the chassis after the chassis has been secured on the rack.

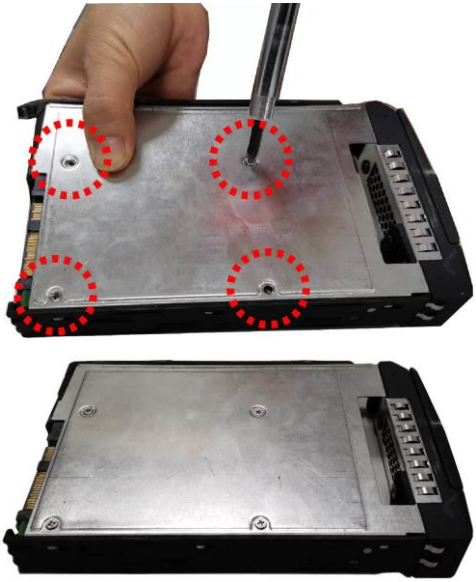
1. Press the locking lever latch and pull the locking lever open.

2. Slide the HDD tray out.

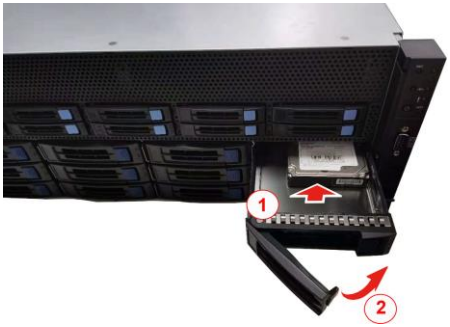
3. Place the 2.5” HDD/SSD into the HDD tray and align the 2.5” HDD/SSD with its hole.



4. Turn over the HDD tray and secure the HDD/SSD to the tray using 4 screws.



5. Reinsert the HDD tray into the chassis. Push to secure the locking lever until it clicks into place.



Follow these instructions to install a 2.5” HDD/SSD.

1. Press the locking lever latch and pull the locking lever open.

2. Slide the HDD tray out.

3. Open the lock to place the 2.5” hard disk drive into the HDD tray. Push the HDD to the left.

4. Lock the tray lever to secure HDD.

5. Reinsert the HDD tray into the chassis. Push to secure the locking lever until it clicks into place.

## 2.2 Rack Mounting

After installing the necessary components, the TYAN TS83A-B7129 chassis can be mounted in a rack using the supplied rack mounting kit.

**Sliding Rail Kit**

- Sliding Rails x 2
- Rail screw Pack x 2

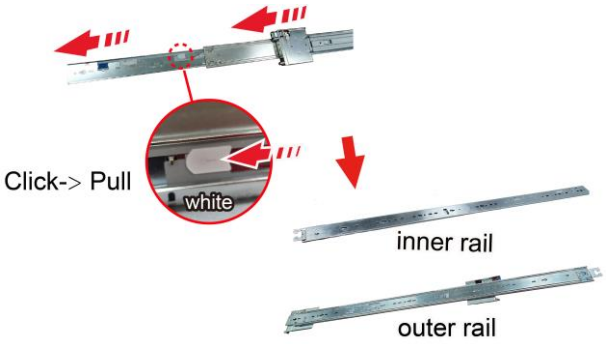
### 2.2.1 Installing the Server in a Rack

Follow these instructions to mount the TYAN TS83A-B7129 into an industry standard 19" rack.

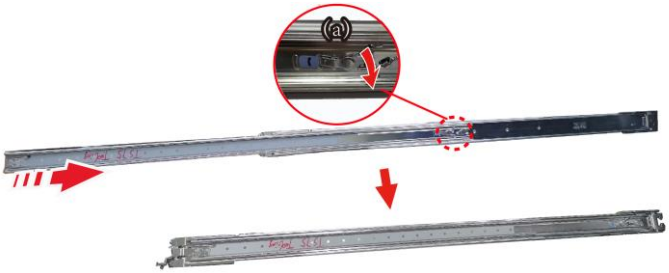
**NOTE:** Before mounting the TYAN TS83A-B7129 chassis in a rack, ensure that all internal components have been installed and that the unit has been fully tested. However, to make the installation easier, we suggest that you remove all HDD trays before you insert the chassis into the rack.

**Remove the Inner Rail**

1. Pull tab forward and take out inner rail.




2. Push (a) and slide middle rail back.



**Install the Inner rail onto the chassis**

1. Align the inner sliding rail on the side of the server, and push towards the arrow to secure the hooks.

2. To install one screw onto chassis base each side.

**NOTE:** Chassis base with or without screw hole design and the screw position for inner rail may be different for each chassis.

**Detach inner rail from standoff**

1. Loosen screw both sides of the server.
2. Pull the latch upward and remove the keyhole from standoff and slide inner rail forward to remove inner rail.

**Fix the Outer rail/bracket assembly to the frame**

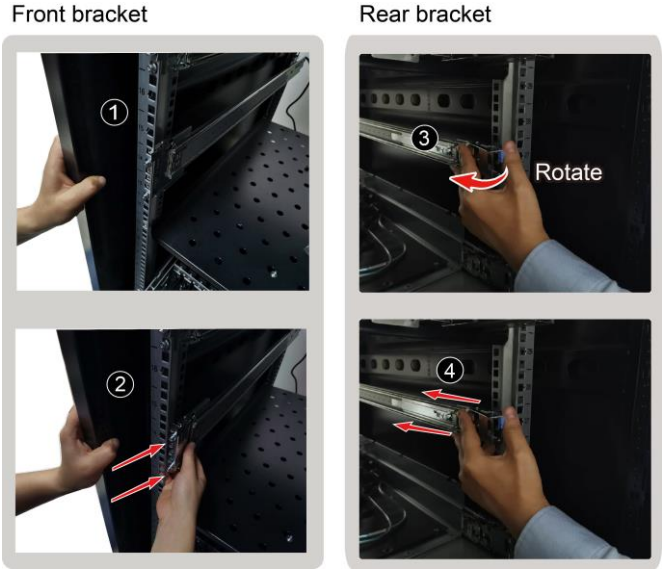
Please according to the bracket type, and refer to the install/detach instruction.

1. Secure the outer rails to the rack on each side.


2. Please repeat installation steps for the other side.

**Detach bracket from rack post to**

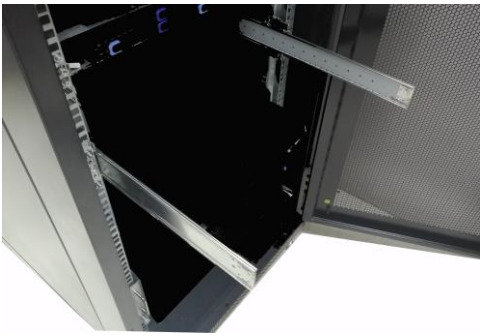
1. Release the outer rails from the rack on each side.




2. Please repeat the detach steps for the other side.

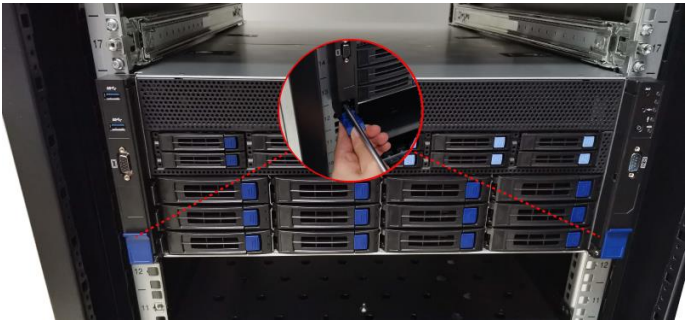
**Rack Mounting the Server**

1. Pull the middle rail fully extended in lock position, ensure ball bearing retainer is located at the front of the middle rail.



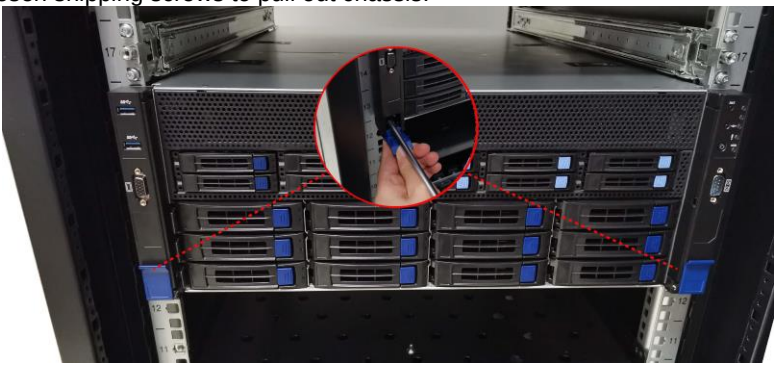
2. Horizontally insert the chassis into middle-outer rails. When hit a stop, please pull/push the blue release tab on the inner rails.

3. Tighten chassis with shipping screws.

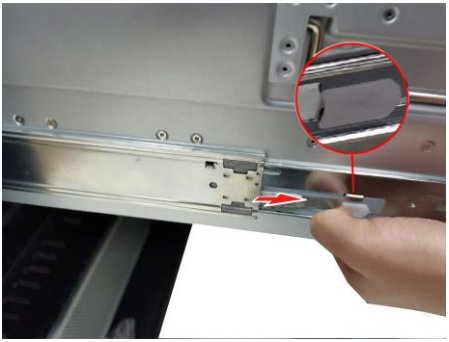


### 2.2.2 Removing the Server from Rack

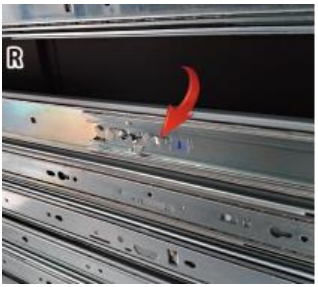
1. Loosen shipping screws to pull out chassis.



2. Pull the disconnect tab forward to remove chassis at the full extension position.



3. Push tab to slide the middle rail back.

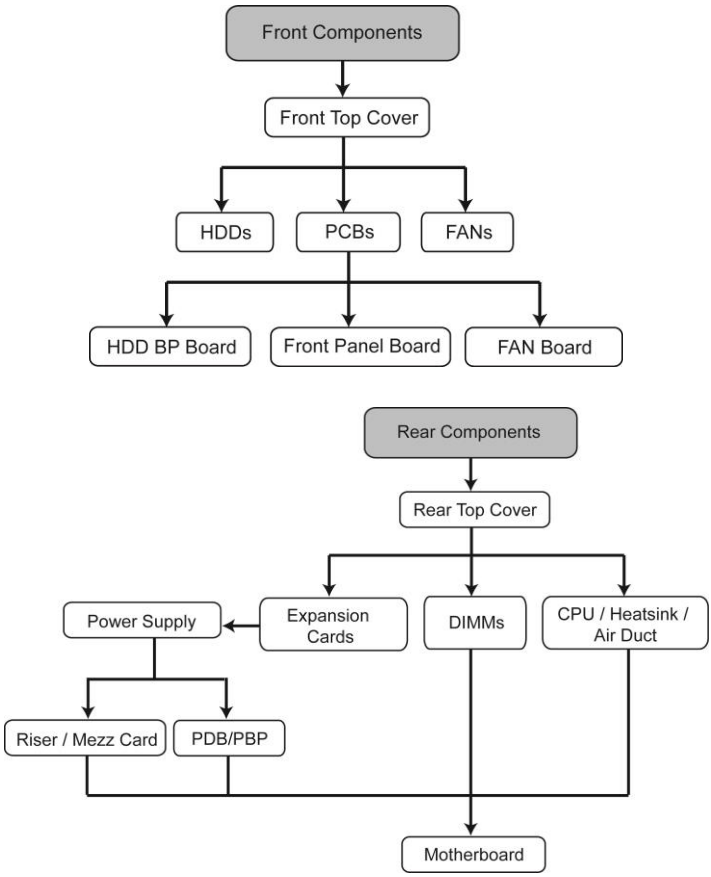
# Chapter 3: Replacing Pre-Installed Components

## 3.1 Introduction

This chapter explains how to replace the pre-installed components, including the S7129GMRE Motherboard, M7129F83A-L16 Riser Card, M1297T65-BP12E-12/ M1315F83A-BP12E-10 HDD Backplane Board, M7129F83A-IO IO board, M7129F83A-RIO Rear IO card, M7129F83A-FB Fan Board, System Fan and Power Supply, etc.

## 3.2 Disassembly Flowchart

The following flowchart outlines the disassembly procedure.



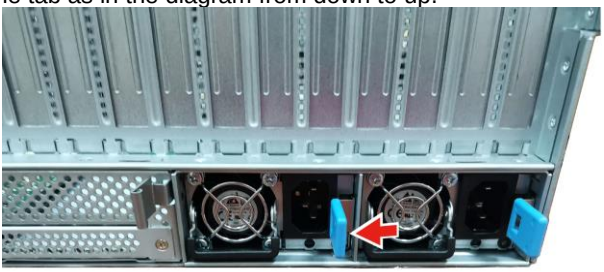
## 3.3 Removing the Cover

Before replacing any parts you must remove the chassis cover. Follow Chapter ***2.1.1*** to remove the cover of FT83A-B7129.

## 3.4 Replacing the Power Supply

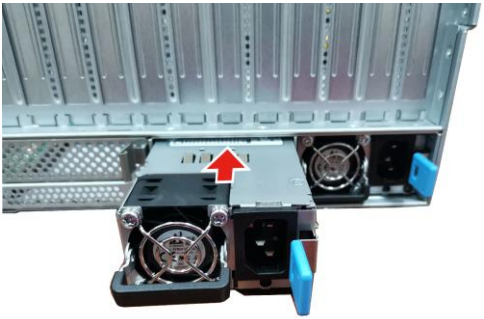
To replace the power supply follow these instructions.

1. Press the tab as in the diagram from down to up.



2. Free the power from the power socket.

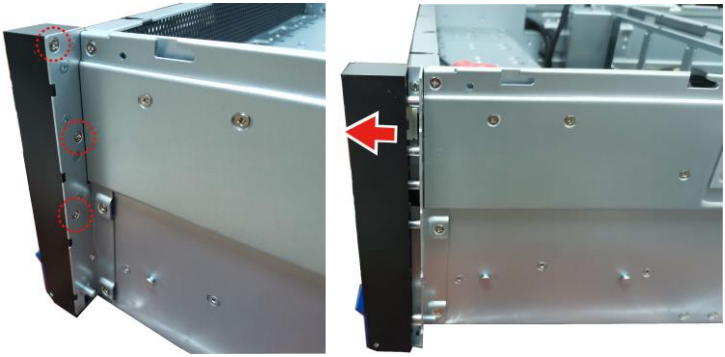
3. Replace a new single power and reinsert it into the power socket following the above steps in reverse.



## 3.5 Replacing the Front Panel Board

Follow these instructions to replace the M1718T65-FPB Front Panel Board.

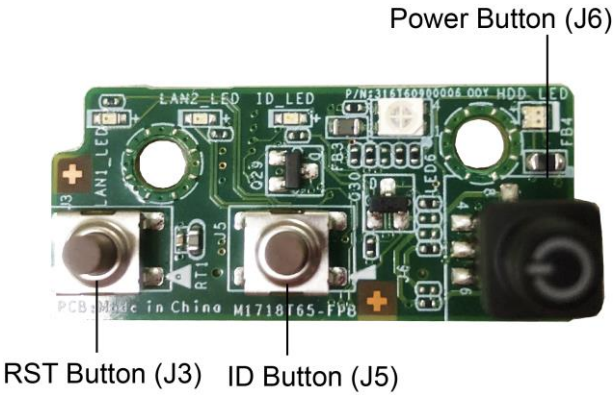
1. Unscrew to remove the front panel board module.



**2.** Loosen three screws to take out the front panel board. Loosen two screws to take out the front panel board.

3. Follow the steps described earlier in reverse order to reinstall the front panel board module.

### 3.5.1 Front Panel Board Features

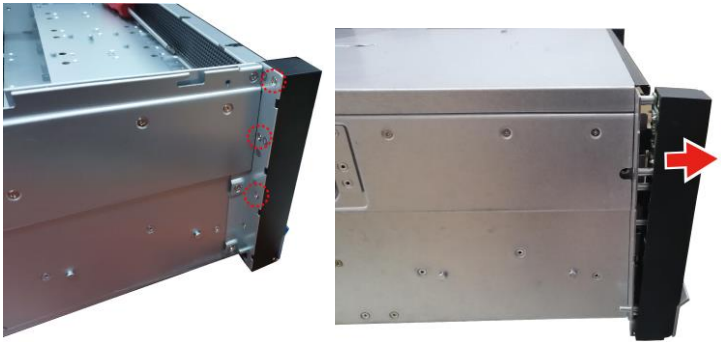



| M1718T65-FPB Front Panel Board | |
|---|---|
| **Form Factor** | ● PCB Dimensions: 40.00*18.00*1.6mm<br>● Thickness: 1.6mm<br>● Layer: 4 layers |
| **Specifications** | ● power button with LED<br>● reset button<br>● ID button<br>● LED: ID LED (blue), Onboard HDD LED (green/Red), FAULT LED (Red/green/Blue), Power LED |

## 3.6 Replacing the USB Board

Follow these instructions to replace the M1717T65-USB USB Board.

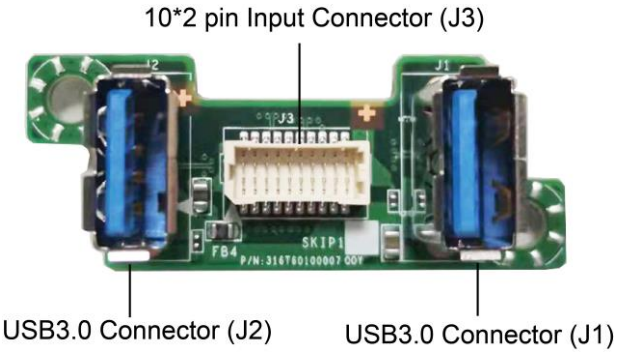
1. Unscrew to remove the front panel board module.



**2.** Loosen three screws to take out the front panel board. Loosen two screws to take out the front panel board.

3. Follow the steps described earlier in reverse order to reinstall the front panel board module.

### 3.6.1 Front Panel Board Features

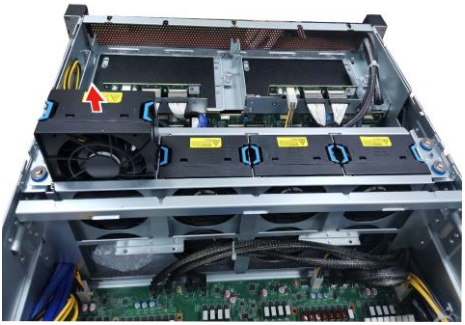



| M1717T65-USB USB Board | |
|---|---|
| **Form Factor** | ● PCB Dimensions: 48.00*19.00*1.6mm<br>● Thickness: 1.6mm<br>● Layer: 4 layers |
| **Specifications** | ● USB 3.0 Connectors<br>● 10*2PIN input Connector |

## 3.7 Replacing the System Fan

Follow these instructions to replace the system Fan.

1. Take out the system fan.



2. Press both sides of the fan cage as in the image.

3. Open the fan cage.

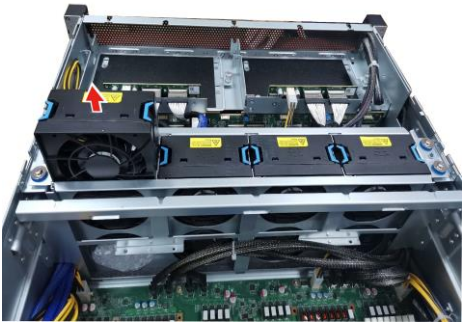
4. Take out the small fans.

5. Replace a new fan.

## 3.8 Replacing the Fan Board

Follow these instructions to replace the M7129F83A-FB Fan Board.

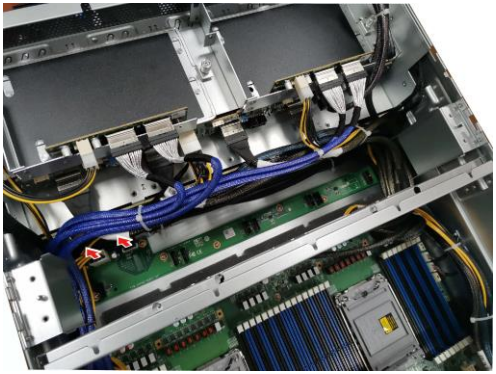
6. Remove all Fan modules.



7. Unscrew the fan cage.

8. Lift up the fan cage.

9. Disconnect all cables from the Fan Board.



10. Unscrew to replace with a new Fan Board. Follow the steps in reverse order to reinstall the Fan Board.

### 3.8.1 Fan Board Features

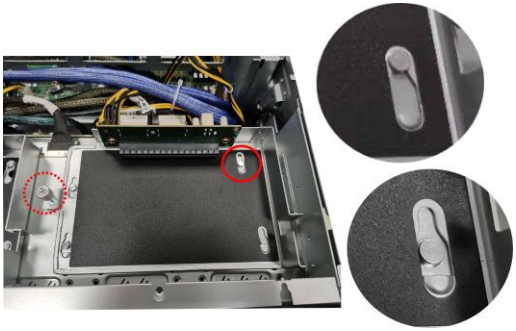

| M7129F83A-FB Fan Board | |
|---|---|
| Specifications | (1) ATX 2*4P Power connector for power input(Power)<br>(8) 7P FAN connector support(FAN1-FAN8)<br>(1) 2*10P System FAN connector for main board(J10) |

## 3.9 Replacing the Riser Board

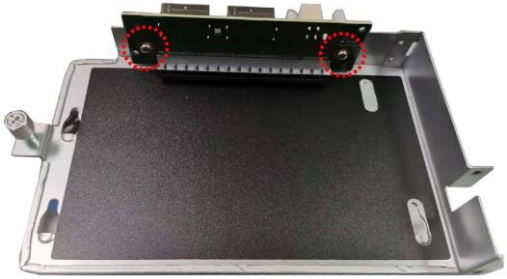
Follow these instructions to replace the **M7129F83A-L16** riser card.

1. Disconnect the from the M7129F83A-PCIE Board.

2. Unscrew the release the buckle in the direction of the image to release the riser tray.



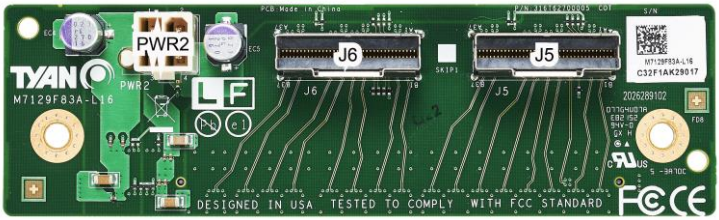
3. Unscrew to release the M7129F83A-L16 riser card.



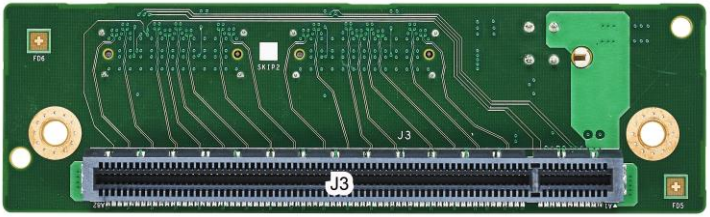
4. Follow the steps described earlier in reverse order to reinstall the IO Bridge Bracket.

### 3.9.1 Riser Board Features

**Front View**




**Rear View**

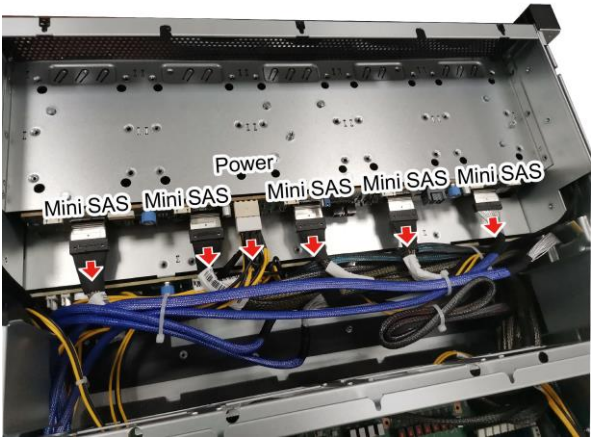



| M7129F83A-L16 IO Bridge Board | |
|---|---|
| **Specifications** | (2) Slim SAS Connector(J5/J6)<br>(1) 2*2 Power Connector(PWR2)<br>(1) PCIE Slot x16 (J3) |

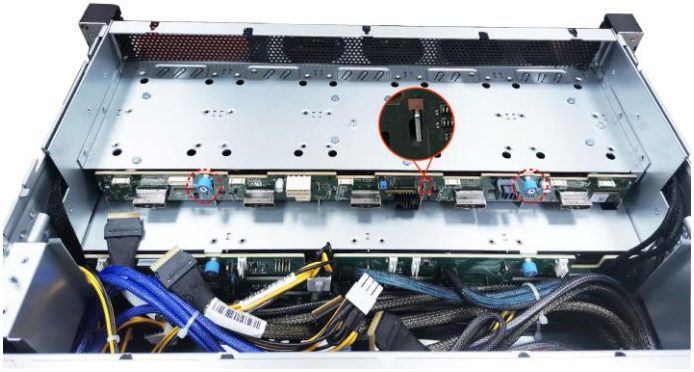
## 3.10 Replacing the HDD Backplane Board

Follow these instructions to replace the M1315F83A-BP12E-10 HDD Backplane Board.

1. Disconnect all cables connected to the HDD BP Board.




2. Unscrew the HDD BP Board and release it from the hook.

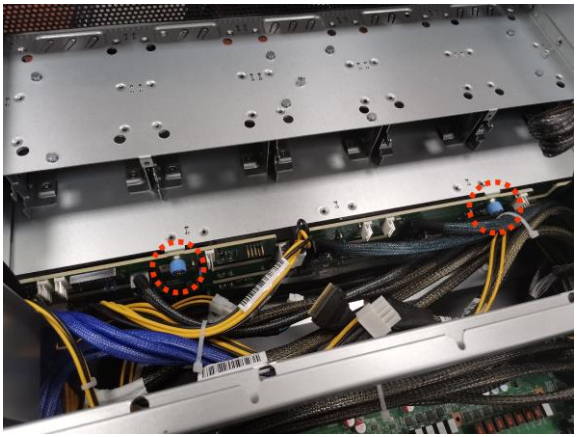


3. Take out the HDD BP Board to replace with a new one. Follow the procedures described earlier in reverse order to reinstall the HDD BP Board and HDD cage.

Follow these instructions to replace the M1297T65-BP12E-12 HDD Backplane Board.

4. Disconnect all cables connected to the HDD BP Board.

5. Unscrew the HDD BP Board from the chassis.

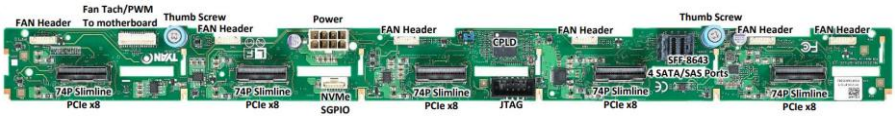


6. Take out the HDD BP Board to replace with a new one. Follow the procedures described earlier in reverse order to reinstall the HDD BP Board and HDD cage.

### 3.10.1 HDD Backplane Board Features

M1315F83A-BP12E-10

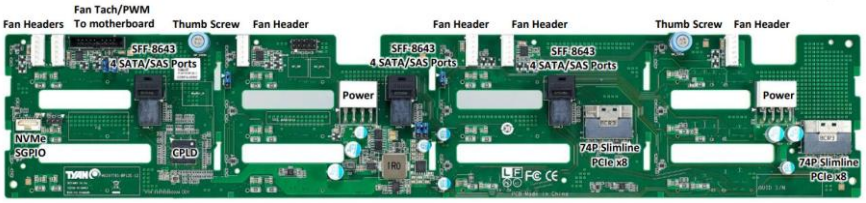
**Front View**




**Rear View**


M1297T65-BP12E-12

**Front View**



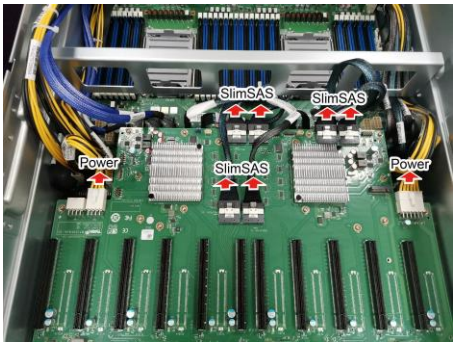

**Rear View**

## 3.11 Replacing PCIE Board

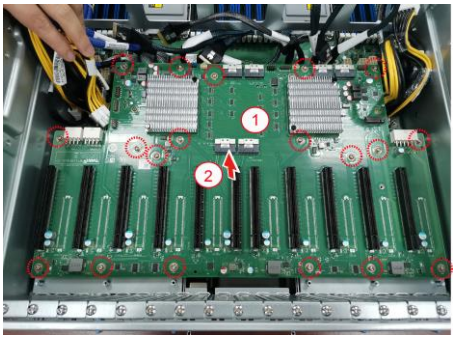
Follow these instructions to replace the M7129F83A-IO PCIE Board.

1. Unscrew to remove the GPU Bracket.

2. Disconnect all cables connected to the PCIE Board.



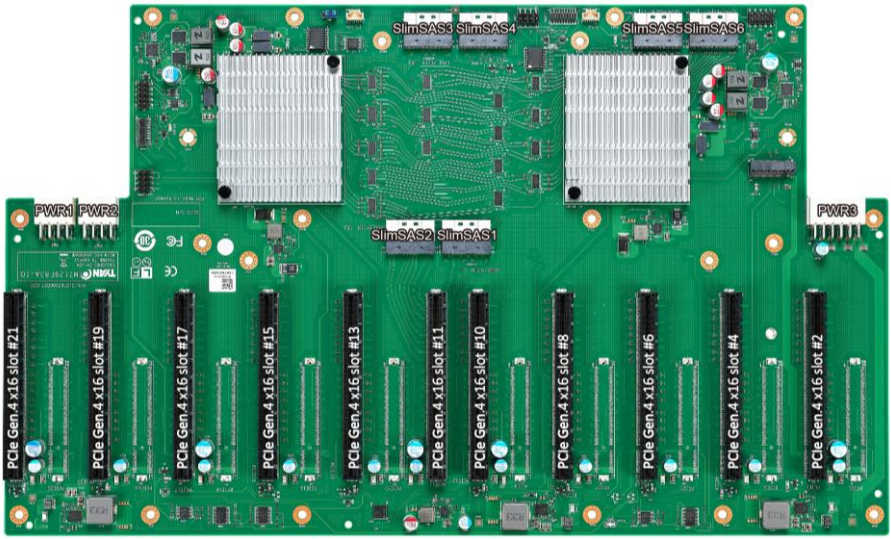

3. Unscrew to lift up the PCIE Board Bracket (totally 19 screws).




4. Replace the PCIE Board with a new one. Follow the steps described earlier in reverse order to reinstall the PCIE Board Bracket.

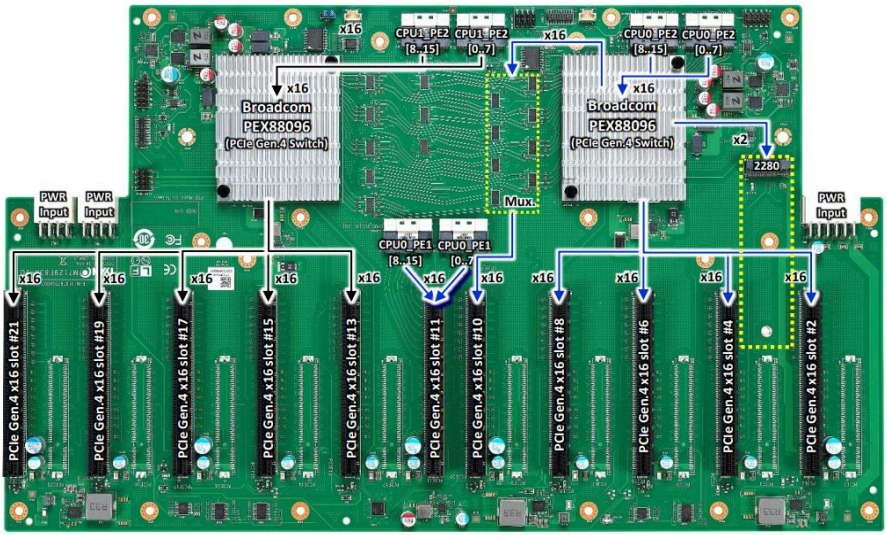
### 3.11.1 PCIE Board Features

**Front View**

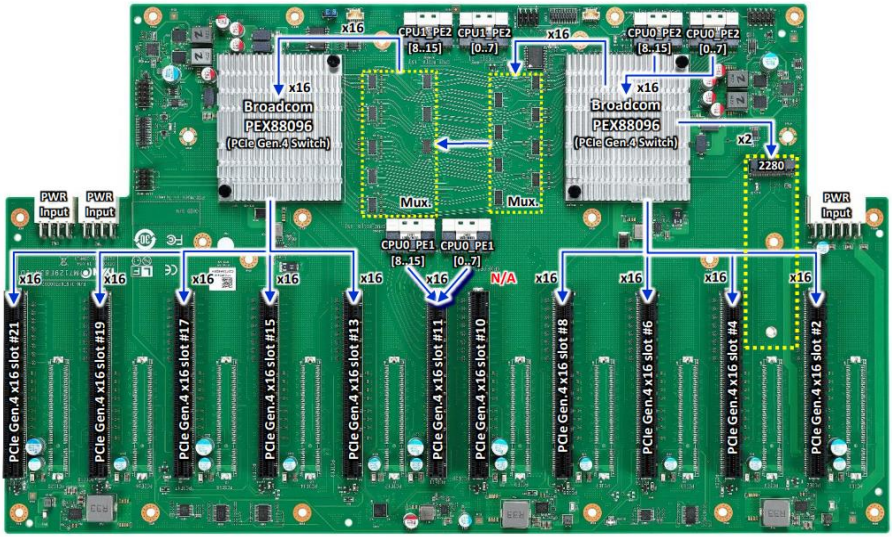



| M7129F83A-IO PCIE Board | |
|---|---|
| **Specifications** | Dual PCIE x24 lanes input and expansion to<br>(1)PCIE x16 +(10) DW PCI-E x16 slots or<br>(1)PCIE x16+ (20) PCIE x8 slots |

M7129F83A-IO Default PCIe Routing Topology (Dual Root)



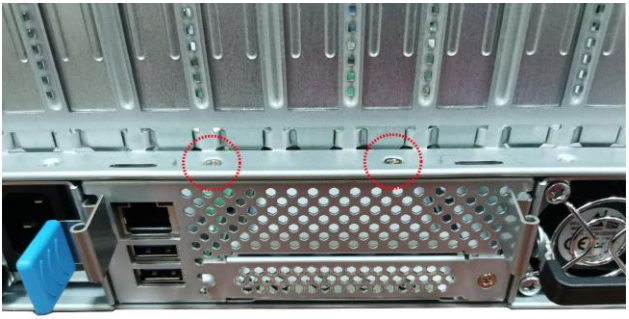

M7129F83A-IO Optional PCIe Routing Topology (Single Root)



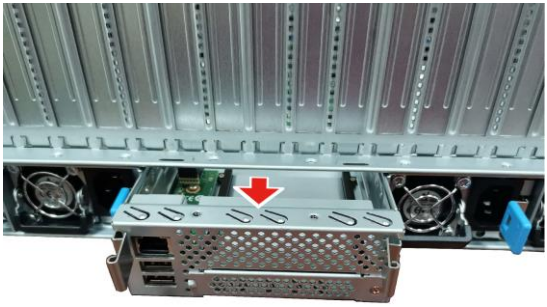
## 3.12 Replacing the Rear IO Board

Follow these instructions to replace the M7129F83A-RIO Rear IO Board.

1. Unscrew the Rear IO Bracket.



2. Push both latches to pull the Rear IO Bracket out.



3. Unscrew to remove the iron bracket.

4. Follow the steps described earlier in reverse order to reinstall the Rear IO Bracket.

### 3.12.1 Rear IO Board Features

**Front View**

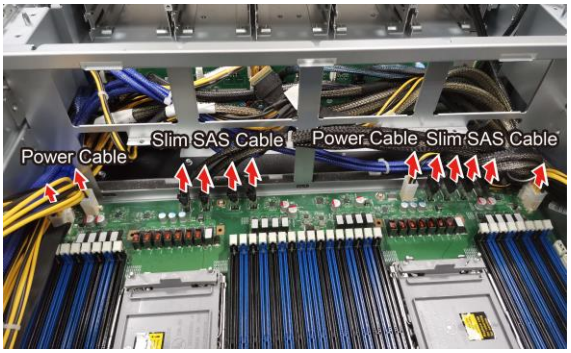
| M7119FA77-RIO Rear IO Board | |
|---|---|
| Specifications | (1)1G RJ-45 port for IPMI + (2)USB3.0 ports<br>(1) FCI Board to board connector to Main board<br>(1) OCP type A + (1)OCP type B connector for NIC OCP card |

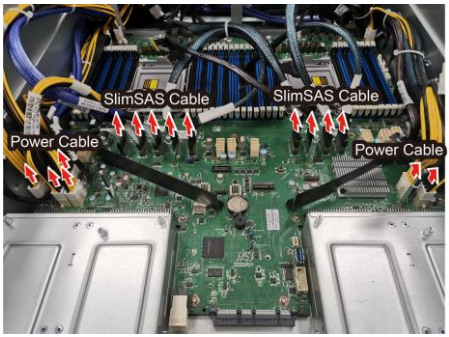
## 3.13 Replacing the Motherboard

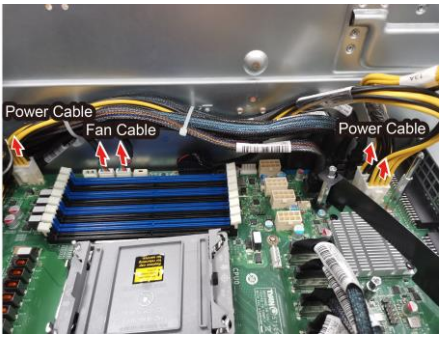
After removing all of the aforementioned cables and components, follow these instructions to remove the motherboard from the chassis.

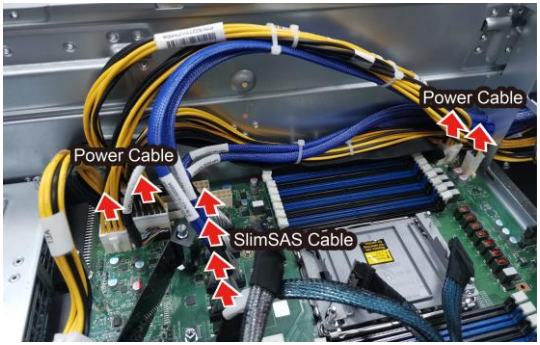
1. Unscrew to remove the board.

2. Disconnect all cables on the motherboard.

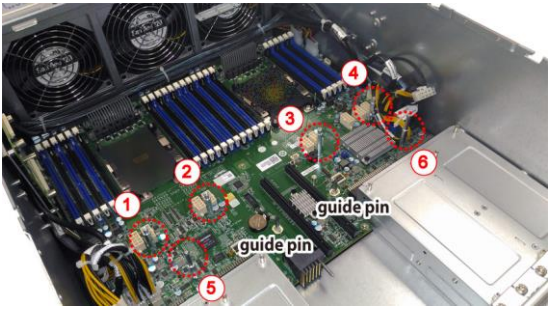


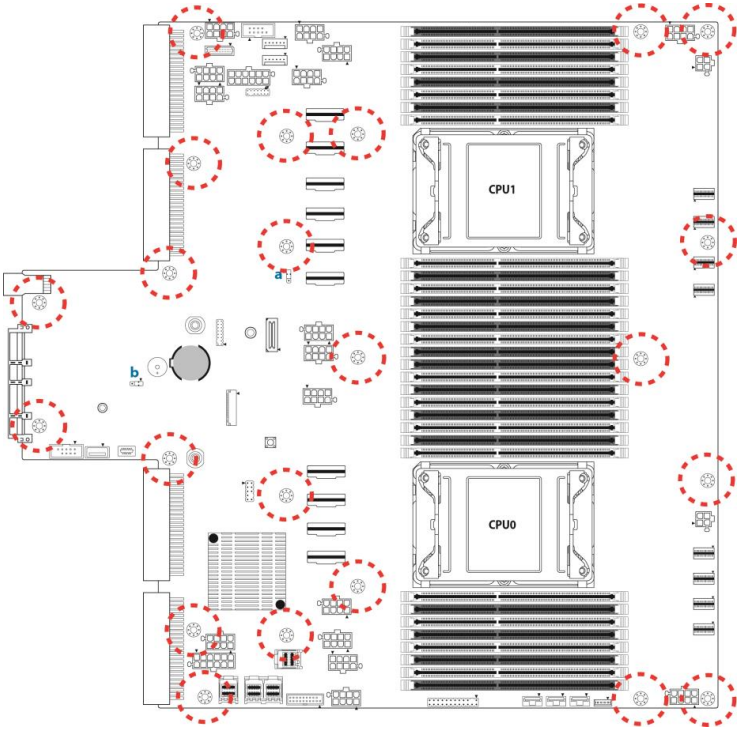



3. Refer to ***3.9 Replacing the IO Board*** to unscrew to lift up the Linkbar.
4. Use a hex screwdriver and Phillips screwdriver to loosen screws.





5. Unscrew the motherboard to lift it up for replacement.



# Chapter 4: Motherboard Information

You are now ready to install your motherboard.

**How to install our products right… the first time**

The first thing you should do is read this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, MiTAC recommends wearing a static safety wrist strap.
(2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
(3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
(4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
(5) Inspect the board for damage.

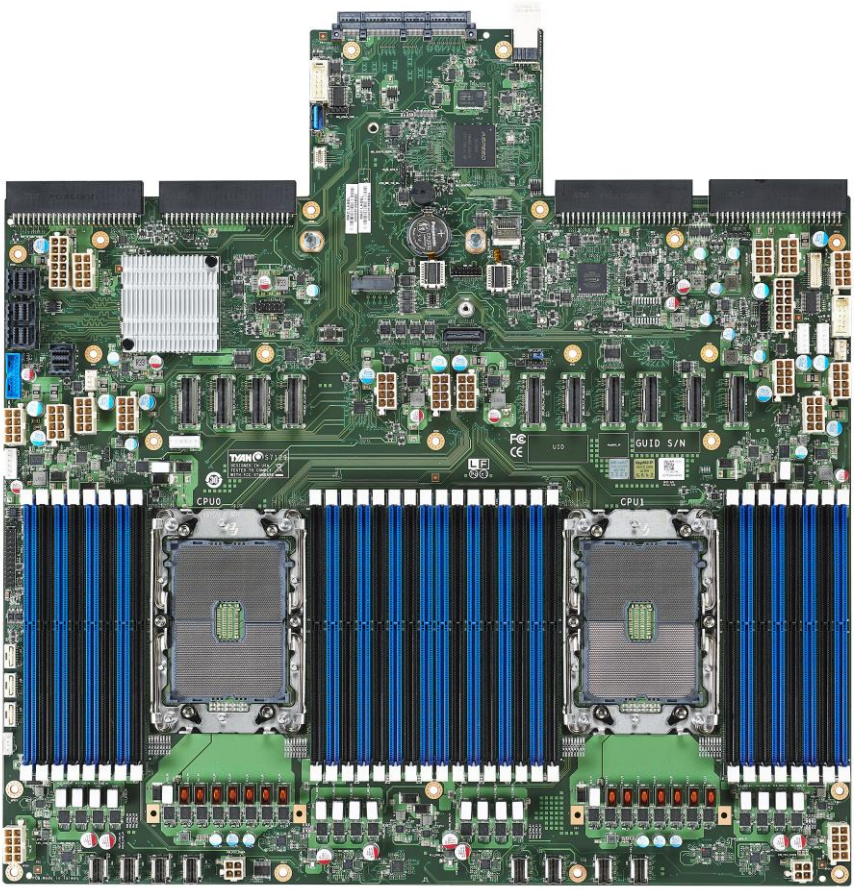
The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

**Caution!**

**3.** To avoid damaging the motherboard and associated components, do not use torque force greater than 7kgf/cm (6.09 lb/in) on each mounting screw for motherboard installation.

**4.** Do not apply power to the board if it has been damaged.

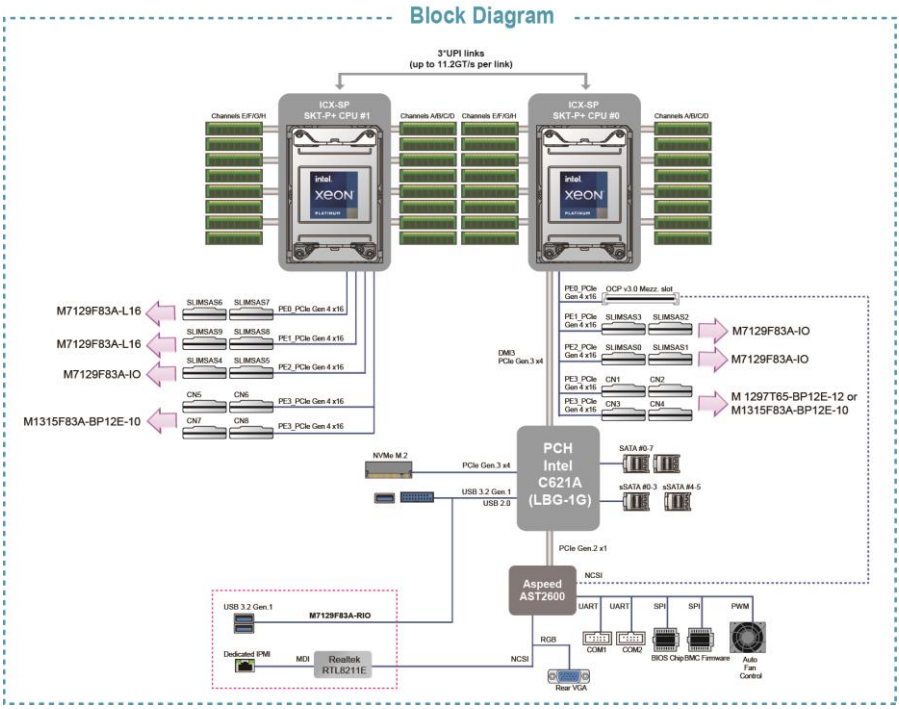
## 4.1 Board Image




S7129

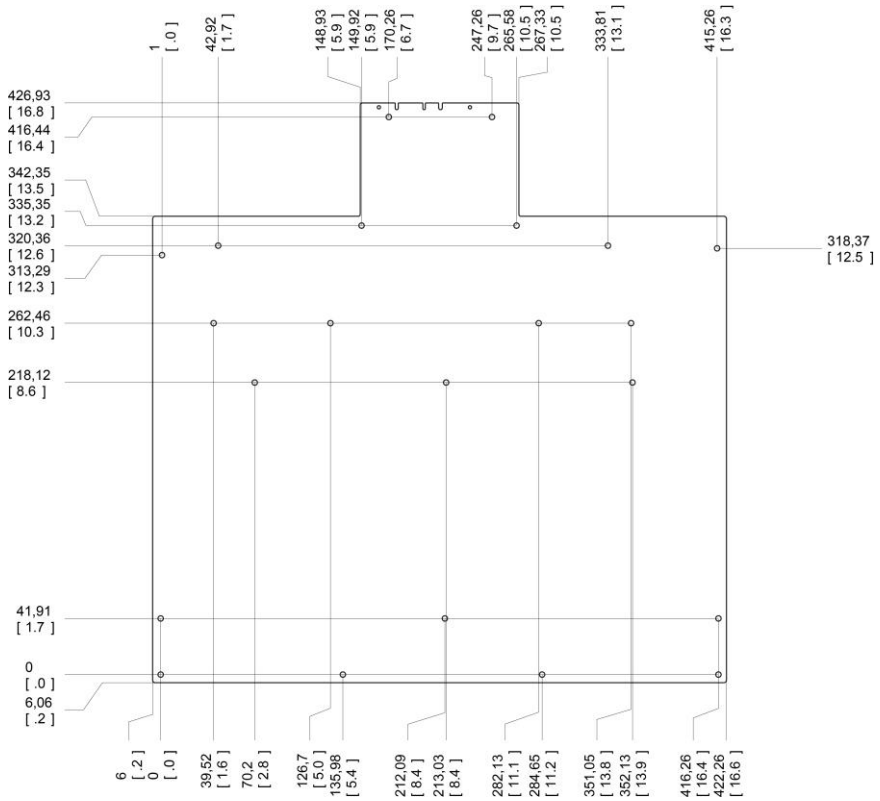
This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.

## 4.2 Block Diagram

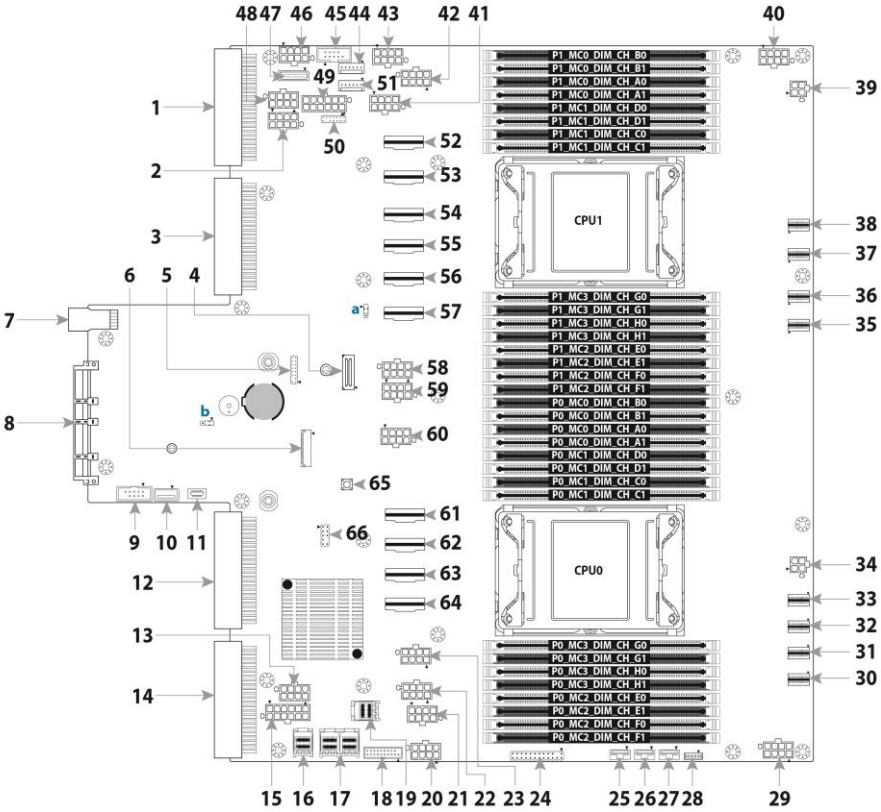



**S7129 Block Diagram**

## 4.3 Motherboard Mechanical Drawing



## 4.4 Board Parts, Jumpers and Connectors

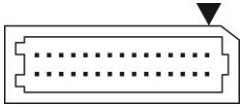



This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. The DIMM slot numbers shown above can be used as a reference when reviewing the DIMM population guidelines shown later in the manual. For the latest board revision, please visit our web site at http://www.tyan.com.

## Jumpers & Connectors

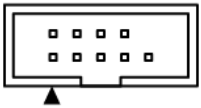
| Connectors | |
|---|---|
| 1.PSU Connector(J1) | 34. Power Connector for Front Riser (J52) |
| 2.Power Connector for Fan (J46) | 35. SlimSAS Connector for HDD BP (CN8) |
| 3.PSU Connector (J2) | 36. SlimSAS Connector for HDD BP (CN7) |
| 4.XDP Connector (J7) | 37. SlimSAS Connector for HDD BP (CN6) |
| 5.TYAN Module Header (DBG_HD1) | 38. SlimSAS Connector for HDD BP (CN5) |
| 6.M.2 Connector (NGFF1) | 39. Power Connector for Front Riser (J36) |
| 7.RGMII/Rear USB B2B Connector (CN9) | 40. Power Connector for MB (J49) |
| 8.OCP3.0 Connector (J39) | 41. Power Connector for GPU(J32) |
| 9. COM2 Port (HD_COM2) | 42. Power Connector for GPU(J16) |
| 10. USB 3.1 TYPEA Connector (J24) | 43. Power Connector for GPU (J6) |
| 11.Reserved for SPI TPM(J34) | 44. Rear Fan Connector(J41) |
| 12.PSU Connector (J3) | 45. COM1 Port (HD_COM1) |
| 13.Power Connector for MB (J45) | 46. Power Connector for MB(J50) |
| 14.PSU Connector (J4) | 47. Fan Header(FAN_HD1) |
| 15.Power Connector for PCIe IO Board (J47) | 48. Power Connector for PCIe IO Board (J15) |
| 16.SSATA Connector (J20) | 49. Power Connector for HDD BP (J55) |
| 17.SATA Connector (SATA0_7) | 50. VGA Port (FPIO_VGA) |
| 18.FPB USB Connector (J5) | 51. Rear Fan Connector (J42) |
| 19.SSATA Connector (J23) | 52. SlimSAS Connector for PCIe Riser (SlimSAS6) |
| 20.Power Connector for GPU(J21) | 53. SlimSAS Connector for PCIe Riser (SlimSAS7) |
| 21.Power Connector for GPU(J37) | 54. SlimSAS Connector for PCIe Riser (SlimSAS9) |
| 22.Power Connector for GPU(J33) | 55. SlimSAS Connector for PCIe Riser (SlimSAS8) |
| 23.Power Connector for GPU(J14) | 56. SlimSAS Connector for PCIe IO (SlimSAS4) |
| 24.Front Panel Header (ID_LED/FPIO) | 57. SlimSAS Connector for PCIe IO (SlimSAS5) |
| 25.Signal For NVMe Hotplug (J17) | 58. Power Connector for GPU (J12) |
| 26.Signal For NVMe Hotplug (J18) | 59. Power Connector for GPU (J13) |
| 27.Signal For NVMe Hotplug (J19) | 60. Power Connector for GPU (J11) |
| 28. SATA Raid Key (J51) | 61. SlimSAS Connector for PCIe IO (SlimSAS3) |
| 29. Power Connector for MB (J54) | 62. SlimSAS Connector for PCIe IO (SlimSAS2) |
| 30.SlimSAS Connector for HDD BP (CN4) | 63. SlimSAS Connector for PCIe IO (SlimSAS0) |
| 31.SlimSAS Connector for HDD BP (CN3) | 64. SlimSAS Connector for PCIe IO (SlimSAS1) |
| 32.SlimSAS Connector for HDD BP (CN2) | 65. Clear CMOS Button (CLEAR_BTN1) |
| 33.SlimSAS Connector for HDD BP (CN1) | 66.JTAG Connector for CPLD (J28) |
| **Jumpers** | |
| **a** LPC Mode(default) (J59_12)<br>ESPI Mode (J59_23) | **b** ME Recovery Mode Jumper (default) (J113-12)<br>ME Firmware Update Jumper(J113_23) |

**FAN_HD1: 30-Pin FAN Connector**



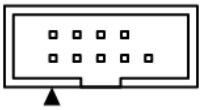
| Signal | Pin | Pin | Signal |
|---|---|---|---|
| FAN_T1 | 1 | 2 | FAN_T6 |
| FAN_T2 | 3 | 4 | FAN_T7 |
| FAN_T3 | 5 | 6 | FAN_T8 |
| FAN_T4 | 7 | 8 | FAN_T9 |
| FAN_T5 | 9 | 10 | FAN_T10 |
| GND | 11 | 12 | GND |
| PWM2 | 13 | 14 | PWM1 |
| FAN_T11 | 15 | 16 | SDA |
| FAN_T12 | 17 | 18 | SCL |
| P5V | 19 | 20 | PWM3 |
| P5V | 21 | 22 | GND |
| FAN_T13 | 23 | 24 | FAN_T15 |
| FAN_T14 | 25 | 26 | FAN_T16 |
| PWM4 | 27 | 28 | PWM5 |
| PWM0 | 29 | 30 | GND |

**HD_COM1: COM Port Header**



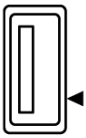
| Signal | Pin | Pin | Signal |
|---|---|---|---|
| BMC_COM1_DCD | 1 | 2 | BMC_COM1_DRS |
| BMC_COM1_RXD | 3 | 4 | BMC_COM1_RTS |
| BMC_COM1_TXD | 5 | 6 | BMC_COM1_CTS |
| BMC_COM1_DTR | 7 | 8 | BMC_COM1_NRI |
| GND | 9 | 10 | KEY |

**HD_COM2: COM Port Header**



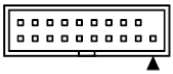
| Signal | Pin | Pin | Signal |
|---|---|---|---|
| COM2_DCD | 1 | 2 | COM2_DSR |
| COM2_RXD | 3 | 4 | COM2_RTS |
| COM2_TXD | 5 | 6 | COM2_CTS |
| COM2_DTR | 7 | 8 | COM2_NRI |
| GND | 9 | 10 | KEY |

**TYPEA_USB3: Vertical Type-A USB3.1 Connector**



| Signal | Pin | Pin | Signal |
|---|---|---|---|
| +5V | 1 | 2 | USB DATA2- |
| USB DATA2+ | 3 | 4 | GND |
| SSRX- | 5 | 6 | SSRX+ |
| GND | 7 | 8 | SSTX- |
| SSTX+ | 9 | | |

**J5: FPB USB3.0 Header**



| Signal | Pin | Pin | Signal |
|---|---|---|---|
| +5V | 1 | 20 | KEY |
| N2_RX | 2 | 19 | +5V |
| P2_RX | 3 | 18 | N1_RX |
| GND | 4 | 17 | P1_RX |
| N2_TX | 5 | 16 | GND |
| P2_TX | 6 | 15 | N1_TX |
| GND | 7 | 14 | P1_TX |
| N12 | 8 | 13 | GND |
| P12 | 9 | 12 | N10 |
| OC_N | 10 | 11 | P10 |

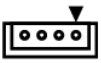
**FPIO_1: Front Panel Header**

| Signal | Pin | Pin | Signal |
|---|---|---|---|
| PW_LED+ | 1 | 2 | FP_PWER(3.3V) |
| KEY | 3 | 4 | FP_ID_LED_PWR |
| PW_LED- | 5 | 6 | FP_ID_LED_N |
| HD_LED+ | 7 | 8 | HWM_FAULT_LED- |
| HD_LED- | 9 | 10 | SYS_FAULT_LED- |
| PW_SW# | 11 | 12 | LAN1_ACTLED+ |
| GND | 13 | 14 | LAN1_ACTLED- |
| RST_SW# | 15 | 16 | SDA |
| GND | 17 | 18 | SCL |
| FP_ID_LED_BTN_N | 19 | 20 | INTRUDER# |
| FPIO_TEMP_IN | 21 | 22 | LAN2_ACTLED+ |
| NMI_SW# | 23 | 24 | LAN2_ACTLED- |

**FPIO_VGA: Front Panel VGA Header**

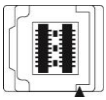
| Signal | Pin | Pin | Signal |
|---|---|---|---|
| GND | 1 | 2 | P5V |
| GND | 3 | 4 | CON_VGA_R |
| GND | 5 | 6 | CON_VGA_G |
| GND | 7 | 8 | CON_VGA_B |
| GND | 9 | 10 | CLK_33M |
| CON_VGA_HS | 11 | 12 | KEY |
| CON_VGA_CLK | 13 | 14 | CON_VGA_VS |

**J51: SATA_RAID_KEY (HW Key for Intel VROC – NVMe only)**



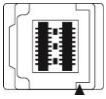
| Signal | Pin | Pin | Signal |
|---|---|---|---|
| GND | 1 | 2 | 2.21K to VCC3_AUX |
| GND | 3 | 4 | 2.21K to VCC3_AUX |

### J20/J23: SSATA SGPIO Connector (SSATA0~3)



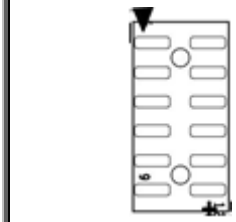
| Signal | Pin | Pin | Signal |
|---|---|---|---|
| RSVD | PIN A1 | PIN A2 | INTL |
| GND | PIN A3 | PIN A4 | RX1_P |
| RX1_N | PIN A5 | PIN A6 | GND |
| RX3_P | PIN A7 | PIN A8 | RX3_N |
| GND | PIN A9 | PIN B1 | VACT |
| RSL | PIN B2 | PIN B3 | GND |
| RX0_P | PIN B4 | PIN B5 | RX0_N |
| GND | PIN B6 | PIN B7 | RX2_P |
| RX2_N | PIN B8 | PIN B9 | GND |
| SCL | PIN C1 | PIN C2 | SDA |
| GND | PIN C3 | PIN C4 | TX1_P |
| TX1_N | PIN C5 | PIN C6 | GND |
| TX3_P | PIN C7 | PIN C8 | TX3_N |
| GND | PIN C9 | PIN D1 | VACT |
| VMAN | PIN D2 | PIN D3 | GND |
| TX0_P | PIN D4 | PIN D5 | TX0_N |
| GND | PIN D6 | PIN D7 | TX2_P |
| TX2_N | PIN D8 | PIN D9 | GND |

### SATA Connector (SATA0~7)



| Signal | Pin | Pin | Signal |
|---|---|---|---|
| RSVD | PIN A1 | PIN A2 | INTL |
| GND | PIN A3 | PIN A4 | RX1_P |
| RX1_N | PIN A5 | PIN A6 | GND |
| RX3_P | PIN A7 | PIN A8 | RX3_N |
| GND | PIN A9 | PIN B1 | VACT |
| RSL | PIN B2 | PIN B3 | GND |
| RX0_P | PIN B4 | PIN B5 | RX0_N |
| GND | PIN B6 | PIN B7 | RX2_P |
| RX2_N | PIN B8 | PIN B9 | GND |
| SCL | PIN C1 | PIN C2 | SDA |
| GND | PIN C3 | PIN C4 | TX1_P |
| TX1_N | PIN C5 | PIN C6 | GND |
| TX3_P | PIN C7 | PIN C8 | TX3_N |
| GND | PIN C9 | PIN D1 | VACT |
| VMAN | PIN D2 | PIN D3 | GND |
| TX0_P | PIN D4 | PIN D5 | TX0_N |
| GND | PIN D6 | PIN D7 | TX2_P |
| TX2_N | PIN D8 | PIN D9 | GND |

**DBG_HD1: TYAN Module Header**

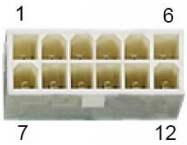


| Signal | Pin | Pin | Signal |
|---|---|---|---|
| P3V3 | 1 | 2 | FRAME_N |
| LAD0 | 3 | 4 | KEY |
| LAD1 | 5 | 6 | PLT_RST_N |
| LAD2 | 7 | 8 | GND |
| LAD3 | 9 | 10 | CLK_33M |
| DBG_SERIRQ | 11 | 12 | GND |
| DBG_PRES_N | 13 | 14 | VCC3_AUX |
| TPM_ADDR_MB | 15 | 16 | PCH_TPM_PP_EN |

**J55: 8-pin Power Connector to HDD BP**


| Signal | Pin | Pin | Signal |
|---|---|---|---|
| GND | 1 | 5 | P12V_IN |
| GND | 2 | 6 | P12V_IN |
| GND | 3 | 7 | P12V_IN |
| GND | 4 | 8 | P12V_IN |

**J47/J15: 8-pin Power Connector to PCIE Board**




| Signal | Pin | Pin | Signal |
|---|---|---|---|
| GND | 1 | 7 | P12V_IN |
| GND | 2 | 8 | P12V_IN |
| GND | 3 | 9 | P12V_IN |
| GND | 4 | 10 | P12V_IN |
| GND | 5 | 11 | P12V_IN |
| GND | 6 | 12 | P12V_IN |

**J45/J50: 8-pin Power Connector to MB**


| Signal | Pin | Pin | Signal |
|---|---|---|---|
| GND | 1 | 5 | P12V_IN |
| GND | 2 | 6 | P12V_IN |
| GND | 3 | 7 | P12V_IN |
| GND | 4 | 8 | P12V_IN |

**Clear_BTN1: RTC reset Button for clear CMOS**


| Pin | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Signal | GND | GND | RST_N | RST_N |

### J6/J11/J12/J13/J16/J21/J32/J33/J37: 8-pin Power Connector to GPU Card

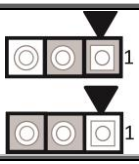

| Signal | Pin | Pin | Signal |
|---|---|---|---|
| GND | 1 | 5 | P12V_IN |
| GND | 2 | 6 | P12V_IN |
| GND | 3 | 7 | P12V_IN |
| GND | 4 | 8 | P12V_IN |

**NOTE:** The 8-pin GPU power connector can support up to 30A.

### J36 / J52: 8-pin Power Connector to Front Riser Card

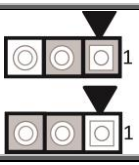

| Signal | Pin | Pin | Signal |
|---|---|---|---|
| GND | 1 | 3 | P12V_IN |
| GND | 2 | 4 | P12V_IN |

### J113: ME Recovery Mode Jumper/ME Firmware Update Jumper




| Pin1 | Pin2 | Pin3 |
|---|---|---|
| NC | FM_ME_RCVR_N | GND |
| 1-2 Closed: Normal<br>2-3 Closed: ME Recovery Mode | | |

### J59: ESPI_LPC Jumper

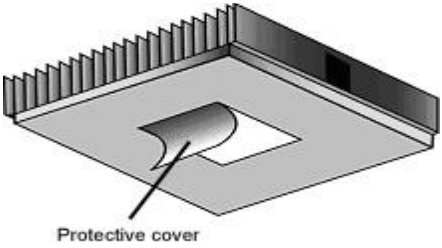



| Pin1 | Pin2 | Pin3 |
|---|---|---|
| PD_ESPI_EN | ESPI_H_LPC_L | VCC3_AUX |
| 1-2 Closed: LPC Mode<br>2-3 Closed: ESPI Mode | | |

### Jumper Legend

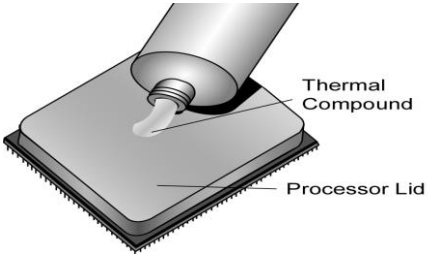
| | | |
|---|---|---|
|  | **OPEN - Jumper OFF** | Without jumper cover |
|  | **CLOSED - Jumper ON** | With jumper cover |

## 4.5 Thermal Interface Material




There are two types of thermal interface materials designed for use with the processors.

The most common material comes as a small pad attached to the heat sink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material. Simply remove the protective cover and place the heat sink on the processor.

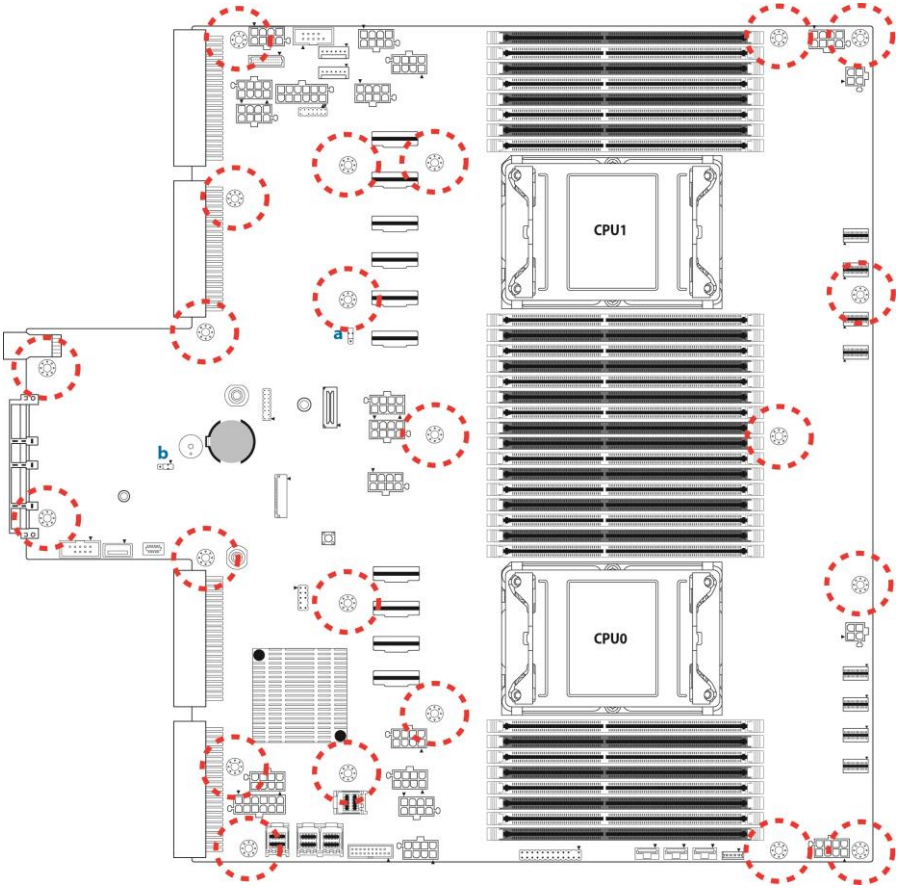



The second type of interface material is usually packaged separately. It is commonly referred to as 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

**NOTE:** Always check with the manufacturer of the heat sink & processor to ensure that the thermal interface material is compatible with the processor and meets the manufacturer's warranty requirements.

## 4.6 Tips on Installing Motherboard in Chassis

Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.



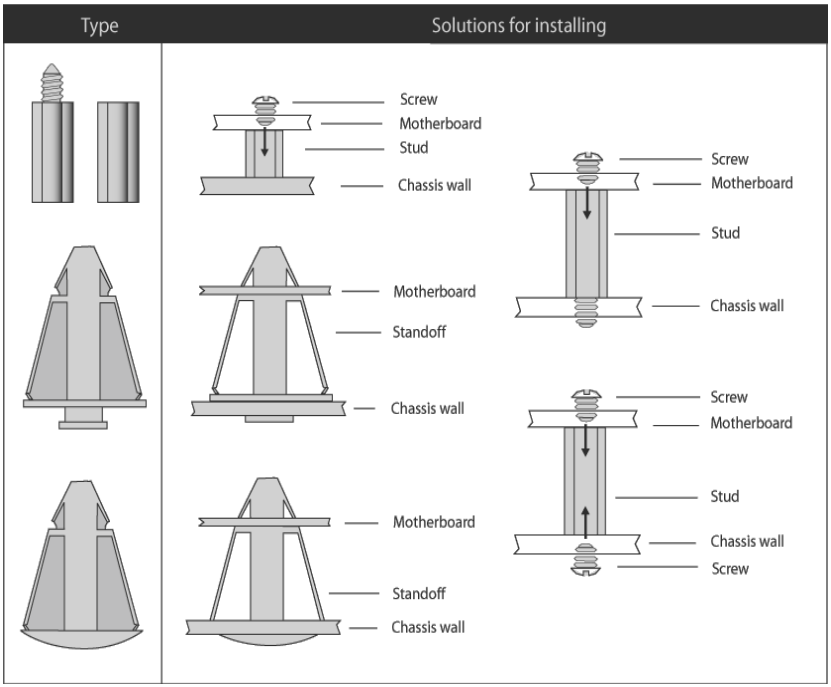

**NOTE:** Be especially careful to look for extra stand-offs. If there are any stand-offs present that are not aligned with a mounting hole on the motherboard, it will likely

short components on the back of the motherboard when installed. This will cause malfunction and/or damage to your motherboard.

Some chassis include plastic studs instead of metal. Although the plastic studs are usable, MITAC recommends using metal studs with screws that will fasten the motherboard more securely in place.

Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

Mounting the Motherboard



Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Check the TYAN Web site at http://www.tyan.com for details of the type of memory recommended for your motherboard.

- This platform supports (16)+(16) DDR4 RDIMM/RDIMM 3DS/LRDIMM/ LRDIMM 3DS 3200/2933/2666/2400
- 1.2V DDR4 DIMMs are supported
- All installed memory will be automatically detected. No jumpers or settings need to be changed for memory detection.
- All memory must be of the same type and density. **Different memory types can NOT be mixed and matched on the same motherboard.**

- **General Population Requirements**

  DIMM Mixing Rules:

  • All DIMMs must be either all DDR4 DIMMs and/or DDR4 and Barlow Pass DIMMs.

  • Mixing of RDIMMs and LRDIMMs is not allowed in the same channel, across different channels, and across different sockets.

  • Mixing of Barlow Pass DIMMs with RDIMMs is supported in Whitley platform.

  • Mixing of Barlow Pass DIMMs with LRDIMMs is supported in Whitley platform.

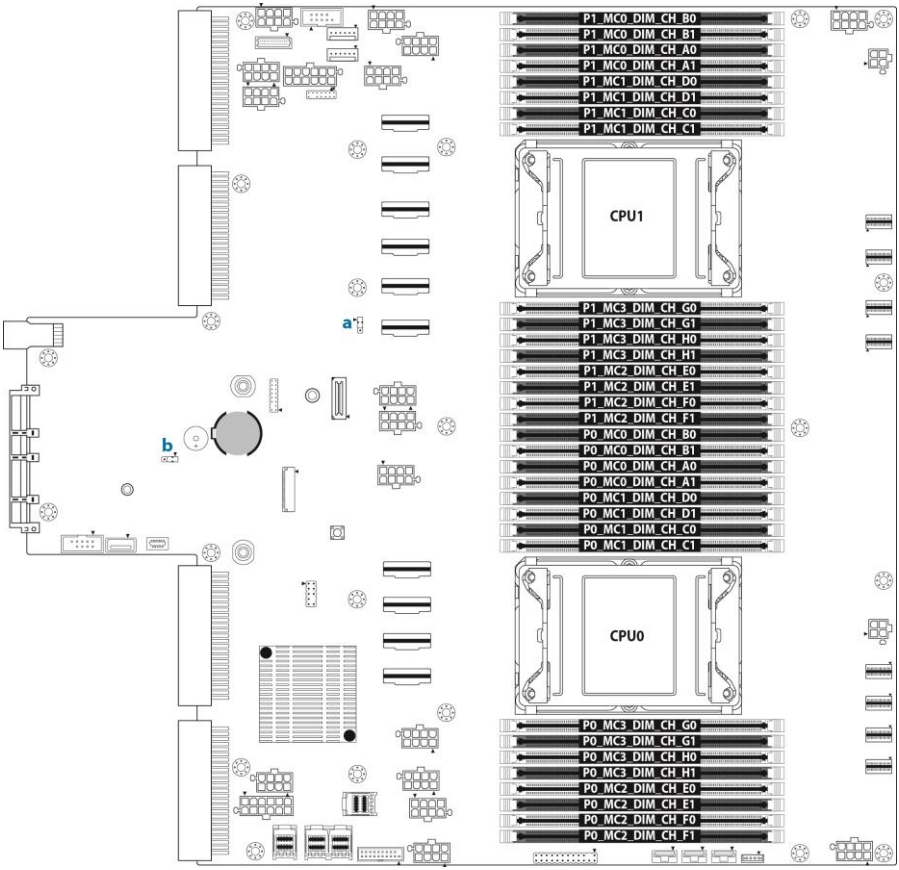
  • Mixing of DDR4 or Barlow Pass operating frequencies is not recommended.

  • NVDIMM is not validated and can not be mixed with Barlow Pass DIMMs.

- **Key Parameters for DIMM Configuration**

| Parameter | Possible Values |
|---|---|
| # of Channels | 1, 2, 3, 4, 5, 6, 7, 8 |
| # of DIMMs Populated per channel | 1DPC or 2DPC |
| DIMM Type | RDIMM (w/ECC), 3DS-RDIMM, LRDIMM, 3DS-LRDIMM, Barlow Pass DIMM |
| DIMM construction | ● non-3DS RDIMM Raw Cards: A/B (2Rx4), C (1Rx4), D (1Rx8), E (2Rx8)<br>● 3DS RDIMM Raw Cards: A/B (4Rx4,8Rx4)<br>● non-3DS LRDIMM Raw Cards: D/E (4Rx4)<br>● 3DS LRDIMM Raw Cards: A/B (4Rx4,8Rx4)<br>● Barlow Pass DIMM |

## DIMM Location




**NOTE:**

1. √ indicates a populated DIMM slot.
2. Use paired memory installation for max performance.
3. Populate the same DIMM type in each channel, specifically
   - Use the same DIMM size
   - Use the same # of ranks per DIMM
4. Always install with CPU0 Socket first.

## Memory Population Table

| Single CPU Installed | Quantity of memory installed | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (CPU0 only) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| CPU0_DIMM_A0 | √ | √ | | √ | | √ | | √ | | | | √ | | | | √ |
| CPU0_DIMM_A1 | | | | | | | | | | | | √ | | | | √ |
| CPU0_DIMM_B0 | | | | | | √ | | √ | | | | √ | | | | √ |
| CPU0_DIMM_B1 | | | | | | | | | | | | √ | | | | √ |
| CPU0_DIMM_C0 | | | | √ | | √ | | √ | | | | √ | | | | √ |
| CPU0_DIMM_C1 | | | | | | | | | | | | √ | | | | √ |
| CPU0_DIMM_D0 | | | | | | | | √ | | | | | | | | √ |
| CPU0_DIMM_D1 | | | NOT Re-commended | | NOT Re-commended | | NOT Re-commended | | NOT Re-commended | NOT Re-commended | NOT Re-commended | | NOT Re-commended | NOT Re-commended | NOT Re-commended | √ |
| CPU0_DIMM_E0 | | √ | | √ | | √ | | √ | | | | √ | | | | √ |
| CPU0_DIMM_E1 | | | | | | | | | | | | √ | | | | √ |
| CPU0_DIMM_F0 | | | | | | √ | | √ | | | | √ | | | | √ |
| CPU0_DIMM_F1 | | | | | | | | | | | | √ | | | | √ |
| CPU0_DIMM_G0 | | | | √ | | √ | | √ | | | | √ | | | | √ |
| CPU0_DIMM_G1 | | | | | | | | | | | | √ | | | | √ |
| CPU0_DIMM_H0 | | | | | | | | √ | | | | | | | | √ |
| CPU0_DIMM_H1 | | | | | | | | | | | | | | | | √ |

| Dual CPU Installed | Quantity of memory installed | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (CPU0 and CPU1) | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 |
| CPU0_DIMM_A0 | √ | √ | | √ | | √ | | √ | | | | √ | | | | √ |
| CPU0_DIMM_A1 | | | | | | | | | | | | √ | | | | √ |
| CPU0_DIMM_B0 | | | | | | √ | | √ | | | | √ | | | | √ |
| CPU0_DIMM_B1 | | | | | | | | | | | | √ | | | | √ |
| CPU0_DIMM_C0 | | | | √ | | √ | | √ | | | | √ | | | | √ |
| CPU0_DIMM_C1 | | | | | | | | | | | | √ | | | | √ |
| CPU0_DIMM_D0 | | | | | | | | √ | | | | | | | | √ |
| CPU0_DIMM_D1 | | | | | | | | | | | | | | | | √ |
| CPU0_DIMM_E0 | | √ | | √ | | √ | | √ | | | | √ | | | | √ |
| CPU0_DIMM_E1 | | | | | | | | | | | | √ | | | | √ |
| CPU0_DIMM_F0 | | | | | | √ | | √ | | | | √ | | | | √ |
| CPU0_DIMM_F1 | | | | | | | | | | | | √ | | | | √ |
| CPU0_DIMM_G0 | | | | √ | | √ | | √ | | | | √ | | | | √ |
| CPU0_DIMM_G1 | | | | | | | | | | | | √ | | | | √ |
| CPU0_DIMM_H0 | | | | | | | | √ | | | | | | | | √ |
| CPU0_DIMM_H1 | | | | | | | | | | | | | | | | √ |
| CPU1_DIMM_A0 | √ | √ | NOT Re-commended | √ | NOT Re-commended | √ | NOT Re-commended | √ | NOT Re- commended | | | √ | NOT Re- commended | | | √ |
| CPU1_DIMM_A1 | | | | | | | | | | | | √ | | | | √ |
| CPU1_DIMM_B0 | | | | | | √ | | √ | | | | √ | | | | √ |
| CPU1_DIMM_B1 | | | | | | | | | | | | √ | | | | √ |
| CPU1_DIMM_C0 | | | | √ | | √ | | √ | | | | √ | | | | √ |
| CPU1_DIMM_C1 | | | | | | | | | | | | √ | | | | √ |
| CPU1_DIMM_D0 | | | | | | | | √ | | | | | | | | √ |
| CPU1_DIMM_D1 | | | | | | | | | | | | | | | | √ |
| CPU1_DIMM_E0 | | √ | | √ | | √ | | √ | | | | √ | | | | √ |
| CPU1_DIMM_E1 | | | | | | | | | | | | √ | | | | √ |
| CPU1_DIMM_F0 | | | | | | √ | | √ | | | | √ | | | | √ |
| CPU1_DIMM_F1 | | | | | | | | | | | | √ | | | | √ |
| CPU1_DIMM_G0 | | | | √ | | √ | | √ | | | | √ | | | | √ |
| CPU1_DIMM_G1 | | | | | | | | | | | | √ | | | | √ |
| CPU1_DIMM_H0 | | | | | | | | √ | | | | | | | | √ |
| CPU1_DIMM_H1 | | | | | | | | | | | | | | | | √ |

## DCPMM Support Location

| Symmetric Population within the Socket | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | iMC1 | | | | | | iMC0 | | | | | | |
| | Channel F | | Channel E | | Channel D | | Channel C | | Channel B | | Channel A | | |
| Modes | Slot 1 | Slot 0 | Slot 1 | Slot 0 | Slot 1 | Slot 0 | Slot 1 | Slot 0 | Slot 1 | Slot 0 | Slot 1 | Slot 0 | |
| AD | DCPMM | DRAM1 | DCPMM | DRAM1 | DCPMM | DRAM1 | DCPMM | DRAM1 | DCPMM | DRAM1 | DCPMM | DRAM1 | 2-2-2 |
| MM | DCPMM | DRAM2 | DCPMM | DRAM2 | DCPMM | DRAM2 | DCPMM | DRAM2 | DCPMM | DRAM2 | DCPMM | DRAM2 | 2-2-2 |
| AD + MM | DCPMM | DRAM4 | DCPMM | DRAM4 | DCPMM | DRAM4 | DCPMM | DRAM4 | DCPMM | DRAM4 | DCPMM | DRAM4 | 2-2-2 |
| AD | - | DRAM1 | - | DRAM1 | DCPMM | DRAM1 | - | DRAM1 | - | DRAM1 | DCPMM | DRAM1 | 2-1-1 |
| MM | - | DRAM3 | - | DRAM3 | DCPMM | DRAM3 | - | DRAM3 | - | DRAM3 | DCPMM | DRAM3 | 2-1-1 |
| AD + MM | - | DRAM4 | - | DRAM4 | DCPMM | DRAM4 | - | DRAM4 | - | DRAM4 | DCPMM | DRAM4 | 2-1-1 |
| AD | - | DRAM1 | DCPMM | DRAM1 | DCPMM | DRAM1 | - | DRAM1 | DCPMM | DRAM1 | DCPMM | DRAM1 | 2-2-1 |
| MM | - | DRAM2 | DCPMM | DRAM2 | DCPMM | DRAM2 | - | DRAM2 | DCPMM | DRAM2 | DCPMM | DRAM2 | 2-2-1 |
| AD + MM | - | DRAM4 | DCPMM | DRAM4 | DCPMM | DRAM4 | - | DRAM4 | DCPMM | DRAM4 | DCPMM | DRAM4 | 2-2-1 |
| AD | - | DCPMM | - | DRAM1 | - | DRAM1 | - | DCPMM | - | DRAM1 | - | DRAM1 | 1-1-1 |
| MM | - | DCPMM | - | DRAM2 | - | DRAM2 | - | DCPMM | - | DRAM2 | - | DRAM2 | 1-1-1 |
| AD + MM | - | DCPMM | - | DRAM4 | - | DRAM4 | - | DCPMM | - | DRAM4 | - | DRAM4 | 1-1-1 |
| AD | - | DCPMM | DRAM1 | DRAM1 | DRAM1 | DRAM1 | - | DCPMM | DRAM1 | DRAM1 | DRAM1 | DRAM1 | 2-2-1 |

| Asymmetric Population within the Socket | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | iMC1 | | | | | | iMC0 | | | | | | |
| | Channel F | | Channel E | | Channel D | | Channel C | | Channel B | | Channel A | | |
| Modes | Slot 1 | Slot 0 | Slot 1 | Slot 0 | Slot 1 | Slot 0 | Slot 1 | Slot 0 | Slot 1 | Slot 0 | Slot 1 | Slot 0 | |
| AD | - | DRAM1 | - | DRAM1 | - | DRAM1 | - | DRAM1 | - | DRAM1 | DCPMM | DRAM1 | 2-1-1 |
| AD* | - | DRAM1 | - | DRAM1 | - | DRAM1 | - | DRAM1 | - | DRAM1 | DCPMM | DRAM1 | 2-1-1 |

- * 2nd socket has no DCPMM DIMM
- Mode definitions: AD=App Direct Mode, MM=Memory Mode, AD+MM=Mixed Mode
- For MM, general DDR4+DCPMM ratio is between 1:4 and 1:16. Excessive capacity for DCPMM can be used for AD.
- For each individual population, rearrangements between channels are allowed as long as the resulting population is consistent to Purley PDG rules
- For each individual population, the same DDR4 DIMM has to used in all slots, as specified by the Purley PDG rules
- For each individual population, sockets are normally symmetric with exceptions for 1 DCPMM per socket and 1 DCPMM per node case.

| | DDR4 Type | | | | Capacity |
|---|---|---|---|---|---|
| **DRAM1** | RDIMM | 3DS RDIMM | LRDIMM | 3DS LRDIMM | Any Capcity |
| **DRAM2** | RDIMM | 3DS RDIMM | LRDIMM | 3DS LRDIMM | Any Capacity and Preferably, >=32GB |
| **DRAM3** | RDIMM | - | - | - | 16GB or 32GB |
| **DRAM4** | RDIMM | 3DS RDIMM | LRDIMM | | Any Capacity |

## 4.7 Finishing Up

Congratulations on making it this far! You have finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially SATA cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.
In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by calling your vendor's support line.

# Chapter 5: BIOS Setup

## 5.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

**To start the BIOS setup utility:**

1. Turn on or reboot your system.
2. Press <**Del>** or <**F2**> during POST (**Del** on remote console) to start the BIOS setup utility.

### 5.1.1 Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

| Key | Function |
|---|---|
| Left/Right Arrow Keys | Change from one menu to the next |
| Up/Down Arrow Keys | Move between selections |
| Enter | Open highlighted section |
| PgUp/PgDn Keys | Change pages |
| +/- | Change options |
| ESC | Exit |

### 5.1.2 Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**] or the [**Enter**] key again.

### 5.1.3 In Case of Problems

If you have trouble booting your computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.
The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of what you are doing. The Chipset defaults have been carefully chosen either by MITAC or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

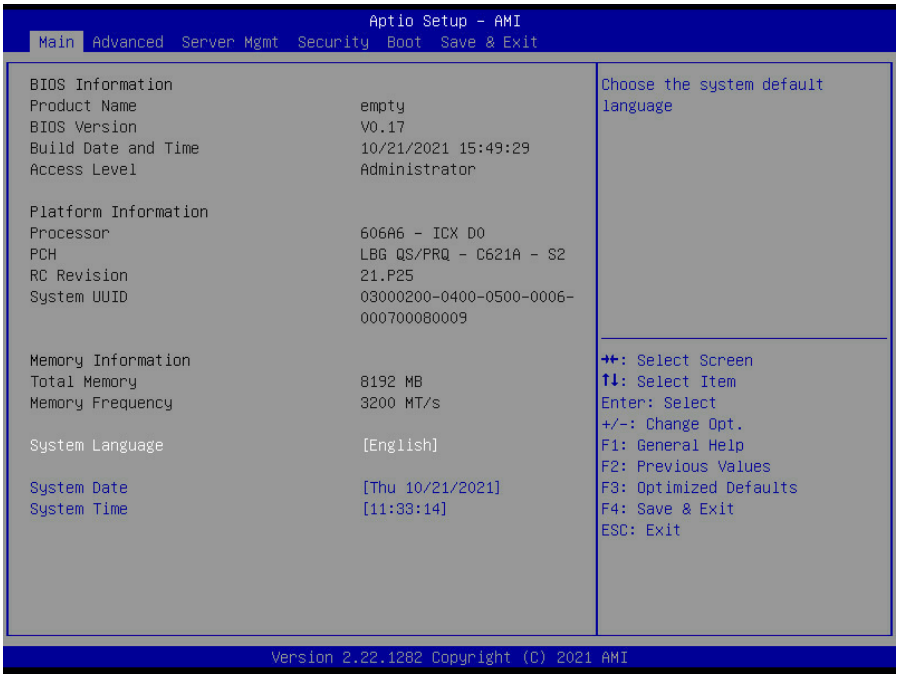
### 5.1.4 Setup Variations

Not all systems have the same BIOS setup layout or options. While the basic look and function of the BIOS setup remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom configuration. In addition, the final appearance of the Setup program depends on the system designer. Your system designer may decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

**NOTE**: The following pages provide the details of BIOS menu. Please be noticed that the BIOS menu are continually changing due to the BIOS updating. The BIOS menu provided are the most updated ones when this manual is written. Please visit TYAN's website at http://www.tyan.com for the information of BIOS updating.

## 5.2 Main Menu

In this section, you can alter general features such as the date and time.
Note that the options listed below are for options that can directly be changed within the Main Setup screen.



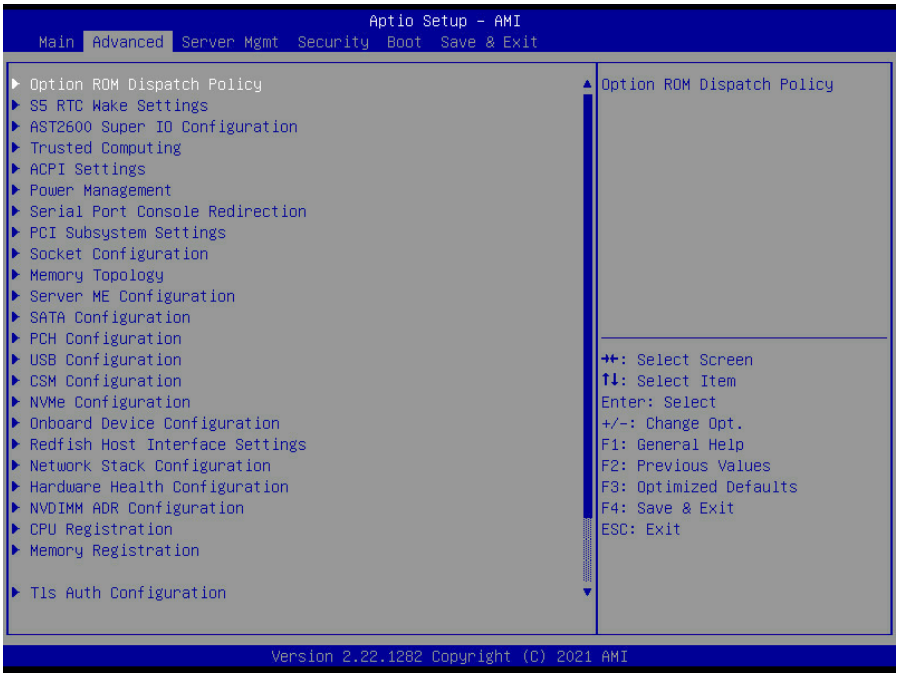

**System Language**
Choose the system default language.
**English** / Simplified Chinese / Japanese

**System Date**
Set the Date. Use Tab to switch between Date elements. Default Ranges:
Year: 1998-9999
Months: 1-12
Days: dependent on month

**System Time**
Set the Time. Use Tab to switch between Time elements.

## 5.3 Advanced Menu

This section facilitates configuring advanced BIOS options for your system.




**NOTE:** This is a sample screenshot of the Advanced Menu. The HII network drivers displayed here depend on the card(s) you installed and the functions you enabled.

**Option ROM Dispatch Policy**
Option ROM Dispatch Policy.

**S5 RTC Wake Settings**
Enable system to wake from S5 using RTC alarm.

**AST2600 Super IO Configuration**
System Super IO Chip Parameters

**Trusted Computing**
Trusted Computing Settings.

**ACPI Settings**
System ACPI Parameters.

**Power Management**
Power Management.

**Serial Port Console Redirection**
Serial Port Console Redirection.

**PCI Subsystem Settings**
PCI, PCI-X and PCI Express Settings.

**Socket Configuration**
Socket Configuration.

**Memory Topology**
Memory Topology.

**Server ME Configuration**
Configure Server ME Technology Parameters.

**SATA Configuration**
SATA devices and settings.

**PCH Configuration**
SATA Device Information.

**USB Configuration**
USB Configuration Parameters.

**CSM Configuration**
CSM configuration: Enable/Disable, Option ROM execution settings, etc.

**NVMe Configuration**
NVMe Device Options Settings.

**Onboard Device Configuration**
Onboard Device and Function Configuration.

**Redfish Host Interface Settings**
Redfish Host Interface Parameters.

**Network Stack Configuration**
Network Stack Settings

**Hardware Health Configuration**
Hardware health Configuration Parameters.

**NVDIMM ADR Configuration**
NVDIMM ADR Configuration.

**CPU Registration**
This item support INTEL CPU, sign the CPU will record current CPU. Once BIOS checked different with registered CPU, show WRNING message on POST screen.

**Memory Registration**
Sign the Memory will record current Memory. Once BIOS checked different with registered Memory, show WARNING message on POST screen.

**T1s Auth Configuration**
Press <Enter> to select T1s Auth Configuration.

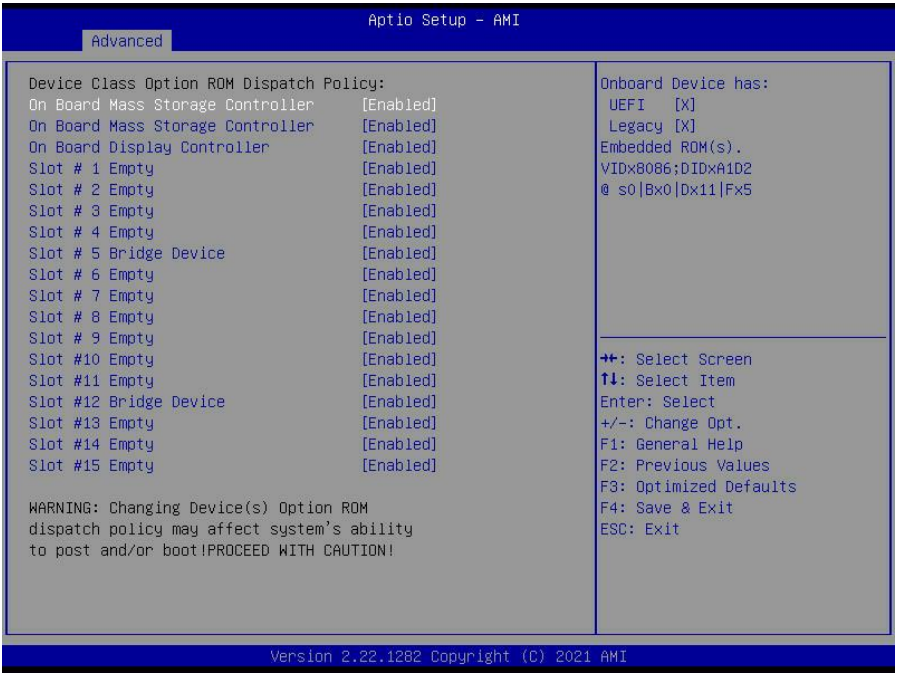
**iSCSI Configuration**
Configure the iSCSI parameters.

**VLAN Configuration (MAC: XXXXXXXXXXXX)**
VLAN Configuration (MAC: XXXXXXXXXXXX)

**MAC: XXXXXXXXXXXX --- IPV4 Network Configuration**
Configure network parameters. (MAC: XXXXXXXXXXXX)

**MAC: XXXXXXXXXXXX --- IPV6 Network Configuration**
Configure IPV6 network parameters. (MAC: XXXXXXXXXXXX)

### 5.3.1 Option ROM Dispatch Policy




**On Board Mass Storage Controller**
Onboard Device has:
UEFI [X].
Legacy [X]
Embedded ROM(s).
VIDx8086; DIDxA252
@ s0|Bx0|Dx11|Fx5
**Enabled** / Disabled

**On Board Mass Storage Controller**
Onboard Device has:
UEFI [X].
Legacy [X]
Embedded ROM(s).
VIDx8086; DIDxA202
@ s0|Bx0|Dx17|Fx0
**Enabled** / Disabled

**On Board Display Controller**
Onboard Device has:
UEFI [X].
Legacy [X]
Embedded ROM(s).
VIDx1A03; DIDx2000
@ s0|Bx4|Dx0|Fx0
**Enabled** / Disabled

**Slot #1~4 Empty**
Enable or Disable Option ROM execution for selected Slot.
**Enabled** / Disabled

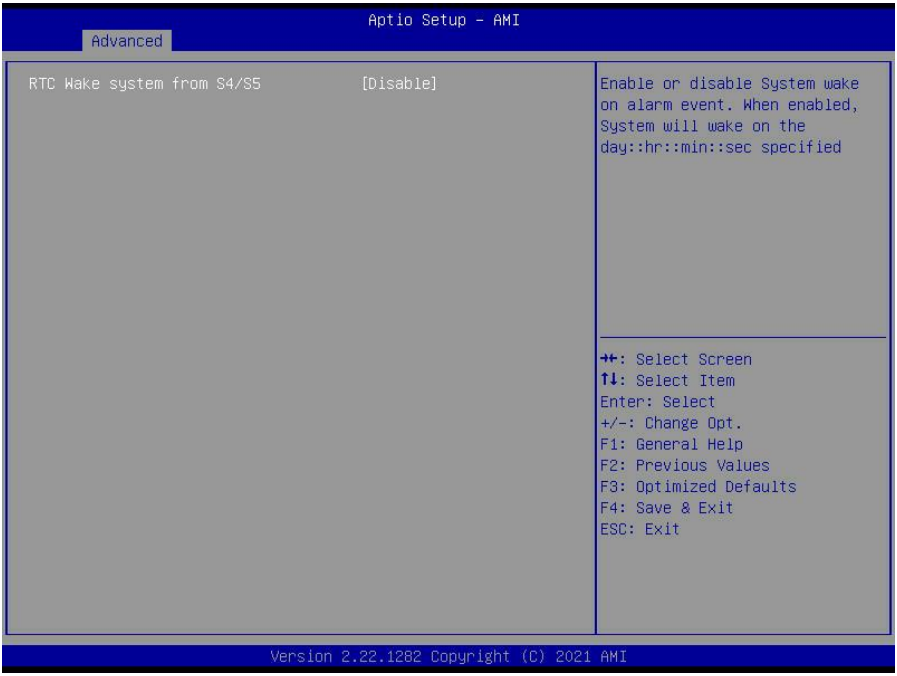
**Slot #5 Bridge Device**
Device on Slot does not have an option ROM.

**Slot #6~11 Empty**
Enable or Disable Option ROM execution for selected Slot.
**Enabled** / Disabled

**Slot #12 Bridge Device**
Device on Slot does not have an option ROM.

**Slot #13~15 Empty**
Enable or Disable Option ROM execution for selected Slot.
**Enabled** / Disabled

### 5.3.2 S5 RTC Wake Settings




**Wake system from S4/S5**
Enable or disable System wake on alarm event. When enabled, System will wake on the day::hr::min::sec specified.

**Disable** / Fixed Time / Dynamic Time

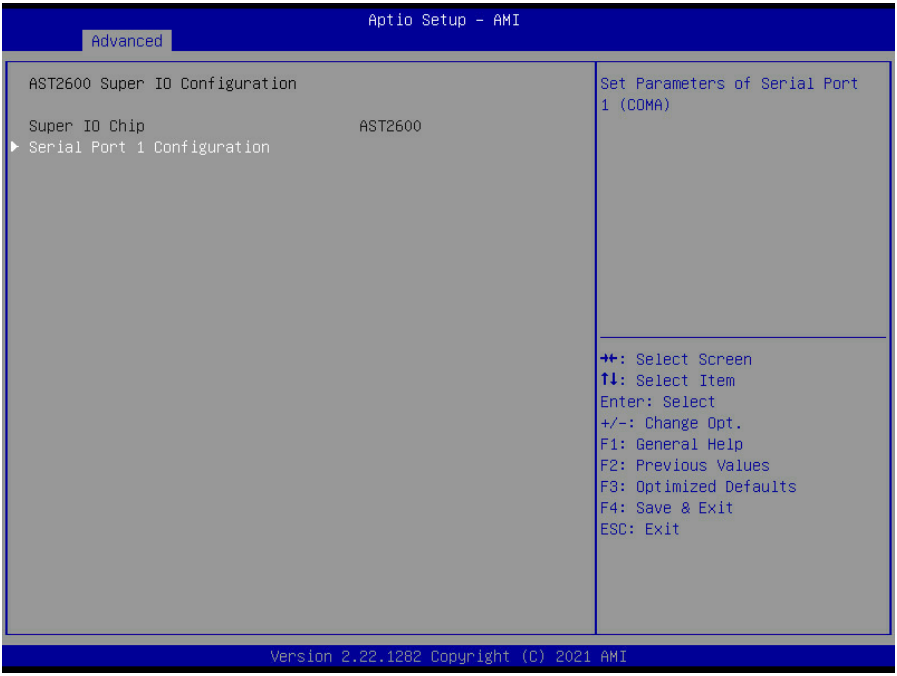
When Wake system from S5 is set to **[Fixed Time]**
**Wake up hour**
Select 0-23. For example enter 3 for 3am and 15 for 3pm.

**Wake up minute**
Select 0-59 for Minute.

**Wake up second**
Select 0-59 for Second.

When Wake system from S5 is set to **[Dynamic Time]**
**Wake up Minute increase**
1

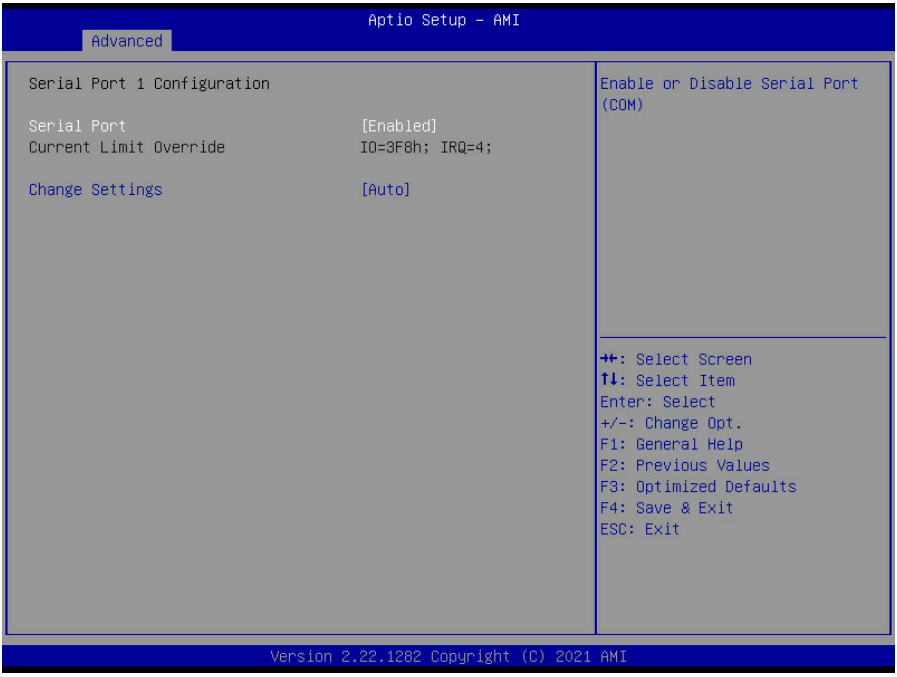
### 5.3.3 AST2600 Super IO Configuration




**Super IO Chip**
Read only.

**Serial Port 1 Configuration**
Set Parameters of Serial Port 1 (COMA).

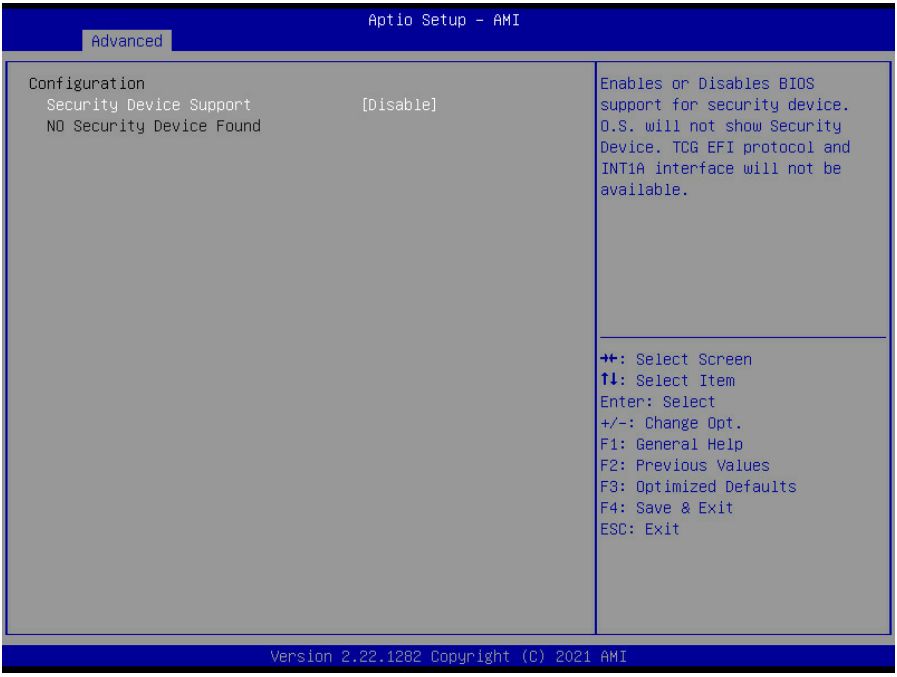
### 5.3.3.1 Serial Port 1 Configuration




**Serial Port**
Enable or disable Serial Port (COM).
**Enabled /** Disabled

**Change Settings**
Select an optimal setting for Super IO Device.
**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;

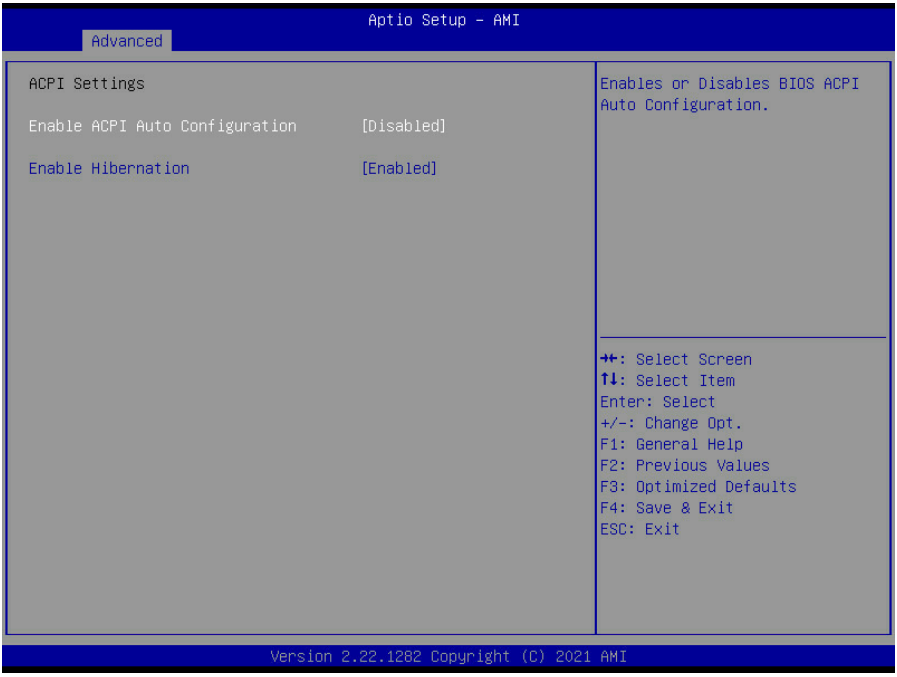
### 5.3.4 Trusted Computing




**Security Device Support**
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

Enable / **Disable**

### 5.3.5 ACPI Settings



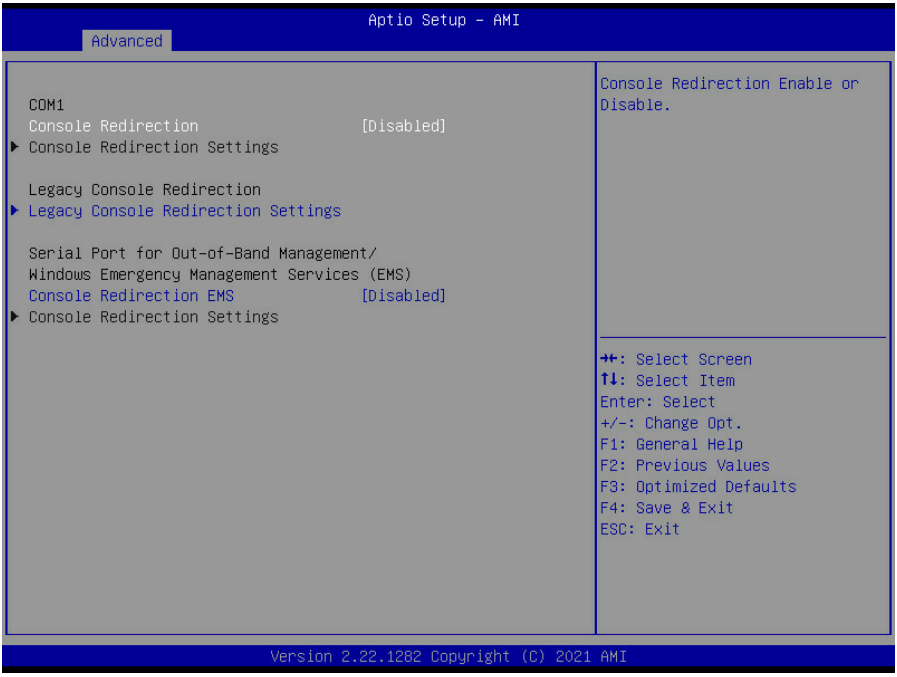

**Enable ACPI Auto Configuration**
Enable or Disable BIOS ACPI Auto Configuration.
**Disabled** / Enabled

**Enable Hibernation**
Enable or Disable System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating system.
Disabled / **Enabled**

### 5.3.6 Power Management


**CPU Power and Performance Policy**
CPU Power and Performance Policy.
**Performance** / Balanced Power / Power

### 5.3.7 Serial Port Console Redirection

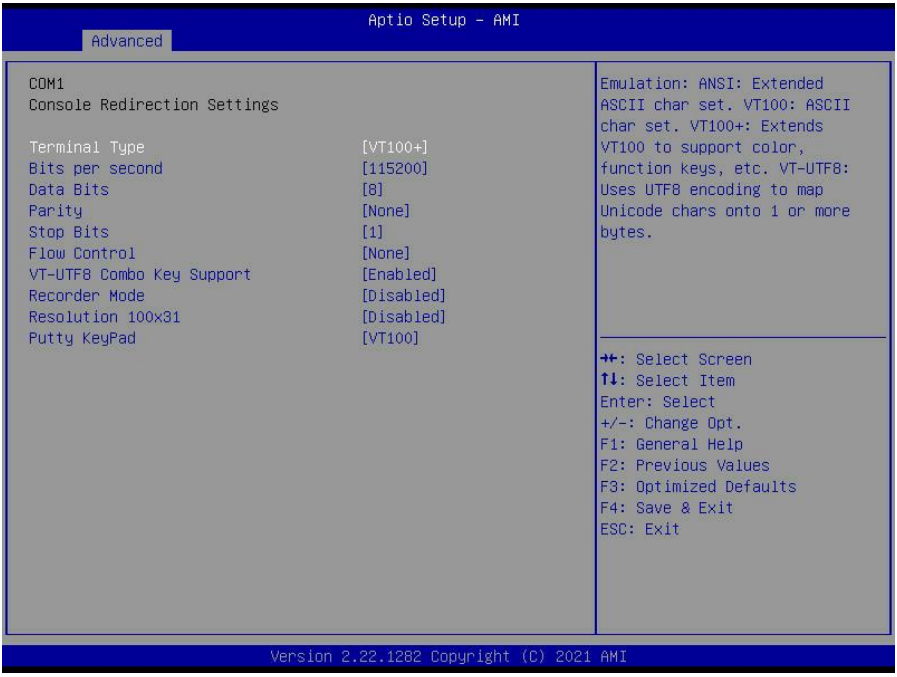



**Console Redirection**
Console redirection enable or disable.
**Disabled** / Enabled

**Legacy Console Redirection Settings**
Legacy Console redirection settings.

**Console Redirection Settings**
The settings specify how the host computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

### 5.3.9.1 COM1 Console Redirection Settings




**Terminal Type**
Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set.
VT100+: Extends VT100 to support color, function keys, etc.
VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
**VT100+ /** VT100 / VT-UTF8 / ANSI

**Bits per Second**
Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
38400 **/** 9600 / 19200 / 57600 / **115200**

**Data Bits**
**8 /** 7

**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 the 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.
**None** / Even / Odd / Mark / Space

**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.

**1** / 2

**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 restart the flow. Hardware flow control uses two wires to send start/stop signal.

**None** / Hardware RTS/CTS

**VT-UTF8 Combo Key Support**
Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.

**Enabled** / Disabled

**Recorder Mode**
On this mode enabled only text will be sent. This is to capture Terminal data.

**Disabled** / Enabled

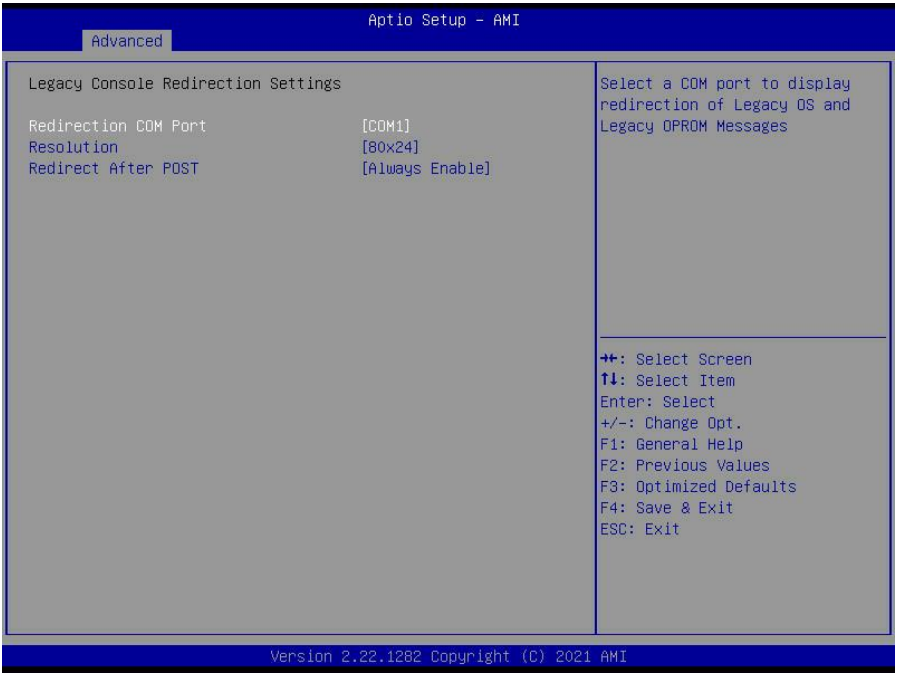
**Resolution 100x31**
Enable or disable extended terminal resolution.

**Disabled** / Enabled

**Putty KeyPad**
Select FunctionKey and KeyPad on Putty.

**VT100** / LINUX / XTERMR6 / SCO / ESCN / VT400

### 5.3.9.2 Legacy Console Redirection Settings




**Legacy Serial Redirection Port**
Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

**COM1**

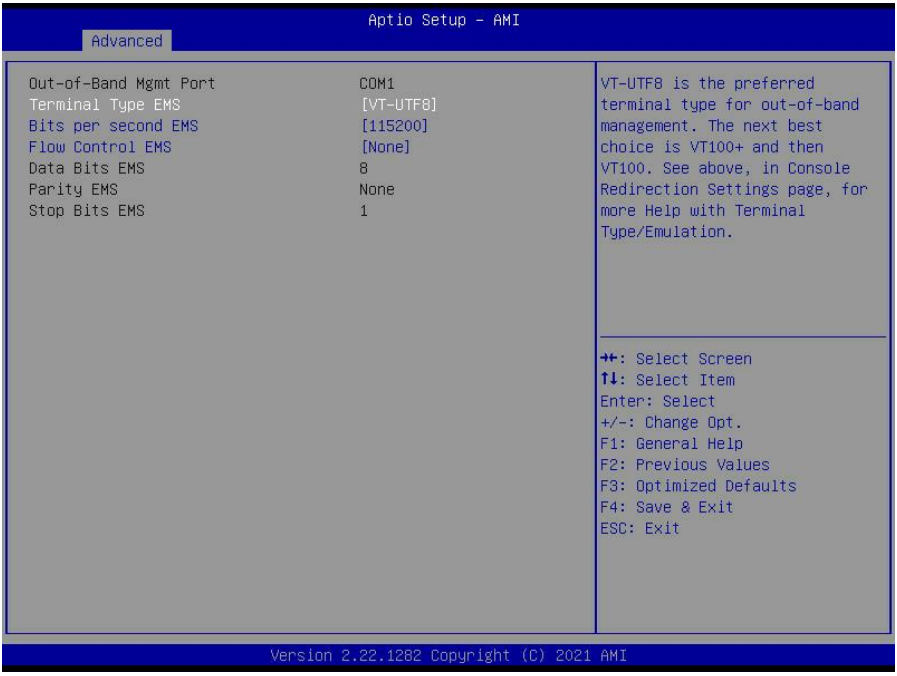
**Resolution**
On Legacy OS, the Number of Rows and Columns supported redirection.

**80x24 /** 80x25

**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. Default setting for this option is set to Always Enable.

**Always Enable /** BootLoader

### 5.3.9.3 Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS) Console Redirection Settings




**Out-of-Band Mgmt Port**
Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.

**COM1**

**Terminal Type**
VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.

**VT-UTF8 /** VT100 **/** VT100+ / ANSI

**Bits per Second**
Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

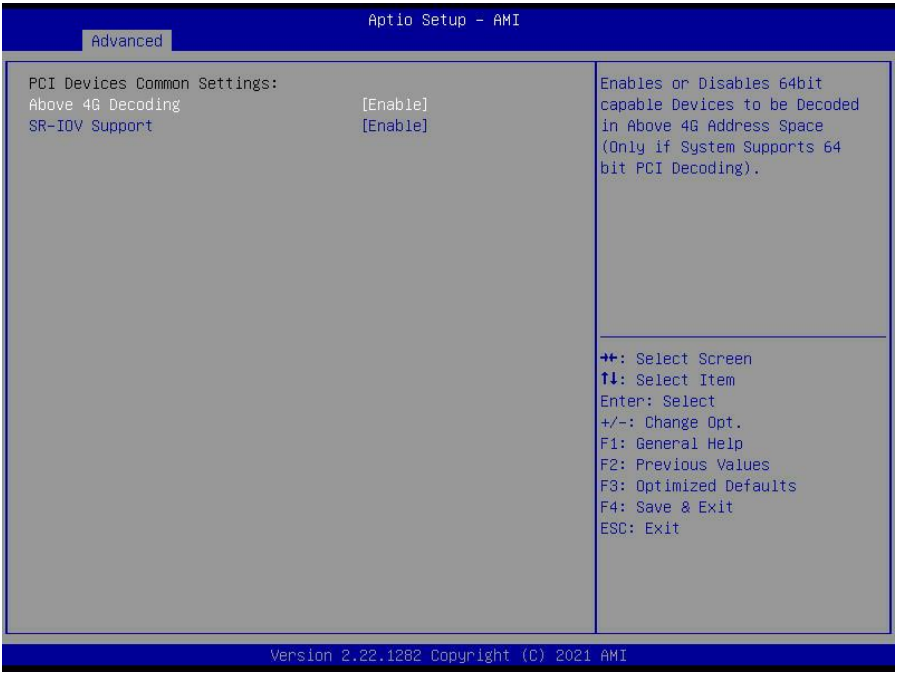
**115200 /** 9600 / 19200 / 57600

**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 restart the flow. Hardware flow control uses two wires to send start/stop signal.

**None** / Hardware RTS/CTS / Software Xon/Xoff

**Data Bits / Parity / Stop Bits**
Read only.

### 5.3.10 PCI Subsystem Settings



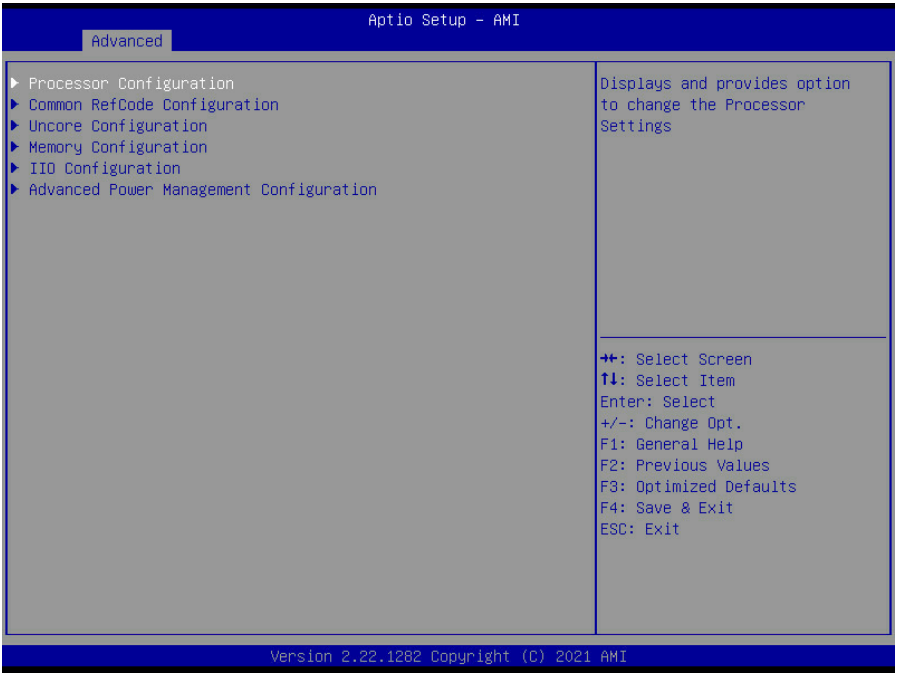

**Above 4G Decoding**
Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).

**Enable** / Disable

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

**Enable** / Disable

### 5.3.11 Socket Configuration




**Processor Configuration**
Displays and provides option to change the Processor Settings.

**Common RefCode Configuration**
Displays and provides option to change the Common RefCode Settings.

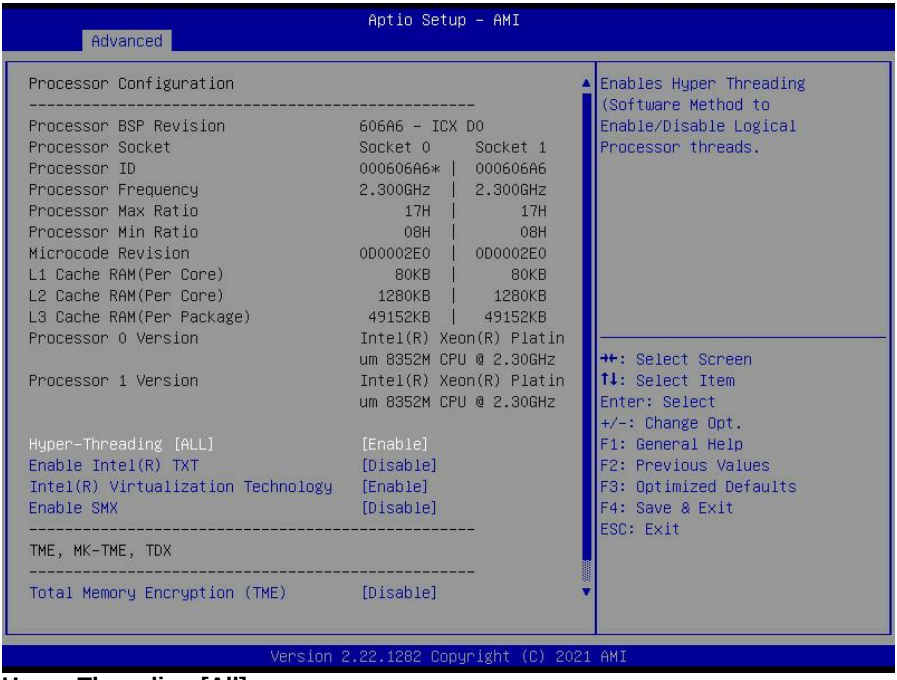
**Uncore Configuration**
Displays and provides option to change the Uncore settings

**Memory Configuration**
Displays and provides option to change the Memory Settings.

**IIO Configuration**
Displays and provides option to change the IIO Settings.

**Advanced Power Management Configuration**
Displays and provides option to change the Power Management Settings.

### 5.3.11.1 Processor Configuration




**Hyper-Threading [All]**
Enables Hyper Threading (Software Method to Enable/Disabled Logical Processor threads).

Disable / **Enable**

**Enable Intel® TXT**
Enable Intel® TXT.

**Disable** / Enable

**Intel® Virtualization Technology**
Intel® Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions. Note: A change to this option requires the system to be powered off and then back on before the setting takes effect.

Disable / **Enable**

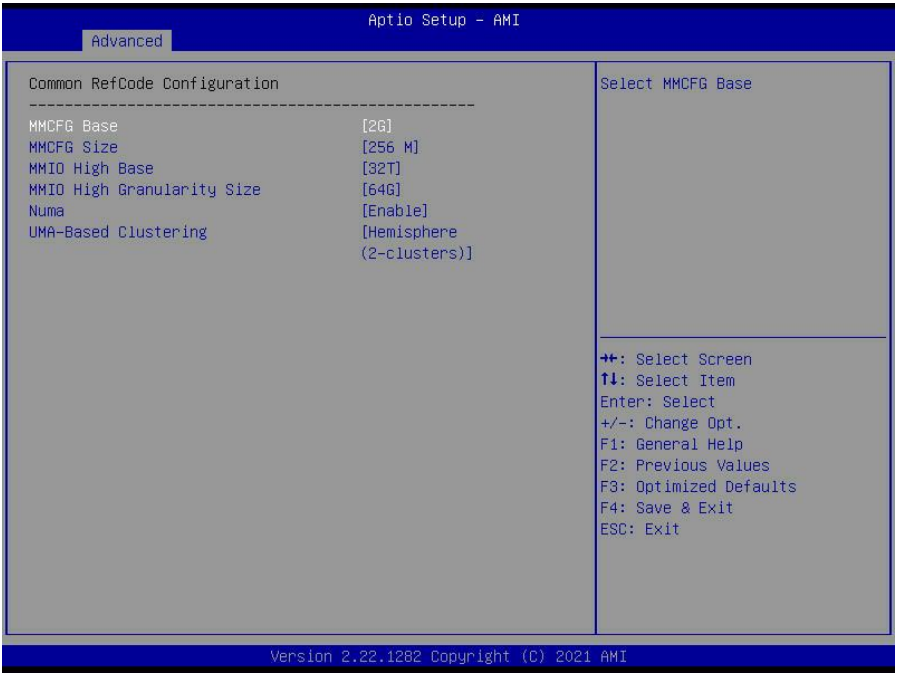
**Enable SMX**
Enables Safer Mode Extensions.

Disable / **Enable**

**Total Memory Encryption (TME)**
Enable/Disable Total Memory Encrytion (TME)

Disable / **Enable**

### 5.3.11.2 Common RefCode Configuration




**MMCFG Base**
Select MMCFG Base.
1G / 1.5G / 1.75G / **2G** / 2.25G / 3G / Auto

**MMCFG Size**
Select MMCFG Size.
64M / 128M / **256M** / 512M / 1G / 2G / Auto

**MMIO High Base**
Select MMIO High Base.
56T / 40T / **32T** / 24T / 16T / 4T / 2T / 1T / 512G / 3584T

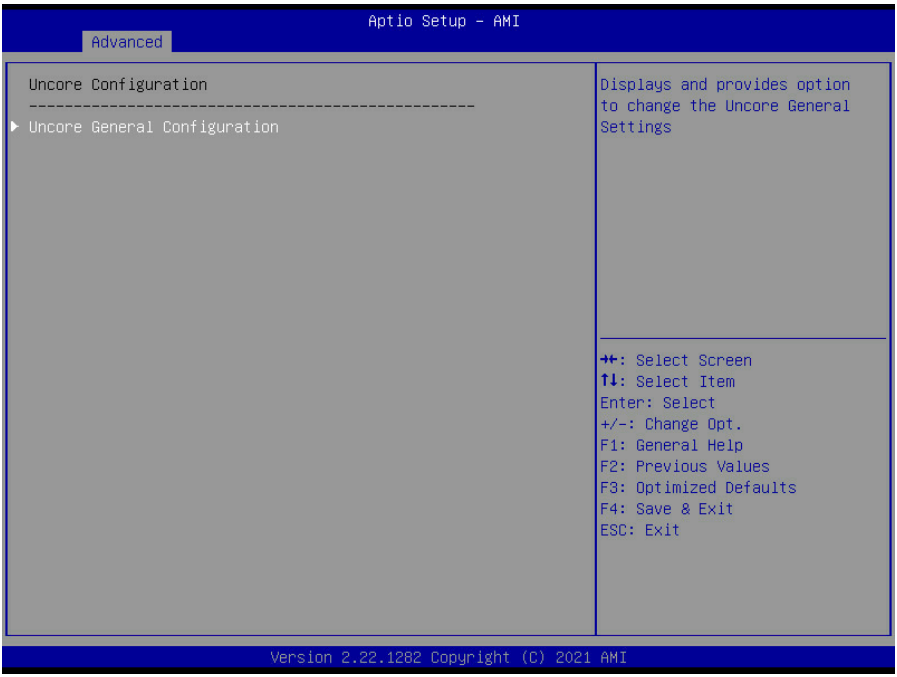
**MMIO High Granularity Size**
Selects the allocation size used to assign mmioh resources. Total mmioh space can be up to 32xgranularity.
Per stack mmioh resource assignments are multiples of the granularity where 1 unit per stack is the default allocation.
1G / 4G / 16G / **64G** / 256G / 1024G

**Numa**
Enable or Disable Non uniform Memory Access (NUMA).
Disable / **Enable**

**UMA-Based Clustering**
UMA Based Clustering options include Disable (ALL2ALL), Hemisphere (2 cluster), and Quadrant (4 cluster, not supported on ICX).These option are only valid when SNC is disabled. If SNC is enabled, UMA-Based Clustering is automatically disabled by BIOS.

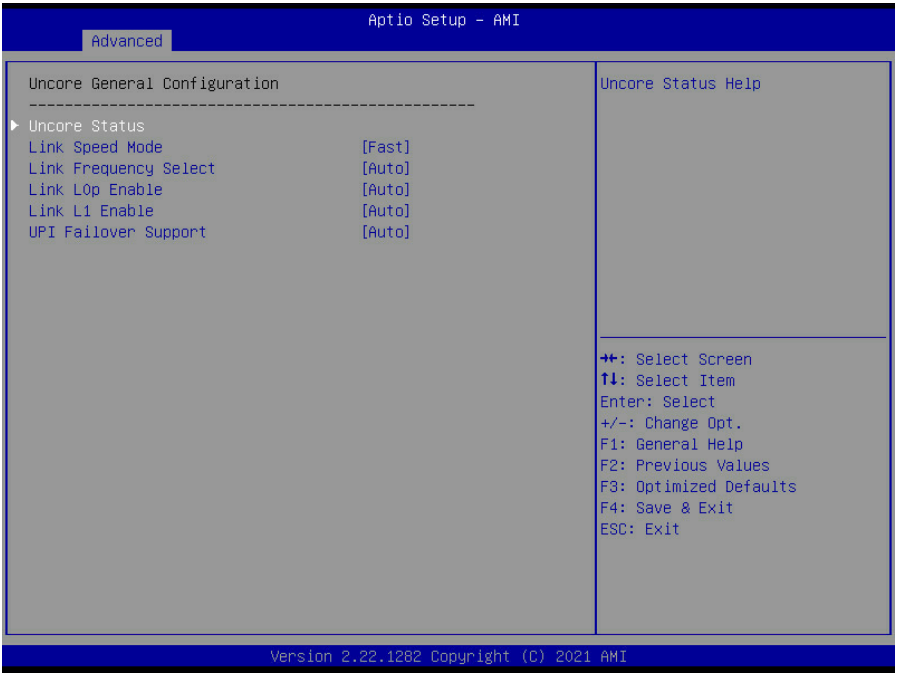
Disable (All2 All) / **Hemisphere (2- clusters)**

### 5.3.11.3 UPI Configuration




**Uncore General Configuration**
Displays and provides option to change the Uncore General Settings.

#### 5.3.11.3.1 UPI General Configuration




**Uncore Status**
Uncore Status Help

**Link Speed Mode**
Select the UPI link speed as either the POR speed (Fast) or default speed (Slow).
Slow / **Fast**

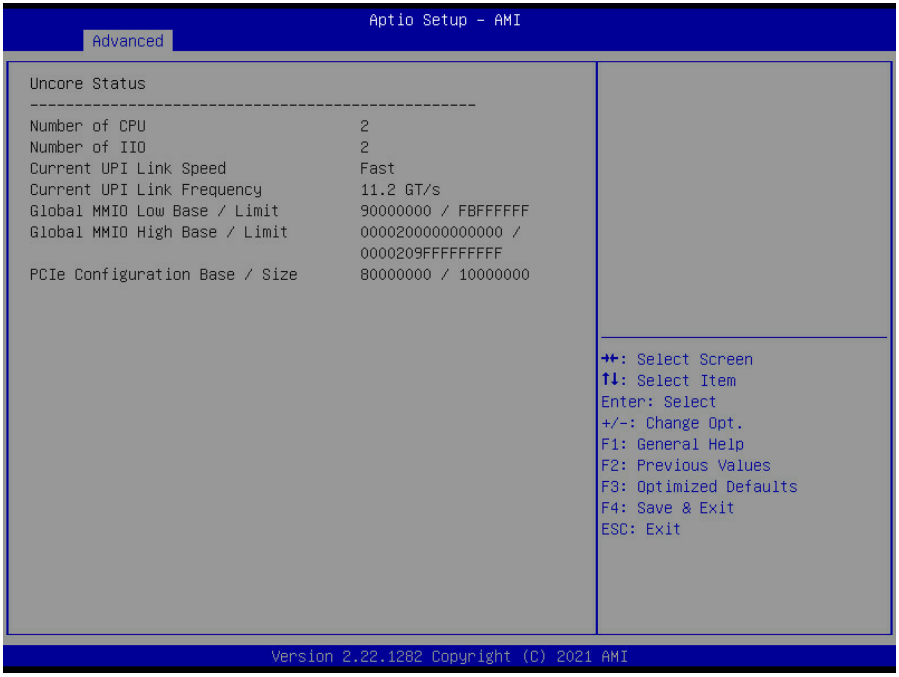
**Link Frequency Select**
Allows for selecting the UPI Link Frequency.
9.6GT/s / 10.4GT/s / 11.2GT/s / **Auto** / Use Per Link Setting

**Link L0p Enable**
Enable --- Set the c_l0p_en,
Disable --- Reset it,
Auto --- Auto decides based on Si Compatibility.
Disable / Enable / **Auto**

**Link L1 Enable**
Enable --- Set the c_l1_en,
Disable --- Reset it,
Auto --- Auto decides based on Si Compatibility.
Disabled / Enable / **Auto**

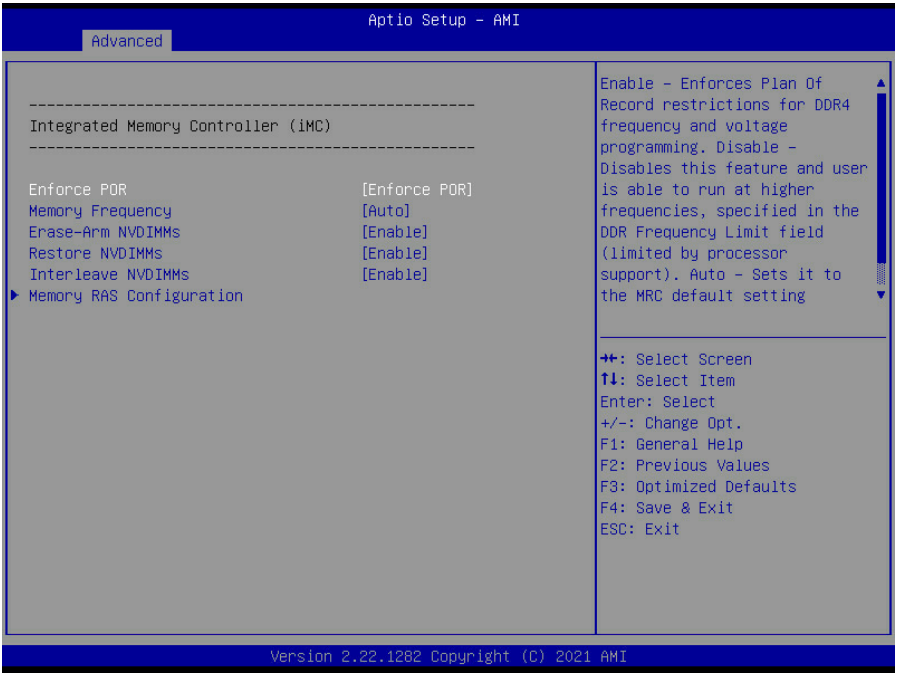
**UPI Failover Support**
Enable - Set the c_failover_en,
Disable - Reset it,
Auto - Auto decides based on Si Compatibility
**Disabled** / Enable / Auto

#### 5.3.11.3.1.1 Uncore Status




Read only

### 5.3.11.4 Memory Configuration




**Enforce POR**
Enable --- Enforces Plan Of Record restrictions for DDR4 frequency and voltage programming. Disable --- disables this feature and user is able to run at higher frequencies, specified in the DDR Frequency Limit field (limited by processor support). Auto --- Sets it to the MRC default setting; current default is Enable.

**Enforce POR** / Disabled

**Memory Frequency**
Maximum Memory Frequency Selections in Mhz. If Enforce POR is disabled, user will be able to run at higher frequencies than the memory support (limited by processor support). Do not select Reserved.

**Auto** / 2400 / 2666 / 2933 / 3200

**Erase-Arm NVDIMMs**
Enables/Disables Erasing and Arming NVDIMMs.

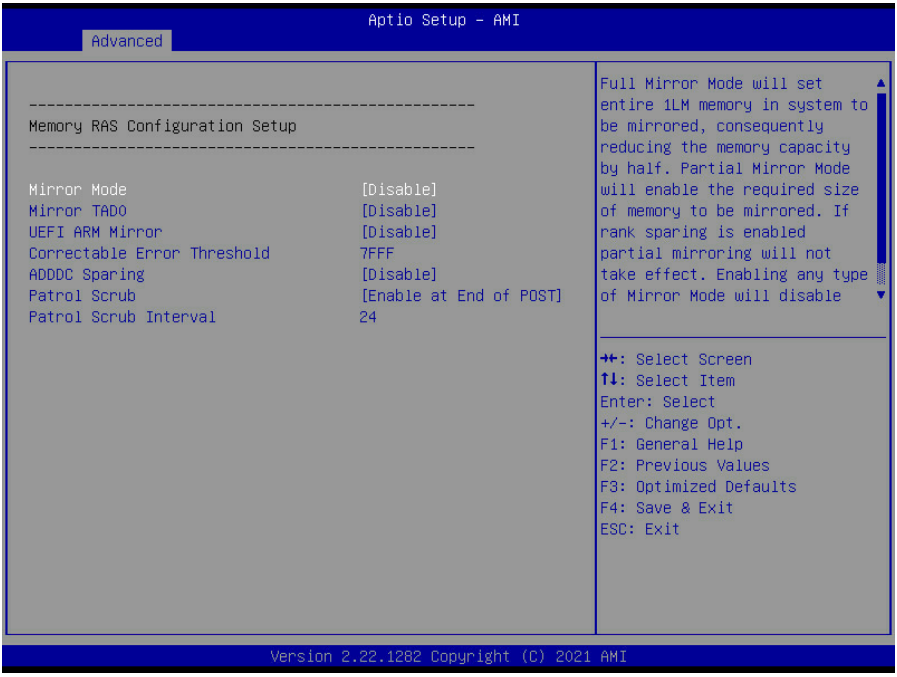
**Enabled** / Disabled

**Restore NVDIMMs**
Enables/Disables automatic restoring of NVDIMMs.

**Enabled** / Disabled

**Interleave NVDIMMs**
Controls if NVDIMMs are interleaved together or not.
**Enabled** / Disabled

### 5.3.11.4.1 Memory RAS Configuration




**Mirror Mode**
Full Mirror Mode will set entire 1LM memory in system to be mirrored, consequently reducing the memory capacity by half. Partial Mirror Mode will enable the required size of memory to be mirrored. If rank sparing is enabled partial mirroring will not take effect. Enabling any type of Mirror Mode will disable XPT Prefetch.

**Disable** / Full Mirror Mode / Partial Mirror Mode

**Mirror TAD0**
Enable Mirror on entire memory for TAD0.

Enable / **Disable**

**UEFI ARM Mirror**
Imitate behavior of UEFI based Address Range Mirror with setup option

Enable **/ Disable**

**Correctable Error Threshold**
Correctable Error Threshold (0x01 – 0x7fff) used for sparing, tagging, and leaky bucket.

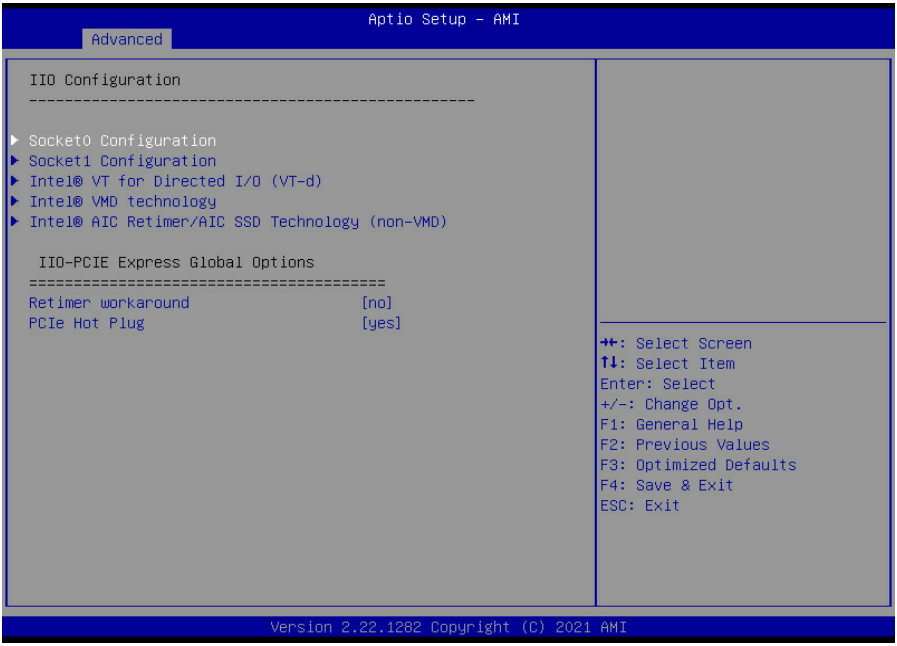
**10**

**ADDDC Sparing**
Enable/Disable ADDDC Sparing
Enable **/ Disable**

**Patrol Scrub**
Enable/Disable Patrol Scrub.
Disabled / Enabled **/ Enable at End of POST**

**Patrol Scrub Interval**
**24**

### 5.3.11.5 IIO Configuration




**Socket0 Configuration**
Socket0 Parameters

**Socket1 Configuration**
Socket1 Parameters

**Intel® VT for Directed I/O (VT-d)**
Press <Enter> to bring up the Intel® VT for Directed I/O (VT-d) Configuration menu.

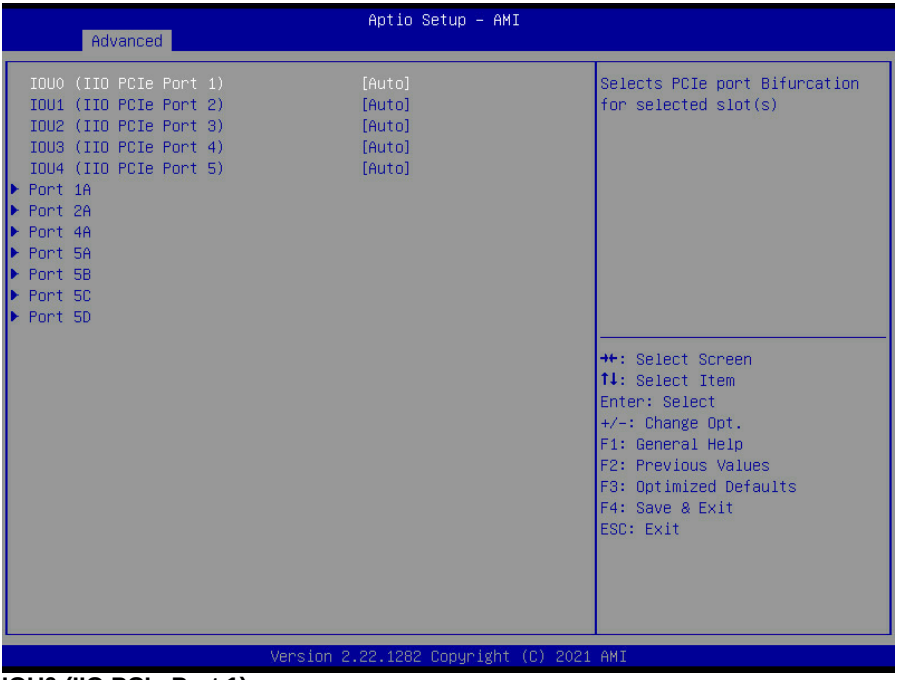
**Intel® VMD Technology**
Press <Enter> to bring up the Intel® VMD for Volume Management Device Configuration menu.

**Intel® AIC Retimer/AIC SSD Technology (non-VMD)**
Press<Enter> to bring up the Intel® AIC Retimer/AIC SSD Configuration menu.

**Retimer workaround**
Enable or disable the retime workaround
**no /** yes

**PCIe Hot Plug**
Enable/Disable PCIe Hot Plug globally.
no / **yes**

#### 5.3.11.5.1 Socket 0 Configuration




**IOU0 (IIO PCIe Port 1)**
Selects PCIe port Bifurcation for selected slot(s).
**Auto** / x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / x16

**IOU1 (IIO PCIe Port 2)**
Selects PCIe port Bifurcation for selected slot(s).
**Auto** / x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / x16

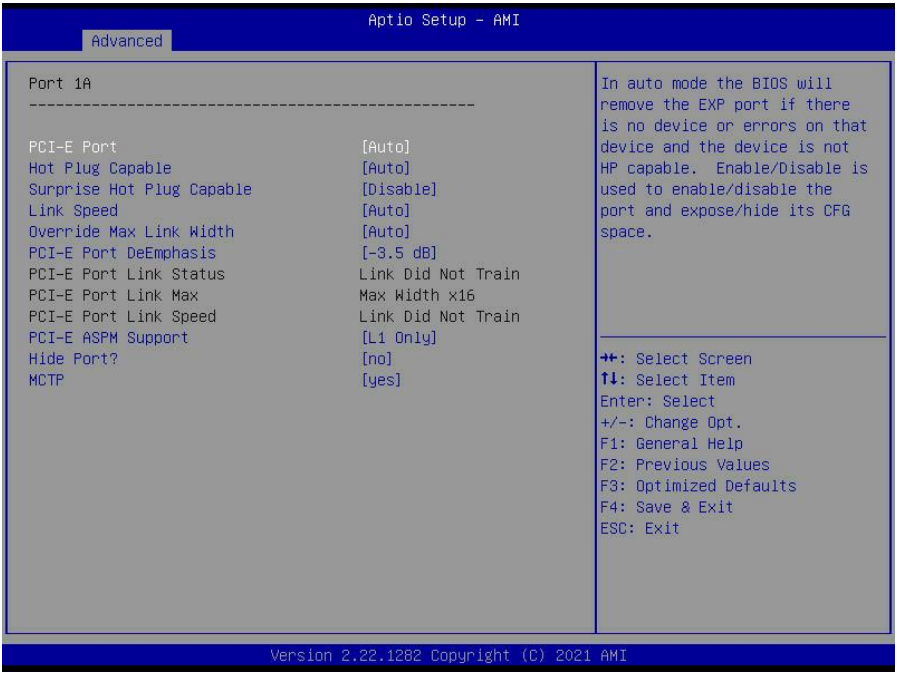
**IOU2 (IIO PCIe Port 3)**
Selects PCIe port Bifurcation for selected slot(s).
**Auto** / x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / x16

**IOU3 (IIO PCIe Port 4)**
Selects PCIe port Bifurcation for selected slot(s).
**Auto** / x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / x16

**IOU4 (IIO PCIe Port 5)**
Selects PCIe port Bifurcation for selected slot(s).
**Auto** / x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / x16

**Port 1A/2A/4A/5A/5B/5C/5D**
Settings related to PCI Express Ports (0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/4B/4C/4D/5A/5B/5C/5D).

#### 5.3.11.5.1.1 Port 1A/2A/4A/5A/5B/5C/5D




**PCI-E Port**
In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Disable is used to disable the port and hide its CFG space.
**Auto /** Disable / Enable

**Hot Plug Capable**
This option specifies if the link is considered Hot Plug capable.
**Auto** / Disable / Enable

**Surprise Hot Plug Capable**
This option specifies if the link is considered Hot Plug capable.
**Disable** / Enable

**Link Speed**
Choose Link Speed for this PCIe port.
**Auto /** Gen1 (2.5 GT/s) / Gen2 (5 GT/s) / Gen3 (8 GT/s) / Gen4 (16 GT/s)

**Override Max Link Width**
Override the max link width that was set by bifurcation.
**Auto /** x1 / x2 / x4 / x8 / x16

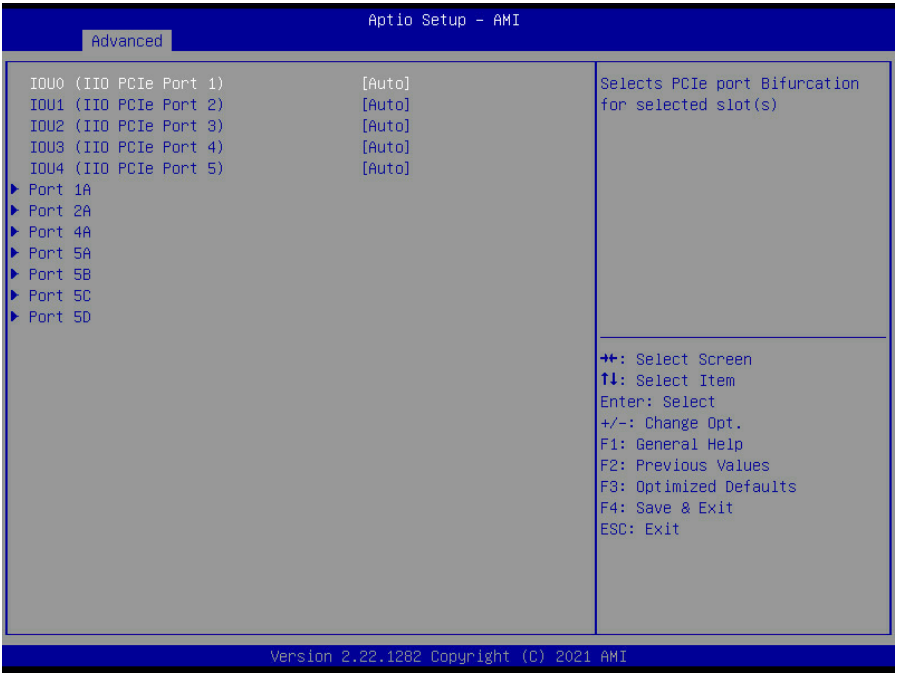
**PCI-E Port DeEmphasis**
De-Emphasis control (LNKCON2[6]) for this PCIe port.
-6.0 dB / **-3.5 dB**

**PCI-E ASPM Support**
This option enables/disables the ASPM (L1) support for the downstream devices.
Auto / **L1 Only** / Disabled

**Hide Port?**
User can force to hide this root port from OS.
**no** / yes

**MCTP**
Enable/Disable MCTP
no / **yes**

### 5.3.11.5.2 Socket 1 Configuration




**IOU0 (IIO PCIe Port 1)**
Selects PCIe port Bifurcation for selected slot(s).
**Auto** / x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / x16

**IOU1 (IIO PCIe Port 2)**
Selects PCIe port Bifurcation for selected slot(s).
**Auto** / x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / x16

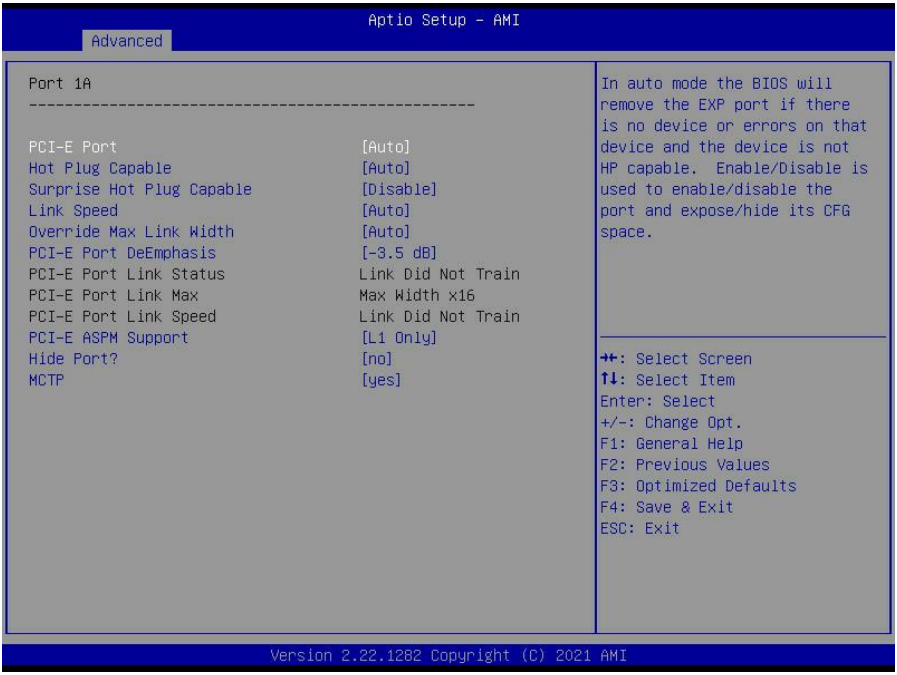
**IOU2 (IIO PCIe Port 4)**
Selects PCIe port Bifurcation for selected slot(s).
**Auto** / x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / x16

**IOU3 (IIO PCIe Port 5)**
Selects PCIe port Bifurcation for selected slot(s).
**Auto** / x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / x16

**IOU4 (IIO PCIe Port 5)**
Selects PCIe port Bifurcation for selected slot(s).
**Auto** / x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / x16

**Port 1A/2A/4A/5A/5B/5C/5D**
Settings PCIe ports Bifurcation for selected slot(s)

### 5.3.11.5.2.1 Port 1A/2A/4A/5A/5B/5C/5D




**PCI-E Port**
In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Disable is used to disable the port and hide its CFG space.
**Auto /** Disable / Enable

**Hot Plug Capable**
This option specifies if the link is considered Hot Plug capable.
**Auto** / Disable / Enable

**Surprise Hot Plug Capable**
This option specifies if the link is considered Hot Plug capable.
**Disable** / Enable

**Link Speed**
Choose Link Speed for this PCIe port.
**Auto /** Gen1 (2.5 GT/s) / Gen2 (5 GT/s) / Gen3 (8 GT/s) / Gen4 (16 GT/s)

**Override Max Link Width**
Override the max link width that was set by bifurcation.
**Auto /** x1 / x2 / x4 / x8 / x16

**PCI-E Port DeEmphasis**
De-Emphasis control (LNKCON2[6]) for this PCIe port.
-6.0 dB / **-3.5 dB**

**PCI-E ASPM Support**
This option enables/disables the ASPM (L1) support for the downstream devices.
Auto / **L1 Only** / Disabled

**Hide Port?**
User can force to hide this root port from OS.
**no** / yes

**MCTP**
Enable/Disable MCTP
no / **yes**

#### 5.3.11.5.3 Intel® VT for Directed I/O (VT-d)


**Intel® VT for Directed I/O (VT-d)**
Enable/Disable Intel@ Virtualization Technology for Directed I/O (VT-d) by reporting the I/O device assignment to VMM through DMAR ACPI Tables.

Disable / **Enable**

**DMA Control Opt-In Flag**
Enable/Disable DMA_CTRL_FLATFORM_OPT_ IN_FLAG in DMAR table in ACPI. Not compatible with Direct Device Assignment (DDA).

Enable / **Disable**

**Interrupt Remapping**
Enable/Disable VT_D Interrupt Remapping Support

**Auto** / Enable / Disable

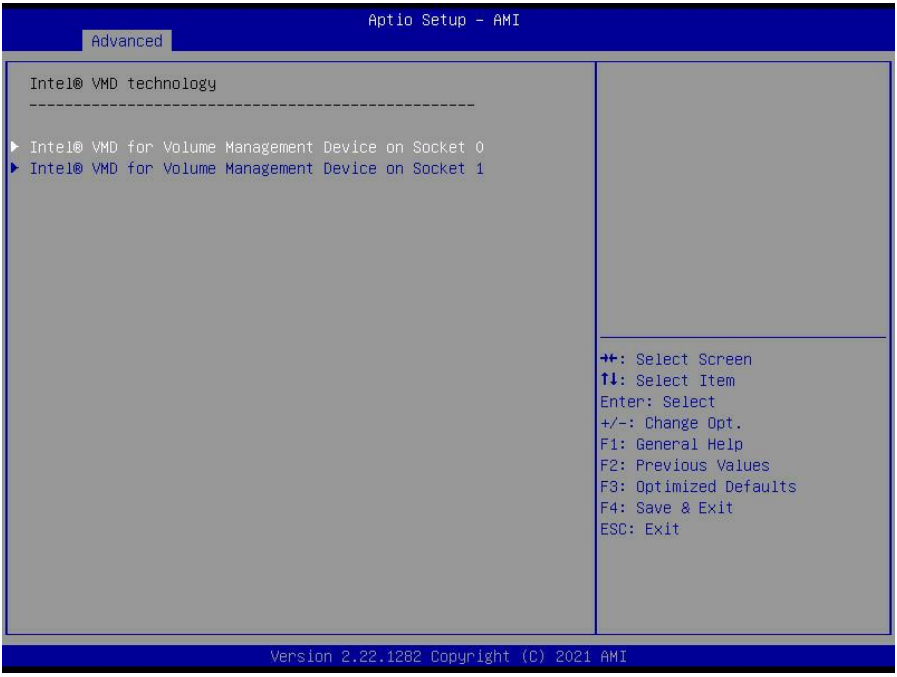
**X2APIC Opt Out**
Enable/Disable x2APIC_OPT_OUT bit

Enable / **Disable**

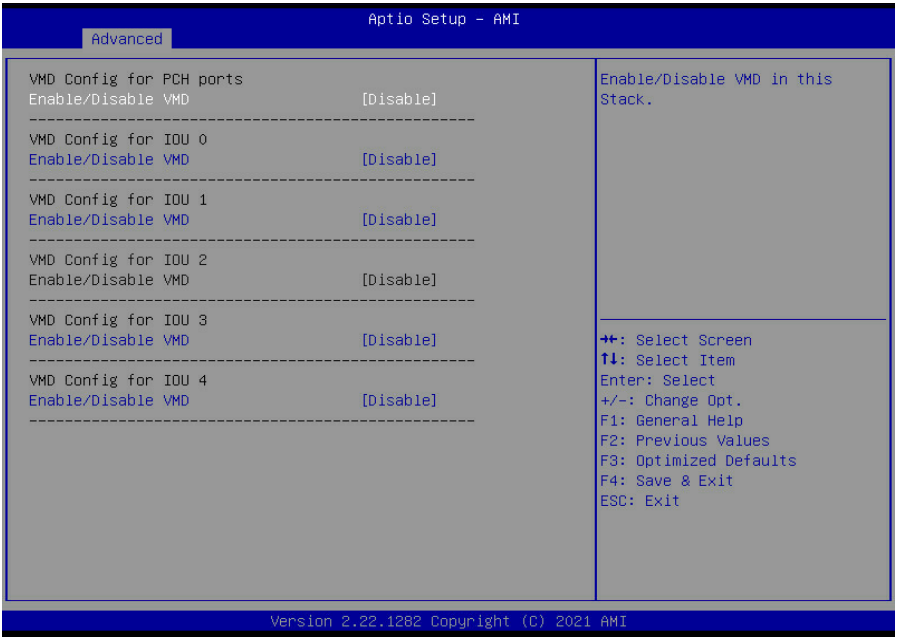
**Pre-boot DMA Protection**
Enable DMA Protection in Pre-boot environment (If DMAR table is installed in DXE and If VTD_INFO_PPT is installed in PEI.)

Enable / **Disable**

### 5.3.11.5.4 Intel® VMD Technology



#### 5.3.11.5.4.1 Intel VMD for Volume Management for Socket 0




**VMD Config for PCH ports**
Enable/Disable VMD
**Disable** / Enable

**VMD Config for IOU0**
Enable/Disable VMD
**Disable** / Enable

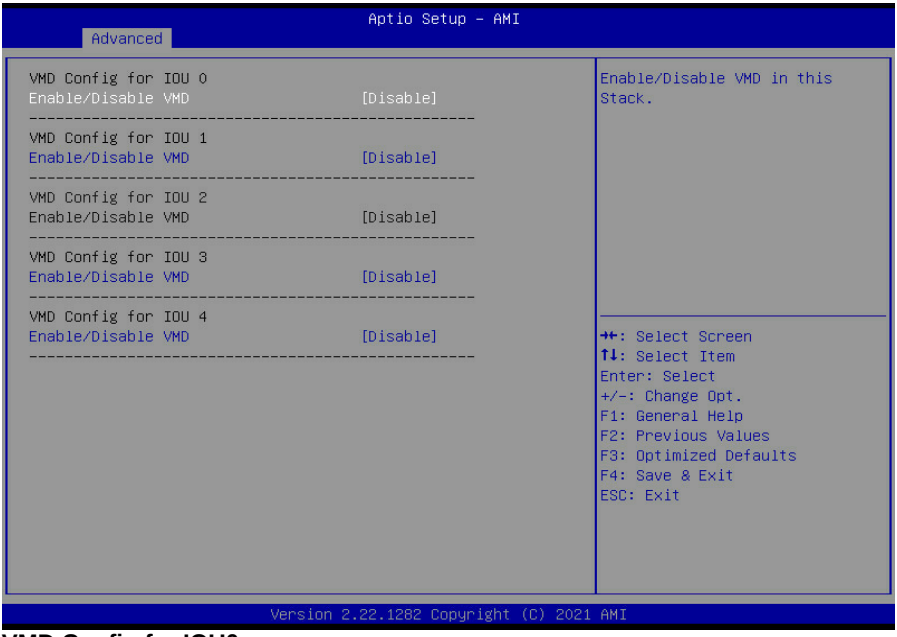
**VMD Config for IOU1**
Enable/Disable VMD
**Disable** / Enable

**VMD Config for IOU2**
Enable/Disable VMD
**Disable** / Enable

**VMD Config for IOU3**
Enable/Disable VMD
**Disable** / Enable

**VMD Config for IOU4**
Enable/Disable VMD
**Disable** / Enable

### 5.3.11.5.4.2 Intel VMD for Volume Management for Socket 1




**VMD Config for IOU0**
**Enable/Disable VMD**
Enable/Disable VMD in this Stack.
**Disable** / Enable

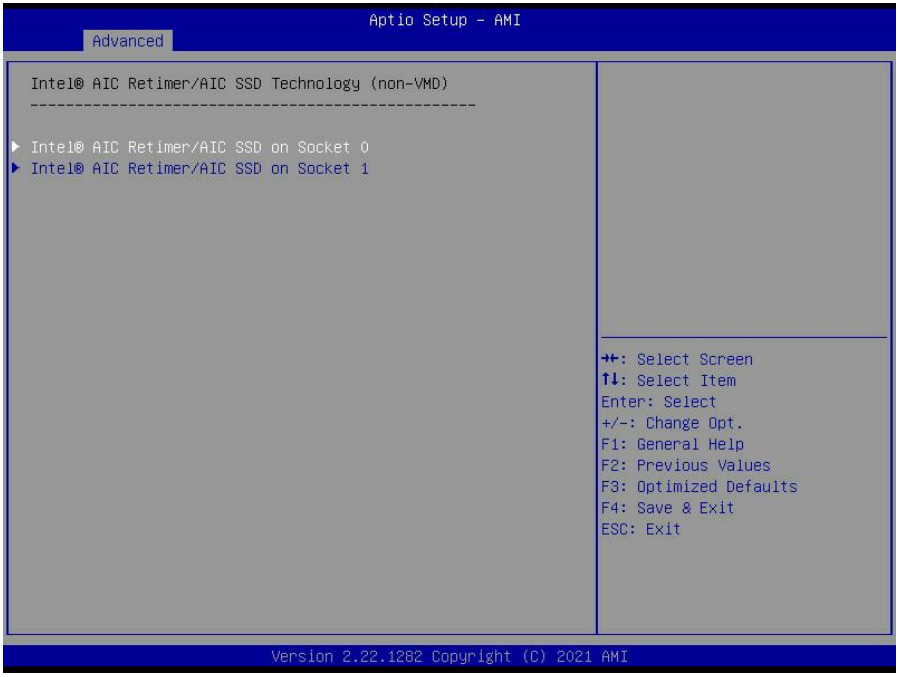
**VMD Config for IOU1**
**Enable/Disable VMD**
Enable/Disable VMD in this Stack.
**Disable** / Enable

**VMD Config for IOU2**
Enable/Disable VMD
Read only.

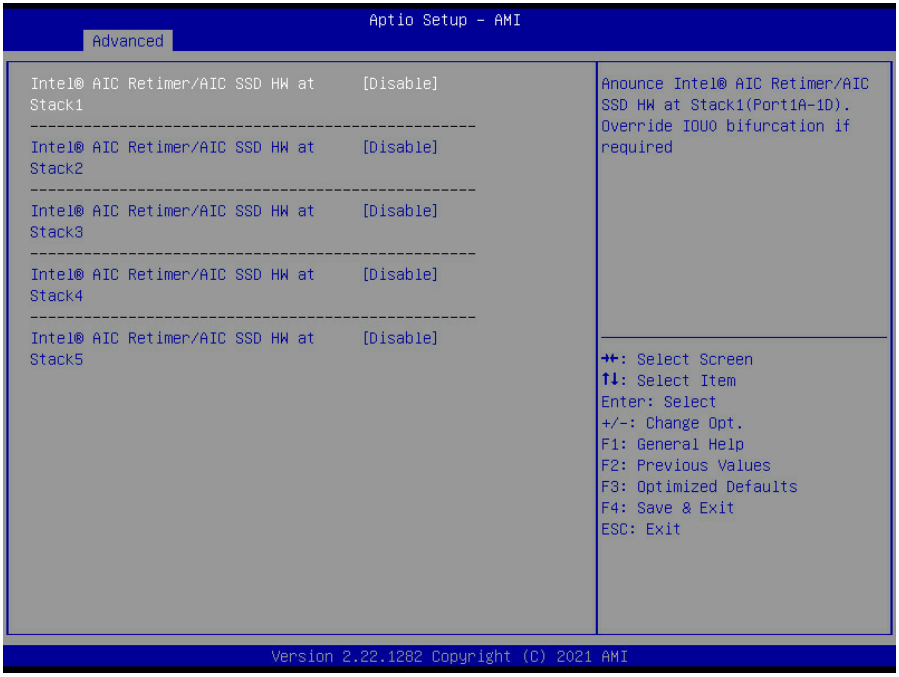
**VMD Config for IOU3**
**Enable/Disable VMD**
Enable/Disable VMD in this Stack.
**Disable** / Enable

**VMD Config for IOU4**
**Enable/Disable VMD**
Enable/Disable VMD in this Stack.
**Disable** / Enable

### 5.3.11.5.5 Intel® AIC Retimer/AIC Technology (non-VMD)



#### 5.3.11.5.5.1 Intel® AIC Retimer/AIC SSD on Socket0




**Intel@ AIC Retimer/AIC SSD HW at Stack1**
Annouce Intel@ AIC Retimer/AIC SSD HW at Stack1(Port1A-1D). Override IOUx bifurcation if required
**Disable** / Enable

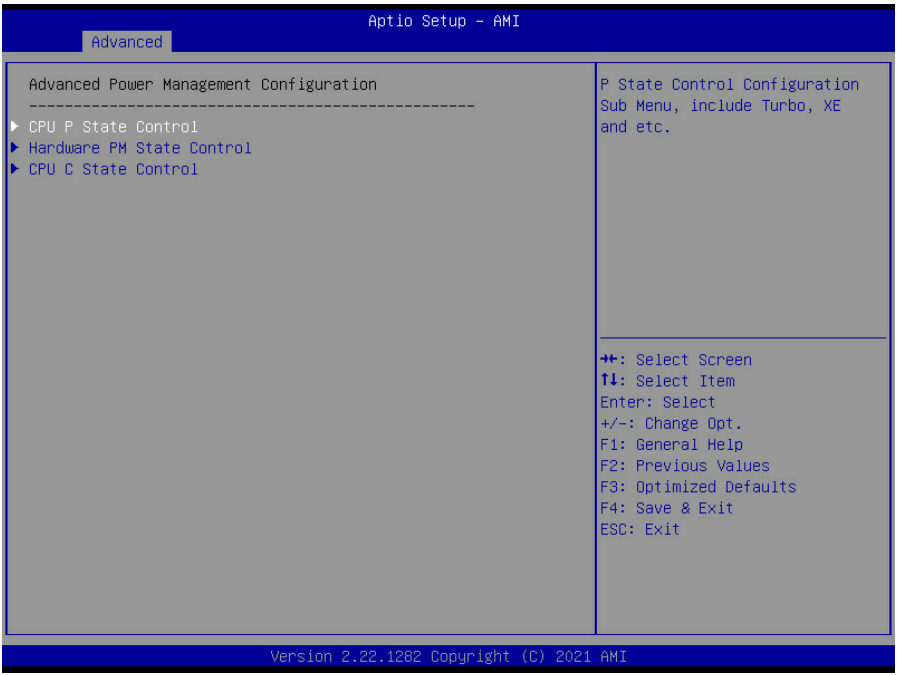
**Intel@ AIC Retimer/AIC SSD HW at Stack2**
Annouce Intel@ AIC Retimer/AIC SSD HW at Stack2(Port2A-2D). Override IOUx bifurcation if required
**Disable** / Enable

**Intel@ AIC Retimer/AIC SSD HW at Stack3**
Annouce Intel@ AIC Retimer/AIC SSD HW at Stack3(Port3A-3D). Override IOUx bifurcation if required
**Disable** / Enable

**Intel@ AIC Retimer/AIC SSD HW at Stack4**
Annouce Intel@ AIC Retimer/AIC SSD HW at Stack4(Port4A-4D). Override IOUx bifurcation if required
**Disable** / Enable

**Intel@ AIC Retimer/AIC SSD HW at Stack5**
Annouce Intel@ AIC Retimer/AIC SSD HW at Stack5(Port5A-5D). Override IOUx bifurcation if required
**Disable** / Enable

### 5.3.11.6 Advanced Power Management Configuration

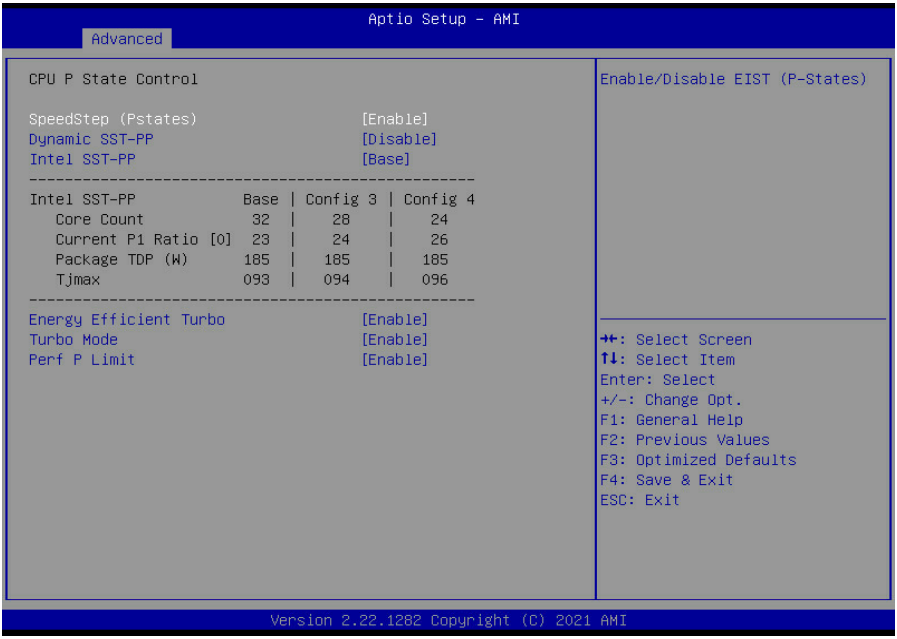



**CPU P State Control**
P State Control Configuration Sub Menu, include Turbo, XE and etc.

**Hardware PM State Control**
Hardware P-State setting.

**CPU C State Control**
CPU C State setting.

### 5.3.11.6.1 CPU P State Control




**SpeedStep (Pstates)**
Enable/Disable EIST (P-States).
Disable / **Enable**

**Dynamic SST-PP**
Support Dynamic SST-PP Select
**Disable** / Enable

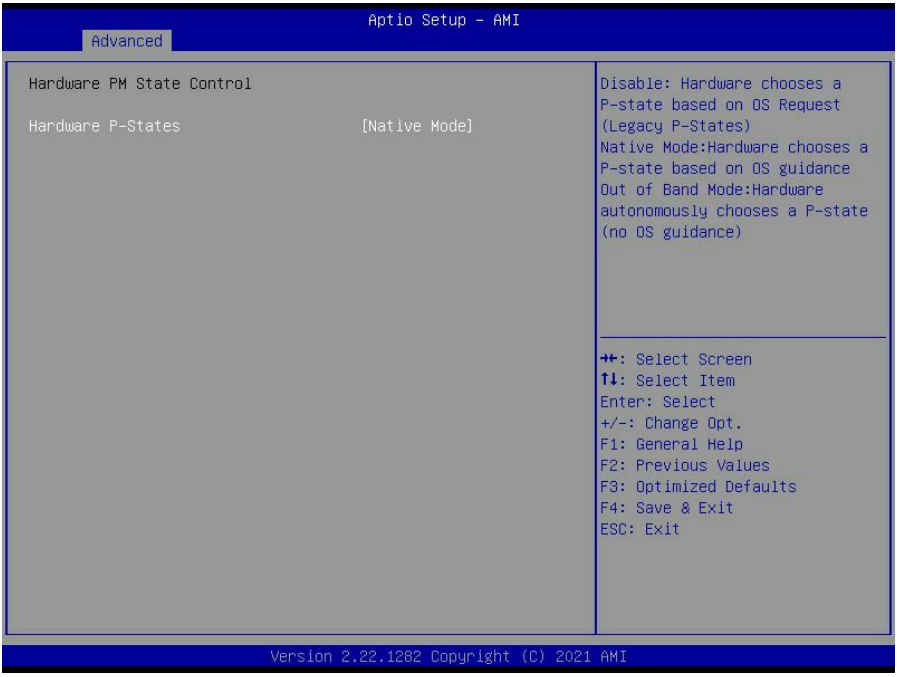
**Intel SST-PP**
Support Dynamic SST-PP select
**Disable** / Enable

**Energy Efficient Turbo**
Energy Efficient Turbo Disable, MSR 0x1FC [19].
**Enable /** Disable

**Turbo Mode**
Enable/Disable processor Turbo Mode (requires EMTTM enabled too).
Disable / **Enable**

**Perf P Limit**
Enable/Disable Performance P-Limit.
Disable / **Enable**

### 5.3.11.6.2 Hardware PM State Control

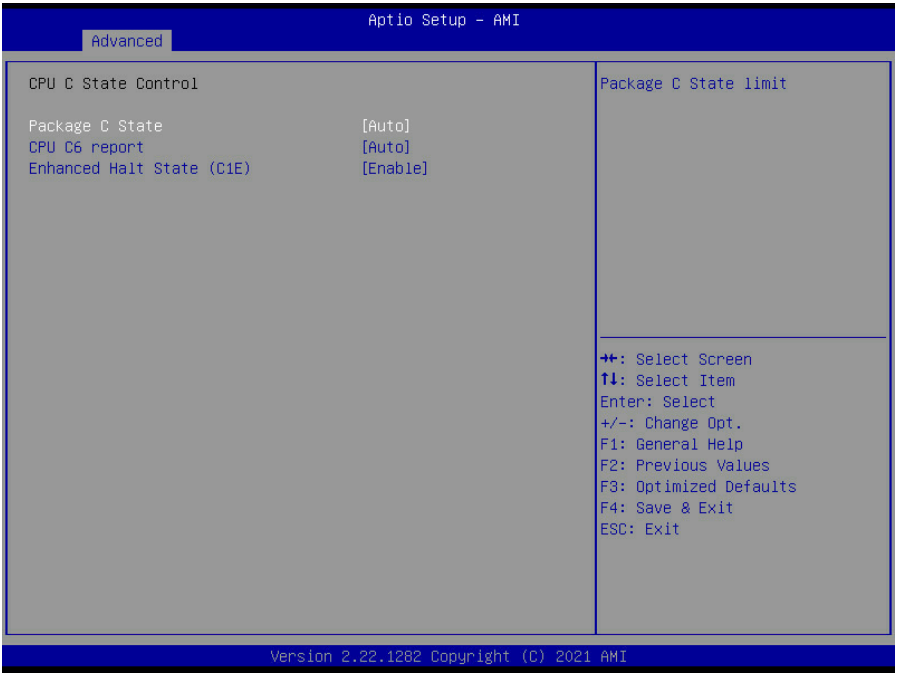



**Hardware P-States**

Disable: Hardware chooses a P-state based on OS Request (Legacy P-States).
Native Mode: Hardware chooses a P-state based on OS guidance.
Out of Band Mode: Hardware autonomously chooses a P-state (no OS guidance).

Disable / **Native Mode** / Out of Band Mode / Native Mode with No Legacy Support

### 5.3.11.6.3 CPU C State Control

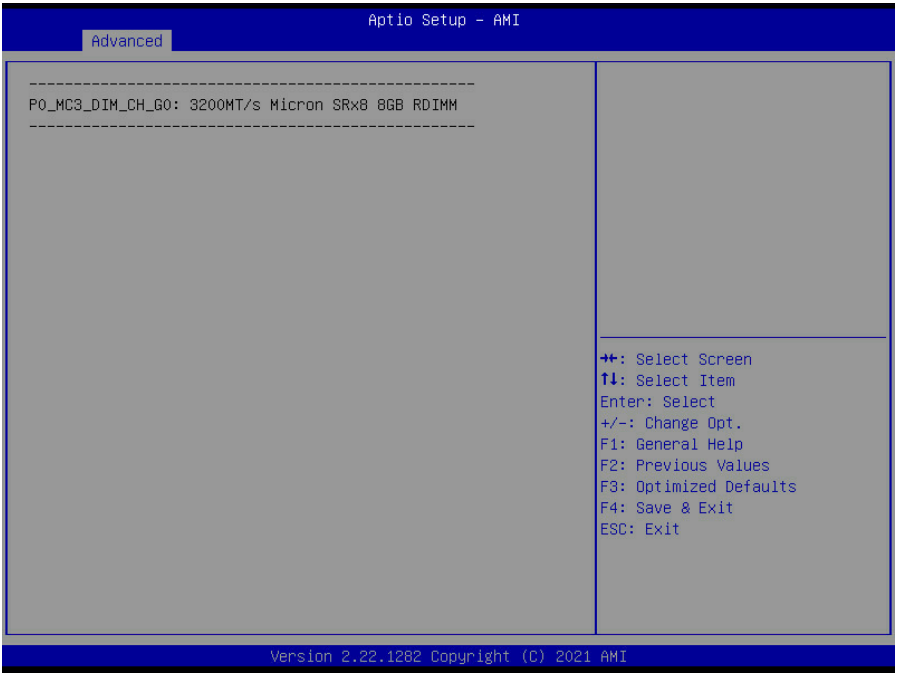



**Package C State**
Package C State limit.
C0/C1 state / C2 state / C6 (non Retention) state / C6(Retention) state / **Auto**

**CPU C6 report**
Enable/Disable CPU C6 (ACPI C3) report to OS.
Disabled / Enabled / **Auto**

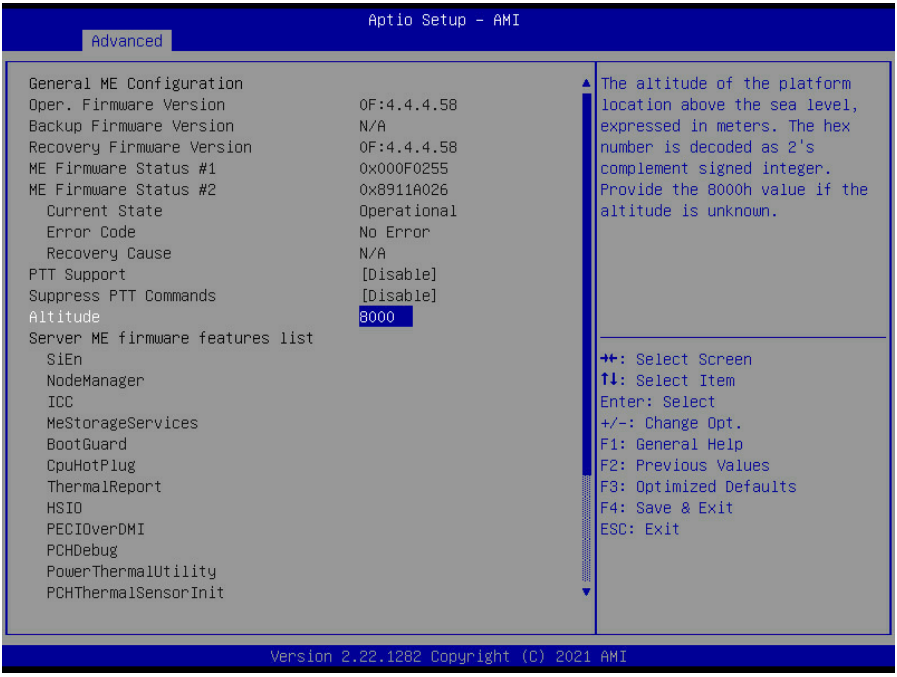
**Enhanced Halt State (C1E)**
Core C1E auto promotion Control. Take effect after reboot.
Disable / **Enable**

### 5.3.12 Memory Topology




Read only.

### 5.3.13 Server ME Configuration




**Altitude**

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

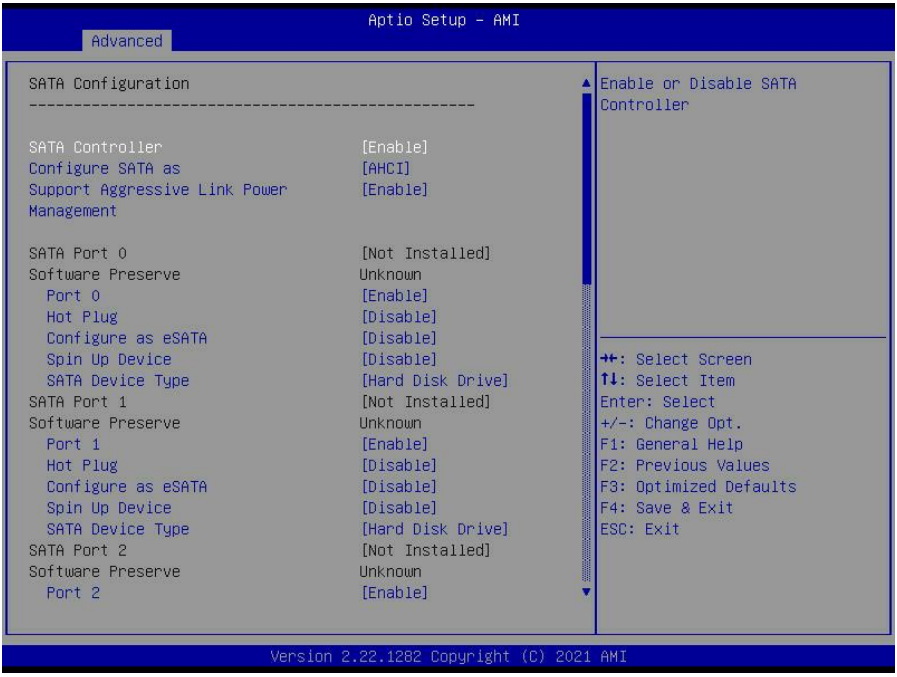
**8000**

### 5.3.14 SATA Configuration


**SATA Configuration**
SATA devices and settings.

**SSATA Configuration**
sSATA devices and settings.

### 5.3.14.1 SATA Configuration




**SATA Controller**
Enable or Disable SATA Controller.
Disable / **Enable**

**Configure SATA as**
Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
**AHCI** / RAID

**Support Aggressive Link Power Management**
Enables/Disables SALP.
Disable / **Enable**

**Port 0/1/2/3/4/5/6/7**
Enable or Disable SATA Port.
**Disable** / Enable

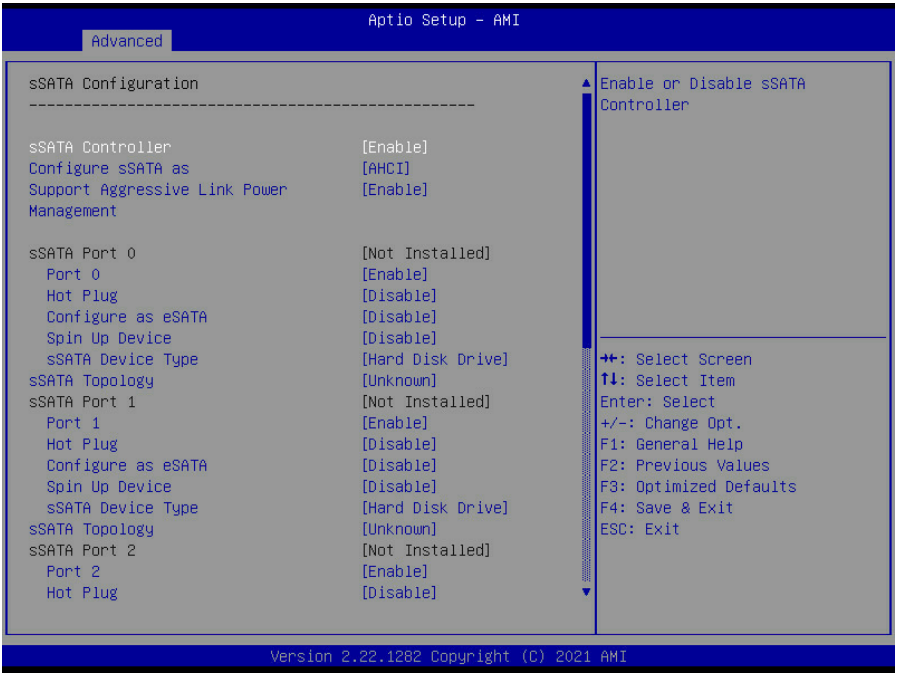
**Hot Plug**
Designates this port as Hot Pluggable.
**Disable** / Enable

**Configure as eSATA**
Configures port as External SATA (eSATA).
**Disable** / Enable

**Spin Up Device**
If enabled for any of ports Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.
**Disable** / Enable

**SATA Device Type**
Identify the SATA port is connected to Solid State Drive or Hard disk Drive.
**Hard Disk Drive** / Solid State Drive

### 5.3.14.2 sSATA Configuration




**sSATA Controller**
Enable or Disable sSATA Controller.
Disable / **Enable**

**Configure sSATA as**
Identify the sSATA port is connected to Solid State Drive or Hard Disk Drive.
**AHCI** / RAID

**Support Aggressive Link Power Management**
Enables/Disables SALP.
Disable / **Enable**

**Port 0/1/2/3/4/5**
Enable or Disable sSATA Port.
Disable / **Enable**

**Hot Plug**
Designates this port as Hot Pluggable.
**Disable** / Enable

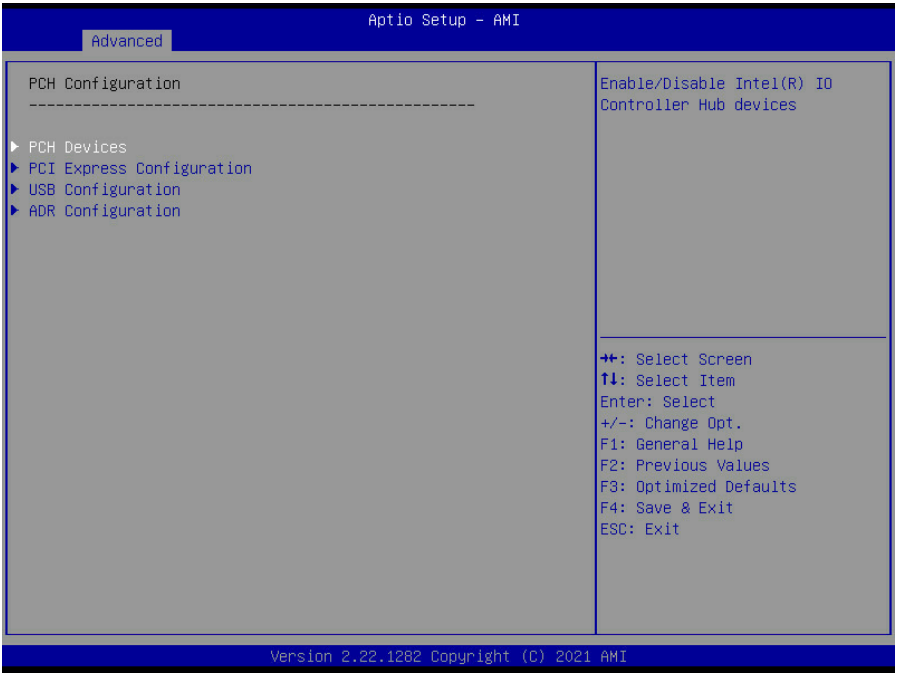
**Configure as eSATA**
Configures port as External SATA (eSATA).
**Disable** / Enable

**Spin Up Device**
If enabled for any of ports Staggered Spin Up will be performed and only the drives witch have this option enabled will spin up at boot. Otherwise all drives spin up at boot.
**Disable** / Enable

**sSATA Device Type**
Identify the SATA port is connected to Solid State Drive or Hard disk Drive.
**Hard Disk Drive** / Solid State Drive

**sSATA Topology**
Identify the Secondary SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2.
**Unknown** / ISATA / Direct Connect / Flex / M2

### 5.3.15 PCH Configuration




**PCH Devices**
Enable/Disable Intel® IO Controller Hub devices.

**PCI Express Configuration**
PCI Express Configuration settings.

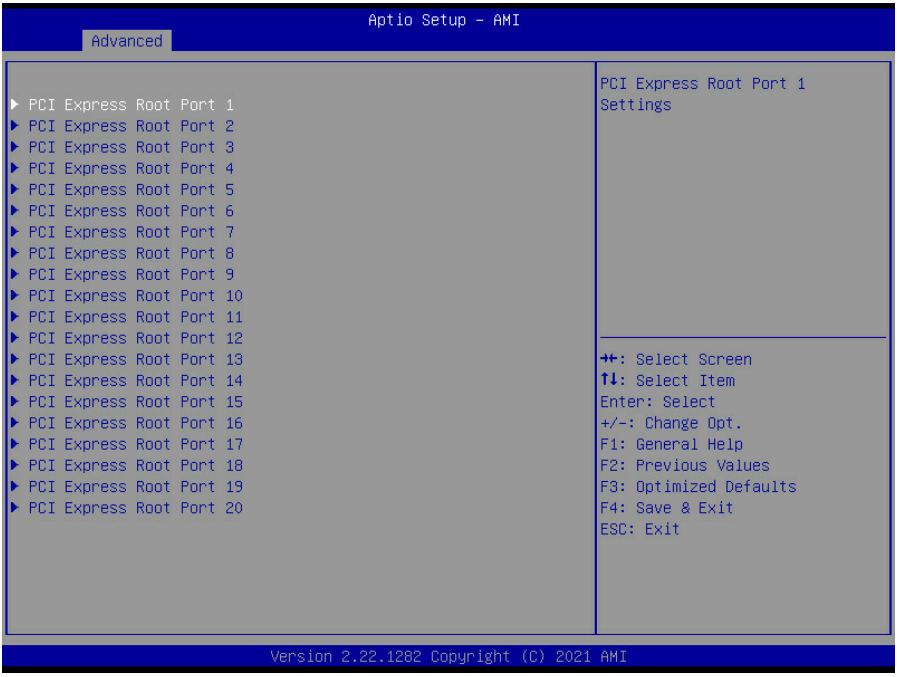
**USB Configuration**
USB Configuration Settings.

**ADR Configuration**
Automatic DIMM Refresh (ADR) Configuration.

### 5.3.15.1 PCH Devices

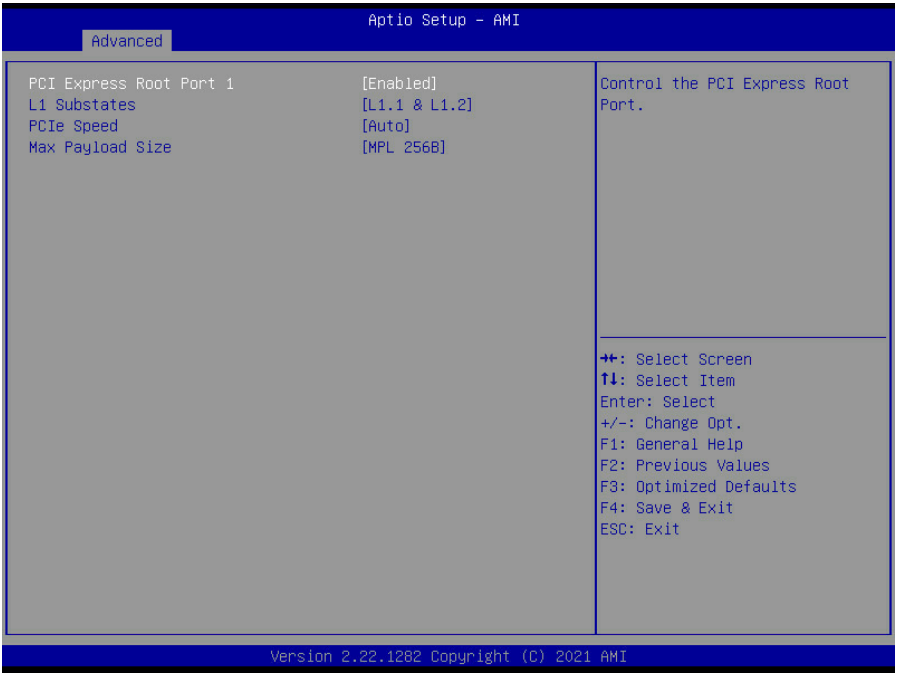

**Restore AC Power Loss**
Select S0/S5 for ACPI state after a G3.
Power On / Power Off / **Last State**

### 5.3.15.2 PCI Express Configuration




**PCI Express Root Port 1~20**
PCI Express Root Port 1~20 Settings.

#### 5.3.15.2.1 PCI Express Root Port 1 ~ 20



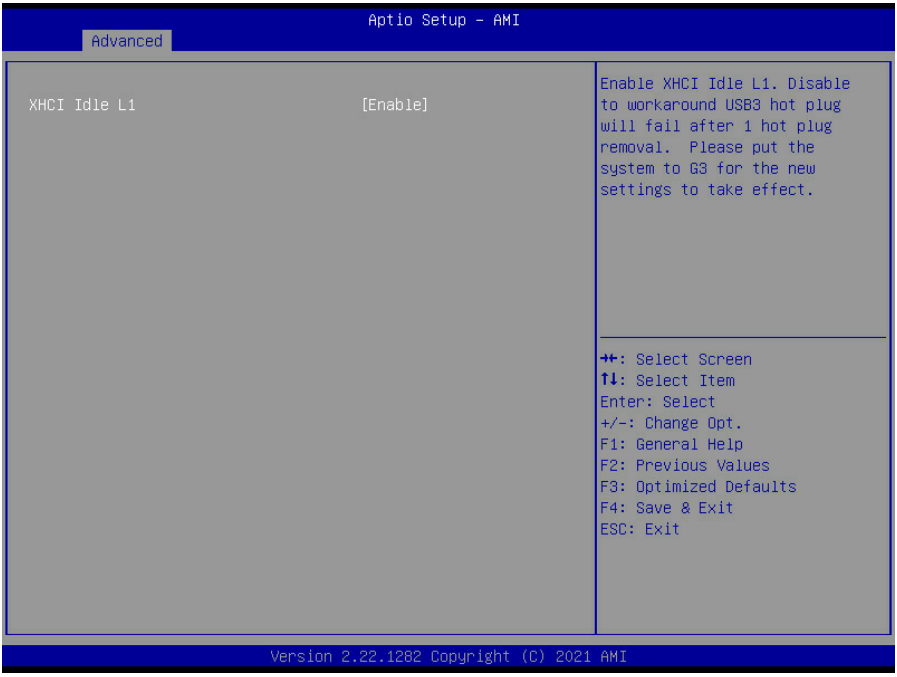

**PCI Express Root Port 1~20**
Control the PCI Express Root Port.
Disabled / **Enabled**
**NOTE: When PCI Express Root Port 1 has set to [Enabled], the following items Will be available to set up.**

**L1 Substates**
PCI Express L1 Substates settings.
Disable / L1.1 / L1.2 / **L1.1 & L1.2**

**PCIe Speed**
Configure PCIe Speed.
**Auto** / Gen1 / Gen2 / Gen3

**Max Payload Size**
PCIE Max Payload Size Selection.
MPL128B / **MPL256B**

### 5.3.15.3 USB Configuration

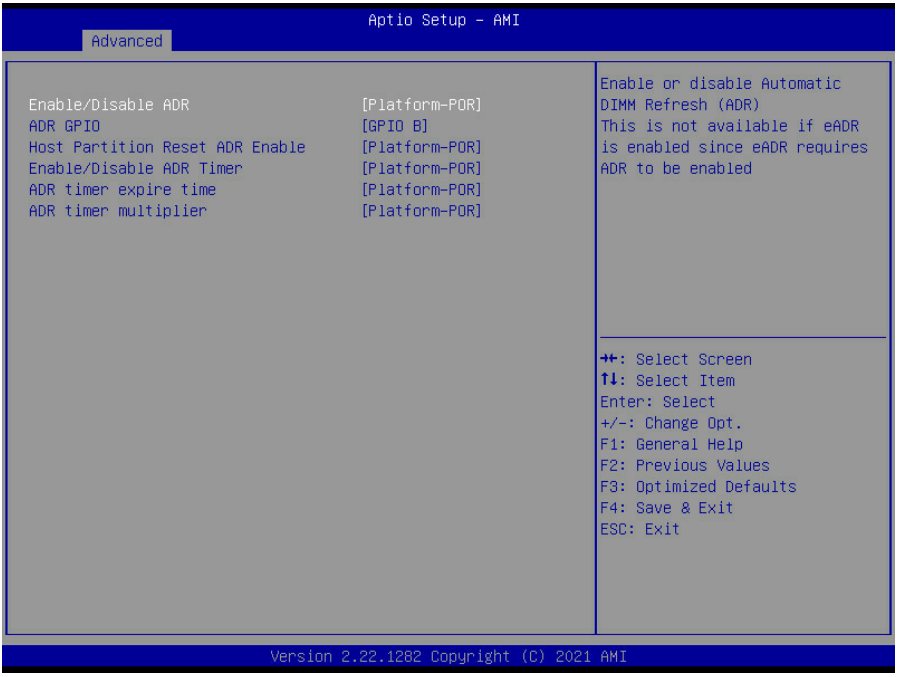



**XHCI Idle L1**

Enable XHCI Idle L1. Disable to workaround USB3 hot plug will fail after 1 hot plug removal. Please put the system to G3 for the new settings to take effect.

Disable **/ Enable**

### 5.3.15.4 ADR Configuration




**Enable/Disable ADR**
Enable or disable Automatic DIMM Refresh (ADR). This is not available if eADR is enabled since eADR requires ADR to be enabled.
**Platform-POR** / Enable / Disable

**ADR GPIO**
Select between GPIO_B or GPIO_C.
**GPIO_B** / GPIO_C

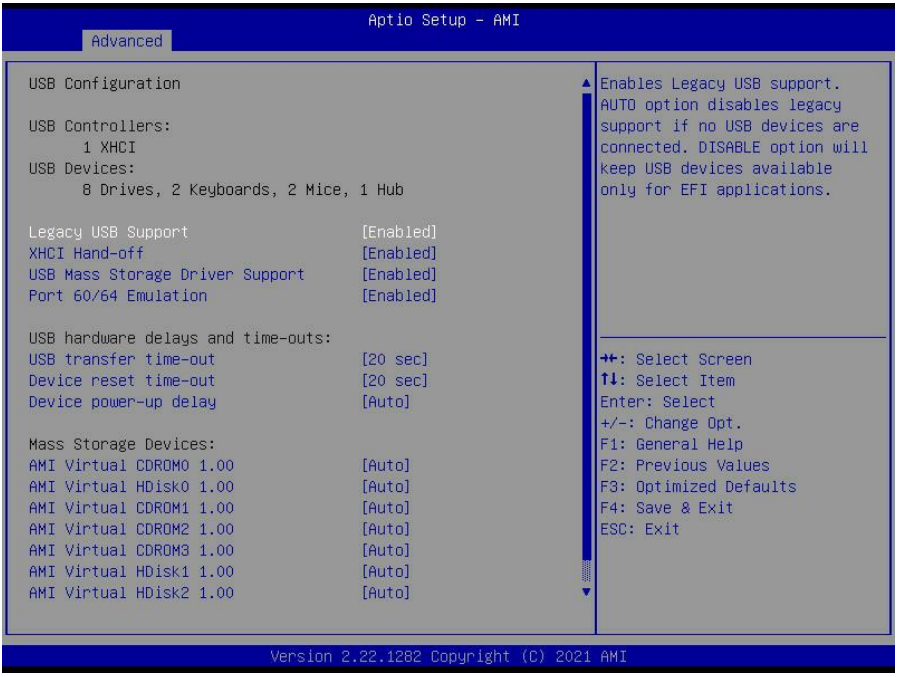
**Host Partition Reset ADR Enable**
Enables/Disables ADR on Host Partition Reset.
**Platform-POR** / Enable / Disable

**Enable/Disable ADR Timer**
Held-off for DEBUG PURPOSES ONLY!.
**Platform-POR** / Enable / Held-off

**ADR timer expire time**
Select proper ADR timer value: 25uS, 50uS, 100uS or 0.
**Platform-POR** / 25 uS / 50 uS / 100 uS / 0 us

**ADR timer multiplier**
Select proper ADR timer multiplier: x1, 8, 24, 40, 56, 64, 72, 80, 88, 96.
**Platform-POR** / x1 / x8 / x24 / x40 / x56 / x64 / x72 / x80 / x88 / x96

### 5.3.16 USB Configuration




**Legacy USB Support**
Enables USB legacy support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

Disabled / **Enabled** / Auto

**XHCI Hand-off**
This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

Disabled / **Enabled**

**USB Mass Storage Driver Support**
Enable/Disable USB Mass Storage Driver Support.

Disabled / **Enabled**

**Port 60/64 Emulation**
Enables I/O Port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

Disabled / **Enabled**

**USB transfer time-out**
The time-out value for Control, Bulk and Interrupt transfers.
1 sec / 5 sec / 10 sec / **20 sec**

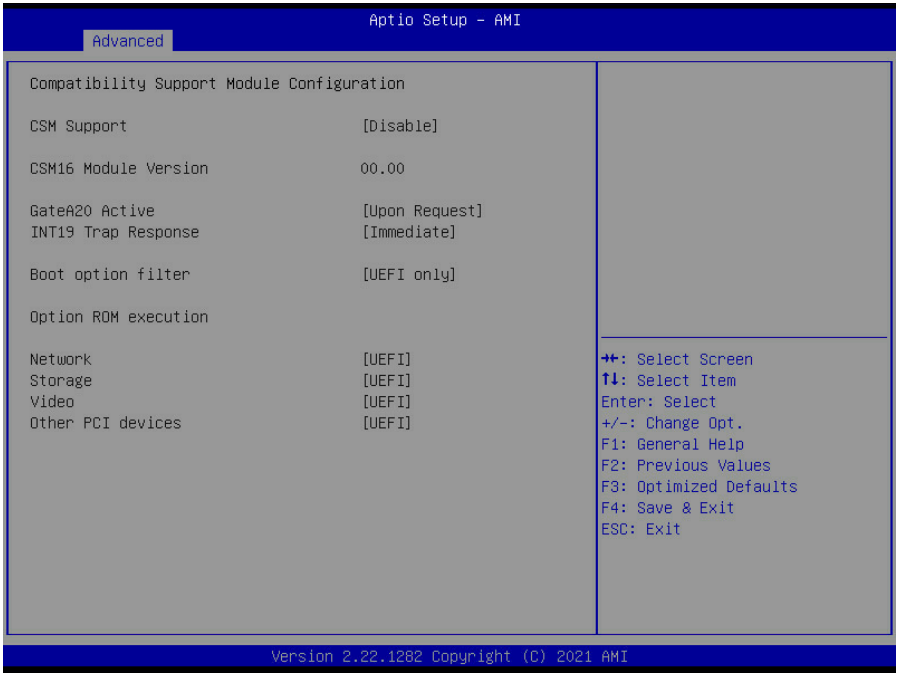
**Device reset time-out**
USB mass storage device Start Unit command time-out.
10 sec / **20 sec** / 30 sec / 40 sec

**Device power-up delay**
Maximum time the device will take before it properly reports itself to the Host Controller. 'AUTO' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.
**Auto** / Manual
**NOTE: Device power up delay in seconds** is available when **Device power-up delay** is set to [Manual].

**AMI Virtual CDROM0/1/2/3 1.00**
Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.
**Auto** / Floppy / Forced FDD / Hard Disk / CD-ROM

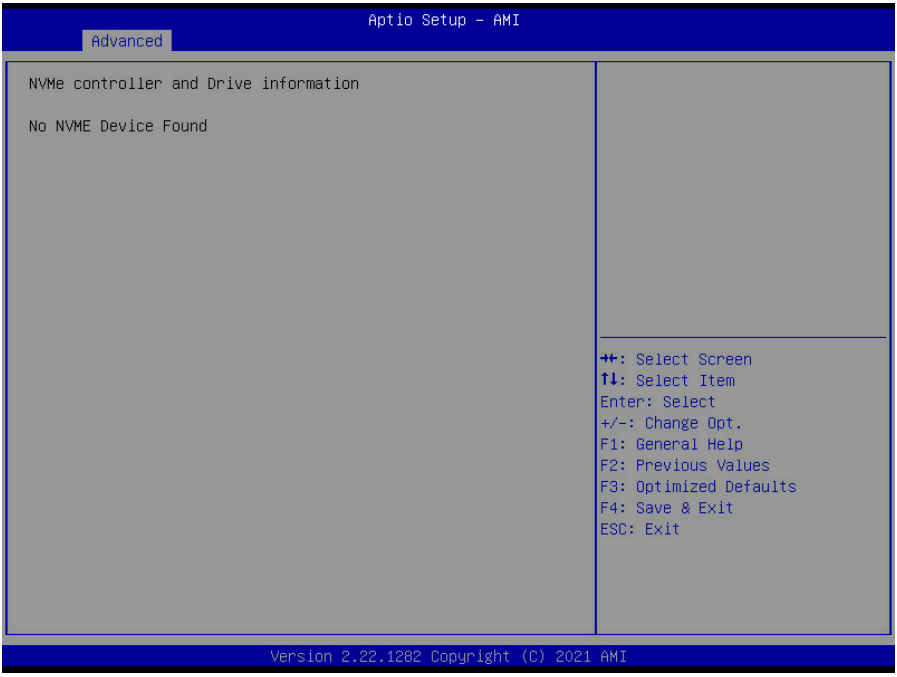
**AMI Virtual HDisk0/1/2/3 1.00**
Mass storage device emulation type. 'Auto' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.
**Auto** / Floppy / Forced FDD / Hard Disk / CD-ROM

### 5.3.17 CSM Configuration



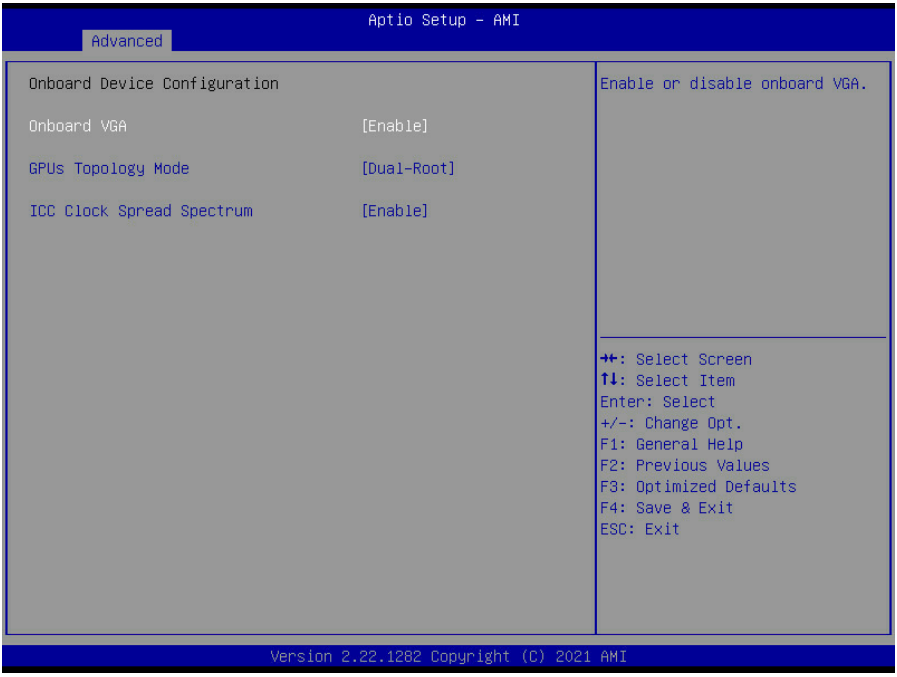

Only Read

### 5.3.18 NVMe Configuration




This page shows the Device Name you installed. Press Enter to read the device information. If no NVME device is installed, it shows no NVME device is found. Read only.

### 5.3.19 Onboard Device Configuration

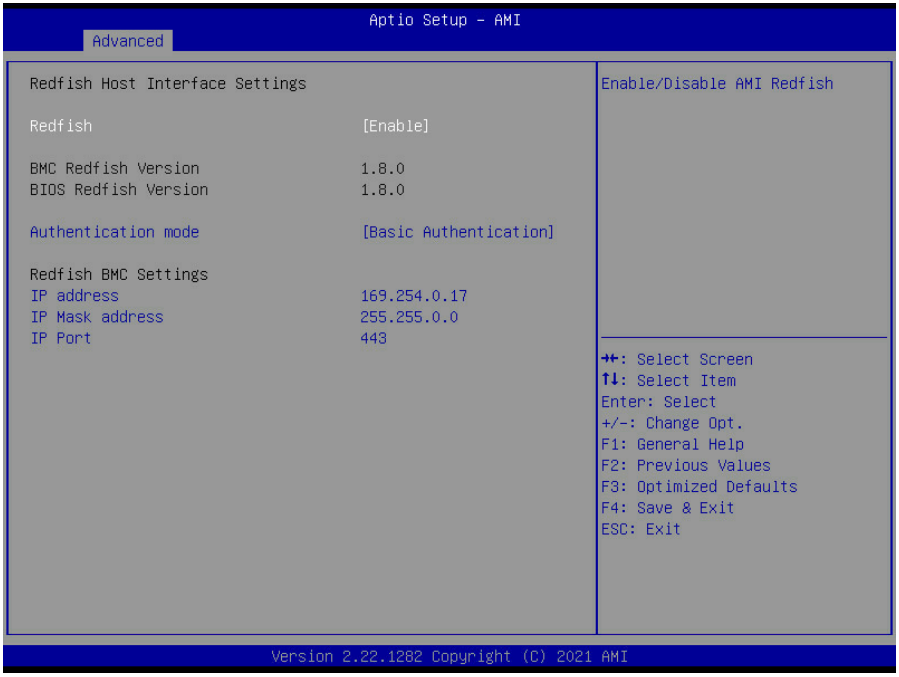



**Onboard VGA**
Enable or disable onboard VGA.
**Enable** / Disable

**GPUs Topology Mode**
Single root means that all GPUs are connected to the same CPU, which is the CPU0. Dual-root means half of the GPUs are on CPU0 and the other half are attached to the CPU1.
Single-Root **/ Dual-Root**

**ICC Clock Spread Spectrum**
Turn on/off Spread Spectrum Setting for IsCLK.
**Enable** / Disable

### 5.3.20 Redfish Host Interface Configuration




**Redish Host Interface Settings**
Enable/Disable AMI Redfish
Disable **/ Enable**
**NOTE: When Redfish Host Interface Settings set to [Enabled], the following items will appear.**

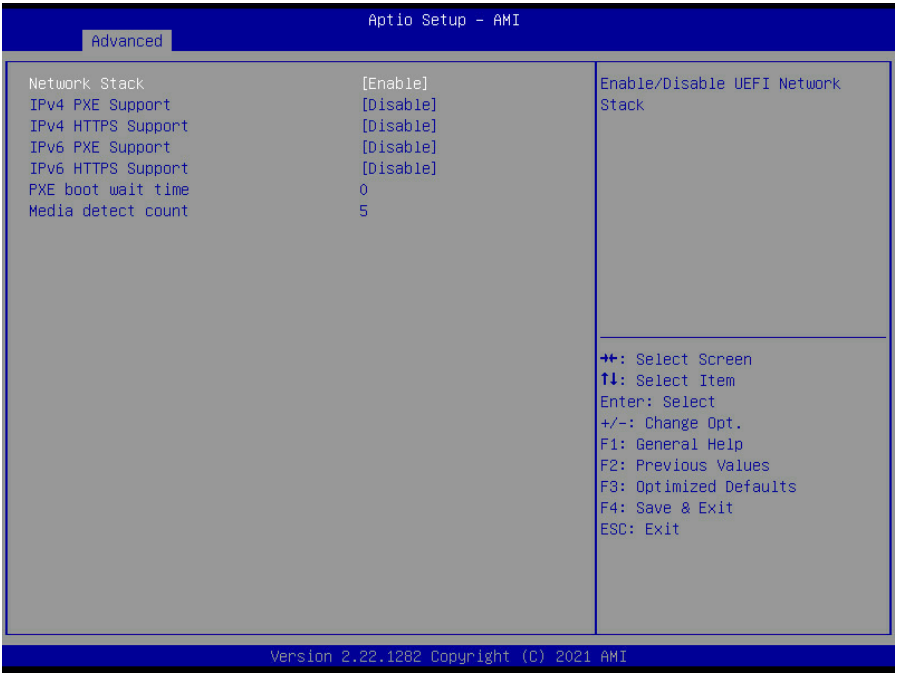
**Authentication mode**
Select authentication mode
**Basic Authentication /** Session Authentication

**IP Address**
Enter IP address.

**IP Mask Address**
Enter IP Mask address.

**IP Port**
Enter IP Port.

### 5.3.21 Network Stack Configuration




**NOTE:** The BIOS will automatically read the onboard LAN controller.

**Network Stack**
Enable/Disable UEFI Network Stack.
Disable / **Enable**
**NOTE: The following items are available when Network Stack is set to [Enable].**

**Ipv4 PXE Support**
Enable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot option will not be created.
**Disable** / Enable

**Ipv4 HTTPS Support**
Enable Ipv4 HTTP Boot Support. If disabled IPV4 HTTP boot option will not be created.
**Disable** / Enable

**Ipv6 PXE Support**
Enable Ipv6 PXE Boot Support. If disabled IPV6 PXE boot option will not be created.
**Disable** / Enable

**Ipv6 HTTPS Support**
Enable Ipv6 HTTP Boot Support. If disabled IPV6 HTTP boot option will not be created.

**Disable** / Enable

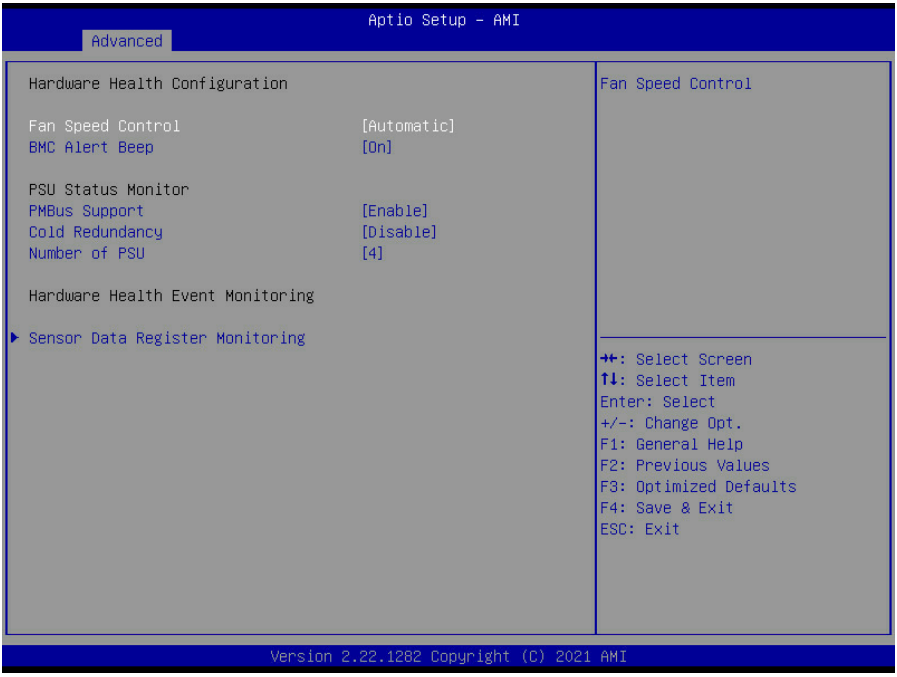
**PXE boot wait time**
Wait time in seconds to press ESC key to abort the PXE boot. Use either+/- or numeric keys to set the value.

**0**

**Media detect count**
Number of times presence of media will be checked. Use either+/- or numeric keys to set the value.

**5**

### 5.3.22 Hardware Health Configuration




**Fan Speed Control**
Fan Speed Control.
**Automatic** / Manual / Full Speed
**NOTE:** Change the **Fan Speed Control** BIOS setting from [Manual] to [Full Speed] when installing the Nvidia GeForce / Quardro GPU and any VGA card.

**PWM Minimal Duty Cycle**
PWM Minimal Duty Cycle (%).
**30**
**NOTE:** This item is available when **Fan Speed Control** is set to [Manual].

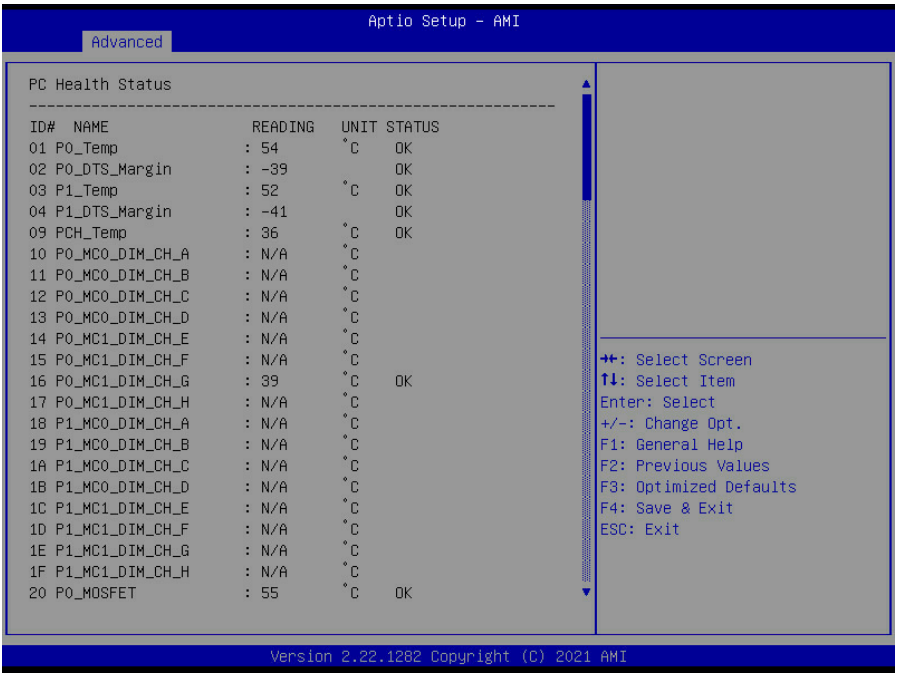
**BMC Alert Beep**
Enable/Disable BMC Alert Beep.
**On** / Off

**PMBus support**
PMBus Support.
**Enable** / Disable

**Cold Redundancy**
Enabled or Disabled Advanced System Power Saving
Enable **/ Disable**

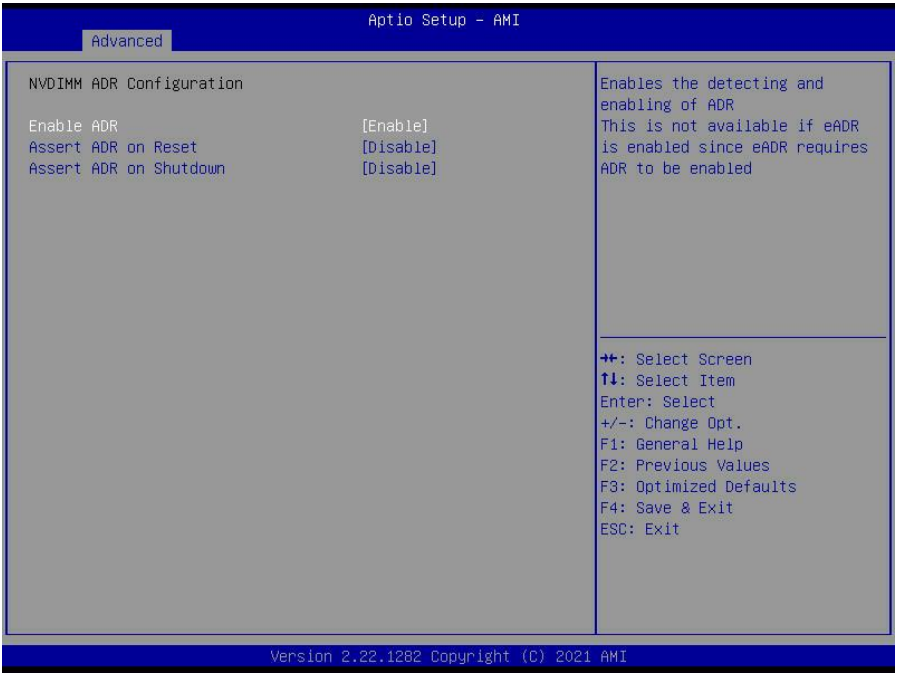
**Number of PSU**
1 / 2 / 3 / **4**

### 5.3.22.1 Sensor Data Register Monitoring




**NOTE:** SDR cannot be modified. Read only.

### 5.3.23 NVDIMM ADR Configuration




**Enable ADR**
Enables the detecting and enabling of ADR. This is not available if eADR is enabled since eADR requires ADR to be enabled.

**Enable** / Disable

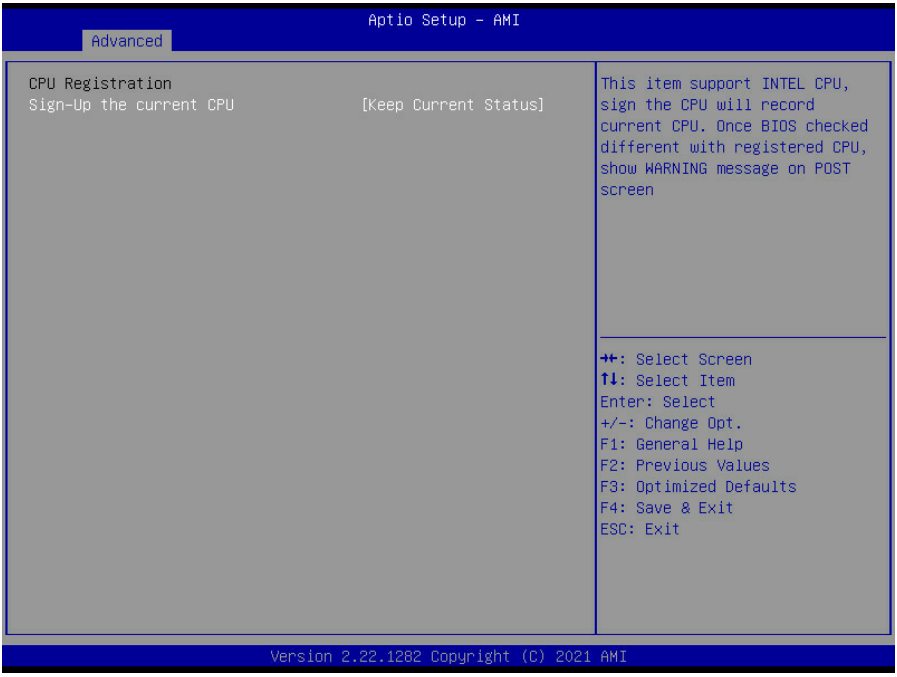
**Assert ADR on Reset**
Assert ADR on Reset.

Enable / **Disable**

**Assert ADR on Shutdown**
Assert ADR on Shutdown.

Enable / **Disable**

### 5.3.24 CPU Registration

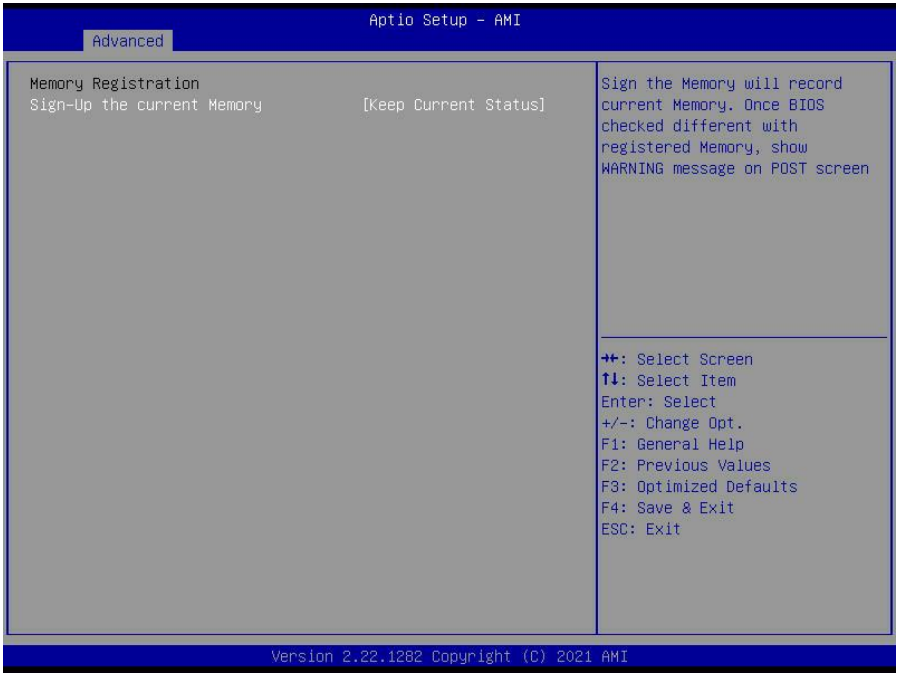



**Sign-Up the current CPU**

This item support INTEL CPU, sign the CPU will record current CPU. Once BIOS checked different with registered CPU, show WARNING message on POST screen.

Deregistration / Sign-up / **Keep Current Status**

### 5.3.25 Memory Registration

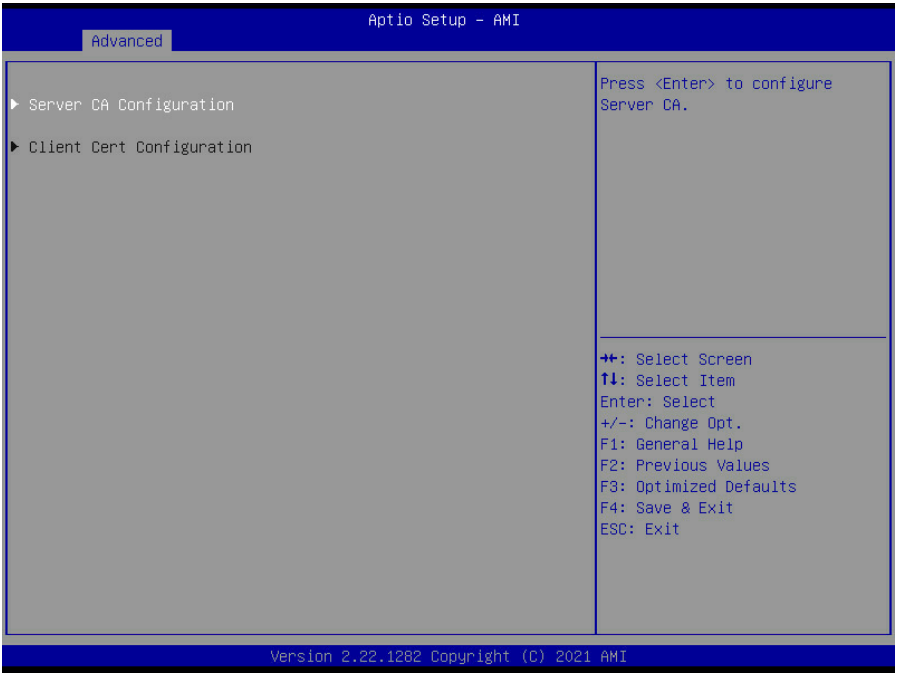



**Sign-up the current Memory**

Sign the Memory will record current Memory. Once BIOS checked different with registered Memory, show WARNING message on POST screen.

Deregistration / Sign-up / **Keep Current Status**

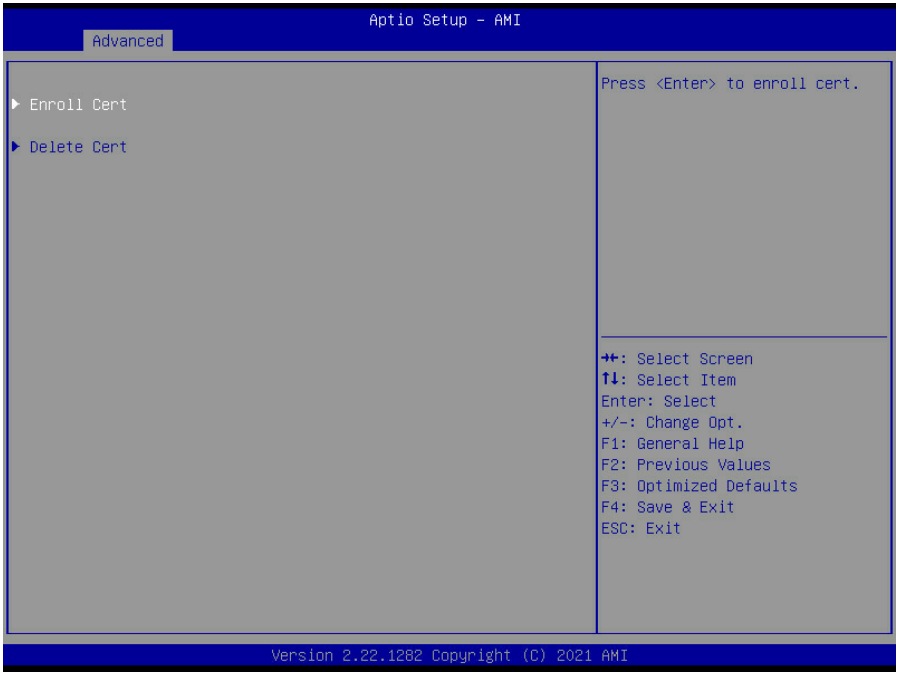
### 5.3.26 T1s Auth Configuration




**Server CA Configuration**
Press <Enter> to configure Server CA.

**Client Cert Configuration**
Press <Enter> to configure Client Cert.

### 5.3.26.1 Server CA Configuration




**Enroll Cert**
Press <Enter> to enroll cert.

**Delete Cert**
Press <Enter> to delete cert.

#### 5.3.25.1.1 Enroll Cert

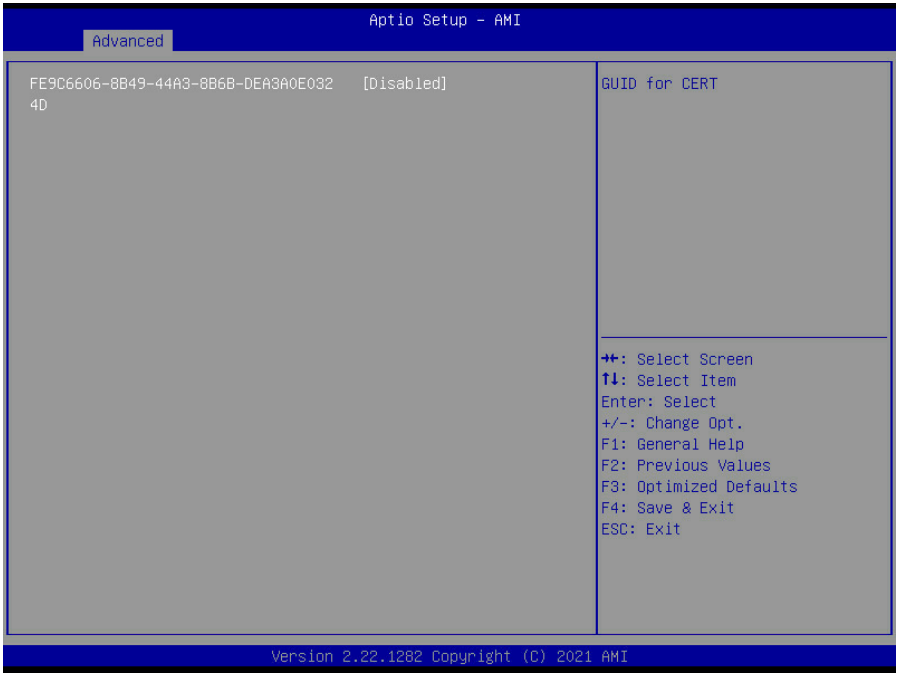

**Enroll Cert Using File**
Enroll Cert Using File.

**Cert GUID**
Input digit character in 11111111-2222-3333-4444-1234567890ab format.

**Commit Changes and Exit**
Commit Changes and Exit.

**Discard Changes and Exit**
Discard Changes and Exit.

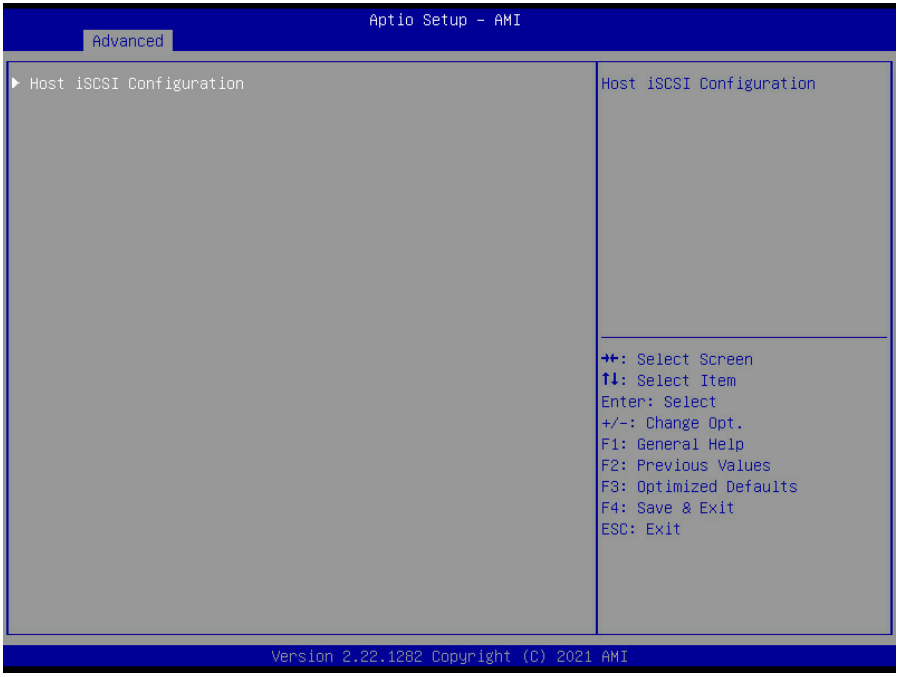
#### 5.3.25.1.2 Delete Cert




**FE9C6606-8B49-44A3-8B6B-DEA3A0E032**
GUID for CERT.

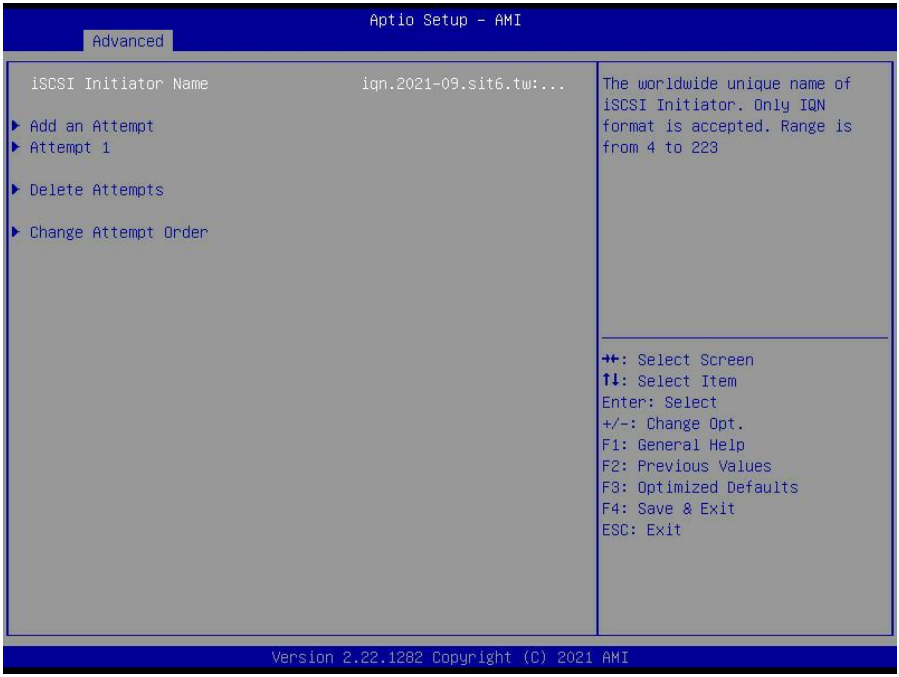
**Disabled** / Enabled

### 5.3.26 iSCSI Configuration




**Host iSCSI Configuration**
Host iSCSI Configuration

### 5.3.26.1 Host iSCSI Configuration



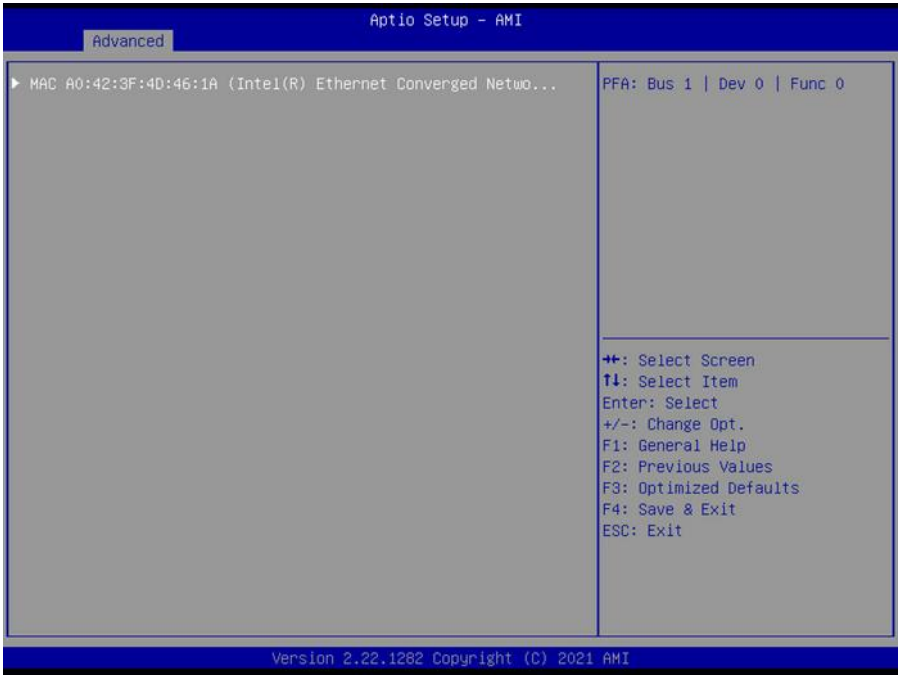

**iSCSI Initiator Name**
The worldwide unique name of iSCSI Initiator. Only IQN format is accepted. Enter [**iqn.xxx**]. xxx ranges from 4 to 223.

**Add an Attempt**
Add an Attempt.

**Delete Attempts**
Delete one or more attempts.

**Change Attempt Order**
Change the order of Attempts using +/- keys. Use arrow keys to select the attempt then press +/- to move the attempt up/down in the attempt order list.

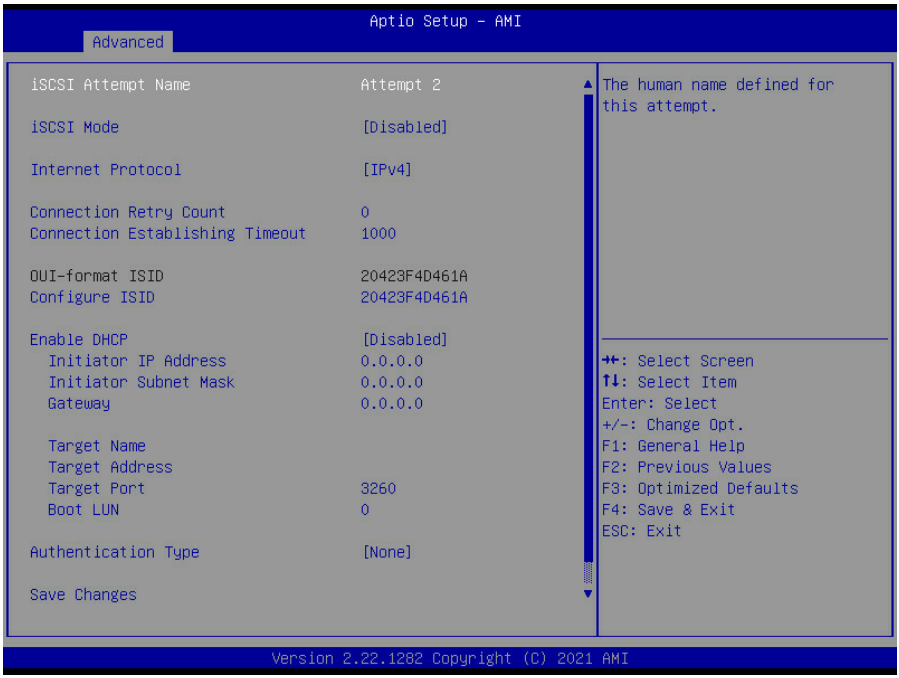
#### 5.3.26.1.1 Add an Attempt




**NOTE:** Only LAN1 supports iSCSI function.

**MAC xx:xx:xx:xx:xx:xx (Intel® I210 Gigabit Network Connection)**
PFA: Bus 2 / Dev 0 / Func 0.

#### 5.3.26.1.1.1 MAC xx:xx:xx:xx:xx:xx (Intel® I210 Gigabit Network Connection)




**iSCSI Attempt Name**
The human name defined for this attempt. Maximum length is up to 12 characters.
**Attempt 2**

**iSCSI Mode**
Disabled, Enabled, Enabled for MPIO.
**Disabled** / Enabled / Enabled for MPIO

**Internet Protocol**
Initiator IP address is system assigned in IP6 mode. In Autoconfigure mode, iSCSI driver will attempt to connect iSCSI target via IPv4 stack, if failed then attempt IPv6 stack.
**IPv4** / IPv6 / Autoconfigure

**Connection Retry Count**
The minimum value is 0 and the maximum is 16. 0 means no retry.

**Connection Establishing Timeout**
The timeout value in milliseconds. The minimum value is 100 milliseconds and the maximum is 20 seconds.

**Configure ISID**
OUI-format ISID in 6 bytes, default value is derived from MAC address. Only last 3 bytes are configurable. Example: update 0ABBCCDDEEFF to OABBCCF07901 by input F07901.

**Enable DHCP**
Enable DHCP.
**Disabled** / Enabled

**Initiator IP Address**
Enter IP address in dotted-decimal notation.

**Initiator Subnet Mask**
Enter IP address in dotted-decimal notation.

**Gateway**
Enter IP address in dotted-decimal notation.

**Target Name**
The worldwide unique name of the target. Only iqn. format is accepted.
**iqu. xxx**

**Target IP Address**
Enter IP address in dotted-decimal notation.

**Target Port**
Target Port.

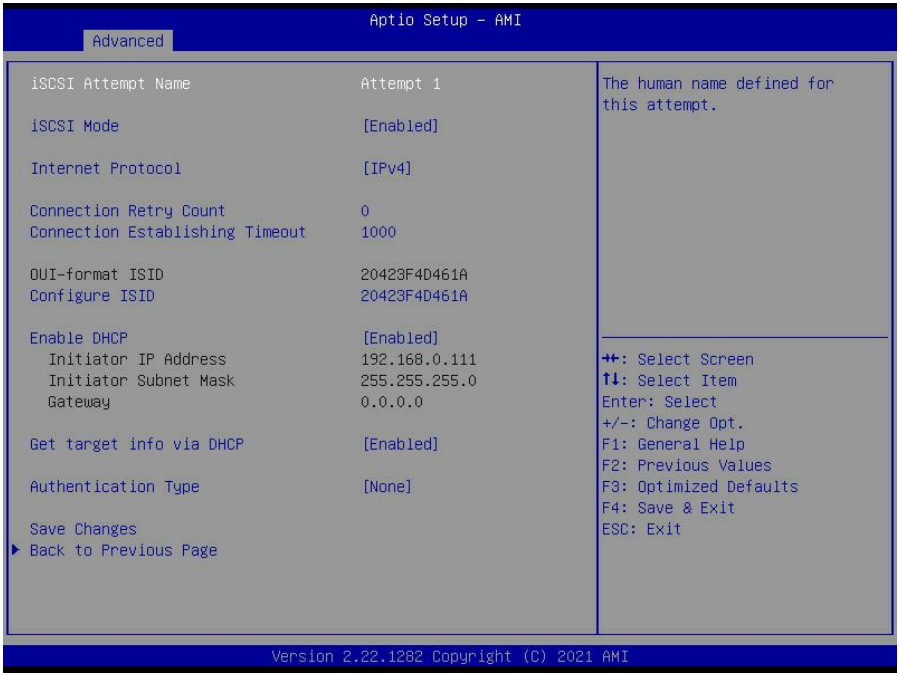
**Boot LUN**
Hexadecimal representation of the LU number. Examples are:
4752-3A4F-6b7e-3F99, 6734-9-156f-127, 4186-9.

**Authentication Type**
Authentication method: CHAP, Kerberos, or None.
CHAP / **None**

**Save Changes**
Must reboot system manually for changes to take place.

**Back to Previous Page**
Back to Previous Page.

### 5.3.26.1.2 Attempt 1




**iSCSI Attempt Name**
The human name defined for this attempt.
**Attempt 1**

**iSCSI Mode**
Disabled, Enabled, Enabled for MPIO.
**Disabled** / Enabled / Enabled for MPIO

**Internet Protocol**
Initiator IP address is system assigned in IP6 mode. In Autoconfigure mode, iSCSI driver will attempt to connect iSCSI target via IPv4 stack, if failed then attempt IPv6 stack.
**IPv4** / IPv6 / Autoconfigure

**Connection Retry Count**
The minimum value is 0 and the maximum is 16. 0 means no retry.

**Connection Establishing Timeout**
The timeout value in milliseconds. The minimum value is 100 milliseconds and the maximum is 20 seconds.

**Configure ISID**
OUI-format ISID in 6 bytes, default value is derived from MAC address. Only last 3 bytes are configurable. Example: update 0ABBCCDDEEFF to OABBCCF07901 by input F07901.

**Enable DHCP**
Enable DHCP.
**Disabled** / Enabled

**Initiator IP Address**
Enter IP address in dotted-decimal notation.

**Initiator Subnet Mask**
Enter IP address in dotted-decimal notation.

**Gateway**
Enter IP address in dotted-decimal notation.

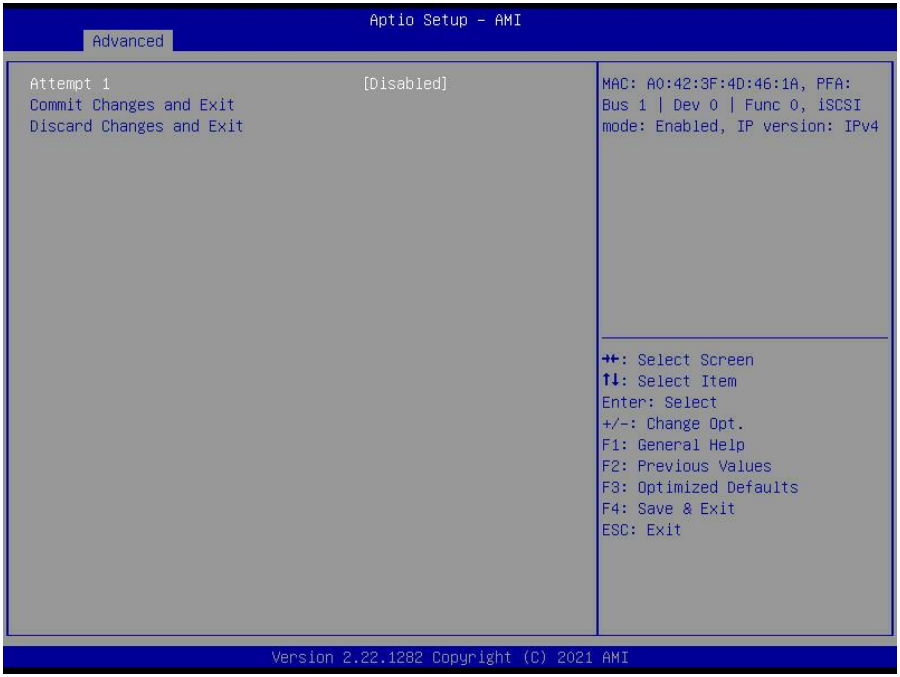
**Get target info via DHCP**
Get target info via DHCP

**Authentication Type**
Authentication method: CHAP, Kerberos, or None.
CHAP / **None**

**Save Changes**
Must reboot system manually for changes to take place.

**Back to Previous Page**
Back to Previous Page.

### 5.3.26.1.3 Delete Attempts




**Attempt 1**
MAC xx:xx:xx:xx:xx:xx, PFA: Bus 2 / Dev 0 / Func 0, iSCSI mode: Disabled, IP version: IPv4.

**Disabled** / Enabled

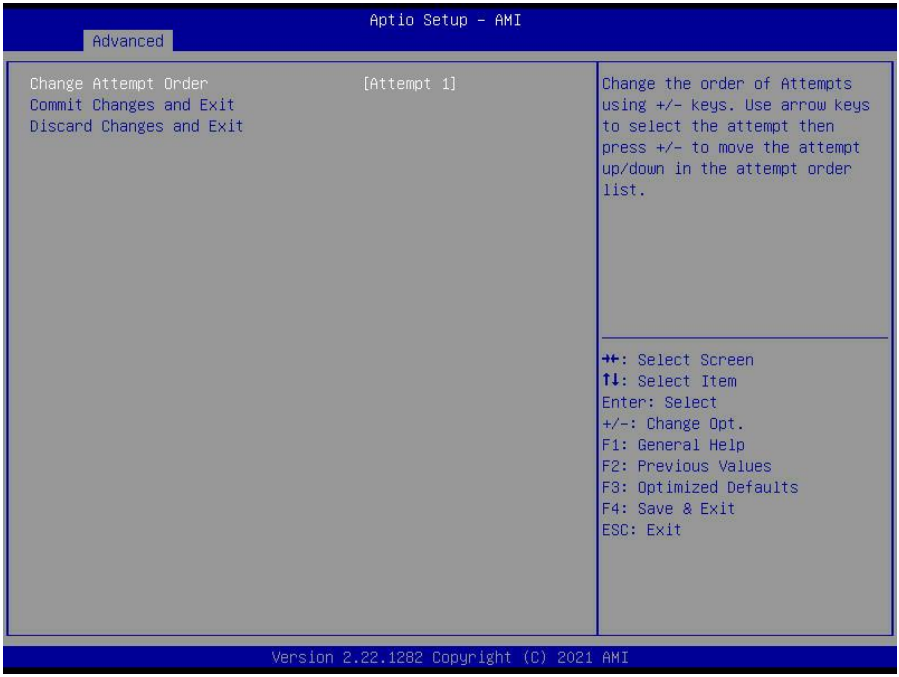
**Attempt 2**
MAC xx:xx:xx:xx:xx:xx, PFA: Bus 2 / Dev 0 / Func 0, iSCSI mode: Disabled, IP version: IPv4.

**Disabled** / Enabled

**Commit Changes and Exit**
Commit Changes and Exit.

**Discard Changes and Exit**
Discard Changes and Exit.

### 5.3.26.1.4 Change Attempt Order



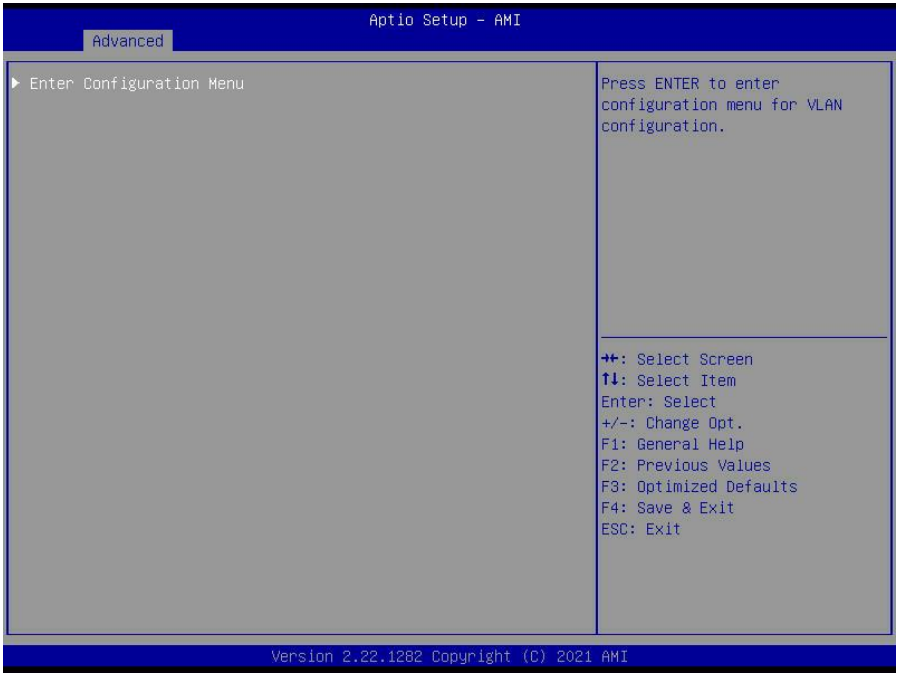

**Change Attempt Order**
Change the order of Attempts using +/- keys. Use arrow keys to select the attempt then press +/- to move the attempt up/down in the attempt order list.

**Attempt 1**

**Commit Changes and Exit**
Commit Changes and Exit.

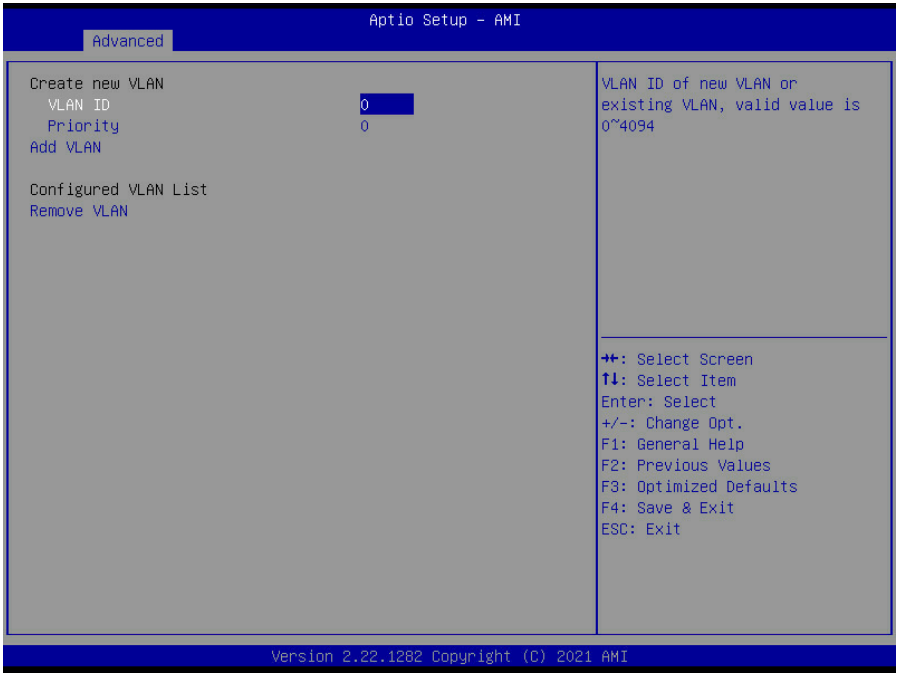
**Discard Changes and Exit**
Discard Changes and Exit.

### 5.3.27 VLAN Configuration (MAC:xxxxxxxxxxxx)




**Enter Configuration Menu**
Press ENTER to enter configuration menu for VLAN configuration.

### 5.3.27.1 Enter Configuration Menu



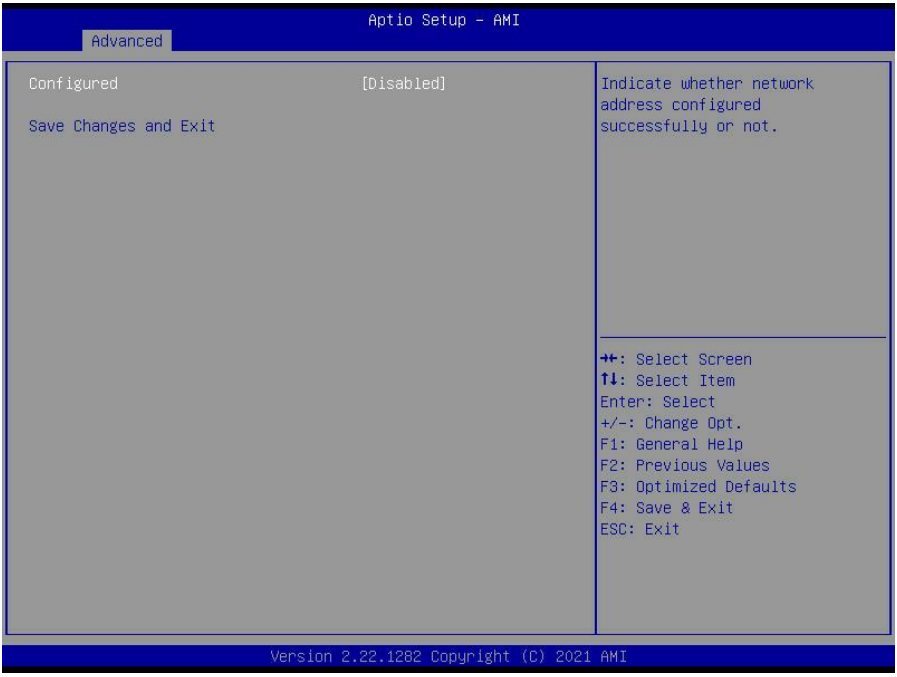

**VLAN ID**
VLAN ID of new VLAN or existing VLAN, valid value is 0~4094.

**Priority**
802.1Q Priority, valid value is 0~7.

**Add VLAN**
Create a new VLAN or update existing VLAN.

**Remove VLAN**
Remove selected VLANs.

### 5.3.28 MAC:xxxxxxxxxxxx - IPv4 Network Configuration




**Configured**
Indicate whether network address configured successfully or not.
**Disabled** / Enabled

**Save Changes and Exit**
Save Changes and Exit.

### 5.3.29 MAC:xxxxxxxxxxxx - IPv6 Network Configuration


**Enter Configuration Menu**
Press ENTER to enter configuration menu for IPv6 configuration.

### 5.3.29.1 Enter Configuration Menu


**Interface ID**
The 64 bit alternative interface ID for the device. The string is colon separated, e.g. ff:dd:88:66:cc:1:2:3

**xx:xx:x:xx:xx:xx:xx:xx**

**DAD Transmit Count**
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.

**1**

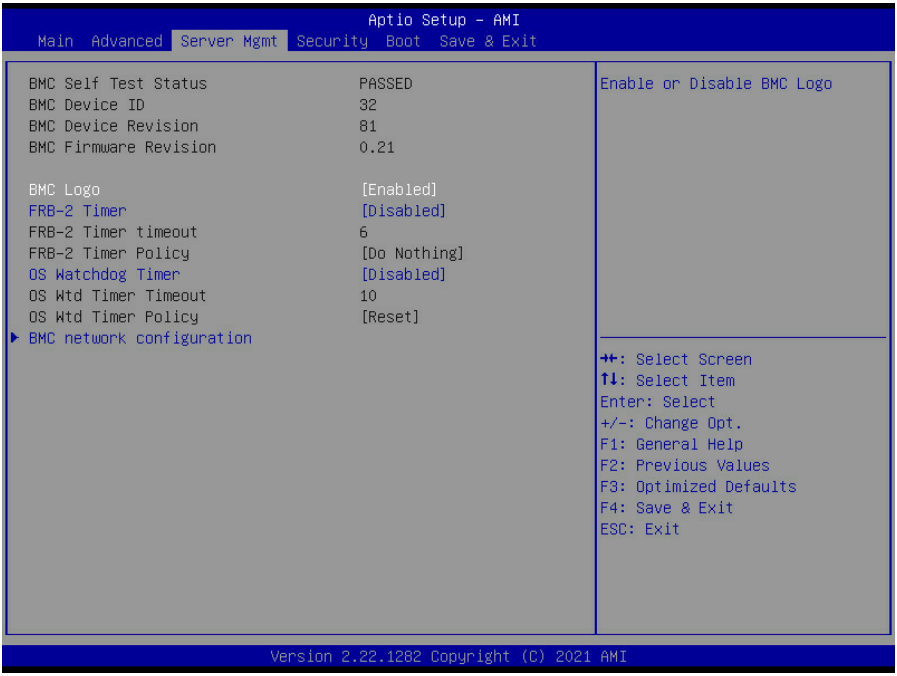
**Policy**
Automatic or manual.

**Automatic** / Manual

**NOTE:** The **Advanced Configuration** submenu is available when **Policy** is set to [Manual].

**Save Changes and Exit**
Save Changes and Exit.

## 5.4 Server Management




**BMC Logo**
Enable or Disable BMC Logo.
**Enabled** / Disabled

**FRB-2 Timer**
Enable or Disable FRB-2 timer (POST timer).
Enabled / **Disabled**
**NOTE: FRB-2 Timer timeout** and **FRB-2 Timer Policy** are available when **FRB-2 Timer** is set to [Enabled].

**FRB-2 Timer timeout**
Enter value Between 3 to 6 min for FRB-2 Timer Expiration value. Not available if FRB-2 Timer is disabled.
**6**

**FRB-2 Timer Policy**
Configure how the system should respond if the FRB-2 Timer expires. Not available if FRB-2 Timer is disabled.
**Do Nothing** / Reset / Power Down / Power Cycle

**OS Watchdog Timer**
If enabled, starts a BIOS timer which can only be shut off by Management Software after the OS loads. Helps determine that the OS successfully loaded or follows the OS Boot Watchdog Timer policy.

Enabled / **Disabled**

**NOTE: OS Wtd Timer timeout** and **OS Wtd Timer Policy** are available when **OS Watchdog Timer** is set to [Enabled].

**OS Wtd Timer timeout**
Configure the length of the OS Boot Watchdog Timer. Not available if OS Boot Watchdog timer is disabled.

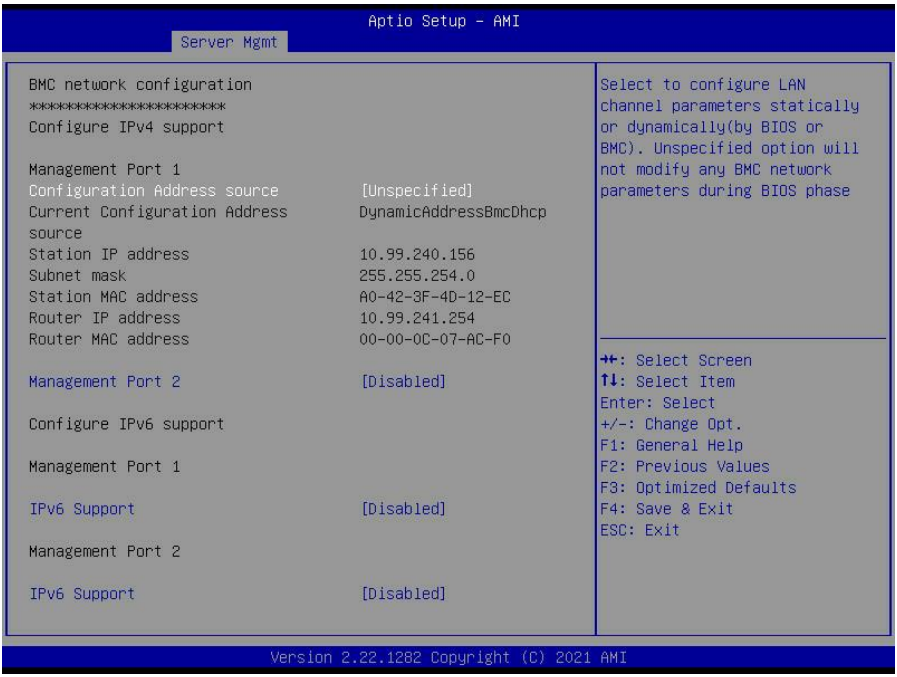
**10**

**OS Wtd Timer Policy**
Configure how the system should respond if the OS Boot Watchdog Timer expires. Not available if OS Boot Watchdog timer is disabled.

Do Nothing / **Reset** / Power Down / Power Cycle

**BMC network configuration**
Configure BMC network parameters.

### 5.4.1 BMC Network Configuration



### Configure IPV4 support

**Management Port 1**

**Configuration Address Source**

Select the configure LAN channel parameters statically or dynamically (by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.

**Unspecified /** Static / DynamicBmcDhcp / DynamicBmcNonDhcp

**Management Port 2**

Enable/Disable BMC Share NIC.

Enabled / **Disabled**

### Configure IPV6 support

**Management Port 1**

**IPV6 Support**

Enable or Disable LAN1 IPV6 Support.

Enabled / **Disabled**

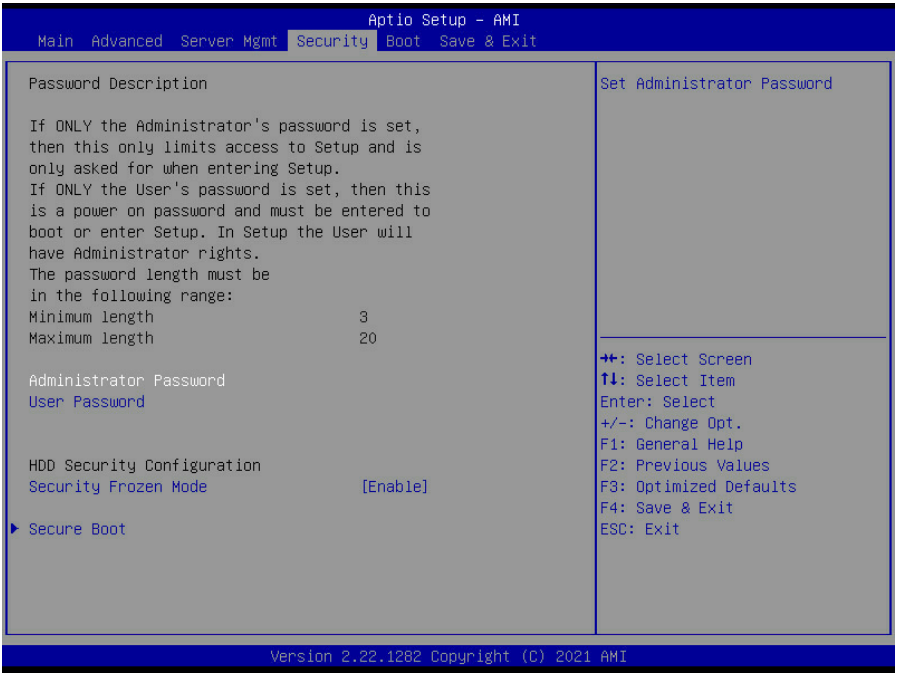
**Management Port 2**

**IPV6 Support**

Enable or Disable LAN2 IPV6 Support.

Enabled / **Disabled**

## 5.5 Security




**Administrator Password**
Set administrator password in the ***Create New Password*** window. After you key in the password, the ***Confirm New Password*** window will pop out to ask for confirmation.

**User Password**
Set user password in the ***Create New Password*** window. After you key in the password, the ***Confirm New Password*** window will pop out to ask for confirmation.

**Secure Frozen Mode**
Disable means Hard Drive on Non-frozen mode. Enable means Hard Drive on Frozen mode.

**Enable** / Disable

**Secure Boot**
Secure Boot Configuration.

### 5.5.1 Secure Boot


**Secure Boot**

Secure Boot feature is Active if Secure Boot is Enabled. Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset.

Enable / **Disable**

**Secure Boot Mode**

Secure Boot mode selector: Standard/Custom. In Custom mode Secure Boot Variables can be configured without authentication.

**Standard** / Custom

**NOTE:** When Secure Boot Mode set to **[Custom]**, **Restore Factory Keys** and **Key management will be available to set up.**

**Restore Factory Keys**

Force System to User Mode. Install factory default Secure Boot key databases. Press 'Yes' to proceed 'No' to cancel.

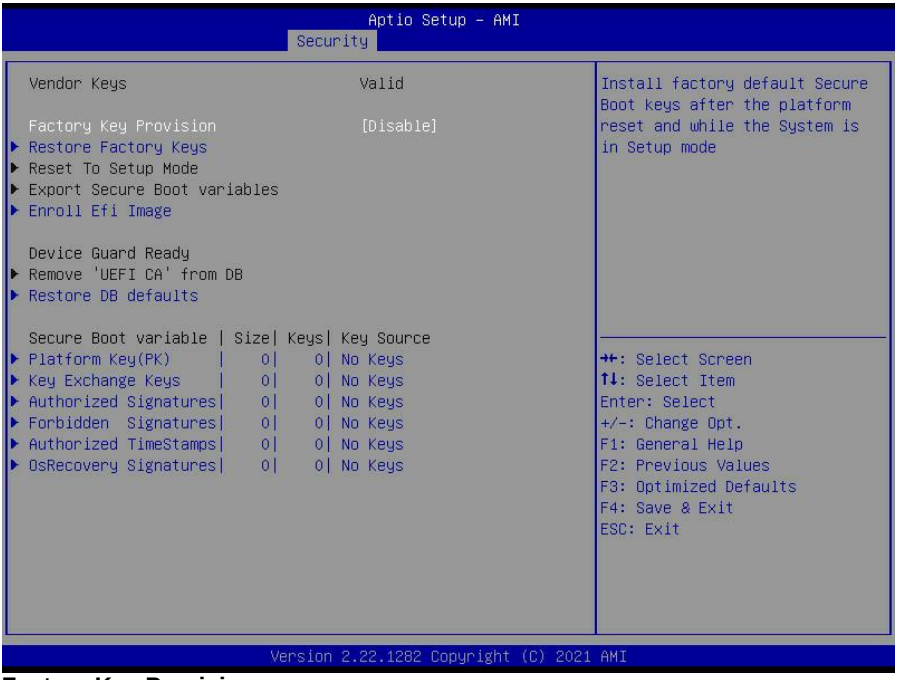
**Reset to Setup Mode**

Delete all Secure Boot key database from NVRAM. Deleting all variables will reset the System to Setup Mode. Press 'Yes' to proceed 'No' to cancel.

**Key Management**

Enables expert users to modify Secure Boot Policy variables without full authentication.

#### 5.5.1.1 Key Management




**Factory Key Provision**
Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.

Enable / **Disable**

**NOTE: Factory Key Provision should be set to [Enable],the following items will be available to set up.**

**Restore Factory Keys**
Force System to User Mode. Install factory default Secure Boot key databases. Press 'Yes' to proceed 'No' to cancel.

**Reset to Setup Mode**
Delete all Secure Boot key database from NVRAM. Deleting all variables will reset the System to Setup Mode.
Press 'Yes' to proceed 'No' to cancel.

**Export Secure Boot variables**
Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.

**Enroll Efi Image**
Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).

**Remove 'UEFI CA' from DB**
Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database (db). Press 'Yes' to proceed 'No' to cancel.

**Restore DB defaults**
Restore DB variable to factory defaults. Press 'Yes' to proceed 'No' to cancel.

**Platform Key (PK)**
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:
    a) EFI_SIGNATURE_LIST
    b) EFI_CERT_X509 (DER)
    c) EFI_CERT_RSA2048 (bin)
    d) EFI_CERT_SHAXXX
2. Authenticated UEFI Variable
3. EFI PE/C0FF Image (SHA256)
Key source: Factory, External, Mixed
Details / Export / Update / Delete

**Key Exchange Keys**
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:
    a) EFI_SIGNATURE_LIST
    b) EFI_CERT_X509 (DER)
    c) EFI_CERT_RSA2048 (bin)
    d) EFI_CERT_SHAXXX
2. Authenticated UEFI Variable
3. EFI PE/C0FF Image (SHA256)
Key source: Factory, External, Mixed
Details / Export / Update / Append / Delete

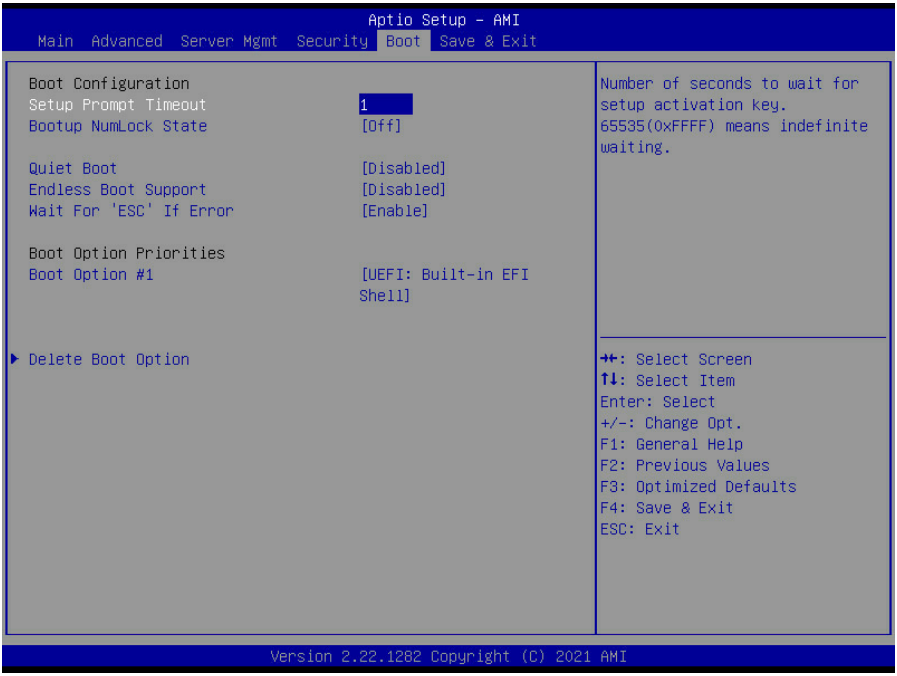
**Authorized Signatures**
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:
    a) EFI_SIGNATURE_LIST
    b) EFI_CERT_X509 (DER)
    c) EFI_CERT_RSA2048 (bin)
    d) EFI_CERT_SHAXXX
2. Authenticated UEFI Variable
3. EFI PE/C0FF Image (SHA256)
Key source: Factory, External, Mixed
Details / Export / Update / Append / Delete

**Forbidden Signatures**
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:
    a) EFI_SIGNATURE_LIST
    b) EFI_CERT_X509 (DER)
    c) EFI_CERT_RSA2048 (bin)
    d) EFI_CERT_SHAXXX
2. Authenticated UEFI Variable
3. EFI PE/C0FF Image (SHA256)
Key source: Factory, External, Mixed
        Details / Export / Update / Append / Delete

**Authorized TimeStamps**
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:
    a) EFI_SIGNATURE_LIST
    b) EFI_CERT_X509 (DER)
    c) EFI_CERT_RSA2048 (bin)
    d) EFI_CERT_SHAXXX
2. Authenticated UEFI Variable
3. EFI PE/C0FF Image (SHA256)
Key source: Factory, External, Mixed
        Update / Append

**OsRecovery Signatures**
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:
    a) EFI_SIGNATURE_LIST
    b) EFI_CERT_X509 (DER)
    c) EFI_CERT_RSA2048 (bin)
    d) EFI_CERT_SHAXXX
2. Authenticated UEFI Variable
3. EFI PE/C0FF Image (SHA256)
Key source: Factory, External, Mixed
        Update / Append

## 5.6 Boot




**Setup Prompt Timeout**
Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

**1**

**Bootup NumLock State**
Select the keyboard NumLock state.

**Off** / On

**Quiet Boot**
Enable or disable Quiet Boot option.

Enabled / **Disabled**

**Endless Boot**
Enable or disable Endless Boot.

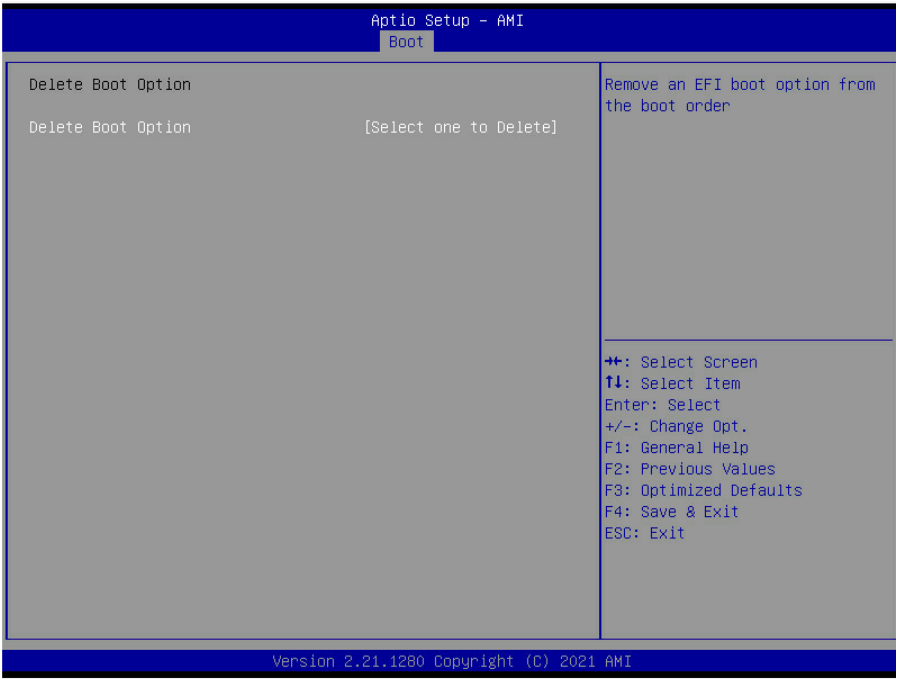
Enabled / **Disabled**

**Wait for 'ESC' If Error**
Wait for 'ESC' key to be pressed if error occurs.
Enabled / **Disabled**

**Boot Option Priorities**
**Boot Option #1**
Select the system boot order.
**Device Name** / Disabled

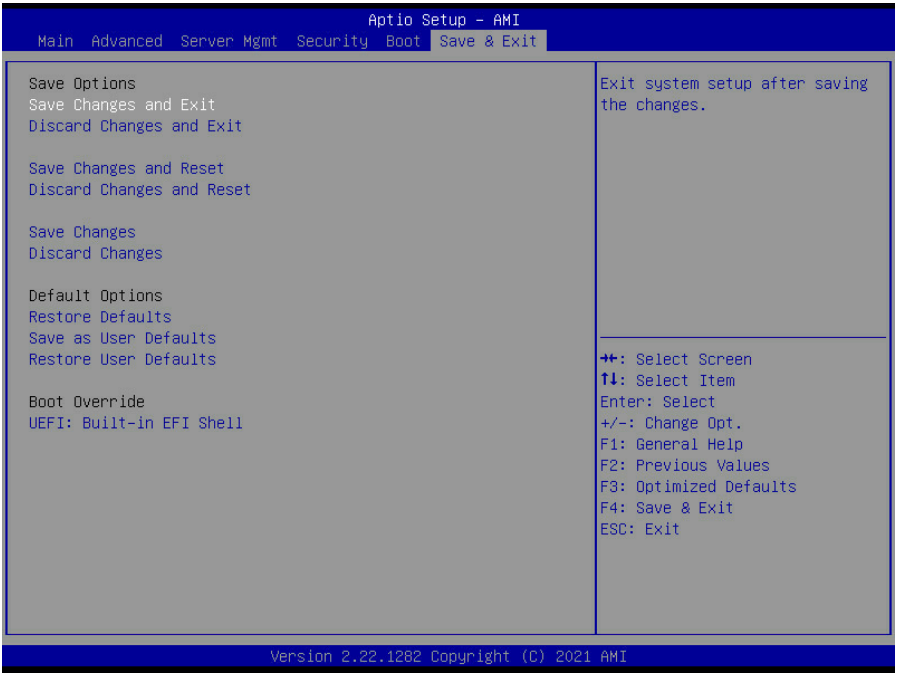
**Delete Boot Option**
Remove an EFI boot option from the boot order.

### 5.6.1 Delete Boot Option




**Delete Boot Option**
Remove an EFI boot option from the boot order.
**Select one to delete** / Device Name

## 5.7 Save & Exit




**Save Changes and Exit**
Exit system setup after saving the changes.

**Discard Changes and Exit**
Exit system setup without saving any changes.

**Save Changes and Reset**
Reset the system after saving the changes.

**Discard Changes and Reset**
Reset system setup without saving any changes.

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

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

**Restore Defaults**
Restore/Load Default values for all the setup options.

**Save as User Defaults**
Save the changes done so far as User Defaults.

**Restore User Defaults**
Restore the User Defaults to all the setup options.

**Boot Override**
Read only.

# Chapter 6: Diagnostics

**NOTE**: if you experience problems with setting up your system, always check the following things in the following order:

**Memory, Video, CPU**

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN website at http://www.tyan.com.

## 6.1 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN web site at http://www.tyan.com

**NOTE:** Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damages done by the end user.

## 6.2 AMIBIOS Post Code

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

### Checkpoint Ranges

| Status Code Range | Description |
|---|---|
| 0x01 – 0x0B | SEC execution |
| 0x0C – 0x0F | Sec errors |
| 0x10 – 0x2F | PEI execution up to and including memory detection |
| 0x30 – 0x4F | PEI execution after memory detection |
| 0x50 – 0x5F | PEI errors |
| 0x60 – 0x8F | DXE execution up to BDS |
| 0x90 – 0xCF | BDS execution |
| 0xD0 – 0xDF | DXE errors |
| 0xE0 – 0xE8 | S3 Resume (PEI) |
| 0xE9 – 0xEF | S3 Resume errors (PEI) |
| 0xF0 – 0xF8 | Recovery (PEI) |
| 0xF9 – 0xFF | Recovery errors (PEI) |

### Standard Checkpoints

SEC Phase

| Status Code | Description |
|---|---|
| 0x00 | Note used |
| **Progress Codes** | |
| 0x01 | Power on. Reset type detection (soft/hard). |
| 0x02 | AP initialization before microcode loading |
| 0x03 | North Bridge initialization before microcode loading |
| 0x04 | South Bridge initialization before microcode loading |
| 0x05 | OEM initialization before microcode loading |
| 0x06 | Microcode loading |
| 0x07 | AP initialization after microcode loading |
| 0x08 | North Bridge initialization after microcode loading |
| 0x09 | South Bridge initialization after microcode loading |
| 0x0A | OEM initialization after microcode loading |
| 0x0B | Cache initialization |

| SEC Error Codes | |
|---|---|
| 0x0C – 0x0D | Reserved for future AMI SEC error codes |
| 0x0E | Microcode not found |
| 0x0F | Microcode not found |

PEI Phase

| Status Code | Description |
|---|---|
| **Progress Codes** | |
| 0x10 | PCI Core is started |
| 0x11 | Pre-memory CPU initialization is started |
| 0x12 | Pre-memory CPU initialization (CPU module specific) |
| 0x13 | Pre-memory CPU initialization (CPU module specific) |
| 0x14 | Pre-memory CPU initialization (CPU module specific) |
| 0x15 | Pre-memory North Bridge initialization is started |
| 0x16 | Pre-Memory North Bridge initialization (North Bridge module specific) |
| 0x17 | Pre-memory North Bridge initialization (North Bridge module specific) |
| 0x18 | Pre-Memory North Bridge initialization (North Bridge module specific) |
| 0x19 | Pre-memory South Bridge initialization is started |
| 0x1A | Pre-Memory South Bridge initialization (South Bridge module specific) |
| 0x1B | Pre-memory South Bridge initialization (South Bridge module specific) |
| 0x1C | Pre-Memory South Bridge initialization (South Bridge module specific) |
| 0x1D – 0x2A | OEM pre-memory initialization codes |
| 0x2B | Memory initialization. Serial Presence Detect (SPD) data reading |
| 0x2C | Memory initialization. Memory presence detection |
| 0x2D | Memory initialization. Programming memory timing information |
| 0x2E | Memory initialization. Configuring memory |
| 0x2F | Memory initialization (other) |
| 0x30 | Reserved for ASL (see ASL Status Codes section below) |
| 0x31 | Memory Installed |
| 0x32 | CPU post-memory initialization is started. |
| 0x33 | CPU post-memory initialization. Cache initialization |
| 0x34 | CPU post-memory initialization. Application Processor(s) (AP) initialization |

| Status Code | Description |
|---|---|
| 0x35 | CPU post-memory initialization. Boot Strap Processor (BSP) selection |
| 0x36 | CPU post-memory initialization. System Management Mode (SMM) initialization |
| 0x37 | Post-Memory North Bridge initialization is started. |
| 0x38 | Post-Memory North Bridge initialization (North Bridge module specific) |
| 0x39 | Post-Memory North Bridge initialization (North Bridge module specific) |
| 0x3A | Post-Memory North Bridge initialization (North Bridge module specific) |
| 0x3B | Post-Memory South Bridge initialization is started |
| 0x3C | Post-Memory South Bridge initialization (South Bridge module specific) |
| 0x3D | Post-Memory South Bridge initialization (South Bridge module specific) |
| 0x3E | Post-Memory South Bridge initialization (South Bridge module specific) |
| 0x3F – 0x4E | OEM post memory initialization codes |
| 0x4F | DXE PIL is started |
| **PEI Error Codes** | |
| 0x50 | Memory initialization error. Invalid memory type or incompatible memory speed |
| 0x51 | Memory initialization error. SPD reading has failed. |
| 0x52 | Memory initialization error. Invalid memory size or memory modules do not match. |
| 0x53 | Memory initialization error. No usable memory detected |
| 0x54 | Unspecified memory initialization error |
| 0x55 | Memory not installed |
| 0x56 | Invalid CPU type or speed |
| 0x57 | CPU mismatch |
| 0x58 | CPU self test failed or possible CPU cache error |
| 0x59 | CPU microcode is not found or microcode update is failed. |
| 0x5A | Internal CPU error |
| 0x5B | Reset PPI is not available. |
| 0x5C – 0x5F | Reserved for future AMI error codes |
| **S3 Resume Progress Codes** | |
| 0xE0 | S3 Resume is started (S3 Resume PPI is called by the DXE IPL). |
| 0xE1 | S3 Boot Script execution |

| Status Code | Description |
|---|---|
| 0xE2 | Video repost |
| 0xE3 | OS S3 wake vector call |
| 0xE4 – 0xE7 | Reserved for future AMI progress codes |
| **S3 Resume Error Codes** | |
| 0xE8 | S3 Resume failed |
| 0xE9 | S3 Resume PPI not found |
| 0xEA | S3 Resume Boot Script error |
| 0xEB | S3 OS wake error |
| 0xEC – 0xEF | Reserved for future AMI error codes |
| **Recovery Progress Codes** | |
| 0xF0 | Recovery condition triggered by firmware (Auto recovery) |
| 0xF1 | Recovery condition triggered by user (forced recovery) |
| 0xF2 | Recovery process started |
| 0xF3 | Recovery firmware image is found. |
| 0xF4 | Recovery firmware image is loaded. |
| 0xF5 – 0xF7 | Reserved for future AMI progress codes |
| Recovery Error Codes | |
| 0xF8 | Recovery PPI is not available. |
| 0xF9 | Recovery capsule is not found. |
| 0xFA | Invalid recovery capsule |
| 0xFB – 0xFF | Reserved for future AMI error codes |

DXE Phase

| Status Code | Description |
|---|---|
| 0x60 | DXE Core is started. |
| 0x61 | NVRAM initialization |
| 0x62 | Installation of the South Bridge Runtime Services |
| 0x63 | CPU DXE initialization is started. |
| 0x64 | CPU DXE initialization (CPU module specific) |
| 0x65 | CPU DXE initialization (CPU module specific) |
| 0x66 | CPU DXE initialization (CPU module specific) |
| 0x67 | CPU DXE initialization (CPU module specific) |
| 0x68 | PCI host bridge initialization |
| 0x69 | North Bridge DXE initialization is started. |

| Status Code | Description |
|---|---|
| 0x6A | North Bridge DXE SMM initialization is started. |
| 0x6B | North Bridge DXE initialization (North Bridge module specific) |
| 0x6C | North Bridge DXE initialization (North Bridge module specific) |
| 0x6D | North Bridge DXE initialization (North Bridge module specific) |
| 0x6E | North Bridge DXE initialization (North Bridge module specific) |
| 0x6F | North Bridge DXE initialization (North Bridge module specific) |
| 0x70 | South Bridge DXE initialization is started. |
| 0x71 | South Bridge DXE SMM initialization is started. |
| 0x72 | South Bridge devices initialization |
| 0x73 | South Bridge DXE initialization (South Bridge module specific) |
| 0x74 | South Bridge DXE initialization (South Bridge module specific) |
| 0x75 | South Bridge DXE initialization (South Bridge module specific) |
| 0x76 | South Bridge DXE initialization (South Bridge module specific) |
| 0x77 | South Bridge DXE initialization (South Bridge module specific) |
| 0x78 | ACPI module initialization |
| 0x79 | CSM initialization |
| 0x7A – 0x7F | Reserved for future AMI DXE codes |
| 0x80 – 0x8F | OEM DXE initialization codes |
| 0x90 | Boot Device Selection (BDS) phase is started |
| 0x91 | Driver connecting is started |
| 0x92 | PCI Bus initialization is started |
| 0x93 | PCI Bus Hot Plug Controller initialization |
| 0x94 | PCI Bus Enumeration |
| 0x95 | PCI BUS Request Resources |
| 0x96 | PCI Bus Assign Resources |
| 0x97 | Console output devices connect |
| 0x98 | Console Input devices connect |
| 0x99 | Super IO initialization |
| 0x9A | USB initialization is started. |
| 0x9B | USB Reset |
| 0x9C | USB Detect |
| 0x9D | USB Enable |
| 0x9E -0x9F | Reserved for future AMI codes |
| 0xA0 | IDE initialization is started |

| Status Code | Description |
|---|---|
| 0xA1 | IDE Reset |
| 0xA2 | IDE Detect |
| 0xA3 | IDE Enable |
| 0xA4 | SCSI initialization is started. |
| 0xA5 | SCSI Reset |
| 0xA6 | SCSI Detect |
| 0xA7 | SCSI Enable |
| 0xA8 | Setup Verifying Password |
| 0xA9 | Start of Setup |
| 0xAA | System has transitioned into ACPI mode. Interrupt controller is in APIC mode. |
| 0xAB | Setup Input Wait |
| 0xAC | System has transitioned into ACPI mode. Interrupt controller is in PIC mode. |
| 0xAD | Ready To Boot event |
| 0xAE | Legacy Boot event |
| 0xAF | Exit Boot Services event |
| 0xB0 | Runtime Set Virtual Address MAP Begin |
| 0xB1 | Runtime Set Virtual Address MAP End |
| 0xB2 | Legacy Option ROM initialization |
| 0xB3 | System Reset |
| 0xB4 | USB hot plug |
| 0xB5 | PCI bus hot plug |
| 0xB6 | Clean-up of NVRAM |
| 0xB7 | Configuration Reset (reset of NVRAM settings) |
| 0xB8 – 0xBF | Reserved for future AMI codes |
| 0xC0 – 0xCF | OEM BDS initialization codes |
| **DXE Error Codes** | |
| 0xD0 | CPU initialization error |
| 0xD1 | North Bridge initialization error |
| 0xD2 | South Bridge initialization error |
| 0xD3 | Some of the Architectural Protocols are not available |
| 0xD4 | PCI resource allocation error. Out of Resources |
| 0xD5 | No Space for Legacy Option ROM |
| 0xD6 | No Console Output Devices are found. |

| Status Code | Description |
|---|---|
| 0xD7 | No Console Input Devices are found. |
| 0xD8 | Invalid password |
| 0xD9 | Error loading Boot Option (LoadImage returned error) |
| 0xDA | Boot Option is failed (StartImage returned error). |
| 0xDB | Flash update is failed. |
| 0xDC | Reset protocol is not available. |

Beep Codes

| # of Beeps | Description |
|---|---|
| 1 (repeatedly) | Memory not detected. |
| 1 | Invalid password. |
| 5 | No Console Output Devices are found. |
| 8 | PCI out of resources. |

### 6.3 Intel MRC Post Code

| Status Code | Description |
|---|---|
| 0xDD00 | MRC initialization start |
| 0xDD02 | Safe Mode Override |
| 0xDD03 | MRC Early Overrides |
| 0xDD09 | DDRIO Config - Pre DCC |
| 0xDD89 | DDRIO Config - Pre DCC Error |
| 0xDD10 | 2D command plot |
| 0xDD90 | 2D command plot Error |
| 0xDD11 | MC Frequency Lock |
| 0xDD91 | MC Frequency Lock Error |
| 0xDD12 | DDRIO Config - Post DCC |
| 0xDD92 | DDRIO Config - Post DCC Error |
| 0xDD13 | DDR SCOMP Config |
| 0xDD93 | DDR SCOMP Config Error |
| 0xDD15 | Memory SubSystem Config |
| 0xDD95 | Memory SubSystem Config Error |
| 0xDD1A | DCC Initialization |
| 0xDD9A | DCC Initialization Error |

| | |
|---|---|
| 0xDD1B | Fast boot permitted |
| 0xDD9B | Fast boot permitted Error |
| 0xDD1C | Restore non-training values |
| 0xDD9C | Restore non-training values Error |
| 0xDD1D | Print input parameters |
| 0xDD9D | Print input parameters Error |
| 0xDD1E | Pre-SPD Timing overrides |
| 0xDD9E | Pre-SPD Timing overrides Error |
| 0xDD20 | SPD processing |
| 0xDDA0 | SPD processing Error |
| 0xDD21 | MRC Auto Updates and Overrides |
| 0xDDA1 | MRC Auto Updates and Overrides Error |
| 0xDD22 | MC Capabilities |
| 0xDDA2 | MC Capabilities Error |
| 0xDD23 | MC Config |
| 0xDDA3 | MC Config Error |
| 0xDD24 | MC Memory map |
| 0xDDA4 | MC Memory map Error |
| 0xDD26 | JEDEC reset |
| 0xDDA6 | JEDEC reset Error |
| 0xDD27 | Pre-Training |
| 0xDDA7 | Pre-Training Error |
| 0xDD28 | Early Command Training |
| 0xDDA8 | Early Command Training Error |
| 0xDD29 | SenseAmp Offset Training |
| 0xDDA9 | SenseAmp Offset Training Error |
| 0xDD2A | Read MPR training |
| 0xDDAA | Read MPR training Error |
| 0xDD2B | Read Leveling training |
| 0xDDAB | Read Leveling training Error |
| 0xDD2C | Jedec Write Leveling training |
| 0xDDAC | Jedec Write Leveling training Error |
| 0xDD2D | LPDDR3 Latency Set B |
| 0xDDAD | LPDDR3 Latency Set B Error |
| 0xDD2E | Write Timing Centering |

| | |
|---|---|
| 0xDDAE | Write Timing Centering Error |
| 0xDD2F | Read Timing Centering |
| 0xDDAF | Read Timing Centering Error |
| 0xDD30 | DIMM ODT Training |
| 0xDDB0 | DIMM ODT Training Error |
| 0xDD31 | Early Write Timing Centering 2D |
| 0xDDB1 | Early Write Timing Centering 2D Error |
| 0xDD32 | Write Drive Strength Up/Dn 2D |
| 0xDDB2 | Write Drive Strength Up/Dn 2D Error |
| 0xDD33 | Write Equalization Training |
| 0xDDB3 | Read Equalization Training Error |
| 0xDD34 | Early Read Timing Centering 2D |
| 0xDDB4 | Early Read Timing Centering 2D Error |
| 0xDD35 | Read ODT Training |
| 0xDDB5 | Read ODT Training Error |
| 0xDD36 | Read Equalization Training |
| 0xDDB6 | Read Equalization Training Error |
| 0xDD37 | Read Amplifier Power |
| 0xDDB7 | Read Amplifier Power Error |
| 0xDD38 | Write Timing Centering 2D |
| 0xDDB8 | Write Timing Centering 2D Error |
| 0xDD39 | Read Timing Centering 2D |
| 0xDDB9 | Read Timing Centering 2D Error |
| 0xDD3A | Command Voltage Centering |
| 0xDDBA | Command Voltage Centering Error |
| 0xDD3B | Write Voltage Centering 2D |
| 0xDDBB | Write Voltage Centering 2D Error |
| 0xDD3C | Read Voltage Centering 2D |
| 0xDDBC | Read Voltage Centering 2D Error |
| 0xDD3D | Post training |
| 0xDDBD | Post training Error |
| 0xDD3E | Late command training |
| 0xDDBE | Late command training Error |
| 0xDD3F | Round Trip Latency Training |
| 0xDDBF | Round Trip Latency Training Error |

| | |
|---|---|
| 0xDD40 | Turn Around Trip Training |
| 0xDDC0 | Turn Around Trip Training Error |
| 0xDD41 | Comp Optimization Training |
| 0xDDC1 | Comp Optimization Training Error |
| 0xDD42 | Save MC Values |
| 0xDDC2 | Save MC Values Error |
| 0xDD43 | Restore Training Values |
| 0xDDC3 | Restore Training Values Error |
| 0xDD44 | Rank Margin Tool |
| 0xDDC4 | Rank Margin Tool Error |
| 0xDD45 | Write Slew Rate |
| 0xDDC5 | Write Slew Rate Error |
| 0xDD46 | DIMM Ron Training |
| 0xDDC6 | DIMM Ron Training Error |
| 0xDD47 | Receive Enable Timing Centering |
| 0xDDC7 | Receive Enable Timing Centering Error |
| 0xDD48 | Save MRs to Scratch Registers |
| 0xDDC8 | Save MRs to Scratch Registers Error |
| 0xDD49 | PowerSavingMeter update |
| 0xDDC9 | PowerSavingMeter update Error |
| 0xDD4A | DDR4 PDA Mapping |
| 0xDDCA | DDR4 PDA Mapping Error |
| 0xDD4B | Write Voltage Centering |
| 0xDDCB | Write Voltage Centering Error |
| 0xDD4C | Early ReadMPR Timing Centering 2D |
| 0xDDCC | Early ReadMPR Timing Centering 2D Error |
| 0xDD4E | Write Leveling FlyBy training |
| 0xDDCE | Write Leveling FlyBy training Error |
| 0xDD4F | MRC Comp override |
| 0xDDCF | MRC Comp override Error |
| 0xDD50 | MRC activate |
| 0xDDD0 | MRC activate Error |
| 0xDD51 | Row Hammer Prevention |
| 0xDDD1 | Row Hammer Prevention Error |
| 0xDD52 | Get MRC Data |

| | |
|---|---|
| 0xDDD2 | Get MRC Data Error |
| 0xDD53 | Write DQ/DQS Retraining |
| 0xDDD3 | Write DQ/DQS Retraining Error |
| 0xDD55 | Memory Init Done |
| 0xDDD5 | Memory Init Done Error |
| 0xDD56 | Write TCO Comp Training |
| 0xDDD6 | Write TCO Comp Training Error |
| 0xDD57 | Read Voltage Centering |
| 0xDDD7 | Read Voltage Centering Error |
| 0xDD58 | Check Margin for Retrain |
| 0xDDD8 | Check Margin for Retrain Error |
| 0xDD59 | Rank Margin Tool Bit |
| 0xDDD9 | Rank Margin Tool Bit Error |
| 0xDD5A | MRC SA GV Switch |
| 0xDDDA | MRC SA GV Switch Error |
| 0xDD5B | MRC Memory alias check |
| 0xDDDB | MRC Memory alias check Error |
| 0xDD5C | MRC Memory Scrubbing |
| 0xDDDC | MRC Memory Scrubbing Error |
| 0xDD5D | MRC done |
| 0xDDDD | MRC done Error |
| 0xDD5E | Update MC Values in Fast flow |
| 0xDDDE | Update MC Values in Fast flow Error |
| 0xDD5F | MRC HW Memory test |
| 0xDDDF | MRC HW Memory test Error |
| 0xDD60 | TXT Memory alias check |
| 0xDDE0 | TXT Memory alias check Error |
| 0xDD61 | MRC Energy Performance Gain |
| 0xDDE1 | MRC Energy Performance Gain Error |
| 0xDD62 | ClkTCO Comp Training |
| 0xDDE2 | ClkTCO Comp Training Error |
| 0xDD63 | Read Per Bit Deskew Calibration |
| 0xDDE3 | Read Per Bit Deskew Calibration Error |
| 0xDD64 | Sense amplifier offset correction |
| 0xDDE4 | Sense amplifier offset correction Error |

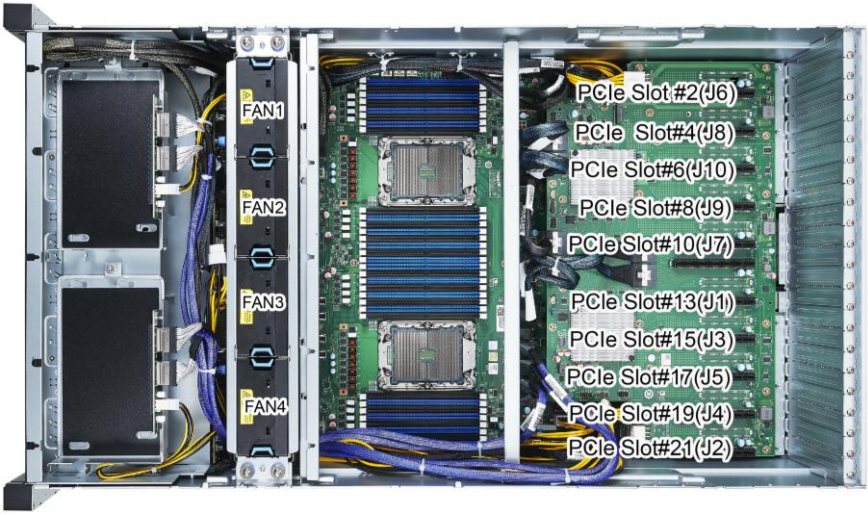
| | |
|---|---|
| 0xDD65 | DCC Replica |
| 0xDDE5 | DCC Replica Error |
| 0xDD66 | DCC Finalization |
| 0xDDE6 | DCC Finalization Error |
| 0xDD68 | Memory Test |
| 0xDDE8 | Memory Test Error |
| 0xDD69 | Fill BDAT Structure |
| 0xDDE9 | Fill BDAT Structure Error |
| 0xDD6A | Command Slew Rate Training |
| 0xDDEA | Command Slew Rate Training Error |
| 0xDD6B | Command Slew Rate Training Off |
| 0xDDEB | Command Slew Rate Training Off Error |
| 0xDD6C | Command Drive Strength and Equalization 2D |
| 0xDDEC | Command Drive Strength and Equalization 2D Error |
| 0xDD6D | DIMM CA ODT Training |
| 0xDDED | DIMM CA ODT Training Error |
| 0xDD6E | Write TCO DqsP/N/Bypass Training |
| 0xDDEE | Write TCO DqsP/N/Bypass Training Error |
| 0xDD6F | DQ DFE Training |
| 0xDDEF | DQ DFE Training Error |
| 0xDD70 | Perform Self Refresh Exit |
| 0xDDF0 | Perform Self Refresh Exit Error |
| 0xDD71 | Normal Operation |
| 0xDDF1 | Normal Operation Error |
| 0xDD72 | Configure Thermal values |
| 0xDDF2 | Configure Thermal values Error |
| 0xDD73 | Margin limit Check on Fast Flow |
| 0xDDF3 | Margin limit Check on Fast Flow Error |
| 0xDD74 | Early Command Voltage Centering |
| 0xDDF4 | Early Command Voltage Centering Error |
| 0xDD76 | Read Timing optimization Shift Rx Vref |
| 0xDDF6 | Read Timing optimization Shift Rx Vref Error |
| 0xDDFE | No Memory detected |

# Appendix II: PCIE Slot Location and Corresponding List

**PCIE address and PCIE number Mapping**

| PCI-e address | Slot number |
|---|---|
| 0000000:3D:00.0 | 13(J1) |
| 0000000:3E:00.0 | 21(J2) |
| 0000000:3F:00.0 | 15(J3) |
| 0000000:40:00.0 | 19(J4) |
| 0000000:41:00.0 | 17(J5) |
| 0000000:60:00.0 | 2(J6) |
| 0000000:61:00.0 | 10(J7) |
| 0000000:62:00.0 | 4(J8) |
| 0000000:63:00.0 | 8(J9) |
| 0000000:64:00.0 | 6(J10) |

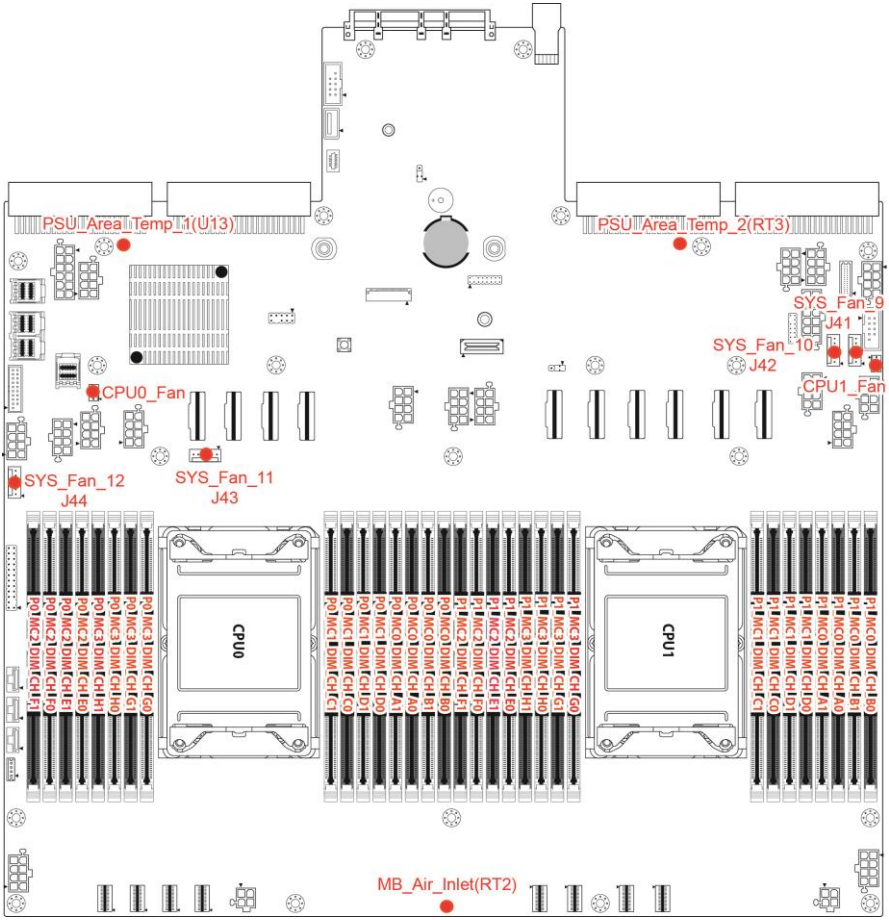
**PCIE Slot Location**



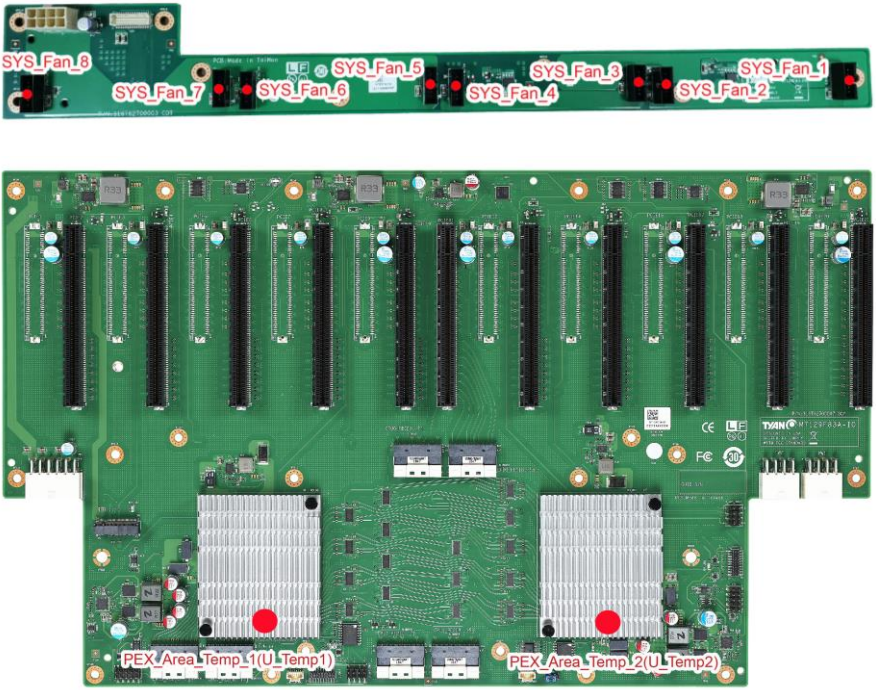
# Appendix III: Fan and Temp Sensors

This section aims to help readers identify the locations of some specific FAN and Temp Sensors on the motherboard. A table of BIOS Temp sensor name explanation is also included for readers' reference.

**Figure 1: Sensor Location**



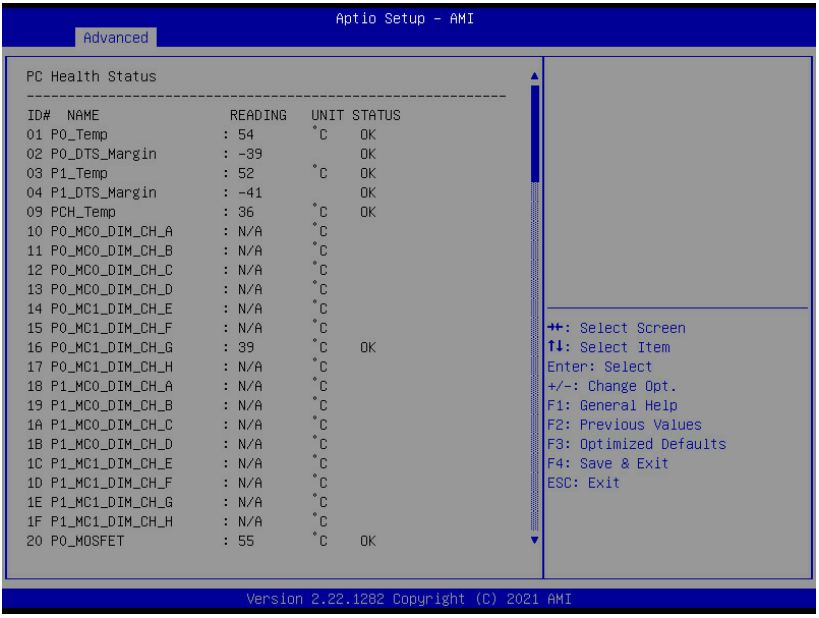

**NOTE:** The red spot indicates the sensor.

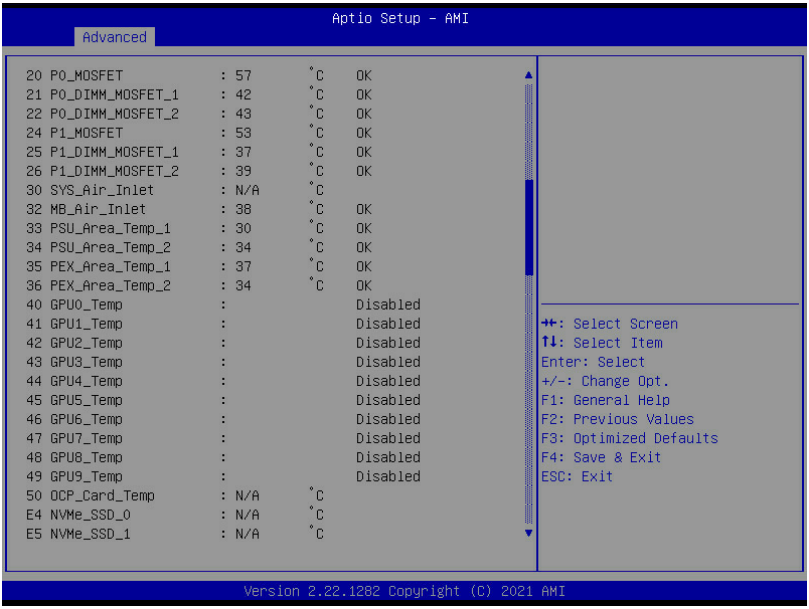


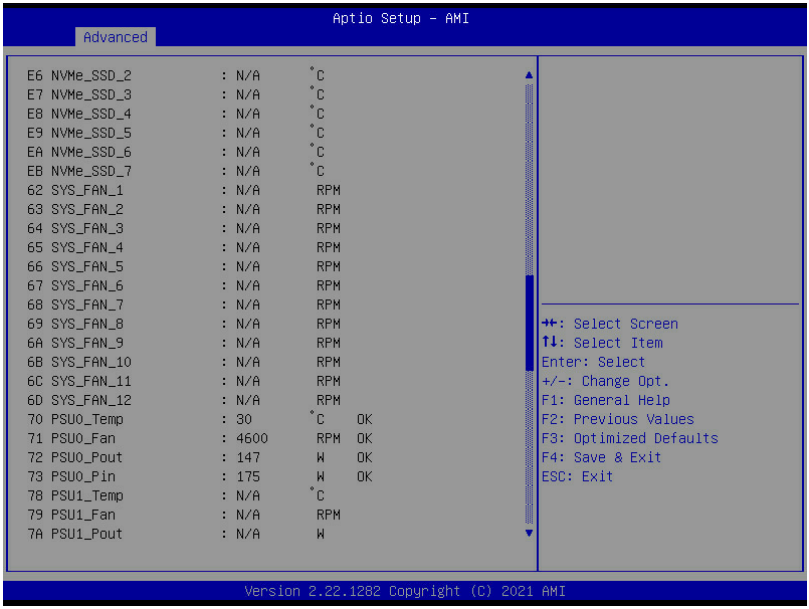

**Fan and Temp Sensor Location:**

1. Fan Sensor: It is located in the third pin of the fan connector, which detects the fan speed (rpm)
2. Temp Sensor: refer to Figure 1: Sensor Location. They detect the system temperature around.

## BIOS Temp Sensor Name Explanation:




Aptio Setup – AMI
Advanced
20 P0_MOSFET : 57 °C OK
21 P0_DIMM_MOSFET_1 : 42 °C OK
22 P0_DIMM_MOSFET_2 : 43 °C OK
24 P1_MOSFET : 53 °C OK
25 P1_DIMM_MOSFET_1 : 37 °C OK
26 P1_DIMM_MOSFET_2 : 39 °C OK
30 SYS_Air_Inlet : N/A °C
32 MB_Air_Inlet : 38 °C OK
33 PSU_Area_Temp_1 : 30 °C OK
34 PSU_Area_Temp_2 : 34 °C OK
35 PEX_Area_Temp_1 : 37 °C OK
36 PEX_Area_Temp_2 : 34 °C OK
40 GPU0_Temp : Disabled
41 GPU1_Temp : Disabled
42 GPU2_Temp : Disabled
43 GPU3_Temp : Disabled
44 GPU4_Temp : Disabled
45 GPU5_Temp : Disabled
46 GPU6_Temp : Disabled
47 GPU7_Temp : Disabled
48 GPU8_Temp : Disabled
49 GPU9_Temp : Disabled
50 OCP_Card_Temp : N/A °C
E4 NVMe_SSD_0 : N/A °C
E5 NVMe_SSD_1 : N/A °C
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2021 AMI


Aptio Setup – AMI
Advanced
E6 NVMe_SSD_2 : N/A °C
E7 NVMe_SSD_3 : N/A °C
E8 NVMe_SSD_4 : N/A °C
E9 NVMe_SSD_5 : N/A °C
EA NVMe_SSD_6 : N/A °C
EB NVMe_SSD_7 : N/A °C
62 SYS_FAN_1 : N/A RPM
63 SYS_FAN_2 : N/A RPM
64 SYS_FAN_3 : N/A RPM
65 SYS_FAN_4 : N/A RPM
66 SYS_FAN_5 : N/A RPM
67 SYS_FAN_6 : N/A RPM
68 SYS_FAN_7 : N/A RPM
69 SYS_FAN_8 : N/A RPM
6A SYS_FAN_9 : N/A RPM
6B SYS_FAN_10 : N/A RPM
6C SYS_FAN_11 : N/A RPM
6D SYS_FAN_12 : N/A RPM
70 PSU0_Temp : 30 °C OK
71 PSU0_Fan : 4600 RPM OK
72 PSU0_Pout : 147 W OK
73 PSU0_Pin : 175 W OK
78 PSU1_Temp : N/A °C
79 PSU1_Fan : N/A RPM
7A PSU1_Pout : N/A W
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2021 AMI

| BIOS Temp Sensor | Name Explanation |
|---|---|
| P0_Temp | CPU0 Tempterature |
| P1_Temp | CPU1 Tempterature |
| PCH_Temp | Temperature of the PCH |
| SYS_Air_Inlet | Temperature of the SYS Air Inlet Area |
| MB_Air_Inet | Temperature of the M/B Air Inlet Area |
| P0_MOSFET | Max Temperature of CPU0_MOSFET |
| P1_MOSFET | Max Temperature of CPU1_MOSFET |
| P0_DIMM_MOSFET_1 | Max Temperature of CPU0 DIMM Area1 MOSFET |
| P0_DIMM_MOSFET_2 | Max Temperature of CPU0 DIMM Area2 MOSFET |
| P1_DIMM_MOSFET_1 | Max Temperature of CPU1 DIMM Area1 MOSFET |
| P1_DIMM_MOSFET_2 | Max Temperature of CPU1 DIMM Area2 MOSFET |
| P0_MC0_DIM_CH_A | Temperature of CPU0 DIMM Channel A |
| P0_MC0_DIM_CH_B | Temperature of CPU0 DIMM Channel B |
| P0_MC0_DIM_CH_C | Temperature of CPU0 DIMM Channel C |
| P0_MC0_DIM_CH_D | Temperature of CPU0 DIMM Channel D |
| P0_MC1_DIM_CH_E | Temperature of CPU0 DIMM Channel E |
| P0_MC1_DIM_CH_F | Temperature of CPU0 DIMM Channel F |
| P0_MC1_DIM_CH_G | Temperature of CPU0 DIMM Channel G |
| P0_MC1_DIM_CH_H | Temperature of CPU0 DIMM Channel H |
| P1_MC0_DIM_CH_A | Temperature of CPU1 DIMM Channel A |
| P1_MC0_DIM_CH_B | Temperature of CPU1 DIMM Channel B |
| P1_MC0_DIM_CH_C | Temperature of CPU1 DIMM Channel C |
| P1_MC0_DIM_CH_D | Temperature of CPU1 DIMM Channel D |
| P1_MC1_DIM_CH_E | Temperature of CPU1 DIMM Channel E |
| P1_MC1_DIM_CH_F | Temperature of CPU1 DIMM Channel F |
| P1_MC1_DIM_CH_G | Temperature of CPU1 DIMM Channel G |
| P1_MC1_DIM_CH_H | Temperature of CPU1 DIMM Channel H |
| NVME0 Temp | Temperature of NVME0 |
| NVME1 Temp | Temperature of NVME1 |
| NVME2 Temp | Temperature of NVME2 |
| NVME3 Temp | Temperature of NVME3 |
| CPU0_FAN | Fan Speed of CPU0_FAN |
| CPU1_FAN | Fan Speed of CPU1_FAN |
| SYS_FAN_1 | Fan Speed of SYS_FAN_1 |
| SYS_FAN_2 | Fan Speed of SYS_FAN_2 |
| SYS_FAN_3 | Fan Speed of SYS_FAN_3 |
| SYS_FAN_4 | Fan Speed of SYS_FAN_4 |
| SYS_FAN_5 | Fan Speed of SYS_FAN_5 |
| SYS_FAN_6 | Fan Speed of SYS_FAN_6 |
| SYS_FAN_7 | Fan Speed of SYS_FAN_7 |
| SYS_FAN_8 | Fan Speed of SYS_FAN_8 |
| SYS_FAN_9 | Fan Speed of SYS_FAN_9 |
| SYS_FAN_10 | Fan Speed of SYS_FAN_10 |
| SYS_FAN_11 | Fan Speed of SYS_FAN_11 |
| SYS_FAN_12 | Fan Speed of SYS_FAN_12 |

| | |
|---|---|
| PSU0_STATUS | Current status of PSU0 |
| PSU0_Temp | Temperature of PSU0 |
| PSU0_FAN | Fan Speed of PSU0 |
| PSU1_STATUS | Current status of PSU1 |
| PSU1_Temp | Temperature of PSU1 |
| PSU1_FAN | Fan Speed of PSU1 |

# Appendix IV: Cable Connection Tables

## 1. Fan PWR & FAN ctrl Cable

| M7129F83-FB to S7129 MB | | |
|---|---|---|
| **Fan board** | **Connect to** | **S7129 M/B** |
| FAN PWR Cable J9 | → | J46<br>P/N: 422T62700004 |
| FAN Ctrl Cable J10 | → | FAN_HD1<br>P/N: 422T53400003 |

## 2. FP Ctrl Cable (P/N: 422T62700009)

| M1718T65-FPB to S7129 MB | | |
|---|---|---|
| **M1718T65-FPB** | **Connect to** | **S7129 M/B** |
| J4 | → | EPIO1 |

## 3. USB Cable (P/N: 422T62800001)

| M1717T65-USB to S7129 MB | | |
|---|---|---|
| **M1717T65-USB** | **Connect to** | **S7129 M/B** |
| J3 & J4 | → | J5 |

## 4. VGA & COM port Cable

| Front BKT to S7129 MB | | |
|---|---|---|
| **Front BKT** | **Connect to** | **S7129 M/B** |
| VGA Cable | → | FPIO_VGA<br>P/N: 422T61000008 |
| COM port Cable | → | HD_COM1<br>P/N: 422T61000009 |

## 5. Rear USB Cable

| M7129F83A-RIO to S7129 MB | | |
|---|---|---|
| **M7129F83A-RIO** | **Connect to** | **S7129 M/B** |
| USB Cable J2 | → | J23<br>P/N: 422T62700008 |

## 6. HDD BP PWR & Mini-SAS HD & Signal Cable

**(B7129F83AV14E8HR-2T-N)**

| M1297T65-BP12E-12 to S7129 MB | | |
|---|---|---|
| **M1297T65-BP12E-12** | **Connect to** | **S7129 M/B** |
| Mini-SAS HD Cable-1<br>(SATA0_3) | → | J20<br>P/N: 422T53400018 |
| Mini-SAS HD Cable-2<br>(SATA4_7) | → | SATA0_7<br>P/N: 422T53400005 |
| Mini-SAS HD Cable-3<br>(SATA8_11) | → | SATA0_7<br>P/N: 422T53400006 |
| HDD BP PWR Cable<br>(2.5" J9 & 3.5" PW1) | → | J55<br>P/N: 422T62700005 |
| Signal Cable<br>(HDR_1) | → | J19<br>P/N: 422T60900011 |

## 7. Mini-SAS HD & Slim-SAS & Signal Cable (B7129F83AV14E8HR-2T-N)

| M1315F83A-BP12E-10 to S7129 MB | | |
|---|---|---|
| **M1315F83A-BP12E-10** | **Connect to** | **S7129 M/B** |
| Slim-SAS Cable-1<br>(J5) | → | CN1 & CN2<br>P/N: 422T62700014 |
| Slim-SAS Cable-2<br>(J14) | → | CN3 & CN4<br>P/N: 422T62700014 |
| Slim-SAS Cable-3<br>(J13) | → | CN5 & CN6<br>P/N: 422T62700014 |
| Slim-SAS Cable-4<br>(J11) | → | CN7 & CN8<br>P/N: 422T62700014 |
| Mini-SAS HD Cable<br>(J19) | → | J23<br>P/N: 422T53400011 |
| Signal Cable<br>(HDR_1) | → | J18<br>P/N: 422T60900011 |

## 8. HDD BP PWR & Mini-SAS HD & Signal Cable

(B7129F83AV8E4HR-2T-N)

| M1297T65-BP12E-12 to S7129 MB | | |
|---|---|---|
| **M1297T65-BP12E-12** | **Connect to** | **S7129 M/B** |
| Mini-SAS HD Cable-1 (SATA0_3) | → | J20 P/N: 422T53400018 |
| Mini-SAS HD Cable-2 (SATA4_7) | → | SATA0_7 P/N: 422T53400005 |
| Mini-SAS HD Cable-3 (SATA8_11) | → | SATA0_7 P/N: 422T53400006 |
| Slim-SAS Cable-1 (SLIMSAS1) | → | CN1 & CN2 P/N: 422T62700014 |
| Slim-SAS Cable-2 (SLIMSAS2) | → | CN3 & CN4 P/N: 422T62700014 |
| HDD BP PWR Cable (2.5" J9 & 3.5" PW1) | → | J55 P/N: 422T62700005 |
| Signal Cable (HDR_1) | → | J19 P/N: 422T60900011 |

## 9. Riser PWR & Slim-SAS Cable

| M7129F83A-L16 to S7129 MB | | |
|---|---|---|
| **M7129F83A-L16** | **Connect to** | **S7129 M/B** |
| Slim-SAS Cable-1 (Riser-1 J5) | → | SLIMSAS6 P/N: 422T60900003 |
| Slim-SAS Cable-2 (Riser-1 J6) | → | SLIMSAS7 P/N: 422T60900003 |
| Slim-SAS Cable-3 (Riser-2 J5) | → | SLIMSAS8 P/N: 422T61600004 |
| Slim-SAS Cable-4 (Riser-2 J6) | → | SLIMSAS9 P/N: 422T61600004 |
| Riser PWR cable-1 (Riser-1 PWR2) | → | J36 P/N: 422T62700006 |
| Riser PWR cable-2 (Riser-2 PWR2) | → | J52 P/N: 422T62700006 |

## 10. 2x4P MB PWR Cable

| S7129 MB to S7129 MB | | |
|---|---|---|
| **S7129 M/B** | **Connect to** | **S7129 M/B** |
| 2x4P PWR Cable-1<br>J45 | → | J54<br>P/N: 422T57200004 |
| 2x4P PWR Cable-2<br>J50 | → | J49<br>P/N: 422T57200004 |

## 11. Slim-SAS & IO PWR Cable

| M7129F83A-IO to S7129 MB | | |
|---|---|---|
| **M7129F83A-IO** | **Connect to** | **S7129 M/B** |
| Slim-SAS Cable-1<br>SLIMSAS6 | → | SLIMSAS0<br>P/N: 422T62700013 |
| Slim-SAS Cable-2<br>SLIMSAS5 | → | SLIMSAS1<br>P/N: 422T62700013 |
| Slim-SAS Cable-3<br>SLIMSAS1 | → | SLIMSAS2<br>P/N: 422T60900001 |
| Slim-SAS Cable-4<br>SLIMSAS2 | → | SLIMSAS3<br>P/N: 422T62700011 (反向) |
| Slim-SAS Cable-5<br>SLIMSAS4 | → | SLIMSAS4<br>P/N: 422T62700012 |
| Slim-SAS Cable-6<br>SLIMSAS3 | → | SLIMSAS5<br>P/N: 422T62700013 |
| 2x4P PWR Cable<br>PW1 | → | J15<br>P/N: 422T62700015 |
| 2x6P PWR Cable<br>PW3 | → | J47<br>P/N: 422T62700007 |

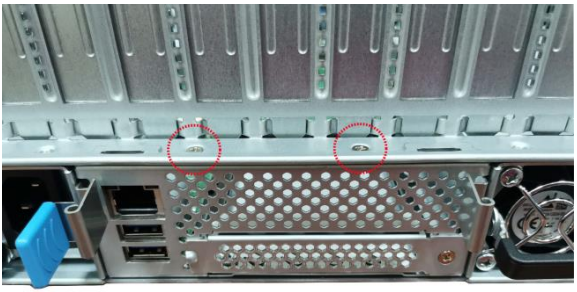
## 12. Rear FAN extend Cable

| Rear FAN to S7129 MB | | |
|---|---|---|
| **Rear FAN** | **Connect to** | **S7129 M/B** |
| FAN1 | → | J41<br>P/N: 422T62700010 |
| FAN2 | → | J42<br>P/N: 422T62700010 |
| FAN3 | → | J43<br>P/N: 422T62700010 |
| FAN4 | → | J44<br>P/N: 422T62700010 |

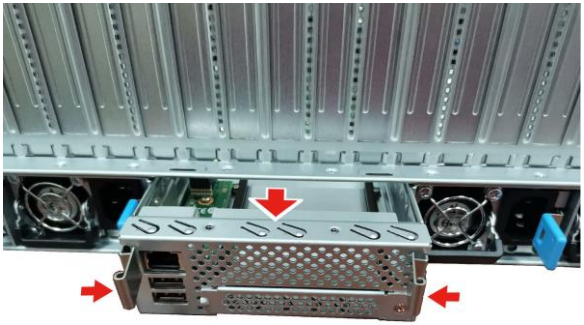
# Appendix V: Installing OCP Card

Follow these instructions to install the OCP 3.0 Card.

1. Unscrew the Rear IO Bracket.



2. Push both latches to pull the Rear IO Bracket out.



3. Unscrew the IO bracket.

4. Pull out the IO bracket.

5. Insert the 3.0 OCP card to the bracket.

6. Reinstall the IO bracket into the chassis.

# Appendix VI: FRU Parts Table

| FT83A-B7129 FRU Parts | | | | |
|---|---|---|---|---|
| **Item** | **Model Number** | **Part Number** | **Picture** | **Description** |
| Air Duct | | 452T62700003 |  | TF-AIR DUCT;SBU,AL,FOR CPUHSK,_NCT,FT77D-B7109 |
| Cable | | 422T53400003 | | TF-CABLE ASSY;CONTROL INTERNAL,SBU,28 AWG,600 mm,FAN CTRL CABLE, 2*15P, P1.0/2*15P, P1.0,TN71-BP012 |
| | | 422T53400005 |  | TF-CABLE ASSY;SAS INTERNAL,SBU,30 AWG,700 mm,MINI-SAS HD CABLE, SHORT MINI-SAS HD 36P/SHORT MINI-SAS HD 36P,TN71-BP012 |
| | | 422T53400006 |  | TF-CABLE ASSY;SAS INTERNAL,SBU,30 AWG,800 mm,MINI-SAS HD CABLE, SHORT MINI-SAS HD 36P/SHORT MINI-SAS HD 36P,TN71-BP012 |
| | | 422T53400018 |  | TF-CABLE ASSY;SAS INTERNAL,SBU,30 AWG,600 mm,MINI-SAS HD CABLE, SHORT MINI-SAS HD 36P/SHORT MINI-SAS HD 36P,TN71-BP012 |
| | | 422T57200004 |  | TF-AC/DC POWER CABLE;SBU,18 AWG,450mm,2*4P(M), P4.2/2*4P(M), P4.2, UL1015,13A,GT62F-B5630 |
| | | 422T60900001 |  | TF-CABLE ASSY;SAS INTERNAL,SBU,32 AWG,250 mm,SlimSAS 8i to SlimSAS 8i CABLE,SlimSAS 8i 74P/SlimSAS 8i 74P,Normal Signal,TS65-B8036 |
| | | 422T60900003 |  | TF-CABLE ASSY;SAS INTERNAL,SBU,32 AWG,700 mm,SlimSAS 8i to SlimSAS 8i CABLE,SlimSAS 8i 74P/SlimSAS 8i 74P,Normal Signal,TS65-B8036 |
| | | 422T60900011 |  | TF-CABLE ASSY;CONTROL INTERNAL,SBU,28 AWG,700 mm, SIGNAL CABLE, 1*7P, P1.25/1*7P,P1.25,TS65-B8036 |
| | | 422T61000008 |  | TF-CABLE ASSY;VGA INTERNAL, SBU,30 AWG,1200 mm,VGA CABLE, 2*7P, P2.0,K11P/VGA PORT 15P(F), W/2PCS HEX SCREW, FT83-B7119 |
| | | 422T61000009 |  | TF-CABLE ASSY;COM PORT INTERNAL,SBU,28 AWG,750 mm, COM PORT CABLE, 2*5P, P2.54,K10P/COM PORT DB9P(M), W/2PCS HEX SCREW,FT83-B7119 |
| | | 422T61600004 |  | TF-CABLE ASSY;SAS INTERNAL, SBU,32 AWG,800 mm,SlimSAS 8i to SlimSAS 8i Cable,Short SlimSAS 8i 74P/Short SlimSAS 8i 74P,Normal |

| | | | | |
|---|---|---|---|---|
| | | | | Signal, GC68-B8036 |
| | | 422T62700004 |  | TF-AC/DC POWER CABLE;SBU,18 AWG,550 mm,2*4P(M),P4.2/ 2*4P(M), P4.2,UL1015, 13A, FT83A-B7129 |
| | | 422T62700005 |  | TF-AC/DC POWER CABLE;SBU,18 AWG,700 mm,2*6P(M),P4.2/ 2*4P(M), P4.2(2), UL1015,13A, FT83A-B7129 |
| | | 422T62700006 |  | TF-AC/DC POWER CABLE;SBU,18 AWG,450 mm,2*2P(M),P4.2/ 2*2P(M),P4.2,FT83A-B7129 |
| | | 422T62700007 |  | TF-AC/DC POWER CABLE;SBU,18 AWG,150 mm,2*6P(M),P4.2/ 2*6P(M), P4.2, UL1015, 13A,FT83A-B7129 |
| | | 422T62700009 | | TF-CABLE ASSY;CONTROL INTERNAL,SBU,28 AWG,1100 mm,FP CTRL CABLE, 2*15P, P1.0/2*12P, P2.54, K4P, FT83A-B7129 |
| | | 422T62700011 |  | TF-CABLE ASSY;SAS INTERNAL, SBU,32 AWG,200 mm,SlimSAS 8i to SlimSAS 8i Cable,Short SlimSAS 8i 74P/Short SlimSAS 8i 74P, Reversed Signal, FT83A-B7129 |
| | | 422T62700012 |  | TF-CABLE ASSY;SAS INTERNAL,SBU,32 AWG,150 mm,SlimSAS 8i to SlimSAS 8i CABLE,SlimSAS 8i 74P/SlimSAS 8i 74P,FT83A-B7129 |
| | | 422T62700013 |  | TF-CABLE ASSY;SAS INTERNAL, SBU,32 AWG,100 mm,SlimSAS 8i to SlimSAS 8i CABLE,SlimSAS 8i 74P/SlimSAS 8i 74P,FT83A-B7129 |
| | | 422T62700014 |  | TF-CABLE ASSY;SAS INTERNAL, SBU,30 AWG,650 mm,SlimSAS 8i to 2*SlimSAS 4i CABLE,SlimSAS 8i 74P/2*SlimSAS 4i 38P,NEW, FT83A-B7129 |
| | | 422T62700015 |  | TF-AC/DC POWER CABLE;SBU,18 AWG,80 mm, 2*4P(M), P4.2/2*4P(M), P4.2, UL1015, 13A,FT83A-B7129 |
| | | 422T62800001 |  | TF-CABLE ASSY;USB INTERNAL, SBU,28 AWG,750 mm,USB 3.0 CABLE,USB 3.0, 2*10P, P2.0, K20P/2*5P*2,P2.0,K3P,TE45-B5645 |
| | | 422T56800011 |  | TF-AC/DC POWER CABLE;SBU,20 AWG,250mm,GPU PWR CABLE, 2*4P(M), P4.2/2*3P+ 2*1P(M)*2pcs, P4.2,FT77D-B7109 |
| | | 422T60400014 |  | TF-AC/DC POWER CABLE;SBU,18 AWG,200 mm,2*4P(M),P4.2/ 2*4P(M), P4.2,UL1015,13A,GT90-B7113 |
| | | 332810000515 |  | TF-POWER CORD;SBU,EU,250 V,16 AWG(1.0mm²),1800mm,AC PWR CORD |

| | | | | |
|---|---|---|---|---|
| | | 332810000514 |  | TF-POWER CORD;SBU,US,125 V,16 AWG(1.31mm²),1800mm,AC PWR CORD |
| Compatible Accessories | FRU-NC-9060 | 5412T5770006 |  | M7062-I599-2T W/Bracket |
| | FRU-NC-9100 | 5412T5770010 |  | M7086-X710-2F W/ Bracket |
| | FRU-NC-9200 | 5412T6100003 |  | M7108-X550-2T W/Bracket |
| | FRU-NC-9210 | 5412T6100004 |  | M7108-I350 W/Bracket |
| | M2217-L16-IO | 411T57700034 |  | OCP Riser Card |
| CPU Heatsink | FRU-TH-0220 | 343T62300001 |  | HF-HEATSINK;SBU,AL,SOLDERLING +PIPE, 4189-2U- PASSIVE-HEATSINK, MICROLOOPS, TNM-ML0873-HN5, 113.5X 78.0X64.0MM, SCREW, TS65-B7120 |
| FAN | FRU-TS-9200 | 422T62700001 |  | TF-FAN ASSY;SBU,FAN, 12V, V80E12BS1NB5-07T095, 2BALL, 4.54A, 54.5W, 15000 RPM, 131.7 CFM, 4.54 inch-H2O, 68.0 dBA, 240g, 80*80*38mm, 6 PIN (HEADER 1*6), WIRE L=170MM, FT83A-B7129 |
| HDD Backplane | | 411T62700043 |  | M1315F83A-BP12E-10,FT83A-B7129 |
| | FRU-BP-9270 | 411T60900096 |  | M1297T65-BP12E-12,FT83A-B7129 |
| Riser card | | 411T62700036 |  | M7129F83A-L16,FT83A-B7129 |
| ME Parts | FRU-SM-9150 | 340T62700008 |  | FRU OPTION KIT; GPU Card BKT; GPU HDR ASM; for NVIDIA GPU; for FT83A-B7129; RoHS |
| | | 340T62700003 |  | REAR TOP COVER,4.5U |
| Power Supply | | 471100000518 |  | TF-POWER SUPPLY;SBU,1600 W,CHICONY,R18-1K6P1WA,R1K6AS 02P,(01),1U CRPS MODULE,REV:01 |
| Rack Mounting Kit | | 452T61000003 |  | TF-SLIDE RAIL KIT;SBU,SGCC+STEEL+SCREW,FT8 3-B7119 |

# Appendix VII: Glossary

**ACPI (Advanced Configuration and Power Interface):** a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

**AGP (Accelerated Graphics Port):** a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

**ATAPI (AT Attachment Packet Interface):** also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

**ATX:** the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

**Bandwidth:** refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

**BBS (BIOS Boot Specification):** a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

**BIOS (Basic Input/Output System):** the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

**Buffer:** a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this

improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

**Bus:** a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

**Bus mastering:** allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

**Cache:** a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

**Closed and open jumpers:** jumpers and jumper pins are active when they are “on” or “closed”, and inactive when they are “off” or “open”.

**CMOS (Complementary Metal-Oxide Semiconductors):** chips that hold the basic startup information for the BIOS.

**COM port:** another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

**DDR (Double Data Rate):** a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

**DIMM (Dual In-line Memory Module):** faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

**DIMM bank:** sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

**DMA (Direct Memory Access):** channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with

IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.
**DRAM (Dynamic RAM):** widely available, very affordable form of RAM which looses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

**ECC (Error Correction Code or Error Checking and Correcting):** allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

**EEPROM (Electrically Erasable Programmable ROM):** also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN®'s BIOS updates can be found at http://**www.tyan.com**

**ESCD (Extended System Configuration Data):** a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

**Firmware:** low-level software that controls the system hardware.

**Form factor:** an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

**Global timer:** onboard hardware timer, such as the Real-Time Clock (RTC).

**HDD:** stands for Hard Disk Drive, a type of fixed drive.

**H-SYNC:** controls the horizontal synchronization/properties of the monitor.

**HyperTransport™:** a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

**IC (Integrated Circuit):** the formal name for the computer chip.

**IDE (Integrated Device/Drive Electronics):** a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

**IDE INT (IDE Interrupt):** Hardware interrupt signal that goes to the IDE.
**I/O (Input/Output):** the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

**IRQ (Interrupt Request):** an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

**Latency:** the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

**NVRAM:** ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

**Parallel port:** transmits the bits of a byte on eight different wires at the same time.

**PCI (Peripheral Component Interconnect):** a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

**PCI PIO (PCI Programmable Input/Output) modes:** the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

**PCI-to-PCI Bridge:** allows you to connect multiple PCI devices onto one PCI slot.

**Pipeline burst SRAM:** a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

**PnP (Plug-n-Play):** a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

**PXE (Preboot Execution Environment):** one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was

designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.

**RAID (Redundant Array of Independent Disks):** a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

**RAIDIOS:** RAID I/O Steering (Intel)

**RAM (Random Access Memory):** technically refers to a type of memory where any byte can be accessed without touching the adjacent data and is often referred to the system's main memory. This memory is available to any program running on the computer.

**ROM (Read-Only Memory):** a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

**SDRAM (Synchronous Dynamic RAM):** called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

**Serial port:** called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

**SCSI Interrupt Steering Logic (SISL):** Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic (LSI) (only on LSI SCSI boards)

**Sleep/Suspend mode:** in this mode, all devices except the CPU shut down.

**SDRAM (Static RAM):** unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

**SLI (Scalable Link Interface)**: NVIDIA SLI technology links two graphics cards together to provide scalability and increased performance. NVIDIA SLI takes advantage of the increased bandwidth of the PCI Express bus architecture, and features hardware and software innovations within NVIDIA GPUs (graphics processing units) and NVIDIA MCPs (media and communications processors). Depending on the application, NVIDIA SLI can deliver as much as two times the performance of a single GPU configuration.

**Standby mode:** in this mode, the video and hard drives shut down; all other devices continue to operate normally.

**UltraDMA-33/66/100:** a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

**USB (Universal Serial Bus):** a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

**VGA (Video Graphics Array):** the PC video display standard

**V-SYNC:** controls the vertical scanning properties of the monitor.

**ZCR (Zero Channel RAID):** PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

**ZIF Socket (Zero Insertion Force socket):** these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

# Appendix VIII: Technical Support

If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assistance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then TYAN® Computer Corporation can help. Besides designing innovative and quality products for over a decade, TYAN® has continuously offered customers service beyond their expectations. TYAN's website (www.tyan.com) provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. TYAN® also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, TYAN® serves multiple market segments with the industry's most competitive services to support them.

"TYAN's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general" - Anandtech.com

You can contact TYAN® Technical Support by using our Online Support System:

http://12.230.196.231/helpstar/hsPages/login.aspx?ReturnUrl=%2fhelpstar%2fhsPages%2fDefault.aspx

**Help Resources:**

1. See the beep codes section of this manual.
2. See the TYAN® website for FAQ's, bulletins, driver updates, and other information: http://www.tyan.com
3. Contact your dealer for help BEFORE calling TYAN®.
4. Check the TYAN® user group: alt.comp.periphs.mainboard.TYAN®

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not

cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

**NOTE:** A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN® will pay to have the board shipped back to you

TYAN® FT83A-B7129 User's Manual v1.0f

Document part No.: D2478 - 110