



GA88-B5631

Service Engineer's Manual



PREFACE

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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.

Warning

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

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.

● 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。

● Safety: EN/IEC 60950-1

This equipment is compliant with CB/LVD of Safety: EN/IEC 60950-1.

About this Manual

This Manual is intended for experienced users and integrators with hardware knowledge of personal computers. It is aimed to provide you with instructions on installing your TYAN GA88-B5631.

How this guide is organized

This guide contains the following parts:

Chapter 1: Overview

This chapter give an introduction to the GA88-B5631 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 GA88-B5631 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: Installing GPU Card

This chapter introduce how to installing the GPU Card and list how many kinds GPU Cards are suitable for GA88-B5631 chassis.

Chapter 5: Mainboard 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.

Chapter6: BIOS Setup

This chapter describes the Petitboot menu program. The menu program lets you modify basic configuration settings. The settings are then stored in a NVRAM partition that retains the information even when the power is turned off.

Chapter 7: Diagnostics

This chapter introduces the Hostboot initial program loads (IPLs) progress codes The table describes the type of checkpoints that may occur during the IPLs portion of the Hostboot: BIOS codes and technical terms to provide better service for the customers.

Appendix:

This chapter provides the cable connection table, the FRU parts list 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 GA88-B5631, 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. To reduce risk of injury from a hot component, allow the surface to cool before touching.

General Precautions

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

Machine Room Environment

- This device is for use only in a machine room or IT room.
- 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.
- 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.
- 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.
- When use 100V-127VAC input: The system does not support redundant PSU operation if the total system load exceeds 20A.

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 technician/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.

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Chapter 1: Overview

1.1 About the TYAN GA88-B5631

Congratulations on your purchase of the TYAN[®] GA88-B5631, a highly optimized rack-mountable 1U barebone system. GA88-B5631 is designed to support [single Intel[®] Xeon[®] Scalable Processor Families](#) and [Up to 384GB RDIMM/ 768GB LRDIMM/ 1,536GB RDIMM 3DS/LRDIMM 3DS DDR4 2400/2666 MHz Memory](#), providing a rich feature set and incredible performance. Leveraging advanced technology from Intel[®], GA88-B5631 server system is capable of offering scalable 32 and 64-bit computing, high-bandwidth memory design, and lightning-fast PCI-E bus implementation. GA88-B5631 not only empowers your company in today's demanding IT environment but also offers a smooth path for future application usage.

TYAN[®] also offers the GA88-B5631 in a version that can support up to two [2.5" Hot-Swap SSDs/HDDs](#). GA88-B5631 uses rack-mountable 1U chassis featuring a robust structure and a solid mechanical enclosure. All of this provides GA88-B5631 the power and flexibility to meet the needs of nearly any server application.



1.2 Features

TYAN GA88-B5631 (B5631G88V2HR-2T-N)

System	Form Factor	1U Rackmount
	Chassis Model	GA88
	Dimension (D x W x H)	34.5" x 17.24" x 1.7" (885 x 438 x 43.5mm)
	Motherboard	S5631GM2NR-2T
Front Panel	Buttons	(1) PWR, (1) RST, (1) ID
	LEDs	(1) PWR, (1) HDD, (2) LAN, (1) Warning
	I/O Ports	(2) USB 3.0 port
External Drive Bay	Type / Q'ty	2.5" Hot-Swap SSD/HDD/ (2)
	HDD backplane support	SAS 12Gb/s, SATA 6Gb/s
	Supported HDD Interface	(2) SATA 6Gb/s
System Cooling Configuration	FAN	(10) 4cm fans
Power Supply	Type	RPSU
	Input Range	AC 100-127V/12A , AC 200-240V/9.48A
	Frequency	47 - 63 Hertz
	Output Watts	1000W(AC100v-127v) 1600W(AC200v-240v)
	Efficiency	PFC, 80 plus Platinum
	Redundancy	1+1
Processor	Socket Type / Q'ty	LGA3647/ (1)
	Supported CPU Series	Intel Xeon Scalable Processor Families
	Thermal Design Power (TDP) wattage	Max up to 165W
Chipset	PCH	Intel C621
	Switch IC	(2) PLX PEX8747
Memory	Supported DIMM Qty	(12) DIMM slots
	DIMM Type / Speed	DDR4 RDIMM/RDIMM 3DS/LRDIMM/LRDIMM 3DS 2666
	Capacity	Up to 384GB RDIMM/ 768GB LRDIMM/ 1,536GB RDIMM 3DS/LRDIMM 3DS *Follow latest

		Intel DDR4 Memory POR	
	Memory channel	6 Channels	
	Memory voltage	1.2V	
Expansion Slots	PCI-E	(5) PCI-E Gen3 x16 slots	
	Pre-install TYAN Riser Card	M2091-R, PCI-E x16 1U riser card (right), (3) M5631-R16-1, PCI-E x16 @front, 1U riser card (right), M5631-R16-2, PCI-E x16 @rear, 1U riser card (right)	
LAN	Port Q'ty	(2) 10GbE ports, (1) PHY	
	Controller	Intel X550-AT2	
	PHY	Realtek RTL8211E	
Storage	M.2 connector	(2) M.2 connector (2280/22110) by PCI-E & SATA interface	
	sSATA	Connector	(2) SATA-III, (2) 7-pin SATA DOM
		Controller	Intel C621
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe) only for 4 SATA devices
Graphic	Connector type	D-Sub 15-pin	
	Resolution	Up to 1920x1200	
	Chipset	Aspeed AST2500	
I/O Ports	USB	(2) USB3.0 ports (2 at front), (1) USB3.0 ports (1 at rear)	
	COM	(1) 2x5 pin-header	
	VGA	(1) D-Sub 15-pin port	
	RJ-45	(2) 10GbE ports, (1) PHY dedicated for IPMI	
TPM (Optional)	TPM Support	Please refer to our TPM supported list.	
System Monitoring	Chipset	Aspeed AST2500	
	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 AST2500
	AST2500 iKVM Feature	IPMI 2.0 compliant baseboard management controller (BMC), Supports storage over IP and remote platform-flash, USB 2.0 virtual hub
	AST2500 IPMI Feature	24-bit high quality video compression, 10/100/1000 Mb/s MAC interface
BIOS	Brand / ROM size	AMI, 32MB
	Feature	Hardware Monitor, SMBIOS 3.0/PnP/Wake on LAN, Boot from USB device/PXE via LAN/Storage, User Configurable FAN PWM Duty Cycle, Console Redirection, ACPI sleeping states S4,S5, ACPI 6.1
Operating System	OS supported list	Please refer to our AVL support lists.
Regulation	FCC (DoC)	Class A
	CE (DoC)	Class A
	VCCI	Class A
	CB/LVD	Yes
	RCM	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%, non-condensing at 35° C
RoHS	RoHS 6/6 Compliant	Yes
Package Contains	Manual	(1) Web User's manual, (1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD
	Barebone	(1) GA88-B5631 w/NV Tesla-aware FW Barebone

NOTE:

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

1.2 Standard Parts List

This section describes GA88-B5631 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.

1.2.1 Box Contents

- (1) 1U chassis
- (2) Power Supply;SBU,1600 W,DELTA,DPS-1600EB B
- (10) 40*40*56mm Fan (pre-installed)
- (1) S5631GM2NR-2T Mother Board (pre-installed)
- (1) M1716G75-FPB Front Panel Board (pre-installed)
- (1) M1287G88-BP12-2 HDD Backplane (pre-installed)
- (3) M5631-R16-1F-1 (pre-installed)
- (1) M5631-R16-1F-2 (pre-installed)
- (1) M2091-R/Riser Card(pre-installed)

1.2.2 Accessories

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

GA88-B5631 Accessory Kit

- (1) CPU Clip Narrow Non-Fabric CPU Carrier+COVER
- (1) Rail kit
- (1) QIG
- (1) CPU heatsink
- (2) US power cord
- (2) EU power cord
- (4) AIR DUCT (1P/4P/5P/CPU MYLAR)
- (3)SCREW KIT






1.3 About the Product

The following views show you the product.

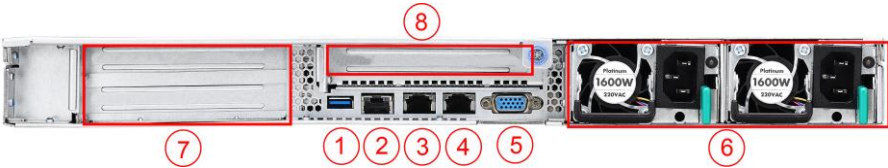
1.3.1 System Front View



M1716G75 Front Panel Board Switch and LED Indication

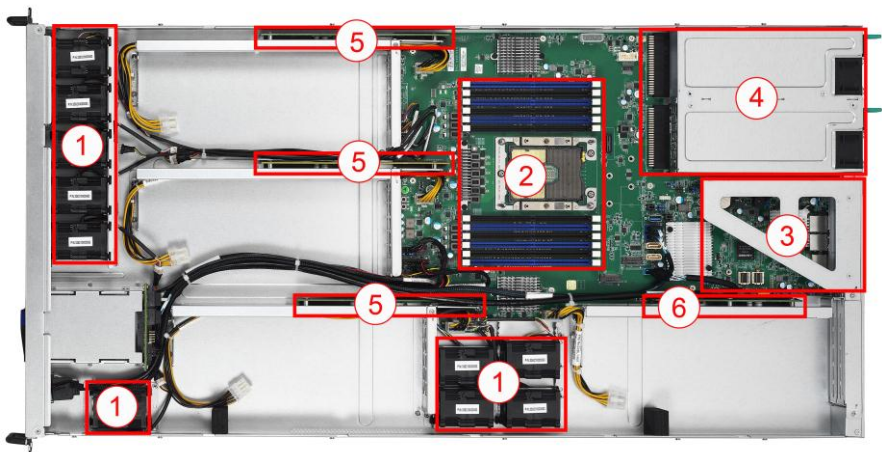
LED	State	LED Color	Behavior
 Power/ ID LED	Power On	Green	System Power On / Green Solid On System Power Off / Green Off
	Power Off	Off	
	ID free	Blue	ID Located / Green off & Blue Solid On
 Warning	System normal	Off	System Normal / Amber Off
	System Warning	Amber	System Warning / Amber Solid On
 HDD	HDD Ready	Green	HDD Access / Green Blinking HDD Ready / Green Off
	HDD Access	Off	
 LAN1	Access	Green	Access / Green Blinking
	Link	Green	Linking / Green Solid On
	Off Link	Off	Off Link / Off
 LAN2	Access	Green	Access / Green Blinking
	Link	Green	Linking / Green Solid On
	Off Link	Off	Off Link / Green Off
Buttons		Descriptions	
Reset Button		Press to reset the system.	
ID(UID) Button		Press once the ID (UID) on the Front Panel, the blue ID LED on the rear panel will light up. The Power LED on the front panel will turn blue.	
Power On/Off Button		Power up and power down the system (Use a pin)	

1.3.2 System Rear View



No.	Description
1	Type-A USB3.0 Ports
2	1Gb RJ45 LAN from Realtek RTL8211E (dedicated for BMC/IPMI)
3	10Gb RJ45 LAN from Intel X550-AT2 (LAN2)
4	10Gb RJ45 LAN from Intel X550-AT2 (LAN1)
5	VGA Port
6	(1)+(1) 1600W RPSU
7	GPU Card Slot
8	PCI-E Gen3 x16 Slot, support low profile add-on card

1.3.3 Internal View



1.	system Fans
2.	CPU and Memory Socket
3.	PCIE Riser Card (with M2091-R)
4.	Power Supply Cage
5.	M5631-R16-1F-1 Riser Card (FH/FL/DW PCI-E Gen.3 x16 slot)
6.	M5631-R16-1F-2 Riser Card (FH/FL/DW PCI-E Gen.3 x16 slot)

Chapter 2: Setting Up

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, use torque force within the range **7 kgf/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 GA88-B5631 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.

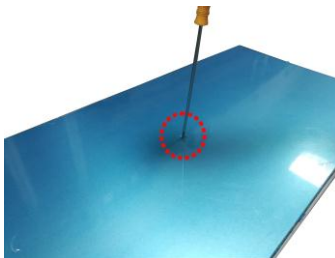
2.1 Installing Motherboard Components

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

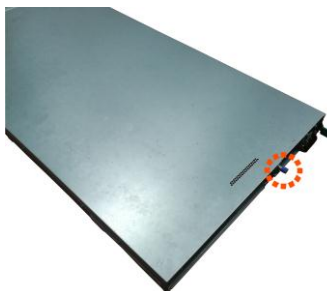
2.1.1 Removing the Chassis Cover

Follow these instructions to remove GA88-B5631 chassis cover.

1. Remove the top screw on the chassis cover as in the small diagram.



2. Loosen the Thumb screw on the back side of the chassis as in the small diagram in a counterclockwise direction.



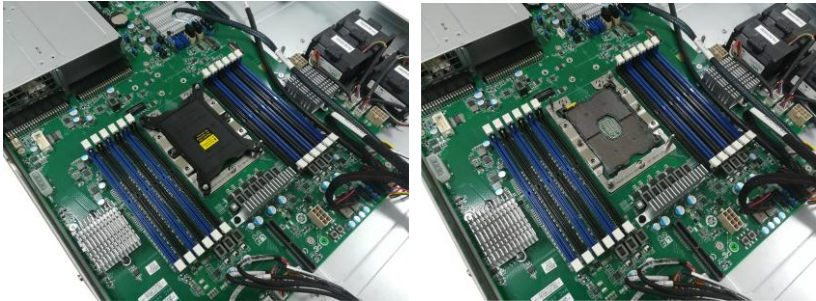
2. Push the cover in the direction of the arrow, and take out the top cover from chassis kit.



2.1.2 Installing the CPU and Heat sink

Follow the steps below on installing CPUs and CPU heat sinks.

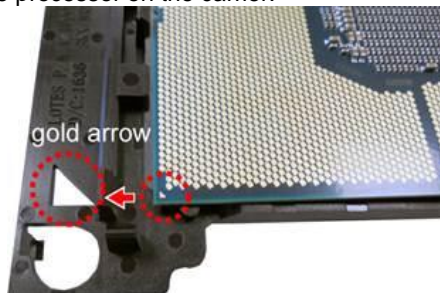
1. Locate the CPU socket. Remove the CPU protection cap.



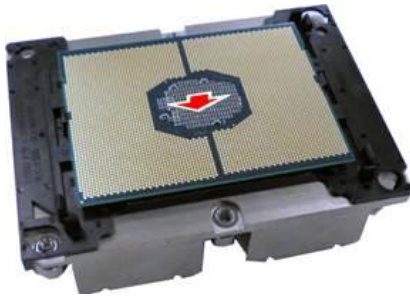
2. Put the Narrow-Fabric processor on the Carrier hook clips.



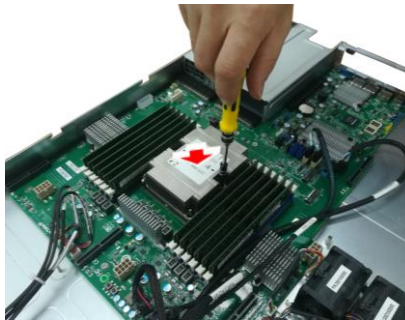
3. Align and install the processor on the carrier.



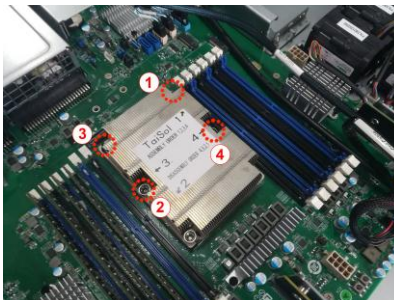
4. Carefully flip the heatsink. Then install the carrier assembly on the bottom of the heatsink and make sure Carrier hook clips is stuck in the heatsink.



5. Place the heatsink on top of the CPU.



6. Align the heatsink on the CPU socket by the guide pins and make sure the gold arrow is located in the correct direction. Then place the heatsink onto the top of the CPU socket.



7. To secure the heatsink, use a T30 Security Torx to tighten the screws in a sequential order (1->2 -> 3 -> 4). When disassembling the heatsink, loosen the screws in reverse order (4 -> 3 -> 2 -> 1).

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 Hard Drives

The GA88-B5631 supports 2 2.5" Hard Drives. Follow these instructions to install a hard drive.

2.5" Hard Disk Drive

1. Located at the 2.5" HDD tray.



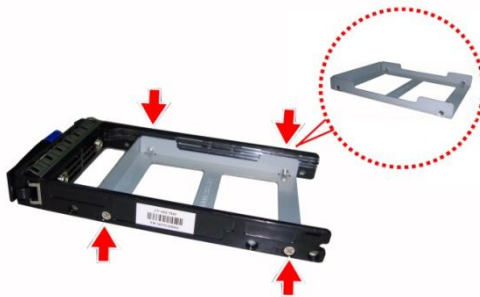
2. Press the locking lever to release the 2.5"SSD/ HDD tray



3. Pull out the 2.5"SSD/ HDD tray.



4. Remove the 4 screws to detach HDD tray bracket.



5. Place a hard drive into the drive tray. Use four screws to secure the HDD.



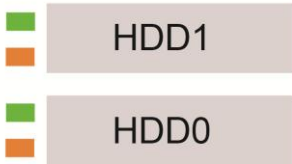
6. Reinsert the HDD tray into the chassis.



7. Press the locking lever to lock the SSD/ HDD tray.



2.5" HDD LED Definition



Activity LED Color: Green	Status LED Color: Amber	Description
OFF	OFF	No Driver Present or power disconnected
Solid On	Off	Drive present, no activity
Blinking	Off	Drive present, with activity
Do not care	Solid On	HDD Fail
Do not care	Blinking @1Hz	Drive Locate Identify
Do not care	Blinking @4Hz	Rebuilding

2.1.5 Installing the Add-On Card

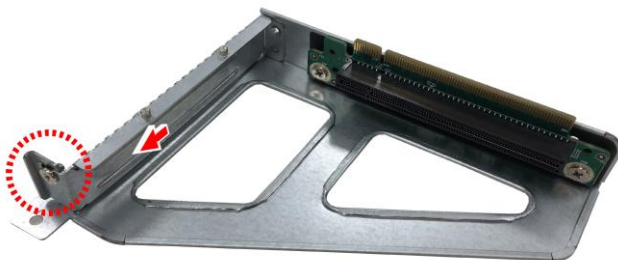
The GA88-B5631 has **one preinstalled M2091-R** riser card.

You can install an Add-On card into the expansion slot which is available with riser card. The following instructions are for Add-On card installation. You may refer to the procedures below for the installation.

1. Remove the screw of PCI-E bracket and lift up the bracket.



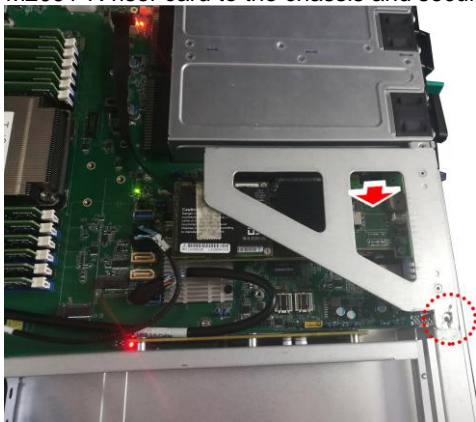
2. Remove the screw to slide the PCIE bracket.



3. Insert the Add-On card to the M2091-R riser card.



4. Reinstall the M2091-R riser card to the chassis and secure with one screw.



2.2 Rack Mounting



CAUTION: Please note that the following illustrations are based on a GA88-B5631 barebone which may not look exactly like the rackmount server you purchased. Therefore, the illustrations should be held for your reference only.

After installing the necessary components, the TYAN GA88-B5631 can be mounted in a rack using the supplied rack mounting kit.

2.2.1 Installing the Server in a Rack

Follow these instructions to mount the TYAN GA88-B5631 into an industry standard 19" rack.

NOTE: Before mounting the TYAN GA88-B5631 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.

2.2.2 Installing the inner Rails to the Chassis

1. Release and detach the inner rail from the sliding rail.



2. Align the inner sliding rail on one side of the server.



3. Pull the inner sliding rail forward to secure it to the chassis.



2.2.3 Installing the Outer Rails to the Rack

1. Secure the outer rails to the rack.



2.2.4 Rack mounting the Server

1. Lift the unit and then insert the inner slide rails into the middle rails.



2. Push the whole system into the rack.



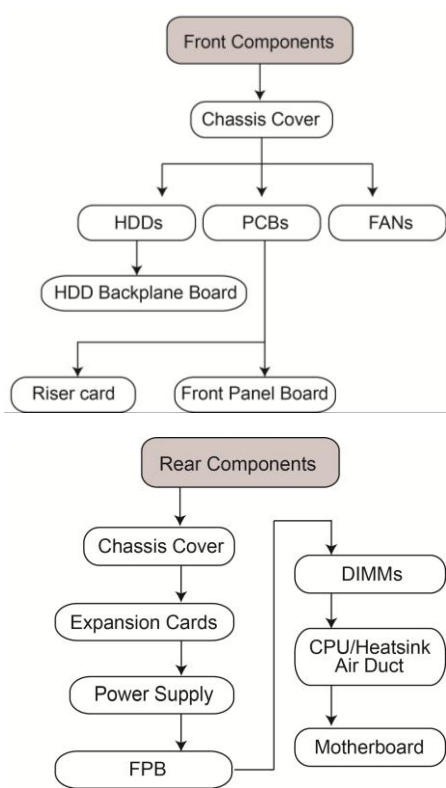
Chapter 3: Replacing Pre-Installed Components

3.1 Introduction

This chapter explains how to replace the pre-installed components, including the [S5631GM2NR-2T](#) Motherboard, [M1716G75-FPB](#) Front Panel Board, [M1287G88-BP12-2](#) Backplane, [M5631-R16-1F-1/ M5631-R16-1F-2/M2091-R](#) Riser Card, System Fan and Power Supply etc.

3.2 Disassembly Flowchart

The following flowchart outlines the disassembly procedure.

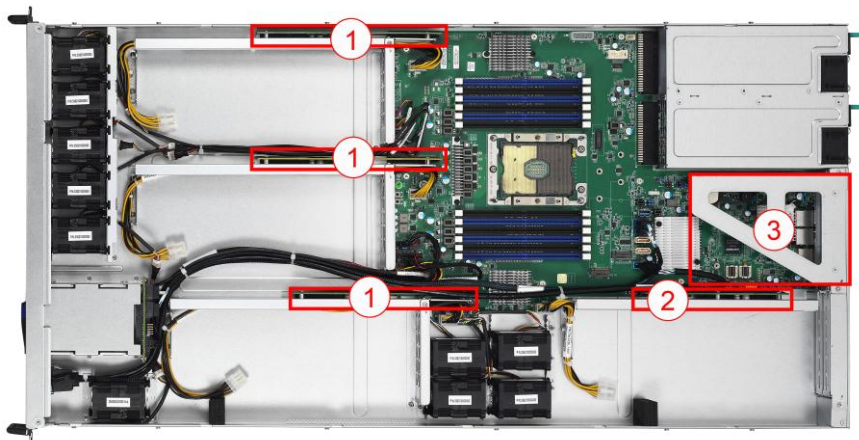


3.3 Removing the Cover

Before replacing any parts you must remove the chassis cover. Follow Chapter 2.1.1 to remove the cover of GA88-B5631.

3.4 Replacing the Riser Card

The GA88-B5631 has preinstalled (3) M5631-R16-1F-1 and (1) M5631-R16-1F-2 and (1) M2091-R riser cards.



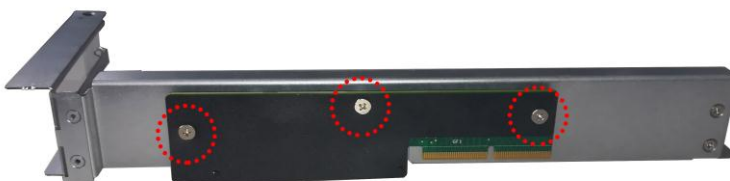
- NOTE:**
- ① (3) M5631-R16-1F-1 Riser Card
 - ② (1) M5631-R16-1F-2 Riser Card
 - ③ (1) M2091-R Riser Card

The following instructions are for how to detach the PCIE riser card and installation. You may refer to the procedures below for the installation.

1. Remove the 3 screws to release the [M5631-R16-1F-1](#) riser card.



2. Remove the 3 screws to release the [M5631-R16-1F-2](#) riser card.



3. Remove the 2 screws to release the [M2091-R](#) riser card.



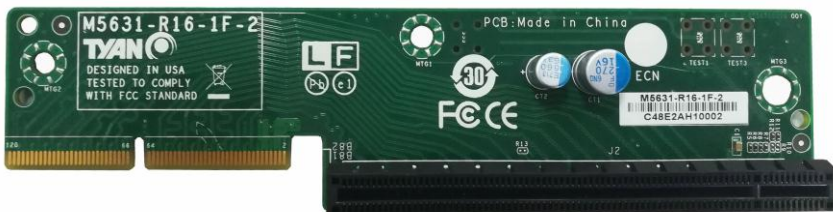
3.4.1 Riser card Feature

M5631-R16-1F-1



PCIe Gen3 x16 slot

M5631-R16-1F-2

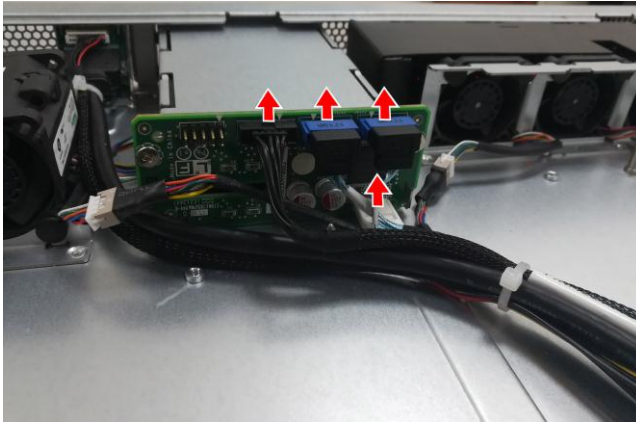


PCIe Gen3 x16 Slot

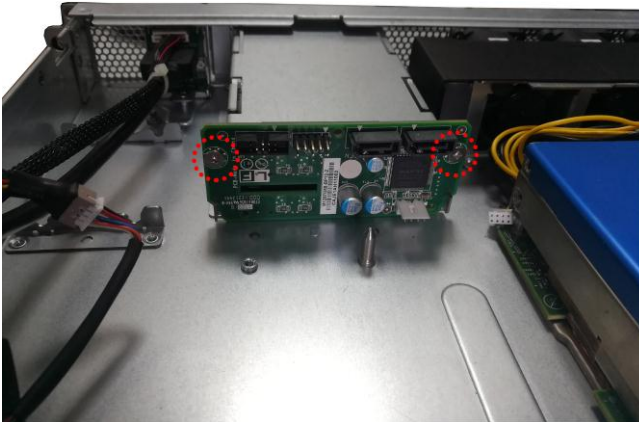
3.5 Replacing the HDD Backplane

Follow these instructions to replace the [M1287G88-BP12-2](#) Front Panel Board.

1. Disconnect all the cables connected to the HDD Backplane.

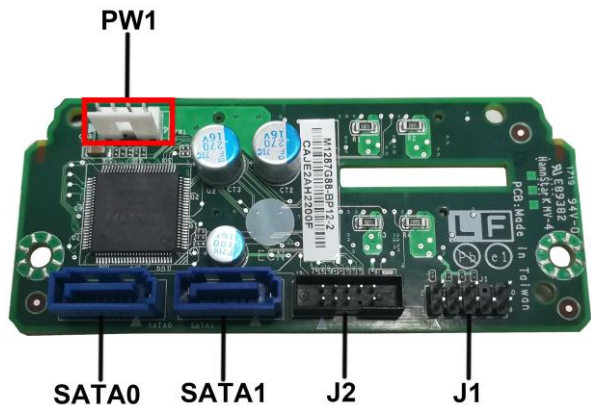


2. Remove the two screws securing the bracket to the chassis base.

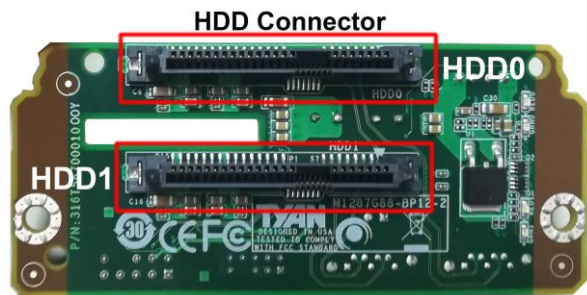


3.5.1 HDD Backplane Features

Front View



Rear View



PCB Dimensions:	➤ 93*36*2mm
Layer:	➤ 4 layers
Integrated I/O	➤ (2) SATA Connectors ➤ (1) JTAG Jumper(J1) ➤ (1) SGPIO Connector(J2) ➤ (2) Mini-SAS HD connector ➤ (1) 4 Pin Power connector

3.5.2 Connector Definition

HDD0: HDD Connector

Definition	Pin	Pin	Definition
SAS_TX0+	S2	S3	SAS_TX0-
GND	S4	S5	SAS_RXBN0
SAS_RXBP0	S6	S7	GND
SAS0_PRESENT_L	S8	S9	NC
NC	S10	S11	GND
NC	S12	S13	NC
GND	S14	P1	NC
NC	P2	P3	NC
GND	P4	P5	GND
GND	P6	P7	HD0_V5
VDD_5_RUN	P8	P9	VDD_5_RUN
HD0_PRS_L	P10	P11	SAS0_LED
GND	P12	P13	HD0_V12HD
VDD_5_RUN	P14	P15	VDD_5_RUN
GND	S1	GND1	GND
GND	GND2		

HDD1: HDD Connector

Definition	Pin	Pin	Definition
SAS_TX1+	S2	S3	SAS_TX1-
GND	S4	S5	SAS_RXBN1
SAS_RXBP1	S6	S7	GND
SAS0_PRESENT_L	S8	S9	NC
NC	S10	S11	GND
NC	S12	S13	NC
GND	S14	P1	NC
NC	P2	P3	NC
GND	P4	P5	GND
GND	P6	P7	HD1_V5
VDD_5_RUN	P8	P9	VDD_5_RUN
HD1_PRS_L	P10	P11	SAS1_LED
GND	P12	P13	HD1_V12HD
VDD_5_RUN	P14	P15	VDD_5_RUN
GND	S1	GND1	GND
GND	GND2		

SATA0: SATA Connector

Definition	Pin	Pin	Definition
GND	1	2	SAS_TX0+
SAS_TX0-	3	4	GND
SAS_RXBN0	5	6	SAS_RXBP0
GND	7		

SATA1: SATA Connector

Definition	Pin	Pin	Definition
GND	1	2	SAS_TX1+
SAS_TX1-	3	4	GND
SAS_RXBN1	5	6	SAS_RXBP1
GND	7		

J1: JTAG Connector

Definition	Pin	Pin	Definition
CPLD_JTAG_TCK	1	2	GND
CPLD_JTAG_TDO	3	4	VDD_3P3_RUN
CPLD_JTAG_TMS	5	6	NC
NC	7	8	NC
CPLD_JTAG_TDI	9	10	GND

J2: SGPIO Connector

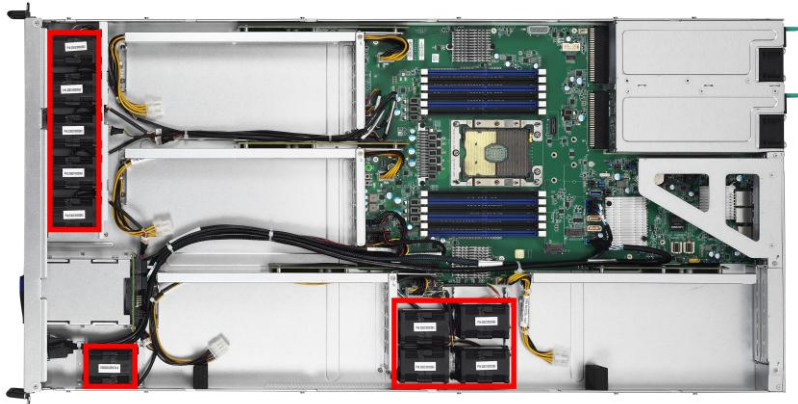
Definition	Pin	Pin	Definition
SMBUS_3V3_CLK	1	2	SAS_SIO_DIN_A
SMBUS_3V3_DATA	3	4	SAS_SIO_DOUT_A
GND	5	6	SAS_SIO_END_A
NC	7	8	SAS_SIO_CLK_A
VCC3_AUX	9	10	NC

PW1: Power Connector

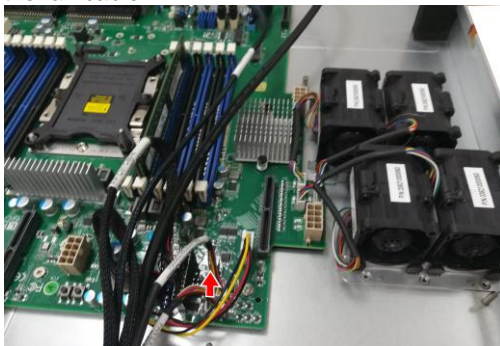
Definition	Pin	Pin	Definition
VDD_12_RUN	1	2	GND
GND	3	4	VDD_5_RUN

3.6 Replacing the System Fan

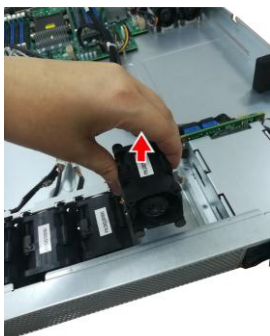
1. GA88-B5631 has equipment with ten system fans which you need to replace up.



2. Disconnect the fan cable.



3. Lift the fan which you need to replace a new one.



Fan Sequence

Front Side

FAN3-4	FAN5-6	FAN7-8	FAN9-10	FAN10-12
--------	--------	--------	---------	----------

FAN1-2

FAN13-14	FAN15-16
----------	----------

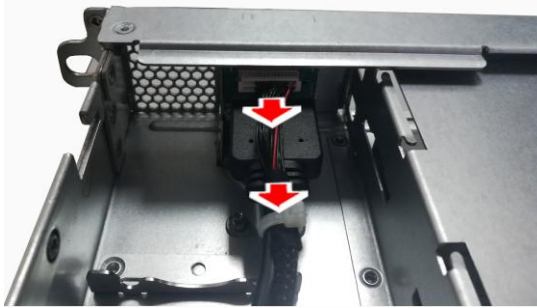
FAN17-18	FAN19-20
----------	----------

Rear Side

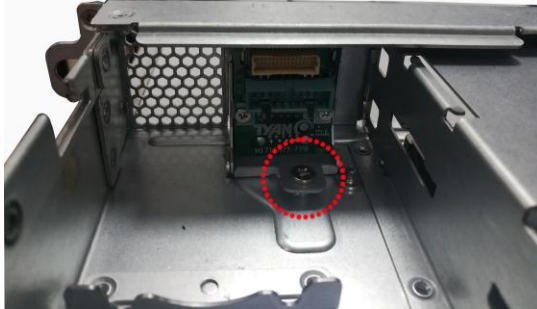
3.7 Replacing the Front Panel Board

Follow these instructions to replace the [M1716G75-FPB](#) Front Panel Board.

1. Disconnect both cables from the front panel board.



2. Unscrew the front panel board module.



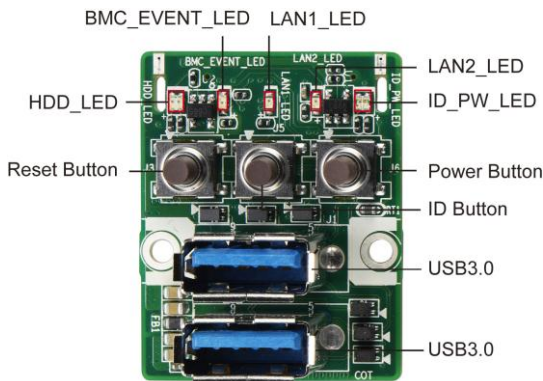
3. Unscrew the front panel board from the front panel tray for a new one.



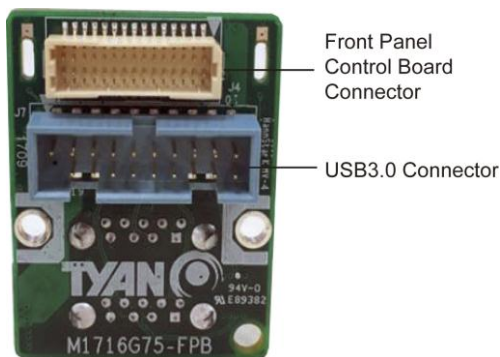
4. Prepare a new one to replace. Follow the procedure described earlier in reverse order to reinsert the front panel board into the chassis.

3.7.1 Front Panel Board Features

Front View



Rear View



Form Factor	28 x 35.4 x 1.6 (mm), 4-layer PCB
Specifications	I/O: (2) USB3.0 Port LED Indicators: (1) HDD LED (1) Warning LED (2) LAN LED (1) Power/ID LED Switch: (1) Reset Button (1) ID Button (1) Power Button

3.7.2 Connector Definition

Location	Definition
HDD_LED	HDD LED
BMC_EVENT_LED	Warning LED
LAN1_LED	LAN1 LED
LAN2_LED	LAN2 LED
ID_PW_LED	Power/ID LED
J1	USB3.0 Port
J2	USB3.0 Port
J3	Reset Button
J5	ID Button
J6	Power Button
J4	Front Panel Control Board Connector
J7	USB3.0 Connector

J7: USB3.0 Header

Definition	Pin	Pin	Definition
USB3_VCC_FPB	1	2	USB3_N5_RX_FPB
USB3_P5_RX_FPB	3	4	GND
USB3_N5_TX_FPB	5	6	USB3_P5_TX_FPB
GND	7	8	USB2_N4_FPB_R
USB2_P4_FPB_R	9	10	USB3_FPB_OC_N_R
USB2_P6_FPB_R	11	12	USB2_N6_FPB_R
GND	13	14	USB3_P6_TX_FPB
USB3_N6_TX_FPB	15	16	GND
USB3_P6_RX_FPB	17	18	USB3_N6_RX_FPB
USB3_VCC_FPB	19		

J4: FPIO Connector

Definition	Pin	Pin	Definition
PW_LED+	1	2	VCC_FPB
NC	3	4	ID_LED+
PW_LED-	5	6	ID_LED-
HD_LED+	7	8	BMC_HW_FAULT_N
HD_LED-	9	10	BMC_SYS_FAULT_N
FP_PWR_BTN_N	11	12	LAN1_LED+
GND	13	14	LAN1_LED-
FP_RST_BTN_N	15	16	NC
GND	17	18	NC
FP_IDLE_BTN_N	19	20	NC
TEMP_SENSOR	21	22	LAN2_LED+
HD_FAIL_LED-	23	24	LAN2_LED-
NC	25	26	NC
NC	27	28	NC
NC	29	30	NC
GND	GND1	GND2	GND

3.8 Replacing the Power Supply

To replace the power supply follow these instructions.

1. Press the tab as shown in the diagram and pull out the power.



2. Free the power from the power socket.



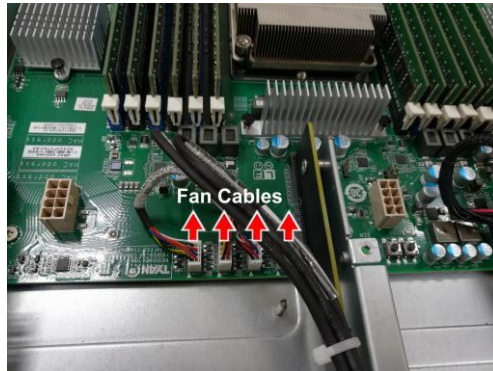
3. Replace a new single power and reinsert it into the power socket following the above steps in reverse.



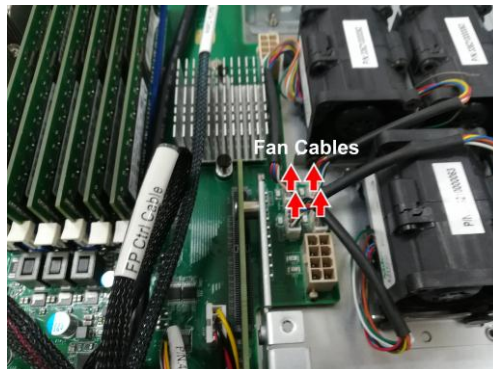
3.9 Replacing the Motherboard

Follow these instructions to remove all of below mentioned cables on the motherboard from the chassis.

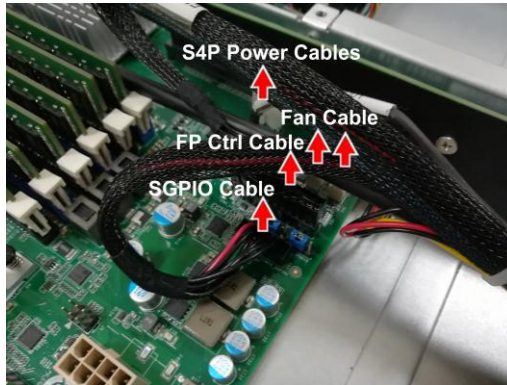
1. Disconnect all the fan cables.



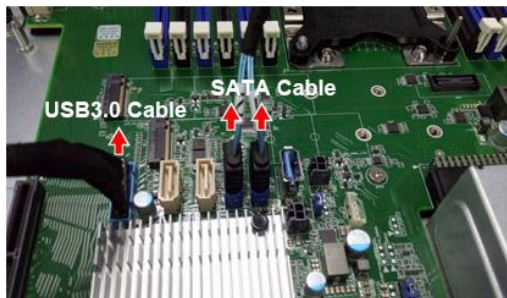
2. Disconnect all the fan cables.



2. Disconnect the front panel control cable.



3. Disconnect the SATA and USB cable.



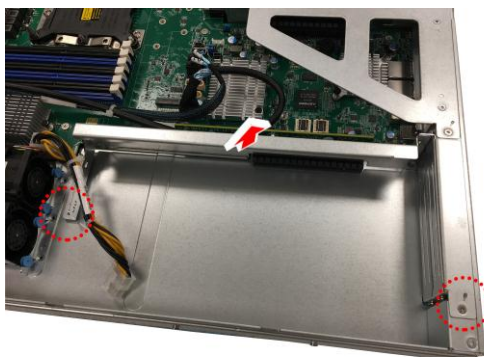
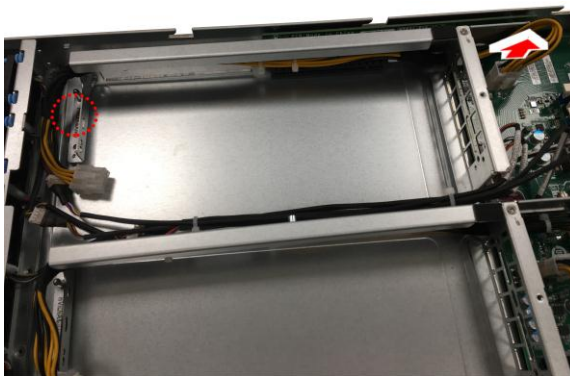
4. Remove the screw of PCIe riser bracket and lift the bracket straight up.



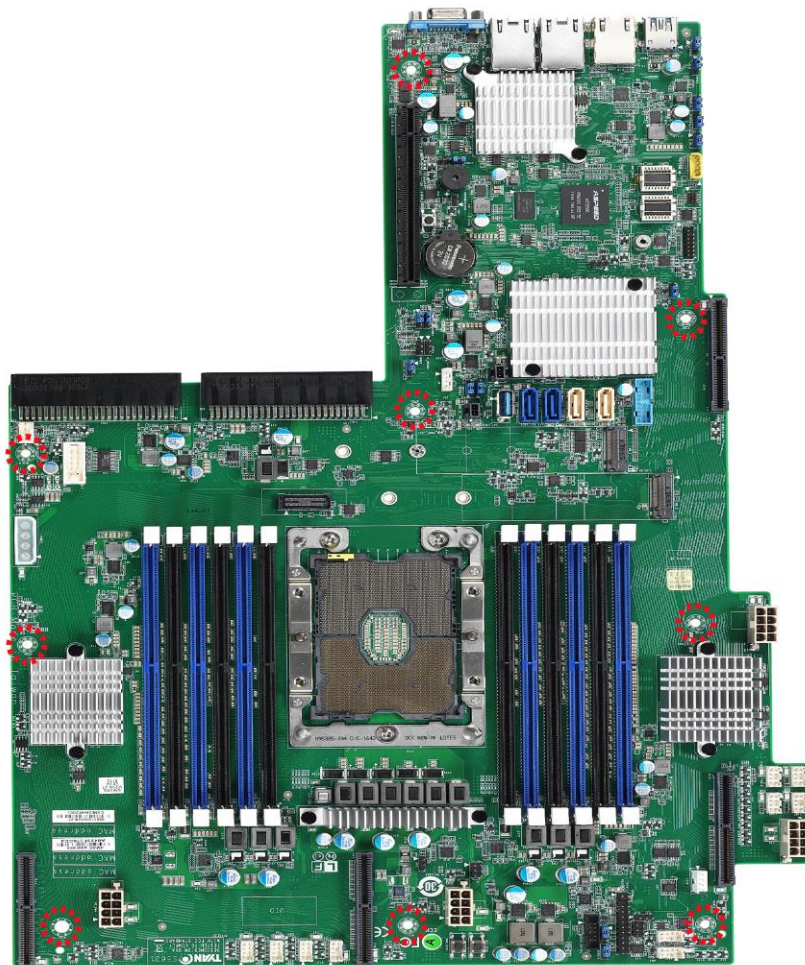
5. Remove both PSUs from chassis.



6. Remove all GPU risers – 3 in front and 1 rear.



7. Unscrew all mounting screws on the board and carefully remove the board being sure not to scrape on chassis stand-offs.



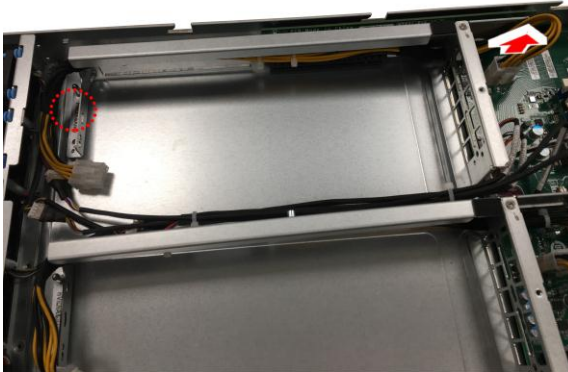
Chapter 4: Installing GPU Cards

The GA88-B5631 supports Four GPU cards, these include the NVIDIA Tesla(default)/GTX/Quadro/Titan X. The GA88-B5631 has 3 PCIe Riser Card Brackets located at the front of the chassis and 1 in the rear. A power cable is required for each GPU card. In this chapter we will show how to install the GPU cards.

NOTE: An accessory kit (FRU-SM-0040) must be purchased to allow the use of Nvidia GTX/Quadro/Titan X GPU cards.

4.1 Installing the front GPU cards (Tesla)

1. Remove the screw marked in the red circle and disconnect the power cable.



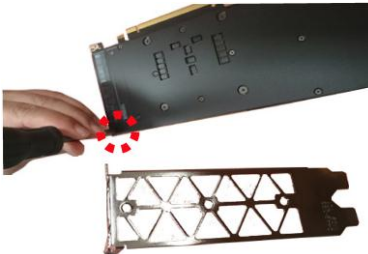
2. Pull out the GPU front bracket.



3. Remove the 4 screws as in the image to take off the GPU original mounting bracket.



(**NOTE:** After detaching the original bracket, screw the screw back in on the underside to the GPU card)



4. Secure the GPU cards to the GPU front bracket with 5 screws (use the original GPU screws and M3_L4 screws in the screw pack from Accessory box) and plug in the power cable.

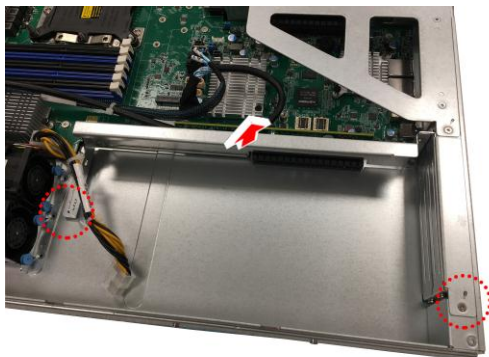


5. Reinsert the GPU bracket into the chassis and connect the GPU power cable to the motherboard. Reinstall the screw removed in Step 1.



4.2 Installing the rear GPU card (Tesla)

1. Remove the 2 screws to take out the GPU back bracket.



2. Remove the 2 screws and pull out the back brackets in the direction of the arrow.



3. Insert the Tesla GPU card onto the M5631-R16-1F-2 riser card.



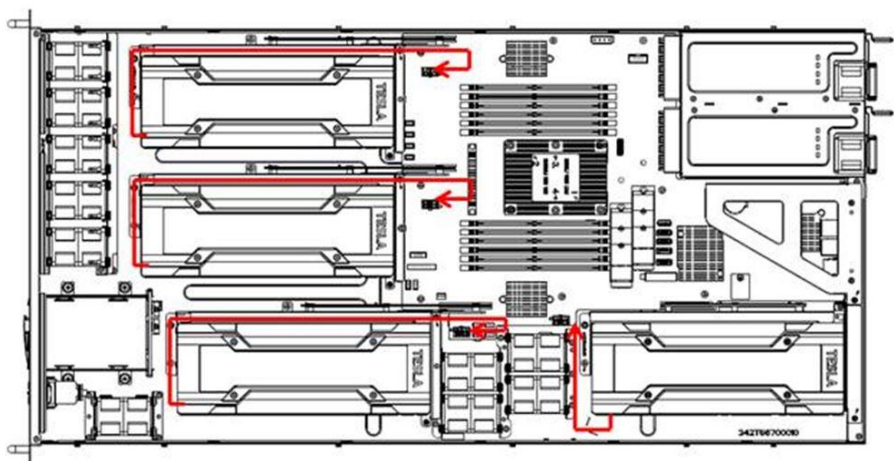
4. Secure the GPU card onto the GPU bracket with 4 screws.



5. Connect the GPU power cable and insert the bracket assembly into the chassis. Secure by replacing the screws removed previously.

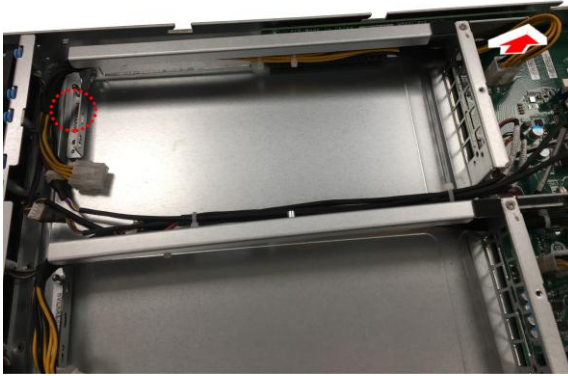


Cable Routing (Tesla)



4.3 Installing the front GPU cards (GTX/Quadro/Titan X)

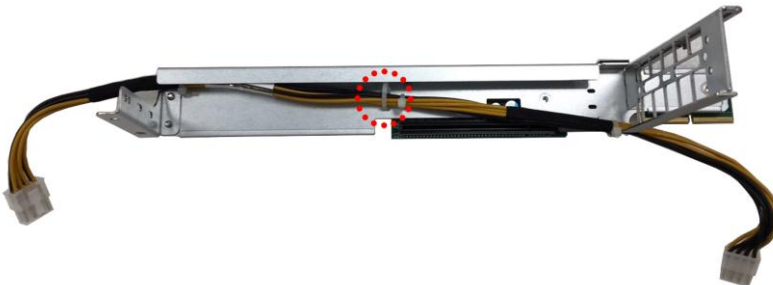
1. Remove the screw marked in the red circle and disconnect the power cable.



2. Pull out the GPU front bracket.



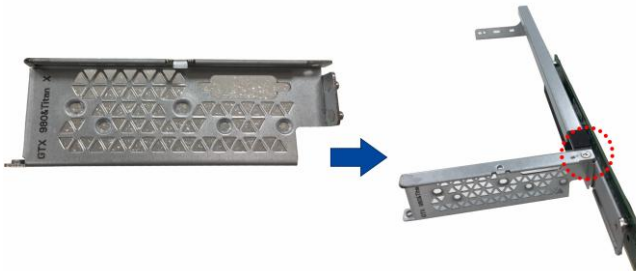
3. Remove the nylon cable tie holding the power cable to the bracket.



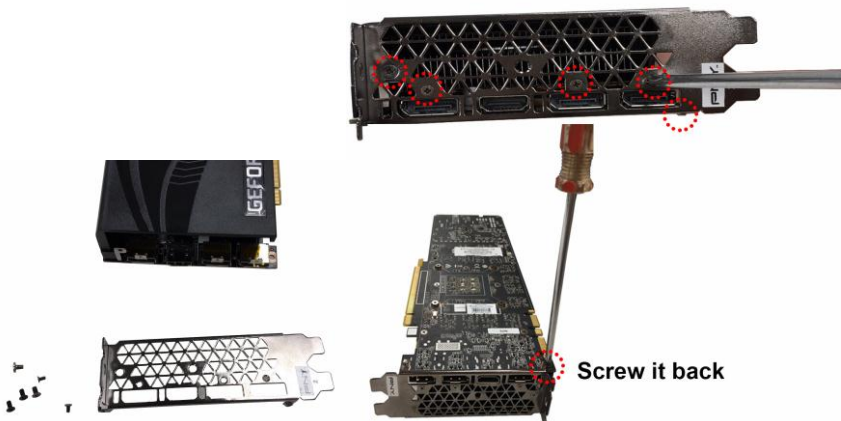
4. Remove the screw to take off the rear bracket.



5. Screw the GTX/Titan X rear bracket to the front riser bracket.



6. Remove the 5 screws holding the GPU mounting bracket shown below. Then remove the bracket.



(NOTE: After detaching the original bracket, screw the screw back in on the underside to the GPU card)

7. Insert the GPU card into the GPU front bracket.



8. Secure the GPU card into the bracket with the 6 screws. (use the original GPU screws and M3_L4 screws from Accessory box)



9. Connect the (PN: 422T56700004) power cable to the GPU card.



10. Reinsert the GPU assembly into the chassis and replace the screw removed earlier.



11. Connect the GPU power cable to the motherboard.



4.4 Installing the rear GPU (GTX/Quadro/Titan X)

1. Remove the 2 screws to take out the GPU back bracket.



2. Pull out the GPU bracket and remove the 2 screws in order to pull out the rear I/O brackets in the direction of the arrows.



3. Insert the GPU card into the **M5631-R16-1F-2** riser card.



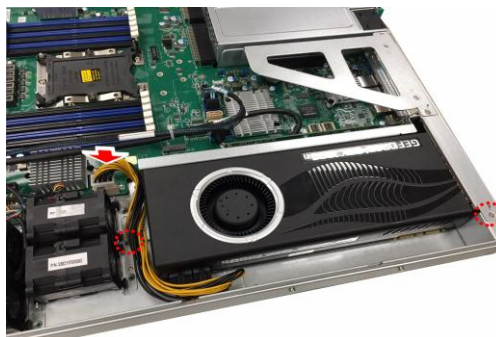
4. Secure the GPU card onto the GPU back bracket.



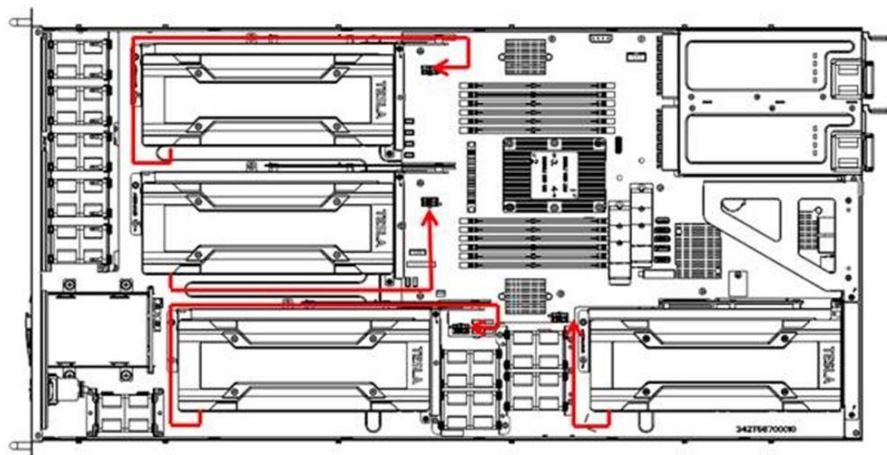
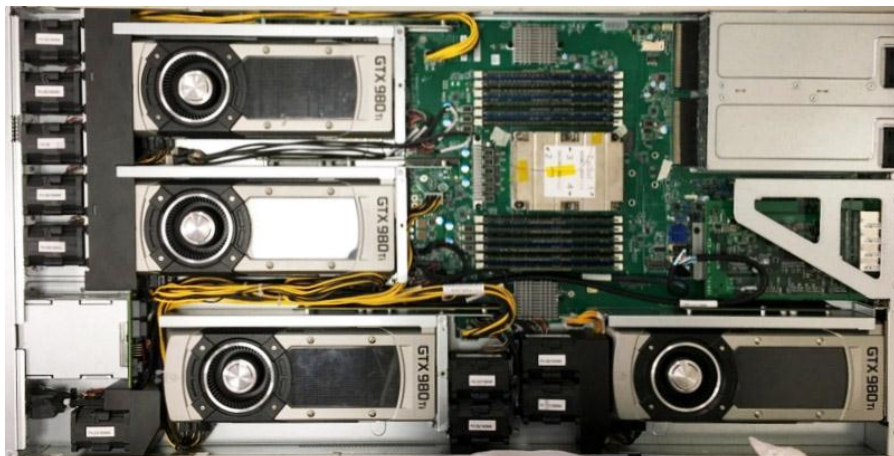
5. Connect the GPU card power cable (PN: 422T64100001).



6. Secure the GPU module to the chassis with 2 screws and connect the power cable to the motherboard.



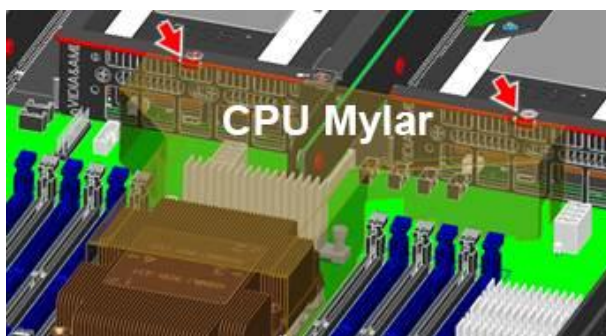
Cable Routing (GTX)



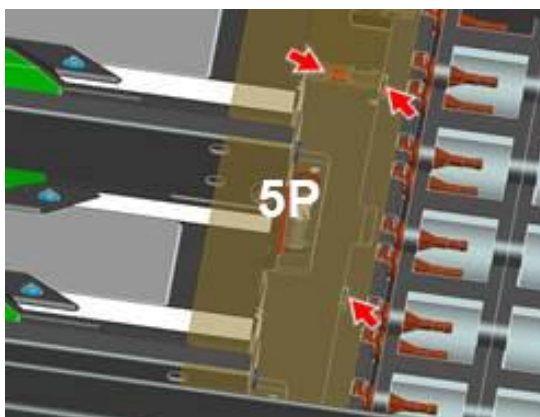
4.5 Installing the Air Duct

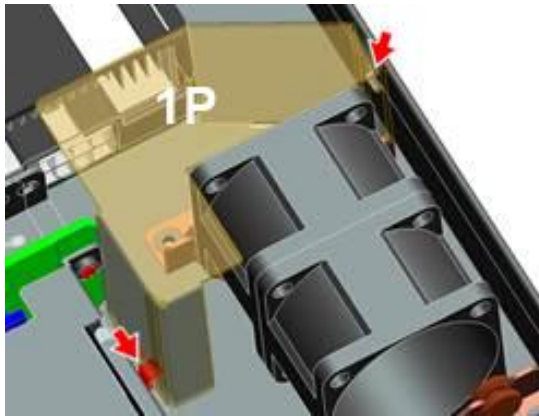
The GA88-B5631 system chassis air duct equipped in the accessory kit. Follow the instruction below to install all the 4 air ducts onto the chassis kit.

1. Align by the guide pins marked with red arrow and then install the air ducts onto the chassis.

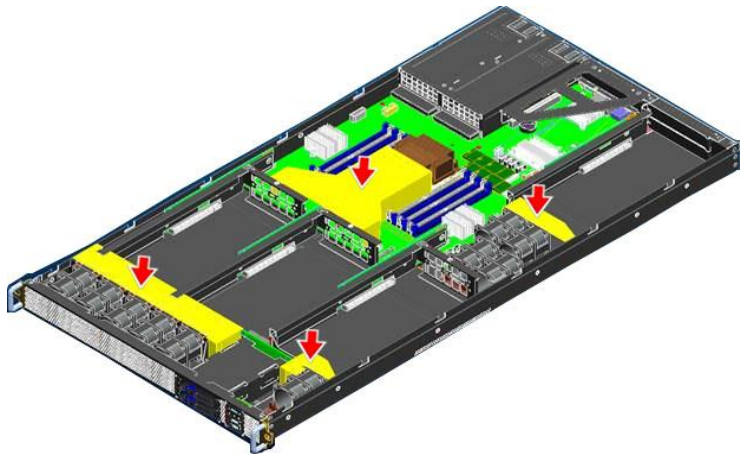


2. Stuck the air duct marked with red arrows onto the chassis.





3. The air duct installation onto the chassis has been complete.



Chapter 5: Mainboard 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.

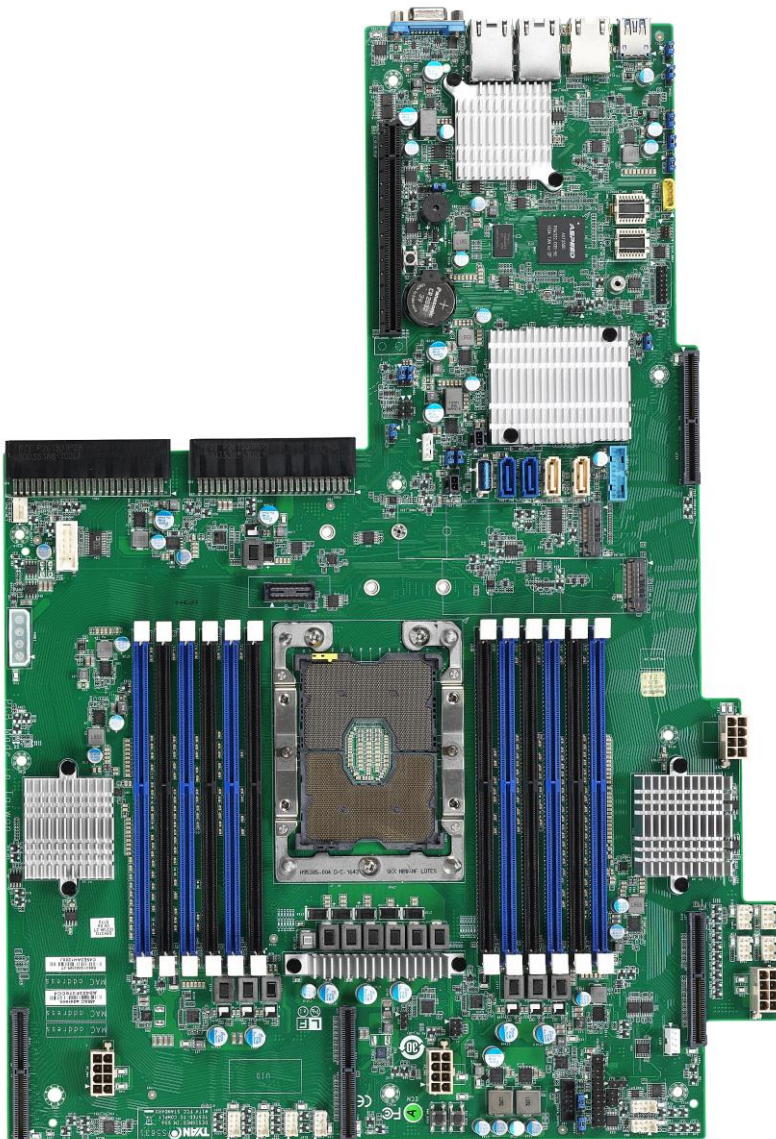
The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.



Caution!

1. To avoid damaging the motherboard and associated components, do not use torque force greater than **5~7kgf/cm (4.35~6.09 lb/in)** on each mounting screw for motherboard installation.
2. Do not apply power to the board if it has been damaged.

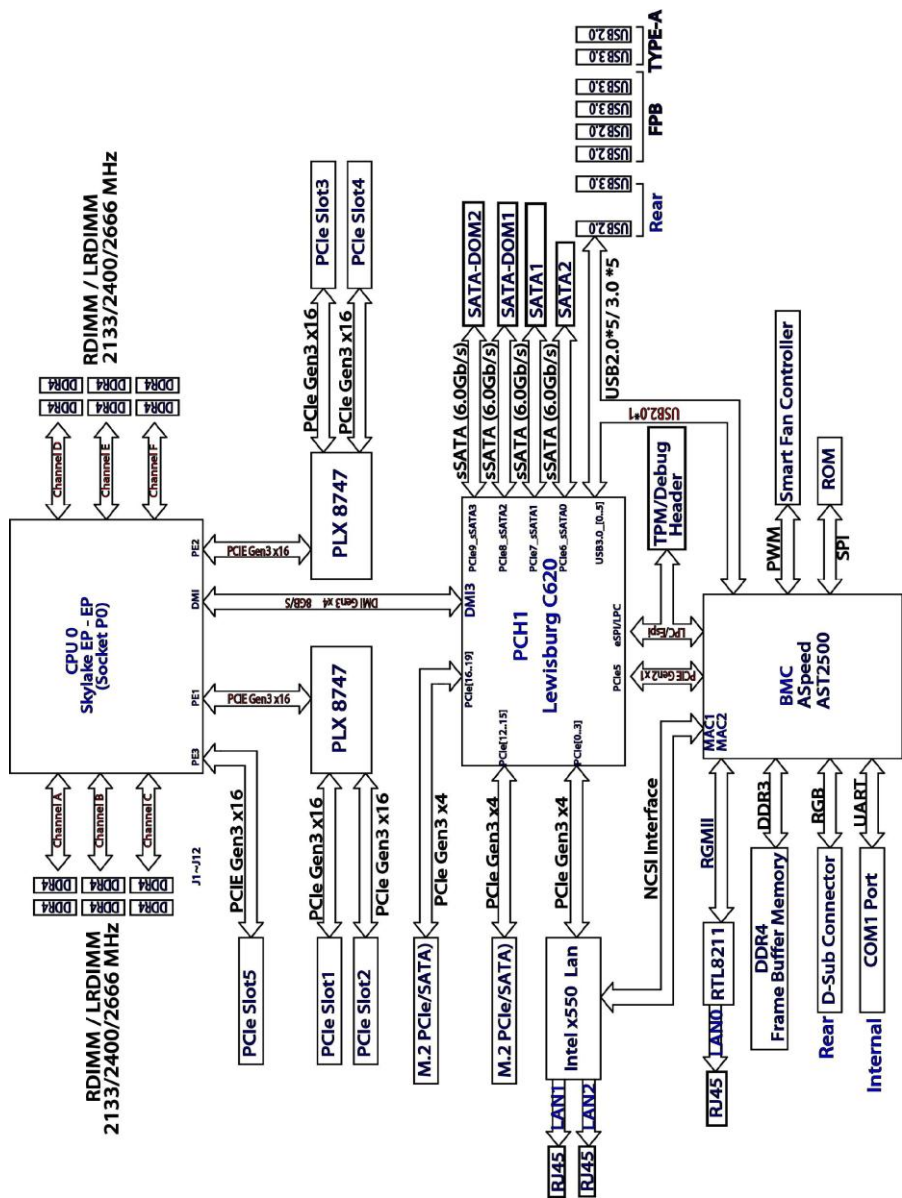
5.1 Board Image



S5631

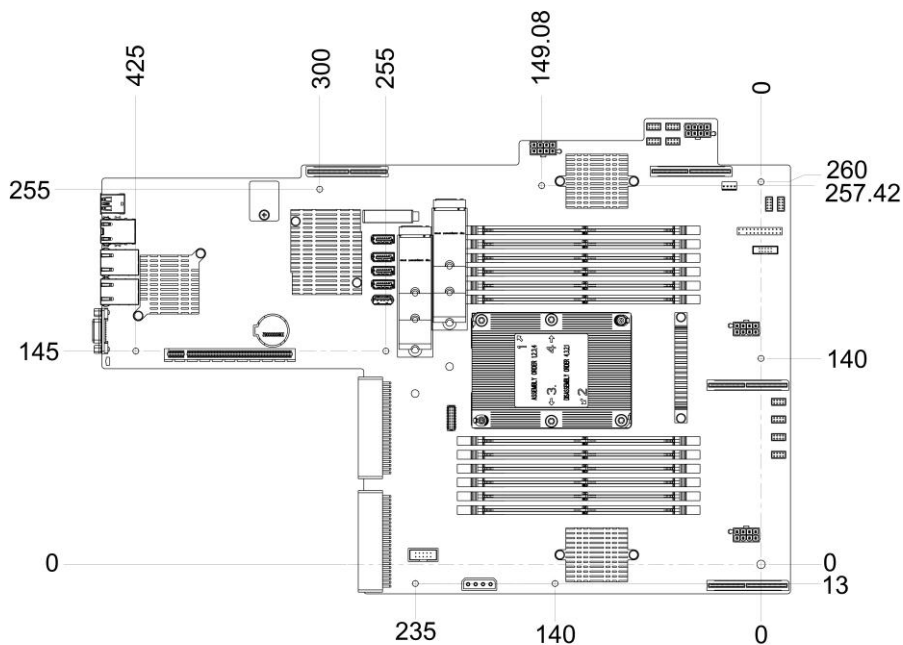
This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.

5.2 Block Diagram

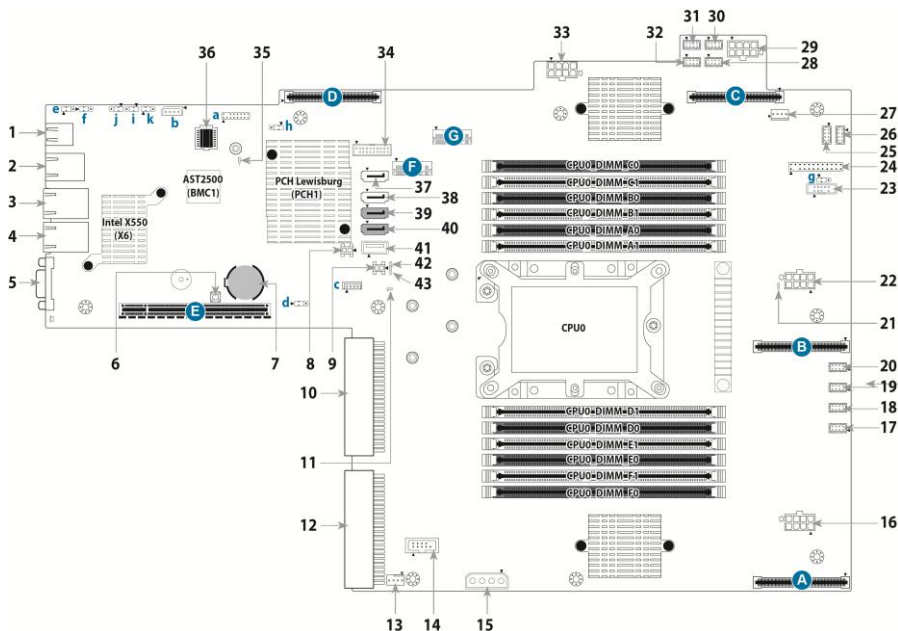


B5631 Block Diagram

5.3 Mainboard Mechanical Drawing



5.4 Board Parts, Jumpers and Connectors

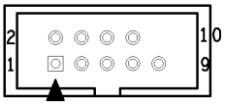


This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. The DIMM slot numbers shown above can be used as a reference when reviewing the DIMM population guidelines shown later in the manual. For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


Jumpers & Connectors

Connectors	
1. USB 3.0 Port (J3)	22. 8-PIN Power Connector for GPU Card (PE_PW1)
2. RJ45 LAN Port (LAN1)	23. PCH SATA SGPIO Header for HD BP (SSATA_SGPIO1)
3. RJ45 LAN Port#1 (X550_LAN2)	24. Front Panel Header (FPIO_1)
4. RJ45 LAN Port#1 (X550_LAN1)	25. SYS_FAN_2 (FAN2)
5. VGA Port (VGA1)	26. SYS_FAN_1 (FAN1)
6. Clear CMOS Button (CLEAR_BTN1)	27. Small 4-PIN Power Header (J116)
7. Battery Socket/Battery (CR1/BT1)	28. SYS_FAN_8 (FAN8)
8. 2-PIN Power Connector for SATA DOM (DOM_5V_PW2)	29. 8-PIN Power Connector for GPU Card (PE_PW5)
9. 2-PIN Power Connector for SATA DOM (DOM_5V_PW1)	30. SYS_FAN_7 (FAN7)
10. 50-PIN Power Card Edge (PSU2)	31. SYS_FAN_9 (FAN9)
11. 50-PIN Power Card Edge (PSU1)	32. SYS_FAN_10 (FAN10)
12. SATA Connector (PCH_SATA_0123)	33. 8-PIN Power Connector for GPU Card (PE_PW2)
13. CPU0 FAN (CPU0_FAN_1)	34. 75Pin M.2 PCIEX4 Mini Card edge (M2_2)
14. COM Header (COM1)	35. BMC LED (BMC_LED1)
15. 4-PIN Power Connector (PWR1)	36. BIOS Socket/BIOS (BIOS_SOCKET1/BIOS_SPI1)
16. 8-PIN Power Connector for GPU Card (PE_PW4)	37. 7-PIN SATA Connector for SATA DOM (SSATA5_DOM2)
17. SYS_FAN_6 (FAN6)	38. 7-PIN SATA Connector for SATA DOM (SSATA4_DOM1)
18. SYS_FAN_5 (FAN5)	39. 7-PIN SATA Connector (SATA3)
19. SYS_FAN_4 (FAN4)	40. 7-PIN SATA Connector (SATA2)
20. SYS_FAN_3 (FAN3)	41. Vertical Type-A USB3.0 Connector (TYPEA_USB1)
21. CPU0 PWOK LED (P0_PG_LED1)	42. CATERR LED (CAT_LED1)
	43. CPU Error LED (ERR_LED1)
Jumpers	
a. TYAN Module Header (DBG_HD1)	g. Intel MIC card/ NVIDIA GPU card Select Jumper (3PHD8)
b. IPMB Pin Header (IPMB_HD1)	h. PSU Alert Function Jumper (3PHD9)
c. Intel VROC Key Header (J2)	i/j. Disable LAN0/LAN1 Jumper (3PHD14/3PHD15)
d. ME Recovery Mode Jumper (3PHD3)	k. Select SPI Path Jumper (J109)
e/f. BMC COM PORT Select Jumper (3PHD6/3PHD7)	
Slots	
A. 120Pin Mini-PCIE Slot For GPU Card (J113)/Slot1	F. 75Pin M.2 PCIEX4 Mini Card edge (M2_1)
B. 120Pin Mini-PCIE Slot For GPU Card (J112)/Slot2	G. 75Pin M.2 PCIEX4 Mini Card edge (M2_2)
C. 120Pin Mini-PCIE Slot For GPU Card (J115)/Slot3	
D. 120Pin Mini-PCIE Slot For GPU Card (J114)/Slot4	
E. 164Pin PCIEX16 Slot (J5)/Slot5 (IOU2)	

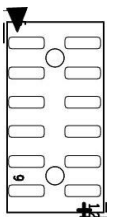
COM1: COM Port Header

	Signal	Pin	Pin	Signal
	DCD	1	2	DSR
	SIN	3	4	RTS
	SOUT	5	6	CTS
	DTR	7	8	RI
	GND	9	10	KEY

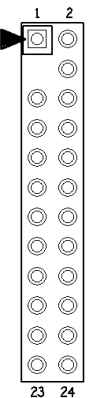
CPU0_FAN_1: 4-pin CPU0 FAN Connector

	Pin	1	2	3	4
	Signal	GND	P12V_IN	TACH	PWM
Use this header to connect the cooling fan to your motherboard to keep the system stable and reliable.					


DBG_HD1: TYAN Module Header

	Signal	Pin	Pin	Signal
	VCC3	1	2	FRAME#
	LAD0	3	4	KEY
	LAD1	5	6	RESET#
	LAD2	7	8	GND
	LAD3	9	10	CLK
	SERIRQ	11	12	GND
	PRSNT#	13	14	VCC3_AUX
	GPIO1	15	16	GPIO2


FPIO_1: Front Panel Connector

	Signal	Pin	Pin	Signal
	PWRLED+	1	2	V3P3_AUX
	KEY	3	4	IDLED+
	PWRLED-	5	6	IDLED-
	HDDLED+	7	8	SYS_FAULT1-
	HDDLED-	9	10	SYS_FAULT2-
	PWR_SW#	11	12	LAN1LED+
	GND	13	14	LAN1LED-
	RESET_SW#	15	16	SMBDATA
	GND	17	18	SMBCLK
	IDLED_SW#	19	20	INTRUSION#
	NC	21	22	LAN2LED+
	NMI_SW#	23	24	X550_LAN1_Act

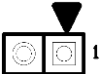
TYPEA_USB3: Type-A USB3.0 Header (blue)

	Signal	Pin	Pin	Signal
	USB3_VCC	1	2	USB2_N8
	USB2_P8	3	4	GND
	USB3_N3_RX	5	6	USB3_P3_RX
	GND	7	8	USB3_N3_TX
	USB3_P3_TX	9		


USB3_FPIO1: Front USB3.0 Connector

	Signal	Pin	Pin	Signal
	USB3_VCC	1	20	NC
	USB3_N5_RX	2	19	USB3_VCC
	USB3_P5_RX	3	18	USB3_N6_RX
	GND	4	17	USB3_P6_RX
	USB3_N5_TX	5	16	GND
	USB3_P5_TX	6	15	USB3_N6_TX
	GND	7	14	USB3_P6_TX
	USB2_N4	8	13	GND
	USB2_P4	9	12	USB2_N6
	NC	10	11	USB2_P6


INTRUDER_HD1: Chassis Intrusion Header

	Signal	Pin	Pin	Signal
	PCH_INTRUDER_N	1	2	GND


CLEAR_BTN1: RTC Reset Button for Clear CMOS

 <p>Normal (Default)</p>	<p>You can reset the CMOS settings by using this button, if you have forgotten your system/setup password or need to clear system BIOS setting.</p> <ol style="list-style-type: none"> 1. Power off the system and disconnect power connectors from the motherboard. 2. Press the button (Clear CMOS). 3. Reconnect power & power on the system. <p>NOTE: After flashing new BIOS, do the following steps:</p> <ol style="list-style-type: none"> a. Clear CMOS b. Enter BIOS setup menu and load Default Settings. Then do a Save and Exit from setup.
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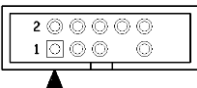
DOM_5V_PW1/DOM_5V_PW2: SSATA DOM Power Connector

	Signal	Pin	Pin	Signal
	GND	1	2	VCC5


SSATA_DOM4/SSATA_DOM5: SSATA DOM Connector

	Signal	Pin	Pin	Signal
	GND	1	2	SSATA_TX+
	SSATA_TX-	3	4	GND
	SSATA_RX-	5	6	SSATA_RX+
	GND	7		
	VCC5	P1	P2	GND

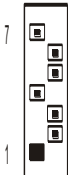
SSATA_SGPIO1: PCH SATA SGPIO Pin Header for HD BP

	Signal	Pin	Pin	Signal
	BMC_SCL	1	2	NC
	BMC_DAT	3	4	SGPIO_DOUT
	GND	5	6	SGPIO_LOAD
	KEY	7	8	SGPIO_CLK
	VCC3_AUX	9	10	NC


IPMB_HD1: IPMB Connector

	Pin	1	2	3	4
	Signal	BMC_SMB_DATA	GND	BMC_SMB_CLK	NC

SATA2/SATA3: SATA Connector

	1	GND	Connects to the Serial ATA ready drives via the Serial ATA cable.		
	2	SSATA_TX+			
	3	SSATA_TX-			
	4	GND			
	5	SSATA_RX-			
	6	SSATA_RX+			
	7	GND			

J2: Intel VROC Key Header (full featured RAID 0, 1, 10, 5, using Intel® VROC, for NVMe SSD SKU)

	Signal	Pin	Pin	Signal
	GND	1	3	GND
	VCC3_AUX	2	4	SATA_RAID_KEY

3PHD3: ME Firmware Recovery Mode Jumper

	Pin	1	2	3
	Signal	NC	FM_ME_RCVR_N	GND
Pin1-2 closed: Normal (Default) Pin2-3 closed: ME Firmware Recovery Mode				

3PHD6/SPHD7: BMC Console Port5 Select Jumper (for BMC Debug)

	Signal	Pin	Pin	Signal
	BMC_TXD5 BMC_RXD5	1	2	TXD_OUT RXD_OUT
	BMC_TXD BMC_RXD	3		
	Pin1-2 closed: BMC COM2 Debug (Default) Pin2-3 closed: BMC COM5 Debug			

3PHD8: Intel MIC card/NVIDIA GPU card Select Jumper

	Signal	Pin	Pin	Signal
	GND	1	2	FM_MIC_IMP_B_EN
	VCC3_AUX	3		
	Pin1-2 closed: NVIDIA GPU - Normal (Default) Pin2-3 closed: Intel MIC			

3PHD9: PSU Alert Function Jumper

	Signal	Pin	Pin	Signal
	NC	1	2	PSU_ALERT
	PSU_Alert_buff	3		
	Pin1-2 closed: Normal (Default) Pin2-3 closed: PSU Alert Reset Mode			

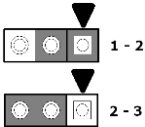
3PHD14: Disable X550 LAN0 Jumper

	Signal	Pin	Pin	Signal
	3.3V_AUX	1	2	X550_LAN0_DIS_N
	GND	3		
	Pin1-2 closed: Normal Mode (Default) Pin2-3 closed: LAN0 Disabled			


3PHD15: Disable X550 LAN1 Jumper

	Signal	Pin	Pin	Signal
	3.3V_AUX	1	2	X550_LAN1_DIS_N
	GND	3		
	Pin1-2 closed: Normal Mode (Default) Pin2-3 closed: LAN1 Disabled			


J109: Select SPI Path Jumper

	Signal	Pin	Pin	Signal
	3.3V_AUX	1	2	SPI-BUS-1
	GND	3		
	Pin1-2 closed: Normal Mode (Default) Pin2-3 closed: Pass through mode			

FAN1~FAN10: 8-pin System FAN Power Connector

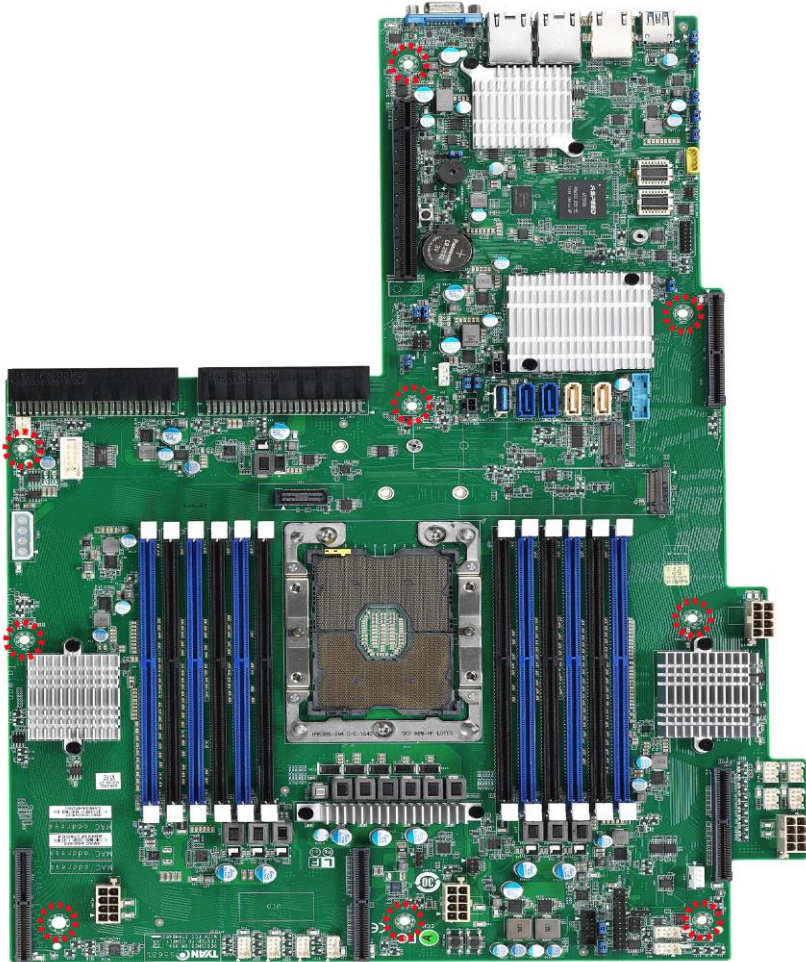
	Signal	Pin	Pin	Signal
	GND1	1	5	VCC12
	FAN TACH1	2	6	FAN PWM1
	GND2	3	7	VCC12
	FAN TACH2	4	8	FAN PWM2

J116: small 4-pin Power Connector

	Signal	Pin	Pin	Signal
	P12V_IN	1	3	GND
	GND	2	4	VCC5

5.5 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.

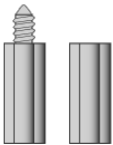
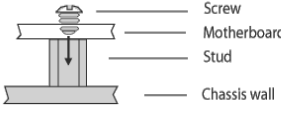
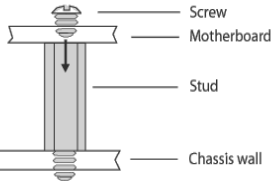
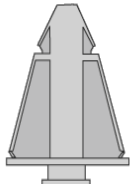
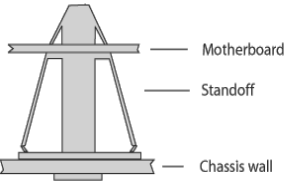
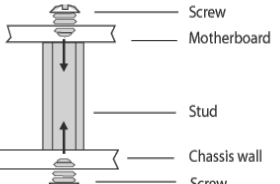
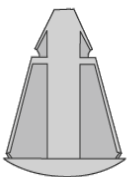
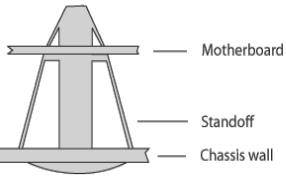
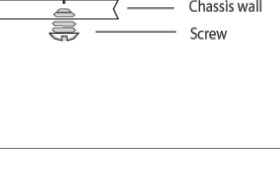


NOTE: Be especially careful to look for extra stand-offs. If there are any stand-offs present that are not aligned with a mounting hole on the motherboard, it will likely short components on the back of the motherboard when installed. This will cause malfunction and/or damage to your motherboard.

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.

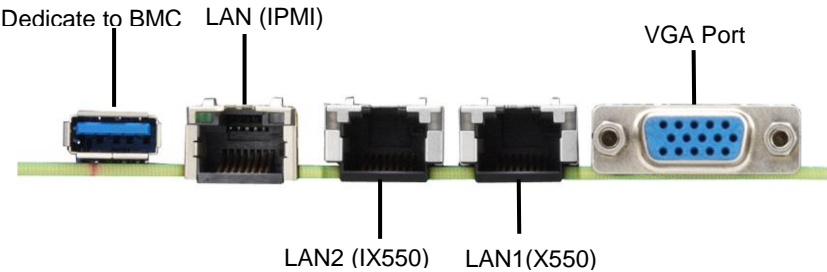
Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

Mounting the Motherboard

Type	Solutions for installing	
		
		
		

5.6 Connecting External Devices

Connecting external devices to the motherboard is an easy task. The motherboard supports a number of different interfaces through connecting peripherals. See the following diagrams for the details.




NOTE: Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.


Onboard LAN LED Color Definition

The onboard Ethernet port has green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

10Gbps LAN Port LAN Indication

10/100/1000 Mbps LAN Link/Activity LED Scheme			
<div>left right</div> 		Left LED (Link/Activity)	Right LED (Speed)
No Link		OFF	OFF
100 Mbps	Link	Solid Green	Solid Green
	Active	Blinking Green	Solid Green
1000 Mbps	Link	Solid Green	Solid Amber
	Active	Blinking Green	Solid Amber
(10Gbps)	Link	Solid Amber	Solid Amber
	Active	Solid Amber	Solid Amber

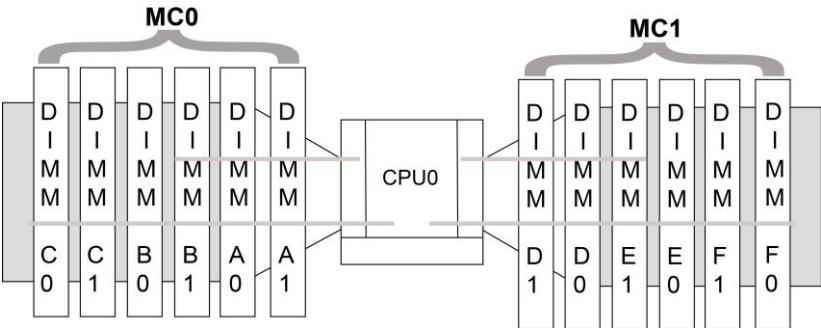
1Gbps LAN Port LAN Indication

10/100/1000 Mbps LAN Link/Activity LED Scheme			
<div>Left LED Right LED</div> 		Left LED (Link/Activity)	Right LED (Speed)
No Link		OFF	OFF
10 Mbps	Link	Solid Green	OFF
	Active	Blinking Green	OFF
100 Mbps	Link	Solid Green	Solid Green
	Active	Blinking Green	Solid Green
1000 Mbps (1Gbps)	Link	Solid Green	Solid Amber
	Active	Blinking Green	Solid Amber

5.7 Memory

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.

- Supports twelve (6+6) DDR4 RDIMM/RDIMM 3DS/LRDIMM/LRDIMM 3DS 2666, up to 384GB RDIMM/ 768GB LRDIMM/ 1,536GB RDIMM 3DS/LRDIMM 3DS DDR4 Memory (*Follow latest Intel DDR4 Memory POR)
- Supports single/dual rank memory
- All installed memory will automatically be detected and no jumpers or settings need changing
- All memory must be of the **same type and density**



Intel DDR4 POR Table

Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slots per Channel (SPC) & DIMMs per Channel (DPC)		
				1 Slot per Channel	2 Slots per Channel	
		DRAM Density		1DPC	1DPC	2DPC
		4Gb	8Gb	1.2V	1.2V	1.2V
RDIMM	SRx4	8GB	16GB	2666	2666	2666
RDIMM	SRx8	4GB	8GB			
RDIMM	DRx8	8GB	16GB			
RDIMM	DRx4	16GB	32GB			
RDIMM 3DS	QRx4	N/A	2H-64GB			
	8Rx4	N/A	4H-128GB			
LRDIMM	QRx4	32GB	64GB			
LRDIMM 3DS	QRx4	N/A	2H-64GB			
	8Rx4	N/A	4H-128GB			


Memory Population Table

Dual CPU Installed	Quantity of memory installed											
	1	2	3	4	5	6	7	8	9	10	11	12
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												√
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 and DIMM_0 Slot first, following the alphabetical order.												


5.8 Power Supply

There are **five (5)** power connectors on your S5631 motherboard. The S5631 supports EPS 12V power supply.

PWR1: 4-pin Power Connector

	Signal	Pin	Pin	Signal
	P12V_IN	1	3	GND
	GND	2	4	VCC5

PE_PW1/PE_PW2/PE_PW4/PE_PW5: 8-pin GPU Power Connector

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

Chapter 6: BIOS Setup

6.1 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 or <F2> during POST (Del on remote console) to start the BIOS setup utility.

6.1.1 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

6.1.2 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.

6.1.3 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.

6.1.4 Setup Variations

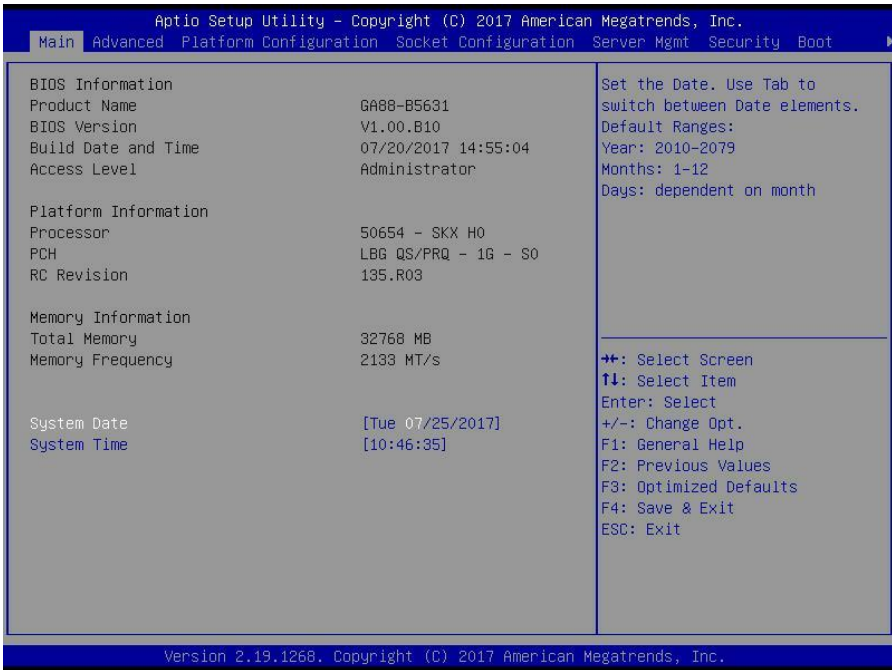
Not all systems have the same BIOS setup layout or options. While the basic look and function of the BIOS setup remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom 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.

6.2 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.



BIOS Information

It displays BIOS related information.

Product Name

It displays Product information.

BIOS Version

It displays BIOS version information

Build Date and Time

It displays the time when built

Access Level

Adminrator

Platform Information

It displays the platform information

Memory Information

It displays the total memory size.

System Date

Set the Date. Use Tab to switch between Date elements. Default Ranges:

Year: 2010-2079

Months: 1-12

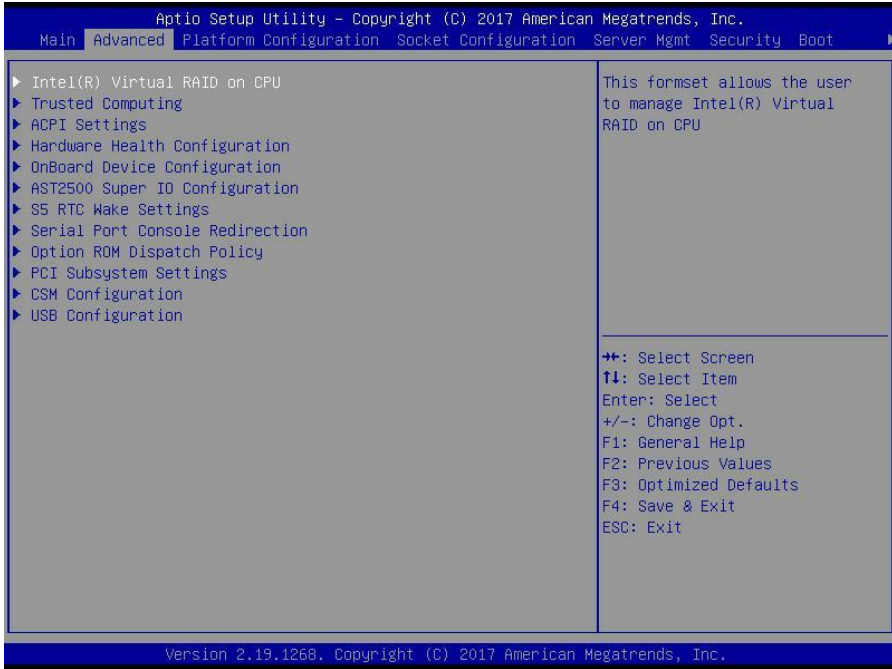
Days: dependent on month

System Time

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

6.3 Advanced Menu

This section facilitates configuring advanced BIOS options for your system.



Intel® Virtual RAID on CPU

This formset allows the user to manage Intel® Virtual RAID on CPU.

Trusted Computing

Trusted Computing Settings.

ACPI Settings

System ACPI Parameters.

Hardware Health Configuration

Hardware health Configuration Parameters.

Onboard Device Configuration

Onboard Device Configuration.

AST2500 Super IO Configuration

System Super IO Chip Parameters.

S5 RTC Wake Settings

Enable system to wake from S5 using RTC alarm.

Serial Port Console Redirection

Serial Port Console Redirection.

Option ROM Dispatch Policy

Option ROM Dispatch Policy.

PCI Subsystem Settings

PCI, PCI-X and PCI Express Settings.

Network Stack Configuration

Network Stack Settings.

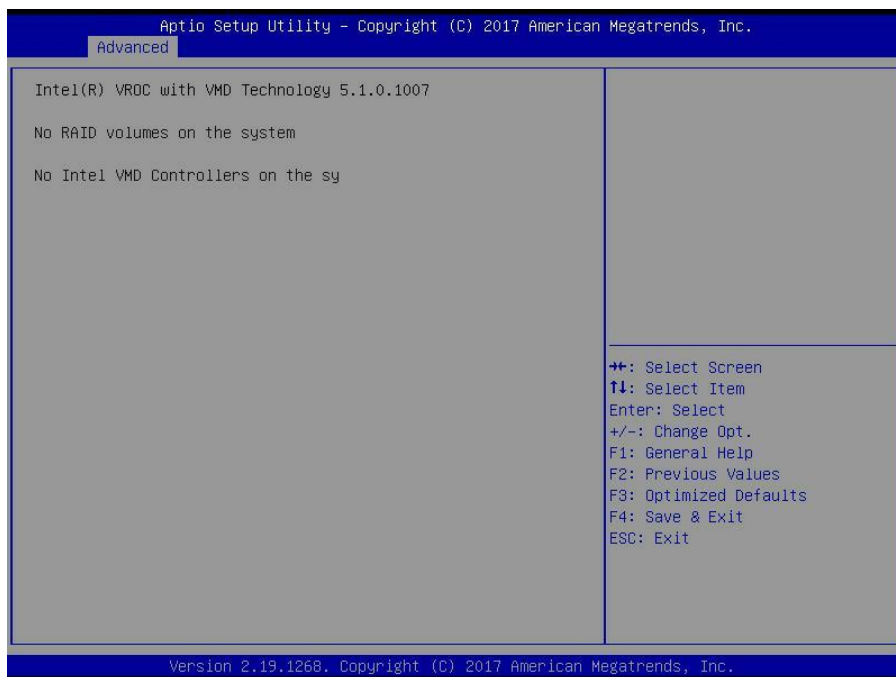
CSM Configuration

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

USB Configuration

USB Configuration Parameters.

6.3.1 Intel® Virtual RAID on CPU



Please follow the instructions to initiate the Intel Virtual RAID on CPU function.

Step 1.

Select **Socket Configuration** → **I/O Configuration** → **Intel® VMD technology** → **Intel® VMD for Volume Management Device on Socket 0** (for CPU0) / **Socket 1** (for CPU1) → **Intel® VMD for Volume Management Device for PStack0** (Slot 1~4) / **PStack1** (Slot 5~8) / **PStack2** (Slot 9~12)

Step 2.

Suppose the card is installed in CPU0 Slot 3, then **Intel® VMD for Volume Management Device for PStack0** will be set to [Enabled].

Step 3.

Save changes and reboot.

6.3.2 Trusted Computing

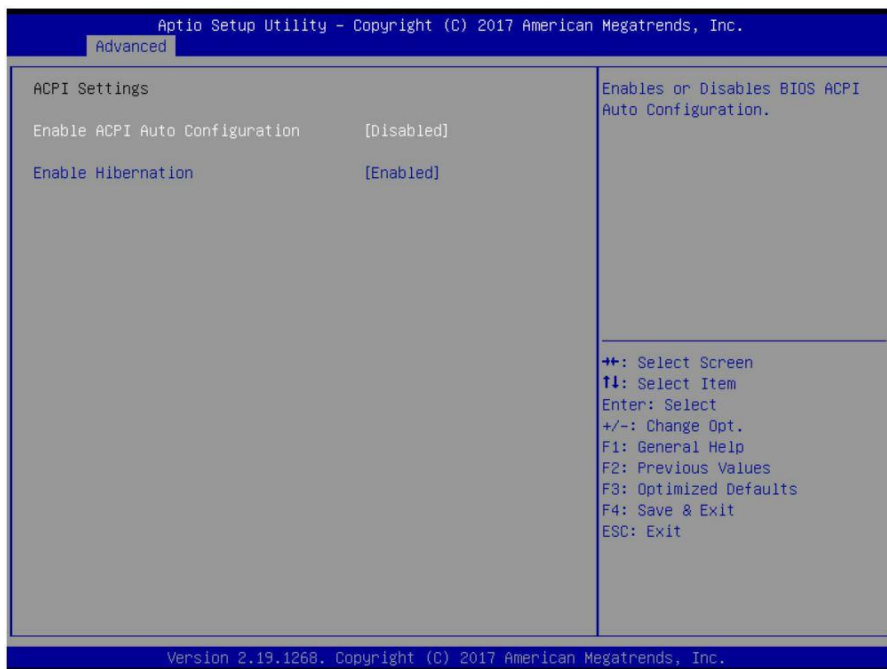


Security Device Support

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.

Enabled / **Disabled**

6.3.3 ACPI Settings



Enable ACPI Auto Configuration

Enable or disable BIOS ACPI Auto Configuration.

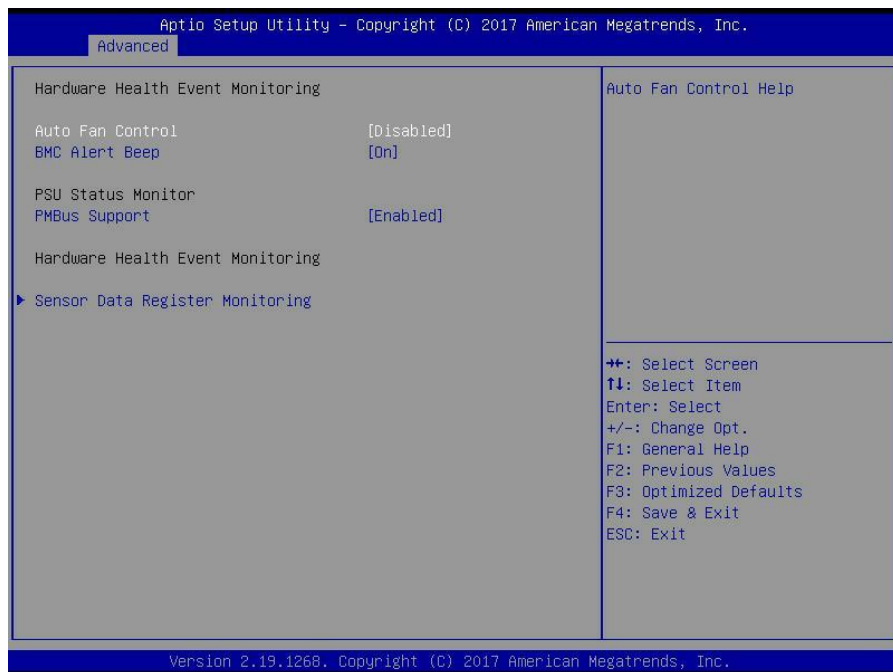
Disabled / Enabled

Enable Hibernation

Enable or disable System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

Disabled / **Enabled**

6.3.4 Hardware Health Configuration



Auto Fan Control

Auto Fan Control Help.

Disabled / Enabled

BMC Alert Beep

Enable/Disable BMC Alert Beep.

On / Off

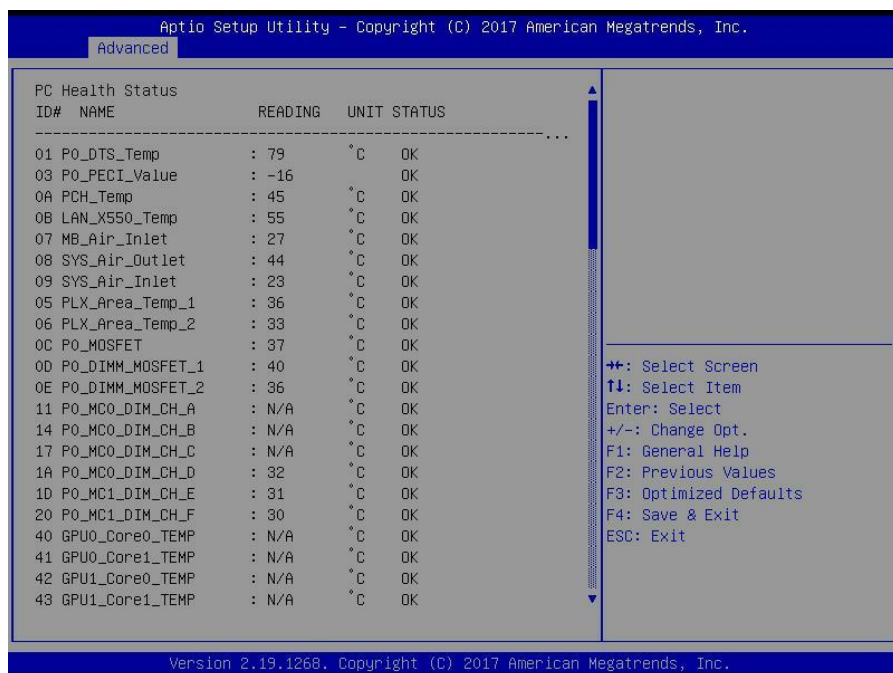
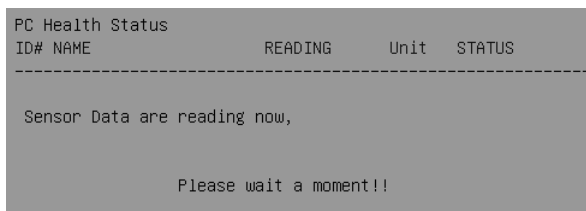
PMBus Support

PMBus Support

Enabled / Disabled

6.3.4.1 Sensor Data Register Monitoring

When you enter the **Sensor Data Register Monitoring** submenu, you will see the following dialog window pop out. Please wait 8~10 seconds.



Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.

Advanced

43	GPU1_Core1_TEMP	:	N/A	°C	OK
44	GPU2_Core0_TEMP	:	N/A	°C	OK
45	GPU2_Core1_TEMP	:	N/A	°C	OK
46	GPU3_Core0_TEMP	:	N/A	°C	OK
47	GPU3_Core1_TEMP	:	N/A	°C	OK
50	PVCCP_CPU0	:	1.3376	V	OK
51	PVCCIO_CPU0	:	1.0208	V	OK
52	PVDDQ_CPU0	:	1.2232	V	OK
53	PVPP_CPU0	:	2.5280	V	OK
58	VCC12	:	12.090	V	OK
59	VCC5	:	5.1025	V	OK
5A	VCC3	:	3.4069	V	OK
5B	VCC3_AUX	:	3.4069	V	OK
5C	P1V8_PCH	:	1.8252	V	OK
5D	PVNN_PCH	:	1.0120	V	OK
5E	P1V05_PCH	:	1.0560	V	OK
5F	RTC_BAT	:	3.0624	V	OK
60	SYS_FAN_1	:	7400	RPM	OK
61	SYS_FAN_2	:	7300	RPM	OK
62	SYS_FAN_3	:	9300	RPM	OK
63	SYS_FAN_4	:	9600	RPM	OK
64	SYS_FAN_5	:	9200	RPM	OK
65	SYS_FAN_6	:	9600	RPM	OK
66	SYS_FAN_7	:	9100	RPM	OK
67	SYS_FAN_8	:	9700	RPM	OK

++: Select Screen

↑↓: Select Item

Enter: Select

+/-: Change Opt.

F1: General Help

F2: Previous Values

F3: Optimized Defaults

F4: Save & Exit

ESC: Exit

Version 2.19.1268, Copyright (C) 2017 American Megatrends, Inc.

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.

Advanced

62	SYS_FAN_3	:	9300	RPM	OK
63	SYS_FAN_4	:	9600	RPM	OK
64	SYS_FAN_5	:	9200	RPM	OK
65	SYS_FAN_6	:	9700	RPM	OK
66	SYS_FAN_7	:	9200	RPM	OK
67	SYS_FAN_8	:	9700	RPM	OK
68	SYS_FAN_9	:	9200	RPM	OK
69	SYS_FAN_10	:	9600	RPM	OK
6A	SYS_FAN_11	:	9300	RPM	OK
6B	SYS_FAN_12	:	9600	RPM	OK
6C	SYS_FAN_13	:	7100	RPM	OK
6D	SYS_FAN_14	:	7600	RPM	OK
6E	SYS_FAN_15	:	7300	RPM	OK
6F	SYS_FAN_16	:	7100	RPM	OK
70	SYS_FAN_17	:	20400	RPM	OK
71	SYS_FAN_18	:	N/A	RPM	OK
72	SYS_FAN_19	:	7000	RPM	OK
73	SYS_FAN_20	:	7500	RPM	OK
90	PSU0_Status	:	1		OK
91	PSU1_Status	:	0		Alert
9A	PSU0_Power	:	176	W	OK
9B	PSU1_Power	:	N/A	W	OK

++: Select Screen

↑↓: Select Item

Enter: Select

+/-: Change Opt.

F1: General Help

F2: Previous Values

F3: Optimized Defaults

F4: Save & Exit

ESC: Exit

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NOTE: SDR can not be modified. Read only.

6.3.5 Onboard Device Configuration



Onboard LAN (Intel X550)

LAN Enable/Disable control function.

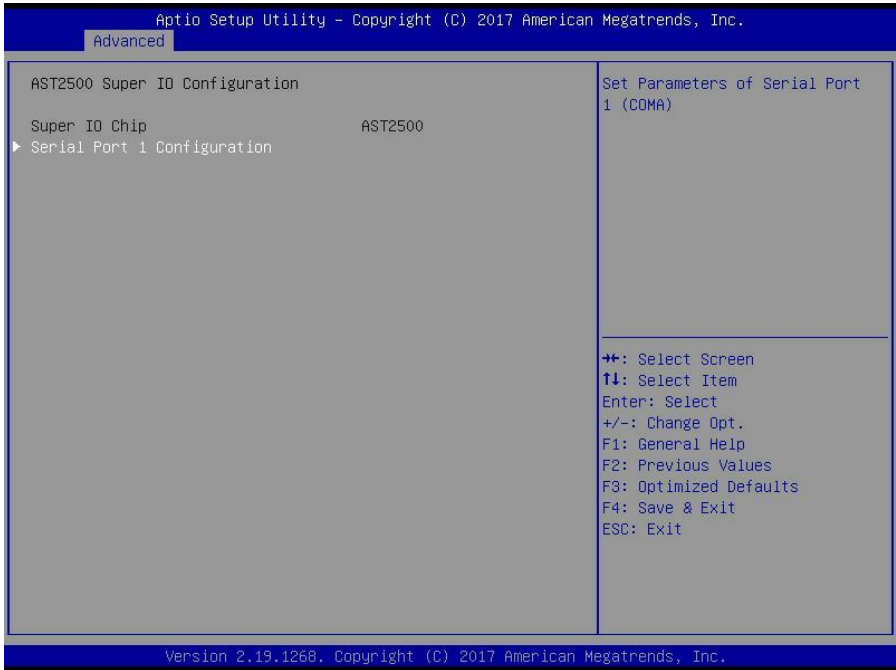
Disabled / **Enabled**

Chassis Intrusion detect

ENABLED: when a chassis open event is detected, the BIOS will record the event.

Disabled / Enabled

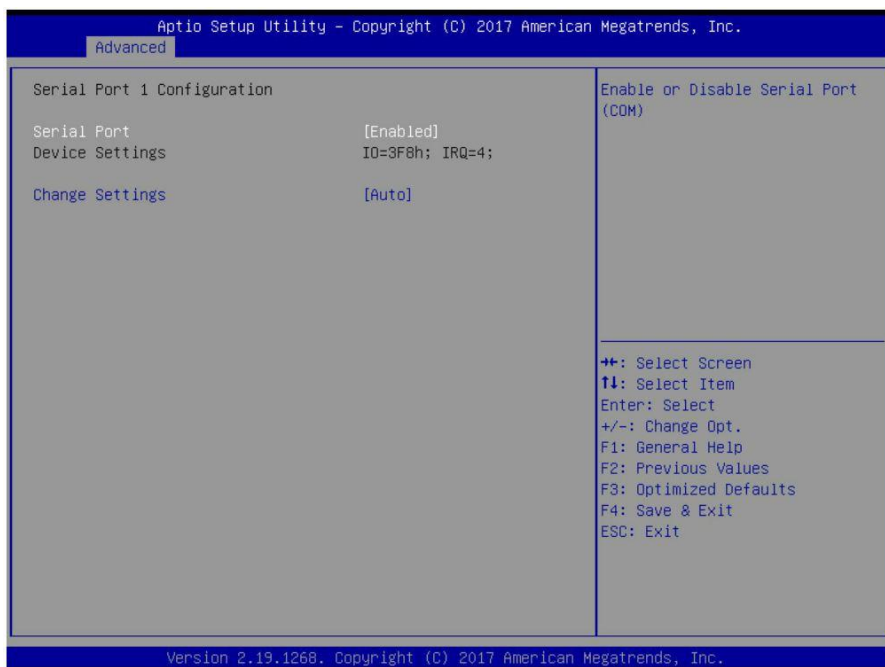
6.3.6 AST2500 Super IO Configuration



Super IO Chip

Read only.

6.3.6.1 Serial Port 1 Configuration



Serial Port

Enable or disable Serial Port (COM).

Enabled / Disabled

Device Settings

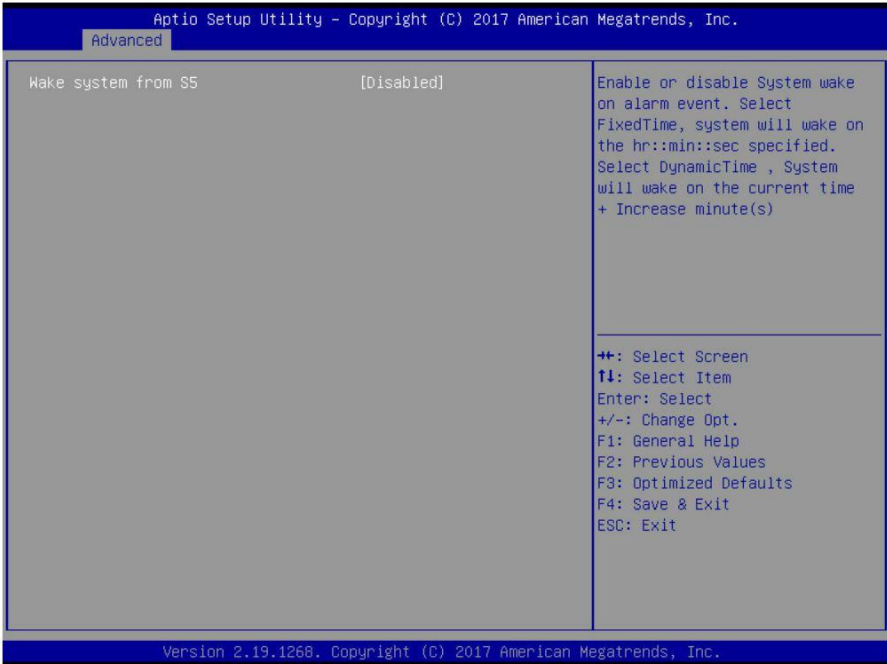
Read only.

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;

6.3.7 S5 RTC Wake Settings



Wake system from S5

Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr:min:sec specified. Select Dynamic Time, system will wake on the current time + increase minute(s).

Disabled / 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

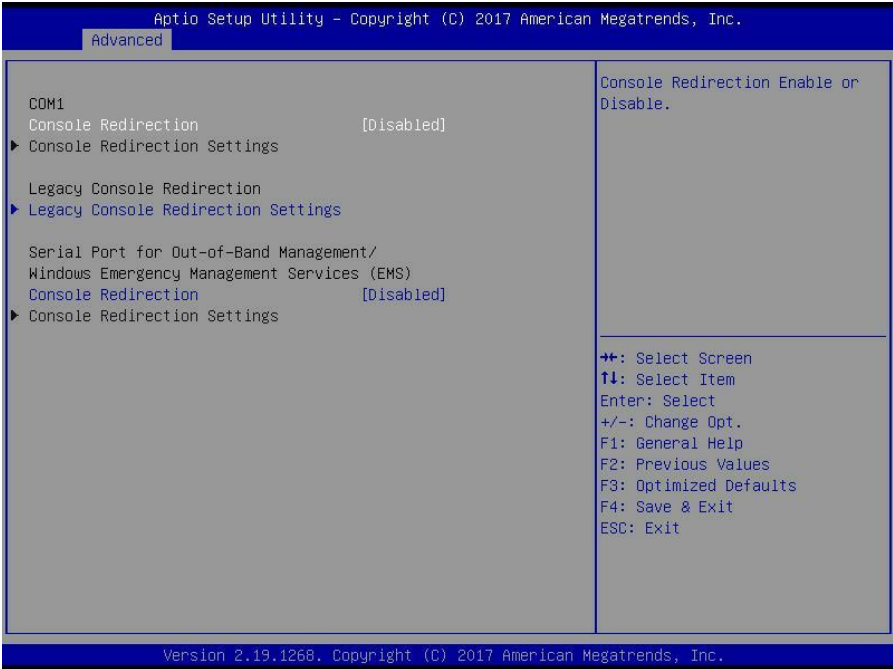
Select 0-59 for Second.

When Wake system from S5 is set to **[Dynamic Time]**

Wake up Minute increase

1-5.

6.3.8 Serial Port Console Redirection



COM1 / Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS)

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.

6.3.8.1 Console Redirection Settings

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.	
Advanced	
COM1 Console Redirection Settings	
Terminal Type	[ANSI]
Bits per second	[115200]
Data Bits	[8]
Parity	[None]
Stop Bits	[1]
Flow Control	[None]
VT-UTF8 Combo Key Support	[Enabled]
Recorder Mode	[Disabled]
Resolution 100x31	[Disabled]
Legacy OS Redirection Resolution	[80x24]
Putty KeyPad	[VT100]
Redirection After BIOS POST	[Always Enable]
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.	
++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.	

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

Legacy OS Redirection Resolution

On Legacy OS, the number of rows and columns supported redirection.

80x24 / 80x25

Putty KeyPad

Select FunctionKey and KeyPad on Putty.

VT100 / LINUX / XTERMR6 / SCO / ESCN / VT400

Redirection after BIOS POST

The settings specify if BootLoader is selected than Legacy console redirection is disabled before booting to Legacy OS. Default value is Always Enable which means Legacy Console Redirection is enabled for Legacy OS.

Always Enable / BootLoader

6.3.8.2 Legacy Console Redirection Settings



Legacy Serial Redirection Port

Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

COM1 / COM2

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

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.		
Advanced		
Out-of-Band Mgmt Port	COM1	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.
Terminal Type	[VT-UTF8]	
Bits per second	[115200]	
Flow Control	[None]	
Data Bits	8	
Parity	None	
Stop Bits	1	
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.		

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

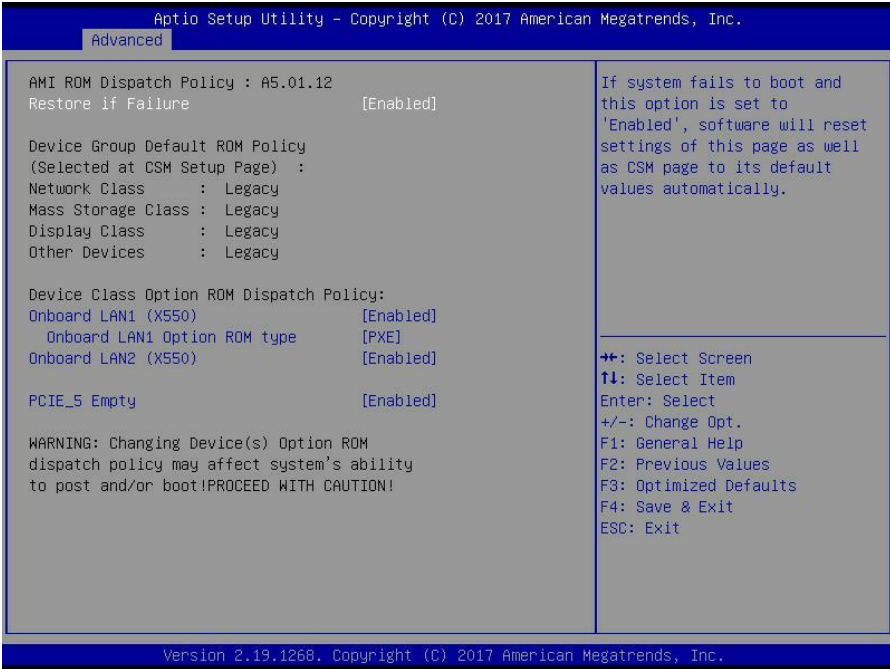
Flow Control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to restart the flow. Hardware flow control uses two wires to send start/stop signal.

None / Hardware RTS/CTS / Software Xon/Xoff

Data Bits / Parity / Stop Bits

Read only.

6.3.9 Option ROM Dispatch Policy



Restore if Failure

If system fails to boot and this option is set to 'Enabled', software will reset settings of this page as well as CSM page to its default values automatically.

Disabled / **Enabled**

Onboard LAN1 (X550)

Enable or disable onboard LAN1 Option ROM.

Disabled / **Enabled**

Onboard LAN1 Option ROM type

Select onboard LAN1 Option ROM type.

PXE / iSCSI

Onboard LAN2 (X550)

Enable or disable onboard LAN2 Option ROM.

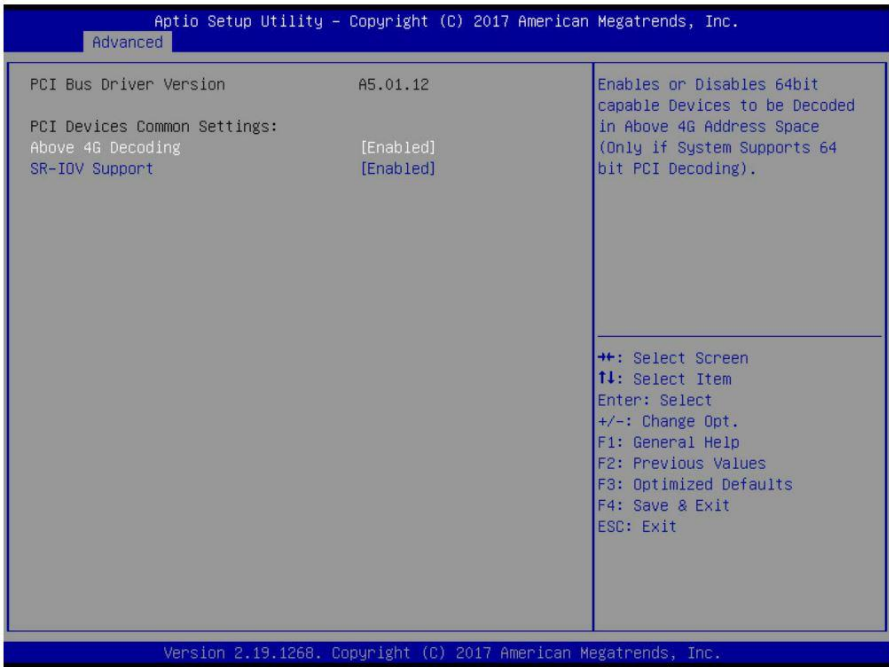
Disabled / **Enabled**

PCIE_5 Empty

Enable or Disable Option ROM execution for selected Slot.

Disabled / **Enabled**

6.3.10 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).

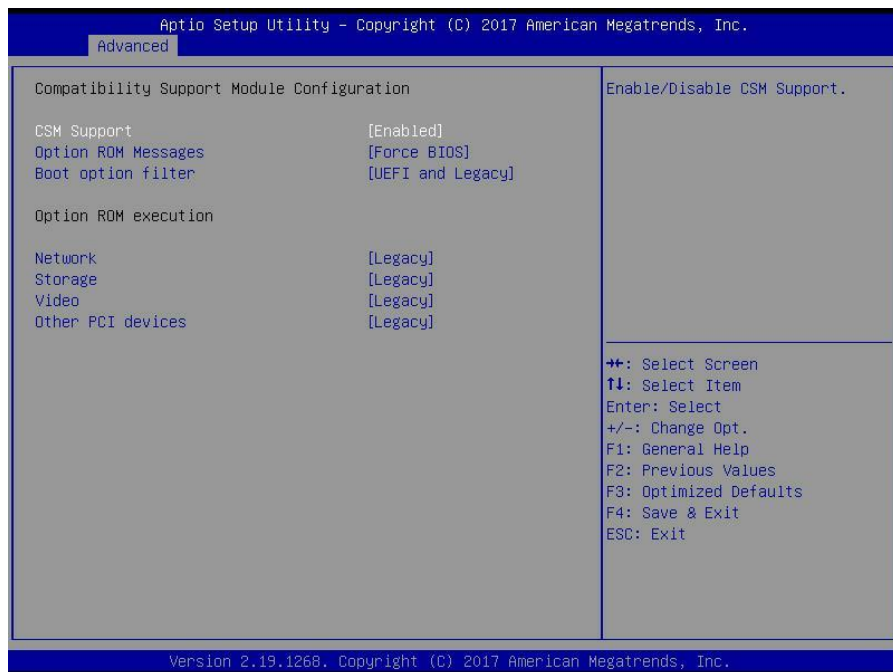
Enabled / Disabled

SR-IOV Support

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

Enabled / Disabled

6.3.11 CSM Configuration



CSM Support

Enable/Disable CSM Support.

Enabled / Disabled

Option ROM Messages

Set display mode for Option ROM.

Force BIOS / Keep Current

Boot option filter

This option controls Legacy/UEFI ROMs priority.

UEFI and Legacy / Legacy only / UEFI only

Network

Controls the execution of UEFI and Legacy PXE OpROM.

Legacy / Do not launch / UEFI

Storage

Controls the execution of UEFI and Legacy Storage OpROM.

Legacy / Do not launch / UEFI

Video

Controls the execution of UEFI and Legacy Video OpROM

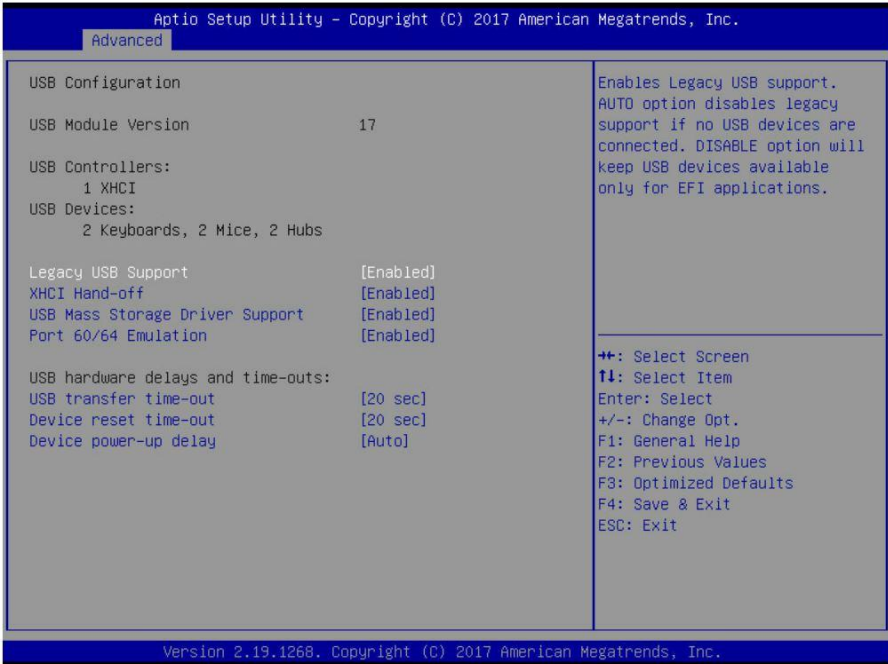
Legacy / Do not launch / UEFI

Other PCI Devices

Determines OpROM execution policy for devices other than Network, Storage, or Video.

Legacy / Do not launch / UEFI

6.3.12 USB Configuration



USB Module Version / USB Controllers / USB Devices

Read only.

Legacy USB Support

Enable 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.

Enabled / Disabled / 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.

Enabled / Disabled

USB Mass Storage Driver Support

Enable/Disable USB Mass Storage Driver Support.

Enabled / Disabled

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.

Enabled / Disabled

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.

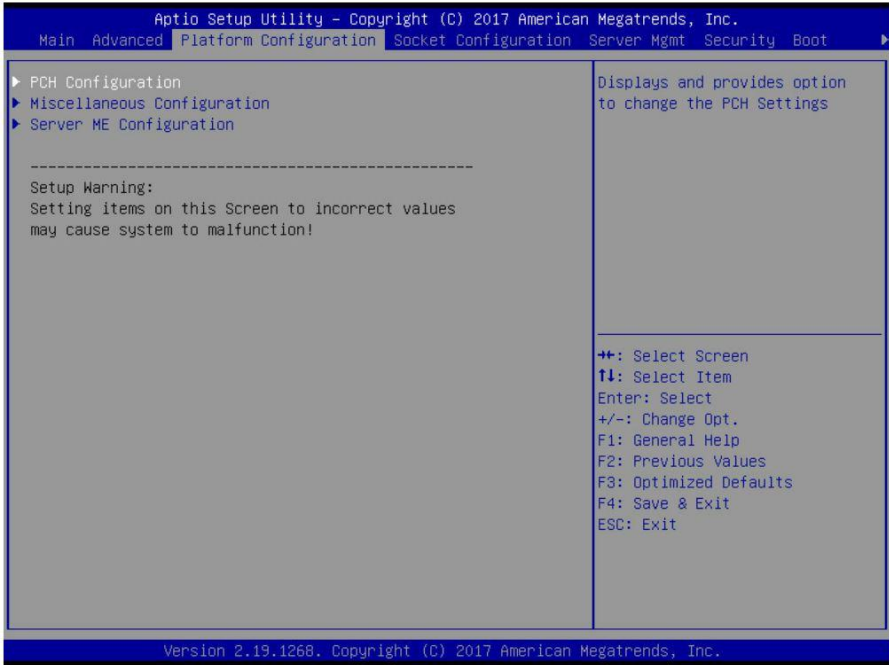
10 sec / **20 sec** / 30 sec / 40 sec

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

6.4 Platform Configuration



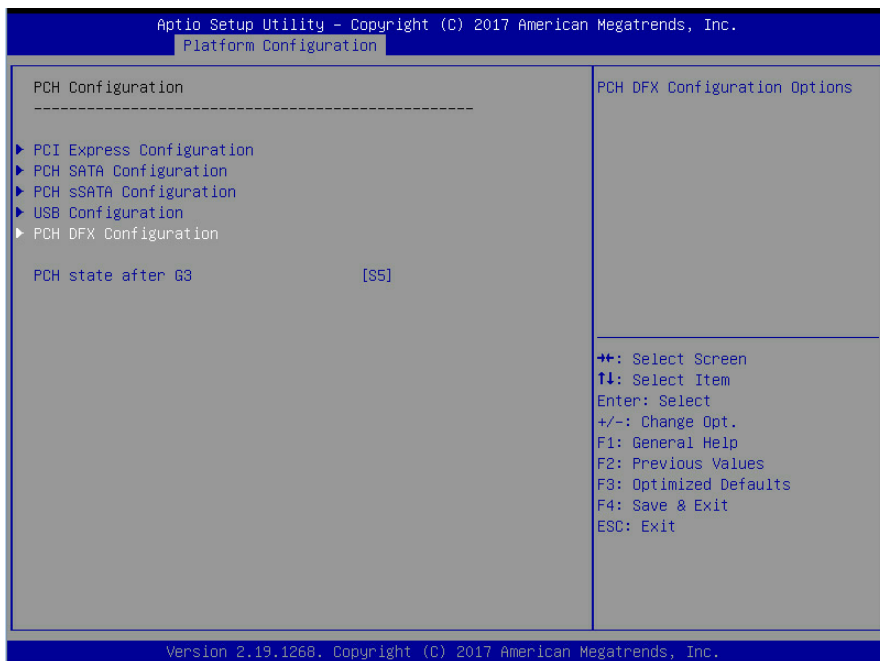
PCH Configuration

Displays and provides option to change the PCH Settings.

Server ME Configuration

Configure Server ME Technology Parameters.

6.4.1 PCH Configuration



PCI Express Configuration

PCI Express Configuration settings.

PCH SATA Configuration

SATA devices and settings.

PCH sSATA Configuration

sSATA devices and settings.

USB Configuration

USB Configuration Settings.

PCH DFX Configuration

PCH DFX Configuration Options.

PCH state after G3

Select S0/S5 for ACPI state after a G3.

S0 / Onboard / **S5** / Leave power state unchanged

6.4.1.1 PCI Express Configuration

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.		
Platform Configuration		
PCI Express Root Port (To Ast2500)	[Enabled]	Control the PCI Express Root Port.
PCIE ASPM	[Disable ASPM]	
L1 Substates	[L1.1 & L1.2]	
PCIe Speed	[Auto]	
Max Payload Size	[MPL 128B]	
		↔: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1268, Copyright (C) 2017 American Megatrends, Inc.		

PCI Express Root Port (To AST2500)

Control the PCI Express Root Port.

Enabled / Disabled

PCIE ASPM

PCI Express Root port ASPM Setting

Disable ASPM / ASPM L1 / ASPM Auto

L1 Substates

PCI Express L1 Substates settings.

Disabled / L1.1 / L1.2 / **L1.1 & L1.2**

PCIe Speed

Configure PCIe Speed.

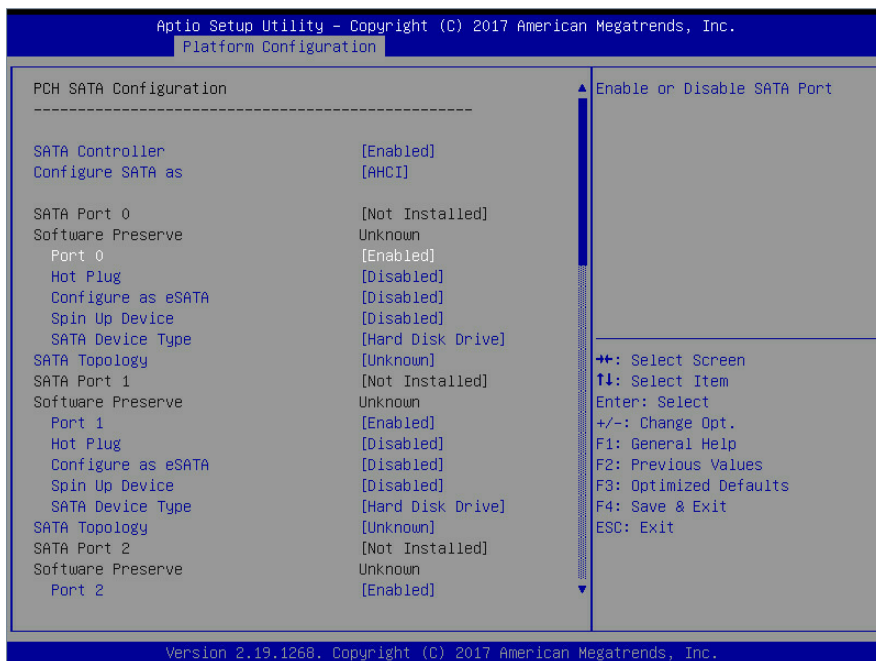
Auto / Gen1 / Gen2 / Gen3

Max Payload Size

PCIE Max Payload Size Selection.

MPL128B / MPL256B

6.4.1.2 PCH SATA Configuration



SATA Controller

Enable or Disable SATA Controller.

Enabled / Disabled

Configure SATA as

Determines how SATA controller(s) operate.

AHCI / RAID

Port 0

Enable or Disable SATA Port.

Disabled / **Enabled**

Hot Plug

Designates this port as Hot Pluggable.

Disabled / Enabled

Configure as eSATA

Configures port as External SATA (eSATA).

Disabled / Enabled

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.

Disabled / Enabled

SATA Device Type

Identify the SATA port is connected to Solid State Drive or Hard disk Drive.

Hard Disk Drive / Solid State Drive

SATA Topology

Identify the SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2.

Unknown / ISATA / Direct Connect / Flex / M2

6.4.1.3 PCH sSATA Configuration

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.		
Platform Configuration		
PCH sSATA Configuration		▲ Enable or Disable SATA Controller
sSATA Controller	[Enabled]	
Configure sSATA as	[AHCI]	
sSATA Port 0	[Not Installed]	
Port 0	[Enabled]	
Hot Plug	[Disabled]	
Configure as eSATA	[Disabled]	
Spin Up Device	[Disabled]	
sSATA Device Type	[Hard Disk Drive]	
SATA Topology	[Unknown]	
sSATA Port 1	[Not Installed]	↕
Port 1	[Enabled]	↕
Hot Plug	[Disabled]	↕
Configure as eSATA	[Disabled]	↕
Spin Up Device	[Disabled]	↕
sSATA Device Type	[Hard Disk Drive]	↕
SATA Topology	[Unknown]	↕
sSATA Port 2	[Not Installed]	↕
Port 2	[Enabled]	↕
Hot Plug	[Disabled]	↕
Configure as eSATA	[Disabled]	↕
Spin Up Device	[Disabled]	↕
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.		
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.		
Platform Configuration		
Configure as eSATA	[Disabled]	▲ Identify the Secondary SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2
Spin Up Device	[Disabled]	
sSATA Device Type	[Hard Disk Drive]	
SATA Topology	[Unknown]	
sSATA Port 3	[Not Installed]	
Port 3	[Enabled]	
Hot Plug	[Disabled]	
Configure as eSATA	[Disabled]	
Spin Up Device	[Disabled]	
sSATA Device Type	[Hard Disk Drive]	
SATA Topology	[Unknown]	
sSATA Port 4	[Not Installed]	
Port 4	[Enabled]	
Hot Plug	[Disabled]	
Configure as eSATA	[Disabled]	
Spin Up Device	[Disabled]	
sSATA Device Type	[Hard Disk Drive]	
SATA Topology	[Unknown]	
sSATA Port 5	[Not Installed]	↕
Port 5	[Enabled]	↕
Hot Plug	[Disabled]	↕
Configure as eSATA	[Disabled]	↕
Spin Up Device	[Disabled]	↕
sSATA Device Type	[Hard Disk Drive]	↕
SATA Topology	[Unknown]	↕
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.		

sSATA Controller

Enable or Disable SATA Controller.

Enabled / Disabled

Configure sSATA as

Determines how SATA controller(s) operate.

AHCI / RAID

Port 0/1/2/3/4/5

Enable or Disable SATA Port.

Disabled / **Enabled**

Hot Plug

Designates this port as Hot Pluggable.

Disabled / Enabled

Configure as eSATA

Configures port as External SATA (eSATA).

Disabled / Enabled

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.

Disabled / Enabled

sSATA Device Type

Identify the SATA port is connected to Solid State Drive or Hard disk Drive.

Hard Disk Drive / Solid State Drive

SATA Topology

Identify the SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2.

Unknown / ISATA / Direct Connect / Flex / M2

6.4.1.4 USB Configuration



XHCI Idle L1

Enabled XHCI Idle L1. Disabled 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.

Enabled / Disabled

6.4.1.5 PCH DFX Configuration

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.		
Platform Configuration		
Enable/Disable ADR	[Enabled]	Enable or disable Automatic DIMM Refresh (ADR)
ADR GPIO	[GPIO B]	
Host Partition Reset ADR Enable	[Disabled]	
Enable/Disable ADR Timer	[Enabled]	
ADR timer expire time	[100 uS]	
ADR timer multiplier	[x1]	
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1268, Copyright (C) 2017 American Megatrends, Inc.		

Enable/Disable ADR

Enable or disable Automatic DIMM Refresh (ADR).

Enabled / Disabled

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.

Enabled / **Disabled**

Enable/Disable ADR Timer

Held-off for DEBUG PURPOSES ONLY!.

Enabled / Held-off

ADR timer expire time

Select proper ADR timer value: 25uS, 50uS, 100uS or 0.

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.

x1 / x8 / x24 / x40 / x56 / x64 / x72 / x80 / x88 / x96

6.4.2 Miscellaneous Configuration



Active Video

Select active video type.

Auto / Onboard Device / PCIE Device

6.4.3 Server ME Configuration

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.																							
Platform Configuration																							
<table><tr><td colspan="2">General ME Configuration</td></tr><tr><td>Oper. Firmware Version</td><td>0A:4.0.3.206</td></tr><tr><td>Backup Firmware Version</td><td>N/A</td></tr><tr><td>Recovery Firmware Version</td><td>0A:4.0.3.206</td></tr><tr><td>ME Firmware Status #1</td><td>0x000F0245</td></tr><tr><td>ME Firmware Status #2</td><td>0x88114006</td></tr><tr><td>Current State</td><td>Operational</td></tr><tr><td>Error Code</td><td>No Error</td></tr><tr><td>Recovery Cause</td><td>N/A</td></tr><tr><td>PTT Support</td><td>[Disabled]</td></tr><tr><td>ME Firmware Features</td><td>SiEn</td></tr></table>		General ME Configuration		Oper. Firmware Version	0A:4.0.3.206	Backup Firmware Version	N/A	Recovery Firmware Version	0A:4.0.3.206	ME Firmware Status #1	0x000F0245	ME Firmware Status #2	0x88114006	Current State	Operational	Error Code	No Error	Recovery Cause	N/A	PTT Support	[Disabled]	ME Firmware Features	SiEn
General ME Configuration																							
Oper. Firmware Version	0A:4.0.3.206																						
Backup Firmware Version	N/A																						
Recovery Firmware Version	0A:4.0.3.206																						
ME Firmware Status #1	0x000F0245																						
ME Firmware Status #2	0x88114006																						
Current State	Operational																						
Error Code	No Error																						
Recovery Cause	N/A																						
PTT Support	[Disabled]																						
ME Firmware Features	SiEn																						
<table><tr><td>→←: Select Screen</td></tr><tr><td>↑↓: Select Item</td></tr><tr><td>Enter: Select</td></tr><tr><td>+/-: Change Opt.</td></tr><tr><td>F1: General Help</td></tr><tr><td>F2: Previous Values</td></tr><tr><td>F3: Optimized Defaults</td></tr><tr><td>F4: Save & Exit</td></tr><tr><td>ESC: Exit</td></tr></table>		→←: Select Screen	↑↓: Select Item	Enter: Select	+/-: Change Opt.	F1: General Help	F2: Previous Values	F3: Optimized Defaults	F4: Save & Exit	ESC: Exit													
→←: Select Screen																							
↑↓: Select Item																							
Enter: Select																							
+/-: Change Opt.																							
F1: General Help																							
F2: Previous Values																							
F3: Optimized Defaults																							
F4: Save & Exit																							
ESC: Exit																							

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Read only.

6.5 Socket Configuration



Processor Configuration

Displays and provides option to change the Processor Settings.

Common RefCode Configuration

Displays the provides option to change the Common RefCode Settings.

Memory Configuration

Displays and provides option to change the Memory Settings.

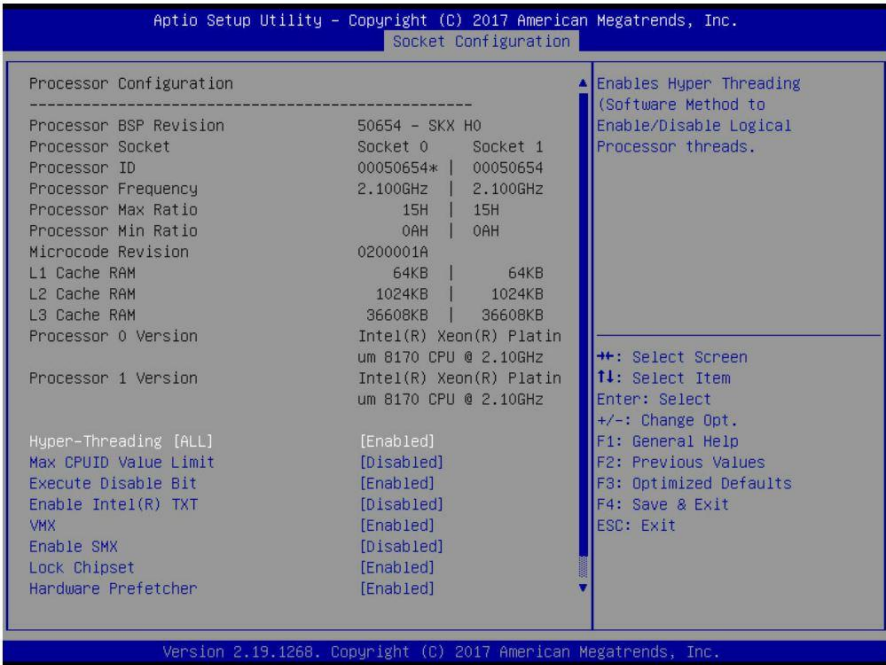
IIO Configuration

Displays and provides option to change the IIO Settings.

Advanced Power Management Configuration

Displays and provides option to change the Power Management Settings.

6.5.1 Processor Configuration



Hyper-Threading [ALL]

Enables Hyper Threading (Software Method) to Enable/Disable Logical Processor threads.

Disabled / **Enabled**

Max CPUID Value Limit

This should be enabled in order to boot legacy OSES that cannot support CPUs with extended CPUID functions.

Disabled / Enabled

Execute Disable Bit

When disabled, forces the XD feature flag to always return 0.

Disabled / **Enabled**

Enable Intel® TXT

Enables Intel® TXT.

Disabled / Enabled

VMX

Enables the Vanderpool Technology, takes effect after reboot.

Disabled / **Enabled**

Enable SMX

Enables Safer Mode Extensions.

Disabled / Enabled

Lock Chipset

Lock or Unlock chipset.

Disabled / **Enabled**

Hardware Prefetcher

MLC Streamer Prefetcher (MSR 1A4h Bit[0]).

Enabled / Disabled

Adjacent Cache Prefetch

MLC Spatial Prefetcher (MSR 1A4h Bit[1]).

Enabled / Disabled

Extended APIC

Enable/Disable extended APIC support.

Disabled / Enabled

6.5.2 Common RefCode Configuration

MMCFG

Select MMCFG Base.

1G / 1.5G / 1.75G / **2G** / 2.25G / 3G

MMCFG Size

Select MMCFG Size.

64M / 128M / **256M** / 512M / 1G / 2G

MMIO High Base

Select MMIO High Base.

56T / 40T / 24T / 16T / 4T / **3T** / 2T / 1T

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.

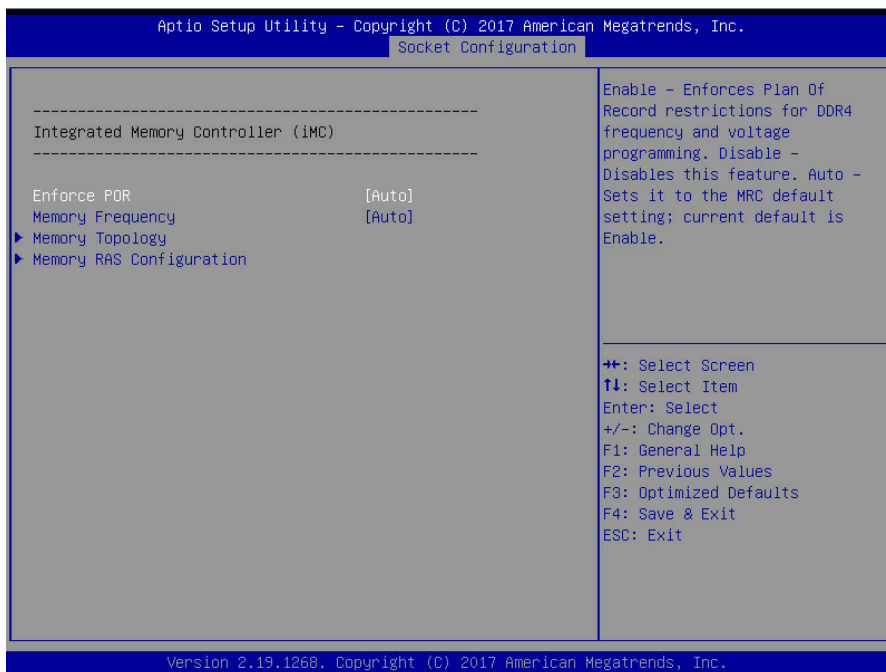
1G / 4G / 16G / **64G** / 256G / 1024G

Numa

Enable or Disable Non uniform Memory Access (NUMA).

Disabled / **Enabled**

6.5.3 Memory Configuration



Enforce POR

Enable --- Enforces Plan Of Record restrictions for DDR4 frequency and voltage programming. Disable --- disables this feature. Auto --- Sets it to the MRC default setting; current default is Enable.

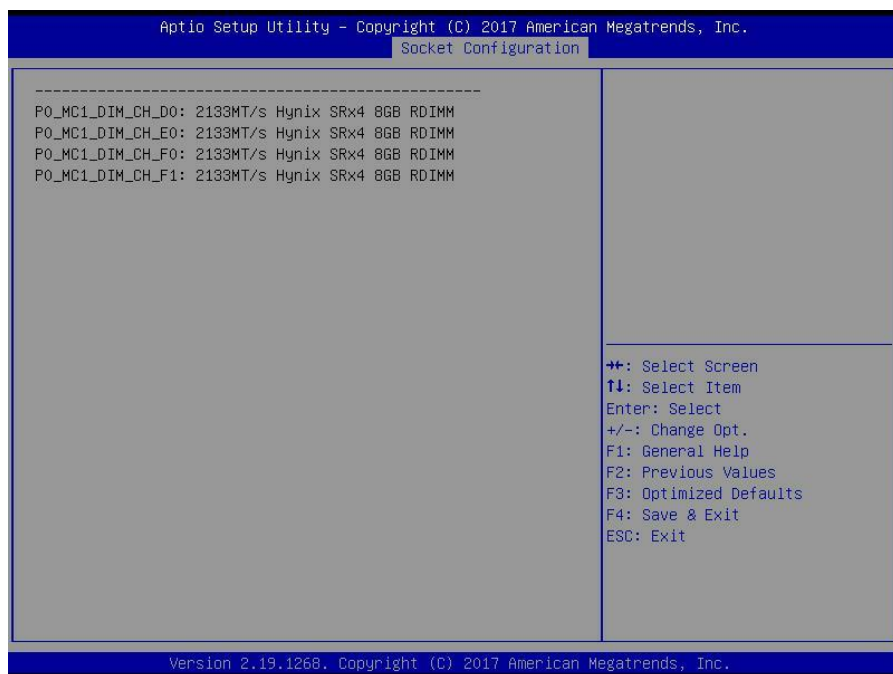
Auto / POR / Disable

Data Scrambling for NVMDIMM

Enable – Enables data scrambling for NVMDIMM. Disable – Disables this feature. Auto – Sets it to the MRC default setting; current default is Enable.

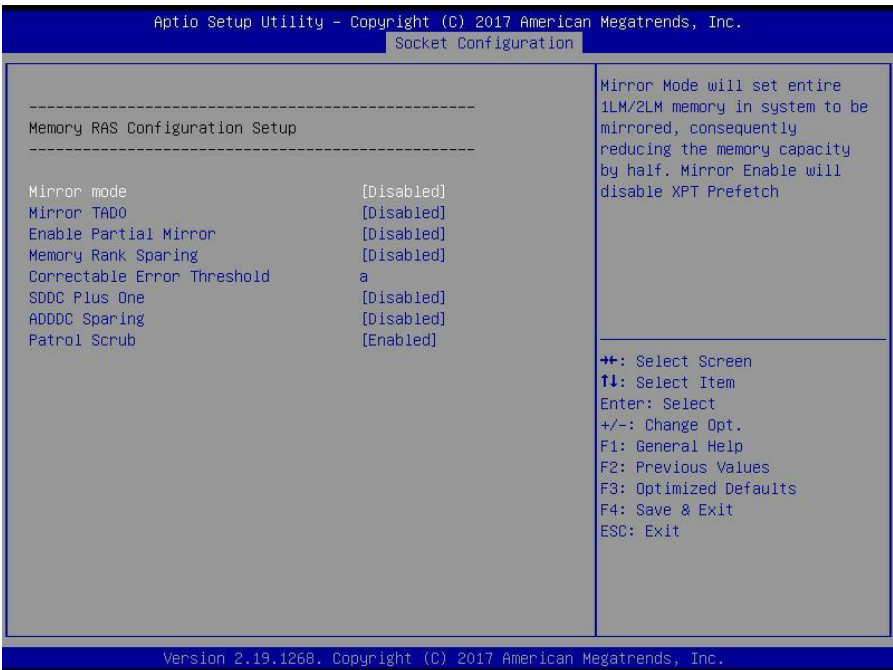
Auto / Disabled / Enabled

6.5.3.1 Memory Topology



Read only.

6.5.3.2 Memory RAS Configuration



Mirror Mode

Mirror Mode will set entire 1LM/2LM memory in system to be mirrored, consequently reducing the memory capacity by half. Mirror Enable will disable XPT Prefetch.

Disabled / Mirror Mode 1LM / Mirror Mode 2LM

Mirror TAD0

Enable Mirror on entire memory for TAD0.

Enabled / **Disabled**

Enable Partial Mirror

Partial mirror mode will enable the required size of memory to be mirrored. If rank sparing is enabled partial mirroring will not take effect. Mirror Enable will disable XPT Prefetch.

Disabled / Partial Mirror mode 1LM / Partial Mirror mode 2LM

Memory Rack Sparing

Enable/Disable Memory Rank Sparing.

Disabled / Enabled

Correctable Error Threshold

Correctable Error Threshold (1 – 32767) used for sparing, tagging, and leaky bucket.

10

SDDC Plus One

Enable/Disable SDDC Plus One.

Disabled / Enabled

ADDDC Sparing

Enable/Disable ADDDC Sparing.

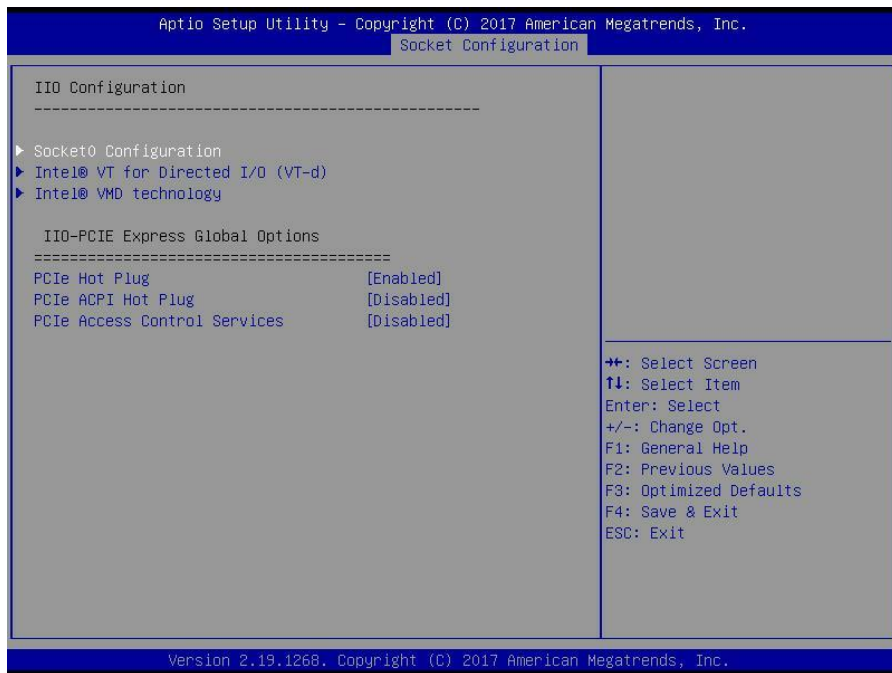
Disabled / Enabled

Patrol Scrub

Enable/Disable Patrol Scrub.

Disabled / **Enabled**

6.5.5 IIO Configuration



Socket0 Configuration

Socket0 Configuration

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.

PCIe Hot Plug

Enable/Disable PCIe Hot Plug globally.

Disabled / **Enabled** / Auto / Manual

PCIe ACPI Hot Plug

Enable/Disable PCIe ACPI Hot Plug globally, or allow per-port control. When Disabled, MSI is generated on HP event. When Enabled, _HPGPE message is generated.

Disabled / Enable / Per-Port

PCIe Access Control Services

Enable or disable Access Control Services (ACS) in PCIe Downstream Switch Port.

Disabled / Enable

6.5.5.1 Socket 0 Configuration

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.		
Socket Configuration		
IOU0 (IIO PCIe Br1)	[x16]	Selects PCIe port Bifurcation for selected slot(s)
IOU1 (IIO PCIe Br2)	[x16]	
IOU2 (IIO PCIe Br3)	[x16]	
▶ Socket 0 PcieBr1D00F0 - Port 1A ▶ Socket 0 PcieBr2D00F0 - Port 2A ▶ Socket 0 PcieBr3D00F0 - Port 3A ▶ Socket 0 PcieBr4D00F0 - MCP 0 ▶ Socket 0 PcieBr5D00F0 - MCP 1		
		⇄: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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IDU0 (IIO PCIe Br1)

Selects PCIe port Bifurcation for selected slot(s).

x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / **x16** / Auto

IDU1 (IIO PCIe Br2)

Selects PCIe port Bifurcation for selected slot(s).

x4x4x4x4 / **x4x4x8** / x8x4x4 / x8x8 / x16 / Auto

IDU2 (IIO PCIe Br3)

Selects PCIe port Bifurcation for selected slot(s).

x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / **x16** / Auto

Socket 0 PcieBr1D00F0 – Port 1A

Settings related to PCI Express Ports

(0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/5A).

Socket 0 PcieBr2D00F0 – Port 2A

Settings related to PCI Express Ports

(0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/5A).

Socket 0 PcieBr3D00F0 – Port 3A

Settings related to PCI Express Ports

(0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/5A).

Socket 0 PcieBr4D00F0 – MCP 0

Settings related to PCI Express Ports

(0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/5A).

Socket 0 PcieBr5D00F0 – MCP1

Settings related to PCI Express Ports

(0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/5A).

6.5.5.1.1 Socket 1 PcieBr1D00F0 – Port 1A

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.	
Socket Configuration	
Socket 0 PcieBr1D00F0 - Port 1A	

PCI-E Port	[Auto]
Hot Plug Capable	[Disabled]
PCI-E Port Link	[Enabled]
Link Speed	[Auto]
PCI-E Port Link Status	Linked as x16
PCI-E Port Link Max	Max Width x16
PCI-E Port Link Speed	Gen 3 (8.0 GT/s)
PCI-E ASPM Support	[Disabled]
LOS Support	[Disabled]
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.	
++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	

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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 / Disabled / Enabled

Hot Plug Capable

This option specifies if the link is considered Hot Plug capable.

Disabled / Enabled

PCI-E Port Link

This option disables the link so that the no training occurs but the CFG space is still active.

Enabled / Disabled

Link Speed

Choose Link Speed for this PCIe port.

Auto / Gen 1 (2.5 GT/s) / Gen 2 (5 GT/s) / Gen 3 (8 GT/s)

PCI-E ASPM Support

This option enables/disables the ASPM (L1) support for the downstream devices.

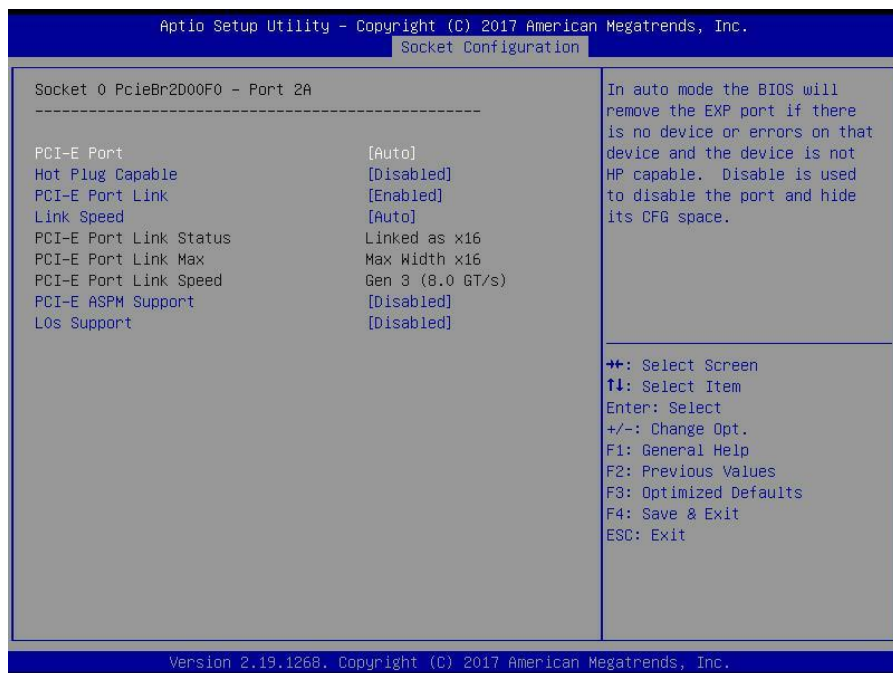
Auto / L1 Only / **Disabled**

L0s Support

When disabled, IIO never puts its transmitter in L0s state.

Disabled / Enabled

6.5.5.1.2 Socket 0 PcieBr2D00F0 – Port 2A/3A



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 / Disabled / Enabled

Hot Plug Capable

This option specifies if the link is considered Hot Plug capable.

Disabled / Enabled

PCI-E Port Link

This option disables the link so that the no training occurs but the CFG space is still active.

Enabled / Disabled

Link Speed

Choose Link Speed for this PCIe port.

Auto / Gen 1 (2.5 GT/s) / Gen 2 (5 GT/s) / Gen 3 (8 GT/s)

PCI-E ASPM Support

This option enables/disables the ASPM (L1) support for the downstream devices.

Auto / L1 Only / **Disabled**

L0s Support

When disabled, I/O never puts its transmitter in L0s state.

Disabled / Enabled

6.5.5.1.3 Socket 0 PcieBr4D00F0 – MCP0/1

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.	
Socket Configuration	
Socket 0 PcieBr4D00F0 - MCP 0	

PCI-E Port	[Auto]
Hot Plug Capable	[Disabled]
PCI-E Port Link	[Enabled]
Link Speed	[Auto]
PCI-E Port Link Status	Link Did Not Train
PCI-E Port Link Max	ERROR: Not Available
PCI-E Port Link Speed	Link Did Not Train
PCI-E ASPM Support	[Disabled]
LOS Support	[Disabled]

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.

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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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 / Disabled / Enabled

Hot Plug Capable

This option specifies if the link is considered Hot Plug capable.

Disabled / Enabled

PCI-E Port Link

This option disables the link so that the no training occurs but the CFG space is still active.

Enabled / Disabled

Link Speed

Choose Link Speed for this PCIe port.

Auto / Gen 1 (2.5 GT/s) / Gen 2 (5 GT/s) / Gen 3 (8 GT/s)

PCI-E ASPM Support

This option enables/disables the ASPM (L1) support for the downstream devices.

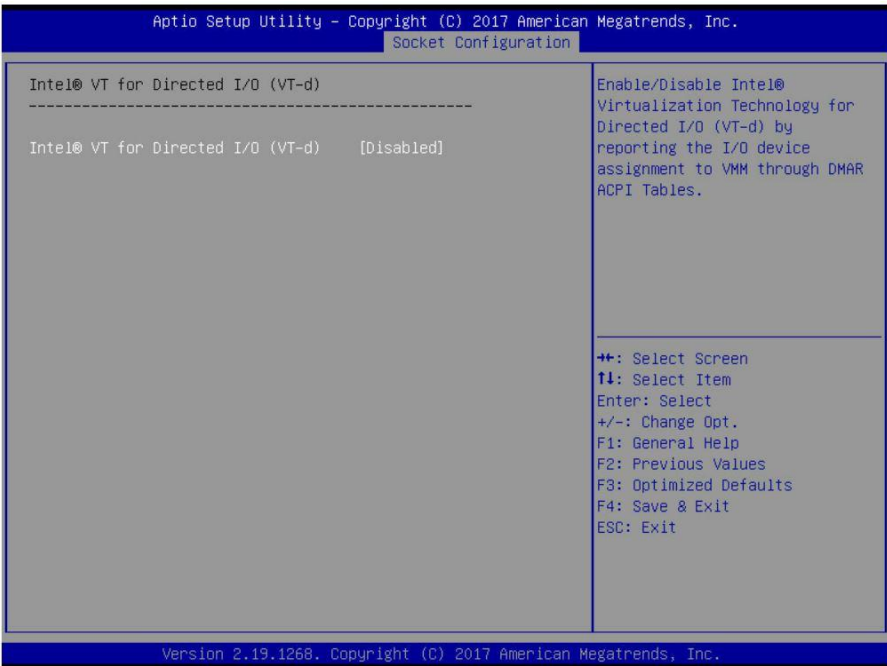
Auto / L1 Only / **Disabled**

L0s Support

When disabled, I/O never puts its transmitter in L0s state.

Disabled / Enabled

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

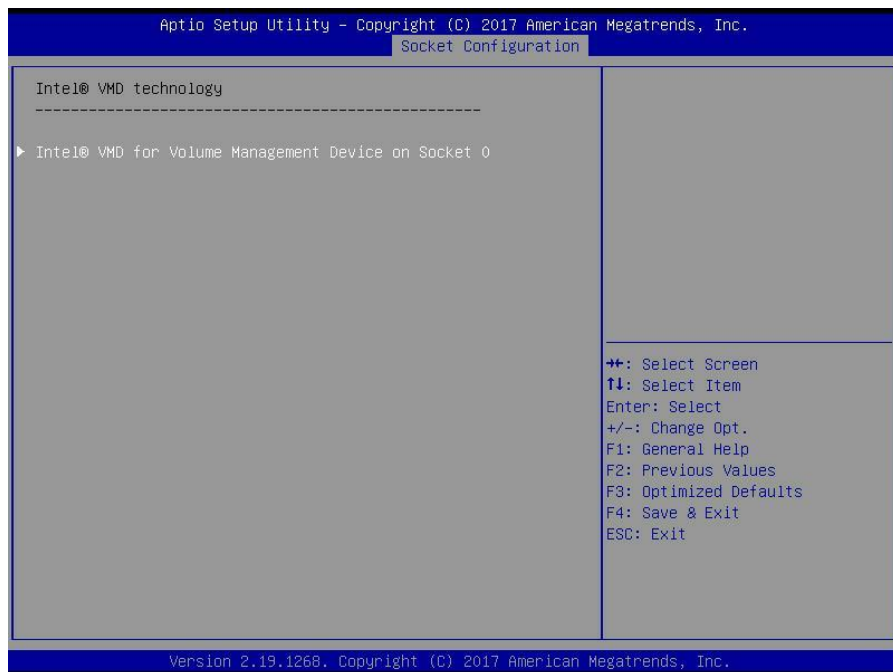


Intel® VT for Directed I/O (VT-d)

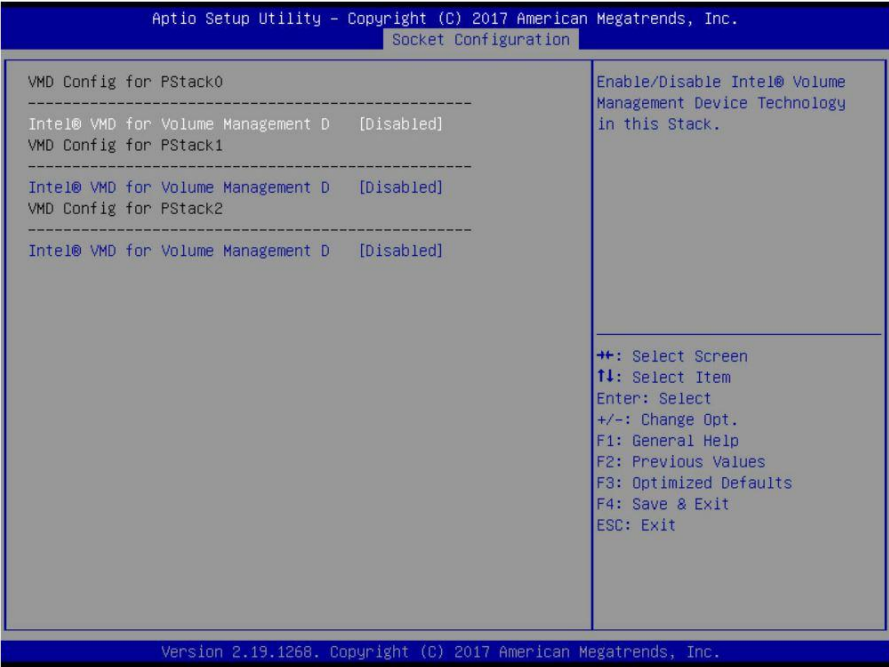
Enable/Disable Intel® Virtualization Technology for Directed I/O (VT-d) by reporting the I/O device assignment to VMM through DMAR ACPI Tables.

Enabled / **Disabled**

6.5.5.4 Intel® VMD Technology



6.5.5.4.1 Intel VMD for Volume Management for Socket 0



Intel® VMD for Volume Management Device for PStack0

Enable/Disable Intel® Volume Management Device Technology in this Stack.
Disabled / Enabled

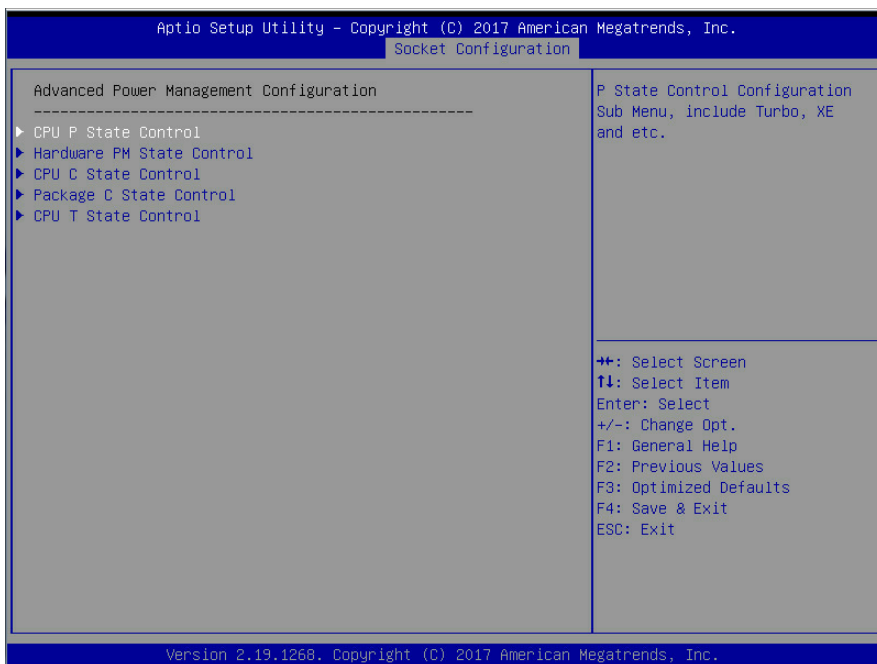
Intel® VMD for Volume Management Device for PStack1

Enable/Disable Intel® Volume Management Device Technology in this Stack.
Disabled / Enabled

Intel® VMD for Volume Management Device for PStack2

Enable/Disable Intel® Volume Management Device Technology in this Stack.
Disabled / Enabled

6.5.5.5 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.

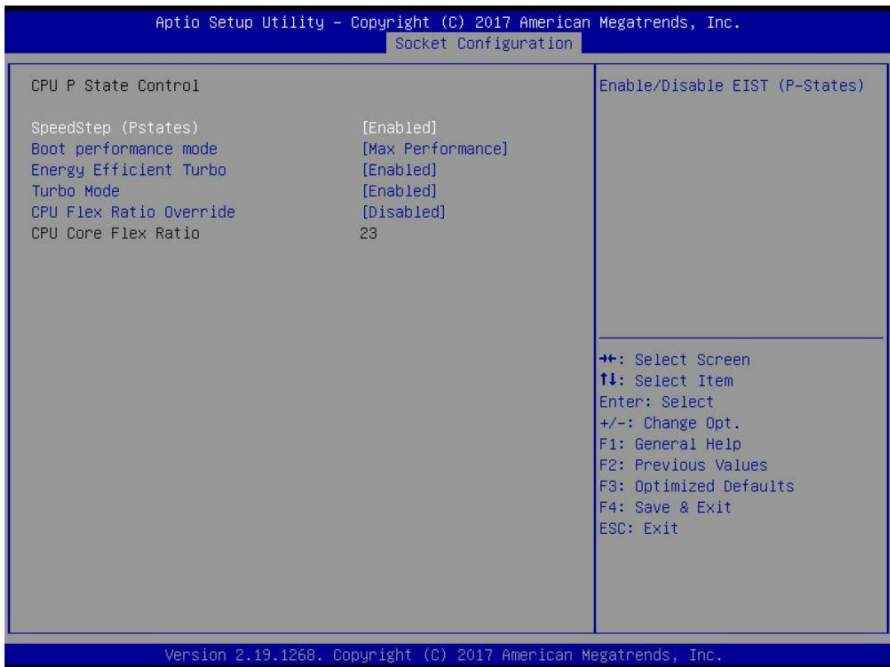
Package C State Control

Package C State setting.

CPU T State Control

CPU T State setting.

6.5.5.5.1 CPU P State Control



SpeedStep (Pstates)

Enable/Disable EIST (P-States).

Disabled / **Enabled**

Boot performance mode

Select the performance state that the BIOS will set before OS hand off.

Max Performance / Max Efficient / Set by Intel Node Manager

Energy Efficient Turbo

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

Enabled / Disabled

Turbo Mode

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

Disabled / **Enabled**

CPU Flex Ratio Override

Enable/Disable CPU Flex Ratio Programming.

Disabled / Enabled

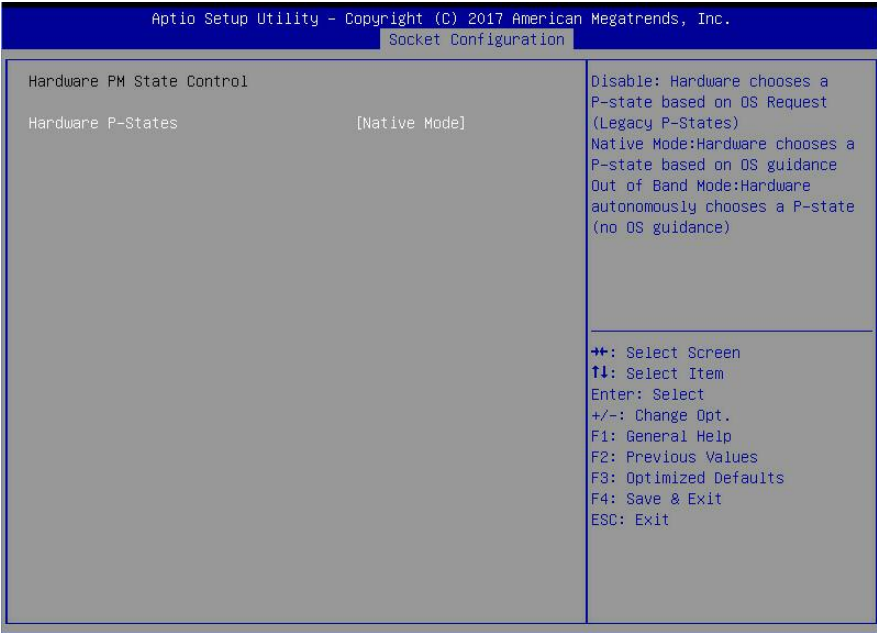
NOTE: When **CPU Flex Ratio Override** set to [Enabled], the following item can be configured.

CPU Core Flex Ratio

Non-Turbo Mode Processor Core Ratio Multiplier.

23

6.5.5.5.2 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).

Disabled / **Native Mode** / Out of Band Mode / Native Mode with NO Legacy Support

6.5.5.5.3 CPU C State Control



CPU C6 report

Enable/Disable CPU C6 (ACPI C3) report to OS.

Disabled / Enabled / **Auto**

Enhanced Halt State (C1E)

Core C1E auto promotion Control. Takes effect after reboot.

Disabled / **Enabled**

OS ACPI Cx

Report CC3/CC6 to OS ACPI C2 or ACPI C3.

ACPI C2 / ACPI C3

6.5.5.5.4 Package C State Control

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.	
Socket Configuration	
Package C State Control	Package C State limit
Package C State [Auto]	
	 ↔: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.	

Package C State

Package C State limit.

C0/C1 state / C2 state / C6 (non Retention) state / C6 (Retention) state / No
Limit / **Auto**

6.5.5.5.5 CPU T State Control

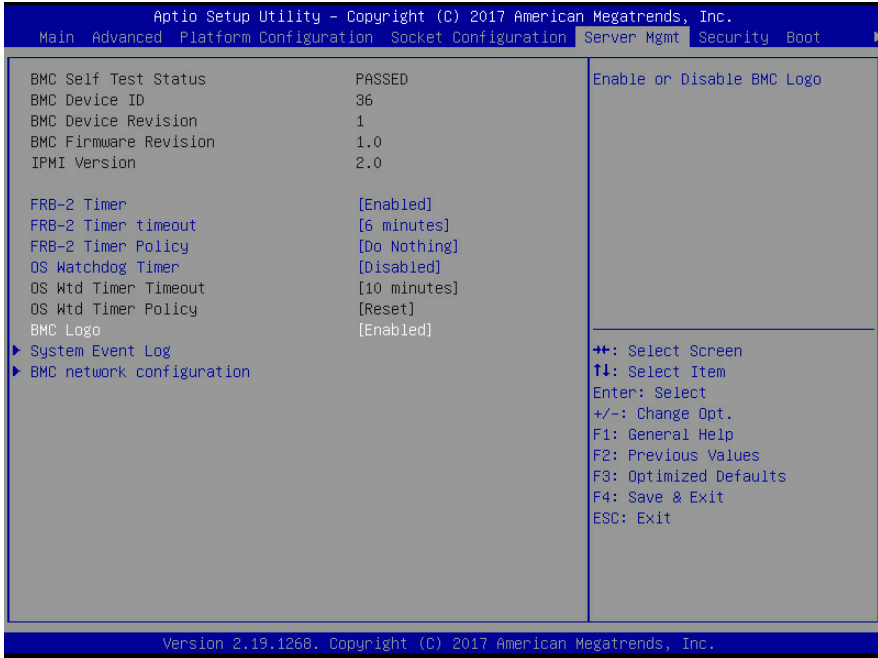
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.	
Socket Configuration	
CPU T State Control	Enable/Disable Software Controlled T-States
Software Controlled T-States [Disabled]	
<hr/>	
+/: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.	

Software Controlled T-States

Enable/Disable Software Controlled T-States.

Disabled / Enabled

6.6 Server Management



FRB-2 Timer

Enable or Disable FRB-2 timer (POST timer).

Enabled / Disabled

FRB-2 Timer timeout

Enter value Between 3 to 6 min for FRB-2 Timer Expiration value.

3 minutes / 4 minutes / 5 minutes / **6 minutes**

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**

OS Wtd Timer timeout

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

5 minutes / **10 minutes** / 15 minutes / 20 minutes

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 Logo

Enable or Disable BMC Logo.

Enabled / Disabled

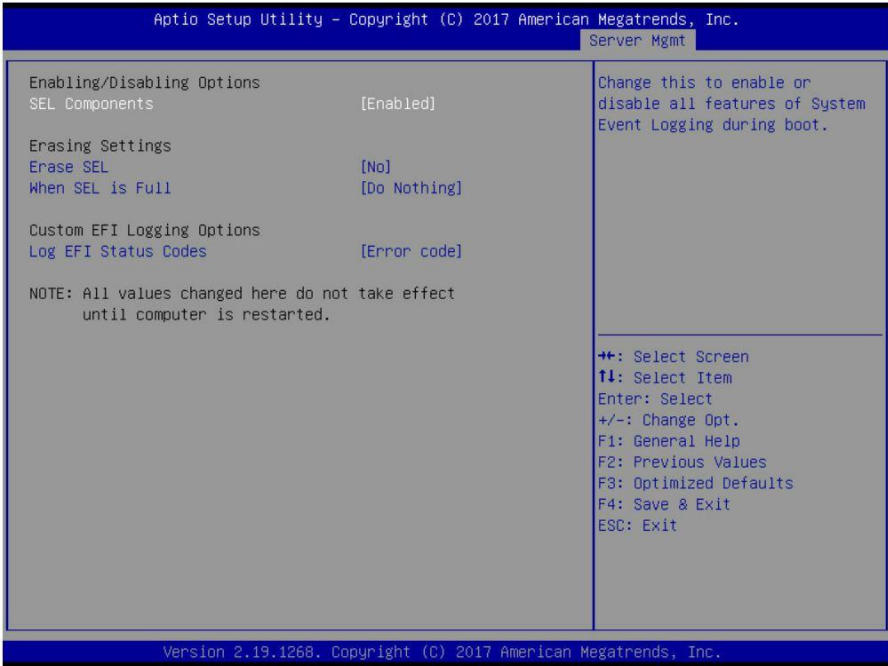
System Event Log

Press <Enter> to change the SEL event log configuration.

BMC network configuration

Configure BMC network parameters.

6.6.1 System Event Log



SEL Components

Change this to enable or disable all features of System Event Logging during boot.

Disabled / **Enabled**

NOTE: When **SEL Components** is set to [Disabled], the following items are read only.

Erase SEL

Choose options for erasing SEL.

No / Yes, on next reset / Yes, on every reset

When SEL is Full

Choose options for reactions to a full SEL.

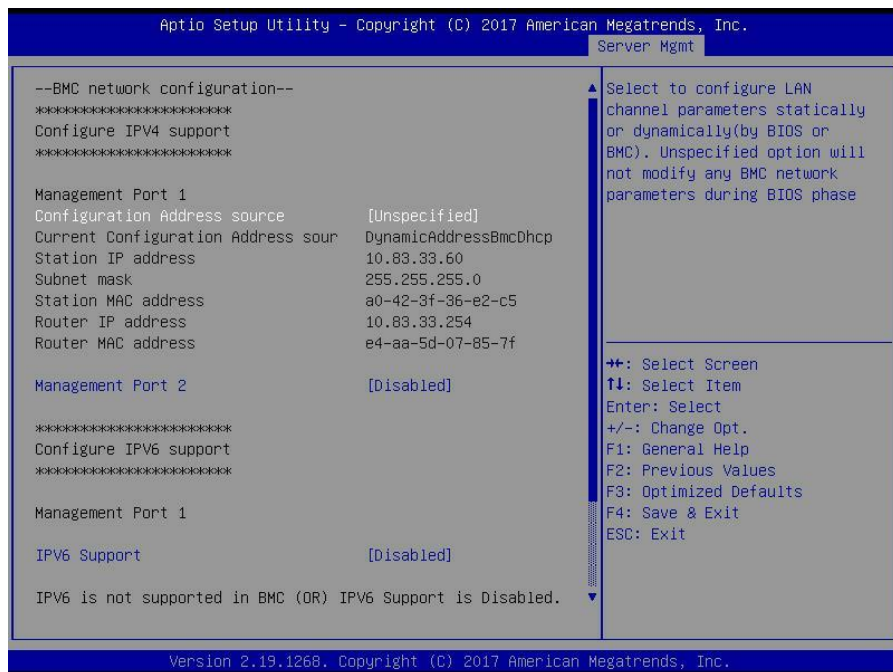
Do Nothing / Erase Immediately

Log EFI Status Codes

Disable the logging of EFI Status Codes or log only error code or only progress code or both.

Disabled / Both / **Error Code** / Progress Code

6.6.2 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**

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

Configure IPV6 Support Server Management Port 1

IPV6 Support

Enable or Disable LAN1 IPV6 Support.

Enabled / **Disabled**

Server Management Port 2

IPV6 Support

Enable or Disable LAN1 IPV6 Support.

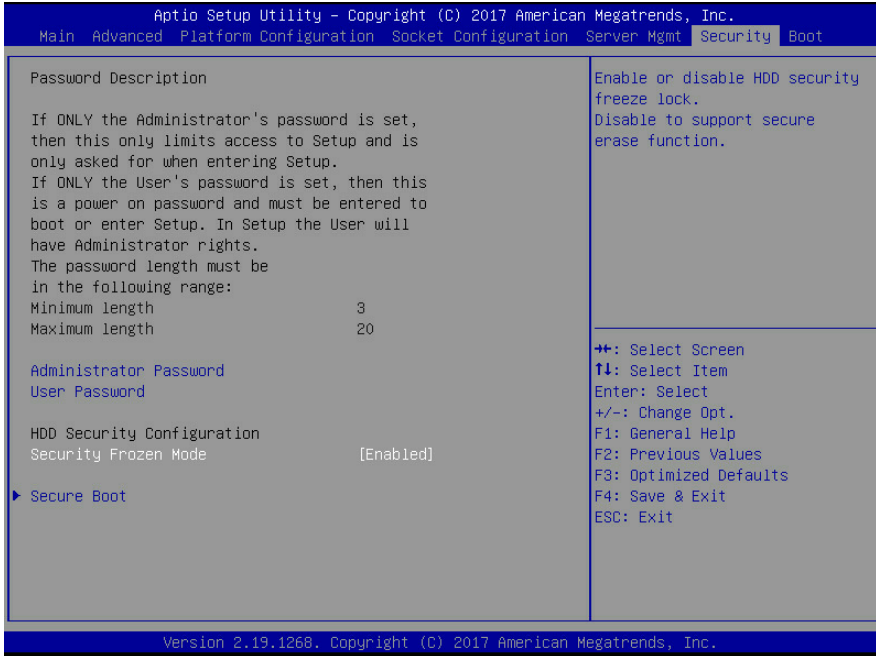
Enabled / **Disabled**

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

6.7 Security



Password Description

Read only.

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.

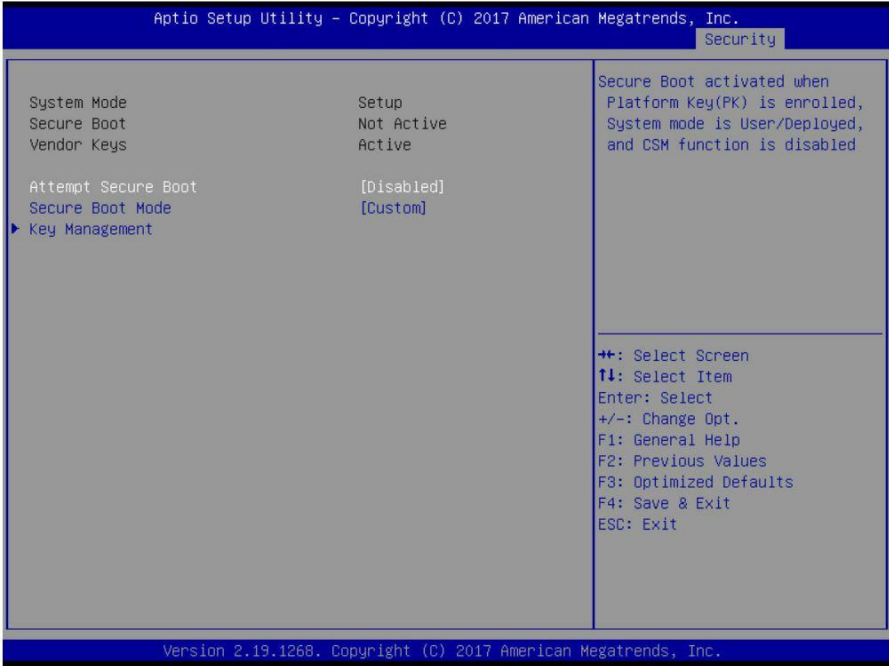
User Password

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.

Security Frozen Mode

Enable or disable HDD security freeze lock. Disable to support secure erase function.

6.7.1 Secure Boot



Attempt Secure Boot

Secure boot activated when Platform Key (PK) is enrolled, System mode is User/Deployed, and CSM function is disabled.

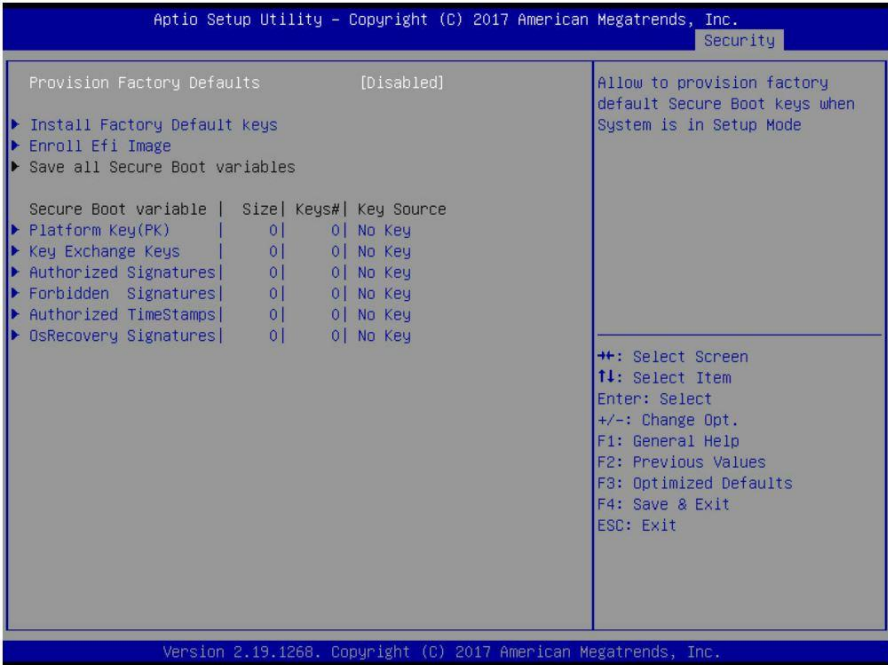
Disabled / Enabled

Secure Boot Mode

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

Standard / **Custom**

6.7.1.1 Key Management



Provision Factory Default keys

Allow to provision factory default Secure Boot keys when System is in Setup Mode.
Disabled / Enabled

Install Factory Default Keys

Force System to User Mode – install all Factory Default Keys. Press “Yes” to install factory default keys.

Enroll Efi Image

Allow the image to run in Secure Boot mode. Enroll SHA256 has of the binary into Authorized signature Database (db).

Save All Secure Boot Variables

Save NVRAM content of all Secure Boot variables to the files (EFI_SIGNATURE_LIST data format) in root folder on a target file system device.

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 encoded)
 - c) EFI_CERT_RSA2048 (bin)
 - d) EFI_CERT_SHA256, 384, 512 (bin)
 - 2. Authenticated UEFI Variable
 - 3. EFI PE/COFF Image (SHA256)
- Key source: Default, External, Mixed, Test

Set New

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 encoded)
 - c) EFI_CERT_RSA2048 (bin)
 - d) EFI_CERT_SHA256, 384, 512 (bin)
 - 2. Authenticated UEFI Variable
 - 3. EFI PE/COFF Image (SHA256)
- Key source: Default, External, Mixed, Test

Set New / Append

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 encoded)
 - c) EFI_CERT_RSA2048 (bin)
 - d) EFI_CERT_SHA256, 384, 512 (bin)
 - 2. Authenticated UEFI Variable
 - 3. EFI PE/COFF Image (SHA256)
- Key source: Default, External, Mixed, Test

Set New / Append

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 encoded)
 - c) EFI_CERT_RSA2048 (bin)
 - d) EFI_CERT_SHA256, 384, 512 (bin)
 - 2. Authenticated UEFI Variable
 - 3. EFI PE/COFF Image (SHA256)
- Key source: Default, External, Mixed, Test

Set New / Append

Authorized TimeStamps

Enroll Factory Defaults or load certificates from a file:

- 1. Public Key Certificate in:

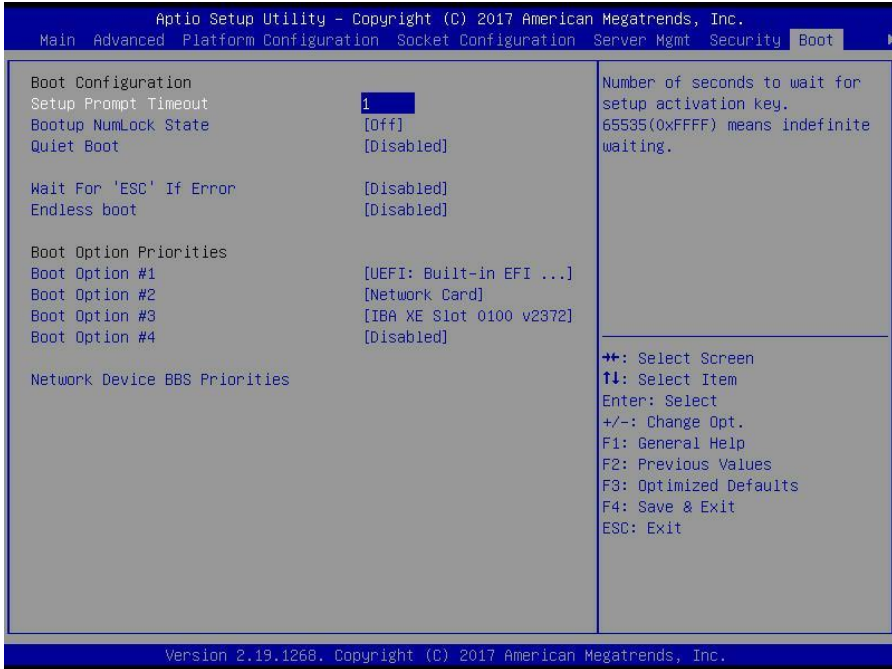
- a) EFI_SIGNATURE_LIST
 - b) EFI_CERT_X509 (DER encoded)
 - c) EFI_CERT_RSA2048 (bin)
 - d) EFI_CERT_SHA256, 384, 512 (bin)
 - 2. Authenticated UEFI Variable
 - 3. EFI PE/COFF Image (SHA256)
- Key source: Default, External, Mixed, Test
- Set New** / Append

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 encoded)
 - c) EFI_CERT_RSA2048 (bin)
 - d) EFI_CERT_SHA256, 384, 512 (bin)
 - 2. Authenticated UEFI Variable
 - 3. EFI PE/COFF Image (SHA256)
- Key source: Default, External, Mixed, Test
- Set New** / Append

6.8 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.

Disabled / Enabled

Wait for 'ESC' If Error

Wait for 'ESC' key to be pressed if error occurs.

Disabled / Enabled

Endless Boot

Enable or disable Endless Boot.

Disabled / Enabled

Boot Option Priorities

Boot Option #1~#4

Select the first/second boot device.

Device Name / Disabled

Network Device BBS Priorities

Set the order of the legacy devices in this group.

6.8.1 Network Device BBS Priorities

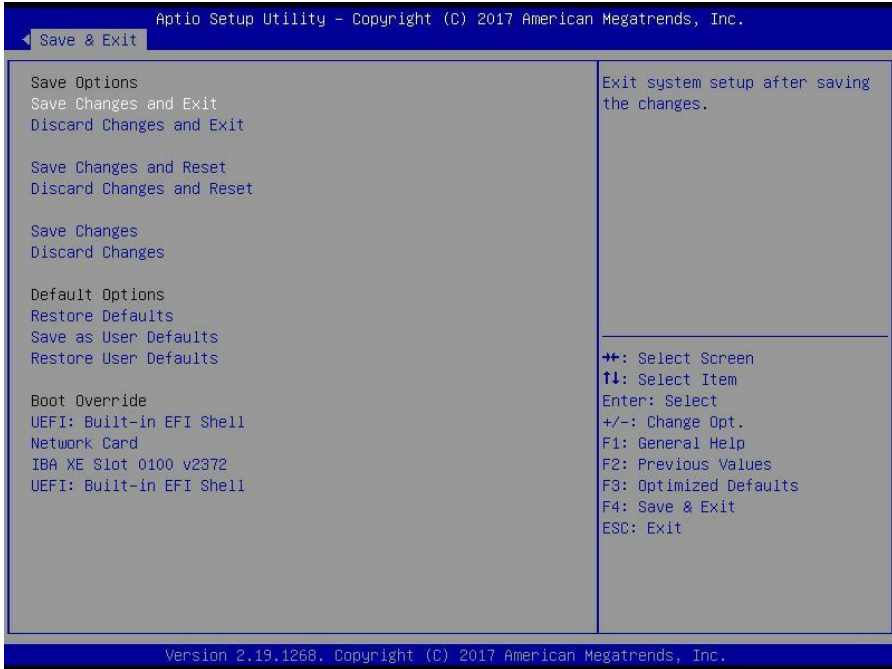
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.		Boot
Boot Option #1	[IBA XE Slot 0100 v2372]	Sets the system boot order
Boot Option #2	[IBA XE Slot 0101 v2372]	
		↔: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1268, Copyright (C) 2017 American Megatrends, Inc.		

Boot Option #1/#2

Set the system boot order.

Device Name / Disabled

6.9 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 7: 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>.

4.1 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.

4.2 AMIBIOS Post Code (Aptio)

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

Status Code	Description
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

SEC Phase
None

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

Status Code	Description
0x34	CPU post-memory initialization. Application Processor(s) (AP) initialization
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
PCI 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

Status Code	Description
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 AML 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
0xE2	Video repost
0xE3	OS S3 wake vector call
0xE4 – 0xE7	Reserved for future AML 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 AML 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 AML 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 AML error codes

PEI Beep Codes

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

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.
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.

Status Code	Description
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
0xA1	IDE Reset
0xA2	IDE Detect

Status Code	Description
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	Reserved for ASL (see ASL Status Codes section below)
0xAB	Setup Input Wait
0xAC	Reserved for ASL (see ASL Status Codes section below)
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 AML 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

Status Code	Description
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found.
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.

DXE Beep Codes

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

ACPI/ASL Checkpoints

Status Code	Description
0x01	System is entering S1 sleep state.
0x02	System is entering S2 sleep state.
0x03	System is entering S3 sleep state.
0x04	System is entering S4 sleep state.
0x05	System is entering S5 sleep state.
0x10	System is waking up from the S1 sleep state.
0x20	System is waking up from the S2 sleep state.
0x30	System is waking up from the S3 sleep state.
0x40	System is waking up from the S4 sleep state.

Status Code	Description
0xAC	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

NOTE

Appendix I: How to recover UEFI BIOS

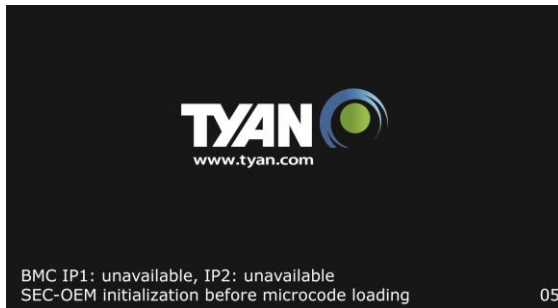
Important Notes:

The emergency UEFI BIOS Recovery process is only used to rescue a system with a failed or corrupted BIOS image that fails to boot to an OS. It is not intended to be used as a general purpose BIOS flashing procedure and should not be used as such. Please do not shutdown or reset the system while the BIOS recovery process is underway or there is risk of damage to the UEFI recovery bootloader that would prevent the recovery process itself from working. In no event shall Tyan be liable for direct, indirect, incidental, special or consequential damages arising from the BIOS update or recovery.

The BIOS Recovery file is named xxxx.cap, where the 'xxxx' portion is the motherboard model number. Examples: 5630.cap, 7106.cap, 7109.cap, etc. Please make sure that you are using the correct BIOS Recovery file from Tyan's web site.

BIOS Recovery Process

1. Place the recovery BIOS file (xxxx.cap) in the root directory of a USB disk.
2. Ensure that the system is powered off.
3. Insert the USB disk to any USB port on the motherboard or chassis.
4. Power the system on while pressing "Ctrl" and "Home" simultaneously on the keyboard. Continue to hold these keys down until the following Tyan screen is displayed on the monitor:




```

Apdio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
Main Advanced Platform Configuration Socket Configuration Recovery >
/-----/
| Please select blocks you want to update | Select this to start |
| Reset NVRAM [Enabled] | flash update |
| Boot Block Update [Enabled] | |
| | |
> Proceed with flash update |
| |
| |
| |
| |
|><: Select Screen |
| ^v: Select Item |
| Enter: Select |
| +/-: Change Opt. |
| F1: General Help |
| F2: Previous Values |
| F3: Optimized Defaults |
| F4: Save & Exit |
| ESC: Exit |
| |
/-----/
DXE-USB hot plug2.19.1268. Copyright (C) 2017 American Megatrends, Inc. B

```

7. Wait for the BIOS recovery procedure to complete. Completion is signified with the message “Flash update completed. Press any key to reset the system” displayed on screen.

If your system does not have video output or the POST code halts at “FF” on the right-lower portion of the screen, please contact Tyan representatives for RMA service.

Appendix II: Cable Connection Tables

1. System Fan Connector

System Fan to S5631 MB		
System Fan	Connect to	S5631
Fan1	→	SYS_FAN_1 (FAN1)
Fan2	→	SYS_FAN_2 (FAN2)
Fan3	→	SYS_FAN_3 (FAN3)
Fan4	→	SYS_FAN_4 (FAN4)
Fan5	→	SYS_FAN_5 (FAN5)
Fan6	→	SYS_FAN_6 (FAN6)
Fan7	→	SYS_FAN_7 (FAN7)
Fan8	→	SYS_FAN_8 (FAN8)
Fan9	→	SYS_FAN_9 (FAN9)
Fan10	→	SYS_FAN_10 (FAN10)

2. SATA Cable & S4P PWR Cable& SGPIO Cable

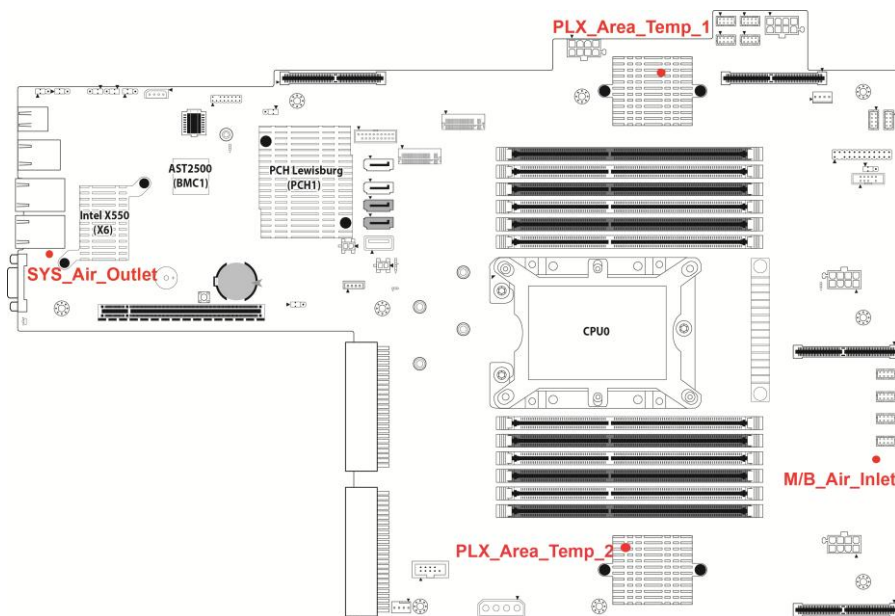
SATA/SAS Backplane (BP) Board to S5631 MB			
	M1287G88-BP12-2	Connect to	S5631
SATA Cable	SATA0/ SATA1	→	SATA2 / SATA3
S4P PWR Cable	PW1	→	J116
SGPIO Cable	J2	→	SSATA_SGPIO1

3. FP Ctrl Cable & USB Cable

Front Panel Board (FPB) to S5631 MB			
	M1716G75-FPB	Connect to	S5631
Control Cable	J4	→	FPIO_1
USB 3.0 Cable	J7	→	USB3_FPIO1

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.



NOTE: The red mark indicates the sensor.

Fan and Temp Sensor Location:

1. Fan Sensor: It is located in the **third and seventh** pin of the fan connector, which detects the fan speed (rpm)
2. Temp Sensor: **Sys Air Outlet**, **MB Air Inlet**, **PLX_Area_Temp1** and **PLX_Area_Temp2**. They detect the system temperature around.

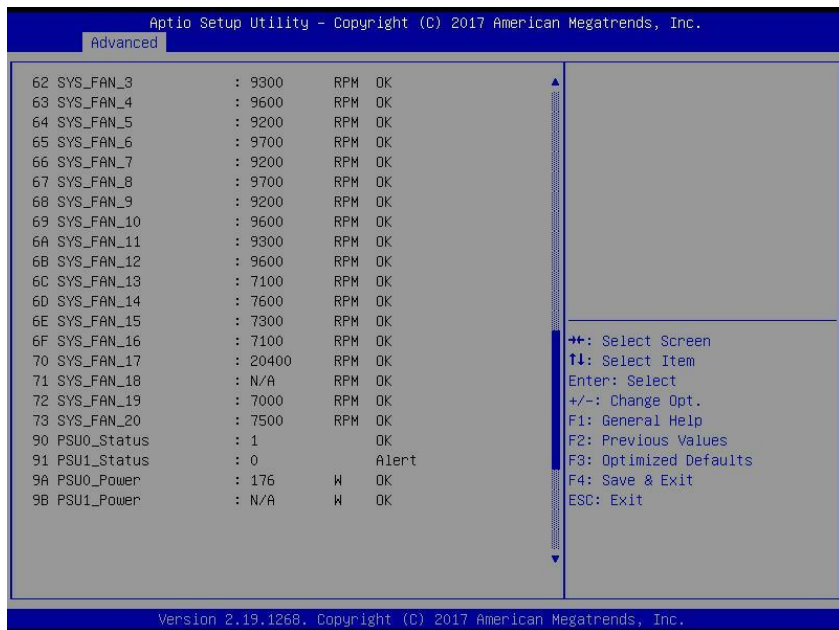
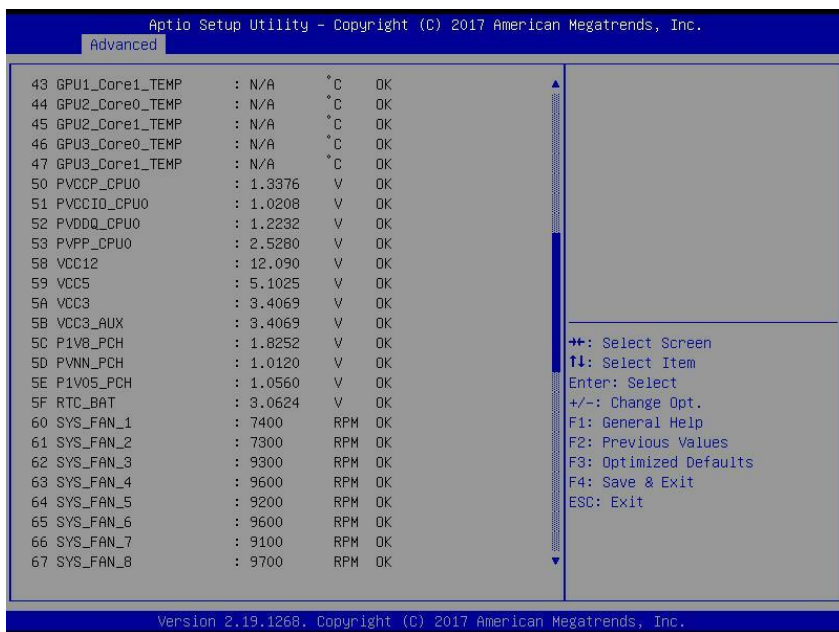
BIOS Temp Sensor Name Explanation:

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.			
Advanced			
PC Health Status			
ID#	NAME	READING	UNIT STATUS

01	P0_DTS_Temp	: 79	°C OK
03	P0_PECI_Value	: -16	°C OK
0A	PCH_Temp	: 45	°C OK
0B	LAN_X550_Temp	: 55	°C OK
07	MB_Air_Inlet	: 27	°C OK
08	SYS_Air_Outlet	: 44	°C OK
09	SYS_Air_Inlet	: 23	°C OK
05	PLX_Area_Temp_1	: 36	°C OK
06	PLX_Area_Temp_2	: 33	°C OK
0C	P0_MOSFET	: 37	°C OK
0D	P0_DIMM_MOSFET_1	: 40	°C OK
0E	P0_DIMM_MOSFET_2	: 36	°C OK
11	P0_MCO_DIM_CH_A	: N/A	°C OK
14	P0_MCO_DIM_CH_B	: N/A	°C OK
17	P0_MCO_DIM_CH_C	: N/A	°C OK
1A	P0_MCO_DIM_CH_D	: 32	°C OK
1D	P0_MC1_DIM_CH_E	: 31	°C OK
20	P0_MC1_DIM_CH_F	: 30	°C OK
40	GPU0_Core0_TEMP	: N/A	°C OK
41	GPU0_Core1_TEMP	: N/A	°C OK
42	GPU1_Core0_TEMP	: N/A	°C OK
43	GPU1_Core1_TEMP	: N/A	°C OK

↔: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit



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BIOS Temp Sensor	Name Explanation
CPU0_DTS_Temp	Temperature of the CPU0 Digital Temperature Sensor
CPU0_PECI_Value	Temperature of the CPU0 Platform Environment Control Interface
PCH_Temp	Temperature of the PCH
LAN_X550_Temp	Temperature of LAN X550
MB_Air_Inlet	Temperature of MB Air Inlet Area
Sys_Air_Outlet	Temperature of System Air Outlet Area
Sys_Air_Inlet	Temperature of System Air Inlet Area
PLX_Area_Temp_1	Temperature of PLX1 area
PLX_Area_Temp_2	Temperature of PLX2 area
P0_MOSFET	The Max Temperature of CPU0 MOSFET
P0_DIMM_MOSFET_1	The Max Temperature of DIMM channel ABC MOSFET
P0_DIMM_MOSFET_2	The Max Temperature of DIMM channel DEF MOSFET
P0_MC0_DIM_CH_A	The Max Temperature of DIMM channel A slot
P0_MC0_DIM_CH_B	The Max Temperature of DIMM channel B slot
P0_MC0_DIM_CH_C	The Max Temperature of DIMM channel C slot
P0_MC1_DIM_CH_D	The Max Temperature of DIMM channel D slot
P0_MC1_DIM_CH_E	The Max Temperature of DIMM channel E slot
P0_MC1_DIM_CH_F	The Max Temperature of DIMM channel F slot
GPU0_Core0_Temp	Temperature of GPU0_Core0
GPU0_Core1_Temp	Temperature of GPU0_Core1
GPU1_Core0_Temp	Temperature of GPU1_Core0
GPU1_Core1_Temp	Temperature of GPU1_Core1
GPU2_Core0_Temp	Temperature of GPU2_Core0
GPU2_Core1_Temp	Temperature of GPU2_Core1
GPU3_Core0_Temp	Temperature of GPU3_Core0
GPU3_Core1_Temp	Temperature of GPU3_Core1
SYS_FAN_1	Fan Speed of System Fan1
SYS_FAN_2	Fan Speed of System Fan2
SYS_FAN_3	Fan Speed of System Fan3
SYS_FAN_4	Fan Speed of System Fan4
SYS_FAN_5	Fan Speed of System Fan5
SYS_FAN_6	Fan Speed of System Fan6
SYS_FAN_7	Fan Speed of System Fan7
SYS_FAN_8	Fan Speed of System Fan8
SYS_FAN_9	Fan Speed of System Fan9
SYS_FAN_10	Fan Speed of System Fan10
SYS_FAN_11	Fan Speed of System Fan11

SYS_FAN_12	Fan Speed of System Fan12
SYS_FAN_13	Fan Speed of System Fan13
SYS_FAN_14	Fan Speed of System Fan14
SYS_FAN_15	Fan Speed of System Fan15
SYS_FAN_16	Fan Speed of System Fan16
SYS_FAN_17	Fan Speed of System Fan17
SYS_FAN_18	Fan Speed of System Fan18
SYS_FAN_19	Fan Speed of System Fan19
SYS_FAN_20	Fan Speed of System Fan20

Appendix IV: FRU Parts Table

GA88-B5631 FRU Parts				
Item	Model Number	Part Number	Picture	Description
Power Supply	FRU-PS-0130	471100000193		TF-POWER SUPPLY;SBU,1600 W,DELTA,DPS-1600EB- B,(S0F),1U MODULE,REV.S0F
FAN Module	FRU-TS-0171	336210000063		40*40*56mm,8PIN (HEADER 1*8)
Heatsink	FRU-TH-0200	343T55800003		HF-HEATSINK;SBU,AL/CU,SOLDERLING+PIPE, 3647-1U-NARROW-PASSIVE HEATSINK,1A0-D032800962,108X78X25.5MM, SCREW,TN76-B7102
Riser		411739100498		M2091-R
Cable	FRU-CS-0760	422T56700005		TF-CABLE ASSY;SATA INTERNAL,SBU,30 AWG,650 mm,SATA CABLE(SAS WIRE),SATA 7P*2/SATA 7P*2,R/A,GA88-B5631
	FRU-CS-0460	332810000515		TF-POWER CORD;SBU,EU,250 V,16 AWG(1.0mm²),1800mm,AC PWR CORD
	FRU-CS-0550	332810000517		TF-POWER CORD;SBU,US,250 V,16 AWG(1.31mm²),1800mm,AC
GTX GPU	FRU-SM-0040	340T56700006		TF-GPU GTX REAR BKT;SBU,SGCC,NCT,NQ,GA88-B5631
		422T56700004		TF-AC/DC POWER CABLE;SBU,20 AWG,600MM,GPU PWR
		422T54100001		TF-AC/DC POWER CABLE;SBU,20 AWG,200MM,GPU PWR

NOTE

Appendix V: 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 consequence).

If these options are not available for you then MITAC COMPUTING TECHNOLOGY CORPORATION can help. Besides designing innovative and quality products for over a decade, MITAC has continuously offered customers service beyond their expectations. TYAN's website (<http://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 their latest software and operating system components to keep their systems running as powerful and productive as possible. MITAC also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, MITAC serves multiple market segments with the industry's most competitive services to support them.

Please feel free to contact us directly for this service at tech-support@tyan.com

Help Resources:

1. See the POST codes section of this manual.
2. See the TYAN's website for FAQ's, bulletins, driver updates, and other information: <http://www.tyan.com>
3. Contact your dealer for help before calling 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.

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