TN76-B7102

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 must not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesirable 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.

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.

About this Manual

This manual is intended for trained service technician/personnel with hardware knowledge of computers. Components inside the compartments should be serviced only by a trained service technician/personnel. This manual is aimed to provide you with instructions on installing your TYAN TN76-B7102.

How this guide is organized

This guide contains the following parts:

Chapter 1: Overview
This chapter provides an introduction to the TYAN TN76-B7102 barebones and standard parts list, describes the external components, gives an overview of the product from different angles.

Chapter 2: Setting Up
This chapter covers procedures on installing the processors, memory modules, hard drivers and other optional parts.

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 TN76-B7102 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 TN76-B7102, 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.
	Warning. This symbol indicates hazardous moving parts. Keep away from moving fan blades.

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.

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 individuals 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.

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

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1.1 About the TYAN TN76-B7102

Congratulations on your purchase of the TYAN® TN76-B7102, a highly optimized 2U rack-mountable barebone system. The TN76-B7102 is designed to support dual Intel® Xeon® E5-2600 v5 (Skylake) series CPU series processors and 6 channel DDR4 1.2V 2666/2400/2133w/ECC RDIMM/LRDIMM/LRDIMM 3DS memory, providing a rich feature set and incredible performance. Leveraging advanced technology from Intel®, the TN76-B7102 server system is capable of offering scalable 32 and 64-bit computing, high bandwidth memory design, and lightning-fast PCI-E bus implementation. The TN76-B7102 not only empowers your company in nowadays IT demand but also offers a smooth path for future application usage.

TYAN® also offers the TN76-B7102 in a version that can support up to twelve 3.5”/2.5’ fixed hard drives. The TN76-B7102 uses TYAN’s latest chassis featuring a robust structure and a solid mechanical enclosure. All of this provides TN76-B7102 the power and flexibility to meet the needs of nowadays server application.

1.2 Product Models

The system board within the Tyan MicroServer blades contain different processors and chipsets, which are defined by the following models:

- **TN76-B7102**: Intel-based platform

1.3 Features

TYAN B7102T76V12HR-2T-N

System	Form Factor	2U Rackmount
	Chassis Model	TN76
	Dimension (D x W x H)	29.9" x 17.2" x 3.4" (760 x 438 x 87.6mm)
	Motherboard	S7102GM2NR-2T
Front Panel	Buttons	(1) PWR w/ LED, (1) UID
	LEDs	(1) ID, (1) Warning
	I/O Ports	(1) USB 3.0 port
External Drive Bay	Type / Q'ty	2.5"/3.5" Hot-Swap SSD/HDD, (12)
	HDD backplane support	SATA 6Gb/s/ SAS 12Gb/s
	Supported HDD Interface	(12) SATA 6Gb/s / SAS 12GB/s
System Cooling Configuration	FAN	(6) 6cm fans
	Redundancy	Yes
Power Supply	Type	RPSU
	Input Range	AC 100-127V/12.47A , AC 200-240V/7.08A
	Output Watts	1,200 Watts
	Efficiency	80 plus Platinum
	Redundancy	1+1
Processor	Socket Type / Q'ty	LGA3647/ (2)
	Supported CPU Series	Intel Xeon Processor Scalable Family
	Thermal Design Power (TDP) wattage	Max up to 165W
	System Bus	Up to 10.4/9.6 GT/s with Intel UltraPath Interconnect (UPI) support
Chipset	Chipset	Intel C621
Memory	Supported DIMM Qty	(12)+(12) DIMM slots
	DIMM Type / Speed	DDR4 RDIMM/RDIMM 3DS/LRDIMM/LRDIMM 3DS 2666
	Capacity	Up to 768GB RDIMM/ 1,536GB LRDIMM/ 3,072GB RDIMM/LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel	6 Channels per CPU
	Memory voltage	1.2V
Expansion Slots	PCI-E	(4) PCI-e GEN3 x8 slots (x8/x0 link), (4) PCI-e GEN3 x16 slots (x8/x16 link)
	Pre-install TYAN Riser Card	M7102T76-R16-2F, (2) M7102T76-L16-2F
LAN	Port Q'ty	(2) 10GbE ports, (1) PHY
	Controller	Intel X550-AT2
	PHY	Realtek RTL8211E
	SATA Connector	(3) Mini-SAS-HD (12-ports) + (2) SATA-III

Storage			(totally support 14 ports)
		Controller	Intel C621
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	Connector type		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2500
I/O Ports	USB		(2) USB3.0 ports (2 at rear), (1) USB3.0 ports (1 at front)
	COM		(1) DB-9 COM port
	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		PXE boot support, ACPI 5.0, SMBIOS 3.0/PnP/Wake on LAN, User-configurable H/W monitoring, ACPI sleeping states S4,S5
Operating System	OS supported list		Please refer to our Intel OS supported list.
Regulation	FCC (DoC)		Class A
	CE (DoC)		Yes
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) Quick Installation Guide
	Installation CD		(1) TYAN installation CD

Barebone	(1) TN76-B7102 w/NV Tesla supported Barebone

1.4 Standard Parts List

This section describes TN76-B7102 package contents and accessories. Open the box carefully and ensure that all components are present and undamaged. The product should arrive packaged as illustrated below.

1.4.1 Box Contents

Chassis Kit

- (1) 2U chassis
- (1) 2U barebone with (12) fixed 3.5”/2.5” HDD bays
- (2) DPS-1200AB-4 B,(00F), power supply unit
- (1) S7102GM2NR-2T system board (pre-installed)
- (1) MP016T76-FB Fan Board(pre-installed)
- (6) System Fans
- (1) M1271T71-BP12-12 (pre-installed)
- (1) M1715T71-FPB (pre-installed)
- (1) M1714T71-USB (pre-installed)
- (2) M7102T76-L16-2F Riser card (pre-installed)
- (1) M7102T76-R16-2F Riser card (pre-installed)

1.4.2 Accessories

If any items are missing or appear damaged, contact your retailer or browse to TYAN’s website for service: http://www.tyan.com
The web site also provides information of other TYAN products, as well as FAQs, compatibility lists, BIOS settings, etc.

Accessory Kit

- (1) Sliding Rail kit
- (1) Quick Installation Guide
- (2) AC Power code (US)
- (2) AC Power code (EU)
- (3) Screw Pack
- (3) GPU_Bracket_K80
- (1) Driver CD
- (2) CPU clip for Narrow Non-Fabric CPU Carrier
- (2) Narrow Fabric CPU Carrier
- (1)I/O QSFP Bracket
- (1)I/O RJ45 Bracket

1.5 About the Product

The following views show you the product.

1.5.1 System Front View

HDD/SSD Sequence

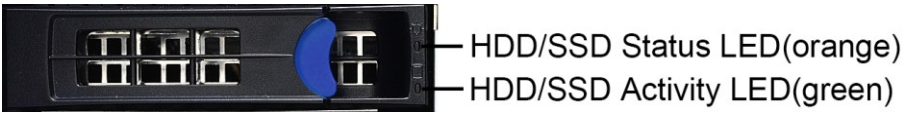
HDD/SSD2	HDD/SSD5	HDD/SSD8	HDD/SSD11
HDD/SSD1	HDD/SSD4	HDD/SSD7	HDD/SSD10
HDD/SSD0	HDD/SSD3	HDD/SSD6	HDD/SSD9

No.	Description
1	USB3.0 Port
2	Front Panel Board
3	Power On/Off Button with green LED
4	ID Button
5	ID LED (blue color)
6	FAULT LED (amber color)
7	(12) 3.5”/2.5” SATA 6G/SAS12G hot-swap HDDs/SSDs

Front Panel LED Definitions

FPB LED	State	Color	Description
ID LED	On	Blue	System identified
	Off	Off	System not identified
Fault LED	On	Amber	Error occurred in the system
	Off	Off	System works fine
Power LED	On	Green	System powered on
	Blinking	Green	System standing by
	Off	Off	System AC off

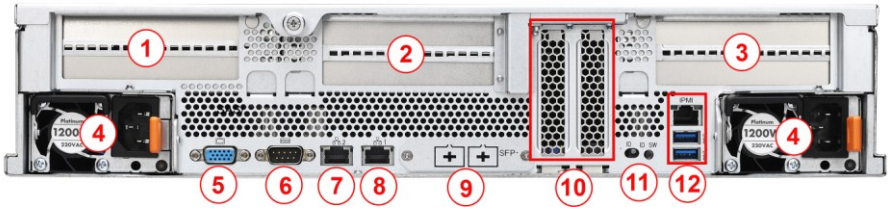
HDD/SSD LED Definitions LED



Drive State	Activity LED (Green color)	Status LED (Orange color)
Drive Present, No Activity	Solid On	Off
Drive Present, with Activity	Blinking	Off
Drive Fail	Don't care	Solid On
Drive identify	Don't care	Blinking @ 1Hz
Drive Rebuild	Don't care	Blinking @ 4Hz

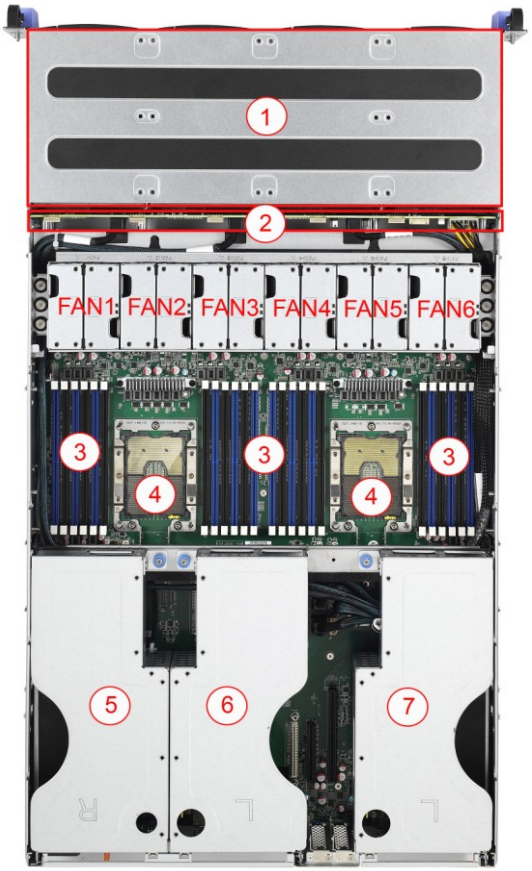
1.5.2 System Rear View

B7102T76V12HR-2T-N



No.	Description
1	Expansion Slots
2	Expansion Slots
3	Expansion Slots
4	(1+1) ERP1U 1200 RPSU, 80+ Platinum Power Supply
5	VGA Port
6	Serial Port
7	RJ-45 Connector (LAN2)
8	RJ-45 Connector (LAN1)
9	SFP2+ SFP1 (interface from mezzanine card)
10	1 x HH-HL PCIE Slot
11	ID-LED / ID-LED SW
12	RJ-45 Connector LAN3 (Dedicated IPMI) upper & USB 3.0 ports x 2 down

1.5.3 System Top View



No.	Description
1	(4) 3.5”/2.5” SAS12G / SATA6G hot-swap HDDs/SSDs
2	HDD Backplane Board
3	Memory Slots
4	CPU Sockets
5/6/7	GPU Card assembly (1+1) 1000W(@110Vac) /1600W(@220Vac) Power Supply (underneath)
NOTE: The system is pre-installed with S7102 mainboard.	

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 hex wrench
- A grounding strap or an anti-static pad

Most of the electrical and mechanical connections can be disconnected with your hands. It is recommended that you do not use pliers to remove connectors as it may damage the soft metal or plastic parts of the connectors.

Caution!

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

2.0.4 Precautions

Components and electronic circuit boards can be damaged by discharges of static electricity. Working on a system that is connected to a power supply can be extremely dangerous. Follow the guidelines below to avoid damage to TN76-B7102 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.

CAUTION: Please note that the following illustrations may not look exactly like the rackmount server you purchased. Therefore, the illustrations should be held for your reference only.

2.1 Installing Motherboard Components

This section describes how to install components on to the motherboard, including CPU, heatsink, air duct, memory modules, HDD/SSD and LAN Card.

2.1.1 Removing the Chassis Cover

Follow these instructions to remove the TN76-B7102 chassis cover.

1. Unscrew the top cover.

2. Slide the top cover off and remove the top cover from the chassis.

2.1.2 Removing the Air Duct

1. Remove the air duct from the chassis.

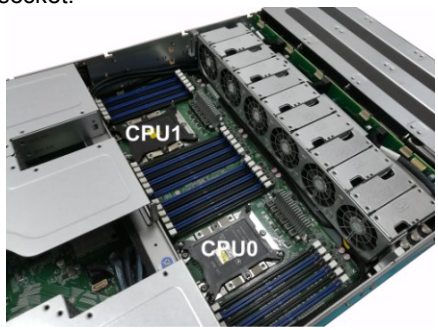
2.1.3 Installing the CPU, Heatsink

There are two kinds of CPU supported in Purley Platform **Intel® Socket-P** S7102

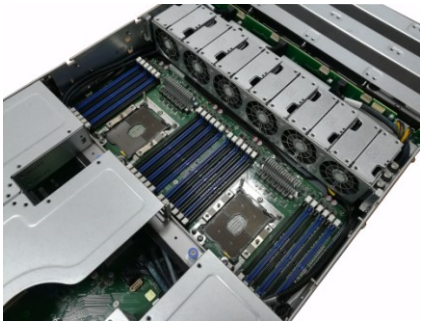
Fabric CPU	Non-Fabric CPU

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

1. Locate the CPU socket.

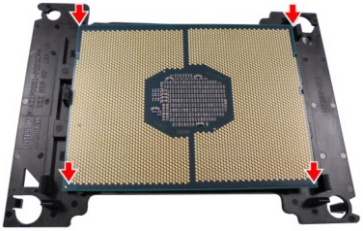


2. Take out the protection cap.

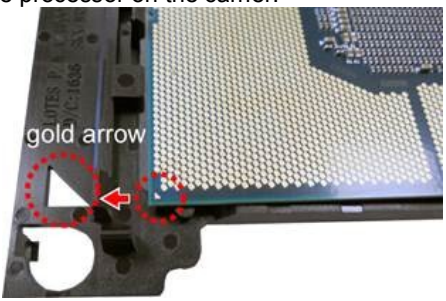


Install the Narrow Non- Fabric CPU

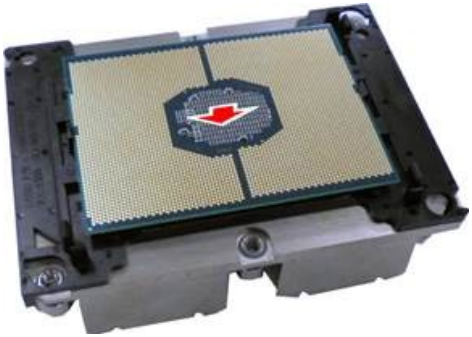
1. Put the Narrow-Fabric processor on the Carrier hook clips.



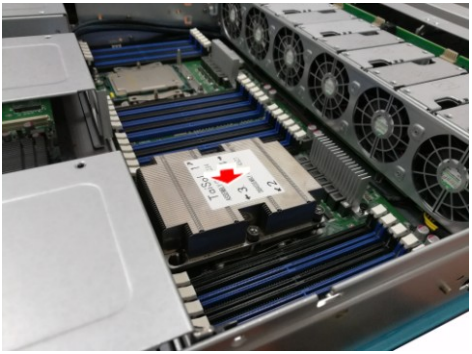
2. Align and install the processor on the carrier.



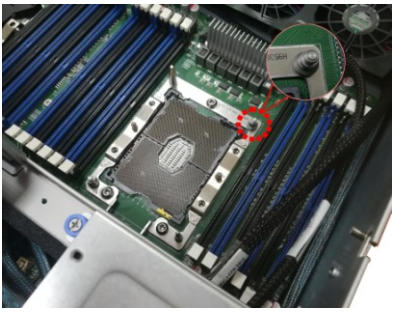
3. Carefully flip the heatsink. Then install the carrier assembly on the bottom of the heatsink and make sure Carrier hook clips is stuck in the heatsink.

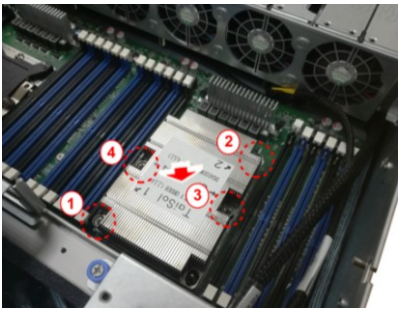


4. Place the heatsink on top of the CPU.



5. 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.



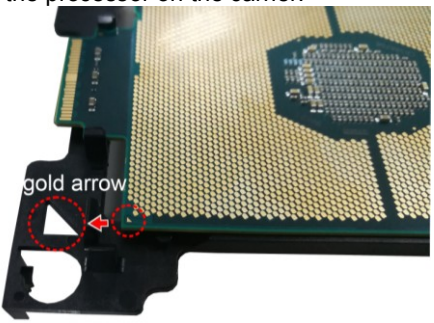


6. To secure the heatsink, use a T30 Security Torx to tighten the screws in a sequential order (1->2 -> 3 -> 4). When disassembling the heatsink, loosen the screws in reverse order (4 -> 3 ->2 ->1).

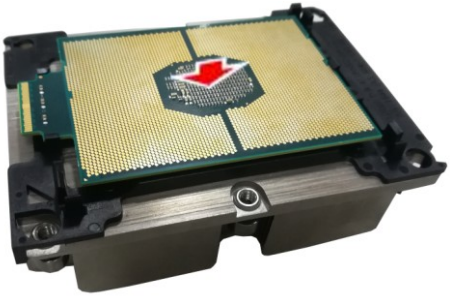
Install the Narrow Fabric CPU

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

2. Align and install the processor on the carrier.

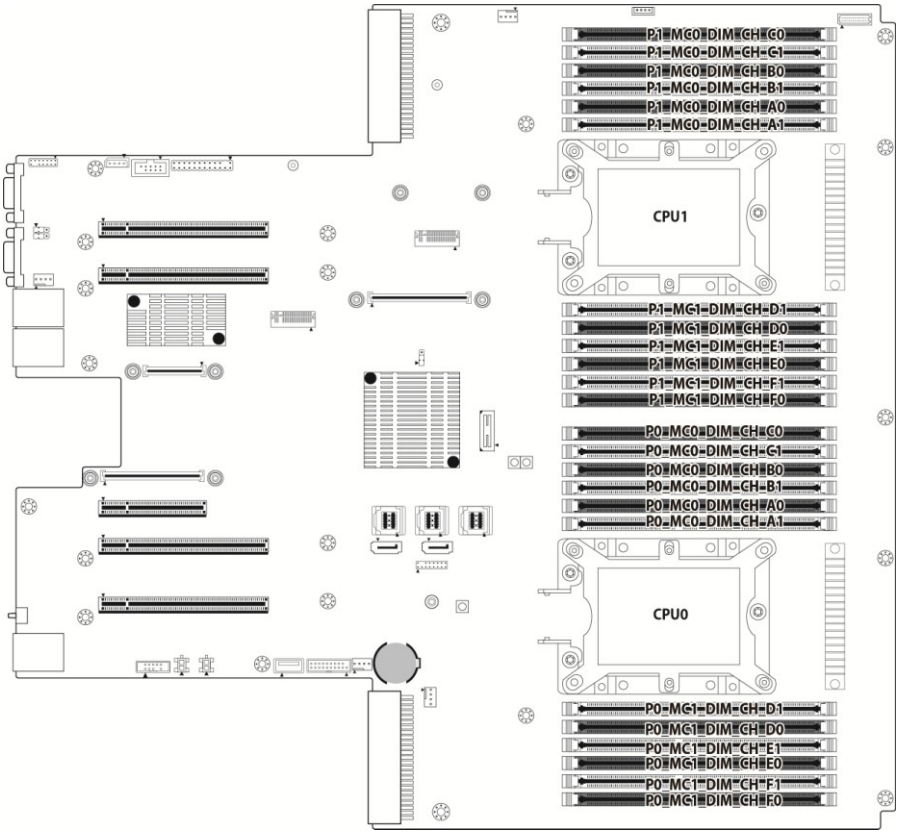


3. Insert the Fabric CPU Carrier hook clips onto the heatsink.



4. The same procedure as non Fabric CPU installation step 4 to step 6.

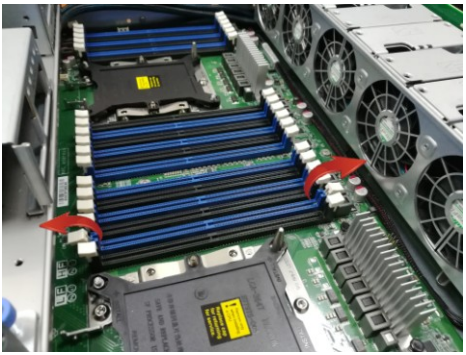
2.1.4 Installing the Memory



Memory population table

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

1. Press the memory slot locking levers in the direction of the arrows as shown in the following illustration.(Always start at CPU0_DIMM_A0)



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. Follow the recommended memory population table to install the other memory modules.

2.1.5 Installing Hard Drives

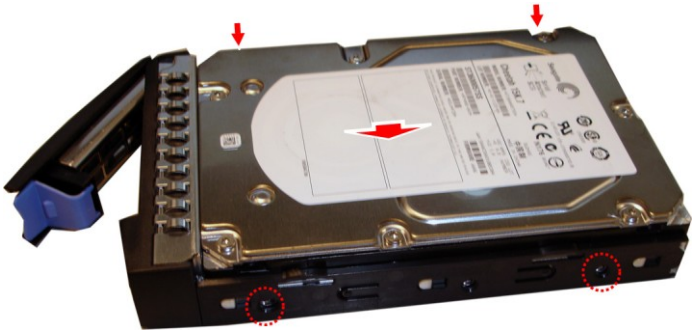
Follow these instructions to install (12) 3.5”/2.5” hard drives.

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

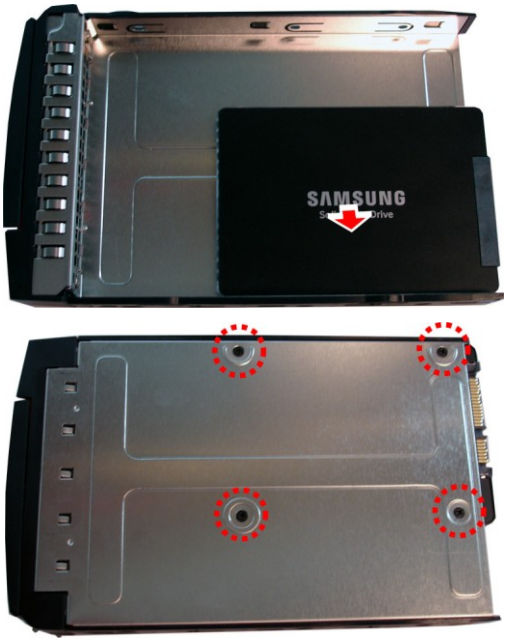
HDD Trays

1. Push the latch to pull the hard disk tray out.

2. (Option 1: 3.5” HDD)
Place a 3.5" hard drive into the HDD tray and secure the HDD with 4 HDD screws.



3. (Option 2: 2.5” HDD/SSD)
Place a 2.5” hard drive into the HDD tray. Turn the HDD tray over and secure the HDD/SSD with 4 screws.



4. Reinsert the HDD tray into the chassis.

2.2 Rack Mounting

CAUTION: Please note that the following illustrations are based on a TN76-B7102 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 TN76-B7102 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 TN76-B7102 into an industry standard 19" rack.

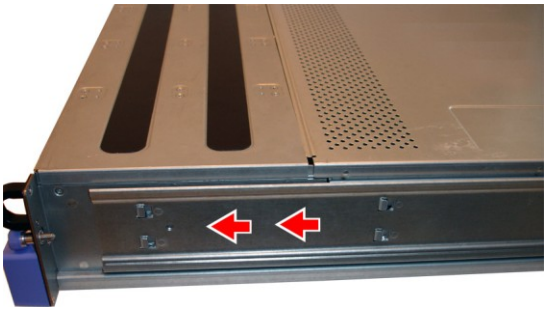
NOTE: Before mounting the TYAN TN76-B7102 in a rack, ensure that all internal components have been installed and that the unit has been fully tested. However, to make the installation easier, we suggest that you remove all HDD trays before you insert the chassis into the rack.

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.

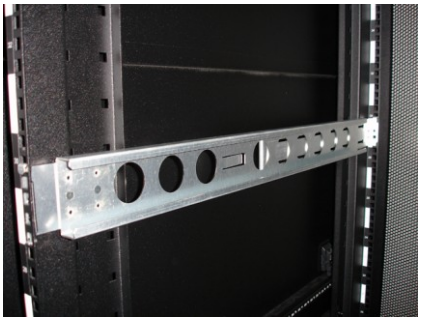


4. Screw the inner rail to the chassis.

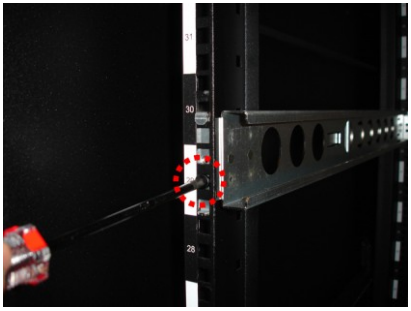
5. Align and screw the inner sliding rail on the other side of the server.

2.2.3 Installing the Outer Rails to the Rack

1. Secure the outer rails to the rack.



2. Screw 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.

3. Secure the whole system to the rack with 2 thumb screws.

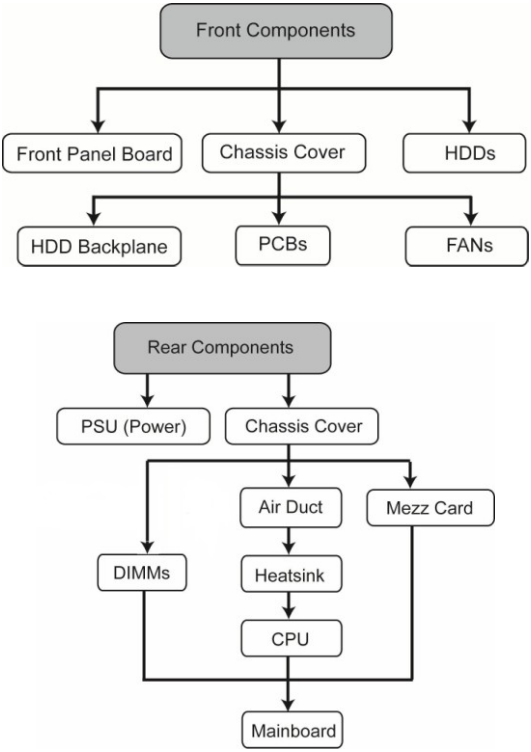
Chapter 3: Replacing Pre-Installed Components

3.0.1 Introduction

This chapter explains how to replace the pre-installed components, including the S7102 Motherboard, M1271T71-BP12-12 12-Ports 6G/12G HDD Backplane Board, M1715T71-FPB Front Panel Board, MP016T76 Fan Board, System Fan and Power Supply Unit etc.

3.0.2 Disassembly Flowchart

The following flowchart outlines the disassembly procedures.



3.1 Removing the Cover

Before replacing any parts you must remove the chassis cover. Follow Section ***2.1.1 Removing the Chassis Cover*** (page **24**) to remove the cover of the TN76-B7102.

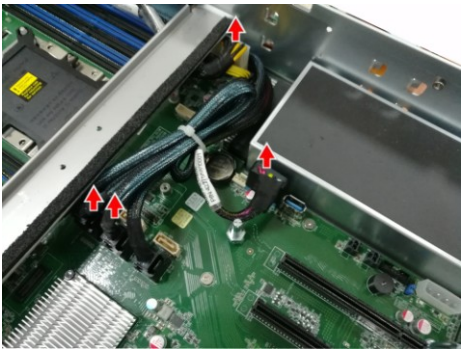
3.2 Replacing Motherboard Components

Follow these instructions to replace motherboard components, including the motherboard.

3.2.1 Disconnecting All Motherboard Cables

Before replacing the motherboard or certain components, remove cables connected to the motherboard. Follow these instructions to remove all cables.

1. Disconnect all cables.



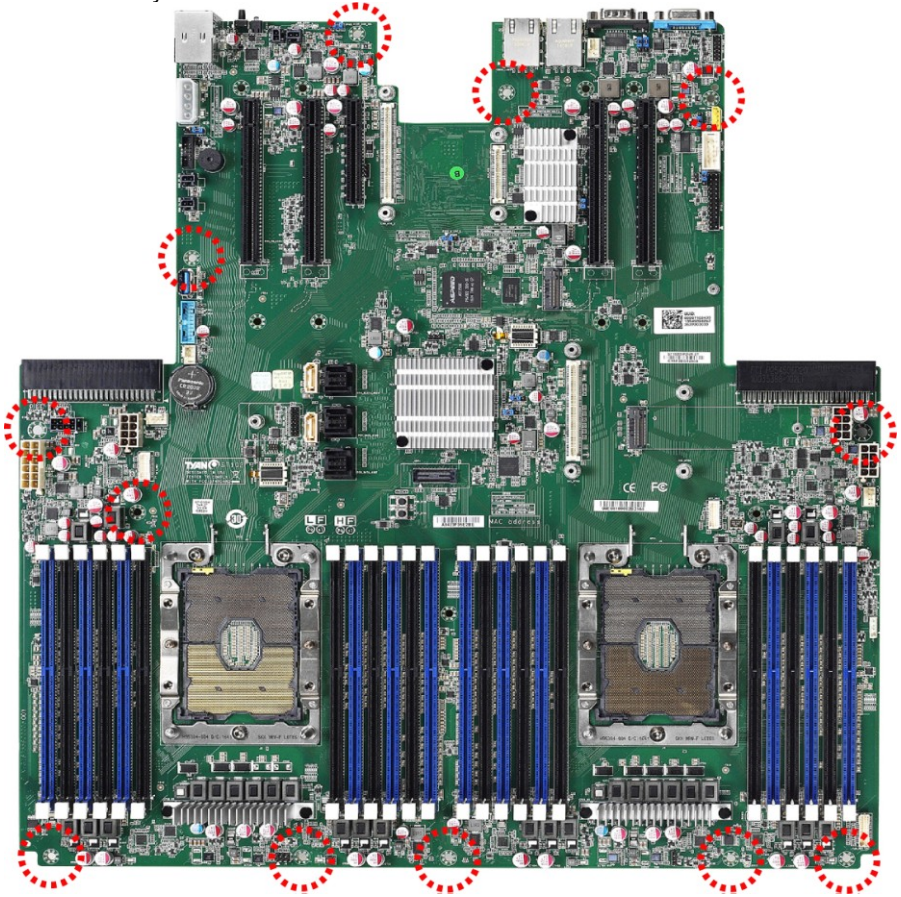
3.2.2 Removing the Motherboard

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

1. Remove the power supplies, air ducts, processor and heatsink (with thermal pad attached) accordingly.
   NOTE: DO NOT remove the thermal pad from the heatsink. If the thermal pad is broken, please order a new heatsink FRU and follow the instruction stated in Section ***2.1.3 Installing the CPU, Heatsink*** **(page 25).**

2. Remove the 12 screws securing the motherboard to the chassis.

3. Carefully lift the motherboard from the chassis.



4. 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.

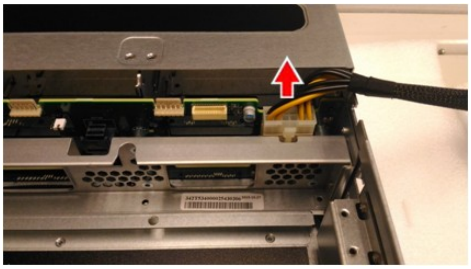
5. **NOTE:** Be especially careful to look for extra stand-offs. If there are any stand-offs present that are not aligned with a mounting hole on the motherboard, it will likely short components on the back of the motherboard when installed. This will cause malfunction and/or damage to your motherboard.

3.3 Replacing the HDD Backplane Board

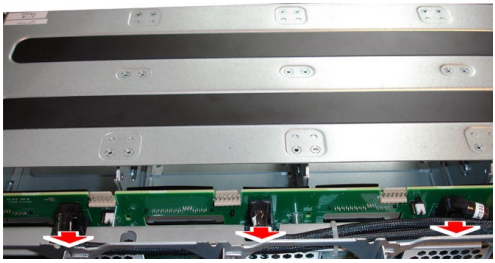
Follow these instructions to replace the M1271T71-BP12-12 12-Ports HDD Backplane Board.

1. Pull all front HDD trays out.

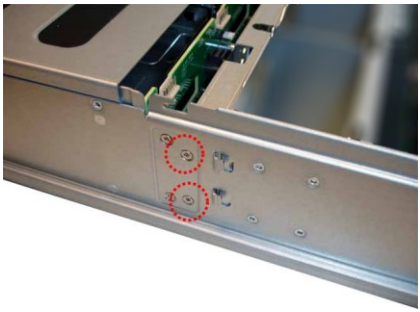
2. Disconnect the power cable.

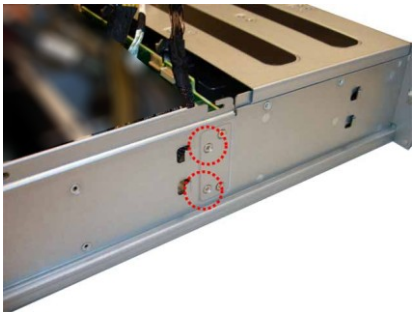


3. Disconnect the 3pcs Mini-SAS HD cable.

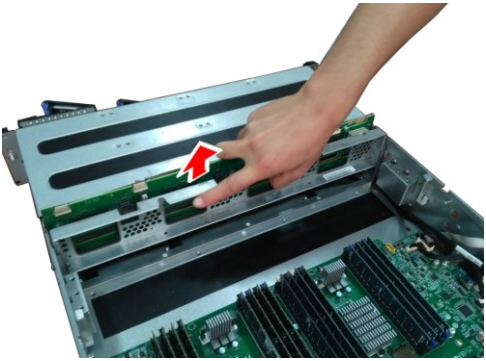


4. Loose the screws on both sides of the chassis.

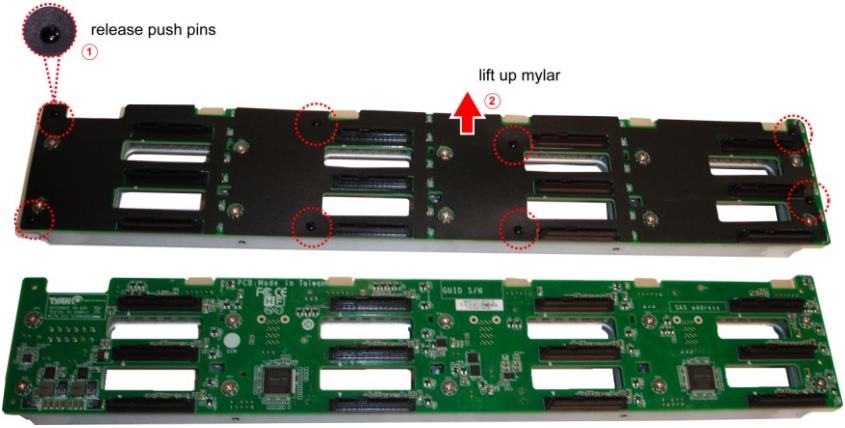




5. Take out the HDD BP board.



6. Release 8 push pins to lift the mylar.



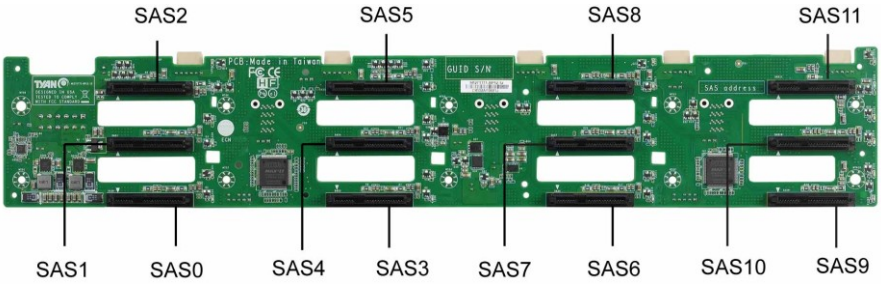
7. Loose ten screws to replace with a new HDD BP Board.

8. Reinstall the HDD BP Board into the chassis following the steps in reverse.

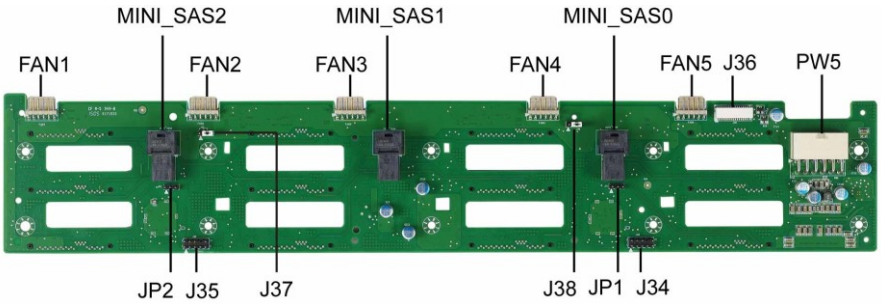
3.3.1 HDD BP Board Features

Here shows the M1271T71-BP12-12 HDD Backplane Board in details.

Front view:



Rear view:



Form Factor	W429.8 x L78.4 (mm), 8-layer PCB
Specifications	(12) SAS/SATA HDD/SSD Connector connected to HDD/SSD (SAS0~11) (3) Mini-SAS HD Connector connected to MB (MINI_SAS0~2) (1) 12-pin Power Connector connected to MB (PW5) (1) 30-pin Fan Connector connected to MB (J36) (5) 6-pin Fan Connector connected to Fan (FAN1~5)
LEDs	(12) HDD/SSD Active LEDs (12) HDD/SSD Fault LEDs

3.3.2 Connector Pin Definitions

PW5: 12-pin Power Connector

Definition	Pin	Pin	Definition
GND	1	7	VDD_12_RUN
GND	2	8	VDD_12_RUN
GND	3	9	VDD_12_RUN
GND	4	10	VDD_12_RUN
GND	5	11	VDD_12_RUN
GND	6	12	VDD_12_RUN

J36: 30-pin FAN Connector

Definition	Pin	Pin	Definition
FAN_TACH1	1	2	FAN_TACH6
FAN_TACH2	3	4	FAN_TACH7
FAN_TACH3	5	6	FAN_TACH8
FAN_TACH4	7	8	FAN_TACH9
FAN_TACH5	9	10	FAN_TACH10
GND	11	12	GND
CON_PWM2	13	14	CON_PWM1
FAN_TACH11	15	16	KEY
FAN_TACH12	17	18	KEY
KEY	19	20	CON_PWM3
KEY	21	22	GND
FAN_TACH13	23	24	FAN_TACH15
FAN_TACH14	25	26	FAN_TACH16
CON_PWM4	27	28	CON_PWM6
GND	29	30	GND

FAN1~FAN5: 6-pin FAN Connector

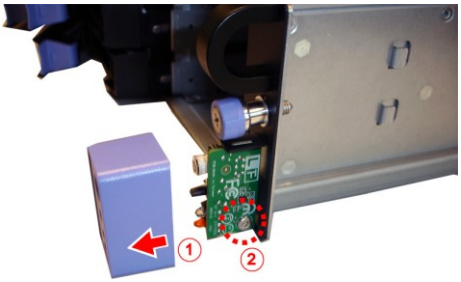
Definition	Pin	Pin	Definition
VDD_12_FAN1	1	2	GND
CON_PWM1	3	4	FAN_TACH1
VDD_12_FAN1	5	6	GND

3.4 Replacing the Front Panel Board

Follow these instructions to replace the M1715T71-FPB Front Panel Board.

1. Unscrew the front panel bezel.

2. Take out the front panel bezel and unscrew the Front Panel Board.

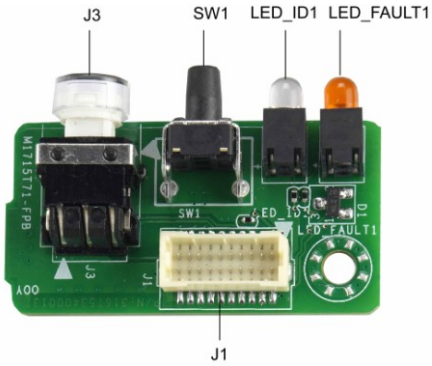


3. Disconnect the Front Panel control cable.

4. Reinstall the Front Panel Board into the chassis following the steps in reverse.

3.4.1 Front Panel Board Features

Here shows the M1715T71-FPB Front Panel Board in details.



Form Factor	W37xL19xT1.6mm, 2-layer PCB
Specifications	(1) Front Panel Board Connector (J1) (1) Power Button with green color Power LED (J3) (1) ID Button (SW1) (1) blue color ID LED (LED_ID1) (1) orange color FAULT LED (LED_FAULT1)

3.4.2 Connector Pin Definitions

J1: Front Panel Board Connector

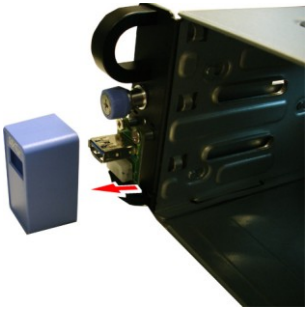
Definition	Pin	Pin	Definition
FP_PW_LED_PW	1	11	FP_PWR_BTN_N
VCC_FPB	2	12	NC
NC	3	13	GND
FP_ID_LED_PW	4	14	NC
FP_PW_LED_GND	5	15	NC
FP_ID_LED_N	6	16	FP_SMB_DAT
NC	7	17	GND
BMC_HW_FAULT_N	8	18	FP_SMB_CLK
NC	9	19	FP_IDLED_BTN_N
BMC_SYS_FAULT_N	10	20	NC

3.5 Replacing the USB Board

Follow these instructions to replace the M1714T71-USB USB Board.

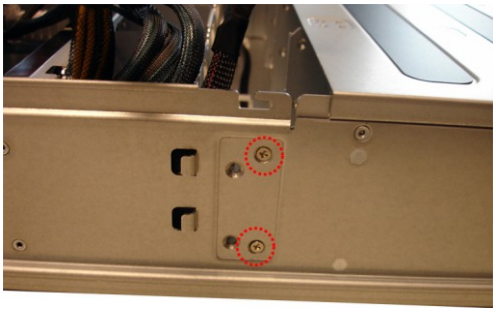
1. Unscrew 4 screws to release the USB board bezel.

2. Take out the USB Board bezel.

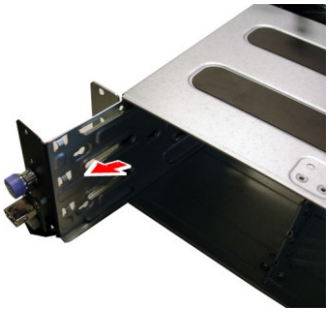


3. Disconnect the Front USB3.0 Cable.

4. Unscrew the USB Board bracket.



5. Slide to take out the USB Board bracket.



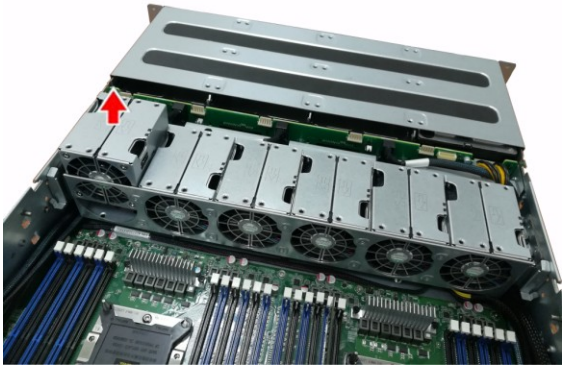
6. Unscrew the USB Board to replace with a new one.

7. Reinstall the USB Board bracket into the chassis following the steps in reverse order.

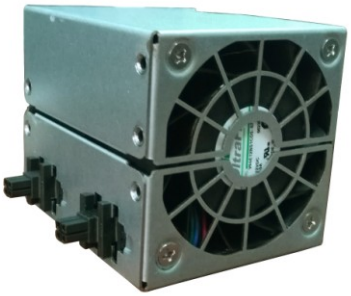
3.6 Replacing the Fans

Follow these instructions to replace the fans.

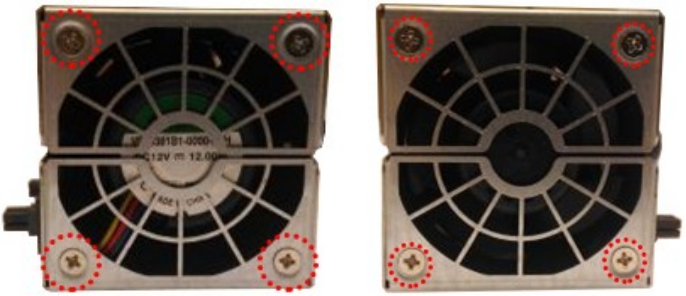
1. Take out the fan module from the chassis.



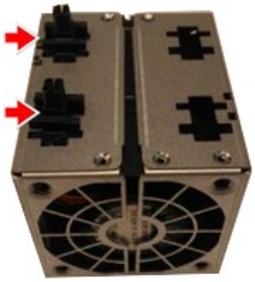
2. Replace the failed fan module with a new one.



3. Loose the screws on both sides.



4. Push the latch in the direction as the arrow shown to release the fan from the iron holder.

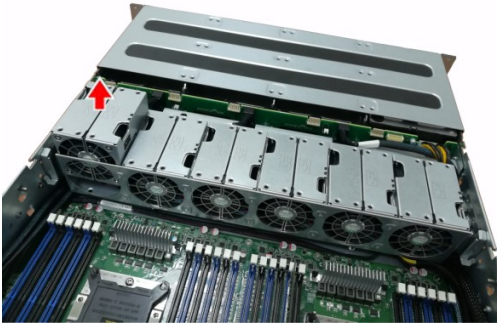


5. Remove the iron holder to replace a new fan. Follow the procedure reverse order to reinstall the system fan.

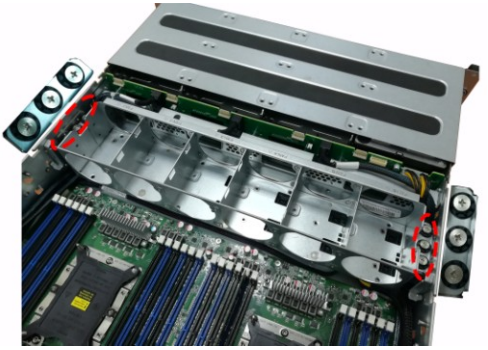
3.7 Replacing the Fan Board

Follow these instructions to replace the MP016T76-FB Fan Board.

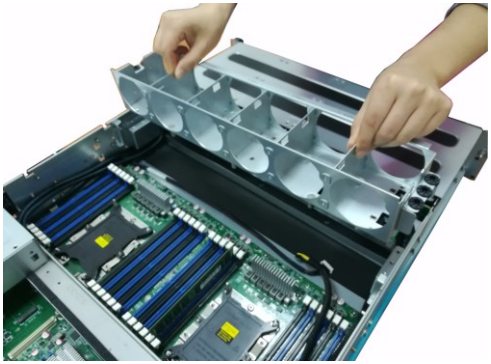
1. Take out the fan modules.



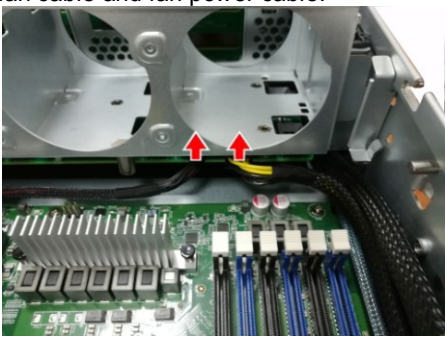
2. Remove the six screws.



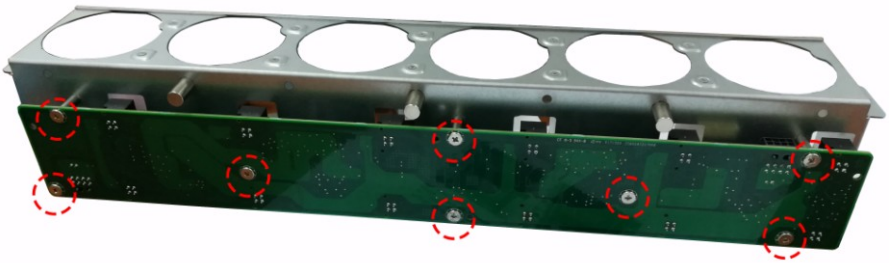
3. Take out the fan chassis.



4. Disconnect the fan cable and fan power cable.



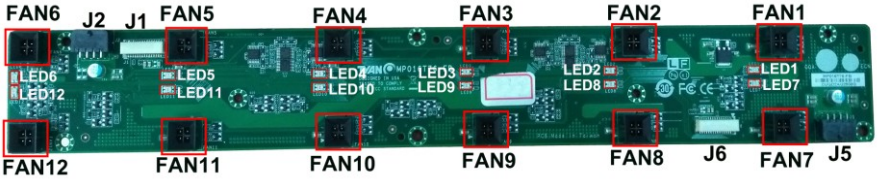
5. Remove the 8 screws.



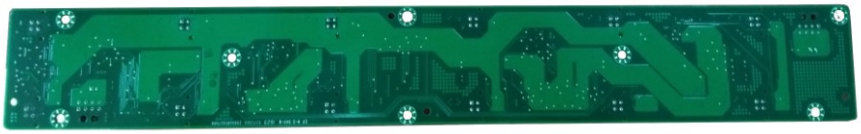
3.7.1 Fan Board Features

Here shows the MP016T76-FB Fan Board in details.

Front view:

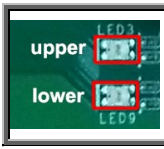


Rear view:



Form Factor	W389.5 x L54 (mm), 4-layer PCB
Specifications	(12) FAN Connector (2) Power Connector(J2/J5) (2) FAN Cable Connector(J1/J6)
LEDs	(12) Fan Fail LEDs

3.7.2 Fan Board LED Definition



FAN Status	Upper LED	lower LED
Normal	On(Green)	On(Green)
Abnormal	Red	Red

3.7.3 Connector Pin Definitions

FAN Cable Connector (J1&J6)

J1&J6	FAN Cable Connector		
PIN 1	PIN 2	PIN 3	PIN 4
SYS_FAN1_TACH	SYS_FAN6_TACH	SYS_FAN2_TACH	SYS_FAN7_TACH
PIN 5	PIN 6	PIN 7	PIN 8
GSYS_FAN3_TACH	SYS_FAN8_TACH	SYS_FAN4_TACH	SYS_FAN9_TACH
PIN 9	PIN 10	PIN 11	PIN 12
SYS_FAN5_TACH	SYS_FAN10_TACH	GND	GND
PIN 13	PIN 14	PIN 15	PIN 16
PWM_SYS2	PWM_SYS1	SYS_FAN11_TACH	NA
PIN 17	PIN 18	PIN 19	PIN 20
SYS_FAN12_TACH	NA	VCC3_AUX	PWM_SYS3
PIN 21	PIN 22	PIN 23	PIN 24
VCC3_AUX	GND	NA	NA
PIN 25	PIN 26	PIN 27	PIN 28
NA	NA	PWM_SYS4	PWM_SYS5
PIN 29	PIN 30		
PWM_SYS6	GND		

FAN Connector (FAN1-FAN12)

FAN1-FAN12	FAN Connector		
PIN 1	PIN 2	PIN 3	PIN 4
VDD_12V_RUN	FAN_PWM	GND	TACH
PIN 5	PIN 6		
NA	NA		

3.8 Replacing PCI-E Riser Cards

The TN76-B7102 has **three pre-installed PCI-E** riser cards.
Follow the instructions below to disassemble the M7102T76-R16-2F and M7102T76-L16-2F riser cards.

Uninstalling the M7102T76-L16-2F riser card

1 There are three GPU brackets in the TN76-B7102 chassis.

2 lift the GPU assembly up.

3 Turn over the bracket and unscrew the M7102T76-L16-2F riser card to replace a new one if necessary.

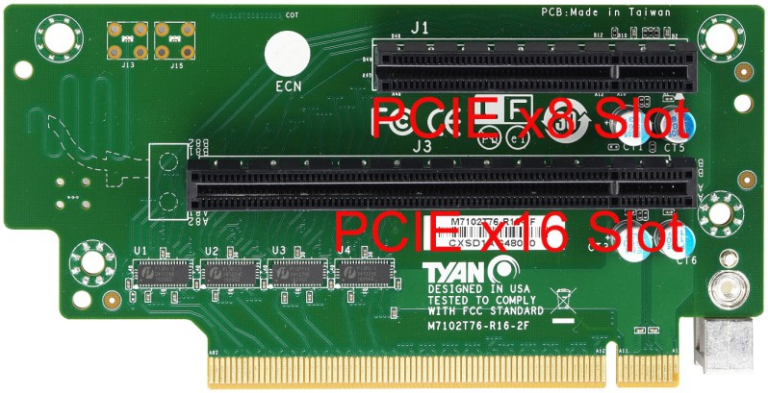
Uninstalling the M7102T76-R16-2F riser card

1 Follow the same procedure to detach the other GPU assembly. Unscrew the M7102T76-R16-1F riser card to replace a new one if necessary.

2 Follow the steps described earlier in reverse to reinstall the M1202-L16-1F riser card.

3.8.1 PCIE Riser card Features

M7102T76-R16-2F riser card



M7102T76-L16-2F riser card

3.9 Replacing the Power Supply

The system has two pre-installed Power Supply Units. Please unplug the power cord before you follow these instructions to replace the power supply units.

1. Press the latch to pull the power supply out.

2. After replacing a new power supply, press the latch to push the power supply back into the chassis.

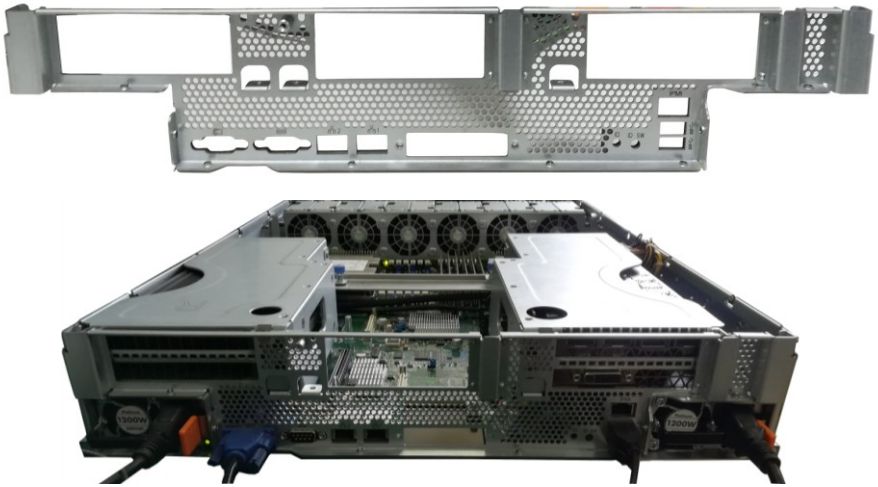
Chapter 4: Installing GPU Cards

The TN76-B7102 supports several kinds of GPU cards which are listed below. In this chapter we will introduce you how to install the **GTX** GPU card.

4.1 Installing the GTX GPU card

The TN76-B7102 supports three PCI-E Riser Card Brackets. A power cable (2x4p) is required for GPU cards. Follow these instructions to install GPU card in your system.

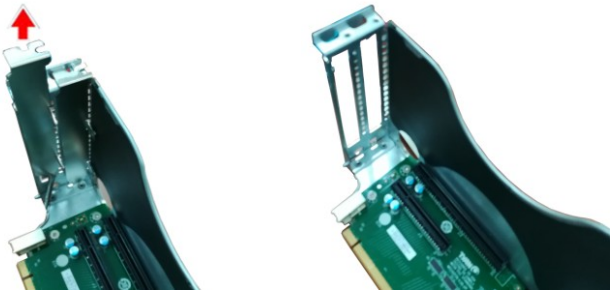
Combine with the B7102T76V12HR-2T-G IO



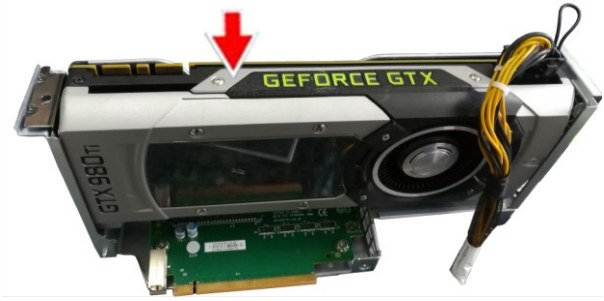
1. TN76-B7102 equips 3 GPU card assembly and lift the bracket up.

2. Remove the 3 screws secure the PCI bracket.

3. Pull the two PCI bracket out. The **GTX** GPU card needs two bracket's space.

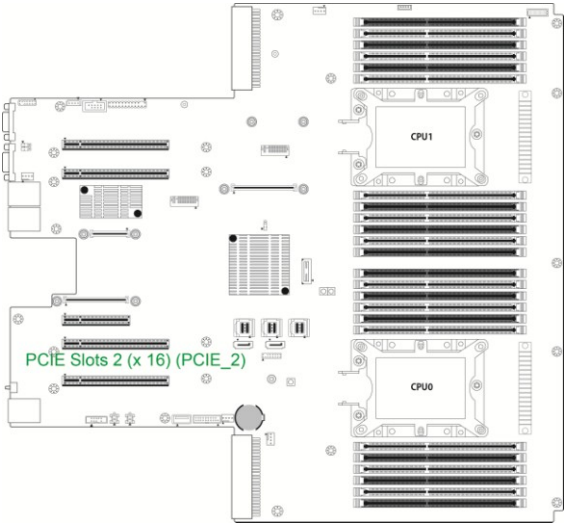


4. Insert the GTX GPU card onto the M7102T76-L16-2F riser card and secure with 2 screws on the expansion slot and connect the GPU cable.



5. Put the PCI bracket back to the chassis and connect the power cable.

NOTE: MP016T76-L16-1F riser card should combine with the Rear I/O shielding. And the riser card should insert in PCIe Slot 2.

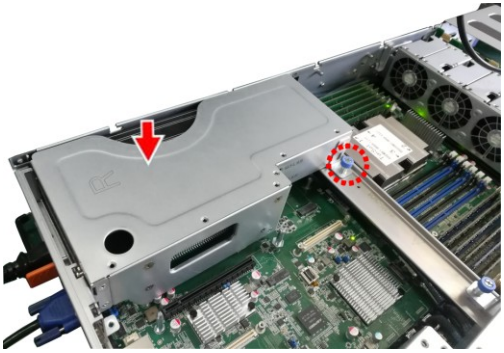


4.2 Installing the Nvidia® K20 GPU card

1. Release to take out the GPU bracket.

2. Install the NVIDIA® K20 GPU card to the GPU bracket.

3. Insert the NVIDIA® K20 GPU card onto the M7102T76-R16-2F riser card and rotate the red circle button clockwise to lock the bracket.



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.

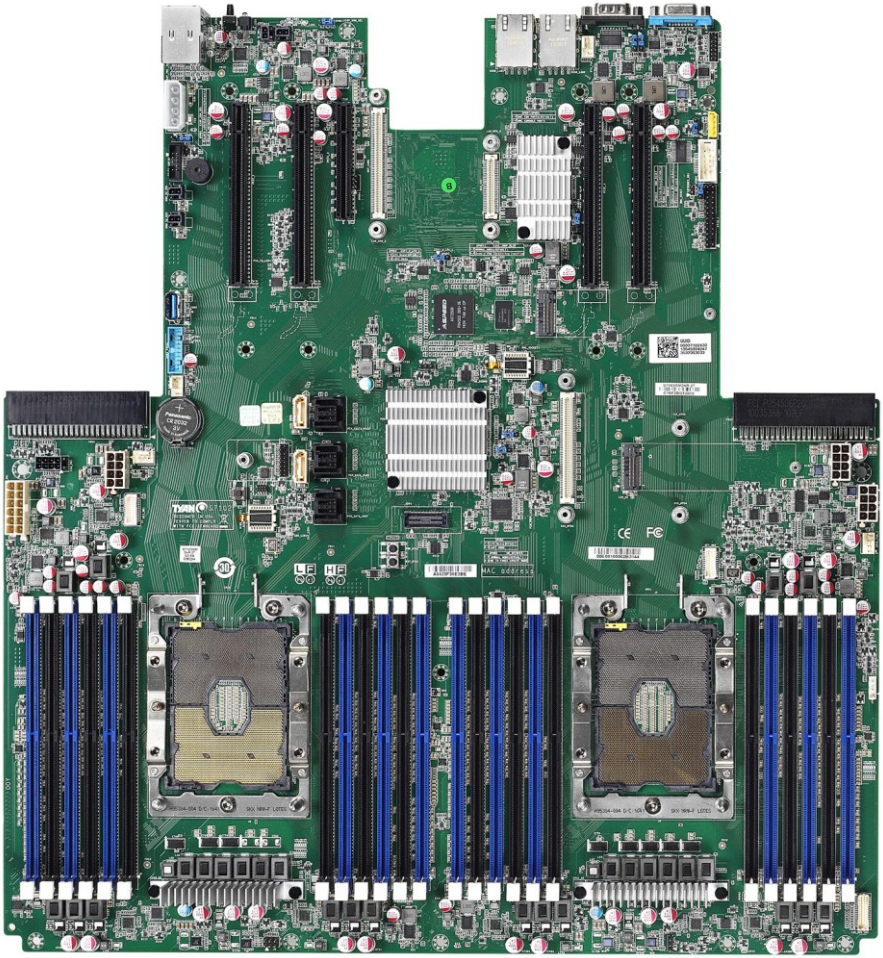
The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

Caution!

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

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

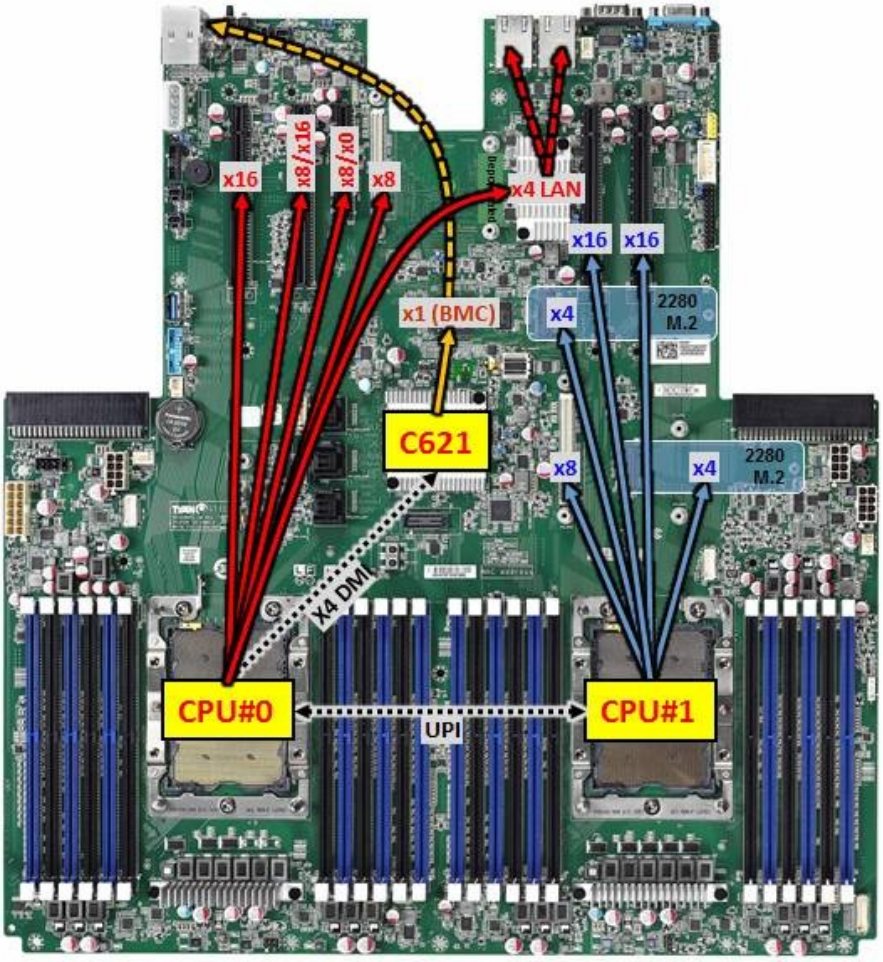
5.1 Board Image



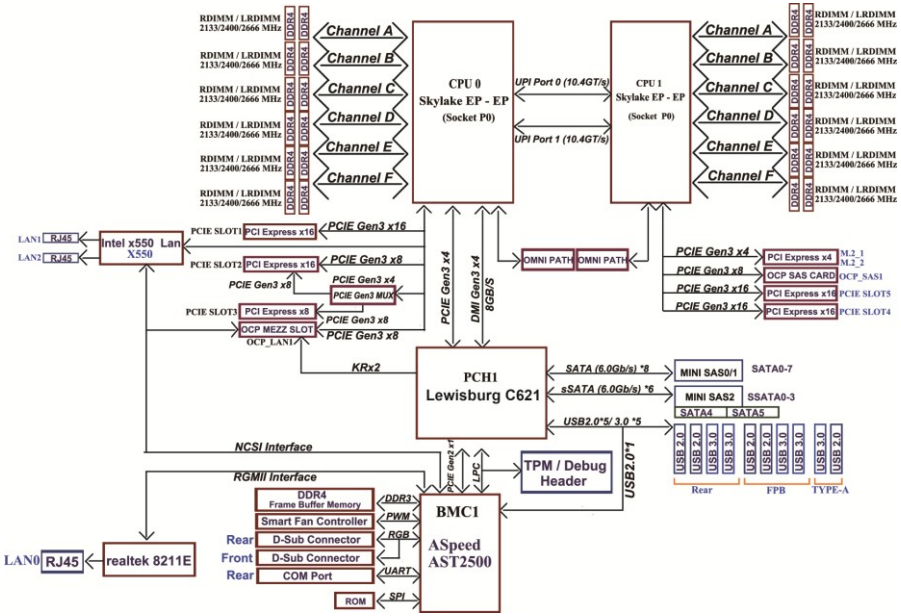
S7102

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 CPU Chipset & PCIe

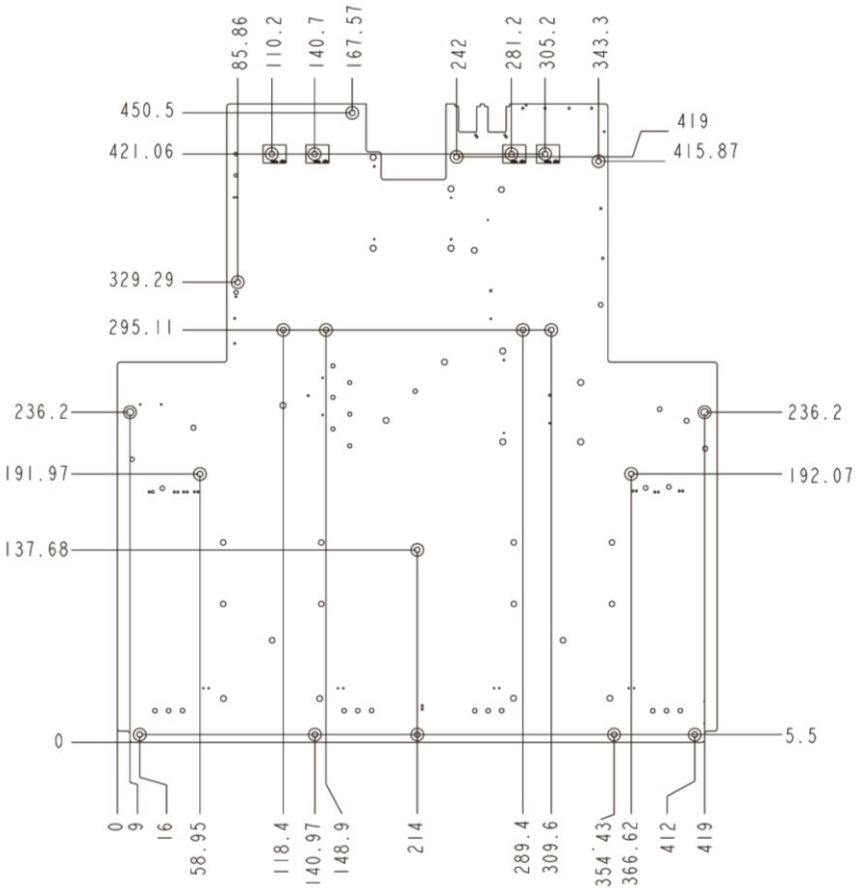


5.3 Block Diagram

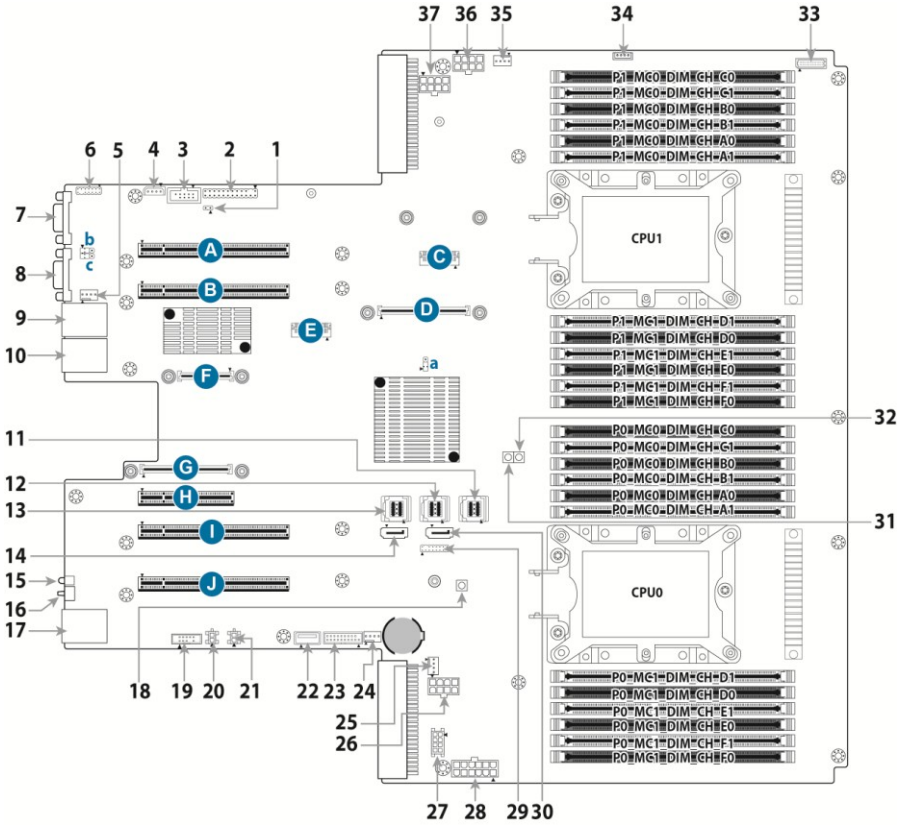


B7102 Block Diagram

5.4 Mainboard Mechanical Drawing



5.5 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.

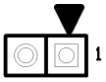
Jumpers & Connectors

Connectors	
1. Intrusion Header (INTRUDER_HD1)	19. SSATA SGPIO Connector (SSATA_SGPIO1)
2. Front panel Connector (FPIO_1)	20. SSATA DOM Power Connector (DOM_5V_PW1)
3. COM2 Header (HD_COM2)	21. SSATA DOM Power Connector (DOM_5V_PW2)
4. IPMB Header (IPMB_HD1)	22. USB TYPEA Connector (TYPEA_USB3)
5. System FAN Connector (SYS_FAN_5)	23. USB Front Panel Connector (USB3_FPIO1)
6. Front panel VGA Header (FPIO_VGA2)	24. System FAN Header (SYS_FAN_4)
7. Rear VGA Connector (VGA1)	25. CPU0 FAN Header (CPU0_FAN_1)
8. Rear COM1 Connector (COM_11)	26.GPU Power Connector (PE_PW1)
9. X550 10G LAN Connector (X550_LAN2)	27. FAN Power Connector (HDD_PW1)
10. X550 10G LAN Connector (X550_LAN1)	28. HDD BP Power Connector (HDD_PW1)
11. SATA Connector (PCH_SATA_4567)	29. TYAN Module Header (DBG_HD1)
12. SATA Connector (PCH_SATA_0123)	30. SSATA DOM Connector (SSATA_DOM5)
13. SSATA Connector (PCH_SSATA_0123)	31. Power Button (PWR_BTN1)
14.SSATA DOM Connector(SSATA_DOM4)	32. Reset Button (RST_BTN1)
15.ID LED (ID_LED1)	33. System FAN Connector (FAN_HD1)
16. ID LED Button (ID LED_BTN1)	34. VROC Header (J51)
17. RJ45 LAN1(IPMI) and USB Connector (USB3_IPMI_LAN1)	35. CPU1 FAN Header (CPU1_FAN_1)
18.Clear Button(CLEAR_BTN1)	36. GPU Power Connector(PE_PW2)
	37. GPU Power Connector(PE_PW4)
Jumpers	
a. ME Recovery Mode Jumper (3PHD2)	c. BMC Console port5 (for BMC Debug) (3PHD8)
b. BMC Console port5 (for BMC Debug) (3PHD7)	
Slots	
A. PCIE Slots 5(x 16) (PCIE_5)	F.OCP 2.0 TYPEC SLOT (OCP_KR1)
B. PCIE Slots 4(x 16) (PCIE_4)	G.OCP 2.0 TYPEA SLOT (OCP_LAN1)
C. PCIE M.2 SLOT (M2_1)	H.PCIE Slots 3 (x 8) (PCIE_3)
D. OCP 2.0 SLOT (OCP_SAS1)	I.PCIE Slots 2 (x 16) (PCIE_2)
E. PCIE M.2 SLOT (M2_2)	J.PCIE Slots 1 (x 16) (PCIE_1)

Jumper Legend

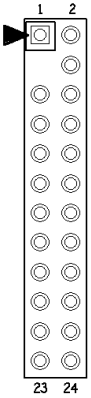
	OPEN - Jumper OFF	Without jumper cover
	CLOSED - Jumper ON	With jumper cover

INTRUDER_HD1: Chassis Intrusion Header



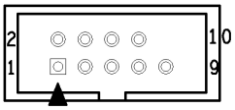
Signal	Pin	Pin	Signal
INTRUDER#	1	2	GND

FPIO_1: Front Panel Connector



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

HD_COM2: COM2 Header

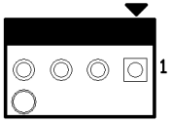


Signal	Pin	Pin	Signal
COM2_DCD	1	2	COM2_DSR
COM2_RXD	3	4	COM2_RTS
COM2_TXD	5	6	COM2_CTS
COM2_DTR	7	8	COM2_NRI
GND	9	10	KEY

IPMB_HD1: IPMB Pin Header

Pin	1	2	3	4
Signal	IPMB_DAT	GND	IPMB_CLK	NA

CPU0/1_FAN/System FAN_4/5: 4-pin System FAN Connector



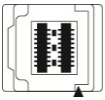
Pin	1	2	3	4
Signal	GND	P12V	FAN_TACH	FAN_PWM

Use this header to connect the cooling fan to your motherboard to keep the system stable and reliable.

FPIO_VGA2: Front panel VGA Header

Signal	Pin	Pin	Signal
GND	1	2	VGA_5V
GND	3	4	HD_VGA_R
GND	5	6	HD_VGA_G
GND	7	8	HD_VGA_B
GND	9	10	HD_VGA_DAT
HD_VGA_HS	11	12	KEY
HD_VGA_CLK	13	14	HD_VGA_VS

Mini SAS HD Connector: (PCH_SATA_0123/ PCH_SATA_4567/ PCH_SSATA_0123)



Signal	Pin	Pin	Signal
SM_DAT	PIN A1	PIN A2	SGPIO _CLK
GND	PIN A3	PIN A4	SATA6G_RX_P1
SATA6G_RX_N1	PIN A5	PIN A6	GND
SATA6G_RX_P3	PIN A7	PIN A8	SATA6G_RX_N3
GND	PIN A9	PIN B1	GND
SGPIO _LOAD	PIN B2	PIN B3	GND
SATA6G_RX_P0	PIN B4	PIN B5	SATA6G_RX_N0
GND	PIN B6	PIN B7	SATA6G_RX_P2
SATA6G_RX_N2	PIN B8	PIN B9	GND
SGPIO_SATA_DATAOUT0	PIN C1	PIN C2	GND
GND	PIN C3	PIN C4	SATA6G_TX_P1
SATA6G_TX_N1	PIN C5	PIN C6	GND
SATA6G_TX_P3	PIN C7	PIN C8	SATA6G_TX_N3
GND	PIN C9	PIN D1	NA
SM_CLK	PIN D2	PIN D3	GND
SATA6G_TX_P0	PIN D4	PIN D5	SATA6G_TX_N0
GND	PIN D6	PIN D7	SATA6G_TX_P2
SATA6G_TX_N2	PIN D8	PIN D9	GND

SSATA_DOM4/ SSATA_DOM5: SSATA DOM Connector

Signal	Pin	Pin	Signal
GND	1	2	sSATA6G_TX_P4
sSATA6G_TX_N4	3	4	GND
sSATA6G_RX_N4	5	6	sSATA6G_RX_P4
GND	7	P1	VCC5
VCC5	P2		

IDLED_BTN1: ID LED Button

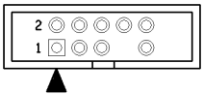
Signal	Pin	Pin	Signal
FP_IDLED_BTN_N	1	2	GND

Clear_BTN1: RTC reset Button for clear CMOS

Normal
(Default)

Pin	1	2	3	4
Signal	GND	GND	RST_N	RST_N

SSATA_SGPIO: SSATA SGPIO Header for SSATA0~5



Signal	Pin	Pin	Signal
SMBCLK	1	2	SDATA IN
SMBDATA	3	4	SDATA OUT
GND	5	6	SLOAD
KEY	7	8	SCLOCK
VCC3_AUX	9	10	NA

DOM_5V_PW1/ DOM_5V_PW2: SSATA DOM Power Connector

Signal	Pin	Pin	Signal
GND	1	2	VCC5

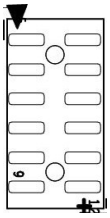
TYPEA_USB3: Vertical (Type_A) USB3.0 Connector

Signal	Pin	Pin	Signal
+5V	1	2	USB2.0_DATA_N
USB2.0_DATA_P	3	4	GND
SSRX-	5	6	SSRX+
GND	7	8	SSTX-
SSTX+	9		

USB3_FPIO1: USB Front Panel Connector

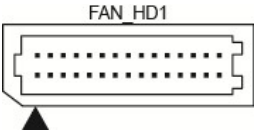
Signal	Pin	Pin	Signal
+5V	1	2	P0_RX_N
P0_RX_P	3	4	GND
P0_TX_N	5	6	P0_TX_P
GND	7	8	P0_N
P0_P	9	10	OC_N
P1_P	11	12	P1_N
GND	13	14	P1_TX_P
P1_TX_N	15	16	GND
P1_RX_P	17	18	P1_RX_N
+5V	19	20	Key

DBG_HD1: TPM(TYAN Module Header)



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

FAN_HD1: SYS_FAN Header



Signal	Pin	Pin	Signal
FAN TACH1	1	2	FAN TACH6
FAN TACH2	3	4	FAN TACH7
FAN TACH3	5	6	FAN TACH8
FAN TACH4	7	8	FAN TACH9
FAN TACH5	9	10	FAN TACH10
GND	11	12	GND
FAN PWM2	13	14	FAN PWM1
FAN TACH11	15	16	SMBDATA
FAN TACH12	17	18	SMBCLK
V3P3_AUX	19	20	FAN PWM3
V3P3_AUX	21	22	GND
FAN TACH13	23	24	FAN TACH15
FAN TACH14	25	26	FAN TACH16
FAN PWM4	27	28	FAN PWM5
PWM0	29	30	GND

PWR_BTN1: POWER Button

Normal
(Default)

Pin	1	2	3	4
Signal	GND	GND	PWR_BTN1	PWR_BTN1

RST_BTN1: Reset Button

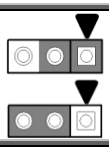
Normal
(Default)

Pin	1	2	3	4
Signal	GND	GND	FP_RST_BTN_N	FP_RST_BTN_N

VROC Header (J51): 4 Pin VROC Header

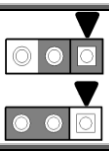
Signal	Pin	Pin	Signal
GND	1	2	VCC3_AUX
GND	3	4	PCH_SATA_RAID_KEY

3PHD_2: ME RECOVERY MODE Jumper



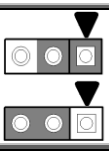
Signal	Pin	Pin	Signal
NC	1	2	FM_ME_RCVR_N
GND	3		
1-2: Normal 2-3: ME Recovery mode			

3PHD_7: BMC COM Port Debug Jumper



Signal	Pin	Pin	Signal
BMC_COM2_RXD	1	2	RXD_2
BMC_COM5_RXD	3		
1-2: BMC COM2 2-3: BMC COM5 debug			

3PHD_8: BMC COM Port Debug Jumper



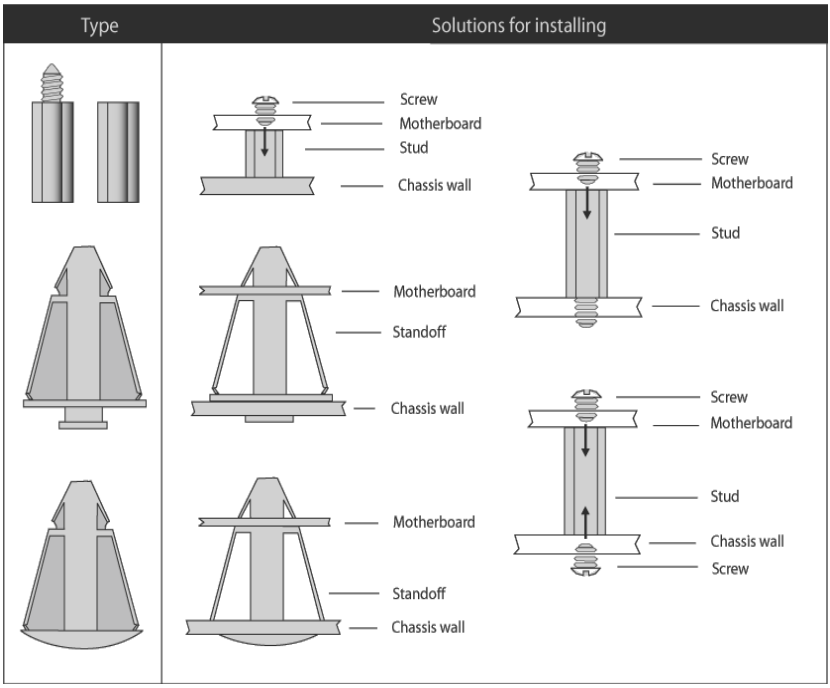
Signal	Pin	Pin	Signal
BMC_COM2_TXD	1	2	TXD_2
BMC_COM5_TXD	3		
1-2: BMC COM2 2-3: BMC COM5 debug			

5.6 Tips on Installing Motherboard in Chassis

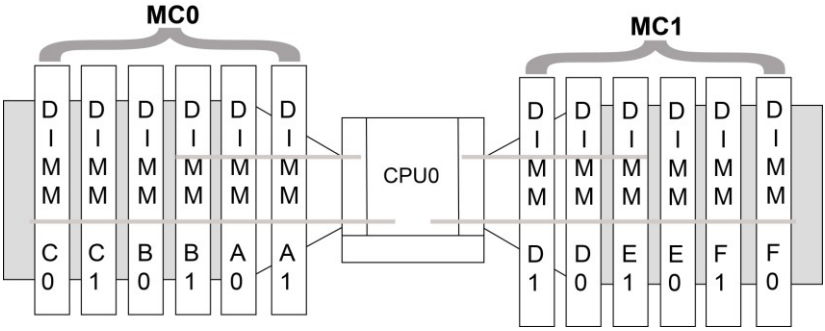
Some chassis include plastic studs instead of metal. Although the plastic studs are usable, MiTAC recommends using metal studs with screws that will fasten the motherboard more securely in place.

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

Mounting the Motherboard



5.7 Memory



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

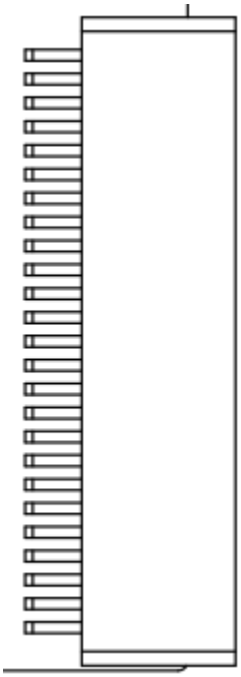
NOTE: " * " represents the quantity of memory installed are not recommended.

Single CPU Installed (CPU0 only)	Quantity of memory installed											
	1	2	3	4	5*	6	7*	8	9*	10*	11*	12
P0_MC0_DIM_CH_A0	√	√	√	√	√	√	√	√	√	√	√	√
P0_MC0_DIM_CH_A1							√	√	√	√	√	√
P0_MC0_DIM_CH_B0		√	√	√	√	√	√	√	√	√	√	√
P0_MC0_DIM_CH_B1								√	√	√	√	√
P0_MC0_DIM_CH_C0			√	√	√	√	√		√	√	√	√
P0_MC0_DIM_CH_C1									√		√	√
P0_MC1_DIM_CH_D0				√	√	√	√	√	√	√	√	√
P0_MC1_DIM_CH_D1								√		√	√	√
P0_MC1_DIM_CH_E0					√	√	√	√	√	√	√	√
P0_MC1_DIM_CH_E1								√		√	√	√
P0_MC1_DIM_CH_F0						√	√		√	√	√	√
P0_MC1_DIM_CH_F1												√

5.8 Power Supply

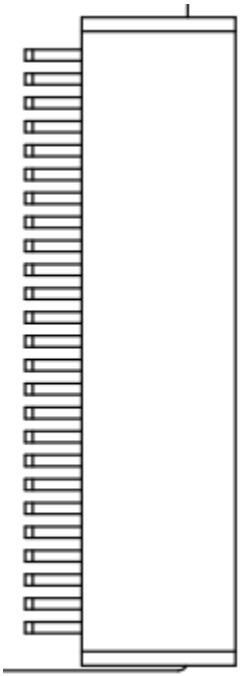
There are **seven (7)** power connectors on your S7102 motherboard. The S7102 supports EPS 12V power supply.

PWR1: 50-pin Power Connector



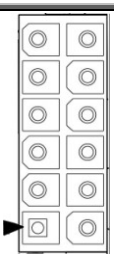
Signal	Pin	Pin	Signal
GND	A1	B1	GND
GND	A2	B2	GND
GND	A3	B3	GND
GND	A4	B4	GND
GND	A5	B5	GND
GND	A6	B6	GND
GND	A7	B7	GND
GND	A8	B8	GND
GND	A9	B9	GND
+12V_IN	A10	B10	+12V_IN
+12V_IN	A11	B11	+12V_IN
+12V_IN	A12	B12	+12V_IN
+12V_IN	A13	B13	+12V_IN
+12V_IN	A14	B14	+12V_IN
+12V_IN	A15	B15	+12V_IN
+12V_IN	A16	B16	+12V_IN
+12V_IN	A17	B17	+12V_IN
+12V_IN	A18	B18	+12V_IN
PSU1_SDA	A19	B19	PSU1_A0
PSU1_SCL	A20	B20	PSU1_A1
PSU1_PSON_N	A21	B21	+12VSB
PSU1_ALERT	A22	B22	PSU1SMART_ON
PSU1_RETURN_S	A23	B23	PSU1_12VLS
PSU1_12VS+	A24	B24	PSU1_PRESENT_N
PSU1_PWOK	A25	B25	PSU1_PS_KILL

PWR2: 50-pin Power Connector



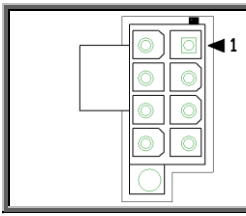
Signal	Pin	Pin	Signal
GND	A1	B1	GND
GND	A2	B2	GND
GND	A3	B3	GND
GND	A4	B4	GND
GND	A5	B5	GND
GND	A6	B6	GND
GND	A7	B7	GND
GND	A8	B8	GND
GND	A9	B9	GND
+12V_IN	A10	B10	+12V_IN
+12V_IN	A11	B11	+12V_IN
+12V_IN	A12	B12	+12V_IN
+12V_IN	A13	B13	+12V_IN
+12V_IN	A14	B14	+12V_IN
+12V_IN	A15	B15	+12V_IN
+12V_IN	A16	B16	+12V_IN
+12V_IN	A17	B17	+12V_IN
+12V_IN	A18	B18	+12V_IN
PSU1_SDA	A19	B19	PSU1_A0
PSU1_SCL	A20	B20	PSU1_A1
PSU1_PSON_N	A21	B21	+12VSB
PSU1_ALERT	A22	B22	PSU1SMART_ON
PSU1_RETURN_S	A23	B23	PSU1_12VLS
PSU1_12VS+	A24	B24	PSU1_PRESENT_N
PSU1_PWOK	A25	B25	PSU1_PS_KILL

HDD_Power1: 12-pin Power Connector



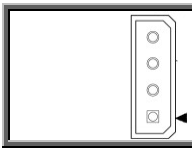
Signal	Pin	Pin	Signal
GND	1	7	+12V
GND	2	8	+12V
GND	3	9	+12V
GND	4	10	+12V
GND	5	11	+12V
GND	6	12	+12V

PE_PW1/PE_PW4/PE_PW2/FAN_PW1: Power Connector for GPU



Signal	Pin	Pin	Signal
GND	1	5	+12V
GND	2	6	+12V
GND	3	7	+12V
GND	4	8	+12V

D4P_PW1: 4-pin Power Connector



Signal	Pin	Pin	Signal
+12V	1	2	GND
GND	3	4	+5V

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

5.1.1 Setup Basics

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

Key	Function
<F1>	General help window
<ESC>	Exit current menu
←arrow → keys	Select a different menu
↑ or ↓ arrow keys	Move cursor up/down
<Tab> / <Shift-Tab>	Cycle cursor up/down
<Home> / <End>	Move cursor to top/bottom of the window
<PgUp> / <PgDn>	Move cursor to next/previous page
<->	Select the previous value/setting of the field
<+>	Select the next value/setting of the field
<F8>	Load Fail Safe default configuration values of the menu
<F3>	Load the Optimal default configuration values of the menu
<F4>	Save and exit
<Enter>	Execute command or select submenu

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.

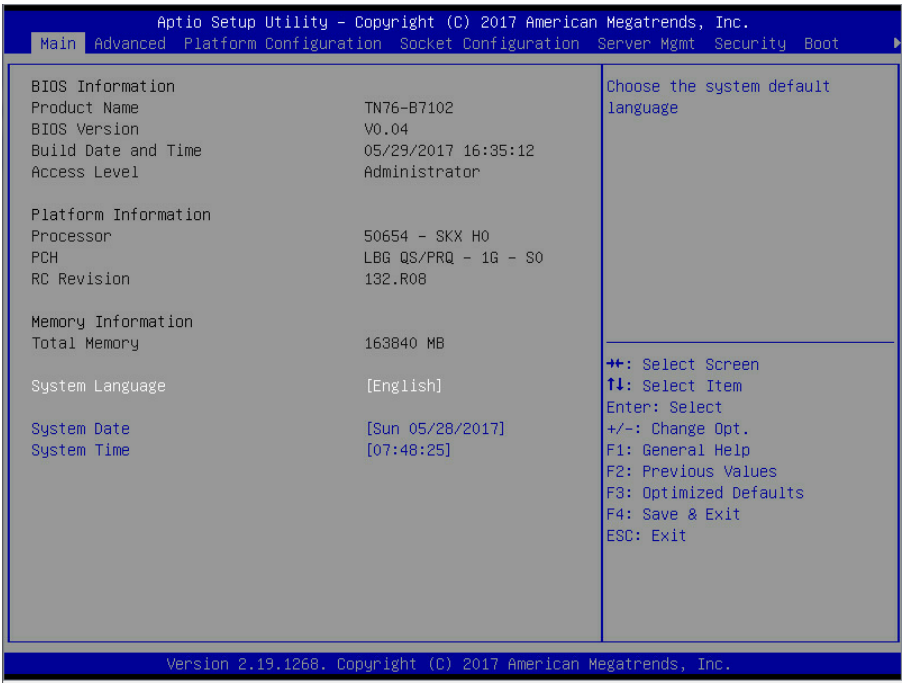
6.1.4 Setup Variations

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 aware that the BIOS menus are continually changing due to continual BIOS updates over the product lifespan of the motherboard. The BIOS menus provided are current as of the date when this manual was written. Please visit TYAN's website at http://www.tyan.com for information on BIOS updates available for this specific motherboard.

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.

Platform Information
It displays Platform information.

Memory Information
This displays the total memory size.

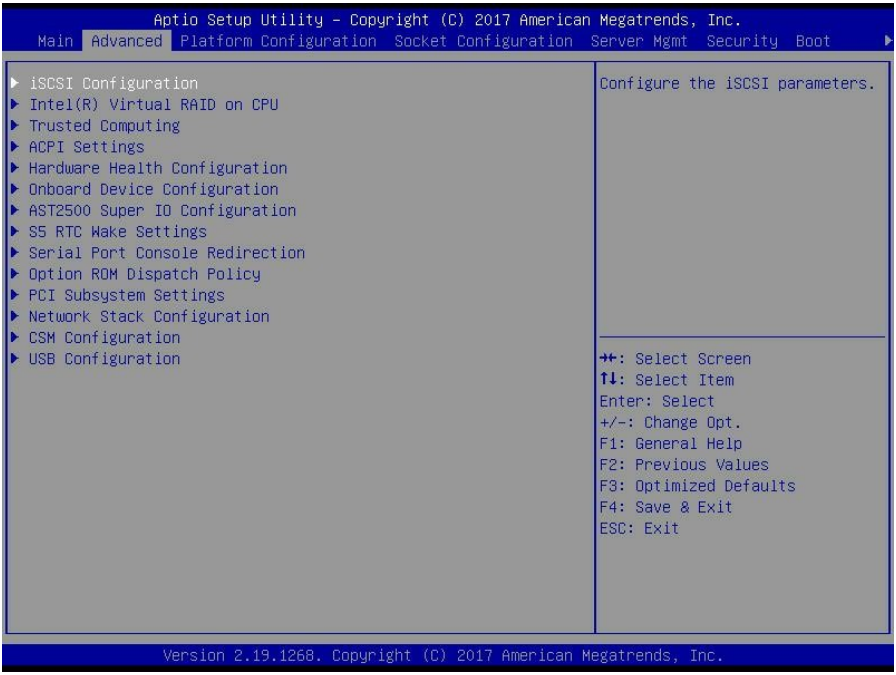
System Language
Choose the system default language.

System Date
Adjust the system date.
MM (Months): DD (Days): YYYY (Years)

System Time
Adjust the system clock.
HH (24 hours format): MM (Minutes): SS (Seconds)

6.3 Advanced Menu

This section facilitates configuring advanced BIOS options for your system.



iSCSI Configuration
Configure the iSCSI parameters.

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

Trusted Computing
Trusted Computing Setting

ACPI Settings
System ACPI Parameters.

Hardware Health Configuration
Hardware health Configuration

Onboard Device Configuration
Onboard Device and Function Configuration

AST2500 Super IO Configuration

System Super IO Chip Parameters

S5 RTC Wake Settings
S5 RTC Wake Settings

Serial Port Console Redirection
Serial Port Console Redirection

Option ROM Dispatch Policy
Option ROM Dispatch Policy

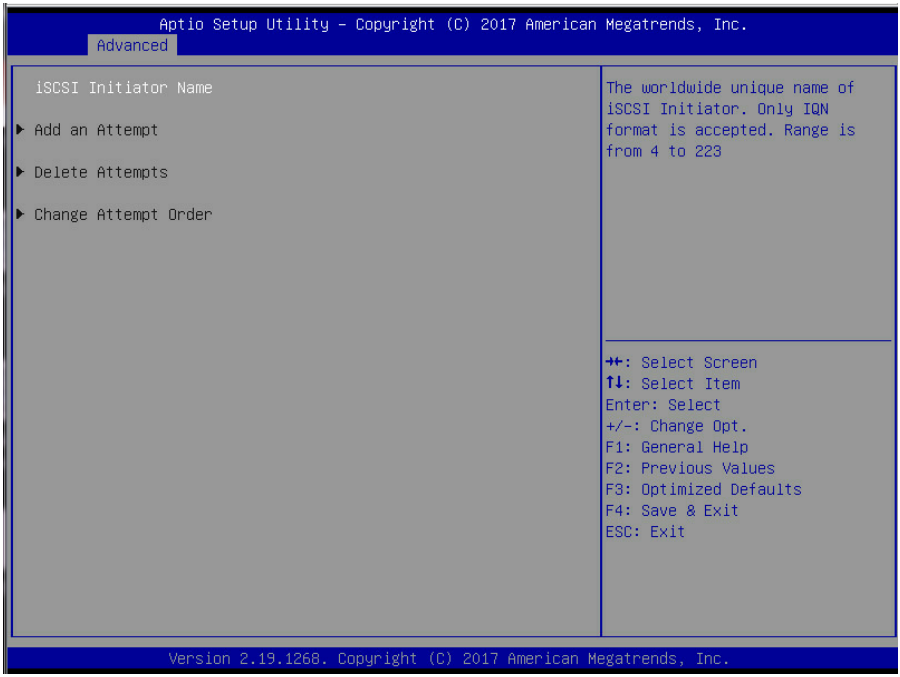
PCI Subsystem Settings
PCI,PCI-X and PCI Express Settings

Network Stack Configuration
Network Stack Settings

CSM Configuration
CSM Configuration, Enable/Disable Option ROM execution setting,etc

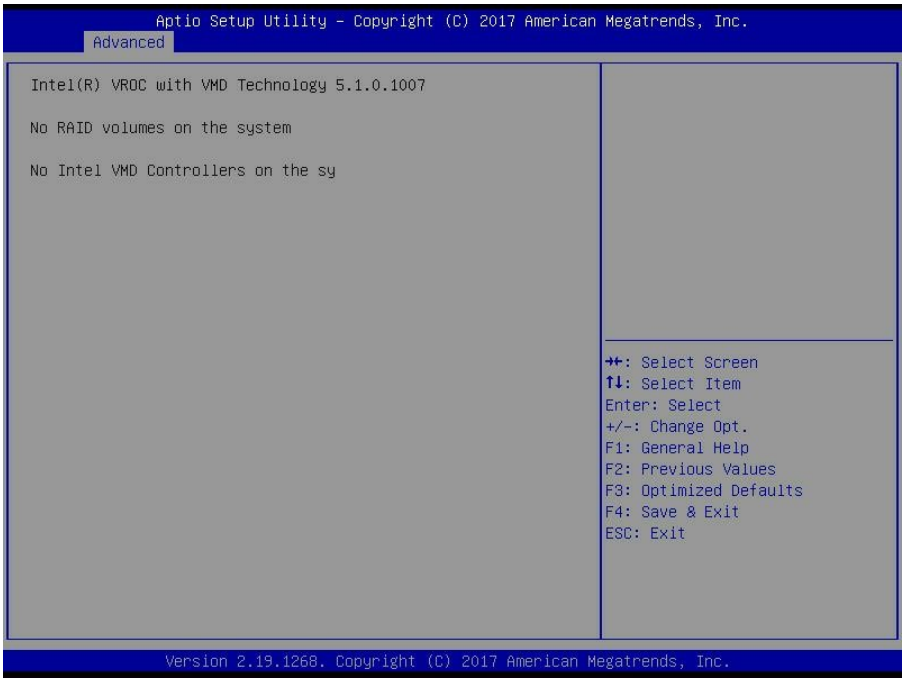
USB Configuration
USB Configuration Parameters.

6.3.1 iSCSI Configuration submenu

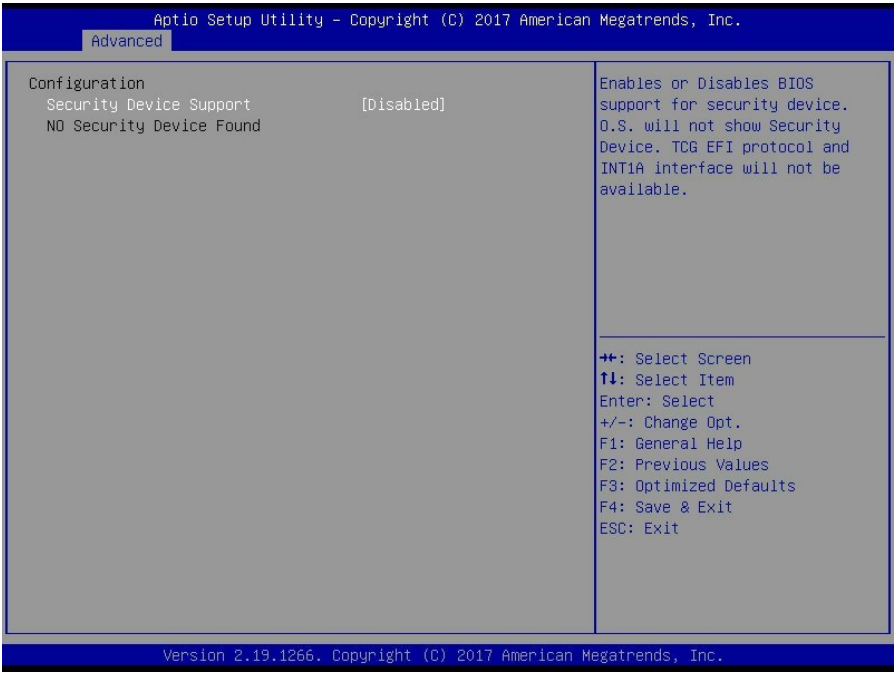


iSCSI Initiator Name
The worldwide unique name of iSCSI Initiator. Only IQM format is accepted. Range is from 4 to 223

6.3.2 Intel(R) Virtual RAID on CPU submenu



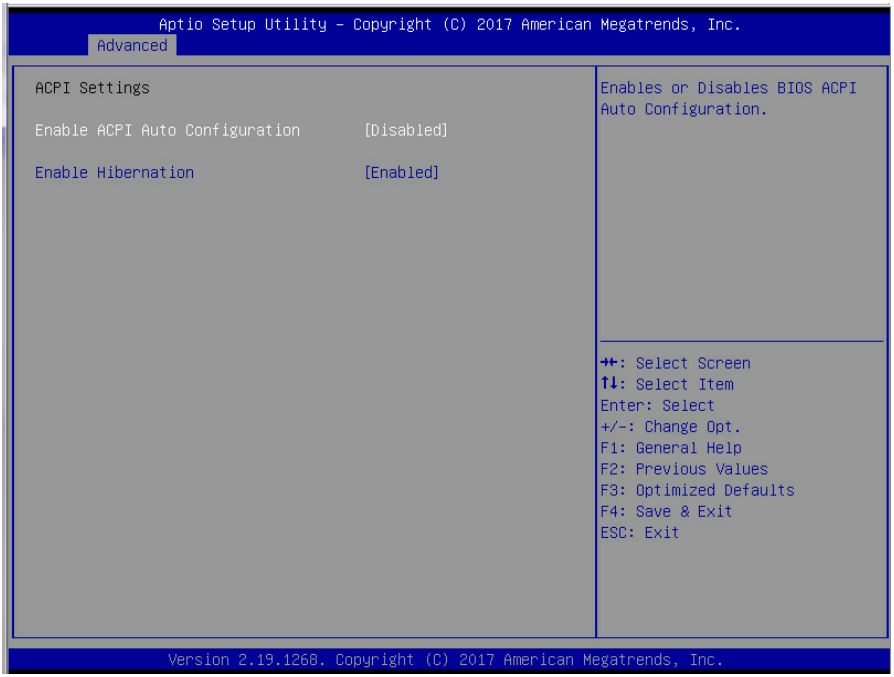
6.3.3 Trusted Computing



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

Enabled / **Disabled**

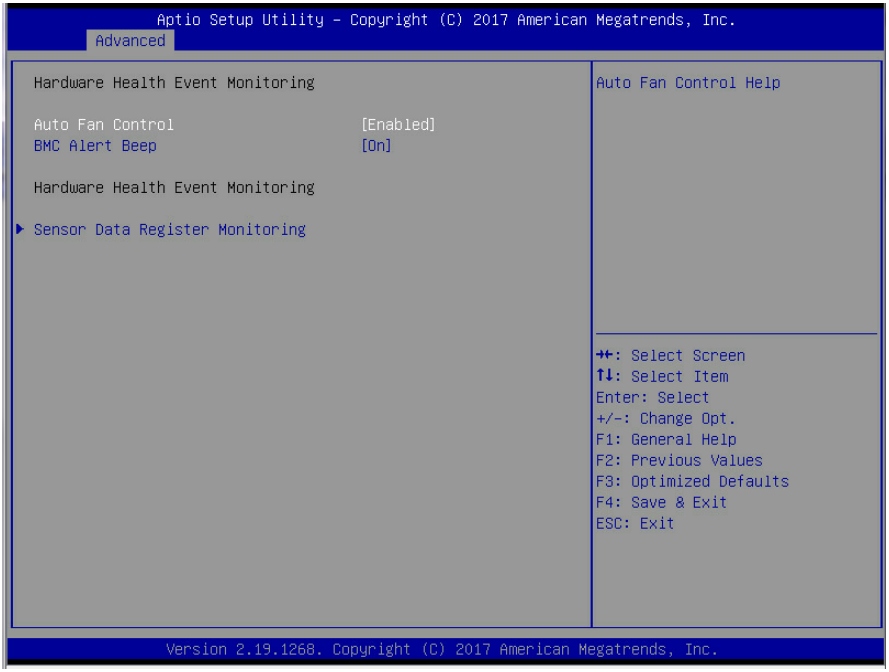
6.3.4 ACPI Settings



Enable ACPI Auto Configuration
Enable or disable BIOS ACPI Auto Configuration.
Disabled / Enabled

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

6.3.5 Hardware Health Configuration

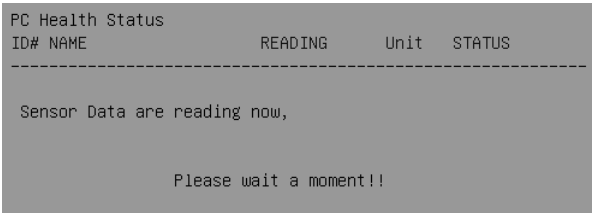


Auto Fan Control
Auto Fan Control help.
Disabled / **Enabled**

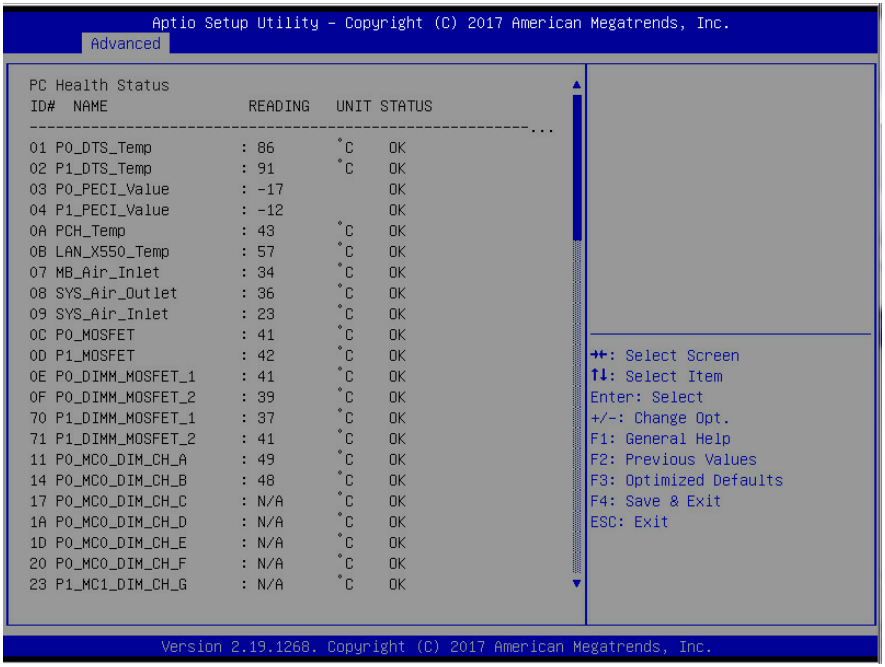
BMC Alert Beep
Enable/Disable BMC Alert Beep
On / Off

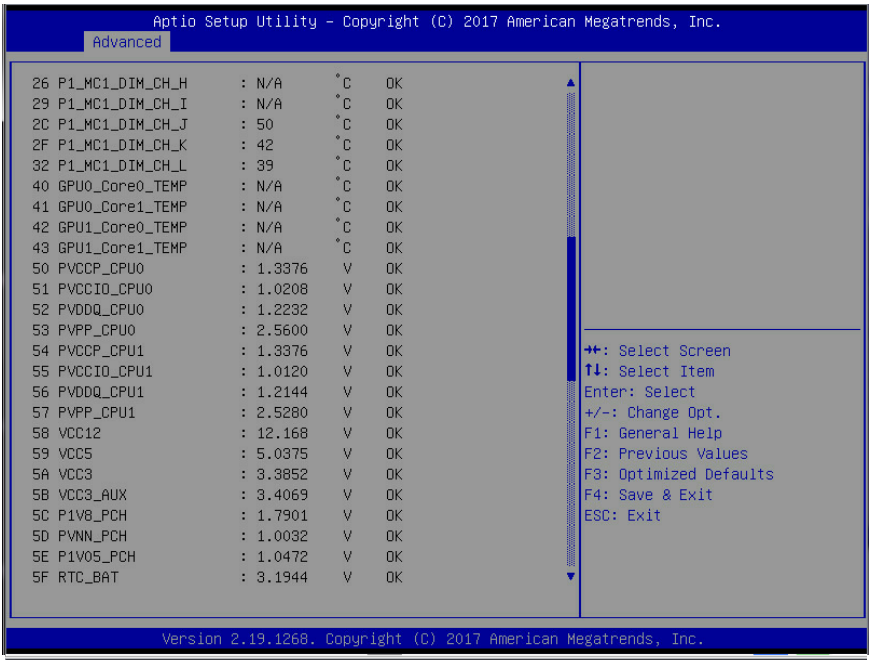
6.3.5.1 Sensor Data Register Monitoring

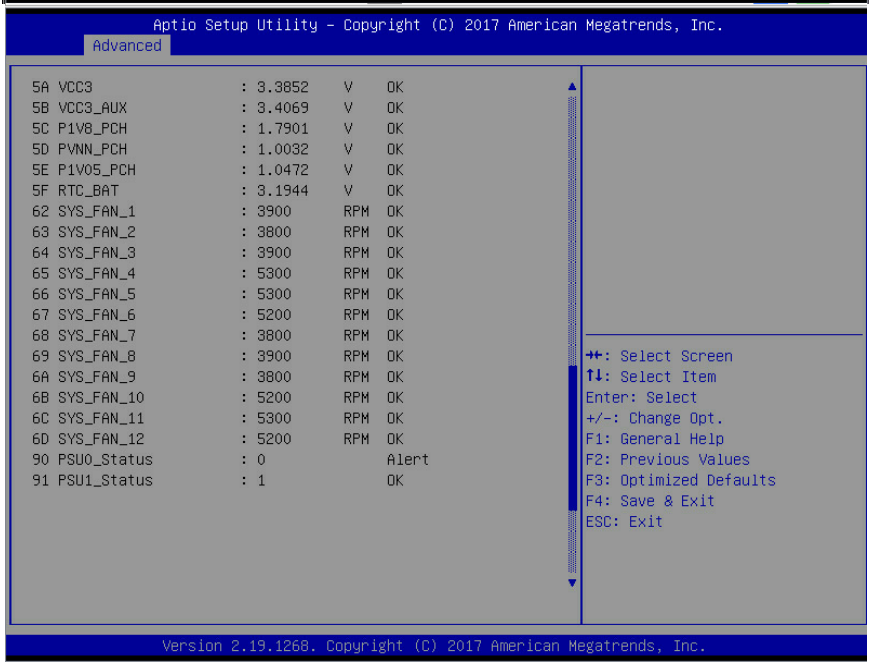
When you enter the **Sensor Data Register Monitoring** submenu, you will see the following dialog window pop out. Please wait 8~10 seconds.



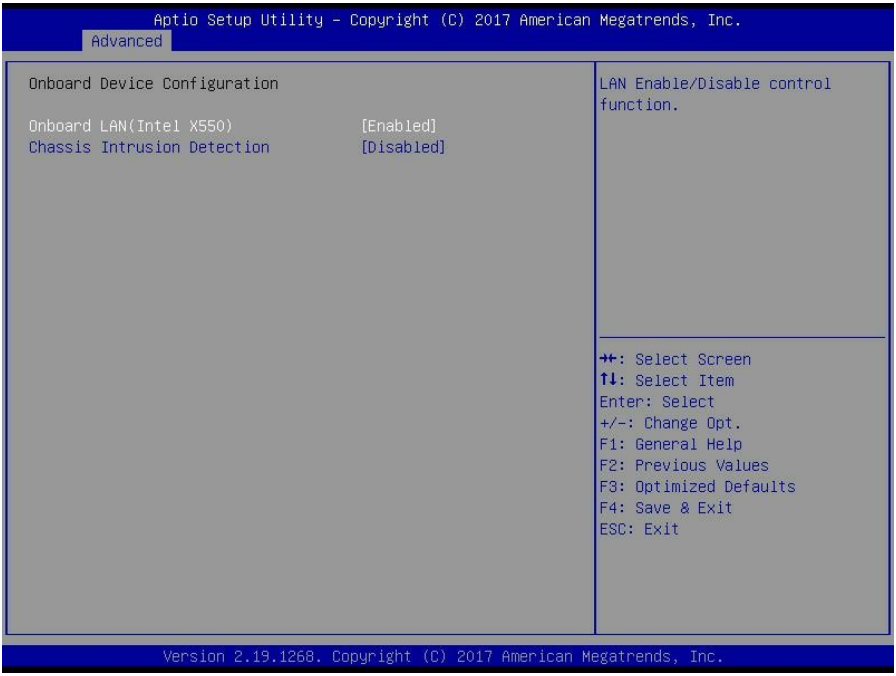
NOTE 1: SDR can not be modified. Read only.




Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced
26 P1_MC1_DIM_CH_H : N/A °C OK
29 P1_MC1_DIM_CH_I : N/A °C OK
2C P1_MC1_DIM_CH_J : 50 °C OK
2F P1_MC1_DIM_CH_K : 42 °C OK
32 P1_MC1_DIM_CH_L : 39 °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
50 PVCCP_CPU0 : 1.3376 V OK
51 PVCCIO_CPU0 : 1.0208 V OK
52 PVDDQ_CPU0 : 1.2232 V OK
53 PVPP_CPU0 : 2.5600 V OK
54 PVCCP_CPU1 : 1.3376 V OK
55 PVCCIO_CPU1 : 1.0120 V OK
56 PVDDQ_CPU1 : 1.2144 V OK
57 PVPP_CPU1 : 2.5280 V OK
58 VCC12 : 12.168 V OK
59 VCC5 : 5.0375 V OK
5A VCC3 : 3.3852 V OK
5B VCC3_AUX : 3.4069 V OK
5C P1V8_PCH : 1.7901 V OK
5D PVNN_PCH : 1.0032 V OK
5E P1V05_PCH : 1.0472 V OK
5F RTC_BAT : 3.1944 V 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
5A VCC3 : 3.3852 V OK
5B VCC3_AUX : 3.4069 V OK
5C P1V8_PCH : 1.7901 V OK
5D PVNN_PCH : 1.0032 V OK
5E P1V05_PCH : 1.0472 V OK
5F RTC_BAT : 3.1944 V OK
62 SYS_FAN_1 : 3900 RPM OK
63 SYS_FAN_2 : 3800 RPM OK
64 SYS_FAN_3 : 3900 RPM OK
65 SYS_FAN_4 : 5300 RPM OK
66 SYS_FAN_5 : 5300 RPM OK
67 SYS_FAN_6 : 5200 RPM OK
68 SYS_FAN_7 : 3800 RPM OK
69 SYS_FAN_8 : 3900 RPM OK
6A SYS_FAN_9 : 3800 RPM OK
6B SYS_FAN_10 : 5200 RPM OK
6C SYS_FAN_11 : 5300 RPM OK
6D SYS_FAN_12 : 5200 RPM OK
90 PSU0_Status : 0 Alert
91 PSU1_Status : 1 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.

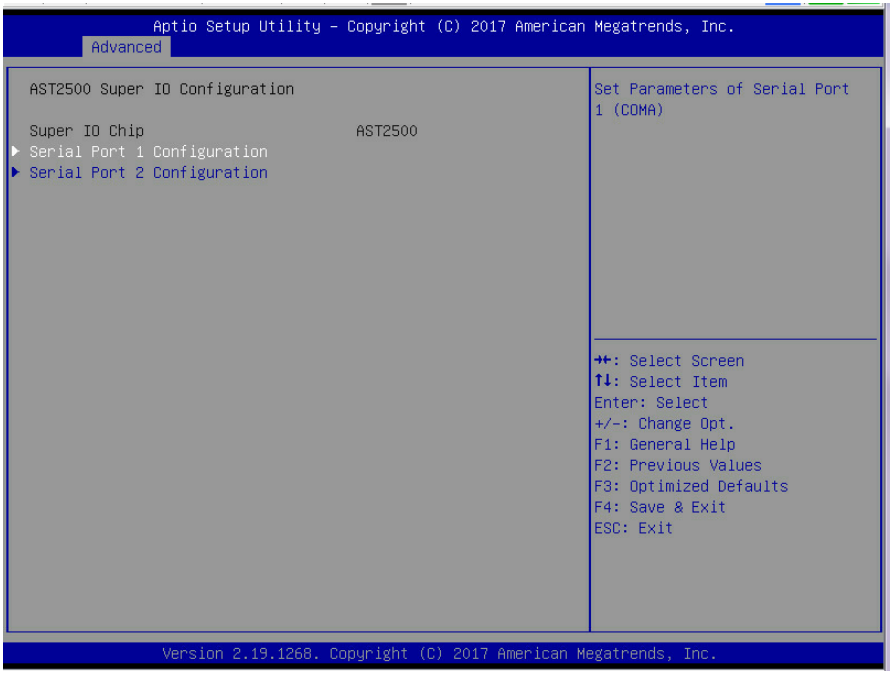
6.3.6 Onboard Device Configuration



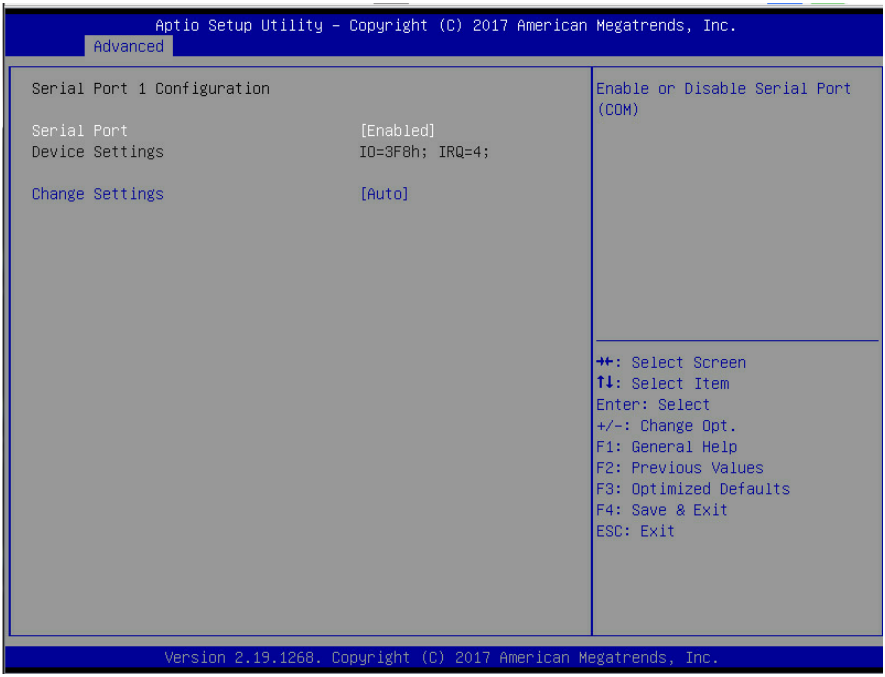
Onboard LAN (Intel X550)
LAN Enable/Disable Control function.
Enabled / Disabled

Chassis Intrusion Detention
LAN Enable/Disable control function
Disabled / Enabled

6.3.7 AST2500 Super IO Configuration



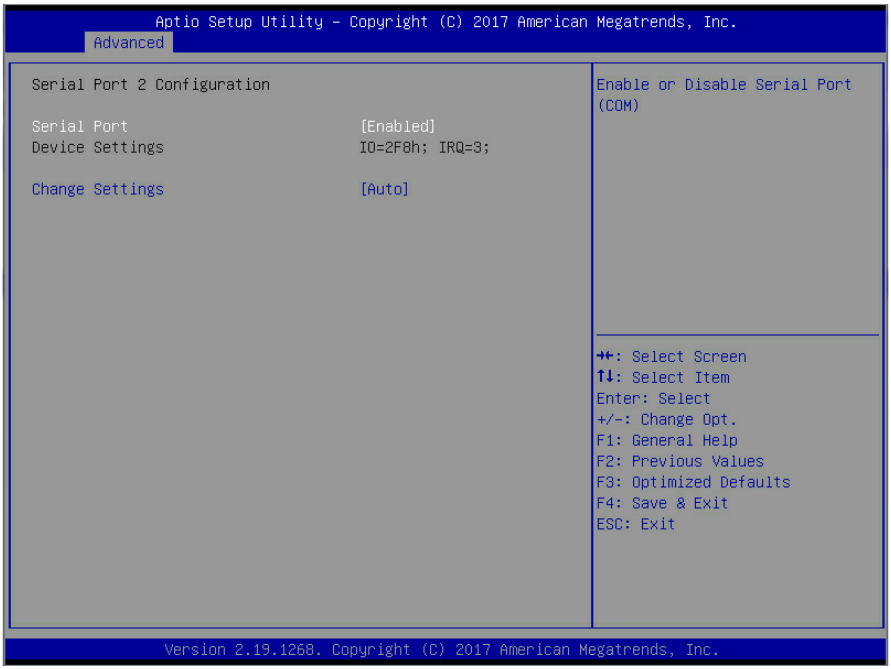
6.3.7.1 Serial Port 1 Configuration



Serial Port
Enable or Disable Serial Port (COM)
Enabled / Disabled

Change Settings
Select an optimal setting for Super IO Device.
Auto / IO=3F8h; IRQ=4;
/ IO=3F8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;
/ IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;
/ IO=3E8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;
/ IO=2E8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

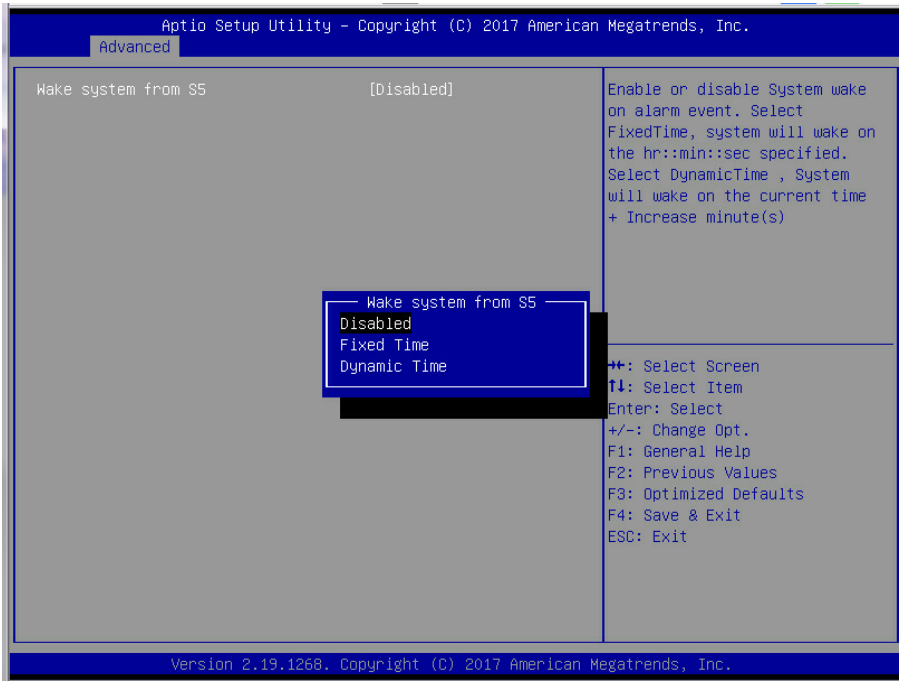
6.3.7.2 Serial Port 2 Configuration



Serial Port
Enable or Disable Serial Port (COM)
Enabled / Disabled

Change Settings
Select an optimal setting for Super IO Device.
Auto / IO=2F8h; IRQ=3;
/ 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;

6.3.8 S5 RTC Wake Settings

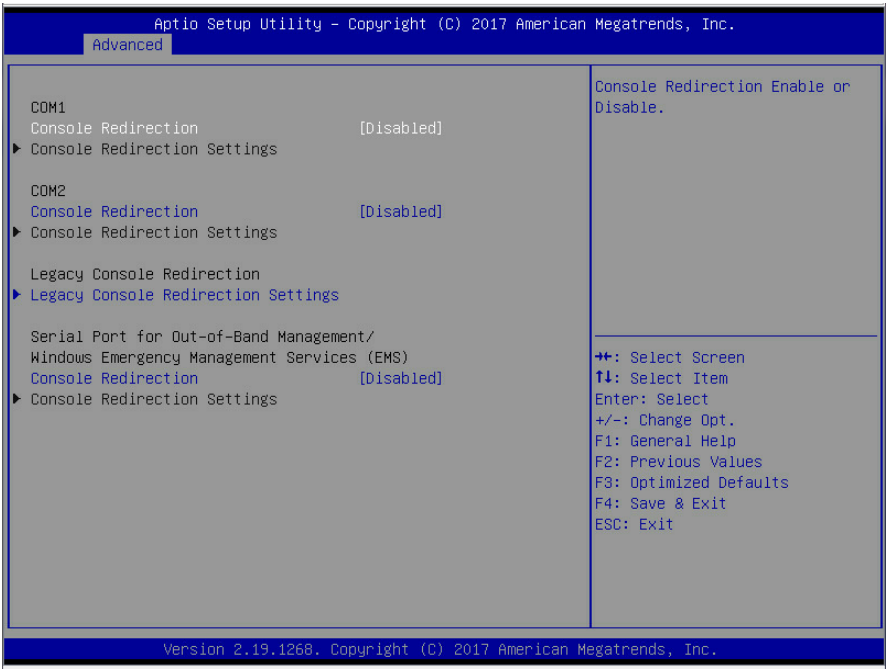


Wake system from S5

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

6.3.9 Serial Port Console Redirection



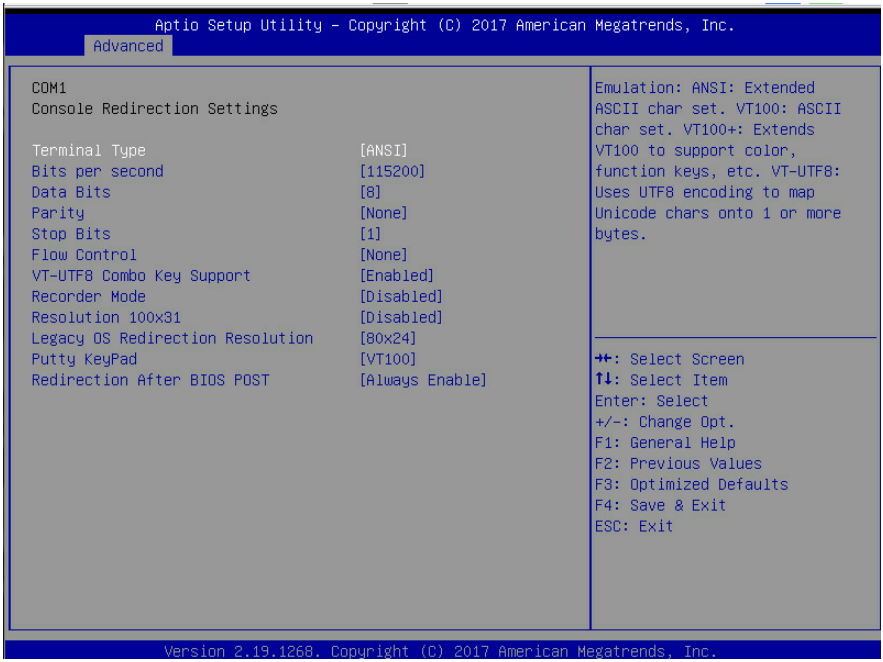
Console Redirection
Console redirection enable or disable.
Disabled / Enabled

Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS) Console Redirection
Console redirection enable or disable.
Disabled / Enabled

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.
NOTE: Console Redirection Settings menu only appear when **Console Redirection** was set to **[Enabled].**

Legacy Console Redirection
Legacy Console Redirection Settings

6.3.9.1 Console Redirection Settings



Terminal Type
Emulation: ANSI: Extended ASCII charset.
VT100: ASCII charset.
VT100+: Extends VT100 to support color function keys, etc.
VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
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.
38400 / 9600 / 19200 / **115200** / 57600

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
With 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

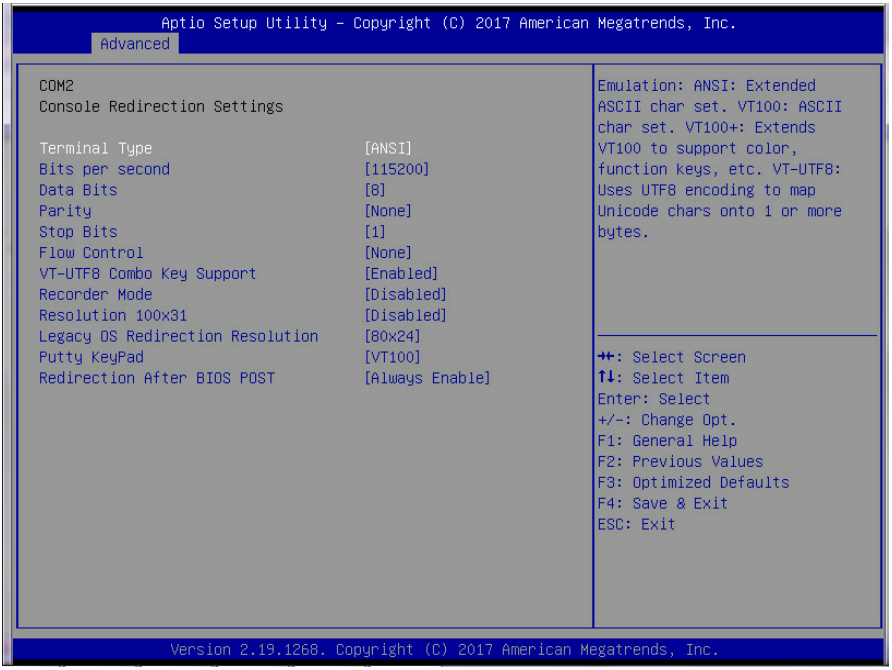
Putty KeyPad
Select FunctionKey and KeyPad on Putty.

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 means Legacy.

Always Enable / Bootloader

6.3.9.2 Console Redirection Settings



Terminal Type
Emulation: ANSI: Extended ASCII charset.
VT100: ASCII charset.
VT100+: Extends VT100 to support color function keys, etc.
VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
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.
38400 / 9600 / 19200 / **115200** / 57600

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
With 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

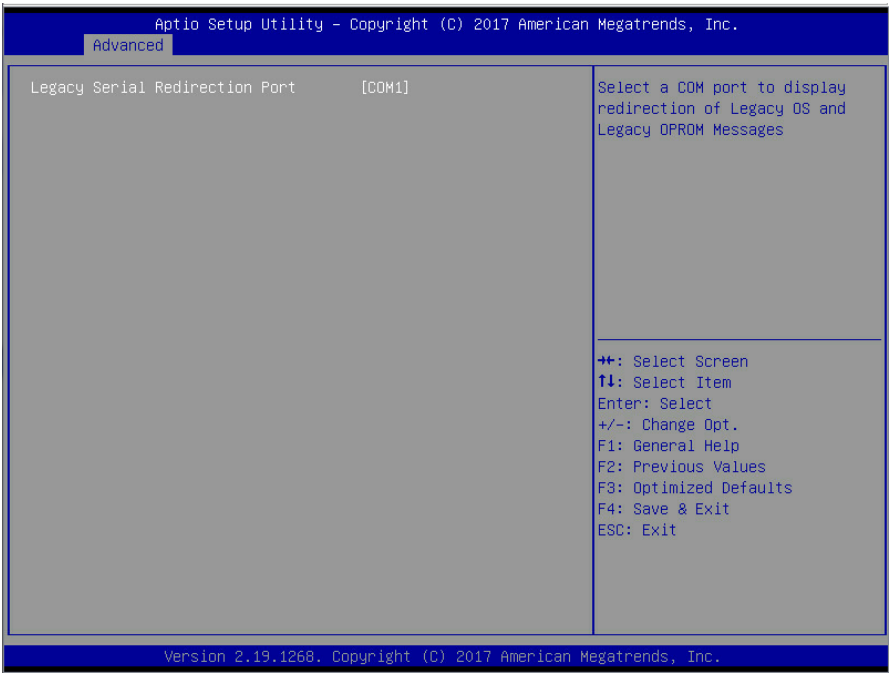
Putty KeyPad
Select FunctionKey and KeyPad on Putty.

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 means Legacy.

Always Enable / Bootloader

6.3.9.3 Legacy Serial Redirection Settings

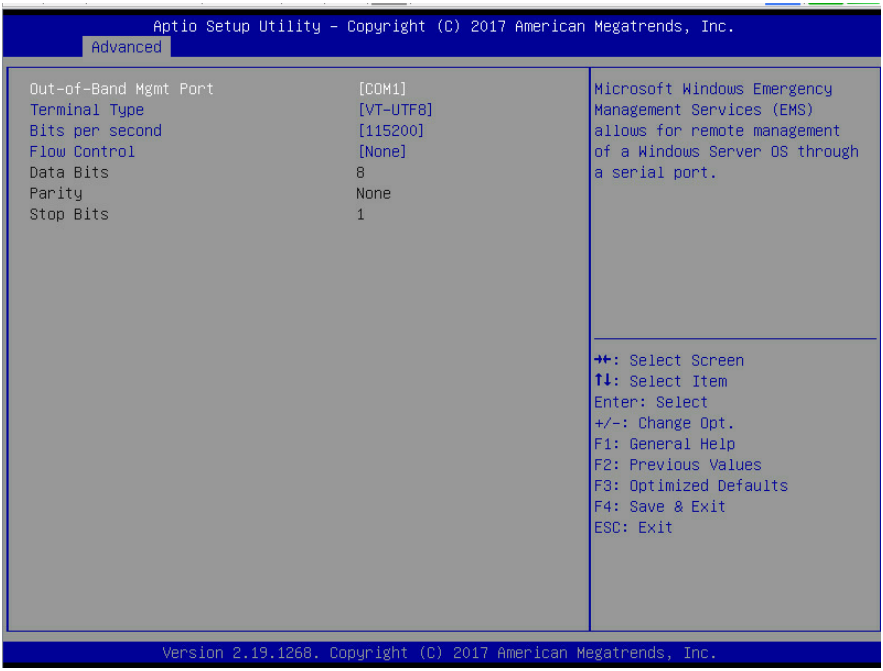


Legacy Serial Redirection Port

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

COM1 / COM2

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



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

COM1 / COM2

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.

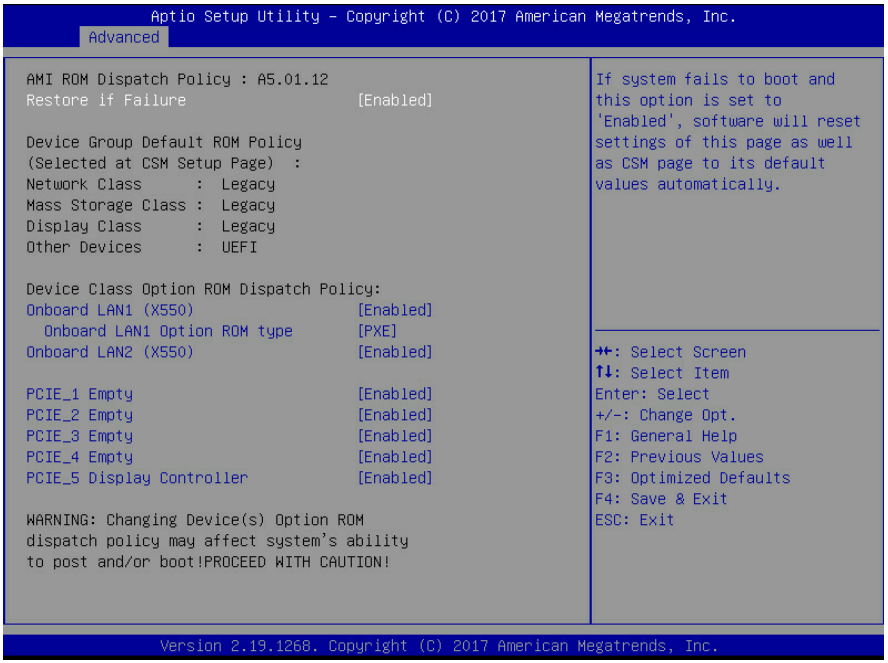
115200 / 9600 / 19200 / 38400 / 57600

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

Data Bits / Parity / Stop Bits
Read only.

6.3.10 Option ROM Dispatch Policy Configuration



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.

Enabled / Disabled

Onboard LAN1 Option ROM type
Select onboard LAN1 Option ROM type
PXE / iSCSI

Onboard LAN2 (X550)
Enable or disable onboard LAN2 Option ROM
Enabled / Disabled

PCIE_1 Empty
Enable or Disable option ROM execution for selected Slot.
Enabled / Disabled

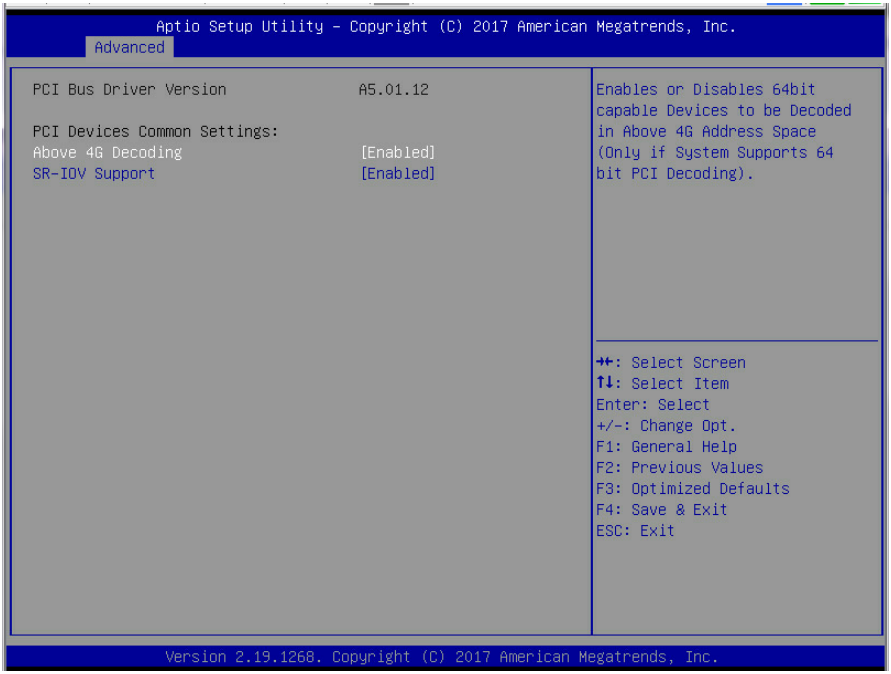
PCIE_2 Empty
Enable or Disable option ROM execution for selected Slot.
Enabled / Disabled

PCIE_3 Empty
Enable or Disable option ROM execution for selected Slot.
Enabled / Disabled

PCIE_4 Empty
Enable or Disable option ROM execution for selected Slot.
Enabled / Disabled

PCIE_5 Display Controller
Device on Slot does not have an option ROM.
Enabled / Disabled

6.3.11 PCI Subsystem



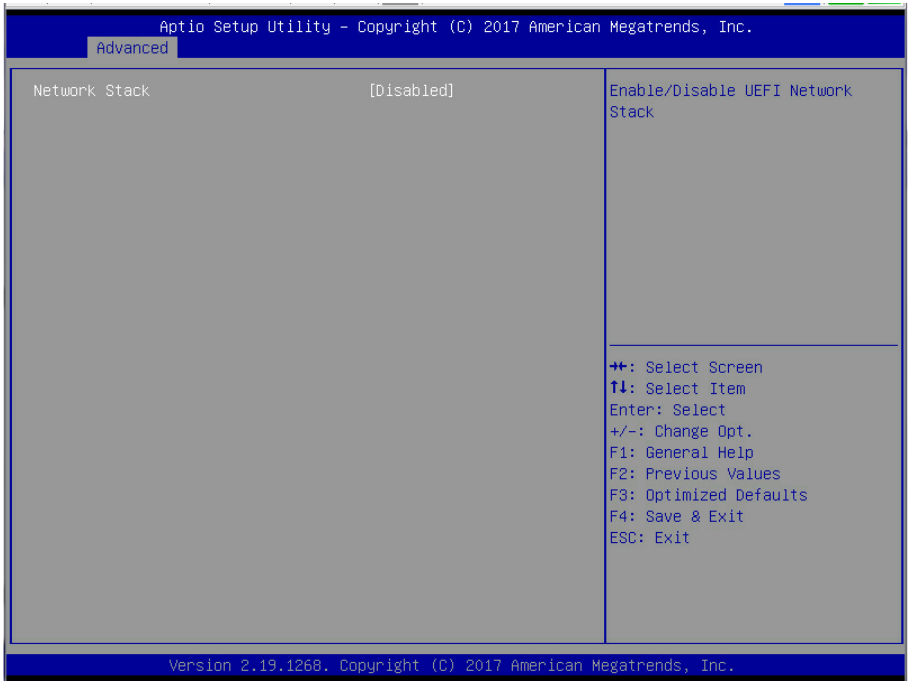
Above 4G Decoding
Enables or Disables 64bit capable Devices to be decoded in Above 4G Address Space(Only if System supports 64 bit PCI decoding).

Enabled / Disabled

SR-IOV Supporting
If system has SR-IOV capable PCIe devices, this option Enable or Disable Single root IO virtualization Support

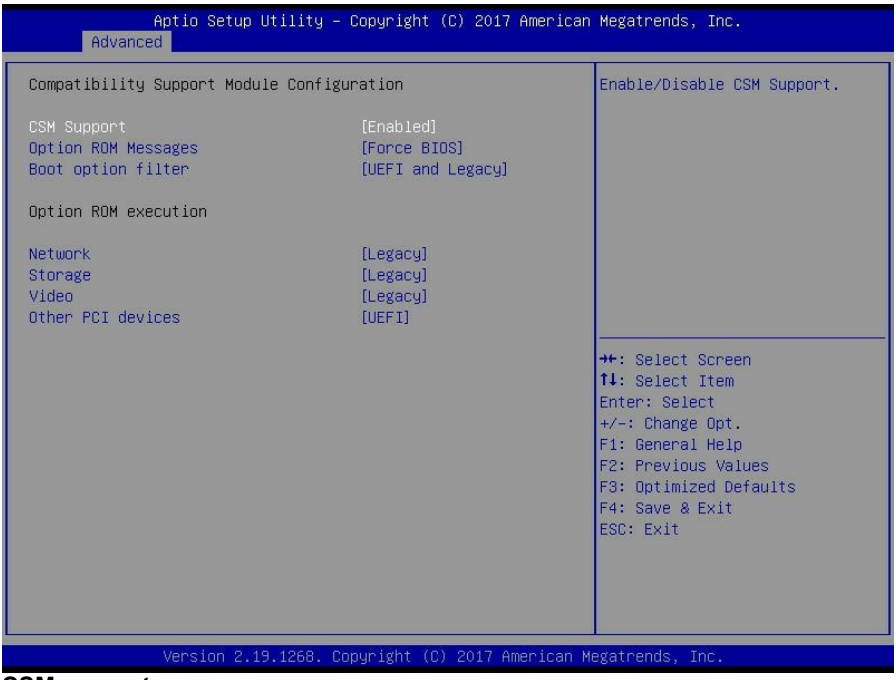
Enabled / Disabled

6.3.12 Network Stack Configuration Subsystem



Network Stack
Enable/Disable UEFI Network Stack
Disabled / Enabled

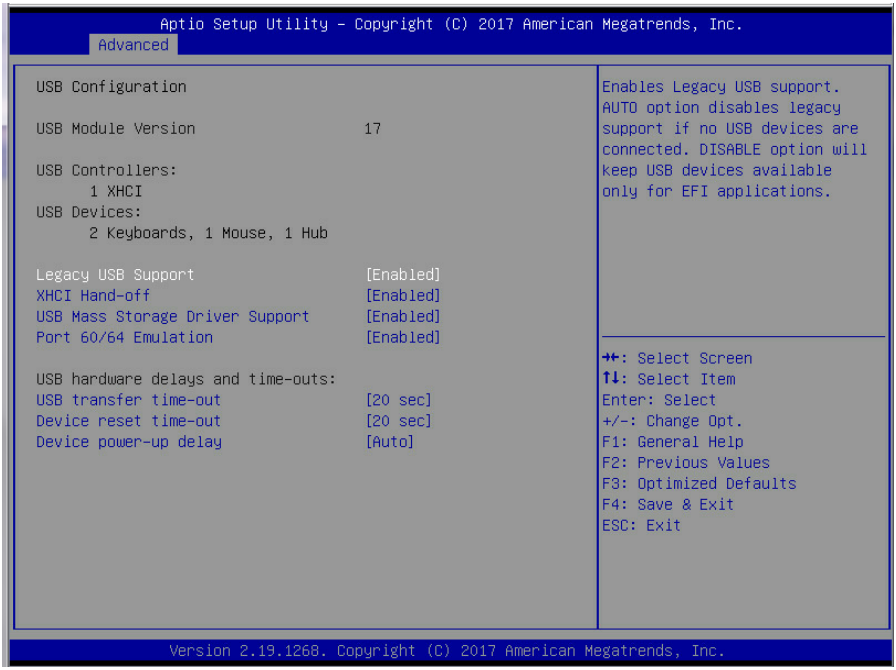
6.3.13 CSM Configuration



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
Do not launch / UEFI / **legacy**
Storage
Controls the execution of UEFI and legacy PXE OpROM
Do not launch / UEFI / **legacy**
Video
Controls the execution of UEFI and legacy PXE OpROM
Do not launch / UEFI / **legacy**
Other PCI devices
Determines OpRom execution policy for devices other than network, storage, or video
legacy / **UEFI**

6.3.14 USB Configuration



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.

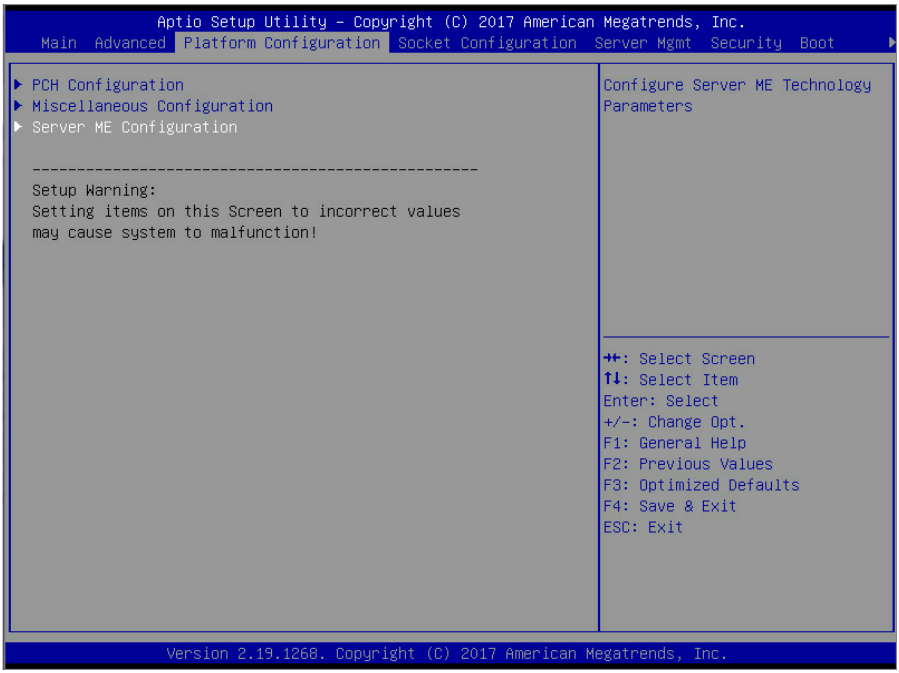
Enabled / Disabled

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

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

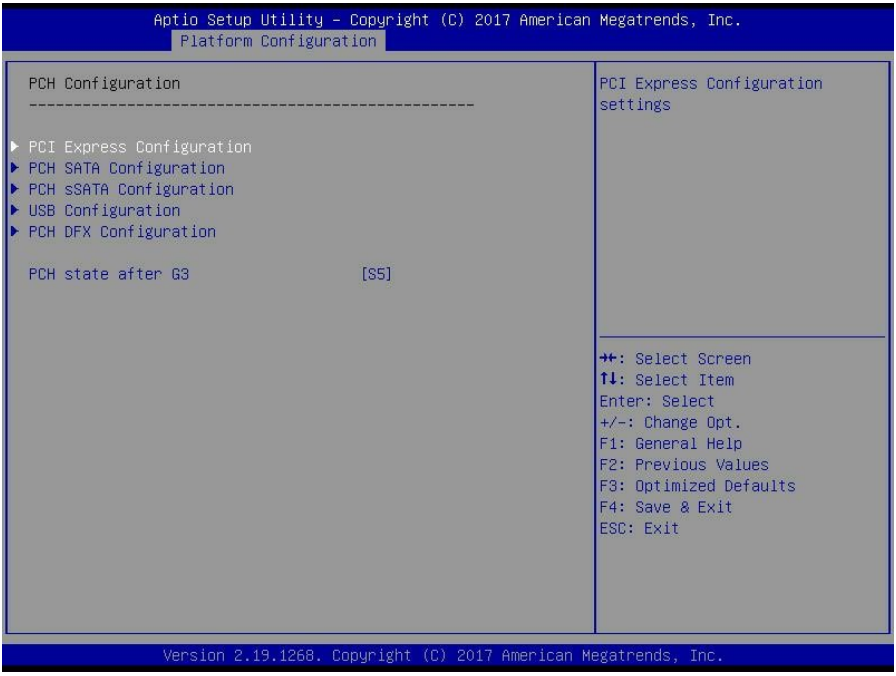


PCH Configuration
Displays and provides option to change the PCH Settings

Miscellaneous Configuration

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

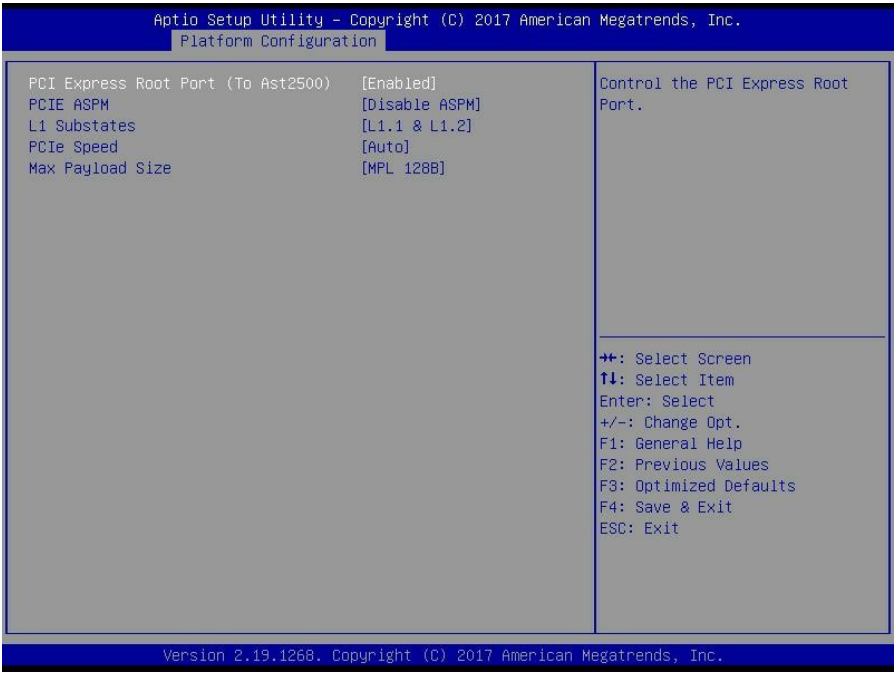
PCH sSATA Configuration
sSATA devices and settings

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 / **S5** / Leave power state

6.4.1.1 PCI Express Configuration



PCI Express Root Port (To Ast2500)
Control the PCI Express Root Port
Enabled / Disabled

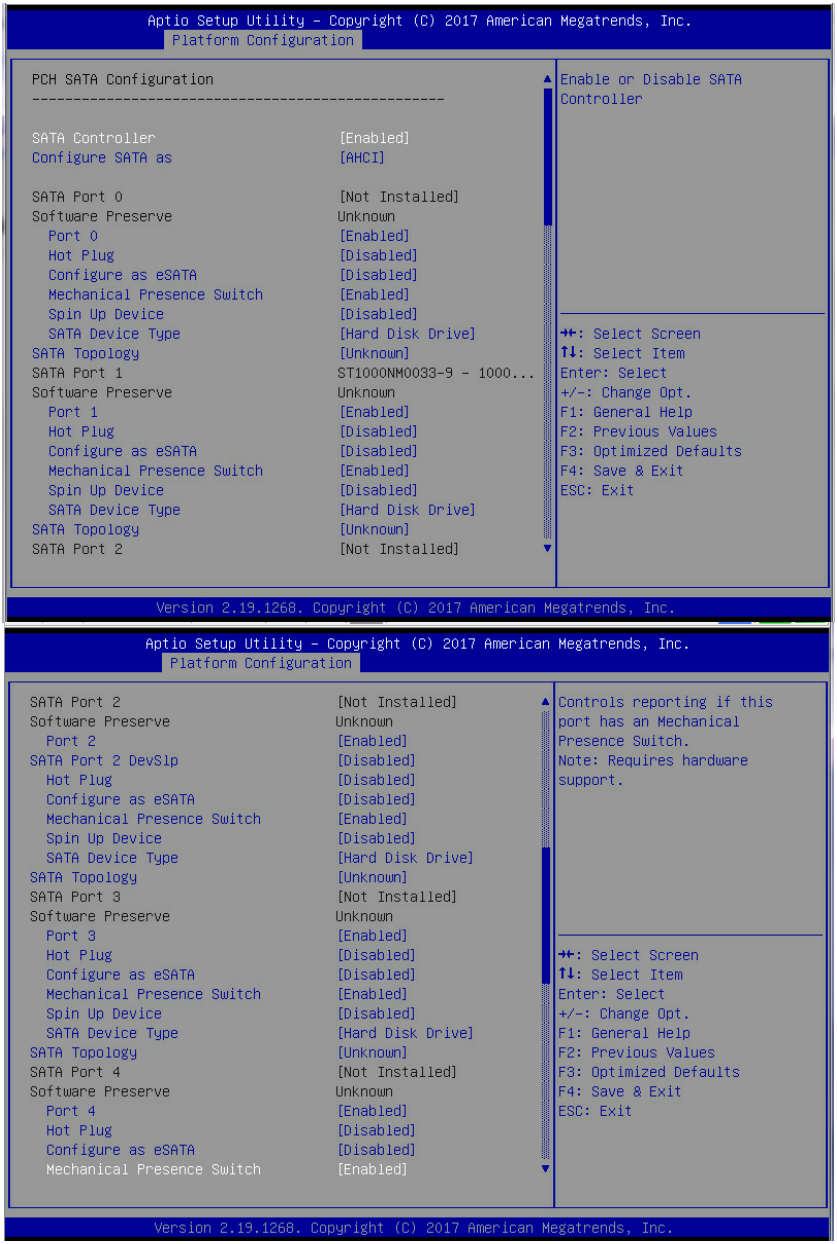
PCIE ASPM
PCI Express Root port ASPM Setting
Disable ASPM / ASPM L1 / ASPM Auto

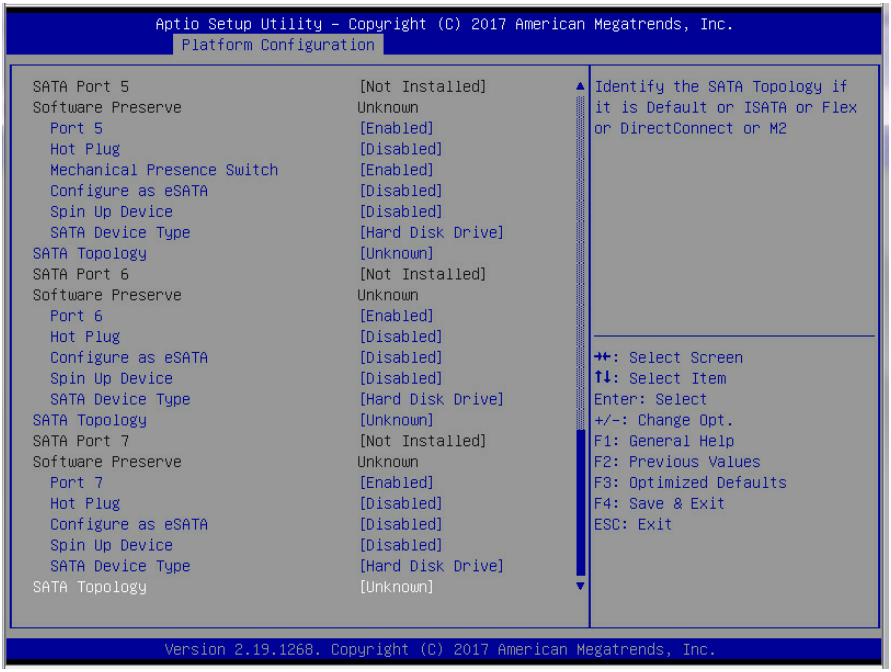
L1 Substates
PCI Express L1 Substates settings
Disabled / L1.1 / L1.2 / **L1.1 & L1.2**

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

Max Payload Size
PCIE Max Payload Size Selection.
MPL 128B / MPL 256B

6.4.1.2 PCH SATA Configuration





SATA Controller
Enable or Disable SATA Controller
Disabled / **Enabled**

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

SATA Port 0/1/2/3/4/5/6/7
Port 0/1/2/3/4/5/6/7
Disabled / **Enabled**

Hot Plug
Enable/Disable SATA Ports Hot Plug Support.
Disabled / Enabled

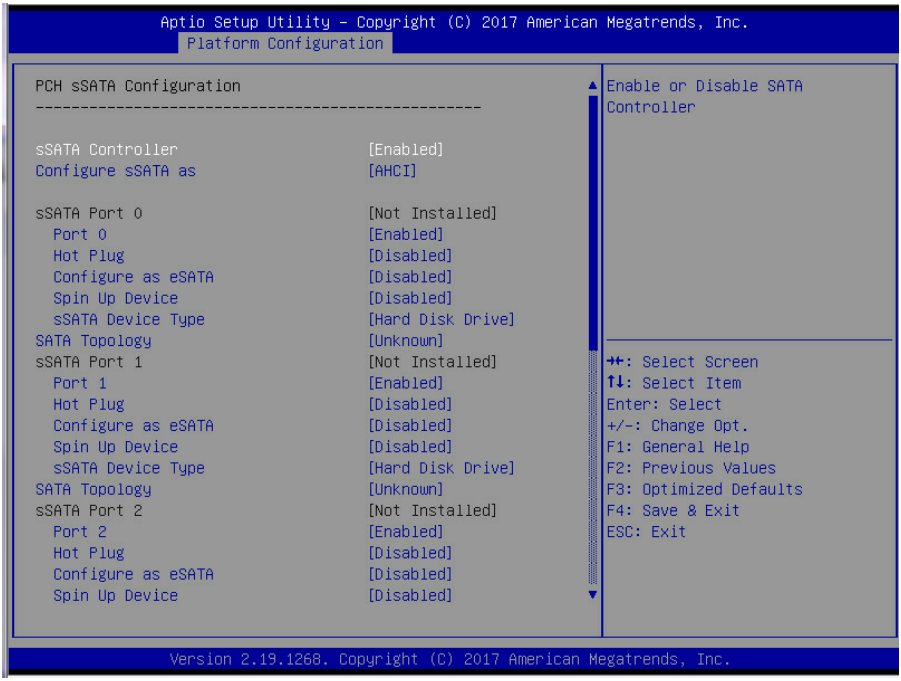
Configure as eSATA
Configures port as External SATA (eSATA)
Disabled / Enabled

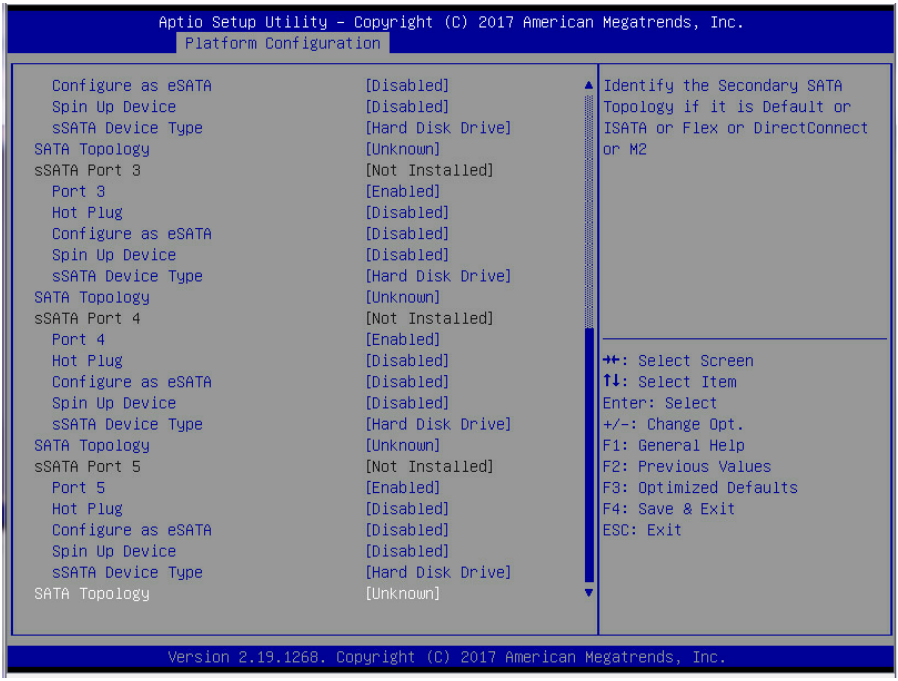
Mechanical Presence Switch
Controls reporting if this port has an Mechanical Presence Switch.
Note: Requires hardware support.
Disabled / **Enabled**

Spin Up Device
AHCI Supports Staggered Spin-up
Disabled / Enabled

SATA Device Type
Indentify the SATA port is connected to Solid State Drive or Hard Disk Drive
Hard Disk Drive / Solid State Drive

6.4.1.3 PCH sSATA Configuration





sSATA Controller
Enable or Disable SATA Controller
Disabled / **Enabled**

Configure sSATA as
Indentify the SATA port is connected to Solid State Drive or Hard Disk Drive
IDE / **AHCI** / RAID

Support Aggressive Link Power Mana
Enable or Disable Aggressive Link Power Mana
Disabled / **Enabled**

sSATA Port 0/1/2/3/4/5
Port 0/1/2/3/4/5
Disabled / **Enabled**

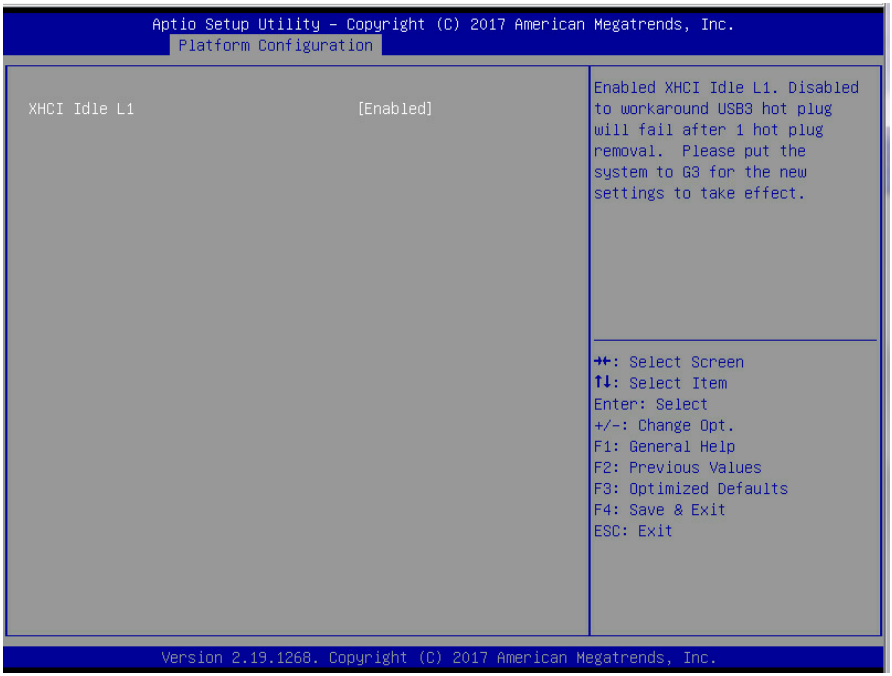
Hot Plug
Enable/Disable SATA Ports Hot Plug Support.
Disabled / Enabled

Spin Up Device
AHCI Supports Staggered Spin-up
Disabled / Enabled

sSATA Device Type
Indentify the SATA port is connected to Solid State Drive or Hard Disk Drive
Hard Disk Drive / Solid State Drive

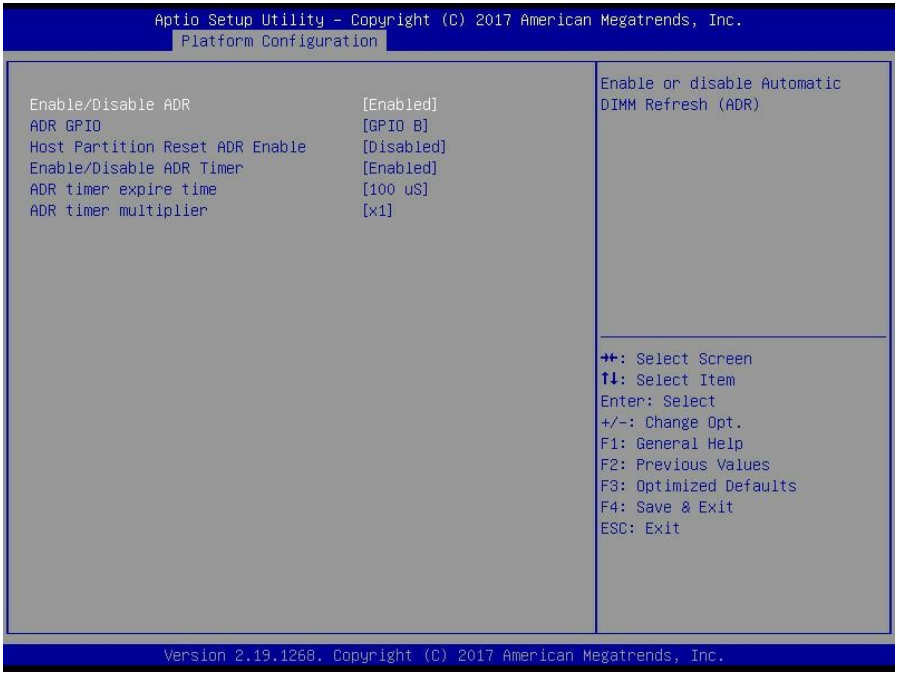
SATA Topology
Indentify the Secondary SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2
Unknown / ISATA / Direct Connect / Flex / M2

6.4.1.4 USB Configuration



xHCI Idle L1
Mode of operation of xHCI controller.
Enabled / Disabled

6.4.1.5 PCH DFX Configuration



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

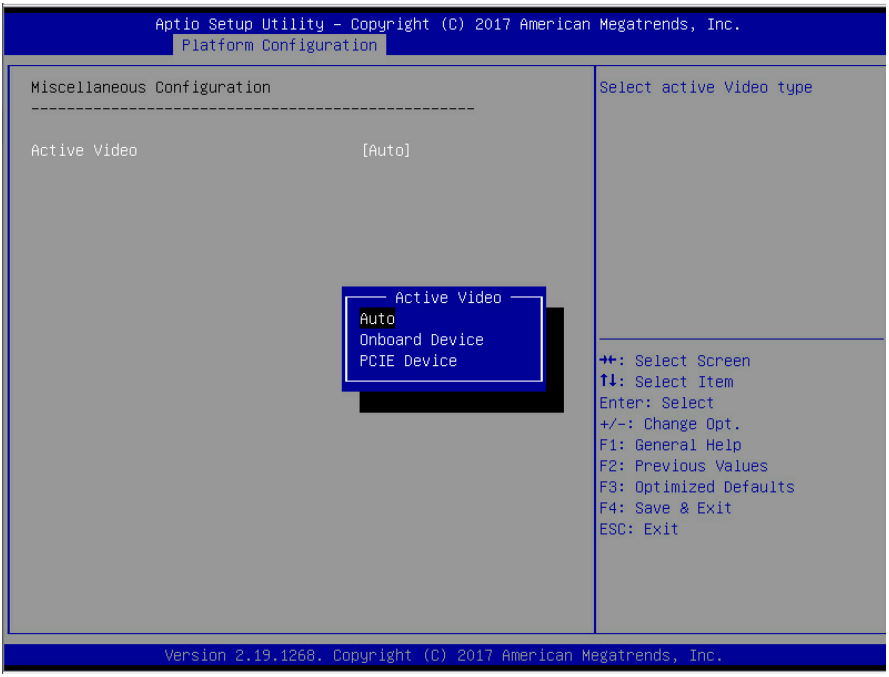
Host Partition Reset ADR Enable
Enable/Disables ADR on Host Partition Reset
Enabled / **Disabled**

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.
25uS / 50uS / **100uS** / 0uS

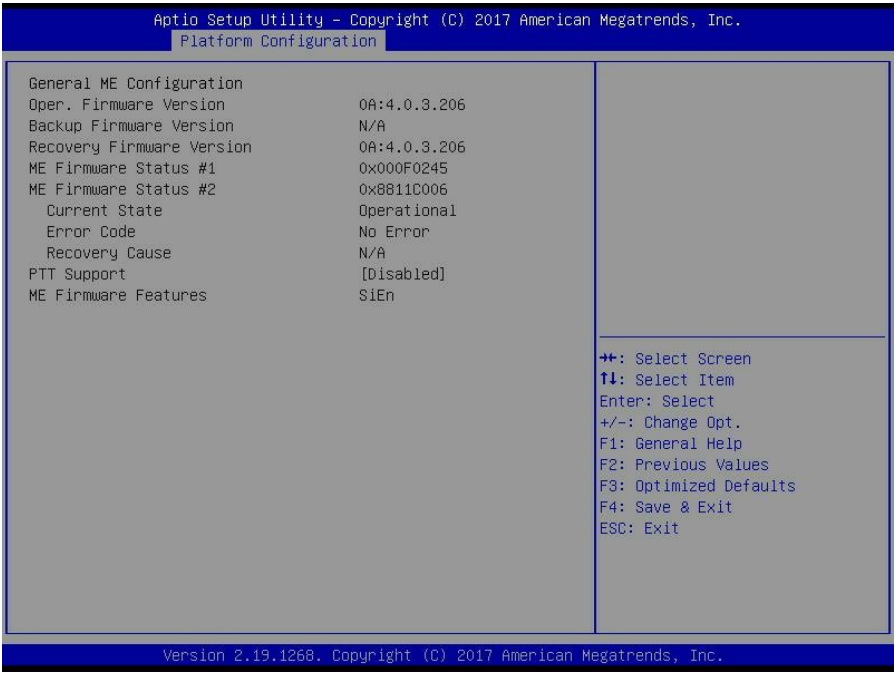
ADR timer multiplier
Select proper ADR timer multiplier:
X1,8,24,40,56,64,72,80,88,96
X1 / x8 / x24 / x40 /x56 / x64 /x72 / x80 / x88 / x96

6.4.2 Miscellaneous Configuration

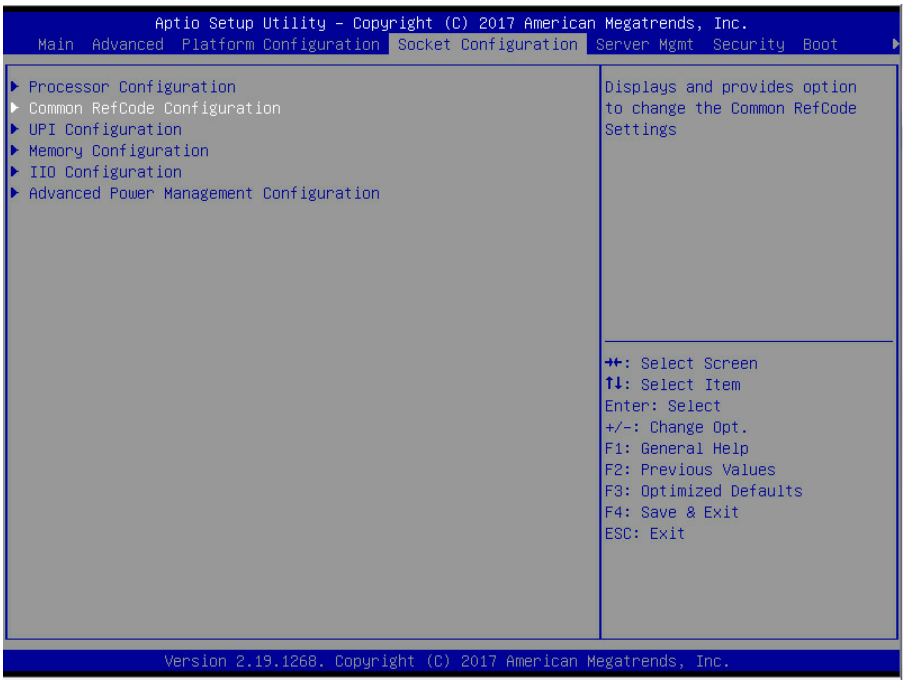


Active Video
Select active video type
Auto / Onboard Device / PCIE Device

6.4.3 General ME Configuration



6.5 Socket Configuration



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

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

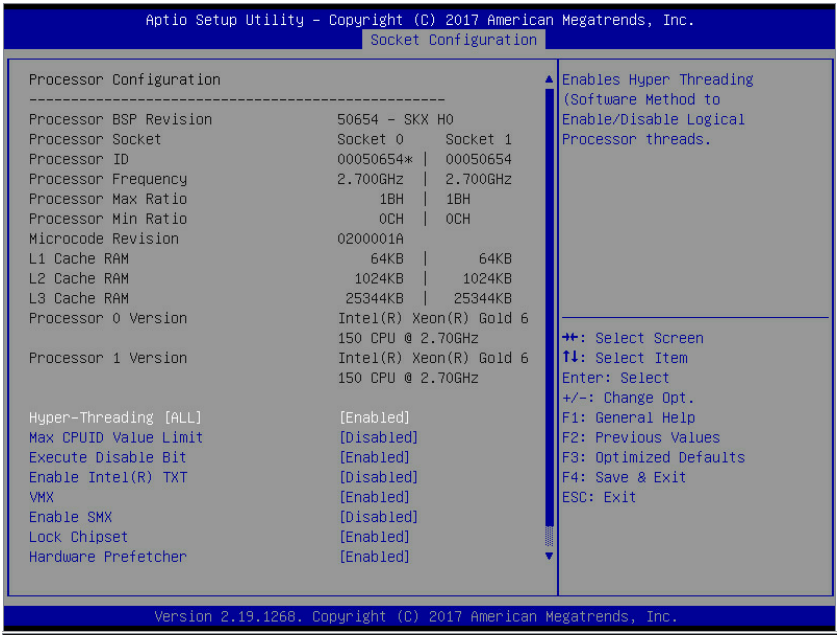
UPI Configurtion
Displays and provides option to change the UPI Settings

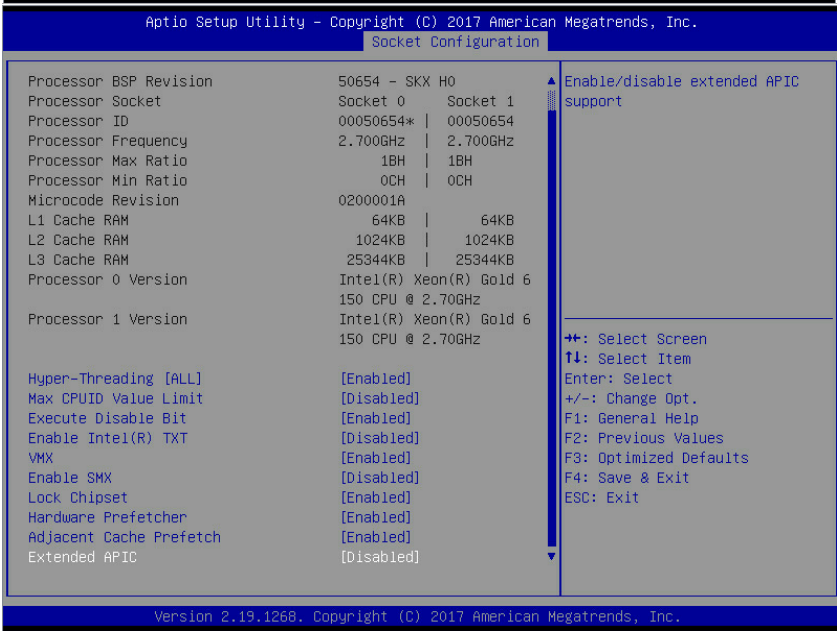
Memory Configuration
Displays and provides option to change the Memory Settings

IIO Configuration
Displays and provides option to change the IIO Settings

Advance Power Management Configuration
Displays and provides option to change the IIO 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.
Disable / Enable

Execute Disable Bit
When disabled, forces the XD feature flag to always return 0.
Disable / **Enable**

Enable Intel(R) TXT
Enables Intel(R) TXT
Disable / Enable

VMX
Enables the Vanderpool Technology, takes effect after reboot.
Disabled / Enabled

Enable SMX
Enables Safer Mode Extensions
Disabled / Enabled

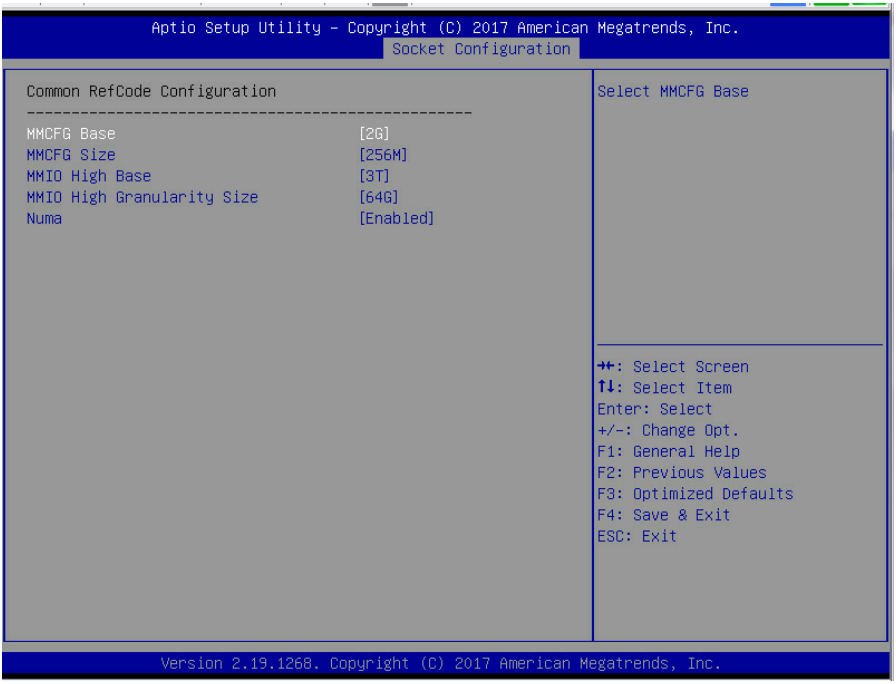
Lock Chipset
Lock or Unlock chipset
Disabled / Enabled

Hardware prefetcher
=MLC Streamer Prefetcher (MSR 1A4h Bit[0])
Disabled / **Enabled**

Adjacent Cache Prefetch
=MLC Spatial Prefetcher (MSR 1A4h Bit [1])
Disabled / **Enabled**

Extended APIC
Enable/disable extended APIC support
Disabled / Enabled

6.5.2 Common RefCode Configuration Submenu



MMCFG Base
Select MMCFG Base

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

MMCFG Size
Select MMCFG Size

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

MMIOH High Base
Select MMIO High Base

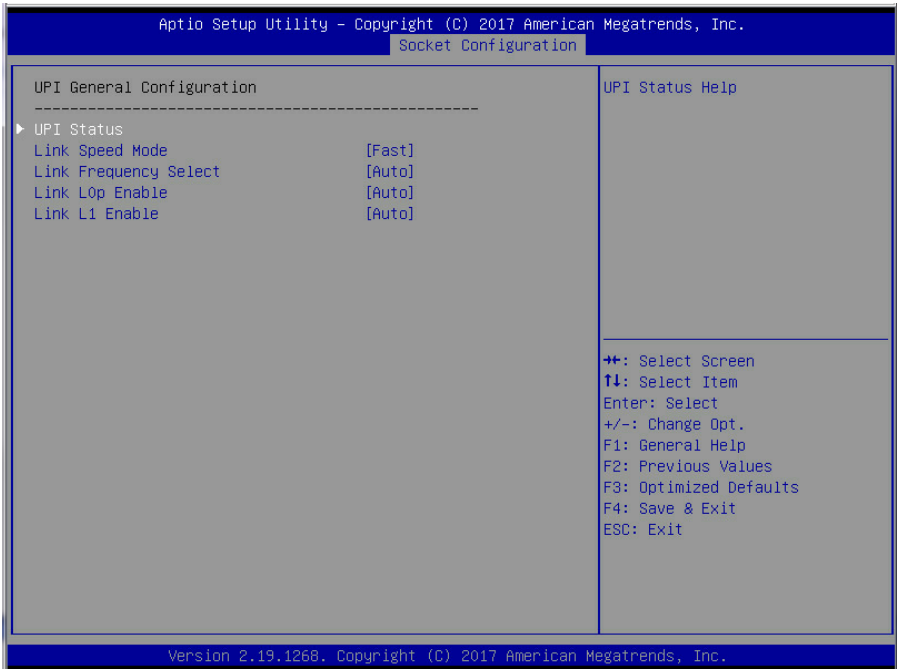
56T / 40T / 24T /16T / 4T/ **3T** / 2T/ 1T

MMIO High Granularity Size
Selects the allocation size used to assign mmioh resources. Total mmioh space can be up to 32x granularity.
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 none uniform Memory Access. (NUMA)
Enabled / Disabled

6.5.3 UPI General Configuration Submenu



UPI Status
UPI Status Help.

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

Link Frequency Select
Allows for selecting the UPI Link frequency
9.6GB/s /10.4GB/s / **Auto** / Use Per Link Setting

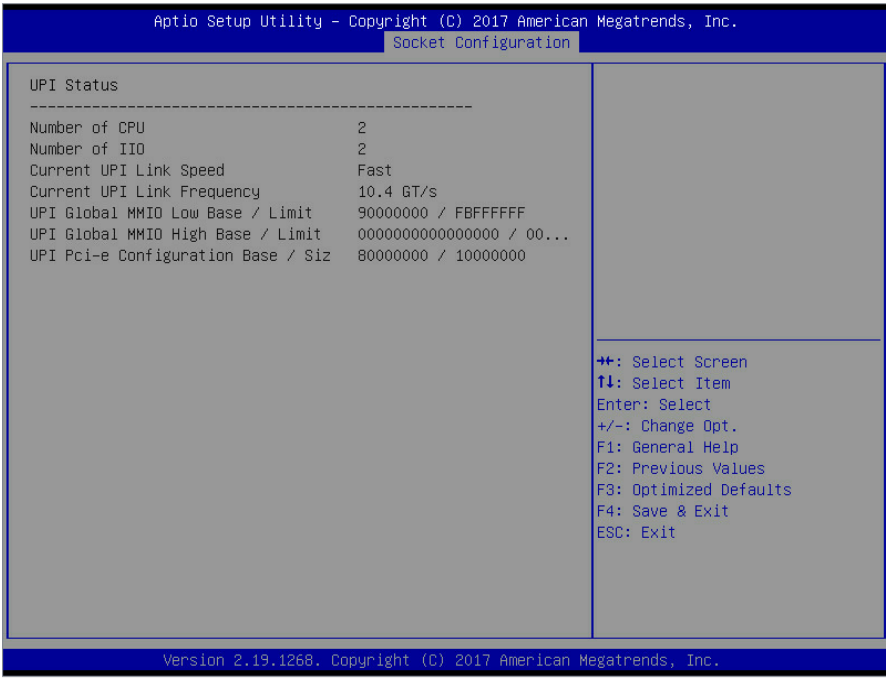
Link L0p Enable
Enable – Set the c_L0p_en, Disable – Reset it, Auto – Auto decides based on Si Compatibility

Disable/Enable/**Auto**

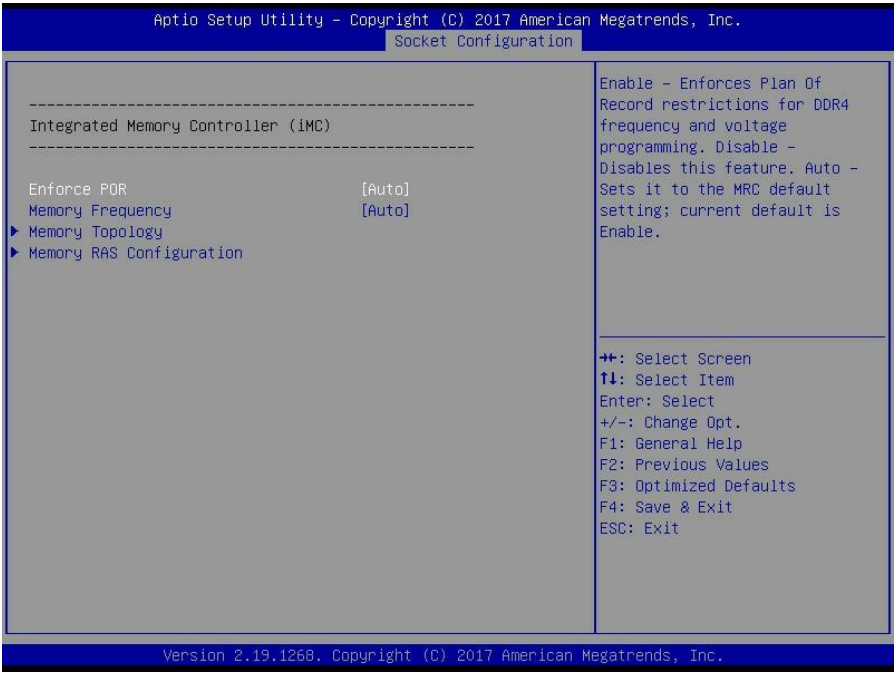
Link L1 Enable
Enable – Set the c_L1_en, Disable – Reset it, Auto – Auto decides based on Si Compatibility

Disable/Enable/**Auto**

6.5.3.1 UPI Status Submenu



6.5.4 Memory Configuration Submenu



Enforce POR
Enable – Enforce 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 / Disabled

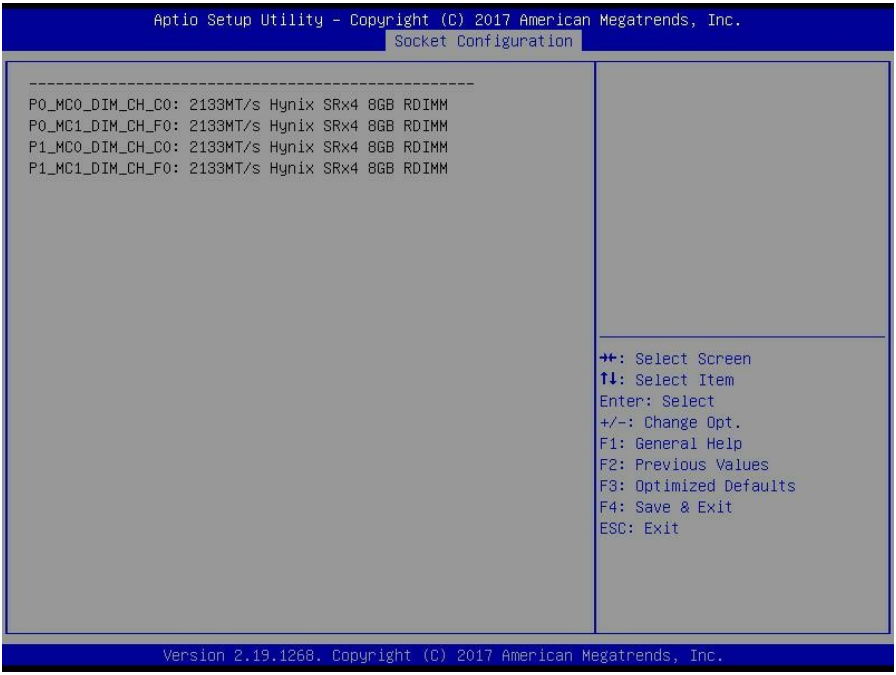
Memory Frequency
Enables/Disables Automatic restoring of NVDIMMs

Auto / 1866 / 2133 / 2400 / 2666

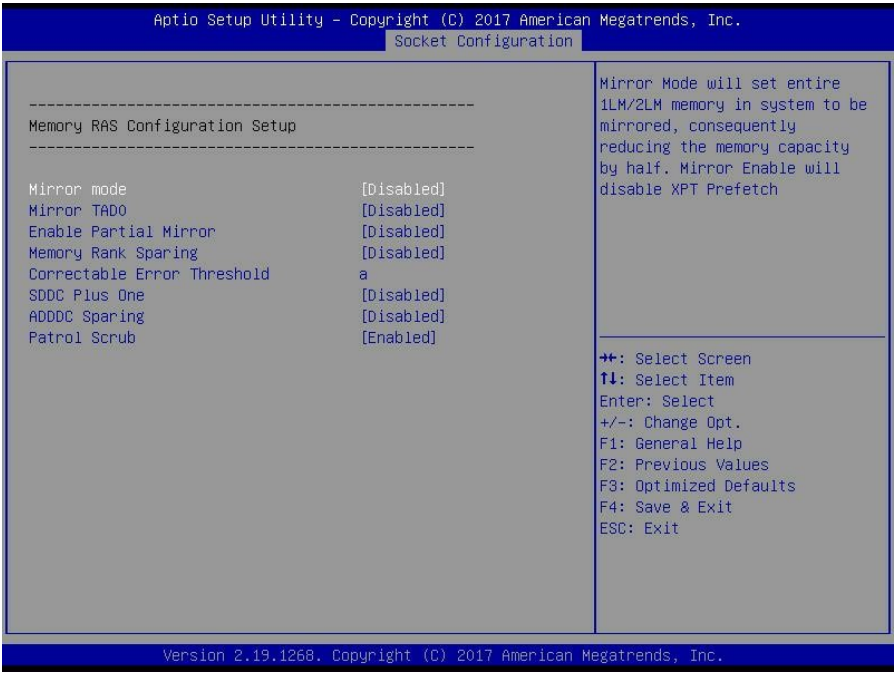
Memory Topology
Maximum Memory Frequency Selections in Mhz. Do not select Reserved

Memory RAS Configuration
Displays and provides option to change the Memory Ras Settings

6.5.4.1 Memory Topology Submenu



6.5.4.2 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.
Disable / Enabled

Mirror TAD0
Enable Mirror on entire memory for TAD0
Disable / Enabled

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.
Disable / Enabled

Memory Rank Sparing
Enable/Disable Memory Rank Sparing
Disable / Enabled

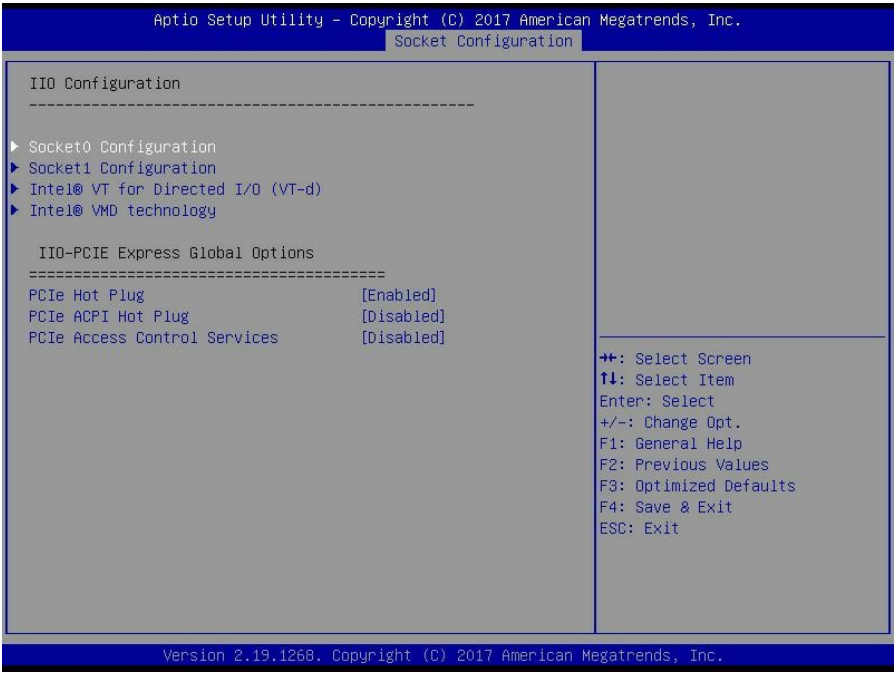
Correctable Error Threshold
Enable/ Disable Memory Rank Sparing

SDDC Plus One
Selects the address mode between System Physical Address (or) Reverse Address
Disable / Enabled

ADDDC Sparing
Enable/ Disable ADDDC Sparing

Patrol Scrub
Enable/Disable Patrol Scrub
Disable / **Enabled**

6.5.5 IIO Configuration Submenu



Socket0 Configuration
Socket0 Configuration

Socket1 Configuration
Socket1 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® VT for Directed I/O (VT-d) Configuration menu.

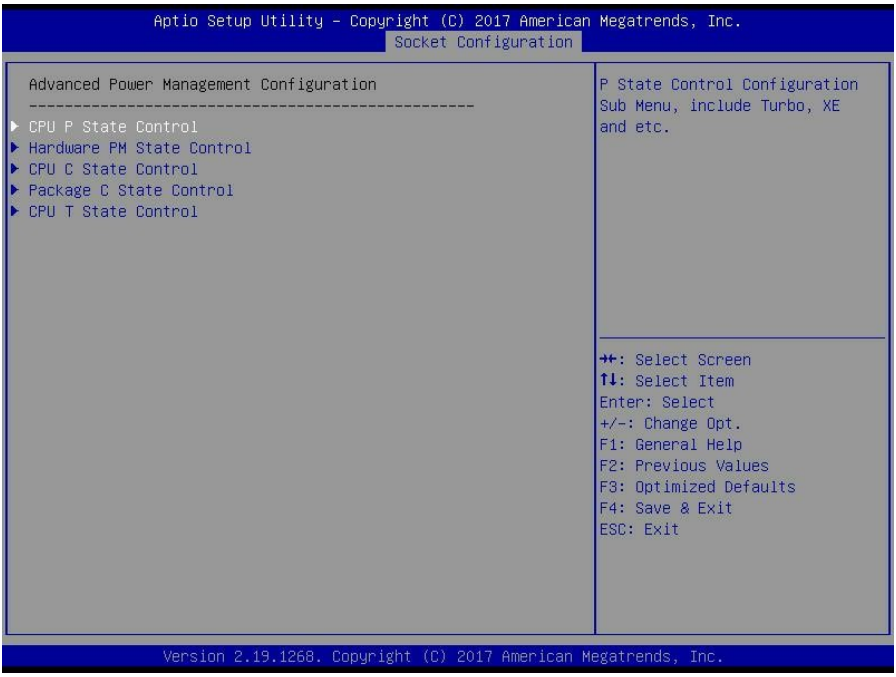
PCIe Hot Plug
Enable/Disable PCIe ACPI Hot Plug globally Configuration menu.
Disabled / Enabled / Auto / Manual

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 / Enabled / Auto / Manual

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

Disabled / Enabled

6.5.6 Advanced Power Management Configuration



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

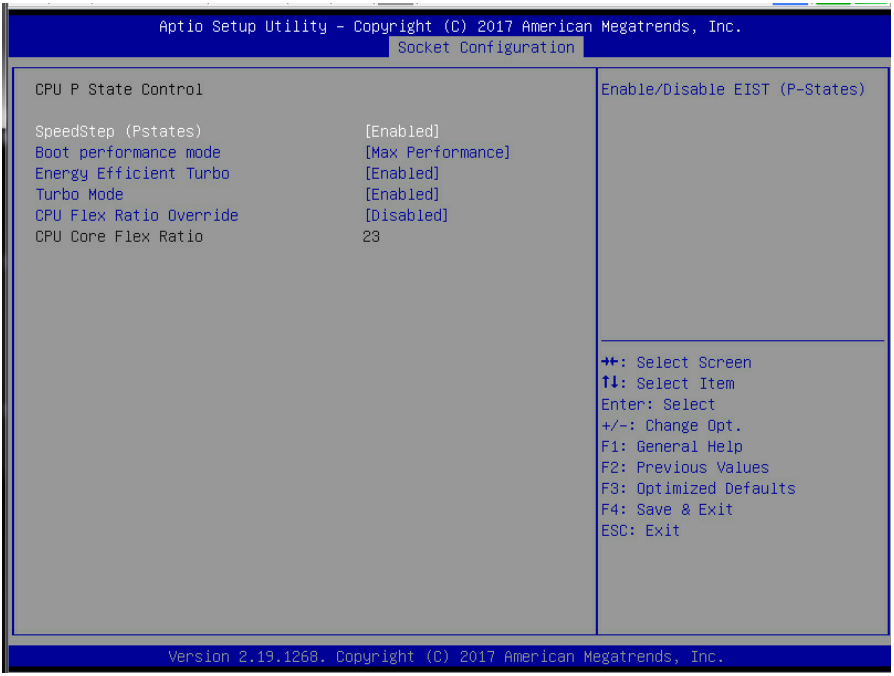
Hardware PM State Control
Hardware P-State setting

CPU C State Control
CPU C State setting

Package C State Control
Package C State setting

CPU T State Control
CPU T State setting

6.5.6.1 CPU P State Control



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

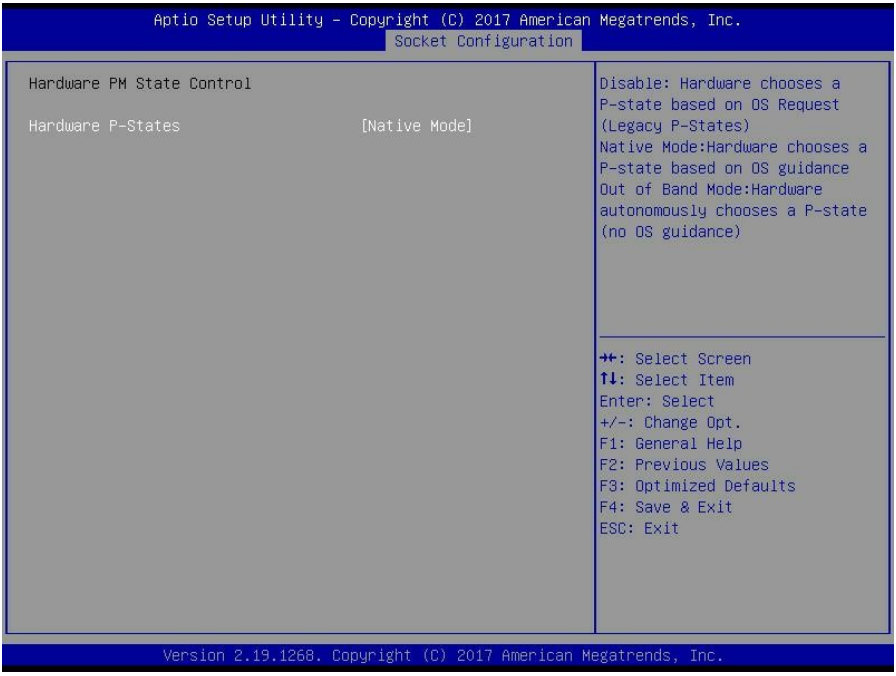
Boot performance mode
Select the performance state that the BIOS will set before OS hand off.
Max Performance / Max Efficient / Set by Intel Node

Energy Efficient Turbo
Energy Efficient Turbo Disable, MSR 0x1FC [19]
Disabled / **Enabled**

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

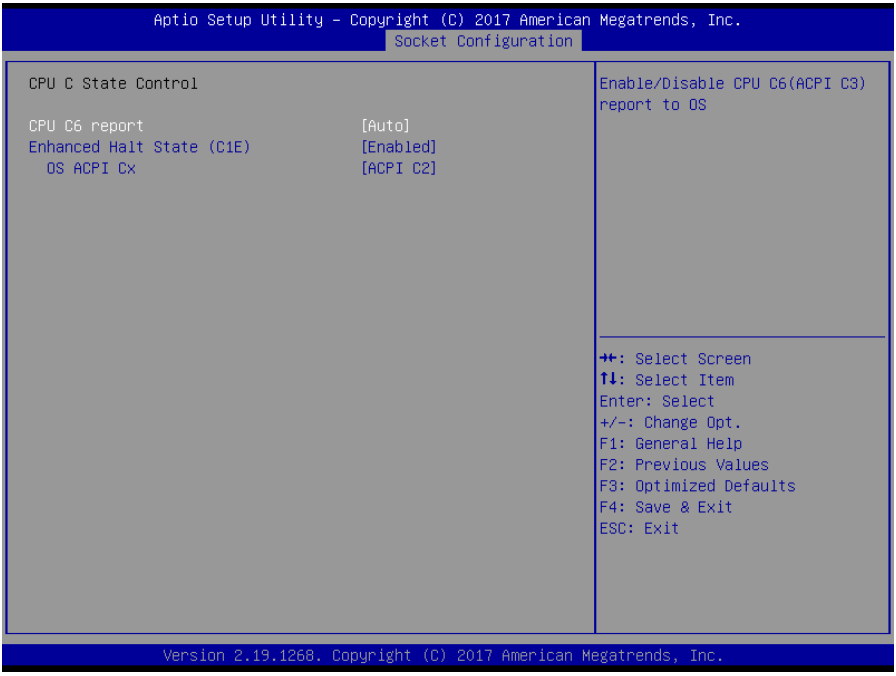
CPU Flex Ratio Override
Enable/Disable CPU Flex Ratio Programming
Disabled / Enabled

6.5.6.2 Hardware PM State Control



Hardware P-States
Disable: Hardware choose a P-state based on OS Request (Legacy P-States)
Native Mode: Hardware choose a P-state based on OS guidance
Out of Band Mode: Hardware autonomously choose a P-state (No OS guidance)
Disable / **Native Mode** / Out of Band Mode / Native Mode with No Legacy Support

6.5.6.3 CPU C State Control

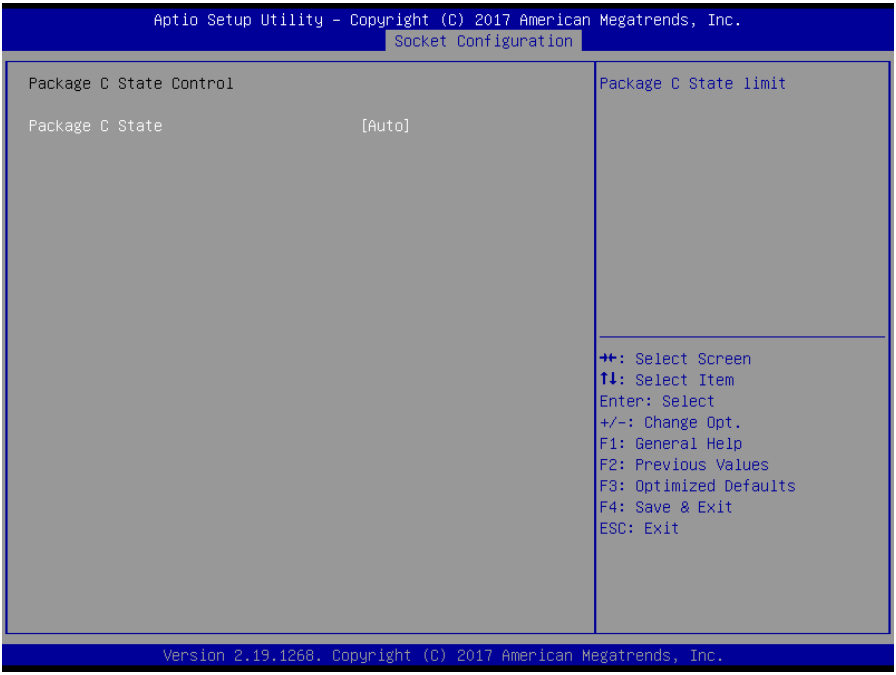


CPU C6 Report
Enable/Disable CPU C6 (ACPI C3) report to OS.
Enabled / Disabled / **Auto**

Enhanced Halt State
Enables the Enhanced C1E state of the CPU, takes effect after reboot
Enabled / Disabled

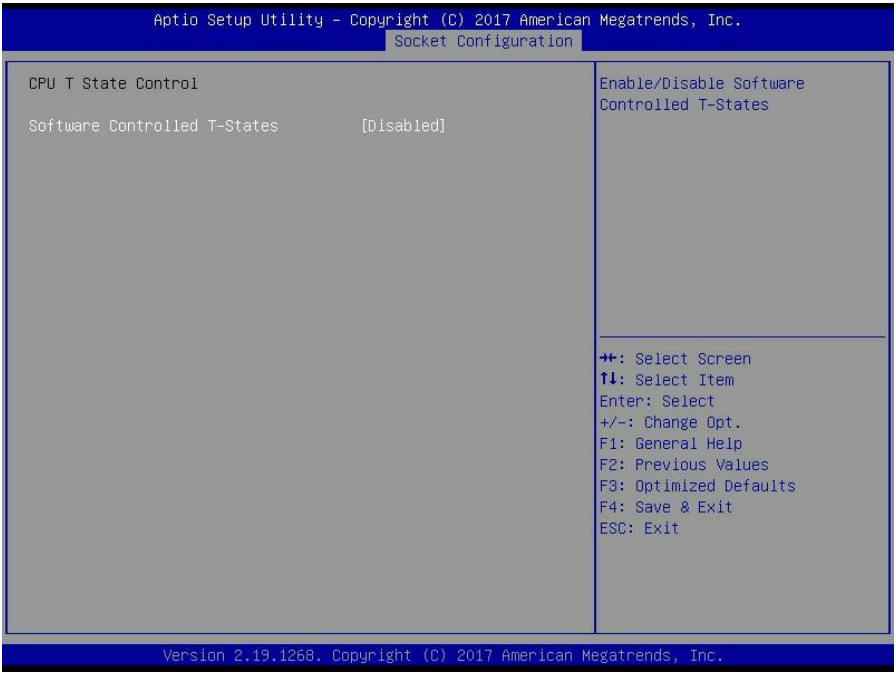
OS ACPI Cx
Enables the Enhanced C1E state of the CPU, takes effect after reboot
ACPI C2 / ACPI C3

6.5.6.4 Package C State Control Submenu



Package C State
Package C State Limit
C0/C1 state / C2 state / C6(non Retention) state / C6 (Retention) state / NO limit / **Auto**

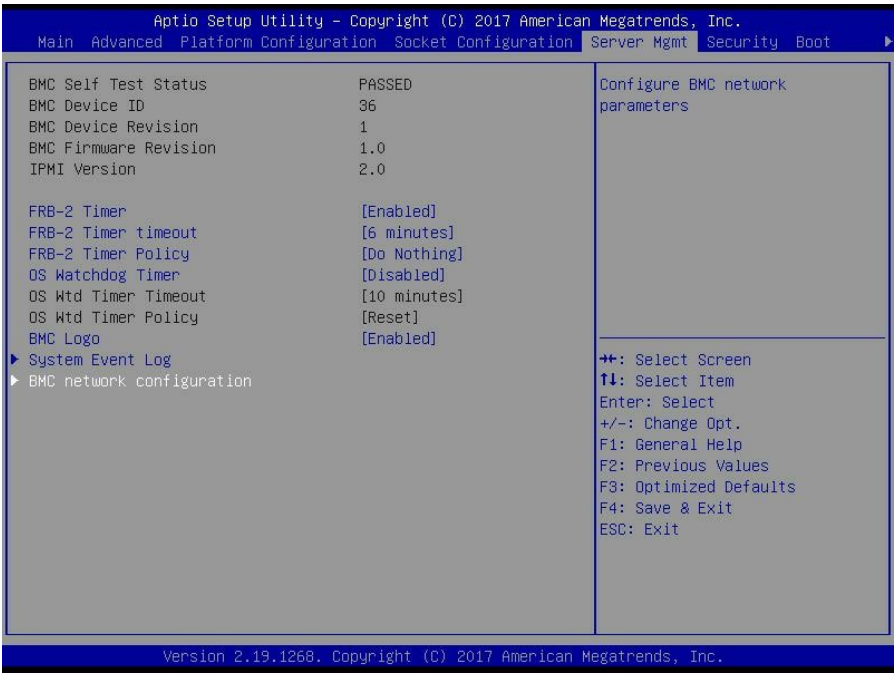
6.5.6.5 CPU T State Submenu



CPU T State Control
CPU T State setting

Software Controller T-States
Enable/Disable Software Controller T-States
Disabled / Enabled

6.6 Server Management



FRB-2 Timer
Enable or Disable FRB-2 timer (POST timer)
Disabled / Enabled
NOTE: When [FRB-2 Timer] is set to [Enabled], the following items will be available.

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**

FBR-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.
Disabled / Enabled

NOTE: When [OS Watchdog Timer] is set to [Enabled], the following items will be available.

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

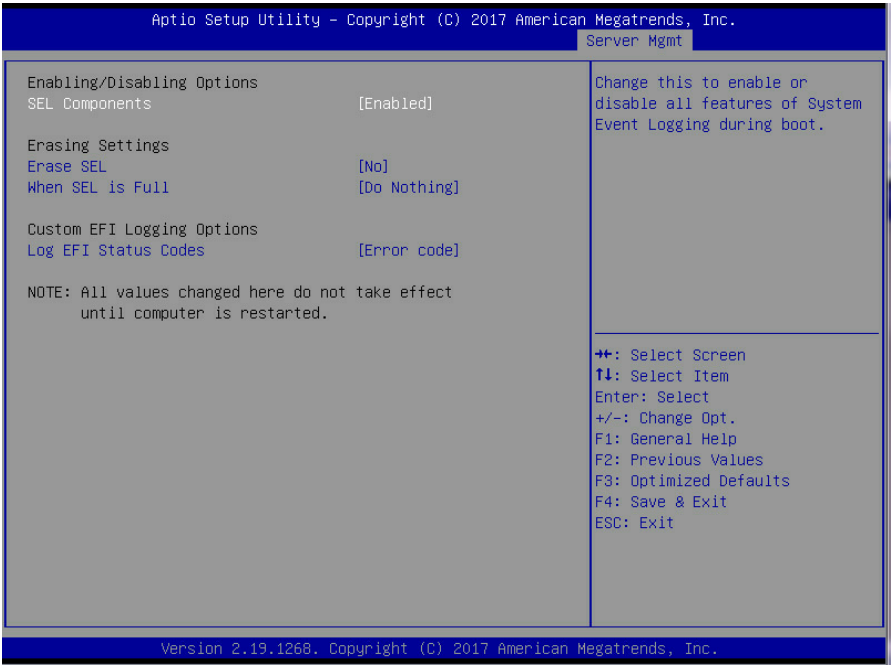
BMC Logos
Enable or disable BMC logo

Disabled / Enabled

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



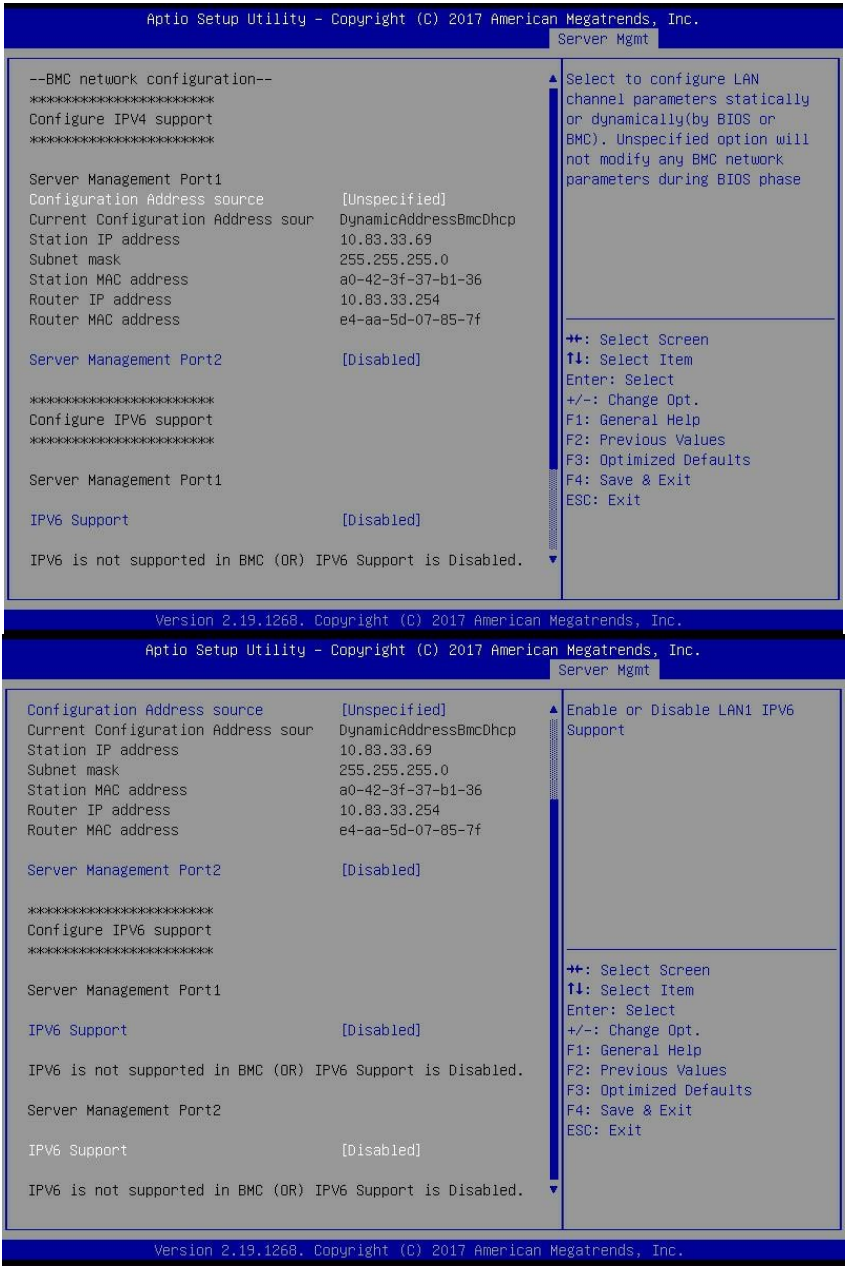
SEL Components
Change this to enable or disable all features of System Event Logging during boot.
Disabled / Enabled

Erase SEL
Choose options for erasing SEL.
No / Yes, on next reset / No, 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.
Both / Disabled / **Error Code** / Progress Code

6.6.2 BMC Network Configuration



Server Management Port1
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

IPV6 Support
Enable or Disable LAN1 IPV6 Support

Enabled / **Disabled**

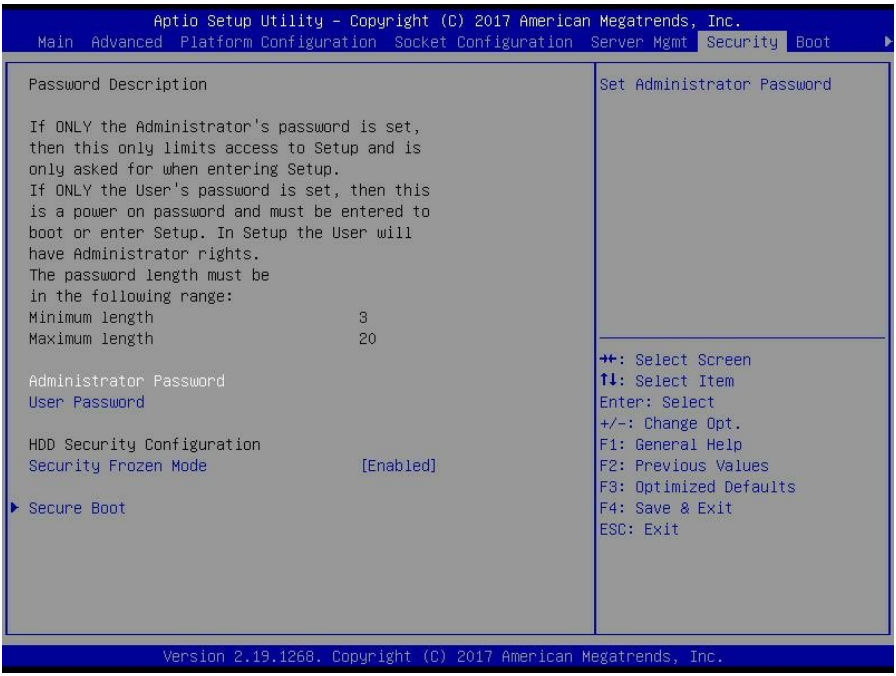
Configuration Address Source
Select the configure LAN channel parameters statically or dynamically (by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.

Unspecified / Static / DynamicBmcDhcp

Server Management Port2
IPV6 Support
Enable or Disable LAN1 IPV6 Support

Enabled / **Disabled**

6.7 Security



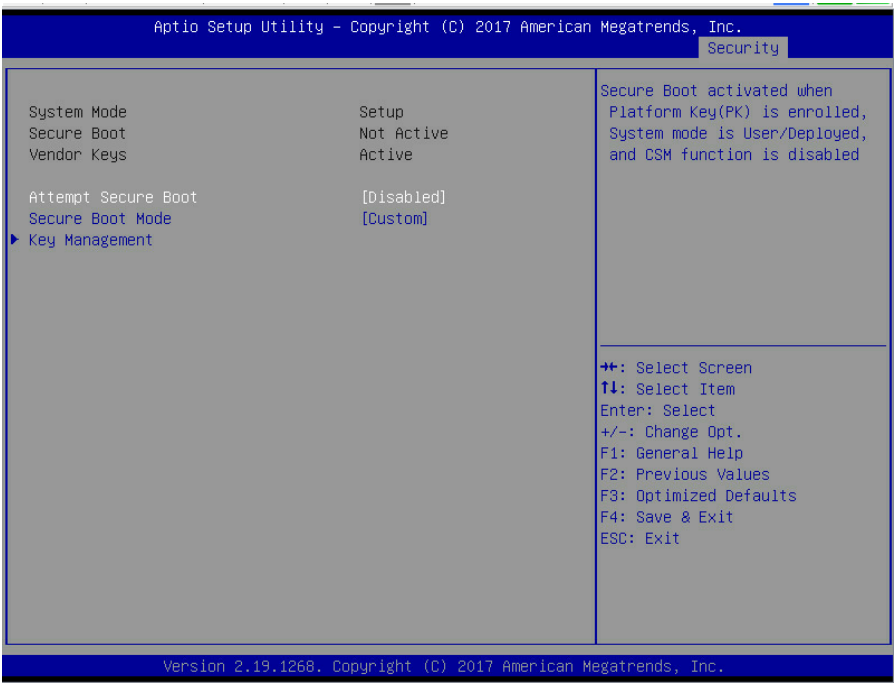
Password Description
Read only.

Administrator Password
Install or change the password.

User Password
Install or change the password.

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

6.7.1 Secure Boot Menu Configuration



Attempt Secure Boot

Secure Boot activated when Platform Key(PK) is enrolled,system mode if 1.system running in User mode with enrolled platform Key(PK)2.CSM function is disabled

Disabled / Enabled

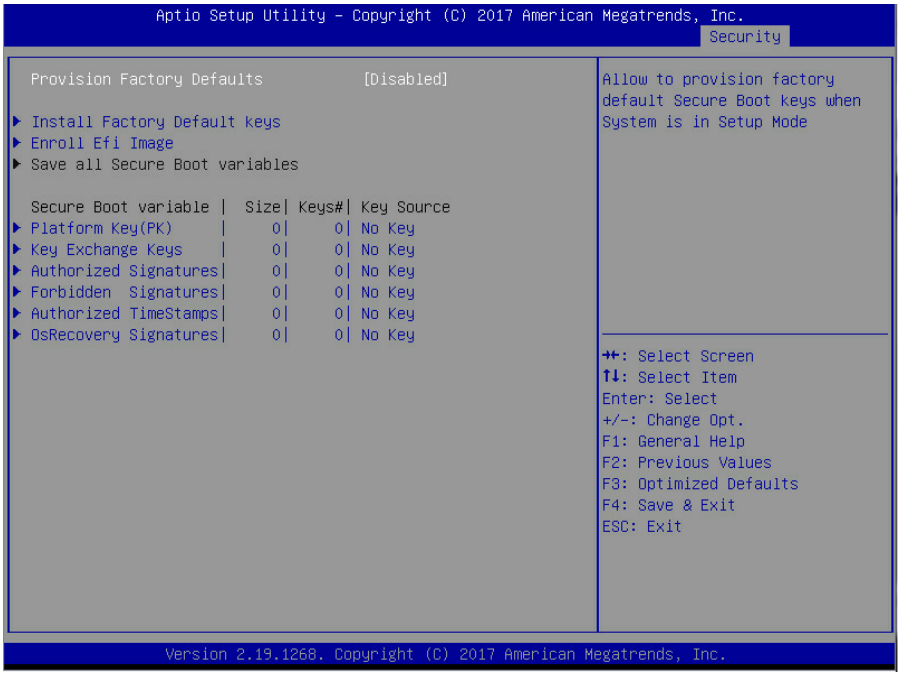
Secure Boot Mode

Secure Boot mode selector: Standard/Custom.

In Custom mode Secure Boot Variables can be configured without authentication

Custom / Standard

6.7.1.1 Key Management Configuration



Provision Factory Defaults
Allow to provision factory default Secure Boot Keys when System is in Setup Mode.
Disabled / Enabled

NOTE: The follow menu will be free when **[Provision Factory Defaults]** is set to [Enabled].

Install Factory Default Keys
Force System to User Mode- install all Factory Default Keys

Enroll Efi Image
Allow the image to run in Secure Boot mode.
Enroll SHA256 hash of the binary into Autorized Signature Database (db)

Save all Secure Boot variables
Save NVRAM content of Secure Boot policy 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
2.Autheticated UEFI Variable
3.EFI PE/COFF Image (SHA256)
Key Source:
Default, External, Mixed, Test
Save to File / Set New / Erase

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
2.Autheticated UEFI Variable
3.EFI PE/COFF Image (SHA256)
Key Source:
Default, External, Mixed, Test
Save to File / Set New / Append / Erase

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
2.Autheticated UEFI Variable
3.EFI PE/COFF Image (SHA256)
Key Source:
Default, External, Mixed, Test
Save to File / set New / Append / Erase

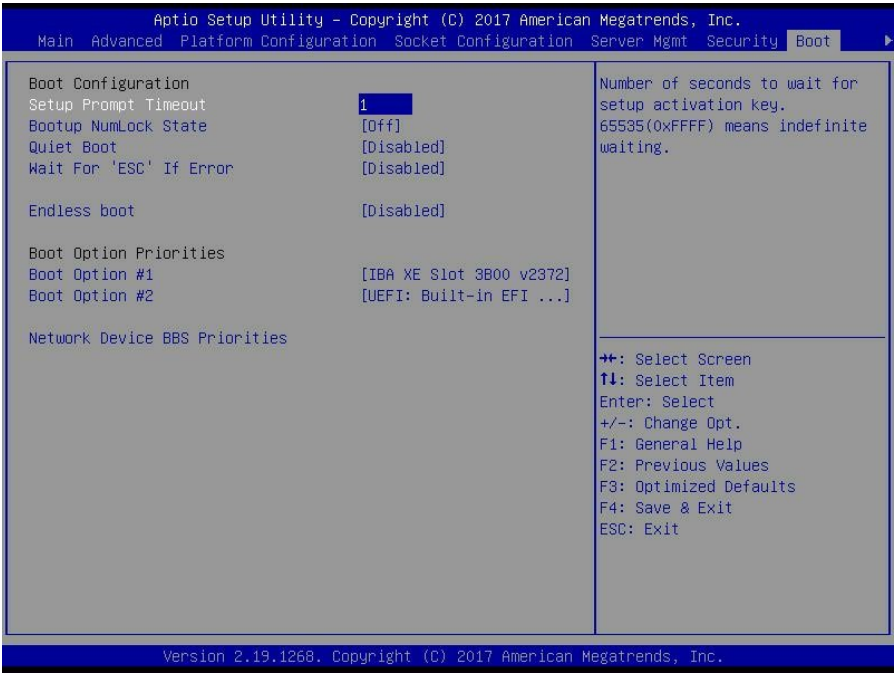
Forbidden Signatures
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:
a)EFI_signature_LIST
b)EFI_CERT_X509 (DER encoded)
c)EFI_CERT_RSA2048(bin)
d)EFI_CERT_SHA256,384,512
2.Autheticated UEFI Variable
3.EFI PE/COFF Image (SHA256)

Key Source:
Default, External, Mixed, Test
Save to File / set New / Append / Erase

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
2.Autheticated 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
2.Autheticated UEFI Variable
3.EFI PE/COFF Image (SHA256)
Key Source:
Default, External, Mixed, Test
Set New / Append

6.8 Boot



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
Enable or disable wait 'ESC' key Function. When chassis intrusion CMOS clear or BMC not Response.
Disabled / Enabled

Endless Boot
Enable or disable Endless Boot.
Disabled / Enabled

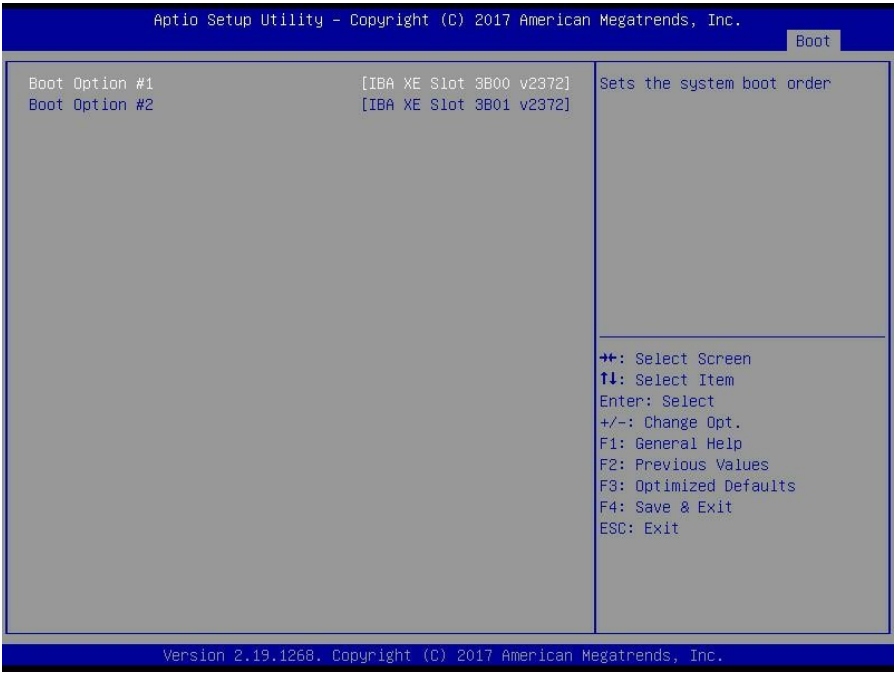
Boot Option #1
Select the first boot device.
IBA XE Slot v2372 / UEFI: Built-in EFI Shell **/** Disabled

Boot Option #2

Select the first boot device.

IBA XE Slot v2372 / **UEFI: Built-in EFI Shell** / Disabled

6.8.1 Network Device BBS Priorities Configuration



Boot Option #1

Sets the system boot order.

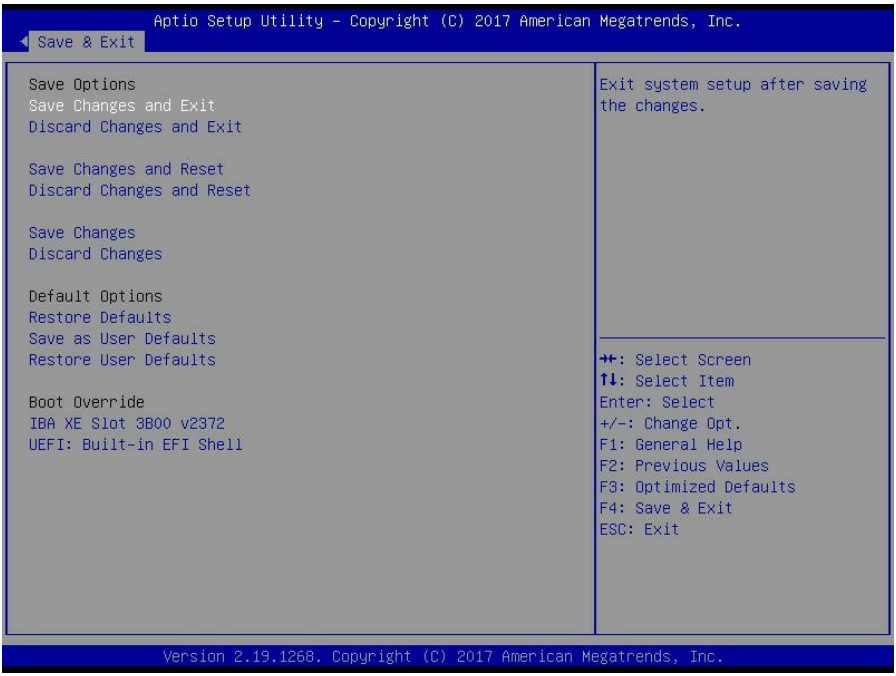
Device Name / Disabled

Boot Option #2

Sets 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.

NOTE

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.

7.1 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.

7.2 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
0x08	North Bridge initialization after microcode loading

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

Status Code	Description
0x35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
0x36	CPU post-memory initialization. System Management Mode (SMM) initialization
0x37	Post-Memory North Bridge initialization is started.
0x38	Post-Memory North Bridge initialization (North Bridge module specific)
0x39	Post-Memory North Bridge initialization (North Bridge module specific)
0x3A	Post-Memory North Bridge initialization (North Bridge module specific)
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module specific)
0x3D	Post-Memory South Bridge initialization (South Bridge module specific)
0x3E	Post-Memory South Bridge initialization (South Bridge module specific)
0x3F – 0x4E	OEM post memory initialization codes
0x4F	DXE PIL is started
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
0x59	CPU microcode is not found or microcode update is failed.
0x5A	Internal CPU error

Status Code	Description
0x5B	Reset PPI is not available.
0x5C – 0x5F	Reserved for future AMI error codes
S3 Resume Progress Codes	
0xE0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL).
0xE1	S3 Boot Script execution
0xE2	Video repost
0xE3	OS S3 wake vector call
0xE4 – 0xE7	Reserved for future AMI progress codes
S3 Resume Error Codes	
0xE8	S3 Resume failed
0xE9	S3 Resume PPI not found
0xEA	S3 Resume Boot Script error
0xEB	S3 OS wake error
0xEC – 0xEF	Reserved for future AMI error codes
Recovery Progress Codes	
0xF0	Recovery condition triggered by firmware (Auto recovery)
0xF1	Recovery condition triggered by user (forced recovery)
0xF2	Recovery process started
0xF3	Recovery firmware image is found.
0xF4	Recovery firmware image is loaded.
0xF5 – 0xF7	Reserved for future AMI progress codes
Recovery Error Codes	
0xF8	Recovery PPI is not available.
0xF9	Recovery capsule is not found.
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AMI error codes

PEI Beep Codes

# of Beeps	Description
Progress Codes	

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

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.
0x71	South Bridge DXE SMM initialization is started.

Status Code	Description
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
0xA3	IDE Enable
0xA4	SCSI initialization is started.

Status Code	Description
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 AMI codes
0xC0 – 0xCF	OEM BDS initialization codes
DXE Error Codes	
0xD0	CPU initialization error
0xD1	North Bridge initialization error
0xD2	South Bridge initialization error
0xD3	Some of the Architectural Protocols are not available
0xD4	PCI resource allocation error. Out of Resources
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found.
0xD7	No Console Input Devices are found.

Status Code	Description
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.
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: Cable Connection Tables

1. Fan Ctrl Cable & Fan PWR Cable

MP016T76-FB FAN board to S7102 MB		
Fan board	**Connect to**	**S7102 M/B**
J1 (Fan ctrl cable)	→	FAN_HD1
J2 (Fan PWR cable)	→	FAN_PW1

2. FP Ctrl Cable

M1715T71-FPB board to S7102		
M1715T71-FPB	**Connect to**	**S7102 M/B**
J1	→	FPIO_1

3. USB Cable

USB cable to S7102		
USB cable	**Connect to**	**S7102 M/B**
USB cable	→	USB3_FPIO1

4. HDD PWR Cable

M1271T71-BP12 to S7102 M/B		
M1271T71-BP12	**Connect to**	**S7102 M/B**
PW5	→	HDD_PW1

5. Mini-SAS HD Cable

M1271T71-BP12 to S7102 M/B		
M1271T71-BP12	**Connect to**	**S7102 M/B**
Mini_SAS0	→	PCH_SSATA_0123
Mini_SAS1	→	PCH_SATA_0123
Mini_SAS2	→	PCH_SATA_4567

6. GPU PWR Cable

S7102 to GPU Card		
S7102	**Connect to**	**GPU Card**
PE_PW1	→	GPU1
PE_PW4	→	GPU2

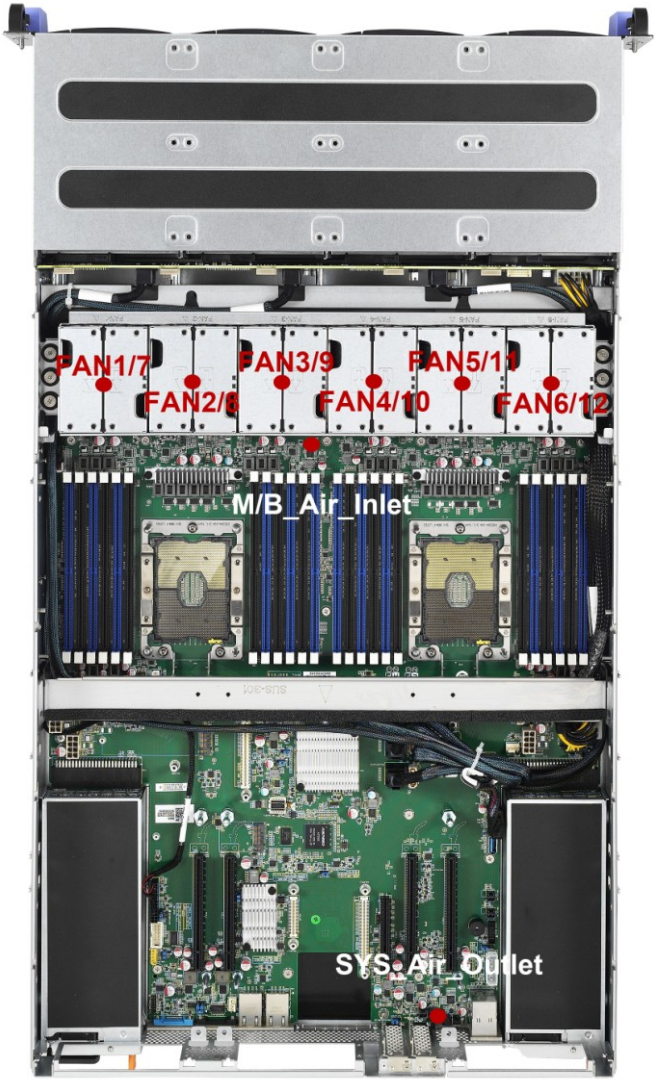
Appendix II: FRU Parts Table

TN76-B7102 FRU Parts				
Item	Model Number	Part Number	Picture	Description
CABLES	FRU-CS-0590	422T55800004		TF-CABLE ASSY;SAS INTERNAL,SBU,30 AWG,900 mm,MINI-SAS HD CABLE,SHORT MINI-SAS HD 36P 90°/SHORT MINI-SAS HD 36P,TN76-B7102
	FRU-CS-0600	422T55800005		TF-CABLE ASSY;SAS INTERNAL,SBU,30 AWG,1000 mm,MINI-SAS HD CABLE,SHORT MINI-SAS HD 36P 90°/SHORT MINI-SAS HD 36P,TN76-B7102
	FRU-CS-0610	422T45900007		TF-AC/DC POWER CABLE;SBU,20 AWG,250MM,GPU PWR CABLE, 2*4P(M),P4.2/GPU 2*4P(M),P4.2/GPU 2*3P(M), P4.2,FT48-B7055
	FRU-CS-0520	422T52100003		TF-AC/DC POWER CABLE;SBU,20 AWG,300MM,GPU PWR CABLE, 2*4P(M),P4.2/GPU,2*3P(M),P4.2+GPU,2*4P(M),P4.2,FT76-B7922
	FRU-CS-0460	332810000515		TF-POWER CORD;SBU,EU,250 V,16 AWG(1.0mm²),1800mm,AC PWR CORD
	FRU-CS-0330	332810000514		TF-POWER CORD;SBU,US,125 V,16 AWG(1.31mm²),1800mm,AC PWR CORD
Power Supply	FRU-PS-0090	471100000238		TF-POWER SUPPLY;SBU,1200 W,DELTA,DPS-1200AB-4 B,(00F),1U MODULE,REV.00F
FAN	FRU-TH-0210	336210000056		TF-FAN;SBU,FAN,12V,VF60381B1-0000-S9H,2BALL,1 A,12 W,18300 RPM,54.1 CFM,4.23 inch-H2O,60.9dBA,120 g,60*60*38mm,4Pin(HEADER 1*6), WIRE=55MM
CPU Heat sink	FRU-TH-0200	343T55800003		HF-HEATSINK;SBU,AL/CU,SOLDERLING+PIPE,3647-1U-NARROW-PASSIVE HEATSINK,1A0-D032800962,108X78X25.5MM,SCREW,TN76-B7102
Rear I/O+MP016T76-L16-1F kit	FRU-RC-0510	5411T5580007		FRU-TF-RISER BD;SBU,MP016T76-16-1F+I/O BKT,TN76-B7102(for change to –G SKU from –N SKU)

NOTE

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.



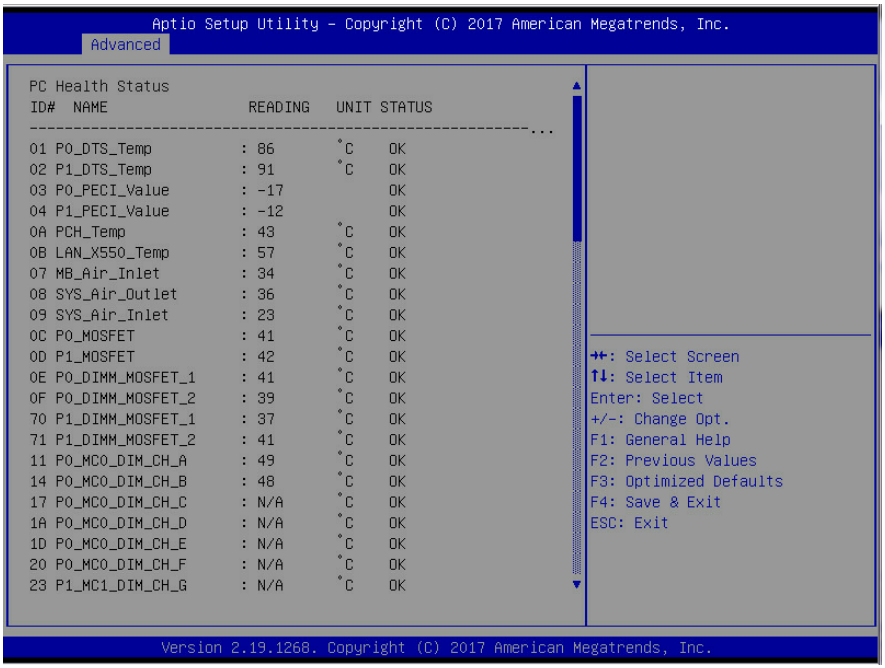
NOTE: The red dot indicates the sensor.

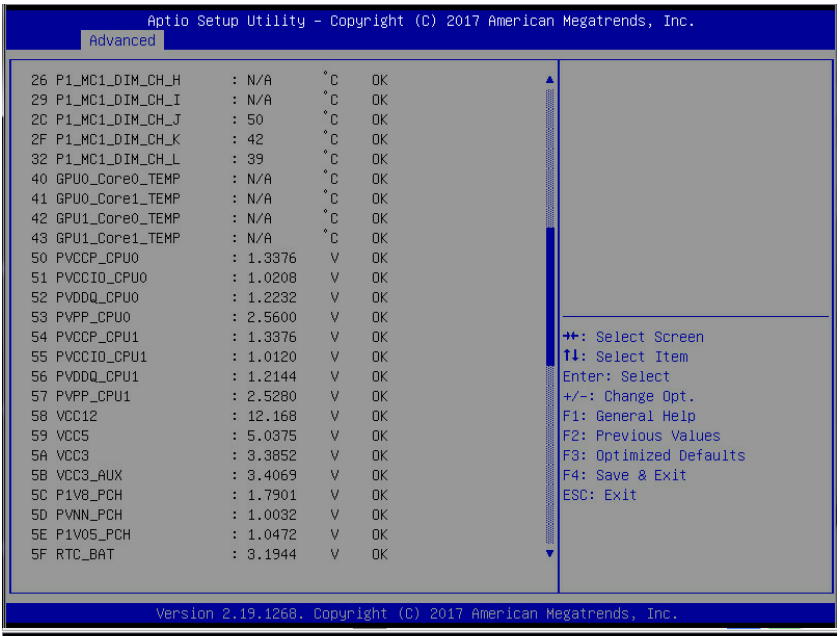
Fan and Temp Sensor Location:

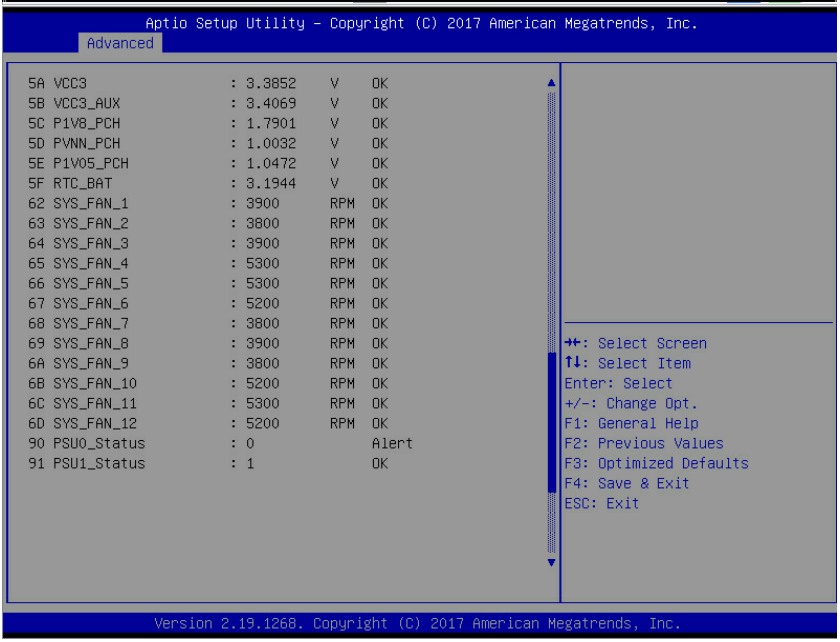
1. Fan Sensor: SYS_FAN_1~12. They detect the fan speed (rpm)
2. Temp Sensor: SYS_Air_Inlet, and M/B_Air_Inlet. They detect the system temperature around.

NOTE: The CPU PECI is measured in a scale defined by Intel, not in Fahrenheit or Celsius.

BIOS Temp Sensor Name Explanation:




Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced
26 P1_MC1_DIM_CH_H : N/A °C OK
29 P1_MC1_DIM_CH_I : N/A °C OK
2C P1_MC1_DIM_CH_J : 50 °C OK
2F P1_MC1_DIM_CH_K : 42 °C OK
32 P1_MC1_DIM_CH_L : 39 °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
50 PVCCP_CPU0 : 1.3376 V OK
51 PVCCIO_CPU0 : 1.0208 V OK
52 PVDDQ_CPU0 : 1.2232 V OK
53 PVPP_CPU0 : 2.5600 V OK
54 PVCCP_CPU1 : 1.3376 V OK
55 PVCCIO_CPU1 : 1.0120 V OK
56 PVDDQ_CPU1 : 1.2144 V OK
57 PVPP_CPU1 : 2.5280 V OK
58 VCC12 : 12.168 V OK
59 VCC5 : 5.0375 V OK
5A VCC3 : 3.3852 V OK
5B VCC3_AUX : 3.4069 V OK
5C P1V8_PCH : 1.7901 V OK
5D PVNN_PCH : 1.0032 V OK
5E P1V05_PCH : 1.0472 V OK
5F RTC_BAT : 3.1944 V 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
5A VCC3 : 3.3852 V OK
5B VCC3_AUX : 3.4069 V OK
5C P1V8_PCH : 1.7901 V OK
5D PVNN_PCH : 1.0032 V OK
5E P1V05_PCH : 1.0472 V OK
5F RTC_BAT : 3.1944 V OK
62 SYS_FAN_1 : 3900 RPM OK
63 SYS_FAN_2 : 3800 RPM OK
64 SYS_FAN_3 : 3900 RPM OK
65 SYS_FAN_4 : 5300 RPM OK
66 SYS_FAN_5 : 5300 RPM OK
67 SYS_FAN_6 : 5200 RPM OK
68 SYS_FAN_7 : 3800 RPM OK
69 SYS_FAN_8 : 3900 RPM OK
6A SYS_FAN_9 : 3800 RPM OK
6B SYS_FAN_10 : 5200 RPM OK
6C SYS_FAN_11 : 5300 RPM OK
6D SYS_FAN_12 : 5200 RPM OK
90 PSU0_Status : 0 Alert
91 PSU1_Status : 1 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.

BIOS Temp Sensor	Name Explanation
P0_DTS_Temp	Temperature of the CPU0 Digital Temperature Sensor
P1_DTS_Temp	Temperature of the CPU1 Digital Temperature Sensor
P0_PECI_Value	Temperature of the CPU0 Platform Environment Control Interface
P1_PECI_Value	Temperature of the CPU1 Platform Environment Control Interface
PCH_Temp	Temperature of PCH
LAN_X550_Temp	Temperature of LAN X550
MB_Air_Inlet	Temperature of the MB_Air_Inlet Area
SYS_Air_Outlet	Temperature of the SYS Air outlet Area
SYS_Air_Inlet	Temperature of the SYS_Air_Inlet Area
P0_MOSFET	Temperature of the CPU0 MOSFET
P1_MOSFET	Temperature of the CPU1 MOSFET
P0_DIMM_MOSFET_1	Temperature of the CPU0 DIMM Channel ABC MOSFET
P0_DIMM_MOSFET_2	Temperature of the CPU0 DIMM Channel DEF MOSFET
P1_DIMM_MOSFET_1	Temperature of the CPU1 DIMM Channel ABC MOSFET
P1_DIMM_MOSFET_2	Temperature of the CPU1 DIMM Channel DEF MOSFET
P0_MC0_DIM_CH_A	The highest temperature of CPU0 DIMM channel A slot
P0_MC0_DIM_CH_B	The highest temperature of CPU0 DIMM channel B slot
P0_MC0_DIM_CH_C	The highest temperature of CPU0 DIMM channel C slot
P0_MC1_DIM_CH_D	The highest temperature of CPU0 DIMM channel D slot
P0_MC1_DIM_CH_E	The highest temperature of CPU0 DIMM channel E slot
P0_MC1_DIM_CH_F	The highest temperature of CPU0 DIMM channel F slot
P1_MC0_DIM_CH_A	The highest temperature of CPU1 DIMM channel A slot
P1_MC0_DIM_CH_B	The highest temperature of CPU1 DIMM channel B slot
P1_MC0_DIM_CH_C	The highest temperature of CPU1 DIMM channel C slot
P1_MC1_DIM_CH_D	The highest temperature of CPU1 DIMM channel D slot
P1_MC1_DIM_CH_E	The highest temperature of CPU1 DIMM channel E slot
P1_MC1_DIM_CH_F	The highest temperature of CPU1 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
BIOS FAN Sensor	**Name Explanation**
SYS_FAN_1	Fan speed of SYS_FAN_1
SYS_FAN_2	Fan speed of SYS_FAN_2
SYS_FAN_3	Fan speed of SYS_FAN_3

SYS_FAN_4	Fan speed of SYS_FAN_4
SYS_FAN_5	Fan speed of SYS_FAN_5
SYS_FAN_6	Fan speed of SYS_FAN_6
SYS_FAN_7	Fan speed of SYS_FAN_7
SYS_FAN_8	Fan speed of SYS_FAN_8
SYS_FAN_9	Fan speed of SYS_FAN_9
SYS_FAN_10	Fan speed of SYS_FAN_10
SYS_FAN_11	Fan speed of SYS_FAN_11
SYS_FAN_12	Fan speed of SYS_FAN_12

Appendix IV: 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.

TYAN® TN76-B7102 Service Engineer's Manual V1.0

Document No.: D2316-100