FT77D-B7109

Service Engineer's Manual



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● FCC Declaration



Notice for the USA

Compliance Information Statement (Supplier's Declaration of Conformity, SDoC) FCC Part 15: This device complies with part 15 of the FCC Rules.

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

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

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

Notice for Canada

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

● Notice for Europe (CE Mark)



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

Warning

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

CAUTION

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

● VCCI-A

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

● Safety: IEC/EN 60950-1

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

About this Manual

This manual is intended for trained service technician/personnel with hardware knowledge of personal computers.
It is aimed to provide you with instructions on installing your TYAN FT77D-B7109.

How this guide is organized

This guide contains the following parts:

Chapter 1: Overview
This chapter provides an introduction to the TYAN FT77D-B7109 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: Motherboard Information
This chapter lists the hardware setup procedures that you need to abide by when installing system components. It includes description of the jumpers and connectors on the motherboard.

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

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

Appendix:
This chapter 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 FT77D-B7109, take note of the following precautions:

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

Safety Information

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

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

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

Symbols on Equipment

	**Caution**. This symbol indicates a potential hazard. The potential for injury exists if cautions are not observed. Consult equipment documentation for specific details.
	**Caution.** Slide-mounted equipment is not to be used as a shelf or a work space.
	**Warning.** This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.
	**Warning**. This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists. To reduce risk of injury from a hot component, allow the surface to cool before touching.

General Precautions

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

Machine Room Environment

- This device is for use only in a restricted access location, such as 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 trained service technician/personnel who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy levels.

• Do not exceed the level of repair specified in the procedures in the product

documentation. Improper repairs can create a safety hazard.

- Allow the product to cool before removing covers and touching internal components.
- Remove all watches, rings, or loose jewelry when working before removing covers and touching internal components.
- Do not use conductive tools that could bridge live parts.
- Use gloves when you remove or replace system components; they can become hot to the touch.
- If the product sustains damage requiring service, disconnect the product from the AC electrical outlet and refer servicing to an authorized service provider. Examples of damage requiring service include:

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

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

– The product has been exposed to rain or water.

– The product has been dropped or damaged.

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

- Retain all screws or other fasteners when removing access cover(s). Upon completion of accessing inside the product, refasten access cover with original screws or fasteners.

Separate Protective Earthing Terminal and Earthing Wire

- This separate protective earthing terminal should be permanently connected to earth and the protective earthing wire should have conductor size of 6 mm^2 with UL/CSA-approved.



A ground conductor and terminated with a lug



Label with following wording affixed adjacent to the PSU AC Inlet indicates that the Equipment is with touch current exceeding 3.5 mA.

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NOTE

1.1 About the TYAN FT77D-B7109

Congratulations on your purchase of the TYAN® FT77D-B7109, a highly optimized 4U rack-mountable barebone system. The FT77D-B7109 is designed to support dual Intel® Xeon® Scalable Processor Families and up to 768GB RDIMM / 1536GB LRDIMM / 3072GB RDIMM 3DS / LRDIMM 3DS, providing a rich feature set and incredible performance. Leveraging advanced technology from Intel®, the FT77D-B7109 server system is capable of offering scalable 32 and 64-bit computing, high bandwidth memory design, and lightning-fast PCI-E bus implementation. The FT77D-B7109 not only empowers your company in nowadays IT demand but also offers a smooth path for future application usage.

TYAN® also offers the FT77D-B7109 in a version that can support up to fourteen (14) internal hot-swappable 2.5" SATA HDD/SSD or NVMe SSD and (4) internal hot-swappable 3.5"/2.5" SATA HDD/SSD. The FT77D-B7109 uses TYAN's latest chassis featuring a robust structure and a solid mechanical enclosure. All of this provides FT77D-B7109 the power and flexibility to meet the needs of nowadays server application.



1.2 Product Models

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

- **B7109F77DV14HR-2T-N**: Intel-based platform
- **B7109F77DV14HR-2T-NF**: Intel-based platform
- **B7109F77DV14HR-8X-2T-F**: Intel-based platform
- **B7109F77DV10E4HR-2T-NF**: Intel-based platform
- **B7109F77DV10E4HR-2T-N**: Intel-based platform
- **B7109F77DV10E4HR-8X-2T-F**: Intel-based platform
- **B7109F77DV4HR-2T-NF**: Intel-based platform
- **B7109F77DV4HR-8X-2T-F**: Intel-based platform

Model	SKU	Internal HDD Bays	Fabric CPU support	GPGPU support
FT77D-B7109	B7109F77DV14HR-2T-N	(14) 2.5”SATA		support
FT77D-B7109	B7109F77DV14HR-2T-NF	(14) 2.5”SATA	support	support
FT77D-B7109	B7109F77DV14HR-8X-2T-F	(14) 2.5”SATA	support	
FT77D-B7109	B7109F77DV10E4HR-2T-NF	(10) 2.5”SATA + (4) NVMe SSD bays	support	support
FT77D-B7109	B7109F77DV10E4HR-2T-N	(10) 2.5”SATA + (4) NVMe SSD bays		support
FT77D-B7109	B7109F77DV10E4HR-8X-2T-F	(10) 2.5”SATA + (4) NVMe SSD bays	support	
FT77D-B7109	B7109F77DV4HR-2T-NF	(4) 3.5”/2.5”SATA	support	support
FT77D-B7109	B7109F77DV4HR-8X-2T-F	(4) 3.5”/2.5”SATA	support	

1.3 GPU limited support list for FT77D-B7109

GPU Card (when 8 slots fully populated)	Configure
NVIDIA Tesla V100/16GB	Need to remove HDD6~HDD13 at 33° C
NVIDIA Tesla P100/16GB	Need to remove HDD6~HDD13 at 35° C
NVIDIA Tesla P100/12GB	Need to remove HDD6~HDD13 at 35° C

1.4 Features

TYAN FT77D-B7109 (B7109F77DV4HR-2T-NF)

System	**Form Factor**	4U Rackmount
	Chassis Model	FT77D
	Dimension (D x W x H)	30.31" x 17.24" x 6.93" (770 x 438 x 176mm)
	Motherboard Name	S7109GM2NR-2T
	Gross Weight	45 kg (99.5 lbs)
	Net weight	26 kg (57.5 lbs)
Front Panel	**Buttons**	(1) RST, (1) NMI, (1) ID, (1) PWR w/ LED
	LEDs	(1) HDD, (1) ID, (1) Warning, (3) LAN
	I/O Ports	(2) USB 3.0 ports
Internal Drive Bay	**Q'ty / Type**	(4) 3.5"/2.5" Hot-Swap SSD/HDD
	HDD Backplane Support	SAS 12Gb/s, SATA 6Gb/s, NVMe
	Supported HDD Interface	(4) SATA 6Gb/s
System Cooling Configuration	**Redundancy**	Yes
	FAN	(5+1) hot-swap 12cm fans
Power Supply	**Type**	RPSU
	Input Range	AC 100-127V/12.9A , AC 200-240V/9.5A
	Frequency	47-63 Hz
	Output Watts	Max. 2,000 Watts (100-127V AC input), Max. 3,200Watts (200-240V AC input)
	Efficiency	PFC, 80 plus Platinum
	Redundancy	2+1 **NOTE:** When use 100V-127V AC input, the system does not support redundant PSU operation if the total system load exceeds 20A (2000 Watts)
Processor	**Q'ty / Socket Type**	(2) LGA3647, *Socket-F support
	Supported CPU Series	Intel Xeon Scalable Processor

	Thermal Design Power (TDP) Wattage	Max up to 205W	
	System Bus	Up to 10.4/9.6 GT/s with Intel UltraPath Interconnect (UPI) support	
Chipset	**PCH**	Intel C621	
	Switch IC	(4) PLX PEX8747	
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 3DS/LRDIMM 3DS *Follow latest Intel DDR4 Memory POR	
	Memory channel	6 Channels per CPU	
	Memory voltage	1.2V	
Expansion Slots	**PCI-E**	(16) PCI-E Gen3 x8 slots (Full-height, Full-length, Single-width) / (1) PCI-E Gen3 x8 storage mezz. slot / (1) PCI-E Gen3 x8 LAN mezz. slot	
	Pre-install TYAN Riser Card	(1) M2215-L8-1F riser card for (1) LAN mezz. slot / (1) M2217-L16-IO riser card for (1) storage mezz. slot	
LAN	**Q'ty / Port**	(2) 10GbE ports, (1) PHY	
	Controller	Intel X550-AT2	
	PHY	Realtek RTL8211E	
Storage	**sSATA**	**Connector**	(1) Mini-SAS HD (4-ports)
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)
Graphic	**Connector type**	D-Sub 15-pin	
	Resolution	Up to 1920x1200	
	Chipset	Aspeed AST2500	
I/O Ports	**USB**	(2) USB3.0 ports (at front)	
	COM	(1) DB-9 COM port (at front)	
	VGA	(1) D-Sub 15-pin port (at front)	

	RJ-45	(2) 10GbE ports, (1) GbE 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	24-bit high quality video compression, Supports storage over IP and remote platform-flash, USB 2.0 virtual hub
	AST2500 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC),10/100/1000 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI, 32MB
	Feature	Hardware Monitor, SMBIOS 3.0/PnP/Wake on LAN, Boot from USB device/PXE via LAN/Storage, User Configurable FAN PWM Duty Cycle, Console Redirection, ACPI sleeping states S4,S5, ACPI 6.1
Operating System	**OS supported list**	Please refer to our AVL support lists.
Regulation	**FCC (SDoC)**	Class A
	CE (DoC)	Class A
	CB/LVD	Yes
	RCM	Class A
	VCCI	Class A
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C

RoHS	RoHS 6/6 Compliant	Yes
Package Contains	Barebone	(1) FT77D-B7109 w/NV Tesla-aware FW Barebone
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN Device Driver CD

TYAN FT77D-B7109 (B7109F77DV4HR-8X-2T-F)

System	Form Factor	4U Rackmount
	Chassis Model	FT77D
	Dimension (D x W x H)	30.31" x 17.24" x 6.93" (770 x 438 x 176mm)
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	LEDs	(1) HDD, (1) ID, (1) Warning, (3) LAN
	I/O Ports	(2) USB 3.0 ports
Internal Drive Bay	Q'ty / Type	(4) 3.5"/2.5" Hot-Swap SSD/HDD
	HDD Backplane Support	SAS 12Gb/s, SATA 6Gb/s, NVMe
	Supported HDD Interface	(4) SATA 6Gb/s
System Cooling Configuration	Redundancy	Yes
	FAN	(5+1) hot-swap 12cm fans
Power Supply	Type	RPSU
	Input Range	AC 100-127V/12.9A , AC 200-240V/9.5A
	Frequency	47-63 Hz
	Output Watts	Max. 2,000 Watts (100-127V AC input), Max. 3,200Watts (200-240V AC input)
	Efficiency	PFC, 80 plus Platinum
	Redundancy	2+1 **NOTE:** When use 100V-127V AC

			input, the system does not support redundant PSU operation if the total system load exceeds 20A (2000 Watts)
Processor	**Q'ty / Socket Type**		(2) LGA3647, *Socket-F support
	Supported CPU Series		Intel Xeon Scalable Processor
	Thermal Design Power (TDP) Wattage		Max up to 205W
	System Bus		Up to 10.4/9.6 GT/s with Intel UltraPath Interconnect (UPI) support
Chipset	**PCH**		Intel C621
	Switch IC		(4) PLX PEX8747
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 3DS/LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel		6 Channels per CPU
	Memory voltage		1.2V
Expansion Slots	**PCI-E**		(16) PCI-E Gen3 x8 slots (Full-height, Full-length, Single-width) / (1) PCI-E Gen3 x8 storage mezz. slot / (1) PCI-E Gen3 x8 LAN mezz. slot
	Pre-install TYAN Riser Card		(1) M2215-L8-1F riser card for (1) LAN mezz. slot / (1) M2217-L16-IO riser card for (1) storage mezz. slot
LAN	**Q'ty / Port**		(2) 10GbE ports, (1) PHY
	Controller		Intel X550-AT2
	PHY		Realtek RTL8211E
Storage	**sSATA**	**Connector**	(1) Mini-SAS HD (4-ports)
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)

Graphic	**Connector type**	D-Sub 15-pin
	Resolution	Up to 1920x1200
	Chipset	Aspeed AST2500
I/O Ports	**USB**	(2) USB3.0 ports (at front)
	COM	(1) DB-9 COM port (at front)
	VGA	(1) D-Sub 15-pin port (at front)
	RJ-45	(2) 10GbE ports, (1) GbE 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	24-bit high quality video compression, Supports storage over IP and remote platform-flash, USB 2.0 virtual hub
	AST2500 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC),10/100/1000 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI, 32MB
	Feature	Hardware Monitor, SMBIOS 3.0/PnP/Wake on LAN, Boot from USB device/PXE via LAN/Storage, User Configurable FAN PWM Duty Cycle, Console Redirection, ACPI sleeping states S4,S5, ACPI 6.1
Operating System	**OS supported list**	Please refer to our AVL support lists.
Regulation	**FCC (SDoC)**	Class A
	CE (DoC)	Class A
	CB/LVD	Yes

	RCM	Class A
	VCCI	Class A
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Barebone**	(1) FT77D-B7109 Barebone
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN Device Driver CD

TYAN FT77D-B7109 (B7109F77DV14HR-2T-N)

System	**Form Factor**	4U Rackmount
	Chassis Model	FT77D
	Dimension (D x W x H)	30.31" x 17.24" x 6.93" (770 x 438 x 176mm)
	Motherboard Name	S7109GM2NR-2T
	Gross Weight	45 kg (99.5 lbs)
	Net weight	26 kg (57.5 lbs)
Front Panel	**Buttons**	(1) RST, (1) NMI, (1) ID, (1) PWR w/ LED
	LEDs	(1) HDD, (1) ID, (1) Warning, (3) LAN
	I/O Ports	(2) USB 3.0 ports
Internal Drive Bay	**Q'ty / Type**	(14) 2.5" Hot-Swap SSD/HDD
	HDD Backplane Support	SAS 12Gb/s, SATA 6Gb/s, NVMe
	Supported HDD Interface	(14) SATA 6Gb/s
System Cooling Configuration	**Redundancy**	Yes
	FAN	(5+1) hot-swap 12cm fans
Power Supply	**Type**	RPSU
	Input Range	AC 100-127V/12.9A , AC 200-240V/9.5A
	Frequency	47-63 Hz

	Output Watts	Max. 2,000 Watts (100-127V AC input), Max. 3,200Watts (200-240V AC input)
	Efficiency	PFC, 80 plus Platinum
	Redundancy	2+1 **NOTE:** When use 100V-127V AC input, the system does not support redundant PSU operation if the total system load exceeds 20A (2000 Watts)
Processor	**Q'ty / Socket Type**	(2) LGA3647
	Supported CPU Series	Intel Xeon Scalable Processor
	Thermal Design Power (TDP) Wattage	Max up to 205W
	System Bus	Up to 10.4/9.6 GT/s with Intel UltraPath Interconnect (UPI) support
Chipset	**PCH**	Intel C621
	Switch IC	(4) PLX PEX8747
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/ 2,048GB RDIMM 3DS/LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel	6 Channels per CPU
	Memory voltage	1.2V
Expansion Slots	**PCI-E**	(16) PCI-E Gen3 x8 slots (Full-height, Full-length, Single-width) / (1) PCI-E Gen3 x8 storage mezz. slot / (1) PCI-E Gen3 x8 LAN mezz. slot
	Pre-install TYAN Riser Card	(1) M2215-L8-1F riser card for (1) LAN mezz. slot / (1) M2217-L16-IO riser card for (1) storage mezz. slot
LAN	**Q'ty / Port**	(2) 10GbE ports, (1) PHY
	Controller	Intel X550-AT2
	PHY	Realtek RTL8211E

Storage	**SATA**	**Connector**	(2) Mini-SAS HD (8-ports)
		Controller	Intel C621
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)
	sSATA	**Connector**	(2) SATA-III, (1) Mini-SAS HD (4-ports)
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2500
I/O Ports	**USB**		(2) USB3.0 ports (at front)
	COM		(1) DB-9 COM port (at front)
	VGA		(1) D-Sub 15-pin port (at front)
	RJ-45		(2) 10GbE ports, (1) GbE 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		24-bit high quality video compression, Supports storage over IP and remote platform-flash, USB 2.0 virtual hub
	AST2500 IPMI Feature		IPMI 2.0 compliant baseboard management controller (BMC),10/100/1000 Mb/s MAC interface
BIOS	**Brand / ROM size**		AMI, 32MB

	Feature	Hardware Monitor, SMBIOS 3.0/PnP/Wake on LAN, Boot from USB device/PXE via LAN/Storage, User Configurable FAN PWM Duty Cycle, Console Redirection, ACPI sleeping states S4,S5, ACPI 6.1
Operating System	**OS supported list**	Please refer to our AVL support lists.
Regulation	**FCC (SDoC)**	Class A
	CE (DoC)	Class A
	CB/LVD	Yes
	RCM	Class A
	VCCI	Class A
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Barebone**	(1) FT77D-B7109 w/NV Tesla-aware FW Barebone
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN Device Driver CD

FT77D-B7109 (B7109F77DV14HR-2T-NF)

System	**Form Factor**	4U Rackmount
	Chassis Model	FT77D
	Dimension (D x W x H)	30.31" x 17.24" x 6.93" (770 x 438 x 176mm)
	Motherboard Name	S7109GM2NR-2T
	Gross Weight	45 kg (99.5 lbs)
	Net weight	26 kg (57.5 lbs)
Front Panel	**Buttons**	(1) RST, (1) NMI, (1) ID, (1) PWR w/ LED
	LEDs	(1) HDD, (1) ID, (1) Warning, (3) LAN
	I/O Ports	(2) USB 3.0 ports
Internal Drive Bay	**Q'ty / Type**	(14) 2.5" Hot-Swap SSD/HDD

	HDD Backplane Support	SAS 12Gb/s, SATA 6Gb/s, NVMe
	Supported HDD Interface	(14) SATA 6Gb/s
System Cooling Configuration	**Redundancy**	Yes
	FAN	(5+1) hot-swap 12cm fans
Power Supply	**Type**	RPSU
	Input Range	AC 100-127V/12.9A , AC 200-240V/9.5A
	Frequency	47-63 Hz
	Output Watts	Max. 2,000 Watts (100-127V AC input), Max. 3,200Watts (200-240V AC input)
	Efficiency	PFC, 80 plus Platinum
	Redundancy	2+1 **NOTE:** When use 100V-127V AC input, the system does not support redundant PSU operation if the total system load exceeds 20A (2000 Watts)
Processor	**Q'ty / Socket Type**	(2) LGA3647, *Socket-F support
	Supported CPU Series	Intel Xeon Scalable Processor
	Thermal Design Power (TDP) Wattage	Max up to 205W
	System Bus	Up to 10.4/9.6 GT/s with Intel UltraPath Interconnect (UPI) support
Chipset	**PCH**	Intel C621
	Switch IC	(4) PLX PEX8747
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 3DS/LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel	6 Channels per CPU
	Memory voltage	1.2V

Expansion Slots	**PCI-E**		(16) PCI-E Gen3 x8 slots (Full-height, Full-length, Single-width) / (1) PCI-E Gen3 x8 storage mezz. slot / (1) PCI-E Gen3 x8 LAN mezz. slot
	Pre-install TYAN Riser Card		(1) M2215-L8-1F riser card for (1) LAN mezz. slot / (1) M2217-L16-IO riser card for (1) storage mezz. slot
LAN	**Q'ty / Port**		(2) 10GbE ports, (1) PHY
	Controller		Intel X550-AT2
	PHY		Realtek RTL8211E
Storage	**SATA**	**Connector**	(2) Mini-SAS HD (8-ports)
		Controller	Intel C621
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)
	sSATA	**Connector**	(2) SATA-III, (1) Mini-SAS HD (4-ports)
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2500
I/O Ports	**USB**		(2) USB3.0 ports (at front)
	COM		(1) DB-9 COM port (at front)
	VGA		(1) D-Sub 15-pin port (at front)
	RJ-45		(2) 10GbE ports, (1) GbE 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	24-bit high quality video compression, Supports storage over IP and remote platform-flash, USB 2.0 virtual hub
	AST2500 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC),10/100/1000 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI, 32MB
	Feature	Hardware Monitor, SMBIOS 3.0/PnP/Wake on LAN, Boot from USB device/PXE via LAN/Storage, User Configurable FAN PWM Duty Cycle, Console Redirection, ACPI sleeping states S4,S5, ACPI 6.1
Operating System	**OS supported list**	Please refer to our AVL support lists.
Regulation	**FCC (SDoC)**	Class A
	CE (DoC)	Class A
	CB/LVD	Yes
	RCM	Class A
	VCCI	Class A
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Barebone**	(1) FT77D-B7109 w/NV Tesla-aware FW Barebone
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN Device Driver CD

TYAN FT77D-B7109 (B7109F77DV14HR-8X-2T-F)

System	**Form Factor**	4U Rackmount
	Chassis Model	FT77D

	Dimension (D x W x H)	30.31" x 17.24" x 6.93" (770 x 438 x 176mm)
	Motherboard Name	S7109GM2NR-8X-2T
	Gross Weight	45 kg (99.5 lbs)
	Net weight	26 kg (57.5 lbs)
Front Panel	**Buttons**	(1) RST, (1) NMI, (1) ID, (1) PWR w/ LED
	LEDs	(1) HDD, (1) ID, (1) Warning, (3) LAN
	I/O Ports	(2) USB 3.0 ports
Internal Drive Bay	**Q'ty / Type**	(14) 2.5" Hot-Swap SSD/HDD
	HDD Backplane Support	SAS 12Gb/s, SATA 6Gb/s, NVMe
	Supported HDD Interface	(14) SATA 6Gb/s
System Cooling Configuration	**Redundancy**	Yes
	FAN	(5+1) hot-swap 12cm fans
Power Supply	**Type**	RPSU
	Input Range	AC 100-127V/12.9A , AC 200-240V/9.5A
	Frequency	47-63 Hz
	Output Watts	Max. 2,000 Watts (100-127V AC input), Max. 3,200Watts (200-240V AC input)
	Efficiency	PFC, 80 plus Platinum
	Redundancy	2+1 **NOTE:** When use 100V-127V AC input, the system does not support redundant PSU operation if the total system load exceeds 20A (2000 Watts)
Processor	**Q'ty / Socket Type**	(2) LGA3647, *Socket-F support
	Supported CPU Series	Intel Xeon Scalable Processor
	Thermal Design Power (TDP) Wattage	Max up to 205W
	System Bus	Up to 10.4/9.6 GT/s with Intel UltraPath Interconnect (UPI) support

Chipset	**PCH**	Intel C621	
	Switch IC	(4) PLX PEX8747	
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 3DS/LRDIMM 3DS *Follow latest Intel DDR4 Memory POR	
	Memory channel	6 Channels per CPU	
	Memory voltage	1.2V	
Expansion Slots	**PCI-E**	(16) PCI-E Gen3 x8 slots (Full-height, Full-length, Single-width) / (1) PCI-E Gen3 x8 storage mezz. slot / (1) PCI-E Gen3 x8 LAN mezz. slot	
	Pre-install TYAN Riser Card	(1) M2215-L8-1F riser card for (1) LAN mezz. slot / (1) M2217-L16-IO riser card for (1) storage mezz. slot	
LAN	**Q'ty / Port**	(2) 10GbE ports, (1) PHY	
	Controller	Intel X550-AT2	
	PHY	Realtek RTL8211E	
Storage	**SATA**	**Connector**	(2) Mini-SAS HD (8-ports)
		Controller	Intel C621
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)
	sSATA	**Connector**	(2) SATA-III, (1) Mini-SAS HD (4-ports)
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)
Graphic	**Connector type**	D-Sub 15-pin	
	Resolution	Up to 1920x1200	
	Chipset	Aspeed AST2500	
I/O Ports	**USB**	(2) USB3.0 ports (at front)	
	COM	(1) DB-9 COM port (at front)	

	VGA	(1) D-Sub 15-pin port (at front)
	RJ-45	(2) 10GbE ports, (1) GbE 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	24-bit high quality video compression, Supports storage over IP and remote platform-flash, USB 2.0 virtual hub
	AST2500 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC),10/100/1000 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI, 32MB
	Feature	Hardware Monitor, SMBIOS 3.0/PnP/Wake on LAN, Boot from USB device/PXE via LAN/Storage, User Configurable FAN PWM Duty Cycle, Console Redirection, ACPI sleeping states S4,S5, ACPI 6.1
Operating System	**OS supported list**	Please refer to our AVL support lists.
Regulation	**FCC (SDoC)**	Class A
	CE (DoC)	Class A
	CB/LVD	Yes
	RCM	Class A
	VCCI	Class A
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating	90%, non-condensing at 35° C

	Humidity	
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Barebone**	(1) FT77D-B7109 Barebone
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN Device Driver CD

FT77D-B7109 (B7109F77DV10E4HR-2T-N)

System	**Form Factor**	4U Rackmount
	Chassis Model	FT77D
	Dimension (D x W x H)	30.31" x 17.24" x 6.93" (770 x 438 x 176mm)
	Motherboard Name	S7109GM2NR-2T
	Gross Weight	45 kg (99.5 lbs)
	Net weight	26 kg (57.5 lbs)
Front Panel	**Buttons**	(1) RST, (1) NMI, (1) ID, (1) PWR w/ LED
	LEDs	(1) HDD, (1) ID, (1) Warning, (3) LAN
	I/O Ports	(2) USB 3.0 ports
Internal Drive Bay	**Q'ty / Type**	(10) 2.5" Hot-Swap SSD/HDD + (4) NVMe
	HDD Backplane Support	SAS 12Gb/s, SATA 6Gb/s, NVMe
	Supported HDD Interface	(10) SATA 6Gb/s + (4) NVMe
System Cooling Configuration	**Redundancy**	Yes
	FAN	(5+1) hot-swap 12cm fans
Power Supply	**Type**	RPSU
	Input Range	AC 100-127V/12.9A , AC 200-240V/9.5A
	Frequency	47-63 Hz
	Output Watts	Max. 2,000 Watts (100-127V AC input), Max. 3,200Watts (200-240V AC input)
	Efficiency	PFC, 80 plus Platinum
	Redundancy	2+1

			NOTE: When use 100V-127V AC input, the system does not support redundant PSU operation if the total system load exceeds 20A (2000 Watts)
Processor	**Q'ty / Socket Type**		(2) LGA3647
	Supported CPU Series		Intel Xeon Scalable Processor
	Thermal Design Power (TDP) Wattage		Max up to 205W
	System Bus		Up to 10.4/9.6 GT/s with Intel UltraPath Interconnect (UPI) support
Chipset	**PCH**		Intel C621
	Switch IC		(4) PLX PEX8747
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/ 2,048GB RDIMM 3DS/LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel		6 Channels per CPU
	Memory voltage		1.2V
Expansion Slots	**PCI-E**		(16) PCI-E Gen3 x8 slots (Full-height, Full-length, Single-width) / (1) PCI-E Gen3 x8 storage mezz. slot / (1) PCI-E Gen3 x8 LAN mezz. slot
	Pre-install TYAN Riser Card		(1) M2215-L8-1F riser card for (1) LAN mezz. slot / (1) M2217-L16-IO riser card for (1) storage mezz. slot
LAN	**Q'ty / Port**		(2) 10GbE ports, (1) PHY
	Controller		Intel X550-AT2
	PHY		Realtek RTL8211E
Storage	**SATA**	**Connector**	(2) Mini-SAS HD (8-ports)
		Controller	Intel C621
		Speed	6.0 Gb/s

		RAID	RAID 0/1/10/5 (Intel RSTe)
	sSATA	**Connector**	(2) SATA-III
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)
	NVMe	**Connector (OCuLink)**	(2) SFF-8612 for (4) NVMe ports via Tyan M2093 PCI-E Gen3 x16 Card
Graphic	**Connector type**	D-Sub 15-pin	
	Resolution	Up to 1920x1200	
	Chipset	Aspeed AST2500	
I/O Ports	**USB**	(2) USB3.0 ports (at front)	
	COM	(1) DB-9 COM port (at front)	
	VGA	(1) D-Sub 15-pin port (at front)	
	RJ-45	(2) 10GbE ports, (1) GbE 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	24-bit high quality video compression, Supports storage over IP and remote platform-flash, USB 2.0 virtual hub	
	AST2500 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC),10/100/1000 Mb/s MAC interface	
BIOS	**Brand / ROM size**	AMI, 32MB	
	Feature	Hardware Monitor, SMBIOS	

		3.0/PnP/Wake on LAN, Boot from USB device/PXE via LAN/Storage, User Configurable FAN PWM Duty Cycle, Console Redirection, ACPI sleeping states S4,S5, ACPI 6.1
Operating System	**OS supported list**	Please refer to our AVL support lists.
Regulation	**FCC (SDoC)**	Class A
	CE (DoC)	Class A
	CB/LVD	Yes
	RCM	Class A
	VCCI	Class A
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Barebone**	(1) FT77D-B7109 w/NV Tesla-aware FW Barebone
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN Device Driver CD

FT77D-B7109 (B7109F77DV10E4HR-2T-NF)

System	**Form Factor**	4U Rackmount
	Chassis Model	FT77D
	Dimension (D x W x H)	30.31" x 17.24" x 6.93" (770 x 438 x 176mm)
	Motherboard Name	S7109GM2NR-2T
	Gross Weight	45 kg (99.5 lbs)
	Net weight	26 kg (57.5 lbs)
Front Panel	**Buttons**	(1) RST, (1) NMI, (1) ID, (1) PWR w/ LED
	LEDs	(1) HDD, (1) ID, (1) Warning, (3) LAN
	I/O Ports	(2) USB 3.0 ports
Internal Drive Bay	**Q'ty / Type**	(10) 2.5" Hot-Swap SSD/HDD + (4) NVMe

	HDD Backplane Support	SAS 12Gb/s, SATA 6Gb/s, NVMe
	Supported HDD Interface	(10) SATA 6Gb/s + (4) NVMe
System Cooling Configuration	**Redundancy**	Yes
	FAN	(5+1) hot-swap 12cm fans
Power Supply	**Type**	RPSU
	Input Range	AC 100-127V/12.9A , AC 200-240V/9.5A
	Frequency	47-63 Hz
	Output Watts	Max. 2,000 Watts (100-127V AC input), Max. 3,200Watts (200-240V AC input)
	Efficiency	PFC, 80 plus Platinum
	Redundancy	2+1 **NOTE:** When use 100V-127V AC input, the system does not support redundant PSU operation if the total system load exceeds 20A (2000 Watts)
Processor	**Q'ty / Socket Type**	(2) LGA3647, *Socket-F support
	Supported CPU Series	Intel Xeon Scalable Processor
	Thermal Design Power (TDP) Wattage	Max up to 205W
	System Bus	Up to 10.4/9.6 GT/s with Intel UltraPath Interconnect (UPI) support
Chipset	**PCH**	Intel C621
	Switch IC	(4) PLX PEX8747
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 3DS/LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel	6 Channels per CPU
	Memory voltage	1.2V

Expansion Slots	**PCI-E**		(16) PCI-E Gen3 x8 slots (Full-height, Full-length, Single-width) / (1) PCI-E Gen3 x8 storage mezz. slot / (1) PCI-E Gen3 x8 LAN mezz. slot
	Pre-install TYAN Riser Card		(1) M2215-L8-1F riser card for (1) LAN mezz. slot / (1) M2217-L16-IO riser card for (1) storage mezz. slot
LAN	**Q'ty / Port**		(2) 10GbE ports, (1) PHY
	Controller		Intel X550-AT2
	PHY		Realtek RTL8211E
Storage	**SATA**	**Connector**	(2) Mini-SAS HD (8-ports)
		Controller	Intel C621
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)
	sSATA	**Connector**	(2) SATA-III
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)
	NVMe	**Connector (OCuLink)**	(2) SFF-8612 for (4) NVMe ports via Tyan M2093 PCI-E Gen3 x16 Card
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2500
I/O Ports	**USB**		(2) USB3.0 ports (at front)
	COM		(1) DB-9 COM port (at front)
	VGA		(1) D-Sub 15-pin port (at front)
	RJ-45		(2) 10GbE ports, (1) GbE 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	24-bit high quality video compression, Supports storage over IP and remote platform-flash, USB 2.0 virtual hub
	AST2500 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC),10/100/1000 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI, 32MB
	Feature	Hardware Monitor, SMBIOS 3.0/PnP/Wake on LAN, Boot from USB device/PXE via LAN/Storage, User Configurable FAN PWM Duty Cycle, Console Redirection, ACPI sleeping states S4,S5, ACPI 6.1
Operating System	**OS supported list**	Please refer to our AVL support lists.
Regulation	**FCC (SDoC)**	Class A
	CE (DoC)	Class A
	CB/LVD	Yes
	RCM	Class A
	VCCI	Class A
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Barebone**	(1) FT77D-B7109 w/NV Tesla-aware FW Barebone
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN Device Driver CD

FT77D-B7109 (B7109F77DV10E4HR-8X-2T-F)

System	**Form Factor**	4U Rackmount
	Chassis Model	FT77D
	Dimension (D x W x H)	30.31" x 17.24" x 6.93" (770 x 438 x 176mm)
	Motherboard Name	S7109GM2NR-8X-2T
	Gross Weight	45 kg (99.5 lbs)
	Net weight	26 kg (57.5 lbs)
Front Panel	**Buttons**	(1) RST, (1) NMI, (1) ID, (1) PWR w/ LED
	LEDs	(1) HDD, (1) ID, (1) Warning, (3) LAN
	I/O Ports	(2) USB 3.0 ports
Internal Drive Bay	**Q'ty / Type**	(10) 2.5" Hot-Swap SSD/HDD + (4) NVMe
	HDD Backplane Support	SAS 12Gb/s, SATA 6Gb/s, NVMe
	Supported HDD Interface	(14) SATA 6Gb/s
System Cooling Configuration	**Redundancy**	Yes
	FAN	(5+1) hot-swap 12cm fans
Power Supply	**Type**	RPSU
	Input Range	AC 100-127V/12.9A , AC 200-240V/9.5A
	Frequency	47-63 Hz
	Output Watts	Max. 2,000 Watts (100-127V AC input), Max. 3,200Watts (200-240V AC input)
	Efficiency	PFC, 80 plus Platinum
	Redundancy	2+1 **NOTE:** When use 100V-127V AC input, the system does not support redundant PSU operation if the total system load exceeds 20A (2000 Watts)
Processor	**Q'ty / Socket Type**	(2) LGA3647, *Socket-F support
	Supported CPU Series	Intel Xeon Scalable Processor
	Thermal Design Power (TDP) Wattage	Max up to 205W

	System Bus		Up to 10.4/9.6 GT/s with Intel UltraPath Interconnect (UPI) support
Chipset	**PCH**		Intel C621
	Switch IC		(4) PLX PEX8747
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 3DS/LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel		6 Channels per CPU
	Memory voltage		1.2V
Expansion Slots	**PCI-E**		(16) PCI-E Gen3 x8 slots (Full-height, Full-length, Single-width) / (1) PCI-E Gen3 x8 storage mezz. slot / (1) PCI-E Gen3 x8 LAN mezz. slot
	Pre-install TYAN Riser Card		(1) M2215-L8-1F riser card for (1) LAN mezz. slot / (1) M2217-L16-IO riser card for (1) storage mezz. slot
LAN	**Q'ty / Port**		(2) 10GbE ports, (1) PHY
	Controller		Intel X550-AT2
	PHY		Realtek RTL8211E
Storage	**SATA**	**Connector**	(2) Mini-SAS HD (8-ports)
		Controller	Intel C621
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)
	sSATA	**Connector**	(2) SATA-III
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RSTe)
	NVMe	**Connector (OCuLink)**	(2) SFF-8612 for (4) NVMe ports via Tyan M2093 PCI-E Gen3 x16 Card

Graphic	**Connector type**	D-Sub 15-pin
	Resolution	Up to 1920x1200
	Chipset	Aspeed AST2500
I/O Ports	**USB**	(2) USB3.0 ports (at front)
	COM	(1) DB-9 COM port (at front)
	VGA	(1) D-Sub 15-pin port (at front)
	RJ-45	(2) 10GbE ports, (1) GbE 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	24-bit high quality video compression, Supports storage over IP and remote platform-flash, USB 2.0 virtual hub
	AST2500 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC),10/100/1000 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI, 32MB
	Feature	Hardware Monitor, SMBIOS 3.0/PnP/Wake on LAN, Boot from USB device/PXE via LAN/Storage, User Configurable FAN PWM Duty Cycle, Console Redirection, ACPI sleeping states S4,S5, ACPI 6.1
Operating System	**OS supported list**	Please refer to our AVL support lists.
Regulation	**FCC (SDoC)**	Class A
	CE (DoC)	Class A
	CB/LVD	Yes

	RCM	Class A
	VCCI	Class A
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Barebone**	(1) FT77D-B7109 Barebone
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN Device Driver CD

NOTE:
1. The specifications are subject to change without prior notice.
2. Please visit our Web site for the latest specifications.

1.5 Standard Parts List

This section describes FT77D-B7109 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.

1.5.1 Box Contents

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

FT77D-B7109 Chassis Kit

- 4U chassis
- (2+1) 3,200W (80+ Platinum) w/ PFC redundant power supply (pre-installed)
- (6) 120X120X38MM Fan (pre-installed)
- S7109 Motherboard (pre-installed)
- M1284F77D-BP12E-14 HDD Backplane Board (pre-installed, only for 2.5" device SKU)
- M1291F77D-BP12E-4 HDD Backplane Board (pre-installed, only for 3.5"/2.5" device SKU)
- M1713F77C-FPB Front Panel Board (pre-installed)
- M7059F77C-D-PDB Power Distribution Board (pre-installed)
- M7109F77D-D-PBP Power Backplane Board (pre-installed)
- M1809F77A-FB Fan Board (pre-installed)
- M2215-L8-1F riser card (pre-installed)
- M2217-L6-IO OCP riser card (pre-installed)
- M2093 riser card (pre-installed) --- only for B7109F77DV10E4HR series

1.5.2 Accessories

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

FT77D-B7109 Accessory Kit

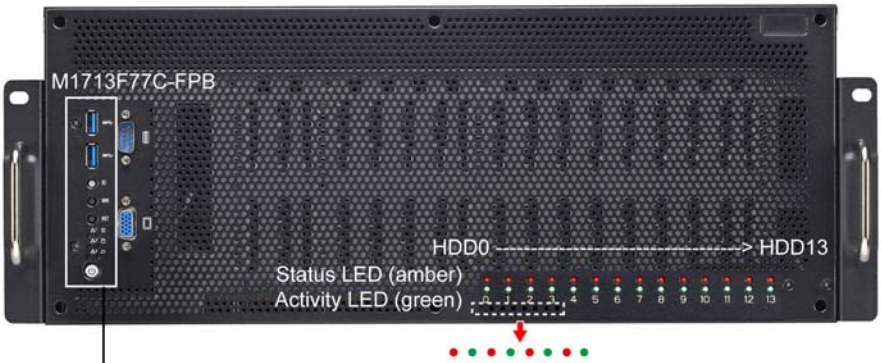
- (1) Rail Kit + (1) Rail screw kit
- (1) Card Guide kit
- (2) Screw Pack
- (2) CPU Heatsinks
- (3) US Power Cords

- (3) EU Power Cords
- (1) Set of Mounting Ears
- (3) PSU Clips
- (8) Screw Standoffs (only for 3.5”/2.5” device SKU)
- (16) 6-Pin PCIe Power Cables (only for -N/-NF SKU)
- (8) 8-Pin PCIe Power Cables (only for -N/-NF SKU)
- (8) 8-Pin EPS 12V CPU Power Cables (only for -N/-NF SKU)
- (8) GPU Card Holder Brackets /w screws (only for -N/-NF SKU)
- (1) CPU Air Duct
- (2) CPU Clips
- (2) Fabric CPU Clip (only for -F/-NF SKU)
- (1) Driver CD
- (1) Addendum for China Use

1.6 About the Product

The following views show you the product.

1.6.1 System Front View





M1713F77C-FPB and Front I/O Ports

1. USB3.0 Ports
2. ID Button
3. NMI Button
4. Reset Button
5. LAN1 LED
6. LAN2 LED
7. LAN3 LED (no function)
8. Power Button with LED
9. ID LED
10. HDD Activity LED
11. Warning LED
12. Serial Port
13. VGA Port

M1713F77C-FPB Front Panel LED Control Board

Switch and LED Indication

Item	Status	LED Color	Behavior	Note
5. LAN1	Access	Green	Blinking	
	Link	Green	Solid On	
	Off Link	Green	Off	
6. LAN2	Access	Green	Blinking	
	Link	Green	Solid On	
	Off Link	Green	Off	
7. LAN3	NA	NA	NA	No Function
8. Power	Power On	Green	Solid On	
	Power Off	Green	Off	
9. ID	Located	Blue	Solid On	
	Free	Blue	Off	
10. HDD Activity	Access	Green	Blinking	
11. Warning	Normal	Amber	Off	BMC & HWM system alert event (＊) N+1 Redundant PSU Indication
	Alert	Amber	Solid On	

＊Warning LED Indication for 2+1 PSU Redundancy System

Status	System Warning LED
All PSU present and plug AC cord when system power on	Off
One of PSU AC lose	Amber solid on
One of PSU not present	Amber solid on

HDD LED Indications

For 2.5" Device SKU (M1284F77D-BP12E-14 HDD BP pre-installed)



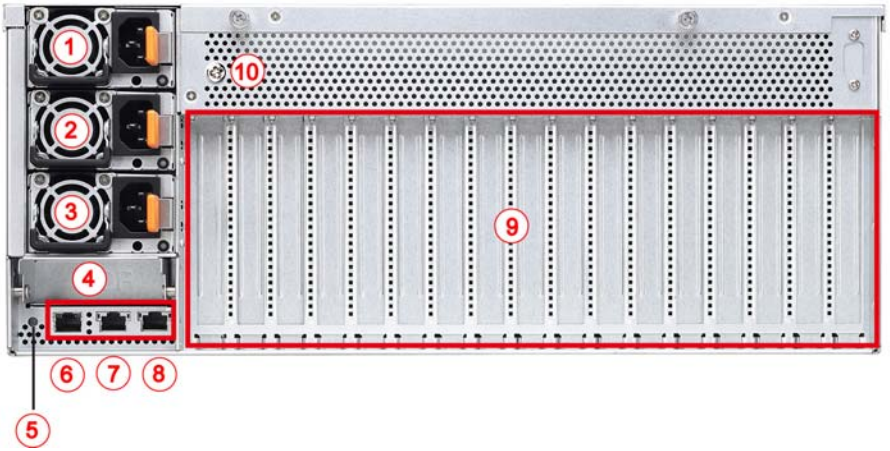
Drive State	Active LED (Green)	Status LED (Red)
Drive Present, not Active	Solid On	Off
Drive Present, Active	Blinking	Off
Drive Failure	Off	Solid On
RAID Rebuild	Blinking	Blinking @ 4 Hz
Drive Locate Identifier	Blinking	Blinking @ 1 Hz

For 3.5"/2.5" Device SKU (M1291F77D-BP12E-4 HDD BP pre-installed)

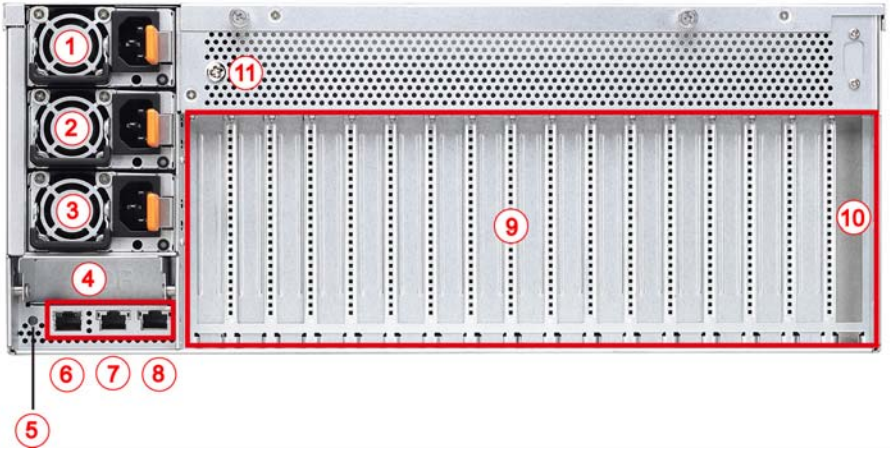


LED	Color	State	Description
HDD Fail LED (Status LED)	Red	ON	NVME/SATA/SAS HDD Failed
		OFF	No failure found
HDD Power/Access LED (Active LED)	Green	ON	NVME/SATA/SAS HDD Ready
		Blinking	NVME/SATA/SAS HDD Access Activity

1.6.2 System Rear View



B7109F77DV14HR Series & B7109F77DV4HR Series	
No.	**Description**
1	PSU2
2	PSU1
3	PSU0
4	Mezzanine Card Slot
5	ID LED Button
6	LAN3 (IPMI)
7	LAN2
8	LAN1
9	PCIE Slots
10	Protective Earthing Terminal (Screw type, M6X1)
NOTE: With every two out of three PSUs can boot up the FT77D-B7109.	



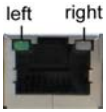
B7109F77DV10E4HR series	
No.	**Description**
1	PSU2
2	PSU1
3	PSU0
4	Mezzanine Card Slot
5	ID LED Button
6	LAN3 (IPMI)
7	LAN2
8	LAN1
9	PCIE Slots
10	PCIE Slot (M2093 pre-installed for NVMe SKU)
11	Protective Earthing Terminal (Screw type, M6X1)
NOTE: With every two out of three PSUs can boot up the FT77D-B7109.	

1.6.3 LED Definitions

10Gbps LAN Port LAN Indication

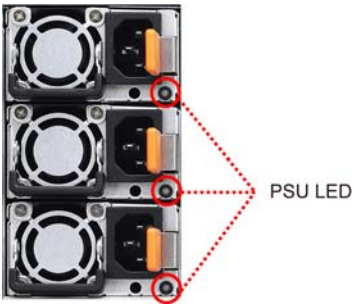
10Gbps LAN Link/Activity LED Scheme			
		**Left LED (Link/Activity) LED Color: Green**	**Right LED (Speed) LED Color: Yellow**
No Link		OFF	OFF
100 Mbps	Link	Green Solid On	Green Solid On
	Active	Green Blinking	Green Solid On
1000 Mbps (1Gbps)	Link	Green Solid On	Yellow Solid On
	Active	Green Blinking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

1Gbps LAN Port LAN Indication

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

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

NOTE:
1. LAN1/LAN2: Intel X550
2. LAN3: Realtek RTL8211E for IPMI



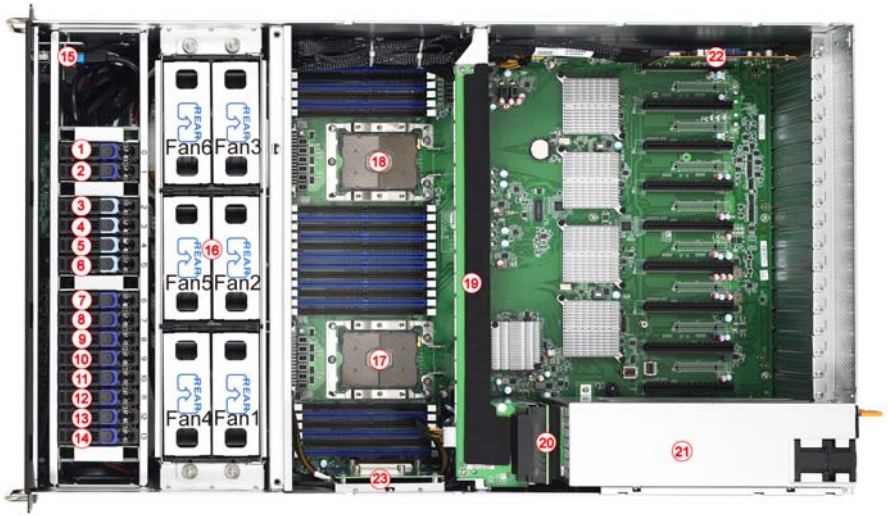
PSU LED Definitions

	Dual-color	
Power Supply Condition	**Green LED**	**Amber LED**
No AC power to all power supplies	OFF	OFF
Power supply critical event causing a shutdown; failure, OCP, OVP, Fan Fail, OTP, UVP	OFF	ON
Power supply warning events where the power supply continues to operate; but triggered high Temperature, high Voltage, high Current, and low fan rpm critical limit.	OFF	1Hz Blinking Amber
AC present only 12VSB on (PS off) or PS in Smart Redundant state	1Hz Blinking Green	OFF
Output ON and OK	ON	OFF
AC cord unplugged	OFF	ON

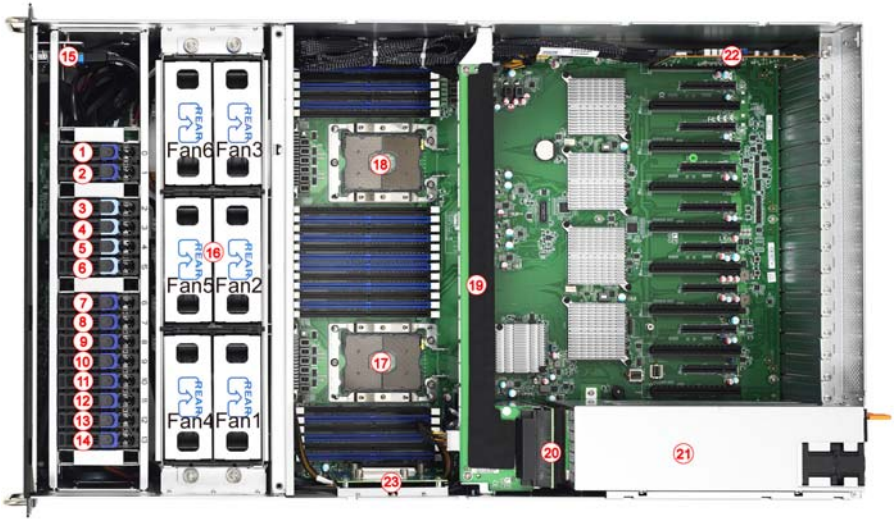
Warning: All PSUs have to be AC-ON at the same time before you power on the system.

1.6.4 System Top View

B7109F77DV10E4HR-2T-N SKU



B7109F77DV10E4HR-2T-8X-F SKU

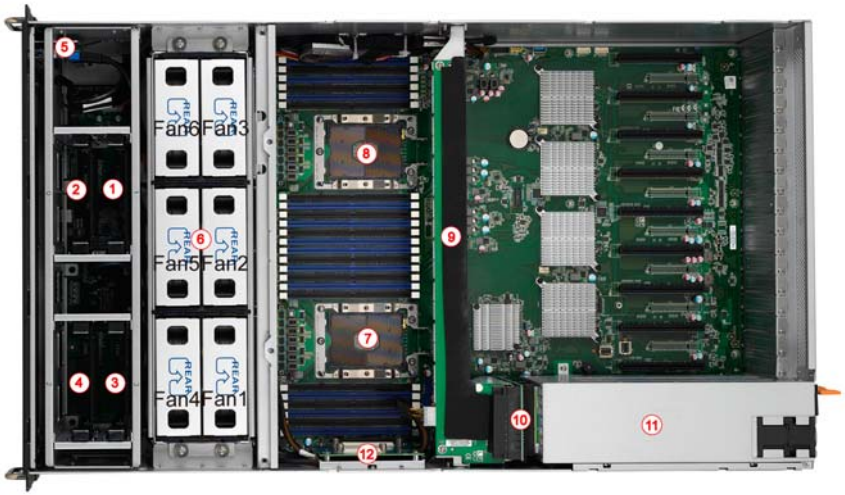


HDD Configurations

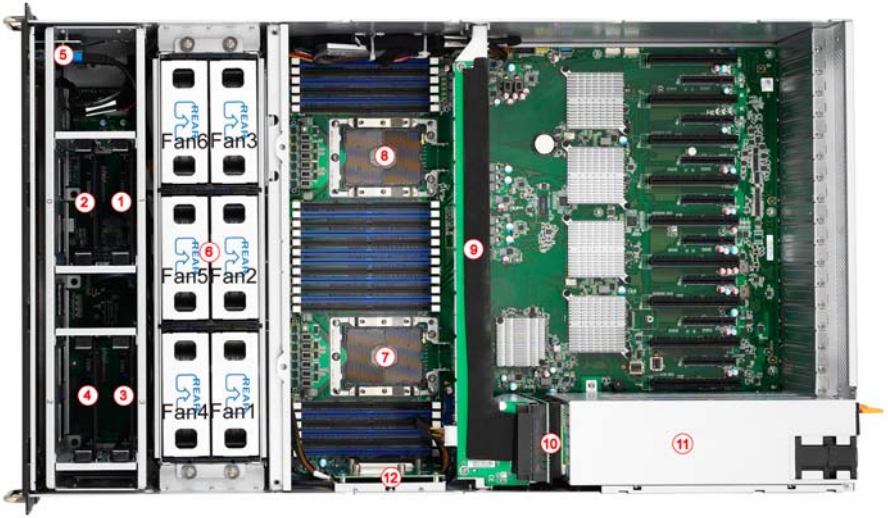
1. (14) SATA (#1~#14)
2. (10) SATA (#1~#2, #7~#14) + (4) NVMe (#3~#6)

No.	Description
1~14	(14) 2.5” HDDs/SSDs (HDD0 ~ HDD13) w/ M1284F77D-BP12E-14 HDD BP Board pre-installed
15	M1713F77C-FPB Front Panel Board
16	System Fans
17	CPU0
18	CPU1
19	M7059F77C-D-PDB Power Distribution Board
20	M7109F77D-D-PBP Power Backplane Board
21	(2+1) Redundant Power Supply
22	M2093 Riser Card (pre-installed for NVME SKU)
23	M2217-L16-IO OCP Riser Card (pre-installed)
NOTE: The system is pre-installed with S7109 motherboard.	

B7109F77DV4HR-2T-NF SKU



B7109F77DV4HR-2T-8X-F SKU



HDD Configurations

(4) SATA (#1~#4)

No.	Description
1~4	(4) 3.5”/2.5” SSDs/HDDs (HDD0 ~ HDD3) w/ M1291F77D-BP12E-4 HDD BP Board pre-installed
5	M1713F77C-FPB Front Panel Board
6	System Fans
7	CPU0
8	CPU1
9	M7059F77C-D-PDB Power Distribution Board
10	M7109F77D-D-PBP Power Backplane Board
11	(2+1) Redundant Power Supply
12	M2217-L16-IO OCP Riser Card (pre-installed)
NOTE: The system is pre-installed with S7109 motherboard.	

2.0.1 Before you Begin

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

2.0.2 Work Area

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

2.0.3 Tools

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

- A cross head (Phillips) screwdriver
- A grounding strap or an anti-static pad
- A T30 Security Torx screwdriver

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



Caution!

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

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 FT77D-B7109 or injury to yourself.

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

- Avoid touching motherboard components, IC chips, connectors, memory modules, and leads.

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

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

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

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

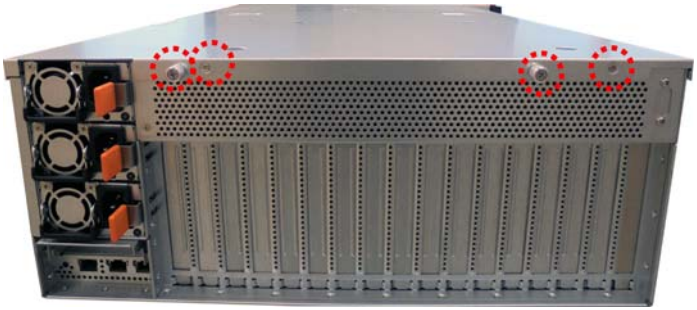
2.1 Installing Motherboard Components

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

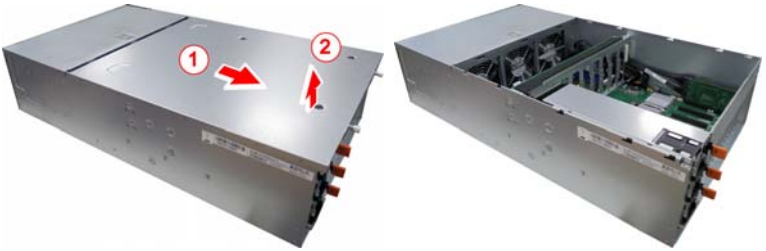
2.1.1 Removing the Chassis Cover

Follow these instructions to remove FT77D-B7109 chassis cover.

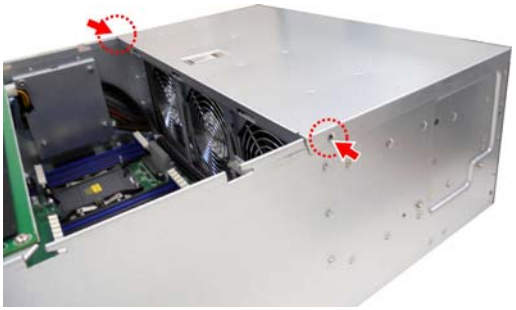
1. Loosen 2 thumb screws and 2 screws on the rear top cover.



2. Slide to lift up the rear top cover.



3. Unscrew the front top cover.



4. Release the latch to lift up the front top cover from the chassis.



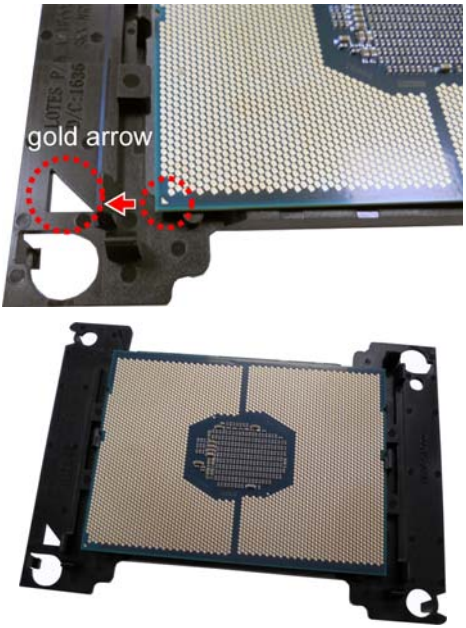




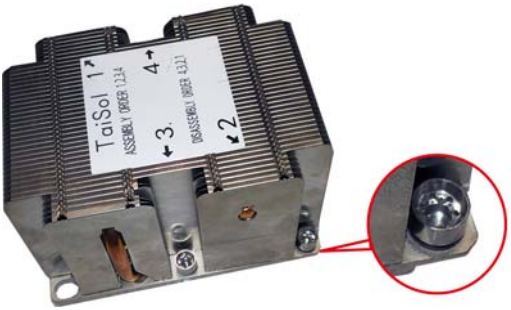
2.1.2 Installing the CPU and Heat sink

Follow the steps below on installing CPUs and CPU heatsinks.

1. Align and install the processor on the carrier.

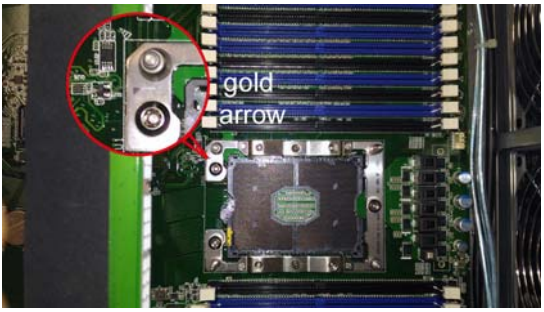


2. Carefully flip the heatsink. Then install the carrier assembly on the bottom of the heatsink and make sure the gold arrow is located in the correct direction.





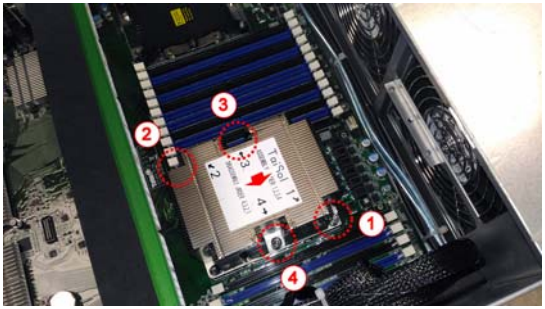
3. Locate the CPU socket's gold arrow. Always start with CPU0 first. Remove the CPU Socket protection cap.



NOTE: A new heatsink comes with pre-applied thermal grease.

Once the heatsink has been removed from the processor, you need to clean the processor and heatsink using an alcohol solvent. Then apply new thermal grease before reinstalling the heatsink.

4. Carefully flip the heatsink. Align the heatsink with 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.



5. To secure the heatsink, use a T30 Security Torx to tighten the screws in a sequential order (1→2→3→4).
NOTE: When disassembling the heatsink, loosen the screws in reverse order (4→3→2→1).

6. Repeat the procedures described earlier to install the second processor and heatsink.

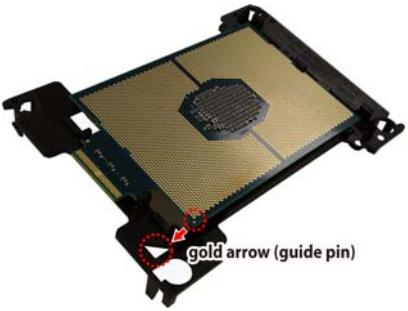
7. Place the CPU air duct back and screw it to the chassis.



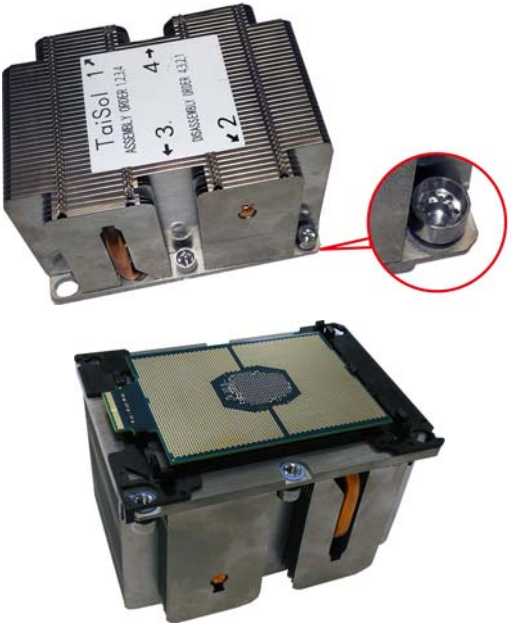
Fabric CPU Installation

Follow the steps below on installing Fabric CPUs and CPU heatsinks.

1. Align and install the processor on the carrier.



2. Carefully flip the heatsink. Then install the carrier assembly on the bottom of the heatsink and make sure the gold arrow is located in the correct direction.



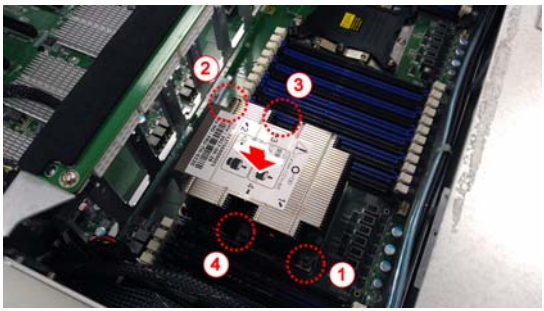
3. Locate the CPU socket's gold arrow. Always start with CPU0 first. Remove the CPU Socket protection cap.



NOTE: A new heatsink comes with pre-applied thermal grease.

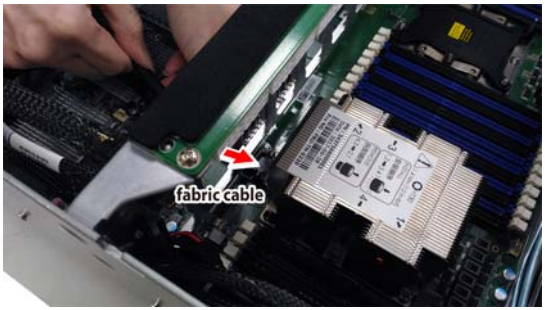
Once the heatsink has been removed from the processor, you need to clean the processor and heatsink using an alcohol solvent. Then apply new thermal grease before reinstalling the heatsink.

4. Carefully flip the heatsink. Align the heatsink with 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.

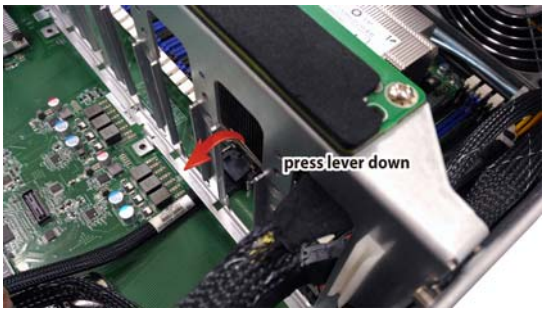


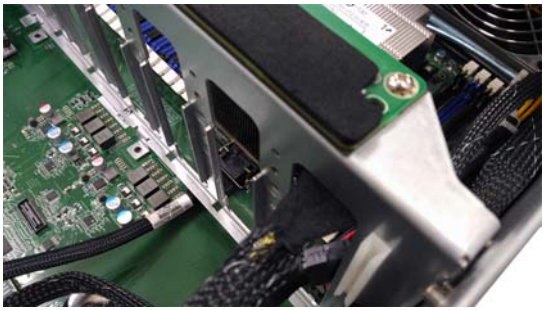
5. To secure the heatsink, use a T30 Security Torx to tighten the screws in a sequential order (1→2→3→4).
NOTE: When disassembling the heatsink, loosen the screws in reverse order (4→3→2→1).

6. Insert the fabric cable underneath the Midbar and connect the fabric cable to the fabric CPU. Note that it is easier to connect if you use a fabric cable with right-angle connector.



7. Press the lever down to secure the cable to the fabric CPU socket.





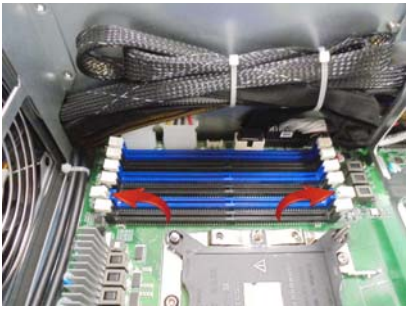
8. Repeat the procedures described earlier to install the second processor and heatsink.

9. Place the CPU air duct back and screw it to the chassis.

2.1.3 Installing the Memory

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

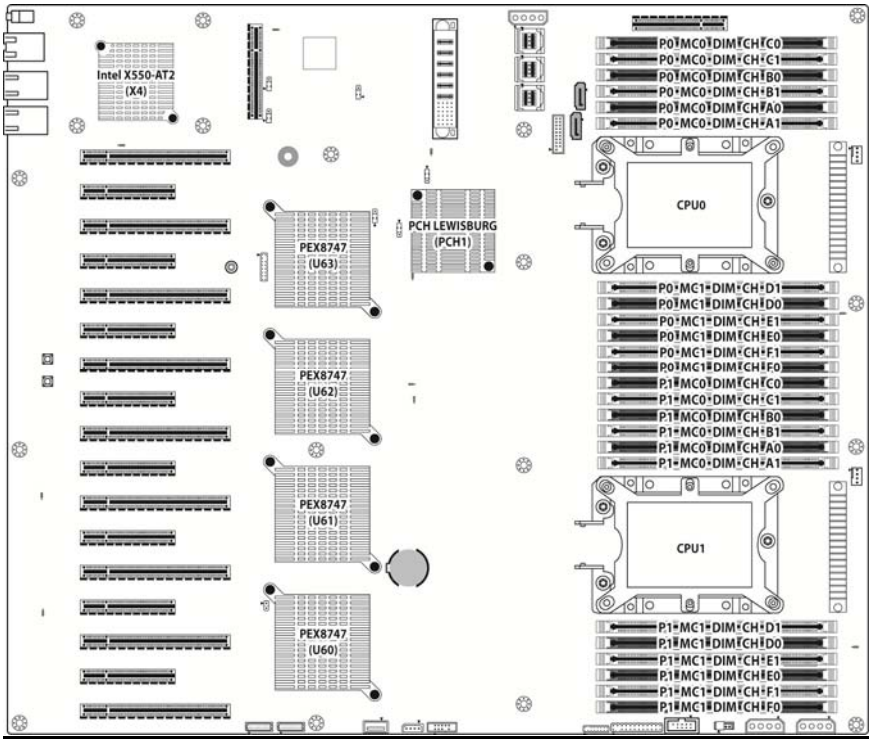
1. Press the memory slot locking levers in the direction of the arrows as shown in the following illustration.



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






Intel X550-AT2
(X4)
PEX8747
(U63)
PEX8747
(U62)
PEX8747
(U61)
PEX8747
(U60)
PCH LEWISBURG
(PCH1)
CPU0
CPU1
P0_MC0_DIMM_CH_C0
P0_MC0_DIMM_CH_C1
P0_MC0_DIMM_CH_B0
P0_MC0_DIMM_CH_B1
P0_MC0_DIMM_CH_A0
P0_MC0_DIMM_CH_A1
P0_MC1_DIMM_CH_D1
P0_MC1_DIMM_CH_D0
P0_MC1_DIMM_CH_E1
P0_MC1_DIMM_CH_E0
P0_MC1_DIMM_CH_F1
P0_MC1_DIMM_CH_F0
P1_MC0_DIMM_CH_C0
P1_MC0_DIMM_CH_C1
P1_MC0_DIMM_CH_B0
P1_MC0_DIMM_CH_B1
P1_MC0_DIMM_CH_A0
P1_MC0_DIMM_CH_A1
P1_MC1_DIMM_CH_D1
P1_MC1_DIMM_CH_D0
P1_MC1_DIMM_CH_E1
P1_MC1_DIMM_CH_E0
P1_MC1_DIMM_CH_F1
P1_MC1_DIMM_CH_F0

Recommended Memory Population Table

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												√
P1_MC0_DIM_CH_A0												
P1_MC0_DIM_CH_A1												
P1_MC0_DIM_CH_B0												
P1_MC0_DIM_CH_B1												
P1_MC0_DIM_CH_C0												
P1_MC0_DIM_CH_C1												
P1_MC1_DIM_CH_D0												
P1_MC1_DIM_CH_D1												
P1_MC1_DIM_CH_E0												
P1_MC1_DIM_CH_E1												
P1_MC1_DIM_CH_F0												
P1_MC1_DIM_CH_F1												

Dual CPU Installed (CPU0 and CPU1)	Quantity of memory installed											
	2	4	6	8	10	12	14	16	18	20	22	24
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												√
P1_MC0_DIM_CH_A0	√	√	√	√	√	√	√	√	√	√	√	√
P1_MC0_DIM_CH_A1							√	√	√	√	√	√
P1_MC0_DIM_CH_B0		√	√	√	√	√	√	√	√	√	√	√
P1_MC0_DIM_CH_B1								√	√	√	√	√
P1_MC0_DIM_CH_C0			√	√	√	√	√	√	√	√	√	√
P1_MC0_DIM_CH_C1									√	√	√	√
P1_MC1_DIM_CH_D0				√	√	√	√	√	√	√	√	√
P1_MC1_DIM_CH_D1										√	√	√
P1_MC1_DIM_CH_E0					√	√	√	√	√	√	√	√
P1_MC1_DIM_CH_E1											√	√
P1_MC1_DIM_CH_F0						√	√	√	√	√	√	√
P1_MC1_DIM_CH_F1												√

NOTE:

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

2.1.4 Installing Expansion Cards (Mainboard)

Only the PCI-E Gen3 x16 slots can support **GPU (Graphic Processing Unit)** cards. Follow these instructions to install the PCIE cards.

Using GPU Bracket

1. Locate the PCI-E Gen.3 x16 slot on the motherboard. Unscrew to take out the dummy brackets.

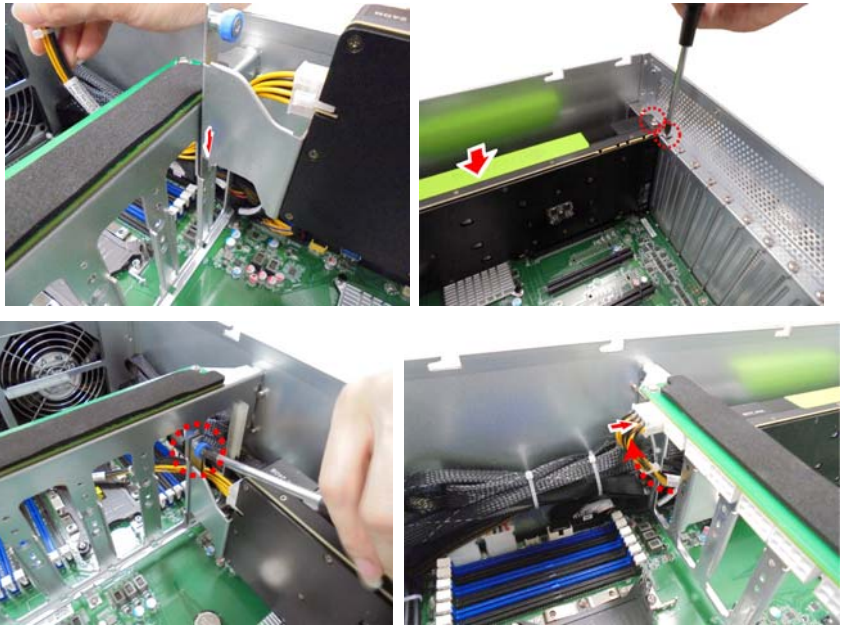




2. Screw the GPU bracket to the GPU card and connect the GPU PWR cable.



3. Insert the GPU card into the PCIE Gen. 3 slot and screw the GPU card to the chassis. Connect the GPU PWR cable to the Power Distribution Board.



NOTE: Please remove the GPU air duct on the top cover for GTX cards or VGA cards which cable is on the top side.

How to remove the GPU Air Duct

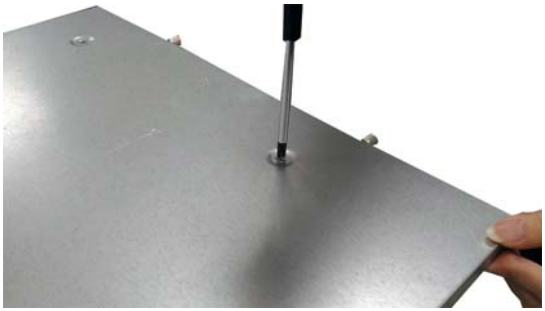
Step 1: Remove 4 mylars on the top cover.



Step 2: Unscrew the top cover to lift it up.



Step 3: Unscrew to separate the GPU air duct from the top cover.







Step 3: Follow the procedures described earlier to replace the top cover.



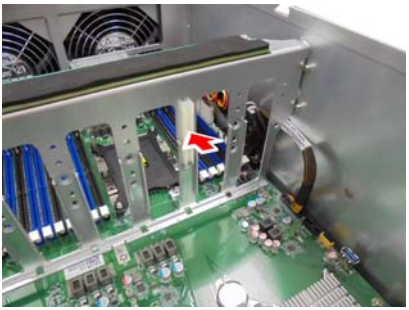
Step 4: Screw the top cover to the chassis and replace 4 mylars as shown below.





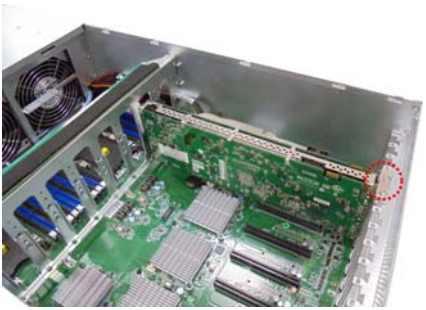
Using Card Guide

1. Insert the card guide onto the power distribution board bracket.



2. Insert the full-length, full-height PCIE card into the PCIE Gen3 x16 slot and screw it firmly to the chassis.





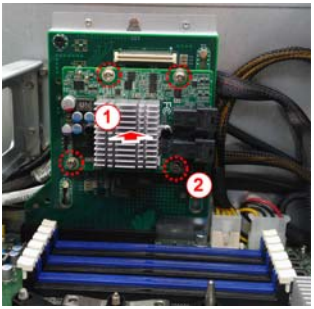
2.1.5 Installing the Expansion Card (OCP Riser Card)

Follow these instructions to install the M7076-3008-8I onto the OCP Riser Card Slot.

1. Locate the OCP Riser Card Slot.



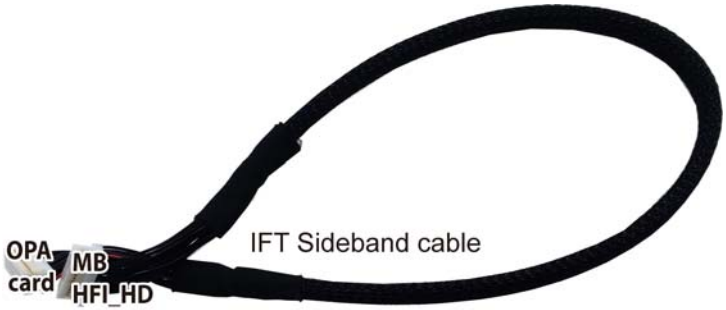
2. Insert the M7076-3008-8I onto the OCP Riser Card Slot and use 4 screws to secure it to the chassis.

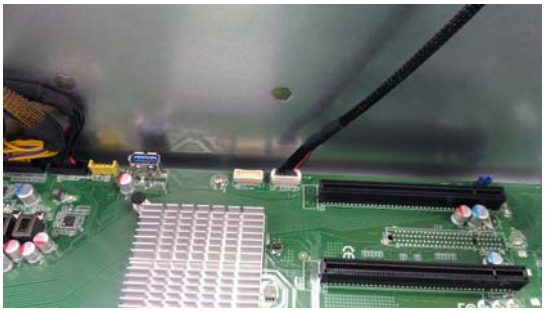


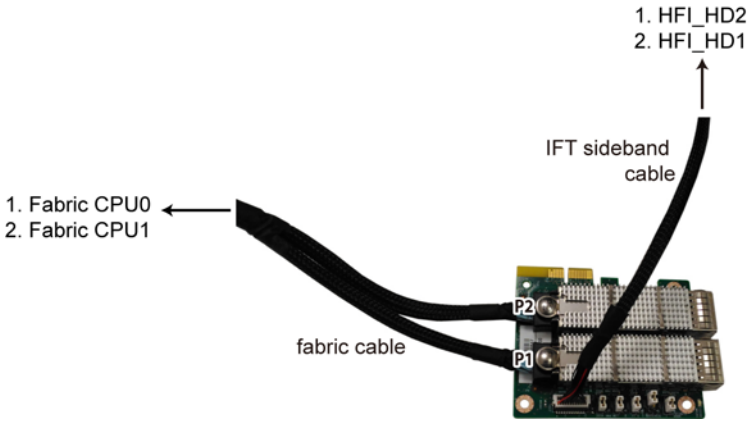
2.1.6 Installing OPA Card (optional)

Follow these instructions to install the OPA Card.

1. Connect one end of the IFT sideband cable to the Sideband Header on the motherboard and the other end to the OPA card (IFT carrier card).







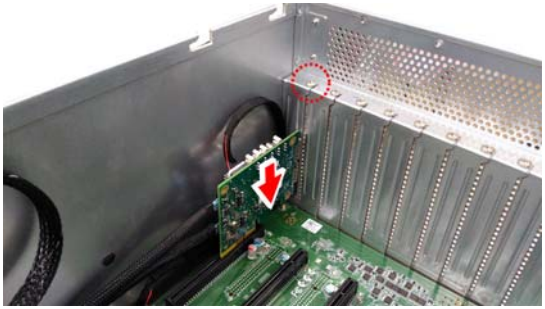
2. Use a fabric cable to connect one end to the CPU and the other end to P1 and P2 connector on the OPA card.



3. Unscrew to remove the dummy bracket before installing the OPA card.



4. Screw a full-length dummy bracket to the OPA card and insert the OPA card onto the PCIE slot. Screw the OPA card bracket to the chassis.



2.1.7 Installing the Mezzanine Card

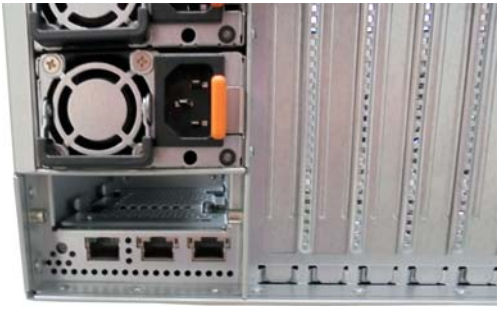
Follow these instructions to install the Mezzanine Card.

1. Unscrew the dummy bracket.

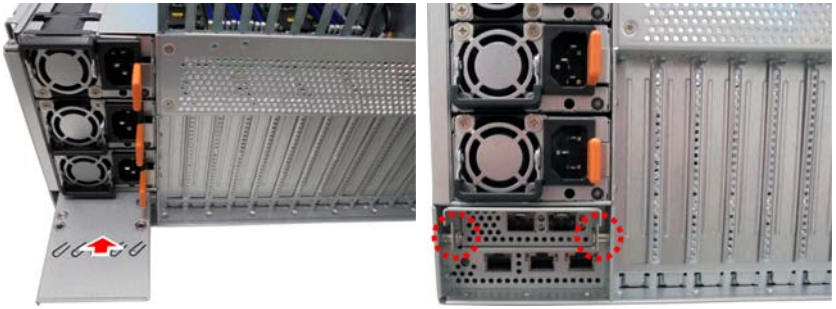


2. Pull the dummy bracket to slide it out.





3. Insert a Mezzanine card associated with tray into the slot and screw it to the chassis.



2.1.8 Installing Hard Drives

The FT77D-B7109 supports fourteen 2.5” HDD/SSD. Follow these instructions to install a hard drive.

1. Pull the HDD tray out from the chassis.



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



3. Place a HDD/SSD into the drive tray. Use four screws to secure the HDD/SSD.



4. Reinsert the HDD tray into the HDD cage.



2.1.9 Installing Hard Drives (optional)

The B7109F77DV4HR-2T-NF SKU supports four 3.5”/2.5” HDD/SSD. Follow these instructions to install a hard drive.

3.5” Hard Disk Drive

1. Push the latches to pull the HDD tray out.





2. Adjusting the 4 HDD locks to the 3.5” location.



3. Place a 3.5” HDD into the HDD tray.



4. Reinsert the HDD tray into the chassis.





2.5” Hard Disk Drive

1. Adjusting the 4 HDD locks to the 2.5” location.



2. Secure the 2 standoffs to the 2.5” HDD.



3. Insert the HDD into the HDD tray.



4. Reinsert the HDD tray into the chassis.

2.2 Rack Mounting

After installing the necessary components, FT77D-B7109 can be mounted in a rack using the supplied rack mounting kit.

Rack mounting kit

Rail with Bracket x 2

Mounting Ears x 2

Screw Sack x 2

NOTE: The users have to prepare two screws and two nuts on their own for rack mounting.

2.2.1 Installing the Server in a Rack

Follow these instructions to mount the FT77D-B7109 into an industry standard 19" rack.



Note:

Before mounting FT77D-B7109 in a rack, ensure that all internal components have been installed and that the unit has been fully tested.

2.2.2 Installing the inner Rails to the Chassis

1. Screw the mounting ear to each side of FT77D-B7109 as shown using 4 screws from the supplied screws kit.



2. Press the latch key to draw out the inner rails from sliding rails.



3. Secure inner rails to both sides of the chassis. Be sure the mounting holes are correctly matched.



4. Secure the screws to both sides of the chassis.



2.2.3 Installing the Outer Rails to the Rack

1. Please note to prepare two nuts and two screws before you start the work.



2. Secure the outer rails to the rack.



2.2.4 Rack mounting the Server

1. Lift the chassis and then insert the inner slide rails into the outer rails.



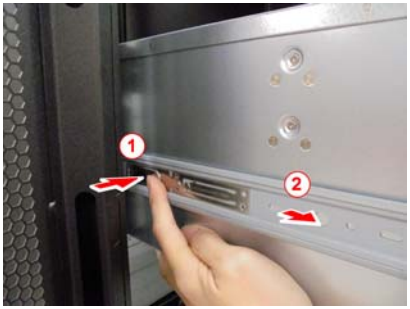
2. Push the chassis in.

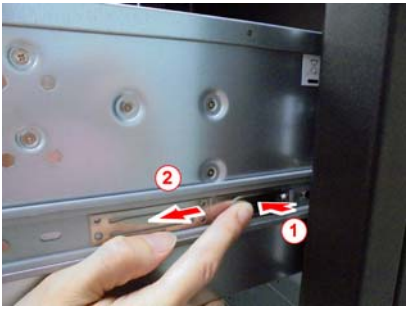


3. Screw the mounting ears of chassis to the rack.



4. Press the latch keys on both sides simultaneously to pull the system out.





NOTE

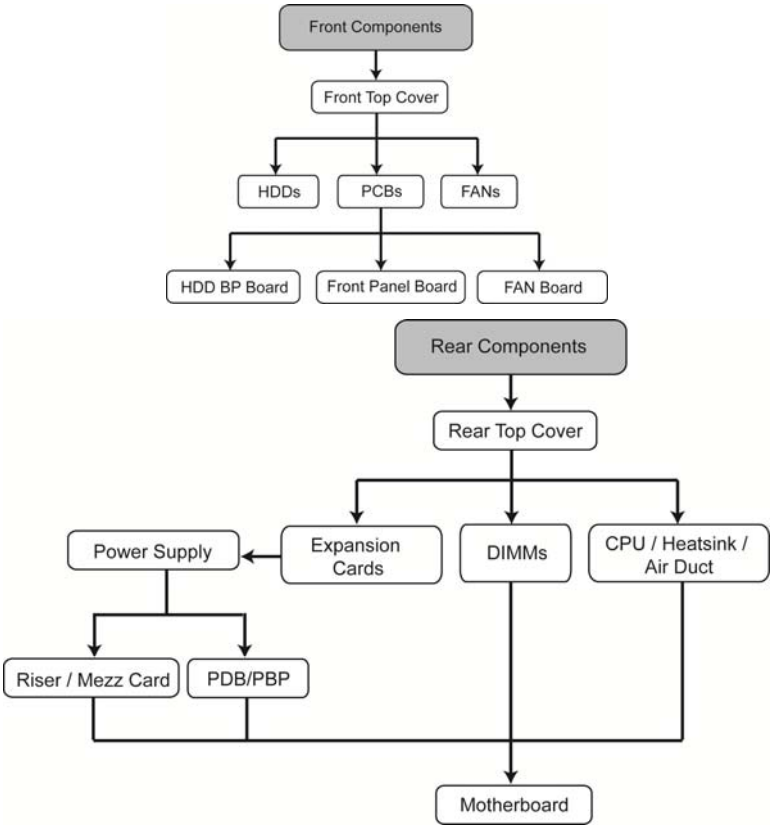
Chapter 3: Replacing Pre-Installed Components

3.1 Introduction

This chapter explains how to replace the pre-installed components, including the S7109 Motherboard, M1713F77C-FPB Front Panel Board, M1809F77A-FB Fan Board, M2215-L8-1F / M2217-L16-IO Riser Card, M1284F77D-BP12E-14 & M1291F77D-BP12E-4 HDD Backplane Board, M7109F77D-D-PBP Power Backplane Board, M7059F77C-D-PDB Power Distribution Board, System Fan and Power Supply etc.

3.2 Disassembly Flowchart

The following flowchart outlines the disassembly procedure.



3.3 Removing the Cover

Follow Chapter ***2.1.1*** to remove the cover of FT77D-B7109.

3.4 Replacing the Power Supply

To replace the power supply follow these instructions.

1. Press the tab as shown to pull out the power.



2. Free the power from the power cage.



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

3.5 Replacing the Front Panel Board

Follow these instructions to replace the M1713F77C-FPB Front Panel Board.

1. Disconnect the USB3.0 and Front Panel Cable.



2. Unscrew to remove the front panel board module.





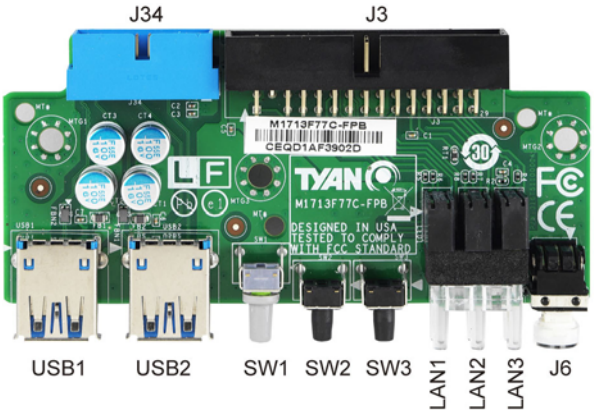


3. Loosen three screws to take out the front panel board. Remove the ID Button cap, LED sponge and LED Lens to reinstall in the new Front Panel Board.



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

3.5.1 Front Panel Board Features



M1713F77C-FPB Front Panel Board	
Specifications	● SSI 24-pin front panel I/O connector to MB ● (1) 20-pin front panel USB3.0 connector to MB ● BTN: PWR BTN w/LED, Reset BTN, ID BTN, NMI BTN ● LED: PWR LED (green), Warning LED (amber), ID LED (blue), HDD LED (green), LAN active LED (green) ● I/O: (2) Type-A USB3.0 Connector ● Temperature sensor inlet build-in

3.6 Replacing the Fan Board

Follow these instructions to replace the M1809F77A-FB Fan Board.

1. Remove all Fan modules.



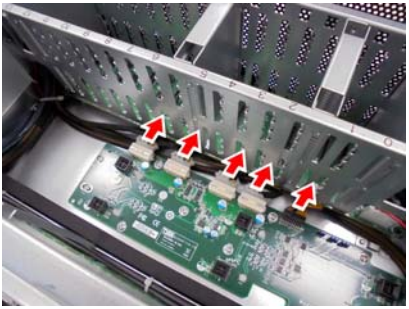
2. Unscrew the fan cage.



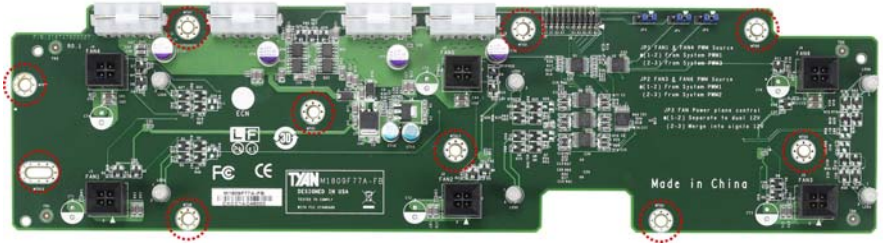
3. Lift up the fan cage.



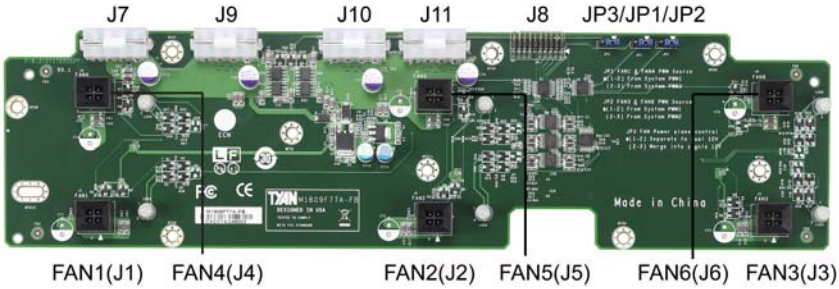
4. Disconnect all cables from the Fan Board.



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



3.6.1 Fan Board Features



M1809F77A-FB Fan Board	
Specifications	Support (6) 120x38 mm system FAN (4) 4-pin B4P RA PWR Connector (run DC+12V) (6) 4-pin Hot-swap FAN Connector (1) 20-pin barebone system FAN connector to MB

FAN Sequence

Front Side (facing HDD)

FAN4	FAN5	FAN6
FAN1	FAN2	FAN3

Rear Side (facing Mainboard)

3.7 Replacing the HDD Backplane Board

a. M1284F77D-BP12E-14

Follow these instructions to replace the M1284F77D-BP12E-14 HDD Backplane Board.

1. Remove the screws on both sides of the chassis.



2. Remove all HDD trays from the HDD cage.



3. Refer to Section **3.5 Replacing the Front Panel Board** to take out the Front Panel Board Tray.



4. Unscrew the Front COM and VGA Ports.



5. Disconnect the COM and VGA cables.



6. Unscrew to release the HDD Cage.





7. Lift up the HDD cage from the chassis

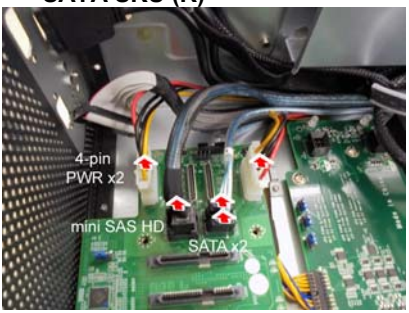


8. Disconnect all cables connected to the HDD BP Board.

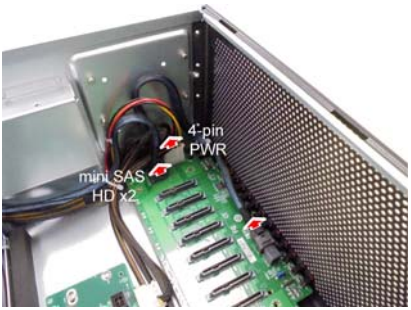
NVME SKU (R)



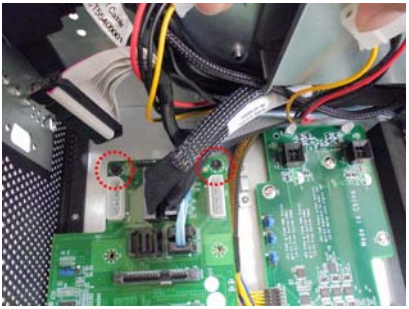
SATA SKU (R)



NVME & SATA SKU (L)



9. Unscrew the HDD BP Board from the chassis.





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

b. M1291F77D-BP12E-4

Follow these instructions to replace the M1291F77D-BP12E-4 HDD Backplane Board. This HDD BP Board is pre-installed for B7109F77DV4HR-2T-NF only.

1. Remove the screws on both sides of the chassis.



2. Remove all HDD trays from the HDD cage.



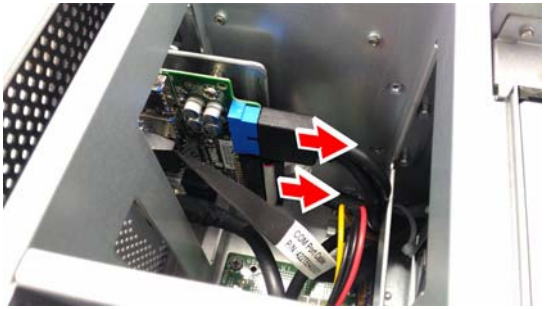


3. Refer to Section **3.5 Replacing the Front Panel Board** to take out the Front Panel Board Tray.

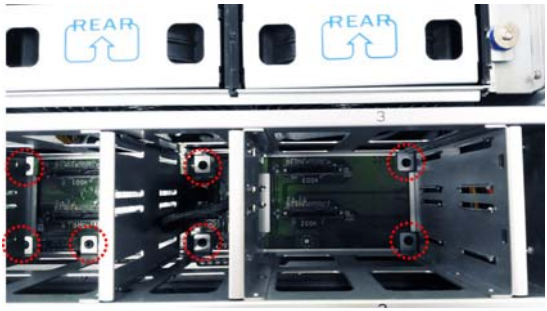
4. Unscrew the Front COM and VGA Ports.



5. Disconnect the COM and VGA cables.



6. Unscrew to release the HDD Cage.

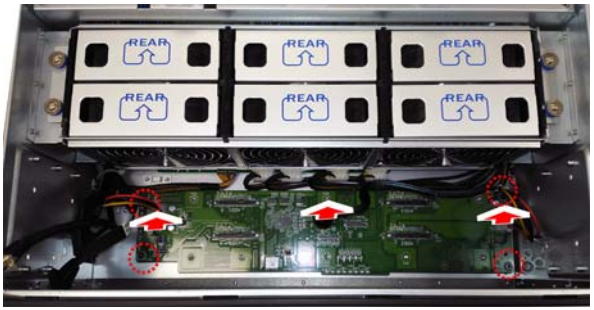


7. Lift up the HDD cage from the chassis



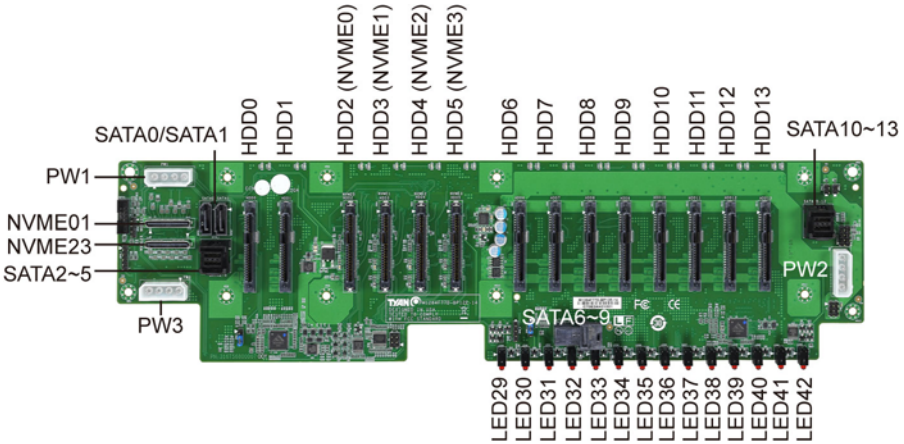


8. Disconnect all cables connected to the HDD BP Board and loosen 4 screws to lift up the HDD BP Board for replacement.



9. Follow the procedures described earlier in reverse order to reinstall the HDD BP Board and HDD cage.

3.7.1 HDD BP Board Features



M1284F77D-BP12E-14 HDD Backplane Board	
Specifications	Support 14 hot-swappable 2.5” HDD/SSD or NVMe SSD, speed up to 12Gb/s Onboard HDD LED indication for HDD status (Active/Status) (3) B4P HDD PWR Connector (2) 7-pin SATA Connector (3) Mini-SAS HD Connector (2) SFF-8611 OCuLink connectors

HDD/SSD sequence

Port #	0	1	2	3	4	5	6	7	8	9	10	11	12	13
	sSATA4	sSATA5	sSATA0~3				SATA0~7							



M1291F77D-BP12E-4 HDD Backplane Board	
Specifications	● Support (4) swappable 3.5”/2.5” HDD/SSD ● Speed up to SATA 6G/s, SAS 12G/s, NVMe 8G/s ● Onboard HDD LED indication for HDD status (Active/Status) ● (2) B4P HDD power connector (PW1, PW2) ● (2) OCULink connector (J1, J2) ● (1) Mini-SAS HD connector (SATA0_3) ● (4) SFF-8639 connector (HDD0, HDD1, HDD2, HDD3)
NOTE: This HDD BP Board is pre-installed for B7109F77DV4HR-2T-NF only.	

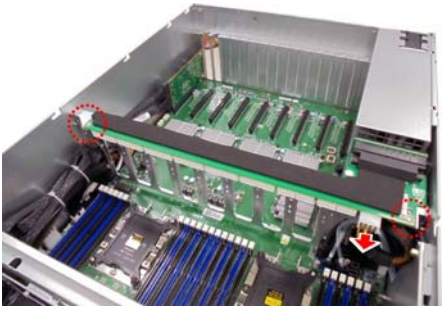
HDD/SSD sequence



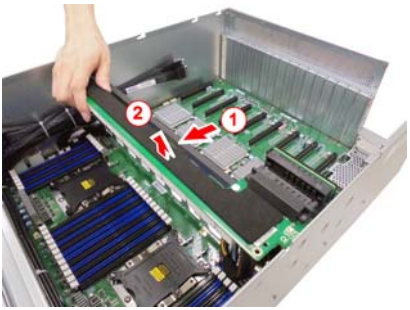
3.8 Replacing Power Distribution Board

Follow these instructions to replace the M7059F77C-D-PDB Power Distribution Board.

1. Disconnect the PWR cable. Unscrew the M7059F77C-D-PDB Power Distribution Board.

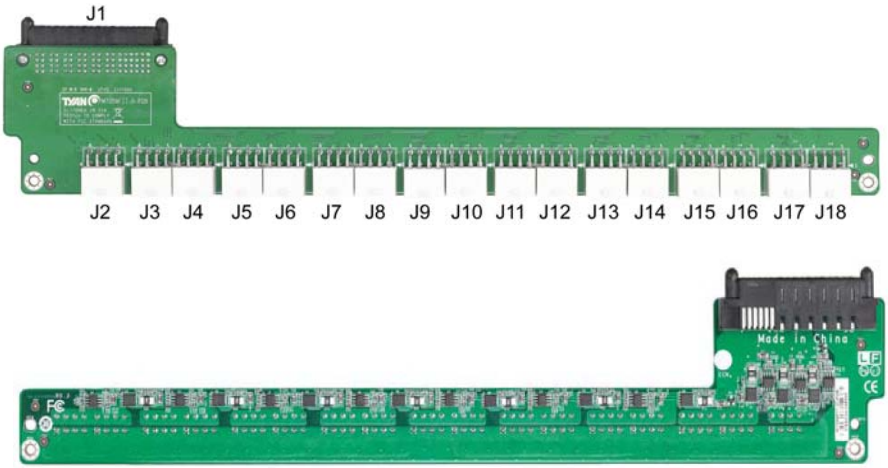


2. Remove the power distribution board for replacement.



3. Follow the steps described earlier in reverse order to reinstall the power distribution board into the chassis.

3.8.1 Power Distribution Board Features



M7059F77C-D-PDB Power Distribution Board	
Specifications	(1) 24S+6P RA Connector to M7109F77D-D-PBP (1) ATX 8-pin PWR Connector to Fan Board (16) ATX 8-pin PWR Connector to GPU card

J3~J18: 2x4pin ATX Power Connector for GPU, the max current is 35A

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

3.9 Replacing the Riser Card

Follow these instructions to replace the M2215-L8-1F Riser Card.

1. Pull out all power supply units and unscrew the Mezz card module. Unscrew the power supply cage.



2. Unscrew the power supply cage.



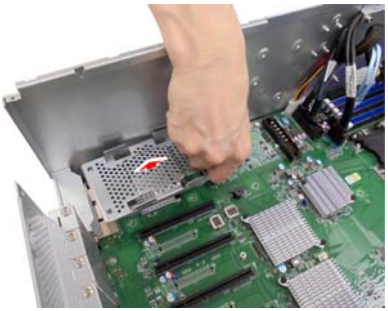


3. Lift up the power supply cage.



4. Loosen the screws to lift up the bracket.





5. Unscrew to replace a new riser card.



6. Follow the steps described earlier in reverse order to reinstall the riser card bracket.

3.9.1 Riser card Feature



M2215-L8-1F Riser Card	
Form Factor	W31.85 x L94 (mm), 4-layer PCB
Specification	(1) PCI-E Gen3 x8 Slot for non-standard add-on card

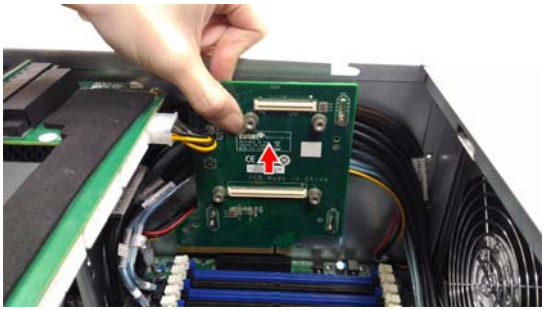
3.10 Replacing the OCP Riser Card

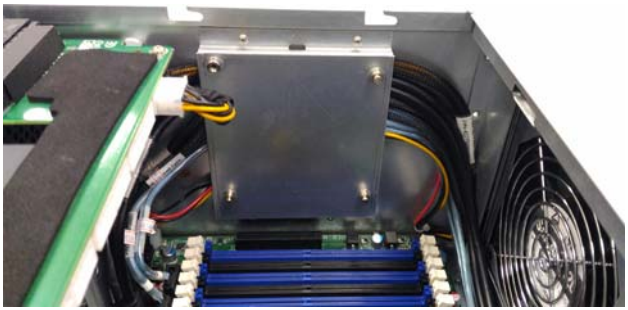
Follow these instructions to replace the M2217-L16-IO OCP Riser Card.

1. Unscrew the M2217-L16-IO OCP Riser Card.



2. Lift up to replace with a new OCP Riser Card.

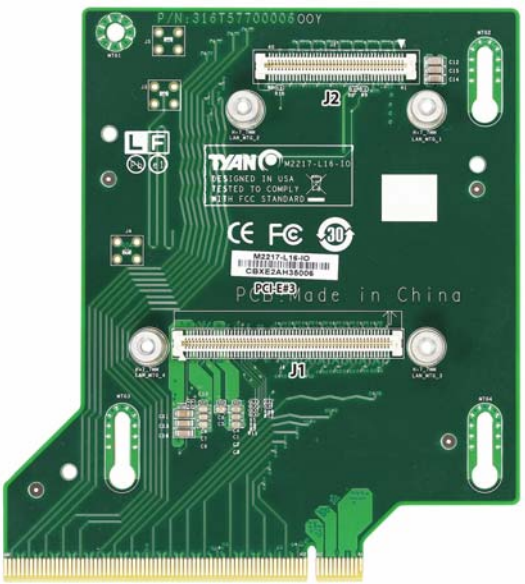




3. Follow the steps described earlier in reverse order to reinstall the OCP Riser Card.

3.10.1 OCP Riser Card Features

Front View



M2217-L16-IO OCP Riser Card	
Specifications	● PCIE x16 support (1) OCPA slot + (1) OCPB slot

3.11 Replace the Power Backplane Board

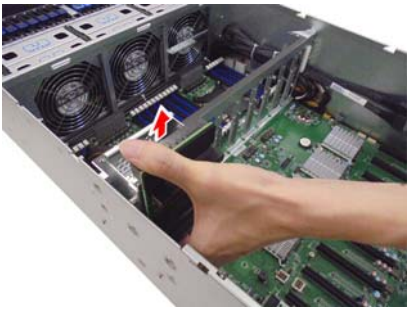
Follow these instructions to replace the M7109F77D-D-PBP Power Backplane Board.

1. Unscrew the Power Backplane Board Tray.





2. Lift up the PBP Board Tray.



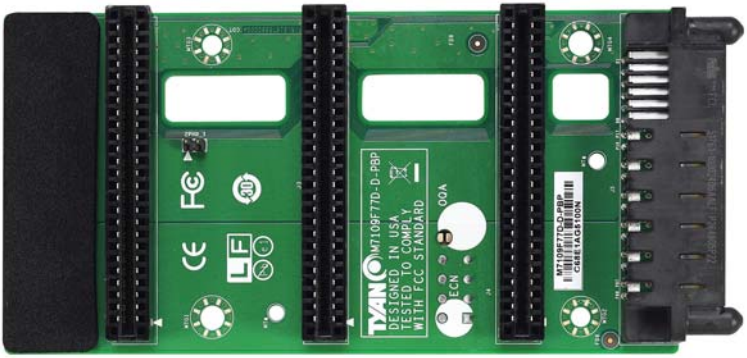
3. Unscrew the M7109F77D-D-PBP from the bracket and replace with a new one.



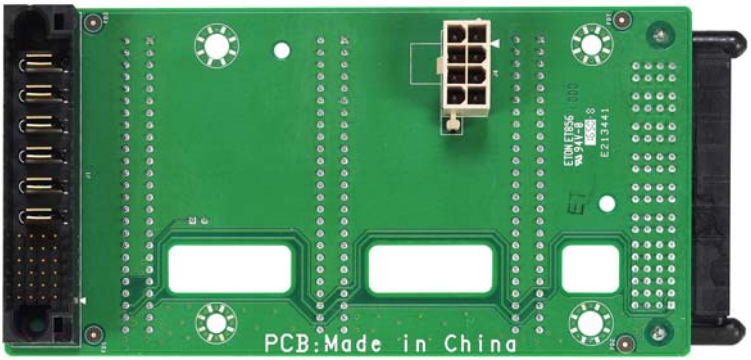
4. Follow the steps described earlier in reverse order to reinstall the power backplane board.

3.11.1 Power Backplane Board Features

Front View



Rear View



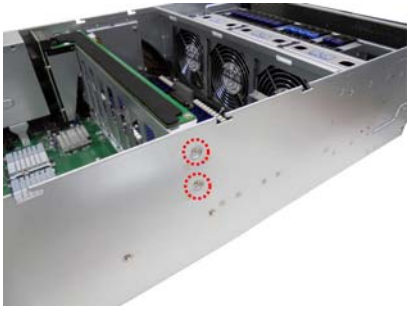
M7109F77D-D-PBP Power Backplane Board	
Specifications	(3) Power supply Connector for DPS-1600CB A / DPS-2200AB-2 D (1) 24S+6P RA Connector to MB (1) 24S+6P Connector to M7059F77C-D-PDB (1) ATX 8-pin PWR Connector

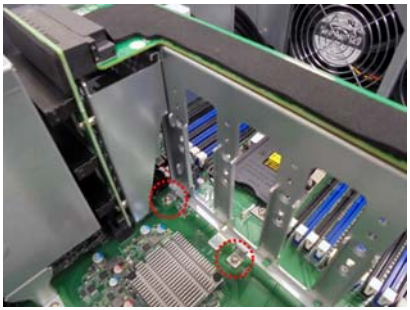
3.12 Replacing the Motherboard

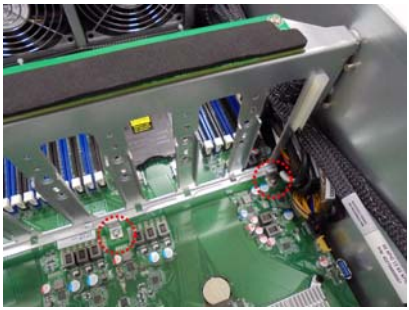
After removing all of the aforementioned cables and components, follow these instructions to remove the motherboard from the chassis.

1. Loosen the screws securing the PDB Bracket to the chassis.



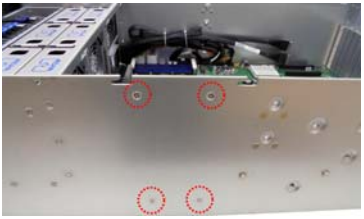








2. Unscrew the OCP Riser Card Bracket.





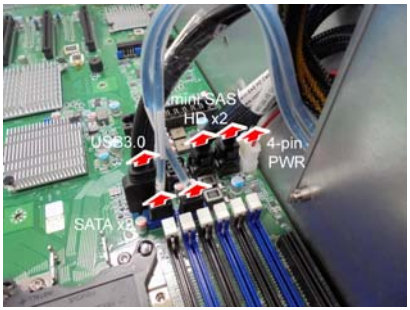
3. Refer to Section **3.9 Replacing the Riser Card** and **3.10 Replacing the Power Backplane Board** to remove the Power Supply Cage and the PBP Tray.

4. (SATA SKU) Disconnect all cables.



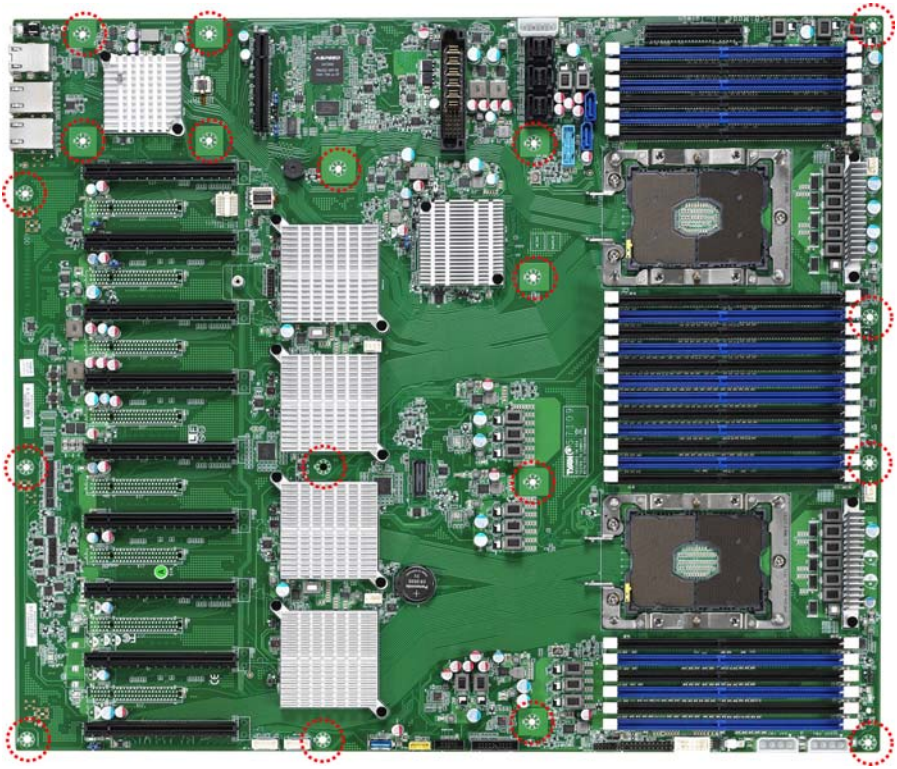


5. (NVME SKU) Disconnect all cables.





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



NOTE

Chapter 4: Motherboard Information

You are now ready to install your motherboard.

How to install our products right… the first time

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

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

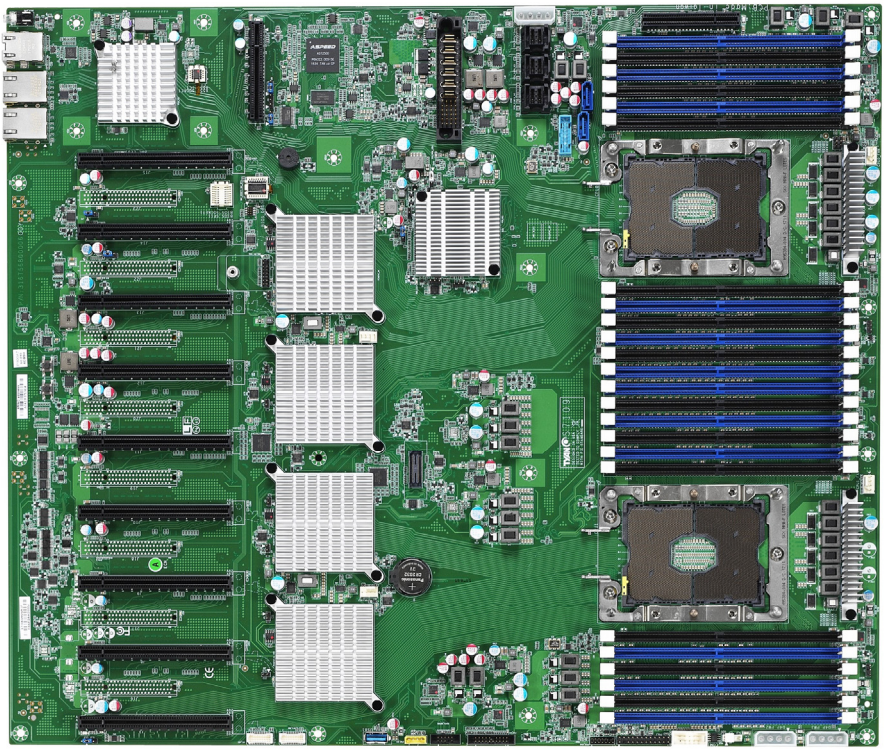
The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.



Caution!

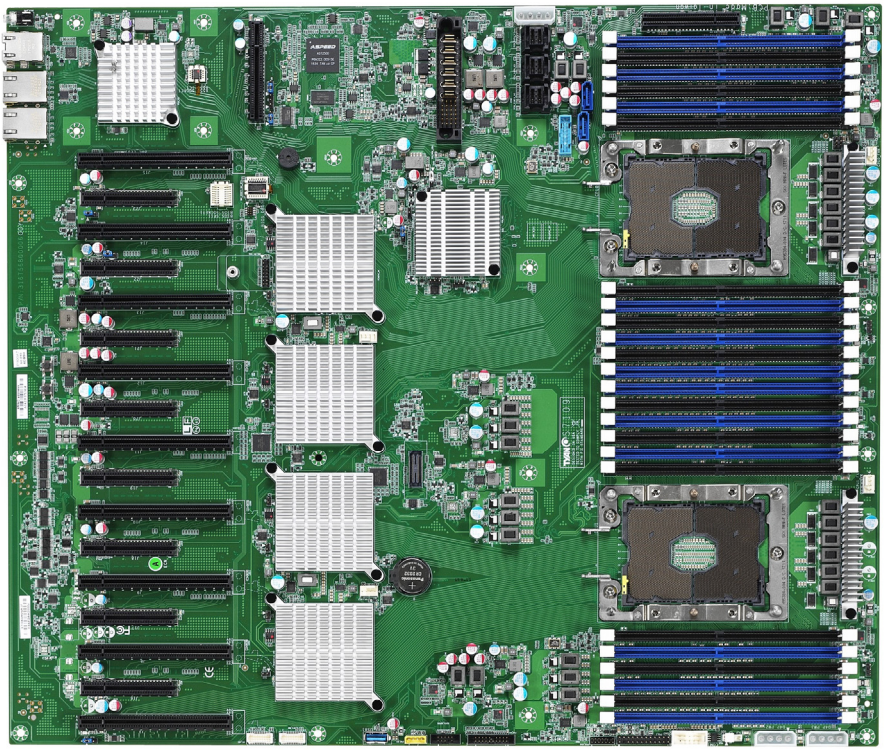
1. To avoid damaging the motherboard and associated components, use torque force within the range **5~7 kgf/cm (4.35 ~ 6.09 lb/in)** on each mounting screw for motherboard installation.
2. Do not apply power to the board if it has been damaged.

4.1 Board Image



S7109GM2NR-2T

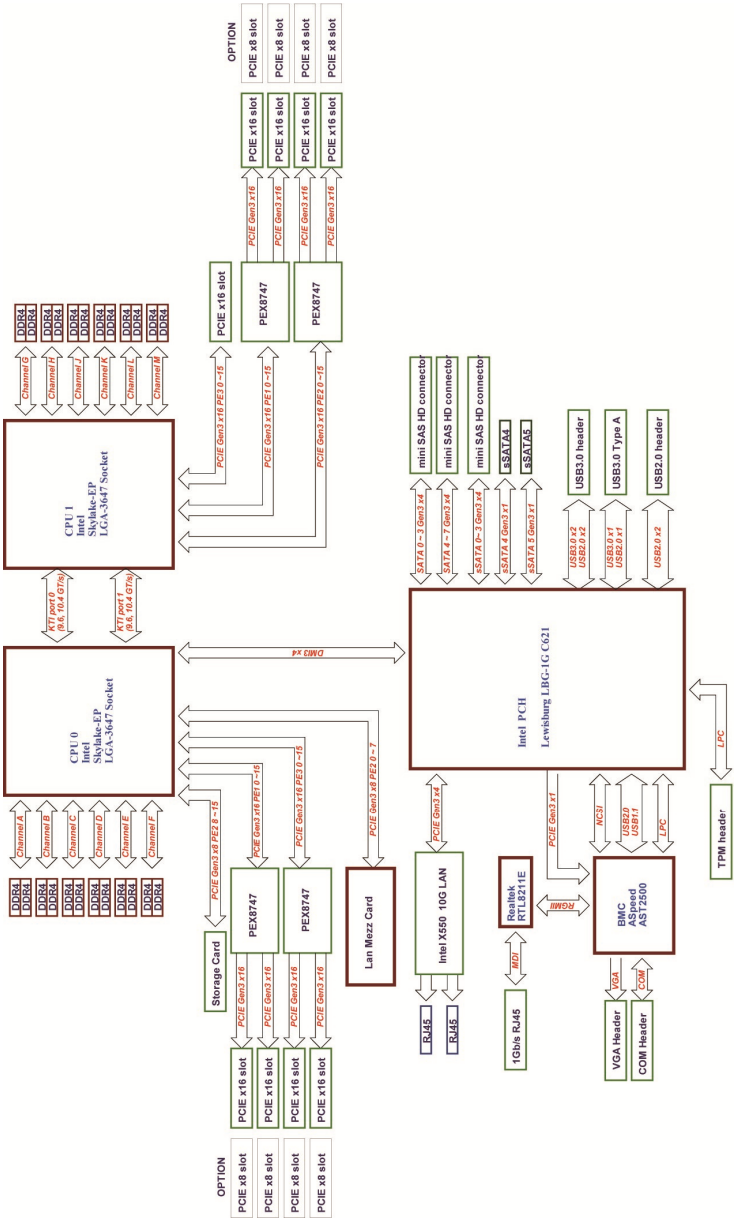
This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.



S7109GM2NR-8X-2T

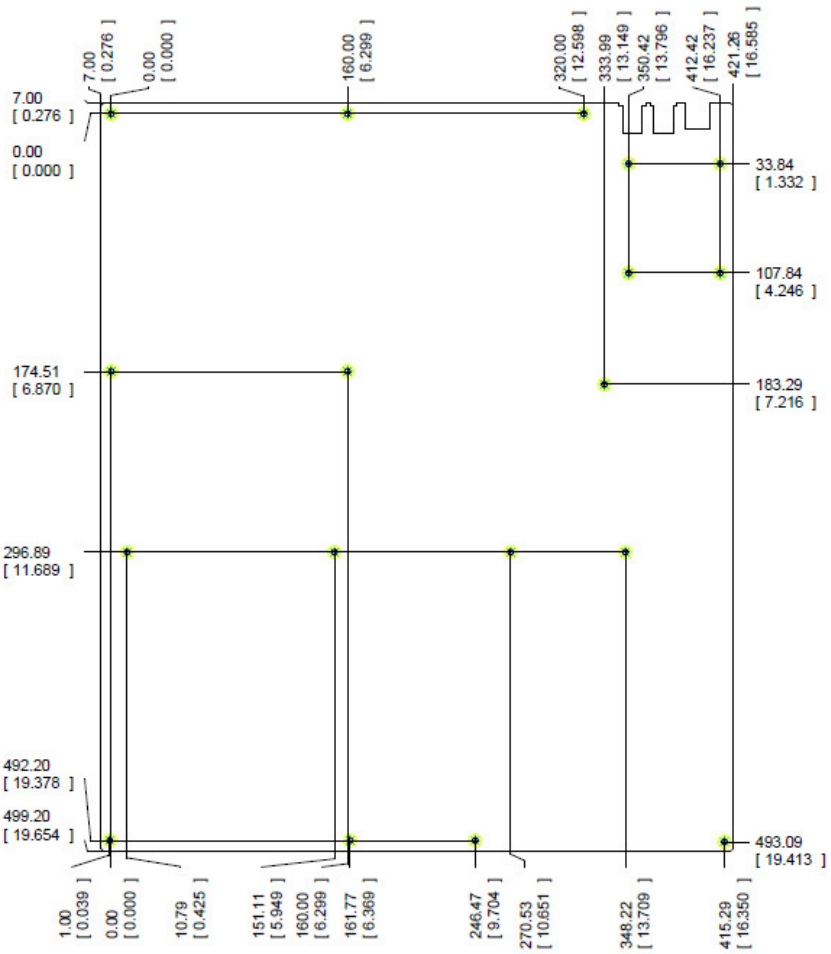
This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.

4.2 Block Diagram

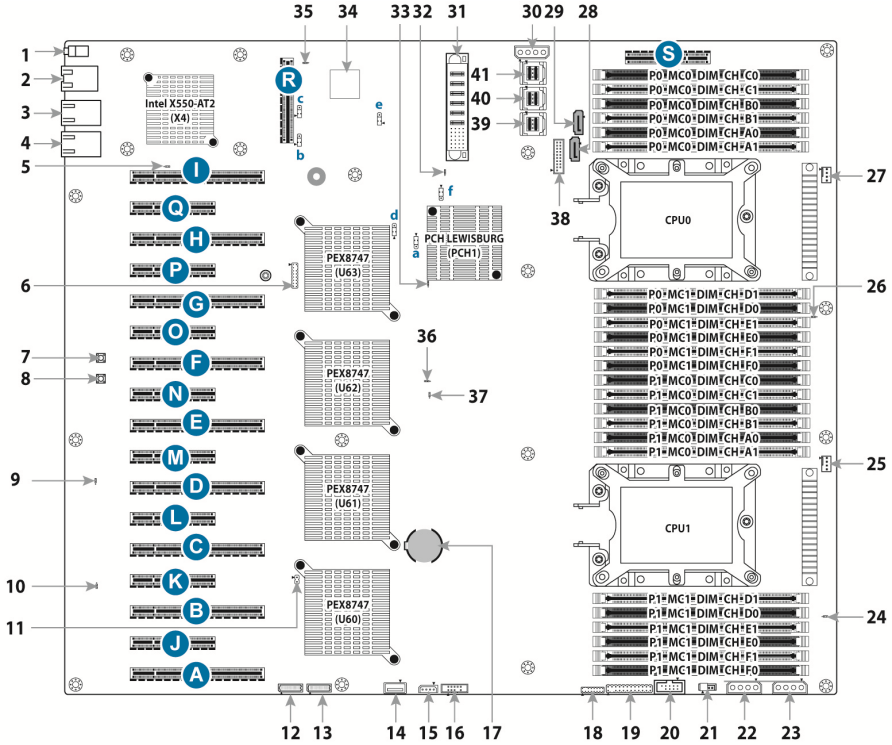


S7109 Block Diagram

4.3 Motherboard Mechanical Drawing



4.4 Board Parts, Jumpers and Connectors



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

Jumpers & Connectors

Connectors	
1. ID LED Button / ID LED (IDLED_BTN1)	22. 4-pin HDD Backplane Power Connector (D4P_PW2)
2. RJ45 LAN Port (LAN3) (IPMI)	23. 4-pin HDD Backplane Power Connector (D4P_PW3)
3. RJ45 LAN Port (LAN2)	24. CPU1 PWR OK LED (P1_PG_LED1)
4. RJ45 LAN Port (LAN1)	25. 4-pin Fan Connector (CPU1_FAN)
5. BMC Heartbeat LED (BMC_LED1)	26. CPU0 PWR OK LED (P0_PG_LED1)
6. TYAN Module Header (DBG_HD1)	27. 4-pin Fan Connector (CPU0_FAN)
7. Reset Button (RST_BTN1)	28. 7-pin Vertical SATA3.0 Connector (SATA) (PCH_SSATA_5)
8. Power Button (PWR_BTN1)	29. 7-pin Vertical SATA3.0 Connector (SATA) (PCH_SSATA_4)
9. Platform RESET OK LED (SYS_RST_LED1)	30. 4-pin HDD Backplane Power Connector (D4P_PW1)
10. ATX PWR OK LED (ATX_PG_LED1)	31. PSU12V Power Connector (J45)
11. FAN Header for BP FAN Board (J29)	32. PCH AUX PWR OK LED (PCH_PWOK_LED1)
12. Sideband Header (HFI_HD1)	33. Onboard HDD Active LED (HDD_LED1)
13. Sideband Header (HFI_HD2)	34. AST2500 (BMC1)
14. Vertical Type-A USB3.0 Connector (USB1)	35. Onboard BMC IPMI alert LED (IPMI_LED1)
15. IPMB Pin Header (IPMB_HD1)	36. CPU Error LED (ERR_LED1)
16. PCH sSATA SGPIO Header for HDD Backplane (SSATA_SGPIO1)	37. CATERR LED (CAT_LED1)
17. Battery Socket (CR1)	38. USB3.0 Header (USB3)
18. VGA Header (FPIO_VGA1)	39. Mini SAS HD Connector (SATA/SAS signals) (PCH_SSATA_03)
19. Front Panel Header (FPIO_1)	40. Mini SAS HD Connector (SATA/SAS signals) (PCH_SSATA_03)
20. COM1 Header (COM1)	41. Mini SAS HD Connector (SATA/SAS signals) (PCH_SSATA_47)
21. Intel VROC Key Header (J47)	
Jumpers	
a ME Recovery Mode Jumper (J38)	d/e LPC Mode Header (J37/J41)
b/c BMC CONSOLE PORT5 Jumper (J34/J36)	f Clear CMOS Header (J44)

Slots	
A PCI-E 3.0x16 slot (J3)	B/C/D/E/F/G/H/I PCI-E3.0x16 slot (x16 link:S7109GM2NR-2T) (x8 link:S7109GM2NR-8X-2T) (J8/J9/J10/J11/J12/J13/J14/J15)
R PCI-E 3.0x8 slot (open-end type, J25)	J/K/L/M/N/O/P/Q PCI-E 3.0x8 slot (x8 link, open-end type, only for S7109GM2NR-8X-2T) (J16/J17/J18/J19/J20/J21/J22/J23)
S PCI-E 3.0x8 slot (open-end type) (J48, only for Tyan riser card)	

Jumper Legend

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

J41J43//J73/J74/J75/J76: 4-Pin FAN Connector



Pin	1	2	3	4
Signal	GND	VCC	Tachometer	PWM

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

J41: CPU0_FAN J43: CPU1_FAN J73: SYS_FAN_4
J74: SYS_FAN_3 J75: SYS_FAN_2 J76: SYS_FAN_1

J5: IDLED Switch Header



Pin	1	2
Signal	FP IDLED Switch	FP IDLED Switch (GND)

J38: Chassis Intrusion Header



open

Pin	1	2
Signal	Intrusion Switch	Intrusion Switch (GND)



Short (**Default**)

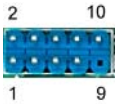
Open: Use this header to **trigger** the system chassis intrusion alarm.
Short: Use this header to **disable** the system chassis intrusion alarm.

J60: Front Panel Header



Signal	Pin	Pin	Signal
PWRLED+	1	2	FP Power(3.3V standby)
KEY	3	4	ID_LED+
PWRLED-(GND)	5	6	ID_LED-(GND)
HD_LED+	7	8	Fault LED1-
HD_LED-	9	10	Fault LED2-
Power Switch+	11	12	LAN1_ACTIVE_LED+
Power Switch-(GND)	13	14	LAN1_ACTIVE_LED-
Reset Switch+	15	16	SMB_DATA
Reset Switch-(GND)	17	18	SMB_CLK
ID Switch+	19	20	INTRUDER#
TEMP Sensor	21	22	LAN2_ACTIVE_LED+
NMI Switch#	23	24	LAN2_ACTIVE_LED -

J39: USB Front Panel Header (blue)



Signal	Pin	Pin	Signal
USB 5V Power	1	2	USB 5V Power
USB Data-	3	4	USB Data-
USB Data+	5	6	USB Data+
GND	7	8	GND
KEY	9	10	NC

J35: Front Fan Connector (Reserved for Barebone Fan Board)



Signal	Pin	Pin	Signal
Tachometer input1	1	2	Tachometer input6
Tachometer input2	3	4	Tachometer input7
Tachometer input3	5	6	Tachometer input8
Tachometer input4	7	8	Tachometer input9
Tachometer input5	9	10	Tachometer input10
GND	11	12	KEY
PWM output2	13	14	PWM output1
Tachometer input11	15	16	SMB DATA
Tachometer input12	17	18	SMB CLK
3.3V Standby	19	20	PWM output3

J31: IPMB Connector



Signal	Pin	Pin	Signal
SMB_SDA2	1	2	GND
SMB_SCL2	3	4	NC

JP5: Clear CMOS Jumper



Normal (**Default**)



Clear CMOS

You can reset the CMOS settings by using this jumper. This can be useful if you have forgotten your system/setup password, or need to clear the system BIOS setting.

1. Power off system and disconnect power connectors from the motherboard.
2. Remove the jumper from Pin_1 and Pin_2 (Default setting).
3. Move the jumper cap to close Pin_2 and Pin_3 for several seconds to Clear CMOS.
4. Put jumper cap back to Pin_1 and Pin_2 (Default setting).
5. Reconnect power connectors to the motherboard and power on system.

LED1 / SW1: ID LED and ID LED Button



Pin	Signal	
+	P3V3_AUX	
-	ID_SW_L	
State	**Color**	**Description**
On	Blue	System identified
Off	Off	System not identified

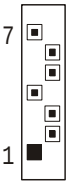
NOTE: The ID LED can be activated remotely using IPMI.
Please visit the TYAN Web Site at **http://www.tyan.com** to download the latest IPMI Configuration Guide for more details.

J58/J59: Vertical Type-A USB Connector



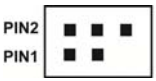
Pin	1	2	3	4
Signal	USB 5V Power	USB Data-	USB Data+	GND

J56/J57: SATA2.0 Connector



1	GND	Connects to the Serial ATA ready drives via the Serial ATA cable. J56: SATA4 J57: SATA5
2	SATA TX DP	
3	SATA TX DN	
4	GND	
5	SATA RX DN	
6	SATA RX DP	
7	GND	

J26: SATA SGPIO Header for BB HD Board



Signal	Pin	Pin	Signal
3.3V Standby	**1**	**2**	SMB SCL
GND	**3**	**4**	SMB SDA
KEY	**5**	**6**	BP HDD FAULT

J18: Flash Security Override Header



Pin	1	2
Signal	Signal Input	GND

D4P_PW1/PW2/PW3: 4-pin HDD Power Connector



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

JP6: BIOS Recovery Mode Jumper

	Pin 1-2 Closed: Normal (**Default**)
	Pin 2-3 Closed: Recovery CMOS

JP7: ME Firmware Update Jumper

	Pin 1-2 Closed: Open (**Default)**
	Pin 2-3 Closed: ME Force Update

J47: VROC Header (full featured RAID 0, 1, 10, 5, using Intel® VROC, for NVMe SSD SKU)



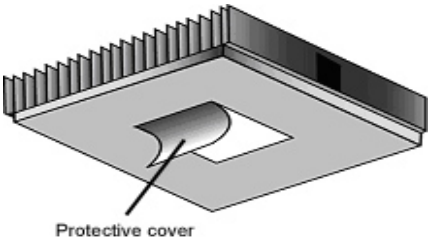
Pin	1	2	3	4
Signal	GND	VCC3_AUX	GND	PCH_SATA_RAID_KEY

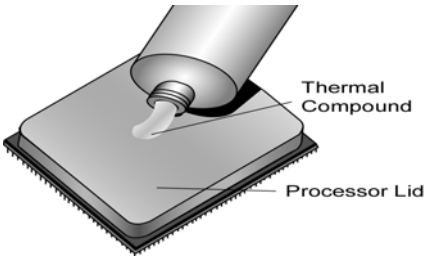
DBG_HD1: TYAN Module Header (TPM_Header)



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

4.5 Thermal Interface Material





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

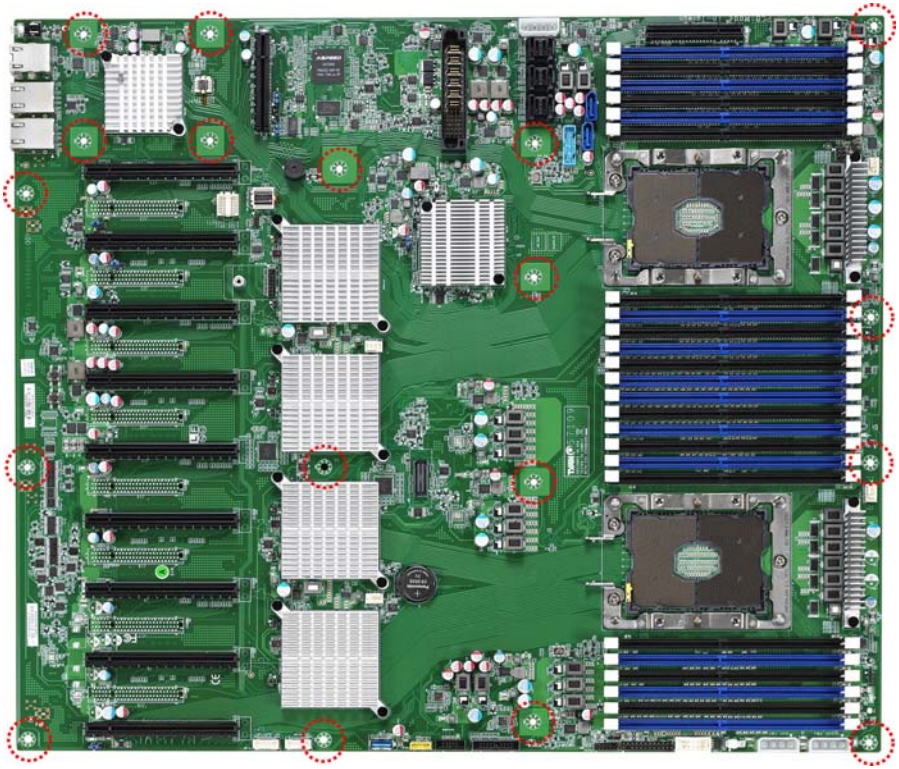
The most common material comes as a small pad attached to the heat sink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material. Simply remove the protective cover and place the heat sink on the processor.

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

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

4.6 Tips on Installing Motherboard in Chassis

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

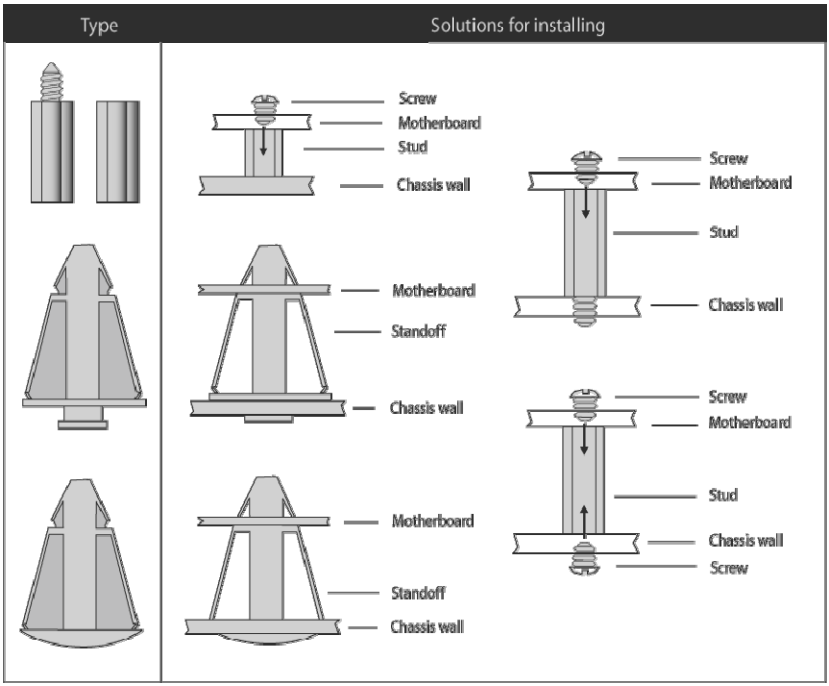


NOTE: Be especially careful to look for extra stand-offs. If there are any stand-offs present that are not aligned with a mounting hole on the motherboard, it will likely short components on the back of the motherboard when installed. This will cause malfunction and/or damage to your motherboard.

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

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

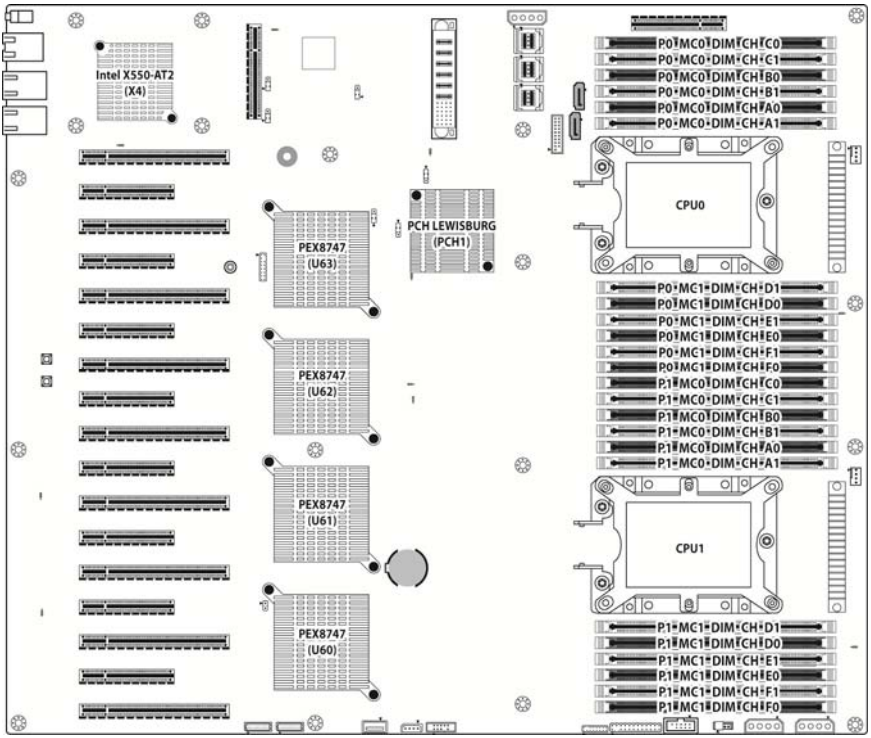
Mounting the Motherboard



4.7 Installing the Memory

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

- This platform supports (12)+(12) DDR4 RDIMM/RDIMM 3DS/LRDIMM/LRDIMM3DS 2666
- Up to 768GB RDIMM/ 1,536GB LRDIMM/ 3,072GB RDIMM 3DS/LRDIMM 3DS are supported
- 1.2V DDR4 DIMMs are supported
- All installed memory will automatically be detected. No jumpers or settings need to be changed for memory detection.
- All memory must be of the same type and density. **Different memory types can NOT be mixed and matched on the same motherboard.**



Recommended Memory Population Table

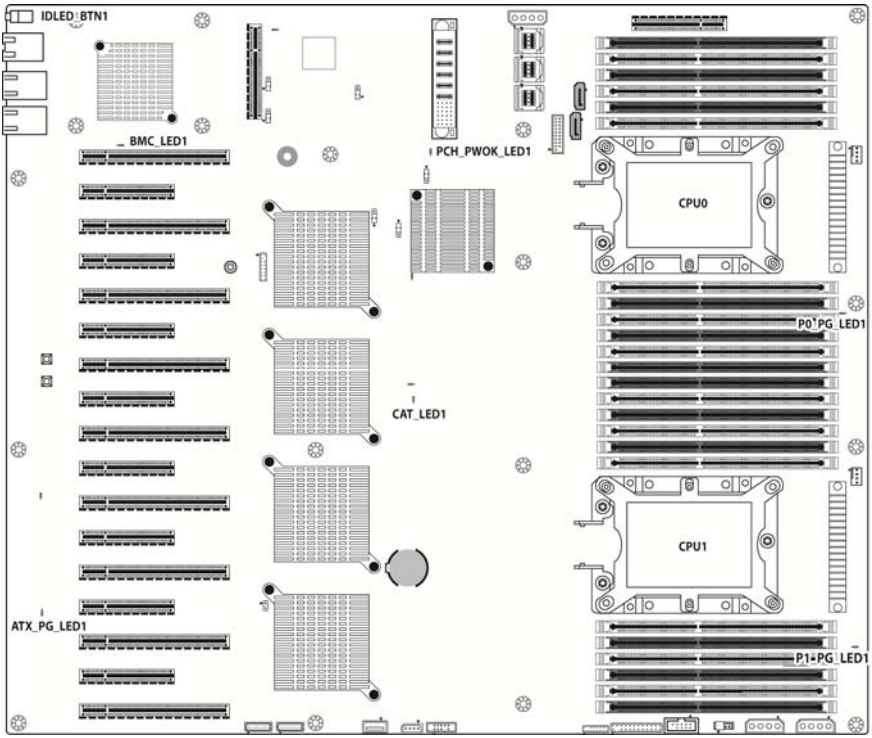
Single CPU Installed (CPU0 only)	Quantity of memory installed											
	1	2	3	4	5	6	7	8	9	10	11	12
P0_MC0_DIM_CH_A0	√	√	√	√	√	√	√	√	√	√	√	√
P0_MC0_DIM_CH_A1							√	√	√	√	√	√
P0_MC0_DIM_CH_B0		√	√	√	√	√	√	√	√	√	√	√
P0_MC0_DIM_CH_B1								√	√	√	√	√
P0_MC0_DIM_CH_C0			√	√	√	√	√	√	√	√	√	√
P0_MC0_DIM_CH_C1									√	√	√	√
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												√
P1_MC0_DIM_CH_A0												
P1_MC0_DIM_CH_A1												
P1_MC0_DIM_CH_B0												
P1_MC0_DIM_CH_B1												
P1_MC0_DIM_CH_C0												
P1_MC0_DIM_CH_C1												
P1_MC1_DIM_CH_D0												
P1_MC1_DIM_CH_D1												
P1_MC1_DIM_CH_E0												
P1_MC1_DIM_CH_E1												
P1_MC1_DIM_CH_F0												
P1_MC1_DIM_CH_F1												

Dual CPU Installed (CPU0 and CPU1)	Quantity of memory installed											
	2	4	6	8	10	12	14	16	18	20	22	24
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												√
P1_MC0_DIM_CH_A0	√	√	√	√	√	√	√	√	√	√	√	√
P1_MC0_DIM_CH_A1							√	√	√	√	√	√
P1_MC0_DIM_CH_B0		√	√	√	√	√	√	√	√	√	√	√
P1_MC0_DIM_CH_B1								√	√	√	√	√
P1_MC0_DIM_CH_C0			√	√	√	√	√	√	√	√	√	√
P1_MC0_DIM_CH_C1									√	√	√	√
P1_MC1_DIM_CH_D0				√	√	√	√	√	√	√	√	√
P1_MC1_DIM_CH_D1										√	√	√
P1_MC1_DIM_CH_E0					√	√	√	√	√	√	√	√
P1_MC1_DIM_CH_E1											√	√
P1_MC1_DIM_CH_F0						√	√	√	√	√	√	√
P1_MC1_DIM_CH_F1												√

NOTE:

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

4.8 Mainboard LED Definition



BMC_LED1	BMC Heart Beat LED	**Pin**	**Signal**	
		+	+3V_AUX	
		-	GND	
		State	**Description**	
		OFF	OFF	The LED shuts off when the BMC controller cannot be detected or properly initiated.
		Blinking	Green	The LED blinks per second to indicate that the BMC controller is working normally
PCH_PWOK_LED1	PCH PWOK LED	**Pin**	**Signal**	
		+	+3V_AUX	
		-	GND	
		State	**Description**	
		OFF	OFF	The LED shuts off when the power of PCH is abnormal.
		ON	Amber	The amber LED lights up when the power of PCH is normal.
CAT_LED1	CAT Error LED	**Pin**	**Signal**	
		+	+3V	
		-	GND	
		State	**Description**	
		OFF	OFF	The LED shuts off when System is running normally.
		ON	Red	The LED lighted up when the system has experienced a fatal or catastrophic error and can not continue to operate.
IDLED_BTN1	Rear ID LED	**Pin**	**Signal**	
		+	+ 3V_AUX	
		-	GND	
		State	**Description**	
		OFF	OFF	OFF
		ON	Green	ON
P0_PG_LED1	CPU0 PWOK LED	**Pin**	**Signal**	
		+	+3V	
		-	GND	
		State	**Description**	
		OFF	OFF	The LED shuts off when the power of CPU0 is abnormal.
		ON	Green	The LED lights up when the power of CPU0 is normally.

P1_PG_LED1	CPU1 PWOK LED	**Pin**	**Signal**	
		+	+ 3V	
		-	GND	
		State	**Description**	
		OFF	OFF	The LED shuts off when the power of CPU1 is abnormal.
		ON	Green	The LED lights up when the power of CPU1 is normally.
ATX_PG_LED1	PSU PWROK LED	**Pin**	**Signal**	
		+	+ 3V	
		-	GND	
		State	**Description**	
		OFF	OFF	The LED shuts off when the PSU is normal.
		ON	Green	The LED lights up when the PSU is abnormally.

4.9 Finishing Up

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

Chapter 5: BIOS Setup

5.1 About the BIOS

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

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

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

To start the BIOS setup utility:

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

5.1.1 Setup Basics

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

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

5.1.2 Getting Help

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

5.1.3 In Case of Problems

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

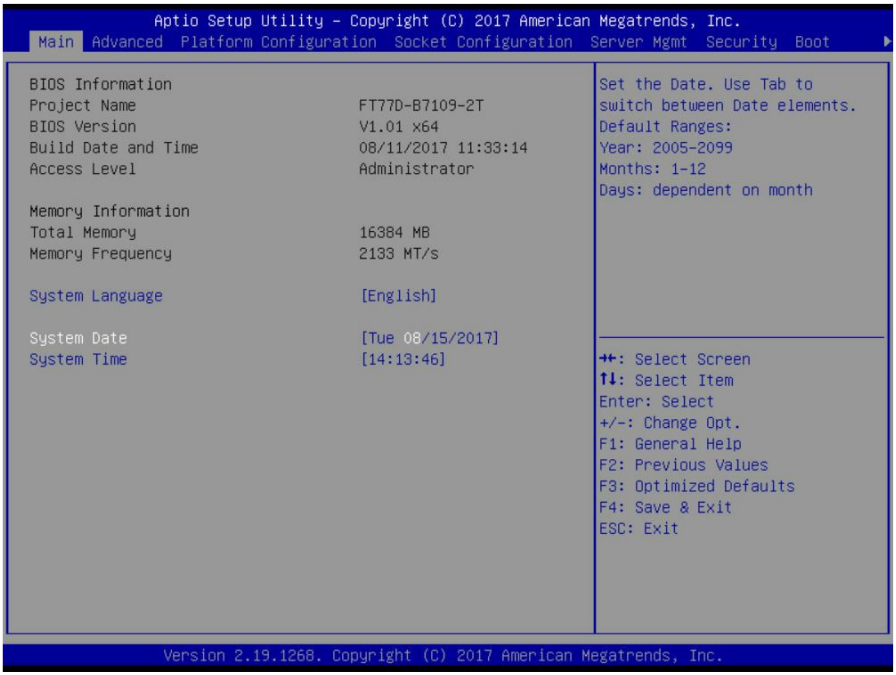
5.1.4 Setup Variations

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

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

5.2 Main Menu

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



BIOS Information
It displays BIOS related information.

Memory Information
This displays the total memory size.

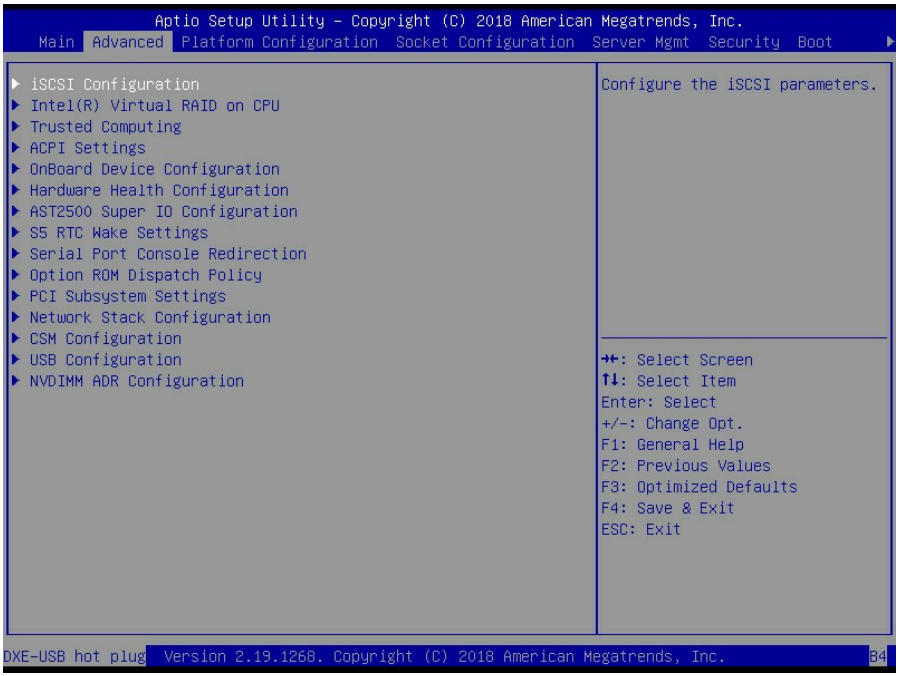
System Language
Choose the system default language.
English

System Date
Set the Date. Use Tab to switch between Date elements. Default Ranges:
Year: 2005-2099
Months: 1-12
Days: dependent on month

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

5.3 Advanced Menu

This section facilitates configuring advanced BIOS options for your system.



iSCSI Configuration
Configure the iSCSI parameters.

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

Trusted Computing
Trusted Computing Settings.

ACPI Settings
System ACPI Parameters.

OnBoard Device Configuration
OnBoard Device and Function Configuration.

Hardware Health Configuration
Hardware Health Configuration.

AST2500 Super IO Configuration
System Super IO Chip Parameters.

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

Serial Port Console Redirection
Serial Port Console Redirection.

Option ROM Dispatch Policy
Option ROM Dispatch Poligy.

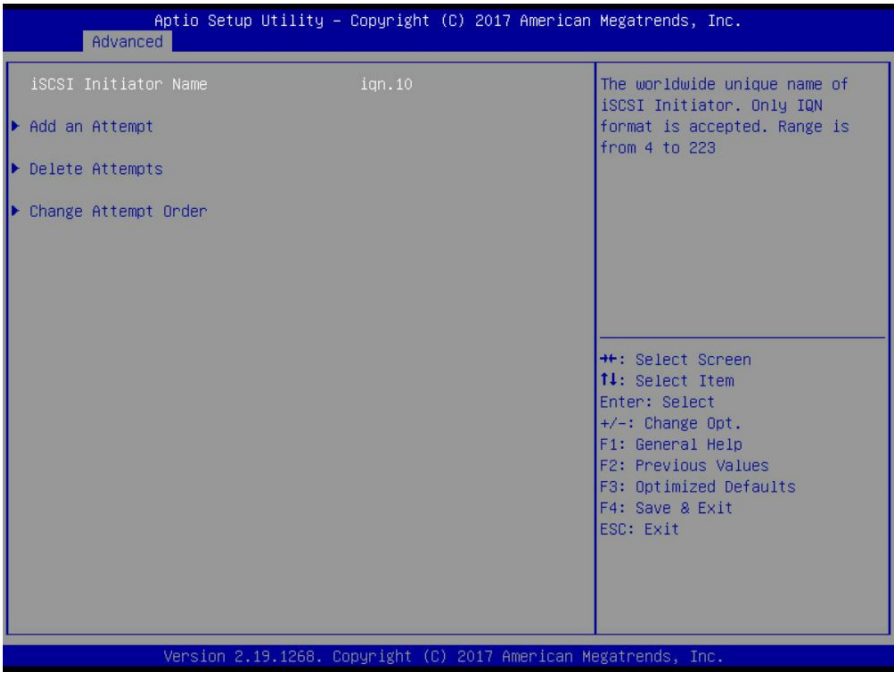
PCI Subsystem Settings
PCI, PCI-X and PCI Express Settings.

Network Stack Configuration
Network Stack Settings.

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

USB Configuration
USB Configuration Parameters.

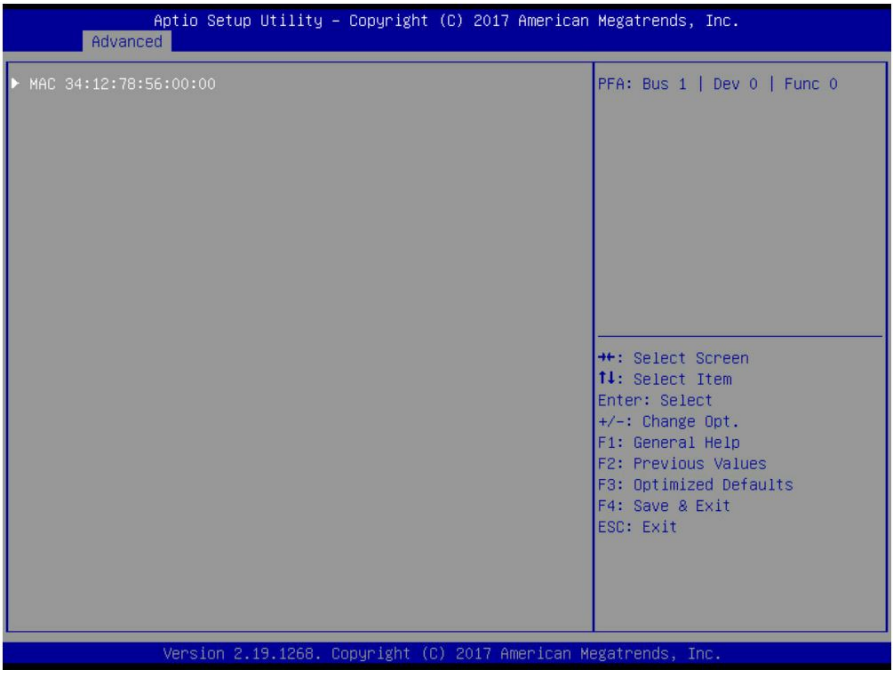
5.3.1 iSCSI Configuration



Please follow the instructions to initiate the iSCSI function.
Step 1.
Select **Advanced → CSM Configuration → Network →** [UEFI].
Step 2.
Select **Advanced → Network Stack Configuration → Network Stack →** [Enabled]
Step 3.
Save changes and reboot.

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

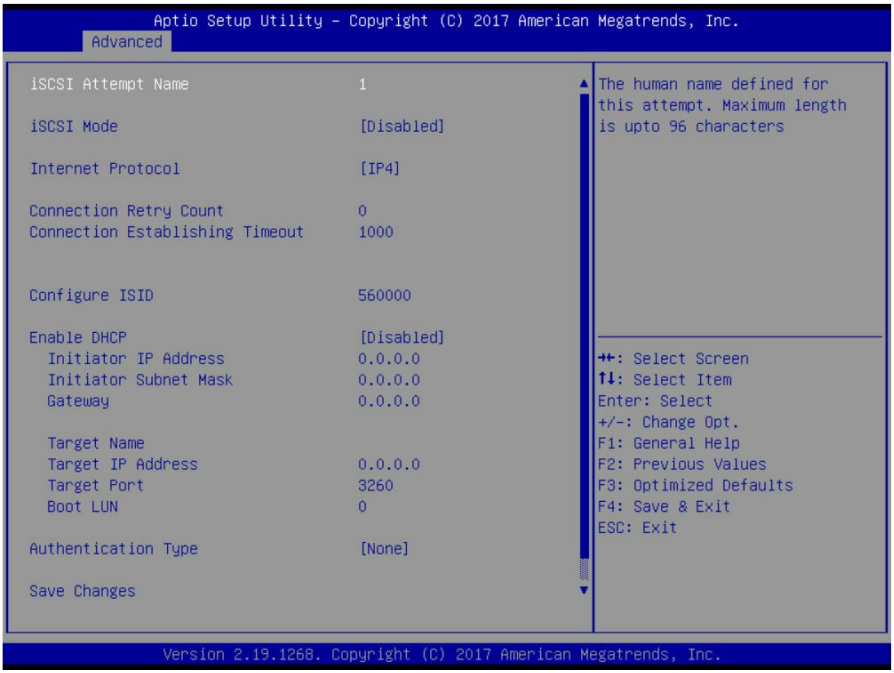
5.3.1.1 Add an Attempt



Read only.

NOTE: Only LAN1 supports iSCSI function.

5.3.1.1.1 MAC 34:12:78:56:00:00



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

Internet Protocol
Initiator IP address is system assigned in IP6 mode. In Autoconfigure mode, iSCSI driver will attempt to connect iSCSI target via IPv4 stack, if failed then attempt IPv6 stack.
IP4 / IP6 / Autoconfigure

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

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

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

Enable DHCP
Enable DHCP.
Disabled / Enabled

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

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

Gateway
Enter IP address in dotted-decimal notation.

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

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

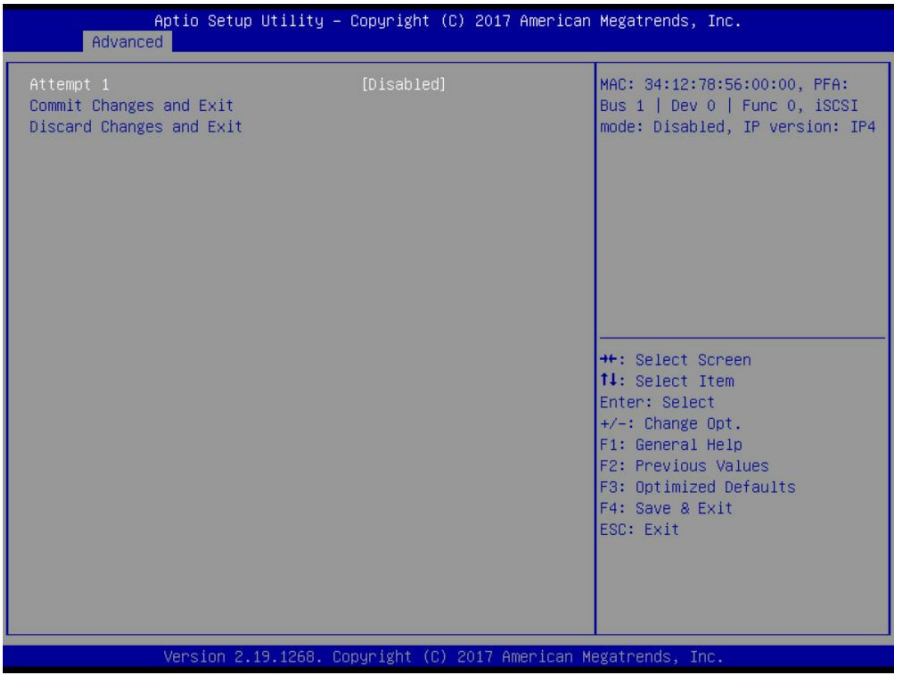
Target Port
Target Port.

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

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

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

5.3.1.2 Delete Attempts



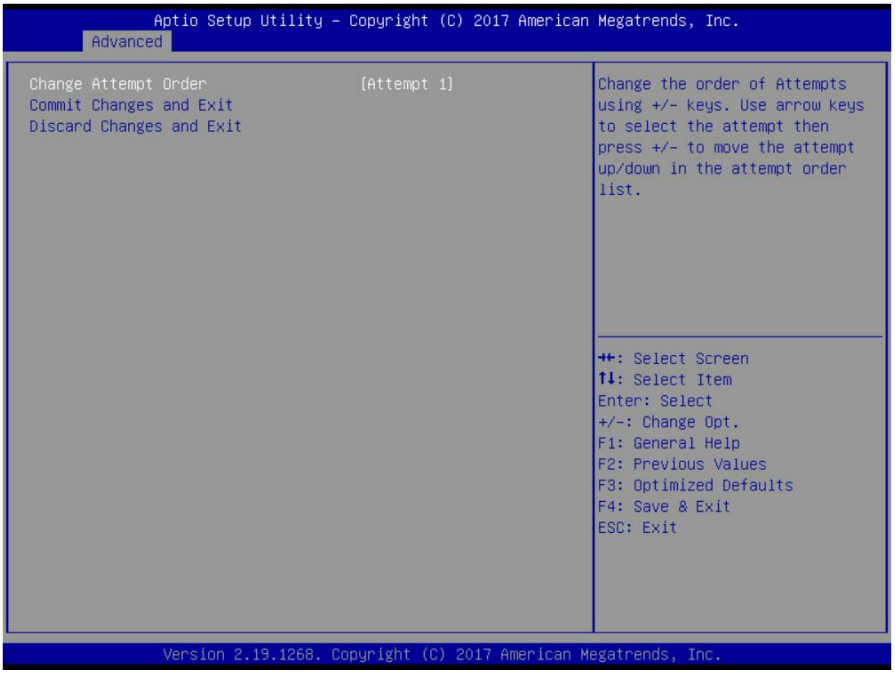
Attempt 1
MAC: 34:12:78:56:00:00, PFA: Bus 1/ Dev 0 / Func 0, iSCSI mode: Disabled, IP version: IP4.

Disabled / Enabled

Commit Changes and Exit
Commit Changes and Exit.

Discard Changes and Exit
Discard Changes and Exit.

5.3.1.3 Change Attempt Order



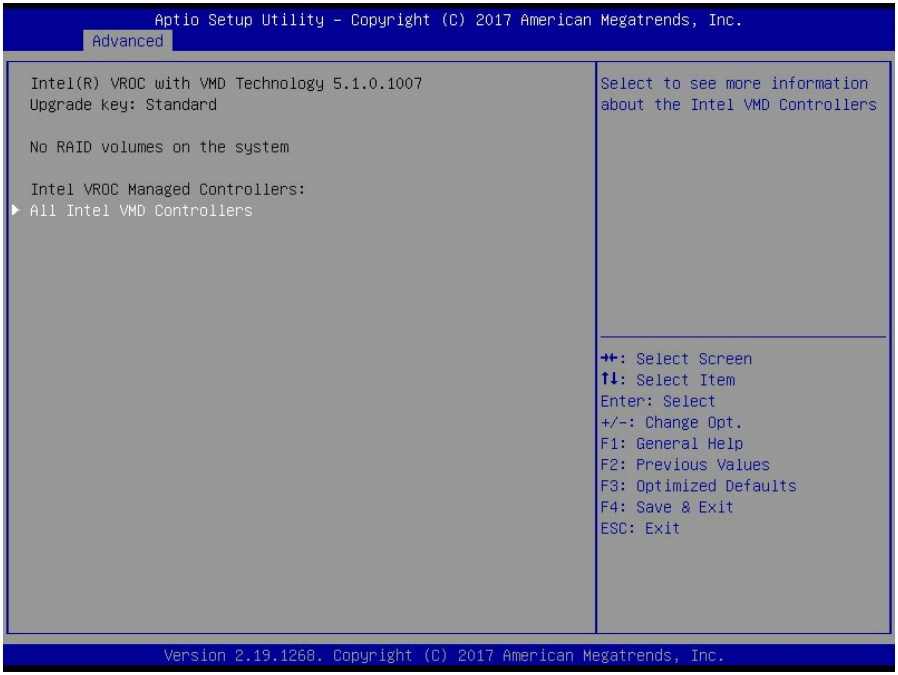
Change Attempt Order
Change the order of Attempts using +/- keys. Use arrow keys to select the attempt then press +/- to move the attempt up/down in the attempt order list.

Attempt 1 / Attempt #

Commit Changes and Exit
Commit Changes and Exit.

Discard Changes and Exit
Discard Changes and Exit.

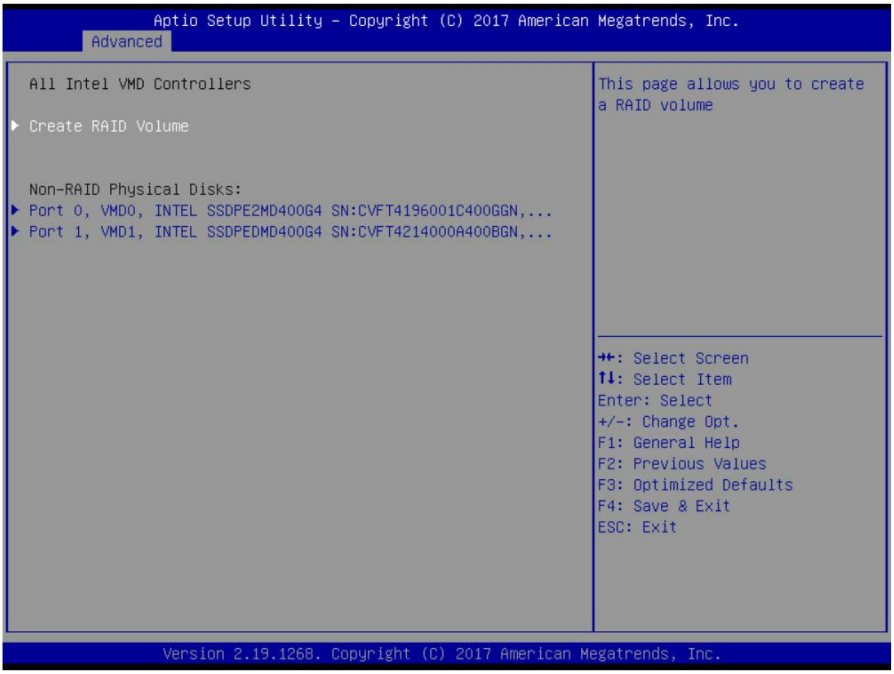
5.3.2 Intel® Virtual RAID on CPU



Please follow the instructions to initiate the Intel Virtual RAID on CPU function.
Step 1.
Select **Socket Configuration → IIO Configuration → Intel® VMD technology → Intel® VMD for Volume Management Device on Socket 0** (for CPU0) / Socket 1 (for CPU1) → **Intel® VMD for Volume Management Device for PStack0** (Slot 1~4) / PStack1 (Slot 5~8) / PStack2 (Slot 9~12)
Step 2.
Suppose the card is installed in CPU0 Slot 3, then **Intel® VMD for Volume Management Device for PStack0** will be set to [Enabled].
Step 3.
Save changes and reboot.

All Intel VMD Controllers
Select to see more information about the Intel VMD Controllers.

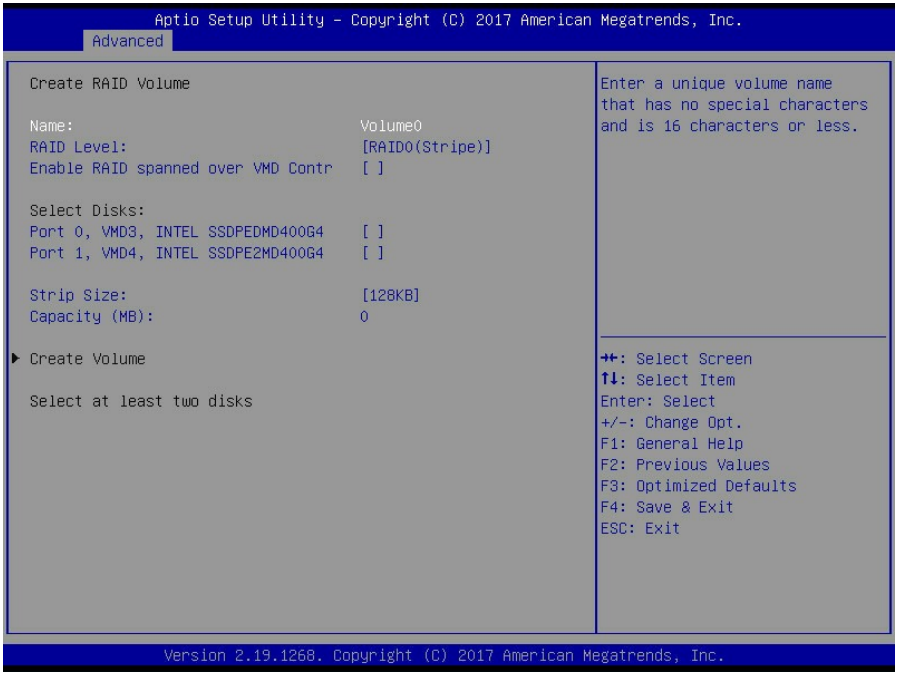
5.3.2.1 All Intel VMD Controllers



Create RAID Volume
This page allows you to create a RAID volume.

Non-RAID Physical Disks
Read only.

5.3.2.1.1 Create RAID Volume



Name
Enter a unique volume name that has no special characters and is 16 characters or less.

Volume0

RAID Level
Select RAID Level.

RAID0 (Stripe)

Enable RAID spanned over VMD Controllers
Enter RAID spanned over VMD Controllers.

blank / X

Port 0, VMD0, INTEL SSDPE2MD400G4
X – to Select Disk.

blank / X

Port 1, VMD1, INTEL SSDPEDME400G4
X – to Select Disk.

blank / X

Strip Size
Strip size help.
4KB / 8KB / 16KB / 32KB / 64KB / **128KB**

Capacity (MB)
Capacity in MB. Enter desired volume size. Maximum size=763099.

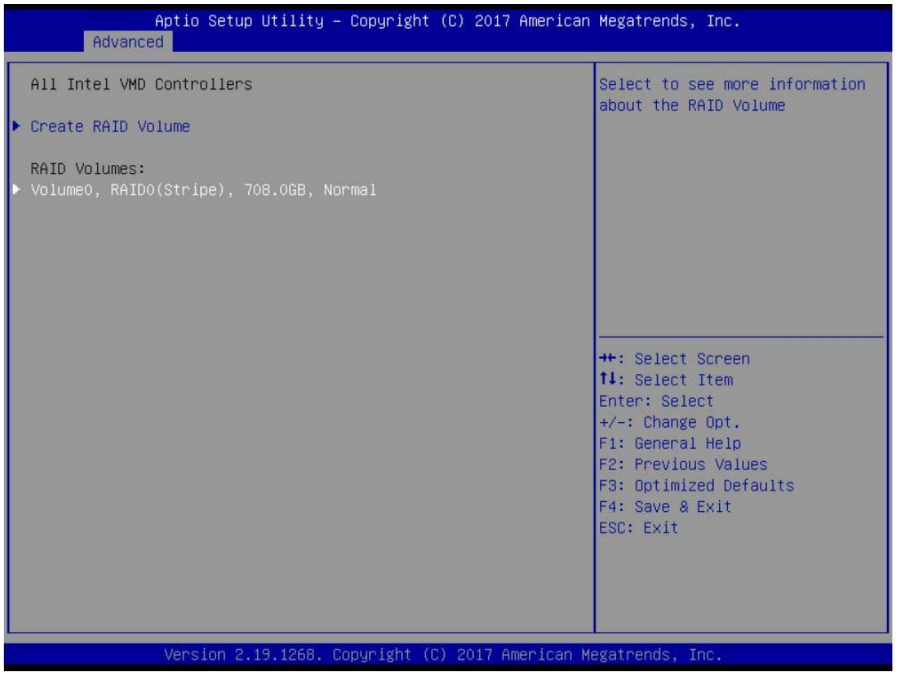
Create Volume
Create a volume with the settings specified above.

NOTE: For **Create Volume** to be configurable, the following items **Enable RAID spanned over VMD Controllers, Port 0, VMD0, INTEL SSDPE2MD400G4** and **Port 1, VMD1, INTEL SSDPEDME400G4** must be set to [X].

5.3.2.1.1.1 Create Volume

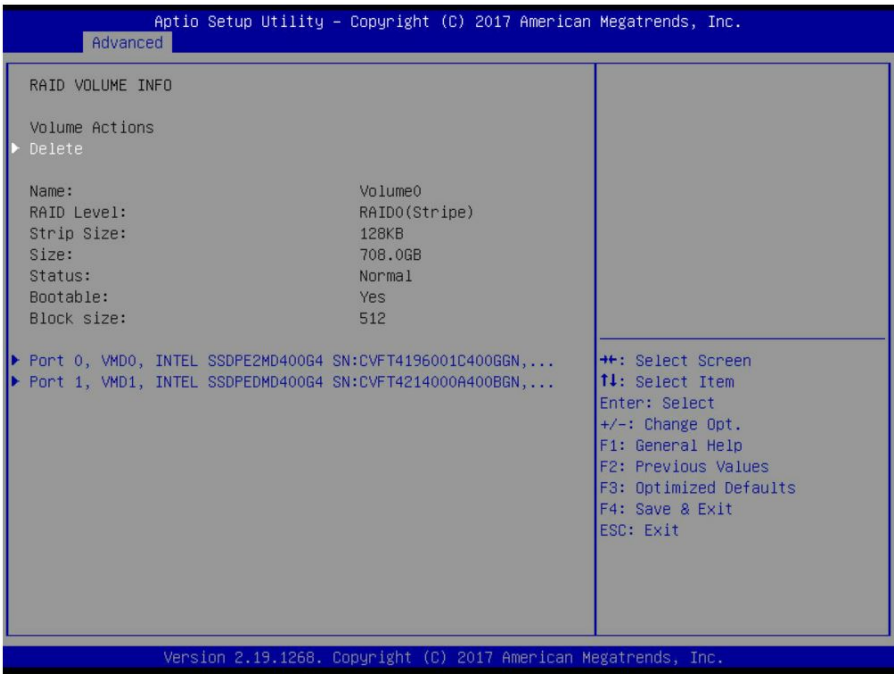


Press ‘y’ to create, ‘n’ to discard.



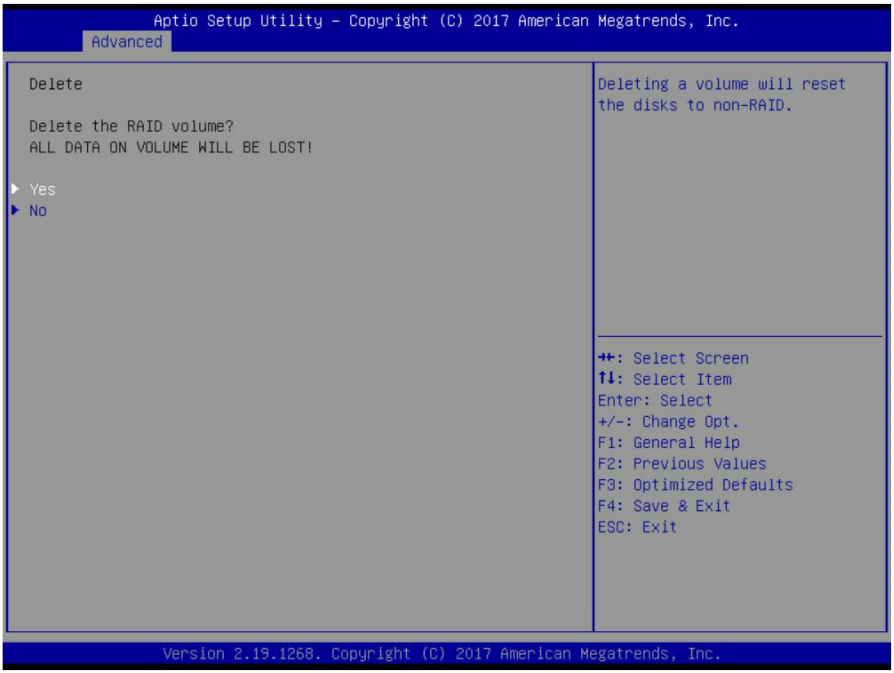
Volume0, RAID0(Stripe), 708.0GB, Normal
Select to see more information about the RAID volume.

5.3.2.1.1.1.1 Volume0, RAID0(Stripe), 708.0GB, Normal



Read only.

5.3.2.1.1.1.1.1 Delete



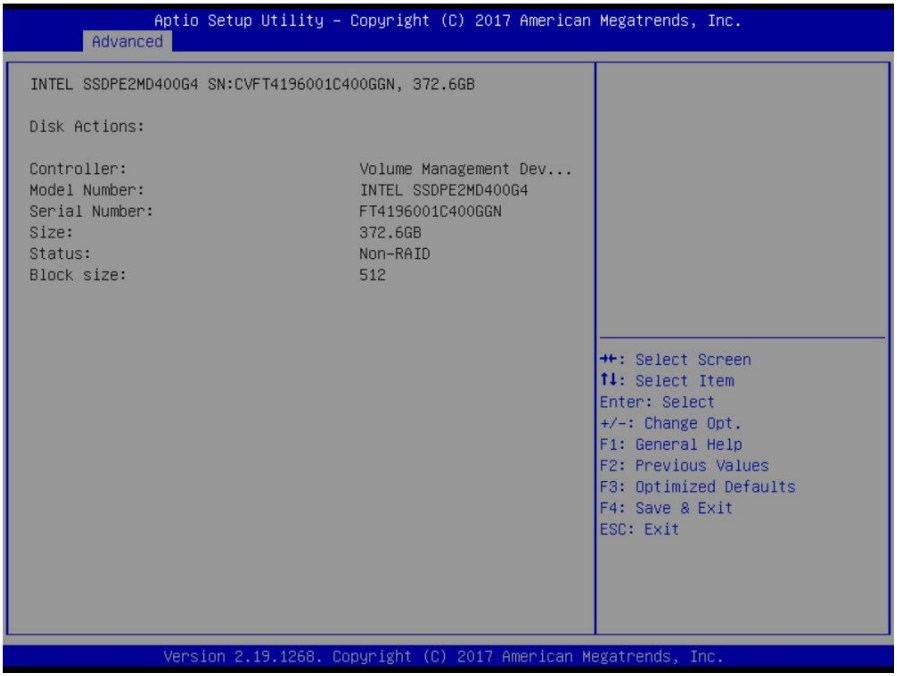
Delete the RAID Volume

Deleting a volume will reset the disks to non-RAID.

Yes / No

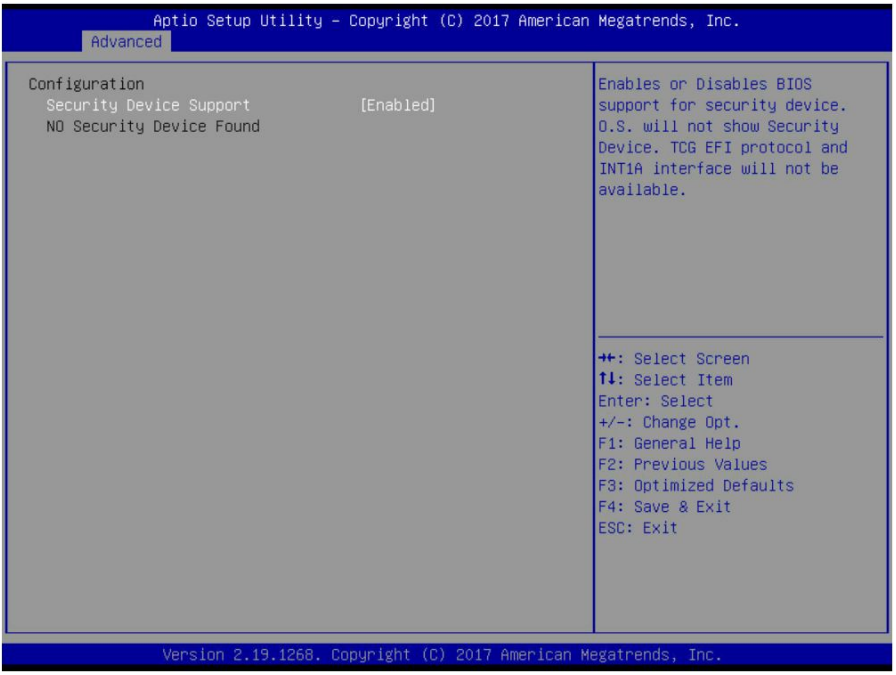
5.3.2.1.2 Port 0, VMD0, INTEL SSDPE2MD400G4 SN: xxxx, …

Port 1, VMD1, INTEL SSDPEDMD400G4 SN: xxxx, ….



Read only.

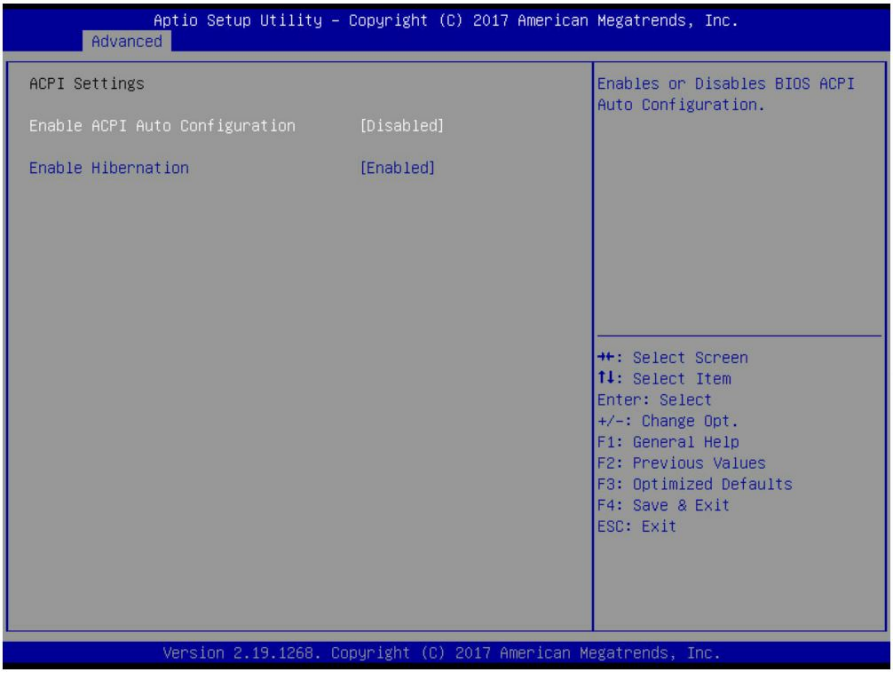
5.3.3 Trusted Computing



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

Enabled / Disabled

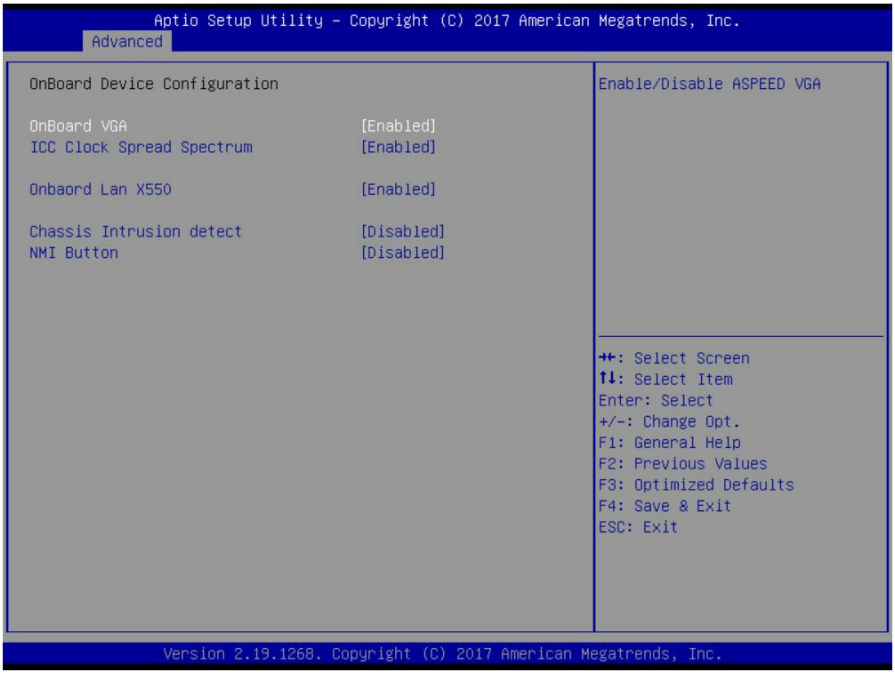
5.3.4 ACPI Settings



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

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

5.3.5 OnBoard Device Configuration



Onboard VGA
Enable/Disable SPEED VGA.
Disabled / **Enabled**

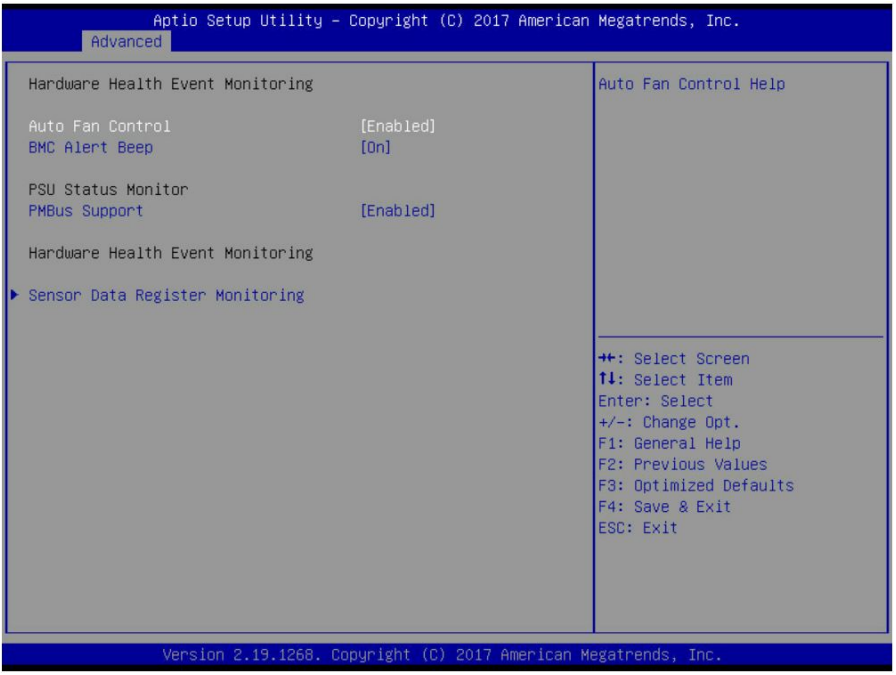
ICC Clock Spread Spectrum
Turn on/off Spread Spectrum Setting of IsCLK.
Disabled / **Enabled**

Onboard Lan X550
Enable/Disable onboard Lan X550.
Disabled / **Enabled**

Chassis Intrusion detect
ENABLED: when a chassis open event is detected, the BIOS will record the event.
Disabled / Enabled

NMI Button
Enable or Disable NMI button.
Disabled / Enabled

5.3.6 Hardware Health Configuration



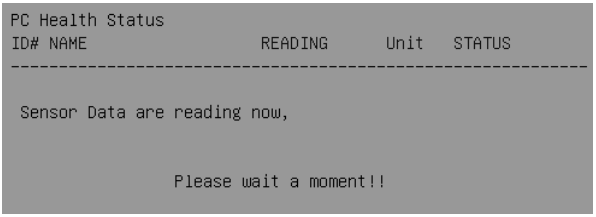
Auto Fan Control
Auto Fan Control Help.
Disabled / **Enabled**

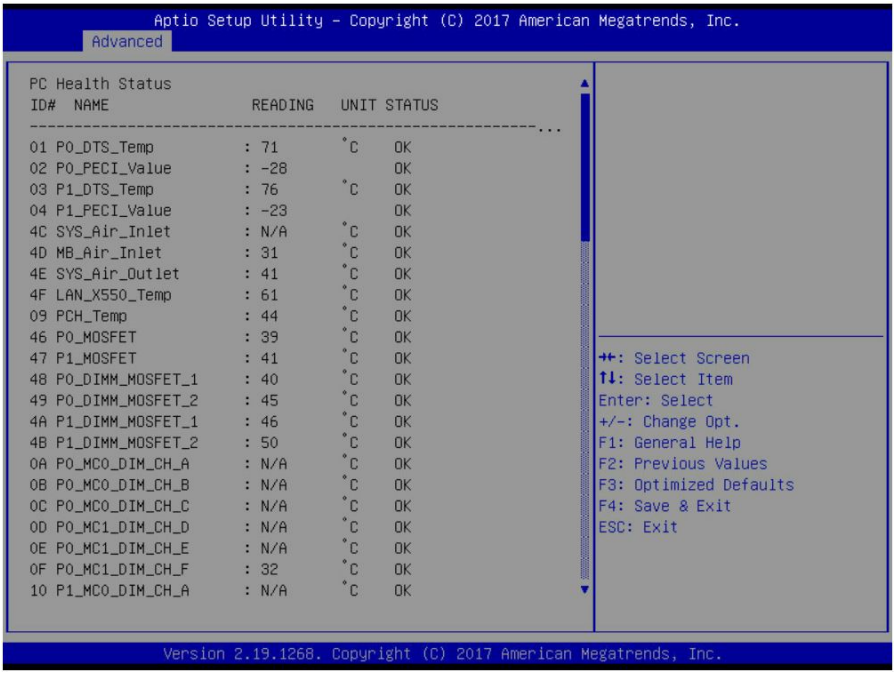
BMC Alert Beep
Enable/Disable BMC Alert Beep.
On / Off

PMBus Support
PMBus Support.
Enabled / Disabled

5.3.6.1 Sensor Data Register Monitoring

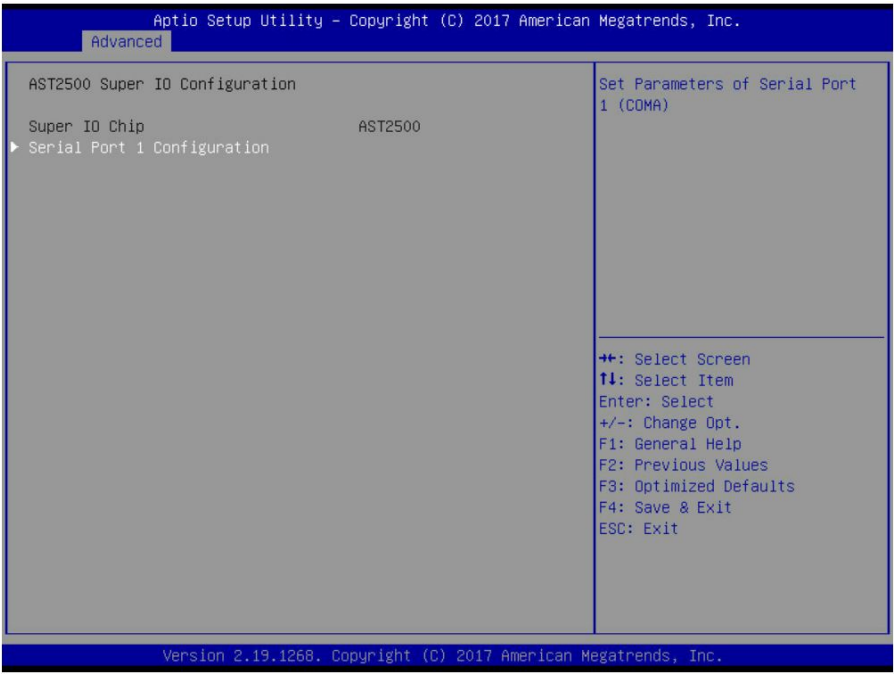
When you enter the **Sensor Data Register Monitoring** submenu, you will see the following dialog window pop out. Please wait 8~10 seconds.





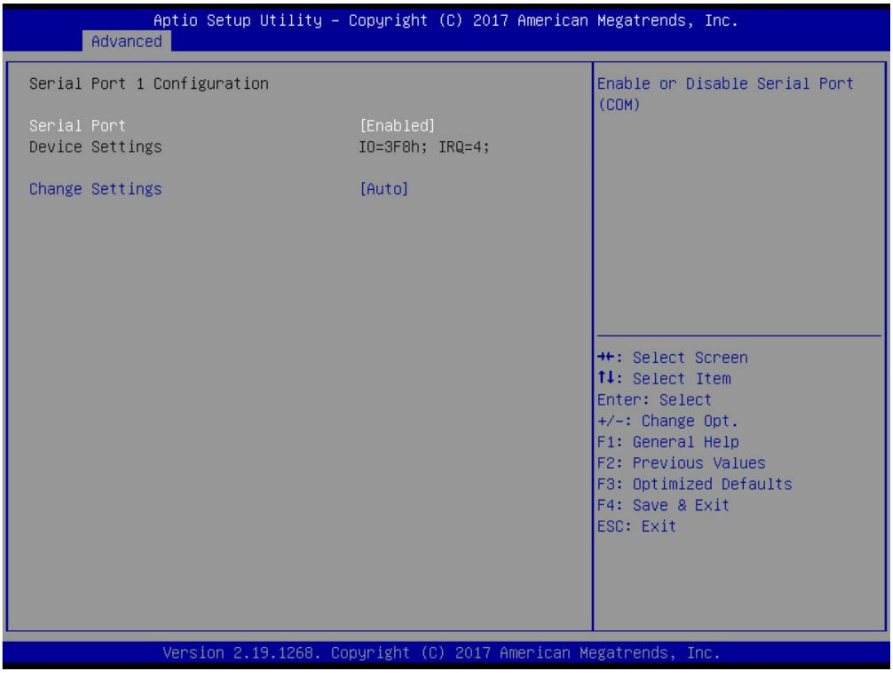
NOTE: SDR can not be modified. Read only.

5.3.7 AST2500 Super IO Configuration



Super IO Chip
Read only.

5.3.7.1 Serial Port 1 Configuration

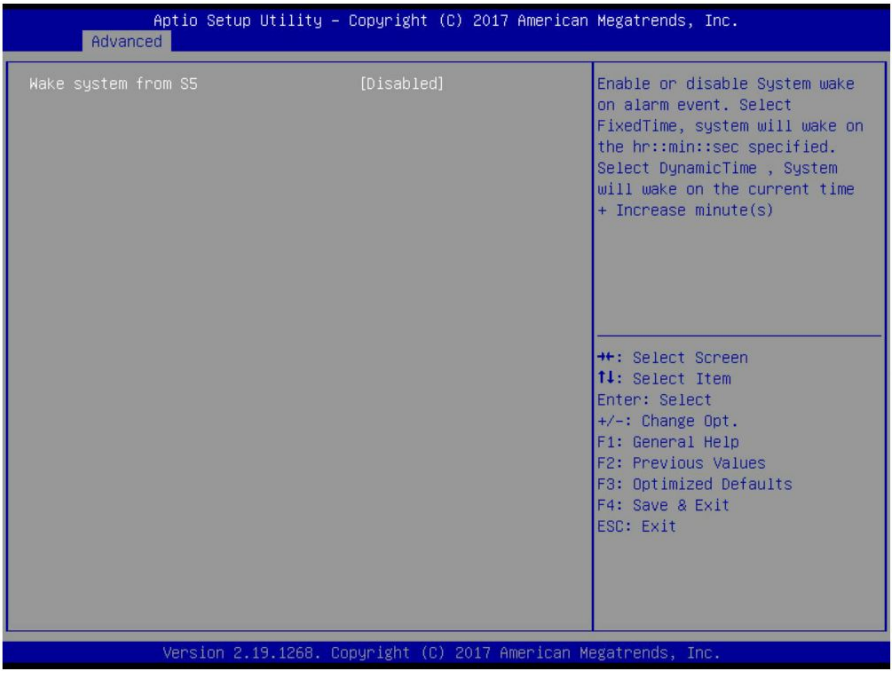


Serial Port
Enable or disable Serial Port (COM).
Enabled / Disabled

Device Settings
Read only.

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

5.3.8 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

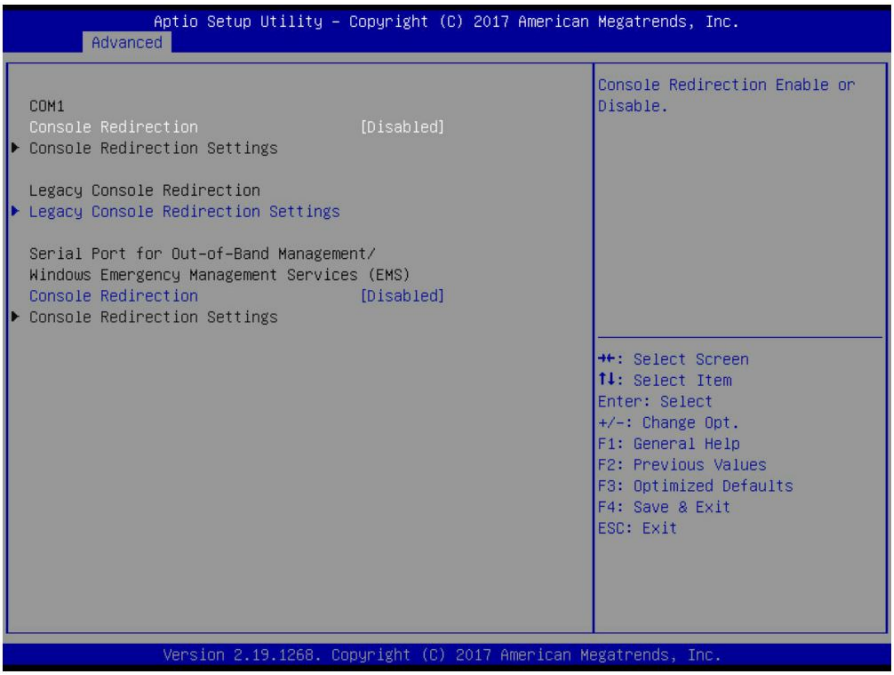
When Wake system from S5 is set to **[Fixed Time]**
Wake up hour
Select 0-23. For example enter 3 for 3am and 15 for 3pm.

Wake up minute
Select 0-59 for Minute.

Wake up second
Select 0-59 for Second.

When Wake system from S5 is set to **[Dynamic Time]**
Wake up Minute increase
1-5.

5.3.9 Serial Port Console Redirection

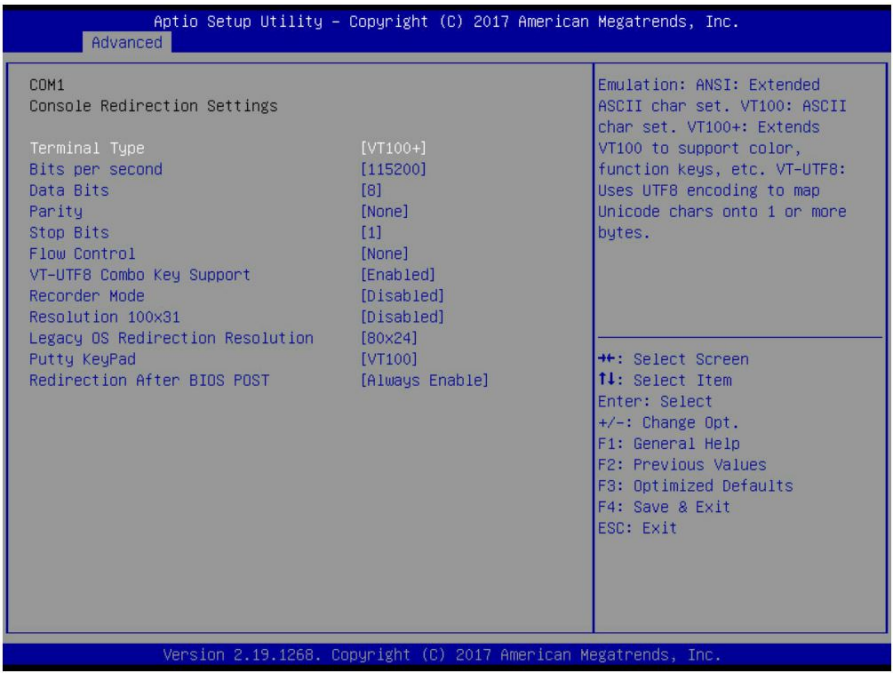


COM1 / Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS)
Console Redirection
Console redirection enable or disable.
Disabled **/ Enabled**

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

Legacy Console Redirection Settings
Legacy Console redirection settings.

5.3.9.1 Console Redirection Settings



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

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

Data Bits
8 / 7

Parity
A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if the num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: parity bit is always 0. Mark and Space parity do not allow for error detection.
None / Even / Odd / Mark / Space

Stop Bits
Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

1 / 2

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

None / Hardware RTS/CTS

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

Enabled / Disabled

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

Disabled / Enabled

Resolution 100x31
Enable or disable extended terminal resolution.

Disabled / Enabled

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

80x24 / 80x25

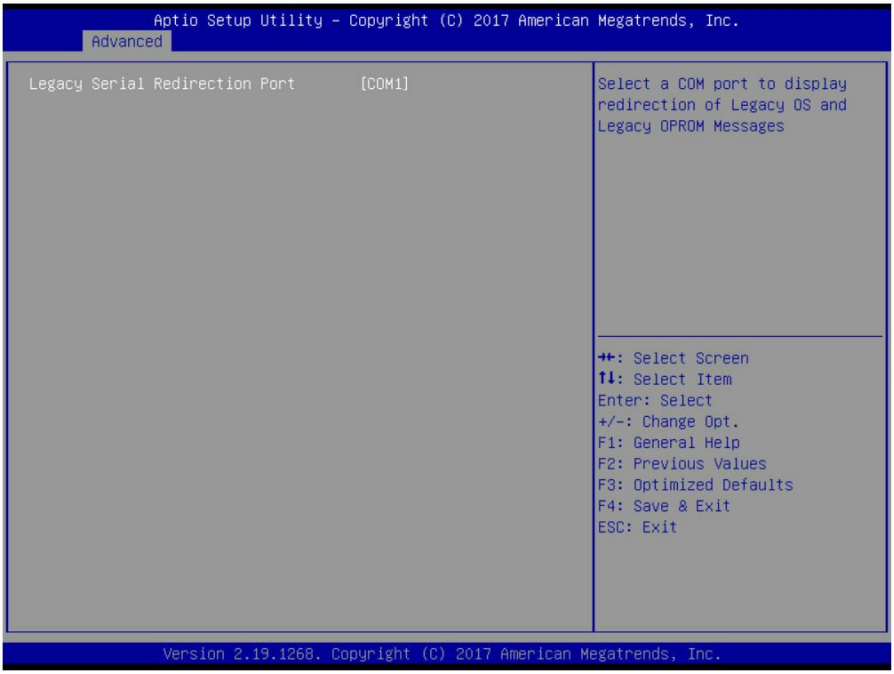
Putty KeyPad
Select FunctionKey and KeyPad on Putty.

VT100 / LINUX / XTERMR6 / SCO / ESCN / VT400

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

Always Enable / BootLoader

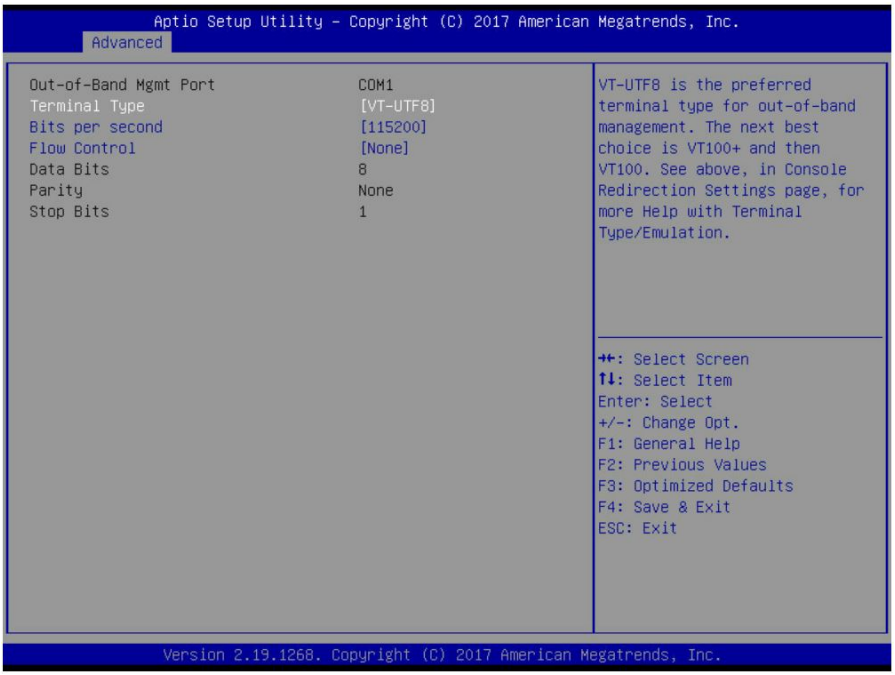
5.3.9.2 Legacy Console Redirection Settings



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

COM1

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



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

COM1

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

VT-UTF8 / VT100 / VT100+ / ANSI

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

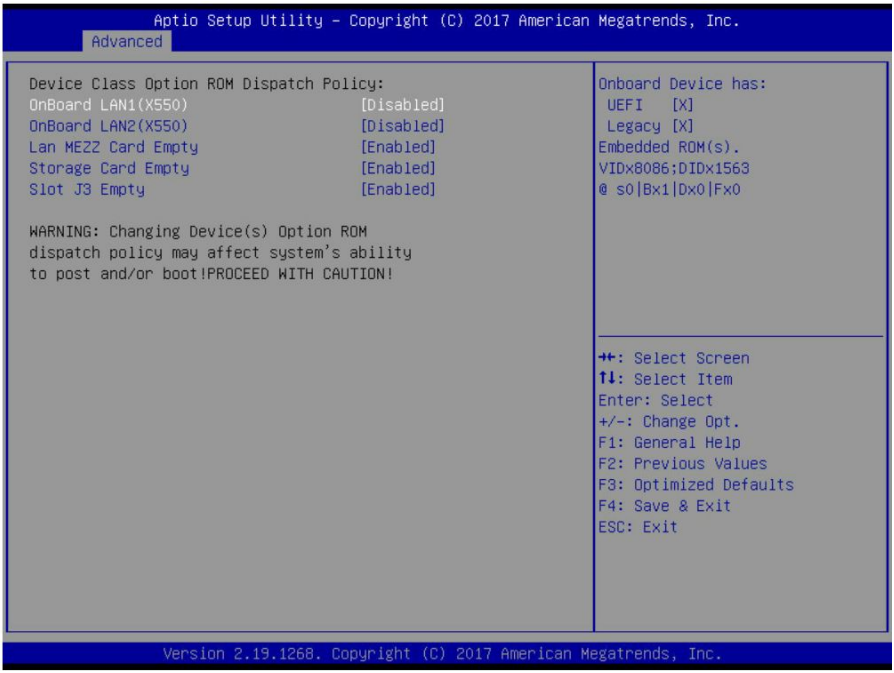
115200 / 9600 / 19200 / 57600

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

None / Hardware RTS/CTS / Software Xon/Xoff

Data Bits / Parity / Stop Bits
Read only.

5.3.10 Option ROM Dispatch Policy



OnBoard LAN1 (X550)
Onboard Device has:
UEFI [X]
Legacy [X]
Emabed ROM(s).
VIDx8086; DIDx1563
@ s0/Bx1/Dx0/Fx0.
Enabled / **Disabled**

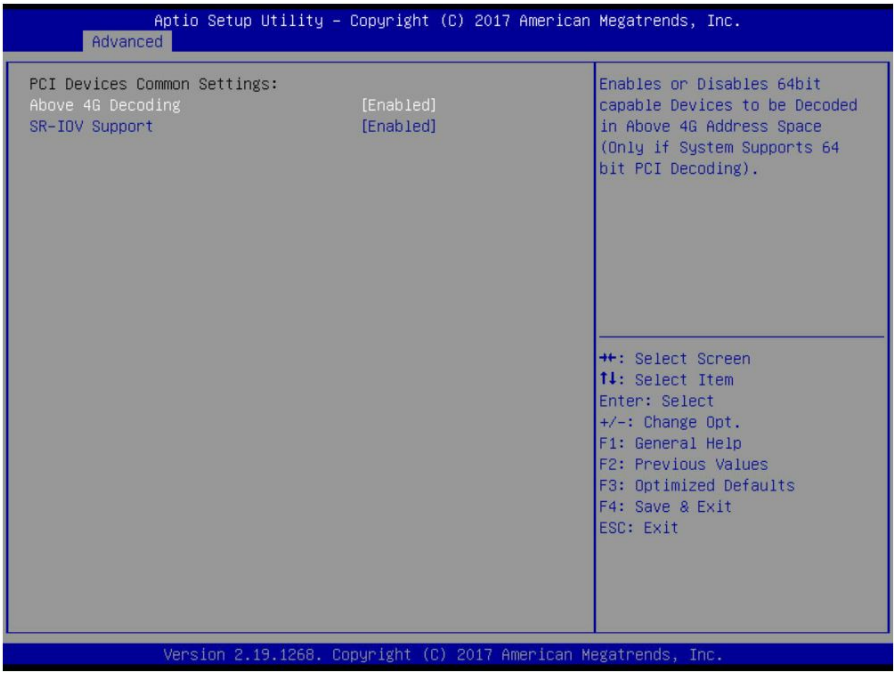
OnBoard LAN2 (X550)
Onboard Device has:
UEFI [X]
Legacy [X]
Emabed ROM(s).
VIDx8086; DIDx1563
@ s0/Bx1/Dx0/Fx1.
Enabled / **Disabled**

Lan MEZZ Card Empty
Enable or Disable Option ROM execution for selected Slot.
Disabled / **Enabled**

Storage Card Empty
Enable or Disable Option ROM execution for selected Slot.
Disabled / **Enabled**

Slot J3 Empty
Enable or Disable Option ROM execution for selected Slot.
Disabled / **Enabled**

5.3.11 PCI Subsystem Settings



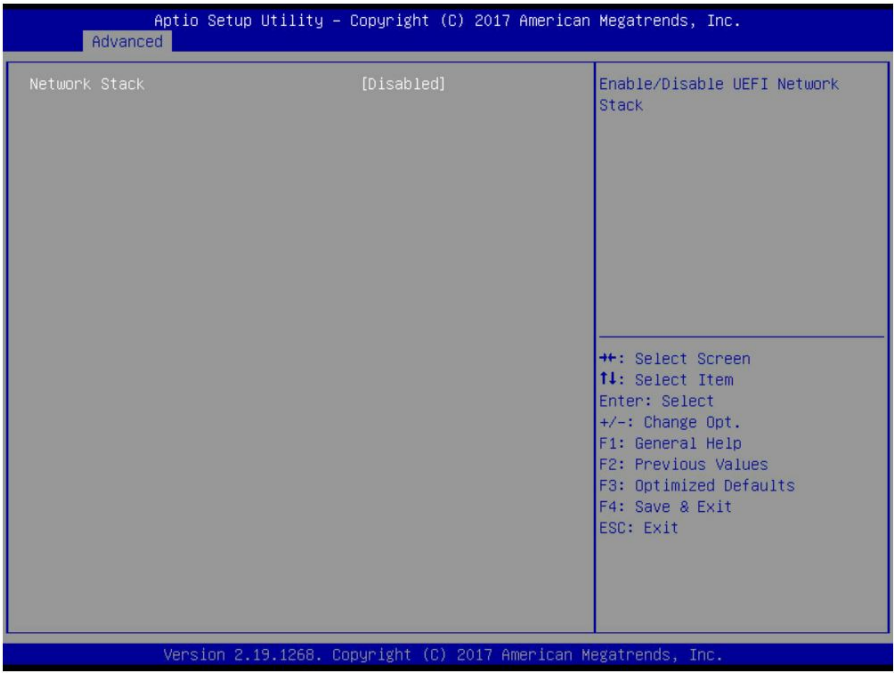
Above 4G Decoding
Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).

Enabled / Disabled

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

Enabled / Disabled

5.3.12 Network Stack Configuration



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

Network Stack
Enable/Disable UEFI Network Stack.
Enabled / **Disabled**

When Network Stack is set to **[Enabled]**
Ipv4 PXE Support
Enable Ipv4 PXE Boot Support. If disabled IPV$ PXE boot option will not be created.
Disabled / Enabled

Ipv4 HTTP Support
Enable Ipv4 HTTP Boot Support. If disabled IPV4 HTTP boot option will not be created.
Disabled / Enabled

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

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

Disabled / Enabled

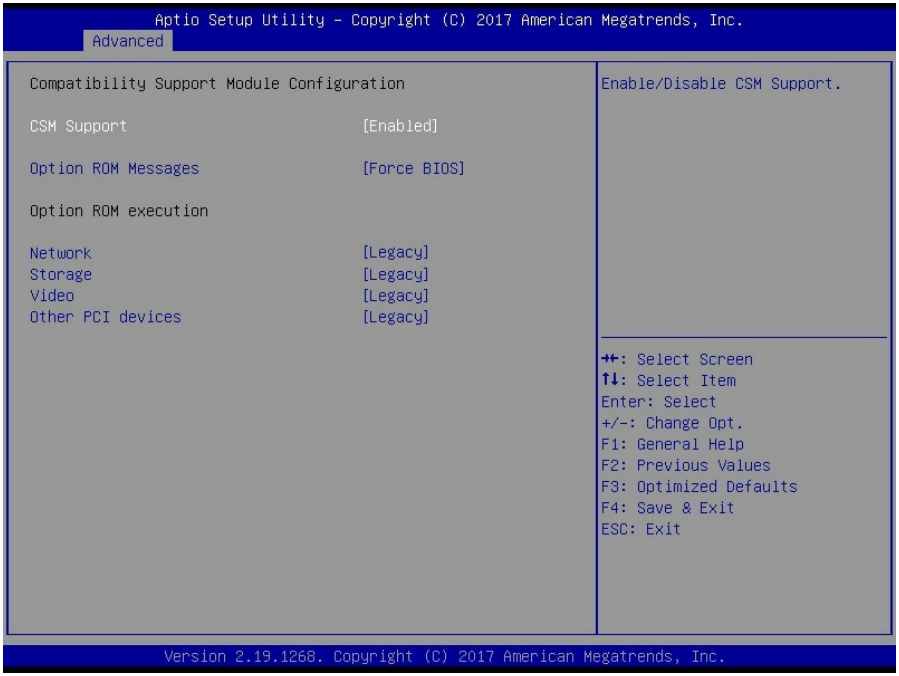
PXE boot wait time
Wait time to press ESC key to abort the PXE boot.

0

Media detect count
Number of times presence of media will be checked.

1

5.3.13 CSM Configuration



CSM Support
Enable/Disable CSM Support.
Enabled / Disabled

Option ROM Messages
Set display mode for Option ROM.
Force BIOS / Keep Current

Network
Controls the execution of UEFI and Legacy PXE OpROM.
Legacy / Do not launch / UEFI

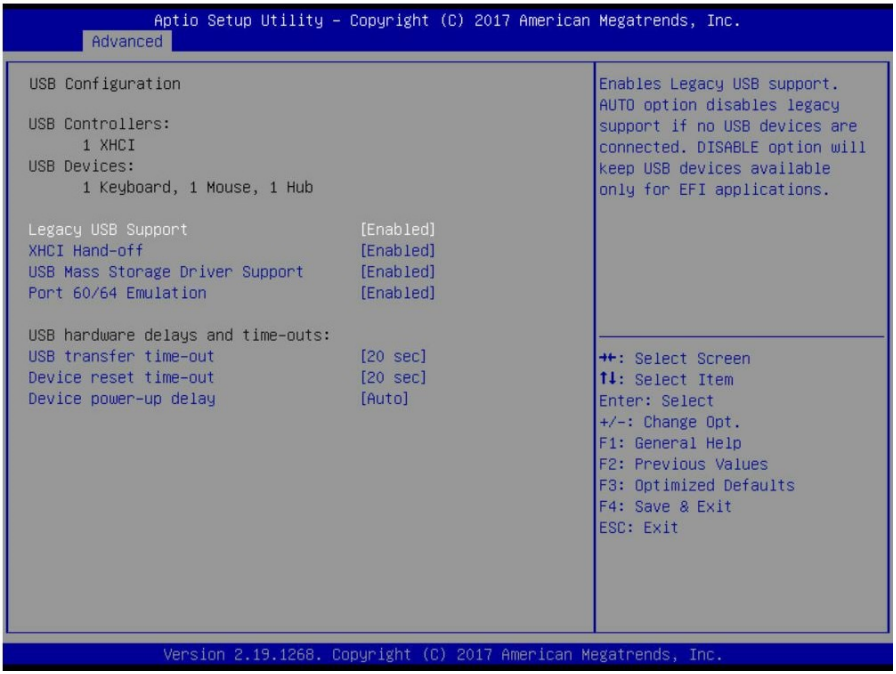
Storage
Controls the execution of UEFI and Legacy Storage OpROM.
Legacy / Do not launch / UEFI

Video
Controls the execution of UEFI and Legacy Video OpROM
Legacy / Do not launch / UEFI

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

Legacy / Do not launch / UEFI

5.3.14 USB Configuration



USB Controllers / USB Devices
Read only.

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

Enabled / Disabled / Auto

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

Enabled / Disabled

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

Enabled / Disabled

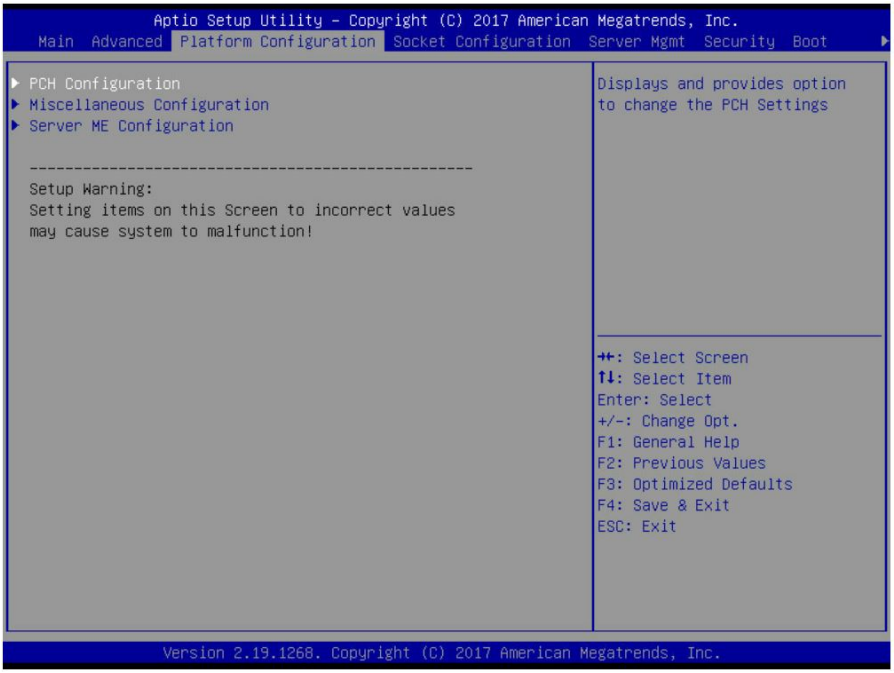
Port 60/64 Emulation
Enables I/O Port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
Enabled / Disabled

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

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

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

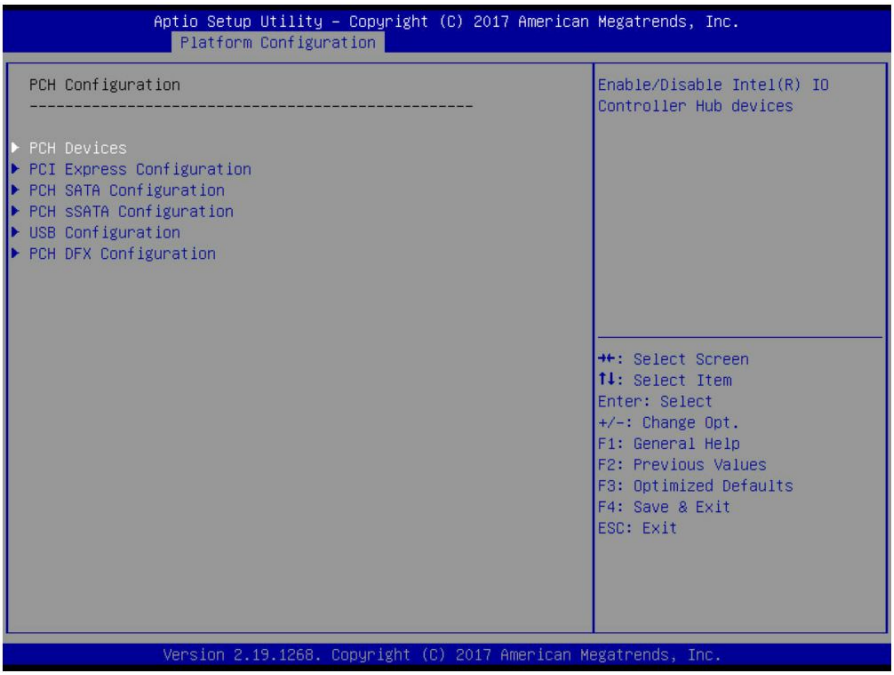
5.4 Platform Configuration



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

Server ME Configuration
Configure Server ME Technology Parameters.

5.4.1 PCH Configuration



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

PCI Express Configuration
PCI Express Configuration settings.

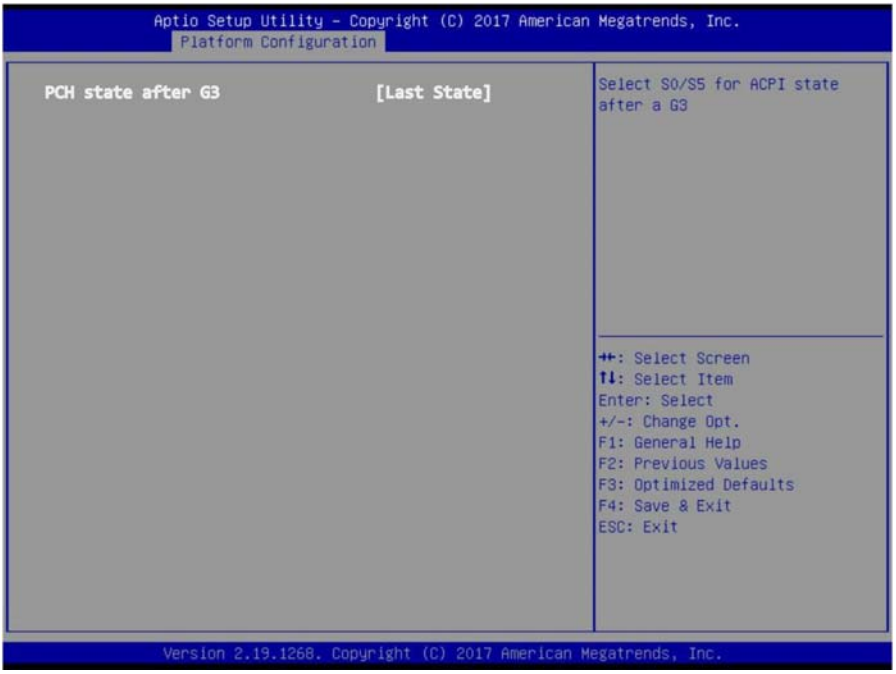
PCH SATA Configuration
SATA devices and settings.

PCH sSATA Configuration
sSATA devices and settings.

USB Configuration
USB Configuration Settings.

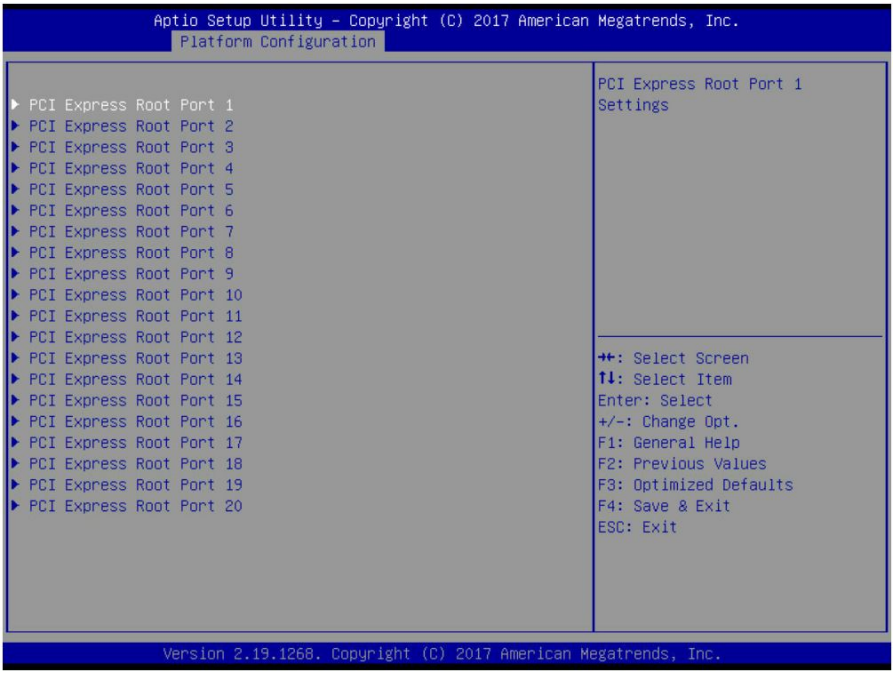
PCH DFX Configuration
PCH DFX Configuration Options.

5.4.1.1 PCH Devices



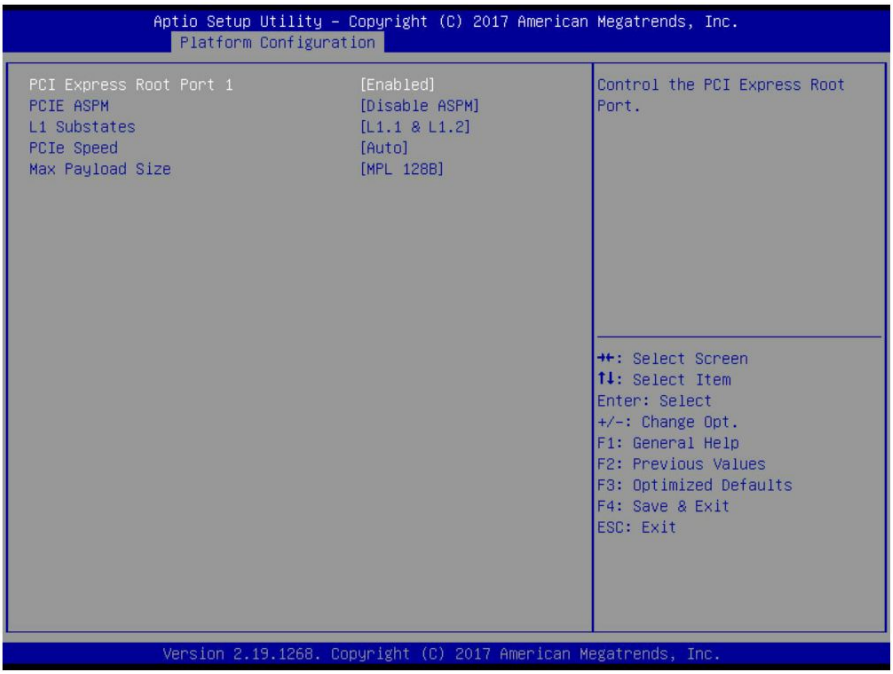
PCH state after G3
Select S0/S5 for ACPI state after a G3.
Power On / Power Off / **Last State**

5.4.1.2 PCI Express Configuration



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

5.4.1.2.1 PCI Express Root Port1 ~ Port20



PCI Express Root Port 1
Control the PCI Express Root Port.
Disabled / **Enabled**

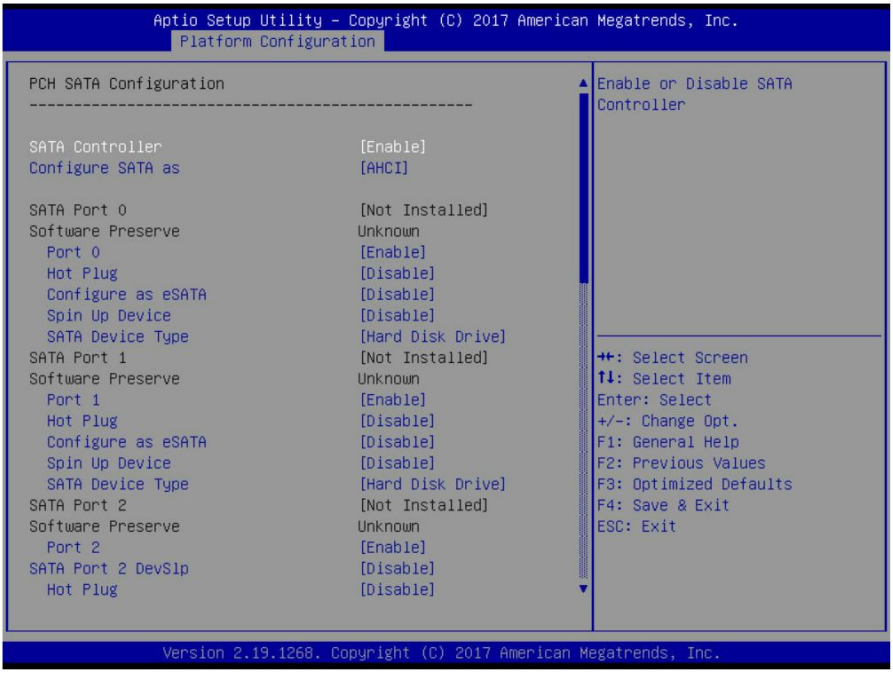
PCIE ASPM
PCI Express Root port ASPM Setting.
Disabled ASPM / ASPM L1 / ASPM Auto

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

5.4.1.3 PCH SATA Configuration



SATA Controller
Enable or Disable SATA Controller.
Enabled / Disabled

Configure SATA as
Determines how SATA controller(s) operate.
AHCI / RAID

SATA Port 0/1/2/3/4/5/6/7 & Software Preserve
Read Only

Port 0
Enable or Disable SATA Port.
Disabled / **Enabled**

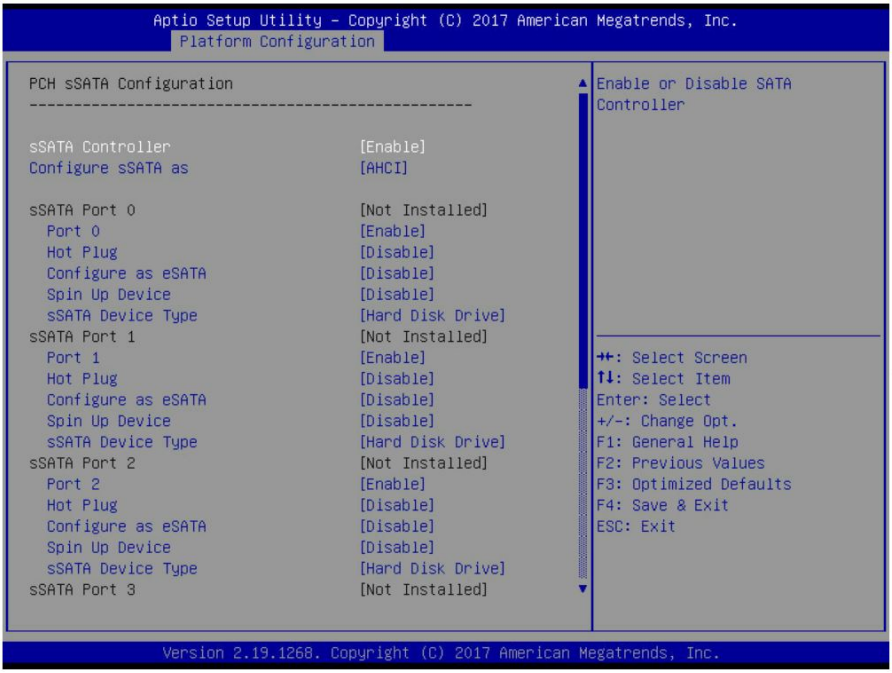
Hot Plug
Designates this port as Hot Pluggable.
Disabled / Enabled

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

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

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

5.4.1.4 PCH sSATA Configuration



sSATA Controller
Enable or Disable SATA Controller.
Enabled / Disabled

Configure sSATA as
Determines how SATA controller(s) operate.
AHCI / RAID

sSATA Port 0/1/2/3/4/5 & Software Preserve
Read Only

Port 0
Enable or Disable SATA Port.
Disabled / **Enabled**

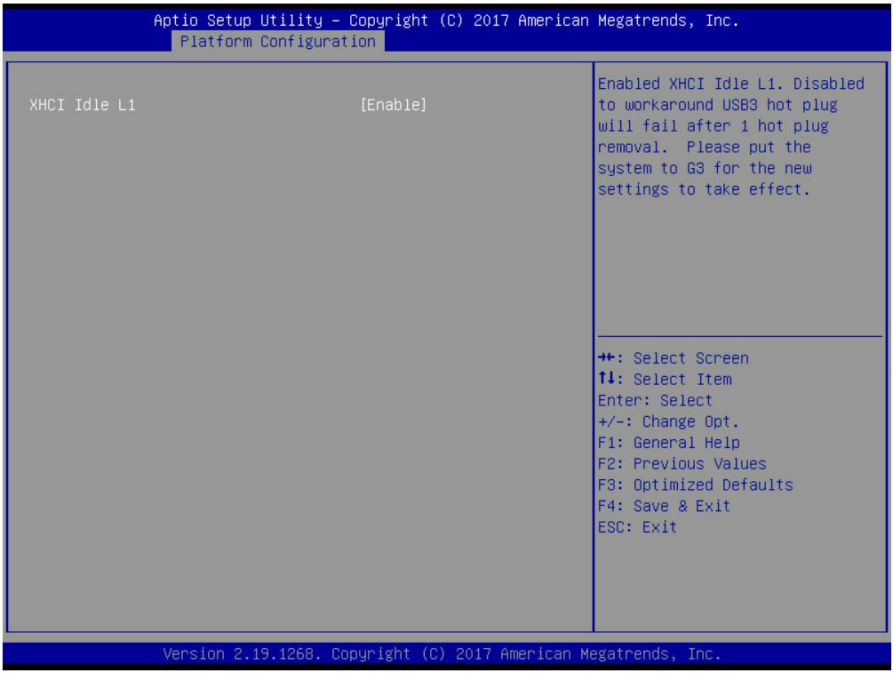
Hot Plug
Designates this port as Hot Pluggable.
Disabled / Enabled

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

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

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

5.4.1.5 USB Configuration

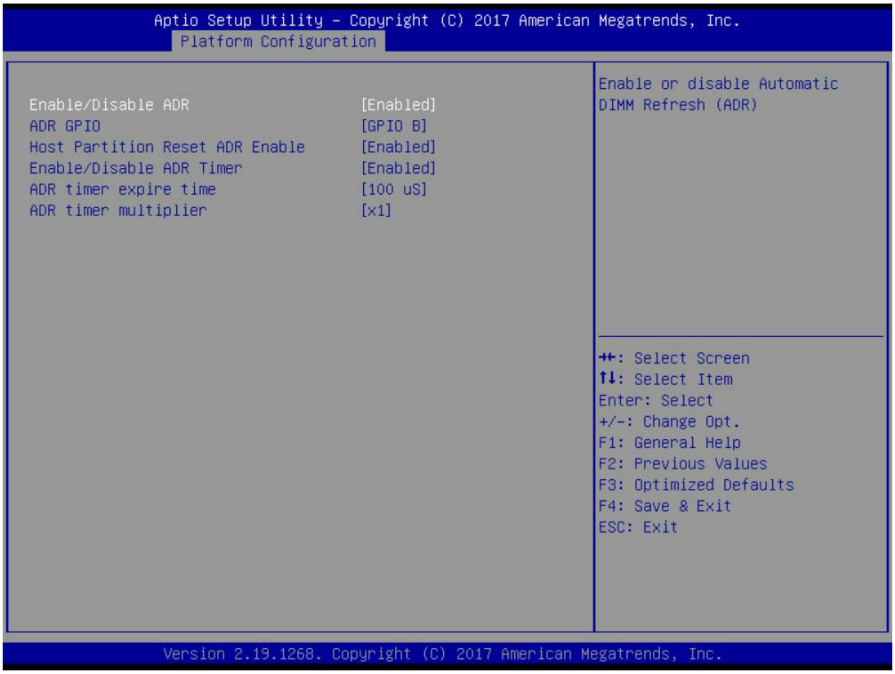


XHCI Idle L1

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

Enabled / Disabled

5.4.1.6 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
Enables/Disables ADR on Host Partition Reset
Enabled / Disabled

Enable/Disable ADR Timer
Held-off for DEBUG PURPOSES ONLY!
Enabled / Held-off

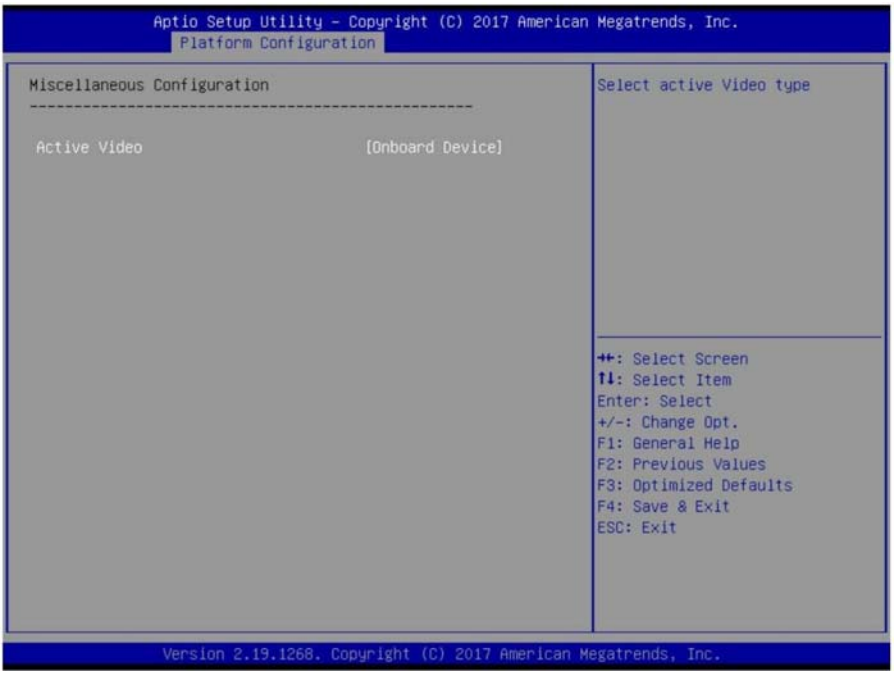
ADR timer expire time
Select proper ADR timer value: 25uS,50uS,100uS or 0.
25 uS / 50 uS / **100 uS** / 0 uS

ADR timer multiplier

Select proper ADR timer multiplier: x1,8,24,40,56,64,72,80,88,96.

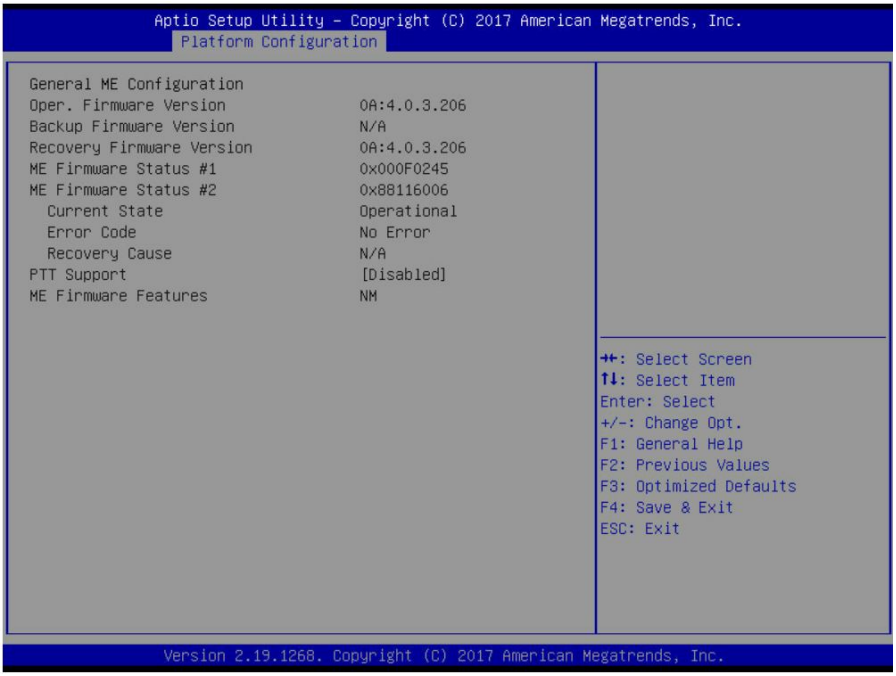
x1 / x8 / x24 / x40 / x56 / x64 / x72 / x80 / x88 /x96

5.4.2 Miscellaneous Configuration



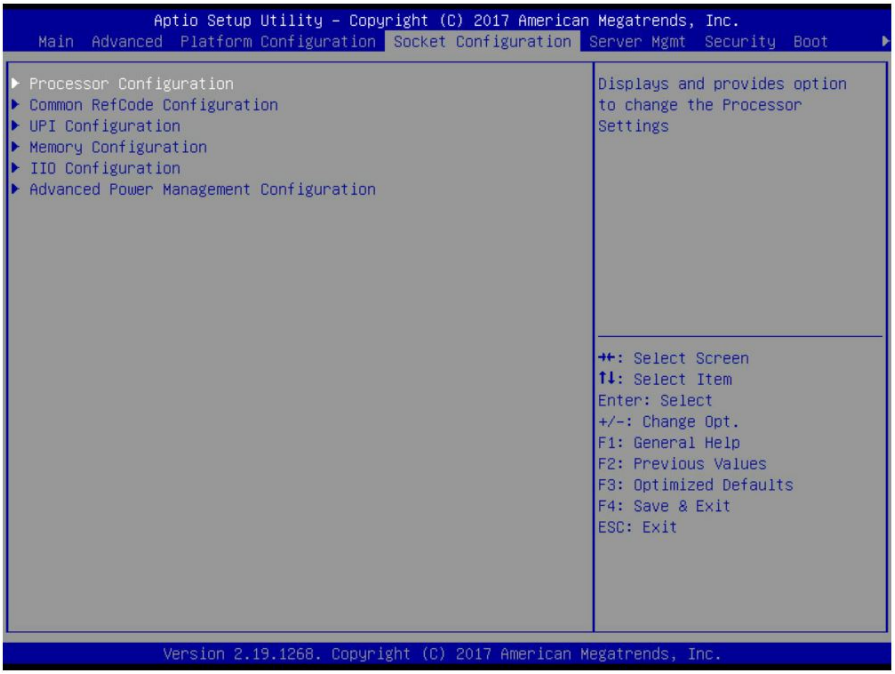
Active Video
Select active video type.
Onboard Device / Offboard Device

5.4.3 Server ME Configuration



Read only.

5.5 Socket Configuration



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

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

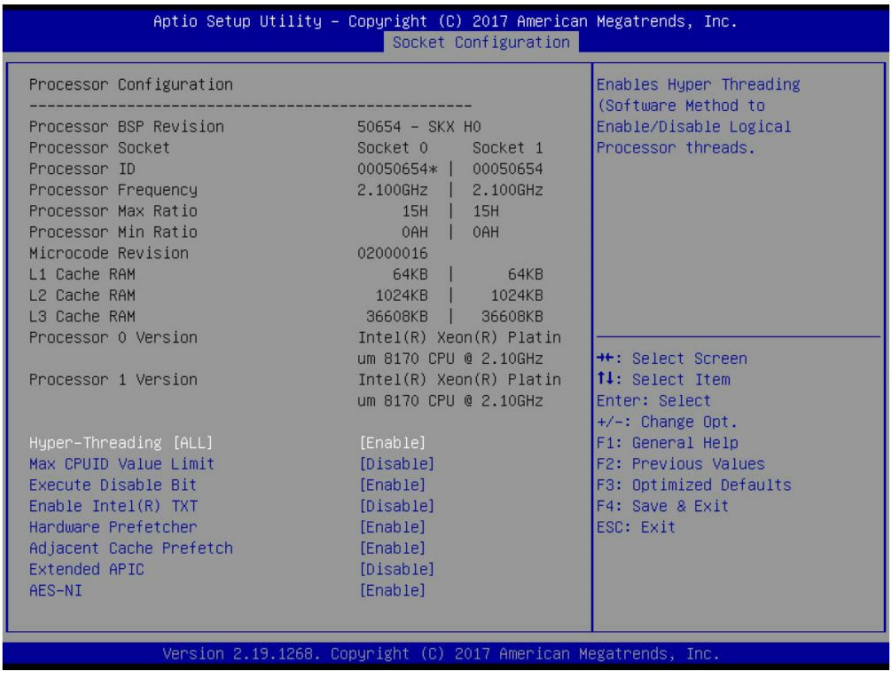
UPI Configuration
Displays and provides option to change the UPI Settings.

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

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

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

5.5.1 Processor Configuration



Hyper-Threading [ALL]
Enables Hyper Threading (Software Method) to Enable/Disable Logical Processor threads.

Disabled / **Enabled**

Max CPUID Value Limit
This should be enabled in order to boot legacy OSes that cannot support CPUs with extended CPUID functions.

Disabled / Enabled

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

Disabled / **Enabled**

Enable Intel® TXT
Enables Intel® TXT.

Disabled / Enabled

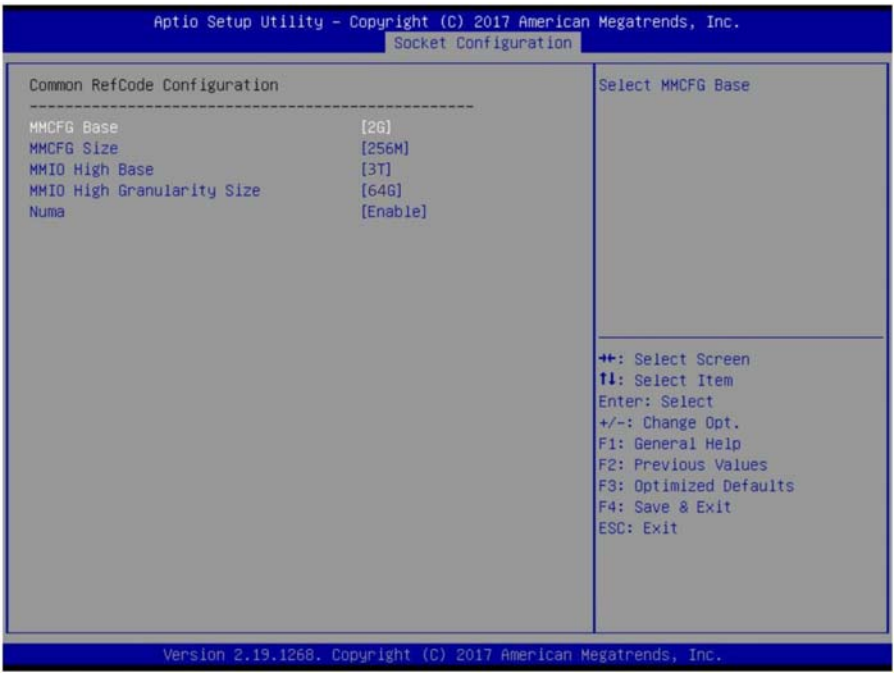
Hardware Prefetcher
MLC Streamer Prefetcher (MSR 1A4h Bit[0]).
Enabled / Disabled

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

Extended APCI
Enable/Disable extended APIC support.
Disabled / Enabled

AES-NI
Enable/Disable AES-NI support.
Enabled / Disabled

5.5.2 Common RefCode Configuration



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

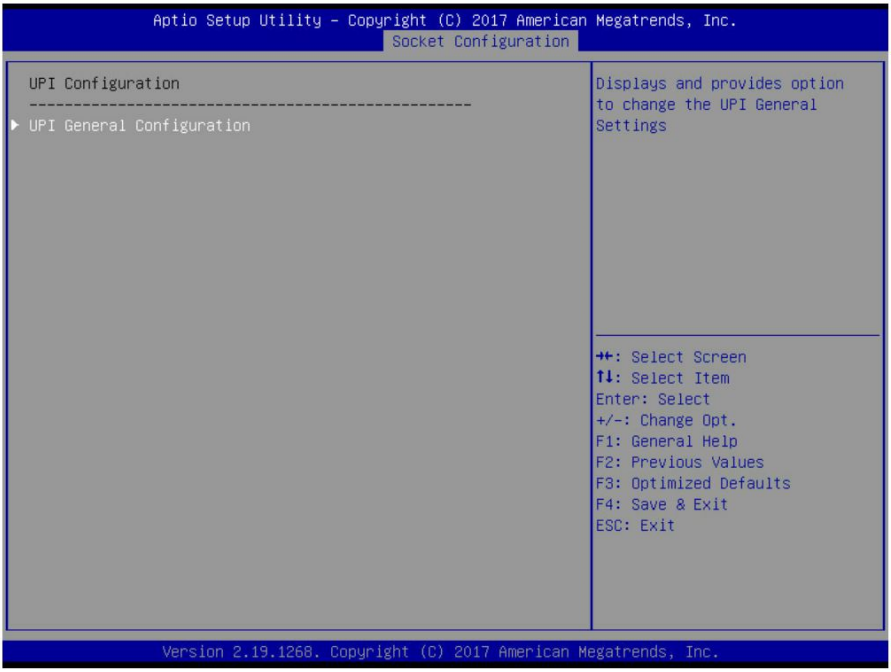
MMCFG Size
Select MMCFG Size.
64M / 128M / **256M** / 512M / 1G / 2G

MMIO High Base
Select MMIO High Base.
56T / 40T / 24T / 16T / 4T / **3T** / 2T / 1T

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

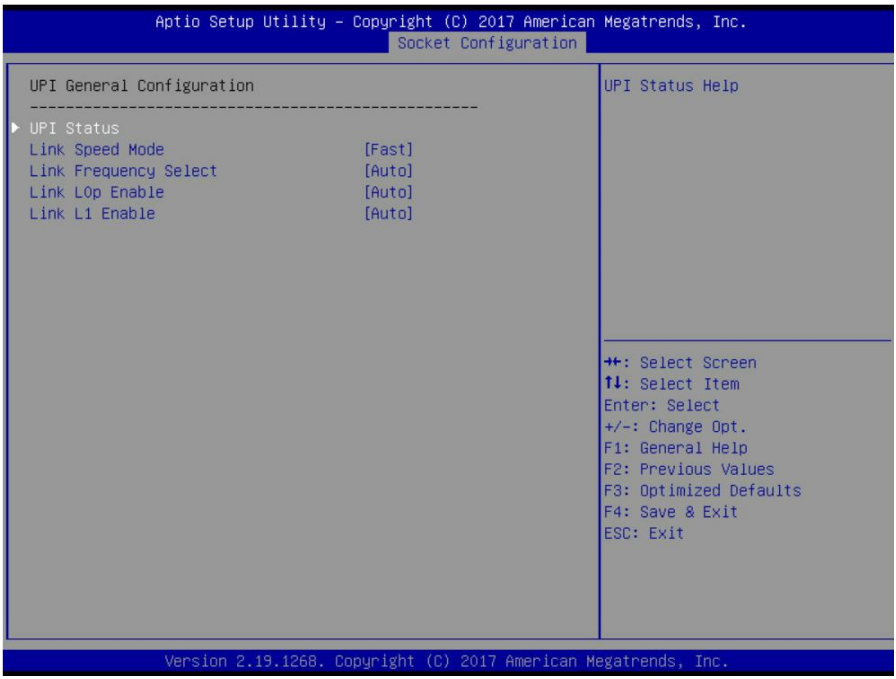
Numa
Enable or Disable Non uniform Memory Access (NUMA).
Disabled / **Enabled**

5.5.3 UPI Configuration



UPI General Configuration
Displays and provides option to change the UPI General Settings.

5.5.3.1 UPI General Configuration



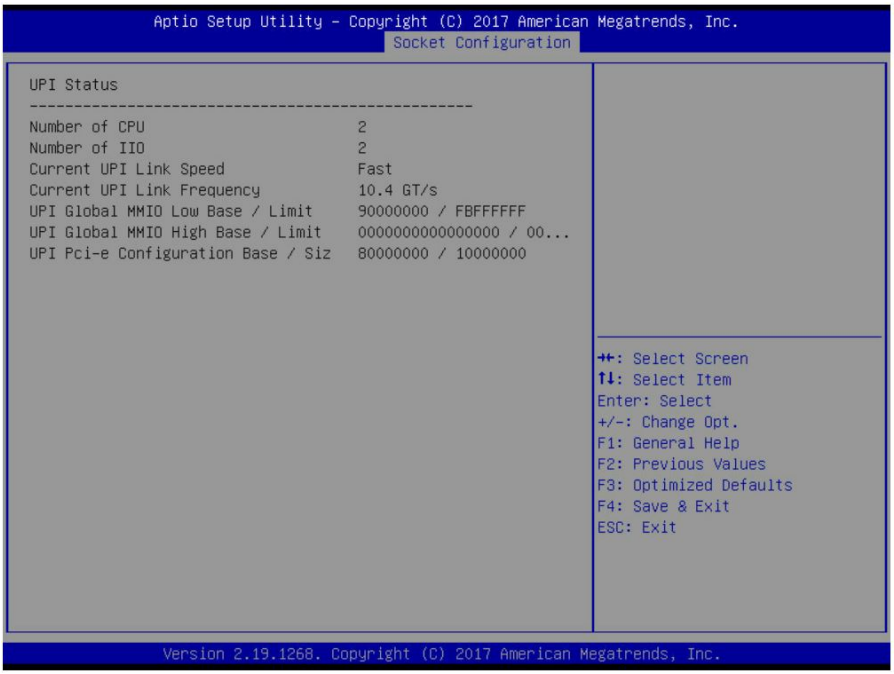
Link Speed Mode
Select the UPI link speed as either the POR speed (Fast) or default speed (Slow).
Slow / **Fast**

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

Link L0p Enable
Disabled / Enable / **Auto**

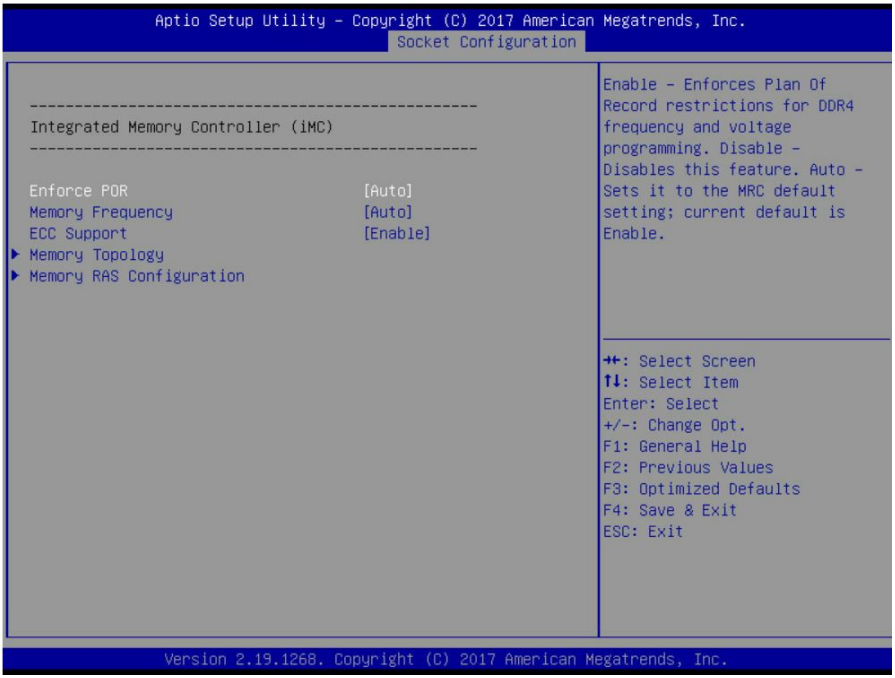
Link L1 Enable
Disabled / Enable / **Auto**

5.5.3.1.1 UPI Status



Read only

5.5.4 Memory Configuration



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

Auto / POR / Disable

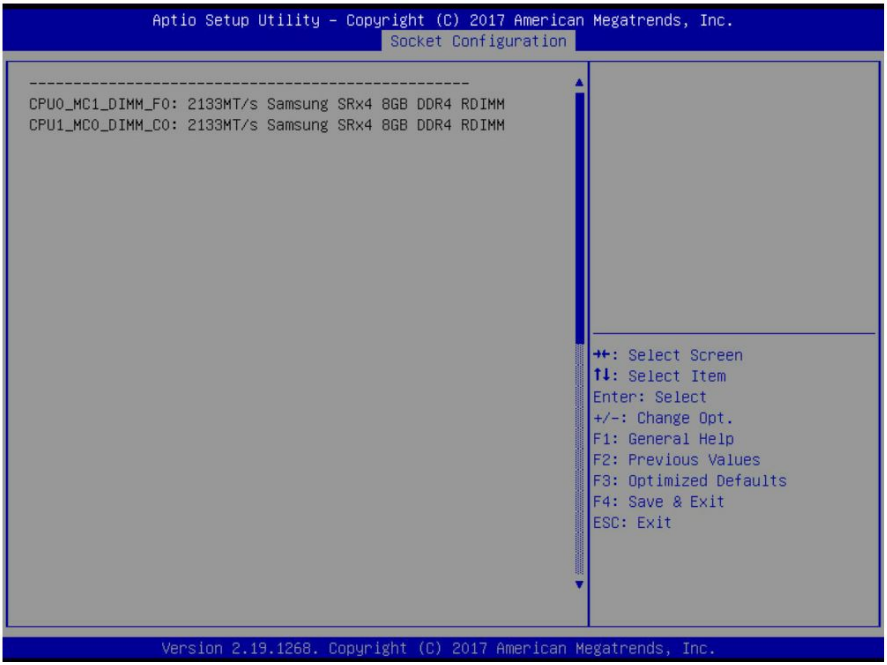
Memory Frequency
Maximum Memory Frequency Selections in Mhz. Do not select Reserved.

Auto / 2133 / 2400 / 2666

ECC Support
Enable --- Enables DDR ECC Support. Disable --- Disables this feature.

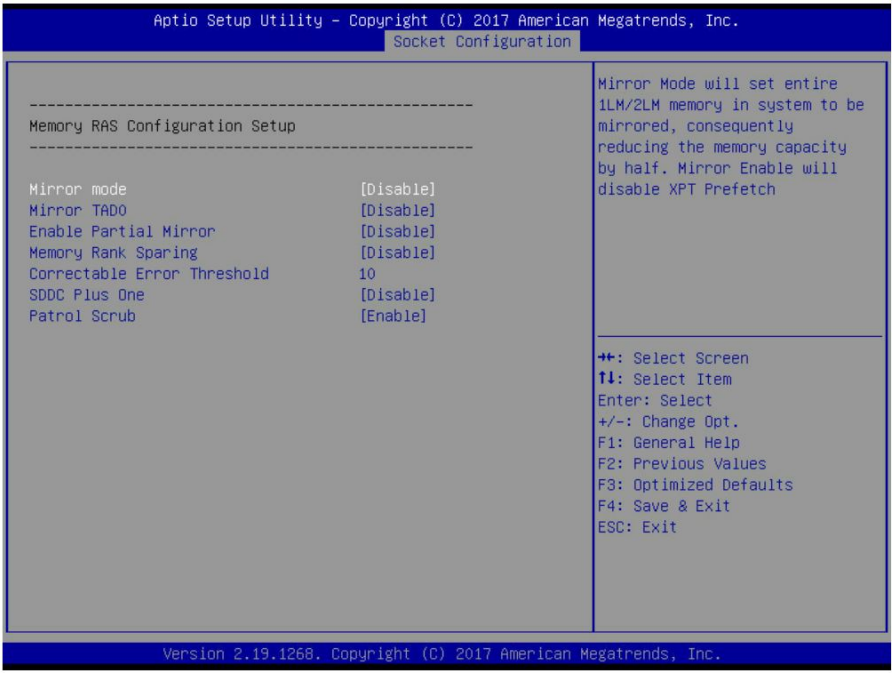
Disabled / **Enabled**

5.5.4.1 Memory Topology



Read only.

5.5.4.2 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.
Disabled / Mirror Mode 1LM / Mirror Mode 2LM

Mirror TAD0
Enable Mirror on entire memory for TAD0.
Enabled / **Disabled**

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

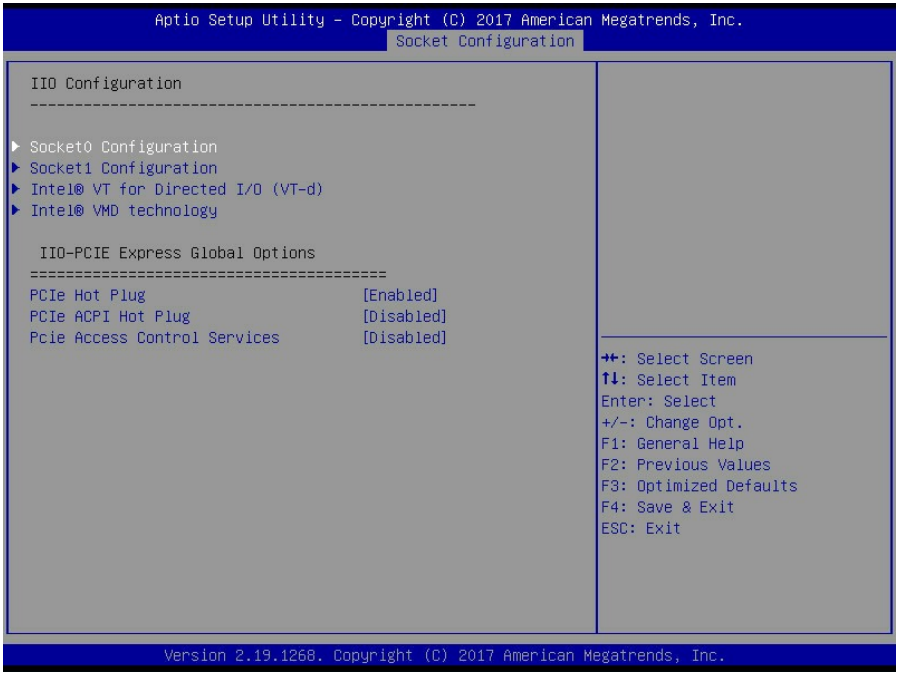
Memory Rack Sparing
Enable/Disable Memory Rank Sparing.
Disabled / Enabled

Correctable Error Threshold
Correctable Error Threshold (1 – 32767) used for sparing, tagging, and leaky bucket.
10

SDDC Plus One
Enable/Disable SDDC Plus One.
Disabled / Enabled

Patrol Scrub
Enable/Disable Patrol Scrub.
Disabled / **Enabled**

5.5.5 IIO Configuration



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

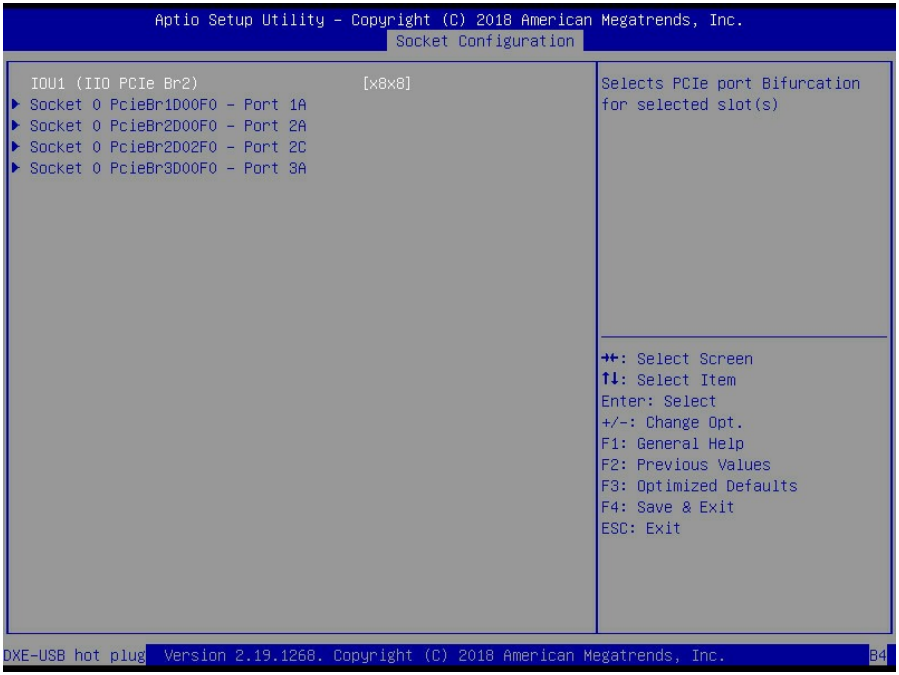
Intel® VMD Technology
Press <Enter> to bring up the Intel® VMD for Volume Management Device Configuration menu.

PCIe Hot Plug
Enable/Disable PCIe Hot Plug globally.
Disabled / **Enabled** / Auto / Manual

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

PCIe Access Control Services
Enable/Disable Access Control Services.
Enable / **Disabled**

5.5.5.1 Socket 0 Configuration



IOU1 (IIO PCIe Br2)
Selects PCIe port Bifurcation for selected slot(s).
x4x4x4x4 / x4x4x8 / x8x4x4 / **x8x8** / x16 / Auto

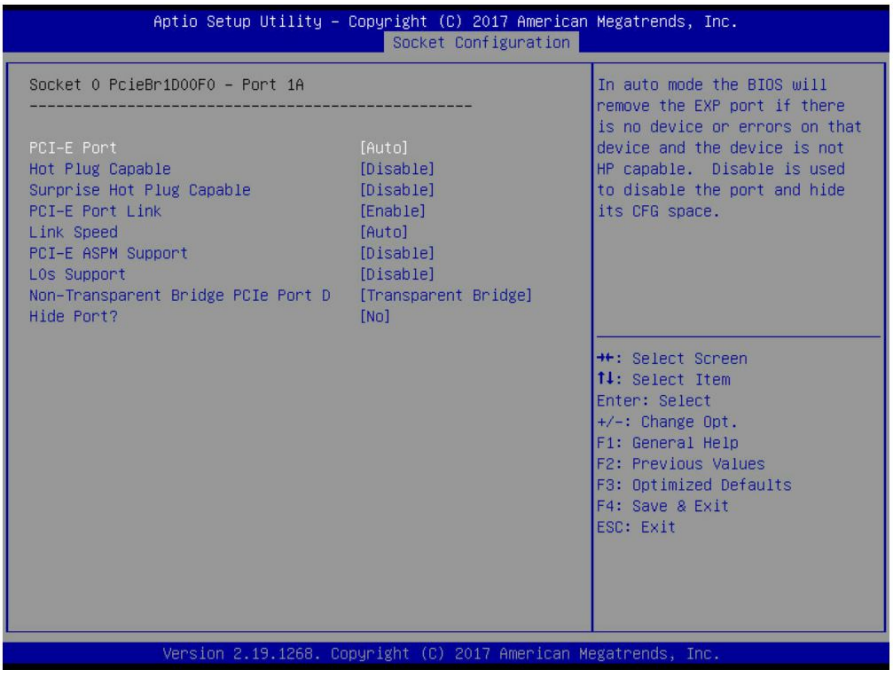
Socket 0 PcieBr1D00F0 – Port 1A
Settings related to PCI Express Ports (0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/5A).

Socket 0 PcieBr2D00F0 – Port 2A
Settings related to PCI Express Ports (0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/5A).

Socket 0 PcieBr2D02F0 – Port 2C
Settings related to PCI Express Ports (0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/5A).

Socket 0 PcieBr3D00F0 – Port 3A
Settings related to PCI Express Ports (0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/5A).

5.5.5.1.1 Socket 1 PcieBr0D00F0 – Port 1A/2A/3A



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

Auto / Disabled / Enabled

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

Disabled / Enabled

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

Disabled / Enabled

PCI-E Port Link
This option disables the link so that the no training occurs but the CFG space is still active.

Enabled / Disabled

Link Speed
Choose Link Speed for this PCIe port.
Auto / Gen 1 (2.5 GT/s) / Gen 2 (5 GT/s) / Gen 3 (8 GT/s)

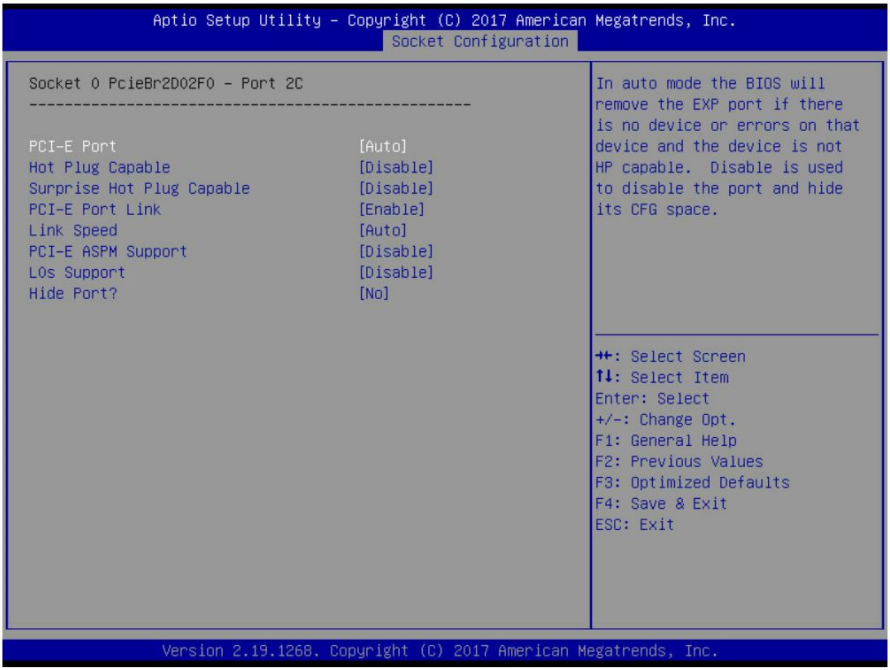
PCI-E ASPM Support
This option enables/disables the ASPM (L1) support for the downstream devices.
Auto / L1 Only / **Disabled**

L0s Support
When disabled, IIO never puts its transmitter in L0s state.
Disabled / Enabled

Non-Transparent Bridge PCIe Port Definition
[EMBAR1XBASE, EMBAR2XBASE] Configures port as TB, NTB-NTB, or NTB-RP (DON'T SELECT NTB-RP for legacy IIO on A0 Si!).
Transparent Bridge / NTB to NTB / NTB to RP

Hide Port?
User can force to hide this root port from OS.
No / Yes

5.5.5.1.2 Socket 0 PcieBr0D00F0 – Port 2C



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

Auto / Disabled / Enabled

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

Disabled / Enabled

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

Disabled / Enabled

PCI-E Port Link
This option disables the link so that the no training occurs but the CFG space is still active.

Enabled / Disabled

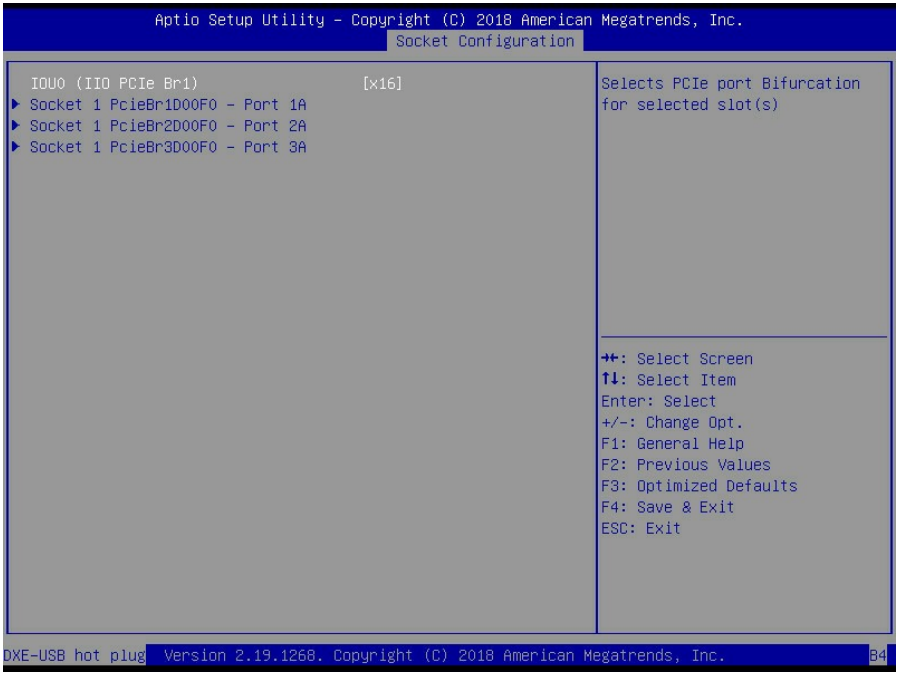
Link Speed
Choose Link Speed for this PCIe port.
Auto / Gen 1 (2.5 GT/s) / Gen 2 (5 GT/s) / Gen 3 (8 GT/s)

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

L0s Support
When disabled, IIO never puts its transmitter in L0s state.
Disabled / Enabled

Hide Port?
User can force to hide this root port from OS.
No / Yes

5.5.5.2 Socket 1 Configuration



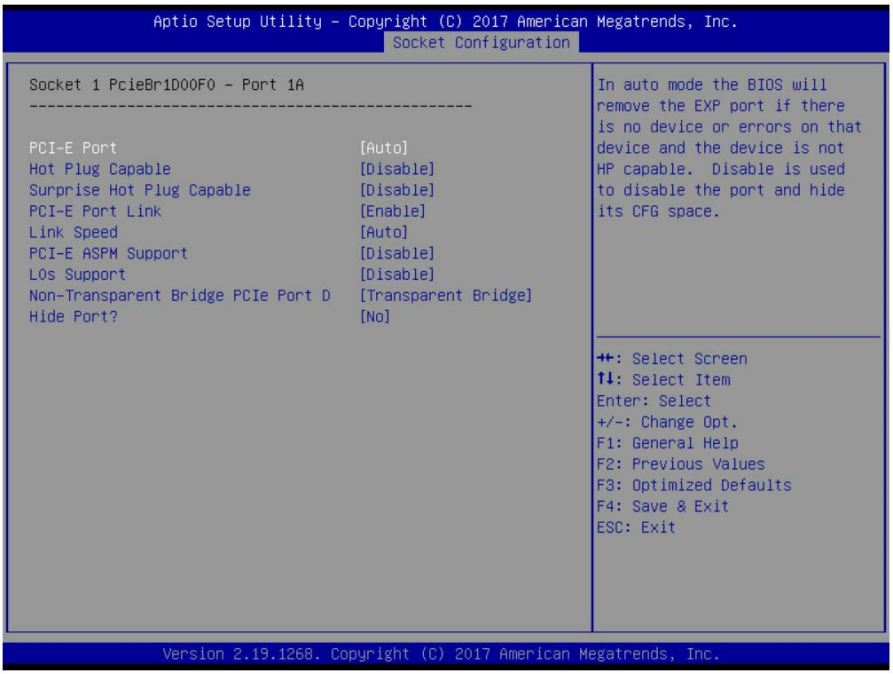
IOU0 (IIO PCIe Br1)
Selects PCIe port Bifurcation for selected slot(s).
x4x4x4x4 / x4x4x8 / x8x4x4 / x8x8 / **x16** / Auto

Socket 1 PcieBr1D00F0 – Port 1A
Settings related to PCI Express Ports (0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/5A).

Socket 1 PcieBr2D00F0 – Port 2A
Settings related to PCI Express Ports (0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/5A).

Socket 1 PcieBr3D00F0 – Port 3A
Settings related to PCI Express Ports (0/1A/1B/1C/1D/2A/2B/2C/2D/3A/3B/3C/3D/4A/5A).

5.5.5.2.1 Socket 1 PcieBr0D00F0 – Port 1A/2A/3A



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

Auto / Disabled / Enabled

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

Disabled / Enabled

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

Disabled / Enabled

PCI-E Port Link
This option disables the link so that the no training occurs but the CFG space is still active.

Enabled / Disabled

Link Speed
Choose Link Speed for this PCIe port.
Auto / Gen 1 (2.5 GT/s) / Gen 2 (5 GT/s) / Gen 3 (8 GT/s)

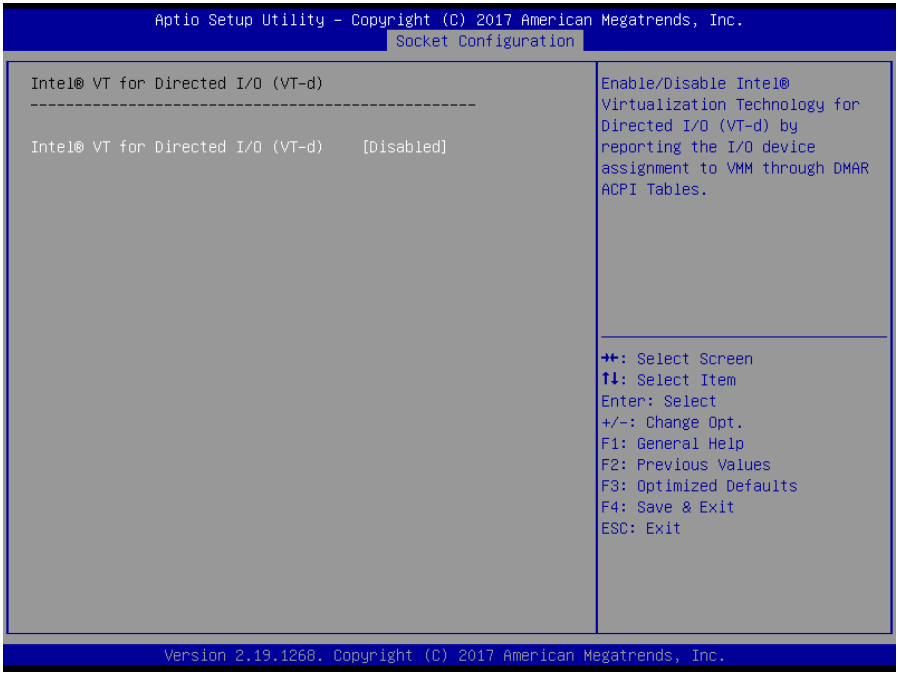
PCI-E ASPM Support
This option enables/disables the ASPM (L1) support for the downstream devices.
Auto / L1 Only / **Disabled**

L0s Support
When disabled, IIO never puts its transmitter in L0s state.
Disabled / Enabled

Non-Transparent Bridge PCIe Port Definition
[EMBAR1XBASE, EMBAR2XBASE] Configures port as TB, NTB-NTB, or NTB-RP (DON'T SELECT NTB-RP for legacy IIO on A0 Si!).
Transparent Bridge / NTB to NTB / NTB to RP

Hide Port?
User can force to hide this root port from OS.
No / Yes

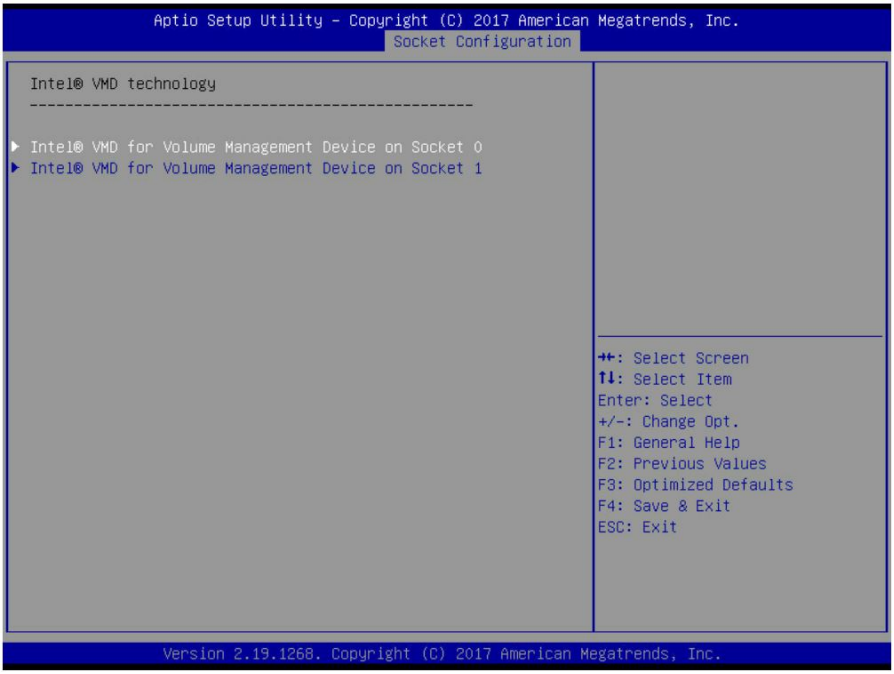
5.5.5.3 Intel® VT for Directed I/O (VT-d)



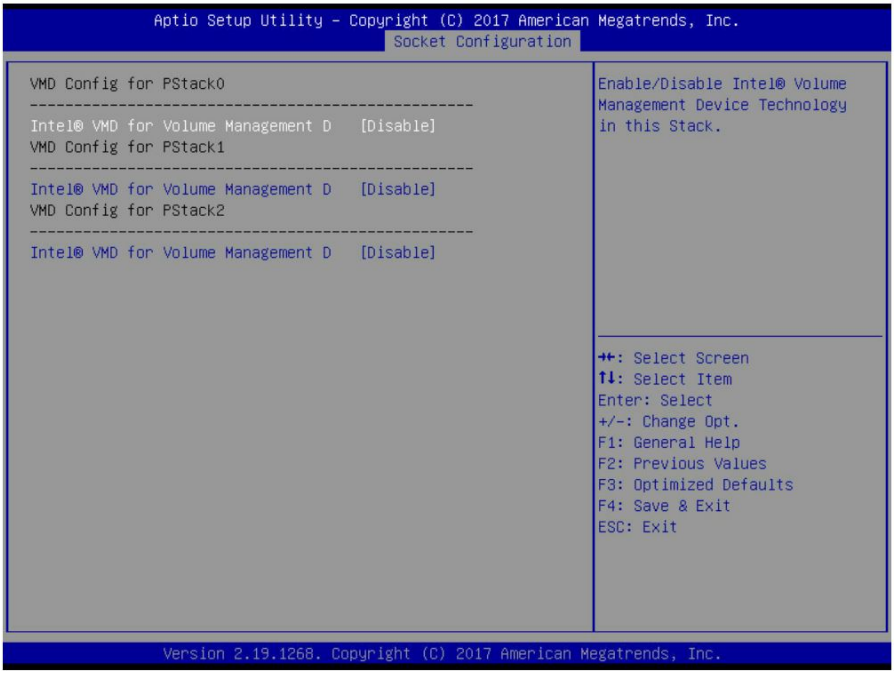
Intel® VT for Directed I/O (VT-d)
Enable/Disable Intel® Virtualization Technology for Directed I/O (VT-d) by reporting the I/O device assignment to VMM through DMAR ACPI Tables.

Enabled / **Disabled**

5.5.5.4 Intel® VMD Technology



5.5.5.4.1 Intel VMD for Volume Management for Socket 0

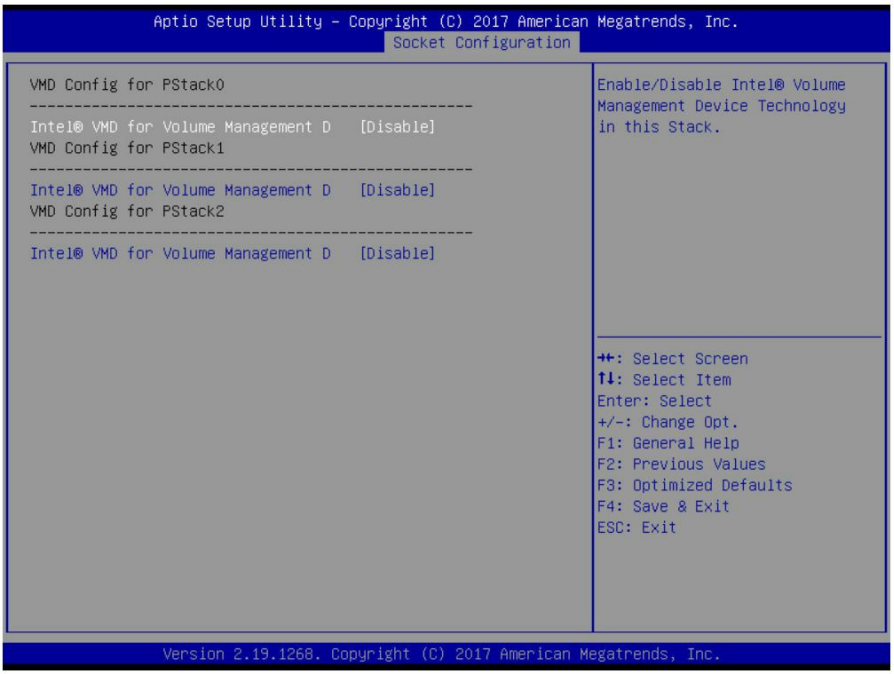


Intel® VMD for Volume Management Device for PStack0
Enable/Disable Intel® Volume Management Device Technology in this Stack.
Disabled / Enabled

Intel® VMD for Volume Management Device for PStack1
Enable/Disable Intel® Volume Management Device Technology in this Stack.
Disabled / Enabled

Intel® VMD for Volume Management Device for PStack2
Enable/Disable Intel® Volume Management Device Technology in this Stack.
Disabled / Enabled

5.5.5.4.2 Intel VMD for Volume Management for Socket 1

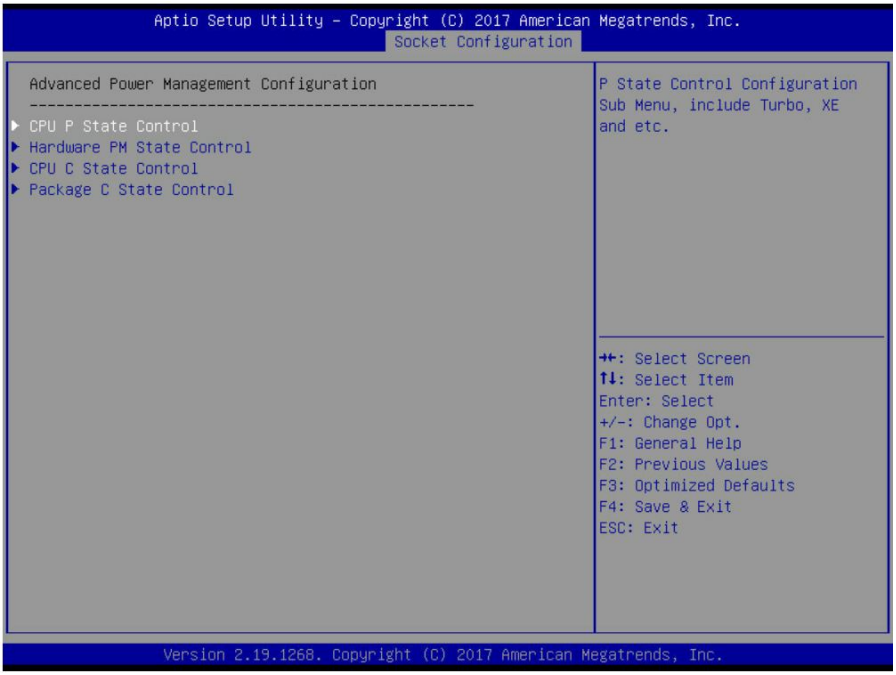


Intel® VMD for Volume Management Device for PStack0
Enable/Disable Intel® Volume Management Device Technology in this Stack.
Disabled / Enabled

Intel® VMD for Volume Management Device for PStack1
Enable/Disable Intel® Volume Management Device Technology in this Stack.
Disabled / Enabled

Intel® VMD for Volume Management Device for PStack2
Enable/Disable Intel® Volume Management Device Technology in this Stack.
Disabled / Enabled

5.5.6 Advanced Power Management Configuration



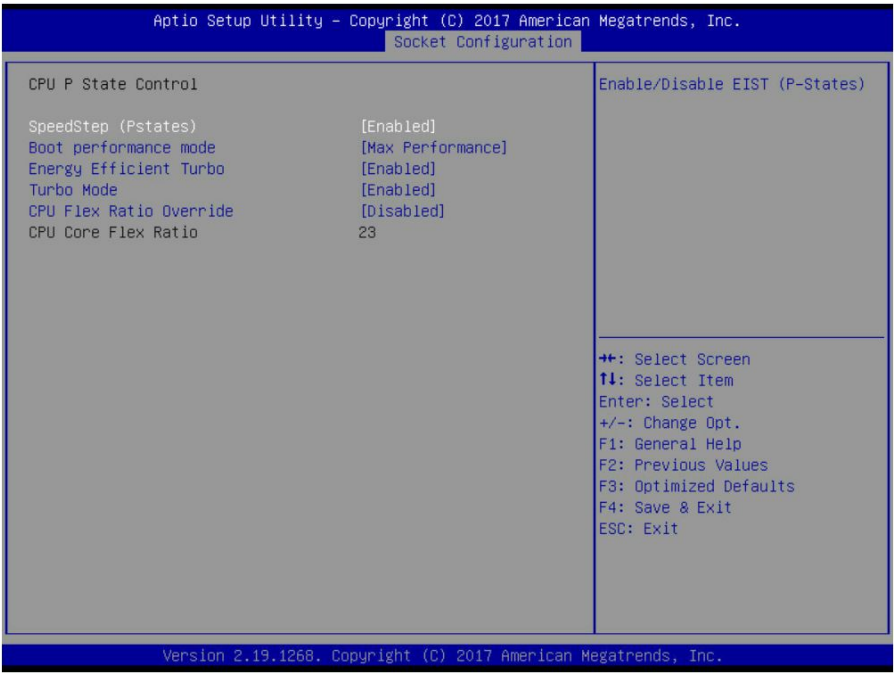
CPU P State Control
P State Control Configuration Sub Menu, include Turbo, XE and etc.

Hardware PM State Control
Hardware P-State setting

CPU C State Control
CPU C State setting

Package C State Control
Package C State setting

3.5.6.1 CPU P State Control



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

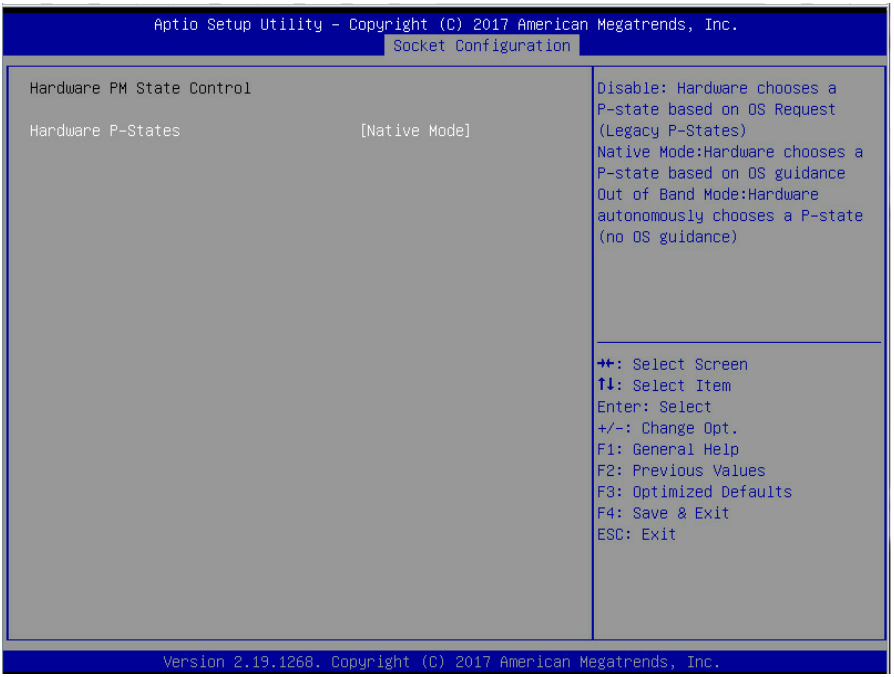
Boot performance mode
Select the performance state that the BIOS will set before OS hand off.
Max Performance / Max Efficient / Set by Intel Node

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

3.5.6.2 Hardware PM State Control Submenu

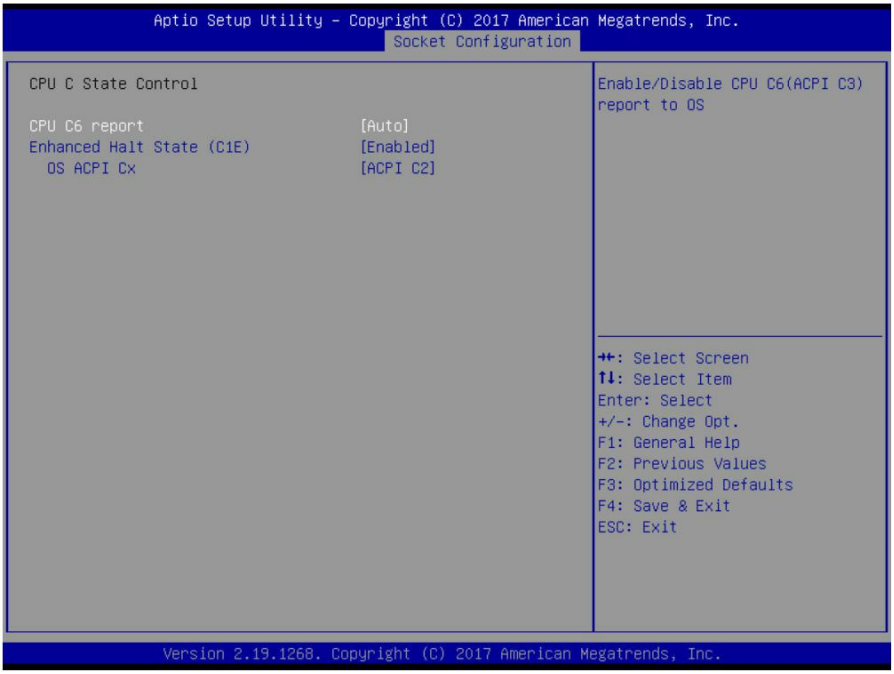


Hardware P-States

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)

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

3.5.6.3 CPU C State Control

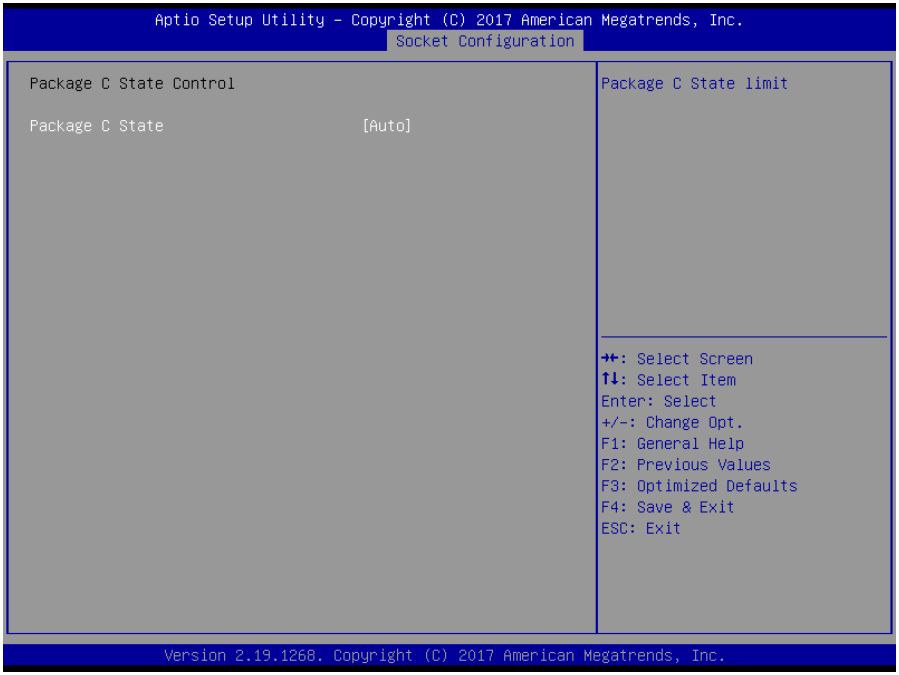


CPU C6 report
Enable/Disable CPU C6(ACPI C3) report to OS
Auto / Enable / Disable

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

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

3.5.6.4 Package C State Control

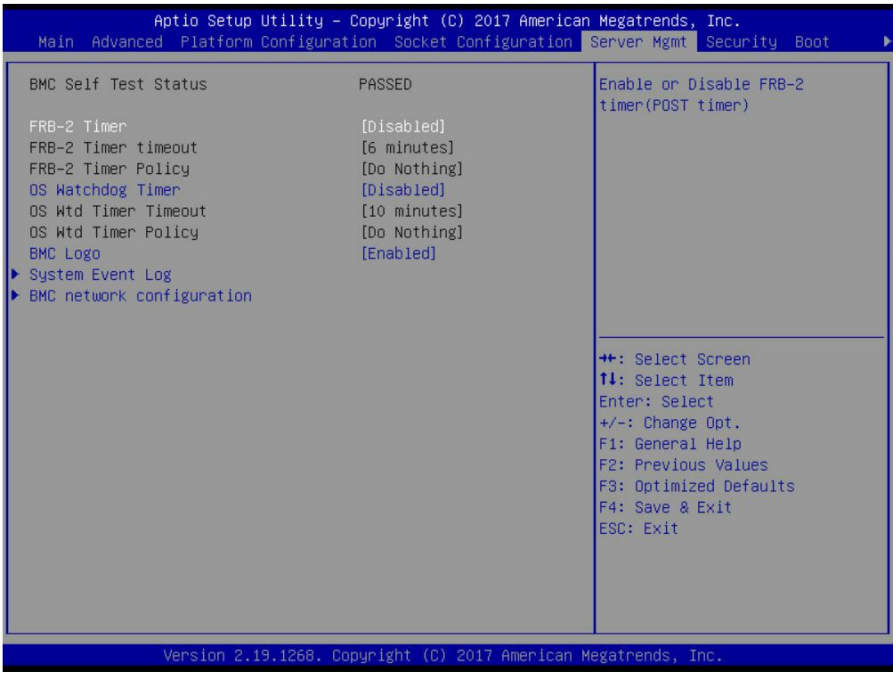


Package C State Control

Package C State Limit

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

5.6 Server Management



FRB-2 Timer
Enable or Disable FRB-2 timer (POST timer).
Disabled / Enabled

FRB-2 Timer timeout
Enter value Between 3 to 6 min for FRB-2 Timer Expiration value.
3 minutes / 4 minutes / 5 minutes / **6 minutes**

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

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

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

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

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

Do Nothing / Reset / Power Down / Power Cycle

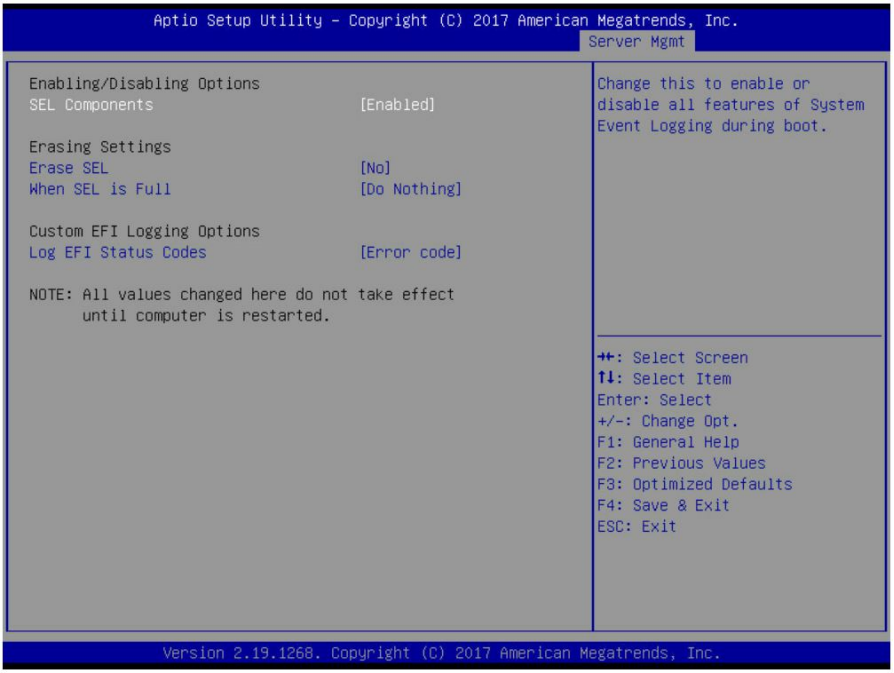
BMC Logo
Enable or Disable BMC Logo.

Enabled / Disabled

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

BMC network configuration
Configure BMC network parameters.

5.6.1 System Event Log



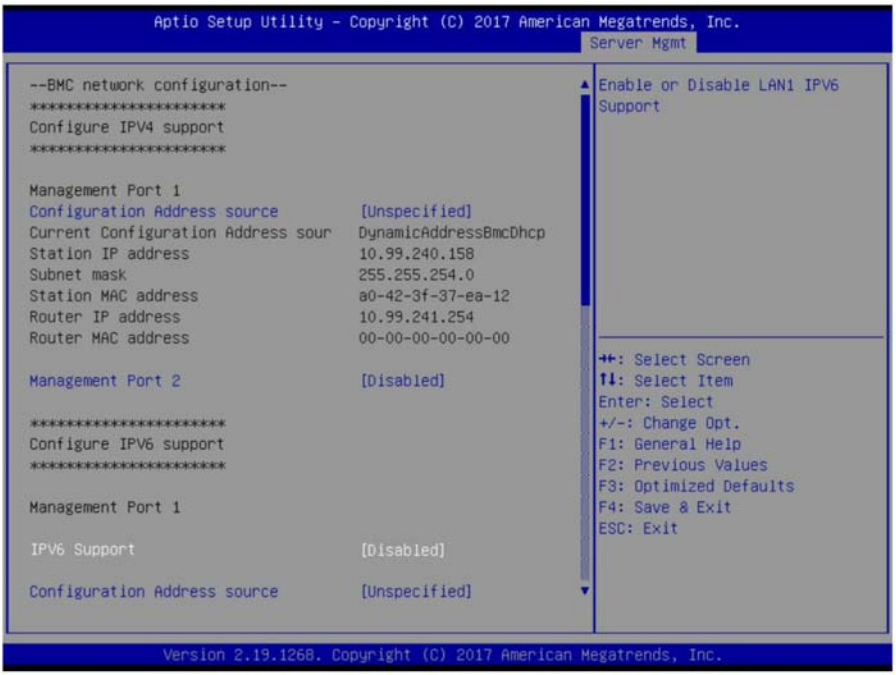
SEL Components
Change this to enable or disable all features of System Event Logging during boot.
Disabled / **Enabled**
NOTE: When **SEL Components** is set to [Disabled], the following items are read only.

Erase SEL
Choose options for erasing SEL.
No / Yes, on next reset / Yes, on every reset

When SEL is Full
Choose options for reactions to a full SEL.
Do Nothing / Erase Immediately

Log EFI Status Codes
Disable the logging of EFI Status Codes or log only error code or only progress code or both.
Disabled / Both / **Error Code** / Progress Code

5.6.2 BMC Network Configuration



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

Unspecified / Static / DynamicBmcDhcp / DynamicBmcNonDhcp

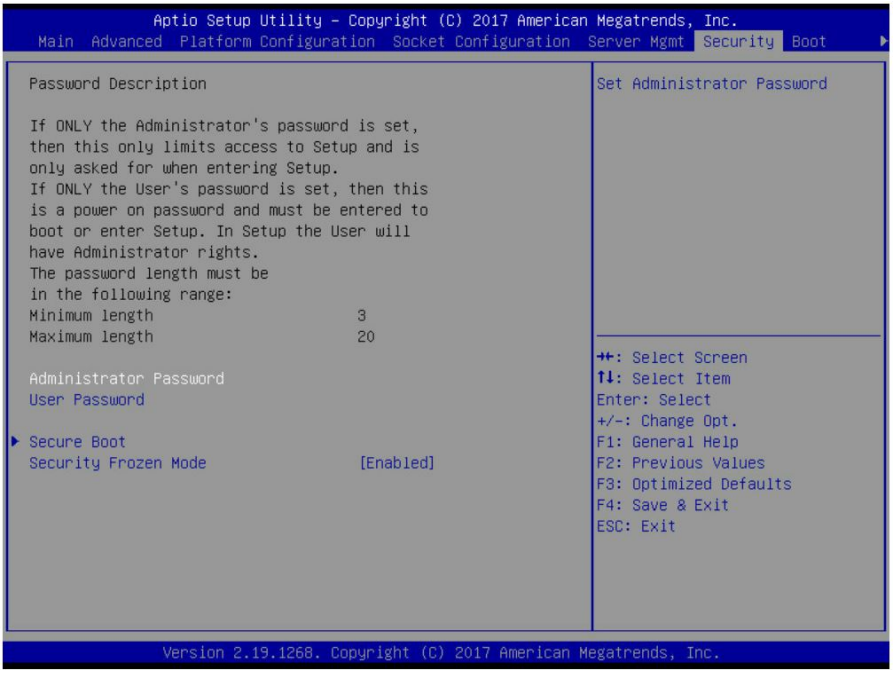
Management Port 2
Enable/Disable BMC Share Nic.

Enabled / **Disabled**

IPV6 Support
Enable or Disable LAN1 IPV6 Support.

Enabled / **Disabled**

5.7 Security



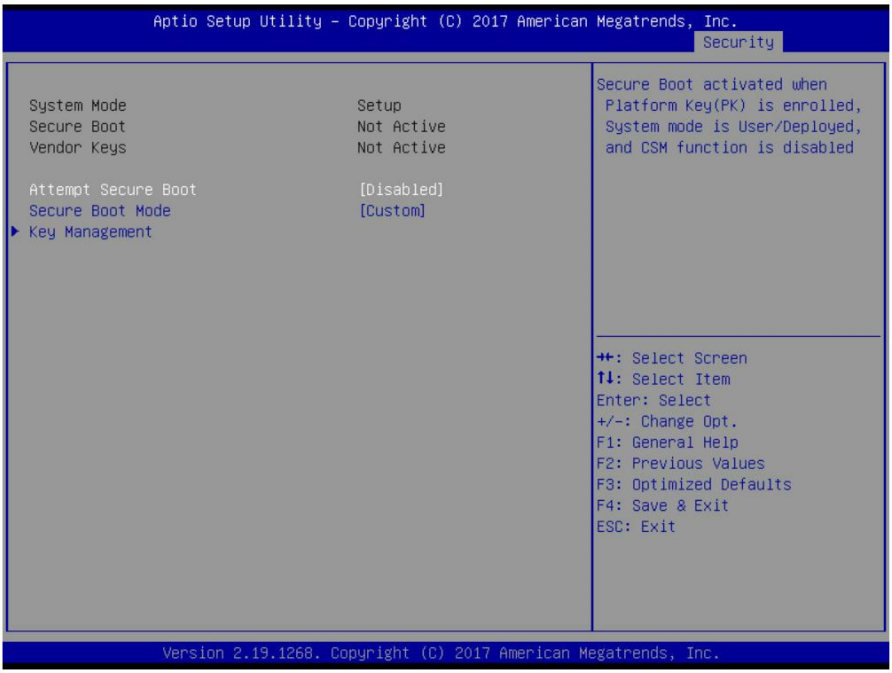
Administrator Password
Set administrator password in the ***Create New Password*** window. After you key in the password, the ***Confirm New Password*** window will pop out to ask for confirmation.

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

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

Disabled / **Enabled**

5.7.1 Secure Boot



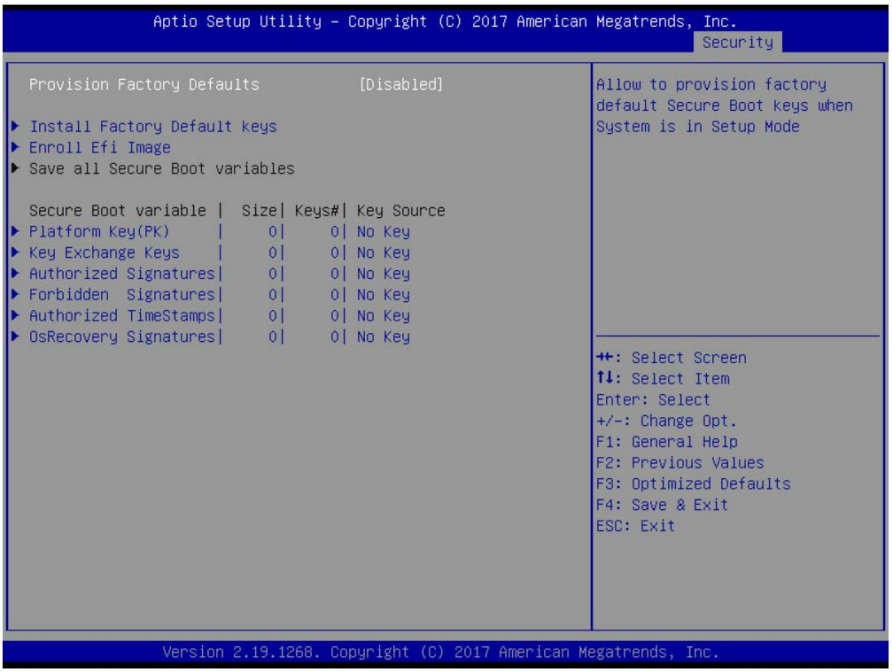
Attempt Secure Boot
Secure boot activated when Platform Key (PK) is enrolled, System mode is User/Deployed, and CSM function is disabled.

Disabled / Enabled

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

Standard / **Custom**

5.7.1.1 Key Management



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

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

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

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

Platform Key (PK)
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:
   a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER encoded)
c) EFI_CERT_RSA2048 (bin)
d) EFI_CERT_SHA256, 384, 512 (bin)
2. Authenticated UEFI Variable
3. EFI PE/C0FF Image (SHA256)
Key source: Default, External, Mixed, Test
Set New

Key Exchange Keys
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:
a) EFI_SIGNATURE_LIST
b) EFI_CERT_X509 (DER encoded)
c) EFI_CERT_RSA2048 (bin)
d) EFI_CERT_SHA256, 384, 512 (bin)
2. Authenticated UEFI Variable
3. EFI PE/C0FF Image (SHA256)
Key source: Default, External, Mixed, Test
Set New / Append

Authorized Signatures
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:
a) EFI_SIGNATURE_LIST
b) EFI_CERT_X509 (DER encoded)
c) EFI_CERT_RSA2048 (bin)
d) EFI_CERT_SHA256, 384, 512 (bin)
2. Authenticated UEFI Variable
3. EFI PE/C0FF Image (SHA256)
Key source: Default, External, Mixed, Test
Set New / Append

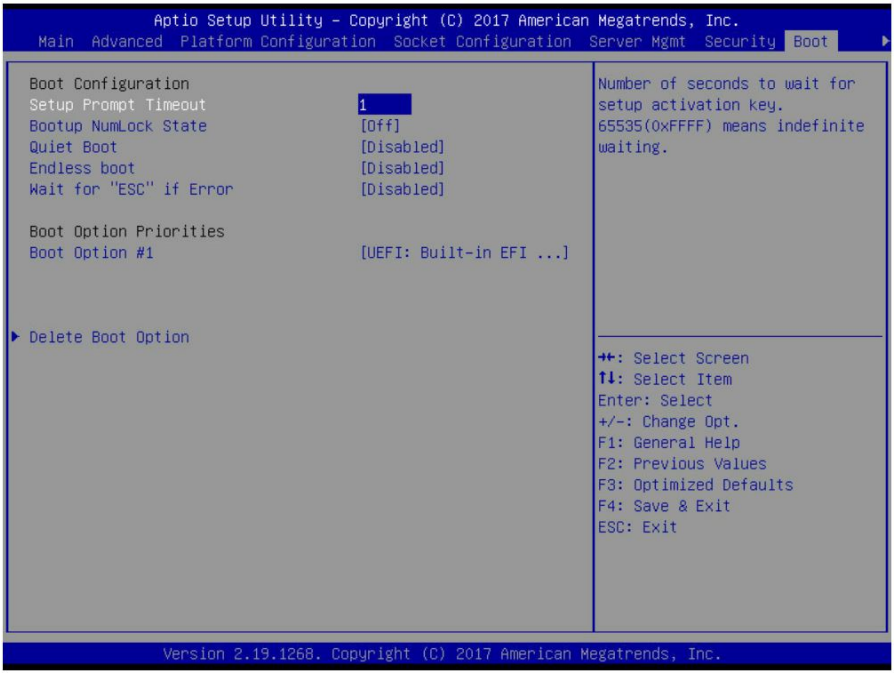
Forbidden Signatures
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:
a) EFI_SIGNATURE_LIST
b) EFI_CERT_X509 (DER encoded)
c) EFI_CERT_RSA2048 (bin)
d) EFI_CERT_SHA256, 384, 512 (bin)
2. Authenticated UEFI Variable
3. EFI PE/C0FF Image (SHA256)
Key source: Default, External, Mixed, Test
Set New / Append

Authorized TimeStamps
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST
b) EFI_CERT_X509 (DER encoded)
c) EFI_CERT_RSA2048 (bin)
d) EFI_CERT_SHA256, 384, 512 (bin)
2. Authenticated UEFI Variable
3. EFI PE/C0FF Image (SHA256)
Key source: Default, External, Mixed, Test
Set New / Append

OsRecovery Signatures
Enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate in:
a) EFI_SIGNATURE_LIST
b) EFI_CERT_X509 (DER encoded)
c) EFI_CERT_RSA2048 (bin)
d) EFI_CERT_SHA256, 384, 512 (bin)
2. Authenticated UEFI Variable
3. EFI PE/C0FF Image (SHA256)
Key source: Default, External, Mixed, Test
Set New / Append

5.8 Boot



Setup Prompt Timeout
Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
1

Bootup NumLock State
Select the keyboard NumLock state.
Off / On

Quiet Boot
Enable or disable Quiet Boot option.
Disabled / Enabled

Endless Boot
Enable or disable Endless Boot.
Disabled / Enabled

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

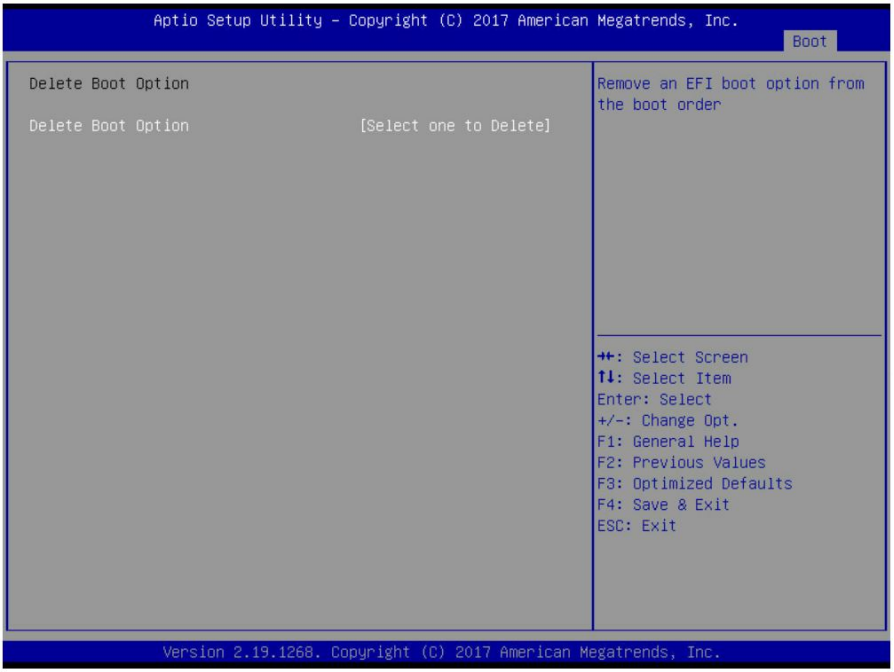
Boot Option Priorities

Boot Option #1

Select the first/second boot device.

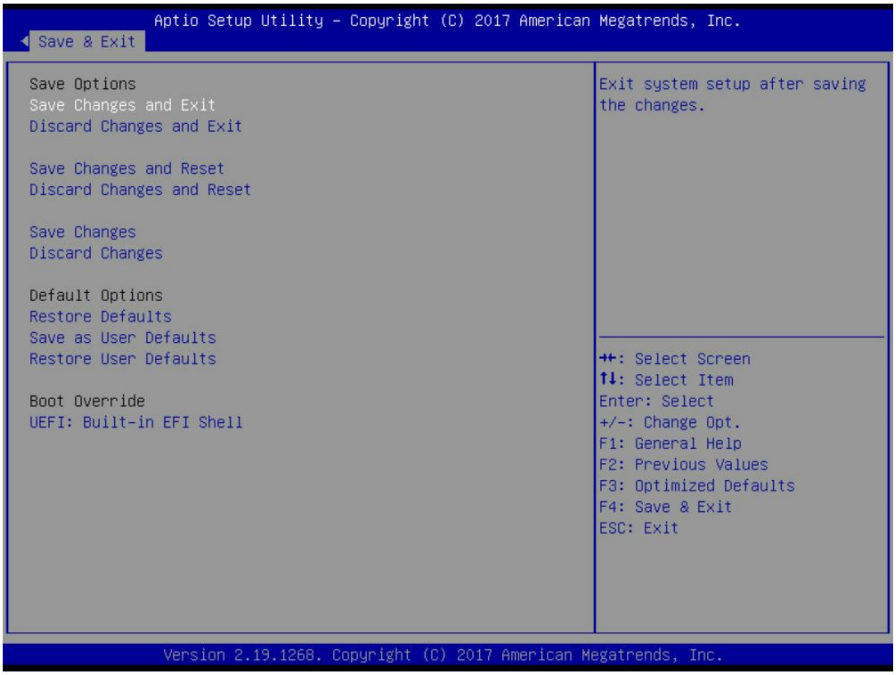
Device Name / Disabled

5.8.1 Delete Boot Option



Delete Boot Option
Remove an EFI boot option from the boot order.
Select one to delete / UEFI: Built-in EFI Shell

5.9 Save & Exit



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

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

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

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

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

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

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

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

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

Boot Override
Read only.

NOTE

Chapter 6: Diagnostics

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

Memory, Video, CPU

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

6.1 Flash Utility

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

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

6.2 AMIBIOS Post Code (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	Not used
Progress Codes	
0x01	Power on. Reset type detection (soft/hard).
0x02	AP initialization before microcode loading
0x03	North Bridge initialization before microcode loading
0x04	South Bridge initialization before microcode loading
0x05	OEM initialization before microcode loading
0x06	Microcode loading
0x07	AP initialization after microcode loading
0x08	North Bridge initialization after microcode loading
0x09	South Bridge initialization after microcode loading

Status Code	Description
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 Beep Codes
None

PEI Phase

Status Code	Description
Progress Codes	
0x10	PEI 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)

Status Code	Description
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
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 IPL 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
0x5B	Reset PPI is not available
0x5C – 0x5F	Reserved for future AMI error codes
S3 Resume Progress Codes	

Status Code	Description
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
1 (repeatedly)	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

# of Beeps	Description
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
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

Status Code	Description
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
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

Status Code	Description
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
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

# of Beeps	Description
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 PIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

NOTE

Appendix I: How to recover UEFI BIOS

Important Notes:

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

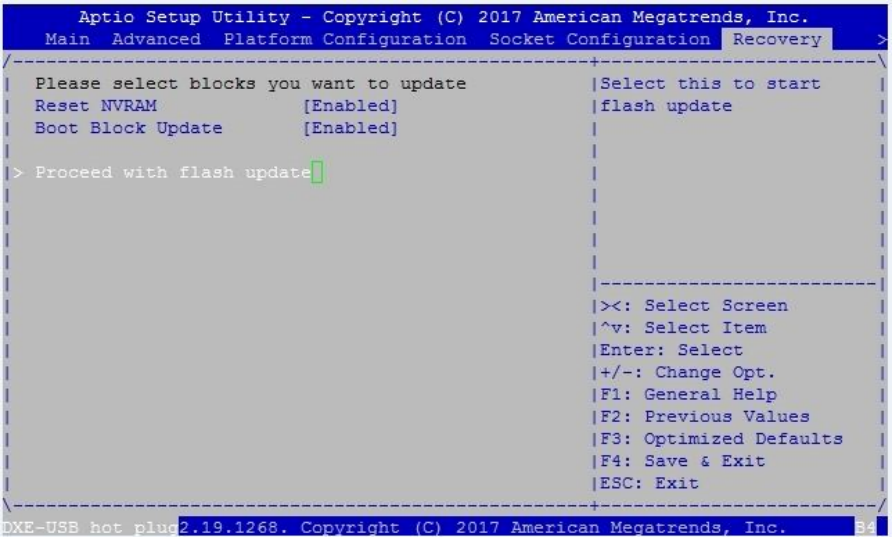
The BIOS Recovery file is named xxxx.cap, where the 'xxxx' portion is the motherboard model number. Examples: 5630.cap, 7106.cap, 7109.cap, etc. Please make sure that you are using the correct BIOS Recovery file from Tyan's web site.

BIOS Recovery Process

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



5. The system will boot to BIOS setup. A new menu item will appear at the far right of the screen. Scroll to the 'Recovery' tab, move the curser to “Proceed with flash update” and press the "Enter" key on the keyboard to start the BIOS recovery process.



6. IMPORTANT: Do not power off or reboot the server during the BIOS recovery process. This can damage the BIOS recovery bootloader and prevent it from loading a subsequent time.
7. Wait for the BIOS recovery procedure to complete. Completion is signified with the message “Flash update completed. Press any key to reset the system” displayed on screen.
8. Remove the USB disk and reboot.

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

Appendix II: PCIE Slot Location and Corresponding List

VMD with PCIE Slot

BIOS Setup → Socket Configuration → VMD config for PStackN (CPUN)		PCIE Slot Location	Reference on UG
PStack0(CPU0)	VMD Port 3A	J14, J15, J22, J23	Chapter 4.4 Board Parts, Jumpers and Connectors and Motherboard Components
PStack0(CPU0)	VMD Port 1A	J12, J13, J20, J21	
PStack1(CPU1)	VMD Port 3A	J10, J11, J18, J19	
PStack1(CPU1)	VMD Port 2A	J8, J9, J16, J17	

*PStack0 corresponds to IOU0 (PCIE PORT 1A1B1C1D)
*PStack1 corresponds to IOU1 (PCIE PORT 2A2B2C2D)
*PStack2 corresponds to IOU2 (PCIE PORT 3A3B3C3D)

PCIE Slot Location with IOU setting

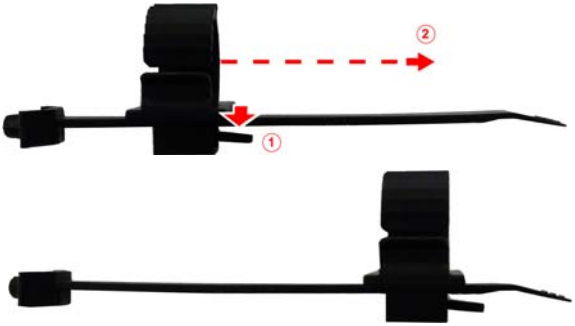
BIOS Setup → IIO Configuration		PCIE PORT	PCIE Slot Location	Reference on UG
Socket1 Configuration	IOU0 (IIO PCIe Br1)	1A1B1C1D	J3	Chapter 4.4 Board Parts, Jumpers and Connectors and Motherboard Components
Socket0 Configuration	IOU1 (IIO PCIe Br2)	2A2B	J25	
Socket0 Configuration	IOU1 (IIO PCIe Br2)	2C2D	J48	

NOTE

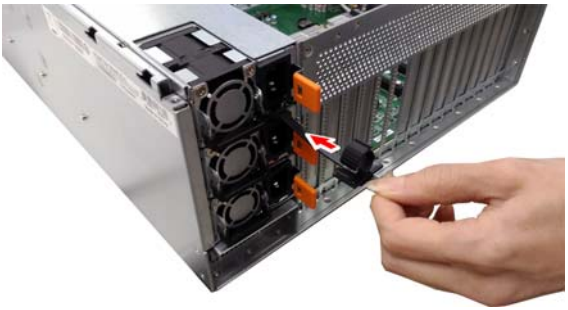
Appendix III: How to install Power Wire Clip

Follow these instructions to install the Power Wire Clip.

1. Press the lever to pull the clip to the right.



2. Insert the Power Wire Clip into the Power Wire Clip Jack.



3. Plug in the AC Power Cord and press to lock the clip and push the clip forwards.



NOTE

Appendix IV: Cable Connection Tables

1. Fan Ctrl Cable

M1809F77A FAN board to S7109 MB		
Fan board	**Connect to**	**S7109 M/B**
J8	→	FAN_HDR1

2. Fan PWR Cable

M1809F77A FAN board to M7059F77 PDB board		
Fan board	**Connect to**	**PDB board**
J7	→	J2
J9	→	
J10	→	
J11	→	

3. FP Ctrl & USB Cable

M1713 FP board to S7109 MB		
M1713 FP board	**Connect to**	**S7109 M/B**
J3_SSI_FP (FP Cable)	→	FPIO_1
J1_USB_IN (USB Cable)	→	USB3

4. VGA & COM port Cable

Front BKT to S7109 MB		
Front BKT	**Connect to**	**S7109 M/B**
VGA Cable	→	FPIO_VGA1
COM port Cable	→	COM1

5. B4P PWR & Mini-SAS HD & SATA & SGPIO Cable

(For B7109F77DV10E4HR series)

M1284F77D HDD BP to S7109 MB		
HDD BP	**Connect to**	**S7109 M/B**
SATA10~13 (Mini-SAS HD Cable-1)	→	PCH_SATA_4 7
SATA6~9 (Mini-SAS HD Cable-2)	→	PCH_SATA_0 3
SATA0 (SATA Cable-1)	→	PCH_SSATA_4
SATA1 (SATA Cable-2)	→	PCH_SSATA_5
PW1(B4P PWR Cable-1)	→	M/B D4P_PW2
PW2(B4P PWR Cable-2)	→	M/B D4P_PW1
PW3(B4P PWR Cable-3)	→	M/B D4P_PW3
SGPIO1 (SGPIO Cable)	→	SSATA_SGPIO1

6. B4P PWR & Mini-SAS HD & SATA Cable

(For B7109F77DV14HR series)

M1284F77D HDD BP to S7109 MB		
HDD BP	**Connect to**	**S7109 M/B**
SATA10~13 (Mini-SAS HD Cable-1)	→	PCH_SATA_4 7
SATA6~9 (Mini-SAS HD Cable-2)	→	PCH_SATA_0 3
SATA2~5 (Mini-SAS HD Cable-3)	→	PCH_SSATA_0 3
SATA0 (SATA Cable-1)	→	PCH_SSATA_4
SATA1 (SATA Cable-2)	→	PCH_SSATA_5
PW1(B4P PWR Cable-1)	→	M/B D4P_PW2
PW2(B4P PWR Cable-2)	→	M/B D4P_PW1
PW3(B4P PWR Cable-3)	→	M/B D4P_PW3

7. Oculink Cable

(For B7109F77DV10E4HR series)

M1284F77D HDD BP to M2093		
HDD BP	**Connect to**	**M2093**
NVME01 (Oculink Cable-1)	→	J1
NVME23 (Oculink Cable-2)	→	J2

8. B4P PWR & Mini-SAS HD Cable

(For B7109F77DV4HR series)

M1291F77D HDD BP to S7109 MB		
HDD BP	**Connect to**	**S7109 M/B**
SATA0~3 Mini-SAS HD Cable	→	PCH_SSATA_0 3
PW1(B4P PWR Cable-1)	→	M/B D4P_PW1
PW2(B4P PWR Cable-2)	→	M/B D4P_PW2

9. 2x3P & 2x4P GPU PWR Cable

M7059F77 PDB to GPU Card		
PDB	**Connect to**	**GPU Card**
J17 or J18	→	GPU1
J15 or J16	→	GPU2
J13 or J14	→	GPU3
J11 or J12	→	GPU4
J9 or J10	→	GPU5
J7 or J8	→	GPU6
J5 or J6	→	GPU7
J3 or J4	→	GPU8

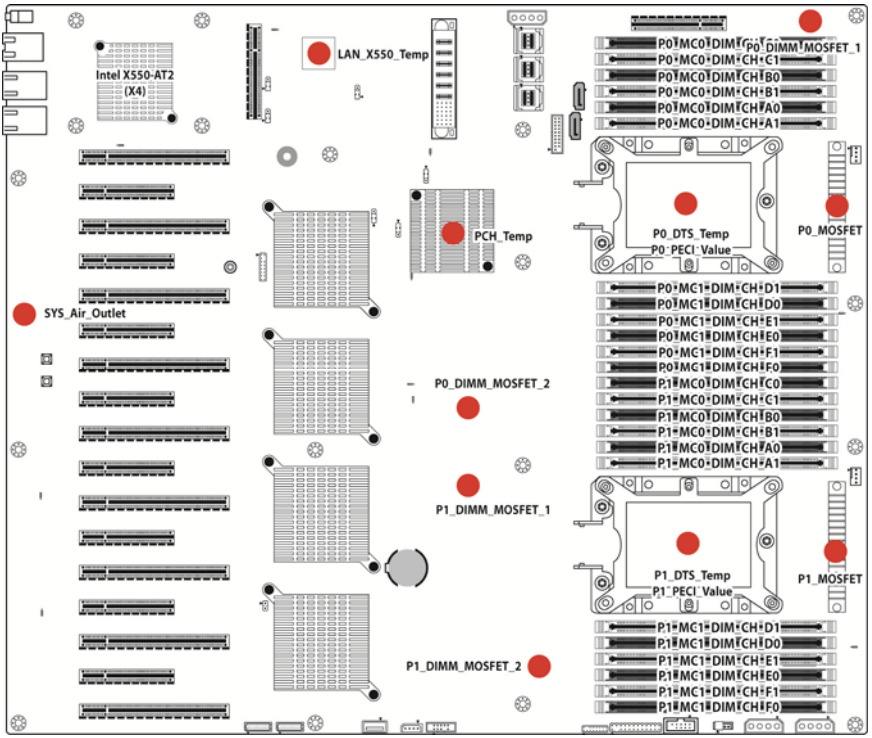
NOTE: Please note the thermal design power (TDP) of GPU must be less than 300W or OCP (over current protect) will occur.

NOTE

Appendix V: Fan and Temp Sensors

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

Figure 1: Sensor Location

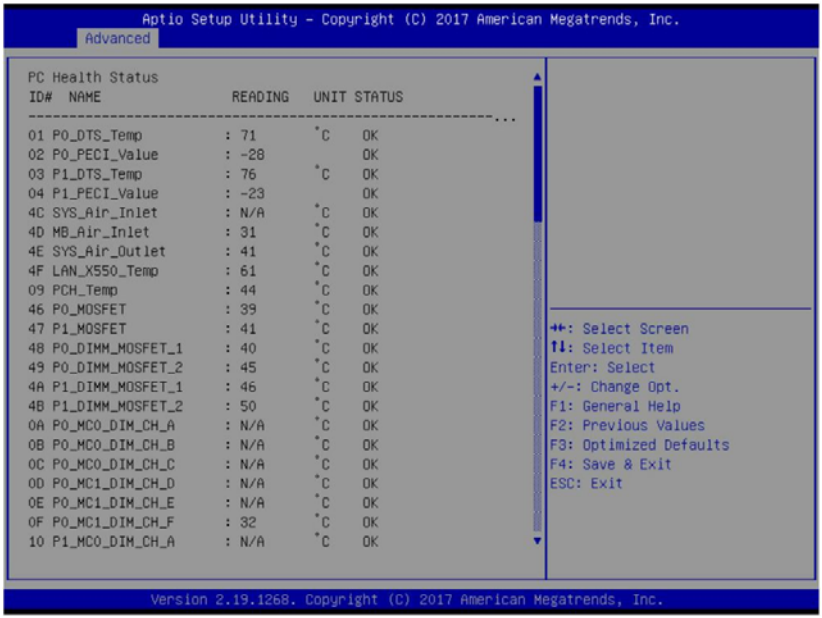


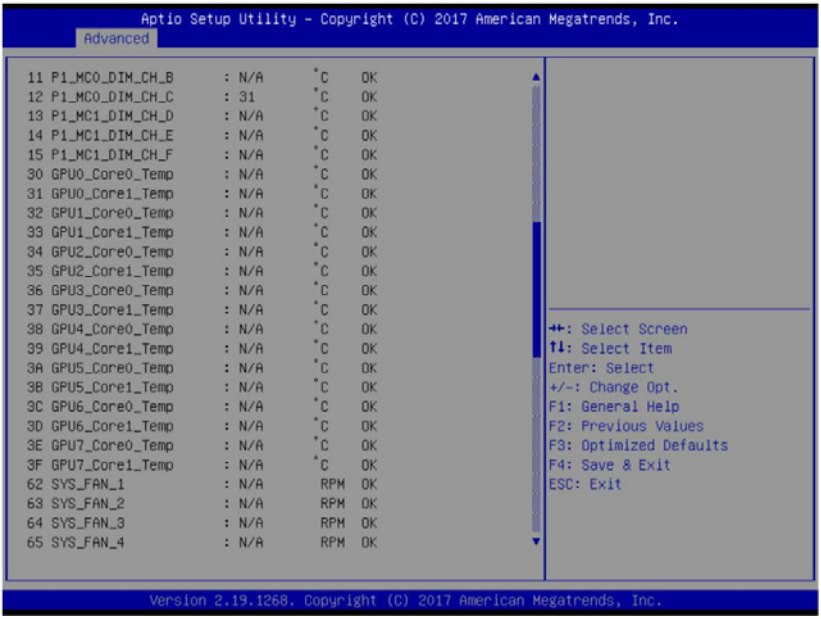
NOTE: The red spot indicates the sensor.

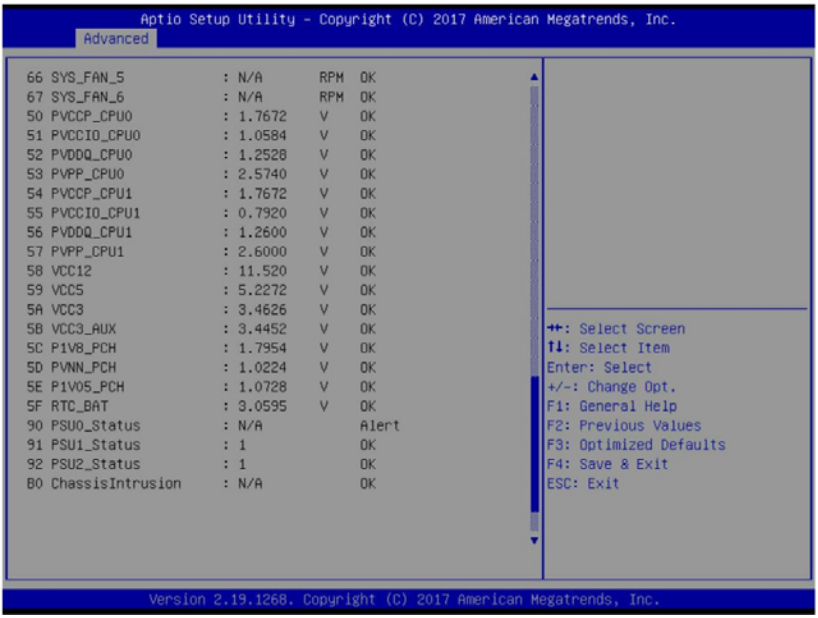
Fan and Temp Sensor Location:

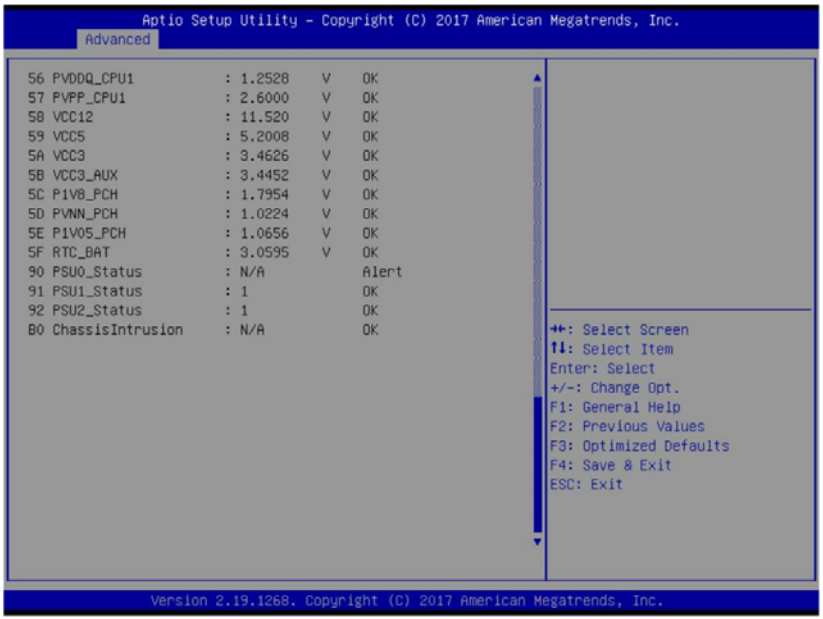
1. Fan Sensor: It is located in the third pin of the fan connector, which detects the fan speed (rpm)
2. Temp Sensor: refer to Figure 1: Sensor Location. They detect the system temperature around.

BIOS Temp Sensor Name Explanation:






Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced
66 SYS_FAN_5 : N/A RPM OK
67 SYS_FAN_6 : N/A RPM OK
50 PVCCP_CPU0 : 1.7672 V OK
51 PVCCIO_CPU0 : 1.0584 V OK
52 PVDDQ_CPU0 : 1.2528 V OK
53 PVPP_CPU0 : 2.5740 V OK
54 PVCCP_CPU1 : 1.7672 V OK
55 PVCCIO_CPU1 : 0.7920 V OK
56 PVDDQ_CPU1 : 1.2600 V OK
57 PVPP_CPU1 : 2.6000 V OK
58 VCC12 : 11.520 V OK
59 VCC5 : 5.2272 V OK
5A VCC3 : 3.4626 V OK
5B VCC3_AUX : 3.4452 V OK
5C P1V8_PCH : 1.7954 V OK
5D PVNN_PCH : 1.0224 V OK
5E P1V05_PCH : 1.0728 V OK
5F RTC_BAT : 3.0595 V OK
90 PSU0_Status : N/A Alert
91 PSU1_Status : 1 OK
92 PSU2_Status : 1 OK
B0 ChassisIntrusion : N/A 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
56 PVDDQ_CPU1 : 1.2528 V OK
57 PVPP_CPU1 : 2.6000 V OK
58 VCC12 : 11.520 V OK
59 VCC5 : 5.2008 V OK
5A VCC3 : 3.4626 V OK
5B VCC3_AUX : 3.4452 V OK
5C P1V8_PCH : 1.7954 V OK
5D PVNN_PCH : 1.0224 V OK
5E P1V05_PCH : 1.0656 V OK
5F RTC_BAT : 3.0595 V OK
90 PSU0_Status : N/A Alert
91 PSU1_Status : 1 OK
92 PSU2_Status : 1 OK
B0 ChassisIntrusion : N/A 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
P0_PECI_Value	Temperature of the CPU0 Platform Environment Control Interface
P1_DTS_Temp	Temperature of the CPU1 Digital Temperature Sensor
P1_PECI_Value	Temperature of the CPU1 Platform Environment Control Interface
SYS_Air_Inlet	Sensor located on the Front Panel Board
MB_Air_Inet	Temperature of the M/B Air Inlet Area
SYS_Air_Outlet	Temperature of the System Air Outlet Area
LAN_X550_Temp.	Temperature of the LAN X550 Chip
PCH_Temp	Temperature of the PCH
P0_MOSFET_Temp	The Max Temperature of CPU0 MOSFET
P1_MOSFET_Temp	The Max Temperature of CPU1 MOSFET
P0_DIMM_MOSFET_1	The Max Temperature of P0 DIMM Area1 MOSFET
P0_DIMM_MOSFET_2	The Max Temperature of P0 DIMM Area2 MOSFET
P1_DIMM_MOSFET_1	The Max Temperature of P1 DIMM Area1 MOSFET
P1_DIMM_MOSFET_2	The Max Temperature of P1 DIMM Area2 MOSFET
P0_DIMM_CH_A_Max	The Max Temperature of CPU0 DIMM A Slot
P0_DIMM_CH_B_Max	The Max Temperature of CPU0 DIMM B Slot
P0_DIMM_CH_C_Max	The Max Temperature of CPU0 DIMM C Slot
P0_DIMM_CH_D_Max	The Max Temperature of CPU0 DIMM D Slot
P0_DIMM_CH_E_Max	The Max Temperature of CPU0 DIMM E Slot
P0_DIMM_CH_F_Max	The Max Temperature of CPU0 DIMM F Slot
P1_DIMM_CH_A_Max	The Max Temperature of CPU1 DIMM A Slot
P1_DIMM_CH_B_Max	The Max Temperature of CPU1 DIMM B Slot
P1_DIMM_CH_C_Max	The Max Temperature of CPU1 DIMM C Slot
P1_DIMM_CH_D_Max	The Max Temperature of CPU1 DIMM D Slot
P1_DIMM_CH_E_Max	The Max Temperature of CPU1 DIMM E Slot
P1_DIMM_CH_F_Max	The Max Temperature of CPU1 DIMM F Slot
GPU0_Core0_Temp	Temperature of GPU0 Core0 Slot
GPU0_Core1_Temp	Temperature of GPU0 Core1 Slot
GPU1_Core0_Temp	Temperature of GPU1 Core0 Slot
GPU1_Core1_Temp	Temperature of GPU1 Core1 Slot
GPU2_Core0_Temp	Temperature of GPU2 Core0 Slot
GPU2_Core1_Temp	Temperature of GPU2 Core1 Slot
GPU3_Core0_Temp	Temperature of GPU3 Core0 Slot
GPU3_Core1_Temp	Temperature of GPU3 Core1 Slot
GPU4_Core0_Temp	Temperature of GPU4 Core0 Slot
GPU4_Core1_Temp	Temperature of GPU4 Core1 Slot

GPU5_Core0_Temp	Temperature of GPU5 Core0 Slot
GPU5_Core1_Temp	Temperature of GPU5 Core1 Slot
GPU6_Core0_Temp	Temperature of GPU6 Core0 Slot
GPU6_Core1_Temp	Temperature of GPU6 Core1 Slot
GPU7_Core0_Temp	Temperature of GPU7 Core0 Slot
GPU7_Core1_Temp	Temperature of GPU7 Core1 Slot
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

NOTE

Appendix VI: FRU Parts Table

FT77D-B7109 FRU Parts				
Item	**Model Number**	**Part Number**	**Picture**	**Description**
Air Duct	FRU-TA-0060	343T56800003		
Cable	FRU-CS-0750	422T57000005		SGPIO Cable
	FRU-CS-0741	422T56800008		80-80 pin OCulink Cable
	FRU-CS-0830	422T56800001		Mini-SAS to 80-pin OCulink Cable
	FRU-CS-0620	422T38700001		SATA Cable
	FRU-CS-0330	332810000514		A/C Power Cord, L=1800mm, US type
	CCBL-0300	332810000281		A/C Power Cord, L=1830mm, EU type
	CCBL-146H	422786600003		6-pin PCI-E Power Cable
	CCBL-146I	422786600004		8-pin PCI-E Power Cable
	CCBL-1086	422797000006		8-pin EPS12V CPU Power Cable (used by several GPU cards)
	FRU-CS-0630	422T53400011		Mini-SAS HD Cable, 1000mm
	FRU-CS-0270	422T53400006		Mini-SAS HD Cable, 800mm
	FRU-CS-0640	422T55600004		Mini-SAS HD Cable, 600mm
Compatible Accessories	FRU-NC-9020	5412T5680008		GPU Server Mezzanine M7059F77D-X540-2T, 10GBase-T Ethernet w/ Associate Tray
	FRU-NC-9040	5412T5680009		GPU Server Mezzanine M7077F77D-B810-2F, 10GBase SFP+ Ethernet w/ Associate Tray
	FRU-NC-9050	5412T5680012		GPU Server Mezzanine M7109F77D-V710-2V, 25GBase SFP28 Ethernet w/ Associate Tray

	FRU-NC-9010	5412T5680006		GPU Server Mezzanine M7059F77D-FDR-2, 56Gb/s FDR InfiniBand w/ Associate Tray
	FRU-NC-9030	5412T5680007		GPU Server Mezzanine M7059F77D-I350, 1000Base-T Ethernet w/ Associate Tray
	FRU-RC-0450	411T57200025		Storage Mezzanine M2093, NVMe Adapter w/ OCulink onboard for (4) NVMe Ports
	FRU-RC-0350	411T55200017		Storage Mezzanine M5539-2E, (8) SAS 12Gb/s HDD/SSD supported
	FRU-RC-9840	5412T5680018		Storage Mezzanine M7076-3008-8i, Storage Mezzanine SAS 12G IOC support
	M2215-L8-1F	411T56800021		Riser Card M2215-L8-1F, 1U Riser Card w/ PCI-E x8 slot
	M2217-L16-IO	411T57700034		Riser Card M2217-L16-IO, OCP Riser Card
CPU Heat Sink	FRU-TH-0220	343T56600001		647-2U-NARROW-PASSIVE HEATSINK, 1A0-D042800991, 108.0X78.0X64.0MM, SCREW
FAN	FRU-TS-0040	5412T4760009		120*120*38MM w/ Holding Bracket
GPU Bracket	FRU-SO-0050	5412T5060005		For Intel Xeon Phi Brackets(w/ **S**crews)
HDD Backplane	FRU-BP-9020	5412T5680014		M1284F77D-BP12E-14, Hybrid SATA/SAS/NVMe Backplane
	FRU-BP-9200	5412T5680013		M1291F77D-BP12E-4, Hybrid SATA/SAS/NVMe Backplane
Mounting Ear Kit	FRU-SO-0130	452T57700001		Mounting Ear Kit w/ Right and Left Ear
Power Supply	FRU-PS-0020	471100000246		Delta, DPS-1600CB A, (00F), 1600W
Rack Mounting Kit	FRU-AS-0050	452T52800001		Sliding Rail Kit

Appendix VII: 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 beep 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® FT77D-B7109 Service Engineer's Manual V1.1b

Document No.: D2381-110