GT86A-B7051

Service Engineer's Manual

Copyright

Version 1.0a

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

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

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

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

Notice for Canada

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

Notice for Europe (CE Mark)
This product is in conformity with the Council Directive 2004/108/EC.

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

About this Manual

This manual is intended for experienced users and integrators with hardware knowledge of personal computers.
It is aimed to provide you with instructions on installing your TYAN GT86A-B7051.

How this guide is organized

This guide contains the following parts:

Chapter 1: Overview
This chapter provides an introduction to the TYAN GT86A-B7051 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 GT86A-B7051, take note of the following precautions:

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

Safety Information

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

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

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

Symbols on Equipment

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

General Precautions

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

Machine Room Environment

- This device is for use only in a machine room or IT room.
- Make sure that the area in which you install the system is properly ventilated and climate-controlled.

- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the electrical rating label of the equipment.
- Do not install the system in or near a plenum, air duct, radiator, or heat register.
- Never use the product in a wet location.

Equipment Chassis

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

Equipment Racks

To avoid injury or damage to the equipment:

- Observe local occupational health and safety requirements and guidelines for manual materials handling.
- Do not attempt to move a rack by yourself; a minimum of two people are needed to move a rack.
- Do not attempt to move a fully loaded rack. Remove equipment from the rack before moving it.
- Do not attempt to move a rack on an incline that is greater than 10 degrees from the horizontal.
- Make sure the rack is properly secured to the floor or ceiling.
- Make sure the stabilizing feet are attached to the rack if it is a single-rack installation.
- Make sure racks are coupled together if it is a multiple-rack installation.
- Make sure the rack is level and stable before installing an appliance in the rack.
- Make sure the leveling jacks are extended to the floor.
- Make sure the full weight of the rack rests on the leveling jacks.

• Always load the rack from the bottom up. Load the heaviest component in the rack first.

• Make sure the rack is level and stable before pulling a component out of the rack.

• Make sure only one component is extended at a time. A rack might become unstable if more than one component is extended.

To avoid damage to the equipment:

• The rack width and depth must allow for proper serviceability and cable management.

• Ensure that there is adequate airflow in the rack. Improper installation or restricted airflow can damage the equipment.

• The rack cannot have solid or restricted airflow doors. You must use a mesh door on the front and back of the rack or remove the doors to ensure adequate air flow to the system.

• If you install the Model in a rack, do not place equipment on top of the unit. It will cause restricted airflow and might cause damage to the equipment.

• Make sure the product is properly matted with the rails. Products that are improperly matted with the rails might be unstable.

• Verify that the AC power supply branch circuit that provides power to the rack is not overloaded. This will reduce the risk of personal injury, fire, or damage to the equipment. The total rack load should not exceed 80 percent of the branch circuit rating. Consult the electrical authority having jurisdiction over your facility wiring and installation requirements.

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• When use 100V-127VAC input: The system does not support redundant PSU operation if the total system load exceeds 20A.

Equipment Power Cords

• Use only the power cords and power supply units provided with your system. The system might have one or more power cords.

• Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

• In all European electrical environments, you must ground the Green/Yellow tab on the power cord. If you do not ground the Green/Yellow tab, it can cause an electrical shock due to high leakage currents.

• Do not place objects on AC power cords or cables. Arrange them so that no one might accidentally step on or trip over them.

• Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

• To reduce the risk of electrical shock, disconnect all power cords before servicing the appliance.

Equipment Batteries

• The system battery contains lithium manganese dioxide. If the battery pack is not handled properly, there is risk of fire and burns.

• Do not disassemble, crush, puncture, short external contacts, or dispose of the battery in fire or water.

• Do not expose the battery to temperatures higher than 60°C (140°F).

• The system battery is not replaceable. If the battery is replaced by an incorrect type, there is danger of explosion. Replace the battery only with a spare designated for your product.

• Do not attempt to recharge the battery.

• Dispose of used batteries according to the instructions of the manufacturer. Do not dispose of batteries with the general household waste. To forward them to recycling or proper disposal, use the public collection system or return them to TYAN, your authorized TYAN partner, or their agents.

Equipment Modifications

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

modified.

Equipment Repairs and Servicing

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

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

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

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

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

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

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

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

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

– The product has been exposed to rain or water.

– The product has been dropped or damaged.

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

Table of Contents

Chapter 1: Overview

1.1 About the TYAN GT86A-B7051

Congratulations on your purchase of the TYAN® GT86A-B7051, a highly optimized rack-mountable barebone system. The GT86A-B7051 is designed to support dual Intel® Xeon E5-2600/E5-2600 v2 series processors and up to 128GB UDIMM, 256GB RDIMM and 512GB LRDIMM DDR3 memory, providing a rich feature set and incredible performance. Leveraging advanced technology from Intel®, the GT86A-B7051 server system is capable of offering scalable 32 and 64-bit computing, high bandwidth memory design, and lightning-fast PCI-E bus implementation. The GT86A-B7051 not only empowers your company in nowadays IT demand but also offers a smooth path for future application usage.

TYAN® also offers the GT86A-B7051 in a version that can support up to twelve 3.5" easy-swap SATA/SAS hard drives. The GT86A-B7051 uses TYAN's latest chassis featuring a robust structure and a solid mechanical enclosure. All of this provides GT86A-B7051 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 model:

- B7051G86AW12-1T-HE: Intel-based platform

1.3 Features

TYAN GT86A B7051 (B7051G86AW12-1T-HE)

System	Form Factor		1U Rackmount
	Chassis Model		GT86A
	Dimension (D x W x H)		33.86" x 17.32" x 1.72" (860 x 440 x 43.6mm)
	Motherboard		B7051G86AW12-1T-HE
	Board Dimension		CEB, 12"x10.5" (305x267mm)
Front Panel	Buttons		(1) RST / (1) PWR w/ LED
Internal Drive Bay	Type / Q'ty		3.5" Fixed / (12)
	HDD backplane support		SAS / SATA 6.0Gb/s
Internal Drive Bay	Type / Q'ty		2.5" fixed / (1)
	Supported HDD Interface		SSD (Solid State Drive)
System Cooling Configuration	FAN		(6) 4cm fans
Power Supply	Type		EPS1U
	Efficiency		80 plus Platinum
	Input Range		100-127V AC/8A
	Output Watts		500 Watts
Processor	Supported CPU Series		Intel Xeon Processor E5-2600/E5-2600 v2 series processors
	Socket Type / Q'ty		LGA2011 / (2)
	Thermal Design Power (TDP) wattage		Up to 115W
	System Bus		Up to 8.0/ 7.2/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	PCH		Intel C602-J
Memory	Supported DIMM Qty		(8)+(8) DIMM slots
	DIMM Type / Speed		RDIMM ECC 1866/1600/1333/1066 / UDIMM/LRDIMM ECC 1866/1600/1333/1066
	Capacity		up to 128GB UDIMM / 256GB RDIMM / 512GB LRDIMM
	Memory channel		4 Channels per CPU
	Memory voltage		1.5V or 1.35V
Expansion Slots	Note:		(1) OCP slot for OCP Mezz Card
LAN	Port Q'ty		(1) 10GbE SFP+ + (1) GbE RJ45 shared with IPMI
	Controller		Intel I210 / Intel 82599EN
	Pre-install TYAN LAN Mezz Card		M7062-I599-1T, PCI-E Gen3 x8, Intel 10GbE Mezz Card
Storage	SAS	Connector	(2) Mini-SAS connectors (totally support 8 ports)
		Controller	LSI SAS2308

		Speed	6.0 Gb/s
		RAID	RAID 0/1/1E/10 (LSI Integrated RAID)
	SATA	**Connector**	(1) Mini-SAS (4-ports) + (2) SATA (totally support 6 ports)
		Controller	Intel C602-J
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2300
I/O Ports	**USB**		(5) USB3.0 ports (2 at rear, 2 via cable, 1 TYPE-A)
	COM		(1) DB-9 COM port
	VGA		(1) D-Sub 15-pin port
	RJ-45		(1) GbE port shared with IPMI
	SFP+		(1) 10GbE SFP+ port
System Monitoring	**Chipset**		Aspeed AST2300
	Voltage		Monitors voltage for CPU, memory, chipset & power supply
	Temperature		Monitors temperature for CPU & memory & system environment
	LED		Over temperature warning indicator / Fan & PSU fail LED indicator
Server Management	**Onboard Chipset**		Onboard Aspeed AST2300
	AST2300 IPMI Feature		IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub / BIOS update
	AST2300 iKVM Feature		24-bit high quality video compression / 10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**		AMI / 8MB
	Feature		User-configurable H/W monitoring / Auto-configurable of hard disk types / SMBIOS 2.7/PnP/Wake on LAN / PXE boot support / ACPI 3.0/ACPI sleeping states S1,S4,S5
Operating System	**OS supported list**		Please refer to our Intel OS supported list.
Regulation	**FCC (DoC)**		Class A
	CE (DoC)		Yes
Operating Environment	**Operating Temp.**		10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.		- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity		90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**		Yes

Package Contains	**Barebone**	(1) GT86A-B7051 Barebone
	Installation CD	(1) TYAN installation CD

1.4 Standard Parts List

This section describes GT86A-B7051 package contents and accessories. Open the box carefully and ensure that all components are present and undamaged. The product should arrive packaged as illustrated below.

1.4.1 Box Contents and Accessories

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

GT86A-B7051 Box Content

- (1) 1U barebone with (12) fixed HDD bays
- (1) DPS-500AB-5 C, power supply unit
- (1) S7051 system board (pre-installed)
- (6) System Fans
- (1) M7062-I599-1T OCP Card (pre-installed)
- (3) M7051G86-BP6-4 HDD BP (pre-installed)

GT86A-B7051 Accessories

- (1) Sliding Rail kit
- (1) Quick Installation Guide
- (1) AC Power code (US)
- (1) AC Power code (EU)
- (3) Screw Pack

1.5 About the Product

The following views show you the product.

1.5.1 System Front View

1	Thumb screw (for top cover)
2	Power Button with LED
3	Reset Button

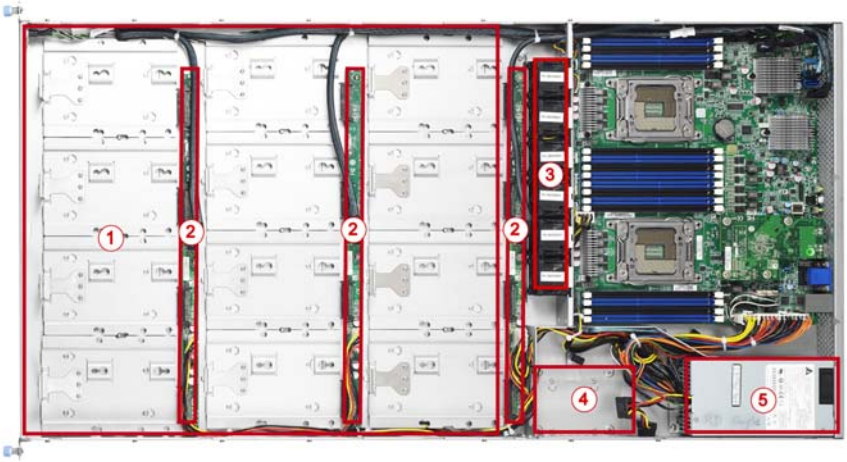
1.5.2 Front Panel Buttons

Button	State Description		
Power	Turn on and off the system (Use a pin).		
	State	**Color**	**Behavior**
	Power On	Green	Solid On
	Power Off		Off
Reset	Press to reset the system.		

1.5.3 System Rear View

1	Power Supply
2	LAN1 (I210, shared BMC)
3	USB2.0 Ports
4	VGA Port
5	Serial Port (COM1)
6	10GB LAN Port
7	Reset Button
8	Power Button with LED
9	ID Button

1.5.4 Internal View



1	(12) 3.5” SAS/SATA 6G HDD from LSI SAS2308
2	M7051G86-BP6-4 HDD Backplane Board
3	(6) System Fans
4	(1) 2.5” SATA 6G SSD from PCH
5	Power supply

NOTE

Chapter 2: Setting Up

2.0.1 Before you Begin

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

2.0.2 Work Area

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

2.0.3 Tools

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

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

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

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 GT86A-B7051 or injury to yourself.

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

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

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

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

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

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

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

2.1 Installing Motherboard Components

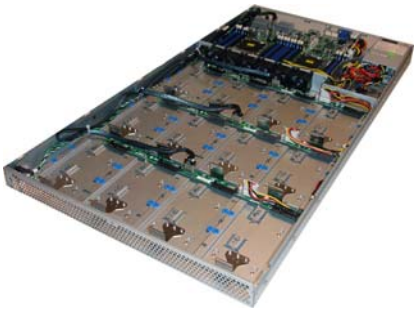
This section describes how to install components on to the motherboard, including CPUs, memory modules, HDD and PCI-E cards.

2.1.1 Removing the Chassis Cover

Follow these instructions to remove the GT86A-B7051 chassis cover.

1. Loosen the thumb screw on the front.

2. Slide the top cover forward and then lift it up.



2.1.2 Installing the CPU and Heatsink

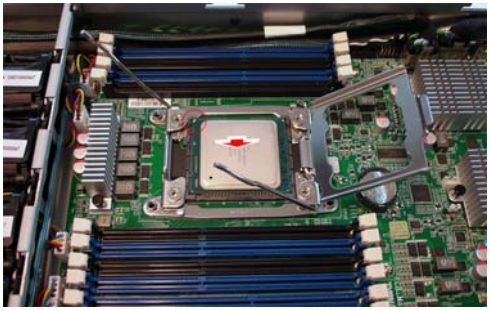
Follow the steps below to install CPUs and CPU heatsinks.

1. Locate the CPU sockets. Always start with CPU0 first.
2. Pull the levers slightly away from the socket and then push them to a fully open position.

3. Lift the CPU socket cover to a fully open position.

4. Remove the protection cap from the CPU socket.

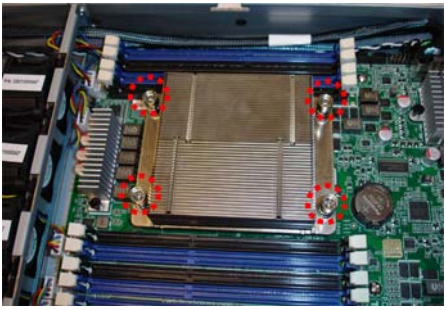
5. Place the CPU into the socket making sure that the gold arrow is located in the right direction.



6. Close the CPU socket cover.

7. Press the levers down to secure the CPU.

8. Position the heatsink on top of the CPU and secure it with 4 screws.



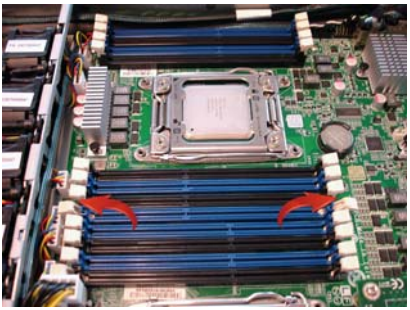
9. Repeat steps 2 to 8 to install the second CPU and heatsink.

2.1.3 Installing the Memory

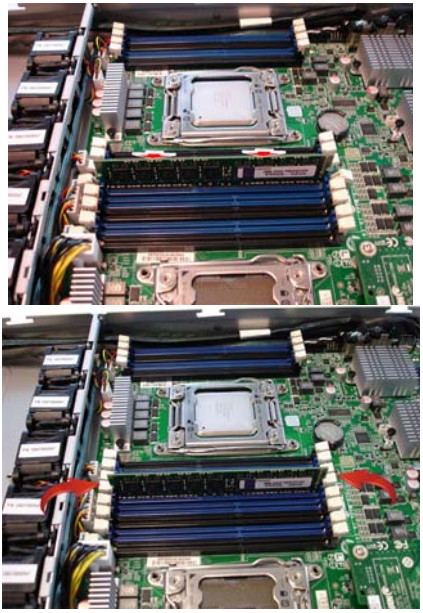
Follow these instructions to install the memory modules onto the motherboard.

1. Locate the memory slots on the motherboard.

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



3. Align and insert the memory module down onto the slot. When inserted properly, the memory slot locking levers lock automatically on the indentations at the ends of the module. Follow the recommended memory population table to install the other memory modules.

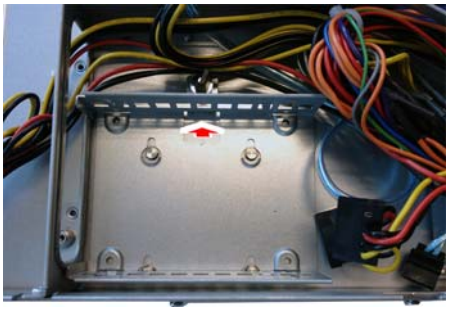


2.1.4 Installing SSD and HDD

The GT86A-B7051 can support up to (1) 2.5” OS SSD and up to (12) 3.5’’ hard drives or (12) 2.5” SSDs. Follow these instructions to install a hard drive.

1. Pull the locking lever open and slide the SSD tray out.

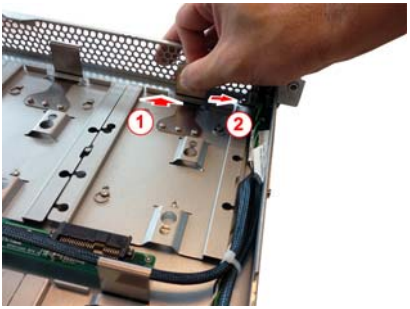
2. Lift the SSD tray up.



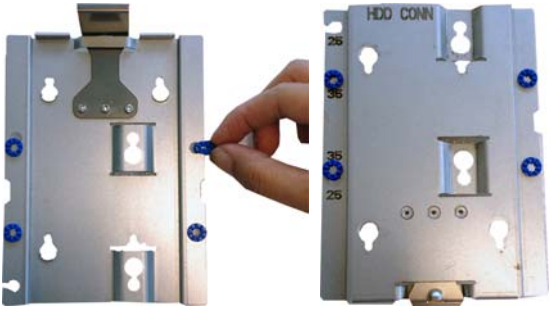
3. Use 4 screws securing the SSD to the SSD tray.

4. Place the SSD tray into the chassis and push the locking lever to secure it. Connect the SATA power cable and SATA cable.

4. Pull up the latch and slightly push backward to release the HDD tray.

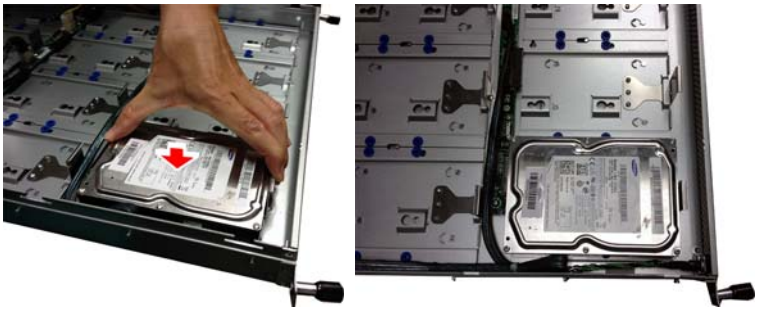


5. Take out the HDD tray. Insert the blue rubber stub into the screw hole.



6. Use four HDD screws in the AK box to secure the HDD to the tray.

7. Place the HDD tray into the chassis.



2.2 Rack Mounting

CAUTION: Please note that the following illustrations are based on a GT86A-B7051 barebone which may not look exactly like the rackmount server you purchased. Therefore, the illustrations should be held for your reference only.

After installing the necessary components, the TYAN GT86A-B7051 can be mounted in a rack using the supplied rack mounting kit.

Rack mounting kit

Sliding Rails x 2

Mounting Ears x 2

2.2.1 Installing the Server in a Rack

Follow these instructions to mount the TYAN GT86A-B7051 into an industry standard 19" rack.

NOTE: Before mounting the TYAN GT86A-B7051 in a rack, ensure that all internal components have been installed and that the unit has been fully tested. However, to make the installation easier, we suggest that you remove all HDD trays before you insert the chassis into the rack.

2.2.2 Installing the inner Rails to the Chassis

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

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

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

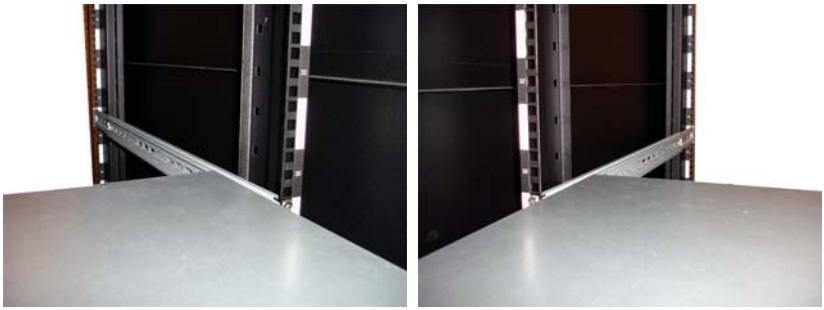
4. Align the inner sliding rail on the other side of the server.

2.2.2 Installing the Outer Rails to the Rack

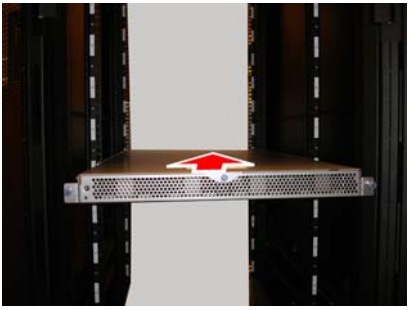
1. Secure the outer rails to the rack.

2.2.3 Rack mounting the Server

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



2. Push the whole system into the rack.



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

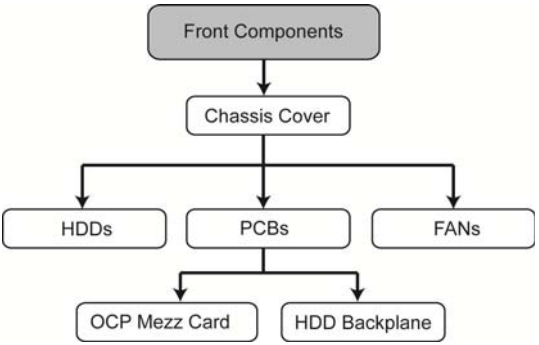
Chapter 3: Replacing Pre-Installed Components

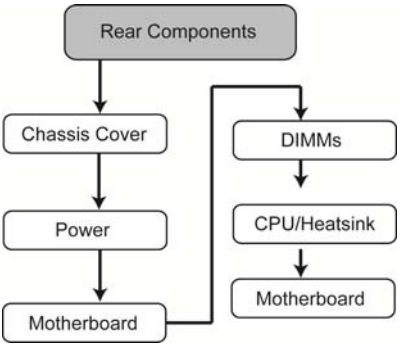
3.1 Introduction

This chapter explains how to replace the pre-installed components, including the Motherboard, M7051G86-BP6-4 HDD Backplane Board, M7062-I599-1T OCP Card, System fan, Power supply unit etc.

3.2 Disassembly Flowchart

The following flowchart outlines the disassembly procedure.





3.3 Removing the Cover

Before replacing any parts you must remove the chassis cover. Follow Section 2.1.1
2.1.1 Removing the Chassis Cover (page ***25***) to remove the cover of the GT86A-B7051.

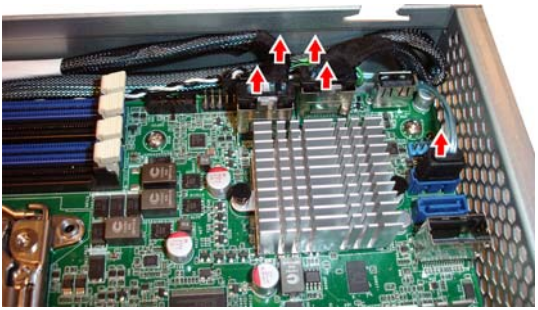
3.4 Replacing Motherboard Components

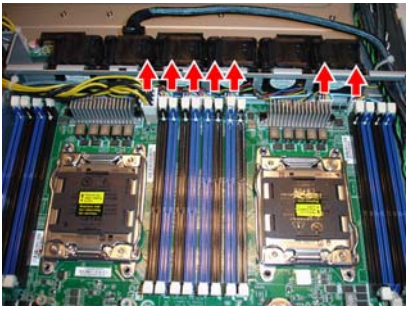
Follow these instructions to replace motherboard components, including the motherboard.

3.4.1 Disconnecting All Motherboard Cables

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

1 Disconnect all cables.

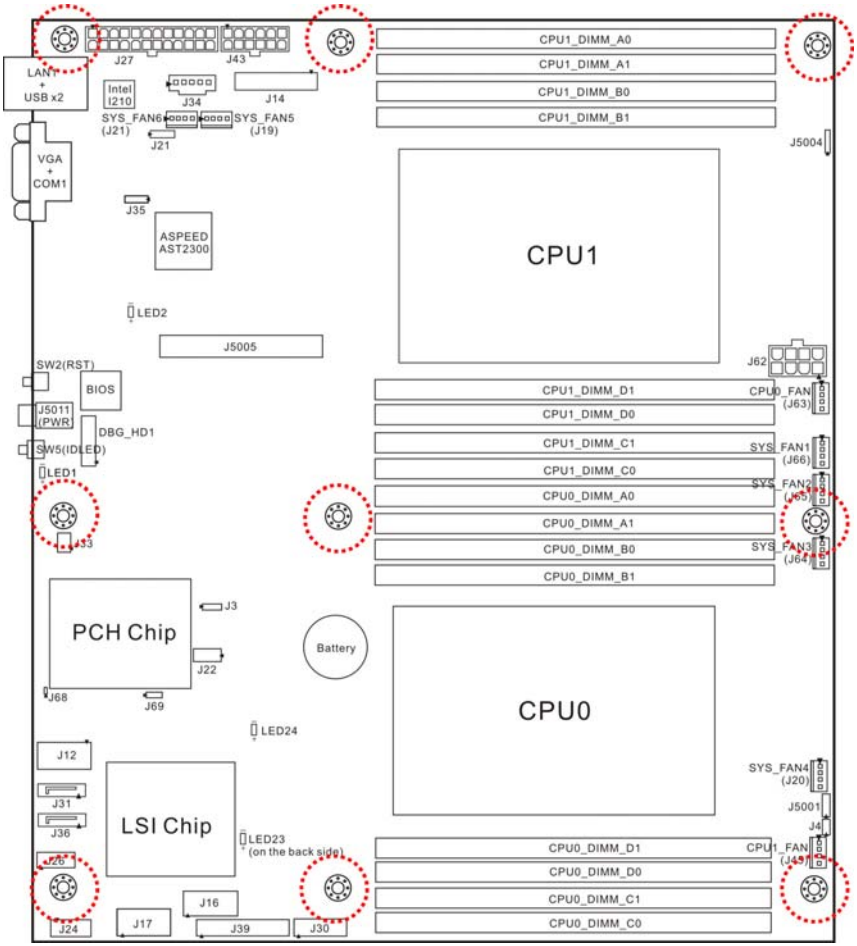




3.4.2 Removing the Motherboard

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

1 Remove the heatsinks and processors if installed.
2 Remove the nine screws securing the motherboard to the chassis.

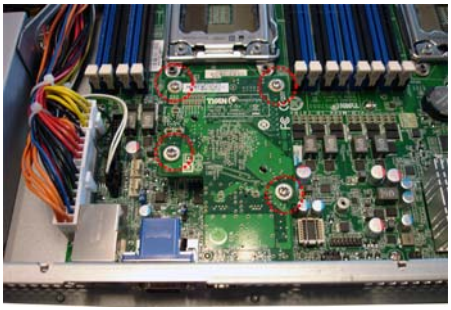


3 Carefully lift the motherboard from the chassis.

3.5 Replacing the OCP LAN Card

Follow these instructions to replace the OCP LAN Card.

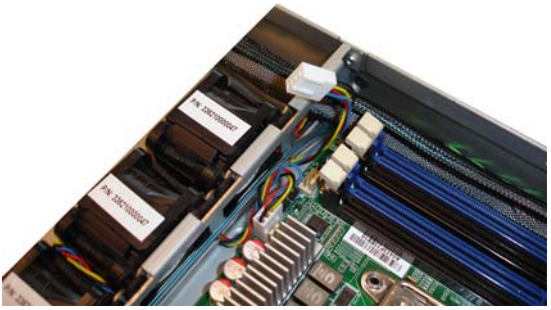
1. Unscrew the OCP LAN Card to replace with a new one.



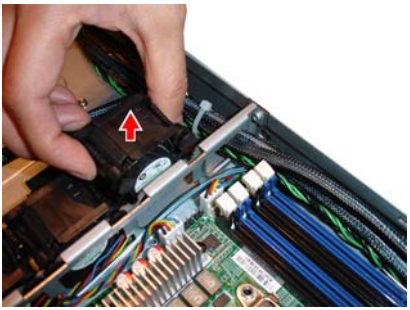
3.6 Replacing the System Fan

Follow these instructions to replace the system fan.

2. Disconnect the fan cable from the mainboard.



3. Take out the failed fan.

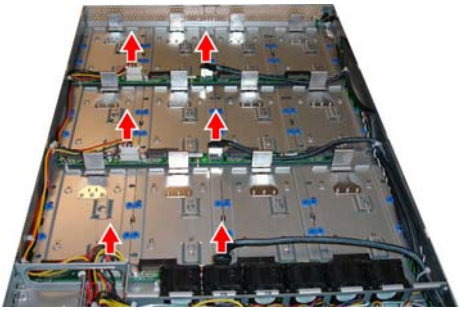


4. After replacing a new fan, follow Step 1 & 2 in reverse order to reinstall the fan.
5. Connect the fan cable to the mainboard connector.

3.7 Replacing the HDD Backplane Board

Follow these instructions to replace the HDD Backplane Board.

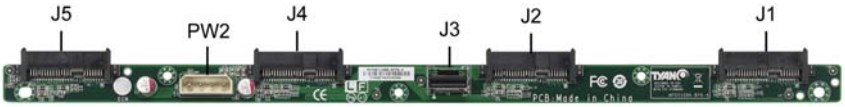
1. Disconnect the power cable and Mini SAS cable attached to the M7051G86-BP6-4 HDD BP Board.



2. Unscrew the HDD BP Board.

3. Take out the failed HDD BP Board and replace with a new one.
4. Screw the HDD BP Board to the chassis and connect the power cable and Mini SAS cable to the HDD BP Board.

3.7.1 M7051G86-BP6-4 HDD BP Board Specifications



Form Factor	➢ 380x17 mm, 4-layer PCB
Integrated I/O	➢ (4) SAS Connector connect to HDD (J1/J2/J4/J5) ➢ (1) MINI SAS Connector connect to MB (J3) ➢ (1) 4-pin power connector (PW2)

J1/J2/J4/J5: SAS Connector

P1	P2	P3	P4	P5
NC	NC	NC	GND	GND
P6	P7	P8	P9	P10
GND	VDD_5_RUN	VDD_5_RUN	VDD_5_RUN	GND
P11	P12	P13	P14	P15
NC	GND	VDD_12_RUN	VDD_12_RUN	VDD_12_RUN
NG1	S1	S2	S3	S4
NC	GND	SAS_TX+	SAS_TX-	GND
S5	S6	S7	S8	S9
SAS_RXBN	SAS_RXBP	GND	NC	NC
S10	S11	S12	S13	S14
NC	NC	NC	NC	NC
NG2				
NC				

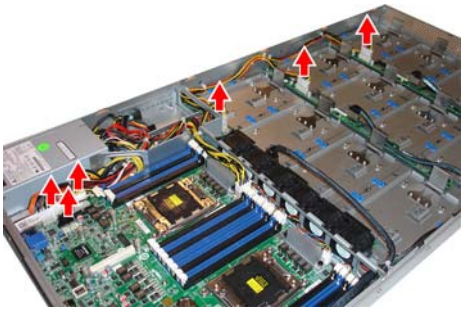
J3: Mini SAS Connector

A1	A2	A3	A4	A5
GND	SAS_TX0+	SAS_TX0-	GND	SAS_TX1+
A6	A7	A8	A9	A10
SAS_TX1-	GND	NC	NC	GND
A11	A12	A13	A14	A15
NC	GND	SAS_TX2+	SAS_TX2-	GND
A16	A17	A18	B1	B2
SAS_TX3+	SAS_TX3-	GND	GND	SAS_RXBP0
B3	B4	B5	B6	B7
SAS_RXBN0	GND	SAS_RXBP1	SAS_RXBN1	GND
B8	B9	B10	B11	B12
NC	GND	NC	NC	GND
B13	B14	B15	B16	B17
SAS_RXBP2	SAS_RXBN2	GND	SAS_RXBP3	SAS_RXBN3
B18	G1	G2	G3	G4
GND	GND	GND	GND	GND
G5	G6	G7	G8	
GND	GND	GND	GND	

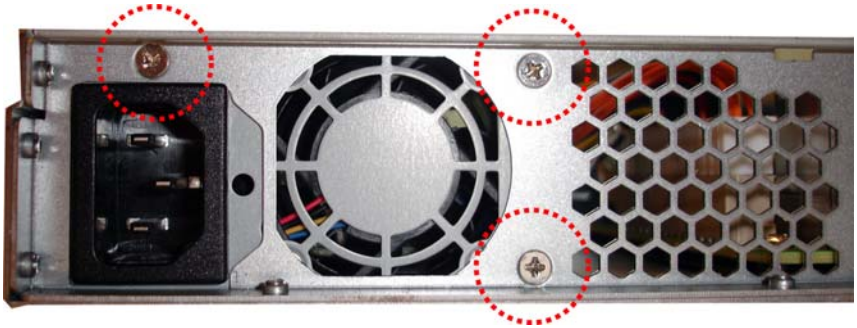
3.8 Replacing the Power Supply

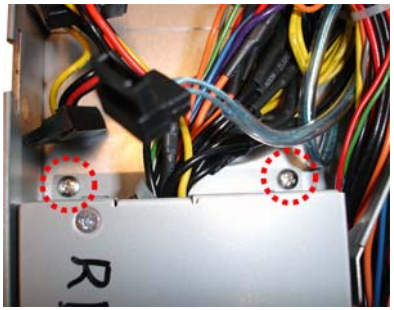
Follow these instructions to replace the power supply.

1. Disconnect all power cables.

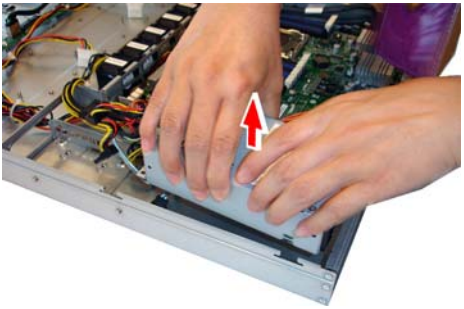


2. Unscrew the power supply.





3. Take out the power supply.



4. After replacing a new power supply, follow Step 1~3 in reverse order to reinstall the power supply.
5. Connect the power cables and the SATA cable to the HDD BP Board and the Mainboard.

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.

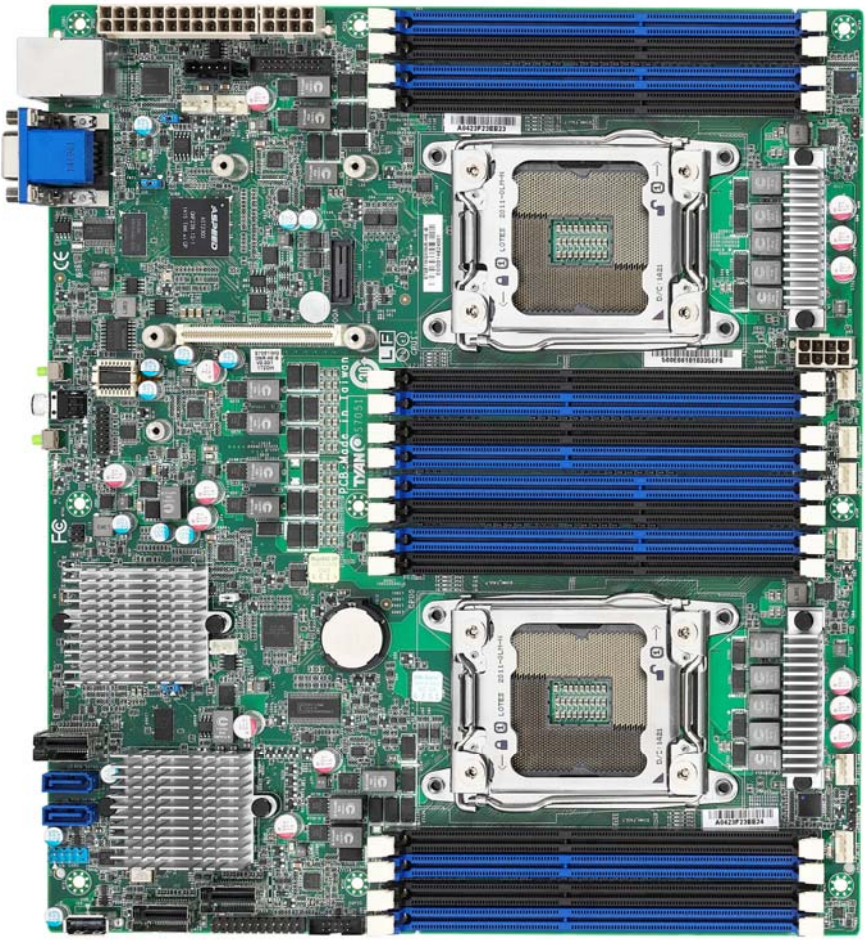
The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

Caution!

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

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

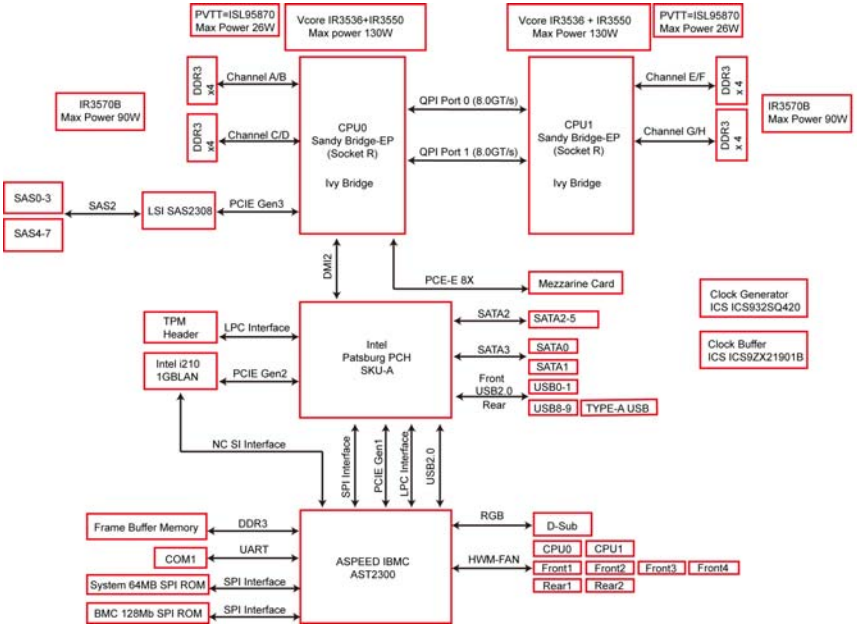
4.1 Board Image



S7051

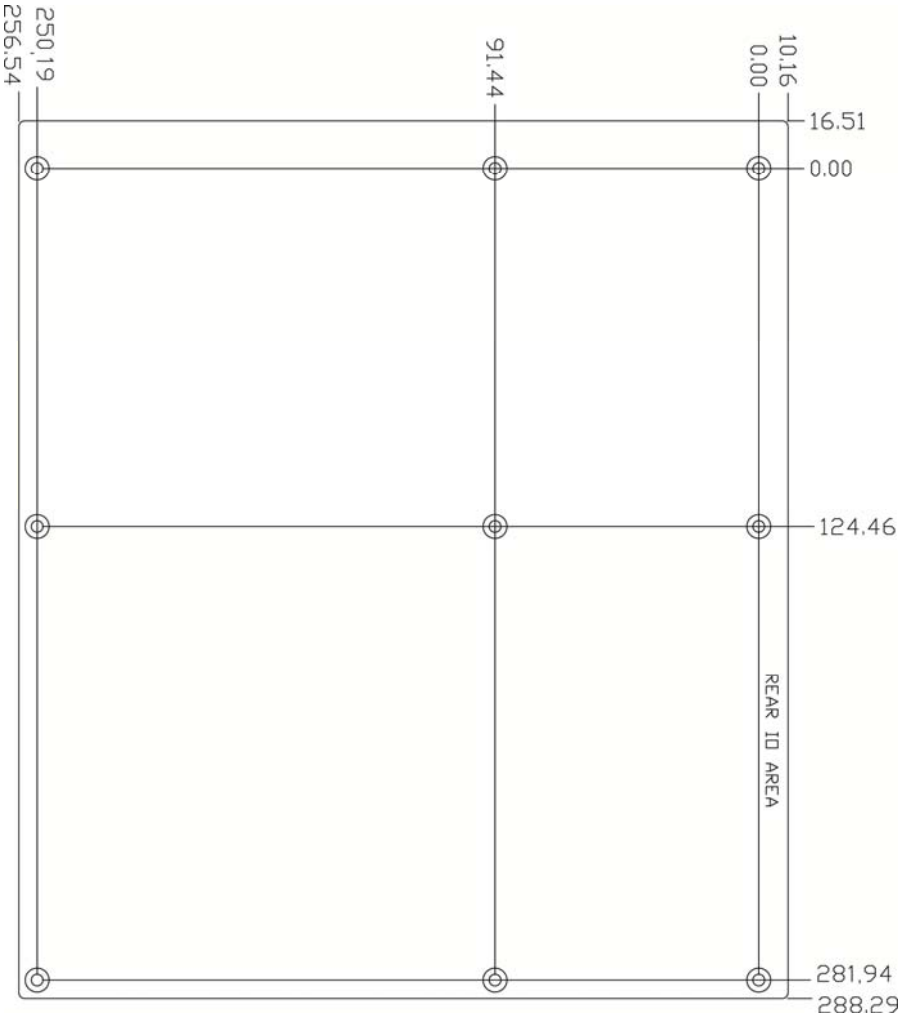
This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.

4.2 Block Diagram

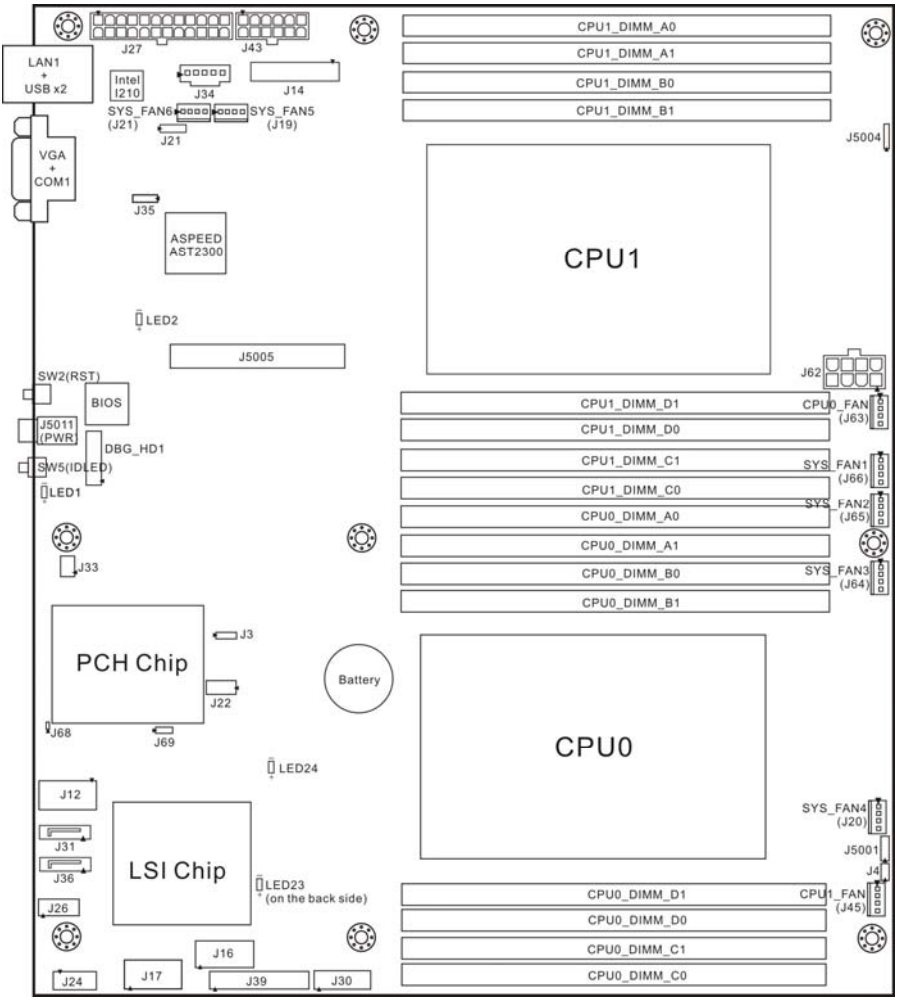


S7051 Block Diagram

4.3 Motherboard Mechanical Drawing



4.4 Board Parts, Jumpers and Connectors



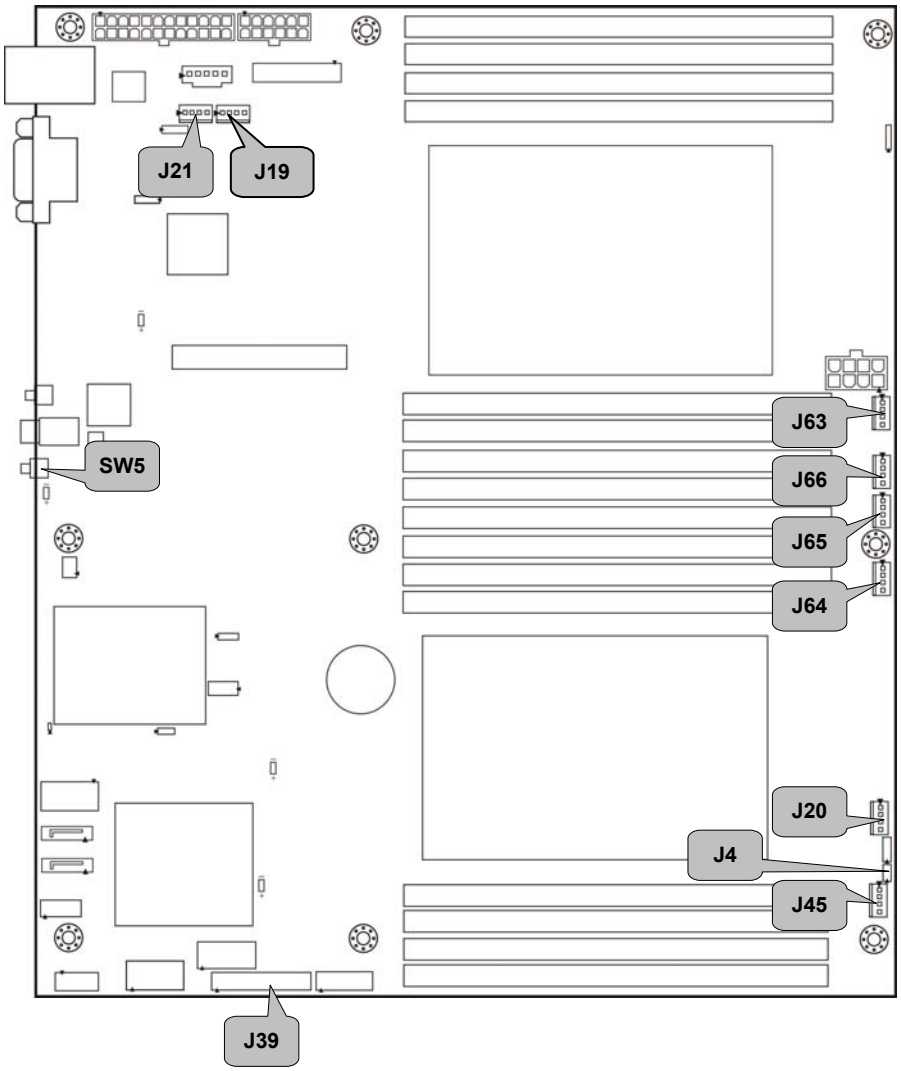
This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. The DIMM slot numbers shown above can be used as a reference when reviewing the DIMM population guidelines shown later in the manual. For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

Jumpers & Connectors

Jumper/Connector	Function
J19/J20/J21/J45/J63/J65/J66	4-pin FAN Connector
J34	PSMI Connector
J14	Front Fan Connector
J31	SATA3.0 Connector
J36	SATA3.0 Connector
J12	MINI SAS Connector
J16	MINI SAS Connector
J17	MINI SAS Connector
J30	SATA SGPIO Header
J24	Vertical Type-A USB Connector
J22	PCH Software RAID KEY
J33	SAS SMB Header
J68	Flash Security Override Header
J69	ME Recover Mode Jumper
J3	Clear CMOS Jumper
J26	USB Front Panel Header (blue)
J4	Chassis Intrusion Header
LED1	ID LED
LED2	BMC Heartbeat LED
LED23	SAS LED
LED24	SAS LED
SW5	ID LED Switch button
SW2	Reset button
J5011	Power button

Jumper Legend

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


J21
J19
SW5
J63
J66
J65
J64
J20
J4
J45
J39

J19/J20/J21/J45/J63/J64/J65/J66: 4-Pin FAN Connector

Pin	1	2	3	4
Signal	GND	+12V	Sensor	Control

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

J19: SYS_FAN_5 J20: SYS_FAN_4 J21: SYS_FAN_6
J45: CPU1_FAN J63: CPU0_FAN J64: SYS_FAN_3
J65: SYS_FAN_2 J66: SYS_FAN_1

SW5: IDLED SW Button

Pin	1	2
Signal	IDLED_SW#	GND

J4: Chassis Intrusion Header

open

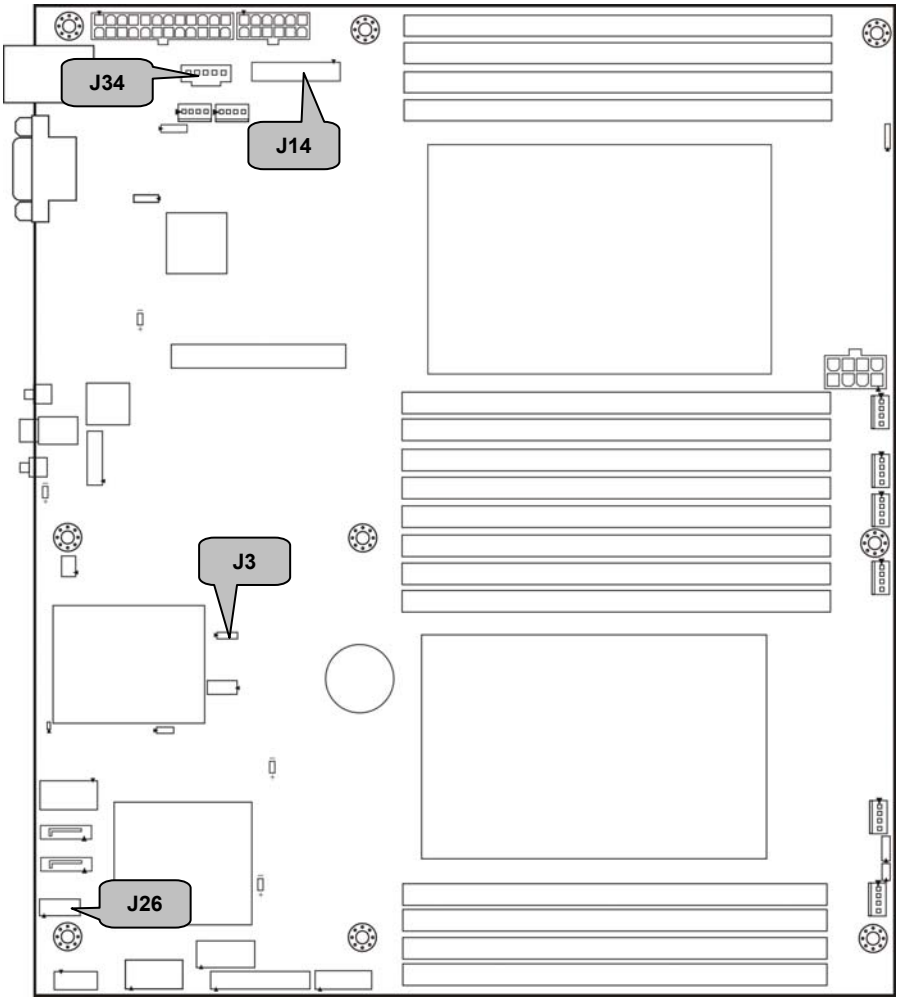
Pin	1	2
Signal	Intrusion#	GND

Short (**Default**)

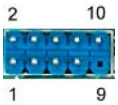
Open: Use this header to **trigger** the system chassis intrusion alarm.
Short: Use this header to **disable** the system chassis intrusion alarm.

J39: Front Panel Header

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


J34
J14
J3
J26

J26: USB Front Panel Header (blue)



Signal	Pin	Pin	Signal
VCC	1	2	VCC
USBD-	3	4	USBD-
USBD+	5	6	USBD+
GND	7	8	GND
KEY	9	10	NC

J14: Front Fan Connector (Reserved for Barebone Fan Board)

Signal	Pin	Pin	Signal
FAN TACH1	1	2	FAN TACH6
FAN TACH2	3	4	FAN TACH7
FAN TACH3	5	6	FAN TACH8
FAN TACH4	7	8	FAN TACH9
FAN TACH5	9	10	FAN TACH10
GND	11	12	KEY
FAN PWM2	13	14	FAN PWM1
FAN TACH11	15	16	SMBDATA
FAN TACH12	17	18	SMBCLK
V3P3_AUX	19	20	FAN PWM3

J34: PSMI Connector

Signal	Pin	Pin	Signal
SMB_CLK	1	2	SMB_DATA
SMB_ALERT#	3	4	GND
V3P3	5		

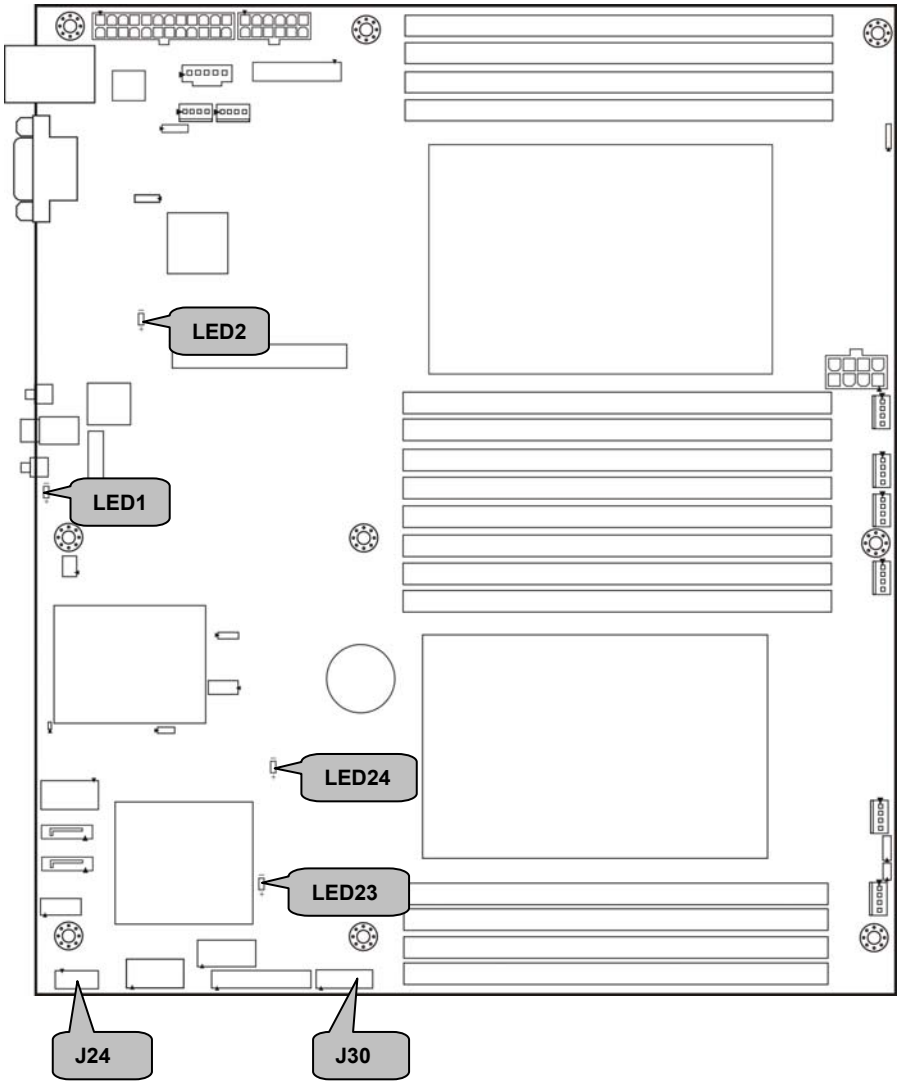
J3: Clear CMOS Jumper

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.


LED2
LED1
LED24
LED23
J24
J30

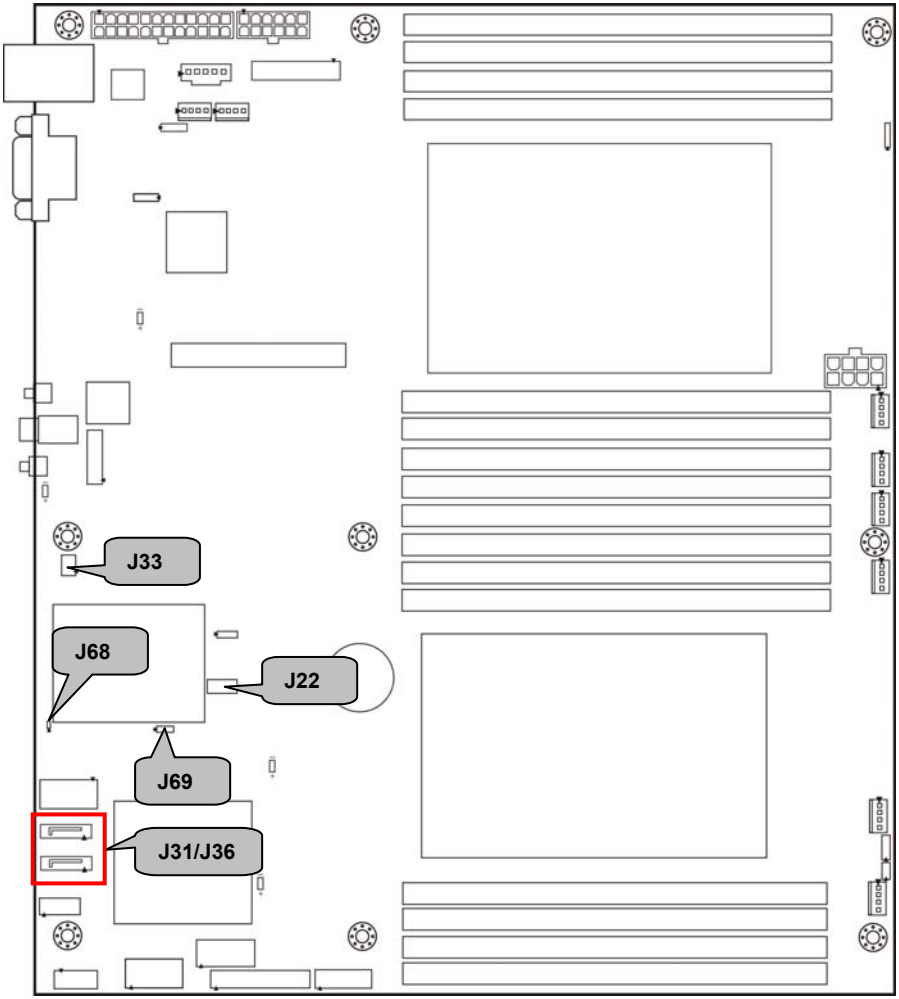
LED1	System ID LED	**Pin**	**Signal**	
		1	GND	
		2	VCC3_AUX	
		State	**Description**	
		OFF	OFF	Close display the corresponding board position
		ON	Blue	Display the corresponding board position
LED2	BMC Heart Beat LED	**Pin**	**Signal**	
		1	GND	
		2	VCC3_AUX	
		State	**Description**	
		OFF	OFF	The LED shuts off when the ***BMC controlle***r can not be detected or properly initiated.
		Blinking	Green	The LED blinks per second to indicate that the ***BMC controller*** is working normally
LED23	SAS/SATA Controller LED	**Pin**	**Signal**	
		1	GND	
		2	VCC3	
		State	**Description**	
		OFF	OFF	The LED shuts off when the ***SAS/SATA Controller*** can not be detected or properly initiated.
		ON	Green	The LED blinks per second to indicate that the ***SAS/SATA Controller*** is working normally
LED24	SAS/SATA Controller ERROR LED	**Pin**	**Signal**	
		1	GND	
		2	VCC3	
		State	**Description**	
		OFF	OFF	SAS/SATA Controller not error
		ON	RED	SAS/SATA Controller error

J30: SATA SGPIO Header for BB HD Board

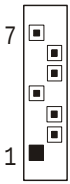
Signal	Pin	Pin	Signal
SMBCLK	**1**	**2**	SATA_DATAOUT1
SMBDATA	**3**	**4**	SATA_DATAOUT0
GND	**5**	**6**	SLOAD
KEY	**7**	**8**	SCLOCK
VCC3_AUX	**9**	**10**	BMC_HDD_FAULT

J24: Vertical Type-A USB Connector

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


J33
J68
J22
J69
J31/J36

J31/J36: SATA3.0 Connector



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

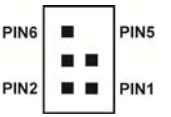
J68: Flash Security Override Header

Pin	1	2
Signal	V3P3_AUX	AUD_AZA_SD0

J22: PCH Software RAID KEY Header

Pin	1	2	3
Signal	GND	PCH_RAID_KEY	GND

J33: SAS SMB Connector

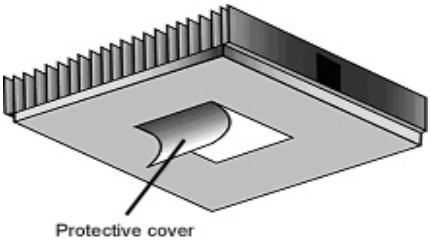


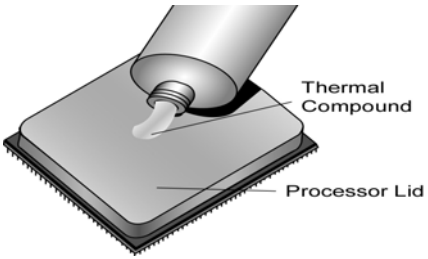
Signal	Pin	Pin	Signal
VCC3_AUX	1	2	BMC_SMB_CLK3
GND	3	4	BMC_SMB_DAT3
KEY	5	6	BMC_HDD_FAULT

J69: ME Recovery Mode Jumper

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

4.5 Thermal Interface Material





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

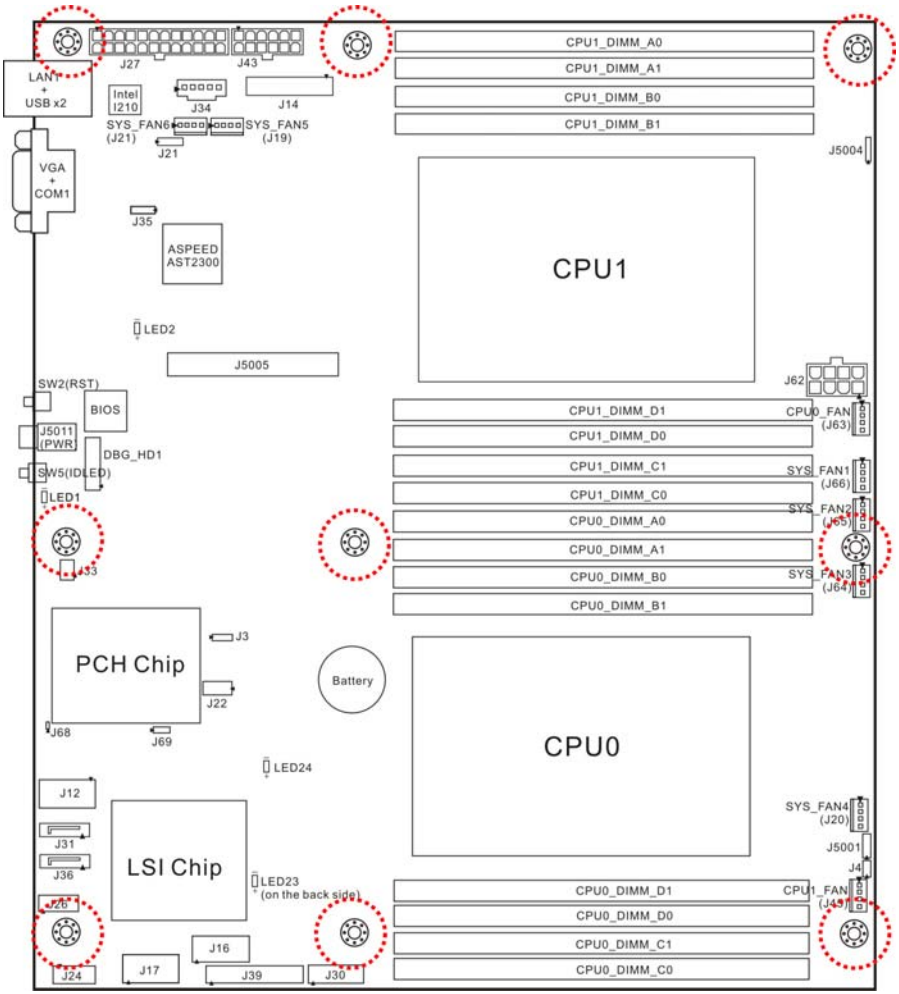
The most common material comes as a small pad attached to the heat sink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material. Simply remove the protective cover and place the heat sink on the processor.

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.

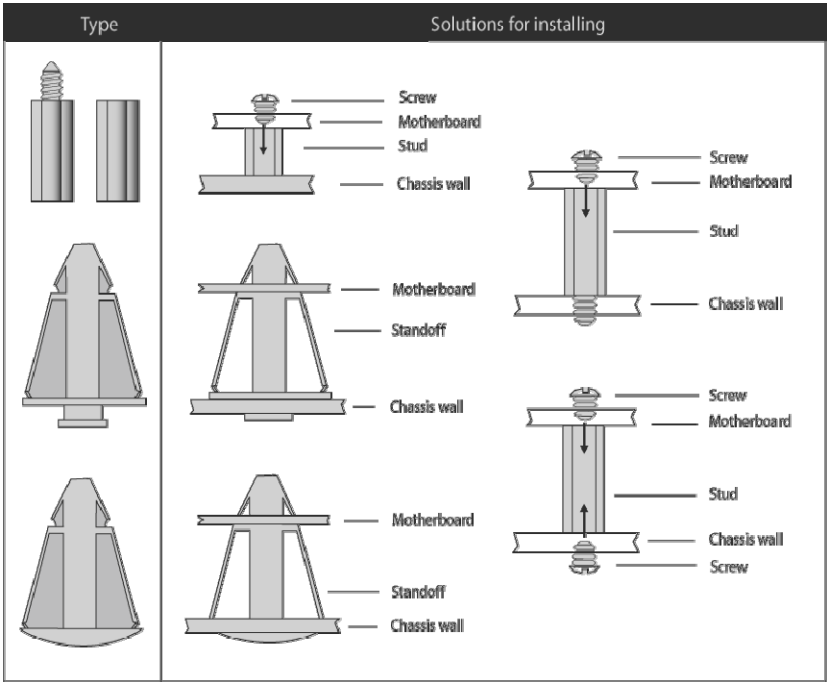


NOTE: Be especially careful to look for extra stand-offs. If there are any stand-offs present that are not aligned with a mounting hole on the motherboard, it will likely short components on the back of the motherboard when installed. This will cause malfunction and/or damage to your motherboard.

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.

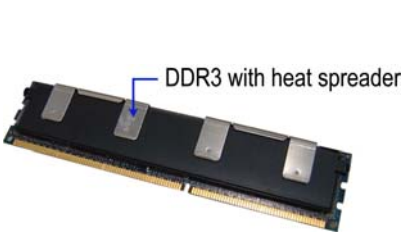
Mounting the Motherboard



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.

The following pictures show common types of DDR3 memory modules.



- RDIMM ECC 1866/1600/1333/1066, UDIMM/LRDIMM ECC 1866/1600/1333/1066
- Memory capacity up to 128GB UDIMM / 256GB RDIMM / 512GN LRDIMM
- Both 1.5V and 1.35V DDR3 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. **Registered, Unbuffered, and LRDIMM 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**	**6**	**8**
CPU0_DIMM_A0	√	√	√	√	√	√
CPU0_DIMM_A1					√	√
CPU0_DIMM_B0		√	√	√	√	√
CPU0_DIMM_B1					√	√
CPU0_DIMM_C0			√	√	√	√
CPU0_DIMM_C1						√
CPU0_DIMM_D0				√	√	√
CPU0_DIMM_D1						√

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. Dual-rank DIMMs are recommended over single-rank DIMMs.
5. Un-buffered DIMM can offer slightly better performance than registered DIMM if populating only a single DIMM per channel.
6. Always install with CPU0 Socket and DIMM_A0 Slot first, following the alphabetical order.

	Dual CPU installed (CPU0 and CPU1)									
Quantity of memory installed	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**12**	**16**
CPU0_DIMM_A0	√	√	√	√	√	√	√	√	√	√
CPU0_DIMM_A1								√	√	√
CPU0_DIMM_B0		√	√	√	√	√	√	√	√	√
CPU0_DIMM_B1									√	√
CPU0_DIMM_C0				√	√	√	√	√	√	√
CPU0_DIMM_C1										√
CPU0_DIMM_D0						√	√	√	√	√
CPU0_DIMM_D1										√
CPU1_DIMM_A0	√	√	√	√	√	√	√	√	√	√
CPU1_DIMM_A1								√	√	√
CPU1_DIMM_B0			√	√	√	√	√	√	√	√
CPU1_DIMM_B1									√	√
CPU1_DIMM_C0					√	√	√	√	√	√
CPU1_DIMM_C1										√
CPU1_DIMM_D0							√	√	√	√
CPU1_DIMM_D1										√

4.8 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.

NOTE

Chapter 5: BIOS Setup

5.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that is a hardware and software interface. 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 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	Select Screen
Up/Down Arrow Keys	Select Item
Enter	Select
+/-	Change opt.
F1	General Help
F2	Previous Value
F3	Optimized Defaults
F4	Save & Exit
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.

3.1.3 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.

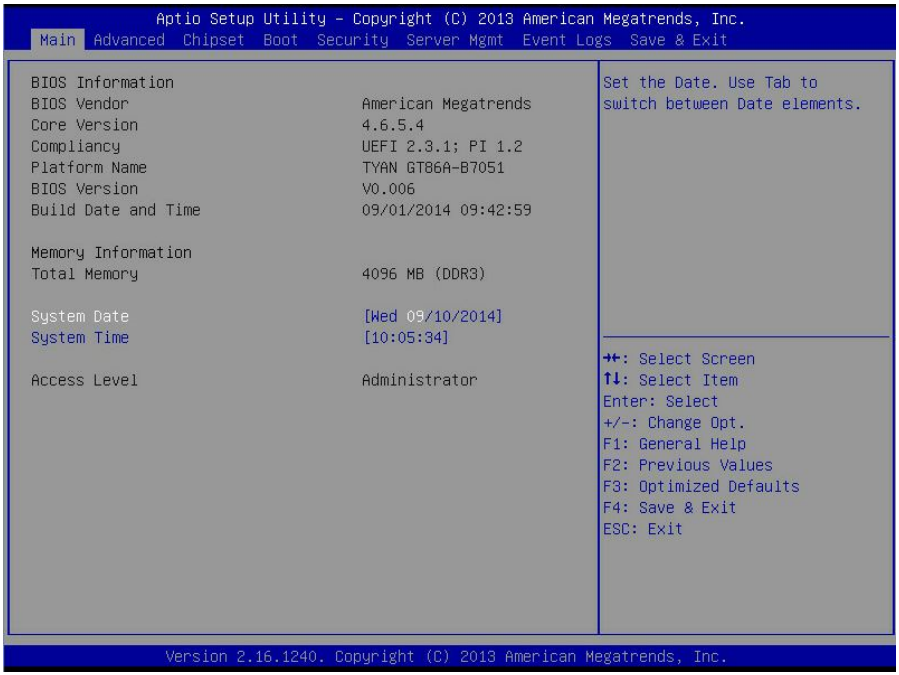
5.1.4 Setup Variations

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.

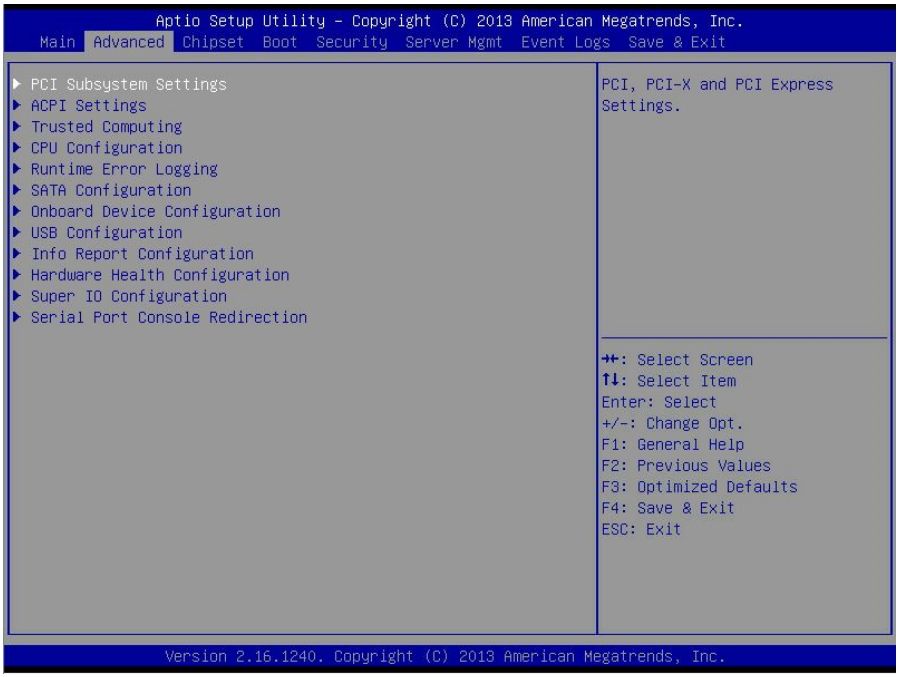
System Date
Adjust the system date.
MM (Months): DD (Days): YYYY (Years)

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

Access Level
Read only.

5.3 Advanced Menu

This section facilitates configuring advanced BIOS options for your system.



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

ACPI Settings
System ACPI Parameters.

Trusted Computing
Trusted Computing Settings.

CPU Configuration
CPU Configuration Parameters.

Runtime Error Logging
Runtime Error Logging Support Setup Options

SATA Configuration
SATA Devices Configuration.

Onboard Device Configuration
Onboard Device Configuration.

PCIe Slot Configuration
PCIe Slot Configuration.

USB Configuration
USB Configuration Parameters.

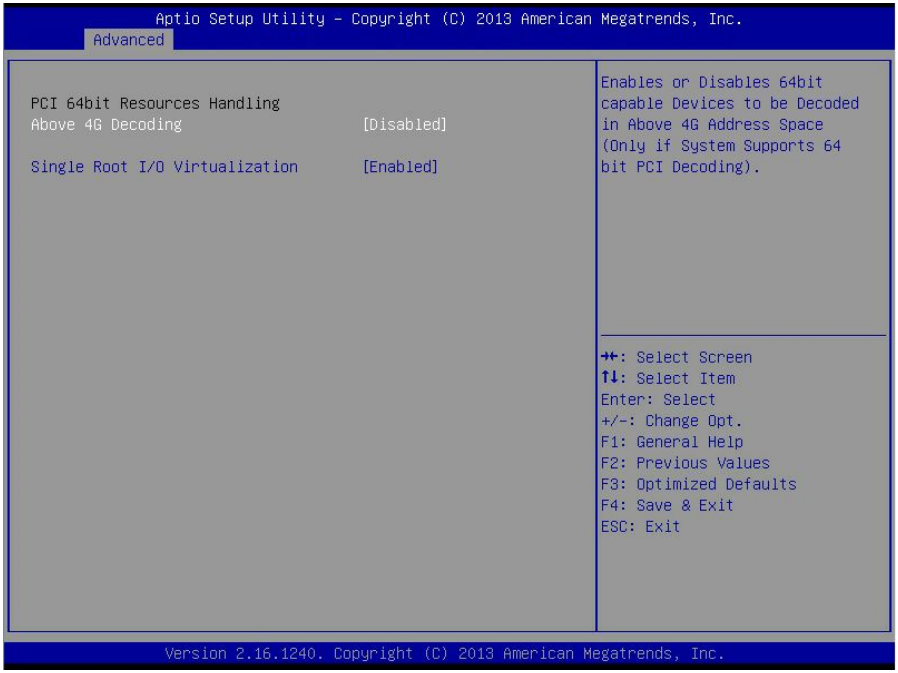
Info Report Configuration
Info Report Configuration.

Hardware Health Configuration
Hardware health Configuration Parameters.

Super IO Configuration
System Super IO Chip Parameters.

Serial Port Console Redirection
Serial Port Console Redirection.

5.3.1 PCI Subsystem Settings



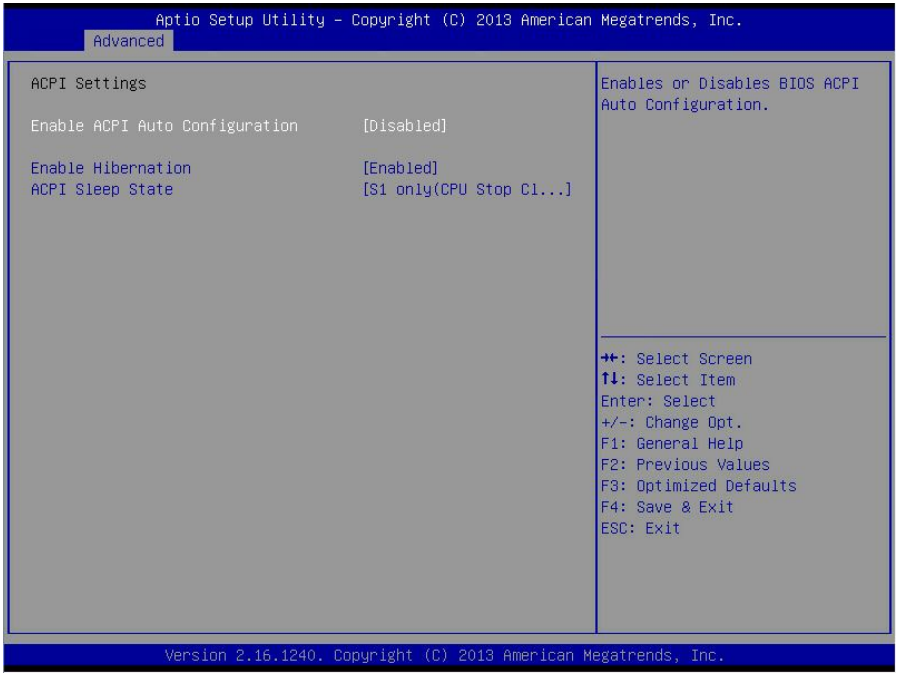
Above 4G Decoding
Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).

Disabled / Enabled

Single Root I/O Virtualization
Enable or disable Single Root I/O Virtualization.

Enabled / Disabled

5.3.2 ACPI Settings

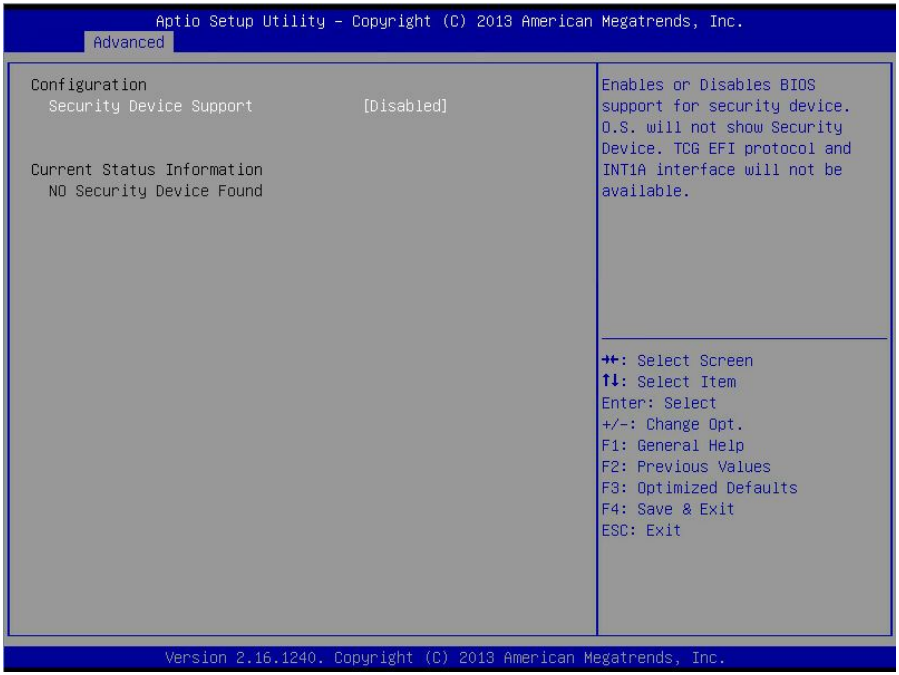


Enable ACPI Auto Configuration
Enable or disable BIOS ACPI Auto Configuration.
Disabled / Enabled

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

ACPI Sleep State
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
S1 only (CPU Stop Clock) / Suspend Disabled

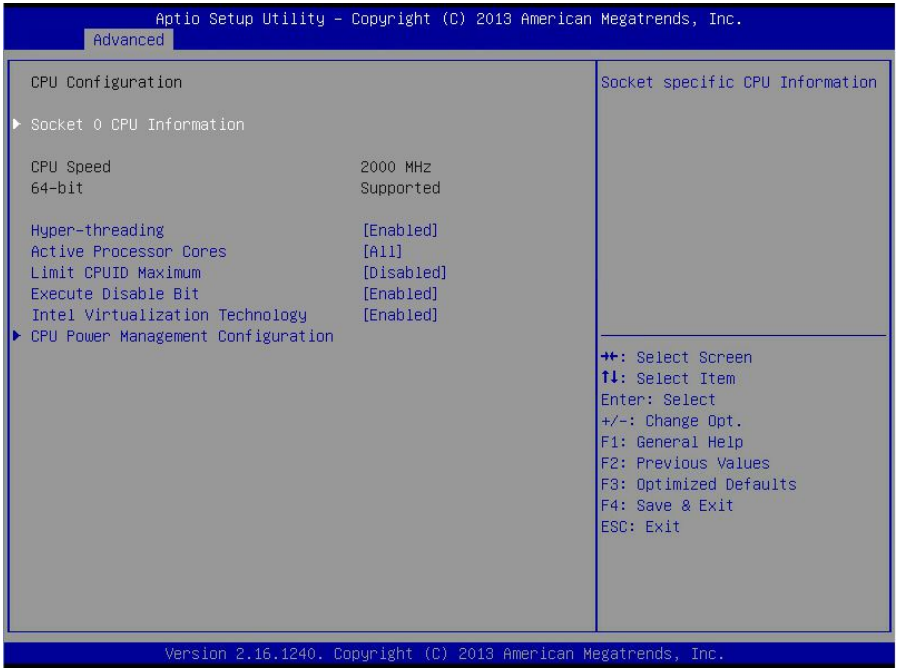
5.3.3 Trusted Computing



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

Disabled / Enabled

5.3.4 CPU Configuration



CPU Speed / 64-bit
Read only.

Hyper Threading
Enabled for Windows XP and Linux (OS optimized for Hyper Threading Technology) and disabled for other OS (OS not optimized for Hyper Threading Technology). When disabled only one thread per enabled core is enabled.

Enabled / Disabled

Active Processor Cores
Number of cores to enable in each processor package.

All / 1 / 2 / 3 / 4 / 5 / 6 / 7

Limit CPUID Maximum
Disabled for Windows XP.

Disabled / Enabled

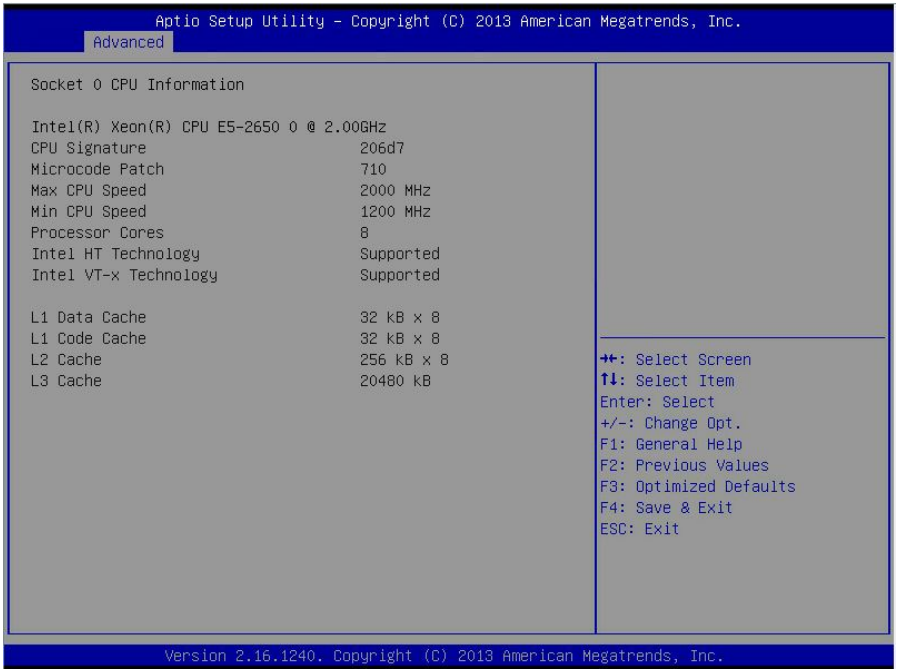
Execute Disable Bit
XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3).

Enabled / Disabled

Intel Virtualization Technology
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
NOTE: Once the lock bit is set, the contents of this register can not be modified until S5 reset occurs.

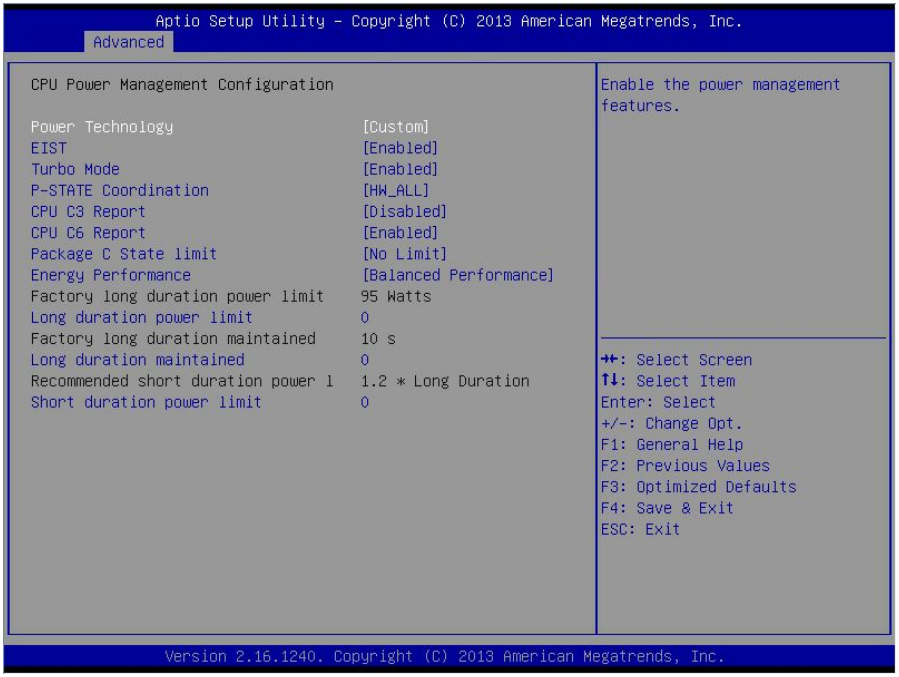
Enabled / Disabled

5.3.4.1 Socket 0 CPU Information



Read only.

5.3.4.2 CPU Power Management Configuration



Power Technology
Enable the power management features.
Custom / Disabled / Energy Efficient

EIST
Enable/Disable Intel StepSpeed.
Disabled / **Enabled**

Turbo Mode
Enable/Disable Turbo Mode.
Enabled / Disabled

P-STATE Coordination
Change P-State coordination type.
HW_ALL / Disabled

CPU C3 Report
Enable/Disable CPU C3 (ACPI C2) report to OS.
Disabled / Enabled

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

Package C State Limit
Select Package C State Limit.
No Limit / C0 / C2 / C6 / C7

Energy Performance
Optimize between performance and power savings. Windows 2008 and later OSes override this value according to its power plan.
Performance / **Balanced Performance** / Balanced Energy / Energy Efficient

Factory Long Duration Power Limit
Read only.

Long Duration Power Limit
Long duration power limit in Watts.

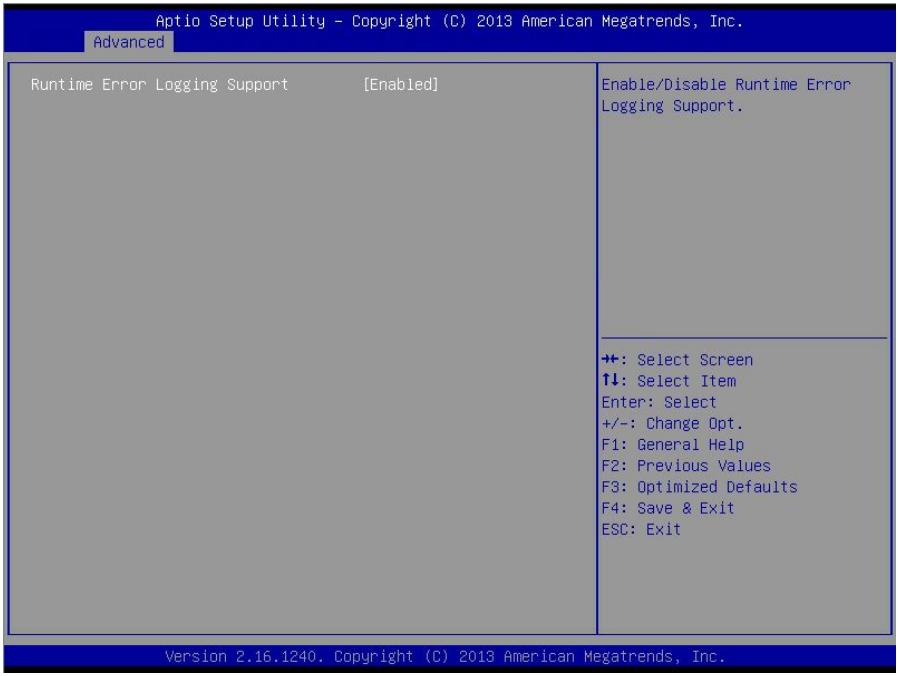
Factory Long Duration Maintained
Read only.

Long Duration Maintained
Time window which the long duration power is maintained.

Recommended short duration power limit
Read only.

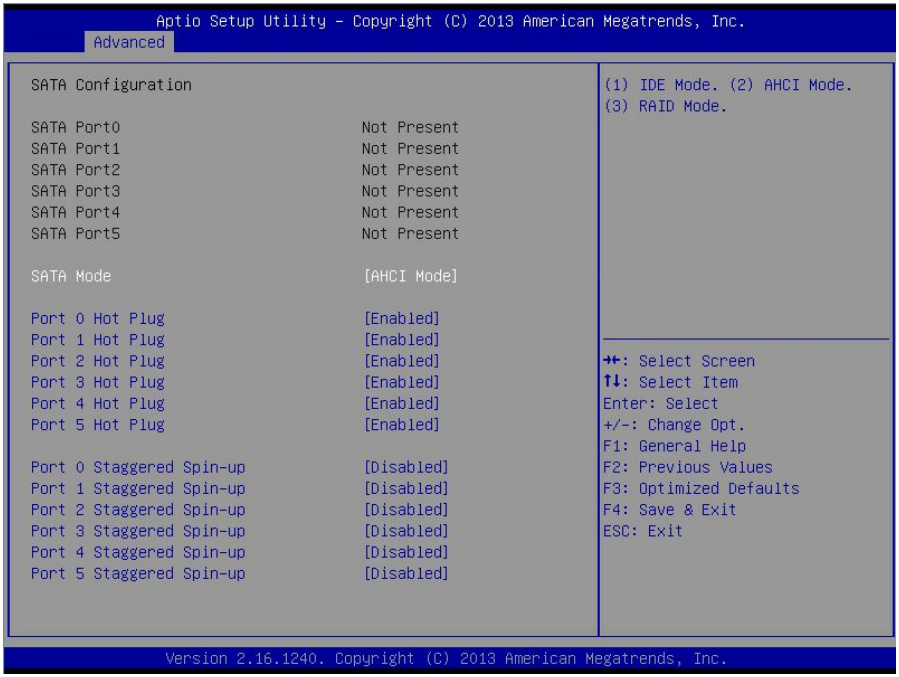
Short duration power limit
Short duration power limit in Watts.

5.3.5 Runtime Error Logging



Runtime Error Logging Support
Enable/Disable Runtime Error Logging Support.
Disabled / **Enabled**

5.3.6 SATA Configuration



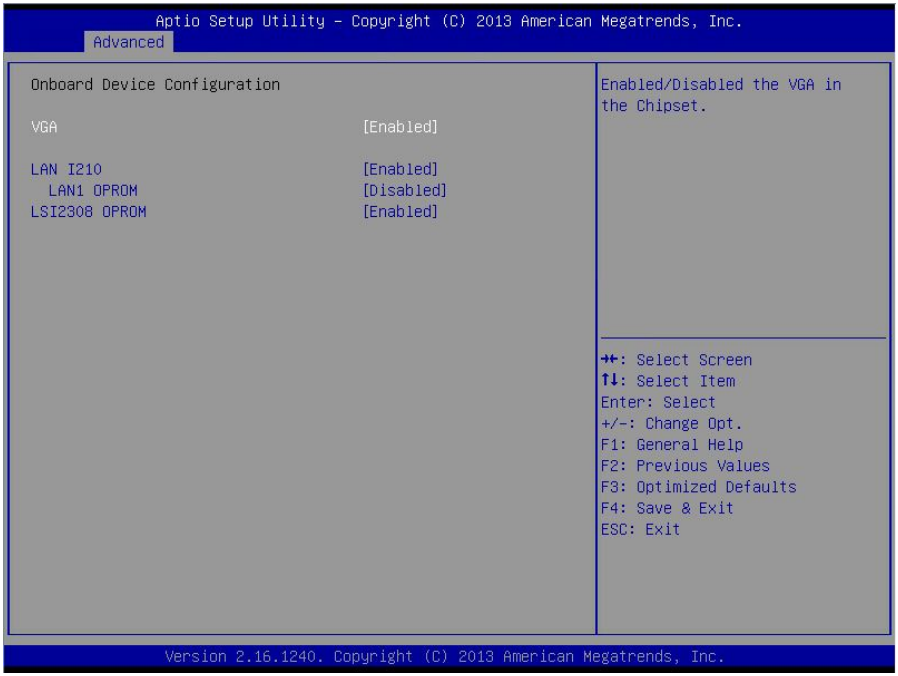
SATA Port 0 / 1 / 2 / 3 / 4 / 5
Read only.

SATA Mode
Select SATA Mode.
IDE Mode / **AHCI Mode** / RAID Mode / Disabled

Port 0 / 1 / 2 / 3 / 4 / 5 Hot Plug
Enable/Disable SATA Ports Hot Plug Support.
Enabled / Disabled

Port 0 / 1 / 2 / 3 / 4 / 5 Staggered Spin-up
AHCI Supports Staggered Spin-up.
Disabled / Enabled

5.3.7 Onboard Device Configuration



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

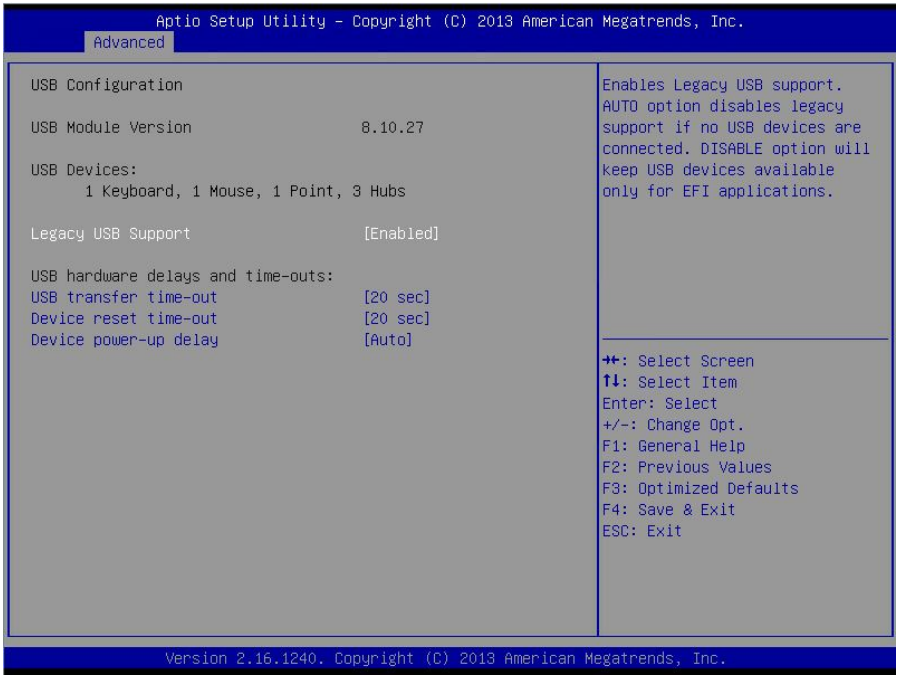
VGA
Enabled/Disabled the VGA in the Chipset.
Enabled / Disabled

LAN (I210)
Enabled/Disabled the LAN in the Chipset.
Enabled / Disabled

LAN1 OPROM
Enabled/Disabled the LAN Option ROM in the Chipset.
Disabled / PXE

LSI2308 OPROM
Enabled/Disabled LSI2308 OPROM in the Chipset.
Disabled / PXE

5.3.8 USB Configuration



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

Enabled / Disabled / Auto

USB transfer time-out
The time-out value for Control, Bulk and Interrupt transfers.

20 sec / 10 sec / 5 sec / 1 sec

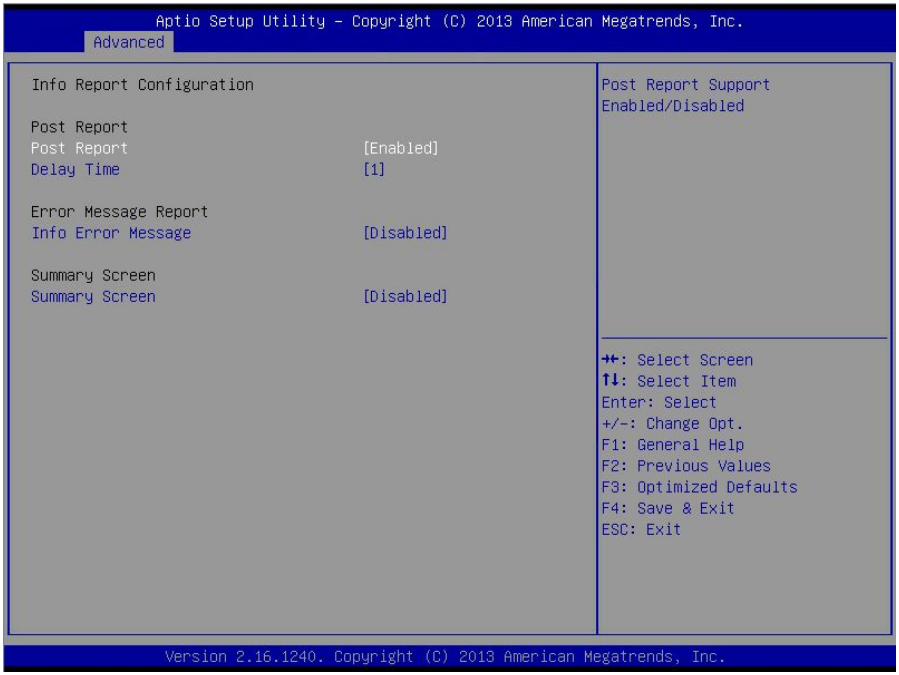
Device reset time-out
USB mass storage device Start Unit command time-out.

20 sec / 10 sec / 30 sec / 40 sec

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

Auto / Manual

5.3.9 Info Report Configuration



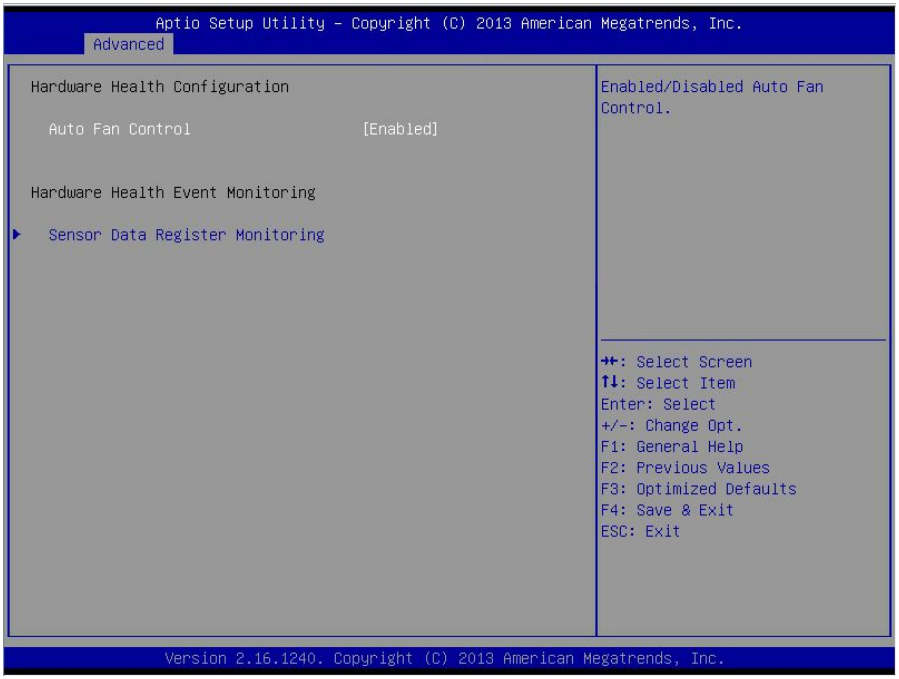
Post Report
Post Report Support enabled/disabled.
Enabled / Disabled

Delay Time
Post Report Wait Time: 0 ~ 10 Seconds.
0 / **1** / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / Until Press ESC

Info Error Message
Info Error Message Support enabled/disabled.
Disabled / Enabled

Summary Screen
Summary Screen Support enabled/disabled.
Disabled / Enabled

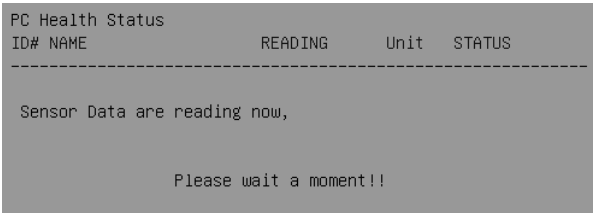
5.3.10 Hardware Health Configuration

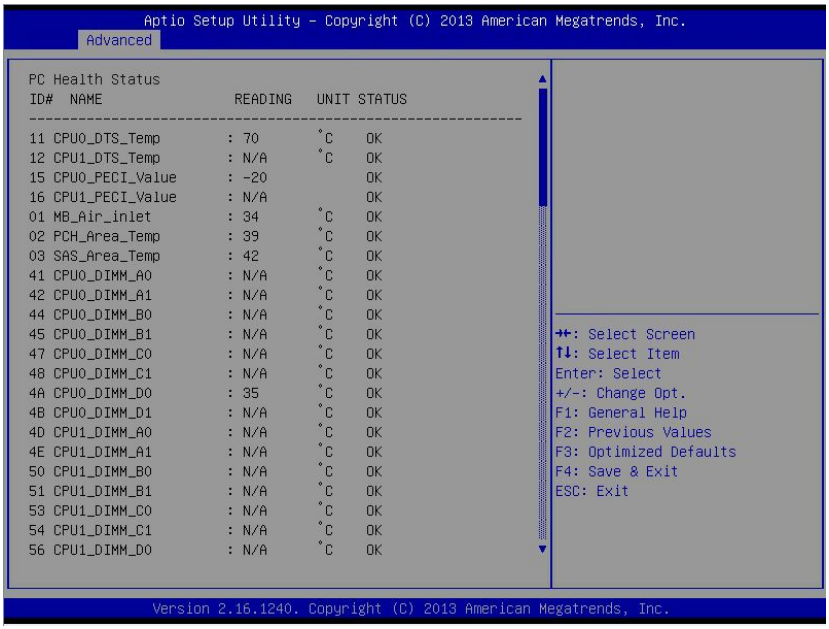


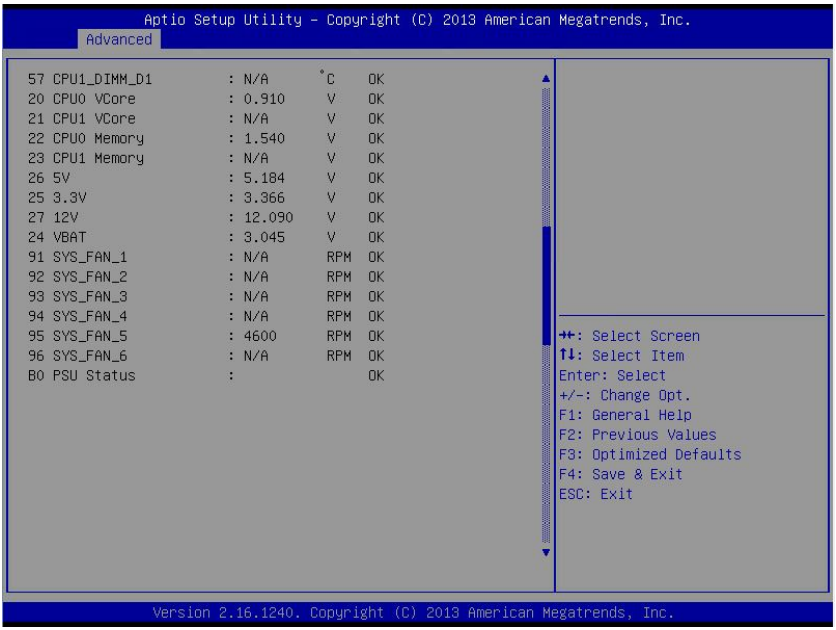
Auto Fan Control
Select [Disabled] to allow the fan speed running FULL ON.
Disabled / Enabled

5.3.11.1 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.

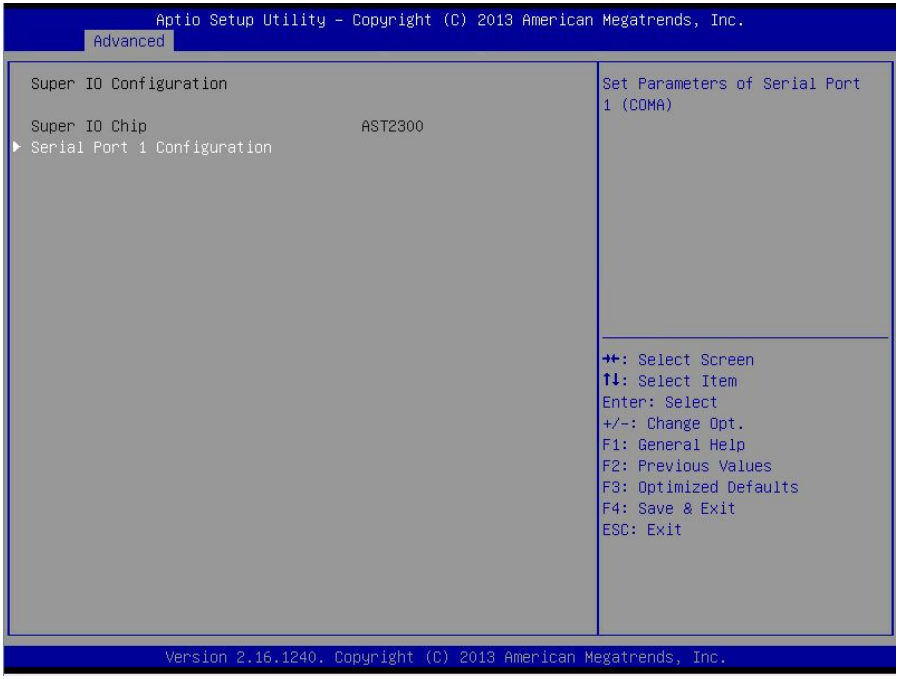






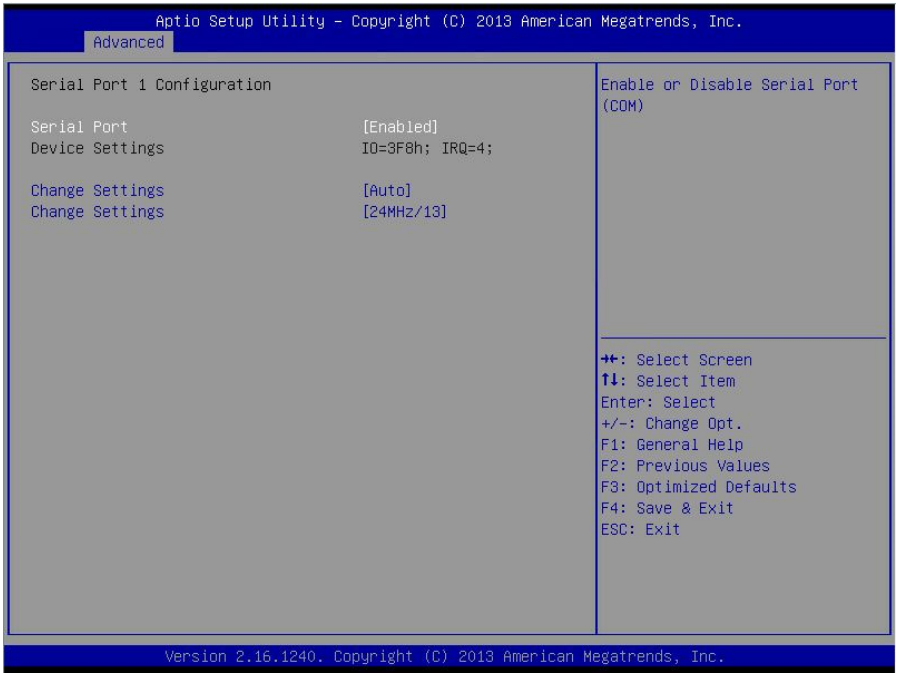
NOTE: SDR can not be modified. Read only.

5.3.11 Super IO Configuration



Super IO Chip
Read only.

5.3.11.1 Serial Port 1 Configuration



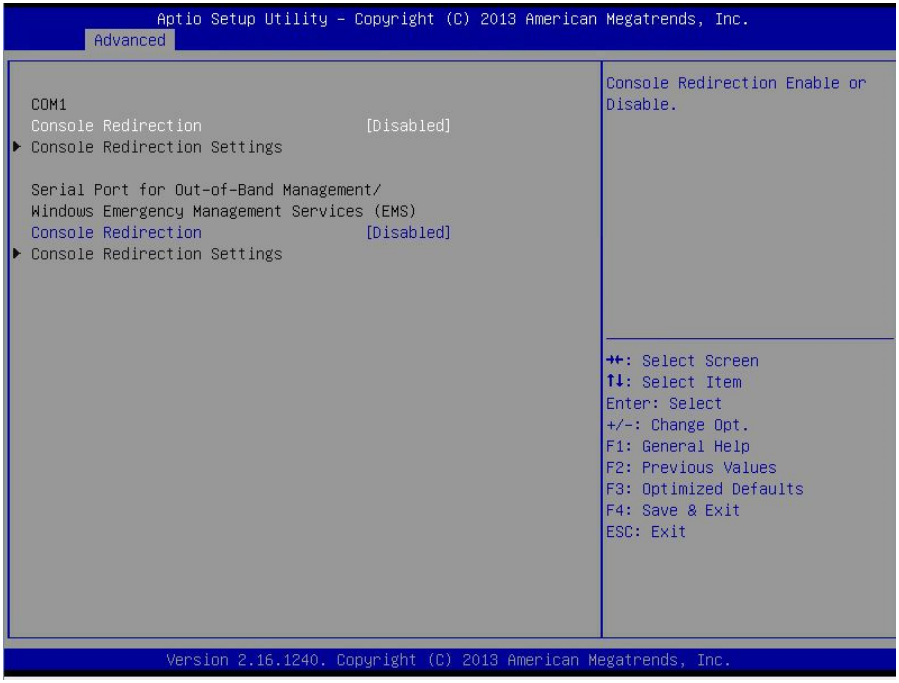
Serial Port
Enable or disable Serial Port (COM).
Enabled / Disabled

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;

Change Settings
SUART clock source.
24MHZ/13 / 24MHz

5.3.12 Serial Port Console Redirection

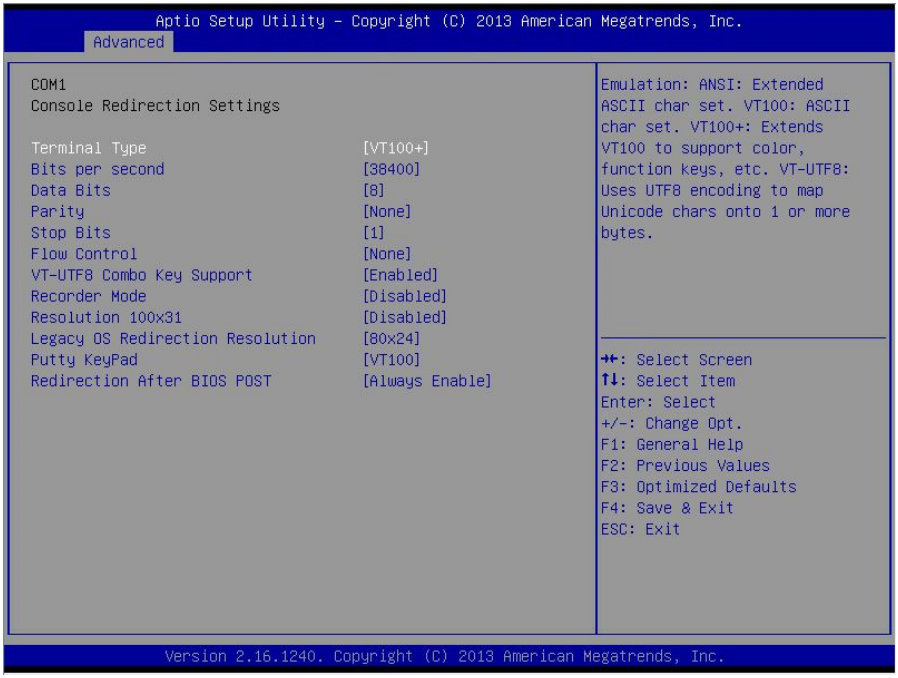


Console Redirection
Console redirection enable or disable.
Disabled / Enabled

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

Console Redirection Settings
The settings specify how the host computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.
NOTE: Console Redirection Settings submenu appears when **Console Redirection** is set to **[Enabled]**.

5.3.12.1 COM1 Console Redirection Settings



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.

38400 / 9600 / 19200 / 115200 / 57600

Data Bits

8 / 7

Parity
A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if the num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: parity bit is always 0. Mark and Space parity do not allow for error detection.

None / Even / Odd / Mark / Space

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

1 / 2

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

None / Hardware RTS/CTS

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

Enabled / Disabled

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

Disabled / Enabled

Resolution 100x31
Enable or disable extended terminal resolution.

Disabled / Enabled

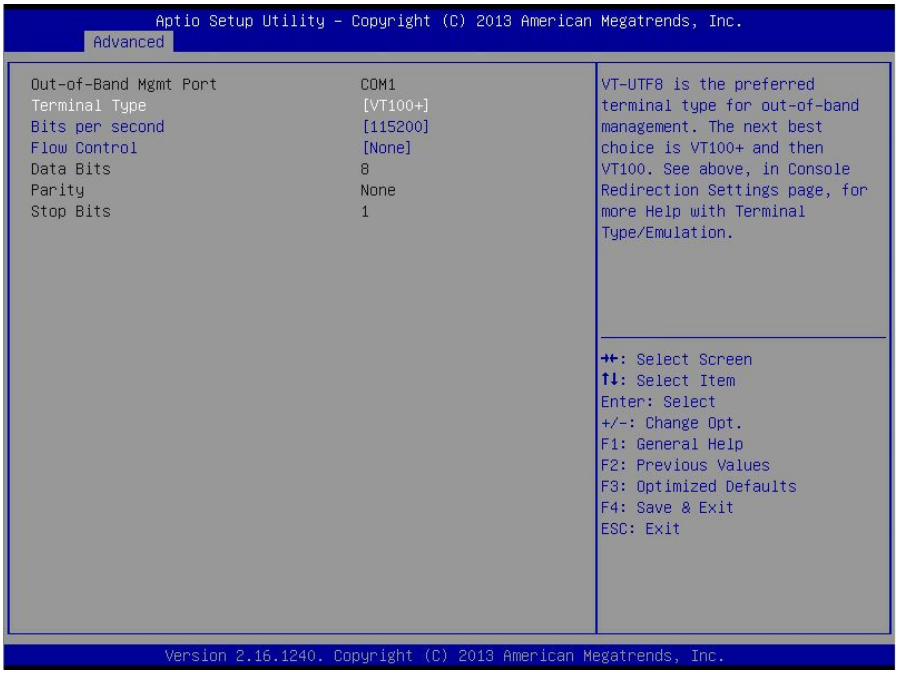
Legacy OS Redirection Resolution
On Legacy OS, the number of rows and columns supported redirection.

80x24 / 80x25

Putty KeyPad
Select FunctionKey and KeyPad on Putty.

VT100 / LINUX / XTERMR6 / SCO / ESCN / VT400

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



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

COM1 / COM2

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

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

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

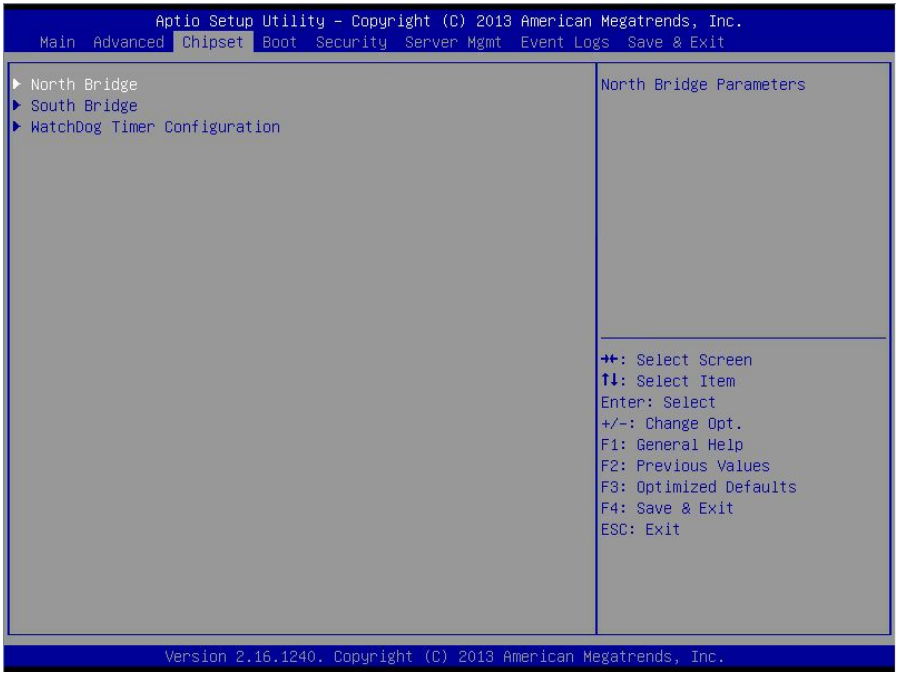
115200 / 9600 / 19200 / 38400 / 57600

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

None / Hardware RTS/CTS

Data Bits / Parity / Stop Bits
Read only.

5.4 Chipset Menu

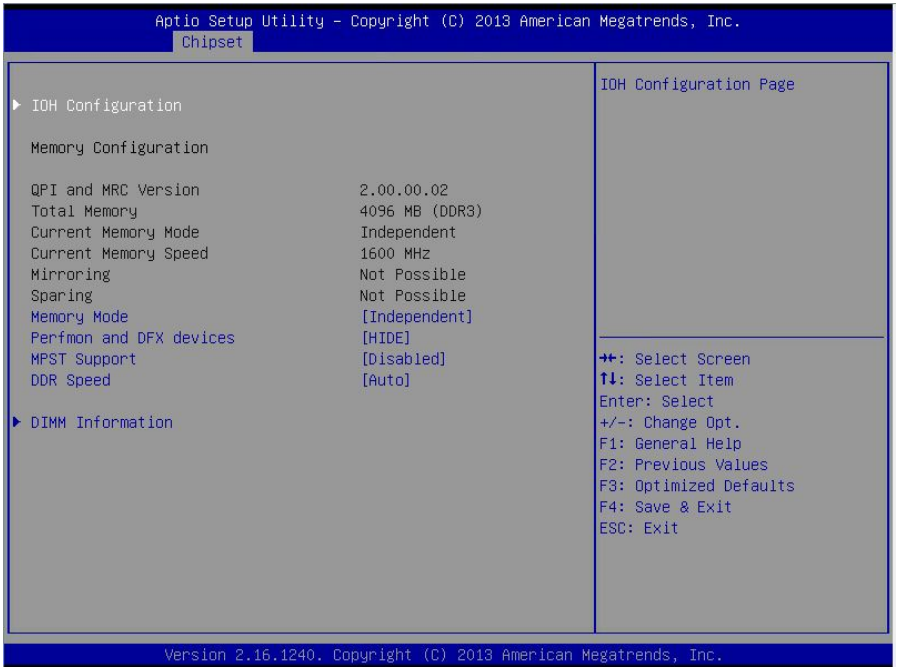


North Bridge
North Bridge Parameters.

South Bridge
South Bridge Parameters.

WatchDog Timer Configuration
WatchDog Configuration.

5.4.1 North Bridge



Memory Configuration

QPI and MRC Version / Total Memory / Current Memory Mode / Current Memory Speed / Mirroring / Sparing

Read only.

Memory Mode

Select the mode for memory initialization.

Independent / Mirroring / Lock Step / Sparing

Perfmon and DFX devices

Unlocked registers will affect Secure Boot.

HIDE / UNHIDE

MPST Support

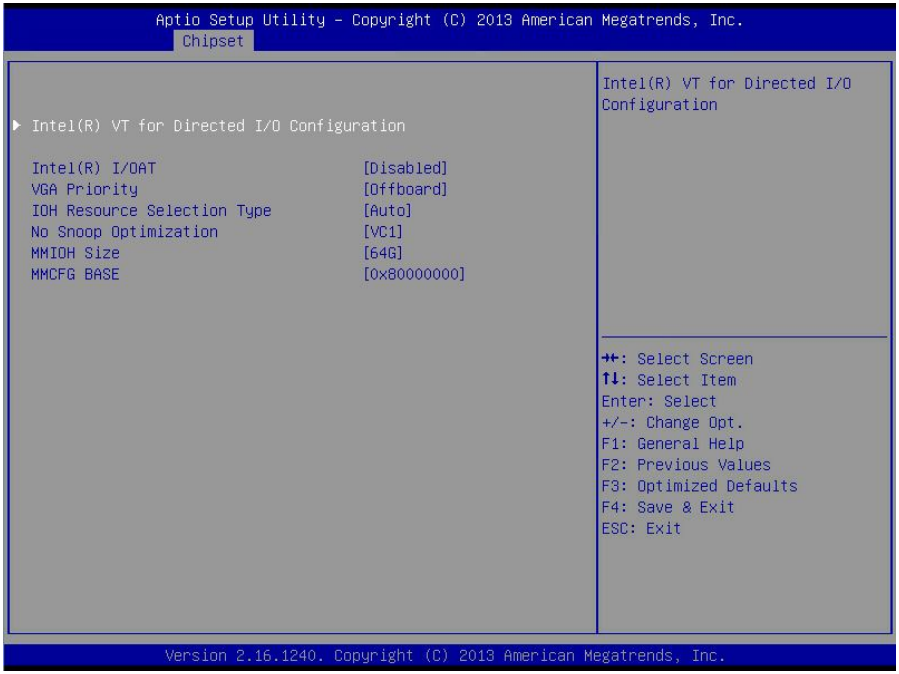
Enable or Disable MPST Support. Along with enabling MPST Support, it also requires NUMA to be enabled and Channel Interleaving to be set to 1-way for MPST tables to be published.

Disabled / Enabled

DDR Speed
Force DDR Speed.

Auto / Force DDR3 800 / Force DDR3 1066 / Force DDR3 1333 / Force DDR3 1600

5.4.1.1 IOH Configuration



Intel® I/OAT
Enable/Disable Intel® I/O Acceleration Technology (I/OAT).
Disabled / Enabled

VGA Priority
Decide the priority between onboard and its offboard video device found.
Offboard / Onboard

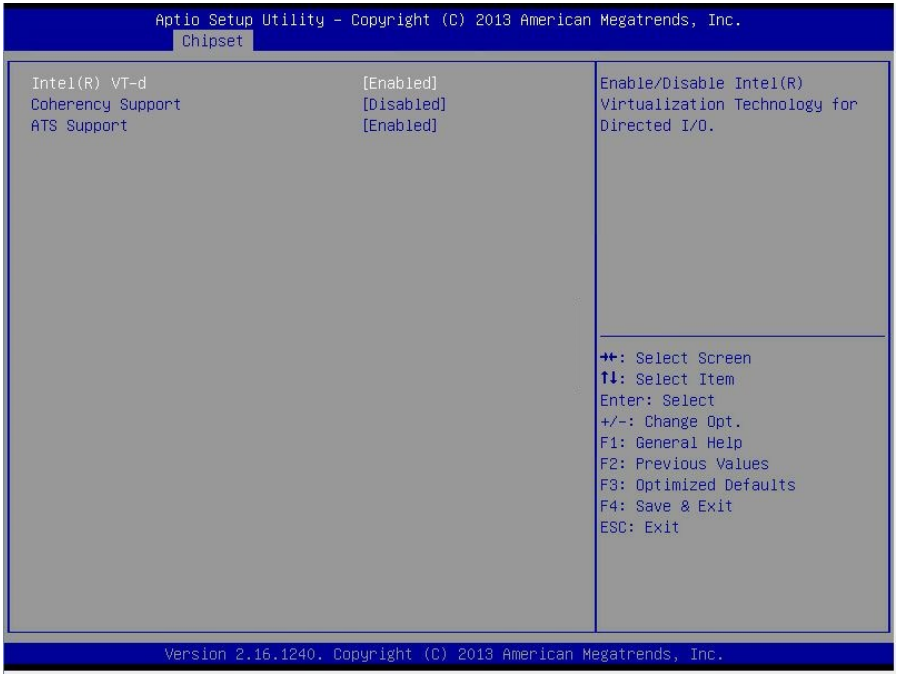
IOH Resource Selection Type
Allow to select Auto/Manual. When Auto option is selected PCI resource allocation across multiple IOHs is optimized automatically based on the PCI devices present. With Manual option user can force the PCI resource allocation across multiple IOHs based on the ratios selected.
Auto / Manual

No Snoop Optimization
This configuration requires that No Snoop in PCI Express Settings is enabled. It is recommended that this option is left at default (VC1).
VC1 / VC0/VCP/VC1

MMIOH Size
Select number of 1GB contiguous regions to be assigned MMIOH space per CPU.
64G / 1G / 2G / 4G / 8G / 16G / 32G / 128G

MMCFG Base
Select the MMCFG BASE Values.
0x80000000 / 0xA0000000 / 0xC0000000

5.4.1.1.1 Intel® VT for Directed I/O Configuration Submenu



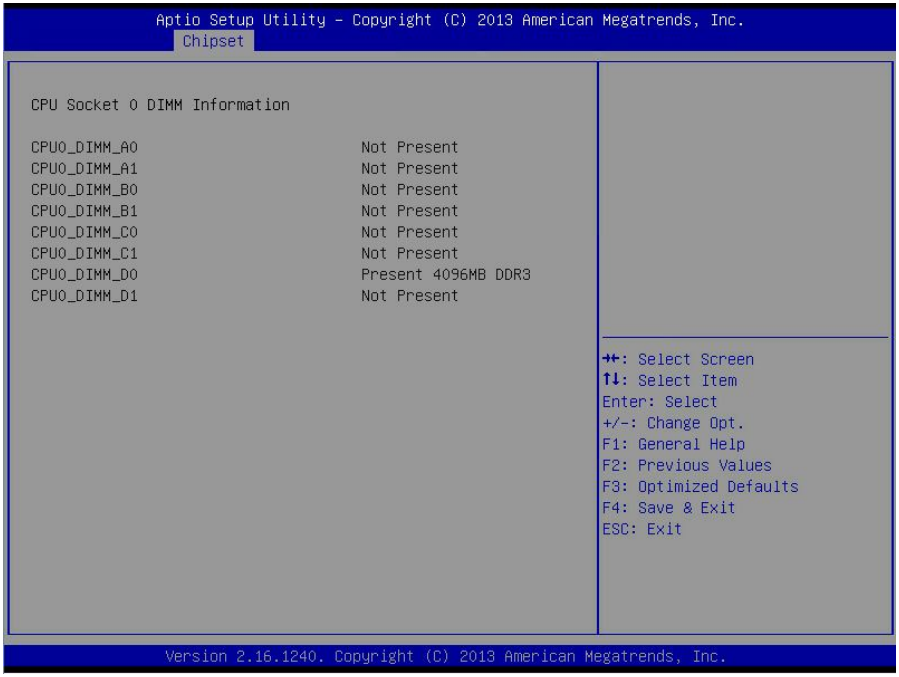
Intel® VT-d
Enable/Disable Intel® Virtualization Technology Directed I/O.
Disabled / Enabled

NOTE: The following items will appear when **Intel® VT-d** is set to [Enabled].

Coherency Support
Enable/Disable VT-d Engine Coherency Support.
Disabled / Enabled

ATS Support
Enable/Disable VT-d Engine Address Translation Services support.
Enabled / Disabled

5.4.1.2 DIMM Information



Read only.

5.4.2 South Bridge

PCH Information

Name / Stepping

Read only.

Restore AC Power Loss

Specify what state to go to when power is re-applied after a power failure (G3 state).

Power Off / Power On / Last State

SLP_S4 Assertion Stretch Enable

Enabled/Disabled SLP_S4# Assertion Stretch.

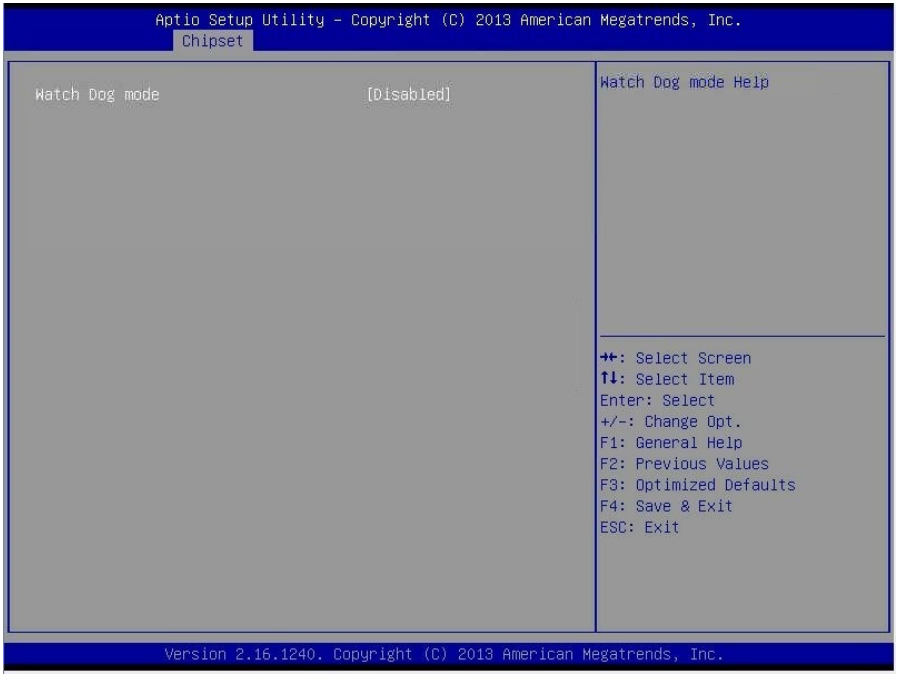
Enabled / Disabled

SLP_S4 Assertion Width

Select a minimum assertion width of the SLP_S4# signal.

4-5 Seconds / 1-2 Seconds / 2-3 Seconds / 3-4 Seconds

5.4.3 WatchDog Timer Configuration

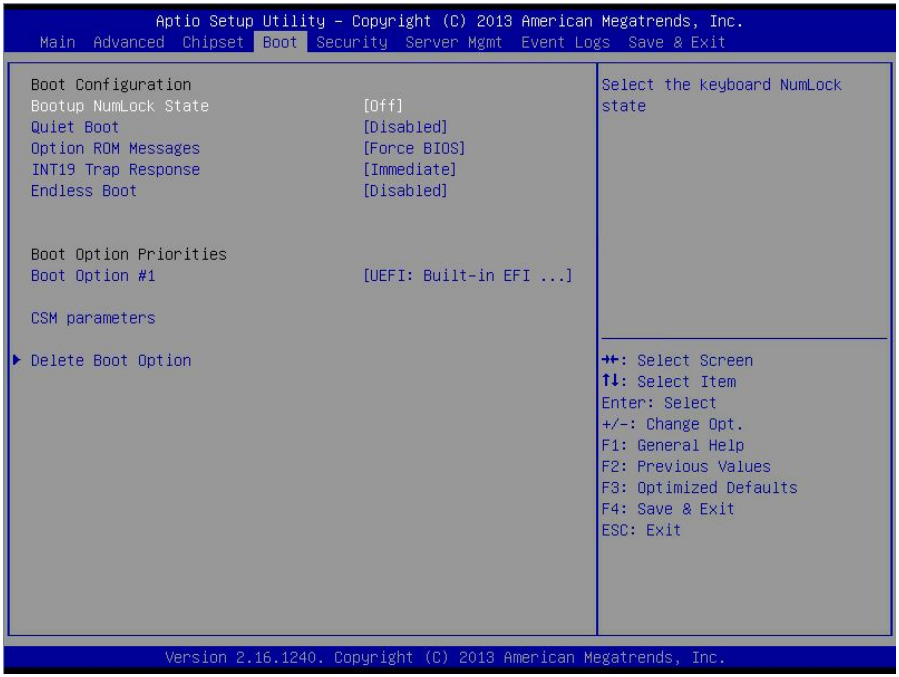


Watch Dog Mode
Watch Dog Mode Help.
Disabled / POST / OS / PowerOn

NOTE: Watch Dog Timer will not appear when **Watch Dog Mode** is set to [Disabled].

Watch Dog Timer
Watch Dog Timer Help.
2 MINS / 4 MINS / 6 MINS / 8 MINS / 10 MINS

5.5 Boot



Boot Configuration

Bootup NumLock State

Select the keyboard NumLock state.

Off / On

Quiet Boot

Enable or disable Quiet Boot option.

Disabled / Enabled

Option ROM Messages

Select display mode for Option ROM.

Force BIOS / Keep Current

INT 19 Trap Response

BIOS reaction on INT19 trapping by option ROM: IMMEDIATE - execute the trap right away; POSTPONED - execute the trap during legacy boot.

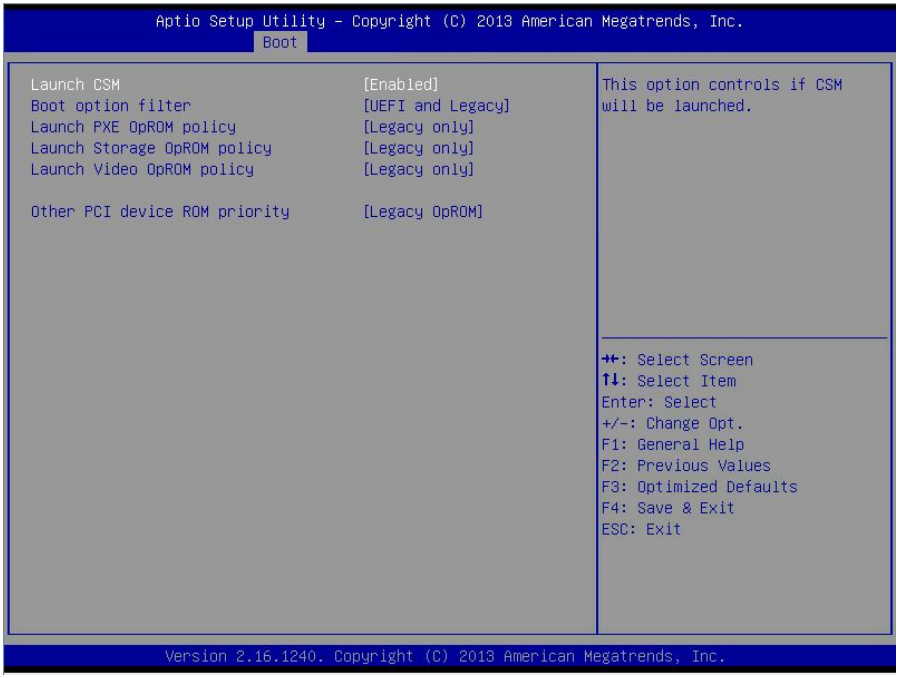
Immediate / Postponed

Endless Boot
Enable or disable Endless Boot.
Disabled / Enabled

Boot Option Priorities

Boot Option #1
Select the first/second boot device.
Device Name / Disabled

5.5.1 CSM Parameters



Launch CSM
This option controls if CSM will be launched.
Enabled / Disabled

Boot option filter
This option controls what devices system can boot to.
UEFI and Legacy / Legacy only / UEFI only

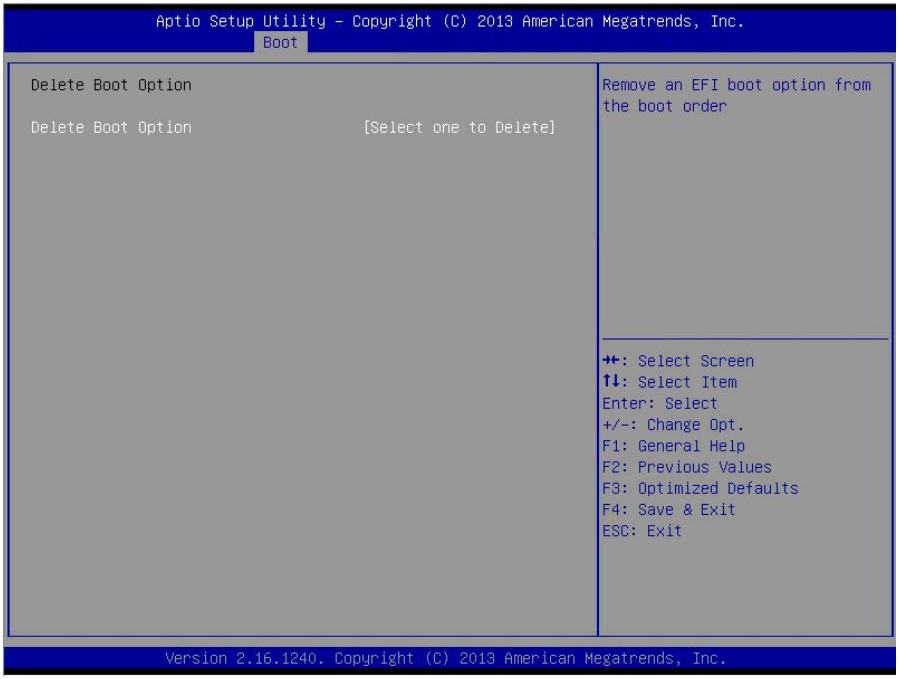
Launch PXE OpROM policy
Control the execution of UEFI and Legacy PXE OpROM.
Do not Launch / UEFI only / **Legacy only**

Launch Storage OpROM policy
Control the execution of UEFI and Legacy Storage OpROM.
Do not Launch / UEFI only / **Legacy only**

Launch Video OpROM policy
Control the execution of UEFI and Legacy Video OpROM.
Do not Launch / UEFI only / **Legacy only**

Other PCI device ROM priority
For PCI devices other than Network, Mass storage or Video defines which OpROM to launch.
UEFI OpROM / **Legacy OpROM**

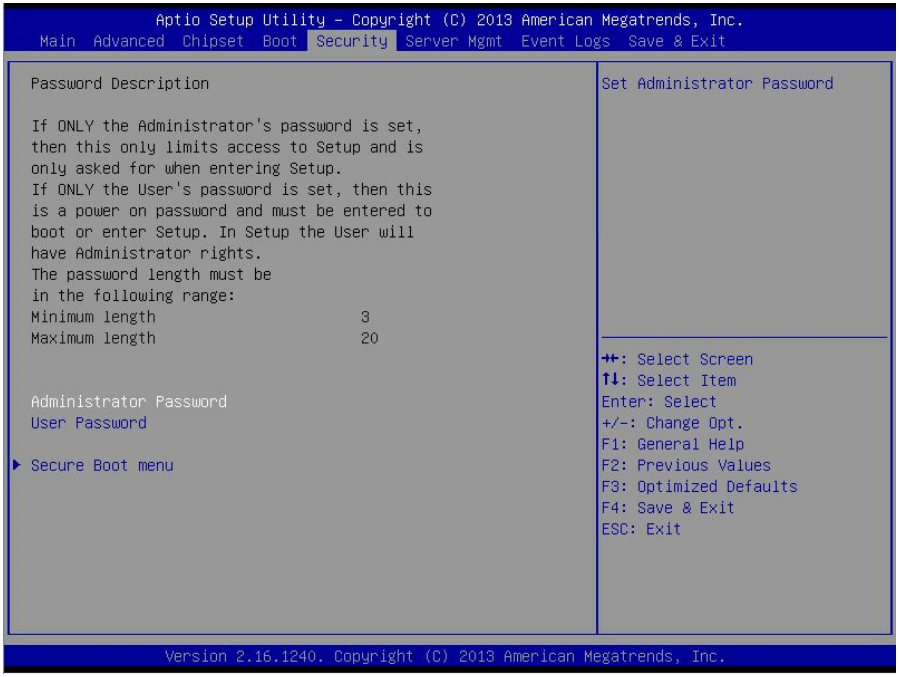
5.5.2 Delete Boot Option



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

Select one to delete / UEFI: Built-in EFI Shell

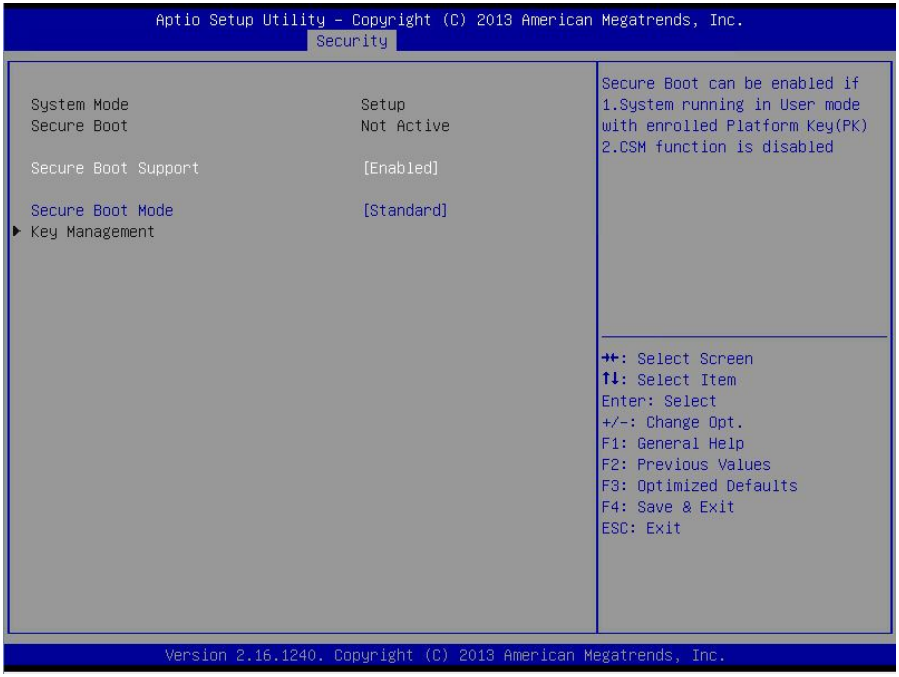
5.6 Security



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.

5.6.1 Secure Boot Menu



System Mode / Secure Boot
Read only.

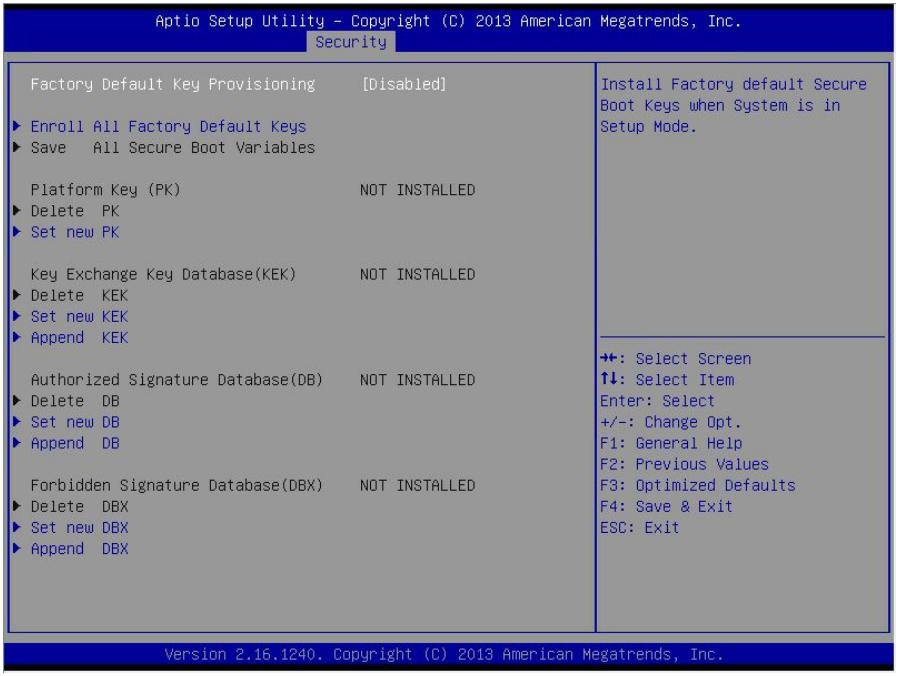
Secure Boot Support
Secure Boot can be enabled if 1. System running in User mode with enrolled Platform Key (PK) 2. CSM function is disabled.

Enabled / Disabled

Secure Boot Mode
Secure Boot mode selector. “Custom” Mode allows for more flexibility changing Image Execution policy and Secure Boot Key management.

Standard / Custom

5.6.1.1 Key Management



Factory Default Key Provisioning
Install Factory default Secure Boot Keys when System is in Setup Mode.
Disabled / Enabled

Enroll All Factory Default Keys
Force System to User Mode – install all Factory Default keys (PK, KEK, db, dbx, dbt). Change takes effect after reboot.

Save All Secure Boot Variables
Store content of each Secure Boot Variable (data formatted as EFI_SIGNATURE_LIST) to a file with matching name on selected file system's root folder.

Delete PK
Delete the Variable from NVRAM. Removing PK will reset System to Setup Mode.

Set new PK
Insert factory default key(s) or load a file formatted as 1. EFI Variable as Time-Based Authenticated Header or 2. Key Certificate list starting with EFI_SIGNATURE_LIST Header or Single Key Certificate in X509_DER, RSA2048_DER or SHA256_BIN format.

Delete KEK
Delete the Variable from NVRAM. Removing PK will reset System to Setup Mode.

Set new KEK
Insert factory default key(s) or load a file formatted as 1. EFI Variable as Time-Based Authenticated Header or 2. Key Certificate list starting with EFI_SIGNATURE_LIST Header or Single Key Certificate in X509_DER, RSA2048_DER or SHA256_BIN format.

Append KEK
Insert factory default key(s) or load a file formatted as 1. EFI Variable as Time-Based Authenticated Header or 2. Key Certificate list starting with EFI_SIGNATURE_LIST Header or Single Key Certificate in X509_DER, RSA2048_DER or SHA256_BIN format.

Delete DB
Delete the Variable from NVRAM. Removing PK will reset System to Setup Mode.

Set new DB
Insert factory default key(s) or load a file formatted as 1. EFI Variable as Time-Based Authenticated Header or 2. Key Certificate list starting with EFI_SIGNATURE_LIST Header or Single Key Certificate in X509_DER, RSA2048_DER or SHA256_BIN format.

Append DB
Insert factory default key(s) or load a file formatted as 1. EFI Variable as Time-Based Authenticated Header or 2. Key Certificate list starting with EFI_SIGNATURE_LIST Header or Single Key Certificate in X509_DER, RSA2048_DER or SHA256_BIN format.

Delete DBT
Delete the Variable from NVRAM. Removing PK will reset System to Setup Mode.

Set New DBT
Insert factory default key(s) or load a file formatted as 1. EFI Variable as Time-Based Authenticated Header or 2. Key Certificate list starting with EFI_SIGNATURE_LIST Header or Single Key Certificate in X509_DER, RSA2048_DER or SHA256_BIN format.

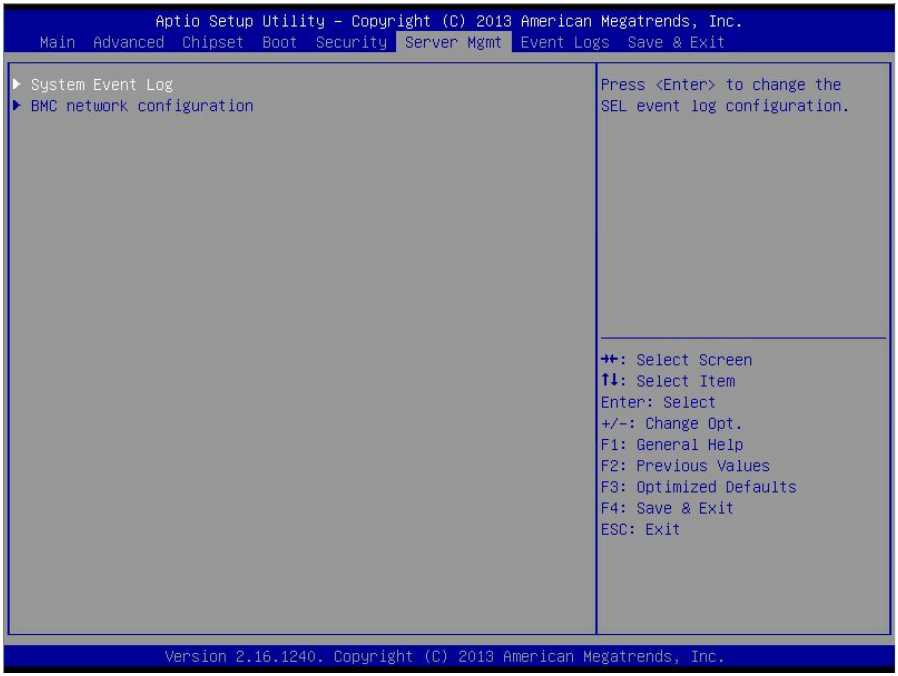
Append DBT
Insert factory default key(s) or load a file formatted as 1. EFI Variable as Time-Based Authenticated Header or 2. Key Certificate list starting with EFI_SIGNATURE_LIST Header or Single Key Certificate in X509_DER, RSA2048_DER or SHA256_BIN format.

Delete DBX
Delete the Variable from NVRAM. Removing PK will reset System to Setup Mode.

Set new DBX
Insert factory default key(s) or load a file formatted as 1. EFI Variable as Time-Based Authenticated Header or 2. Key Certificate list starting with EFI_SIGNATURE_LIST Header or Single Key Certificate in X509_DER, RSA2048_DER or SHA256_BIN format.

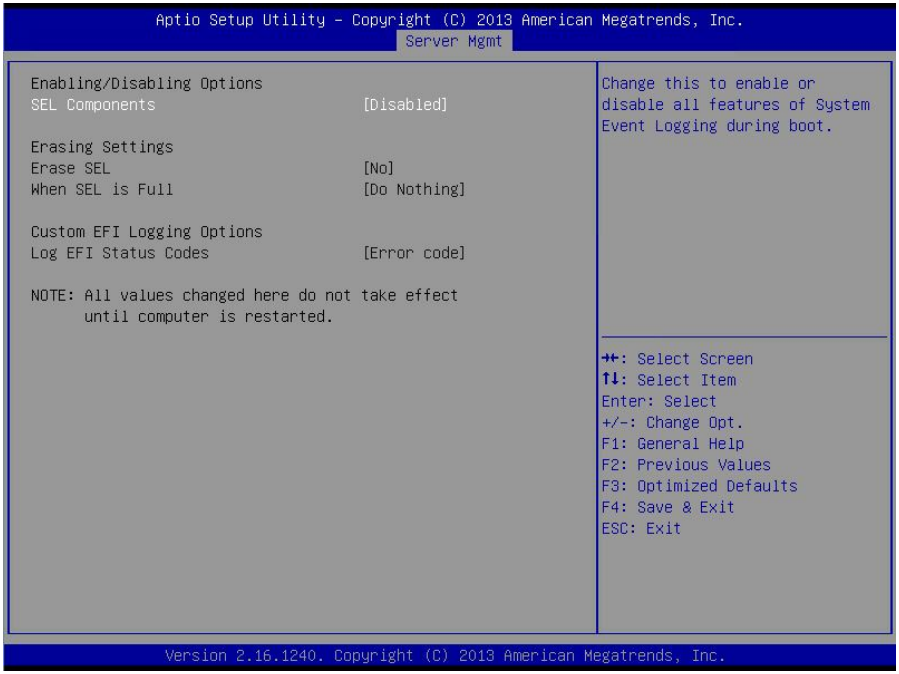
Append DBX
Insert factory default key(s) or load a file formatted as 1. EFI Variable as Time-Based Authenticated Header or 2. Key Certificate list starting with EFI_SIGNATURE_LIST Header or Single Key Certificate in X509_DER, RSA2048_DER or SHA256_BIN format.

5.7 Server Management



Press <Enter> to change the SEL event log configuration.
Enable/Disable interfaces to communicate with BMC.

5.7.1 System Event Log



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

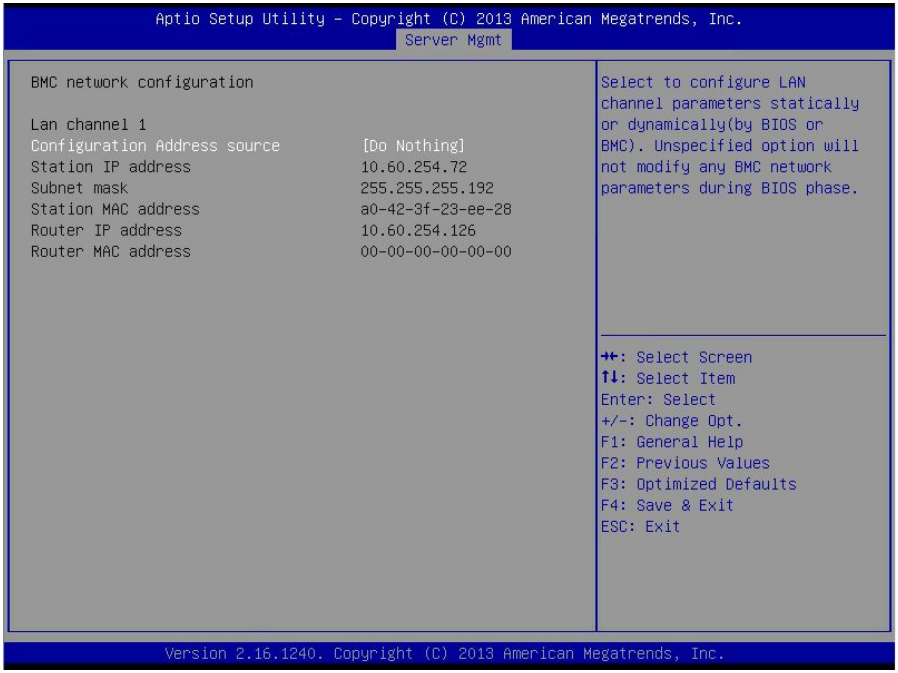
NOTE: When **SEL Components** is set to [Disabled], the following items are read only.

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

5.7.2 BMC Network Configuration



Lan channel 1

Configuration Address Source

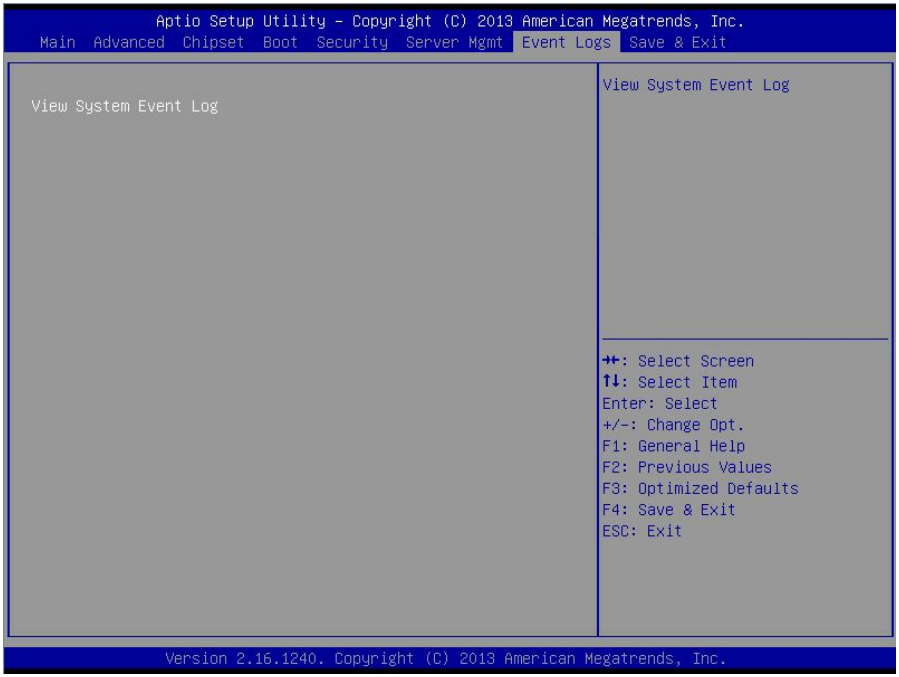
Select the configure LAN channel parameters statically or dynamically (by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.

Unspecified / Static / Dynamic-Obtained by BMC

Station IP Address / Subnet Mask / Station MAC Address / Router IP Address / Router MAC Address

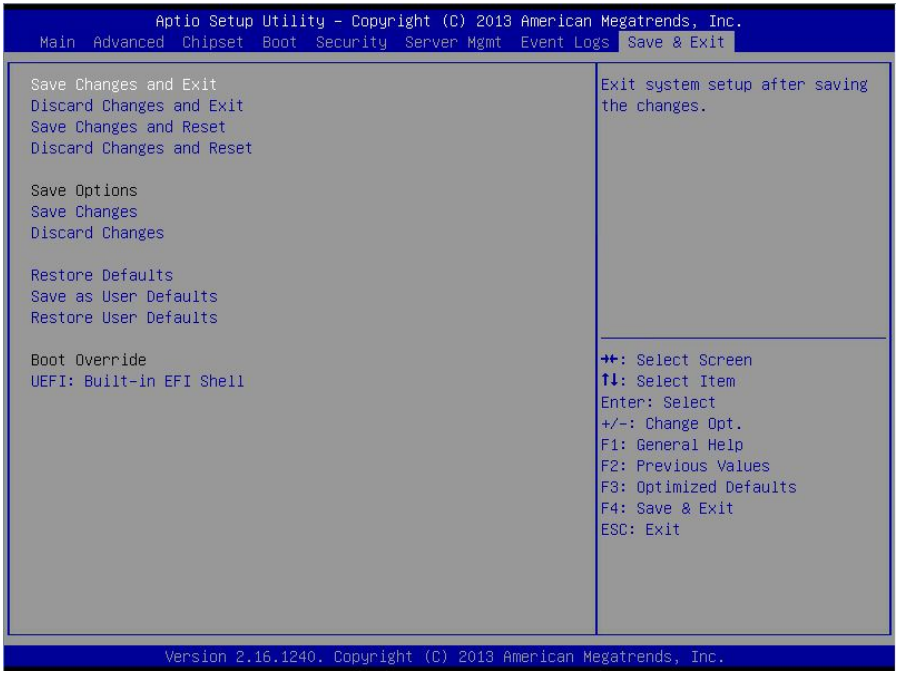
Read only.

5.8 Event Logs



Read only.

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 Options
Read only.

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

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

SEC Beep Codes
None

PEI Phase

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

Status Code	Description
0x38	Post-Memory North Bridge initialization (North Bridge module specific)
0x39	Post-Memory North Bridge initialization (North Bridge module specific)
0x3A	Post-Memory North Bridge initialization (North Bridge module specific)
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module specific)
0x3D	Post-Memory South Bridge initialization (South Bridge module specific)
0x3E	Post-Memory South Bridge initialization (South Bridge module specific)
0x3F – 0x4E	OEM post memory initialization codes
0x4F	DXE PIL is started
PCI Error Codes	
0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed.
0x52	Memory initialization error. Invalid memory size or memory modules do not match.
0x53	Memory initialization error. No usable memory detected
0x54	Unspecified memory initialization error
0x55	Memory not installed
0x56	Invalid CPU type or speed
0x57	CPU mismatch
0x58	CPU self test failed or possible CPU cache error
0x59	CPU microcode is not found or microcode update is failed.
0x5A	Internal CPU error
0x5B	Reset PPI is not available.
0x5C – 0x5F	Reserved for future AMI error codes
S3 Resume Progress Codes	
0xE0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL).
0xE1	S3 Boot Script execution
0xE2	Video repost
0xE3	OS S3 wake vector call
0xE4 – 0xE7	Reserved for future AMI progress codes
S3 Resume Error Codes	
0xE8	S3 Resume failed
0xE9	S3 Resume PPI not found
0xEA	S3 Resume Boot Script error
0xEB	S3 OS wake error
0xEC – 0xEF	Reserved for future AMI error codes

Recovery Progress Codes	
0xF0	Recovery condition triggered by firmware (Auto recovery)
0xF1	Recovery condition triggered by user (forced recovery)
0xF2	Recovery process started
0xF3	Recovery firmware image is found.
0xF4	Recovery firmware image is loaded.
0xF5 – 0xF7	Reserved for future AMI progress codes
Recovery Error Codes	
0xF8	Recovery PPI is not available.
0xF9	Recovery capsule is not found.
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AMI error codes

PEI Beep Codes

# of Beeps	Description
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
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)

Status Code	Description
0x6C	North Bridge DXE initialization (North Bridge module specific)
0x6D	North Bridge DXE initialization (North Bridge module specific)
0x6E	North Bridge DXE initialization (North Bridge module specific)
0x6F	North Bridge DXE initialization (North Bridge module specific)
0x70	South Bridge DXE initialization is started.
0x71	South Bridge DXE SMM initialization is started.
0x72	South Bridge devices initialization
0x73	South Bridge DXE initialization (South Bridge module specific)
0x74	South Bridge DXE initialization (South Bridge module specific)
0x75	South Bridge DXE initialization (South Bridge module specific)
0x76	South Bridge DXE initialization (South Bridge module specific)
0x77	South Bridge DXE initialization (South Bridge module specific)
0x78	ACPI module initialization
0x79	CSM initialization
0x7A – 0x7F	Reserved for future AMI DXE codes
0x80 – 0x8F	OEM DXE initialization codes
0x90	Boot Device Selection (BDS) phase is started
0x91	Driver connecting is started
0x92	PCI Bus initialization is started
0x93	PCI Bus Hot Plug Controller initialization
0x94	PCI Bus Enumeration
0x95	PCI BUS Request Resources
0x96	PCI Bus Assign Resources
0x97	Console output devices connect
0x98	Console Input devices connect
0x99	Super IO initialization
0x9A	USB initialization is started.
0x9B	USB Reset
0x9C	USB Detect
0x9D	USB Enable
0x9E -0x9F	Reserved for future AMI codes
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable
0xA4	SCSI initialization is started.

Status Code	Description
0xA5	SCSI Reset
0xA6	SCSI Detect
0xA7	SCSI Enable
0xA8	Setup Verifying Password
0xA9	Start of Setup
0xAA	Reserved for ASL (see ASL Status Codes section below)
0xAB	Setup Input Wait
0xAC	Reserved for ASL (see ASL Status Codes section below)
0xAD	Ready To Boot event
0xAE	Legacy Boot event
0xAF	Exit Boot Services event
0xB0	Runtime Set Virtual Address MAP Begin
0xB1	Runtime Set Virtual Address MAP End
0xB2	Legacy Option ROM initialization
0xB3	System Reset
0xB4	USB hot plug
0xB5	PCI bus hot plug
0xB6	Clean-up of NVRAM
0xB7	Configuration Reset (reset of NVRAM settings)
0xB8 – 0xBF	Reserved for future AMI codes
0xC0 – 0xCF	OEM BDS initialization codes
DXE Error Codes	
0xD0	CPU initialization error
0xD1	North Bridge initialization error
0xD2	South Bridge initialization error
0xD3	Some of the Architectural Protocols are not available
0xD4	PCI resource allocation error. Out of Resources
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found.
0xD7	No Console Input Devices are found.
0xD8	Invalid password
0xD9	Error loading Boot Option (LoadImage returned error)
0xDA	Boot Option is failed (StartImage returned error).
0xDB	Flash update is failed.
0xDC	Reset protocol is not available.

DXE Beep Codes

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

ACPI/ASL Checkpoints

Status Code	Description
0x01	System is entering S1 sleep state.
0x02	System is entering S2 sleep state.
0x03	System is entering S3 sleep state.
0x04	System is entering S4 sleep state.
0x05	System is entering S5 sleep state.
0x10	System is waking up from the S1 sleep state.
0x20	System is waking up from the S2 sleep state.
0x30	System is waking up from the S3 sleep state.
0x40	System is waking up from the S4 sleep state.
0xAC	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

Appendix I: Cable Connection Tables

1. System Fan Connector

System Fan to S7051 MB		
System Fan	Connect to	S7051
Fan1	→	J63
Fan2	→	J66
Fan3	→	J65
Fan4	→	J64
Fan5	→	J20
Fan6	→	J45

2. Mini-SAS Cables

M7051G86-BP6-4 BP to S7051 MB			
Cable	M7051G86-BP 6-4	Connect to	S7051
Mini-SAS CABLE	J3	→	J16
Mini-SAS CABLE	J3	→	J17
Mini-SAS CABLE	J3	→	J12

3. SATA Cable

M7051G86-BP6-4 BP to S7051 MB			
Cable	SSD	Connect to	S7051
SATA CABLE	SSD	→	J36

4. Power LED Cable & Reset Cable

Chassis to S7051 MB			
	Chassis	Connect to	S7051
Power LED Cable	POWER LED	→	J39(PIN1,5)
	POWER SW	→	J39(PIN11,13)
Reset Cable	Reset SW	→	J39 (PIN15,17)

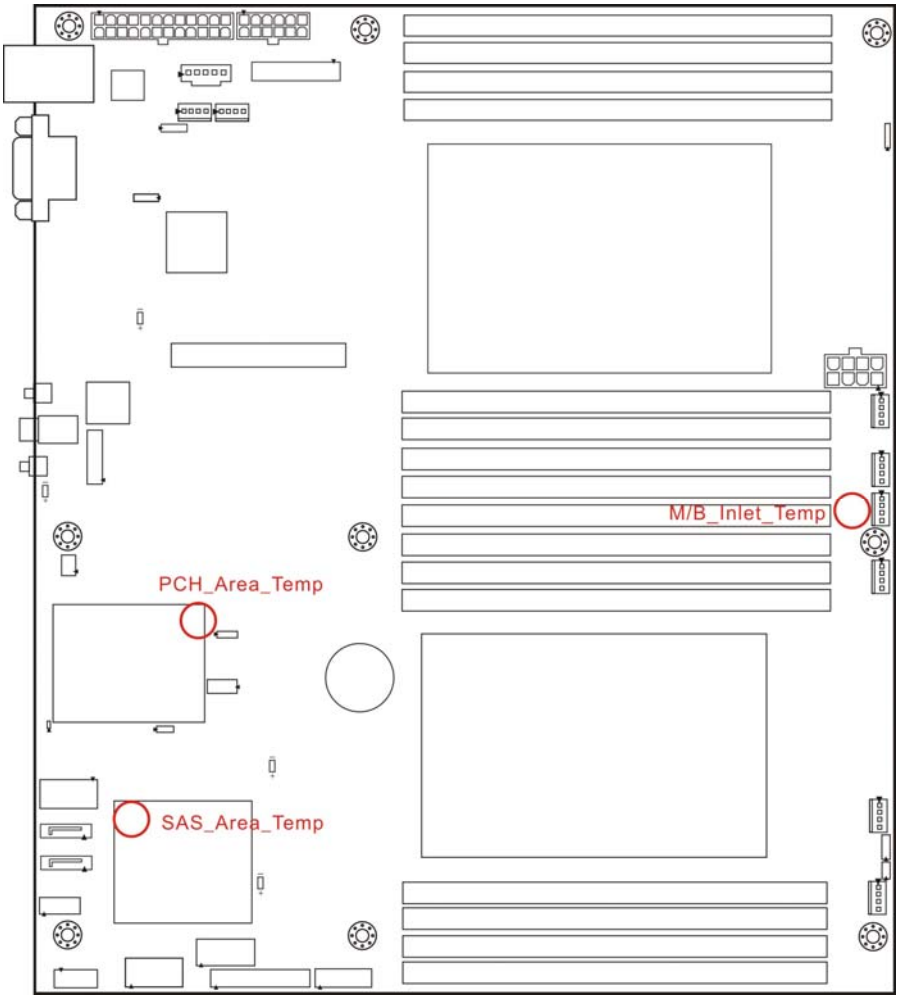
5. Power Supply Cables

PSU to S7051 MB		
PSU	Connect to	S7051
P1	→	J27
P2	→	J62
P9	→	J43
P7	→	J34

PSU to M7051G86-BP6-4 BP		
PSU	Connect to	M7051G86-BP6-4
B4P P3	→	PW2
B4P P4	→	PW2
B4P P5	→	PW2

Appendix II: Fan and Temp Sensors

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



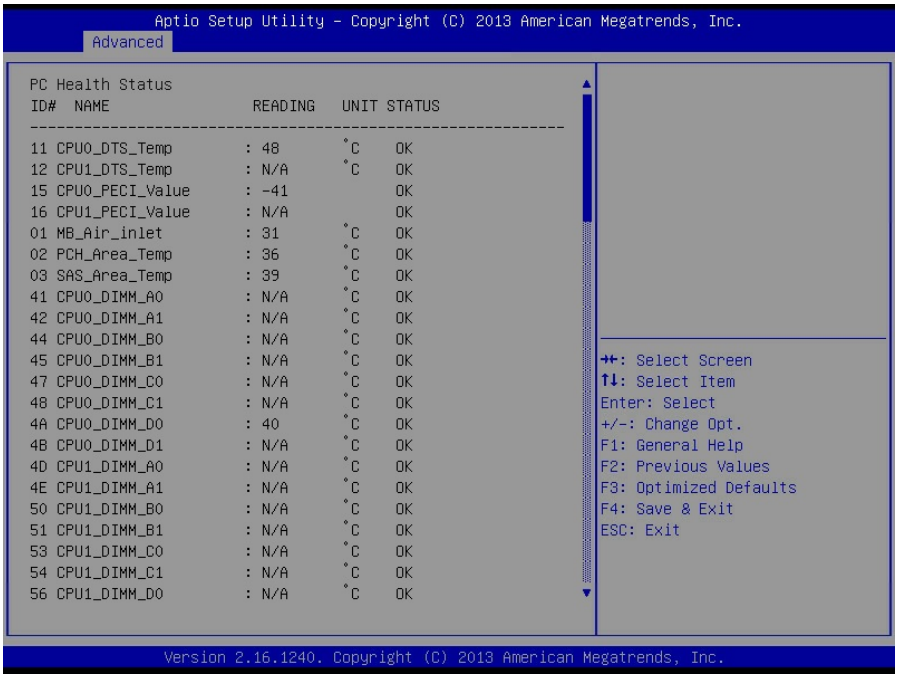
NOTE: The red dot indicates the sensor.

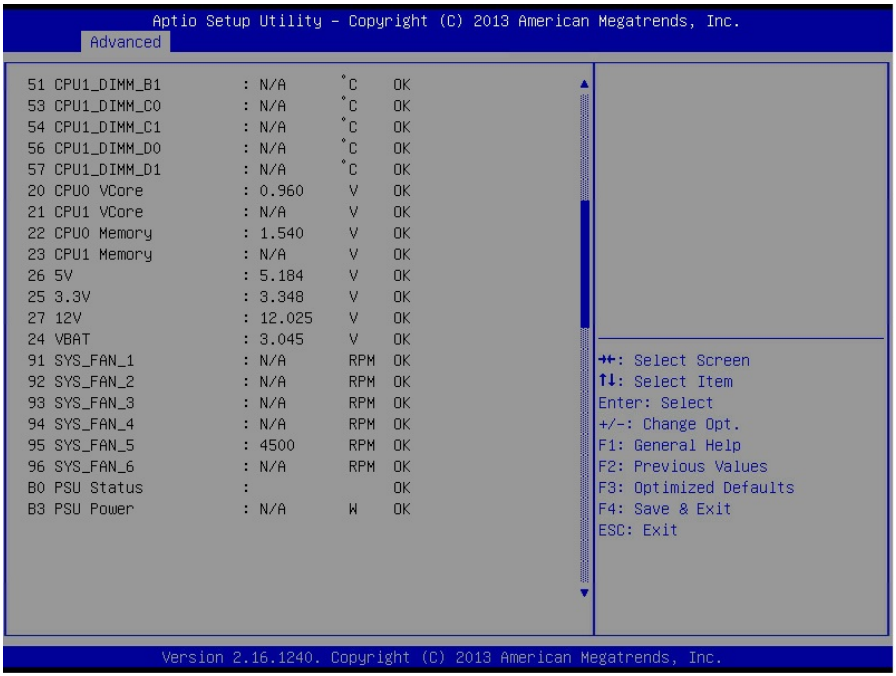
Fan and Temp Sensor Location:

1. Fan Sensor: It is located in the third pin of the fan connector, which detects the fan speed (rpm)
2. Temp Sensor: PCH_Area_Temp, SAS_Area_Temp and M/B_Inlet_Temp. They detect the system temperature around.

NOTE: The system temperature is measured in a scale defined by **Intel**, not in Fahrenheit or Celsius.

BIOS Temp Sensor Name Explanation:





BIOS Temp Sensor	Name Explanation
CPU0_DTS_Temp	Temperature of the CPU0 Digital Temperature Sensor
CPU1_DTS_Temp	Temperature of the CPU1 Digital Temperature Sensor
CPU0_PECI_Temp	Temperature of the CPU0 Platform Environment Control Interface
CPU1_PECI_Temp	Temperature of the CPU1 Platform Environment Control Interface
PCH_Area_Temp.	Temperature of the PCH Area
M/B_Inlet_Temp	Temperature of the MB Air Inlet Area
SAS_Area_Temp	Temperature of the SAS Area
CPU0_DIMM_A0	Temperature of CPU0_DIMM_A0 Slot
CPU0_DIMM_A1	Temperature of CPU0_DIMM_A1 Slot
CPU0_DIMM_B0	Temperature of CPU0_DIMM_B0 Slot
CPU0_DIMM_B1	Temperature of CPU0_DIMM_B1 Slot
CPU0_DIMM_C0	Temperature of CPU0_DIMM_C0 Slot
CPU0_DIMM_C1	Temperature of CPU0_DIMM_C1 Slot
CPU0_DIMM_D0	Temperature of CPU0_DIMM_D0 Slot
CPU0_DIMM_D1	Temperature of CPU0_DIMM_D1 Slot
CPU1_DIMM_A0	Temperature of CPU1_DIMM_A0 Slot

CPU1_DIMM_A1	Temperature of CPU1_DIMM_A1 Slot
CPU1_DIMM_B0	Temperature of CPU1_DIMM_B0 Slot
CPU1_DIMM_B1	Temperature of CPU1_DIMM_B1 Slot
CPU1_DIMM_C0	Temperature of CPU1_DIMM_C0 Slot
CPU1_DIMM_C1	Temperature of CPU1_DIMM_C1 Slot
CPU1_DIMM_D0	Temperature of CPU1_DIMM_D0 Slot
CPU1_DIMM_D1	Temperature of CPU1_DIMM_D1 Slot
BIOS FAN Sensor	**Name Explanation**
SYS_FAN_1	Fan speed of SYS_FAN_1
SYS_FAN_2	Fan speed of SYS_FAN_2
SYS_FAN_3	Fan speed of SYS_FAN_3
SYS_FAN_4	Fan speed of SYS_FAN_4
SYS_FAN_5	Fan speed of SYS_FAN_5
SYS_FAN_6	Fan speed of SYS_FAN_6

Appendix III: FRU Parts Table

GT86A-B7051 FRU Parts				
Item	**Model Number**	**Part Number**	**Picture**	**Description**
Cable	CCBL-0688	422797000003		MINI-SAS CABLE,SHORT MINI-SAS 36P/SHORT MINI-SAS 36P,L=800MM,TN70-B7016-X2
	FRU-CS-0220	422T42300011		SAS INTERNAL,1000 mm,MINI-SAS CABLE,SHORT MINI-SAS 36P/SHORT MINI-SAS 36P
	CCBL-033V	422794300003		SATA CABLE(SAS WIRE),7P 180°/7P 180°,L=900MM
	CCBL-0317	332810000397		TF-PWR CORD;US,125V,18AWGX3C,L:1800MM
	CCBL-0300	332810000281		TF-PWR CORD;EU,250V,H05VV-FX3C,10A,0.75MM
Power Supply	FRU-PS-0071	471100000200		500W PSU DPS-500AB-5C S0F
FAN	FRU-TS-0120	336210000047		40*40*28mm
Rack Mounting Kit	FRU-AS-0050	452T52800001		TF-SLIDE RAIL KIT;SBU,SECC,GT86A-B7051
Heatsink	FRU-TS-0120	343T51400003		HF-HEATSINK;SBU,AL/CU,SOLDERLING+PIPE,2011-1U-SPECIAL- NARROW –PASSIVE 105.5X80X25.5MM,SCREW,

NOTE

Appendix IV: GT86A-B7051 SKUs

Product Name	Customer Product Name	Product Configuration	System Fan
BS7051G86AW8-1T-HE	Config DH	CPU: Intel®Xeon E5-2620 v2 *2 DIMM: Samsung R-DDR3L 16GB *8 OS SSD: Sandisk SD7SB6S 256G / Intel® 530 240GB *1 Data HDD: 3.5" WD 4TB HDD *8	6
BS7051G86AV2-1T-HE	Config DG	CPU: Intel®Xeon E5-2620 v2 *2 DIMM: Samsung R-DDR3L 16GB *8 OS SSD: Sandisk SD7SB6S 256G / Intel® 530 240GB *1	5
BS7051G86AW7-1T-HE	Config DI	CPU: Intel®Xeon E5-2620 v2 *2 DIMM: Samsung R-DDR3L 16GB *8 OS SSD: Sandisk X300 256G / Intel® 530 240GB *1 Data SSD: 2.5" SanDisk X300s 512GB SSD*7	
BS7051G86AW6-1T-HE-DI	Config DI	CPU: Intel®Xeon E5-2620 v2 *2 DIMM: Samsung R-DDR3L 16GB *8 OS SSD: Sandisk X300 256G / Intel® 530 240GB *1 Data SSD: 2.5" Sandisk X300s 512GB SSD*6	
BS7051G86AW8-1T-HE-DS	Config DS	CPU: Intel®Xeon E5-2620 v2 *2 DIMM: Samsung R-DDR3L 16GB *8 OS SSD: Sandisk X300 256G / Intel® 530 240GB *1 Data SSD: 2.5" Sandisk X300s 1TB SSD / Samsung SSD 960GB *8	

BS7051G86AW6-1T-HE-DJ	Config DJ	CPU: Intel®Xeon E5-2620 v2 *2 DIMM: Samsung R-DDR3L 16GB *8 OS SSD: Sandisk X300 256G / Intel® 530 240GB *1 Data SSD: 2.5" Sandisk X300s 1TB SSD / Samsung SSD 960GB *6	

Appendix V: Technical Support

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

If these options are not available for you then MiTAC International 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® GT86A-B7051 Service Engineer's Manual V1.0

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