S5533

Version 1.0

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About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This guide contains the following parts:

Chapter1: Instruction
This chapter describes the features of the motherboard and the new technology it supports.

Chapter2: Board Installation
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.

Chapter3: BIOS Setup
This chapter tells how to change system settings through the BIOS setup menu. Detailed descriptions of the BIOS parameters are also provided.

Chapter4: Diagnostics
This chapter introduces some BIOS codes and technical terms to provide better service for the customers.

Appendix I: 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.

Contents

Before you begin… 4

Chapter 1: Instruction 5

1.1 Congratulations 5
1.2 Hardware Specification 5
1.3 Software Specifications 7

Chapter 2: Board Installation 9

2.1 Board Image 10
2.2 Block Diagram 11
2.3 Mainboard Mechanical Drawing 12
2.4 Board Parts, Jumpers and Connectors 13
2.5 Installing the Processor and Heatsink 21
2.6 Thermal Interface Material 25
2.7 Tips on Installing Motherboard in Chassis 26
2.8 Installing the Memory 28
2.9 Attaching Drive Cables 31
2.10 Installing Add-In Cards 31
2.11 Connecting External Devices 32
2.12 Installing the Power Supply 33
2.13 Finishing Up 34

Chapter 3: BIOS Setup 35

3.1 About the BIOS 35
3.2 Main Menu 37
3.3 Advanced Menu 38
3.4 Chipset Menu 62
3.5 Boot 70
3.6 Security 74
3.7 Server Management 75
3.8 Save & Exit 77

Chapter 4: Diagnostics 79

4.1 Flash Utility 79
4.2 AMIBIOS Post Code (Aptio) 80

Appendix I: Fan and Temp Sensors 87

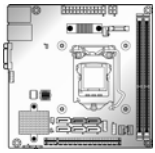
Glossary 89

Technical Support 95

Before you begin…

Check the box contents!

The retail motherboard package should contain the following:

	1 x S5533 Motherboard
	6 x SATA Single Cable
	1 x IO shield
	1 x S5533 Quick Installation Guide
	1 x TYAN® Driver CD

IMPORTANT NOTE:
Sales samples may not come with any of the accessories listed above.
If you have ordered a sales sample and you are missing any of the above items, please contact your sales representative to help order accessories.

Chapter 1: Instruction

1.1 Congratulations

You have purchased the powerful TYAN® S5533 motherboard, based on the Intel® C222 chipset. The S5533 is designed to support single Intel® Xeon E3-1200 v3, i3 (22nm/Haswell) series processor, and up to 32GB Unbuffered ECC DDR3 1600/1333/1066 memory. Leveraging advanced technology from Intel®, the S5533 is capable of offering scalable 32 and 64-bit computing, high-bandwidth memory design, and lightning-fast PCI-E bus implementation.

The S5533 not only empowers you in today's demanding IT environment but also offers a smooth path for future application upgradeability. All of these rich feature sets provide the S5533 with the power and flexibility to meet demanding requirements for today's IT environments.

Remember to visit the TYAN® website at http://www.tyan.com. There you can find all the information on all TYAN® products as well as all the supporting documentation, FAQs, Drivers and BIOS upgrades.

1.2 Hardware Specification

TYAN S5533 (S5533GM2NR-LE)

Processor	Supported CPU Series		Intel Xeon E3-1200 v3, i3 (22nm/Haswell) series processors
	Socket Type / Q'ty		LGA 1150/ (1)
	Thermal Design Power (TDP) wattage		Max up to 95W
Chipset	PCH		Intel C222
Memory	Supported DIMM Qty		(2) DIMM slots
	DIMM Type / Speed		Unbuffered ECC DDR3 1600/1333/1066
	Capacity		Up to 32GB
	Memory voltage		1.5V
Expansion Slots	PCI-E		(1) PCI-E Gen3 x16 slots
LAN	Port Q'ty		(2) GbE ports + (1) dedicated for IPMI
	Controller		Intel I210
	PHY		Realtek RTL 8211E
Storage	SATA	Connector	(6) SATA
		Controller	Intel C222
		Speed	(2) 6.0 Gb/s (blue color), (4) 3.0 Gb/s (black color)
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	Connector type		D-Sub 15-pin

	Chipset	Aspeed AST2300
Input /Output	**USB**	(2) USB3.0 ports (at rear) / (2) USB 2.0 ports (via cable)
	COM	(1) header
	VGA	(1) D-Sub 15-pin VGA port
	RJ-45	(2) GbE + (1) Dedicated for IPMI
	Front Panel	(1) 2x12-pin SSI front panel header
	SATA	(4) SATA-II and (2) SATA-III connectors
System Monitoring	**Chipset**	Aspeed AST2300
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (3) 4-pin headers
	Temperature	Monitors temperature for CPU & memory
	LED	Fan fail LED indicator / Over temperature warning 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
	AST2300 iKVM Feature	24-bit high quality video compression / 10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI / 16MB
	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,S3,S4,S5
Physical Dimension	**Form Factor**	mini-ITX
	Board Dimension	6.69" x 6.69" (170 x 170mm)
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	**Motherboard**	(1) S5533 Motherboard
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD
	I/O Shield	(1) I/O Shield
	Cable SATA	(6) SATA signal cables

1.3 Software Specifications

For the latest OS (operation system) support and IPMI Configuration Guide, please visit our Web site for information.

NOTE

Chapter 2: Board Installation

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:

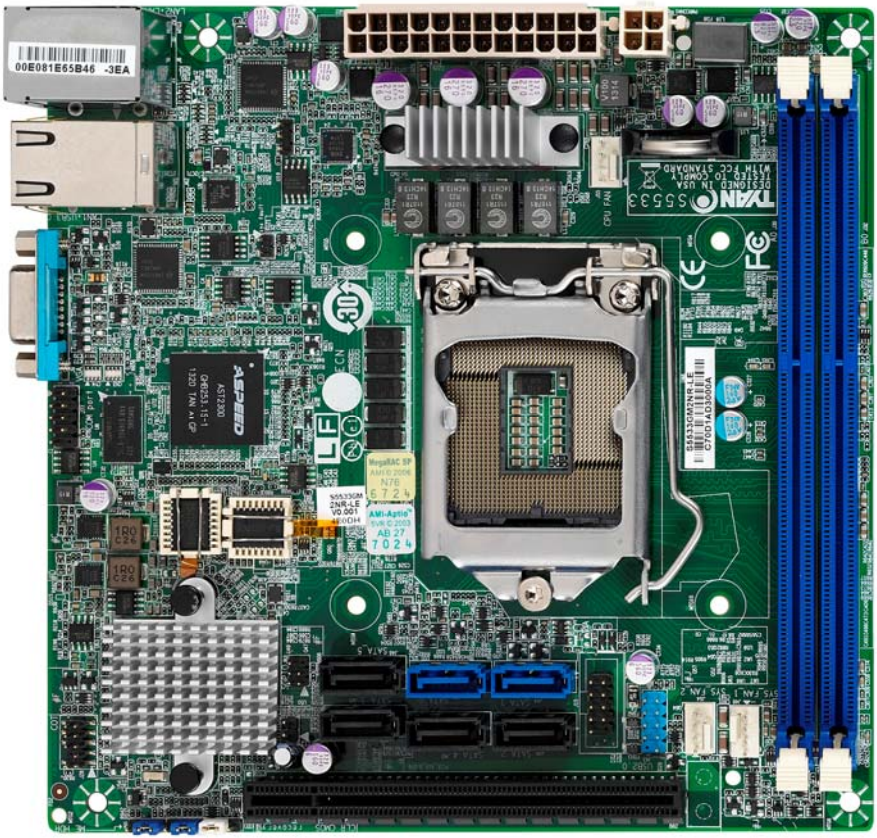
(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, MiTAC recommends wearing a static safety wrist 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.

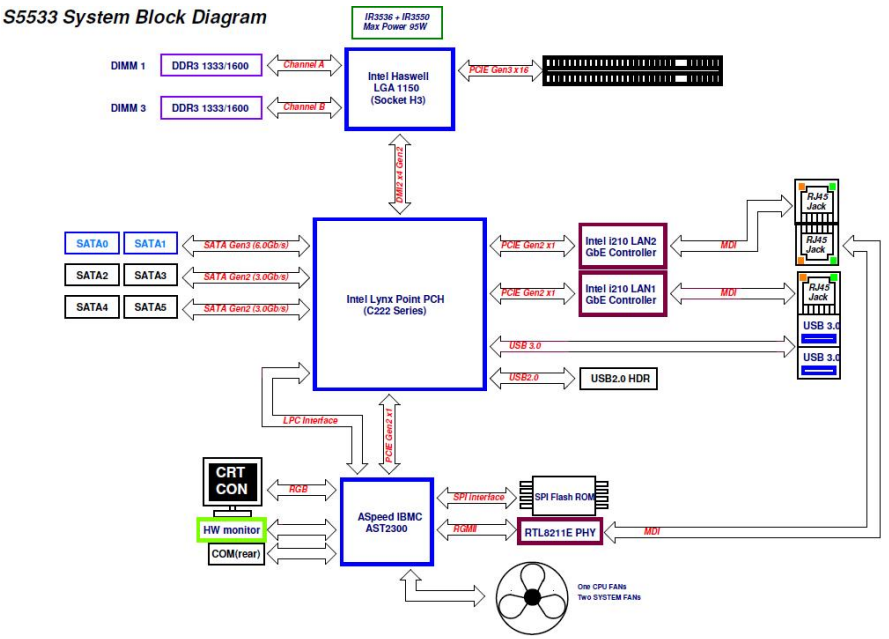
2.1 Board Image



S5533

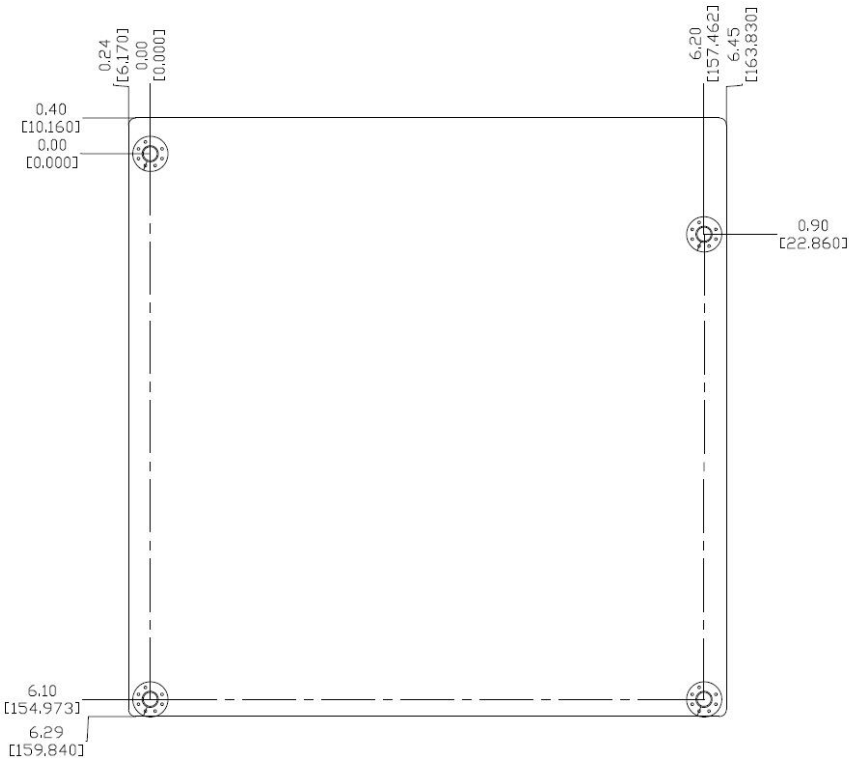
This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.

2.2 Block Diagram

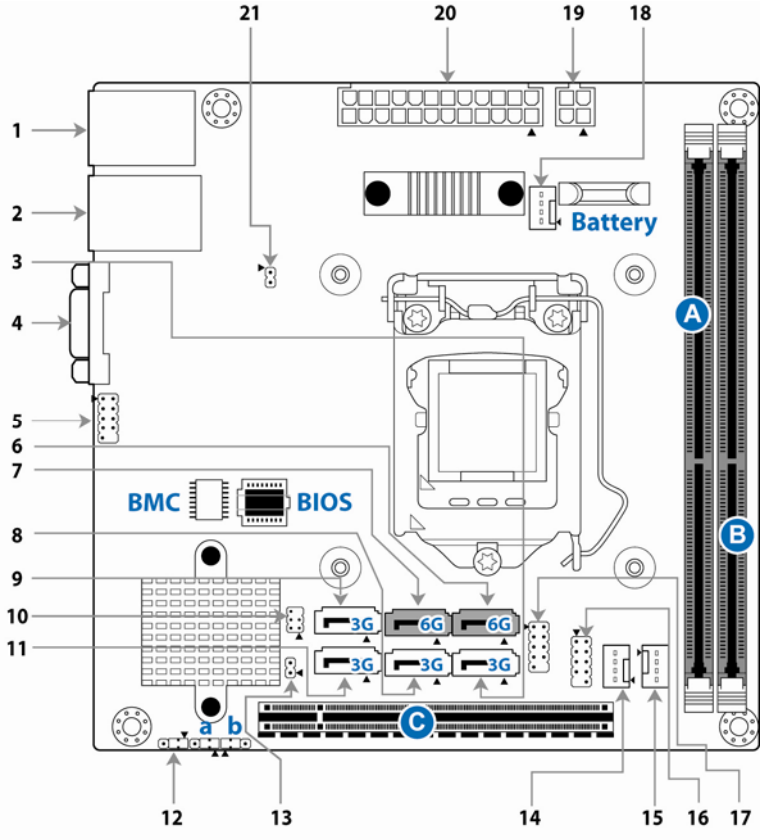


S5533 Block Diagram

2.3 Mainboard Mechanical Drawing



2.4 Board Parts, Jumpers and Connectors



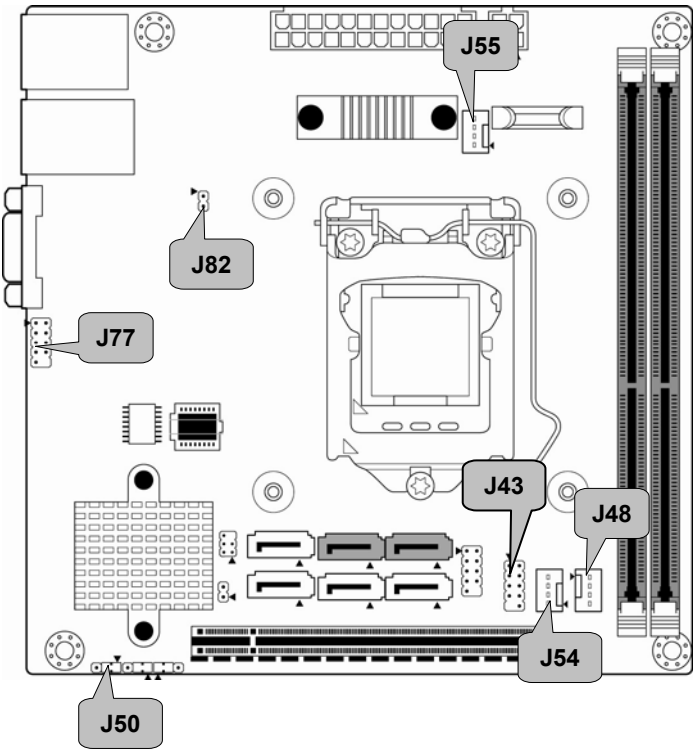
This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. The DIMM slot numbers shown above can be used as a reference when reviewing the DIMM population guidelines shown later in the manual. For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

Connectors, Jumpers & Slots

Connector/Jumper	
1 LAN Port #1 (LAN1) + USB 3.0 Ports	12 ME Header (J50)
2 Top: LAN Port #2 (LAN2) Bottom: BMC Dedicated LAN Port #3 (LAN3)	13 Chassis Intrusion Header (J81)
3 SATA2.0 Connector (SATA2, J39)	14 4-Pin Fan Connectors (SYS_FAN2, J54)
4 VGA Port	15 4-Pin Fan Connectors (SYS_FAN1, J48)
5 COM Header (J77)	16 USB Front Panel Header (J43)
6 SATA3.0 Connector (SATA1, J44)	17 Front Panel Header (J15)
7 SATA3.0 Connector (SATA0, J38)	18 CPU FAN Connector (J55)
8 SATA2.0 Connector (SATA4, J40)	19 ATX 4-pin Power Connector (PWRCONN1)
9 SATA2.0 Connector (SATA5, J46)	20 ATX 24-pin Power Connector (J18)
10 SGPIO Header (J83)	21 Fault LED Header (J82)
11 SATA2.0 Connector (SATA3, J45)	
Jumpers	**Slots**
a BIOS Recovery Mode Jumper (J52)	A DDR Memory Slot (DIMM_A0)
b Clear CMOS Jumper (J42)	B DDR Memory Slot (DIMM_B0)
	C PCIE Gen3 x16 Slot

Jumper Legend

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


J55
J82
J77
J43
J48
J54
J50

J48/J54/J55: 4-Pin FAN Connector

Pin	1	2	3	4
Signal	GND	VCC	TACHOMETER	PWM

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

J48: SYS_FAN_1 J54: SYS_FAN_2 J55: CPU_FAN

J77: COM Port Header

Signal	Pin	Pin	Signal
DCD	1	2	DSR
RXD	3	4	RTS
TXD	5	6	CTS
DTR	7	8	NRI
GND	9	10	NONE

J82: Fault LED Header

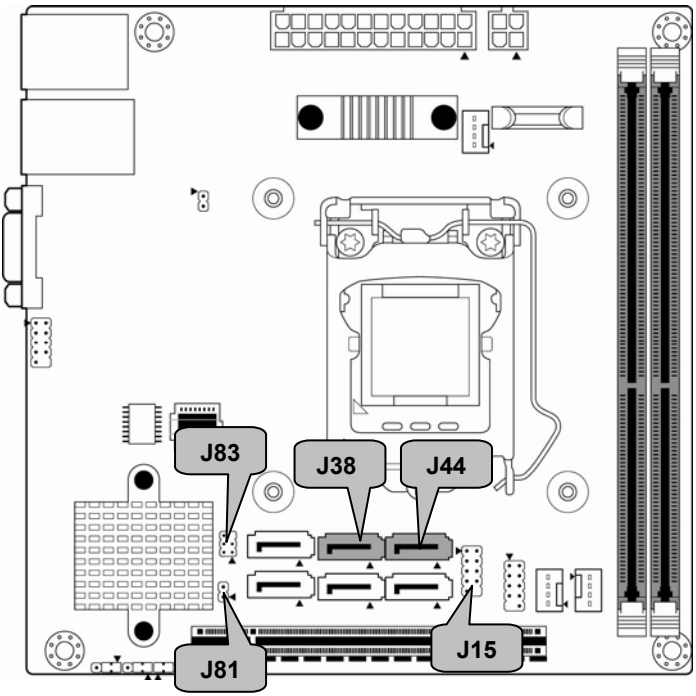
Pin	1	2
Signal	power	system_fault

J50: ME Header

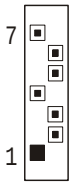
Pin	1	2	3
Signal	NA	Recovery	GND

J43: USB Front Panel Header (blue)

Signal	Pin	Pin	Signal
power	1	2	power
USB_DN	3	4	USB_DN
USB_DP	5	6	USB_DP
GND	7	8	GND
GUIDE pin	9	10	NA


J83
J38
J44
J81
J15

J38/J44: SATA3.0 Connector



1	GND	Connects to the Serial ATA ready drives via the Serial ATA cable. J38: SATA0 J44: SATA1
2	SATA TX DP	
3	SATA TX DN	
4	GND	
5	SATA RX DN	
6	SATA RX DP	
7	GND	

J15: Front Panel Header

Signal	Pin	Pin	Signal
VCC	1	2	GRN BLNK HRD
SATA LED	3	4	YLW BKNK HRD
GND	5	6	PWRBTN
FP RST	7	8	GND
VCC	9	10	NA

J83: SGPIO Header for BB HD Board

Signal	Pin	Pin	Signal
SATA_LOAD	1	2	SATA_CLOCK
GND	3	4	SATA_DATAOUT0
NA	5	6	SATA_DATAOUT1

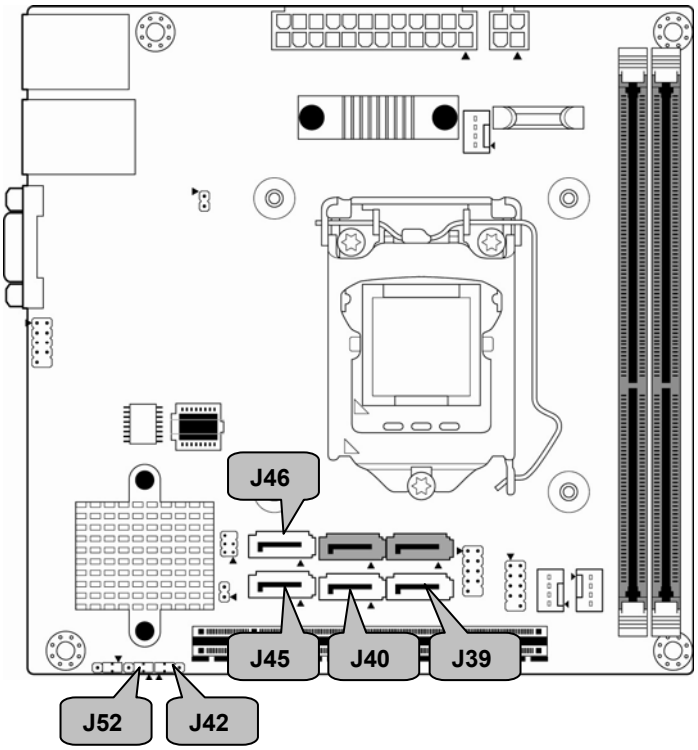
J81: Chassis Intrusion Header

Open

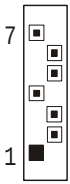
Pin	1	2
Signal	GND	INTRUDER#

Short (**Default**)

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


J46
J45
J40
J39
J52
J42

J39/J40/J45/J46: SATA2.0 Connector



1	GND
2	SATA TX DP
3	SATA TX DN
4	GND
5	SATA RX DN
6	SATA RX DP
7	GND

Connects to the Serial ATA ready drives via the Serial ATA cable.

J39: SATA2 J40: SATA4
J45: SATA3 J46: SATA5

J52: BIOS Recovery Mode Jumper

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

J42: Clear CMOS Jumper

Normal (**Default**)	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.
Clear CMOS	

2.5 Installing the Processor and Heatsink

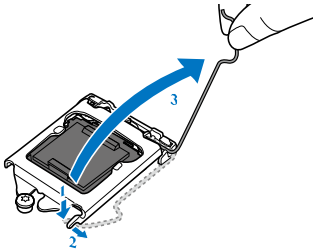
The types of processors supported by the S5533 are listed in the section 1.2 Hardware Specification on page 5. Check our website at **http://www.tyan.com** for the latest list of validated Intel® processors for this specific motherboard.

> **NOTE:** MiTAC is not liable for damage as a result of operating an unsupported configuration.

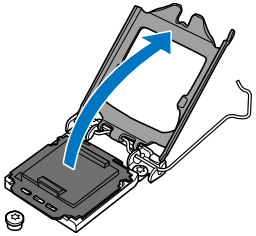
Processor Installation (Socket H3 for Intel CPU)

Follow the steps described later to install the processors and heat sinks.
NOTE: Please save and replace the CPU protection cap when returning for service.

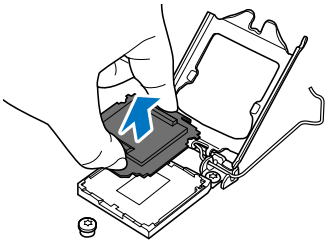
1. Open the socket lever.



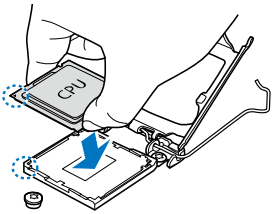
2. Open the CPU socket cover.



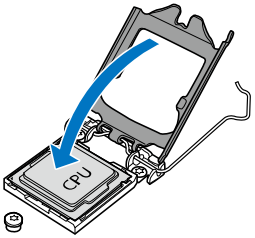
3. Remove the CPU protection cap.



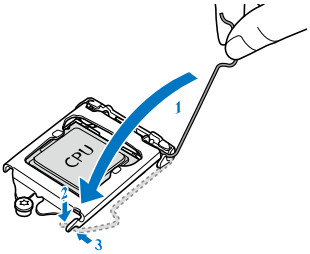
4. Install the processor and make sure the gold arrow is located in the right direction.



5. Close the CPU socket cover.



6. Close the socket lever.



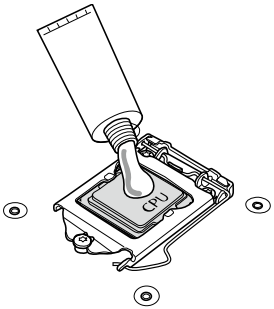
Heat sink Installation

After installing the processor, you will need to proceed to install the heat sink. The CPU heat sink will ensure that the processor do not overheat and continue to operate at maximum performance for as long as you own them. An overheated processor is dangerous to the motherboard. The processors will overheat within seconds, enter thermal protection, and shut down if heatsinks are not installed.

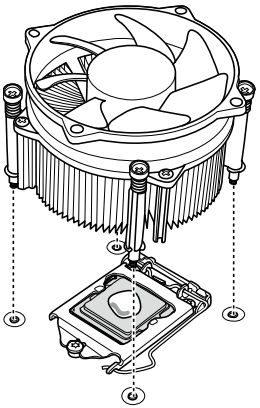
For the safest method of installation and information on choosing the appropriate heat sink, using heat sinks validated by Intel®. Please refer to the Intel® website: **http://www.intel.com**

The following diagram illustrates how to install the heatsink on the Intel® H3 Socket:

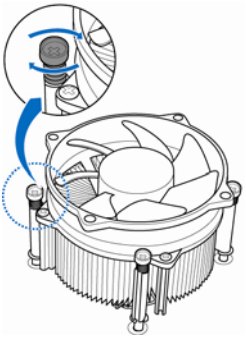
1. Apply the thermal grease.



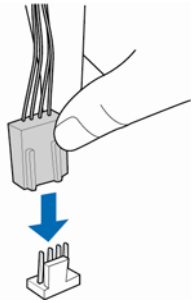
2. Install the CPU heatsink.



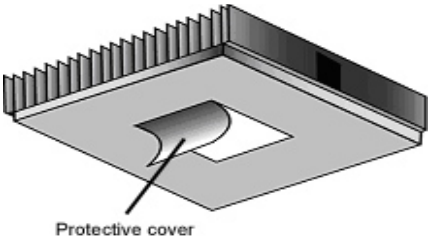
3. Secure the heatsink screws.

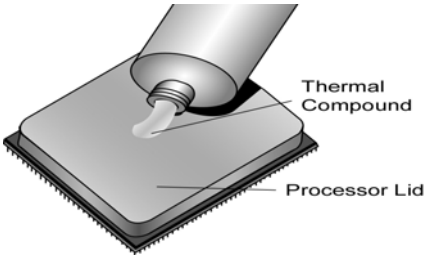


4. Connect the heatsink fan cable.



2.6 Thermal Interface Material





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

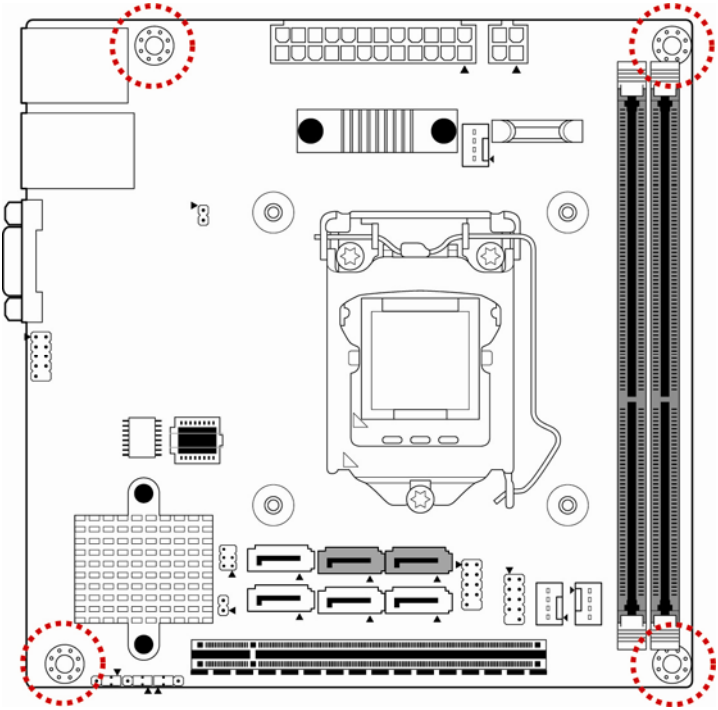
The most common material comes as a small pad attached to the heat sink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material. Simply remove the protective cover and place the heat sink on the processor.

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.

2.7 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.

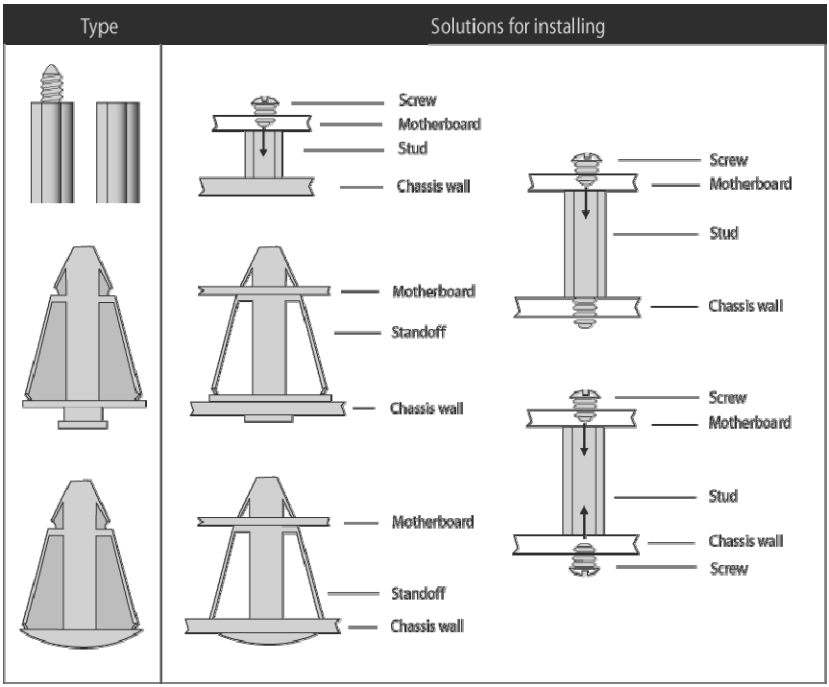


Note: Be especially careful to look for extra stand-offs. If there are any stand-offs present that are not aligned with a mounting hole on the motherboard, it will likely short components on the back of the motherboard when installed. This will cause malfunction and/or damage to your motherboard.

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



2.8 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 Intel® Xeon E3-1200 v3, i3 (22nm/Haswell) series processor supports 4 DIMM slots.
- This platform supports Unbuffered ECC DDR3, up to 32GB.
- DDR3 data transfer rates of 1066, 1333, and 1600 MT/s are supported.
- 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

Quantity of memory installed	Single CPU Installed	
	1	2
DIMM_A0	√	√
DIMM_B0		√

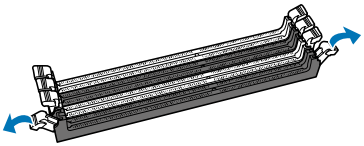
NOTE:

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 registerd DIMM if populating only a single DIMM per channel.
6. Always install with CPU0 Socket and DIMM_A0 Slot first, following the alphabetical order.

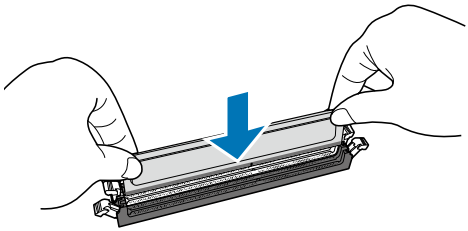
Memory Installation Procedure

Follow these instructions to install memory modules into the S5533.

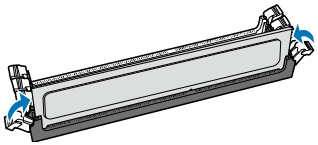
1. Press the locking levers in the direction shown in the following illustration.



2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.



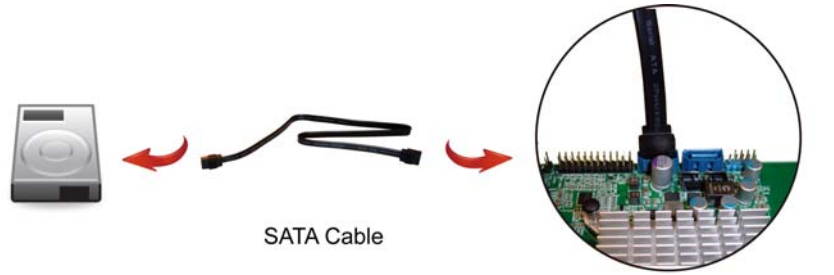
3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.



2.9 Attaching Drive Cables

Attaching SATA Cables

The following illustrates how to make a SATA Cable connection. If you are in need of SATA/SAS cables or power adapters please contact your local sales representative.



2.10 Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the slots that may appear on your motherboard.

PCI-E Gen3 x16 slot

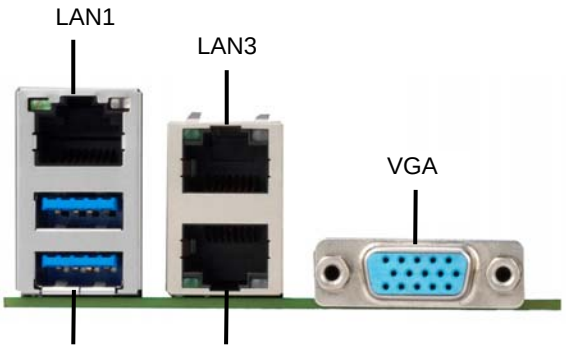
Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

TIP: It's a good practice to install add-in cards in a staggered manner rather than making them directly adjacent to each other. Doing so allows air to circulate within the chassis more easily, thus improving cooling for all installed devices.

NOTE: You must always unplug the power connector from the motherboard before performing system hardware changes to avoid damaging the board or expansion device.

2.11 Connecting External Devices

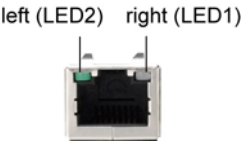
Connecting external devices to the motherboard is an easy task. The motherboard supports a number of different interfaces through connecting peripherals. See the following diagrams for the details.



Onboard LAN LED Color Definition

The **three (3)** onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

1Gbps LAN Link/Activity LED Scheme



Description		Left LED(LED2) Link/Activity	Right LED(LED1) Speed
No Link		OFF	OFF
Linked at 10 Mbps	Link	Green	OFF
	Active	Blinking Green	OFF
Linked at 100 Mbps	Link	Green	Solid Green
	Active	Blinking Green	Solid Green
Linked at 1 Gbps	Link	Green	Solid Yellow
	Active	Blinking Green	Solid Yellow

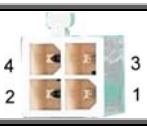
2.12 Installing the Power Supply

There are **two (2)** power connectors on your S5533 motherboard. The S5533 supports EPS 12V power supply.

J18: ATX 24-Pin Power Connector

Signal	Pin	Pin	Signal
+3.3V	1	13	+3.3V
+3.3V	2	14	-12V
GND	3	15	GND
+5V	4	16	PS ON#
GND	5	17	GND
+5V	6	18	GND
GND	7	19	GND
Power OK	8	20	Reserve
+5VSB	9	21	+5
+12V	10	22	+5
+12V	11	23	+5
+3.3V	12	24	GND

PWRCONN1: ATX 4-Pin Power Connector



Signal	Pin	Pin	Signal
GND	1	5	+12V
GND	2	6	+12V

NOTE: You must unplug the power supply before plugging the power cables to motherboard connectors.

2.13 Finishing Up

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

Chapter 3: BIOS Setup

3.1 About the BIOS

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

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

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

To start the BIOS setup utility:

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

3.1.1 Setup Basics

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

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

3.1.2 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.

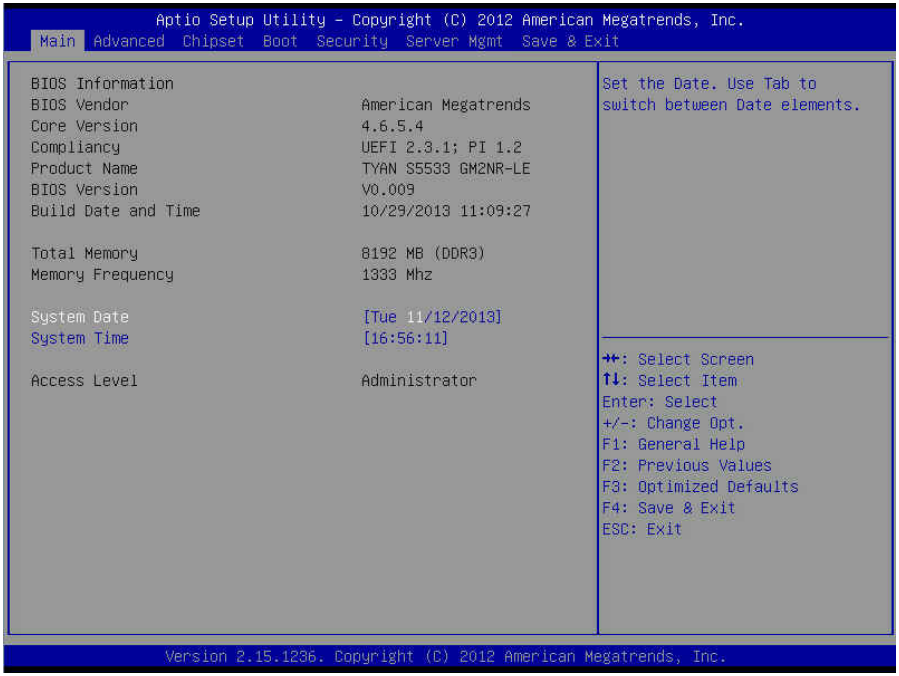
3.1.4 Setup Variations

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.

3.2 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.

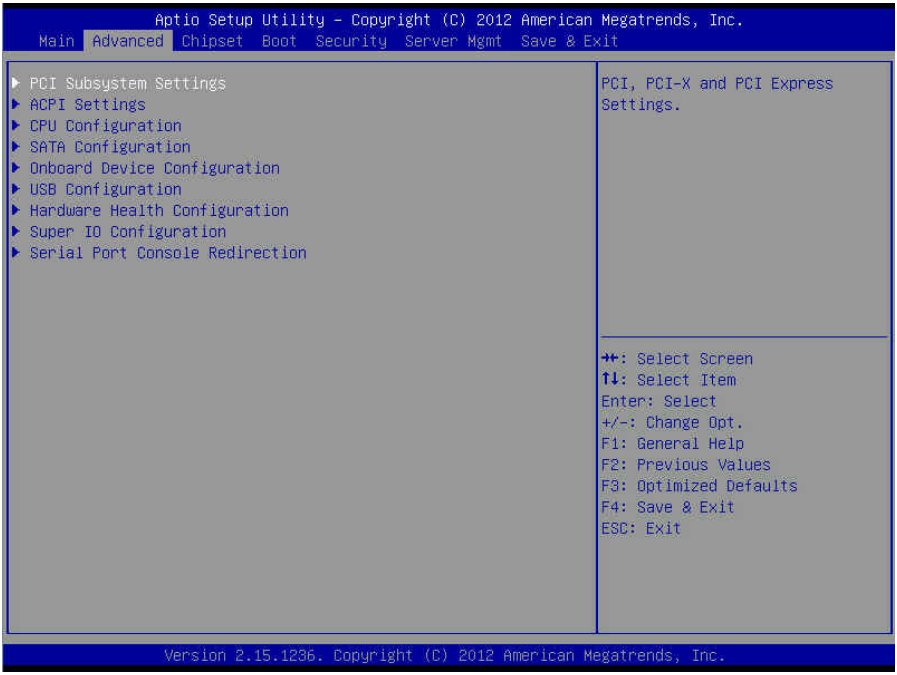
System Date
Adjust the system date.
MM (Months): DD (Days): YYYY (Years)

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

Access Level
Read only.

3.3 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.

CPU Configuration
CPU Configuration Parameters.

SATA Configuration
SATA Devices Configuration.

Onboard Device Configuration
Onboard Device Configuration.

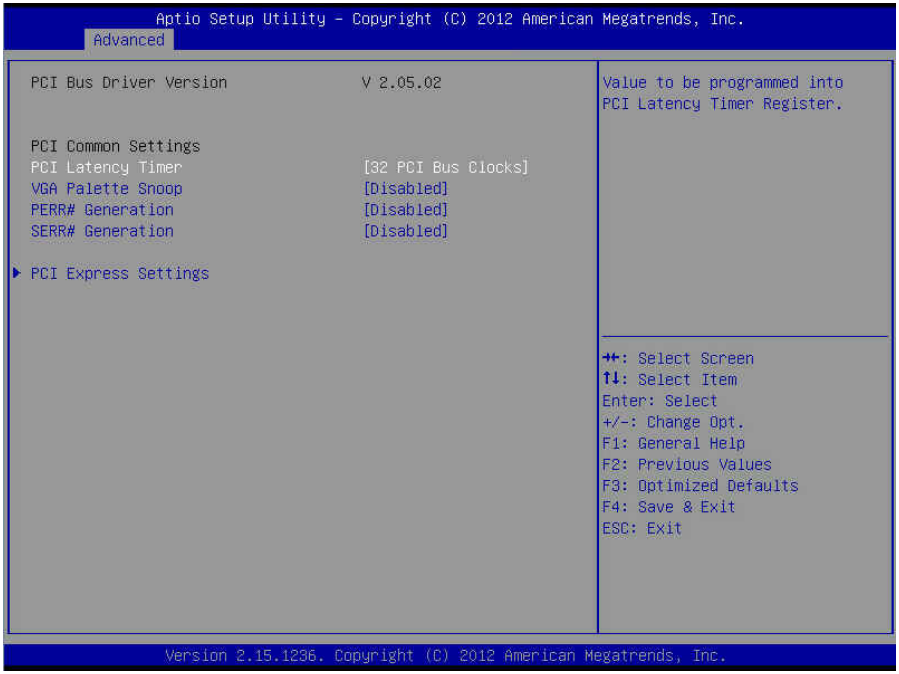
USB Configuration
USB Configuration Parameters.

Hardware Health Configuration
Hardware health Configuration Parameters.

Super IO Configuration
System Super IO Chip Parameters.

Serial Port Console Redirection
Serial Port Console Redirection.

3.3.1 PCI Subsystem Settings



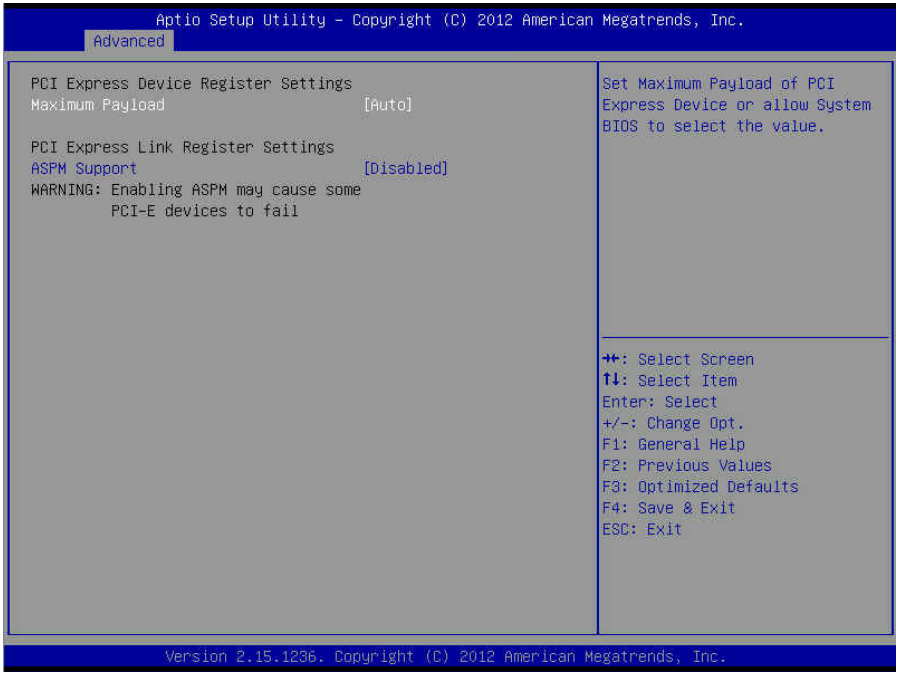
PCI Latency Timer
Value to be programmed into PCI Latency Timer Register.
32 PCI Bus Clocks / 64 PCI Bus Clocks / 96 PCI Bus Clocks / 128 PCI Bus Clocks / 160 PCI Bus Clocks / 192 PCI Bus Clocks / 224 PCI Bus Clocks / 248 PCI Bus Clocks

VGA Palette Snoop
Enables or Disables VGA Palette Registers Snooping.
Disabled / Enabled

PERR# Generation
Enables or Disables PCI Device to generate PERR#.
Disabled / Enabled

SERR# Generation
Enables or Disables PCI Device to generate SERR#.
Disabled / Enabled

3.3.1.1 PCI Express Settings



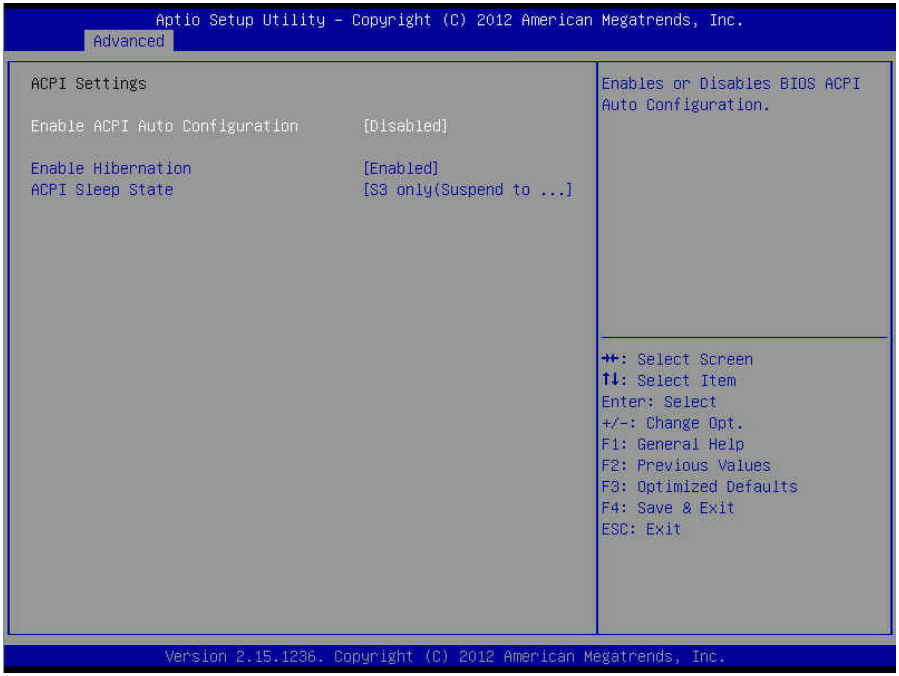
Maximum Payload
Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.

Auto / 128 Bytes / 256 Bytes / 512 Bytes / 1024 Bytes / 2048 Bytes / 4096 Bytes

ASPM Support
Set the ASPM Level: Force L0s---Force all links to L0s State; AUTO: BIOS auto configure; DISABLE: Disables ASPM.

Disabled / AUTO / Force L0s

3.3.2 ACPI Settings

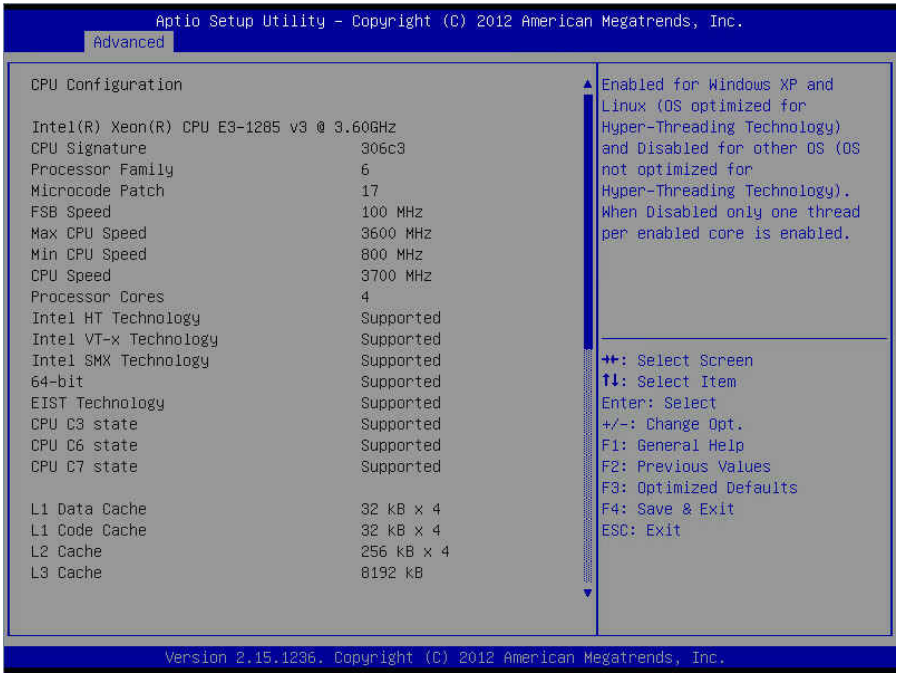


Enable ACPI Auto Configuration
Enable or disable ACPI Auto Configuration.
Disabled / Enabled

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.
Suspend Disabled / **S3 only (Suspend to RAM)**

3.3.3 CPU Configuration



CPU Configuration
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

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

Hardware Prefetcher
Enable the Mid Level Cache (L2) streamer prefetcher.
Enabled / Disabled

Adjacent Cache Line Prefetch
Enable the Mid Level Cache (L2) prefetching of adjacent cache lines.
Enabled / Disabled

CPU AES
Enable/Disable CPU Advanced Encryption Standard Instructions.
Enabled / Disabled

Boot Performance Mode
Select the performance state that the BIOS will set before OS handoff.
Turbo Performance / Max Non-Turbo Performance / Max Battery

EIST
Enable/Disable Intel SpeedStep.
Enabled / Disabled

Turbo Mode
Turbo Mode support.
Enabled / Disabled

Energy Performance
Optimize between performance and power savings.
Performance / Balanced Performance / Balanced Energy / Energy Efficient

CPU C states
Enable or disable CPU C states.
Enabled / Disabled

Enhanced C1 State
Enhanced C1 state.
Enabled / Disabled

CPU C3 Report
Enable/Disable CPU C3 Report to OS.
Enabled / Disabled

CPU C6 Report
Enable/Disable CPU C6 Report to OS.
Enabled / Disabled

C6 Latency
Configure Short/Long latency for C6.

Short / Long

CPU C7 Report
Enable/Disable CPU C7 Report to OS.
CPU C7s / CPU C7 / Disabled

C7 Latency
Configure Short/Long latency for C7.
Short / Long

C1 state auto demotion
Processor will conditionally demote C3/C6/C7 requests to C1 based on uncore auto-demote information.
Enabled / Disabled

C3 state auto demotion
Processor will conditionally demote C6/C7 requests to C3 based on uncore auto-demote information.
Enabled / Disabled

Package C state demotion
Enable Package C state demotion.
Disabled / Enabled

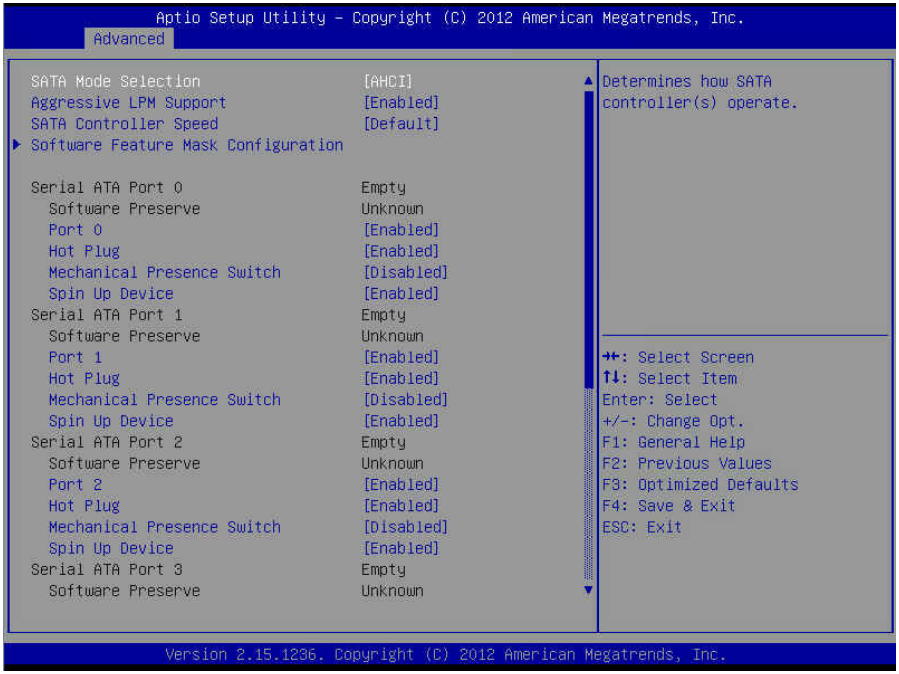
C1 state auto undemotion
Un-demotion from Demoted C1.
Enabled / Disabled

C3 state auto undemotion
Un-demotion from Demoted C3.
Enabled / Disabled

Package C state undemotion
Enable Package C state undemotion.
Disabled / Enabled

Package C State Limit
Select Package C State Limit.
Auto / C0/C1 / C2 / C3 / C6/ C7 / C7s

3.3.4 SATA Configuration



SATA Mode Selection
Determines how SATA controller(s) operate.
IDE / **AHCI** / RAID

Aggressive LPM Support
Enable PCH to aggressively enter link power state.
Enabled / Disabled

SATA Controller Speed
Indicates the maximum speed the SATA controller can support.
Default / Gen1 / Gen2 / Gen3

Serial ATA Port 0/1/2/3/4/5 /Software Preserve
Read only.

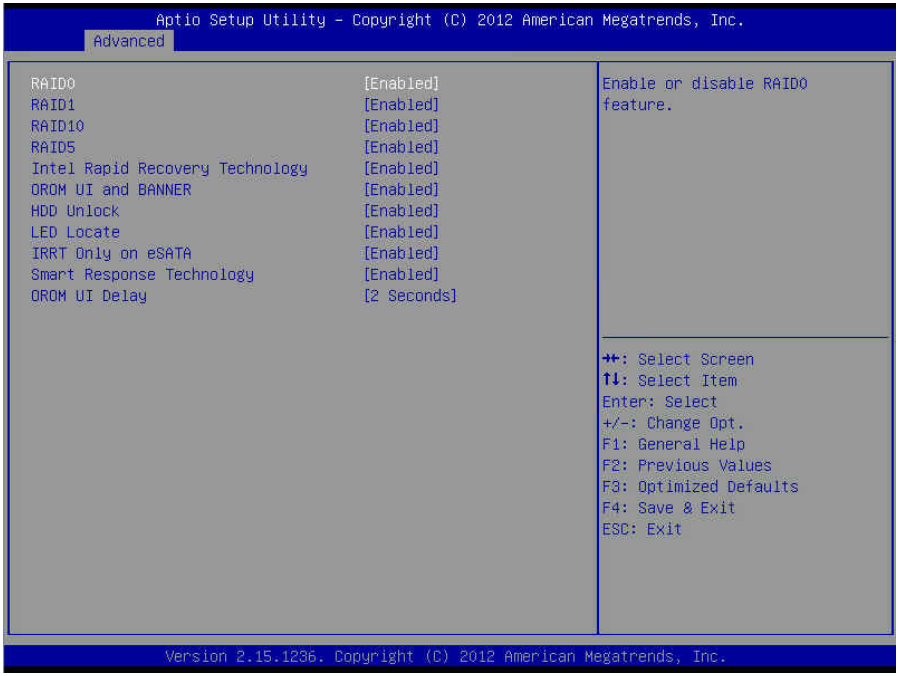
Port 0/1/2/3/4/5
Enable or disable SATA Port.
Enabled / Disabled

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

Mechanical Presence Switch
Controls reporting if this port has a Mechanical Presence Switch. NOTE: Requires hardware support.
Disabled / Enabled

Spin Up Device
On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.
Enabled / Disabled

3.3.4.1 Software Feature Mask Configuration



RAID0
Enable or disable RAID0 feature.
Enabled / Disabled

RAID1
Enable or disable RAID1 feature.
Enabled / Disabled

RAID10
Enable or disable RAID10 feature.
Enabled / Disabled

RAID5
Enable or disable RAID5 feature.
Enabled / Disabled

Intel Rapid Recovery Technology
Enable or disable Intel Rapid Recovery Technology.
Enabled / Disabled

OROM UI and BANNER
If enabled, then the OROM UI is shown. Otherwise, no OROM banner or information will be displayed if all disks and RAID volumes are Normal.
Enabled / Disabled

HDD Unlock
If enabled, indicates that the HDD password unlock in the OS is enabled.
Enabled / Disabled

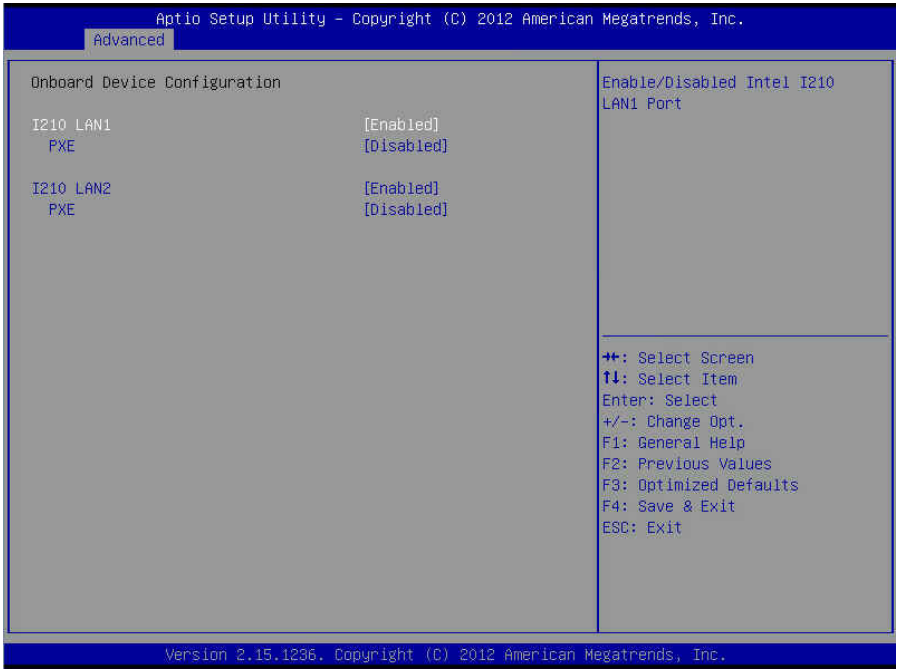
LED Locate
If enabled, indicates that the LED/SGPIO hardware is attached and ping to locate feature is enabled on the OS.
Enabled / Disabled

IRRT Only on eSATA
If enabled, then only IRRT volumes can span internal and eSATA drives. If disabled, then any RAID volume can span internal and eSATA drives.
Enabled / Disabled

Smart Response Technology
Enable or disable Smart Response Technology.
Enabled / Disabled

OROM UI Delay
If enabled, indicates the delay of the OROM UI Splash Screen is a normal status.
2 Seconds / 4 Seconds / 6 Seconds / 8 Seconds

3.3.5 Onboard Device Configuration



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

I210 LAN1
Enable/disable Intel I210 LAN1 Port.
Enabled / Disabled

I210 LAN1 PXE
Enable/disable I210 LAN1 PXE.
Disabled / Enabled

I210 LAN2
Enable/disable Intel I210 LAN2 Port.
Enabled / Disabled

I210 LAN2 PXE
Enable/disable I210 LAN2 PXE.
Disabled / Enabled

3.3.6 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

USB3.0 Support
Enable/disable USB3.0 (XHCI) Controller support.

Enabled / Disabled

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

Enabled / Disabled

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

Enabled / **Disabled**

USB Mass Storage Driver Support
Enable/disable USB Mass Storage Driver Support.
Enabled / Disabled

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

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

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

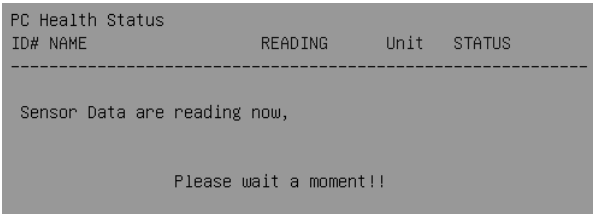
3.3.7 Hardware Health Configuration

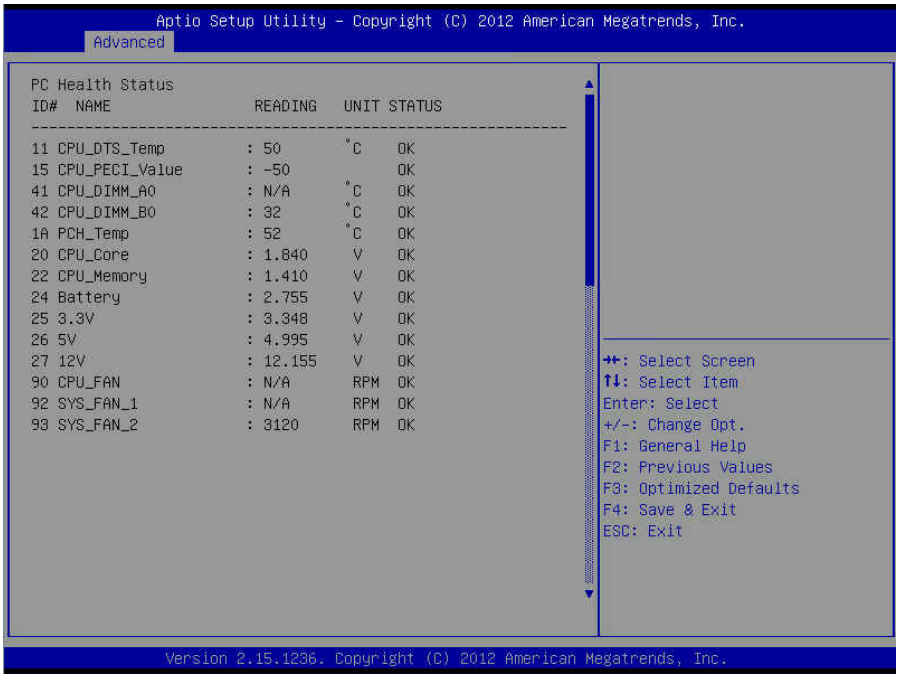
Auto Fan Control
Auto Fan Control Help.
Disabled / Enabled

BMC Alert Beep
BMC Alert Beep On/Off.
On / Off

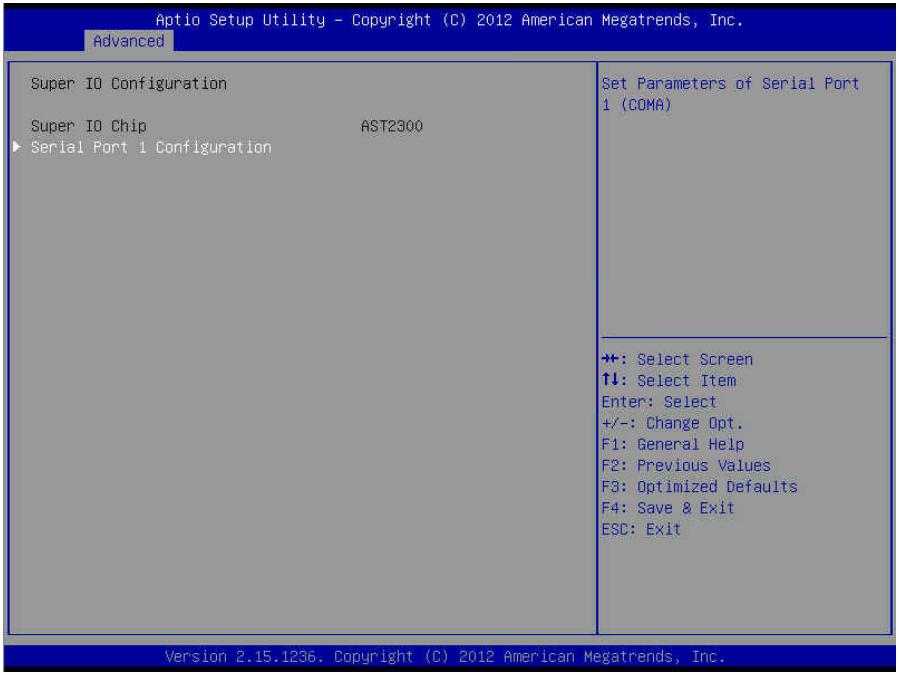
3.3.7.1 Sensor Data Register Monitoring

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.



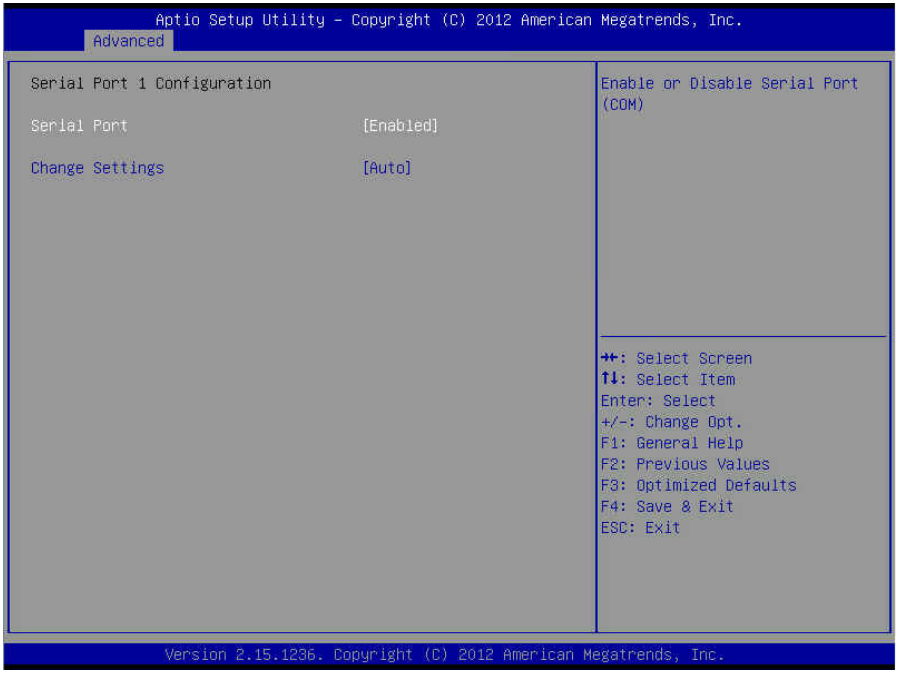

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
PC Health Status
ID# NAME READING UNIT STATUS
11 CPU_DTS_Temp : 50 °C OK
15 CPU_PECI_Value : -50 OK
41 CPU_DIMM_A0 : N/A °C OK
42 CPU_DIMM_B0 : 32 °C OK
1A PCH_Temp : 52 °C OK
20 CPU_Core : 1.840 V OK
22 CPU_Memory : 1.410 V OK
24 Battery : 2.755 V OK
25 3.3V : 3.348 V OK
26 5V : 4.995 V OK
27 12V : 12.155 V OK
90 CPU_FAN : N/A RPM OK
92 SYS_FAN_1 : N/A RPM OK
93 SYS_FAN_2 : 3120 RPM OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

3.3.8 Super IO Configuration



Super IO Chip
Read only.

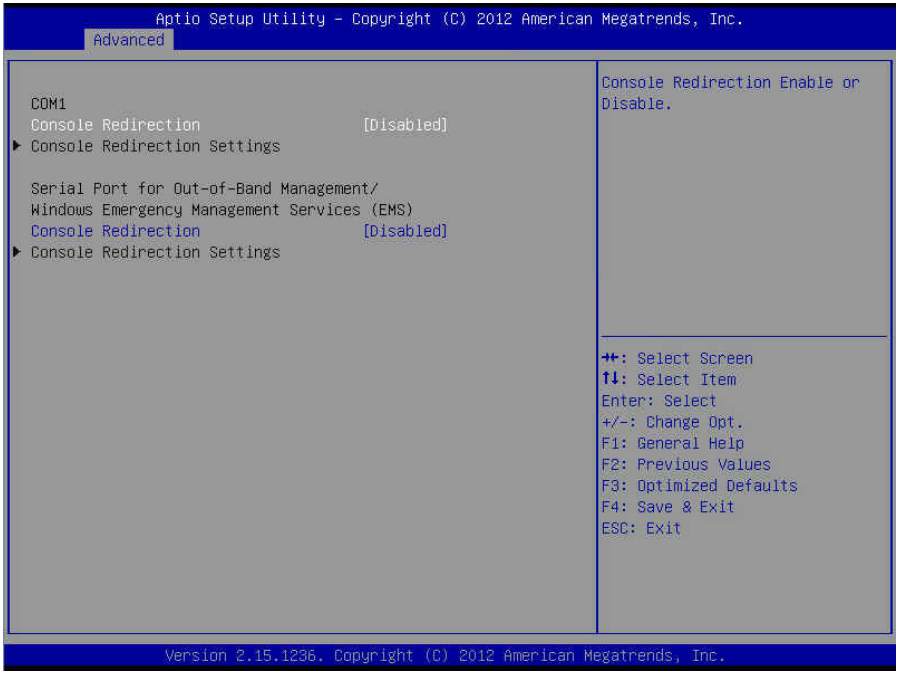
3.3.8.1 Serial Port 1 Configuration



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

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

3.3.9 Serial Port Console Redirection

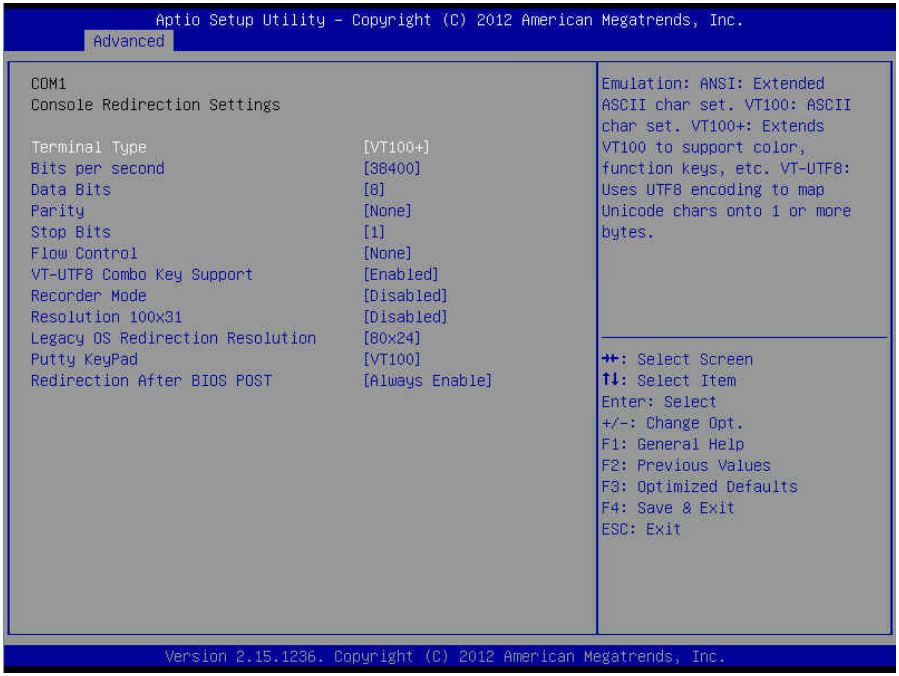


Console Redirection
Console redirection enable or disable.
Disabled / Enabled

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

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

3.3.9.1 Console Redirection Settings



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

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

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

38400 / 9600 / 19200 / 115200 / 57600

Data Bits

8 / 7

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

None / Even / Odd / Mark / Space

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

1 / 2

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

None / Hardware RTS/CTS

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

Enabled / Disabled

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

Disabled / Enabled

Resolution 100x31
Enable or disable extended terminal resolution.

Disabled / Enabled

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

80x24 / 80x25

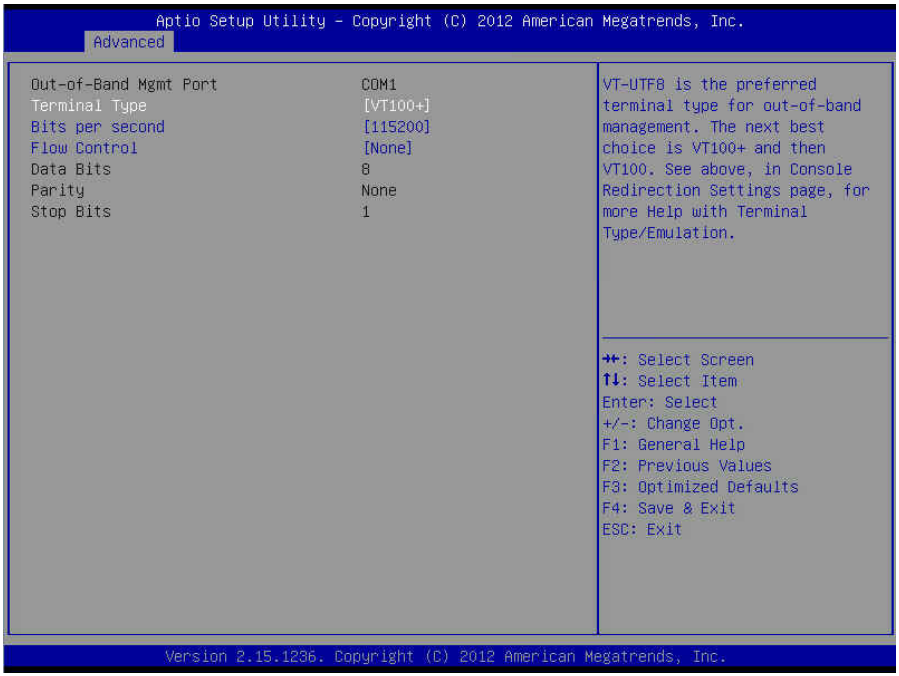
Putty KeyPad
Select FunctionKey and KeyPad on Putty.

VT100 / LINUX / XTERMR6 / SCO / ESCN / VT400

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

Always Enable / BootLoader

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



Out-of Band Mgmt Port
Read only

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

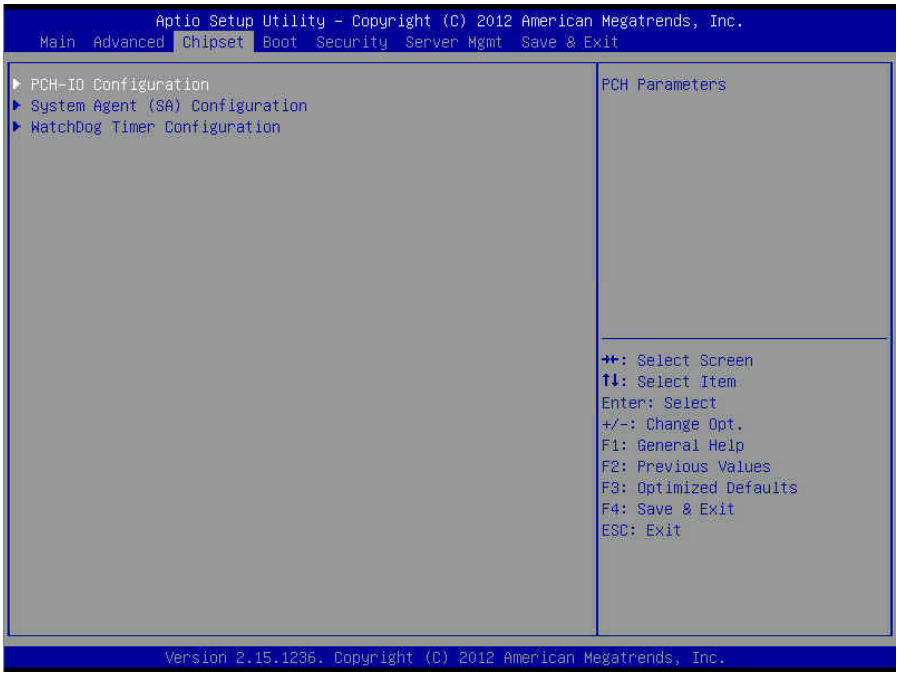
buffers are empty, a ‘start’ signal can be sent to restart the flow. Hardware flow control uses two wires to send start/stop signal.

None / Hardware RTS/CTS

Data Bits / Parity / Stop Bits

Read only.

3.4 Chipset Menu

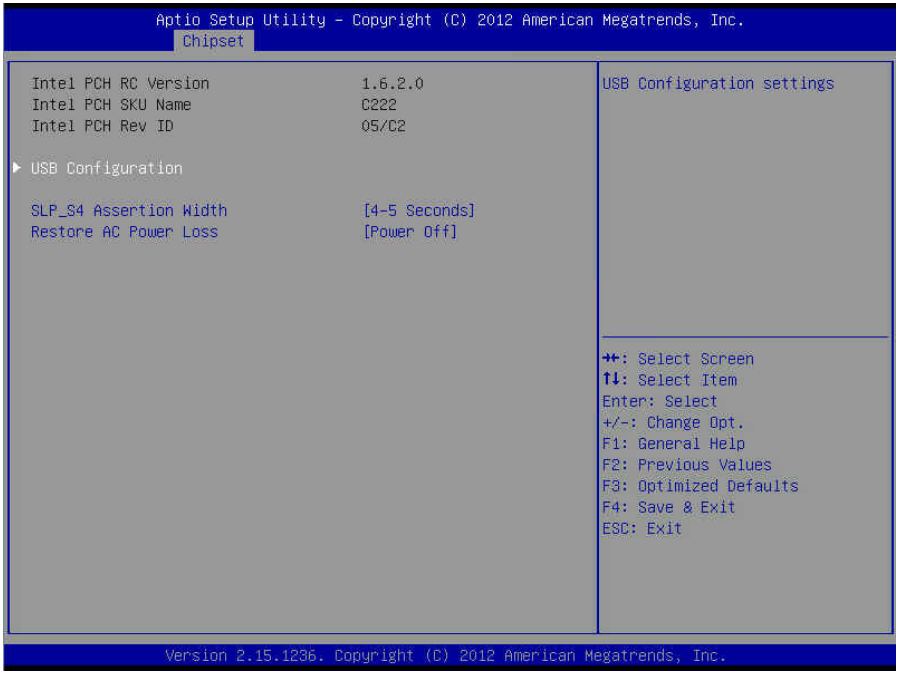


PCH-IO Configuration
PCH Parameters.

System Agent (SA) Configuration
System Agent (SA) Parameters.

WatchDog Timer Configuration
WatchDog Timer Configuration.

3.4.1 PCH-IO Configuration



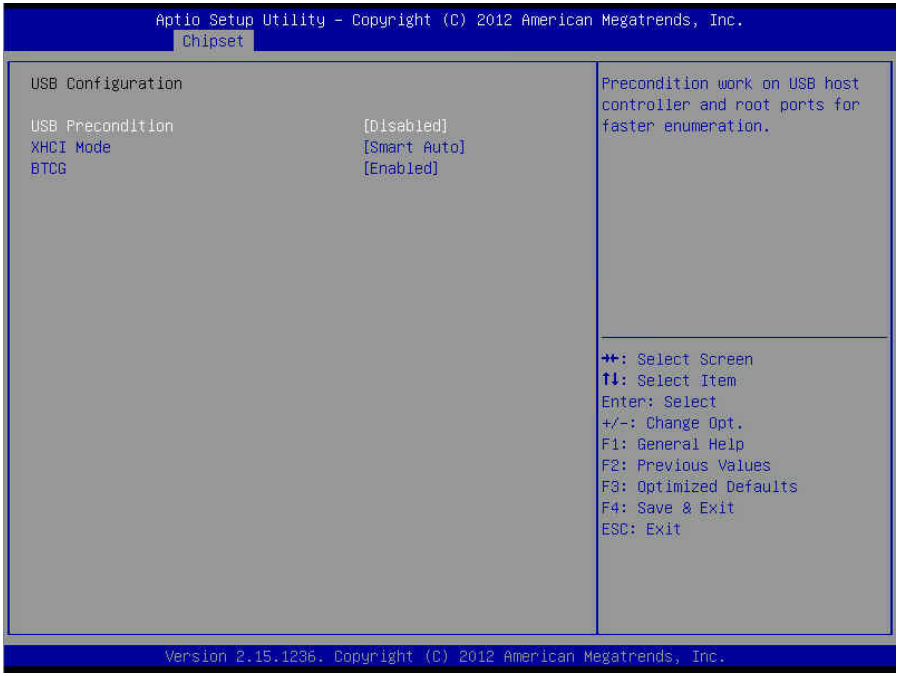
SLP_S4 Assertion Width
Select a minimum assertion width of the SLP_S4# signal.

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

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

3.4.1.1 USB Configuration

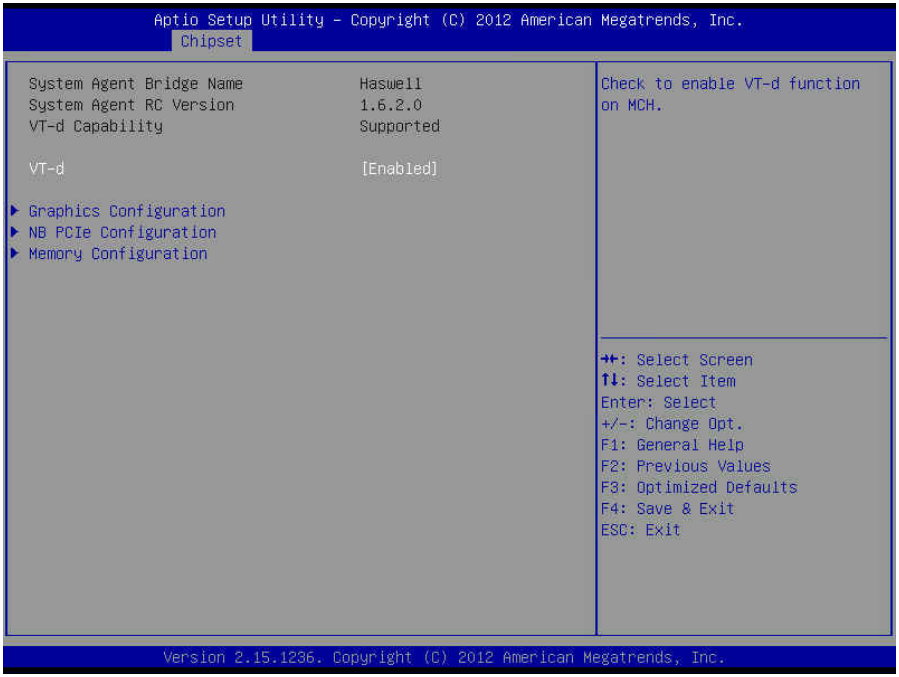


USB Precondition
Precondition work on USB host controller and root ports for faster enumeration.
Disabled / Enabled

XHCI Mode
Mode of operation of XHCI controller.
Smart Auto / Auto / Enabled / Disabled / Manual

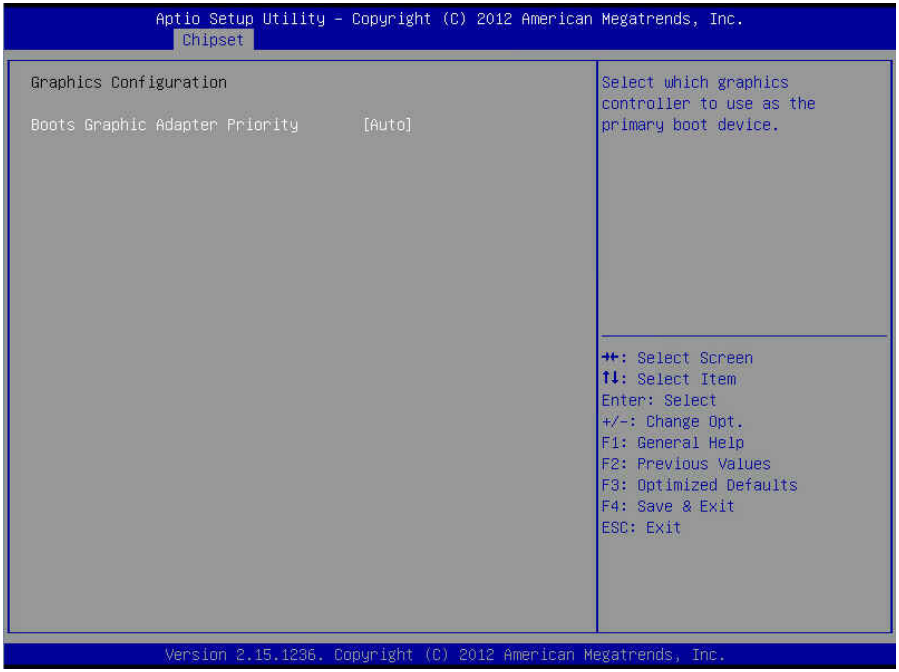
BTCG
Enable/disable trunk clock gating.
Disabled / Enabled

3.4.2 System Agent (SA) Configuration



VT-d
Check to enable VT-d function on MCH.
Enabled / Disabled

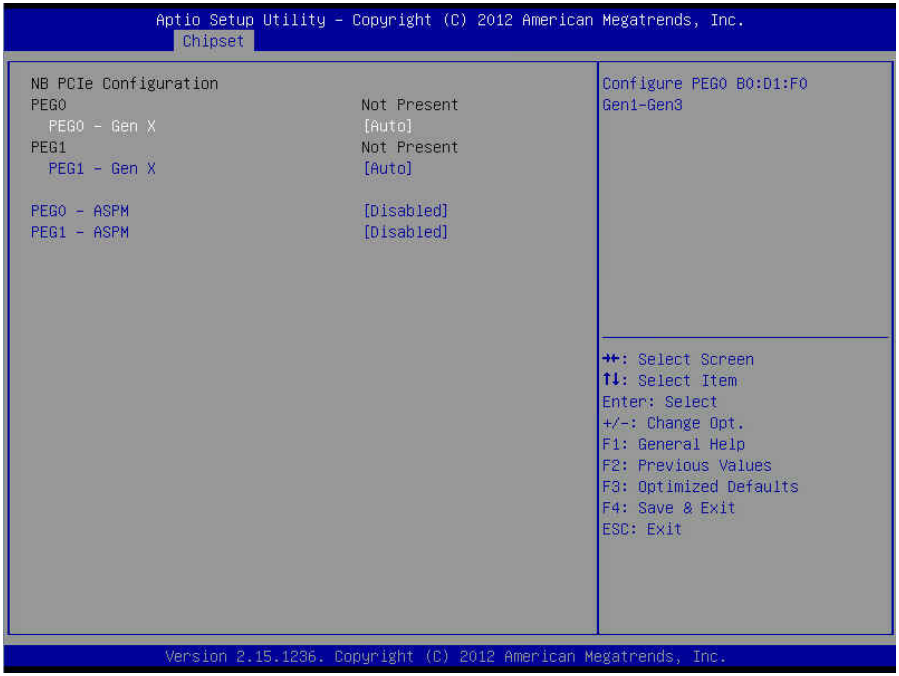
3.4.2.1 Graphics Configuration



Boots Graphic Adapter Priority
Select which graphics controller to use as the primary boot device.

Auto / PEG / Onboard VGA

3.4.2.2 NB PCIe Configuration



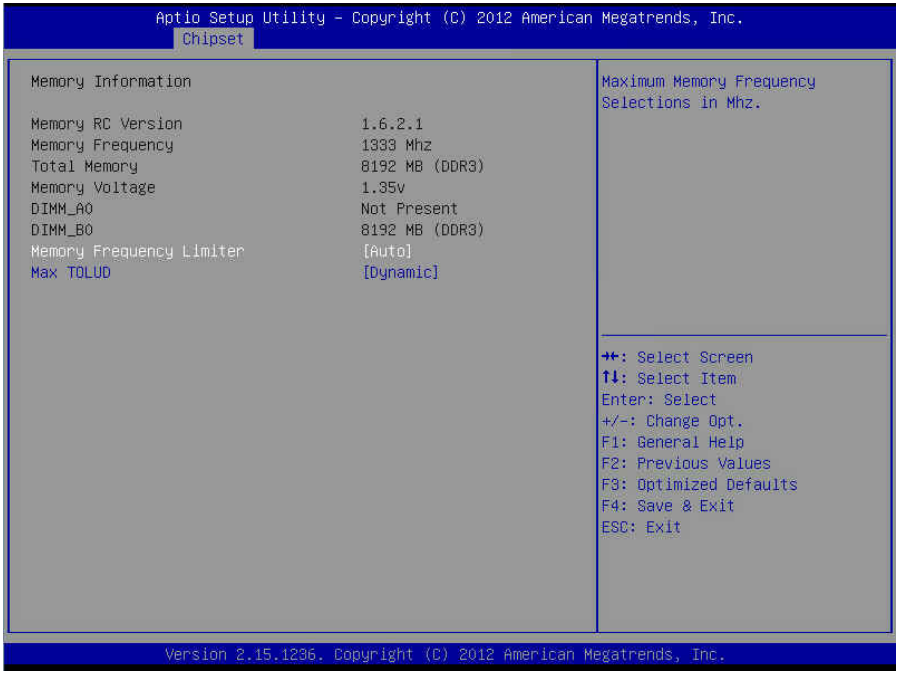
PEG0 – Gen X
Configure PEG0 B0:D1:F0 Gen1-Gen3.
Auto / Gen1 / Gen2 / Gen3

PEG1 – Gen X
Configure PEG1 B0:D1:F1 Gen1-Gen3.
Auto / Gen1 / Gen2 / Gen3

PEG0 ASPM
Control ASPM support for the PEG Device. This has no effect if PEG is not the currently active device.
Disabled / Auto / ASPM L0s / ASPM L1s / ASPM L0sL1

PEG1 ASPM
Control ASPM support for the PEG Device. This has no effect if PEG is not the currently active device.
Disabled / Auto / ASPM L0s / ASPM L1s / ASPM L0sL1

3.4.2.3 Memory Configuration



Memory Information
Read only.

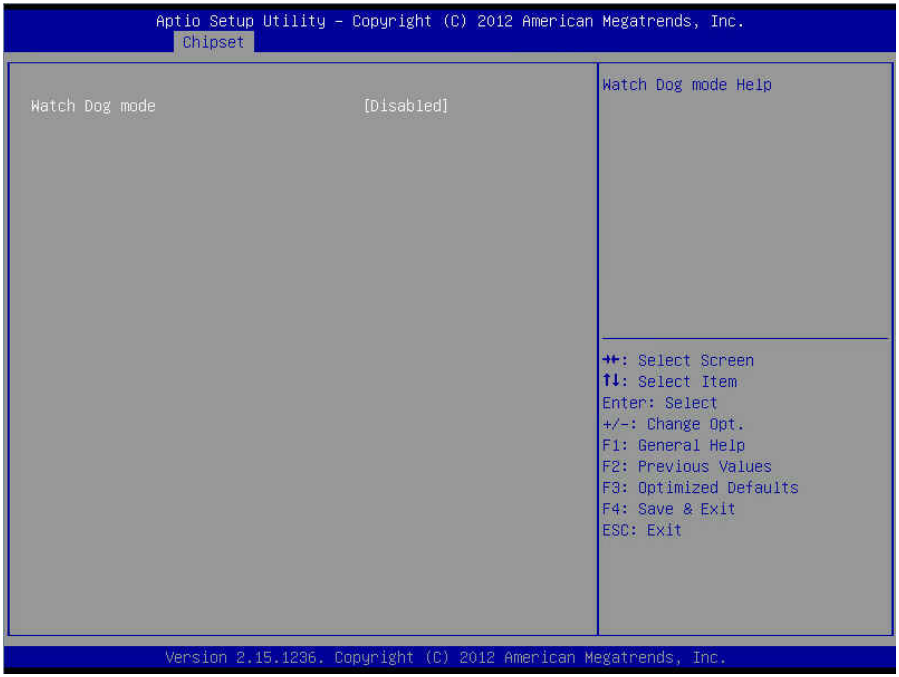
Memory Frequency Limiter
Maximum Memroy Frequency Selections in MHz.

Auto / 1067 / 1333 / 1600 / 1867 / 2133 / 2400 / 2667

Max TOLUD
Maximum value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.

Dynamic / 1GB / 1.25GB / 1.5GB / 1.75GB / 2GB / 2.25GB / 2.5GB / 2.75GB / 3GB / 3.25GB

3.4.3 WatchDog Timer Configuration

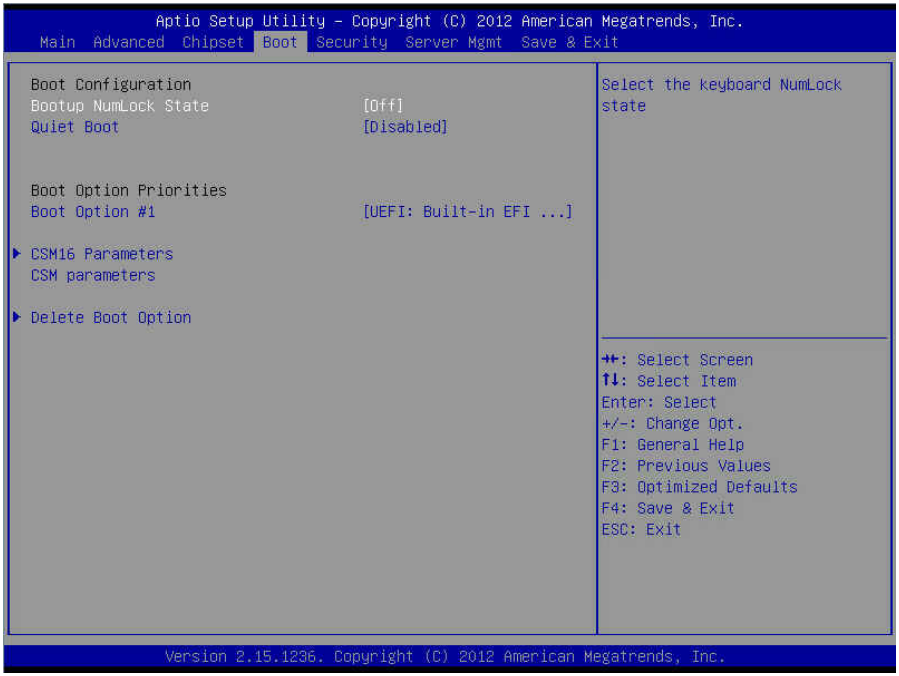


Watch Dog Mode
Watch Dog Mode Help.
Disabled / POST / OS / PowerON

NOTE: Watch Dog Timer will appear when **Watch Dog Mode** is set to [Enabled].

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

3.5 Boot

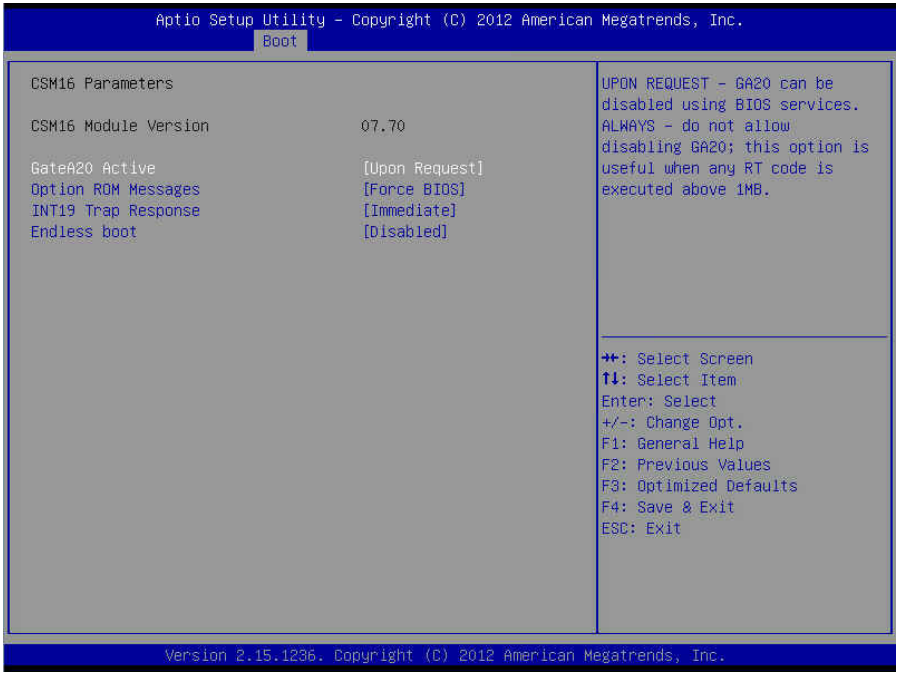


Bootup NumLock State
Select the keyboard NumLock state.
Off / On

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

Boot Option #1
Set the system boot order.
Device Name / Disabled

3.5.1 CSM16 Parameters



GateA20 Active
Upon Request: GA20 can be disabled using BIOS services.
Always: do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Upon Request / Always

Option ROM Messages
Set display mode for Option ROM.

Force BIOS / Keep Current

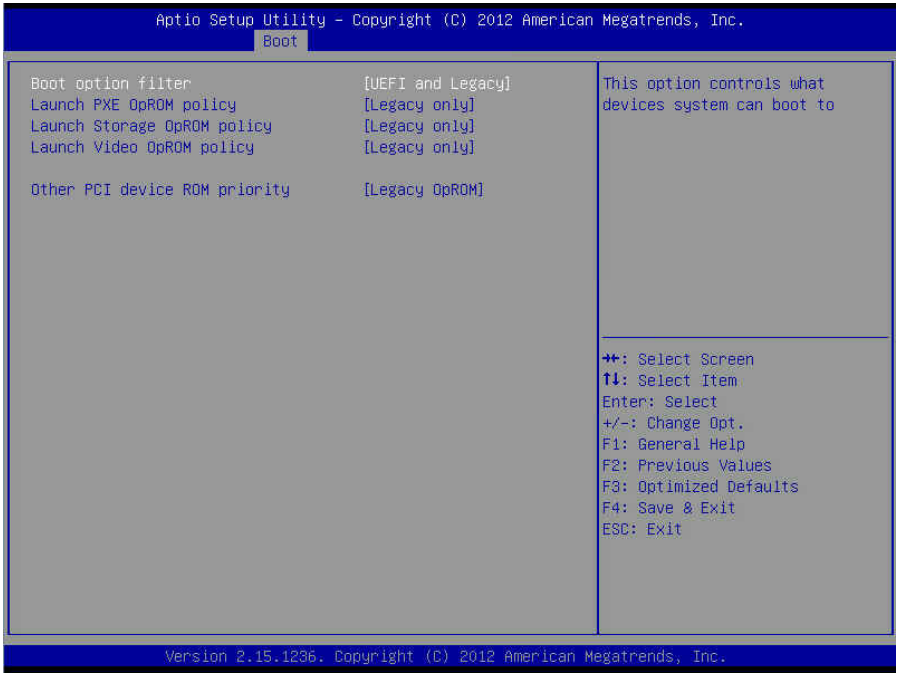
INT19 Trap Response
BIOS reaction on INT19 trapping by Option ROM:
Immediate --- execute the trap right away; Postponed --- execute the trap during the legacy boot.

Immediate / Postponed

Endless Boot
Enable or disable endless boot.

Disabled / Enabled

3.5.2 CSM Parameters



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

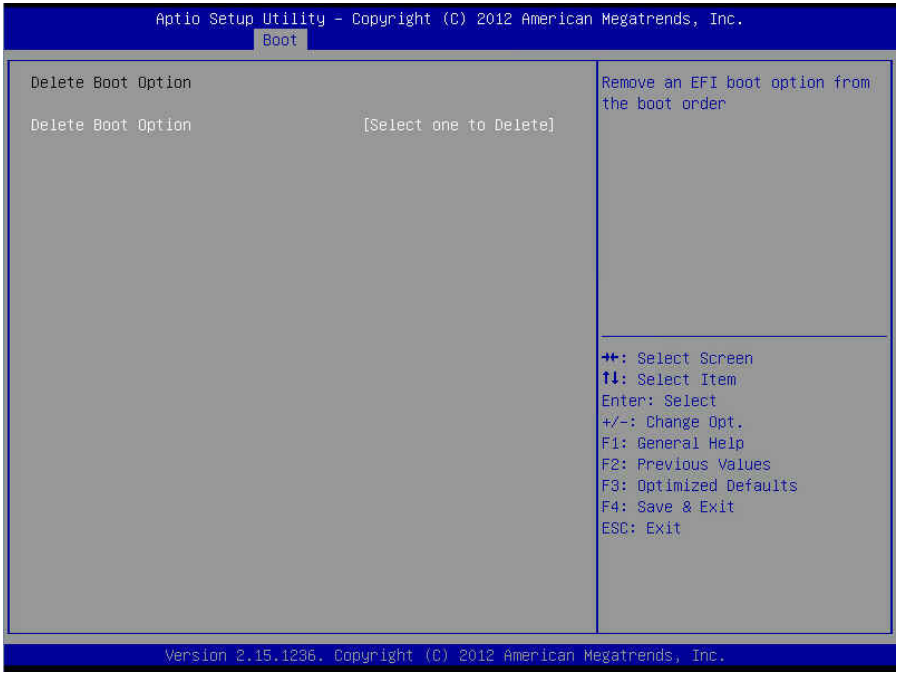
Launch PXE OpROM policy
Control the execution of UEFI and Legacy PXE OpROM.
Do not launch / UEFI only / **Legacy only**

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 / **Legacy only** / UEFI only

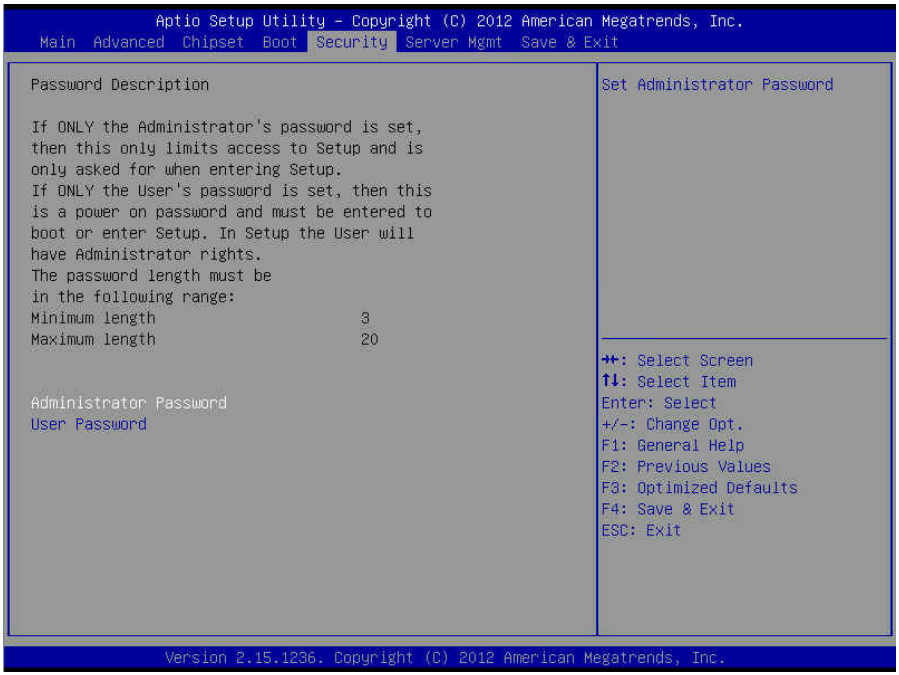
Other PCI device ROM priority
For PCI devices other than Network, Mass storage or Video defines which OpROM to launch.
Legacy OpROM / UEFI OpROM

3.5.3 Delete Boot Option



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

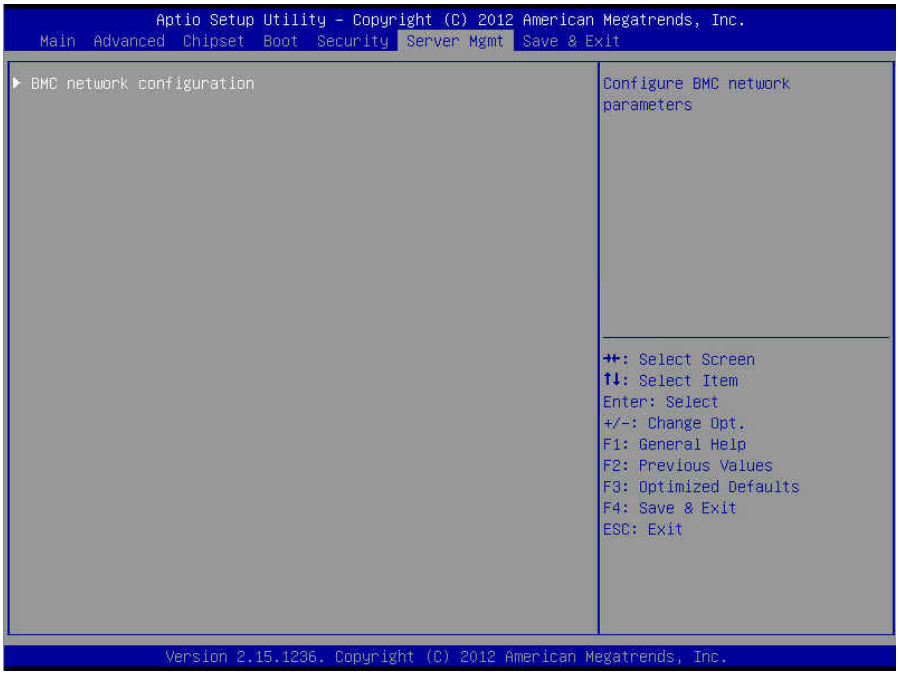
3.6 Security



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.

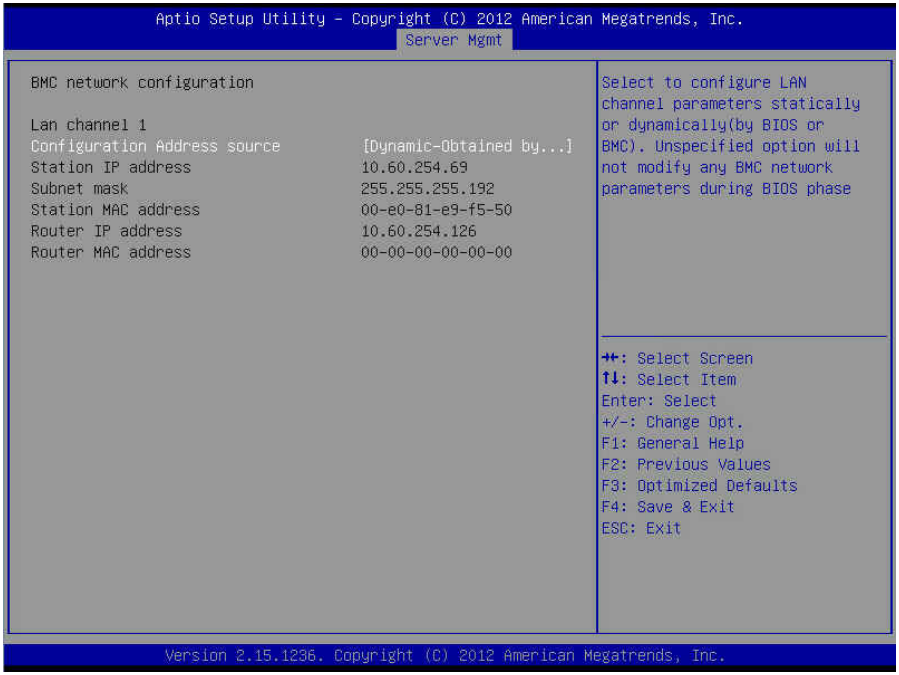
User Password
Set user password in the ***Create New Password*** window. After you key in the password, the ***Confirm New Password*** window will pop out to ask for confirmation.

3.7 Server Management



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

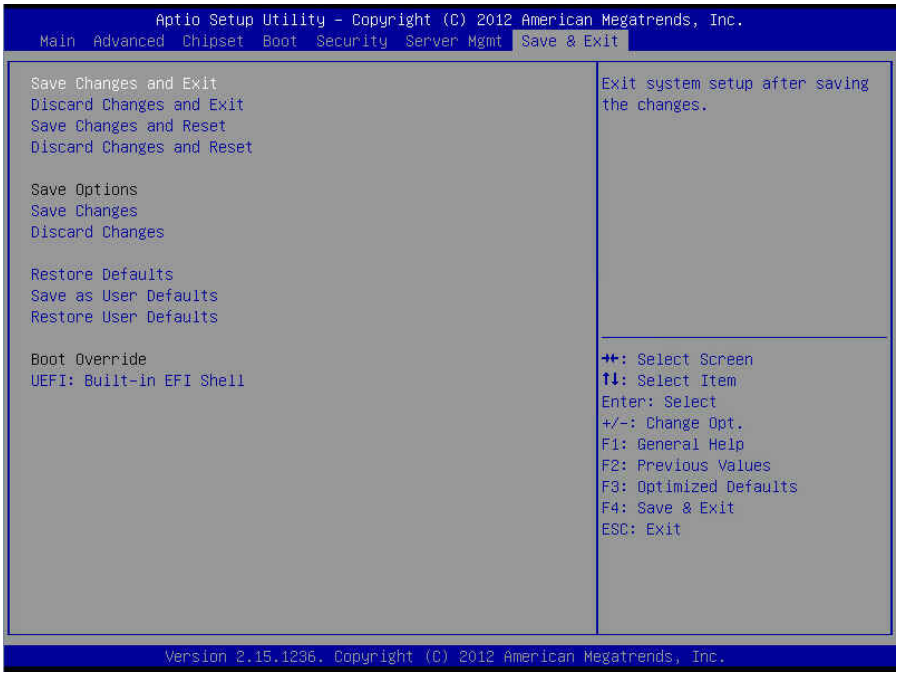
3.7.1 BMC Network Configuration



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

Unspecified / Static / Dynamic-Obtained by BMC

3.8 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.

Chapter 4: Diagnostics

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

Memory, Video, CPU

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

4.1 Flash Utility

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

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

4.2 AMIBIOS Post Code (Aptio)

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

Checkpoint Ranges

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

Standard Checkpoints

SEC Phase

Status Code	Description
0x00	Not used
Progress Codes	
0x01	Power on. Reset type detection (soft/hard).
0x02	AP initialization before microcode loading
0x03	North Bridge initialization before microcode loading
0x04	South Bridge initialization before microcode loading
0x05	OEM initialization before microcode loading
0x06	Microcode loading
0x07	AP initialization after microcode loading
0x08	North Bridge initialization after microcode loading
0x09	South Bridge initialization after microcode loading
0x0A	OEM initialization after microcode loading
0x0B	Cache initialization

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

SEC Beep Codes
None

PEI Phase

Status Code	Description
Progress Codes	
0x10	PEI Core is started
0x11	Pre-memory CPU initialization is started
0x12	Pre-memory CPU initialization (CPU module specific)
0x13	Pre-memory CPU initialization (CPU module specific)
0x14	Pre-memory CPU initialization (CPU module specific)
0x15	Pre-memory North Bridge initialization is started
0x16	Pre-Memory North Bridge initialization (North Bridge module specific)
0x17	Pre-memory North Bridge initialization (North Bridge module specific)
0x18	Pre-Memory North Bridge initialization (North Bridge module specific)
0x19	Pre-memory South Bridge initialization is started
0x1A	Pre-Memory South Bridge initialization (South Bridge module specific)
0x1B	Pre-memory South Bridge initialization (South Bridge module specific)
0x1C	Pre-Memory South Bridge initialization (South Bridge module specific)
0x1D – 0x2A	OEM pre-memory initialization codes
0x2B	Memory initialization. Serial Presence Detect (SPD) data reading
0x2C	Memory initialization. Memory presence detection
0x2D	Memory initialization. Programming memory timing information
0x2E	Memory initialization. Configuring memory
0x2F	Memory initialization (other)
0x30	Reserved for ASL (see ASL Status Codes section below)
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 IPL is started
PCI Error Codes	
0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed
0x52	Memory initialization error. Invalid memory size or memory modules do not match
0x53	Memory initialization error. No usable memory detected
0x54	Unspecified memory initialization error
0x55	Memory not installed
0x56	Invalid CPU type or speed
0x57	CPU mismatch
0x58	CPU self test failed or possible CPU cache error
0x59	CPU microcode is not found or microcode update is failed
0x5A	Internal CPU error
0x5B	Reset PPI is not available
0x5C – 0x5F	Reserved for future AMI error codes
S3 Resume Progress Codes	
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

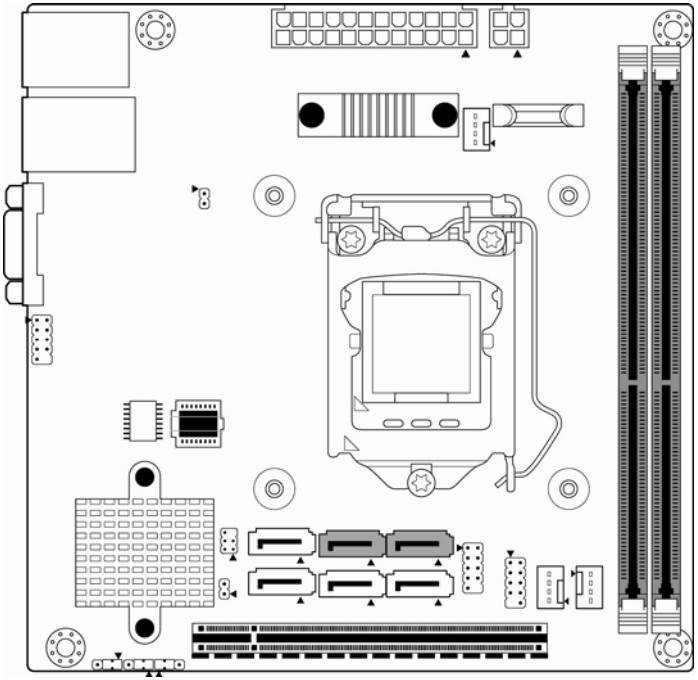
# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met

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 PIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

Appendix I: Fan and Temp Sensors

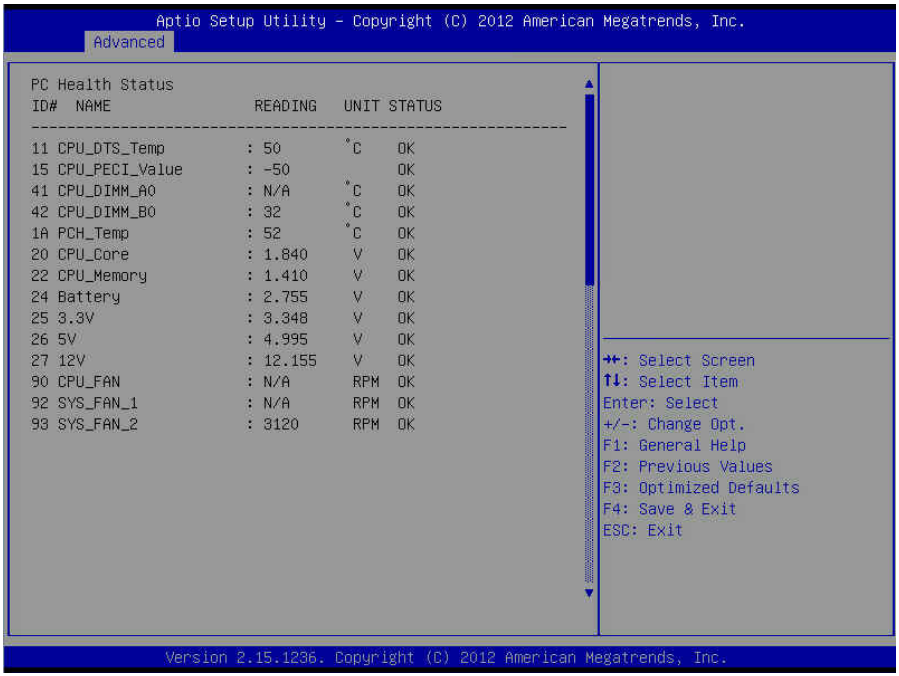
This section aims to help readers identify the locations of some specific FAN and Temp Sensors on the motherboard. A table of BIOS Temp sensor name explanation is also included for readers' reference.



Fan Sensor Location:

1. Fan Sensor: It is located in the third pin of the fan connector, which detects the fan speed (rpm)

BIOS Temp Sensor Name Explanation:



BIOS Temp Sensor	Name Explanation
CPU_DTS_Temp	Temperature of the CPU Digital Temperature Sensor
CPU_PECI_Value	Temperature of the CPU Platform Environment Control Interface
CPU_DIMM_A0	Temperature of DIMM1 Slot
CPU_DIMM_B0	Temperature of DIMM2 Slot
PCH_ Temp.	Temperature of the PCH Area
BIOS FAN Sensor	**Name Explanation**
CPU_FAN	Fan speed of CPU_FAN
SYS_FAN_1	Fan speed of SYS_FAN_1
SYS_FAN_2	Fan speed of SYS_FAN_2

Glossary

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

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

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

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

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

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

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

Buffer: a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

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

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

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

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

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

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

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

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

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

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which looses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

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

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

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

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

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

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

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

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

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

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

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

IDE INT (IDE Interrupt): Hardware interrupt signal that goes to the IDE.

I/O (Input/Output): the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

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

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

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

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

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

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

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

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

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

PXE (Preboot Execution Environment): one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.

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

RAIDIOS: RAID I/O Steering (Intel)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Technical Support

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

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

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

Help Resources:

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

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

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

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

Operation is subject to the following conditions:

This device may not cause harmful interference, and this device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:
Reorient or relocate the receiving antenna.
Increase the separation between the equipment and the receiver.
Plug the equipment into an outlet on a circuit different from that of the receiver.
Consult the dealer on an experienced radio/television technician for help.

Notice for Canada
This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteference radio.)

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. There is danger of an explosion if the 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.

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