



S5537

Version 1.0

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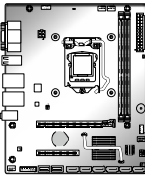
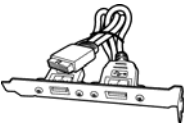
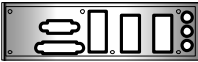
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Before you begin...

Check the box contents!

The retail motherboard package should contain the following:

	1 x S5537 Motherboard
	6 x SATA Cable
	1 x USB 3.0 Bracket
	1 x Rear IO Shield
	1 x S5537 Quick reference guide
	1 x TYAN® Driver's and Utilities DVD

IMPORTANT NOTE:

Sales sample may not come with the accessory listed above.

Please contact your sales representative to help order accessory for your evaluation.

Chapter 1: Instruction

1.1 Congratulations

You have purchased the powerful TYAN® S5537 motherboard, based on the Intel® Q87 and Nuvoton NCT6683D-T chipsets. The S5537 is designed to support single Intel® Core i3/i5/i7 series processor, and up to 16GB of un-buffered ECC 1066/1333/1600MHz DDR3 memory. Leveraging advanced technology from Intel®, the S5537 is capable of offering scalable 32 and 64-bit computing, high-bandwidth memory design, and lightning-fast PCI-E bus implementation.

The S5537 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 provides the S5537 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 Specifications

TYAN S5537 (S5537AG2NR)

Processor	Supported CPU Series	Intel Core i3/ i5/ i7 series processors
	Socket Type / Q'ty	LGA 1150/ (1)
	Thermal Design Power (TDP) wattage	Max up to 95W
Chipset	PCH	Intel Q87
	Super I/O	NCT6683D-T
Memory	Supported DIMM Qty	(2) DIMM slots
	DIMM Type / Speed	Unbuffered Non-ECC DDR3 1600/1333/1066
	Capacity	Up to 16GB
	Memory channel	1 Channel
	Memory voltage	1.5V
Expansion Slots	PCI-E	(1) PCI-E Gen.2 x8 slots (w/ x4 link) / (1) PCI-E Gen3 x16 slot
	Port Q'ty	(2)
LAN	Controller	Intel I210
	PHY	Intel I217
Storage	SATA Connector	(6) SATA

	Controller	Intel Q87
	Speed	6.0 Gb/s
	RAID	RAID 0/1/10/5 (Intel RST)
Graphic	Connector type	D-Sub 15-pin / DVI-D
	Resolution	Up to 1920x1440
	Chipset	Intel Q87
Audio	Chipset	Realtek ALC892-GR
	Feature	High Definition Audio
Input /Output	USB	(4) USB3.0 ports (2 at rear, 2 via cable)+(8) USB2.0 ports (6 at rear, 2 Type-A)
	COM	(1) header
	VGA	(1) D-Sub 15-pin VGA port
	DVI	(1) DVI-D connector
	Audio	LINE_IN, LINE_OUT, MIC_IN connectors
	RJ-45	(2) GbE ports
	Power	SSI/ATX 24-pin + 4-pin power connectors
	Front Panel	(1) 2 x 5 header
	SATA	(6) SATA-III connectors
System Monitoring	Chipset	NCT6683D-T
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (4) 4-pin headers
	Temperature	Monitors temperature for CPU & system environment
	LED	PSU fail LED indicator
	Others	Watchdog timer support
BIOS	Brand / ROM size	AMI / 16MB
	Feature	Plug and Play (PnP) /SMBIOS2.8 /PXE boot / ACPI 5.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types / S0,S3,S4,S5 states supported
Physical Dimension	Form Factor	Flex ATX
	Board Dimension	9"x7.5" (228.6x190.5mm)
Operating System	OS supported list	Please refer to our Intel OS supported list.
Regulation	FCC (DoC)	Class B
	CE (DoC)	Yes
Operating Environment	Operating Temp.	0° C ~ 55° C (32° F~ 131° 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) S5537 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
		USB (1) CCBL-035J, 2-port USB bracket cable

1.3 Software Specifications

For OS (operation system) support, please check with TYAN® support for latest information.

NOTE

Chapter 2: Board Installation

You are now ready to install your motherboard.

How to install our products right... the first time

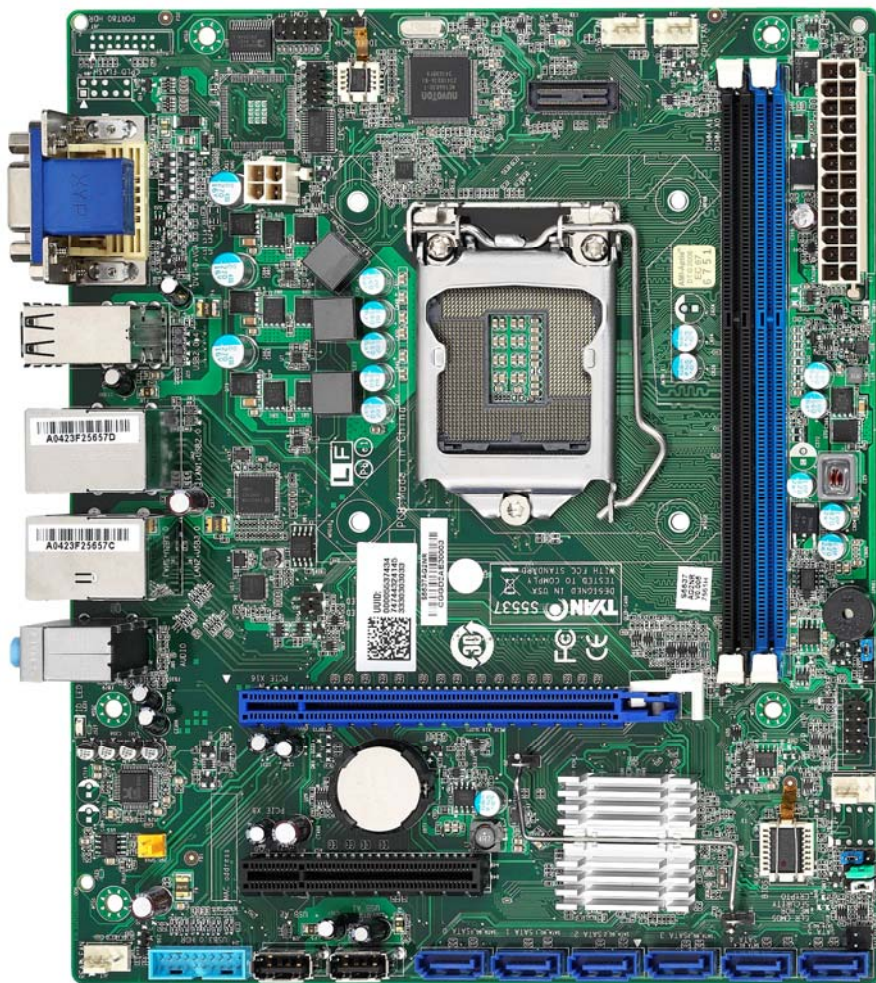
The first thing you should do is reading this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

- (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.

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

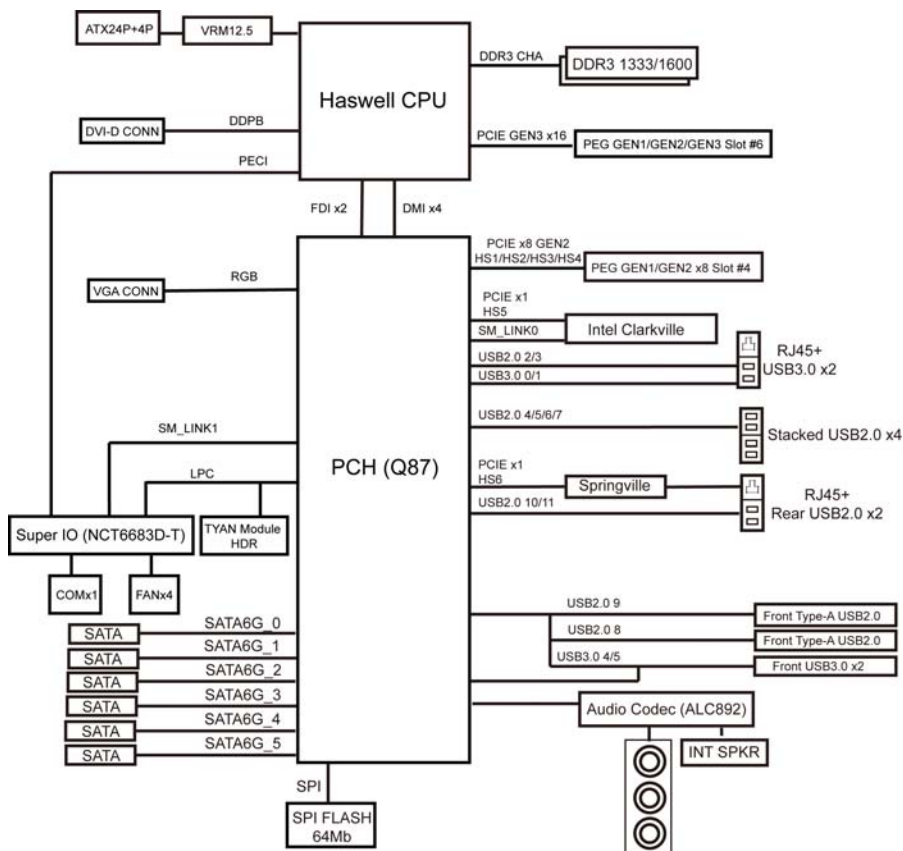
2.1 Board Image



S5537

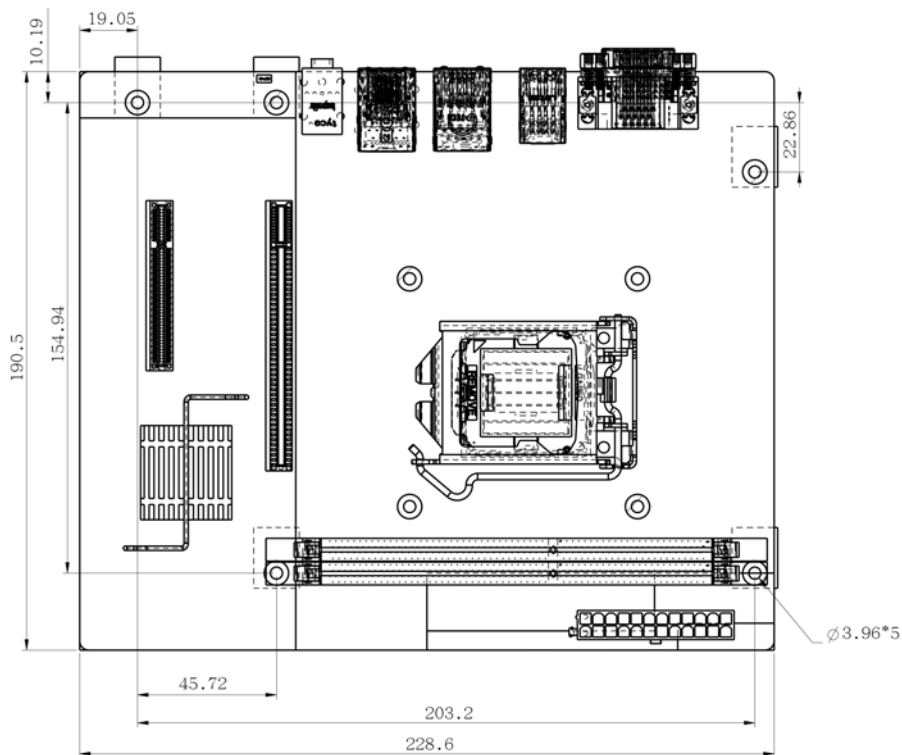
This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.

2.2 Block Diagram

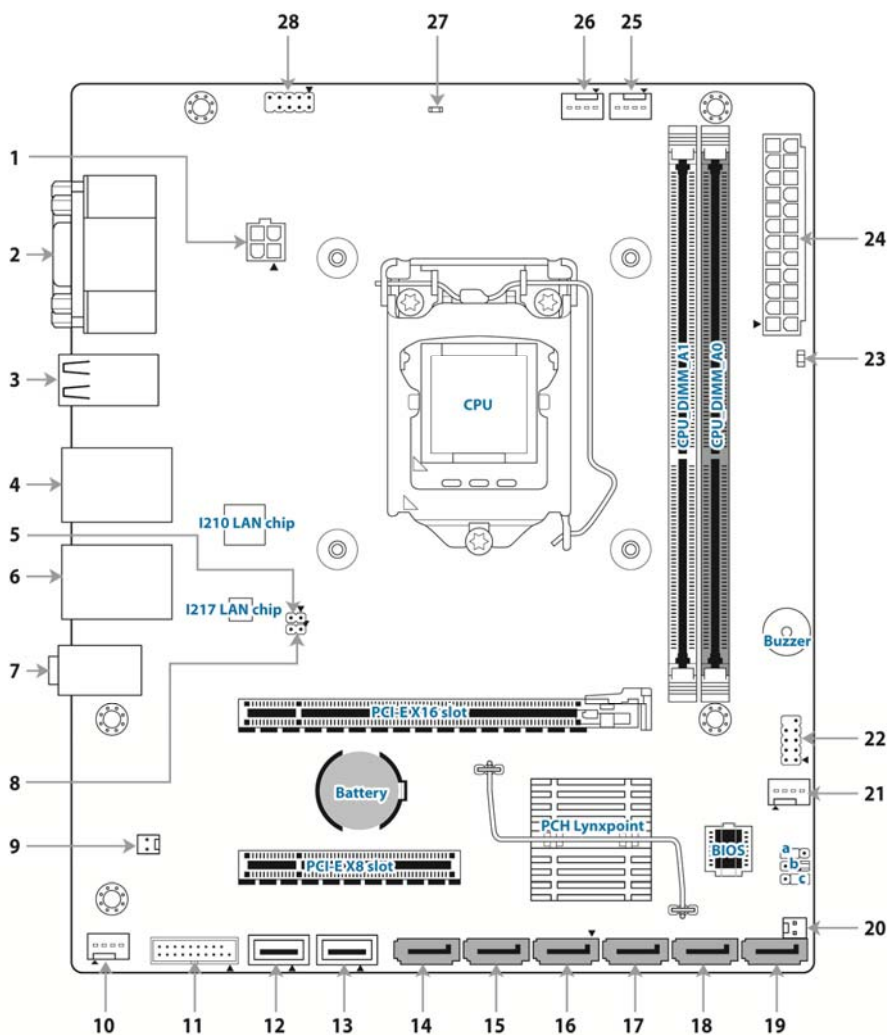


S5537 Block Diagram

2.3 Mainboard Mechanical Drawing



2.4 Board Parts, Jumpers and Connectors



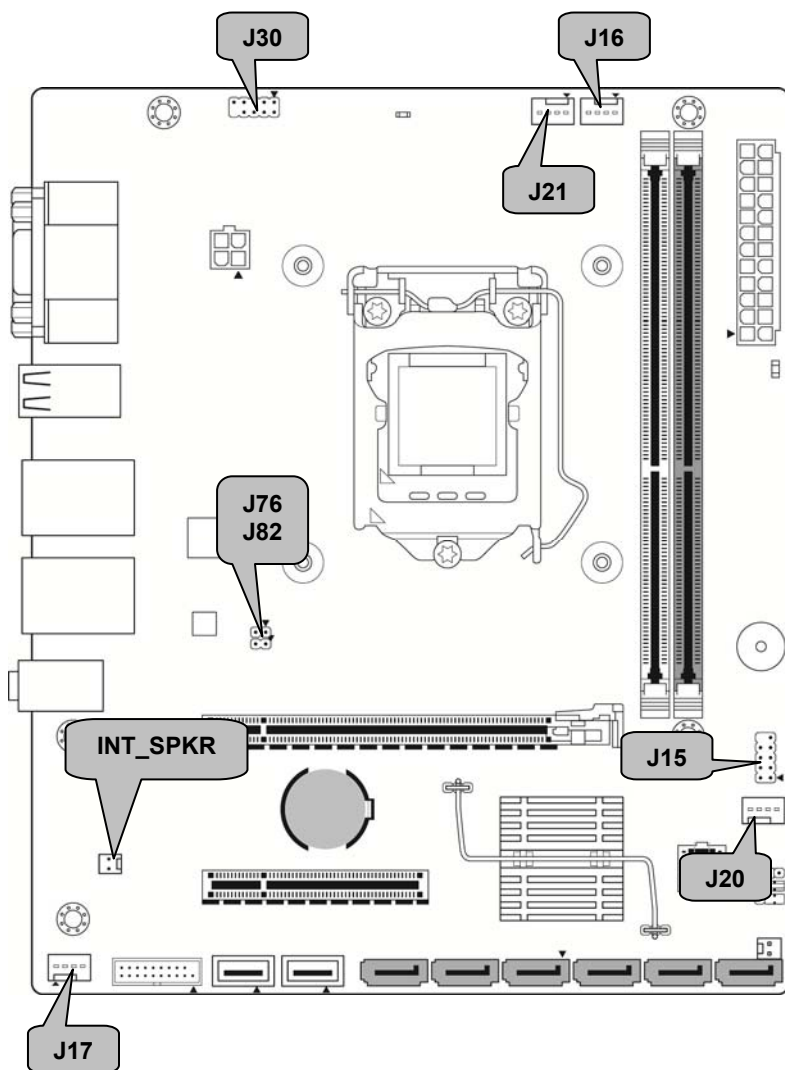
This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. But for the DIMM number please refer to the above placement for memory installation. For the latest board revision, please visit our web site at <http://www.tyan.com>.

Jumpers & Connectors

Connector	
1 ATX 4-pin Power Connector (J18)	15 SATA port 1 (SATA_6G_1)
2 Top: VGA connector (J88) Bottom: DVI-D connector (J88)	16 SATA port 2 (SATA_6G_2)
3 USB2.0 connector (J25)	17 SATA port 3 (SATA_6G_3)
4 Top: RJ45 LAN port #1(LAN1)(J42) Bottom: USB 2.0 ports (J42)	18 SATA port 4 (SATA_6G_4)
5 LAN1 LED header (J76)	19 SATA port 5 (SATA_6G_5)
6 Top: RJ45 LAN port #2(LAN2) (J9) Bottom: Two USB 3.0 ports (J9)	20 Intruder header (INTRD1)
7 Audio connector (J85)	21 Front FAN (J20)
8 LAN2 LED header (J82)	22 Front header (J15)
9 Internal speaker header (INT_SPKR)	23 Power LED (D_STDBY1)
10 Rear FAN (J17)	24 ATX 24-pin Power Connector (ATX24P_1)
11 USB 3.0 header (J24)	25 CPU FAN (J16)
12 Vertical Type-A USB2.0 connector2 (J28)	26 System FAN (J21)
13 Vertical Type-A USB2.0 connector1 (J27)	27 System fault LED (LED4)
14 SATA port 0 (SATA_6G_0)	28 COM header (J77)
Jumper	
a ME Security Override Header (J1)	
b ME Header (J2)	
c Clear CMOS Header (J4)	

Jumper Legend

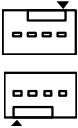
	OPEN - Jumper OFF	Without jumper cover
	CLOSED - Jumper ON	With jumper cover



J30: COM Port Header

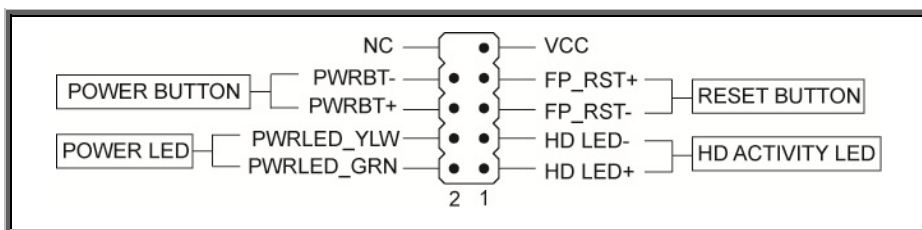
	Signal	Pin	Pin	Signal
	DCD	1	2	DSR
	RXD	3	4	RTS
	TXD	5	6	CTS
	DTR	7	8	RI
	GND	9	10	KEY-Pin

J16 (CPU FAN) / J20 (Front FAN) / J17 (Rear FAN) / J21 (Sys FAN): 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.

J15: Front Panel Header

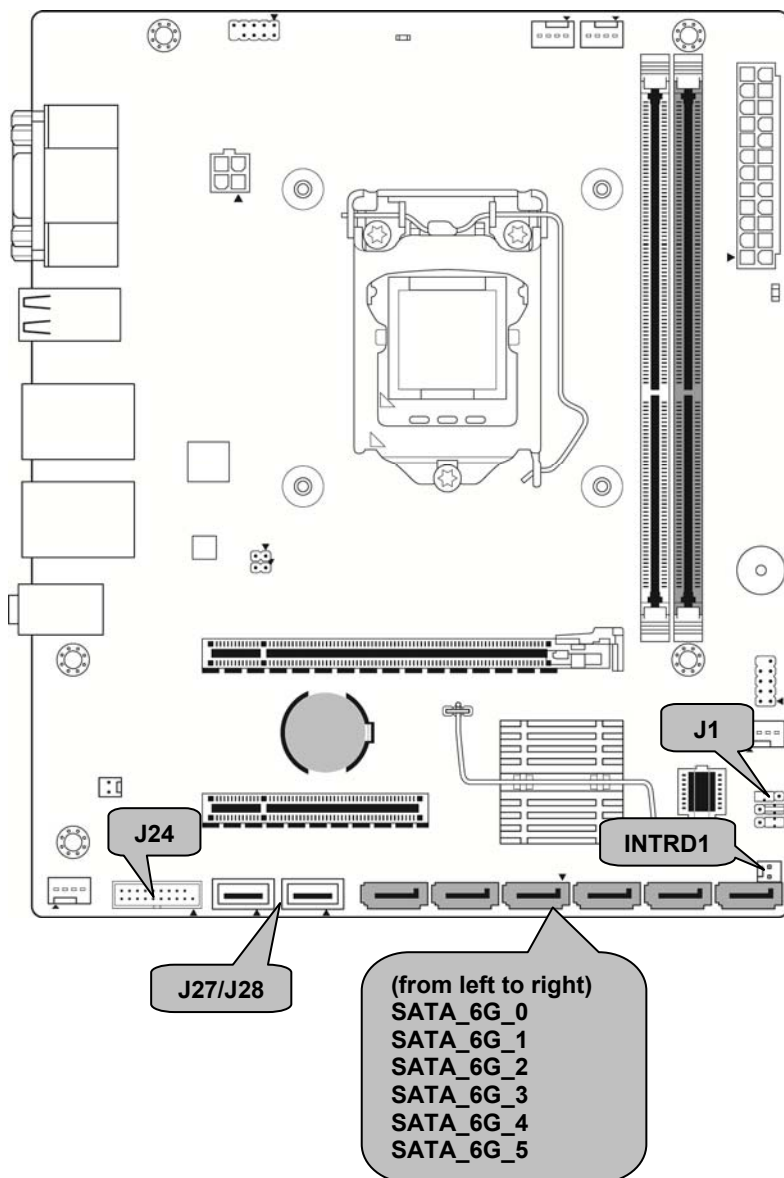


INT_SPKR: Internal Speaker Header

	Pin	1	2
	Signal	INT_SPKR-	INT_SPKR+

J76/J82: LAN1/LAN2 LED Header

	Pin	1	2
	Signal	VCC	ACTIVITY



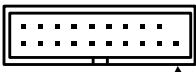
INTRD1: Intruder Header

	Signal	Pin	Pin	Signal
	GND	1	2	INTRUDER

SATA_6G_0 / SATA_6G_1 / SATA_6G_2 / SATA_6G_3 / SATA_6G_4 / SATA_6G_5: 7-pin SATA3 Connector

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

J24: USB3.0 Header

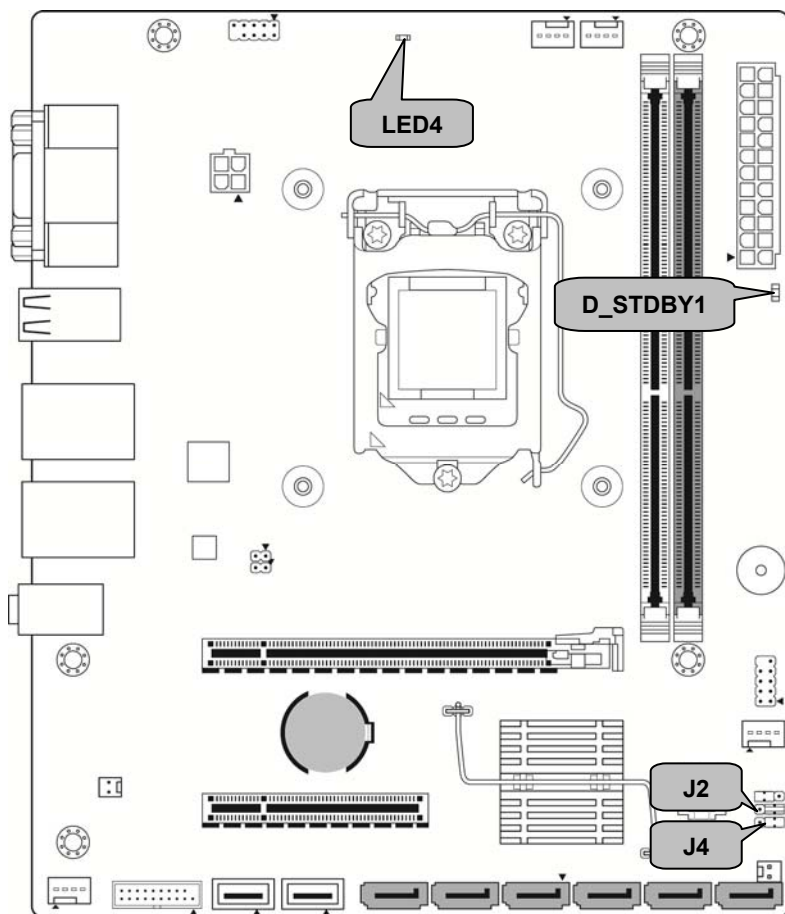
	Signal	Pin	Pin	Signal
			1	VCC
	VCC	19	2	USB30RX_0N
	USB30TX_1N	18	3	USB30RX_0P
	USB30RX_1P	17	4	GND
	GND	16	5	USB30TX_0N
	USB30TX_1N	15	6	USB30TX_0P
	USB30TX_1P	14	7	GND
	GND	13	8	USB20_DN0
	USB20_DN1	12	9	USB20_DP0
	USB20_DP1	11	10	USB_OC

J27/J28: Vertical Type-A USB Connector

	Signal	Pin	Pin	Signal
	VCC	1	2	USB_DN
	USB_DP	3	4	GND

J1: ME Security Override Header

	Pin 1-2 Closed: Normal (Default)
	Pin 2-3 Closed: Secure
 PIN1	Remove Cap: Reset



LED4	System Fault LED	Pin	Signal	
		A	5V	
		K	Fault	
		State	Description	
		OFF	OFF	The LED shuts off when the system PSU voltage level is normal.
		ON	Red	The LED lights up when the system PSU voltage level is abnormal.
NOTE: The normal range of the PSU voltage of +3.3V, +5V and +12V is within 20% above or below.				
D_STDBY1	Power LED	Pin	Signal	
		A	+5V_STBY	
		K	GND	
		State	Description	
		OFF	OFF	The LED shuts off when AC loss.
		ON	Green	The LED lighted up when AC on.

J4: 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_2 and Pin_3 (Default setting). 3. Move the jumper cap to close Pin_1 and Pin_2 for several seconds to Clear CMOS. 4. Put jumper cap back to Pin_2 and Pin_3 (Default setting). 5. Reconnect power connectors to the motherboard and power on system.
 Clear CMOS	

J2: ME Header

	Pin 1-2 Closed: Flash ME FW
	Pin 2-3 Closed: Normal (Default)

2.4 Installing the Processor and Heat sink

The S5537 supported Intel® processors are listed in section **1.2 Hardware Specifications** on page 5. Check our website at <http://www.tyan.com> for latest processor support.

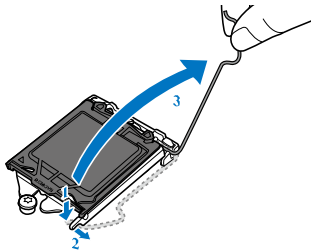
NOTE: MiTAC TYAN is not liable for damage as a result of operating an unsupported configuration.

Processor Installation

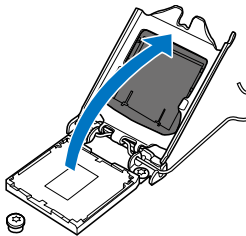
Follow the steps below to install the processors and heat sinks.

NOTE: Please save and replace the CPU protection cap when returning for service.

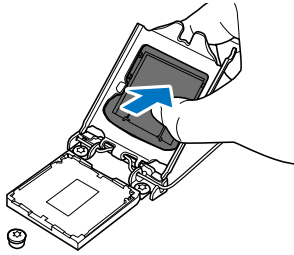
1. Open the socket lever.



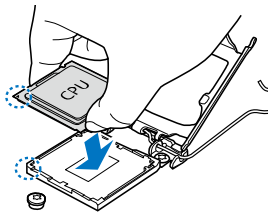
2. Open the CPU socket cover.



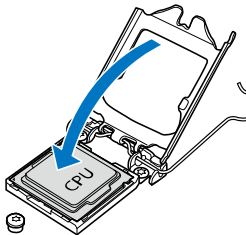
3. Remove the CPU protection cap.



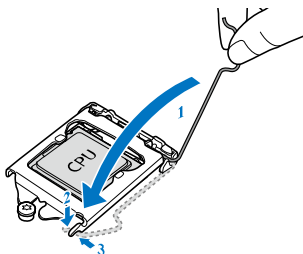
4. Install the processor and make sure the gold arrow is located in the right direction.



5. Close the CPU socket cover.



6. Close the socket lever.



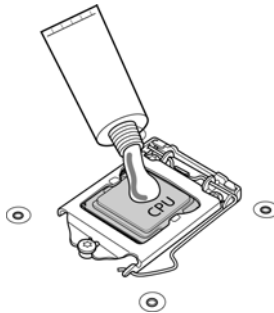
Heat sink Installation

After installing the processor, you should 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. The overheated processor is dangerous to the motherboard.

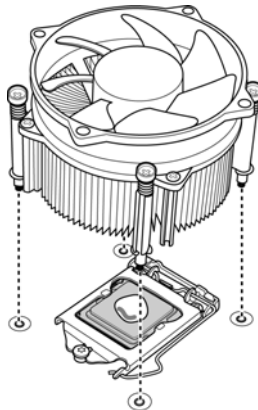
For the safest method of installation and information on choosing the appropriate heat sink, using heat sinks validated by Intel®. Please refer to the Intel® website: <http://www.intel.com>

The following diagram illustrates how to install the heat sink for the SNB_H3 (LGA1150) socket.

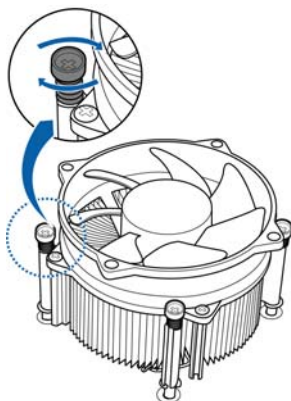
1. Apply the thermal grease.



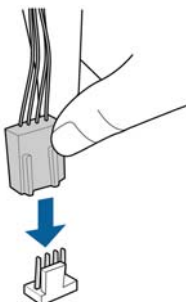
2. Install the CPU heatsink.



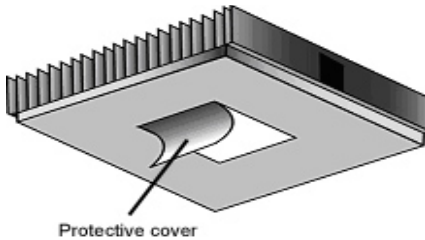
3. Secure the heatsink screws.



4. Connect the heatsink fan cable.

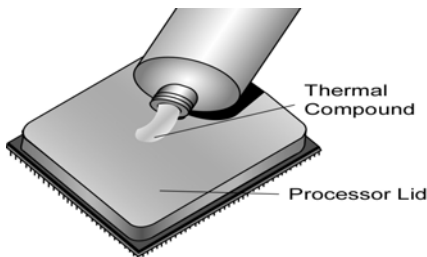


2.5 Thermal Interface Material



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.

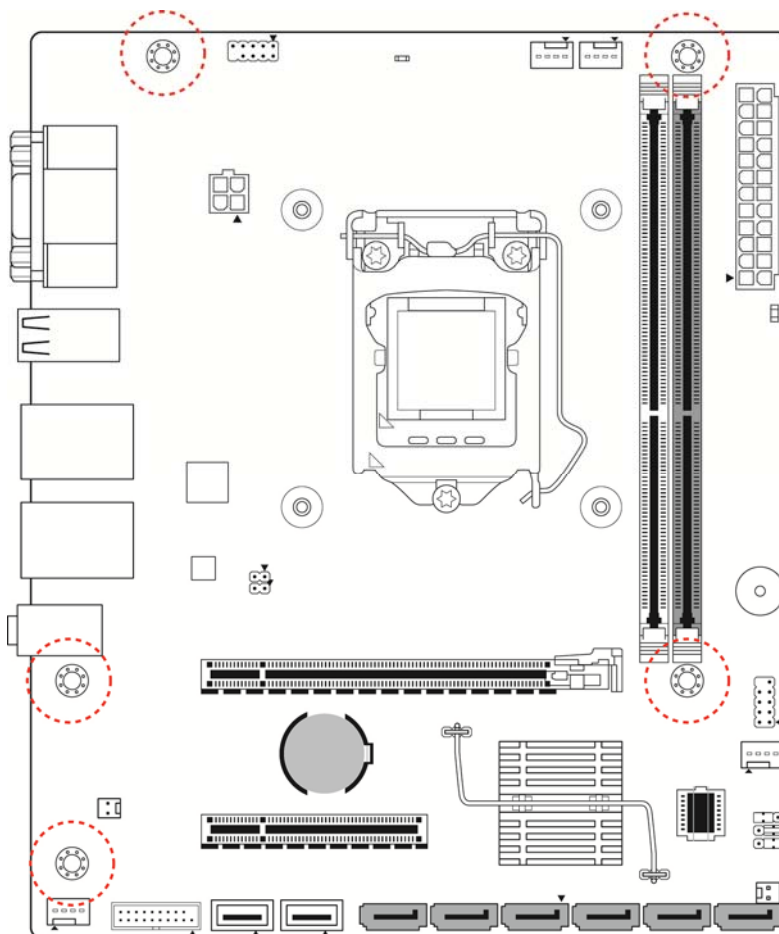


The second type of interface material is usually packaged separately. It is commonly referred to as 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

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.

2.6 Tips on Installing Motherboard in Chassis

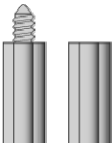
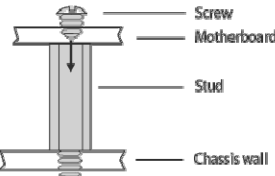
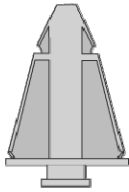
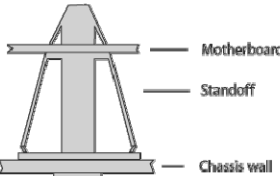
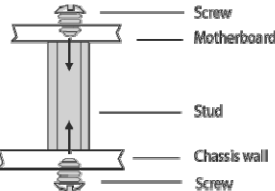
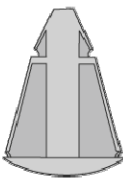
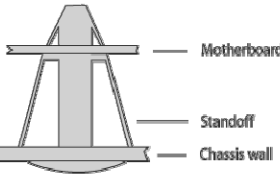
Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard 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.



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

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

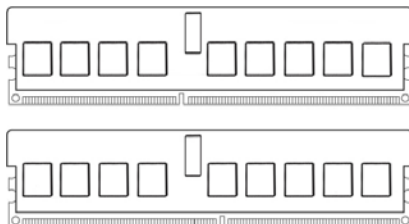
Mounting the Motherboard

Type	Solutions for installing	
		
		
		

2.7 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 diagram shows common types of DDR3 memory modules.



- Supports 240-Pin un-buffered DDR3 non-ECC 1066, 1333, or 1600MHz speeds
- All installed memory will automatically be detected and no jumpers or settings need changing
- All memory must be of the **same type and density**

Recommended Memory Population Table

Quantity of memory installed	1	2
DIMM A1 (Black)		√
DIMM A0 (Blue)	√	√

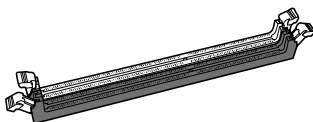
NOTE:

1. √ indicates a populated DIMM slot.
2. 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 only a single DIMM per channel populated
6. We don't suggest other memory installation.

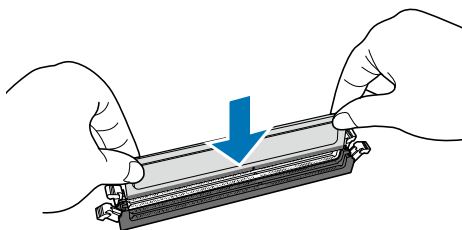
Memory Installation Procedure

Follow these instructions to install memory modules into the S5537.

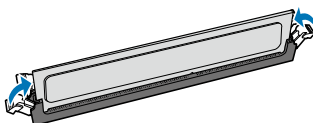
1. Unlock the clips.



2. Insert the memory module.



3. Lock the clips.



2.8 Attaching Drive Cables

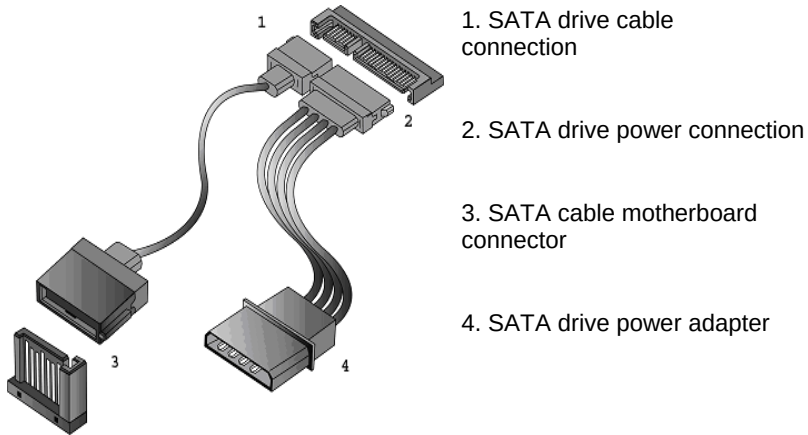
Attaching Serial ATA Cables

S5537 is equipped with **six (6)** Serial ATA (SATA) channel. Connections for the drives are very simple.

There is no need to set Master/Slave jumpers on SATA drives.

If you are in need of SATA/SAS cables or power adapters please contact your place of purchase.

The following pictures illustrate how to connect an SATA drive.



2.9 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 x 16 slot



PCI-E x 8 slot



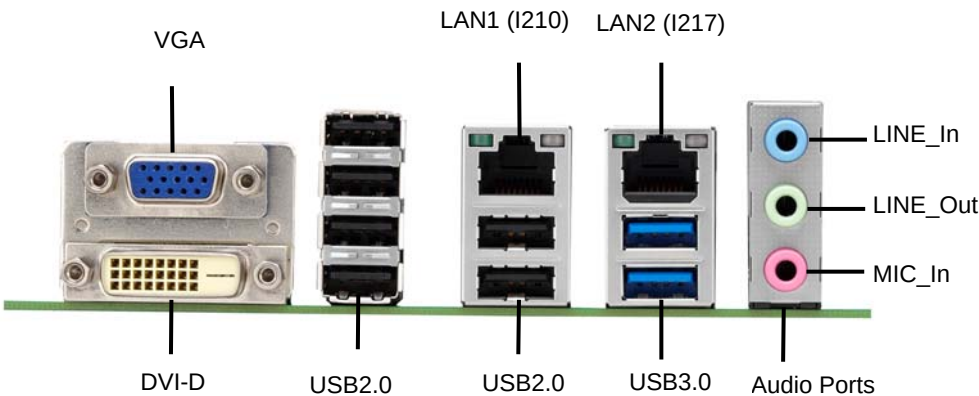
Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

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 to the motherboard before performing system hardware changes to avoid damaging the board or expansion device.

2.10 Connecting External Devices

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



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

Onboard LAN LED Color Definition

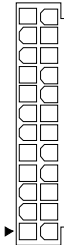
The **two (2)** onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

10/100/1000 Mbps LAN Link/Activity LED Scheme			
LEFT RIGHT 		Left LED	Right LED
10 Mbps	Link	Green	Off
	Active	Blinking Green	Off
100 Mbps	Link	Green	Green
	Active	Blinking Green	Green
1000 Mbps	Link	Green	Amber
	Active	Blinking Green	Amber
No Link		Off	Off

2.11 Installing the Power Supply

There are **two (2)** power connectors on your S5537 motherboard. The S5537 supports EPS 12V power supply.

ATX24P_1: 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

J18: ATX 4-pin Power Connector

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

NOTE:

1. You must unplug the power supply before plugging the power cables to motherboard connectors.
2. Apply 5Vsb power supply with current support below 2.5A.

2.12 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 IDE 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 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 or <F2> during POST 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	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

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.

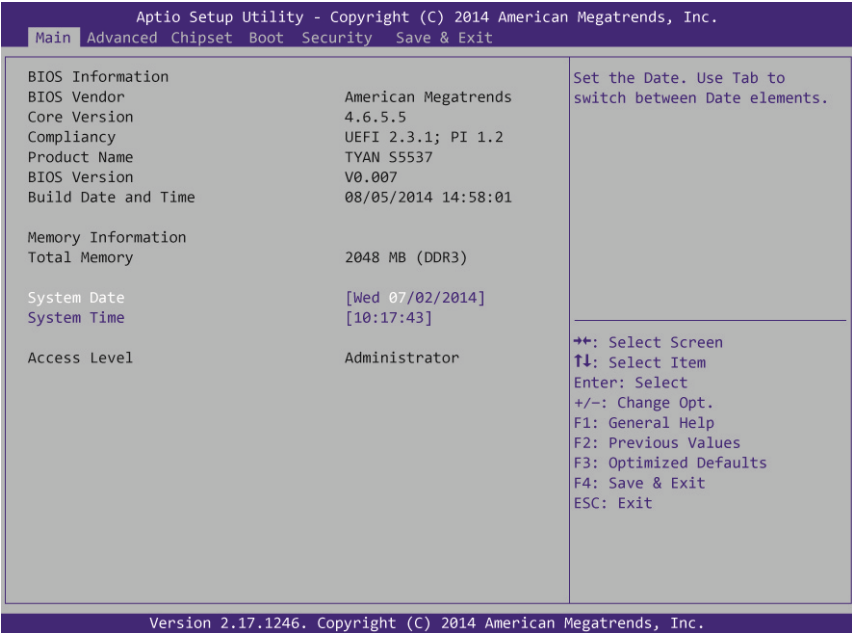
3.1.4 Setup Variations

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.

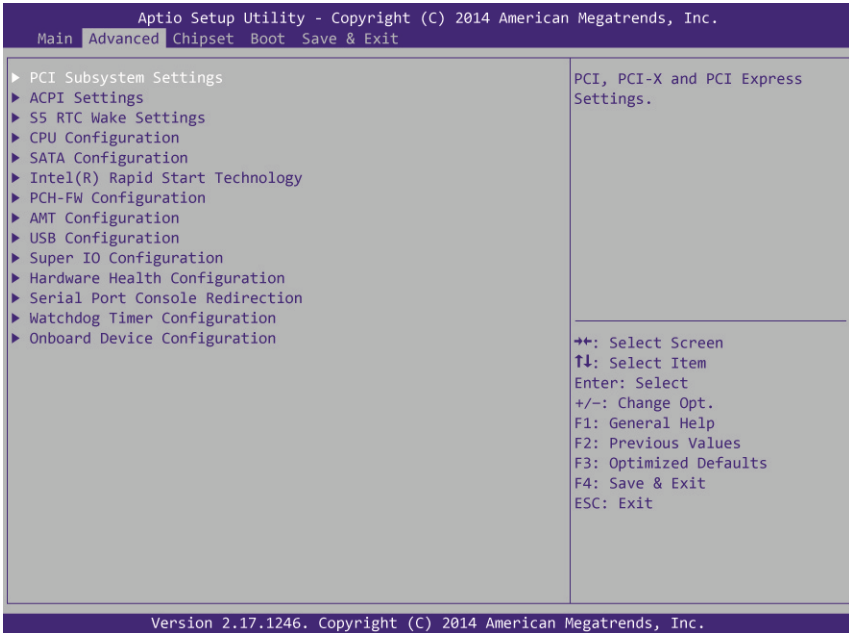
HH (24 hours format): MM (Minutes): SS (Seconds)

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.

S5 RTC Wake Settings

Enable system to wake from S5 using RTC alarm.

CPU Configuration

CPU Configuration Parameters.

SATA Configuration

SATA Device Options Settings.

Intel® Rapid Start Technology (for Intel PCH Q87 SKU only)

Intel® Rapid Start Technology.

PCH-FW Configuration

Configure Management Engine Technology Parameters.

AMT Configuration

Configure Active Management Technology Parameters.

USB Configuration

USB Configuration Parameters.

Super IO Configuration

System Super IO Chip Parameters.

Hardware Health Configuration

Monitor hardware status.

Serial Port Console Redirection

Serial Port Console Redirection.

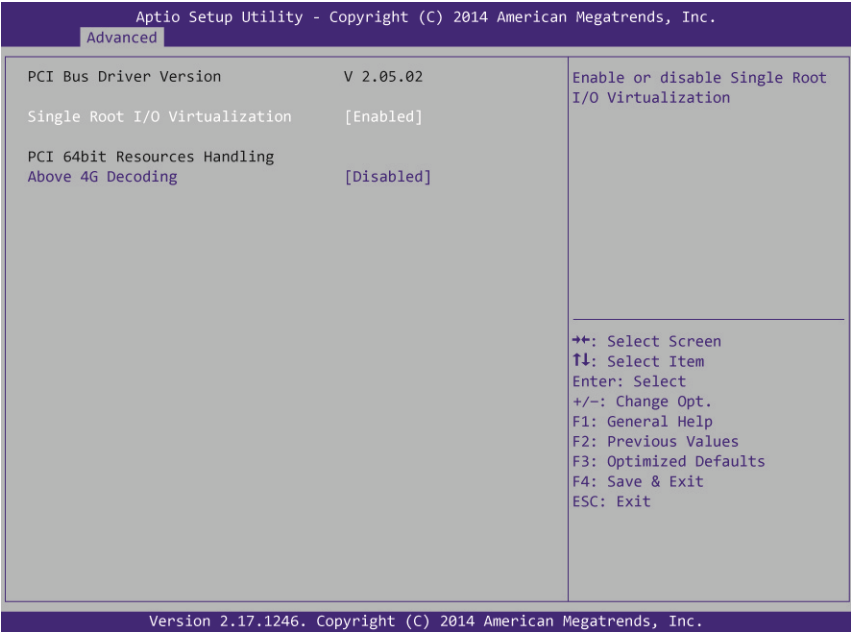
Watchdog Timer Configuration

Watchdog Configuration.

Onboard Device Configuration

Onboard Device Configuration.

3.3.1 PCI Subsystem Settings



Single Root I/O Virtualization

Enables or Disables Single Root I/O Virtualization.

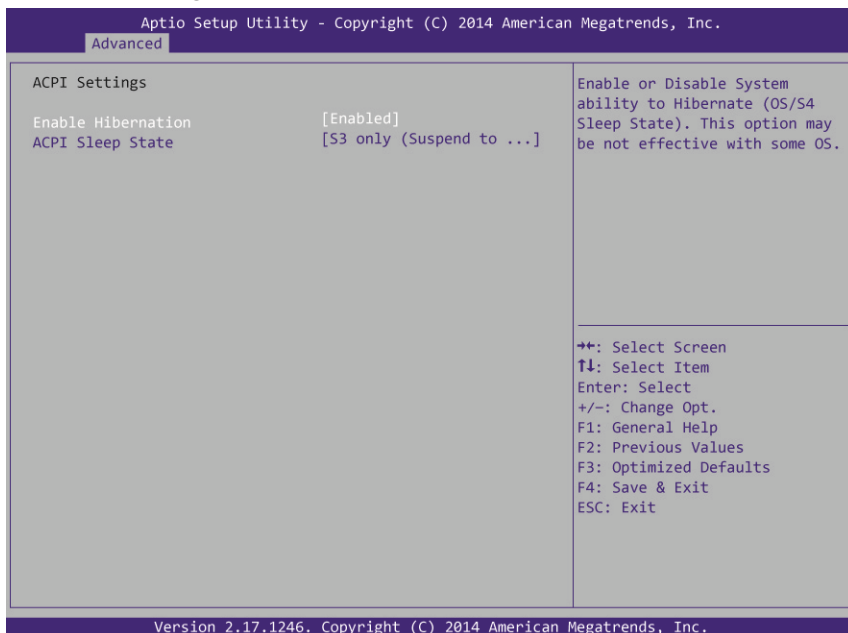
Enabled / Disabled

Above 4G Decoding

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

Enabled / **Disabled**

3.3.2 ACPI Settings



Enable Hibernation

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

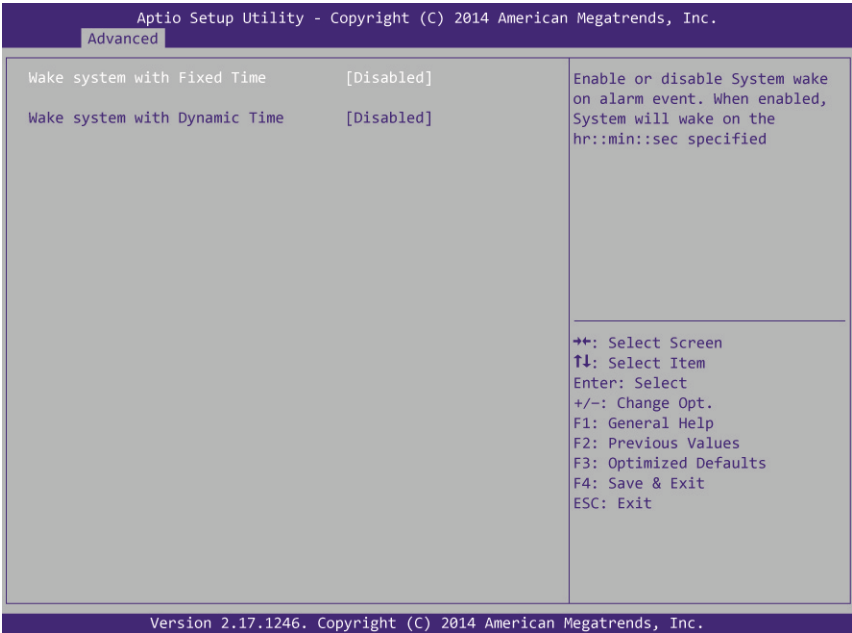
Disabled / **Enabled**

ACPI Sleep State

Select ACPI sleep state the system will enter when the SUSPEND button is pressed.

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

3.3.3 S5 RTC Wake Settings



Wake System with Fixed Time

Enable or disable System wake on alarm event. When enabled, System will wake on the hr:min:sec specified.

Disabled / Enabled

NOTE: When set to [Enabled], the following items **Wake up hour**, **Wake up minute** and **Wake up second** will appear.

Wake up hour

Select 0-23. For example enter 3 for 3am and 15 for 3pm.

0-23

Wake up minute

Select 0-59.

0-59

Wake up second

Select 0-59.

0-59

Wake System on Dynamic Time

Enable or disable System wake on alarm event. When enabled, System will wake on the current time + Increase minute(s).

Disabled / Enabled

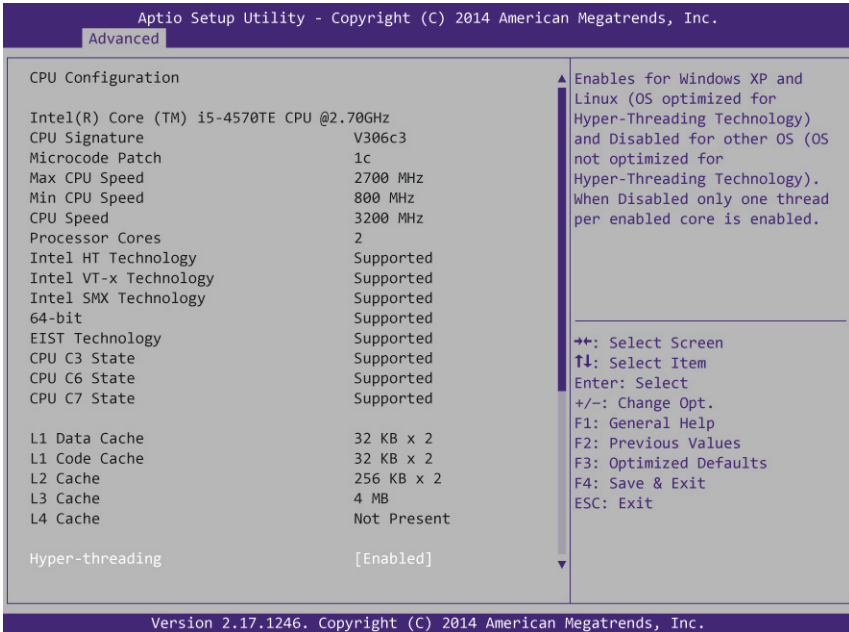
NOTE: When set to [Enabled], the following item will appear.

Wake up minute increase

Select 1-5.

1-5

3.3.4 CPU Configuration



CPU Configuration

Read only.

Hyper-threading (optional)

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

NOTE: Hyper-threading will appear when the system supports Intel HT Technology.

Active Processor Cores

Number of cores to enable in each processor package.

All / 1 / 2 / 3 (**Note:** The number of cores depends on your CPU.)

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.

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 (optional, depending on if CPU supports)

Turbo Mode support.

Enabled / Disabled

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

CPU C7 report

Enable/Disable CPU C7 report to OS.

CPU C7s / CPU C7 / Disabled

Package C State Limit

Select Package C State Limit.

C0 / C1 / C2 / C3 / C6/ C7 / C7s / **AUTO**

Intel TXT(LT) Support

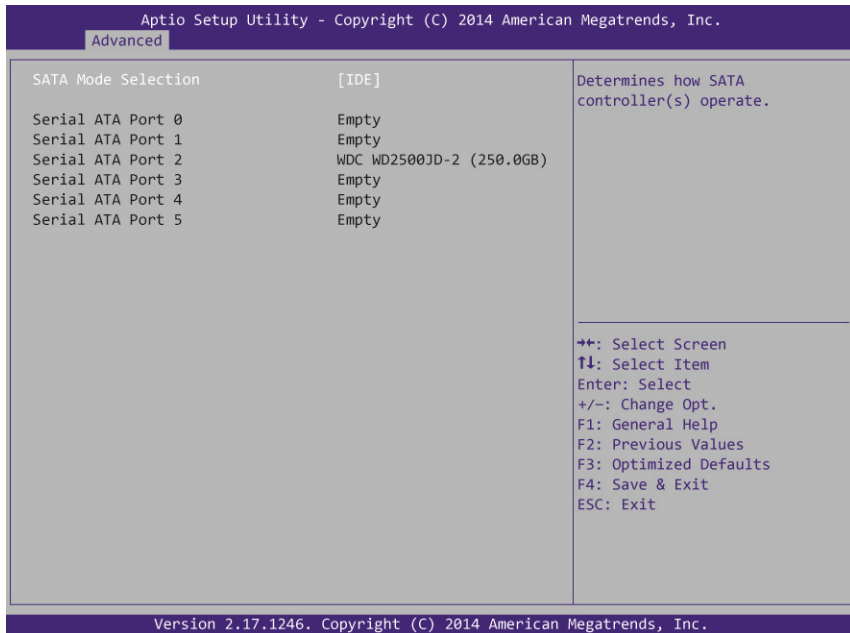
Enable/Disable Intel® TXT(LT) support.

Disabled / Enabled

NOTE: Intel TXT(LT) Support will appear when the system supports Intel SMX Technology.

3.3.5 SATA Configuration

NOTE: When SATA Mode Selection is set to [IDE], the following screen will appear.



SATA Mode Selection

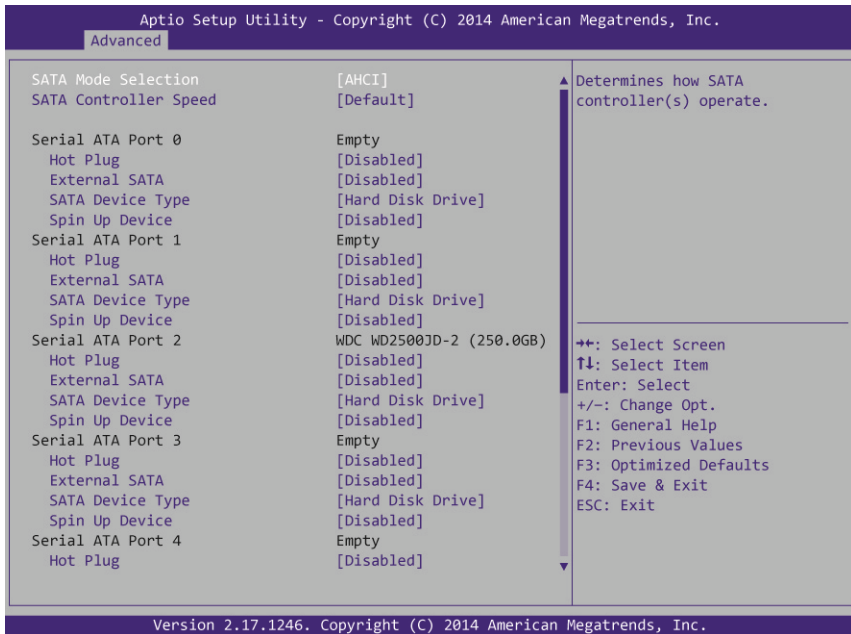
Determines how SATA controller(s) operate.

IDE / **AHCI** / RAID

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

Read only.

NOTE: When SATA Mode Selection is set to [AHCI], the following screen will appear.



SATA Mode Selection

Determines how SATA controller(s) operate.

IDE / **AHCI** / RAID

SATA Controller Speed

Indicates the maximum speed the SATA controller can support.

Default / Gen1 / Gen2 / Gen3

Hot Plug

Designates this port as Hot Pluggable.

Disabled / Enabled

External SATA

External SATA Support.

Disabled / Enabled

SATA Device Type

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

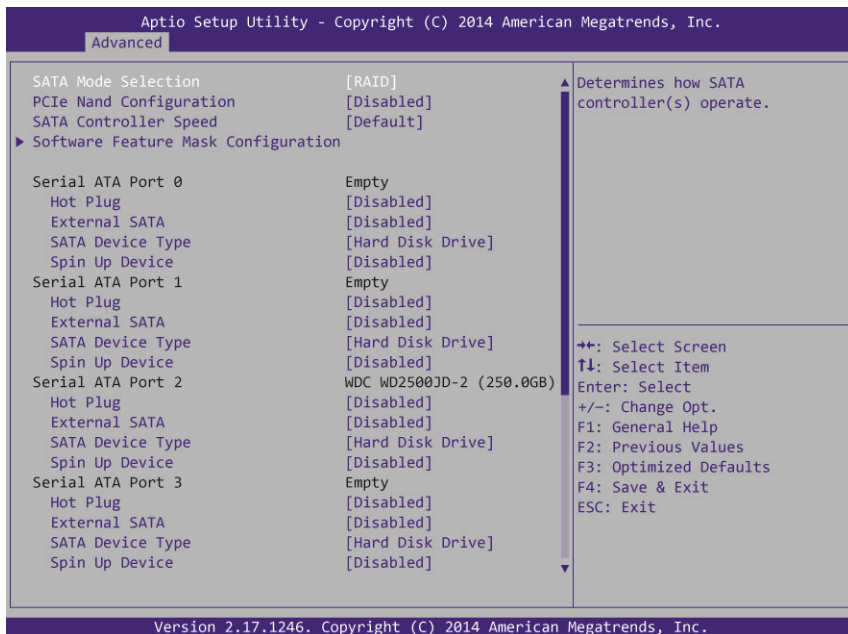
Hard Disk Drive / Solid State Drive

Spin Up Device

On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

Disabled / Enabled

NOTE: When SATA Mode Selection is set to [RAID], the following screen will appear.



SATA Mode Selection

Determines how SATA controller(s) operate.

IDE / **AHCI** / RAID

PCIe Nand Configuration

Enable/Disable PCIe Nand.

Disabled / Enabled

SATA Controller Speed

Indicates the maximum speed the SATA controller can support.

Default / Gen1 / Gen2 / Gen3

Hot Plug

Designates this port as Hot Pluggable.

Disabled / Enabled

External SATA

External SATA Support.

Disabled / Enabled

SATA Device Type

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

Hard Disk Drive / Solid State Drive

Spin Up Device

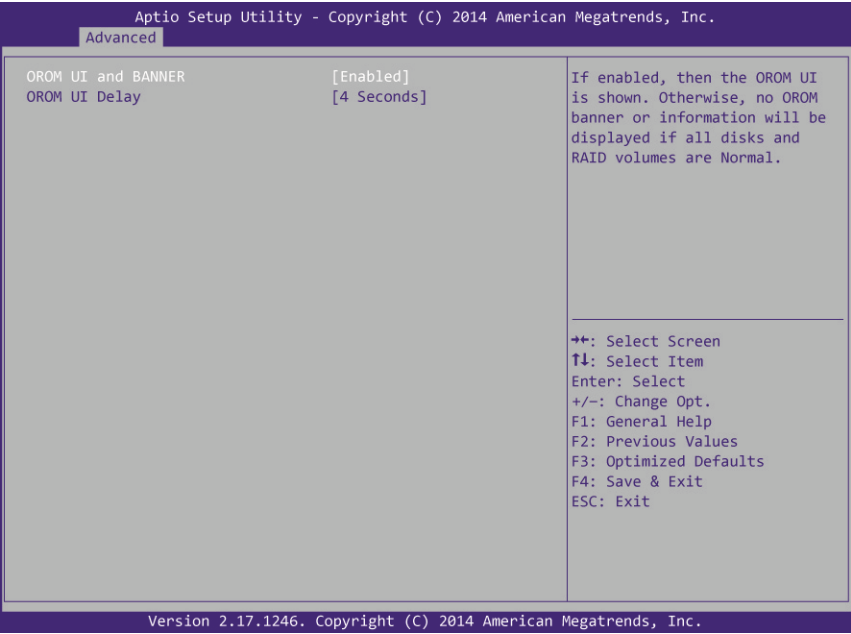
On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

Disabled / Enabled

Software Feature Mask Configuration

RAID OROM/RST driver will refer to the SWFM configuration to enable or disable the storage features.

3.3.5.1 Software Feature Mask Configuration



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.

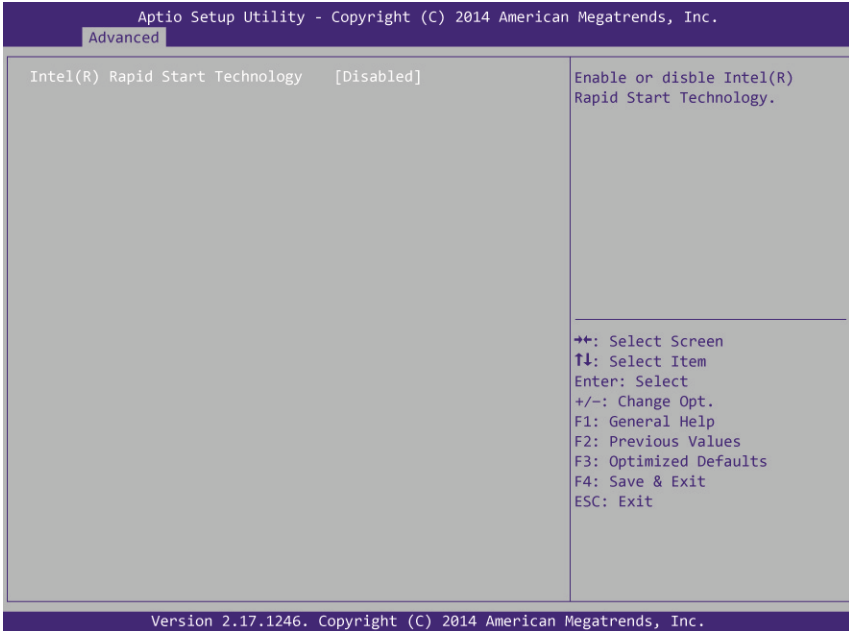
Disabled / Enabled

OROM UI Delay

If enabled, indicates the delay of the OROM UI Splash Screen in a normal status.

2 seconds / **4 seconds** / 6 seconds / 8 seconds

3.3.6 Intel® Rapid Start Technology Setting



Intel® Rapid Start Technology

Enables or Disables Intel® Rapid Start Technology.

Disabled / Enabled

NOTE: When set to [Enabled], the following items will appear.

No valid partition

Read only. The message will be displayed on the screen when the system does not find available Hibernation Partition.

Entry on S3 RTC Wake

RapidStart Invocation upon S3 RTC wake.

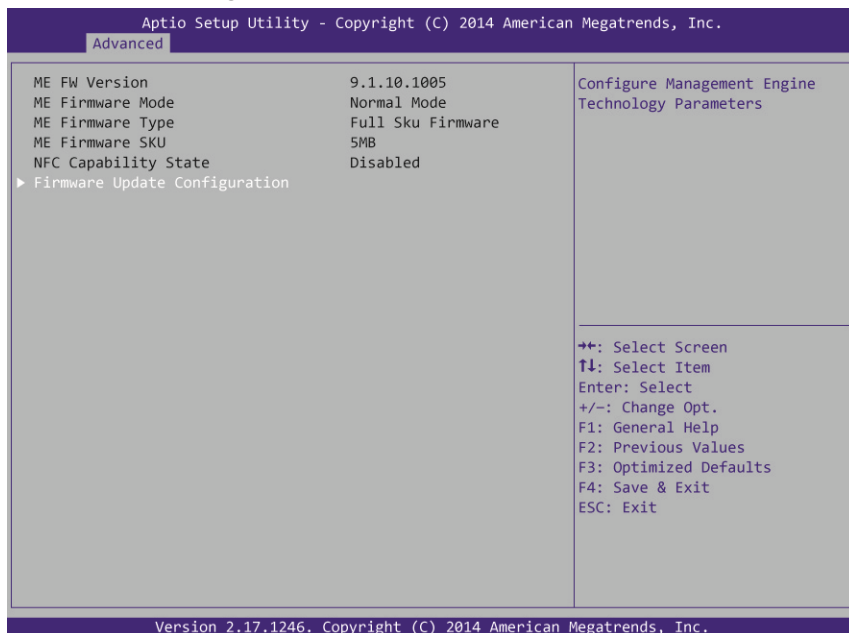
Enabled / Disabled

Entry After

Enable RTC Wake timer at S3 entry. Value range from 0(Immediately) to 120 minutes.

0-120

3.3.7 PCH-FW Configuration



ME FW Version

Read only.

ME Firmware Mode

Read only.

ME Firmware Type

Read only.

ME Firmware SKU

Read only.

ME Unconfig on RTC Clear State

Enable/Disable ME Firmware Un-configure on RTC Clear.

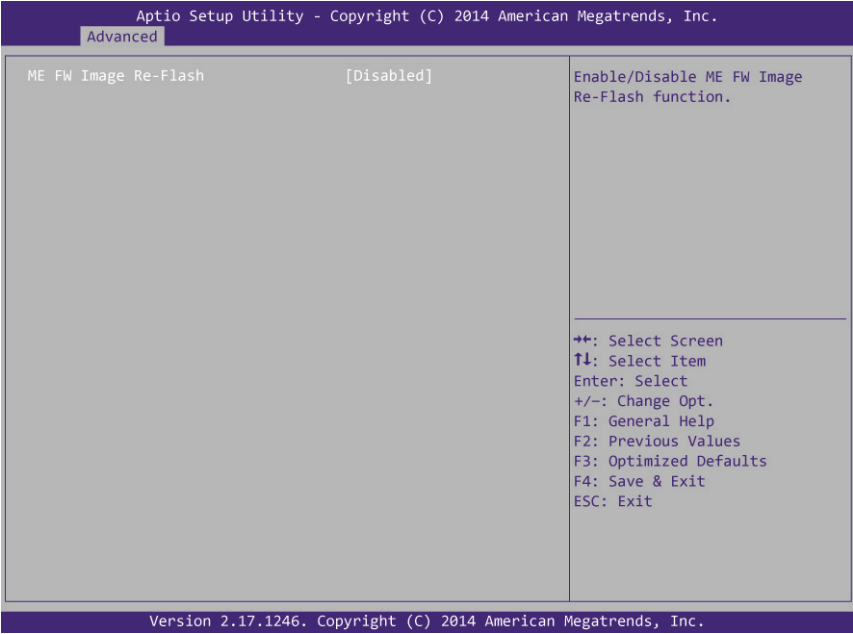
Enabled / Disabled

NOTE: This item will appear when jumper is disabled.

Firmware Update Configuration

Configure Management Engine Technology Parameters.

3.3.7.1 Firmware Update Configuration

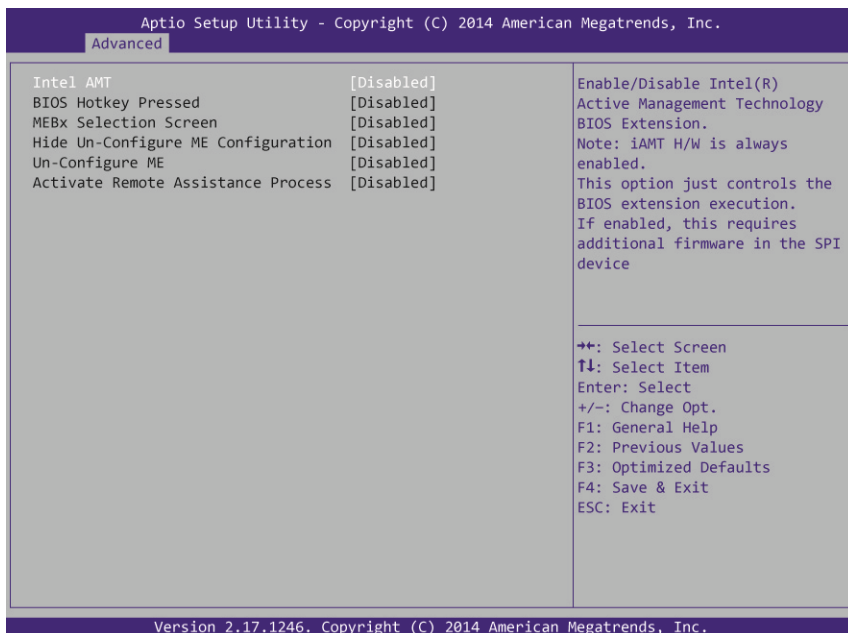


Me FW Image Re-Flash

Enable or disable ME FW Image Re-Flash function.

Disabled / Enabled

3.3.8 AMT Configuration



Intel AMT

Enable/Disable Intel® Active Management Technology BIOS Extension.

Disabled / Enabled

BIOS Hotkey Pressed

Enable/disable BIOS hotkey press.

Disabled / Enabled

MEBx Selection Screen

Enable/disable MEBx selection screen.

Disabled / Enabled

Hide Un-Configure ME Confirmation Prompt

Hide Un-Configure ME without password confirmation prompt.

Disabled / Enabled

Un-Configure ME

Un-Configure ME without password.

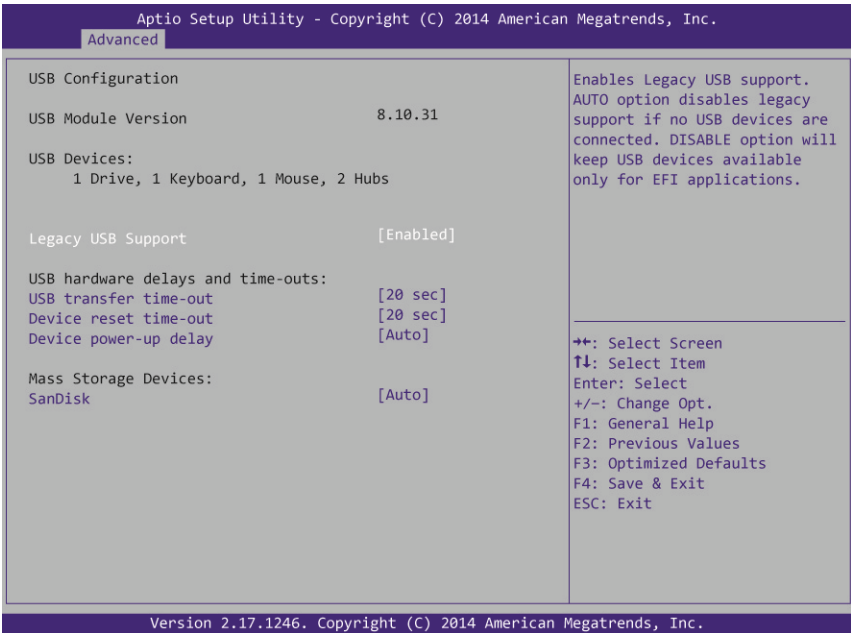
Disabled / Enabled

Activate Remote Assistance Process

Trigger CIRA boot.

Disabled / Enabled

3.3.9 USB Configuration



USB Module Version / USB Devices

Read only.

Legacy USB Support

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

Enabled / Disabled / Auto

USB transfer time-out

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

1 sec / 5 sec / 10 sec / **20 sec**

Device reset time-out

USB mass storage device Start Unit command time-out.

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

Device power-up delay

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

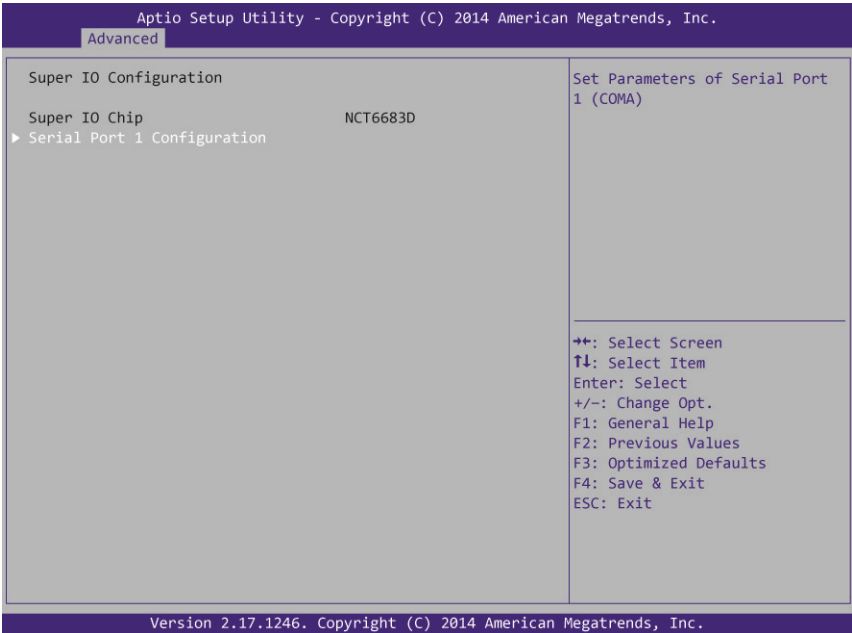
Auto / Manual

Mass Storage Devices

Mass storage device emulation type. 'Auto' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.

Auto / Floppy / Forced FDD / Hard Disk / CD-ROM

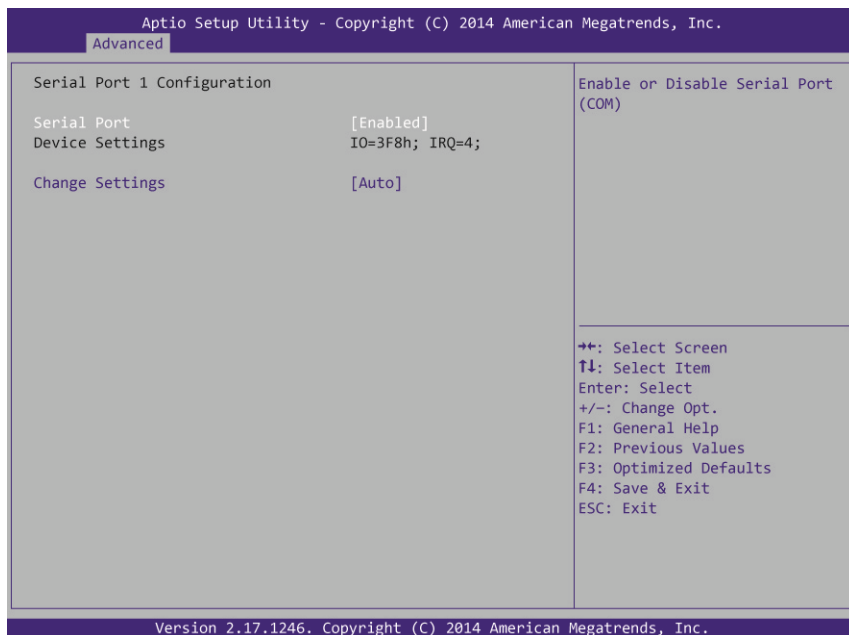
3.3.10 Super IO Configuration



Super IO Chip

Read only.

3.3.10.1 Serial Port 1 Configuration



Serial Port

Enable or disable Serial Port (COM).

Enabled / Disabled

Device Settings

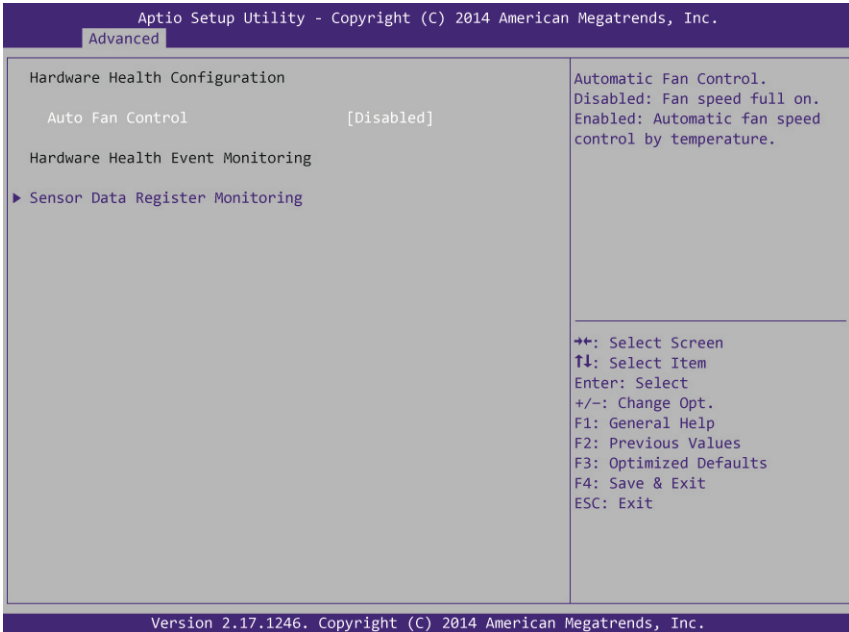
Read only.

Change Settings

Select an optimal setting for Super IO Device.

Auto / IO=3F8h; IRQ=4;
/ IO=3F8h, IRQ=3, 4, 5, 6, 7, 10, 11, 12;
/ IO=2F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;
/ IO=3E8h, IRQ=3, 4, 5, 6, 7, 10, 11, 12;
/ IO=2E8h, IRQ=3, 4, 5, 6, 7, 10, 11, 12;

3.3.11 Hardware Health Configuration



Auto Fan Control

Automatic Fan Control.

Disabled: Fan speed full on.

Enabled: Automatic fan speed control by temperature

Disabled / Enabled

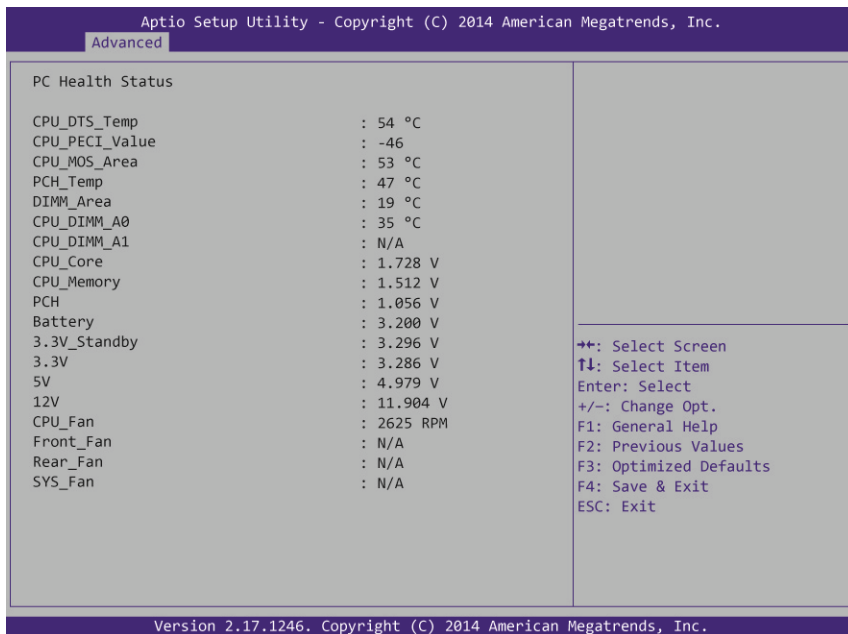
NOTE: When set to [Enabled], the following item will appear.

PWM Minimal Duty Cycle

PWM Minimal Duty Cycle.

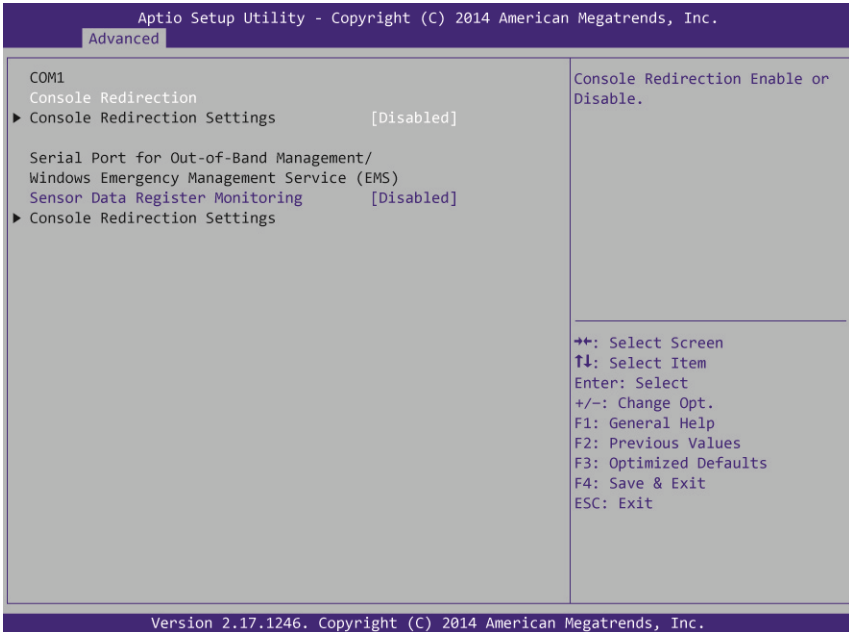
30% Duty Cycle / 45% Duty Cycle / 60% Duty Cycle

3.3.11.1 Sensor Data Register Monitoring



Read only.

3.3.12 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.

3.3.12.1 Console Redirection Settings

Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.	
Advanced	
COM1 Console Redirection Settings	
Terminal Type	[VT100+]
Bits per second	[38400]
Data Bits	[8]
Parity	[None]
Stop Bits	[1]
Flow Control	[None]
VT-UTF8 Combo Key Support	[Enabled]
Recorder Mode	[Disabled]
Resolution 100x31	[Disabled]
Legacy OS Redirection Resolution	[80x24]
Putty KeyPad	[VT100]
Redirection After BIOS POST	[Always Enable]
Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.	
++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.17.1246. Copyright (C) 2014 American Megatrends, Inc.	

Terminal Type

Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set.

VT100+: Extends VT100 to support color, function keys, etc.

VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.

VT100+ / VT100 / VT-UTF8 / ANSI

Bits per Second

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

9600 / 19200 / **38400** / 57600 / 115200

Data Bits

7 / **8**

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.

Disabled / **Enabled**

Recorder Mode

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

Disabled / Enabled

Resolution 100x31

Enable or disable extended terminal resolution.

Disabled / Enabled

Legacy OS Redirection Resolution

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

80x24 / 80x25

Putty KeyPad

Select FunctionKey and KeyPad on Putty.

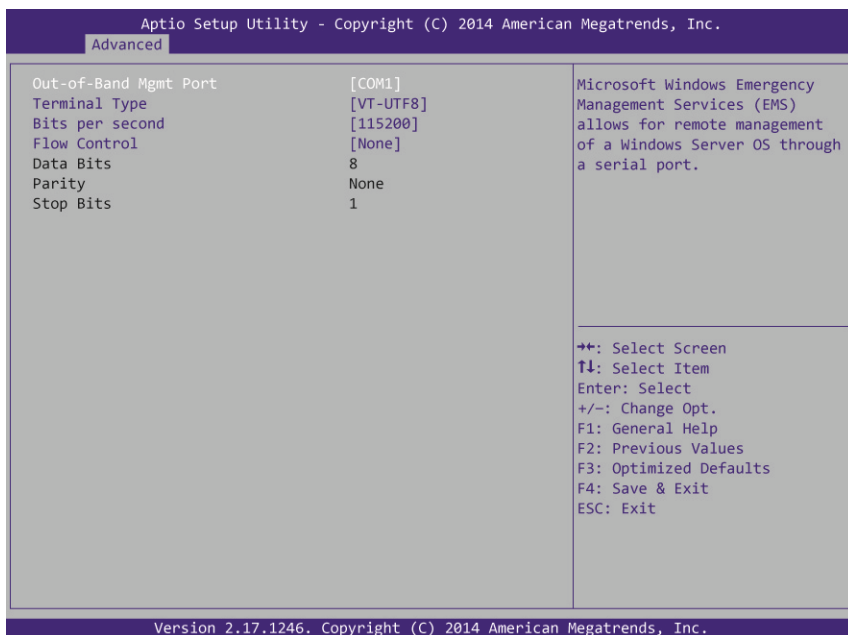
VT100 / LINUX / XTERMR6 / SCO / ESCN / VT400

Redirection after BIOS POST

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

Always Enable / BootLoader

3.3.12.2 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 (Pci Bus0, Dev0, Func0) (Disabled)

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.

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

Bits per Second

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

9600 / 19200 / 57600 / **115200**

Flow Control

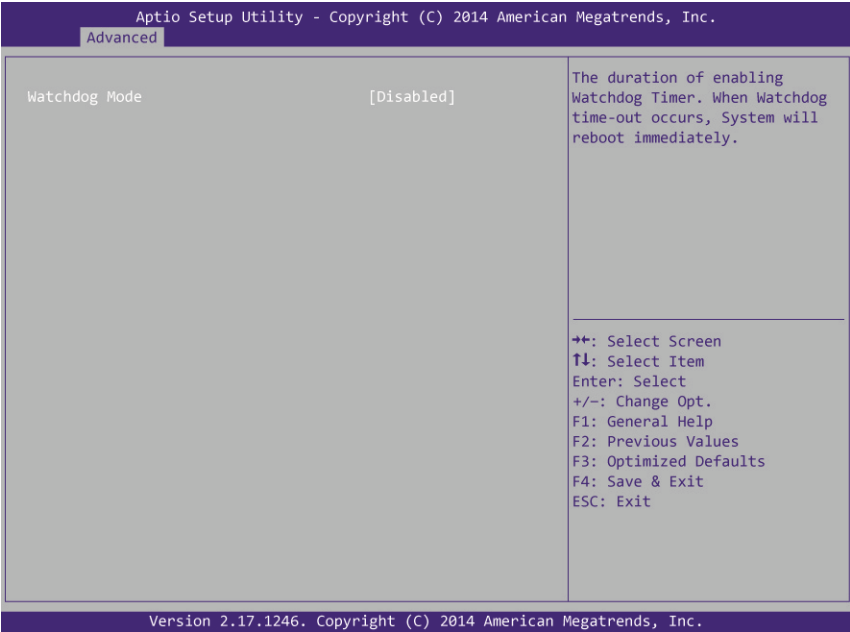
Flow Control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to restart the flow. Hardware flow control uses two wires to send start/stop signal.

None / Hardware RTS/CTS / Software Xon/Xoff

Data Bits / Parity / Stop Bits

Read only.

3.3.13 Watchdog Timer Configuration



Watchdog Mode

The duration of enabling Watchdog Timer. When Watchdog time-out occurs, System will reboot immediately.

Disabled / OS / POST / Power On

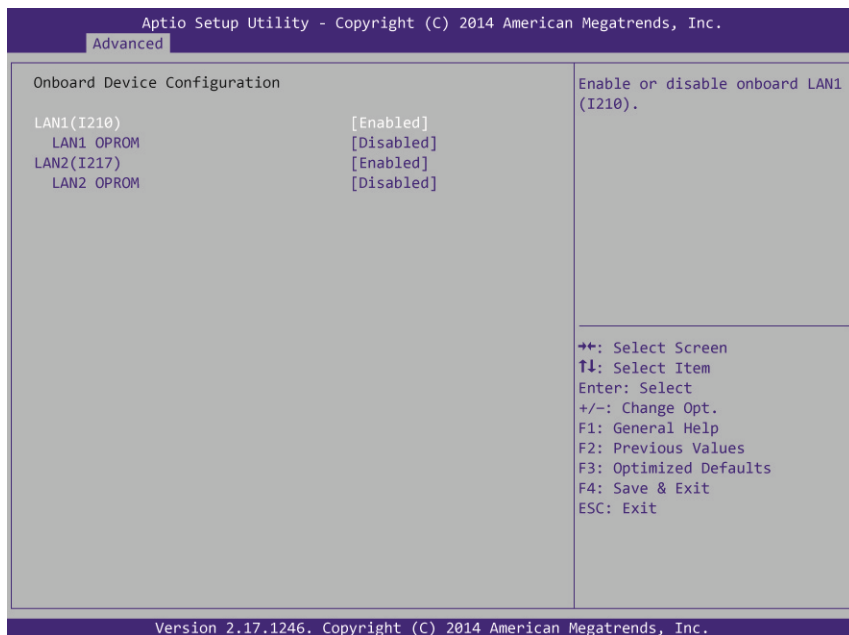
NOTE: The following item will appear when not set to [Disabled].

Watchdog Timer

Select 2/4/6/8/10 minutes for Watchdog time intervals.

2 mins / 4 mins / 6 mins / 8 mins / 10 mins

3.3.14 Onboard Device Configuration



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

LAN1 (I210)

Enable or disable onboard LAN1 (I210).

Enabled / Disabled

LAN1 OPROM

Enable or disable onboard LAN1 OPROM.

Disabled / PXE / iSCSI

LAN2 (I217)

Enable or disable onboard LAN2 (I217).

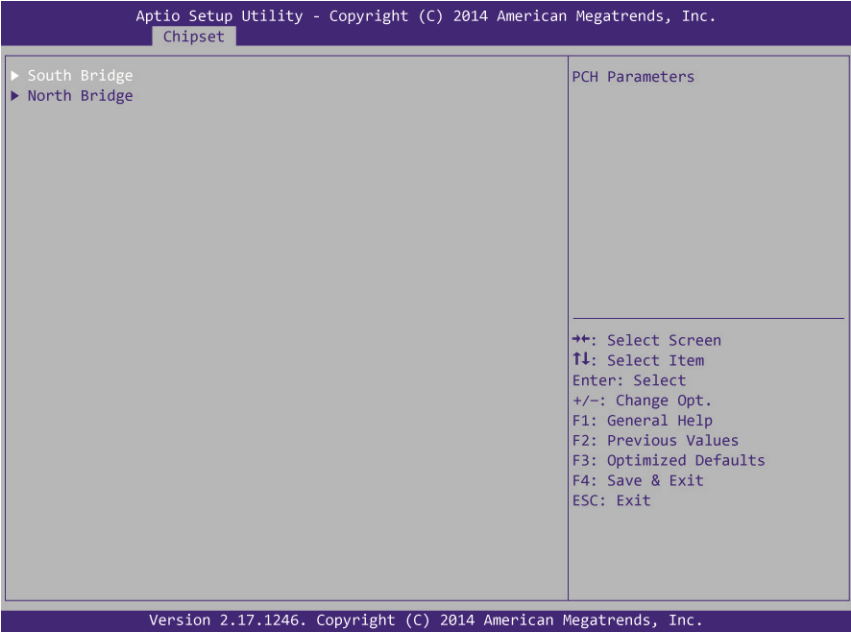
Enabled / Disabled

LAN2 OPROM

Enable or disable onboard LAN2 OPROM.

Disabled / PXE

3.4 Chipset Menu



South Bridge

PCH Parameters.

North Bridge

System Agent (SA) Parameters.

3.4.1 South Bridge Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Chipset		
Intel PCH RC Version	2.1.0.0	Select a minimum assertion width of the SLP_S4# signal
Intel PCH SKU Name	Q87	
Intel PCH Rev ID	05/C2	
South Bridge		
SLP_S4 Assertion Width	[4-5 Seconds]	
Deep Sx	[Disabled]	
PCH Azalia Configuration		
Azalia	[Auto]	
XHCI Configuration		
XHCI Mode	[Smart Auto]	
Restore AC Power Loss	[Power Off]	
Chassis Intrusion Detection	[Disabled]	
++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit		

Version 2.17.1246. Copyright (C) 2014 American Megatrends, Inc.

SLP_S4 Assertion Width

Select a minimum assertion width of the SLP_S4# signal.

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

Deep Sx

Configure the DeepSx Mode Configuration. WOL wake up function would not usable when users enable Sx function. Note : Mobile platforms support Deep S4/S5 in DC only and Desktop platforms support Deep S4/S5 in AC only.

Disabled / Enabled in S5 / Enabled in S4-S5

Azalia

Control detection of the Azalia device.

Disabled = Azalia will be unconditionally disabled

Enabled = Azalia will be unconditionally Enabled

Auto = Azalia will be enabled if present, disabled otherwise.

Disabled / Enabled / **Auto**

XHCI Mode

Mode of operation of xHCI controller.

Smart Auto / Auto / Enabled / Disabled

NOTE: When **XHCI Mode** is set to [Disabled], the following items will appear.

EHCI1

Control the USB EHCI (USB2.0) functions. One EHCI controller must always be enabled.

Disabled / **Enabled**

EHCI2

Control the USB EHCI (USB2.0) functions. One EHCI controller must always be enabled.

Disabled / **Enabled**

Restore AC Power Loss

Select AC power state when power is re-applied after a power failure.

Power Off / Power On / Last State

Chassis Intrusion Detection

Enabled: When a chassis open event is detected, the BIOS will display the event.

Disabled / Enabled

3.4.2 North Bridge Configuration

Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.		
Chipset		
System Agent Bridge Name	Haswell	Maximum Memory Frequency Selections in Mhz.
System Agent RC Version	2.1.0.0	
VT-d Capability	Supported	
Memory Configuration		
Total Memory	8192 MB (DDR3)	
DIMM_A0	8192 MB (DDR3)	
DIMM_A1	Not Present	
Memory Frequency Limiter	[Auto]	
DMI Gen 2	[Enabled]	
VT-d	[Enabled]	
Primary Display	[Auto]	
Internal Graphics	[Auto]	
DVMT Pre-Allocated For Haswell	[32M]	
DVMT Total Gfx Mem	[128M]	
Enable PEG	[Auto]	
Detect Non-Compliance Device	[Disabled]	

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

Version 2.17.1246. Copyright (C) 2014 American Megatrends, Inc.

Memory Frequency Limiter

Maximum Memory Frequency Selections in Mhz.

Auto / 1067 / 1333 / 1600

DMI Gen 2

Enable or disable DMI Gen 2. Auto means Disabled for IVB A0 MB/DT and IVB B0 MB. Enabled for other CPUs.

Auto / Disabled / Enabled

VT-d

Check to enable the VT-d function on MCH.

Enabled / Disabled

Primary Display

Select which of IGFX/PEG/PCIE Graphics device should be the Primary Display.

- IGFX - Internal Graphics Device (Onboard VGA)
- PEG - PCI Express Graphics. (PCIe x16 Slot)
- PCIE - PCI Express (PCIe x8 Slot, PCIe x1 Slot)

Auto / IGFX / PEG / PCIE

Internal Graphics

Keep IGD enabled based on the setup options.

Auto / Disabled / Enabled

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the internal Graphics Device.

32M / 64M / 96M / 128M / 160M / 192M / 224M / 256M / 288M / 320M /
352M / 384M / 416M / 448M / 480M / 512M / 1024M

DVMT Total Gfx Mem

Select DVMT5.0 Total Graphics Memory size used by the Internal Graphics Devices.

128M / **256M** / MAX

Enable PEG

Enable or disable PEG.

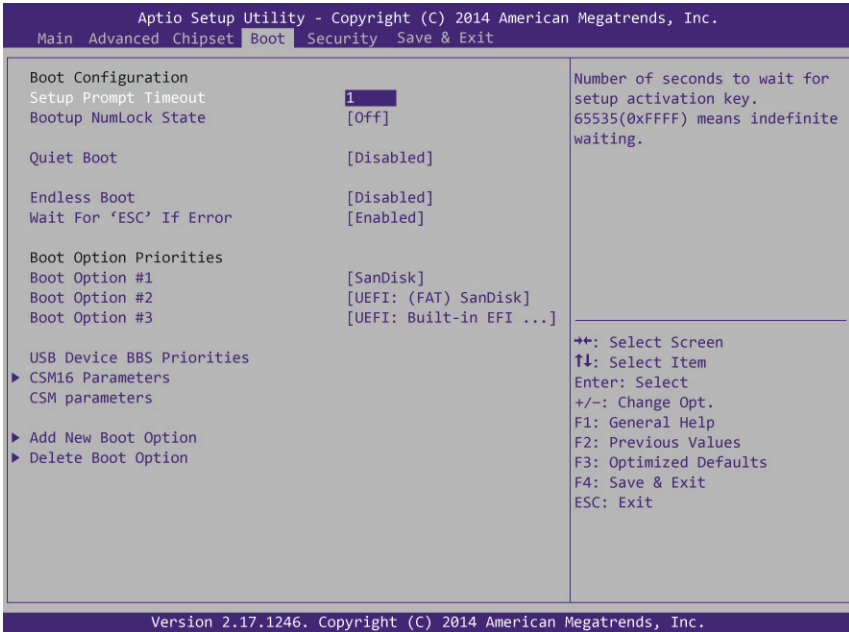
Auto / Disabled / Enabled

Detect Non-Compliance Device

Detect Non-Compliance PCI Express Device in PEG.

Disabled / Enabled

3.5 Boot



Setup Prompt Timeout

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

1

Bootup NumLock State

Select the keyboard NumLock state.

On / **Off**

Quiet Boot

Enable or disable Quiet Boot option.

Disabled / Enabled

Endless Boot

Restart the INT19 boot process automatically if all IPL devices fail to boot..

Enabled / **Disabled**

Wait for 'ESC' If Error

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

Enabled / Disabled

Boot Option #1

Set the system boot order.

Device name / Disabled

Boot Option #2

Set the system boot order.

Device name / Disabled

Boot Option #3

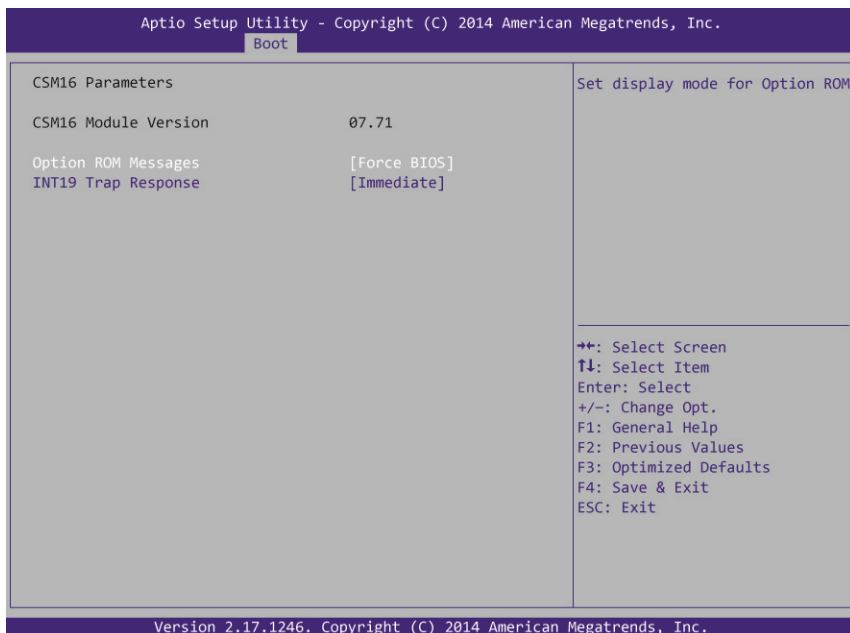
Set the system boot order.

Device name / Disabled

USB Device BBS Priorities

Set the order of the legacy devices in this group.

3.5.1 CSM16 Parameters



Option ROM Messages

Set display mode for Option ROM.

Force BIOS / Keep Current

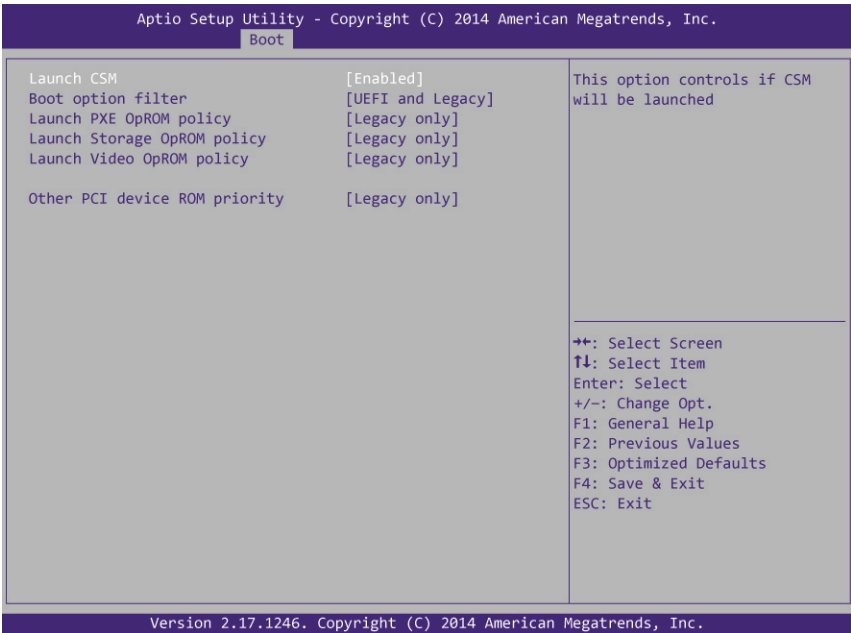
INT19 Trap Response

BIOS reaction on INT19 trapping by Option ROM:

Immediate --- execute the trap right away; Postponed --- execute the trap during the legacy boot.

Immediate / Postponed

3.5.2 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.

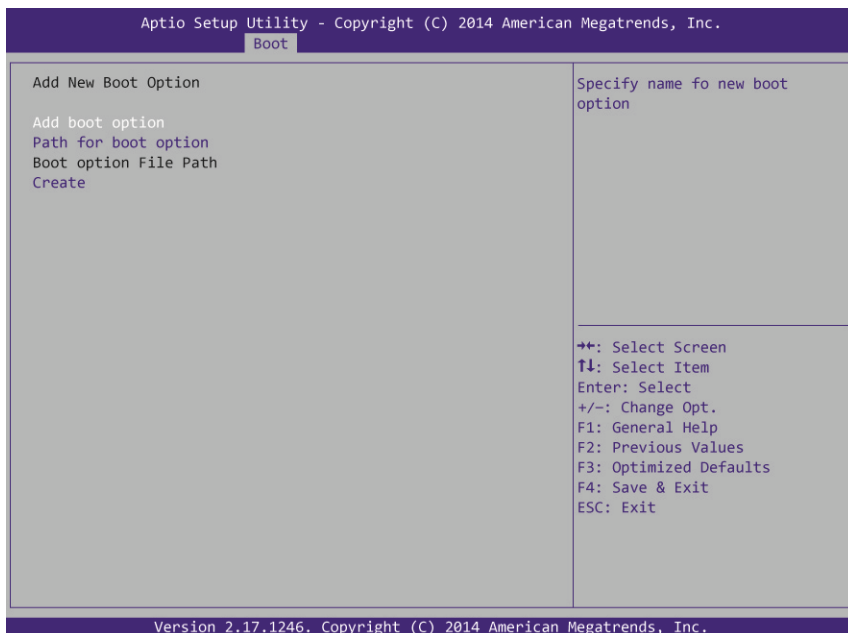
Do not Launch / UEFI only / **Legacy only**

Other PCI device ROM priority

For PCI devices other than Network, Mass storage or Video defines which OpROM to launch.

UEFI OpROM / **Legacy OpROM**

3.5.3 Add new Boot Option



Add boot option

Specify name for new boot option.

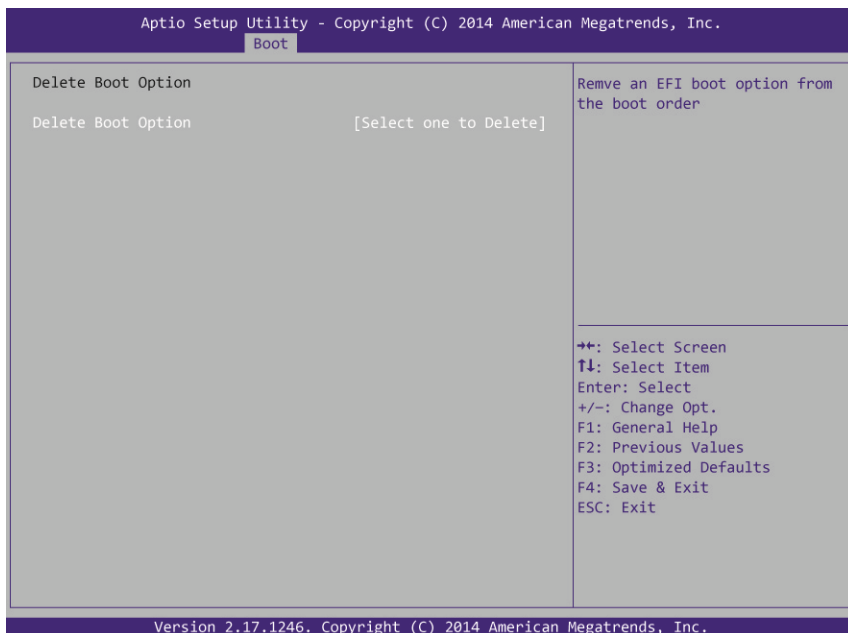
Path for boot option

Enter the path to the boot option in the format fsx:\path\filename.efi.

Create

Creates the newly formed boot option.

3.5.4 Delete Boot Option

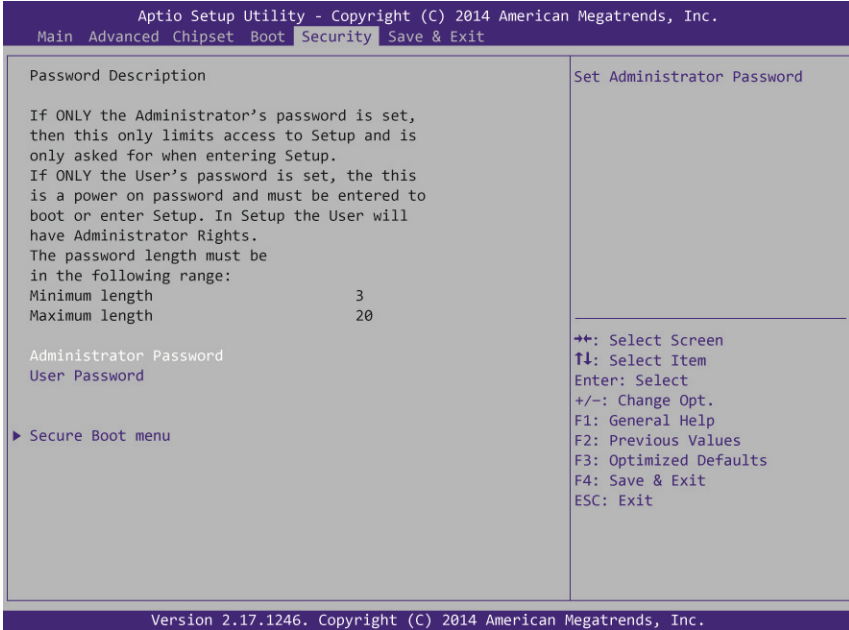


Delete Boot Option

Remove an EFI boot option from the boot order.

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

3.6 Security



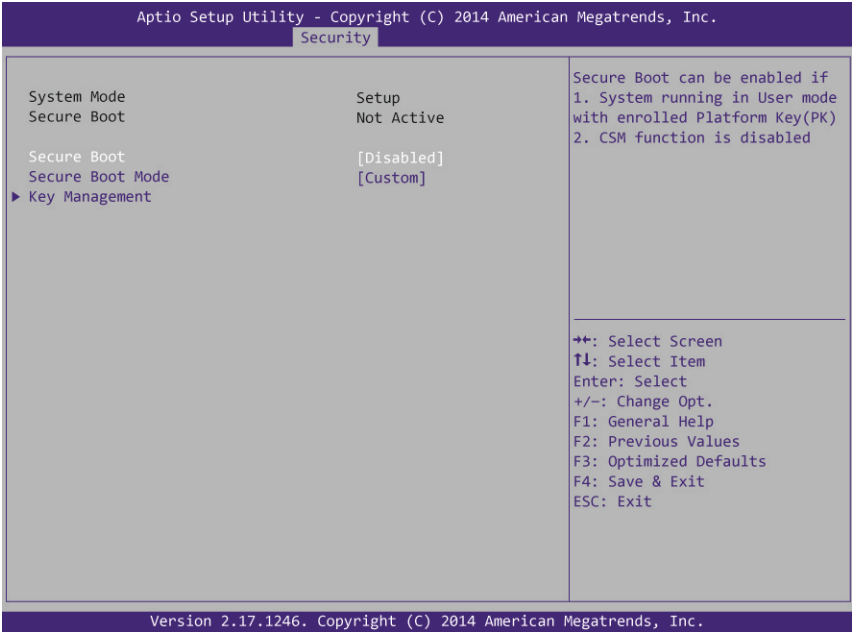
Administrator Password

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.

3.6.1 Secure Boot Menu



Secure Boot

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

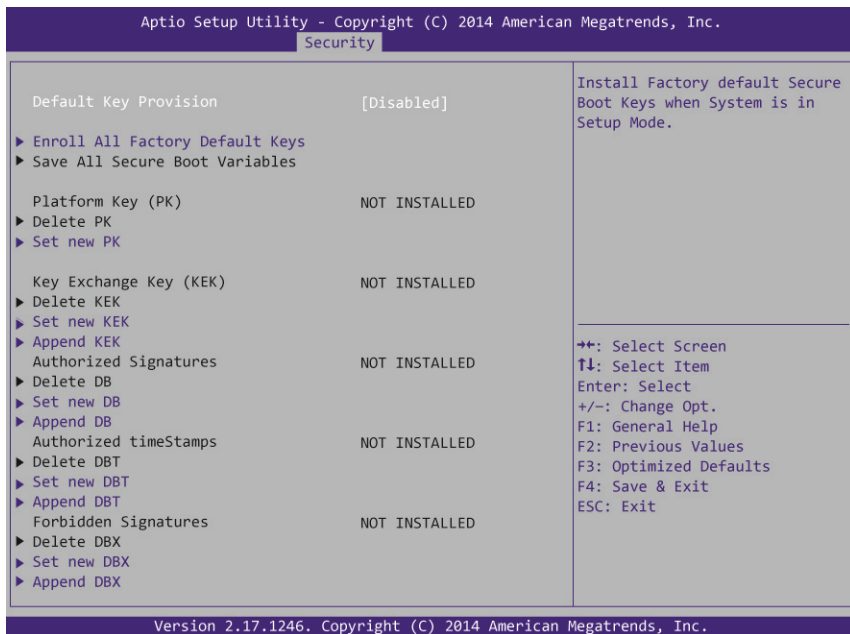
Disabled / Enabled

Secure Boot Mode

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

Standard / **Custom**

3.6.1.1 Key Management



Default Key Provision

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.

Save 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.

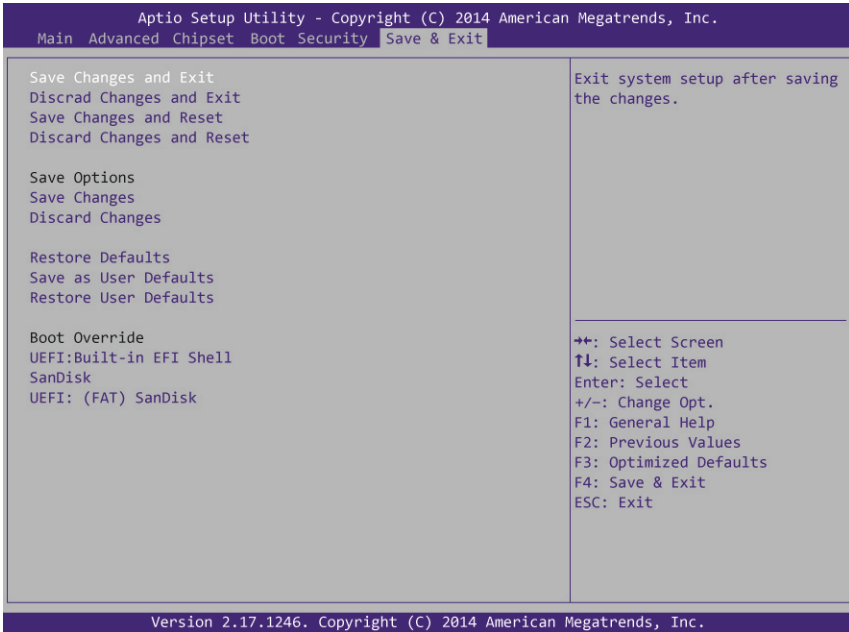
Set New DBX

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.

3.7 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.

NOTE

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 AML progress codes
Recovery Error Codes	
0xF8	Recovery PPI is not available
0xF9	Recovery capsule is not found
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AML error codes

PEI Beep Codes

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

DXE Phase

Status Code	Description
0x60	DXE Core is started
0x61	NVRAM initialization
0x62	Installation of the South Bridge Runtime Services
0x63	CPU DXE initialization is started
0x64	CPU DXE initialization (CPU module specific)
0x65	CPU DXE initialization (CPU module specific)
0x66	CPU DXE initialization (CPU module specific)
0x67	CPU DXE initialization (CPU module specific)
0x68	PCI host bridge initialization
0x69	North Bridge DXE initialization is started
0x6A	North Bridge DXE SMM initialization is started
0x6B	North Bridge DXE initialization (North Bridge module specific)

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

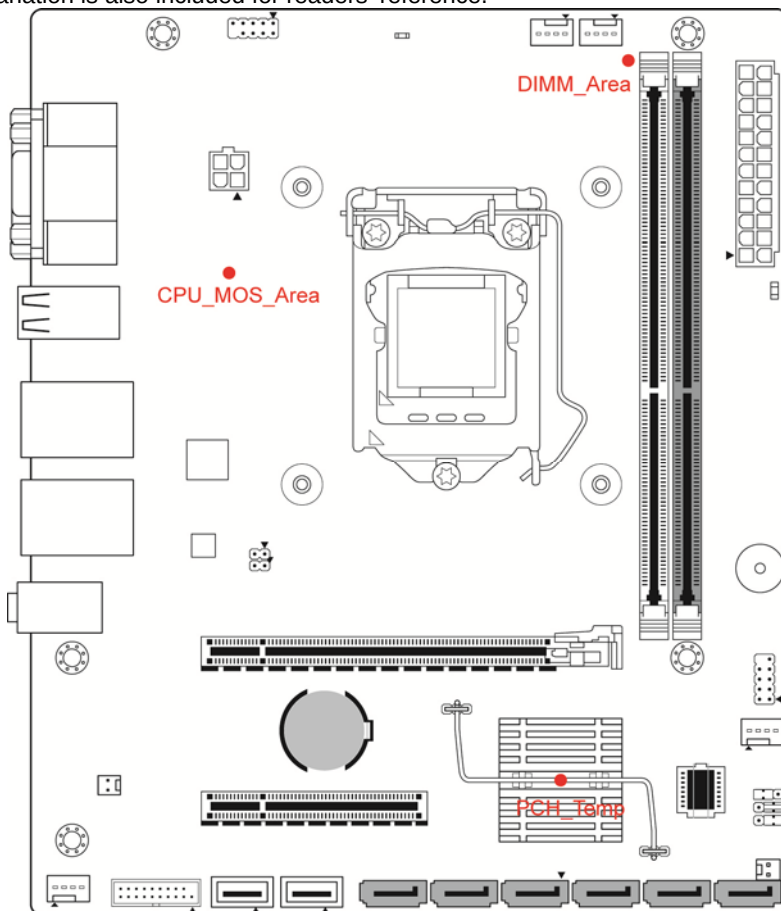
# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met

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: Fan and Temp Sensors

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



NOTE: The red mark indicates the sensor.

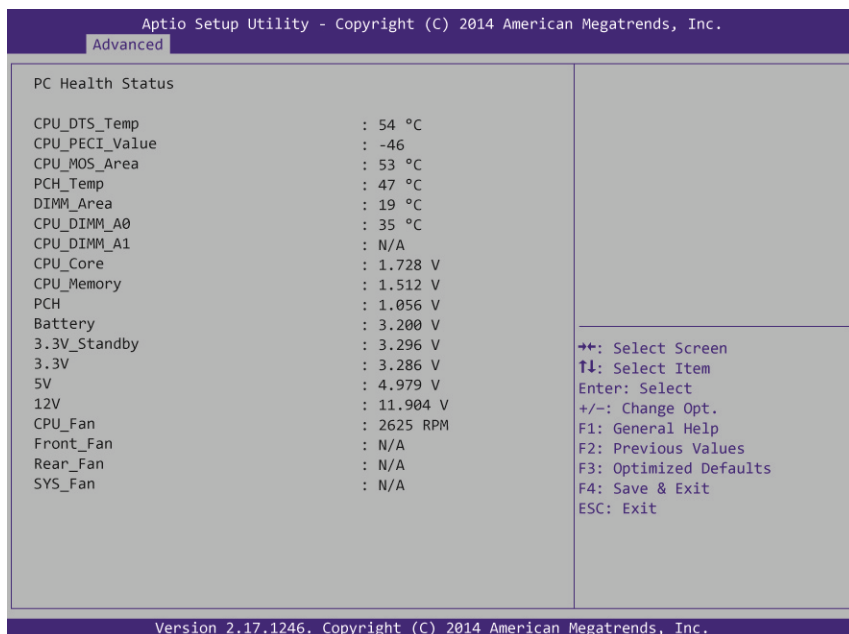
Fan and Temp Sensor Location:

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

2. Temp Sensor: [CPU_MOS_Area](#), [PCH_Temp](#), and [DIMM_Area](#). 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
CPU_DTS_Temp	Temperature of the CPU Digital Temperature Sensor
CPU_PECI_Value	Temperature of the CPU Platform Environment Control Interface
CPU_MOS_Area	Temperature of the CPU MOS Area
PCH_Temp	Temperature of the PCH Area
DIMM_Area	Temperature of the DIMM Area
CPU_DIMM_A0	Temperature of CPU DIMM A0 Slot
CPU_DIMM_A1	Temperature of CPU DIMM A1 Slot
CPU_Fan	Fan Speed of CPU_Fan
Front_Fan	Fan Speed of Front_Fan
Rear_Fan	Fan Speed of Rear_Fan
SYS_Fan	Fan Speed of SYS_Fan

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 loses 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 10 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 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:
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 normes 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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