User's Manual

Sapphire Pure Fusion Mini E350

AMD Dual Core E350 Series Mainboard

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Federal Communications Commission (FCC) Statement

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions contained in this manual, may cause harmful interference to radio and television communications. However, there is no guarantee that interference will not occur in a particular installation.

If this product 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 to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the product into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note1: Connecting this device to peripheral devices that do not comply with Class B requirements, or using an unshielded peripheral data cable, could also result in harmful interference to radio or television reception

Note2: The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this product.

Note3: To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables

CE: Radiation of EN 55022 & Immunity of EN 55024

Waste Electrical and Electronic Equipment (WEEE) Statement

To protect the global environment, this product must be sent to separate collection facilities for recovery and recycling.

DISPOSAL

Do not dispose of this product as unsorted municipal waste. Collect such waste separately for special treatment.

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Chapter 1 Introduction

1-1 Mainboard Specifications

APU

- AMD® Dual Core Processor E350 with AMD Radeon™ HD6310 Graphics

Chip

- AMD® Hudson-M1 (A50M) Chip

Graphics

- ATI Radeon™ HD6310 GPU
- Three independent displays supporting concurrent display of either two combination of HDMI, DVI and D-Sub

Port	Supported resolution
D-Sub	2560x1600@60MHz & 30bpp
DVI-D	1920x1080@60MHz & 36bpp
HDMI	1920x1080@60MHz & 24bpp (HDMI 1.3b)

System Memory

- Two 204-pin DDR3 SO-DIMM sockets
- Supports 1.5v DDR3-1066/800 SO-DIMMs with single channel architecture
- Supports non-ECC, un-buffered DIMMs
- Supports up to 4GB system memory

USB Ports

- Eight USB 2.0 ports (four at rear panel, four onboard by header), supporting transfer speeds up to 480Mbps, Supports wake-up from S3 mode
- Two USB 3.0 ports (at rear panel) backwardly compatible with USB 2.0 supporting transfer speeds up to 4.8Gbps

SATA Ports

- Five SATA III ports with 6Gb/s data transfer rate
- One eSATA port at real panel with 3Gb/s data transfer rate

Onboard LAN

- One Gigabit Ethernet from Marvell 88E8057 Gigabit controller

Bluetooth

- Atheros AR3011 is a highly integrated, all-CMOS, single chip with Bluetooth® 2.1 + EDR supported

Onboard Audio

- Supports 8-channel High-Definition audio and optical S/PDIF output
- Supports Jack-detection function

Expansion Slots

- One PCI-Express 2.0 x16 connector, supports x4 bandwidth, for VGA card use only.
- One Mini PCI-Express 2.0 x1 connector

I/O

- Onboard Fintek F71808E LPC bus I/O controller

BIOS

- 16Mb SPI Flash with AMI based BIOS
- Supports ACPI (Advanced Configuration and Power Interface)

Form Factor

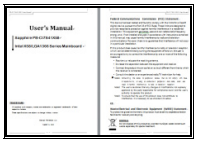
- Mini-ITX form factor of 170mm x 170mm

Operating systems:

- Supports Windows Vista and Windows 7

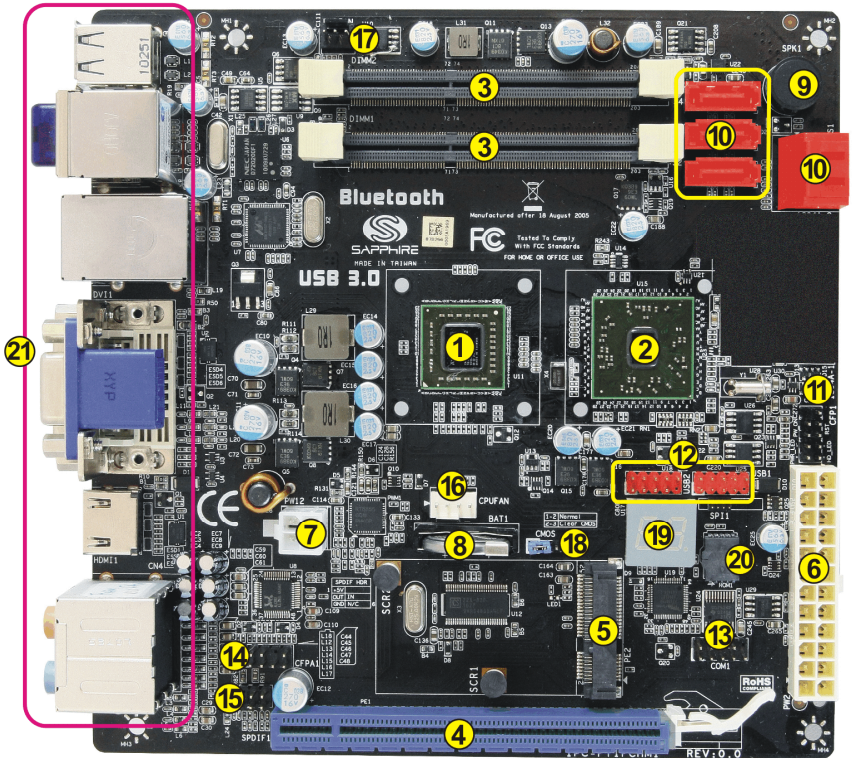
1-2 Package Contents

Your Sapphire Pure Mini E350 mainboard comes with the following accessories.

1. Mainboard	
2. Quick Installation Guide	**3. Driver CD**
	
4. I/O Shield	**5. SATA Data Cable *2**

1-3 Mainboard Layout

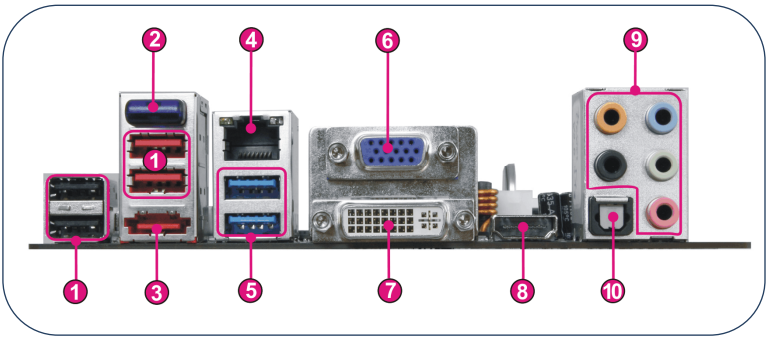
The following figure shows the location of components on the mainboard. See following page for description.



Item	Component description
1	AMD E350 APU
2	AMD Hudson-M1 (A50M) Chip
3	DDR3 SO-DIMM Slots 1-2
4	PCI-E x16 Slot (supports x4 bandwidth)
5	Mini PCI-E Slot
6	24-Pin ATX Power Connector
7	4-pin ATX_12V Power Connector
8	Mainboard Battery
9	PC Speaker
10	SATA III Connectors *5
11	Front Panel Header
12	USB2.0 Header *4
13	Serial Port Header
14	Front Panel Audio Header
15	S/PDIF Header
16	CPU Fan Header
17	Power Fan Header
18	Clear CMOS Jumper
19	Debug LED Display
20	16Mb SPI Flash
21	Back Panel Connectors (see next page for detail)

I/O Back Panel

The I/O back panel for this mainboard is shown below. When installing the mainboard into the computer case, use the bundled I/O shield to protect this back panel.



1. USB 2.0 Ports (Four)
   The mainboard provides an OHCI (Open Host Controller Interface) Universal Serial Bus root for attaching USB devices such as a keyboard, mouse or other USB-compatible devices. Supports data transfer rates up to 480Mb/s.

2. Bluetooth
   Bluetooth wireless technology is an interface intended for wireless control/data communication.

3. ESATA Port
   The ESATA (External SATA) port provides connection to ESATA hard drives.

4. LAN Ports with LEDs
   The mainboard provides one standard RJ-45 jack for connecting to a Local Area Network (LAN). Two LEDs are built into the RJ-45 LAN connector. These LEDs indicate the status of the LAN.

LED	LED Color	LED state	Indicates
A	Green	Off	LAN link is not established
		On	LAN link is established
		Blinking	LAN activity is occurring
B	N/A	Off	10 Mb/s data rate
	Green	On	100 Mb/s data rate
	Yellow	On	1000 Mb/s data rate

5. USB 3.0 ports (Two)
   USB 3.0 ports are backwardly compatible with USB 2.0 devices. Supports data transfer rates up to 4.8Gb/s (SuperSpeed).

6. D-Sub Port
   The D-Sub female port provides connection to analogue VGA monitors.

7. DVI-D Port
   The DVI-D (Digital Visual Interface-Digital) port provides a high-speed digital interconnection between the computer and its display device. Connect a monitor that supports DVI-D connection to this port. The DVI-D port does not support analogue VGA monitors using a passive DVI to VGA adapter.

8. HDMI Port
   The HDMI (High-Definition Multimedia Interface) provides an all-digital audio/video interface to transmit the uncompressed audio/video signals and is HDCP compliant. Connect the HDMI audio/video device to this port.

   Dual Display Configurations:
   This mainboard provides three ports for video output: D-Sub, DVI-D and HDMI. Please refer to table below for dual display configurations supported.

Supported configurations
D-Sub + DVI-D
DVI-D + HDMI
D-Sub + HDMI

9. Audio Ports
   This mainboard provides 2, 6, or 8channel audio. It is easy to differentiate between the audio functions by referring to the color of the jacks.

Ports	2 channel	6 channel	8 channel
Blue	Line-In	Line-In	Line-In
Lime	Line-Out	Front Stereo-Out	Front Stereo-Out
Pink	Min-In	Min-In	Min-In
Orange	--	Center/Subwoofer	Center/Subwoofer
Black	--	Rear Stereo-Out	Rear Stereo-Out

10. Optical S/PDIF-Out
    This SPDIF (Sony & Philips Digital Interconnect Format) connector is used for digital audio transmission to external speakers/amplifier through an optical fiber cable.

Chapter 2 Installation

2-1 Before You Begin

Please take note of all precautions before you install anything on to the mainboard or change any of the mainboard settings.
Turn off the power to your system and discharge your body's static electric charge by touching a grounded surface—for example, the metal surface of the power supply—before performing any hardware procedure.
The manufacturer assumes no liability for any damage, caused directly or indirectly, by improper installation of any components by unauthorized service personnel. If you do not feel comfortable performing the installation, consult a qualified computer technician.
Damage to system components, the mainboard, and injury to you may result if power is applied during installation.

2-2 Installing the I/O Shield

The mainboard comes complete with an I/O shield. When installed in the chassis, the shield blocks radio frequency transmissions, protects internal components from dust and foreign objects, and promotes correct airflow within the chassis.

Install the I/O shield before installing the mainboard in the chassis. Place the shield inside the chassis. Press the shield into place so that it fits tightly and securely. If the shield does not fit, obtain a properly sized shield from the chassis supplier.

2-3 Securing to the Chassis

When installing the mainboard, you have to secure the mainboard into the chassis by fastening with nine screws. Please refer to your chassis manual for instructions on installing.

2-4 Installing System Memory

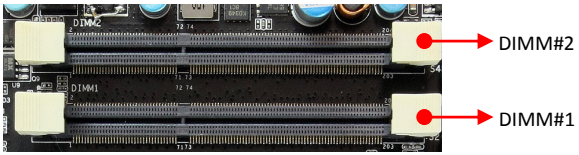
This mainboard has two 204-pin SO-DIMM sockets for DDR3 memory.

- Supports 1GB, 2GB and 4GB DDR3 SO-DIMMs.
- Supports 1.5v DDR3-1066/800 SO-DIMMs with single channel architecture

Memory configurations:

To use 1 DIMM: Install into either DIMM slot 1 or slot 2.

To use 2 DIMMs: Install into DIMM slot 1 and DIMM slot 2.



Memory Installation:

DDR3 and DDR2 memory modules are physically different. Please only install DDR3 DIMMs in this mainboard.

To make sure you have the correct DIMM, check that all the notches line up with the DDR3 DIMM slot.

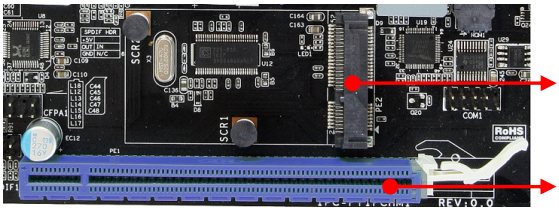
To install the DIMM, follow these steps:

1. Pull both clips on either side of the slot outwards. Align the DIMM module with the slot.

2. Press straight down until the plastic clips close and the module fits tightly into the DIMM slot.

2-5 Installing Expansion Cards

The mainboard provides one PCI Express 2.0 x16 slot and one mini PCI-E slot.



PCI-E Slot

The design of this motherboard supports PCI-E Express x16 card complying with the PCI Express specification.

Note: This PCI-Express x16 slot only supports x4 bandwidth and is intended only for use by a graphics card.

To install a PCI Express card:

1. Place the card in an available PCI Express slot and press down on the card until it is completely seated in the slot. If the card is not seated properly, it could cause a short across the pins.
2. Secure the card's metal bracket to the chassis back panel with a screw.

Mini PCI-E Slot

The Mini PCI-E Slot is used to connect compliant Mini PCI-Express x1 devices such as a wireless network card, USB card or other devices.

To install a Mini PCI-E card:

1. Align the notch in the Mini PCI card edge connector with the tab in the slot.
2. Plug the Mini PCI card firmly into the slot at a 45-degree angle, and until it clicks into place.
3. Fasten Mini PCI-E card onto the two nuts with accompanied screws.

2-6 Connecting Cables

This section takes you through all the necessary connections on the mainboard.

Connecting Power Supply Cables

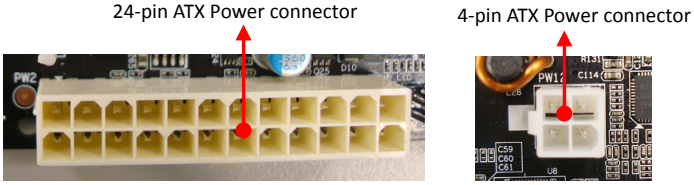
- 24-pin ATX Power

PW2 is the main power supply connector. Make sure that the power supply cable and pins are properly aligned with the connector on the mainboard. Firmly plug the power supply cable into the connector and make sure it is secure.

Note: If you'd like to use the 20-pin ATX power supply, please plug in your power supply cable aligned with pins 1 & 13. The 24-pin main power connector is backwardly compatible with ATX power supplies with 20-pin connectors.

- 4-pin ATX 12V Power

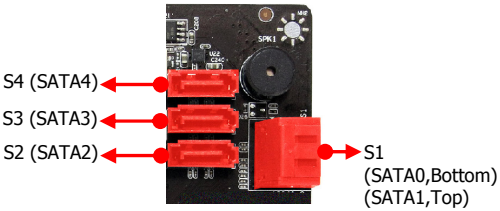
PW12, the 4-pin ATX 12V power connector, is used to provide power to the CPU. Align the power plug to the connector and press firmly until seated.

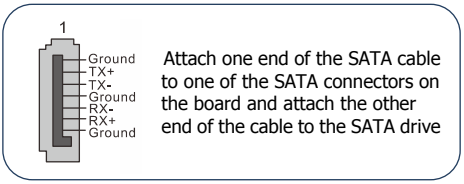


Connecting Serial ATA (SATA) Cables

SATA cables support the Serial ATA protocol. Each cable can be used to connect one internal SATA drive to mainboard.

The S1 ~S4 connectors are SATAIII connectors operate at a speed up to 6Gb/s.





Connecting to the Internal Headers and Connectors

Front Panel Header

The front panel header on this motherboard is one connector used to connect the front panel switches and LEDs.

▶PWR_LED

Attach the front panel power LED cable to these two pins of the connector. The Power LED indicates the system's status.

System Status	Power LED indicates
On	The LED is on
Off	The LED is off
S3	The LED will blink
S4	The LED is off

▶PW_ON

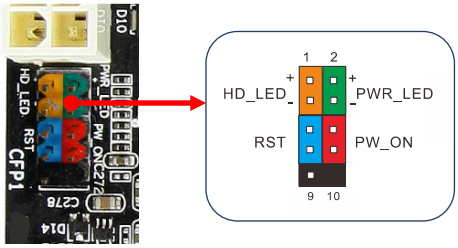
Attach the power button cable from the case to these two pins. Pressing the power button on the front panel turns the system on and off rather than using the onboard button.

▶HD_LED

Attach the hard disk drive indicator LED cable to these two pins. The HDD indicator LED indicates the activity status of the hard disks.

▶RESET

Attach the Reset switch cable from the front panel of the case to these two pins. The system restarts when the RESET switch is pressed.



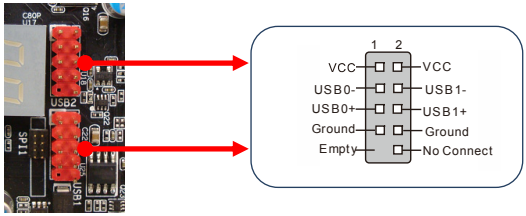
Header	Pin	Signal
HD_LED	1	HD_PWR
	3	HD Active
PWRLED	2	PWR LED+
	4	PWR LED-
RESET	5	Ground
	7	RST BTN
PWRSW	6	PWR BTN
	8	Ground
No Connect	9	+5V
Empty	10	Empty

USB Header

This mainboard contains four (4) USB 2.0 ports that are exposed on the rear panel of the chassis. This mainboard also contains two 10-pin internal header connectors onboard that can be used to connect an optional external bracket containing four (4) USB 2.0 ports.

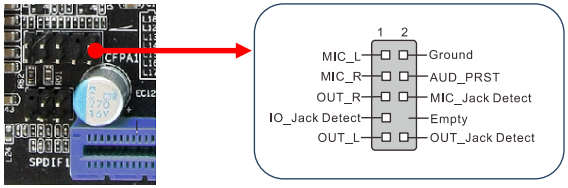
Refer to the following steps:

1. Secure the bracket to either the front or rear panel of your chassis (not all chassis are equipped with the front panel option).
2. Connect the cable(s) to the USB 2.0 header on the mainboard.



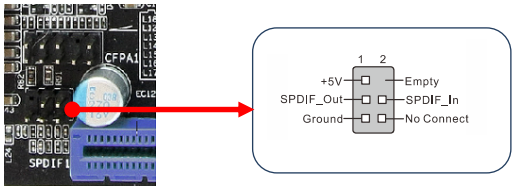
CFPA Header

This header allows you to connect the front panel audio. The audio connector supports HD audio standard.



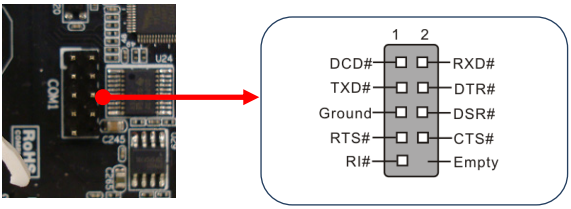
S/PDIF Header

This header is used to connect S/PDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.



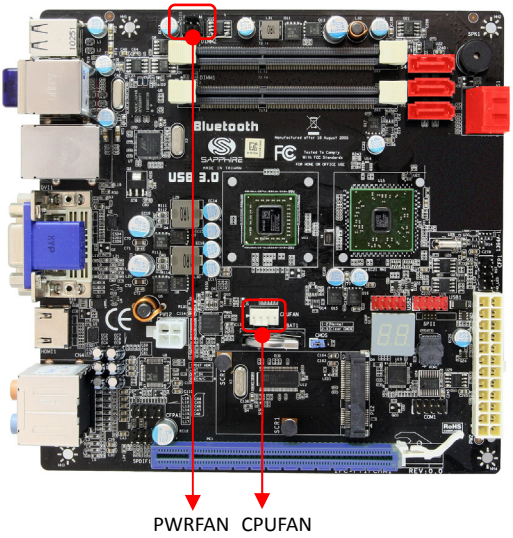
COM1 (Serial Port Header)

The COM header can provide one serial port via an optional COM port cable.



Fan Header

There are two fan headers (CPUFAN, PWRFAN) on the motherboard. They can be speed detected/controlled and displayed in the Hardware Health Configuration section of the CMOS Setup. The fans are automatically turned off after the system enters S3, S4 or S5 mode.



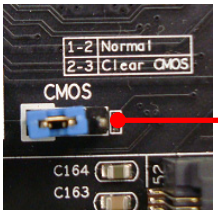
CPUFAN

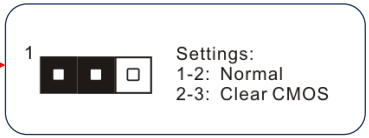
Note:
The CPU fan cable can be either a 3-pin or a 4-pin connector. Connect a 3-pin connector to pins 1, 2, and 3on the mainboard connector.

PWRFAN

2-7 Jumper Settings

If the CMOS data becomes corrupted or you forgot the supervisor or user password, clear the CMOS data to reconfigure the system back to the default values stored in the ROM BIOS.





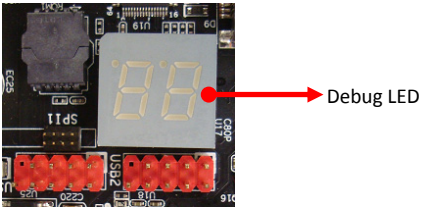
To clear CMOS data, please follow the steps below.

1. Turn off the system.
2. Change the jumper from “1-2” to “2-3” position for a few seconds.
3. Replace the jumper back to the “1-2” position.
4. Turn on the system and hold down the <Del> key to enter BIOS Setup.

2-8 Diagnostics LED

This mainboard provides a two-digit POST code to show why the system may be failing to boot. It is useful during a troubleshooting situation.

Please find a list of debug codes in the full manual found on your installation CD.



Chapter 3 Configuring the BIOS

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

3-1 Enter BIOS Setup

The BIOS is the communication bridge between hardware and software. Correctly setting the BIOS parameters is critical to maintain optimal system performance.

Use the following procedure to change BIOS settings.

1. Power on the computer.
2. Press the **Del** key when the following message briefly shows upon the bottom of the display during Power On Self Test (POST).

   Press F1 to continue, DEL to enter Setup.

Pressing Del takes you to the BIOS Aptio Setup Utility.

Note1: It is strongly recommended that you do not change the default BIOS settings. Changing some settings could damage your computer.

Note2: The BIOS options in this manual are for reference only. BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version from our official website

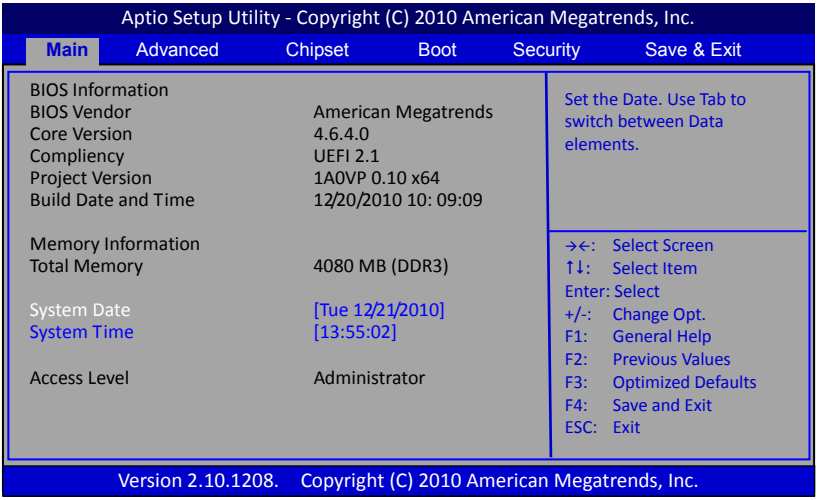
ControlKeys

Please check the following table for the function description of each Controlkey.

Control Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F2>	To load previous values for all the settings
<F3>	To load optimal default values for all the settings
<F4>	To save changes and exit the SETUP UTILITY
<ESC>	To jump to the Exit Screen or exit the current screen

3-2 Main Menu

When entering the Aptio Setup Utility, the main menu screen appears. This main menu includes the system overview and displays the basic system configuration, such as BIOS information, memory size and system date/time.



BIOS Information

This field displays the current BIOS version, build date and ID information etc..

Memory Information

Displays current system memory size.

System Date

Allows you to set the system date.The format is <Day><Month><Date><Year>.

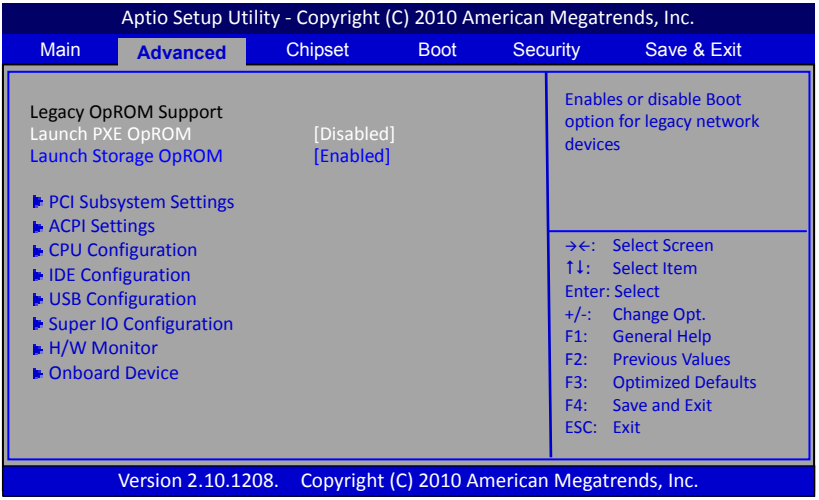
[Day] Weekday from Sun. to Sat., this is automatically displayed by BIOS.
[Month] The month from 1 to 12.
[Date] The date from 1 to 31 can be keyed by numeric function keys.
[Year] The year can be adjusted by users.

System Time

Allows you to set the system time. The time format is <hour>:<minute>:<second>.

3-3 Advanced Menu

The Advanced menu items allow you to change the settings for the CPU, USB and other system devices. Press <Enter> to display the configuration options.



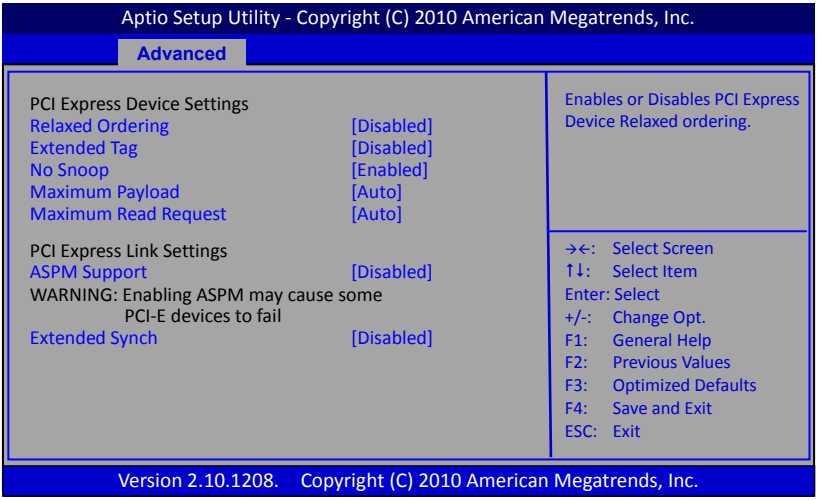
Launch PXE OpROM

Enables the Boot option for legacy network devices.
Options: Enabled, Disabled.

Launch Storage OpROM

Enables the Boot option for mass storage devices with option ROM.
Options: Enabled, Disabled.

PCI Subsystem Settings



Relaxed Ordering
Enables the PCI Express device Relaxed Ordering.
Options: Enabled, Disabled.

Extended Tag
Allows device to use 8-bit TAG field as a requester.
Options: Enabled, Disabled

No Snoop
Enables the No Snoop function of PCI Express device.
Options: Enabled, Disabled.

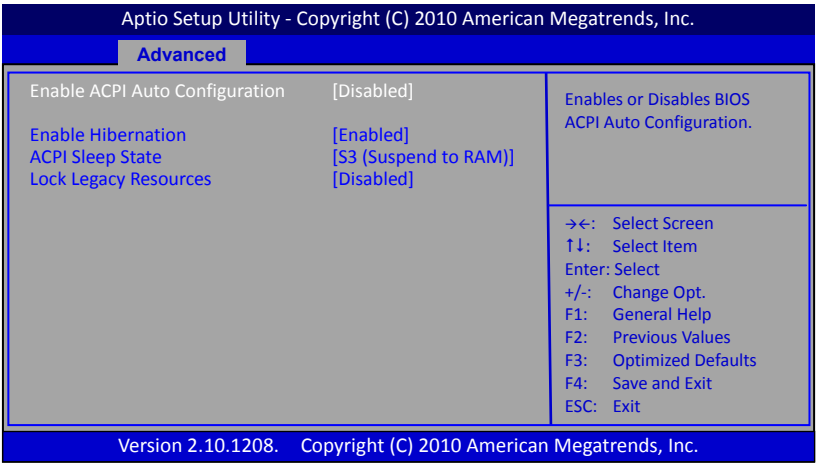
Maximum Payload
Sets the Maximum Payload size of PCI Express Device or allows the System BIOS to select the value.
Options: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes.

Maximum Read Request
Sets the Maximum Read Request of PCI Express Device or allows the System BIOS to select the value.
Options: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes.

ASPM Support
Sets the ASPM level, select "Force L0" can force all links to L0 state.
Options: Disabled, Auto, Force L0.

Extended Synch
If select "Enabled", allows generation of Extended Synchronization patterns.
Options: Enabled, Disabled.

▶ ACPI Settings



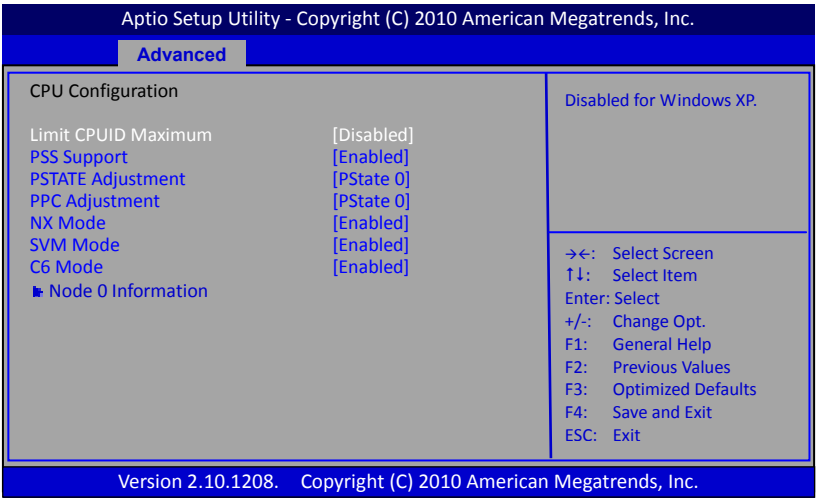
Enable ACPI Auto Configuration
Enables the BIOS ACPI auto configuration.
Options: Enabled, Disabled.

Enable Hibernation
Enables system ability to Hibernate (OS/S4 Sleep Sate). This option may be not effective with some OS.
Options: Enabled, Disabled.

ACPI Sleep State
Selects the ACPI state used to suspend system.
Options: Suspend Disabled, S3 (Suspend to RAM).

Lock Legacy Resources
When enabled (locked), this option prevents the operating system from modifying assignments for legacy resources.
Options: Enabled, Disabled.

CPU Configuration



Max CPUID Value Limit

We recommend leaving it disabled, unless you are using a very old OS or experiencing problems related to CPU identification/compatibility.
Options: Enabled, Disabled.

PSS Support

Enables the generation of ACPI_PCC,_PSS, and _PCT object.
Options: Enabled, Disabled.

PSTATE Adjustment

This item allows you to adjust startup P-State level.
Options: PState 0 ~7.

PPC Adjustment

This item allows you to adjust _PPC object.
Options: PState 0 ~2

NX Mode

Enables the No-execute page protection function.
Options: Enabled, Disabled.

SVM Mode

Enables the CPU SVM(Secure Virtual Machine) function.
Options: Enabled, Disabled.

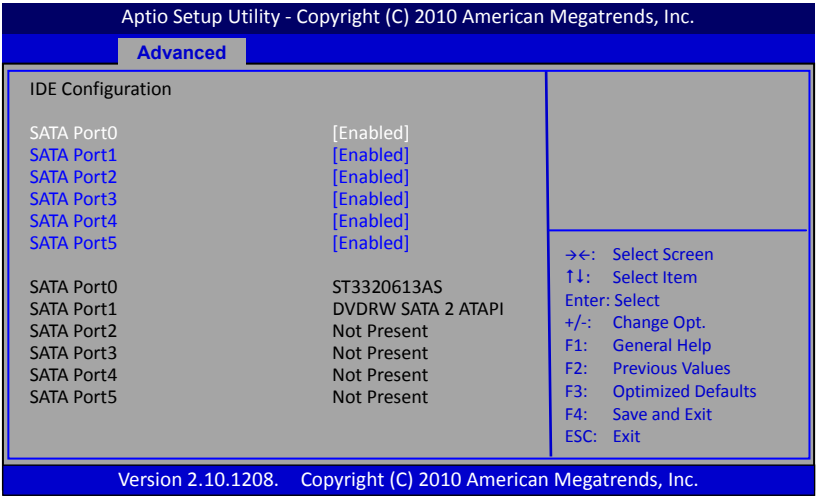
C6 Mode

Allows you to select C6 State for Nehalem processor.
Options: Enabled, Disabled.

Node 0 Information

Displays the Node 0 Information.

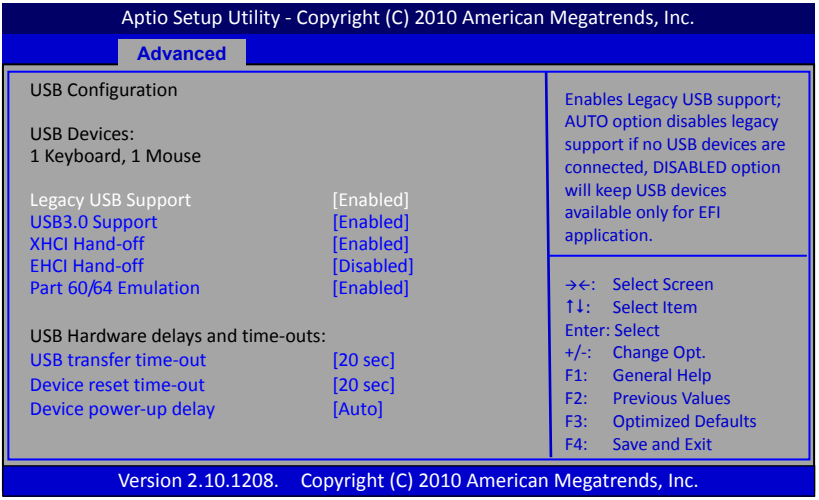
▶ IDE Configuration



IDE Configuration

This filed allows you to enable or disable the SATA port.

USB Configuration



Legacy USB Support

Allows you select legacy support for USB devices.

Enabled: Enables Legacy USB support.

Disabled: Keep USB devices available only for EFI application.

Auto: Disables legacy support if no USB devices are connected.

USB3.0 Support

Enables USB3,0 (XHCI) controller support.

Options: 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.

Options: Enabled, Disabled.

EHCI Hand-off

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

Options: Enabled, Disabled.

Part 60/64 Emulation

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

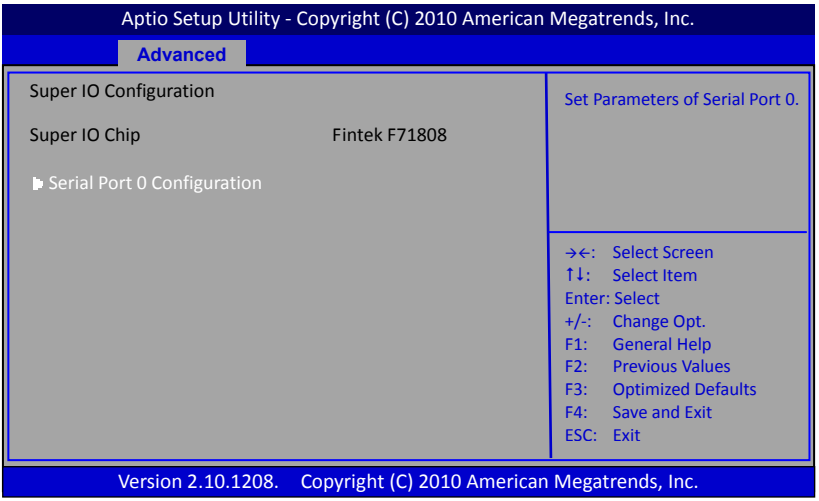
Options: Enabled, Disabled.

USB transfer time-out
The time-out value for control, bulk, and interrupt transfers.
Options: 1 sec, 5 sec, 10 sec, 20 sec.

Device reset time-out
Sets USB mass storage devices start unit command time-out.
Options: 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 values; for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.
Options: Auto, Manual.

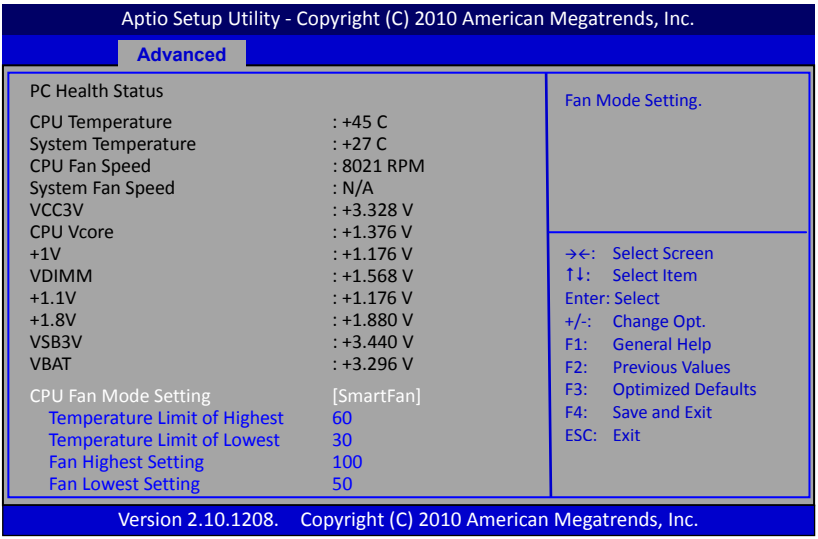
▶ Super IO Configuration



Serial Port 0 Configuration
Select parameters for Serial Port 0.
Options: Enabled, Disabled.

Change Settings
Select an optimal setting for super I/O device.
Options: 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

H/W Monitor



CPU / System Temperature

Displays the current CPU and system temperature.

CPU /System Fan Speed

Displays the current CPU and System Speed

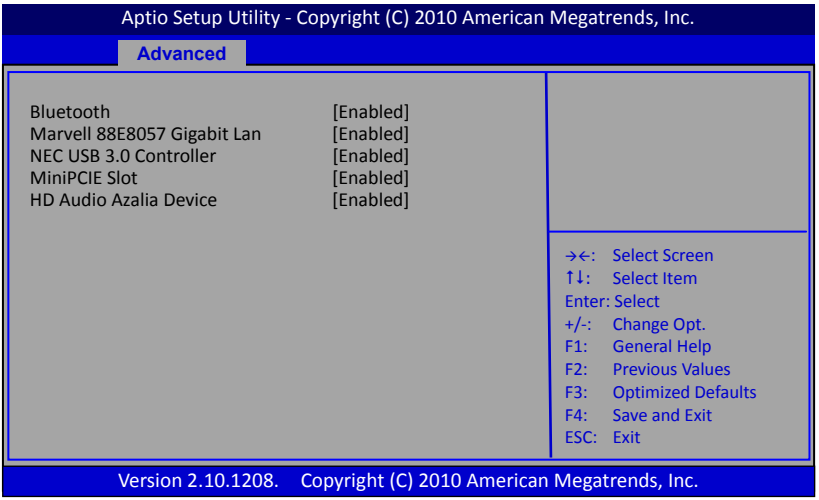
VCC3V/CPU Vcore/+1V/VDIMM/+1.1V/+1.8V/VSB3V/VBAT

The current voltages are automatically detected and displayed by the system.

CPU Fan Mode Setting

This item controls the speed of the various fans on the motherboard. Choose [SmartFan] when you want the speed of the fans automatically controlled based on temperature. To set the fan speed to a constant rate, select [Manual Mode] and then enter the speed from 0% to 100%.

Onboard Device



Bluetooth
Enables Bluetooth function.
Options: Enabled, Disabled.

Marvell 88E8057 Gigabit Lan
Enables the onboard Marvell GigaLan function for LAN.
Options: Auto, Enabled, Disabled

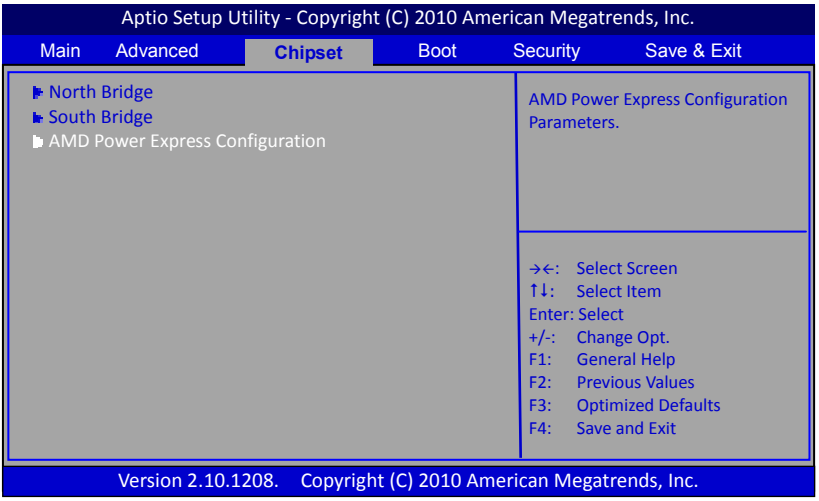
NEC USB 3.0 Controller
Enables the onboard USB 3.0 controller.
Options: Enabled, Disabled.

MiniPCIE Slot
Enables the onboard MiniPCIE Slot.
Options: Enabled, Disabled

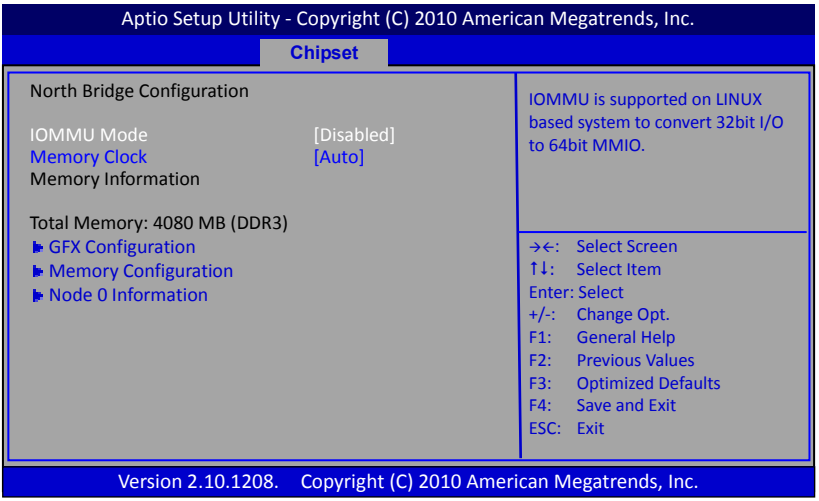
HD Audio Azalia Device
Enables the onboard High Definition Audio controller.
Options: Auto, Enabled, Disabled.

3-4 Chipset Menu

The chipset menu items allow you to change the advanced chipset settings. Press <Enter> to display the sub-menu.



▶ North Bridge



IOMMU Mode
IOMMU is supported on LINUX based system to convert 32bit I/O to 64bit MMIO.
Options: Disabled, 32MB, 64MB, 128MB, 256MB, 512MB, 1GB, 2GB.

Memory Clock
Allows you to select different memory clock.
Options: Auto, 400MHz, 533MHz.

▶ **GFX Configuration**

PSPP Policy
Allows you to select PCIE speed power policy.
Options: Disabled, Performance, Balanced-High, Balanced-Low, Power Saving.

▶ **Memory Configuration**

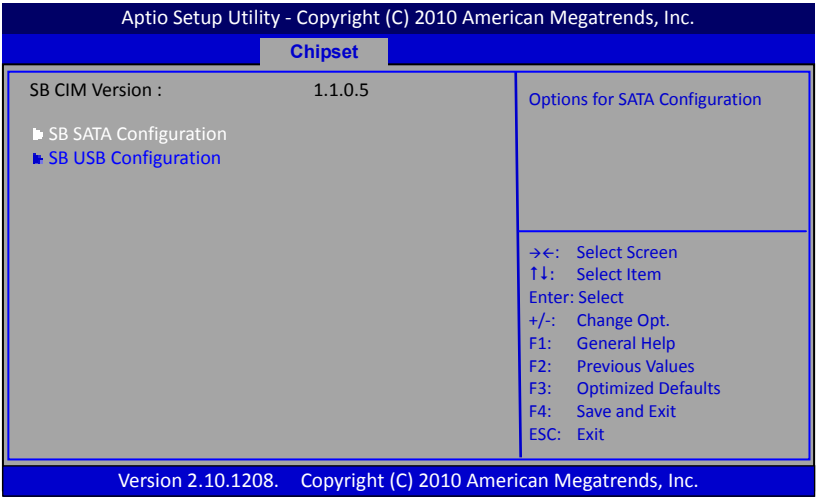
Integrated Graphics
Enables integrated graphics controller.
Options: Disabled, Auto, Force.

UMA Frame buffer Size
This item will only appear when "Integrated Graphics" item is set to "Force" option. It controls the amount of system memory that is allocated to the integrated graphics processor.
Options: 32M, 64M, 128M, 256M, 512M, 1G, 2G.

Bank Interleaving
Bank Interleaving is an important parameter for improving overclocking capability of memory. It allows system to access multiple banks simultaneously.
Options: Enabled, Disabled.

▶ **Node 0 Information**
This filed displays the Node 0 Information.

South Bridge



SB ATA Configuration

OnChip SATA Channel
Enables onboard SATA Channel.
Options: Enabled, Disabled.

OnChip SATA Type
Allows you to set the onboard Serial SATA type.
Options: AHCI, Legacy IDE.

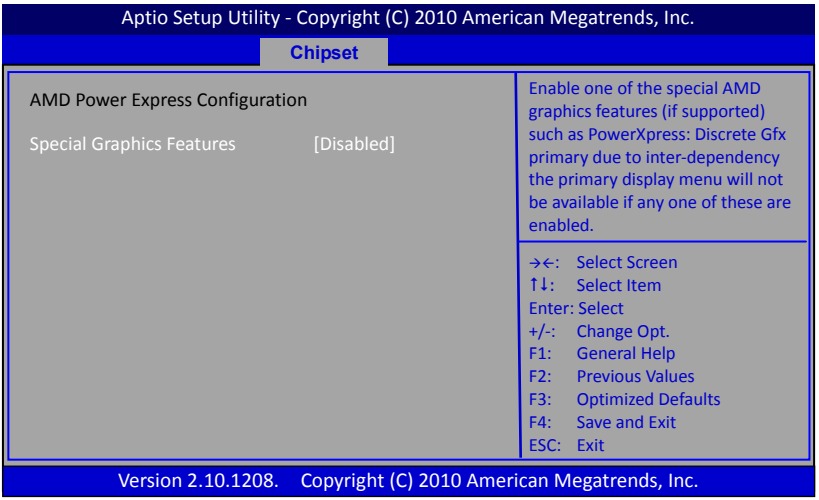
SATA IDE Combined Mode
Enables onboard SATA Channel.
Options: Enabled, Disabled.

External SATA on Port 0/ 1/ 2/ 3/ 4/ 5
Enables onboard external SATA port 0/ 1/ 2/ 3/ 4/ 5.
Options: Enabled, Disabled.

SB USB Configuration

USB Device Wakeup From S3 or S4
Allows a USB keyboard device to wake-up the system from S3 or S4 state.
Options: Enabled, Disabled.

▶ AMD Power Express Configuration



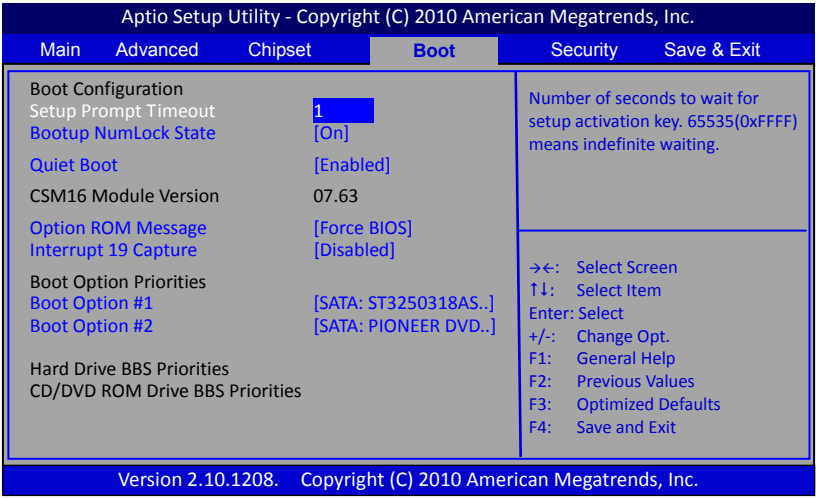
Special Graphics Features

Enable one of the special AMD graphics features (if supported) such as PowerXpress: Discrete Gfx primary due to inter-dependency the primary display menu will not be available if any one of these are enabled.

Options: Disabled, Power Express Enabled.

3-5 Boot Menu

The Boot menu is used to configure the boot settings and the boot priority.



Setup Prompt Timeout

This is used to set an additional time the POST should wait for the operator to press the key to enter setup. The time is entered in seconds.

Bootup NumLock State

Selects the state of the keyboard's numlock function after POST.
Options: On, Off.

Quiet Boot

Displays normal POST message. Select disable to display Logo instead of POST message.
Options: Enabled, Disabled.

Option ROM Message

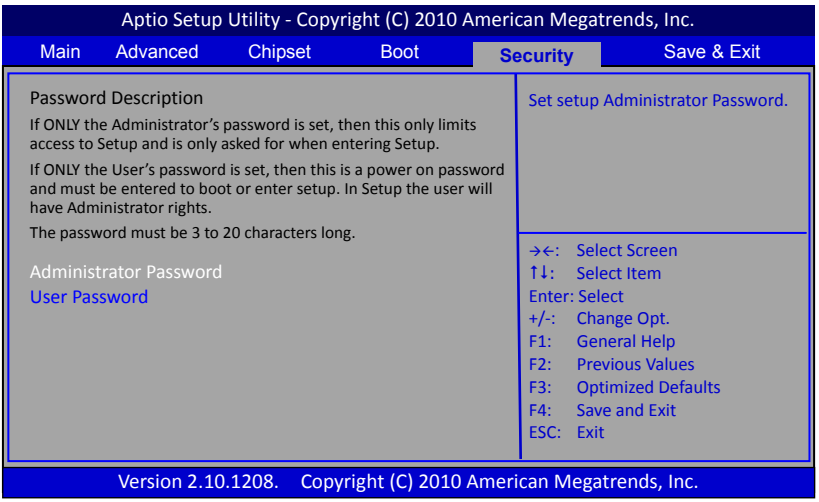
Sets display mode for Option ROM.
Force BIOS: To force to a BIOS-compatible output. This will show the option ROM messages.
Keep Current: To keep the current video mode. This will suppress option ROM messages. Option ROMs requiring interactive inputs may not work properly in this mode.

Interrupt 19 Capture
Allows specify if legacy PCI option ROMs are allowed to capture software interrupt 19h.
Options: Enabled, Disabled.

Boot Option #1/#2
These options are used to form the boot order and are dynamically generated.

3-6 Security Menu

The Security menu allows you to change the system security settings.

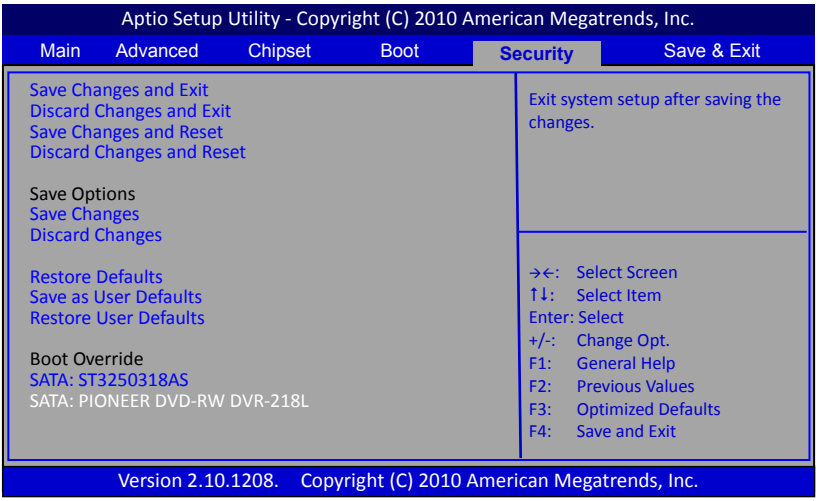


Administrator Password
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. The password must be 3 to 20 characters long.

User Password
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter setup. In Setup the user will have Administrator rights. The password must be 3 to 20 characters long.

3-7 Save & Exit Menu

The Save & Exit menu allows you to load the optimal default values for BIOS, and save or discard your changes to the BIOS items.



Save Changes and Exit

This saves the changes to the CMOS RAM and exits the BIOS Setup program.

Discard Changes and Exit

This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS.

Save Changes and Reset

This resets system after saving the changes.

Discard Changes and Reset

This resets system without saving the changes.

Save Option

Allows you to save the options you made to the CMOS RAM.

Save Change

Allows you to save the changes you made to the CMOS RAM.

Discard Changes

Allows you to discard the selections you made.

Restore Defaults

The restore defaults are the factory settings of this motherboard.

Save as User Defaults
This is used to save all current settings as user default. The current setup state can later be restored using Restore User Defaults.

Restore User Defaults
This is used to restore all tokens to settings previously stored by Save as User Defaults.

Boot Override
This group of functions includes a list, each of them corresponding to one device within the boot order. Select a drive to immediately boot that device regardless of the current boot order.

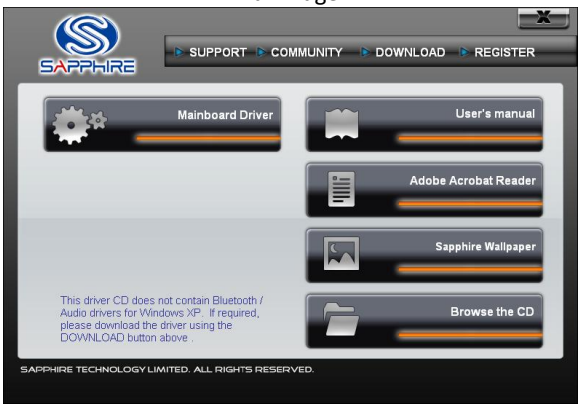
Chapter 4 Driver Installation

After the operating system has been installed, you need to install drivers for this mainboard.

The support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard features.

Insert the bundled driver CD into your optical drive and the main menu will be displayed on your PC screen. Click each item button and select the item you want to install.

<Main Page>



The Mainboard Drivers item shows the available device drivers. Install the necessary drivers to use the devices.

<Mainboard Drivers page>

Note : If Autorun function is not enabled in your computer, browse the contents of the support CD to locate the file SETUP.EXE, and click this file to run the CD.

Chapter 5 POST Code

This chapter provides the Aptio POST Codes List for the mainboard during the BIOS pre-boot process.

The POST Codes are displayed on the Debug LED readout located directly onboard the mainboard.

Please refer to following "boot phases", which may apply to various status code & checkpoint descriptions:

- ♦ Security (SEC) – initial low-level initialization
- ♦ Pre-EFI Initialization (PEI) – memory initialization
- ♦ Driver Execution Environment (DXE) – main hardware initialization
- ♦ Boot Device Selection (BDS) – system setup, pre-OS user interface & selecting a bootable device (CD/DVD, HDD, USB, Network, Shell,..)

Checkpoint Ranges

Status Code Range	Description
01 – 0B	SEC execution
0C – 0F	SEC errors
10 – 2F	PEI execution up to and including memory detection
30 – 4F	PEI execution after memory detection
50 – 5F	PEI errors
60 – 8F	DXE execution up to BDS
90 – CF	BDS execution
D0 – DF	DXE errors
E0 – E8	S3 Resume (PEI)
E9 – EF	S3 Resume errors (PEI)
F0 – F8	Recovery (PEI)
F9 – FF	Recovery errors (PEI)

Standard Checkpoints

♦ SEC Phase

Status Code	Description
00	Not used
Progress Codes	
01	Power on. Reset type detection (soft/hard).
02	AP initialization before microcode loading
03	North Bridge initialization before microcode loading
04	South Bridge initialization before microcode loading

05	OEM initialization before microcode loading
06	Microcode loading
07	AP initialization after microcode loading
08	North Bridge initialization after microcode loading
09	South Bridge initialization after microcode loading
0A	OEM initialization after microcode loading
0B	Cache initialization
SEC Error Codes	
0C – 0D	Reserved for future AMI SEC error codes
0E	Microcode not found
0F	Microcode not loaded

♦ PEI Phase

Status Code	Description
Progress Codes	
10	PEI Core is started
11	Pre-memory CPU initialization is started
12– 14	Pre-memory CPU initialization (CPU module specific)
15	Pre-memory North Bridge initialization is started
16	Pre-Memory North Bridge initialization (North Bridge module specific)
17	Pre-Memory North Bridge initialization (North Bridge module specific)
18	Pre-Memory North Bridge initialization (North Bridge module specific)
19	Pre-memory South Bridge initialization is started
1A	Pre-memory South Bridge initialization (South Bridge module specific)
1B	Pre-memory South Bridge initialization (South Bridge module specific)
1C	Pre-memory South Bridge initialization (South Bridge module specific)
1D – 2A	OEM pre-memory initialization codes
2B	Memory initialization. Serial Presence Detect (SPD) data reading
2C	Memory initialization. Memory presence detection
2D	Memory initialization. Programming memory timing information
2E	Memory initialization. Configuring memory
2F	Memory initialization (other).
30	Reserved for ASL (see ASL Status Codes section below)
31	Memory Installed
32	CPU post-memory initialization is started
33	CPU post-memory initialization. Cache initialization
34	CPU post-memory initialization. Application Processor(s) (AP) initialization
35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
36	CPU post-memory initialization. System Management Mode (SMM) initialization
37	Post-Memory North Bridge initialization is started
38	Post-Memory North Bridge initialization (North Bridge module specific)
39	Post-Memory North Bridge initialization (North Bridge module specific)
3A	Post-Memory North Bridge initialization (North Bridge module specific)

3B	Post-Memory South Bridge initialization is started
3C	Post-Memory South Bridge initialization (South Bridge module specific)
3D	Post-Memory South Bridge initialization (South Bridge module specific)
3E	Post-Memory South Bridge initialization (South Bridge module specific)
3F-4E	OEM post memory initialization codes
4F	DXE IPL is started
PEI Error Codes	
50	Memory initialization error. Invalid memory type or incompatible memory speed
51	Memory initialization error. SPD reading has failed
52	Memory initialization error. Invalid memory size or memory modules do not match.
53	Memory initialization error. No usable memory detected
54	Unspecified memory initialization error.
55	Memory not installed
56	Invalid CPU type or Speed
57	CPU mismatch
58	CPU self test failed or possible CPU cache error
59	CPU micro-code is not found or micro-code update is failed
5A	Internal CPU error
5B	reset PPI is not available
5C-5F	Reserved for future AMI error codes
S3 Resume Progress Codes	
E0	S3 Resume is stared (S3 Resume PPI is called by the DXE IPL)
E1	S3 Boot Script execution
E2	Video repost
E3	OS S3 wake vector call
E4-E7	Reserved for future AMI progress codes
S3 Resume Error Codes	
E8	S3 Resume Failed
E9	S3 Resume PPI not Found
EA	S3 Resume Boot Script Error
EB	S3 OS Wake Error
EC-EF	Reserved for future AMI error codes
Recovery Progress Codes	
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5-F7	Reserved for future AMI progress codes
Recovery Error Codes	
F8	Recovery PPI is not available
F9	Recovery capsule is not found
FA	Invalid recovery capsule
FB – FF	Reserved for future AMI error codes

♦ DXE Phase

Status Code	Description
60	DXE Core is started
61	NVRAM initialization
62	Installation of the South Bridge Runtime Services
63	CPU DXE initialization is started
64	CPU DXE initialization (CPU module specific)
65	CPU DXE initialization (CPU module specific)
66	CPU DXE initialization (CPU module specific)
67	CPU DXE initialization (CPU module specific)
68	PCI host bridge initialization
69	North Bridge DXE initialization is started
6A	North Bridge DXE SMM initialization is started
6B	North Bridge DXE initialization (North Bridge module specific)
6C	North Bridge DXE initialization (North Bridge module specific)
6D	North Bridge DXE initialization (North Bridge module specific)
6E	North Bridge DXE initialization (North Bridge module specific)
6F	North Bridge DXE initialization (North Bridge module specific)
70	South Bridge DXE initialization is started
71	South Bridge DXE SMM initialization is started
72	South Bridge devices initialization
73	South Bridge DXE Initialization (South Bridge module specific)
74	South Bridge DXE Initialization (South Bridge module specific)
75	South Bridge DXE Initialization (South Bridge module specific)
76	South Bridge DXE Initialization (South Bridge module specific)
77	South Bridge DXE Initialization (South Bridge module specific)
78	ACPI module initialization
79	CSM initialization
7A – 7F	Reserved for future AMI DXE codes
80 – 8F	OEM DXE initialization codes
90	Boot Device Selection (BDS) phase is started
91	Driver connecting is started
92	PCI Bus initialization is started
93	PCI Bus Hot Plug Controller Initialization
94	PCI Bus Enumeration
95	PCI Bus Request Resources
96	PCI Bus Assign Resources
97	Console Output devices connect
98	Console input devices connect
99	Super IO Initialization
9A	USB initialization is started
9B	USB Reset
9C	USB Detect
9D	USB Enable
9E – 9F	Reserved for future AMI codes

A0	IDE initialization is started
A1	IDE Reset
A2	IDE Detect
A3	IDE Enable
A4	SCSI initialization is started
A5	SCSI Reset
A6	SCSI Detect
A7	SCSI Enable
A8	Setup Verifying Password
A9	Start of Setup
AA	Reserved for ASL (see ASL Status Codes section below)
AB	Setup Input Wait
AC	Reserved for ASL (see ASL Status Codes section below)
AD	Ready To Boot event
AE	Legacy Boot event
AF	Exit Boot Services event
B0	Runtime Set Virtual Address MAP Begin
B1	Runtime Set Virtual Address MAP End
B2	Legacy Option ROM Initialization
B3	System Reset
B4	USB hot plug
B5	PCI bus hot plug
B6	Clean-up of NVRAM
B7	Configuration Reset (reset of NVRAM settings)
B8 – BF	Reserved for future AMI codes
C0 – CF	OEM BDS initialization codes
DXE Error Codes	
D0	CPU initialization error
D1	North Bridge initialization error
D2	South Bridge initialization error
D3	Some of the Architectural Protocols are not available
D4	PCI resource allocation error. Out of Resources
D5	No Space for Legacy Option ROM
D6	No Console Output Devices are found
D7	No Console Input Devices are found
D8	Invalid password
D9	Error loading Boot Option (LoadImage returned error)
DA	Boot Option is failed (StartImage returned error)
DB	Flash update is failed
DC	Reset protocol is not available