

H61MU3B UEFI BIOS Manual

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UEFI BIOS Setup

Introduction

The purpose of this manual is to describe the settings in the AMI UEFI BIOS Setup program on this motherboard. The Setup program allows users to modify the basic system configuration and save these settings to NVRAM.

UEFI BIOS determines what a computer can do without accessing programs from a disk. This system controls most of the input and output devices such as keyboard, mouse, serial ports and disk drives. BIOS activates at the first stage of the booting process, loading and executing the operating system. Some additional features, such as virus and password protection or chipset fine-tuning options are also included in UEFI BIOS.

The rest of this manual will to guide you through the options and settings in UEFI BIOS Setup.

Plug and Play Support

This AMI UEFI BIOS supports the Plug and Play Version 1.0A specification.

EPA Green PC Support

This AMI UEFI BIOS supports Version 1.03 of the EPA Green PC specification.

ACPI Support

AMI ACPI UEFI BIOS support Version 1.0/2.0 of Advanced Configuration and Power interface specification (ACPI). It provides ASL code for power management and device configuration capabilities as defined in the ACPI specification, developed by Microsoft, Intel and Toshiba.

PCI Bus Support

This AMI UEFI BIOS also supports Version 2.3 of the Intel PCI (Peripheral Component Interconnect) local bus specification.

DRAM Support

DDR3 SDRAM (Double Data Rate III Synchronous DRAM) is supported.

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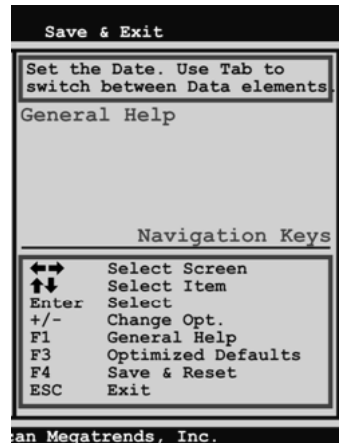
Supported CPUs

This AMI UEFI BIOS supports the Intel CPU.

Using Setup

When starting up the computer, press during the **Power-On Self-Test (POST)** to enter the UEFI BIOS setup utility.

In the UEFI BIOS setup utility, you will see **General Help** description at the top right corner, and this is providing a brief description of the selected item. **Navigation Keys** for that particular menu are at the bottom right corner, and you can use these keys to select item and change the settings.



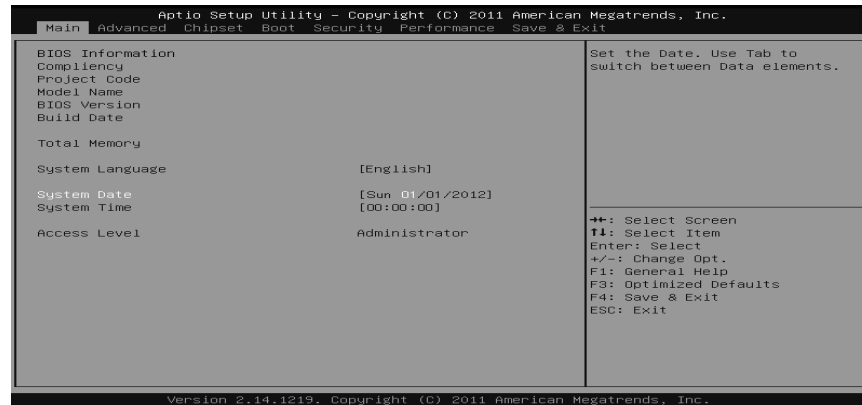
Notice

- The default UEFI BIOS settings apply for most conditions to ensure optimum performance of the motherboard. If the system becomes unstable after changing any settings, please load the default settings to ensure system's compatibility and stability. Use Load Setup Default under the Exit Menu.
- For better system performance, the UEFI BIOS firmware is being continuously updated. The UEFI BIOS information described in this manual is for your reference only. The actual UEFI BIOS information and settings on board may be slightly different from this manual.
- The content of this manual is subject to be changed without notice. We will not be responsible for any mistakes found in this user's manual and any system damage that may be caused by wrong-settings.

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1 Main Menu

Once you enter AMI UEFI BIOS Setup Utility, the Main Menu will appear on the screen providing an overview of the basic system information.



BIOS Information

Shows system information including UEFI BIOS version, model name, marketing name, built date, etc.

Total Memory

Shows system memory size, VGA shard memory will be excluded.

System Date

Set the system date. Note that the 'Day' automatically changes when you set the date.

System Time

Set the system internal clock.

Access Level

Shows the access level of current user.

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2 Advanced Menu

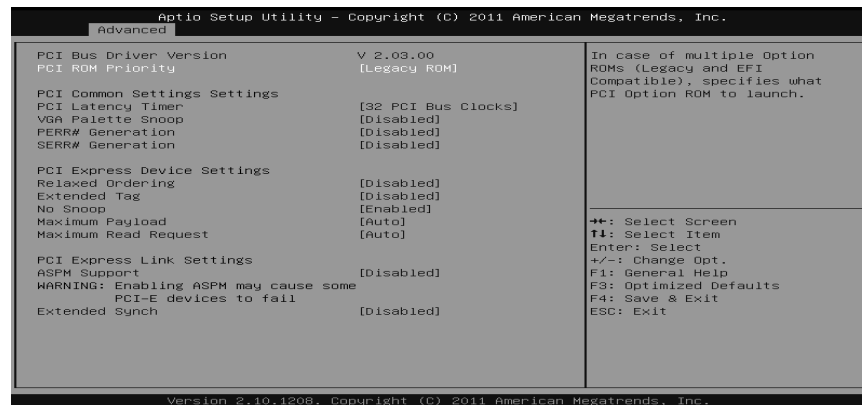
The Advanced Menu allows you to configure the settings of CPU, Super I/O, Power Management, and other system devices.

Notice

- Beware of that setting inappropriate values in items of this menu may cause system to malfunction.



PCI Subsystem Settings



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PCI ROM Priority

In case of multiple option ROMs (Legacy and EFI Compatible), this item specifies what PCI Option ROM to launch

Options: Legacy ROM (Default) / EFI Compatible ROM

PCI Latency Timer

This item sets the value to be programmed into PCI Latency Timer Register.

Options: 32 PCI Bus Clocks (Default) / 64 PCI Bus Clocks / 96 PCI Bus Clocks / 128 PCI Bus Clocks / 160 PCI Bus Clocks / 192 PCI Bus Clocks / 224 PCI Bus Clocks / 248 PCI Bus Clocks

VGA Palette Snoop

This item enables or disables VGA Palette Registers Snooping.

Options: Disabled (Default) / Enabled

PERR# Generation

Enables or disables PCI device to generate SERR#.

Options: Disabled (Default) / Enabled

SERR# Generation

Enables or disables PCI device to generate SERR#.

Options: Disabled (Default) / Enabled

Relaxed Ordering

Enables or disables PCI express device No snoop option.

Options: Disabled (Default) / Enabled

Extended Tag

If enabled allows device to use 8-bit tag field as a requester.

Options: Disabled (Default) / Enabled

No Snoop

This item enables or disables PCI Express Device No Snoop option.

Options: Enabled (Default) / Disabled

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Maximum Payload

This item sets Maximum Payload of PCI Express Device or allows System BIOS to select the value.

Options: Auto (Default) / 128 Bytes / 256 Bytes / 512 Bytes / 1024 Bytes / 2048 Bytes / 4096 Bytes

Maximum Read Request

This item sets Maximum Read Request Size of PCI Express Device or allows System BIOS to select the value.

Options: Auto (Default) / 128 Bytes / 256 Bytes / 512 Bytes / 1024 Bytes / 2048 Bytes / 4096 Bytes

ASPM Support

This item sets the ASPM Level: Force LO – Force all links to LO State; Auto – BIOS auto configures; Disabled – Disables ASPM.

Options: Disabled (Default) / Auto / Force LO

Extend Synch

If enabled allows generation of extended synchronization patterns.

Options: Disabled (Default) / Enabled

Link Training Retry

Defines number of retry attempts software will take to retrain the link if previous training attempt was unsuccessful.

Options: 5 (Default) / Disabled / 2 / 3

Link Training Timeout(uS)

Defines number of microseconds software will wait before polling 'Link Training' bit in link status register. Value range from 10 to 1000 uS.

Options: 100 (Default)

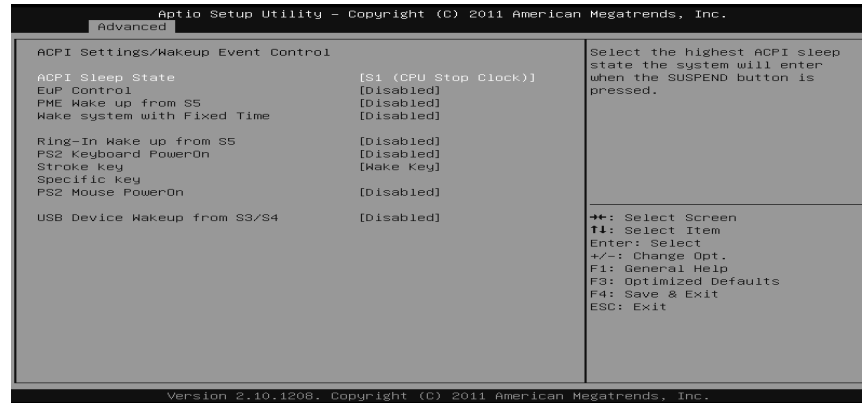
Unpopulated Links

In order to save power, software will disable unpopulated PCI Express links, if this option set to 'Disable Link'.

Options: Keep Link ON (Default) / Disable Link

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ACPI Settings/WakeUp Event control



ACPI Sleep State

This item selects the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

Options: S1 (CPU Stop Clock) (Default) / Suspend Disabled

EuP Control

When EuP is enabled, the system will meet EuP requirement.

Options: Disabled (Default) / Enabled

PME Wake up from S5

The item enables the system to wake from S5 using PME event.

Options: Disabled (Default) / Enabled

Wake system with Fixed Time

This item enables or disables the system to wake on by alarm event. When this item is enabled, the system will wake on the hr::min::sec specified.

Options: Disabled (Default) / Enabled

Wake up date

You can choose which date the system will boot up.

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Wake up hour / Wake up minute / Wake up second

You can choose the system boot up time, input hour, minute and second to specify.

Ring-In Wake up from S5

This item enables the system to wake from S5 using Ring-In event.

Options: Disabled (Default) / Enabled

PS2 Keyboard PowerOn

This item allows you to control the keyboard power on function.

Options: Disabled (Default) / Any Key / Stroke Key / Specific Key

Stroke Keys Selected

This item will show only when Keyboard PowerOn is set “Stroke Key.”

Options: Wake Key (Default) / Power Key / Ctrl+F1 / Ctrl+F2 / Ctrl+F3 /
Ctrl+F4 / Ctrl+F5 / Ctrl+F6

Specific Key Enter

This item will show only when Keyboard PowerOn is set “Specific Key.” Press Enter to set Specific key.

PS2 Mouse PowerOn

This item allows you to control the mouse power on function.

Options: Disabled (Default) / Enabled

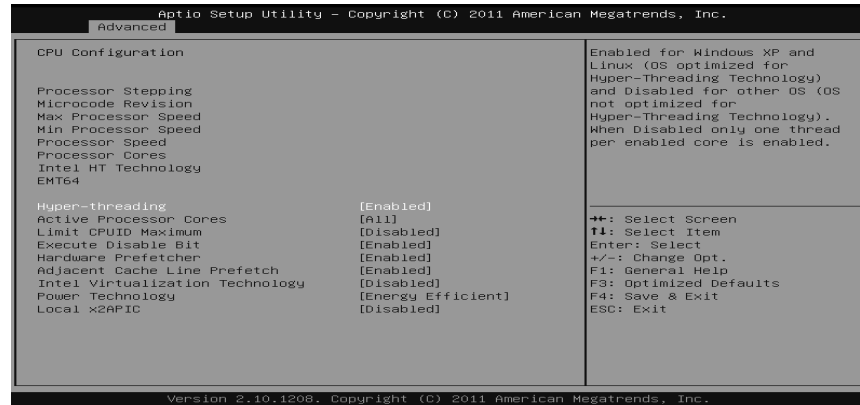
USB Device Wakeup from S3/S4

This item allows you to enable or disabled the USB resume from S3/S4 function.

Options: Disabled (Default) / Enabled

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CPU Configuration



Hyper-threading

Hyper Threading Technology can improve performance by splitting instructions into multiple streams. This item is enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and disabled for other OS (OS not optimized for Threading Technology). When this item is disabled, only one thread per enabled core is enabled.

Options: Enabled (Default) / Disabled

Active Processor Cores

This item sets number of cores to enable in each processor package.

Options: All (Default) / 1 / 2 / 3

Limit CPUID Maximum

When the computer is booted up, the operating system executes the CPUID instruction to identify the processor and its capabilities. Before it can do so, it must first query the processor to find out the highest input value CPUID recognizes. This determines the kind of basic information CPUID can provide the operating system.

Options: Disabled (Default) / Enabled

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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.).

Options: Enabled (Default) / Disabled

Hardware Prefetcher

The processor has a hardware prefetcher that automatically analyzes its requirements and prefetches data and instructions from the memory into the Level 2 cache that are likely to be required in the near future. This reduces the latency associated with memory reads.

Options: Enabled (Default) / Disabled

Adjacent Cache Line Prefetch

The processor has a hardware adjacent cache line prefetch mechanism that automatically fetches an extra 64-byte cache line whenever the processor requests for a 64-byte cache line. This reduces cache latency by making the next cache line immediately available if the processor requires it as well.

Options: Enabled (Default) / Disabled

Intel Virtualization Tech

Virtualization Technology can virtually separate your system resource into several parts, thus enhance the performance when running virtual machines or multi interface systems.

Options: Disabled (Default) / Enabled

Power Technology

This item enables the power management features.

Options: Energy Efficient (Default) / Disabled / Custom

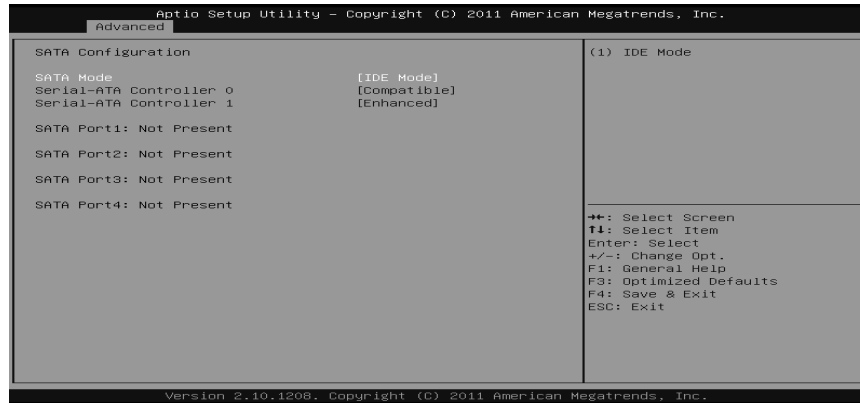
Local x2APIC

This item enables local x2APIC. Some OSes do not support this.

Options: Disabled (Default) / Enabled

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SATA Configuration



SATA Mode

This item sets SATA Mode.

Options: IDE Mode (Default) / AHCI Mode / Disabled

Serial-ATA Controller 0

This item enables/disables Serial ATA Controller 0.

Options: Compatible (Default) / Disabled / Enhanced

Serial-ATA Controller 1

This item enables/disables Serial ATA Controller 1.

Options: Enhanced (Default) / Disabled

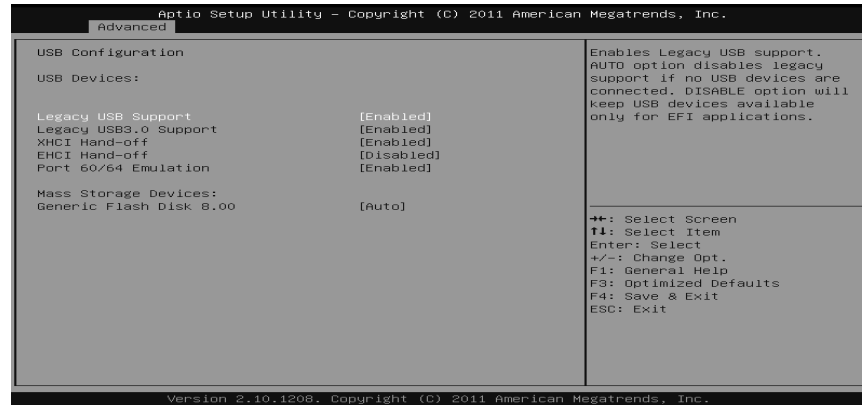
Aggressive Link Power Management

Aggressive Link Power Management Support.

Options: Enabled (Default) / Disabled

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USB Configuration



Legacy USB Support

This item determines if the BIOS should provide legacy support for USB devices like the keyboard, mouse, and USB drive. This is a useful feature when using such USB devices with operating systems that do not natively support USB (e.g. Microsoft DOS or Windows NT).

Options: Enabled (Default) / Disabled / Auto

USB3.0 Support

This item enables or disables USB3.0 (XHCI) Controller support.

Options: Enabled (Default) / 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 (Default) / 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: Disabled (Default) / Enabled

Port 60/64 Emulation

This items 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 (Default) / Disabled

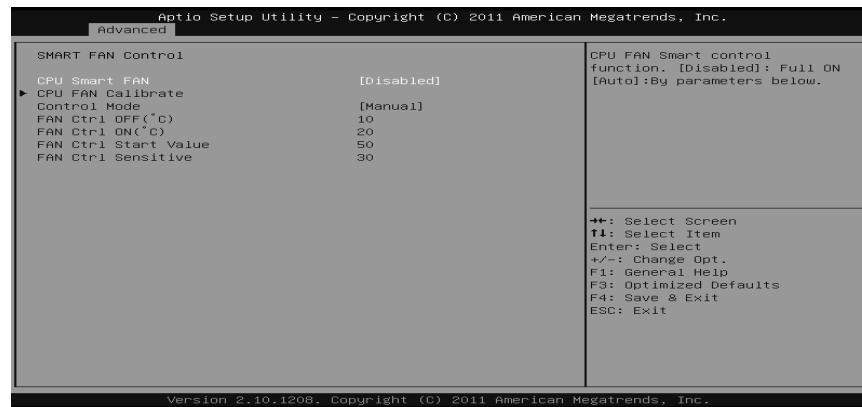
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Generic Flash Disk 8.00

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

Options: Auto (Default) / Floppy / Forced FDD / Hard Disk / CD-ROM

SMART FAN Control



CPU Smart FAN

This item allows you to control the CPU Smart Fan function.

Options: Disabled (Default) / Auto

CPU FAN Calibrate

Press [ENTER] to calibrate CPU FAN.

Control Mode

This item provides several operation modes of the fan.

Options: Quiet / Aggressive / Manual

Fan Ctrl OFF(°C)

When CPU temperature is lower than this value, the CPU fan will keep lowest RPM.

Options: 10 (°C) (default)

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Fan Ctrl On(°C)

When CPU temperature is higher than this value, the CPU fan controller will turn on.
Options: 20 (°C) (Default)

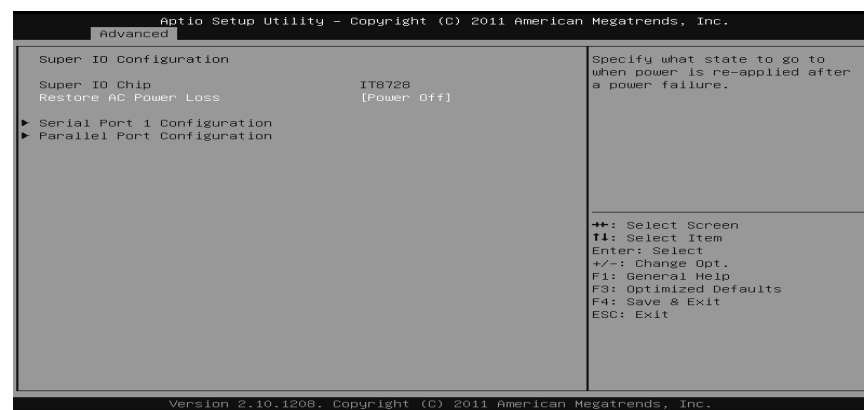
Fan Ctrl Start Value

This item sets CPU FAN Start Speed Value.
Options: 50 (Default)

Fan Ctrl Sensitive

The bigger the numeral is, the higher the FAN speed is.
Options: 30 (Default)

Super IO Configuration



Restore AC Power Loss

This setting specifies how your system should behave after a power fail or interrupts occurs. Power Off: Leaving the system in power-off status after power recovers. Power ON: Powering on the system immediately when power returns. Last State: 1. Leaving the system in power-off if the system shuts down at DC off status; 2. Powering on the system immediately if the system shuts down at DC on status.
Options: Power Off (Default) / Power On / Last State

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Serial Port 1 Configuration

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
Serial Port 1 Configuration	
Serial Port	[Enabled]
Device Settings	IO=3F8h; IRQ=4;
Change Settings	[Auto]
Enable or Disable Serial Port (COM)	
++: Select Screen F1: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.10.1208, Copyright (C) 2011 American Megatrends, Inc.	

Serial Port

This item enables or disables Serial Port (COM).

Options: Enabled (Default) / Disabled

Change Settings

This item allows you to select an optimal setting for Super IO device.

Options: Auto (Default) / IO=3F8h; IRQ=4 / IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12 / IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12 / IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12 / IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12

Parallel Port Configuration

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
Parallel Port Configuration	
Parallel Port	[Enabled]
Device Settings	IO=378h; IRQ=5;
Change Settings	[Auto]
Device Mode	[Standard Parallel ...]
Enable or Disable Parallel Port (LPT/LPTE)	
++: Select Screen F1: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.10.1208, Copyright (C) 2011 American Megatrends, Inc.	

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Parallel Port

This item enables or disables Parallel Port (LPT/LPTE).

Options: Enabled (Default) / Disabled

Change Settings

This item allows you to select an optimal setting for Super IO device.

Options: Auto (Default) / IO=378h; IRQ=5 / IO=378h; IRQ=5, 6, 7, 9, 10, 11, 12 / IO=278h; IRQ=5, 6, 7, 9, 10, 11, 12 / IO=3BCh; IRQ=5, 6, 7, 9, 10, 11, 12

Device Mode

This item allows you to determine how the parallel port should function.

Options: Standard Parallel Port Mode (Default) (Using Parallel port as Standard Printer Port) /
EPP Mode (Using Parallel Port as Enhanced Parallel Port) /
ECP Mode (Using Parallel port as Extended Capabilities Port) /
ECP Mode & EPP Mode (Using Parallel port as ECP & EPP mode)

H/W Monitor



Shutdown Temperature

This item allows you to set up the CPU shutdown Temperature.

Options: Disabled (Default) / 70°C/158°F / 75°C/167°F / 80°C/176°F / 85°C/185°F / 90°C/194°F

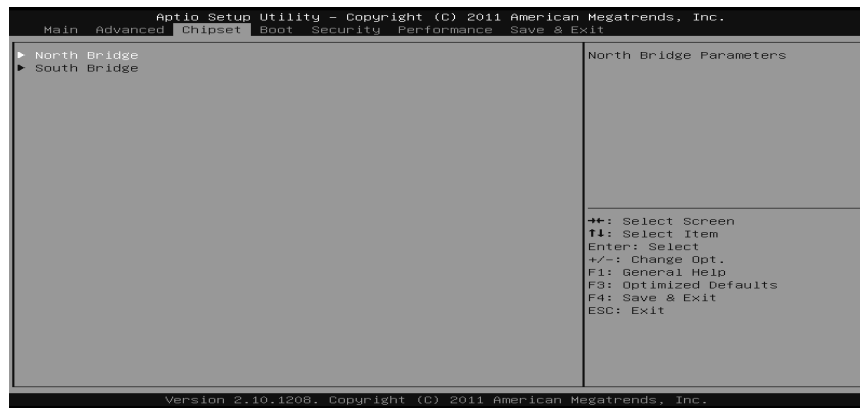
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3 Chipset Menu

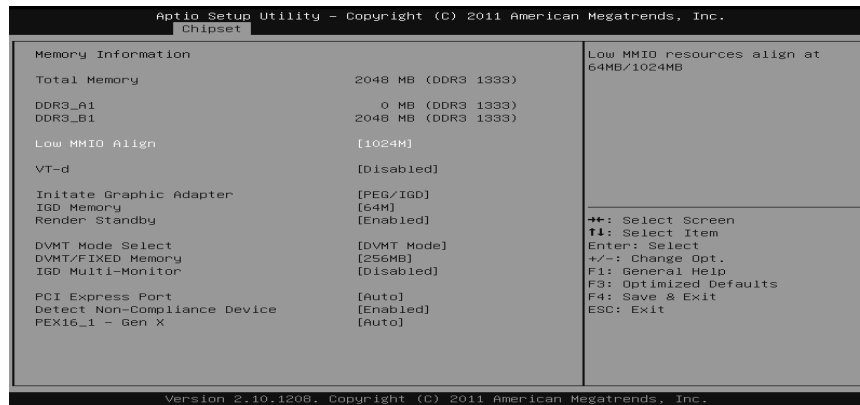
This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed of the CPU itself uses when communicating with its own special components.

Notice

- Beware of that setting inappropriate values in items of this menu may cause system to malfunction.



North Bridge



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Low MMIO Align

Low MMIO resources align at 64MB/1024MB.

Options: 1024M (Default) / 64M

VT-d

This item enables/disables VT-d function.

Options: Disabled (Default) / Enabled

Initiate Graphic Adapter

This item allows you to select which graphics controller to use as the primary boot device.

Options: PEG/IGD (Default) / IGD / PCI/IGD / PCI/PEG / PEG/PCI

IGD Memory

This item sets IGD Share Memory Size.

Options: 64M (Default) / Disabled / 32M / 128M / 160M / 192M / 224M / 256M / 288M / 320M / 352M / 384M / 416M / 448M / 480M / 512M

Render Standby

This item enables/disables Render Standby by Internal Graphics Device.

Options: Enabled (Default) / Disabled

DVMT Mode Select

This item selects DVMT Mode used by Internal Graphics Device.

Options: DVMT Mode (Default) / Fixed Mode

DVMT/FIXED Memory Size

DVMT stands for “Dynamic Video Memory Technology”. This is an enhancement of the unified memory architecture (UMA) concept. DVMT will set the optimum amount of memory to be allocated for a balance between graphics and system performance. DVMT dynamically respond to system requirements and applications demands, by allocating the proper amount of display, texturing and buffer memory after the operating system has booted.

Options: 256MB (Default) / 128MB / Maximum

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IGD Multi-Monitor

This item enables/disables IGD Multi-Monitor by Internal Graphics Device.
Options: Disabled (Default) / Enabled

PCI Express Port

This item allows user to control PCI Express x16 Port.
Options: Auto (Default) / Disabled / Enabled

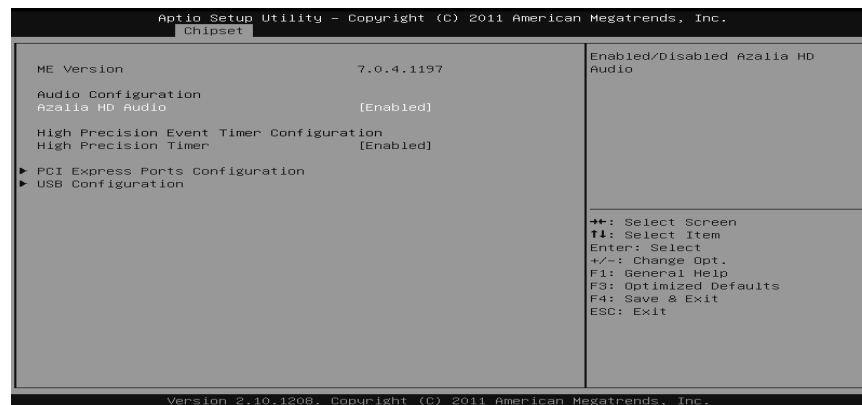
Detect Non-Compliance Device

Detect Non-Compliance PCI Express Device in PEG.
Options: Enabled (Default) / Disabled

PEX16_1 - GenX

This item sets PEX16_1 Gen1 – Gne3
Options: Auto (Default) / Gen1 / Gen2

South Bridge Configuration



Azalia HD Audio

This item enables/disables Azalia HD Audio.
Options: Enabled (Default) / Disabled

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High Precision Timer

This item enables/disables the High Precision Event Timer.

Options: Enabled (Default) / Disabled

PCI Express Ports Configuration



Onboard Lan Option ROM

This item enables/disables onboard LAN option ROM.

Options: Disabled (Default) / Enabled

Launch Storage OpROM

This item enables/disables Boot Option for Legacy Mass Storage Devices with Option ROM.

Options: Enabled (Default) / Disabled

Onboard PCIE LAN

This item enables/disables Onboard PCIE LAN.

Options: Auto (Default) / Disabled / Enabled

Onboard USB3.0

This item enables/disables the PCI express ports in the chipset

Options: Auto (Default) / Disabled / Enabled

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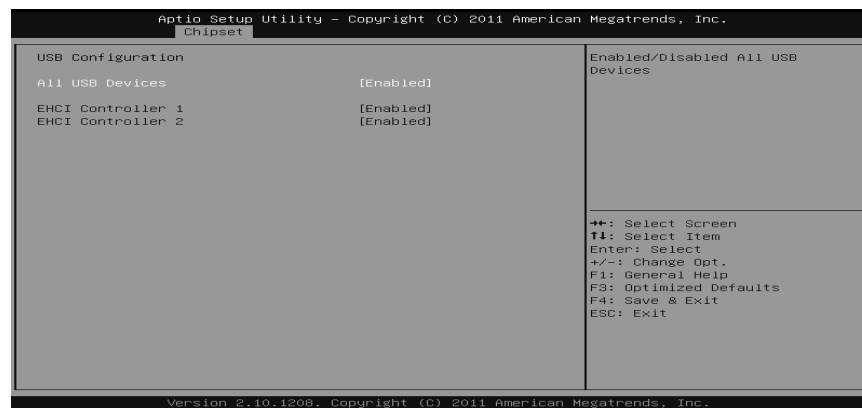
PCI Express Port x1

This item enables/disables the PCI express ports in the chipset
Options: Auto (Default) / Disabled / Enabled

PCIe Sub Decode

This item enables/disables the PCIe sub decode port. (This option is available when subtractive decode agent enable(PCHTrap9[14])='1b')
Options: Disabled (Default) / Enabled

USB Configuration



All USB Devices

This item enables/disables All USB Devices.
Options: Enabled (Default) / Disabled

EHCI Controller 1

This item enables/disables USB 2.0 (EHCI) Support.
Options: Enabled (Default) / Disabled

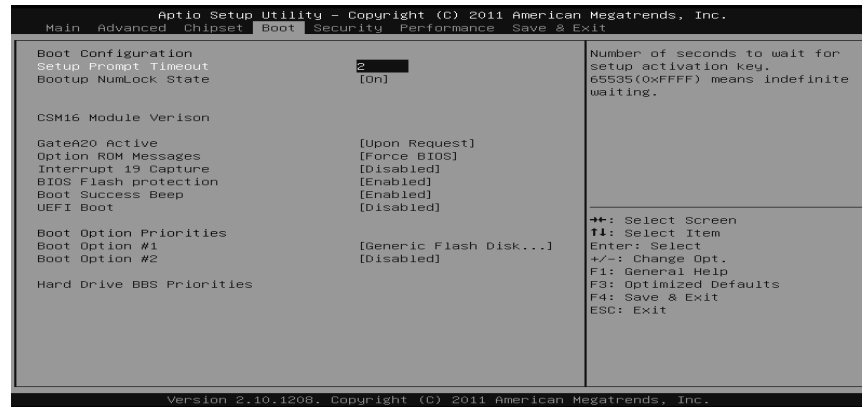
EHCI Controller 2

This item enables/disables USB 2.0 (EHCI) Support.
Options: Enabled (Default) / Disabled

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4 Boot Menu

This menu allows you to setup the system boot options.



Setup Prompt Timeout

This item sets number of seconds to wait for setup activation key.

Options: 2 (Default)

Bootup NumLock State

This item selects the keyboard NumLock state.

Options: On (Default) / Off

GateA20 Active

Upon Request – FA20 can be disabled using BIOS services. Always – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB

Options: Upon Request (Default) / Always

Option ROM Messages

This item sets the display mode for Option ROM.

Options: Force BIOS (Default) / Keep Current

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Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When set to Enabled, this item allows the option ROMs to trap interrupt 19.

Options: Disabled (Default) / Enabled

BIOS Flash protection

While enabled, it can't flash write and flash erase by SMI.

Options: Enabled (Default) / Disabled

Boot Success Beep

When this item is set to Enabled, BIOS will let user know boot success with beep.

Options: Enabled (Default) / Disabled

UEFI Boot

This option enables/disables boot from the UEFI Devices.

Options: Disabled (Default) / Enabled

Boot Option #1/#2

The items specify the boot device priority sequence from the available devices.

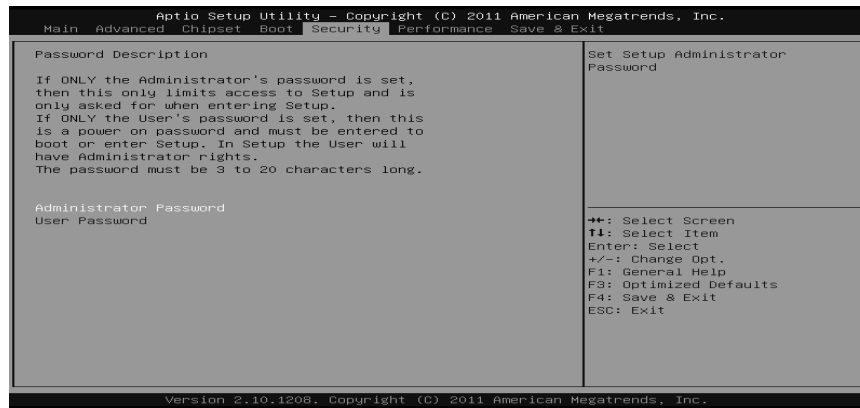
The number of device items that appears on the screen depends on the number of devices installed in the system.

Hard Drive BBS Priorities

This item sets the order of the legacy devices in this group.

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5 Security Menu



Administrator Password

This item sets Administrator Password.

User Password

This item sets User Password.

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6 Performance Menu

This submenu allows you to change voltage and clock of various devices.
(However, we suggest you use the default setting. Changing the voltage and clock improperly may damage the device.)

Notice

- Beware of that setting inappropriate values in items of this menu may cause system to malfunction.



Start Page

You can set the entrance page when you enter UEFI BIOS Setup.

Options: Page – Main (Default) / Page – Advanced / Page – Chipset / Page – Boot / Page – Security / Page – Performance / Page – Save & Exit

Fixed CPU Ratio

This item enables/disables Fixed CPU Ratio all the time.

Options: Disabled (Default) / Enabled

CPU Ratio

This item allows you to set the CPU ratio. This item is adjustable only when Fixed CPU Ratio is set to Enabled.

Options: 34 (Default) / 10 ~ 50

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CPU Core Current Max (Amp)

This item sets the Max instantaneous current allowed at any given time.
Options: 105 (Default)

Power Limit 1 Value (Watt)

This item sets the power limit value which CPU must not exceed over a specific time.
Options: 95 (Default)

Power Limit 2 Switch

This item enables/disables Power Limit 2 Switch.
Options: Enabled (Default) / Disabled

Power Limit 2 Value

This item sets Power Limit Value which CPU must not exceed in a short duration time.
Options: 118 (Default)

Enhanced Intel SpeedStep Technology

This item enables/disables Enhanced Intel SpeedStep Technology.
Options: Enabled (Default) / Disabled

Turbo Mode

This item enables/disables Turbo Mode.
Options: Enabled (Default) / Disabled

CPU C1E

C1E is “Enhanced Halt State” function, this function helps to save power and decrease heat by lowering CPU frequency while the processor is not working.
Options: Enabled (Default) / Disabled

Graphics Core Ratio Limit

This item sets Graphics Core Ratio Limit.
Options: 30 (Default)

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DDR3 DRAM Multiplier

This item allows you to set DDR3 DRAM Multiplier.

Options: Auto (Default) / 10.67 / 13.33

DRAM Timing Control

This item allows you to choose to manually or automatically regulate the DRAM Timing.

Options: By SPD (Default) / Manual

DRAM Command Rate

This item allows you to select command rate of DDR3.

Options: Auto (Default) / 1T / 2T

CAS# Latency (tCL)

This item allows you to select CAS Latency of DDR3.

Options: 9 (Default) / 3 ~ 15

Row Precharge Time (tRP)

This item allows you to select Row Precharge Time of DDR3.

Options: 9 (Default) / 3 ~ 15

RAS# to CAS# Delay (tRCD)

This item allows you to select Row Address to Column Address Delay of DDR3.

Options: 9 (Default) / 3 ~ 15

RAS# Active Time (tRAS)

This item allows you to select Row Active Time of DDR3.

Options: 24 (Default) / 9 ~ 63

Write Recovery Time (tWR)

This item allows you to select Internal Write to Read Command Delay of DDR3.

Options: 10 (Default) / 3 ~ 31

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Row Refresh Cycle Time (tRFC)

This item allows you to select Minimum Refresh Recovery Time of DDR3.
Options: 107 (Default) / 15 ~ 255

Write to Read Delay (tWTR)

This item allows you to select Internal Write to Read Command Delay of DDR3.
Options: 5 (Default) / 3 ~ 31

Active to Active Delay (tRRD)

This item allows you to select Row Active to Row Active Delay of DDR3.
Options: 4 (Default) / 4 ~ 15

Read CAS# Precharge (tRTP)

This item allows you to select Read to Precharge Delay of DDR3.
Options: 5 (Default) / 4 ~ 15

Four Active Window Delay (tFAW)

This item allows you to select Four Active Window Delay of DDR3.
Options: 20 (Default) / 4 ~ 63

DRAM Voltage

This item sets DRAM Voltage.

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DDR3 A1/B1 Information

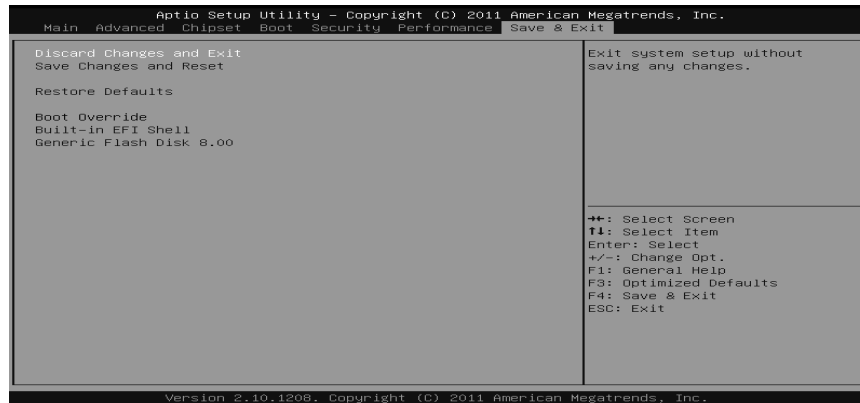
These items display SPD information of DDR3 memory.



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7 Exit Menu

This menu allows you to load the optimal default settings, and save or discard the changes to the BIOS items.



Discard Changes and Exit

Abandon all changes made during the current session and exit setup.

Save Changes and Reset

Reset the system after saving the changes.

Restore Defaults

This selection allows you to reload the BIOS when problem occurs during system booting sequence. These configurations are factory settings optimized for this system.

Built-in EFI Shell

Press enter to execute UEFI BIOS built-in EFI Shell.