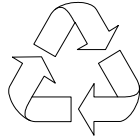


Aspire XC600

Desktop Computer Service Guide



100% Recycled Paper

SG V1.00
PRINTED IN TAIWAN

Revision History

Please refer to the table below for the updates made on this service guide.

Date	Version	Chapter	Updates
08-17-2012	First Draft		
08-22-2012	V1.00		

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Conventions

The following conventions are used in this manual:

SCREEN MESSAGES	Denotes actual messages that appear on screen.
NOTE	Gives additional information related to the current topic.
WARNING	Alerts you to any physical risk or system damage that might result from doing or not doing specific actions.
CAUTION	Gives precautionary measures to avoid possible hardware or software problems.
IMPORTANT	Reminds you to do specific actions relevant to the accomplishment of procedures.

Service Guide Coverage

This Service Guide provides you with all technical information relating to the BASIC CONFIGURATION decided for Acer's "global" product offering. To better fit local market requirements and enhance product competitiveness, your regional office MAY have decided to extend the functionality of a machine (e.g. add-on card, modem, or extra memory capability). These LOCALIZED FEATURES will NOT be covered in this generic service guide. In such cases, please contact your regional offices or the responsible personnel/channel to provide you with further technical details.

FRU Information

Please note WHEN ORDERING FRU PARTS, that you should check the most up-to-date information available on your regional web or channel. If, for whatever reason, a part number change is made, it will not be noted in the printed Service Guide. For ACER-AUTHORIZED SERVICE PROVIDERS, your Acer office may have a DIFFERENT part number code to those given in the FRU list of this printed Service Guide. You MUST use the list provided by your regional Acer office to order FRU parts for repair and service of customer machines.

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Features and Specifications

This chapter lists the features and specifications of the Aspire XC600 computer.

NOTE The items listed in this section are for reference only. The exact configuration of your PC depends on the model purchased. Refer to the FRU list chapter on page 85 for a detailed list of models supported by each hardware component.

System Features

Component	Description
Operating system support	<ul style="list-style-type: none"> • Microsoft Windows 8 ML (X64) • Linpus Xwindows • FreeDos • Neokylin Linux
Processor	<ul style="list-style-type: none"> • One LGA 1155 socket • Supports the following Intel processors: <ul style="list-style-type: none"> – Core i5-3330 (3.0G 6M DDR3 1600/1333), Quad Core, 77W – Core i5-2320 (3.0G 6M DDR3 1333/1066), Quad Core, 95W – Core i3-3220 (3.3G 3M DDR3 1600/1333), Dual Core, 55W – Core i3-2130 (3.4G 3M DDR3 1333/1066), Dual Core, 65W – Core i3-2100 (3.1G 3M DDR3 1333/1066), Dual Core, 65W – Pentium Dual Core G645 (2.9G 3M DDR3 1066), Dual Core, 65W – Pentium Dual Core G640 (2.8G 3M DDR3 1066), Dual Core, 65W – Celeron G550 (2.6G 2M DDR3 1066), Dual Core, 65W – Celeron G465 (1.9G 1.5M DDR3 1066), Single Core, 35W
Chipset	Intel H61 Express Chipset (BD82H61 PCH)
Memory	<ul style="list-style-type: none"> • Two DIMM slots supporting dual-channel DDR3 memory architecture • Data rate supported: 1066/1333 MT/s • Maximum memory: 8 GB (using two 4 GB modules)
Expansion options	<ul style="list-style-type: none"> • One PCI Express x16 slot (reserved for GPU card installation) • One PCI Express x1 slot • Two SATA 3.0 Gb/s connectors
Connectivity	<ul style="list-style-type: none"> • Wired LAN: Intel 82579V Gbe LAN controller PHY • WLAN option: Low-profile PCI-E x1 802.11 b/g/n wireless network adapter and Wireless 802.11b/g/n USB Adapter • Modem option: 56K Low Profile Dial-Up PCI-E Modem
Hard disk drive (HDD)	<ul style="list-style-type: none"> • One HDD bay supporting 3.5-inch 25.4 mm SATA HDDs • Support SATA HDD in 160 – 1500 GB capacities
Optical disc drive (ODD)	<ul style="list-style-type: none"> • One ODD bay supporting 5.25-inch standard SATA ODD • Supports DVD-R/RW drive or DVD-Super Multi double-layer drive

Component	Description
Card reader	<ul style="list-style-type: none"> • Multi-in-1 card reader • The following memory cards are supported: <ul style="list-style-type: none"> – CompactFlash (CF) Types I and II – Memory Stick (MS) – xD-Picture Card (xD) – Secure Digital (SD) – MultiMediaCard (MMC) – Reduced-Size MultiMediaCard (RS-MMC) – Memory Stick PRO (MS PRO) – Microdrive
Power supply	<ul style="list-style-type: none"> • 100~127/200~240 Vac, 220 W non-power factor correction (non-PFC) power supply unit • 200~240 Vac, 220 W power factor correction (PFC) power supply unit
Antivirus software	Symantec NTI 2009
System BIOS	<ul style="list-style-type: none"> • AMI BIOS with 8 MB SPI Flash ROM • Supports ACPI and DMI • Supports Plug and Play, S1/STR(S3)/STD(S4), hardware monitor
Power management	<ul style="list-style-type: none"> • ACPI 2.0 or 1.0b (Advanced Configuration Power Interface) standard • S0, S1, S2 and S5 sleep states support • On-board device power management support • On-board device configuration support

Audio

Item	Description
Audio codec	Realtek ALC662 6-Ch High Definition Audio Codec
Audio jacks	<ul style="list-style-type: none"> • Front panel: Headphone and microphone jacks • Rear panel: Microphone, line-out, and line-in jacks

I/O Ports and LED Indicators

Component	Description
I/O ports	<ul style="list-style-type: none"> • Front panel <ul style="list-style-type: none"> – USB ports (two) – Headphone jack – Microphone jack – Multi-in-1 card reader slots • Rear panel <ul style="list-style-type: none"> – PS/2 keyboard port – PS/2 mouse port port – External display (VGA) port – HDMI port – USB 2.0 ports (four) – USB 3.0 ports (two) – Ethernet jack (RJ45) – Microphone, line-out, and line-in jacks

Component	Description
LED display and buttons	<ul style="list-style-type: none">• Power LED• Power button

Physical Specifications

Aspect	Description
Chassis dimension (W x D x H)	100 mm (W) x 367 mm (D) x 269.5 mm (H)
System weight	5.808 Kg.
Mainboard form factor	microATX (µATX)
Mainboard dimensions (W x H)	200mm*244mm , 4 Layers

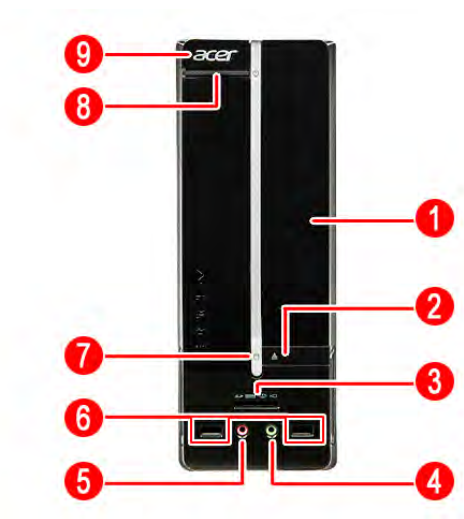
Environmental Requirements

Aspect	Description
Operating temperature	5 to 35 °C (41 to 95 °F)
Operating humidity	15% to 80% RH non-condensing

System Tour

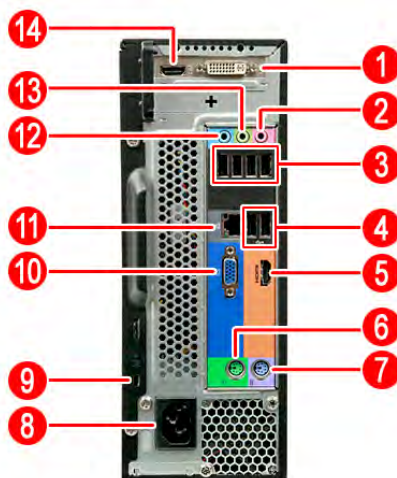
The pictures and tables in this section illustrate the physical outlook of the computer.

Front View



No.	Component
1	Optical drive cover
2	Optical drive eject button
3	Multi-in-1 optional card reader supporting Memory Stick (MS), xD-Picture Card (xD), Secure Digital (SD), MultiMediaCard (MMC), Reduced-Size MultiMediaCard (RS-MMC), CompactFlash (CF) Types I and II, and Memory Stick PRO (MS PRO)
4	Headphone jack
5	Microphone-in jack
6	USB 2.0 ports
7	ODD LED indicator
8	Power button/indicator
9	Acer logo

Rear Panel



No.	Component
1	PCI Expansion slot
2	Microphone jack
3	USB 2.0 ports
4	USB 3.0 ports
5	HDMI port
6	PS/2 mouse connector
7	PS/2 keyboard connector
8	Power connector
9	Kensington lock
10	External monitor port
11	LAN connector
12	Line-in jack
13	Line-out jack
14	HDMI port

System Utilities

CMOS Setup Utility

CMOS Setup Utility is a hardware configuration program built into the system ROM. Since most systems are already properly configured and optimized, there is normally no need to run this utility.

You will need to run this utility under the following conditions:

- When changing the system configuration including:
 - Setting the system time and date
 - Configuring the system drives and peripherals
 - Specifying the boot device sequence
 - Configuring the power management modes
 - Setting up system passwords or making other changes to the security setup
- When trying to resolve IRQ conflicts
- When a configuration error is detected by the system and you are prompted ("**Run Setup**" message) to make changes to the BIOS settings.

The Setup Utility loads the configuration values in a battery-backed nonvolatile memory called CMOS RAM. This memory area is not part of the system RAM, which allows configuration data to be retained when power is turned off. The values take effect when the system is booted. POST uses these values to configure the hardware. If the values and the actual hardware do not agree, POST generates an error message. You must run this utility to change the hardware settings from the default or current configuration.

IMPORTANT If you repeatedly receive "**Run Setup**" messages, the RTC battery located on the mainboard (BT1) may be defective. In this case, the system cannot retain configuration values in CMOS. Replace the RTC battery with a new one.

NOTE For ease of reading, CMOS Setup Utility will be simply referred to as "Setup" or "Setup Utility" in this Service Guide.

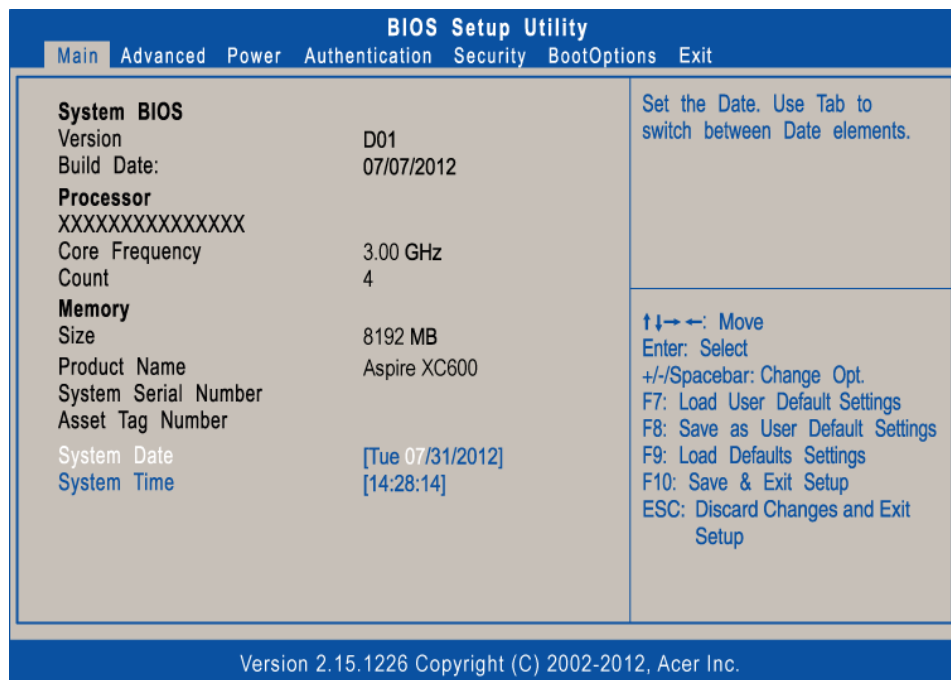
Accessing the Setup Utility

1. Turn on the computer.

If the computer is already turned on, save your data and close all open applications, then restart the computer.

2. During POST, press **Delete**.

If you fail to press **Delete** before POST is completed, you will need to restart the computer.



Use the **Left/Right/Up/Down** arrow keys to move between the menu screens, then press **Enter** to view that menu tab.

Some options lead to pop-up dialog boxes that prompt you to verify that you wish to execute that option. Other options lead to dialog boxes that prompt you for information.

Some options (marked with a ►) lead to submenus that enable you to change the values for the option. Use the **Up/Down/Left/Right** arrow keys to scroll through the items in the submenu

Navigating through the Setup Utility

Use the keys listed in the legend bar on the bottom of the Setup screen to work your way through the various menu and submenu screens of the Setup Utility. The table below lists these legend keys and their respective functions.

Key	Function
Left/Right arrow keys	Move the cursor to the menu screen you want. The currently selected screen will be highlighted and the items it contain will be shown.
Up/Down arrow keys	Move the cursor to the item you want. The currently selected field will be highlighted.
Enter	<ul style="list-style-type: none">• To open the page for the currently selected menu/submenu• To apply a field value.
+ / - / space bar	To select a value for the currently selected field (only if it is user-configurable). Press these keys repeatedly to display all possible entries. A parameter that is enclosed in square brackets [] is user-configurable. Black font parameters are not user-configurable for one of the following reasons: <ul style="list-style-type: none">• The field value is auto-configured or auto-detected.• The field value is informational only.• The field is password-protected.
F1	To bring up the <u>General Help</u> window. The <u>General Help</u> window describes other Setup navigation keys that are not displayed on the legend bar.
F7	Restore the saved User Default settings.
F8	Save the current menu settings as User Default settings.
F9	Press to load default system values.
F10	Press to save changes and close the Setup Utility.
Esc	If you press this key: <ul style="list-style-type: none">• On one of the primary menu screens, the <u>Exit</u> menu displays.• On a submenu screen, the previous screen displays.• When you are making selections from a pop-up menu, closes the pop-up without making a selection.

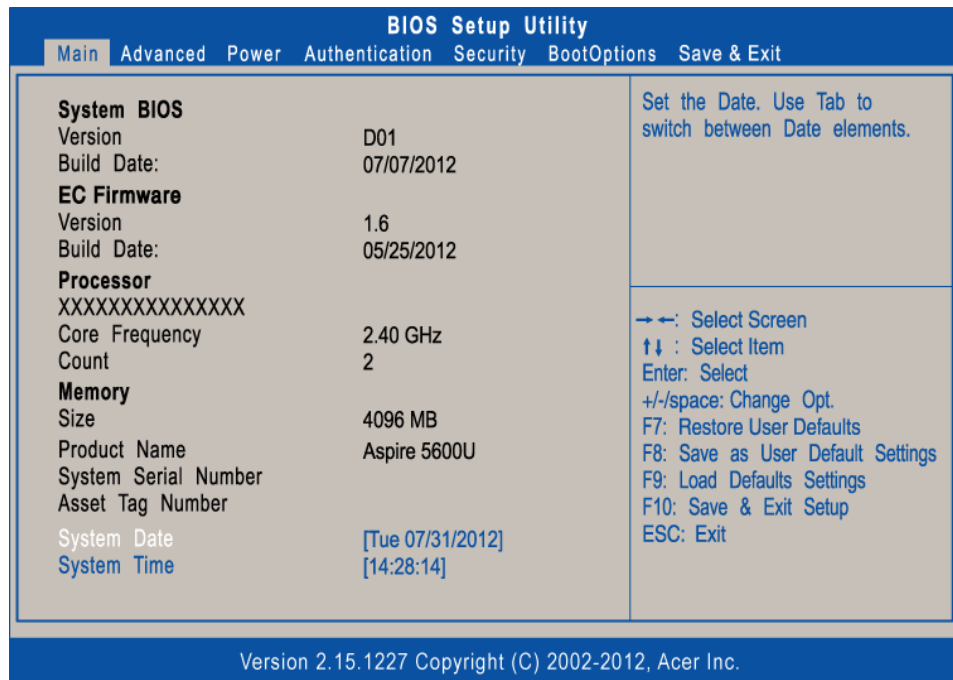
Setup Utility Menus

The Setup Utility has seven menus for configuring the various system functions. These include:

Main	Advanced	Power	Authentication	Security	Boot Options	Exit
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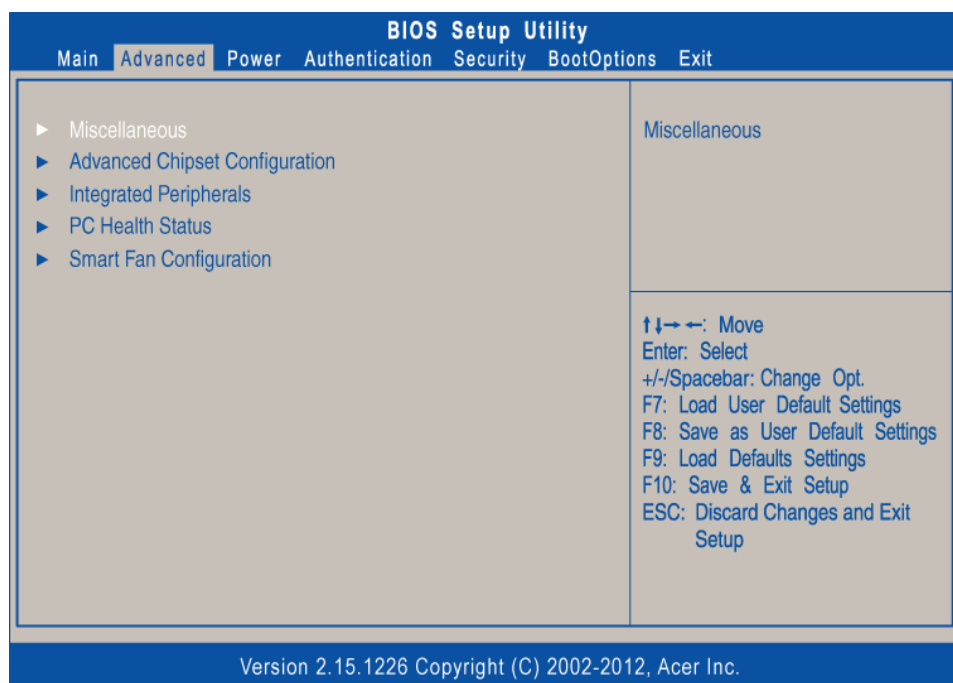
- NOTES**
- The screenshots used in this section are for illustration only. The values displayed may not be the same as those in your computer.
 - In the descriptive tables following each of the menu screen illustrations, settings in **boldface** are the default and suggested settings.

Main menu



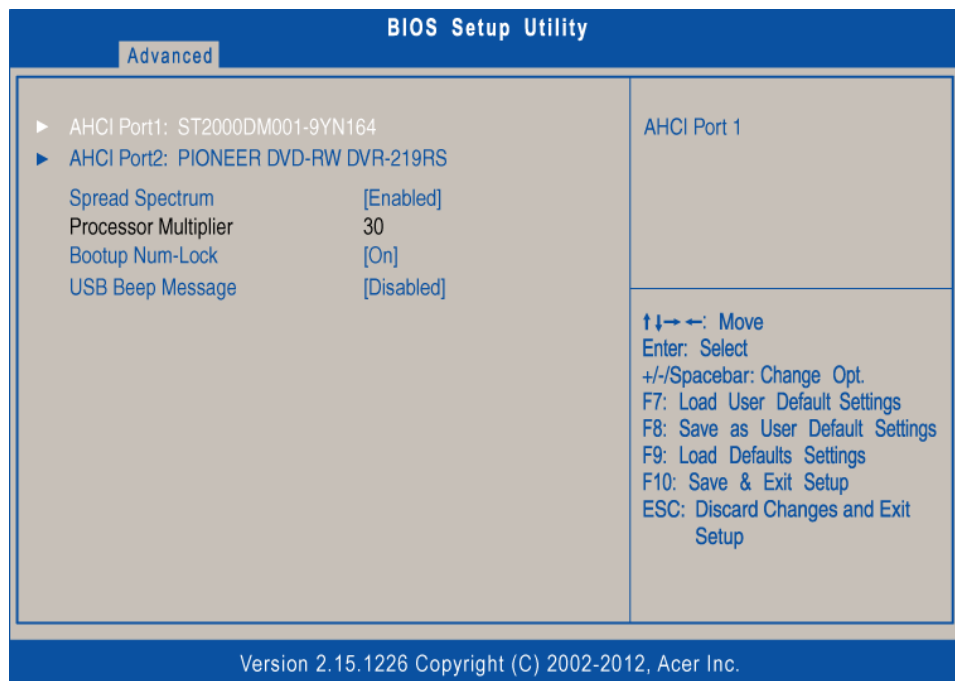
Field	Description
System BIOS	
Version	Current system BIOS version
Build Date	Date when the system BIOS was built.
Processor	
<model>	Processor model installed
Core Frequency	Core frequency of the installed processor
Count	Multi-core factor of the installed processor (number of processor cores)
Memory	
Size	Size of system memory detected during boot-up
Product Name	Official model name of the computer.
System Serial Number	System serial number.
Asset Tag Number	System asset tag number
System Date	Sets the system date.
System Time	Sets the system time.

Advanced menu



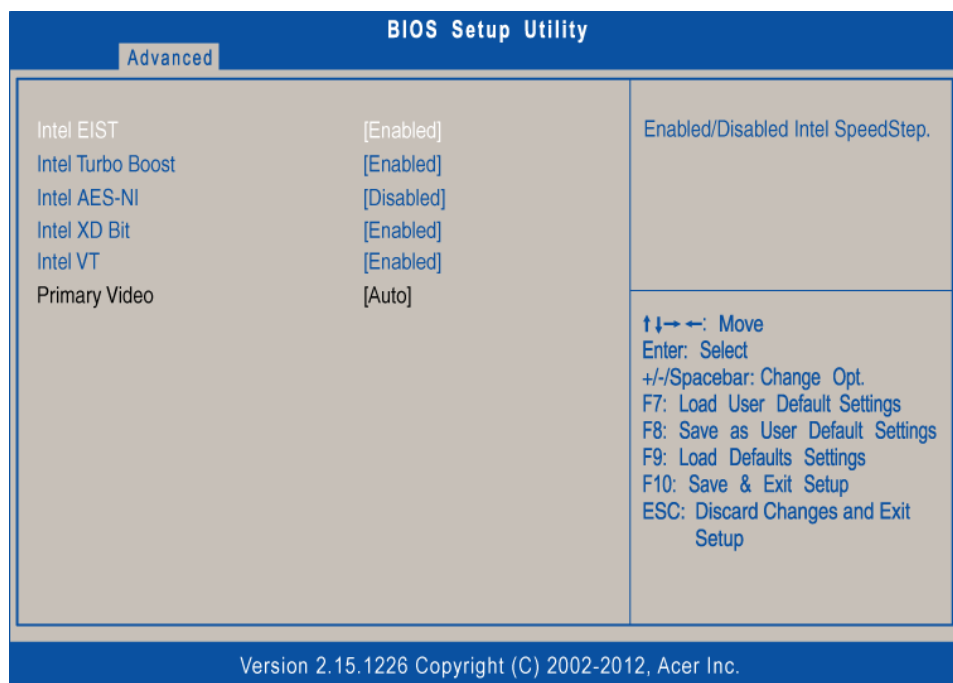
Field	Description
Miscellaneous	Access this submenu to view the properties of installed SATA devices and configure miscellaneous system settings.
Advanced Chipset Configuration	Access this submenu to enable or disable various Intel technology functions and configure video memory settings.
Integrated Peripherals	Access this submenu to enable or disable operation modes for the onboard I/O controllers.
PC Health Status	Access this submenu to view current level of system/processor/PCH temperature, voltages, and fan speed.
Smart Fan Configuration	Access this submenu to view current smart fan configuration setting.

Miscellaneous submenu



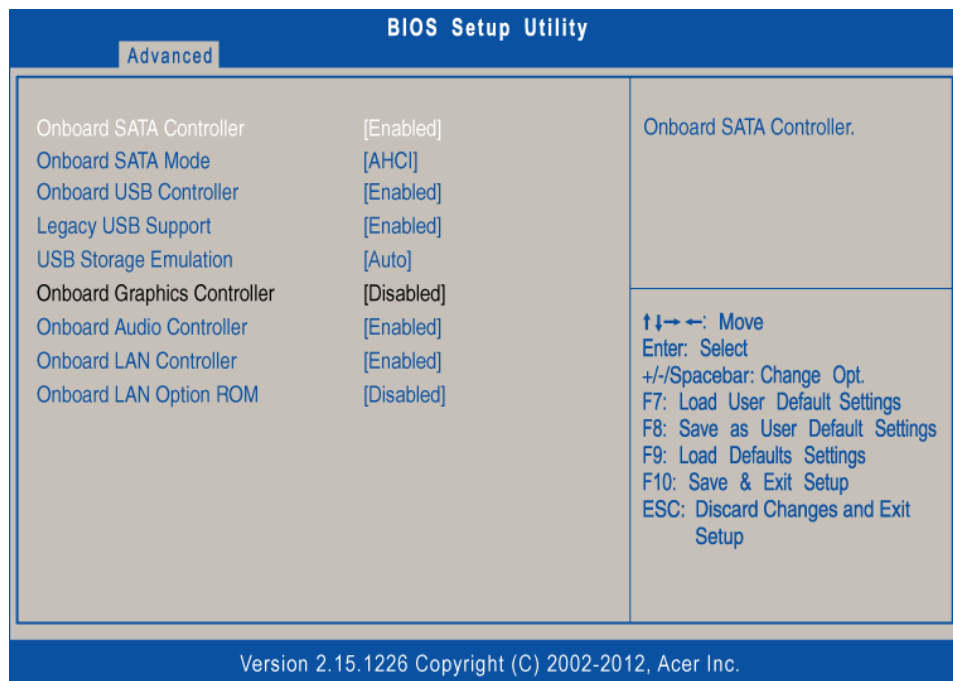
Field	Description	Value
AHCI Port 0-2	Your computer supports three SATA channels, each channel allows one SATA device to be installed. Press Enter to display the individual configuration screen of installed SATA drive(s).	
Spread Spectrum	Enable or Disable mainboard spread spectrum clocking.	Enabled Disabled
Processor Multiplier	Displays the current system processor multiplier value.	
Bootup Num-Lock	If you set this item to On, the keyboard Num Lock key will be active when the computer boots up.	On Off
USB Beep Message	Select whether to allow the BIOS to emit error beeps or display error messages during USB device enumeration.	Enabled Disabled

Advanced Chipset Configuration submenu



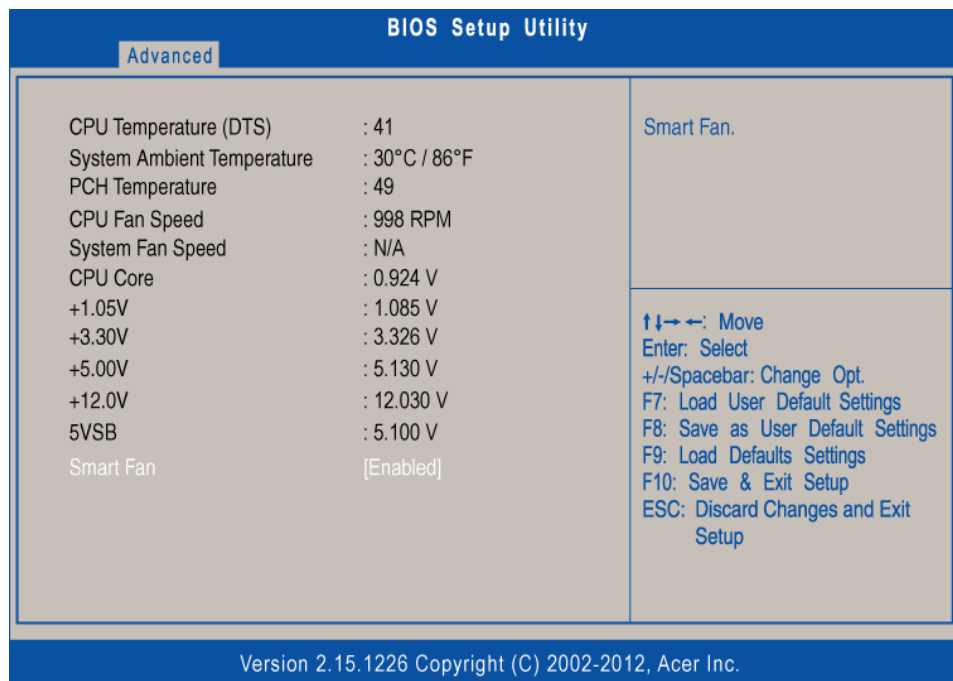
Field	Description	Value
Intel EIST	Select whether to enable the Enhanced Intel SpeedStep Technology. EIST allows a compliant OS to dynamically adjust the processor voltage and core frequency based on system usage. This can result in decreased average power consumption and decreased average heat production. Note: After enabling EIST in BIOS Setup, you need to enable it on your operating system as well. Consult your OS documentation for related instructions.	Enabled Disabled
Intel Turbo Boost	Select whether to enable the Intel Turbo Boost Technology. The Intel Turbo Boost technology automatically allows processor cores to run faster than the base operating frequency if they're operating below power, current, and temperature specification limits.	Enabled Disabled
Intel AES-NI	Select whether to enable the Intel AES-NI Technology. The Intel AES-NI technology delivers faster, more affordable data protection and greater security.	Enabled Disabled
Intel XD Bit	Select whether to enable the Intel Execute Disable Bit Technology. XD Bit is a hardware-based security feature that can reduce exposure to viruses and malicious-code attacks and prevent harmful software from executing and propagating on the computer or network.	Enabled Disabled
Intel VT	Select whether to enable the Intel Virtualization Technology. VT allows a single platform to run multiple operating systems in independent partitions.	Enabled Disabled
Primary Video	Select the graphics card adapter used at startup.	Auto PCIe Onboard

Integrated Peripherals submenu



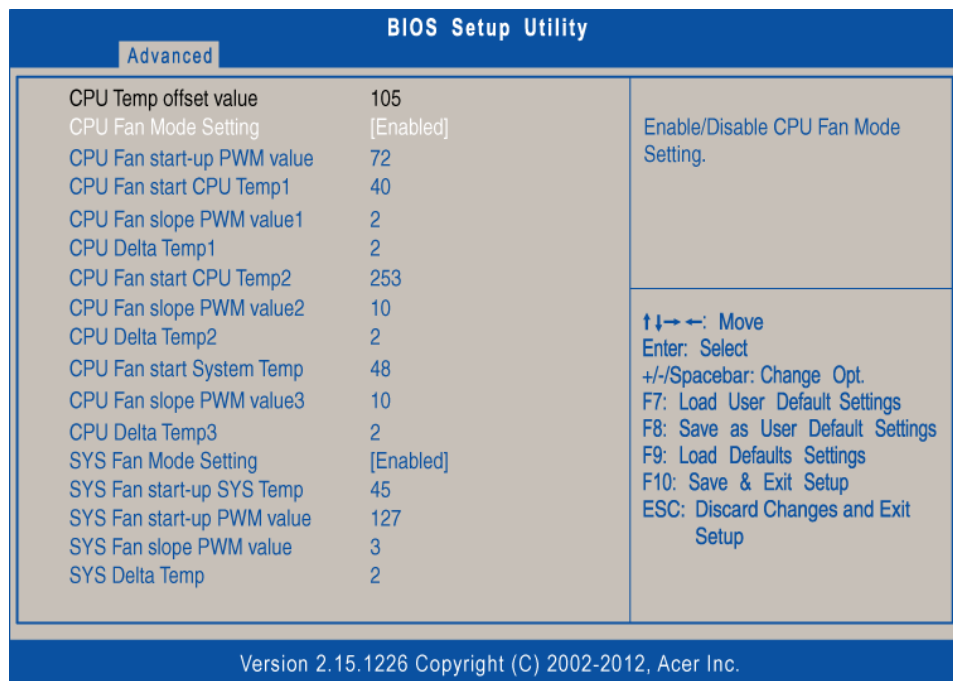
Field	Description	Value
Onboard SATA Controller	Enables or disables the onboard SATA controller.	Enabled Disabled
Onboard SATA Mode	Set the operating mode for the onboard SATA controller.	AHCI Native IDE RAID
Onboard USB Controller	Enables or disables the onboard USB controller.	Enabled Disabled
Legacy USB Support	Enables or disables support for a USB mouse and USB keyboard. When enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.	Enabled Disabled
USB Storage Emulation	If set to Auto, a USB devices with a capacity of equal or less than 2 GB will be emulated as a bootable floppy disk.	Auto Floppy Hard Disk
Onboard Graphics Controller	Enables or disables the onboard graphics controller.	Enabled Disabled
Onboard Audio Controller	Enables or disables the onboard audio controller.	Enabled Disabled
Onboard LAN Controller	Enables or disables the onboard LAN controller.	Enabled Disabled
Onboard LAN Option ROM	Enables or disables the onboard LAN option ROM function.	Enabled Disabled

PC Health Status submenu



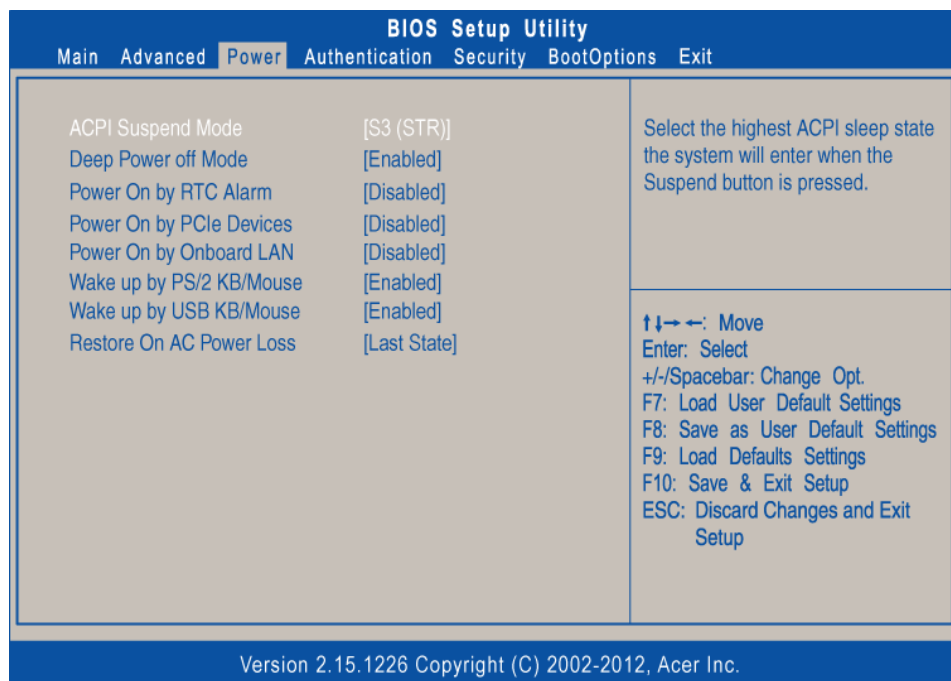
Field	Description	Value
CPU Temperature (DTS) System Ambient Temperature CPU Fan Speed CPU Core +3.30V +5.00V +12.0V 5VSB VBAT	These items lets you monitor the parameters for critical voltages, temperatures and fan speeds.	
Smart Fan	When enabled, fan speed will speed up or slow down depending on the system temperature.	Enabled Disabled

Smart Fan Configuration submenu



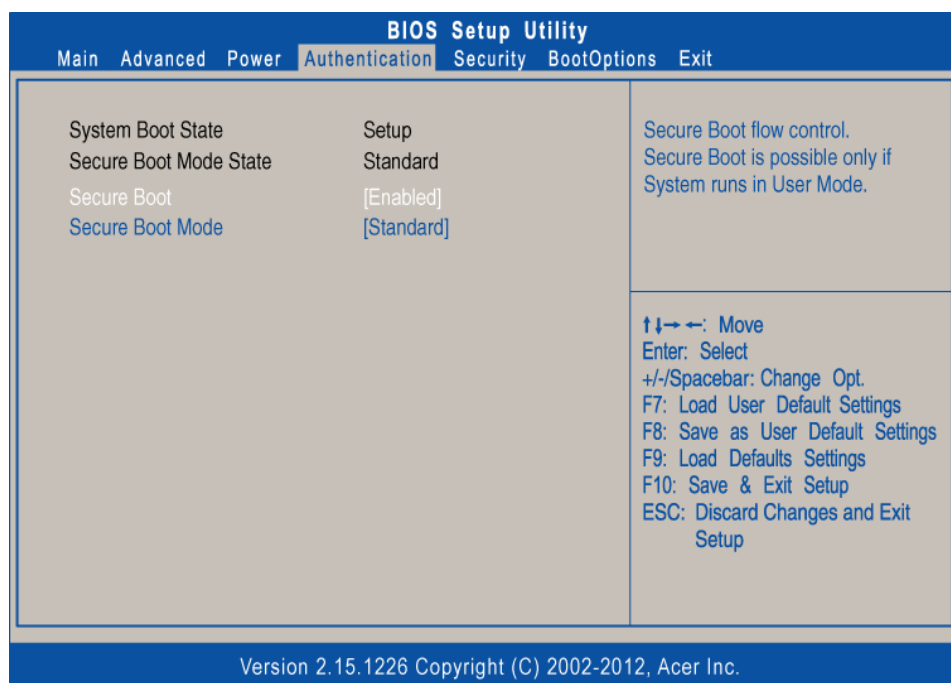
Field	Description	Value
CPU Fan Mode Setting	When enabled, this will help you monitor various CPU fan parameters.	Enabled Disabled
SYS Fan Mode Setting	When enabled, this will help you monitor various system fan parameters.	Enabled Disabled

Power menu



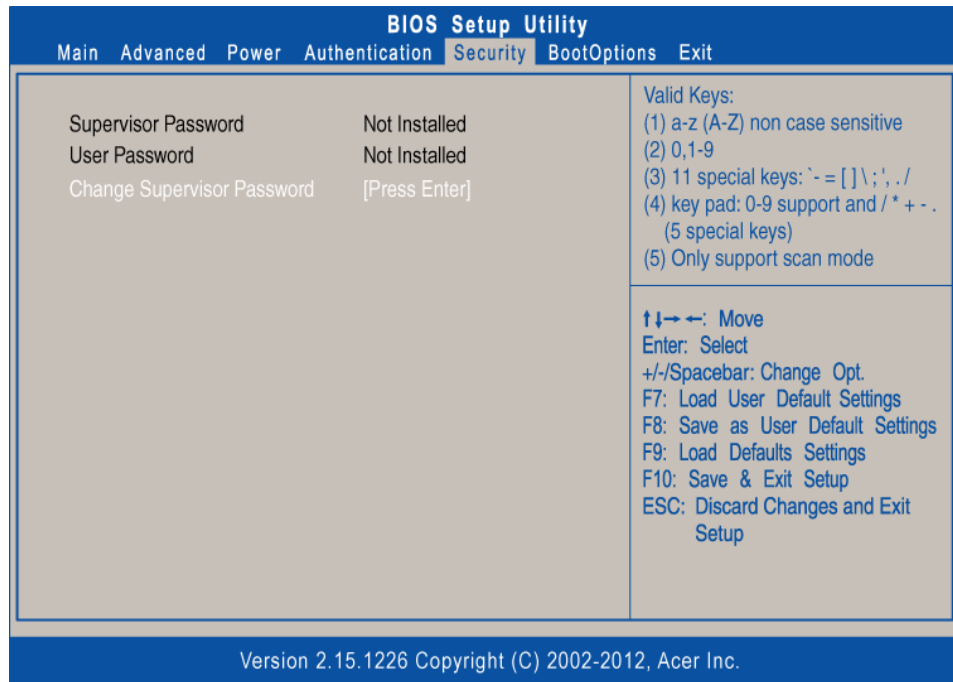
Field	Description	Value
ACPI Suspend Mode	Use this item to define how your system suspends. Default value is S3 (STR), the suspend mode is suspend to RAM, i.e., the system shuts down with the exception of a refresh current to the system memory.	S3 (STR)
Deep Power Off Mode	Enables or disables compliance to the Energy-using Products Lot 6 Directives (EuP Lot 6).	Enabled Disabled
Power On by RTC Alarm	Enables or disables the system to wake up from a power-saving mode when an RTC alarm occurs.	Enabled Disabled
Power On by PCIE Devices	Enables or disables the system to wake up from a power-saving mode when an installed PCIe LAN card received an incoming call.	Enabled Disabled
Power On by Onboard LAN	Enables or disables the system to wake up from a power-saving mode when an onboard LAN card received an incoming call.	Enabled Disabled
Wake Up by PS/2 KB/Mouse	Enables or disables the system to wake up from a power-saving mode when a PS/2 keyboard or mouse is used.	Enabled Disabled
Wake Up by USB KB/Mouse	Enables or disables the system to wake up from a power-saving mode when a USB keyboard or mouse is used.	Enabled Disabled
Restore On AC Power Loss	Select the power state when an AC power loss occurs. <ul style="list-style-type: none"> Last State - The computer reverts to the last power state before the power loss occurred. Off - The computer remains off until the power button is pressed. On - The computer switches back on after the AC power loss. 	Last State Off On

Authentication menu



Field	Description	Value
System Boot State	Displays the current system boot status. <ul style="list-style-type: none"> • <i>Setup</i> - Secure keys not installed. • <i>User</i> - Secure keys installed 	Setup User
Secure Boot Mode State	Displays the current system boot mode status.	Enabled Disabled
Secure Boot	Enables or disables the secure boot function.	Enabled Disabled
Secure Boot Mode	Select the secure boot mode when secure boot is enabled.	Standard Custom

Security menu



Field	Description	Value
Supervisor Password	Displays the supervisor password status. When set to <i>Installed</i> , this password will allow the user to access and change all settings in the Setup Utility.	Installed Not Installed
User Password	Displays the user password status. Only the following menus will be accessible when this password is used to logged in: <ul style="list-style-type: none"> System Date and System Time Exit Without Saving The F9 key (Load Default Settings) will also be unavailable.	
Change Supervisor Password	Press Enter to change the supervisor password.	
Change User Password	Press Enter to change the user password. Note that this field: <ul style="list-style-type: none"> is only accessible when a supervisor password is set; is cleared when the supervisor password is cleared. 	

Note the following before you define a system password:

- The maximum length of password contains 8 alphanumeric characters. The following keys are valid:
 - A-Z, a-z (case-insensitive)
 - 0-9
 - ` - + [] \ ; ' , . / ,
 - Special keypad characters: 0-9 / * - +
- When you are prompted to enter a password, you have three tries before the system halts. Do not forget your password. If you forget your password, you may have to return your computer to your dealer to reset it.

To set a system password:

NOTE You need to set a supervisor password first before setting the user password.

1. Select Change Supervisor Password or Change User Password, then press **Enter**.

The password box appears.

2. Type a password then press **Enter**.

IMPORTANT Be very careful when typing your password because the characters do not appear on the screen. Only shaded blocks representing each typed character are visible.

3. Retype the password to verify the first entry, then press **Enter**.

You will be prompted to save the new password.

4. Press **Enter**.
5. Press **F10** to save the password and close the Setup Utility.

To change a system password:

1. Select Change Supervisor Password or Change User Password, then press **Enter**.

The password box appears.

2. Type the original password, then press **Enter**.
3. Type a new password, then press **Enter**.
4. Retype the new password to verify the first entry, then press **Enter**.

You will be prompted to save the new password.

5. Press **Enter**.
6. Press **F10** to save the password and close the Setup Utility.

To remove a system password:

NOTE When the supervisor password is removed, the user password will also be remove.

1. Select Change Supervisor Password or Change User Password, then press **Enter**.

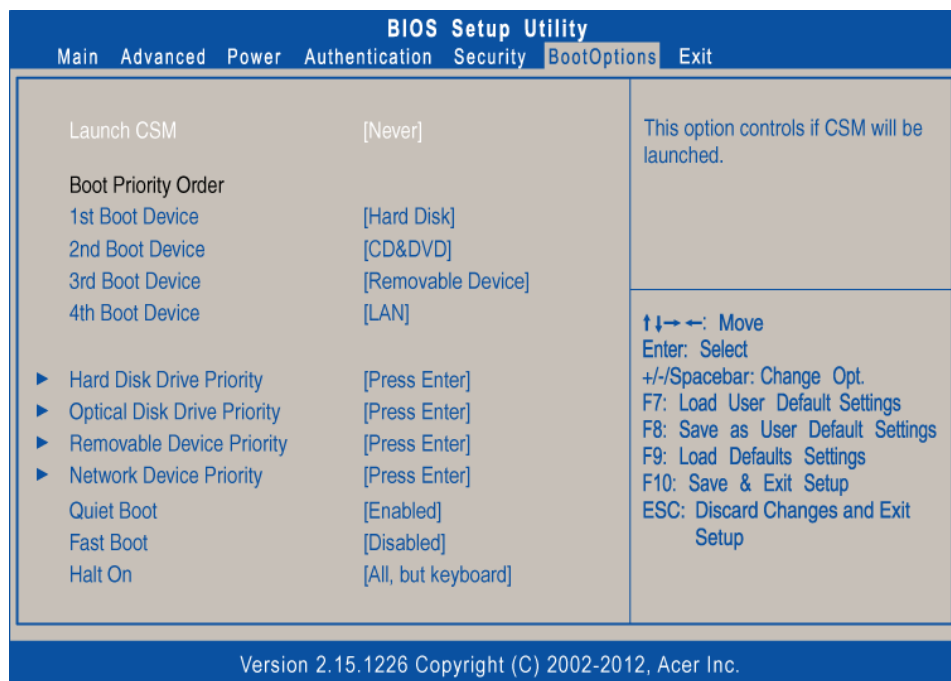
The password box appears.

2. Type the original password, then press **Enter**.
3. Press **Enter** twice without entering anything in the new and confirm password fields.

You will be prompted to confirm the password removal.

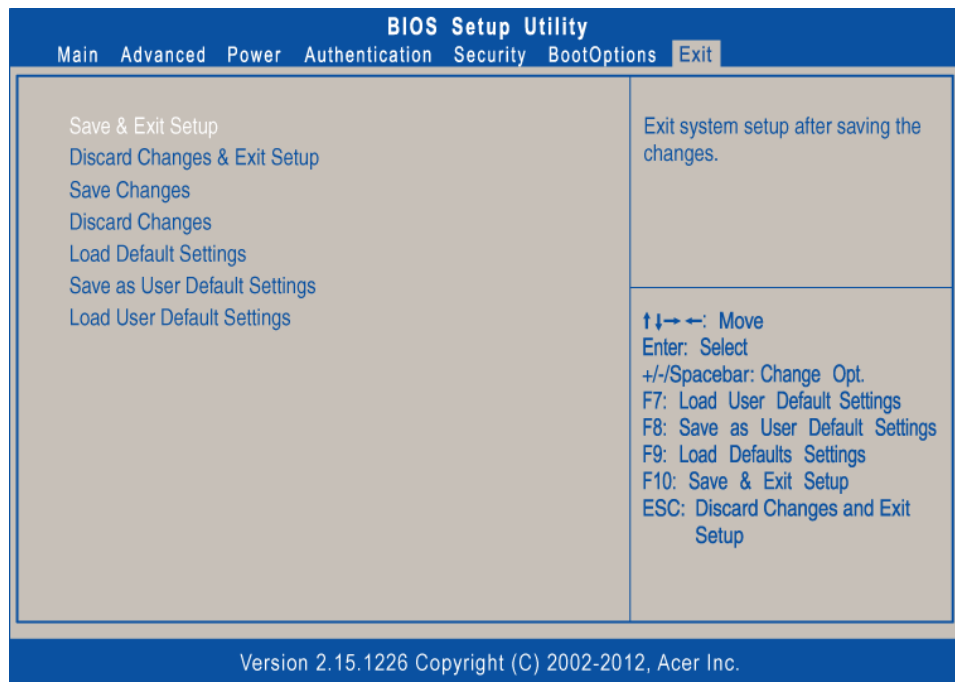
4. Press **Enter**.
5. Press **F10** to save the changes you made and close the Setup Utility.

Boot Options menu



Field	Description	Value
Launch CSM	Controls the launching the Compatibility Support Module function when booting.	Never Always
Boot Priority Order 1st Boot Device 2nd Boot Device 3rd Boot Device 4th Boot Device	Displays the device assigned to the specified boot sequence. The Setup Utility attempts to boot the operating system in this order. By default, the computer searches for boot devices in the following order: <ul style="list-style-type: none"> • Hard disk • Optical drive (CD/DVD) • Removable device • Network boot (LAN) 	
Hard Disk Drive Priority	Press Enter to set the boot priority for the hard drive.	
Optical Disc Drive Priority	Press Enter to set the boot priority for the optical drive.	
Removable Device Priority	Press Enter to set the boot priority for a removable USB drive.	
Network Device Priority	Press Enter to set the boot priority for a network boot.	
Quiet Boot	When enabled, BIOS will show a full screen logo when booting; if disabled, BIOS will show the diagnostic POST screen when booting.	Enabled Disabled
Fast Boot	Enable or disable the fast boot function.	Enabled Disabled
Halt On	Determines whether the system will stop for an error during the POST. Options include: <ul style="list-style-type: none"> • All, but Keyboard – If a keyboard error is detected, BIOS will pause the system. • All Errors – Any error detected will pause the system. • No Errors – BIOS will ignore any errors detected during POST 	All, But Keyboard All Errors No Errors

Exit menu



Field	Description
Save and Exit Setup	Save changes made and close the Setup utility. Keyboard shortcut: F10
Discard Changes and Exit Setup	Discard changes made and close the Setup utility. Keyboard shortcut: Esc
Save Changes	Save all changes made to the Setup utility.
Discard Changes	Discard all changes made to the Setup utility and load the previous configuration settings.
Load Default Settings	Load the factory default settings for all Setup parameters. Keyboard shortcut: F9
Save as User Default Settings	Save the current configuration settings as user default values. Keyboard shortcut: F8
Load User Default Settings	Load the user default settings for all Setup parameters. Keyboard shortcut: F7

System Disassembly

This chapter contains step-by-step procedures on how to disassemble the desktop computer for maintenance and troubleshooting.

Disassembly Requirements

To disassemble the computer, you need the following tools:

- Wrist grounding strap and conductive mat for preventing electrostatic discharge
- Philips screwdriver

NOTE: The screws for the different components vary in size. During the disassembly process, group the screws with the corresponding components to avoid mismatch when putting back the components.

Pre-disassembly Procedure

Before proceeding with the disassembly procedure, perform the steps listed below:

1. Turn off the system and all the peripherals connected to it.
2. Unplug the power cord from the power outlets.
3. Unplug the power cord from the system.
4. Unplug all peripheral cables from the system.
5. Place the system unit on a flat, stable surface.

Disassembly Procedures

Removing the Side Panel

1. Put the computer on a flat surface.
2. Remove the two screws that secure the side panel to the chassis.



3. Slide the side panel toward the back of the chassis until the tabs on the side panel disengage with the slots on the chassis.



4. Detach the side panel from the unit and put it aside for reinstallation later.

Removing the Front Bezel

1. Release the front bezel retention tabs from the chassis interior.



2. Pull the front bezel away from the chassis.



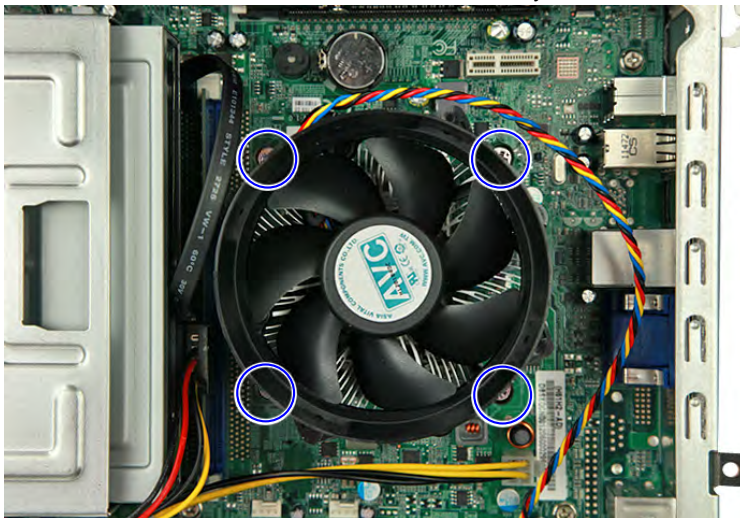
Removing the Heatsink Fan Assembly

WARNING: The heatsink becomes very hot when the system is on. NEVER touch the heatsink with any metal or with your hands.

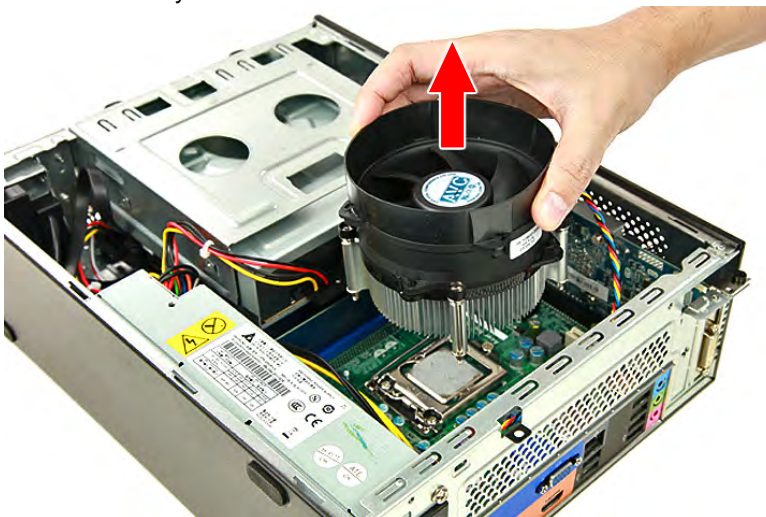
1. Disconnect the heatsink fan cable from its mainboard connector.



2. Loosen the four screws that secure the heatsink fan assembly to the mainboard.



3. Lift the heatsink fan assembly off the mainboard.

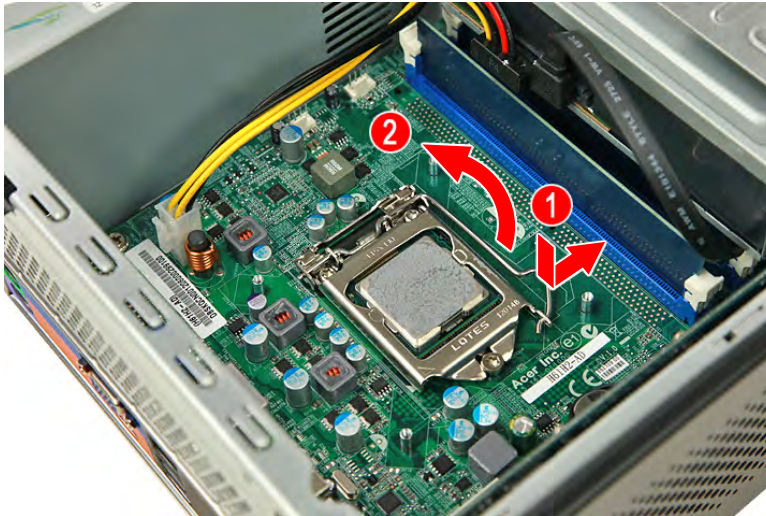


Removing the Processor

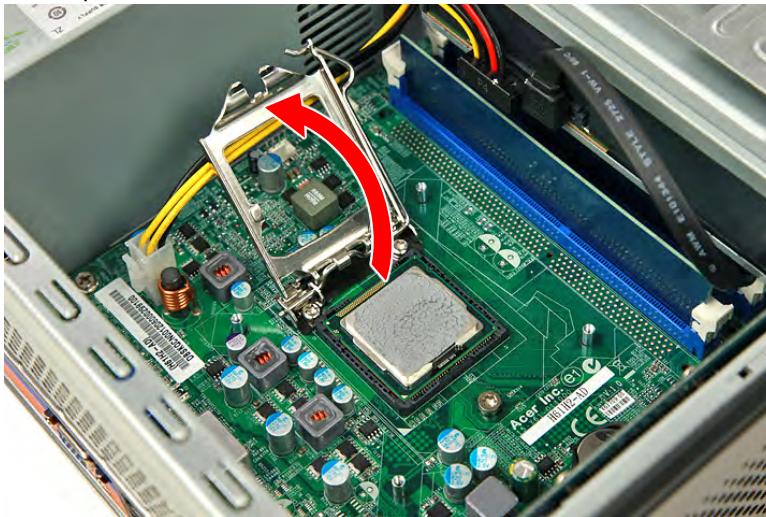
IMPORTANT: Before removing a processor from the mainboard, make sure to create a backup file of all important data.

WARNING: The processor becomes very hot when the system is on. Allow it to cool off first before handling.

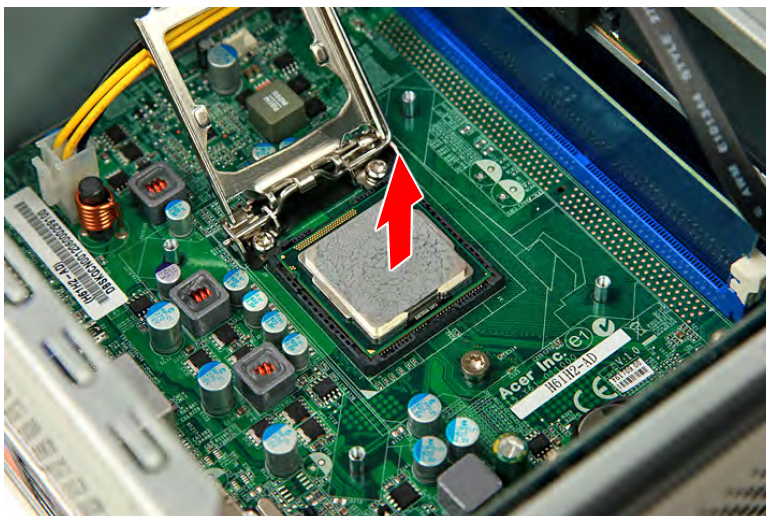
1. Press the load lever and move it to the right to release the load lever from the retention tab (1), then pull the load lever to the fully open, upright position (2).



2. Open the cpu cover plate.



3. Pull out the processor from the socket.

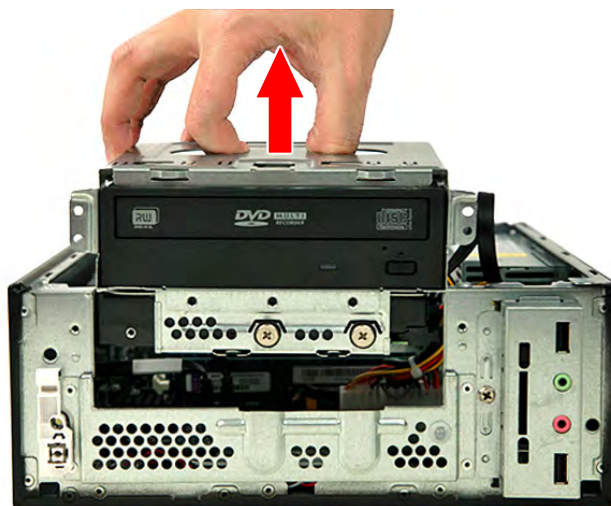


Removing the HDD-ODD Assembly

1. Remove the two screws that secure the HDD-ODD bracket to the chassis.



2. Lift up the HDD-ODD bracket.



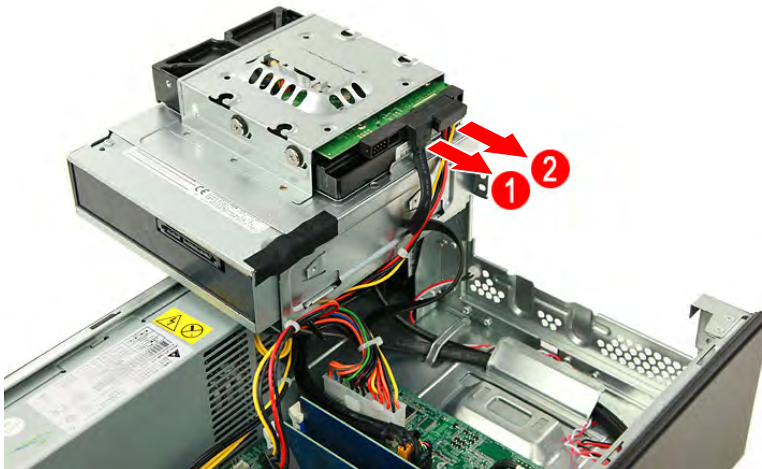
3. Disconnect the data and power cables from the rear of the optical drive.



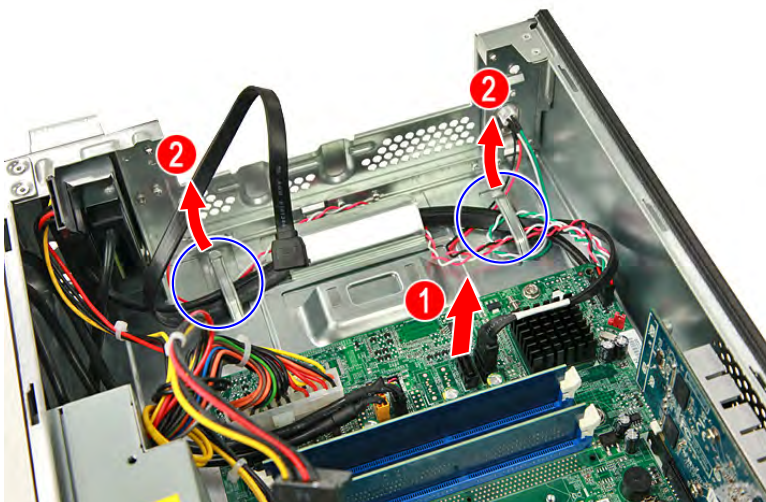
4. Disconnect the other end of the data cable from the mainboard.



5. Disconnect the data and power cables from the rear of the hard disk drive.



6. Disconnect the other end of the data cable from the mainboard (1) and lift the metal tabs (2) to remove the data cable.



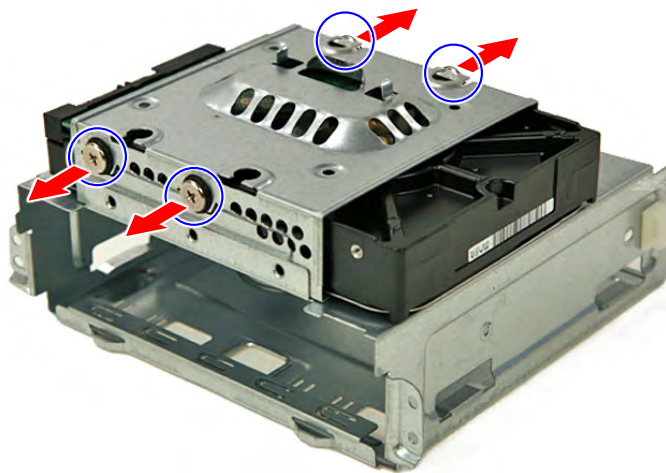
-
7. Remove the two screws that secure the optical drive to the ODD bracket.



8. Pull the optical drive out of the drive bay.



9. Remove the four screws that secure the hard disk drive to the HDD bracket.



10. Slide the hard disk drive out of the bracket.

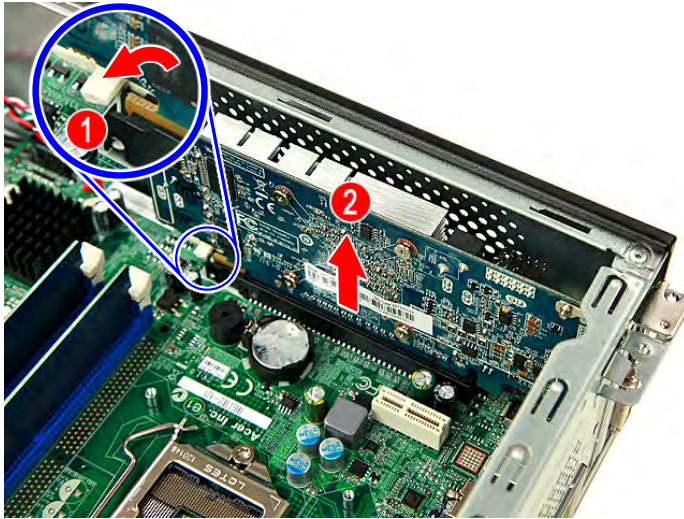


Removing the Expansion Board

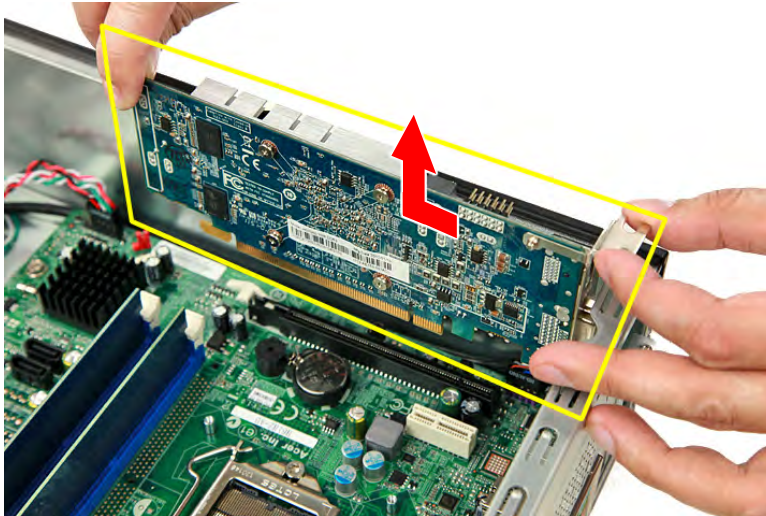
1. Remove the screw that secures the expansion board bracket to the chassis.



2. Push to open the expansion slot lock (1) in the direction indicated until the expansion board pops out of its socket (2).



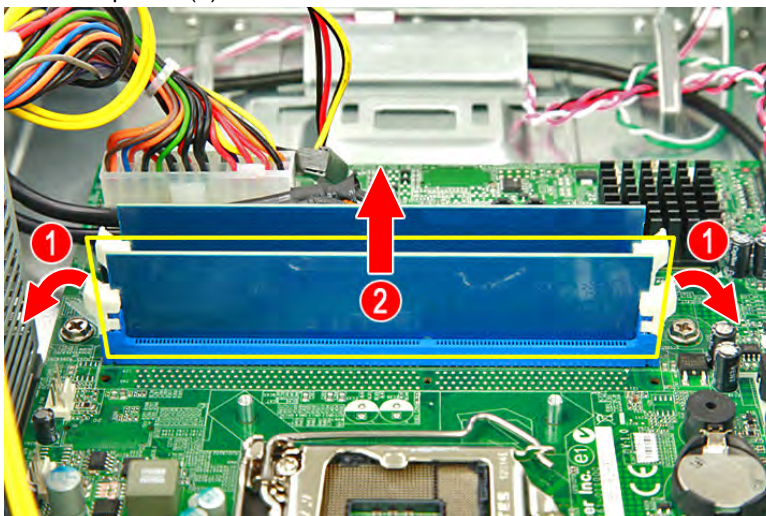
3. Gently move the expansion board slightly to the left and remove it from the slot.



Note: Circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

Removing the Memory Modules

1. Press outward the holding clips (1) on both sides of the DIMM slot to release the DIMM.
2. Gently pull the DIMM upward (2) to remove it from the chassis.

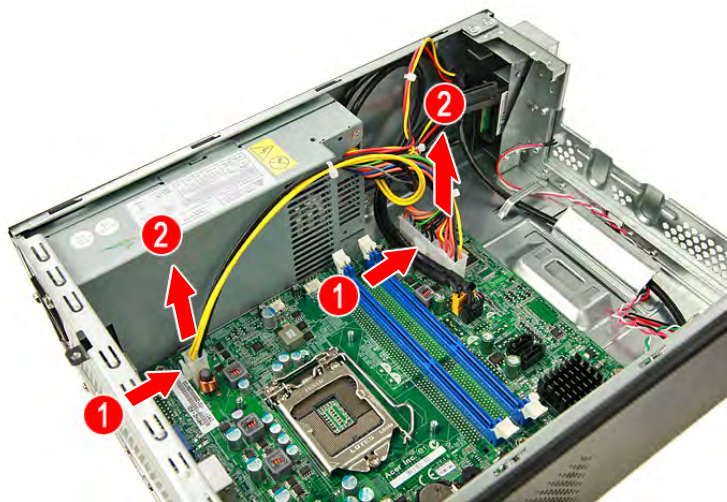


Note: Circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

3. Repeat Steps 1 & 2 to remove the other memory module.

Removing the Power Supply Module

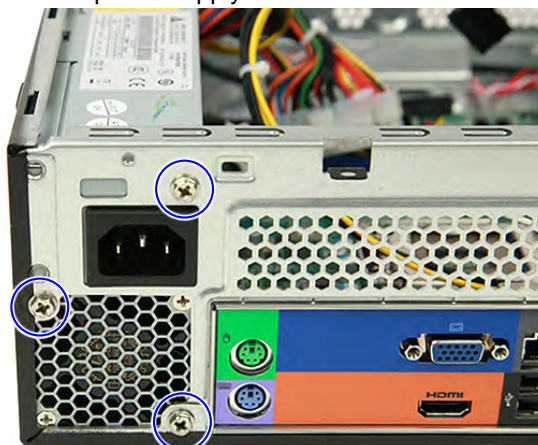
1. Press the latching clips (1) then disconnect the 4-pin and 24-pin ATX power supply cables from the mainboard (2).



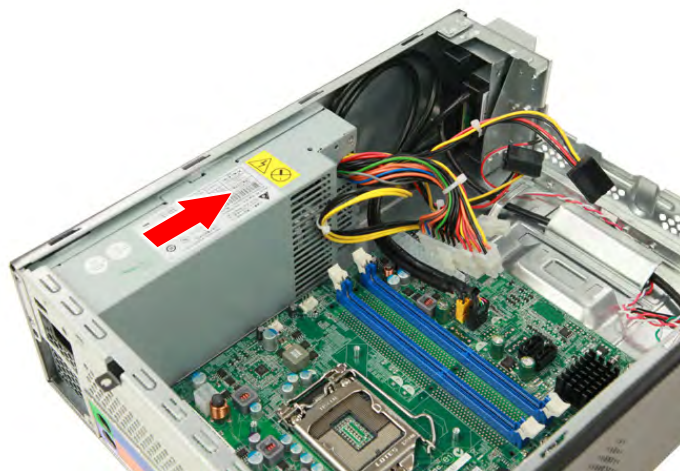
2. Remove the screw that secures the power supply module to the chassis.



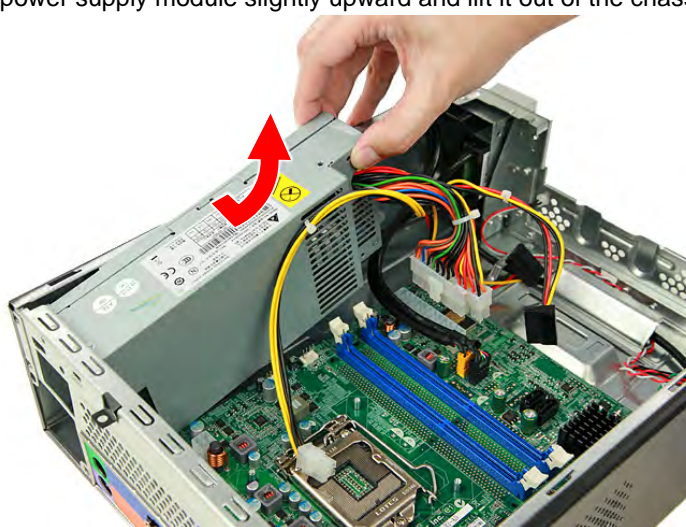
3. Remove the three screws that secure the power supply module to the chassis.



-
4. Push the power supply module toward the front.



5. Tilt the edge of the power supply module slightly upward and lift it out of the chassis.



Removing the Front I/O and Card Reader Board

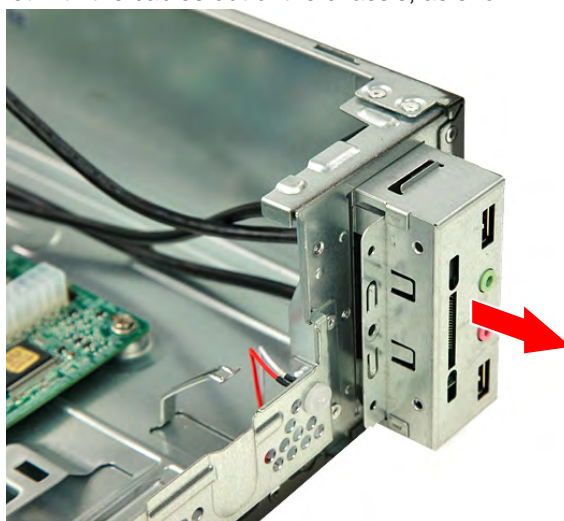
1. Disconnect the front I/O board and card reader board cables from their mainboard connectors.



2. Remove the screw that secures the bracket to the chassis.

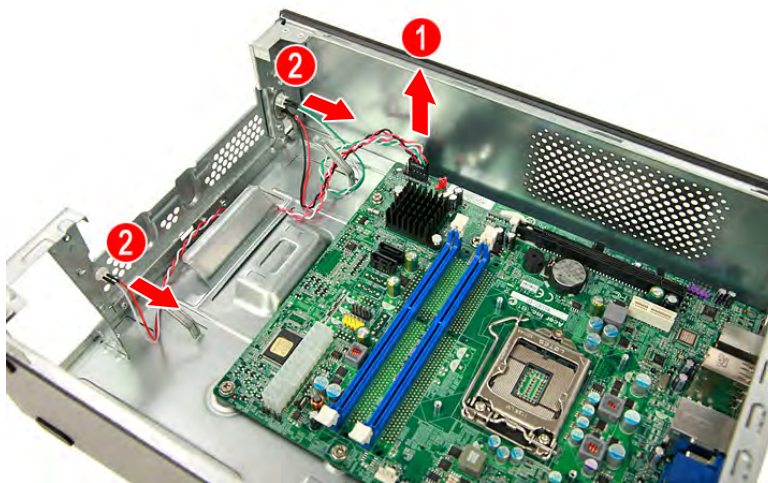


3. Pull the bracket with the cables out of the chassis, as shown.



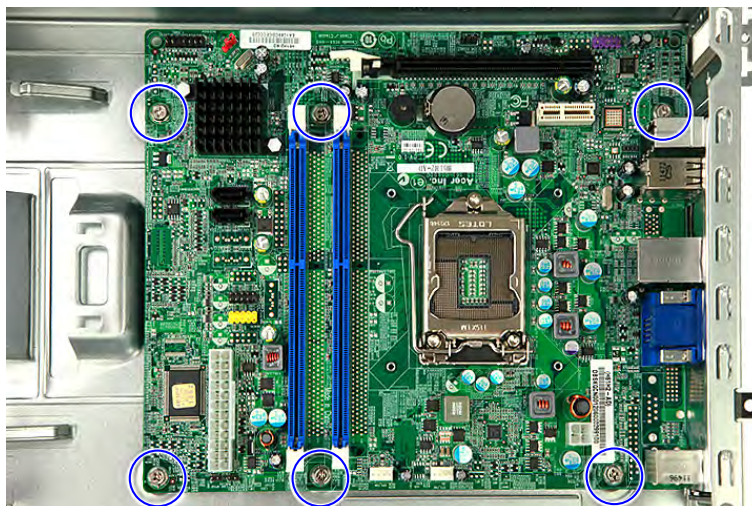
Removing the Power Switch/LED module

1. Disconnect the power switch and LED cable from the mainboard (1) then detach the Power Switch & LED module from the chassis (2).



Removing the Mainboard

1. Remove the six screws that secure the mainboard to the chassis.

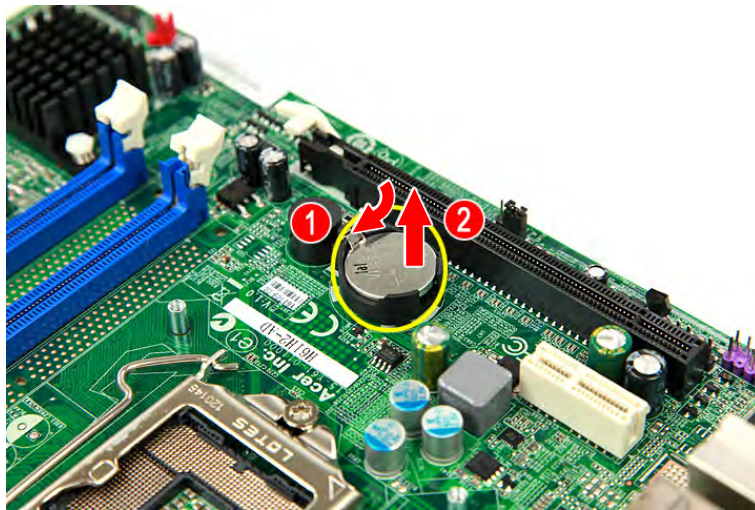


2. Gently lift the board off the chassis.



Note: Circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

3. Remove the RTC battery.



Note: The RTC battery has been highlighted with the yellow circle as shown above. Please follow local regulations for disposal of used batteries.

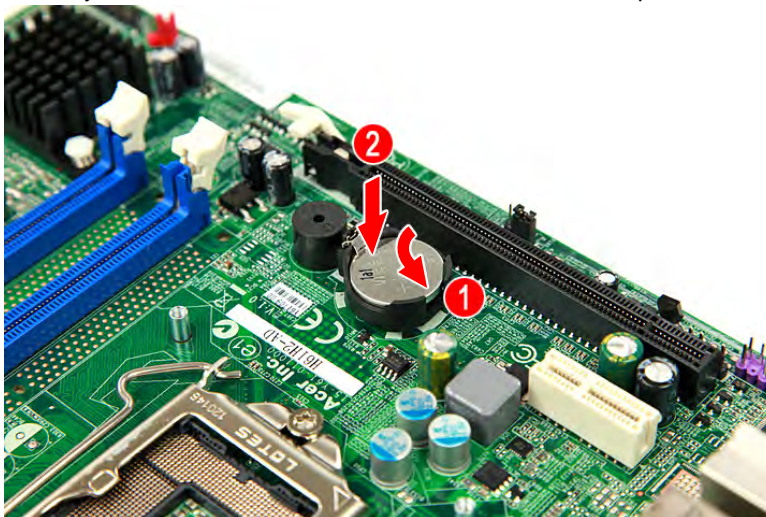


Caution: Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

Reassembly Procedures

Reinstalling the Mainboard

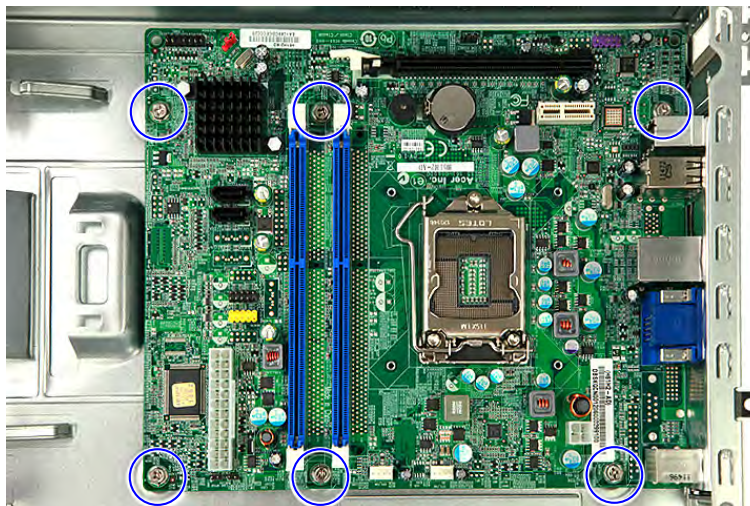
1. Slide the RTC battery into its socket in the mainboard until it latch into place.



2. Slide the mainboard into the chassis, with the I/O ports of the mainboard extruding from their port holes, then lower the mainboard in place.

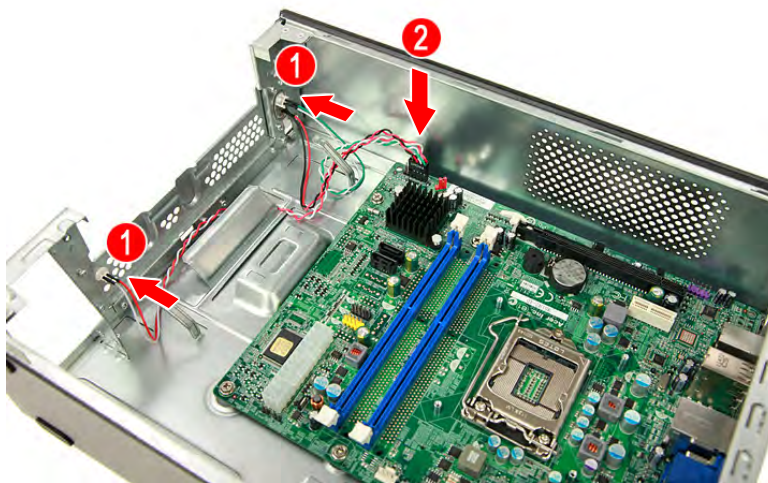


3. Secure the mainboard to the chassis using six screws.



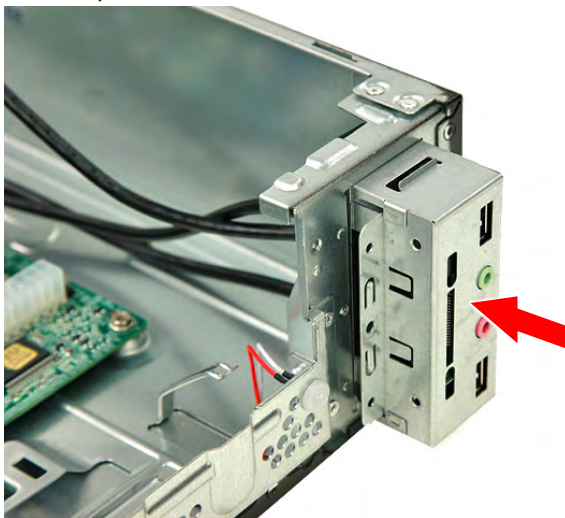
Reinstalling the Power Switch/LED module

1. Insert the Power Switch & LED module into its socket in the chassis (1) connect the power switch and LED cable to the mainboard (2) .



Reinstalling the Front I/O and Card Reader Board

1. Insert the cables and place the the front I/O and card reader in its socket.



2. Secure the bracket to the chassis using one screw.

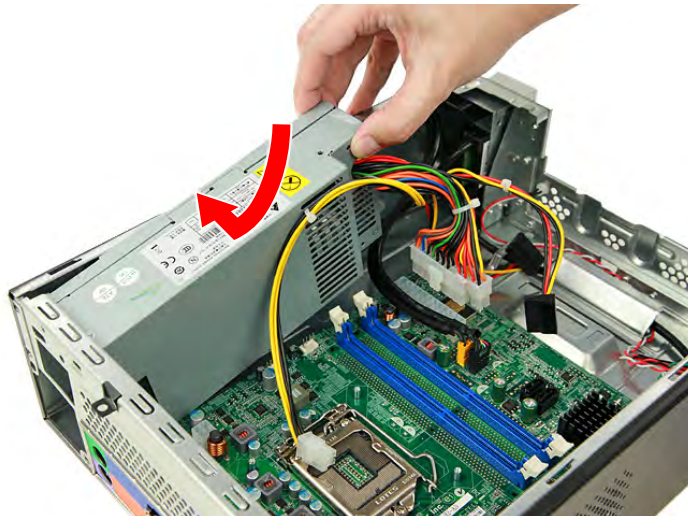


3. Connect the front I/O board and card reader board cables to their mainboard connectors.



Reinstalling the Power Supply Module

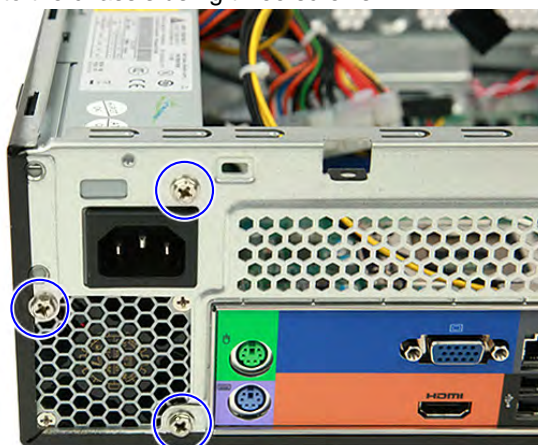
1. Slide the power supply module into its place in the chassis at a slightly tilted angle.



2. Push the power supply module toward the back of the chassis until all the screw holes align.



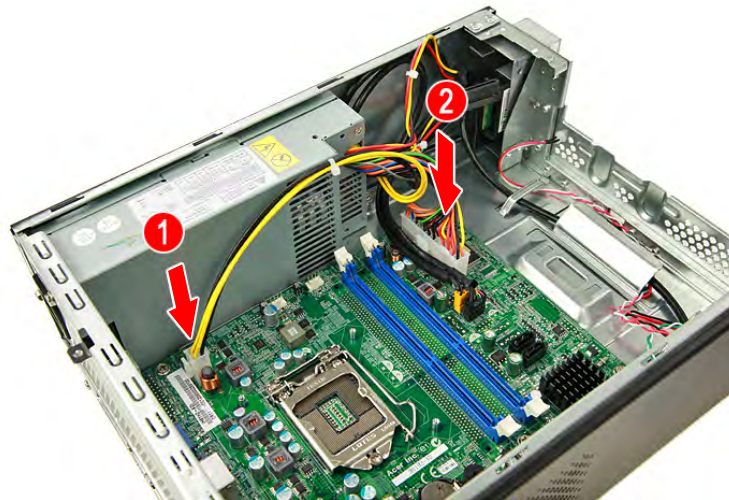
3. Secure the power supply module to the chassis using three screws.



- Secure the power supply module to the chassis using one screw.

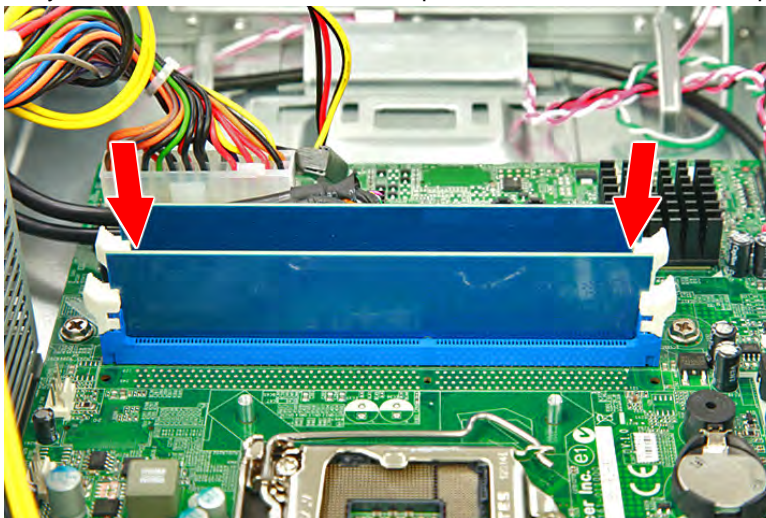


- Connect the 4-pin and 24-pin ATX power supply cables to the mainboard.



Reinstalling the Memory Modules

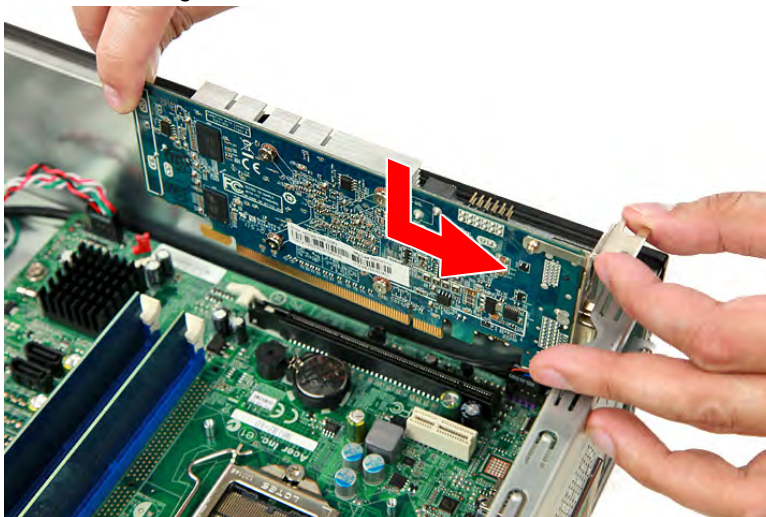
1. Insert the memory module into the DIMM slot then press it down until it latch into place.



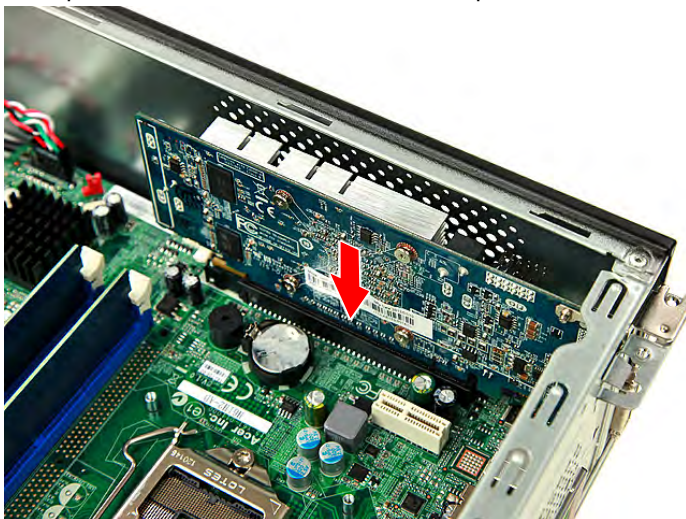
2. Repeat Step 1 to install the other memory module.

Reinstalling the Expansion Board

1. Position the expansion board over the PCIe x16 slot and move it slightly to the right, making sure the card guide is aligned with the slot guide on the chassis.



2. Gently push the expansion board downward until the expansion slot lock latch into place.



3. Secure the expansion card bracket to the chassis using one screw.

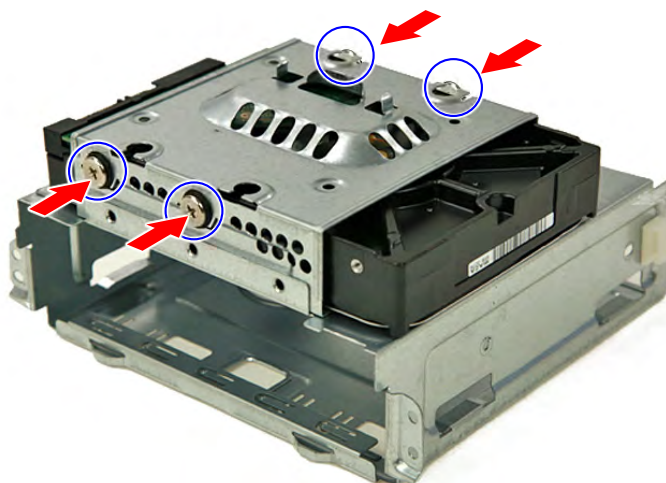


Reinstalling the HDD-ODD Assembly

1. Slide the hard disk drive into the bracket.



2. Secure the hard disk drive to the HDD bracket using four screws.



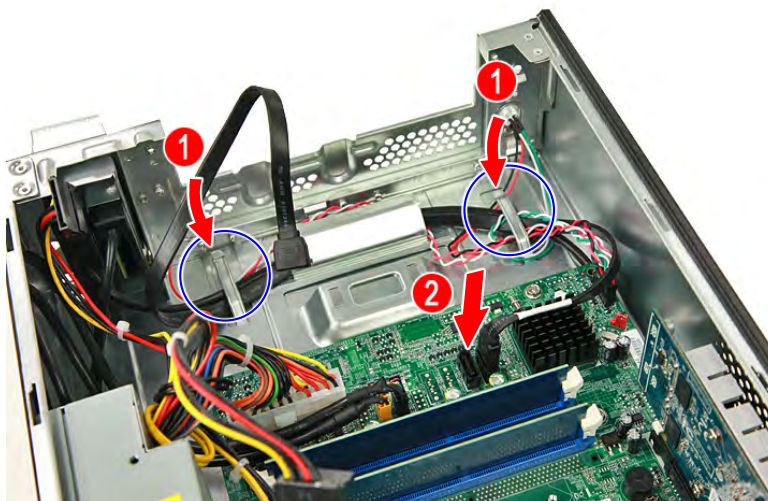
3. Slide the optical drive into the drive bay.



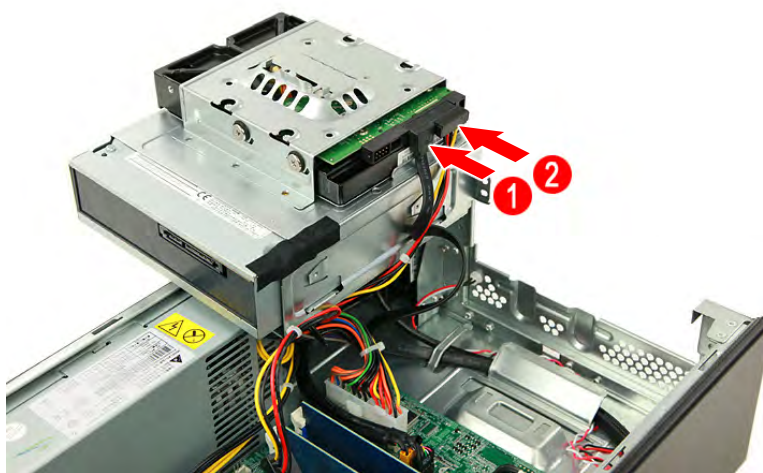
- Secure the optical drive to the ODD bracket using two screws.



- Secure the data cable to the metal tabs (1) and connect the data cable to the mainboard (2).



- Connect the data and power cables to the rear of the hard disk drive.



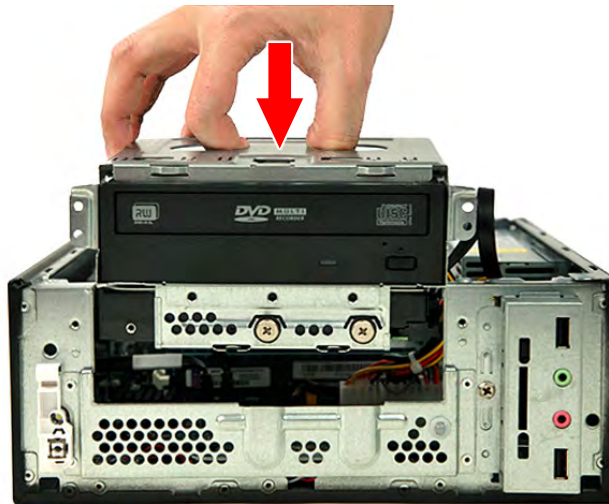
7. Connect the ODD data cable to the mainboard.



8. Connect the data and power cables to the rear of the optical drive.



9. Install the HDD-ODD bracket into the chassis.

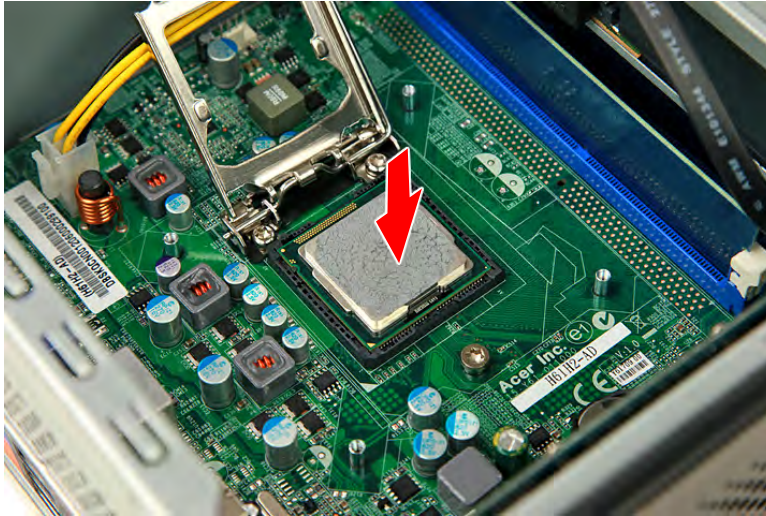


10. Secure the HDD-ODD bracket to the chassis using two screws.

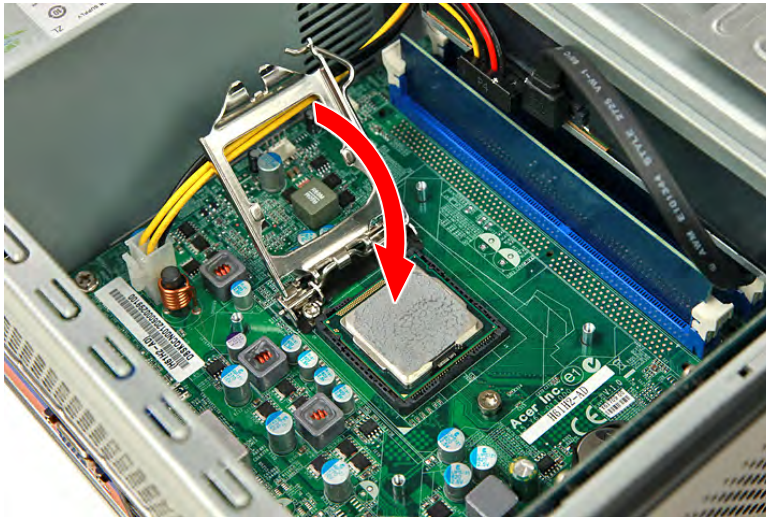


Reinstalling the Processor

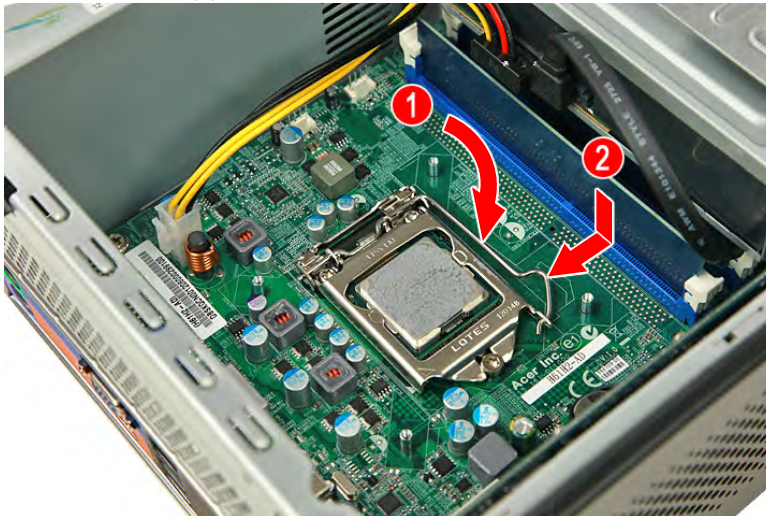
1. Place the processor into the socket. Make sure the gold arrow on the corner of the processor is aligned with the beveled corner of the socket. The processor will easily fit into the socket if it is properly oriented.



2. Close the cpu cover plate.

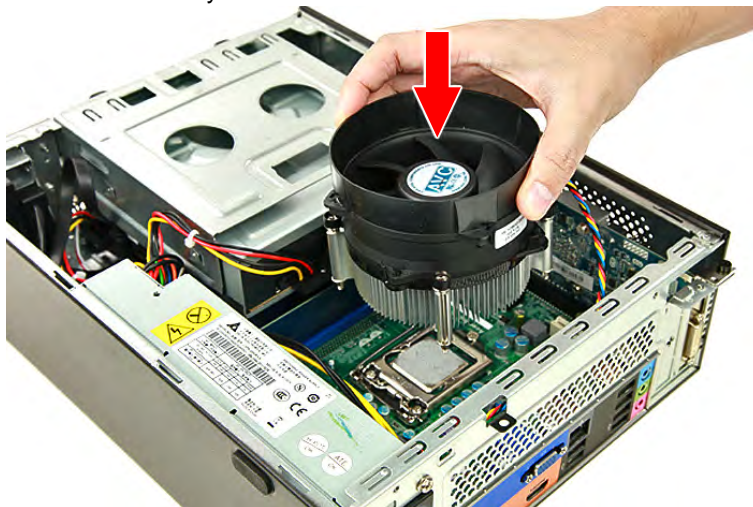


3. Push the load lever downward (1), then slide the load lever to the left until it latches into the retention tab (2).

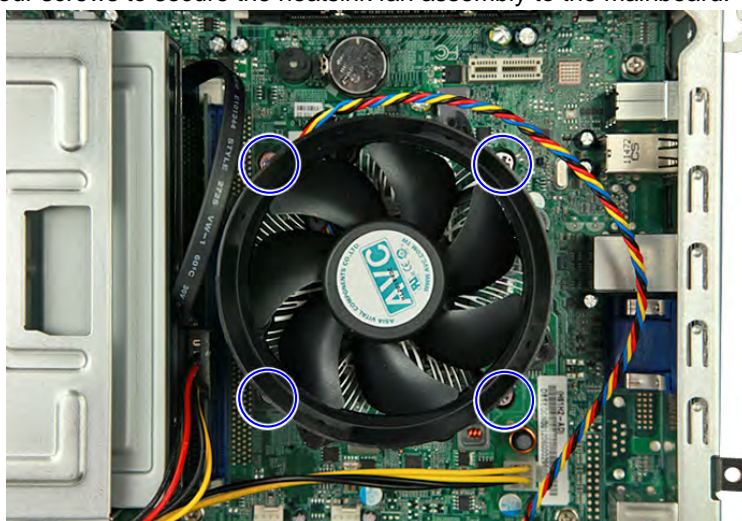


Reinstalling the Heatsink Fan Assembly

1. Insert the heatsink fan assembly into the mainboard.



2. Tighten the four screws to secure the heatsink fan assembly to the mainboard.

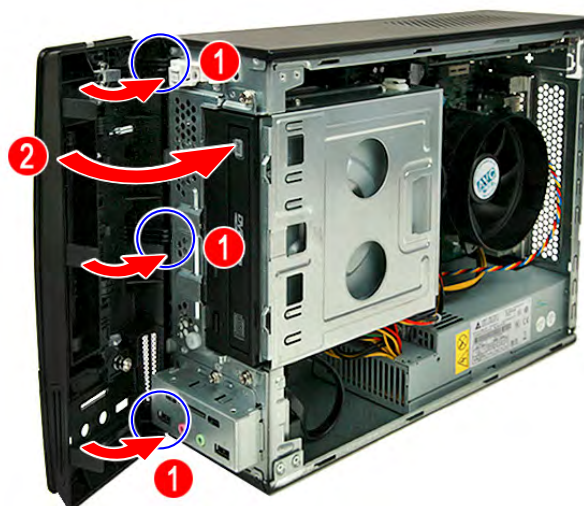


3. Connect the heatsink fan cable to its mainboard connector.



Reinstalling the Front Bezel

1. Insert the tabs on the front bezel into the notches (1) on the left side of the chassis and attach the front bezel (2) in the direction indicated.



2. Push the front bezel until the retention tabs latch into place and are securely fastened to the chassis interior.



Reinstalling the Side Panel

1. Slide the side panel toward the front of the chassis until the tabs on the side panel engage with the slots on the chassis.



2. Secure the side panel to the chassis using two screws.



Troubleshooting

This chapter lists the POST error indicators and BIOS beep codes, as well general troubleshooting instructions.

Hardware Diagnostic Procedure

1. Obtain as much detail as possible about the symptoms of the system failure.
2. Verify the symptoms by attempting to recreate the failure by running the diagnostic tests or repeating the same operation.
3. Refer to “Power System Check” procedure on the next section and the “Beep Codes” section on page 72 to determine which corrective action to take.

System Check Procedures

IMPORTANT The diagnostic tests described in this chapter are only intended to test Acer products. Non-Acer products, prototype cards, or modified options can give false errors and invalid system responses.

Power System Check

If the system can be powered on, skip this section. Proceed to the “System Internal Inspection” procedure on the next page.

If the system will not power on, do the following:

- Check if the power cable is properly connected to the AC power jack and a functional AC power source.
- Check if the voltage selector switch is set to the correct voltage setting.

System External Inspection

1. Inspect the power and LED indicators on the front panel. Go to “Front View” section on page 4 for the location and description of the LED behaviour.
2. Make sure that the ventilation slots on the rear panel are not blocked.
3. Make sure that there is no point of contact in the system that can cause a power short.

If the cause of the failure is still can not be determined, perform the “System Internal Inspection” procedure described on the next page.

System Internal Inspection

1. Turn off the power to the computer and all peripherals.
2. Unplug the power cord from the computer.
3. Unplug the network cable and all connected peripheral devices from the computer.
4. Place the computer on a flat, steady surface.
5. Remove the side panel as described in page 26.
6. Verify that the processor, memory module(s), and expansion board(s) are properly seated.
7. Verify that all power and data cables are firmly and properly attached to the installed drives.
8. Verify that all cable connections inside the system are firmly and properly attached to their appropriate mainboard connectors.
9. Verify that all components are Acer-qualified and supported.
10. Reinstall the side panel.
11. Power on the system.

If the cause of the failure is still can not be determined, review the POST messages and BIOS checkpoints during the system startup.

Checkpoints

A checkpoint is either a byte or word value output to I/O port 80h. The BIOS outputs checkpoints during bootblock and Power-On Self Test (POST) to indicate the task the system is currently executing. Checkpoints are very useful in aiding software developers or technicians in debugging problems that occur during the pre-boot process.

Viewing BIOS Checkpoints

Viewing all checkpoints generated by the BIOS requires a checkpoint card, also referred to as a POST card or POST diagnostic card. These are ISA or PCI add-in cards that show the value of I/O port 80h on a LED display. Checkpoints may appear on the bottom right corner of the screen during POST. This display method is limited, since it only displays checkpoints that occur after the video card has been activated.

NOTE Please note that checkpoints may differ between different platforms based on system configuration. Checkpoints may change due to vendor requirements, system chipset or option ROMs from add-in PCI devices.

Boot Block Initialization Code Checkpoints

The boot block initialization code sets up the chipset, memory, and other components before system memory is available. The following table describes the type of checkpoints that may occur during the boot block initialization portion of the BIOS.

Checkpoint	Description
Before D1	Early chipset initialization is done. Early super I/O initialization is done including RTC and keyboard controller. NMI is disabled.
D1	Perform keyboard controller BAT test. Check if waking up from power management suspend state. Save power-on CPUID value in scratch CMOS.
D0	Go to flat mode with 4GB limit and GA20 enabled. Verify the bootblock checksum.
D2	Disable CACHE before memory detection. Execute full memory sizing module. Verify that flat mode is enabled.
D3	If memory sizing module not executed, start memory refresh and do memory sizing in bootblock code. Do additional chipset initialization. Re-enable CACHE. Verify that flat mode is enabled.

Checkpoint	Description
D4	Test base 512 KB memory. Adjust policies and cache first 8 MB. Set stack.
D5	Bootblock code is copied from ROM to lower system memory and control is given to it. BIOS now executes out of RAM.
D6	Both key sequence and OEM specific method is checked to determine if BIOS recovery is forced. Main BIOS checksum is tested. If BIOS recovery is necessary, control flows to checkpoint E0. See the "Boot Block Recovery Code Checkpoints" section for more information.
D7	Restore CPUID value back into register. The Bootblock Runtime interface module is moved to system memory and control is given to it. Determine whether to execute serial flash.
D8	The Runtime module is uncompressed into memory. CPUID information is stored in memory.
D9	Store the Uncompressed pointer for future use in PMM. Copying Main BIOS into memory. Leaves all RAM below 1 MB Read-Write including E000 and F000 shadow areas but closing SMRAM.
DA	Restore CPUID value back into register. Give control to BIOS POST (ExecutePOSTKernel). See the "POST Code Checkpoints" section for more information.

Boot Block Recovery Code Checkpoints

The boot block recovery code gets control when the BIOS determines that a BIOS recovery is required because the user has forced the update or the BIOS checksum is corrupt. Refer to "BIOS Recovery" section on page 75 for more information. The following table describes the type of checkpoints that may occur during the boot block recovery portion of the BIOS.

Checkpoint	Description
E0	Initialize the floppy controller in the super I/O. Some interrupt vectors are initialized. DMA controller is initialized. 8259 interrupt controller is initialized. L1 cache is enabled.
E9	Set up floppy controller and data. Attempt to read from floppy.
EA	Enable ATAPI hardware. Attempt to read from ARMD and ATAPI CDROM.
EB	Disable ATAPI hardware. Jump back to checkpoint E9.
EF	Read error occurred on media. Jump back to checkpoint EB.
E9 or EA	Determine information about root directory of recovery media.
F0	Search for pre-defined recovery file name in root directory.
F1	Recovery file not found.
F2	Start reading FAT table and analyze FAT to find the clusters occupied by the recovery file.
F3	Start reading the recovery file cluster by cluster.
F5	Disable L1 cache.
FA	Check the validity of the recovery file configuration to the current configuration of the flash part.
FB	Make flash write enabled through chipset and OEM specific method. Detect proper flash part. Verify that the found flash part size equals the recovery file size.
F4	The recovery file size does not equal the found flash part size.
FC	Erase the flash part.
FD	Program the flash part.
FF	The flash has been updated successfully. Make flash write disabled. Disable ATAPI hardware. Restore CPUID value back into register. Give control to F000 ROM at F000:FFF0h.

POST Code Checkpoints

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

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules. GPNV is initialized at this checkpoint.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See DIM Code Checkpoints section for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.
38	Initializes different devices through DIM. See DIM Code Checkpoints section for more information. USB controllers are initialized at this point.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.

Checkpoint	Description
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, ... etc.) successfully installed in the system and update the BDA, EBDA...etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory. Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
60	Initializes Num-Lock status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested. Check boot password if installed.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected.
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module. Display boot option popup menu.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

DIM Code Checkpoints

The Device Initialization Manager (DIM) gets control at various times during BIOS POST to initialize different system busses. The following table describes the main checkpoints where the DIM module is accessed.

Checkpoint	Description
2A	Initialize different buses and perform the following functions: Reset, Detect, and Disable (function 0); Static Device Initialization (function 1); Boot Output Device Initialization (function 2). Function 0 disables all device nodes, PCI devices, and PnP ISA cards. It also assigns PCI bus numbers. Function 1 initializes all static devices that include manual configured onboard peripherals, memory and I/O decode windows in PCI-PCI bridges, and noncompliant PCI devices. Static resources are also reserved. Function 2 searches for and initializes any PnP, PCI, or AGP video devices.
38	Initialize different buses and perform the following functions: Boot Input Device Initialization (function 3); IPL Device Initialization (function 4); General Device Initialization (function 5). Function 3 searches for and configures PCI input devices and detects if system has standard keyboard controller. Function 4 searches for and configures all PnP and PCI boot devices. Function 5 configures all onboard peripherals that are set to an automatic configuration and configures all remaining PnP and PCI devices.

POST Error Indicators

When a system error is detected during POST (Power On Self Test), the Setup utility will switch to diagnostic mode and will either:

- Displays a POST error message, or
- Emits a series of beep codes

POST Error Messages

POST error messages tell users what failure the system has detected. Some error messages could be related to a hardware device. Others may indicate a problem with a device configuration. In some cases an error message may include recommendations for troubleshooting or require that you press the **Enter** key to display recommendations. Follow the instructions on the screen. It is recommended that you correct the error before proceeding, even if the computer appears to boot successfully.

IMPORTANT If your system fails after you make changes in the Setup menus, reboot the computer, enter Setup again and load Setup defaults to correct the error.

Memory

Message	Description
Gate20 Error	The BIOS is unable to properly control the mainboard's Gate A20 function, which controls access of memory over 1 MB. This may indicate a problem with the mainboard.
Multi-Bit ECC Error	This message will only occur on systems using ECC enabled memory modules. ECC memory has the ability to correct single-bit errors that may occur from faulty memory modules. A multiple bit corruption of memory has occurred, and the ECC memory algorithm cannot correct it. This may indicate a defective memory module.
Parity Error	Fatal Memory Parity Error. System halts after displaying this message.
RAM R/W test failed	This message is displayed by the AMIBIOS8 when the RAM read/write test fails.
CMOS Memory Size Wrong	The base memory (memory below 1MB) size that is reported in the CMOS (offset 15h) mismatches with the actual size detected. This condition may occur when the hole is set at 512K base memory or when CMOS is corrupted.

Boot

Message	Description
Boot Failure...	This is a generic message indicating the BIOS could not boot from a particular device. This message is usually followed by other information concerning the device.
Invalid Boot Diskette	A diskette was found in the drive, but it is not configured as a bootable diskette.
Drive Not Ready	The BIOS was unable to access the drive because it indicated it was not ready for data transfer. This is often reported by drives when no media is present.
A: Drive Error	The BIOS attempted to configure the A: drive during POST, but was unable to properly configure the device. This may be due to a bad cable or faulty diskette drive.
B: Drive Error	The BIOS attempted to configure the B: drive during POST, but was unable to properly configure the device. This may be due to a bad cable or faulty diskette drive.
Insert BOOT diskette in A:	The BIOS attempted to boot from the A: drive, but could not find a proper boot diskette. Reboot and Select proper Boot device or Insert Boot Media in selected Boot device BIOS could not find a bootable device in the system and/or removable media drive does not contain media.
Reboot and select proper boot device or Insert boot media in selected boot device	BIOS could not find a bootable device in the system and/or removable media drive does not contain media.
NO ROM BASIC	This message occurs on some systems when no bootable device can be detected.

Storage Device

Message	Description
Primary Master Hard Disk Error	The IDE/ATAPI device configured as Primary Master could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Primary Slave Hard Disk Error	The IDE/ATAPI device configured as Primary Slave could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Secondary Master Hard Disk Error	The IDE/ATAPI device configured as Secondary Master could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Secondary Slave Hard Disk Error	The IDE/ATAPI device configured as Secondary Slave could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
3rd Master Hard Disk Error	The IDE/ATAPI device configured as Master in the 3rd IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
3rd Slave Hard Disk Error	The IDE/ATAPI device configured as Slave in the 3rd IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
4th Master Hard Disk Error	The IDE/ATAPI device configured as Master in the 4th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
4th Slave Hard Disk Error	The IDE/ATAPI device configured as Slave in the 4th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
5th Master Hard Disk Error	The IDE/ATAPI device configured as Master in the 5th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
5th Slave Hard Disk Error	The IDE/ATAPI device configured as Slave in the 5th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
6th Master Hard Disk Error	The IDE/ATAPI device configured as Master in the 6th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
6th Slave Hard Disk Error	The IDE/ATAPI device configured as Slave in the 6th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Primary Master Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Primary Master failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Primary Slave Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Primary Slave failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Secondary Master Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Secondary Master failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Secondary Slave Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Secondary Slave failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
3rd Master Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Master in the 3rd IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.

Message	Description
3rd Slave Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Slave in the 3rd IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
4th Master Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Master in the 4th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
4th Slave Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Slave in the 4th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
5th Master Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Master in the 5th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
5th Slave Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Slave in the 5th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
6th Master Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Master in the 6th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
6th Slave Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Slave in the 6th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
S.M.A.R.T. Capable but Command Failed	The BIOS tried to send a S.M.A.R.T. message to a hard disk, but the command transaction failed. This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk.
S.M.A.R.T. Command Failed	The BIOS tried to send a S.M.A.R.T. message to a hard disk, but the command transaction failed. This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk.
S.M.A.R.T. Status BAD, Backup and Replace	A S.M.A.R.T. capable hard disk sends this message when it detects an imminent failure. This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk.
S.M.A.R.T. Capable and Status BAD	A S.M.A.R.T. capable hard disk sends this message when it detects an imminent failure. This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk.

Virus-related

Message	Description
BootSector Write!!	The BIOS has detected software attempting to write to a drive's boot sector. This is flagged as possible virus activity. This message will only be displayed if Virus Detection is enabled in AMIBIOS setup.
VIRUS: Continue (Y/N)?	If the BIOS detects possible virus activity, it will prompt the user. This message will only be displayed if Virus Detection is enabled in AMIBIOS setup.

System Configuration

Message	Description
DMA-1 Error	Error initializing primary DMA controller. This is a fatal error, often indication a problem with system hardware.
DMA-2 Error	Error initializing secondary DMA controller. This is a fatal error, often indication a problem with system hardware.
DMA Controller Error	POST error while trying to initialize the DMA controller. This is a fatal error, often indication a problem with system hardware.
Checking NVRAM... Update Failed	BIOS could not write to the NVRAM block. This message appears when the FLASH part is write-protected or if there is no FLASH part (System uses a PROM or EPROM).
Microcode Error	BIOS could not find or load the CPU Microcode Update to the CPU. This message only applies to INTEL CPUs. The message is most likely to appear when a brand new CPU is installed in a mainboard with an outdated BIOS. In this case, the BIOS must be updated to include the Microcode Update for the new CPU.
NVRAM Checksum Bad, NVRAM Cleared	There was an error in while validating the NVRAM data. This causes POST to clear the NVRAM data.
Resource Conflict	More than one system device is trying to use the same non-shareable resources (Memory or I/O).
NVRAM Ignored	The NVRAM data used to store Plug'n'Play (PnP) data was not used for system configuration in POST.
NVRAM Bad	The NVRAM data used to store Plug'n'Play (PnP) data was not used for system configuration in POST due to a data error.
Static Resource Conflict	Two or more Static Devices are trying to use the same resource space (usually Memory or I/O).
PCI I/O conflict	A PCI adapter generated an I/O resource conflict when configured by BIOS POST.
PCI ROM conflict	A PCI adapter generated an I/O resource conflict when configured by BIOS POST.
PCI IRQ conflict	A PCI adapter generated an I/O resource conflict when configured by BIOS POST.
PCI IRQ routing table error	BIOS POST (DIM code) found a PCI device in the system but was unable to figure out how to route an IRQ to the device. Usually this error is causing by an incomplete description of the PCI Interrupt Routing of the system.
Timer Error	Indicates an error while programming the count register of channel 2 of the 8254 timer. This may indicate a problem with system hardware.
Refresh timer test failed	BIOS POST found that the refresh timer hardware failed to pass the Refresh Retrace Test.
Interrupt Controller-1 error	BIOS POST could not initialize the Master Interrupt Controller. This may indicate a problem with system hardware.
Interrupt Controller-2 error	BIOS POST could not initialize the Slave Interrupt Controller. This may indicate a problem with system hardware.

CMOS

Message Displayed	Description
CMOS Date/Time Not Set	The CMOS date and/or time are invalid. This error can be resolved by readjusting the system time in AMIBIOS Setup.
CMOS Battery Low	CMOS battery is low. This message usually indicates that the CMOS battery needs to be replaced. It could also appear when the user intentionally discharges the CMOS battery.
CMOS Settings Wrong	CMOS settings are invalid. This error can be resolved by using AMIBIOS Setup.
CMOS Checksum Bad	CMOS contents failed the Checksum check. Indicates that the CMOS data has been changed by a program other than the BIOS or that the CMOS is not retaining its data due to malfunction. This error can typically be resolved by using AMIBIOS Setup.

Miscellaneous

Message Displayed	Description
KBC BAT Test failed	Keyboard controller BAT test failed. This may indicate a problem with keyboard controller initialization.
Keyboard Error	Keyboard is not present or the hardware is not responding when the keyboard controller is initialized.
PS/2 Keyboard not found	PS/2 keyboard support is enabled in the BIOS setup but the device is not detected.
PS/2 Mouse not found	PS/2 mouse support is enabled in the BIOS setup but the device is not detected.
Keyboard/Interface Error	Keyboard controller failure. This may indicate a problem with system hardware.
Unlock Keyboard	PS/2 keyboard is locked. User needs to unlock the keyboard to continue the BIOS POST.
System Halted	The system has been halted. A reset or power cycle is required to reboot the machine. This message appears after a fatal error has been detected.
<INS> Pressed	Indicates that <INS> key is pressed during the BIOS POST. The POST will load and use default CMOS settings.
Password check failed	The password entered does not match the password set in the setup. This condition may occur for both Supervisor and User password verification.
Unknown BIOS error. Error code = 004Ah	This message is displayed when ADM module is not present in the AMIBIOS8 ROM.
Unknown BIOS error. Error code = 004Bh	This message is displayed when language module is not present in the AMIBIOS8 ROM.
Floppy Controller Failure	Error in initializing legacy Floppy Controller.

Index of Symptom-to-FRU Error Messages

To use the information in this section to diagnose a problem:

1. Find the error symptom in the left column.
2. If directed to a check procedure, replace the FRU indicated in the check procedure.

If no check procedure is indicated, the first Action/FRU item listed in the right column is the most likely cause.

NOTE If you cannot find a symptom or an error in this list and the problem remains, see “Undetermined Problems” on page 65.

Processor/Processor Fan-related Symptoms

Symptom/Error	Action/FRU
Processor fan does not run but power supply fan runs.	<ul style="list-style-type: none">• Ensure the system is not in power saving mode.• With the system powered on, measure the voltage of the processor fan connector. Its reading should be +12Vdc. If the reading shows normal, but the fan still does not work, then replace the heat sink fan.• Mainboard
Processor test failed.	<ul style="list-style-type: none">• Processor• Mainboard

NOTE Normally, the processor fan should be operative, and the processor clock setting should be exactly set to match its speed requirement before diagnosing any processor problems.

Mainboard and Memory-related Symptoms

Symptom/Error	Action/FRU
Memory test failed.	<ul style="list-style-type: none">• Memory module• Mainboard
Incorrect memory size shown or repeated during POST.	<ul style="list-style-type: none">• Insert the memory modules in the DIMM sockets properly, then reboot the system.• Memory module• Mainboard
System works but fails to enter power saving mode when the Power Management Mode is set to Enabled.	<ul style="list-style-type: none">• Enter CMOS Setup and load the default settings. In Windows systems, check settings in Power Management Property of the Control Panel.• Reload software from Recovery CD.
Blinking cursor only; system does not work.	<ul style="list-style-type: none">• IDE drive connection/cables• IDE disk drives• See “Undetermined Problems”.• Mainboard

NOTE Ensure the memory modules are installed properly and the contact leads are clean before diagnosing any system problems.

Hard Disk Drive-related Symptoms

Symptom/Error	Action/FRU
Hard disk drive test failed.	<ul style="list-style-type: none"> • Enter CMOS Setup and load the default settings. • Hard disk drive cable • Hard disk drive • Mainboard
Hard disk drive cannot format completely.	<ul style="list-style-type: none"> • Enter CMOS Setup and load the default settings. • Hard disk drive cable • Hard disk drive • Mainboard
Hard disk drive has write error.	<ul style="list-style-type: none"> • Enter CMOS Setup and load the default settings. • Hard disk drive
Hard disk drive LED fails to light, but system operates normally.	<ul style="list-style-type: none"> • With the system power on, measure the voltage of the HDD LED connector. • HDD LED cable

NOTE Make sure the hard disk drive is configured correctly in CMOS Setup and that cable/jumper are set correctly before diagnosing any hard disk drive problems. (If only one drive is installed, please make sure the drive is connected to master connector or the drive is set to master.)

Optical Disc Drive-related Symptoms

Symptom/Error	Action/FRU
CD/DVD-ROM drive LED doesn't come on but works normally.	<ul style="list-style-type: none"> • Enter CMOS Setup and load the default settings. • DIMM • Mainboard
CD/DVD-ROM drive LED flashes for more than 30 seconds before LED shutting off. Software asks to reinstall disc. Software displays a reading CD/DVD error.	<ul style="list-style-type: none"> • CD/DVD-ROM may have dirt or foreign material on it. Check with a known good disc. • CD/DVD-ROM is not inserted properly. • CD/DVD-ROM is damaged.
CD/DVD-ROM drive cannot load or eject when the system is turned on and its eject button is pressed and held.	<ul style="list-style-type: none"> • Disconnect all cables from CD/DVD-ROM drive except power cable, then press the eject button to try to unload the disc. • CD/DVD-ROM drive power cable • CD/DVD-ROM drive
CD/DVD-ROM drive does not read and there are no messages are displayed.	<ul style="list-style-type: none"> • CD may have dirt or foreign material on it. Check with a known good disc. • Ensure the CD/DVD-ROM driver is installed properly. • CD/DVD-ROM drive.
CD/DVD-ROM drive can play audio CD but no sound output.	<ul style="list-style-type: none"> • Ensure the headphone jack of the CD/DVD-ROM has an output. • Turn up the sound volume. • Speaker power/connection/cable. • CD/DVD-ROM drive.

NOTE Make sure the optical disc drive is configured correctly in CMOS Setup, the cable/jumper are set correctly and the drive's optical lens is clean before diagnosing any optical drive problems.

Real-Time Clock-related Symptoms

Symptom/Error	Action/FRU
Real-time clock is inaccurate.	<ul style="list-style-type: none">• Ensure the information in the Standard CMOS Feature of BIOS Setup is set correctly.• RTC battery• Mainboard

Audio-related Symptoms

Symptom/Error	Action/FRU
Audio software program invoked but no sound comes from speakers.	<ul style="list-style-type: none">• Speaker power/connection/cable

Modem-related Symptoms

Symptom/Error	Action/FRU
Modem ring cannot wake up system from suspend mode.	<ul style="list-style-type: none">• For an external modem, make sure Power on By Ring in BIOS Setup or Power Management is set to Enabled. For the PCI modem, make sure Wake up by PCI card is set to Enabled.• If a PCI modem card is used, reinsert the modem card to the PCI slot firmly or replace the modem card.• In Win 98, ensure the telephone application is configured correctly for your modem and set to receive messages and/or fax.
Data/fax modem software program invoked but cannot receive/send data/fax	<ul style="list-style-type: none">• Ensure the modem card is installed properly.
Fax/voice modem software program invoked but has no sound output. (Data files are received normally; voice from modem cannot be produced, but system sound feature works normally.)	<ul style="list-style-type: none">• Ensure the modem voice-in cable from modem adapter card is connected to the mainboard

Video and Monitor-related Symptoms

Symptom/Error	Action/FRU
Video memory test failed.Video adapter failed.	<ul style="list-style-type: none">• Remove all non-factory-installed cards.• Load default settings (if screen is readable).• Mainboard
Display problem <ul style="list-style-type: none">• Incorrect colors• No high intensity• Missing, broken, or incorrect characters• Blank monitor (dark)• Blank monitor (bright)• Distorted image• Unreadable monitor	<ul style="list-style-type: none">• Monitor signal connection/cable• Monitor• Video adapter card• Mainboard

Video and Monitor-related Symptoms

Symptom/Error	Action/FRU
Display changing colors.	<ul style="list-style-type: none">• Monitor signal connection/cable• Video adapter card• Mainboard

Printer-related Symptoms

Symptom/Error	Action/FRU
Printing failed.	<ul style="list-style-type: none">• Ensure the printer driver is properly installed. Refer to the printer service manual.• Printer• Printer cable• Mainboard.
Printer problems.	<ul style="list-style-type: none">• Refer to the service manual for the printer.

Keyboard-related Symptoms

Symptom/Error	Action/FRU
Some or all keys on keyboard do not work.	<ul style="list-style-type: none">• Keyboard

Power Supply-related Symptoms

Symptom/Error	Action/FRU
Pressing the power button does not turn off the system. (Only unplugging the power cord from electrical outlet can turn off the system.)	<ul style="list-style-type: none">• Ensure the Soft-off by PWR-BTTN in CMOS Setup (under Power Management) is not set to Instant-off.• Power switch cable assembly
Pressing the power button does not turn on the system	<ul style="list-style-type: none">• Ensure the power override switch (located at the back of the computer, just above the connector for the power cable) is not set to OFF.• Power switch cable assembly.
Executing software shutdown from Windows98 Start menu does not turn off the system. (Only pressing power button can turn off the system).	<ul style="list-style-type: none">• Enter CMOS Setup and load the default settings.• Reload software from Recovery CD.
No system power, or power supply fan is not running.	<ul style="list-style-type: none">• Power supply• Mainboard

Beep Codes

When no error message is displayed but the computer stops during POST, listen for beep codes.

Beep	Status	Possible Causes
One short beep.	System ready	System is OK.
Continuous one long beep	Memory not installed or memory error	<ul style="list-style-type: none">• Something is wrong with the memory installed• There is problem accessing the memory (i.e., mainboard problem)
One long beep, then two short beeps and repeat	VGA not installed or VGA error	<ul style="list-style-type: none">• The mainboard can not access the video card for some reasons. Either the video card is not working, its memory is not accessible, or its BIOS may be corrupt.• Something is wrong with the mainboard.
One long beep, then one short beep	BIOS failure	BIOS damaged. Processor jump to boot block to execute the default procedure.
Two short beeps.	CMOS failure	CMOS checksum error

Undetermined Problems

- NOTE**
- Verify that all attached devices are supported by the computer.
 - Verify that the power supply being used at the time of the failure is operating correctly. (See “Power System Check” on page 57)

Follow the procedures below to isolate the failing FRU. Do not isolate non-defective FRU.

1. Power off the computer.
2. Visually check them for damage. If any problems are found, replace the FRU.
3. Remove or disconnect all of the following devices:
 - Non-Acer devices
 - Printer, mouse, and other external devices
 - Hard disk drive
 - DIMM
 - CD/DVD-ROM drive
 - Expansion boards
4. Power on the computer.
5. Determine if the problem has been resolved.
6. If the problem does not recur, reconnect the removed devices one at a time until you find the failed FRU.

If the problem persists, replace the mainboard, and then LCD assembly (one at a time). Do not replace a non-defective FRU.

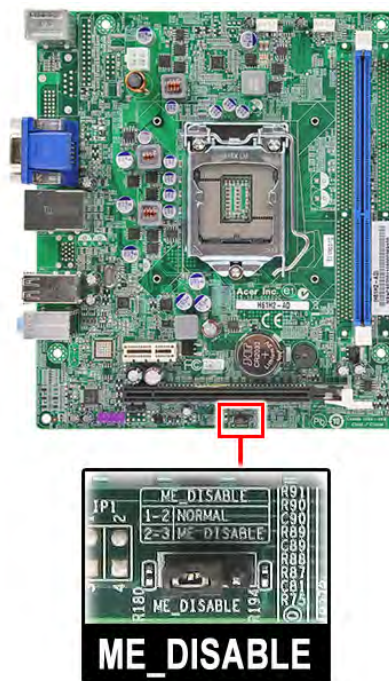
Configuring the ME Firmware

You need to disable the Manageability Engine (ME) firmware before updating the BIOS. Use the ME_DISABLE jumper to do this.

- 1-2 position: Normal operation (default)
- 2-3 position: ME disable

To disable the ME firmware:

1. Turn off the power to the computer and all peripherals.
2. Unplug the power cord from the computer.
3. Unplug the network cable and all connected peripheral devices from the computer.
4. Place the computer on a flat, steady surface with the rear cover facing upward.
5. Remove the computer cover by following the procedures described on page 26.
6. Remove the graphics card by following the procedure described on page 34.
7. If necessary, remove any other assemblies or cables that prevent access to the ME_DISABLE jumper.
8. Locate the ME_DISABLE jumper on the mainboard.



9. Remove the jumper block and set it over the 2-3 pins for 20 to 30 seconds.
10. Return the jumper block to its default 1-2 position.
11. Reinstall the graphics card.
12. Reinstall any any other assemblies or cables that have previously been removed.
13. Reinstall the computer cover.
14. Connect the power cord to the system.
15. Press the power button to turn on the computer.
16. During POST, press **Delete** to access the Setup Utility.
17. Press **F9** to load the system default values.
18. Press **F10** to save the changes you made and close the Setup Utility.

Clearing CMOS

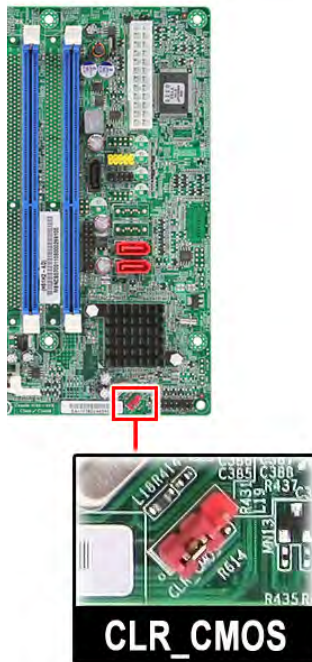
You may need to clear the Setup configuration values (CMOS) if the configuration has been corrupted, or if incorrect settings made in the Setup Utility caused error messages to be unreadable. This procedure will clear the BIOS supervisor password as well.

Use the CLR_CMOS jumper to clear the CMOS data.

- 1-2 position: Normal operation (default)
- 2-3 position: Clear CMOS data

To clear the CMOS data:

1. Turn off the power to the computer and all peripherals.
2. Unplug the power cord from the computer.
3. Unplug the network cable and all connected peripheral devices from the computer.
4. Place the computer on a flat, steady surface with the rear cover facing upward.
5. Remove the computer cover by following the procedures described on page 26.
6. Remove the graphics card by following the procedure described on page 34.
7. If necessary, remove any other assemblies or cables that prevent access to the CLR_CMOS jumper.
8. Locate the CLR_CMOS jumper on the mainboard.



9. Remove the jumper block and set it over the 2-3 pins for 20 to 30 seconds.
10. Return the jumper block to its default 1-2 position.
11. Reinstall the graphics card.
12. Reinstall any other assemblies or cables that have previously been removed.
13. Reinstall the computer cover.
14. Connect the power cord to the system.
15. Press the power button to turn on the computer.
16. During POST, press **Delete** to access the Setup Utility.
17. Press **F9** to load the system default values.
18. Press **F10** to save the changes you made and close the Setup Utility.

BIOS Recovery

When you boot up the computer and you hear one long beep, followed by a shorter one, the system BIOS is damaged. This may be caused by an interruption during a BIOS flash procedure (e.g. a power outage) or a corrupted BIOS code, which will cause the system to go into an unbootable state. You need to access and execute the boot block program to reboot the computer and recover the regular BIOS code.

Note the following when restoring the BIOS settings:

- Make sure the computer is connected to a UPS unit during the BIOS recovery process.
- The BIOS crisis recovery disk should be prepared in a computer running the Windows XP or Windows Vista OS. A USB floppy, optical, or hard drive can be used.

Creating the BIOS Crisis Recovery Disk

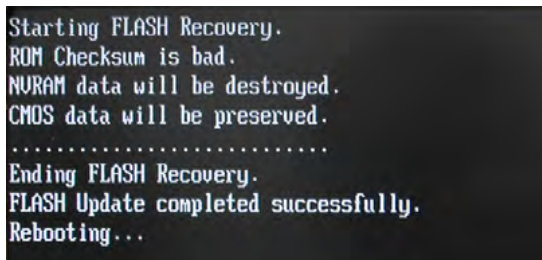
1. Set up a computer running the Windows XP or Windows Vista operating system and connect the BIOS recovery media.
2. Copy the target BIOS ROM file to the BIOS recovery media and rename it as "amiboot.rom".
3. Eject the BIOS recovery media from the computer.

Performing a BIOS Recovery

NOTE This procedure is only applicable when the boot block section is still valid.

1. Shut down the BIOS failed-computer.
2. Connect the BIOS recovery media to the failed computer.
3. Press the power button to turn on the computer.

The system will now execute the BIOS recovery process. When the process is complete, the computer will automatically reboot.

A screenshot of a BIOS recovery process displayed on a black background with white text. The text reads: "Starting FLASH Recovery.", "ROM Checksum is bad.", "NVRAM data will be destroyed.", "CMOS data will be preserved.", followed by a line of dots ".....", then "Ending FLASH Recovery.", "FLASH Update completed successfully.", and "Rebooting...".

```
Starting FLASH Recovery.  
ROM Checksum is bad.  
NVRAM data will be destroyed.  
CMOS data will be preserved.  
.....  
Ending FLASH Recovery.  
FLASH Update completed successfully.  
Rebooting...
```

4. Eject the BIOS recovery media from the computer
5. Press **Delete** to run the CMOS Setup Utility.
6. Press **F9** to load the system default settings.
7. Select **Ok**, then press **Enter**.
8. Press **F10** to save the default settings and close the Setup utility.
9. Select **Ok**, then press **Enter**.

BIOS Update

Updating the BIOS in DOS Mode

1. Press the power button to turn on the computer and boot to DOS mode.
2. Key in 'cd dostool'. (Go to BIOS path like "A:\DOSTOOL")
3. Key in 'flash2M.bat' or 'flash2M'.

```
A:\>cd d01
A:\D01>cd dostool
A:\D01\DOSTOOL>flash2m_
```

4. Press **Enter** to flash the system BIOS.

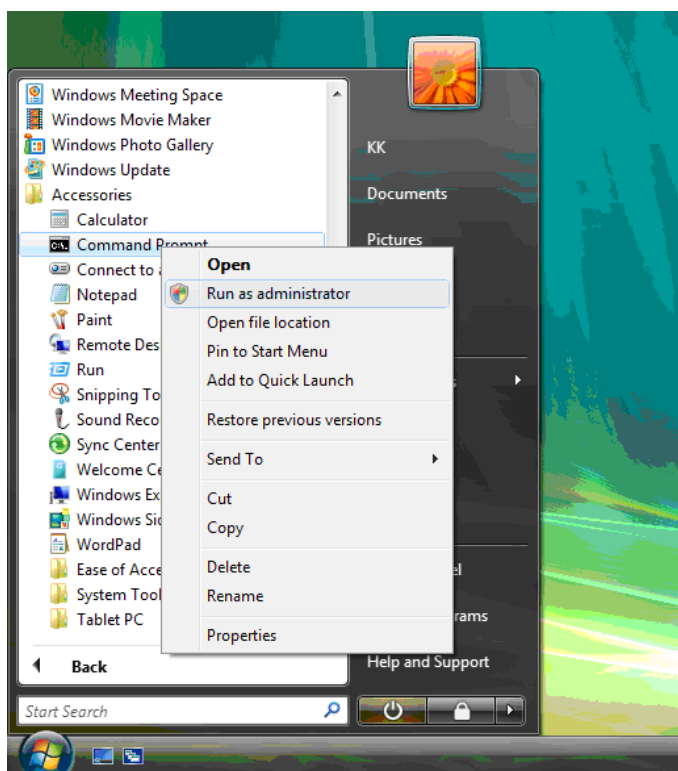
```
A:\>cd d01
A:\D01>cd dostool
A:\D01\DOSTOOL>flash2m
A:\D01\DOSTOOL>afudos ..\ROM\D01.2M /p /b /n /r
+-----+
|                AMI Firmware Update Utility(APTIO)  v2.31                |
|                Copyright (C)2009 American Megatrends Inc. All Rights Reserved. |
+-----+
Reading file ..... done
FFS checksums ..... ok
Erasing flash ..... done
Writing flash ..... done
Verifying flash ..... done
Erasing NVRAM ..... done
Writing NVRAM ..... done
Verifying NVRAM ..... done
Erasing BootBlock .... done
Writing BootBlock .... done
Verifying BootBlock ... done
A:\D01\DOSTOOL>
```

5. Reboot the computer.
6. Press **Delete** to run the CMOS Setup Utility.
7. Press **F9** to load the system default settings.
8. Select **Ok**, then press **Enter**.
9. Press **F9** to save the default settings and close the Setup utility.
10. Select **Ok**, then press **Enter**.

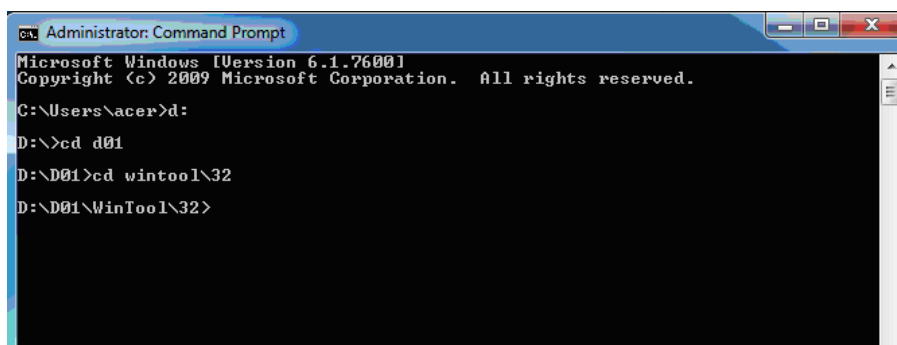
Updating the BIOS in Windows Mode

This BIOS updating procedure is for a computer running a 32- or 64-bit Windows OS.

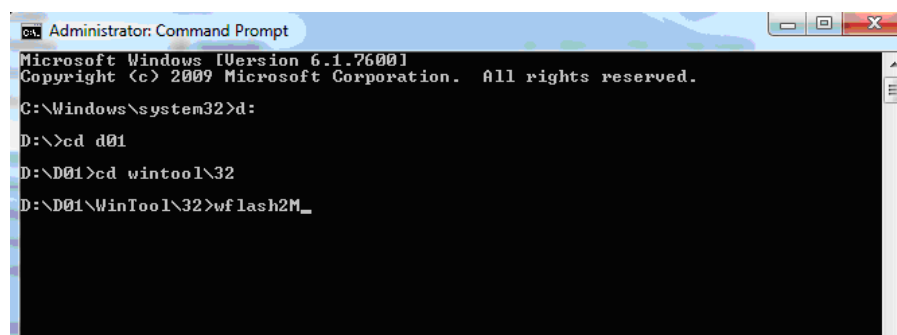
1. Press the power button to turn on the computer.
2. Click **Start | Command Prompt | Run as administrator**.



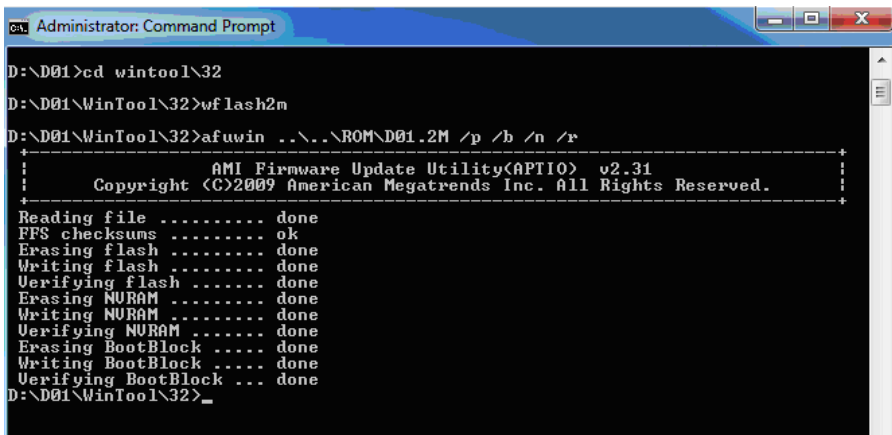
3. Perform the steps below if your computer is running 32-bit Windows.
 - a. Key in 'cd wintool\32'. (Go to BIOS path like "D:\WinTool\32")



- b. Key in 'wflash2M.bat' or 'wflash2M'.

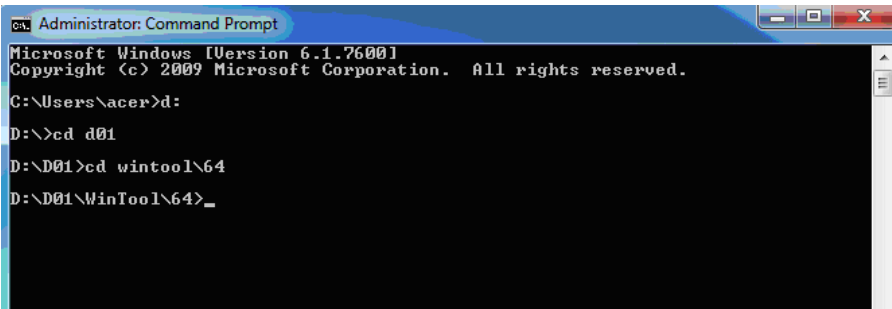


- c. Press **Enter** to flash the system BIOS.



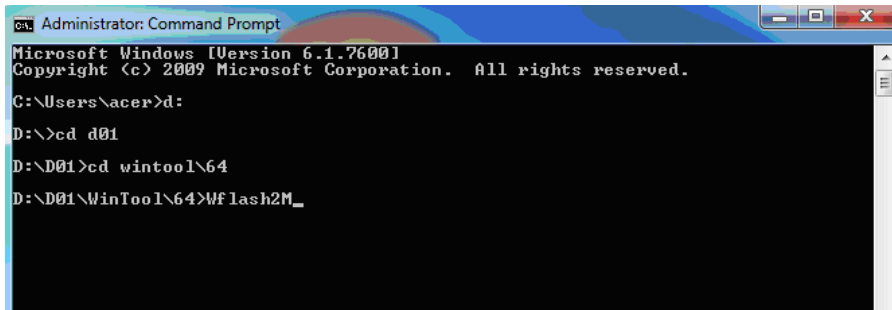
```
Administrator: Command Prompt
D:\D01>cd wintool\32
D:\D01\WinTool\32>wf lash2m
D:\D01\WinTool\32>afuwin ..\..\ROM\D01.2M /p /b /n /r
+-----+
|          AMI Firmware Update Utility(APTIO) v2.31          |
| Copyright (C)2009 American Megatrends Inc. All Rights Reserved. |
+-----+
Reading file ..... done
FFS checksums ..... ok
Erasing flash ..... done
Writing flash ..... done
Verifying flash ..... done
Erasing NURAM ..... done
Writing NURAM ..... done
Verifying NURAM ..... done
Erasing BootBlock ..... done
Writing BootBlock ..... done
Verifying BootBlock ... done
D:\D01\WinTool\32>_
```

4. Perform the steps below if your computer is running 64-bit Windows.
a. Key in 'cd wintool\64'. (Go to BIOS path like "D:\WinTool\64")



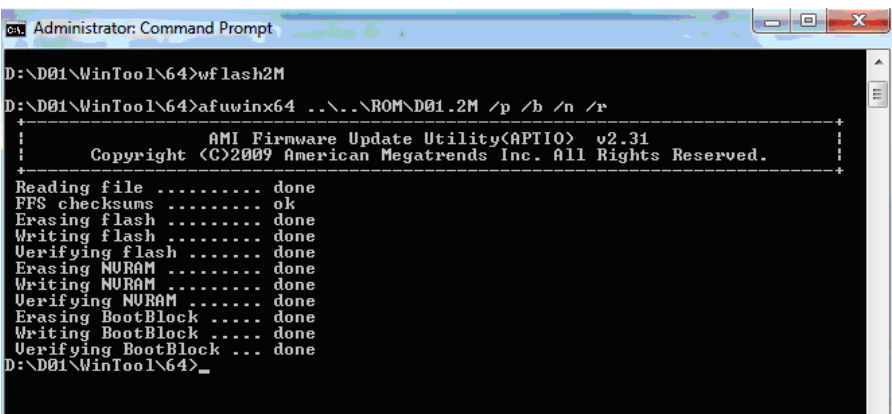
```
Administrator: Command Prompt
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Users\acer>d:
D:\>cd d01
D:\D01>cd wintool\64
D:\D01\WinTool\64>_
```

- b. Key in 'flash2M.bat' or 'flash2M'.



```
Administrator: Command Prompt
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Users\acer>d:
D:\>cd d01
D:\D01>cd wintool\64
D:\D01\WinTool\64>Wflash2M_
```

- c. Press **Enter** to flash the system BIOS.



```
Administrator: Command Prompt
D:\D01\WinTool\64>wf lash2M
D:\D01\WinTool\64>afuwinx64 ..\..\ROM\D01.2M /p /b /n /r
+-----+
|          AMI Firmware Update Utility(APTIO) v2.31          |
| Copyright (C)2009 American Megatrends Inc. All Rights Reserved. |
+-----+
Reading file ..... done
FFS checksums ..... ok
Erasing flash ..... done
Writing flash ..... done
Verifying flash ..... done
Erasing NURAM ..... done
Writing NURAM ..... done
Verifying NURAM ..... done
Erasing BootBlock ..... done
Writing BootBlock ..... done
Verifying BootBlock ... done
D:\D01\WinTool\64>_
```

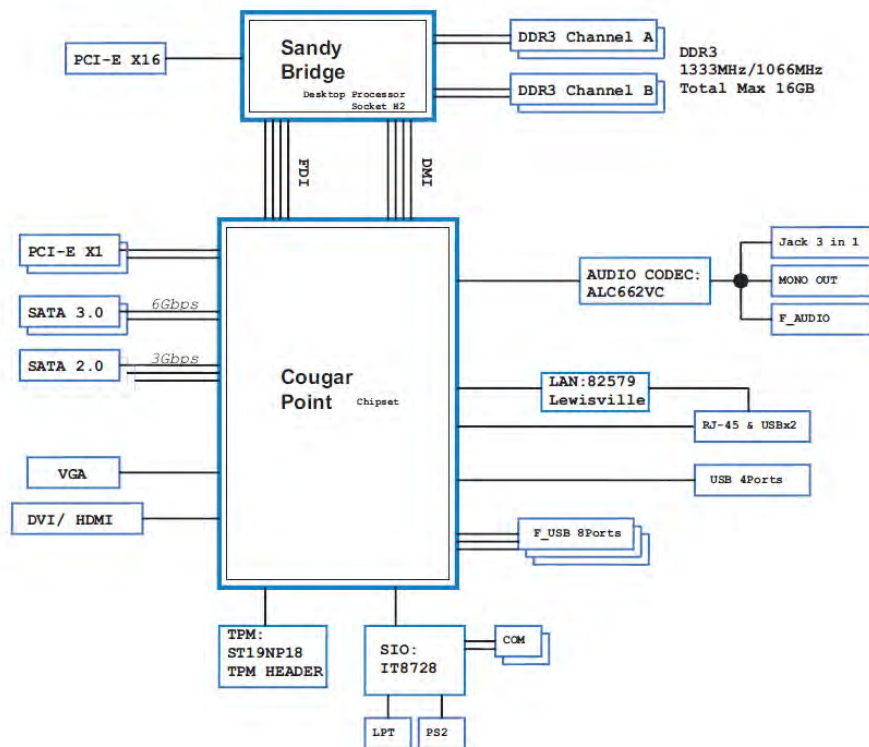
-
5. Reboot the computer.
 6. Press **Delete** to run the CMOS Setup Utility.
 7. Press **F9** to load the system default settings.
 8. Select **Ok**, then press **Enter**.
 9. Press **F9** to save the default settings and close the Setup utility.
 10. Select **Ok**, then press **Enter**.

System Architecture

This chapter shows the system block diagram and board layout.

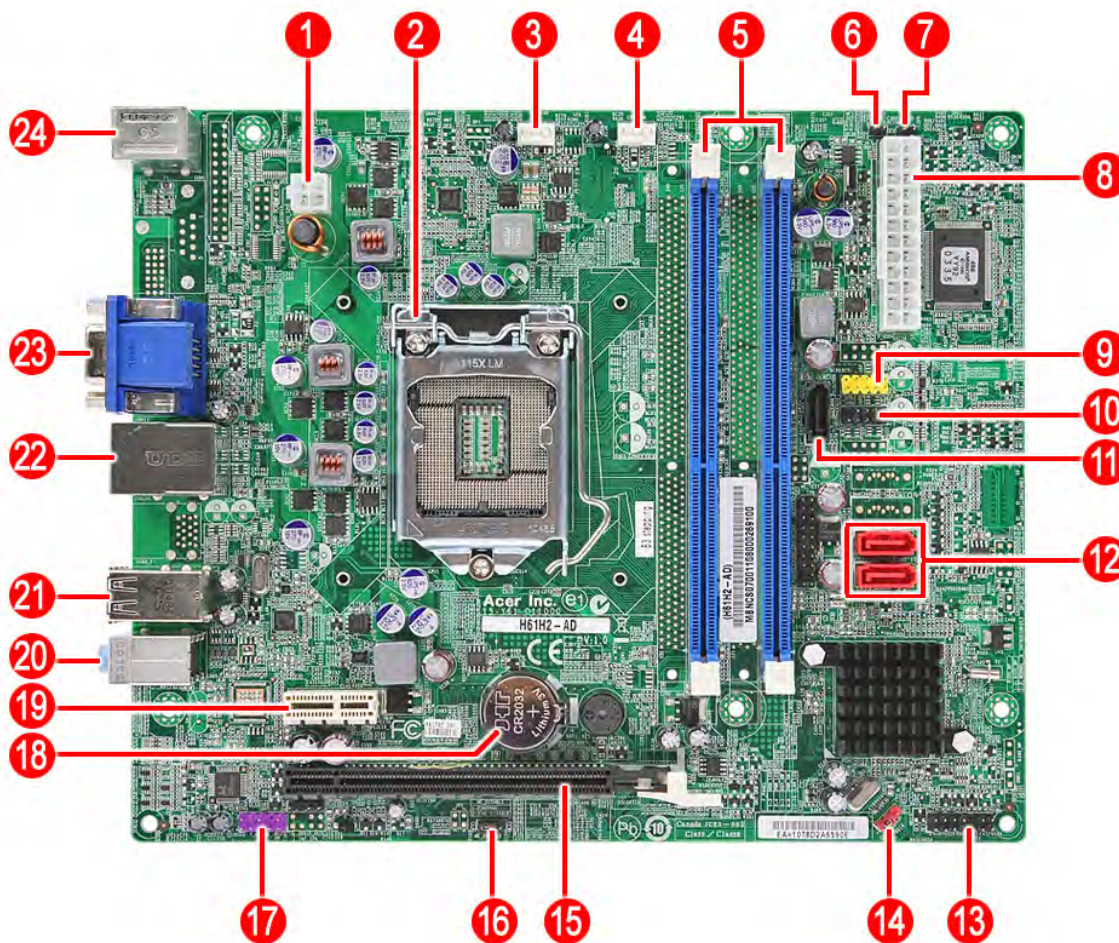
Block Diagram

The core subsystems of the computer are depicted in the following block diagram.



Mainboard Layout

This section shows the major mainboard components.



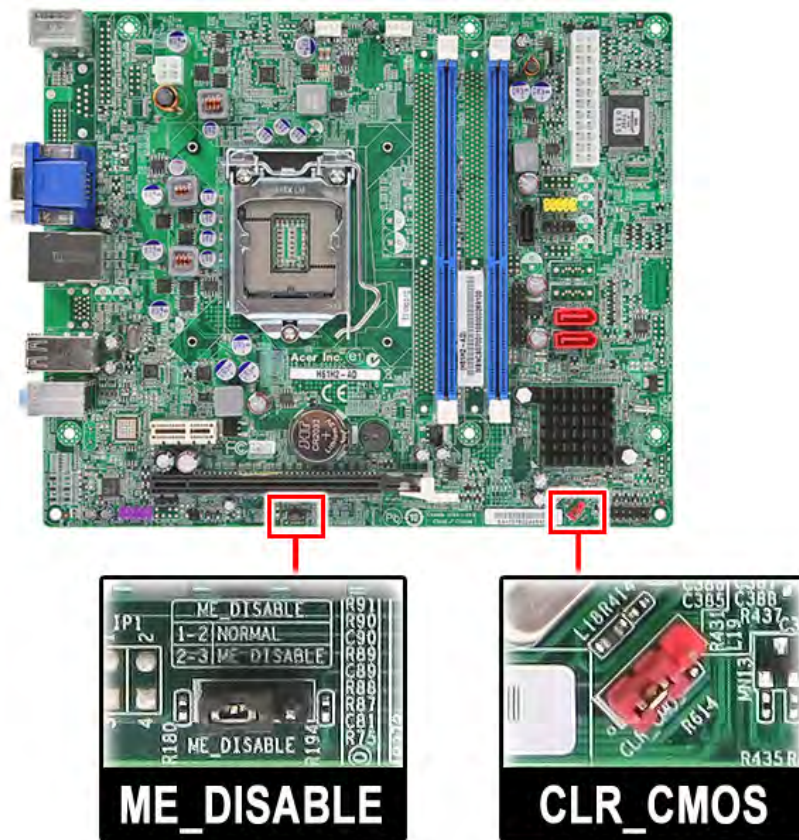
No.	Label	Description	No.	Label	Description
1	ATX_12V	ATX 4-pin connector	13	F_PANEL	Power button/LED cable connector
2	CPU	Processor socket	14	CLR_CMOS	Clear CMOS jumper
3	SYS_FAN	System fan connector	15	PCIE16X	PCI Express 2.0 Gen 2 x16 expansion slot
4	CPU_FAN	CPU cooling fan connector	16	ME_DISABLE	ME disable jumper
5	DIMM1-2	DDR3 240-pin slots	17	F_AUDIO	Front panel audio jack header
6	GPIO1	General Purpose I/O Signal 1	18	BAT1	Battery
7	GPIO2	General Purpose I/O Signal 2	19	PCIE1X_1	PCI Express 2.0 Gen 2 x1 expansion slot
8	ATX_POWER	Standard 24-pin power connector	20	AUD/JACK	Line in/Line Out/MIC
9	F_USB 3	Front panel USB header (card reader)	21	USB	USB 2.0 ports
10	F_USB 2	Front panel USB header	22	USBLAN	RJ45 + USB ports
11	SATA5	Serial ATA connector	23	HDMI1/VGA	VGA + HDMI ports
12	SATA1-2	Serial ATA connectors	24	KB/MS	PS/2 keyboard + PS/2 mouse ports

Jumper Setting



This section explains how to set the jumper for correct configuration of the main board.

Jumpers with more than one pin are numbered. When setting a jumper, ensure that the jumper caps are placed on the correct pins.

The following illustration shows the location of the jumpers.



The following table shows the settings of the Clear CMOS and ME Disable jumper. Place the jumper cap on pins 1 and 2 to close or short the jumper. Place the jumper cap on pins 2 and 3 to open or clear the jumper.

Jumper	Type	Description	Setting (default)	
Clear CMOS	3-pin	Clear CMOS	1-2: Normal operation (default) 2-3: Clear CMOS data Before clearing the CMOS, make sure to turn off the system. See "Clearing CMOS" section on page 74 for detailed instruction.	
ME Disable	3-pin	Disable ME	1-2: Normal operation (default) 2-3: ME disable For more information on how to clear the CMOS data jumper configure the ME Disable jumper see "Configuring the ME Firmware" section on page 73.	

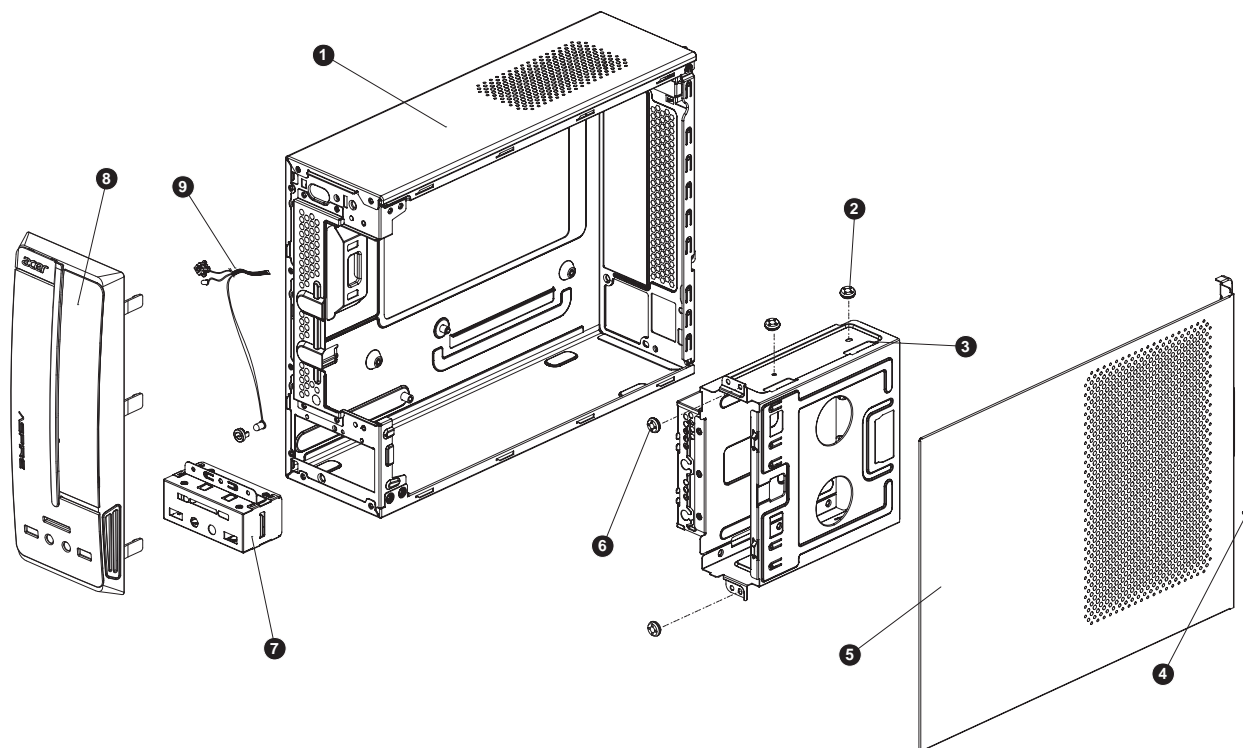
Field Replaceable Unit (FRU) List

This chapter gives you the FRU (Field Replaceable Unit) listing of the Aspire XC600 computer global configurations. Refer to this list when ordering for repair parts or for RMA (Return Merchandise Authorization).

IMPORTANT When ordering FRU parts, check the most up-to-date information available on your regional web or channel. For whatever reasons a part number is changed, it will NOT be noted on the printed Service Guide. For Acer authorized service providers, your Acer office may have a different part number code from those given in the FRU list of this printed Service Guide. You **MUST** use the local FRU list provided by your regional Acer office to order FRU parts for service.

NOTE Follow the local government regulations, or the rules set by your regional office on how to return or dispose of defective parts.







Exploded Diagram







No.	Description	Quantity
1	Lowercase assembly	1
2	Screw Pan, M3 L5	2
3	HDD-ODD bracket	1
4	Screw I #6-32 L5	2
5	Side cover	1
6	Screw Pan, M3 L5	2
7	Front I/O and card reader board bracket	1
8	Front cover assembly	1
9	LED module	1


Aspire XC600 FRU List

ACER_XC600_W_AELENAC(NO:81.3HW01.001G)

Category	Part Name	Description	Acer Part No.
	CARD READER BOARD	CARD READER L43CR002-R FOR DAA75L-VIC	55.SKQD1.001
	FRONT IO BOARD USB 2.0 2 USB PORT 2 AUDIO PORT W/O CARD READER	F-IO BOARD/2AUDIO JACK+ 2 USB CO	55.SKQD1.002
	WIRELESS LAN BOARD 802.11BGN 1X1 RALINK RT3090 LOW-PROFILE	WLAN 802.11BGN 1X1 RALINK RT3090 (LOW-PR	NI.10200.038
	VGA CARD 299-7N161-X03AC 505 512MB 64BITS DDR3 DVI-I + HDMI LP	PCP NV505 512MB DDR3 DVI-I/HDMI/VGA LP	VG.PCP50.502
	VGA CARD 288-AE153-X01AC HD7350 1GB DDR3 64BIT DVI-I + HDMI LP	PCP AMD HD7350 1GB DSUB/DVI/HDMI/LP	VG.PCP73.502
	VGA CARD 288-9E145-X03AC HD7470 2GB SDDR3 64BIT DVI-I + HDMI LP	PCP AMD HD7470 2GB DVI/HDMI LP	VG.PCP74.702
	CABLES POWER CORD 1800MM 250V CHINA	POWER CORD 250V CCC 1800MM PRC	27.01518.0K1
	ODD CABLE SATA	C.A. SATA ODD GTL ELENA	50.SFF01.003
	ODD CABLE SATA	C.A. SATA ODD VSO ELENA	50.SFF01.004
	HDD SATA CABLE	C.A. SATA HDD VSO APITBULL	50.SD101.002
	HDD SATA CABLE	C.A. SATA HDD GL APITBULL	50.SD101.002
	DVI TO VGA DONGLE CONNECTOR	DVI TO VGA DONGLE	D0.VGA26.P01
	CASE/COVER/ BRACKET ASSEMBLY CRT COVER	CVR CRT BOXER II	42.SF601.001
	HDMI DUMMY COVER	CRV HDMI COVER	42.SF601.002
	"ASSEMBLY MAIN-CHASSIS BLACK W/UPPER CASE,LOWER CASE,FRONT IO BRACKET,HDD&ODD BRACKET"	ASSY MAIN-CHASSIS AELENAC	60.SKQD1.001

Category	Part Name	Description	Acer Part No.
	UPPER CASE	ASSY UCASE AELENAC	60.SKQD1.002
	LOWER CASE	ASSY LCASE ASM AELENAC	60.SKQD1.003
	FRONT IO BRACKET	ASSY BRKT FRONT IO AELENAC	33.SKQD1.001
	HDD&ODD BRACKET	ASSY CAGE ODD HDD ASM AELENAC	33.SKQD1.002
	ASSEMBLY FRONT BEZEL SILVER W/LED SWITCH CABLE FOR CARD READER	ASSY MAIN BEZEL AELENAC HOT STAMPING	60.SKQD1.004
CPU/ PROCESSOR 	"CPU INTEL CORE I3 2120 LGA 3M 1333 1155 65W 3.3G, DUAL CORE"	IC CPU SANDY BRIDGE I3-2120 3MB 2C 3.3GH	KC.21201.CI3
	CPU INTEL CELERON G530 LGA 2.4G 2M 1066 1155 65W DUAL CORE	IC CPU CELERON G530 DC 2MB 2.4GHZ 65W LG	KC.53001.CDG
	CPU INTEL PENTIUM DUAL-CORE G630 LGA 2.7G 3M 1066 1155 65W	IC CPU INTEL PENTIUM DUAL-CORE G630 LGA	KC.63001.DEG
	CPU INTEL CELERON G460 LGA 1.7G 1.5M 1066 1155 35W	IC CPU INTEL CELERON G460 1.8G 1.5M	KC.G0001.460
DVD-RW DRIVE 	ODD PIONEER SUPER-MULTI DRIVE HH DL 16X DVR-219RS LF BLACK BEZEL SATA (WIN7+HF)	ODD DVD RW SATA 12.7 PIONEER DVR-219RS	KU.01605.007
	ODD PLDS SUPER-MULTI DRIVE HH DL 16X DH-16ACSH LF+HF BLACK BEZEL SATA (WIN7)	ODD SUPER-MULTI HH DL PLDS DH-16ACSH	KU.0160F.013
	ODD PIONEER DVD-ROM HH 16X DVD-231RS LF+HF BLACK BEZEL SATA (WIN7)	ODD DVD-ROM HH TL PIONEER DVR-231RS	KV.01605.007
	ODD PLDS DVD-ROM HH 16X DH-16D6SH LF+HF BLACK BEZEL SATA (WIN7)	ODD DVD-ROM HH PLDS DH-16D6SH	KV.0160F.006

Category	Part Name	Description	Acer Part No.
HDD/HARD DISK DRIVE 	"HDD 1TB 7200RPM 3.5" SEAGATE SATA3 ST31000524AS 6G 32MB"	"HDD 1TB3.5" S3 SEAGATE ST31000524AS 6G7.2"	KH.01K01.016
	"HDD HGST 3.5" 7200RPM 1000GB HDS721010DLE630(MARS) SATA III 32MB LF F/W:5R0"	"HDD1TB 3.5" HGST HDS721010DLE630 6G 7.2K"	KH.01K07.006
	"HDD WD 3.5" 5400RPM 1000GB WD10EARX- 22N0YB0(GP667,4K) SATA III 64MB LF F/W:51.0AB51"	"HDD 1TB 3.5" WD WD10EARX-22N0YB0 5.4K GP"	KH.01K08.020
	"HDD WD 3.5" 5400RPM 1500GB WD15EARX-22PASB0 SATA III 64MB LF F/ W:51.0AB51"	"HDD 1.5TB 3.5" WD WD15EARX-22PASB0 GP"	KH.15K08.004
	"HDD SEAGATE 3.5" 7200RPM 500GB ST3500413AS(PHARAOH 6G) SATA III 16MB LF F/W:JC45"	"HDD 500GB 3.5" S3 SGT ST3500413AS 6G 7.2K"	KH.50001.022
	"HDD WD 3.5" 7200RPM 500GB WD5000AAKX- 221CA1(XL500, 6G) SATA III 16MB LF F/W:17.01H17"	"HDD 500GB 3.5" S3 WD5000AAKX-221CA1 7200"	KH.50008.025
HEATSINK 	CPU HEATSINK AIR COOLER LGA1156 95W WITH DUCT	LGA1156 95W COOLER WITH DUCT	HI.10800.068
	CPU HEATSINK AIR COOLER LGA1156 95W COOLER CM	INTEL LGA1156 95W COOLER CM	HI.10800.071
KEYBOARD	KEYBOARD SUNREX JME- 8105P PS/2 STANDARD 104KS BLACK SIMPLIFIED CHINESE NEW ACER LOGO	KB SUNREX JME-8105P PS2 BLACK SIMPLIFIED	KB.PS20S.032
	KEYBOARD SUNREX JME- 8105U USB STANDARD 104KS BLACK SIMPLIFIED CHINESE NEW ACER LOGO	KB SUNREX JME-8105U USB BLACK SIMPLIFIED	KB.USB0S.031
MAINBOARD 	MB KIT A1600X INTEL H61 INTEL 82579V GBE PROPRIETARY W/O 1394 LF DDRIII 2 DIMM W/ EUP W/IO SHIELDING	MB KIT A1600X INTEL H61 INTEL 82579V GBE	DB.SKQCN.00 1
MEMORY 	MEMORY NANYA UNB-DIMM DDRIII 1333 1GB NT1GC64BH4B0PF-CG LF 128*16 0.055UM	DIMM 1G NT1GC64BH4B0PF-CG DDR3 UNB.	KN.1GB03.035
	MEMORY KINGSTON DDR3 1333MHZ 1G ACR128X64D3U1333C9	DIMM 1G ACR128X64D3U1333C9	KN.1GB07.002

Category	Part Name	Description	Acer Part No.
MEMORY	MEMORY UNIFOSA DDR3 1333MHZ 1G UNB-DIMM GU502203EP0201 LF 128*8 0.065UM	DIMM 1G GU502203EP0201 UNB.	KN.1GB0H.01 5
	MEMORY NANYA UNB-DIMM DDRIII 1333 2GB NT2GC64B88G0NF-CG LF+HF 256*8 46NM V79D	DIMM 2G NT2GC64B88G0NF-CG DDR3 1333MHZ	KN.2GB03.026
	MEMORY KINGSTON UNB- DIMM DDRIII 1333 2GB ACR256X64D3U13C9G LF+HF	DIMM 2G ACR256X64D3U13C9G DDR3 UNB.	KN.2GB07.007
	MEMORY UNIFOSA UNB-DIMM DDRIII 1333 2GB HU524303EP0200 LF 256*8 46NM	DIMM 2G HU524303EP0200 DDR3 1333MHZ UNB.	KN.2GB0H.01 2
	MEMORY KINGSTON UNB- DIMM DDRIII 1333 4GB ACR512X64D3U13C9G LF+HF	DIMM 4G ACR512X64D3U13C9G DDR3 UNB.	KN.4GB07.002
	MEMORY A-DATA UNB-DIMM DDRIII 1333 4GB AD63I1C1624EV LF+HF	DIMM 4G AD63I1C1624EV DDR3 1333MHZ UNB.	KN.4GB0C.00 2
	MEMORY UNIFOSA UNB-DIMM DDRIII 1333 4GB HU564403EP0200 LF 256*8 46NM	DIMM 4G HU564403EP0200 DDR3 1333MHZ UNB.	KN.4GB0H.00 1
POINTING DEVICE	LOGITECH OPTICAL MOUSE PS2 M-S0004-O WITH ACER LOGO	OPTICAL MOUSE PS2 M- S0004-O WIT	MS.11200.104
	PRIMAX OPTICAL MOUSE PS2 MOFGKO WITH ACER LOGO	OPTICAL MOUSE PS2 MOFGKO WITH ACE	MS.11200.105
	LOGITECH OPTICAL MOUSE USB M-U0027-O WITH ACER LOGO	MOUSE OPTICAL USB M- U0027-O WITH ACER LO LOGO	MS.11200.106
	PRIMAX OPTICAL MOUSE USB MOFGUO WITH ACER LOGO	MOUSE OPTICAL MOUSE USB MOFGUO WITH ACER	MS.11200.107
POWER SUPPLY 	POWER SUPPLY 220W PFC 230V DELTA DPS-220UB-4A EUP	SPS 220W EUP PFC 230V DPS-220UB-4A(NEW)	PY.22009.010
	POWER SUPPLY 220W LITE- ON PFC 230V PE-5221-08AF EUP	SPS PFC 220W (8.5L) EUP PE-5221-08AF ABO	PY.2200B.010
	POWER SUPPLY 220W CHICONYPower PFC CPB09- D220A AAGASSI	SPS 220W PFC CPB09- D220A AAGASSI	PY.2200F.005
SCREWS	SCRW I T NO6-32 L5 BZN	SCRW I T NO6-32 L5 BZN	86.SG901.001

Technical Specifications

This section provides technical specifications for the system.

Processor

Item	Specification								
Type	Intel Core / Celeron processor								
Processor Number	Ci5-3330	Ci5-2320	Ci3-3220	Ci3-2130	Ci3-2100	PDC-G645	PDC-G640	CD G550	CD G465
Number of Cores	Quad	Quad	Dual	Dual	Dual	Dual	Dual	Dual	Single
Clock Speed (GHz)	3.0	3.0	3.3	3.4	3.1	2.9	2.8	2.6	1.9
Turbo Speed (GHz)	3.2	3.3							
Cache Size (MB)	6	6	3	3	3	3	3	2	1.5
Thermal Design Power (W)	77	95	55	65	65	65	65	65	35

System Board Major Chips

Item	Specification
System Core Logic	Intel H61 Express chipset
Memory Controller	Intel H61 Express chipset
Storage Controller	Intel H61 Express chipset
PCIE Controller	Intel H61 Express chipset
LAN Controller	Intel PCI-E Gbe LAN controller PHY
Audio Controller	Realtek ALC662-VC0-GR Audio Codec
Input Devices Controller	Super I/O ITE 8728F-CX

System Memory

Item	Specification			
DIMM Sockets	Two			
Memory Type	DDR3-1066/1333 unbuffered DIMM			
Module Name	PC3-8500/10600			
Organization	ECC			
Maximum Memory	8 GB			
Vendor	Unifosa	Nanya	Kingston	A-data
DIMM Size (GB)	1, 2	2	2	2
Pin	240	240	240	240

System BIOS

Item	Specification
BIOS Vendor	American Megatrends Inc.
BIOS Version	P01-A0

PCI Interface

Item	Specification
Number of Slots	PCI Express x 1 slot PCI Express x16 slot

Hard Disk Drive

Item	Specification
Number of HDD bays	1
Form factor	3.5-inch 25.4 mm
Interface	SATA 3.0
Supported capacities	
500 GB	<ul style="list-style-type: none">Seagate Pharaoh – ST3500413ASWD – WD5000AAKX-221CA1
1000 GB	<ul style="list-style-type: none">HGST Mars – HDS721010DLE630Seagate Pharaoh – ST31000524ASWD – WD10EARX-22N0YB0
1500 GB	<ul style="list-style-type: none">WD – WD15EARX-22PASB0

VGA Interface

Item	Specification
Connector	VGA/monitor port

Network Interface

Item	Specification
LAN Controller	Intel 82579V Gbe LAN controller PHY
Supports LAN Protocol	10/100/1000 Mbps
LAN Connector Type	RJ45

SATA Interface

Item	Specification
SATA Controller	Embedded SATA controller
Connectors	Two SATA 2.0 ports Two SATA 3.0 ports

Audio Interface

Item	Specification
Audio Controller	Realtek ALC662-VC0-GR Audio Codec
Connectors	Three audio jacks

Keyboard and Input Devices

Item	Specification
Controller	Super I/O ITE 8728F-CX
Connectors	<ul style="list-style-type: none">PS/2 keyboard and mouse connectorsEight USB ports (four on front and six on rear)

Optical Drive

BD Combo Module

Item	Specification	
Vendor	HLDS	PLDS
Model name	CH20N	DH-6E2S/DH-4O3S
Drive type	BD-Combo	BD-Combo/BD-ROM
Write Speed	DVD-R 2x, 4x CLV, 8x ZCLV, 8x PCAV, 12x PCAV, 16x CAV DVD-R DL 2x, 4x CLV DVD-RW2x, 4x, 6x CLV DVD-RAM2x, 3x CLV, 5x PCAV DVD+R2.4x, 4x CLV, 8x ZCLV, 8x PCAV, 12x PCAV, 16x CAV DVD+R DL2.4x, 4x CLV DVD+RW2.4x, 4x, 6x CLV, 8x ZCLV CD-R8x, 16x CLV, 24x, 32x PCAV, 40x CAV CD-RW4x, 10x, 16x CLV, 24x ZCLV	12X Zone CLV at DVD-R / +R 6X CLV at DVD-RW / +RW 5X CLV at DVD-RAM 4X CLV at DVD--R DL / +R DL 24X Zone CLV at CD-R / RW
Read Speed	BD-ROM (SL/DL)6x / 4.8x CAV BD-R (SL/DL)6x / 4.8x CAV BD-RE (SL/DL)4.8x / 4.8x CAV BDMV (AACs Compliant Disc) 4.8x CAV DVD-ROM (SL/DL)16x / 8x CAV DVD-R (SL/DL)16x / 8x CAV DVD-RW (SL/DL)10x CAV / Not support DVD+R (SL/DL)16x / 8x CAV DVD+RW (SL/DL)10x CAV / Not support DVD-RAM 2x, 3x ZCLV, 5x PCAV DVD-Video (CSS Compliant Disc) (SL/DL) 8x CAV CD-R/ROM40x CAV CD-RW 40x CAV CD-DA (DAE) 32x CAV Video CD 10x CAV 80 mm CD 10x CAV	12X CAV at DVD-ROM and DVD-R / +R 8X CAV at DVD-ROM DL and DVD - RW / +RW / -R DL / +R DL 5X CAV at BD-ROM / R / RE 5X CLV at DVD-RAM 2X CLV at BD-ROM DL / R DL / RE DL 32X CAV at CD-ROM and CD-R 24X CAV at CD-RW
Data Transfer Rate	BD-ROM 215.79 Mbits/s (6x) max. DVD-ROM 22.16 Mbytes/s (16x) max. CD-ROM 6,000 kB/s (40x) max.	—
Access Time	BD-ROM 180 ms typ DVD-ROM 150 ms typ. DVD-RAM 180 ms typ. CD-ROM 150 ms typ.	BD-ROM 250 ms typ DVD-ROM 150 ms typ. DVD-RAM 180 ms typ. CD-ROM 150 ms typ.
Buffer Size	4 MB	2 MB
Interface Type	Serial ATA	Serial ATA

Super Multi

Item	Specification		
Vendor	HLDS	PLDS	Pioneer
Model Name	GH80N	DH-16ACSH	DVR-219RS
Drive Type	Super Multi	Super Multi	Super Multi
Write Speed	CD-R: 4x, 8x, 16x CLV, 24x, 32x, 40x P-CAV CD-RW: 4x, 10x, 16x CLV, 24x, 32x Z-CLV (High Speed: 10x, Ultra Speed: 16x, 24x, US Plus: 16x, 24x, 32x) DVD+R: 2.4x, 4x, 6x CLV, 8x, 12x Z-CLV, 8x, 12x P-CAV, 16x CAV DVD+R DL: 2.4x, 4x, 6x CLV, 8x Z-CLV DVD+RW: 2.4x, 4x, 6x CLV, 8x Z-CLV (High Speed DVD+RW: 6x CLV, 8x Z-CLV) DVD-R: 2x, 4x, 6x CLV, 8x Z-CLV, 8x P-CAV, 16x CAV DVD-R DL: 2x, 4x, 6x CLV, 8x Z-CLV DVD-RW: 1x, 2x, 4x, 6x CLV DVD-RAM: 2x, 3x Z-CLV, 3x-5x P-CAV (Ver.2.2)	CD-R: 16x CLV, 24x 17x ~ 24x P-CAV, 32x 17x ~ 32x P-CAV, 40x 17x ~ 40x CAV CD-RW: 4x CLV, 10x CLV, 16x CLV, 24x 16x-24x Zone-CLV1, 16x CLV, 24x / 32x 16x-24x-32x Zone CLV2 DVD+R: 24x / 32x 16x-24x-32x Zone CLV2, 4x / 6x CLV, 8x P-CAV DVD+R9: 12x / 16x CAV, 2.4x / 4x CLV, 6x / 8x Zone CLV, 12x CAV DVD+RW: 2.4x / 4x / 6x CLV 8x Zone CLV DVD-R: 4x / 6x CLV, 8x P-CAV DVD-R9: 12x / 16x CAV, 4x CLV 6x / 8x Zone CLV 12x CAV DVD-RW 2x / 4x CLV, 6x Zone CLV DVD-RAM 2x / 3x / 5x / 6x CLV, 8x / 12x P-CAV	CD-R: 16x CLV, 24x 17x ~ 24x P-CAV, 32x 17x ~ 32x P-CAV, 40x 17x ~ 40x CAV CD-RW: 4x CLV, 10x CLV, 16x CLV, 24x 16x-24x Zone-CLV1, 16x CLV, 24x / 32x 16x-24x-32x Zone CLV2 DVD+R: 24x / 32x 16x-24x-32x Zone CLV2, 4x / 6x CLV, 8x P-CAV DVD+R9: 12x / 16x CAV, 2.4x / 4x CLV, 6x / 8x Zone CLV, 12x CAV DVD+RW: 2.4x / 4x / 6x CLV 8x Zone CLV DVD-R: 4x / 6x CLV, 8x P-CAV DVD-R9: 12x / 16x CAV, 4x CLV 6x / 8x Zone CLV 12x CAV DVD-RW 2x / 4x CLV, 6x Zone CLV DVD-RAM 2x / 3x / 5x / 6x CLV, 8x / 12x P-CAV

Super Multi

Item	Specification		
Read Speed	CD-R/RW/ROM:40x/40x/ 40x max. CD-DA (DAE):40x max. 80 mm CD:10x max DVD+R/+RW:10x / 8x max. DVD+R DL:8x max. DVD-R/RW/ROM(SL/ DL):10x / 8x / 16x / 12x max. DVD-R DL:8x max. DVD-RAM (Ver.1.0/ 2.2):2x/ 3x-5x PCAV	CD-ROM: 4x / 8x CLV, 4x~10x / 6.4x~16x / 9.6x~24x /12.8x~32x / 16x~40x / 19.2x~48x CAV CD-RW: 4x / 8x CLV, 4x~10x / 6.4x~16x / 9.6x~24x /12.8x~32x / 16x~40x CAV CD-R/RW: 8x CLV DVD-ROM (single layer): 1.6x~4x / 2.4x~6x / 3.2x~8x /4.8x~12x / 6.4x~16x CAV DVD-ROM (dual layer): 1.6x~4x / 2.4x~6x / 3.2x~8x /4.8x~12x DVD+R: 2.4x / 4x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x /6.4x~16x CAV DVD-R: 2x / 4x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x /6.4x~16x DVD+RW: 2.4x / 4x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x CAV DVD-RW: 2x / 4x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x CAV DVD+R9: 4x / 8x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x CAV DVD-R9: 2x / 4x CLV, 2x / 3x / 5x / 6x CAV DVD-RAM: 2x / 3x / 5x / 6x CLV, 8x / 12x PCAV	CD-ROM: 4x / 8x CLV, 4x~10x / 6.4x~16x / 9.6x~24x /12.8x~32x / 16x~40x / 19.2x~48x CAV CD-RW: 4x / 8x CLV, 4x~10x / 6.4x~16x / 9.6x~24x /12.8x~32x / 16x~40x CAV CD-R/RW: 8x CLV DVD-ROM (single layer): 1.6x~4x / 2.4x~6x / 3.2x~8x /4.8x~12x / 6.4x~16x CAV DVD-ROM (dual layer): 1.6x~4x / 2.4x~6x / 3.2x~8x /4.8x~12x DVD+R: 2.4x / 4x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x /6.4x~16x CAV DVD-R: 2x / 4x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x /6.4x~16x DVD+RW: 2.4x / 4x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x CAV DVD-RW: 2x / 4x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x CAV DVD+R9: 4x / 8x CLV, 2.4x~6x / 3.2x~8x / 4.8x~12x CAV DVD-R9: 2x / 4x CLV, 2x / 3x / 5x / 6x CAV DVD-RAM: 2x / 3x / 5x / 6x CLV, 8x / 12x PCAV
Data Transfer Rate	CD-ROM:6,000 kB/s (40x) max. DVD-ROM:22.16 MB/s (16x) max.	CD-ROM: 7150 KB/s DVD-ROM: 20.85 MB/s	CD-ROM: 7150 KB/s DVD-ROM: 20.85 MB/s
Access Time	CD-ROM: 125 ms DVD-ROM: 145 ms	CD-ROM: 140 ms DVD-ROM: 160/180 ms	CD-ROM: 140 ms DVD-ROM: 160/180 ms
Buffer Size	2 MB	2 MB	2 MB
Interface Type	Serial ATA	Serial ATA	Serial ATA

DVD-ROM

Item	Specification		
Vendor	HLDS	PLDS	Pioneer
Model Name	DH50N	DH-16D6SH	DVR-231RS
Drive Type	DVD-ROM	DVD-ROM	DVD-ROM
Write Speed	—	—	—
Read Speed	—	DVD-ROM (single layer) 2x CLV, 4X, 6X, 8X, 10X, 12X, 16X CAV DVD-ROM (dual layer) 2x CLV, 4X, 6X, 8X CAV DVD±R 2x CLV, 4X, 6X, 8X CAV DVD±RW 2x CLV, 4X, 6X, 8X CAV DVD±R DL2x CLV, 4X, 6X CAV CD-ROM, CD-R 4X, 8X CLV, 16X, 24X, 32X, 40X, 48X CAV CD-DAE4X, 8X CLV, 16X, 24X, 32X, 40X, 48X CAV CD-RW 4X, 8X CLV, 16X, 24X, 32X, 40X CAV DVD-RAM 2x CLV, 5X CAV	DVD-ROM (single layer) 2x CLV, 4X, 6X, 8X, 10X, 12X, 16X CAV DVD-ROM (dual layer) 2x CLV, 4X, 6X, 8X CAV DVD±R 2x CLV, 4X, 6X, 8X CAV DVD±RW 2x CLV, 4X, 6X, 8X CAV DVD±R DL2x CLV, 4X, 6X CAV CD-ROM, CD-R 4X, 8X CLV, 16X, 24X, 32X, 40X, 48X CAV CD-DAE4X, 8X CLV, 16X, 24X, 32X, 40X, 48X CAV CD-RW 4X, 8X CLV, 16X, 24X, 32X, 40X CAV DVD-RAM 2x CLV, 5X CAV

DVD-ROM

Item	Specification		
Data Transfer Rate	—	DVD-ROM outside (20956 KB/ sec) DVD-ROM inside (8100 KB/sec) DVD 9 Disc Outside (10200 KB/ sec) DVD 9 Disc Inside (4050KB/sec) DVD+R/-R DL Disc Outside (7400 KB/sec) DVD+R/-R DL Disc Inside (2700 KB/sec) CD-ROM outside (7200 KB/sec) CD-ROM inside (2850 KB/sec) DVD-RAM outside (7000 KB/sec) DVD-RAM inside (2335 KB/sec)	DVD-ROM outside (20956 KB/ sec) DVD-ROM inside (8100 KB/sec) DVD 9 Disc Outside (10200 KB/ sec) DVD 9 Disc Inside (4050KB/sec) DVD+R/-R DL Disc Outside (7400 KB/sec) DVD+R/-R DL Disc Inside (2700 KB/sec) CD-ROM outside (7200 KB/sec) CD-ROM inside (2850 KB/sec) DVD-RAM outside (7000 KB/sec) DVD-RAM inside (2335 KB/sec)
Access Time	—	CD 120 ms DVD 140 ms DVD-RAM 200 ms	CD 120 ms DVD 140 ms DVD-RAM 200 ms
Buffer Size	—	198 KB	198 KB
Interface Type	Serial ATA	Serial ATA	Serial ATA

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