



880GM-LE FX

User Manual

Version 1.1

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- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.

"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

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Contents

1. Introduction	5
1.1 Package Contents	5
1.2 Specifications	6
1.3 Motherboard Layout	12
1.4 I/O Panel	13
2. Installation	14
Pre-installation Precautions	14
2.1 CPU Installation	15
2.2 Installation of CPU Fan and Heatsink	15
2.3 Installation of Memory Modules (DIMM)	16
2.4 Expansion Slots (PCI and PCI Express Slots)	17
2.5 Dual Monitor and Surround Display Features	18
2.6 ATI™ Hybrid CrossFireX™ Operation Guide	21
2.7 Jumpers Setup	23
2.8 Onboard Headers and Connectors	24
2.9 SATAII Hard Disk Setup Guide	28
2.10 Serial ATA (SATA) / Serial ATAII (SATAII) Hard Disks Installation	29
2.11 Hot Plug and Hot Swap Functions for SATA / SATAII HDDs	30
2.12 SATA / SATAII HDD Hot Plug Feature and Operation Guide	31
2.13 Driver Installation Guide	33
2.14 Installing Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit With RAID Functions	33
2.14.1 Installing Windows® XP / XP 64-bit With RAID Functions	33
2.14.2 Installing Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit With RAID Functions	34
2.15 Installing Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit Without RAID Functions	35
2.15.1 Installing Windows® XP / XP 64-bit Without RAID Functions	35
2.15.2 Installing Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit Without RAID Functions	36
2.16 Untied Overclocking Technology	37

3 . BIOS SETUP UTILITY	38
3.1 Introduction	38
3.1.1 BIOS Menu Bar	38
3.1.2 Navigation Keys	39
3.2 Main Screen	39
3.3 OC Tweaker Screen	40
3.4 Advanced Screen	44
3.4.1 CPU Configuration	45
3.4.2 Chipset Configuration	46
3.4.3 ACPI Configuration	47
3.4.4 Storage Configuration	48
3.4.5 PCI/PnP Configuration	50
3.4.6 Floppy Configuration	51
3.4.7 Super IO Configuration	51
3.4.8 USB Configuration	53
3.5 Hardware Health Event Monitoring Screen	54
3.6 Boot Screen	55
3.6.1 Boot Settings Configuration	55
3.7 Security Screen	56
3.8 Exit Screen	57
4 . Software Support	58
4.1 Install Operating System	58
4.2 Support CD Information	58
4.2.1 Running Support CD	58
4.2.2 Drivers Menu	58
4.2.3 Utilities Menu	58
4.2.4 Contact Information	58

1. Introduction

Thank you for purchasing ASRock **880GM-LE FX** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the configuration guide to BIOS setup and information of the Support CD.



Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest VGA cards and CPU support lists on ASRock website as well. ASRock website <http://www.asrock.com>
If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.
www.asrock.com/support/index.asp

1.1 Package Contents

ASRock **880GM-LE FX** Motherboard

(Micro ATX Form Factor: 9.6-in x 7.8-in, 24.4 cm x 19.8 cm)

ASRock **880GM-LE FX** Quick Installation Guide

ASRock **880GM-LE FX** Support CD

2 x Serial ATA (SATA) Data Cables (Optional)

1 x I/O Shield

1.2 Specifications

Platform	<ul style="list-style-type: none">- Micro ATX Form Factor: 9.6-in x 7.8-in, 24.4 cm x 19.8 cm- Solid Capacitor for CPU power
CPU	<ul style="list-style-type: none">- Support for Socket AM3+ processors- Support for Socket AM3 processors: AMD Phenom™ II X6 / X4 / X3 / X2 (except 920 / 940) / Athlon II X4 / X3 / X2 / Sempron processors- Supports 8-Core CPU- Supports AMD OverDrive™ with ACC feature (Advanced Clock Calibration)- Supports AMD's Cool 'n' Quiet™ Technology- FSB 2600 MHz (5.2 GT/s)- Supports Untied Overclocking Technology (see CAUTION 1)- Supports Hyper-Transport 3.0 (HT 3.0) Technology
Chipset	<ul style="list-style-type: none">- Northbridge: AMD 880G- Southbridge: AMD SB710
Memory	<ul style="list-style-type: none">- Dual Channel DDR3 Memory Technology (see CAUTION 2)- 2 x DDR3 DIMM slots- Support DDR3 1800(OC)/1600(OC)/1333/1066/800 non-ECC, un-buffered memory (see CAUTION 3)- Max. capacity of system memory: 8GB (see CAUTION 4)
Expansion Slot	<ul style="list-style-type: none">- 1 x PCI Express 2.0 x16 slot (blue @ x16 mode)- 1 x PCI Express 2.0 x1 slot- 2 x PCI slots- Supports AMD Hybrid CrossFireX™
Graphics	<ul style="list-style-type: none">- Integrated AMD Radeon HD 4250 graphics- DX10.1 class iGPU, Shader Modle 4.1- Max. shared memory 512MB (see CAUTION 5)- Dual VGA Output: support DVI-D and D-Sub ports by independent display controllers- Supports DVI with max. resolution up to 1920x1200 @ 75Hz- Supports D-Sub with max. resolution up to 2048x1536 @ 85Hz- Supports HDCP function with DVI-D port- Supports Full HD 1080p Blu-ray (BD) / HD-DVD playback with DVI-D port
Audio	<ul style="list-style-type: none">- 5.1 CH HD Audio (ALC662 Audio Codec)

LAN	<ul style="list-style-type: none"> - PCIE x1 Gigabit LAN 10/100/1000 Mb/s - Realtek RTL8111DL - Supports Wake-On-LAN - Supports PXE
Rear Panel I/O	<p>I/O Panel</p> <ul style="list-style-type: none"> - 1 x PS/2 Mouse Port - 1 x PS/2 Keyboard Port - 1 x D-Sub Port - 1 x DVI-D Port - 6 x Ready-to-Use USB 2.0 Ports - 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED) - HD Audio Jack: Line in/Front Speaker/Microphone
Connector	<ul style="list-style-type: none"> - 6 x SATA2 3.0Gb/s connectors, support RAID (RAID 0, RAID 1, RAID 10 and JBOD), NCQ, AHCI and "Hot Plug" functions (see CAUTION 6) - 1 x ATA133 IDE connector (supports 2 x IDE devices) - 1 x Floppy connector - 1 x IR header - 1 x Print port header - 1 x COM port header - CPU/Chassis/Power FAN connector - 24 pin ATX power connector - 4 pin 12V power connector - CD in header - Front panel audio connector - 3 x USB 2.0 headers (support 6 USB 2.0 ports)
BIOS Feature	<ul style="list-style-type: none"> - 8Mb AMI BIOS - AMI Legal BIOS - Supports "Plug and Play" - ACPI 1.1 Compliance Wake Up Events - Supports jumperfree - SMBIOS 2.3.1 Support - VCCM, NB Voltage Multi-adjustment
Support CD	<ul style="list-style-type: none"> - Drivers, Utilities, AntiVirus Software (Trial Version), CyberLink MediaEspresso 6.5 Trial, Google Chrome Browser and Toolbar
Unique Feature	<ul style="list-style-type: none"> - ASRock OC Tuner (see CAUTION 7) - ASRock Intelligent Energy Saver (see CAUTION 8) - ASRock Instant Boot - ASRock Instant Flash (see CAUTION 9) - ASRock OC DNA (see CAUTION 10) - ASRock APP Charger (see CAUTION 11)

	<ul style="list-style-type: none"> - ASRock XFast USB (see CAUTION 12) - ASRock XFast LAN (see CAUTION 13) - Hybrid Booster: <ul style="list-style-type: none"> - CPU Frequency Stepless Control (see CAUTION 14) - ASRock U-COP (see CAUTION 15) - Boot Failure Guard (B.F.G.)
Hardware Monitor	<ul style="list-style-type: none"> - CPU Temperature Sensing - Chassis Temperature Sensing - CPU/Chassis/Power Fan Tachometer - CPU Quiet Fan - Voltage Monitoring: +12V, +5V, +3.3V, Vcore
OS	<ul style="list-style-type: none"> - Microsoft® Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP Media Center / XP 64-bit compliant
Certifications	<ul style="list-style-type: none"> - FCC, CE, WHQL - ErP/EuP Ready (ErP/EuP ready power supply is required) (see CAUTION 16)

* For detailed product information, please visit our website: <http://www.asrock.com>

WARNING

Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using the third-party overclocking tools. Overclocking may affect your system stability, or even cause damage to the components and devices of your system. It should be done at your own risk and expense. We are not responsible for possible damage caused by overclocking.

CAUTION!



1. This motherboard supports Untied Overclocking Technology. Please read "Untied Overclocking Technology" on page 37 for details.
2. This motherboard supports Dual Channel Memory Technology. Before you implement Dual Channel Memory Technology, make sure to read the installation guide of memory modules on page 16 for proper installation.
3. Whether 1800/1600MHz memory speed is supported depends on the AM3/AM3+ CPU you adopt. If you want to adopt DDR3 1800/1600 memory module on this motherboard, please refer to the memory support list on our website for the compatible memory modules.
ASRock website <http://www.asrock.com>

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4. Due to the operating system limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® 8 / 7 / Vista™ / XP. For Windows® OS with 64-bit CPU, there is no such limitation.
 5. The maximum shared memory size is defined by the chipset vendor and is subject to change. Please check AMD website for the latest information.
 6. Before installing SATAII hard disk to SATAII connector, please read the "SATAII Hard Disk Setup Guide" on page 28 to adjust your SATAII hard disk drive to SATAII mode. You can also connect SATA hard disk to SATAII connector directly.
 7. It is a user-friendly ASRock overclocking tool which allows you to surveil your system by hardware monitor function and overclock your hardware devices to get the best system performance under Windows® environment. Please visit our website for the operation procedures of ASRock OC Tuner. ASRock website: <http://www.asrock.com>
 8. Featuring an advanced proprietary hardware and software design, Intelligent Energy Saver is a revolutionary technology that delivers unparalleled power savings. The voltage regulator can reduce the number of output phases to improve efficiency when the CPU cores are idle. In other words, it is able to provide exceptional power saving and improve power efficiency without sacrificing computing performance. To use Intelligent Energy Saver function, please enable Cool 'n' Quiet option in the BIOS setup in advance. Please visit our website for the operation procedures of Intelligent Energy Saver. ASRock website: <http://www.asrock.com>
 9. ASRock Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows®. With this utility, you can press <F6> key during the POST or press <F2> key to BIOS setup menu to access ASRock Instant Flash. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.
 10. The software name itself – OC DNA literally tells you what it is capable of. OC DNA, an exclusive utility developed by ASRock, provides a convenient way for the user to record the OC settings and share with others. It helps you to save your overclocking record under the operating system and simplifies the complicated recording process of overclocking settings. With OC DNA, you can save your OC settings as a profile and share with your friends! Your friends then can load the OC profile to their own system to get the same OC settings as yours! Please be noticed that the OC profile can only be shared and worked on the same motherboard.

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11. If you desire a faster, less restricted way of charging your Apple devices, such as iPhone/iPod/iPad Touch, ASRock has prepared a wonderful solution for you - ASRock APP Charger. Simply installing the APP Charger driver, it makes your iPhone charged much quickly from your computer and up to 40% faster than before. ASRock APP Charger allows you to quickly charge many Apple devices simultaneously and even supports continuous charging when your PC enters into Standby mode (S1), Suspend to RAM (S3), hibernation mode (S4) or power off (S5). With APP Charger driver installed, you can easily enjoy the marvelous charging experience than ever.

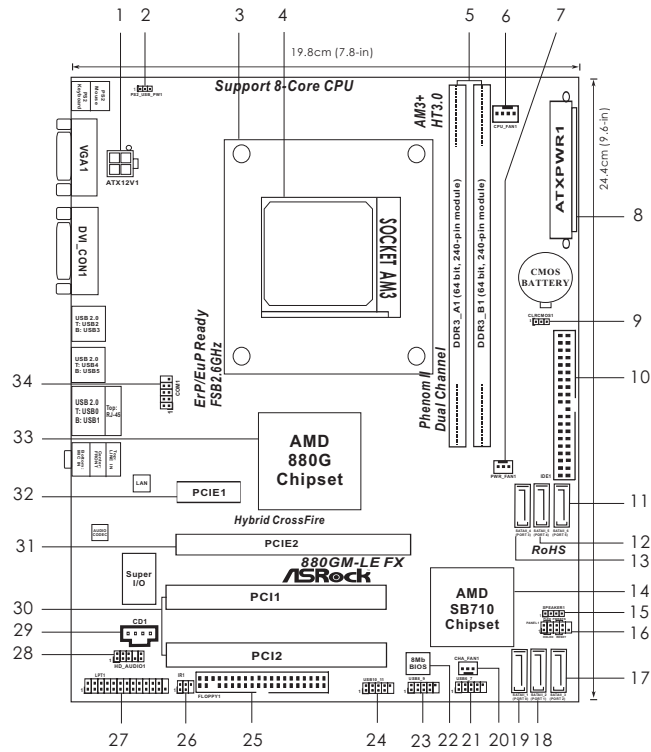
ASRock website: <http://www.asrock.com/Feature/AppCharger/index.asp>

12. ASRock XFast USB can boost USB storage device performance. The performance may depend on the property of the device.
13. ASRock XFast LAN provides a faster internet access, which includes below benefits. LAN Application Prioritization: You can configure your application priority ideally and/or add new programs. Lower Latency in Game: After setting online game priority higher, it can lower the latency in game. Traffic Shaping: You can watch Youtube HD video and download files simultaneously. Real-Time Analysis of Your Data: With the status window, you can easily recognize which data streams you are currently transferring.
14. Although this motherboard offers stepless control, it is not recommended to perform over-clocking. Frequencies other than the recommended CPU bus frequencies may cause the instability of the system or damage the CPU.
15. While CPU overheat is detected, the system will automatically shutdown. Before you resume the system, please check if the CPU fan on the motherboard functions properly and unplug the power cord, then plug it back again. To improve heat dissipation, remember to spray thermal grease between the CPU and the heatsink when you install the PC system.



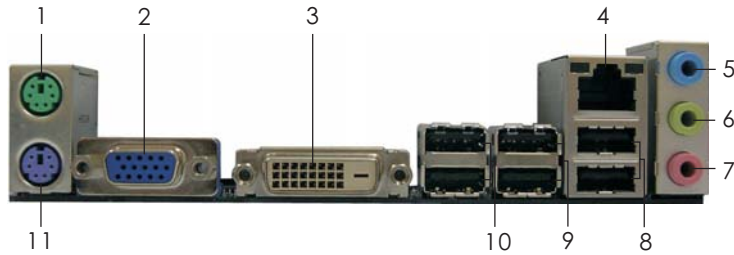
16. EuP, stands for Energy Using Product, was a provision regulated by European Union to define the power consumption for the completed system. According to EuP, the total AC power of the completed system shall be under 1.00W in off mode condition. To meet EuP standard, an EuP ready motherboard and an EuP ready power supply are required. According to Intel's suggestion, the EuP ready power supply must meet the standard of 5v standby power efficiency is higher than 50% under 100 mA current consumption. For EuP ready power supply selection, we recommend you checking with the power supply manufacturer for more details.

1.3 Motherboard Layout



- | | | | |
|----|--|----|--|
| 1 | ATX 12V Power Connector (ATX12V1) | 19 | Primary SATAII Connector (SATAII_1 (PORT 0)) |
| 2 | PS2_USB_PW1 Jumper | 20 | Chassis Fan Connector (CHA_FAN1) |
| 3 | CPU Heatsink Retention Module | 21 | USB 2.0 Header (USB6_7, Blue) |
| 4 | AM3 CPU Socket | 22 | SPI Flash Memory (8Mb) |
| 5 | 2 x 240-pin DDR3 DIMM Slots (Dual Channel: DDR3_A1, DDR3_B1; Blue) | 23 | USB 2.0 Header (USB8_9, Blue) |
| 6 | CPU Fan Connector (CPU_FAN1) | 24 | USB 2.0 Header (USB10_11, Blue) |
| 7 | Power Fan Connector (PWR_FAN1) | 25 | Floppy Connector (FLOPPY1) |
| 8 | ATX Power Connector (ATXPWR1) | 26 | Infrared Module Header (IR1) |
| 9 | Clear CMOS Jumper (CLRCMOS1) | 27 | Print Port Header (LPT1, White) |
| 10 | Primary IDE Connector (IDE1, Blue) | 28 | Front Panel Audio Header (HD_AUDIO1, White) |
| 11 | Sixth SATAII Connector (SATAII_6 (PORT 5)) | 29 | Internal Audio Connector: CD1 (Black) |
| 12 | Fifth SATAII Connector (SATAII_5 (PORT 4)) | 30 | PCI Slots (PCI1-2) |
| 13 | Fourth SATAII Connector (SATAII_4 (PORT 3)) | 31 | PCI Express 2.0 x16 Slot (PCIE2; Blue) |
| 14 | Southbridge Controller | 32 | PCI Express 2.0 x1 Slot (PCIE1; White) |
| 15 | Chassis Speaker Header (SPEAKER 1, White) | 33 | Northbridge Controller |
| 16 | System Panel Header (PANEL1, White) | 34 | Serial Port Connector (COM1) |
| 17 | Third SATAII Connector (SATAII_3 (PORT 2)) | | |
| 18 | Secondary SATAII Connector (SATAII_2 (PORT 1)) | | |

1.4 I/O Panel




- | | |
|---------------------------|--------------------------------|
| 1 PS/2 Mouse Port (Green) | 7 Microphone (Pink) |
| 2 D-Sub Port | 8 USB 2.0 Ports (USB01) |
| 3 DVI-D Port | 9 USB 2.0 Ports (USB45) |
| *4 RJ-45 Port | 10 USB 2.0 Ports (USB23) |
| 5 Line In (Light Blue) | 11 PS/2 Keyboard Port (Purple) |
| 6 Front Speaker (Lime) | |

* There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.

LAN Port LED Indications

Activity/Link LED		SPEED LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection
Blinking	Data Activity	Orange	100Mbps connection
On	Link	Green	1Gbps connection




ACT/LINK LED SPEED LED

LAN Port

To enable Multi-Streaming function, you need to connect a front panel audio cable to the front panel audio header. Please refer to below steps for the software setting of Multi-Streaming.

For Windows® XP:

After restarting your computer, you will find "Mixer" tool on your system. Please select "Mixer ToolBox" , click "Enable playback multi-streaming", and click "ok". Choose "2CH" or

"4CH" and then you are allowed to select "Realtek HDA Primary output" to use Rear Speaker and Front Speaker, or select "Realtek HDA Audio 2nd output" to use front panel audio. Then reboot your system.

For Windows® 8 / 7 / Vista™:

After restarting your computer, please double-click "Realtek HD Audio Manager" on the system tray. Set "Speaker Configuration" to "Quadraphonic" or "Stereo". Click "Device advanced settings", choose "Make front and rear output devices playbacks two different audio streams simultaneously", and click "ok". Then reboot your system.

2. Installation

This is a Micro ATX form factor (9.6-in x 7.8-in, 24.4 cm x 19.8 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Pre-installation Precautions

Take note of the following precautions before you install motherboard components or change any motherboard settings.



Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.
5. When placing screws into the screw holes to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

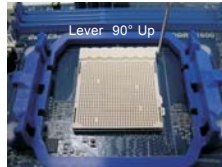
2.1 CPU Installation

- Step 1. Unlock the socket by lifting the lever up to a 90° angle.
- Step 2. Position the CPU directly above the socket such that the CPU corner with the golden triangle matches the socket corner with a small triangle.
- Step 3. Carefully insert the CPU into the socket until it fits in place.

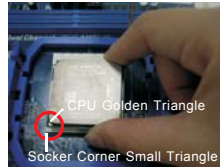


The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to avoid bending of the pins.

- Step 4. When the CPU is in place, press it firmly on the socket while you push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.



STEP 1:
Lift Up The Socket Lever



STEP 2 / STEP 3:
Match The CPU Golden Triangle
To The Socket Corner Small
Triangle



STEP 4:
Push Down And Lock
The Socket Lever

2.2 Installation of CPU Fan and Heatsink

After you install the CPU into this motherboard, it is necessary to install a larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU FAN connector (CPU_FAN1, see Page 12, No. 6). For proper installation, please kindly refer to the instruction manuals of the CPU fan and the heatsink.

2.3 Installation of Memory Modules (DIMM)

880GM-LE FX motherboard provides two 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Dual Channel Memory Technology. For dual channel configuration, you always need to install two **identical** (the same brand, speed, size and chip-type) memory modules in the DDR3 DIMM slots to activate Dual Channel Memory Technology. Otherwise, it will operate at single channel mode.



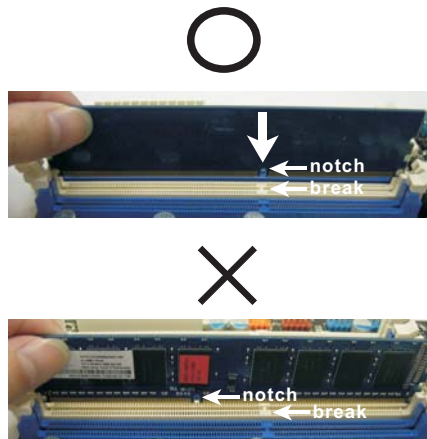
1. It is not allowed to install a DDR or DDR2 memory module into DDR3 slot; otherwise, this motherboard and DIMM may be damaged.
2. If you install only one memory module or two non-identical memory modules, it is unable to activate the Dual Channel Memory Technology.

Installing a DIMM



Please make sure to disconnect power supply before adding or removing DIMMs or the system components.

- Step 1. Unlock a DIMM slot by pressing the retaining clips outward.
- Step 2. Align a DIMM on the slot such that the notch on the DIMM matches the break on the slot.



The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

- Step 3. Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated.

2.4 Expansion Slots (PCI and PCI Express Slots)

There are 2 PCI slots and 2 PCI Express slots on this motherboard.

PCI slots: PCI slots are used to install expansion cards that have the 32-bit PCI interface.

PCIe slots:

PCIe1 (PCIe x1 slot; White) is used for PCI Express cards with x1 lane width cards, such as Gigabit LAN card, SATA2 card, etc.

PCIe2 (PCIe x16 slot; Blue) is used for PCI Express cards with x16 lane width graphics cards.

Installing an expansion card

- Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
- Step 2. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.
- Step 3. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 4. Fasten the card to the chassis with screws.

2.5 Dual Monitor and Surround Display Features

Dual Monitor Feature

This motherboard supports dual monitor feature. With the internal dual VGA output support (DVI-D and D-Sub), you can easily enjoy the benefits of dual monitor feature without installing any add-on VGA card to this motherboard. This motherboard also provides independent display controllers for DVI-D and D-Sub to support dual VGA output so that DVI-D and D-sub can drive same or different display contents.

To enable dual monitor feature, please follow the below steps:

1. Connect the DVI-D monitor cable to the DVI-D port on the I/O panel. And connect the D-Sub monitor cable to the D-Sub port on the I/O panel.



D-Sub port DVI-D port

2. If you have installed onboard VGA driver from our support CD to your system already, you can freely enjoy the benefits of dual monitor function after your system boots. If you haven't installed onboard VGA driver yet, please install onboard VGA driver from our support CD to your system and restart your computer. Then you can start to use dual monitor function on this motherboard.



When you playback HDCP-protected video from Blu-ray (BD) or HD-DVD disc, the content will be displayed only in one of the two monitors instead of both monitors.

Surround Display Feature

This motherboard supports surround display upgrade. With the internal dual VGA output support (DVI-D and D-Sub) and the external add-on PCI Express VGA card, you can easily enjoy the benefits of surround display feature.

Please refer to the following steps to set up a surround display environment:

1. Install the ATI™ PCI Express VGA card on PCIE2 slot. Please refer to page 17 for proper expansion card installation procedures for details.
2. Connect the DVI-D monitor cable to the DVI-D port on the I/O panel. And connect the D-Sub monitor cable to the D-Sub port on the I/O panel. Connect the other DVI-D monitor cable and D-Sub monitor cable to the corresponding connectors of the add-on PCI Express VGA card on PCIE2 slot.

-
3. Boot your system. Press <F2> or to enter BIOS setup. Enter "Share Memory" option to adjust the memory capability to [32MB], [64MB], [128MB] [256MB] or [512MB] to enable the function of D-sub. Please make sure that the value you select is less than the total capability of the system memory. If you do not adjust the BIOS setup, the default value of "Share Memory", [Auto], will disable D-Sub function when the add-on VGA card is inserted to this motherboard.
 4. Install the onboard VGA driver and the add-on PCI Express VGA card driver to your system. If you have installed the drivers already, there is no need to install them again.
 5. Set up a multi-monitor display.

For Windows® XP / XP 64-bit OS:

Right click the desktop, choose "Properties", and select the "Settings" tab so that you can adjust the parameters of the multi-monitor according to the steps below.

- A. Click the "Identify" button to display a large number on each monitor.
- B. Right-click the display icon in the Display Properties dialog that you wish to be your primary monitor, and then select "Primary". When you use multiple monitors with your card, one monitor will always be Primary, and all additional monitors will be designated as Secondary.
- C. Select the display icon identified by the number 2.
- D. Click "Extend my Windows desktop onto this monitor".
- E. Right-click the display icon and select "Attached", if necessary.
- F. Set the "Screen Resolution" and "Color Quality" as appropriate for the second monitor. Click "Apply" or "OK" to apply these new values.
- G. Repeat steps C through E for the display icon identified by the number one, two, three and four.

For Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS:

Right click the desktop, choose "Personalize", and select the "Display Settings" tab so that you can adjust the parameters of the multi-monitor according to the steps below.

- A. Click the number "2" icon.
- B. Click the items "This is my main monitor" and "Extend the desktop onto this monitor".
- C. Click "OK" to save your change.
- D. Repeat steps A through C for the display icon identified by the number three and four.

6. Use Surround Display. Click and drag the display icons to positions representing the physical setup of your monitors that you would like to use. The placement of display icons determines how you move items from one monitor to another.



HDCP Function

HDCP function is supported on this motherboard. To use HDCP function with this motherboard, you need to adopt the monitor that supports HDCP function as well. Therefore, you can enjoy the superior display quality with high-definition HDCP encryption contents. Please refer to below instruction for more details about HDCP function.

What is HDCP?

HDCP stands for High-Bandwidth Digital Content Protection, a specification developed by Intel® for protecting digital entertainment content that uses the DVI interface. HDCP is a copy protection scheme to eliminate the possibility of intercepting digital data midstream between the video source, or transmitter - such as a computer, DVD player or set-top box - and the digital display, or receiver - such as a monitor, television or projector. In other words, HDCP specification is designed to protect the integrity of content as it is being transmitted.

Products compatible with the HDCP scheme such as DVD players, satellite and cable HDTV set-top-boxes, as well as few entertainment PCs requires a secure connection to a compliant display. Due to the increase in manufacturers employing HDCP in their equipment, it is highly recommended that the HDTV or LCD monitor you purchase is compatible.

2.6 ATI™ Hybrid CrossFireX™ Operation Guide

This motherboard supports ATI™ Hybrid CrossFireX™ feature. ATI™ Hybrid CrossFireX™ brings multi-GPU performance capabilities by enabling an AMD 880G integrated graphics processor and a discrete graphics processor to operate simultaneously with combined output to a single display for blisteringly-fast frame rates. Currently, ATI™ Hybrid CrossFireX™ Technology is only supported with Windows® Vista™ / 7 / 8 OS, and is not available with Windows® XP OS. In the future, ATI™ Hybrid CrossFireX™ may be supported with Windows® XP OS. Please visit our website for updated information.



What does an ATI™ Hybrid CrossFireX™ system include?

An ATI™ Hybrid CrossFireX™ system includes an ATI™ Radeon™ 2400 or ATI™ Radeon™ 3450 series graphics processor and a motherboard based on an AMD 880G integrated chipset, all operating in a Windows® Vista™ / 7 / 8 environment. Please refer to below PCI Express graphics card support list for ATI™ Hybrid CrossFireX™. For the future update of more compatible PCI Express graphics cards, please visit our website for further information.

Vendor	Chipset	Model	Driver
ATI	RADEON HD2400XT	POWERCOLOR HD2400 XT 256MB DDR3	Support CD 8.71
	RADEON HD3450	POWERCOLOR AX3450 256MD2-S	Support CD 8.71

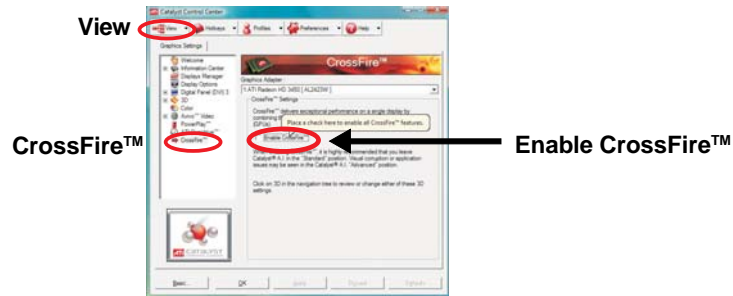
Enjoy the benefit of ATI™ Hybrid CrossFireX™

- Step 1. Install one compatible PCI Express graphics card to PCIE2 slot (blue). For the proper installation procedures, please refer to section "Expansion Slots".
- Step 2. Connect the monitor cable to the correspondent connector on the PCI Express graphics card on PCIE2 slot.
- Step 3. Boot your system. Press <F2> to enter BIOS setup. Enter "Advanced" screen, and enter "Chipset Settings". Then set the option "Surround View" to [Enabled].
- Step 4. Boot into OS. Please remove the ATI™ driver if you have any VGA driver installed in your system.
- Step 5. Install the onboard VGA driver from our support CD to your system for both the onboard VGA and the discrete graphics card.
- Step 6. Restart your computer. Then you will find "ATI Catalyst Control Center" on your Windows® taskbar.

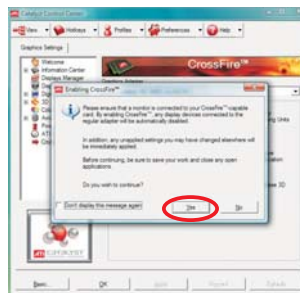


ATI Catalyst Control Center

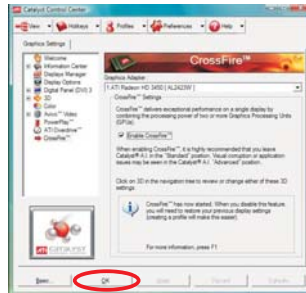
Step 7. Double-click "ATI Catalyst Control Center". Click "View", click "CrossFire™", and then select the option "Enable CrossFire™".



Step 8. Click "Yes" to continue.



Step 9. Click "OK" to save your change.



Step 10. Reboot your system. Then you can freely enjoy the benefit of Hybrid™ CrossFireX™ feature.



* Hybrid CrossFireX™ appearing here is a registered trademark of ATI™ Technologies Inc., and is used only for identification or explanation and to the owners' benefit, without intent to infringe.

* For further information of ATI™ Hybrid CrossFireX™ technology, please check AMD website for up dates and details.

2.7 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is "Short". If no jumper cap is placed on pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when jumper cap is placed on these 2 pins.



Jumper	Setting	
PS2_USB_PW1 (see p.12, No. 2)	 	Short pin2, pin3 to enable +5VSB (standby) for PS/2 or USB wake up events.

Note: To select +5VSB, it requires 2 Amp and higher standby current provided by power supply.

Clear CMOS Jumper (CLR CMOS1) (see p.12, No. 9)	 	Default Clear CMOS
---	---	-------------------------

Note: CLR CMOS1 allows you to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLR CMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action.

2.8 Onboard Headers and Connectors



Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

Floppy Connector

(33-pin FLOPPY1)
(see p.12 No. 25)



Note: Make sure the red-striped side of the cable is plugged into Pin1 side of the connector.

Primary IDE connector (Blue)

(39-pin IDE1, see p.12 No. 10)



connect the blue end
to the motherboard



connect the black end
to the IDE devices

80-conductor ATA 66/100/133 cable

Note: Please refer to the instruction of your IDE device vendor for the details.

Serial ATAII Connectors

(SATAII_1 (PORT 0):

see p.12, No. 19)

(SATAII_2 (PORT 1):

see p.12, No. 18)

(SATAII_3 (PORT 2):

see p.12, No. 17)

(SATAII_4 (PORT 3):

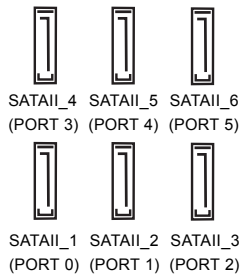
see p.12, No. 13)

(SATAII_5 (PORT 4):

see p.12, No. 12)

(SATAII_6 (PORT 5):

see p.12, No. 11)



These six Serial ATAII (SATAII) connectors support SATAII or SATA hard disk for internal storage devices. The current SATAII interface allows up to 3.0 Gb/s data transfer rate.

Serial ATA (SATA)

Data Cable

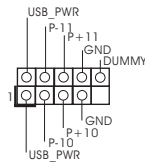
(Optional)



Either end of the SATA data cable can be connected to the SATA / SATAII hard disk or the SATAII connector on the motherboard.

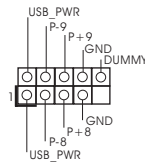
USB 2.0 Headers

(9-pin USB10_11)
(see p.12 No. 24)

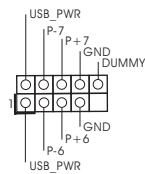


Besides six default USB 2.0 ports on the I/O panel, there are three USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

(9-pin USB8_9)
(see p.12 No. 23)

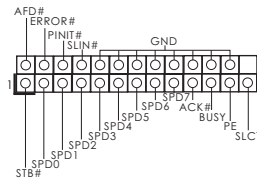


(9-pin USB6_7)
(see p.12 No. 21)



Print Port Header

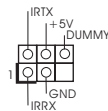
(25-pin LPT1)
(see p.12 No. 27)



This is an interface for print port cable that allows convenient connection of printer devices.

Infrared Module Header

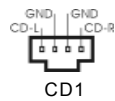
(5-pin IR1)
(see p.12 No. 26)



This header supports an optional wireless transmitting and receiving infrared module.

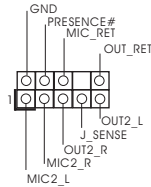
Internal Audio Connectors

(4-pin CD1)
(CD1: see p.12 No. 29)





This connector allows you to receive stereo audio input from sound sources such as a CD-ROM, DVD-ROM, TV tuner card, or MPEG card.

Front Panel Audio Header
 (9-pin HD_AUDIO1)
 (see p.12, No. 28)

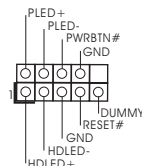


This is an interface for the front panel audio cable that allows convenient connection and control of audio devices.



1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC'97 audio panel, please install it to the front panel audio header as below:
 - A. Connect Mic_IN (MIC) to MIC2_L.
 - B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
 - C. Connect Ground (GND) to Ground (GND).
 - D. MIC_RET and OUT_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.
 - E. Enter BIOS Setup Utility. Enter Advanced Settings, and then select Chipset Configuration. Set the Front Panel Control option from [Auto] to [Enabled].
 - F. Enter Windows system. Click the icon on the lower right hand taskbar to enter Realtek HD Audio Manager.
 - For Windows® XP / XP 64-bit OS:
Click "Audio I/O", select "Connector Settings" , choose "Disable front panel jack detection", and save the change by clicking "OK".
 - For Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS:
Click the right-top "Folder" icon , choose "Disable front panel jack detection", and save the change by clicking "OK".
 - G. To activate the front mic.
 - For Windows® XP / XP 64-bit OS:
Please select "Front Mic" as default record device.
If you want to hear your voice through front mic, please deselect "Mute" icon in "Front Mic" of "Playback" portion.
 - For Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS:
Go to the "Front Mic" Tab in the Realtek Control panel.
Click "Set Default Device" to make the Front Mic as the default record device.

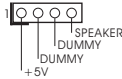
System Panel Header
 (9-pin PANEL1)
 (see p.12 No. 16)



This header accommodates several system front panel functions.

Chassis Speaker Header

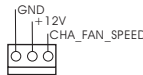
(4-pin SPEAKER 1)
(see p.12 No. 15)



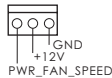
Please connect the chassis speaker to this header.

Chassis and Power Fan Connectors

(3-pin CHA_FAN1)
(see p.12 No. 20)



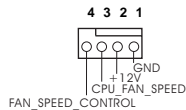
(3-pin PWR_FAN1)
(see p.12 No. 7)



Please connect the fan cables to the fan connectors and match the black wire to the ground pin.

CPU Fan Connector

(4-pin CPU_FAN1)
(see p.12 No. 6)



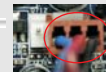
Please connect the CPU fan cable to this connector and match the black wire to the ground pin.



Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.

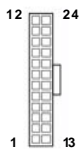
Pin 1-3 Connected

3-Pin Fan Installation



ATX Power Connector

(24-pin ATXPWR1)
(see p.12 No. 8)

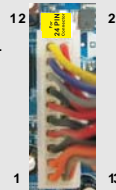


Please connect an ATX power supply to this connector.



Though this motherboard provides 24-pin ATX power connector, it can still work if you adopt a traditional 20-pin ATX power supply. To use the 20-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 13.

20-Pin ATX Power Supply Installation



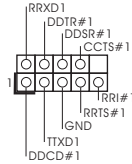
ATX 12V Power Connector

(4-pin ATX12V1)
(see p.12 No. 1)



Please note that it is necessary to connect a power supply with ATX 12V plug to this connector. Failing to do so will cause power up failure.

Serial port Header
(9-pin COM1)
(see p.12 No. 34)

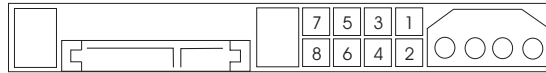


This COM1 header supports a serial port module.

2.9 SATAII Hard Disk Setup Guide

Before installing SATAII hard disk to your computer, please carefully read below SATAII hard disk setup guide. Some default setting of SATAII hard disks may not be at SATAII mode, which operate with the best performance. In order to enable SATAII function, please follow the below instruction with different vendors to correctly adjust your SATAII hard disk to SATAII mode in advance; otherwise, your SATAII hard disk may fail to run at SATAII mode.

Western Digital



If pin 5 and pin 6 are shorted, SATA 1.5Gb/s will be enabled.

On the other hand, if you want to enable SATAII 3.0Gb/s, please remove the jumpers from pin 5 and pin 6.

SAMSUNG



If pin 3 and pin 4 are shorted, SATA 1.5Gb/s will be enabled.

On the other hand, if you want to enable SATAII 3.0Gb/s, please remove the jumpers from pin 3 and pin 4.

HITACHI

Please use the Feature Tool, a DOS-bootable tool, for changing various ATA features. Please visit HITACHI's website for details:

<http://www.hitachigst.com/hdd/support/download.htm>



The above examples are just for your reference. For different SATAII hard disk products of different vendors, the jumper pin setting methods may not be the same. Please visit the vendors' website for the updates.

2.10 Serial ATA (SATA) / Serial ATAII (SATAII) Hard Disks Installation

This motherboard adopts AMD SB710 south bridge chipset that supports Serial ATA (SATA) / Serial ATAII (SATAII) hard disks and RAID (RAID 0, RAID 1, RAID 10 and JBOD) functions. You may install SATA / SATAII hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA / SATAII hard disks.

- STEP 1: Install the SATA / SATAII hard disks into the drive bays of your chassis.
- STEP 2: Connect the SATA power cable to the SATA / SATAII hard disk.
- STEP 3: Connect one end of the SATA data cable to the motherboard's SATAII connector.
- STEP 4: Connect the other end of the SATA data cable to the SATA / SATAII hard disk.



If you plan to use RAID 0 or RAID 1 function, you need to install at least 2 SATA / SATAII hard disks. If you plan to use RAID 10 function, you need to install 4 SATA / SATAII hard disks.

2.11 Hot Plug and Hot Swap Functions for SATA / SATAII HDDs

This motherboard supports Hot Plug and Hot Swap functions for SATA / SATAII Devices in RAID / AHCI mode. AMD SB710 south bridge chipset provides hardware support for Advanced Host controller Interface (AHCI), a new programming interface for SATA host controllers developed thru a joint industry effort. AHCI also provides usability enhancements such as Hot Plug.



NOTE

What is Hot Plug Function?

If the SATA / SATAII HDDs are NOT set for RAID configuration, it is called "Hot Plug" for the action to insert and remove the SATA / SATAII HDDs while the system is still power-on and in working condition. However, please note that it cannot perform Hot Plug if the OS has been installed into the SATA / SATAII HDD.

What is Hot Swap Function?

If SATA / SATAII HDDs are built as RAID 1 then it is called "Hot Swap" for the action to insert and remove the SATA / SATAII HDDs while the system is still power-on and in working condition.

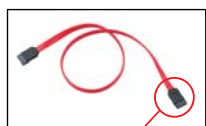
2.12 SATA / SATAII HDD Hot Plug Feature and Operation Guide

This motherboard supports Hot Plug feature for SATA / SATAII HDD in RAID / AHCI mode. Please read below operation guide of SATA / SATAII HDD Hot Plug feature carefully. Before you process the SATA / SATAII HDD Hot Plug, please check below cable accessories from the motherboard gift box pack.

A. 7-pin SATA data cable

B. SATA power cable with SATA 15-pin power connector interface

A. SATA data cable (Red)



SATA 7-pin connector

B. SATA power cable



The SATA 15-pin power connector (Black) connect to SATA / SATAII HDD

1x4-pin conventional power connector (White) connect to power supply

Caution

1. Without SATA 15-pin power connector interface, the SATA / SATAII Hot Plug cannot be processed.
2. Even some SATA / SATAII HDDs provide both SATA 15-pin power connector and IDE 1x4-pin conventional power connector interfaces, the IDE 1x4-pin conventional power connector interface is definitely not able to support Hot Plug and will cause the HDD damage and data loss.

Points of attention, before you process the Hot Plug:

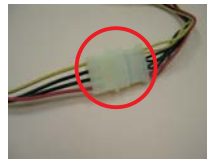
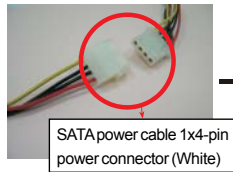
1. Below operation procedure is designed only for our motherboard, which supports SATA / SATAII HDD Hot Plug.
 - * The SATA / SATAII Hot Plug feature might not be supported by the chipset because of its limitation, the SATA / SATAII Hot Plug support information of our motherboard is indicated in the product spec on our website:
www.asrock.com
2. Make sure your SATA / SATAII HDD can support Hot Plug function from your dealer or HDD user manual. The SATA / SATAII HDD, which cannot support Hot Plug function, will be damaged under the Hot Plug operation.
3. Please make sure the SATA / SATAII driver is installed into system properly. The latest SATA / SATAII driver is available on our support website:
www.asrock.com
4. Make sure to use the SATA power cable & data cable, which are from our motherboard package.
5. Please follow below instructions step by step to reduce the risk of HDD crash or data loss.

How to Hot Plug a SATA / SATAII HDD:

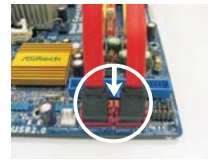
Points of attention, before you process the Hot Plug:

Please do follow below instruction sequence to process the Hot Plug, improper procedure will cause the SATA / SATAII HDD damage and data loss.

Step 1 Please connect SATA power cable 1x4-pin end (White) to the power supply 1x4-pin cable.



Step 2 Connect SATA data cable to the motherboard's SATAII connector.



Step 3 Connect SATA 15-pin power cable connector (Black) end to SATA / SATAII HDD.



Step 4 Connect SATA data cable to the SATA / SATAII HDD.



How to Hot Unplug a SATA / SATAII HDD:

Points of attention, before you process the Hot Unplug:

Please do follow below instruction sequence to process the Hot Unplug, improper procedure will cause the SATA / SATAII HDD damage and data loss.

Step 1 Unplug SATA data cable from SATA / SATAII HDD side.



Step 2 Unplug SATA 15-pin power cable connector (Black) from SATA / SATAII HDD side.



2.13 Driver Installation Guide

To install the drivers to your system, please insert the support CD to your optical drive first. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page. Please follow the order from up to bottom side to install those required drivers. Therefore, the drivers you install can work properly.

2.14 Installing Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit With RAID Functions

If you want to install Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit on a RAID disk composed of 2 or more SATA / SATAII HDDs with RAID functions, please follow below procedures according to the OS you install.

2.14.1 Installing Windows® XP / XP 64-bit With RAID Functions

If you want to install Windows® XP / XP 64-bit on a RAID disk composed of 2 or more SATA / SATAII HDDs with RAID functions, please follow below steps.

STEP 1: Set up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → Storage Configuration.
- B. Set the "SATA Operation Mode" option to [RAID].

STEP 2: Make a SATA / SATAII Driver Diskette.

- A. Insert the ASRock Support CD into your optical drive to boot your system.
- B. During POST at the beginning of system boot-up, press <F11> key, and then a window for boot devices selection appears. Please select CD-ROM as the boot device.
- C. When you see the message on the screen, "Generate Serial ATA driver diskette [YN]?", press <Y>.
- D. Then you will see these messages,
**Please insert a blank
formatted diskette into floppy
drive A:
press any key to start**
Please insert a floppy diskette into the floppy drive, and press any key.
- E. The system will start to format the floppy diskette and copy SATA / SATAII drivers into the floppy diskette.

STEP 3: Use “RAID Installation Guide” to set RAID configuration.

Before you start to configure RAID function, you need to check the RAID installation guide in the Support CD for proper configuration. Please refer to the BIOS RAID installation guide part of the document in the following path in the Support CD:

.. \ RAID Installation Guide

STEP 4: Install Windows® XP / XP 64-bit OS on your system.

After step 1, 2, 3, you can start to install Windows® XP / XP 64-bit OS on your system. At the beginning of Windows® setup, press F6 to install a third-party RAID driver. When prompted, insert the SATA / SATAII driver diskette containing the AMD RAID driver. After reading the floppy disk, the driver will be presented. Select the driver to install according to the OS you install. (Select “AMD AHCI Compatible RAID Controller-x86 platform” for Windows® XP, or “AMD AHCI Compatible RAID Controller-x64 platform” for Windows® XP 64-bit.)

NOTE. If you install Windows® XP / XP 64-bit on IDE HDDs and want to manage (create, convert, delete, or rebuild) RAID functions on SATA / SATAII HDDs, you still need to set up “SATA Operation Mode” to [RAID] first. Then, please set the RAID configuration by using the Windows RAID installation guide in the following path in the Support CD:
.. \ RAID Installation Guide

2.14.2 Installing Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit With RAID Functions

If you want to install Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit on a RAID disk composed of 2 or more SATA / SATAII HDDs with RAID functions, please follow below steps.

STEP 1: Set up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → Storage Configuration.
- B. Set the “SATA Operation Mode” option to [RAID].

STEP 2: Use “RAID Installation Guide” to set RAID configuration.

Before you start to configure RAID function, you need to check the RAID installation guide in the Support CD for proper configuration. Please refer to the BIOS RAID installation guide part of the document in the following path in the Support CD:

.. \ RAID Installation Guide

STEP 3: Install Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.

NOTE1. If you install Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit on IDE HDDs and want to manage (create, convert, delete, or rebuild) RAID functions on SATA / SATAII HDDs, you still need to set up “SATA Operation Mode” to [RAID] in BIOS first. Then, please set the RAID configuration by using the Windows RAID installation guide in the following path in the Support CD:

.. \RAID Installation Guide

NOTE2. Currently, if you install Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit on IDE HDDs and there are no SATA / SATAII device used, please set up “SATA Operation Mode” to [IDE] in BIOS.

2.15 Installing Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit Without RAID Functions

If you want to install Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit OS on your SATA / SATAII HDDs without RAID functions, please follow below procedures according to the OS you install.

2.15.1 Installing Windows® XP / XP 64-bit Without RAID Functions

If you want to install Windows® XP / XP 64-bit on your SATA / SATAII HDDs without RAID functions, please follow below steps.

Using SATA / SATAII HDDs with NCQ and Hot Plug functions (AHCI mode)

STEP 1: Set Up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → Storage Configuration.
- B. Set the “SATA Operation Mode” option to [AHCI].

STEP 4: Install Windows® XP / XP 64-bit OS on your system.

You can start to install Windows® XP / XP 64-bit OS on your system. At the beginning of Windows® setup, press F6 to install a third-party AHCI driver. When prompted, insert the SATA / SATAII driver diskette containing the AMD AHCI driver. After reading the floppy disk, the driver will be presented. Select the driver to install according to the OS you install. (Select “AMD AHCI Compatible RAID Controller-x86 platform” for Windows® XP, or “AMD AHCI Compatible RAID Controller-x64 platform” for Windows® XP 64-bit.)

Using SATA / SATAII HDDs without NCQ and Hot Plug functions (IDE mode)

STEP 1: Set up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → Storage Configuration.
- B. Set the “SATA Operation Mode” option to [IDE].

STEP 2: Install Windows® XP / XP 64-bit OS on your system.

2.15.2 Installing Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit Without RAID Functions

If you want to install Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit on your SATA / SATAII HDDs without RAID functions, please follow below steps.

Using SATA / SATAII HDDs with NCQ and Hot Plug functions (AHCI mode)

STEP 1: Set Up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → Storage Configuration.
- B. Set the “SATA Operation Mode” option to [AHCI].

STEP 2: Install Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.

Using SATA / SATAII HDDs without NCQ and Hot Plug functions (IDE mode)

STEP 1: Set up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → Storage Configuration.
- B. Set the “SATA Operation Mode” option to [IDE].

STEP 2: Install Windows® 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.

2.16 Untied Overclocking Technology

This motherboard supports Untied Overclocking Technology, which means during overclocking, FSB enjoys better margin due to fixed PCI / PCIE buses. Before you enable Untied Overclocking function, please enter "Overclock Mode" option of BIOS setup to set the selection from [Auto] to [CPU, PCIE, Async.]. Therefore, CPU FSB is untied during overclocking, but PCI / PCIE buses are in the fixed mode so that FSB can operate under a more stable overclocking environment.



Please refer to the warning on page 8 for the possible overclocking risk before you apply Untied Overclocking Technology.

3. BIOS SETUP UTILITY

3.1 Introduction

This section explains how to use the BIOS SETUP UTILITY to configure your system. The SPI Memory on the motherboard stores the BIOS SETUP UTILITY. You may run the BIOS SETUP UTILITY when you start up the computer. Please press <F2> or during the Power-On-Self-Test (POST) to enter the BIOS SETUP UTILITY, otherwise, POST will continue with its test routines.

If you wish to enter the BIOS SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.



Because the BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

3.1.1 BIOS Menu Bar

The top of the screen has a menu bar with the following selections:

- Main** To set up the system time/date information
- OC Tweaker** To set up overclocking features
- Advanced** To set up the advanced BIOS features
- H/W Monitor** To display current hardware status
- Boot** To set up the default system device to locate and load the Operating System
- Security** To set up the security features
- Exit** To exit the current screen or the BIOS SETUP UTILITY

Use <←> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen.

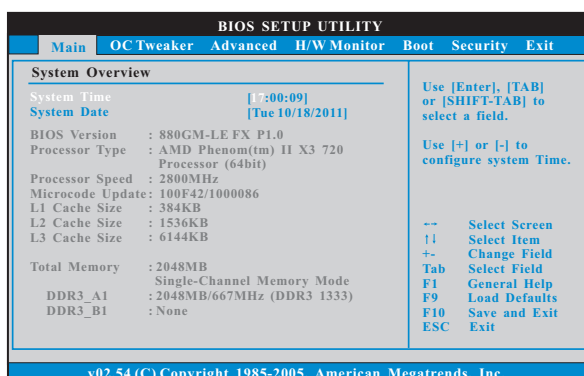
3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F9>	To load optimal default values for all the settings
<F10>	To save changes and exit the BIOS SETUP UTILITY
<ESC>	To jump to the Exit Screen or exit the current screen

3.2 Main Screen

When you enter the BIOS SETUP UTILITY, the Main screen will appear and display the system overview.



System Time [Hour:Minute:Second]

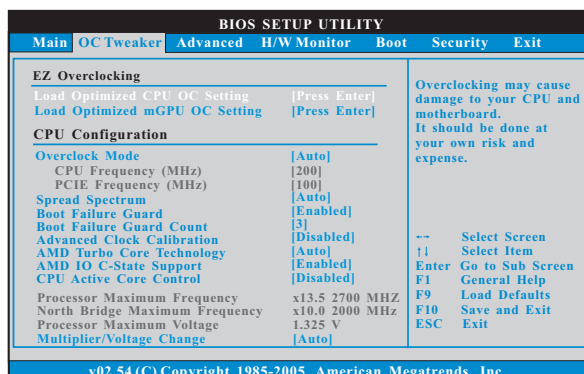
Use this item to specify the system time.

System Date [Day Month/Date/Year]

Use this item to specify the system date.

3.3 OC Tweaker Screen

In the OC Tweaker screen, you can set up overclocking features.



EZ Overclocking

Load Optimized CPU OC Setting

You can use this option to load the optimized CPU overclocking setting.

Please note that overclocking may cause damage to your CPU and motherboard. It should be done at your own risk and expense.

Load Optimized mGPU OC Setting

You can use this option to load mGPU overclocking setting. Please note that overcloing may cause damage to your mGPU and motherboard. It should be done at your own risk and expense.

CPU Configuration

Overclock Mode

Use this to select Overclock Mode. The default value is [Auto]. Configuration options: [Auto], [CPU, PCIE, Sync.], [CPU, PCIE, Async.] and [Optimized].

CPU Frequency (MHz)

Use this option to adjust CPU frequency.

PCIE Frequency (MHz)

Use this option to adjust PCIE frequency.

Spread Spectrum

This item should always be [Auto] for better system stability.

Boot Failure Guard

Enable or disable the feature of Boot Failure Guard.

Boot Failure Guard Count

Enable or disable the feature of Boot Failure Guard Count.

Advanced Clock Calibration

This allows you to adjust Advanced Clock Calibration feature. The default value is [Disabled]. Configuration options: [Disabled], [Auto], [All Cores] and [Per Core]. If you select [All Cores], you will see the option "Value (All Cores)". Configuration options: [+12%] to [-12%]. If you select [Per Core], you will see the options "Value (Core 0)", "Value (Core 1)", "Value (Core 2)" and "Value (Core 3)". Configuration options: [+12%] to [-12%].

AMD Turbo Core Technology

This item appears only when the processor you adopt supports this feature. Use this to select enable or disable AMD Turbo Core Technology. Configuration options: [Auto] and [Disabled]. The default value is [Auto].

AMD IO C-State Support

This allows you to enable or disable AMD IO C-State Support. The default value is [Enabled].

CPU Active Core Control

This allows you to adjust CPU Active Core Control feature. The configuration options depend on the CPU core you adopt. The default value is [All Cores].

Processor Maximum Frequency

It will display Processor Maximum Frequency for reference.

North Bridge Maximum Frequency

It will display North Bridge Maximum Frequency for reference.

Processor Maximum Voltage

It will display Processor Maximum Voltage for reference.

Multiplier/Voltage Change

This item is set to [Auto] by default. If it is set to [Manual], you may adjust the value of Processor Frequency and Processor Voltage. However, it is recommended to keep the default value for system stability.

BIOS SETUP UTILITY		
Main	OC Tweaker	Advanced H/W Monitor Boot Security Exit
EZ Overclocking		
Load Optimized CPU OC Setting	[Press Enter]	Overclocking may cause damage to your CPU and motherboard. It should be done at your own risk and expense.
Load Optimized mGPU OC Setting	[Press Enter]	
CPU Configuration		
Overclock Mode	[Auto]	
CPU Frequency (MHz)	[200]	
PCIE Frequency (MHz)	[Auto]	
Spread Spectrum	[Auto]	
Boot Failure Guard	[Enabled]	
Boot Failure Guard Count	[3]	
Advanced Clock Calibration	[Disabled]	-- Select Screen
AMD Turbo Core Technology	[Auto]	↑ Select Item
AMD IO C-State Support	[Enabled]	Enter Go to Sub Screen
CPU Active Core Control	[Disabled]	F1 General Help
Processor Maximum Frequency	x13.5 2700 MHz	F9 Load Defaults
North Bridge Maximum Frequency	x10.0 2000 MHz	F10 Save and Exit
Processor Maximum Voltage	1.325 V	ESC Exit
Multiplier/Voltage Change	[Manual]	

CPU Frequency Multiplier

For safety and system stability, it is not recommended to adjust the value of this item.

Processor Voltage

It allows you to adjust the value of processor voltage. However, for safety and system stability, it is not recommended to adjust the value of this item.

NB Frequency Multiplier

For safety and system stability, it is not recommended to adjust the value of this item.

HT Bus Speed

This feature allows you selecting Hyper-Transport bus speed. Configuration options: [Auto], [x1 200MHz] to [x8 1600MHz].

HT Bus Width

This feature allows you selecting Hyper-Transport bus width. Configuration options: [Auto], [8 Bit] and [16 Bit].

Memory Configuration

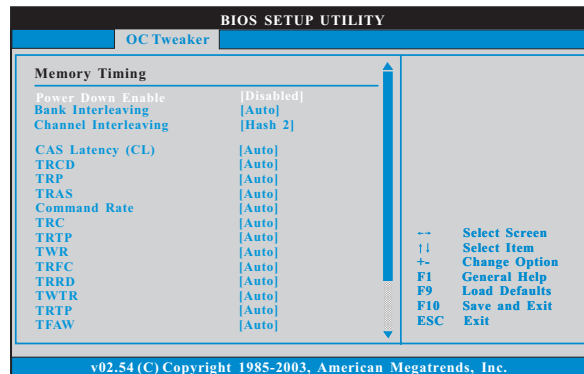
Memory Clock

This item can be set by the code using [Auto]. You can set one of the standard values as listed: [400MHz DDR3_800], [533MHz DDR3_1066], [667MHz DDR3_1333] and [800MHz DDR3_1600].

DRAM Voltage

Use this to select DRAM voltage. The default value is [Auto].

Memory Timing



Power Down Enable

Use this item to enable or disable DDR power down mode.

Bank Interleaving

Interleaving allows memory accesses to be spread out over banks on the same node, or across nodes, decreasing access contention.

Channel Interleaving

It allows you to enable Channel Memory Interleaving. Configuration options: [Disabled], [Address bits 6], [Address bits 12], [HASH 1] and [HASH 2]. The default value is [HASH 2].

CAS Latency (CL)

Use this item to adjust the means of memory accessing. The default value is [Auto].

TRCD

Use this to adjust TRCD values. The default value is [Auto].

TRP

Use this to adjust TRP values. The default value is [Auto].

TRAS

Use this to adjust TRAS values. The default value is [Auto].

Command Rate

Use this item to change Command Rate Auto/Manual setting. Min: 1N. Max: 2N. The default is [Auto].

TRC

Use this to adjust TRC values. The default value is [Auto].

TRTP

Use this to adjust TRTP values. The default value is [Auto].

TWR

Use this to adjust TWR values. The default value is [Auto].

TRFC

Use this to adjust TRFC values. The default value is [Auto].

TRRD

Use this to adjust TRRD values. The default value is [Auto].

TWTR

Use this to adjust TWTR values. The default value is [Auto].

TRTP

Use this to adjust TRTP values. The default value is [Auto].

TFAW

Use this to adjust TFAW values. The default value is [Auto].

Chipset Settings

Onboard GPU Clock Override

This allows you to enable or disable the Onboard GPU Clock Override feature.

Onboard GPU Clock

This option only appears when you enable "Onboard GPU Clock Override". The default value is [560].

mGPU Voltage

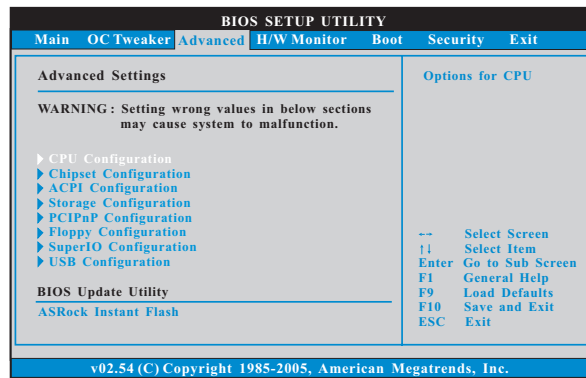
Use this to select mGPU voltage. The default value is [Auto].

Would you like to save current setting user defaults?

In this option, you are allowed to load and save three user defaults according to your own requirements.

3.4 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, ACPI Configuration, Storage Configuration, PCIPnP Configuration, Floppy Configuration, SuperIO Configuration, and USB Configuration.

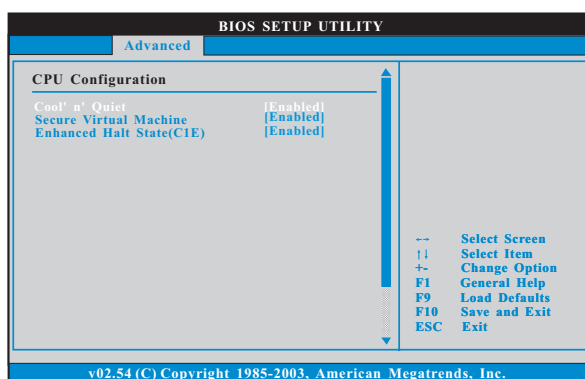


Setting wrong values in this section may cause the system to malfunction.

ASRock Instant Flash

ASRock Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows®. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute ASRock Instant Flash utility, the utility will show the BIOS files and their respective information. Select the proper BIOS file to update your BIOS, and reboot your system after BIOS update process completes.

3.4.1 CPU Configuration



Cool 'n' Quiet

Use this item to enable or disable AMD's Cool 'n' Quiet™ technology. The default value is [Enabled]. Configuration options: [Auto], [Enabled] and [Disabled]. If you install Windows® 8 / 7 / Vista™ and want to enable this function, please set this item to [Enabled]. Please note that enabling this function may reduce CPU voltage and memory frequency, and lead to system stability or compatibility issue with some memory modules or power supplies. Please set this item to [Disable] if above issue occurs.

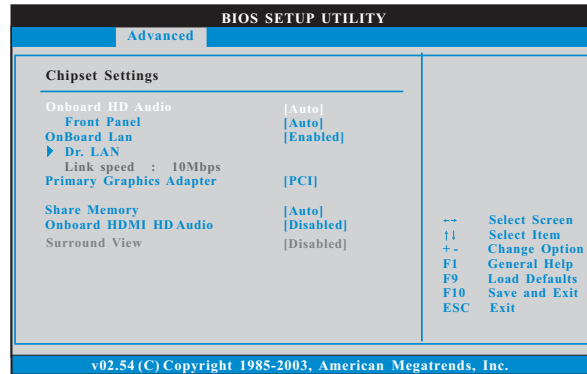
Secure Virtual Machine

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by AMD-V. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled].

Enhance Halt State (C1E)

All processors support the Halt State (C1). The C1 state is supported through the native processor instructions HLT and MWAIT and requires no hardware support from the chipset. In the C1 power state, the processor maintains the context of the system caches.

3.4.2 Chipset Configuration



Onboard HD Audio

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

Front Panel

Select [Auto] or [Disabled] for the onboard HD Audio Front Panel.

OnBoard Lan

This allows you to enable or disable the onboard Lan feature.

Dr. LAN

This allows you to select "LAN Cable Detection" function.

Primary Graphics Adapter

This item will switch the PCI Bus scanning order while searching for video card. It allows you to select the type of Primary VGA in case of multiple video controllers. The default value of this feature is [PCI]. Configuration options: [PCI], [Onboard] and [PCI Express].

Share Memory

This allows you to set share memory feature. The default value is [Auto]. Configuration options: [Auto], [32MB], [64MB], [128MB], [256MB] and [512MB].

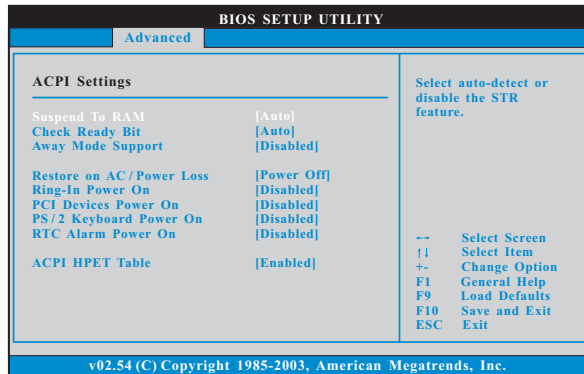
Onboard HDMI HD Audio

This allows you to enable or disable the onboard HDMI HD Audio in AMD 880G.

Surround View

This allows you to enable or disable the Surround View feature or Hybrid CrossFireX™ feature.

3.4.3 ACPI Configuration



Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it.

Check Ready Bit

Use this item to enable or disable the feature Check Ready Bit.

Away Mode Support

Use this item to enable or disable Away Mode support under Windows® XP Media Center OS. The default value is [Disabled].

Restore on AC/Power Loss

This allows you to set the power state after an unexpected AC/power loss. If [Power Off] is selected, the AC/power remains off when the power recovers. If [Power On] is selected, the AC/power resumes and the system starts to boot up when the power recovers.

Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

PCI Devices Power On

Use this item to enable or disable PCI devices to turn on the system from the power-soft-off mode.

PS/2 Keyboard Power On

Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

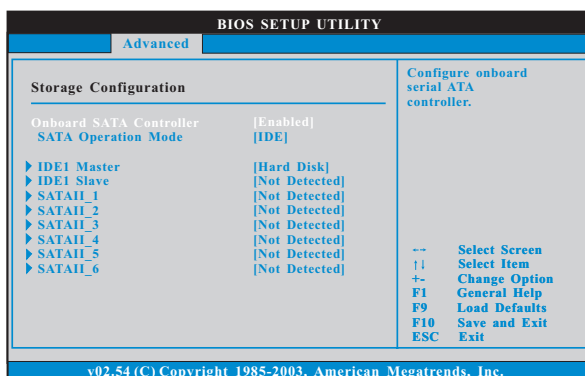
RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

ACPI HPET Table

Use this item to enable or disable ACPI HPET Table. The default value is [Disabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® Vista™ certification.

3.4.4 Storage Configuration



Onboard SATA Controller

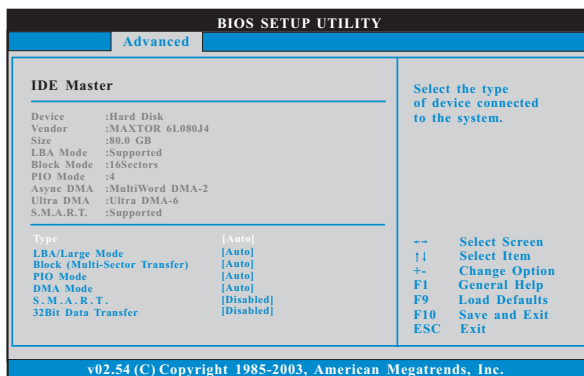
Use this item to enable or disable the “Onboard SATA Controller” feature.

SATA Operation Mode

Use this item to adjust SATA Operation Mode. The default value of this option is [IDE]. If you want to operate RAID function on SATA/ SATAII HDDs, please select [RAID]. Configuration options: [AHCI], [RAID] and [IDE].

IDE Device Configuration

You may set the IDE configuration for the device that you specify. We will use the “IDE1 Master” as the example in the following instruction, which can be applied to the configurations of “IDE1 Slave” as well.



TYPE

Use this item to configure the type of the IDE device that you specify.
Configuration options: [Not Installed], [Auto], [CD/DVD], and [ARMD].

[Not Installed]: Select [Not Installed] to disable the use of IDE device.

[Auto]: Select [Auto] to automatically detect the hard disk drive.



After selecting the hard disk information into BIOS, use a disk utility, such as FDISK, to partition and format the new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to active.

[CD/DVD]: This is used for IDE CD/DVD drives.

[ARMD]: This is used for IDE ARMD (ATAPI Removable Media Device), such as MO.

LBA/Large Mode

Use this item to select the LBA/Large mode for a hard disk > 512 MB under DOS and Windows; for Netware and UNIX user, select [Disabled] to disable the LBA/Large mode.

Block (Multi-Sector Transfer)

The default value of this item is [Auto]. If this feature is enabled, it will enhance hard disk performance by reading or writing more data during each transfer.

PIO Mode

Use this item to set the PIO mode to enhance hard disk performance by optimizing the hard disk timing.

DMA Mode

DMA capability allows the improved transfer-speed and data-integrity for compatible IDE devices.

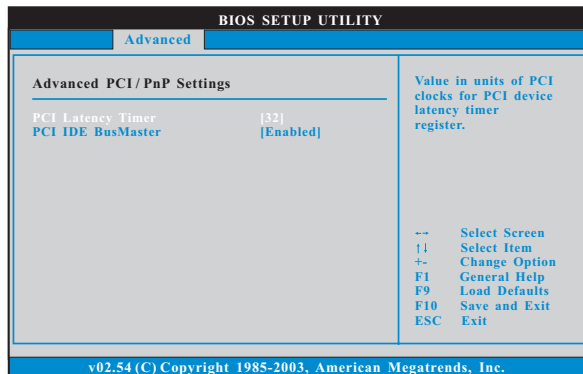
S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled], [Auto], [Enabled].

32Bit Data Transfer

Use this item to enable 32-bit access to maximize the IDE hard disk data transfer rate.

3.4.5 PCIPnP Configuration



Setting wrong values in this section may cause the system to malfunction.

PCI Latency Timer

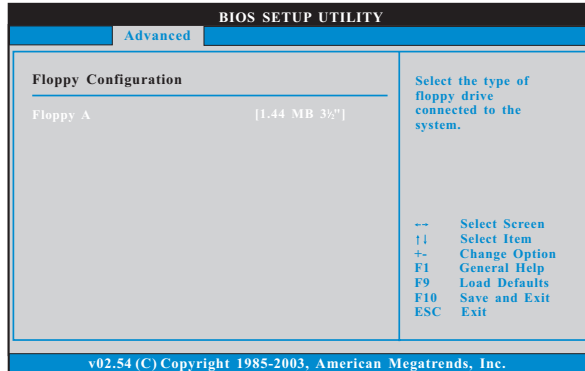
The default value is 32. It is recommended to keep the default value unless the installed PCI expansion cards' specifications require other settings.

PCI IDE BusMaster

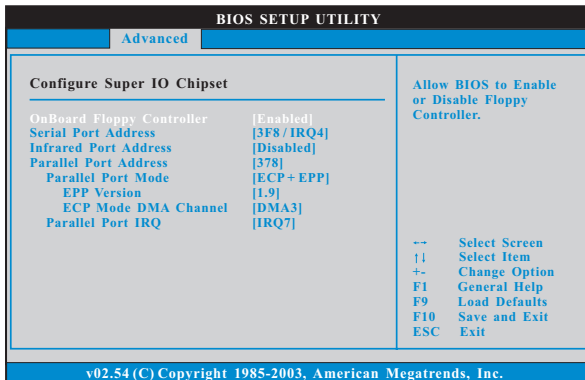
Use this item to enable or disable the PCI IDE BusMaster feature.

3.4.6 Floppy Configuration

In this section, you may configure the type of your floppy drive.



3.4.7 Super IO Configuration



OnBoard Floppy Controller

Use this item to enable or disable floppy drive controller.

Serial Port Address

Use this item to set the address for the onboard serial port or disable it.

Configuration options: [Disabled], [3F8 / IRQ4], [2F8 / IRQ3], [3E8 / IRQ4], [2E8 / IRQ3].

Infrared Port Address

Use this item to set the address for the onboard infrared port or disable it.

Configuration options: [Disabled], [2F8 / IRQ3], and [2E8 / IRQ3].

Parallel Port Address

Use this item to set the address for the onboard parallel port or disable it. Configuration options: [Disabled], [378], and [278].

Parallel Port Mode

Use this item to set the operation mode of the parallel port. The default value is [ECP+EPP]. If this option is set to [ECP+EPP], it will show the EPP version in the following item, "EPP Version". Configuration options: [Normal], [Bi-Directional], and [ECP+EPP].

EPP Version

Use this item to set the EPP version. Configuration options: [1.9] and [1.7].

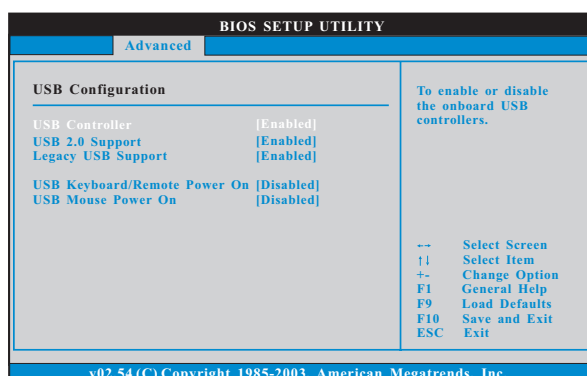
ECP Mode DMA Channel

Use this item to set the ECP mode DMA channel. Configuration options: [DMA0], [DMA1], and [DMA3].

Parallel Port IRQ

Use this item to set the IRQ for the parallel port. Configuration options: [IRQ5] and [IRQ7].

3.4.8 USB Configuration



USB Controller

Use this item to enable or disable the use of USB controller.

USB 2.0 Support

Use this item to enable or disable the USB 2.0 support.

Legacy USB Support

Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto], [Disabled] and [BIOS Setup Only]. The default value is [Enabled]. Please refer to below descriptions for the details of these four options:

[Enabled] - Enables support for legacy USB.

[Auto] - Enables legacy support if USB devices are connected.

[Disabled] - USB devices are not allowed to use under legacy OS and BIOS setup when [Disabled] is selected. If you have USB compatibility issue, it is recommended to select [Disabled] to enter OS.

[BIOS Setup Only] - USB devices are allowed to use only under BIOS setup and Windows / Linux OS.

USB Keyboard/Remote Power On

Use this item to enable or disable USB Keyboard/Remote Power On on the system.

USB Mouse Power On

Use this item to enable or disable USB Mouse Power On on the system.

3.5 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.

BIOS SETUP UTILITY						
Main	OC Tweaker	Advanced	H/W Monitor	Boot	Security	Exit
Hardware Health Event Monitoring			Enable/Disable CPU Quiet Fan Function.			
CPU Temperature	:	37°C / 98°F				
M/B Temperature	:	27°C / 80°F				
CPU Fan Speed	:	4722 RPM				
Chassis Fan Speed	:	N/A				
Power Fan Speed	:	N/A				
Vcore	:	1.216V	--	Select Screen		
+ 3.30V	:	3.248V	F1	Select Item		
+ 5.00V	:	5.136V	F1	General Help		
+ 12.00V	:	12.091V	F9	Load Defaults		
CPU Quiet Fan	:	[Disabled]	F10	Save and Exit		
			ESC	Exit		
v02.54 (C) Copyright 1985-2003, American Megatrends, Inc.						

CPU Quiet Fan

This item allows you to identify the temperature of CPU fan. If you set this option as [Disabled], the CPU fan will operate in full speed. If you set this option as [Enabled], you will find the items "Target CPU Temperature" and "Target Fan Speed" appear to allow you adjusting them. The default value is [Disabled]. You are allowed to enable this function only when you install 4-pin CPU fan.

Target CPU Temperature

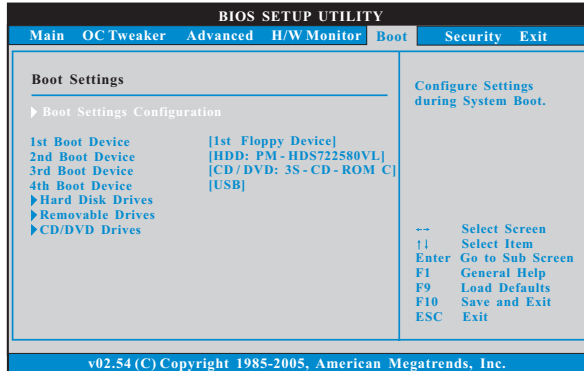
The target temperature will be between 45° C/113° F and 65° C/149° F. The default value is [50° C/122° F].

Target Fan Speed

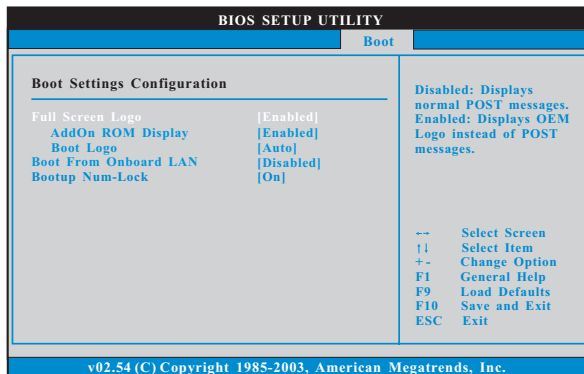
Use this option to set the target fan speed. You can freely adjust the target fan speed according to the target CPU temperature that you choose. Configuration options: [Level 1], [Level 2], [Level 3], [Level 4], [Level 5], [Level 6] [Level 7], [Level 8] and [Level 9].

3.6 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



3.6.1 Boot Settings Configuration



Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

AddOn ROM Display

Use this option to adjust AddOn ROM Display. If you enable the option "Full Screen Logo" but you want to see the AddOn ROM information when the system boots, please select [Enabled]. Configuration options: [Enabled] and [Disabled]. The default value is [Enabled].

Boot Logo

Use this option to select logo in POST screen. This option only appears when you enable the option "Full Screen Logo". Configuration options: [Auto], [EuP], [Scenery] and [ASRock]. The default value is [Auto].

Boot From Onboard LAN

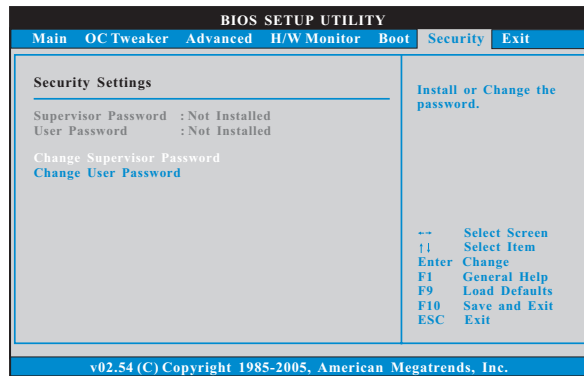
Use this item to enable or disable the Boot From Onboard LAN feature.

Boot Up Num-Lock

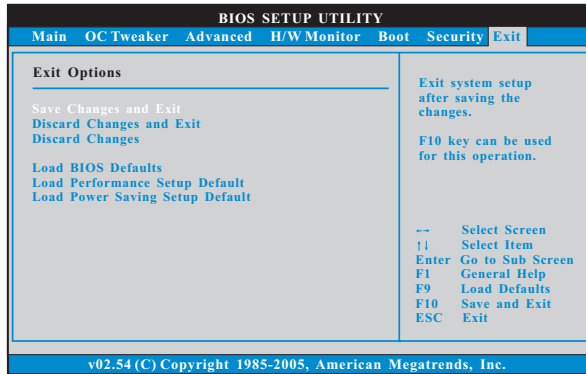
If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

3.7 Security Screen

In this section, you may set or change the supervisor/user password for the system. For the user password, you may also clear it.



3.8 Exit Screen



Save Changes and Exit

When you select this option, it will pop-out the following message, "Save configuration changes and exit setup?" Select [OK] to save the changes and exit the BIOS SETUP UTILITY.

Discard Changes and Exit

When you select this option, it will pop-out the following message, "Discard changes and exit setup?" Select [OK] to exit the BIOS SETUP UTILITY without saving any changes.

Discard Changes

When you select this option, it will pop-out the following message, "Discard changes?" Select [OK] to discard all changes.

Load BIOS Defaults

Load BIOS default values for all the setup questions. F9 key can be used for this operation.

Load Performance Setup Default

This performance setup default may not be compatible with all system configurations. If system boot failure occurs after loading, please resume optimal default settings. F5 key can be used for this operation.

Load Power Saving Setup Default

Load power saving setup default. F6 key can be used for this operation.

4. Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® operating systems: 8 / 8 64-bit / 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP Media Center / XP 64-bit. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

4.2 Support CD Information

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

4.2.1 Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu did not appear automatically, locate and double click on the file "ASSETUP.EXE" from the BIN folder in the Support CD to display the menus.

4.2.2 Drivers Menu

The Drivers Menu shows the available devices drivers if the system detects the installed devices. Please install the necessary drivers to activate the devices.

4.2.3 Utilities Menu

The Utilities Menu shows the applications software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

4.2.4 Contact Information

If you need to contact ASRock or want to know more about ASRock, welcome to visit ASRock's website at <http://www.asrock.com>; or you may contact your dealer for further information.