

## Frequently Asked Questions



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## 1 Thermal Questions

### 1.1 Does AMD recommend the use of heatsinks for their range of processors?

Yes.

AMD Athlon™ and AMD Duron™ processors should **NEVER** be operated without a heatsink, even for a few seconds. Doing so will cause the processor to overheat and fail immediately, resulting in permanent damage. Never boot an AMD Athlon or AMD Duron processor without a heatsink and fan installed.

To help you select a thermal solution for your system, AMD provides a list of heatsinks that have been evaluated and recommended for use with AMD processors.

For the list of heatsinks recommended for AMD Processors please visit the AMD website at the following links.

AMD Athlon: <http://www.amd.com/AthlonHardware>

AMD Athlon XP: <http://www.amd.com/AthlonXPHardware>

AMD Athlon MP: <http://www.amd.com/AthlonMPHardware>

AMD Duron: <http://www.amd.com/DuronHardware>

**Note:** The list is not intended to show a comprehensive listing for all heatsinks that support AMD processors.

In addition we have created a video that shows you how to install a processor and heatsink. You can download the video here:

[http://www.amd.com/gb-uk/Support/0,,238\\_251\\_6244,00.html](http://www.amd.com/gb-uk/Support/0,,238_251_6244,00.html)

### 1.2 Does AMD have a heatsink installation guide?

Yes. We have compiled an installation document that goes through the heatsink installation process in a methodical manner. We also have a "AMD Thermal, Mechanical, and Chassis Cooling Design Guide," both of which can be found on our website:

[http://www.amd.com/gb-uk/Processors/ProductInformation/0,,30\\_118\\_756\\_3734^4348^1065,00.html](http://www.amd.com/gb-uk/Processors/ProductInformation/0,,30_118_756_3734^4348^1065,00.html)

**IMPORTANT:** We highly recommend that you read the installation guide. This guide will provide you with useful technical information that will help you to build a professional system.

In addition we offer a video that shows you how to install a processor and heatsink. You can download the video here:

[http://www.amd.com/gb-uk/Support/0,,238\\_251\\_6244,00.html](http://www.amd.com/gb-uk/Support/0,,238_251_6244,00.html)

**Note:** Improper installation of your heatsink will lead to failure of your AMD processor and void your warranty.

### 1.3 What is the maximum operating temperature for my AMD processor?

The maximum operating temperature of an AMD processor is determined by the processor's Ordering Part Number (OPN). The OPN is located on the top of the processor.

**Example: A X1800 D M S 3 C**

The temperature is indicated by the third character from the right in the OPN and is denoted by an S, T or V character. Current data for the AMD Athlon™ XP processor identifies the maximum operating temperature as: **V=85°C, T= 90°C, S = 95°C.**

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#### 1.4 What is the normal operating temperature of my AMD processor?

The operating temperature of a system or processor is highly dependent on the characteristics of the system as a whole and the combination of components that make up the system. Consequently, the "normal" operating temperature will vary from system to system, depending on each system's make-up. Some of the variables that affect the operating temperature of a system are: case size, air flow characteristics, installed components, processor speed, processor heatsink/fan solution, thermal interface material, power supply, voltage settings, workload, and ambient air temperature.

**An approximation to the typical reading from a BIOS or an external software utility is expected to be around 60°C-65°C or lower.**

Although "normal" operating temperatures are not specified for AMD processors, there are maximum operating temperature ratings that must not be exceeded. The maximum operating temperature of a processor may be determined by the processor's Ordering Part Number (OPN), see also: [What Is The Maximum Operating Temperature For My AMD Processor?](#).

**Note:** The maximum operating temperature specification is based on a measurement taken directly from the top center of the processor die. The temperature reported by a system's BIOS might not reflect the true temperature of the processor if the measurement is taken from an alternative location. Additionally, the reported temperature will be affected by the accuracy of the thermal probe, hardware monitor, and analog to digital signal conversion. As a result, some variance should be allowed when comparing the maximum operating temperature to the temperature reported by the system's BIOS.

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## 2 Hardware Questions

#### 2.1 Can I install an AMD Athlon™ XP processor in a dual processor motherboard?

The use of an AMD processor other than an AMD Athlon™ MP processor in a multiprocessor motherboard is not recommended. Only AMD Athlon MP processors have been designed to work with dual processor support motherboards featuring the AMD multiprocessor chipset. AMD has not tested a desktop, mobile AMD Athlon 4, mobile AMD Athlon XP or AMD Duron processor in a multiprocessor system. AMD will not provide technical support for AMD processors for Uni-Processor-Systems used in such a configuration.

#### 2.2 Does my motherboard support an AMD processor?

For a list of recommended motherboards that support the AMD processors please refer to the AMD processor recommended motherboard list available from the AMD Website.

To view these lists, please use the following link:

AMD Athlon™: <http://www.amd.com/AthlonHardware>  
AMD Athlon XP: <http://www.amd.com/AthlonXPHardware>  
AMD Athlon MP: <http://www.amd.com/AthlonMPHardware>  
AMD Duron™: <http://www.amd.com/DuronHardware>

#### 2.3 What do I need to consider when installing an AMD Athlon™ XP processor based on the 0.13 micron technology in my old motherboard?

Before installing a new processor please make sure that the motherboard and/or BIOS settings for processor detection (multiplier and voltage) are set to auto detect. Manually setting these

values might lead to operating the processor outside datasheet specifications, voiding the processor warranty, and perhaps in the destruction of the CPU.

If your processor is not detected correctly, please check with the manufacturer of the motherboard for a BIOS update that correctly identifies the AMD Athlon™ XP processor.

**NOTE:** Always follow the motherboard manufacturers guide carefully when upgrading your BIOS.

## 2.4 How do I know what System-Bus speed my processor supports?

AMD Athlon™ XP and AMD Athlon MP processors support a System-Bus of 266MHz, 333MHz or 400MHz. In general the last letter of the OPN denominates the maximum System-Bus speed; the letter B = 200 MHz, C = 266 MHz, D = 333 MHz and E = 400MHz. The frequencies shown are virtual frequencies and are the effect of transferring data twice per clock cycle instead of once per cycle (called DDR technology). As such, motherboard manufacturers may specify the base frequency, which is 100MHz, 133MHz, 166MHz and 200MHz respectively instead of this virtual frequency.

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## 2.5 What type of memory should I use with my AMD Athlon™ XP processor-based system?

Memory support is dependent on the chipset and the motherboard, not the processor. Consequently, it is best to follow the motherboard manufacturers' recommendations for compatible memory. There are several chipsets available for AMD Athlon™ processor-based systems supporting various memory types. For example, motherboards that utilize the AMD-760™ chipset may require PC1600, PC2100 or PC2700 DDR memory. Additional chipsets from companies such as VIA, ALI, SIS, and NVIDIA may have different memory requirements. Also, some motherboards may require particular brands or types of memory for optimal performance. As a result, it is best to obtain memory compatibility information from the motherboard manufacturer.

## 3 Software Questions

### 3.1 I have upgraded my current system with an AMD Athlon™ XP processor. Do I have to reinstall the operating system (OS) in order to optimise it to run on the AMD Athlon™ XP processor?

This depends on the operating system. So for some OS's yes, for optimum performance you should re-install the operating system to take advantage of the full features of the AMD Athlon™ XP processor. For further details, please visit the operating system manufacturers web page.

### 3.2 Will my favorite software work with the AMD Athlon™ and AMD Duron™ processors?

AMD Athlon™, AMD Athlon XP and AMD Duron™ processors are all based on the AMD Athlon processor architecture that is designed to work with more than 60,000 software packages i.e. current Microsoft Windows operating systems such as Windows 98/ME, Windows 2000, Windows XP, as well as other leading operating systems such as Unix, Linux, OS/2 Warp, and Novell NetWare.

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### 3.3 How do I install an operating system on my AMD Athlon™ processor-based system?

Installing an operating system can be quite difficult if not done correctly. Many hours can be wasted trying to fix problems that could have easily been avoided. The following guidelines will give you the best opportunity for an easy, successful installation of your operating system.

Before installing the operating system, make sure that no more than the following components are properly installed:

- Motherboard
- Memory
- Processor, with heatsink and fan
- Video Card
- Mouse
- Monitor
- Keyboard
- CD-ROM drive
- Floppy drive with the proper cable
- Hard drive (just one) with proper cable

When loading an operating system, there are many items that the computer has to contend with. By starting with just the basics (the core components), the computer system will have less difficulties searching and attempting to configure multiple devices. If the operating system cannot be loaded with only the core components installed, then having other components in the system will not help, it will only mask the problems that are occurring.

Make sure you have all motherboard drivers that will be required for your specific brand and model motherboard. Without these drivers, your computer system may be unstable and will most likely give you numerous problems.

Make sure that your CD-ROM drive is operating correctly since some drives can experience damage during shipping. It is possible that the mechanism that reads the CD-ROM can be displaced or knocked from its normal position. If this happens, the results can range from not being able to read the CD-ROM disk to physically scoring and destroying it. Take the time to insert an old CD-ROM (an expendable one) to test the functionality of the CD-ROM drive. It should be able to retrieve an index (directory) of the contents. When you remove it from the drive tray, the back should be free of any marks.

During the installation of the operating system, you may be asked to "configure" the video card. Cancel this option, or set the video card to the most generic setting possible (Standard VGA is a good choice). Do not load the video card drivers at this point. Until you have completely loaded the operating system and applicable motherboard chipset drivers, loading video card drivers prematurely may result in an unsuccessful operating system installation or unstable operations.

After successfully loading the operating system, you are ready to install all of the appropriate motherboard chipset drivers that came with the motherboard. Remember that these drivers are constantly being reviewed and updated by the manufacturers, so check on the motherboard manufacturer's web site for new versions and updates. **Always** download applicable readme files along with driver updates. These files contain critical information needed to properly install the updated drivers.

After all motherboard drivers are installed, install the video card drivers. Follow the video card manufacturer's instructions.

Begin installing other peripherals and components, one at a time. Read all instructions and readme files before installing any component or accessory. A minute now could easily save an hour later.

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## 4 Troubleshooting Tips

### 4.1 How do I resolve system stability issues (lockups, blue screens, resets, etc)?

The cause of system stability issues can be very difficult to diagnose. There are many factors that can cause stability issues in a system from software conflicts to hardware failure. Consequently, pinpointing the problem can be a very time-consuming and challenging task. The following guidelines can make that task much more manageable, saving you time and effort in the process.

Lock-ups, resets, blue screens, as well as other symptoms, can often be traced to thermal issues. For optimal performance, use a heatsink solution evaluated and recommended by AMD. Always follow AMD instructions for proper installation. Improper installation could result in inadequate contact between the heatsink and processor die. A thermal interface material should always be used between the heatsink and processor.

Lists of recommended thermal solutions are available on the hardware pages for:

Athlon™: <http://www.amd.com/AthlonHardware>  
Athlon XP: <http://www.amd.com/AthlonXPHardware>  
Athlon MP: <http://www.amd.com/AthlonMPHardware>  
Duron™: <http://www.amd.com/DuronHardware>

Efficient heatsink solutions must conform to the heatsink design specifications as outlined in the "AMD Thermal, Mechanical, and Chassis Cooling Design Guide", which can be downloaded from the Technical Documents page ([http://www.amd.com/gb-uk/Processors/ProductInformation/0,,30\\_118\\_756\\_759^2983,00.html](http://www.amd.com/gb-uk/Processors/ProductInformation/0,,30_118_756_759^2983,00.html)) for the AMD Athlon Processor. We have also created a video that shows you how to install a processor and heatsink. You can download the video here: [http://www.amd.com/gb-uk/Support/0,,238\\_251\\_6244,00.html](http://www.amd.com/gb-uk/Support/0,,238_251_6244,00.html)

Incompatible or defective memory is a common cause of stability issues. Always follow the recommendations of the motherboard manufacturer, since memory compatibility is dependent on the motherboard and chipset. Contact the motherboard manufacturer to determine what types of memory are supported.

An outdated BIOS/driver can result in an unstable system. Consequently, the latest BIOS update and motherboard drivers from the motherboard manufacturer should be used. Many motherboards will not boot if a faster processor is installed until the BIOS update that supports the faster processor has been installed. The latest drivers for all components (i.e. video card, sound card, etc.) should be used as well. Drivers are usually available on the component manufacturer's web site.

If both the system's motherboard and processor are being upgraded, a clean installation on a reformatted hard drive (the partition with the operating system) should be performed. A hard drive with a preinstalled operating system may contain incorrect system information.

**NOTE:** Reformatting/Repartitioning will erase all data from the hard drive!

Make sure that the correct cables are being used. A mixture of high frequency signals and electronic radio signals surround the data cables inside the case. This could result in data

corruption, especially if the cables are long and the frequency of the signal is high. Many motherboards ship with UDMA 33 cables only. If a UDMA 66/100 hard drive is being used, a UDMA 66/100 cable must be used as well.

Initially configure the system as a bare-bone system (install only the motherboard, processor, one memory module, video card and necessary drives). Once the system is stable, add components one at a time. This will make it much easier to identify problem components and resolve any IRQ conflicts.

For optimal performance, use a high quality power supply that meets the characteristics of industry standard market power supplies. AMD processor-based systems typically utilize the industry standard ATX/ATX12V power supply specifications. Choose a power supply that adheres to these specifications. Power supplies that do not meet these specifications, such as electrical specifications (typical power distributions, timing requirements, efficiency, output protection, etc.), may cause stability problems or even system failure.

To help ensure reliable operation, use AMD recommended motherboards with the AMD Athlon, AMD Athlon XP and the AMD Duron processor. AMD evaluates motherboards using an internally developed suite of BIOS, electrical, and software tests. The motherboards on these lists have been tested to ensure compliance with motherboard design guidelines for AMD processors.

Lists of recommended motherboards can be found here:

AMD Athlon™: <http://www.amd.com/AthlonHardware>  
AMD Athlon XP: <http://www.amd.com/AthlonXPHardware>  
AMD Athlon MP: <http://www.amd.com/AthlonMPHardware>  
AMD Duron™: <http://www.amd.com/DuronHardware>

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## 4.2 Why is my processor incorrectly identified by my system at start-up?

There are several possibilities for an incorrect identification of the processor.

A) **Situation:**

You have an AMD Athlon™ XP or an AMD Athlon with a System-Bus of 266MHz and the latest BIOS version.

**Cause:**

Motherboards that support 400MHz, 333MHz, 266MHz and a 200MHz System-Bus will typically have a factory-default System-Bus setting of 200MHz (100MHz system clock) to protect 200MHz System-Bus processors from accidentally being overclocked. If an AMD Athlon XP or AMD Athlon processor that supports a 400MHz System-Bus is installed on a motherboard that is configured to operate the System-Bus at 200MHz, it will operate at a lower frequency. This is a result of the processor's multiplier. The function of the multiplier is to multiply the bus frequency to derive the processor frequency. A System-Bus that is set to operate at 200MHz is operating at a frequency lower than expected for an AMD Athlon XP or AMD Athlon processor that supports a 266MHz System-Bus. Consequently, a 266MHz System-Bus processor will operate at a lower frequency if the System-Bus is only running at 200MHz.

**For example:**

A 1000MHz AMD Athlon processor that supports a 266MHz System-Bus requires a 133MHz system clock (266MHz system-Bus) and a 7.5x multiplier. This results in a processor frequency of 1000MHz (system clock x multiplier = processor frequency). However, if the motherboard's System-Bus is set to 200MHz (100MHz system clock), the

processor will only operate at 750MHz (100MHz clock x 7.5 multiplier = 750MHz CPU speed).

**Solution:**

A jumper on the motherboard or a setting in the BIOS usually configures the System-Bus. Contact the motherboard manufacturer for detailed instructions.

B)

**Situation:**

You have an AMD Athlon XP and the processor does not run at the expected frequency.

**Cause/Solution:**

The AMD Athlon™ XP processor is identified using model numbers, as opposed to frequency. Model numbers are designed to communicate the relative application performance among the various AMD Athlon XP processors, as well as communicate the architectural superiority over previous models of AMD Athlon processors.

C)

**Situation:**

You have an AMD Athlon XP or an AMD Athlon and your System-Bus speed is set correctly.

**Cause:**

A misidentified processor is usually the result of an outdated BIOS. If the reported frequency is incorrect and all motherboard settings are configured correctly (core voltage, System-Bus speed, and clock multiplier), the processor is probably running at the correct speed, but is being misidentified by the BIOS. This can be confirmed by running a utility such as CPUID. This utility, available at the AMD Processor Utilities and Updates page([http://www.amd.com/gb-uk/Processors/TechnicalResources/0,,30\\_182\\_871\\_2364,00.html](http://www.amd.com/gb-uk/Processors/TechnicalResources/0,,30_182_871_2364,00.html)), will measure the frequency the processor is actually running at. An outdated BIOS can also result in the processor's type being identified incorrectly, or being identified as "unknown".

**Solution:**

Motherboard manufacturers periodically release BIOS updates. The process of updating, or flashing, the BIOS may vary from motherboard to motherboard, so it is important that information on BIOS updates and instructions be obtained from the manufacturer of the motherboard. BIOS updates are motherboard make, model, and revision specific, and often require special flashing utilities from the motherboard manufacturer.

**Note:** Flashing the BIOS with the wrong update, or failure to follow the motherboard manufacturer's instructions can permanently disable the motherboard!

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