Visual/Mechanical, Packing, Shipping, Storage & Handling Guidelines for AMD Distributors & Resellers

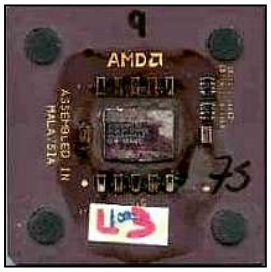
Microprocessor returns that are Out-of-Warranty or have any of the following types of severe visual-mechanical damage may not be returned. These include:

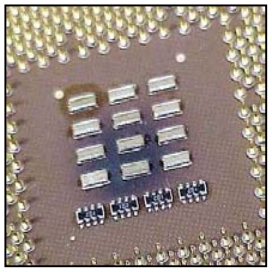
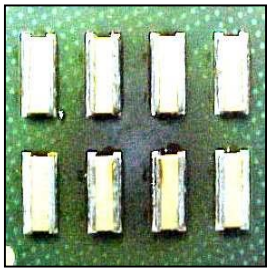
1. Chips or Cracks in the Package or Die

Severe chips or cracks in the package or die are most often caused by improper heat-sink installation or removal. This mode of damage is usually the result of applying excessive force onto the die or substrate, or from the collision of the die with a hard surface. Die cracks can be observed by tilting the part in the light. All die cracks are considered user-induced damage. All die chips with length or width greater than the width of a chip-capacitor on the CPU (approximately 1.65mm) are considered user-induced damage. *AMD's outgoing specification for die chippage is that no chip should exceed 0.76 mm long by 0.38 mm wide (or 30 mils long by 15 mils wide).* All package chips or cracks are considered user-induced damage.

2. Burned-Up Units

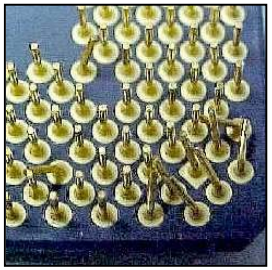
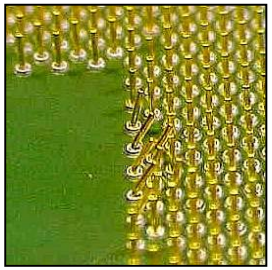
Burned-up units are often the result of improper heat-sink installation, not using thermal interface material, not removing the protective tape from the heatsink, and/or by using a non-recommended thermal compound. These types of defects create electrical shorts in the part and render them unable to be tested in a motherboard. Attempting to test electrically shorted parts will damage the motherboard. Burned-up units are frequently severely discolored, however, some mild discoloration is normal.



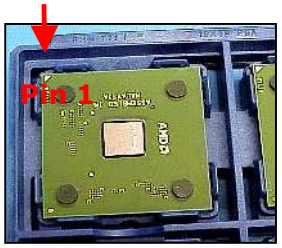
3. Multiple Bent or Damaged Pins

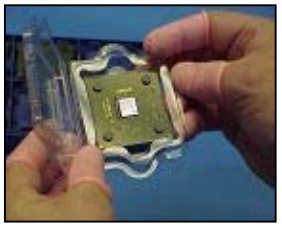
Improper handling often results in multiple package pins being bent. This level of damage is most often caused by forcing the unit into the socket incorrectly, by dropping the unit, or by forcing the pins against a hard surface.


Handling, Storage and Packing Guidelines

- **Grounding:** If removed from the shipping box, the CPUs must be protected from ESD damage by storing the trays on a grounded anti-static surface.
- **Store Processors in Trays Provided by AMD:** CPUs must be stored in the correct orientation to prevent damage to the leads. The pin 1 notch on the CPU should be aligned with the beveled corner of the tray.
- **Transporting Trays:** When multiple CPUs have to be transported, use trays provided by AMD and ensure the following:
  - Trays are stacked without gaps in between individual trays, and strapped
  - Adequate packing material is used in the shipping box
  - Do not use thin rubber bands or adhesive tape. If a strapper is unavailable, use thick ESD-safe bands
- **AMD-Approved Clamshell:** When individual CPUs have to be transported, ensure that the CPU is packed in an AMD-approved clamshell. Do not use unapproved clamshells as they may not meet the required ESD material properties or physical dimensions that protect the package and leads. *(Contact your AMD sales person for information on approved clamshells.)*
- **Clamshell Alternative:** If an AMD-approved clamshell is unavailable, care must be taken to protect the leads and protect the CPU from ESD damage during transit. Use ESD foam for the leads and anti-static bags to shield the CPU from ESD damage.





At the point of sale, resellers should advise their customers of the following:

- Study the "*Important Information for AMD Users"* notice (provided by the reseller).
- For Processor-in-a-Box customers only: Study the "*Read-This-First"* notice enclosed in the clear plastic PIB packaging before using the processor. Older inventory may not enclose this notice. In that case, resellers should provide the leaflet separately.
- Inspect the package pins to make sure there are no bent pins before inserting the processor into the socket.
- Do not use thermal grease and do not combine thermal grease with the thermal compound; this will cause the CPU to overheat.
- Retain the processor clamshell. If customers ever need to return the processor, they should do so in the clamshell.
- PIB customers should read AMD's limited warranty in its entirety. Failure to comply with its terms may void the limited warranty.

Common Mistakes, ‘Read-This-First’ Notice (PIB), Point-Of-Sale Notice, Power Pin Shorts Test,

Seven Common Mistakes That Will Damage a Processor

1. Misalignment of heatsink/fan over processor die.
This can happen if both ends of the heatsink/fan clip are not properly located on the mounting tabs of the socket. If not properly aligned, the heatsink may end up resting on the backside of the socket, and not make contact with the die.
Consequences: Burned-up processor

2. Failure to remove the mylar plastic cover on the heatsink's thermal interface material.
Protective Mylar film is present on heatsinks with pre-applied thermal interface material, and must be removed prior to heatsink installation.
Consequences: Melted mylar and a burned-up processor

3. Leaving the thermal interface material exposed to the environment for too long.
Dust particles may stick to the material. This causes gaps to form between the heatsink and die resulting in poor heat conduction between the two surfaces.
Consequences: Shortened functional life and burned up processor

4. Re-using the thermal interface material
If a heatsink/fan is removed from a processor the heatsink/fan, and die, must be completely and appropriately cleaned, i.e., all residual thermal interface material must be removed from the surface of the heatsink/fan. A new pad of thermal interface material must be applied to the heatsink/fan. The same holds true even if the heatsink/fan is removed before power is applied. Once the thermal pad is compressed between the heatsink and processor die, removal can cause the pad to be distorted making it unusable. For a new pad or information regarding the nearest vendor of the thermal interface material, contact an AMD Technical Service Center.
Consequences: Burned-up processor

5. "Pressing" on the heatsink/fan while attaching the heatsink
Assemblers do this to facilitate the hooking of the clip on the Socket A mounting tab. Pressing on the heatsink/fan during installation is not necessary, and may damage the processor or motherboard
Consequences: Cracked die or chipped corners

6. Plugging the heatsink/fan into the wrong connector
Motherboards typically have two fan connectors in the vicinity of the processor socket: (1) CPU FAN PLUG, and (2) SYSTEM FAN PLUG. SYSTEM FAN PLUG has a delay at start-up and, as a result, should not be utilized for plugging the heatsink/fan. The CPU FAN PLUG should be utilized because it applies power immediately.
Consequences: Burned-up processor

7. "Scraping" the motherboard with the heatsink clip during installation
As the clip is fastened onto the processor socket, it may scrape the surface of the motherboard. This can result in damaged traces on some motherboards. Avoid problems by placing a thin insulating material under the socket mounting tabs during heatsink installation.
Consequences: Burned-up processor or damaged motherboard

Read This First

IMPORTANT—Prior to installing: To help ensure a positive experience, continued limited warranty coverage, and reliable operation, please adhere to the following points before installing the processor:

1.Record the serial number (SN#_____) of your processor on the cover of the Certificate of Authenticity booklet. The serial number is required for any warranty claims. The serial number is located directly below the barcode.

2.Use *only* the heatsink/fan provided. Use of any other heatsink/fan will void the limited warranty.

3.Never use the processor without the heatsink/fan installed.

4.Never handle the processor by the pins.

5.Read and follow installation instructions ***carefully***. Incorrect installation may result in overheating or other damage to the processor that will void the limited warranty.

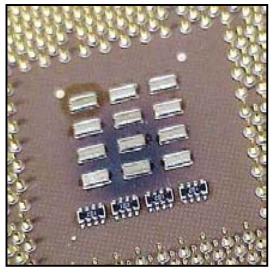
6.The Phase-Change thermal interface Material (PCM) that comes with the PIB (pre-applied to the heatsink/fan) is required for all AMD processors. Use only recommended PCM (see Thermal Cooling Guideline at www.amd.com for a complete list of recommended PCM). DO NOT USE ANY THERMAL GREASES. *PCM has a one-time use only. If you remove the heatsink/fan after initial installation the effectiveness of the thermal bond will be compromised. Always completely and appropriately clean the heatsink/fan and die surfaces, and apply new PCM before reinstalling heatsink/fan after removal.*

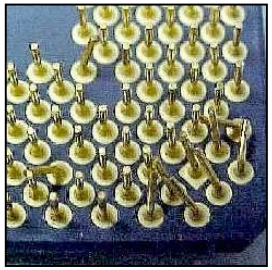
To obtain warranty service for your AMD Processor in a Box, first contact the company from which you bought your boxed processor or computer system or the manufacturer of the computer system. After their warranty expires or if you are unable to otherwise obtain warranty service, you should contact AMD.

IMPORTANT INFORMATION FOR AMD PRODUCT USERS

CAUTION ! HANDLE WITH CARE !

USER MISHANDLING DAMAGE WILL VOID THE LIMITED WARRANTY !





PREVENT DAMAGE TO YOUR AMD PROCESSOR BY OBSERVING THE FOLLOWING:

1. **Use only the heatsink/fan enclosed in the AMD processor in a box (PIB) package.**
2. ***Never*** **use the processor without the heatsink/fan installed.**
3. ***Never*** **press on the heatsink/fan with your hand during installation.**
4. **AMD does not recommend the use Thermal Grease. Use *only* approved Phase-Change Material .**
5. ***Never*** **reuse Phase-Change Material**
6. ***Never*** **handle the processor by the pins.**
7. ***Read*** **the installation instructions provided.**

How Resellers Can Verify if a Returned Part is Burned-Up.

Test For Power Pin Shorts in an AMD Athlon™ Package

•With an Ohmmeter, measure the Vcc to Vss resistance of each unit according to Figure 1 for ceramic packages, and according to Figure 2 for organic packages. Use the indicated orientation of the colored probes. The black probe is Vss in both figures.

•Each digital multi-meter probe in Figures 1 and 2 is only making contact with one edge of a capacitor.

•The resistance of a good processor, between Vcc and Vss, should be > 10 ohms ("Palomino" core) and >5 ohms ("Thoroughbred" core).

•If the resistance is < 10 ohms ("Palomino" core) and < 5 ohms ("Thoroughbred" core), the processor should be considered as shorted. DO NOT INSERT A SHORTED PROCESSOR INTO A MOTHERBOARD.

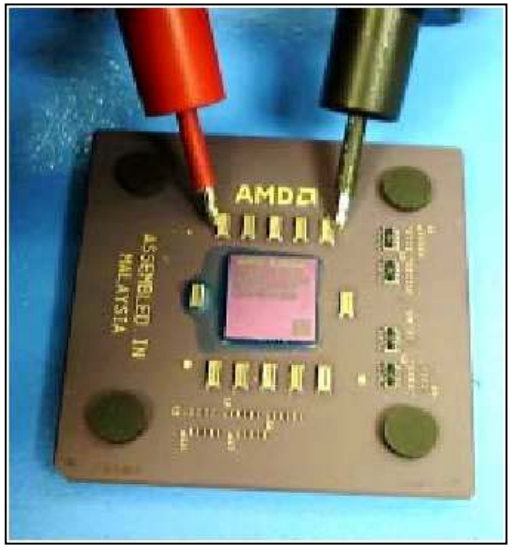


Figure 1

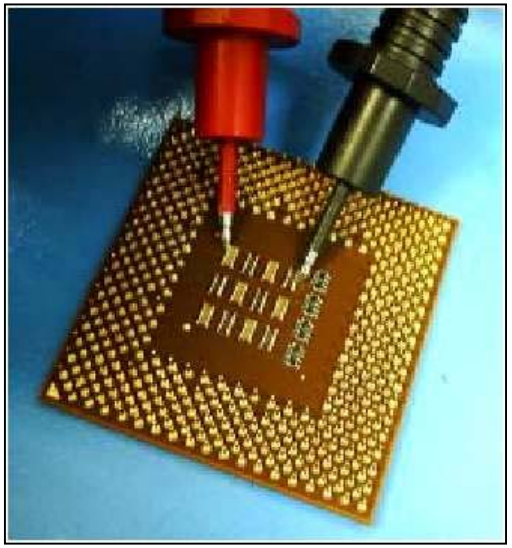


Figure 2