

COMPUTER SCIENCE

Computer Case

Components and Overview



By

Assist . Lec . Ameer Mohammed

12 JAN 2025

Department of Architecture

Explore the fundamental components of a computer case through engaging visuals.



Case Overview

The computer case is the metal and plastic box that contains the main components of the computer, including the motherboard, central processing unit (CPU), and power supply. The front of the case usually has an On/Off button and one or more optical drives.

Computer cases come in different shapes and sizes. A desktop case lies flat on a desk, and the monitor usually sits on top of it. A tower case is tall and sits next to the monitor or on the floor. All-in-one computers come with the internal components built into the monitor, which eliminates the need for a separate case.



Back of Computer Case

The back of a computer case has connection ports that are made to fit specific devices. The placement will vary from computer to computer, and many companies have their own special connectors for specific devices. Some of the ports may be color coded to help you determine which port is used with a particular device.



Power Supply

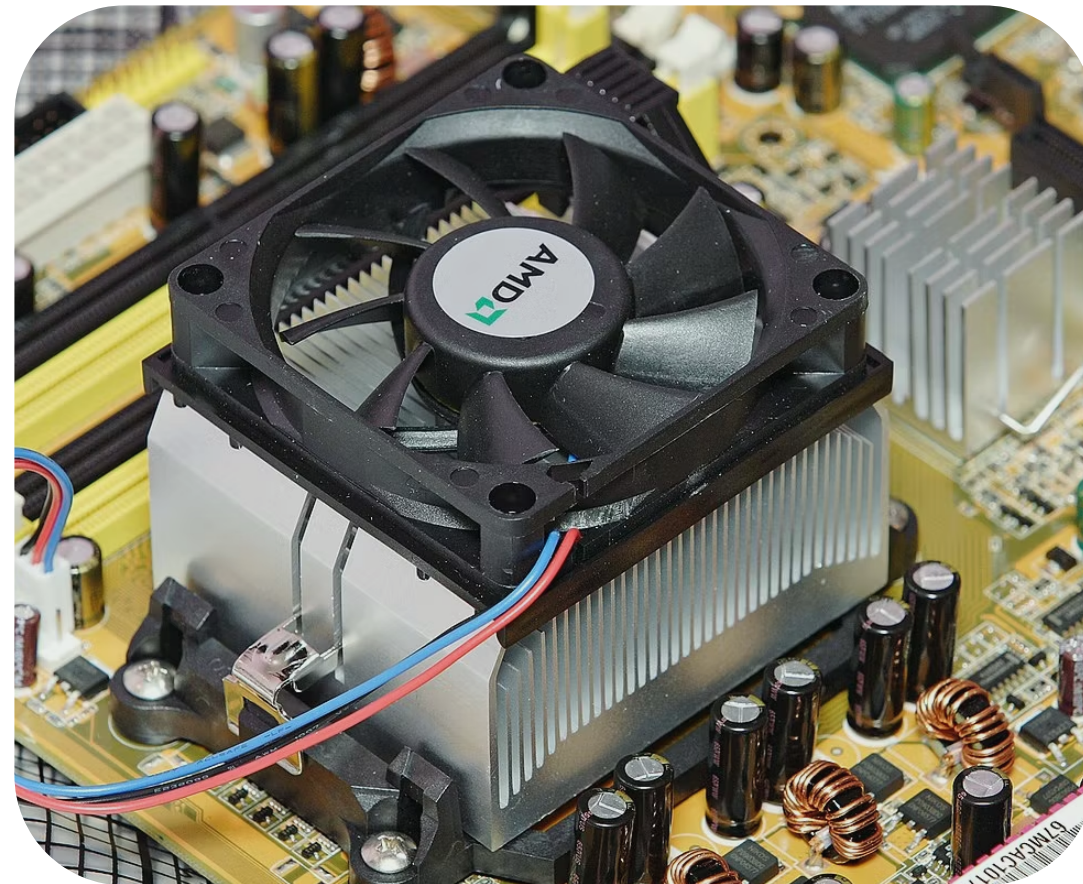
The power supply unit in a computer converts the power from the wall outlet to the type of power needed by the computer. It sends power through cables to the motherboard and other components. Usually, the power chord is present at the back of the CPU or the PC tower and goes directly into the electricity socket. Many modern personal computers have in-built UPS units



Cooling System



Fans



Heat Sink



Water

Cooling Fan

A computer system or laptop uses electricity to operate and produces heat in the process. All CPUs and laptops have a cooling fan to circulate air in the internal system and prevent overheating. May also have more than one cooling fan to ensure that the user can use heavy-duty applications that require high performance from the system. Usually, gaming computers and computers for professional purposes, like video editing and sound mixing, have more than one cooling fan.

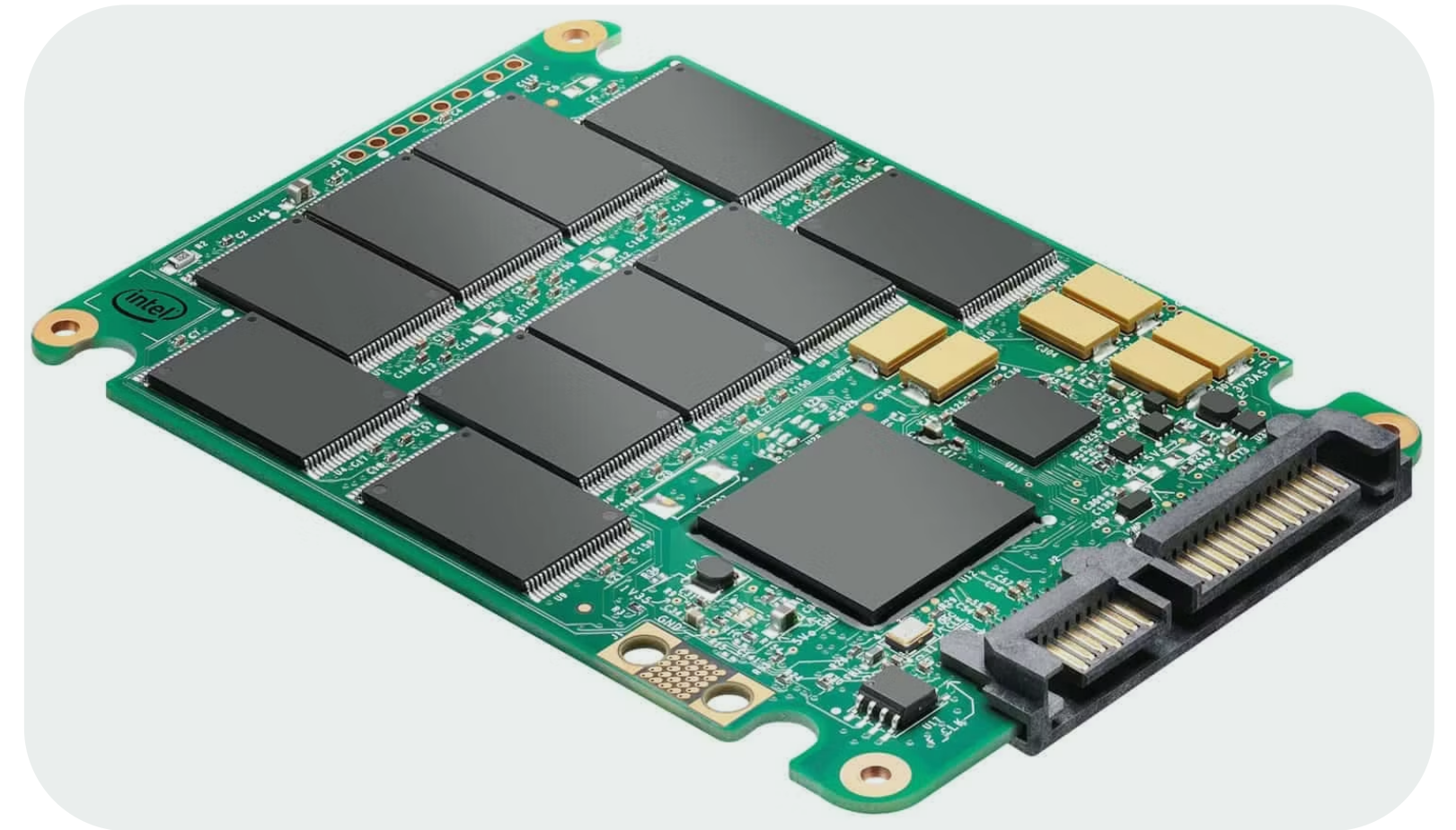


Storage device

provides the memory for installing programs and saving files. The data is saved permanently inside its memory bank, preserving them even after you turn off the PC (unless manually deleted or uninstalled)



HDD
Hard Disk Drive



SSD
Solid-State Drive

HDD

It is an electromechanical device that employs magnetic storage technology, which records data on spinning discs made of magnetised metal. Similar to an antique record player, an arm collects and records data on a disk.

HDD need mechanical rotations to function and are slower to start

HDD can generate heat and noise

The battery life of an HDD-equipped gadget may get over quickly since they consume more power during startup and operation.

SSD

Smaller drive technology magnetically coated metal plates, separate memory chips and interconnected circuits house the data. This flash-based memory can enhance a computer's performance with short read-access times.

direct connection to user interfaces and memory reserves often speeds up file transfers.

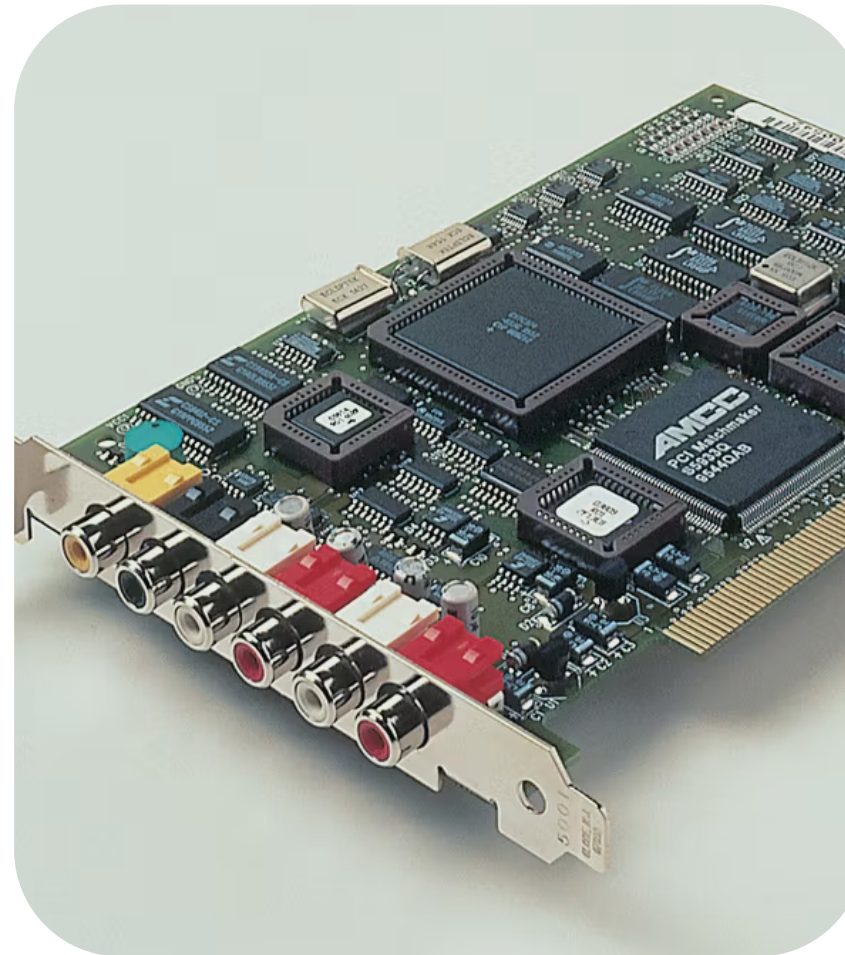
SSD are not mechanical, they do not generate heat or noise.

SSDs have a longer battery life since they use less power.

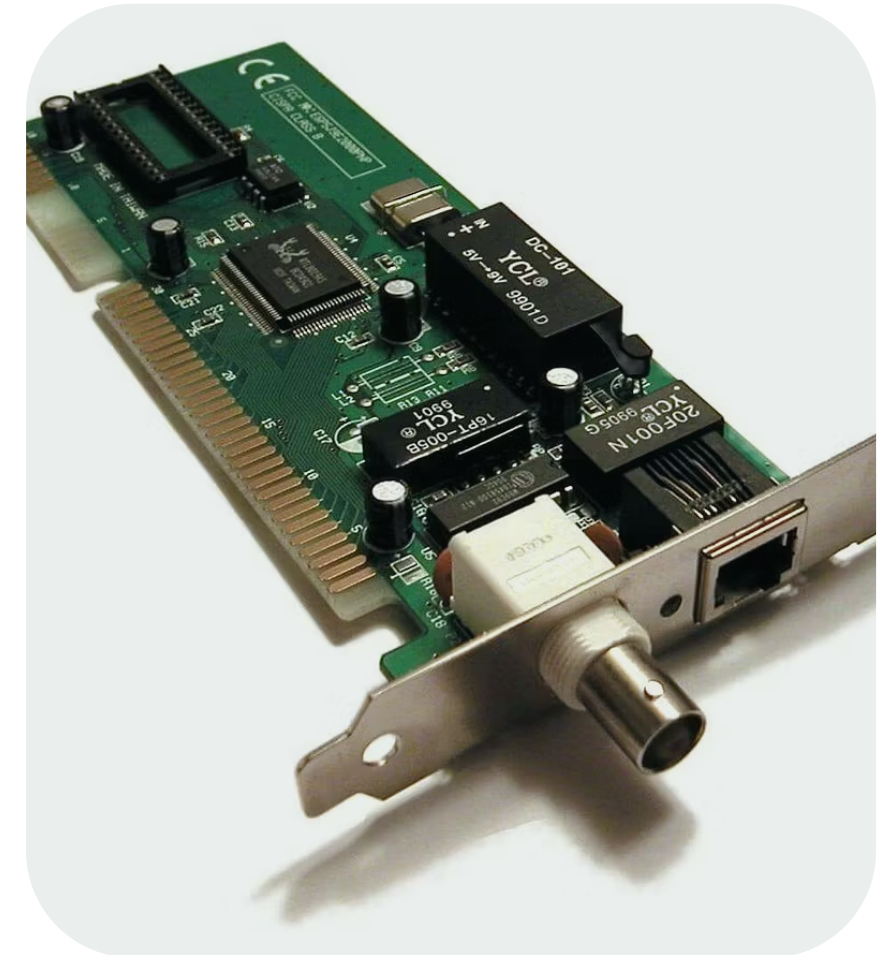
Expansion Slots



Video Card



Sound Card



Network Card

Video Card

The video card is responsible for what you see on the monitor. Most computers have a GPU (graphics processing unit) built into the motherboard instead of having a separate video card. If you like playing graphics-intensive games, you can add a faster video card to one of the expansion slots to get better performance

Sound Card

The sound card also called an audio card is responsible for what you hear in the speakers or headphones. Most motherboards have integrated sound, but you can upgrade to a dedicated sound card for higher-quality sound

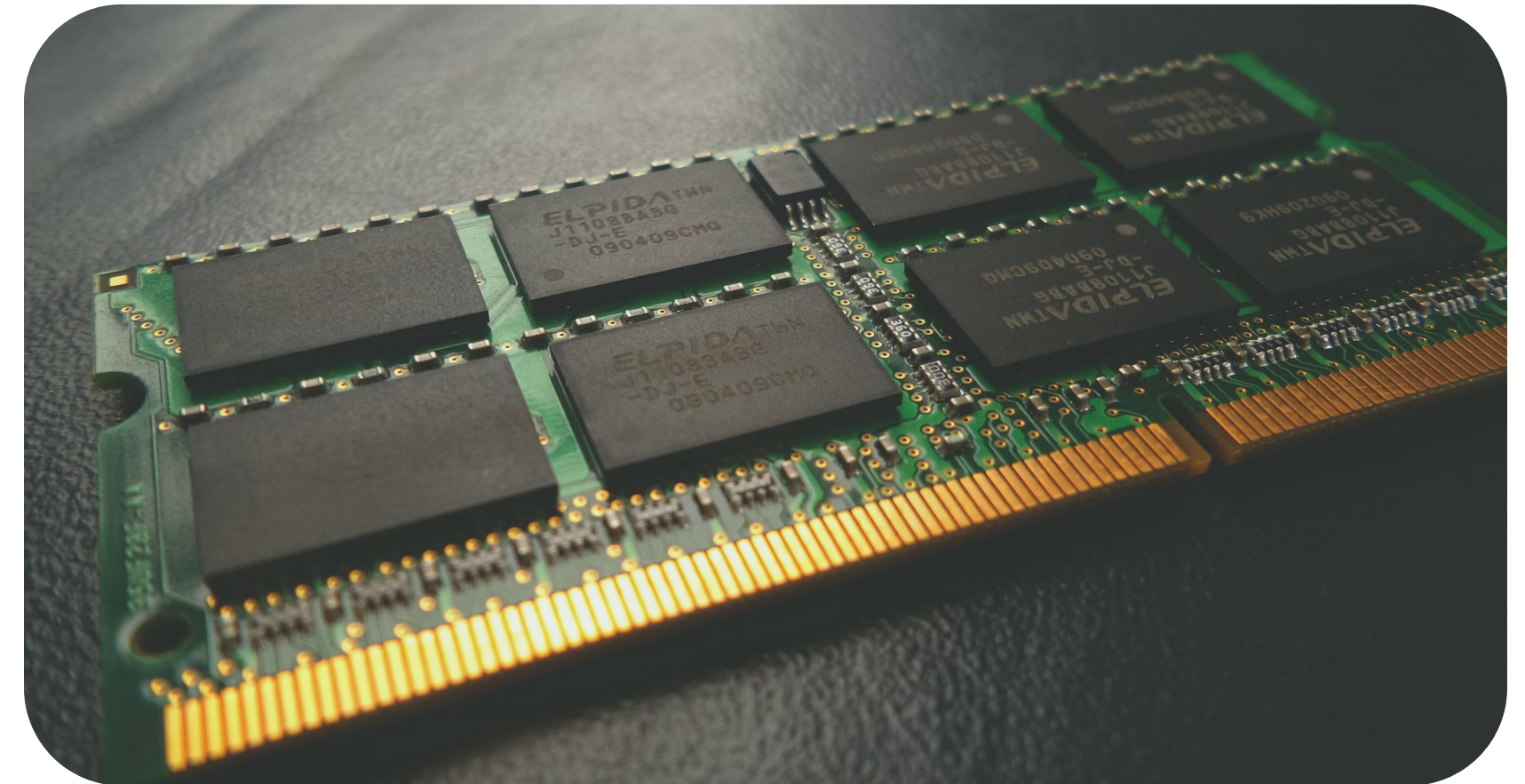
Network Card

The network card allows your computer to communicate over a network and access the Internet. It can either connect with an Ethernet cable or through a wireless connection (often called Wi-Fi). Many motherboards have built-in network connections, and a network card can also be added to an expansion slot

Random Access Memory

Is a hardware device generally located on the motherboard of a computer and acts as an internal memory of the CPU. It allows CPU store data, program, and program results when you switch on the computer. It is the read and write memory of a computer, which means the information can be written to it as well as read from it.

When you switch on the computer the data and instructions from the hard disk are stored in the RAM, e.g., when the computer is rebooted, and when you open a program, the operating system (OS), and the program are loaded into RAM, generally from an HDD or SSD. As soon as you shut down the computer, the RAM loses the data. The benefit of loading data into RAM is that reading data from the RAM is much faster than reading from the hard drive.



RAM comes in the form of a chip that is individually mounted on the motherboard or in the form of several chips on a small board connected to the motherboard. It is the main memory of a computer.

Types of RAM



SRAM

Static RAM



DRAM

Dynamic RAM

SRAM

Type of random access memory that retains its state for data bits or holds data as long as it receives the power. It is made up of memory cells and is called a static RAM as it does not need to be refreshed on a regular basis because it does not need the power to prevent leakage, unlike dynamic RAM. So, it is faster than DRAM.

DRAM

Made up of memory cells. It is an integrated circuit (IC) made of millions of transistors and capacitors which are extremely small in size and each transistor is lined up with a capacitor to create a very compact memory cell so that millions of them can fit on a single memory chip. The capacitor needs to be refreshed after regular intervals to maintain the charge in the capacitor. This is the reason it is called dynamic RAM as it needs to be refreshed continuously

كَمُهَنْدِسِينَ نَخْتَلِفُ عَنْ بَاقِي الْبَشَرِ!