

COMPUTER



Computer is derived from a Latin word “computare” which means to “*to calculate*”, “*to count*”, “*to sum up*” or “*to think together*”. So, more precisely the word computer means a "device that performs computation".

Definition of Computer

A Computer is programmed device with a set of instructions to perform specific tasks and generate results at a very high speed.

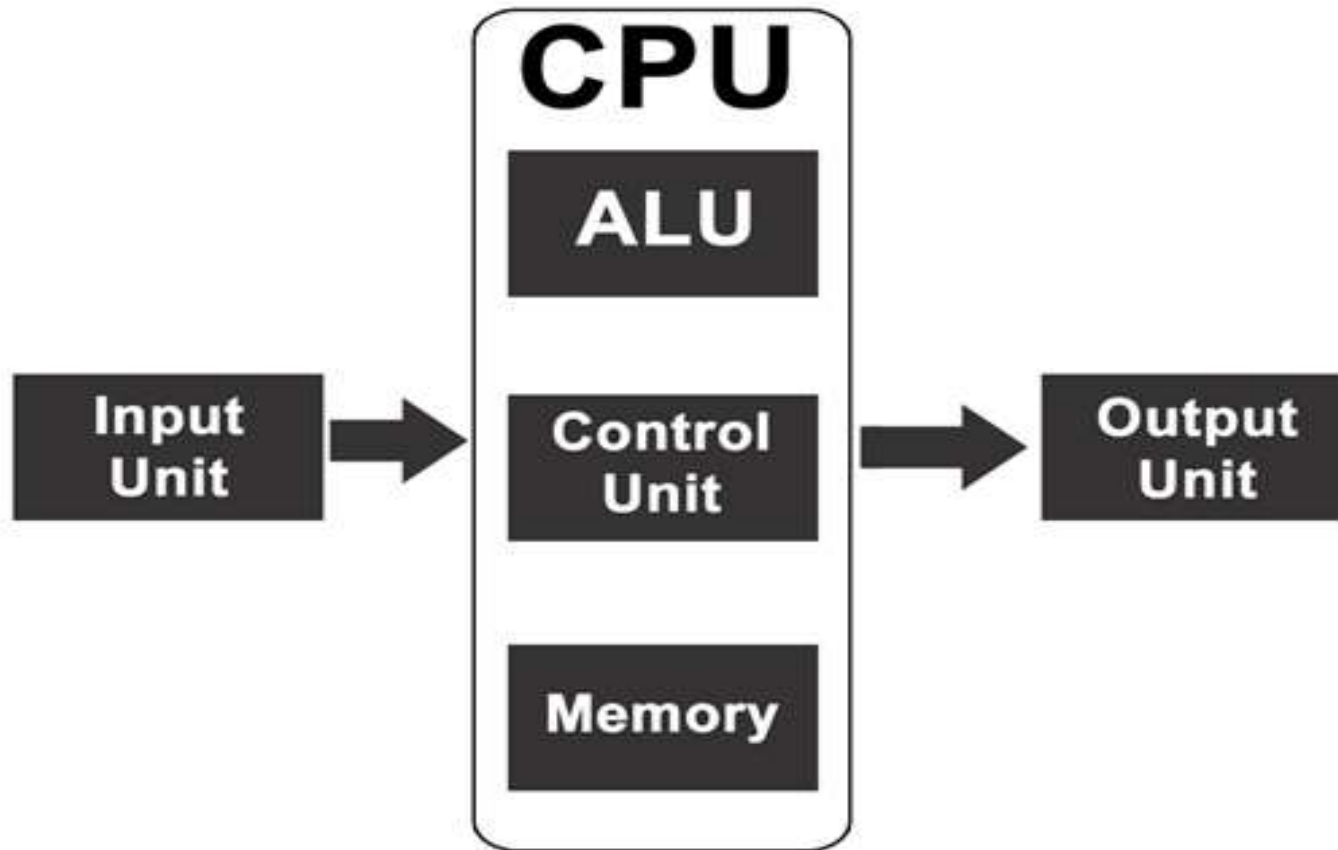
COMPUTER

Commonly operating machine particularly or preferred to be used in trade education and research.

Generations of Computers

- **First Generation:**
 - ***Vacuum Tubes (1940-1956)***
- **Second Generation:**
 - ***Transistors (1956-1963)***
- **Third Generation:**
 - ***Integrated Circuits (1964-1971)***
- **Fourth Generation:**
 - ***Microprocessors (1971-Present)***
- **Fifth Generation:**
 - ***Artificial Intelligence (Present and Beyond)***

BLOCK DIAGRAM



INPUT DEVICES

The hardware components used to enter the data and instructions to a computer.

Examples: Key board, mouse And scanner.



OUTPUT DEVICES

An output device is a device which allows data to be displayed or passed out of a computer system.

Examples: Monitor, printer, speakers, projector.



CPU



CPU: It stands for central processing unit. CPU is the brain of the computer. It performs arithmetic and logical operations.

TYPES OF PROCESSORS

Intel



Processor Pentium 1

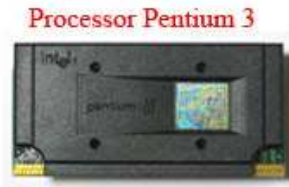
Processor Pentium 1



Processor Pentium 4

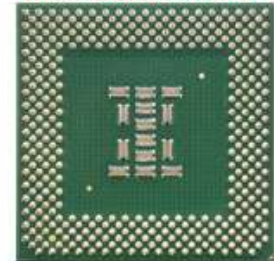


Processor Pentium 2



Processor Pentium 3

Processor Pentium 3



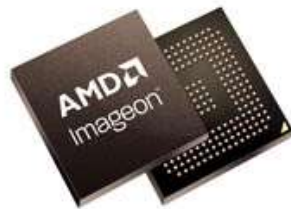
Processor Pentium 3



Processor Pentium 4



Processor Pentium 4 LGA



Processor AMD



VS



CACHE MEMORY

Cache memory is a small-sized type of volatile computer memory that provides high-speed data access to a processor and stores frequently used computer programs, applications and data. It is the fastest memory in a computer, and is typically integrated onto the motherboard and directly embedded in the processor or main random access memory (RAM).

CPU PARTS

- ALU (Arithmetic and logic unit)
- CU (Control unit)
- MU (Memory unit)
 - Primary Memory (RAM&ROM)
 - Cache Memory (L1,L2&L3)
 - Secondary Memory

Memory Units

- 1 Bit = 0 or 1
- 1Byte = 8 bits
- 1 nibble = 4 bits
- 1 kilo byte = 1024 bytes
- 1 mega byte = 1024 KB
- 1 Giga byte = 1024 MB
- 1 Tera byte = 1024 GB
- 1 Peta byte = 1024 TB
- 1 Exa byte = 1024 PB
- 1 Zeta byte = 1024 EB
- 1 Yotta byte = 1024 ZB

Parts of a computer system

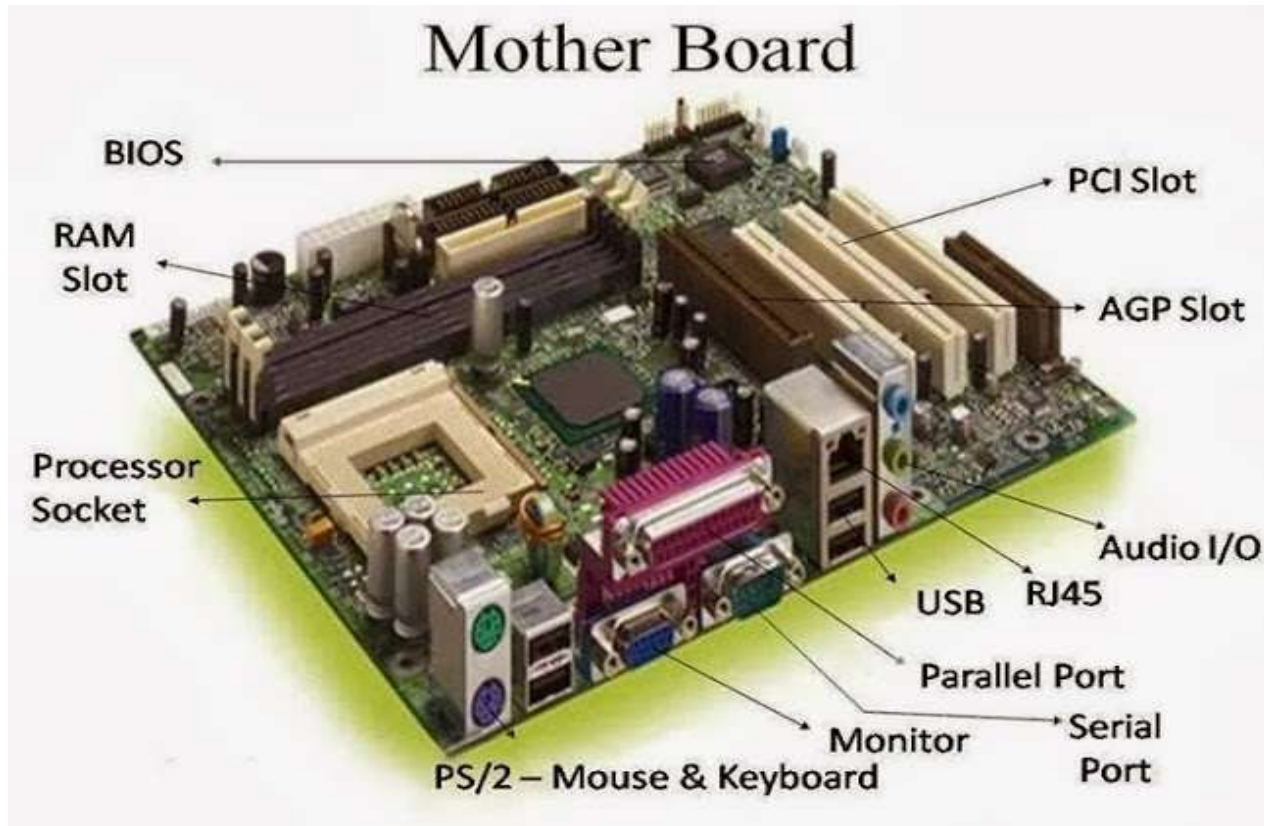
- System cabinet
- Mother board
- CPU
- SMPS
- Heat sink & fan
- RAM
- HDD & FDD Drives
- CD – ROM & DVD Drives
- North & south bridge
- AGP & PCI Cards

ATX CABINET



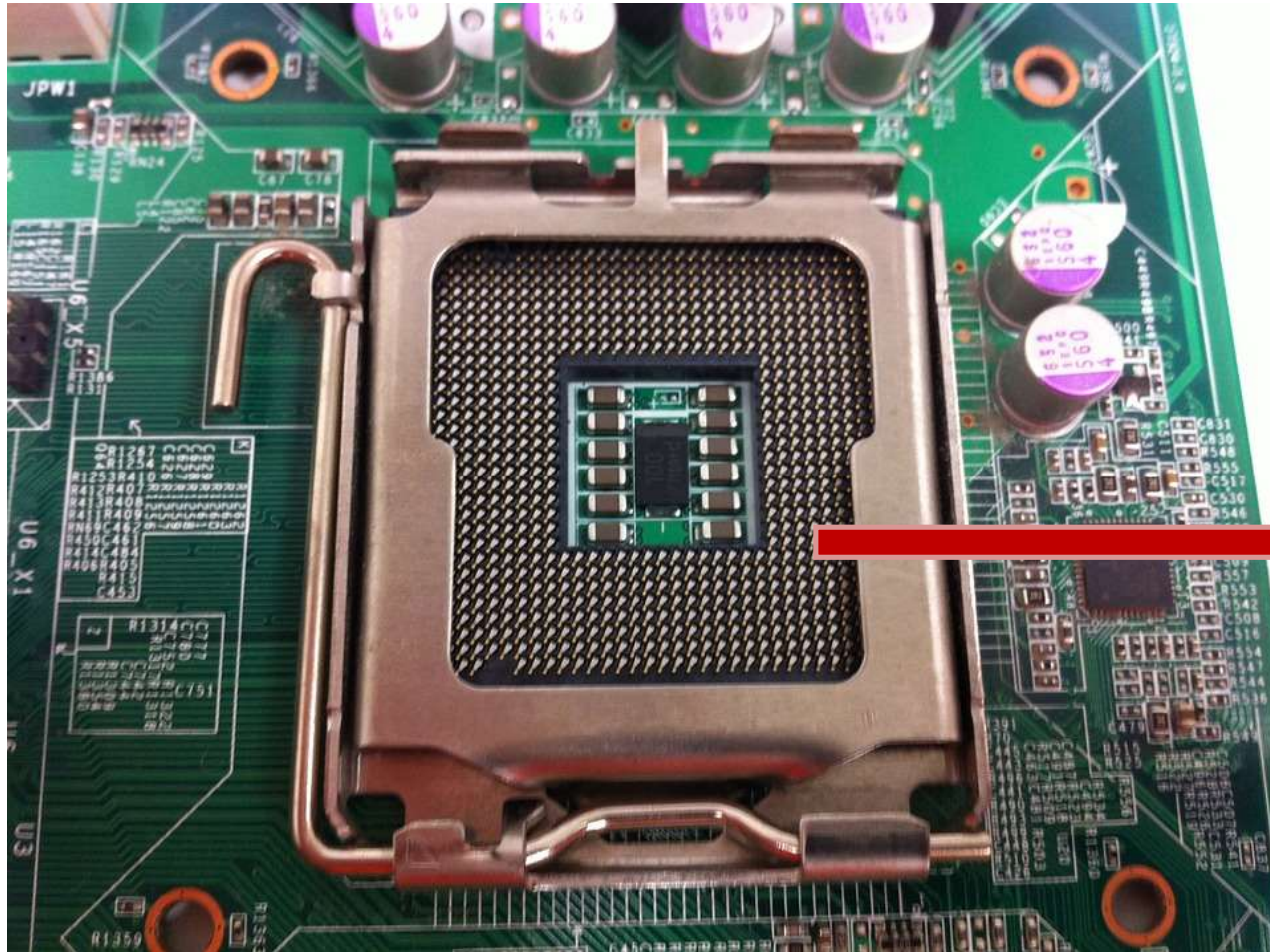
ATX : Advanced Technology Extended

MOTHERBOARD



It is the main printed circuit board (PCB), it holds many of the crucial electronic components of the computer.

LGA



LGA

LAND GRID AREA

HEAT SINK: A **heat sink** is a thermal conductive metal device designed to absorb and disperse **heat** away from a high temperature object such as a computer processor.



Thermal paste :**Thermal paste** is a very high heat conductive **paste** that is used between two objects (usually a heat sink and a CPU/GPU) to get better heat conduction.

RAM

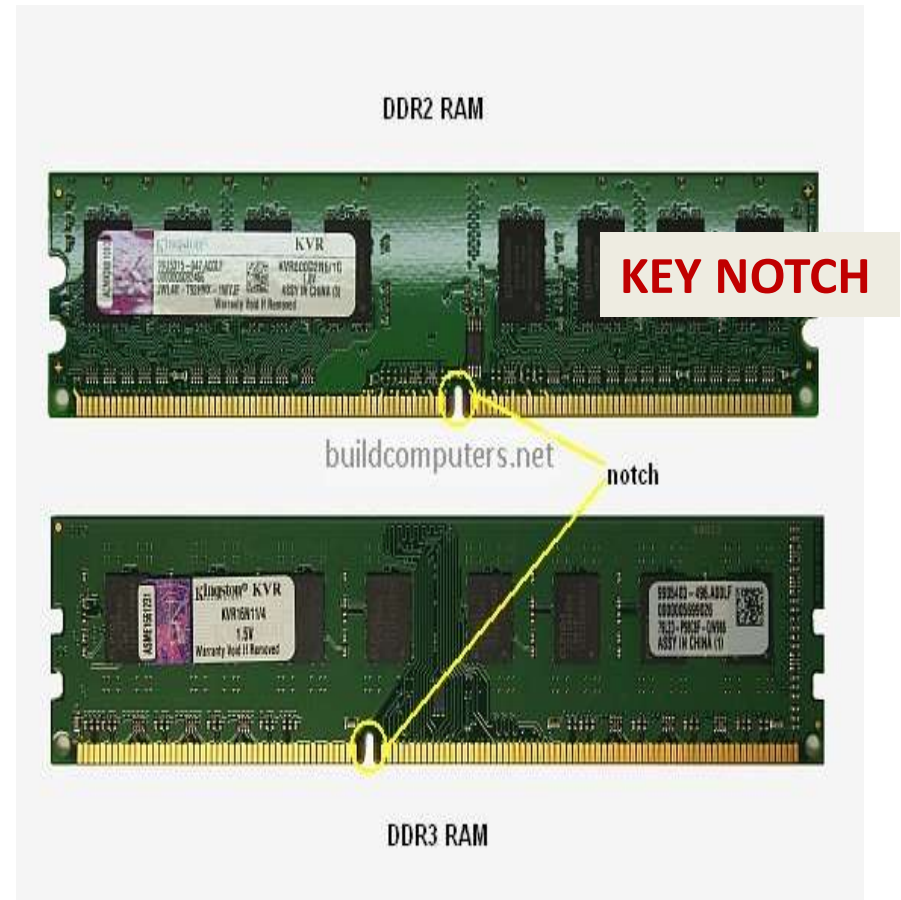
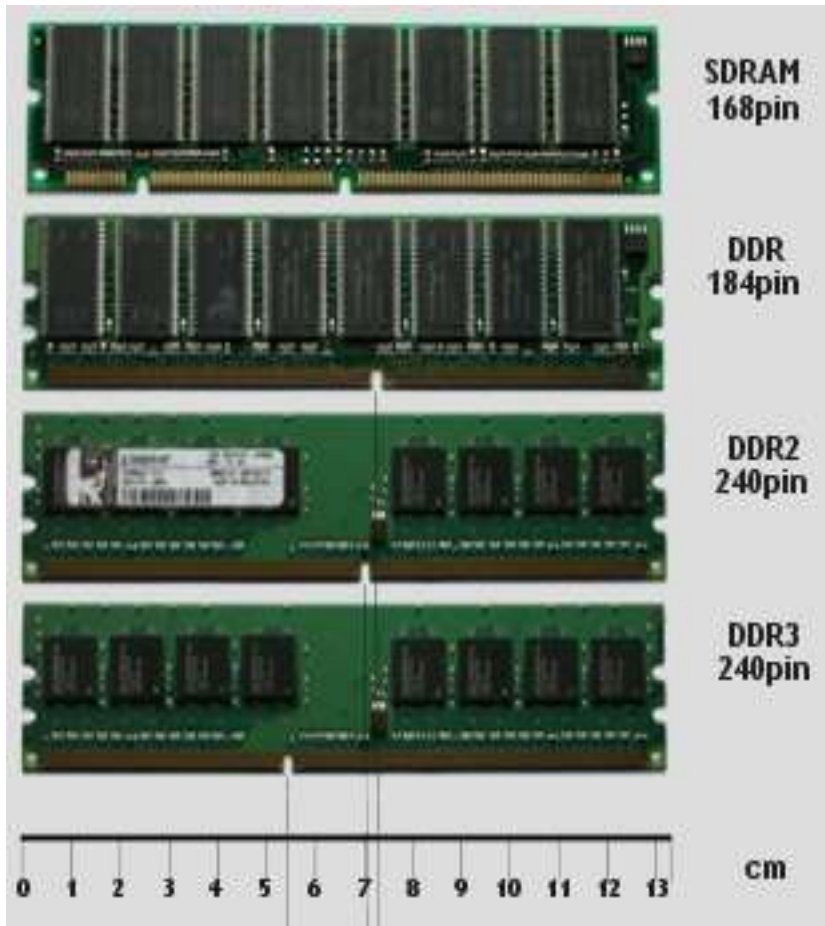
RAM is considered as volatile memory, which means that the stored information is lost when there is no power. So, RAM is used by the central processing unit (CPU) when a computer is **running** to **store** information that it needs to be stored very quickly, but it does not **store** any information permanently.

Types of RAM

Different RAM(Random Access Memory) Types

- ❖ SDRAM (Synchronous Dynamic RAM)
- ❖ DDRRAM(Double Data Rate RAM)

RAM Ports



ROM

ROM (Read Only Memory)

- **ROM** stands for **Read Only Memory**
- **ROM** is a built in memory that can not be changed (it can only be read from)
- **ROM** normally holds the 'boot up' program to a computer – *without it the computer wouldn't know what to do when on button is switched on*
- **ROM** is non volatile(*data remains even though the power is turned off*).



HARD DISK



A **hard disk** drive (HDD), **hard disk**, **hard** drive or fixed **disk** is a data storage device that uses magnetic storage to store and retrieve digital information using one or more rigid rapidly **disks** (platters) coated with magnetic material. It is also known as secondary memory and non-volatile(permanently stored).

Types of HDD: IDE(**Integrated Device Electronics**),SATA(**Serial Advanced Technology Attachment**),SSD(**Solid State Drive**).

SOLID STATE DISK(SSD)



BIOS & CMOS

- **Basic Input/Output System (BIOS)** is a program that controls communication between all input and output devices on the **computer** (such as disk drives, display, keyboard, mouse, and printer).

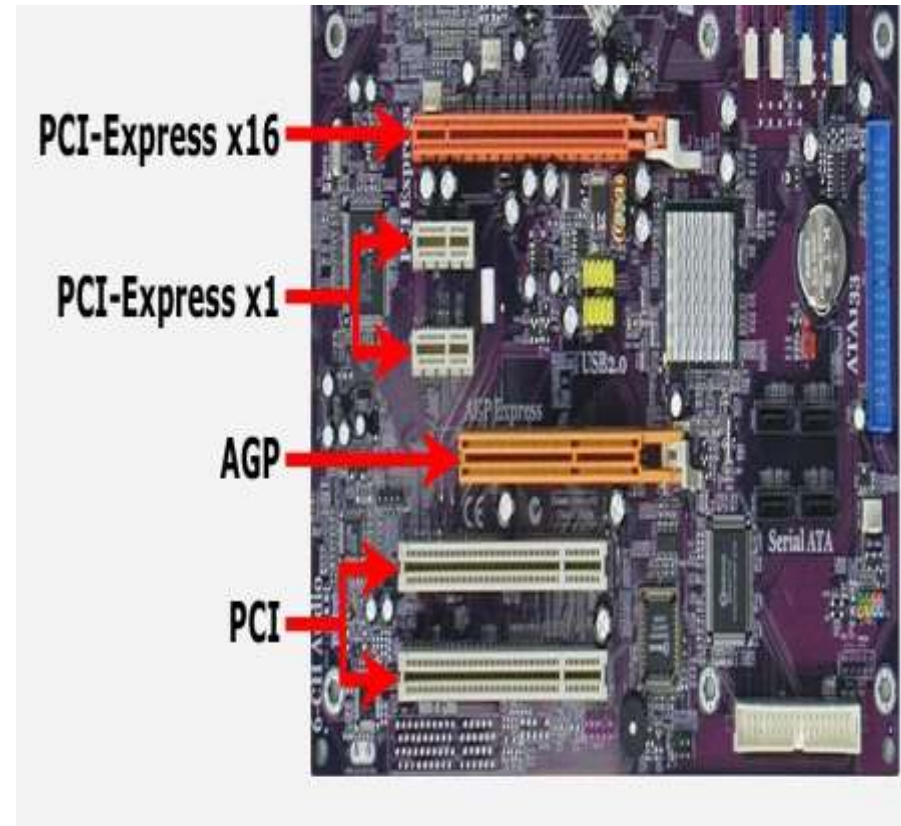


- **complementary metal oxide semiconductor (CMOS)**.
Computers contains a small amount of battery-powered CMOS memory to hold the date, time, and system setup parameters.



PCI & AGP SLOTS

- Accelerated Graphics Port (**AGP**) is a high-speed point-to-point channel for attaching a video card to a computer system.
- PCI Express (**Peripheral Component Interconnect Express**), is a high-speed serial computer expansion.



NORTH & SOUTH BRIDGE

- The Northbridge is responsible for coordinating the data flow between the memory, video card and the processor.
- A secondary chip known as Southbridge, has a similar function, coordinating the data flow between the processor and peripherals as sound cards or network cards.



SOUTHBRIDGE

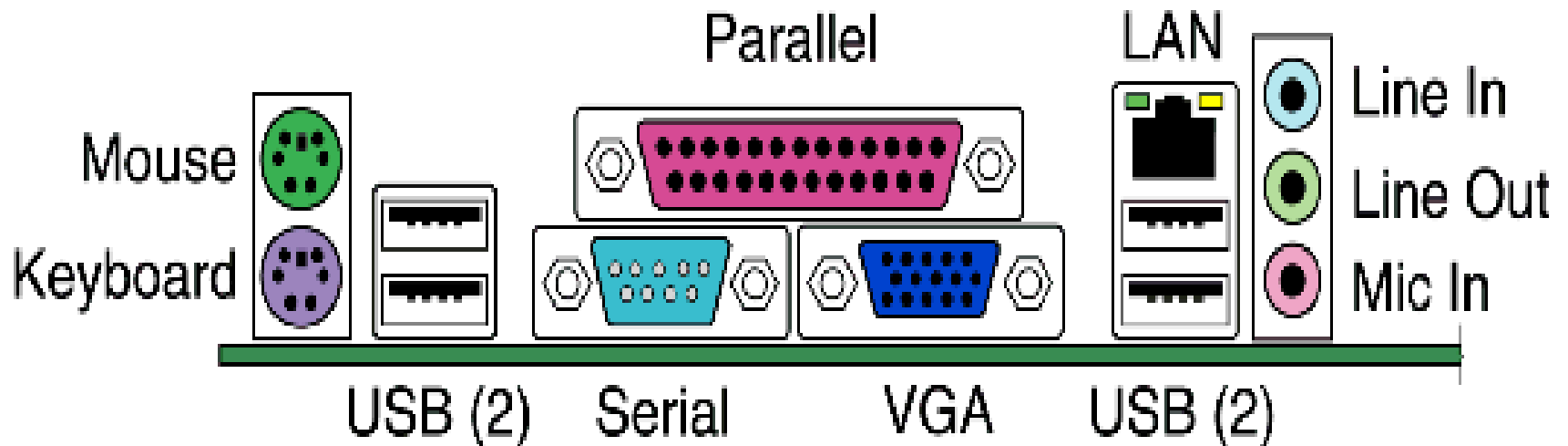
NORTHBRIDGE

SMPS



SMPS(Switched-Mode Power Supply)
an **SMPS** transfers power from a AC to DC source.

MB BACK PANEL



Steps for disassembling

- Remove the side panels
- Remove all the connections in CPU
- Remove front panel followed by the CDROM
- Unscrew the hard disk and remove it
- Unscrew the heat sink and remove it which is placed above the processor
- Now remove the processor inside the CPU socket
- Remove RAM from RAM Slots
- Remove the north bridge
- At last remove the mother board.

Steps for assembling

- Fix the mother board
- Attach the north bridge
- Fix the RAM to its slots
- Insert the processor to its place
- Keep the heat sink above the processor and tighten the screws
- Attach the hard disk and tighten the screws wherever needed
- Keep the CDROM in front panel and attach the front panel to the cabinet
- Connect all the connections
- At last attach the back panel as well