



Motherboards

KT0401 Function of motherboard

What is the Function of the Computer Motherboard?



In the world of modern technology, our conception of what a computer is capable of achieving continues to expand at an unprecedented rate of speed. As powerful hardware becomes more lightweight, portable and affordable than ever before, our computing devices are evolving rapidly. Although our expectations of what a computer is capable of may be changing, the central hardware powering these complex operations is not. A computer motherboard is one of the most integral elements of the modern computer, and it has served as the focal point of operations since the days of the first desktop computers. Understanding the motherboard function can help you gain a better idea of how computers work and how all the various technology "under the hood" works together.

The Function of Motherboard Hardware

The motherboard, also referred to as the main circuit board, is considered the home base of many important computer hardware elements, including the central processing unit (CPU), memory, sound cards and other peripheral items. During use, the motherboard establishes vital electronic connections between these various hardware units to ensure that tasks undertaken by the user are completed successfully and efficiently. The process

of managing all these connections in real time is demanding on the motherboard. Because of this, cooling fans are often attached to motherboards to help control the temperature and ensure that all hardware remains protected from heat damage.

Exploring Modern Motherboards

One of the most important hardware items attached to the motherboard is the CPU. Typically, motherboards feature a small socket connector somewhere centrally located on the hardware. This socket is intended solely for the computer's CPU. Although much of the additional hardware connected to the motherboard is critical for a computer to function properly, the lack of a CPU renders the computer unable to function at all.

An often overshadowed element of the motherboard that plays a huge role in maintaining successful functionality is the power connector. The power connector on the motherboard usually features 20 or 24 pins and directly connects to the connector on the computer's primary power supply. Once an electrical connection is established between the power supply and the motherboard, the motherboard distributes additional power to all the peripheral hardware connected to it. With that in mind, it can be argued that the motherboard is not only the central hub of information distribution within the computer but also of electrical distribution.

KT0402 Location of primary components

Components of a Computer System

Given below are the 5 components of a computer along with their purpose and functions.

Input Unit

A computer will only respond when a command is given to the device. These commands can be given using the input unit or the input devices.

For example: Using a keyboard we can type things on a Notepad and the computer processes the entered data and then displays the output of the same of the screen.

The data entered can be in the form of numbers, alphabet, images, etc. We enter the information using an input device, the processing units convert it into computer understandable languages and then the final output is received by a human-understandable language.

Output Unit

When we command a computer to perform a task, it reverts for the action performed and gives us a result. This result is called output. There are various output devices connected to the computer. The most basic of which is a monitor. Whatever we write using a keyboard or click using a mouse, is all displayed on the monitor.

Thus, the output unit gives us the final result once the entire processing is done within the mechanism of a device.

For example: when we visit an ATM, we enter our details like language, pin, amount to be withdrawn, etc. and then the final money which the cash dispenser releases is our outcome. In this case, the cash dispenser acts as an output unit.

To get a [list of computer input and output devices](#) and the function of the various I/O devices, visit the linked article.

For better understanding and more interactive analysis of the components of the computer, candidates can check the video given below and get detailed information reading the five major components responsible for the functioning of a computer device.

Memory Unit

When we enter the data into the computer using an input device, the entered information immediately gets saved in the memory unit of the Central Processing Unit (CPU). Because of the presence of some existing programming, the Memory Unit transmits the data further to the other parts of the CPU.

Similarly, when the output of our command is processed by the computer, it is saved in the memory unit before giving the output to the user.

Control Unit

This is the core unit which manages the entire functioning of the computer device. It is one of the most essential components of the computer system.

The Control Unit collects the data entered using the input unit, leads it on for processing and once that is done, receives the output and presents it to the user. It can be said to be the centre of all processing actions taking place inside a computer device.

Basically, the instructions taken, interpretation of entered data, issuing signals to execute the data and then finally retrieving the data is all done in the Control Unit.

Arithmetic & Logical Unit

As the name suggests, all the mathematical calculations or arithmetic operations are performed in the Arithmetic and Logical Unit of the CPU.

It can also perform actions like a comparison of data and decision-making actions. The ALU comprises circuits using which addition, subtraction, multiplication, division and other numerical based calculations can be performed.

Central Processing Unit (CPU)

The Central Processing Unit is the core of any computer devices. It comprises three major components of the computer which have been discussed above:

Memory Unit

Control Unit

Arithmetic and Logical Unit

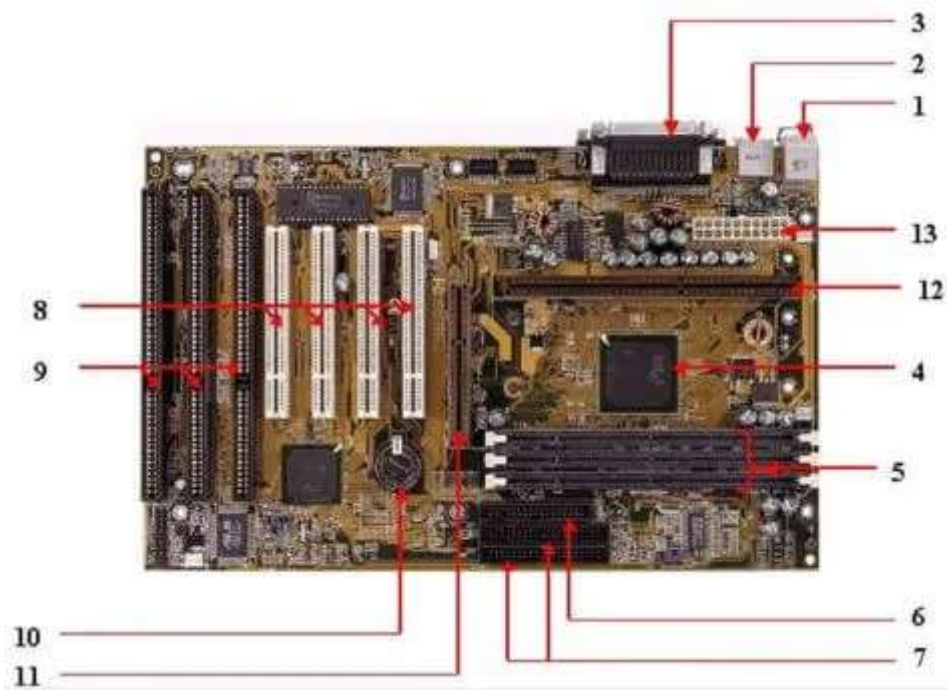
All these three units are elements of CPU and together help in the efficient working and processing of data. It is also known as the "Brain of Computer" and no action can be conducted by a device without the execution and permission of the Central Processing Unit.

The device is a close-knit circuit comparison microprocessor which helps in fetching the data and proving suitable results to the user. Thus, CPU is the main processing unit of the computer

KT0403 Motherboard chipsets, audio connections, drive activity light, the power light, on/off buttons, and USB connections

Components of Motherboard

In the below section, some of the important components of the motherboard are defined below:



1. Keyboard and mouse

There are mainly 2 types of mouse and keyboard connectors. The first connector is known as PS/2 & the second connector is known as USB.

2. Universal Serial Bus (USB)

The USB port is used for connecting the computer system. In the computer system, there is various type of devices that are connected with the USB port like keyboard, mouse, camera, scanner, printers, and another device. The main use of a USB port is to connect the peripheral devices and computer motherboards. The peripheral device connected to the computer system can be inserted or remove without system restarts that can be the main advantage of a USB port.

3. Parallel port

The old printers that are used in past use the parallel port to connect with the computer system. In the parallel port, multiple wires are used to send or receive multiple bits of the data in a single instance. On the other hand, serial ports use only one wire at a time. In the parallel port, 25 pins female DB type connector is used.

4. CPU chip

The central processing unit is the processor that controls all the functions of the computer system. The overall flow of task and functions are controlled by the central processing unit. For the computer system, the central processing unit is called the brain of the computer system.

5. RAM slots

The RAM slots are used for connecting the RAM (memory) in the computer system. In the general computer system, there are mainly two RAM slots but sometimes there can be four-plus slots in the motherboard to increase the memory of the computer system.

6. Floppy Controller

The older motherboard chip contains a 34-pin type ribbon cable for connecting the computer system with a floppy drive. In this ribbon cable, one end is directly connected with the computer system and one end is connected with the motherboard.

7. IDE controller

The integrated drive electronics are also known as ATA or Parallel ATA. The IDE is the type of component that issued for hard drive control. In today's computer system, the IDE controller supports is not supported.

8. PCI slot

The full form of PCI is a peripheral component interface. The PCI slot is mainly used to insert the expansion cards on the computer. The other PCI devices can also be connected like a sound card, network card, video, card, modems, and other device3s. In today's computer system support for PCI expansion slots are not there.

9. ISA slot

Industry-standard architecture (ISA) is defined as standard architecture for expansion bus. The ISA slot issued for connecting input devices and modems.

10. CMOS Battery

The CMOS battery is used for storing the BIOS settings on the motherboard. The CMOS battery is also capable of storing the time and data in it.

11. AGP slot

AGP (Accelerated Graphics slot) is a type of computer slot that is used for attaching the video card to the system. This slot is a high-speed slot so that data transfer can be done at high speed.

12. CPU slot

The CPU slot is a type of port that is used to connect the central processing unit to the motherboard of the computer system.

13. Power supply slot

The power supply slot is used for providing the electric supply to the computer system so that it can start and perform its functions. The total power supply given to the system is around 110 ac power. In the power supply type connector, there are a total of 20-pins that are used to maintain the power supply to the computer system.

Factors of Motherboard

The main form factor for the motherboard is size and shape. The other factors are physical layout, mounting holes, and board organization.

In the below section, some of the form factors are mentioned below:

1. ATX

In this type, the standard locations were defined for mouse, keyboard, input/output devices, video connectors, and other devices. In the year 1990, the ATX form factor was developed. The expansion slot given new location as in this form factor expansion slot were given separate space so that they can be connected with the motherboard.

2. Micro-ATX

The benefit obtained from the Micro-ATX is the same as from the ATX form factor. The main difference is an improvement in system design so that the overall cost of the component can be reduced as the size of the motherboard is reduced in this form factor. The size is reduced by reducing the I/O slots number on the motherboard.

Uses of Motherboard

The motherboard is the main component in the computer system that is used for connecting all the components of the computer system so that they can perform several tasks and functions in the system. The motherboard is considered as the spine of the system as all components are connected to a single circuit board for performing their functions. The motherboard is a costly device and once it gets damaged the user needs to spend a lot of money to buy a new motherboard for a computer system. The motherboard is a central device where all devices are get connected and maintain the flow in the computer system.

Internal Assessment Criteria and Weight