Microprocessor

A **microprocessor** is a computer processor where the data processing logic and control is included on a single integrated circuit, or a small number of integrated circuits. The microprocessor contains the arithmetic, logic, and control circuitry required to perform the functions of a computer's central processing unit. The integrated circuit is capable of interpreting and executing program instructions and performing arithmetic operations.[1] The microprocessor is a multipurpose, clock-driven, register-based, digital integrated circuit that accepts binary data as input, processes it according to instructions stored in its memory, and provides results (also in binary form) as output. Microprocessors contain both combinational logic and sequential digital logic, and operate on numbers and symbols represented in the binary number system.

The integration of a whole CPU onto a single or a few integrated circuits using Very-Large-Scale Integration (VLSI) greatly reduced the cost of processing power. Integrated circuit processors are produced in large numbers by highly automated metal—oxide—semiconductor (MOS) fabrication processes, resulting in a relatively low unit price. Single-chip processors increase reliability because there are much fewer electrical connections that could fail. As microprocessor designs improve, the cost of manufacturing a chip (with smaller components built on a semiconductor chip the same size) generally stays the same according to Rock's law.

Before microprocessors, small computers had been built using racks of circuit boards with many medium- and small-scale integrated circuits, typically of TTL type. Microprocessors combined this into one or a few large-scale ICs. While there is disagreement over who deserves credit for the invention of the microprocessor, the first commercially available microprocessor was the Intel 4004, designed by Federico Faggin and introduced in 1971.[2]

Continued increases in microprocessor capacity have since rendered other forms of computers almost completely obsolete (see history of computing hardware), with one or momicroprocessors used in everything from the smallest embedded systems and handheld devices to the largest mainframes and supercomputers.

Vacuum tube

The type known as a **thermionic tube** or **thermionic valve** utilizes thermionic emission of electrons from a hot cathode for fundamental electronic functions such as signal amplification and current rectification. Non-thermionic types such as a vacuum phototube, however, achieve electron emission through the photoelectric effect, and are used for such purposes as the detection of light intensities. Inboth types, the electrons are accelerated from the cathode to the anode by the electric field in the tube.

Audio power amplifier using tubes, in operation. Red-orange glow is from heated filaments.

Illustration representing a primitive triode vacuum tube and the polarities of the typical dc operating potentials. Not shown are the impedances (resistors or inductors) that would be included in series with the C and B voltage sources.

The simplest vacuum tube, the diode (i.e. Fleming valve), invented in 1904 by John Ambrose Fleming, contains only a heated electron-emitting cathode and an anode. Electrons can only flow in one direction through the device–from the cathode to the anode. Adding one or more control grids within the tube allows the current between the cathode and anode to be controlled by the voltage on the grids.[5]

These devices became a key component of electronic circuits for the first half of the twentieth century. They were crucial to the development of radio, television, radar, sound recording and reproduction, long-distance telephone networks, and analog and early digital computers. Although some applications had used earlier technologies such as the spark gap transmitter for radio or mechanical computers for computing, it was the invention of the thermionic vacuum tube that made these technologies widespread and practical, and created

What is evaluation of Sensor Technology?

A sensor refers to a device that can sense a specified measurement parameter and convert it into a usable output signal. Sensing technology, computer technology, and communication are collectively known as the three pillars of information technology. Sensing technology is a multidisciplinary, modern science and engineering technology focused on the obtaining of information from natural sources, processing and identifying that information, and using it for planning, designing, developing, manufacturing, and testing. The degree of application and evaluation of sensors is an important indicator of a country's informatization. Intelligent sensing technology is a comprehensive and intensive technology involving various disciplines such as micro-mechanical electronic technology, computer technology, signal processing technology, sensing technology, and artificial intelligence technology. It can realize functions that traditional sensors cannot.Smart sensors are mainly composed of sensors, microprocessors, and related circuits. At present, smart sensors have been widely used in various fields such as aerospace, aviation, national defense, science and technology, and industrial and agricultural production.

As a tool for humans to obtain information, sensors are an important part of modern information technology. Most of the output of traditional sensors are analog signals, which do not have signal processing and networking functions. They need to be connected to specific measuring instruments to complete signal processing and transmission functions. Smart sensors are based on silicon material micro

fabrication and CMOS circuit integration technology. According to the manufacturing technology, smart sensors can be divided into three categories: micro electromechanical systems (MEMS), complementary metal-oxide semiconductors (CMOS), and spectroscopy. MEMS and CMOS technologies are easy to achieve low-cost mass production and can integrate sensor elements, bias, conditioning circuits, and even ultra-large-scale circuits in the same substrate or the same package, enabling the device to have multiple detection functions and intelligent data processing functions. For example, smart devices that use the Hall effect to detect magnetic fields, the See beck effect to detect temperature, the **piezoresistive effect** to detect stress, and the photoelectric effect to detect light.

What is an Arm processor?

An Arm processor is one of a family of central processing units (CPUs) based on the reduced instruction set computer (RISC) architecture for computer processors. Arm Limited, the company behind the Arm processor, designs the core CPU components and licenses the intellectual property to partner organizations, which then build Arm-based chips according to their own requirements. Arm Limited does not manufacture or sell any chips directly.

Acorn Computers first developed the Arm processor in the 1980s. Until recently, the name *Arm* was treated as an acronym, *ARM*, which at first stood for *Acorn RISC Machine* and then for *Advanced RISC Machine*. The acronym is still widely used, although Arm Limited uses only *Arm* when describing its processor technology.

Arm Limited offers designs for both 32-bit and 64-bit RISC multicore processors. The processors use a much simpler instruction set than their Intel counterparts, which are based on the complex instruction set computing (CISC) architecture. The two types of processors also employ different methods to optimize performance and increase efficiency. For example, Intel takes a hardware approach to maximizing performance, whereas Arm takes a software approach.