

What is a capacitor in Electrical Engineering?

In electrical engineering, a capacitor is a device that stores electrical energy by accumulating electric charges on two closely spaced surfaces that are insulated from each other. The capacitor was originally known as the condenser, a term still encountered in a few compound names, such as the condenser microphone.

When were capacitors invented?

The earliest forms of capacitors were created in the 1740s, when European experimenters discovered that electric charge could be stored in water-filled glass jars that came to be known as Leyden jars. Today, capacitors are widely used in electronic circuits for blocking direct current while allowing alternating current to pass.

Why are capacitors combined in series?

Capacitors are combined in series to achieve a higher working voltage, for example for smoothing a high voltage power supply. The voltage ratings, which are based on plate separation, add up, if capacitance and leakage currents for each capacitor are identical.

Is a capacitor a passive electronic component?

It is a passive electronic component with two terminals. The utility of a capacitor depends on its capacitance. While some capacitance exists between any two electrical conductors in proximity in a circuit, a capacitor is a component designed specifically to add capacitance to some part of the circuit.

What are the different types of capacitors?

An assortment of capacitor types. From left: multilayer ceramic, ceramic disc, multilayer polyester film, tubular ceramic, polystyrene, metalized polyester film, aluminum electrolytic. Major scale divisions are in centimetres. Most capacitors have a dielectric spacer, which increases their capacitance compared to air or a vacuum.

What is a capacitor used for?

Today, capacitors are widely used in electronic circuits for blocking direct current while allowing alternating current to pass. In analog filter networks, they smooth the output of power supplies. In resonant circuits they tune radios to particular frequencies. In electric power transmission systems, they stabilize voltage and power flow.

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OverviewNon-ideal behaviorHistoryTheory of operationCapacitor typesCapacitor markingsApplicationsHazards and safety In practice, capacitors deviate from the ideal capacitor equation in several aspects. Some of these, such as leakage current and parasitic effects are linear, or can be analyzed as nearly linear, and can be accounted for by adding virtual components to form an equivalent circuit. The usual methods of network analysis can then be applied. In other cases, such as with breakdown voltage, the effe...

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