

B. CAPACITOR APPLICATIONS

Ceramic capacitor technology covers a wide range of product types, based on a multitude of dielectric materials and physical configurations, yet all are basically storage devices for electric energy which find use in varied applications in the electronic industry, and include the following:

Discharge of Stored Energy: This, the most basic of applications for a capacitor, involves the generation of a current pulse by discharge of a capacitor in the circuit.

Blockage of Direct Current: Capacitors, once charged, act as high impedance elements and thereby block the direct current in a specified portion of a circuit.

Coupling of Circuit Components: In an AC circuit, a capacitor charges and discharges with opposing polarity of the input signal, and thus allows alternating current to appear on either side of the component, so that sections of a circuit can be “coupled”. The current does not flow physically through the capacitor, as the dielectric is an insulator; continuous current surges are the result of the change in voltage across the capacitor.

By-Passing of an AC Signal: By virtue of the ability of a capacitor to block direct current and yet permit the passage of alternating current, the device can be used in parallel with another circuit element to allow AC to “by-pass” the element without passing the DC portion of the signal.

Frequency Discrimination: An input signal of mixed frequencies can be segregated by the use of a capacitor which is nonresponsive (by virtue of its capacitance value) to the low frequency portion of the signal. For capacitors in an AC circuit, the current “flow” increases with frequency. Also, the capacitance reactance, i.e. the resistance to flow of alternating current, is inversely proportional to the capacitance value. A device selected to display relatively minor opposition to current flow for the high frequency portion of the signal, while offering greater opposition to the lower frequency current, can thus be used to discriminate and filter out the desired frequency range.

Transient Voltage and Arc Suppression: Capacitors are utilized to stabilize circuits by removal of undesired transient voltage surges, and to eliminate arcing of contact points. The capacitor absorbs the energy generated by these voltage surges.