

17.0 Introduction

Capacitance is the property of an electrical circuit that enables it to store electrical energy by means of an electric field and to release that energy at a later time. Capacitance exists whenever an insulating material (dielectric) separates two conductors that have a difference of potential between them. Devices that intentionally introduce capacitance into circuits are called capacitors. An older term for these components is “condensers.” **Figure 17-1**

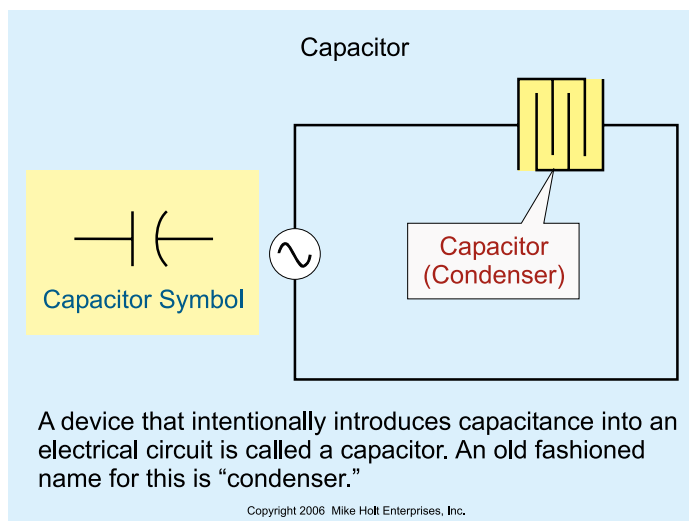


Figure 17-1

Capacitor Current Flow

Direct current does not flow through a capacitor. An old-fashioned name for this is “Condenser.” In an ac circuit, the electrons in the circuit move back

and forth to alternately charge the capacitor, first in one direction, and then in the other. A capacitor permits current to flow because of its ability to store energy and then discharge the energy as the ac current flows in the opposite direction.

Capacitors as Filters

Figure 17-2 shows a diagram of a full-wave rectifier, which makes use of four rectifiers. A rectifier is a device that allows current to flow in only one direction, thus converting ac current to dc current.

Each rectifier only provides current flow for one-half of the ac sine wave, which is not a very practical dc current. Connecting four rectifiers into the full-wave rectifier circuit shown provides a bridge circuit which allows different rectifiers to alternately provide current to the load during each half of the sine wave alternation, while always keeping the same dc polarity on the load. This provides a partial solution; however, the current produced is still not a pure dc current, but what is called pulsating dc. A capacitor can be used to level out the pulsating dc into a filtered dc current.

AUTHOR’S COMMENT: As a “full-wave rectifier” converts the ac voltage to filtered dc voltage, the capacitor will be continuously charged. **Figure 17-2**