

# Ultracapacitors

Temporary Energy Source of Peak Loads

# Ultracapacitors

An ultracapacitor, also called a supercapacitor, is a very high value capacitor used to store energy that can supply short duration peak current to a load. They are also used as a temporary or backup DC source while charging batteries or fuel cell.

Capacitance values of 1 to 10 farads (F) are common.

The voltage ratings are typically less than 3 volts.

Typical values are 4 F and 6 F at 2.5 volts.

## Increasing the Value Ultracapacitors

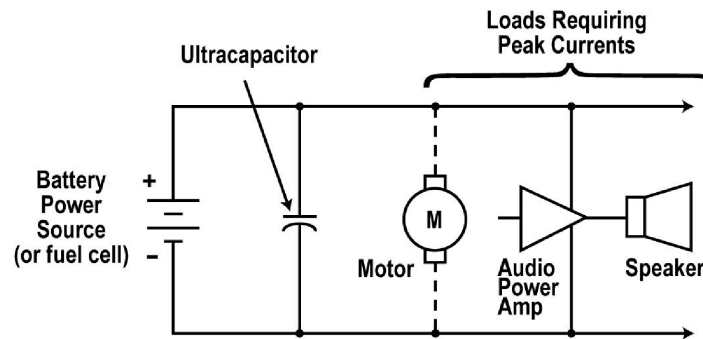
Higher values of capacitance can be obtained by placing ultracapacitors in parallel.

They may be put in series to obtain higher voltage ratings.

Ultracapacitors are just like standard capacitors in that they are charged and discharged in the same way.

The primary value of an ultracapacitor is that it can store a huge amount of energy and release it when needed.

# Ultracapacitor Operation



\* Battery not capable of providing needed peak current

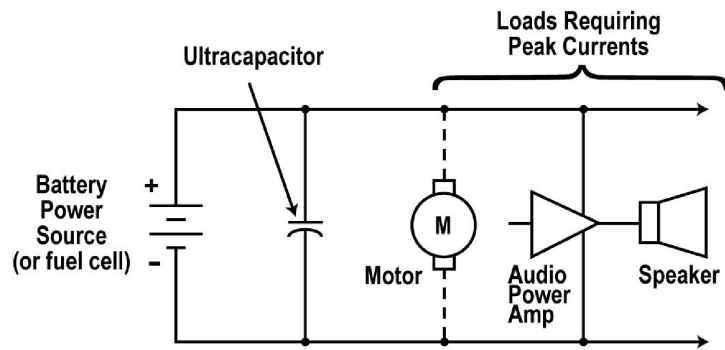
\* Ultracapacitor stores energy from battery then supplies peak current during motor starting, high bass audio peaks, etc.

Ultracapacitors are normally used with some other DC power source such as a battery or fuel cell.

The ultracapacitor is charged to the battery or fuel cell voltage.

When the battery is temporarily removed for replacement, the voltage on the capacitor is usually sufficient to power the circuitry for a short time.

# Ultracapacitor Application



\* Battery not capable of providing needed peak current

\* Ultracapacitor stores energy from battery then supplies peak current during motor starting, high bass audio peaks, etc.

The main application of the ultracapacitor is to supply short term energy to electrical or electronic components. Most batteries cannot supply high current for short periods unless much larger versions with greater Ah ratings are used. These batteries would be wasteful because the entire Ah capacity is not needed for normal operation. The ultracapacitor can supplement a smaller, cheaper battery for peak load conditions.

# Ultracapacitor Uses

Ultracapacitors are used in digital cameras, camcorders, and cell phones.

They are also used in auto sound systems in cars to supply high audio peak power at high volume level.

They can be used to supplement fuel cells.

In personal computers and laptops, they are used to back up the clock chip

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