

Using Supercapacitors to Support High Power Applications from Low Power Energy Sources

(What you wanted to know but were afraid to ask)

Abstract

Wireless sensors are becoming ubiquitous. They are used in applications ranging from HVAC, industrial control, condition monitoring, security monitoring, and location tracking. Providing power to these sensors can be problematic - it is too expensive to wire power to them, and batteries require replacement and disposal. The environment on the other hand, can provide effectively infinite energy but at very low power. These sensor applications usually have a low duty cycle with a high peak power requirement to periodically or sporadically gather and transmit data drawing very low average power. This makes them ideal to be powered from an energy harvester, which charges a supercapacitor at low power, and the supercapacitor provides the peak power burst to collect and transmit data. In recent years a range of ICs have been released to charge supercapacitors from energy harvesters. This paper will explain the properties of supercapacitors, what designers need to know, discuss the principles of charging circuits, and give examples for solar and vibration harvesters.

<https://sensorexpo2017.sched.com/event/960y/pre-conference-symposium-2-energy-harvesting-and-energy-efficient-power-solutions-for-sensor-applications-tutorials?iframe=no&w=100%&sidebar=yes&bg=no>