

The supercap data sheet linked gives a supercap energy density (actually, specific energy) of 1-10 W-hr/kg, and battery energy density of 10 - 100 W-hr/kg. The supercaps shown have a specific energy of 4.3, so let's assume a specific energy of 40 for a car battery. Actually, Wikipedia says 33 to 43, so let's go with 35.



Aakash Jog. 33 3. Battery capacity in generaly stated in Ah, Your supercaps are in Farads which is Ampsecond per Volt . So this means that your supercaps wont operate the Leds for as long as a battery does .If this is acceptable to yo then you can have something that has essentialy no maintainence . ??? Autistic.



A relatively dead battery will have high impedance and when I first apply say 12 to 15V to it the current into the battery will be low compared to the current into the system motor. While there will be some loss of charge it will be a small portion over the time taken to start the engine.

## SUPERCAPACITOR BATTERY





7. To calculate capacitor size, you must define what is the voltage range your device works with. Is it 11 to 13V or 11.9 and 12.1V or something else.However, it is unlikely that you actually want to use any capacitors at all to power a 12V ???

Image: state stat

 $I = C \times dV dt I = C \times d V d t$ . in our case, I = 200 mA I= 200 m A, dV = 250 mV d V = 250 mV, dt = 200 msd t = 200 ms, solving, we get a value of 250 mF 250 m F for the required capacitance. i would go with considerable margin (even twice the value) with the value considering life time of the capacitor.



The paper you reference is ONLY true for pulse loads. Certainly worthwhile for use as an ESR reduction in a battery powered MCU application which spends most of its time in sleep mode. However the only energy available in this type of application is that from the battery, since the battery has to charge the Supercap. \$endgroup\$ ???

## SUPERCAPACITOR BATTERY





I can"t answer the actual question about a supercap being used in place of a Lithium battery, but you can try to simulate a battery with a 4V - 4.5V power supply. I"d put a diode in series with the power supply to prevent the battery charting circuit of your router from trying to "charge" the power supply by reversing the voltage at the point



\$begingroup\$ 0.5\*83\*16.2? is the total energy stored - unfortunately this is erroneous as (a) the battery voltage (and hence the capacitor voltage) is more likely to be around 13V and (b) the capacitor voltage can only fall the same amount as the battery so the amount of energy available from the capacitors will only be a small fraction of