A Battery Voltage and Current Smoother

1 Introduction

The project revolved around maintaining a stable power supply for the reliable operation of sensitive equipment. Batteries, despite being a convenient and portable power source, can sometimes deliver fluctuating current and voltage due to various factors such as load changes, batter health, and environmental conditions. These fluctuations can lead to noise, instability, and reduced efficiency in electronic applications. To address the issue, a smoothing circuit is employed to minimize voltage fluctuations and stabilize the voltage.

2 Requirements

- A smoothening circuit typically consists of passive components and sometimes voltage regulators. All the components should work together to filter out ripples and noise from battery output.
- The circuit should be able to maintain a constant voltage level until the battery is totally dead.
  - If you consider a 9v battery, it will be considered a dead battery if the voltage falls under 7v. With the proper regulation techniques, the lifetime of the battery can be extended to 7.5 V
- Design and develop circuits to maintain constant voltage and constant current from a 9 V battery. In this case you can design a regulator for constant voltage and regulator separately. The output voltage can be lower than the battery. The current can be any value if it's sufficient to keep your controller operational for a longer time.

3 Additional Rules

- Any change of the above specifications is negotiable only before the mid review.
- All the circuits should be simulated using software before the implementation.

- It is allowed to use an external PCB manufacturer for producing the circuits, and no marks will be reduced or added.
- Using any other pre-built ICs (other than transistors and op-amps) are prohibited.
- Regardless of the method of PCB manufacture, the full set of output files required to mass produce the PCBs, to assemble the circuit and to package it is required.
- Follow provided "General guidelines".