

Power Distribution

ME218B Winter 2017, Team 4

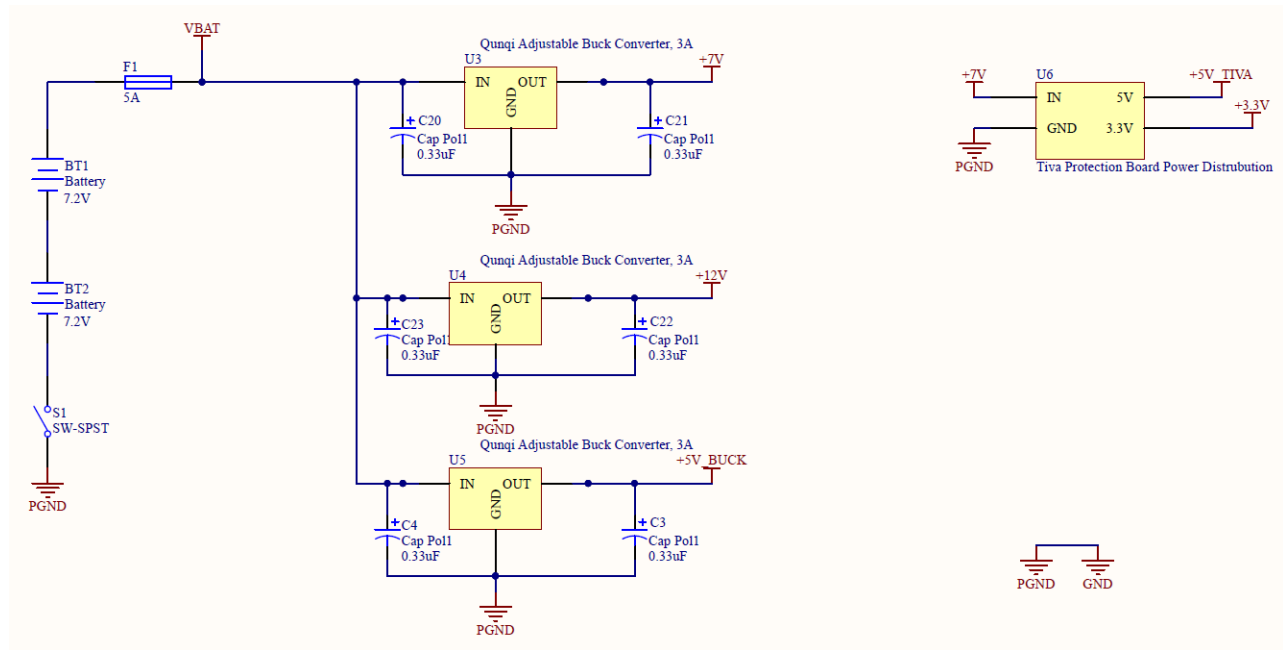


Figure 1: Power Circuitry in Altium

Our robot was powered from two 7.2V NiMH batteries. A 5A fuse was used to protect our circuits. Three buck converters powered our robot - a 7V line was used to power the Tiva Protection Board, our drive motors were run from a 12V rail, and our servos were run from a 5V rail. Our use of efficient buck converters instead of LDOs where possible increased our battery life significantly and enabled us to test our robot for long periods of time without having to charge our batteries frequently.

The 5V rail generated by the LDO on the Tiva Protection Board was used to power our analog circuitry. The LOC was powered by the 3.3V rail generated by another LDO on the Tiva Protection Board.

The buck converters can provide up to 3A each. Our most power-hungry components, the drive motors, draw a total of 2.4A when stalled, therefore driving them from our buck converters does not pose an issue. The servos draw about 1A when stalled, however since it is very unlikely that all three of them would be stalled at the same time, we did not run into any issues while powering them from our buck converters.