

Power Distribution System for a CubeSat

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Objective

To design and implement a fully autonomous power generation, storage and distribution system for a CubeSat

Methodology

- Identifying the power requirements
 - Architecture design and topology selection
 - Forming Specifications
 - Design and simulation
 - Procurement of components
 - Fabrication and testing

System Architecture

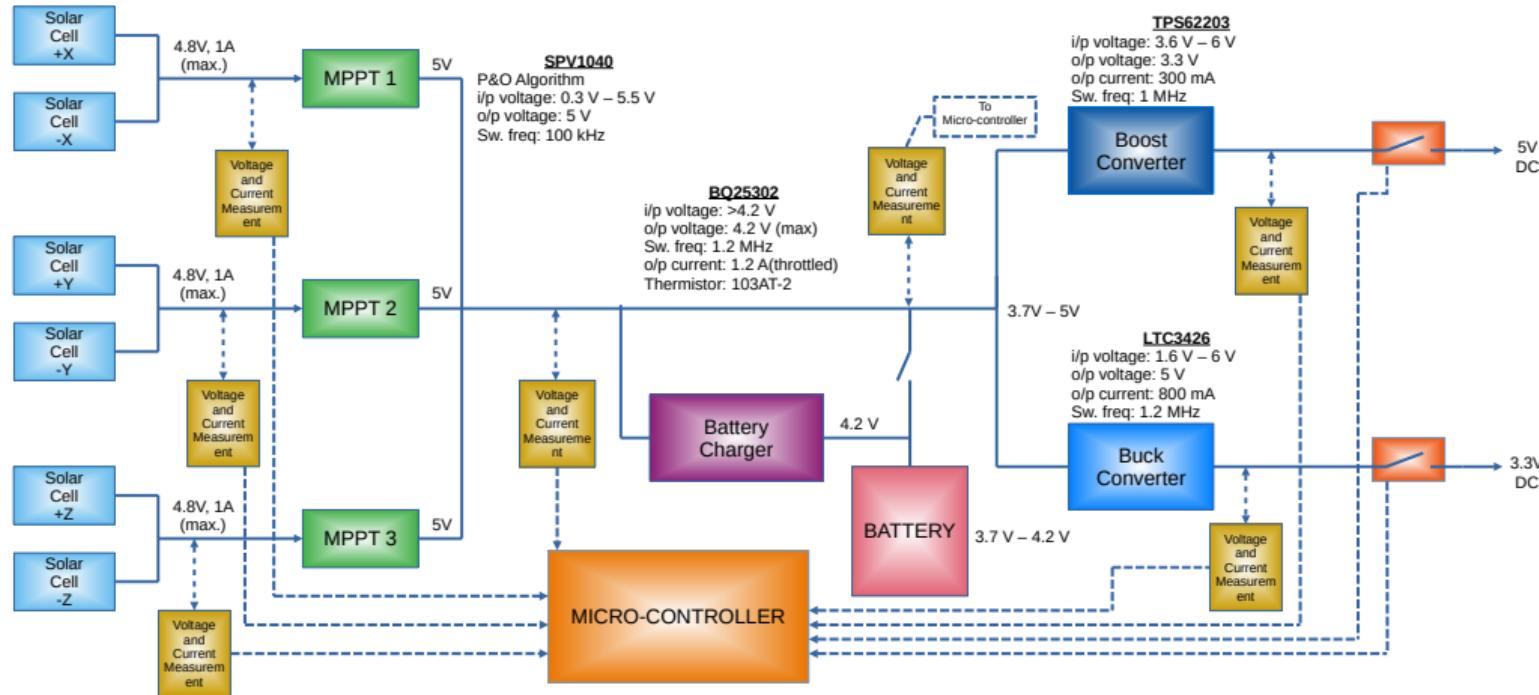


Figure 1: CubeSat EPS Architecture

Hardware Design

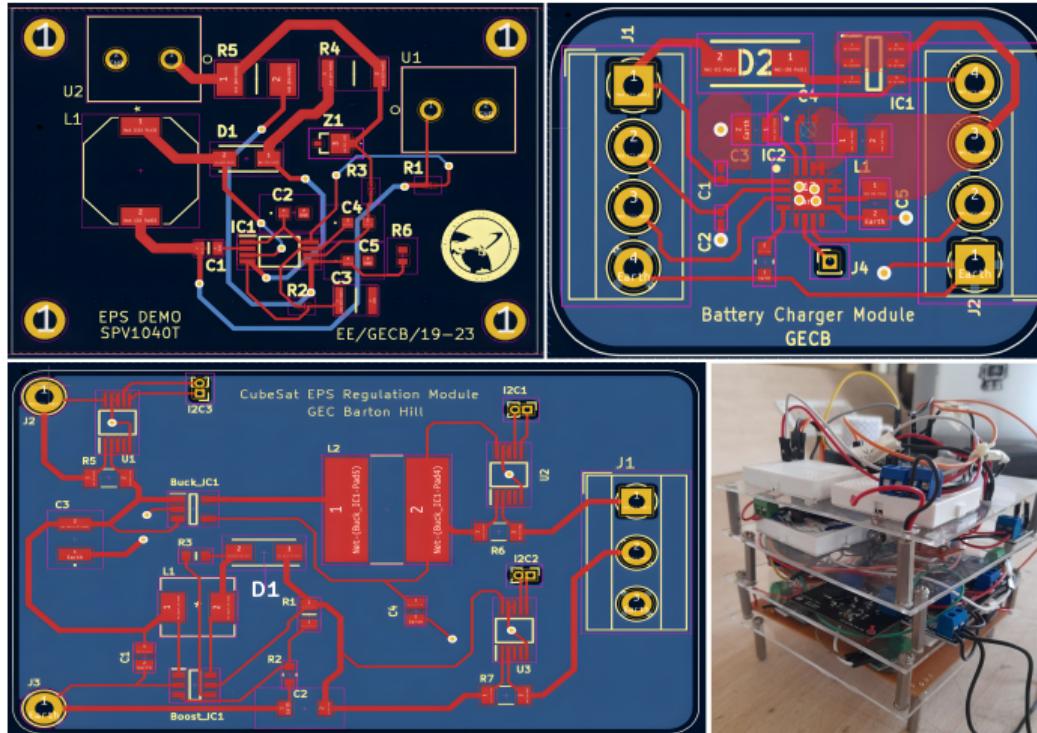


Figure 2: Circuit design of buck and boost converters with monitoring

Fully Integrated EPS

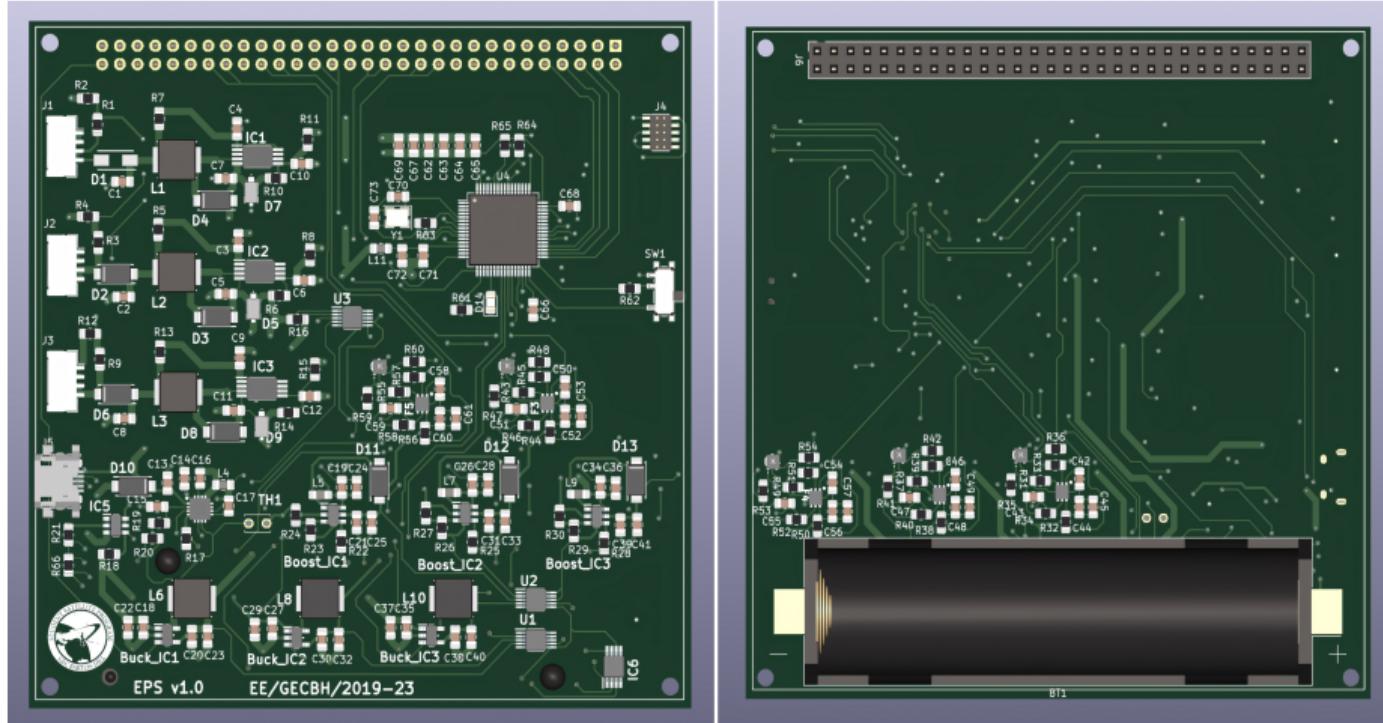


Figure 3: Circuit design of MPPT

Work Accomplished and Future Scope

- Work Accomplished
 - Initial power budget
 - System architecture
 - PCB design, fabrication and soldering
 - Preliminary testing of all modules
 - line regulation, load regulation
 - Design of fully integrated EPS
- Future Scope
 - Update power budget
 - Improvements in design
 - Battery heater, Remove Before Flight pin, Watchdog timer
 - Circuit Redundancy
 - FreeRTOS in STM32 microcontroller

Thank You