

Current Project: Electric Vehicle Battery Monitoring System (BMS) Prototype.

The purpose of this project is to develop a battery monitoring system for DIY electric vehicles. This will allow accurate measurement of the voltage, current, and temperature of the high voltage traction pack, as well as enabling the use the DC fast charging standard known as 'CHAdEMO' to quickly charge an electric vehicle to 80-90% charge in less than 30 minutes. The prototype consists of a single – two-layer PCB which has been designed to fit a readily available IP67 rated waterproof enclosure. The heart of the BMS is the ATmega328 microcontroller – the same microcontroller chip found in the Arduino Uno. The INA226 voltage monitoring chip has been used, which takes the high voltage input from the battery through a resistor divider and isolates that and gives a representative signal at the 0-2v range which can then be fed into the microcontroller.

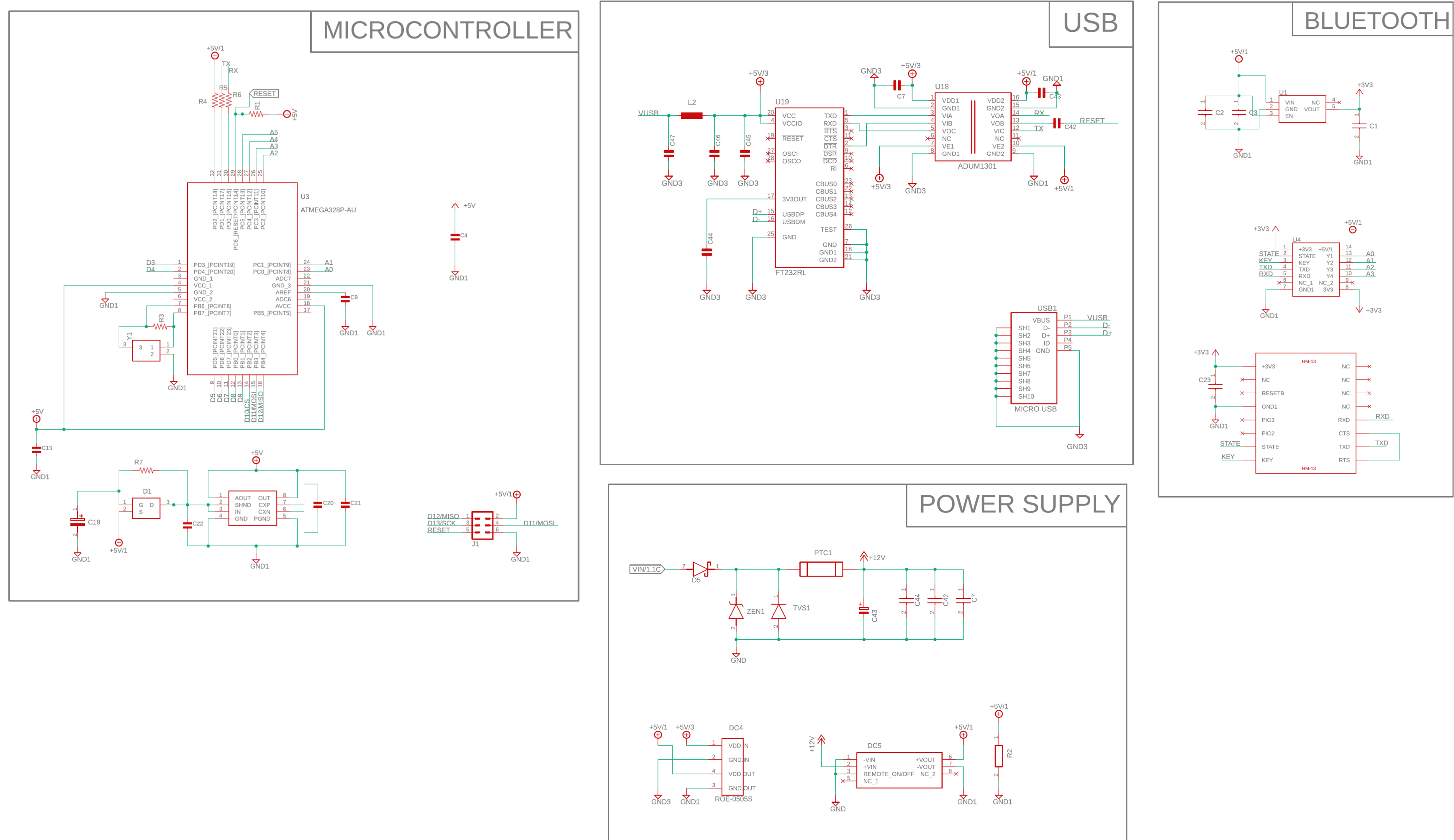


Figure 1: Section of schematic for Battery Monitoring System (BMS). Designed in Autodesk Eagle.

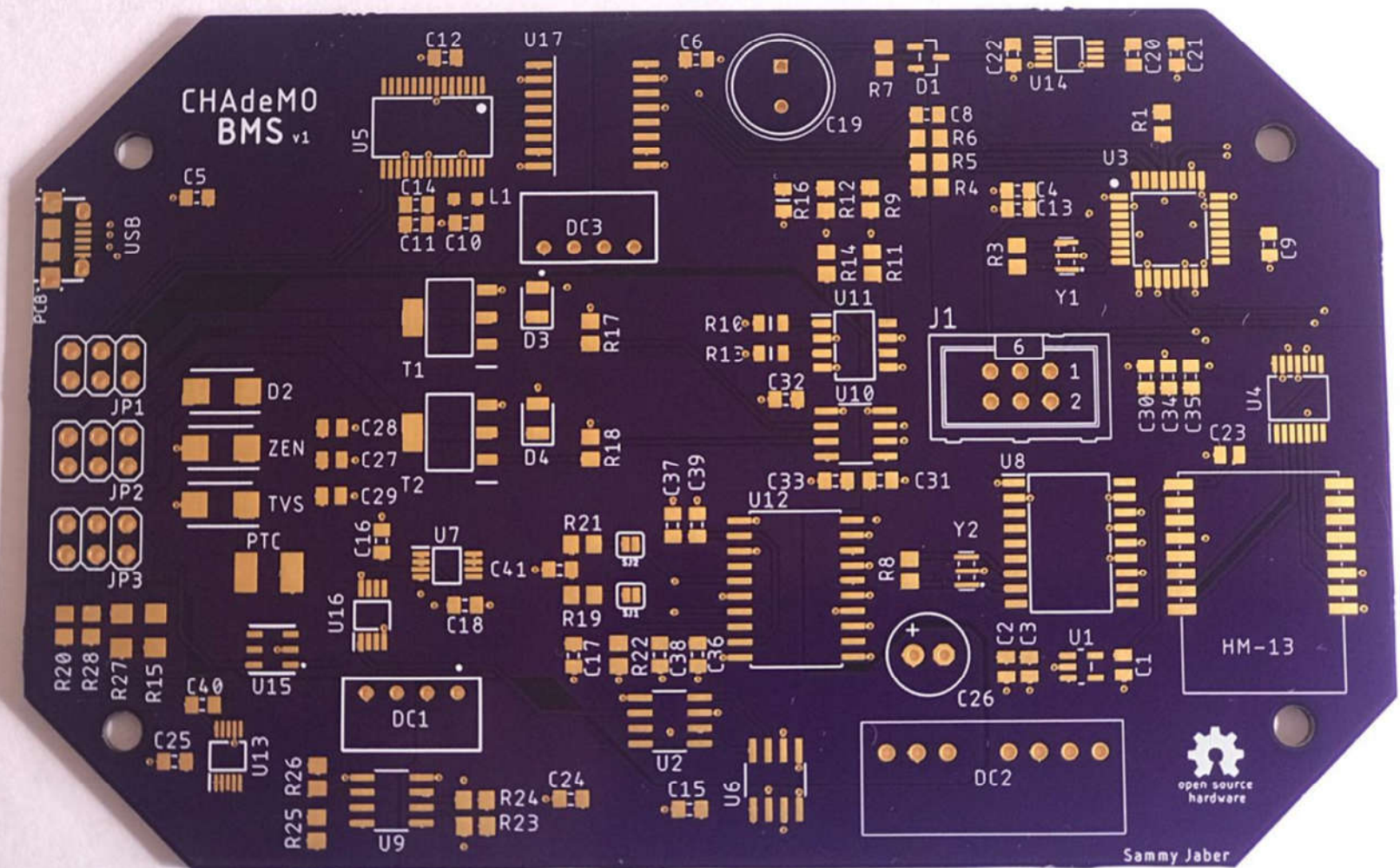
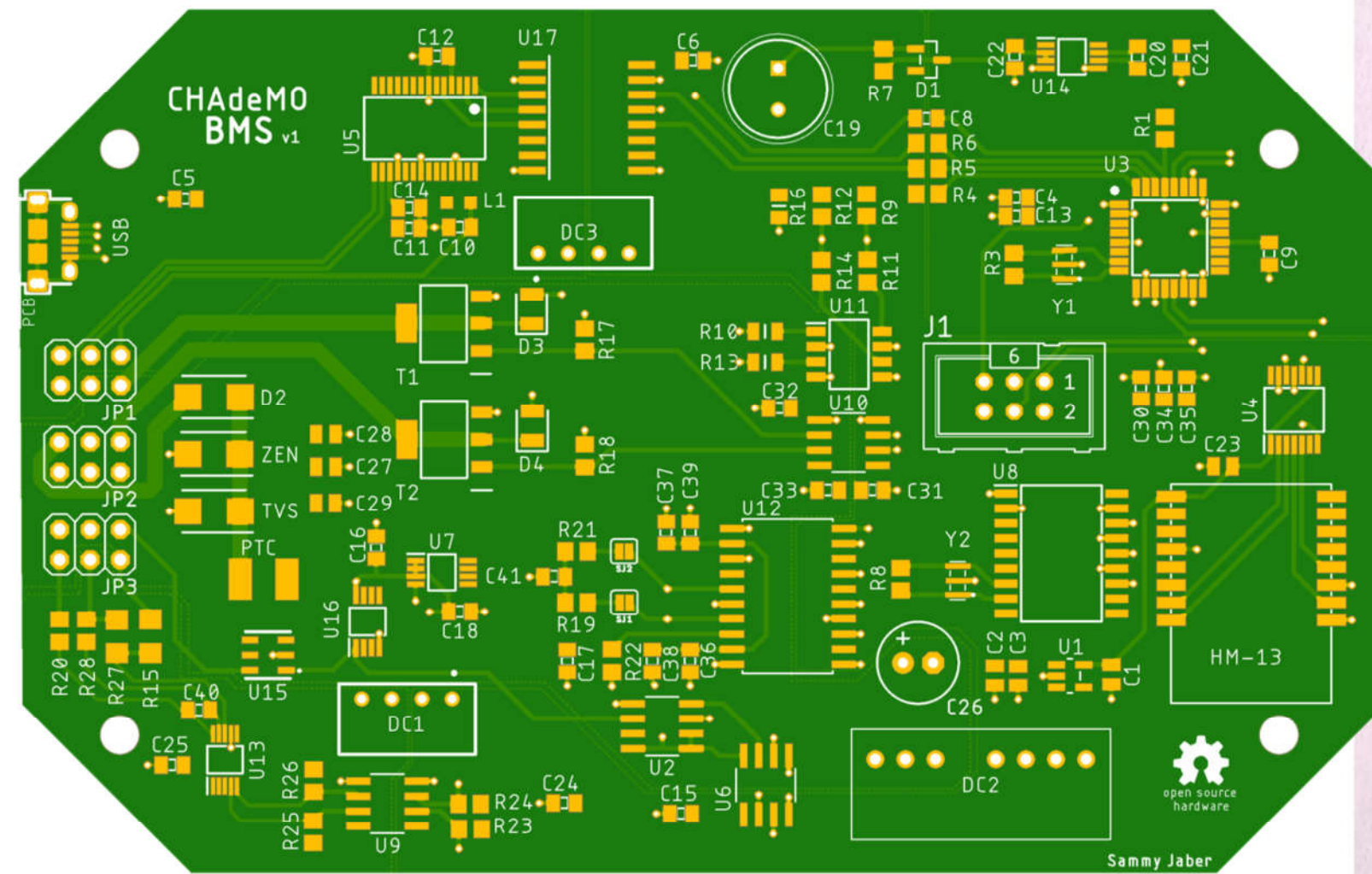


Figure 2: 2 layer PCB. 2D design output from Eagle on the left. Manufactured PCB from OSHpark shown on the right.

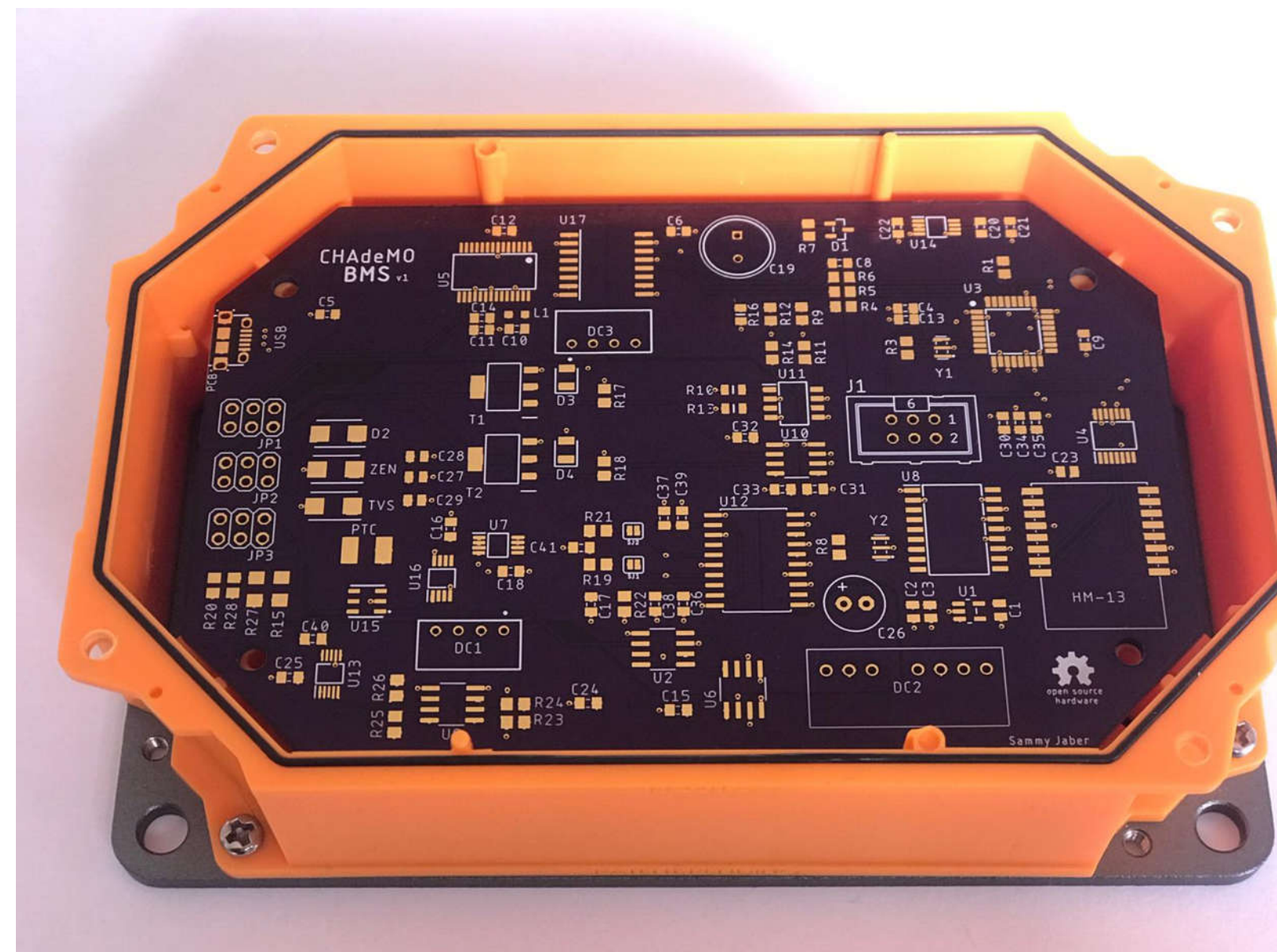
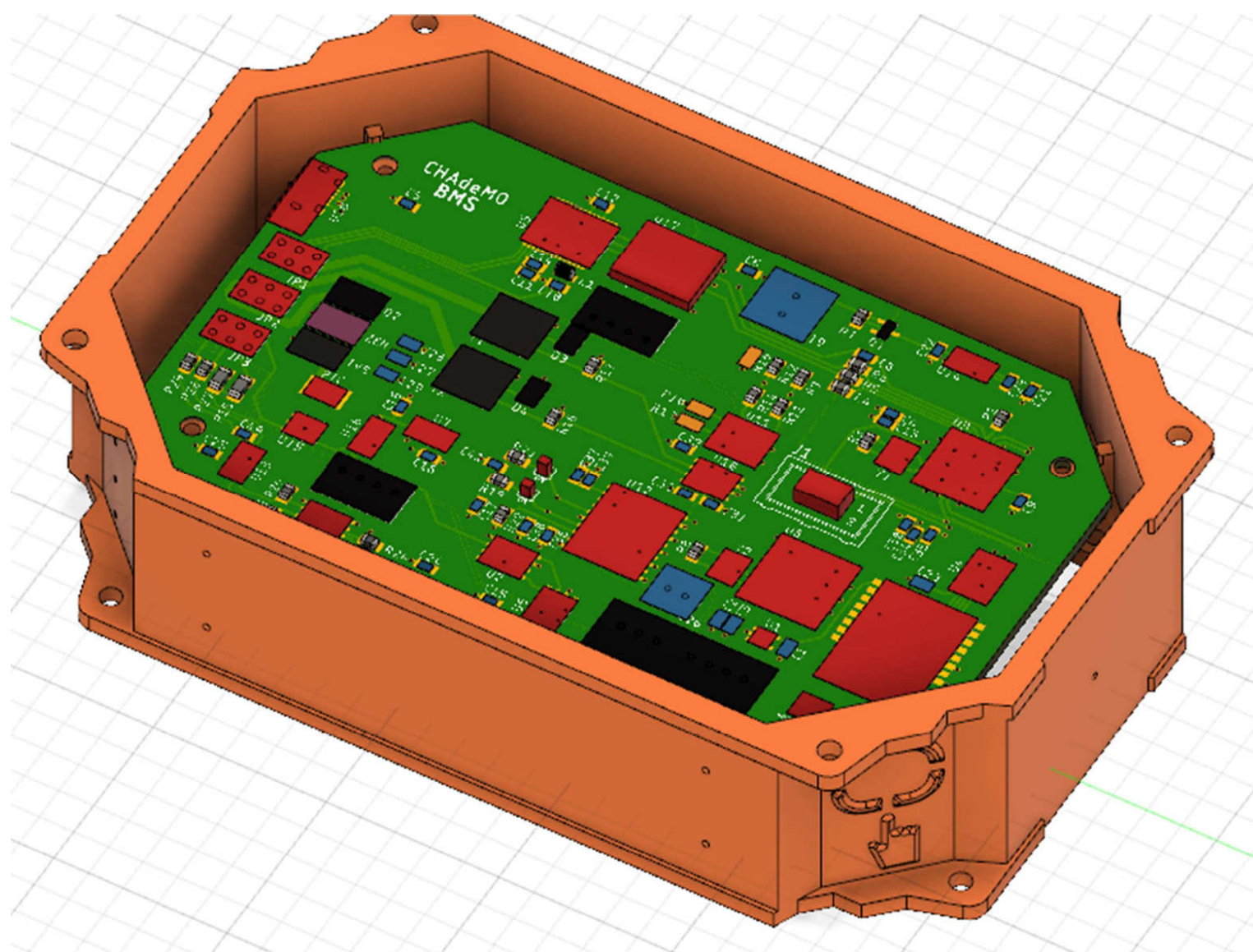


Figure 3: Use of Autodesk Fusion360 software to specify mounting holes, enabling the PCB to fit within an IP67 rated enclosure.