BOM

Bom obviously excludes the Teensy 4.1, Seeeduino Xiao, and K230D. Subdivided into two parts for Battery and Main, alongside explanations of the circuits.

Battery:

Basic Building Blocks:

- Resistors
  - 143 Ω (E96 sub for 148 Ω) (×1): 311-143HRCT-ND
  - 2 kΩ (×1): 311-2.00KHRCT-ND
  - 10 kΩ (x1): 311-10.0KHRCT-ND
  - 221 kΩ (E96 sub for 225 kΩ) (×1): 311-221KHRCT-ND
  - 1 MΩ (×2): 311-1.00MHRCT-ND
- Capacitors
  - 330 pF (×1): 399-1095-1-ND
  - 130 pF (sub for 128 pF) (×1): 490-1430-1-ND
  - 2.2 nF (×1): 399-9227-1-ND
  - 22 nF (×1): 399-3560-1-ND
  - 470 nF (×1): 490-3291-1-ND
- LED
  - Green (×1): 160-1446-1-ND
- Transistors:
  - P-Channel MOSFET (x1): SI2333DDS-T1-GE3CT-ND
  - NPN BJT (x1): 4518-SS8050CT-ND

Miscellaneous:

- Connectors:
  - (1×2) (x5): 455-1639-ND
- Switches:
  - Sliding Switch (x2): 2223-SLW-682715-25A-SMT-TR-ND

ICs:

- eFuse IC – TPS25983DRCT (x1): 96-TPS259830ONRGERTR-ND (Texas Instruments)

Main:

The circuit divides the grounds in two in order to isolate the logic circuitry from the noisy motor currents. VUSB goes high when the Teensy is connected to the usb, this allows us to create a

signal that closes the UART connections in that situation. A BJT inverts the VUSB logic and two source-to-source PMOSs close off communication bidirectionally. The AP63201 is an adjustable voltage regulator. The output is set by the resistor pairs R5/R6 and R7/R8 such that the bus voltage is 5.3V. They are connected to the controllers via diodes. The adjusted voltage ensures that the controllers see ~5V after the diode drops. This way when the board is powered off, there is no back current to the other controllers. The BOM is below:

Basic building blocks:

- Resistors
    - 1kΩ (x2) : RMCF0603FT1K00TR-ND
    - 10kΩ (x2): 541-10KAQTR-ND
    - 30kΩ (x2): P30KDBTR-ND
    - 169kΩ (x2): 541-169KHTR-ND
- Capacitors
    - 0.1 µF (x2): 311-1088-2-ND
    - 10 µF (x2): 587-3258-2-ND
    - 22 µF (x6): 1276-1274-2-ND
    - 100 pF (x2): 490-1427-2-ND
    - 47 µF (x1): 490-GRM188R60J476ME15JCT-ND
- Inductor
    - 10 µH (x2):535-AOTA-C322512Q100MTTR-ND
- Diodes
    - Schottky (x4): CD0603-B0240RTR-ND
- Transistors
    - P-Channel Mosfet(x1) : SSM3J338RLFTR-ND
    - NPN BJT (x1): FMMT493TR-ND

ICs:

- AP63201WU (x2): AP63201WU-7DITR-ND

Miscellaneous:

- Connectors:
    - (1x2) (x5): 455-1639-ND
    - (1x4) (x2): 455-B4P-VH-ND
    - (1x8) (x4): SAM1148-08-ND