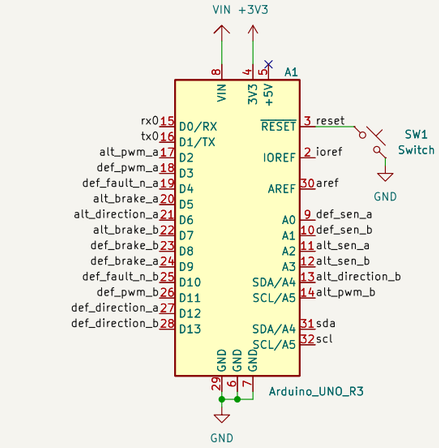


Standard Motorshield Assignments:
Channel A:

D12 – Direction
D3 – PWM (work duty)
D9 – Brake
A0 – current sensing.

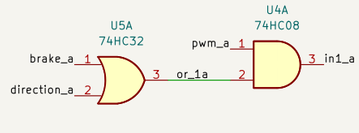
Channel B:

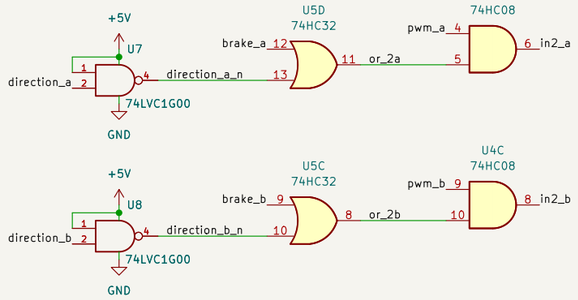
D13 – Direction
D11 – PWM (work duty)
D8 – Brake
A1 – current sensing

New Addistions:
D4 – fault_n_a
D10 – fault_n_b

MAX22201 control logic:
in out
00 ZZ
10 10
01 01
11 00

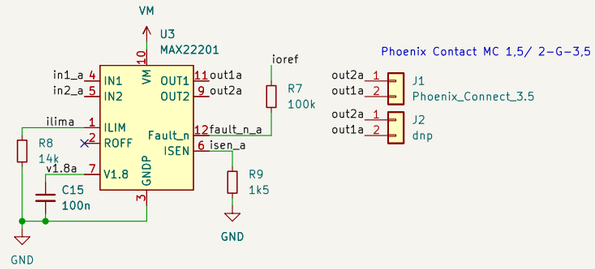
IN1 = pwm and (brake or dir)
IN2 = pwm and (brake or dir_n)

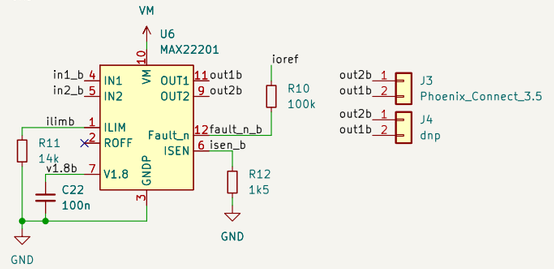




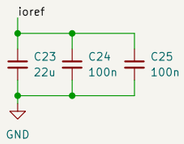
r_isen = 5000*(V_isen/I_max)

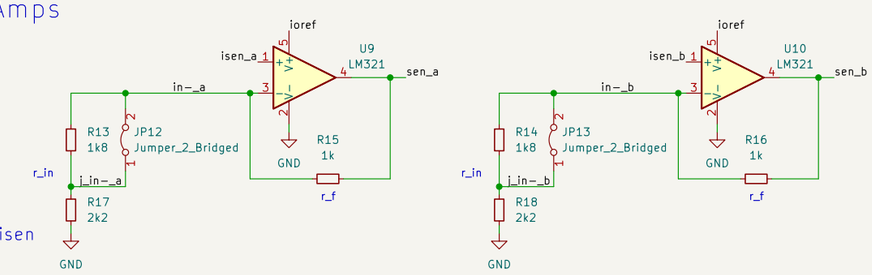
1k5 –> 1V reached at 3.3 Amps





Current Sense OpAmps





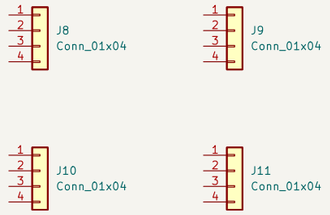
aim for full saturation @ 1V isen

vout/vin = 1+r_f/r_in

3V3: r_f 1k, r_in 2k3
5V: r_f 1k, r_in 4k

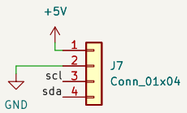
Supplied by IOref to protect ADCs
Jumper needs to be cut for x3.2 gain, otherwise x5 gain

TODO i2c headers



OLED Header

TODO look up actual pin assignment



Power

File: power.kicad_sch

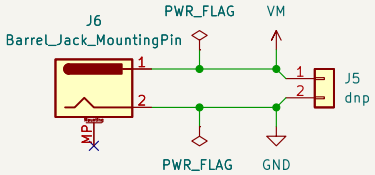
Engineer: Erwin Peterlin
semify-eda.com

Sheet: /
File: motor-shield.kicad_sch

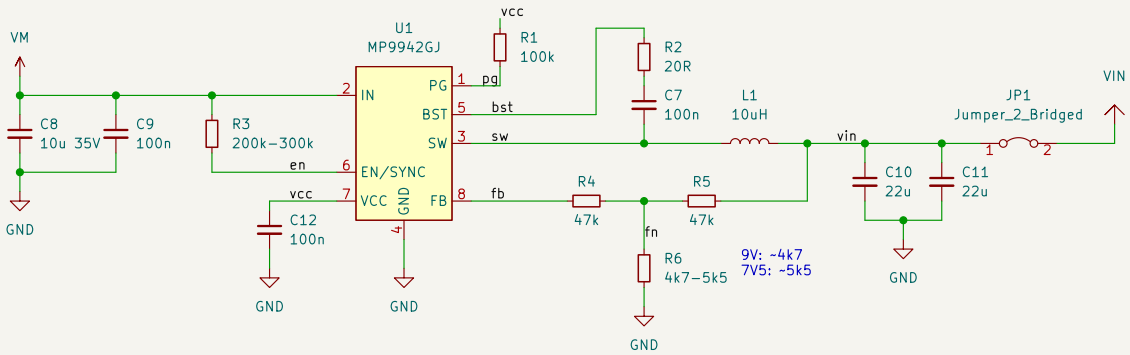
Title: Motor Shield (DCC-EX compatible)

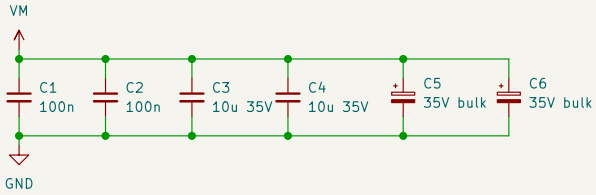
Size: A3	Date: 2023-01-30	**Rev: Prototype A**
KiCad E.D.A. kicad (6.0.10)		Id: 1/2

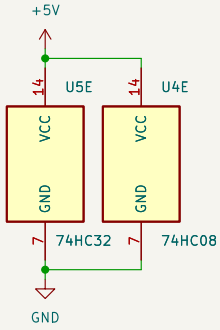
Barrel Jack



VIN DCDC Buck Converter

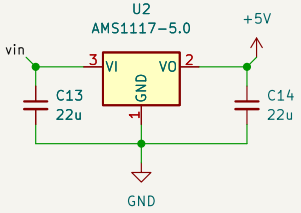




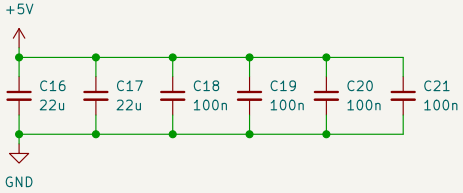


5V LDO

Better to rely on our own 5V
(for i2c devices, OLED Display etc)



TODO should this switch between 5V and 3V3?



Engineer: Erwin Peterlin
semify-eda.com
Sheet: /Power/
File: power.kicad_sch

Title: Motor Shield (DCC-EX compatible)

Size: A4	Date: 2023-01-30	**Rev: Prototype A**
KiCad E.D.A. kicad (6.0.10)		Id: 2/2