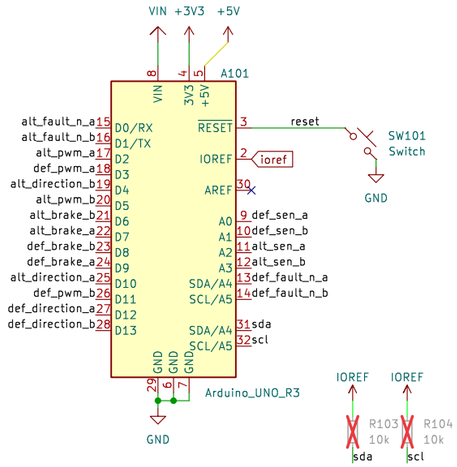
Arduino Header



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

DRV8874 control logic:

PH/EN Mode (PMODE Low)

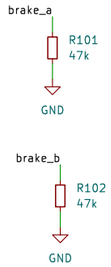
nSleep/EN/PH	out1/2
0 X X	ZZ
1 0 X	00
1 1 0	01
1 1 1	10

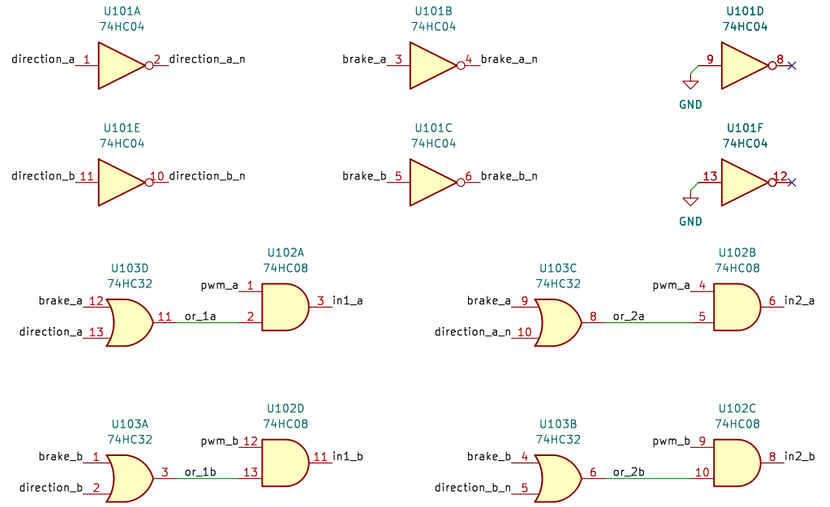
nSleep = high / pwm
EN = not brake / pwm
PH = dir

PWM Mode (PMODE High)

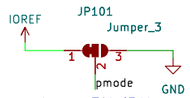
nSleep/in1/2	out1/2
0 X X	ZZ
1 0 0	ZZ
1 0 1	01
1 1 0	10
1 1 1	00

nSleep = high
in1 = pwm and (dir or brake)
in2 = pwm and (not dir or brake)



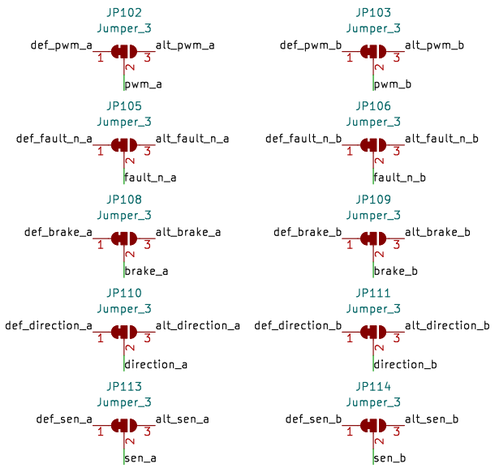


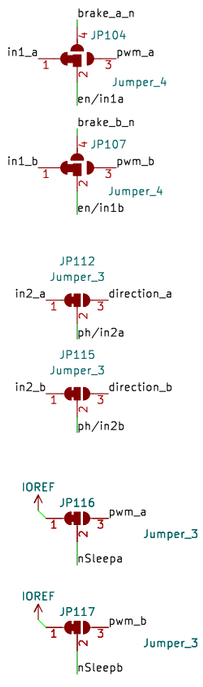
DRV8874 Mode Select



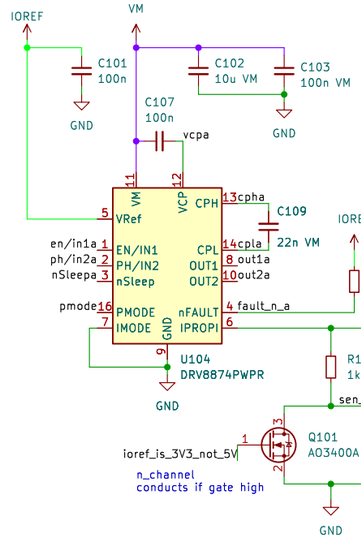
Low: EN/PH
High: PWM
Z: Independent

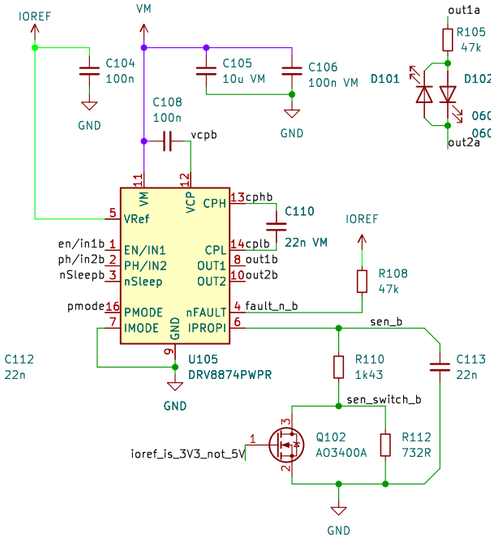
Alternative pinout to allow stacking



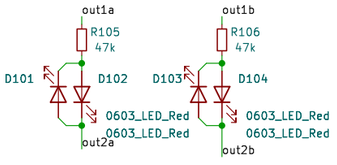


DRV8874 Motor Driver

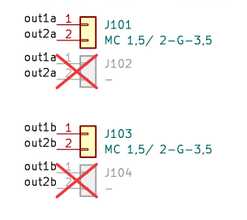




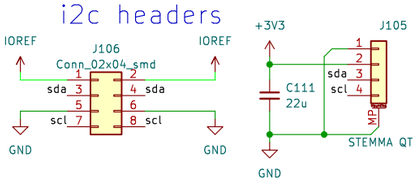
Track LEDs



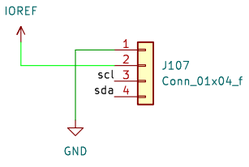
Track Connector



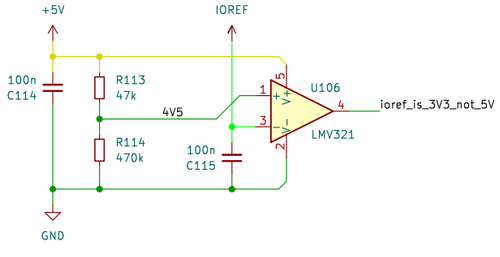
i2c headers



OLED Header



OpAmp as IORef Comparator



DRV8874 (max 6A) Current Sensing:
V_prop is limited to VRef inside DRV8874

5V = 0.000455*(1430+732)*A => A=5,08
3,3V = 0.000455* 1430 *A => A=5,07

if subbed with DRV8876 (max 3.5A):
5V = 0.001*(x+y)*A => A=
3,3V = 0.001* x *A => A=

---

candidate values:

2k+1k	3.63/1.65 1%
1k8+(680+220)	4.0/1.83 1%
1k5+(680+100)	4.8/2.2 0.2%
1k43+732(extend.)	5.08 0.1% <-- USED HERE
(1k2+120)+680	5.5/2.5 0.0%
1k2+(470+180)	5.9/2.7 2%
1k2+620(extend.)	5.9/2.7 0.1%
1k1+560 (0603)	6.6/3.0 0.4%

Power Sheet

Power

File: power.kicad_sch

Engineer: Erwin Peterlin
semify-eda.com

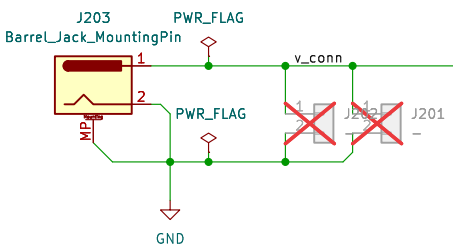
DCC-EX

Sheet: /
File: motor-shield.kicad_sch

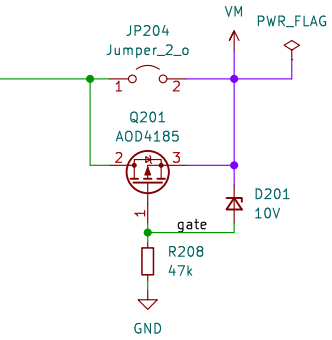
Title: EX-Motorshield8874

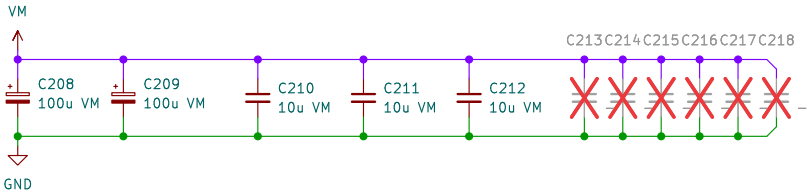
Size: A3	Date: 2023-02-23	Rev: RevA
KiCad E.D.A. kicad 7.0.1		Id: 1/2

Barrel Jack

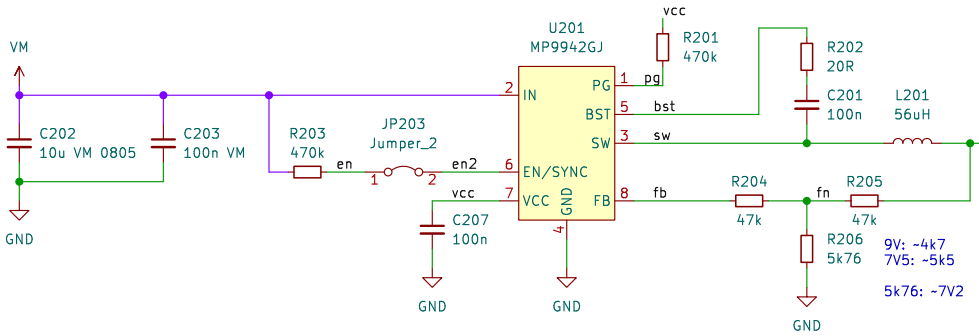


Reverse Polarity Protection

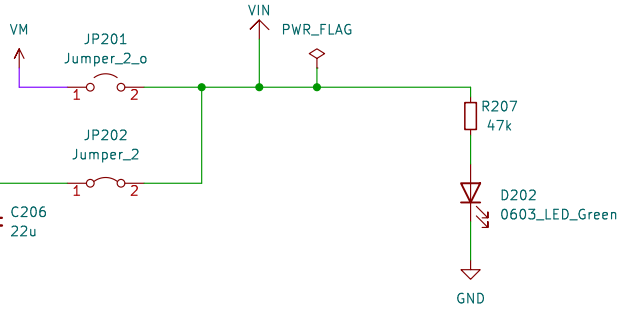




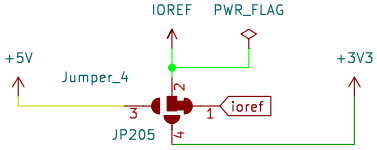
VIN DCDC Buck Converter



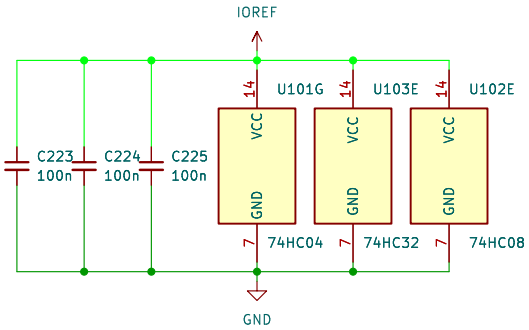
Status LED

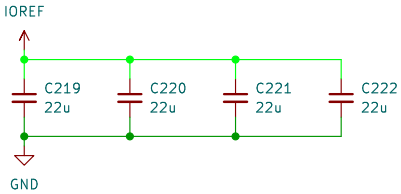


IORef Override



Logic IC Power





Engineer: Erwin Peterlin
semify-eda.com

DCC-EX

Sheet: /Power/
File: power.kicad_sch

Title: EX-Motorshield8874

Size: A4	Date: 2023-02-23	**Rev: RevA**
KiCad E.D.A. kicad 7.0.1		Id: 2/2