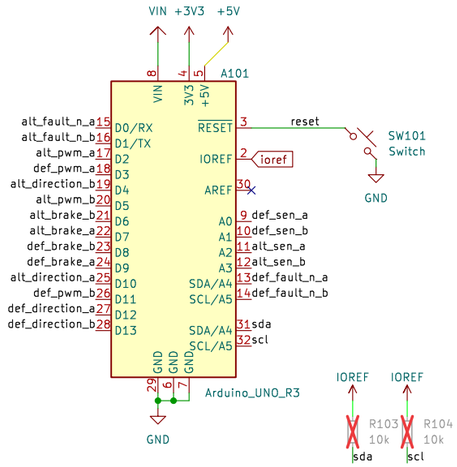
Arduino Header



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)

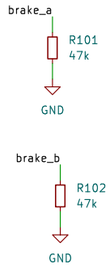
nSleep/EN/PH	out1/2
0 X X	ZZ
1 0 X	00
1 1 0	01
1 1 1	10

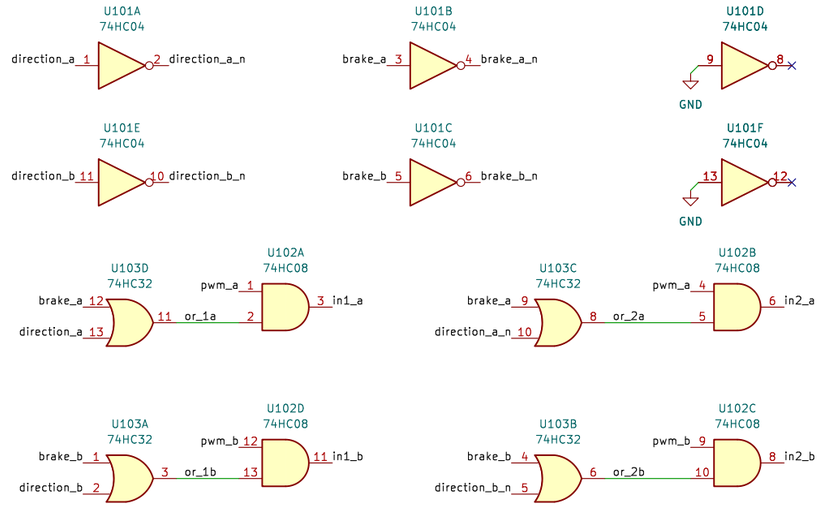
nSleep = high / pwm
EN = not brake / pwm
PH = dir

PWM Mode (PMODE High)

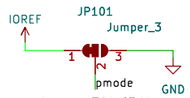
nSleep/in1/2	out1/2
0 X X	ZZ
1 0 0	ZZ
1 0 1	01
1 1 0	10
1 1 1	00

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



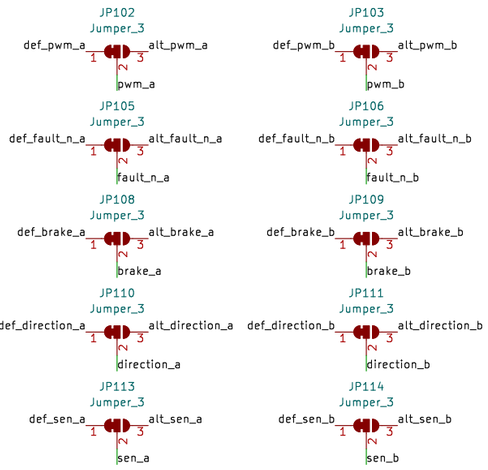


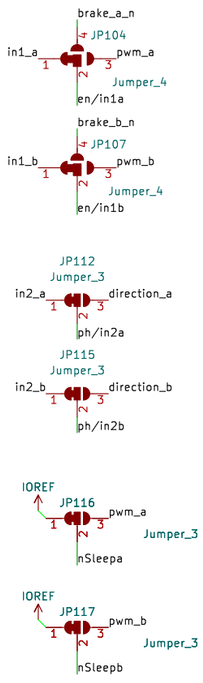
DRV8874 Mode Select



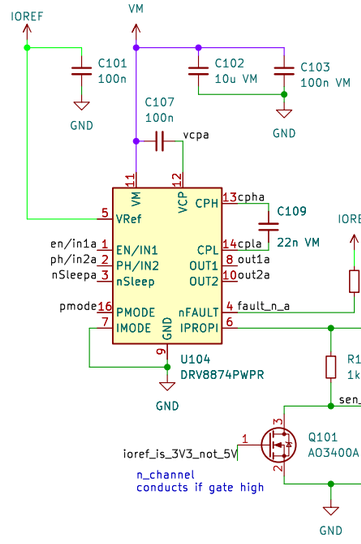
Low: EN/PH
High: PWM
Z: Independent

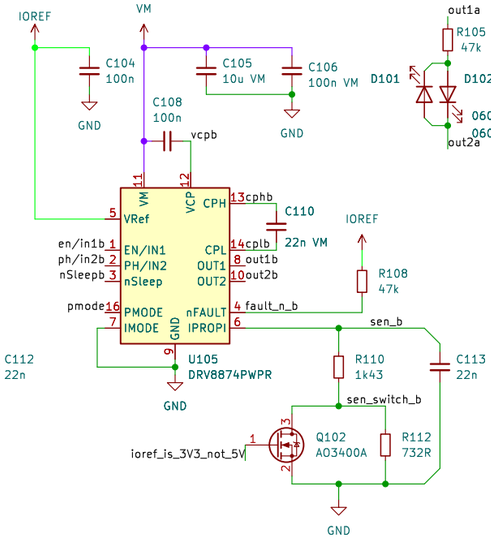
Alternative pinout to allow stacking



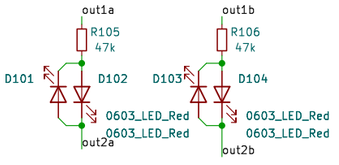


DRV8874 Motor Driver

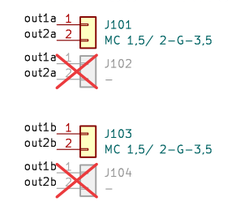




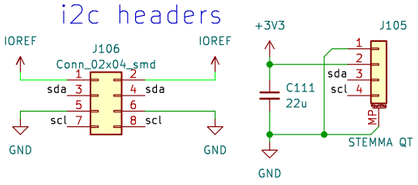
Track LEDs



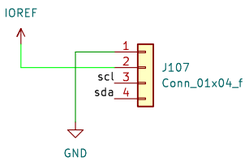
Track Connector



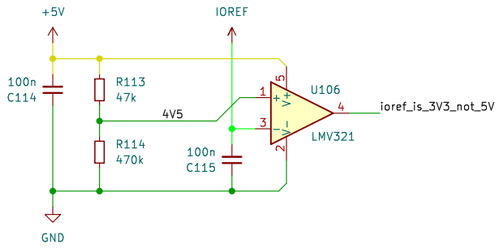
i2c headers



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%

FID101 Toolinghole_jlc
FID102 Toolinghole_jlc
FID103 Toolinghole_jlc
FID104 Fiducial
FID105 Fiducial
FID106 Fiducial

Power Sheet

Power

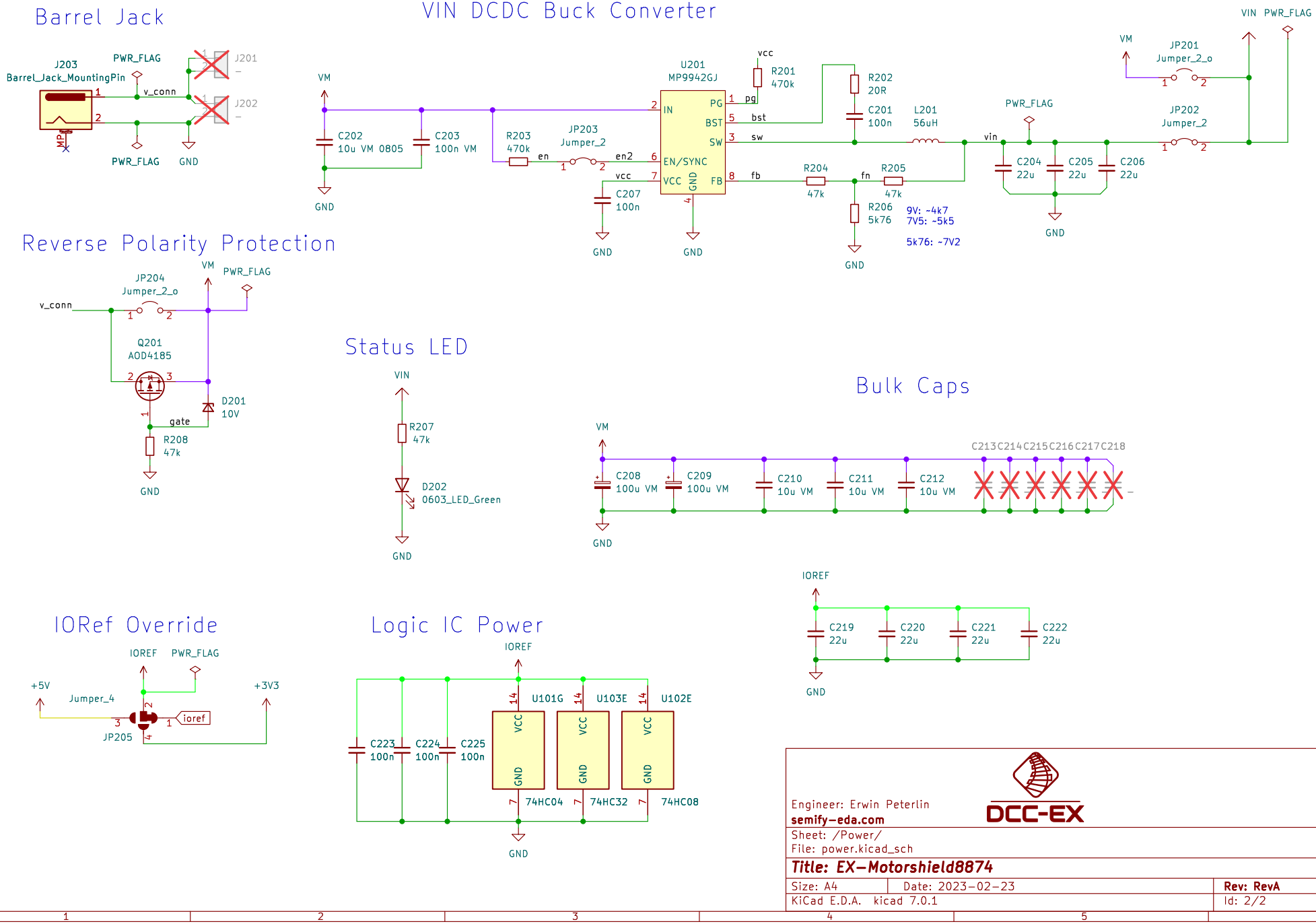
File: power.kicad_sch

Engineer: Erwin Peterlin
semify-eda.com

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
J203
Barrel_Jack_MountingPin
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v_conn
J201
J202
MP
PWR_FLAG
GND
VIN DCDC Buck Converter
VM
C202
10u VM 0805
C203
100n VM
GND
R203
470k
en
JP203
Jumper_2
en2
vcc
C207
100n
U201
MP9942GJ
IN
EN/SYNC
VCC
GND
PG
BST
SW
FB
pg
bst
sw
fb
R201
470k
R202
20R
C201
100n
L201
56uH
vin
R204
47k
fn
R205
47k
R206
5k76
9V: ~4k7
7V5: ~5k5
5k76: ~7V2
PWR_FLAG
C204
22u
C205
22u
C206
22u
VM
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Jumper_2_o
JP202
Jumper_2
VIN PWR_FLAG
Reverse Polarity Protection
JP204
Jumper_2_o
v_conn
VM
PWR_FLAG
Q201
AOD4185
gate
D201
10V
R208
47k
GND
Status LED
VIN
R207
47k
D202
0603_LED_Green
GND
Bulk Caps
VM
C208
100u VM
C209
100u VM
C210
10u VM
C211
10u VM
C212
10u VM
C213 C214 C215 C216 C217 C218
GND
IOREF
C219
22u
C220
22u
C221
22u
C222
22u
GND
IORef Override
IOREF
PWR_FLAG
+5V
Jumper_4
ioref
+3V3
JP205
Logic IC Power
IOREF
C223
100n
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C225
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U103E
U102E
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GND
74HC04
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GND
Engineer: Erwin Peterlin
semify-eda.com
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Size: A4
Date: 2023-02-23
Rev: RevA
KiCad E.D.A. kicad 7.0.1
Id: 2/2