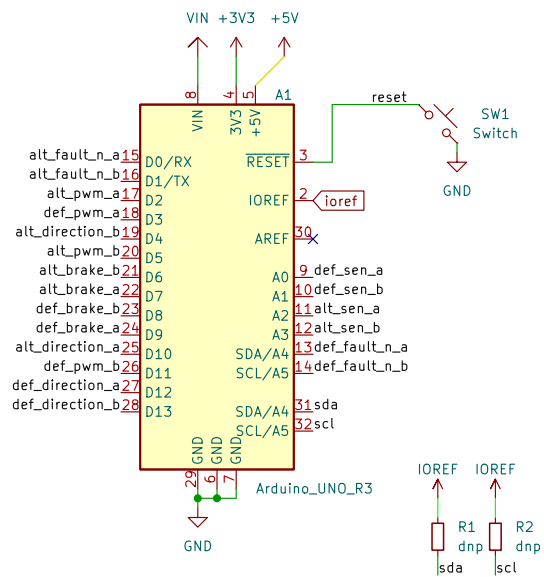


## Arduino Header



## 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

## New Additions:

D4 – fault\_n\_a  
D10 – fault\_n\_b

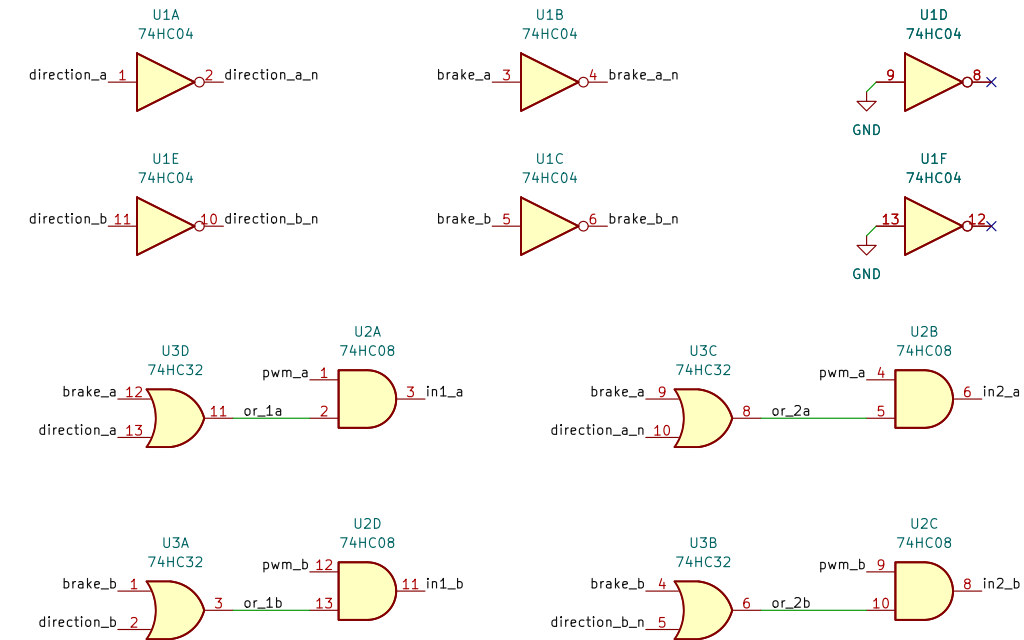
## DRV8874 control logic:

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

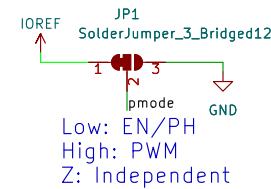
nSleep = high / pwm  
EN = not brake / pwm  
PH = dir

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

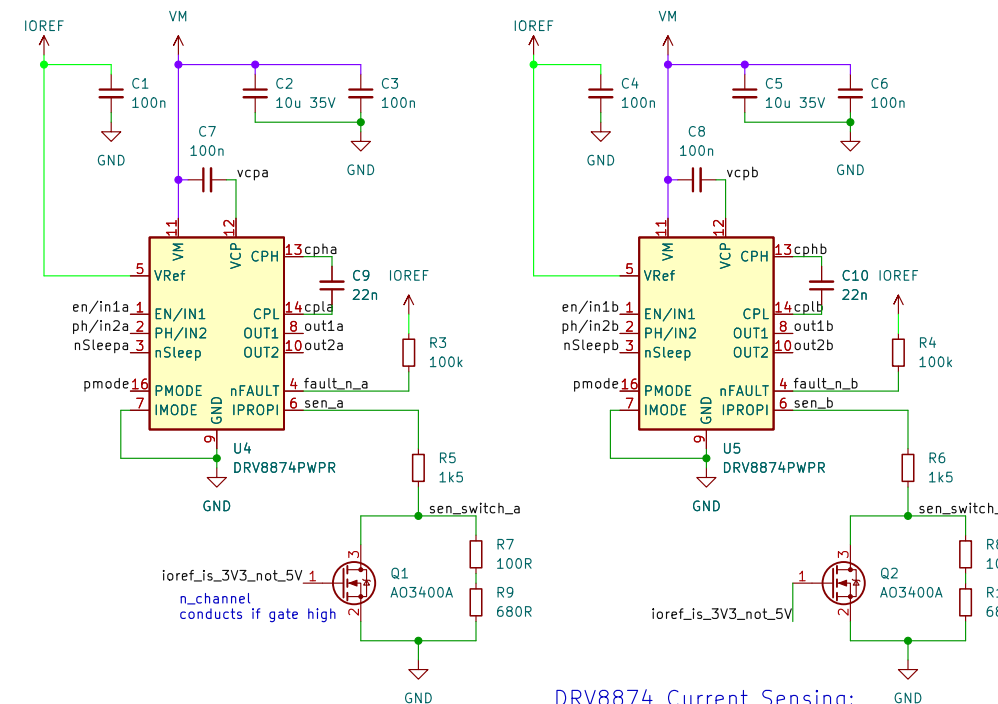
nSleep = high  
in1 = pwm and ( dir or brake)  
in2 = pwm and (not dir or brake)



## DRV8874 Mode Select



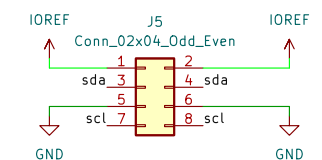
## DRV8874 Motor Driver



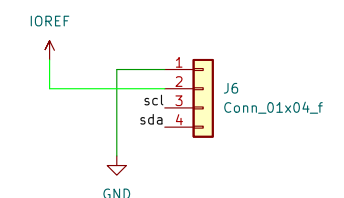
out1a\_1 J1  
out2a\_2 Phoenix Contact MC 1.5/ 2-G-3.5  
out1a\_1 J2  
out2a\_2 dnp

out1b\_1 J3  
out2b\_2 Phoenix Contact MC 1.5/ 2-G-3.5  
out1b\_1 J4  
out2b\_2 dnp

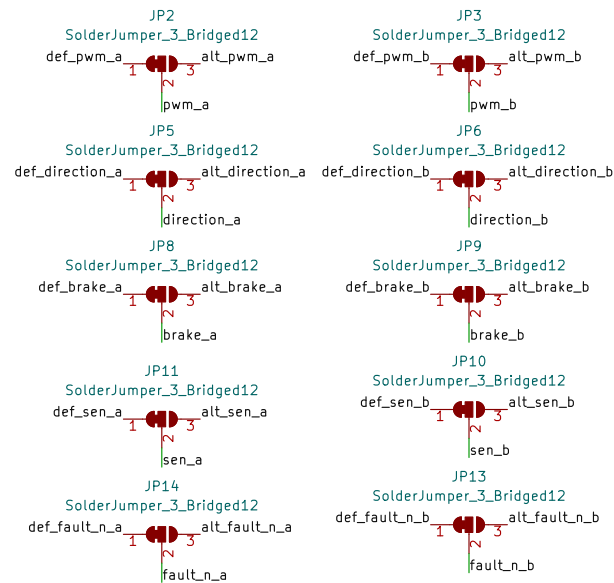
## i2c headers



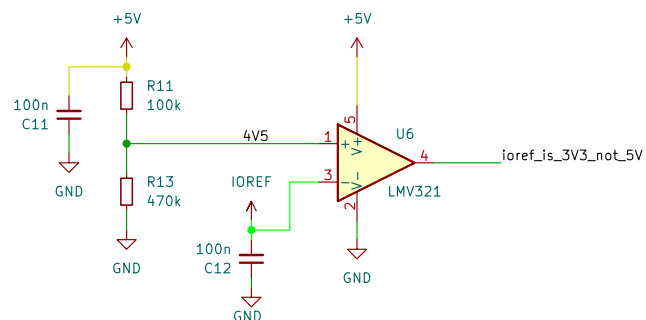
## OLED Header



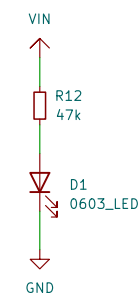
## Alternative pinout to allow stacking



## OpAmp as IORef Comparator



## Status LEDs



## DRV8874 Current Sensing:

0.000455 A<sub>prop</sub> per A

5V = 0.000455\*(1500+780)\*A => A=4,82  
3,3V = 0.000455\* 1500 \*A => A=4,83

V<sub>prop</sub> is limited to V<sub>Ref</sub> inside DRV8874

## Power Sheet



FID1 Toolinghole\_jlc  
FID2 Toolinghole\_jlc  
FID3 Toolinghole\_jlc

Engineer: Erwin Peterlin  
semify-eda.com  
Sheet: /  
File: motor-shield.kicad\_sch

Title: Motor Shield (DCC-EX compatible)

Size: A3 Date: 2023-02-06  
KiCad E.D.A. kicad (6.0.11)

Rev: Prototype A  
Id: 1/2

Barrel Jack

VIN DCDC Buck Converter

Reverse Polarity Protection

Bulk Caps

IOREF

Engineer: Erwin Peterlin  
semify-eda.com  
Sheet: /Power/  
File: power.kicad\_sch

**Title: Motor Shield (DCC-EX compatible)**

Size: A4 Date: 2023-02-06 Rev: Prototype A  
KiCad E.D.A. kicad (6.0.11) Id: 2/2

## Barrel Jack

## VIN DCDC Buck Converter

## Reverse Polarity Protection

## Bulk Caps

Engineer: Erwin Peterlin

semify-eda.com

Sheet: /Power/

File: power.kicad\_sch

**Title: Motor Shield (DCC-EX compatible)**

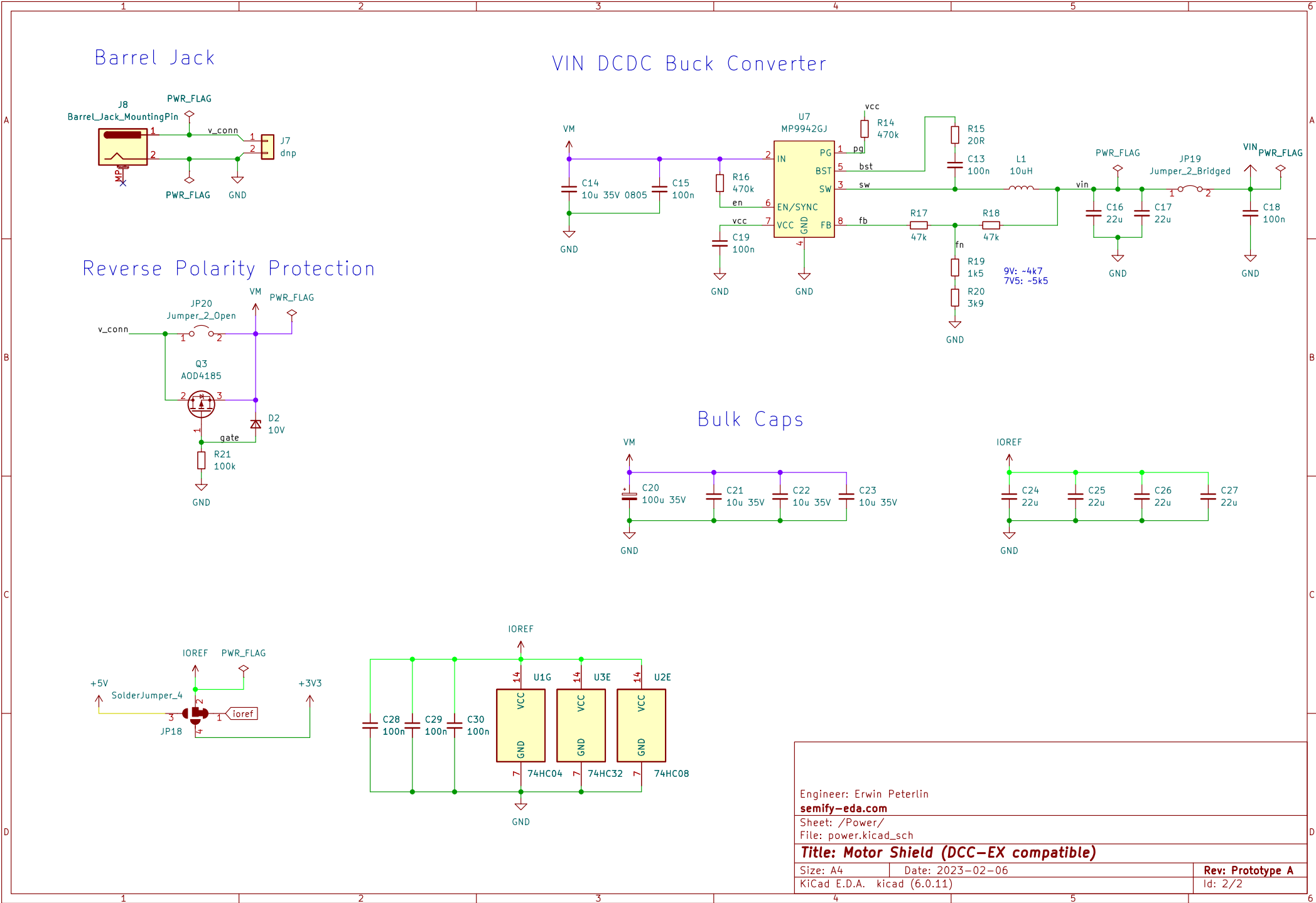
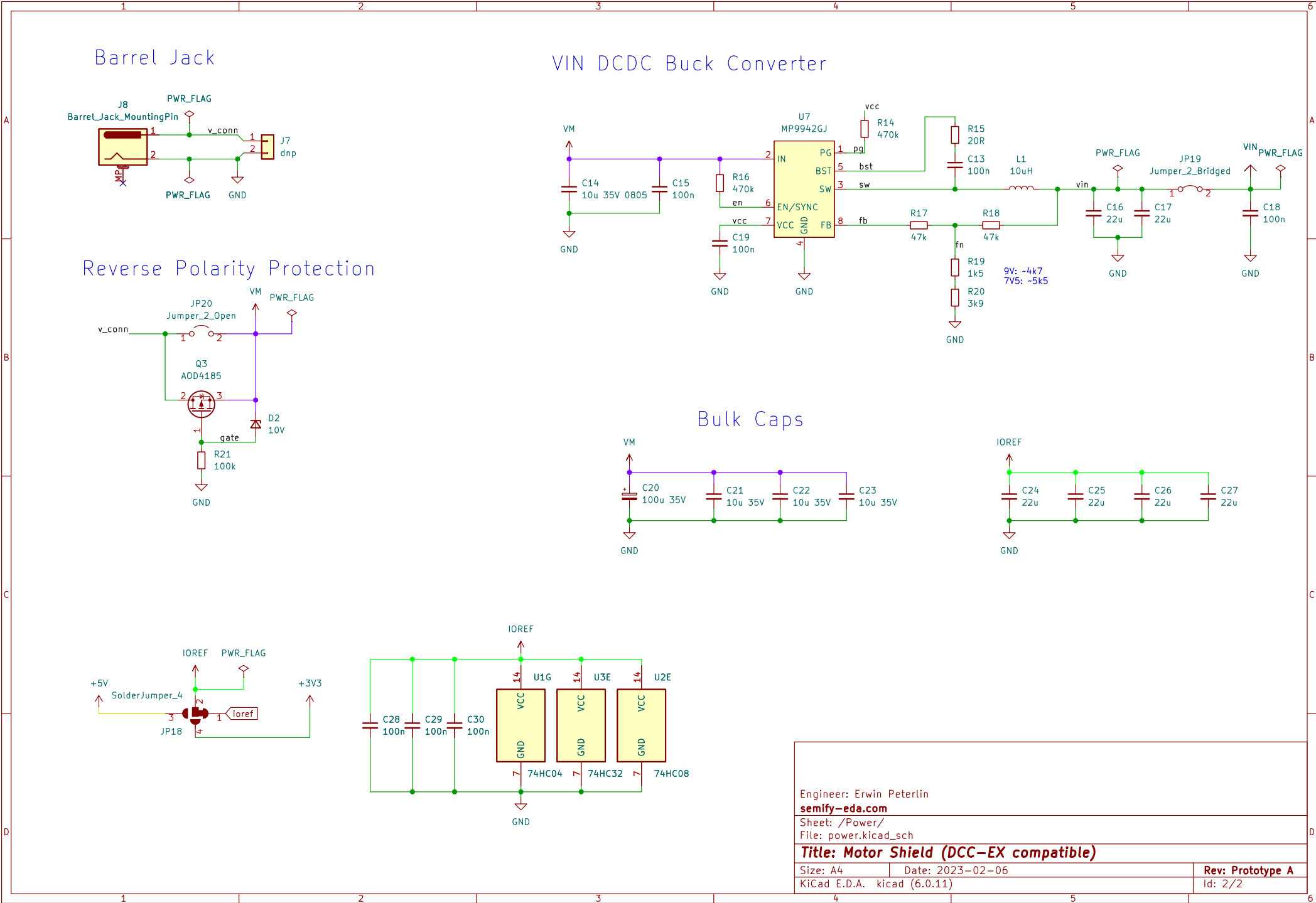
Size: A4

Date: 2023-02-06

Rev: Prototype A

KiCad E.D.A. kicad (6.0.11)

Id: 2/2

[illegible]

## Barrel Jack

## Reverse Polarity Protection

## VIN DCDC Buck Converter

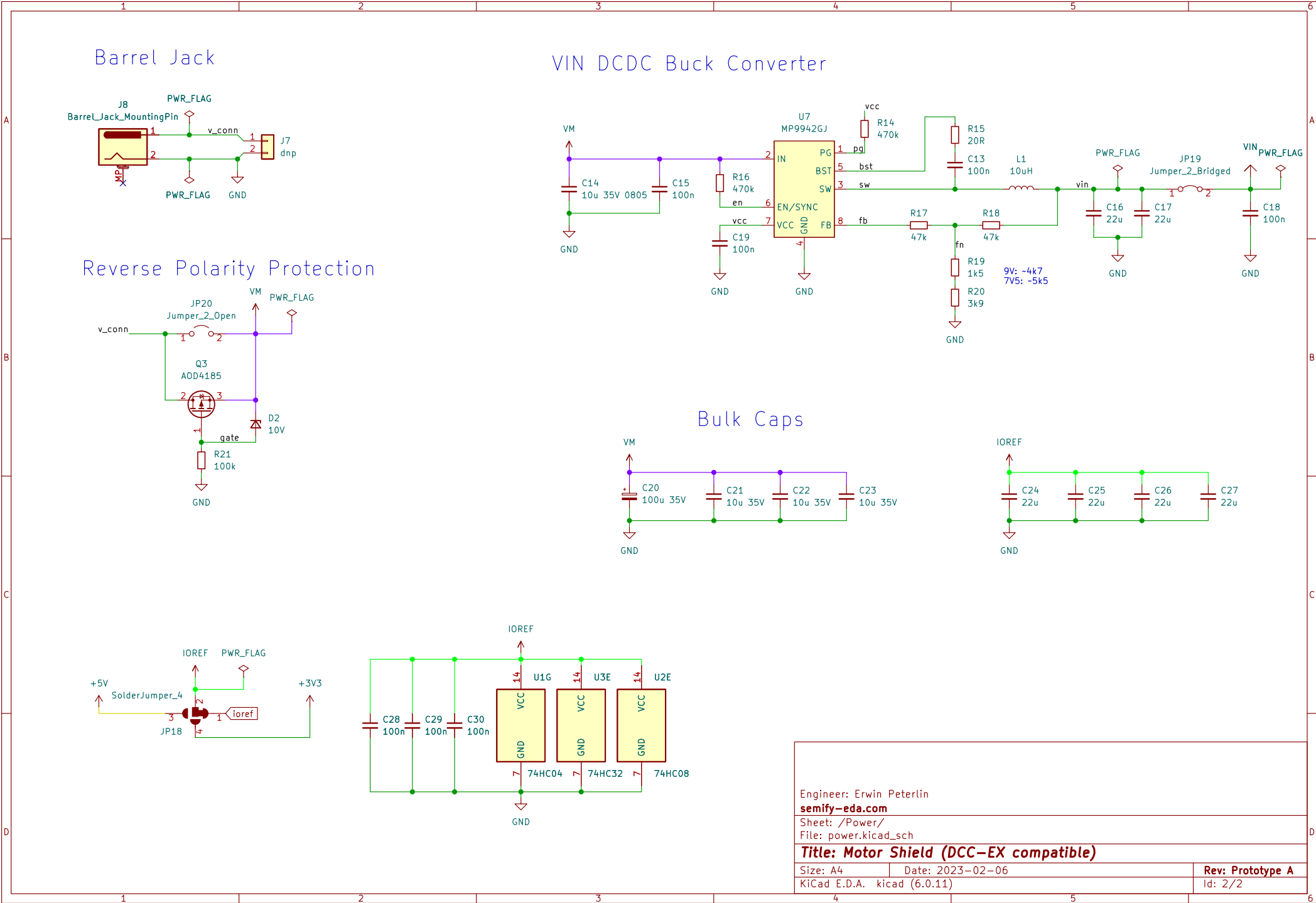
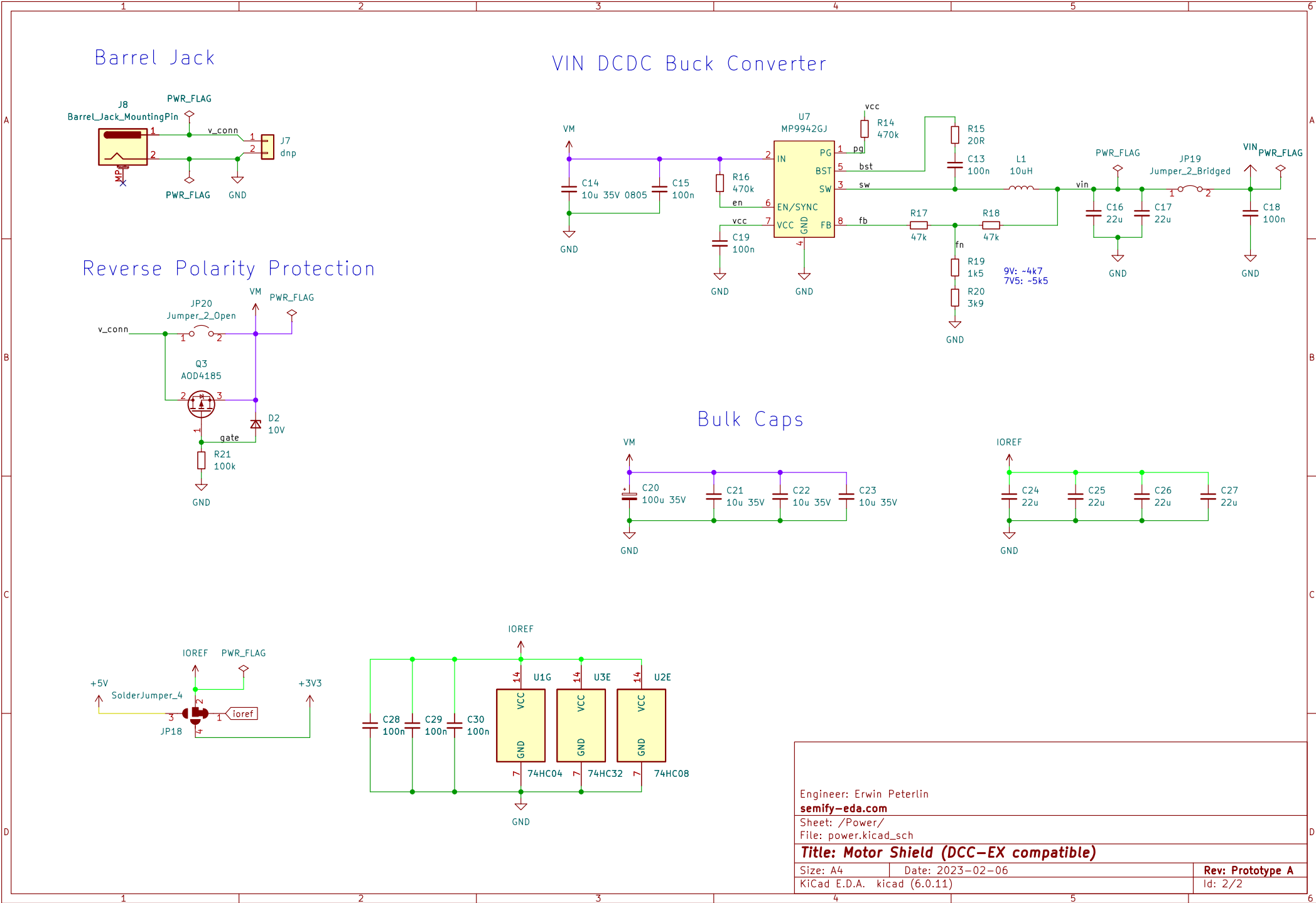
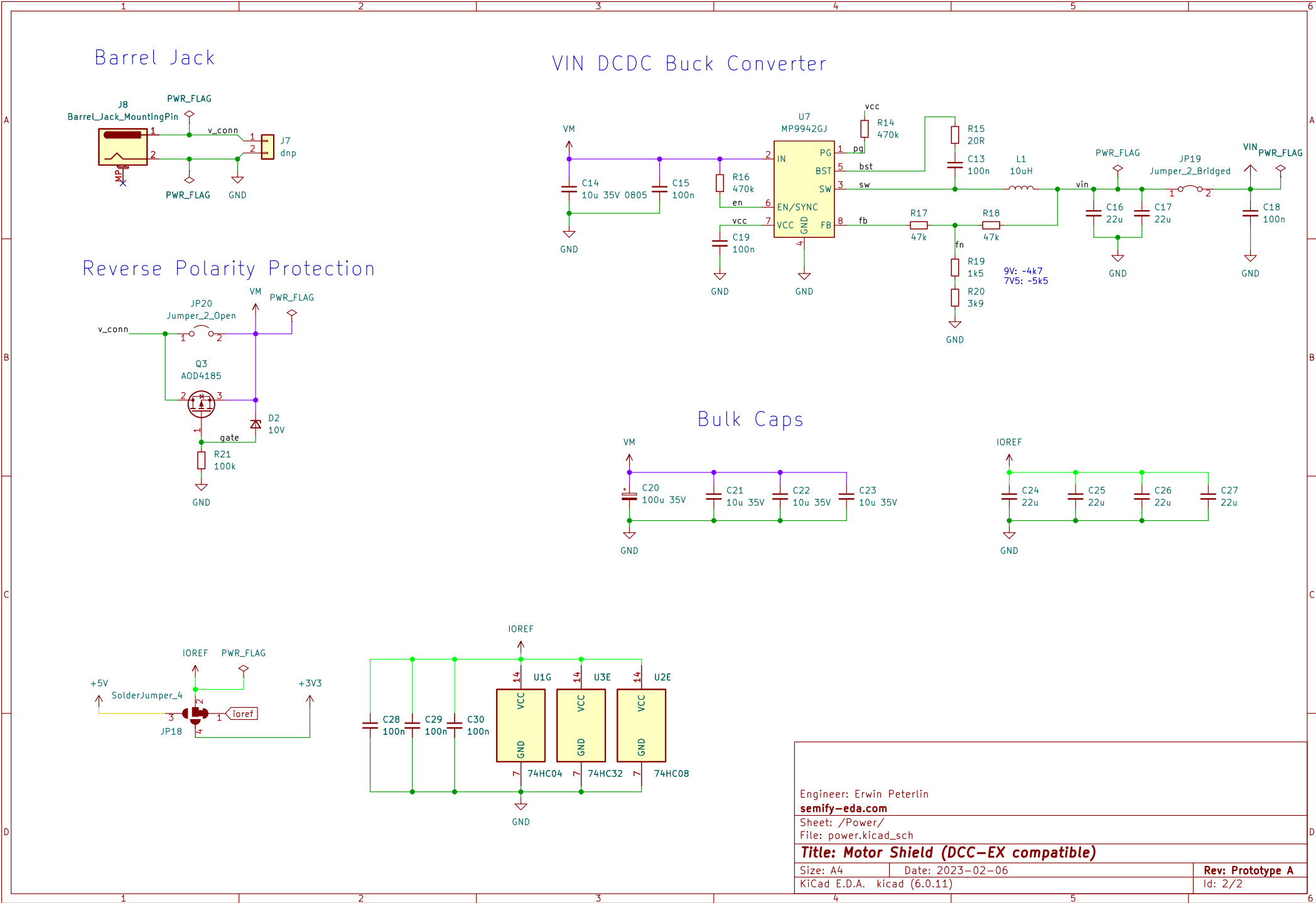
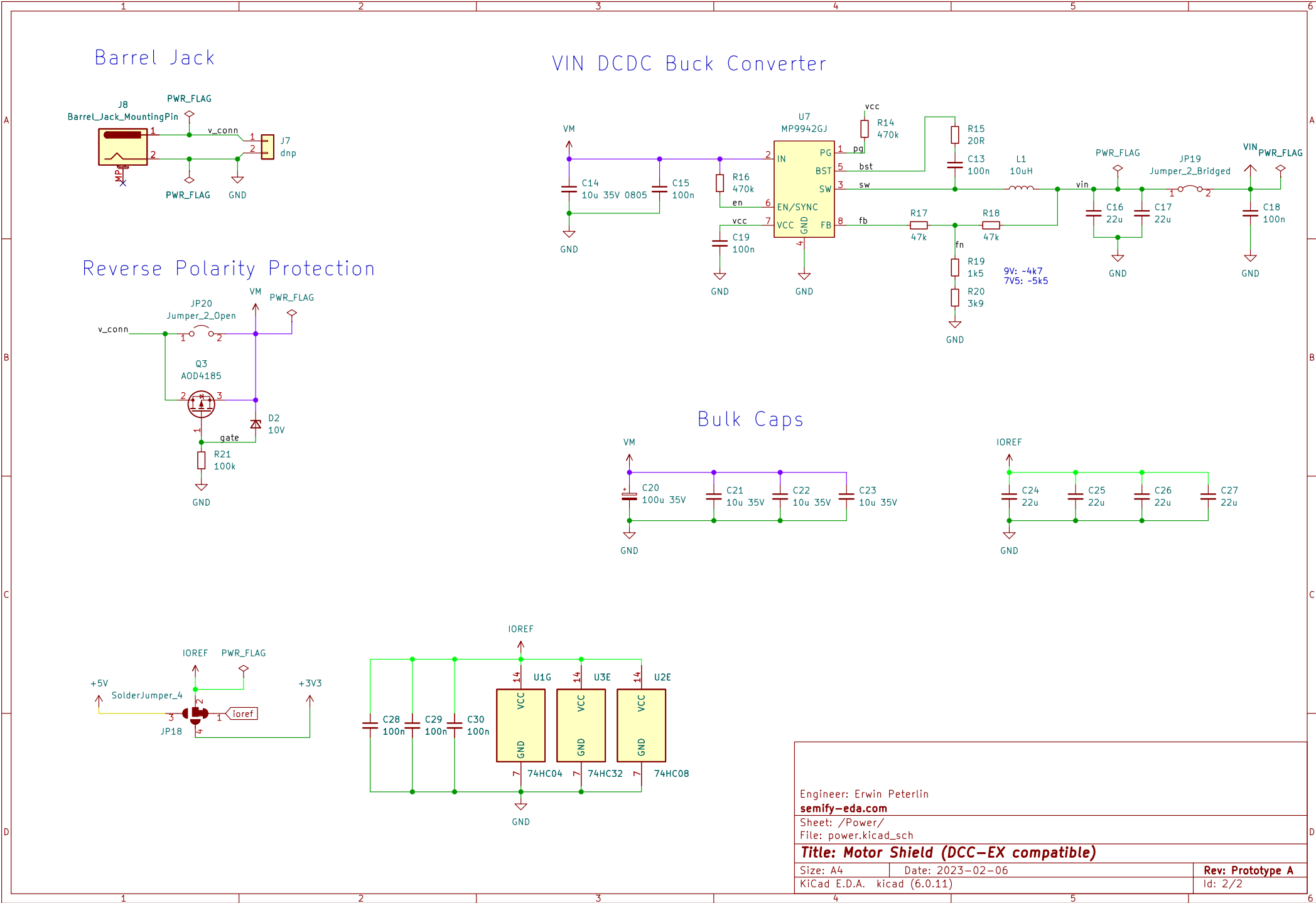
## Bulk Caps

Engineer: Erwin Peterlin  
semify-eda.com  
Sheet: /Power/  
File: power.kicad\_sch

**Title: Motor Shield (DCC-EX compatible)**

Size: A4 Date: 2023-02-06  
KiCad E.D.A. kicad (6.0.11)

Rev: Prototype A  
Id: 2/2



Sheet: /Power/		D
File: power.kicad_sch		
<b>Title: Motor Shield (DCC-EX compatible)</b>		
Size: A4	Date: 2023-02-06	Rev: Prototype A
KiCad E.D.A. kicad (6.0.11)		Id: 2/2

<b>Title: Motor Shield (DCC-EX compatible)</b>		
Size: A4	Date: 2023-02-06	Rev: Prototype A
KiCad E.D.A. kicad (6.0.11)		Id: 2/2

Size: A4	Date: 2023-02-06	Rev: Prototype A
KiCad E.D.A. kicad (6.0.11)		Id: 2/2

KiCad E.D.A. kicad (6.0.11)	Id: 2/2
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A horizontal number line is shown with tick marks at every integer from 0 to 6. The numbers 4, 5, and 6 are labeled below the line. The segment of the line between the tick marks for 4 and 5 is shaded in light blue.

KiCad E.D.A. kicad (6.0.11)	Id: 2/2
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A horizontal number line is shown with tick marks at every integer from 0 to 6. The numbers 4, 5, and 6 are labeled below the line. The segment of the line between the tick marks for 4 and 5 is shaded in light blue.