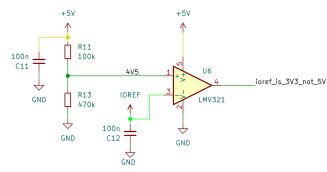
DRV8874 control logic: Standard Motorshield Assignments: PH/EN Mode (PMODE Low) Channel A: nSleep/EN/PH out1/2 Arduino Header direction a 1 brake a 3 0 X X D12 - Direction 00 1 0 X VIN +3V3 +5V D3 - PWM (work duty) 1 1 0 01 D9 - Brake` 1 1 1 10 74HC04 74HC04 AO - current sensing. nSleep = high / pwm √10 direction_b_n Channel B: EN = not brake / pwm Switch = dir alt_fault_n_a<u>15</u> D13 - Direction D11 - PWM (work duty) alt_fault_n_b16 D1/TX alt_pwm_a17 IOREF ioref def_pwm_a 18 03 U2A 74HC08 D8 - Brake PWM Mode (PMODE High) alt_direction_b19 AREF 30 nSleep/in1/2 out1/2 alt_pwm_b<u>20</u> A1 - current sensing 74HC32 A0 9 def_sen_a A1 10def_sen_b A2 11alt_sen_a A3 12alt_sen_b SDA/A4 13def_fault_n_a SCL/A5 14def_fault_n_b alt_brake_b21 D6 $0 \times X$ ZZ ZZ alt_brake_a22 def_brake_a24 def_brake_a24 D9 1 0 0 New Additions: 1 0 1 01 alt_direction_a 25 D10 D4 - fault_n_a 1 1 0 1 1 1 10 def_pwm_b<u>26</u> D11 D10 - fault_n_b 00 def_direction_a27 SDA/A4 31 sda def_direction_b28 U2D nSleep = high74HC08 in1 = pwm and (dir or brake) 74HC32 in2 = pwm and (not dir or brake) brake_b 1 brake_b_4 \$ 29 9 Arduino_UNO_R3 direction_b_2 direction_b_n 5 R1 R2 dnp DRV8874 Mode Select GND JP1 SolderJumper_3_Bridged12 omode DRV8874 Motor Driver Alternative pinout to allow stacking Low: EN/PH High: PŴM Z: Independent SolderJumper_3_Bridged12 SolderJumper_3_Bridged12 def_pwm_a_alt_pwm_a def_pwm_b___alt_pwm_b C5 10u 35V 10u 35V 🛨 100n brake_a_n JP4 100n JP6 100n GND GND in1_a__pwm_a SolderJumper_3_Bridged12 SolderJumper_3_Bridged12 vcna def_direction_a____alt_direction_a def_direction_b___alt_direction_b en/in1a direction a direction b brake_b_n C10 IOREF 22n A C9 IOREF JP7 SolderJumper_3_Bridged12 SolderJumper_3_Bridged12 pwm_b en/in1b_1 ph/in2b_2 PH/IN2 en/in1a_1_EN/IN1 def_brake_a____alt_brake_a def_brake_b___alt_brake_b 0UT1 8 out1a 0UT2 10 out2a ph/in2a 2 PH/IN2 SolderJumper_4 nSleepa 3 nSleep nSleepb 3 nSleep Onut2h brake_b en/in1b OUT2 JP10 pmode 16 PMODE NFAULT 4 fault_n_a IMODE 2 IPROPI 6 sen_a pmode 16 PMODE nFAULT 4 fault_n_b SolderJumper_3_Bridged12 SolderJumper_3_Bridged12 7 IMODE S IPROPI 6 sen_b JP12 def_sen_b___alt_sen_b def_sen_a__alt_sen_a SolderJumper_3_Bridged12 in2_a___direction_a R6 1k5 R5 1k5 DRV8874PWPR DRV8874PWPR sen_b sen a JP13 ph/in2a GND sen_switch_a sen_switch_b SolderJumper_3_Bridged12 SolderJumper_3_Bridged12 def_fault_n_b___alt_fault_n_b JP15 def_fault_n_a___alt_fault_n_a 100R 100R SolderJumper 3 Bridged12 ioref_is_3V3_not_5V_1 in2_b___direction_b A03400A A03400A R10 n_channel conducts if gate high ioref is 3V3 not 5V ph/in2b

OpAmp as IORef Comparator



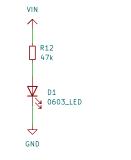
Status LEDs

JP16

nSleena

nSleepb

SolderJumper_3_Bridged12



$0.000455 \text{ A_prop per A}$ 5V = 0.000455*(1500+780)*A => A=4.82 3.3V = 0.000455*1500 *A => A=4.83

DRV8874 Current Sensing:

GND

V_prop is limited to VRef inside DRV8874

i2c headers i2c headers iOREF J5 IOREF Conn_02x04_0dd_Even sda_3 4 sda 5 6 Scl. 7 B scl. GND OLED Header IOREF J6 Scl. 3 GND GND

Power Sheet

GND

74HC32

74HC32

out1a_1 out2a_2 74HC04

74HC08

74HC08

out1b 1 J3 out2b 2 Phoenix Contact MC 1,5/ 2-G-3,5



O FID1
Toolinghole_jlc
O FID2
Toolinghole_jlc
O FID3
Toolinghole_jlc
O FID3
Toolinghole_jlc
O FID3
Toolinghole_jlc

Sheet: /
File: motor-shield.kicad_sch

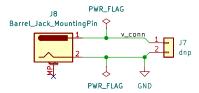
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 Size: A3
 Date: 2023-02-06
 Rev: Prototype A

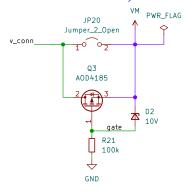
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 Id: 1/2

File: power.kicad_sch

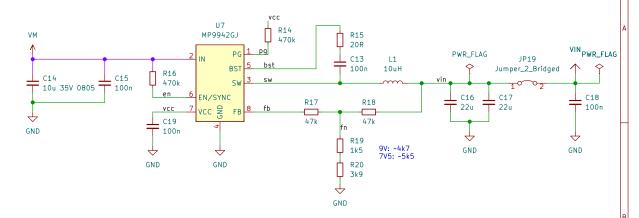
Barrel Jack



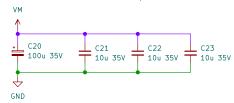
Reverse Polarity Protection

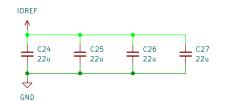


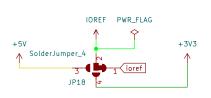
VIN DCDC Buck Converter

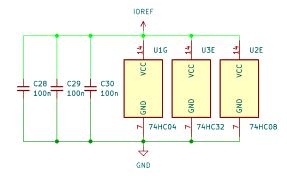


Bulk Caps









Engineer: Erwin Peterlin

semify-eda.com

Sheet: /Power/ File: power.kicad_sch

Title: Motor Shield (DCC-EX compatible)

 Size: A4
 Date: 2023-02-06
 Rev: Prototype A

 KiCad E.D.A. kicad (6.0.11)
 Id: 2/2