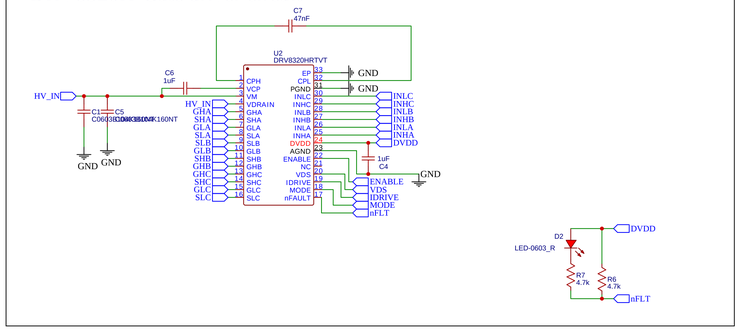
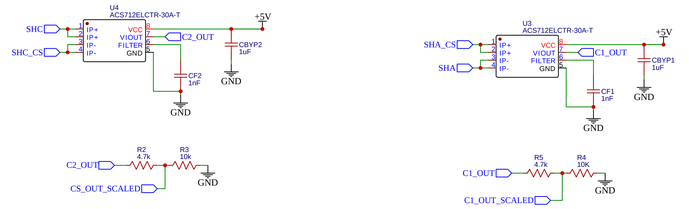
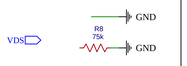
DRV8320H Gate driver circuit



ACS712 Current Sense Circuit

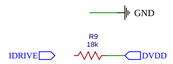


VDS config



VDS
voltage between SHx and SLx
limiting the voltage to limit the current
max current 50Amps (t_OCP= 4us impulse)
drain-source resistance 5mOhm
VDS = 50A*0.005Ohm = 0.25V
configuration
VDS = Tied to AGND 0.06V
VDS = 18 kΩ ± 5% tied to AGND 0.13V
VDS = 75 kΩ ± 5% tied to AGND 0.26V
VDS = Hi-Z 0.6V (BEST)
VDS = 75 kΩ ± 5% tied to DVDD 1.13VV
VDS = 18 kΩ ± 5% tied to DVDD 1.88

IDRIVE config



IDRIVE
Setting the target gate current
directly determining the mosfet rise time
our mosfet gate-source charge Q = 3nC
rise time = Q/IDRIVE (pp 66)
we want the rise time of 50ns
IDRIVE = Q/50ns = 0.06A

configuration
IDRIVE = Tied to AGND 10mA
IDRIVE = 18 kΩ ± 5% tied to AGND 30mA
IDRIVE = 75 kΩ ± 5% tied to AGND 60mA
IDRIVE = Hi-Z 120mA
IDRIVE = 75 kΩ ± 5% tied to DVDD 260mA
IDRIVE = 18 kΩ ± 5% tied to DVDD 570mA
IDRIVE = Tied to DVDD 1000mA

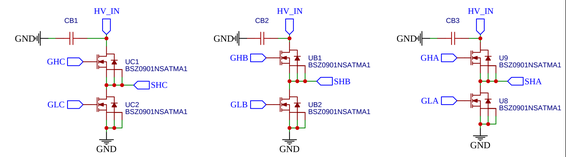
MODE config

MODE
Setting the 3xPWM mode
Option for 6xPWM as well
pp 31

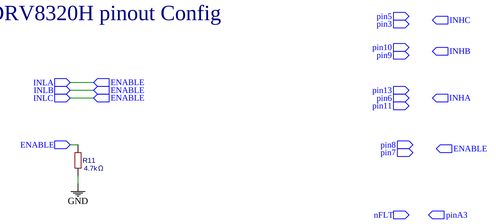
configuration
MODE - 00b = Tied to AGND 6xPWM
MODE - 01b= 47 kΩ ± 5% tied to AGND 3xPWM
…

3x3mm MOSFETs (ex.BSZ0904NSI)

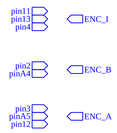
30V max
75Amp max
R_on = 4mOhm
Q_gd=3nC



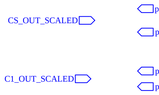
DRV8320H pinout Config



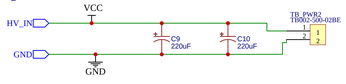
Encoder/Hall pinout config



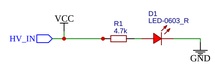
Current Sense Pin Config



Capacitors



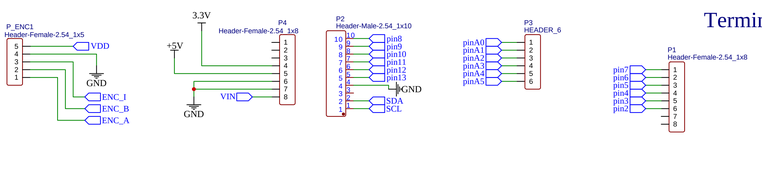
LED Circuit



5/3.3V VDD selector

Enable/Disable Pullups Config

Arduino Header R3
Encoder/Hall Interface
Terminal blocks: Power + Motor



Motor output terminal

TITLE: SimpleFOC DriveShield		REV: 1.2
EasyEDA	Company: Your Company	Sheet: 1/1
	Date: 2024-07-06 Drawn By: the.skuric	