

rails



File: rails.kicad_sch

thermistors



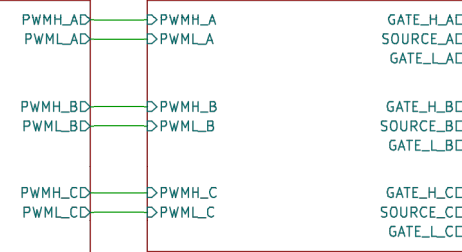
File: thermistors.kicad_sch

microcontroller



File: microcontroller.kicad_sch

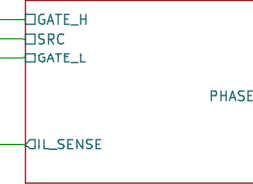
gate_driver



File: gate_driver.kicad_sch

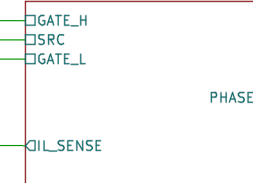


power_stage_A



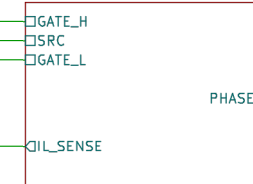
File: power_stage.kicad_sch

power_stage_B



File: power_stage.kicad_sch

power_stage_C

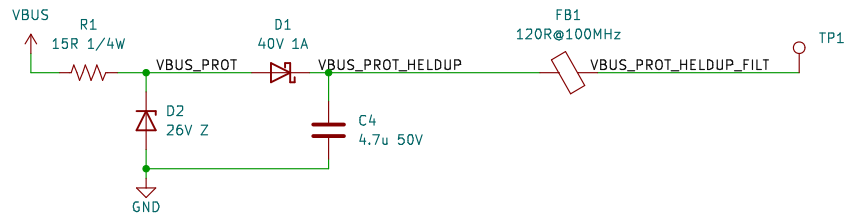


File: power_stage.kicad_sch

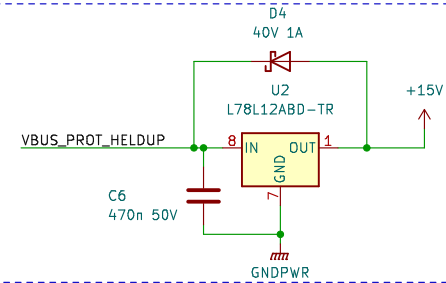
power_connectors



File: power_connectors.kicad_sch



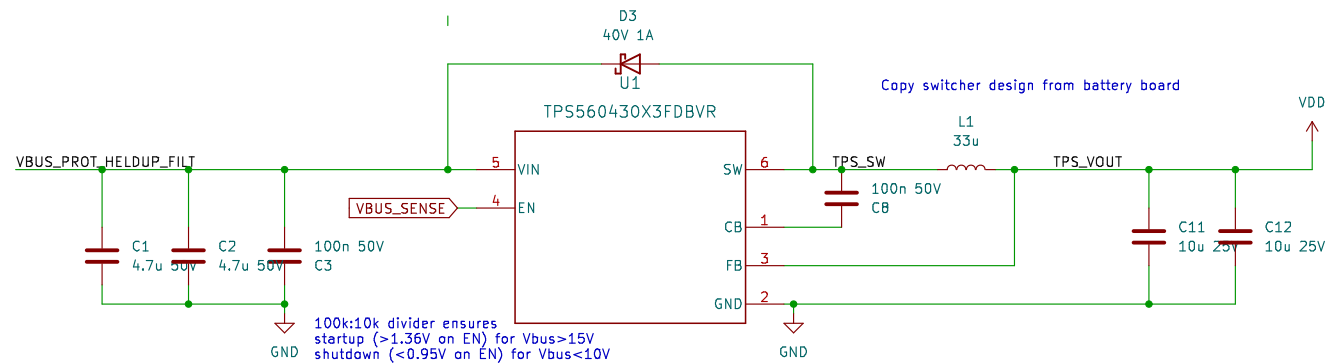
Bus voltage filtering



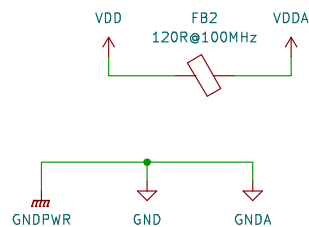
Gate driver supply: 12V linear regulator

Use a linear reg for the 15V gate driver supply as not much current is needed. We can calculate the power as $f_{sw}(30kHz) * C_{gate}(8nF) * V_{gate}(15V)^2 * 6 = 330mW$ which corresponds at 15V to 25mA current. The regulator dropping 10V will diss. 1/4W, which is OK

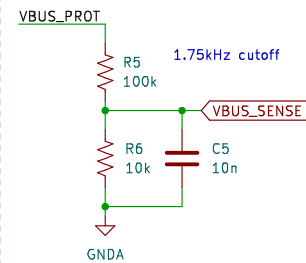
input cap is taken care of by filtering earlier
output cap is mostly over by the gate driver



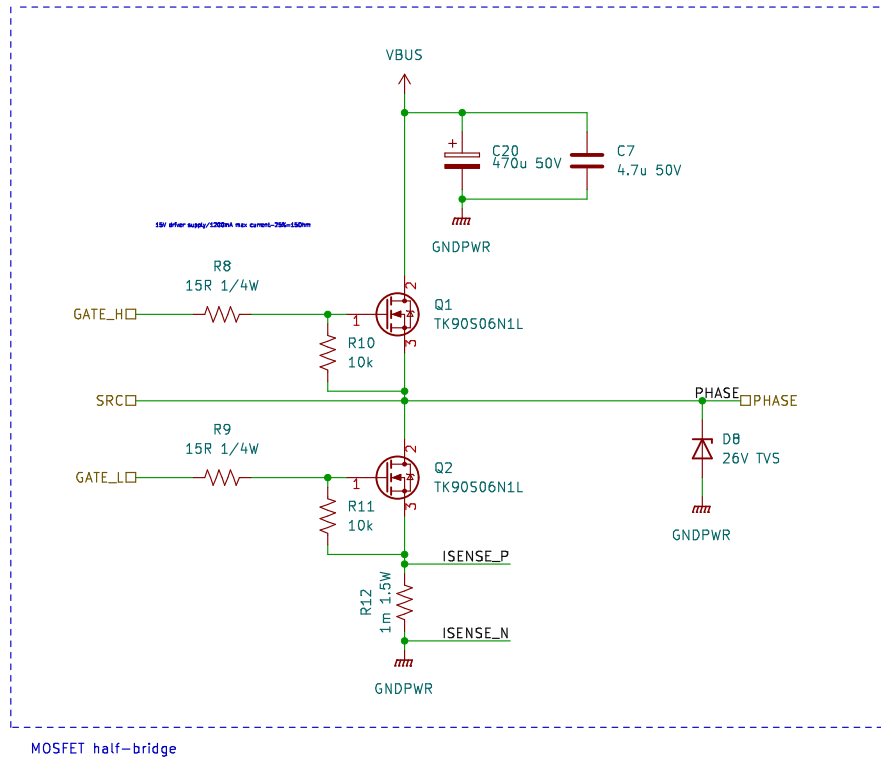
Logic supply: 3.3V step-down converter



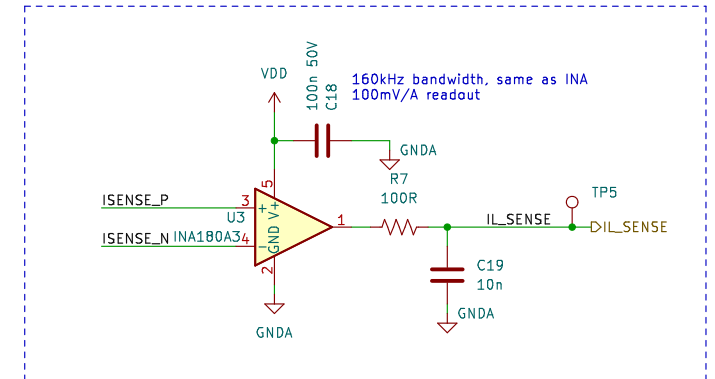
Analog domain supply filter



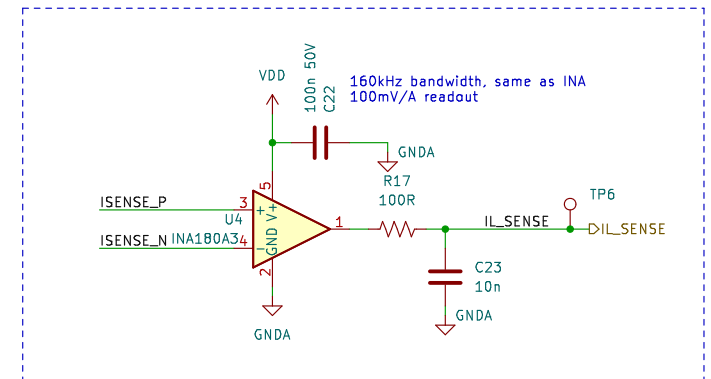
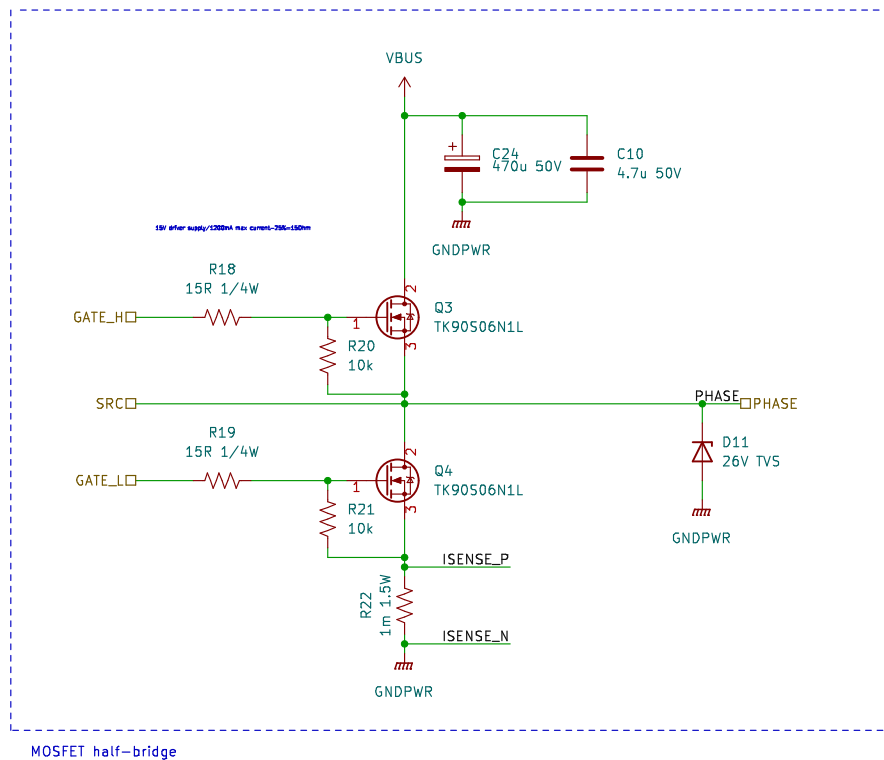
Supply voltage sensing

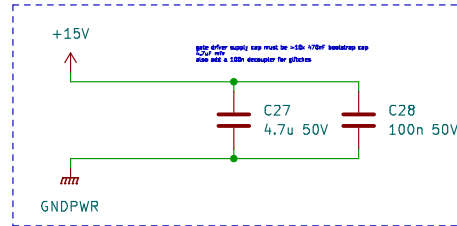


MOSFET half-bridge

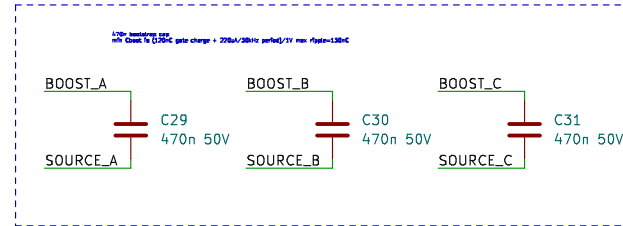


Current sense amplifier and signal conditioning

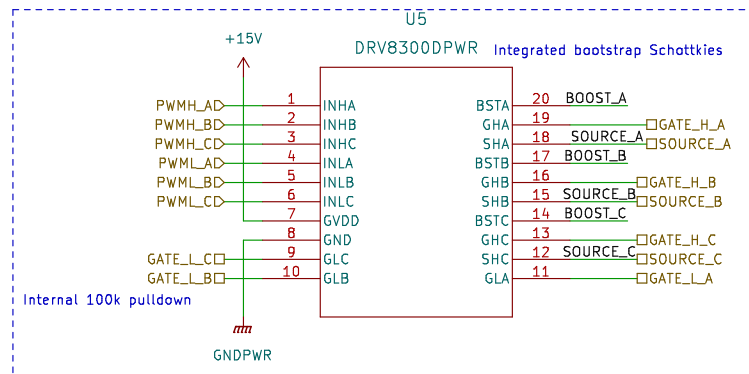




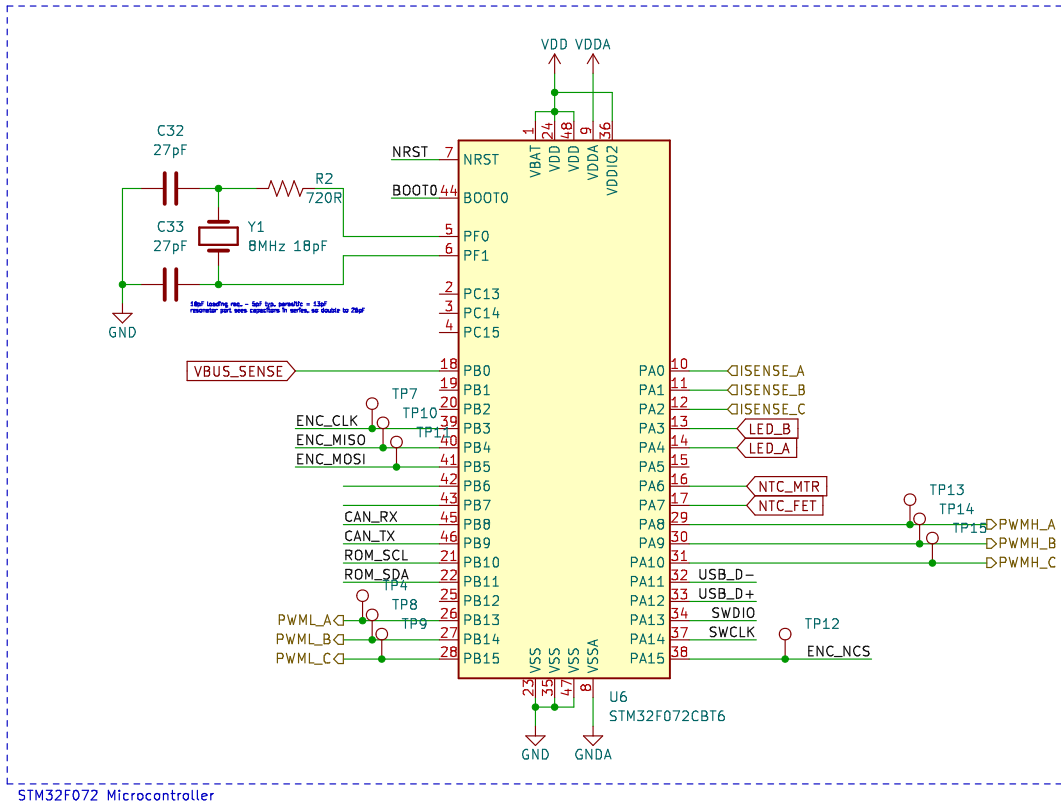
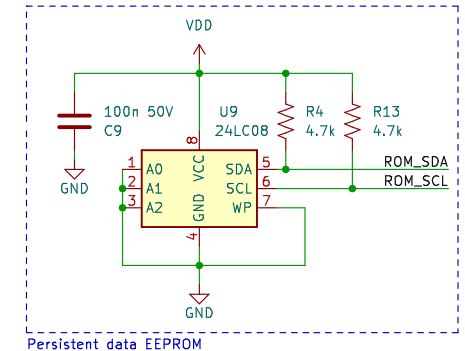
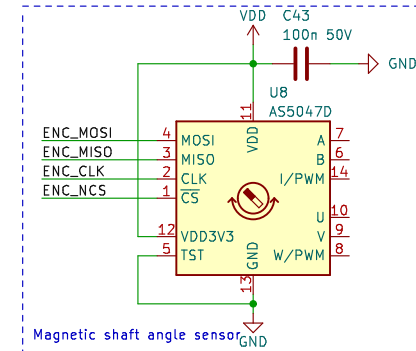
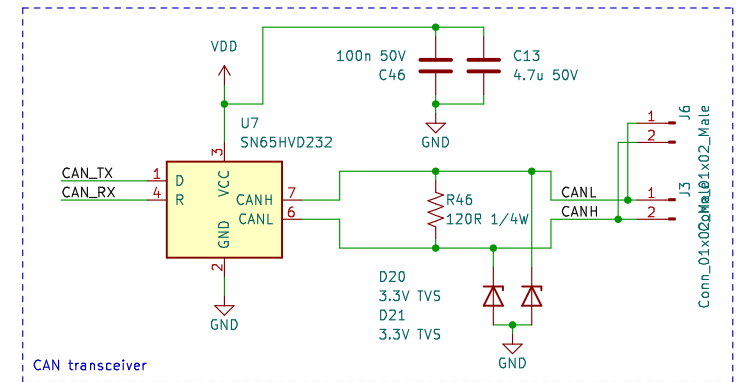
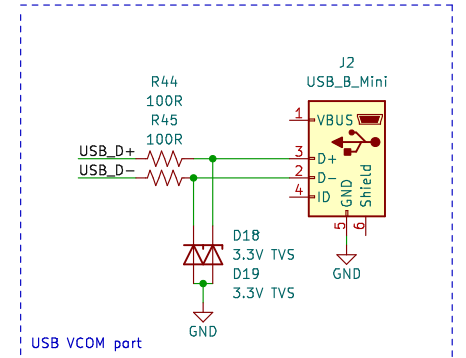
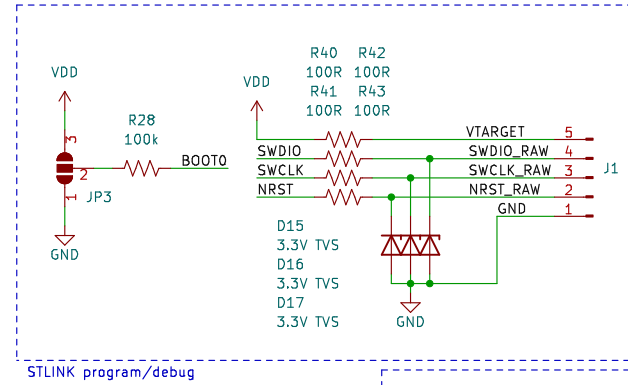
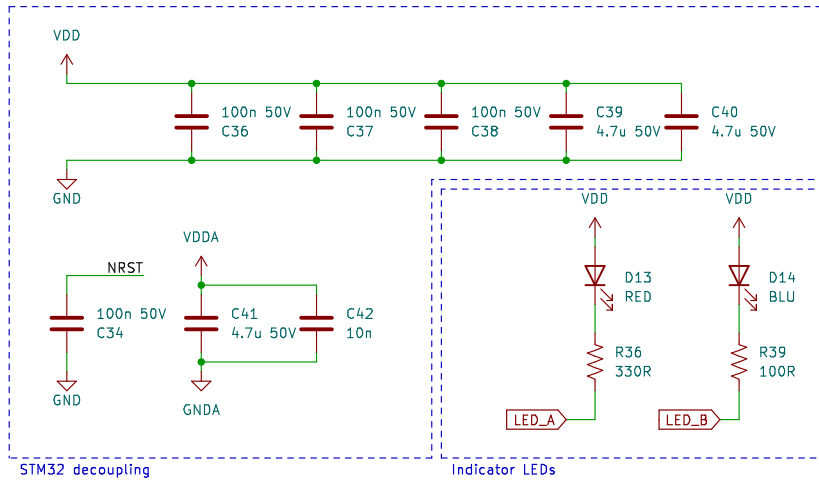
Supply decoupling

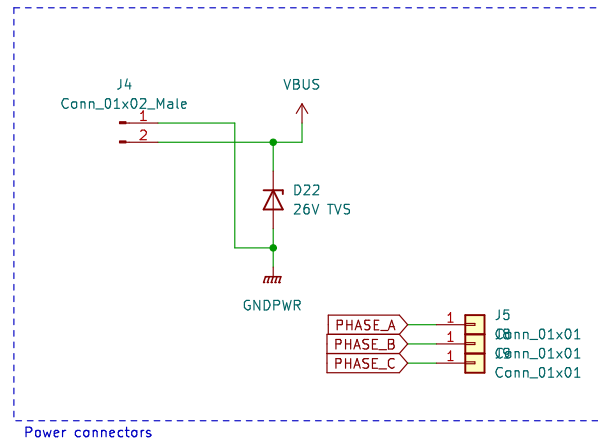


Bootstrap capacitors

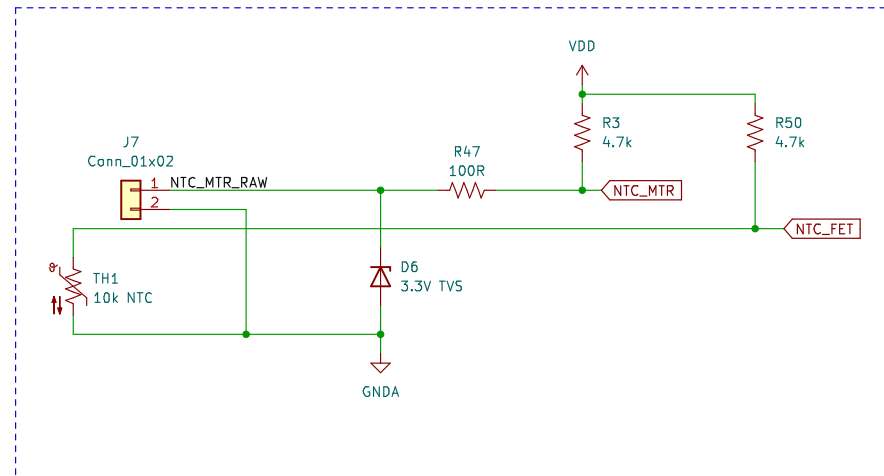


Triple half-bridge gate driver IC

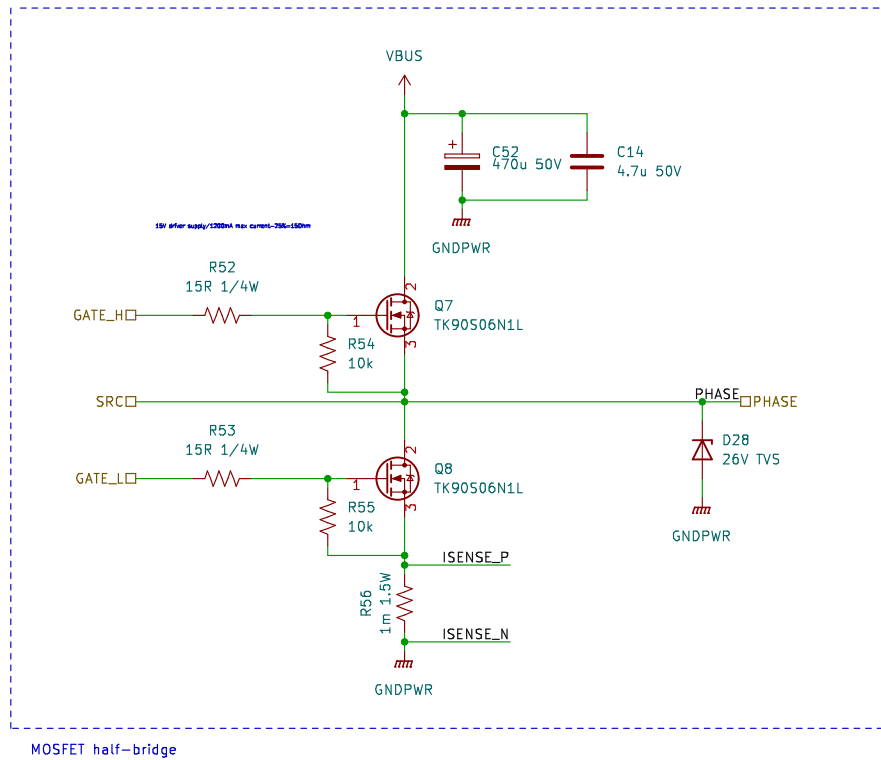




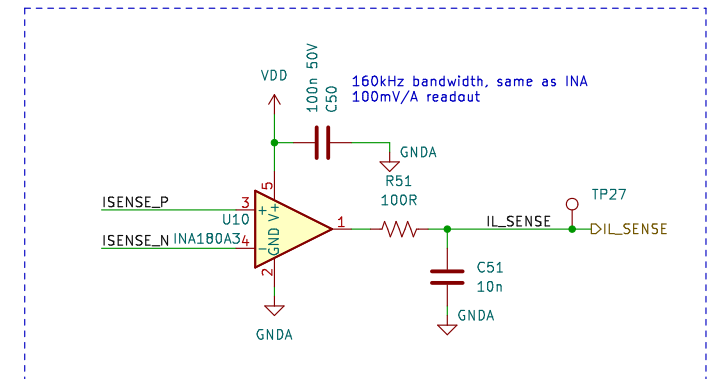
- H2 MountingHole
- H3 MountingHole
- H4 MountingHole



Thermistor inputs



MOSFET half-bridge



Current sense amplifier and signal conditioning