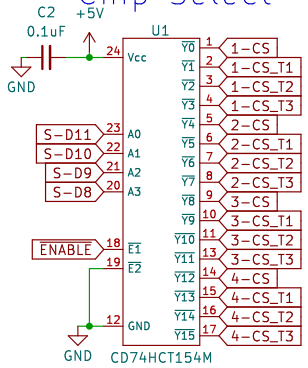
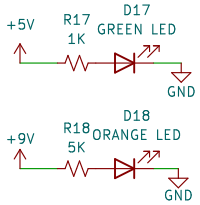
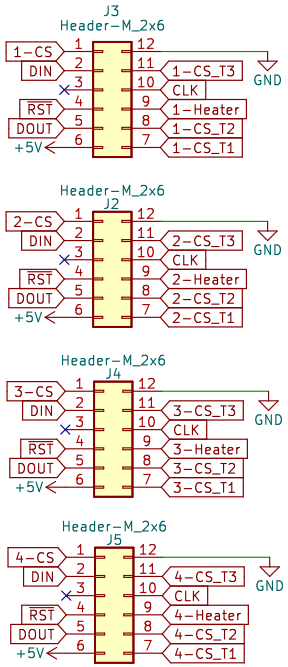
Chip Select



Power Indicators

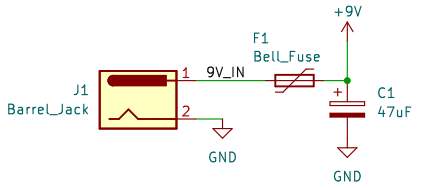


Thermal Mockup Connectors

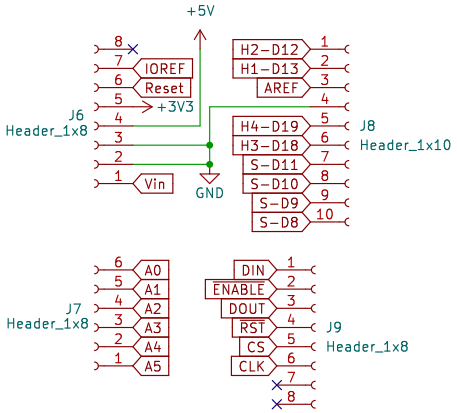


Connector: FCS-12-SG

Power Input For Heaters



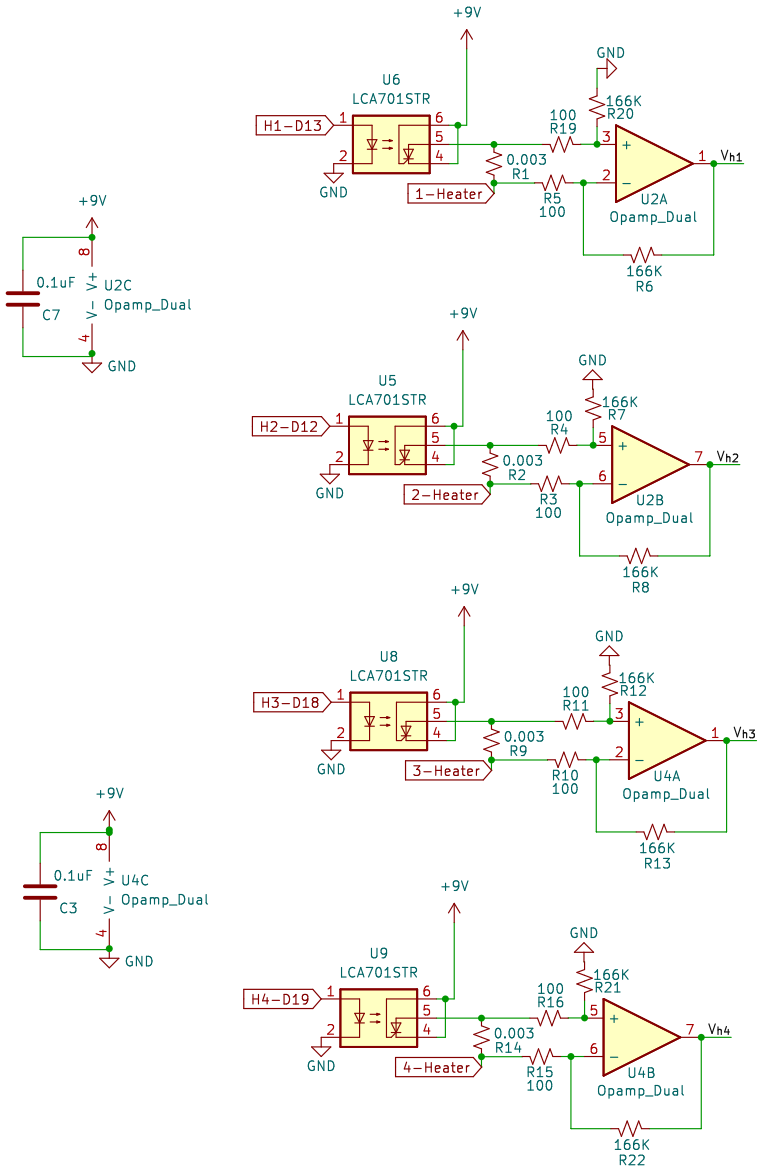
Arduino Uno Connectors



current-sensing

File: current-sensing-p2.kicad_sch

Heater Current Sensing

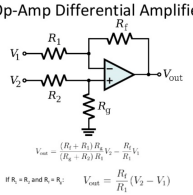


Gain:

$V_{sense} = I_{max} \times R_{sense}$
$3\ mV = 1A * 0.003\Omega$

$G_{needed} = V_{ACD\_max}/V_{sense}$
$G_{needed} = 1666$

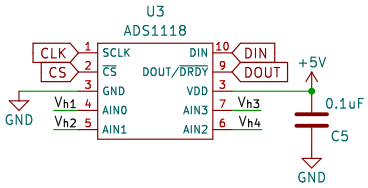
Op-Amp Differential Amplifier



$V_{out} = \frac{(R_2 + R_1)R_g}{(R_g + R_2)R_1} V_2 - \frac{R_f}{R_1} V_1$

If $R_g = R_f$ and $R_2 = R_1$: $V_{out} = \frac{R_f}{R_1}(V_2 - V_1)$

Current Read–out



ADS1118:
16–bit ADC (Max Input Singal 5v)
$5/(2^{16} - 1) = 7.6295 \times 10^{-5}$ $V_{smallest\_step}$
$V_{smallest\_step}$ / G = 7.6295×10^{-5} / 1661 = 4.59×10^{-8} V
$4.59 \times 10^{-8} = I_R * 0.003$
$I_R \approx 0.015mA$