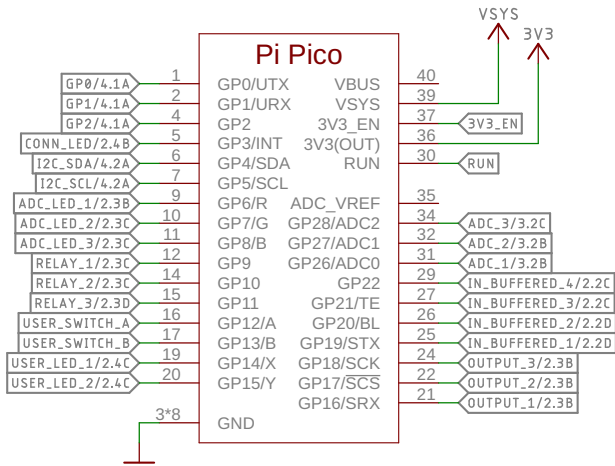
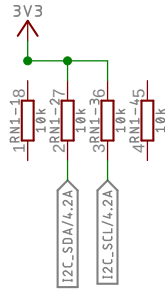


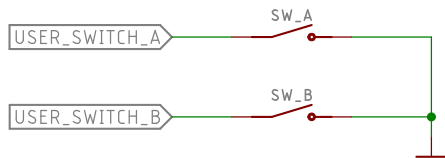
Raspberry Pi Pico W



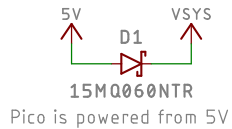
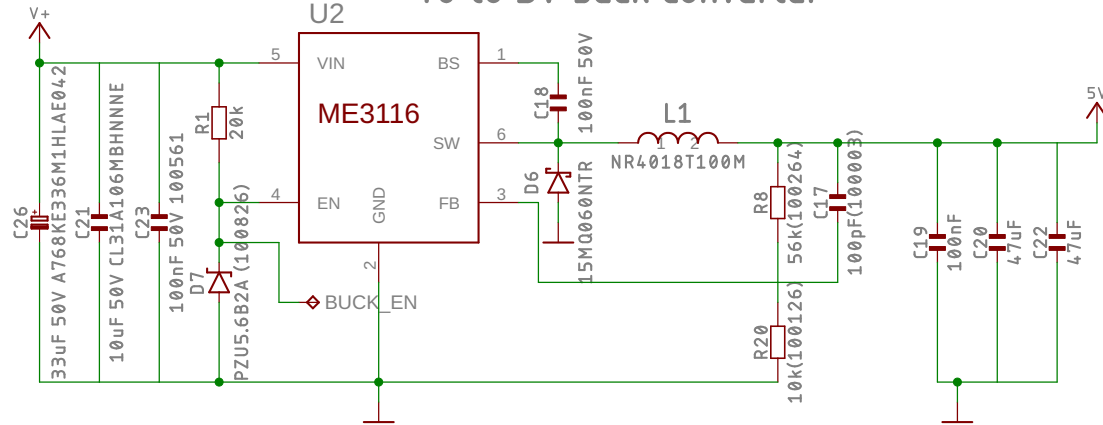
I2C pullups



Buttons



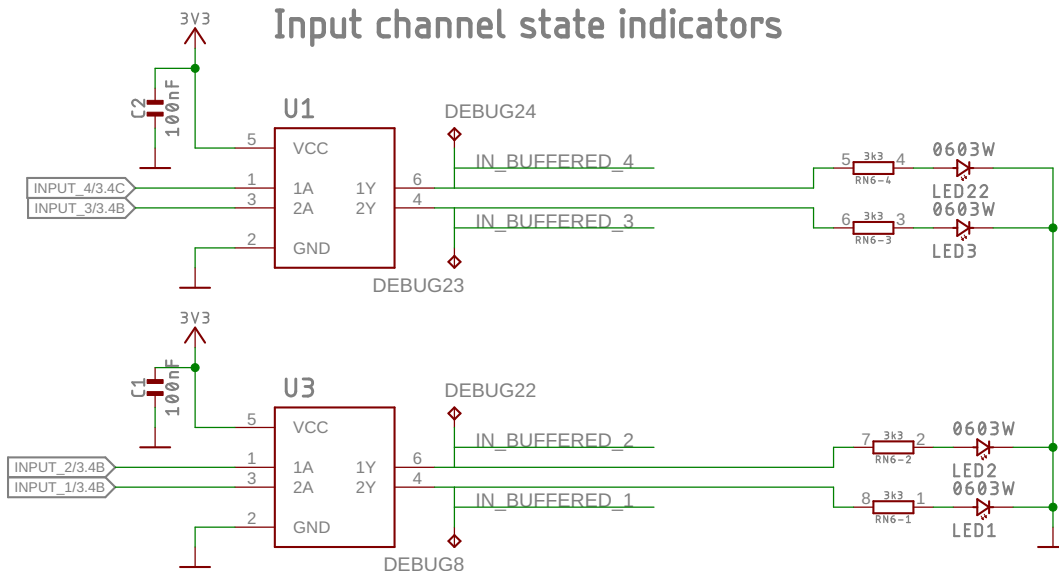
40 to 5V buck converter



5V current draw:
 * 18 x 2mA = 36mA LEDs
 * 3x 28mA = 84mA Relays
 * 3v3 LDO, max 100mA
 TOTAL 220mA

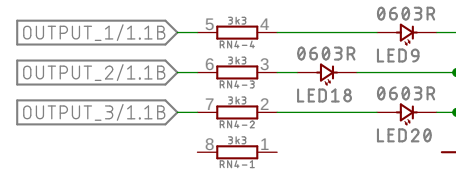
Max total for external 5V outputs: 500mA

Input channel state indicators

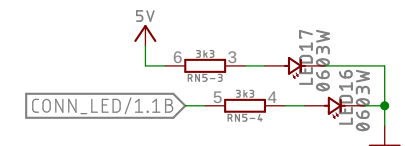


LEDs

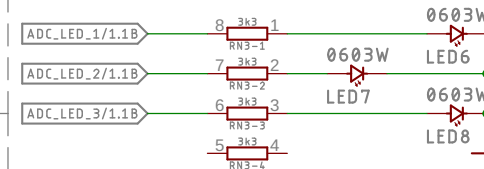
Output channel state indicators



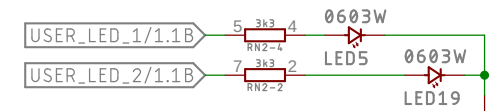
System state indicators



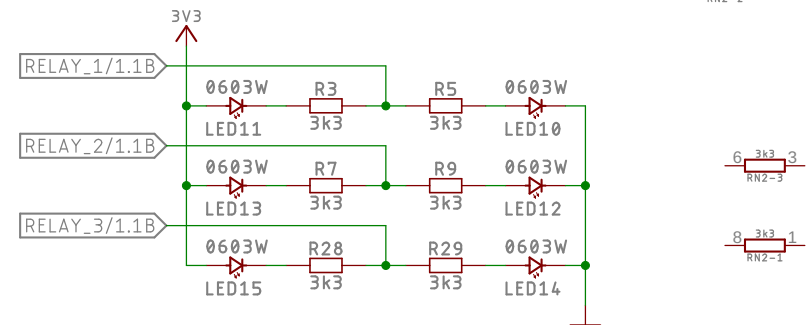
ADC channel state indicators



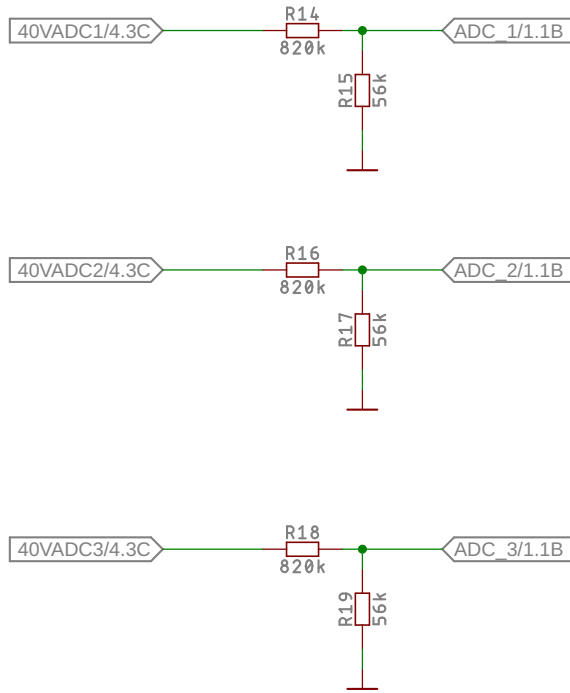
User indicators



Relay state indicators

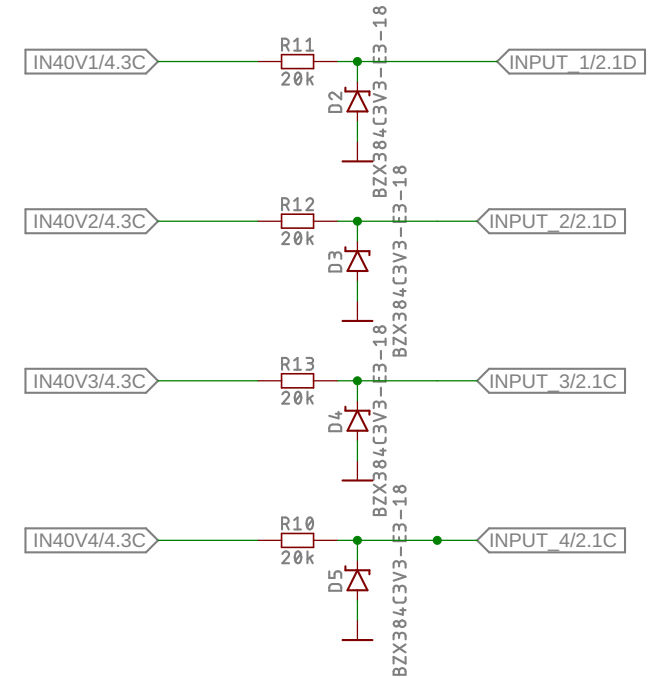


Analog Input Resistor Dividers



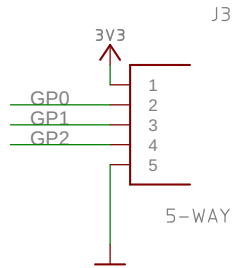
Scale the input on ADC channels to bring the maximum of 40V to below the ADCs non amplified range of 0V to 3.3V.
 56k and 820k scale 51.62 V to 3.3V leaving a bit of headroom.
 $V_{adc} = V_{in} * (56 / (56 + 820))$
 $V_{in} = V_{adc} / (56 / (56 + 820))$

Buffers for 40V Tolerant Inputs

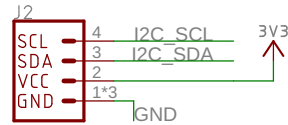
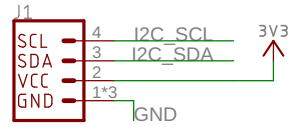


Max drop across resistor is 37V,
 20k resistor inline limits current
 to around 2mA

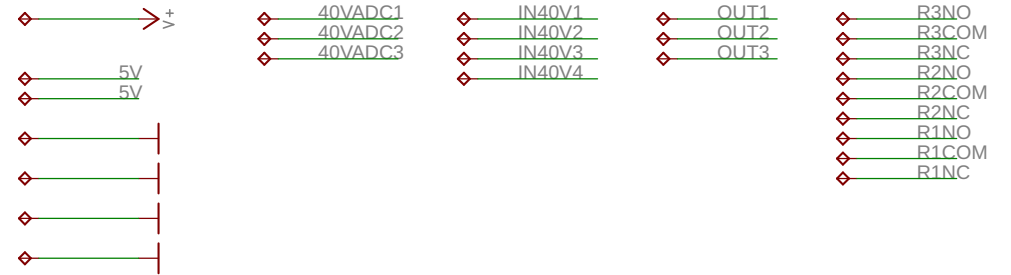
GPIO header



Qwiic connectors

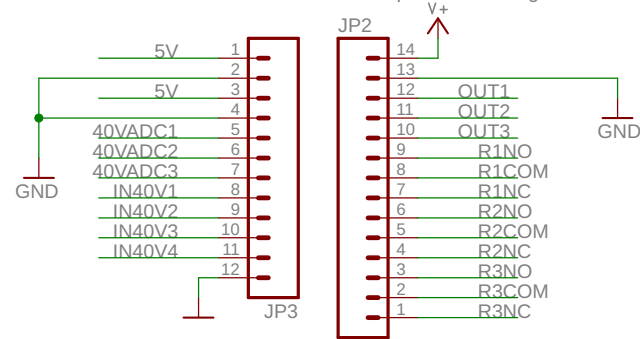


Debug pads

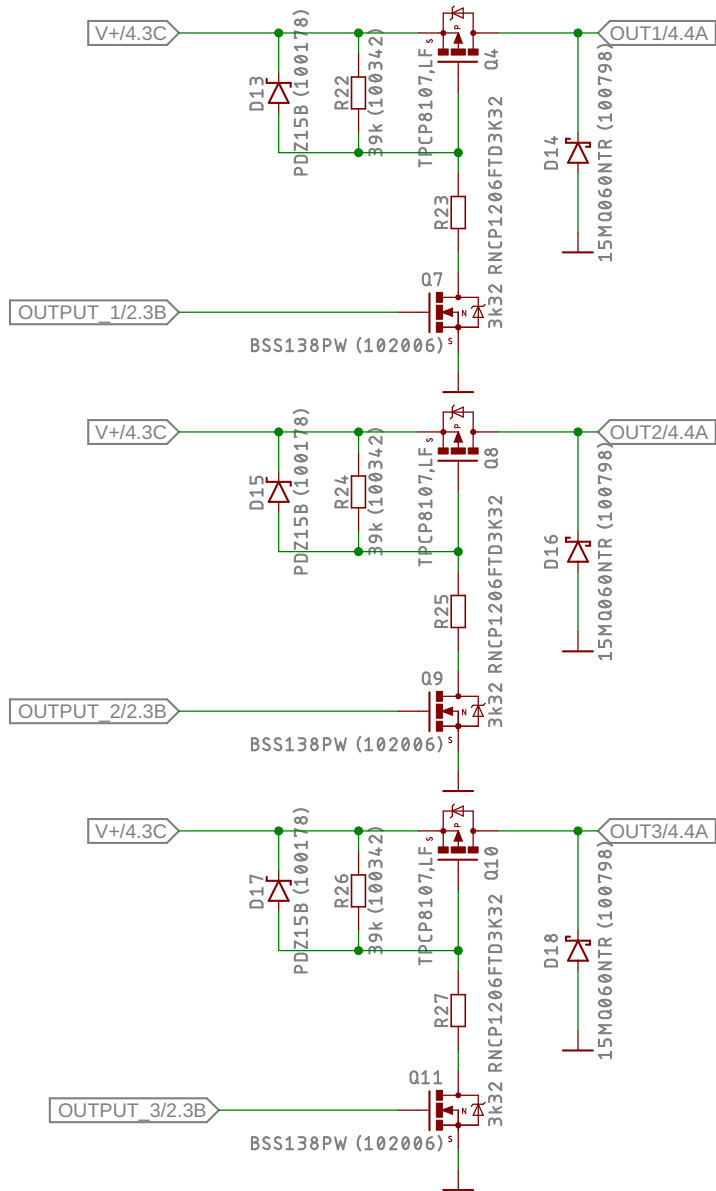


Screw terminals

Max 500mA draw in total on the 5V outputs when using the buck



Outputs (current sourcing)



Relays

