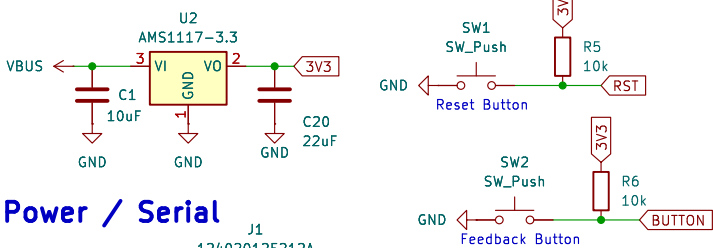
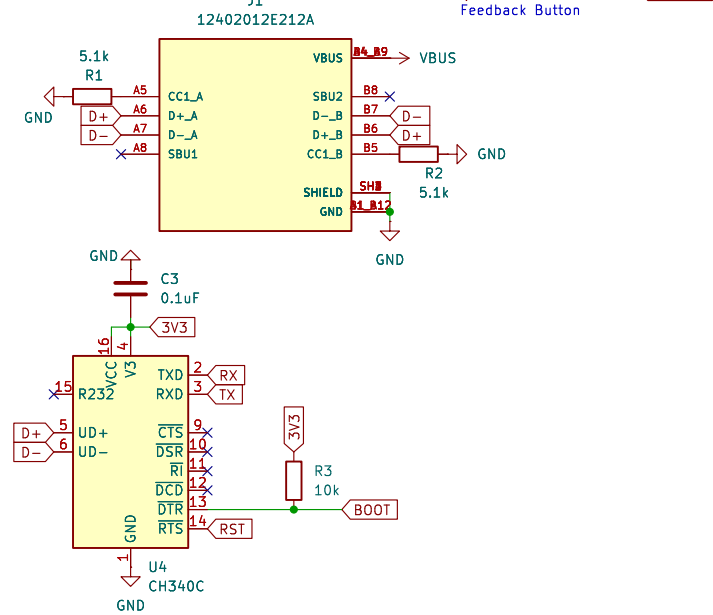


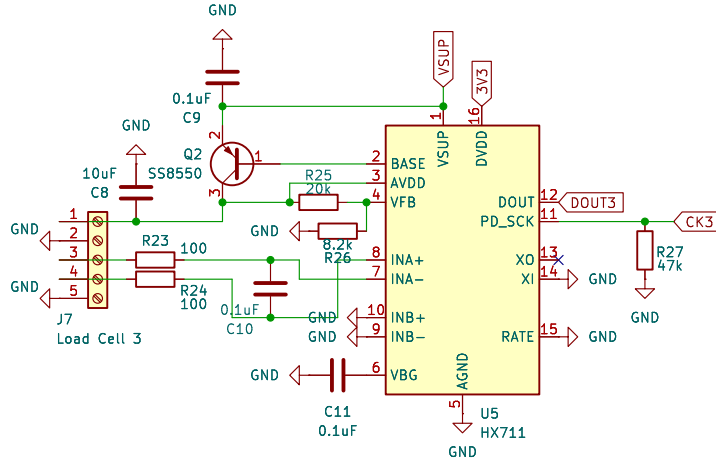
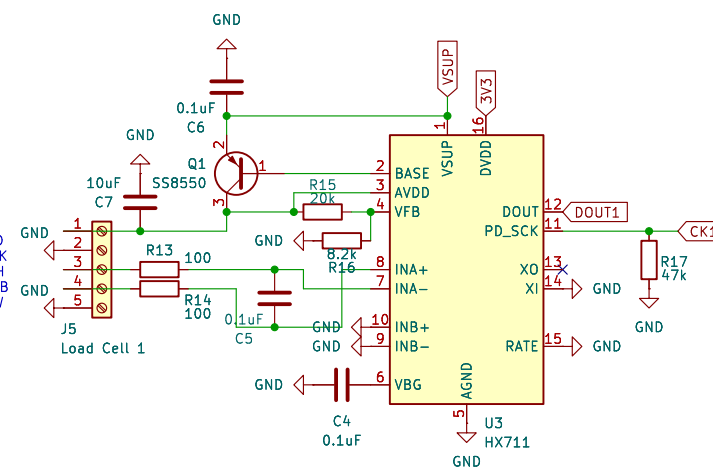
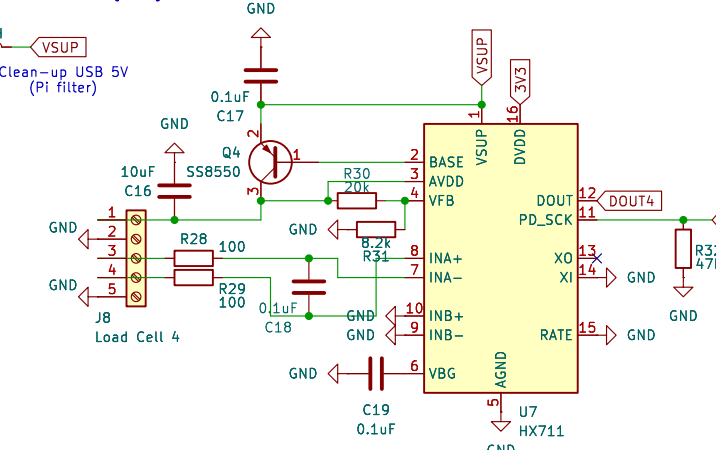
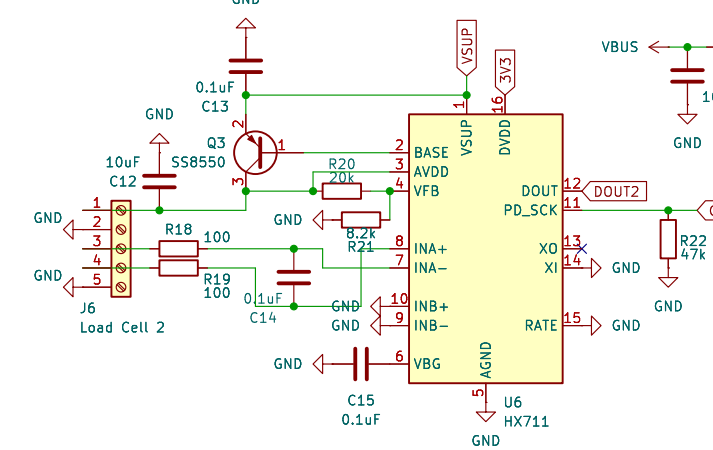
### 3V3 / Reset



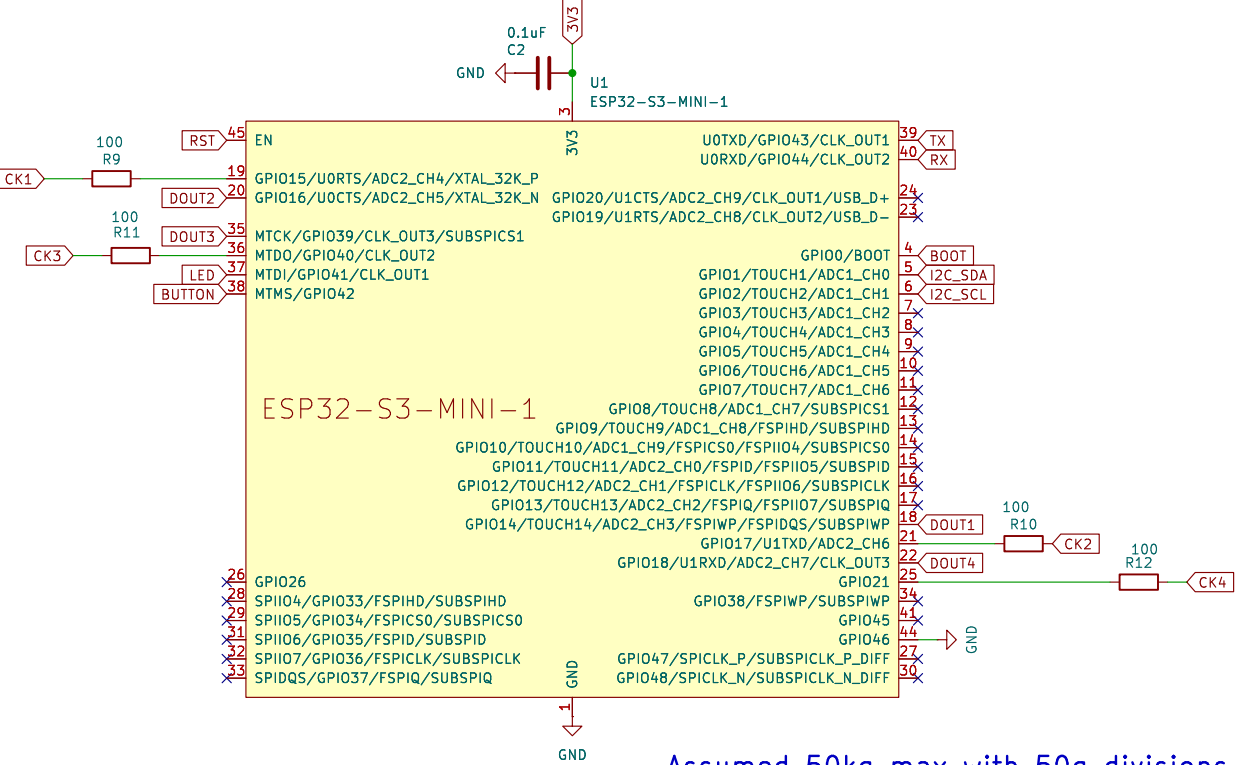
### Power / Serial



### Load Cell Amplifiers (5V)



### ESP32-S3-MINI-1



- Assumed 50kg max with 50g divisions
- 2 channels of HX711 with different properties.
- Input range (V) =  $\pm 0.5 \cdot AVDD / \text{gain}$ . Increase gain for smaller range but higher resolution?
- Use channel A of HX711: gain = 128.
- With 3V3, range =  $\pm 12.9\text{mV}$ .
- Assume load cell with  $2\text{mV/V} \Rightarrow \cdot 3\text{V3} = 6.6\text{mV}$  @ max 50kg. (Fits inside channel A range)
- 50g change =  $0.1\%FS = 6.6\mu\text{V}$ .
- Expected noise is 50nV (gain=128, 10Hz), not issue at 10Hz (samples/second).
- Suitable for max 50kg with 50g steps.

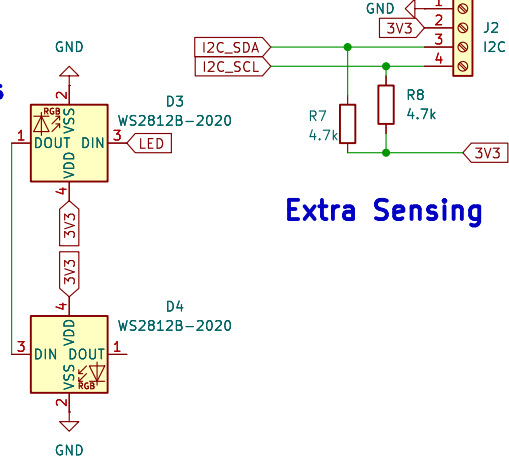
### Notes

- Chip is 2-wire serial: DIN, DOUT.
- $AVDD/DVDD = 3.3\text{V}$ ; RATE=0 (10 SPS); XI→GND (internal osc); Ch=A, G=128.
- RC input filter:  $\sim 100\Omega$  in series per leg +  $0.1\mu\text{F}$  across  $INA\pm$ .
- Place  $10\mu\text{F} + 0.1\mu\text{F}$  decouplers close to DVDD and AVDD/VSUP.
- DOUT→ISR-capable GPIO; PD\_SCK→quiet output GPIO.
- Calibrate two-point (zero & known weight), track tare, and average a small moving window at 10 SPS.

### AVDD

- $1.25 \cdot (R1 + R2) / R1 < 4.9$  must be true, to sit below PNP transistor dropout.
- R1=20k, R2=8.2k

### LEDs



### Extra Sensing

Sheet: / File: ESP-MINI-LOADCELL.kicad_sch		
Title:		
Size: A3	Date:	Rev:
KiCad E.D.A. 9.0.5		Id: 1/1