

## M-90 - Circuit python on Pico

Tested solar charge controller w/ blinking LED on Pico ✓

Button test - issues w/ loop if button.value:

Got very basic Rf integration.

Successfully received & sent w/ circuit python

Rf 993 uses 9600 baud, 998 → 115200

- Set up 993 modules to func. on 998 commands
  - Labeled all LoRa modules w/ Network & address
  - Started w/ circuit python
- TODO: Range test → 998s vs. 993s?

Start integrating I2C - bme first?

30625

- Tested BME 688, able to pull readings off of it.
- Tested PMSA003 I AQI, able to pull readings.
- Tested reading from both sensors @ same time, same I2C bus.

Sensor break in tracker: +3min + 9min + 27.5 + 21.5  
+ 140? + 45

- Used GPT to write a sensor to AQI converter program.
- Accuracy limitations - lack of gaseous pollutant sensing
  - Potential inaccuracies in PM sizing - affected by humidity
  - Limited response to varying environmental conditions
    - + Prof. grade apply correction factors for temp, humidity, & pollutant sources

Date 306025

- BME 688 can be used to apply correction factors for AQI

Correction Strategies from GPT:

$$\text{Humidity (EPA method)}: \text{PM2.5} = \text{PM2.5}_{\text{raw}} / \exp(0.059 \cdot R.H.)$$

relative  
humidity  
works

exponential func.

$$\text{Temp. correction: } \text{PM2.5} = \text{PM2.5}_{\text{corrected}} \cdot (1 - 0.02 \cdot (T - 25))$$

temp

Suggested sensor Burn in: BME 688 - 48h. + 30 mins in desired mode when in use

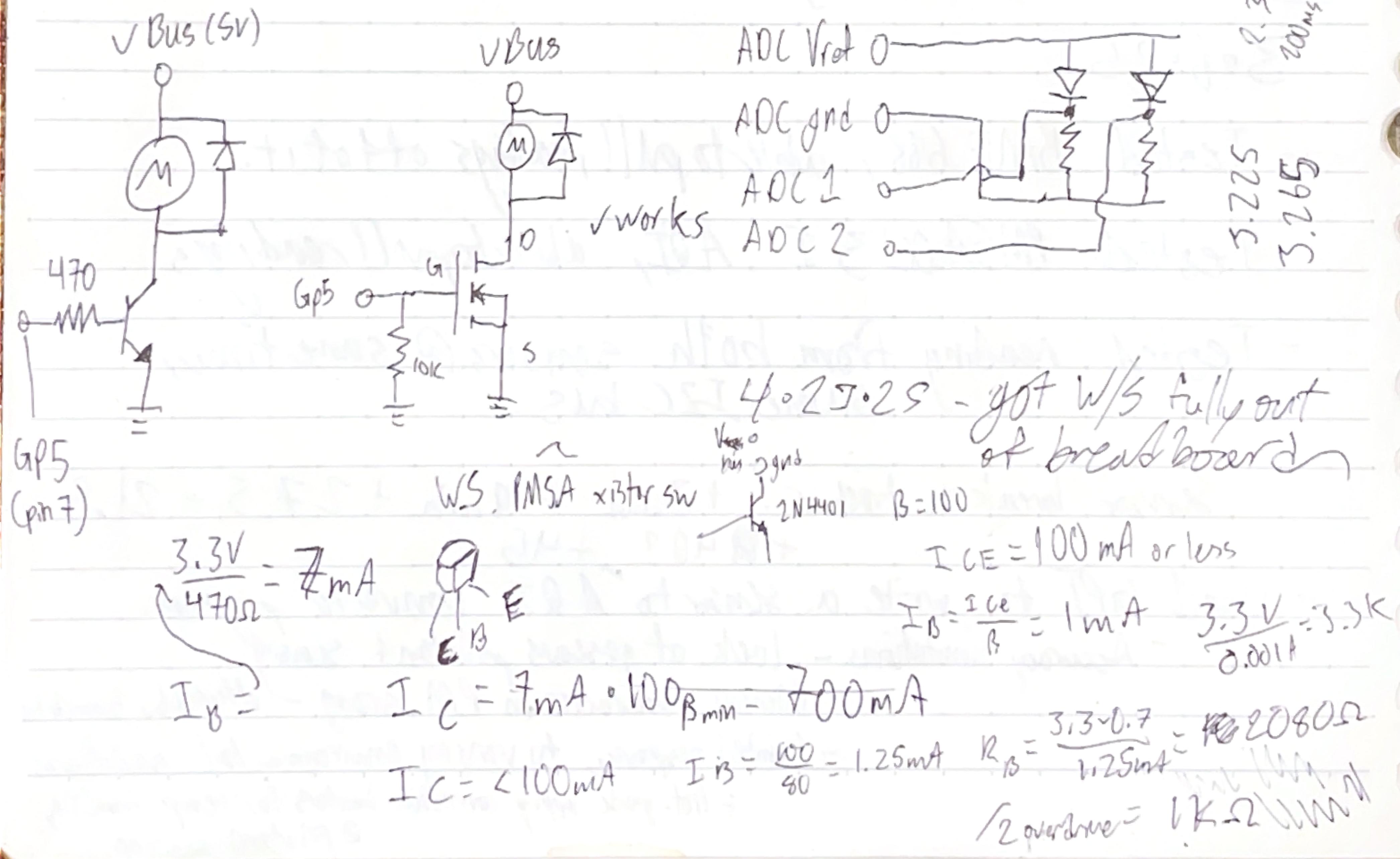
PMSA - let warm up for 30s-1m. prior to taking readings

Specify data want to send w/ LORA:

4.10.25

Temp, RH, BP, AQI, ~~Corrected AQI~~, light.

Pi zo motor driver



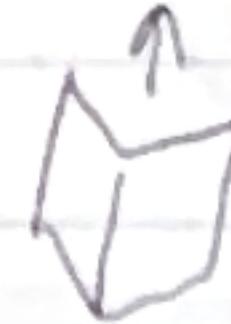
M-90

Weather Station:

3 pc: - top w/ panels

- Main w/ rest components

- Final cover



Top:

3 sides



- mount points?



founded in



3/4 side for bottom/main?



or rounder edges?

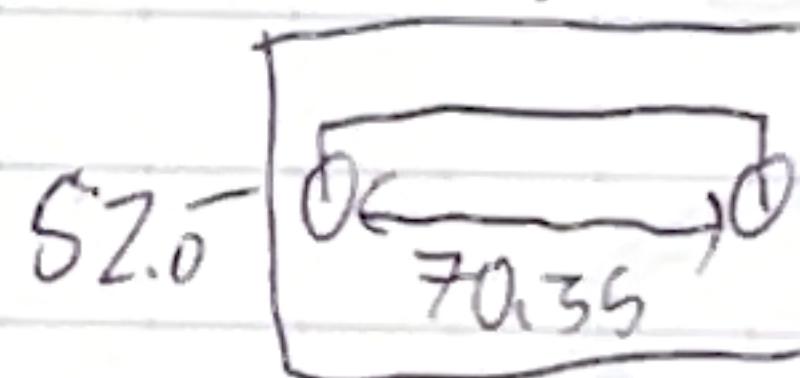
- needs air flow

main:



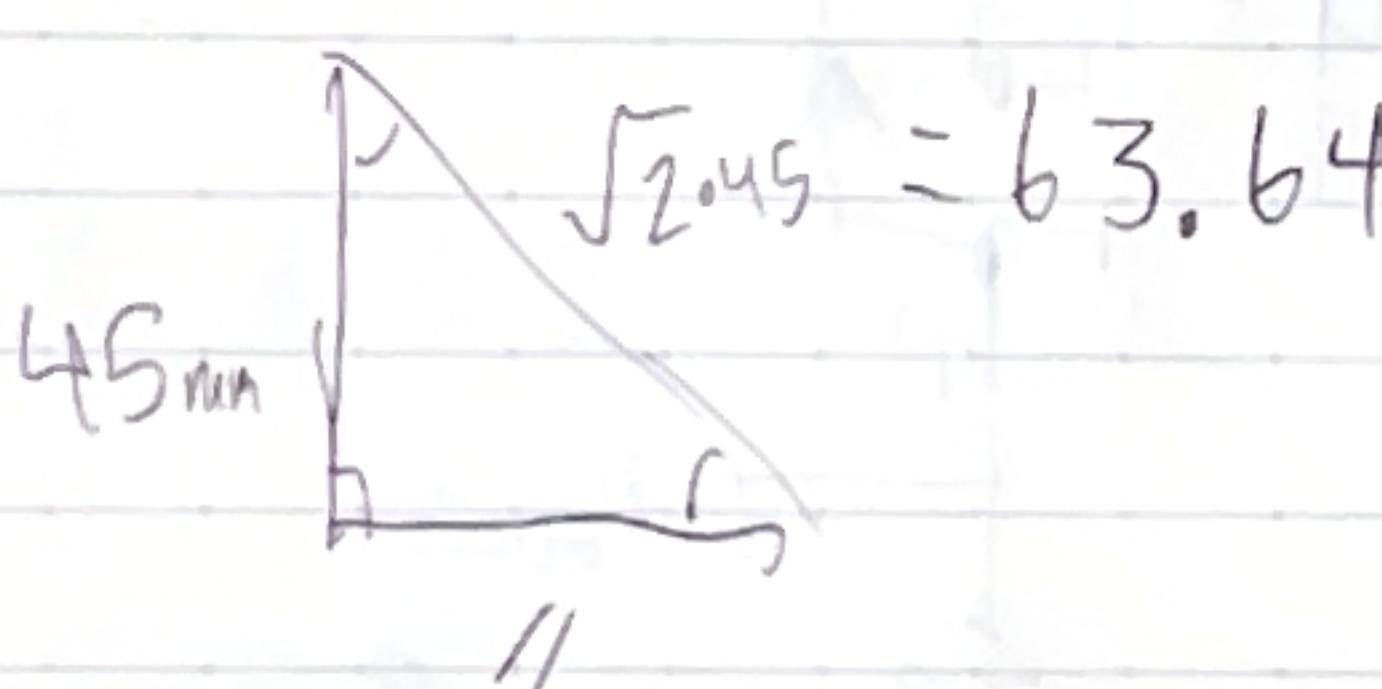
mounting spacing - M3 inserts &amp; screws

Elevation:

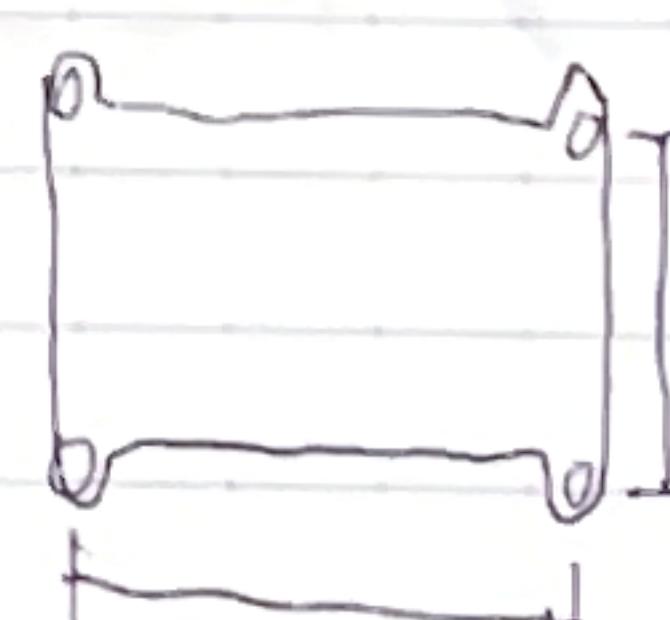


3.330

$$89.0 + 8.8 = 73.68 \text{ O.C.}$$

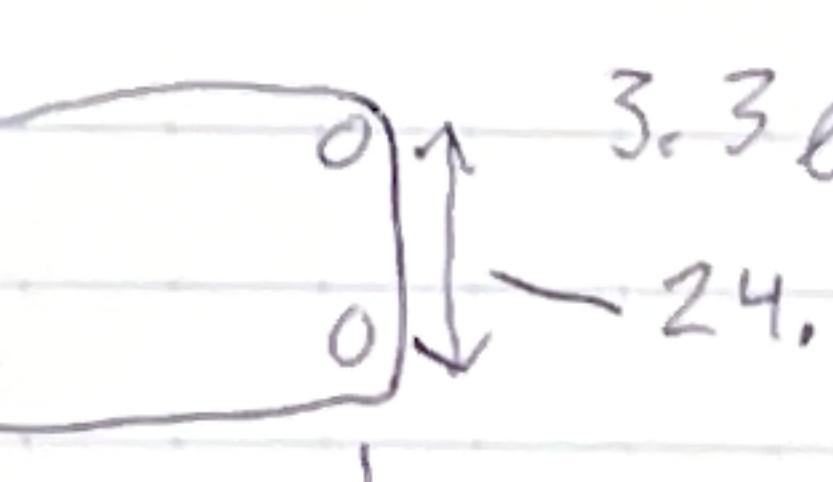


P10 TB:



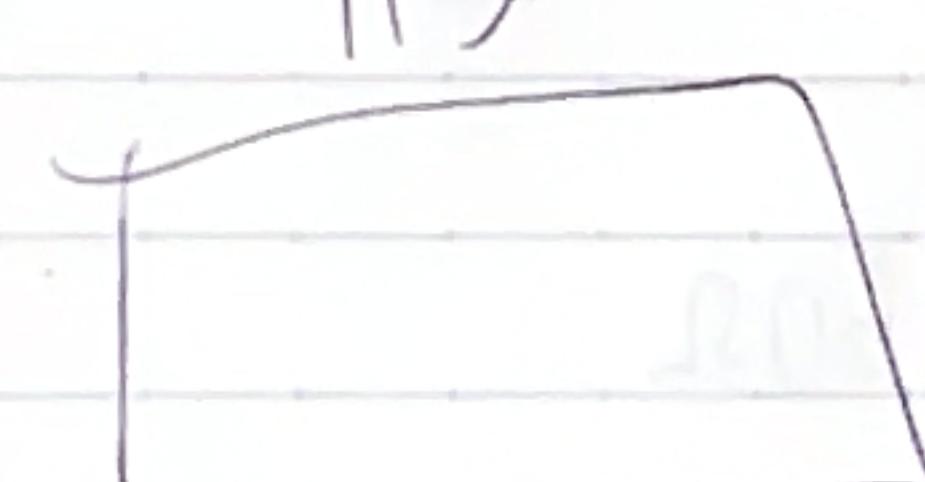
3.000

38.0 O.C.

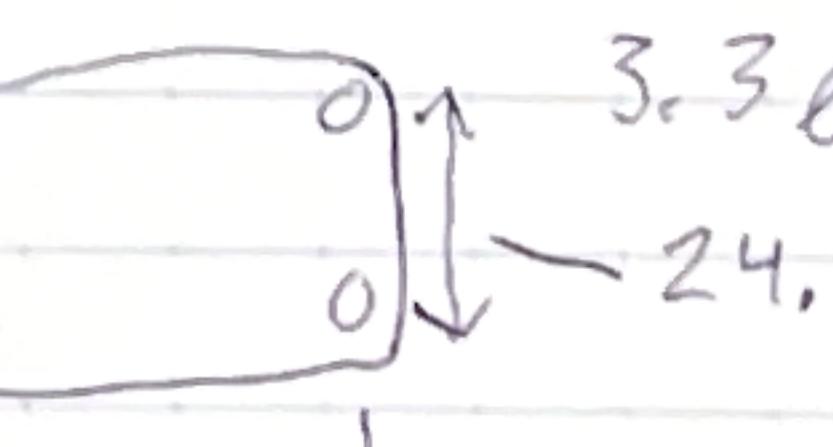


54.8 mm O.C.

Sol. CC:

10mm risers 7.5 mm  
f-thread

66



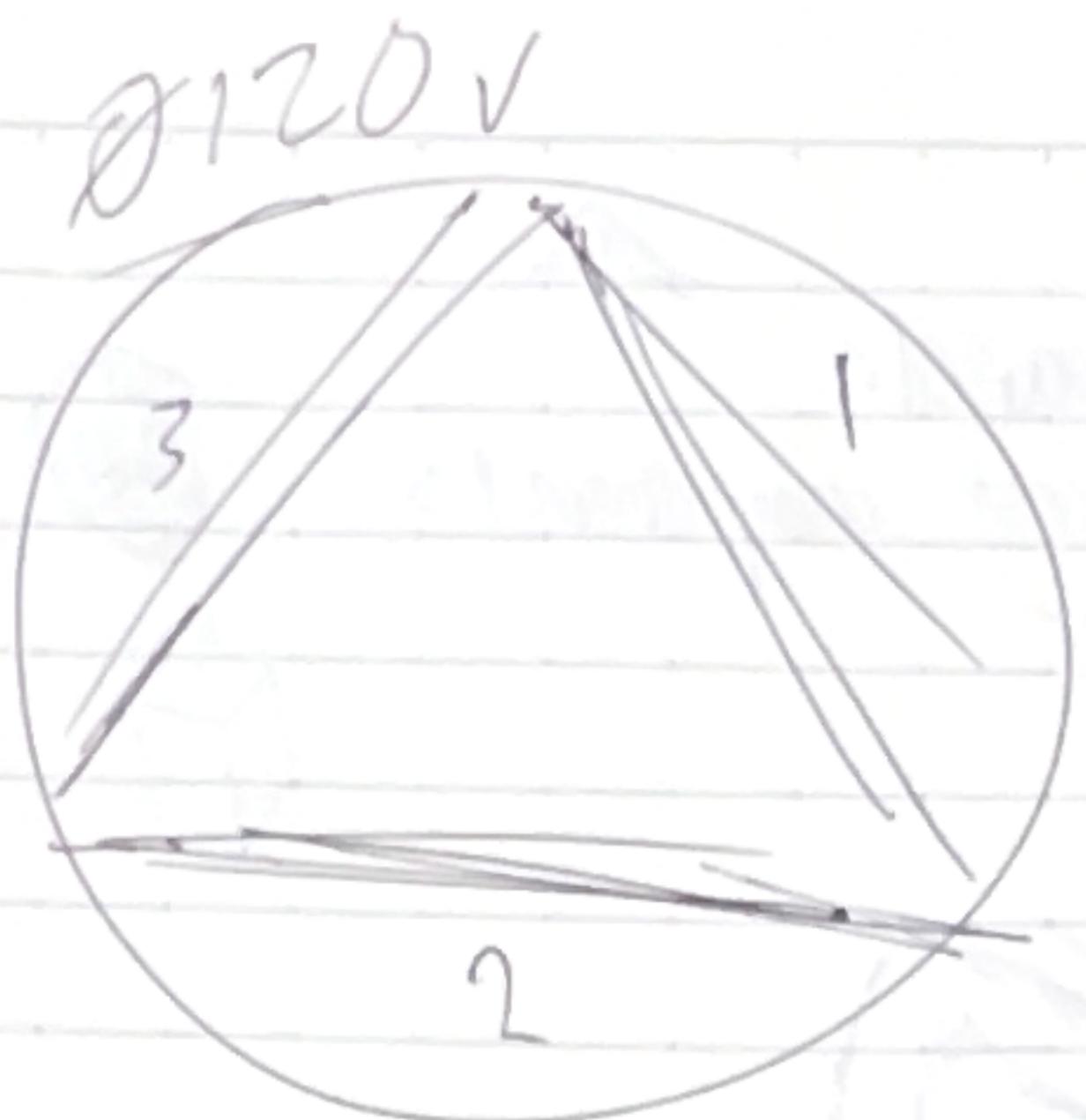
24.9 mm O.C.

113

No.

Date

2023-08-26



1 - sensor / breakout board

2 - PIZO

3 - S.CC + bat.

+ might need to sink wall to allow for H.S.  
Spacer mount + 3

1 & 2 connected, 3 separate piece for  
access

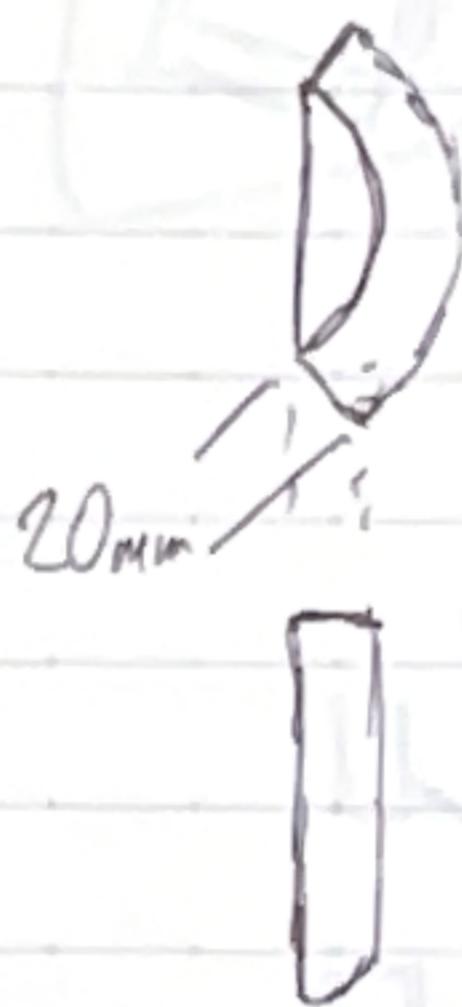


hinge?

reinforce  
corner

↳ solid forming,  
need leads for solar on breakout

- ↳ ~100-110 ↴

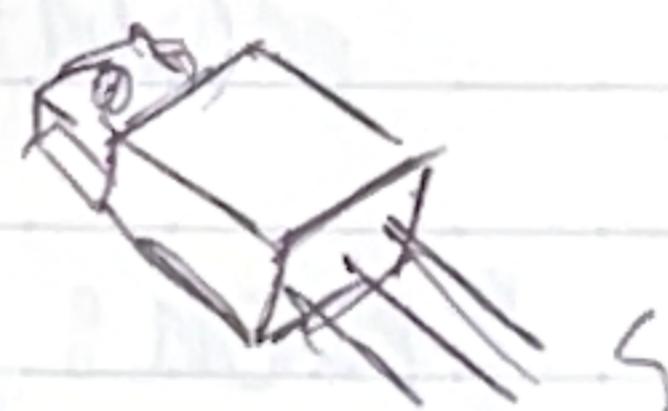


Some sort of  
tooth/key



↳ overlap bottom

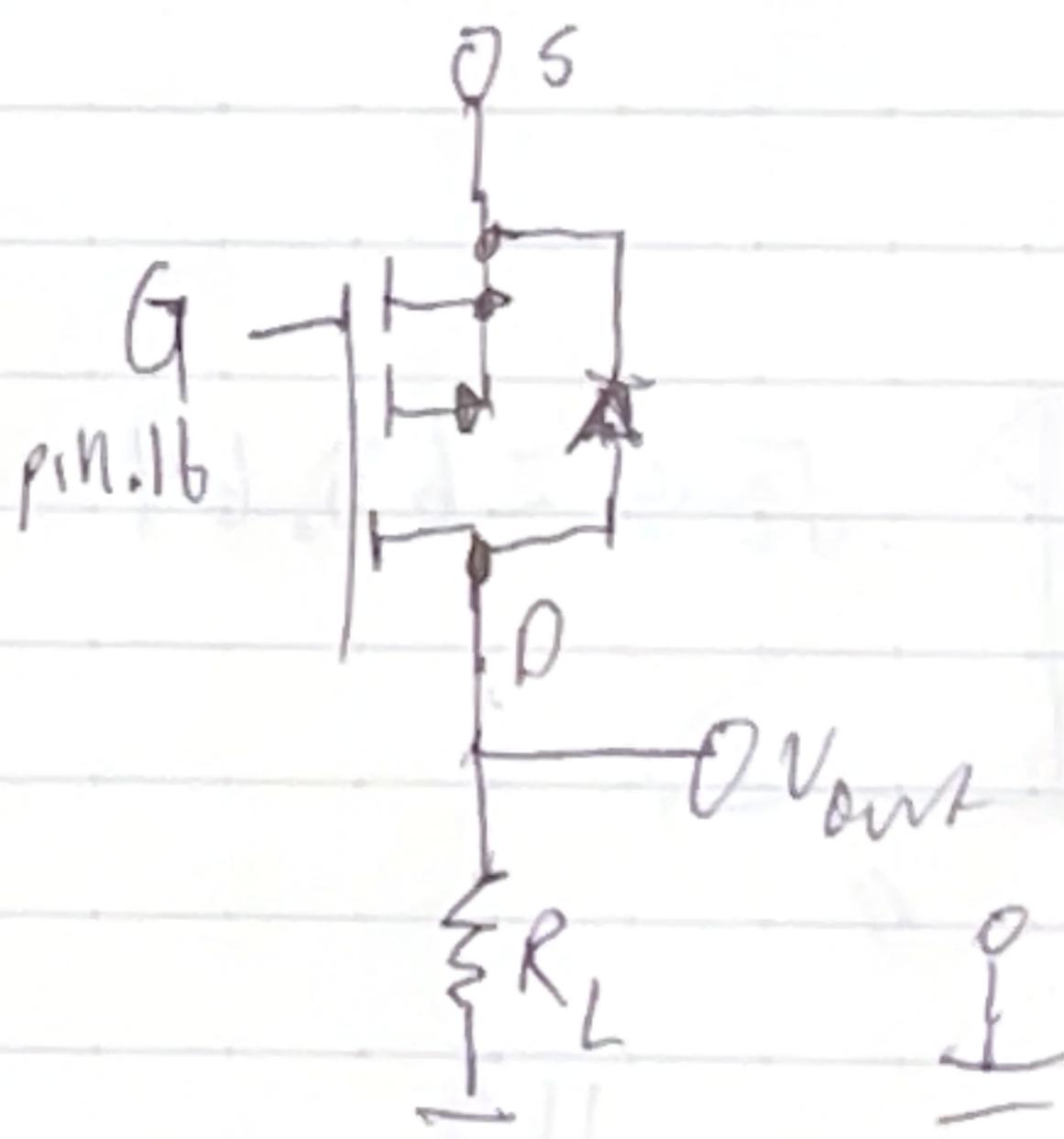
water proofing last  
as possible



$V_{DS} = 5V$

$I_L = 100mA$

$R_{DS(on)} = 0.25\Omega$



$$R_L = \frac{5V}{I_L} = \frac{5V}{0.1A} = 50\Omega$$