

This board's job is to provide climate control for plants.  
It has three main functions:  
- lights: dimmable  
- fans: move air throughout the enclosure  
- mist: water the plants

## Main microcontroller: esp32-c3

Info on auto-programming circuitry / strapping pins  
[https://dl.espressif.com/dl/schematics/esp32\\_devkitc\\_v4-sch-20180607a.pdf](https://dl.espressif.com/dl/schematics/esp32_devkitc_v4-sch-20180607a.pdf)

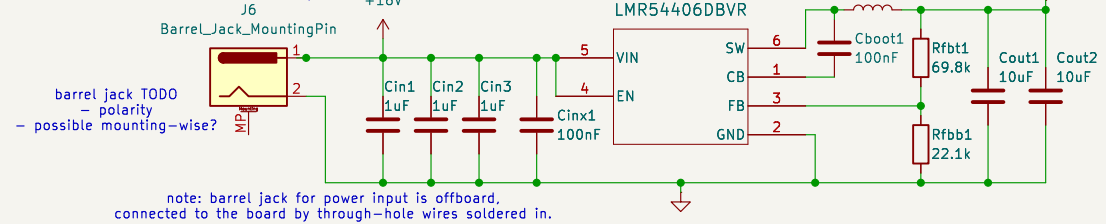
strapping pins:

- \* io2, io8 should be pulled high
- \* io9 low = programming mode, high = normal boot
- \* io9 has a weak internal pull-up

## 18v -> 3.3v for microcontroller

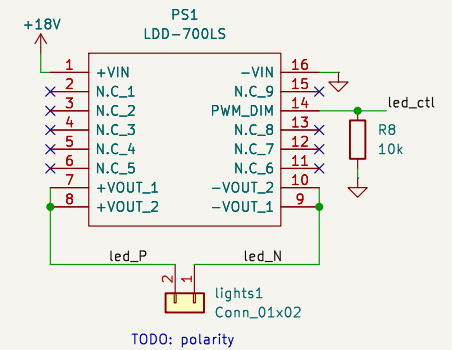
voltage converter circuit based on:  
<https://webench.ti.com/appinfo/webench/scripts/SDP.cgi?ID=A3B25FF3CB499236>  
datasheet page 27 shows layout

### 18v Power Input

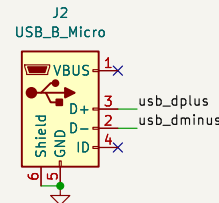


### LED Driver

powers 5 Cree XT-E LEDs and allows dimming  
note: led driver contains internal caps to filter power input



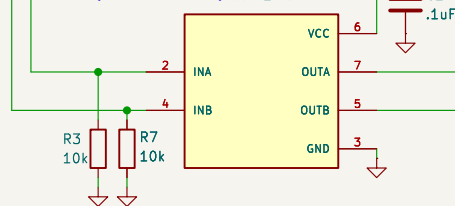
### USB for programming



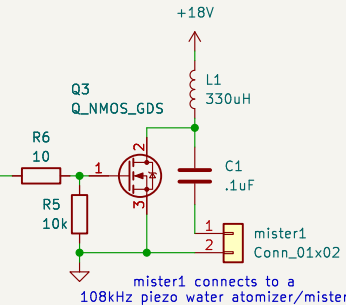
notes:

- this board design leaves the input voltage line from USB \*disconnected\*
- power input from the usb is not used for anything on the board
- to program the esp32, you must plug in usb to the computer \*and\* 18v wall power

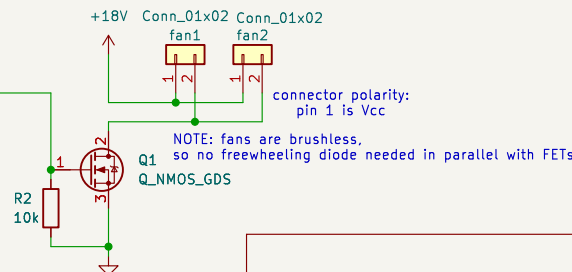
### FET gate driver (2 channel)



### Ultrasonic mister



### Fans



Sheet: /  
File: pcb.kicad\_sch

### Title: Terrarium Control Board

Size: A4 Date: 2024-07-18

KiCad E.D.A. 9.0.0

Rev: v0.2

Id: 1/1

based on <https://www.instructables.com/Make-Your-Own-Super-Simple-Ultrasonic-Mist-Maker/>

so i'm making unused pins accessible for experimentation

H1 MountingHole