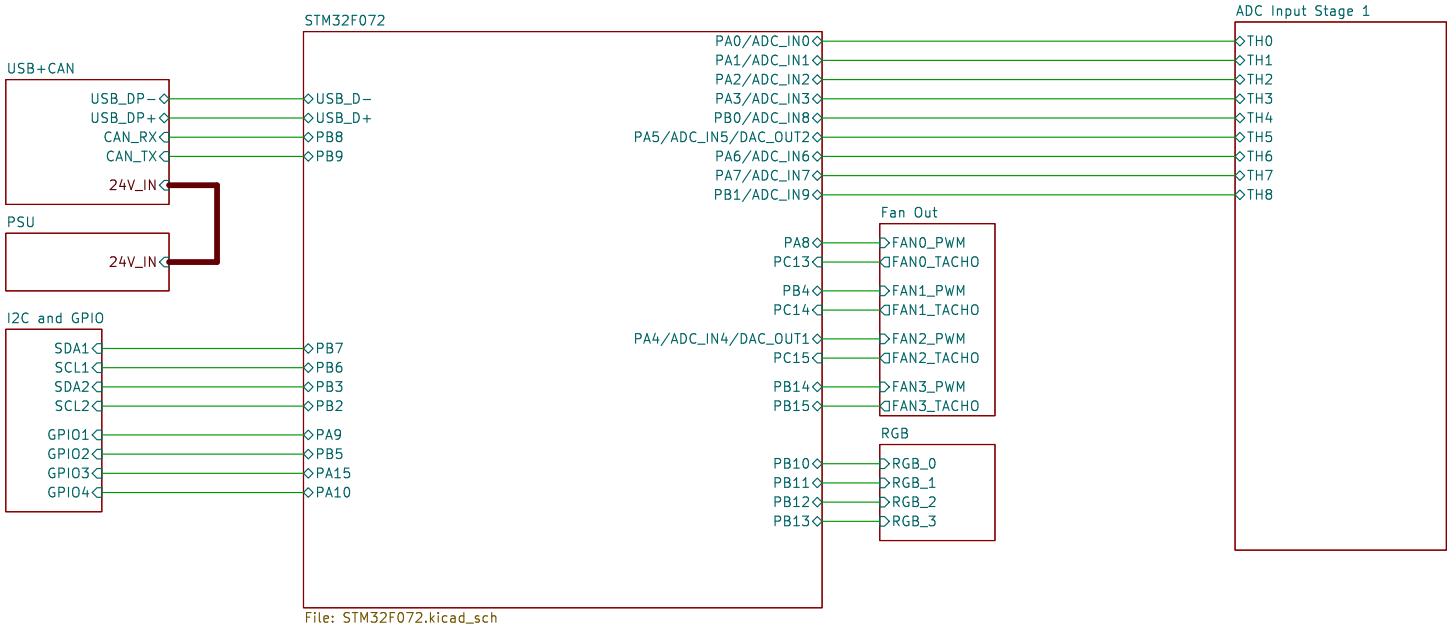
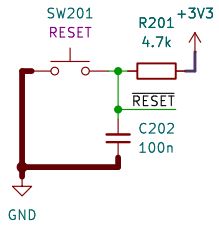
# DragonDinghy

## System Overview

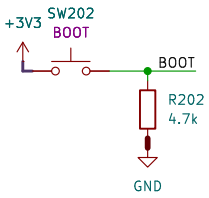



| | | |
|---|---|---|
| **Dragonkitty** | | |
| Sheet: / | | |
| File: DragonDinghy.kicad_sch | | |
| ***Title: Klipper Dinghy*** | | |
| Size: A4 | Date: | **Rev: 1.0** |
| KiCad E.D.A. 9.0.2 | | Id: 1/8 |

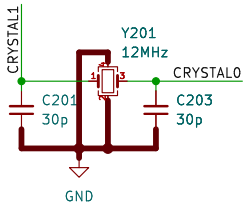
## RESET




## BOOT

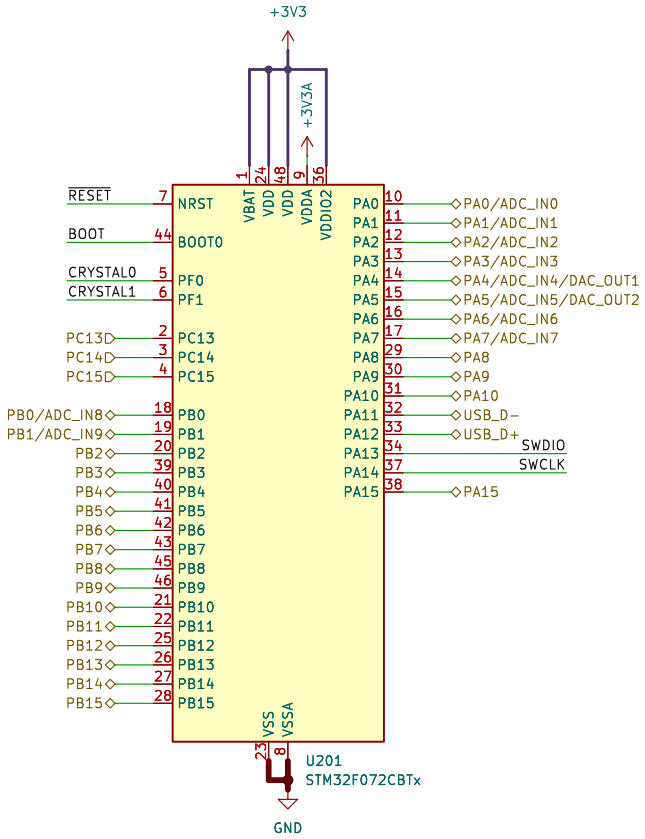



## Crystal

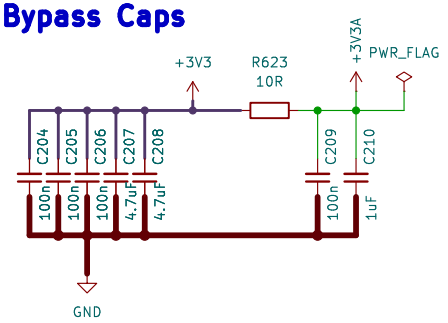



## MCU

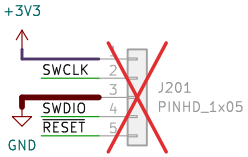
Mothership Control Unit




## Bypass Caps

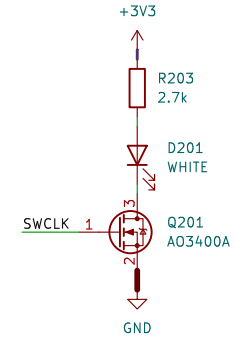



## Debug



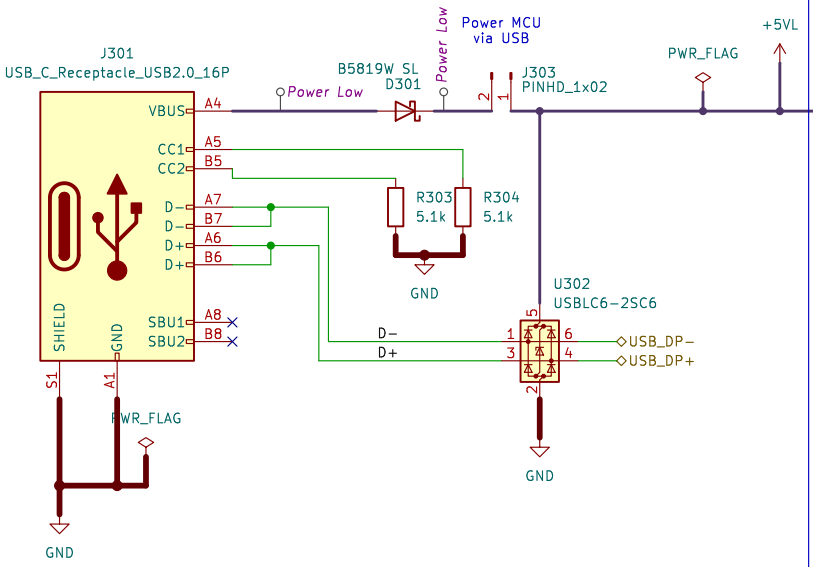

## DFU Indicator

can also be used for status




| | |
|---|---|
| Dragonkitty | |
| Sheet: /STM32F072/ | |
| File: STM32F072.kicad_sch | |
| **Title: Klipper Dinghy** | |
| Size: A4 | Date: |
| KiCad E.D.A. 9.0.2 | Rev: 1.0 |
| | Id: 2/8 |

# USB input

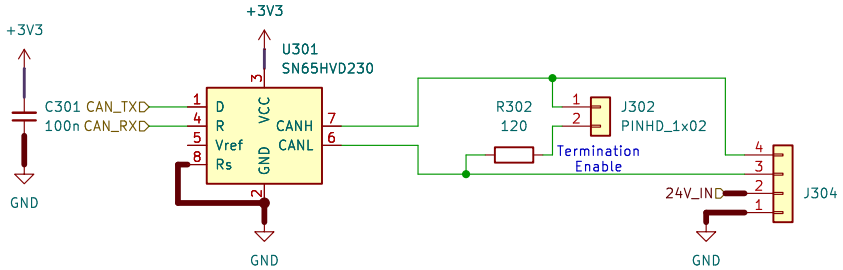



# 5V protection


The 0.2A polyfuse prevents the regular +5V rail to draw excessive current via the USB cable in case the user forgets to remove the jumper.

USB only powers the +5VL rail, which in turn powers the 3.3V rail

# CAN





Main Input Terminal, pluggable

Black:
LCSC C2938680 + C2938681 (Dorabo DB2ERC−3.81−4P−BK / DB2EK−3.81−4P−BK−S)

Green:
TME 15EDGRC3.81−04P + 15EDGK3.81−04P

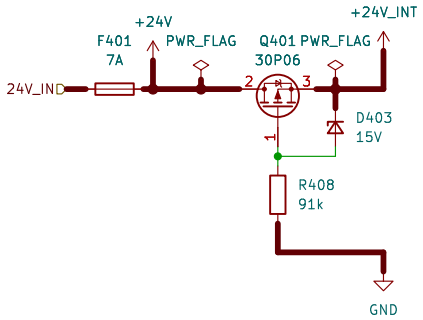
**Dragonkitty**

Sheet: /USB+CAN/
File: USB+CAN.kicad_sch

***Title: Klipper Dinghy***

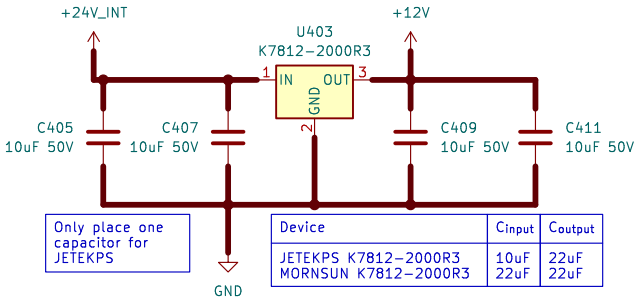
| Size: A4 | Date: | **Rev: 1.0** |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 3/8 |

# 24V Input Rev. Polarity Protection




# 12V PSU

Replace K7812-500R3 with K7812-2000R3 for maxi variant

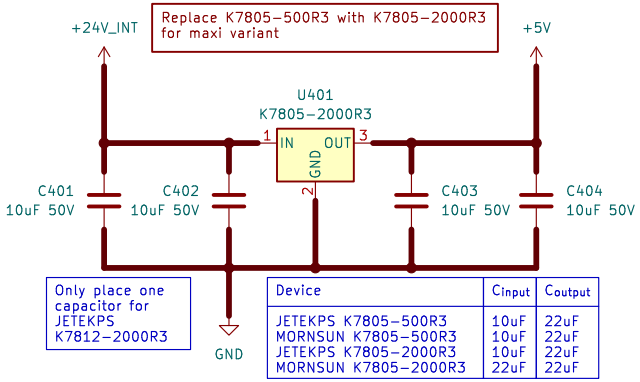



Only place one capacitor for JETEKPS

| Device | Cinput | Coutput |
|---|---|---|
| JETEKPS K7812-2000R3 | 10uF | 22uF |
| MORNSUN K7812-2000R3 | 22uF | 22uF |

# 5V PSU

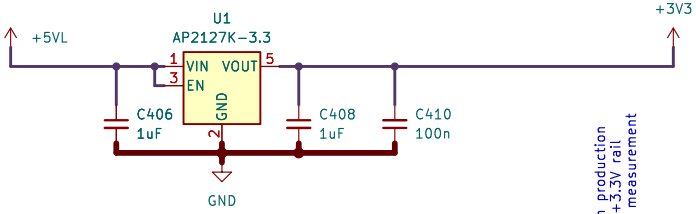
Replace K7805-500R3 with K7805-2000R3 for maxi variant




Only place one capacitor for JETEKPS K7812-2000R3

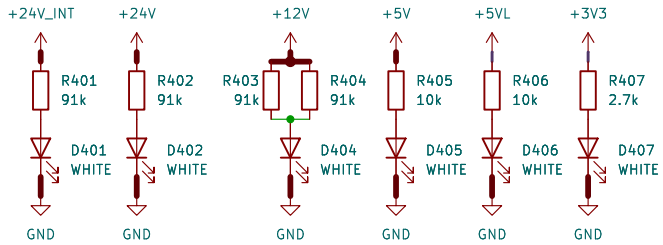
| Device | Cinput | Coutput |
|---|---|---|
| JETEKPS K7805-500R3 | 10uF | 22uF |
| MORNSUN K7805-500R3 | 10uF | 22uF |
| JETEKPS K7805-2000R3 | 10uF | 22uF |
| MORNSUN K7805-2000R3 | 22uF | 22uF |

# 3.3V PSU




TODO: Remove from production
Cut to allow for +3.3V rail
current consumption measurement

# PSU Rail Status



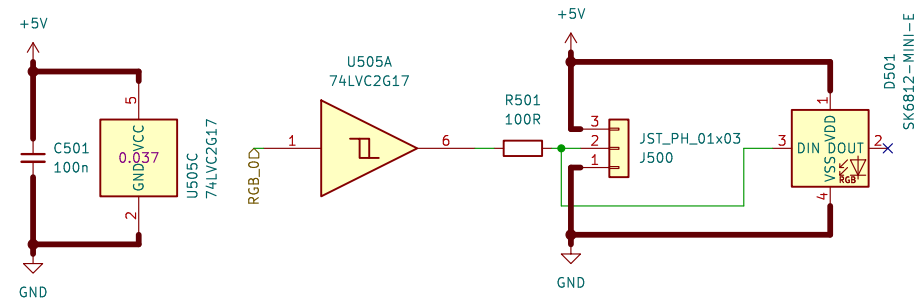

**Dragonkitty**

Sheet: /PSU/
File: PSU.kicad_sch

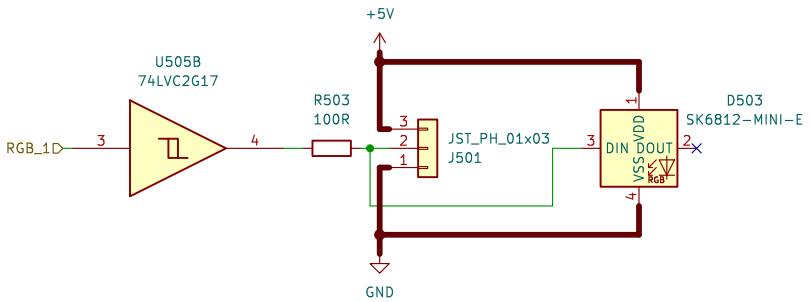
***Title: Klipper Dinghy***

| Size: A4 | Date: | **Rev: 1.0** |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 4/8 |

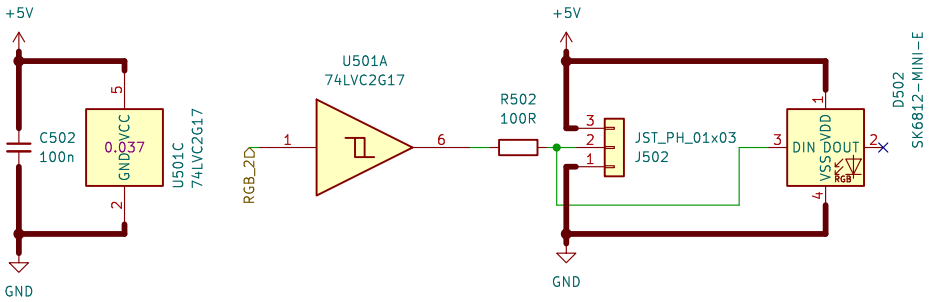
# RGB Port 0



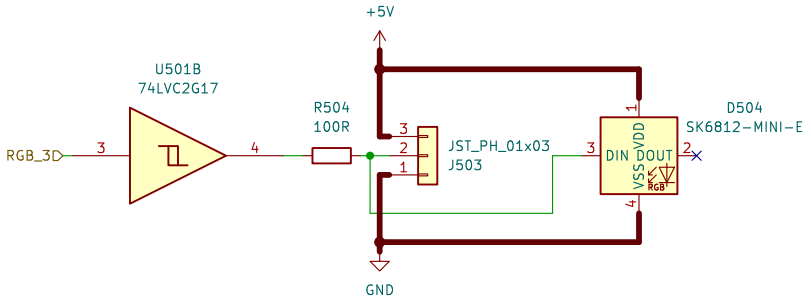

# RGB Port 1



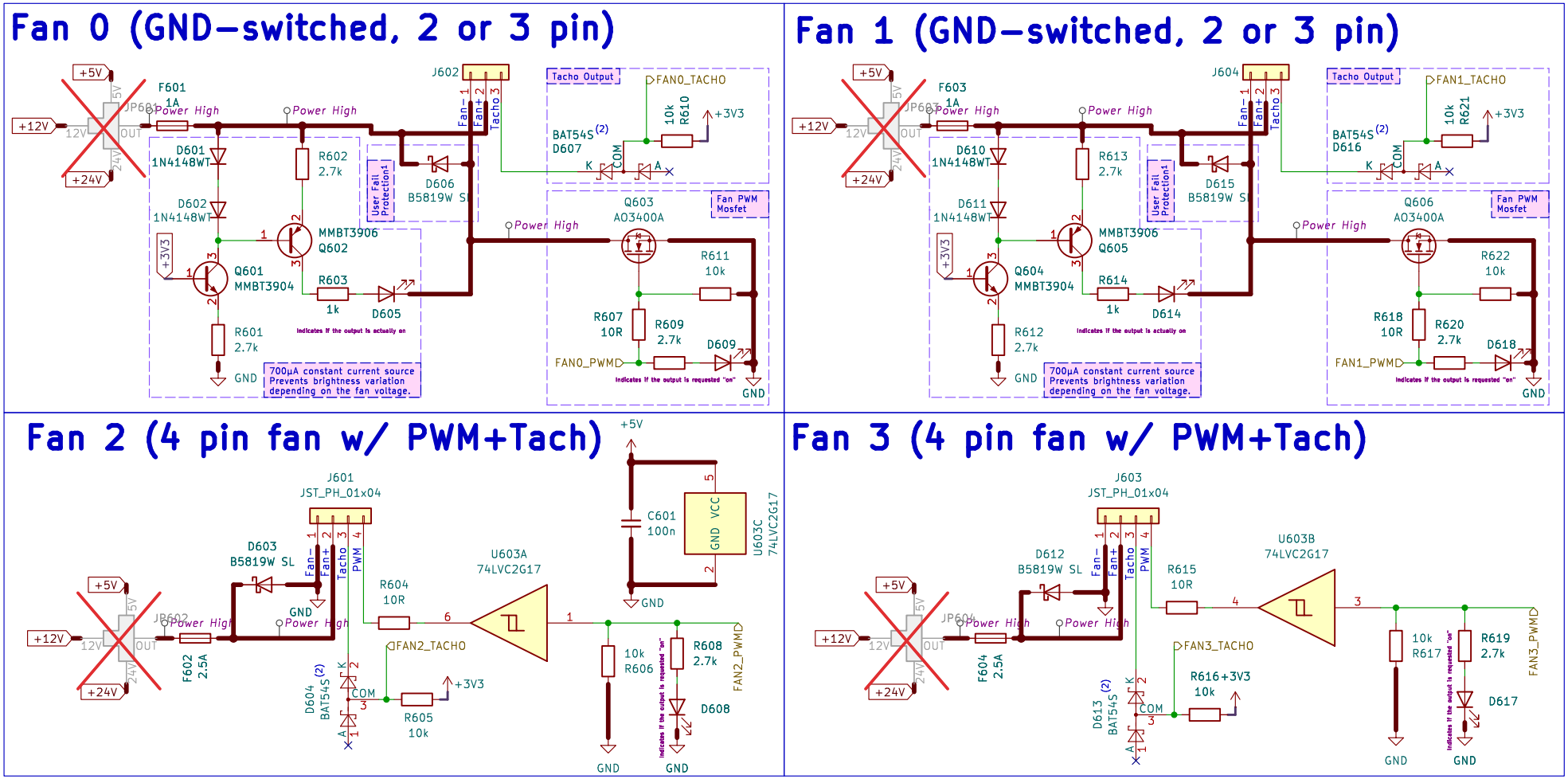

# RGB Port 2




# RGB Port 3




| | | |
|---|---|---|
| **Dragonkitty** | | |
| Sheet: /RGB/ | | |
| File: Neopixel.kicad_sch | | |
| ***Title: Klipper Dinghy*** | | |
| Size: A4 | Date: | **Rev: 1.0** |
| KiCad E.D.A. 9.0.2 | | Id: 5/8 |




GND-switched fan ports

- Provides a safe 3-way voltage selector (24V, 12V, 5V)
- Tachometer input as standard
- 500mA maximum current
- Fused with 1A to account for inrush current
- 2 LED indicators per port:
  - One to show WANTED state (=to debug if e.g. the Klipper pin is configured correctly)
  - One to show ACTUAL state (=to debug if the mosfet is permanently on or fuse is blown)

PWM fan ports

- Provides a safe 3-way voltage selector (24V, 12V, 5V)
- Tachometer input as standard
- Fused with 2.5A to allow for inrush current

General Notes

1 BLDC fans aren't inductive devices, but a bit of extra protection in case someone tries to use a relay on this port doesn't hurt.
2 Dual BAT84S is re-used as a single diode to reduce the BOM count

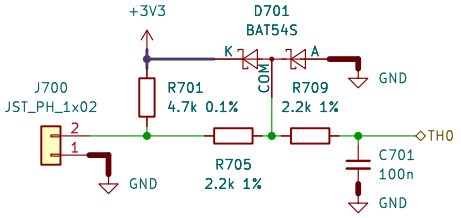
**Dragonkitty**

Sheet: /Fan Out/
File: fan_out.kicad_sch

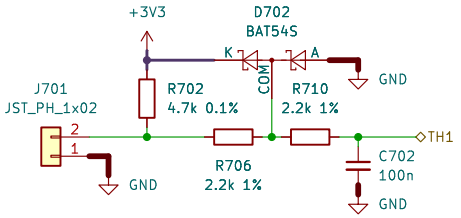
***Title: Klipper Dinghy***

| Size: A4 | Date: | **Rev: 1.0** |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 6/8 |

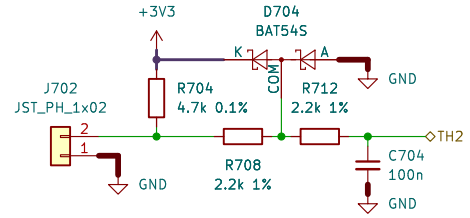
# Thermistor TH0



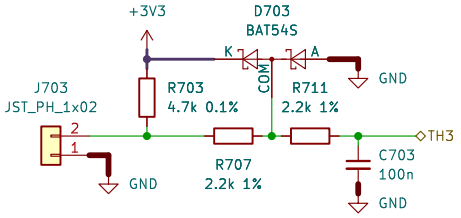

# Thermistor TH1



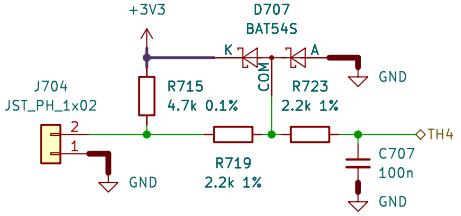

# Thermistor TH2



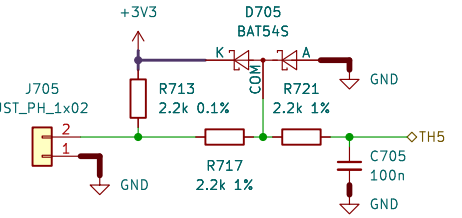

# Thermistor TH3



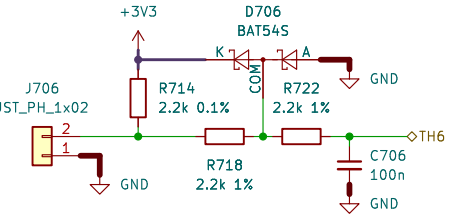

# Thermistor TH4



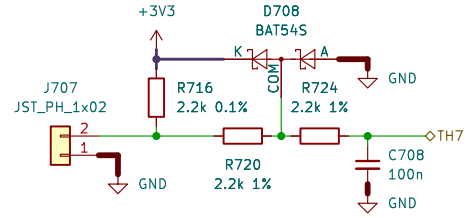

# Thermistor TH5



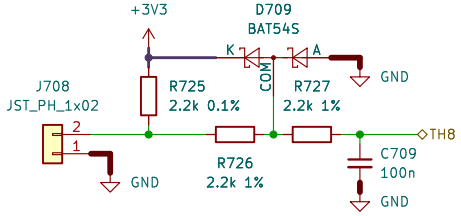

# Thermistor TH6




# Thermistor TH7




# Thermistor TH8




The input resistors are specified as 1206 to allow for enough power dissipation in case of an overload.

The BAT54S diode in conjunction with the 2 resistors are used for overload protection.

Previously tested was BAV99, however, it pulls the 3.3V to a bit over 4V via the STM32's input protection pins.

Using a BAT54S only results in 3.6V, which is still within limits of $V_{ADC}$ and $V_{DDA}$.

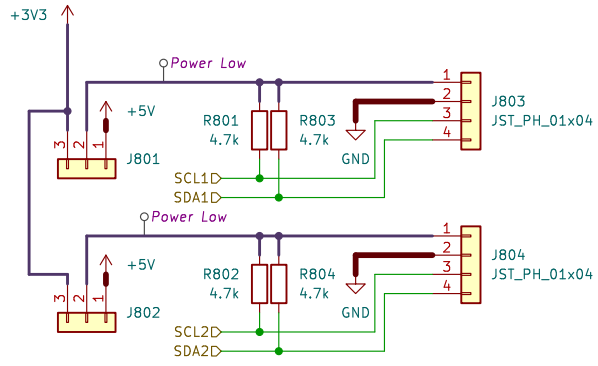
**Dragonkitty**

Sheet: /ADC Input Stage 1/
File: AdcInputStage.kicad_sch

***Title: Klipper Dinghy***

| Size: A4 | Date: | **Rev: 1.0** |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 7/8 |

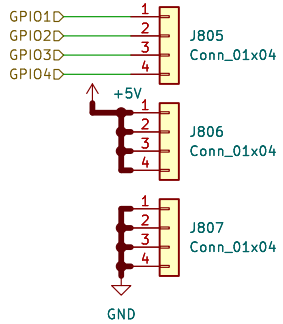
# I2C Ports




Second I2C port is software I2C only due to a Klipper limitation

# GPIO

aka "leftovers"




| | | |
|---|---|---|
| **Dragonkitty** | | |
| Sheet: /I2C and GPIO/ | | |
| File: I2C_GPIO.kicad_sch | | |
| ***Title: Klipper Dinghy*** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. 9.0.2 | | Id: 8/8 |