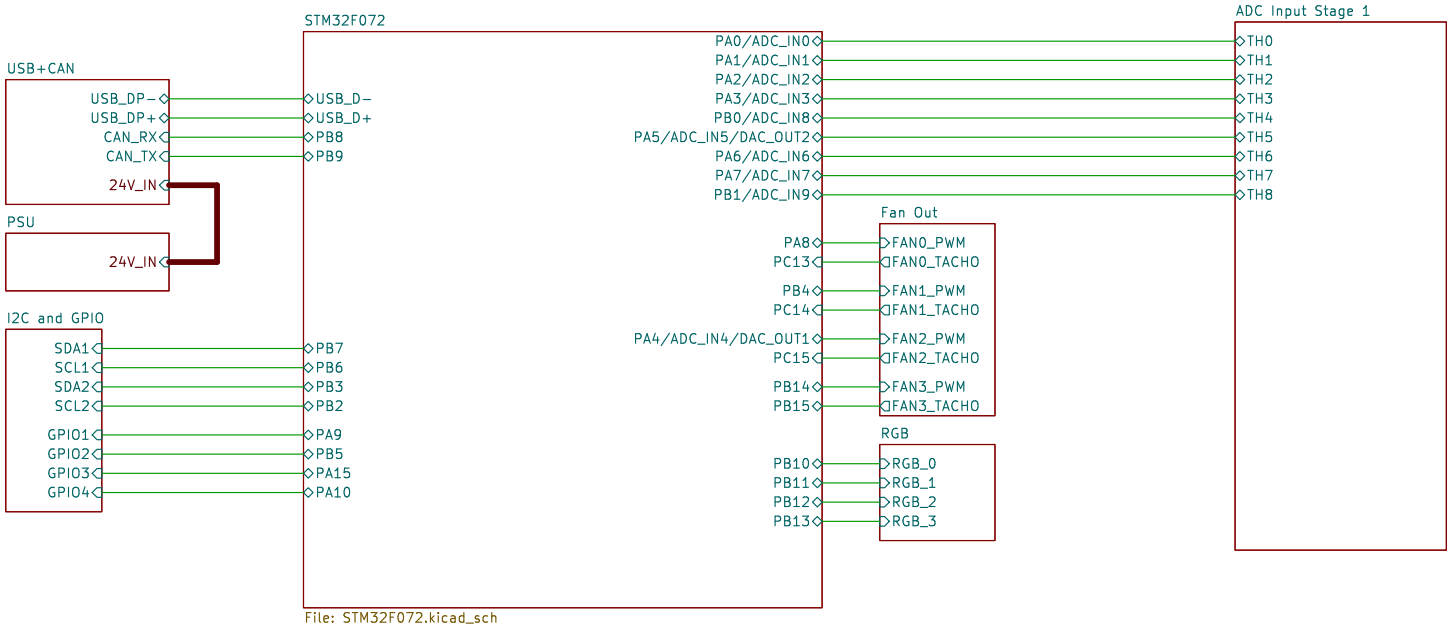
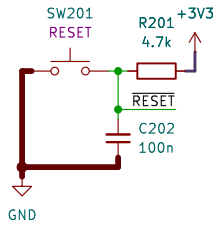
DragonDinghy

System Overview

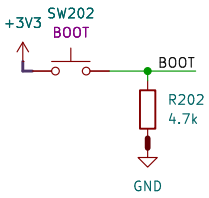


Dragonkitty		
Sheet: /		
File: DragonDinghy.kicad_sch		
Title: Klipper Dinghy		
Size: A4	Date:	**Rev: 1.0**
KiCad E.D.A. 9.0.2		Id: 1/8

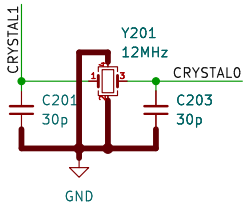
RESET



BOOT

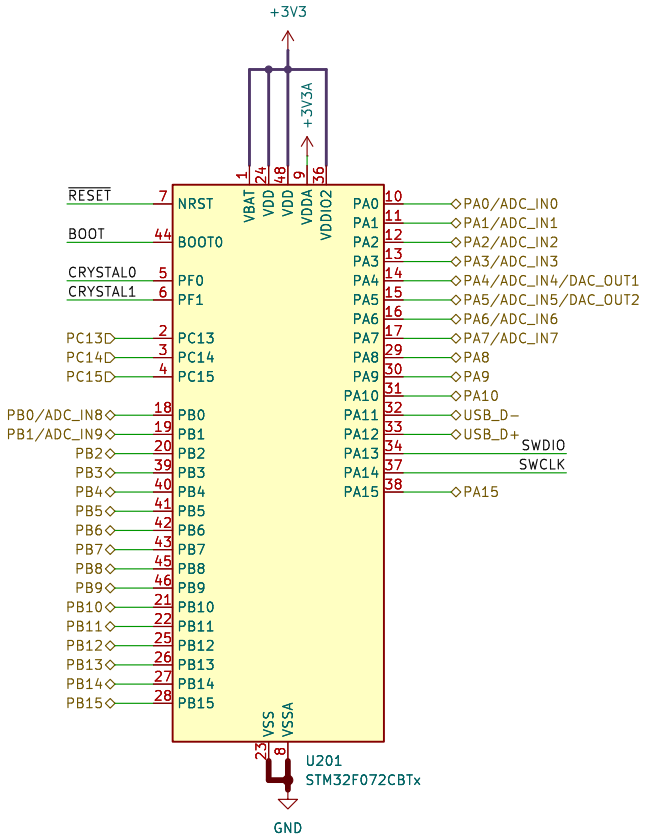


Crystal

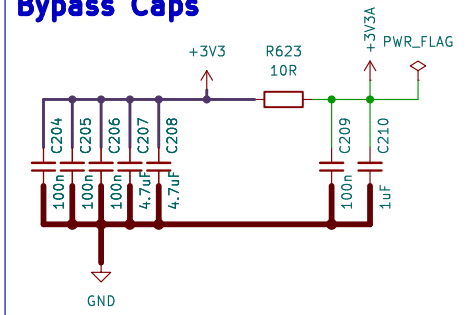


MCU

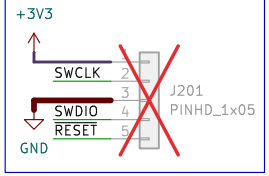
Mothership Control Unit



Bypass Caps

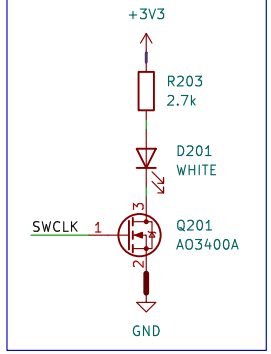


Debug



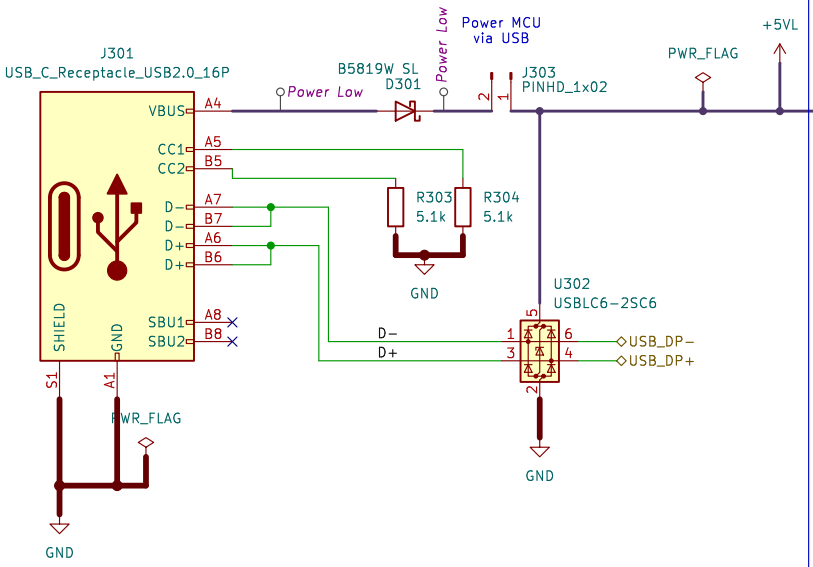
DFU Indicator

can also be used for status



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

USB input

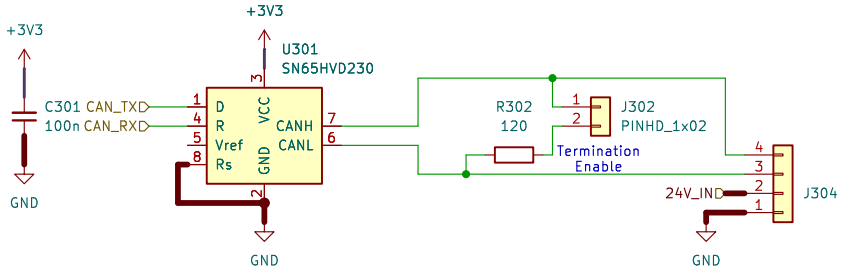


5V protection

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

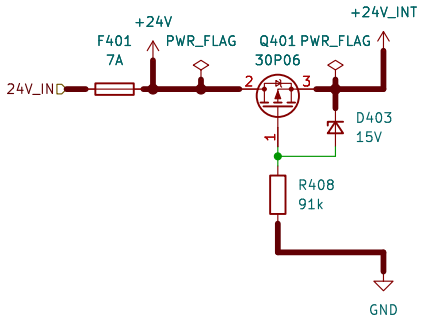
Dragonkitty

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

Title: Klipper Dinghy

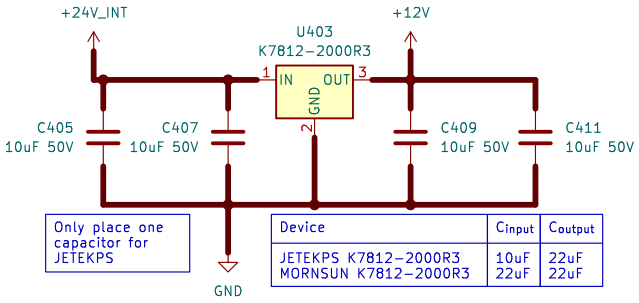
Size: A4	Date:	**Rev: 1.0**
KiCad E.D.A. 9.0.2		Id: 3/8

24V Input Rev. Polarity Protection



12V PSU

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

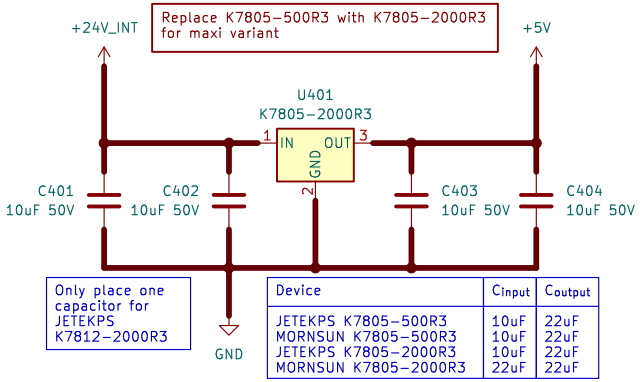


Only place one capacitor for JETEKPS

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

5V PSU

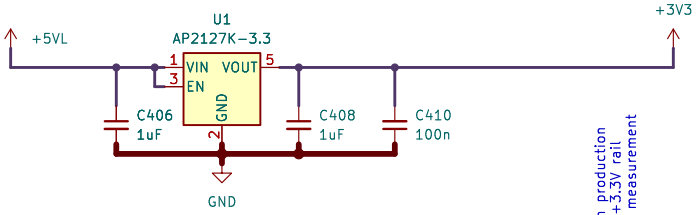
Replace K7805-500R3 with K7805-2000R3 for maxi variant



Only place one capacitor for JETEKPS K7812-2000R3

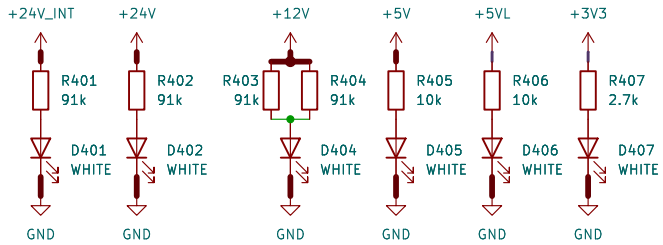
Device	Cinput	Coutput
JETEKPS K7805-500R3	10uF	22uF
MORNSUN K7805-500R3	10uF	22uF
JETEKPS K7805-2000R3	10uF	22uF
MORNSUN K7805-2000R3	22uF	22uF

3.3V PSU



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

PSU Rail Status



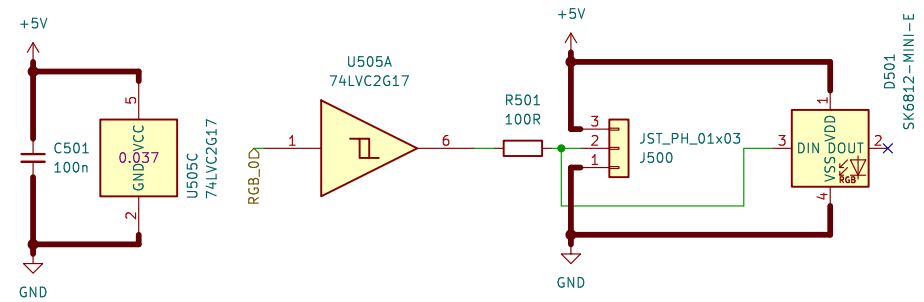
Dragonkitty

Sheet: /PSU/
File: PSU.kicad_sch

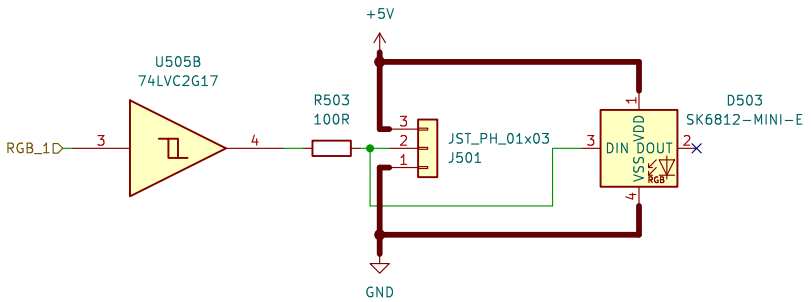
Title: Klipper Dinghy

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

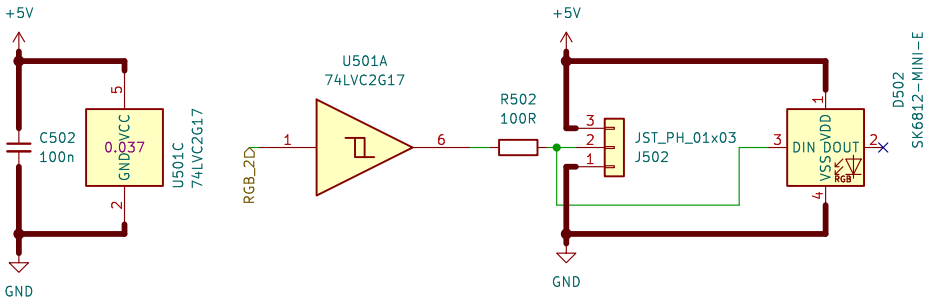
RGB Port 0



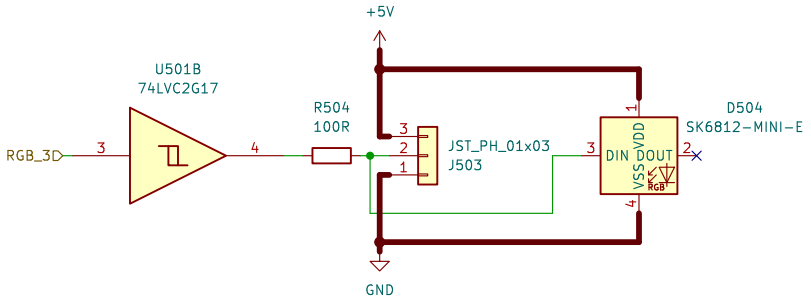
RGB Port 1



RGB Port 2



RGB Port 3



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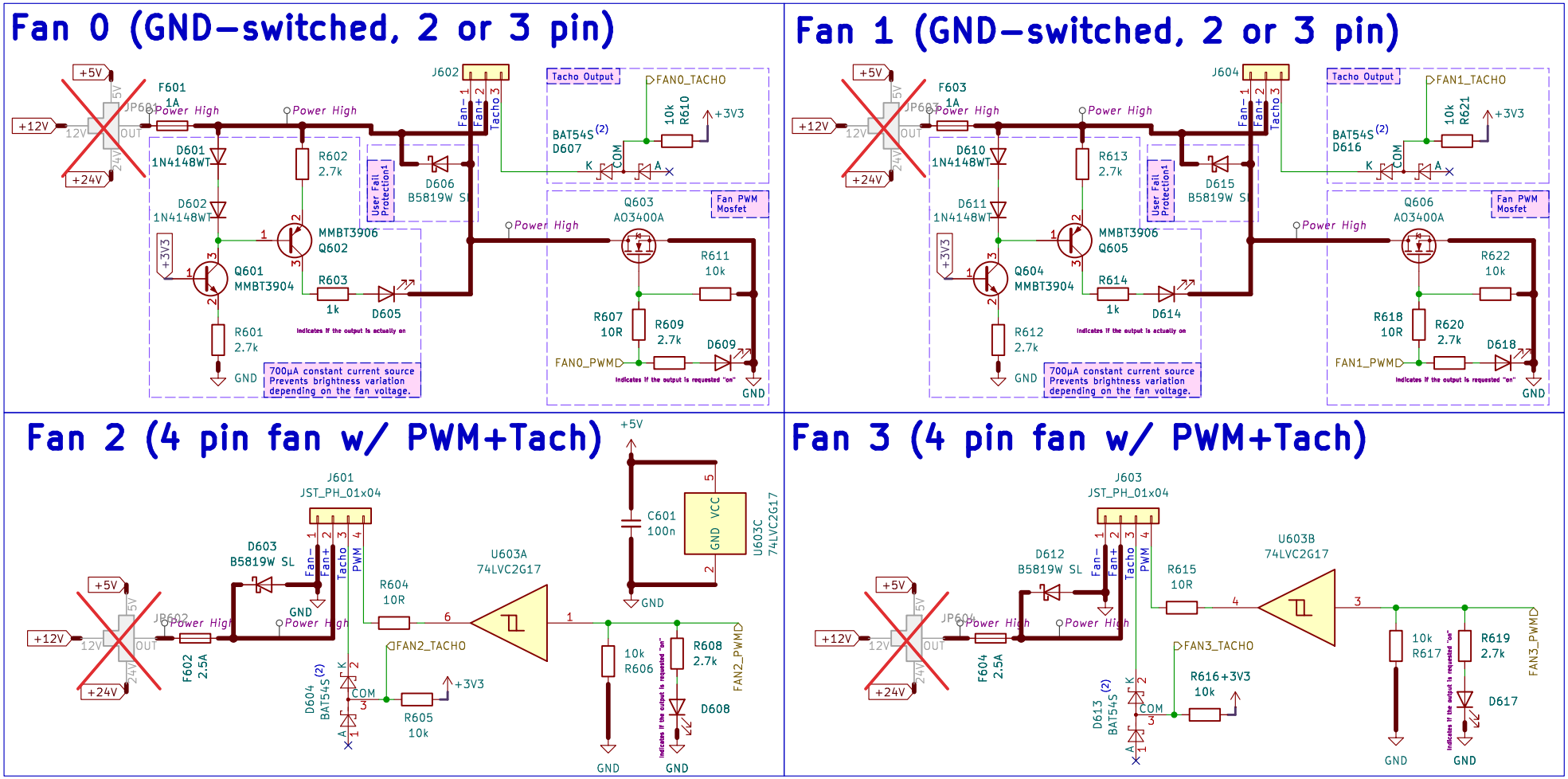
File: Neopixel.kicad_sch		
Title: Klipper Dinghy		
Size: A4	Date:	**Rev: 1.0**
KiCad E.D.A. 9.0.2		Id: 5/8



GND-switched fan ports

- Provides a safe 3-way voltage selector (24V, 12V, 5V)
- Tachometer input as standard
- 1A maximum current
- Fused with 1A to account for inrush current (200% for 5s is enough for inrush)
- 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

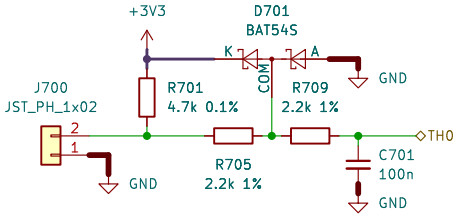
Dragonkitty

Sheet: /Fan Out/
File: fan_out.kicad_sch

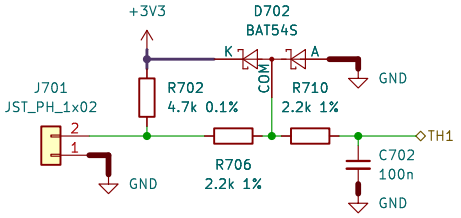
Title: Klipper Dinghy

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

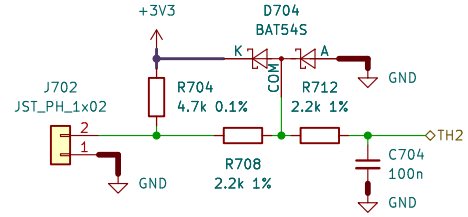
Thermistor TH0



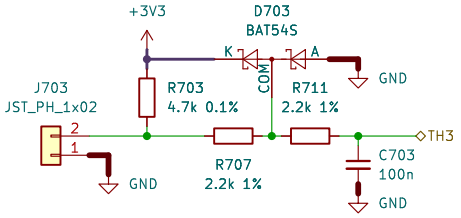
Thermistor TH1



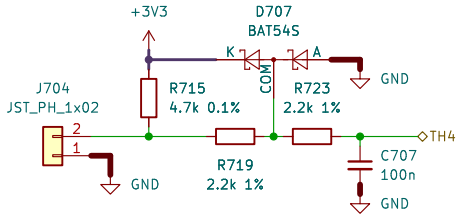
Thermistor TH2



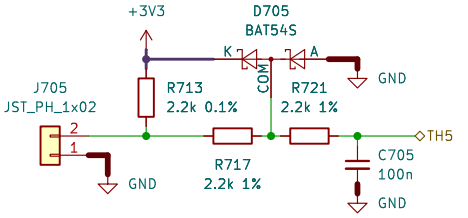
Thermistor TH3



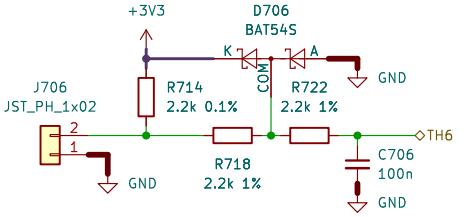
Thermistor TH4



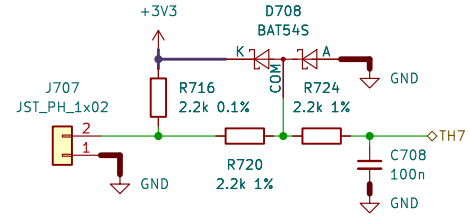
Thermistor TH5



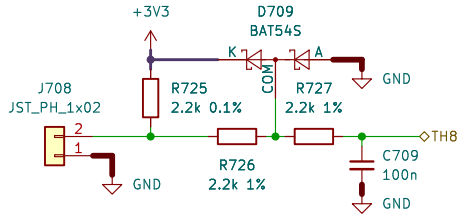
Thermistor TH6



Thermistor TH7



Thermistor TH8



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

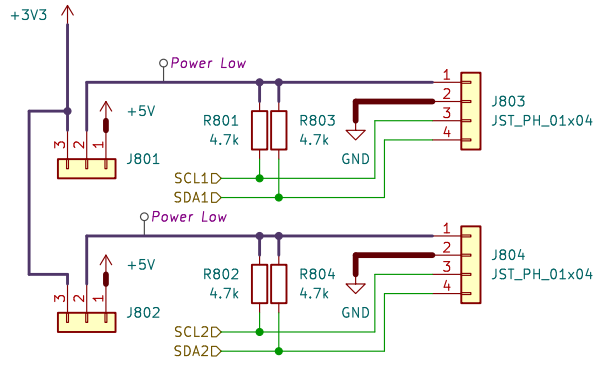
The BAT54S diode in conjunction with the 2 resistors are used for overload protection.

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

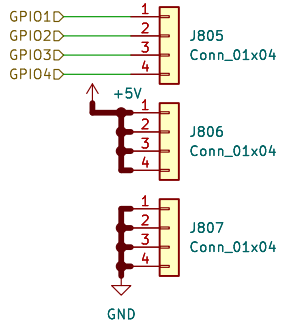
I2C Ports



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