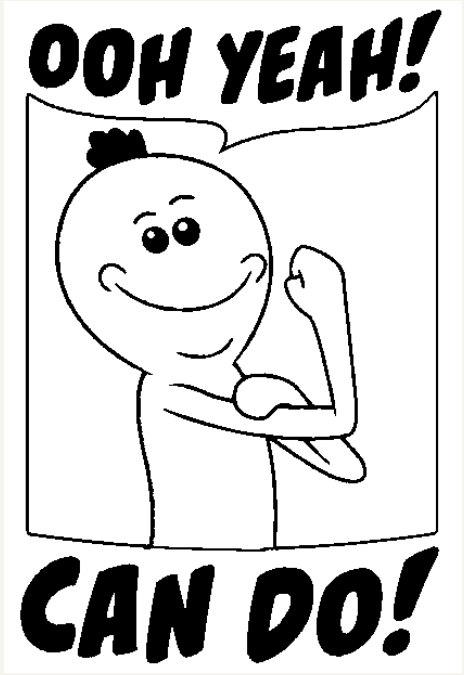


Connectors

File: connectors.kicad_sch

Power Regulation

File: power_regulation.kicad_sch

STM32F103C8T6

File: STM32F103C8T6.kicad_sch

Author: Shirley Lam
Author: Kurtis Dinelle
OSU DAM Robotics

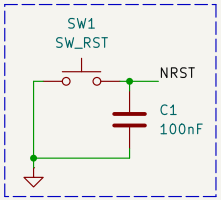
Sheet: /
File: stm32-can-do.kicad_sch

Title: STM32 CAN-Do!

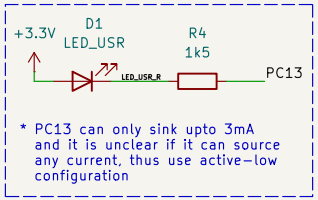
Size: A4	Date: 2024-11-02	**Rev: v0.1**
KiCad E.D.A. 8.0.6		Id: 1/4

STM32 Microcontroller & Supporting Circuitry

Reset Button

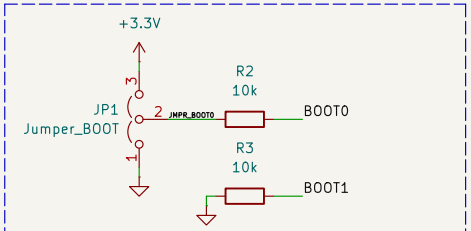


User LED



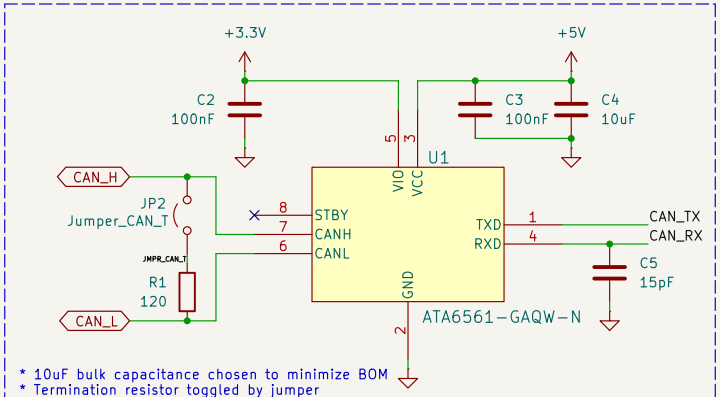
* PC13 can only sink upto 3mA and it is unclear if it can source any current, thus use active-low configuration

Boot Mode Select



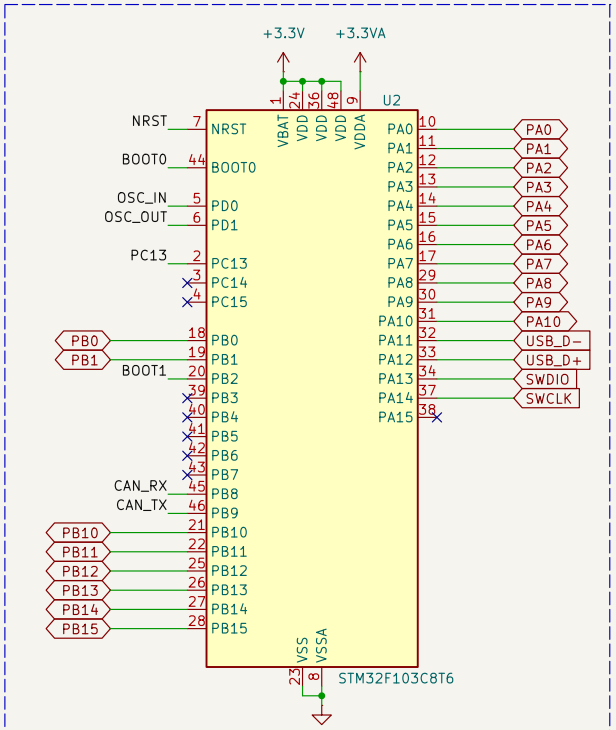
* BOOT1 pulled low permanently, giving two boot modes:
  BOOT0=0: Main (Flash) Memory
  BOOT0=1: System (Bootloader) Memory

CAN Transceiver

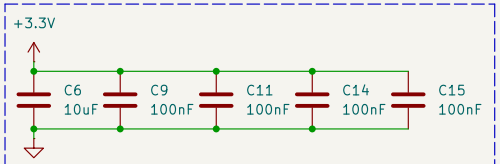


* 10uF bulk capacitance chosen to minimize BOM
* Termination resistor toggled by jumper
* Standard (vs split w/ cap) termination chosen for simplicity
* STBY pulled-up internally thus left floating as standby not used

Microcontroller IC

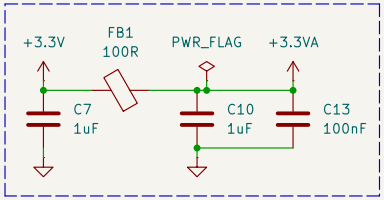


Power Supply

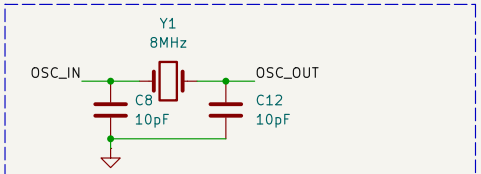


* 1x 100nF cap per VDD/VBAT pin (placed as close to pin as possible)
* Single 10uF bulk decoupling cap placed near IC

Analog Power Supply



HSE Crystal



* The calculation for these external load capacitors is supposed to follow a rough formula of:

  C_ext1 = C_ext2 = 2(C_load − C_stray)

  Where C_load is model dependent (found in datasheet) and C_stray depends on several factors which are really hard to calculate...

  A typical rule of thumb is to assume 3-5pF for C_stray, and using a crystal with 8pF C_load, that gives us roughly 6-10pF for C_ext. This crystal is used with Nucleo boards which uses 10pF C_ext, so go with that.

Author: Kurtis Dinelle
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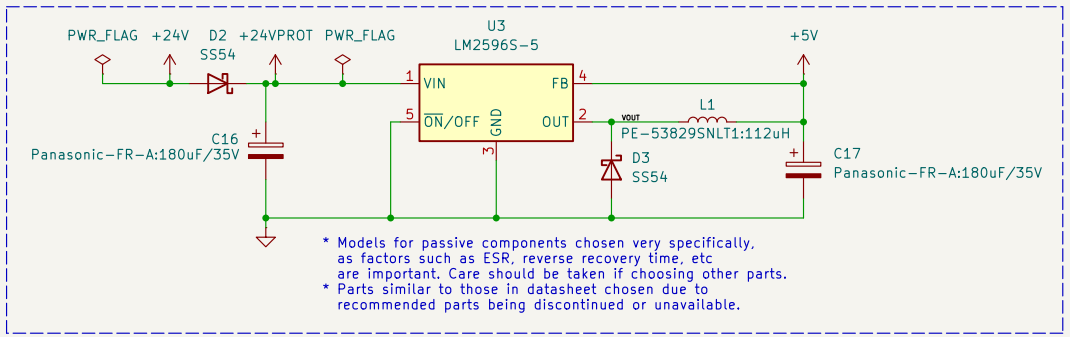
Sheet: /STM32F103C8T6/
File: STM32F103C8T6.kicad_sch

Title: STM32 Microcontroller

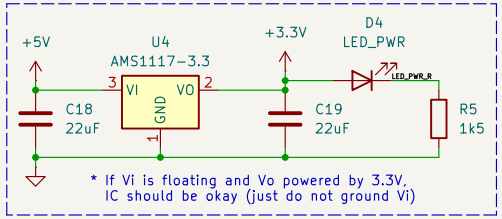
Size: A4	Date: 2024-11-02	**Rev: v0.1**
KiCad E.D.A. 8.0.6		Id: 2/4

Power Regulation

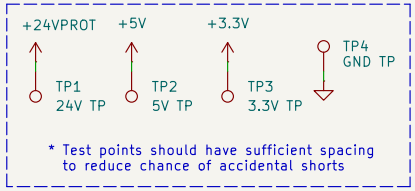
24V to 5V Buck Converter



5V to 3.3V LDO Regulator



Test Points



Author: Shirley Lam
Author: Kurtis Dinelle
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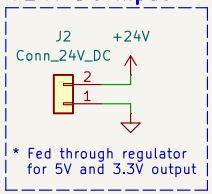
Sheet: /Power Regulation/
File: power_regulation.kicad_sch

Title: Power Regulation

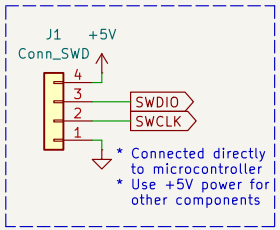
Size: A4	Date: 2024-11-03	**Rev: v0.1**
KiCad E.D.A. 8.0.6		Id: 3/4

Connectors & Header Pins

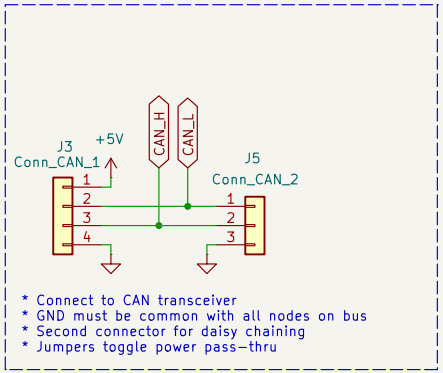
+24V DC Input



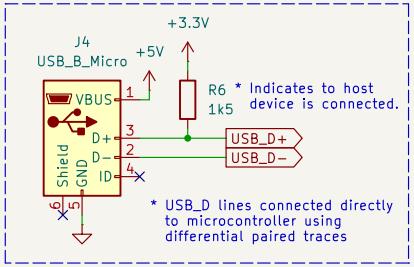
SWD



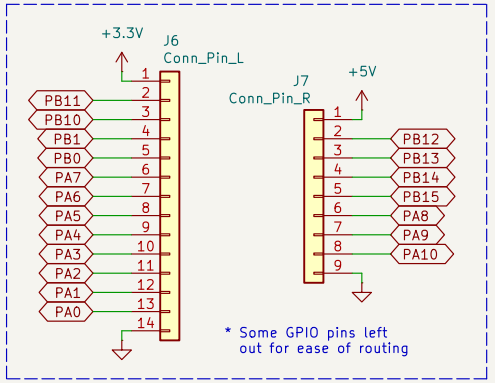
CAN Bus



USB Micro



Pin Breakout



Author: Kurtis DInelle
OSU DAM Robotics

Sheet: /Connectors/
File: connectors.kicad_sch

Title: Connectors & Header Pins

Size: A4	Date: 2024-11-03	**Rev:**
KiCad E.D.A. 8.0.6		Id: 4/4