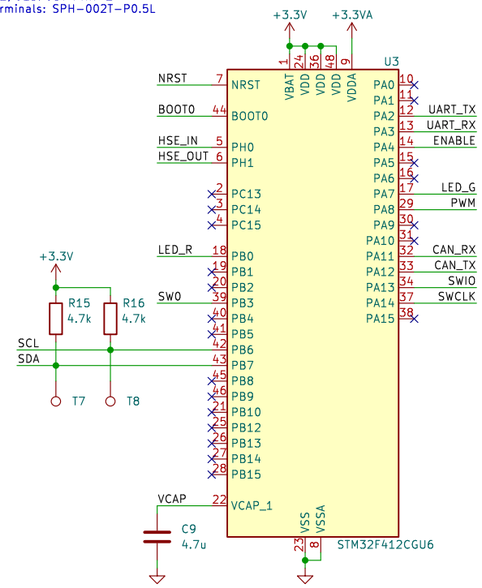
Revisions			
Rev.	Issue No.	Description	Date
A	14	Release for prototype	2/7/2024
B	17	Added connector for HC-05. Removed regen diode. Updated SWD connector. Added status LED's.	3/11/2024

Microcontroller

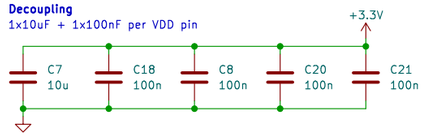
Mating Connectors

J12, J13: JST PHR-2
Terminals: SPH-002T-P0.5L

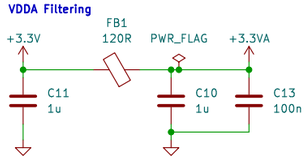


Decoupling

1x10uF + 1x100nF per VDD pin

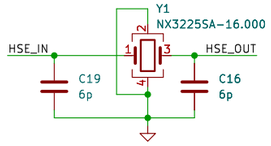


VDDA Filtering

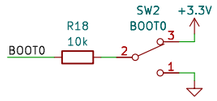


Crystal Oscillator

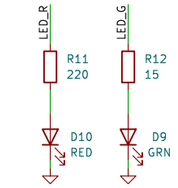
CL = 2*(CLO-Cs) = 2*(8-5)pF = 6pF



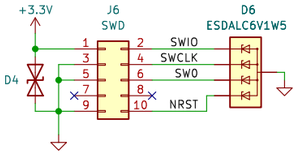
BOOT0 Switch



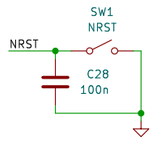
B Status LED's



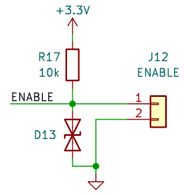
B SWD



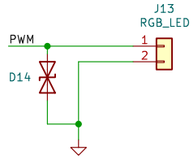
NRST Switch



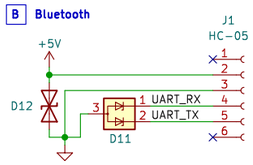
Enable Switch



LED Signal



B Bluetooth



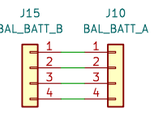
Power Supply

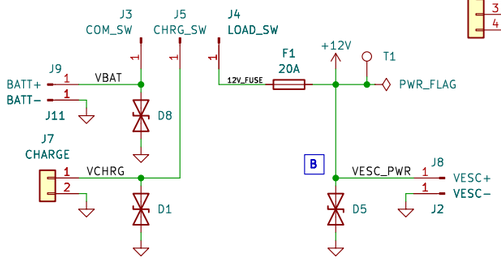
Mating Connectors

J7: XT60-M

J3-J5 act as e-stop/charge mode select
Connect to external SPDT switch (VBAT = COM)

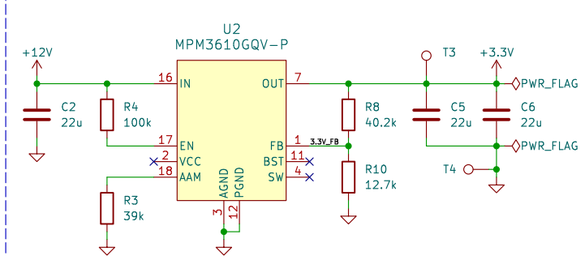
Battery Balance Pass-Thru





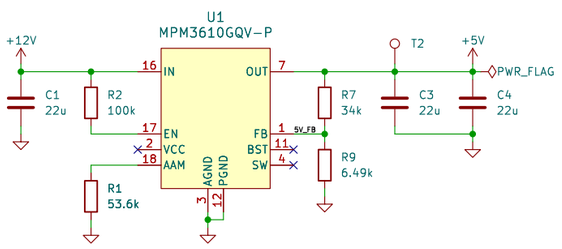
3.3V Regulator

1.2A max current output
Components draw <200mA
3.3V * 0.2A = 0.66W max
Eff. = 70% est.
P = 0.66 / 0.70 = 0.94W Total
Ploss = 0.28W
Tr = 46 C/W
T = 0.28 * 46 = 12.9C rise

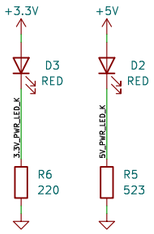


5V Regulator

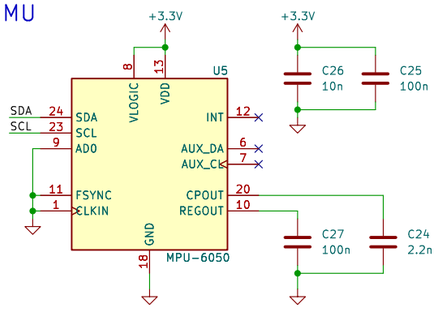
1.2A max current output
Components draw <150mA
5V * 0.15A = 0.75W max
Eff. = 70% est.
P = 0.75 / 0.70 = 1.07W Total
Ploss = 0.32W
Tr = 46 C/W
T = 0.32 * 46 = 14.7C rise



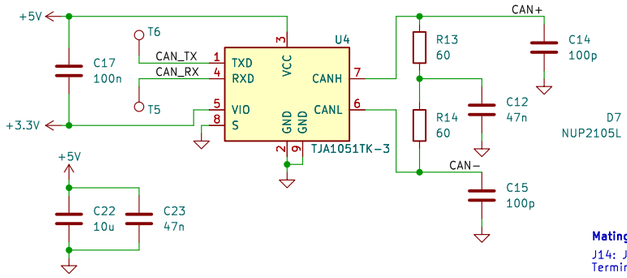
Power-On LED's



IMU



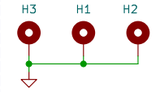
CAN



Mating Connectors:

J14: JST PHR-3
Terminals: SPH-002T-P0.5L

M3 Mounting Holes



Engineer: A.Loehr	
Sheet: /	
File: Balance_Controller.kicad_sch	
Title: Balance Controller	
Size: A3	Date: 2024-03-08 **Rev: B**
KiCad E.D.A. 8.0.1-rc2	Id: 1/1