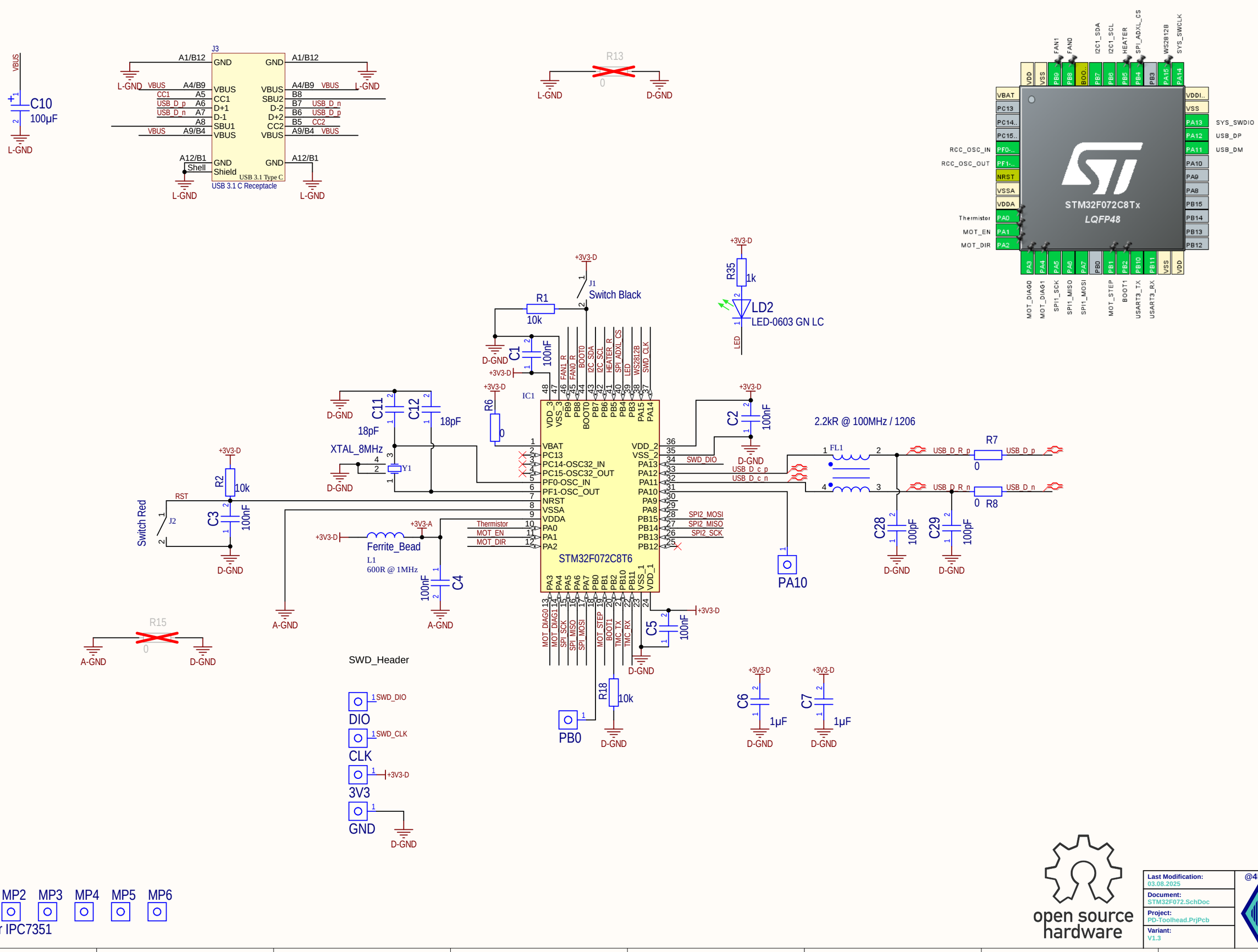

C10
100µF
L-GND
J3
USB 3.1 C Receptacle
USB 3.1 Type C
R13
0
D-GND
STM32F072C8Tx
LQFP48
R35
1k
LD2
LED-0603 GN LC
J1
Switch Black
R1
10k
C1
100nF
C11
C12
18pF
XTAL_8MHz
Y1
R2
10k
C3
100nF
J2
Switch Red
RST
R6
0
IC1
STM32F072C8T6
C2
100nF
2.2kR @ 100MHz / 1206
FL1
R7
0
R8
C28
100pF
C29
100pF
PA10
Ferrite_Bead
L1
600R @ 1MHz
C4
100nF
C5
100nF
R15
0
A-GND
SWD_Header
DIO
CLK
3V3
GND
R18
10k
PB0
C6
1µF
C7
1µF
MP1
MP2
MP3
MP4
MP5
MP6
Marker IPC7351
open source hardware
Last Modification: 03.08.2025
Document: STM32F072.SchDoc
Project: PD-Toolhead.PrjPcb
Variant: V1.3
@4R3Ngineering

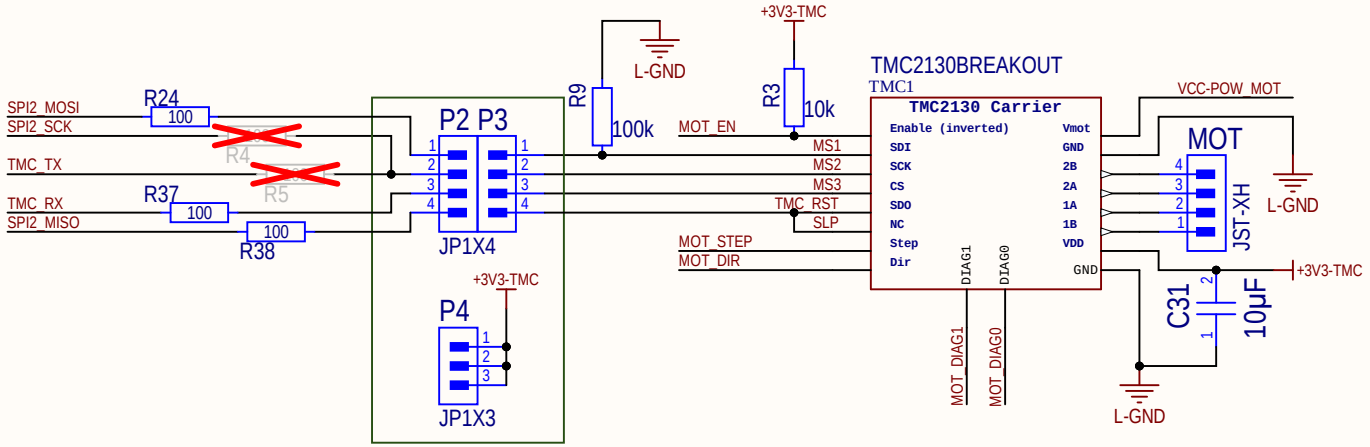
Normally RX signal is routed to the CS/MS3 pin if TMC2208/TMC2209 are used

However there are some TMC2208/TMC2209 out which require RX signal to be routed to SCK/MS2 pin

With R4 & R5, signals can be rerouted to fit the needs for your stepper driver.

Remove R4 to disconnect SPI-SCK and populate R5 to use PB10 as software UART "RX"-Pin

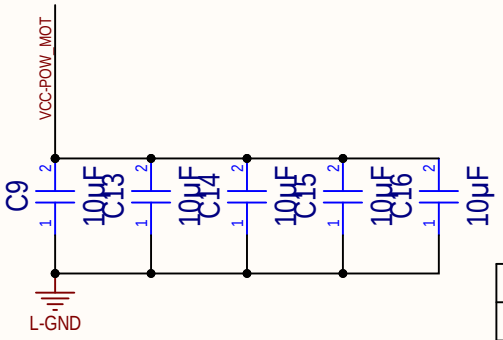
VCC-POW_MOT VBUS



For SPI TMC Drivers: connect all 4 Pins from P2 to P3

For UART TMC Drivers: Connect P2.3 to P3.3 (or P2.2 to P3.2 is you are using "odd" drivers, see note above!)

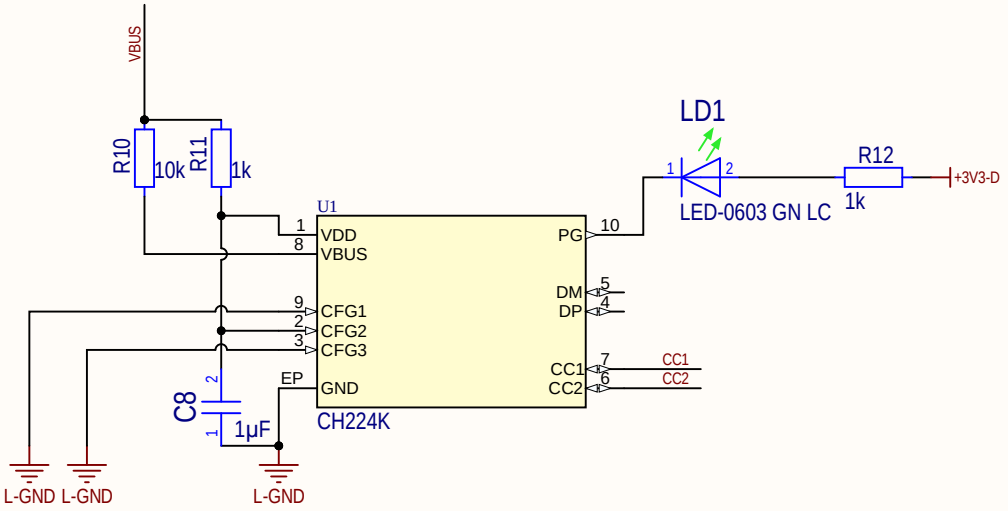
For "dumb" Drivers: Use P3.1 - P3.3 with P4.1 to P4.3 to set MS1/MS2/MS3 pins



open source hardware

Last Modification:	03.08.2025
Document:	Stepper_Driver.SchDoc
Project:	PD-Toolhead.PrjPcb
Variant:	V1.3

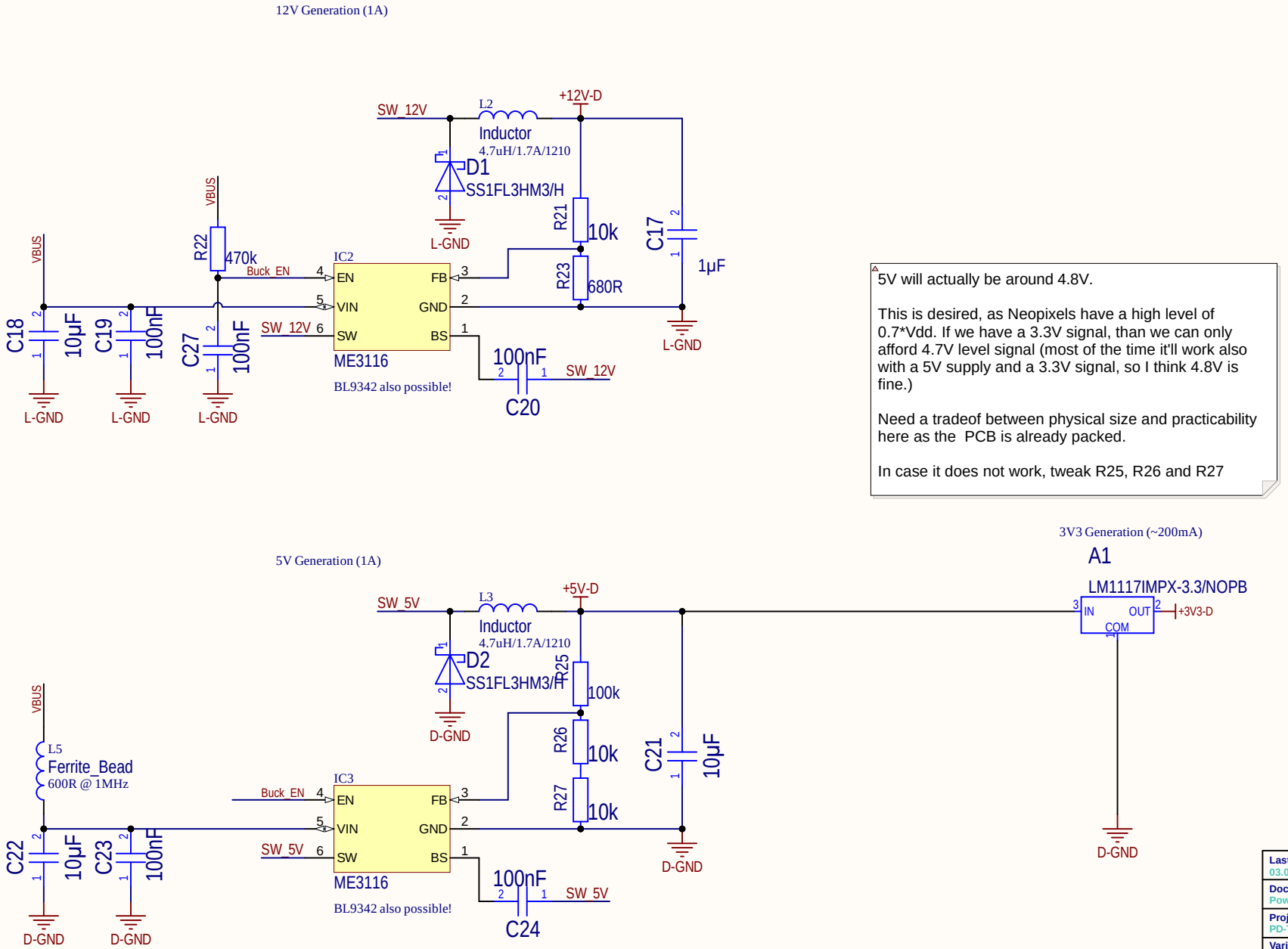
@4R3Ngineering

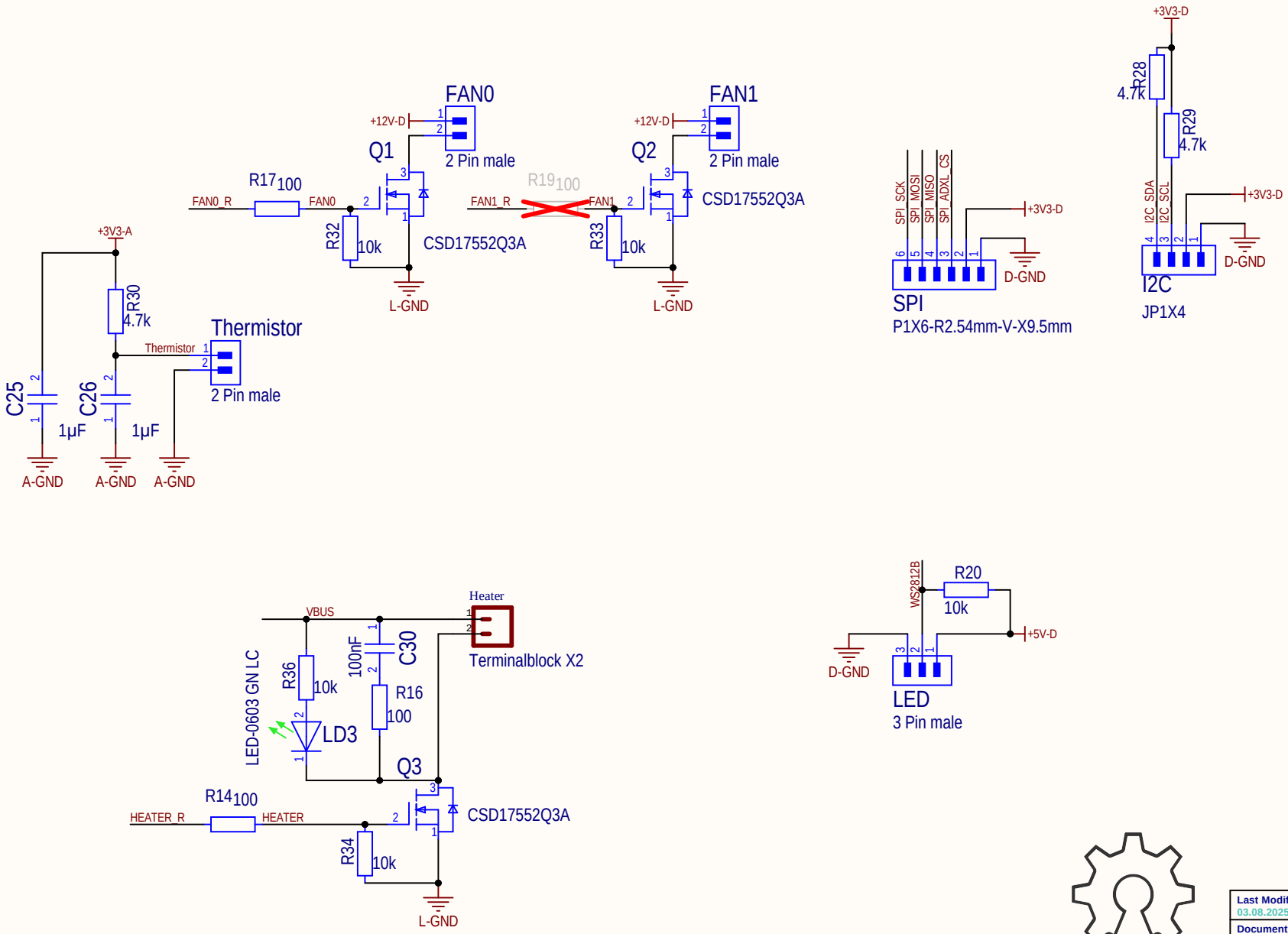


open source hardware

Last Modification:	03.08.2025
Document:	PD-Sink.SchDoc
Project:	PD-Toolhead.PrjPcb
Variant:	V1.3

@4R3Ngineering


12V Generation (1A)
SW_12V
L2
Inductor
4.7uH/1.7A/1210
+12V-D
D1
SS1FL3HM3/H
L-GND
R21
10k
R23
680R
C17
1µF
VBUS
R22
470k
Buck_EN
IC2
EN
VIN
SW
FB
GND
BS
ME3116
BL9342 also possible!
C18
10µF
C19
100nF
C27
100nF
100nF
C20
SW_12V
5V will actually be around 4.8V.
This is desired, as Neopixels have a high level of 0.7*Vdd. If we have a 3.3V signal, than we can only afford 4.7V level signal (most of the time it'll work also with a 5V supply and a 3.3V signal, so I think 4.8V is fine.)
Need a tradeof between physical size and practicability here as the PCB is already packed.
In case it does not work, tweak R25, R26 and R27
3V3 Generation (~200mA)
A1
LM1117IMPX-3.3/NOPB
IN
OUT
COM
+3V3-D
5V Generation (1A)
SW_5V
L3
Inductor
4.7uH/1.7A/1210
+5V-D
D2
SS1FL3HM3/H
D-GND
R25
100k
R26
10k
R27
10k
C21
10µF
L5
Ferrite_Bead
600R @ 1MHz
IC3
ME3116
BL9342 also possible!
C22
10µF
C23
100nF
C24
SW_5V
open source hardware
Last Modification: 03.08.2025
Document: Power.SchDoc
Project: PD-Toolhead.PrjPcb
Variant: V1.3
@4R3Ngineering



open source hardware

Last Modification:	03.08.2025
Document:	MISC_Connectors.SchDoc
Project:	PD-Toolhead.PrjPcb
Variant:	V1.3

@4R3Ngineering