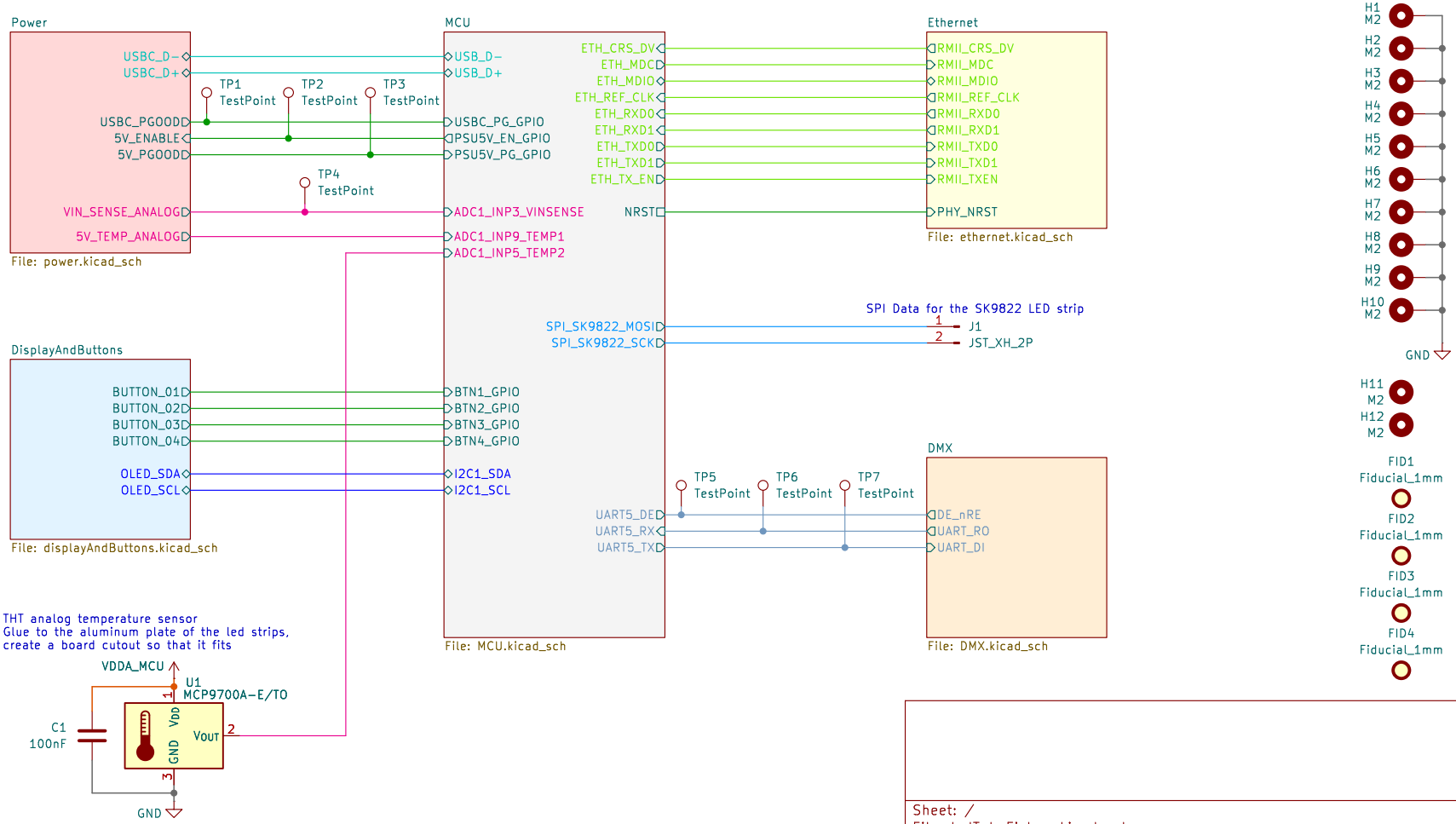
LED TUBE

Introduction
This is the schematic for the mainboard of the Led Tube project. It features the STM32H723Vxx MCU, an ethernet transciever, an isolated RS485 transciever for DMX, and a few connectors for the SPI LED strip, display, buttons, and a temperature sensors. It gets 20–24V power form a barrel or USB-C connector. There are two buck converters on board. 3.3V for the board and 5V for the LED strip.

Table of contents

BOM items that are excluded from JLCPCB assembly
2x MCP9700A-E/TO temperature sensor
1x HS96L03W2C03 0.96in I2C OLED display board
1x NE8FAH Neutrik EtherCON connector
2x JST XH 3pin connector
1x JST XH 2pin connector
3x DB301V-3.5-2P-GN-S screw terminal
1x DC-005-A200 barrel connector



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File: ledTubeFixture.kicad_sch

Title: Led Tube MCU Board

Size: A4	Date: 2025-11-01	**Rev: A**
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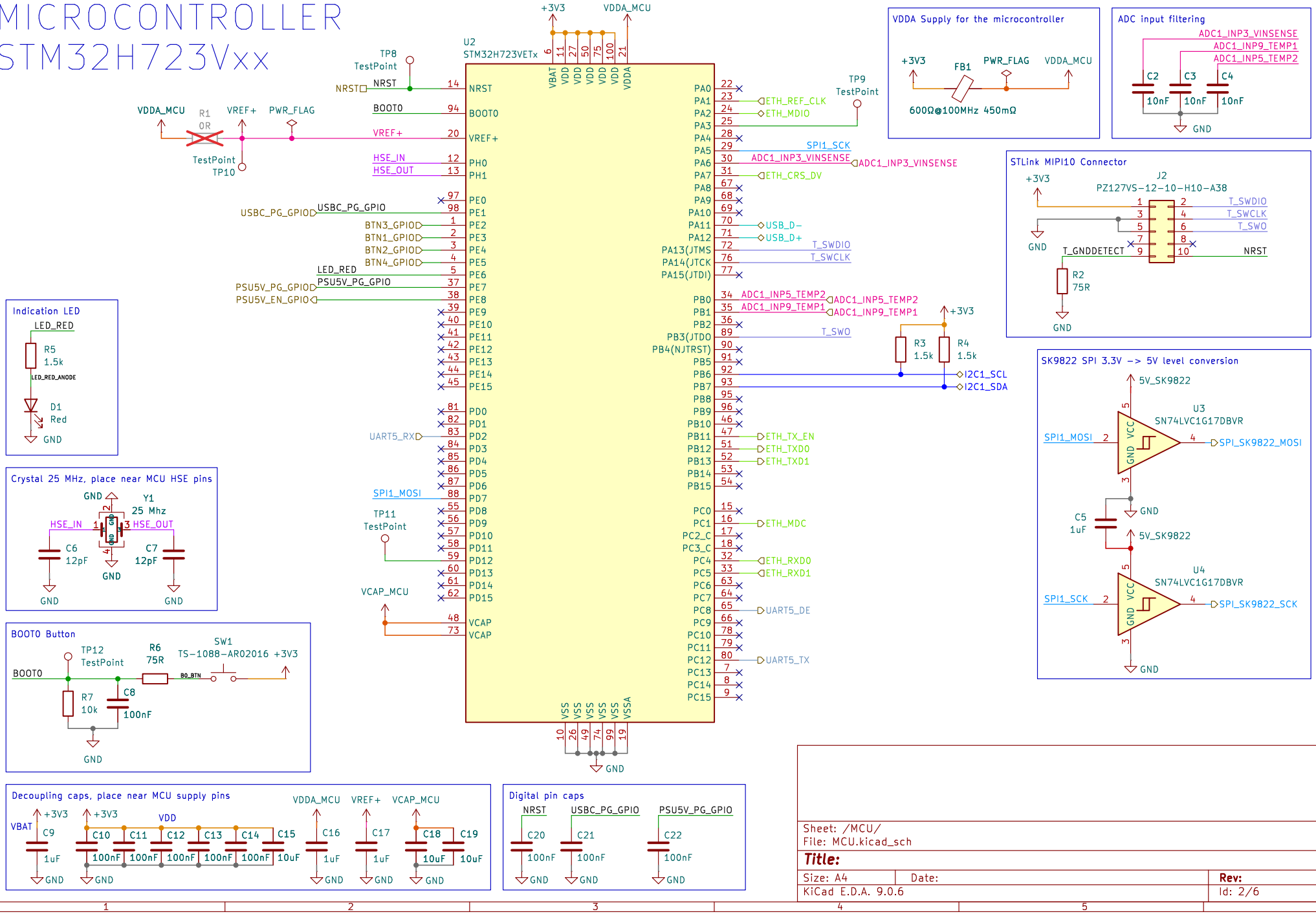
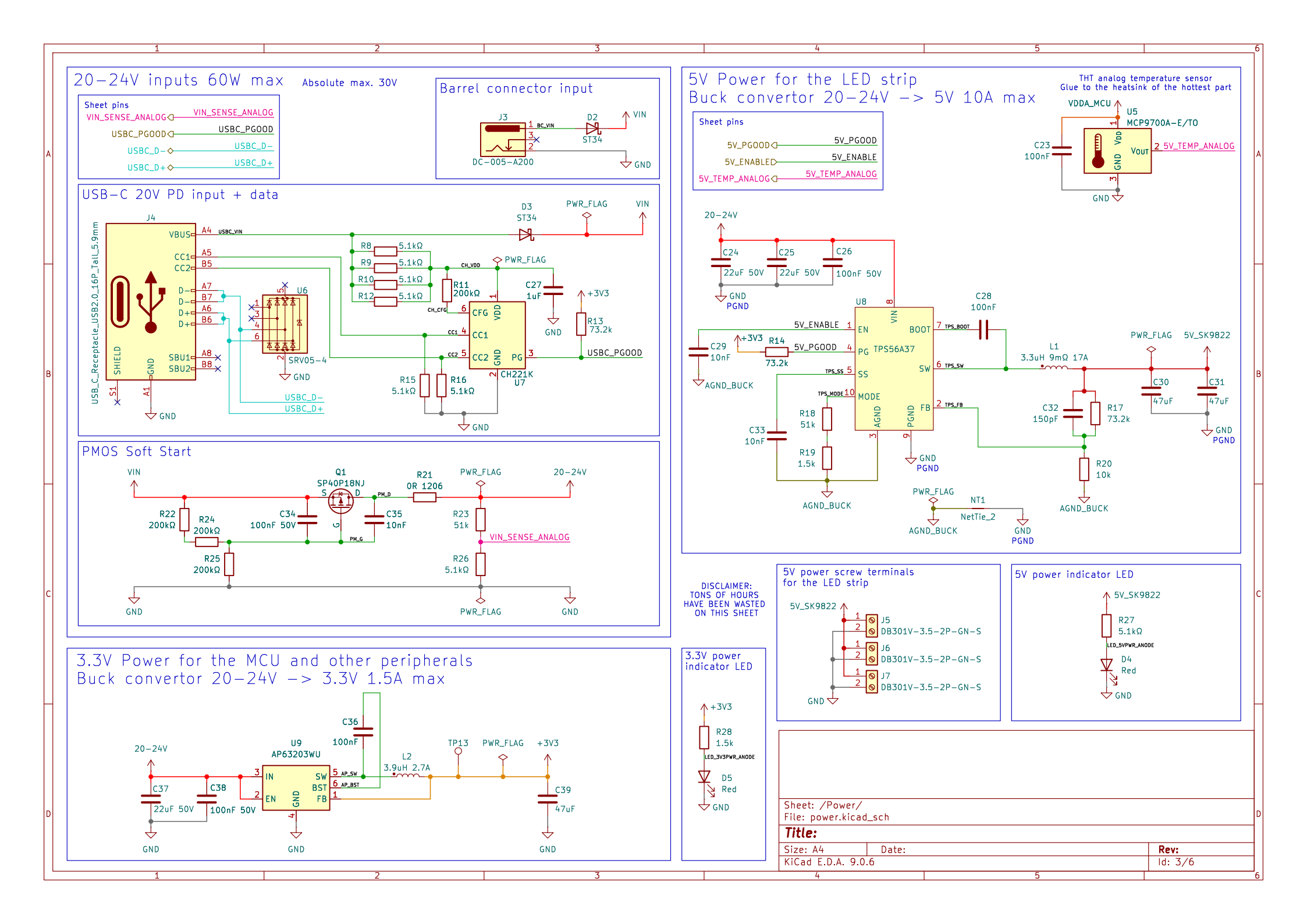
MICROCONTROLLER
STM32H723Vxx




20–24V inputs 60W max
Absolute max. 30V
Sheet pins
VIN_SENSE_ANALOG
USBC_PGOOD
USBC_D–
USBC_D+
Barrel connector input
J3
DC–005–A200
D2
ST34
VIN
GND
USB–C 20V PD input + data
J4
USB_C_Receptacle_USB2.0_16P_Tall_5.9mm
VBUS
CC1
CC2
D–
D+
SBU1
SBU2
SHIELD
GND
U6
SRV05–4
D3
ST34
PWR_FLAG
R8
R9
R10
R12
5.1kΩ
R11
200kΩ
C27
1uF
+3V3
R13
73.2k
U7
CH221K
CFG
CC1
CC2
VDD
PG
R15
R16
5.1kΩ
USBC_PGOOD
USBC_D–
USBC_D+
PMOS Soft Start
Q1
SP40P18NJ
R21
0R 1206
R22
200kΩ
R24
200kΩ
R25
200kΩ
C34
100nF 50V
C35
10nF
R23
51k
R26
5.1kΩ
VIN_SENSE_ANALOG
20–24V
5V Power for the LED strip
Buck convertor 20–24V –> 5V 10A max
Sheet pins
5V_PGOOD
5V_ENABLE
5V_TEMP_ANALOG
THT analog temperature sensor
Glue to the heatsink of the hottest part
VDDA_MCU
U5
MCP9700A–E/TO
C23
100nF
5V_TEMP_ANALOG
C24
C25
C26
22uF 50V
100nF 50V
U8
TPS56A37
EN
PG
SS
MODE
BOOT
SW
FB
AGND
PGND
VIN
C28
100nF
C29
10nF
R14
73.2k
5V_ENABLE
5V_PGOOD
L1
3.3uH 9mΩ 17A
C30
47uF
C31
47uF
5V_SK9822
C32
150pF
R17
73.2k
R18
51k
R19
1.5k
C33
10nF
R20
10k
AGND_BUCK
NT1
NetTie_2
DISCLAIMER:
TONS OF HOURS
HAVE BEEN WASTED
ON THIS SHEET
5V power screw terminals
for the LED strip
J5
J6
J7
DB301V–3.5–2P–GN–S
5V power indicator LED
R27
5.1kΩ
D4
Red
3.3V Power for the MCU and other peripherals
Buck convertor 20–24V –> 3.3V 1.5A max
U9
AP63203WU
IN
EN
SW
BST
FB
C36
100nF
L2
3.9uH 2.7A
TP13
C37
22uF 50V
C38
100nF 50V
C39
47uF
3.3V power
indicator LED
R28
1.5k
D5
Red
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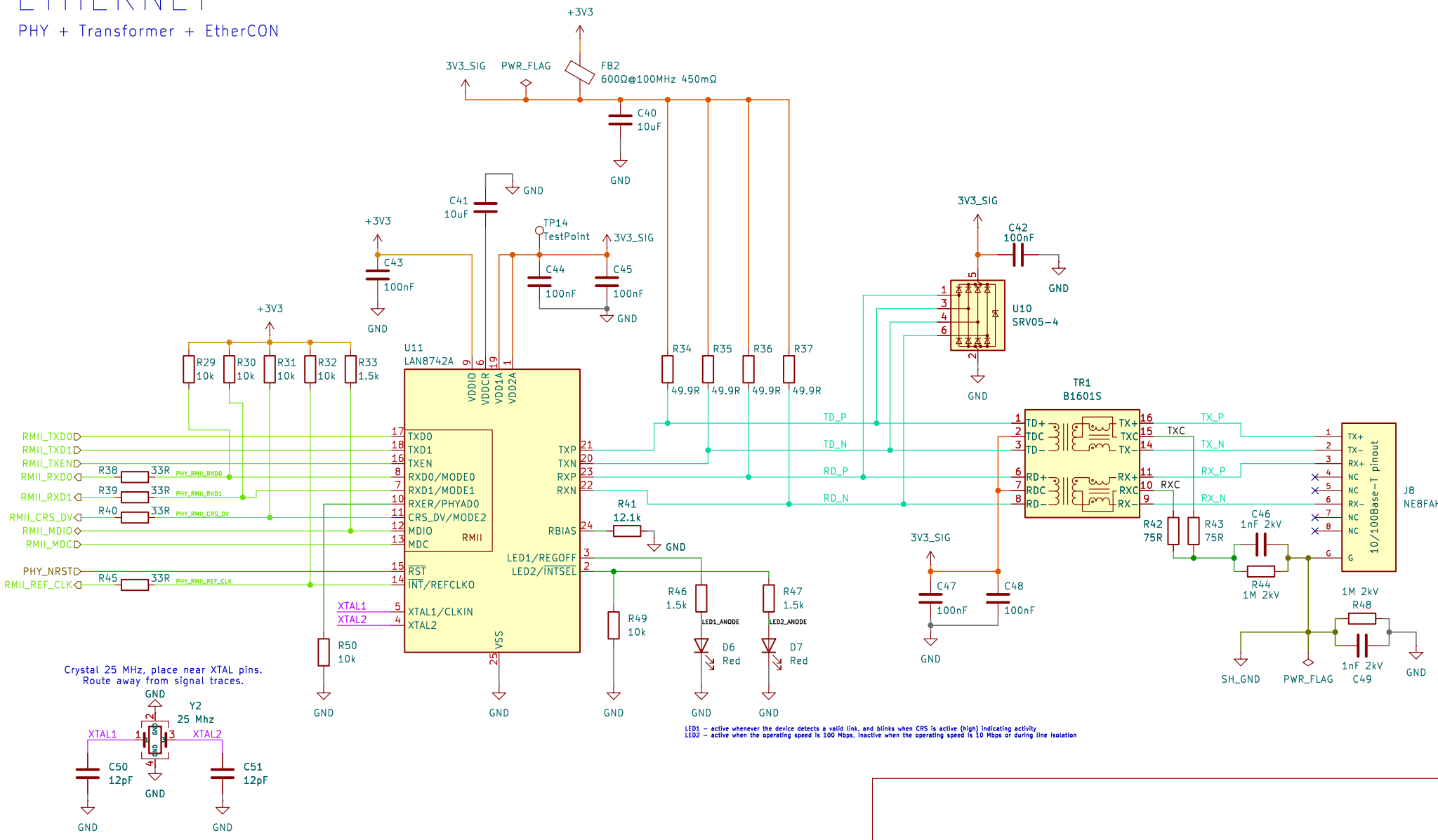
ETHERNET

PHY + Transformer + EtherCON



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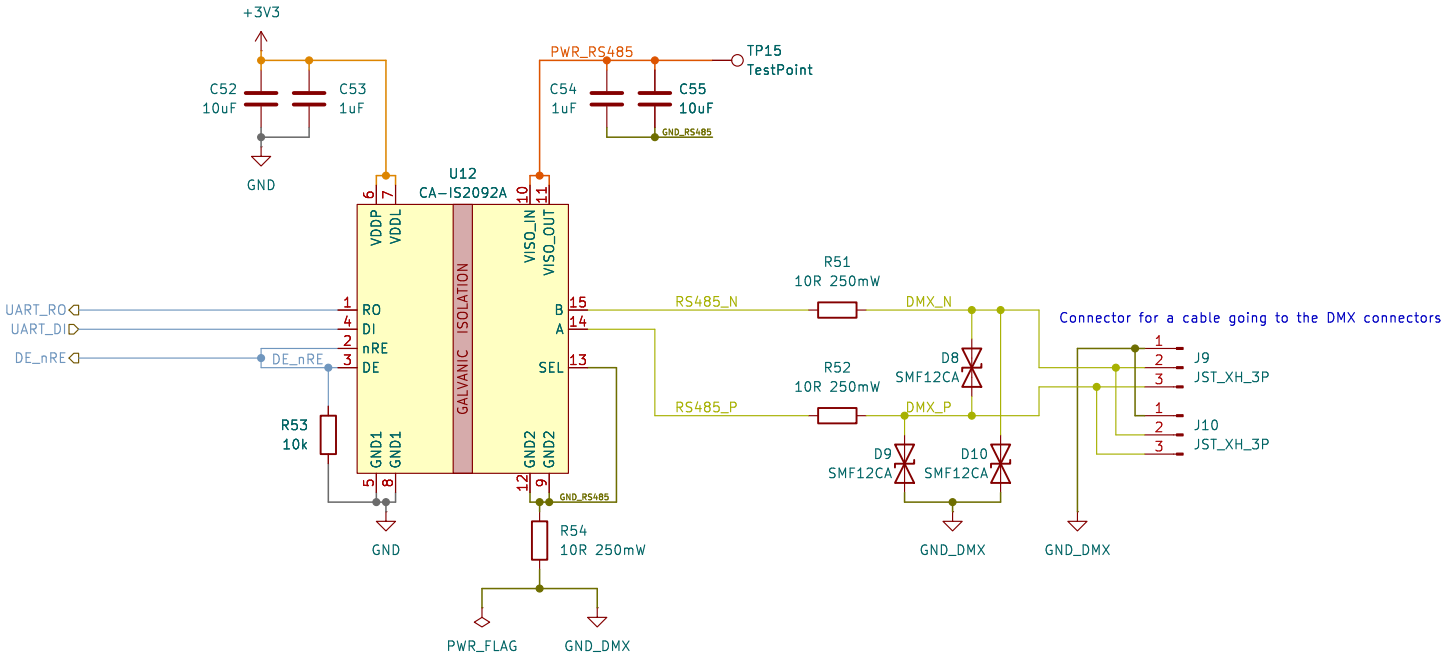
Isolated RS485(DMX) transciever



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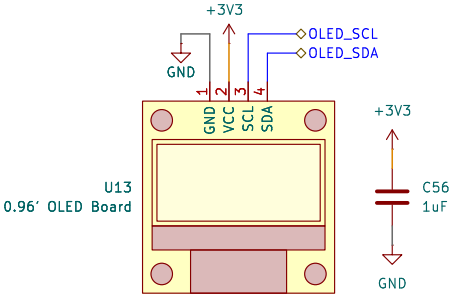
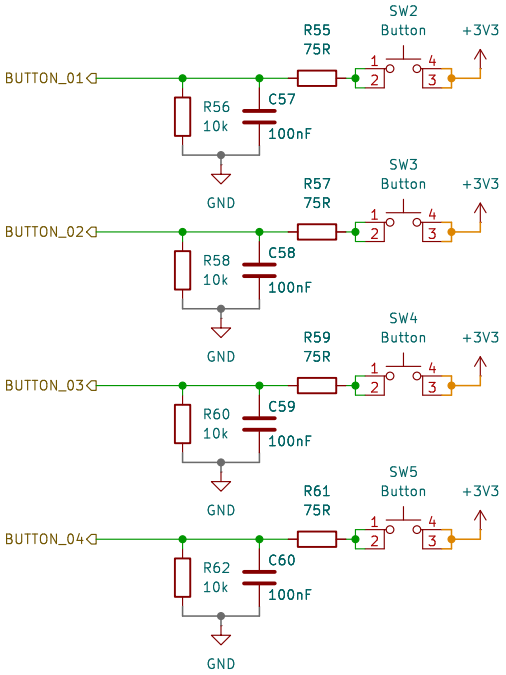
OLED display 0.96in



Control Buttons



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