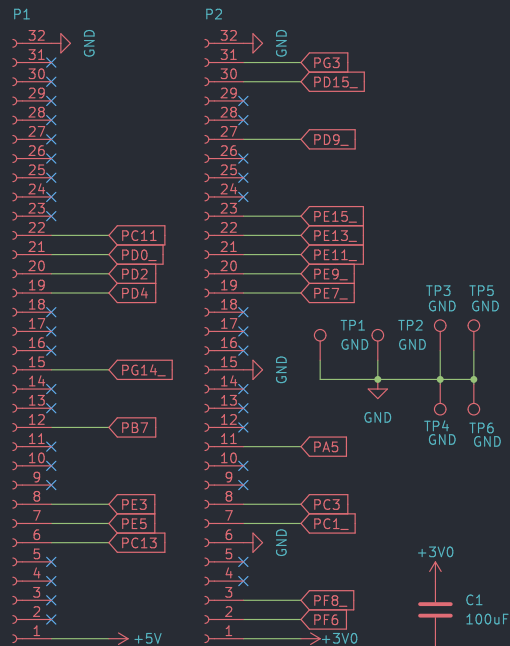


# Cable-Monitor

A Project by A.Horvat and T.Wey  
for PM3 Module ZHAW



GPIOs with names ending by a \_ might be used for board peripherals. Check their availability.

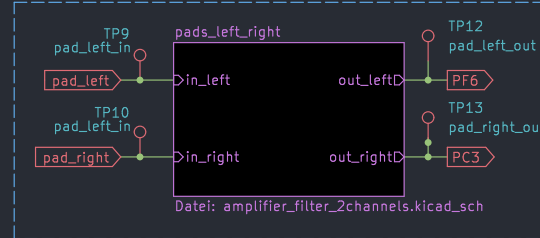
The outline of the extension connectors of the microcontroller board with a list of the available functions and peripherals on each pin is in Microcontroller\_STM32F429/Datasheets/Extension\_Connectors.xlsx

Recommended use of ADC inputs for ET.PM3:

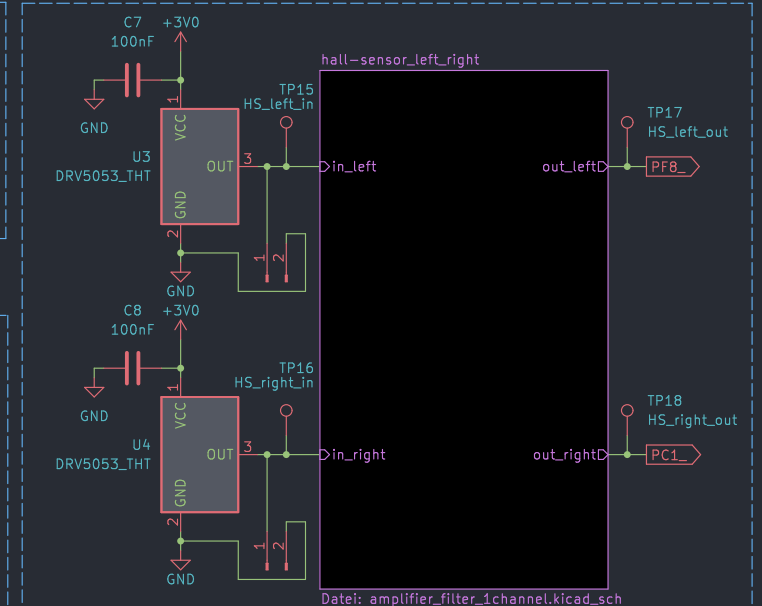
PF6 = ADC3\_IN4 = PAD\_LEFT  
PC3 = ADC123\_IN13 = PAD\_RIGHT  
PF8 = ADC3\_IN6 = COIL\_LEFT  
PC1 = ADC123\_IN11 = COIL\_RIGHT  
PA5 = ADC12\_IN5 (= DAC\_OUT2) if additional PAD or COIL

DAC output controls VCO input for ET.PM4  
PA5 = ADC12\_IN5 = DAC\_OUT2

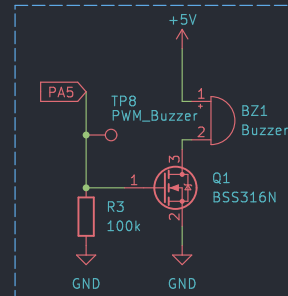
Pads for picking up Electrical Field. Including Filtering and amplifying



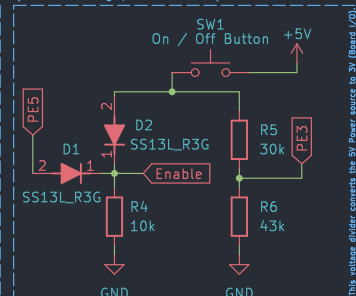
Hall-Sensor to detect Magnetic Fields (and allow us to calculate Current) includes filtering and amplifying



PWM controlled Buzzer



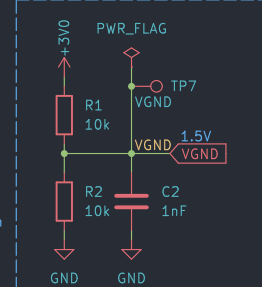
Logic for On/Off Switch (soft latching power circuit)



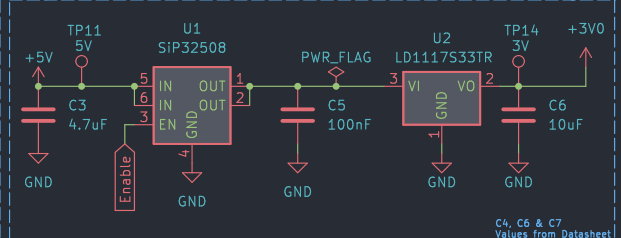
This circuit is a soft latching power circuit. It is used to control the power source to 3V (Board VDD). This circuit is used to read the magnetic field.

Load switch  
Can be used to power on with pushbutton and power off via microcontroller.

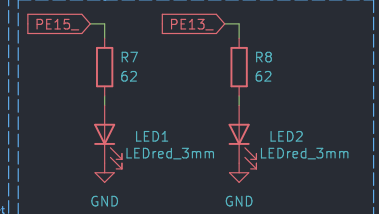
Virtual Ground



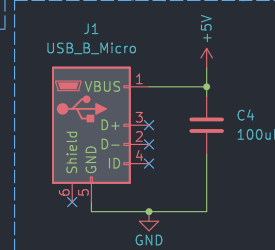
Linear 3.3V low drop regulator



Left and Right LED's to show direction of Fields



Micro USB Connector for 5V external supply (Powerbank)



This is the Hardware Schematic of the Cable Monitor PCB which was designed for ET.PM3  
Created by: horvaale & weytim01  
ZHAW

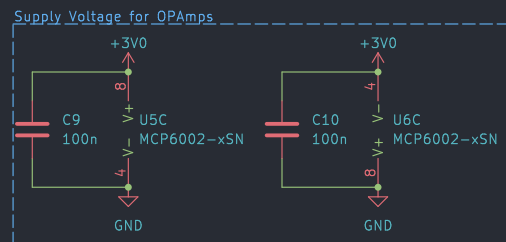
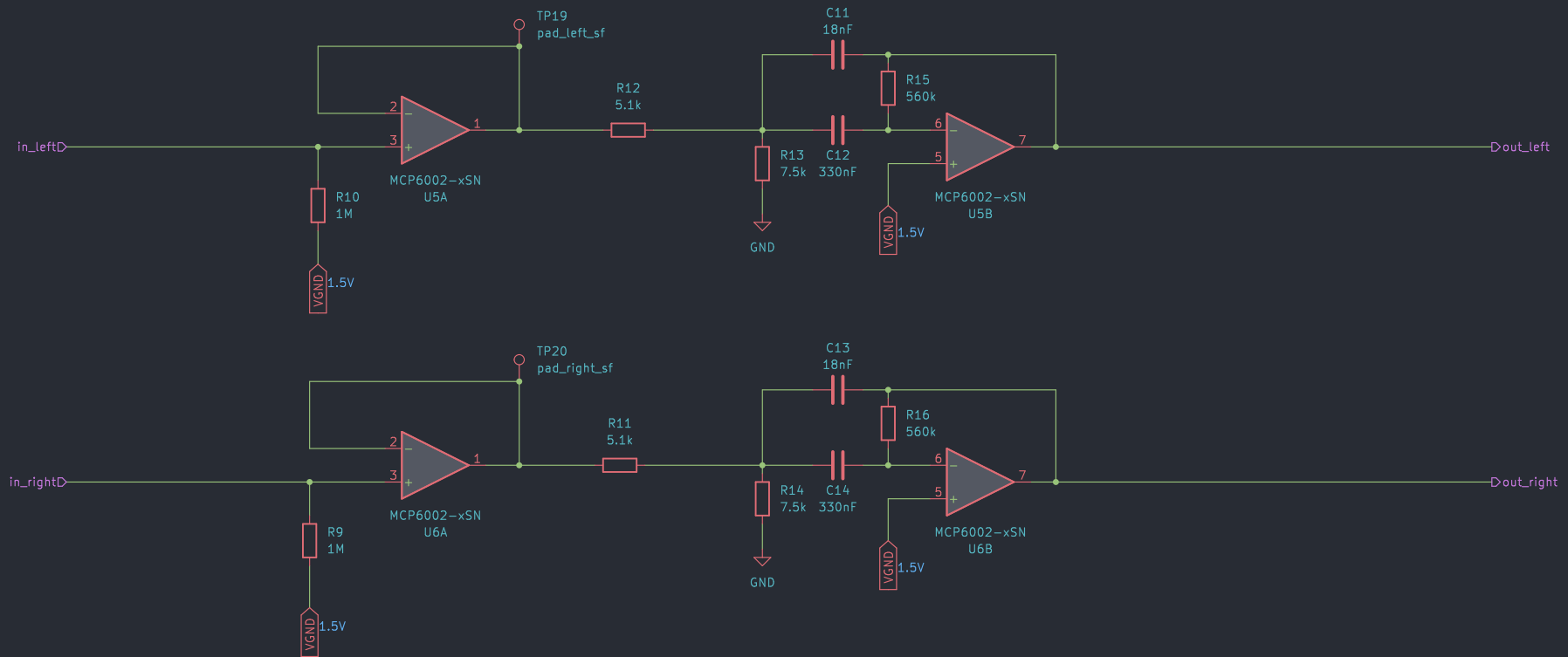
Sheet: /  
File: Cable\_Monitor.kicad\_sch

Title: Cable Monitor

Size: A4 Date: 2023-09-29  
KiCad E.D.A. kicad 7.0.7

Rev: V.1.0  
Id: 1/3

Filtering and Amplification to measure Electric Fields.  
This will allow us to measure Fields generated by Cables and thus allow us to calculate the distance from an AC Voltage source.



Pads for measuring electric fields (voltage)

Created by: horvaale & weytim01

ZHAW

Sheet: /pads\_left\_right/

File: amplifier\_filter\_2channels.kicad\_sch

**Title: Amplifiers and Filters for Pads**

Size: A4 Date: 2022-12-22

KiCad E.D.A. kicad 7.0.7

Rev: V.1.0

Id: 2/3

