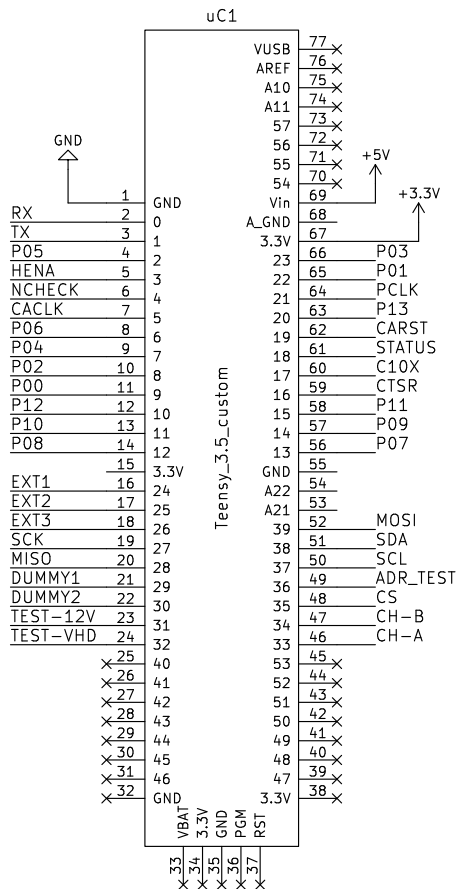
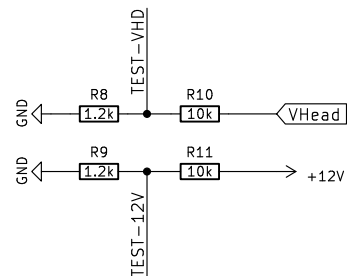


## Microcontroller

DMA bus C is 15-22-23-09-10-13-11-12  
DMA bus D is 02-14-07-08-06-20-21-05

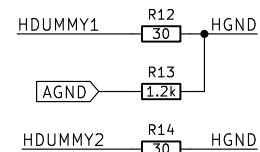


## Voltage check circuit

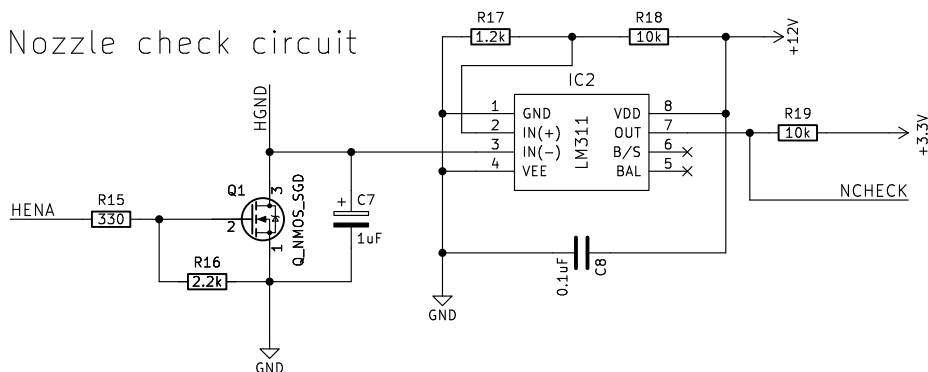


## Dummy Nozzle

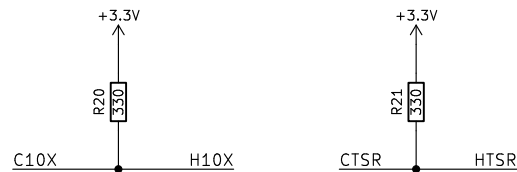
Address pulldown in HP45 is 24k  
4017 has CMOS protection network  
with 1-5k resistor and diodes  
This totals to roughly 1.2k to AGND



## Nozzle check circuit



## Sense resistors circuit



Sheet: /  
File: HP45 Standalone V4.02.kicad\_sch

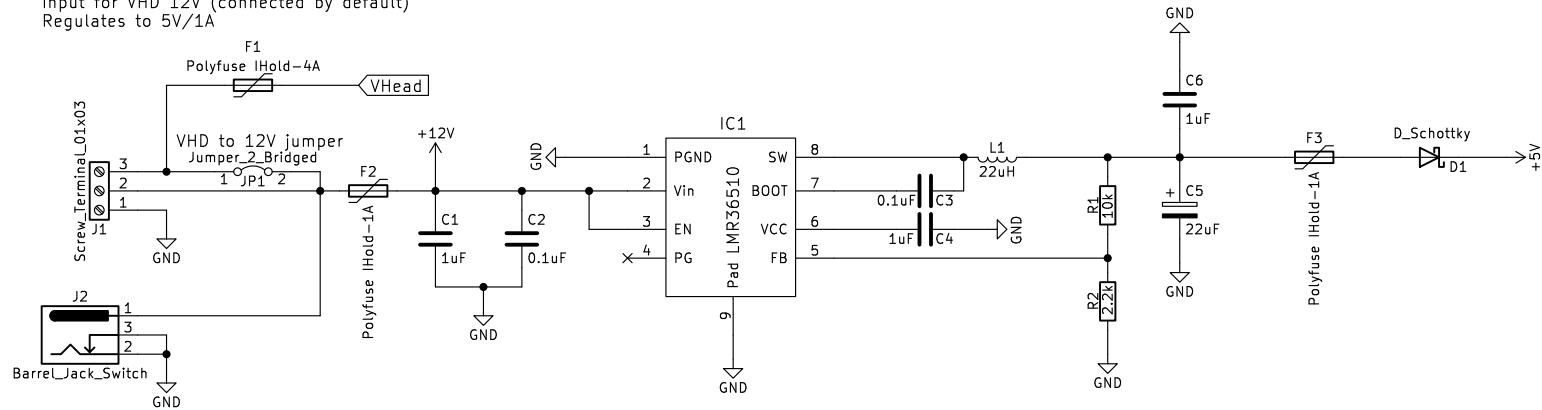
### Title:

Size: A4 Date: 2023-05-09  
KiCad E.D.A. kicad 7.0.2-6a45011f42-172-ubuntu22.04.1

Rev:  
Id: 1/2

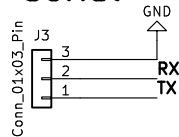
# Power input

Input for VHD 12V (connected by default)  
Regulates to 5V/1A

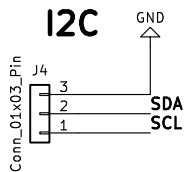


## Peripherals

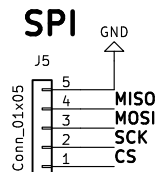
### Serial



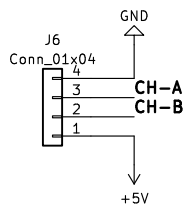
### I2C



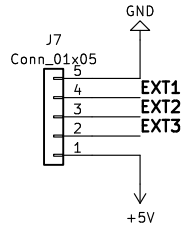
### SPI



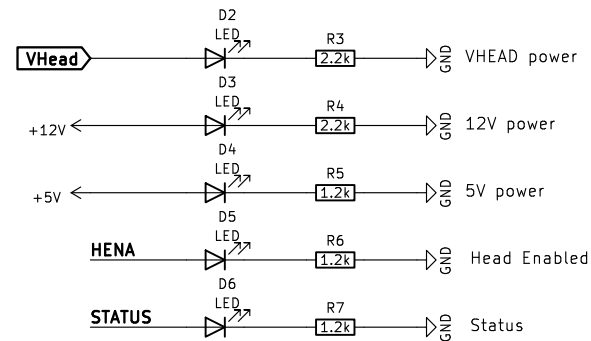
## Encoder Input



## External input



## LEDs



Sheet: /Power input/  
File: Power input.kicad\_sch

### Title:

Size: A4 Date: 2023-05-09  
KiCad E.D.A. kicad 7.0.2-6a45011f42-172-ubuntu22.04.1

Rev: 2/2