

RP2040 MCU

DECOUPLING

MAIN BOARD

1.1.0

David Sipos / DvidMakesThings

ENERGIS\_Rack-PDU\_1.1.0

9/20/2025 4:11 PM

Sheet: 1/11

RP2040 MCU

DECOUPLING

MAIN BOARD

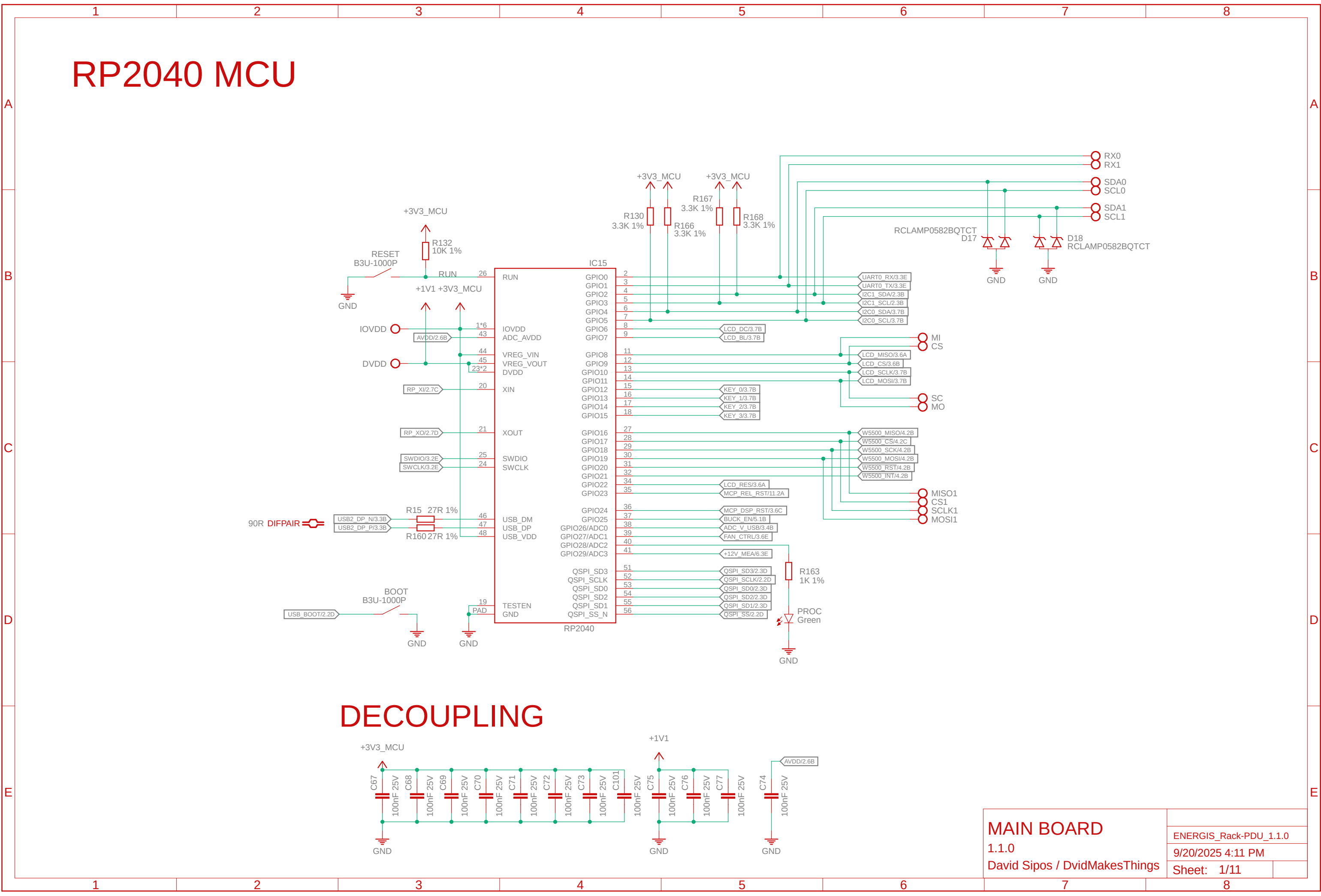
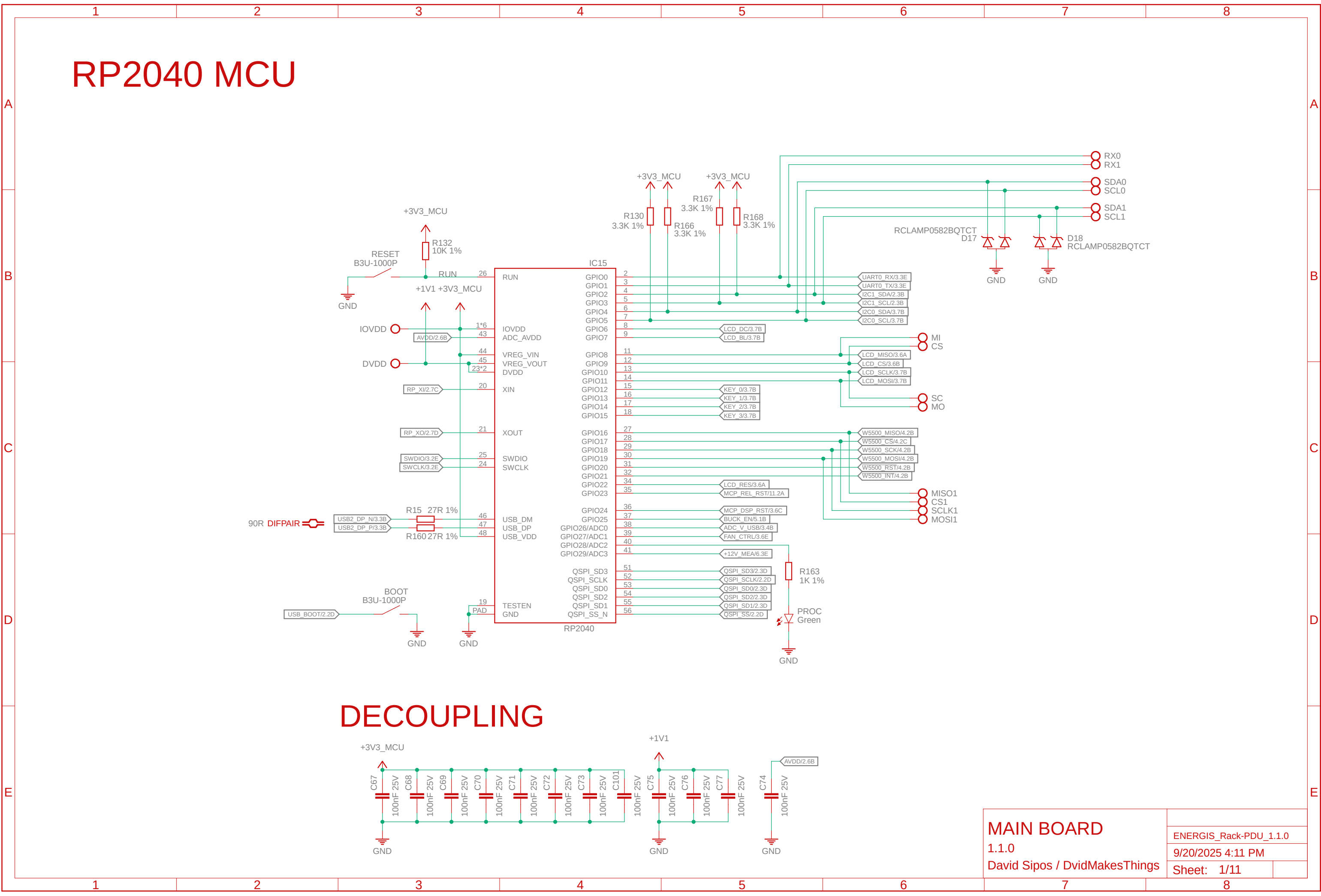
1.1.0

David Sipos / DvidMakesThings

ENERGIS\_Rack-PDU\_1.1.0

9/20/2025 4:11 PM

Sheet: 1/11



RP2040 MCU

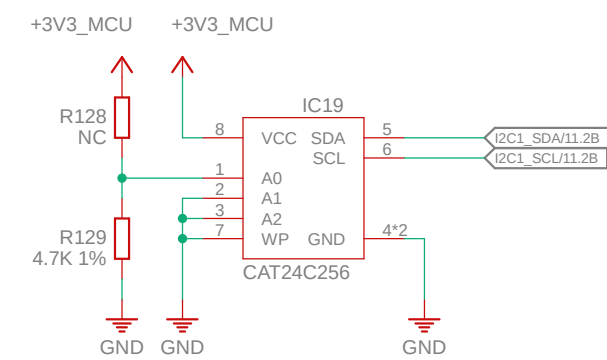
DECOUPLING

MAIN BOARD

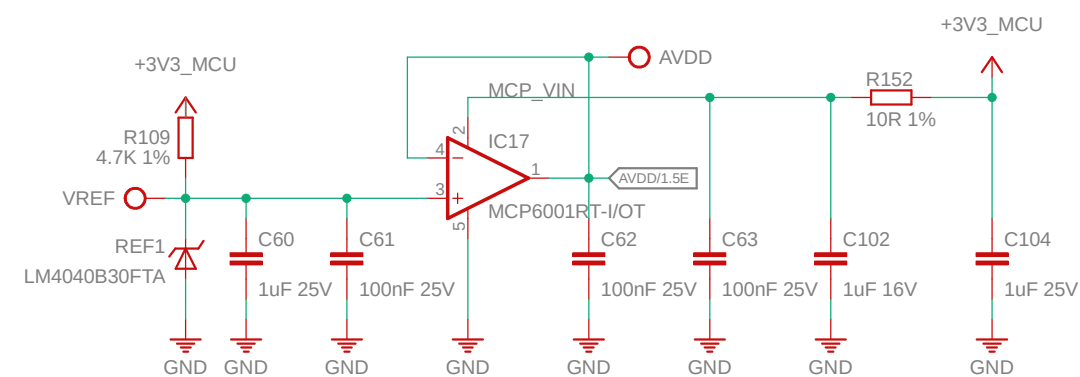
1.1.0  
David Sipos / DvidMakesThings

ENERGIS\_Rack-PDU\_1.1.0  
9/20/2025 4:11 PM  
Sheet: 1/11

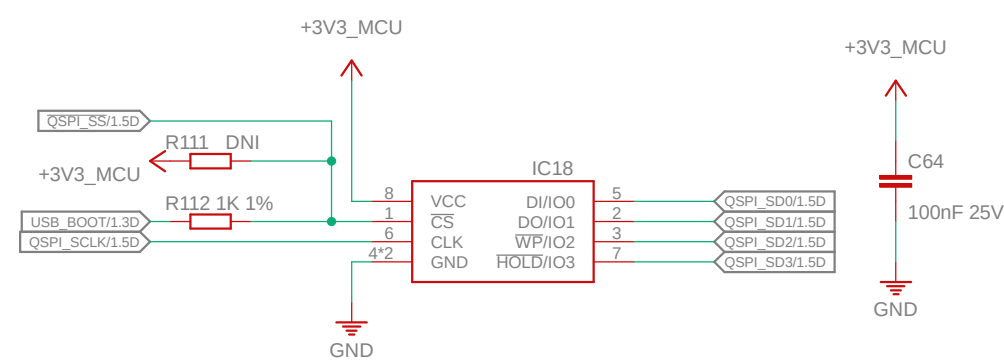
USER MEMORY



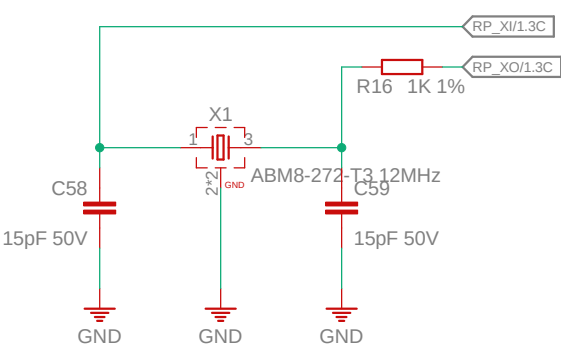
ADC VREF



RP2040 FLASH



12MHZ CRYSTAL



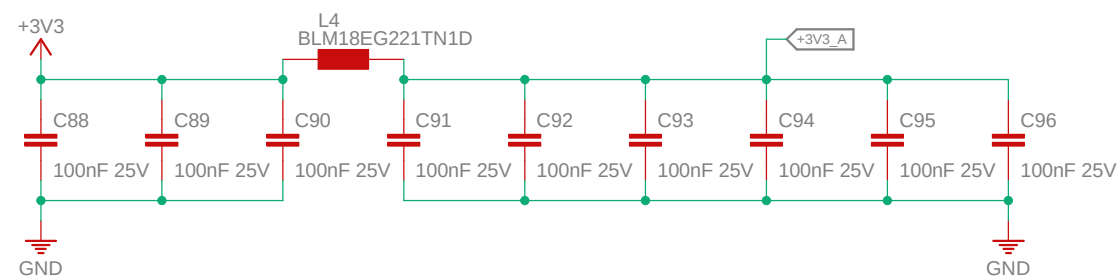
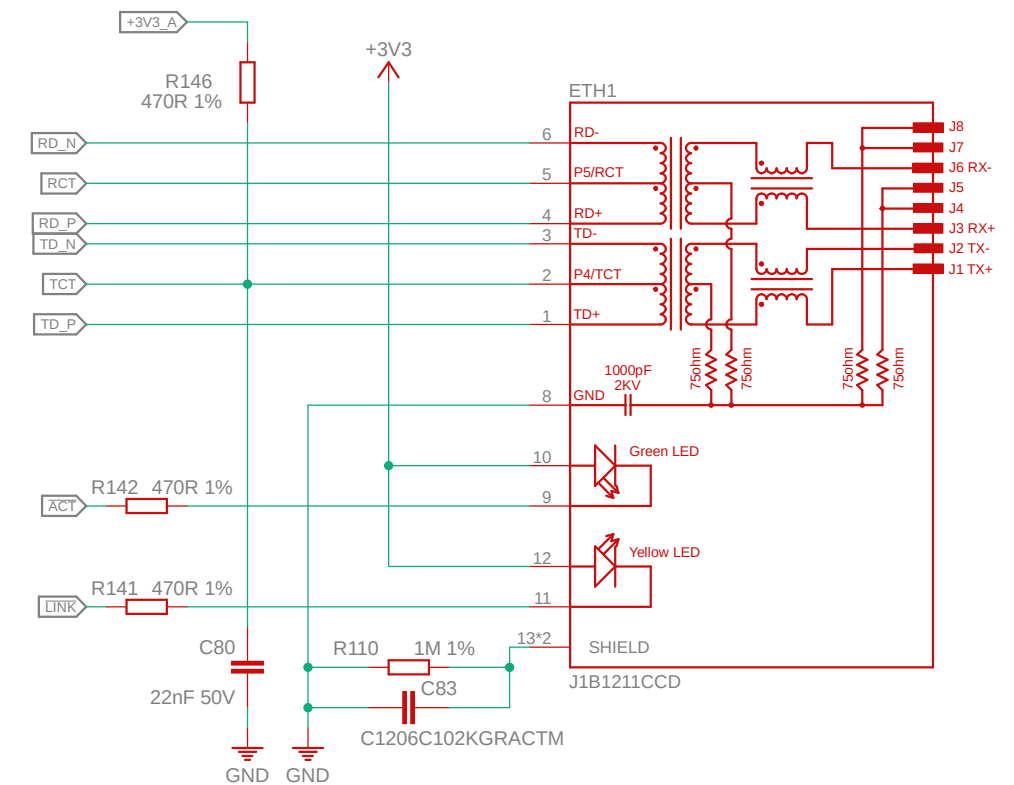
MAIN BOARD

1.1.0  
David Sipos / DvidMakesThings

ENERGIS\_Rack-PDU\_1.1.0  
9/20/2025 4:11 PM  
Sheet: 2/11

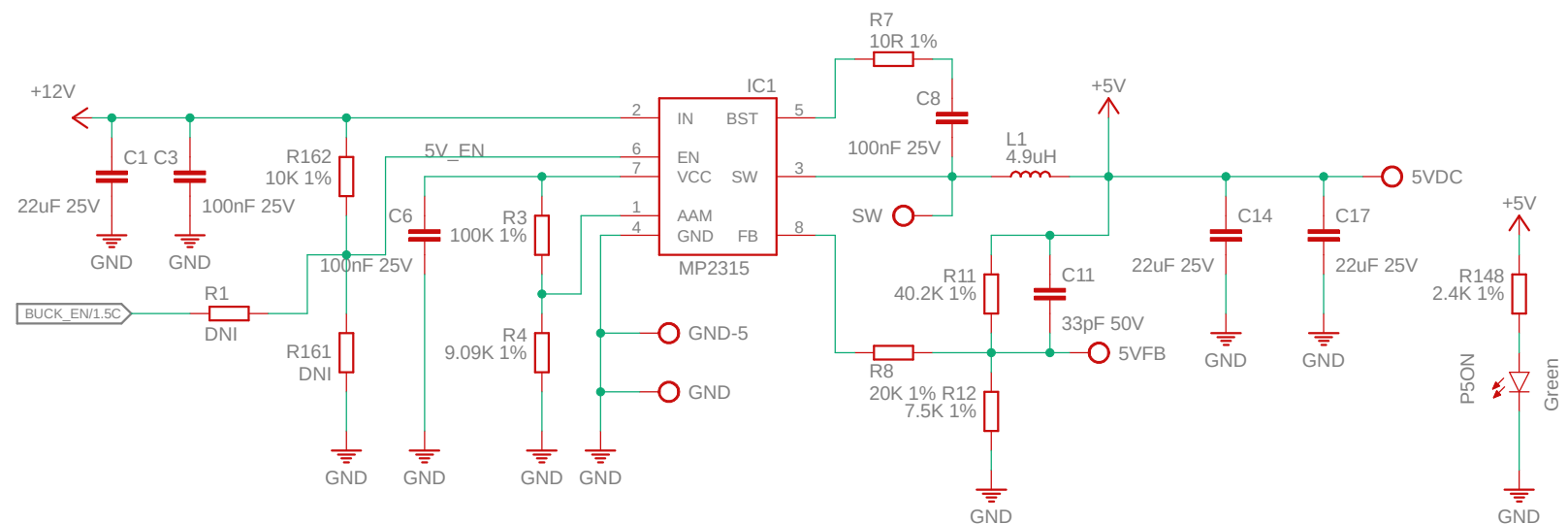


# DECOUPLING



Sheet: 4/11

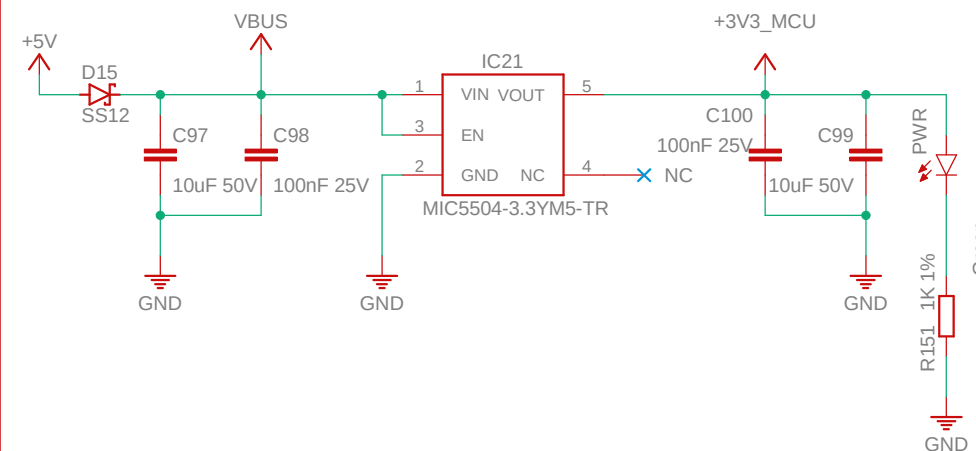
# 5V DC-DC CONVERTER



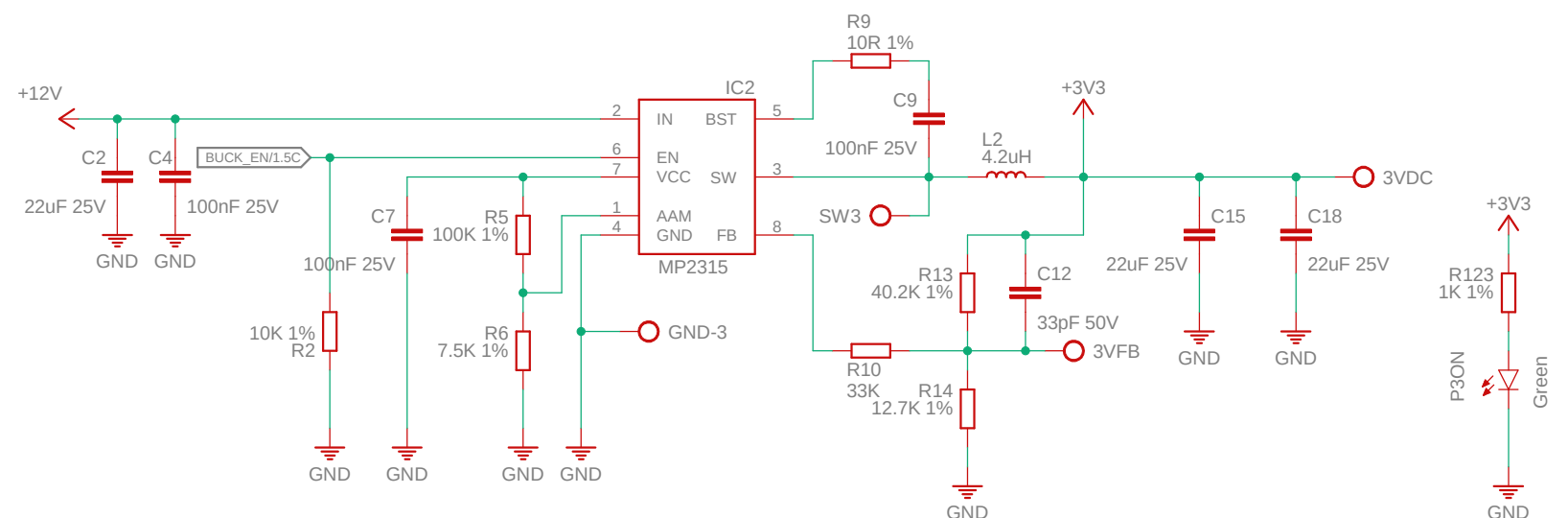
230VAC

12VDC

# 3.3 VBUS-LDO



# 3.3V DC-DC CONVERTER



ENABLE/DISABLE

USB-C 5VDC

PERIPHERALS

MCU

MAIN BOARD

1.1.0

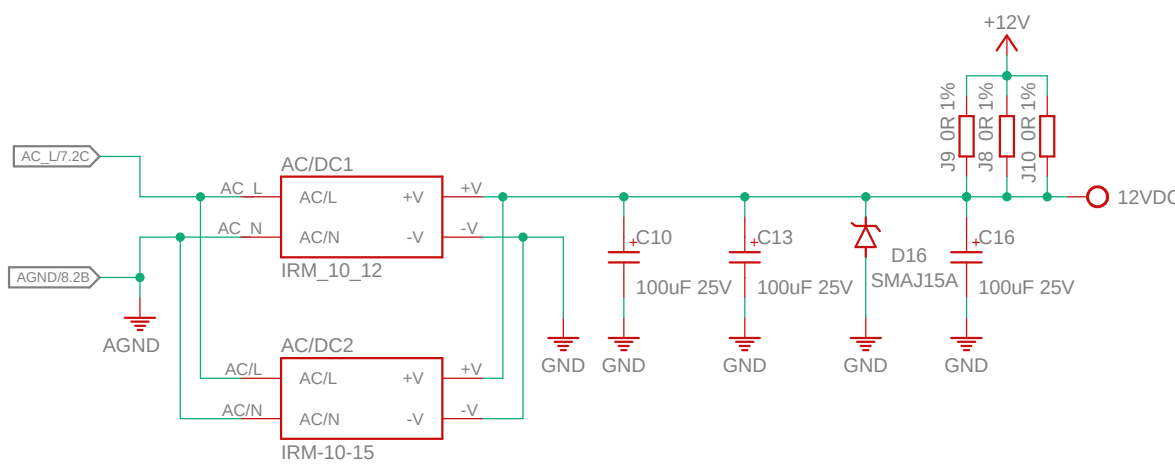
David Sipos / DvidMakesThings

ENERGIS\_Rack-PDU\_1.1.0

9/20/2025 4:11 PM

Sheet: 5/11

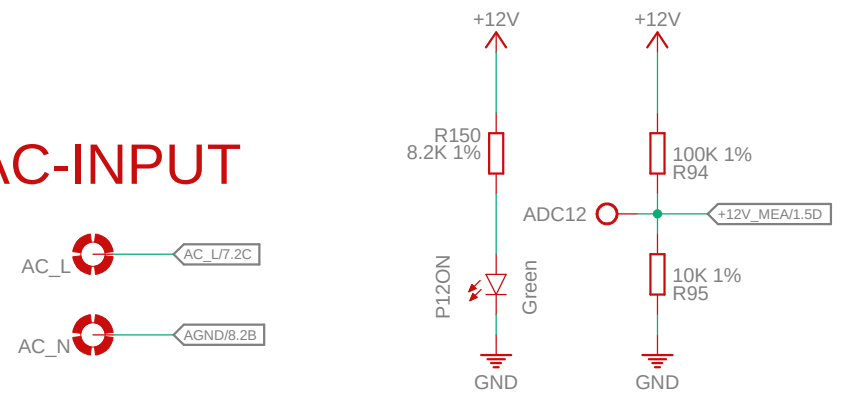
# 12V - 10W FLYBACK CONVERTER



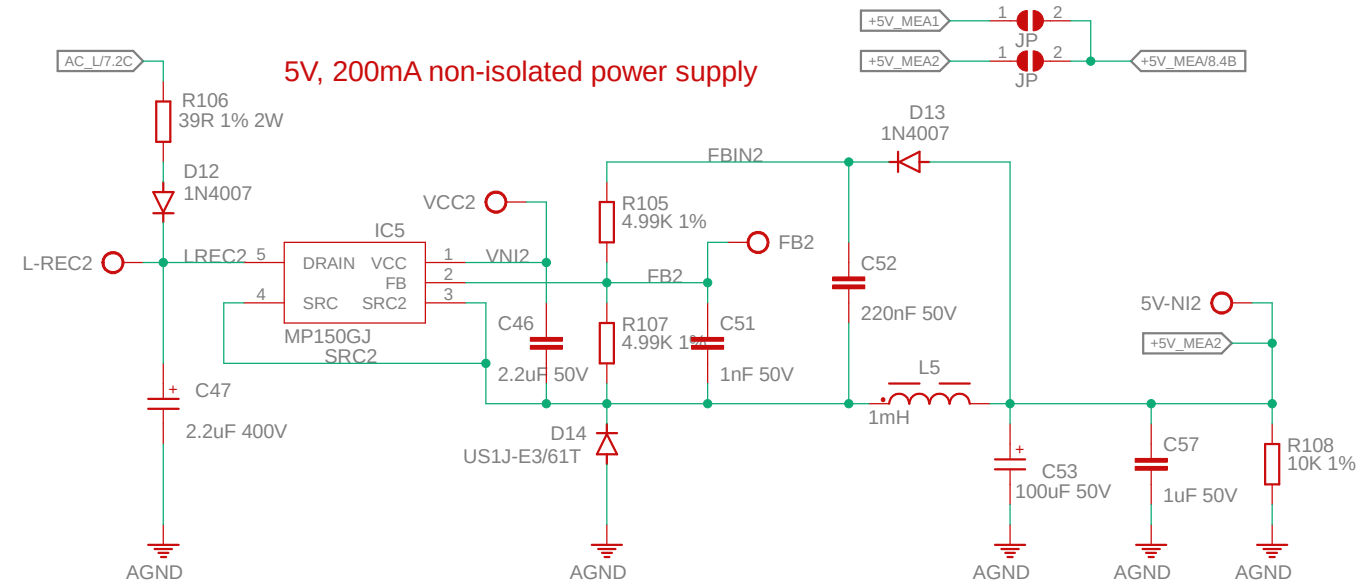
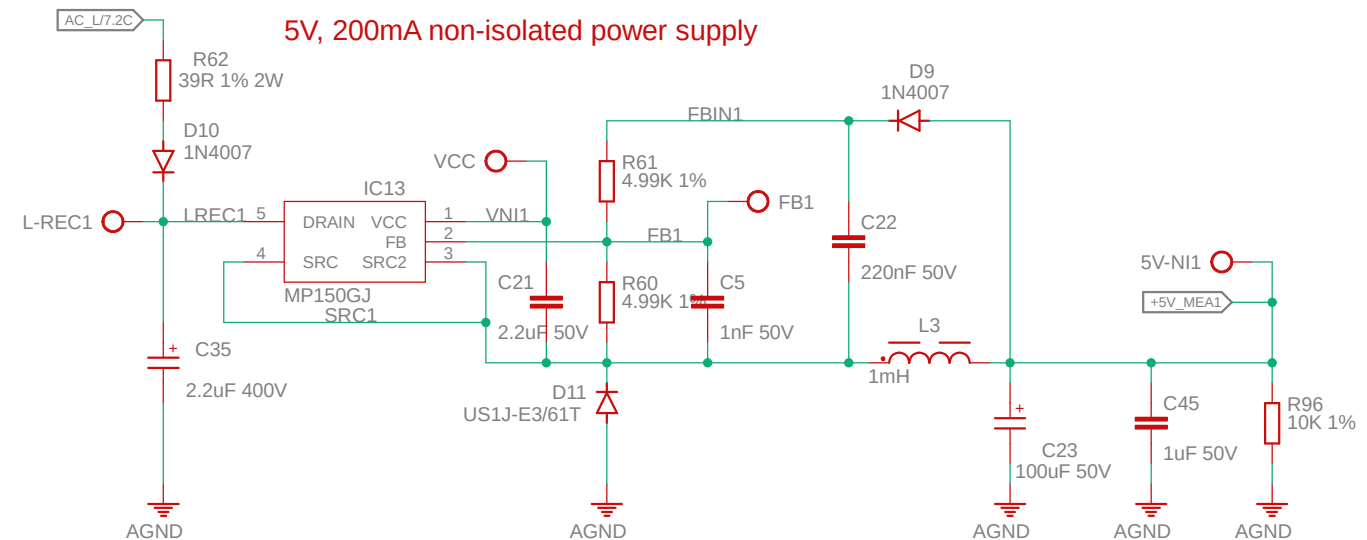
Design Note — 12 V supply (Mean Well IRM-10 series), universal 110 V/230 V AC

This schematic uses the Mean Well IRM-10 encapsulated AC-DC module (e.g., IRM-10-12) to produce 12 VDC. The IRM-10 series is specified for a wide input range of 85–305 VAC (47–440 Hz) and 120–430 VDC, meaning it operates from both ~115 VAC and ~230 VAC mains with no selector or changes to the circuit. Safety approvals (IEC/UL/EN 62368-1), Class II construction, and built-in EMI/EMC compliance are provided by the module.

## AC-INPUT



# 5V NON-ISOLATED



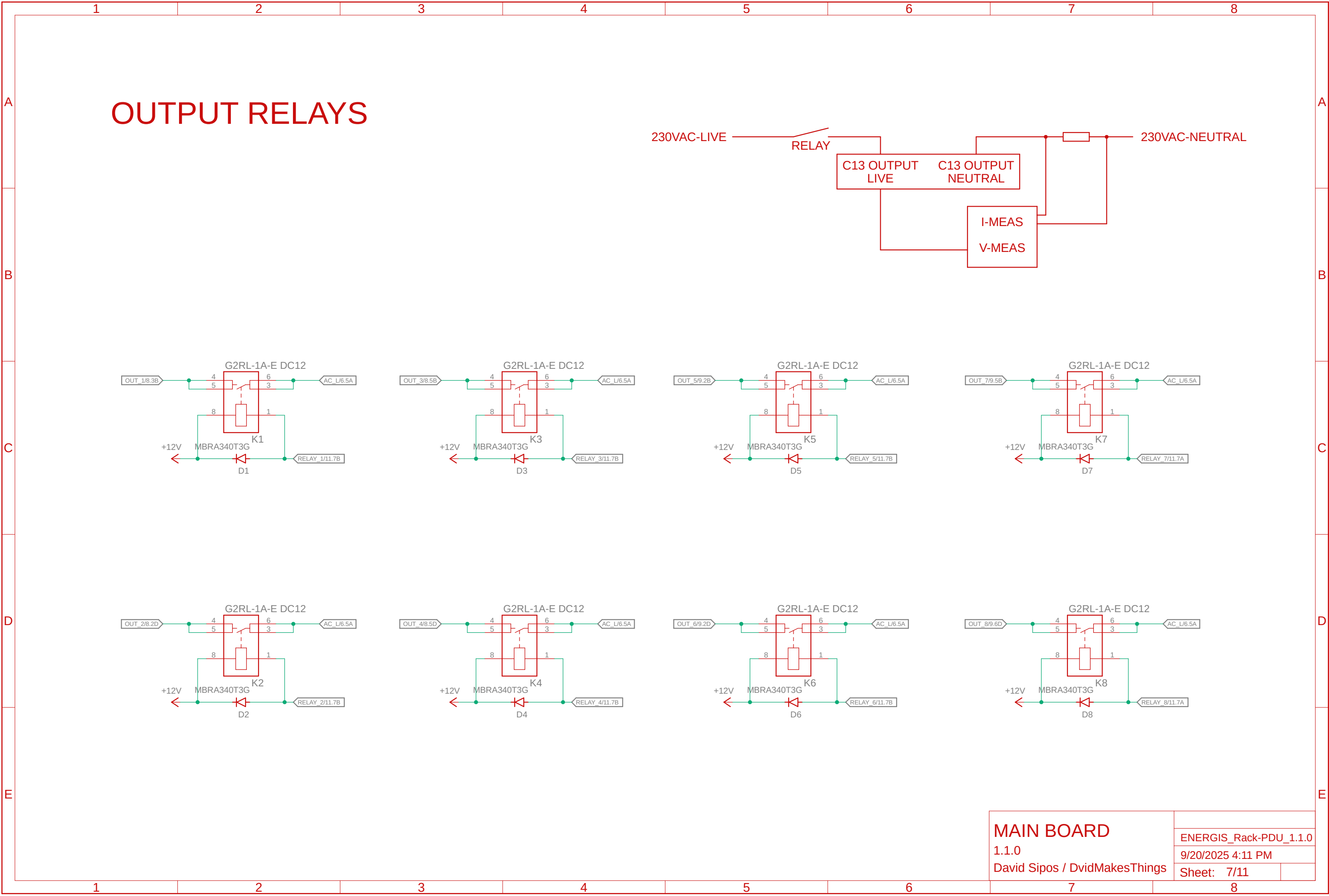
Design Note — 5 V / 200 mA non-isolated supply (MP150), universal 110 V/230 V AC

This design uses MPS MP150 in high-side buck to generate 5 V/200 mA directly from rectified mains. MP150 integrates a 500 V MOSFET (Drain-to-Source rating 500 V), covering the ~325 VDC peak from 230 VAC and ~155 VDC from 115 VAC, so the circuit from 85–265 VAC ("universal input").

## MAIN BOARD

1.1.0  
David Sipos / DvidMakesThings

ENERGIS\_Rack-PDU\_1.1.0  
9/20/2025 4:11 PM  
Sheet: 6/11



# A



8

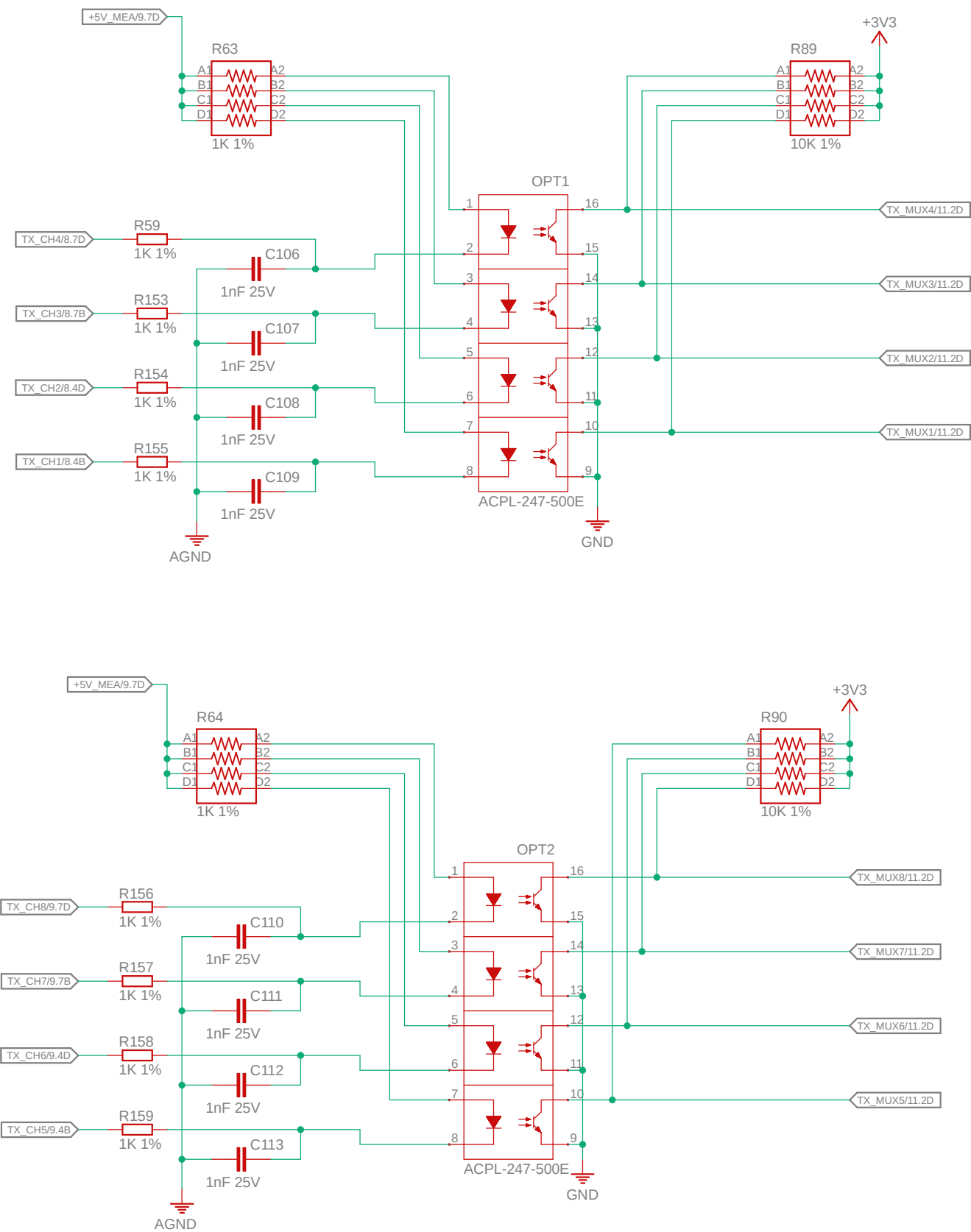


## A

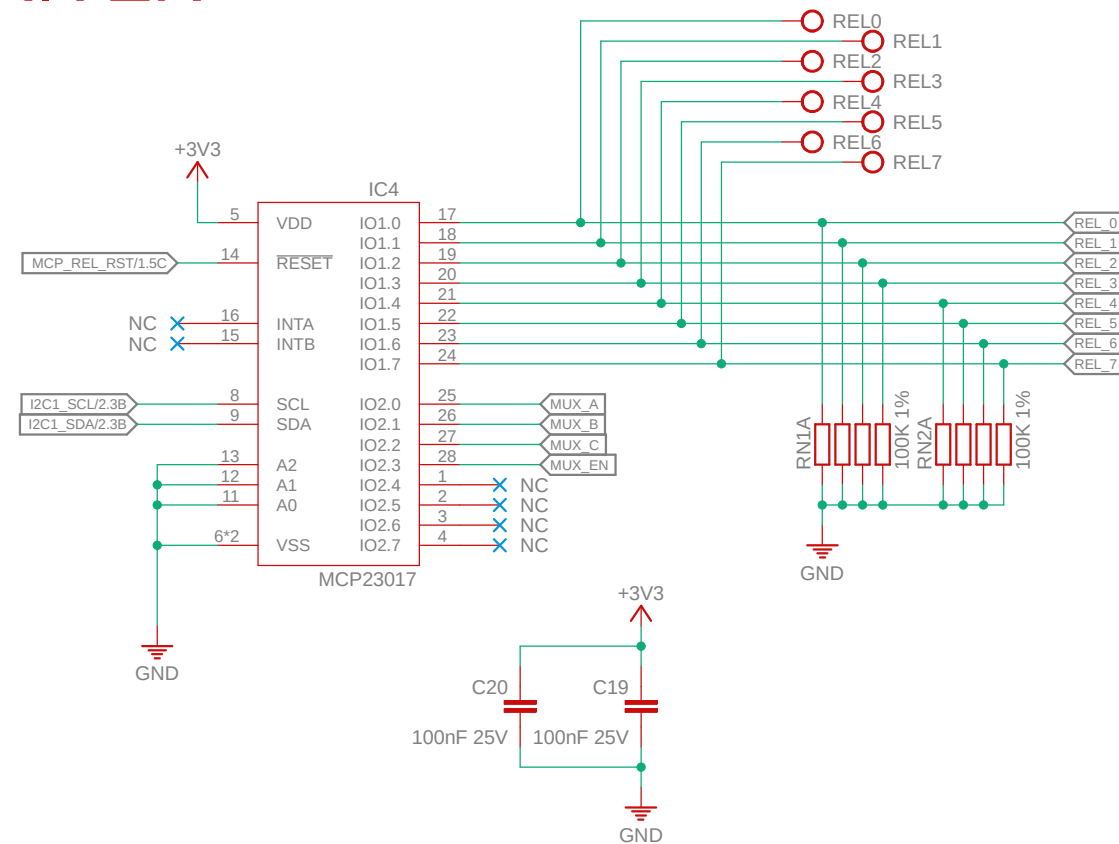


Sheet: 9/11

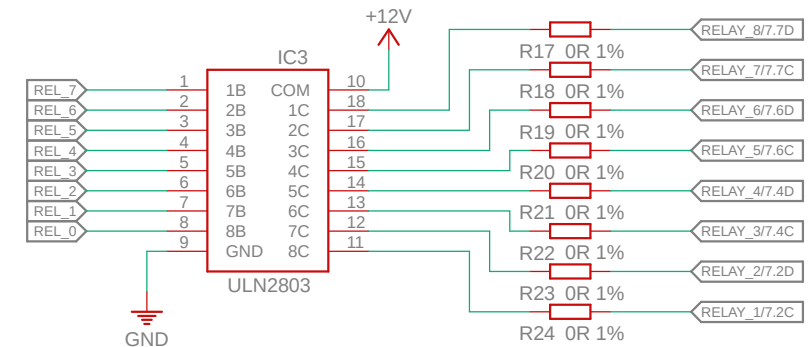
# SERIAL OPTOISOLATOR



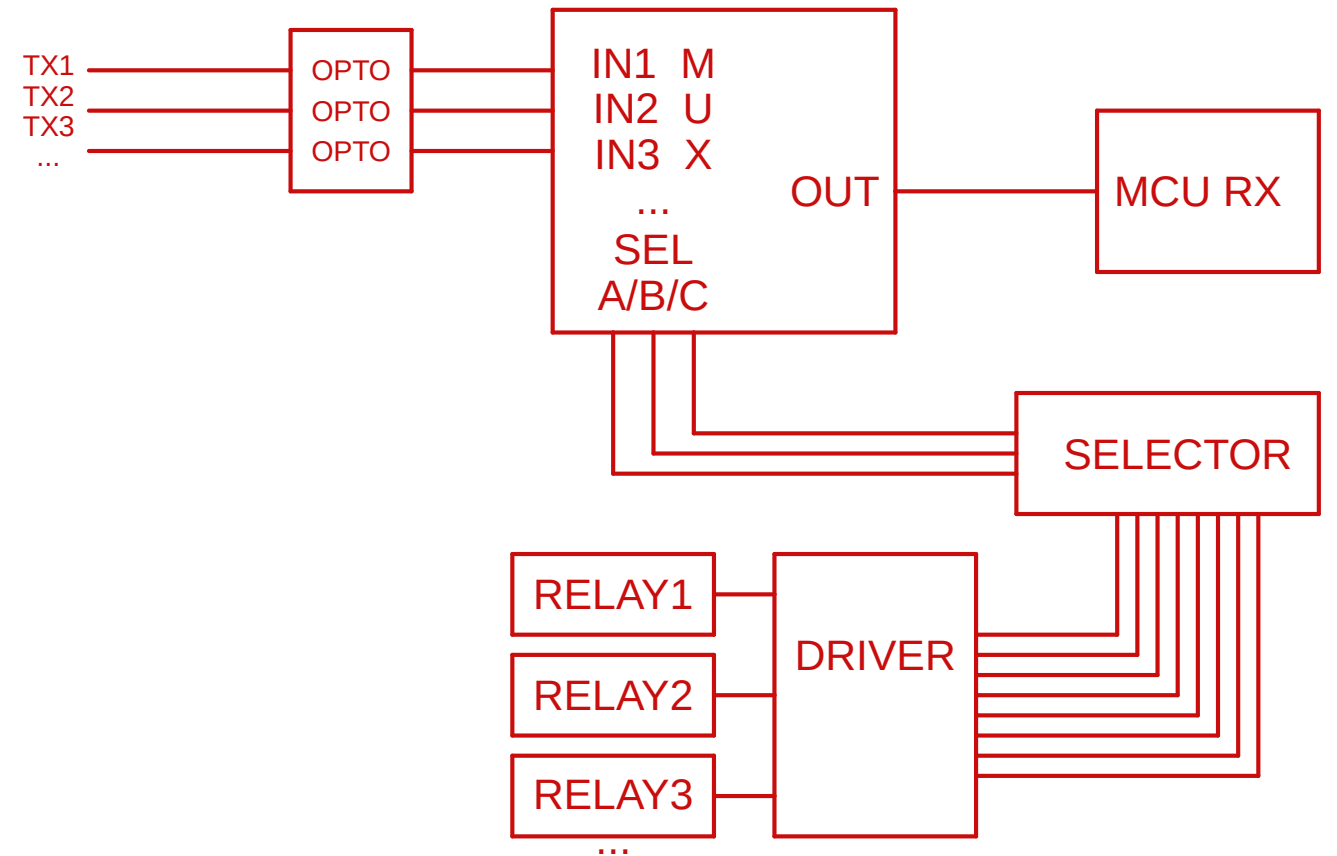
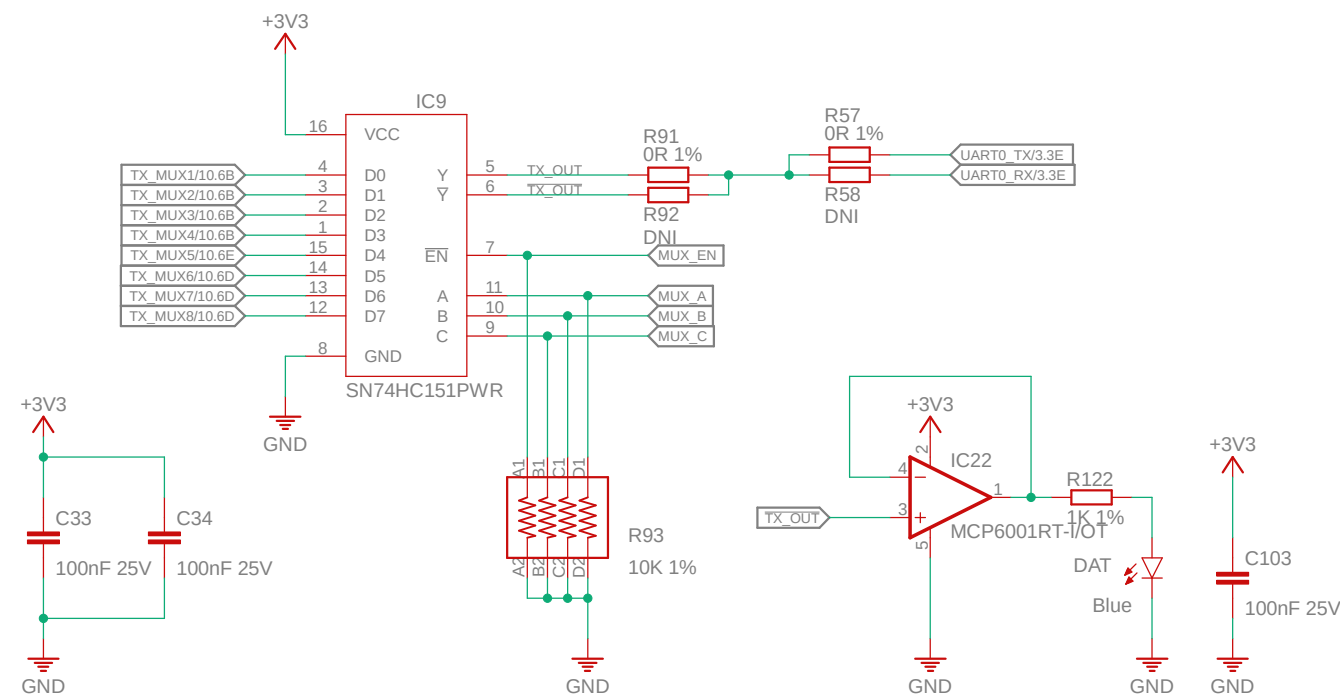
# IO DRIVER



# ULN2803 RELAY DRIVER



# SERIAL MUX



MAIN BOARD

1.1.0

David Sipos / DvidMakesThings

ENERGIS\_Rack-PDU\_1.1.0

9/20/2025 4:11 PM

Sheet: 11/11