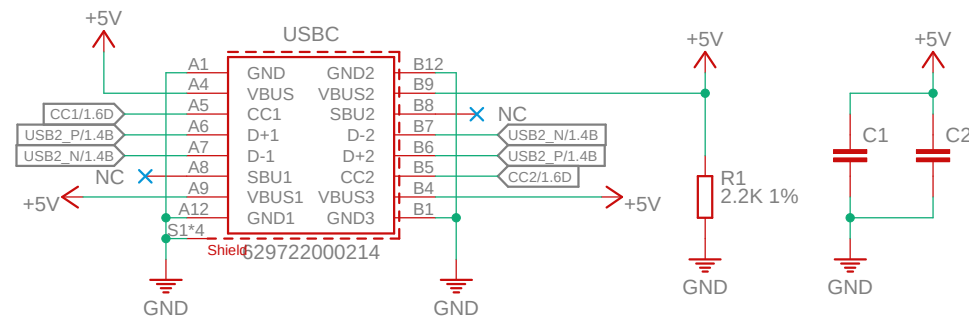
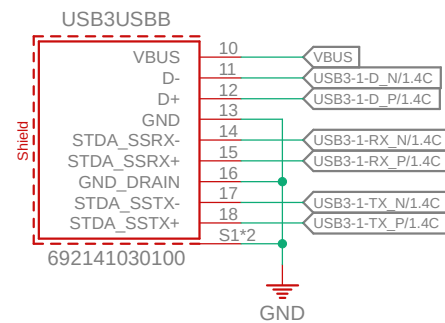
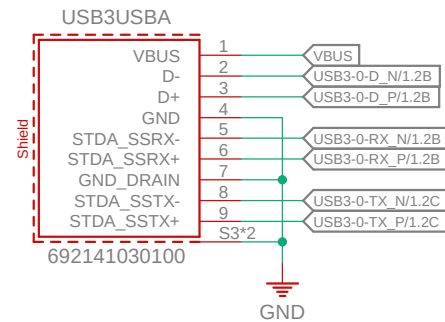


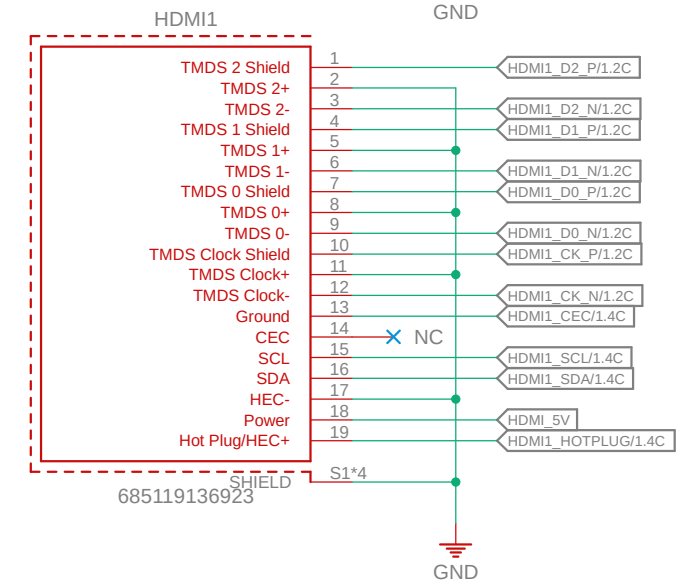
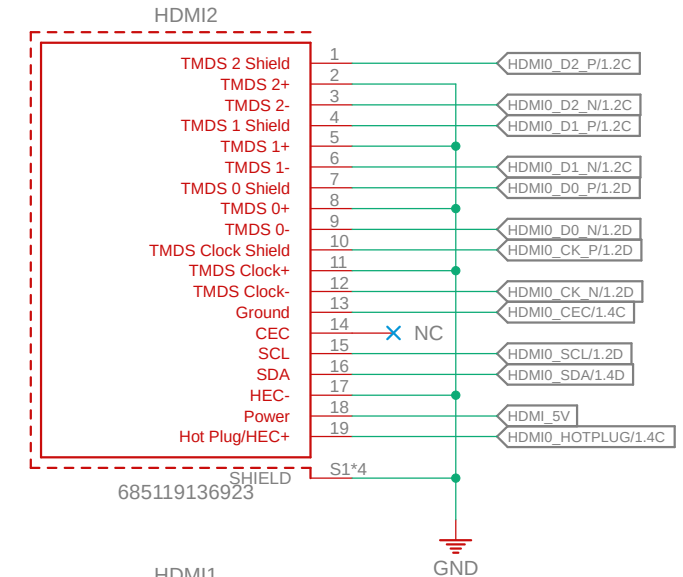
## USB-C POWER CONNECTOR



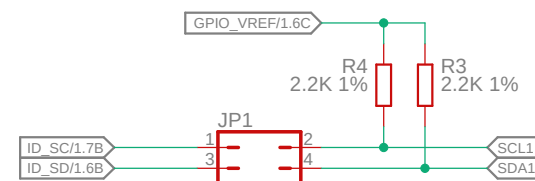
## USB3 CONNECTORS



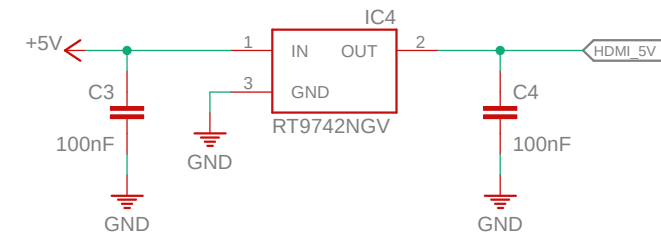
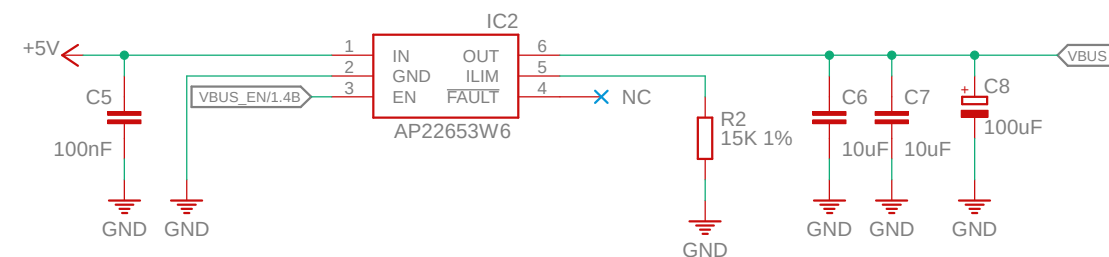
## DUAL-HDMI CONNECTOR



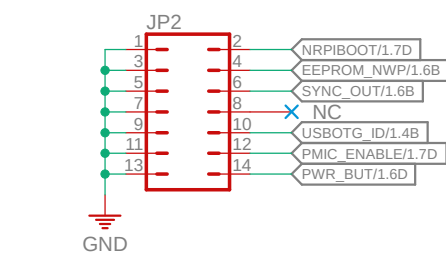
# DPHY1 JUMPERS



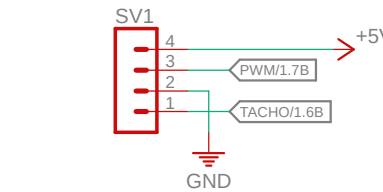
## CURRENT LIMIT SWITCH



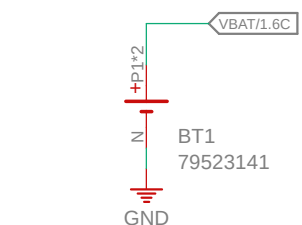
JUMPERS



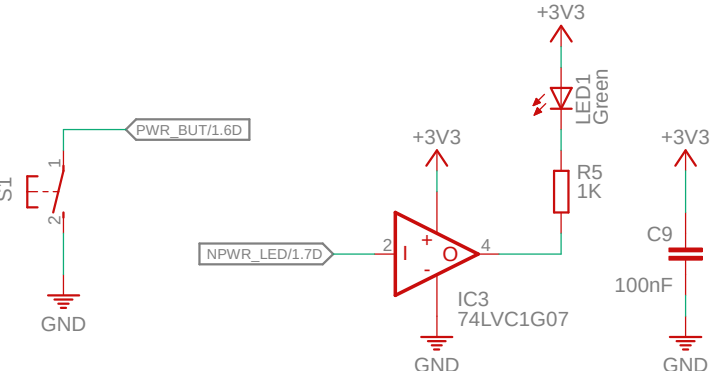
FAN CONNECTOR



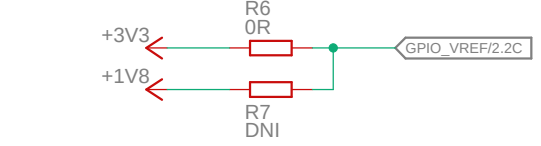
RTC BATTERY



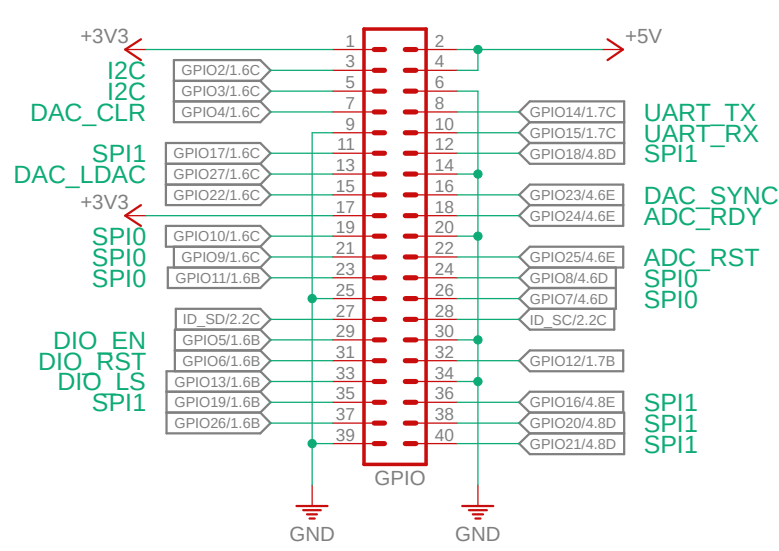
POWER BUTTON AND LED



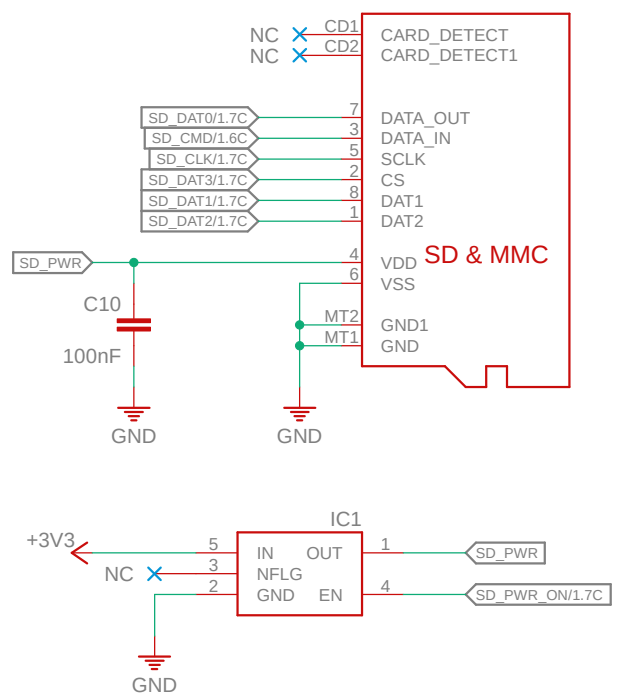
GPIO VOLTAGE SELECT



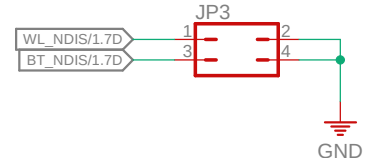
40-PIN GPIO HEADER



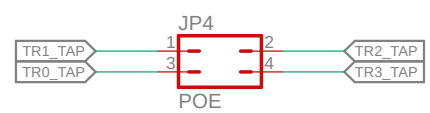
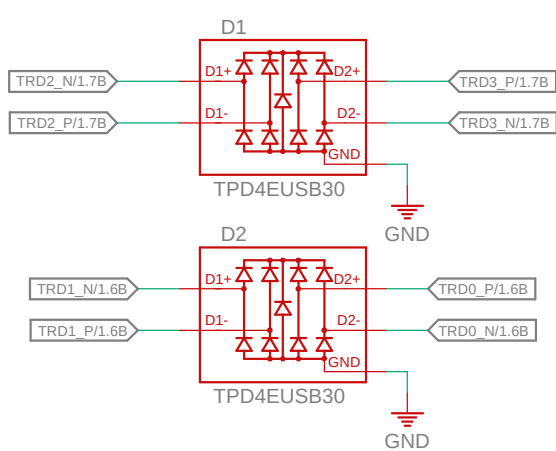
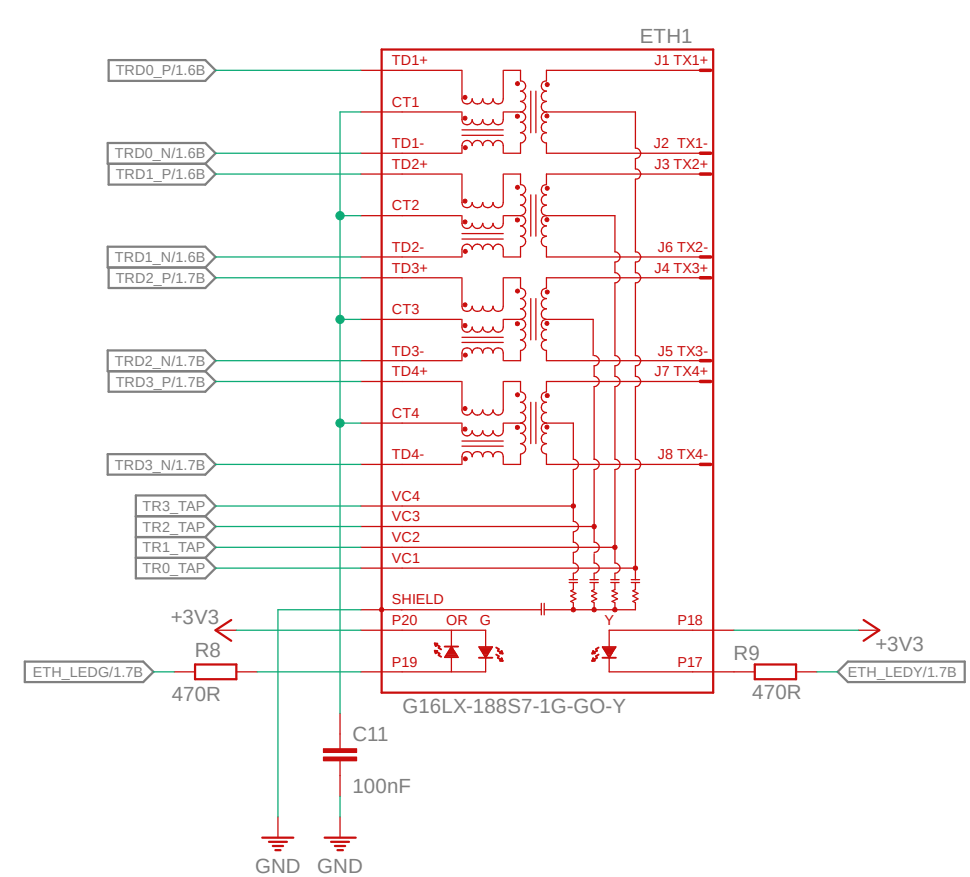
MICRO-SD SOCKET



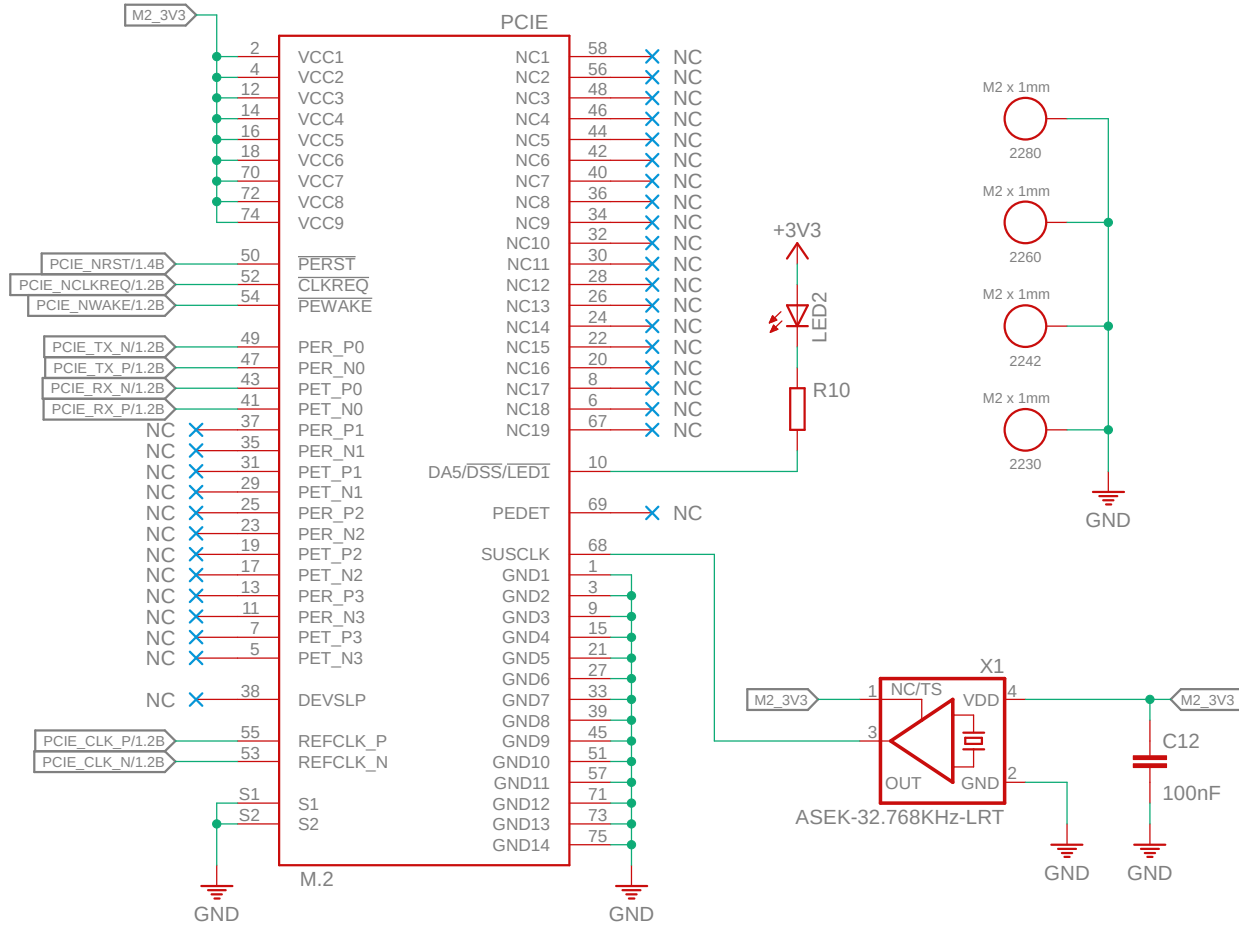
RF DISABLE



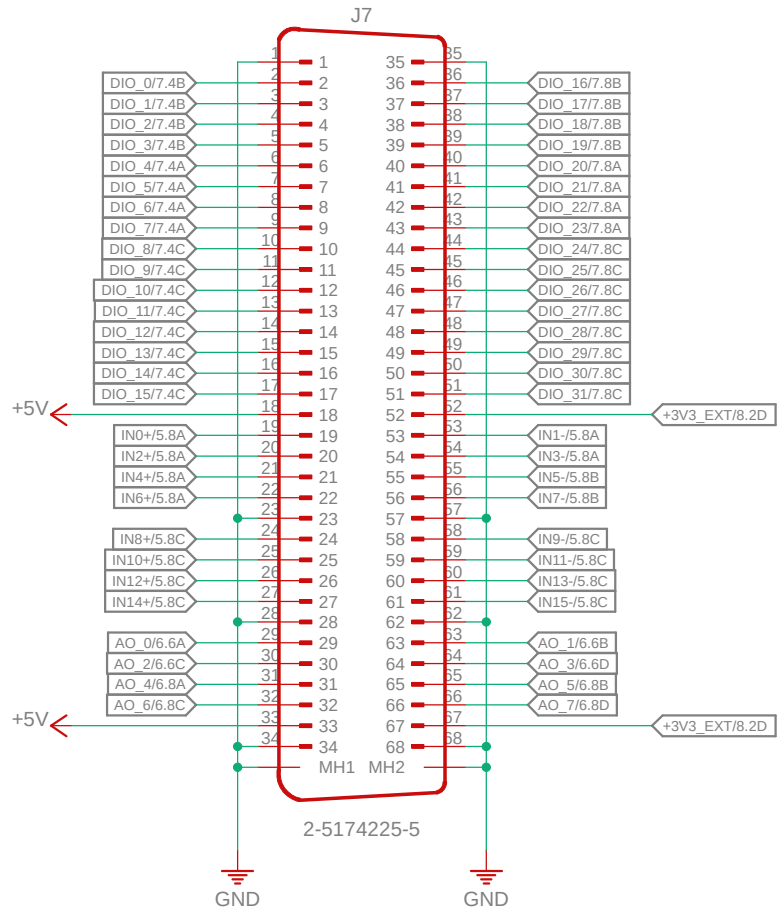
1000 BASE ETHERNET



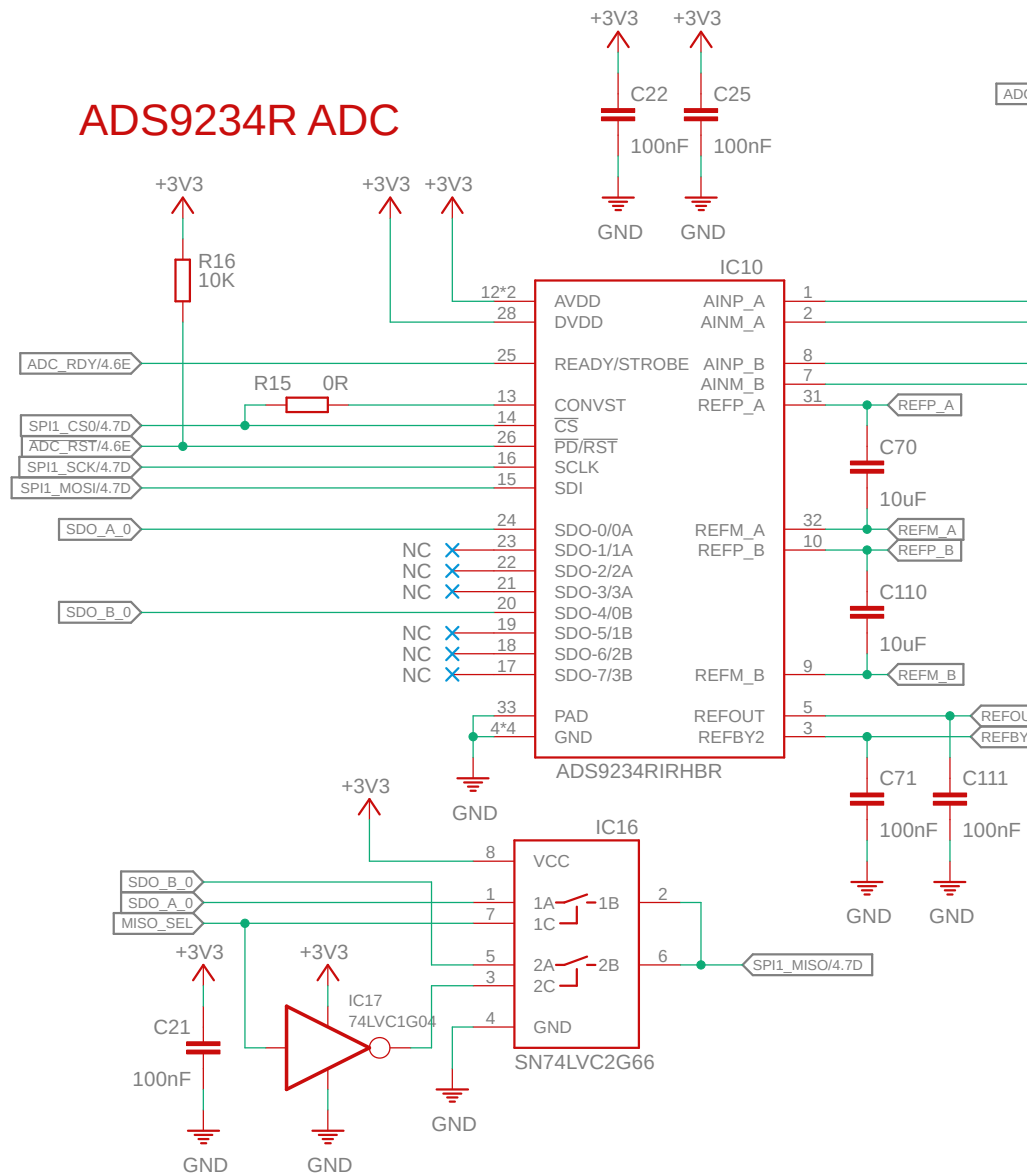
PCIE-M.2 M-KEY CONNECTOR



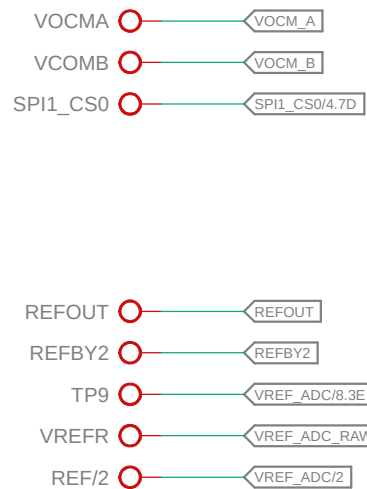
TEST CONNECTOR



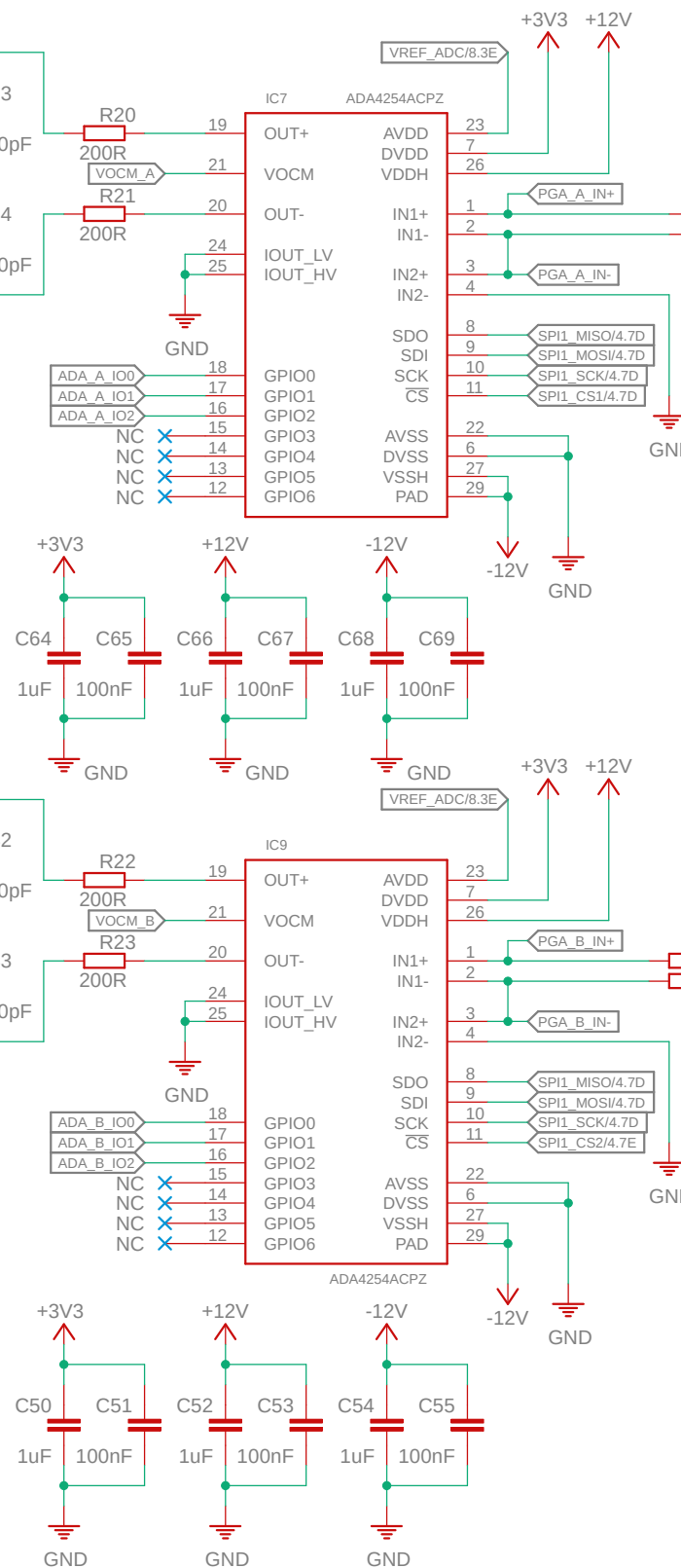
## ADS9234R ADC



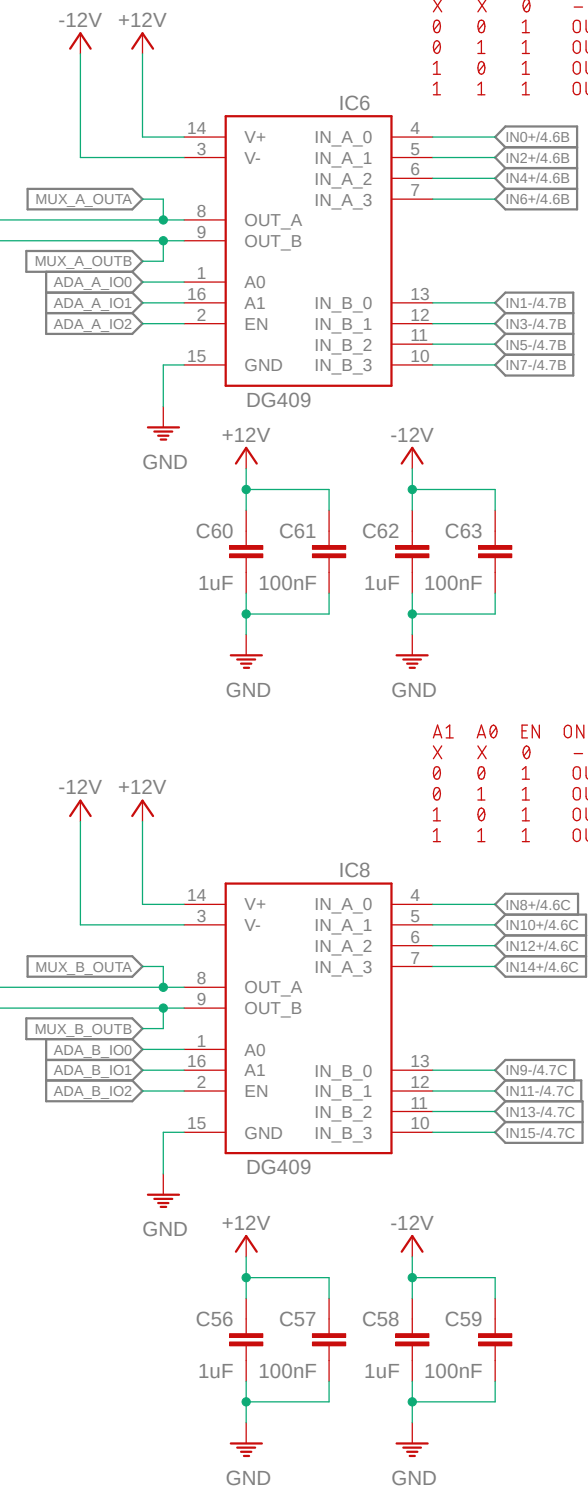
## ANALOG-IN TESTPOINTS



## PGA



## INPUT MULTIPLEXER



## ADC ON SPI1

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## A



C

D

E

R\_TB = 43 kOhm  
R\_G1 = R\_G2 = 10 kOhm  
Output resolution: 0.365 mV per step

$$V_{\text{drop}} = I_{\text{load}} * R_{\text{ISO}}$$

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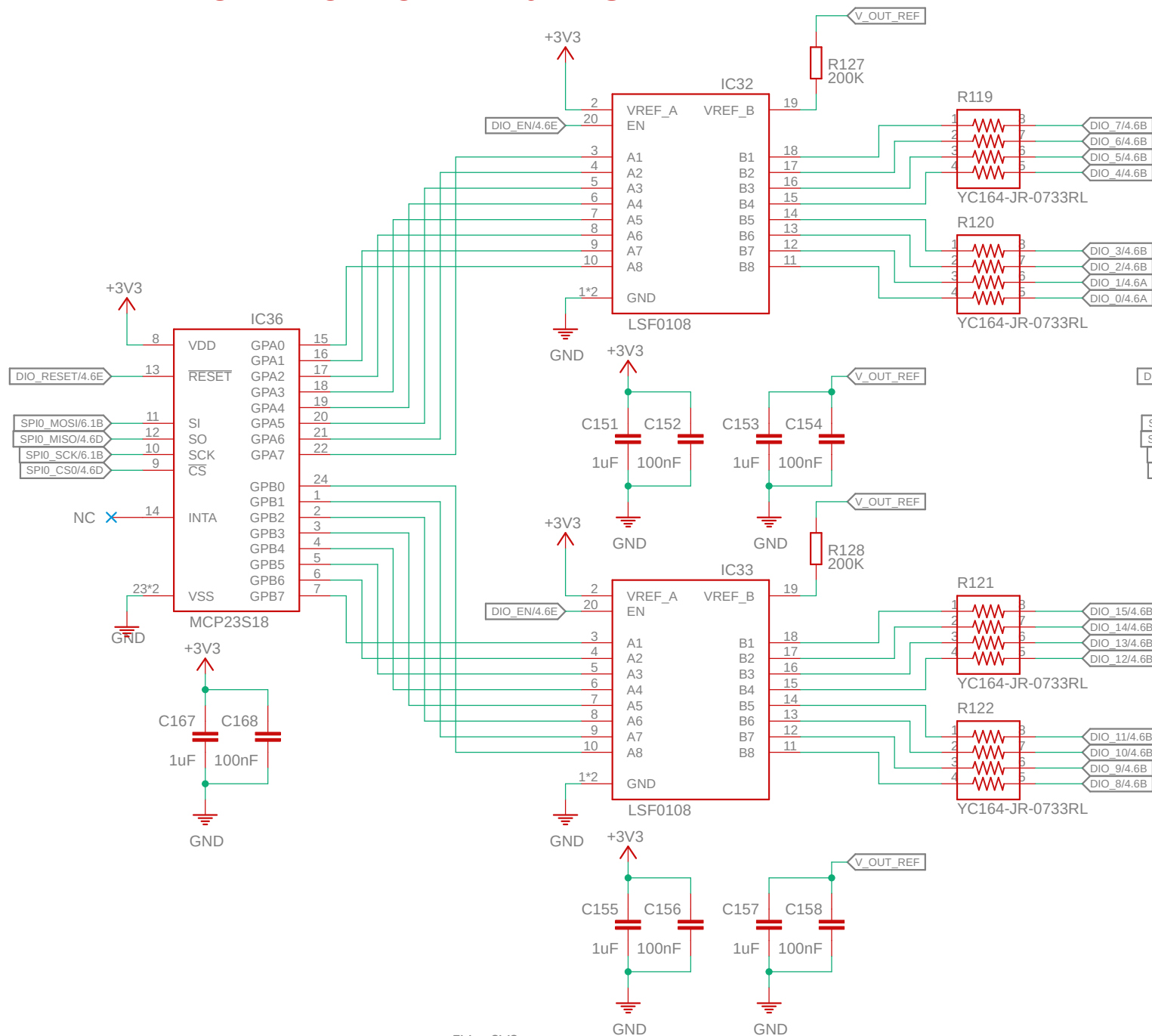
F

## 04

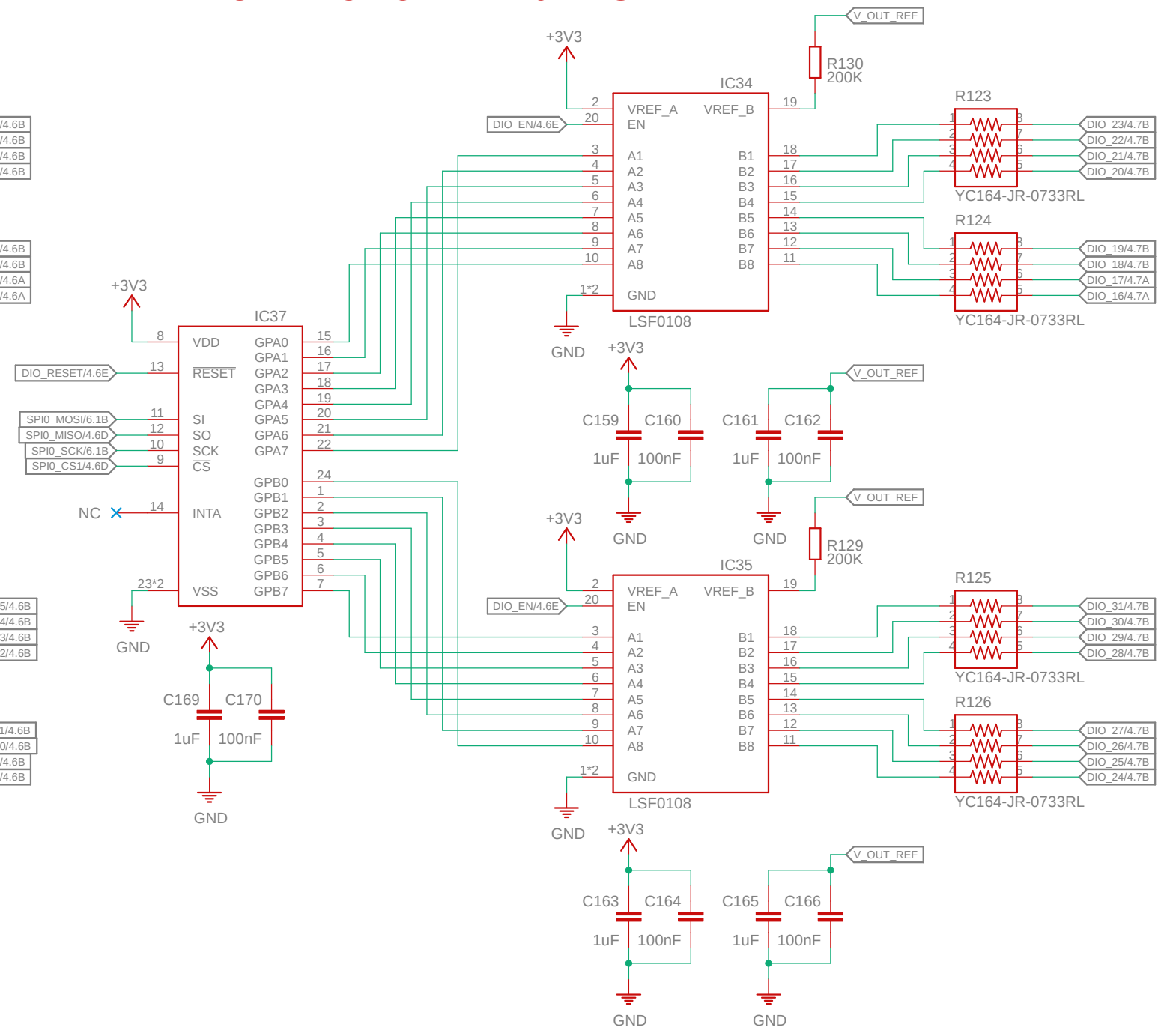
## A



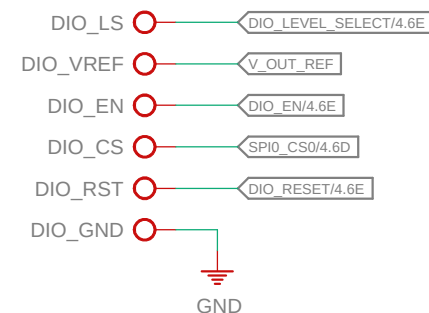
## DIGITAL IO - LOWER 16 BITS



## DIGITAL IO - UPPER 16 BITS



## ANALOG-OUT TESTPOINTS



DIO ON SPI0

Positive Output (Vout\_pos = 14V):

- Given:

- R1 = 976 k $\Omega$
- Calculated R2  $\approx$  102.3 k $\Omega$
- Nearest E96 Standard Value:
- R2 = 102 k $\Omega$
- Resulting Output Voltage:
- Vout =  $1.213 \times (1 + R1 / R2)$
- Vout =  $1.213 \times (1 + 976 / 102) \approx 13.98$  V

- Final Pair:

- R1 = 976 k $\Omega$
- R2 = 102 k $\Omega$

Positive Channel:

- Target VOUTP = 14 V,
- adjustment range: 12.6 V to 15.4 V.
- Configuration:
- R2P = 102 k $\Omega$  (fixed).
- R1P = 950 k $\Omega$  (fixed) + 250 k $\Omega$  (trimmer).
- Adjustment Range:
- R1P = 950 k $\Omega$  to 1200 k $\Omega$ .

Negative Output (Vout\_neg = -14V):

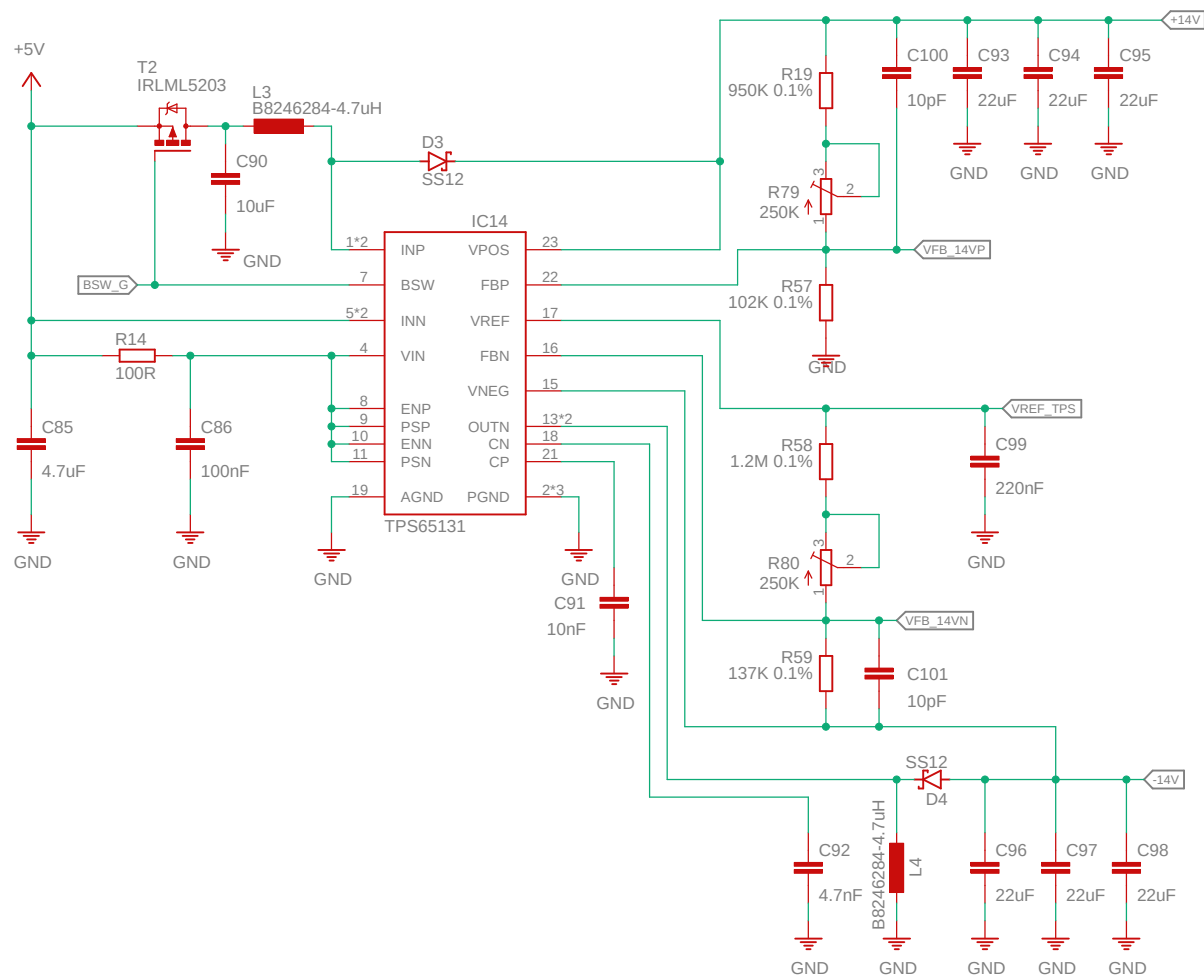
- Given:

- R1 = 1.3 M $\Omega$
- Calculated R2  $\approx$  136.3 k $\Omega$
- Nearest E96 Standard Value:
- R2 = 137 k $\Omega$
- Resulting Output Voltage:
- Vout =  $1.213 \times (1 + R1 / R2)$
- Vout =  $1.213 \times (1 + 1300 / 137) \approx 14.01$  V
- Final Pair:
- R1 = 1.3 M $\Omega$
- R2 = 137 k $\Omega$

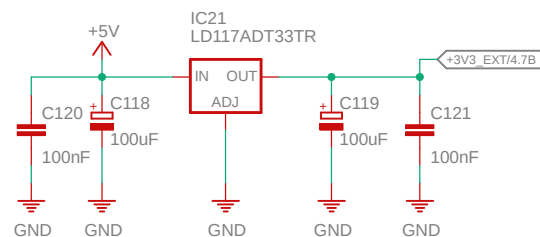
Negative Channel:

- Target VOUTN = -14 V,
- adjustment range: -12.6 V to -15.4 V.
- Configuration:
- R2N = 137 k $\Omega$  (fixed).
- R1N = 1.2 M $\Omega$  (fixed) + 250 k $\Omega$  (trimmer).
- Adjustment Range:
- R1N = 1.2 M $\Omega$  to 1.45 M $\Omega$ .

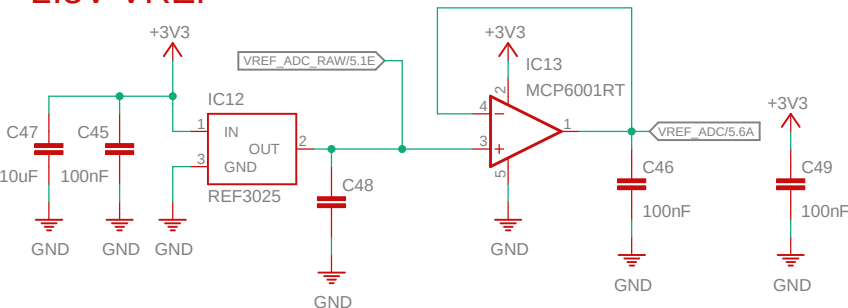
## 5V to +/-14V BOOST CONVERTER



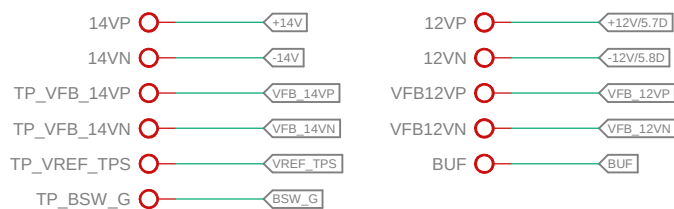
## 3.3V TARGET LDO



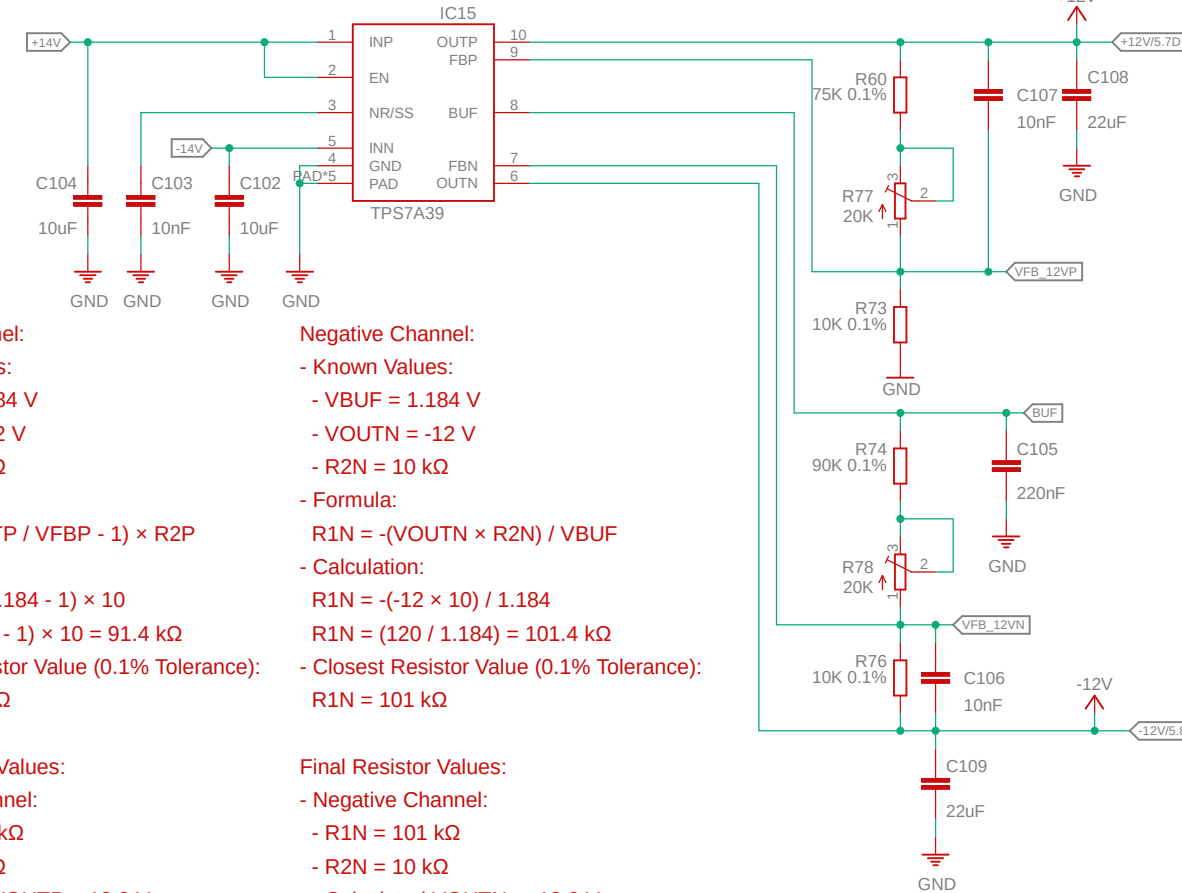
## 2.5V VREF



## TESTPOINTS POWER



## +/-14V to +/-12V LDO



Positive Channel:

- Known Values:
- VFBP = 1.184 V
- VOUTP = 12 V
- R2P = 10 k $\Omega$
- Formula:
- $$R1P = (VOUTP / VFBP - 1) \times R2P$$
- Calculation:
- $$R1P = (12 / 1.184 - 1) \times 10$$
- $$R1P = (10.14 - 1) \times 10 = 91.4 \text{ k}\Omega$$
- Closest Resistor Value (0.1% Tolerance):
- $$R1P = 91.5 \text{ k}\Omega$$

Final Resistor Values:

- Positive Channel:
- R1P = 91.5 k $\Omega$
- R2P = 10 k $\Omega$
- Calculated VOUTP  $\approx$  12.0 V

Positive Channel:

- Target VOUTP = 12 V,
- adjustment range: 10.8 V to 13.2 V.
- Feedback Resistor Configuration:
- R2P = 10 k $\Omega$  (fixed).
- R1P = 75 k $\Omega$  (fixed) + 20 k $\Omega$  (trimmer).
- Adjustment Range:
- R1P = 81.2 k $\Omega$  to 101.5 k $\Omega$ .

Negative Channel:

- Known Values:
- VBUF = 1.184 V
- VOUTN = -12 V
- R2N = 10 k $\Omega$
- Formula:
- $$R1N = -(VOUTN \times R2N) / VBUF$$
- Calculation:
- $$R1N = -(-12 \times 10) / 1.184$$
- $$R1N = (120 / 1.184) = 101.4 \text{ k}\Omega$$
- Closest Resistor Value (0.1% Tolerance):
- $$R1N = 101 \text{ k}\Omega$$

Final Resistor Values:

- Negative Channel:
- R1N = 101 k $\Omega$
- R2N = 10 k $\Omega$
- Calculated VOUTN  $\approx$  -12.0 V

Negative Channel:

- Target VOUTN = -12 V,
- adjustment range: -10.8 V to -13.2 V.
- Feedback Resistor Configuration:
- R2N = 10 k $\Omega$  (fixed).
- R1N = 90 k $\Omega$  (fixed) + 20 k $\Omega$  (trimmer).
- Adjustment Range:
- R1N = 91.2 k $\Omega$  to 111.5 k $\Omega$ .

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