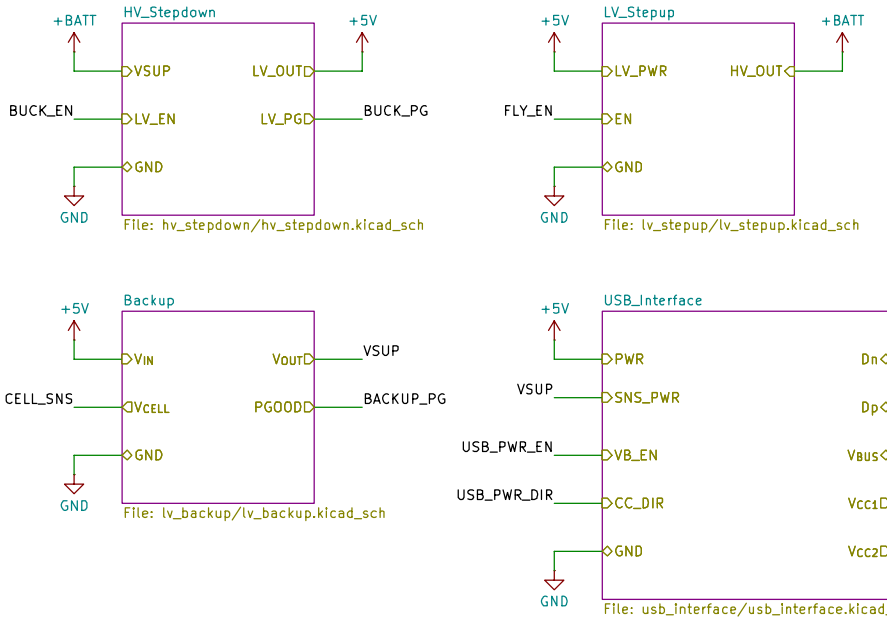
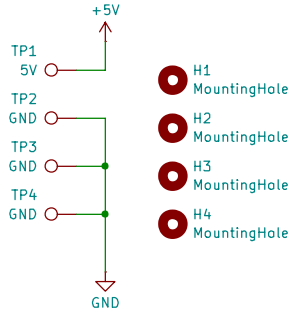
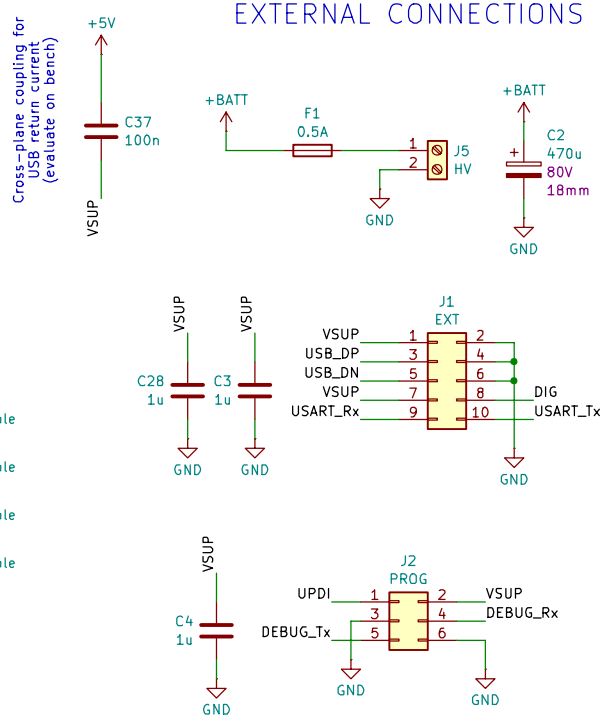
## SUBSYSTEMS



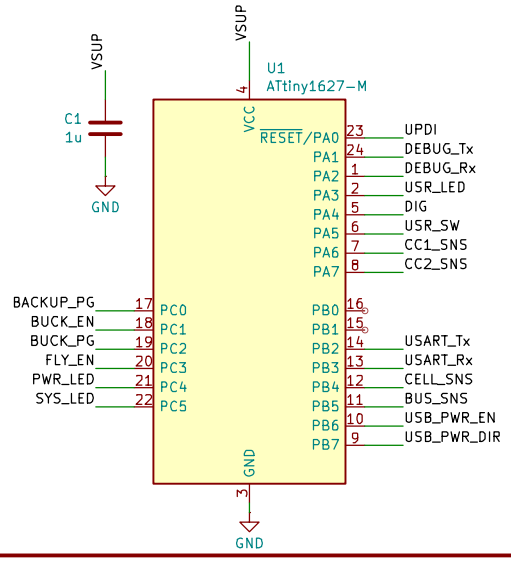

## MECHANICAL



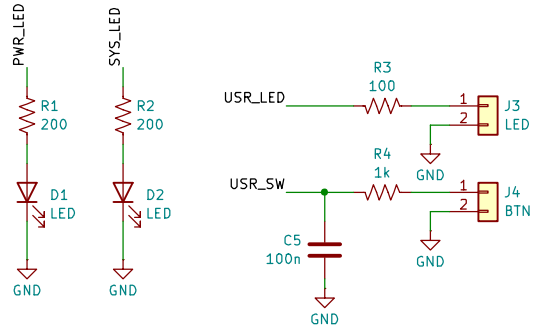

## EXTERNAL CONNECTIONS




## MICROCONTROLLER



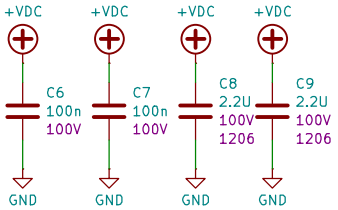

## USER INTERFACE



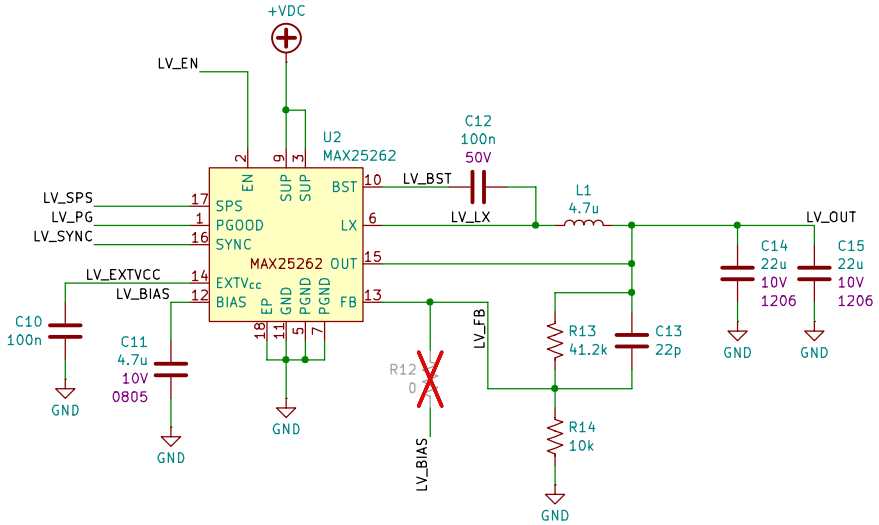

| | |
|---|---|
| Project: Low Voltage Power System | |
| Schematic: Root | |
| All resistors 0603 1% 0.1W unless noted<br>All capacitors 0603 16V 10% X5R unless noted | |
| Date: 2025-07-16 Rev: 0 page: 1/5 | SMITH EMPIRE LABORATORIES |

# HV STEP-DOWN REGULATOR

## BYPASSING




One cap of each type
per input pin

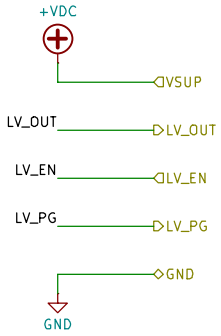



Short FB to BIAS for fixed output

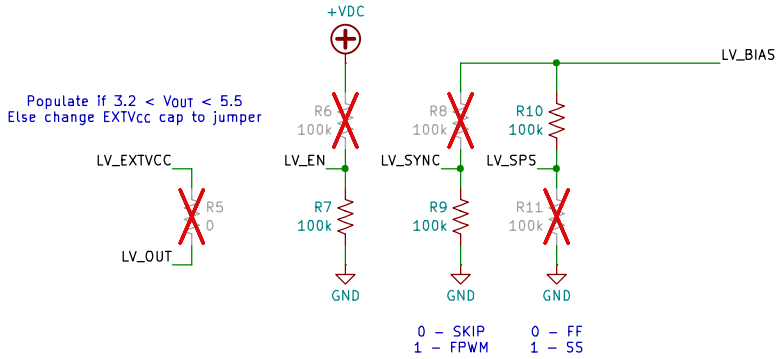
Otherwise, use formula for output:

$V_{OUT} = (R_T/R_B + 1)$

## SHEET INTERFACES

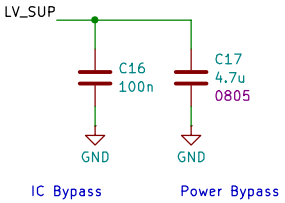



## CONFIGURATION

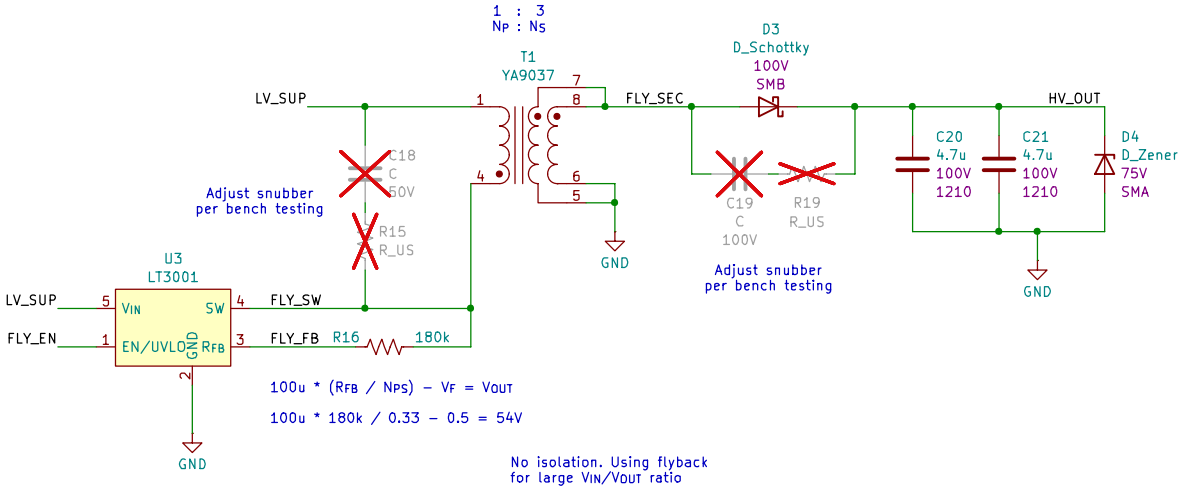


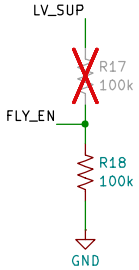

| | |
|---|---|
| Project: HV Step-Down Regulator | |
| Schematic: HV_Stepdown | |
| All resistors 0603 1% 0.1W unless noted<br>All capacitors 0603 16V X5R 10% unless noted | |
| Date: 2025-07-15 Rev: 0 page: 2/5 | SMITH EMPIRE LABORATORIES |

## BYPASSING

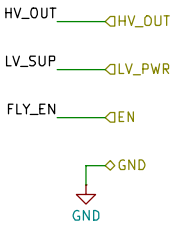



## FLYBACK REGULATOR




## SHEET INTERFACES



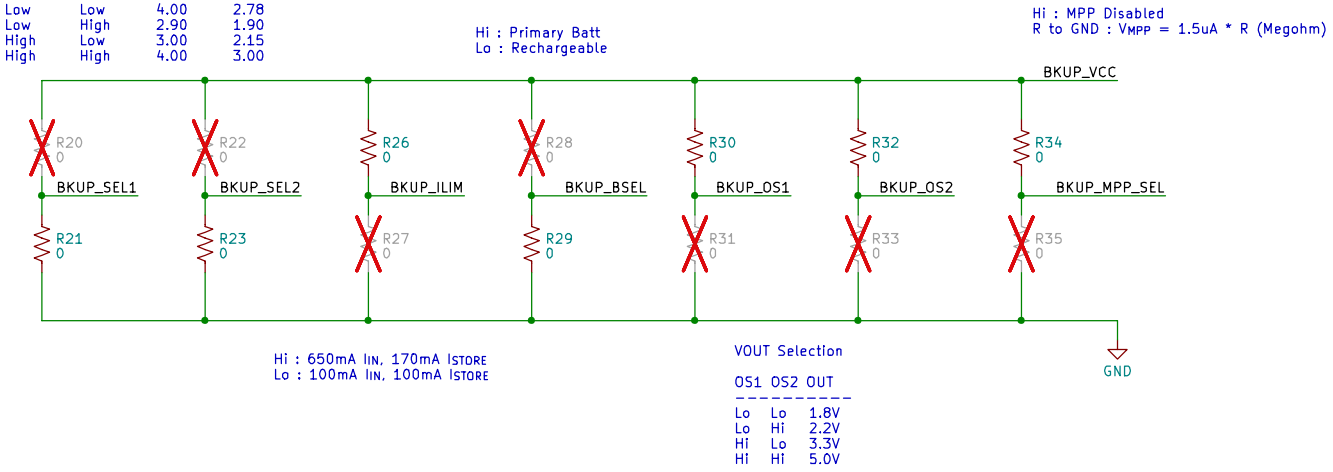

| | | |
|---|---|---|
| Project: LV Step-Up (Flyback) Regulator | | |
| Schematic: LV_Stepup | | |
| All resistors 0603 1% 0.1W unless noted<br>All capacitors 0603 16V 10% X5R unless noted | | |
| Date: 2025-07-16 | Rev: 0 | page: 3/5 |

SMITH EMPIRE LABORATORIES

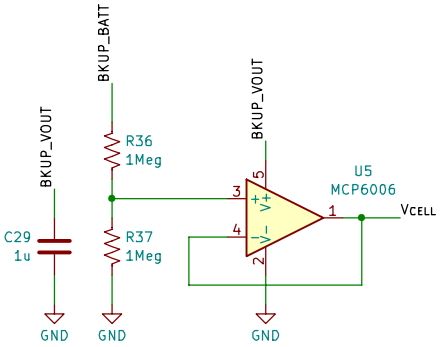
## Pin Configuration Options

OV/UV Settings (Rechargeable)

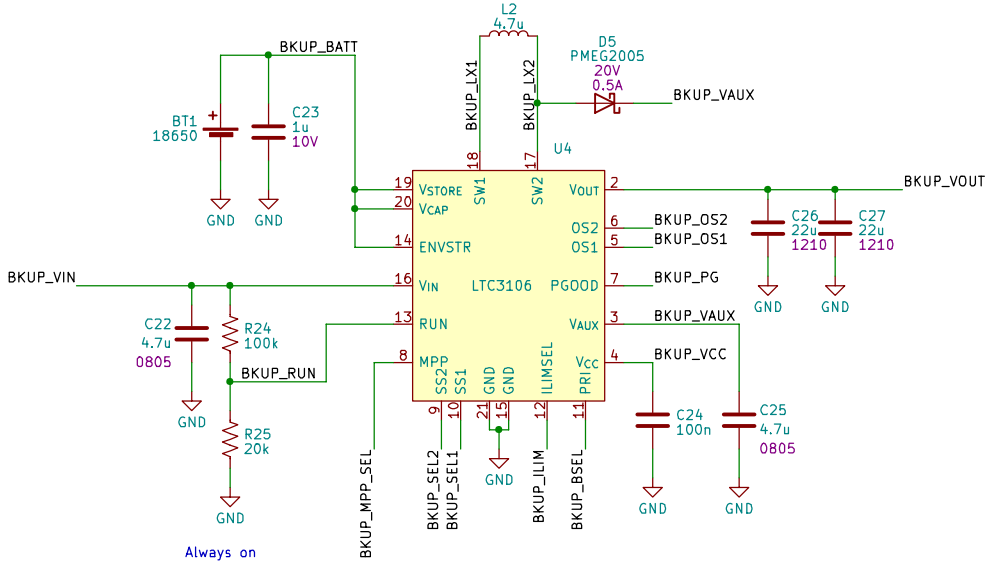
| SEL1 | SEL2 | OV | UV |
|---|---|---|---|
| Low | Low | 4.00 | 2.78 |
| Low | High | 2.90 | 1.90 |
| High | Low | 3.00 | 2.15 |
| High | High | 4.00 | 3.00 |



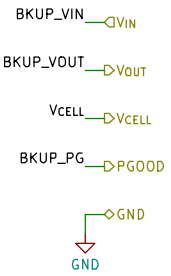

## Cell Voltage Buffer




## Regulator Circuit

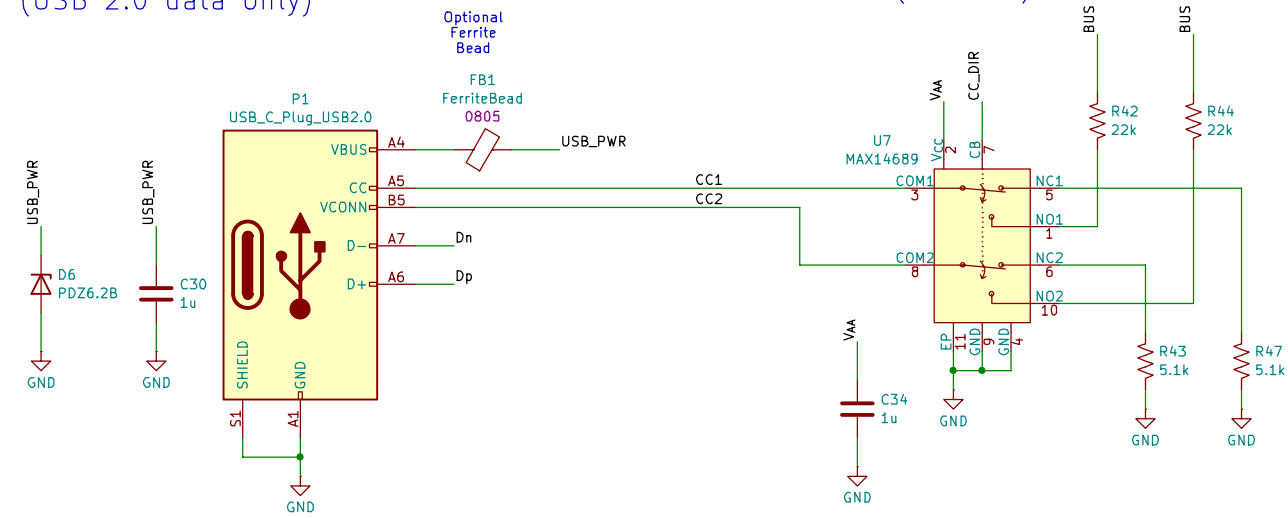



## Sheet Interfaces




| | |
|---|---|
| Project: LV Backup Power System | |
| Schematic: Backup | |
| All resistors 0603 1% 0.1W unless noted<br>All capacitors 0603 16V 10% X5R unless noted | |
| Date: 2025-07-15 Rev: 0 page: 4/5 | SMITH EMPIRE LABORATORIES |

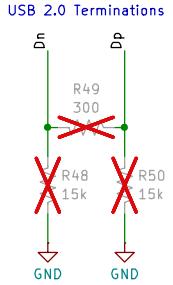
## USB-C Connector (USB 2.0 data only)



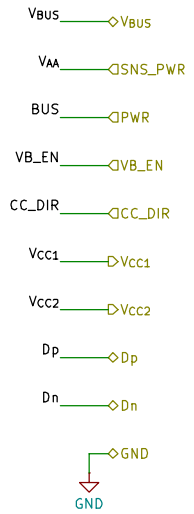

## Analog Switch (CC Pins)



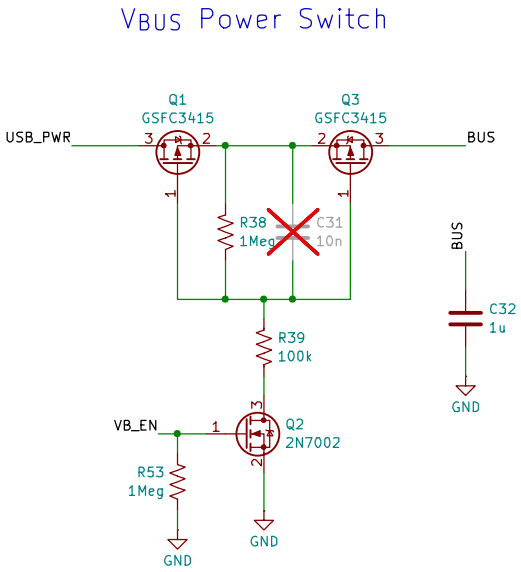

## USB 2.0 Terminations



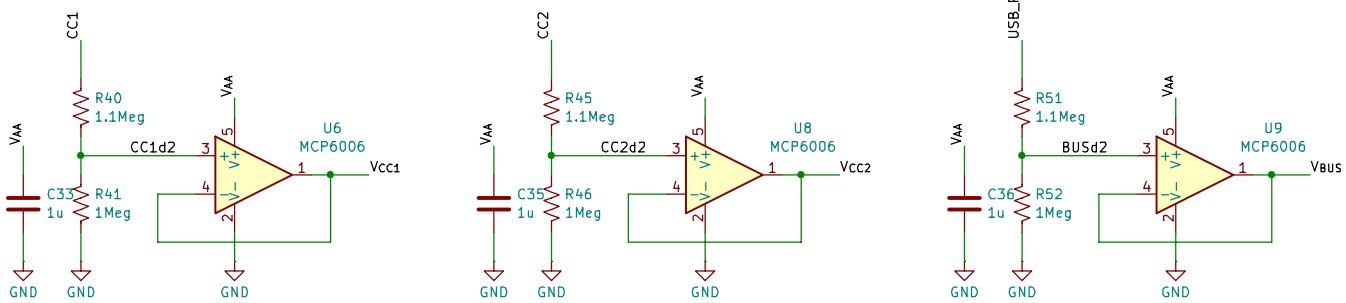

## Sheet Interfaces




## VBUS Power Switch




## Voltage Signal Buffers




| | |
|---|---|
| Project: USB Interface | |
| Schematic: USB_Interface | |
| All resistors 0603 1% 0.1W unless noted<br>All capacitors 0603 16V 10% X5R unless noted | |
| Date: 2025-01-24 Rev: 0 page: 5/5 | SMITH EMPIRE LABORATORIES |