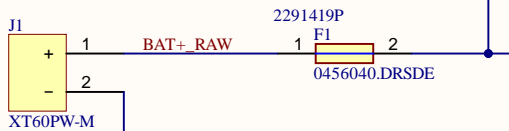
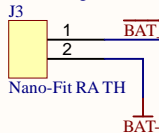


MAIN BATTERY INPUT



BATTERY DISCONNECT SIGNAL

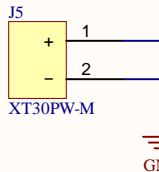
Short across connector to pull !BAT\_DC low. This will disable the precharge circuit effectively disconnecting the onboard battery.



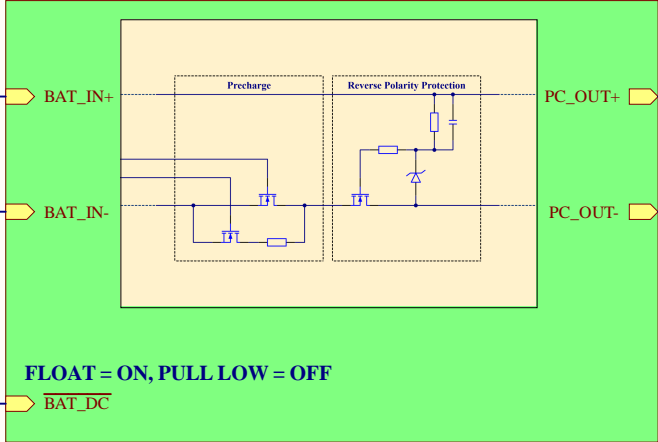
"!BAT\_DC" connects to the 12V supply within the precharge subsystem. On pulling "!BAT\_DC" to ground, and sinking roughly 3mA of current, the 12V supply will be starved and drop to 0V. This will prevent the gate drivers from supplying voltage to the N-FETs and the robot will effectively be fully off. Some parasitic current draw from the battery may still be present, but the main current path (to motors, DC/DC, etc.) will be broken.

P2: Option to break connection to !BAT\_DC and disable the function of the Robot on/off switch ( J3 ).  
OPEN = Robot on/off switch cannot turn robot off  
CLOSED (default) = Robot on/off switch functional

BATTERY SWAP INPUT



U\_InrushLimiter  
InrushLimiter.SchDoc



PC\_OUT+  
PC\_OUT-  
GND

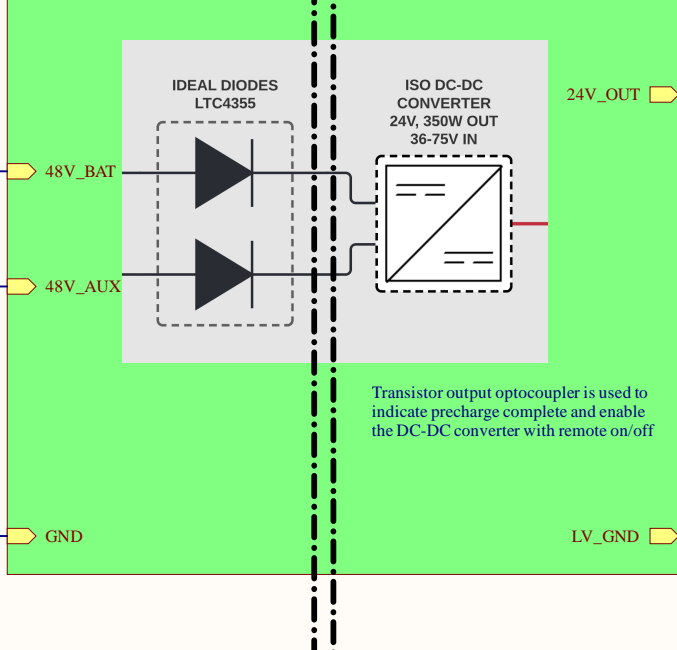
48V

FLOAT = ON, PULL LOW = OFF

LOAD SIDE - TO FEI-FEI

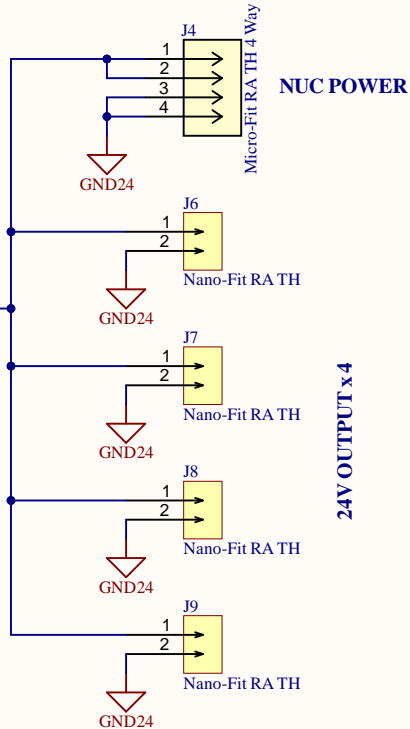
BATTERY DOMAIN

U\_Rus  
Rus.SchDoc



24V DOMAIN

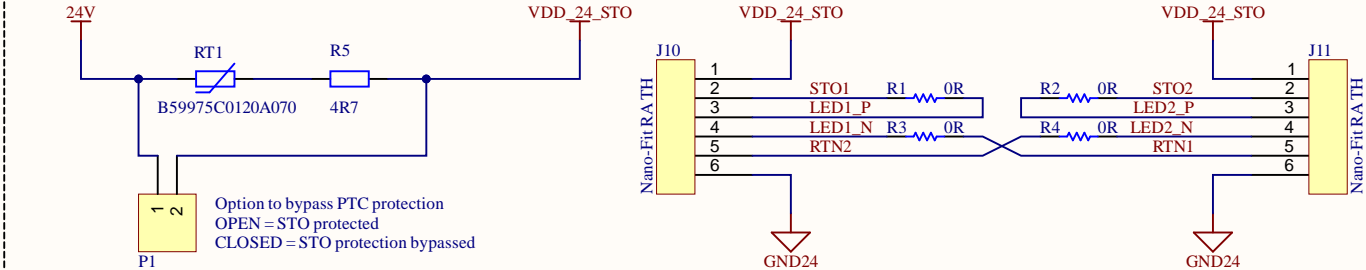
24V OUTPUTS



NUC POWER

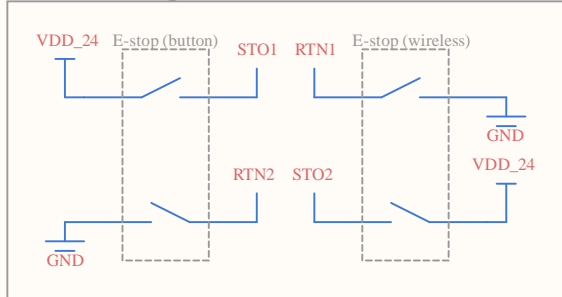
24V OUTPUT x 4

STO BUTTON AND HOPPER

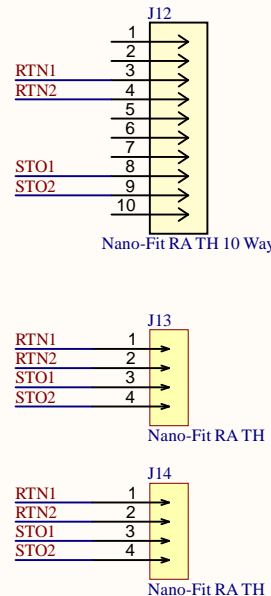


From testing; a full robot STO draws just under 200mA from 24V when on. A current draw of 450mA can be considered a failure of the STO without causing the 24V line to drop out. A PTC thermistor is therefore used with rated current 450mA to protect the 24V line in case of STO short circuit or similar.

STO Button Logic



STO OUTPUT AND SPARES



CREATIVE COMMONS  
PUBLIC LICENSE:

CC BY-NC 4.0

THIS DESIGN IS BEING PROVIDED FOR NON-COMMERCIAL USE ONLY. THE USE OF DANIELA RUS'S NAME IN CONNECTION WITH THE DESIGN IS NOT INTENDED TO IMPLY THAT DANIELA RUS SPONSORS OR ENDORSES THE DESIGN, GOOGLE LLC, OR ANY OF GOOGLE LLC'S PRODUCTS OR SERVICES.

BARKOUR ROBOT

RUS POWER DISTRO BOARD V4

APPROVED GOOGLE LLC

DWNG NO 650-03253-01

RELEASED 2024/05/09

FILE Inrus.SchDoc

Inrus.SchDoc

Google DeepMind

1600 AMPHITHEATRE PARKWAY  
MOUNTAIN VIEW CA 94043

SIZE A3

SHEET 1 OF 3

Grounding Detail

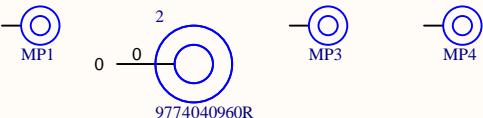
GND = General use "Ground" net. Exists after the precharge circuit.

BAT- = Direct connection to battery negative. This net is at -VBAT with respect to GND before precharge so components should not reference both domains.

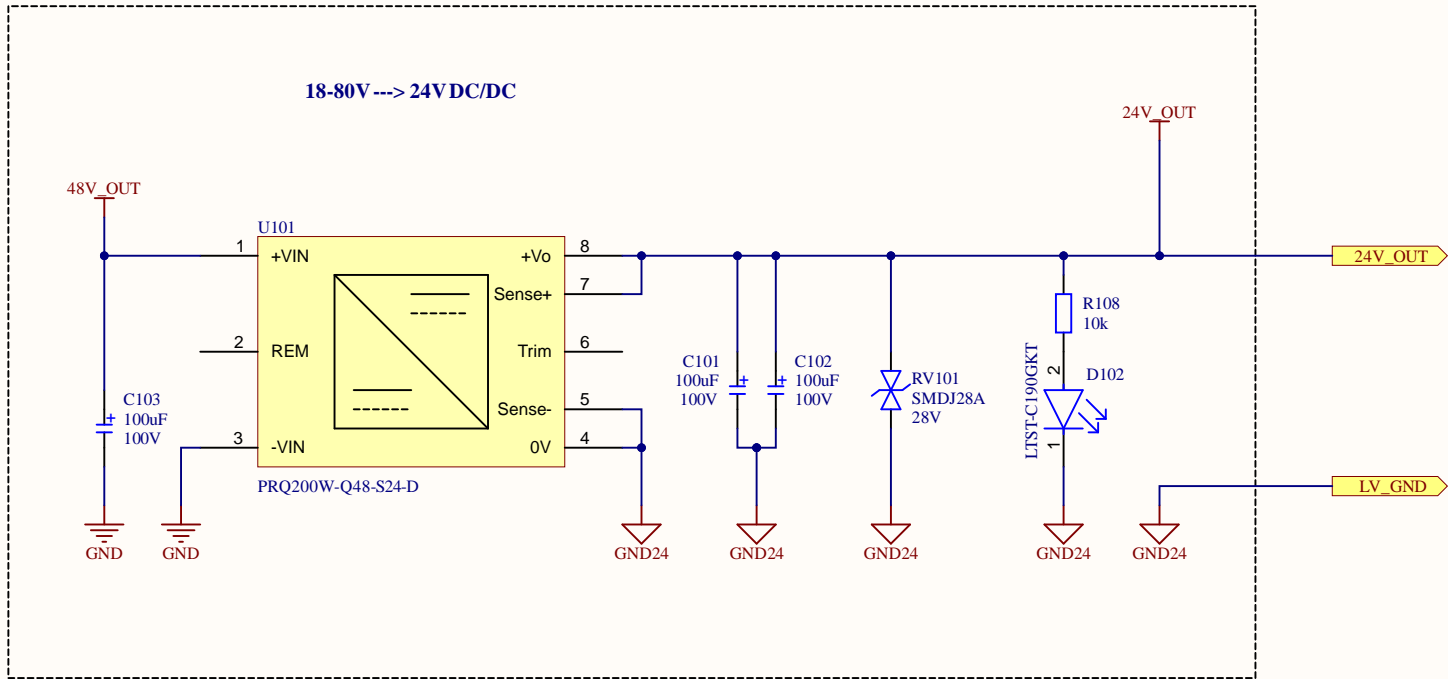
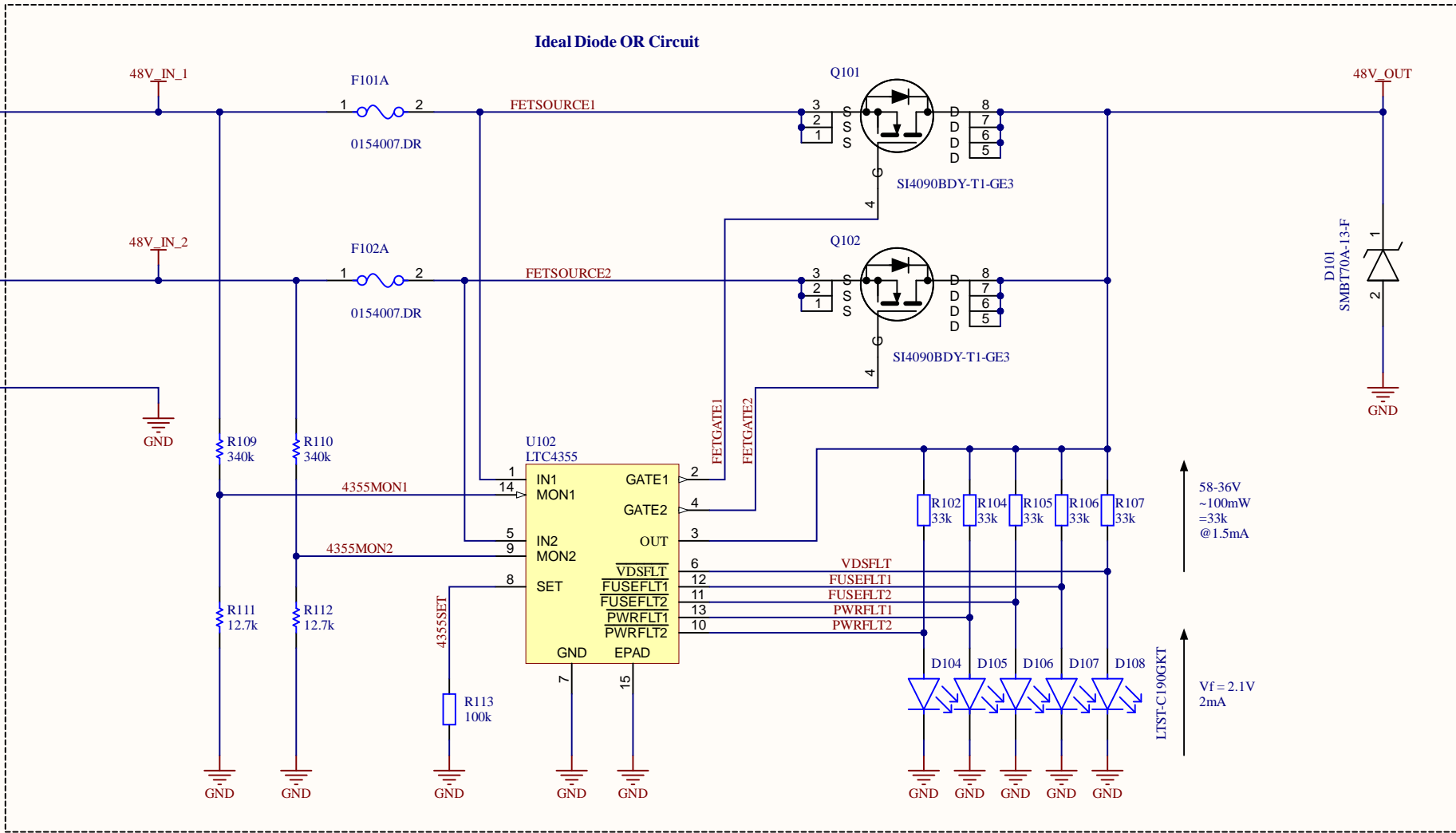
GND24 = Negative side of isolated supply generated by DC/DC converter. Keep isolated across barrier shown.

NOTE:

In this project we are using the "Strict Hierarchical" net option. This prevents power ports from working globally across the design unless explicitly connected through sheet entry ports. This decision was made because connection of power ports is fundamental to the design and must be made explicit.







**CREATIVE COMMONS  
PUBLIC LICENSE:**

**CC BY-NC 4.0**

THIS DESIGN IS BEING PROVIDED FOR NON-COMMERCIAL USE ONLY. THE USE OF DANIELA RUS'S NAME IN CONNECTION WITH THE DESIGN IS NOT INTENDED TO IMPLY THAT DANIELA RUS SPONSORS OR ENDORSES THE DESIGN, GOOGLE LLC, OR ANY OF GOOGLE LLC'S PRODUCTS OR SERVICES.

**BARKOUR ROBOT**

**RUS POWER DISTRO BOARD V4**

APPROVED GOOGLE LLC

DWG NO 650-03253-01

RELEASED 2024/05/09

FILE Rus.SchDoc

*Rus.SchDoc*

**Google DeepMind**

1600 AMPHITHEATRE PARKWAY  
MOUNTAIN VIEW CA 94043

SIZE

A3

SHEET 3 OF 3