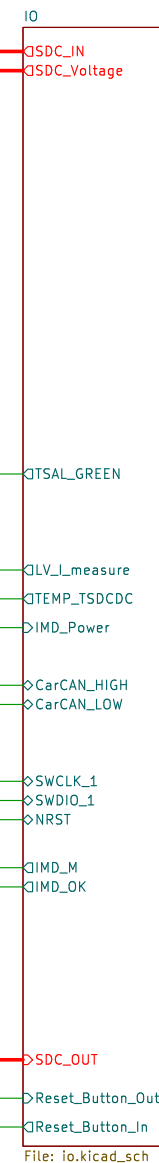
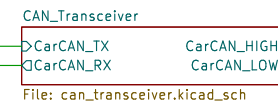
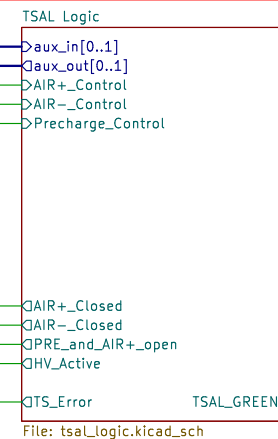
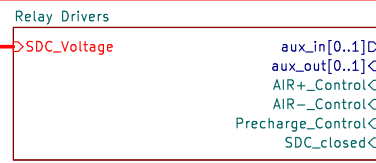
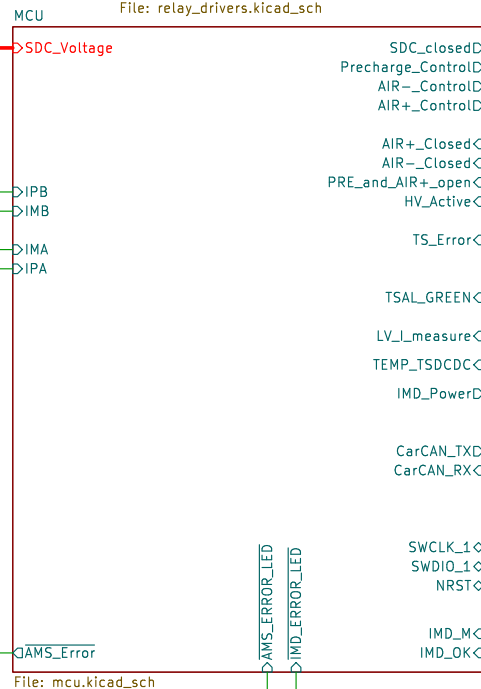
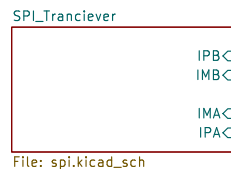
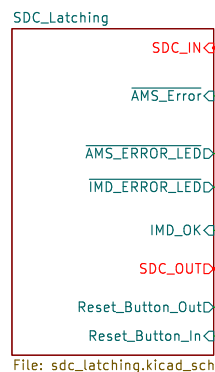
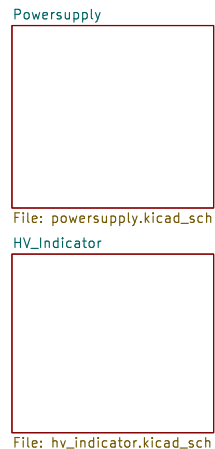


- H1 MountingHole
- H3 MountingHole
- H4 MountingHole
- H5 MountingHole
- FID1 Fiducial
- FID2 Fiducial
- FID3 Fiducial

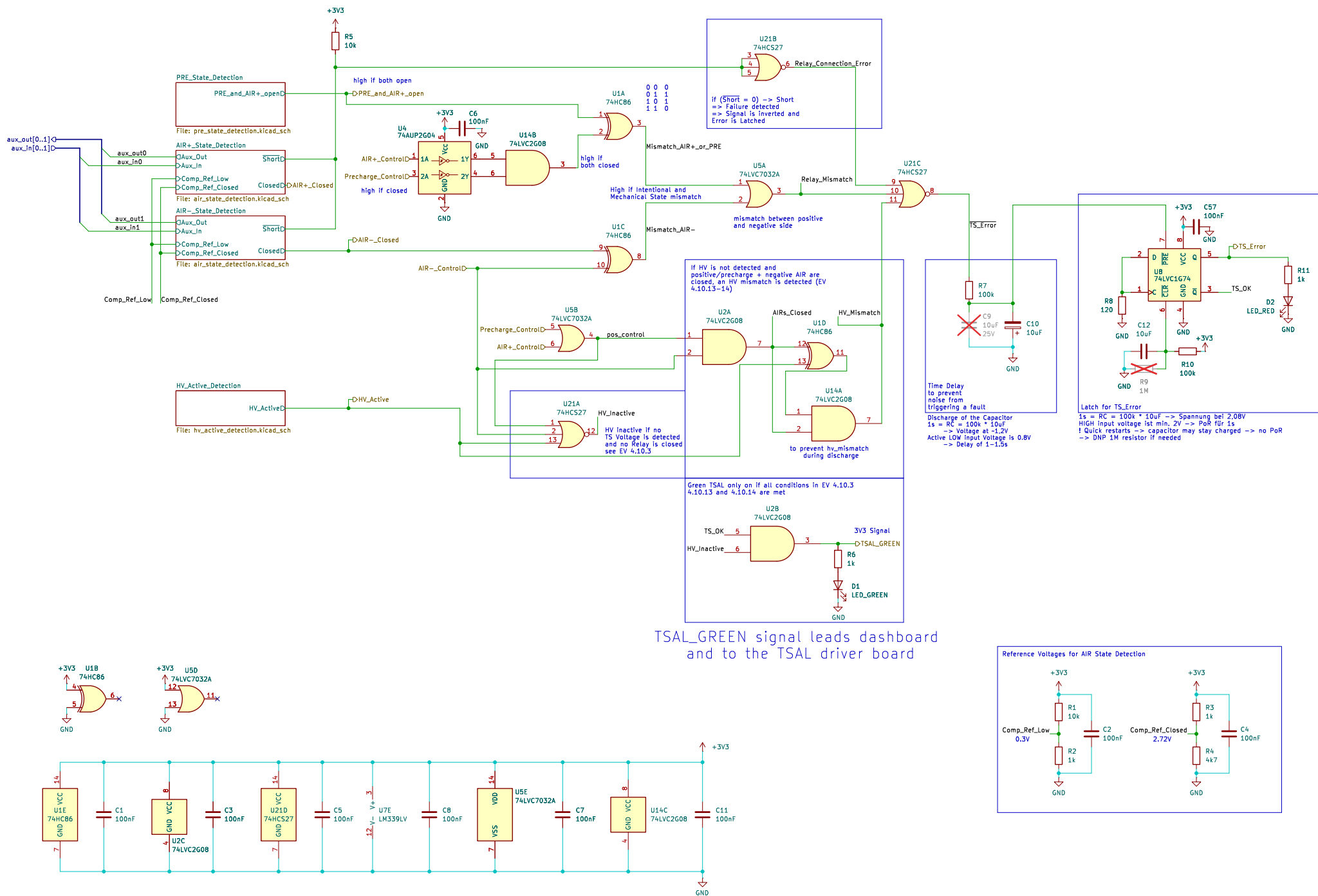


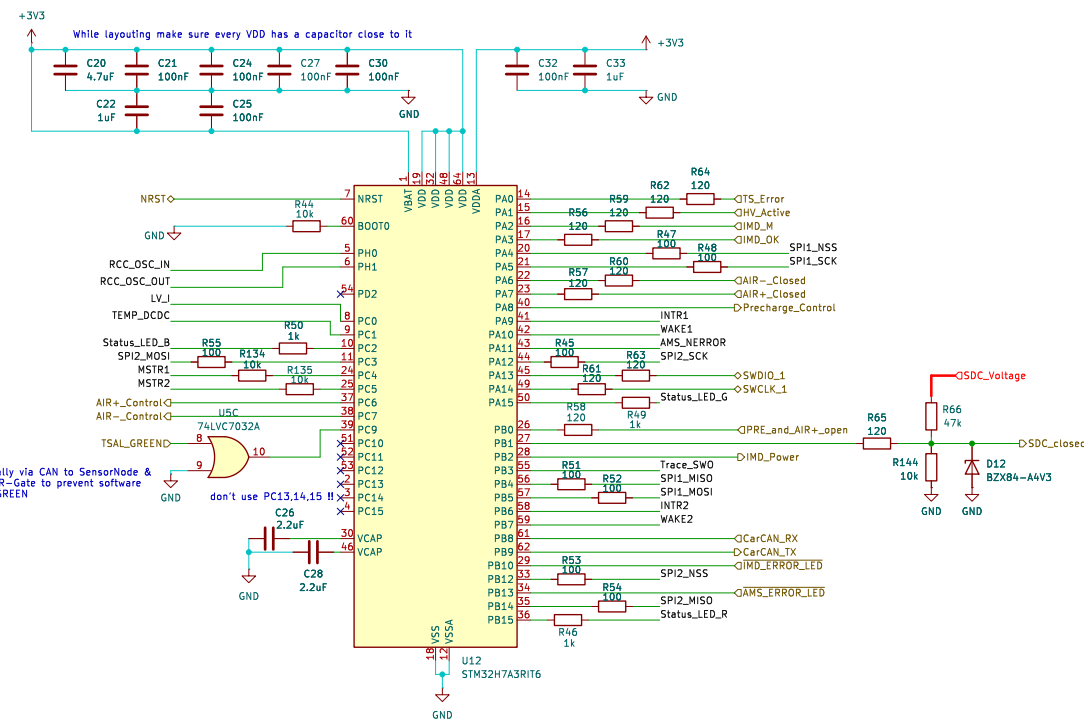
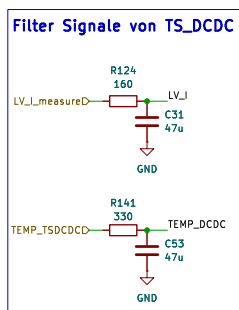
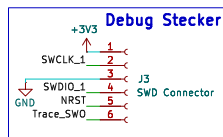
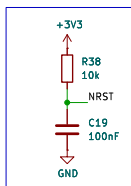
FT25 V2 or FT26:

TSAL Sheet:

- schaltung im Dischargefall (U14A) vereinfachen
- "Bei USB hast du ja schon PC_ctl OR AIR+_ctl, das müsste man nur noch invertieren. Zum invertieren könnte man auch einfach das übrige U1B benutzen ($XOR(a,1) == NOT(a)$). Aber besser natürlich den Pull umdrehen und einfach zwei "closed" Signale vergleichen. " - Oskar

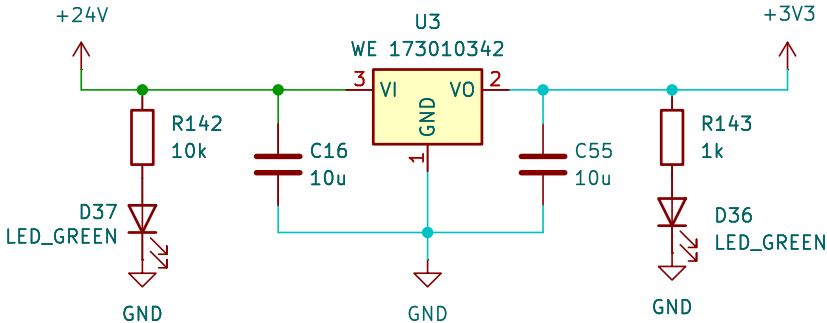
| | |
|------------------------------------|--|
| FASTTUBE | |
| Title: AMS Master Rootsheet | |
| Project: Master_FT25 | |
| Author: Lene Marquardt | |
| Rev: V1 | |
| Date: 2025-03-09 | |
| Exp. Date: 2025-04-27 | |
| Size: A4 Page: 1/15 | |







Power supply from PDU
always on signal



FASTTUBE

Title: Powersupply

Rev: V1

Date: 2025-03-09

Project: Master_FT25

Exp. Date: 2025-04-27

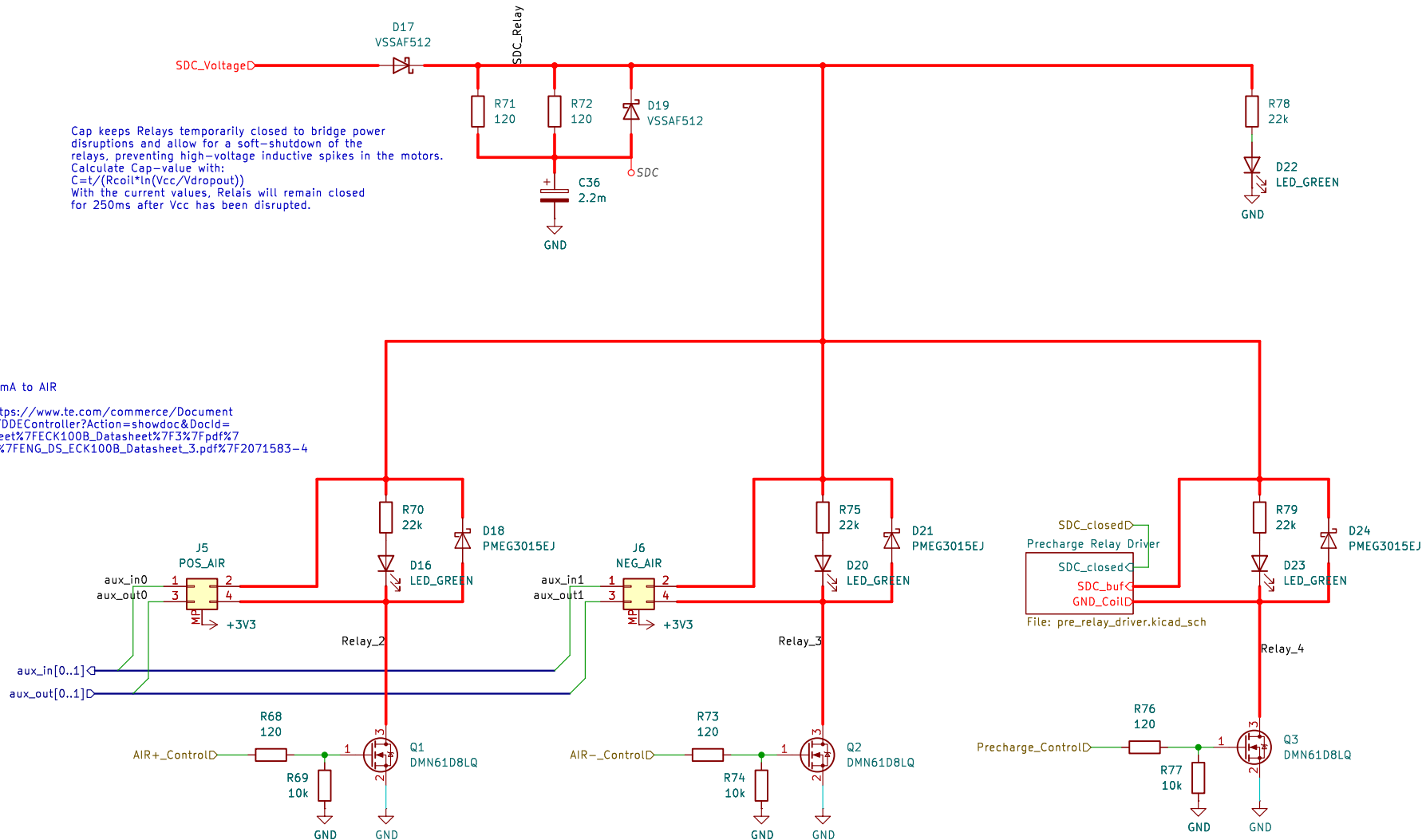
Author: Lene Marquardt

Size: A5 | Page: 8/15

Cap keeps Relays temporarily closed to bridge power disruptions and allow for a soft-shutdown of the relays, preventing high-voltage inductive spikes in the motors.
Calculate Cap-value with:
 $C = t / (R_{coil} * \ln(V_{cc} / V_{dropout}))$
With the current values, Relais will remain closed for 250ms after Vcc has been disrupted.

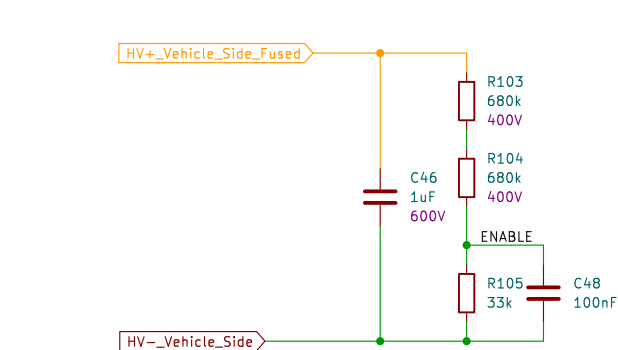
max 500mA to AIR

siehe: https://www.te.com/commerce/DocumentDelivery/DDEController?Action=showdoc&DocId=Data+Sheet%7FECK100B_Datasheet%7F3%7Fpdf%7FEnglish%7FENG_DS_ECK100B_Datasheet_3.pdf%7F2071583-4



The MOSFETs act as a low-side switch for the Power-relais used. The diodes protect the MOSFETs from inductive voltage spikes caused by the Relais-coils when powered off.

HV Indicator nicht verändert, wie FT24

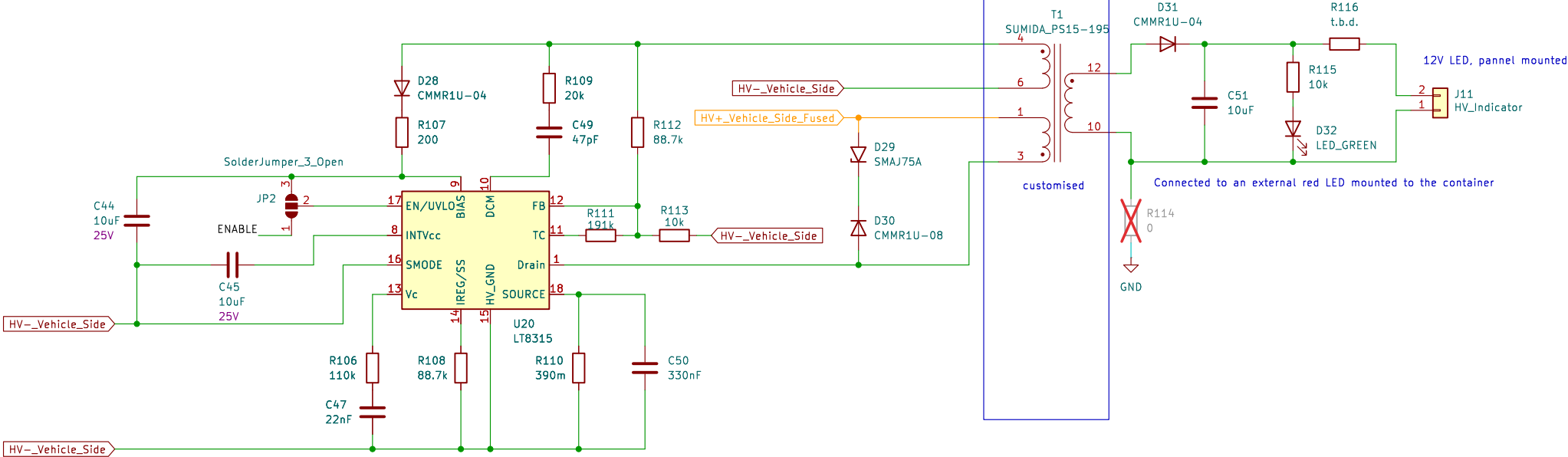


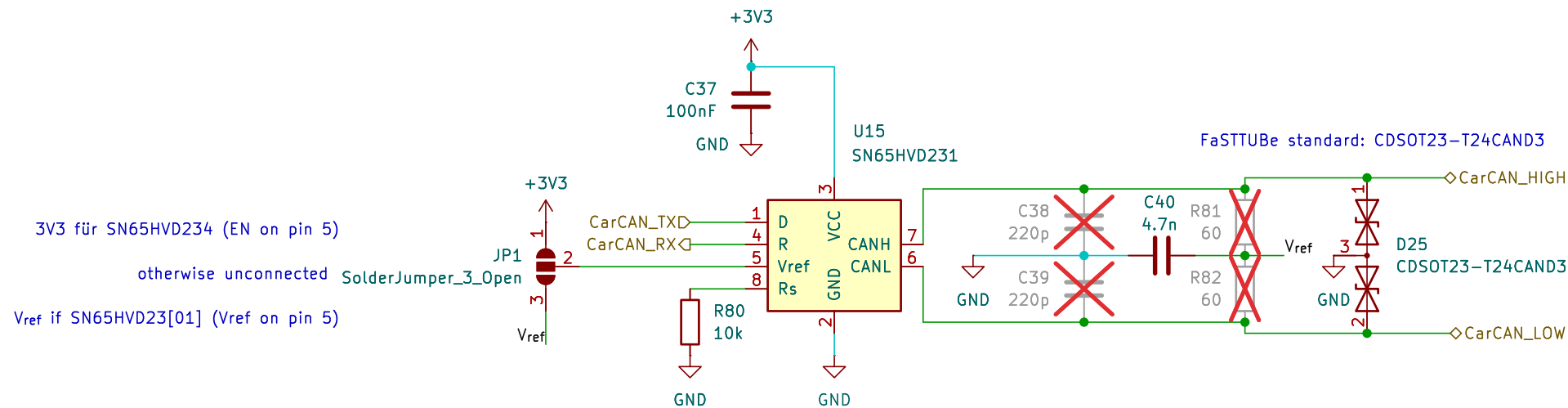
The Enable threshold of the LT8315 is 1.22V
with the given resistor divider the following threshold voltage can be calculated:
 $1.22V \cdot (1360k\Omega + 33k\Omega) / 33k\Omega = 51.5V$
Considering the hysteresis of 65mV mentioned in the datasheet,
the following are the maximum turn-on/off levels:
turn-on: 54.2V
turn-off: 48.7V

The connections go directly to the vehicle side contacts of the AIR+ and AIR-

TS

LV





FASTTUBE

Title: CAN Transciever

Rev: V1

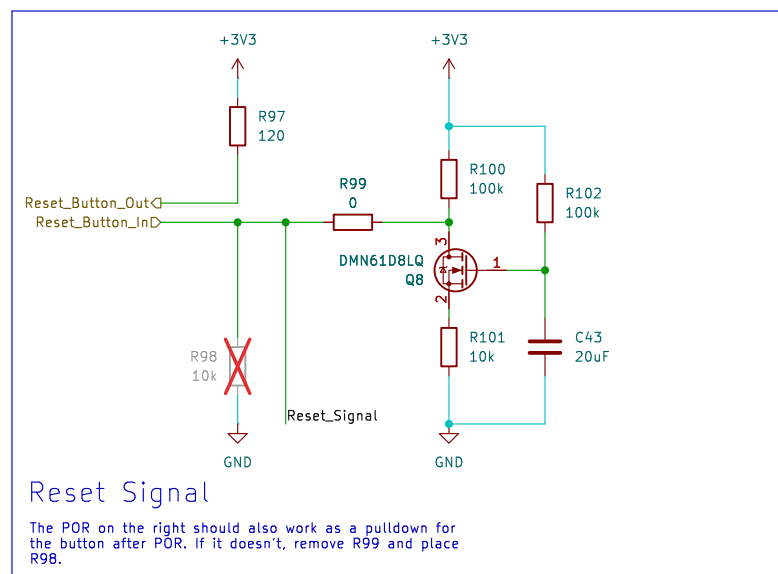
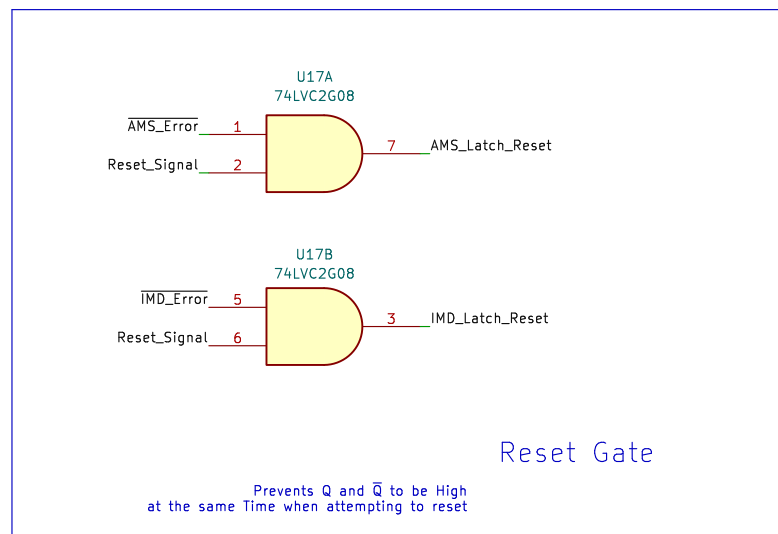
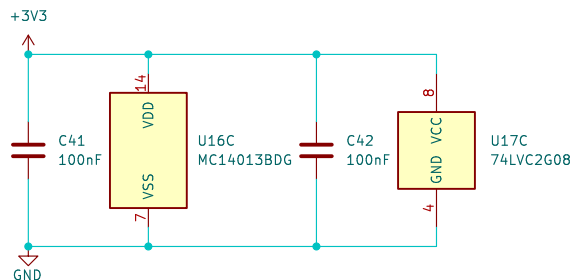
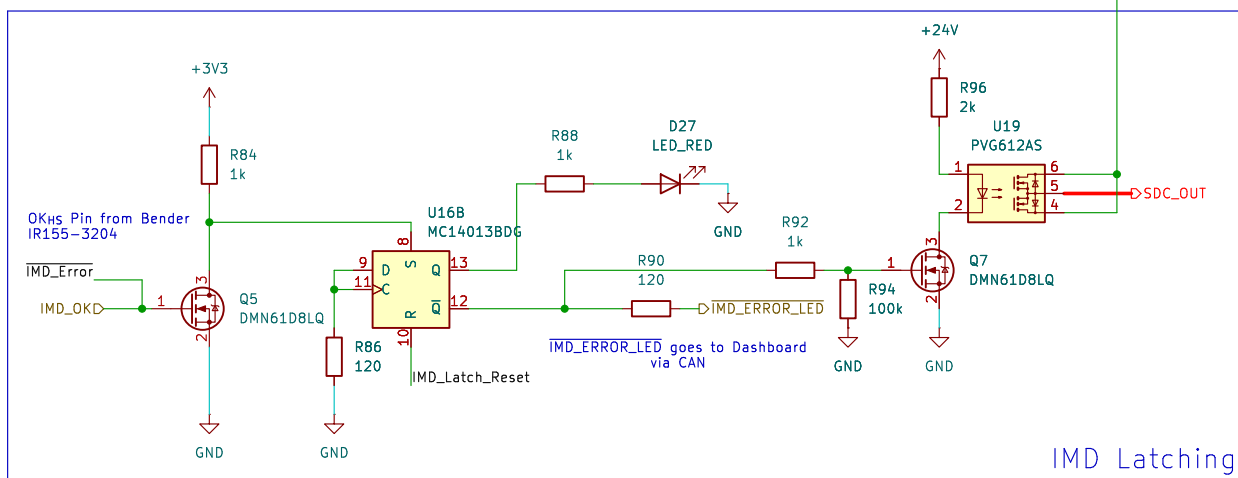
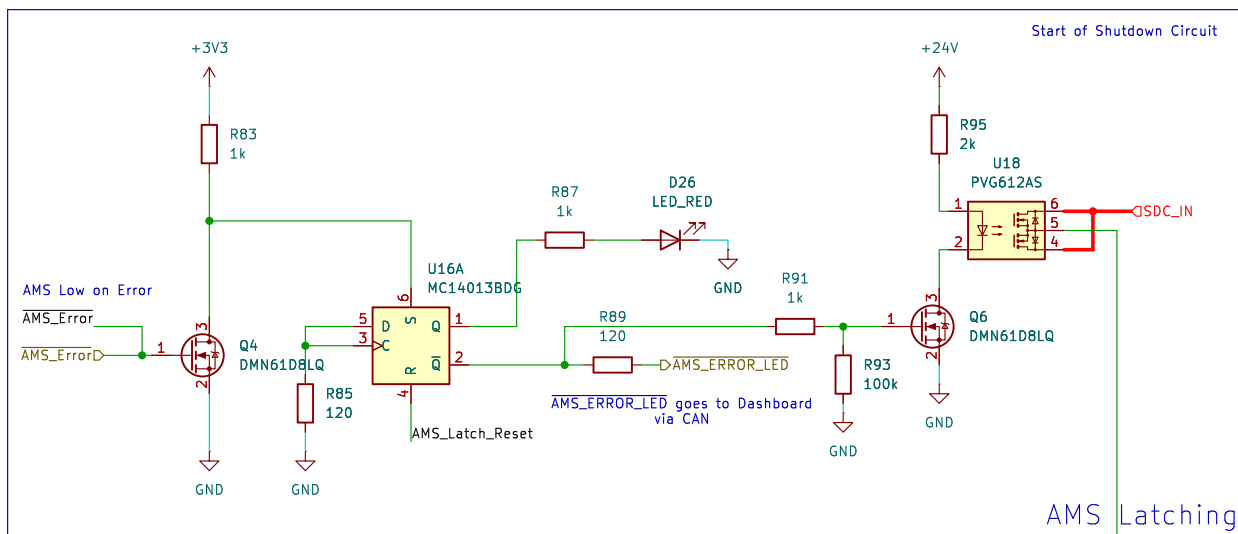
Date: 2025-03-09

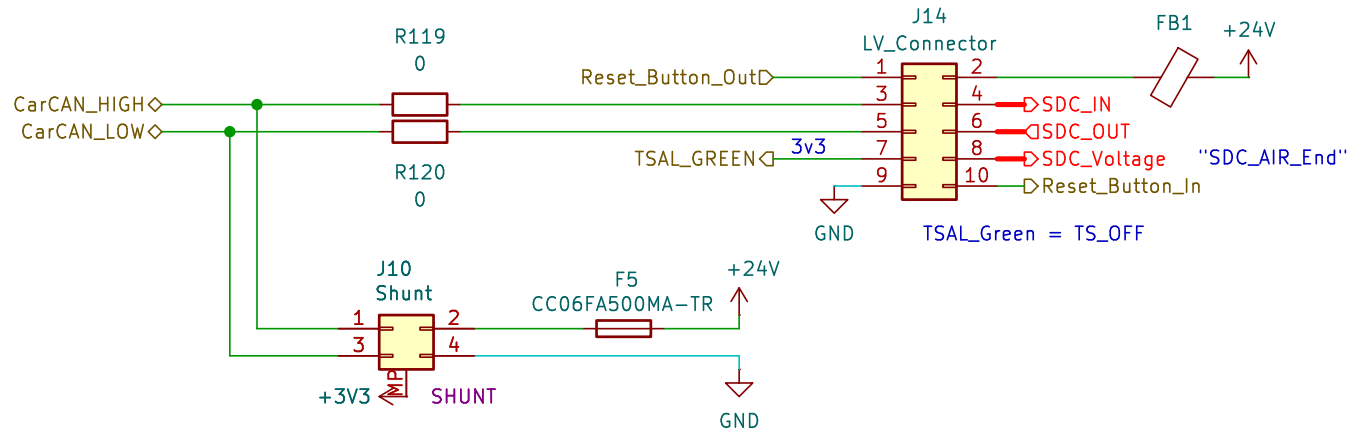
Project: Master_FT25

Exp. Date: 2025-04-27

Author: Lene Marquardt

Size: A5 Page: 11/15



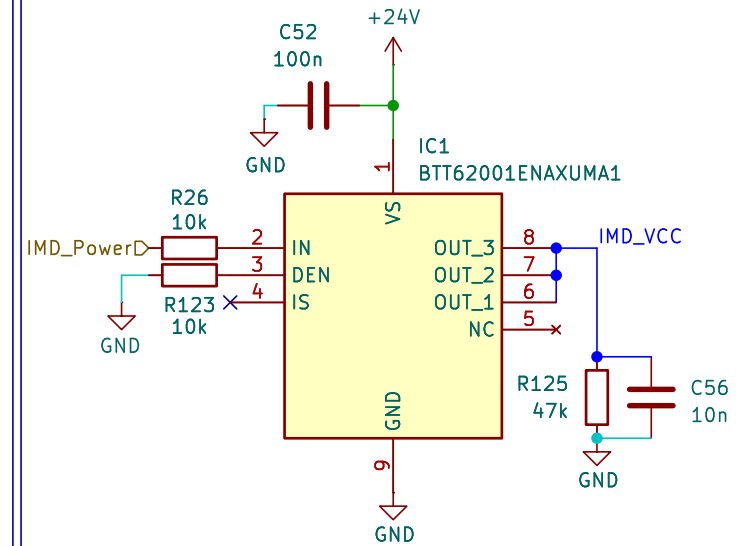


SHUNT:
IVT-S-300-U3-I-CAN1-12/24
max. 80mA

Datasheet
<https://www.isabellenhuettestusa.com/wp-content/uploads/2022/07/Datasheet-IVT-S-V1.03.pdf>

Main Connector

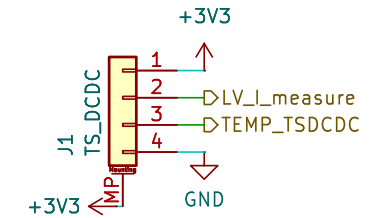
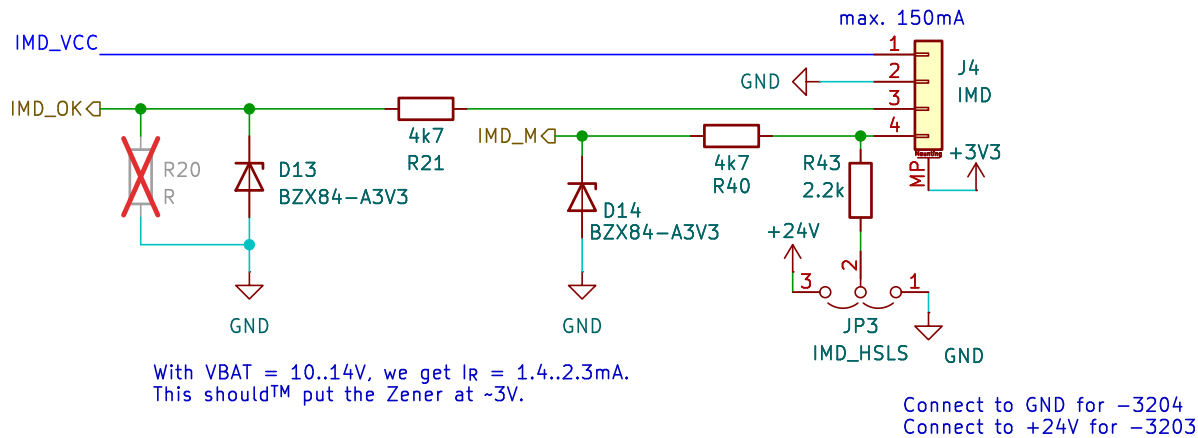
IMD Supply



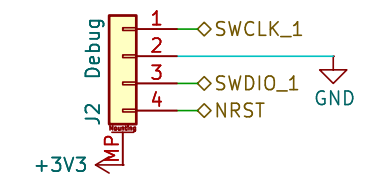
IMD Connector

IMD - Datasheet

https://www.bender.de/fileadmin/content/Products/d/e/IR155-32xx-V004_D00115_D_XXEN.pdf



TSDCDC Connector



Debug Connector

FASTTUBE

Title: Input/Output

Project: Master_FT25

Author: Lene Marquardt

Rev: V1

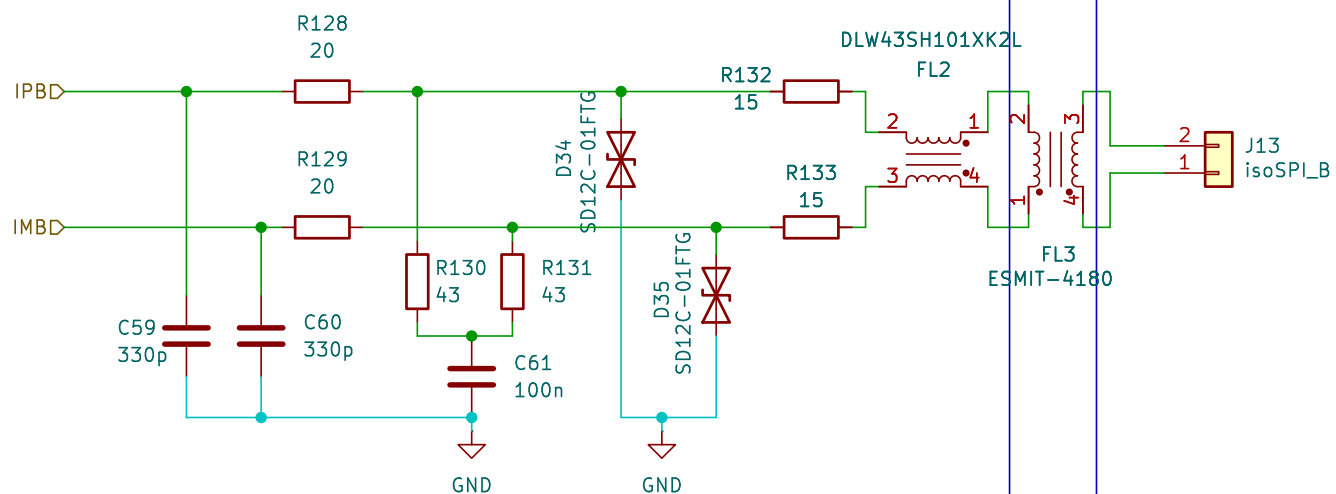
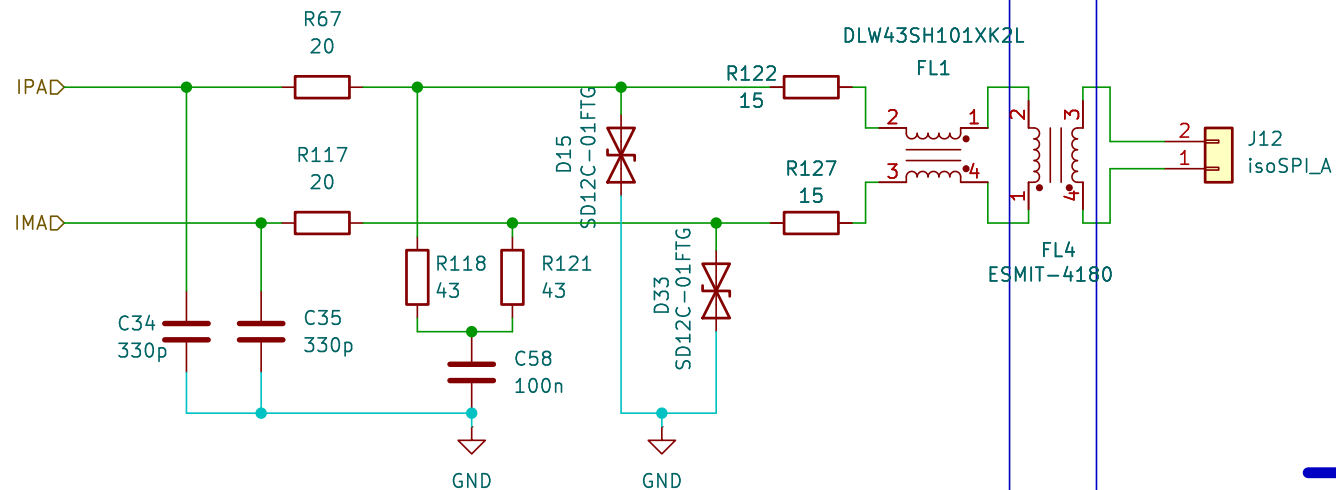
Date: 2025-03-09

Exp. Date: 2025-04-27

Size: A5 Page: 13/15

LV

TS



FASTTUBE

Title: Isolated SPI Transciever

Rev: V1

Date: 2025-03-09

Project: Master_FT25

Exp. Date: 2025-04-27

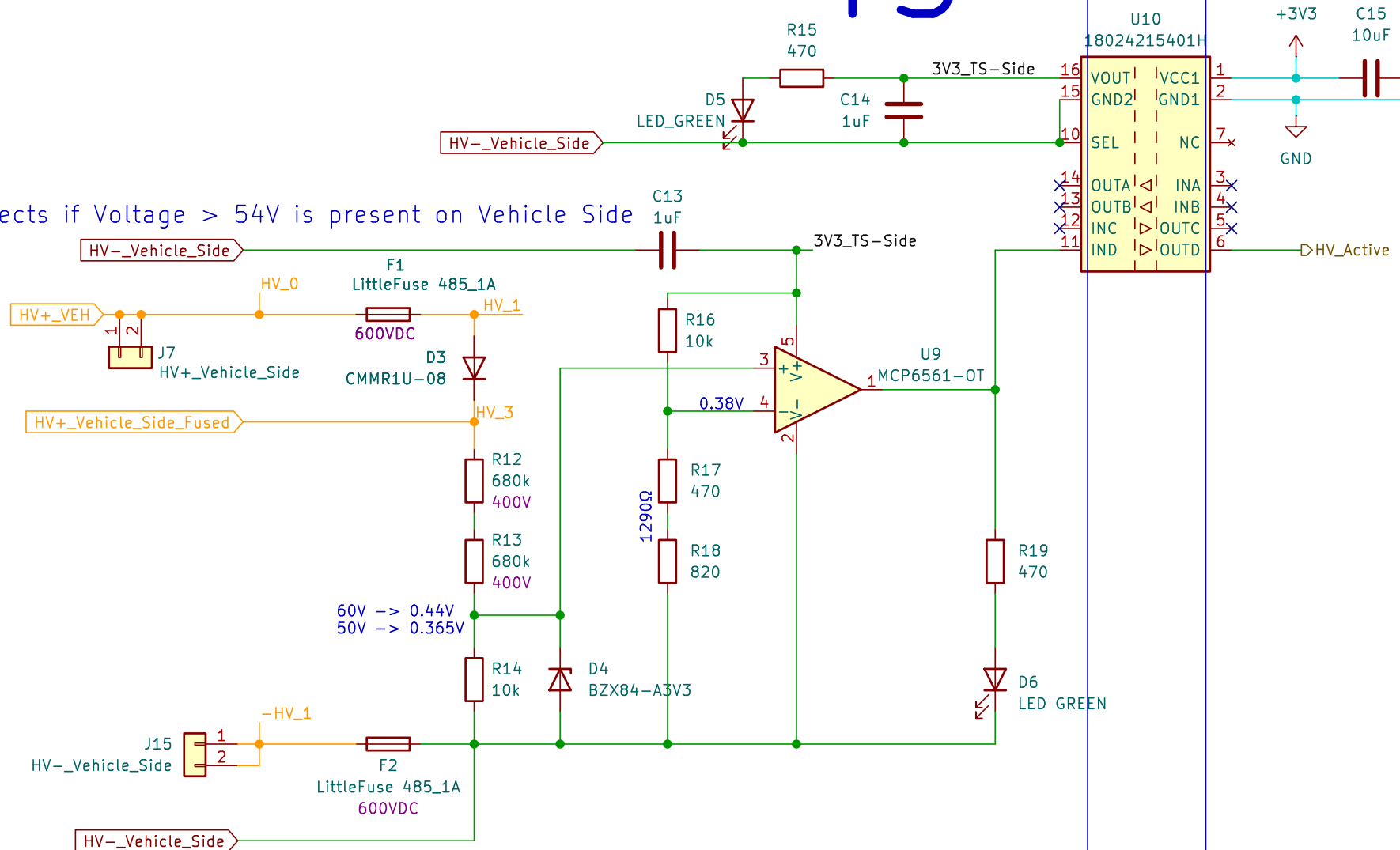
Author: Lene Marquardt

Size: A5 Page: 14/15

TS

LV

Detects if Voltage > 54V is present on Vehicle Side



FASTTUBE

Title: TSAL HV Detection

Rev: V1

Date: 2025-03-09

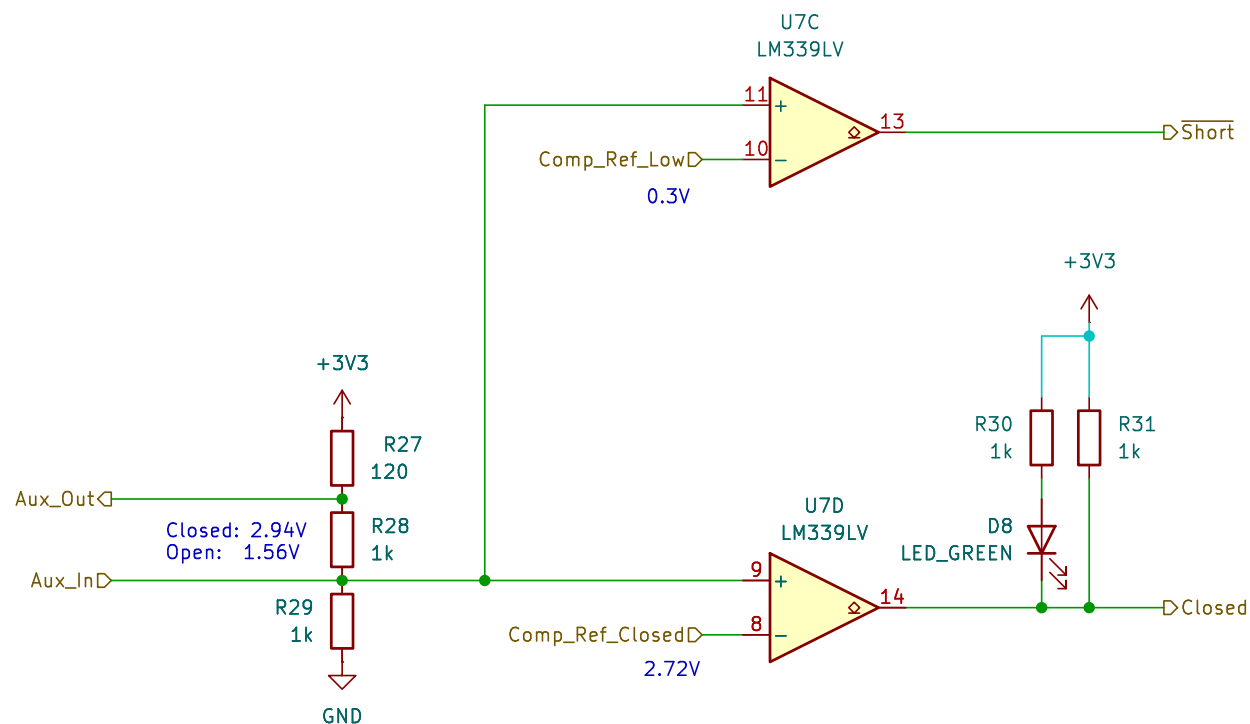
Project: Master_FT25

Exp. Date: 2025-04-27

Author: Lene Marquardt

Size: A5 | Page: 3/15

Accumulator TSAL – Relay state detection



FASTTUBE

Title: AIR Relay State Detection

Rev: V1

Date: 2025-03-09

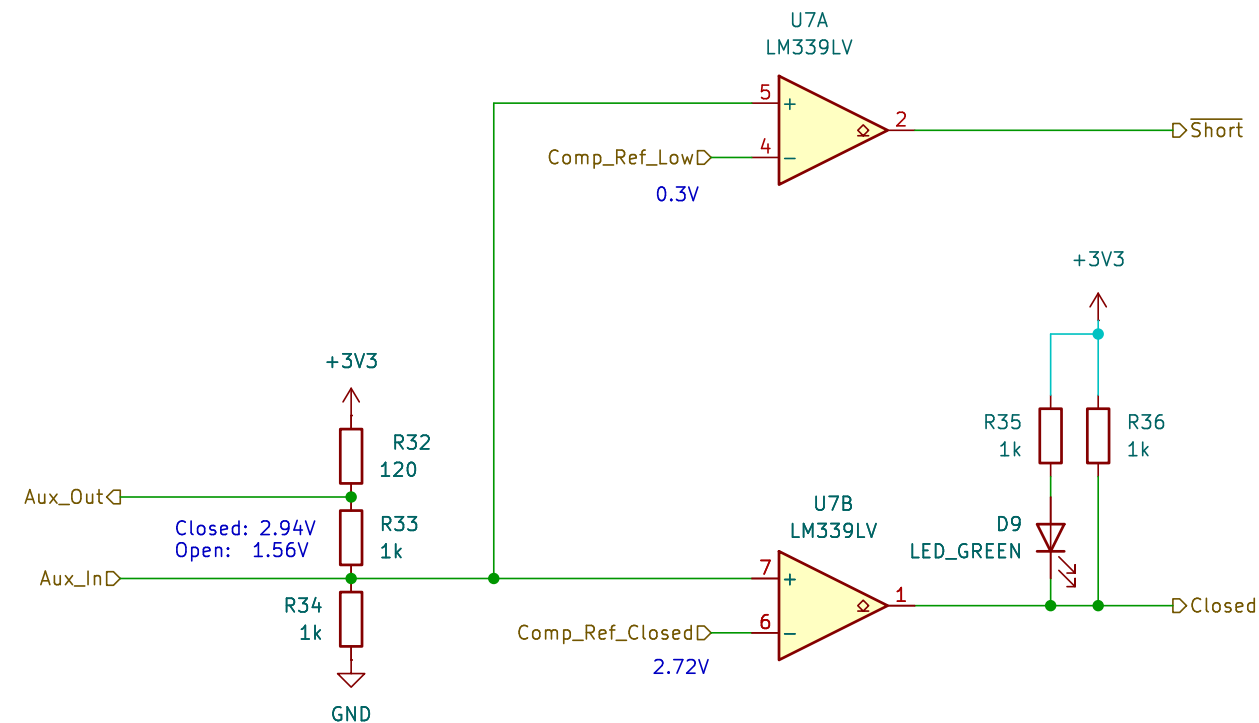
Project: Master_FT25

Exp. Date: 2025-04-27

Author: Lene Marquardt

Size: A5 **Page:** 4/15

Accumulator TSAL – Relay state detection



FASTTUBE

Title: AIR Relay State Detection

Rev: V1

Date: 2025-03-09

Project: Master_FT25

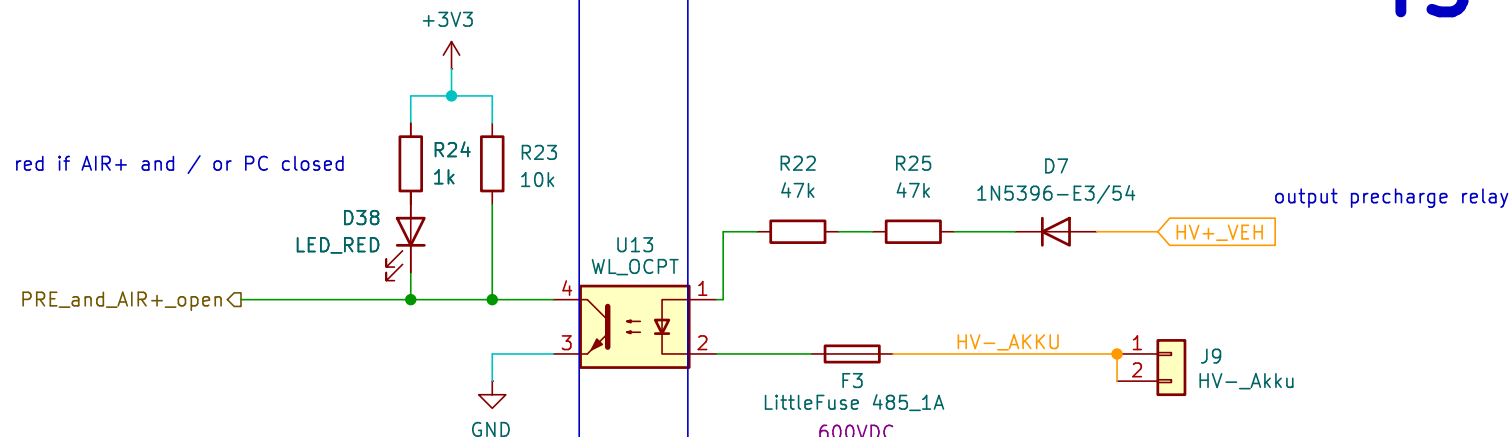
Exp. Date: 2025-04-27

Author: Lene Marquardt

Size: A5 | Page: 5/15

LV

TS



Detects if Precharge or Positive AIR are closed:
 PRE_AIR+_open = 3V3 if both Relays are Open
 PRE_AIR+_open = 0V if one or both are Closed

opto diode current:
 @ maximum TS Voltage 403V = 4,27 mA
 @ minimum TS Voltage 240V = 2,55 mA

FASTTUBE

Title: Precharge State Detection

Rev: V1

Date: 2025-03-09

Project: Master_FT25

Exp. Date: 2025-04-27

Author: Lene Marquardt

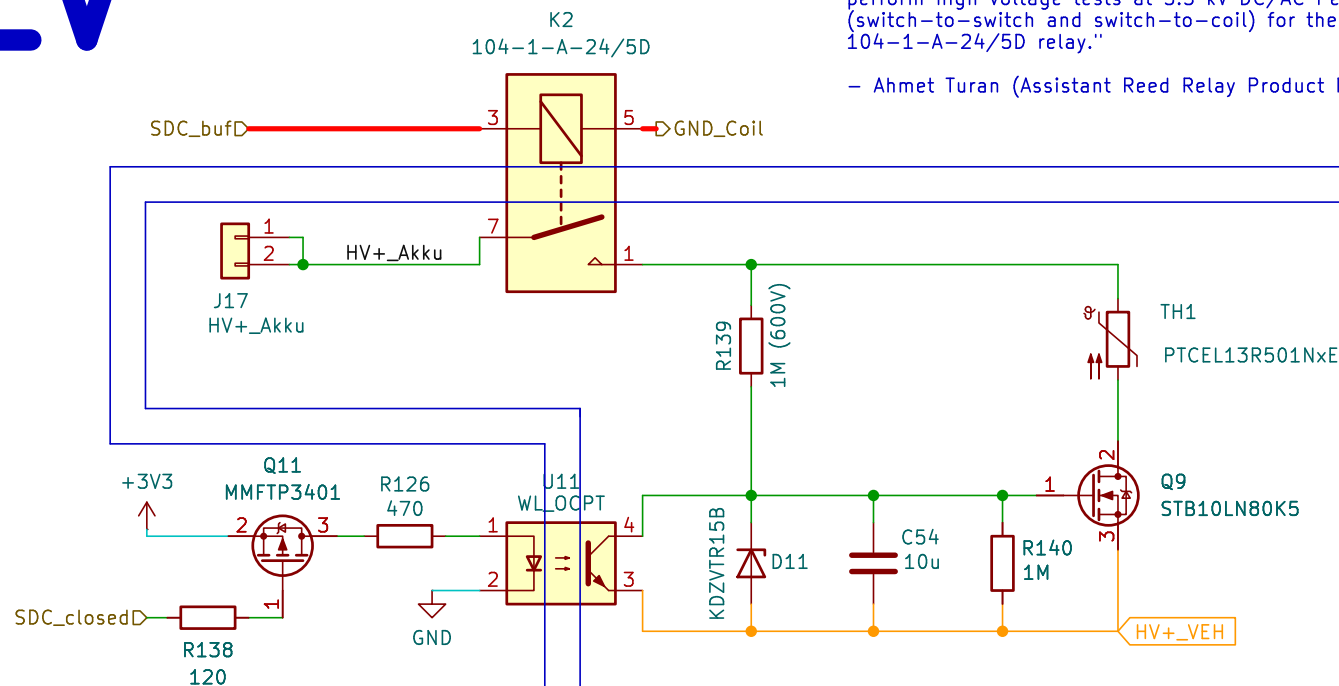
Size: A5 | Page: 6/15

LV

TS-LV isolation via relay pn distance (10.16mm)

"Regarding your questions about our testing process, we perform high voltage tests at 5.5 kV DC/AC Peak (switch-to-switch and switch-to-coil) for the 104-1-A-24/5D relay."

- Ahmet Turan (Assistant Reed Relay Product Manager)



TS

FASTTUBE

Title: Precharge Relay Driver

Rev: V1

Date: 2025-03-09

Project: Master_FT25

Exp. Date: 2025-04-27

Author: Lene Marquardt

Size: A5 | Page: 10/15