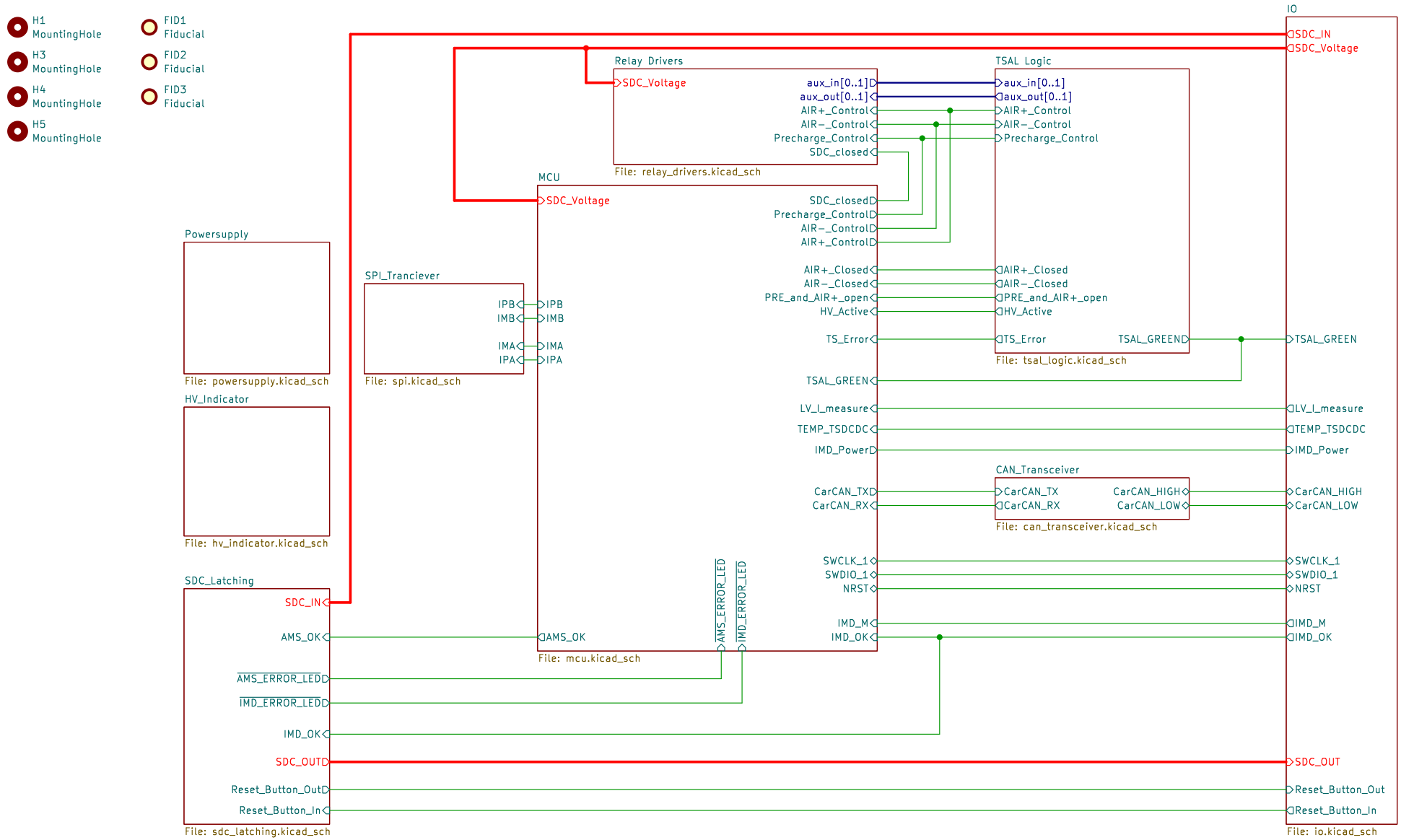


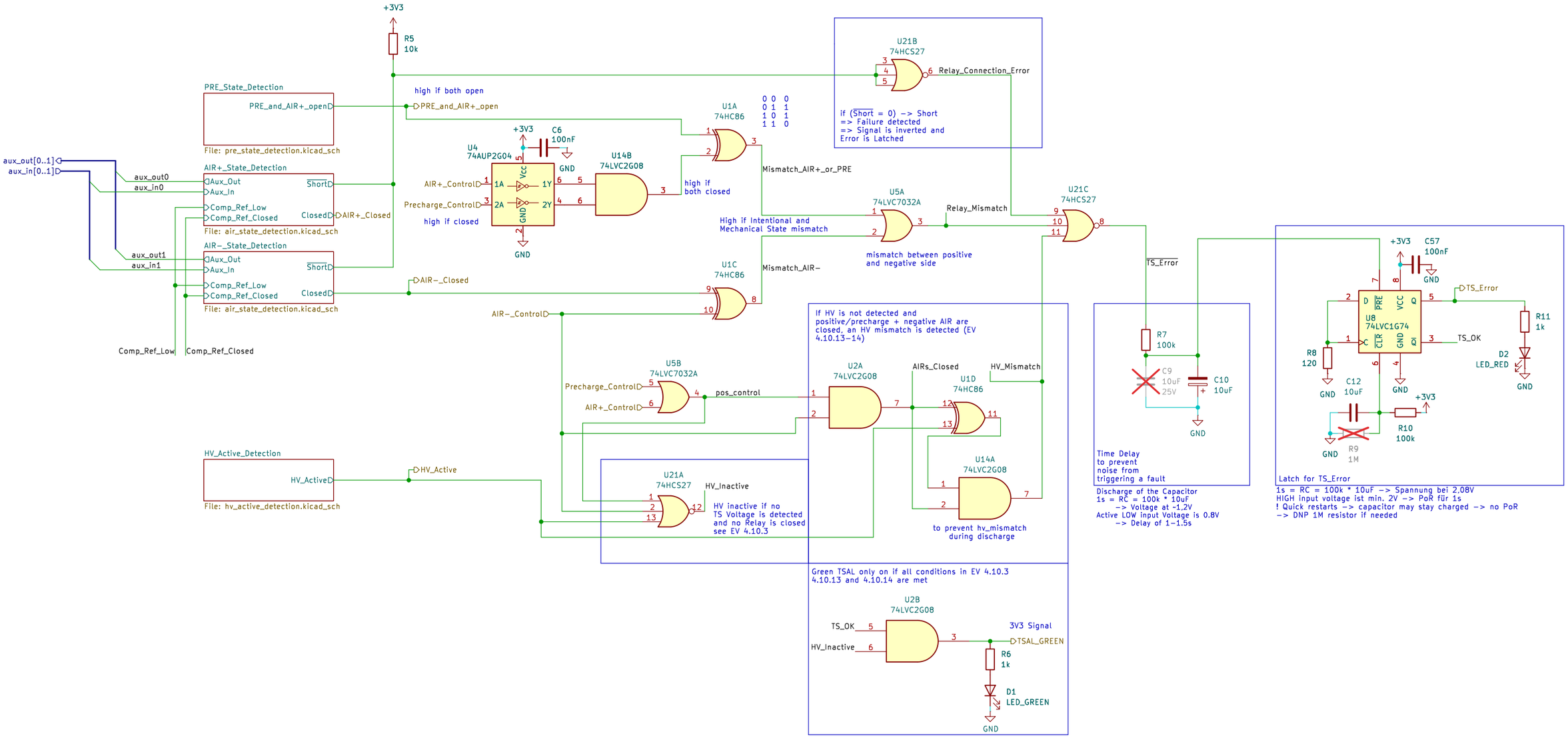

FT25 V2 or FT26:

TSAL Sheet:
- schaltung im Dischargefall (U14A) vereinfachen

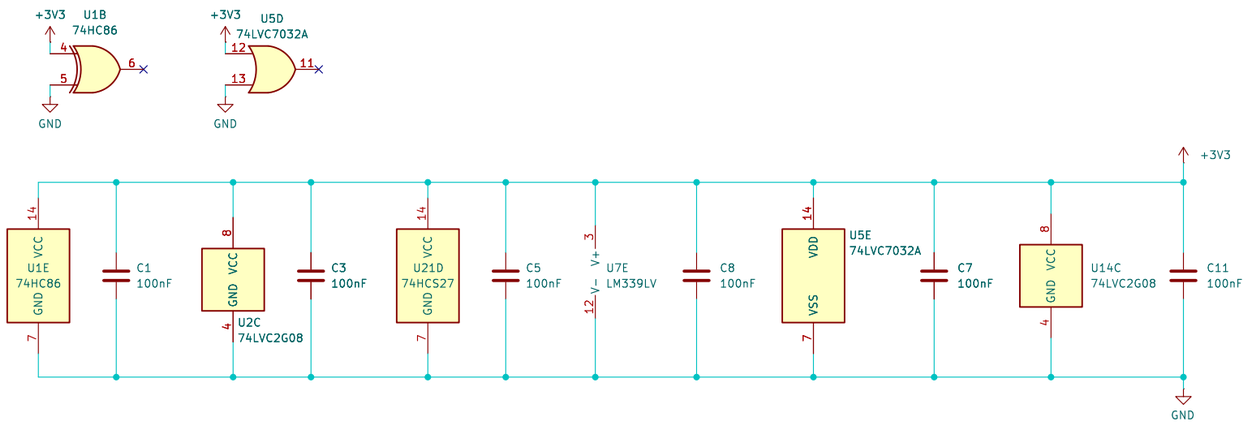
- "Bei U5B hast du ja schon PC_ctl OR AIR+_ctl, das müsste man nur noch invertieren. Zum invertieren könnte man auch einfach das übrige U1B benutzen ( XOR(a,1) == NOT(a) ). Aber besser natürlich den Pull umdrehen und einfach zwei "closed" Signale vergleichen. " – Oskar

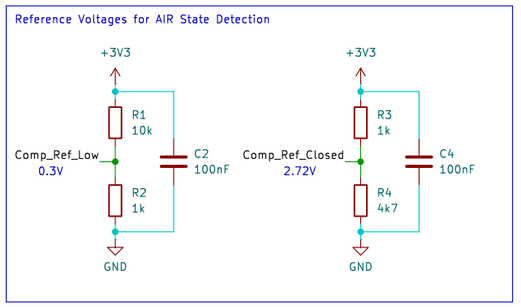
FASTTUBE

| | |
|---|---|
| **Title: AMS Master Rootsheet** | **Rev: V1** |
| | **Date: 2025-03-09** |
| *Project: Master_FT25* | Exp. Date: 2025-05-01 |
| *Author: Lene Marquardt* | Size: A4 \| Page: 1/15 |



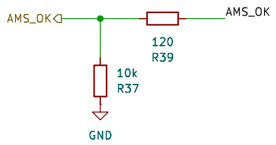

TSAL_GREEN signal leads dashboard
and to the TSAL driver board

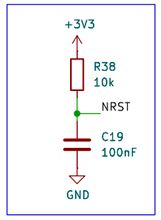


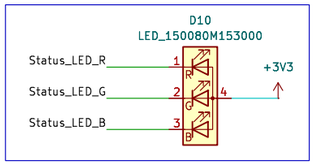




| | |
|---|---|
| FASTTUBE | |
| **Title: TSAL Logic** | **Rev: V1** |
| | **Date: 2025−03−09** |
| **Project: Master_FT25** | Exp. Date: 2025−05−01 |
| **Author: Lene Marquardt** | Size: A3 \| Page: 2/15 |

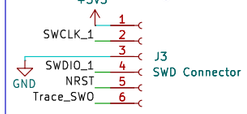
Wired Or for AMS Master Error



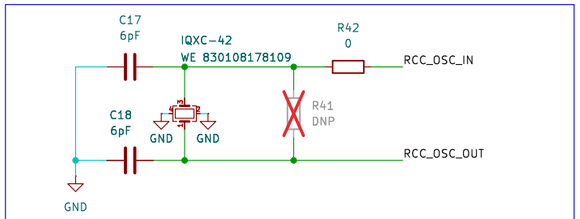




Debug Stecker




add esd
siehe slave 24




Crystal: WE 830108178109

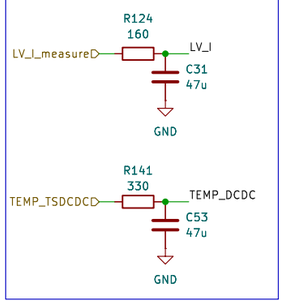
From crystal datasheet:
$C_L$ = 8pF
$C_S$ = 5pF (see link)

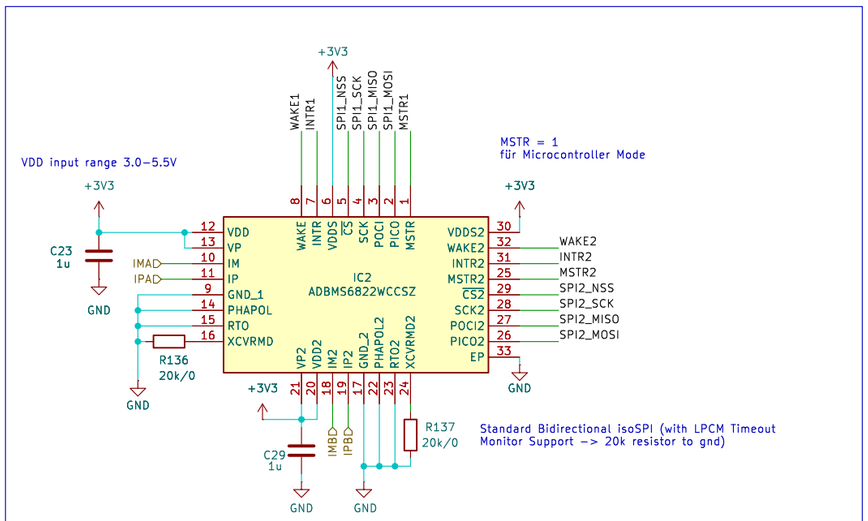
6pF = $C_{L1}$ = $C_{L2}$ = 2*($C_L$ − $C_S$) = 2*(8pF − 5pF)
grob gerechnet, +−1pF wird passen

From AN2867:
$C_L$ = $C_{L1}$ * $C_{L2}$ / ($C_{L1}$ + $C_{L2}$) + $C_S$

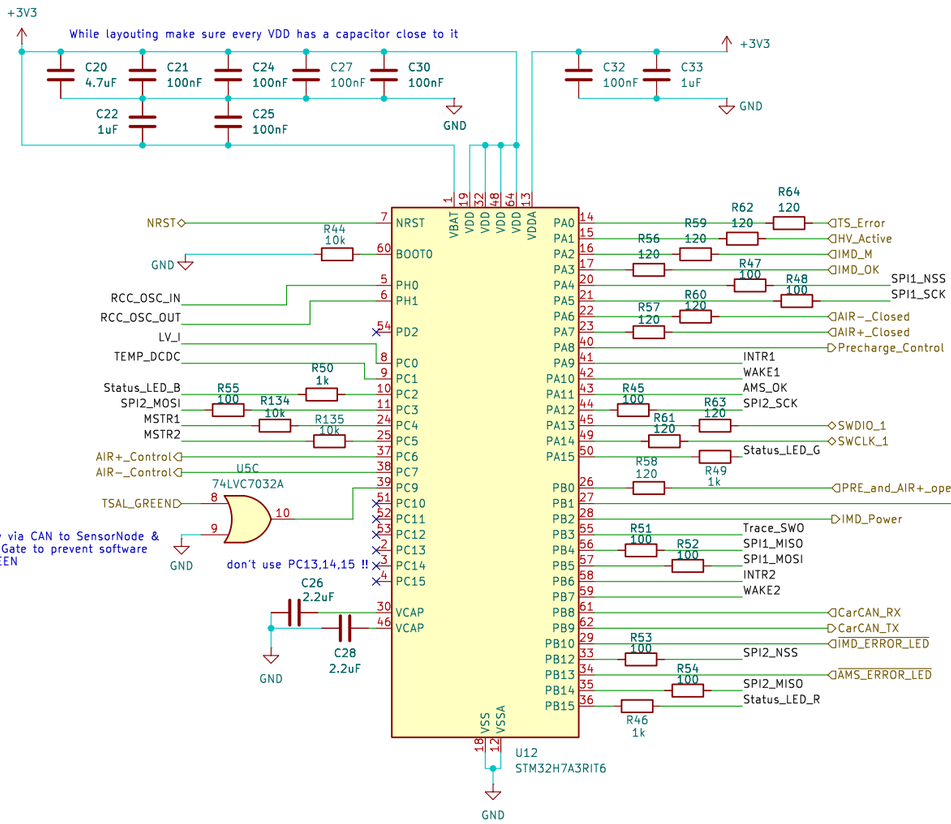
https://electronics.stackexchange.com/questions/17891/stray-capacitance-for-crystals

Filter Signale von TS_DCDC



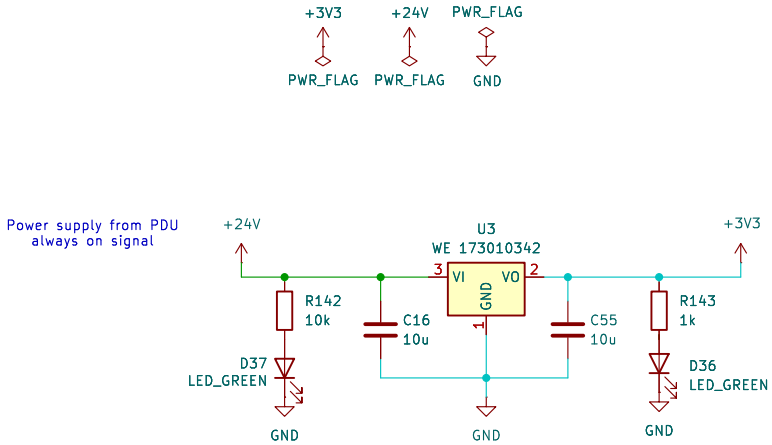




SPI Tranciever



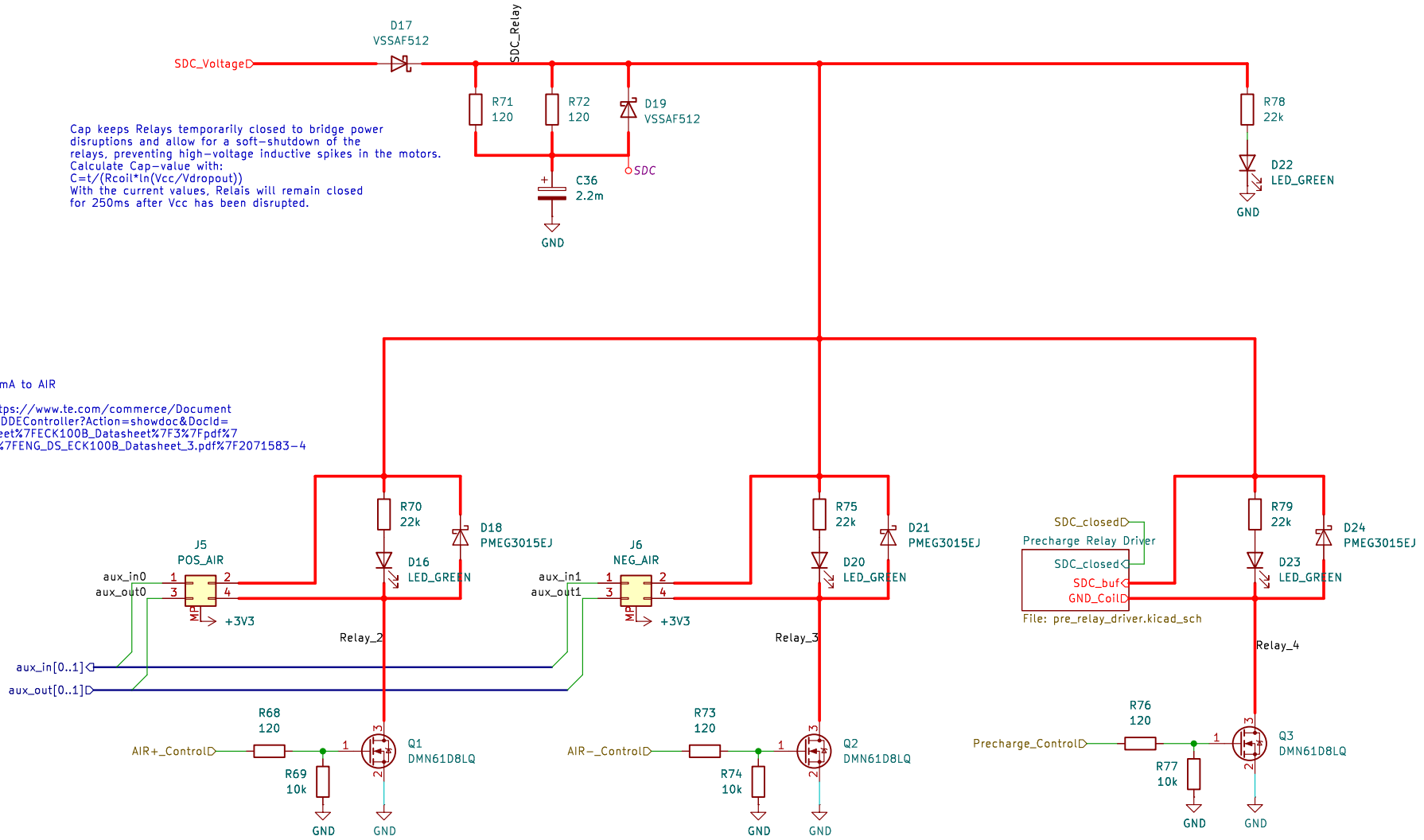

FASTTUBE

| | |
|---|---|
| Title: Microcontroller | Rev: V1 |
| | Date: 2025−03−09 |
| Project: Master_FT25 | Exp. Date: 2025−05−01 |
| Author: Lene Marquardt | Size: A3 \| Page: 7/15 |




FASTTUBE

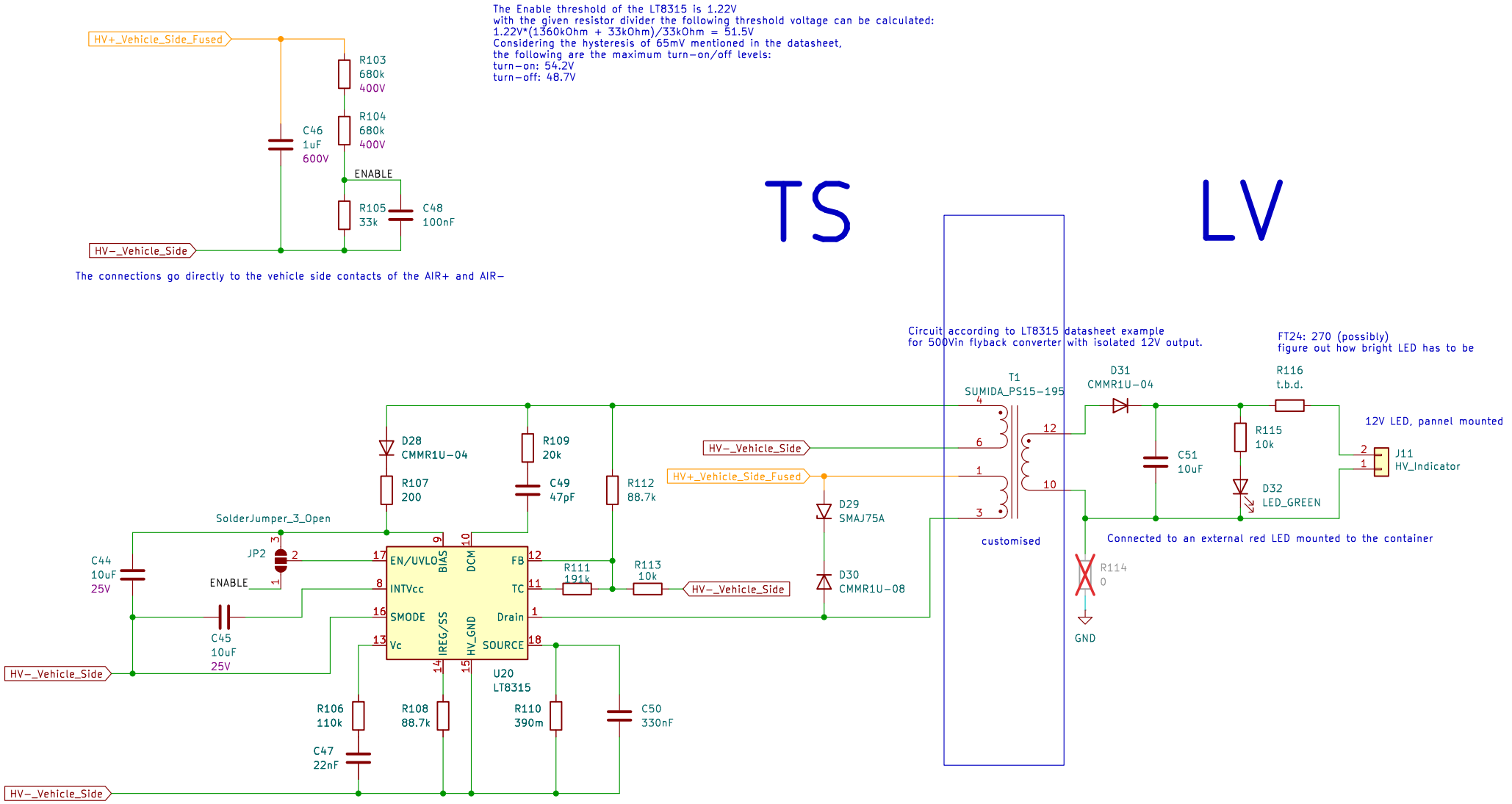
| | |
|---|---|
| **Title: Powersupply** | **Rev: V1** |
| | **Date: 2025-03-09** |
| **Project: Master_FT25** | Exp. Date: 2025-05-01 |
| **Author: Lene Marquardt** | Size: A5 \| Page: 8/15 |




FASTTUBE

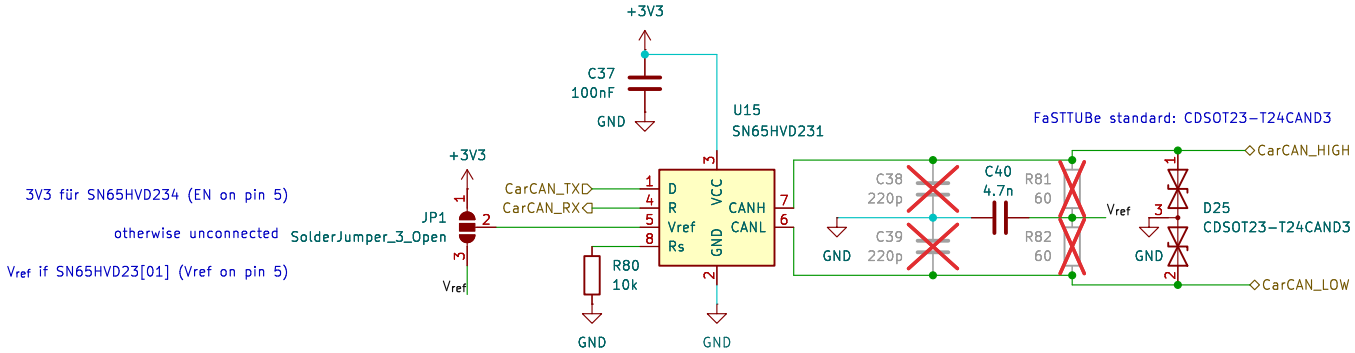
| | |
|---|---|
| **Title: Relay Drivers** | **Rev: V1** |
| | **Date: 2025-03-09** |
| *Project: Master_FT25* | Exp. Date: 2025-05-01 |
| *Author: Lene Marquardt* | Size: A4 \| Page: 9/15 |

# HV Indicator nicht verändert, wie FT24



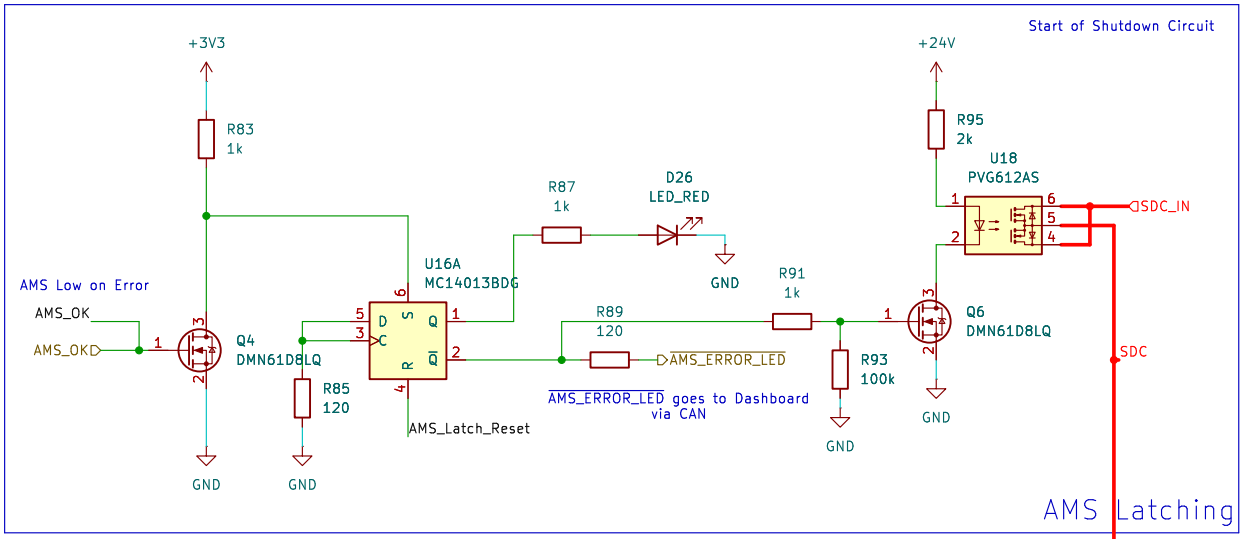

FASTTUBE

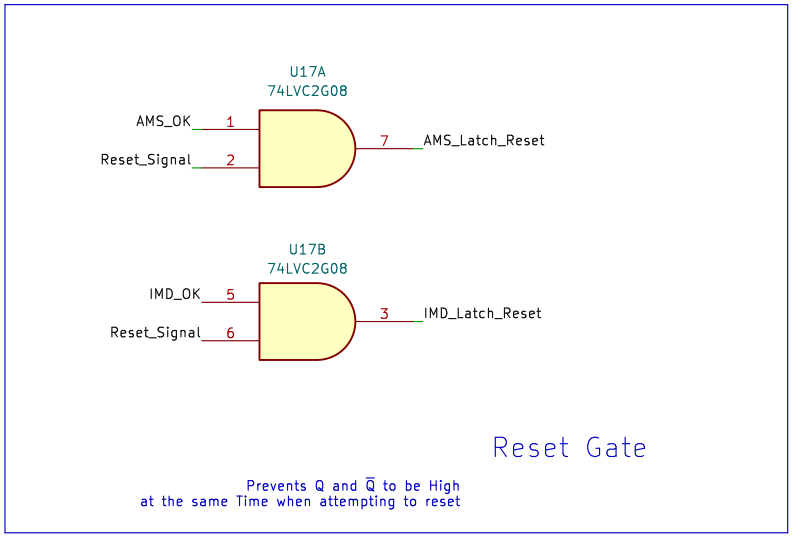
| | |
|---|---|
| **Title: HV Indicator Driver** | **Rev: V1** |
| | **Date: 2025-03-09** |
| *Project: Master_FT25* | Exp. Date: 2025-05-01 |
| *Author: Lene Marquardt* | Size: A4 \| Page: 11/15 |

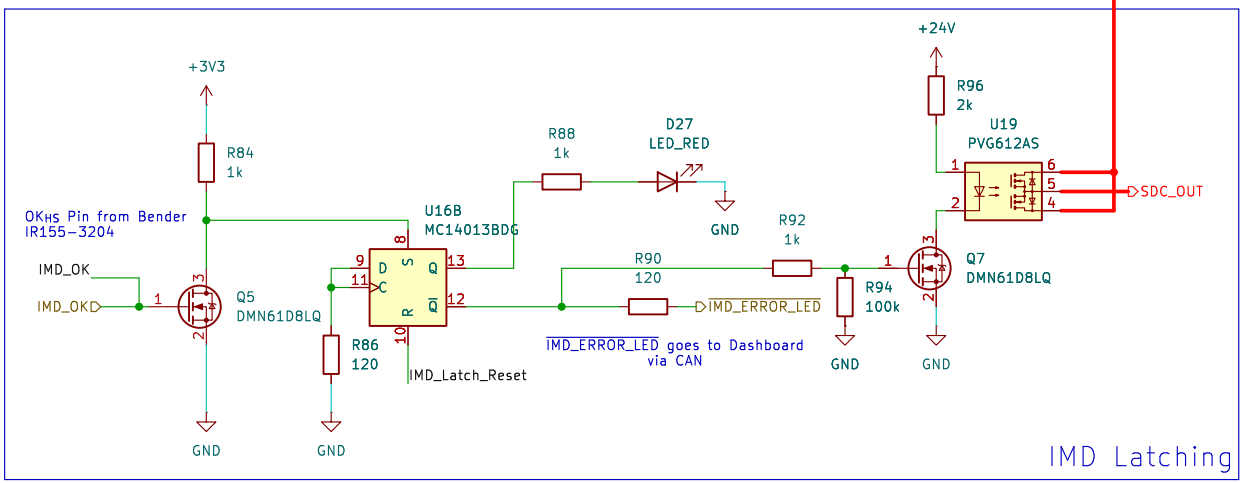


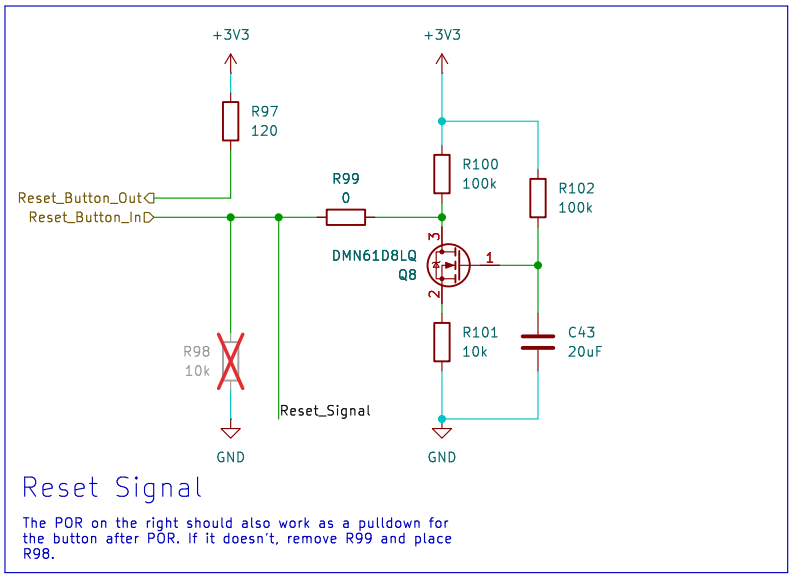

FaSTTUBe

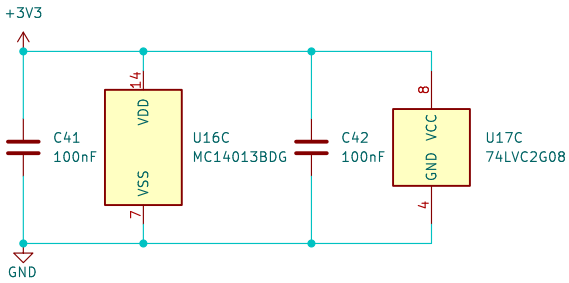
| | |
|---|---|
| **Title: CAN Transciever** | **Rev: V1** |
| | **Date: 2025-03-09** |
| **Project: Master_FT25** | Exp. Date: 2025-05-01 |
| **Author: Lene Marquardt** | Size: A5 \| Page: 11/15 |



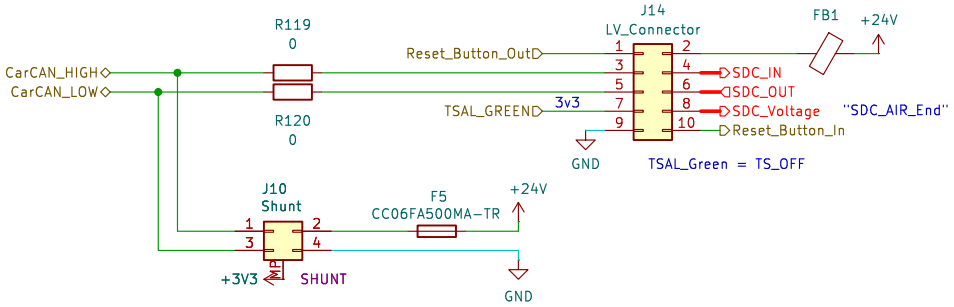




FASTTUBE

| | |
|---|---|
| **Title: SDC Latching** | **Rev: V1** |
| | **Date: 2025-03-09** |
| **Project: Master_FT25** | Exp. Date: 2025-05-01 |
| **Author: Lene Marquardt** | Size: A4 \| Page: 12/15 |

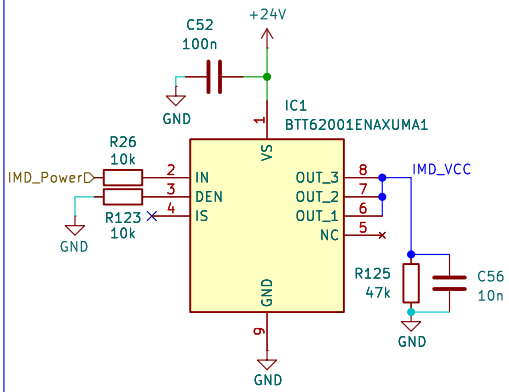



SHUNT:
IVT-S-300-U3-I-CAN1-12/24
max. 80mA

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

## Main Connector

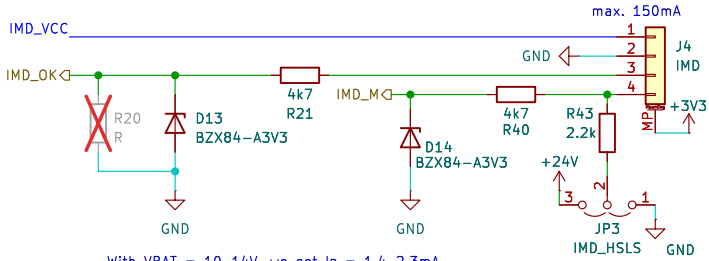
## IMD Supply




IMD – Datasheet

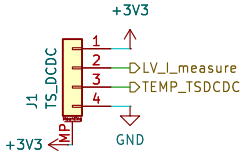
https://www.bender.de/fileadmin/content/Products/d/e/IR155-32xx-V004_D00115_D_XXEN.pdf

## IMD Connector

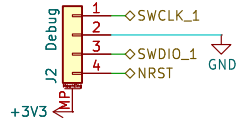



With VBAT = 10..14V, we get IR = 1.4..2.3mA.
This should™ put the Zener at ~3V.

Connect to GND for -3204
Connect to +24V for -3203



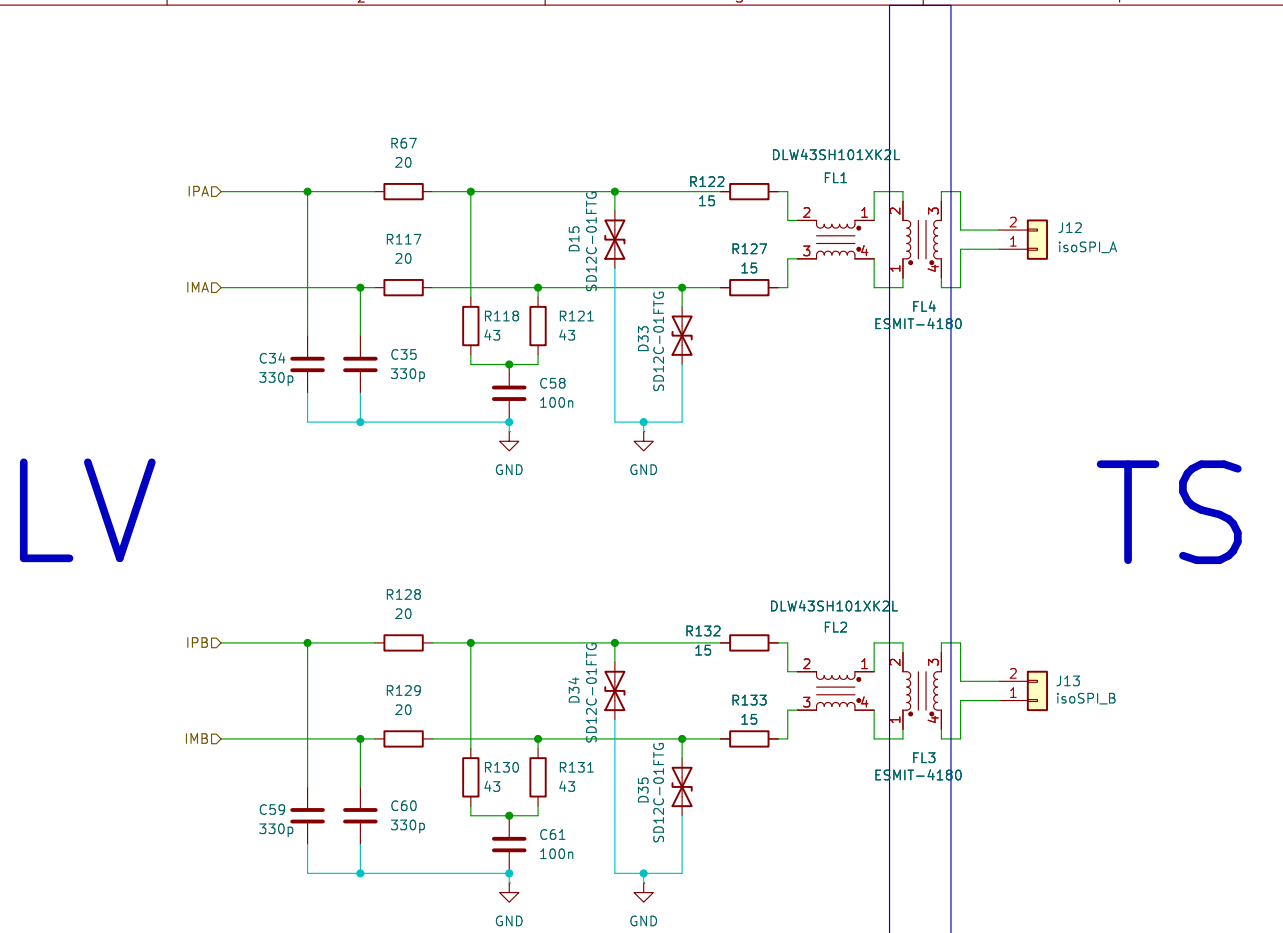

## TSDCDC Connector




## Debug Connector

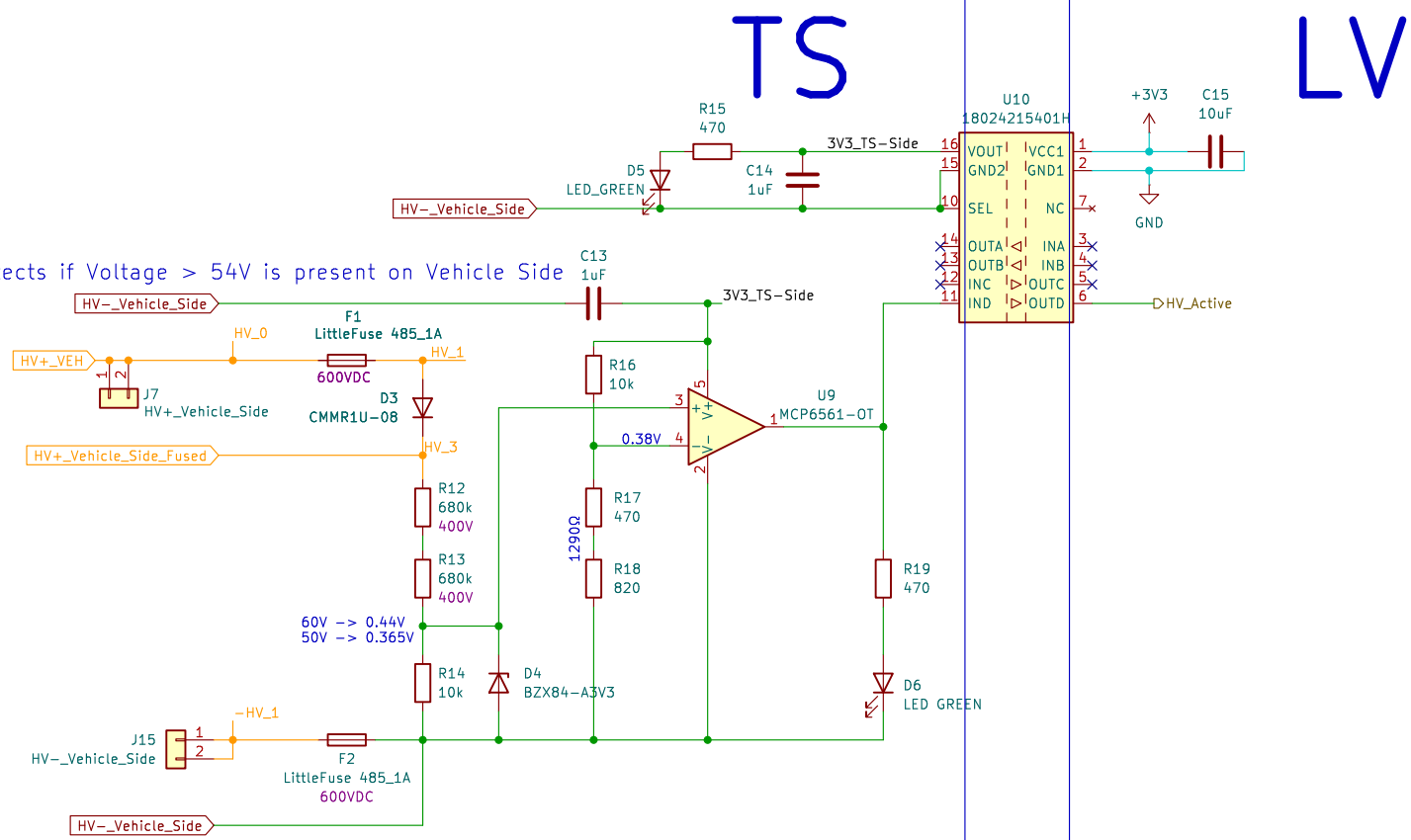
FASTTUBE

| | |
|---|---|
| **Title: Input/Output** | **Rev: V1** |
| | **Date: 2025-03-09** |
| **Project: Master_FT25** | Exp. Date: 2025-05-01 |
| **Author: Lene Marquardt** | Size: A5 \| Page: 13/15 |




FASTTUBE

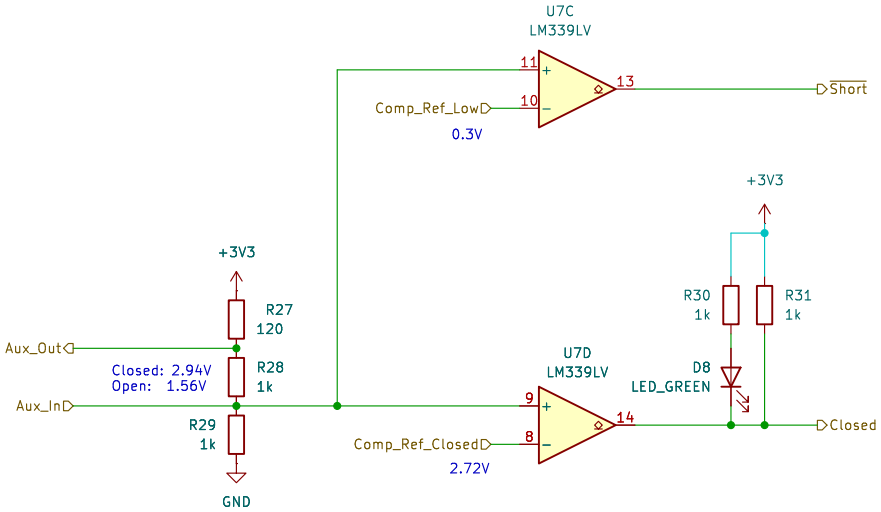
| | |
|---|---|
| **Title: Isolated SPI Transciever** | **Rev: V1** |
| | **Date: 2025-03-09** |
| **Project: Master_FT25** | Exp. Date: 2025-05-01 |
| **Author: Lene Marquardt** | Size: A5 \| Page: 14/15 |




FASTTUBE

| | |
|---|---|
| **Title: TSAL HV Detection** | **Rev: V1** |
| | **Date: 2025-03-09** |
| **Project: Master_FT25** | Exp. Date: 2025-05-01 |
| **Author: Lene Marquardt** | Size: A5 \| Page: 3/15 |

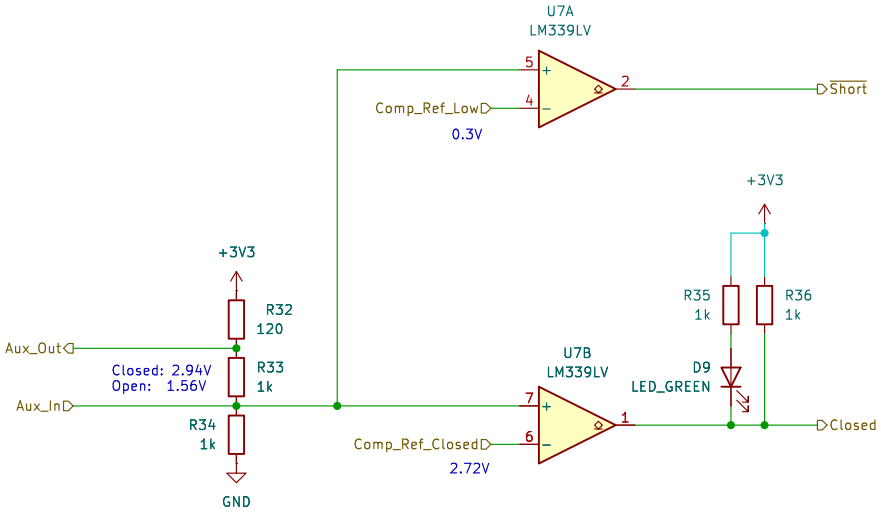
# Accumulator TSAL – Relay state detection



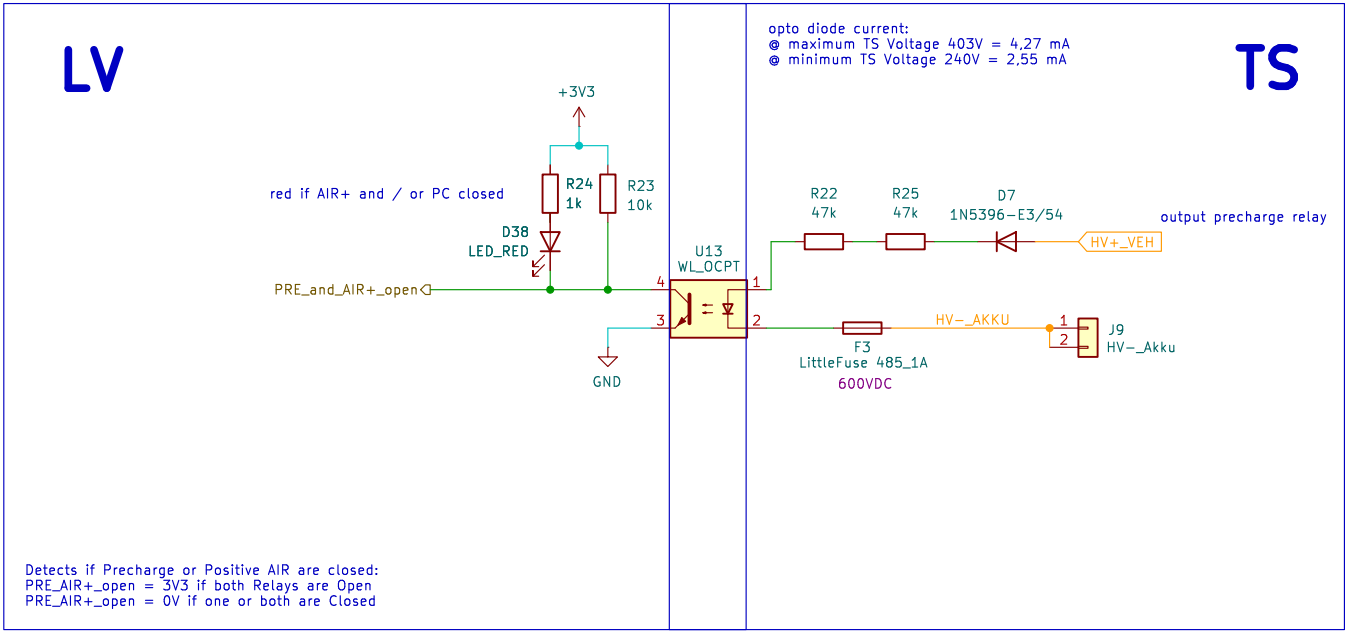

FASTTUBE

| | |
|---|---|
| **Title: AIR Relay State Detection** | **Rev: V1** |
| | **Date: 2025-03-09** |
| *Project: Master_FT25* | Exp. Date: 2025-05-01 |
| *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: 2025-05-01 |
| Author: Lene Marquardt | | Size: A5 \| Page: 5/15 |




FASTTUBE

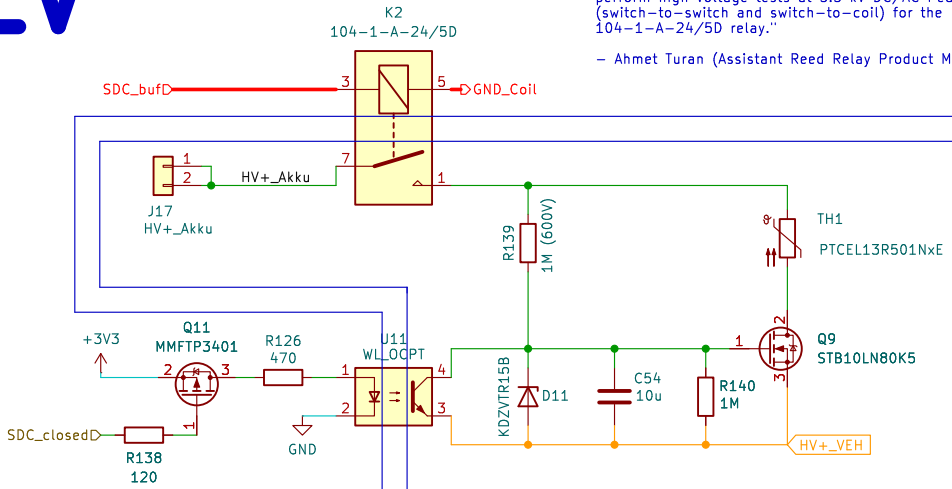
| | |
|---|---|
| **Title: Precharge State Detection** | **Rev: V1** |
| | **Date: 2025-03-09** |
| **Project: Master_FT25** | Exp. Date: 2025-05-01 |
| **Author: Lene Marquardt** | Size: A5 \| Page: 6/15 |

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: 2025–05–01 |
| Author: Lene Marquardt | Size: A5 \| Page: 10/15 |