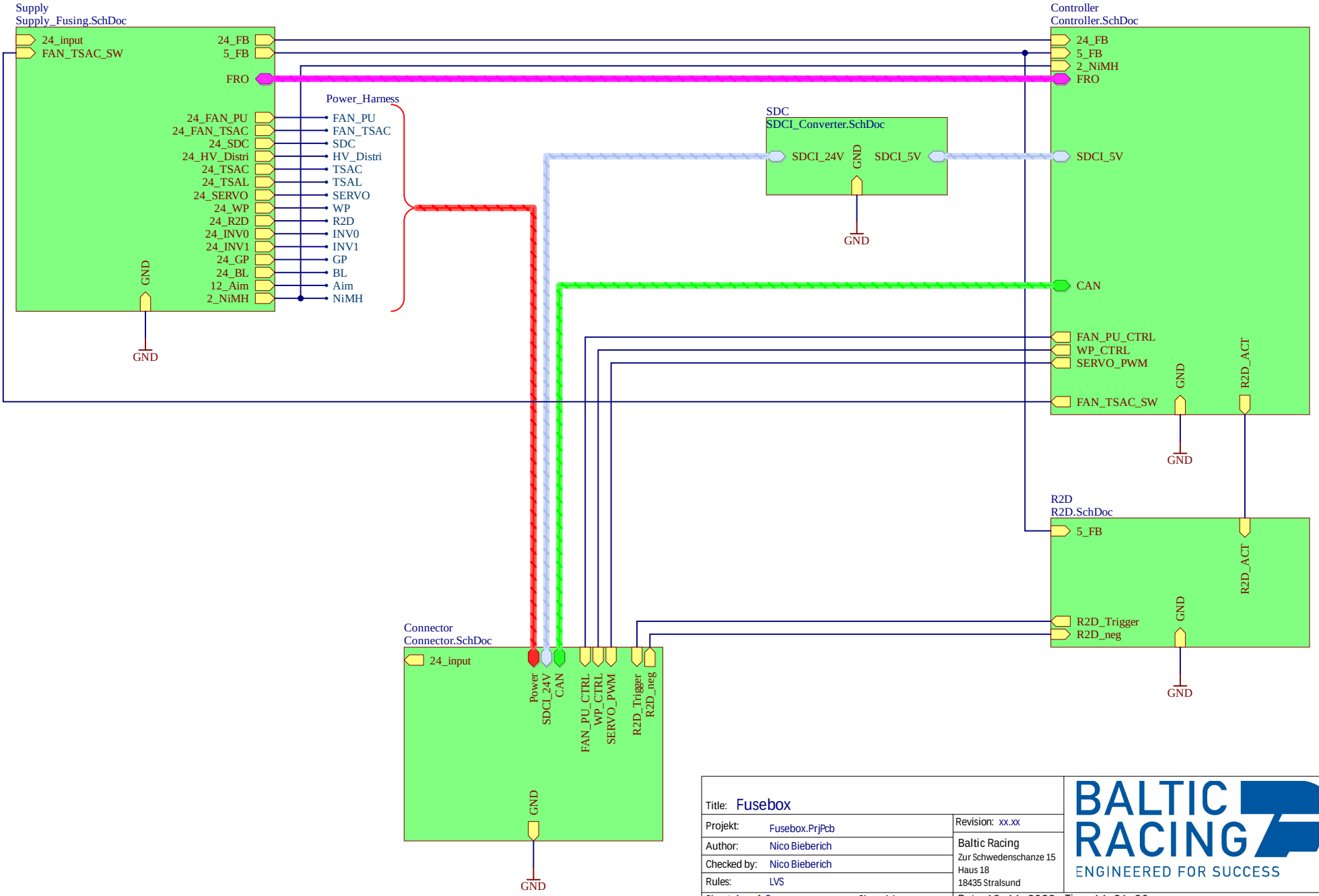


| | |
|---|---|
| Title: | Fusebox |
| Projekt: | Fusebox.PrjPcb |
| Author: | Nico Bieberich |
| Checked by: | Nico Bieberich |
| Rules: | LVS |
| Sheet 1 of 6 | Size: A4 |
| Revision: | xx.xx |


Baltic Racing
Zur Schwedenschanze 15
Haus 18
18435 Stralsund


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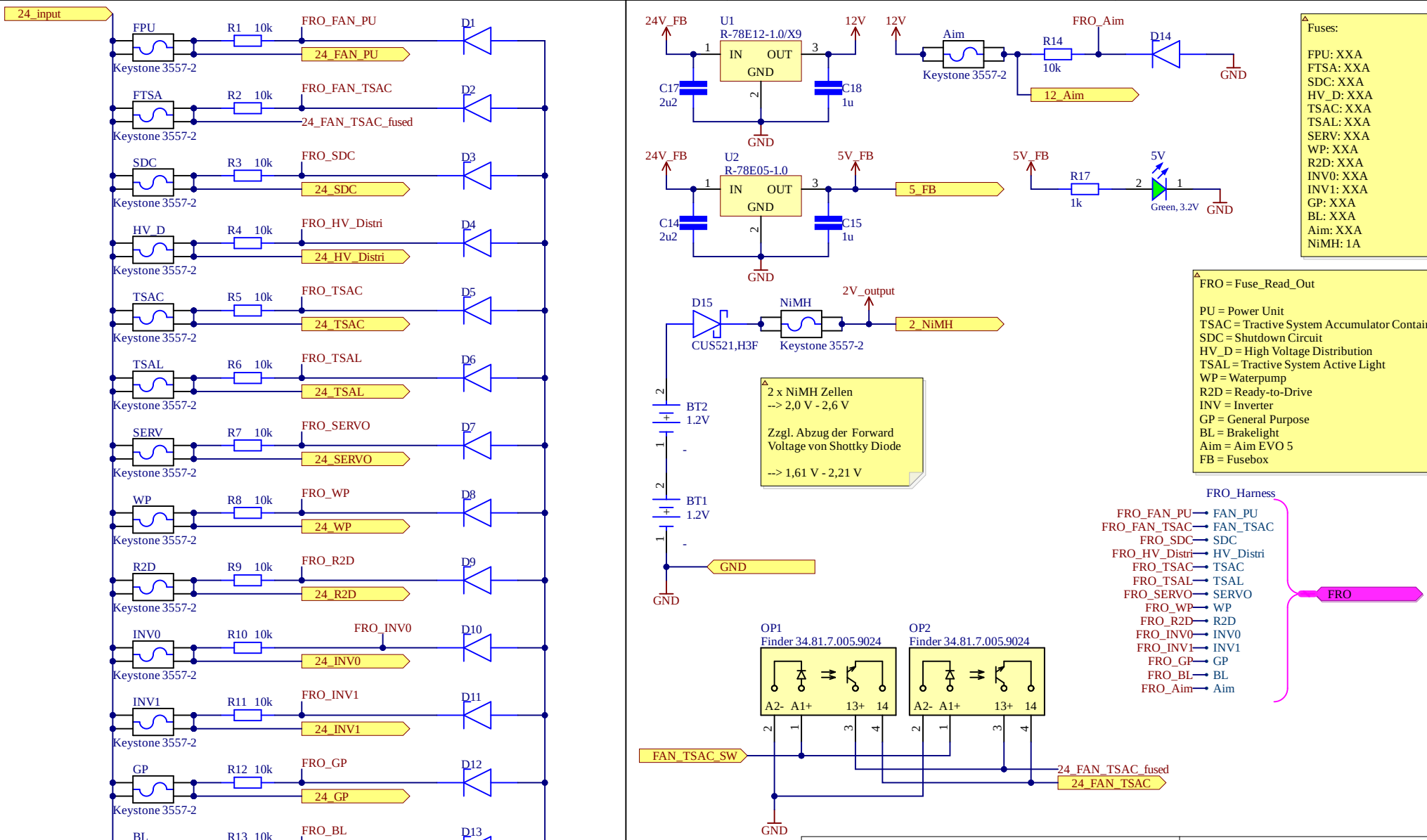


Title: Supply and Fusing

| | |
|---|---|
| Projekt: | Fusebox.PrjPcb |
| Author: | Nico Bieberich |
| Checked by: | Nico Bieberich |
| Rules: | LVS |
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Revision: xx.xx

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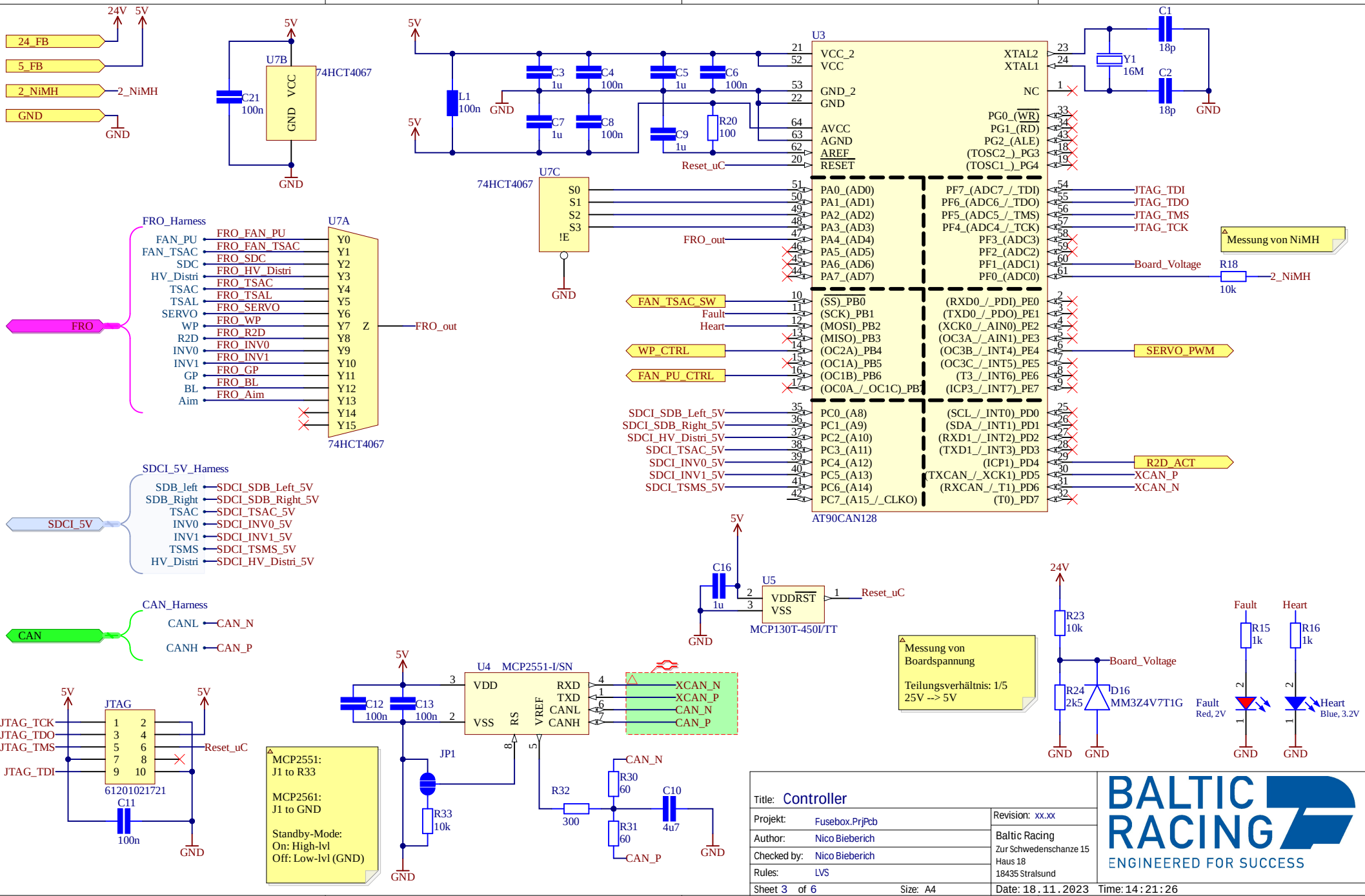
24V
5V
24_FB
5_FB
2_NiMH
2_NiMH
GND
GND
U7B
74HCT4067
VCC
GND
C21
100n
GND
L1
100n
C3
1u
C4
100n
C5
1u
C6
100n
C7
1u
C8
100n
C9
1u
R20
100
Reset_uC
U3
VCC_2
VCC
GND_2
GND
AVCC
AGND
AREF
RESET
XTAL2
XTAL1
NC
PG0_(WR)
PG1_(RD)
PG2_(ALE)
(TOSC2_)_PG3
(TOSC1_)_PG4
C1
18p
Y1
16M
C2
18p
U7C
74HCT4067
S0
S1
S2
S3
!E
FRO_out
PA0_(AD0)
PA1_(AD1)
PA2_(AD2)
PA3_(AD3)
PA4_(AD4)
PA5_(AD5)
PA6_(AD6)
PA7_(AD7)
PF7_(ADC7_/_TDI)
PF6_(ADC6_/_TDO)
PF5_(ADC5_/_TMS)
PF4_(ADC4_/_TCK)
PF3_(ADC3)
PF2_(ADC2)
PF1_(ADC1)
PF0_(ADC0)
JTAG_TDI
JTAG_TDO
JTAG_TMS
JTAG_TCK
Board_Voltage
R18
10k
2_NiMH
Messung von NiMH
FRO_Harness
FRO
FAN_PU
FAN_TSAC
SDC
HV_Distri
TSAC
TSAL
SERVO
WP
R2D
INV0
INV1
GP
BL
Aim
FRO_FAN_PU
FRO_FAN_TSAC
FRO_SDC
FRO_HV_Distri
FRO_TSAC
FRO_TSAL
FRO_SERVO
FRO_WP
FRO_R2D
FRO_INV0
FRO_INV1
FRO_GP
FRO_BL
FRO_Aim
U7A
Y0
Y1
Y2
Y3
Y4
Y5
Y6
Y7
Y8
Y9
Y10
Y11
Y12
Y13
Y14
Y15
Z
FRO_out
74HCT4067
FAN_TSAC_SW
Fault
Heart
WP_CTRL
FAN_PU_CTRL
(SS)_PB0
(SCK)_PB1
(MOSI)_PB2
(MISO)_PB3
(OC2A)_PB4
(OC1A)_PB5
(OC1B)_PB6
(OC0A_/_OC1C)_PB7
(RXD0_/_PDI)_PE0
(TXD0_/_PDO)_PE1
(XCK0_/_AIN0)_PE2
(OC3A_/_AIN1)_PE3
(OC3B_/_INT4)_PE4
(OC3C_/_INT5)_PE5
(T3_/_INT6)_PE6
(ICP3_/_INT7)_PE7
SERVO_PWM
SDCI_SDB_Left_5V
SDCI_SDB_Right_5V
SDCI_HV_Distri_5V
SDCI_TSAC_5V
SDCI_INV0_5V
SDCI_INV1_5V
SDCI_TSMS_5V
PC0_(A8)
PC1_(A9)
PC2_(A10)
PC3_(A11)
PC4_(A12)
PC5_(A13)
PC6_(A14)
PC7_(A15_/_CLKO)
(SCL_/_INT0)_PD0
(SDA_/_INT1)_PD1
(RXD1_/_INT2)_PD2
(TXD1_/_INT3)_PD3
(ICP1)_PD4
(TXCAN_/_XCK1)_PD5
(RXCAN_/_T1)_PD6
(T0)_PD7
R2D_ACT
XCAN_N
XCAN_P
AT90CAN128
SDCI_5V_Harness
SDCI_5V
SDB_left
SDB_Right
TSAC
INV0
INV1
TSMS
HV_Distri
SDCI_SDB_Left_5V
SDCI_SDB_Right_5V
SDCI_TSAC_5V
SDCI_INV0_5V
SDCI_INV1_5V
SDCI_TSMS_5V
SDCI_HV_Distri_5V
C16
1u
U5
VDD
RST
VSS
Reset_uC
MCP130T-450I/TT
CAN_Harness
CAN
CANL
CANH
CAN_N
CAN_P
Messung von
Boardspannung
Teilungsverhältnis: 1/5
25V --> 5V
R23
10k
Board_Voltage
R24
2k5
D16
MM3Z4V7T1G
Fault
Heart
R15
1k
R16
1k
Fault
Red, 2V
Heart
Blue, 3.2V
JTAG
JTAG_TCK
JTAG_TDO
JTAG_TMS
JTAG_TDI
Reset_uC
61201021721
C11
100n
U4
MCP2551-I/SN
VDD
VSS
RS
VREF
RXD
TXD
CANL
CANH
C12
100n
C13
100n
JP1
R33
10k
R32
300
R30
60
R31
60
C10
4u7
MCP2551:
J1 to R33
MCP2561:
J1 to GND
Standby-Mode:
On: High-lvl
Off: Low-lvl (GND)
Title: Controller
Projekt: Fusebox.PrjPcb
Author: Nico Bieberich
Checked by: Nico Bieberich
Rules: LVS
Revision: xx.xx
Baltic Racing
Zur Schwedenschanze 15
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Sheet 3 of 6
Size: A4
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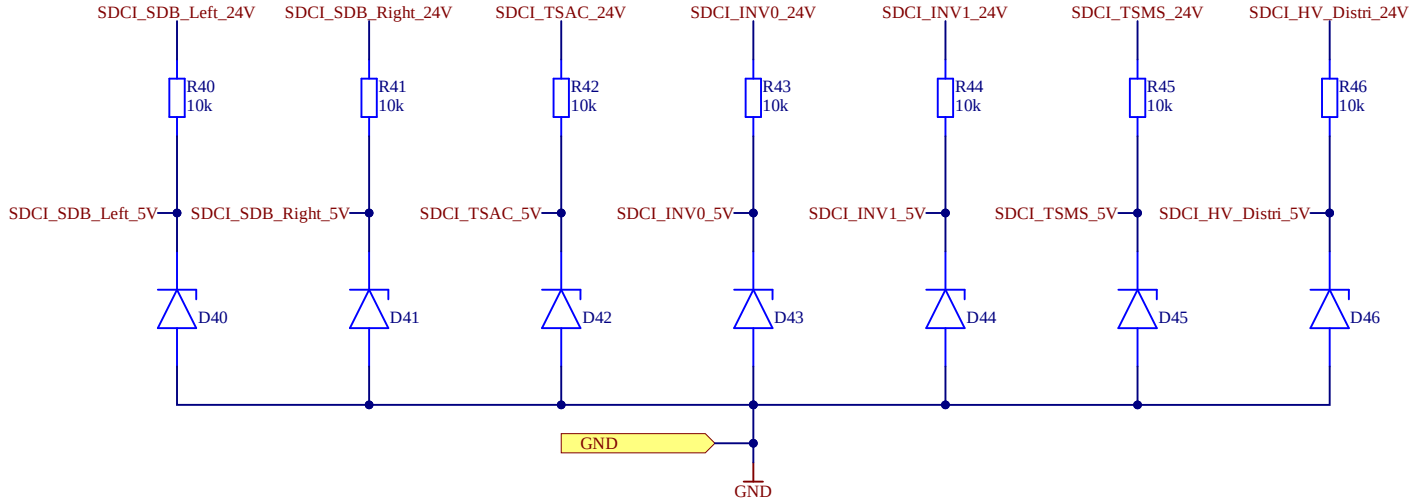


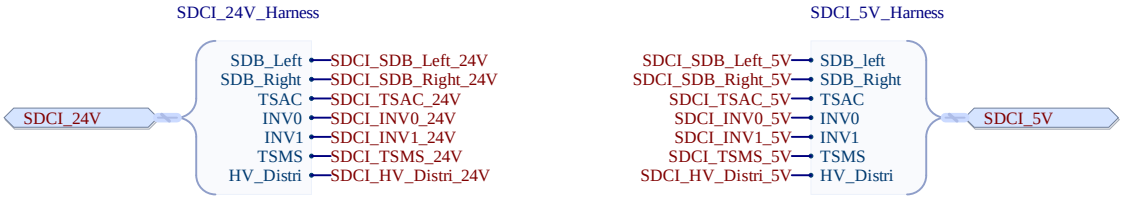


| | | | |
|---|---|---|---|
| Title: Shutdown Circuit Indicator | | | |
| Projekt: | Fusebox.PrjPcb | Revision: xx.xx | |
| Author: | Nico Bieberich | Baltic Racing<br>Zur Schwedenschanze 15<br>Haus 18<br>18435 Stralsund | |
| Checked by: | Nico Bieberich | | |
| Rules: | LVS | | |
| Sheet 4 of 6 | Size: A4 | Date: 18.11.2023 | Time: 14:21:26 |

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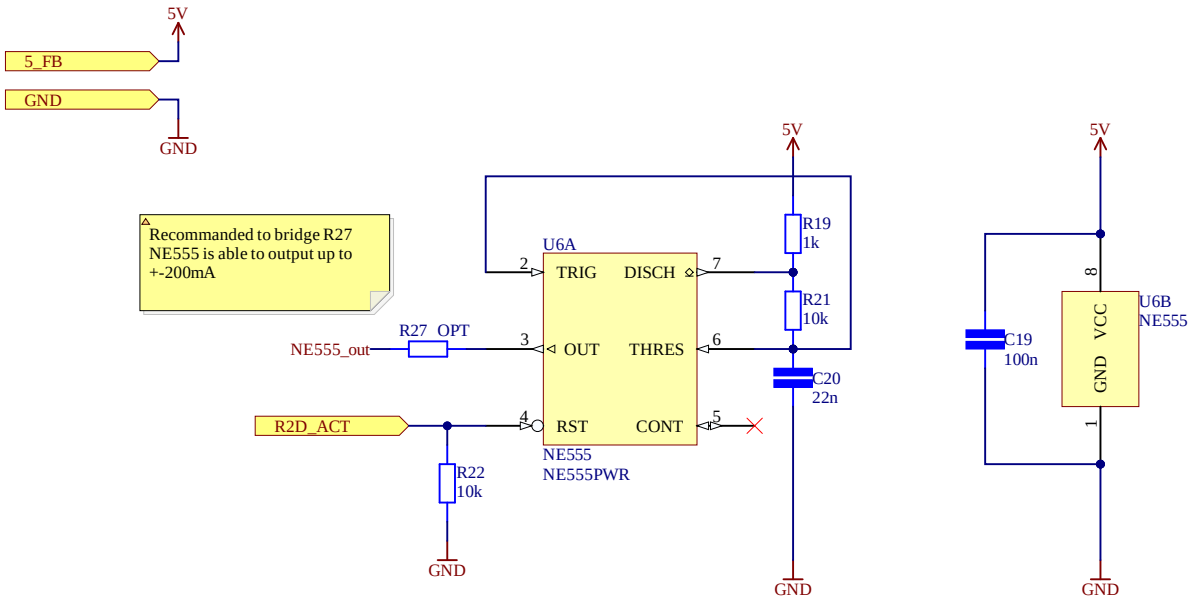



Values for astable operation at 4kHz.
RA = R19
RB = R21
C = C20

tH = 0.693 * (RA + RB) * C
tL = 0.693 * RB * C

tL/tH = RB/(RA + RB))

f = 1.44/((RA + 2*RB) * C)

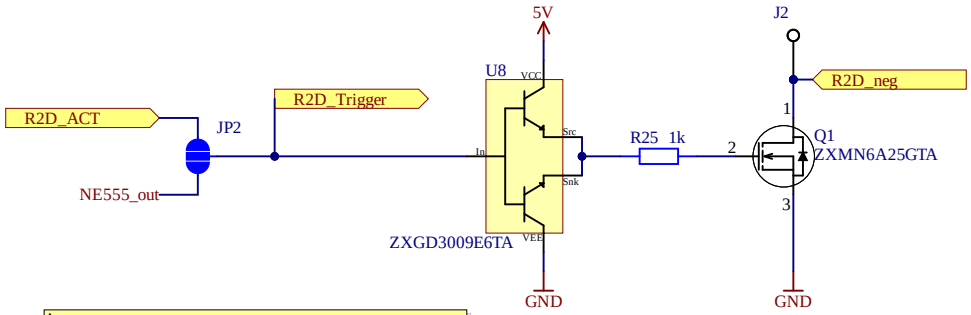
Approx DC of 50%: RA = RB * 0.1

tL/tH = RB / (RB * 1.1) = 0.9091

with RB = 10k and f = 4kHz

4kHz = 1.44/((1k + 2*10k) * C)
4kHz = 1.44/(21k * C)
C = 1.44/(4kHz + 21k)
C ~= 17nF

C (4kHz) ~= 17nF
C (3kHz) ~= 23nF
C (2kHz) ~= 34nF
C (1kHz) ~= 69nF




R25_max = 1/(2*pi*fs*Ciss)
With Ciss = 1063pF (Datasheet of MOSFET)
and fs = 4kHz (Apprx freq. of R2D)

R25_max ~= 37k

Lowering R25 increases switching frequency fs and power dissipation

Simulation is recommended to watch power dissipation

| | | | |
|---|---|---|---|
| Title: | Ready-to-Drive Sound | | |
| Projekt: | Fusebox.PrjPcb | Revision: | xx.xx |
| Author: | Nico Bieberich | Baltic Racing | Zur Schwedenschanze 15 Haus 18 18435 Stralsund |
| Checked by: | Nico Bieberich | | |
| Rules: | LVS | | |
| Sheet 5 of 6 | Size: A4 | Date: 18.11.2023 | Time: 14:21:26 |

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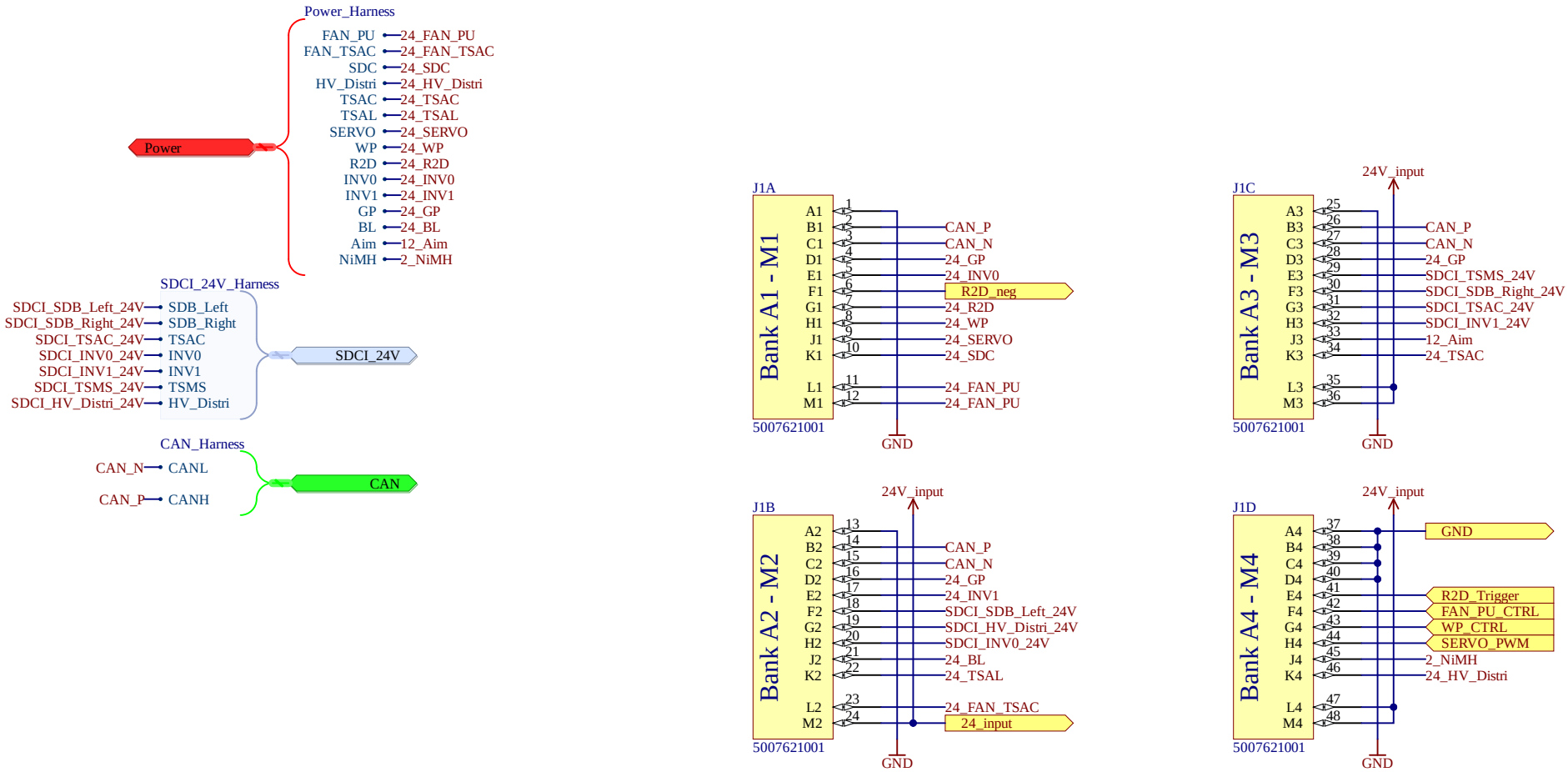


| | | | |
|---|---|---|---|
| Title: Connector | | | |
| Projekt: | Fusebox.PrjPcb | Revision: | xx.xx |
| Author: | Nico Bieberich | Baltic Racing<br>Zur Schwedenschanze 15<br>Haus 18<br>18435 Stralsund | |
| Checked by: | Nico Bieberich | | |
| Rules: | LVS | | |
| Sheet 6 of 6 | Size: A4 | Date: 18.11.2023 | Time: 14:21:26 |

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