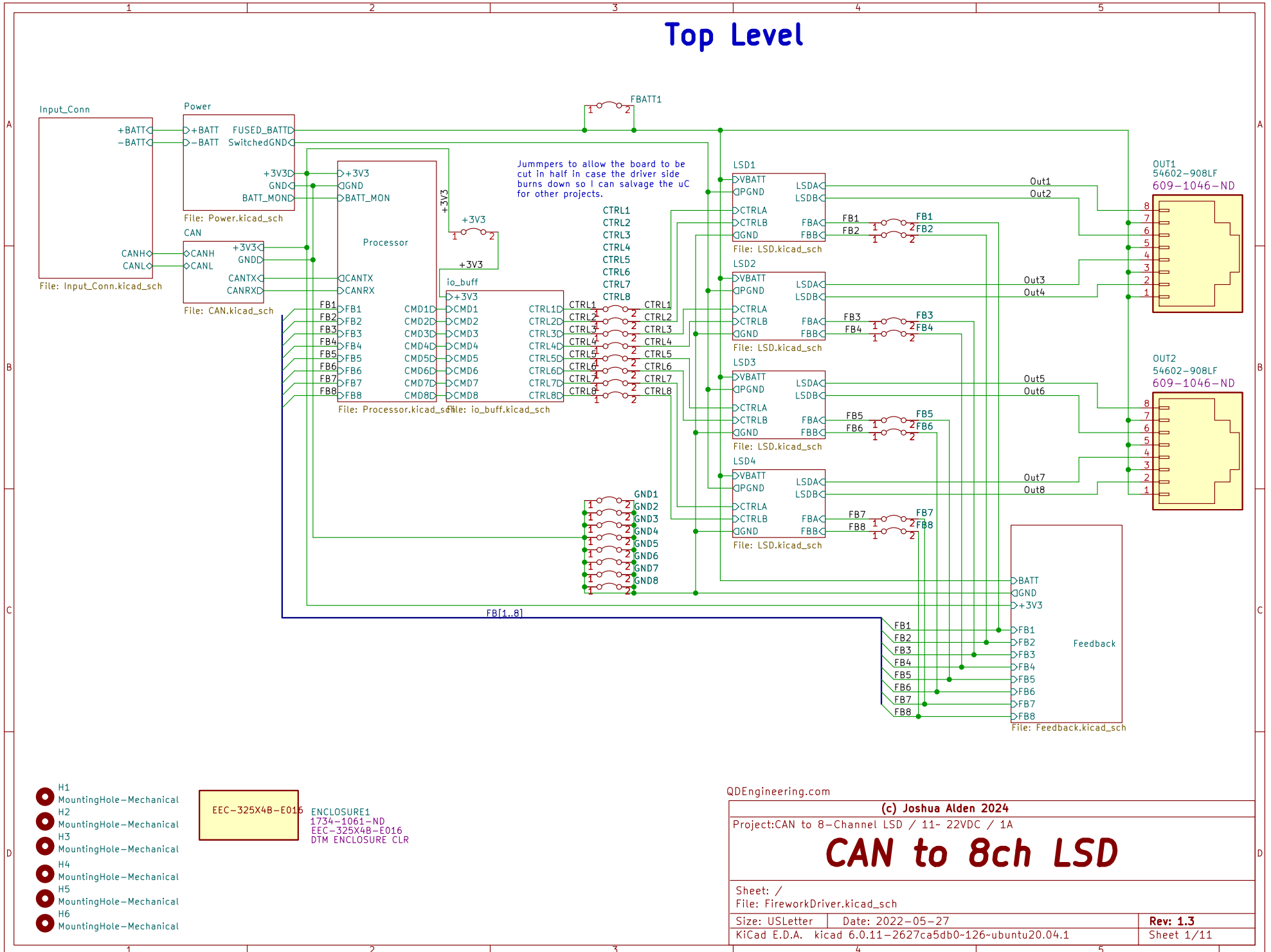
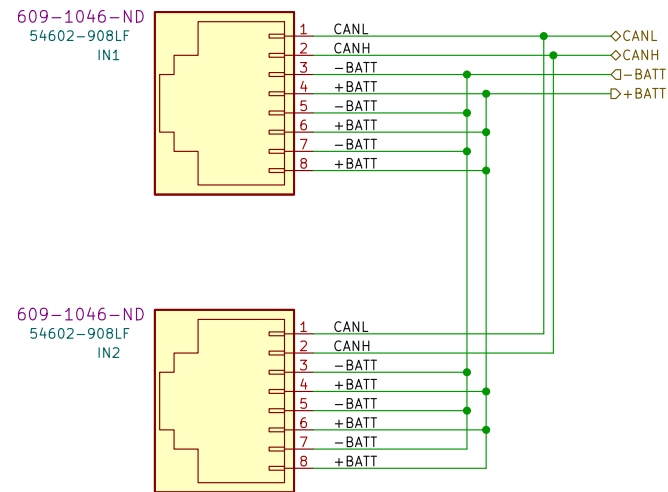


# Top Level



# Input Connectors

11~22VDC (Vehicle 12V Lead-Acid or Ryobi 18V Battery)  
~200mA Quiescent (SWAG)  
8.5A Peak (All-on, intend to software limit < 1.5 seconds)  
CAN: Unterminated by default



Ethernet cables are cheap and easy, plenty laying around the house.  
Single pair for CAN, can easily daisy-chain.  
Three pair for power, which has proven sufficient in rev 0.2 board.

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## Input Connectors

Sheet: /Input\_Conn/  
File: Input\_Conn.kicad\_sch

Size: A4 Date: 2022-05-27  
KiCad E.D.A. kicad 6.0.11-2627ca5db0-126-ubuntu20.04.1

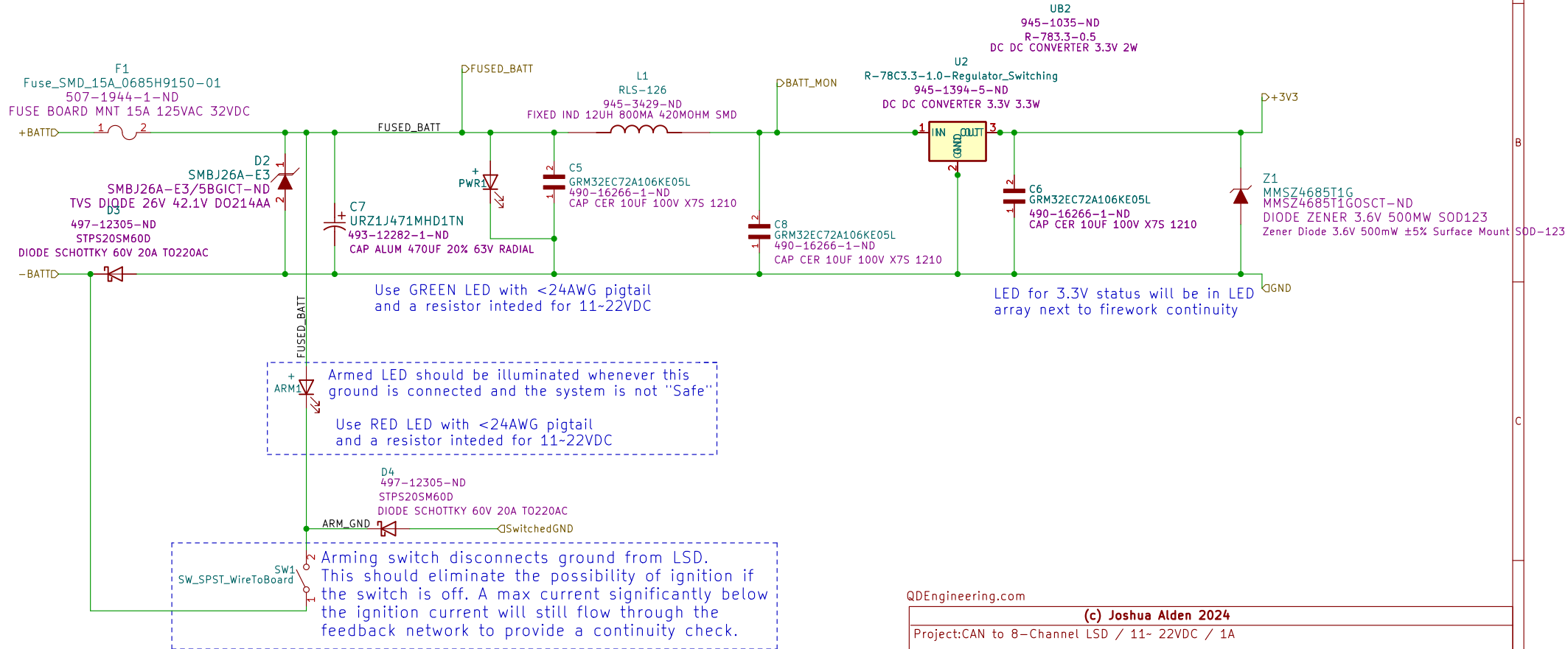
Rev: 1.3  
Sheet 2/11

# Power Conditioning

- +BATT from positive battery terminal
- +12V fused, with 1mF reservoir
- +12LF fused, and inductor filter
- +3V3 from 3.3V DC/DC converter

GND has a reverse-polarity diode and is one diode drop above -BATT  
 SwitchGND enabled by SW\_ARM switch and has a reverse-polarity diode making it one diode drop above -BATT  
 -BATT from negative battery terminal

**NOTE: Originally designed for 12V LA battery.  
 Typical use now expected to include  
 18V Lithium battery, 11-22VDC input.**



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## Power Conditioning

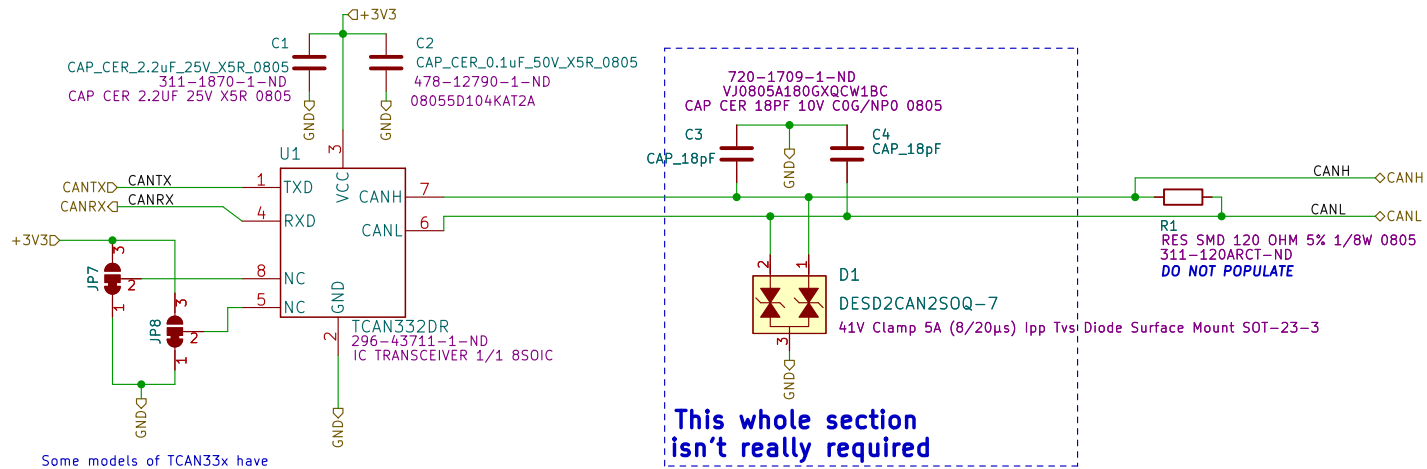
Sheet: /Power/  
 File: Power.kicad\_sch

Size: A4 Date: 2022-05-27

KiCad E.D.A. kicad 6.0.11-2627ca5db0-126-ubuntu20.04.1

Rev: 1.3

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C1 CAP\_CER\_2.2uF\_25V\_X5R\_0805 311-1870-1-ND  
 CAP CER 2.2UF 25V X5R 0805  
 C2 CAP\_CER\_0.1uF\_50V\_X5R\_0805 478-12790-1-ND  
 08055D104KAT2A

720-1709-1-ND  
 VJ0805A180GXQCW1BC  
 CAP CER 18PF 10V COG/NPO 0805

R1 RES SMD 120 OHM 5% 1/8W 0805  
 311-120ARCT-ND  
**DO NOT POPULATE**

C3 CAP\_18pF  
 C4 CAP\_18pF

D1 DESD2CAN2SOQ-7  
 41V Clamp 5A (8/20µs) Ipp TvsI Diode Surface Mount SOT-23-3

Some models of TCAN33x have additional functionality on pins 5 and 8 (e.g. silent mode and slew-rate limiting)

**This whole section isn't really required**

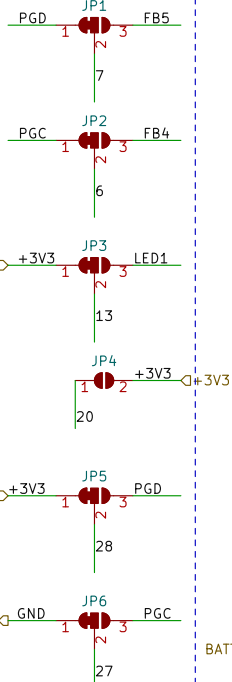
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 Project: CAN to 8-Channel LSD / 11- 22VDC / 1A  

# CAN Bus

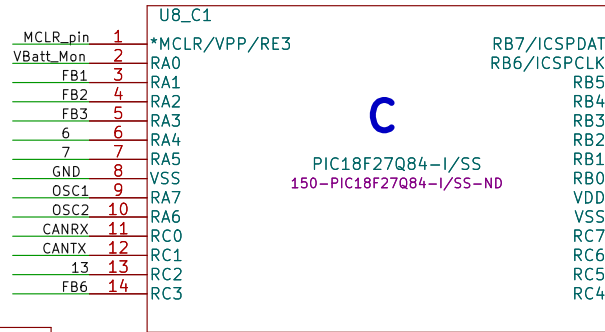
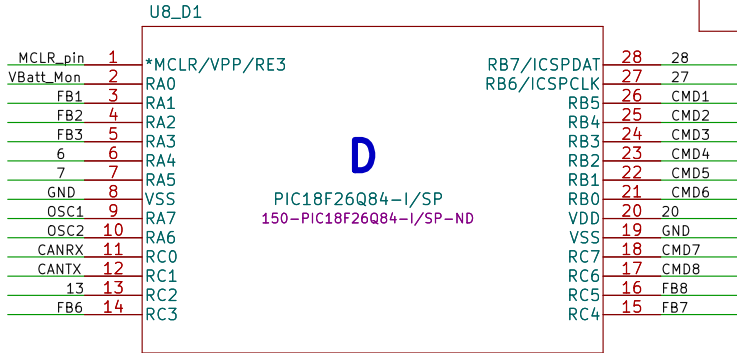
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 File: CAN.kicad\_sch  
 Size: A4 Date: 2022-05-27 Rev: 1.3  
 KiCad E.D.A. kicad 6.0.11-2627ca5db0-126-ubuntu20.04.1 Sheet 4/11

**Defaulted for uC A**

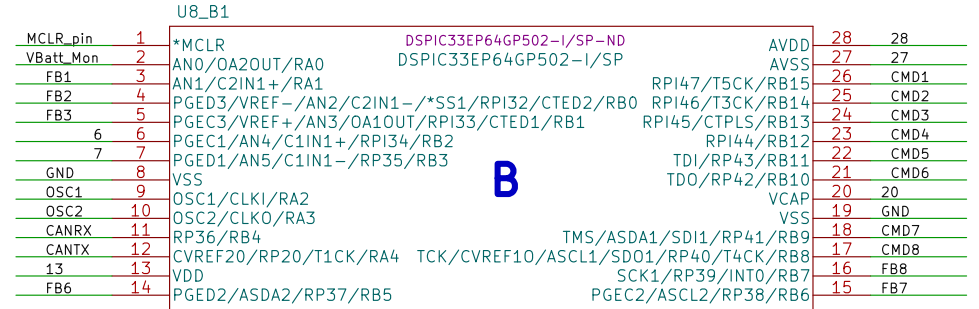
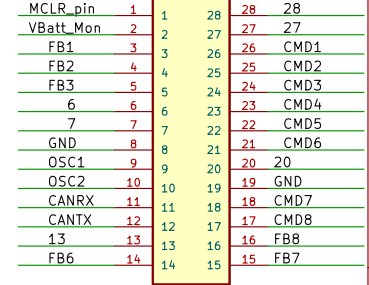


**Microcontroller**

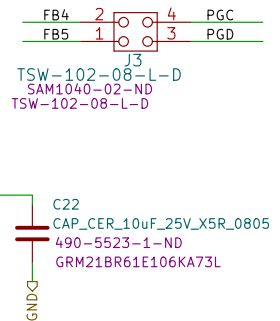
Due to part availability, options for three additional uC's have been added.



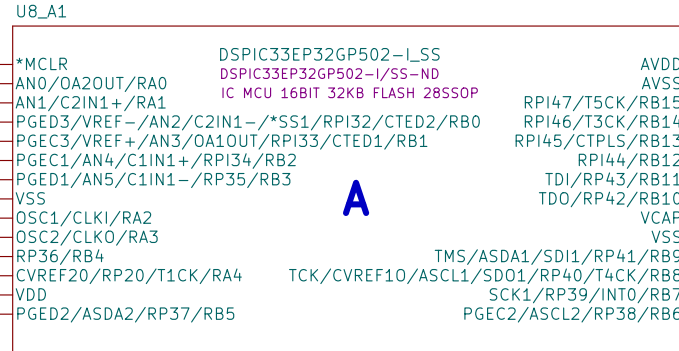
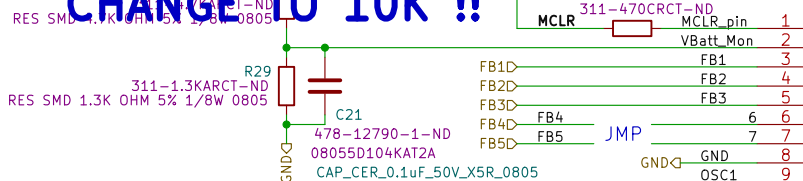
X1 ED281DT  
28 (2 x 14) Pos DIP, 0.3" (7.62mm) Row Spacing Socket Tin Through Ho



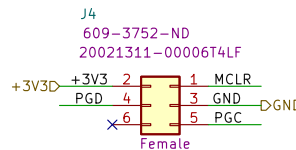
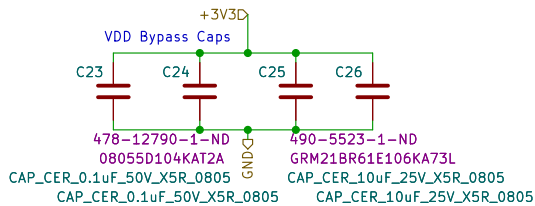
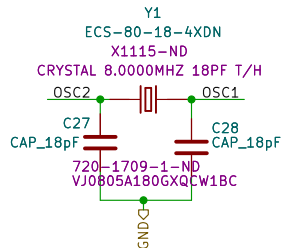
**Remove jumpers to program**



**CHANGE TO 10K !!**



SWAG: C\_OSC2 = 15pF and C\_OSC1 = 15pF;  
C1=C2=15pF; Cstray=3pF  
C\_Load = 18pF  
C\_Load = [(C1+COSC1)\*(C2+COSC2)]/[C1+COSC1+C2+COSC2] + Cstray



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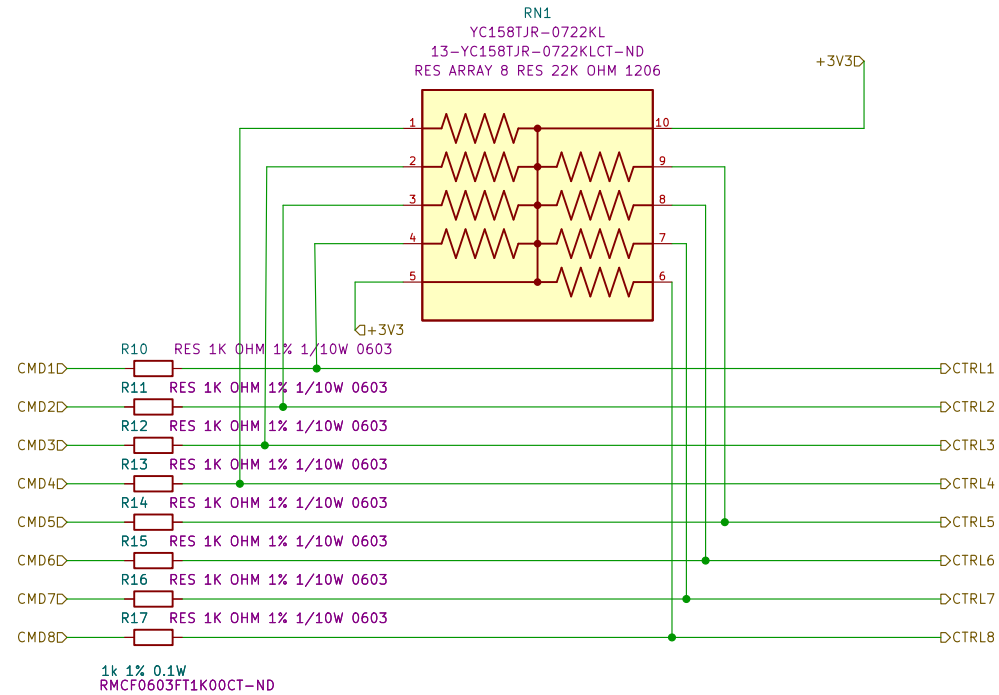
**Swappable Microcontroller**

Sheet: /Processor/  
File: Processor.kicad\_sch

Size: A4 Date: 2022-05-27  
KiCad E.D.A. kicad 6.0.11-2627ca5db0-126-ubuntu20.04.1

Rev: 1.3  
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# CTRL Signal Pull-Ups



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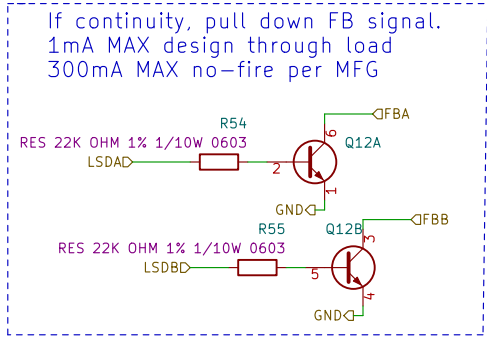
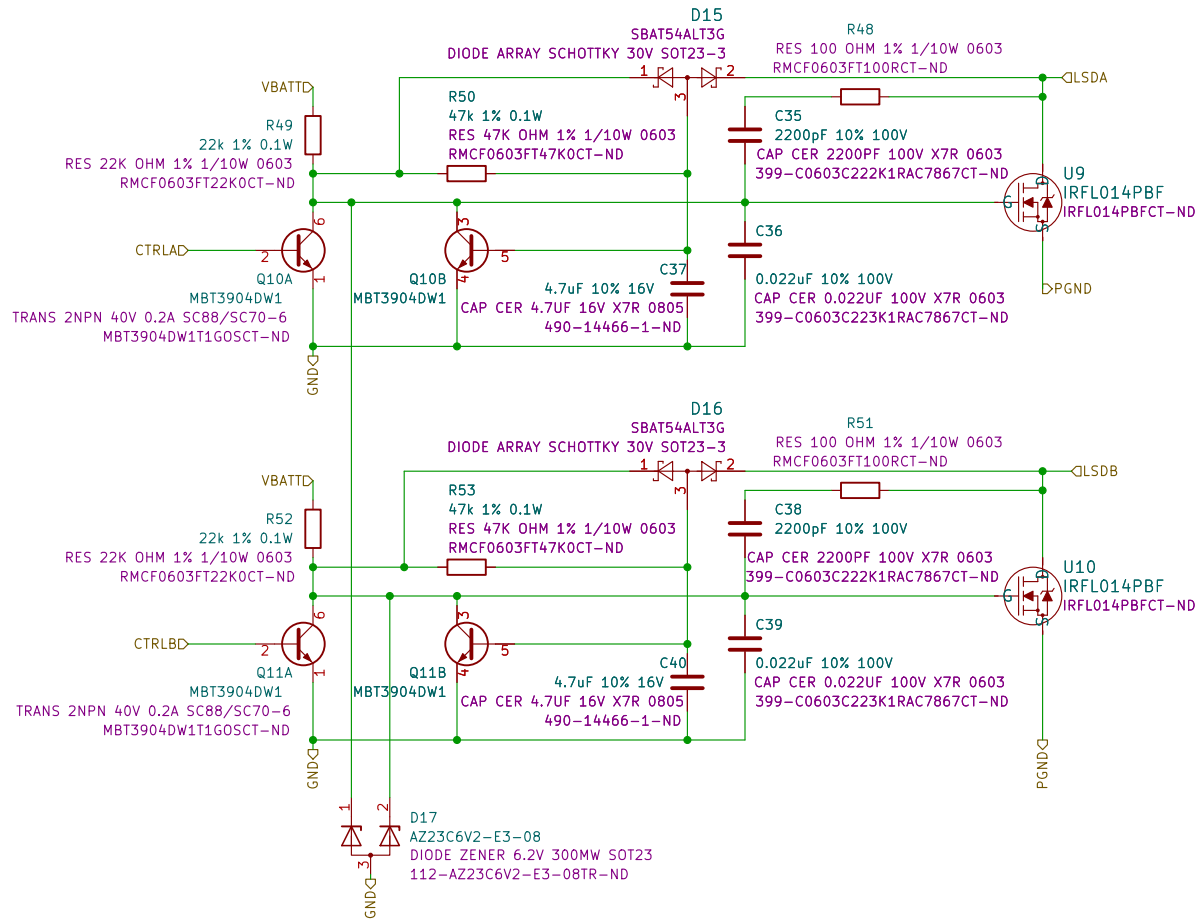
## CTRL Sig Cond.

Sheet: /io\_buff/  
File: io\_buff.kicad\_sch

Size: A4 Date: 2022-05-27  
KiCad E.D.A. kicad 6.0.11-2627ca5db0-126-ubuntu20.04.1

Rev: 1.3  
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# Low-Side Drive w/ Desat and Cont.



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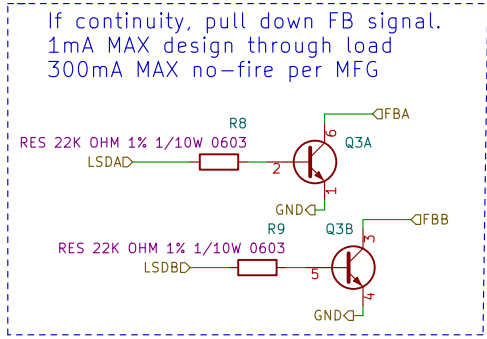
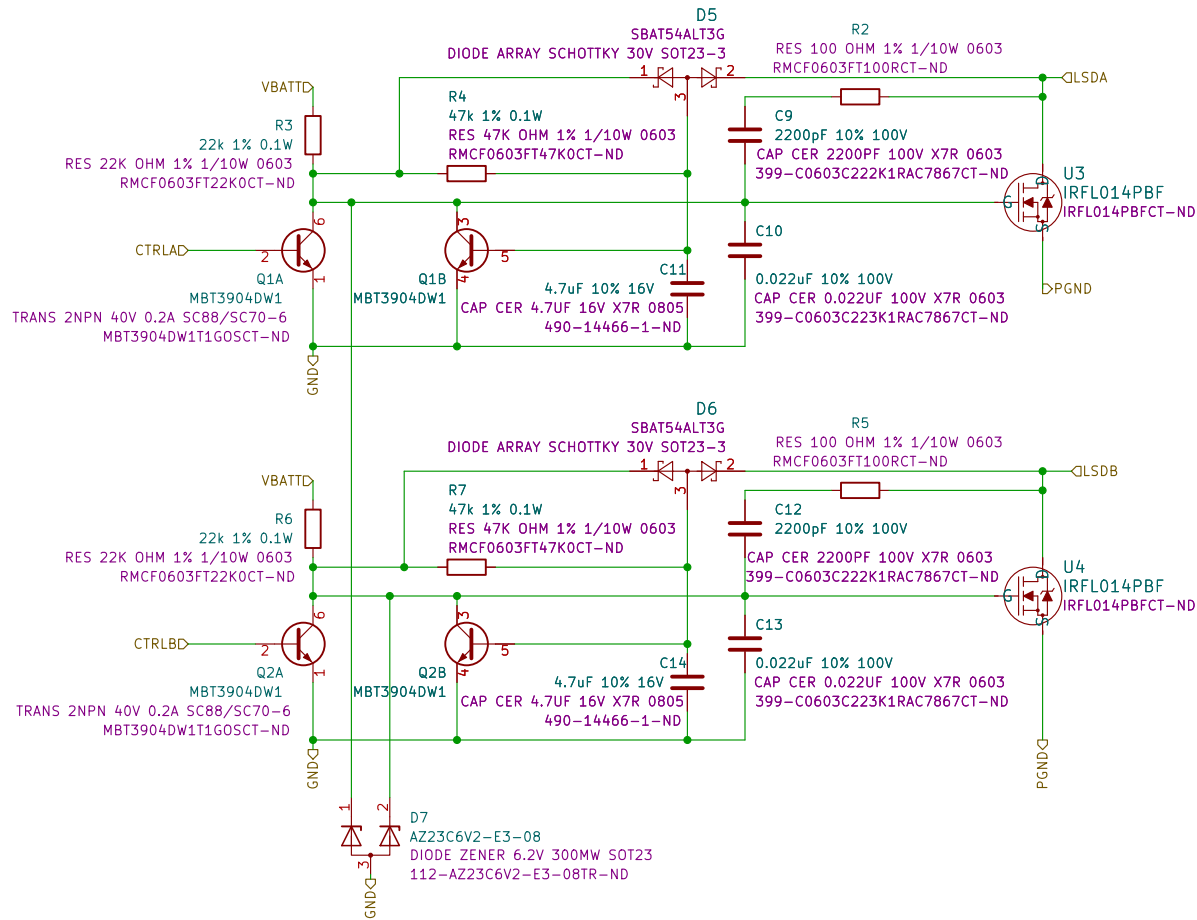
Project: CAN to 8-Channel LSD / 11- 22VDC / 1A

## Low-Side Driver

Sheet: /LSD1/  
File: LSD.kicad\_sch

Size: A	Date: 2022-05-27	Rev: 1.3
KiCad E.D.A. kicad 6.0.11-2627ca5db0-126-ubuntu20.04.1		Sheet 7/11

# Low-Side Drive w/ Desat and Cont.



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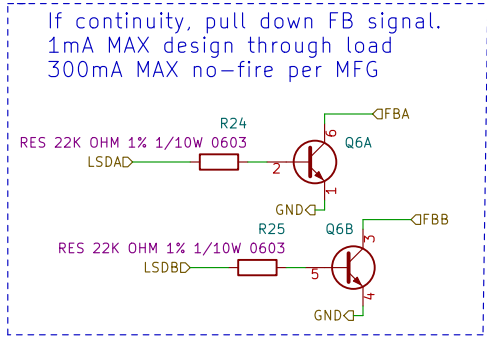
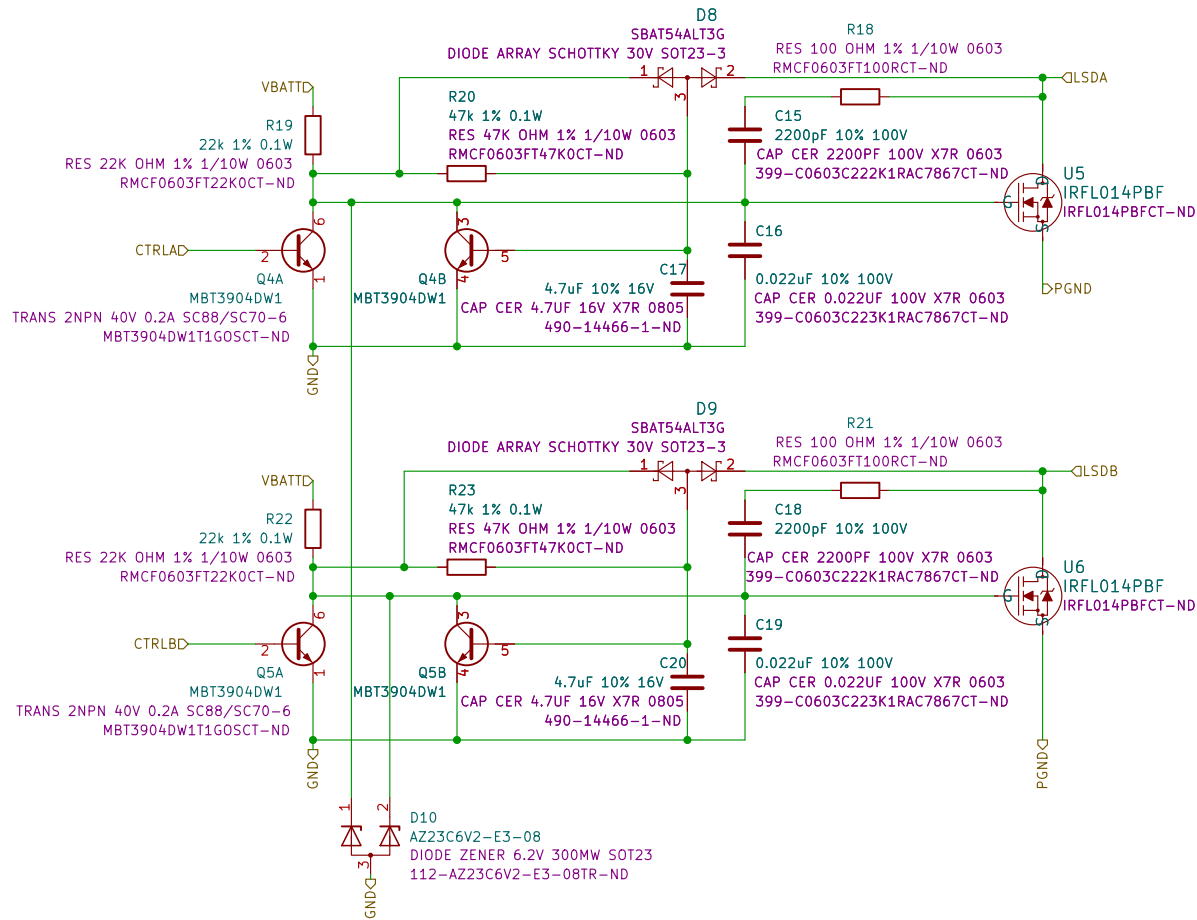
## Low-Side Driver

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File: LSD.kicad\_sch

Size: A	Date: 2022-05-27	Rev: 1.3
KiCad E.D.A. kicad 6.0.11-2627ca5db0-126-ubuntu20.04.1		Sheet 8/11



# Low-Side Drive w/ Desat and Cont.



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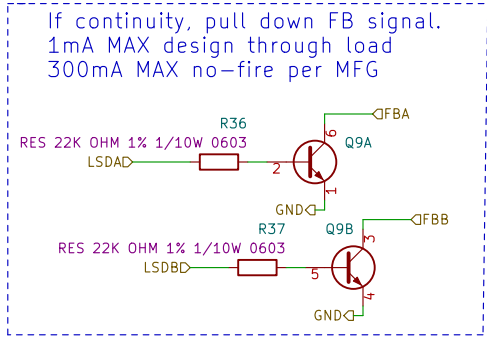
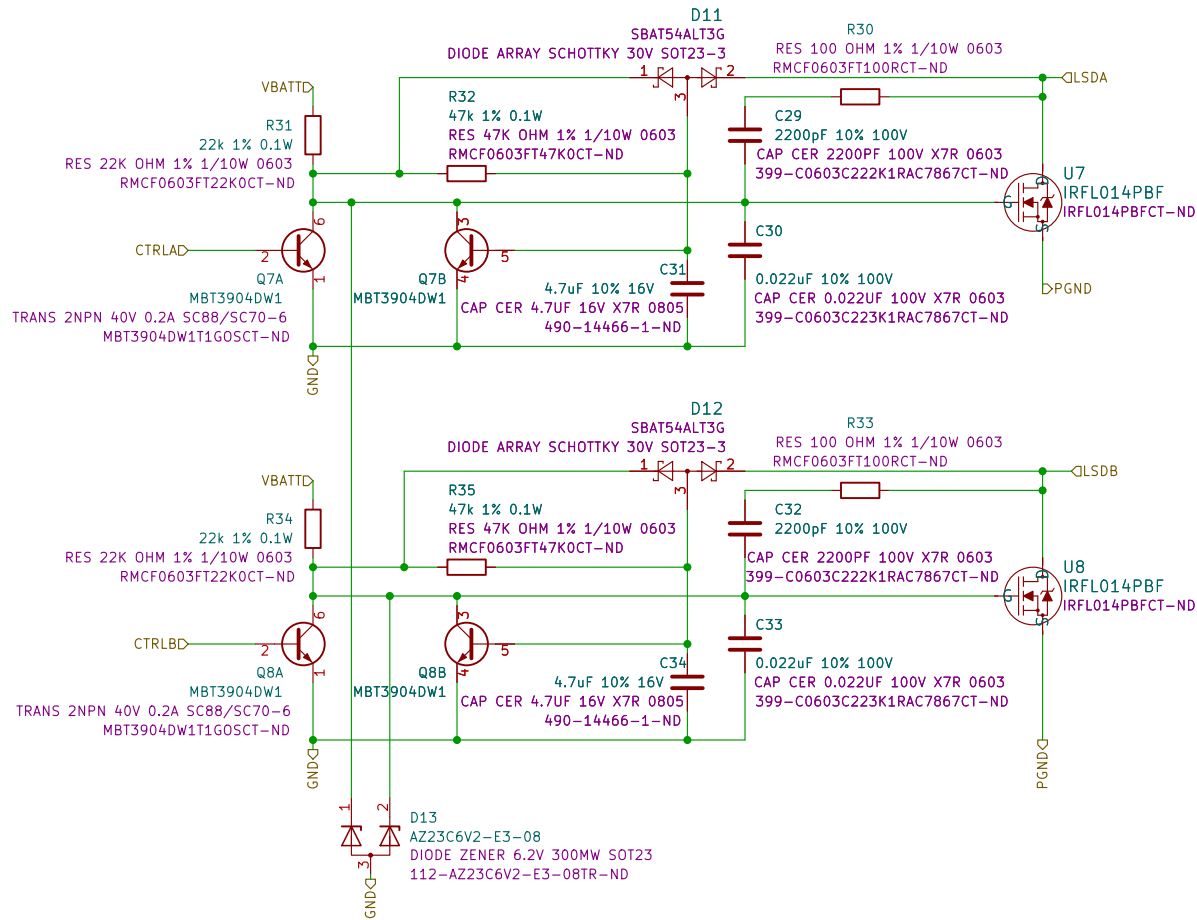
Project: CAN to 8-Channel LSD / 11- 22VDC / 1A

## Low-Side Driver

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Size: A	Date: 2022-05-27	Rev: 1.3
KiCad E.D.A. kicad 6.0.11-2627ca5db0-126-ubuntu20.04.1		Sheet 9/11

# Low-Side Drive w/ Desat and Cont.



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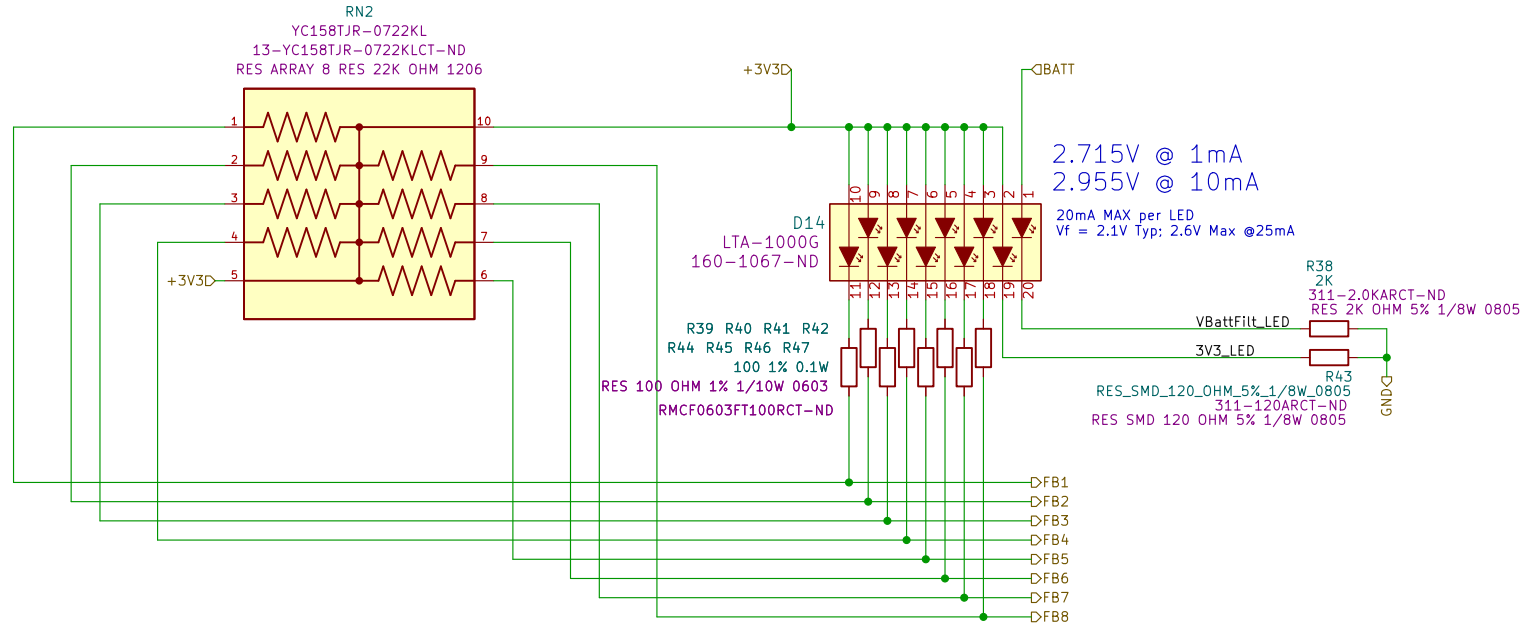
## Low-Side Driver

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Size: A	Date: 2022-05-27	Rev: 1.3
KiCad E.D.A. kicad 6.0.11-2627ca5db0-126-ubuntu20.04.1		Sheet 10/11

# Continuity and Power Indicators

**CHANGE TO 4.7K !!**



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## Feedback & Indicators

Sheet: /Feedback/  
 File: Feedback.kicad\_sch

Size: A4  
 KiCad E.D.A. kicad 6.0.11-2627ca5db0-126-ubuntu20.04.1

Date: 2022-05-27

Rev: 1.3  
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