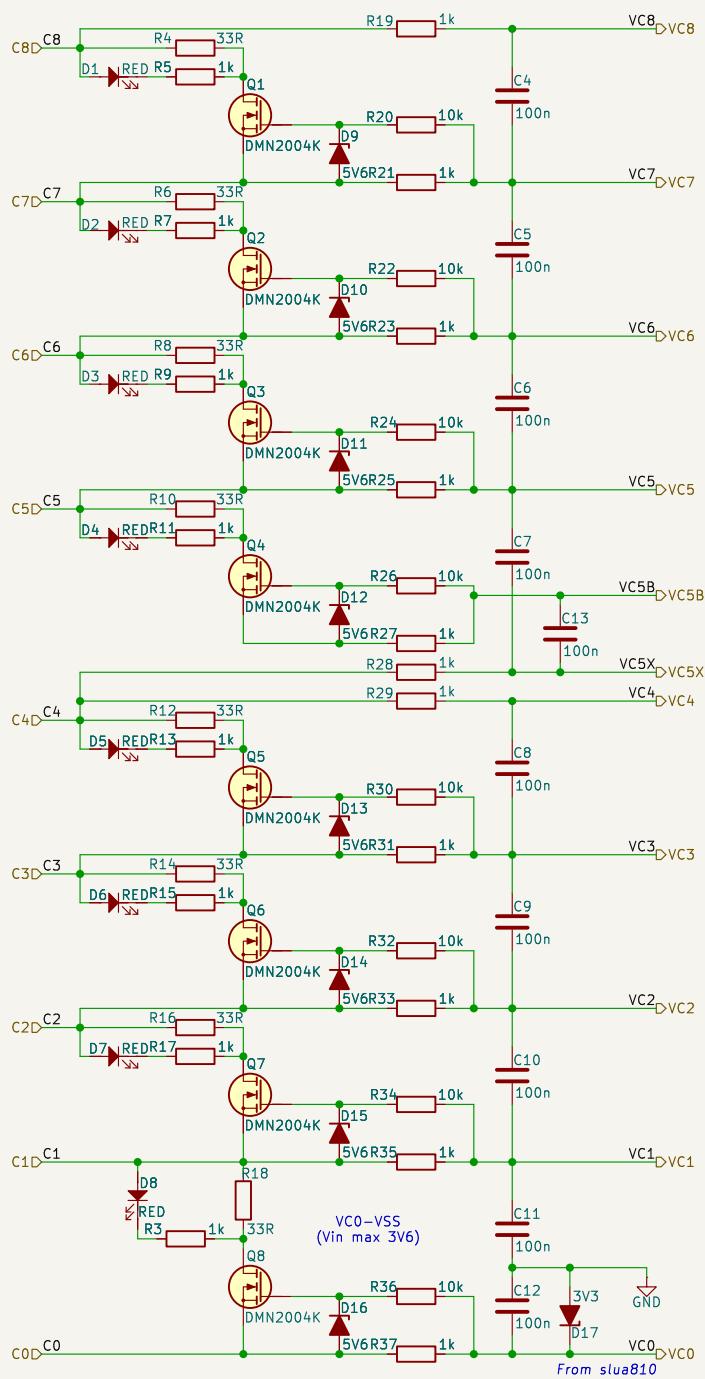
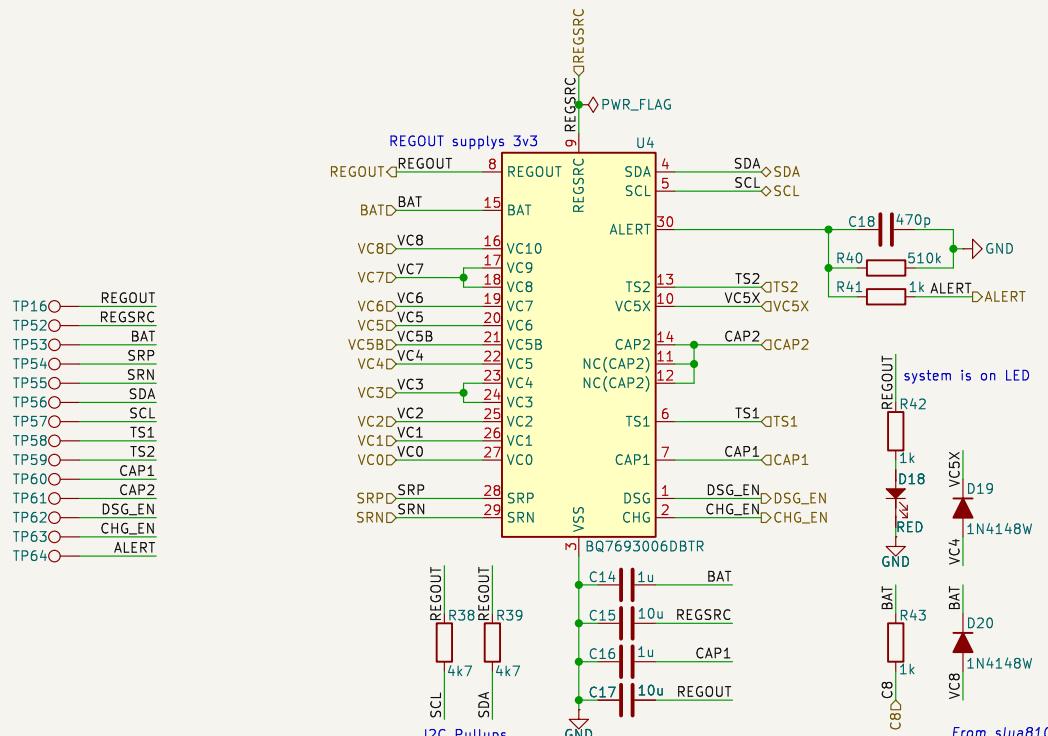


Passive Balancing Circuit





Balancing & BMC (AFE)

Sheet: /BMS Protection Board/Balancing – BMC (AFE)/
File: Balancing – BMC.kicad_sch

Title:

Size: A4 Date:
KiCad E.D.A. 9.0.4

Rev:
d: 4/33

A

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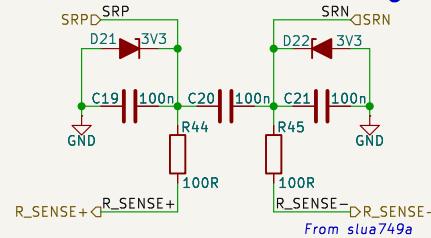
C

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Current Sense Filtering



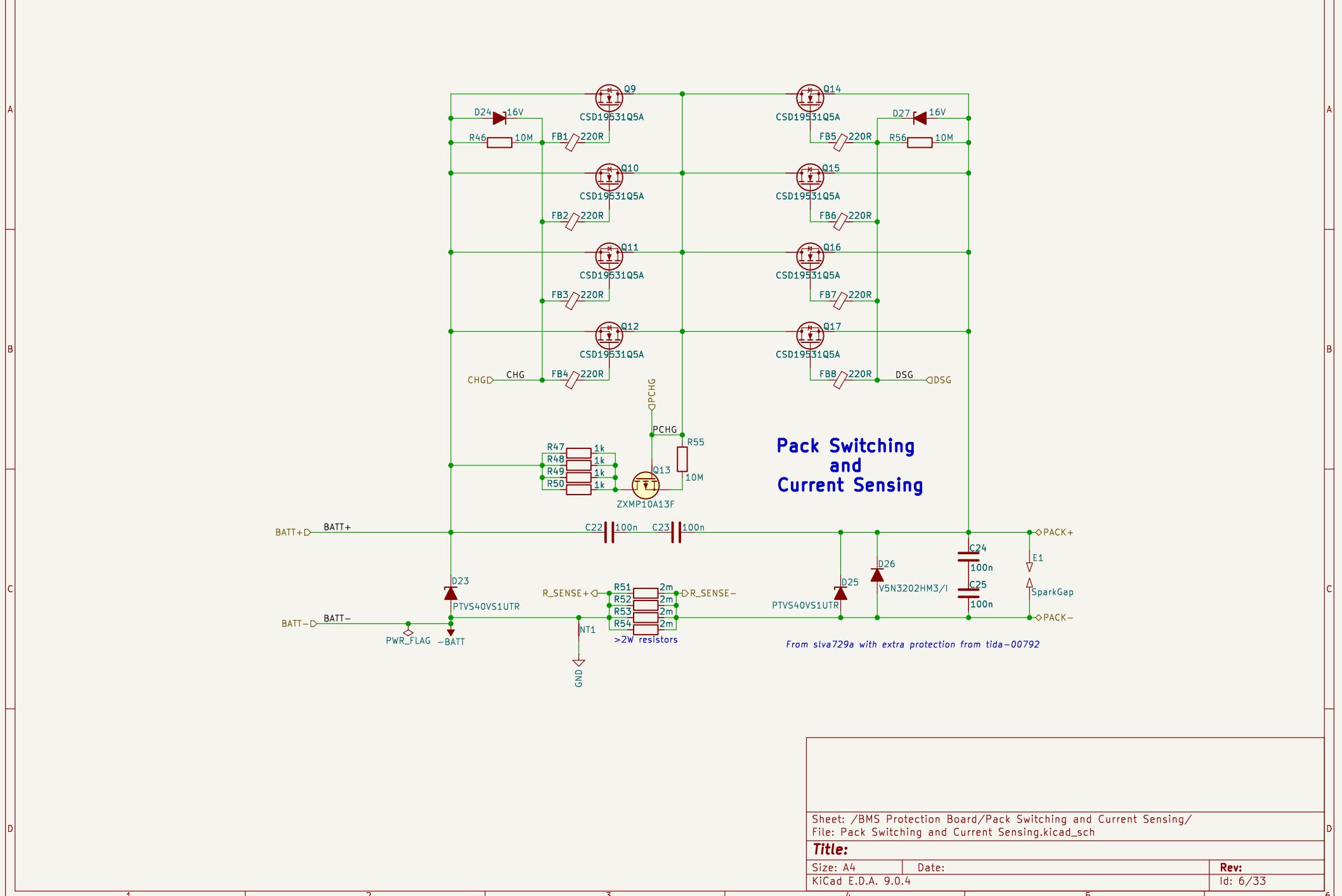
TP65 — R_SENSE+
TP66 — R_SENSE-

Sheet: /BMS Protection Board/Current Sense Filtering/
File: Current Sense Filtering.kicad_sch

Title:

Size: A4 | Date:
KiCad E.D.A. 9.0.4

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Id: 5/33



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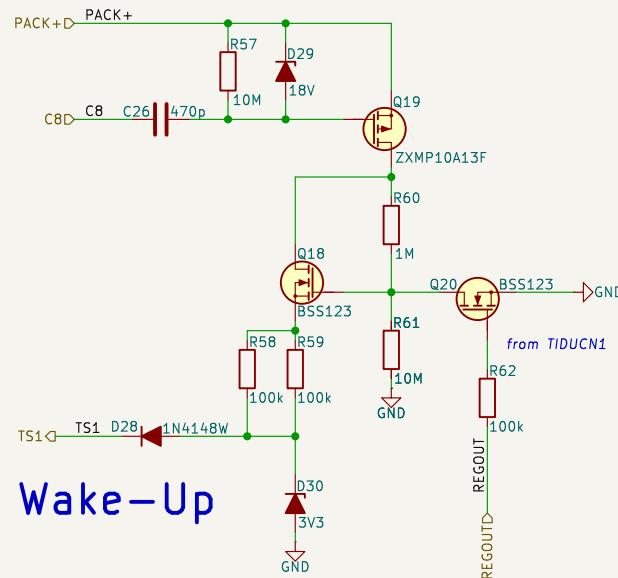
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Sheet: /BMS Protection Board/Wake Up/
File: Wake Up.kicad_sch

Title:

Size: A4 | Date:
KiCad E.D.A. 9.0.4

Rev:
Id: 7/33

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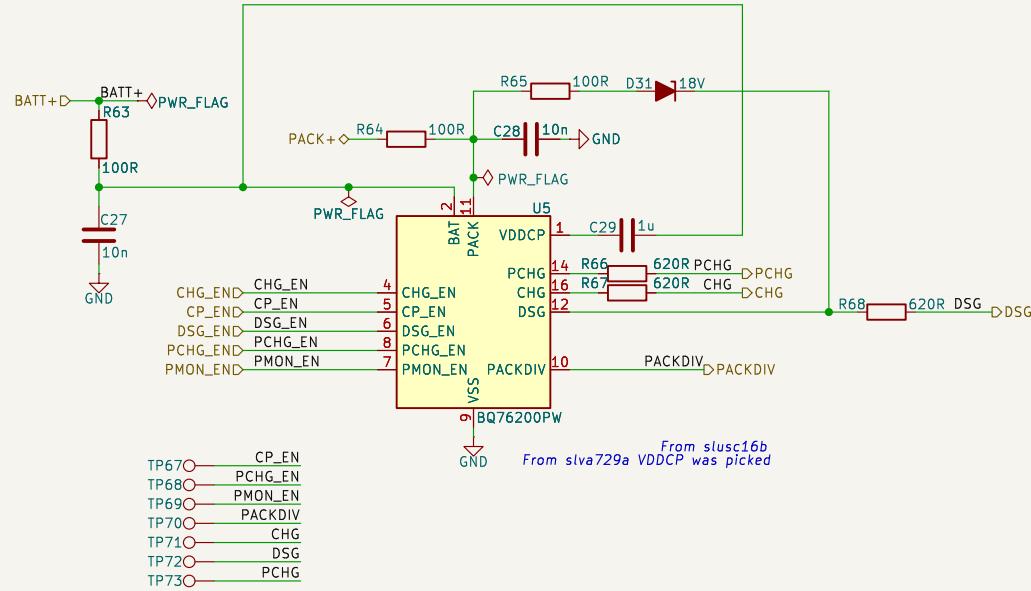
C

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High-Side Gate Driver



Sheet: /BMS Protection Board/High Side Gate Driver/
File: High Side Gate Driver.kicad_sch

Title:

Size: A4 | Date:
KiCad E.D.A. 9.0.4

Rev:
Id: 8/33

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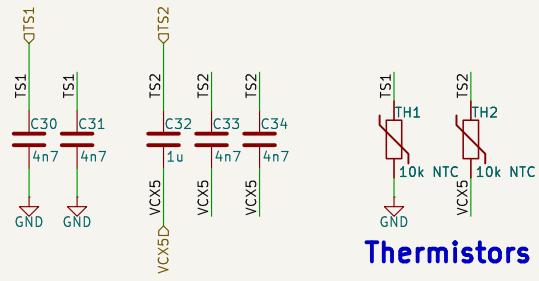
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Thermistors

Sheet: /BMS Protection Board/BMS Thermistors/
File: BMS Thermistors.kicad_sch

Title:

Size: A4 | Date:
KiCad E.D.A. 9.0.4

Rev:
Id: 9/33

A

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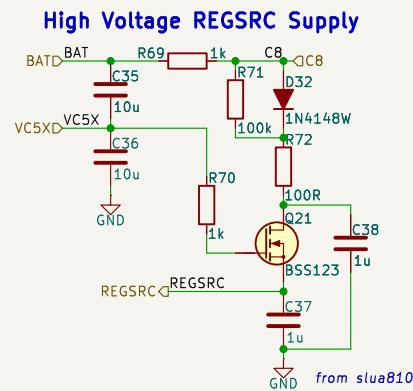
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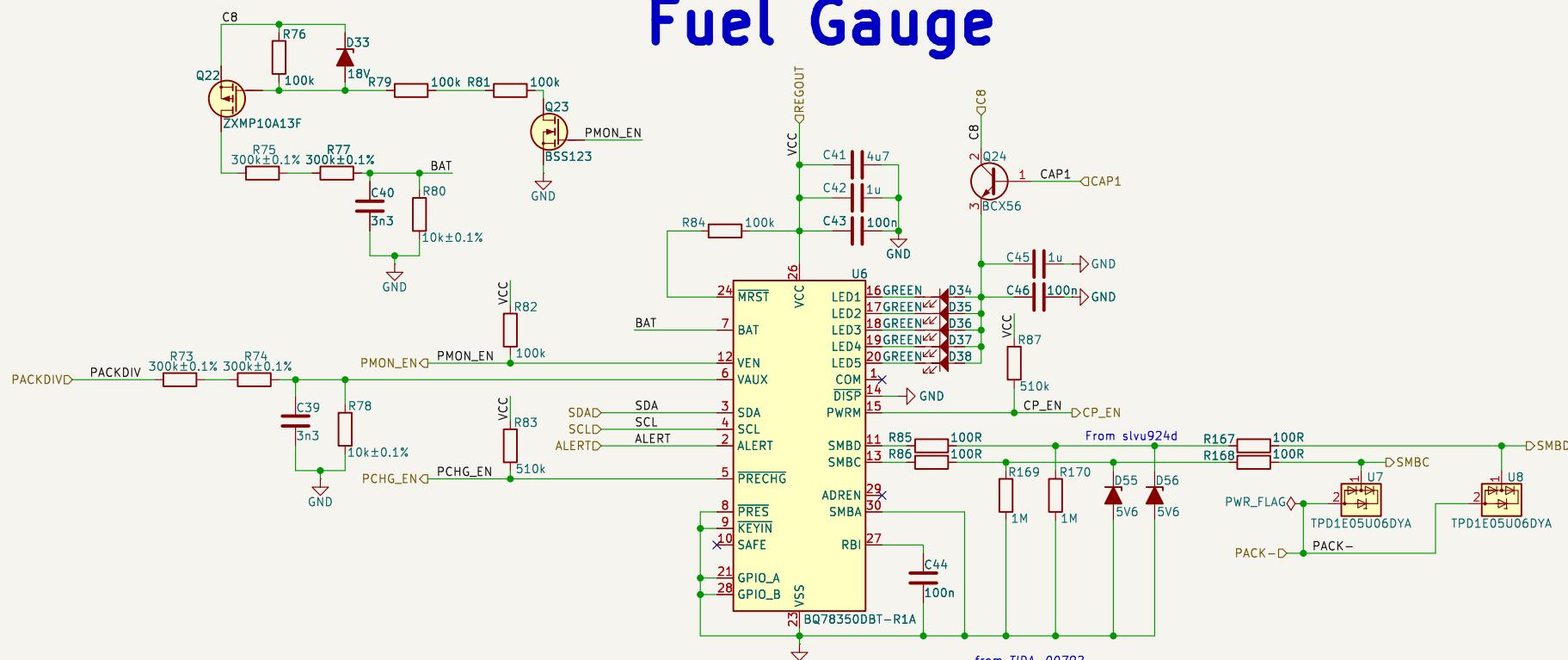


Sheet: /BMS Protection Board/High Voltage REGSRC Supply/
File: High Voltage REGSRC Supply.kicad_sch

Title:

Size: A4 | Date:
KiCad E.D.A. 9.0.4

Rev:
Id: 10/33

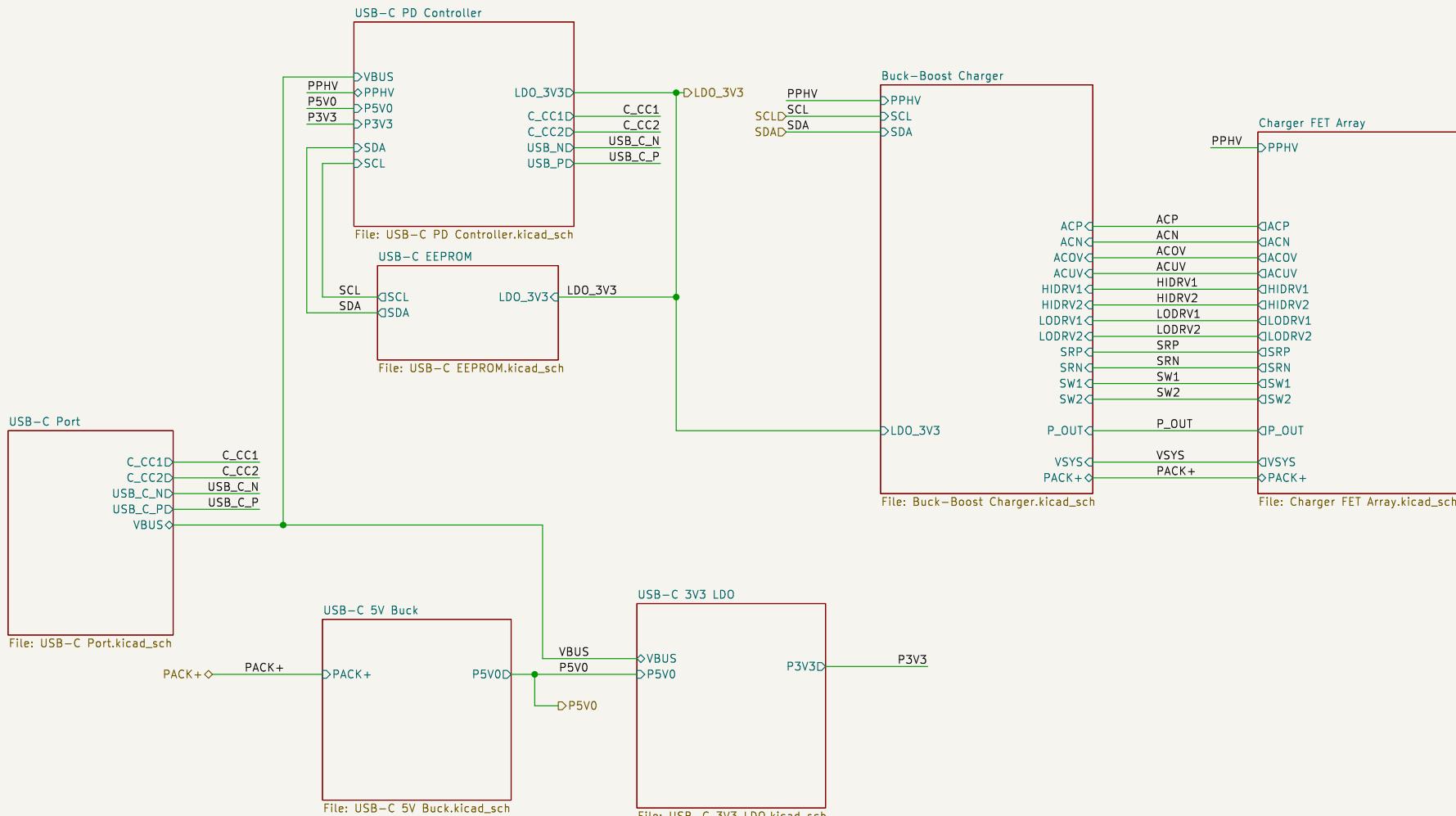


Sheet: /BMS Protection Board/Fuel Gauge/
File: Fuel Gauge.kicad_sch

Title:

Size: A4 | Date:
KiCad E.D.A. 9.0.4

Rev:
Id: 11/33



Design is based off of PMP41062

The Correct Flashing Process
Here is the correct workflow:

Generate Your Configuration: Use the TPS2575x Application Customization Tool from Texas Instruments to create the binary file (.bin) that contains all your desired settings.

Program the EEPROM Separately: Connect the CAT24C512 EEPROM to your dedicated flasher or an Arduino. Do this before connecting it to the TPS25751.

Connect power (VCC), ground (GND), SDA, and SCL.

Use the flasher's software to write the .bin file you generated onto the EEPROM.

Assemble the Final Circuit: Once the EEPROM is successfully flashed, connect it to the I₂C_c (the controller port) of the TPS25751.

Now, when you power on your circuit, the TPS25751 will use its I_CC port to automatically read the settings you loaded onto the EEPROM and will configure itself correctly.

Sheet: /USB-C Power Delivery/
File: USB-C Power Delivery.kicad_sch

Titles

Size: A4 Date:

Rev: 12/33

A

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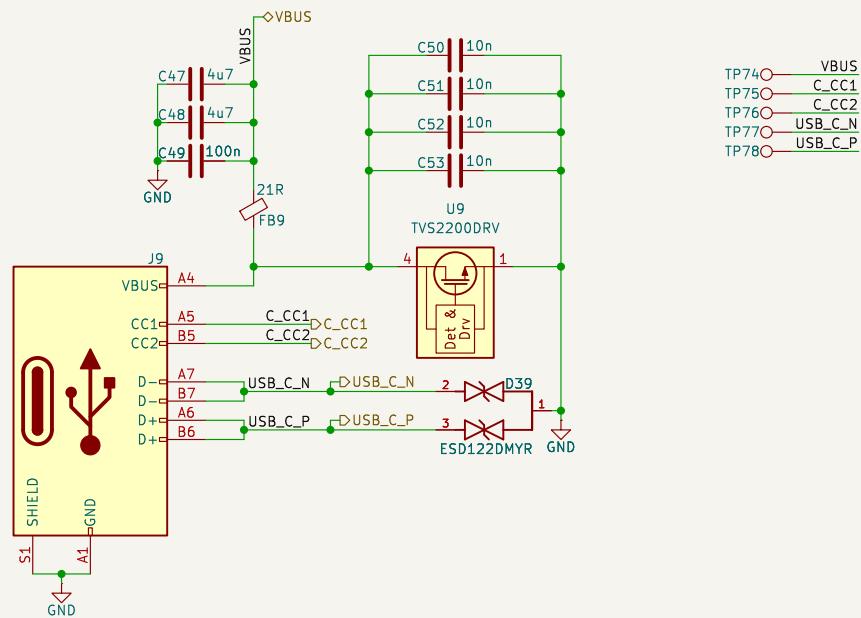
B

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Sheet: /USB-C Power Delivery/USB-C Port/
 File: USB-C Port.kicad_sch

Title:

Size: A4 | Date:
 KiCad E.D.A. 9.0.4

Rev:
 Id: 13/33

A

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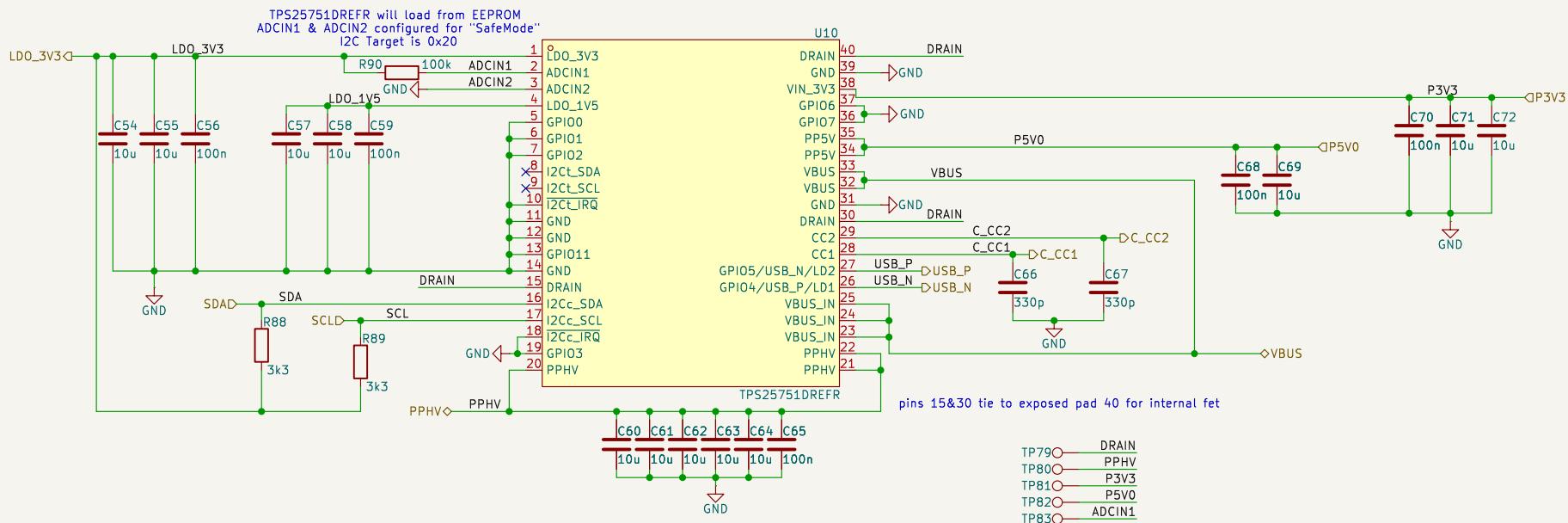
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Sheet: /USB-C Power Delivery/USB-C PD Controller/
File: USB-C PD Controller.kicad_sch

Title:

Size: A4 | Date:
KiCad E.D.A. 9.0.4

Rev:
Id: 14/33

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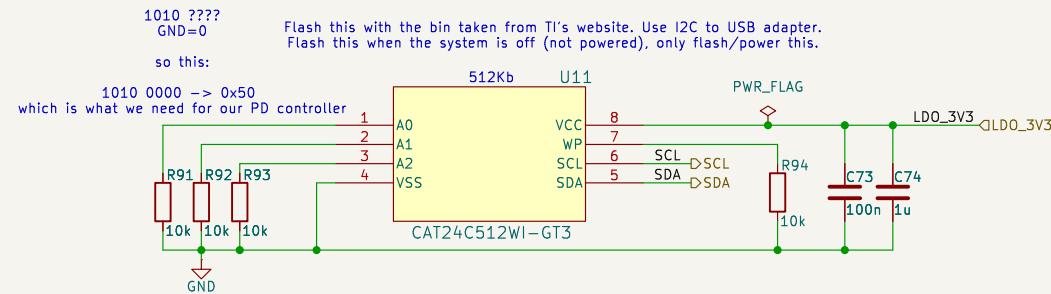
D

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Sheet: /USB-C Power Delivery/USB-C EEPROM/
File: USB-C EEPROM.kicad_sch

Title:

Size: A4 Date:
KiCad E.D.A. 9.0.4

Rev:
Id: 15/33

A

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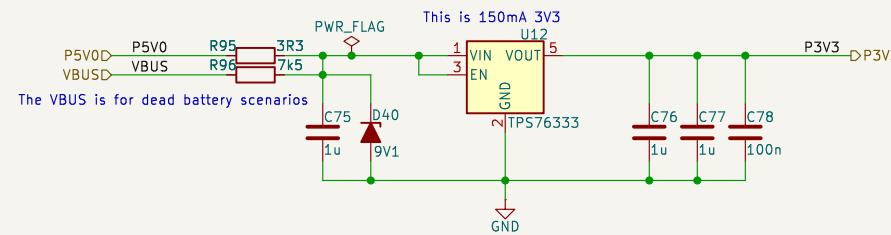
B

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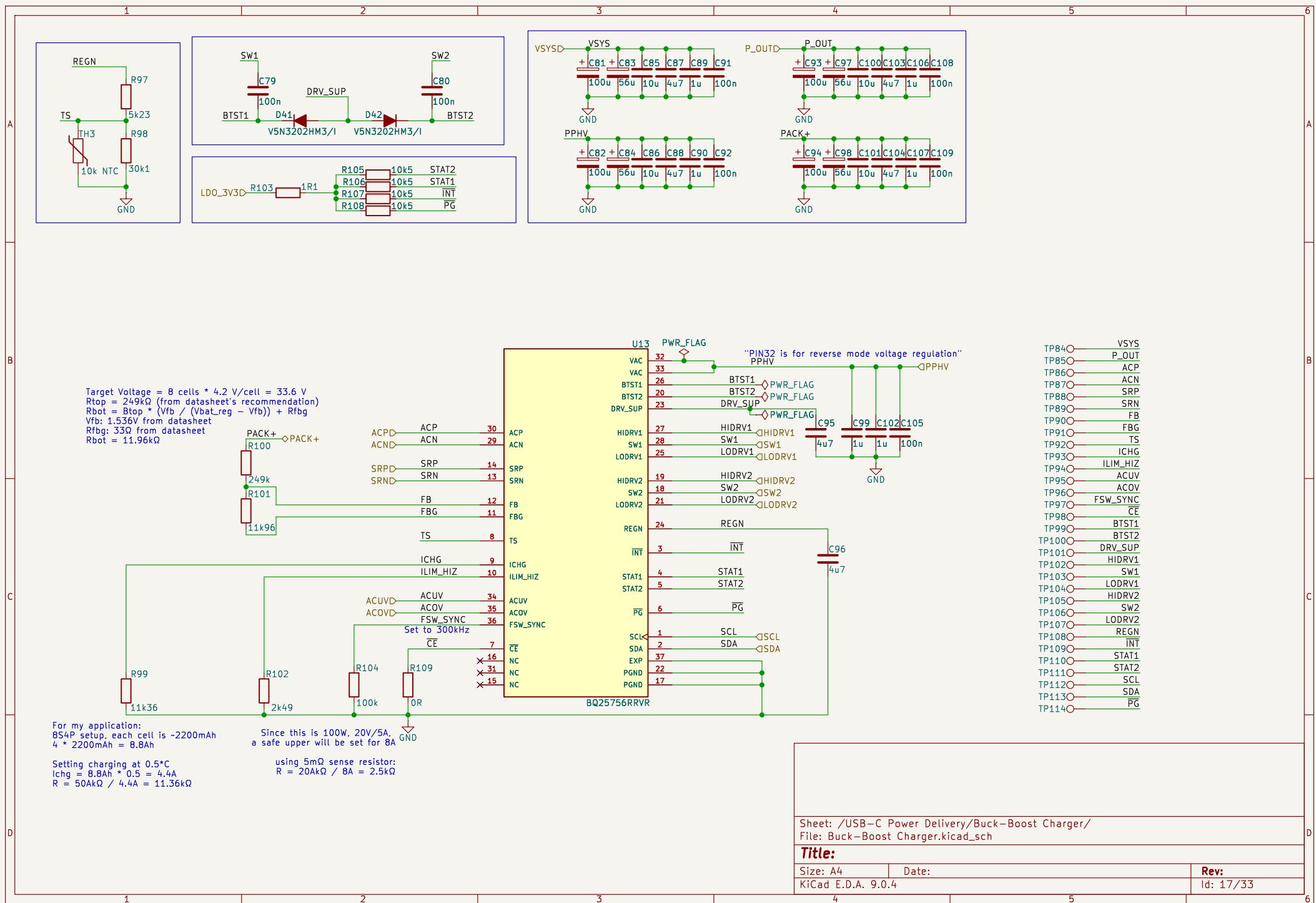


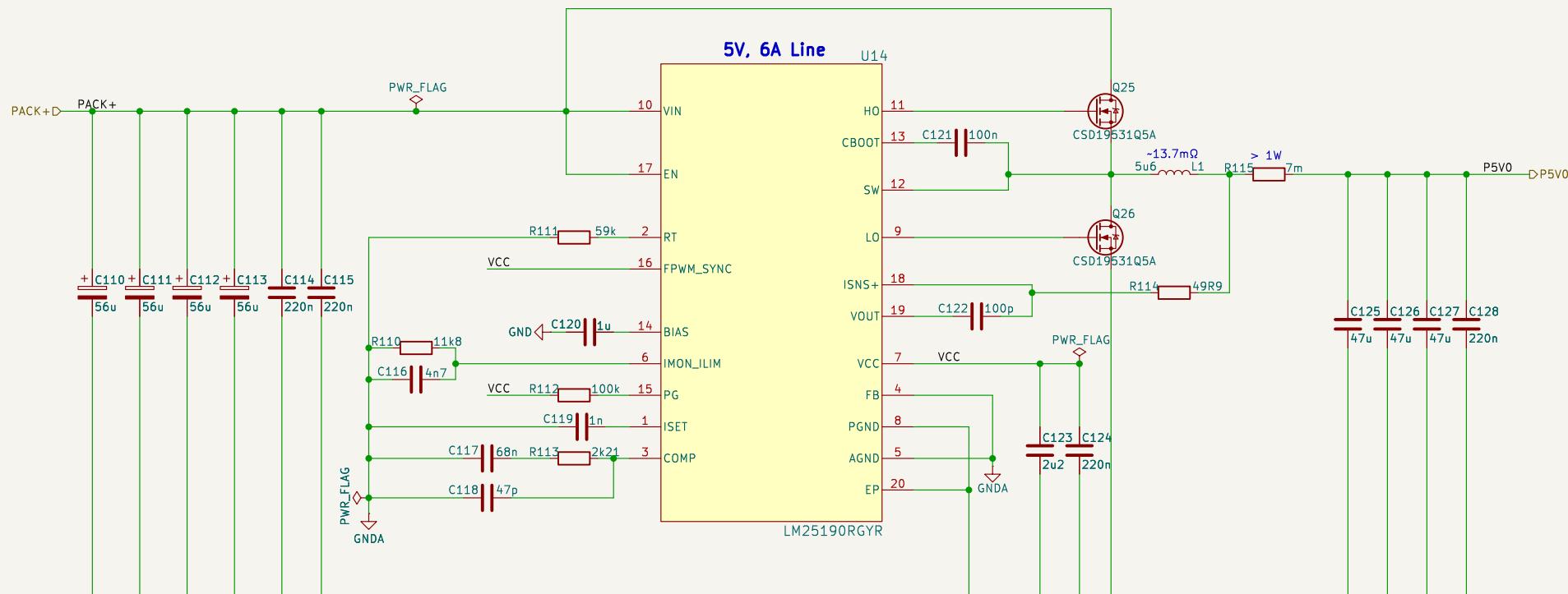
Sheet: /USB-C Power Delivery/USB-C 3V3 LDO/
File: USB-C 3V3 LDO.kicad_sch

Title:

Size: A4 | Date:
KiCad E.D.A. 9.0.4

Rev:
Id: 16/33





P5V0 must support $3A(VBUS) + 0.315A(VCONN) = 3.315A$
with headroom, 5A is a good amount

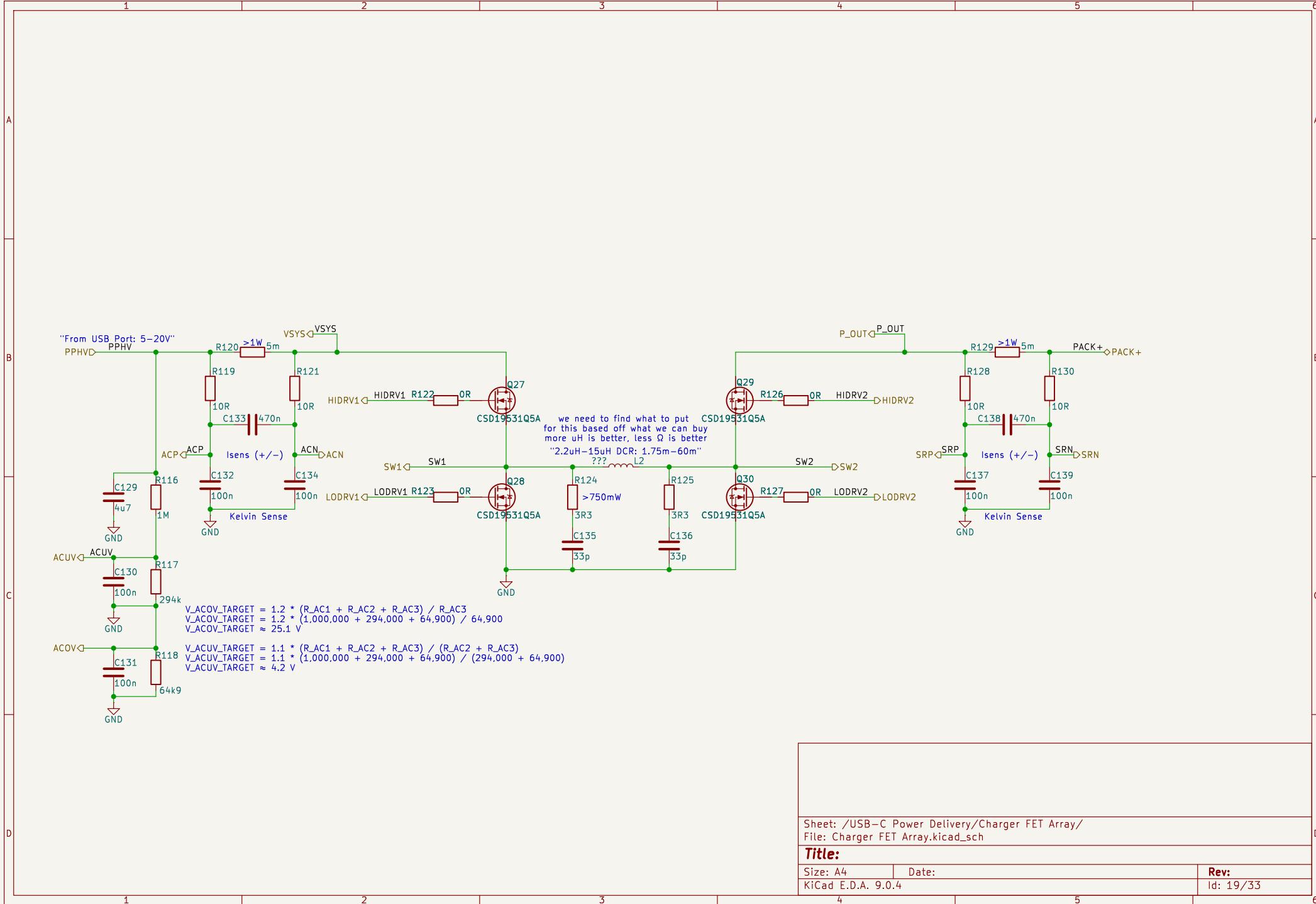
also some logic will require 5V:
Optical Encoders, 10mA x 4: 40mA
Other Sensors: idk, but prob < 1A
6A was the picked headroom

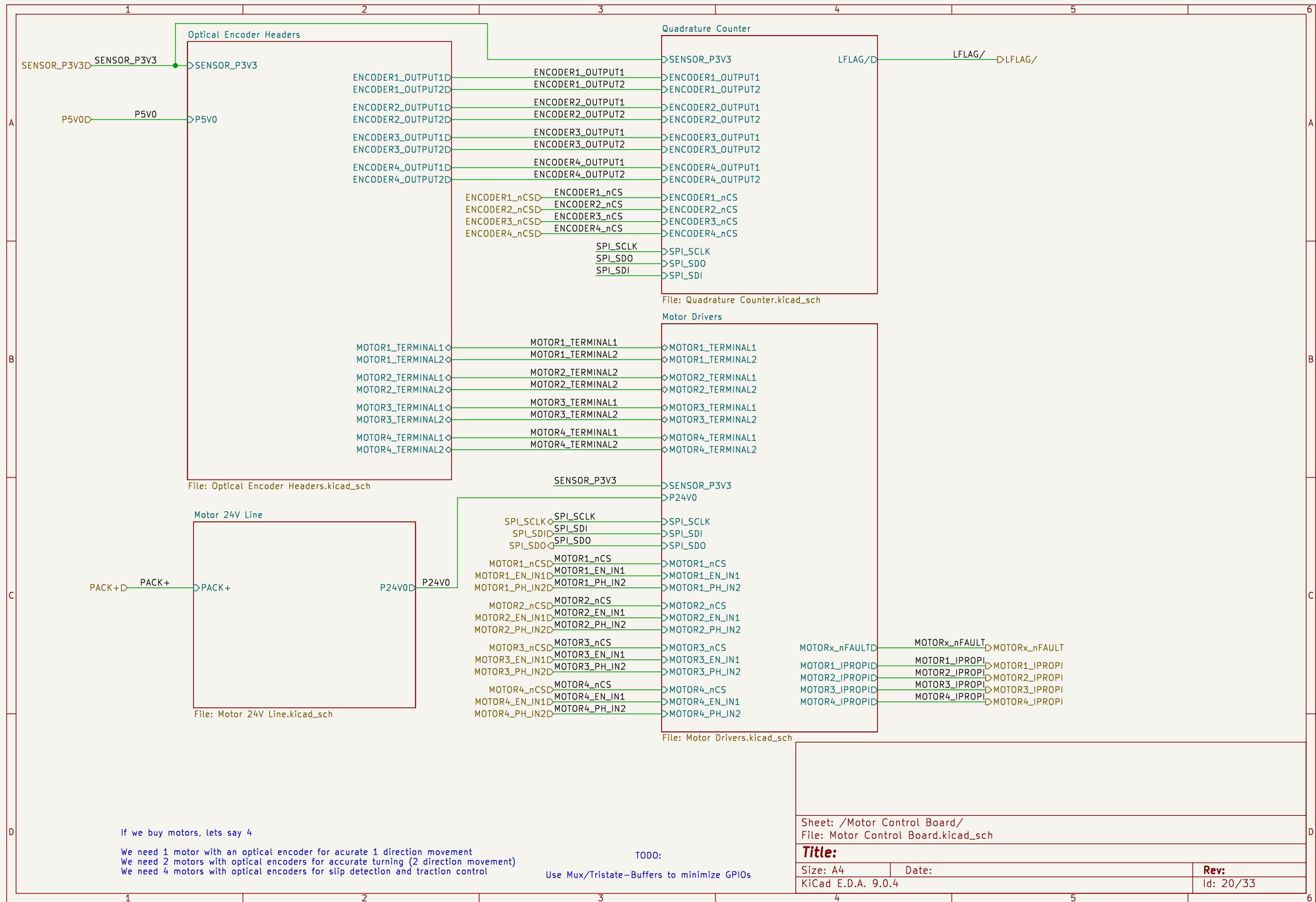
Sheet: /USB-C Power Delivery/USB-C 5V Buck/
File: USB-C 5V Buck.kicad_sch

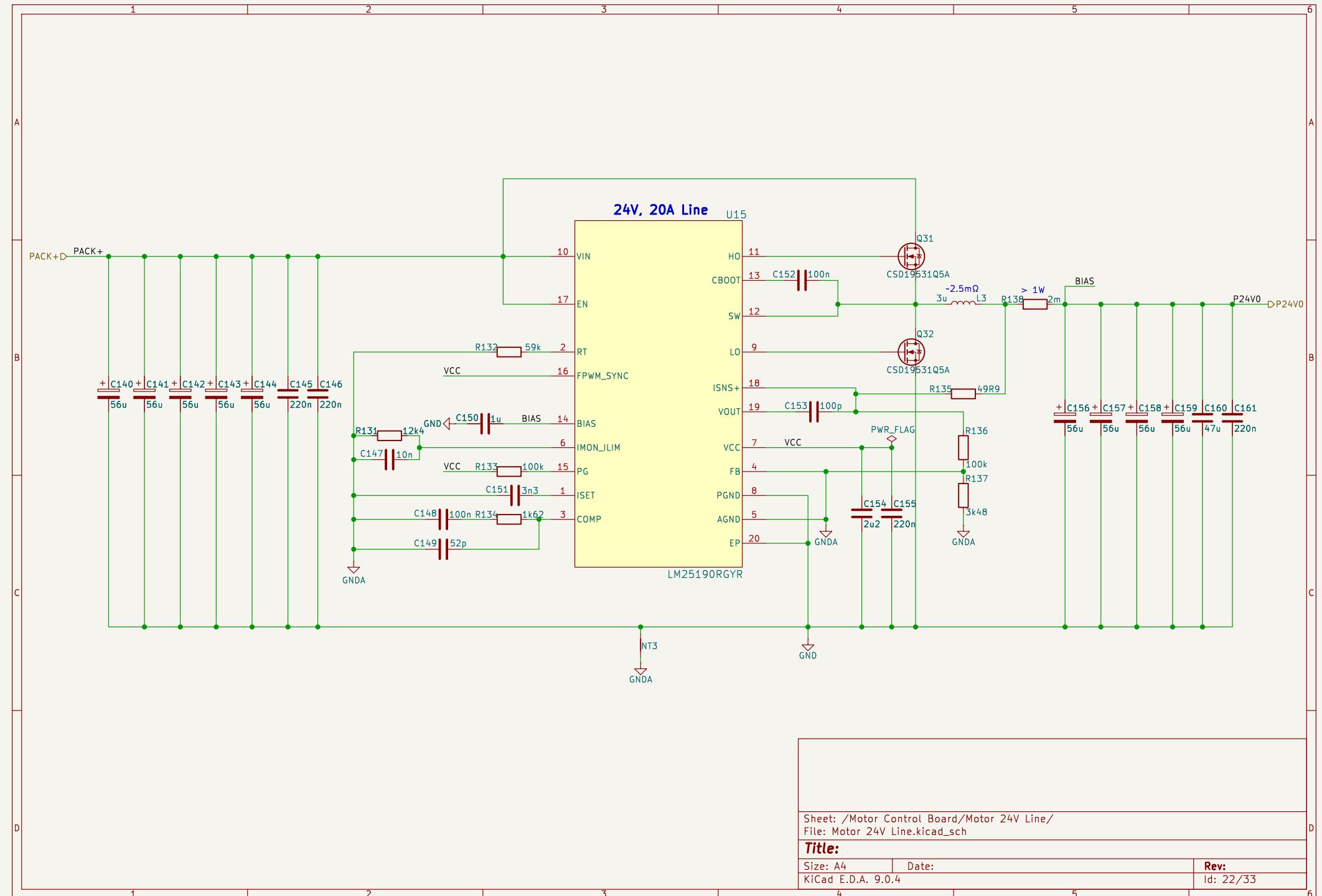
Title:

Size: A4 Date:
KiCad E.D.A. 9.0.4

Rev:
Id: 18/33

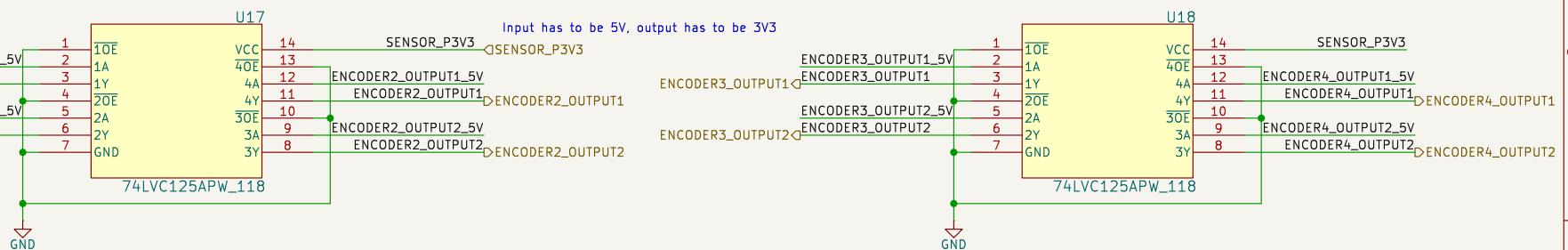
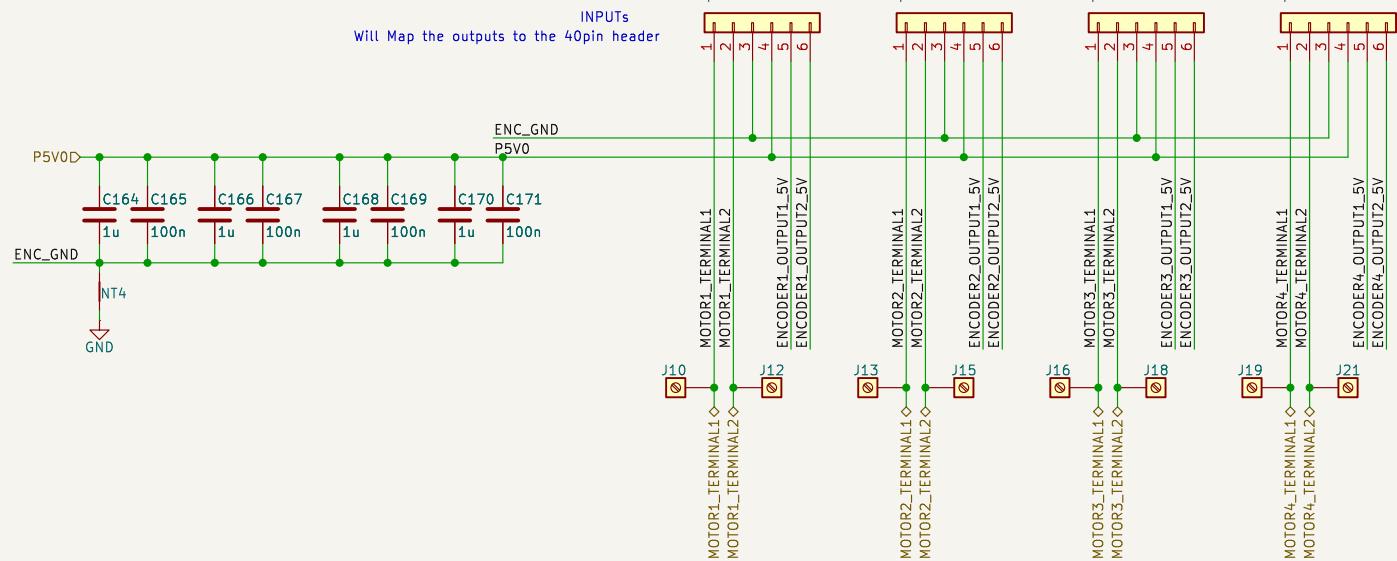






(1) Red	motor power (connects to one motor terminal)
(2) Black	motor power (connects to the other motor terminal)
(3) Green	encoder GND
(4) Blue	encoder Vcc (3.5 – 20 V)
(5) Yellow	encoder A output
(6) White	encoder B output

TP115	SENSOR_P3V3
TP116	ENC_GND
TP117	MOTOR1_TERMINAL1
TP118	MOTOR1_TERMINAL2
TP119	ENCODER1_OUTPUT1_5V
TP120	ENCODER1_OUTPUT2_5V
TP121	MOTOR2_TERMINAL1
TP122	MOTOR2_TERMINAL2
TP123	ENCODER2_OUTPUT1_5V
TP124	ENCODER2_OUTPUT2_5V
TP125	MOTOR3_TERMINAL1
TP126	MOTOR3_TERMINAL2
TP127	ENCODER3_OUTPUT1_5V
TP128	ENCODER3_OUTPUT2_5V
TP129	MOTOR4_TERMINAL1
TP130	MOTOR4_TERMINAL2
TP131	ENCODER4_OUTPUT1_5V
TP132	ENCODER4_OUTPUT2_5V
TP133	ENCODER1_OUTPUT1
TP134	ENCODER1_OUTPUT2
TP135	ENCODER2_OUTPUT1
TP136	ENCODER2_OUTPUT2
TP137	ENCODER3_OUTPUT1
TP138	ENCODER3_OUTPUT2
TP139	ENCODER4_OUTPUT1
TP140	ENCODER4_OUTPUT2



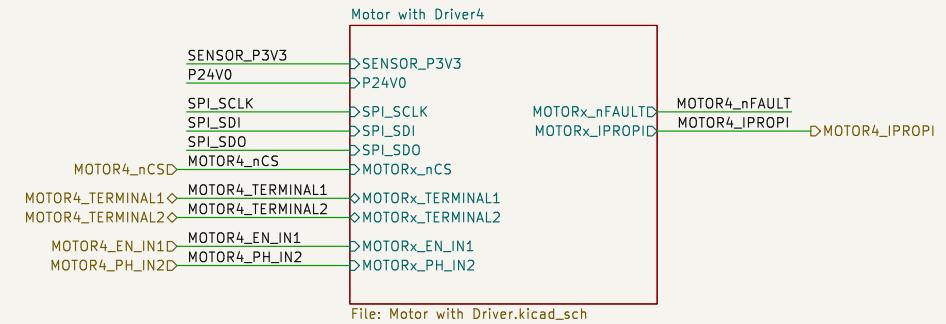
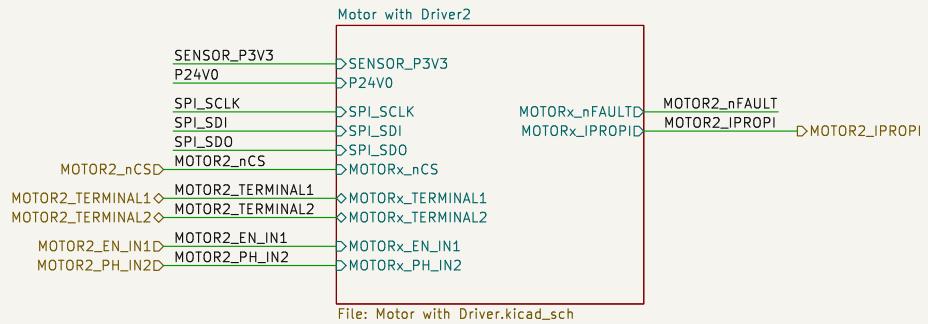
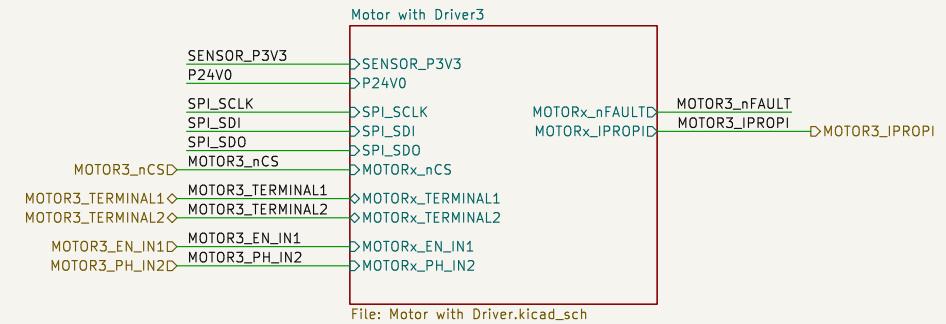
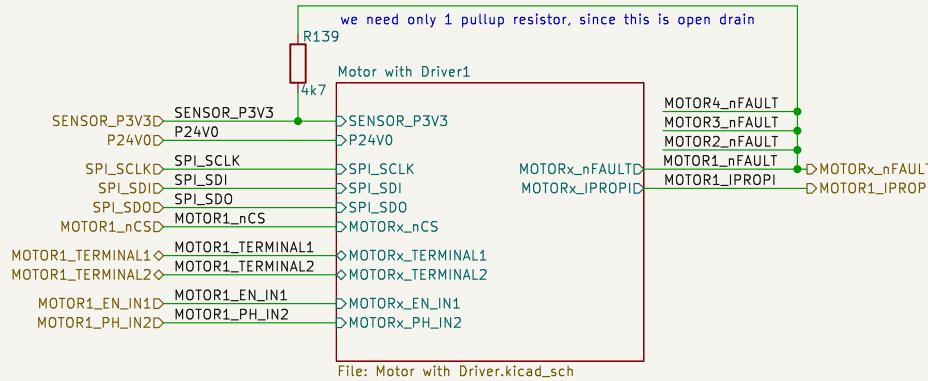
Sheet: /Motor Control Board/Optical Encoder Headers/
File: Optical_Encoder_Headers.kicad_sch

Title:

Size: A4 Date:
KiCad E.D.A. 9.0.4

Rev:
Id: 24/33

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Sheet: /Motor Control Board/Motor Drivers/
File: Motor Drivers.kicad_sch

Title:

Size: A4	Date:
KiCad E.D.A. 9.0.4	Rev: Id: 25/33

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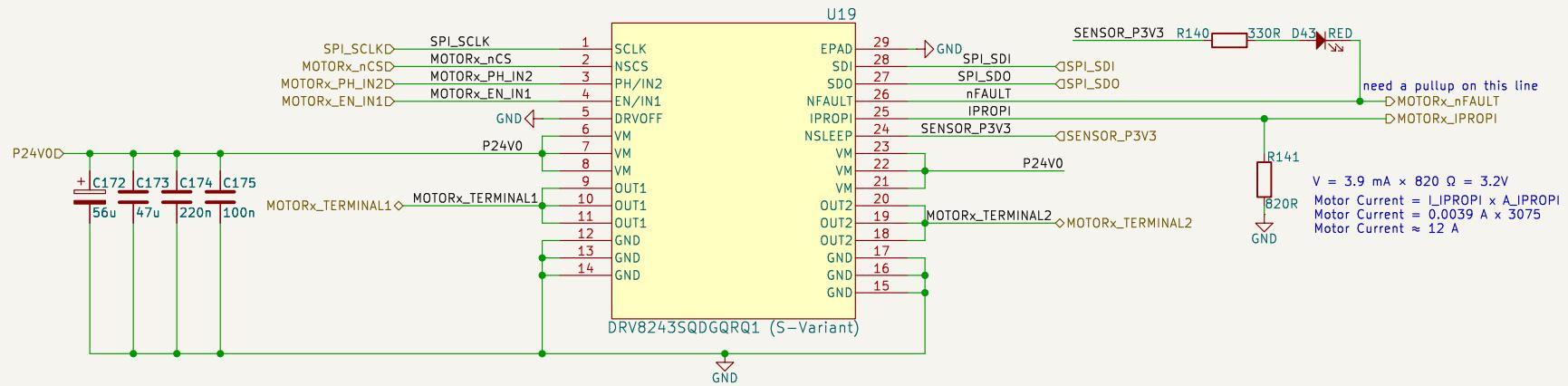
C

D

D

For the SPI (P) variant, you can set the SCLK frequency up to 10 MHz.

For the SPI (S) variant, the maximum is 10 MHz, but you should reduce it to 8 MHz if you have a 20 pF load on the SDO line.



Sheet: /Motor Control Board/Motor Drivers/Motor with Driver1/
File: Motor with Driver.kicad_sch

Title:

Size: A4 | Date:

KiCad E.D.A. 9.0.4

Rev:

Id: 26/33

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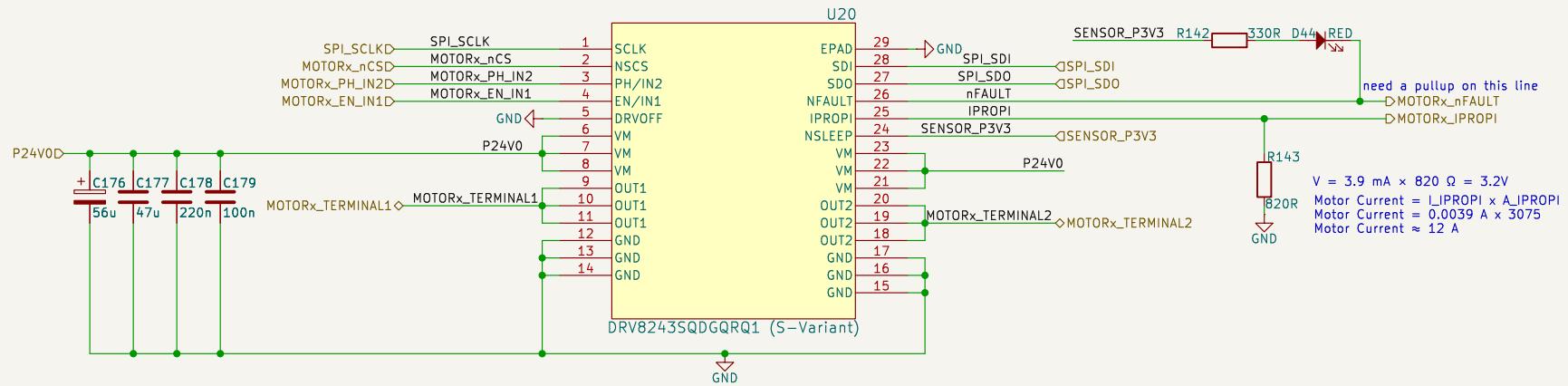
C

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For the SPI (P) variant, you can set the SCLK frequency up to 10 MHz.

For the SPI (S) variant, the maximum is 10 MHz, but you should reduce it to 8 MHz if you have a 20 pF load on the SDO line.



Sheet: /Motor Control Board/Motor Drivers/Motor with Driver2/
File: Motor with Driver.kicad_sch

Title:

Size: A4 | Date:

KiCad E.D.A. 9.0.4

Rev:

Id: 27/33

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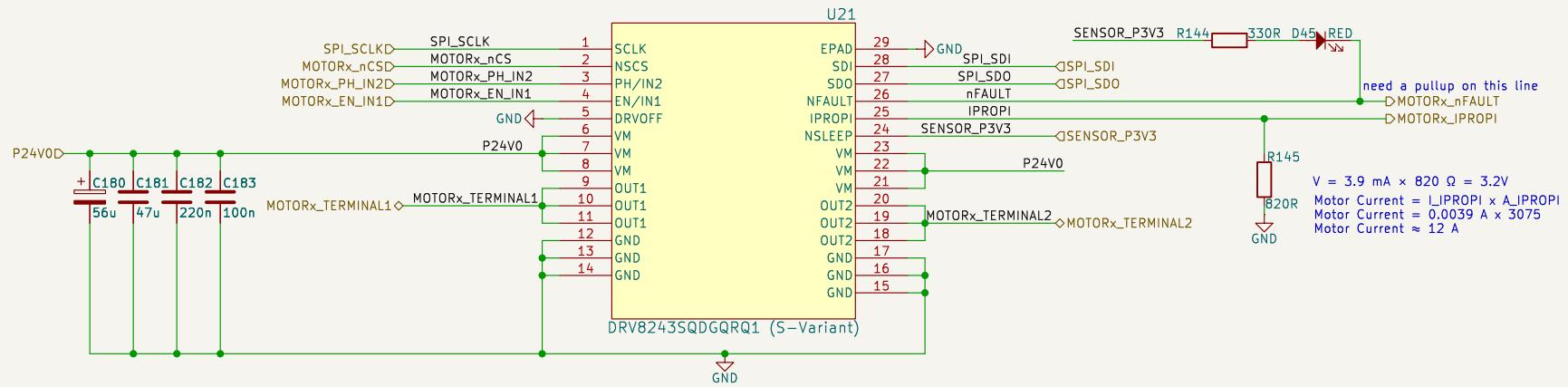
C

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For the SPI (P) variant, you can set the SCLK frequency up to 10 MHz.

For the SPI (S) variant, the maximum is 10 MHz, but you should reduce it to 8 MHz if you have a 20 pF load on the SDO line.



Sheet: /Motor Control Board/Motor Drivers/Motor with Driver3/
File: Motor with Driver.kicad_sch

Title:

Size: A4 | Date:

KiCad E.D.A. 9.0.4

Rev:

Id: 28/33

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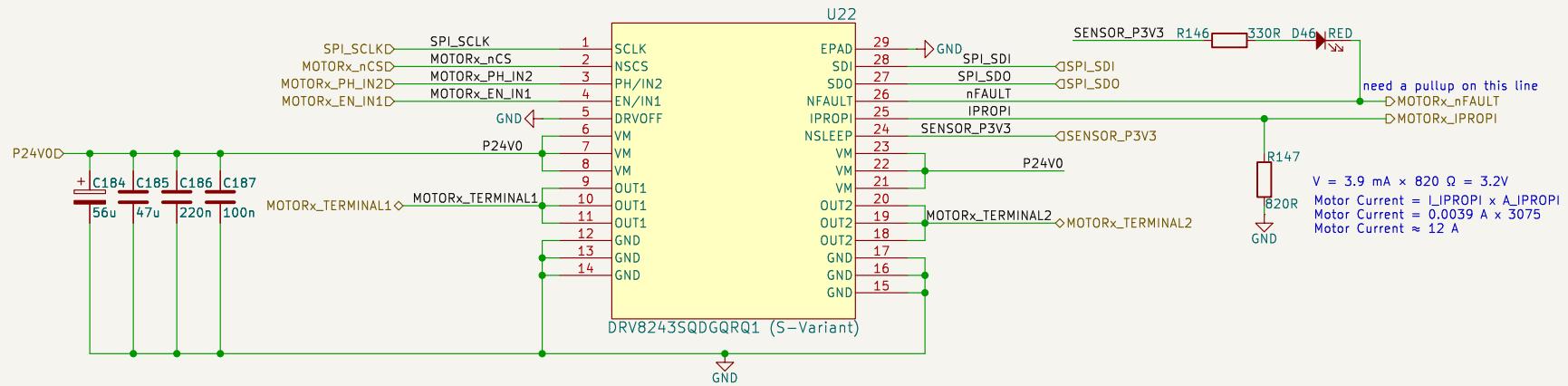
C

D

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For the SPI (P) variant, you can set the SCLK frequency up to 10 MHz.

For the SPI (S) variant, the maximum is 10 MHz, but you should reduce it to 8 MHz if you have a 20 pF load on the SDO line.



Sheet: /Motor Control Board/Motor Drivers/Motor with Driver4/
File: Motor with Driver.kicad_sch

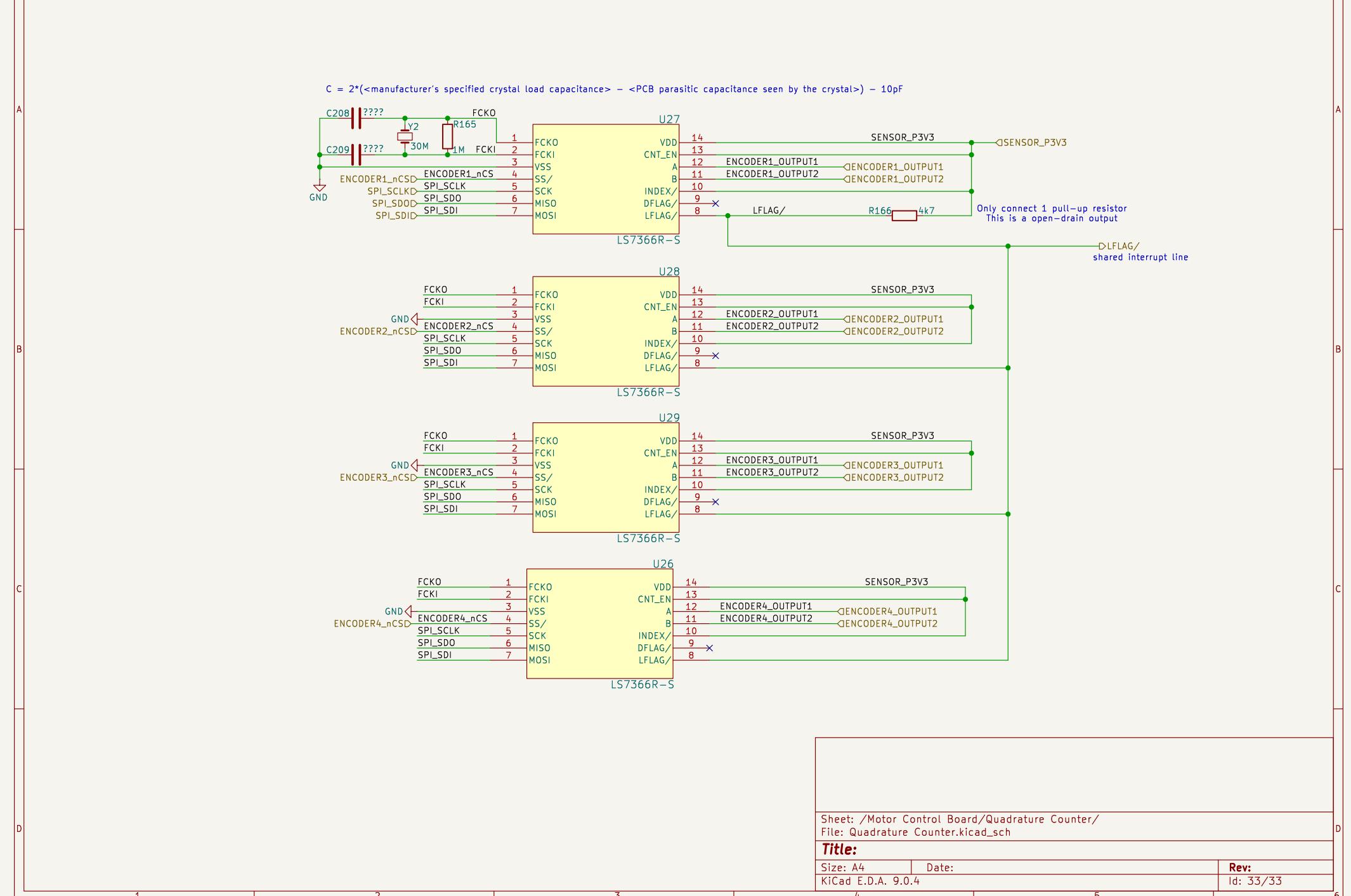
Title:

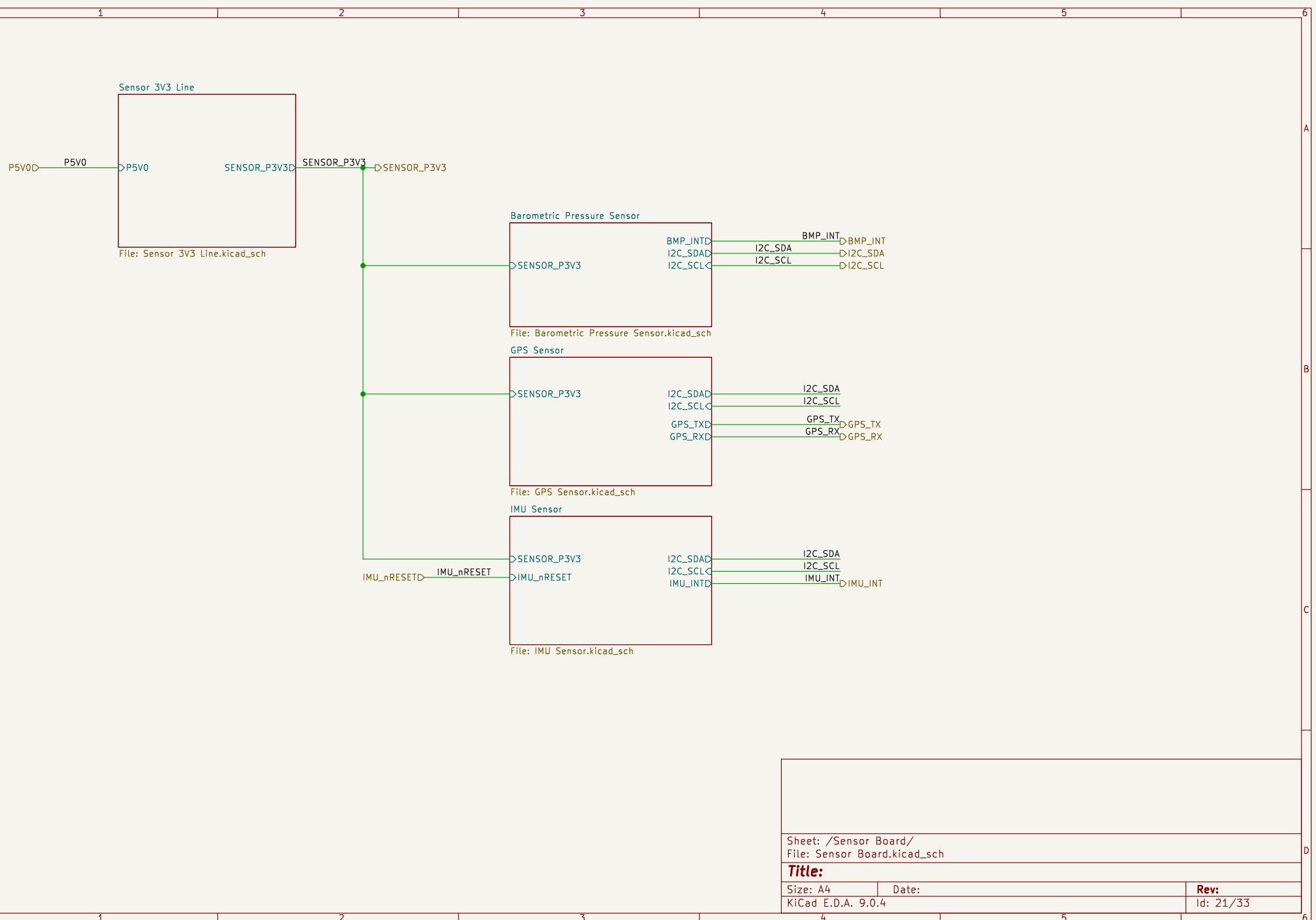
Size: A4 | Date:

KiCad E.D.A. 9.0.4

Rev:

Id: 29/33





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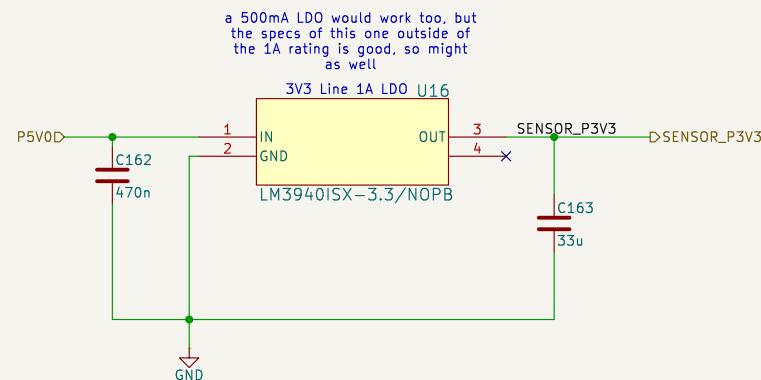
B

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Sheet: /Sensor Board/Sensor 3V3 Line/
File: Sensor 3V3 Line.kicad_sch

Title:

Size: A4 | Date:
KiCad E.D.A. 9.0.4

Rev:
Id: 23/33

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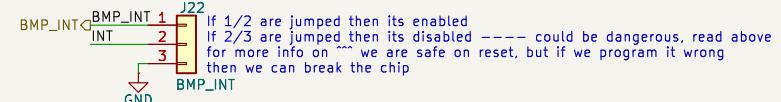
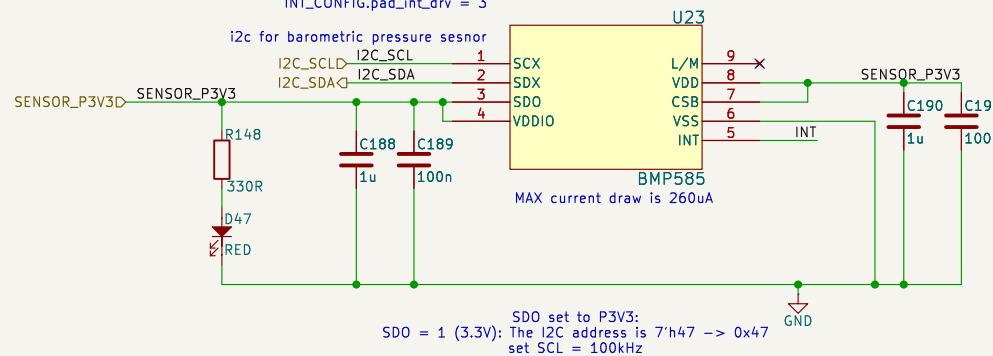
C

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Per the datasheet, the unused INT pin is tied to GND to prevent a floating input.
CRITICAL: The interrupt pin must be disabled in software to prevent a short circuit.
 Ensure the 'int_en' bit in the INT_CONFIG register (0x14) remains disabled (set to 0).

Datasheet sets the IRQ to 0 on start up, so never turn it on
 PAGE49: <int_en 2bits> <int_od 2bits> <int_pol 2bits> <int_mode 2bits LSB>
 PAGE51: 8.5, setup for 0x14, <0> <1> <0> <1>
 this means: int_mode = latched, int_pol = active low, int_od = open_drain, int_en = disabled
 INT_CONFIG.int_en = 0
 INT_CONFIG.od = 1
 INT_CONFIG.pol = 0
 INT_CONFIG.mode = 1
 INT_CONFIG.pad_int_drv = 3

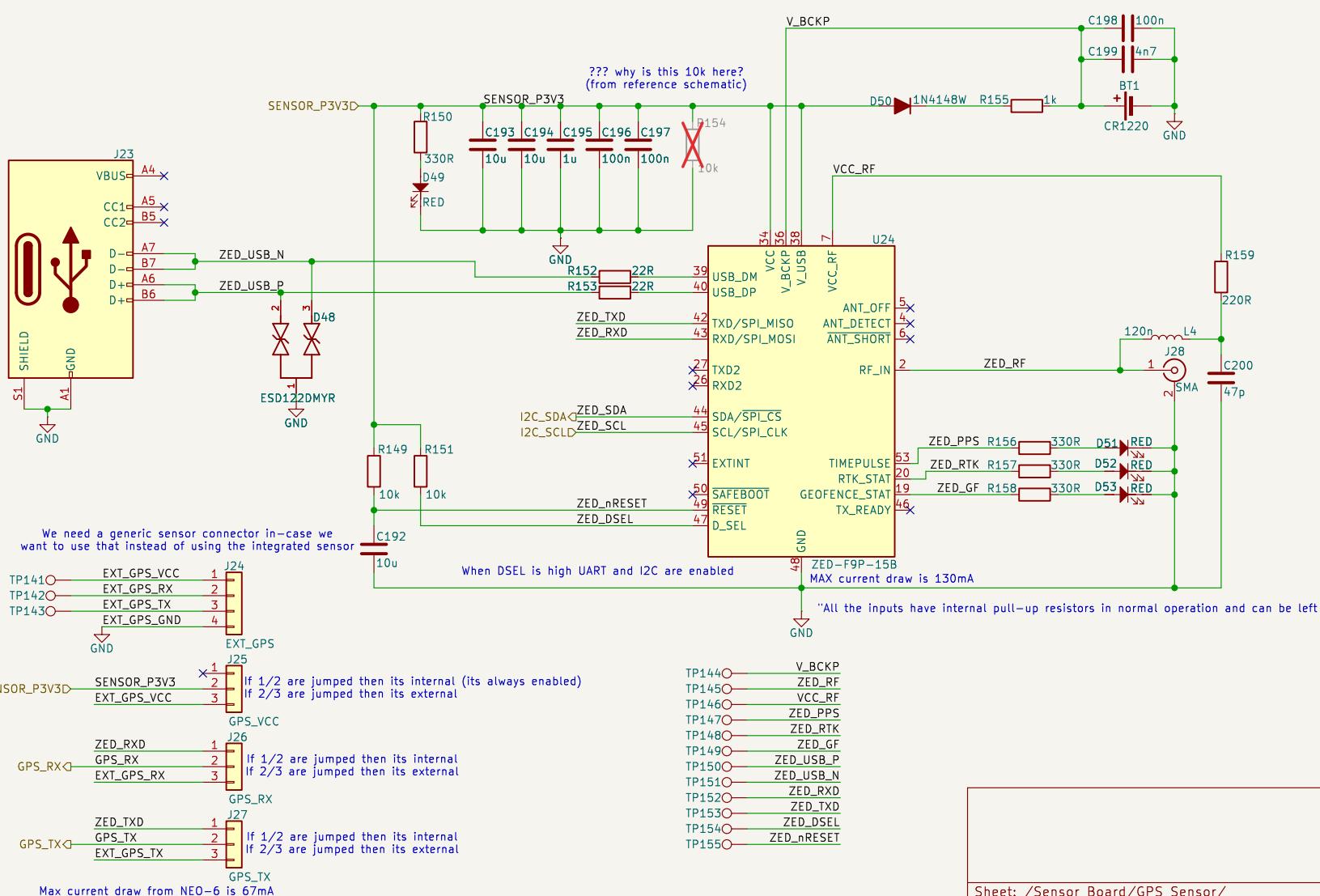


Sheet: /Sensor Board/Barometric Pressure Sensor/
 File: Barometric Pressure Sensor.kicad_sch

Title:

Size: A4 | Date:
 KiCad E.D.A. 9.0.4

Rev:
 Id: 30/33



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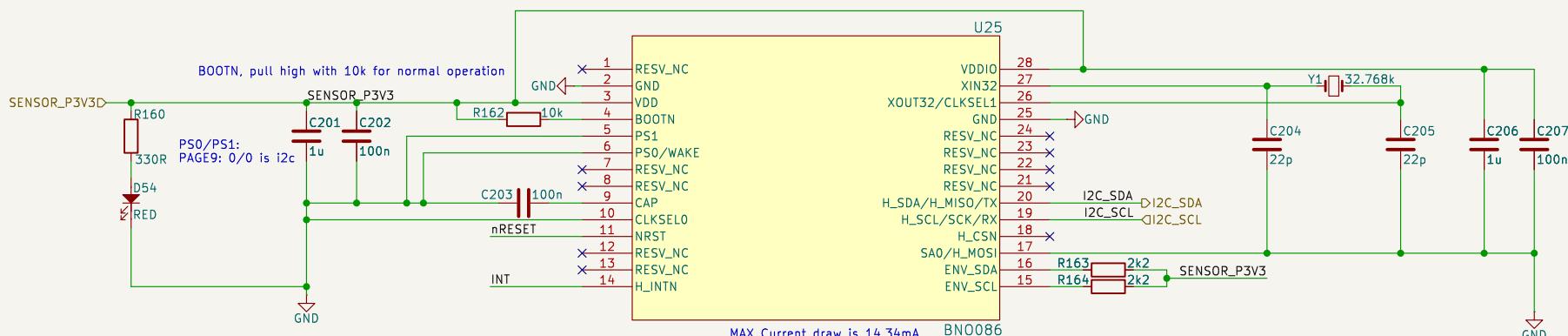
C

C

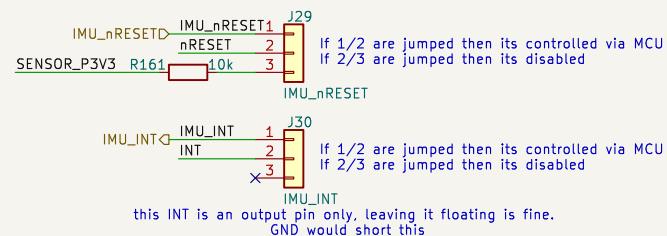
D

D

PAGE55: reflow soldering with a peak temperature up to 260°C



Address is 0x4A



Sheet: /Sensor Board/IMU Sensor/
File: IMU Sensor.kicad_sch

Title:

Size: A4 | Date:

KiCad E.D.A. 9.0.4

Rev:

Id: 32/33