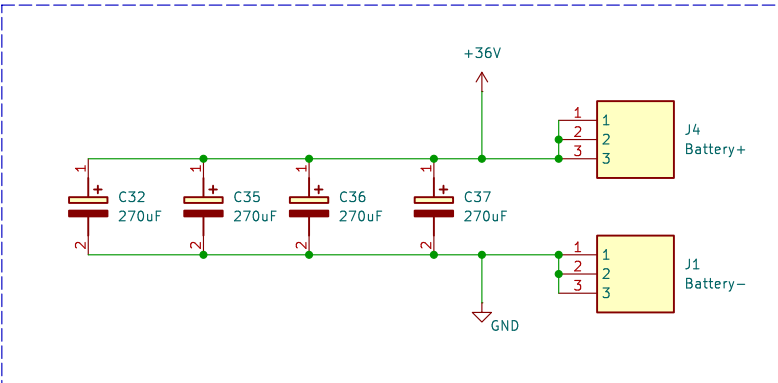
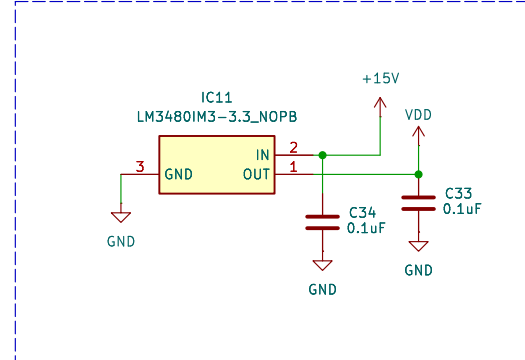


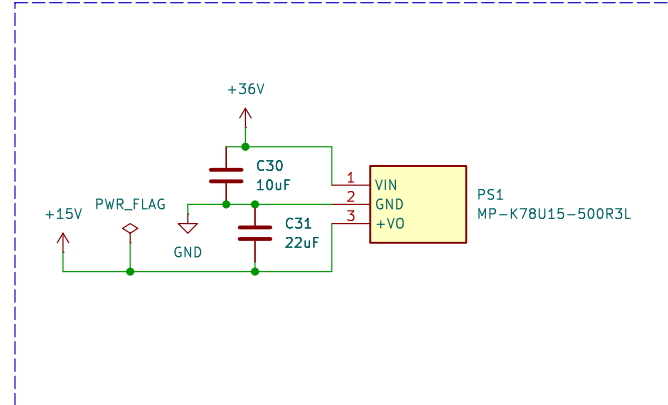
Battery input



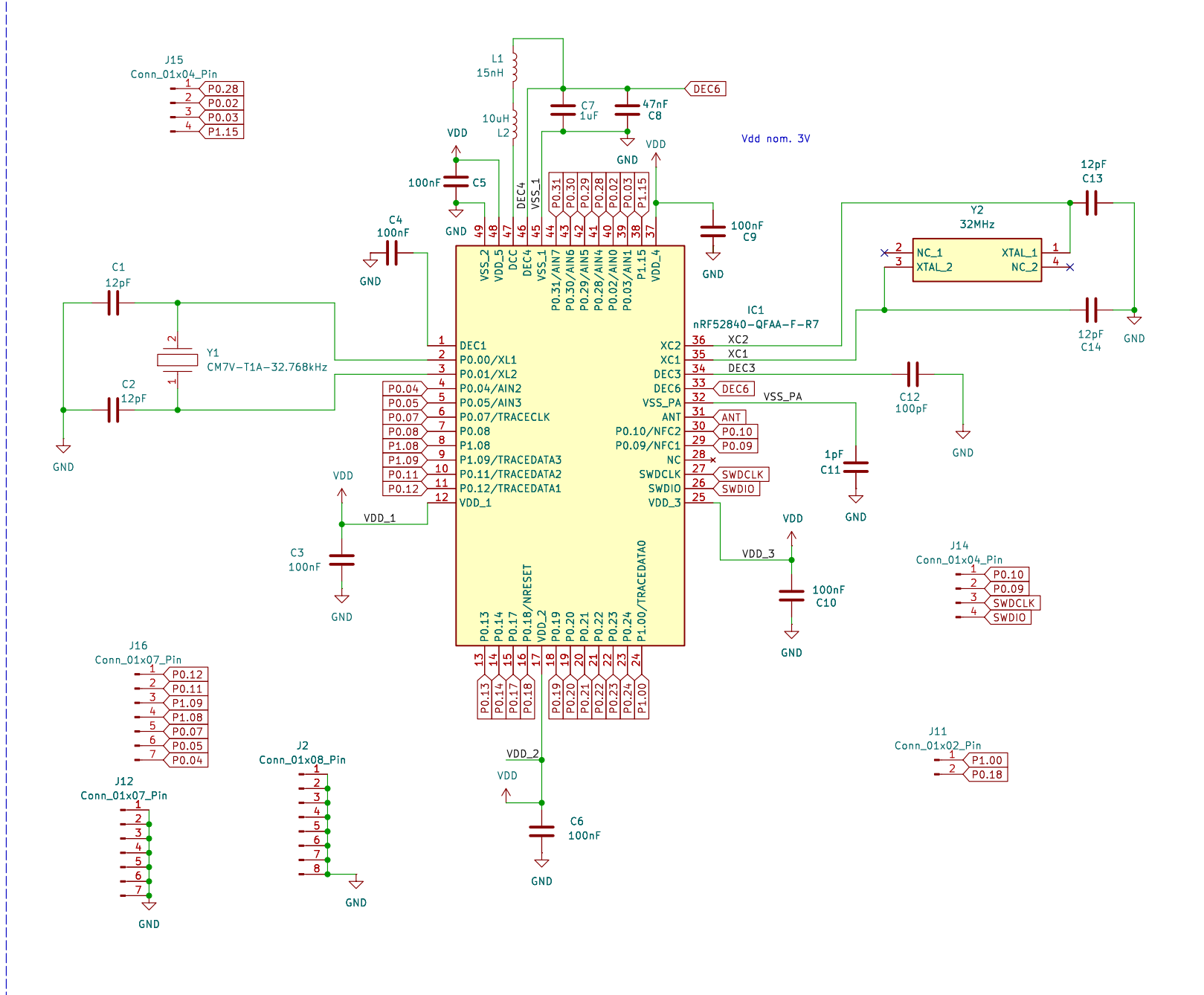
3.3 V regulator



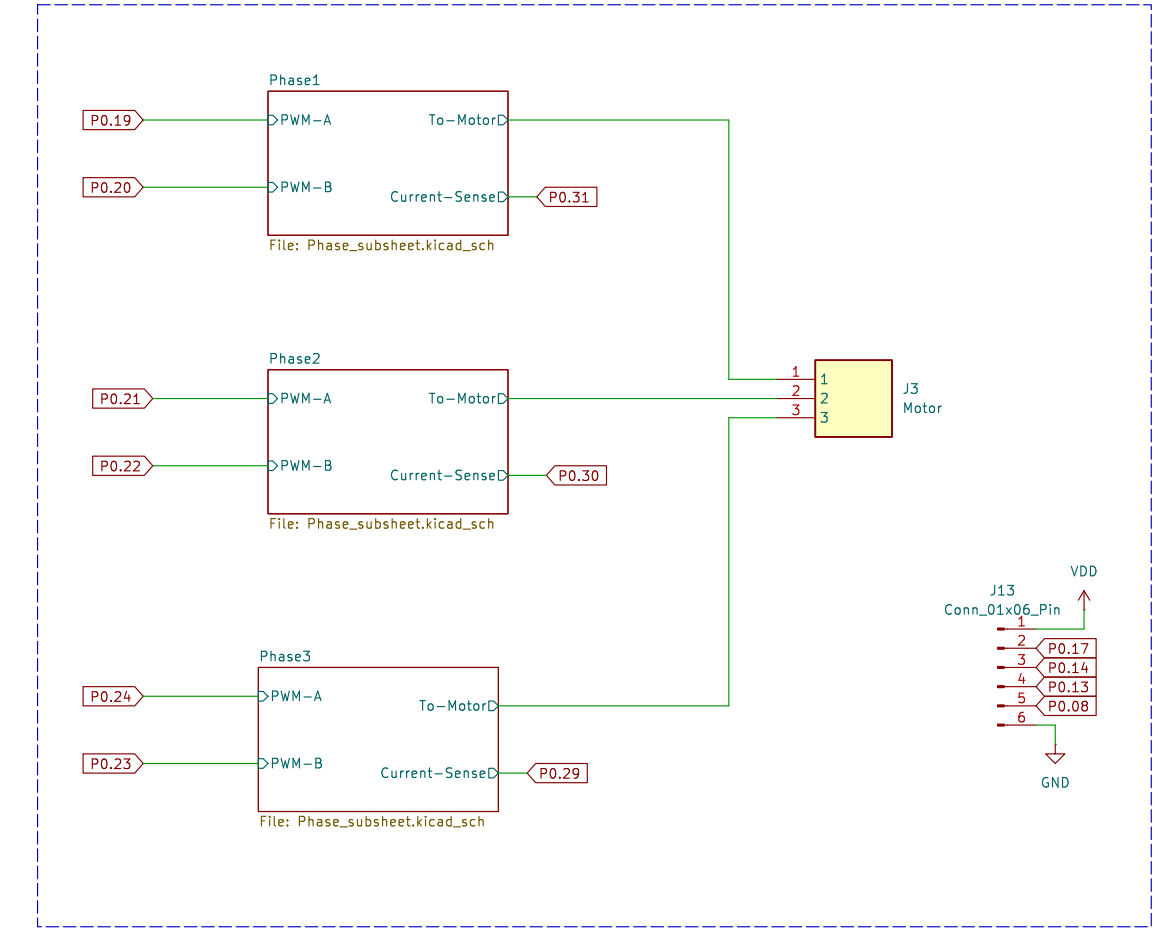
15 V regulator



nRF52840 Circuit



Input/Output to the motor



- H1 MountingHole
- H2 MountingHole
- H3 MountingHole
- H4 MountingHole

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File: ESC_Texas.kicad_sch		
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KiCad E.D.A. 8.0.4		Id: 1/7

VDD för drivaren verkar ska vara mellan 13.5V och 25V medan batteriet har 36V. Så vi behöver någonting där emellan. Buck converters som också kan ge ut mycket ström är inte så billiga vad vi sett hittills. Så frågan är väl hur mycket ström som kommer behövas och lämpligaste metoden för att stappa ner spänningen från batteriet.

R_BOOT: 1–20R. Page 25

R_BOOT = 6.8 Ohm

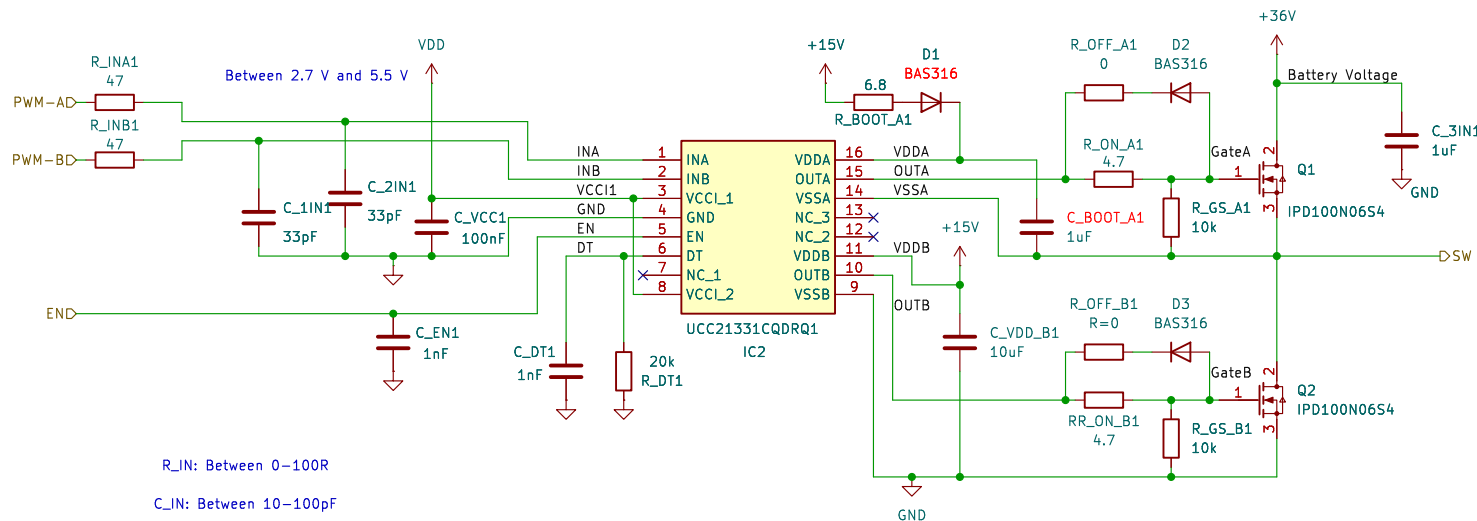
C_BOOT: 1.1–μF capacitance from VDDA and VDDB to VSSA and VSSB
Page 8

R_{GS}: 5.1k – 20k
R_{GS} = 10K

R_{ON} High: 5R. Page 8
R_{ON} = 4.7

8.2.2.7.3 Select a VDDB Capacitor

Chanel B has the same current requirements as Channel A. Therefore, a VDDB capacitor (shown as CVDD in Figure 8–1) is needed. In this example with a bootstrap configuration, the VDDB capacitor will also supply current for VDDA through the bootstrap diode. A 50–V, 10–μF MLCC and a 50–V, 220–nF MLCC are chosen for CVDD. If the bias power supply output is a relatively long distance from the VDDB pin, a tantalum or electrolytic capacitor, with a value over 10 μF, should be used in parallel with CVDD.



R_{IN}: Between 0–100R

C_{IN}: Between 10–100pF

It is recommended to use an RC filter on EN pin to filter high frequency noise, with R = 0 Ω to 100 Ω and C = 100 pF to 1000 pF

C_{VDD}: Low-ESR and low-ESL capacitors must be connected close to the device between the VCCI and GND pins and between the VDD and VSS pins to support high peak currents when turning on the external power transistor

R_{DT}, C_{DT}: It is recommended to place the dead-time setting resistor, RDT, and its bypassing capacitor close to DT pin of the UCC21331.

C_{VCC}: Similarly, a bypass capacitor should also be placed between the VCCI and GND pins. Given the small amount of current drawn by the logic circuitry within the input side of the UCC21331, this bypass capacitor has a minimum recommended value of 100 nF.

C_{EN}: It is recommended to bypass using a ≈1nF low ESR/ESL capacitor, CEN, close to EN pin when connecting to a μC with distance

Red text on component name means high current path

Pay attention to high current path that includes the bootstrap capacitor, bootstrap diode, local VSSB-referenced bypass capacitor, and the low-side transistor body/anti-parallel diode. The bootstrap capacitor is recharged on a cycle-by-cycle basis through the bootstrap diode by the VDD bypass capacitor. This recharging occurs in a short time interval and involves a high peak current. Minimizing this loop length and area on the circuit board is important for ensuring reliable operation.

The gate driver must be placed as close as possible to the transistors.

Sheet: /Phase1/Driver_subsheet_1/
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VDD för drivaren verkar ska vara mellan 13.5V och 25V medan batteriet har 36V. Så vi behöver någonting där emellan. Buck converters som också kan ge ut mycket ström är inte så billiga vad vi sett hittills. Så frågan är väl hur mycket ström som kommer behövas och lämpligaste metoden för att stappa ner spänningen från batteriet.

R_BOOT: 1–20R. Page 25

R_BOOT = 6.8 Ohm

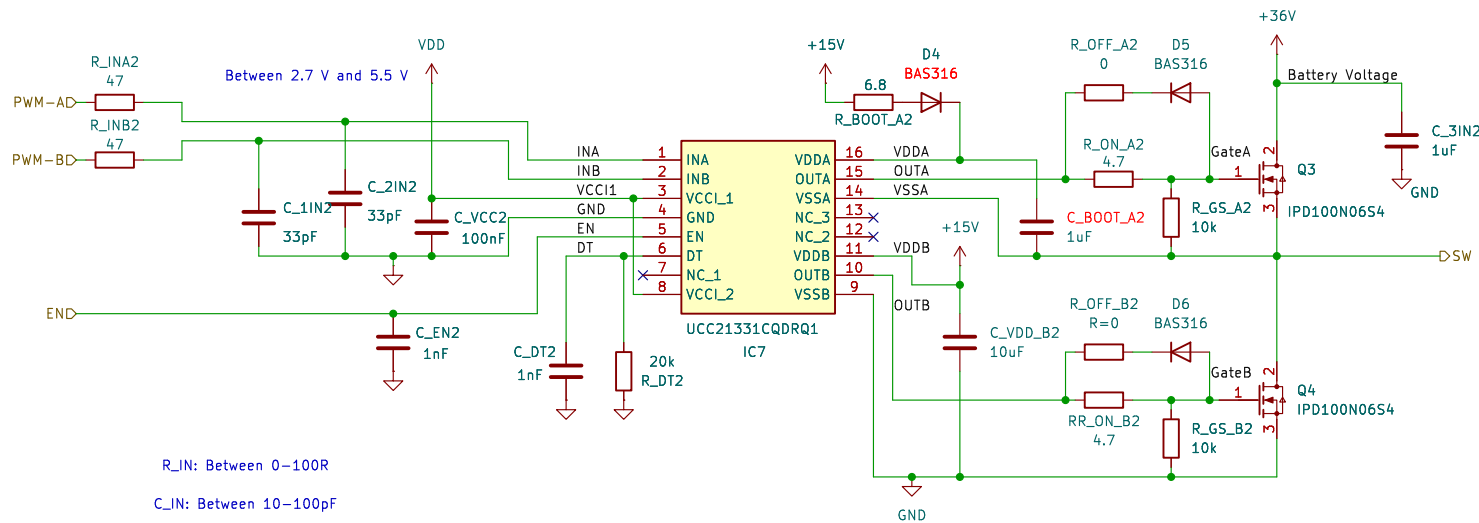
C_BOOT: 1.1–μF capacitance from VDDA and VDB to VSSA and VSSB
Page 8

R_{GS}: 5.1k – 20k
R_{GS} = 10K

R_{ON} High: 5R. Page 8
R_{ON} = 4.7

8.2.2.7.3 Select a VDB Capacitor

Chanel B has the same current requirements as Channel A. Therefore, a VDB capacitor (shown as CVDD in Figure 8–1) is needed. In this example with a bootstrap configuration, the VDB capacitor will also supply current for VDDA through the bootstrap diode. A 50–V, 10–μF MLCC and a 50–V, 220–nF MLCC are chosen for CVDD. If the bias power supply output is a relatively long distance from the VDB pin, a tantalum or electrolytic capacitor, with a value over 10 μF, should be used in parallel with CVDD.



R_{IN}: Between 0–100R

C_{IN}: Between 10–100pF

It is recommended to use an RC filter on EN pin to filter high frequency noise, with R = 0 Ω to 100 Ω and C = 100 pF to 1000 pF

C_{VDD}: Low-ESR and low-ESL capacitors must be connected close to the device between the VCCI and GND pins and between the VDD and VSS pins to support high peak currents when turning on the external power transistor

R_{DT}, C_{DT}: It is recommended to place the dead-time setting resistor, RDT, and its bypassing capacitor close to DT pin of the UCC21331.

C_{VCC}: Similarly, a bypass capacitor should also be placed between the VCCI and GND pins. Given the small amount of current drawn by the logic circuitry within the input side of the UCC21331, this bypass capacitor has a minimum recommended value of 100 nF.

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Red text on component name means high current path

Pay attention to high current path that includes the bootstrap capacitor, bootstrap diode, local VSSB-referenced bypass capacitor, and the low-side transistor body/anti-parallel diode. The bootstrap capacitor is recharged on a cycle-by-cycle basis through the bootstrap diode by the VDD bypass capacitor. This recharging occurs in a short time interval and involves a high peak current. Minimizing this loop length and area on the circuit board is important for ensuring reliable operation.

The gate driver must be placed as close as possible to the transistors.

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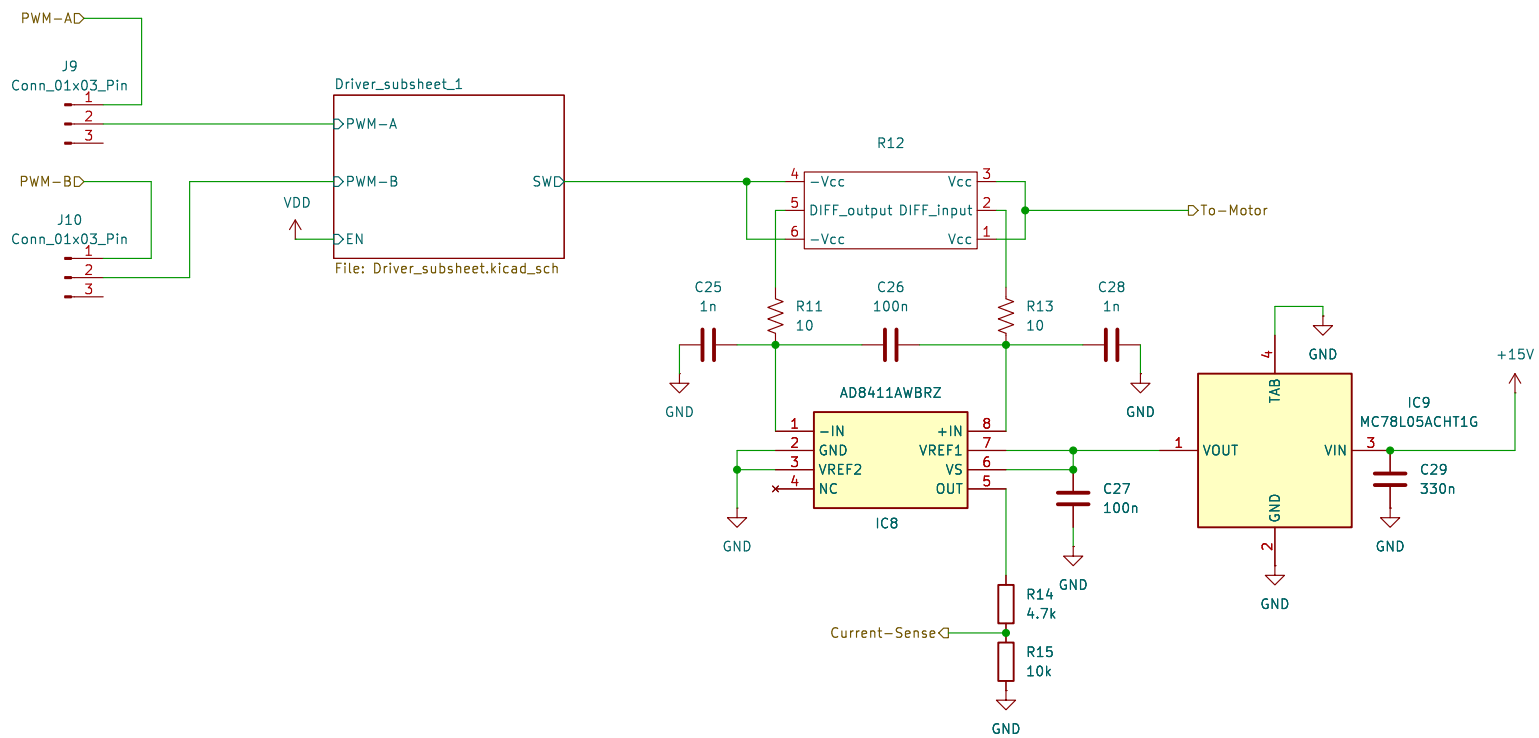
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