

Chinese Diesel Heater – modern ECU replacement

Daniel Edwards

Sheet: /FAN_DRIVER/

File: fan_driver.kicad_sch

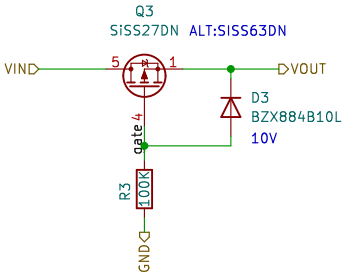
Title: CDH_ECU

Size: A4 Date: 2022-03-06

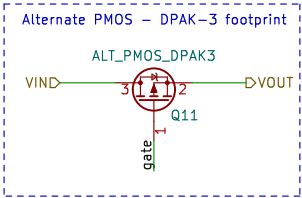
KiCad E.D.A. kicad (6.0.2)

Rev: 1.2.3

Id: 2/15



SiSS27DN
 $R_{ds(ON)} = 5m60hm @ V_{gs} -10V$
 $R_{\theta ja} = 26^{\circ}C/W$
 $P(16A) = I^2 \cdot R = 16A^2 \cdot 0.0056 \text{ Ohm} = 1.4W \text{ (nice)}$
 $T = T_a + R_{\theta ja} \cdot P = 25^{\circ}C + (26^{\circ}C/W \cdot 1.4W) = 62^{\circ}C$



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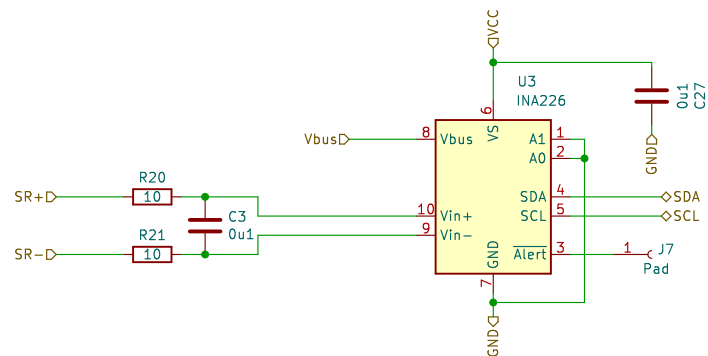
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Title: CDH_ECU

Size: A4 Date: 2022-03-06
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Id: 3/15





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Sheet: /INA226/

File: INA226.kicad_sch

Title: CDH_ECU

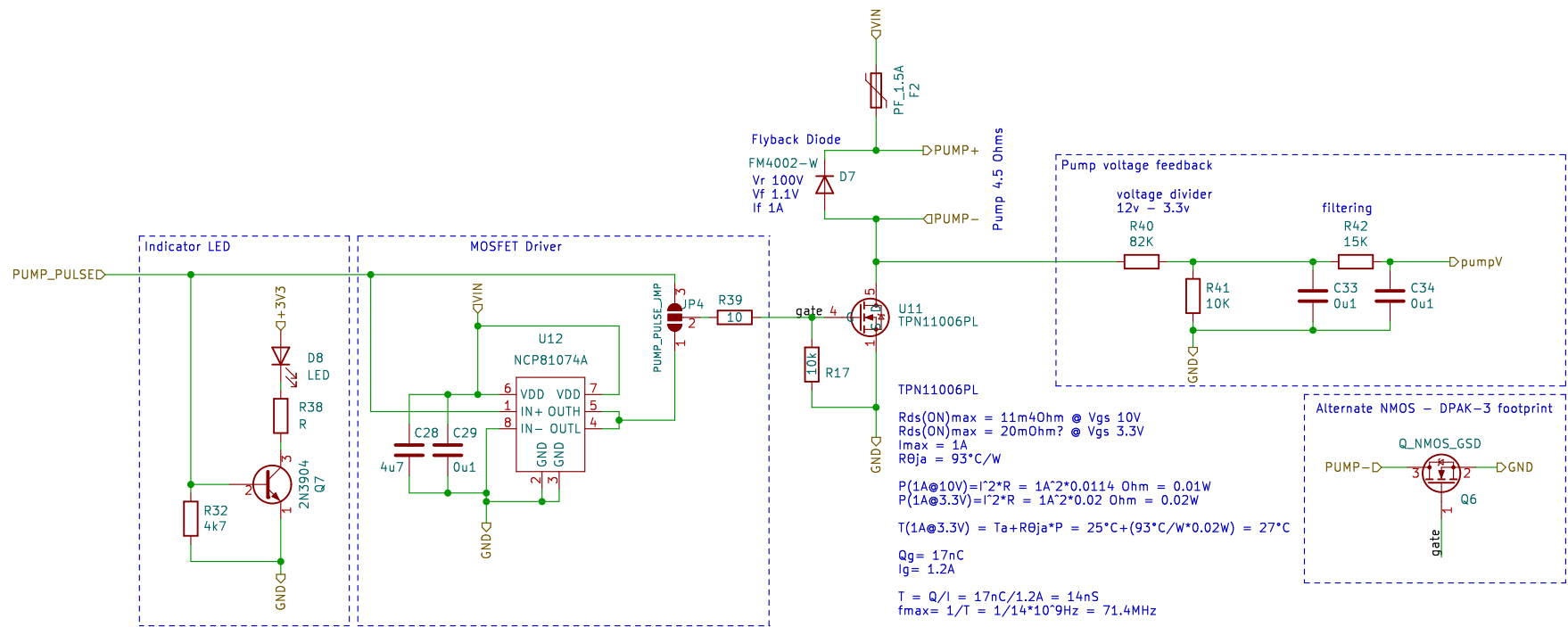
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Sheet: /PUMP_DRIVER/

File: pump_driver.kicad_sch

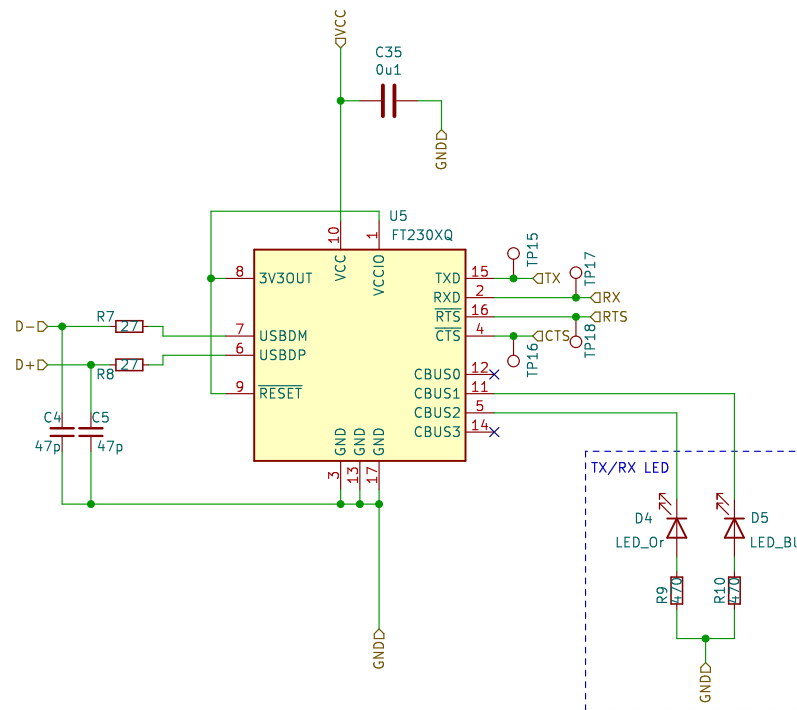
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Id: 8/15



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Sheet: /FT230XS/

File: FT230XS.kicad_sch

Title: CDH_ECU

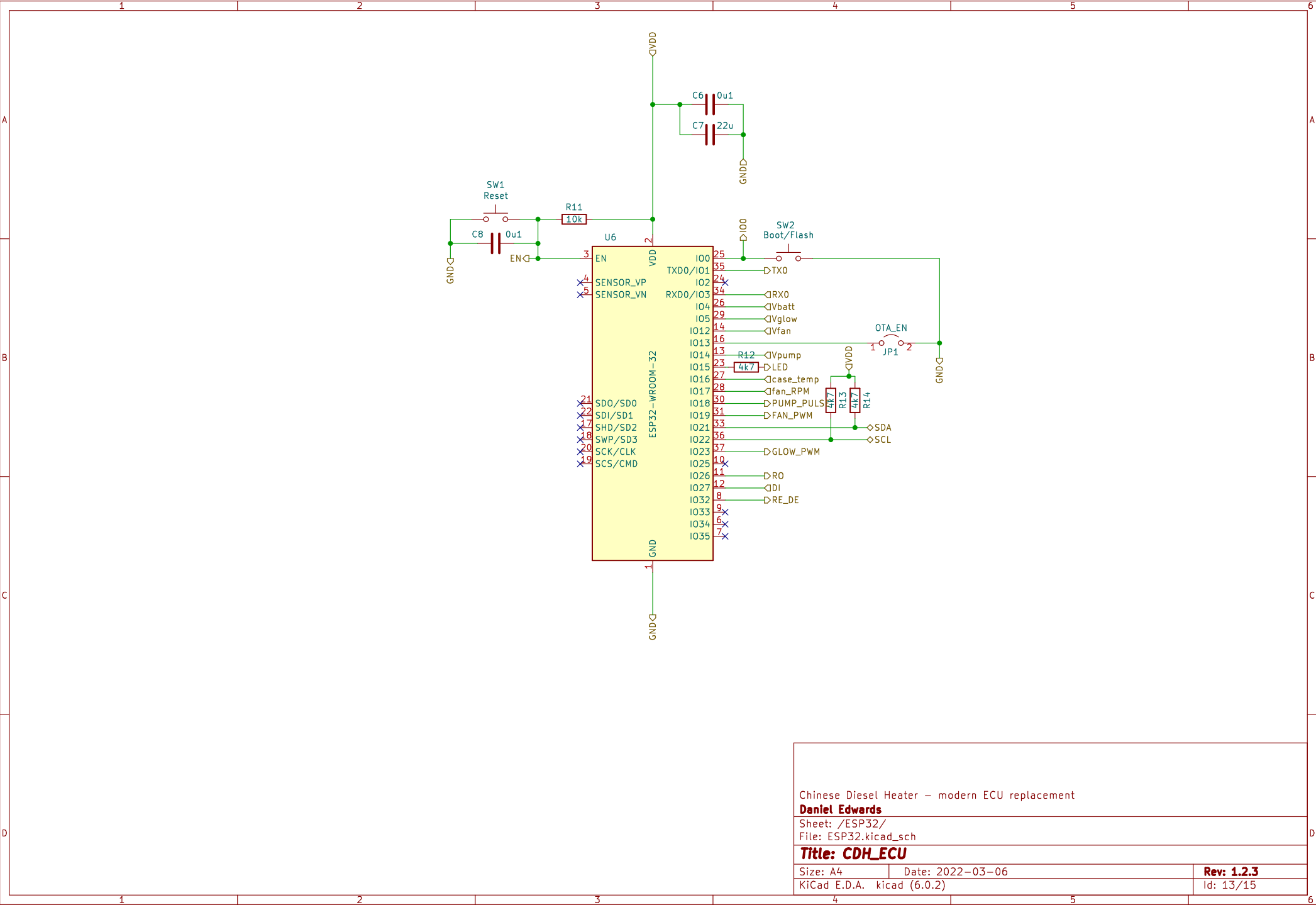
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Rev: 1.2.3

Id: 12/15



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Sheet: /ESP32/

File: ESP32.kicad_sch

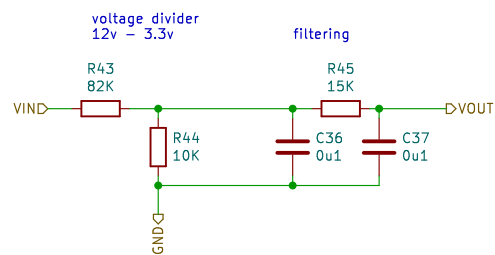
Title: CDH_ECU

Size: A4 Date: 2022-03-06

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Rev: 1.2.3

Id: 13/15



Voltage divider calculation

$$\begin{aligned} V_{in} &= V_{out} \\ 14V &= 1.47V \\ 12V &= 1.26V \\ 10V &= 1.05V \end{aligned}$$

ESP32 ADC Attenuation

ADC_ATTEN_DB_6

150 mV ~ 1750 mV

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Sheet: /VIN_Voltage_divider/

File: VIN_vDiv.kicad_sch

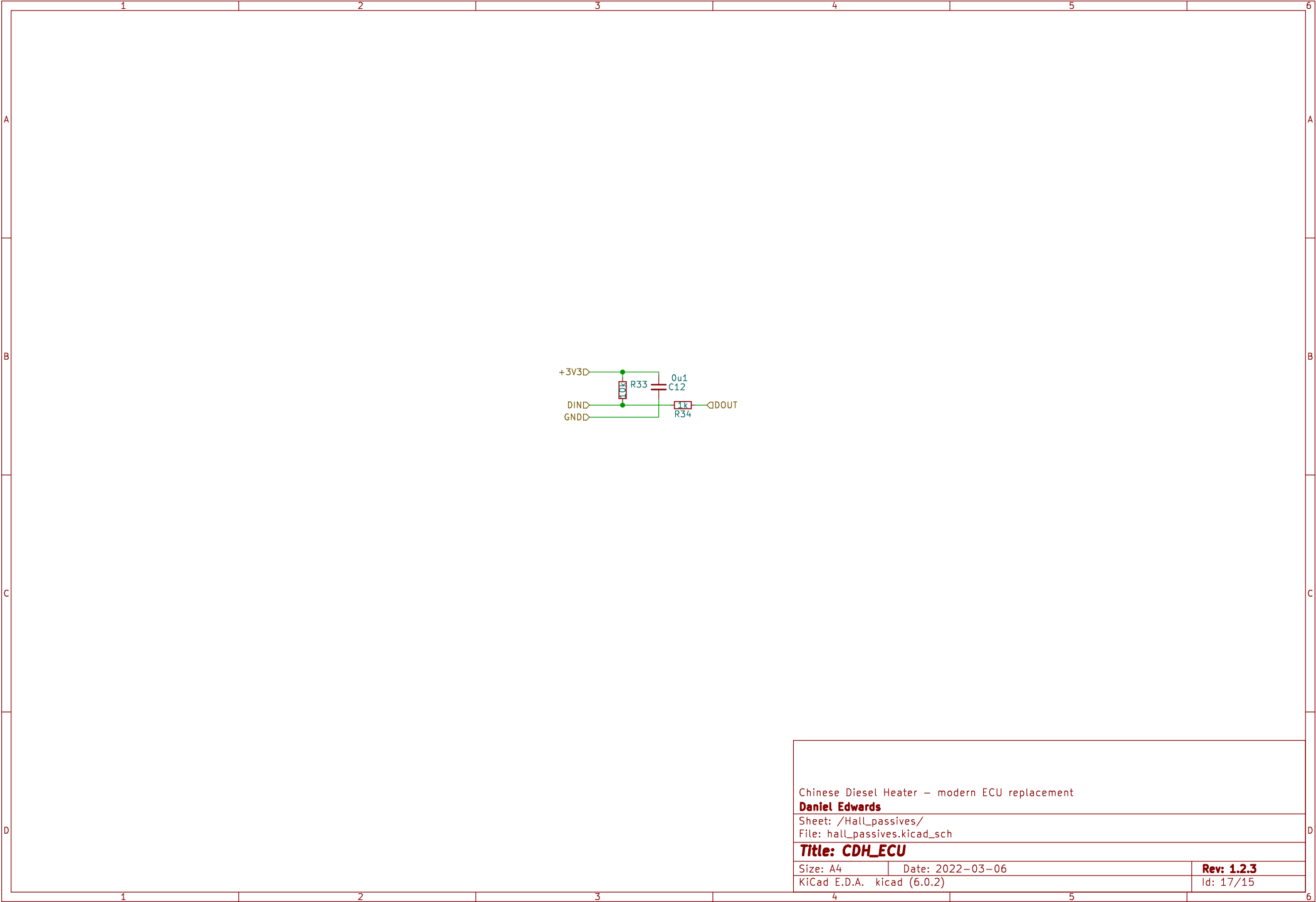
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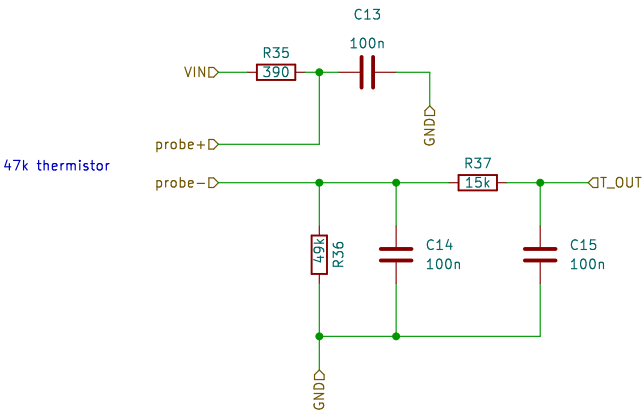
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https://www.bapihvac.com/wp-content/uploads/2010/11/Thermistor_47K.pdf

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Sheet: /body_temp/

File: body_temp.kicad_sch

Title: CDH_ECU

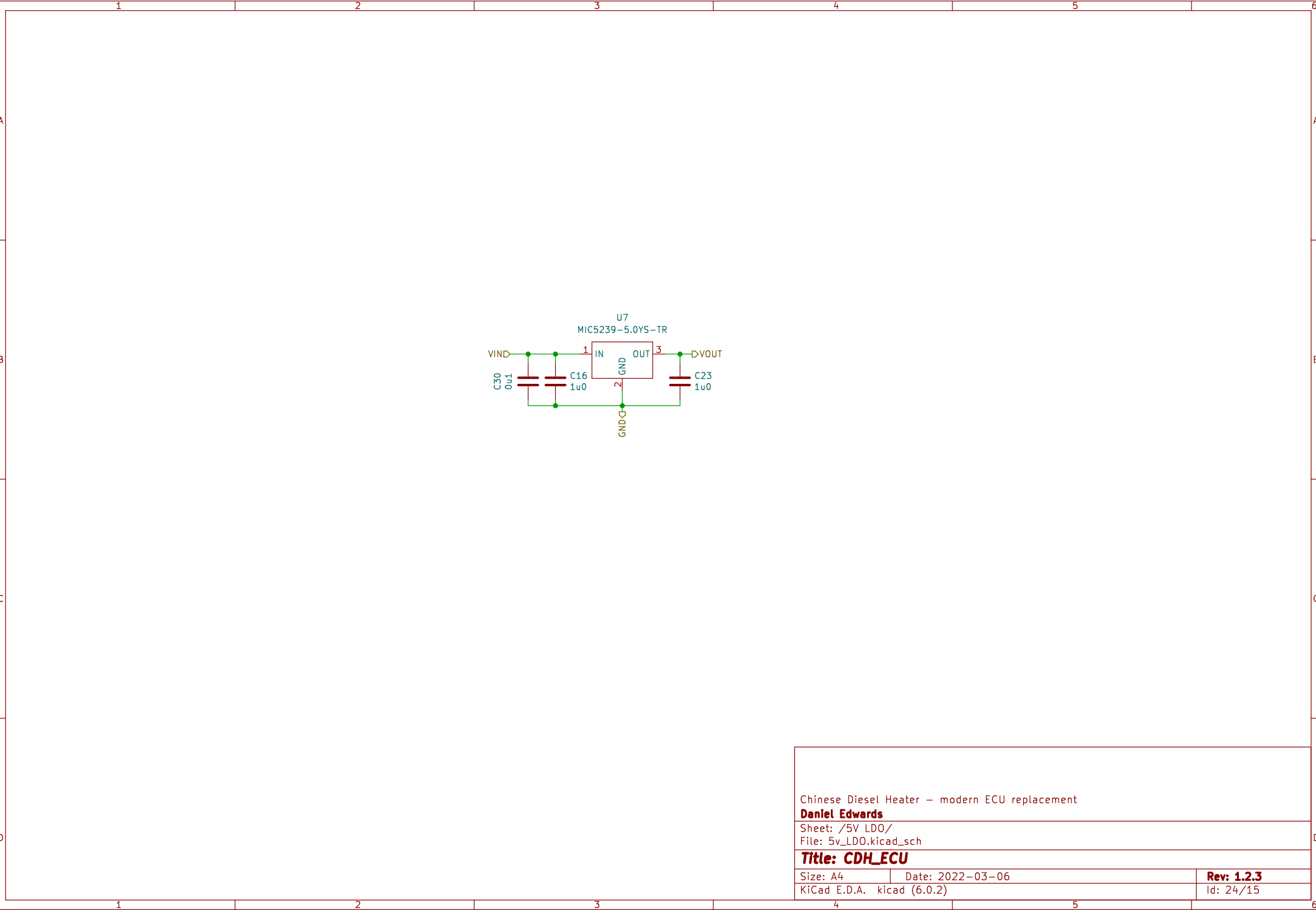
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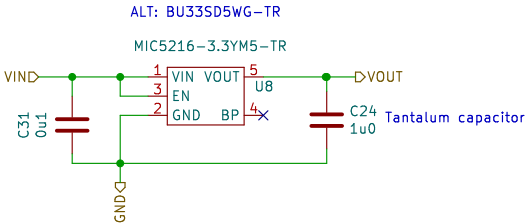
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Sheet: /3v3 LDO/

File: 3v3_LDO.kicad_sch

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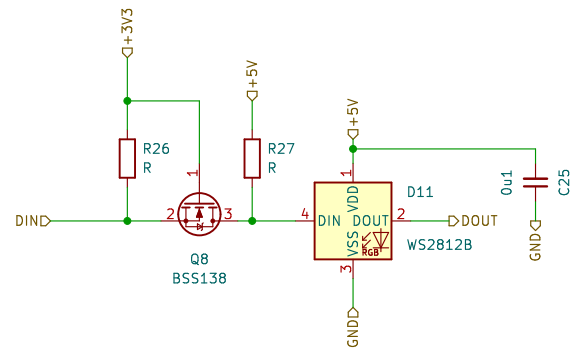
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Sheet: /Neopixel/

File: neopixel.kicad_sch

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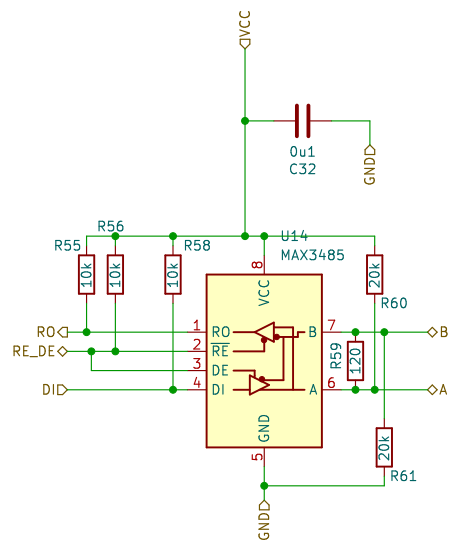
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Sheet: /MAX3485/

File: MAX3485.kicad_sch

Title: CDH_ECU

Size: A4 Date: 2022-03-06

KiCad E.D.A. kicad (6.0.2)

Rev: 1.2.3

Id: 30/15