

DC-DC Converters



File: dcdc\_converters.kicad\_sch

Hall and Phase Voltage Sensing



File: hall\_and\_phase\_voltage\_sensing.kicad\_sch

Hardware and Notes



File: hardware\_and\_notes.kicad\_sch

MCU Connections



File: mcu\_connections.kicad\_sch

Gate Driver and External Connections



File: gate\_driver\_and\_connections.kicad\_sch

Fault Reporting



File: fault\_reporting.kicad\_sch

**THIS IS THE ROOT PAGE OF THE "HIERACHAL" SCHEMATIC AND WAS CREATED TO OVERCOME KICAD'S LIMITATION OF A FLAT MULTI-PAGE SCHEMATIC.**

**CUSTOMER NOTICE**

THIS CIRCUIT IS FOR DEMONSTRATION PURPOSES ONLY. IT REMAINS THE RESPONSIBILITY OF THE CUSTOMER TO VERIFY PROPER AND RELIABLE OPERATION IN THE ACTUAL APPLICATION. COMPONENT SUBSTITUTION AND PRINTED CIRCUIT BOARD LAYOUT MAY SIGNIFICANTLY AFFECT CIRCUIT PERFORMANCE OR RELIABILITY. CONTACT NEXPERIA FOR SUPPORT VIA <https://www.nexperia.com/support>



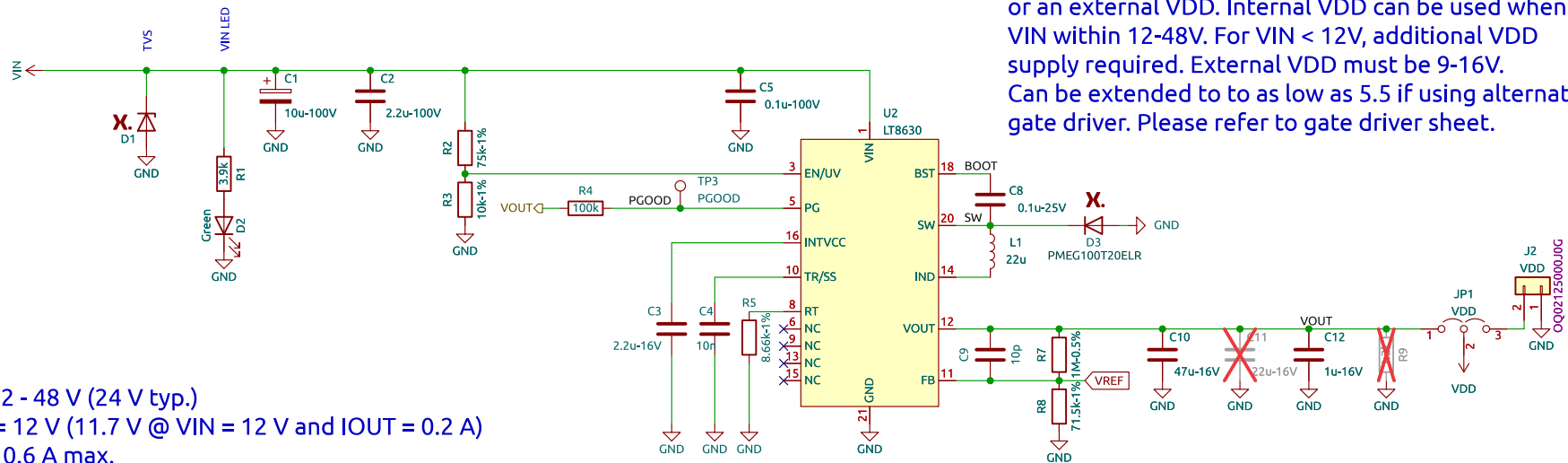
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Sheet: /  
File: nevb\_mctrl\_100.kicad\_sch

**Title: Motor Controller Board NEVB-MCTRL-100-xx**

Size: A4 Date: 2024-03-15  
KICad E.D.A. kicad 7.0.9

Rev: 00  
Id: 1/7

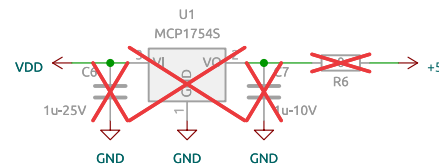


VDD powers the gate drivers, and MCU board. VDD source can be selected between the internal VDD or an external VDD. Internal VDD can be used when VIN within 12-48V. For VIN < 12V, additional VDD supply required. External VDD must be 9-16V. Can be extended to as low as 5.5 if using alternative gate driver. Please refer to gate driver sheet.

VIN = 12 - 48 V (24 V typ.)  
 VOUT = 12 V (11.7 V @ VIN = 12 V and IOU = 0.2 A)  
 IOU = 0.6 A max.  
 UVLO = 10 V

**12-48V DC to 12V DC**

The fault demultiplexer and phase voltage sensing comparators require 5V which is supplied from the microcontroller board. Alternatively this circuit can be populated if 5V supply from the MCU board is not possible. Also remove R10.



**Alternative 5V Supply (Not used)**

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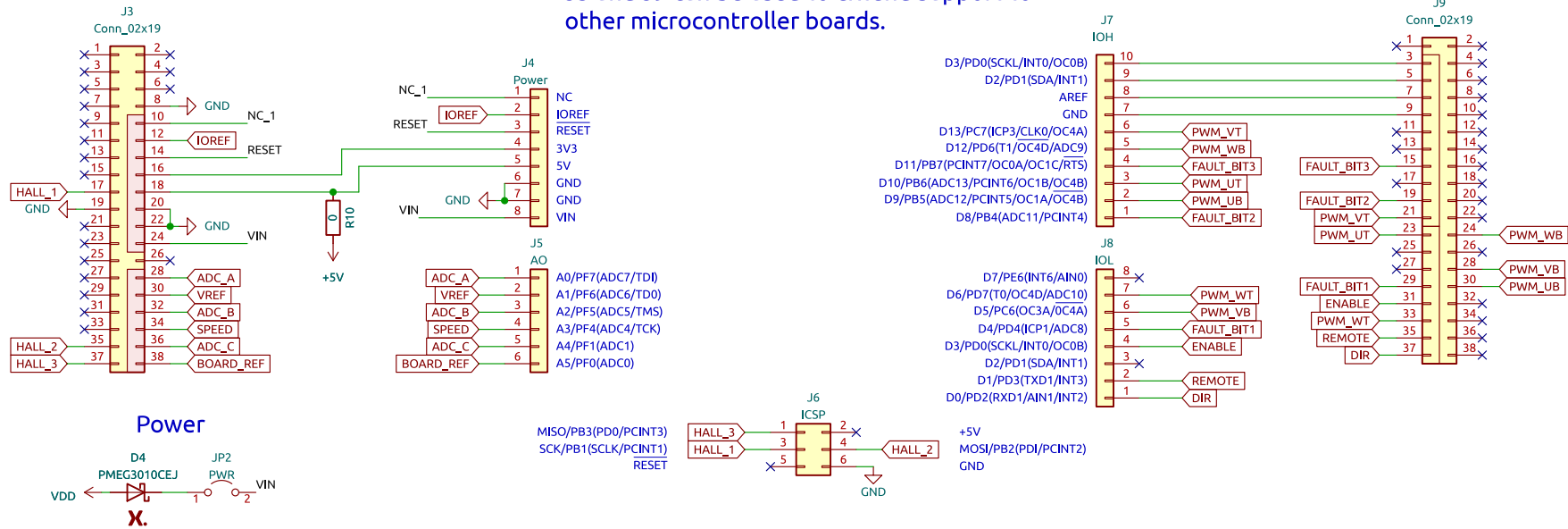
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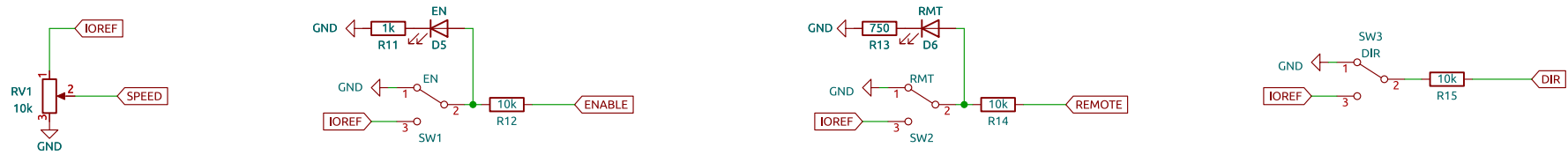
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J3 and J9 can be used to extend support to other microcontroller boards.



**Connections to Microcontroller Board (e.g. Arduino™ Leonardo)**



**User Inputs**

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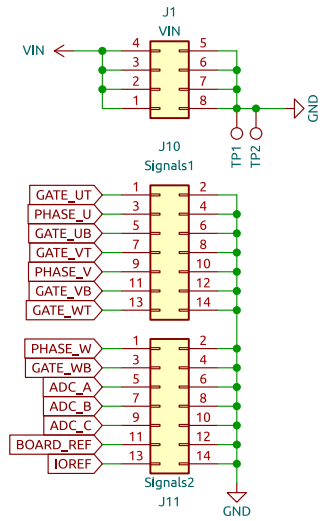
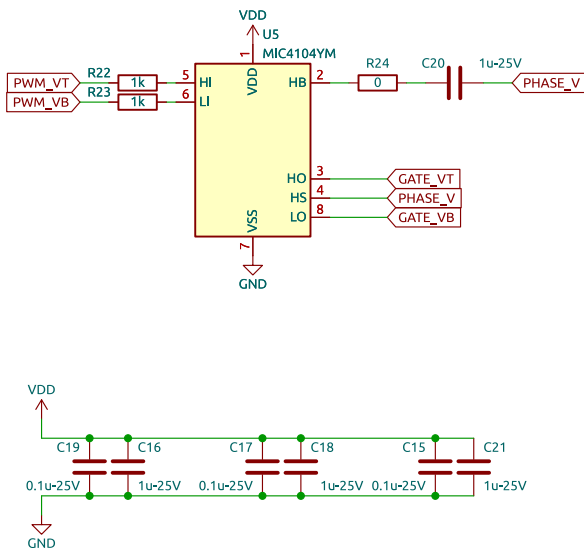
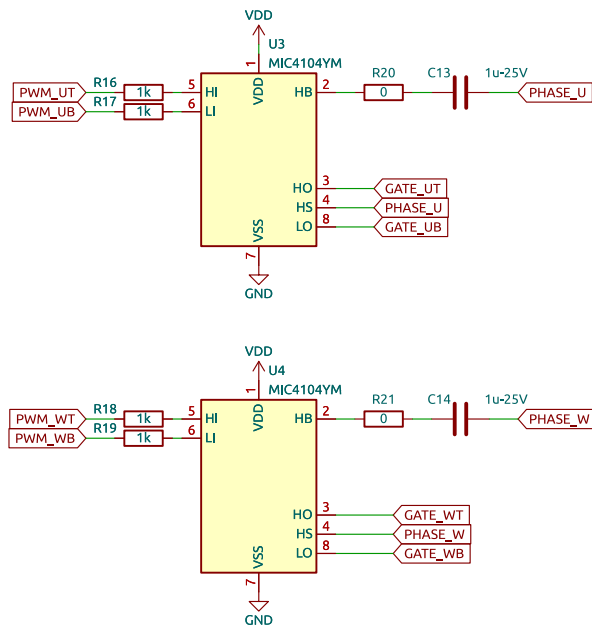
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**Connections to Inverter Board**

Gate driver options:  
 MIC4104YM for TTL logic, 9-16V supply voltage, 3A source/2A sink  
 MIC4103YM for CMOS logic, 9-16V supply voltage, 3A source/2A sink  
 MIC4605-1YM for TTL logic, 5.5-16V supply voltage, 1A source/1A sink

**Gate Drivers**

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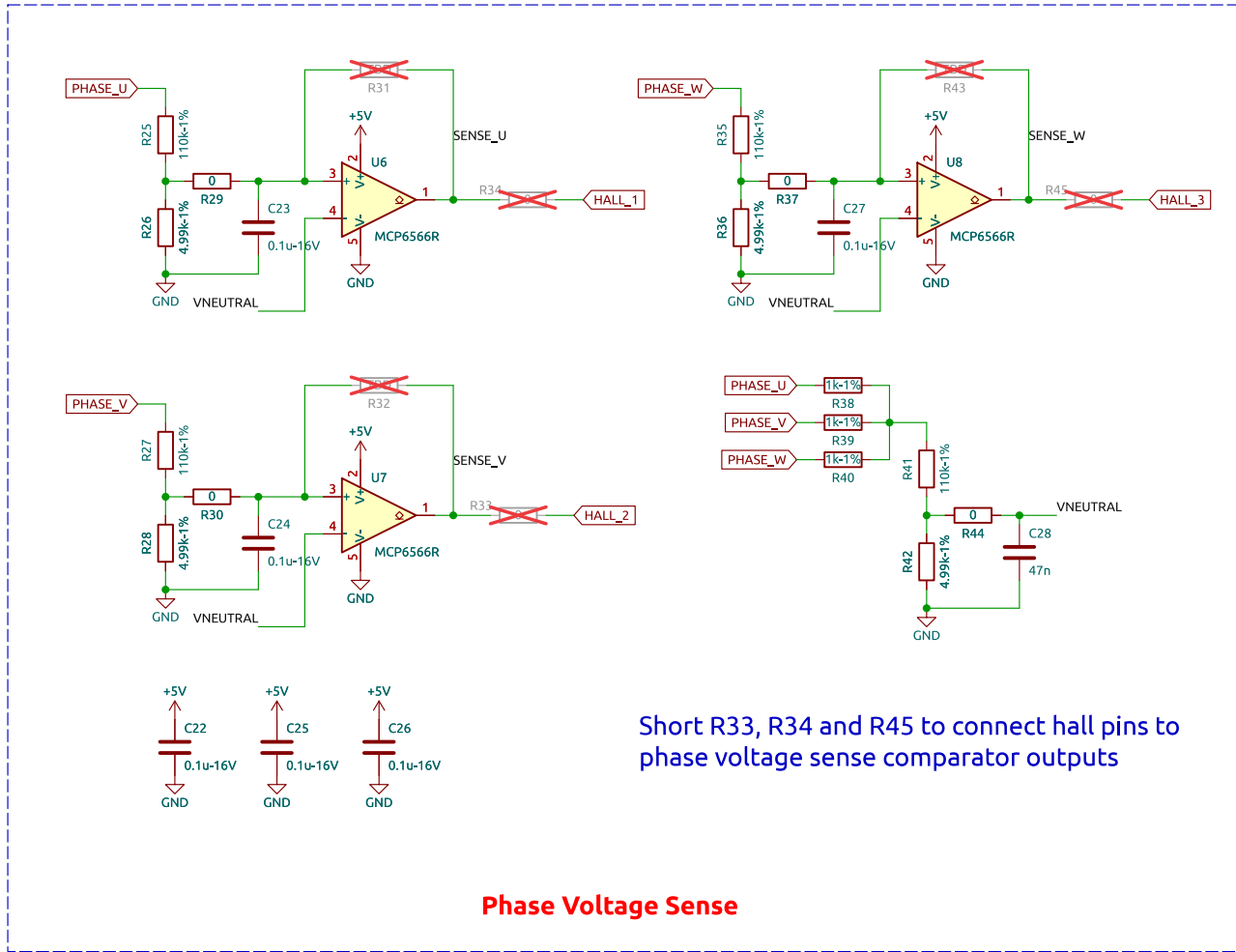
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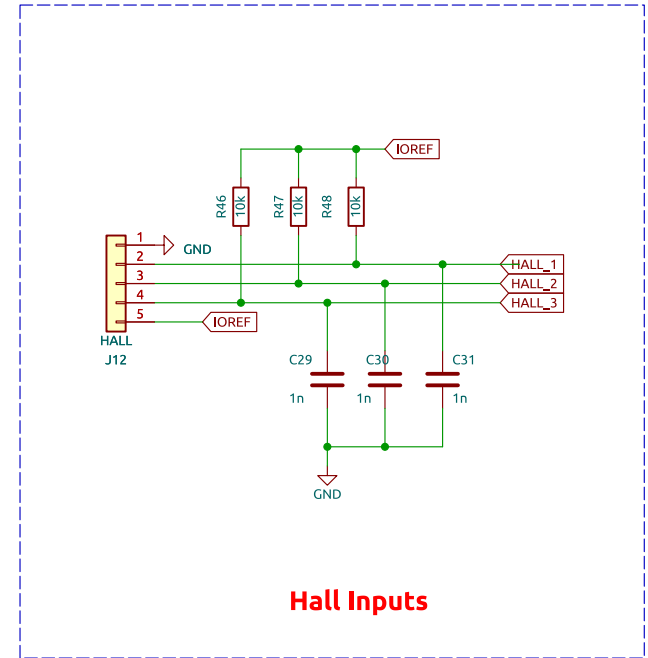
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Short R33, R34 and R45 to connect hall pins to phase voltage sense comparator outputs



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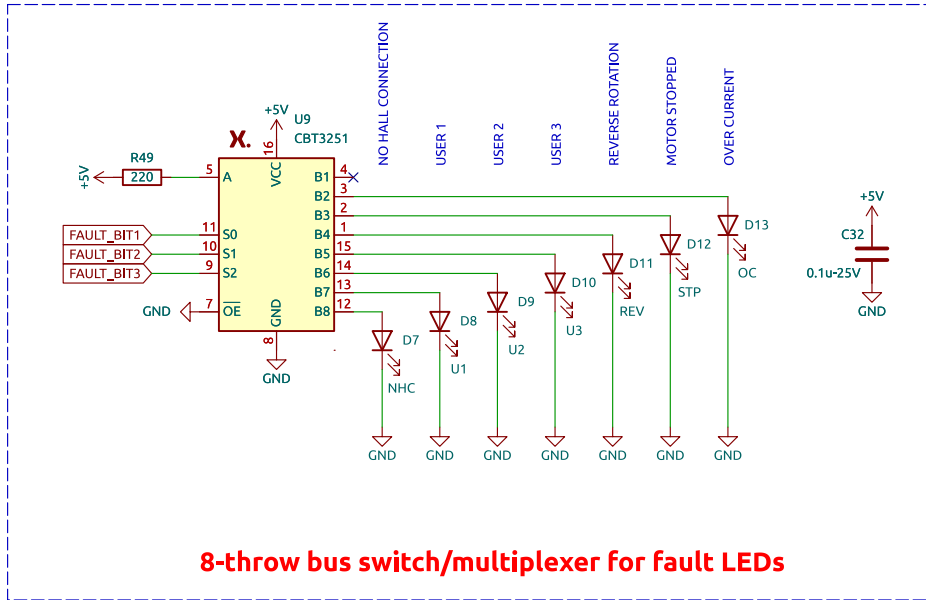
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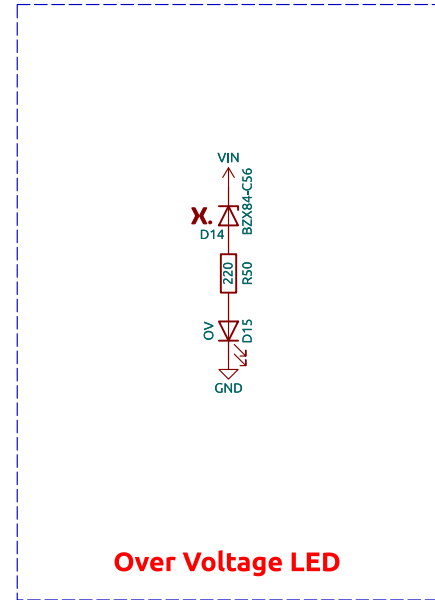
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Rev: 00  
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**8-throw bus switch/multiplexer for fault LEDs**



**Over Voltage LED**

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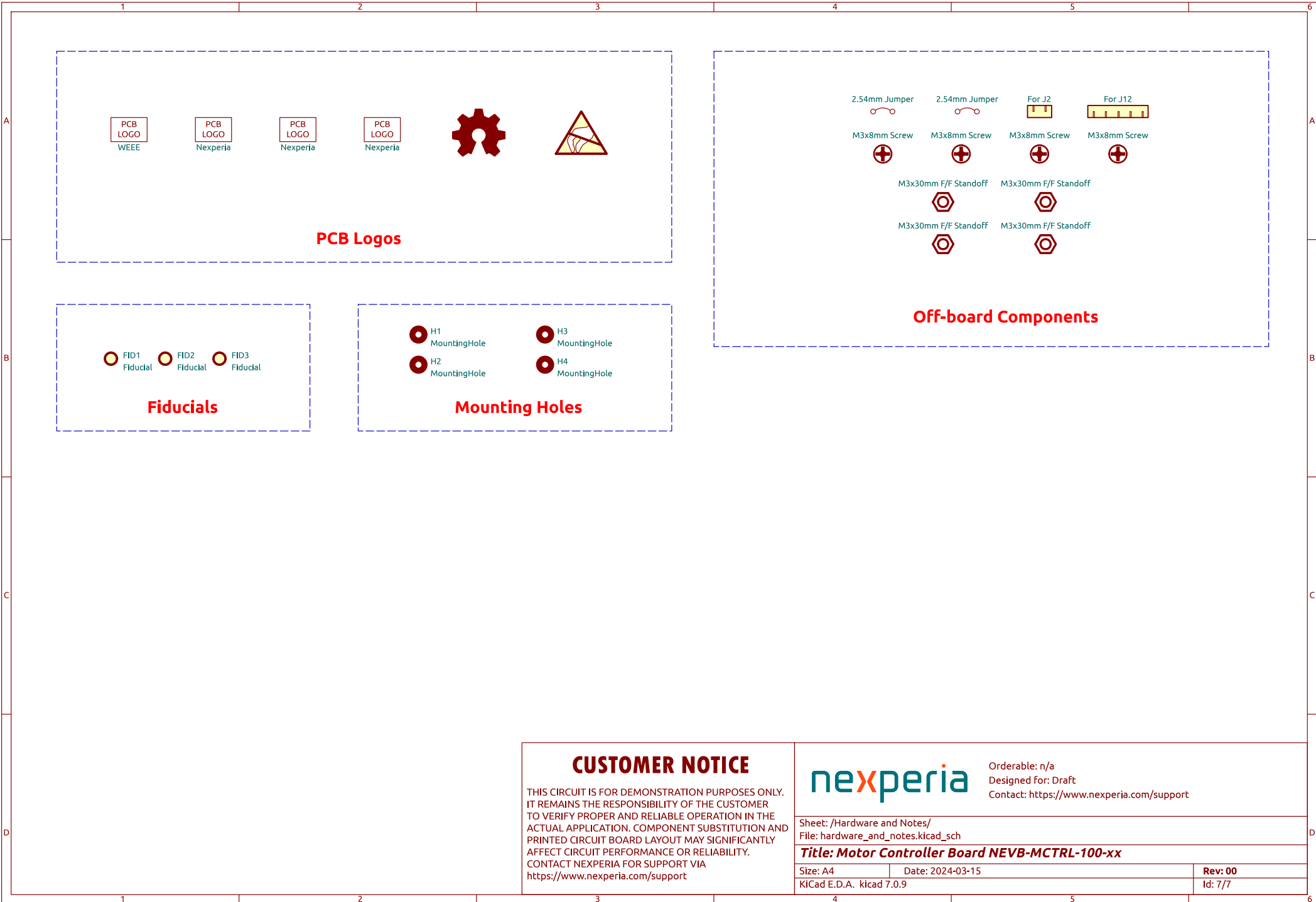
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