

Title: Block Diagram

Designer: Akshat Doctor

Date:

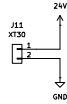
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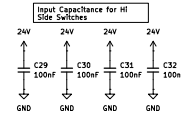
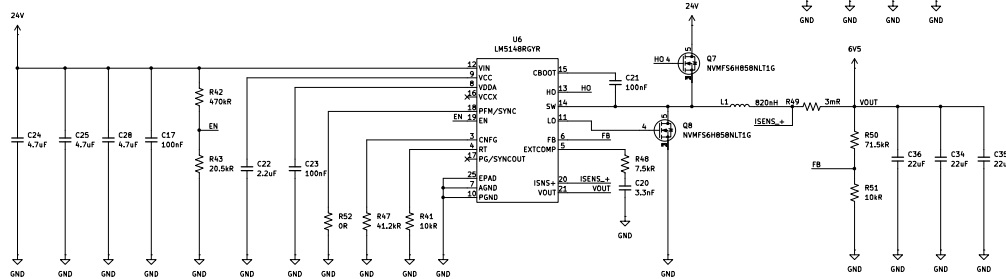


INPUT CONNECTOR

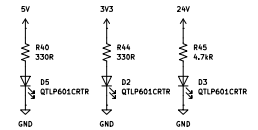


Use four 10-nF, 50-V, X7R, 0603 ceramic capacitors near the high-side MOSFET to supply the high dI/dt current during MOSFET switching transitions. Such capacitors offer high self-resonant frequency (SRF) and low effective impedance above 150 MHz. The result is lower power loop parasitic inductance, thus minimizing switch-node voltage overshoot and ringing for lower conducted and radiated EMI signature. Refer to Section 5A.1 for more details.

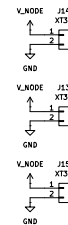
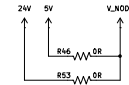
24 -> 6V5



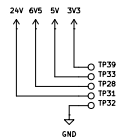
STATUS LED



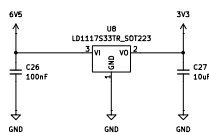
OUTPUT CONNECTOR



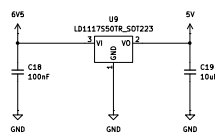
Testpoints



6V5 -> 3V3 LDO



6V5 -> 5V LDO



Title: Power

Designers: Akshat Doctor

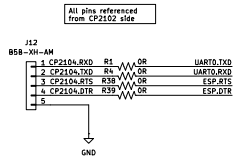
Date: 2024-12-16

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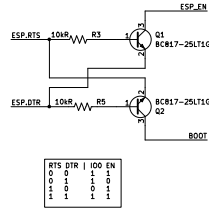
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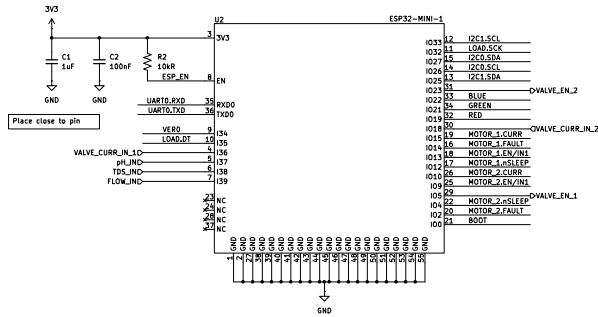
CP2102 Breakout



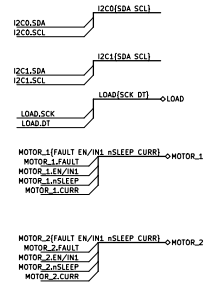
Auto-Programming Circuit



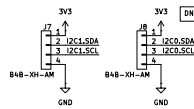
Microcontroller Module



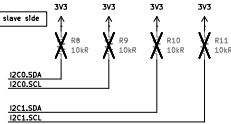
BUS DEFINITIONS



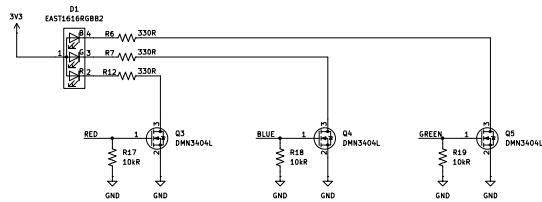
I2C BUS CONNECTIONS



PULLUPS



RGB STATUS LED



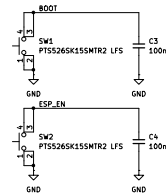
Toggle Color via uC pin for different status modes

VERSIONING RESISTORS



Versioning Resistors for HW to detect SW version. DNP appropriately

BOOT/RESET



Place C4 close to switch

Title: Microcontroller

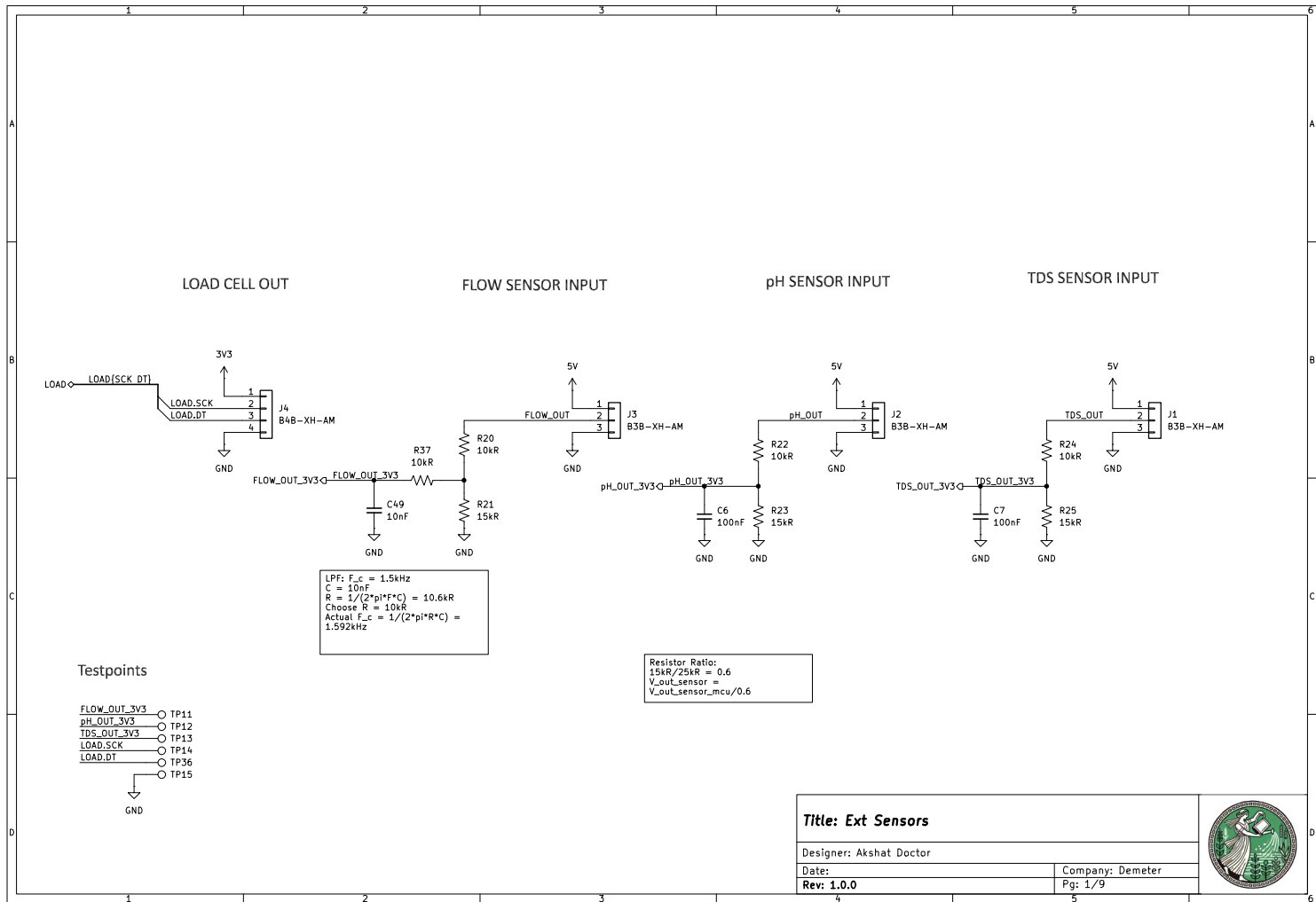
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Title: Ext Sensors

Designer: Akshat Doctor

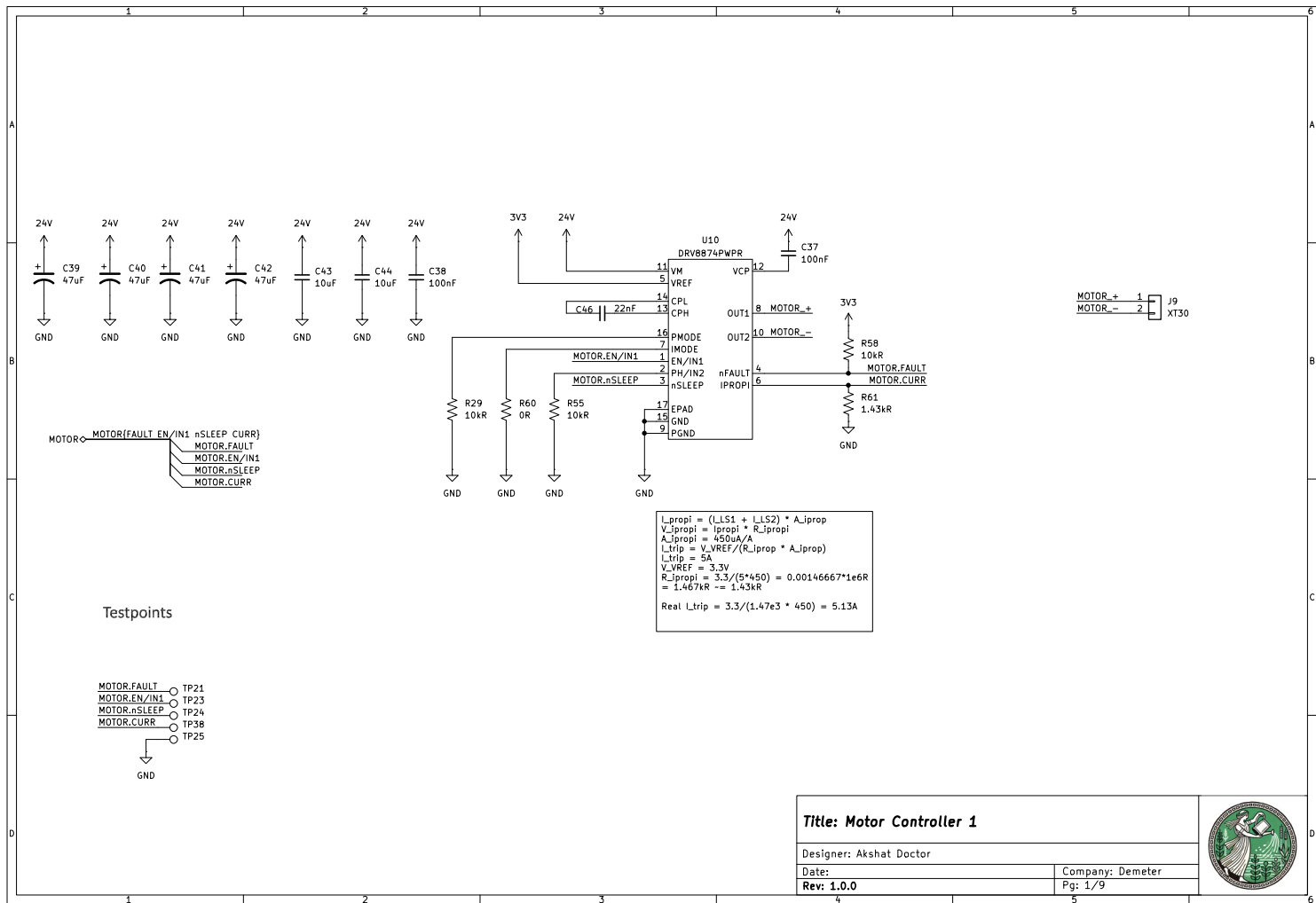
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Title: Motor Controller 1

Designer: Akshat Doctor

Date:

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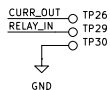


INA181 Amplification Ranges:
20, 50, 100, 200

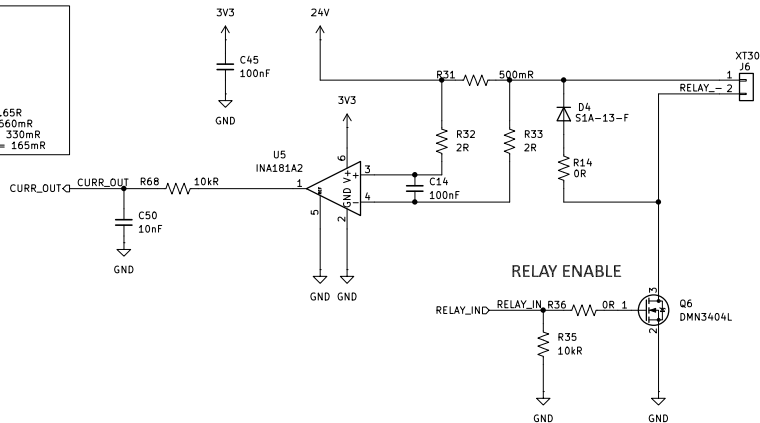
If:
V_SOLENOID = 24V
- I_out = 83mA
- I_max = 100mA
- V_out_max = 3.3V
- V_shunt_max = 100mA * R
@20: R_max = $3.3 / (20 * (100\text{mA})) = 1.65\text{R}$
@50: R_max = $3.3 / (50 * (100\text{mA})) = 660\text{mR}$
@100: R_max = $3.3 / (100 * (100\text{mA})) = 330\text{mR}$
@200: R_max = $3.3 / (200 * (100\text{mA})) = 165\text{mR}$

Cutoff Freq:
 $1 / (2 * \pi * (2\text{R}) * \text{C}) =$
 $1 / (2 * \pi * 10 * 100\text{e-}9) = 398\text{kHz}$

Testpoints



Current Sense



Title: Relay Controller 1

Designer: Akshat Doctor

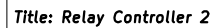
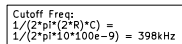
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Designer: Akshat Doctor

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Company: Demeter

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