

Wheel Sensor Board

U_MainConnector
MainConnector.SchDoc

U_STM32F417VGT6TR
Processor.SchDoc

U_Oscillator
Oscillator.SchDoc

U_Programming
Programming.SchDoc

U_MicroSD
MicroSD.SchDoc

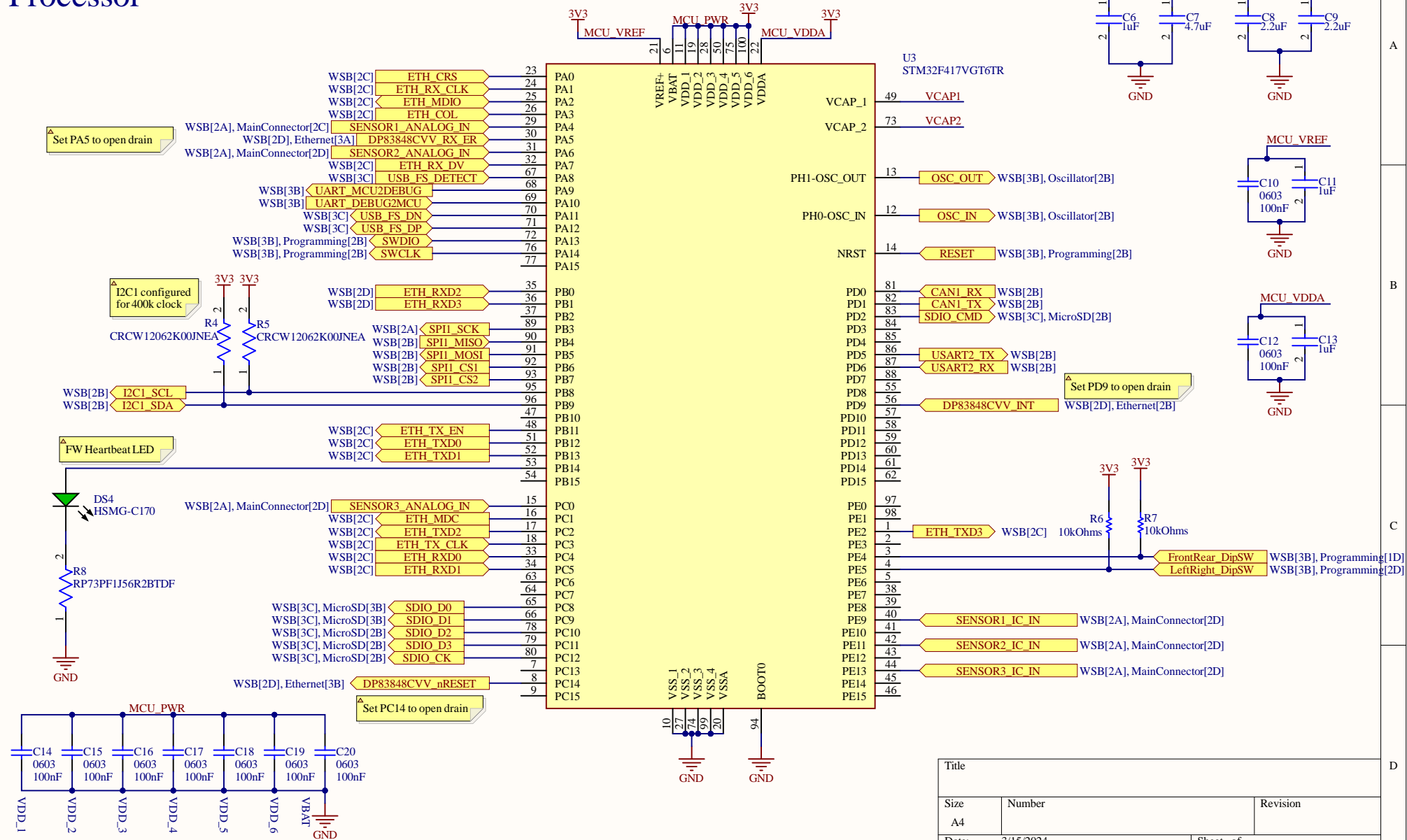
U_VehicleCAN
CAN.SchDoc

U_Ethernet
Ethernet.SchDoc

U_POWER
Power.SchDoc

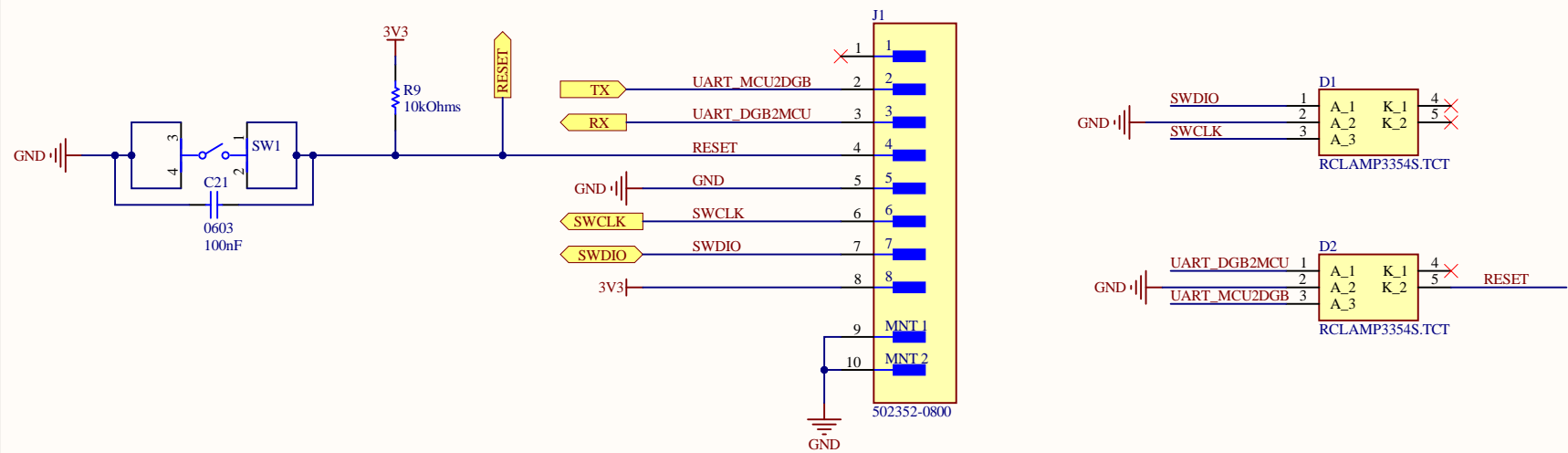
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Processor



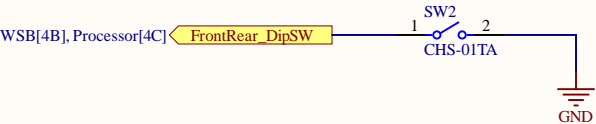
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Programming



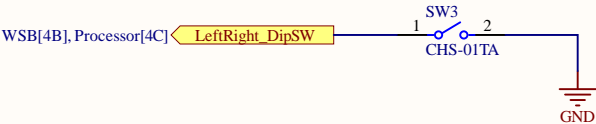
Front/Rear Dip Switch

Close switch to configure as rear WSB



Left/Right Dip Switch

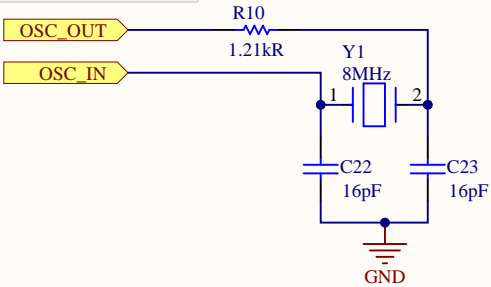
Close switch to configure as right WSB



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Oscillator

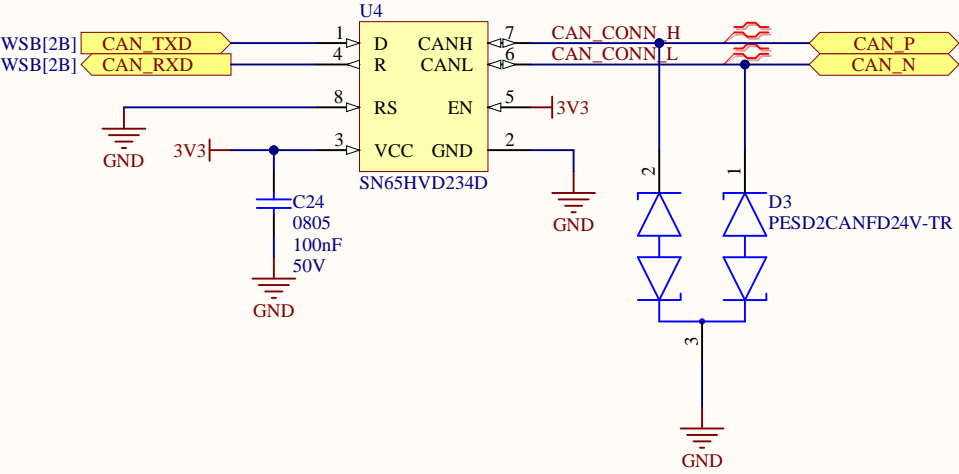
⚠ Oscillator external resistor must be selected to limit power dissipation to < 100uW. Value selected based value used for existing F7 boards but should be verified experimentally but a general equation in AN2867 is given in section 3.5.3 as:
 $R_EXT = 1/(2*\pi * F_osc * C_L2)$
 $R_EXT = 1/(2*\pi *(8*10^6)*(16*10^{-12}))$
 $R_EXT = 1243$



⚠ See ST AN2867 Rev 19 and datasheet section 5.3.8 External clock source characteristics for details. MCU datasheet recommends a 10pF estimate for pararsitic capacitance. This is a Pierce Oscillator (variant of Colpitts Oscillator). R_Ext is used to limit inverter output current. See Figure 5 in AN2867. From AN2867 Section 3.3 with C_L1 = C_L2 and C_L as 18pF:
 $C_L1 = 2*(C_L - C_s)$
 $C_L1 = 16pF$

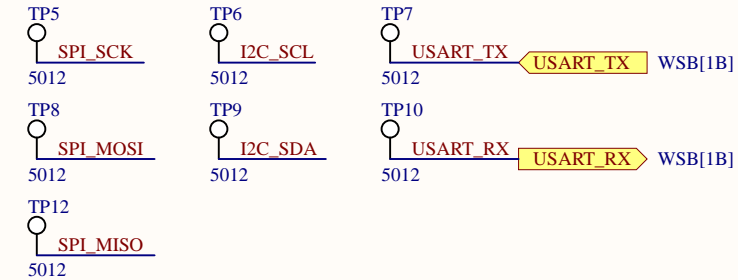
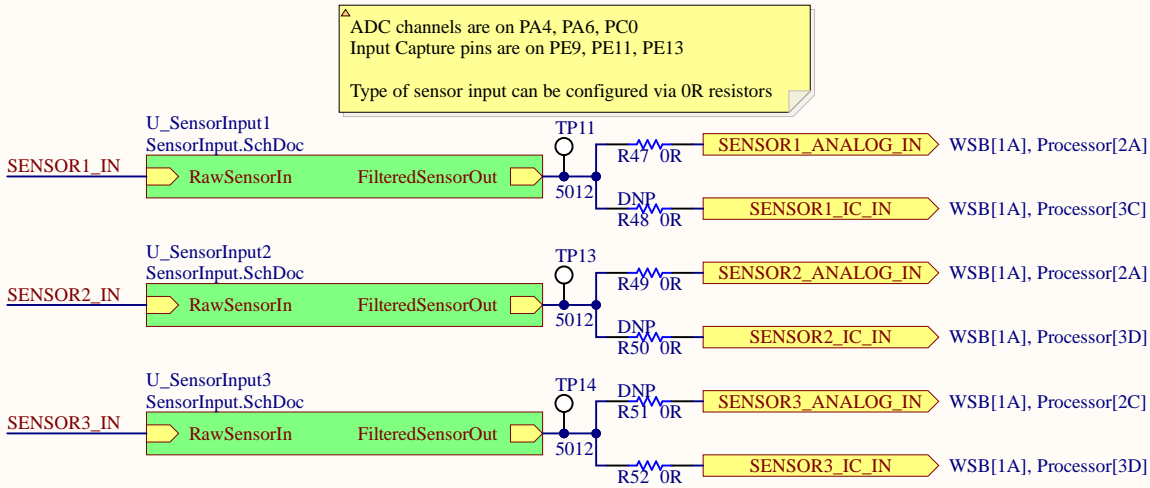
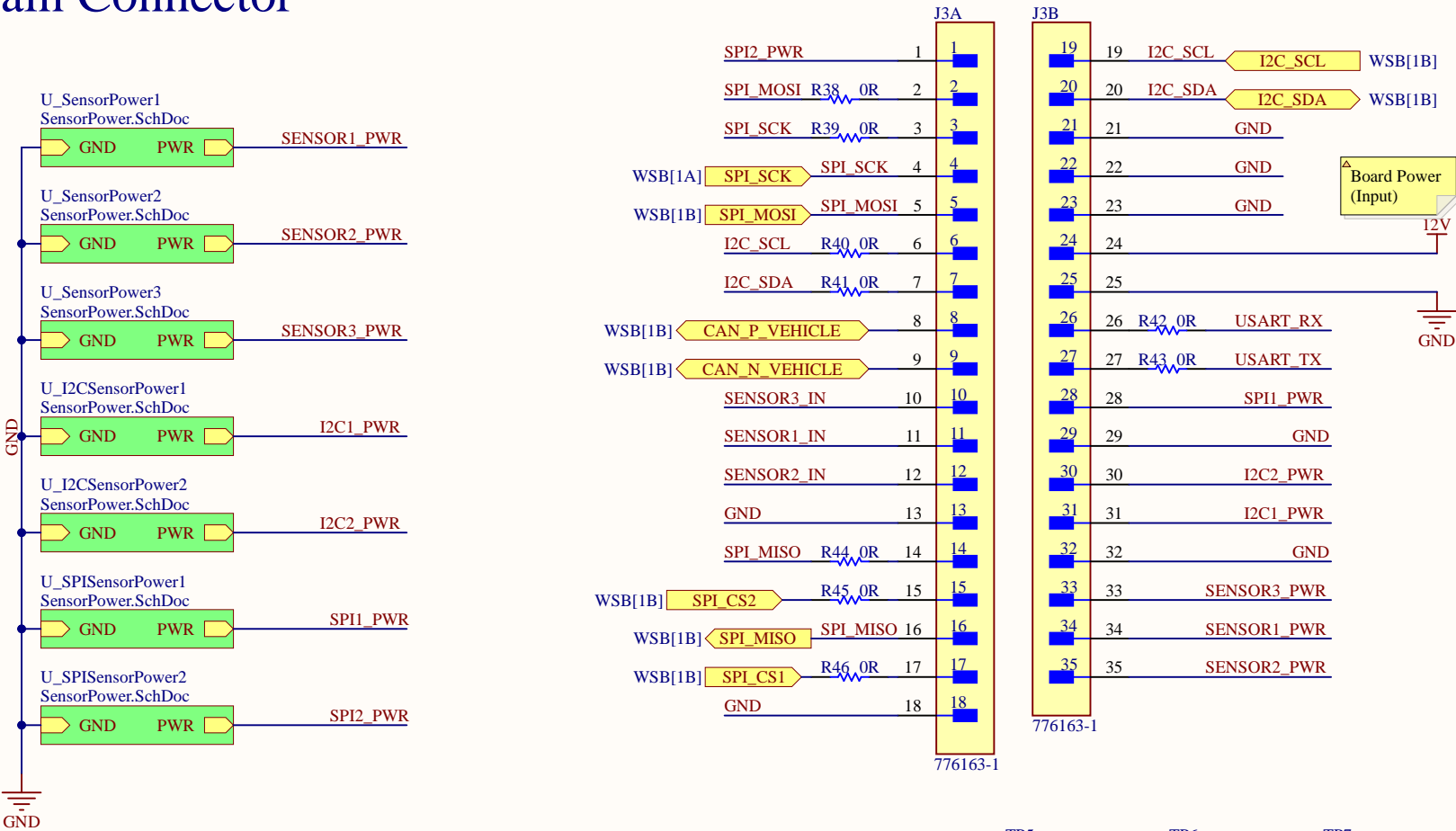
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CAN



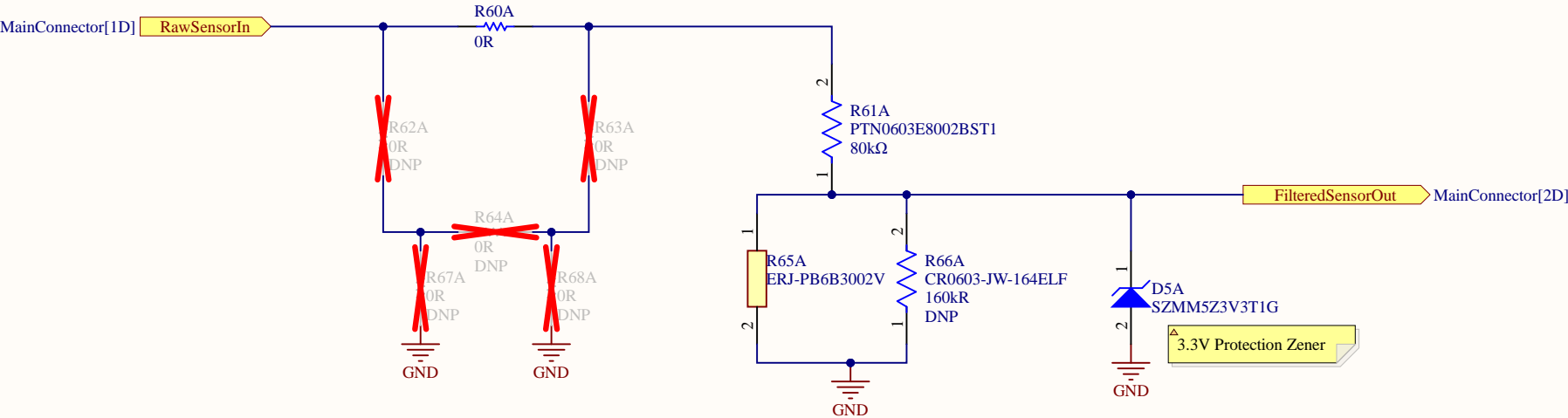
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Main Connector



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Sensor Input

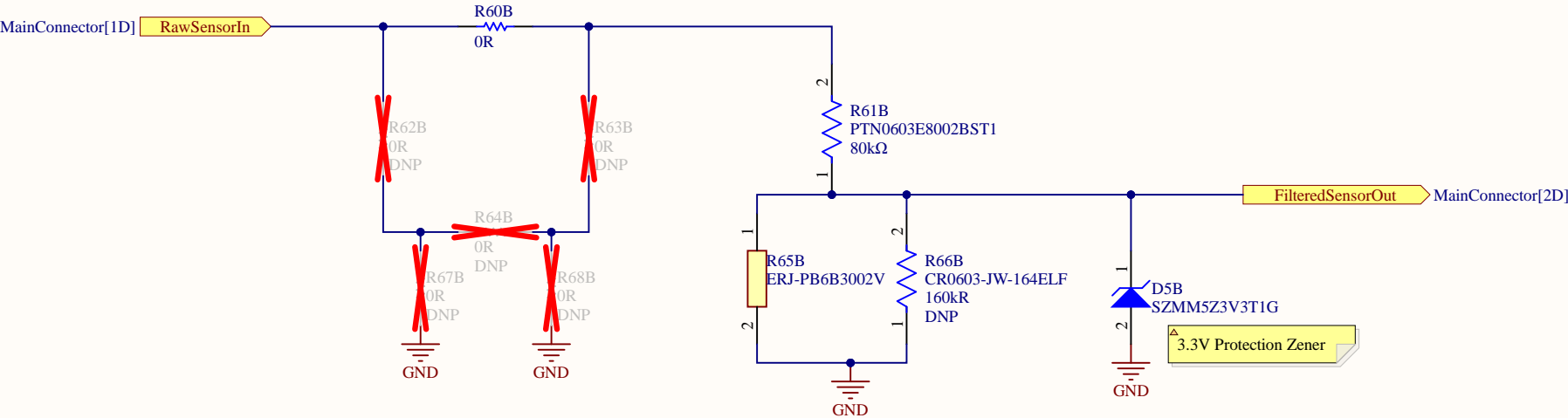


Filter Stage
Optional band pass filter with 0805 components

Step Down Stage
Populate 30kOhm Resistor if sensor output is 12V,
160kOhm if 5V, bridge 80kOhm if 3.3V

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Sensor Input

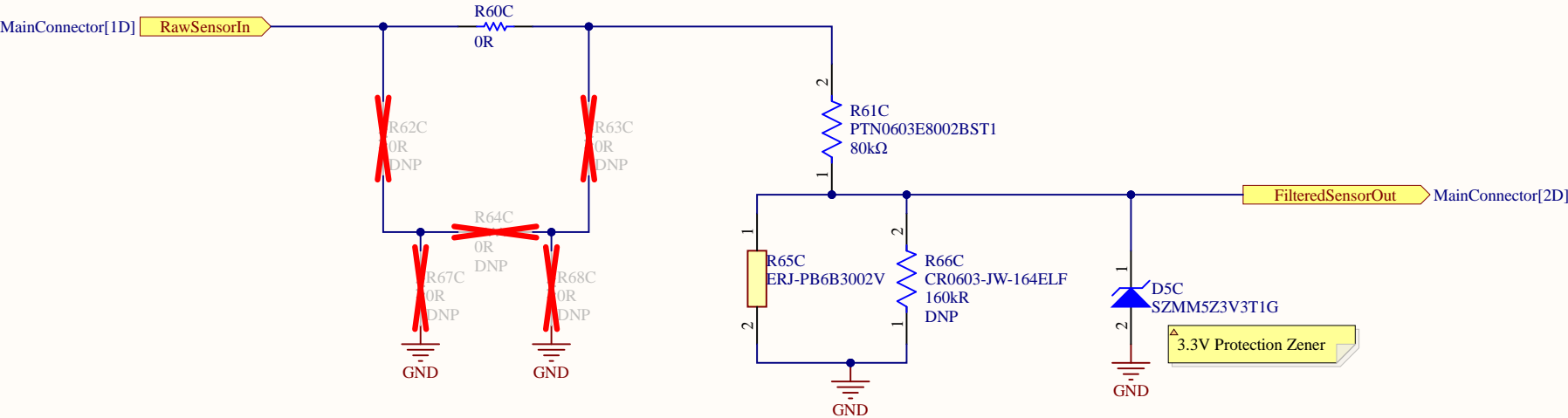


△ Filter Stage
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Sensor Input

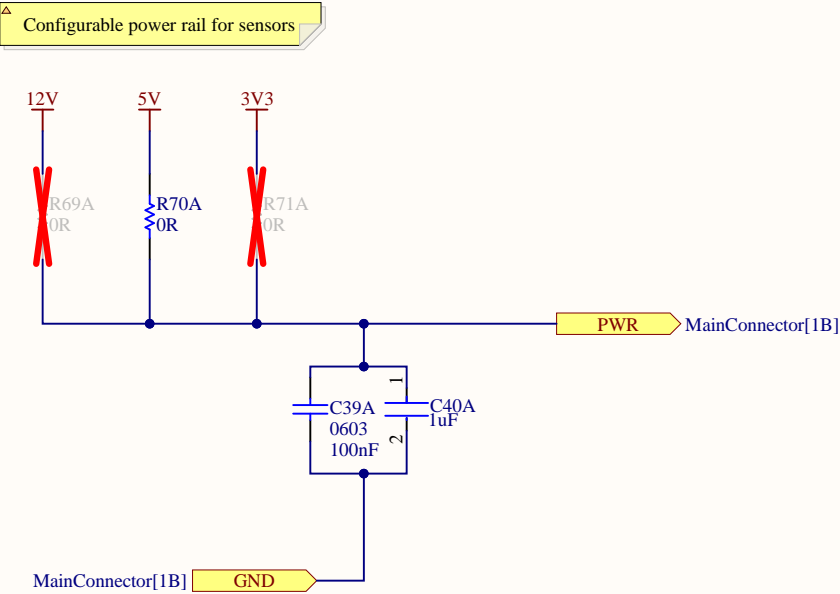


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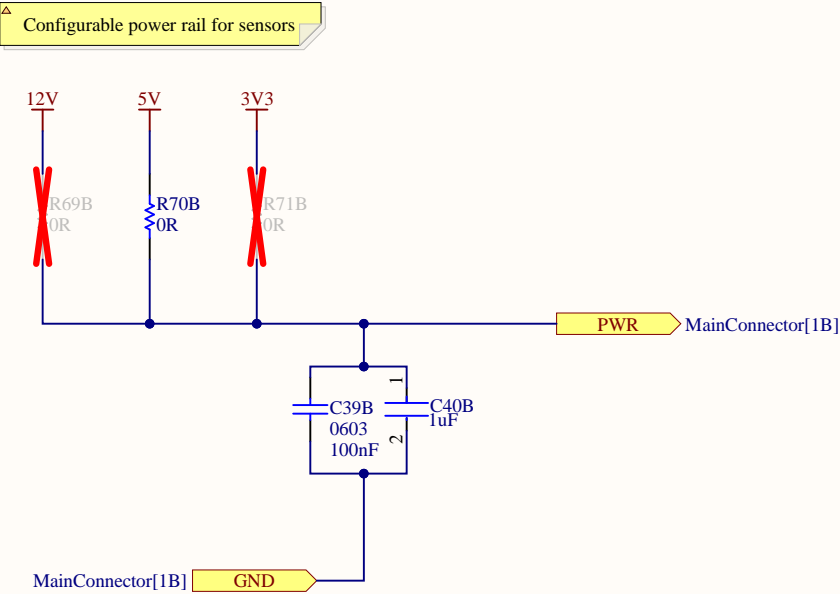
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Sensor Power



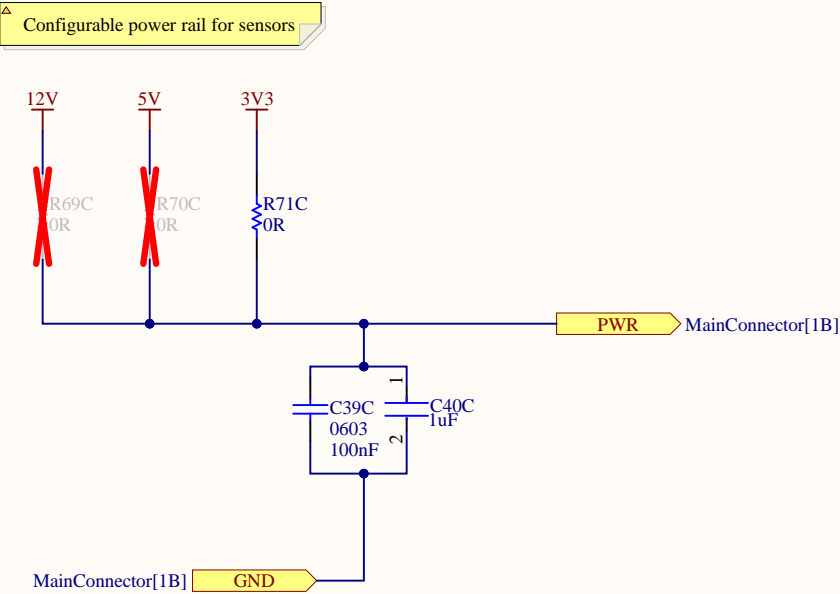
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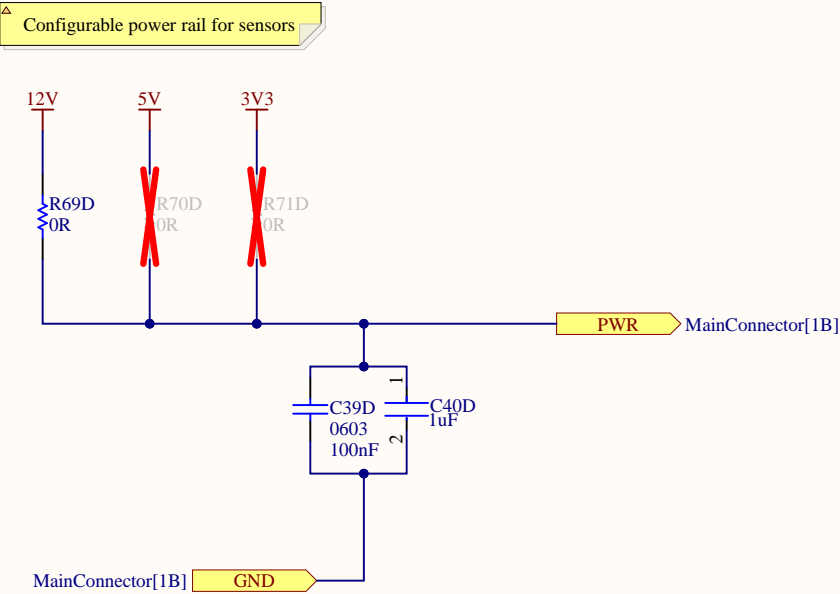
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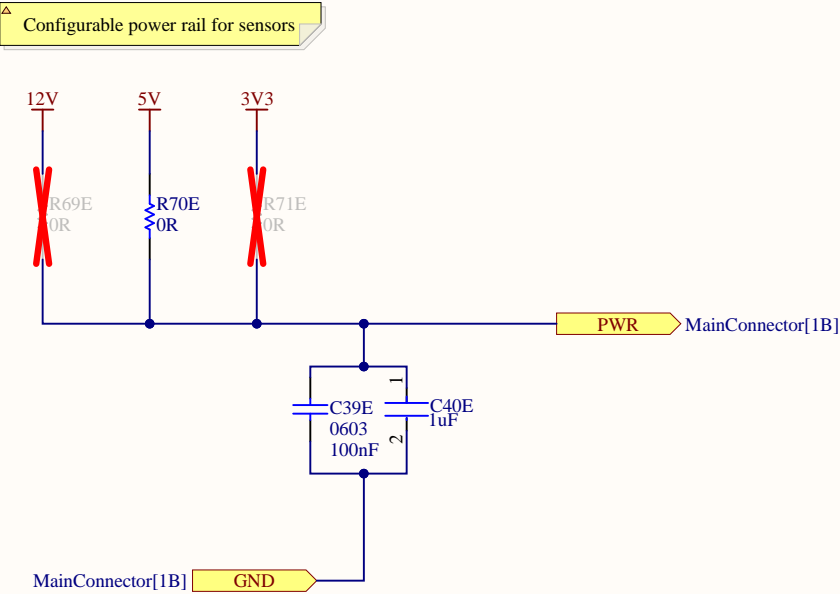
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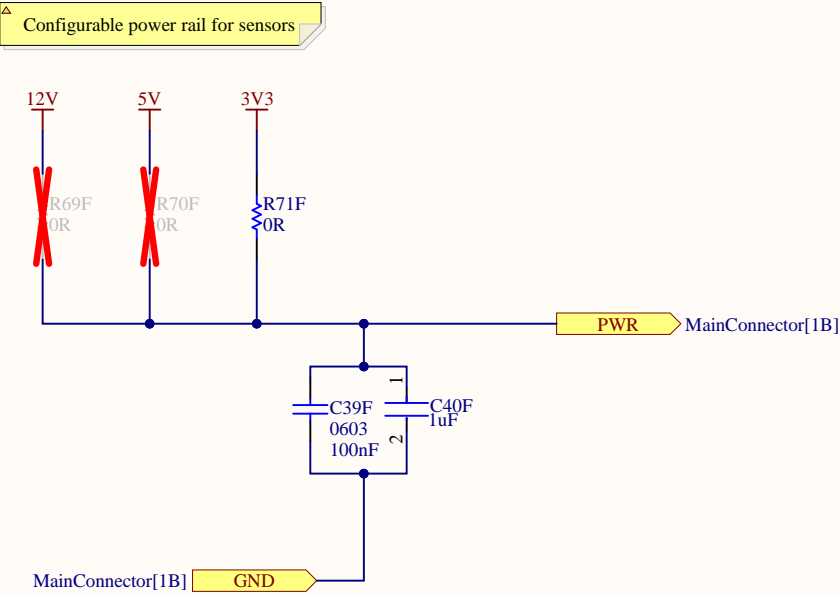
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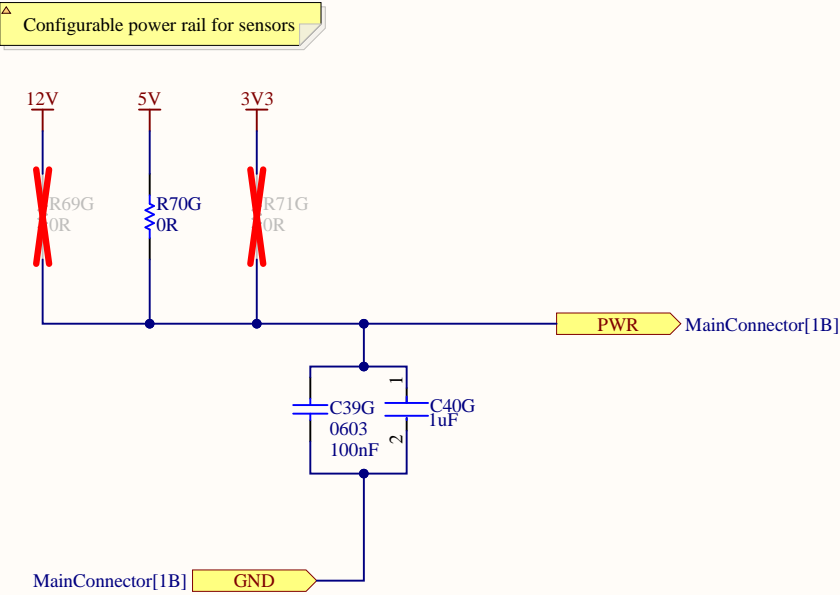
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Sensor Power



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Sensor Power



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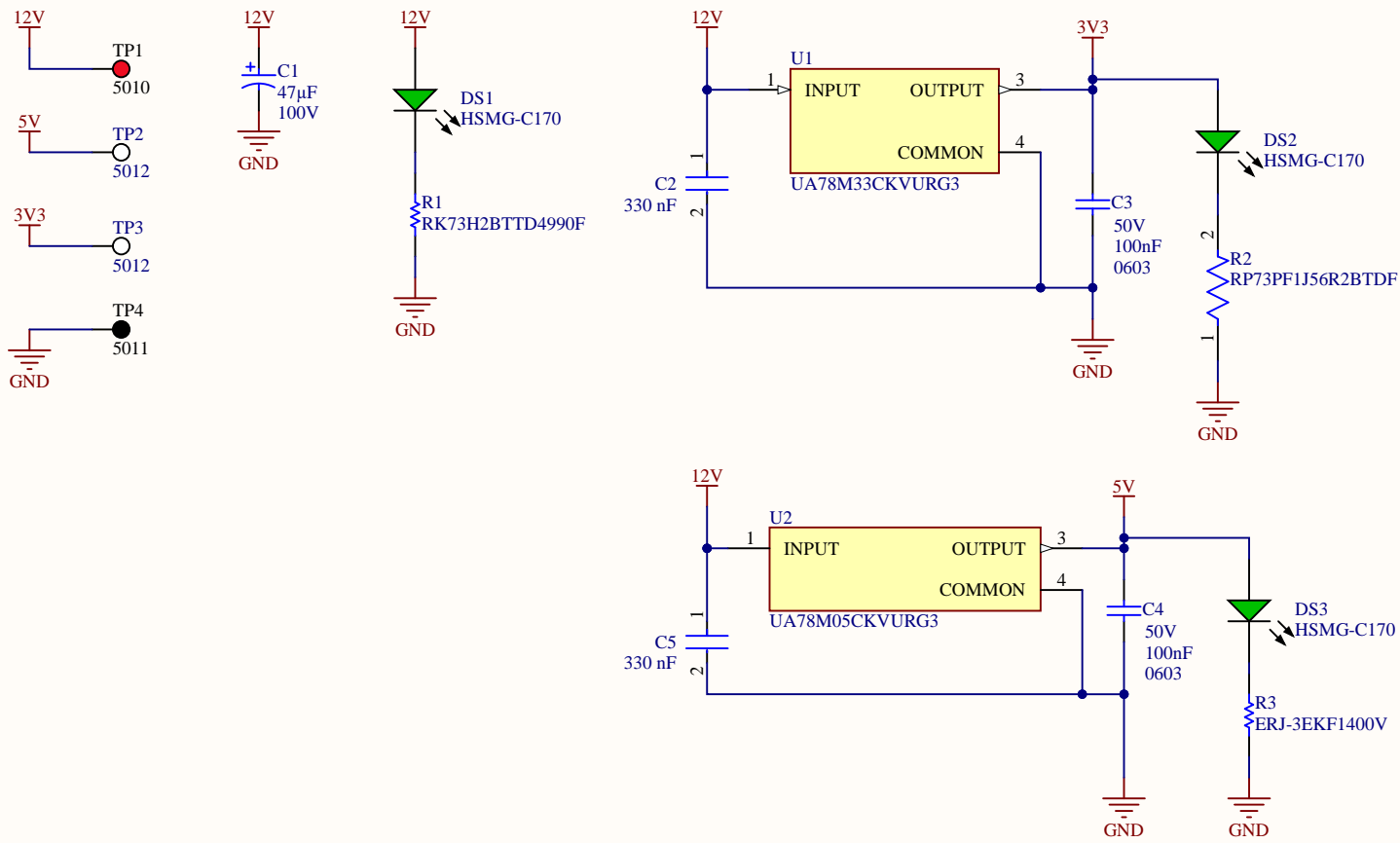


ESD protection for VBUS:
<https://www.st.com/resource/en/a>

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Power



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