

RP2350 Layout

Sheet: /MCU/
File: rp2350_layout.kicad_sch

Title: LoRa Water Quality Management System Sensor Node

Size: A3	Date:	Rev:
KiCad E.D.A. 9.0.4		Id: 2/6

A

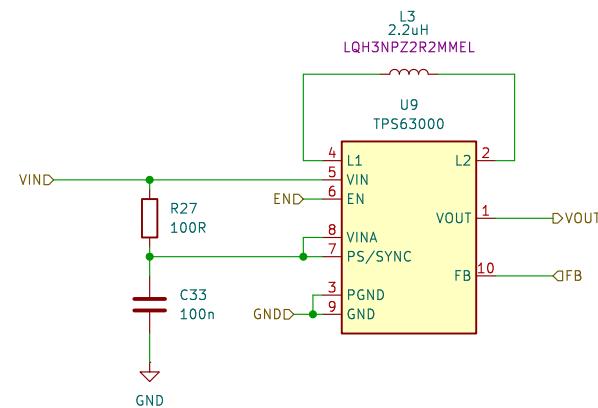
Maximum Current Throughput:

RP2350: ~100mA max
 sx1262: 118mA max in +22dBm TX Mode
 +200mA headroom

Let's call it 500mA expected worst case input current. Most of the time we will be in sleep mode and never come close to this.

Energizer considers the useable life of their D-Cell batteries to be up to 0.8V, meaning a minimum expected input voltage of 2.4V is reasonable. To add some factor of safety, I'll do the calculations with 2V input:

B



C

D

Power Supply

Sheet: /Buck-Boost Regulator Layout/
 File: lwqms_power_supply.kicad_sch

Title: LoRa Water Quality Management System Sensor Node

Size: A4	Date:
KiCad E.D.A. 9.0.4	Rev: Id: 3/6

A

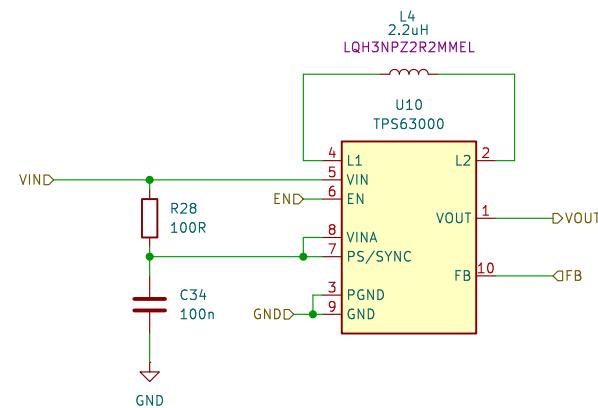
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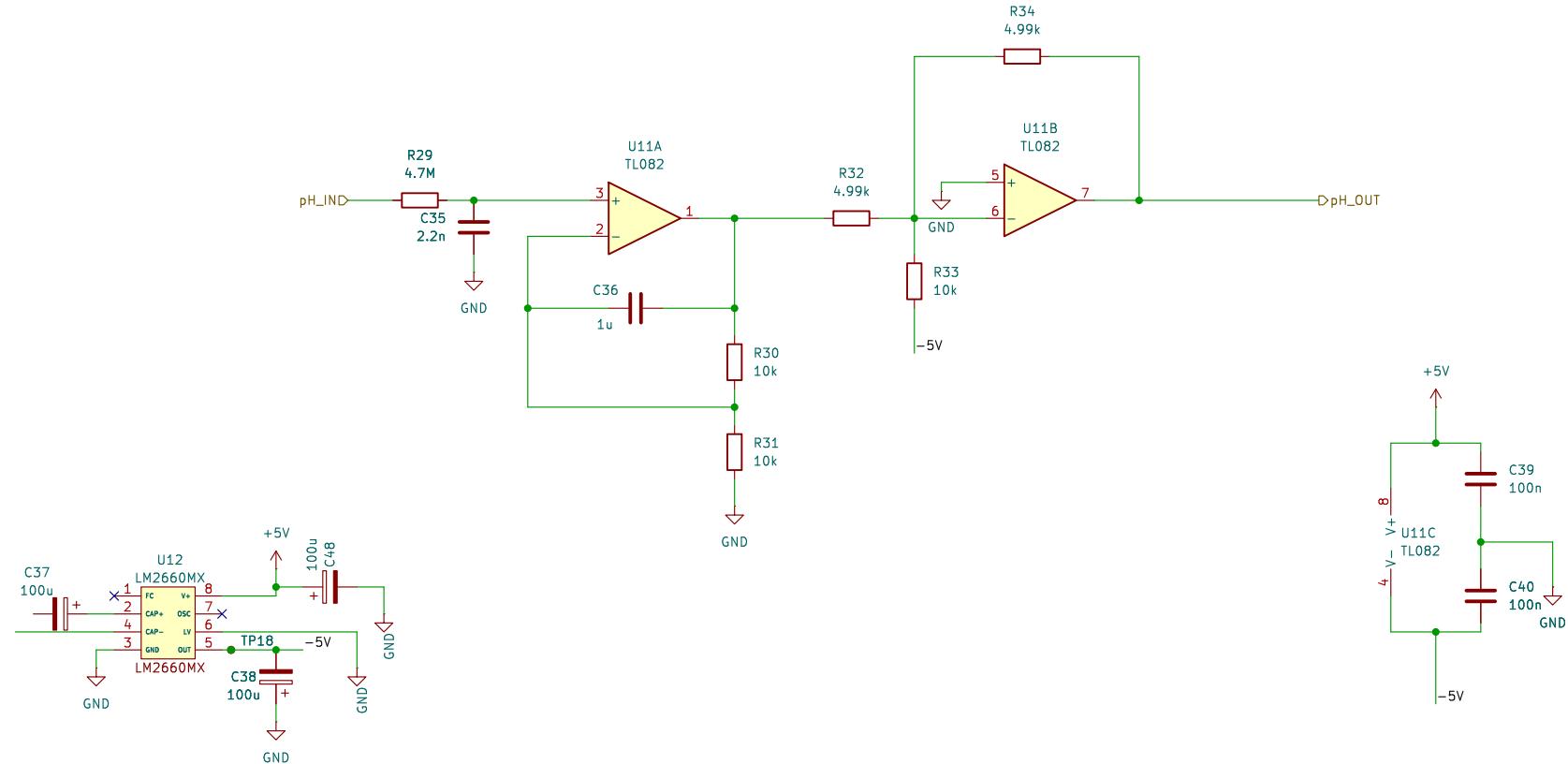
D

Power Supply

Sheet: /Buck-Boost Regulator Layout1/
 File: lwqms_power_supply.kicad_sch

Title: LoRa Water Quality Management System Sensor Node

Size: A4	Date:
KiCad E.D.A. 9.0.4	Rev: Id: 4/6



pH Sensor Pre-Amplifier

Sheet: /PH Sensor Pre-Amplifier ALT/
File: phsensorboard_alt.kicad_sch

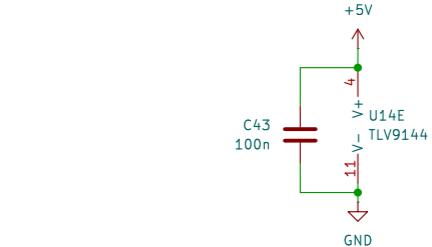
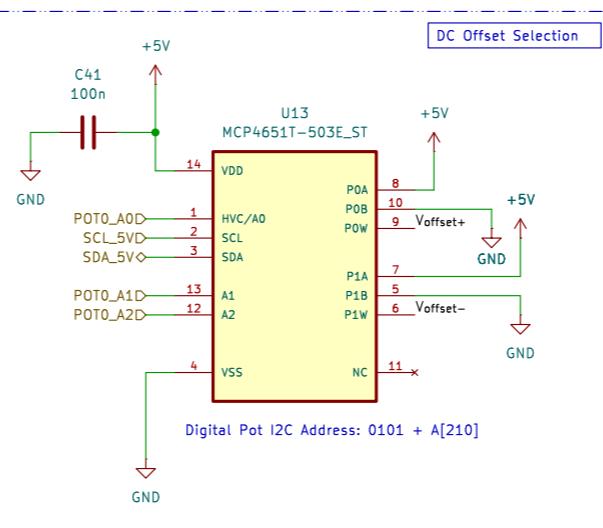
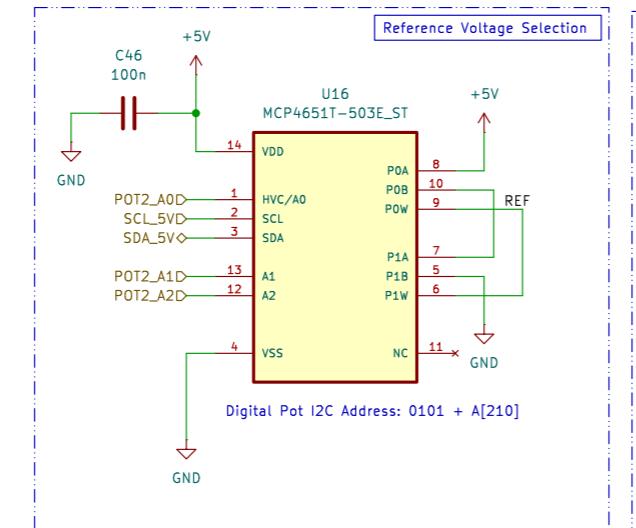
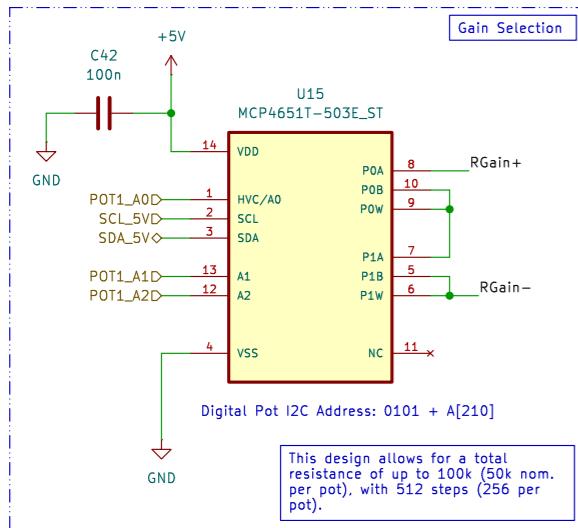
Title: LoRa Water Quality Management System Sensor Node

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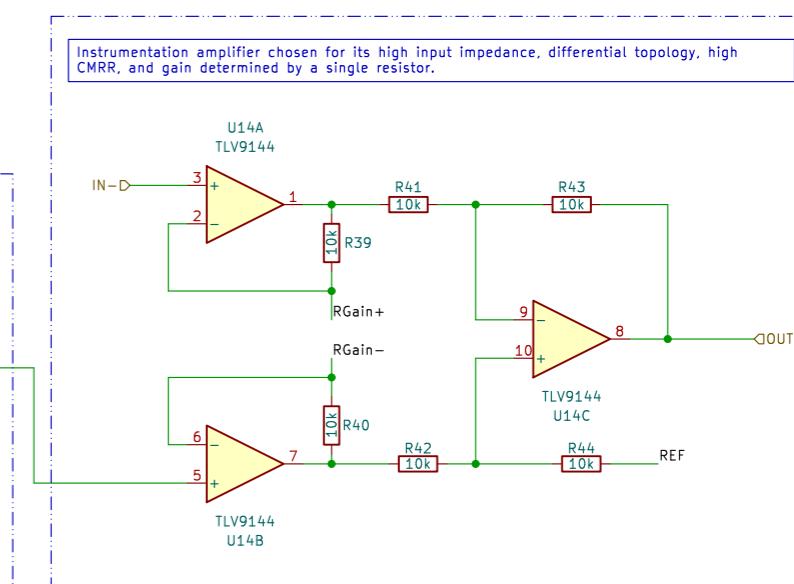
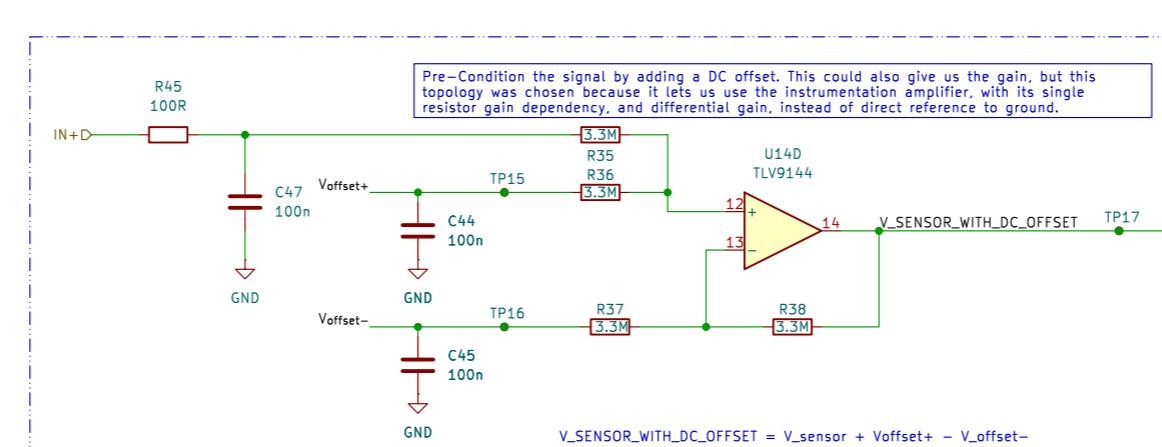
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Software-Defined Instrumentation Amplifier



$$V_{out} = (V_{in+} + V_{OFFSET+} - V_{OFFSET-} - V_{in-})(20K/R_{GAIN} + 1) + V_{REF}$$



$$GAIN = 1 + 2R/R_{GAIN} \longrightarrow \text{See excel sheet for possible gain values!}$$

Sheet: /Software-Defined Instrumentation Amplifier/
File: software_defined_inst_amp.kicad_sch

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