Design Assignment 2

Zurizadae Soto Maya [1010229548]
Zarah Mathew [1009961720]

October 12, 2025

I. Updated Schematic

Design Changes Summary

1. Current Sense Amplifier (DA1)

No design changes were made as it was approved and validated by our instructor.

2. Low-Pass Fiter

A 4th-order Butterworth Bessel 0.95 filter implemented using two cascaded op-amps. This type of filter is used to achieve smooth roll-off and minimal phase distortion.

- Gain: 0 dB
- Cutoff Frequency: 1kHz (-0.399 dB at cutoff) ($\simeq$0dB)
- Stopband Frequency: 5kHz with -43 dB attenuation ($\leq$-35dB).
- Resistors: 9kΩ, 38.6kΩ, 5.71kΩ, 11.2 kΩ
- Capacitors: 1.8nF, 18nF, 12nF, 15nF

Attached below is the updated schematic. Resistor and capacitor values are adjusted to the nearest standard values accordingly.

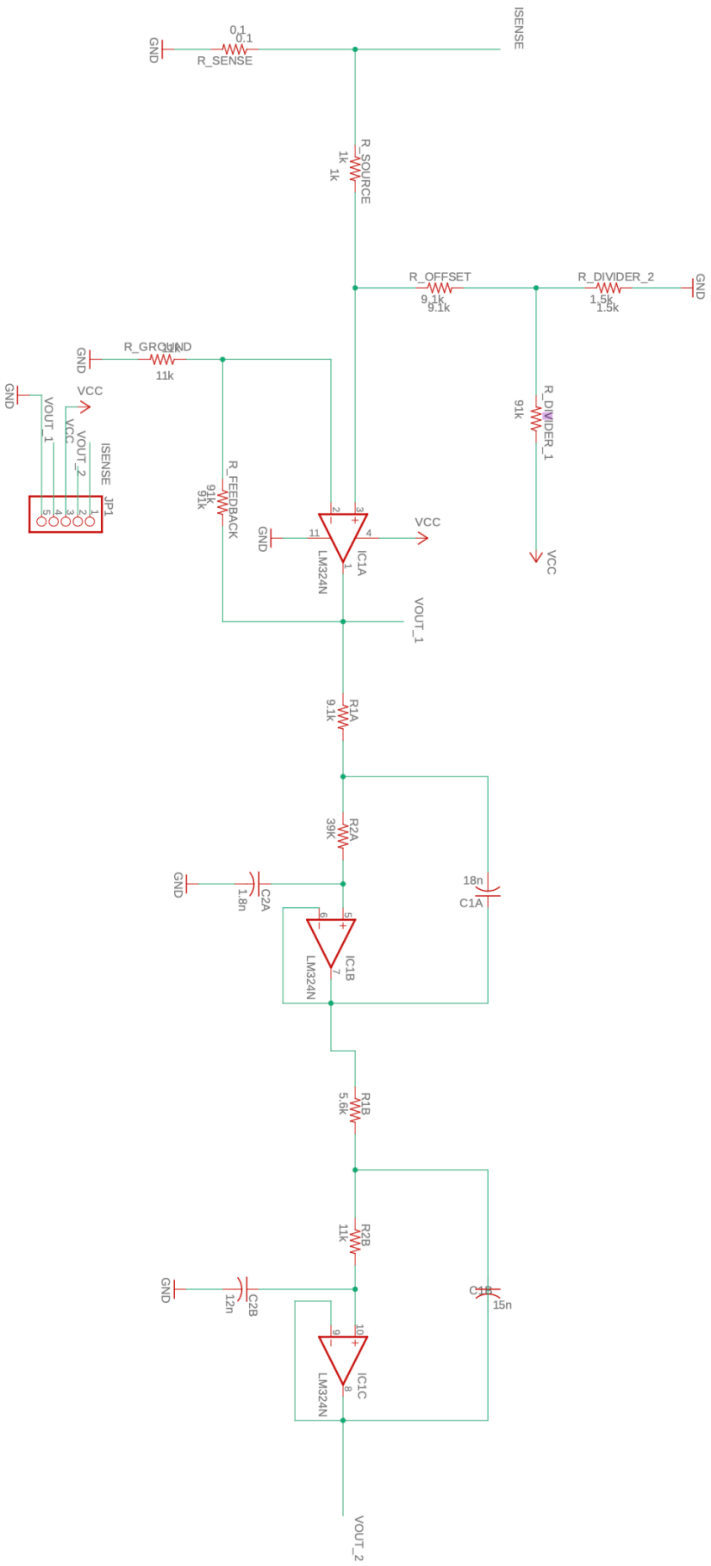

Figure 1: Updated Schematic

II. PCB Layout

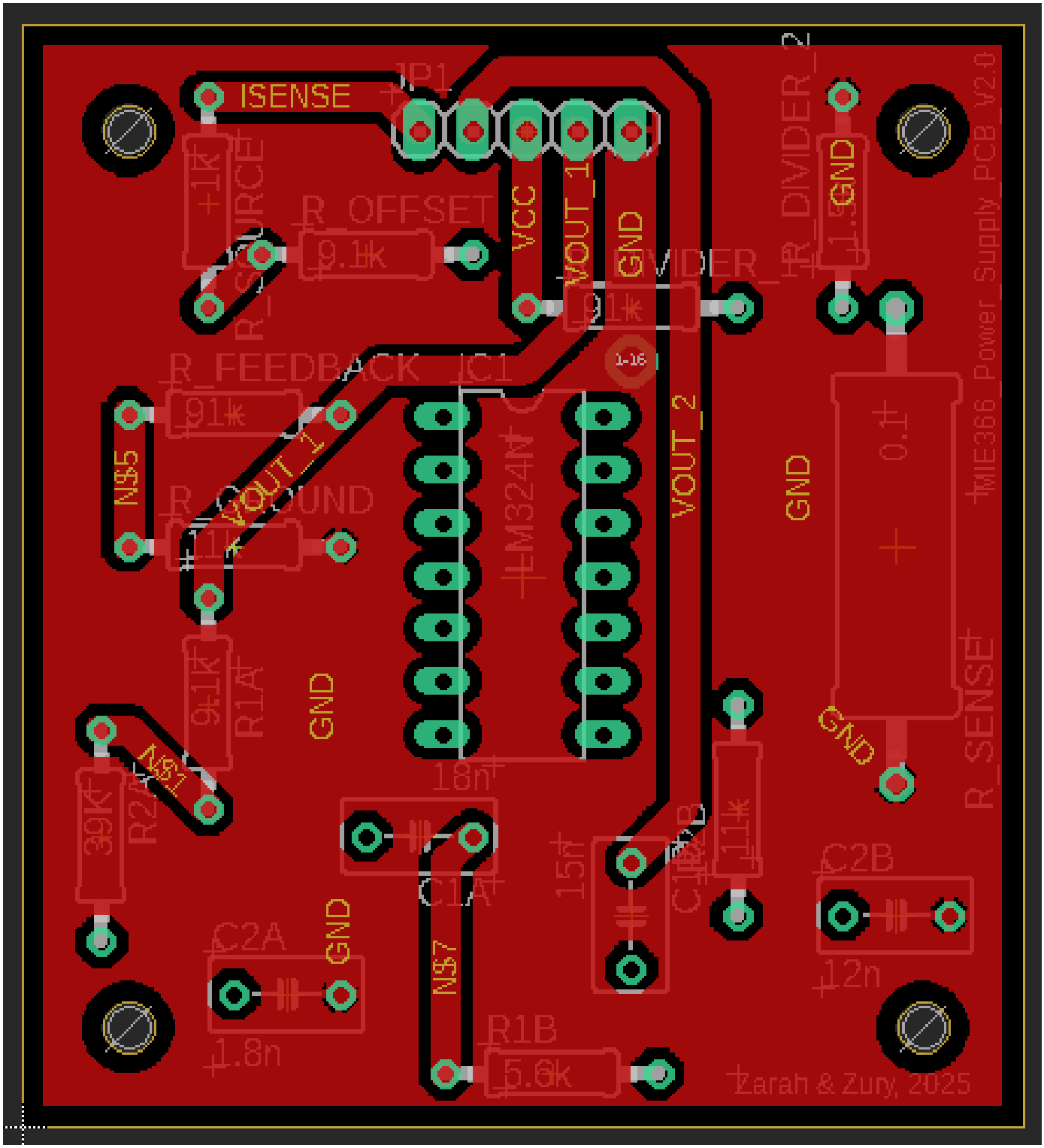

Figure 2: Updated Top Component Layer

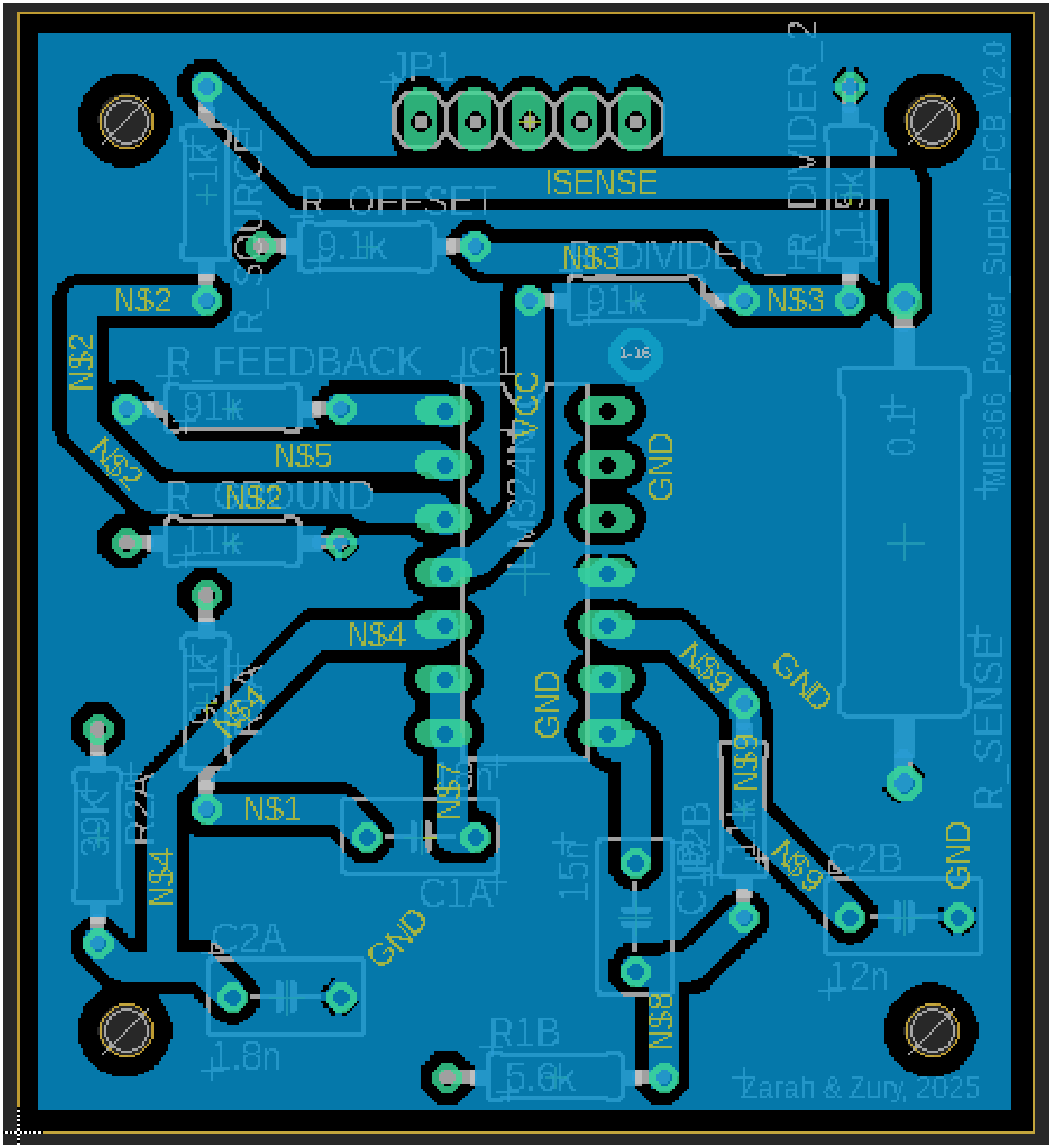

Figure 3: Updated Bottom Soldering Layer

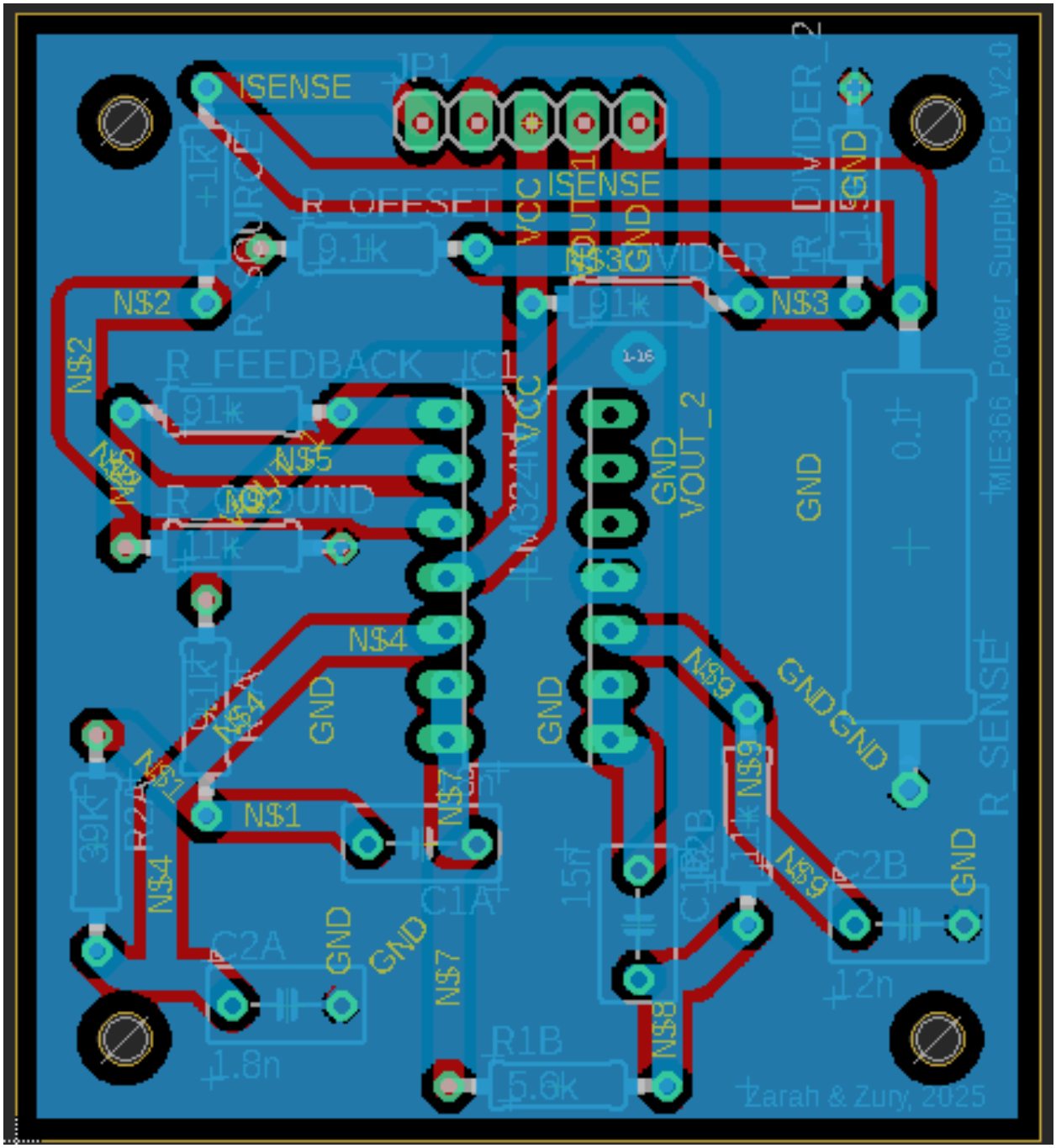

Figure 4: Updated Combined Top and Bottom Layer