

# Designing Printed Circuit Boards

## Scope

- Crash course for absolute beginners
- High level overview of the PCB design process

## What is a PCB?

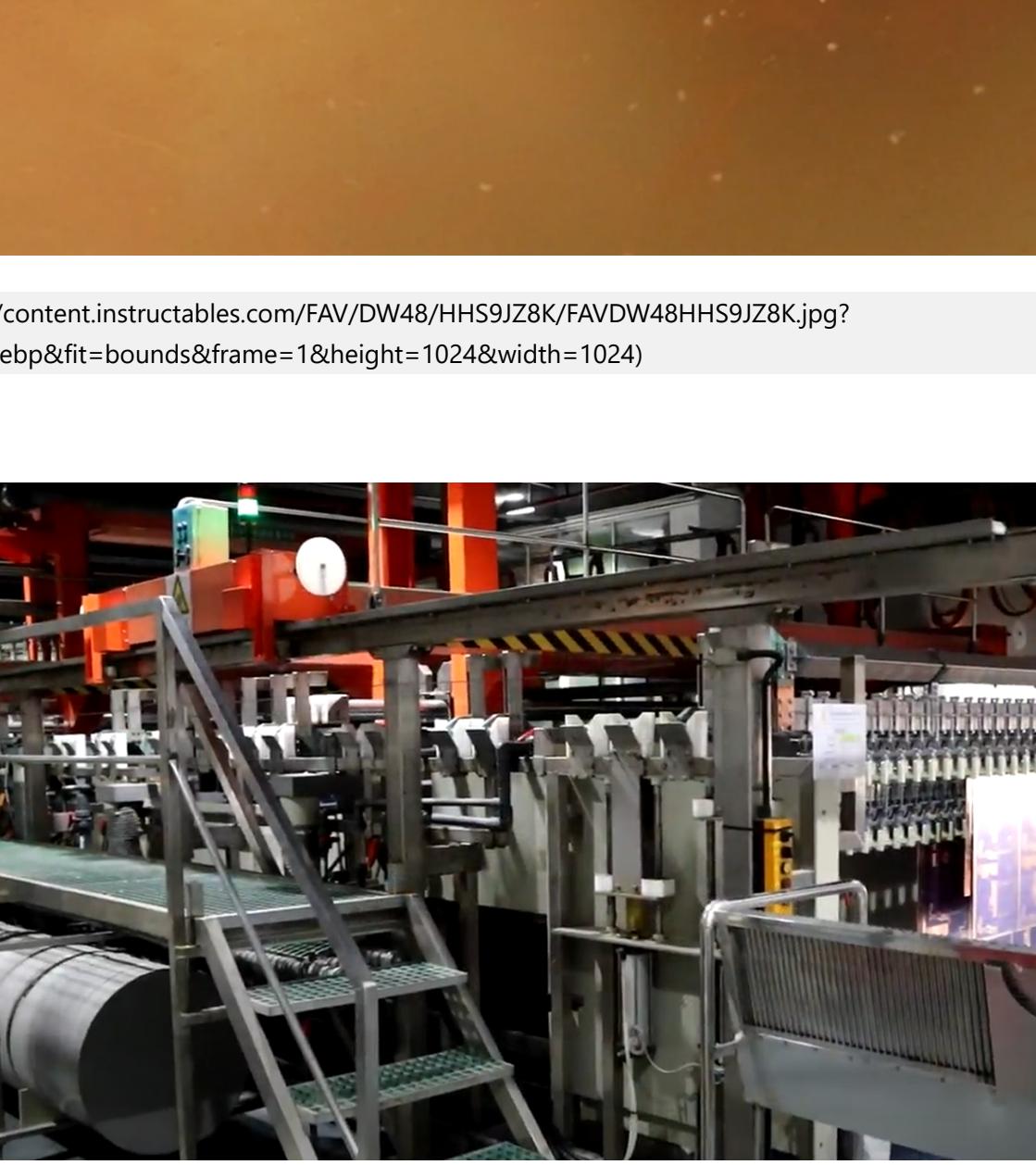
- Mechanical structure
- Electrical connection

### Single layer PCB



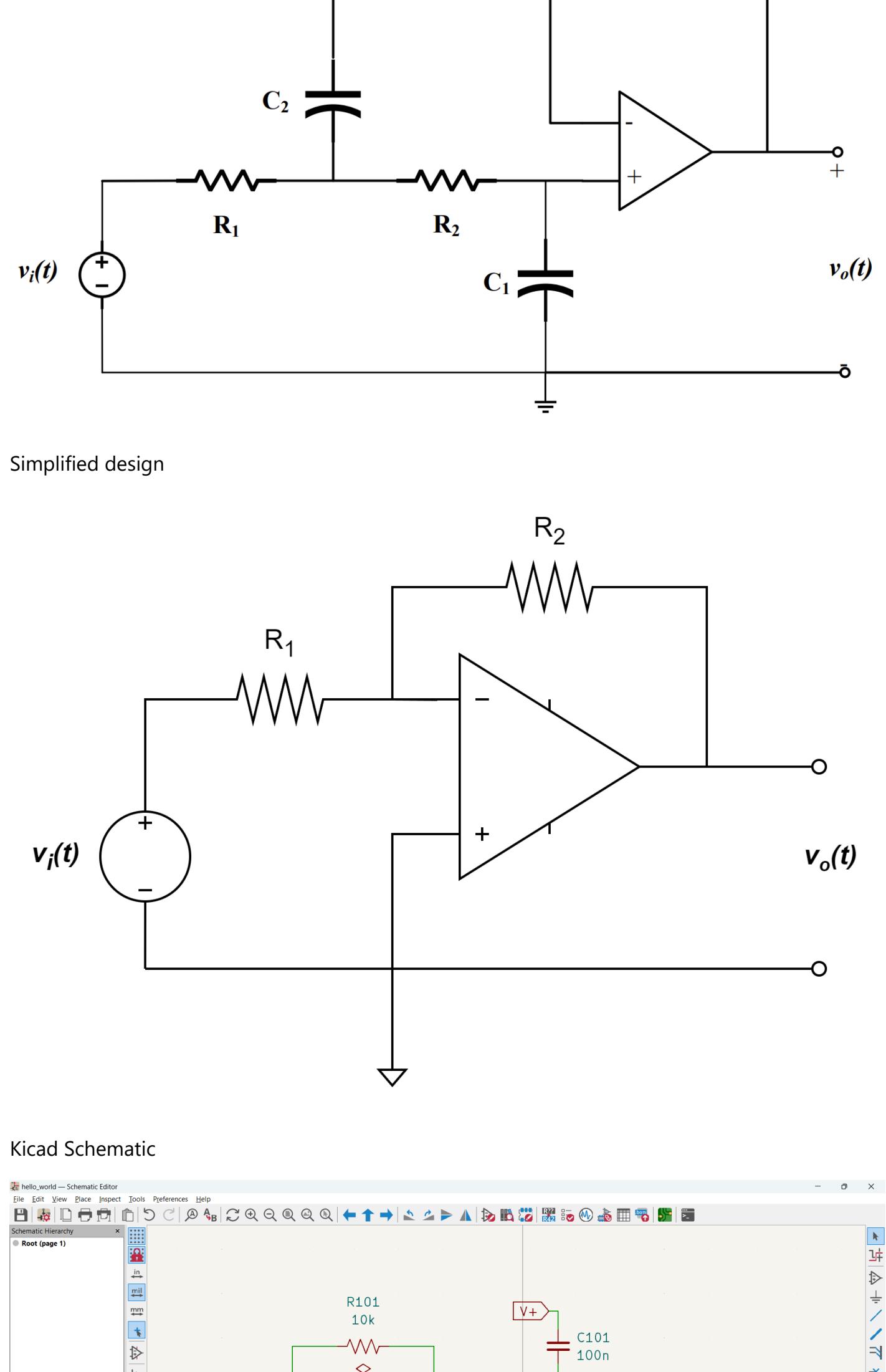
(<https://manage.pcbgogo.com/img/js/ueditor/ueditor1.4.3.3/net/upload/image/20190927/63705190834565200681116.png>)

### Multilayer PCB



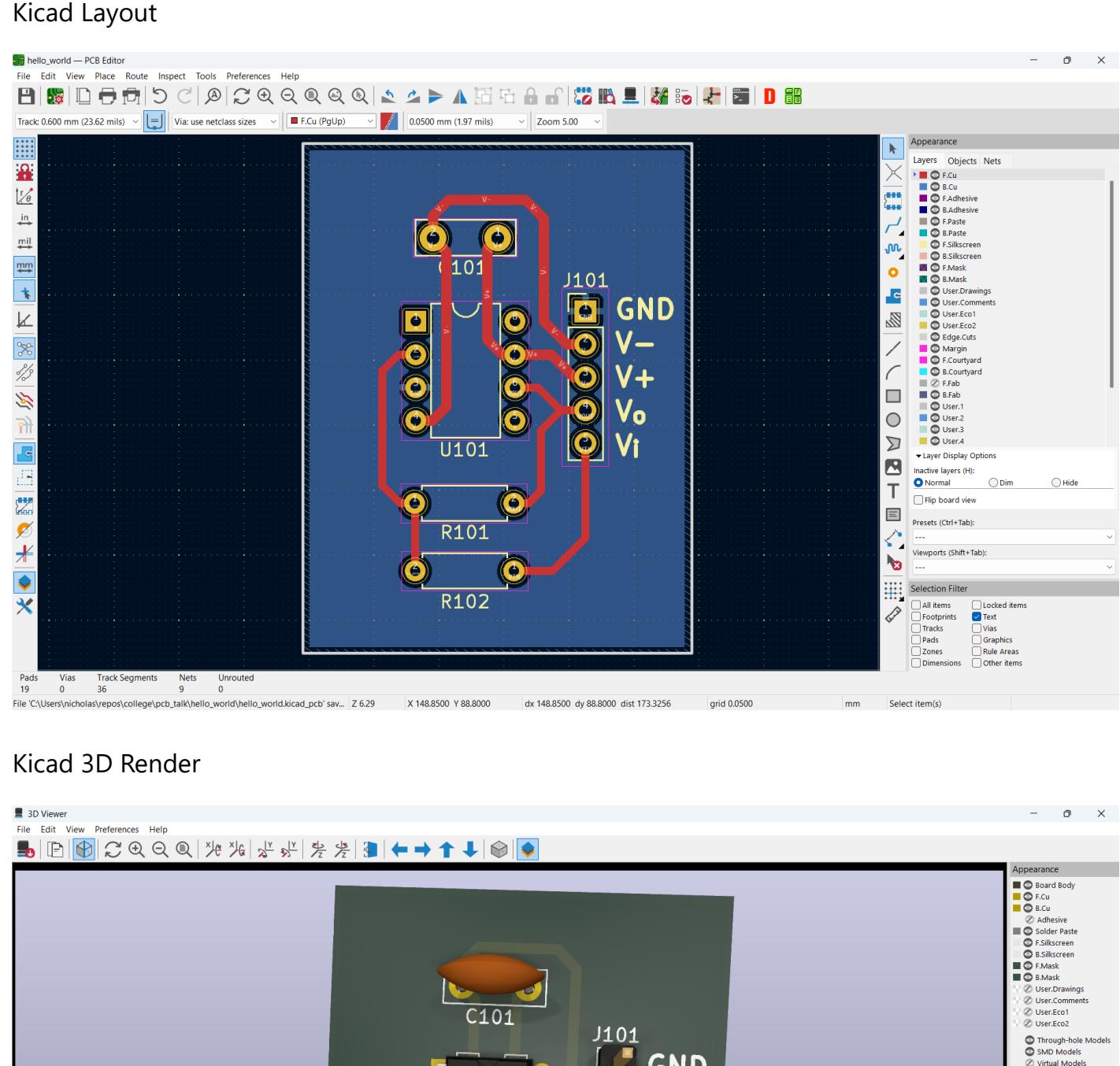
(<https://www.elecrow.com/media/wysiwyg/pcb/multilayer-PCB.jpg>)

### CNC Routing



(<https://content.instructables.com/FAV/DW48/HHS9JZ8K/FAVDW48HHS9JZ8K.jpg?auto=webp&fit=bounds&frame=1&height=1024&width=1024>)

### PCBWay



([https://youtu.be/KKd\\_TkJRMAs?si=ITFjYFM6-m2PwDht&t=753](https://youtu.be/KKd_TkJRMAs?si=ITFjYFM6-m2PwDht&t=753))

## Designing a PCB

- Schematic capture
- Layout
- Manufacturing
- Assembly

### Lab 5 design



### Simplified design

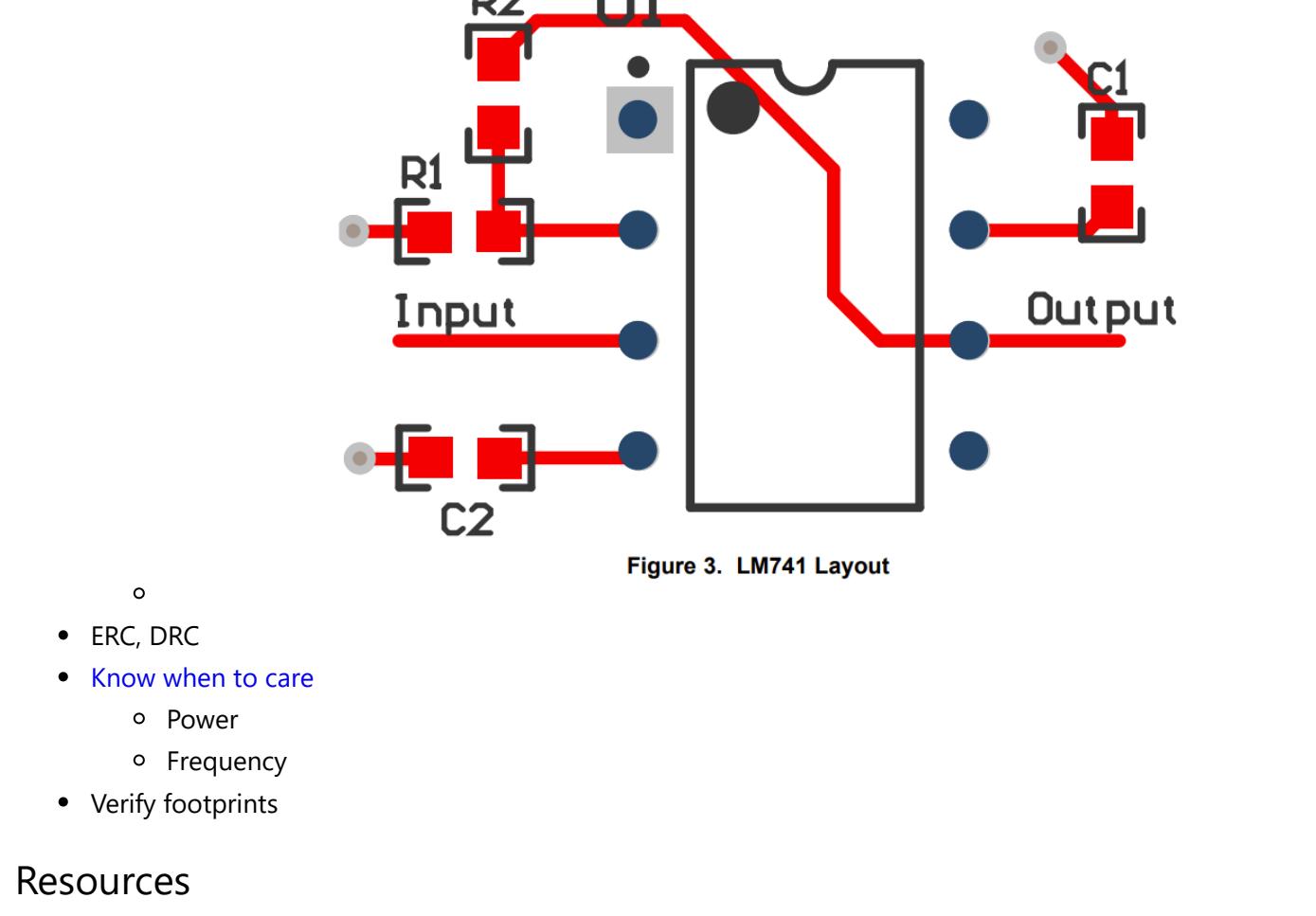
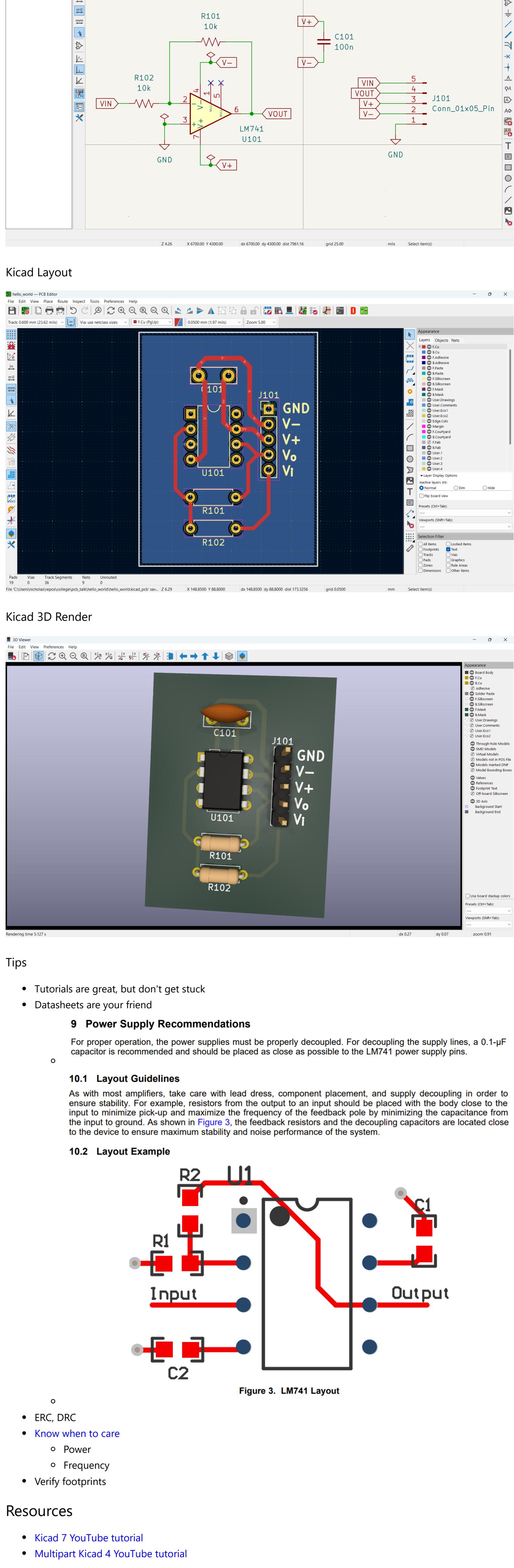


Figure 3. LM741 Layout

- ERC, DRC
- Know when to care
  - Power
  - Frequency
- Verify footprints

### Kicad Schematic



### Kicad Layout

