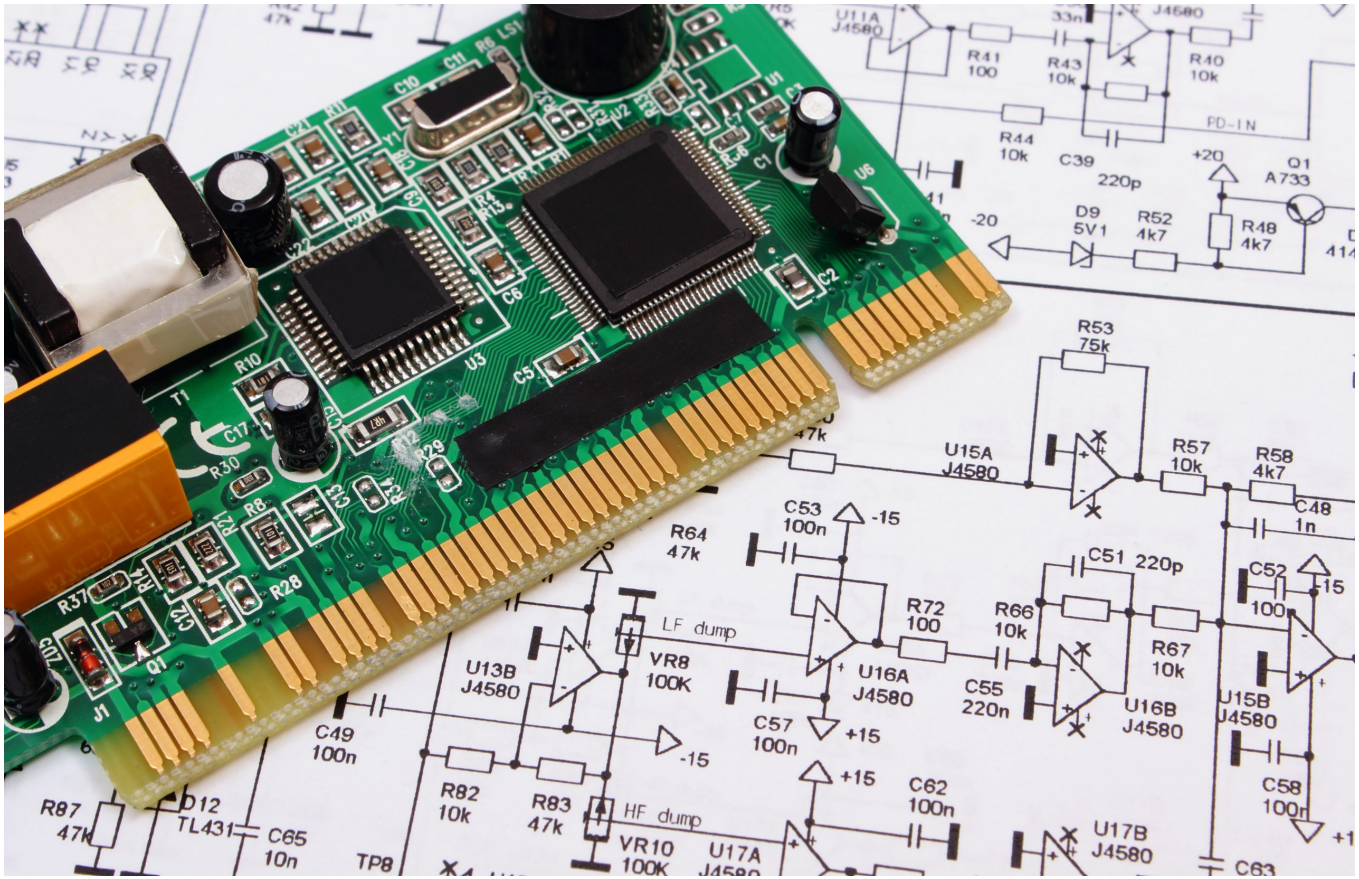
Making PCBs using a resin 3D printer

9.3.2026.

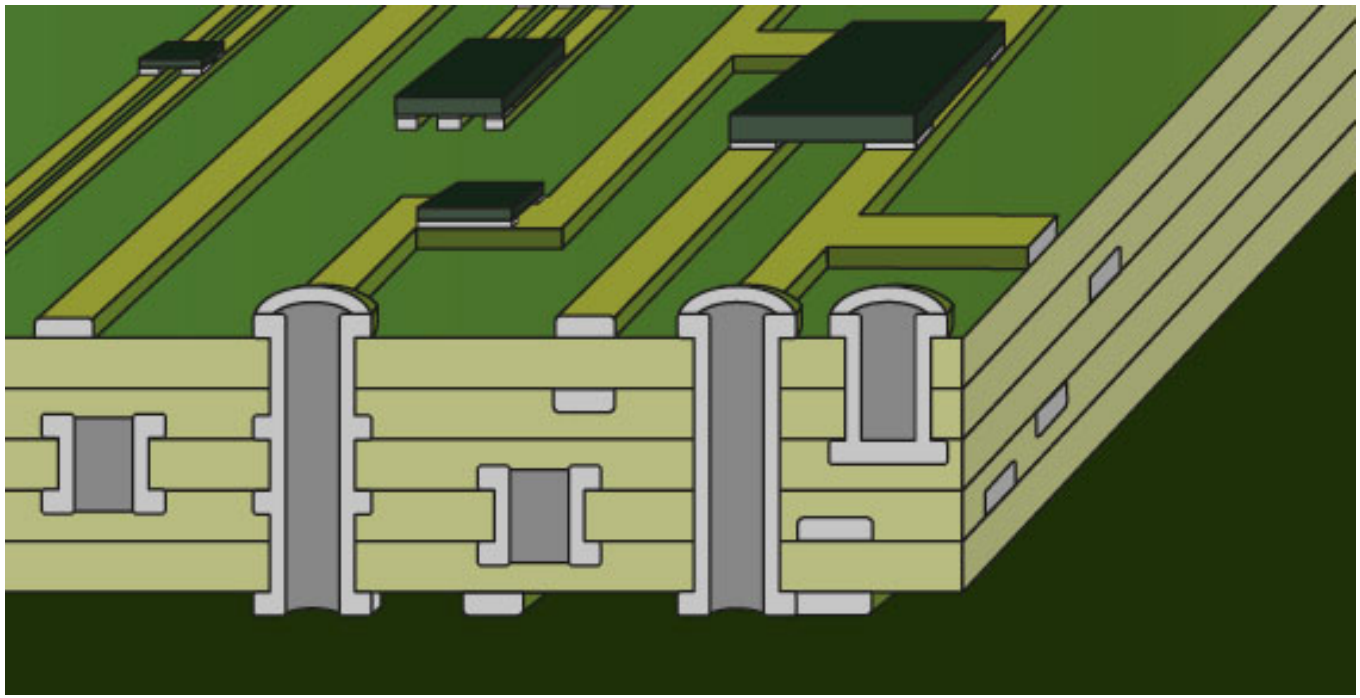
What are PCBs

Printer circuit board



What are PCBs

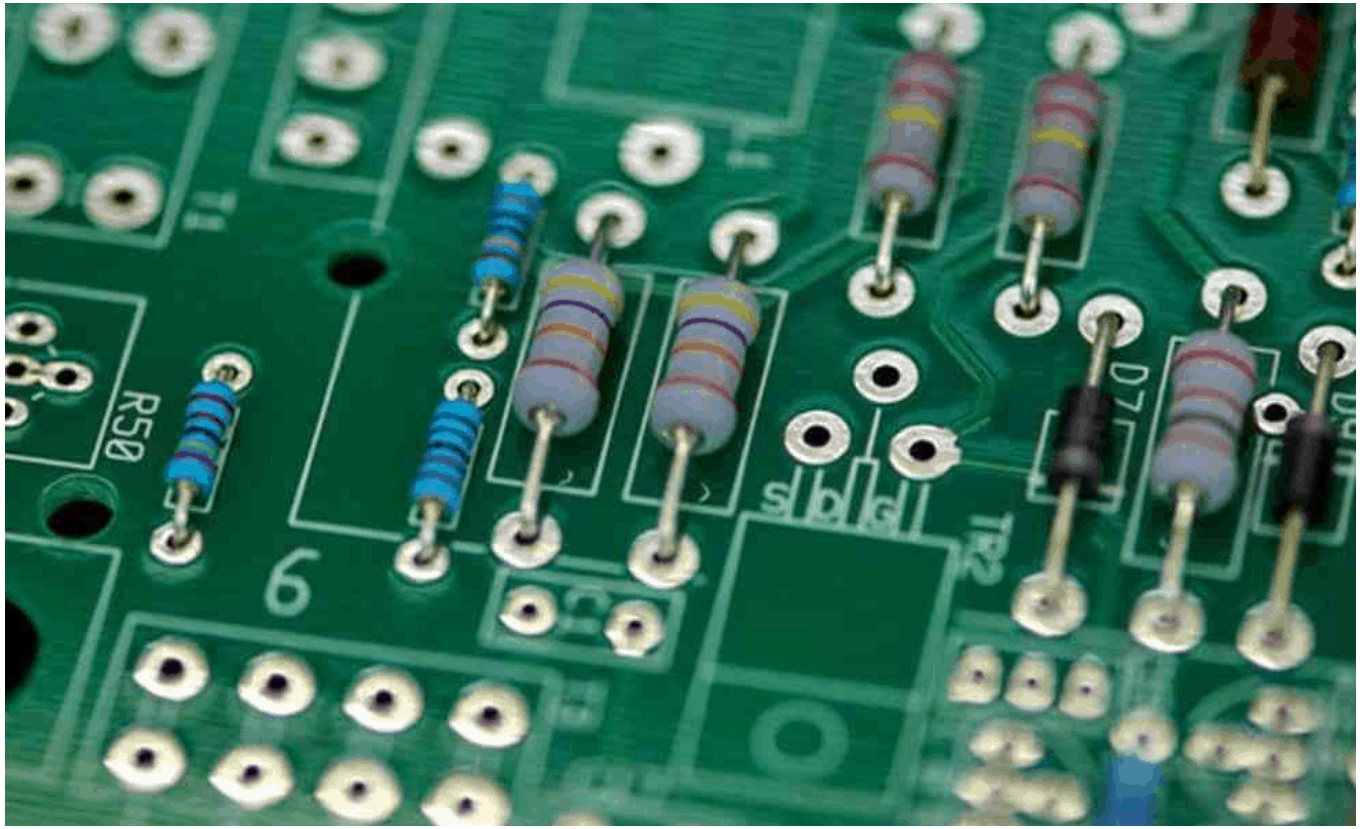
Multi-layer PCB cross section



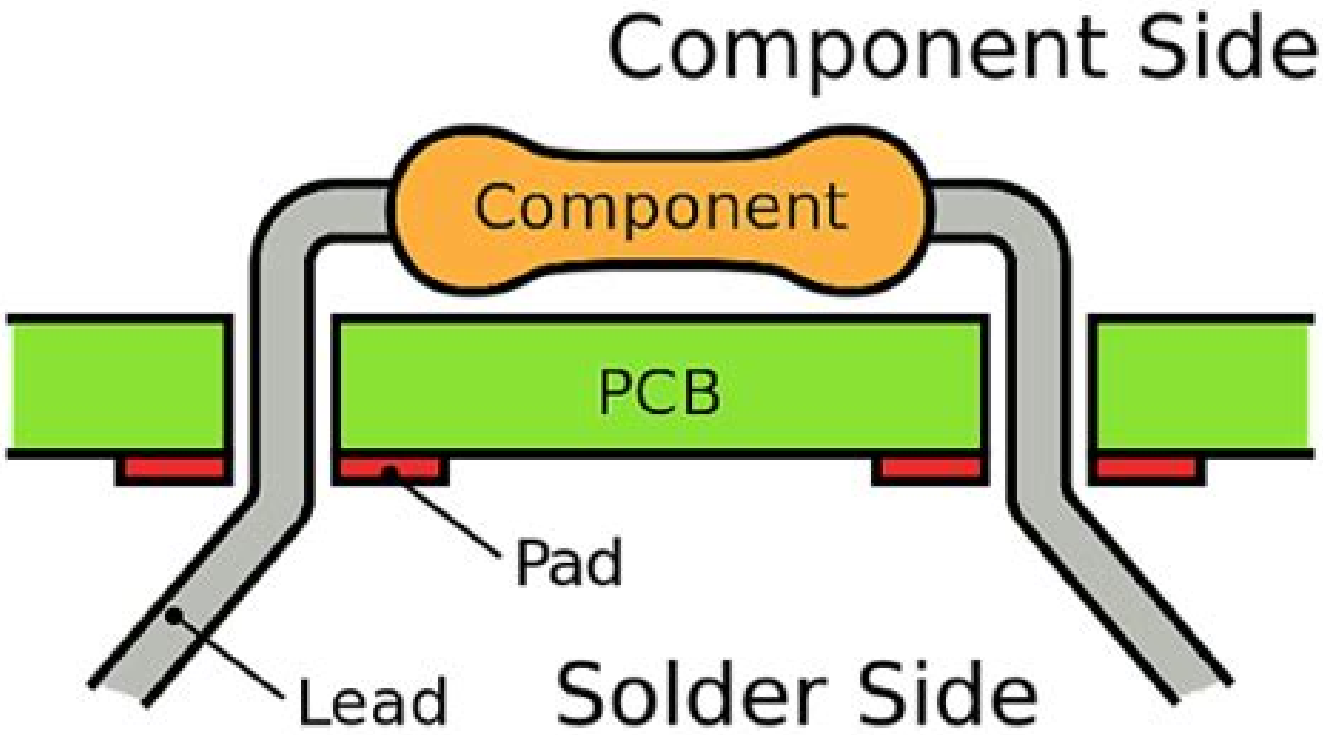
PCB component types

- Through-hole technology (THT)
- Surface mount device (SMD)

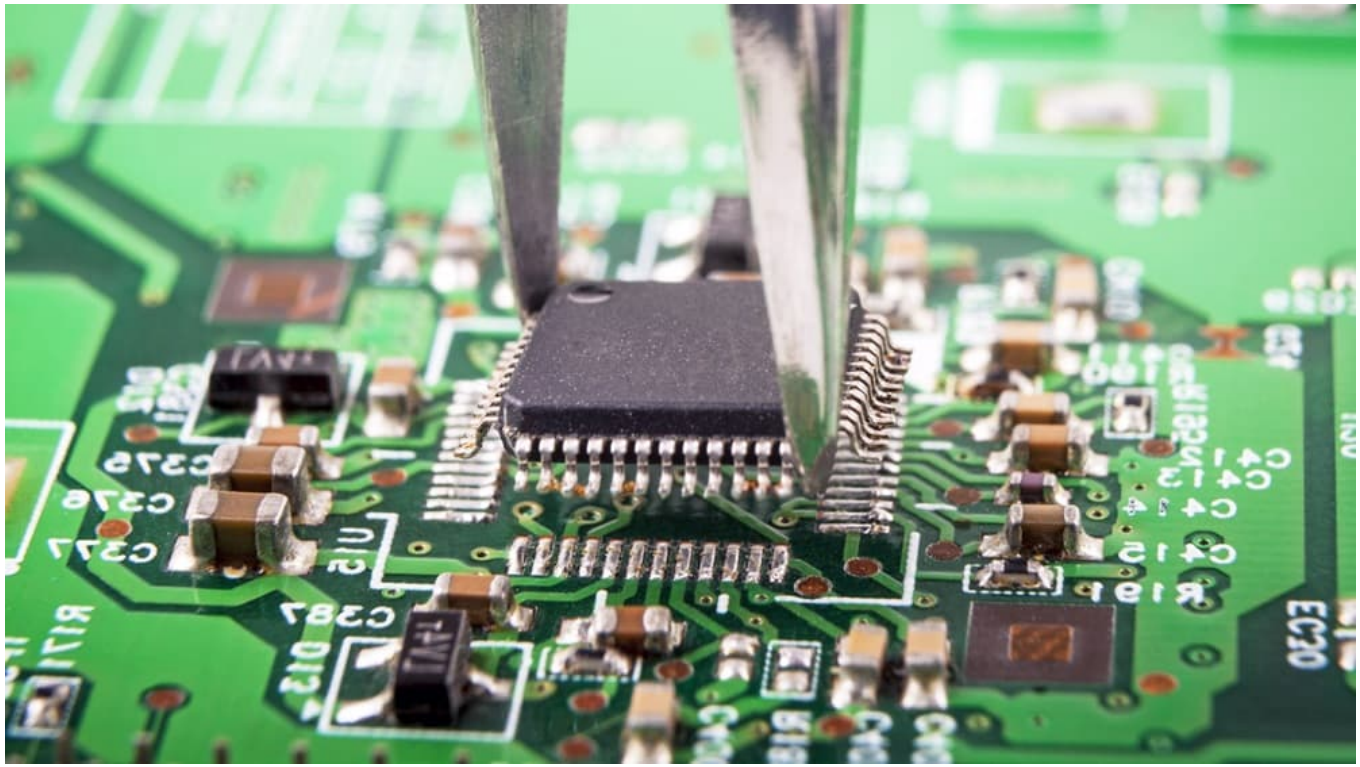
Through hole technology (THT)



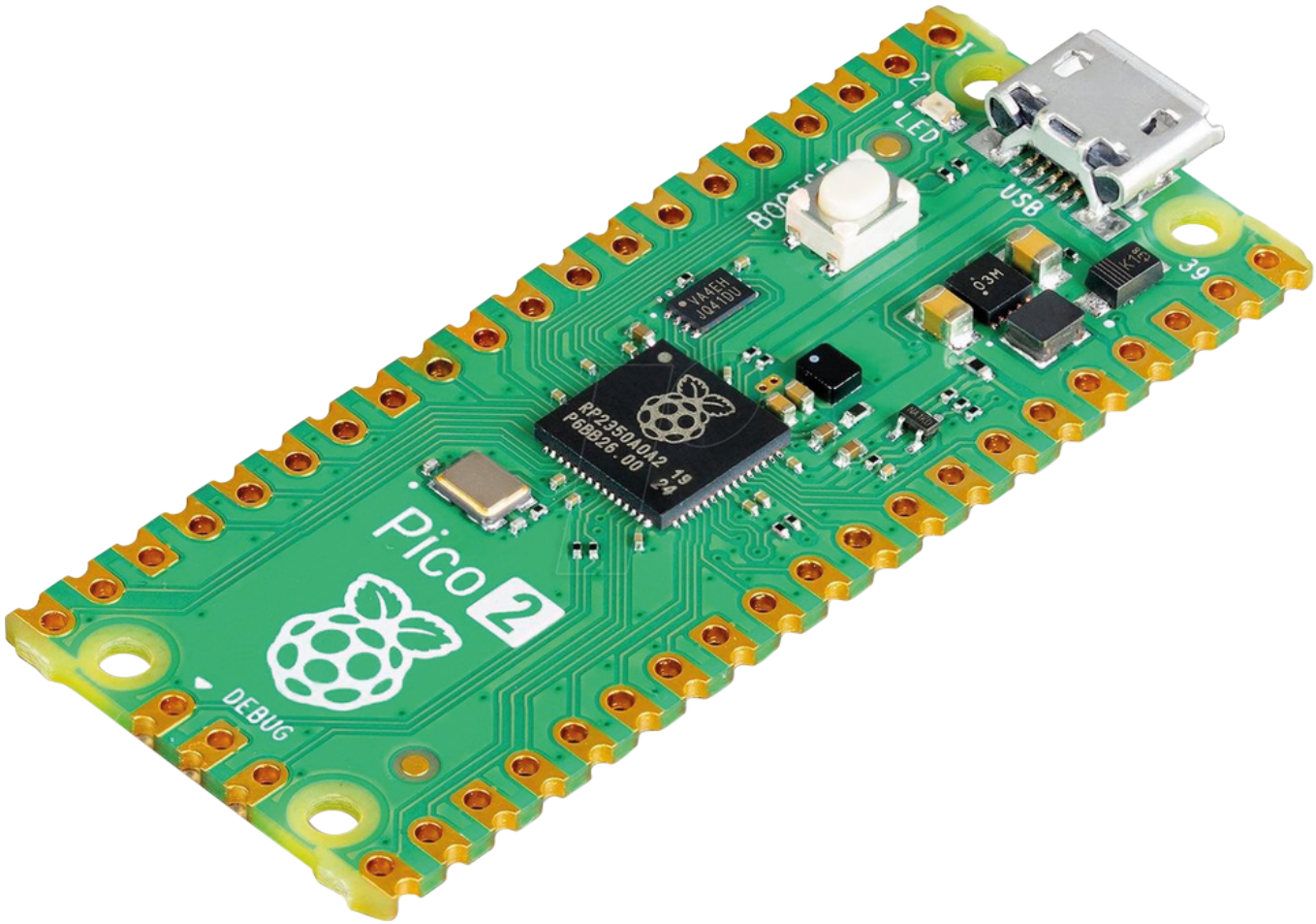
Through hole technology (THT)



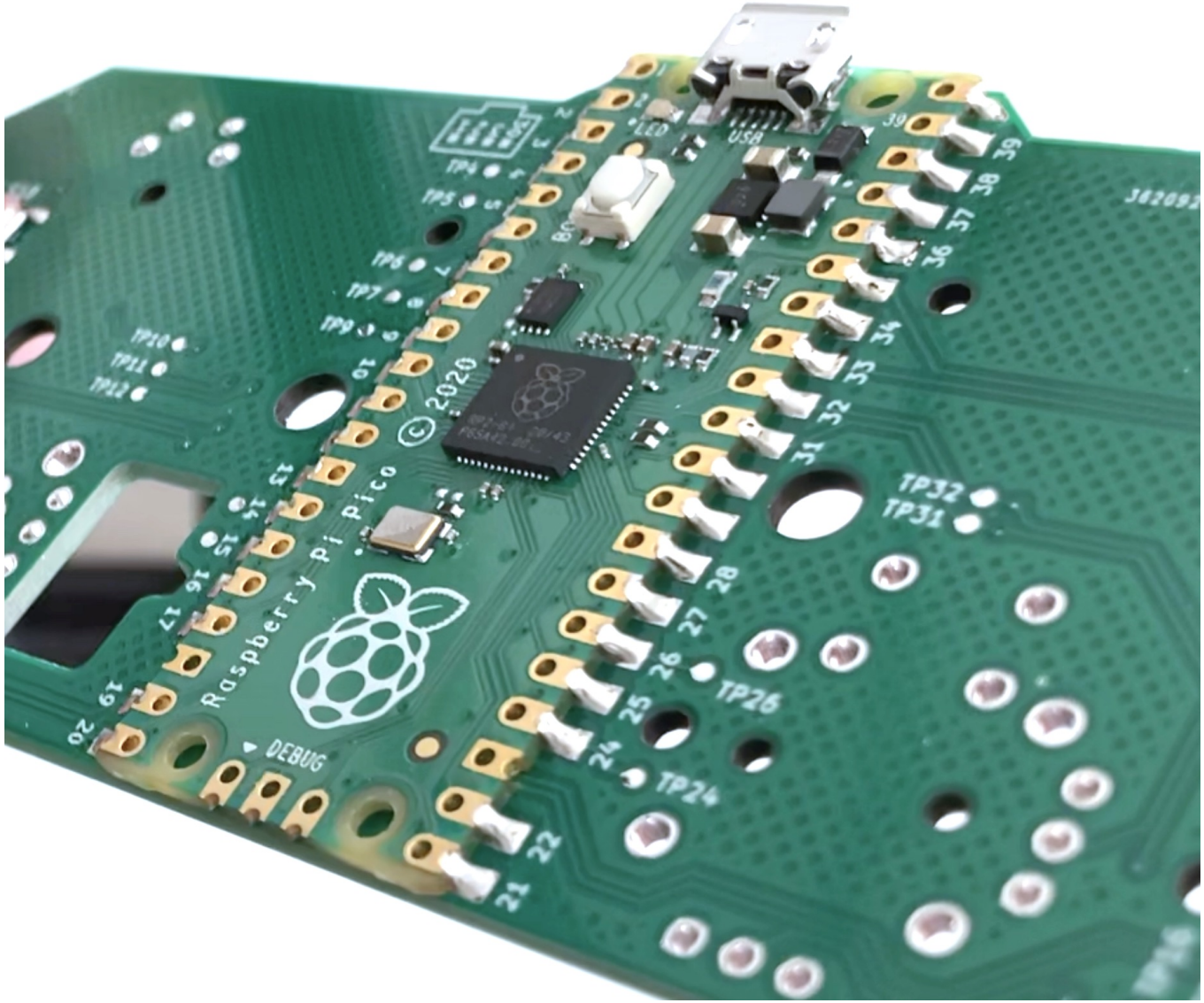
Surface mount device



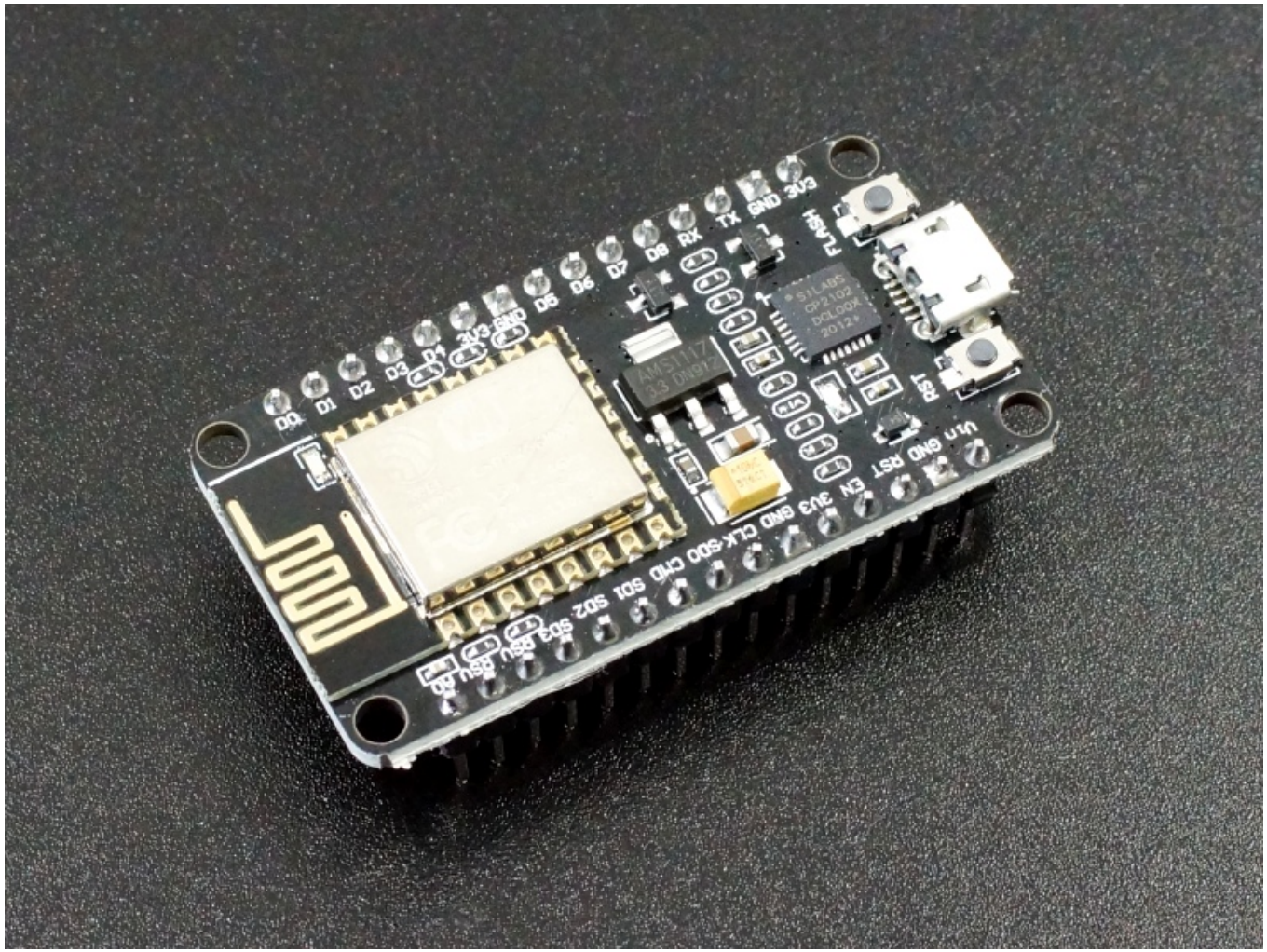
Castellated edges



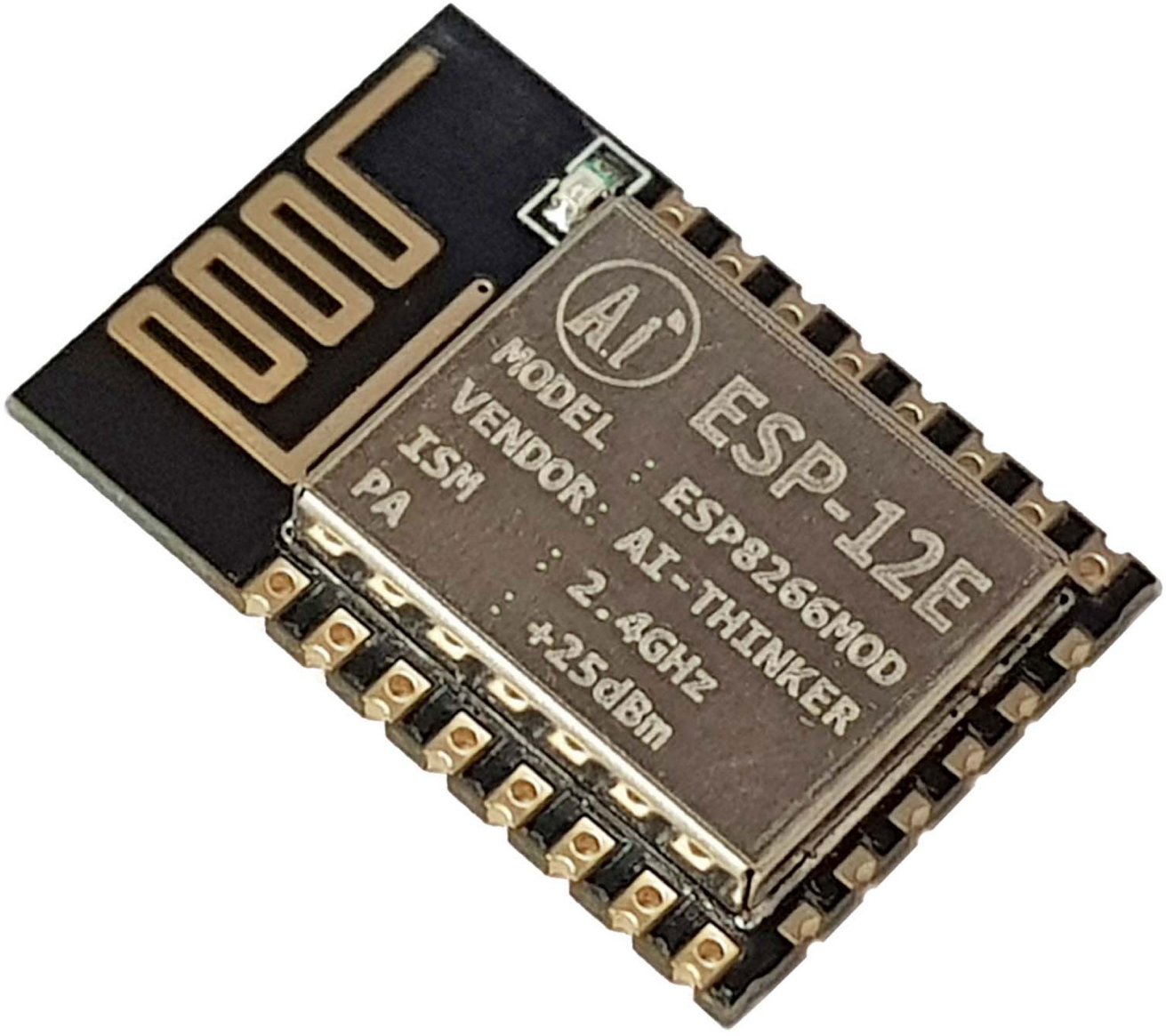
Castellated edges



Castellated edges

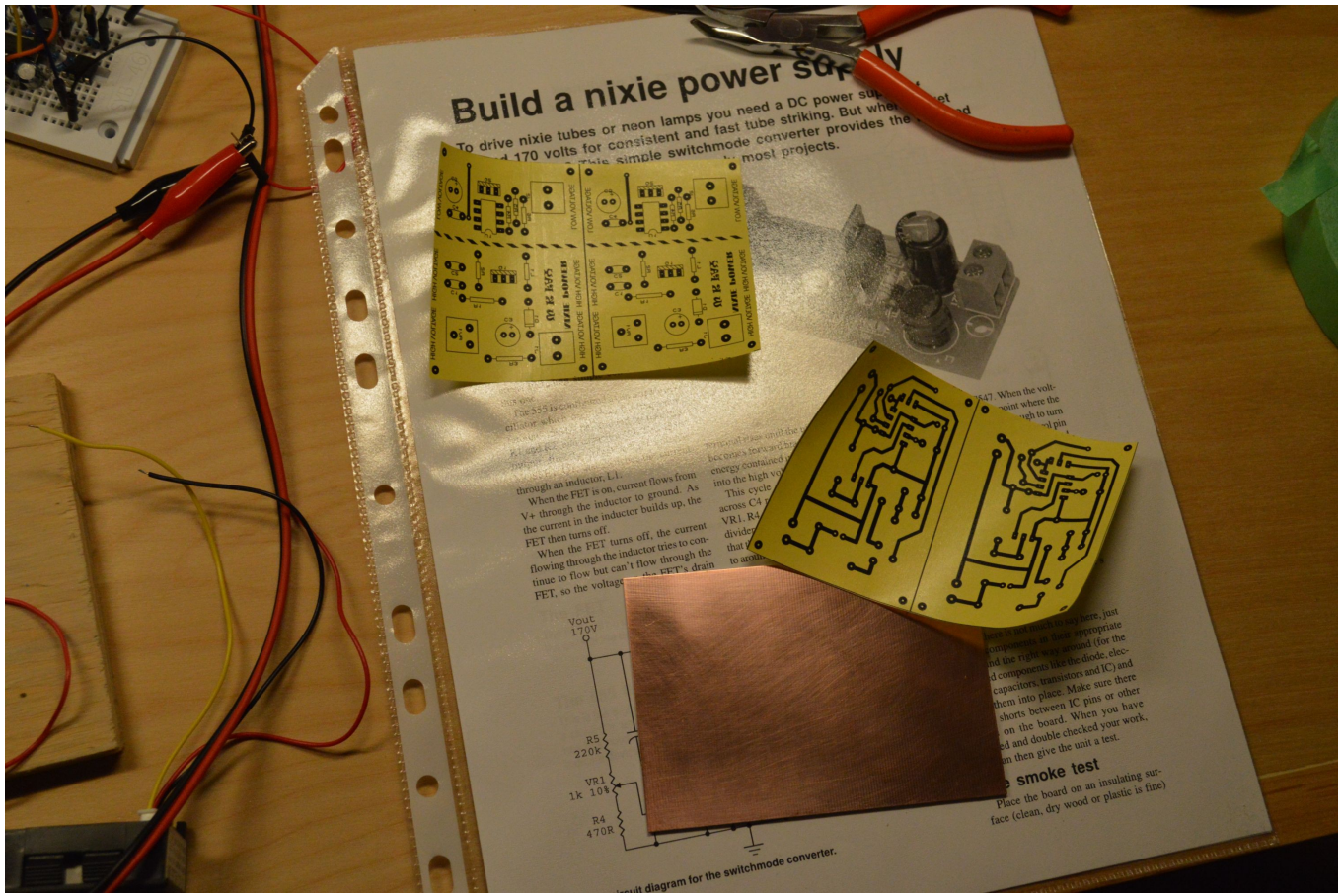


Castellated edges



Toner transfer method

1. Print layout on toner transfer paper using a laser printer

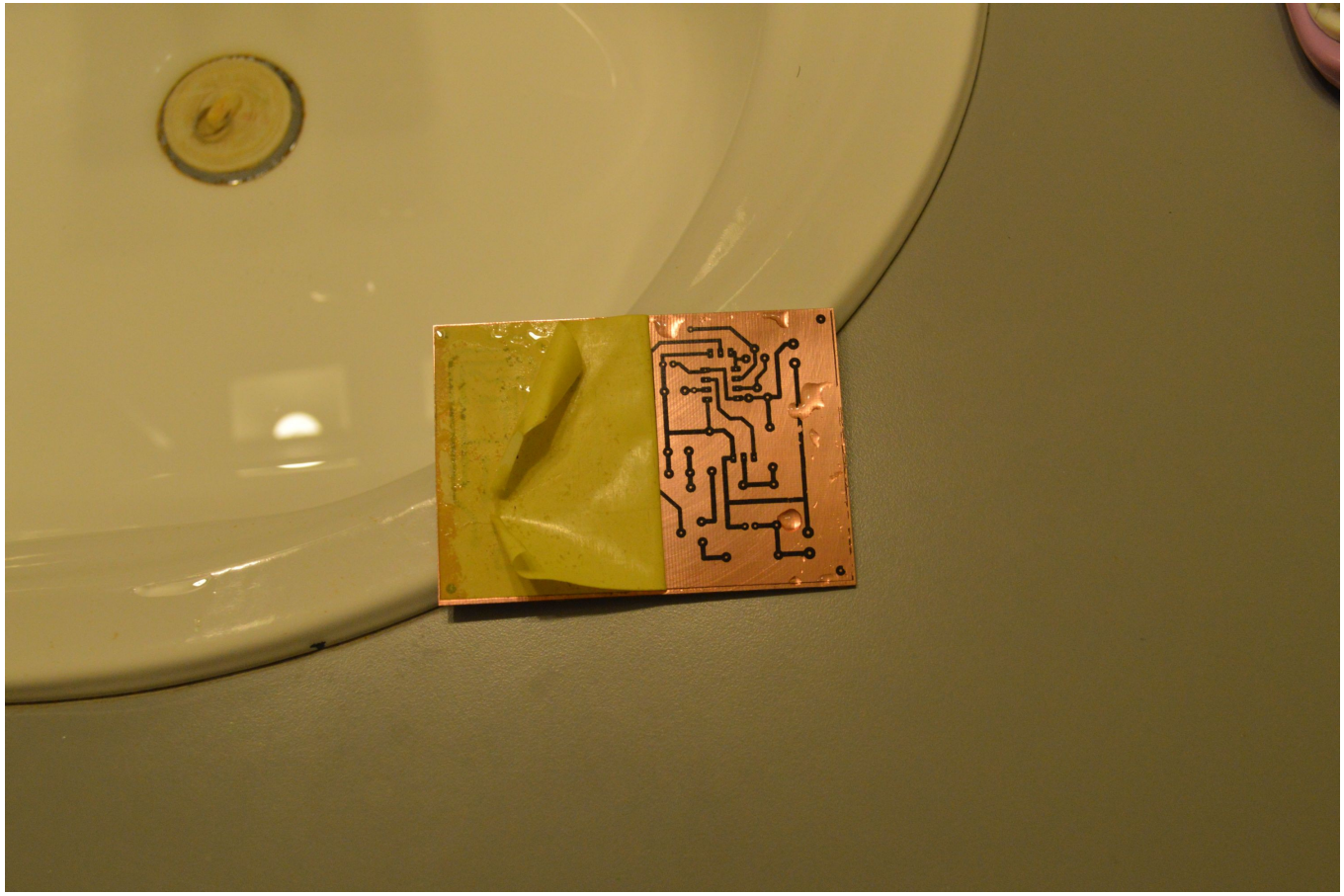


Toner transfer method

2. Laminate the layout to the bare copper board

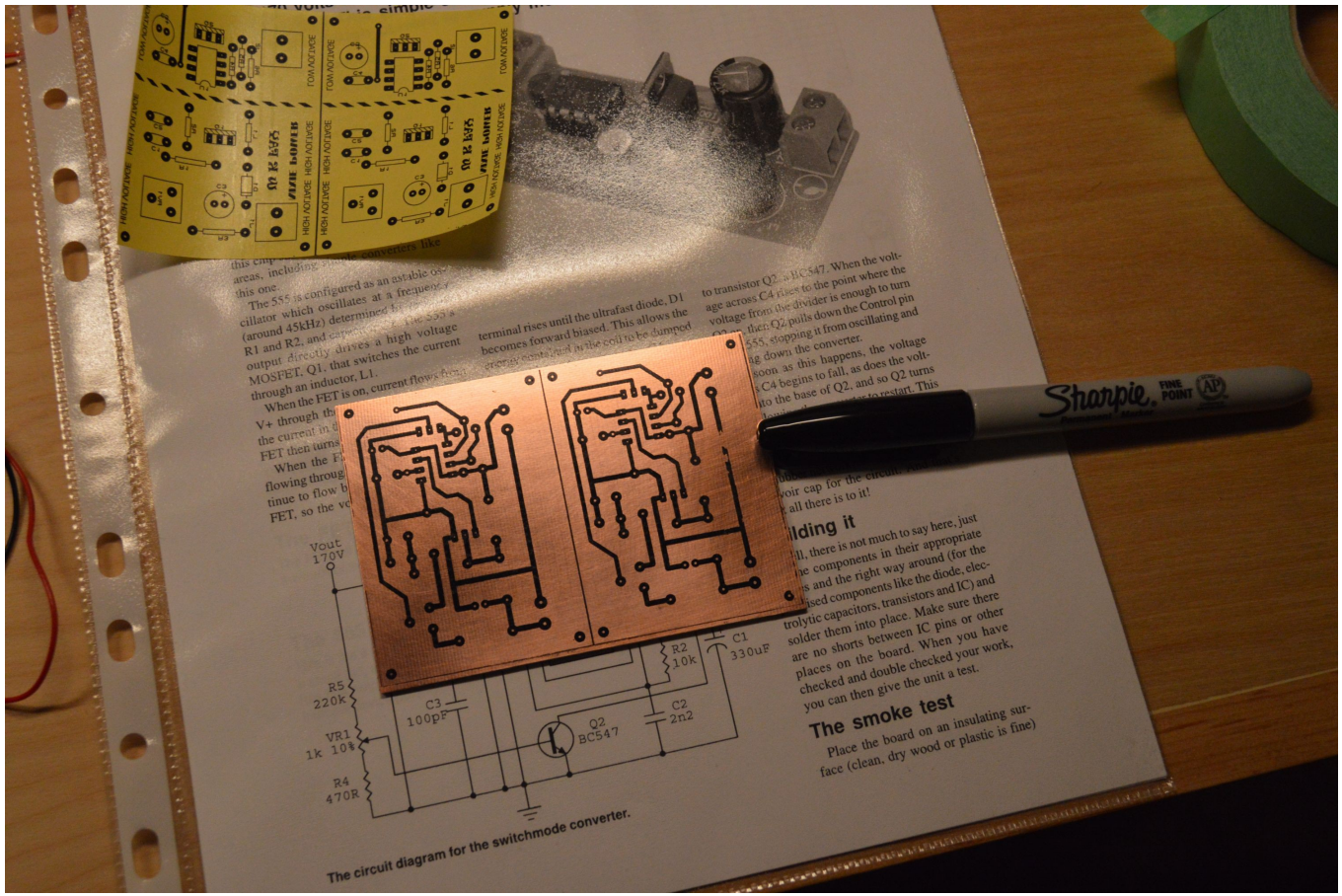
Toner transfer method

3. Remove the paper making sure the toner sticks to the copper



Toner transfer method

4. Fix any broken traces with a sharpie



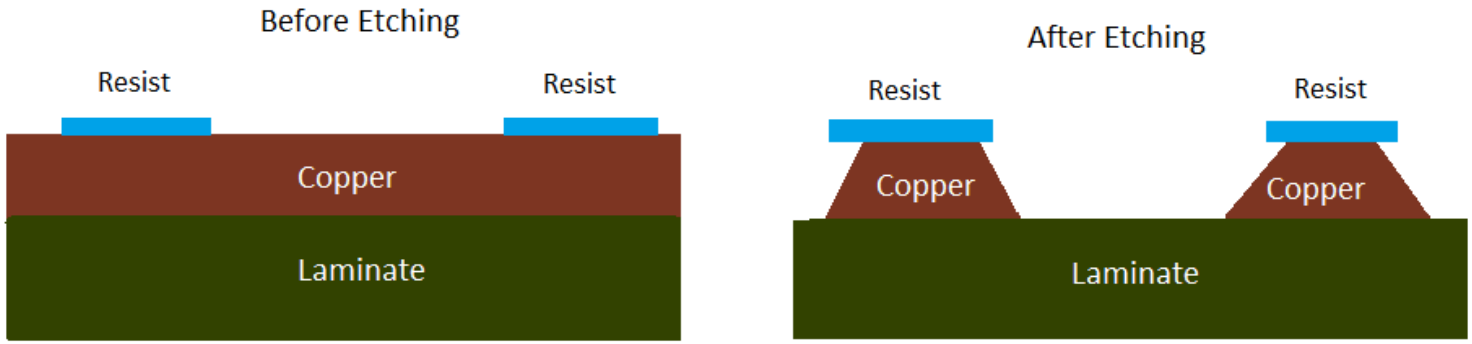
Etching solution

Two common etching solutions:

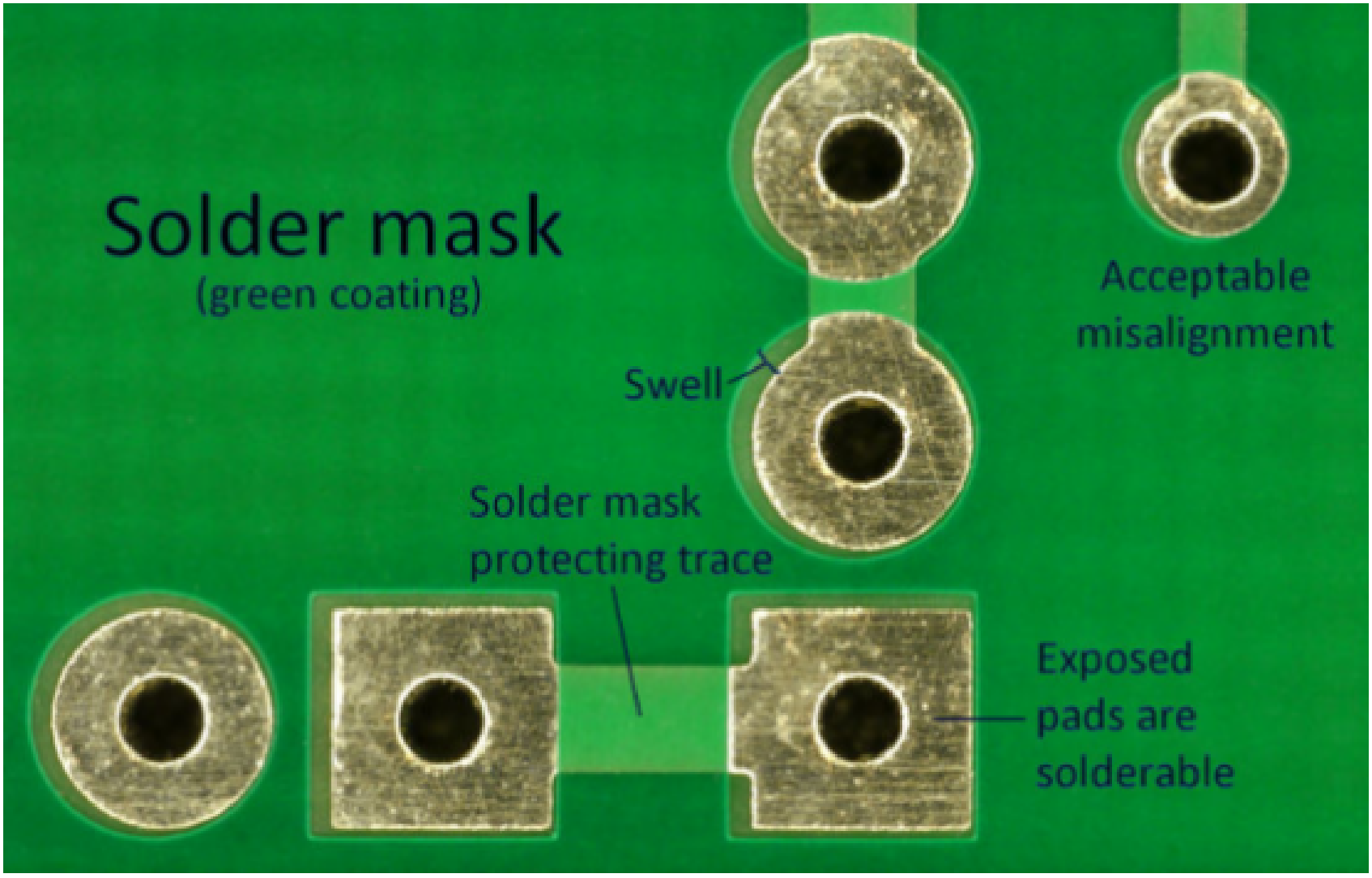
- Ferric Chloride ($\mathrm{FeCl_3}$)
- Hydrochloric acid + hydrogen peroxide

Follow safety precautions!

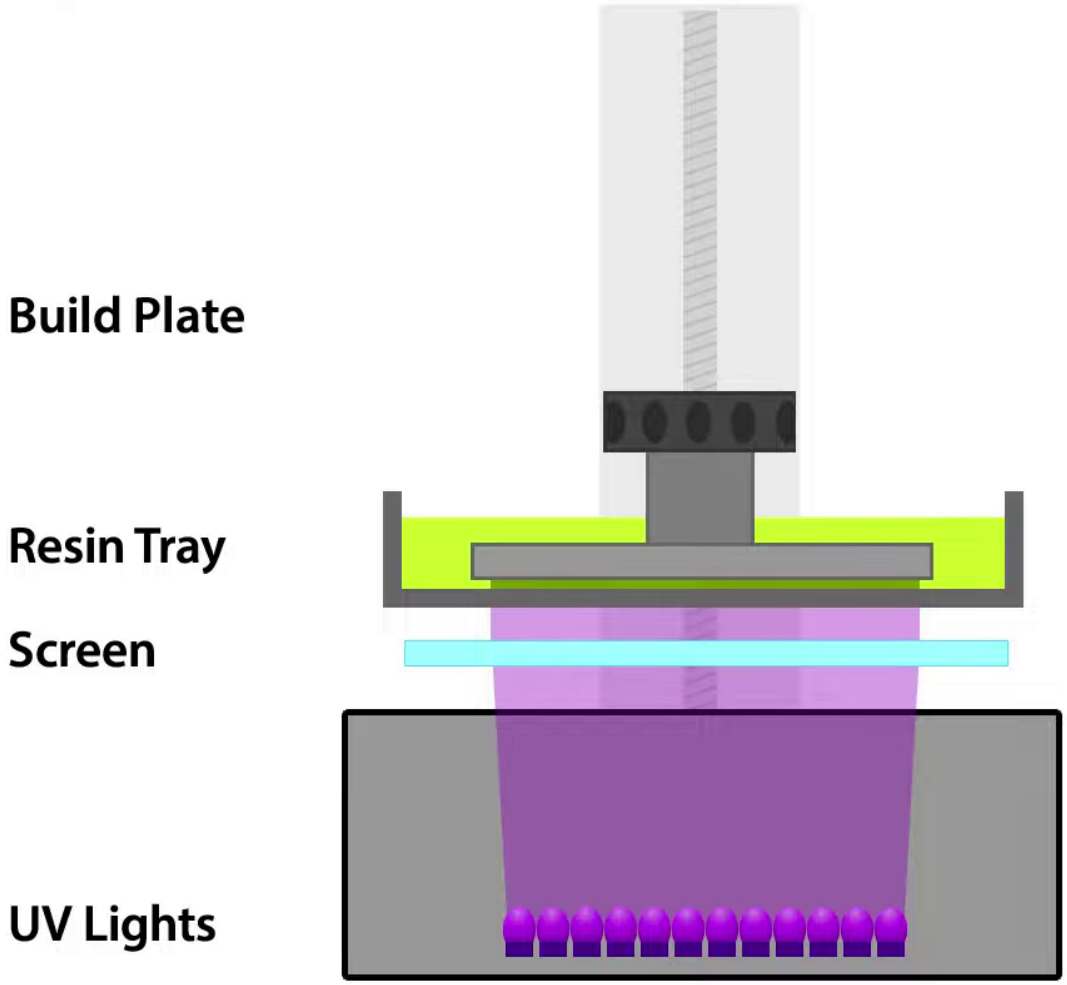
Etching


Before Etching
Resist
Resist
Copper
Laminate
After Etching
Resist
Resist
Copper
Copper
Laminate

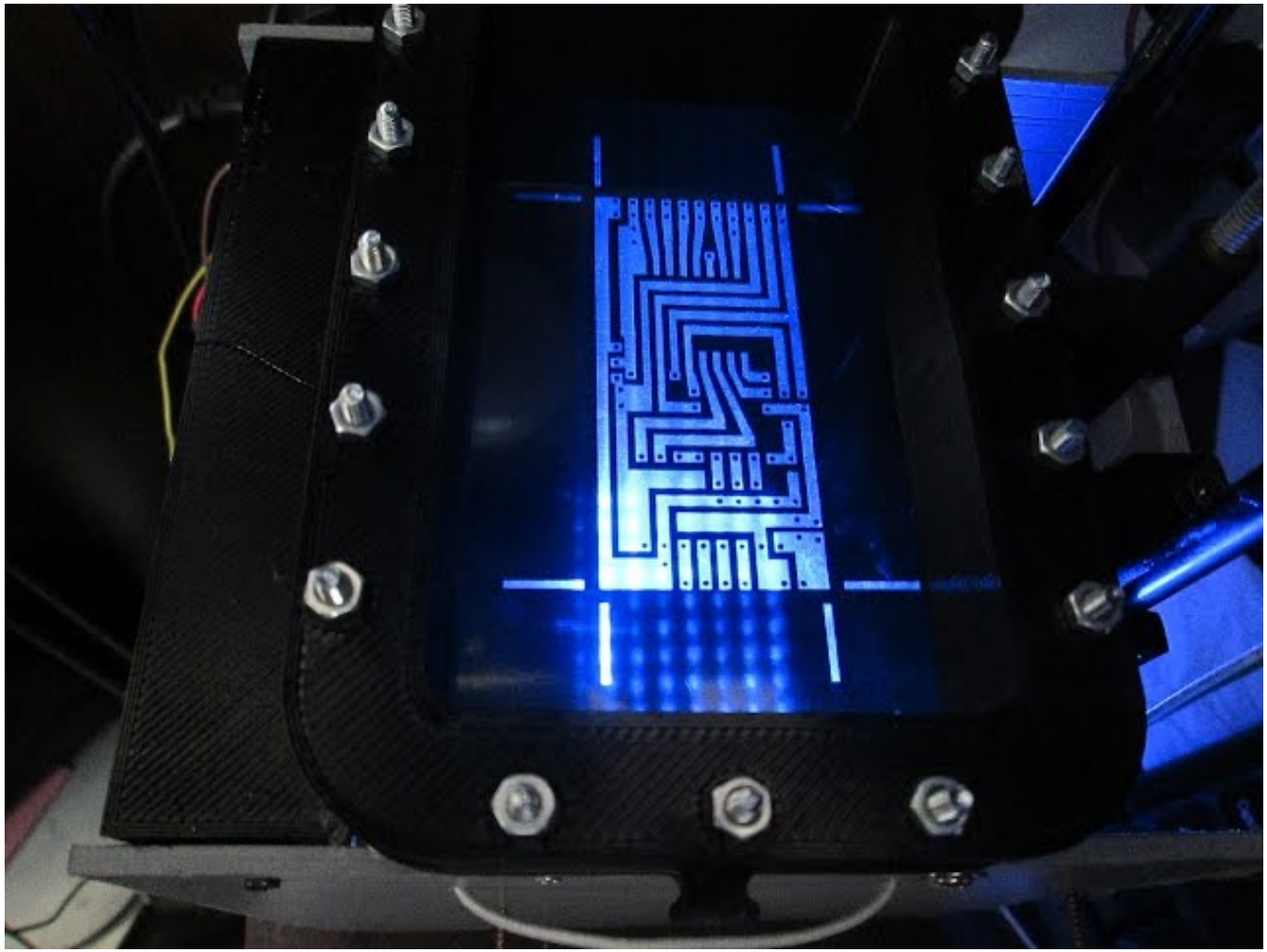
Solder mask


Solder mask
(green coating)
Swell
Acceptable
misalignment
Solder mask
protecting trace
Exposed
pads are
solderable

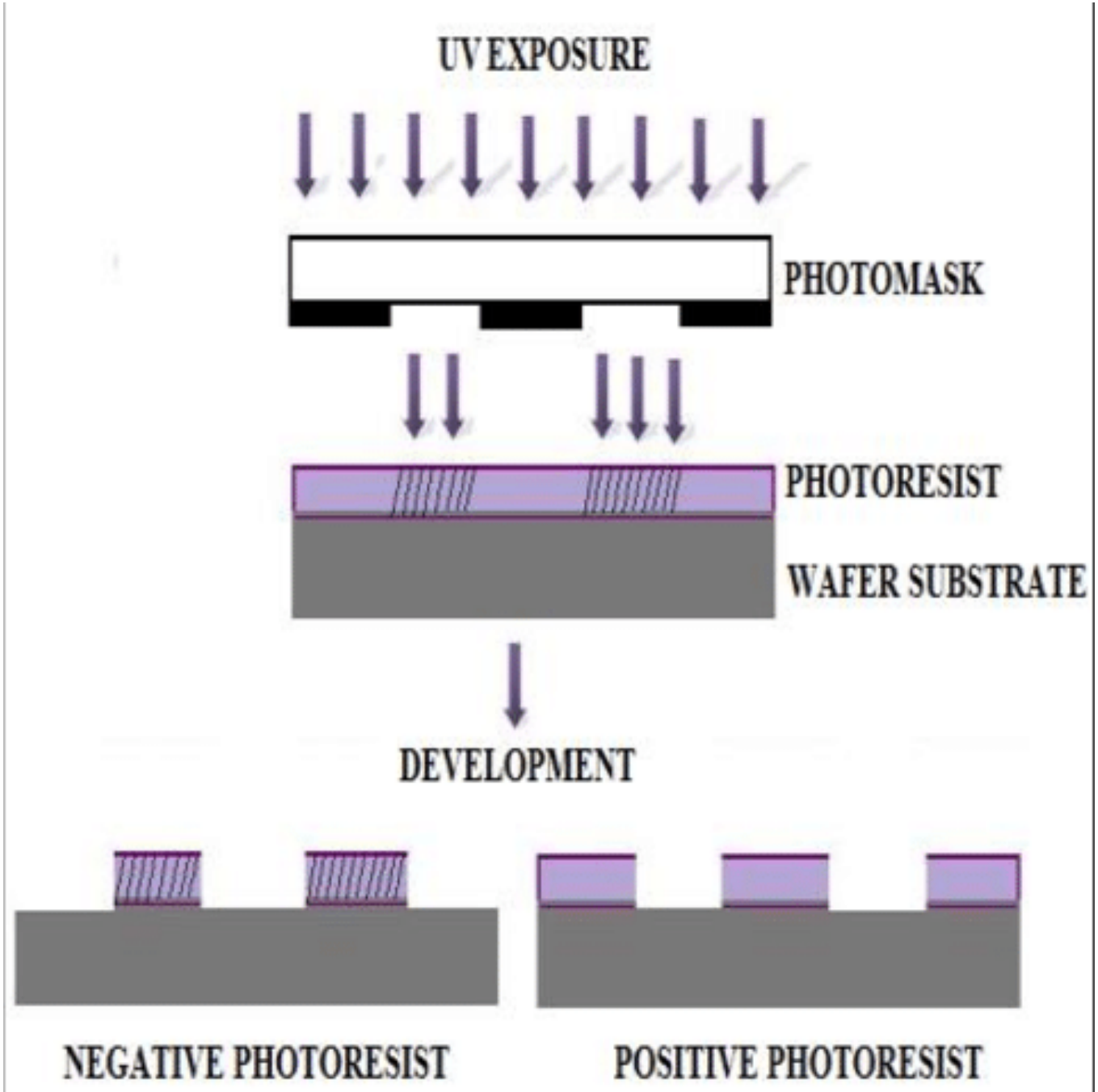
Resin 3D printer (mSLA)



Resin 3D printer (mSLA)



Photoresist



Procedure

1. Prepare the layout for printing

Procedure

1. Prepare the layout for printing
2. Expose the photoresist

Procedure

1. Prepare the layout for printing
2. Expose the photoresist
3. Develop the photoresist

Procedure

1. Prepare the layout for printing
2. Expose the photoresist
3. Develop the photoresist
4. Etch

Limitations

Limitations

- Calibration

Limitations

- Calibration
- Resolution

Limitations

- Calibration
- Resolution
- Vias

Limitations

- Calibration
- Resolution
- Vias
- Cutting and drilling

Improvements

Improvements

- Double layer PCB

Improvements

- Double layer PCB
- Solder mask

Improvements

- Double layer PCB
- Solder mask
- Liquid tin

Q&A

Thank you for your attention.
Let's get printing!