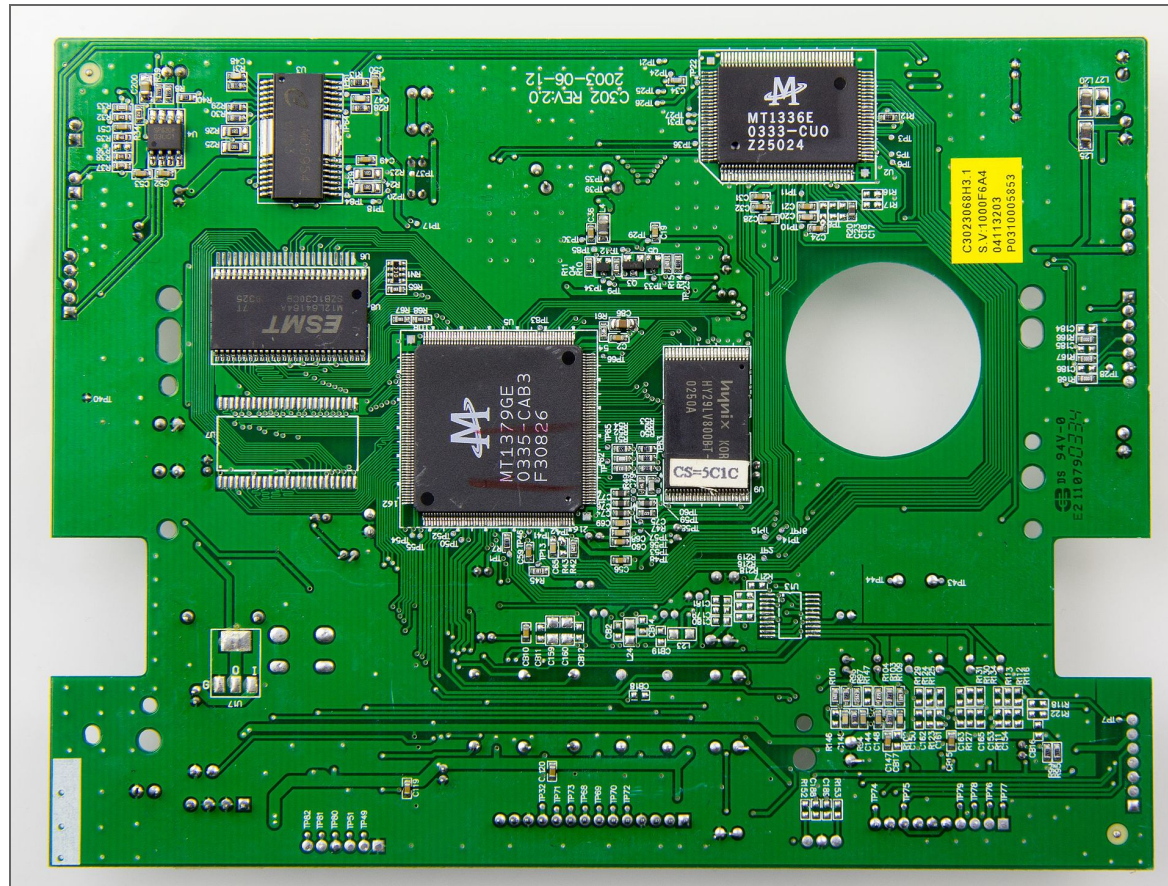


MAKING YOUR OWN PRINTED CIRCUIT BOARDS

Ilan Mandel

WHAT IS A PRINTED CIRCUIT BOARD?



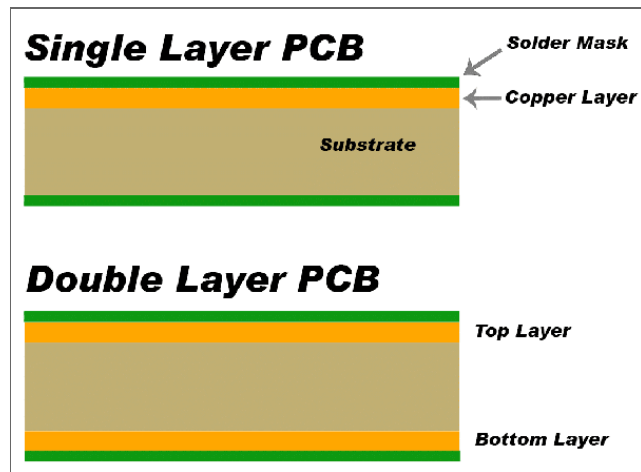
TYPES OF PCBS

Single Sided

Double Sided

Multi-layer

Flexible PCBs



wellpcb

ANATOMY OF A PCB

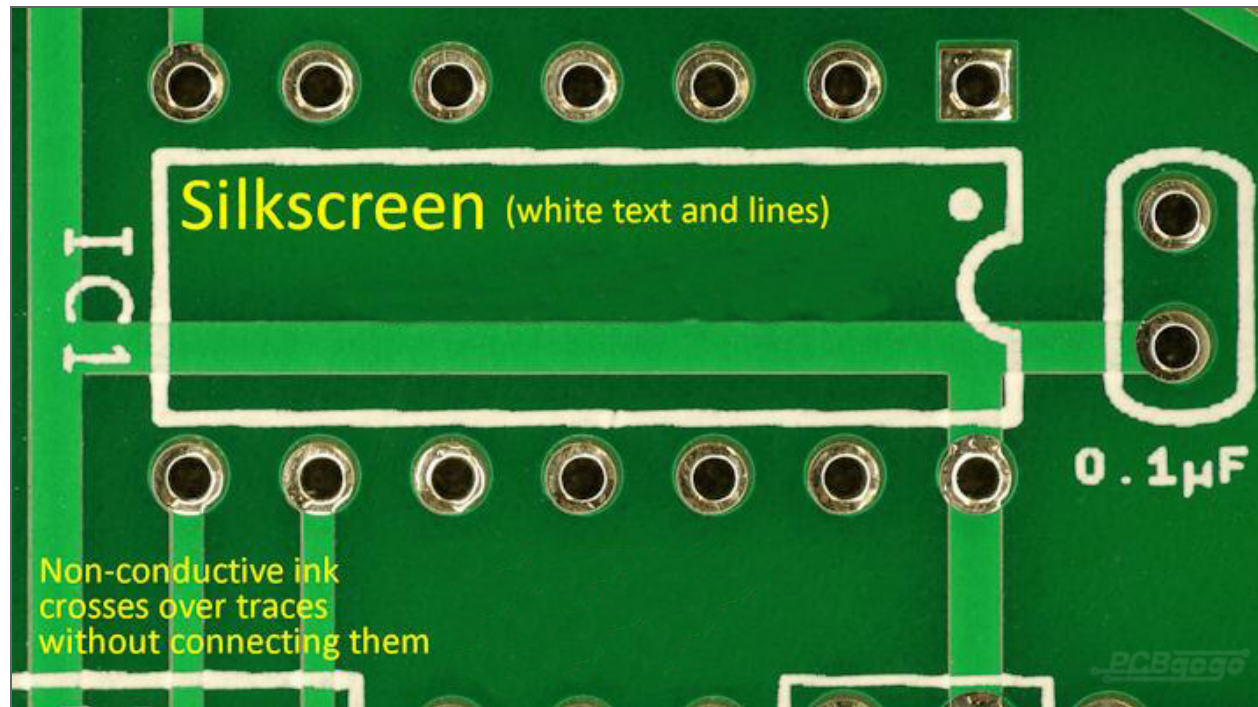
read more at [Autodesk](#)

SILKSCREEN

The very top and bottom layer of your board includes:

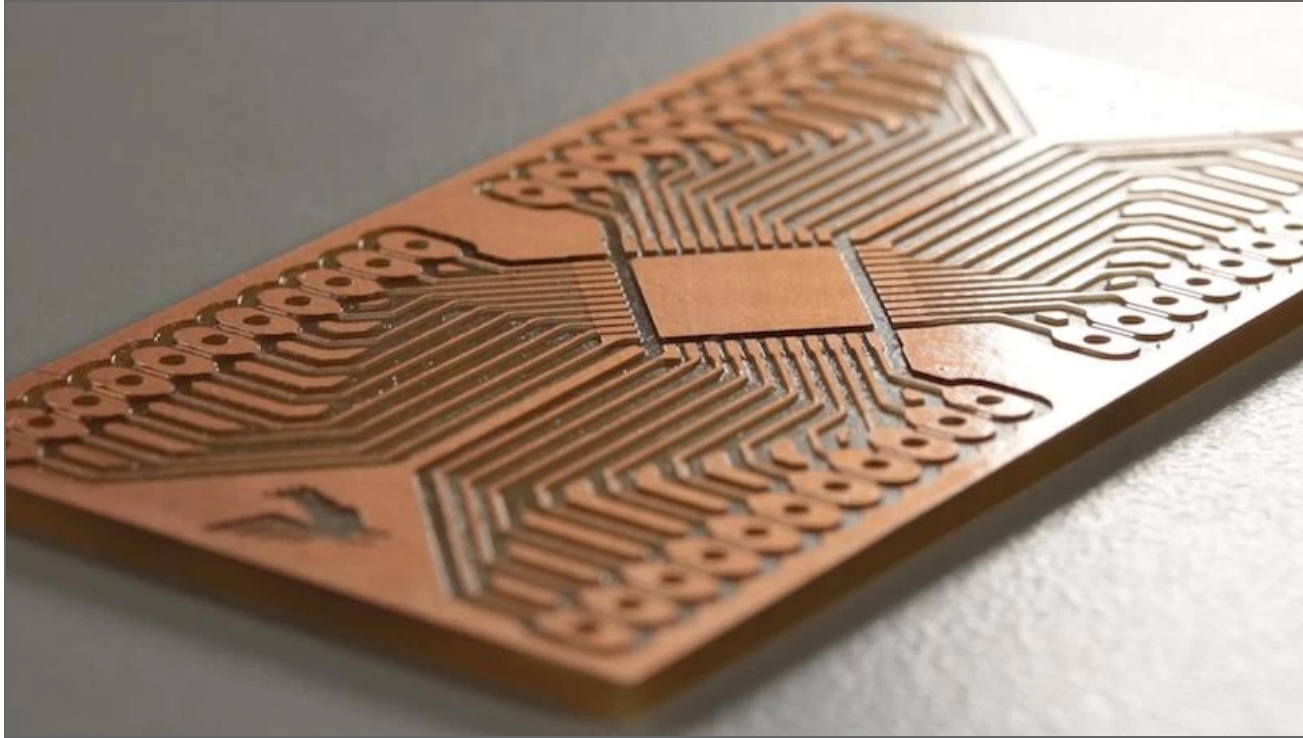
Layer 21-22: tPlace/bPlace

Layer 25-26: tNames/bNames



pcbogo

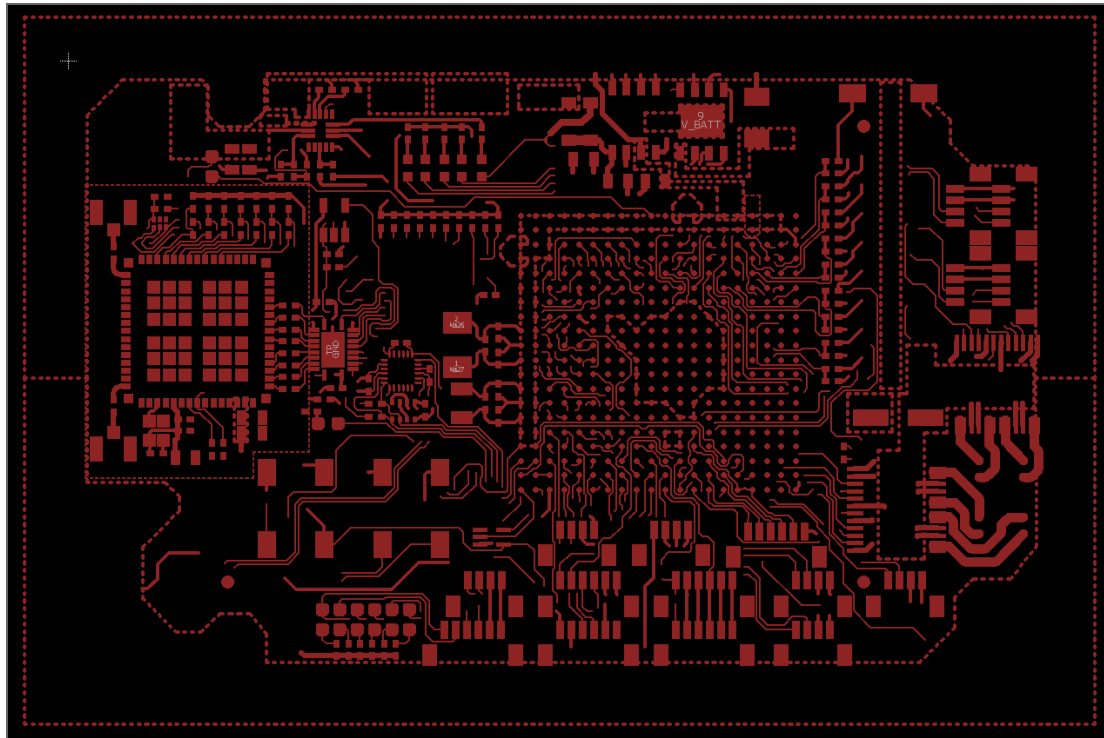
SOLDERMASK



Bantam Tools

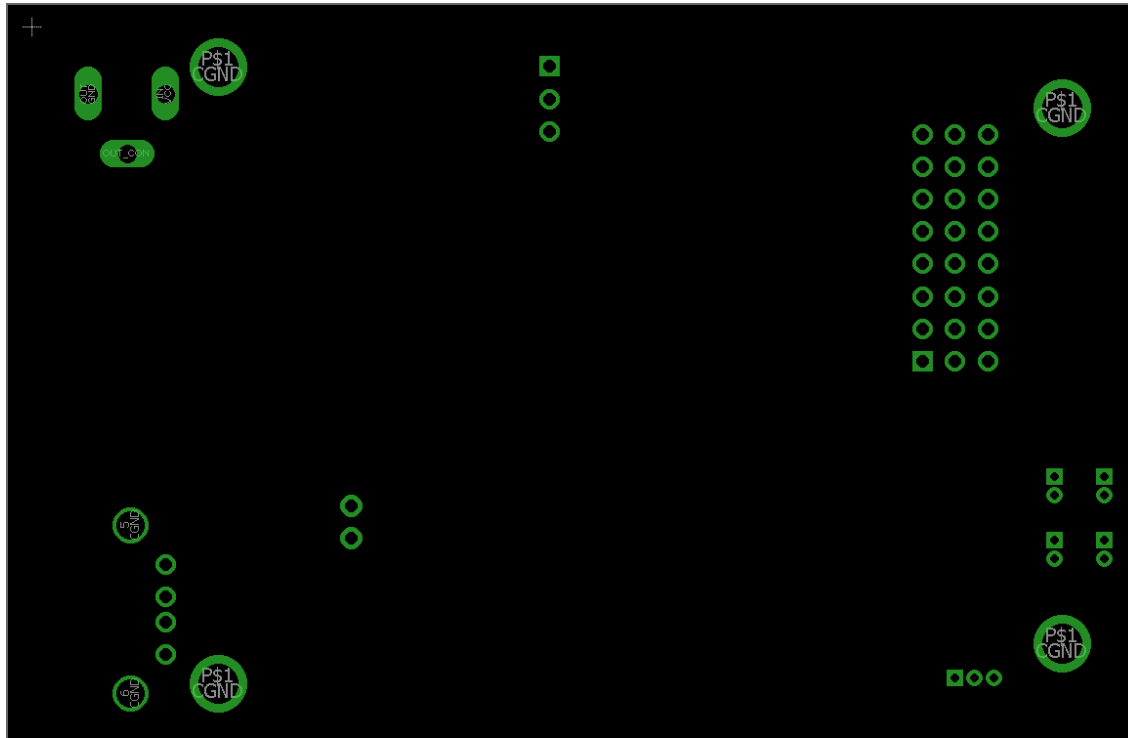
TOP

This is the top copper routing layer of the board



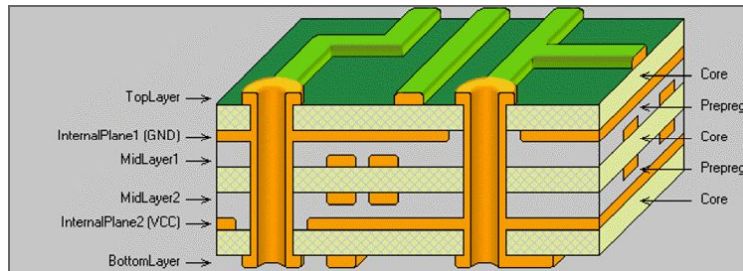
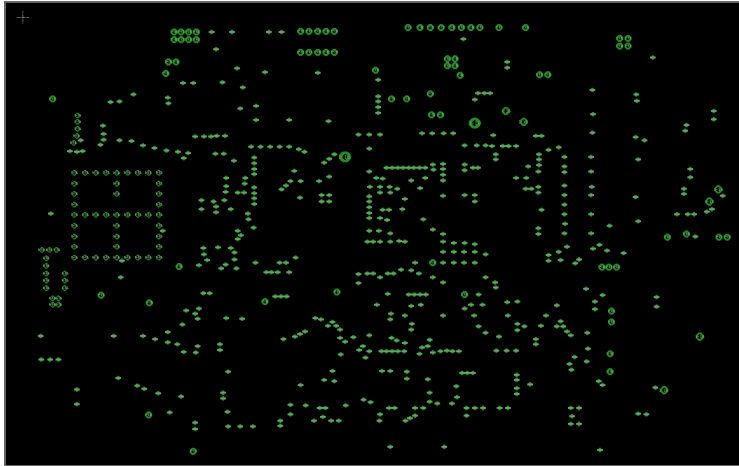
PADS

Layer 17: These include the annular ring for through hole pads



VIAS

Layer 18: Vias are used for passing a signal between layers of a board



All About Circuits

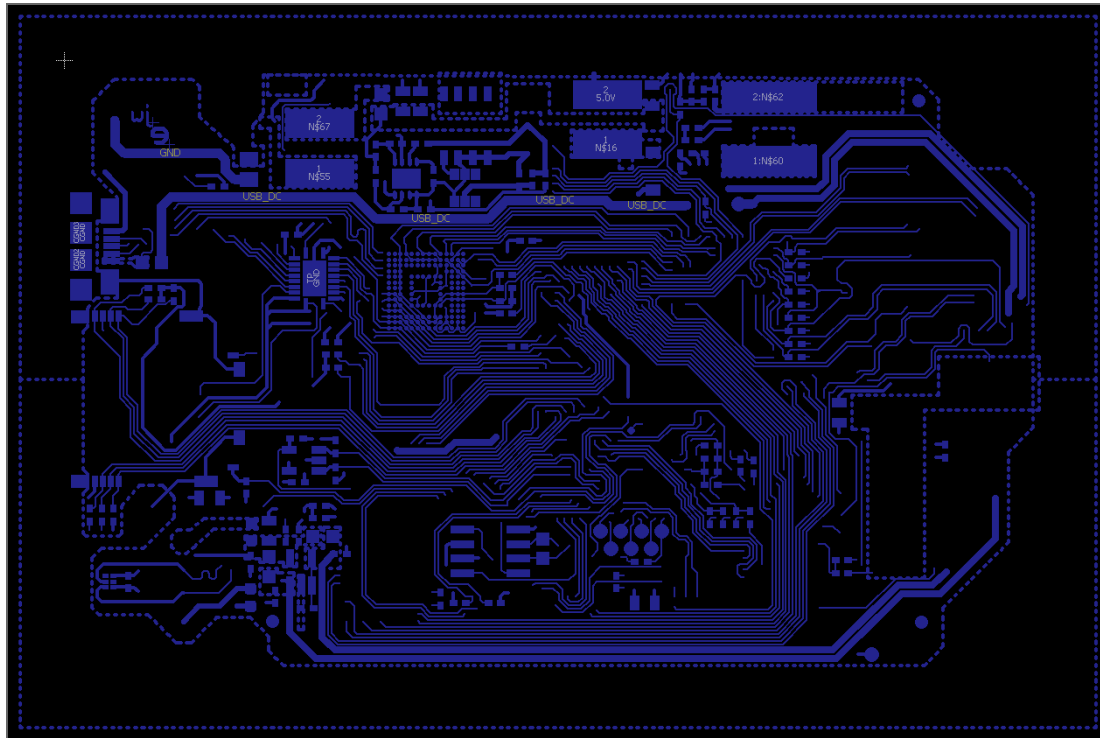
DIMENSION

Layer 20: Specifies the board outline



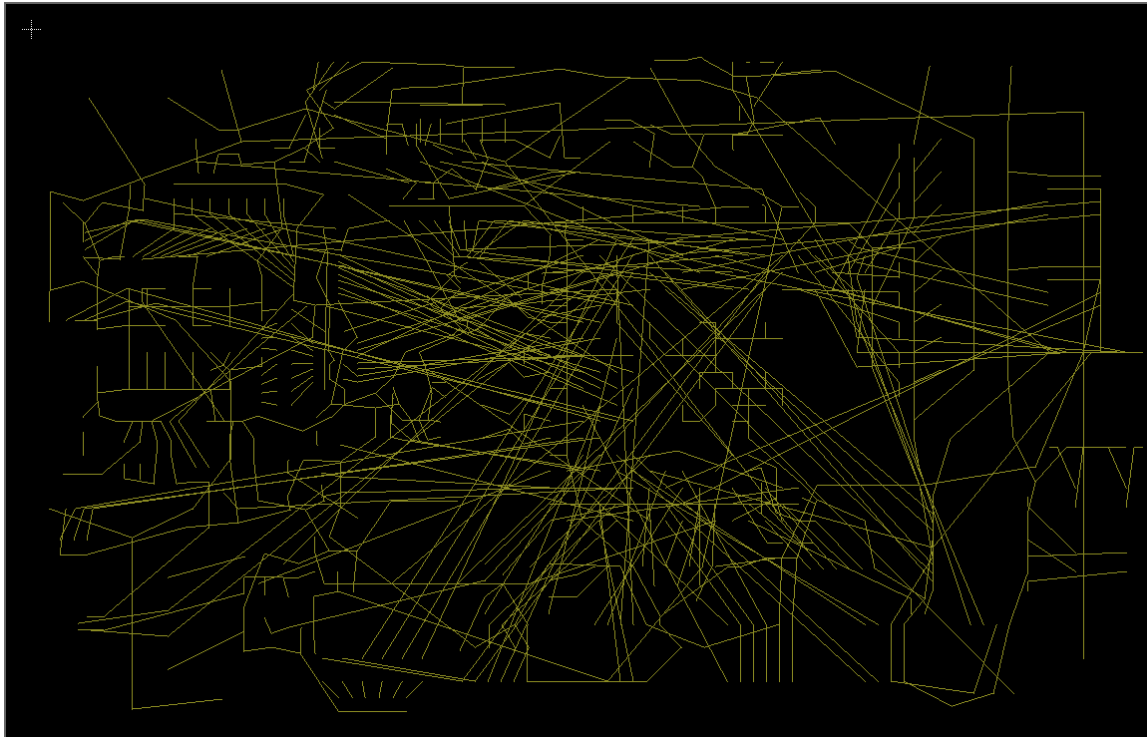
BOTTOM

Layer 16: Specifies the bottom copper traces



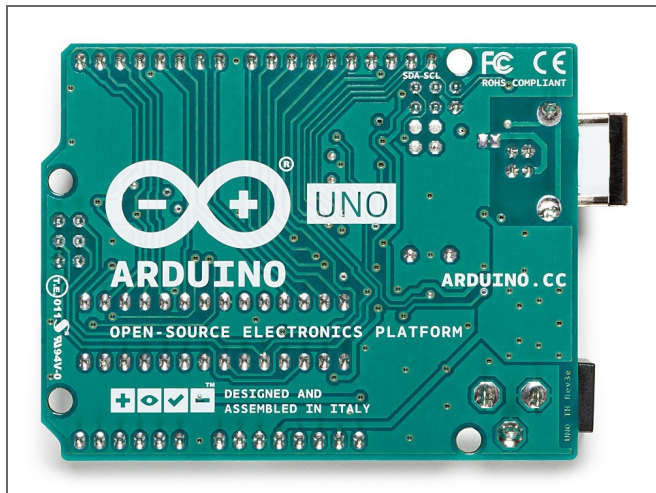
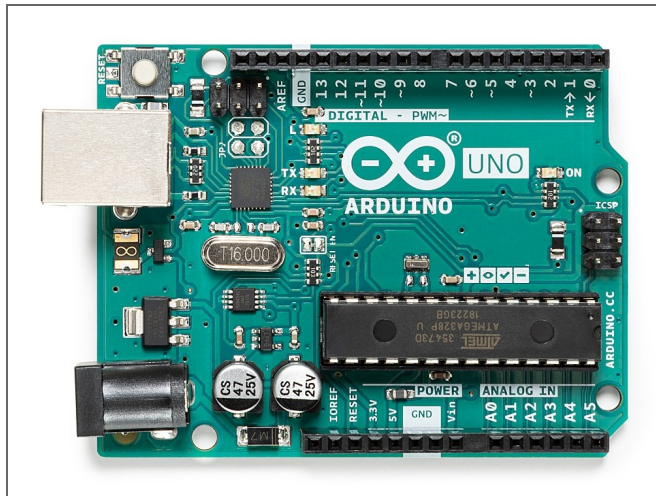
UNROUTED

Layer 19: "air wires" show routes from your schematic that have not yet been drawn on your board



BOARD DESIGN TIPS

- Leave enough spacing for assembly
- Orient parts in the same direction
- No 90° bends in routes
- Ground planes are your friend
- Perpendicular traces across layers



Arduino

POWER CONSIDERATIONS

- Separate power and control ground as much as possible
- If you need to make traces wider here is a [calculator](#)
- Separate analog and digital ground/traces

ARDUINO+ GENERAL PROCEDURE

1. Find open source hardware as a starting point

Sources: [Adafruit](#), [Sparkfun](#), [Arduino](#), [Kitspace](#)

2. Find the parts you're adding to the board

Sources: [Digikey](#), [Mouser](#), [Mouser](#)

3. Add the new parts to your schematic

4. Edit/re-route the board

5. Figure out where to [get it made](#)