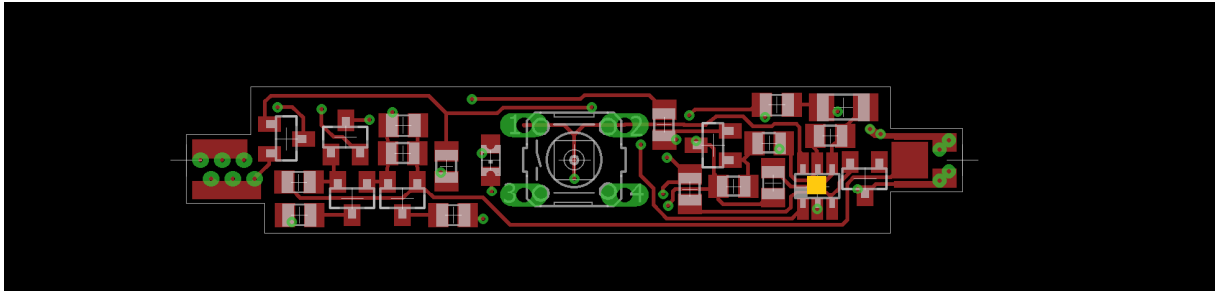


### Step 1: solder SMD parts on PCB

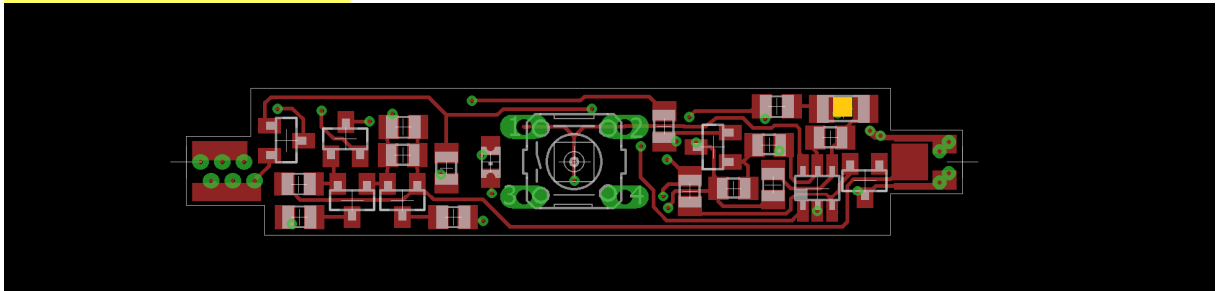
All the SMD parts can be soldered on your PCB's as explained in the following pictures. Parts with a polarity should have a dot on the PCB silk screen and on the PCB. Pay extra attention when soldering the LED and microcontroller, since those fit in multiple ways. In the pictures, red is the top layer and blue is the bottom layer.

For the parts that look the same:

- There is only one voltage reference (TL431), two small MOSFETS (BVSS123), and more diodes (BAT54S).
- There is only one 1nF capacitor, and multiple 100nF capacitors.



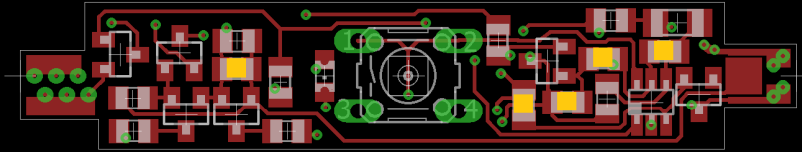
ATINY10\_top



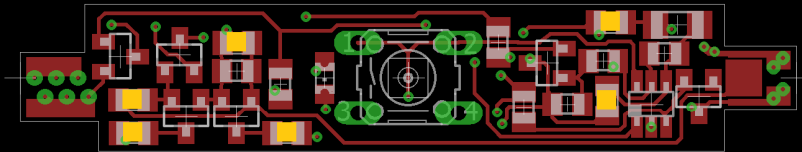
NB20M00333KBA\_top



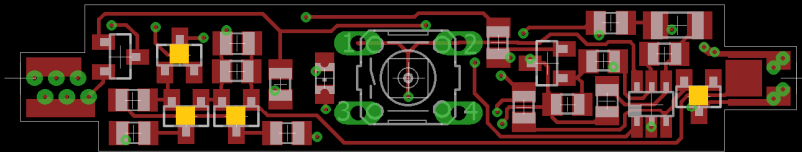
TL431BMFDT\_top



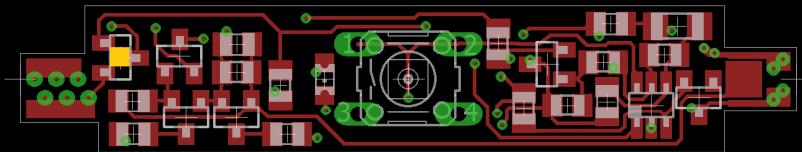
33k\_top



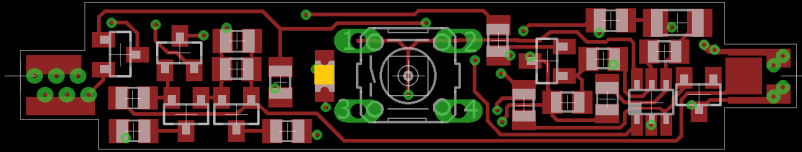
100n\_top



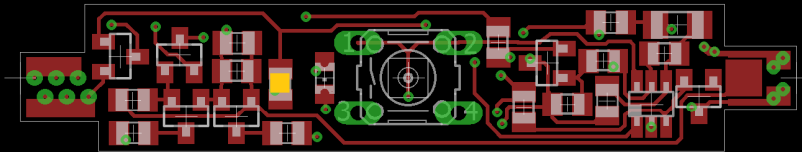
BAT54S\_top



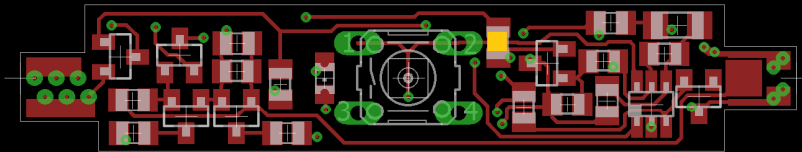
BVSS123LT1G\_top



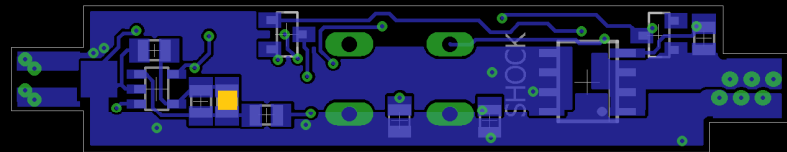
LED0805\_top



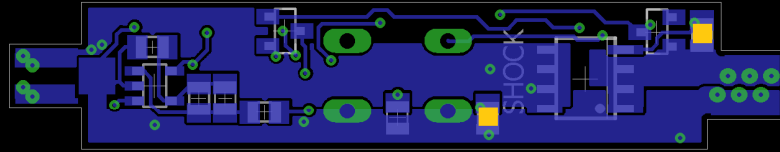
1k\_top



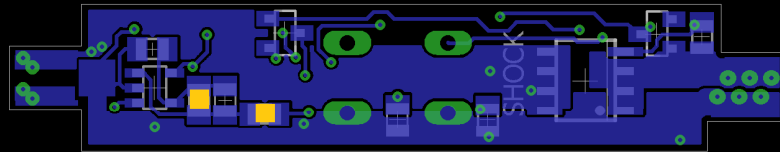
4k7\_top



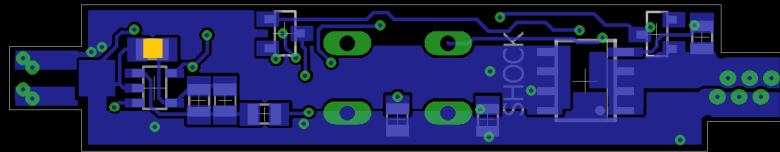
1n\_bot



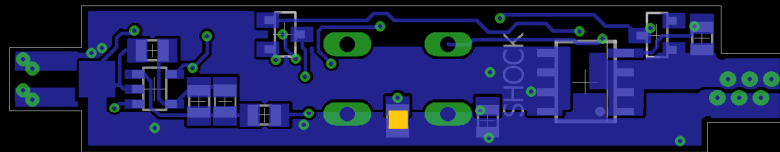
4k7\_bot



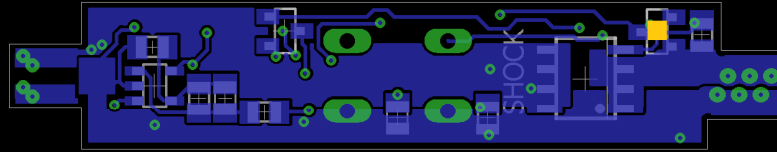
33k\_bot



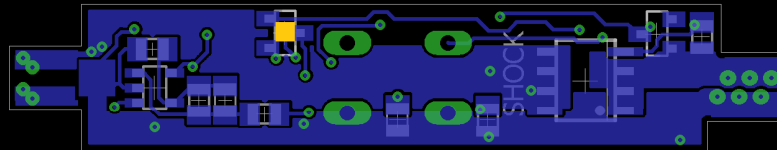
47\_bot



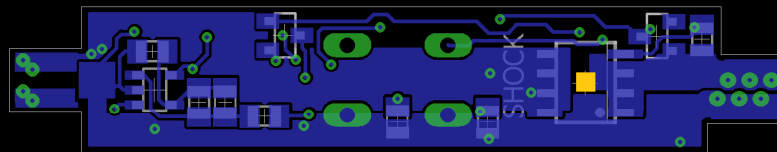
100n\_bot



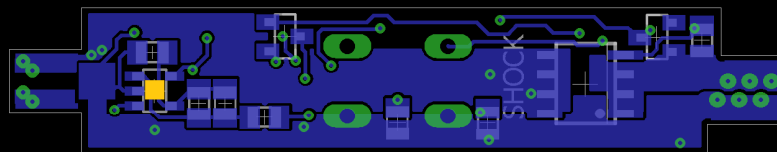
BAT54S\_bot



BVSS123LT1G\_bot



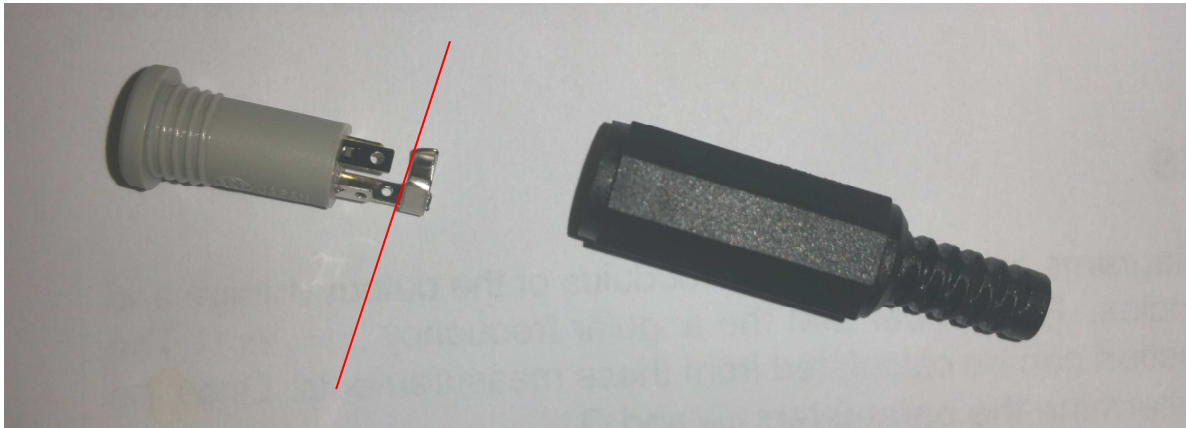
DMG4435SSS\_bot



MCP6V71\_bot

**Step 2: solder the connectors to the PCB**

Remove the nut from the dc power jack first. Before the connectors can be soldered, the 3.5mm jack (4 pin, grey) connector should be cropped as in the following picture. Pay attention to the correct orientation; the longer leg and the longer (power jack) or furthest away (3.5mm jack) island on the PCB should correspond.



### **Step 3: create programming cable**

To create the programming cable, solder 4 of the 5 wires to the 4 pins of the female 3.5mm jack. The 5<sup>th</sup> wire should be soldered to the through hole (2.2K $\Omega$ ) resistor, and the other end of the resistor is soldered to the center pin of the jack. Use the small-diameter heat shrink to cover the resistor. Remember which wire is connected to which pin before screwing on the connector cover.

### **Step 4: program the soldering iron**

Upload the 'ATtiny4\_5\_9\_10\_20\_40Programmer.ino' sketch to an Arduino Uno (not in kit). Connect according to the following table; pin 1 of the jack is the center pin, 'pin' R is the wire only connected to the resistor.

<b>Arduino</b>	<b>Jack</b>
11	R
12	1
13	2
9	3
GND	4

Use the serial monitor to program the target ATtiny10:

- Open the serial monitor at 1200 bps
- Reset the Arduino Uno; if everything went well, the monitor should print a few lines, the last one being 'ATtiny10 connected'
- Set the 'Reset disable fuse', by entering a capital 'S' and following instructions on the console
- Program the firmware, by entering a capital 'P' and pasting the .hex file contents in the monitor. If you copied the newline at the end of the file, you might get an error after 'Successfully wrote program'. This is OK.
- The correct .hex file is 'soldering\_danger.hex'. The "safe" version only turns on when the button is pushed.

**Step 5: test, and hope for the best ;-)**

Your soldering iron should now be finished. Connect the power, and watch the LED (and heater) turn on. The soldering iron should finish heating up within approximately 7 seconds, and the LED should blink when the heater is turned on to keep the temperature constant. Pay attention, as the soldering tip might be damaged if something is wrong and the heater is never turned off. If this happens, disconnect the power and find the error, before the tip gets red hot and possibly breaks.