

Building Your Night-Time Blinky Board Heart

Verify Your Parts

- Resistors
220 OHM (Red Red Brown)
(R1 & R4)



- 47K OHM (Yellow Violet Orange)
(R2 & R3)



- 22K OHM (Red Red Orange)
(R5)

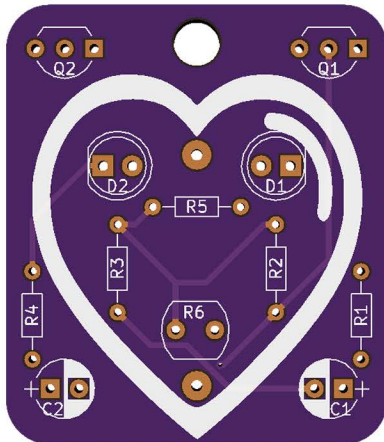


- LDR
Light Dependent Resistor
(R6)

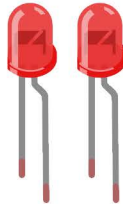


- PCB - Printed Circuit Board

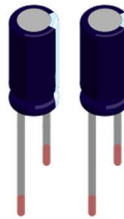
Heart



- LEDs
Light Emitting Diodes
(D1 & D2)



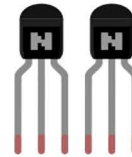
- Capacitors
10uF
(C1 & C2)



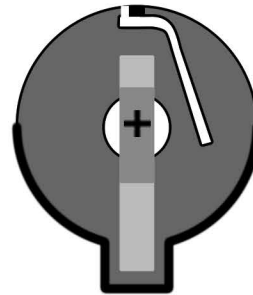
- Lanyard



- NPN Transistors
(Q1 & Q2)



- Battery Holder
(BT1)



- CR2032 Battery



- Jump Ring



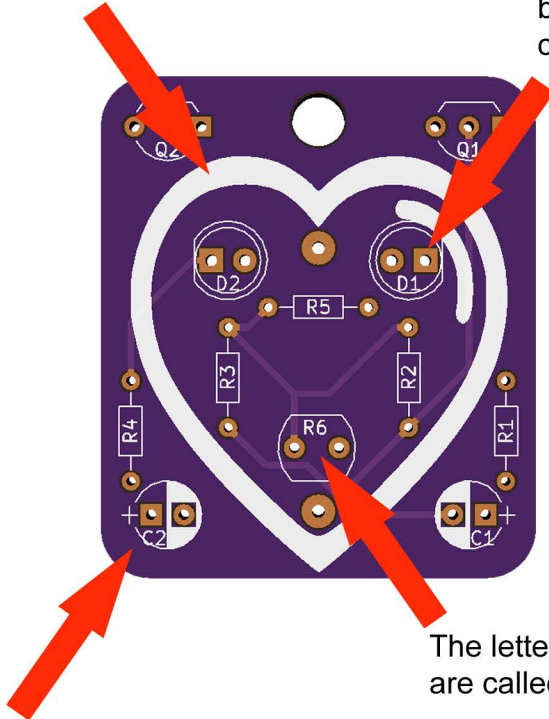
Items You Will Need

- Soldering Iron
- Solder - 60/40 or 63/37 Rosin Core or No-Clean
- Wire Cutters
- Needle Nose Pliers
- Protective Eyewear
- Circuit Board Holder (3rd Hand Tool)

Getting to Know your Printed Circuit Board

The white printing is called “**Silkscreen**”.

The round and square areas are called “**Pads**”. The Pads are gold plated copper. The top and bottom Pads are connected electrically by copper plating through the holes in the board.



Top Side of PCB

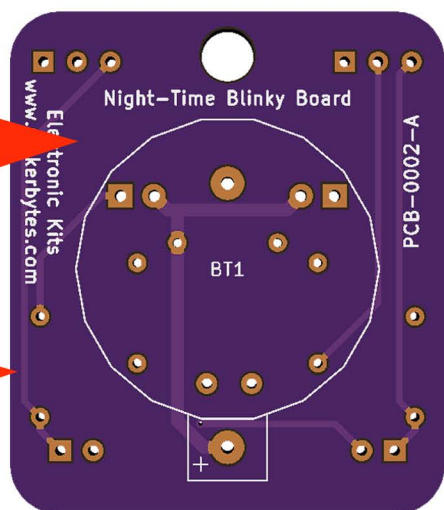
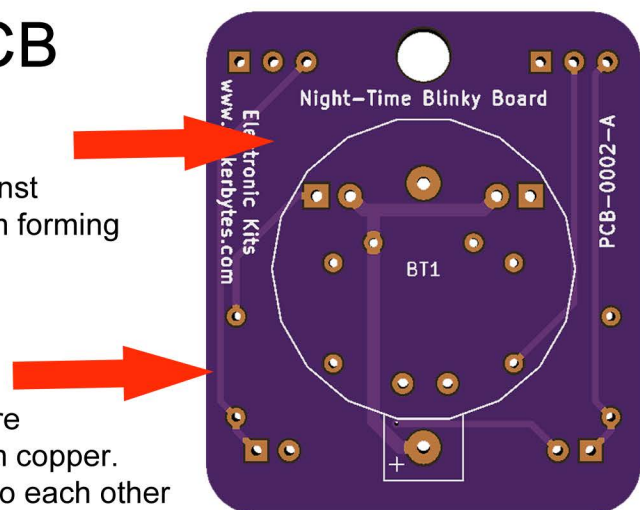
The letter - number pairs, for example, “**R6**” are called “**Reference Designators**”.

The area around the Reference Designators and Pads is called the “**Part Outline**”. All of the pads for the part outline is called the “**Part Footprint**”.

Bottom Side of PCB

The purple color of the PCB is called the “**Solder Mask**”. It helps protection against oxidation and to prevent solder bridges from forming between closely spaced solder pads.

The lines you see under the Solder Mask are called “**Traces**”. The Traces are made from copper. This is what electrically connects the parts to each other when they are soldered to the Pads.

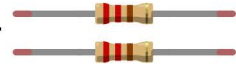


Let's Begin Making Your Blinky Board!

Step 1 - Resistors R1, R2, R3 & R4

NOTE: The resistors can be inserted in either direction.

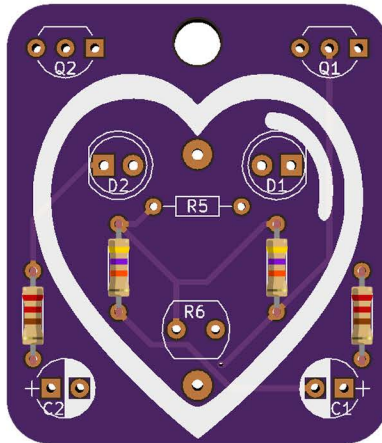
- a. Insert the 220 ohm (red red brown) resistors into locations R1 & R4.



- b. Insert the 47K ohm (yellow purple orange) resistors into locations R2 & R3.



- c. Solder on **bottom side** and trim wires.



Step 2 - Resistor R5 & R6 (LDR)

NOTE: The resistor and LDR can be inserted in either direction.

- a. Insert the 22K ohm (red red orange) resistor into location R5.



- b. Insert the Light Dependent Resistor (LDR) into location R6.



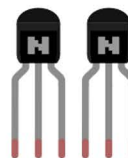
- c. Solder on **bottom side** and trim wires.



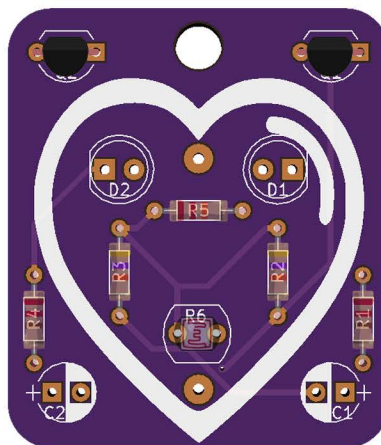
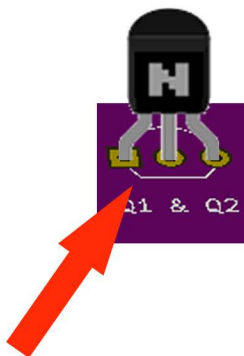
Step 3 - Transistors Q1 & Q2

CAUTION: The transistors must be inserted in the correct direction according to the part outline.

- a. Insert the transistors into locations Q1 & Q2 as shown in Detail 1.
- b. Solder on **bottom side** and trim wires.



Detail 1.

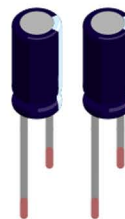


Align flat side of transistor with flat side of part outline.
Do not force the transistors against the PCB!
Expect them to stand off the board a bit.

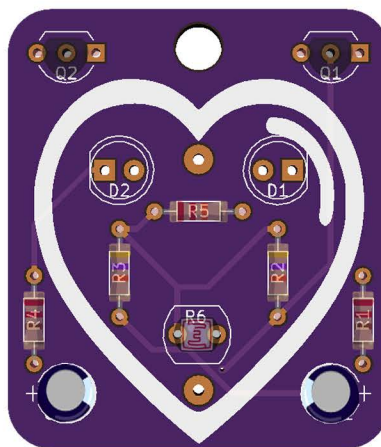
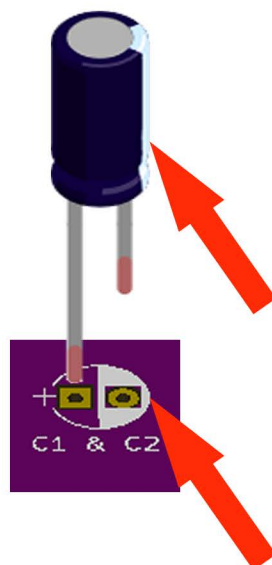
Step 4 - Capacitors C1 & C2

CAUTION: The capacitors must be inserted in the correct direction according to the part outline.

- a. Insert the capacitors into locations C1 & C2 as shown in Detail 2.
- b. Solder on **bottom side** and trim wires.



Detail 2.



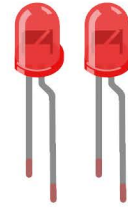
Align white side of capacitor with the white side of the part outline.
(The longer wire goes into the square pad)

Step 5 - LEDs D1 & D2

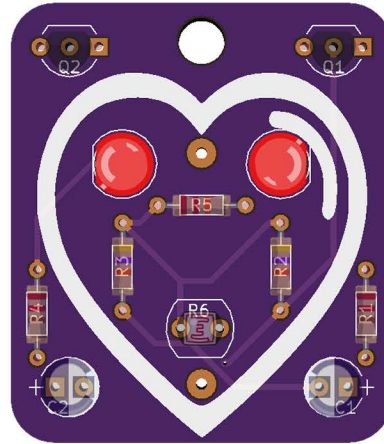
CAUTION: The LEDs must be inserted in the correct direction according to the part outline.

a. Insert the LEDs into locations D1 & D2 as shown in Detail 3.

b. Solder on **bottom side** and trim wires.



Detail 3.



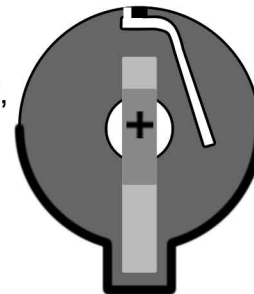
Align flat side of LED with the flat side of the part outline.
(The longer wire goes into the round pad)

Step 6 - Double Check and Verify Your Work!

- a. Go back to Steps 1 & 2.
Verify that your resistors and LDR are in the correct locations and of the correct values.
- b. Go back to Step 3.
Verify that your transistors are in the correct locations and are inserted according to Detail 1.
- c. Go back to Step 4.
Verify that your capacitors are in the correct locations and are inserted according to Detail 2.
- d. Go back to Step 5.
Verify that your LEDs are in the correct locations and are inserted according to Detail 3.

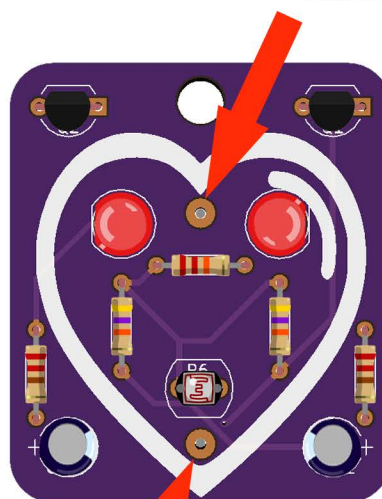
Step 6 - Battery Holder BT1

- a. Insert the battery holder into location BT1 on bottom side of board, aligning holder with the battery holder outline. Trim any wires that may interfere with the battery holder sitting level to the board.
- b. Turn the board over and solder battery holder into place.
Do not trim the battery holder wires!



Trim wires under battery holder if they interfere BEFORE soldering

Solder Here



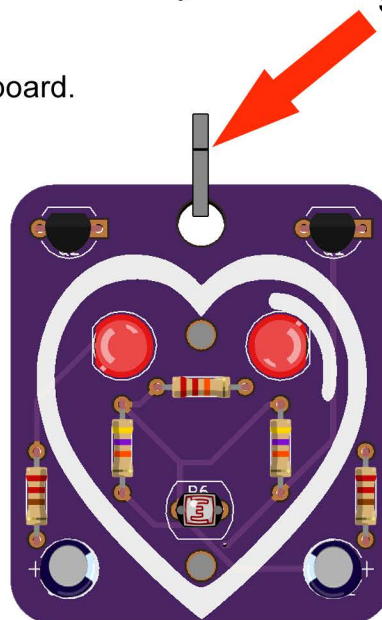
Solder Here

Step 7 - Jump Ring

- a. Using pliers, separate the jump ring by twisting the cut ends away from each other as show in Detail 4.
- b. Slip the jump ring through the hole in the top of the board. Using pliers, twist the jump ring closed such that the cut ends are aligned and touching.
- c. Solder jump ring where the cut ends meet.

Solder Here

Detail 4.



Step 8 - Lanyard

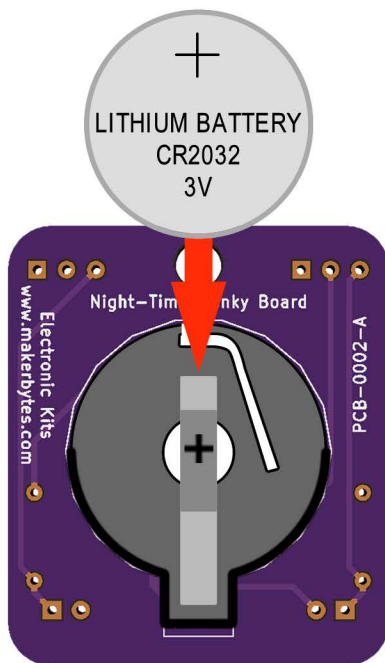
- a. You can use the supplied lanyard or use one of your own to make a necklace.



Step 9 - Activate!

- a. You're now read to ACTIVATE your Blinky Board! Turn the board over and insert the CR2032 battery with the "Plus" side up as show in Detail 5.

Detail 5.



Completed Blinky Board



Congratulations! You Did It!
Now go find a dark place and test your Blinky Board.
The darker it is, the faster the LEDs will blink!