

## LED Adjustable Speed Flasher Model GSK-109

This is an excellent kit for introducing basic electronic principles. Two LED's will alternatively blink and the blinking speed is adjustable. Kit is easy to assemble with minimal components.

### Technical Specifications

- Power Source: 9-12 VDC
- Consumption: 16-22 mA max.
- Adjust flashing speed with potentiometer
- PCB dimensions: 1.39 x 1.22 inches

### Operating Principles

This is a two LED circuit that works alternatively through transistor 1 and transistor 2 in the form of a multi-vibrator frequency circuit. When TR1 is powered, LED1 will light and LED2 is off. When TR2 is powered, LED2 will light and LED1 is off. Blinking speed is controlled by potentiometer VR1.

### Circuit Assembly

Please refer to Figures 1, 2, and 3 for aid in component placement. It is recommended to start with lower components i.e. diodes, resistors, electrolyte capacitors, and transistors. Be careful to check polarity with Figure 3 before soldering. If a problem is detected it is best to use a desoldering pump or desoldering braids to remove component. This will minimize potential damage to the printed circuit board.

### Testing

Connect circuit to 9-12 VDC power source. LED1 and LED2 will work alternatively. Adjust blinking speed with VR1. If LED's do not light or blinking speed will not vary please review Troubleshooting.

### Troubleshooting

This circuit has only a few components. The main cause of problems come from misplaced components or faulty soldering. Utilize Figure 3 to ensure proper placement/polarity and then check solder points for connectivity.

### Accessories

Use GSB-17 (sold separately) to house the PCB and batteries.

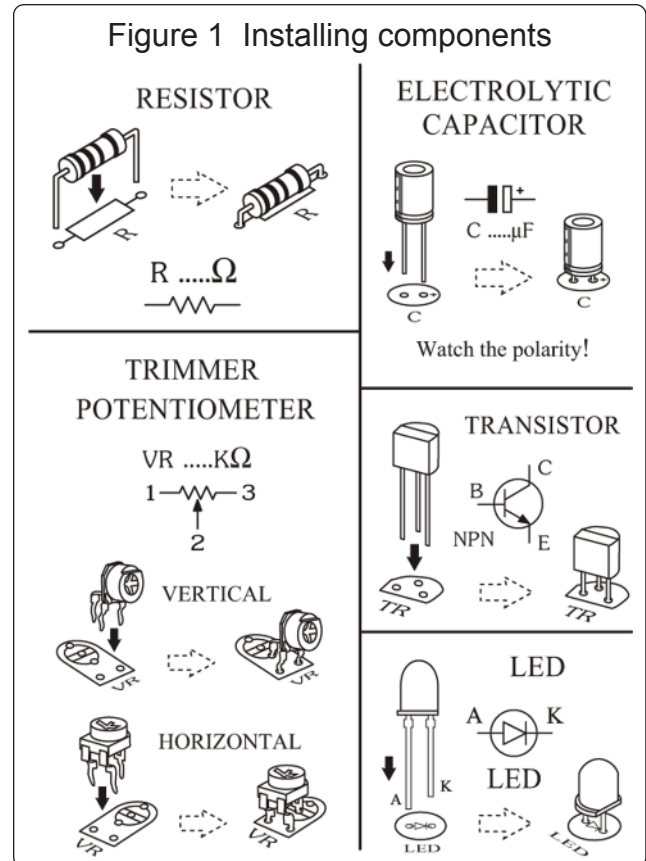


Figure 2 LED flasher 2 dot circuit

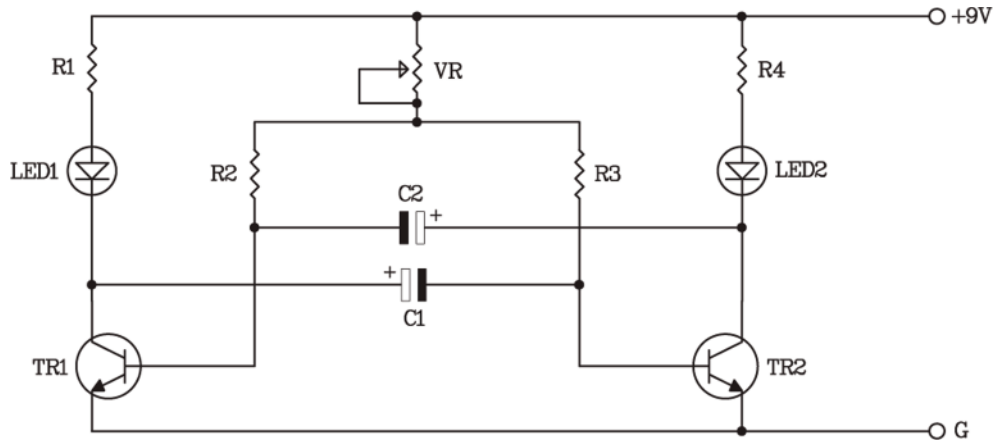
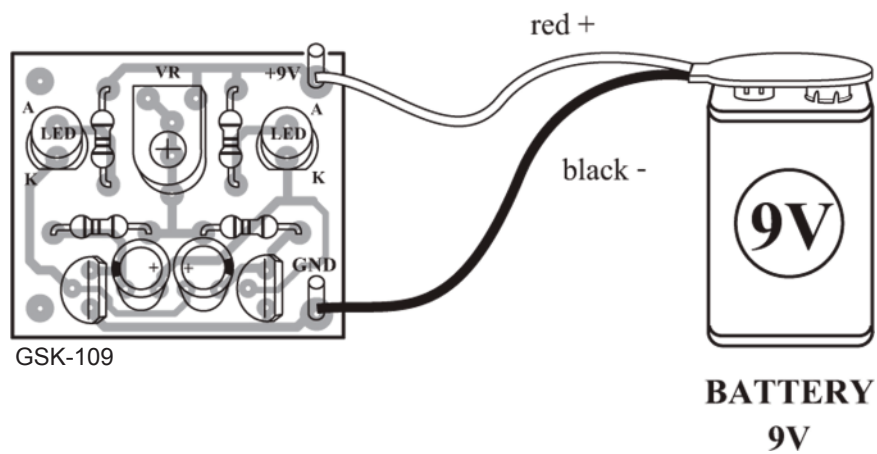


Figure 3 Connecting circuits



Resistors

R1, R4      470  $\Omega$       yellow – violet – brown – gold  
 R2, R3      3 k $\Omega$       orange – orange – red – gold

Potentiometer

VR1      10 k $\Omega$  or 103

Electrolytic Capacitors

C1, C2      33  $\mu$ F

Transistors

TR1, TR2      C458, C828, C945, C1815

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