Title: Music-Reactive RGB LEDs Circuit

Music-Reactive RGB LEDs Circuit

Presented By

- Presented By:
- Naveed Ahmad
- Muhammad Kamil Khan
- Sharjeel Qureshi

Music-Reactive RGB LEDs Circuit

What is a Music-Reactive RGB LEDs Circuit?

- Introduction
- A music-reactive RGB LED circuit combines RGB LEDs and audio input to produce visually captivating light displays.
- These circuits respond to sound levels and frequencies, transforming them into dynamic lighting effects that follow the rhythm of the music.
- The LEDs turn on and off according to the music pattern.

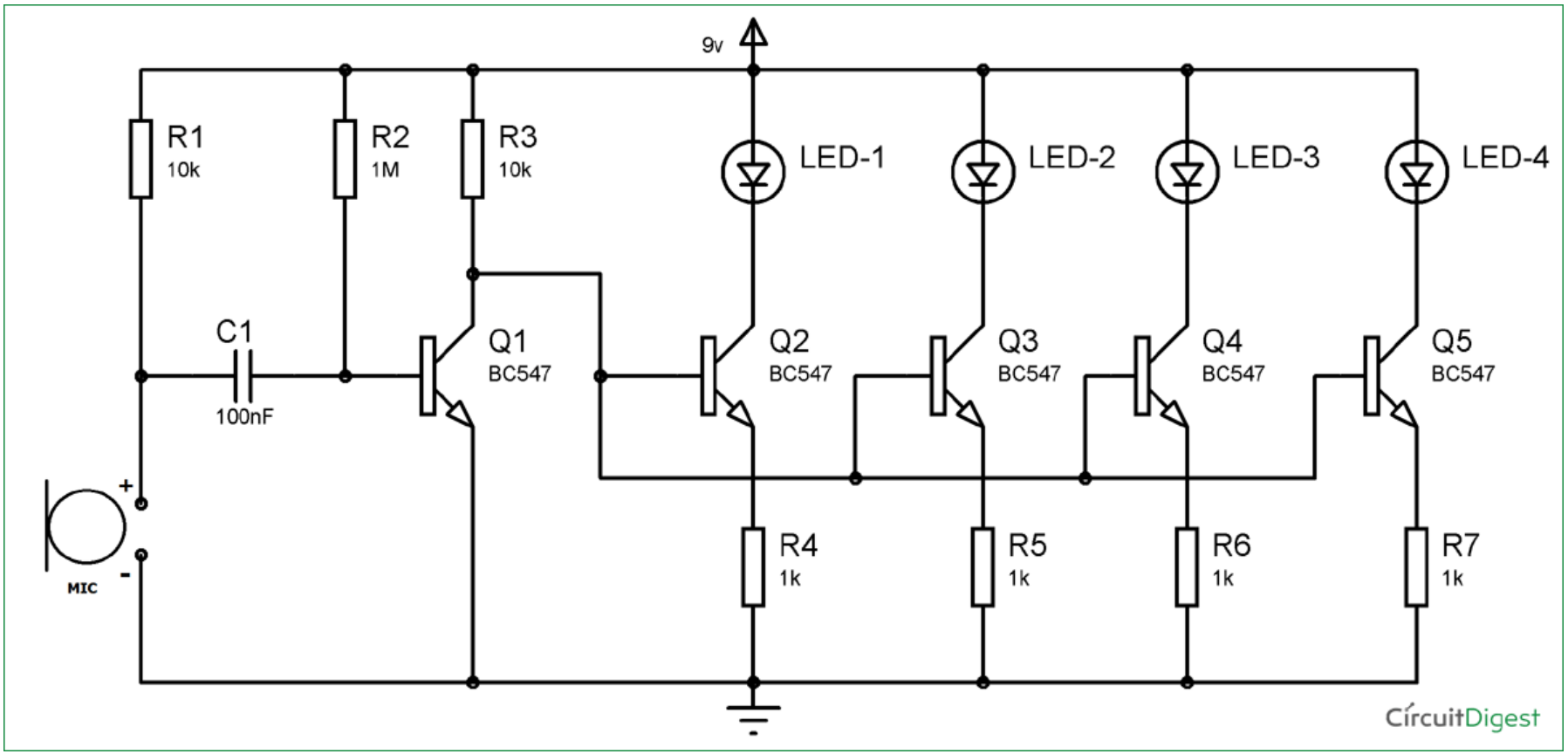
Music-Reactive RGB LED Circuit

Components

- Components:
  - Mic
  - NPN Transistor (e.g., BC547)
  - Resistors: 10k (2), 1k (4), 1M (1)
  - Ceramic Capacitor: 100nF
  - RGB LEDs
  - 9V Battery
  - Breadboard and connecting wires

Music-Reactive RGB LED Circuit

Schematic Diagram



Music-Reactive RGB LED Circuit

How Does It Work?

- Works in four steps:
- (I) Sound Input:
- (II) Noise Filtering:
- (III) Signal Amplification:
- (IV) LEDs Activation:

Music-Reactive RGB LED Circuit

Sound Input

- Sound Input:
- The circuit uses a condenser microphone to pick up sound signals and convert them into voltage levels.
- The microphone acts as a sensor that captures the surrounding sound.
- The microphone converts sound signals into varying voltage levels.

Music-Reactive RGB LED Circuit

how Mic convert sound signal into voltage levels?

- The microphone consists of a diaphragm and a transducer.
- Sound waves cause the diaphragm to vibrate, changing the capacitance of the transducer.
- The changing capacitance generates an electrical signal that represents the sound.
- The electrical signal from the microphone is in the form of varying voltage levels corresponding to the sound waves.

Simple LED Music Light Circuit

Noise Filtering

- Noise Filtering:
- To remove any unwanted noise from the sound signals, a high-pass filter is used.
- The filter consists of a resistor (R2) and a capacitor (C1).
- This filter allows higher frequency components associated with the music or sound to pass through while blocking lower frequency noise.

Simple LED Music Light Circuit

Signal Amplification

- Signal Amplification:
- The filtered signals are then amplified using an NPN transistor (Q1).
- The transistor acts as an amplifier, boosting the strength of the signals for further processing.

Simple LED Music Light Circuit

LEDs Activation

- LEDs Activation:
- The amplified signals are fed into an array of transistors.
- Each transistor in the array acts as an amplifier as well.
- When the amplified signals pass through the transistors, they trigger the corresponding LEDs to light up.
- Each transistor in the array works as an amplifier, causing the LEDs to glow based on the sound pattern.
- Additional LEDs can be added with transistors to enhance the visual effect.
- Based on the analyzed data, the intensity or color of the RGB LEDs changes, creating synchronized lighting effects.