Neopixel Strip (WS2812B)

A Neopixel strip is an addressable RGB LED strip using WS2812B or similar LEDs that allow control of each LED individually with a single data line.

Working Principle:
Each LED has a built-in IC that receives and forwards data. A microcontroller sends a specially timed signal controlling the brightness and color of each LED.

Types:
- WS2812 (RGB)
- WS2812B (improved version)
- WS2813, SK6812 (RGBW)
- Strip, Ring, Matrix, or individual module

Applications:
- Decorative lighting
- Wearables
- Displays and signs
- Visual effects in projects
- LED cubes and art installations

Advantages:
- Individually addressable
- High brightness
- Flexible and customizable
- Controlled with just one data pin

Disadvantages:
- Requires precise timing (use libraries like Adafruit Neopixel)
- Sensitive to voltage and power supply
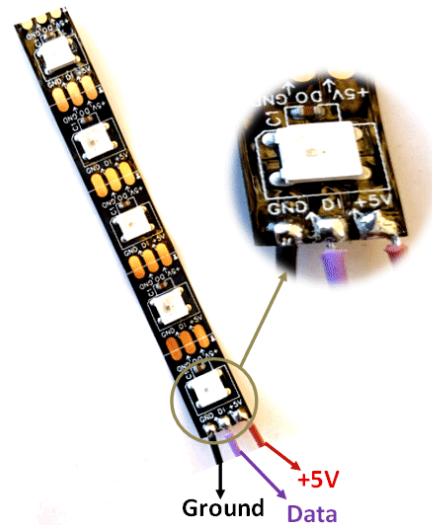- Generates heat on high brightness

Fig: NeoPixel Strip