## Resistor Basics

Resistors are components that limit the flow of electric current in a circuit. They convert electrical energy into heat, protecting sensitive components like LEDs from excessive current1.

## Types of Resistors

The video discusses several types of resistors:

1. Through-hole resistors:
   * Carbon film
   * Metal film
   * Carbon composite
2. Surface Mount Device (SMD) resistors
3. Variable resistors:
   * Potentiometers
   * Rheostats
4. Automatic variable resistors:
   * Thermistors
   * Light Dependent Resistors (LDRs)
   * Varistors

## Resistor Construction

## Carbon Composite Resistors

Made by mixing conducting material (carbon or graphite) with insulating powder (clay), forming a solid core.

## Carbon Film Resistors

Consist of a ceramic core coated with a thin layer of carbon. A helical groove is cut into the carbon layer to control resistance.

## Metal Film Resistors

Similar to carbon film resistors but use a metal layer instead of carbon. They offer higher tolerance and better stability.

## Wire Wound Resistors

Use a wire wrapped around a ceramic core, offering high power and current ratings.

## Resistance Value Identification

* Through-hole resistors use color-coded bands to indicate resistance value
* SMD resistors use numerical codes printed on their surface

## Potentiometers

These variable resistors have a dial to adjust resistance. They consist of a resistive track and a wiper that moves along the track to change resistance.

## Applications

Resistors are used in various applications, including:

* Current limiting for LEDs
* Volume control in audio devices
* Voltage dividers
* Calibration of electronic circuits