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 current[1].

Types of Resistors

The video discusses several types of resistors:

1. Through-hole resistors:
    - Carbon film
    - Metal film
    - Carbon composite
2.
3. Surface Mount Device (SMD) resistors
4. Variable resistors:
    - Potentiometers
    - Rheostats
5.
6. Automatic variable resistors:
    - Thermistors
    - Light Dependent Resistors (LDRs)
    - Varistors
7.

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