

Understanding Basic Electronic Components

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1. Introduction

- Electronic components are the building blocks of circuits that control the flow of electric current.
- They are classified as passive or active depending on whether they can amplify or generate signals.

2. Passive Components

- **Resistor:** limits current flow; its value is measured in ohms and read from colour bands.
- **Capacitor:** stores electric charge and smooths or blocks DC while passing AC.
- **Inductor:** stores energy in a magnetic field and opposes changes in current.

3. Active Components

- **Diode:** allows current to flow in one direction only; used for rectification.
- **Transistor:** acts as a switch or amplifier and is fundamental to modern electronics.
- **Integrated circuit (IC):** combines many components on a single chip.

4. Power and Signal Sources

- Batteries and power supplies provide the voltage needed to drive circuits.
- Sensors convert physical quantities into electrical signals.

5. Identification

- Components are identified by markings, colour codes, and symbols on schematics.
- Datasheets give ratings such as voltage, current, and tolerance.

6. Summary

- Understanding each component's function is the basis of circuit design.
- Correct selection by value and rating ensures safe, reliable operation.