

Introduction to Basic Electronics

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1. Introduction

- Electronics is the study and control of electric current in circuits and devices.
- It underpins computers, communications, and modern appliances.

2. Fundamental Quantities

- **Voltage:** electrical potential difference, measured in volts.
- **Current:** the flow of electric charge, measured in amperes.
- **Resistance:** opposition to current flow, measured in ohms.

3. Ohm's Law

- **Ohm's Law:** voltage equals current multiplied by resistance, or $V = IR$.
- It relates the three core electrical quantities.
- It is used to calculate unknown values in simple circuits.

4. Circuit Components

- Resistors limit current; capacitors store charge.
- Inductors store energy in magnetic fields; diodes allow one-way flow.
- Sources such as batteries supply electrical energy.

5. Circuit Types

- **Series circuit:** components share a single current path.
- **Parallel circuit:** components share the same voltage across branches.
- Conductors carry current while insulators block it.