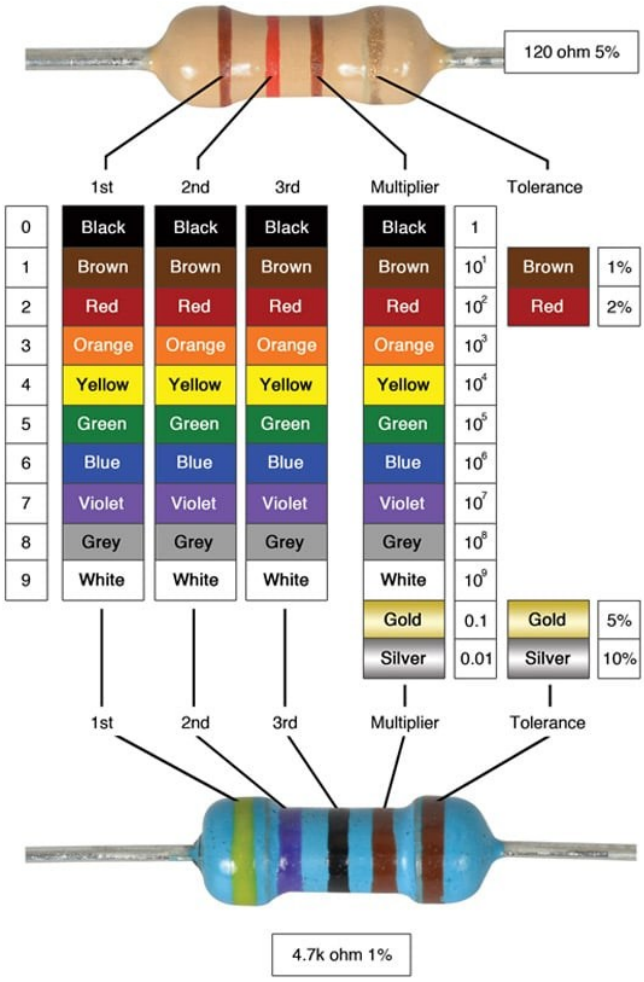
Resistor

A resistor is a passive electrical component that limits or regulates the flow of electrical current in a circuit.

Working Principle:

It resists the flow of current, converting some electrical energy into heat. The amount of resistance is measured in ohms (Ω).



Types:

- Fixed Resistor
- Variable Resistor (Potentiometer, Rheostat)
- Wire-wound Resistor
- SMD Resistor
- Thermistor, LDR (light-sensitive resistor)

Applications:

- Voltage regulation
- Current limiting
- Pull-up/pull-down in digital circuits
- Biasing transistors
- Timing circuits

Advantages:

- Simple and robust
- Wide range of values available
- Inexpensive

Disadvantages:

- Power dissipation as heat
- Not adjustable (for fixed types)