



In electrical and electronic circuits, all parts are mainly classified into active and passive components. These components are classified as either **active** or **passive** based on their functionality and ability to control electrical signals.

### Active Components:

An **active component** in a circuit is a part that needs power to work and can control the flow of electricity. It can amplify signals.

**Examples:** Transistors, Operational Amplifiers (Op-Amps), Battery(Source) etc.

Battery

Transistor



Active components are fundamental in modern electronic systems, like amplifiers, radios, and computers, where signal manipulation and control are necessary.

### Passive Components:

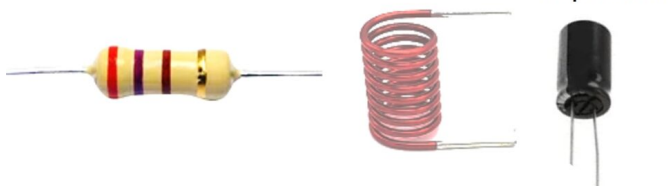
A **passive component** is a part that doesn't need power to work. It can't control or boost electricity but can do other things like Store energy, dissipate energy, etc.

**Examples:** [Resistor](#), Inductor, Capacitor etc.

Resistor

Inductor

Capacitor





**Passive components** play a crucial role in stabilising and supporting the performance of circuits by controlling current and voltage levels.

### **Difference between Active and Passive Components:**

#### **Active Components**

Requires external power to operate

Can amplify, control, or switch signals

Can add energy to a circuit

**Examples:** Transistors, Diodes, Operational Amplifiers (Op-Amps), Battery(Source) etc.

#### **Passive Component**

Does not require external power

Cannot amplify, only store or dissipate energy

Cannot add energy, only dissipate or store it

**Examples:** [Resistor](#), Inductor, Capacitor etc.

### **FAQs on Active and Passive Components**

#### **1. What are active and passive components?**

Active and passive components are the main parts of an electronic circuit.

- Active components need extra power to work and can control the flow of current.
- Passive components do not need extra power and only store or limit energy.

#### **2. What is the main difference between them?**

Active components **can amplify signals**, but passive components **cannot**. Passive parts only **store, block, or release** electrical energy.

#### **3. What are some examples of active components?**

Examples of active components are:

- Transistor
- Diode
- Integrated Circuit (IC)
- SCR (Silicon Controlled Rectifier)



#### **4. What are some examples of passive components?**

Examples of passive components are:

- Resistor
- Capacitor
- Inductor
- Transformer

#### **5. Do passive components need power to work?**

No. Passive components do not need any external power supply. They work with the energy already in the circuit.

#### **6. Why are active components important?**

Active components are important because they amplify signals, switch currents, and control voltages in electronic devices.

#### **7. Why are passive components important?**

Passive components are important because they support active components. They help to store energy, filter signals, and protect the circuit.

#### **8. Can a circuit work with only passive components?**

Yes, but such a circuit cannot amplify or control signals. It can only store, filter, or divide voltage.

#### **9. Which type is more important?**

Both are important. Active parts control and amplify, and passive parts support and balance the circuit.

#### **10. How do they work together in a circuit?**

Active and passive components work together to make a complete circuit. Active parts handle signal and power control, while passive parts make the flow smooth and stable.