

Distinguish, differentiate, compare and explain what is the Difference between Inductor and Capacitor. Comparison and Differences.

In addition to resistors, there are two other basic electronic components that can be found everywhere: the capacitor and the inductor. Capacitors and inductors store electrical energy—capacitors in an electric field, inductors in a magnetic field.

Inductor

Inductors are the complementary component to the capacitor. They are not commonly found in electronic circuits because they are bulky and expensive, and practical inductors are far from ideal. However, they are found in motors, transformers and other electrical mechanisms. They are also found as stray effects (undesirable side effects) with interconnecting wires (such as wires that you use to connect circuits on the breadboard). Inductors are used as antennae for sending and receiving radio signals, and form part of transformers used in wireless charging. Here are some basic equations governing an inductor.

Capacitor

Besides resistors, capacitors are one of the most common electronic components that you will encounter. Sometimes capacitors are components that one would deliberately add to a circuit. Other times, capacitors are side effects that come about even if we don't want them.

The simplest capacitor is formed by an insulating material (known as dielectric) sandwiched between two parallel conducting plates. When a voltage potential is applied to the two ends, charge accumulates on the plates. In capacitors, voltage v is proportional to the charged stored q . The constant of proportionality is the capacitance C . Since current is the rate of change of charge (i.e. the flow of charge), the relationship between v and I involves differentiation or integration.

Capacitance is measured in Farads.

Difference between Inductor and Capacitor

S.No.	Parameter	Inductor	Capacitor
1	Working	An Inductor is a device that resist the changes in current.	A Capacitor is a device that resist the changes in voltage.
2	Unit	Inductance is measured in Henry.	Capacitance is measured in Farad.
3	Phase	Voltage leads Current with 90°	Current leads Voltage with 90°
4	Energy	Energy is stored in the form of magnetic field.	Energy is stored in the form of electric field.
5	Stability	The current in the inductor does not get change instantaneously.	The voltage in the capacitor does not get change instantaneously.
6	Short Circuit Behavior	Inductor functions as a short circuit for direct current.	Capacitor functions as a short circuit for alternating current.
7	i vs V relationship	$v = L \cdot di/dt$	$i = C \cdot dv/dt$
8	Behavior at Steady state	At steady state, looks like short circuit.	At steady state, looks like open circuit.