

What are Drift Current and Diffusion Current : Their Differences

In a [semiconductor](#), the majority and minority charge carriers will exist in p-type or n-type. Because both the types of semiconductors will present over a single crystal at the center so that [PN-junction](#) can be formed. When the doping of this junction diode is done non-uniformly then charge carriers movement will be an exit from high to low concentration which leads to the recombination of carriers as well as to the diffusion process. There is an additional method is also occurs based on the applied electric field namely drift current. This article discusses the main differences between drift current and diffusion current.

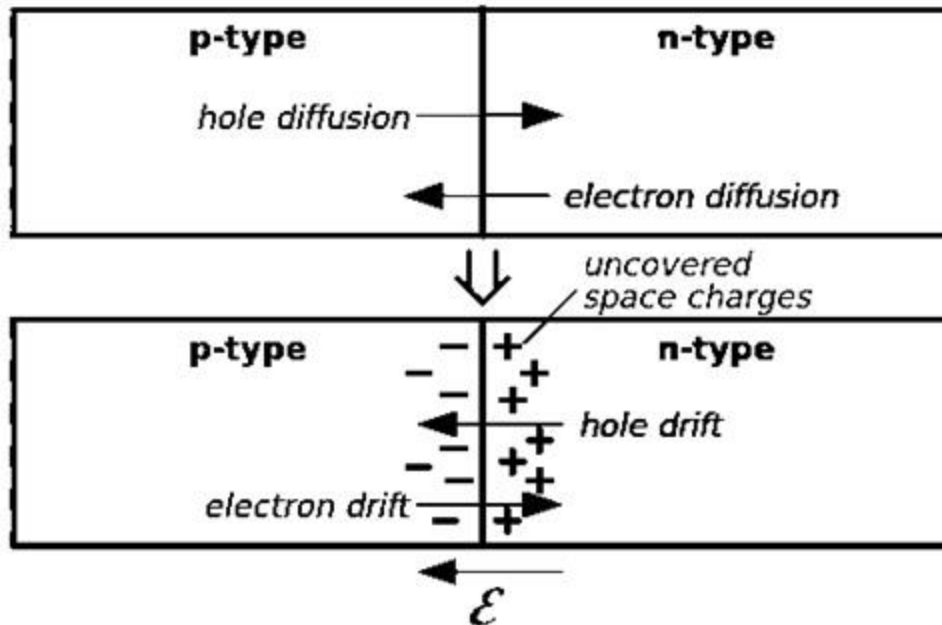
What are the Drift Current and Diffusion Current?

In a semiconductor material, [the drift](#), as well as diffusion currents, will occur. Semiconductors are fabricated with two kinds of materials namely p-type as well as n-type. There are several kinds of switching devices available in the market like [transistors](#), diodes, etc. These are designed by placing one material among other materials so that the material's conducting property can be modified.

What is a Drift Current?

Drift current can be defined as the charge carrier's moves in a semiconductor because of the electric field. There are two kinds of charge carriers in a semiconductor like holes and electrons. Once the voltage is applied to a semiconductor, then electrons move toward the +Ve terminal of a battery whereas the holes travel toward the -Ve terminal of a battery.

Here, holes are positively charged carriers whereas the electrons are negatively charged carriers. Therefore, the electrons attract by the +Ve terminal of [a battery](#) whereas the holes attract by the -Ve terminal of a battery.



drift-current-&-diffusion-current

What is Diffusion Current?

The diffusion current can be defined as the flow of charge carriers within a semiconductor travels from a higher concentration region to a lower concentration region. A higher concentration region is nothing but where the number of electrons present in the semiconductor. Similarly, a lower concentration region is where the less number of electrons present in the semiconductor. The process of diffusion mainly occurs when a semiconductor is doped non-uniformly.

In an N-type semiconductor, when it is doped non-uniformly then a higher concentration region can be formed at the left side whereas the lower concentration region can be formed at the right side. The electrons in the higher concentration region are more in the semiconductor so they will experience a repulsive force from each other.

Difference between Drift Current and Diffusion Currents

The difference between drift current and diffusion current includes the following.

Drift Current	
	Diffusion Current

The movement of charge carriers is because of the applied electric field is known as drift current.	The diffusion current can be occurred because of the diffusion in charge carriers.
It requires electrical energy for the process of drift current.	Some amount of external energy is enough for the process of diffusion current.
This current obeys <u>Ohm's Law</u> .	This current obeys Fick's Law.
The direction of charge carriers in the semiconductor is reverse to each other.	For charge carriers, the densities of diffusion are reverse in symbol to each other.
The direction of the drift current, as well as the electric field, will be the same.	The direction of this current can be decided by the concentration of the carrier slope.
It depends on the permittivity	It is independent of permittivity
The direction of this current mainly depends on the polarity of the applied electric field.	The direction of this current mainly depends on the charge within the concentrations of carrier