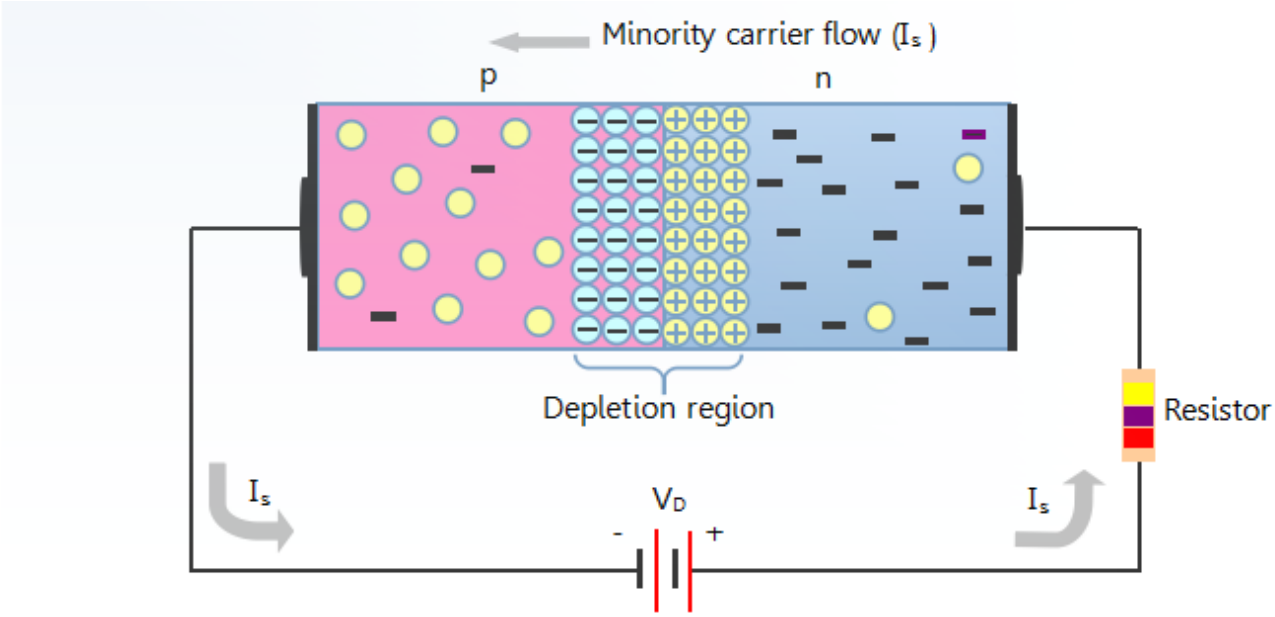
Reverse Biasing

When the positive terminal of the battery is connected to n-type material and the negative terminal of the battery is connected to p-type material, such a connection is called reverse bias.



Above figure shows the diode connected in reverse bias. You can clearly see that the negative terminal of the battery is connected to p-type material and the positive terminal of the battery is connected to n-type material. A resistor is also connected in series with the diode, although resistor is not required when the diode is reverse biased. When the diode is reverse biased, the electric field due to the battery and the electric field of the depletion region are in the same direction. This makes the electric field even stronger than that before reverse bias was applied. The electrons from the n-type material (majority carriers) now faces a stronger electric field and it becomes even more difficult for them to move towards the p-type material. Same discussion also applies to holes. The holes from the p-type material (majority carriers) now faces a stronger electric field and it becomes even more difficult to move from p-type to n-type material.Hence we conclude that there is no flow of current due to majority carriers when the diode is reverse biased.

We shall discuss following important points with regards to the reverse biased p-n junction.

Effect of reverse bias on the width of depletion region

Reverse saturation current

Reverse breakdown voltage

Effect of reverse bias on the width of depletion region