

Answer on Question #50349, Physics, Electric Circuits

A diode allows current to flow in one direction only.

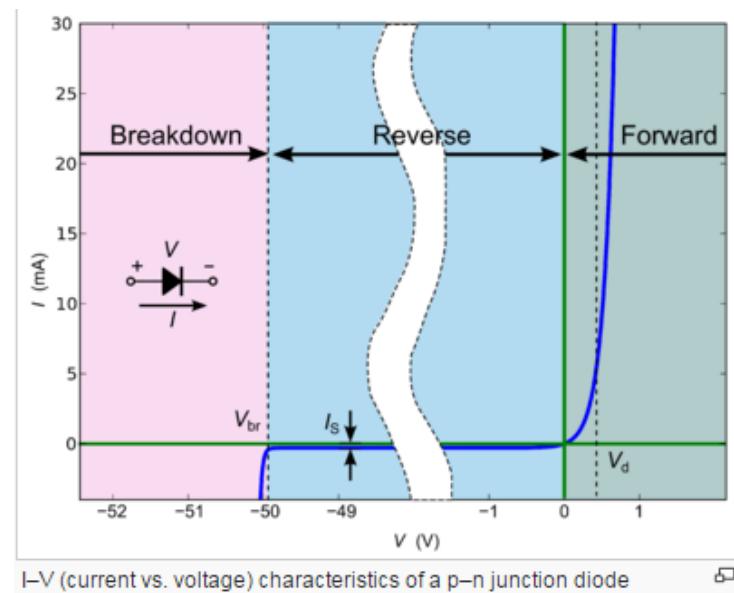
Consider the case when the anode is connected to the positive end of a power supply via a resistor and the cathode to the negative terminal of the same power supply.

Which of the following statements is true about the diode for this particular case?

1. The diode is in reverse bias
2. The diode is in Forward bias
3. The diode conducts
4. The diode does not conduct

Answer:

In electronics, a diode is a two-terminal electronic component with asymmetric conductance; it has low (ideally zero) resistance to current in one direction, and high (ideally infinite) resistance in the other.



With a small forward bias, where only a small forward current is conducted, the current–voltage curve is exponential in accordance with the ideal diode equation. There is a definite forward voltage at which the diode starts to conduct significantly. This is called the knee voltage or cut-in voltage and is equal to the barrier potential of the p-n junction. This is a feature of the exponential curve, and is seen more prominently on a current scale more compressed than in the diagram here.

At larger forward currents the current–voltage curve starts to be dominated by the ohmic resistance of the bulk semiconductor. The curve is no longer exponential, it is asymptotic to a straight line whose slope is the bulk resistance. This region is particularly important for power diodes. The effect can be modelled as an ideal diode in series with a fixed resistor.

In our case the diode is in Forward bias.