

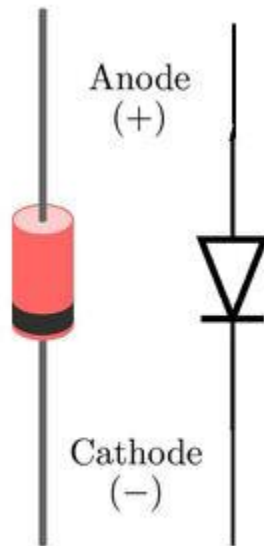
UNDERSTANDING RECTIFIER DIODES

This article explains the characteristics and use of diode rectifier circuits, as well as detailed information regarding the process of rectification. The article also deals with testing procedures in simple steps that can be very handy for new electronic enthusiasts.

Introduction:

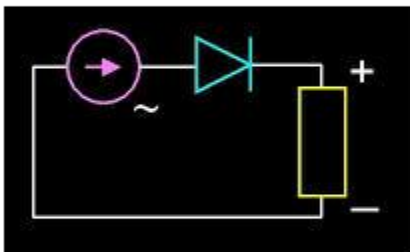
A diode rectifier is a semiconductor device and comes under 'active' electronic components. Its basic function is to allow the passage of electric current only in one direction and block from the other. This property also results in rectification of electric current when an AC source is used. A rectifier diode is generally recognized by its black color and a white ring at one of its ends, something comparable to the resistor colour coding we studied in a previous article. Its size may differ with its power handling capacity. Its two ends are with two leads or terminals and hence the name diode (meaning two- legged in greek).

Internal Description:



A diode like all semiconductors is basically made up of pure silicon (more popular nowadays than germanium). By nature silicon is a bad conductor of electricity therefore by mixing certain impurities into it (doping), conductivity to an extent is achieved. These impurities can be positive carriers or negative carriers of charge known as p-type and n-type respectively. In a diode the p-type and n-type silicon are fused together to form a junction called pn junction. When connected to a voltage source, this junction will restrict the flow of current from n-type to p-type and will allow the flow of current from p-type to n-type silicon, only if the voltage is more than 0.6 volts. This minimum voltage is required in any silicon semiconductor to initiate the conduction of electrons and is known as the forward-voltage. The p-type terminal of a diode is called the anode and the n-type terminal is called the cathode and is indicated by a ring or band on its body.

Functions and uses:



In an electronic circuit a diode acts in the same as a rubber valve in a bicycle tire. The valve allows the pumped air to enter from one side and blocks from the other . Similarly a rectifier diode allows the flow of current only through one direction. Thus it is used as a polarity guard in

electronic circuits to avoid the dangers of an accidental reversal of supply voltage. Another important function of a rectifier diode is rectification, i.e. converting an alternating current(AC) to direct current. The voltage in an AC changes from positive to negative and vice versa number of times per second. Depending upon the connection, a rectifier diode will allow only a positive or a negative cycle to pass and block the other. Thus the output will be either purely positive or negative. This is known as rectification. This property is well exploited and used in power supplies, AC/DC adapters, battery chargers etc. But it is important to know that a diode will need a minimum input voltage of at least 0.7 volts across it to successfully carry on the above procedure of rectification or in simple words, a diode needs at least 0.7 volts to satisfactorily initiate the conduction of electricity. Its called the low forward voltage drop of a rectifier diode.

Source : <http://tonisage.wordpress.com/2013/12/01/understanding-rectifier-diodes/>