What is Diac?

The DIAC is a bidirectional trigger diode designed to trigger a Triac or SCR. The Diac like the four-layered diode remains non-conducting until its 'break-over voltage' is reached. At this point, it turns on fully and remains on until the applied voltage or circuit current is reduced below the 'holding values'. The basic action of a diac is that, when connected across a voltage source with a current limiting resistor, it act like a 'high impedance' till the applied voltage rises to above 35 volts. Then the diac act as a 30 volt Zener diode and conducts. The remaining 5 volts develop across the current limiting resistor. At the avalanche state, diac exhibits 'negative resistance characteristics' and the voltage across it 'snaps back' typically about 5 volts sufficient to trigger the Triac or SCR. If the forward current falls below the minimum holding value of 30 volts (typical), diac will turn off. The important draw back of the device is that, it cannot be triggered at just any point in the AC power cycle. It triggers at its preset break over voltage only.

Diacs are used in AC power control circuits to provide trigger pulse to Triacs for its proper operation.

During each half cycle of waveform, capacitor C1 charges depending on the value of R1. When the voltage in the capacitor rises to the break down voltage of diac, it will conduct sending a positive pulse to the gate of triac. The triac and lamp then turns on and remains in the' On state' until the waveform crosses through zero voltage again.