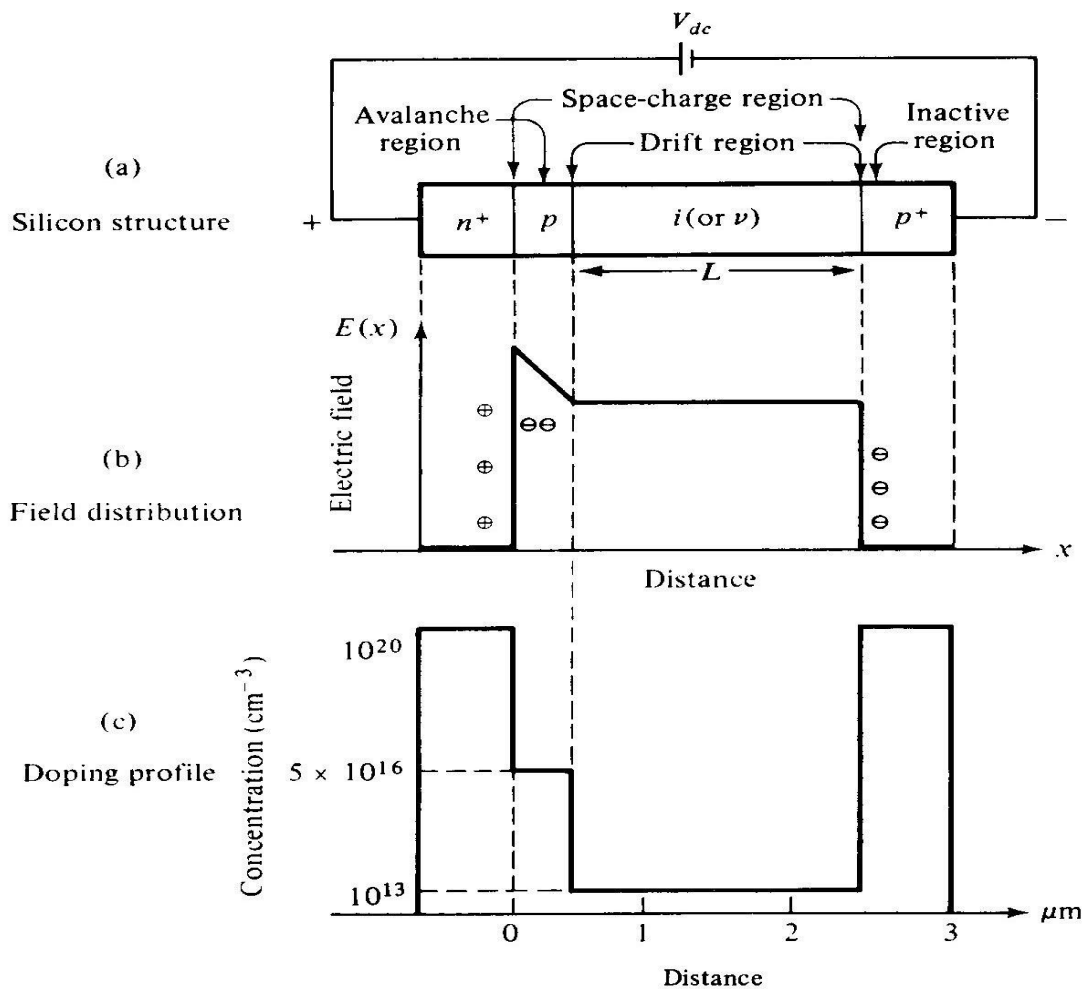


READ DIODE:

Read diode was the first proposed avalanche diode. The basic operating principles of IMPATT diode can be easily understood by first understanding the operation of read diode.

The basic read diode consists of four layers namely n^+ p i p^+ layers. The plus superscript refers to very high doping levels and 'i' denotes intrinsic layer. A large reverse bias is applied across diode. the avalanche multiplication occurs in the thin "p" region which is also called the high field region or avalanche region.



The holes generated during the avalanche process drift through the intrinsic region while moving towards p⁺ contact. The region between n⁺ p junction and the i-p⁺ junction is known as space charge region.

When this diode is reverse biased and placed inside an inductive microwave cavity microwave oscillations are produced due to the resonant action of the capacitive impedance of the diode and cavity inductance. The dc bias power is converted into microwave power by that read diode oscillator.

Avalanche multiplication occurs when the applied reverse bias voltage is greater than the breakdown voltage so that the space charge region extends from n⁺p junction through the p and I regions, to the i to p⁺ junction.

Source : <http://elearningatria.files.wordpress.com/2013/10/ece-v-microwaves-and-radar-10ec54-notes.pdf>