

## Semiconductor Physics And Devices Basic Principles

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A semiconductor material has an electrical conductivity value falling between that of a conductor, such as metallic copper, and an insulator, such as glass. Its resistivity falls as its temperature rises; metals are the opposite. Its conducting properties may be altered in useful ways by introducing impurities ("doping") into the crystal structure. When two differently-doped regions exist in the ...

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The basic function of such a device is to switch ON and OFF the flow of electricity as and when required. A semiconductor device can perform the function of a vacuum tube with hundreds of times its volume. A single integrated circuit (IC), such as a microprocessor chip, can do the work of a set of vacuum tubes.

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A semiconductor is a substance whose resistivity lies between the conductors and insulators. The property of resistivity is not the only one that decides a material as a semiconductor, but it has few properties as follows. Semiconductors have the resistivity which is less than insulators and more than conductors.

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There are two ways to teach semiconductor physics. The first is to start from first principles (as much as is possible) of quantum mechanics, statistical mechanics, etc., and derive for the reader the basic relationships and equations that the rest of the text relies on.

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