

1 Features and Structure

IGBT: Insulated Gate Bipolar Transistor

IGBTs combine the MOSFET advantage of high input impedance with the bipolar transistor advantage of high-voltage drive.

The conductivity modulation characteristics of a bipolar transistor make it ideal for load control applications that require high breakdown voltage and high current.

Toshiba offers a family of fast switching IGBTs, which are low in carrier injection and recombination in carrier.

Features of the Toshiba Discrete IGBTs

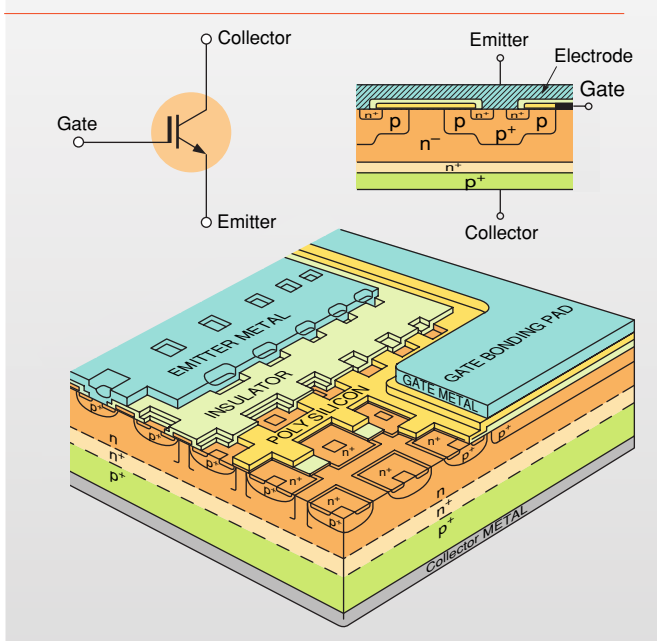
The Toshiba discrete IGBTs are available in high-voltage and high-current ratings. They are used in inverter and power conversion circuits for such diverse applications as motor drivers, uninterruptible power supply (UPS) systems, IH cookers, plasma display panels (PDPs), strobe flashes and so on.

- (1) IGBTs also featuring fast switching
- (2) Low collector-emitter saturation voltage even in the large current area
- (3) IGBTs featuring a built-in diode with optimal characteristics tailored to specific applications
- (4) High input impedance allows voltage drives
- (5) Available in a variety of packages

Construction

The basic structure of the planar IGBT consists of four layers (pnpn), as shown in the following figure. Low saturation voltage is achieved by using a pnp transistor to allow conductivity modulation during conduction. Unlike MOSFETs, the IGBT does not have an integral reverse diode, since the collector contact is made on the p⁺ layer.

Planar Structure



Equivalent Circuit

