

The IGBT has been developed to combine the properties of both MOSFET and Bipolar devices. This overcomes some of the limitations of both enabling high voltages to be switched and high currents to be controlled with the use of relatively simple gate drive circuitry. The active component, the silicon chip, has a metal gate contact which is isolated from the underlying p-n structure by a thin oxide layer (see fig 1.)

individual should take the precaution of discharging themselves to earth via a high value resistor (typically 2 to 4MΩ) or preferably be earthed via a wrist strap. The conductive link between the gate and emitter should be retained in place and only removed immediately prior to wiring.

Care should be taken to ensure that any tools used, particularly soldering irons, have a low resistance to earth.

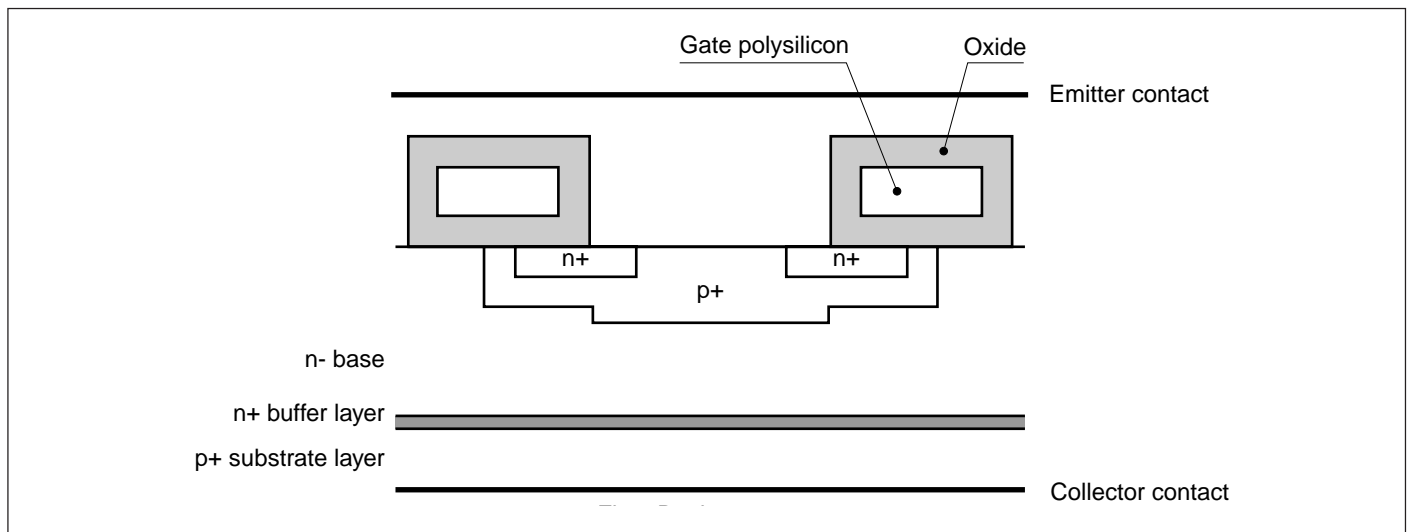


Fig.1 Device silicon cross section

In order to achieve the required switching characteristics, this structure requires a design in which the oxide layer is a few hundred angstroms thick. For this reason manufacturers limit the gate-emitter voltage to $< \pm 20V$. If this voltage is exceeded there is a danger that the chip will be destroyed and its control action lost due to the gate-emitter structure becoming degraded. As well as the possibility of such voltages occurring in the circuit they can result from the accumulation of electrostatic charge. Precautions must therefore be taken to avoid such damage. IGBT products shipped from the Mitel Semiconductor factory have a physical conducting material connecting the gate to emitter and/or are packed in anti static conducting material. It is important that the terminals are not touched by hand unless the individual handling them is on an anti-static surface and /or is grounded by an earthing wrist strap. Modules should only be handled by their base. If it is necessary to touch the terminals the

Note 1: For further detail regarding the protection of electrostatic sensitive devices the reader is recommended to consult British Standard BS CECC 00015 entitled Basic Specification: Protection of Electrostatic Sensitive Devices. This documentation is available from:

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