

Insulated gate bipolar transistor wikipedia

A power MOSFET is a specific type of metal-oxide-semiconductor field-effect transistor (MOSFET) designed to handle significant power levels. Compared to the other power semiconductor devices, such as an insulated-gate bipolar transistor (IGBT) or a thyristor, its main advantages are high switching speed and good efficiency at low voltages. It shares with the IGBT an isolated gate that makes it easy to drive. They can be subject to low gain, sometimes to a degree that the gate voltage needs to be higher than the voltage under control.

The design of power MOSFETs was made possible by the evolution of MOSFET and CMOS technology, used for manufacturing integrated circuits since the 1960s. The power MOSFET shares its operating principle with its low-power counterpart, the lateral MOSFET. The power MOSFET, which is commonly used in power electronics, was adapted from the standard MOSFET and commercially introduced in the 1970s.

The superjunction MOSFET is a type of power MOSFET that uses P⁺ columns that penetrate the N- epitaxial layer. The idea of stacking P and N layers was first proposed by Shozo Shirota and Shigeo Kaneda at Osaka University in 1978; David J. Coe at Philips invented the superjunction MOSFET with alternating p-type and n-type layers by filing a US patent in 1984 which was awarded in 1988.

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