This Sheet Has Been Replaced

POWER MOSFET WITH OVERCURRENT AND OVER-TEMPERATURE PROTECTION

ABSTRACT OF THE DISCLOSURE

A power integrated circuit is pin-compatible with a three-terminal power MOSFET and contains integrated circuits to turn off the device in the event of an overcurrent or an over-temperature condition. Control power voltage V_{cc} is applied through a first MOSFET (20) connected between the gate pin (16) and the gate electrode (10) of the power device. A second control MOSFET (14) is connected across the power device gate (10) and source (12) electrodes. The first control MOSFET is turned off and the second control MOSFET is turned on in response to a fault condition. The turn off of the first MOSFET limits the current sinked by the gate pin. A novel boot strap circuit is disclosed which permits the use of all N channel MOSFETs with an N channel power device, and a novel trimmable temperature shutdown circuit is provided. An integrated bipolar transistor is also integrated into the chip to prevent conduction of the P well/N epi diode formed in the device substrate.