The ESD Protection Design of Lateral DMOSFETs

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ABSTRACT

In recent years, many electric systems, such as automatic electronics, power switches, power rectifiers, and display drivers, have widely used power MOSFETs . In the future, the electric industry will develop power MOSFETs into high voltage, high current, and high speed switch modules. However, the problems of ESD still exist and are even more serious than intelligent circuit in low voltage process. Because electrical static discharge (ESD) problems are getting more and more serious, design of traditional ESD devices mostly utilizes trial and error, experimental measurements, or equal circuit simulations with SPICE to acquire proper protection devices. This research used computer simulation software TSUPREM-4 and MEDICI to simulate and improve the electrical property of device and to design a set of ESD protection circuits. Besides, this study also used the comparison results of the SCR layout parameters to make the electrical property of device performance meet the Design Window range and to reach the optimum of the ESD protection.

Keywords : LDMOS ; SCR ; TSUPREM-4 ; MEDICI ; ESD

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