The Device Manufacture and ESD Characteristics Measurement in an Advanced IGBT

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ABSTRACT

In this thesis, an advanced IGBT device was simulated by using of three dimension simulation tool-Davinci, which could simulate the three dimension device structure and analyze the device characteristics. Meanwhile, the Davinci also could be used to design the physical parameters in manufacturing process, and it will exactly accomplish the object of device designing. The advanced IGBT is mainly toward improve the power performance.However, the device should be operated at high current density and high voltage situation.Thus, to reduce the loss of power performance, the device need to be haven the lower on-resistance and the fast switching speed in the forward conduction. Finally, in order to avoid the ESD(Electrostatic Discharge) damage, which could be caused the breakdown of gate oxidation, the IGBT device will be added the zener diode for the ESD protection consideration. Key words : Power performance, On-resistance, Switching speed, ESD, Zener diode

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