

Fabrication and Analysis of Vertical Double-Diffused Metal Oxide Semiconductor (VDMOS)

Authors : Deepika Sharma, Bal Krishan

Abstract : In this paper, the structure of N-channel VDMOS was designed and analyzed using Silvaco TCAD tools by varying N⁺ source doping concentration, P-Body doping concentration, gate oxide thickness and the diffuse time. VDMOS is considered to be ideal power switches due to its high input impedance and fast switching speed. The performance of the device was analyzed from the I_{ds} vs V_{gs} curve. The electrical characteristics such as threshold voltage, gate oxide thickness and breakdown voltage for the proposed device structures were extracted. Effect of epitaxial layer on various parameters is also observed.

Keywords : on-resistance, threshold voltage, epitaxial layer, breakdown voltage

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