

A Double Epilayer PSGT Trench Power MOSFETs for Low to Medium Voltage Power Applications

Authors : Alok Kumar Kamal, Vinod Kumar

Abstract : The trench gate MOSFET has shown itself as the most appropriate power device for low to medium voltage power applications due to its lowest possible ON resistance among all power semiconductor devices. In this research work a double-epilayer PSGT structure using a thin layer of N+ polysilicon as gate material. The total ON-state resistance (RON) of UMOSFET can be reduced by optimizing the epilayer thickness. The optimized structure of Double-Epilayer exhibits a 25.8% reduction in the ON-state resistance at $V_{gs}=5V$ and improving the switching characteristics by reducing the Reverse transfer capacitance (Cgd) by 7.4%.

Keywords : Miller-capacitance, double-Epilayer;switching characteristics, power trench MOSFET (U-MOSFET), on-state resistance, blocking voltage

Conference Title : ICACEEE 2024 : International Conference on Applied Control, Electrical and Electronics Engineering

Conference Location : Dubai, United Arab Emirates

Conference Dates : March 11-12, 2024