

Abstract Submitted
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Improved n-type 4H-SiC Schottky Barrier Diodes Using Metal Boride Contacts¹ RANI KUMMARI, TOM ODER — We fabricated Schottky barrier diodes using Schottky contacts of different refractory metal borides deposited at room temperature ($\sim 20^\circ\text{C}$) and high temperature (600°C) on 4H n-type SiC. The borides investigated included W_2B , W_2B_5 , WB , CrB_2 , TiB_2 , HfB_2 and ZrB_2 . The thermal stability of the diodes was tested by annealing using rapid thermal processor (RTP) at 600°C for 20 minutes in nitrogen. The electrical properties of the diodes were characterized by using current-voltage (I-V) and capacitance-voltage (C-V) measurements before and after the annealing. The physical property of the boride/SiC contact was investigated using Rutherford backscattering spectroscopy (RBS). The diodes with the contacts deposited at 600°C had ideality factors around 1.04 – 1.17, while the diodes with the contacts deposited at room temperature had much larger ideality factors, and in both cases, the barrier heights varied from 0.94 to 1.12 eV. This improvement was traced to the removal of oxygen from the boride/SiC interface.

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