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Electrical properties of Ti/SiC Schottky barrier diodes TOM ODER, KRISHNA KUNDETI, SUNDAR ISUKAPATI, NICHOLAS BROUCKI, Department of Physics and Astronomy, Youngstown State University — Silicon carbide Schottky barrier diodes were fabricated with Ti Schottky contacts. The contacts were deposited at different temperatures ranging from 28 ^{o}C to 900 ^{o}C using a magnetron sputtering deposition system. The diodes were then annealed at 500 ^{o}C in vacuum for up to 60 hours. Diodes with the contacts deposited at 200 ^{o}C and annealed for 60 hours had the optimum current-voltage characteristics consisting of large barrier height of 1.13 eV and ideality factor of 1.04. These diodes also had a very low leakage current of 6.6 x 10-^{8} A at a reverse voltage bias of 400 V. The X-ray diffraction analysis of the Ti/SiC contacts revealed the formation of TiC, Ti5Si3 and Ti3SiC2 at the interface. The improved properties for diodes with contacts deposited at 200 ^{o}C could be related to formation of reaction products possessing high work functions. These improvements could provide significant gains in performance of 4H-SiC Schottky diodes where Ti is a common metal contact.

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